# Chapter 3 MITIGATION STRATEGY

## *In This Chapter*

The Oregon NHMP Mitigation Strategy is divided into five sections:

1. **Introduction:** States the purpose of the mitigation strategy.
2. **Mission, Vision, and Goals:** Presents Oregon's natural hazard mitigation mission, vision, and goals, and describes the review and revision of the goals that guide the selection of mitigation actions. Discusses the links between the Risk Assessment,goals, and mitigation actions and demonstrates how the goals guide the selection of mitigation actions.
3. **Mitigation Actions:** Includes the following components:
   - Mitigation Actions: Describes the process for identifying, evaluating, and prioritizing cost-effective, environmentally sound, and technically feasible mitigation actions and activities the state is considering implementing over the next five years (Priority); that the state implements as part of its agencies' regular work programs (Ongoing); and that the state has or will not implement (Removed). Descriptions of the mitigation actions in the tables explain how each action contributes to the overall mitigation strategy. Identifies changes in mitigation action priorities from the 2012 Plan. Presents the 2015 mitigation action tables and a crosswalk showing the disposition of the 2012 mitigation actions in the 2015 Plan. Three tables and a score sheet demonstrating key phases of the process are located in **Appendices 9.2.1**, **9.2.2**, **9.2.3**, and **9.2.4**.
   - Funding Sources for Mitigation Actions: Current and potential sources of funding for mitigation actions are discussed briefly in this section and more fully in the State Capability Assessment section of this chapter. They are also noted on the Priority and Ongoing mitigation action tables. The sources of funding used to implement mitigation actions since approval of the 2012 Oregon NHMP are noted on the Ongoing and Removed mitigation action tables in this chapter.
   - Mitigation Successes: Describes successful mitigation actions throughout Oregon from 2012 through 2014.
4. **Capability Assessment:**
   - State: Assesses the state's capability to carry out the mitigation strategy through its pre- and post-disaster hazard management policies, including those related to development in hazard-prone areas, programs, and funding capabilities. Discusses changes in these capabilities since approval of the 2012 Oregon NHMP.
   - Local: Generally describes and analyzes in table format the effectiveness of local mitigation policies, programs, and capabilities. Also in table format, indicates status of local jurisdictions' NHMPs and participation in the National Flood Insurance and CRS Programs.
5. **Coordinating State and Local Mitigation Planning:** Describes the state's support of local mitigation planning through funding and technical assistance, as well as the way the state prioritizes funding for local mitigation planning and projects. Describes the processes the state uses to review local NHMPs and to coordinate and link local NHMPs to the Oregon NHMP.

## 3.1 Introduction

The purpose of this chapter is to establish Oregon's mission and vision for mitigation planning, and to present the State's strategy for achieving that vision. The mission, vision, and goals are purposefully aspirational, providing the foundation for the state's overall mitigation strategy. The culture of our state is influenced by its rich natural resources and pioneering spirit. Oregon has often taken a leading role in the development of innovative and progressive strategies to address issues that impact our residents, our economy and our natural and built environment. The Oregon Beach Bill (1967), the Oregon Bottle Bill (1971) and the Oregon Land Use Program (1973) are but three historical examples of Oregon's visionary spirit.

As it relates to natural hazard mitigation, Oregon is no less visionary. The state adopted its first natural hazards mitigation plan in 1992 with subsequent updates occurring in 2000, 2004, 2006, 2009, and 2012. In addition, Oregon's Clackamas County adopted the nation's first FEMA approved Natural Hazards Mitigation Plan under DMA2K in 2002. Hazard mitigation planning as a foundation for plan implementation through hazard risk reduction project activities is a top priority in Oregon when using available state funding, post-disaster FEMA mitigation grants and non-disaster FEMA grant funding.

Given the current economic climate, it is important to acknowledge that state resources are limited. Oregon is not unique in that regard. Even so, Oregon is committed to remaining at the forefront of mitigation planning and will continue to innovate and leverage limited resources to reduce losses resulting from natural hazards in our state. The mitigation strategy presented herein reflects that commitment.

## 3.2 Mission, Vision, and Goals

***Requirement 44 CFR §201.4(c),*** *To be effective the plan must include the following elements:*
*(3) A Mitigation Strategy that provides the State's blueprint for reducing the losses identified in the risk assessment. This section shall include:*
*(i) A description of State goals to guide the selection of activities to mitigate and reduce potential losses.*

MISSION — Create a disaster-resilient state of Oregon.

VISION — Natural hazard events result in no loss of life, minimal property damage, and limited long-term impacts to the economy.

GOALS

1. Protect life and reduce injuries resulting from natural hazards.
2. Minimize public and private property damages and the disruption of essential infrastructure and services from natural hazards.
3. Increase the resilience of local, regional, and statewide economies.
4. Minimize the impact of natural hazards while protecting, restoring, and sustaining environmental processes.
5. Enhance and maintain state capability to implement a comprehensive statewide hazard loss reduction strategy.
6. Document and evaluate Oregon's progress in achieving hazard mitigation.

7 Motivate the public, private sector, and government agencies to mitigate against the effects of natural hazards through information and education.

8 Eliminate development within mapped hazardous areas where the risks to people and property cannot be mitigated.

9 Minimize damage to historic and cultural resources.

10 Increase communication, collaboration, and coordination among agencies at all levels of government and the private sector to mitigate natural hazards.

11 Integrate local NHMPs with comprehensive plans and implementing measures.

### 3.2.1 Goals: Review and Revision

At its April 2014 meeting, the State IHMT reviewed the eight 2012 Oregon NHMP goal statements (Goals 1–8) and decided to revise Goal 4 to reflect the state's focus not only on protecting and restoring the environment, but also on sustaining environmental processes.

At the same meeting, the State IHMT discussed topics addressed by county-level NHMP goals but not by Oregon's: 1) cultural and historic resource protection; 2) better collaboration and coordination between all levels of government and the private sector; and 3) integration of NHMPs with local comprehensive plans. More information is provided in **Section 3.5.3.2** and **Table 3-18**. The State IHMT adopted Goals 9-11 addressing these topics, better aligning and coordinating State and local natural hazards mitigation plans.

### 3.2.2 Goals: Linking the Risk Assessment and Mitigation Actions

Natural hazard mitigation plan goals link the risk assessment and mitigation actions, guiding the direction of future natural hazard risk reduction and loss prevention activities.

The risk assessment speaks directly to protection of life and property, infrastructure and services, and local, regional, and state economic resilience, the topics of Goals 1, 2, and 3. The vulnerability assessments for each hazard and the potential loss estimates highlight the importance of informing and educating citizens about the risks and what they can do to reduce potential losses, including eliminating development where risks cannot be mitigated, the topics of Goals 7 and 8. Environmental stewardship, the topic of Goal 4, plays a role in mitigating some hazards, and must be considered in designing mitigation projects. While not specifically called out in the goal language, mitigation of repetitive loss and severe repetitive loss properties is unquestionably supported by Goals 1, 2, 4, and 8. Goals 1,2, and 4 set policy direction for reducing harm to people, property, and the environment respectively. Goal 8 is more specific, setting policy direction for prohibiting development in or moving development out of hazard areas under certain circumstances. These are clear connections between the information in the risk assessment and the existing goals.

Goals 5 and 6 are more administrative in nature. Goal 5 focuses on the state's ability to implement the Plan, the subject of the *Capability Assessment* element of the *Mitigation Strategy*. Goal 6 focuses on documenting and evaluating progress in achieving mitigation, elements of the *Mitigation Strategy* and the *Planning Process*.

The information in the risk assessment also supports these statements:

A. More data are available for some hazards than others, resulting in a more robust risk analysis for the more data-rich hazards.

B. There is a clear need to develop a statewide standardized risk assessment methodology across all hazards.

C. Similarities and differences between state and local level vulnerability assessments have not been analyzed. Some state and local vulnerability assessments are quite consistent, while others are starkly inconsistent. Communication and education among state and local staff responsible for assessing vulnerability would improve understanding and consistency.

D. Several hazards are related to one another through cause and effect (e.g., earthquakes and tsunamis, floods and landslides, drought and wildfires) or through shared drivers (e.g., El Nino Southern Oscillation [ENSO]), indicating opportunity for increasing interagency collaboration and efficiencies in research and mitigation activities.

E. Some State-owned/leased buildings or critical/essential facilities and their contents cannot be accurately identified using available state data. Property values are not available for critical/essential facilities that are not State-owned/leased. Local knowledge could be helpful in improving the state data by more accurately identifying buildings and their contents and determining which buildings and critical/essential facilities should be prioritized for mitigation. The state data could be useful at the local level as well. This opportunity for state and local collaboration could improve risk assessments and loss estimates at both levels.

These statements address issues covered by Goals 1, 2, 3, 7, and 8. In particular, they raise an important question concerning Goal 5, the state's capability to implement a comprehensive statewide hazard loss reduction strategy. The State currently recognizes 11 hazards, obligating it to address each one, and strives to do so as fully and equitably as possible. Due to staffing, funding, data availability, access to expertise, or other reasons, some hazards cannot be addressed to the same extent as others. Prioritizing hazards would allow resources to be strategically targeted. At the same meeting, the IHMT decided to consider prioritizing hazards for the next Plan update.

These statements also suggest a few new mitigation actions:

1. Analyze the similarities and differences between state and local vulnerability assessments.
2. Schedule three opportunities for state/local dialogue on local vulnerability assessments in the next year to improve consistency and mutual understanding.
3. Collaborate with local governments to improve the accuracy of potential loss totals by more accurately identifying critical/essential facilities, and determining their property values.
4. Improve state agency procedures for tracking data on State-owned/leased buildings and critical/essential facilities.
5. Develop an improved methodology for gathering data and identifying the communities most vulnerable to drought.
6. Establish a program for studying winter storms and their impacts statewide. Install snowfall sensors throughout the state to develop annual snowfall data.

The IHMT decided further to include these mitigation actions with a few revisions as follow in the 2015 Plan:

1. Analyze the similarities and differences between state and local vulnerability assessments. (Same)
2. Schedule three opportunities *over the life of this plan* for state/local dialogue on vulnerability assessments to improve consistency and mutual understanding. *(Revised)*
3. Collaborate with local governments *to develop a database of non-State-owned critical/essential facilities and their property values. (Revised)*
4. Improve state agency procedures for tracking data on State-owned/leased buildings and critical/essential facilities. (Same)
5. Develop an improved methodology for gathering data and identifying the communities most vulnerable to drought *and related impacts*. *(Revised)*
6. Establish a program for studying winter storms and their impacts statewide. *As a part of that program, develop a system for gathering snowfall data statewide. (Revised)*

Later in the process, new mitigation actions #1 and #2 were combined. The mitigation action tables (Priority, Ongoing, and Removed) demonstrate the link between the goals and mitigation actions by noting the goal(s) that each mitigation action addresses.

## 3.3 Mitigation Actions

**Requirement 44 CFR §201.4(c),** To be effective the plan must include the following elements:

(3) A Mitigation Strategy that provides the State's blueprint for reducing the losses identified in the risk assessment. This section shall include:

(iii) An identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy. This section should be linked to local plans, where specific local actions and projects are identified.

(iv) Identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities.

### 3.3.1 Identification, Evaluation, and Prioritization

Mitigation actions are detailed recommendations for activities that the state is considering implementing to reduce risk and prevent loss from natural hazards.

The 2015 Oregon NHMP mitigation actions were developed through a process that began with reviewing the 2012 Plan mitigation actions to establish their implementation status (not started, progressing, completed, not being pursued) and evaluating them against several criteria:

1. Statutory (cost-effective, technically feasible, environmentally sound);

2. SMART (specific, measurable, achievable, realistic, time-oriented); and

3. Whether they were integrated with related state initiatives (e.g., Oregon Resilience Plan, Oregon Climate Change Adaptation Framework, Oregon Plan for Salmon and Watersheds, etc.).

As a result of this evaluation process, the mitigation actions were placed into one of three categories: priority, ongoing, or removed. Priority actions are those the state aspires to begin or complete; ongoing actions are those the state is doing in the normal course of business, continually over a long period of time; and removed actions are those that have been completed; will not be completed for various reasons; have been replaced by other actions; are not mitigation actions; or have been determined not to be within the State's purview. A table has been created for each category.

Also as a result of this evaluation, many actions were broken into their component parts and placed on the appropriate tables. For example, LP-5, *Establish a system of special zones, procedures, restrictions, and conditions to limit development in tsunami inundation zones* was broken into four component parts:

1. *Develop* land use guidance and best practices for local governments for reducing risk within tsunami inundation zones.
2. *Provide* land use guidance and best practices for reducing risk within tsunami inundation zones to local governments.
3. *Assist* local governments in implementing the land use guidance and best practices for reducing risk within tsunami inundation zones.
4. *Monitor* the effectiveness of the land use guidance and best practices for reducing risk within tsunami inundation zones provided to local governments.

The first two parts—develop guidance and provide it to local governments—have been done, and they are entered on the *Removed* table. The last two—assist local governments in using the guidance and monitor its effectiveness—have not, and will continue to be implemented for many years to come. They have been entered on the *Ongoing* table. While this approach results in more actions, it facilitates tracking, reporting, and highlighting achievements.

The next task was to prioritize the actions on the *Priority* table. This was done in two steps. First, each action was scored according to the statutory criteria (cost-effective, technically feasible, and environmentally sound) and STAPLEE (social, technical, administrative, political, legal, economic, and environmental). A score sheet was developed that weighted all the criteria except cost-effectiveness and political support. The score totals were considered to be an indication of cost-effectiveness—the higher the score the more cost-effective the action.

The political criterion was covered in the second step. State agency managers who would be responsible for implementing the actions were asked to provide their agency's level of support for the actions for which their agency was identified as the lead. A rating of *1* indicated that the action is likely to be funded and undertaken during the life of the 2015 Plan. A rating of *3* indicated that although the action is important and the agency wants to accomplish it, the action is unlikely to be funded or undertaken during the life of the 2015 Plan. A rating of *2* indicated uncertainty about the likelihood of funding or accomplishment.

The Progress and Initial Evaluation, Prioritization, and Level of Support tables and Prioritization Score Sheet illustrating these key points in the development of the final 2015 Plan Mitigation Action Tables are presented in **Appendices 9.2.1**, **9.2.2**, **9.2.3**, and **9.2.4**, respectively.

Each priority action was then ranked according to its political rating first and then its score. Where tied, the number of hazards addressed was considered next, then the number of Plan goals addressed, then the target date, and finally the original action number. The State IHMT members agreed that ongoing actions #79 - #82 are so important and representative of the essence of the State's natural hazard mitigation program that they should be listed first. The rest of the ongoing actions were ranked using first the number of hazards addressed, then the number of goals addressed, then the original action number. Removed actions are listed in the same order as they appear in the 2012 Plan, with new or revised but removed actions inserted in association with related 2012 actions. These inserted new or revised actions were removed because they were already done. To avoid confusion in subsequent updates they were assigned the letters A–G instead of numbers.

### 3.3.2 Mitigation Action Tables: Priority, Ongoing, Removed

The 2015 Oregon NHMP mitigation actions are arranged in a series of three tables: *Priority*, *Ongoing*, and *Removed* (**Table 3-1**, **Table 3-2**, and **Table 3-3**, respectively). On each table, mitigation actions are numbered and presented as a brief statement with a longer description that explains its contribution to the overall mitigation strategy of the 2015 Plan. The goal(s) and hazard(s) each action addresses are identified. The *Priority* table includes the individual action item scores, ratings, and final ranking. On the *Priority* and *Ongoing* tables, other state initiative(s) with which an action is integrated is identified.

Current and potential funding sources are also identified. For actions on the *Priority* table, the funding sources should be understood primarily as potential sources since the State budget for the 2015-2017 biennium is still being developed and many are based on outside grant funding that is still uncertain. More of the funding sources for actions on the *Ongoing* table are stable, but again should be considered primarily as potential sources. On the *Removed* table, funding sources for actions that have been completed are identified.

A crosswalk (**Table 3-4**) has been developed to aid in demonstrating how the 2012 Plan's mitigation actions are represented in the 2015 plan.

### 3.3.3 Changes in Mitigation Action Priorities

The 2012 Plan's priority mitigation actions were recommended to and confirmed by the State IHMT. The recommendation was made by a subcommittee of the State IHMT based on existing knowledge about probability and vulnerability. Twenty-three of the 148 mitigation actions are identified as priority actions. The 2015 Plan identifies 78 priority mitigation actions and 71 ongoing mitigation actions for a total of 149. The 2015 Plan's priority mitigation actions were ranked less subjectively, using a numerical scoring method.

To meet SMART (Specific, Measurable, Achievable, Realistic, Time-oriented) criteria, several of the 2012 Plan's actions were revised or split into two or more actions. Because there is not a clear action-for-action relationship between the two lists of actions, it is difficult to provide a meaningful accounting or statistics describing how the mitigation action priorities may have changed. Nevertheless, it is possible to make some statements.

Of the 2012 Plan's priority actions:

- Two were completed as stated.

- Three more were split into a total of twelve parts. Of those, three actions were completed; three actions are ongoing; and six are priority actions in the 2015 Plan.
- Eight more remain among the 2015 priority actions.
- Four others were removed because they are covered by 2015 priority actions.
- Three were removed because they are covered by ongoing actions.
- Three of the 2012 priority actions were considered not to be mitigation actions at all for the 2015 Plan. Two are administrative in nature and one is a recovery action.

Completed 2012 priority actions indicate that those priorities did not change. The majority of the remainder are in the top 40% (ranked between 1 and 31) of 2015 priority actions. Taken together and considered generally, this indicates that the priorities of the 2012 and 2015 plans are still largely aligned.

In terms of themes, however, continued alignment between the two sets of mitigation actions becomes clear. The shared priorities include:

- Obtaining legislative support for implementation of natural hazards policies and mitigation actions.
- Implementing Statewide Goal 7, including supporting local government integration of NHMPs with comprehensive plans; and developing, distributing, and assisting local governments with implementing risk reduction techniques and model codes.
- Enhancing coordination of state and local mitigation planning.
- Enhancing implementation of the Community Rating System statewide.
- Inventorying and protecting State-owned/leased buildings from natural hazards.
- Improving reliability and resiliency of critical infrastructure statewide.

### 3.3.4 Funding Sources for Mitigation Actions

Oregon's mitigation activities are funded directly and most visibly through sources such as FEMA's Pre-Disaster Mitigation Grant, Flood Mitigation Assistance, Public Assistance, and Hazard Mitigation Grant Programs, as well as NOAA grants with state, local, or private funds providing the non-federal cost share. The State's Seismic Rehabilitation Grant Program is a direct funding source for earthquake mitigation projects. The Oregon Disaster Assistance Loan and Grant account provides post-disaster mitigation funds to local governments and school districts. The Governor's 2015-2017 budget includes funding for beginning development of the new risk assessment concept methodology and for providing grants to local governments to support local NHMP development and updates through its existing Technical Assistance Grant Program. Final State budget decisions will be made by the Oregon Legislature after this Plan is complete. More indirect and less visible funding comes from state general funds through in-kind activities and other state funds. More detailed information about mitigation funding sources is in the State Capability Assessment, **Funding Sources** section.

**Table 3-1. Priority Mitigation Actions**

## 2015 MITIGATION ACTIONS—PRIORITY

| Action Item | | | PRIORITY | Score | Level of Support | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | RANK | Score ≈ Benefit/Cost | 1 = Likely by 3/2020<br>2 = Not sure<br>3 = Unlikely by 3/2020 | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Other Initiative | Lead | Support | Current or Potential Funding Source(s) | Target Date |
| **1** | Develop and fund a legislative package for general funds or lottery funds to match federal funding for local hazard mitigation planning, including additional funds for DLCD Technical Assistance Grants. | Continue—and enhance where possible—state technical and planning grant assistance to cities and counties for addressing issues associated with local hazards. | 1 | 28 | 1 | X | X | X | X | X | | X | X | X | | X | 9 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Local Disaster Assistance Loan and Grant Account. | DLCD | OEM | State-OEM, DLCD | 2015 |
| **2** | Create a "Clearinghouse" for natural hazards data. | Emergency responders and community planners alike need access to the best and most current natural hazards data that is available. This project would be a cooperative effort between authoritative data sources -- DLCD, DOGAMI, OEM, OWRD, and federal partners (FEMA, USACE, NWS, USGS)—and would include:<br>• Establishing a single point of online access to reliable data, maps, and information about natural hazards;<br>• Developing, in conjunction with DAS-GEO, a "portal" to distribute this data;<br>• Developing a multi-agency State of Oregon flood hazard website;<br>• Providing an ongoing inventory and assessment of existing natural hazards data; and<br>• Creating a central library for natural hazard risk assessments. | 2 | 23 | 1 | X | X | | | X | | X | X | X | X | X | 8 | X | X | X | X | X | X | X | X | X | X | X | 11 | Risk MAP; Risk Plan; Framework Implementation Teams; OEM's Master Dataset; Local Natural Hazards Mitigation Plans; Governor's interagency collaboration initiative; Goal 7 implementation; NFIP; DEQ's IRIS database; etc. | DLCD | DAS-GEO, DEQ, DOGAMI, OWRD, OEM, FEMA, USACE, NDWS, USGS | FEMA, State-DAS-GEO | 2016 |
| **3** | Enroll three coastal communities in the Tsunami Ready Program each year. | The Tsunami Ready Program is a program sponsored by the National Weather Service that is designed to provide communities with incentives to reduce their tsunami risk. Cannon Beach was the first community for Oregon. Under a proposed plan through the National Tsunami Hazard Mitigation Program (NTHMP), three communities per year will be added to the rolls of the program. This program is currently evolving through a review process being carried out by the NTHMP National Coordinating Committee. OEM is the primary point of contact for more information about the Tsunami Ready Program. | 3 | 23 | 1 | X | X | X | | | | X | | | X | | 5 | | | | | | X | | | | | 1 | Oregon Resilience Plan | OEM | DOGAMI | NOAA | 2018 |

# 2015 MITIGATION ACTIONS—PRIORITY

| Action Item | | | PRIORITY | Score | Level of Support | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | RANK | Score ≈ Benefit/Cost | 1 = Likely by 3/2020<br>2 = Not sure<br>3 = Unlikely by 3/2020 | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Other Initiative | Lead | Support | Current or Potential Funding Source(s) | Target Date |
| **4** | Complete a hazard mitigation policy legislative needs assessment | The Oregon NHMP contains a number of specific policy recommendations. In addition, the state of Oregon maintains a number of policies related to natural hazards and the mitigation thereof. It is unclear at this time what legislative action may be needed in order to fully implement existing and proposed mitigation actions. The State IHMT recommends completing an assessment of the potential legislation needed to implement hazard mitigation policies. | **4** | 22 | 1 | X | X | X | X | X | X | X | X | X | X | X | 11 | X | X | X | X | X | X | X | X | X | X | X | 11 | NFIP, Goal 7 | OEM | State IHMT Agencies | State-OEM | 2015 |
| **5** | Develop model risk reduction techniques and ordinances for landslide-prone communities | Techniques can involve requiring geological or geotechnical studies for new development, stormwater control for neighborhoods on hillsides, strict land use ordinances for active landslides, working with infrastructure operators to increase reliability of services after storms, and more. | **5** | 22 | 1 | X | X | X | | | | X | X | | X | X | 7 | | | | | | X | | | | | | 1 | Statewide Planning Goal 7 | DLCD | DOGAMI | State-DLCD | 2015 |
| **6** | Form an Oregon Landslide Workgroup. | An Oregon Landslide Workgroup will be created to prioritize areas for new mapping projects, to promote landslide hazard awareness through education & outreach, to develop and influence policy at the federal state, and local levels, and to assist in response & recovery efforts during disasters. | **6** | 22 | 1 | X | X | X | | X | | X | | | X | X | 7 | | | | | | X | | | | | | 1 | Statewide Planning Goal 7 | DOGAMI | | State-DOGAMI | 2015 |
| **7** | Through FEMA's Risk MAP program, update 1,000 miles of streams with lidar-based flood mapping. | FEMA's Risk MAP program funds revisions of Flood Insurance Studies and Flood Insurance Rate Maps. The State should focus on updating these products so they are based on high quality topographic data (e.g., lidar). Lidar-derived streams are a by-product of high quality topographic data. These more accurately located streams will assist in the improvement of a community's flood maps to more accurately show flood risk to life and property. The State should continue to pursue Risk MAP funds for this purpose. | **7** | 22 | 1 | X | X | | | | | X | X | | X | X | 6 | | | | | X | | | | | | | 1 | NFIP | DLCD, DOGAMI | | FEMA | 2016 |
| **8** | Create a new lidar-based statewide landslide susceptibility map. | DOGAMI will develop a statewide landslide susceptibility map of Oregon as part of the Oregon Geographic Information Council (OGIC) Framework Data Development Program. This map will be used by the Oregon Landslide Workgroup (#6, Priority) to prioritize locations for more detailed Landslide Inventory and Susceptibility Maps. | **8** | 22 | 1 | X | X | X | | | | X | X | | | | 5 | | | | | | X | | | | | | 1 | Statewide Planning Goal 7 | DOGAMI | | DAS-GEO | 2015 |
| **9** | Upgrade the Oregon Landslide Warning System. | The current warning system needs updating to include rainfall thresholds from local rainfall gauges. A permanent real-time website will be constructed to show the areas under a landslide warning that will include guidance on what people should do to help protect their life and property from a landslide. | **9** | 22 | 1 | X | X | | | X | | X | | | X | | 5 | | | | | | X | | | | | | 1 | | DOGAMI | | DOGAMI, USGS | 2020 |

# 2015 MITIGATION ACTIONS—PRIORITY

| Action Item | | | PRIORITY | Score | Level of Support | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | RANK | Score ≈ Benefit/Cost | 1 = Likely by 3/2020<br>2 = Not sure<br>3 = Unlikely by 3/2020 | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Other Initiative | Lead | Support | Current or Potential Funding Source(s) | Target Date |
| **10** | Implement the Rapid Assessment of Flooding Tool (RAFT) | The RAFT has been funded and developed by the US Army Corps of Engineers (USACE) through FY 14 for $115,000. The goal of the RAFT is to take real time flood forecasts and relate them to flood frequency curves from FEMA, USGS, and OWRD. This will help decision makers prioritize real-time flood fighting assistance. The tool will also incorporate other important decision-influencing factors, possibly including structures in danger of flooding, population affected, and likelihood of levee failure. The RAFT is intended to work in concert with and feed data to other emergency management tools, such as OEM's RAPTOR. The RAFT is in very early development, and the scope and schedule are under development. Once RAFT is completed, OEM will have operational oversight when the ECC is activated. | **10** | 22 | 1 | X | X | | | | | | | X | | 3 | | | | | X | | | | | | | | 1 | Silver Jackets | Silver Jackets | DLCD, OEM, DOGAMI, OWRD | FEMA, USACE | 2016 |
| **11** | Develop guidance for local Gov'ts on how to use Goal 7 together with other pertinent Statewide Land Use Planning Goals to classify lands subject to natural hazards in the buildable lands inventory and adjust urban growth boundaries in a manner that minimizes or eliminates potential damage to life, property, and the environment while continuing to provide for efficient development patterns. | Goal 7 discourages new development in areas subject to natural hazards. Goal 14 and other Statewide Land Use Planning Goals encourage development within urban growth boundaries. Local Gov'ts need guidance on how to classify lands subject to natural hazards in their buildable lands inventories and adjust urban growth boundaries to protect life, property, and the environment from natural hazards while providing for efficient development patterns within urban growth boundaries. This guidance will assist local Gov'ts in integrating local natural hazards mitigation plans with comprehensive plans. | **11** | 21 | 1 | X | X | X | X | | | | X | | X | X | 7 | X | X | X | X | X | X | X | X | X | X | X | 11 | Statewide Planning Goals | DLCD | DOGAMI, ODF | State-DLCD | 2020 |
| **12** | Assist one coastal community per year in considering vertical evacuation structures and improved evacuation routes due to evacuation constraints. | Use the anisotropic path modeling to measure the time needed to evacuate all parts of the maximum-considered Cascadia tsunami inundation zone in order to evaluate the need for vertical evacuation structures and improvements in evacuation routes. These actions will provide guidance to communities on the best locations to build vertical evacuation structures that will save lives in a catastrophic tsunami event. The results will also inform communities of priority evacuation routes needing additional signage or way-finding markers. The planned communities are:<br>2014 = Seaside<br>2015 = Warrenton<br>2016 = Rockaway Beach<br>2017 = Siletz Bay area<br>2018 = Pacific City | **12** | 21 | 1 | X | | X | | | | X | | | X | X | 5 | X | | | X | | | X | | | | | 3 | Oregon Resilience Plan | DOGAMI | OEM | NOAA | 2018 |

# 2015 MITIGATION ACTIONS—PRIORITY

| Action Item | | | PRIORITY | Score | Level of Support | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
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| **13** | Produce new lidar-based flood hazard maps | Lidar-based flood hazard maps are produced for counties or watershed as funding is provided. These maps have newly delineated flood zones based on new detailed studies, new coastal analysis, and/or delineation of existing zones based on new topography data (lidar). Lidar-based flood hazard maps are being produced or are anticipated to be produced for:<br>• Silvies Watershed<br>• Lower Columbia River/Sandy River Watershed<br>• Clatsop County<br>• Tillamook County<br>• Lincoln County<br>• Curry County<br>• Lane County<br>• Douglas County | **13** | 21 | 1 | X | X | X | | | | X | X | | | | 5 | | | | | X | | | | | | | 1 | NFIP, Risk MAP | DOGAMI | DLCD | FEMA, Local Gov'ts | 2018 |
| **14** | Create an informational website for the new Base Flood Elevation Determination Service. | Create website that describes the state's base Flood Elevation Determination Service. Website will include brochure, pricing, map of completed determinations, and data clearinghouse for completed determinations. | **14** | 21 | 1 | X | X | | | | | X | X | | | | 4 | | | | | X | | | | | | | 1 | NFIP, Risk MAP | DOGAMI | DLCD | State-DOGAMI | 2015 |
| **15** | Develop new standardized risk assessment methodology across all hazards, at the state and local levels. | Oregon does not have a clear and common methodology to identify the most vulnerable populations across all hazards at the state and local levels. In 2013, the State IHMT Risk Assessment Subcommittee in partnership with the OPDR and the U of O InfoGraphics Lab developed a model concept, work plan and budget. Pending funding, this model could be fully developed between 2014 and 2019 and then be used to inform the 2020 Oregon NHMP. Upon full development, the model will allow state and local Gov'ts to strategically target mitigation resources. | **15** | 20 | 1 | X | X | | | | | | | X | X | | 4 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Resilience Plan, NFIP, Risk MAP, Oregon Climate Change Adaptation Framework, Oregon Health Authority | DLCD | DEQ, OEM, DOGAMI, OHA, UO, BusOR-IFA, FEMA | FEMA, State-DLCD, OEM, DOGAMI, OHA, UO, BusOR-IFA | 2019 |
| **16** | Complete a Climate Change Vulnerability Assessment and Adaptation Pilot for north coast highways. | The goal of ODOT's pilot is to conduct a regional vulnerability assessment and prepare options for adaptation actions and priorities. In coordination with ODOT Maintenance, the project will collect and map vulnerability and risk data based on climate science, asset conditions, and known and anticipated natural hazards. Hazard sites will be selected within a study corridor for more detailed analysis. Based on engineering and technical reviews, adaptation measures will be developed for vulnerable infrastructure and assembled into a coastal adaptation implementation plan. ODOT received a Federal Highway Administration grant to conduct the project, scheduled for completion in fall 2014. | **16** | 20 | 1 | X | X | | | | | | | | X | | 3 | X | | | X | X | X | X | | | | | 5 | Oregon Resilience Plan, NFIP, Risk MAP, Oregon Climate Change Adaptation Framework, Oregon Health Authority | ODOT | OCCRI, DOGAMI, DLCD | FHWA | 2015 |

# 2015 MITIGATION ACTIONS—PRIORITY

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| **17** | Request LCDC to include Local Natural Hazards Mitigation Planning as a priority for DLCD Technical Assistance Grant awards to use as match for federal funds when available. | The Land Conservation and Development Commission (LCDC) awards Technical Assistance Grants to local Gov'ts to support local planning efforts in certain priority land use topic areas which at this time do not include natural hazard mitigation. If LCDC were to include natural hazards mitigation planning as a priority topic area, local Gov'ts would have the opportunity to compete for funding and the state would be better able to provide technical assistance for natural hazards mitigation planning. | **17** | 19 | 1 | X | X | X | X | X | | X | X | | | X | 8 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Local Disaster Assistance Loan and Grant Account. | DLCD | | State-DLCD | 2015 |
| **18** | Develop a process for implementing Goal 7. | Under Goal 7, DLCD is responsible for notifying local Gov'ts if new hazard information requires a local response. The process for determining which information should trigger local land use evaluations and notifying local Gov'ts, however, remains untested. DLCD will implement the process, review the results, and determine whether any changes are necessary. This action is necessary to ensure that local Gov'ts evaluate new hazard information and take necessary action to protect life and property. | **18** | 19 | 1 | X | X | X | | | | | X | | | X | 5 | X | X | X | X | X | X | X | X | X | X | X | 11 | Local Natural Hazards Mitigation Plans | DLCD | DOGAMI | State-DLCD | 2017 |
| **19** | Work with Business Oregon to introduce in 2015 legislation allowing reconstruction of structures that cannot feasibly be retrofitted. | Revise SRGP legislation or develop an alternate funding mechanism to help replace schools and emergency facilities that are too structurally deficient for cost-effective retrofit and need to be replaced instead. This would also include structures in the "local" tsunami inundation zone that should not be retrofit in-place but, rather, rebuilt on natural high ground. | **19** | 19 | 1 | X | X | X | | | | | | | | | 3 | | | | X | | | X | | | | | 2 | Oregon Resilience Plan | BusOR-IFA | OEM | State-SRGP | 2015 |
| **20** | Add at least five jurisdictions, with emphasis on coastal jurisdictions, to the Community Rating System (CRS) program during the life of each Oregon NHMP. | The CRS, part of the NFIP, is a program that rewards communities for going above and beyond the minimum requirements of the NFIP in minimizing potential losses due to flooding. Participating in the CRS benefits the jurisdiction with extra flood protection and benefits property owners by lowering flood insurance rates. See the CRS Information Center at: http://training.fema.gov/EMIWeb/CRS/ for more information. Each year DLCD conducts community assistance visits in an average of five NFIP communities. During this process, qualified jurisdictions will be encouraged to participate in CRS or strengthen CRS ratings. DLCD will also create a "pathway to CRS" schedule for each jurisdiction for which it conducts a community assistance visit.<br>The state has also started CRS Users' Groups (#C, Removed and #112, Ongoing) to encourage greater participation in the CRS program. | **20** | 19 | 1 | X | X | X | | | | X | | | | | 4 | | | | | X | | | | | | | 1 | NFIP | DLCD | | FEMA-CAP-SSSE | 2020 |

# 2015 MITIGATION ACTIONS—PRIORITY

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| **21** | Update the inventory of shoreline protective structures. | Update the inventory of existing and new coastal engineering (shore protection) structures on the Oregon Coast in order to provide local Gov'ts and applicable agencies an important coastal management tool to address anticipated increasing coastal erosion. | **21** | 19 | 1 | X | X | | | | | | | | | | 2 | X | | | | | | | | | | | 1 | NFIP, Risk MAP | OPRD | DLCD | NOAA, State-OPRD | 2015 |
| **22** | Develop flood protection standards for State-owned/leased buildings. | According to the SB 814 Task Force (Oregon Legislature, 1997 Session), there is a need to develop and effectively implement a strict standard governing the siting, construction, and leasing of buildings occupied by state agencies in flood-prone areas. | **22** | 19 | 1 | X | X | | | | | | | | | | 2 | | | | | X | | | | | | | 1 | NFIP | DAS-CFO | DLCD | State-DAS-CFO | 2020 |
| **23** | Update the state's Peak Discharge Estimation Program. | Peak discharge estimation tools can help determine the magnitude and frequency of floods. The state's program provides engineers and land managers with the information needed to make informed decisions about development in or near watercourses.<br>The Peak Discharge Estimation Program is based on a modified version of the U.S. Geological Survey's "Bulletin 17b." The U.S. Geological Survey is in the process of updating this bulletin. OWRD's methodology will need to be brought up to date to reflect these recent findings. | **23** | 19 | 1 | X | X | | | | | | | | | | 2 | | | | | X | | | | | | | 1 | Integrated Water Resource Strategy | OWRD | ODOT<br>OEM | State-OWRD | 2020 |
| **24** | Develop evacuation plans for ports and harbors at the rate of one per year. | Ports and harbors are the haven for commercial and recreational fishing and recreational boating industries. They are often the major centers of economic activity in coastal communities that have bays. To protect the vessels from tsunami damage requires a unique evacuation plan for both distant and local tsunamis. The plans should be integrated with community evacuation plans. The Oregon State University Extension Sea Grant Program has identified this as a major issue in their pilot project in Yaquina Bay. Their project is titled *Reducing Earthquake and Tsunami Hazards in the Pacific Northwest Ports and Harbors.*<br>For distant tsunami events and storm surge events that can occur during any winter, evaluate potential port and harbor mitigation retrofit projects that protect and strengthen floating and anchored infrastructure such as piers, bulkheads and landings. | **24** | 18 | 1 | X | X | X | | | | | | | X | | 4 | X | | | X | | X | | | | | | 3 | Oregon Resilience Plan, OSU Extension Sea Grant Program | DOGAMI | DLCD, OPDR | NOAA | 2018 |
| **25** | Integrate the GIS database of tsunami safe zones and assembly areas into local government databases. | Assist counties not only with how to integrate the data, but also how the data can be used for tsunami evacuation planning. | **25** | 18 | 1 | X | | | | | | X | | | X | X | 4 | X | | | | | | X | | | | | 2 | Oregon Resilience Plan | OEM | DOGAMI | NOAA, State, Local Gov'ts | 2015 |

# 2015 MITIGATION ACTIONS—PRIORITY

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| 26 | Incorporate text addressing hazard mitigation into natural resource agencies' guidance and process documents focusing on environmental quality to ensure that natural resources are protected in the design and construction of hazard mitigation projects. | Government and private nonprofit agencies in Oregon must address complex issues associated with flood hazard mitigation in the context of clean drinking water, riparian habitat, watershed health, fisheries, wetlands protection, and overall environmental quality.<br>An important plan related to this effort is the *Oregon Plan for Salmon and Watersheds.* Solutions require multi-agency and intergovernmental efforts. While the decisions and projects will vary with each disaster, the state will continue its efforts to develop appropriate policies and criteria to ensure that these are considered along with hazard mitigation needs. This includes guidance on large wood placement, restoration after flood events, and habitat-friendly methods to accomplish pre- and post-disaster hazard mitigation. Watershed assessments being completed around the state by local watershed councils will be used in the evaluation of flood hazards and floodplain processes. | 26 | 18 | 1 | | | | X | | | | | X | X | 3 | X | | | | X | | | | | | | | 2 | Oregon Plan for Salmon & Watersheds | ODFW, DSL | OEM, DLCD | USFWS, State-ODFW, DSL, OEM, DLCD, DEQ, OHA | 2015 |
| **27** | Develop a statewide strategy to encourage the purchase of flood insurance. | It's well-known that well-insured communities recover faster. A strategy will help the state direct information to under-insured areas thereby reducing vulnerability, facilitating recovery, and increasing access to "increased cost of compliance" funding. | **27** | 18 | 1 | X | X | X | | | | X | X | | X | | 6 | | | | | X | | | | | | | 1 | NFIP, CRS | DLCD | OEM | FEMA-CAP-SSSE | 2020 |
| **28** | Establish a web page where building owners can register their interest in participating in acquisition programs for flood-damaged buildings. | FEMA funds can be used to buyout repetitive loss and severe repetitive loss properties in the floodplain. The paperwork and process to achieve a buyout are lengthy and complex. First and foremost, a property owner must be willing to sell. Buyout funds could be more efficiently and effectively spent if willing sellers were identified and paperwork prepared before funds became available. This registry would augment the state's current outreach efforts, making it easy for willing sellers to identify themselves and for the state to prepare for and execute buyouts. | **28** | 18 | 1 | X | X | X | | | | X | | | X | | 5 | | | | | X | | | | | | | 1 | NFIP | OEM | DLCD | FEMA-CAP-SSSE, State-OEM, DLCD | 2015 |
| **29** | Strengthen the existing Community Rating System (CRS) rating of at least five jurisdictions, with emphasis on coastal jurisdictions, during the life of each Oregon NHMP. | The CRS, part of the NFIP, is a program that rewards communities for going above and beyond the minimum requirements of the NFIP in minimizing potential losses due to flooding. There are a number of measures a community can implement to obtain a CRS rating, and most communities do not implement them all. As a community implements more CRS flood protection measures, its CRS rating is strengthened, and the community is rewarded with better flood protection and lower flood insurance rates. | **29** | 18 | 1 | X | X | X | | | | X | | | | | 4 | | | | | X | | | | | | | 1 | NFIP | DLCD | | FEMA-CAP-SSSE | 2020 |

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| **30** | Provide technical assistance to local Gov'ts to help integrate hazard mitigation plans with local comprehensive plans. | Local NHMPs are often adopted as an appendix to the comprehensive plan or separately and are therefore in practice not used to their full potential. By assisting local Gov'ts in integrating the two plans, hazard mitigation will be more easily and meaningfully implemented in local land use planning practice. | **30** | 17 | 1 | X | X | X | X | | | X | X | | | X | 7 | X | X | X | X | X | X | X | X | X | X | X | 11 | Statewide Planning Goal 7 | DLCD, OPDR | | FEMA-PDM, Risk MAP, State-DLCD | 2015 |
| **31** | Improve state agency procedures for tracking data on State-owned/leased buildings and critical or essential facilities. | Create a policy standard for facilities data collection required from state agencies on an annual basis. Develop a facilities data framework standard that best enables hazard mitigation analysis; incorporate data into DAS-CFO DataMart and make available to partner agencies at will. | **31** | 17 | 1 | X | X | X | | X | | | | | X | | 5 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Resilience Plan | DAS-CFO, DAS-CIO | DOGAMI | State-DAS-CFO, DAS-CIO | 2016 |
| **32** | Request and compile seismic and flood information for personnel-occupied buildings from other agencies. | Determine flood and earthquake damage and losses expected to occur to the State-owned building inventory including higher education buildings. Produce information to enable development of statewide priorities and strategies to guide mitigation of earthquake risk, to protect lives during an earthquake, and to preserve ongoing operations after an earthquake. Use accepted methods to determine building type, construction and occupancy, to estimate damage and losses due to various earthquake scenarios and probabilities relating to building codes. | **32** | 17 | 1 | X | X | | | | | | | | X | | 3 | | | | X | X | | | | | | | 2 | Oregon Resilience Plan, NFIP | DAS-CFO | DOGAMI | State-DAS-CFO, Local Gov'ts | 2020 |
| **33** | Request seismic and flood information from landlords as part of analyzing potential leased spaces going forward in new leases and potential renewals. | Determine flood and earthquake damage and losses expected to occur to the state owned building inventory including higher education buildings. Produce information to enable development of statewide priorities and strategies to guide mitigation of earthquake risk, to protect lives during an earthquake, and to preserve ongoing operations after an earthquake. Use accepted methods to determine building type, construction and occupancy, to estimate damage and losses due to various earthquake scenarios and probabilities relating to building codes. | **33** | 17 | 1 | X | X | | | | | | | | | | 2 | | | | X | X | | | | | | | 2 | Oregon Resilience Plan, NFIP | DAS-EAM | DOGAMI | State-DAS-EAM, Local Gov'ts | 2020 |
| **34** | Lidar survey the State's ROW (rights of way), west of the Cascade Range, to determine where landslide potential exists. | The acquired information can improve critical infrastructure resilience in the face of landslide events, by providing useful information to planners, design professionals and decision makers prior to delivery system construction. | **34** | 17 | 1 | X | X | X | | | | X | X | | | | 5 | | | | | | X | | | | | | 1 | Statewide Planning Goal 7 | DOGAMI | ODOT | State-ODOT | 2015 |
| **35** | Investigate/inventory DAS-owned buildings for seismic risk. | Determine earthquake damage and losses expected to occur to the state owned building inventory including higher education buildings. Produce information to enable development of statewide priorities and strategies to guide mitigation of earthquake risk, to protect lives during an earthquake, and to preserve ongoing operations after an earthquake. Use accepted methods to determine building type, construction and occupancy, to estimate damage and losses due to various earthquake scenarios and probabilities relating to building codes. | **35** | 17 | 1 | X | X | | | | | | | | | | 2 | | | | X | | | | | | | | 1 | Oregon Resilience Plan | DAS-CFO | DOGAMI | State-DAS-CFO | 2016 |

# 2015 MITIGATION ACTIONS—PRIORITY

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| **36** | Host at least one workshop or other educational opportunity on a biennial basis in communities where a Volcano Coordination Plan has been adopted. | The State of Oregon will actively work to increase the public's knowledge of the volcano hazard in Oregon. | **36** | 16 | 1 | X | X | | | | | X | X | | | | 4 | | | | | | | | X | | | | 1 | Statewide Planning Goal 7 | OEM | DOGAMI | State-OEM | 2018 |
| **37** | Achieve 100% state agency participation in the Great Oregon ShakeOut | Practicing to "drop, cover, and hold" is critical in reducing injury and loss of life in the workplace and home during an earthquake. The more people practice the drill, the better they will respond to a real event. State agencies are setting an example by conducting a drill annually. The State of Oregon will have 100% State agency participation in the Great Oregon ShakeOut and will encourage schools and universities to participate. | **37** | 16 | 1 | X | X | | | | | X | | | X | | 4 | | | | X | | | | | | | | 1 | Oregon Resilience Plan | OEM | | NEHRP, State-EMPG | 2018 |
| **38** | Fund and provide technical assistance for local Gov'ts to engage in evacuation route planning and project implementation. | After a Cascadia Subduction Zone earthquake, a tsunami could arrive within minutes. It is essential that residents and visitors be able to quickly move to high ground. Some evacuation planning is already underway. Local Gov'ts need funding and technical assistance to begin or continue to engage in evacuation planning. | **38** | 15 | 1 | X | | | | | | | | | X | X | 3 | X | | | X | | | X | | | | | 3 | OSSPAC, Statewide Planning Goal 7, ORS 455 | DOGAMI | OEM, DLCD | NOAA | 2016 |
| **39** | Install real-time monitoring capabilities on the remaining 51 state-operated stream gages, with the goal of making the network 100% real-time by the year 2020. | The availability of timely and accurate data from stream gages is essential for flood forecasting, for prediction of imminent flood hazards, and for response to flood emergencies. Today, 178 of the state's 229 stream gages provide real-time data. Upgrade the state's existing stream gaging network, with the goal of installing real-time capability on all remaining gages. | **39** | 15 | 1 | X | X | | | | | | | | | | 2 | | | | | X | | | | | | | 1 | Integrated Water Resource Strategy; Silver Jackets | OWRD | | State-OWRD | 2020 |
| **40** | Implement better way-finding solutions for tsunami evacuation. Create hardened and improved evacuation routes to include elevated safe areas above the level of modeled inundation. | After a Cascadia Subduction Zone earthquake, a tsunami could arrive within minutes. It is essential that residents and visitors be able to quickly move to high ground on foot. This requires clearly marked and safe routes that pedestrians are able to navigate even in dark and stormy weather. Where high ground is available, projects should be identified that will enable Oregon to establish new standards and guidelines for methods to harden and mark way-finding of tsunami evacuation routes to natural high ground. Where natural high ground is not within the expected evacuation time, evaluate the retrofit of existing facilities and/or construction of new facilities that rise above the level of tsunami inundation and can serve as safe haven refuges. | **40** | 14 | 1 | X | | | | | | X | | | | | 2 | X | | | X | | | X | | | | | 3 | Oregon Resilience Plan | OEM | DOGAMI | NOAA-NTHMP, Local Gov'ts | 2015 |
| **41** | Develop an incentive or subsidy program for retrofit of one and two family residences | Design a system of grants or tax credits to encourage homeowners to retrofit residences to minimize displaced post-earthquake shelter demand and reduce population loss during recovery. At the same time, take advantage of weatherization measures such as energy audits, cash rebates, and tax credits to help keep the cold out during winter. | **41** | 14 | 1 | X | X | X | | | | | | | | | 3 | | | | X | | | | | | | | 1 | Clean Energy Works; Portland Homeowner Seismic Retrofit Project; Certified local contractors | OEM | BusOR-IFA | FEMA, Local Gov'ts | 2018 |

# 2015 MITIGATION ACTIONS—PRIORITY

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| **42** | Request the Oregon Legislature to fund the State Disaster Loan and Grant Account" immediately following a presidentially declared disaster or other disaster. | The State Disaster Loan and Grant Account includes an account that can be used to fund local government and school district mitigation projects after a Presidentially declared disaster. The Oregon Legislature may authorize deposits to the account when requested. | **42** | 11 | 1 | X | X | X | | | | | | | | | 3 | X | X | X | X | X | X | X | X | X | X | X | 11 | DLCD Technical Assistance Grants | OEM | BusOR-IFA | State-EMPG | 2015 |
| **43** | Review and adjust State IHMT membership. | As state and agency priorities and personnel change, agency membership should be reviewed and adjusted, and member agencies should be encouraged to budget for participation in State IHMT activities. In late 2014, Emergency Support Functions were reassigned, and the new structure should be considered when reviewing State IHMT membership. When membership is aligned with its goals and mitigation actions, the State IHMT will provide better oversight and leadership of the state's mitigation strategy and programs. | **43** | 23 | 2 | X | X | X | X | X | X | X | X | | X | | 9 | X | X | X | X | X | X | X | X | X | X | X | 11 | OSSPAC, OWEB | OEM | OPDR, DLCD, DOGAMI | State-EMPG | 2017 |
| **44** | Establish formal and official authority for the State IHMT | Since its formation, the State IHMT has continued to play a major role in hazard mitigation activities, including the development of this hazard mitigation plan. There is strong agreement that the State IHMT is important, should be continued, and ought to be made permanent because it is the only state body focused on coordination of natural hazard mitigation. It is recommended that the State IHMT be formally and officially established. | **44** | 23 | 2 | X | X | X | X | X | X | X | X | | X | | 9 | X | X | X | X | X | X | X | X | X | X | X | 11 | OSSPAC | OEM | OPDR, DLCD, DOGAMI | State-EMPG | 2017 |
| **45** | Develop a system for prioritizing and ranking State-owned facilities, including critical facilities, for mitigation. | Create an evaluation framework for determining a comprehensive list of critical State-owned facilities in terms of local and regional service needs in the event of a natural disaster; prioritize these critical facilities based on mitigation needs by disaster type; and evaluate each critical facility on the basis of investment cost and potential relocation/decommission in locations with increased hazard risk. | **45** | 23 | 2 | X | X | X | | | | | | | | | 3 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Resilience Plan | DOGAMI, DLCD, OEM | DAS-CFO | State-DAS-CFO | 2020 |
| **46** | Provide the updated *Planning for Natural Hazards: Oregon Technical Resource Guide* to local Gov'ts. | To encourage communities to use *Planning for Natural Hazards: Oregon Technical Resource Guide* it must be provided to them. | **46** | 22 | 2 | X | X | X | X | X | | X | X | X | X | X | 10 | X | X | X | X | X | X | X | X | X | X | X | 11 | Goal 7, NFIP, Risk MAP, Oregon Resilience Plan, Oregon Climate Change Adaptation Framework | DLCD | OPDR, OEM | FEMA, State-DLCD | 2020 |
| **47** | Produce Coastal Development Handbook | Produce a *Coastal Development Handbook* that addresses coastal process and hazards, beach and shoreland public policy, buying oceanfront property [what to look for, what questions to ask], building on oceanfront property, choosing appropriate hazard mitigation techniques, and choosing and using geotechnical consultants and engineers. | **47** | 22 | 2 | X | X | X | X | X | | X | X | | | X | 8 | X | | | X | X | X | X | | | | | 5 | Statewide Planning Goals 5 & 7 | DLCD | DOGAMI, OPRD | NOAA, FEMA, State-DLCD | 2020 |

# 2015 MITIGATION ACTIONS—PRIORITY

| Action Item | | | PRIORITY | Score | Level of Support | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | RANK | Score ≈ Benefit/Cost | 1 = Likely by 3/2020<br>2 = Not sure<br>3 = Unlikely by 3/2020 | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Other Initiative | Lead | Support | Current or Potential Funding Source(s) | Target Date |
| **48** | Evaluate the impact of climate change on landslides. | The precipitation-triggered landslides will increase or decrease with changes in climate. Evaluation of this change will be important for the future of Oregon. | **48** | 22 | 2 | X | X | | | | | | X | | | | 3 | | | | | | X | | | | | | 1 | Oregon Climate Change Adaptation Framework | DOGAMI | | NOAA, State-DOGAMI | 2016 |
| **49** | Create new lidar-based Landslide Inventory and Susceptibility Maps, especially near population centers. | DOGAMI will create these maps in cooperation with local jurisdictions. Specific methods and priority locations are still to be determined. The locations will be determined by the Oregon Landslide Workgroup (#6, Priority). These new maps will enable communities to introduce development restrictions or recommend mitigation strategies in areas highly susceptible to landslides. | **49** | 21 | 2 | X | X | X | | | | X | X | | | | 5 | | | | | | X | | | | | | 1 | Statewide Planning Goal 7 | DOGAMI | | State-DOGAMI, Local Gov'ts | 2040 |
| **50** | Update *Planning for Natural Hazards: Oregon Technical Resource Guide*. | *Planning for Natural Hazards: Oregon Technical Resource Guide* was published in 2000 and needs to be updated. | **50** | 20 | 2 | X | X | X | X | X | | X | X | X | X | X | 10 | X | X | X | X | X | X | X | X | X | X | X | 11 | Statewide Planning Goal 7 | DLCD, OPDR | OPDR | FEMA, NOAA, State-DLCD | 2020 |
| **51** | Facilitate self-sustaining outreach programs staffed by Community Emergency Response Teams (CERT) in each coastal population center aimed at creating a culture of preparedness and response for both local Cascadia and distant tsunami events. | Establish Community Emergency Response Teams (CERT). These teams will work to save lives and restore communities following a major disaster. Encourage CERT to use outreach techniques tested in a 2005 pilot study of Seaside (#1 priority = door-to-door education; #2 priority = community evacuation drill; #3 = K-12 education supplemented by workshops targeted at specific user groups such as the lodging industry).<br>Create measures of sustainability and success. | **51** | 20 | 2 | X | | X | | | | X | | | X | | 4 | X | | | X | | | X | | | | | | 3 | Oregon Resilience Plan | OEM | DOGAMI | NEHRP, NOAA | 2018 |
| **52** | Determine the effectiveness of and the feasibility of using the Emergency Alert System (EAS) in dust prone areas to provide timely information to the traveling public about dangerous blowing dust conditions and make improvements if needed. | ODOT and OSP have primary responsibility for activating the traffic advisory components of the dust storm response plan for the Mid-Columbia Region. The National Weather Service can also activate EAS from their forecast offices in Pendleton, Boise, Medford, and Portland. Many local emergency program managers can also activate the system. Providing this information can save lives in the event of a dust storm. | **52** | 20 | 2 | X | | | | | | | | | | | 1 | | | X | | | | | | | | | 1 | National Weather Service | ODOT, OSP | OEM | NOAA, State-ODOT, OSP, Local Gov'ts | 2017 |
| **53** | Add at least three new flood inundation forecast points to the National Weather Service's Flood Inundation Mapping website and the USGS's Flood Inundation Mapper before 2018. | The National Weather Service (NWS) Advanced Hydrologic Prediction Service (AHPS) has developed inundation mapping sites for various stream gage locations nationwide. Currently there are none in Oregon. This is a useful tool for understanding potential inundation areas based on NWS forecasts. NWS: http://water.weather.gov/ahps/inundation.php; USGS: http://wim.usgs.gov/fimi/) | **53** | 19 | 2 | X | X | | | | | | | | X | | 3 | | | | | X | | | | | | | 1 | National Weather Service, Silver Jackets | DOGAMI | OWRD | USGS, USACE, NOAA-NWS | 2017 |

# 2015 MITIGATION ACTIONS—PRIORITY

| Action Item | | | PRIORITY | Score | Level of Support | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | RANK | Score ≈ Benefit/Cost | 1 = Likely by 3/2020<br>2 = Not sure<br>3 = Unlikely by 3/2020 | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Other Initiative | Lead | Support | Current or Potential Funding Source(s) | Target Date |
| **54** | Support and implement the actions in the February 2013 Oregon Resilience Plan and recommended in the Oregon Resilience Plan Task Force's October 2014 report. | The Oregon Resilience Task Force was established by Senate Bill 33. It was tasked to facilitate a comprehensive and robust plan to implement the strategic vision and roadmap of the Oregon Resilience Plan for responding to the consequences of naturally occurring seismic events associated with geologic shift along the Cascadia subduction zone. The Task Force's report was delivered to the legislature on October 1, 2014. | **54** | 18 | 2 | X | X | X | | | | X | | | | | 4 | | | | X | | | X | | | | | 2 | Oregon Resilience Plan | OEM | BCD, ODE, DOGAMI, ODF, OHA, DLCD, ODOT, OPDR, PUC, UO, OSU, PSU | State-OEM | 2017 |
| **55** | Use DAS-CFO data and investigation/inventory of seismic and flood risk to DAS-owned/leased buildings in an effective, routine decision-making process for building occupancy, maintenance, use and potential mitigation treatments. | This information over time can provide for strategic and responsible voluntary flood and seismic upgrades in areas of greatest need for reasonable cost as a part of broader facilities management. | **55** | 17 | 2 | X | X | | | | | | | | | | 2 | | | | X | X | | | | | | | 2 | Oregon Resilience Plan, NFIP | DAS-CFO | DAS-EAM, DOGAMI | State-DAS-CFO | 2020 |
| **56** | Identify, prioritize, and map areas susceptible to rapid channel migration | Identify areas susceptible to rapid channel migration. Prioritize those areas' susceptibility and rank their risk from a rapid channel migration event. Create channel migration zone and risk maps for the areas determined to have the highest risk for rapid channel migration. | **56** | 17 | 2 | X | X | X | | | | X | X | | | | 5 | | | | | X | | | | | | | 1 | NFIP, Risk MAP, Statewide Planning Goal 7 | DOGAMI | | State-DLCD | 2015 |
| **57** | Prepare model coordination protocols for local Floodplain Managers and Building Officials. | Local government Floodplain Managers and Building Officials are often unaware of the other's role in floodplain management and how they could work together to better manage floodplain development and mitigate flood hazards. Providing model protocols for the two positions to coordinate would increase each one's awareness of the other's role, ultimately enhancing local flood hazard mitigation. | **57** | 17 | 2 | X | X | | | | | | X | | X | | 4 | | | | | X | | | | | | | 1 | NFIP, ORS 455 | DLCD | DCBS-BCD | FEMA | 2016 |
| **58** | Develop a database of non-State-owned critical/essential facilities and their property values. | FEMA requires the state's plan to: 1) identify critical facilities located in the identified hazard areas; and 2) estimate the potential dollar losses to those structures. Data for non-State-owned critical facilities is incomplete and lacks standardization, therefore creating a wide margin of error. Identifying local non-State-owned critical facilities and gathering descriptive data for these structures will help increase the quality of the data, resulting in a more precise understanding of state and regional vulnerabilities and mitigation priorities. | **58** | 16 | 2 | | | | | | | | | | X | | 1 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Resilience Plan | OEM, DAS-GEO | DOGAMI | FEMA, State-OEM, DAS-GEO | 2020 |

# 2015 MITIGATION ACTIONS—PRIORITY

| Action Item | | | PRIORITY | Score | Level of Support | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
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| # | Statement | Description | RANK | Score ≈ Benefit/Cost | 1 = Likely by 3/2020<br>2 = Not sure<br>3 = Unlikely by 3/2020 | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Other Initiative | Lead | Support | Current or Potential Funding Source(s) | Target Date |
| **59** | Schedule three opportunities over the life of this plan for state-local dialogue on vulnerability assessments to improve consistency and mutual understanding. | Traditionally, local jurisdictions have used the OEM Hazard Analysis Methodology to update LNHMP vulnerability assessments. State agencies with hazard oversight use a wide range of methods to conduct statewide vulnerability assessments for the Oregon NHMP. The results are varying degrees of similarities and differences among local and state vulnerability scores. This dialogue is intended for the state and local Gov'ts to educate each other on the rationale behind the differing scores and to identify ways to better align local and state vulnerability assessments. | **59** | 16 | 2 | | | | | | | | | | X | | 1 | X | X | X | X | X | X | X | X | X | X | X | 11 | Statewide Planning Goal 7 | OEM | DLCD | State-OEM, DLCD | 2020 |
| **60** | Identify funding to support various public transportation providers and local jurisdictions to conduct comprehensive vulnerability assessments of their transportation facilities and services. | OSSPAC, in the Oregon Resilience Plan has identified an immediate near-term need to inventory and assess vulnerability and mitigation opportunities for local street networks, transit assets, ports, airports, and railroads. The Oregon Resilience Task Force in its October 2014 report to the Oregon Legislature suggested ongoing funding inventory, assessment, and mitigation. These activities would serve to reduce vulnerability to a Cascadia Subduction Zone event. | **60** | 16 | 2 | X | X | X | | | | | | | X | | 4 | | | | X | | | X | | | | | 2 | Oregon Highway Plan (OHP); The Oregon Resilience Plan | ODOT | DOGAMI | FEMA, State-ODOT | 2016 |
| **61** | Install High Water Mark (HWM) signs after flood events and co-locate stage crest gages on select HWM signs. | HWM signs installed in high visibility areas increase the general public's awareness of flood risk and drive flood mitigation actions in communities. They spark conversations about past floods and are a good entry point for discussions promoting mitigation actions such as elevating buildings, purchasing flood insurance, and participating in FEMA's Community Rating System Program. Stage crest gages co-located with select HWM signs will capture new high-water data when floods occur. | **61** | 15 | 2 | X | X | | | | | X | | | X | | 4 | | | | | X | | | | | | | 1 | NFIP | Silver Jackets | OEM, DLCD | USACE, FEMA | **2020** |
| **62** | Develop incentives to increase the rate of replacement of privately-owned seismically deficient buildings | Develop tax incentives, permit facilitation, and other means to increase the natural rate of building turnover. | **62** | 14 | 2 | X | X | X | | | | | | | | | 3 | | | | X | | | | | | | | 1 | | OEM | | State-OEM | 2017 |
| **63** | Identify areas on the coast that will be "islands", or cut off, from other cities or critical recovery resources following a Cascadia Subduction Zone earthquake & tsunami. | Produce GIS database of resources in each "island" expected to be isolated after a Cascadia Subduction Zone (CSZ) earthquake and resulting tsunami in order to preplan for response. Shape files are to be imported into RAPTOR, Oregon Explorer, and other GIS tools. This action item supports the local community's ability to prepare for and sustain or recover function following a CSZ earthquake and tsunami. | **63** | 23 | 3 | X | X | X | | | | | | | | | 3 | | | | X | | | X | | | | | 2 | Oregon Resilience Plan | OEM | DOGAMI | NOAA, State and Local Gov'ts | 2018 |

# 2015 MITIGATION ACTIONS—PRIORITY

| Action Item | | | PRIORITY | Score | Level of Support | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
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| # | Statement | Description | RANK | Score ≈ Benefit/Cost | 1 = Likely by 3/2020<br>2 = Not sure<br>3 = Unlikely by 3/2020 | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Other Initiative | Lead | Support | Current or Potential Funding Source(s) | Target Date |
| **64** | Evaluate sediment impacts to Oregon's water resources. | Oregon has unique water resources, some of which are for drinking water. Landslides can have a great impact on this resource by input of large amounts of sediment. Evaluation of erosion potential by watershed would help the regulators and providers identify areas for mitigation. | 64 | 22 | 3 | X | | X | | X | | | | | | | 3 | | | | | | X | | | | | | 1 | DEQ and ODFW Water Quality Programs | DOGAMI | DEQ, OHA | Federal, State-DEQ, OHA, and Local Gov'ts | 2018 |
| **65** | Prioritize mitigation and retrofit projects on seismic lifelines. | ODOT Seismic Lifelines Evaluation, Vulnerability Synthesis and Identification Report provides recommended priority corridors but does not provide sufficient detail to actually prioritize retrofit investment packages. Engineering evaluations and cost estimation are ongoing on a funding-available basis and will inform that prioritization process. | 65 | 22 | 3 | X | X | | | | | | | | | | 2 | | | | X | | | | | | | | 1 | Oregon Highway Plan (OHP); The Oregon Resilience Plan | ODOT | | FHWA, STATE-ODOT | 2020 |
| **66** | Provide funding and technical assistance to local Gov'ts to use the new guidance on classifying lands subject to natural hazards in their buildable lands inventories and adjusting urban growth boundaries. | Local Gov'ts need funding and technical assistance to be able to use the new guidance on how to classify lands subject to natural hazards and adjust urban growth boundaries to protect life, property, and the environment from natural hazards while providing for efficient development patterns within urban growth boundaries. Comprehensive Plan amendments are likely to result. This funding and technical assistance will promote integration of local natural hazards mitigation plans with comprehensive plans. | 66 | 21 | 3 | X | X | | X | | | | X | | X | X | 6 | X | X | X | X | X | X | X | X | X | X | X | 11 | Statewide Planning Goals | DLCD | | State-DLCD | 2018 |
| **67** | Initiate an outreach strategy to encourage local jurisdictions to disseminate volcano preparedness educational materials. | Increase the ability of Oregonians to prepare for and recover from volcanic hazards. | 67 | 20 | 3 | X | X | X | | | | X | | | X | | 5 | | | | | | | | X | | | | 1 | Goal 7 | OEM | DOGAMI | State-OEM | **2020** |
| **68** | Develop guidance on determination of mudslides triggers and relation to rain or flood events | Work with FEMA Region 10, DOGAMI, and other interested parties to develop scientifically and legally-based guidance on when mudflows are to be considered part of a rain or flood event pursuant to the NFIP. Address the definition of mudflow, regulatory factors, scientific understanding of mudslides, and implications for flood insurance. | 68 | 20 | 3 | X | X | | | X | | | | | | | 3 | | | | | X | | | | | | | 1 | NFIP | DLCD, DOGAMI | | FEMA, State-DOGAMI, DLCD | 2018 |
| **69** | Update the 2000 Guidelines for conducting site-specific geohazard investigations. | The state has guidelines for conducting site-specific seismic investigations. The guidelines date from 2000 and need to be updated. The update should expand the scope of the guidelines to cover site-specific investigations for all geohazards. This will improve local government implementation of development regulations in areas subject to geohazards. | 69 | 19 | 3 | X | X | | | | | | X | | | | 3 | X | | | X | | X | | X | | | | 4 | Statewide Planning Goal 7 | DOGAMI | | State-DOGAMI | 2018 |
| **70** | Conduct a pilot project on two coastal estuaries to develop a framework for modeling sea level rise and to assess the overall impact of sea level rise on the estuaries. | Implement sea level rise modeling for the pilot study areas. Study results will be used to guide a future, more comprehensive and coast-wide assessment of sea level rise impacts. Once completed, the results can be used minimize future damage or loss of property and the environment. | 70 | 19 | 3 | X | X | X | | | | X | X | | | | 5 | X | | | | | | | | | | | 1 | Oregon Climate Change Adaptation Framework | DOGAMI | DLCD | NOAA through OSU | 2016 |

# 2015 MITIGATION ACTIONS—PRIORITY

| Action Item | | | PRIORITY | Score | Level of Support | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
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| **71** | Coordinate development of a post-disaster scientific and technical clearinghouse with other state and federal agencies, higher education, and associations. | When an earthquake, flood, tsunami, or other disaster strikes the state, there will be an influx of scientists and engineers from inside and outside the state to study the event and offer help. There needs to be a coordination of their efforts to put them to use in the most efficient and effective way possible. This clearinghouse will work with the emergency coordination center established immediately after the earthquake, flood, tsunami, or other disaster. | **71** | 18 | 3 | X | X | | | X | X | X | | | X | | 6 | X | X | X | X | X | X | X | X | X | X | X | 11 | Silver Jackets | DOGAMI | OEM, DLCD | FEMA, USGS, USACE, NOAA, State-DOGAMI, OEM | 2018 |
| **72** | Update DOGAMI Special Paper 29 (Wang and Clark, 1999) | Update 1999 Special Paper 29, Earthquake Damage In Oregon: Preliminary Estimates of Future Earthquake Losses, a statewide damage and loss estimation study (Wang and Clark, 1999). This update, at a minimum, should incorporate damage and loss estimates for a magnitude 9 Cascadia earthquake, an exposure analysis of tsunami hazards, and probabilistic hazards including updated probabilistic earthquake ground motions and flooding zones. School and emergency facilities from the 2007 DOGAMI database should be incorporated. | **72** | 18 | 3 | X | X | | | | | | | | | | 2 | | | | X | X | | X | | | | | 3 | Oregon Resilience Plan | DOGAMI | | State-DOGAMI | 2018 |
| **73** | Develop probabilistic multi-hazard risk maps for the Oregon Coast | Consider and examine combinations and permutations of multi-hazard risk exposure and maps for the entire Oregon Coast. | **73** | 17 | 3 | X | X | X | | | | X | X | | | | 5 | X | | | X | X | X | X | | X | X | X | 8 | Oregon Resilience Plan, NFIP, Risk MAP, Oregon Climate Change Adaptation Framework | DOGAMI | | NOAA, State-DOGAMI | 2020 |
| **74** | Lidar survey the State's ROW (rights of way), west of the Cascade Range, to determine where seismic fault potential exists. | The acquired information can improve critical infrastructure resilience in the face of seismic events, by providing useful information to planners, design professionals and decision makers prior to delivery system construction. | **74** | 17 | 3 | X | X | X | | X | | X | X | | | | 6 | | | | X | | | | | | | | 1 | Oregon Resilience Plan | DOGAMI | ODOT | State-ODOT | 2018 |
| **75** | Assess hazards associated with active crustal faults newly discovered by statewide lidar program. | Particularly in central and eastern Oregon, the major earthquake hazards result from poorly known crustal faults. Lidar has greatly expanded the ability to find these faults, which should be systematically evaluated for their potential to generate damaging earthquakes using trenching, geophysical and field studies. This action would help communities prepare and mitigate for newly defined hazard areas in central and eastern Oregon. | **75** | 15 | 3 | X | X | | | | | X | | | | | 3 | | | | X | | | | | | | | 1 | Oregon Resilience Plan | DOGAMI | | USGS, State-DOGAMI | 2020 |
| **76** | Establish process for assigning inspection teams to needed areas for post-disaster facility inspection. | Work with OEM, local government building officials, and emergency planners to establish an effective process for assigning inspection teams to needed areas and educating local Gov'ts regarding the circumstances and process for initiating BCD and state involvement. | **76** | 14 | 3 | X | X | X | | | | | | | X | | 4 | | | | | X | | | | | | | 1 | NFIP, Oregon Recovers | DLCD | OEM | FEMA-CAP-SSSE | **2020** |

# 2015 MITIGATION ACTIONS—PRIORITY

| Action Item | | | PRIORITY | Score | Level of Support | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
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| # | Statement | Description | RANK | Score ≈ Benefit/Cost | 1 = Likely by 3/2020<br>2 = Not sure<br>3 = Unlikely by 3/2020 | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Other Initiative | Lead | Support | Current or Potential Funding Source(s) | Target Date |
| **77** | Develop an improved methodology for gathering data and identifying the communities most vulnerable to drought and related impacts. | Although we know that areas in Oregon have suffered from drought, there has not been a coordinated effort to systematically characterize how frequently droughts have occurred, or the impact on Oregonians and ecosystems. Communities are beginning to plan for worst case drought scenarios and need better information about the frequency, duration, and intensity of previous droughts in order to assess the appropriate response. Comprehensive information is not currently available by region, or statewide. | **77** | 11 | 3 | X | X | X | | X | | | | | | X | 5 | | X | | | | | | | | | | 1 | Goal 7 | OWRD, OCCRI | OEM | State-OWRD, OEM, OCCRI | 2017 |
| **78** | Establish a program for studying winter storms and their impacts statewide. As a part of that program, develop a system for gathering snowfall data statewide. | Establish a network of snow accumulation tracking stations at strategic locations throughout the state to provide data tracking of snow fall accumulation over the short term and long term in order to develop statistics for studying snow level trends across the state. | **78** | 10 | 3 | X | X | | | X | | | | | X | | 4 | | | | | | | | | | X | 1 | Climate Change Adaptation Framework | ODOT | OEM, NOAA-NWS | NOAA-NWS, State-OCCRI | 2020 |

**Table 3-2. Ongoing Mitigation Actions**

## 2015 MITIGATION ACTIONS—ONGOING

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
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| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Other Initiative | Lead | Support | Current or Potential Funding Source(s) | Progress & Comments |
| **79** | Continue to refine statewide natural hazard identification and characterization. | The Oregon NHMP identifies the types of natural hazards affecting Oregon, their geographic extent, history and probability of occurrence, and as they may be affected by climate change. Throughout the life of the Plan, new and continuing research studies and projects provide new data and analysis, improving our ability to identify and understand Oregon's natural hazards and their probability of occurrence. To advance hazard mitigation in Oregon, it is important for the State to plan, budget, and take advantage of opportunities that arise for continued research and new studies to enhance our knowledge of Oregon's natural hazards. | X | X | X | X | X | | X | X | | X | X | 9 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Resilience Plan; Goal 7; NFIP; Risk MAP; Oregon Climate Change Adaptation Framework; Integrated Water Resources Strategy; Community Wildfire Protection Plans, Seismic Lifeline Studies | DOGAMI, ODF, OWRD, OEM, ODOT, OHA | FEMA, NOAA, BLM, OCCRI, OCS, Other State IHMT Agencies | FEMA, NOAA, BLM, National Fire Plan, State-DOGAMI, ODF, OWRD, OEM, ODOT | **ONGOING** |
| **80** | Continue to refine the State's risk assessment methodology and statewide assessments of natural hazard exposure, vulnerability, and potential losses. | At the core of the Oregon NHMP is a statewide risk assessment of exposure and vulnerability, and an estimate of potential dollar losses to State-owned/leased buildings, infrastructure, and critical or essential facilities from natural hazard events. Schools, emergency facilities, water and waste water, dams and levees, transportation, telecommunications, and energy facilities are examples of structures, infrastructure, and facilities that could be exposed and vulnerable to natural hazards. Other examples include populations, businesses, and industries. At this time, the state does not have a standardized risk assessment methodology across all hazards at the state and local levels. To advance hazard mitigation in Oregon, it is important for the State to plan, budget, and take advantage of opportunities that arise for continued enhancement of the risk assessment, better enabling limited mitigation resources to be directed to the areas that most need them. | X | X | X | X | X | | X | X | X | X | X | 10 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Resilience Plan; Goal 7; NFIP; Risk MAP; Oregon Climate Change Adaptation Framework; Integrated Water Resources Strategy; Community Wildfire Protection Plans, Seismic Lifeline Studies | DOGAMI, ODF, OWRD, OEM, ODOT, DLCD, OHA | FEMA, NOAA, BLM, OCCRI, OCS, OPDR, Other State IHMT Agencies | FEMA, NOAA, BLM, National Fire Plan, State-DOGAMI, ODF, OWRD, OEM, ODOT, DLCD | **ONGOING** |
| **81** | Continue to refine statewide identification and prioritization of the greatest risks from and communities most vulnerable to Oregon's natural hazards. | Identifying and prioritizing the greatest risks from and communities most vulnerable to natural hazard events will enable the state to leverage its limited mitigation resources in ways that efficiently protect life, property, and the environment from natural hazard events and facilitate recovery. | X | X | X | X | X | | X | X | X | X | X | 10 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Resilience Plan; Goal 7; NFIP; Risk MAP; Oregon Climate Change Adaptation Framework; Integrated Water Resources Strategy; Community Wildfire Protection Plans, Seismic Lifeline Studies | DOGAMI, ODF, OWRD, OEM, ODOT, DLCD, OHA | FEMA, NOAA, BLM, OCCRI, OCS, OPDR, Other State IHMT Agencies | FEMA, NOAA, BLM, National Fire Plan, State-DOGAMI, ODF, OWRD, OEM, ODOT, DLCD | **ONGOING** |

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| **82** | Continue to develop and implement resilience initiatives statewide. | Natural hazard mitigation is a fundamental element of resilience. It is important for the state to plan, budget, and partner with other public and private entities to alleviate potential damage from natural hazard events before they occur by (a) improving the reliability of critical/essential facilities, services, and infrastructure during and after a natural hazard event; (b) developing evacuation routes and facilities; (c) informing the public; (d) planning for long-term recovery; and (e) taking other necessary actions. | X | X | X | X | X | X | X | X | X | X | X | 11 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Resilience Plan; Goal 7; NFIP; Risk MAP; Oregon Climate Change Adaptation Framework; Integrated Water Resources Strategy; Community Wildfire Protection Plans, Seismic Lifeline Studies | DOGAMI, ODF, OWRD, OEM, ODOT, DLCD, OHA | FEMA, NOAA, BLM, OCCRI, OCS, OPDR, Other State IHMT Agencies | FEMA, NOAA, BLM, National Fire Plan, State-DOGAMI, ODF, OWRD, OEM, ODOT, DLCD | **ONGOING** |
| **83** | Assist local governments in using the updated *Planning for Natural Hazards: Oregon Technical Resource Guide* to update their comprehensive plans and development regulations. | The original purpose of *Planning for Natural Hazards: Oregon Technical Resource Guide* was to assist communities in amending their comprehensive plans and development regulations to reduce risk from natural hazards, implementing Statewide Goal 7. The updated document will also be helpful in developing local hazard mitigation plans and integrating them with local comprehensive plans and development regulations. | X | X | X | X | X | | X | X | X | X | X | 10 | X | X | X | X | X | X | X | X | X | X | X | 11 | Goal 7 | DLCD | OPDR, OEM | FEMA, State-DLCD | **ONGOING - Not started** |
| **84** | Monitor the implementation of the updated *Planning for Natural Hazards: Oregon Technical Resource Guide* provided to local governments by tracking the number of jurisdictions that have used it. | Monitoring success of *Planning for Natural Hazards: Oregon Technical Resource Guide* will allow the State to adjust its approach and update the guidance as necessary, leading to better protection of life and property. | X | X | X | X | X | | X | X | X | X | X | 10 | X | X | X | X | X | X | X | X | X | X | X | 11 | Goal 7 | DLCD | OPDR, OEM | FEMA, State-DLCD | **ONGOING-Not started** |
| **85** | Provide support for development and update of local and state hazard mitigation plans. | The State provides support for development of local NHMPs and the state NHMP by managing federal grant funding in ways that assist the state and local governments with NHMP development and update tasks and processes. | X | X | X | | X | X | X | X | X | X | X | 10 | X | X | X | X | X | X | X | X | X | X | X | 11 | Goal 7 | OEM | DLCD, OPDR, DOGAMI | FEMA-PDM, HMGP, State-DLCD, Local Gov'ts | **ONGOING** |
| **86** | Improve and sustain public information and education programs aimed at mitigating the damage caused by natural hazards | While ongoing efforts are being made in this area, a strong message conveyed by several State IHMT Reports notes the need to strengthen and sustain public information, education, and training efforts by providing additional resources. Although commonly recognized that interest in reducing losses increase during and after events, there is an ongoing need to provide residents and key stakeholder groups (such as infrastructure operators) with hazard mitigation information. These reports cite the need to have timely seasonal information available, better methods to inform residents of sources of hazard mitigation information, use improved electronic methods (e.g., web sites), and materials oriented toward the intended users. This helps keep awareness levels higher, will stimulate actions by some, and reminds users to consider and include hazard mitigation measures in the contexts of regular activities, such as building a new home, relocating an office, or repairing a business. | X | X | X | X | X | | X | | | X | | 7 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Resilience Plan, NFIP, Risk MAP | OEM, DOGAMI | State IHMT Agencies | DOGAMI, NOAA, FEMA, USGS, STATE-EMPG, Local Gov'ts | **ONGOING** |

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| **87** | Continue to improve inventory of State-owned/leased buildings in all hazard areas. | Using DAS's data, DOGAMI developed an inventory of State-owned/leased buildings and identified those in hazard areas for the 2012 Plan and updated the inventory for the 2015 Plan. The data should be continuously updated by DAS-CFO to facilitate DOGAMI's inventory updates in future plan cycles. | X | X | X | | | | | | | X | | 4 | X | X | X | X | X | X | X | X | X | X | X | 11 | Oregon Resilience Plan | DAS-CFO | DOGAMI | State-DAS-CFO | **ONGOING** |
| **88** | Encourage citizens to prepare and maintain at least two weeks' worth of emergency supplies. | State agencies should work with the American Red Cross and local emergency managers to encourage citizens to be prepared to survive on their own for at least two weeks. | X | | X | | | | X | | | X | | 4 | X | X | X | X | X | X | X | X | X | X | X | 11 | | OEM | OERS agencies | NEHRP, State-EMPG | **ONGOING** |
| **89** | Continue to assist local governments with GIS capability development | Assist local governments with GIS program development, including system planning, hardware/software costs, training, and data development in relation to all hazards mapping and regulation of coastal development. | X | X | | | X | | | | | X | | 4 | X | X | X | X | X | X | X | X | X | X | X | 11 | Goal 7, NFIP, Risk MAP, Oregon Resilience Plan | DLCD, DAS-GEO | DOGAMI | FEMA-Risk MAP, State-DAS-GEO | **ONGOING** |
| **90** | Use lidar for statewide analysis of all natural hazards | Lidar is currently the best source of regional topographic data and allows for highly precise and accurate natural hazard mapping (landslide, flooding, volcanic hazards, channel migration zones, tsunami, geologic faults, etc.) and infrastructure inventories (buildings, utilities, lifelines, etc.). Many Oregon state agencies currently use lidar for natural hazard analyses and will continue to do so where lidar is available. | X | X | | | X | | | | | | X | 4 | X | X | X | X | X | X | X | X | X | X | X | 11 | NFIP, Risk MAP, Goal 7, Oregon Resilience Plan | DOGAMI | DAS-GEO | State-DOGAMI and Local Gov'ts | **ONGOING** |
| **91** | Continue to act upon opportunities to advance the State's lifeline mitigation investment practice. | Expand upon the State's mitigation investment practice by: (1) Supporting efforts by jurisdictions and transportation districts to develop mitigation policy and retrofit plans for lifeline assets and service facilities; (2) Continuing to advance design and maintenance standards and requirements for bridges and unstable slopes, transit, rail, ports, and priority lifeline airfields; (3) Developing a temporary bridge installation policy and standards; (4) Supporting research on retrofit methods and strategies for Cascadia subduction zone earthquake loads and tsunamis. | X | X | X | | X | | | | | X | | 5 | X | | | X | X | X | X | | | | | 5 | Oregon Highway Plan (OHP); The Oregon Resilience Plan | ODOT | OEM, DOGAMI, DLCD | FHWA, FTA, STATE-ODOT, OEM, DOGAMI, DLCD | **ONGOING** |
| **92** | Improve reliability and resiliency of critical infrastructure statewide by adopting industry-specific best practices, guidelines, and standards. | Lifeline Service Delivery Systems (critical infrastructure), including electric supply, natural gas, telecommunications, water/wastewater, hydraulic structures (e.g., dikes, levees, dams), transportation corridors, pipelines and petroleum fuels storage facilities, are all vital resources for a community's life-safety and economic viability. However, much of Oregon's existing critical infrastructure has not been designed or constructed to withstand the impact of severe natural disasters such as extreme wind & winter storms, major earthquakes, or large landslides. Lifeline Service Delivery Systems (critical infrastructure) should be evaluated statewide, and reliable and measurable performance objectives which insure the region's critical infrastructure can withstand future damage without crippling consequences should be instituted. | X | X | X | | X | | | | | | | 4 | | | | X | X | X | | | | X | X | 5 | Oregon Resilience Plan, Oregon Highway Plan | OPUC, OWRD, ODOT | Other State IHMT Agencies | FEMA, State-OWRD, State Highway Fund, Private Utility Fees, Private Property Owners | **ONGOING** |
| **93** | Acquire statewide lidar coverage for the purpose of improving natural hazard mapping and infrastructure inventories. | Lidar is currently the best source of regional topographic data and allows for highly precise and accurate natural hazard mapping (landslide, flooding, volcanic hazards, channel migration zones, tsunami, geologic faults, etc.) and infrastructure inventories (buildings, utilities, lifelines, etc.). The state should continue to invest in lidar acquisition for the purpose of understanding risk to natural hazards at a local scale. | X | X | | | X | | | | | | | 3 | | | | X | X | X | X | X | | | | 5 | NFIP, Risk MAP, Goal 7, Oregon Resilience Plan | DOGAMI | State IHMT Agencies | FEMA, USGS, NRCS, BLM, State-DOGAMI and Local, Gov'ts | **ONGOING** |

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| **94** | Provide technical assistance and funding to local governments to evaluate the need and opportunities for inter-tie projects in Local Natural Hazards Mitigation Plans. | The capital expense associated with this action needs to be carried mostly by local governments, perhaps with some grant or low-interest loan funding provided by the state or federal governments. The role of the state in this action is to encourage local governments located proximate to one another, yet with separate water systems, to develop the physical capability to send water from one system to the other. Oftentimes during drought situations, one local government will have a bit of water to spare while a nearby government is struggling to meet its needs. Transferring water by truck is expensive and inefficient when compared to transferring water via pipeline. Water inter-ties are also effective mitigation for the flood and earthquake hazards where one system can serve as back-up for another. | X | X | X | | X | | | | | X | | 5 | | X | | X | X | | | | | | | 3 | NFIP, Oregon Resilience Plan, Integrated Water Resources Strategy Action 7B | OWRD | | State-OWRD, Local Gov'ts | **ONGOING** |
| **95** | Educate citizens about the different National Weather Service announcements. | State agencies should work with the National Weather Service and local governments to educate the public about the meaning of the different National Weather Service announcements: winter storm watch, winter storm warning, ice storm warning, heavy snow warning, blizzard warning, severe blizzard warning, dust storm and high wind warning. | X | X | | | | | X | | | X | | 4 | | | X | | | | | | X | X | 3 | | Silver Jackets | | NOAA-NWS, USGS | **ONGOING** |
| **96** | Continue to maintain the existing roster of qualified post-earthquake, flood, and wind inspectors with ATC-20 earthquake and ATC-45 flood & wind inspection training. | Continue to compile and maintain a list of individuals trained and certified for post-disaster inspection. Support the recruitment and training of qualified ATC-20 post earthquake inspectors and inspection teams. | | | X | | X | | | | | X | | 3 | | | | X | X | | | | X | | 3 | NFIP, Oregon Resilience Plan | BCD | OEM, ODOT | State-BCD | **ONGOING** |
| **97** | Expand the state's stream gaging network. Seek stable funding for the operation, and maintenance of stream gages. | The availability of timely and accurate telemetered data from stream gages is essential for flood forecasting, for prediction of imminent flood hazards, and for response to flood emergencies. Streamflow data also provides basic hydrologic information for floodplain mapping and watershed management by communities throughout the state, and is critical for understanding and forecasting drought conditions. Numerous local, state and federal water management agencies rely on data from stream gages for effective management of projects and resources; the installation and maintenance of stream gages has traditionally been a responsibility of state and federal agencies. State agencies plan to work with their partners to ensure adequate funding and support for existing gages and for the installation of new gaging sites where needed. It is recommended that state agencies endeavor to leverage federal funding with state resources and local matching commitments to achieve a reliable network of stream gages around the state. The data from these gages is used to support the RAFT and Raptor tools highlighted in Action #10, Priority. | X | X | | X | X | | | | | X | | 5 | | X | | | X | | | | | | | 2 | Integrated Water Resources Strategy Action 1B | OWRD | | USFWS, State-OWRD, OWEB | **ONGOING** |
| **98** | Better coordinate, fund, and publicize programs to reduce the abundance of Juniper trees in arid landscapes across Oregon | Juniper trees develop extensive root systems that draw critically needed water from arid soils, transpiring water vapor into the atmosphere, intensifying drought and increasing the risk of wildfire. There are programs in Oregon to reduce Juniper trees from areas where their competition for groundwater resources is harmful, but these programs need to be better coordinated, funded, and publicized. | X | | X | X | | | X | | | X | | 5 | | X | | | | | | | X | | | 2 | Sage Grouse Conservation Partnership | ODF | ODA, DEQ, ODFW, DSL, NRCS, OWEB | ODF, NRCS | **ONGOING** |
| **99** | Educate homeowners about choosing ice and windstorm-resistant trees and landscaping practices to reduce tree-related hazards in future ice storms | Trees that don't stand up well to ice and wind, especially when planted near power lines, can cause power outages and other damage. Certain species of trees hold up better to winter's fury than others. Other factors, such as where a tree is planted and use of proper pruning techniques, can also help trees be more resistant to ice storm damage. | X | X | | X | | | X | | | | | 4 | | | | | | | | | X | X | 2 | ODF Urban Forestry Strategy | ODF | PUC, OSU Ext. | ODF, OSU Ext. | **ONGOING** |

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| **100** | Each year, ask the Governor to designate October to be Earthquake and Tsunami Awareness Month. | Practicing to "Drop, cover, and hold" is critical in reducing injury and loss of life in the workplace and home during an earthquake. The more people practice the drill, the better they will respond to a real event. A gubernatorial declaration will promote increased participation in the Great Oregon ShakeOut, or other annual earthquake Drop, Cover, and Hold On drill. | X | X | | | | | X | | | X | | 4 | | | | X | | | X | | | | | 2 | Oregon Resilience Plan | OEM | Governor's Office | NEHRP, State-EMPG | **ANNUALLY** |
| **101** | Continue to facilitate accessibility and use of the *Coastal Atlas* GIS resources. | Make the *Coastal Atlas* geographic information system (GIS) more useful for a wider audience, from local and state staff to interested citizens, by continuing to improve its data and tools, and providing training on how to access and use them. | X | X | | X | | | X | X | | X | | 6 | X | | | | | | | | | | | 1 | Goal 7, Risk MAP, NFIP | DLCD, OPRD | | NOAA, State-OPRD | **ONGOING** |
| **102** | Research the effects of changing ocean water levels and wave dynamics along the central and southern Oregon coast, and use that data to augment the coastal geomorphic database. | As recent research has shown, ocean water levels and wave dynamics along the Oregon coast are changing. These will, in turn, affect beach sand budgets and rates of erosion. More research must be done on alternative shore protection methods, effects of hard shore protection structures, near-shore circulation processes and sediment budgets, sea cliff erosion processes, and other hazard processes | X | X | | X | | | | X | | | | 4 | X | | | | | | | | | | | 1 | NFIP, Risk MAP, Goal 7 | DOGAMI, OSU | DLCD | NOAA (309) | **ONGOING** |
| **103** | Survey coastline to monitor erosion | Continue to periodically measure and monitor the Oregon coastline in order to document the response of Oregon's beach and bluffs to changes in ocean water levels (sea level rise and storm surges), storms (frequency and intensity), precipitation patterns that may threaten lives and property. Maintain a long-term, permanent Oregon Beach and Shoreline Mapping and Analysis Program (OBSMAP). The program will be a partnership with local, state, and federal agencies that have responsibility over coastal and ocean activities. | X | X | | X | | | | | | X | | 4 | X | | | | | | | | | | | 1 | NFIP, Risk MAP, Goal 7 | DOGAMI | OSU, DLCD, OPRD | NOAA, State-DOGAMI, OPRD, OSU, and Local Gov'ts | **ONGOING -** 30% of coast actively monitored; 60% monitored to a lesser degree. |
| **104** | Maintain the updated inventory of shoreline protection structures. | Maintain the inventory of existing and new coastal engineering (shore protection) structures on the Oregon Coast in order to provide local governments and applicable agencies an important coastal management tool to address anticipated increasing coastal erosion. It is anticipated that this inventory and information will assist in potential future policy changes to address a changing climate and associated coastal erosion impacts. | X | X | | X | | | | | | | | 3 | X | | | | | | | | | | | 1 | | OPRD | | Permit Fees | **ONGOING - Will begin after 21 (Priority) is completed.** |
| **105** | Implement the improved methodology for gathering data and identifying the communities most vulnerable to drought and related impacts. | Although we know that areas in Oregon have suffered from drought, there has not been a coordinated effort to systematically characterize how frequently droughts have occurred, or the impact on Oregonians and ecosystems. Communities are beginning to plan for worst case drought scenarios and need better information about the frequency, duration, and intensity of previous droughts in order to assess the appropriate response. Comprehensive information is not currently available by region, or statewide. | X | X | X | | X | | | | | | X | 5 | | X | | | | | | | | | | 1 | Integrated Water System Strategy | OWRD | OEM | State-OWRD, OEM | **ONGOING** |
| **106** | Publicize and facilitate the implementation of both structural and non-structural seismic mitigation measures for home owners, business owners, renters, and contractors, including methods of reducing hazards | Working with federal partners, such as FEMA, and non-profit industry groups, such as AIA, Oregon will enhance education on structural and non-structural seismic mitigation measures by adopting the following actions:<br>• Increase the number of educational opportunities by working with FEMA to offer courses from the National Earthquake Technical Assistance Program.<br>• Work with the Construction Contractors Board, public and private sector lenders, private sector construction material suppliers and nonprofit organizations to develop programs to assist home and business owners and renters to implement innovative structural and non-structural seismic mitigation measures. | X | X | X | | | | X | | | | X | 5 | | | | X | | | | | | | | 1 | Oregon Resilience Plan | OEM | BCD | State-EMPG, Local Gov'ts | **ONGOING** |

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| **107** | Provide information and technical assistance to implement mitigation of non-structural hazards in K-12 schools. | Provide training to school officials and teachers in reducing non-structural hazards in schools such as unsecured bookcases, filing cabinets, and light fixtures, which can cause injuries and block exits. The program should include a procedure for periodic life safety inspections of non-structural seismic hazards in schools that can be implemented by local fire department inspectors. BCD will have an important role in providing technical assistance in the development of educational materials. | X | X | X | | | | X | | | X | | 5 | | | | X | | | | | | | | 1 | Oregon Resilience Plan | OEM | OSSPAC, BCD, OSFM, ODE | NEHRP, State-SRGP | **ONGOING** |
| **108** | Each year, ask the Governor to designate the third Thursday of the month of October as the Great Oregon ShakeOut Day by proclamation. | Practicing to "drop, cover, and hold" is critical in reducing injury and loss of life in the workplace and home during an earthquake. The more people practice the drill, the better they will respond to a real event. A gubernatorial declaration will promote increased participation in the Great Oregon ShakeOut, or other annual earthquake Drop, Cover, and Hold On drill. | X | X | | | | | X | | | X | | 4 | | | | X | | | | | | | | 1 | Oregon Resilience Plan | OEM | Governor's Office | NEHRP, State-EMPG | **ANNUALLY** |
| **109** | Include information about the benefits of purchasing earthquake insurance in public outreach materials and disseminate those materials through appropriate public outreach programs and venues. | Unlike flood insurance, which is underwritten by the U.S. Government (through the National Flood Insurance Program), earthquake insurance is offered by private sector agents, generally as a rider to a standard homeowner or business property insurance policy. Because earthquake insurance is a type of catastrophic coverage, most policies carry a high deductible,<br>Oregon's Department of Consumer and Business Services Insurance Division offers information about earthquake insurance on its website and provides personal assistance through its insurance hotline. In addition, the Division is active in outreach activities, partnering with other agencies and organizations to bring insurance information to the public. | X | X | X | | | | X | | | | | 4 | | | | X | | | | | | | | 1 | Oregon Resilience Plan | DCBS-ID | DOGAMI, OEM | State-DCBS-ID | **ONGOING** |
| **110** | Continue seismic rehabilitation of hospital, fire, and police facilities under the Seismic Rehabilitation Grant Program administered by Business Oregon's Infrastructure Finance Division. | Continue to rehabilitate to operational readiness in the event of an earthquake essential hospital buildings, fire, and police stations that pose a threat to occupant safety. Senate Bill 15 of the 2001 Legislative Session requires that rehabilitation or other actions to be completed by January 1, 2022.<br>Senate Bills 2 to 5 (2005) provided the mechanism to accomplish some of these legislatively mandated tasks. Under SB 2, Oregon Department of Geology and Mineral Industries developed a seismic needs assessment database of emergency response facilities buildings. These data are being used by the Seismic Rehabilitation Grant Program to provide funding for seismic rehabilitation of eligible buildings (SB 3). Senate Bill 5 allows the State Treasury to sell Government Obligation Bonds to fund the program. | X | X | X | | X | | | | | | | 4 | | | | X | | | | | | | | 1 | Oregon Resilience Plan | BusOR-IFA | OSSPAC, DOGAMI, BCD, OSFM (SB 3). OEM, OHD | State-BusOR-IFA | **ONGOING** |

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| **111** | Continue seismic rehabilitation of public schools buildings under the Seismic Rehabilitation Grant Program administered by Business Oregon's Infrastructure Finance Division. | Continue to rehabilitate to occupant life safety standards certain public school and community college buildings. Senate Bill 14 from the 2001 Session of the Oregon Legislature requires that the State Board of Education examine buildings used for both instructional and non-instructional activities, including libraries, auditoriums, and dining facilities in order to determine which buildings are in most need of additional analysis. Following the identification of high-risk buildings and additional analysis, high-risk buildings must be rehabilitated by January 1, 2032, subject to available funding. SJR 21 and 22 are bond measures (November 2002 election) which would provide funding to implement this proposed action.<br>SB 2 to 5 (2005) provided the mechanism to accomplish some of these legislatively mandated tasks. Under SB 2, Oregon Department of Geology and Mineral Industries developed a seismic needs assessment database of K-12 and Community College public school buildings. These data are being used the SRGP to administer a grant program for seismic rehabilitation of eligible buildings (SB 3). SB 4 allows the State Treasury to sell Government Obligation Bonds to fund the program. | X | X | X | | X | | | | | | | 4 | | | | X | | | | | | | | 1 | Oregon Resilience Plan | BusOR-IFA | OSSPAC, DOGAMI, BCD, ODE | State-BusOR-IFA | **ONGOING** |
| **112** | Continue implementing the Oregon CRS Users Group Program. | DLCD will continue to coordinate Oregon's two NFIP CRS Users' Groups. Each group will meet a minimum of three times per year to share floodplain best management practices and to receive technical support from the State, FEMA's Insurance Support Organization, and others as needed. The State anticipates that the support provided through the CRS Users' Groups will encourage more communities to participate in the CRS program and participating communities to strengthen their CRS ratings, resulting in greater protection from flood damage at lower cost to property owners. | X | X | X | X | X | | X | X | | X | X | 9 | | | | | X | | | | | | | 1 | NFIP, Goal 7, Local Natural Hazards Mitigation Plans | DLCD | FEMA, Local Gov'ts | FEMA, CAP-SSSE | **ONGOING** |
| **113** | Monitor the effectiveness of the statewide strategy to encourage the purchase of flood insurance by demonstrating that the number of flood insurance policies held throughout the state continues to increase. | Despite the statewide availability of flood insurance, coverage in place in most communities in Oregon varies from 10% to 20% of the homes and businesses located in the Special Flood Hazard Area (100-year floodplain). Not only does flood insurance reduce the financial vulnerability of individuals, families, businesses, government agencies, other organizations, and the community to the costs posed by flooding, but through the "increased cost of compliance" provision of flood insurance, it also provides funding for the elevation, flood-proofing, demolition, or relocation of homes and businesses when required due to "substantial damage" to the structure. | X | X | X | X | X | | X | X | | | | 7 | | | | | X | | | | | | | 1 | NFIP | DLCD | DCBS-ID | FEMA | **ONGOING - Start Date 2015** |
| **114** | Update the Model Ordinance for Flood Damage Prevention | FEMA Region 10 has approved for use in Oregon a model ordinance for flood damage prevention. DLCD views the model ordinance as a living document and will continue to work with Region 10 and other interested parties to develop model ordinance provisions that address issues such as "fish-friendly" floodplain management, reducing flood insurance costs, etc. | X | X | X | X | X | | | | | X | X | 7 | | | | | X | | | | | | | 1 | NFIP, Goal 7 | DLCD | BCD | FEMA—CAP-SSSE, State DLCD, BCD | **ONGOING** |
| **115** | Maintain the Riparian Lands Tax Incentive Program | This program is administered by the ODFW. This program involves the preparation of a plan and agreement between the landowner and the ODFW. The plan details measures the landowner will implement to preserve, enhance, or restore the riparian areas. Landowners receive a complete property tax exemption for the riparian property (up to 100 feet from the top of stream bank or the edge of non-aquatic vegetation). This program helps reduce sediment and protect stream banks which helps reduce the filling of river and stream channels. | X | X | | X | X | | | | | | X | 5 | | | | | X | | | | | | | 1 | NFIP, DEQ-Water Quality | ODFW | ODR | State-ODFW | **ONGOING** |

# 2015 MITIGATION ACTIONS—ONGOING

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
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| **116** | Provide information and potentially resources to local governments for developing "flood fight" plans and protocols. | Several post-disaster mitigation strategy reports call for the development of flood fight plans and protocols in advance of flood emergencies. In addition to the state agencies potentially involved in flood fighting such as OEM and OWRD, environmental protection and habitat conservation agencies such as DEQ and ODFW should be involved in flood fight planning. At the federal level, the U.S. Army Corps of Engineers is a key partner. These plans and protocols might include improving emergency warnings, strengthening communications systems, stockpiling needed materials, preparing procedures for emergency vehicle access to flooded areas, and other related subjects, including ongoing public education efforts. | X | X | | | | | X | | | X | | 4 | | | | | X | | | | | | | 1 | Silver Jackets | OEM | ODOT | USACE, State-EMPG | **ONGOING** |
| **117** | Continue the State's active Floodplain Management Outreach Program | DLCD has an active floodplain and natural hazards outreach program. The department publishes and distributes newsletters and other outreach information to local governments and other interested parties. DLCD also maintains a website which includes a link to this NHMP. The natural hazards website (http://www.oregon.gov/LCD/HAZ/index.shtml) contains information and links to floodplain management information including many of the documents and booklets prepared by FEMA. DLCD uses an email distribution service for its Natural Hazard Newsletter and other correspondence. The email distribution service affords interested subscribers a greater opportunity to obtain flood management and natural hazards information from DLCD in a timely manner and for DLCD to more readily share information from a variety of sources. | X | X | | | | | X | | | X | | 4 | | | | | X | | | | | | | 1 | NFIP | DLCD | | FEMA | **ONGOING** |
| **118** | Continue the State's active Floodplain Management Training Program | DLCD and other State IHMT participants conduct or sponsor training sessions and meetings throughout the year focused on up-to-date floodplain management practices and projects. DLCD will continue to deliver focused training to surveyors, building officials, real estate agents and planners as well as local floodplain managers. The interdependent relationships among these key players in providing comprehensive floodplain management will also be highlighted during trainings. | X | X | | | | | X | | | X | | 4 | | | | | X | | | | | | | 1 | NFIP | DLCD | | FEMA | **ONGOING** |
| **119** | Prepare text for local broadcast of one Public Service Announcement (PSA) each year on a seasonal topic. | PSAs are an effective method for disseminating pertinent seasonal information about hazard preparedness and mitigation. | X | X | | | | | X | | | X | | 4 | | | | | X | | | | | | | 1 | NFIP | DLCD | | FEMA | **ANNUALLY** |
| **120** | Assist local communities in securing funding to mitigate damage to repetitive flood loss properties or those substantially damaged by flooding. | The state maintains an inventory of high priority repetitively damaged buildings located in floodplains. DLCD and OEM have worked closely with communities to secure funding to mitigate buildings located in the flood hazard zone and to buyout properties located in the floodway. These agencies will continue to provide such expertise statewide where needed. | X | X | | | X | | | | | X | | 4 | | | | | X | | | | | | | 1 | NFIP | OEM, DLCD | State IHMT Agencies | FEMA—CAP-SSSE, Local Gov'ts | **ONGOING** |
| **121** | Continue implementation of FEMA's Risk MAP program in Oregon, including building effective community strategies for reducing risk. | Measurably increase the public's awareness of flood and other natural hazards through a combination of regulatory and non-regulatory products, tools, community outreach. Address gaps in flood hazard data, identifying areas of dated and/or inconsistent mapping and updating high-priority areas with new mapping and innovative natural hazard mapping techniques that lead to actions that reduce risk to life and property. Provide support to help manage the FEMA Map Modernization projects that remain to be completed. | X | X | | | X | | | | | X | | 4 | | | | | X | | | | | | | 1 | NFIP | DLCD | DOGAMI, OPDR, SILVER JACKETS | FEMA-Risk MAP | **ONGOING** |

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| **122** | Continue developing Emergency Action Plans for all remaining high hazard dams in Oregon. | In Oregon, money from FEMA grants and state funds is used to help dam owners create Emergency Action Plans (EAP). An EAP helps identify situations where a dam failure might occur, actions to take that could save the dam, if possible, and evacuation routes for a dam failure situation. There is an Oregon-specific EAP template available, designed for owners of remote dams that have limited personnel. Approximately 75% of state-regulated high hazard dams have, or are currently developing EAPs. There are 67 state regulated high hazard dams, and another 65 federal high hazard dams in which OWRD plays a coordinating role. | X | X | | | X | | | | | X | | 4 | | | | | X | | | | | | | 1 | Integrated Water Resources Strategy Action 7a | OWRD | Silver Jackets | FEMA, State-OWRD | **ONGOING** |
| **123** | Implement flood protection standards for State-owned/leased buildings. | According to the Senate Bill 814 Task Force (Oregon Legislature, 1997 Session), there is a need to develop and effectively implement a strict standard governing the siting, construction, and leasing of buildings occupied by state agencies in flood-prone areas. | X | X | | | | | | | | | | 2 | | | | | X | | | | | | | 1 | NFIP | DAS-EAM | DLCD | State-DAS-EAM | **2020** |
| **124** | Acquire existing homes and businesses seriously threatened or damaged by landslide hazards | When opportunities and funding become available (pre- and/or post-disaster) explore options for the acquisition of developed property, particularly homes, in areas of repetitive or ongoing landslide hazards. Acquired properties will be maintained as open space in perpetuity and may also provide a buffer for landslide movements and debris that could otherwise impact improvements such as transportation routes. | X | X | | | X | | | | | X | | 4 | | | | | | X | | | | | | 1 | Goal 7 | OEM | DOGAMI, ODF, DLCD | FEMA-HMGP, Local Resources | **ONGOING - and as opportunities (funding and project needs) arise** |
| **125** | Assist local governments in implementing the tsunami land use guidance. | The risk of tsunami hazard for Oregon's coastal communities is well-documented with the completion of comprehensive tsunami inundation maps developed by DOGAMI. The State of Oregon can assist affected communities with its implementation, leading to better protection of life and property from tsunamis. | X | X | X | | | | X | X | | X | X | 7 | | | | | | | X | | | | | 1 | Goal 7 | DLCD | | NOAA, State-DLCD | **ONGOING** |
| **126** | Monitor implementation of the tsunami land use guidance by tracking the number of jurisdictions that have used it. | The risk of tsunami hazard for Oregon's coastal communities is well-documented with the completion of comprehensive tsunami inundation maps developed by DOGAMI. Monitoring success of the guidance will allow the State to adjust its approach and update the guidance as necessary, leading to better protection of life and property. | X | X | X | | | | | X | | X | X | 6 | | | | | | | X | | | | | 1 | Goal 7 | DLCD | | NOAA, State-DLCD | **ONGOING—Start Date 2015** |
| **127** | Continue to renew coastal communities' enrollments in the Tsunami Ready Program. | The Tsunami Ready Program is a program sponsored by the National Weather Service that is designed to provide communities with incentives to reduce their tsunami risk. Cannon Beach was the first community for Oregon. Under a proposed plan through the NTHMP, additional communities will be added until there is full participation. This program is currently evolving through a review process being carried out by the NTHMP National Coordinating Committee. OEM is the primary point of contact for more information about the Tsunami Ready Program. | X | X | X | | | | X | | | X | | 5 | | | | | | | X | | | | | 1 | Oregon Resilience Plan | OEM | DLCD, DOGAMI | NOAA, State-EMPG | **ONGOING** |
| **128** | Continue supporting school participation in annual tsunami evacuation drills. | Increase the ability of Oregonians to prepare for and recover from earthquakes and tsunamis on the Oregon Coast. | X | X | X | | | | X | | | X | | 5 | | | | | | | X | | | | | 1 | Oregon Resilience Plan, Goal 7 | OEM, DOGAMI | DLCD, ODOT | NOAA, State-EMPG, DOGAMI | **ONGOING** |

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| **129** | Continue supporting local agencies and local non-profits, such as CERT, in participating in educational efforts such as door-to-door campaigns to educate those living or working in the inundation zone on how to respond to an earthquake and tsunami. | Increase the ability of Oregonians to prepare for and recover from earthquakes and tsunamis on the Oregon Coast. | X | X | X | | | | X | | | X | | 5 | | | | | | | X | | | | | 1 | Oregon Resilience Plan, Goal 7 | OEM, DOGAMI | DLCD, ODOT | NOAA, State-EMPG, DOGAMI | **ONGOING** |
| **130** | Continue innovative outreach activities, such as tsunami evacuation route fun runs. | Increase the ability of Oregonians to prepare for and recover from earthquakes and tsunamis on the Oregon Coast. | X | X | X | | | | X | | | X | | 5 | | | | | | | X | | | | | 1 | Oregon Resilience Plan, Goal 7 | OEM, DOGAMI | DLCD, ODOT | FEMA, NOAA, State-EMPG, DOGAMI | **ONGOING** |
| **131** | Continue to develop training and information packets and articles for local building officials informing them of their responsibilities and authority under ORS 455.446 and 455.447 and the State Building Code. | Statutes and the State Building Code limit construction of new essential facilities and special occupancy structures in the mapped tsunami inundation zone. Definitions of essential and special occupancy structures are in the Oregon State Structural Specialty Code. As personnel change and time passes, additional training and information for officials will be provided. | X | X | | | X | | X | | | X | | 5 | | | | | | | X | | | | | 1 | Oregon Resilience Plan | BCD, DLCD | DOGAMI, OEM | State-BCD, DLCD | **ONGOING** |
| **132** | Work with ODOT to replace or move existing Entering/Leaving Tsunami Hazard Zone signs to correspond with the XXL inundation line developed by DOGAMI. | Existing tsunami hazard zones signs are considered inadequate for placement along stretches of Highway 101, or on any roads, that are within the tsunami hazard zone. A single tsunami hazard zone sign will not indicate the boundaries of the inundation zone. Tsunami Hazard Zone signs should be located to correspond with the XXL inundation line developed by DOGAMI. | X | X | | | | | X | | | X | | 4 | | | | | | | X | | | | | 1 | Oregon Resilience Plan | OEM | ODOT | NOAA, Local Gov'ts | **ONGOING** |
| **133** | Work with ODOT to develop additional signage as needed to increase awareness of the tsunami hazard. | Existing tsunami hazard zones signs are considered inadequate for placement along stretches of Highway 101, or on any roads, that are within the tsunami hazard zone. A single tsunami hazard zone sign will not indicate the boundaries of the inundation zone. There is need for increased public education program to let the public, including motorists who are not local residents, know what the signs mean and what actions they should take. | X | X | | | | | X | | | X | | 4 | | | | | | | X | | | | | 1 | Oregon Resilience Plan | OEM | ODOT | NOAA, Local Gov'ts | **ONGOING** |
| **134** | Work with Oregon Parks & Recreation Department and Oregon Travel Experience to increase the number of interpretive educational installations along Highway 101. | Existing tsunami hazard zones signs are considered inadequate for placement along stretches of Highway 101, or on any roads, that are within the tsunami hazard zone. There is need for increased public education program to let the public, including motorists who are not local residents, know what the signs mean and what actions they should take. | X | X | | | | | X | | | X | | 4 | | | | | | | X | | | | | 1 | Oregon Resilience Plan | OEM | OPRD, DOGAMI | NOAA, State–DOGAMI, L ocal Gov'ts | **ONGOING** |
| **135** | Develop volcanic hazard evacuation maps | Volcanic eruptions often produce lahars that travel down river valleys. Evacuation maps should include the hazard area as well as preferred evacuation routes and evacuation sites. USGS staff should support local and state agencies in this effort. | X | X | X | | | | X | | | X | | 5 | | | | | | | | X | | | | 1 | Oregon Resilience Plan | DOGAMI | ODOT, OEM | DOGAMI, USGS | **ONGOING** |
| **136** | Each year, ask the Governor to designate May to be Volcano Awareness Month by proclamation. | Working with federal partners, such as the USGS Cascades Volcano Observatory, the state of Oregon will increase the ability for citizens to respond to volcanic eruptions by increasing the level of awareness and preparedness in the public and governmental agencies. | X | X | | | | | X | | | X | | 4 | | | | | | | | X | | | | 1 | Oregon Resilience Plan | OEM | Governor's Office | NEHRP, State-EMPG | **ANNUALLY** |

# 2015 MITIGATION ACTIONS—ONGOING

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| **137** | Support development, enhancement and implementation of local education programs designed to mitigate the wildfire hazard and to reduce wildfire losses, such as the Firewise Communities/NFPA Program and the annual Wildfire Awareness Week Campaign. | As part of its statewide fire prevention program, the Oregon Department of Forestry actively encourages and promotes local education and awareness programs that are designed to mitigate, or reduce the impacts of wildfires. This action reflects ODF's ongoing intentions to: 1) collaborate with agencies and organizations to promote consistency in the development and application of fire prevention standards; 2) work to make individuals aware of their personal accountability and responsibility for wildfire safety; 3) determine local resources and capacity; and 4) define needs and solutions required to increase capacity. | X | X | | | | | X | | | X | | 4 | | | | | | | | | X | | | 1 | | ODF | OSFM, BCD, DCBS-ID, DLCD, KOG, OSU Ext. | BLM-Title III, ODF, OSFM | **ANNUALLY** |
| **138** | Continue to increase the number of local governments using the Wildfire Hazard Zone process to mitigate wildfire risk and losses | The Wildfire Hazard Zone (WHZ) process allows local governments to require the use of fire resistant roofing materials in jurisdictions assessed to be at a high risk of wildland fire. Currently, only a few eligible entities have utilized the WHZ process. To promote additional use, an assessment will be made of the portions of the state where it appears the WHZ process will have the greatest benefit. Following this assessment, local governments in the areas identified will be educated on the desirability of implementing the process. Those governments that express an interest in applying the process will be assisted in completing the required analysis work. | X | X | | | | | X | | | X | | 4 | | | | | | | | | X | | | 1 | Local Community Wildfire Protection Plan processes, Goal 7 | ODF, BCD | OSFM | BLM-Title III, State-ODF | **ONGOING** |
| **139** | Continue to develop and increase the number of updated Community Wildfire Protection Plans (CWPPs) with the goal of aligning CWPP updates with 5-year NHMP updates, where possible. | The federal Healthy Forests Restoration Act (HFRA) includes statutory incentives for federal agencies to give consideration to the priorities of local communities as they develop and implement wildfire hazard mitigation projects. To become eligible for priority consideration under HFRA, a community must first prepare a *Community Wildfire Protection Plan* (CWPP). Most Oregon counties and many Oregon communities have completed CWPPs. To encourage the completion of additional CWPPs, as well as future updates of CWPP's counties and communities will be informed of the benefits to be gained from maintaining a CWPP and assistance will be offered to help facilitate the development and/or update of the plans. Since the majority of Counties refer to CWPP's as their Wildfire Chapters, aligning CWPP updates with NHMP updates will ensure consistency and promote efficiencies in planning processes. | X | X | | | | | X | | | X | | 4 | | | | | | | | | X | | | 1 | Community Wildfire Protection Plans | ODF | OSFM | BLM-Title III, USDA-USFS & USDOI-National Fire Plan, FEMA-PDM | **ONGOING** |
| **140** | Continue to provide technical assistance in accessing funding for fire prevention or wildfire mitigation projects through Title III, the National Fire Plan, or other funding mechanisms. | Under the federal *Secure Rural Schools and Community Self-Determination Act of 2000* (Title III, Section 301(5) of PL 106-393, commonly known as *Title III*), counties have the ability to receive and spend federal funds for projects that educate homeowners about wildfire mitigation efforts they can apply on their property and for planning projects that increase the protection of people and property from wildfires. National Fire Plan and other funding mechanisms may also be available for assisting communities in preventing wildfires and implementing wildfire mitigation projects. | X | X | | | | | X | | | X | | 4 | | | | | | | | | X | | | 1 | | ODF | OSFM | National Fire Plan, State-ODF | **ONGOING** |

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| **141** | Implement the Oregon Forestland-Urban Interface Fire Protection Act ("Senate Bill 360") in all Oregon counties that meet criteria under the law. | The *Oregon Forestland-Urban Interface Fire Protection Act*, more commonly known as "Senate Bill 360," was enacted by the Oregon Legislature in response to the growing incidence of wildfire destroying homes and communities in Oregon's wildland-urban interface. The Act recognizes that individual property owners are in the best position to take mitigation actions which will have the most direct impact to whether or not a structure will survive a wildfire. Under this action item, the Act will be implemented county by county in those portions of the state, based on weather, fire incidence, fuels, or on the number of structures at risk. It has been Legislature's stated preference that implementation be accomplished with federal grant funds. | X | X | | | X | | | | | X | | 4 | | | | | | | | | X | | | 1 | Goal 7 | ODF | OSFM | State-ODF | **ONGOING** |
| **142** | Analyze wildfire ignition probability statistics to better target prevention efforts at the leading causes of fires. | There is currently no single database or common method of collecting fire cause information for wildfires occurring in Oregon. This results in different entities focusing their prevention and mitigation efforts on those causes which may not be the state's leading causes of fires. This likelihood can be lessened by developing a process to compare fire cause data collected by the Oregon Department of Forestry, the Office of the State Fire Marshal, and federal wildfire agencies.<br>It is also important to understand the ignition probability from homes within and adjacent to the wildland interface because of the ignition risk to nearby wildlands. While there is no centralized database, wildland and structural fire agencies will continue to work collaboratively to determine leading fire causes and focus efforts statewide and locally to prevent future ignitions. | X | X | | | X | | | | | X | | 4 | | | | | | | | | X | | | 1 | PNWCG | ODF | OSFM, KOG | State-ODF, OSFM | **ONGOING** |
| **143** | Collaborate through work groups within the Pacific Northwest Coordination Group (PNWCG) to continue collecting and analyzing wildfire occurrence data using the standardized statewide method and report to the state legislature as required. | Previously, data concerning the causes of wildfire incidents was collected and analyzed by at least two state agencies, five federal agencies, and numerous local fire departments. These agencies had no database standardization or common reporting requirements. A standardized data collection system has been developed and data collection and reporting continues collaboratively through work groups within the Pacific Northwest Coordination Group (PNWCG). The new system allows rapid identification of fire ignition trends and permits timely design and delivery of targeted prevention programs and activities. | X | X | | | X | | | | | X | | 4 | | | | | | | | | X | | | 1 | | ODF | PNWCG | State-ODF | **ONGOING** |
| **144** | Collaborate through work groups within the Pacific Northwest Coordination Group to encourage the U.S. Forest Service to allow the owners of long-term dwelling leases to apply mitigation standards adjacent to their dwellings. | In Oregon, several thousand seasonal homes, which are located in high-risk wildland-urban interface areas, are on lands owned by the U.S. Forest Service. Because these structures are located on ground owned by the federal government, they are not subject to the *Oregon Forestland-Urban Interface Fire Protection Act*. In many locations, even when the owners of these homes desire to complete wildfire mitigation practices, federal lease requirements totally or substantially prevent them from doing so. Under this action item, a survey will be made of all lease locations in Oregon and the federal mitigation limitation and prohibitions will be identified. This information will then be used to approach the appropriate federal officials with a request to change their policies or regulations, to allow for the application of mitigation practices on leased property. | X | X | | | | | | | | X | | 3 | | | | | | | | | X | | | 1 | | ODF | OSFM | USFS | **ONGOING** |

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| **145** | Develop a single, comprehensive statewide method or process to collect and analyze wildfire occurrence data in a timely manner | Currently, data concerning the causes of wildfire incidents is collected and analyzed by at least two state agencies, five federal agencies, and numerous local fire departments. These agencies have no database standardization or common reporting requirements. This results in great difficulty, when attempting to determine the number of wildfires that occur in Oregon, when identifying fire cause trends, and generally in obtaining information concerning wildfire trends in a timely manner. Under this action item, all agencies responsible for suppressing wildfires will be requested to report incident occurrence information to a central data repository, in a standard format, and within prescribed reporting time limits. Such a system would allow for the rapid identification of fire ignition trends and would permit the timely design and delivery of targeted prevention programs and activities. The State Fire Marshal's Oregon All Incident Reporting System (OAIRS) may be a key component in the solution. | | X | | | | | X | | | | | 2 | | | | | | | | | X | | | 1 | | OSFM, ODF | | State-OSFM, ODF | **ONGOING** |
| **146** | Continue to educate communities, workers, and the public about the role of proper tree pruning and care in preventing damage during windstorms. | Arboricultural groups, public agencies, and utilities should cooperate in promoting proper tree pruning and care practices that can reduce the risk of tree failure and property damage. Common messages refined by state level entities such as the Oregon Department of Forestry (ODF) and OSU Extension can help provide continuity and efficiency across the state.<br>While implementation of this action largely takes place at the local government level, the state has a role in encouraging and providing incentives for best management practices. ODF maintains and implements a communication plan that includes educational initiatives aimed at improving tree health in cities. This includes a variety of products, including a bimonthly newsletter, a website, and brochures that help convey these messages.<br>OSHA requires utilities to:<br>• Provide training to crews working on power lines in worker safety and the identification of trees to prune or remove; and<br>• Review regulations and standards for easement and right of way maintenance, and provide training to foresters and logging crews.<br>Utilities should instruct homeowners in pruning of vegetation, tree care safety, and proper tree care for trees bordering utility corridors and public rights of way. | X | X | | X | | | X | | | X | | 5 | | | | | | | | | | X | | 1 | OSU Land Steward Program, Oregon Small Woodland Association Tree Schools | ODF | PUC, OEM, OSU Ext. | ODF, OSU Ext. | **ONGOING** |
| **147** | Use industry best practices to minimize impact and outages to service delivery system of overhead line operators, during windstorm events. | Implement outreach efforts through existing safety-related programs managed by the PUC in coordination with private and public utilities. Compliance with PUC administrative rules includes safety codes and vegetation management. The PUC provides administrative to support to the Oregon Utility Safety Committee where all utility operators (electric, natural gas, telecommunication & water) discuss safety issues and best practices. | X | X | X | | | | X | | | | | 4 | | | | | | | | | X | | 1 | | PUC | ODF, ODOT, OR-OSHA | State-OPUC, Public and Private Utilities | **ONGOING** |

# 2015 MITIGATION ACTIONS—ONGOING

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Integrated | Implementation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Other Initiative | Lead | Support | Current or Potential Funding Source(s) | Progress & Comments |
| **148** | Educate citizens about safe emergency heating equipment. | Improper use of alternate heat sources during winter storms can cause fires. Ongoing efforts of the Office of State Fire Marshal and its work with local fire departments through the Life Safety Team (http://www.oregon.gov/OSP/SFM/Pages/CommEd_OLST.aspx). In addition, people can be killed by carbon monoxide emitted by fuels such as charcoal briquettes when used for heating homes. To reduce the threat of carbon monoxide poisoning, known as the silent killer, the 2009 Legislature passed HB 3450a requiring landlords to install carbon monoxide alarms in rentals with a carbon monoxide source and homeowners must ensure they are installed in homes at the time of sale, if the home has a source. Sources include gas heating or fireplaces, wood-burning fireplaces or stoves and attached garages. Partnerships for consistent public education messages and outreach are underway, and will include information on the dangers of introducing a carbon monoxide risk. | X | X | | | | | X | | | X | | 4 | | | | | | | | | | | X | 1 | | OSFM | OPH, BCD | State-OSFM | **ONGOING** |
| **149** | Continue educating motorists on safe winter driving, including how to be prepared for traveling over snowy and icy mountain passes. | Actions such as sanding, applying de-icing chemicals, and snowplowing do not make the road safe. Motorists must drive at speeds appropriate for the weather and road conditions, and be prepared to handle adverse conditions. Many drivers do not carry chains and do not know how or simply do not install them when conditions warrant. Also, many drivers are not prepared for a long wait in their car. Education programs would help save lives on snowy and icy roads. | X | X | | | | | X | | | | | 3 | | | | | | | | | | | X | 1 | | ODOT | OSP | State-ODOT | **ONGOING** |

**Table 3-3. Removed Mitigation Actions**

## 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **LP-4*** | Promote a state disaster and hazard mitigation fund to assist local governments' mitigation and response efforts | The availability of funding to meet immediate emergency needs, including hazard mitigation activities, is a major concern. Federal assistance programs require various matching fund contributions from state and local applicants and are not guaranteed to exist in the future. Legislation has been considered to create such a fund, common to many states, so that financial commitments can be made quickly to support hazard mitigation. The federal Disaster Mitigation Act of 2000 (DMA2K) addresses hazard mitigation planning and projects. This legislation reinforces the importance of mitigation planning, and emphasizes implementing local actions to reduce risk before disasters occur. DMA2K established a federal Pre-Disaster Mitigation (PDM) Program and new requirements for the post-disaster Hazard Mitigation Grant Program (HMGP). Section 322 of DMA2K specifically addresses hazard mitigation planning at the state and local government levels. It identifies new requirements that allow HMGP funds to be used for planning activities, and increases the amount of HMGP funds available to states that have developed a comprehensive, "enhanced" mitigation plan prior to a disaster. States and local governments must have approved hazard mitigation plans in place in order to qualify to receive post-disaster HMGP funds. Mitigation plans must demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for risk and capabilities. Establishing a state fund to assist local governments with hazard mitigation and response efforts would go a long way toward securing and leveraging federal funds. | | | | | X | | | | | | | 1 | X | X | X | X | X | X | X | X | X | X | X | 11 | State General Funds, other state funds | **DONE.** |
| **LP-5*** | Establish a system of special zones, procedures, restrictions, and conditions to limit development in tsunami inundation zones | Decisions on land use planning, siting of improvements, or capital expenditure for public and private infrastructure, critical lifeline facilities and residential, commercial, industrial and other development do not explicitly factor in potential tsunami-related hazards. Some method for factoring in tsunami hazard information is desirable. One possibility among many is implementation of a system of special zones, etc. that would include the means to determine the appropriate level of allowable activities.<br>A thorough discussion of the policy implications of any proposed land use restrictions would need to precede any decisions. Such discussions would need to factor in the probabilities and areas potentially exposed to distant versus local tsunamis, economic and social coasts of any restrictions, and the potential benefits in terms of life and property saved. Any land use restrictions would need to be based on relatively sophisticated information and mapping that would include a determination of hazardous areas for both distant and local tsunami sources, an evaluation of the hazard, an evaluation of the severity, and the level of allowable risk.<br>Detailed mapping for local Cascadia Subduction Zone tsunamis has been completed for six areas (Warrenton/Astoria, Seaside/Gearhart, Lincoln City, Newport, Coos Bay, and Gold Beach). Mapping for a worst case distant tsunami has been completed for Seaside/Gearhart. The adoption might involve amendment of DLCD's Goal 7. | | X | X | | | | | X | | | | 3 | | | | | | | X | | | | | 1 | NOAA, State-DLCD, Local Governments | **REPLACED** by #A and B (Removed), 125 and 126 (Ongoing). |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **A (NEW)** | Develop tsunami land use guidance for local governments for reducing risk within tsunami inundation zones. The guidance would include model comprehensive plan and code amendments (policies, procedures, incentives, best practices, restrictions, conditions, and a tsunami overlay zone). | The risk of tsunami hazard for Oregon's coastal communities is well-documented with the completion of comprehensive tsunami inundation maps developed by DOGAMI. The State of Oregon can assist affected communities by developing land use guidance for tsunami risk reduction. | X | X | | | X | | | | | | X | 4 | | | | | | | | X | | | | 1 | NOAA, State-DLCD | **DONE.** New Tsunami Guidance completed by DLCD in December 2013. |
| **B (NEW)** | Provide the tsunami land use guidance to local governments. | The risk of tsunami hazard for Oregon's coastal communities is well-documented with the completion of comprehensive tsunami inundation maps developed by DOGAMI. The State of Oregon can assist affected communities by providing them with land use guidance for tsunami risk reduction. | X | X | | | X | | X | | | X | X | 6 | | | | | | | | X | | | | 1 | NOAA, State-DLCD | **DONE.** New Tsunami Guidance issued by DLCD in January 2014. |
| **LP-6*** | Integrate hazard data into planning and regulations | Integrate new high-resolution hazard data into local planning and regulations. Special regulations should be established for proposed new critical facilities and/or infrastructure. | X | X | | X | | | X | | | | | 4 | X | | | X | X | X | X | X | X | | | 7 | N/A | **COVERED** by #18 (Priority). |
| **LP-7** | Improve ocean shore and related permit process | Enhance where possible the involvement of key state agencies in the ocean shore permit and related permit processes (local government, U.S. Army Corps of Engineers, etc.). | | | | | X | | | | | | | 1 | X | | | | | | | | | | | 1 | N/A | **NOT A MITIGATION ACTION.** |
| **LP-8 (REVISED)** | Develop procedures for escorting vehicular traffic through dust storms | ODOT and OSP both have procedures for escorting traffic under various circumstances. ODOT especially has much experience escorting traffic. It may be possible to develop and implement procedures for escorting traffic through dangerous dust storm conditions. | X | | | | | | | | | | | 1 | | | X | | | | | | | | | 1 | N/A | **UNNECESSARY.** Part of Traffic Incident Management Plan which is all-hazard based. |
| **LP-9** | Obtain a secure source of funding for wildfire related use of the Emergency Conflagration Act | Currently, when the Conflagration Act is used to respond to wildfire related events, the funds expended by the Office of State Marshal must either be subsequently appropriated by the Oregon Legislature or be taken from an account available to the Office of State Fire Marshal. In the latter case, the result is that monies are used for a purpose for which it was not intended and other valuable programs and projects are negatively impacted. Under this action item, the Office of State Fire Marshal will work with the Oregon Legislature to identify and fund a secure source of funding that will pay the expenses incurred in the use of the Emergency Conflagration Act. Currently, within the budget process, the OSFM has identified the need to have funds held aside for responses. | | | | | X | | | | | | | 1 | | | | | | | | | X | | | 1 | N/A | **NOT A MITIGATION ACTION.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **LP-11** | Work toward the floodplain management goals outlined in the Willamette River Legacy Program | The Governor's office has established a Willamette River initiative that lays out various goals for repairing water quality, restoring habitats, and supporting recreational opportunities. Several proposed actions would support sound floodplain management in the river basin. This includes a proposed action to protect existing functioning floodplains and reconnect historic floodplains, with a target of reconnecting 200 acres per year, 1,000 acres by 2010 focusing on tributary confluence areas between Eugene and Salem. Projected benefits of this action include reduced stream temperature, less severe flooding downstream, improved water quality, improved habitat, and increased natural storage of water. The Governor's office has identified potential funding sources as OWEB grants, CREP enrollments, 319 Grants (watershed restoration), Restoration and Enhancement Grants, Wetlands Reserve Program (WRP) and WREP, TNC utility customer salmon habitat grants, and BPA habitat compensation funds. | | | | X | | | | | | | | 1 | | | | | X | | | | | | | 1 | State-ODFW | **DONE.** |
| **LP-13** | Seek funding for the installation and operation of additional stream gages | The availability of timely and accurate telemetered data from stream gauges is essential for flood forecasting, for prediction of imminent flood hazards, and for response to flood emergencies. Stream gauging data also provide basic hydrologic information for floodplain mapping and watershed management by communities throughout the state. Numerous agencies of the federal government need data from stream gauges for effective management of projects and resources; therefore the installation and maintenance of stream gauges has traditionally been a responsibility of the federal government. State agencies plan to work with their federal counterparts to ensure adequate funding and support for existing gauges and for the installation of new gauging sites where required. It is recommended that state agencies endeavor to leverage federal funding with state resources and local matching commitments to achieve a reliable network of stream gauges around the state. | X | X | | | X | | | | | | | 3 | | X | | | X | | | | | | | 2 | State-2013 Legislature provided funding for 1.75 FTE and 16 additional stream gages. | **DONE.** |
| **LP-14** | Seek funding to enhance capacity of state floodplain management program to better support implementation of the NFIP and higher regulatory standards. | DLCD and OEM provide various services to FEMA Region 10, local governments, other governmental agencies, and the general public in support of implementation of the NFIP in Oregon. While coordination and cooperation and pursuit of various federal funding opportunities have allowed the state to temporarily enhance the services provided in some areas, neither DLCD nor OEM have been able to secure funding to permanently enhance the work capacity of the two agencies. FEMA funding is supporting a permanent position focused on Risk MAP. The agencies could more fully serve the needs of local floodplain management programs and the citizens of Oregon if additional resources could be secured. | X | X | X | | X | | | | | | | 4 | | | | | X | | | | | | | 1 | N/A | **NOT A MITIGATION ACTION.** |
| **LP-18** | Establish a method for verifying the adequacy of geotechnical site reports on an as-needed basis | Independent peer review by qualified and registered geotechnical professionals is one of the best methods of ensuring that site reports done for local governments, property owners, developers, and others are of an acceptable quality and adequately address landslide issues. It is recommended that peer review processes throughout the state be strengthened so landslide hazards are minimized. | | X | | | X | | | | | | | 2 | | | | | | X | | | | | | 1 | N/A | **LOCAL LEVEL ACTIVITY.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **C (NEW)** | Initiate a Community Rating System (CRS) Users' Group Program for Oregon. | Communities in Oregon that participate in the NFIP's CRS Program lack a way to network with and learn from other CRS communities in the state. Users' groups would provide such a forum. The groups would be open to communities already participating in the CRS Program and to others interested in floodplain best management practices. The state anticipates that the CRS Users' Groups will facilitate and strengthen participation in the CRS Program, resulting in greater protection from flood damage at lower cost to property owners. | X | X | X | X | X | | X | X | | X | X | 9 | | | | | X | | | | | | | | FEMA, CAP-SSSE | **DONE.** Two CRS Users' Groups (northern and southern Oregon) initiated in 2014. |
| **EO-3*** | Assist communities to adopt risk reduction techniques and ordinances | Techniques can involve requiring geological or geotechnical studies for new development, stormwater control for neighborhoods on slopes, strict land use ordinances for active landslides, working with infrastructure operators to increase reliability of services after storms, and more. | X | X | X | | | | X | | | | | 4 | | | | | | X | | | | | | 1 | N/A | **COVERED** by #5, 11, 12, 20 (Priority), and others. |
| **EO-4*** | Encourage Oregon coastal communities to enroll in the NFIP's Community Rating System (CRS) which includes tsunami standards. | The CRS, included in the National Flood Insurance Program, is a FEMA program that provides incentives to communities to mitigate flood disasters. By enrolling in the CRS, communities, through specific actions, receive points that go toward a reduction in insurance rates. Tsunami actions are included in the CRS and have recently been revised by FEMA in conjunction with the Insurance Services Office (ISO). Contact DLCD, OEM, or FEMA for information about the CRS tsunami program. | | X | X | | X | | X | | | | | 4 | | | | | X | | | | | | | 1 | N/A | **COVERED** by #20 and 29 (Priority). |
| **EO-5** | Improve hazard mitigation technical assistance for local governments and infrastructure operators | A DLCD-led review of the implementation of statewide planning Goal 7 resulted in the identification of several needs to strengthen local hazard mitigation efforts. These included providing current hazard information and technical assistance to local governments, improving communications between local governments and state agencies with respect to natural hazards, and providing hazard mitigation training.An ongoing need to provide technical assistance to local governments exists, and the State IHMT continues to look for ways to bridge the gaps between local planning, building, and emergency management programs, and between the local and state levels.Despite this recognition, implementation of such activities is difficult to fund and institutionalize. Through the Oregon Partnership for Disaster Resilience (OPDR) these issues have been addressed since 1999. OPDR has offered measurable outcomes on how increased communication, coordination, and collaboration between diverse partners (public and private) can assist the state and communities in reducing their risk and exposure to natural hazards.Various State IHMT partners will continue to look for opportunities to provide technical assistance in a manner that encourages coordination among various local programs and informs communities of assistance available. The State IHMT also continues to seek stable non-federal funding for OPDR.The State IHMT will endeavor to ensure that technical assistance materials provided by DLCD, OEM, DOGAMI, BCD, OPDR, PUC and other agencies support local officials' and infrastructure operator's understanding and use of hazard and risk information. | | | | | X | | X | | | | | 2 | X | X | X | X | X | X | X | X | X | X | X | 11 | N/A | **COVERED** by #1, 17, 66 (Priority); 106 and 107 (Ongoing); and others. |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **EO-6** | Develop and distribute local hazard mitigation planning guidance; provide plan development support | The Oregon Partnership for Disaster Resilience (OPDR) assists communities in developing and implementing local risk reduction plans and projects. Funding for planning-related activities comes from the Pre-Disaster Mitigation Grant Program, and 2012 marks the ninth year of regional planning efforts aimed at developing multi-jurisdictional natural hazards mitigation plans. As a direct result of OPDR activities, the majority of Oregon's counties maintain FEMA-approved natural hazards mitigation plans. On October 1, 2012, new FEMA local plan review procedures will be fully phased-in, and this will require outreach and training on a state-wide basis.<br>In conjunction with PDM plan development assistance, OPDR develops and implements training programs that benefit communities, agencies, and partners in natural hazards risk reduction. For communities developing hazard mitigation plans, OPDR develops and facilitates a series of quarterly plan development workshops. The series includes workshops on developing planning processes; involving stakeholders and conducting public outreach; mapping community assets and assessing local risks and vulnerabilities; developing goals and action items; and developing strategies for plan implementation and maintenance. OPDR also hosts a two-part plan update training series and business continuity trainings.<br>In addition to the trainings, OPDR provides communities with support, tools, and resources necessary to develop and/or update their natural hazards mitigation plans. Communities developing natural hazards mitigation plans receive a Pre-Disaster Mitigation Community Training Manual. The Training Manual offers technical information and resources to assist communities in the development of local mitigation plans, and is used in conjunction with OPDR's four-part work session series. Both the work sessions and manual synthesize the approaches developed by OPDR for Disaster Resilience, state and federal agencies, and other organizations to assist communities in developing natural hazards mitigation plans. OPDR has also created an addendum to the Training Manual to assist communities in the plan update process.<br>OPDR plays an instrumental role in the packaging and distribution of scientific and technical knowledge. Based on information provided by State IHMT and OPDR members/agencies, OPDR develops and distributes regional profiles and risk assessments to local communities. The regional reports are part of the State's Enhanced Natural Hazards Mitigation Plan, and they also serve as regional resources for local planning initiatives. The regional profiles and risk assessments are maintained and updated in accordance with the State's Plan implementation and maintenance schedule. As such, the reports include and disseminate the most recent scientific and technical knowledge available at the time. Likewise, communities are encouraged to update the regional profiles and risk assessments with local data, as available.<br>Additionally, OPDR's website hosts a number of useful resources for communities developing and/or updating natural hazards mitigation plans, including the searchable natural hazard mitigation action item database. The | | X | | | X | | X | | | | | 3 | X | X | X | X | X | X | X | X | X | X | X | 11 | N/A | **REPLACED** by #46 and 50 (Priority), 83, 84, and 85 (Ongoing). |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| | | database includes action items from plans developed as part of the Pre-Disaster Mitigation Planning Grants covering the Mid/Southern Willamette Valley, Mid-Columbia, Southeast Oregon, Northeast Oregon, and Oregon Coast regional planning initiatives. Eventually, this database will host the action items from all local plans. Additional online resources include the state's enhanced natural hazards mitigation plan, links to regional planning initiatives, technical memos, links to state agencies' websites, and hazard-specific resources. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **EO-8** | Develop tsunami hazard and evacuation maps | Tsunami run-up areas and evacuation maps continue to be developed in conjunction with local governments. Tsunamis can dramatically affect coastal erosion and must be taken into account in planning activities. | X | | | | | | X | | | | | 2 | | | | | | | X | | | | | 1 | **NOAA** | **DONE.** |
| **EO-14 (REVISED)** | Develop protocols for improving communication of hazardous blowing dust conditions between public safety answering points, ODOT, OSP, and local law enforcement agencies. | Community Solutions Team (CST) meetings in the Mid-Columbia Region of Oregon during the spring of 2000 identified that better communication between public safety answering points (PSAPs) about the existence and likely direction of travel of dust storms might have provided additional warning time for ODOT, OSP, and local law enforcement to stop travel on downwind highways likely to be affected.<br>Protocols should be developed and training provided should be considered that would result in PSAPs relaying information, as appropriate, to ODOT, OSP, local law enforcement, and the downwind neighboring PSAP regarding reports of dust storms headed in a particular direction. This may provide additional time for ODOT and law enforcement agencies to briefly close stretches of highways in the path of the storm and/or for reader boards and other advisory systems to be activated with information. There are a number of issues and factors that would need to be addressed in determining the feasibility of developing protocols and training on them:<br>▪ Staffing/Costs—Some PSAPs do not have more than one or two people per shift on duty; when events<br>such as dust storms happen, personnel sometimes find it difficult to keep-up with existing, ongoing protocols.<br>▪ Feasibility—If the only information PSAPs have is based on what they are told by callers or mobile police/fire units via radio, will they know enough about the direction of travel of the dust storm to issue reliable information?<br>▪ Technology—Is new technology needed to accomplish the task contemplated?<br>4 Liability—Would adding such protocols unnecessarily contribute to potential liability for PSAPs?<br>Work with APCO/NENA—and especially local PSAPs in dust storm prone areas—to develop and train on communication protocols for dust storms. | X | X | | | | | X | | | X | | 4 | | | X | | | | | | | | | 1 | N/A | **UNNECESSARY.** Existing protocols for hazardous weather traffic management are sufficient to use for dust conditions. |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **EO-16** | Provide additional information to the traveling public about dust storm driving safety | Among the ideas generated by the Community Solutions Team meetings in the spring of 2000 was to provide additional public education outreach in dust storm prone areas of the state, especially Morrow and Umatilla counties. Among the ideas were the following: 1) Provide dust storm driving information in safety rest area kiosks. 2)Develop, print, and distribute "table cards" to area restaurants and truck stops, providing information on driving when visibility is reduced (dust storms, fog, smoke, etc.), perhaps making similar information available at DMV offices. 3)Develop and distribute PSAs on the topic of driving in dust storm conditions to radio stations; stations would be encouraged to run these during peak periods when there is a strong possibility of high winds and blowing dust (Tri-Cities radio stations should be included). Determine the merit of these ideas and implement those that are likely to result in a better-informed traveling public, thereby increasing safety on Oregon's highways. | X | | | | | | X | | | | | 2 | | | X | | | | | | | | | 1 | N/A | **COVERED** by #95 (Ongoing). |
| **EO-18** | Promote agricultural practices that are known to reduce erosion of soil by wind, thereby reducing the frequency and magnitude of dust storms | It is clear that certain agricultural practices reduce the frequency and amount of blowing dust, as well as reduce wind-caused soil erosion. Oregon Department of Agriculture should continue to work with farmers, agricultural associations, and soil and water conservation districts to further promote and implement: 1) Residue management, including no-till or direct seed farming. 2) Cover crops and other BMPs (see below). 3) Field strip cropping systems. 4) Landscape buffers/windbreaks. The most commonly used practice for both wind and water erosion control is residue management. This involves leaving some or all of the residue from the previous crop on the soil surface to provide cover and surface roughness to provide protection against erosion. Residue management involves tillage practices that do not turn the soil over thus burying the residue. Reduced tillage, minimum tillage, no-till, mulch till, and conservation tillage are all terms used to describe the various methods used to accomplish residue management. Other "best management practices" (BMPs) used in wind erosion prone areas include cover crops, annual or continuous cropping, and crop rotations. On irrigated land, a common practice is to irrigate soon after tillage to form a crust on the soil that reduces the potential for wind erosion. Field strip cropping systems can reduce exposed surface area by up to 50% on each field. Landscape buffers/windbreaks are likely the most expensive alternative because a series of properly spaced tree and shrub windbreaks requires the purchase of trees/shrubs, and since it would likely need irrigation, requires some infrastructure development and maintenance costs. Additionally, to be effective, it needs to be done as a system, involving multiple ownerships. The Coordinated Resource Management System approach might be used to obtain cooperation and achieve coordinated implementation. The Columbia Plateau Wind Erosion/Air Quality Project, also known as the Columbia Plateau $PM_{10}$ Project, has conducted years of research and has produced many fine publications. The latest report, *Farming with the Wind II* (Special Report XB1042) was released in Feb. 2004. For more information, see: http://pnw-winderosion.wsu.edu | | | | X | | | | | | | | 1 | | | X | | | | | | | | | 1 | State-ODA | **DONE.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
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| **EO-21** | Provide information to local governments regarding adoption of programs and model ordinances for mitigation of existing, hazardous, unsecured buildings elements, such as parapets | Some common building features subject to earthquake damage and corresponding safety hazards include parapets, awnings, signs, decorative features, and masonry moldings. BCD has adopted the International Building Code (IEBC) as an alternate method, which was amended to support Portland's local ordinances on seismic design requirements for existing buildings. Local governments that wish to adopt hazard mitigation standards for existing buildings as permitted by ORS 455.020(4) should follow the City of Portland's local ordinance (Chapter 24.85 Seismic Design Requirements for Existing Buildings). | X | X | X | | | | X | | | | | 4 | | | | X | | | | | | | | 1 | N/A | **NO AUTHORITY.** Not allowed under current law. |
| **EO-23** | Identify an Oregon institution to host the Advanced National Seismic System (ANSS) Interpretive Center in Oregon | The August 2001 implementation plan for the ANSS Pacific Northwest Region identifies a need for an institution in Oregon to interpret ANSS Oregon earthquake data and information products for users ranging from emergency managers and news media to research scientists. This project is, in part, a USGS effort mandated by Congress, which involves the purchase, installation, monitoring, and maintenance of strong motion seismographs. | | | | | X | | X | | | | | 2 | | | | X | | | | | | | | 1 | N/A | **NOT BEING PURSUED.** |
| **EO-24** | Continue to improve the communication of historical information on stream flows during past El Niño and La Niña years to water managers throughout Oregon; historical data provides the earliest clue on where flooding may occur or where there could be water shortages. | Stream flow data from past El Niño and La Niña years can provide clues as to where the state is more likely than during an "average" year to experience water shortages or flooding. This information should be better communicated to water managers, floodplain managers, emergency managers, and others with an interest in stream flows. The apparent association of ENSO signals and stream flows shows up only in some basins and some years and thus cannot be relied on with certainty. A forecast based only on ENSO signals may be overly simplified, or in some cases, misleading. (For example) the SOI variable is significant in both the Wilson and Trask rivers but the La Niña variable is not significant in these two basins. Neither variable is significant in the Siletz (which has 60-plus years of record). Although (there is) a potential role for ENSO signals in flood planning, relevance will depend in part on the physical characteristics of individual watersheds and on the particular flow metrics of interest to floodplain managers. An apparently strong ENSO signal in a particular region may be of little use for some individual catchments in the region other factors can play major roles in whether a high flow results in a flood event. Along Oregon's coast, for example, floods in some smaller rivers that empty into bays often are caused by storm surges and high tides in concert with heavy precipitation. These surges and tides pile-up bay water and decrease the rate at which stream flows can be discharged to the open sea. | X | X | | | | | X | | | | | 3 | | | | | X | | | | | | | 1 | N/A | **NOT A MITIGATION ACTION.** |
| **EO-25** | Facilitate additional training on seismic design of structures and requirements of the State Building Code relating to hazard mitigation. | Facilitate the development of training courses for individuals involved in earthquake hazard mitigation and building design, construction, and inspection. Focus on audiences that include architects, engineers, contractors and code enforcement personnel. The workshops will also provide a forum for instruction on construction and retrofitting techniques to increase the seismic resistance of existing buildings. | | | | | | | X | | | | | 1 | | | | X | | | | | | | | 1 | N/A | **NO AUTHORITY.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
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| **EO-26** | Draft model intergovernmental agreements to establish clear definitions of assistance and authority across jurisdictional lines or when state or federal resources are needed. | Create a model mutual aid agreement to be used by state and local governments when providing assistance across jurisdiction lines. Establish additional clear guidelines when local jurisdictions need additional state, federal, or special resources. | X | X | | | | | | | | | | 2 | X | X | X | X | X | X | X | X | X | X | X | 11 | N/A | **NOT A MITIGATION ACTION.** |
| **EO-30** | Expand the Firewise Communities/NFPA program in Oregon | The national Firewise Communities/USA recognition program promotes a self-help approach by which local communities can improve their level of protection from wildfires. Within a community, the program is started when a fire service professional provides information about how the community can successfully coexist with wildfires, explains basic fire mitigation measures, and helps to complete a community assessment of their situation. The community then uses this information to develop and carry out a mitigation plan which is tailored to its unique location and situation. Currently, several of Oregon's communities have participated in the program. More will be encouraged to do so. | X | X | X | X | | | X | | | | | 4 | | | | | | | | | X | | | 1 | N/A | **COVERED** by #137 (Ongoing). |
| **EO-31** | Encourage increased commercial utilization of biomass materials from wildland-urban interface areas | For a variety of reasons, vegetative fuels in and adjacent to wildland-urban interface (WUI) areas are accumulating at historically high rates. The ability to properly, cost effectively, or ecologically dispose of such fuels, as a part of a comprehensive mitigation strategy, is often limited and may even be nonexistent in some locales. One way to address this problem is to encourage increased commercial utilization of biomass materials which are created by mitigation activities in WUI areas, such as by burning to create steam and electricity (co-generation). The development of the infrastructure to support such utilization requires significant marketing and investment. Under this action item, the desirability of entering such markets will be promoted to potential developers and investors. | | | | X | | | X | | | | | 2 | | | | | | | | | X | | | 1 | N/A | **NOT BEING PURSUED.** |
| **EO-32 (REVISED)** | Continue Oregon's annual Wildfire Awareness Week campaign | Creating public awareness of the need to consider and to apply wildfire mitigation actions, such as hazardous fuels removal, on privately owned lands is one of the keys to the successful implementation of a comprehensive wildfire awareness program. In recent years, the states of Oregon and Washington have jointly conducted an annual wildfire awareness campaign, early in the spring. Under this action item, Oregon will devote more time, energy, and money to designing and conducting an annual wildfire awareness week campaign. The goal will be to make residents more aware of the wildfire risks they face and how they can help to reduce that risk. | X | X | X | X | | | X | | | | | 5 | | | | | | | | | X | | | 1 | N/A | **COVERED** by #137 (Ongoing). |

# 2015 MITIGATION ACTIONS—REMOVED

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| **EO-35** | Floodplain Management Outreach | DLCD has an active floodplain and natural hazards outreach program. The department publishes and distributes newsletters and other outreach information to local governments and other interested parties. DLCD also maintains a website which includes a link to this NHMP. The natural hazards website (http://www.oregon.gov/LCD/HAZ/index.shtml) contains information and links to floodplain management information including many of the documents and booklets prepared by FEMA. DLCD uses an email distribution service for its Natural Hazard Newsletter and other correspondence. The email distribution service affords interested subscribers a greater opportunity to obtain flood management and natural hazards information from DLCD in a timely manner and for DLCD to more readily share information from a variety of sources. DLCD and other State IHMT participants also conduct or sponsor training sessions and meetings throughout the year focused on up-to-date floodplain management practices and projects. DLCD will continue to deliver focused training to surveyors, building officials, real estate agents and planners as well as local floodplain managers. The interdependent relationships among these key players in providing comprehensive floodplain management will also be highlighted during trainings.In addition to the on-going activities mentioned, DLCD will add the following to its outreach program. DLCD will prepare text for local broadcast two Public Service Announcements (PSAs) each year on a seasonal topic. DLCD will also complete and disseminate the Floodplain Management Administrative Procedures Guidebook to all 270 Oregon communities participating in the NFIP. This guidebook clarifies roles, responsibilities and actions to be taken by local communities. It will also be used during NFIP trainings given to local officials. | X | X | X | | X | X | X | | | | | 6 | | | | | 5 | | | | | | | 1 | N/A | **REPLACED** by #117, 118, 119 (Ongoing), and D (Removed). |
| **D (From EO-35)** | DLCD will also disseminate the Floodplain Management Administrative Procedures Guidebook to all 270 OR communities participating in the NFIP. | This guidebook clarifies roles, responsibilities and actions to be taken by local communities. It will also be used during NFIP trainings given to local officials. | X | X | X | | X | X | X | | | X | | 7 | | | | | 5 | | | | | | | 1 | FEMA-CAP-SSSE | **DONE.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
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| **EO-36** | Develop effective means and information to minimize erosion of soils and stream banks during flood events of varying magnitude | Several State IHMT Reports call attention to the need to systematically develop means and information to help minimize the effects of erosion from farmlands, stream embankments, slide areas, farm roads, and other locales. There is a need to promote effective erosion control techniques, including bioengineering of stream banks and planting of riparian vegetation, to help preserve soils, riparian zones, and habitats. Evaluate and use post-disaster funding opportunities (such as the Hazard Mitigation Grant Program) to study the efficacy of natural, bioengineering stream bank protection strategies. Potential projects could be the outcome of these studies and proposed treatments that demonstrate cost-effective solutions.<br>DSL is the state agency responsible for issuing the required permits for instream work, and those required to build or repair a levee. DEQ is also involved in the permitting process with help from ODFW, USACE, and the NRCS. DEQ often requires bioengineering in conjunction with the issuance of a permit. DEQ is also responsible for setting water quality standards. ODFW is involved with riparian planting and restoration projects. Various state agencies have opportunities to participate in riparian protection or erosion prevention programs, and those efforts, when taken collectively, should help the state make progress with this action. | | | | X | | | X | | | | | 2 | | | | | X | | | | | | | 1 | State-DSL | **DONE.** |
| **EO-38** | Complete an evacuation mapping GIS database | With funding from the National Tsunami Hazard Mitigation Program all existing evacuation maps are being entered into a GIS database. Data collected for future maps will also be entered into the database. This will provide not only a centralized location for all the evacuation maps but the ability to make maps and permanent signs with a similar format for all coastal areas. The long-term objective is to empower users to make their own evacuation maps through an interactive web site that allows placement of the evacuation zone on a variety of base maps at any scale desired. | X | | | | | | X | | | | | 2 | | | | | | | X | | | | | 1 | NOAA-NTHMP | **DONE.** |

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| **EO-40** | Public information and education about tsunami preparedness and mitigation | Each year more people visit or move to the coast. There is thus a constant need for public education: what are the tsunami hazards, what to do in the event of a tsunami, and how to mitigate tsunami hazards. This is especially important in light of the problems some coastal counties had during the Nisqually Earthquake in Washington that was felt on the Oregon Coast and the Peru earthquake and tsunami where the Oregon Coast was twice in a tsunami watch.A systematic study of what educational strategies work the best was accomplished in a NTHMP-supported pilot study of Seaside, Oregon (see DOGAMI Open File Report O-05-10). According to polls conducted for this study, door-to-door outreach and evacuation drills were the most effective techniques. As demonstrated in the Seaside study, tsunami evacuation drills help people respond quickly and efficiently to a tsunami warning and generate local media attention to the issue. This is particularly important if a major earthquake is expected to trigger a near-source-generated tsunami. Tsunami surges may arrive within just a few minutes, so it is imperative for people to instinctively know where to evacuate to immediately after the shaking stops. Community Emergency Response Teams (CERT) are an effective means of doing door-to-door outreach and organizing evacuation drills. The long-term objective is to implement CERT in every coastal community.The Seaside format was used in Lincoln City to great success, showing the usefulness of the methods. Leveraging the various volunteers, such as CERT and Neighborhood Watch, is one of the most effective uses of scarce resources.As a result of post-disaster mitigation funding (HMGP) from DR-1964, there will be potential project opportunities to evaluate and demonstrate effective mitigation techniques that identify natural, high ground locations outside of the tsunami inundation zone as safe havens for evacuation. | X | X | X | | X | | X | | | | | 5 | | | | | | | X | | | | | 1 | N/A | **REPLACED** by #128, 129, and 130 (Ongoing). |
| **EO-41** | Coordinate an Oregon-specific distant tsunami warning workshop | The Oregon Distant Tsunami Working Group (ODTWG) is a partnership between Federal, State and Local agency representatives; local business partners and community members designed to reduce the impact of distant tsunamis on coastal Oregon communities. Led by the Oregon Office of Emergency Management (OEM), the ODTWG is Oregon's community-focused program to improve tsunami mitigation and preparedness of at-risk areas within Oregon. One goal of the Working Group will be to look at how response to a distant tsunami could be applied in the case of a local tsunami.<br>The ODTWG includes Counties, Cities, the Oregon Office of Emergency Management, the National Weather Service, the Federal Management Agency, the Oregon Department of Geology and Mineral Industries, Media representatives and community members. This strong and active partnership enables all levels of government to work toward the common goal of saving lives of all people at risk for a tsunami at our state's coastline, and reducing damage to property and the economy. | | | | | | | X | | | | | 1 | | | | | | | X | | | | | 1 | NOAA, State-OEM | **DONE.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
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| **EO-42** | Develop tsunami evacuation maps for all affected communities with established assembly areas | The key to effective tsunami mitigation is to insure that people know what to do and where to go in the event of a tsunami. Evacuation maps that are consistent and easy to read and that identify the safe areas, best evacuation routes and destination sites are critical. With the development of the GIS database the maps can be easily disseminated. | X | | | | | | X | | | | | 2 | | | | | | | X | | | | | 1 | NOAA, State-DOGAMI, OEM | **DONE.** |
| **EO-44 (REVISED)** | Install tsunami signs in all affected coastal communities | Signs reinforce the evacuation maps and tsunami educational materials and are a very visible reminder of the tsunami hazard, where the hazard zone is and where the best evacuation routes are. A few communities have already installed hazard zone and evacuation route signs. Many counties have signs, but are waiting either for the time and/or money or development of evacuation maps before installing them. Robust signage that delineates evacuation routes leading to natural, high ground outside of the tsunami inundation zone is a low-cost, top mitigation priority. | X | | | | | | | | | | | 1 | | | | | | | X | | | | | 1 | **N/A** | **REPLACED** by #132, 133, and 134 (Ongoing). |
| **EO-45** | Encourage local emergency managers with potential volcanic hazards to include volcanoes in their response and natural hazards mitigation plans | State and local emergency managers plan responses for a variety of hazards, including volcanoes. Clackamas County, which includes the southwest portion of Mount Hood, was the first jurisdiction in the nation to complete a FEMA-approved natural hazards mitigation plan, which includes short and long-term proposed actions to mitigate the effects of volcanic eruptions. Local response plan chapters (annexes) developed for volcanic hazards should include pre-eruption through post-eruption sections. | | | | | X | | X | | | | | 2 | | | | | | | | X | | | | 1 | N/A | **LOCAL ACTIVITY.** NHMP requirement for affected local governments. |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
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| **EO-47** | Encourage communities to include volcano hazards, if appropriate, in their multi-hazard mitigation planning process | How a community might respond to volcano hazards depends on a number of things including proximity of the community to the volcano, the nature of the volcano hazards, local volcano history, what is at risk/vulnerable to volcano hazards, and the probability of when or if an event might occur.The difficulty in predicting how catastrophic volcano-associated hazards might be and how often they might occur creates a problem for land use planning solutions. Except for a few Oregon communities on or very near a volcano (e.g., Government Camp on Mount Hood), stringent standards solely based on the prospect of volcanic activity are not realistic. The best approach may be multi-hazards instead of treating volcano-associated hazards separately. A multi-hazard approach would take all natural hazards into consideration during a community's planning process. For example, prohibiting development in the 100-year (1%) floodplain ensures some degree of safety from flood, lahars, earthquake damage (e.g., liquefiable soils), and so on, while preserving the floodplain for natural and beneficial uses. In addition, siting standards for infrastructure and/or critical facilities would include volcano-associated hazards among other hazards to be avoided. DOGAMI published two special papers to help communities look at multi-hazard mitigation: Special Paper 31, Mitigating Geologic Hazards in Oregon: a Technical Reference Manual (Beaulieu and Olmstead, 1999a) and Special Paper 32, Geologic Hazards: Reducing Oregon's Losses (Beaulieu and Olmstead, 1999b). These publications have been widely distributed to local governments. Secondary effects also need to be incorporated into the multi-hazard framework. These effects include degradation or loss of habitat for endangered species (or species that may become endangered after a major eruption), the economic loss if timber resources are destroyed or made inaccessible, and the loss of surface water as a source of drinking water, irrigation, or for industrial needs. Each of these can have a long-lasting economic effect on Oregonians as well as create physical changes in the landscape made by an eruption. | X | X | | | X | | X | | | | | 4 | | | | | | | | X | | | | 1 | N/A | **LOCAL ACTIVITY.** NHMP requirement for affected local governments. |
| **EO-53 (REVISED)** | Educate citizens about ways to weatherize their homes. | Weatherization measures can help keep the cold out during winter. Energy audits, cash rebates, and tax credits are available to help homeowners. Energy audits, cash rebates, and education are also provided by the Energy Trust of Oregon to customers of the regulated energy utilities with oversight by the OPUC. | X | X | | | | | X | | | X | | 4 | | | | | | | | | | | X | 1 | FEMA, Local Governments | **COVERED** by #41 (Priority). |
| **EO-54** | Educate citizens about the dangers of hypothermia and other winter health conditions. | State agencies should work with the American Red Cross and local health authorities to educate citizens about the dangers of winter health conditions, including hypothermia, exhaustion, and heart attacks caused by overexertion. | X | X | | | | | X | | | X | | 4 | | | | | | | | | | | X | 1 | N/A | **NOT A MITIGATION ACTION.** |
| **EO-56** | Educate motorists who plan to travel over mountain passes in winter about the need to be prepared | During the December 2003 closure of the Siskiyou Pass on Interstate 5, ODOT and Oregon State Police freed many drivers only to have them spin out and get stuck again. If drivers would have had tire chains, and installed them when conditions warranted, clearing the pass would have been completed hours earlier. Many drivers were not prepared for a long wait in their car. Each year ODOT finds stranded motorists who either do not have or do not know how to install chains. | X | | | | | | X | | | | | 2 | | | | | | | | | | | X | 1 | N/A | **COVERED** by #149 (Ongoing). |

# 2015 MITIGATION ACTIONS—REMOVED

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| **EO-57 (REVISED)** | Improve geotechnical report standards for the coast. | Numerous local jurisdictions have upgraded the geotechnical report standards for assessing the risk and mitigation measures for development proposed in coastal hazard area. | X | X | | | X | | X | | | X | X | 6 | X | | | | | X | | | | | | 2 | Professional Fees | **DONE.** |
| **EO-59** | Improve coastal erosion hazard mapping and inventories | Coastal hazard mapping is a long-term program for four reasons. One is budgetary. It is expensive to research and map information for such a dynamic system. Another reason is the dynamic nature of the Oregon coast. Beaches, dunes, and headlands change over relatively short (and longer) time spans. As headlands recede, for example, new maps with new shorelines and erosion rates need to be developed. New technology is the third reason. For example, the tsunami maps issued by DOGAMI are created with the help of sophisticated computer models and high resolution digital elevation models that were not available until a few years ago. Finally, different uses require maps of different scales.<br>Mapping is one element needed in an inventory. Progress is being made by DOGAMI and DLCD to increase assistance to local governments in developing inventories based on sound technological research (Figure CE-6). While this process takes significant time to complete, there are a variety of strategies local governments and state agencies can use:<br>• Inventory and catalog existing coastal natural hazards, studies, maps, digital data, and other information available from city, county, state, federal, university, private, and other resources.<br>• Establish criteria and standards for collecting, reporting, and mapping information about chronic and catastrophic coastal natural hazards.<br>• Develop standardized, detailed coastal hazard maps for priority areas along the Oregon Coast. | X | X | | | X | | X | | | | | 4 | X | | | | X | X | | | | | | 3 | NOAA, State General Funds - DOGAMI, and Local Governments | **DONE.** Detailed coastal hazard mapping has been done for Tillamook, Lincoln, and Clatsop Counties, and the portion of Curry County from Gold Beach to Nesika Beach. |
| **EO-60 (REVISED)** | Better understand beach processes by developing a coastal geomorphic database. | Develop a coastal geomorphic database that describes the various morphological parameters of beaches, dunes, and bluffs present along the central to northern Oregon coast, specifically in Clatsop and Tillamook Counties. | X | X | | X | | | | X | | | | 4 | X | | | | | | | | | | | 1 | NOAA 309 | **DONE.** |
| **EO-61** | Mandate review for site-specific seismic hazard reports | Independent peer review by qualified and registered geotechnical and engineering geologic professionals is one of the best methods of ensuring that site reports done for local governments, property owners, developers, and others are of an acceptable quality and adequately address site issues associated with earthquake faults and earthquake-caused ground failures. A mandatory review requirement and funding/cost recovery mechanism are needed. | | X | | | X | | X | | | | | 3 | | | | X | | | | | | | | 1 | N/A | **LOCAL ACTIVITY.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
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| **EO-62** | Install new Entering and Leaving Tsunami Hazard Zone signs in selected areas in the inundation zone along Highway 101. | Existing tsunami hazard zones signs are considered inadequate for placement along stretches of Highway 101, or on any roads, that are within the tsunami hazard zone. A single tsunami hazard zone sign will not indicate the boundaries of the inundation zone. Highway 101 often stays within the inundation zone for miles. Therefore ODOT, in collaboration with OEM, DOGAMI, and the coastal county emergency managers, designed the template for Entering and Leaving Tsunami Hazard Zone signs and placed the signs to identify the hazard zones. Resources for this project were limited, so signs are not present in every hazardous part of the coast highway system. A long-term goal is to complete this project and to reposition signs where new inundation mapping indicates a need. There is need for increased public education program to let the public, including motorists who are not local residents, know what the signs mean and what actions they should take. Additional/improved signage is proposed to reflect changes in maps by 2015. | X | | | | | | | | | | | 1 | | | | | | | X | | | | | 1 | N/A | **REPLACED** by #132, 133, and 134 (Ongoing). |
| **E (NEW)** | Refine coastal erosion risk mapping for Tillamook County and its cities to utilize a fully probabilistic approach. | Revise coastal erosion risk mapping and analysis for Tillamook County, and cities within the County, to utilize a fully probabilistic approach. Probabilistic modeling approaches will be used to better address uncertainty and allow local and state hazard managers to use the information to better manage uses based on relative risks. This will allow DLCD and DOGAMI to increase assistance to local governments in developing inventories based on sound technological research and in incorporating this information into their coastal management programs. | X | X | | | | | X | X | | X | | 5 | X | | | | | | | | | | | 1 | NOAA, State-DOGAMI | **DONE.** |
| **F (NEW)** | Establish Base Flood Elevation Determination Service | Establish state-approved service to provide Base Flood Elevations to surveyors for the purpose of completing Letters of Map Amendment under the National Flood Insurance Program. Base Flood Elevations are determined by DOGAMI by producing hydraulic models based on lidar topographic data. This is useful in areas where Base Flood Elevations have not been determined by FEMA, though Special Flood Hazard Areas have been mapped. | X | X | | | X | | | | | X | | 4 | | | | | X | | | | | | | 1 | State- DOGAMI | **DONE.** |

# 2015 MITIGATION ACTIONS—REMOVED

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| **CI-1*** | Complete a statewide evaluation of the condition of levees, dikes, and dams built for flood control purposes | Several reports indicate a broad need to assess the capabilities, conditions, and maintenance of levees statewide to assess performance under flood conditions. As part of the FIRM modernization program, FEMA identified 12 levees in Oregon that are mapped as providing protection against flood waters, but may in fact be deficient. FEMA asked affected communities to complete an accreditation process to prove the levees are capable of controlling the 1% annual flood before they can be shown as providing protection against the 1% annual flood on the FIRM. Five communities managed to complete the accreditation The levees identified by FEMA by no means reflect the full inventory of levees in the state that provide flood protection, but which may be insufficiently or improperly maintained. Many of these levees are privately owned.<br>One of the challenges identified during FEMA accreditation process was confusion over what kind of vegetation is appropriate to allow on levees and how it should be maintained. This is not a new concern. DEQ, ODFW, USACE, and other agencies have been discussing development of a guidance document on preferred levee types and appropriate use of vegetation. At a minimum, the federal agencies NRCS and USACE should be involved with the state agencies noted below in implementing this action item.<br>Dams present another challenge. Regardless of whether a particular dam was designed and built for flood control, the presence of any large dam will serve to reduce the peak flow in the downstream river channel to some degree. Typically, the larger the structure, the greater the corresponding effects of reservoir flood routing and the greater the perceived reduction in short-term or periodic flooding. In Oregon, there are many examples of areas below such dams where development has encroached upon riparian areas that formerly were subject to periodic flooding. However, it is important to realize that long-term reduction in downstream flooding does not exist below most such dams. Runoff from large storms may need to be passed downstream to avoid the potential for dam failure. This sudden release of water may prove very damaging to downstream life and property.<br>All dams and reservoirs which would likely result in direct loss of life in the event of failure and the associated sudden release of water are defined as “high hazard” structures. Maps illustrating the zone of downstream inundation area are required to be produced for these structures. The inundation zone shows the physical boundaries, water depths, and arrival times associated with the projected flood wave. Existing “high hazard” dams that have inundation maps will be inventoried and copies of these maps provided to local emergency managers for incorporation into local mitigation plans. High priority must be given to inundation mapping for existing “high hazard” dams that do not currently have inundation maps. | X | X | X | | | | | | | | 3 | | | | | X | | | | | | | 1 | N/A | **COVERED** by #92 (Priority). |
| **CI-1B (REVISED)** | Complete statewide tsunami hazard identification. | Identify local and distant tsunami inundation zones. | X | X | | | X | | | | | | | 3 | | | | | | | X | | | | | 1 | NOAA, State-EMPG | **DONE.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
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| **CI-2* (REVISED)** | Continue to conduct and improve risk assessments for state owned properties | FEMA requires the state's plan to: 1) describe the types of state owned or operated critical facilities located in the identified hazard areas; and 2) present an estimate of the potential dollar losses to state owned or operated buildings, infrastructure, and critical facilities in the identified hazard areas. In addition, FEMA also requires that the state develop a comprehensive multi-year plan to mitigate the risks posed to existing buildings that have been identified as necessary for post-disaster response and recovery. Part of this risk assessment for state owned property should be to identify: 1) which facilities would be necessary for response and recovery efforts and 2) mitigation strategies for those priority facilities. Currently, the State Plan's assessment of state owned properties consists of a 'low,' 'moderate,' or 'high' vulnerability ranking. Rankings are derived from county-wide hazard analysis scores that do not account for local variations in vulnerability. Likewise, the structural integrity and physical condition of the critical facilities are not yet considered. As such, the State IHMT will encourage the state to invest resources in performing more detailed vulnerability assessments for State-owned properties. The assessments may result in mitigation opportunities that reduce the state's vulnerability to natural hazards. | X | X | X | | | | | | | | | 3 | X | X | X | X | X | X | X | X | X | X | X | 11 | FEMA, State-DOGAMI, DLCD | **COVERED** by #45 (Priority). |
| **CI-5* (REVISED)** | Strongly encourage voluntary relocation of existing essential facilities, hazardous facilities, and special occupancy structures that are in the tsunami inundation zone. | A large tsunami (preceded by a locally devastating earthquake) would likely destroy many buildings in coastal communities that are located in the tsunami inundation zone. The damage would be from the combined effects of the forces from the tsunami surges, currents and debris as well as the earthquake hazards. Essential facilities and special occupancy structures, such as fire stations/hospitals and schools, and hazardous facilities are often located in the tsunami inundation zone. Because of the critical need of essential facilities during a disaster, the added danger from hazardous materials, and the importance of protecting children, these facilities and structures need to be relocated out of the inundation zone through some type of incentive program. A voluntary program can be implemented without statutory change; however, a mandatory program would require legislative support. After a tsunami disaster, the top priority would be to reconstruct essential facilities, special occupancy structures, and hazardous facilities out of the tsunami inundation zone as defined in the maps produced for ORS 455.466 and 455.467. Finally, when these facilities come up for replacement, they should be encouraged to build out of the tsunami inundation zone. | X | X | X | | | | X | | | | X | 5 | | | | | | | X | | | | | 1 | DOGAMI, OEM, DLCD, PDM, NEHRP, Local Governments | **COVERED** by #125 (Priority). |
| **CI-10 (REVISED)** | Promote vulnerability studies of critical infrastructure | Promote vulnerability studies of critical infrastructure (lifelines) to operators. Lifeline services, such as electricity, gas, and telecommunications, can be critical to a community's wellbeing. However, much of Oregon's infrastructure has not been designed to tolerate extreme conditions, such as severe storms, major earthquakes, or large landslides. Certain lifeline services should have reliable performance to ensure that the region can withstand future damage without crippling consequences. Critical infrastructure including energy and telecom utilities infrastructure require vulnerability studies in order to understand potential damages and consequences. Transportation, water, wastewater and other important services are also important. | X | X | | | X | | | | | | | 3 | X | X | X | X | X | X | X | X | X | X | X | 11 | N/A | **COVERED** by #34 and 74 (**Priority**), and 92 (**Ongoing**). |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
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| **CI-11** | Determine where additional aquifer studies might lead to greater water supplies and how to fund these studies | There are many areas in the state where the dynamics of the aquifers are not well understood. Studying these aquifers may reveal under-utilized water resources and other information useful to water managers. Determine which aquifers would benefit by detailed studies and how these studies can be funded. | | | | X | | | | | | | | 1 | | X | | | | | | | | | | 1 | N/A | **NOT A MITIGATION ACTION.** Investigations are an ongoing program under the Integrated Water System Plan. |
| **CI-12 (REVISED)** | Increase storage of water, especially off stream storage | The need to store water is very apparent to irrigators in Eastern Oregon who find creeks going dry during summer and early autumn. One way to avoid that common occurrence is by encouraging storage facilities where they are needed and where they are feasible to construct. In an initial study of potential reservoir locations, storage sites were identified that are very high in drainage basins so that the impact to anadromous fish would be minimal. High elevation, small stream type structures may be considered environmentally acceptable. ODA has also looked at diverting water away from streams through pipelines or canals into off-channel basins. These types of structures are more costly but don't have the impacts on fish passage that are oftentimes associated with instream structures. Other ideas include development of aquifer storage and recovery projects. Surface water from streams is diverted during times of abundance and injected into underground aquifers for storage. OWRD has developed an inventory of above ground and below ground storage opportunities: http://apps2.wrd.state.or.us/apps/planning/owsci/sw_project_search.aspx http://apps2.wrd.state.or.us/apps/planning/owsci/gw_project_search.aspx . These are also available from the following link, which includes introductory information: http://www.wrd.state.or.us/OWRD/LAW/owsci_info.shtml#Potential_Water_Storage_Sites. Land management practices that slow down or prevent runoff are also being employed by landowners such as creation of wetlands, catchment depressions, diversion dikes, or terraces. The idea is to simply retain water in the watershed. For additional information, see the following Oregon Department of Agriculture web site and the OWRD web site: http://www.oregon.gov/ODA/NRD/water_quality_front.shtml www.oregon.gov/OWRD ODA should work with private landowners and special districts to implement projects such as those described above. | X | X | | X | | | | | | | | 3 | | X | | | | | | | | | | 1 | State-OWRD | **LOCAL ACTIVITY.** State offers funding and technical assistance to local governments and other entities to build structural water storage facilities. |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
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| **CI-15** | Require fish passage at all new and replaced structures | ODFW statutes require fish passage at all artificial barriers to fish migration. New structures, such as dams and culverts, are currently required to provide fish passage. Old structures that are replaced need to provide fish passage as well. DLCD, ODFW and OEM will continue to integrate FEMA's 1999 "Policy on Fish Enhancement Structures in the Floodway" policy memorandum into fish passage projects and design guidelines. ODFW will continue to ensure that projects meet fish-passage standards and are also designed with consideration of the need to pass wood and sediment. Standards that provide for fish passage should also provide better passage for floodwaters and organic materials. Efforts to replace structures proactively to ensure passage of fish and floodwaters/debris will be supported as feasible. | | | | X | | | | | | | | 1 | | | | | X | | | | | | | 1 | State-ODFW | **DONE.** |
| **CI-16** | Evaluate expected earthquake damage and system interruptions to existing lifelines and hydraulic structures, including dams | Lifelines include all essential transportation facilities and the associated bridges, tunnels, locks, and ferries, including airports and railways, petroleum and natural gas pipelines, electric transmission lines, water and sewage systems, "emergency operations and telecommunications infrastructure. The evaluation proposed would study the vulnerability of existing lifeline systems and hydraulic structures to a major seismic event, and estimate the expected damage and losses. Estimating the expected losses will include determining those systems that likely would experience a total loss of operation immediately following a major event, although the actual physical damage to the system may not be total or extensive.<br>In order to implement this action, the State of Oregon will need to work with several federal agencies which are involved in ownership, authority, or responsibility for some of the structures and facilities cited.<br>Detailed benefit-cost analyses (to include hazard damages to facilities, downstream impacts and economic loss of service) can be used to identify and prioritize potential mitigation projects (retrofits, intake relocations, or even new construction). | X | X | | | | | | | | | 2 | | | | X | | | | | | | | 1 | N/A | **COVERED** by #92 (Ongoing). |

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| **CI-17** | Encourage/require public entities adopt and follow ANSI National Tree Care Standards | This action requires additional scoping to determine how best to encourage and require state and local agencies to adopt and routinely implement ANSI A300, Tree Care Operations Standards. These national standards were developed by a diverse committee of tree care professionals from the private and public sectors and cover proper tree pruning, fertilization, and tree support systems. These standards set forth the requirements and recommendations for satisfactory tree care maintenance. Public entities and tree care companies who perform work according to ANSI A300 standards are following accepted industry practices for proper tree care maintenance operations, resulting in healthier trees with reduced tree hazards.<br>For more information, see:<br>http://www.ansi.org/news_publications/media_tips/tree_care.aspx?menuid=7<br>This action may result in a legislative concept for a future session of the Oregon Legislature, and may include an incentive such as limited liability when the standards are implemented. Currently, the state has not adopted the ANSI A300 standards, though several state agencies follow them voluntarily. As a first step, the lead and support agencies noted below will better publicize the standards and persuade additional agencies to voluntarily adopt them. | X | X | X | | | | | | | | | 3 | | | | | | | | | | X | X | 2 | Private Utility Fees | **DONE.** |
| **CI-18 (REVISED)** | Introduce legislation in 2015 requiring all overhead facility operators to mitigate service outages due to natural hazards by installing emergency electrical energy generation units; using underground or buried facilities for initial construction in areas where other hazards (e.g., landslide, earthquake, flood) are unlikely cause damage to them; and instituting other mitigation and preparedness measures. | Previous incidents and events demonstrate that overhead facilities are vulnerable to severe storms. The impact of such an event creates safety issues and system outages which can cause serious concerns to customers, communities, and the public in general as a result of the increasing dependency upon service delivery systems and networks. As such, individuals, local government, communities and commercial enterprises should be encouraged to engage in preparedness efforts in support of service outage mitigation, including the installation of emergency electrical energy generation units. This effort is especially warranted at other critical infrastructure lifeline facilities, where additional health and environmental impacts are witnessed by the loss of commercial power (i.e., medical facilities and water-waste water treatment facilities). The PUC, in collaboration with industry stakeholders, strives to improve the safety and reliability of overhead lines (ORS 758-010-035) through improved design, construction, maintenance, and rights-of-way management. Additional consideration should be given to initial constructs, utilizing underground or buried techniques, as opposed to conversion of overhead lines as a reactionary solution, keeping in mind that underground and buried constructs are vulnerable to geologic and flooding events that may cause the same result, and impact that the conversion of the same facilities was intended to resolve. | X | X | X | | X | | X | | | X | | 6 | | | | X | X | X | | | | X | X | 5 | N/A | **NO AUTHORITY.** The state has no authority to require placement of utilities above or below ground. |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
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| **LU-4*** | Complete a model "Substantial Improvement/Substantial Damage" program to support local government regulation of floodplain development | DLCD and OEM are in the process of creating a Substantial Improvement/Substantial Damage (SI/SD) manual. The SI/SD Manual will include local ordinance language and companion guidance on administrative processes that can be used by local jurisdictions for cumulative tracking of substantial improvements. It will also address common implementation difficulties encountered at the local level, and suggest approaches that could be used by local governments to overcome those difficulties. The SI/SD Manual will be completed and integrated into Model Code and ongoing NFIP training. | | X | | | X | | X | | | | | 3 | | | | | X | | | | | | | 1 | FEMA—CAP-SSSE | **DONE.** |
| **LU-9 (REVISED)** | Change state land use laws to better connect use of land with water supply | Occasionally land is developed in Oregon utilizing well water without regard to other nearby existing uses. Land developments can reduce recharging of the aquifer that is under them due to sending runoff largely away from the development. Farmers have lost well water or been forced to develop deeper wells due to loss of aquifer water to the newly developed land in the vicinity. Oregon land use law needs to require that new developments not create water hardships on existing land uses and other beneficial uses of water. | | | | X | X | | | | | | | 2 | | X | | | | | | | | | | 1 | N/A | **NOT A MITIGATION ACTION.** |
| **LU-10** | Work with the insurance industry to develop and apply a common standard of interface mitigation measures adjacent to dwellings | The *Oregon Forestland-Urban Interface Fire Protection Act* recognizes that individual property owners are in the best position to take mitigation actions which will have a direct relationship to whether or not their structures survive a wildfire. To that end, the Act required the development of standards that owners are to apply on their property. At the same time, some insurance companies have developed or adopted different standards which their customers must apply on their property in order to obtain or retain insurance coverage. Such a situation of "competing" standards is confusing to property owners and can hamper the application of effective mitigation measures. Under this action item, insurance companies will be encouraged to adopt the Act's standards or, rather than apply a different set of standards, that they will encourage their customers to comply with the Act. | X | X | | X | | | | | | | | 3 | | | | | | | | | X | | | 1 | N/A | **UNNECESSARY.** Insurers generally use NFPA 1144 Standards. |
| **LU-11** | Strongly encourage the adoption of State Building Code standards (or other incentives) for retrofitting, upgrading, protecting, essential facilities, hazardous facilities, and special occupancy structures in coastal communities that are vulnerable to tsunamis. | A large tsunami (and associated earthquake) would likely destroy many buildings in coastal communities that are located in the tsunami inundation zone. The damage would be from the combined effects of the forces from the tsunami surges, currents and debris, as well as the earthquake hazards. The State of Hawaii has adopted construction standards for buildings in tsunami zones. The National Tsunami Hazard Mitigation Program recently completed the document Designing for Tsunamis that outlines some of these issues. These documents could be evaluated and used as a starting point in developing standards. Although not under the jurisdiction of Building Code Standards, port and harbor facilities can benefit from lessons learned from DR-1964 and damages (distant generated tsunami impacts) at facilities in Brookings-Harbor, Depoe Bay, and Bandon. Such mitigation measure include strengthen pilings for floating docks, improved dock supports that facilitate unrestricted up-down movement during wave surges, and strengthened bulkhead walls that reduce scour from wave surges. | X | X | | | | | X | | | | | 3X | | | | | | | X | | | | | 1 | N/A | **NO AUTHORITY.** Not allowed under current law. |

# 2015 MITIGATION ACTIONS—REMOVED

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| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **LU-12 (REVISED)** | Establish and maintain a priority ranking system for properties for flood mitigation | The State's strategy for selecting properties for flood hazard mitigation projects is four-fold. It prioritizes projects that 1) are geographically balanced 2) are in communities with a FEMA-approved local hazard mitigation plan, 3) address properties with sustained substantial damages or repetitive losses, 4) provide communities with information and/or tools to evaluate properties suitable for mitigation, and to develop mitigation projects.<br>Repetitive flood loss properties (those which have experienced multiple flood insurance claims) have been identified as high priority hazard mitigation projects by the NFIP.<br>The state, working with local jurisdictions, will verify the FEMA-provided repetitive flood loss information at least once during this plan's term and establish a priority ranking for properties that would benefit most from hazard mitigation by means of acquisition, relocation, elevation, or demolition. The state will maintain and review this list annually as a basis for selecting and funding hazard mitigation projects that directly benefit homeowners and businesses. The review of the repetitive lost list is tied to the FMA Program guidance that is updated annually with the state grant allocations. Following a major disaster declaration, these properties could be pre-approved by FEMA for hazard mitigation to include post-disaster mitigation funding from the Hazard Mitigation Grant Program that can oftentimes be expedited.<br>Once the repetitive loss list is verified, DLCD and OEM will analyze and summarize the information in a geographical information system to discover spatial patterns associated with repetitive losses. Results will be shared with jurisdictions in which repetitive loss structures are located, with the recommendation that the loss areas be addressed in local hazard mitigation plans as potential mitigation action items (in concept but not by specific property address). DLCD will provide NFIP communities with RL properties the information necessary for them to identify and pre-qualify potential mitigation project opportunities that are cost-effective, environmentally sound and technically feasible. OEM will work with these communities in turning qualified potential projects into sub-grant applications.<br>The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the National Flood Insurance Program (NFIP). As of May 2011, there are nine identified SRL properties in Oregon, eight of which are insured with the NFIP. The State has been working closely with the property owner of the property with the highest number of losses (7) to mitigate against future loss. This mitigation project is projected to come to completion in 2011 using SRL grant funds (pending FEMA approval). DLCD and OEM will develop a plan for addressing the remaining SRL properties based upon experience with the 2011 mitigation project. Cost effectiveness of mitigation must be proven for SRL properties and unfortunately the dollar losses suffered by the remaining SRL properties in Oregon may not allow mitigation to be funded using the SRL grant program | X | X | | | X | | | | | X | | 4 | | | | | X | | | | | | | 1 | FEMA- CAP-SSSE, State-DLCD, OEM | **DONE.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| | | (or Federal mitigation grant programs). FEMA's Greatest-Savings-to-the-Fund (GSTF) calculation does not provide sufficient benefits to mitigate any of Oregon's SRL properties. Mitigation costs will likely exceed the GSTF calculation in all cases. Consequently, DLCD and OEM will evaluate the remaining SRL properties, including conducting screening benefit-cost analysis, to determine whether the remaining SRL properties qualify for priority ranking for mitigation action. Results will be shared with FEMA and local jurisdictions. Any decision to move forward will be made in consultation with local jurisdictions and property owners. | | | | | | | | | | | | | | | | | | | | | | | | | |
| **LU-14** | Develop additional littoral cell plans | The state intends to pursue development of plans for additional sections of coastline, based on need and the level of risk to development. | | X | | X | | | | | | | | 2 | X | | | | | | | | | | | 1 | N/A | **NOT BEING PURSUED.** Will not be undertaken during the life of this Plan. |
| **LU-17** | Organize a GIS tsunami database workshop | A GIS database of tsunami safe zones, evacuation routes, and evacuation sites is presently under construction. Once completed, it is important to integrate the data into county databases. The workshop would not only assist counties with how to integrate the data, but also how the data can be used for tsunami evacuation planning. | | | | | X | | | | | | | 1 | | | | | | | X | | | | | 1 | NOAA | **DONE.** Database is done and workshop has been held. |
| **G (NEW)** | Provide guidance to the maritime community for evacuation response for local Cascadia and distant tsunami events. | Tsunami model data including minimum flow depths and maximum flow velocities will be analyzed to determine port-specific maritime guidance. | X | | | | | | X | | | X | | 3 | X | | | X | | | X | | | | | 3 | NOAA | **DONE.** |
| **MP-1*** | State IHMT Agency Action Item Progress Reports | Prior to the April State IHMT meetings of each year, State IHMT priority functional category leads will submit progress briefs on all mitigation activities to OEM for review. Briefs will include a progress update on primary action item responsibilities, identification of agency success stories, suggestions for potential new action items and identification of any new or updated information that will be germane to the update of the state NHMP chapters or appendices. Leads will complete success stories for any completed actions at that time. Priority functional categories for the 2012—2015 planning period include:<br>• Legislative/Policy<br>• Education/Outreach and<br>• Critical Infrastructure / Essential Public Facilities | | | | | | X | | | | | | 1 | X | X | X | X | X | X | X | X | X | X | X | 11 | N/A | **NOT A MITIGATION ACTION.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **MP-2*** | Develop post-disaster strategic reconstruction plans based on damage projections from a Cascadia Subduction Zone earthquake and tsunami. | A large Cascadia Subduction Zone (CSZ) earthquake/tsunami may destroy a significant percentage of the buildings in coastal communities, as well as much of the public and private infrastructure that ties them together. Reconstruction of buildings and associated infrastructure will be a massive, long-term undertaking, requiring a great deal of financial aid, planning, technical assistance and cooperation among agencies and the public. Although tragic, such a disaster will also present communities with an opportunity to physically redesign and reshape themselves, creating safer places for people to live and work.A state post disaster planning and recovery task force would be established to plan for reconstruction and to oversee post disaster reconstruction. The Cascadia Region Earthquake Workgroup has recently developed a detailed damage scenario for a CSZ event using HAZUS (Hazards U.S. loss estimation software program) and other information to supplement the HAZUS data. For example, HAZUS does not take into account tsunami damage. This scenario could be used as the basis for developing reconstruction plans. | | X | X | X | X | | | | | | | 4 | | | | X | | | X | | | | | 2 | N/A | **NOT A MITIGATION ACTION.** |
| **MP-3*** | Monitor hazard mitigation implementation | It is recommended that OEM establish and maintain a formal process to ensure that actions in this plan are being properly implemented. By monitoring implementation of successful mitigation projects, important data can be obtained to support loss avoidance studies that quantify the benefits of mitigation. Monitoring of floodplain and landslide property acquisitions (funded by FEMA mitigation grants) is required and must be reported to FEMA every three years. Although not a federal requirement, monitoring of floodplain property elevations will ensure compliance with meeting NFIP flood insurance requirements.<br>Hazard mitigation implementation may also be reviewed and this plan revised following any Presidential emergency or major disaster declaration. At one time this was a requirement of federal law, but it now is simply a good idea, especially if interest in the event has provided both resources and opportunity for mitigation. | | | | | X | X | | | | | | 2 | X | X | X | X | X | X | X | X | X | X | X | 11 | N/A | **NOT A MITIGATION ACTION.** |
| **MP-4** | Maintain a statewide action item database | OPDR hosts a searchable action item database on its website that identifies the actions from existing local natural hazards mitigation plans. During the 2009 Oregon NHMP update, revisions were made to the action item database to allow for local actions to be categorized underneath the state plan goals. This will allow the state or FEMA to quickly sort local actions by the various state plan goals. This function will allow for easier reporting on the State of Oregon's progress toward reducing risk and can be organized under the six Oregon NHMP goals. OPDR is working to add the state plan goal references to actions that are currently listed and is also working to add the actions of new plans as they are developed. Maintaining this database is time and resource intensive; therefore, all local actions may not be categorized during this plan update. This will be an ongoing task for OPDR and OEM staff.<br>Action Item Database: http://csc.uoregon.edu/opdr/actionitems/ | X | X | X | X | X | | | | | | | 5 | X | X | X | X | X | X | X | X | X | X | X | 11 | N/A | **NOT A MITIGATION ACTION.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **MP-5 (REVISED)** | Complete implementation of NFIP Map Modernization program in Oregon. | Work cooperatively with FEMA to ensure that the NFIP map modernization program is fully implemented in Oregon, giving high priority to remapping of coastal areas due to age of existing FIRM maps and potential severity of flooding and related erosion hazards. | | 2<br>2 | 3 | X | X | | | | | X | X | | | | 4 | | | | | X | | | | | FEMA, DOGAMI, DLCD | **COVERED** by #121 (Ongoing). |
| **MP-6** | Establish a Silver Jackets Program | The State IHMT should consider establishing a joint state-federal flood mitigation subcommittee, which is tied to a national USACE initiative called "Silver Jackets" (Oregon is not required to adopt this name for the subcommittee). It would provide a forum where DLCD, DOGAMI, OEM, USACE, FEMA, USGS, and additional federal, state and sometimes local and Tribal agencies can come together to collaboratively plan and implement flood mitigation, optimizing multi-agency utilization of federal assistance by leveraging state/local/Tribal resources, including data/information, talent and funding, and preventing duplication among agencies.<br>Objectives of this subcommittee might include:<br>• Facilitate strategic life-cycle flood risk reduction,<br>• Create or supplement a continuous mechanism to collaboratively solve state-prioritized issues and implement or recommend those solutions,<br>• Improve processes, identifying and resolving gaps and counteractive programs,<br>• Leverage and optimize resources,<br>• Improve and increase flood risk communication and present a unified interagency message, and<br>• Establish close relationships to facilitate integrated post-disaster recovery solutions.<br>The State of Oregon will establish a "Silver Jackets", as a subcommittee to the State IHMT, with the primary intents of strengthening interagency relationships and cooperation, optimizing resources, and improving risk communication and messaging. | | X | X | X | X | | X | | | | | 5 | | | | | X | | | | | | | 1 | USACE, FEMA, USGS, NWS,<br>State-OEM, DLCD | **DONE.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **MP-7** | Revise OEM Hazard Analysis Methodology | Each county in Oregon is required to conduct a hazard analysis within their communities. As part of the hazard analysis, each county develops risk scores for the natural hazards that affect their communities. These scores range from 24 (low) to 240 (high), and reflect the county's perceived risk for each particular hazard. The hazard analysis methodology was first developed by the Federal Emergency Management Agency (FEMA) circa 1983, and gradually refined by the Oregon Office of Emergency Management (OEM) over the years. The current methodology could be improved upon to allow for the integration of more detailed risk assessment information. Currently, communities are tasked with determining whether hazards have a 'high,' 'moderate,' or 'low' probability of occurrence; likewise, communities are asked to determine whether their community has a 'high,' 'moderate,' or 'low' vulnerability to each hazard. When better probability or vulnerability data is available, communities should be able to reflect these data in their hazard analyses. Additionally, OEM will work with OPDR to integrate the hazard analysis methodology with the three-phase risk assessment used and taught by OPDR with respect to the development of local natural hazards mitigation plans. In the development of local mitigation plans, the county's hazard analysis scores are typically referenced. If, however, the planning steering committee believes the scores should be different, the scores are simply changed, and the perceived validity of the OEM hazard analysis methodology is weakened. The integration of the analysis with the three-phase risk assessment should therefore be refined. | | | | | X | | | | | | | 1 | X | X | X | X | X | X | X | X | X | X | X | 11 | N/A | **NOT A MITIGATION ACTION.** |
| **MP-8 (REVISED)** | Track key performance measures toward a disaster resistant state. | State "benchmarks" for mitigation have been superseded by Key Performance Measures (KPMs), and are comprised of the following: DLCD KPM #9, "Percent of urban areas that have updated buildable land inventories to account for natural resource and hazard areas"; DOGAMI KPM #1, "Percent of communities and other stakeholders with hazard maps and risk studies for earthquake and landslide hazards"; DOGAMI KPM #2, "Percent target communities with official, reviewed evacuation map brochures"; DOGAMI KPM #3, "Percent target communities with standardized, 4-risk zone erosion hazard maps"; DOGAMI KPM #4, "Public awareness of geologic hazards and mitigation efforts"; DOGAMI KPM #9, "Percent of coastal communities provided with detailed tsunami inundation maps for local emergency planning"; OMD-OEM KPM #10, "Percent of Oregon coastal counties with complete evacuation plans"; and OMD-OEM KPM #12, "Percent of jurisdictions with approved hazard mitigation plans." In combination, these KPMs are moving Oregon toward the goal of developing a disaster resistant state, which institutionalizes hazard mitigation, including: the characterization of natural hazards; the presence of ordinances or standards at the local government level to mitigate natural hazards; and ongoing education on natural hazard mitigation. | | | | | | X | | | | | | 1 | X | X | X | X | X | X | X | X | X | X | X | 11 | N/A | **NOT A MITIGATION ACTION.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **MP-10** | Improve statewide earthquake hazard datasets, develop more accurate and detailed risk datasets, make hazard and risk information widely and easily available | In order to assess the likely impact of future earthquakes, improved shaking models are needed, along with more accurate and detailed mapping of the distribution of soils that might amplify shaking or liquefy, and mapping of areas susceptible to coseismic landslides. These data should be combined with improved asset information to do risk studies using HAZUS and exploring the use of GIS-based exposure analysis. Detailed hazard and risk mapping and modeling provides local and state governments with essential planning tools. Hazard and risk information should be made widely and easily available to planners, decision makers, and most importantly the general public. Easy to use interactive web tools with comprehensive earthquake and multi-hazard information should be deployed statewide. | | | | | X | | | | | | | 1 | | | | X | | | | | | | | 1 | N/A | **COVERED** by #2 (Priority). |
| **MP-15** | Work to improve forecasting for warning and hazard mitigation | State agencies plan to continue to work with the State Climatologist and the National Weather Service to better understand the nature and frequency of windstorms, and to improve communication of long and short range forecasts in order to allow for improved warnings and lead time for local governments to take effective hazard mitigation actions. | X | | | | | | | | | | | 1 | | | | | | | | | | X | | 1 | N/A | **REPLACED** by #10 and 53 (Priority). |
| **MP-16** | Seek funding for the installation and operation of additional precipitation gauges | The availability of timely and accurate telemetered data from rain (precipitation) gauges is essential for flash flood and debris flow forecasting. State agencies plan to work with their federal counterparts to ensure adequate funding and support for existing gauges and for the installation of new gauging sites where required. It is recommended that state agencies leverage federal funding with state resources and local matching commitments to achieve a reliable network of rain gauges in those areas that are susceptible to flash flooding and rapidly moving landslides (debris flows). | X | X | | | X | | | | | | | 3 | | X | | | X | | | | | | X | 3 | N/A | **COVERED** by #39 (Priority). |
| **MP-17** | Develop statewide resiliency plan consistent with intent of HR 3 | Set realistic and achievable, graduated resiliency goals. Evaluate existing weaknesses in structures, infrastructure, systems and institutions to identify critical vulnerabilities that will severely hinder response and recovery from a future megathrust earthquake. Develop prioritized and graduated levels of mitigation activity with estimates of costs and benefits. Identify needed mandates, regulations, codes, incentives and educational and cultural changes needed to reach resiliency goals. Prepare written plan and report for 2013-2015 legislatures. | X | X | X | | X | | | | | | | 4 | | | | X | | | | | | | | 1 | State-OEM, and other state agencies, Port of Portland, Volunteers | **DONE.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **MP-18** | Support the completion of updated, digital floodplain mapping projects initiated through the FEMA Map Modernization Program (previously short-term action #1) and transition to FEMA's current Risk MAP program. | The state continues to participate in FEMA's national effort to update flood hazard maps, and through the 2004-2009 Map Modernization Program (Map Mod) the majority of flood maps for Oregon have now been issued in a new digital, countywide format. The state will continue to provide support to help manage the Map Mod projects that remain to be completed (Coos, Lane, Tillamook, and Washington Counties), and DLCD will continue to implement the map modernization management support strategy and activities by:<br>1. Establishing and maintaining a premier data collection and delivery system,<br>2. Achieving effective long-term management of flood hazard maps,<br>3. Building and maintaining mutually beneficial partnerships to accomplish mapping work, and<br>4. Expanding and better informing the flood map user community.<br><br>Risk MAP (Mapping, Assessment, and Planning) is FEMA's new multi-year mapping program. The program builds on flood hazard data and maps produced through Map Mod while including the vision of building effective community strategies for reducing risk. In partnership with DOGAMI, FEMA contractors, and other state and local agencies, the objectives in Oregon's Risk MAP business plan include:<br>1. Addressing gaps in flood hazard data, identifying areas of dated and/or inconsistent mapping and updating high-priority areas with new mapping (Coos (remap), Curry, Lincoln, Tillamook, Clatsop, and Klamath Counties, as well as the Silvies Watershed and the Lower Columbia-Sandy Watershed—most projects contracted with DOGAMI);<br>2. Acquire new lidar topographic data for precise flood hazard mapping;<br>5. Measurably increase the public's awareness of flood and other natural hazards through a combination of regulatory and non-regulatory products, tools, community outreach, and innovative natural hazard mapping techniques (such as those developed by DOGAMI) that lead to actions that reduce risk to life and property;<br>6. Lead effective engagement in flood mitigation planning through partnerships and shared datasets;<br>7. Provide a coordinated multi-agency digital platform that includes data, links to data, applications, strategies, a digital library of flood hazard maps, and a web map depicting the most recent statewide Special Flood Hazard Area layer;<br>8. Coordinate events, project status, and actions; and<br>9. Align risk analysis programs and develop synergies. | X | X | X | | X | | | | | | | 4 | | | | | X | | | | | | | 1 | N/A | **COVERED** by #121 (Ongoing)**.** |
| **MP-19** | New maps of precipitation intensity | A basic study of precipitation intensity will be done, including twenty-four hour isopluvials (two, five, ten, fifty, and 100-year maps), as well as development of probable maximum precipitation coverages for Oregon. | | X | | | X | | | | | | | 2 | | X | | | X | | | | | | X | 3 | N/A | **NOT BEING PURSUED.** |

# 2015 MITIGATION ACTIONS—REMOVED

| Action Item | | | Goal | | | | | | | | | | | | Hazard | | | | | | | | | | | | Implementation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Statement | Description | 1 - Protect Life | 2 - Protect Property | 3 - Inc Ec Resilience | 4 - Protect Env | 5 - Enh OR Capability | 6 - Evaluate Progress | 7 - Info & Ed | 8 - Elim Haz Area Dev | 9 - Cultural & Hist Res | 10 - Agency Coord | 11 - NHMP/Comp Plan | # Goals | Coastal Hazards | Drought | Dust Storms | Earthquakes | Floods | Landslides | Tsunamis | Volcanic Hazards | Wildfires | Windstorms | Winter Storms | # Hazards | Funding Source(s) | **REASON** for Removal and Comments |
| **MP-21** | Develop a post-disaster tsunami scientific data recovery plan | After a damaging tsunami, response and short-term recovery efforts may destroy any scientific evidence of the tsunami, such as surge heights and inundation distances. These data are critical in understanding the tsunami and helping to better prepare for future ones. Once lost it can never be retrieved. Therefore, it is imperative that data gathering be a part of the overall response and recovery plan. This effort should be coordinated with the scientific and technical clearinghouse discussed in the earthquake chapter (short-term #3) and emergency management response and recovery efforts. | X | X | X | | | | | | | | | X | | | | | | | X | | | | | 1 | N/A | **COVERED** by #71 (Priority). |
| **MP-22** | Reconvene the committee that oversees the Mount Hood Coordination Plan. | The committee, including the Oregon Office of Emergency Management, USDA Forest Service, U.S. Geological Survey, Oregon Department of Geology and Mineral Industries, Clackamas County, Multnomah County, Hood River County, Wasco County, the Confederated Tribes of the Warm Springs, Clark County, Skamania County, Washington Emergency Management Division, and the Federal Emergency Management Agency (Region X), should reconvene and incorporate new data from the recent DOGAMI Multi-Hazard and Risk Study for the Mount Hood Region (Burns et al., 2011b). | | | | | | | X | | | | | X | | | | | | | | X | | | | 1 | State-OEM | **DONE.** |
| **MP-24 (REVISED)** | Perform multi-hazard risk analysis at all potentially active volcanoes in Oregon | Multi-hazard risk analysis should be performed at all potentially active volcanoes in Oregon. For an example see the DOGAMI Multi-Hazard and Risk Study for the Mount Hood Region (Burns et al., 2011b). | X | X | | | X | | X | | | | X | 5 | | | | | | | | | X | | | 1 | N/A | **COVERED** by #80 (Ongoing). |
| **MP-25 (REVISED)** | Install a multi-function lahar warning system in areas of high vulnerability | A warning system should be developed for volcano and weather-induced hazards like flood, channel migration, and landslides. | X | X | | | X | | X | | | X | | 5 | | | | | | | | | X | | | 1 | N/A | **NOT BEING PURSUED.** |
| **MP-26** | Develop coordination plans for other volcanoes in Oregon | This action has been completed for Mount Hood. Some similar documents have been completed for other volcanoes in Oregon. | | | | | | | X | | | | | 1 | | | | | | | | | X | | | 1 | N/A | **DONE.** |
| **MP-27** | Evaluation of Landslide Risk | DOGAMI will complete this evaluation in cooperation with local municipalities. Specific methods and priority locations are still to be determined. | | | | | | | X | | | | | 1 | | | | | | X | | | | | | 1 | N/A | **COVERED** by #8 and 49 (Priority). |

**Table 3-4. Crosswalk—2012 to 2015 Mitigation Actions**

| 2012 to 2015 Mitigation Action Crosswalk | | | | | | |
|---|---|---|---|---|---|---|
| **2012 Action #** | **2012 Action Statement** | **2012 Action Description** | **2015 Action #** | **2015 Action Statement** | **2015 Action Description** | **Revised or New? Which 2015 Table?** |
| **LEGISLATIVE/POLICY** | | | | | | |
| **LP-1*** | Review and re-establish State IHMT membership and member responsibilities | When first established, the State IHMT membership consisted largely of agency directors or other high level agency staff. Over time, agency interaction with and oversight of State IHMT activities has been delegated. In some instances, this has resulted in better connection with the individuals that are actually responsible for mitigation activities in the respective agencies. In other cases, such delegation has resulted in the loss of an overall understanding of mitigation activities occurring throughout individual agencies. Given the lack of dedicated resources at the agency level for participation in the State IHMT, a review and re-establishment of the State IHMT membership and member responsibilities based on current resource constraints is needed. | **43** | Review and adjust State IHMT membership. | As state and agency priorities and personnel change, agency membership should be reviewed and adjusted, and member agencies should be encouraged to budget for participation in State IHMT activities. In late 2014, Emergency Support Functions were reassigned, and the new structure should be considered when reviewing State IHMT membership. When membership is aligned with its goals and mitigation actions, the State IHMT will provide better oversight and leadership of the state's mitigation strategy and programs. | Revised. Priority. |
| **LP-2*** | Complete a hazard mitigation policy legislative needs assessment | The Oregon NHMP contains a number of specific policy recommendations. In addition, the state of Oregon maintains a number of policies related to natural hazards and the mitigation thereof. It is unclear at this time what legislative action may be needed in order to fully implement existing and proposed mitigation actions. The State IHMT has identified greater interaction with the legislature as a top priority in the coming years. As a first step, the State IHMT recommends completing an assessment of the potential legislation needed to implement hazard mitigation policies. The assessment shall review existing and proposed policies and develop a list of potential legislative priorities. | **4** | Complete a hazard mitigation policy legislative needs assessment | The Oregon NHMP contains a number of specific policy recommendations. In addition, the state of Oregon maintains a number of policies related to natural hazards and the mitigation thereof. It is unclear at this time what legislative action may be needed in order to fully implement existing and proposed mitigation actions. The State IHMT recommends completing an assessment of the potential legislation needed to implement hazard mitigation policies. | Revised. Priority. |
| **LP-3*** | Establish statutory authority for the State IHMT | Since its formation, the State IHMT has continued to play major roles in hazard mitigation activities, including the development of this hazard mitigation plan. There is strong agreement that the State IHMT is important, should be continued, and ought to be made permanent because it is the only state body focused on coordination of natural hazard mitigation. It is recommended that the State IHMT be formally established in Oregon statute. | **44** | Establish formal and official authority for the State IHMT | Since its formation, the State IHMT has continued to play a major role in hazard mitigation activities, including the development of this hazard mitigation plan. There is strong agreement that the State IHMT is important, should be continued, and ought to be made permanent because it is the only state body focused on coordination of natural hazard mitigation. It is recommended that the State IHMT be formally and officially established. | Revised. Priority. |
| **LP-4*** | Promote a state disaster and hazard mitigation fund to assist local governments' mitigation and response efforts | The availability of funding to meet immediate emergency needs, including hazard mitigation activities, is a major concern. Federal assistance programs require various matching fund contributions from state and local applicants and are not guaranteed to exist in the future. Legislation has been considered to create such a fund, common to many states, so that financial commitments can be made quickly to support hazard mitigation. The federal Disaster Mitigation Act of 2000 (DMA2K) addresses hazard mitigation planning and projects. This legislation reinforces the importance of mitigation planning, and emphasizes implementing local actions to reduce risk before disasters occur. DMA2K established a federal Pre-Disaster Mitigation (PDM) Program and new requirements for the post-disaster Hazard Mitigation Grant Program (HMGP). Section 322 of DMA2K specifically addresses hazard mitigation planning at the state and local government levels. It identifies new requirements that allow HMGP funds to be used for planning activities, and increases the amount of HMGP funds available to states that have developed a comprehensive, "enhanced" mitigation plan prior to a disaster. States and local governments must have approved hazard mitigation plans in place in order to qualify to receive post-disaster HMGP funds. Mitigation plans must demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for risk and capabilities. Establishing a state fund to assist local governments with hazard mitigation and response efforts would go a long way toward securing and leveraging federal funds. | **LP-4*** | Promote a state disaster and hazard mitigation fund to assist local governments' mitigation and response efforts | The availability of funding to meet immediate emergency needs, including hazard mitigation activities, is a major concern. Federal assistance programs require various matching fund contributions from state and local applicants and are not guaranteed to exist in the future. Legislation has been considered to create such a fund, common to many states, so that financial commitments can be made quickly to support hazard mitigation. The federal Disaster Mitigation Act of 2000 (DMA2K) addresses hazard mitigation planning and projects. This legislation reinforces the importance of mitigation planning, and emphasizes implementing local actions to reduce risk before disasters occur. DMA2K established a federal Pre-Disaster Mitigation (PDM) Program and new requirements for the post-disaster Hazard Mitigation Grant Program (HMGP). Section 322 of DMA2K specifically addresses hazard mitigation planning at the state and local government levels. It identifies new requirements that allow HMGP funds to be used for planning activities, and increases the amount of HMGP funds available to states that have developed a comprehensive, "enhanced" mitigation plan prior to a disaster. States and local governments must have approved hazard mitigation plans in place in order to qualify to receive post-disaster HMGP funds. Mitigation plans must demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for risk and capabilities. Establishing a state fund to assist local governments with hazard mitigation and response efforts would go a long way toward securing and leveraging federal funds. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
|---|---|---|---|---|---|---|
| **LP-5*** | Establish a system of special zones, procedures, restrictions, and conditions to limit development in tsunami inundation zones | Decisions on land use planning, siting of improvements, or capital expenditure for public and private infrastructure, critical lifeline facilities and residential, commercial, industrial and other development do not explicitly factor in potential tsunami-related hazards. Some method for factoring in tsunami hazard information is desirable. One possibility among many is implementation of a system of special zones, etc. that would include the means to determine the appropriate level of allowable activities.<br>A thorough discussion of the policy implications of any proposed land use restrictions would need to precede any decisions. Such discussions would need to factor in the probabilities and areas potentially exposed to distant versus local tsunamis, economic and social coasts of any restrictions, and the potential benefits in terms of life and property saved. Any land use restrictions would need to be based on relatively sophisticated information and mapping that would include a determination of hazardous areas for both distant and local tsunami sources, an evaluation of the hazard, an evaluation of the severity, and the level of allowable risk.<br>Detailed mapping for local Cascadia Subduction Zone tsunamis has been completed for six areas (Warrenton/Astoria, Seaside/Gearhart, Lincoln City, Newport, Coos Bay, and Gold Beach). Mapping for a worst case distant tsunami has been completed for Seaside/Gearhart. The adoption might involve amendment of DLCD's Goal 7. | **LP-5*** | Establish a system of special zones, procedures, restrictions, and conditions to limit development in tsunami inundation zones | Decisions on land use planning, siting of improvements, or capital expenditure for public and private infrastructure, critical lifeline facilities and residential, commercial, industrial and other development do not explicitly factor in potential tsunami-related hazards. Some method for factoring in tsunami hazard information is desirable. One possibility among many is implementation of a system of special zones, etc. that would include the means to determine the appropriate level of allowable activities.<br>A thorough discussion of the policy implications of any proposed land use restrictions would need to precede any decisions. Such discussions would need to factor in the probabilities and areas potentially exposed to distant versus local tsunamis, economic and social coasts of any restrictions, and the potential benefits in terms of life and property saved. Any land use restrictions would need to be based on relatively sophisticated information and mapping that would include a determination of hazardous areas for both distant and local tsunami sources, an evaluation of the hazard, an evaluation of the severity, and the level of allowable risk.<br>Detailed mapping for local Cascadia Subduction Zone tsunamis has been completed for six areas (Warrenton/Astoria, Seaside/Gearhart, Lincoln City, Newport, Coos Bay, and Gold Beach). Mapping for a worst case distant tsunami has been completed for Seaside/Gearhart. The adoption might involve amendment of DLCD's Goal 7. | Removed. |
| | | | **A** | Develop tsunami land use guidance for local governments for reducing risk within tsunami inundation zones. The guidance would include model comprehensive plan and code amendments (policies, procedures, incentives, best practices, restrictions, conditions, and a tsunami overlay zone). | The risk of tsunami hazard for Oregon's coastal communities is well-documented with the completion of comprehensive tsunami inundation maps developed by DOGAMI. The State of Oregon can assist affected communities by developing land use guidance for tsunami risk reduction. | New. Removed. |
| | | | **B** | Provide the tsunami land use guidance to local governments. | The risk of tsunami hazard for Oregon's coastal communities is well-documented with the completion of comprehensive tsunami inundation maps developed by DOGAMI. The State of Oregon can assist affected communities by providing them with land use guidance for tsunami risk reduction. | New. Removed. |
| | | | **125** | Assist local governments in implementing the tsunami land use guidance. | The risk of tsunami hazard for Oregon's coastal communities is well-documented with the completion of comprehensive tsunami inundation maps developed by DOGAMI. The State of Oregon can assist affected communities with its implementation, leading to better protection of life and property from tsunamis. | New. Ongoing. |
| | | | **126** | Monitor implementation of the tsunami land use guidance by tracking the number of jurisdictions that have used it. | The risk of tsunami hazard for Oregon's coastal communities is well-documented with the completion of comprehensive tsunami inundation maps developed by DOGAMI. Monitoring success of the guidance will allow the State to adjust its approach and update the guidance as necessary, leading to better protection of life and property. | New. Ongoing. |
| **LP-6*** | Integrate hazard data into planning and regulations | Integrate new high-resolution hazard data into local planning and regulations. Special regulations should be established for proposed new critical facilities and/or infrastructure. | **LP-6*** | Integrate hazard data into planning and regulations | Integrate new high-resolution hazard data into local planning and regulations. Special regulations should be established for proposed new critical facilities and/or infrastructure. | Removed. |
| **LP-7** | Improve ocean shore and related permit process | Enhance where possible the involvement of key state agencies in the ocean shore permit and related permit processes (local government, U.S. Army Corps of Engineers, etc.). | **LP-7** | Improve ocean shore and related permit process | Enhance where possible the involvement of key state agencies in the ocean shore permit and related permit processes (local government, U.S. Army Corps of Engineers, etc.). | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **LP-8** | Consider developing procedures for escorting vehicular traffic through dust storms | ODOT and OSP both have procedures for escorting traffic under various circumstances. ODOT especially has much experience escorting traffic. It may be possible to develop and implement procedures for escorting traffic through dangerous dust storm conditions. | **LP-8** | Develop procedures for escorting vehicular traffic through dust storms | ODOT and OSP both have procedures for escorting traffic under various circumstances. ODOT especially has much experience escorting traffic. It may be possible to develop and implement procedures for escorting traffic through dangerous dust storm conditions. | Revised. Removed. |
| **LP-9** | Obtain a secure source of funding for wildfire related use of the Emergency Conflagration Act | Currently, when the Conflagration Act is used to respond to wildfire related events, the funds expended by the Office of State Marshal must either be subsequently appropriated by the Oregon Legislature or be taken from an account available to the Office of State Fire Marshal. In the latter case, the result is that monies are used for a purpose for which it was not intended and other valuable programs and projects are negatively impacted. Under this action item, the Office of State Fire Marshal will work with the Oregon Legislature to identify and fund a secure source of funding that will pay the expenses incurred in the use of the Emergency Conflagration Act. Currently, within the budget process, the OSFM has identified the need to have funds held aside for responses. | **LP-9** | Obtain a secure source of funding for wildfire related use of the Emergency Conflagration Act | Currently, when the Conflagration Act is used to respond to wildfire related events, the funds expended by the Office of State Marshal must either be subsequently appropriated by the Oregon Legislature or be taken from an account available to the Office of State Fire Marshal. In the latter case, the result is that monies are used for a purpose for which it was not intended and other valuable programs and projects are negatively impacted. Under this action item, the Office of State Fire Marshal will work with the Oregon Legislature to identify and fund a secure source of funding that will pay the expenses incurred in the use of the Emergency Conflagration Act. Currently, within the budget process, the OSFM has identified the need to have funds held aside for responses. | Removed. |
| **LP-10** | Continue seeking effective hazard mitigation opportunities compatible with habitat and fisheries protection via multi-objective mitigation efforts | Government and private nonprofit agencies in Oregon must address complex issues associated with flood hazard mitigation in the context of clean drinking water, riparian habitat, watershed health, fisheries, wetlands protection, and overall environmental quality.<br>An important plan related to this effort is the Oregon Plan for Salmon and Watersheds. Solutions require multi-agency and intergovernmental efforts. While the decisions and projects will vary with each disaster, the state will continue its efforts to develop appropriate policies and criteria to ensure that these are considered along with hazard mitigation needs. This includes guidance on large wood placement, restoration after flood events, and habitat-friendly methods to accomplish pre- and post-disaster hazard mitigation. Watershed assessments being completed around the state by local watershed councils will be used in the evaluation of flood hazards and floodplain processes. | **26** | Incorporate text addressing hazard mitigation into natural resource agencies' guidance and process documents focusing on environmental quality to ensure that natural resources are protected in the design and construction of hazard mitigation projects. | Government and private nonprofit agencies in Oregon must address complex issues associated with flood hazard mitigation in the context of clean drinking water, riparian habitat, watershed health, fisheries, wetlands protection, and overall environmental quality.<br>An important plan related to this effort is the *Oregon Plan for Salmon and Watersheds.* Solutions require multi-agency and intergovernmental efforts. While the decisions and projects will vary with each disaster, the state will continue its efforts to develop appropriate policies and criteria to ensure that these are considered along with hazard mitigation needs. This includes guidance on large wood placement, restoration after flood events, and habitat-friendly methods to accomplish pre- and post-disaster hazard mitigation. Watershed assessments being completed around the state by local watershed councils will be used in the evaluation of flood hazards and floodplain processes. | Revised. Priority. |
| **LP-11** | Work toward the floodplain management goals outlined in the Willamette River Legacy Program | The Governor's office has established a Willamette River initiative that lays out various goals for repairing water quality, restoring habitats, and supporting recreational opportunities. Several proposed actions would support sound floodplain management in the river basin. This includes a proposed action to protect existing functioning floodplains and reconnect historic floodplains, with a target of reconnecting 200 acres per year, 1,000 acres by 2010 focusing on tributary confluence areas between Eugene and Salem. Projected benefits of this action include reduced stream temperature, less severe flooding downstream, improved water quality, improved habitat, and increased natural storage of water. The Governor's office has identified potential funding sources as OWEB grants, CREP enrollments, 319 Grants (watershed restoration), Restoration and Enhancement Grants, Wetlands Reserve Program (WRP) and WREP, TNC utility customer salmon habitat grants, and BPA habitat compensation funds. | **LP-11** | Work toward the floodplain management goals outlined in the Willamette River Legacy Program | The Governor's office has established a Willamette River initiative that lays out various goals for repairing water quality, restoring habitats, and supporting recreational opportunities. Several proposed actions would support sound floodplain management in the river basin. This includes a proposed action to protect existing functioning floodplains and reconnect historic floodplains, with a target of reconnecting 200 acres per year, 1,000 acres by 2010 focusing on tributary confluence areas between Eugene and Salem. Projected benefits of this action include reduced stream temperature, less severe flooding downstream, improved water quality, improved habitat, and increased natural storage of water. The Governor's office has identified potential funding sources as OWEB grants, CREP enrollments, 319 Grants (watershed restoration), Restoration and Enhancement Grants, Wetlands Reserve Program (WRP) and WREP, TNC utility customer salmon habitat grants, and BPA habitat compensation funds. | Removed. |
| **LP-12** | Address problem of structures requiring replacement but ineligible under SRGP | Revise SRGP legislation or develop an alternate funding mechanism to help replace schools and emergency facilities that are too structurally deficient for cost-effective retrofit and need to be replaced instead. This would also include structures in the "local" tsunami inundation zone that should not be retrofit in-place but, rather, rebuilt on natural high ground. | **19** | Work with Business Oregon to introduce in 2015 legislation allowing reconstruction of structures that cannot feasibly be retrofitted. | Revise SRGP legislation or develop an alternate funding mechanism to help replace schools and emergency facilities that are too structurally deficient for cost-effective retrofit and need to be replaced instead. This would also include structures in the "local" tsunami inundation zone that should not be retrofit in-place but, rather, rebuilt on natural high ground. | Revised. Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **LP-13** | Seek funding for the installation and operation of additional stream gauges | The availability of timely and accurate telemetered data from stream gauges is essential for flood forecasting, for prediction of imminent flood hazards, and for response to flood emergencies. Stream gauging data also provide basic hydrologic information for floodplain mapping and watershed management by communities throughout the state. Numerous agencies of the federal government need data from stream gauges for effective management of projects and resources; therefore the installation and maintenance of stream gauges has traditionally been a responsibility of the federal government. State agencies plan to work with their federal counterparts to ensure adequate funding and support for existing gauges and for the installation of new gauging sites where required. It is recommended that state agencies endeavor to leverage federal funding with state resources and local matching commitments to achieve a reliable network of stream gauges around the state. | **LP-13** | Seek funding for the installation and operation of additional stream gages | The availability of timely and accurate telemetered data from stream gauges is essential for flood forecasting, for prediction of imminent flood hazards, and for response to flood emergencies. Stream gauging data also provide basic hydrologic information for floodplain mapping and watershed management by communities throughout the state. Numerous agencies of the federal government need data from stream gauges for effective management of projects and resources; therefore the installation and maintenance of stream gauges has traditionally been a responsibility of the federal government. State agencies plan to work with their federal counterparts to ensure adequate funding and support for existing gauges and for the installation of new gauging sites where required. It is recommended that state agencies endeavor to leverage federal funding with state resources and local matching commitments to achieve a reliable network of stream gauges around the state. | Removed. |
| | | | **97** | Expand the state's stream gaging network. Seek stable funding for the operation, and maintenance of stream gages. | The availability of timely and accurate telemetered data from stream gages is essential for flood forecasting, for prediction of imminent flood hazards, and for response to flood emergencies. Streamflow data also provides basic hydrologic information for floodplain mapping and watershed management by communities throughout the state, and is critical for understanding and forecasting drought conditions. Numerous local, state and federal water management agencies rely on data from stream gages for effective management of projects and resources; the installation and maintenance of stream gages has traditionally been a responsibility of state and federal agencies... State agencies plan to work with their partners to ensure adequate funding and support for existing gages and for the installation of new gaging sites where needed. It is recommended that state agencies endeavor to leverage federal funding with state resources and local matching commitments to achieve a reliable network of stream gages around the state. The data from these gages is used to support the RAFT and Raptor tools highlighted in Action "NEW MP-15A" | New. Ongoing. |
| **LP-14** | Seek funding to enhance capacity of state floodplain management program to better support implementation of the NFIP and higher regulatory standards | DLCD and OEM provide various services to FEMA Region 10, local governments, other governmental agencies, and the general public in support of implementation of the NFIP in Oregon. While coordination and cooperation and pursuit of various federal funding opportunities have allowed the state to temporarily enhance the services provided in some areas, neither DLCD nor OEM have been able to secure funding to permanently enhance the work capacity of the two agencies. FEMA funding is supporting a limited duration position focused on Risk MAP. The agencies could more fully serve the needs of local floodplain management programs and the citizens of Oregon if additional resources could be secured. | **LP-14** | Seek funding to enhance capacity of state floodplain management program to better support implementation of the NFIP and higher regulatory standards. | DLCD and OEM provide various services to FEMA Region 10, local governments, other governmental agencies, and the general public in support of implementation of the NFIP in Oregon. While coordination and cooperation and pursuit of various federal funding opportunities have allowed the state to temporarily enhance the services provided in some areas, neither DLCD nor OEM have been able to secure funding to permanently enhance the work capacity of the two agencies. FEMA funding is supporting a permanent position focused on Risk MAP. The agencies could more fully serve the needs of local floodplain management programs and the citizens of Oregon if additional resources could be secured. | Removed. |
| **LP-15** | Develop incentive/subsidy program for retrofit of one and two family residences | Design a system of grants or tax credits to encourage homeowners to retrofit residences to minimize displaced post-earthquake shelter demand and reduce population loss during recovery. | **41** | Develop an incentive or subsidy program for retrofit of one and two family residences | Design a system of grants or tax credits to encourage homeowners to retrofit residences to minimize displaced post-earthquake shelter demand and reduce population loss during recovery.<br>At the same time, take advantage of weatherization measures such as energy audits, cash rebates, and tax credits to help keep the cold out during winter. | Priority. |
| **LP-16** | Develop incentives to increase the rate of replacement of privately-owned seismically deficient buildings | Develop tax incentives, permitting facilitation, other means to increase the natural rate of building turnover. | **62** | Develop incentives to increase the rate of replacement of privately-owned seismically deficient buildings | Develop tax incentives, permit facilitation, and other means to increase the natural rate of building turnover. | Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **LP-17** | Encourage the U.S. Forest Service to allow the owners of long-term dwelling leases to apply mitigation standards adjacent to their dwellings | In Oregon, several thousand seasonal homes, which are located in high-risk wildland-urban interface areas, are on lands owned by the U.S. Forest Service. Because these structures are located on ground owned by the federal government, they are not subject to the Oregon Forestland-Urban Interface Fire Protection Act. In many locations, even when the owners of these homes desire to complete wildfire mitigation practices, federal lease requirements totally or substantially prevent them from doing so. Under this action item, a survey will be made of all lease locations in Oregon and the federal mitigation limitation and prohibitions will be identified. This information will then be used to approach the appropriate federal officials with a request to change their policies or regulations, to allow for the application of mitigation practices on leased property. | **144** | Collaborate through work groups within the Pacific Northwest Coordination Group to encourage the U.S. Forest Service to allow the owners of long-term dwelling leases to apply mitigation standards adjacent to their dwellings. | In Oregon, several thousand seasonal homes, which are located in high-risk wildland-urban interface areas, are on lands owned by the U.S. Forest Service. Because these structures are located on ground owned by the federal government, they are not subject to the *Oregon Forestland-Urban Interface Fire Protection Act*. In many locations, even when the owners of these homes desire to complete wildfire mitigation practices, federal lease requirements totally or substantially prevent them from doing so. Under this action item, a survey will be made of all lease locations in Oregon and the federal mitigation limitation and prohibitions will be identified. This information will then be used to approach the appropriate federal officials with a request to change their policies or regulations, to allow for the application of mitigation practices on leased property. | Revised. Ongoing. |
| **LP-18** | Establish a method for verifying the adequacy of geotechnical site reports on an as-needed basis | Independent peer review by qualified and registered geotechnical professionals is one of the best methods of ensuring that site reports done for local governments, property owners, developers, and others are of an acceptable quality and adequately address landslide issues. It is recommended that peer review processes throughout the state be strengthened so landslide hazards are minimized. | **LP-18** | Establish a method for verifying the adequacy of geotechnical site reports on an as-needed basis | Independent peer review by qualified and registered geotechnical professionals is one of the best methods of ensuring that site reports done for local governments, property owners, developers, and others are of an acceptable quality and adequately address landslide issues. It is recommended that peer review processes throughout the state be strengthened so landslide hazards are minimized. | Removed. |
| **LP-19** | Develop and implement flood protection standards for State-owned buildings | According to the Senate Bill 814 Task Force (Oregon Legislature, 1997 Session), there is a need to develop and effectively implement a strict standard governing the siting, construction, and leasing of buildings occupied by state agencies in flood-prone areas. There is a corresponding need to inventory existing state buildings located in flood-prone areas. | **22** | Develop flood protection standards for State-owned/leased buildings. | According to the SB 814 Task Force (Oregon Legislature, 1997 Session), there is a need to develop and effectively implement a strict standard governing the siting, construction, and leasing of buildings occupied by state agencies in flood-prone areas. | Revised. Priority. |
| | | | **87** | Continue to improve inventory of State-owned/leased buildings in all hazard areas. | Using DAS's data, DOGAMI developed an inventory of State-owned/leased buildings and identified those in hazard areas for the 2012 Plan and updated the inventory for the 2015 Plan. The data should be continuously updated by DAS-CFO to facilitate DOGAMI's inventory updates in future plan cycles. | Revised. Ongoing |
| | | | **123** | Implement flood protection standards for State-owned/leased buildings. | According to the Senate Bill 814 Task Force (Oregon Legislature, 1997 Session), there is a need to develop and effectively implement a strict standard governing the siting, construction, and leasing of buildings occupied by state agencies in flood-prone areas. | Revised. Ongoing. |
| | | | **39** | Install real-time monitoring capabilities on the remaining 51 state-operated stream gages, with the goal of making the network 100% real-time by the year 2020. | The availability of timely and accurate data from stream gages is essential for flood forecasting, for prediction of imminent flood hazards, and for response to flood emergencies. Today, 178 of the state's 229 stream gages provide real-time data. Upgrade the state's existing stream gaging network, with the goal of installing real-time capability on all remaining gages. | New. Priority. |
| | | | **23** | Update the state's Peak Discharge Estimation Program. | Peak discharge estimation tools can help determine the magnitude and frequency of floods. The state's program provides engineers and land managers with the information needed to make informed decisions about development in or near watercourses.<br>The Peak Discharge Estimation Program is based on a modified version of the U.S. Geological Survey's "Bulletin 17b." The U.S. Geological Survey is in the process of updating this bulletin. OWRD's methodology will need to be brought up to date to reflect these recent findings. | New. Priority. |
| | | | **42** | Request the Oregon Legislature to fund the "State Disaster Loan and Grant Account" immediately following a presidentially declared disaster or other disaster. | The State Disaster Loan and Grant Account includes an account that can be used to fund local government and school district mitigation projects after a Presidentially declared disaster. The Oregon Legislature may authorize deposits to the account when requested. | New. Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | | **17** | Request LCDC to include Local Natural Hazards Mitigation Planning as a priority for DLCD Technical Assistance Grant awards to use as match for federal funds when available. | The Land Conservation and Development Commission (LCDC) awards Technical Assistance Grants to local governments to support local planning efforts in certain priority land use topic areas which at this time do not include natural hazard mitigation. If LCDC were to include natural hazards mitigation planning as a priority topic area, local governments would have the opportunity to compete for funding and the state would be better able to provide technical assistance for natural hazards mitigation planning. | New. Priority. |
| **EDUCATION/OUTREACH** | | | | | | |
| **EO-1*** | Continue promoting the CRS program throughout the state | The CRS, part of the NFIP, is a program that rewards communities for going above and beyond the minimum requirements of the NFIP in minimizing potential losses due to flooding (See previous CRS summary under Section 2 of Hazard Mitigation Successes). The state will continue its efforts to implement CRS in local communities. See the CRS Information Center at: http://training.fema.gov/EMIWeb/CRS/ for more information.<br>Each year DLCD conducts community assistance visits in an average of five NFIP communities. During this process, qualified jurisdictions will be encouraged to participate in CRS and/or strengthen CRS ratings. DLCD will also create a "pathway to CRS" schedule for each jurisdiction for which it conducts a community assistance visit | **20** | Add at least five jurisdictions, with emphasis on coastal jurisdictions, to the Community Rating System (CRS) program during the life of each Oregon NHMP. | The CRS, part of the NFIP, is a program that rewards communities for going above and beyond the minimum requirements of the NFIP in minimizing potential losses due to flooding. Participating in the CRS benefits the jurisdiction with extra flood protection and benefits property owners by lowering flood insurance rates. See the CRS Information Center at: http://training.fema.gov/EMIWeb/CRS/ for more information.<br>Each year DLCD conducts community assistance visits in an average of five NFIP communities. During this process, qualified jurisdictions will be encouraged to participate in CRS or strengthen CRS ratings. DLCD will also create a "pathway to CRS" schedule for each jurisdiction for which it conducts a community assistance visit.<br>The state has also started CRS Users' Groups (NEW EO-1C and EO-1D) to encourage greater participation in the CRS program. | Revised. Priority. |
| | | | **29** | Strengthen the existing Community Rating System (CRS) rating of at least five jurisdictions, with emphasis on coastal jurisdictions, during the life of each Oregon NHMP. | The CRS, part of the NFIP, is a program that rewards communities for going above and beyond the minimum requirements of the NFIP in minimizing potential losses due to flooding. There are a number of measures a community can implement to obtain a CRS rating, and most communities do not implement them all. As a community implements more CRS flood protection measures, its CRS rating is strengthened, and the community is rewarded with better flood protection and lower flood insurance rates. | New. Priority. |
| | | | **C** | Initiate a Community Rating System (CRS) Users' Group Program for Oregon. | Communities in Oregon that participate in the NFIP's CRS Program lack a way to network with and learn from other CRS communities in the state. Users' groups would provide such a forum. The groups would be open to communities already participating in the CRS Program and to others interested in floodplain best management practices. The state anticipates that the CRS Users' Groups will facilitate and strengthen participation in the CRS Program, resulting in greater protection from flood damage at lower cost to property owners. | New. Removed. |
| | | | **112** | Continue implementing the Oregon CRS Users Group Program. | DLCD will continue to coordinate Oregon's two NFIP CRS Users' Groups. Each group will meet a minimum of three times per year to share floodplain best management practices and to receive technical support from the State, FEMA's Insurance Support Organization, and others as needed. The State anticipates that the support provided through the CRS Users' Groups will encourage more communities to participate in the CRS program and participating communities to strengthen their CRS ratings, resulting in greater protection from flood damage at lower cost to property owners. | New. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-2*** | Develop a statewide strategy to encourage the purchase of flood insurance | Despite the statewide availability of flood insurance, coverage in place in most communities in Oregon varies from 10% to 20% of the homes and businesses located in the Special Flood Hazard Area (100-year floodplain). Not only does flood insurance reduce the financial vulnerability of individuals, families, businesses, government agencies, other organizations, and the community to the costs posed by flooding, but through the "increased cost of compliance" provision of flood insurance, it also provides funding for the elevation, floodproofing, demolition, or relocation of homes and businesses when required due to "substantial damage" to the structure.<br>State agencies, local governments, and private sector insurance companies need to promote the purchase of flood insurance. Efforts could be linked with NFIP efforts such as the floodsmart.gov website and associated advertising campaigns. | **27** | Develop a statewide strategy to encourage the purchase of flood insurance. | It's well-known that well-insured communities recover faster. A strategy will help the state direct information to under-insured areas thereby reducing vulnerability, facilitating recovery, and increasing access to "increased cost of compliance" funding. | Revised. Priority. |
| **EO-3*** | Assist communities to adopt risk reduction techniques and ordinances | Techniques can involve requiring geological or geotechnical studies for new development, stormwater control for neighborhoods on hillslopes, strict land use ordinances for active landslides, working with infrastructure operators to increase reliability of services after storms, and more. | **EO-3*** | Assist communities to adopt risk reduction techniques and ordinances | Techniques can involve requiring geological or geotechnical studies for new development, stormwater control for neighborhoods on slopes, strict land use ordinances for active landslides, working with infrastructure operators to increase reliability of services after storms, and more. | Removed. |
| **EO-4*** | Encourage Oregon coastal communities to enroll in the NFIP's Community Rating System (CRS) which includes tsunami standards. | The CRS, included in the National Flood Insurance Program, is a FEMA program that provides incentives to communities to mitigate flood disasters. By enrolling in the CRS, communities, through specific actions, receive points that go toward a reduction in insurance rates. Tsunami actions are included in the CRS and have recently been revised by FEMA in conjunction with the Insurance Services Office (ISO). Contact DLCD, OEM, or FEMA for information about the CRS tsunami program. | **EO-4*** | Encourage Oregon coastal communities to enroll in the NFIP's Community Rating System (CRS) which includes tsunami standards. | The CRS, included in the National Flood Insurance Program, is a FEMA program that provides incentives to communities to mitigate flood disasters. By enrolling in the CRS, communities, through specific actions, receive points that go toward a reduction in insurance rates. Tsunami actions are included in the CRS and have recently been revised by FEMA in conjunction with the Insurance Services Office (ISO). Contact DLCD, OEM, or FEMA for information about the CRS tsunami program. | Removed. |
| **EO-5** | Improve hazard mitigation technical assistance for local governments and infrastructure operators | A DLCD-led review of the implementation of statewide planning Goal 7 resulted in the identification of several needs to strengthen local hazard mitigation efforts. These included providing current hazard information and technical assistance to local governments, improving communications between local governments and state agencies with respect to natural hazards, and providing hazard mitigation training.<br>An ongoing need to provide technical assistance to local governments exists, and the State IHMT continues to look for ways to bridge the gaps between local planning, building, and emergency management programs, and between the local and state levels.<br>Despite this recognition, implementation of such activities is difficult to fund and institutionalize. Through the Oregon Partnership for Disaster Resilience (OPDR) these issues have been addressed since 1999. OPDR has offered measurable outcomes on how increased communication, coordination, and collaboration between diverse partners (public and private) can assist the state and communities in reducing their risk and exposure to natural hazards.<br>Various State IHMT partners will continue to look for opportunities to provide technical assistance in a manner that encourages coordination among various local programs and informs communities of assistance available. The State IHMT also continues to seek stable non-federal funding for OPDR.<br>The State IHMT will endeavor to ensure that technical assistance materials provided by DLCD, OEM, DOGAMI, BCD, OPDR, PUC and other agencies support local officials' and infrastructure operator's understanding and use of hazard and risk information. | **EO-5** | Improve hazard mitigation technical assistance for local governments and infrastructure operators | A DLCD-led review of the implementation of statewide planning Goal 7 resulted in the identification of several needs to strengthen local hazard mitigation efforts. These included providing current hazard information and technical assistance to local governments, improving communications between local governments and state agencies with respect to natural hazards, and providing hazard mitigation training.An ongoing need to provide technical assistance to local governments exists, and the State IHMT continues to look for ways to bridge the gaps between local planning, building, and emergency management programs, and between the local and state levels.Despite this recognition, implementation of such activities is difficult to fund and institutionalize. Through the Oregon Partnership for Disaster Resilience (OPDR) these issues have been addressed since 1999. OPDR has offered measurable outcomes on how increased communication, coordination, and collaboration between diverse partners (public and private) can assist the state and communities in reducing their risk and exposure to natural hazards.Various State IHMT partners will continue to look for opportunities to provide technical assistance in a manner that encourages coordination among various local programs and informs communities of assistance available. The State IHMT also continues to seek stable non-federal funding for OPDR.The State IHMT will endeavor to ensure that technical assistance materials provided by DLCD, OEM, DOGAMI, BCD, OPDR, PUC and other agencies support local officials' and infrastructure operator's understanding and use of hazard and risk information. | Removed. |
| **EO-6** | Develop and distribute local hazard mitigation planning guidance; provide plan development support | The Oregon Partnership for Disaster Resilience (OPDR) assists communities in developing and implementing local risk reduction plans and projects. Funding for planning-related activities comes from the Pre-Disaster Mitigation Grant Program, and 2012 marks the ninth year of regional planning efforts aimed at | **EO-6** | Develop and distribute local hazard mitigation planning guidance; provide plan development support | The Oregon Partnership for Disaster Resilience (OPDR) assists communities in developing and implementing local risk reduction plans and projects. Funding for planning-related activities comes from the Pre-Disaster Mitigation Grant Program, and 2012 marks the ninth year of regional planning efforts aimed at | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | developing multi-jurisdictional natural hazards mitigation plans. As a direct result of OPDR activities, the majority of Oregon's counties maintain FEMA-approved natural hazards mitigation plans. On October 1, 2012, new FEMA local plan review procedures will be fully phased-in, and this will require outreach and training on a state-wide basis.<br>In conjunction with PDM plan development assistance, OPDR develops and implements training programs that benefit communities, agencies, and partners in natural hazards risk reduction. For communities developing hazard mitigation plans, OPDR develops and facilitates a series of quarterly plan development workshops. The series includes workshops on developing planning processes; involving stakeholders and conducting public outreach; mapping community assets and assessing local risks and vulnerabilities; developing goals and action items; and developing strategies for plan implementation and maintenance. OPDR also hosts a two-part plan update training series and business continuity trainings.<br>In addition to the trainings, OPDR provides communities with support, tools, and resources necessary to develop and/or update their natural hazards mitigation plans. Communities developing natural hazards mitigation plans receive a Pre-Disaster Mitigation Community Training Manual. The Training Manual offers technical information and resources to assist communities in the development of local mitigation plans, and is used in conjunction with OPDR's four-part work session series. Both the work sessions and manual synthesize the approaches developed by OPDR for Disaster Resilience, state and federal agencies, and other organizations to assist communities in developing natural hazards mitigation plans. OPDR has also created an addendum to the Training Manual to assist communities in the plan update process.<br>OPDR plays an instrumental role in the packaging and distribution of scientific and technical knowledge. Based on information provided by State IHMT and OPDR members/agencies, OPDR develops and distributes regional profiles and risk assessments to local communities. The regional reports are part of the State's Enhanced Natural Hazards Mitigation Plan, and they also serve as regional resources for local planning initiatives. The regional profiles and risk assessments are maintained and updated in accordance with the State's Plan implementation and maintenance schedule. As such, the reports include and disseminate the most recent scientific and technical knowledge available at the time. Likewise, communities are encouraged to update the regional profiles and risk assessments with local data, as available.<br>Additionally, OPDR's website hosts a number of useful resources for communities developing and/or updating natural hazards mitigation plans, including the searchable natural hazard mitigation action item database. The database includes action items from plans developed as part of the Pre-Disaster Mitigation Planning Grants covering the Mid/Southern Willamette Valley, Mid-Columbia, Southeast Oregon, Northeast Oregon, and Oregon Coast regional planning initiatives. Eventually, this database will host the action items from all local plans. Additional online resources include the state's enhanced natural hazards mitigation plan, links to regional planning initiatives, technical memos, links to state agencies' websites, and hazard-specific resources. | | | developing multi-jurisdictional natural hazards mitigation plans. As a direct result of OPDR activities, the majority of Oregon's counties maintain FEMA-approved natural hazards mitigation plans. On October 1, 2012, new FEMA local plan review procedures will be fully phased-in, and this will require outreach and training on a state-wide basis.<br>In conjunction with PDM plan development assistance, OPDR develops and implements training programs that benefit communities, agencies, and partners in natural hazards risk reduction. For communities developing hazard mitigation plans, OPDR develops and facilitates a series of quarterly plan development workshops. The series includes workshops on developing planning processes; involving stakeholders and conducting public outreach; mapping community assets and assessing local risks and vulnerabilities; developing goals and action items; and developing strategies for plan implementation and maintenance. 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Likewise, communities are encouraged to update the regional profiles and risk assessments with local data, as available.<br>Additionally, OPDR's website hosts a number of useful resources for communities developing and/or updating natural hazards mitigation plans, including the searchable natural hazard mitigation action item database. The database includes action items from plans developed as part of the Pre-Disaster Mitigation Planning Grants covering the Mid/Southern Willamette Valley, Mid-Columbia, Southeast Oregon, Northeast Oregon, and Oregon Coast regional planning initiatives. Eventually, this database will host the action items from all local plans. Additional online resources include the state's enhanced natural hazards mitigation plan, links to regional planning initiatives, technical memos, links to state agencies' websites, and hazard-specific resources. | |
| | | | **50** | Update *Planning for Natural Hazards: Oregon Technical Resource Guide.* | *Planning for Natural Hazards: Oregon Technical Resource Guide* was published in 2000 and needs to be updated. | Revised. Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | | **46** | Provide the updated *Planning for Natural Hazards: Oregon Technical Resource Guide* to local governments. | To encourage communities to use *Planning for Natural Hazards: Oregon Technical Resource Guide* it must be provided to them. | New. Priority. |
| | | | **83** | Assist local governments in using the updated *Planning for Natural Hazards: Oregon Technical Resource Guide* to update their comprehensive plans and development regulations. | The original purpose of *Planning for Natural Hazards: Oregon Technical Resource Guide* was to assist communities in amending their comprehensive plans and development regulations to reduce risk from natural hazards, implementing Statewide Goal 7. The updated document will also be helpful in developing local hazard mitigation plans and integrating them with local comprehensive plans and development regulations. | New. Ongoing. |
| | | | **84** | Monitor the implementation of the updated *Planning for Natural Hazards: Oregon Technical Resource Guide* provided to local governments by tracking the number of jurisdictions that have used it. | Monitoring success of *Planning for Natural Hazards: Oregon Technical Resource Guide* will allow the State to adjust its approach and update the guidance as necessary, leading to better protection of life and property. | New. Ongoing. |
| | | | **85** | Provide support for development and update of local and state hazard mitigation plans. | The State provides support for development of local NHMPs and the state NHMP by managing federal grant funding in ways that assist the state and local governments with NHMP development and update tasks and processes. | New. Ongoing. |
| **EO-7** | Improve and sustain public information and education programs aimed at mitigating the damage caused by natural hazards | While ongoing efforts are being made in this area, a strong message conveyed by several State IHMT Reports notes the need to strengthen and sustain public information, education, and training efforts by providing additional resources. Although commonly recognized that interest in reducing losses increase during and after events, there is an ongoing need to provide residents and key stakeholder groups (such as infrastructure operators) with hazard mitigation information. These reports cite the need to have timely seasonal information available, better methods to inform residents of sources of hazard mitigation information, use improved electronic methods (e.g., web sites), and materials oriented toward the intended users. This helps keep awareness levels higher, will stimulate actions by some, and reminds users to consider and include hazard mitigation measures in the contexts of regular activities, such as building a new home, relocating an office, or repairing a business. | **86** | Improve and sustain public information and education programs aimed at mitigating the damage caused by natural hazards | While ongoing efforts are being made in this area, a strong message conveyed by several State IHMT Reports notes the need to strengthen and sustain public information, education, and training efforts by providing additional resources. Although commonly recognized that interest in reducing losses increase during and after events, there is an ongoing need to provide residents and key stakeholder groups (such as infrastructure operators) with hazard mitigation information. These reports cite the need to have timely seasonal information available, better methods to inform residents of sources of hazard mitigation information, use improved electronic methods (e.g., web sites), and materials oriented toward the intended users. This helps keep awareness levels higher, will stimulate actions by some, and reminds users to consider and include hazard mitigation measures in the contexts of regular activities, such as building a new home, relocating an office, or repairing a business. | Ongoing. |
| **EO-8** | Develop tsunami hazard and evacuation maps | Tsunami runup areas and evacuation maps continue to be developed in conjunction with local governments. Tsunamis can dramatically affect coastal erosion and must be taken into account in planning activities. | **EO-8** | Develop tsunami hazard and evacuation maps | Tsunami runup areas and evacuation maps continue to be developed in conjunction with local governments. Tsunamis can dramatically affect coastal erosion and must be taken into account in planning activities. | Removed. |
| **EO-9** | Assist local governments | Continue—and enhance where possible—state technical and planning grant assistance to coastal cities and counties for addressing issues associated with coastal erosion and related hazards. | **1** | Develop and fund a legislative package for general funds or lottery funds to match federal funding for local hazard mitigation planning, including additional funds for DLCD Technical Assistance Grants. | Continue—and enhance where possible—state technical and planning grant assistance to cities and counties for addressing issues associated with local hazards. | Revised. Priority. |
| **EO-10** | Expand Coastal Atlas GIS resources | Expand the Coastal Atlas geographic information system (GIS) in terms of data content and tools available for use. Continue to promote the use of the Coastal Atlas by local and state land use planners, permit reviewers and other practitioners | **101** | Continue to facilitate accessibility and use of the *Coastal Atlas* GIS resources. | Make the *Coastal Atlas* geographic information system (GIS) more useful for a wider audience, from local and state staff to interested citizens, by continuing to improve its data and tools, and providing training on how to access and use them. | Revised. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-11** | Produce Coastal Development Handbook | Produce a Coastal Development Handbook that addresses coastal process and hazards, beach and shoreland public policy, buying oceanfront property [what to look for, what questions to ask], building on oceanfront property, choosing appropriate hazard mitigation techniques, and choosing and using geotechnical consultants and engineers. | **47** | Produce Coastal Development Handbook | Produce a *Coastal Development Handbook* that addresses coastal process and hazards, beach and shoreland public policy, buying oceanfront property [what to look for, what questions to ask], building on oceanfront property, choosing appropriate hazard mitigation techniques, and choosing and using geotechnical consultants and engineers. | Priority. |
| **EO-12** | Better coordinate, fund, and publicize programs to reduce the abundance of Juniper trees in arid landscapes across Oregon | Juniper trees are not native to Oregon. They develop extensive root systems that draw critically needed water from arid soils, transpiring water vapor into the atmosphere. There are programs in Oregon to reduce Juniper trees from areas where their competition for groundwater resources is harmful, but these programs need to be better coordinated, funded, and publicized. | **98** | Better coordinate, fund, and publicize programs to reduce the abundance of Juniper trees in arid landscapes across Oregon | Juniper trees develop extensive root systems that draw critically needed water from arid soils, transpiring water vapor into the atmosphere, intensifying drought and increasing the risk of wildfire. There are programs in Oregon to reduce Juniper trees from areas where their competition for groundwater resources is harmful, but these programs need to be better coordinated, funded, and publicized. | Ongoing. |
| **EO-13** | Determine the effectiveness of EAS in dust prone areas at providing timeline information to the traveling public about dangerous blowing dust conditions and make improvements if needed. | One of several ideas proposed following the Sept. 1999 accidents on Interstate 84 near Echo was to "put word out quickly" utilizing the Emergency Alert System (EAS) via area radio stations about dust storm potential, and especially about actual conditions that are interfering with visibility. This idea was in addition to ODOT's Highway Advisory Radio and related resources noted as success stories on pages DS-5 to DS-7. With regard to the Mid-Columbia Region, it was noted that Tri-Cities radio stations need to be included because many people driving through that area are listening to stations based in Washington State. ODOT and OSP have primary responsibility for activating the traffic advisory components of the dust storm response plan for the Mid-Columbia Region. The National Weather Service can also activate EAS from their forecast offices in Pendleton, Boise, Medford, and Portland. Many local emergency program managers can also activate the system. | **52** | Determine the effectiveness of and the feasibility of using the Emergency Alert System (EAS) in dust prone areas to provide timely information to the traveling public about dangerous blowing dust conditions and make improvements if needed. | ODOT and OSP have primary responsibility for activating the traffic advisory components of the dust storm response plan for the Mid-Columbia Region. The National Weather Service can also activate EAS from their forecast offices in Pendleton, Boise, Medford, and Portland. Many local emergency program managers can also activate the system. Providing this information can save lives in the event of a dust storm. | Revised. Priority. |
| **EO-14** | Explore ways of improving communication of hazardous blowing dust conditions between public safety answering points, ODOT, OSP, and local law enforcement agencies | Community Solutions Team (CST) meetings in the Mid-Columbia Region of Oregon during the spring of 2000 identified that better communication between public safety answering points (PSAPs) about the existence and likely direction of travel of dust storms might have provided additional warning time for ODOT, OSP, and local law enforcement to stop travel on downwind highways likely to be affected.<br>Protocols and training should be considered that would result in PSAPs relaying information, as appropriate, to ODOT, OSP, local law enforcement, and the downwind neighboring PSAP regarding reports of dust storms headed in a particular direction. This may provide additional time for ODOT and law enforcement agencies to briefly close stretches of highways in the path of the storm and/or for reader boards and other advisory systems to be activated with information. There are a number of issues and factors that would need to be addressed in determining the feasibility of developing protocols and training on them:<br>• Staffing/Costs—Some PSAPs do not have more than one or two people per shift on duty; when events such as dust storms happen, personnel sometimes find it difficult to keep-up with existing, ongoing protocols.<br>• Feasibility—If the only information PSAPs have is based on what they are told by callers or mobile police/fire units via radio, will they know enough about the direction of travel of the dust storm to issue reliable information?<br>• Technology—Is new technology needed to accomplish the task contemplated?<br>Liability—Would adding such protocols unnecessarily contribute to potential liability for PSAPs?<br>• Work with APCO/NENA—and especially local PSAPs in dust storm prone areas—to explore the possibility of developing and training on communication protocols for dust storms. | **EO-14** | Develop protocols for improving communication of hazardous blowing dust conditions between public safety answering points, ODOT, OSP, and local law enforcement agencies. | Community Solutions Team (CST) meetings in the Mid-Columbia Region of Oregon during the spring of 2000 identified that better communication between public safety answering points (PSAPs) about the existence and likely direction of travel of dust storms might have provided additional warning time for ODOT, OSP, and local law enforcement to stop travel on downwind highways likely to be affected.<br>Protocols should be developed and training provided should be considered that would result in PSAPs relaying information, as appropriate, to ODOT, OSP, local law enforcement, and the downwind neighboring PSAP regarding reports of dust storms headed in a particular direction. This may provide additional time for ODOT and law enforcement agencies to briefly close stretches of highways in the path of the storm and/or for reader boards and other advisory systems to be activated with information. There are a number of issues and factors that would need to be addressed in determining the feasibility of developing protocols and training on them:<br>• Staffing/Costs—Some PSAPs do not have more than one or two people per shift on duty; when events such as dust storms happen, personnel sometimes find it difficult to keep-up with existing, ongoing protocols.<br>• Feasibility—If the only information PSAPs have is based on what they are told by callers or mobile police/fire units via radio, will they know enough about the direction of travel of the dust storm to issue reliable information?<br>• Technology—Is new technology needed to accomplish the task contemplated?<br>• Liability—Would adding such protocols unnecessarily contribute to potential liability for PSAPs?<br>• Work with APCO/NENA—and especially local PSAPs in dust storm prone areas—to develop and train on communication protocols for dust storms. | Revised. Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

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| **EO-15** | Coordinate development of a post disaster scientific and technical clearinghouse with other state and federal agencies, higher education, and associations | When an earthquake strikes the state, there will be an influx of scientists and engineers from inside and outside the state to study the event and offer help. There needs to be a coordination of their efforts to put them to use in the most efficient and effective way possible. This clearinghouse will work with the emergency coordination center established immediately after the earthquake, including working with the state agencies implementing State Support Function #3, Public Works and Engineering. | **71** | Coordinate development of a post-disaster scientific and technical clearinghouse with other state and federal agencies, higher education, and associations. | When an earthquake, flood, tsunami, or other disaster strikes the state, there will be an influx of scientists and engineers from inside and outside the state to study the event and offer help. There needs to be a coordination of their efforts to put them to use in the most efficient and effective way possible. This clearinghouse will work with the emergency coordination center established immediately after the earthquake, flood, tsunami, or other disaster. | Priority. |
| **EO-16** | Provide additional information to the traveling public about dust storm driving safety | Among the ideas generated by the Community Solutions Team meetings in the spring of 2000 was to provide additional public education outreach in dust storm prone areas of the state, especially Morrow and Umatilla Counties. Among the ideas were the following: 1) Provide dust storm driving information in safety rest area kiosks. 2)Develop, print, and distribute "table cards" to area restaurants and truck stops, providing information on driving when visibility is reduced (dust storms, fog, smoke, etc.), perhaps making similar information available at DMV offices. 3)Develop and distribute PSAs on the topic of driving in dust storm conditions to radio stations; stations would be encouraged to run these during peak periods when there is a strong possibility of high winds and blowing dust (Tri-Cities radio stations should be included). Determine the merit of these ideas and implement those that are likely to result in a better-informed traveling public, thereby increasing safety on Oregon's highways. | **EO-16** | Provide additional information to the traveling public about dust storm driving safety | Among the ideas generated by the Community Solutions Team meetings in the spring of 2000 was to provide additional public education outreach in dust storm prone areas of the state, especially Morrow and Umatilla Counties. Among the ideas were the following: 1) Provide dust storm driving information in safety rest area kiosks. 2)Develop, print, and distribute "table cards" to area restaurants and truck stops, providing information on driving when visibility is reduced (dust storms, fog, smoke, etc.), perhaps making similar information available at DMV offices. 3)Develop and distribute PSAs on the topic of driving in dust storm conditions to radio stations; stations would be encouraged to run these during peak periods when there is a strong possibility of high winds and blowing dust (Tri-Cities radio stations should be included). Determine the merit of these ideas and implement those that are likely to result in a better-informed traveling public, thereby increasing safety on Oregon's highways. | Removed. |
| **EO-17** | Publicize and facilitate the implementation of both structural and non-structural seismic mitigation measures for home owners, business owners, renters, and contractors, including methods of reducing hazards | Models to display chimney reinforcing techniques, attaching homes to foundations and non-structural measures for building contents have been developed by FEMA following the Nisqually earthquake disaster. Oregon will request models from FEMA Region 10 and/or other sources; develop and deploy a training program for seismic retrofits to be conducted regionally throughout the state. Work with various "Showcase State" partners, as well as the Construction Contractors Board, public and private sector lenders, private sector construction material suppliers and nonprofit organizations to develop programs to assist home and business owners and renters to implement structural and non-structural seismic mitigation measures. | **106** | Publicize and facilitate the implementation of both structural and non-structural seismic mitigation measures for home owners, business owners, renters, and contractors, including methods of reducing hazards | Working with federal partners, such as FEMA, and non-profit industry groups, such as AIA, Oregon will enhance education on structural and non-structural seismic mitigation measures by adopting the following actions:<br>• Increase the number of educational opportunities by working with FEMA to offer courses from the National Earthquake Technical Assistance Program.<br>• Work with the Construction Contractors Board, public and private sector lenders, private sector construction material suppliers and nonprofit organizations to develop programs to assist home and business owners and renters to implement innovative structural and non-structural seismic mitigation measures. | Revised. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-18** | Promote agricultural practices that are known to reduce erosion of soil by wind, thereby reducing the frequency and magnitude of dust storms | It is clear that certain agricultural practices reduce the frequency and amount of blowing dust, as well as reduce wind-caused soil erosion. Oregon Department of Agriculture should continue to work with farmers, agricultural associations, and soil and water conservation districts to further promote and implement: 1) Residue management, including no-till or direct seed farming. 2) Cover crops and other BMPs (see below). 3) Field strip cropping systems. 4) Landscape buffers/windbreaks. The most commonly used practice for both wind and water erosion control is residue management. This involves leaving some or all of the residue from the previous crop on the soil surface to provide cover and surface roughness to provide protection against erosion. Residue management involves tillage practices that do not turn the soil over thus burying the residue. Reduced tillage, minimum tillage, no-till, mulch till, and conservation tillage are all terms used to describe the various methods used to accomplish residue management. Other "best management practices" (BMPs) used in wind erosion prone areas include cover crops, annual or continuous cropping, and crop rotations. On irrigated land, a common practice is to irrigate soon after tillage to form a crust on the soil that reduces the potential for wind erosion. Field strip cropping systems can reduce exposed surface area by up to 50% on each field. Landscape buffers/windbreaks are likely the most expensive alternative because a series of properly spaced tree and shrub windbreaks requires the purchase of trees/shrubs, and since it would likely need irrigation, requires some infrastructure development and maintenance costs. Additionally, to be effective, it needs to be done as a system, involving multiple ownerships. The Coordinated Resource Management System approach might be used to obtain cooperation and achieve coordinated implementation. The Columbia Plateau Wind Erosion/Air Quality Project, also known as the Columbia Plateau $PM_{10}$ Project, has conducted years of research and has produced many fine publications. The latest report, Farming with the Wind II (Special Report XB1042) was released in Feb. 2004. For more information, see: http://pnw-winderosion.wsu.edu | **EO-18** | Promote agricultural practices that are known to reduce erosion of soil by wind, thereby reducing the frequency and magnitude of dust storms | It is clear that certain agricultural practices reduce the frequency and amount of blowing dust, as well as reduce wind-caused soil erosion. Oregon Department of Agriculture should continue to work with farmers, agricultural associations, and soil and water conservation districts to further promote and implement: 1) Residue management, including no-till or direct seed farming. 2) Cover crops and other BMPs (see below). 3) Field strip cropping systems. 4) Landscape buffers/windbreaks. The most commonly used practice for both wind and water erosion control is residue management. This involves leaving some or all of the residue from the previous crop on the soil surface to provide cover and surface roughness to provide protection against erosion. Residue management involves tillage practices that do not turn the soil over thus burying the residue. Reduced tillage, minimum tillage, no-till, mulch till, and conservation tillage are all terms used to describe the various methods used to accomplish residue management. Other "best management practices" (BMPs) used in wind erosion prone areas include cover crops, annual or continuous cropping, and crop rotations. On irrigated land, a common practice is to irrigate soon after tillage to form a crust on the soil that reduces the potential for wind erosion. Field strip cropping systems can reduce exposed surface area by up to 50% on each field. Landscape buffers/windbreaks are likely the most expensive alternative because a series of properly spaced tree and shrub windbreaks requires the purchase of trees/shrubs, and since it would likely need irrigation, requires some infrastructure development and maintenance costs. Additionally, to be effective, it needs to be done as a system, involving multiple ownerships. The Coordinated Resource Management System approach might be used to obtain cooperation and achieve coordinated implementation. The Columbia Plateau Wind Erosion/Air Quality Project, also known as the Columbia Plateau $PM_{10}$ Project, has conducted years of research and has produced many fine publications. The latest report, *Farming with the Wind II* (Special Report XB1042) was released in Feb. 2004. For more information, see: http://pnw-winderosion.wsu.edu | Removed. |
| **EO-19** | Encourage local jurisdictions to hold biennial volcano preparedness forums | Preparedness forums should include talks from USGS, DOGAMI, and local emergency management specialists. Preparedness and response education materials should be distributed | **136** | Each year, ask the Governor to designate May to be Volcano Awareness Month by proclamation. | Working with federal partners, such as the USGS Cascades Volcano Observatory, the state of Oregon will increase the ability for citizens to respond to volcanic eruptions by increasing the level of awareness and preparedness in the public and governmental agencies. | Revised. Ongoing. |
| | | | **36** | Host at least one workshop or other educational opportunity on a biennial basis in communities where a Volcano Coordination Plan has been adopted. | The State of Oregon will actively work to increase the public's knowledge of the volcano hazard in Oregon. | New. Priority. |
| **EO-20** | Continue mandatory earthquake drills for state agencies, private employers with more than 250 employees. | "Drop, cover, and hold" or other protective action is critical in reducing injury and loss of life in the workplace and home during an earthquake. The more people practice the drill, the better they will respond to a real event. State agencies are setting an example by conducting a drill annually. OAR 104, Division 20 defines the responsibilities of state and local agencies, and private sector employers with 250 or more employees to hold annual drills instructing employees on earthquake emergency procedures. | **108** | Each year, ask the Governor to designate the third Thursday of the month of October as the Great Oregon ShakeOut Day by proclamation. | Practicing to "drop, cover, and hold" is critical in reducing injury and loss of life in the workplace and home during an earthquake. The more people practice the drill, the better they will respond to a real event. A gubernatorial declaration will promote increased participation in the Great Oregon ShakeOut, or other annual earthquake Drop, Cover, and Hold On drill. | Revised. Ongoing. |
| | | | **37** | Achieve 100% state agency participation in the Great Oregon ShakeOut | Practicing to "drop, cover, and hold" is critical in reducing injury and loss of life in the workplace and home during an earthquake. The more people practice the drill, the better they will respond to a real event. State agencies are setting an example by conducting a drill annually. The State of Oregon will have 100% State agency participation in the Great Oregon ShakeOut and will encourage schools and universities to participate. | New. Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-21** | Provide information to local governments regarding adoption of programs and model ordinances for mitigation of existing, hazardous, unsecured buildings elements, such as parapets | Some common building features subject to earthquake damage and corresponding safety hazards include parapets, awnings, signs, decorative features, and masonry moldings. BCD has adopted the International Building Code (IEBC) as an alternate method, which was amended to support Portland's local ordinances on seismic design requirements for existing buildings. Local governments that wish to adopt hazard mitigation standards for existing buildings as permitted by ORS 455.020(4) should follow the City of Portland's local ordinance (Chapter 24.85 Seismic Design Requirements for Existing Buildings). | **EO-21** | Provide information to local governments regarding adoption of programs and model ordinances for mitigation of existing, hazardous, unsecured buildings elements, such as parapets | Some common building features subject to earthquake damage and corresponding safety hazards include parapets, awnings, signs, decorative features, and masonry moldings. BCD has adopted the International Building Code (IEBC) as an alternate method, which was amended to support Portland's local ordinances on seismic design requirements for existing buildings. Local governments that wish to adopt hazard mitigation standards for existing buildings as permitted by ORS 455.020(4) should follow the City of Portland's local ordinance (Chapter 24.85 Seismic Design Requirements for Existing Buildings). | Removed. |
| **EO-22** | Encourage the purchase of earthquake insurance | Unlike flood insurance, which is underwritten by the U.S. Government (through the National Flood Insurance Program), earthquake insurance is offered by private sector agents and generally "packaged" as a rider to a standard homeowner or business property insurance policy. For some people, the question should not be whether or not to purchase earthquake insurance, but rather, how much to buy. For others, the decision requires a risk assessment: how likely is an earthquake?; how much damage would it inflict on ones property?; and how much can one afford to lose? Earthquake insurance rates are determined differently by each insurance company and can vary widely depending on several rating factors. Generally, older homes cost more to insure than new homes. Wood homes get better rates than brick ones because they tend to withstand earthquake stresses better. Because earthquake insurance is a type of catastrophic coverage, most policies carry a high deductible; usually anywhere from 5% to 15% of the value of a house. It is recommended that state agencies, local governments, and private sector insurance companies do a better job of promoting the purchase of earthquake insurance. | **109** | Include information about the benefits of purchasing earthquake insurance in public outreach materials and disseminate those materials through appropriate public outreach programs and venues. | Unlike flood insurance, which is underwritten by the U.S. Government (through the National Flood Insurance Program), earthquake insurance is offered by private sector agents, generally as a rider to a standard homeowner or business property insurance policy. Because earthquake insurance is a type of catastrophic coverage, most policies carry a high deductible, Oregon's Department of Consumer and Business Services Insurance Division offers information about earthquake insurance on its website and provides personal assistance through its insurance hotline. In addition, the Division is active in outreach activities, partnering with other agencies and organizations to bring insurance information to the public. | Revised. Ongoing. |
| **EO-23** | Identify an Oregon institution to host the Advanced National Seismic System (ANSS) Interpretive Center in Oregon | The August 2001 implementation plan for the ANSS Pacific Northwest Region identifies a need for an institution in Oregon to interpret ANSS Oregon earthquake data and information products for users ranging from emergency managers and news media to research scientists. This project is, in part, a USGS effort mandated by Congress, which involves the purchase, installation, monitoring, and maintenance of strong motion seismographs. | **EO-23** | Identify an Oregon institution to host the Advanced National Seismic System (ANSS) Interpretive Center in Oregon | The August 2001 implementation plan for the ANSS Pacific Northwest Region identifies a need for an institution in Oregon to interpret ANSS Oregon earthquake data and information products for users ranging from emergency managers and news media to research scientists. This project is, in part, a USGS effort mandated by Congress, which involves the purchase, installation, monitoring, and maintenance of strong motion seismographs. | Removed. |
| **EO-24** | Continue to improve the communication of historical information on stream flows during past El Niño and La Niña years to water managers throughout Oregon; historical data provides the earliest clue on where flooding may occur or where there could be water shortages. | Stream flow data from past El Niño and La Niña years can provide clues as to where the state is more likely than during an "average" year to experience water shortages or flooding. This information should be better communicated to water managers, floodplain managers, emergency managers, and others with an interest in stream flows. The apparent association of ENSO signals and streamflows shows up only in some basins and some years and thus cannot be relied on with certainty… A forecast based only on ENSO signals may be overly simplified, or in some cases, misleading. (For example) the SOI variable is significant in both the Wilson and Trask rivers but the La Niña variable is not significant in these two basins. Neither variable is significant in the Siletz (which has 60-plus years of record). Although (there is) a potential role for ENSO signals in flood planning, relevance will depend in part on the physical characteristics of individual watersheds and on the particular flow metrics of interest to floodplain managers. An apparently strong ENSO signal in a particular region may be of little use for some individual catchments in the region other factors can play major roles in whether a high flow results in a flood event. Along Oregon's coast, for example, floods in some smaller rivers that empty into bays often are caused by storm surges and high tides in concert with heavy precipitation. These surges and tides pile-up bay water and decrease the rate at which streamflows can be discharged to the open sea. | **EO-24** | Continue to improve the communication of historical information on stream flows during past El Niño and La Niña years to water managers throughout Oregon; historical data provides the earliest clue on where flooding may occur or where there could be water shortages. | Stream flow data from past El Niño and La Niña years can provide clues as to where the state is more likely than during an "average" year to experience water shortages or flooding. This information should be better communicated to water managers, floodplain managers, emergency managers, and others with an interest in stream flows. The apparent association of ENSO signals and stream flows shows up only in some basins and some years and thus cannot be relied on with certainty. A forecast based only on ENSO signals may be overly simplified, or in some cases, misleading. (For example) the SOI variable is significant in both the Wilson and Trask rivers but the La Niña variable is not significant in these two basins. Neither variable is significant in the Siletz (which has 60-plus years of record). Although (there is) a potential role for ENSO signals in flood planning, relevance will depend in part on the physical characteristics of individual watersheds and on the particular flow metrics of interest to floodplain managers. An apparently strong ENSO signal in a particular region may be of little use for some individual catchments in the region other factors can play major roles in whether a high flow results in a flood event. Along Oregon's coast, for example, floods in some smaller rivers that empty into bays often are caused by storm surges and high tides in concert with heavy precipitation. These surges and tides pile-up bay water and decrease the rate at which stream flows can be discharged to the open sea. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-25** | Facilitate additional training on seismic design of structures and requirements of the State Building Code relating to hazard mitigation | Facilitate the development of training courses for individuals involved in earthquake hazard mitigation and building design, construction, and inspection. Focus on audiences that include architects, engineers, contractors and code enforcement personnel. The workshops will also provide a forum for instruction on construction and retrofitting techniques to increase the seismic resistance of existing buildings. | **EO-25** | Facilitate additional training on seismic design of structures and requirements of the State Building Code relating to hazard mitigation. | Facilitate the development of training courses for individuals involved in earthquake hazard mitigation and building design, construction, and inspection. Focus on audiences that include architects, engineers, contractors and code enforcement personnel. The workshops will also provide a forum for instruction on construction and retrofitting techniques to increase the seismic resistance of existing buildings. | Removed. |
| **EO-26** | Draft model intergovernmental agreements to establish clear definitions of assistance and authority across jurisdictional lines or when state or federal resources are needed. | Create a model mutual aid agreement to be used by state and local governments when providing assistance across jurisdiction lines. Establish additional clear guidelines when local jurisdictions need additional state, federal, or special resources. | **EO-26** | Draft model intergovernmental agreements to establish clear definitions of assistance and authority across jurisdictional lines or when state or federal resources are needed. | Create a model mutual aid agreement to be used by state and local governments when providing assistance across jurisdiction lines. Establish additional clear guidelines when local jurisdictions need additional state, federal, or special resources. | Removed. |
| **EO-27** | Support development, enhancement and implementation of local education programs designed to mitigate the wildfire hazard and to reduce wildfire losses | As part of its statewide fire prevention program, the Oregon Department of Forestry actively encourages and promotes local education and awareness programs that are designed to mitigate, or reduce the impacts of wildfires. This action reflects ODF's ongoing intentions to: 1) collaborate with agencies and organizations to promote consistency in the development and application of fire prevention standards; 2) work to make individuals aware of their personal accountability and responsibility for wildfire safety; 3) determine local resources and capacity; and 4) define needs and solutions required to increase capacity. Please see Section 3 of the SNHMP for descriptions of current statewide educational programs. | **137** | Support development, enhancement and implementation of local education programs designed to mitigate the wildfire hazard and to reduce wildfire losses, such as the Firewise Communities/NFPA Program and the annual Wildfire Awareness Week Campaign. | As part of its statewide fire prevention program, the Oregon Department of Forestry actively encourages and promotes local education and awareness programs that are designed to mitigate, or reduce the impacts of wildfires. This action reflects ODF's ongoing intentions to: 1) collaborate with agencies and organizations to promote consistency in the development and application of fire prevention standards; 2) work to make individuals aware of their personal accountability and responsibility for wildfire safety; 3) determine local resources and capacity; and 4) define needs and solutions required to increase capacity. | Revised. Ongoing. |
| **EO-28** | Increase the number of local governments using the Wildfire Hazard Zone process to mitigate wildfire risk and losses | The Wildfire Hazard Zone (WHZ) process allows local governments to require the use of fire resistant roofing materials in jurisdictions assessed to be at a high risk of wildland fire. Currently, only a few eligible entities have utilized the WHZ process. To promote additional use, an assessment will be made of the portions of the state where it appears the WHZ process will have the greatest benefit. Following this assessment, local governments in the areas identified will be educated on the desirability of implementing the process. Those governments that express an interest in applying the process will be assisted in completing the required analysis work. | **138** | Continue to increase the number of local governments using the Wildfire Hazard Zone process to mitigate wildfire risk and losses | The Wildfire Hazard Zone (WHZ) process allows local governments to require the use of fire resistant roofing materials in jurisdictions assessed to be at a high risk of wildland fire. Currently, only a few eligible entities have utilized the WHZ process. To promote additional use, an assessment will be made of the portions of the state where it appears the WHZ process will have the greatest benefit. Following this assessment, local governments in the areas identified will be educated on the desirability of implementing the process. Those governments that express an interest in applying the process will be assisted in completing the required analysis work. | Revised. Ongoing. |
| **EO-29** | Increase the number of counties and communities that have current Community Wildfire Protection Plans. | The federal Healthy Forests Restoration Act (HFRA) includes statutory incentives for federal agencies to give consideration to the priorities of local communities as they develop and implement wildfire hazard mitigation projects. To become eligible for priority consideration under HFRA, a community must first prepare a Community Wildfire Protection Plan (CWPP). Most Oregon counties and many Oregon communities have completed CWPPs. To encourage the completion of additional CWPPs, as well as future updates of CWPP's counties and communities will be informed of the benefits to be gained from maintaining a CWPP and assistance will be offered to help facilitate the development and/or update of the plans. | **139** | Continue to develop and increase the number of updated Community Wildfire Protection Plans (CWPPs) with the goal of aligning CWPP updates with 5-year NHMP updates, where possible. | The federal Healthy Forests Restoration Act (HFRA) includes statutory incentives for federal agencies to give consideration to the priorities of local communities as they develop and implement wildfire hazard mitigation projects. To become eligible for priority consideration under HFRA, a community must first prepare a *Community Wildfire Protection Plan* (CWPP). Most Oregon counties and many Oregon communities have completed CWPPs. To encourage the completion of additional CWPPs, as well as future updates of CWPP's counties and communities will be informed of the benefits to be gained from maintaining a CWPP and assistance will be offered to help facilitate the development and/or update of the plans. Since the majority of Counties refer to CWPP's as their Wildfire Chapters, aligning CWPP updates with NHMP updates will ensure consistency and promote efficiencies in planning processes. | Revised. Ongoing. |
| **EO-30** | Expand the Firewise Communities/NFPA program in Oregon | The national Firewise Communities/USA recognition program promotes a self-help approach by which local communities can improve their level of protection from wildfires. Within a community, the program is started when a fire service professional provides information about how the community can successfully coexist with wildfires, explains basic fire mitigation measures, and helps to complete a community assessment of their situation. The community then uses this information to develop and carry out a mitigation plan which is tailored to its unique location and situation. Currently, several of Oregon's communities have participated in the program. More will be encouraged to do so. | **EO-30** | Expand the Firewise Communities/NFPA program in Oregon | The national Firewise Communities/USA recognition program promotes a self-help approach by which local communities can improve their level of protection from wildfires. Within a community, the program is started when a fire service professional provides information about how the community can successfully coexist with wildfires, explains basic fire mitigation measures, and helps to complete a community assessment of their situation. The community then uses this information to develop and carry out a mitigation plan which is tailored to its unique location and situation. Currently, several of Oregon's communities have participated in the program. More will be encouraged to do so. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-31** | Encourage increased commercial utilization of biomass materials from wildland-urban interface areas | For a variety of reasons, vegetative fuels in and adjacent to wildland-urban interface (WUI) areas are accumulating at historically high rates. The ability to properly, cost effectively, or ecologically dispose of such fuels, as a part of a comprehensive mitigation strategy, is often limited and may even be nonexistent in some locales. One way to address this problem is to encourage increased commercial utilization of biomass materials which are created by mitigation activities in WUI areas, such as by burning to create steam and electricity (co-generation). The development of the infrastructure to support such utilization requires significant marketing and investment. Under this action item, the desirability of entering such markets will be promoted to potential developers and investors. | **EO-31** | Encourage increased commercial utilization of biomass materials from wildland-urban interface areas | For a variety of reasons, vegetative fuels in and adjacent to wildland-urban interface (WUI) areas are accumulating at historically high rates. The ability to properly, cost effectively, or ecologically dispose of such fuels, as a part of a comprehensive mitigation strategy, is often limited and may even be nonexistent in some locales. One way to address this problem is to encourage increased commercial utilization of biomass materials which are created by mitigation activities in WUI areas, such as by burning to create steam and electricity (co-generation). The development of the infrastructure to support such utilization requires significant marketing and investment. Under this action item, the desirability of entering such markets will be promoted to potential developers and investors. | Removed. |
| **EO-32** | Expand Oregon's annual Wildfire Awareness Week campaign | Creating public awareness of the need to consider and to apply wildfire mitigation actions, such as hazardous fuels removal, on privately owned lands is one of the keys to the successful implementation of a comprehensive wildfire awareness program. In recent years, the states of Oregon and Washington have jointly conducted an annual wildfire awareness campaign, early in the spring. To date, these campaigns have been relatively low-key and have had only moderate success in improving the public's awareness. Under this action item, Oregon will devote more time, energy, and money to designing and conducting an annual wildfire awareness week campaign. The goal will be to make residents more aware of the wildfire risks they face and how they can help to reduce that risk. | **EO-32** | Continue Oregon's annual Wildfire Awareness Week campaign | Creating public awareness of the need to consider and to apply wildfire mitigation actions, such as hazardous fuels removal, on privately owned lands is one of the keys to the successful implementation of a comprehensive wildfire awareness program. In recent years, the states of Oregon and Washington have jointly conducted an annual wildfire awareness campaign, early in the spring. Under this action item, Oregon will devote more time, energy, and money to designing and conducting an annual wildfire awareness week campaign. The goal will be to make residents more aware of the wildfire risks they face and how they can help to reduce that risk. | Revised. Removed. |
| **EO-33** | Promote the use of monies for fire prevention and wildfire mitigation projects by counties received pursuant to Title III, Section 302(5) of Public Law 106-393, or other similar federal legislation | Under the federal Secure Rural Schools and Community Self-Determination Act of 2000, counties have the ability to receive and spend federal funds for projects that educate homeowners about wildfire mitigation efforts they can apply on their property and for planning projects that increase the protection of people and property from wildfires. Under this action item, counties will be encouraged to apply for these monies and guidance will be offered on how the monies can best be applied. | **140** | Continue to provide technical assistance in accessing funding for fire prevention or wildfire mitigation projects through Title III, the National Fire Plan, or other funding mechanisms. | Under the federal *Secure Rural Schools and Community Self-Determination Act of 2000* (Title III, Section 301(5) of PL 106-393, commonly known as *Title III*), counties have the ability to receive and spend federal funds for projects that educate homeowners about wildfire mitigation efforts they can apply on their property and for planning projects that increase the protection of people and property from wildfires. National Fire Plan and other funding mechanisms may also be available for assisting communities in preventing wildfires and implementing wildfire mitigation projects. | Revised. Ongoing. |
| **EO-34** | Promote "flood fight" plans and protocols | Several State IHMT Reports call for the development of flood fight plans and protocols in advance of flood emergencies. In addition to the state agencies potentially involved in flood fighting such as OEM, WRD, and the National Guard, environmental protection and habitat conservation agencies such as DEQ and ODFW should be involved in flood fight planning. At the federal level, the U.S. Army Corps of Engineers is a key partner. These plans and protocols might include improving emergency warnings, strengthening communications systems, stockpiling needed materials, preparing procedures for emergency vehicle access to flooded areas, and other related subjects, including ongoing public education efforts. | **116** | Provide information and potentially resources to local governments for developing "flood fight" plans and protocols. | Several post-disaster mitigation strategy reports call for the development of flood fight plans and protocols in advance of flood emergencies. In addition to the state agencies potentially involved in flood fighting such as OEM and OWRD, environmental protection and habitat conservation agencies such as DEQ and ODFW should be involved in flood fight planning. At the federal level, the U.S. Army Corps of Engineers is a key partner. These plans and protocols might include improving emergency warnings, strengthening communications systems, stockpiling needed materials, preparing procedures for emergency vehicle access to flooded areas, and other related subjects, including ongoing public education efforts. | Revised. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-35** | Floodplain Management Outreach | DLCD has an active floodplain and natural hazards outreach program. The department publishes and distributes newsletters and other outreach information to local governments and other interested parties. DLCD also maintains a website which includes a link to this NHMP. The natural hazards website (http://www.oregon.gov/LCD/HAZ/index.shtml) contains information and links to floodplain management information including many of the documents and booklets prepared by FEMA. DLCD uses an email distribution service for its Natural Hazard Newsletter and other correspondence. The email distribution service affords interested subscribers a greater opportunity to obtain flood management and natural hazards information from DLCD in a timely manner and for DLCD to more readily share information from a variety of sources.<br>DLCD and other State IHMT participants also conduct or sponsor training sessions and meetings throughout the year focused on up-to-date floodplain management practices and projects. DLCD will continue to deliver focused training to surveyors, building officials, real estate agents and planners as well as local floodplain managers. The interdependent relationships among these key players in providing comprehensive floodplain management will also be highlighted during trainings.<br>In addition to the on-going activities mentioned, DLCD will add the following to its outreach program.<br>DLCD will prepare text for local broadcast two Public Service Announcements (PSAs) each year on a seasonal topic.<br>DLCD will also complete and disseminate the Floodplain Management Administrative Procedures Guidebook to all 270 OR communities participating in the NFIP. This guidebook clarifies roles, responsibilities and actions to be taken by local communities. It will also be used during NFIP trainings given to local officials. | **EO-35** | Floodplain Management Outreach | DLCD has an active floodplain and natural hazards outreach program. The department publishes and distributes newsletters and other outreach information to local governments and other interested parties. DLCD also maintains a website which includes a link to this NHMP. The natural hazards website (http://www.oregon.gov/LCD/HAZ/index.shtml) contains information and links to floodplain management information including many of the documents and booklets prepared by FEMA. DLCD uses an email distribution service for its Natural Hazard Newsletter and other correspondence. The email distribution service affords interested subscribers a greater opportunity to obtain flood management and natural hazards information from DLCD in a timely manner and for DLCD to more readily share information from a variety of sources.<br>DLCD and other State IHMT participants also conduct or sponsor training sessions and meetings throughout the year focused on up-to-date floodplain management practices and projects. DLCD will continue to deliver focused training to surveyors, building officials, real estate agents and planners as well as local floodplain managers. The interdependent relationships among these key players in providing comprehensive floodplain management will also be highlighted during trainings.<br>In addition to the on-going activities mentioned, DLCD will add the following to its outreach program. DLCD will prepare text for local broadcast two Public Service Announcements (PSAs) each year on a seasonal topic.DLCD will also complete and disseminate the Floodplain Management Administrative Procedures Guidebook to all 270 Oregon communities participating in the NFIP. This guidebook clarifies roles, responsibilities and actions to be taken by local communities. It will also be used during NFIP trainings given to local officials. | Removed. |
| | | | **117** | Continue the State's active Floodplain Management Outreach Program | DLCD has an active floodplain and natural hazards outreach program. The department publishes and distributes newsletters and other outreach information to local governments and other interested parties. DLCD also maintains a website which includes a link to this NHMP. The natural hazards website (http://www.oregon.gov/LCD/HAZ/index.shtml) contains information and links to floodplain management information including many of the documents and booklets prepared by FEMA. DLCD uses an email distribution service for its Natural Hazard Newsletter and other correspondence. The email distribution service affords interested subscribers a greater opportunity to obtain flood management and natural hazards information from DLCD in a timely manner and for DLCD to more readily share information from a variety of sources. | Revised. Ongoing. |
| | | | **118** | Continue the State's active Floodplain Management Training Program | DLCD and other State IHMT participants conduct or sponsor training sessions and meetings throughout the year focused on up-to-date floodplain management practices and projects. DLCD will continue to deliver focused training to surveyors, building officials, real estate agents and planners as well as local floodplain managers. The interdependent relationships among these key players in providing comprehensive floodplain management will also be highlighted during trainings. | Revised. Ongoing. |
| | | | **119** | Prepare text for local broadcast of one Public Service Announcement (PSA) each year on a seasonal topic. | PSAs are an effective method for disseminating pertinent seasonal information about hazard preparedness and mitigation. | Revised. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | | **D** | DLCD will also disseminate the Floodplain Management Administrative Procedures Guidebook to all 270 OR communities participating in the NFIP. | This guidebook clarifies roles, responsibilities and actions to be taken by local communities. It will also be used during NFIP trainings given to local officials. | Revised. Removed. |
| **EO-36** | Develop effective means and information to minimize erosion of soils and stream banks during flood events of varying magnitude | Several State IHMT Reports call attention to the need to systematically develop means and information to help minimize the effects of erosion from farmlands, stream embankments, slide areas, farm roads, and other locales. There is a need to promote effective erosion control techniques, including bioengineering of stream banks and planting of riparian vegetation, to help preserve soils, riparian zones, and habitats. Evaluate and use post-disaster funding opportunities (such as the Hazard Mitigation Grant Program) to study the efficacy of natural, bioengineering stream bank protection strategies. Potential projects could be the outcome of these studies and proposed treatments that demonstrate cost-effective solutions.<br>DSL is the state agency responsible for issuing the required permits for instream work, and those required to build or repair a levee. DEQ is also involved in the permitting process with help from ODFW, USACE, and the NRCS. DEQ often requires bioengineering in conjunction with the issuance of a permit. DEQ is also responsible for setting water quality standards. ODFW is involved with riparian planting and restoration projects. Various state agencies have opportunities to participate in riparian protection or erosion prevention programs, and those efforts, when taken collectively, should help the state make progress with this action. | **EO-36** | Develop effective means and information to minimize erosion of soils and stream banks during flood events of varying magnitude | Several State IHMT Reports call attention to the need to systematically develop means and information to help minimize the effects of erosion from farmlands, stream embankments, slide areas, farm roads, and other locales. There is a need to promote effective erosion control techniques, including bioengineering of stream banks and planting of riparian vegetation, to help preserve soils, riparian zones, and habitats. Evaluate and use post-disaster funding opportunities (such as the Hazard Mitigation Grant Program) to study the efficacy of natural, bioengineering stream bank protection strategies. Potential projects could be the outcome of these studies and proposed treatments that demonstrate cost-effective solutions.<br>DSL is the state agency responsible for issuing the required permits for instream work, and those required to build or repair a levee. DEQ is also involved in the permitting process with help from ODFW, USACE, and the NRCS. DEQ often requires bioengineering in conjunction with the issuance of a permit. DEQ is also responsible for setting water quality standards. ODFW is involved with riparian planting and restoration projects. Various state agencies have opportunities to participate in riparian protection or erosion prevention programs, and those efforts, when taken collectively, should help the state make progress with this action. | Removed. |
| **EO-37** | Creation of New Lidar-Based Landslide Inventory and Susceptibility Maps, especially near population centers | DOGAMI will create these maps in cooperation with local municipalities. Specific methods and priority locations are still to be determined. | **49** | Create new lidar-based Landslide Inventory and Susceptibility Maps, especially near population centers. | DOGAMI will create these maps in cooperation with local jurisdictions. Specific methods and priority locations are still to be determined. The locations will be determined by the Oregon Landslide Workgroup (New EO-73). These new maps will enable communities to introduce development restrictions or recommend mitigation strategies in areas highly susceptible to landslides. | Revised. Priority. |
| | | | **8** | Create a new lidar-based statewide landslide susceptibility map. | DOGAMI will develop a statewide landslide susceptibility map of Oregon as part of the Oregon Geographic Information Council (OGIC) Framework Data Development Program. This map will be used by the Oregon Landslide Workgroup (New EO-73) to prioritize locations for more detailed Landslide Inventory and Susceptibility Maps. | New. Priority. |
| | | | **13** | Produce new lidar-based flood hazard maps | Lidar-based flood hazard maps are produced for counties or watershed as funding is provided. These maps have newly delineated flood zones based on new detailed studies, new coastal analysis, and/or delineation of existing zones based on new topography data (lidar). Lidar-based flood hazard maps are being produced or are anticipated to be produced for:<br>Silvies Watershed<br>Lower Columbia River/Sandy River Watershed<br>Clatsop County<br>Tillamook County<br>Lincoln County<br>Curry County<br>Lane County<br>Douglas County | New. Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-38** | Complete an evacuation mapping GIS database | With funding from the National Tsunami Hazard Mitigation Program all existing evacuation maps are being entered into a GIS database. Data collected for future maps will also be entered into the database. This will provide not only a centralized location for all the evacuation maps but the ability to make maps and permanent signs with a similar format for all coastal areas. The long-term objective is to empower users to make their own evacuation maps through an interactive web site that allows placement of the evacuation zone on a variety of base maps at any scale desired. | **EO-38** | Complete an evacuation mapping GIS database | With funding from the National Tsunami Hazard Mitigation Program all existing evacuation maps are being entered into a GIS database. Data collected for future maps will also be entered into the database. This will provide not only a centralized location for all the evacuation maps but the ability to make maps and permanent signs with a similar format for all coastal areas. The long-term objective is to empower users to make their own evacuation maps through an interactive web site that allows placement of the evacuation zone on a variety of base maps at any scale desired. | Removed. |
| **EO-39** | Encourage coastal communities to enroll in the Tsunami Ready Program. | The Tsunami Ready Program is a program sponsored by the National Weather Service that is designed to provide communities with incentives to reduce their tsunami risk. Cannon Beach was the first community for Oregon. There are currently six communities and three counties on the coast that are Tsunami Ready. Under a proposed plan through the NTHMP, three communities per year will be added to the roles of the program. This program is currently evolving through a review process being carried out by the NTHMP national Coordinating Committee. OEM is the primary point of contact for more information about the Tsunami Ready Program. | **3** | Enroll 3 coastal communities in the Tsunami Ready Program each year. | The Tsunami Ready Program is a program sponsored by the National Weather Service that is designed to provide communities with incentives to reduce their tsunami risk. Cannon Beach was the first community for Oregon. Under a proposed plan through the National Tsunami Hazard Mitigation Program (NTHMP), three communities per year will be added to the rolls of the program. This program is currently evolving through a review process being carried out by the NTHMP National Coordinating Committee. OEM is the primary point of contact for more information about the Tsunami Ready Program. | Revised. Priority. |
| | | | **127** | Continue to renew coastal communities' enrollments in the Tsunami Ready Program. | The Tsunami Ready Program is a program sponsored by the National Weather Service that is designed to provide communities with incentives to reduce their tsunami risk. Cannon Beach was the first community for Oregon. Under a proposed plan through the NTHMP, additional communities will be added until there is full participation. This program is currently evolving through a review process being carried out by the NTHMP National Coordinating Committee. OEM is the primary point of contact for more information about the Tsunami Ready Program. | New. Ongoing. |
| **EO-40** | Public information and education about tsunami preparedness and mitigation | Each year more people visit or move to the coast. There is thus a constant need for public education: what are the tsunami hazards, what to do in the event of a tsunami, and how to mitigate tsunami hazards. This is especially important in light of the problems some coastal counties had during the Nisqually Earthquake in Washington that was felt on the Oregon Coast and the Peru earthquake and tsunami where the Oregon Coast was twice in a tsunami watch.<br>A systematic study of what educational strategies work the best was accomplished in a NTHMP-supported pilot study of Seaside, Oregon (see DOGAMI Open File Report O-05-10). According to polls conducted for this study, door-to-door outreach and evacuation drills were the most effective techniques. As demonstrated in the Seaside study, tsunami evacuation drills help people respond quickly and efficiently to a tsunami warning and generate local media attention to the issue. This is particularly important if a major earthquake is expected to trigger a near-source-generated tsunami. Tsunami surges may arrive within just a few minutes, so it is imperative for people to instinctively know where to evacuate to immediately after the shaking stops. Community Emergency Response Teams (CERT) are an effective means of doing door-to-door outreach and organizing evacuation drills. The long-term objective is to implement CERT in every coastal community.<br>The Seaside format was used in Lincoln City to great success, showing the usefulness of the methods. Leveraging the various volunteers, such as CERT and Neighborhood Watch, is one of the most effective uses of scarce resources.<br>As a result of post-disaster mitigation funding (HMGP) from DR-1964, there will be potential project opportunities to evaluate and demonstrate effective mitigation techniques that identify natural, high ground locations outside of the tsunami inundation zone as safe havens for evacuation. | **EO-40** | Public information and education about tsunami preparedness and mitigation | Each year more people visit or move to the coast. There is thus a constant need for public education: what are the tsunami hazards, what to do in the event of a tsunami, and how to mitigate tsunami hazards. This is especially important in light of the problems some coastal counties had during the Nisqually Earthquake in Washington that was felt on the Oregon Coast and the Peru earthquake and tsunami where the Oregon Coast was twice in a tsunami watch.A systematic study of what educational strategies work the best was accomplished in a NTHMP-supported pilot study of Seaside, Oregon (see DOGAMI Open File Report O-05-10). According to polls conducted for this study, door-to-door outreach and evacuation drills were the most effective techniques. As demonstrated in the Seaside study, tsunami evacuation drills help people respond quickly and efficiently to a tsunami warning and generate local media attention to the issue. This is particularly important if a major earthquake is expected to trigger a near-source-generated tsunami. Tsunami surges may arrive within just a few minutes, so it is imperative for people to instinctively know where to evacuate to immediately after the shaking stops. Community Emergency Response Teams (CERT) are an effective means of doing door-to-door outreach and organizing evacuation drills. The long-term objective is to implement CERT in every coastal community.The Seaside format was used in Lincoln City to great success, showing the usefulness of the methods. Leveraging the various volunteers, such as CERT and Neighborhood Watch, is one of the most effective uses of scarce resources.As a result of post-disaster mitigation funding (HMGP) from DR-1964, there will be potential project opportunities to evaluate and demonstrate effective mitigation techniques that identify natural, high ground locations outside of the tsunami inundation zone as safe havens for evacuation. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | | **128** | Continue supporting school participation in annual tsunami evacuation drills. | Increase the ability of Oregonians to prepare for and recover from earthquakes and tsunamis on the Oregon Coast. | New. Ongoing. |
| | | | **129** | Continue supporting local agencies and local non-profits, such as CERT, in participating in educational efforts such as door-to-door campaigns to educate those living or working in the inundation zone on how to respond to an earthquake and tsunami. | Increase the ability of Oregonians to prepare for and recover from earthquakes and tsunamis on the Oregon Coast. | New. Ongoing. |
| | | | **130** | Continue innovative outreach activities, such as tsunami evacuation route fun runs. | Increase the ability of Oregonians to prepare for and recover from earthquakes and tsunamis on the Oregon Coast. | New. Ongoing. |
| **EO-41** | Coordinate an Oregon-specific distant tsunami warning workshop | The Oregon Distant Tsunami Working Group (ODTWG) is a partnership between Federal, State and Local agency representatives; local business partners and community members designed to reduce the impact of distant tsunamis on coastal Oregon communities. Led by the Oregon Office of Emergency Management (OEM), the ODTWG is Oregon's community-focused program to improve tsunami mitigation and preparedness of at-risk areas within Oregon. One goal of the Working Group will be to look at how response to a distant tsunami could be applied in the case of a local tsunami.<br>The ODTWG includes Counties, Cities, the Oregon Office of Emergency Management, the National Weather Service, the Federal Management Agency, the Oregon Department of Geology and Mineral Industries, Media representatives and community members. This strong and active partnership enables all levels of government to work toward the common goal of saving lives of all people at risk for a tsunami at our state's coastline, and reducing damage to property and the economy. | **EO-41** | Coordinate an Oregon-specific distant tsunami warning workshop | The Oregon Distant Tsunami Working Group (ODTWG) is a partnership between Federal, State and Local agency representatives; local business partners and community members designed to reduce the impact of distant tsunamis on coastal Oregon communities. Led by the Oregon Office of Emergency Management (OEM), the ODTWG is Oregon's community-focused program to improve tsunami mitigation and preparedness of at-risk areas within Oregon. One goal of the Working Group will be to look at how response to a distant tsunami could be applied in the case of a local tsunami.<br>The ODTWG includes Counties, Cities, the Oregon Office of Emergency Management, the National Weather Service, the Federal Management Agency, the Oregon Department of Geology and Mineral Industries, Media representatives and community members. This strong and active partnership enables all levels of government to work toward the common goal of saving lives of all people at risk for a tsunami at our state's coastline, and reducing damage to property and the economy. | Removed. |
| **EO-42** | Develop evacuation maps for all affected communities with established assembly areas | The key to effective tsunami mitigation is to insure that people know what to do and where to go in the event of a tsunami. Evacuation maps that are consistent and easy to read and that identify the safe areas, best evacuation routes and destination sites are critical. With the development of the GIS database the maps can be easily disseminated | **EO-42** | Develop tsunami evacuation maps for all affected communities with established assembly areas | The key to effective tsunami mitigation is to insure that people know what to do and where to go in the event of a tsunami. Evacuation maps that are consistent and easy to read and that identify the safe areas, best evacuation routes and destination sites are critical. With the development of the GIS database the maps can be easily disseminated. | Removed. |
| **EO-43** | Encourage local jurisdictions to disseminate volcano preparedness educational materials | Preparedness materials should include what to do in the event of an eruption, evacuation maps, and volcano specific items to include in first aid kits (e.g., breathing masks and goggles). The USGS and FEMA have existing educational materials. | **67** | Initiate an outreach strategy to encourage local jurisdictions to disseminate volcano preparedness educational materials. | Increase the ability of Oregonians to prepare for and recover from volcanic hazards. | Revised. Priority. |
| **EO-44** | Install tsunami signs in all affected coastal communities | Signs reinforce the evacuation maps and tsunami educational materials and are a very visible reminder of the tsunami hazard, where the hazard zone is and where the best evacuation routes are. A few communities have already installed hazard zone and evacuation route signs. Many counties have signs, but are waiting either for the time and/or money or development of evacuation maps before installing them. Robust signage that delineates evacuation routes leading to natural, high ground outside of the tsunami inundation zone is a low-cost, top mitigation priority. | **EO-44** | Install tsunami signs in all affected coastal communities | Signs reinforce the evacuation maps and tsunami educational materials and are a very visible reminder of the tsunami hazard, where the hazard zone is and where the best evacuation routes are. A few communities have already installed hazard zone and evacuation route signs. Many counties have signs, but are waiting either for the time and/or money or development of evacuation maps before installing them. Robust signage that delineates evacuation routes leading to natural, high ground outside of the tsunami inundation zone is a low-cost, top mitigation priority. | Revised. Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
|---|---|---|---|---|---|---|
| **EO-45** | Encourage local emergency managers with potential volcanic hazards to include volcanoes in their response and natural hazards mitigation plans | State and local emergency managers plan responses for a variety of hazards, including volcanoes. Clackamas County, which includes the southwest portion of Mount Hood, was the first jurisdiction in the nation to complete a FEMA-approved natural hazards mitigation plan, which includes short and long-term proposed actions to mitigate the effects of volcanic eruptions. Local response plan chapters (annexes) developed for volcanic hazards should include pre-eruption through post-eruption sections. | **EO-45** | Encourage local emergency managers with potential volcanic hazards to include volcanoes in their response and natural hazards mitigation plans | State and local emergency managers plan responses for a variety of hazards, including volcanoes. Clackamas County, which includes the southwest portion of Mount Hood, was the first jurisdiction in the nation to complete a FEMA-approved natural hazards mitigation plan, which includes short and long-term proposed actions to mitigate the effects of volcanic eruptions. Local response plan chapters (annexes) developed for volcanic hazards should include pre-eruption through post-eruption sections. | Removed. |
| **EO-46** | Encourage development of volcanic hazard evacuation maps | Volcanic eruptions often produce lahars that travel down river valleys. Evacuation maps should include the hazard area as well as preferred evacuation routes and evacuation sites. USGS staff should support local and state agencies in this effort. | **135** | Develop volcanic hazard evacuation maps | Volcanic eruptions often produce lahars that travel down river valleys. Evacuation maps should include the hazard area as well as preferred evacuation routes and evacuation sites. USGS staff should support local and state agencies in this effort. | Revised. Ongoing. |
| **EO-47** | Encourage communities to include volcano hazards, if appropriate, in their multi-hazard mitigation planning process | How a community might respond to volcano hazards depends on a number of things including proximity of the community to the volcano, the nature of the volcano hazards, local volcano history, what is at risk/vulnerable to volcano hazards, and the probability of when or if an event might occur.<br>The difficulty in predicting how catastrophic volcano-associated hazards might be and how often they might occur creates a problem for land use planning solutions. Except for a few Oregon communities on or very near a volcano (e.g., Government Camp on Mount Hood), stringent standards solely based on the prospect of volcanic activity are not realistic.<br>The best approach may be multi-hazards instead of treating volcano-associated hazards separately. A multi-hazard approach would take all natural hazards into consideration during a community's planning process. For example, prohibiting development in the 100-year (1%) floodplain ensures some degree of safety from flood, lahars, earthquake damage (e.g., liquefiable soils), and so on, while preserving the floodplain for natural and beneficial uses. In addition, siting standards for infrastructure and/or critical facilities would include volcano-associated hazards among other hazards to be avoided. DOGAMI published two special papers to help communities look at multi-hazard mitigation: Special Paper 31, *Mitigating Geologic Hazards in Oregon: a Technical Reference Manual* (Beaulieu and Olmstead, 1999a) and Special Paper 32, *Geologic Hazards: Reducing Oregon's Losses* (Beaulieu and Olmstead, 1999b). These publications have been widely distributed to local governments.<br>Secondary effects also need to be incorporated into the multi-hazard framework. These effects include degradation or loss of habitat for endangered species (or species that may become endangered after a major eruption), the economic loss if timber resources are destroyed or made inaccessible, and the loss of surface water as a source of drinking water, irrigation, or for industrial needs. Each of these can have a long-lasting economic effect on Oregonians as well as create physical changes in the landscape made by an eruption. | **EO-47** | Encourage communities to include volcano hazards, if appropriate, in their multi-hazard mitigation planning process | How a community might respond to volcano hazards depends on a number of things including proximity of the community to the volcano, the nature of the volcano hazards, local volcano history, what is at risk/vulnerable to volcano hazards, and the probability of when or if an event might occur.The difficulty in predicting how catastrophic volcano-associated hazards might be and how often they might occur creates a problem for land use planning solutions. Except for a few Oregon communities on or very near a volcano (e.g., Government Camp on Mount Hood), stringent standards solely based on the prospect of volcanic activity are not realistic. The best approach may be multi-hazards instead of treating volcano-associated hazards separately. A multi-hazard approach would take all natural hazards into consideration during a community's planning process. For example, prohibiting development in the 100-year (1%) floodplain ensures some degree of safety from flood, lahars, earthquake damage (e.g., liquefiable soils), and so on, while preserving the floodplain for natural and beneficial uses. In addition, siting standards for infrastructure and/or critical facilities would include volcano-associated hazards among other hazards to be avoided. DOGAMI published two special papers to help communities look at multi-hazard mitigation: Special Paper 31, *Mitigating Geologic Hazards in Oregon: a Technical Reference Manual* (Beaulieu and Olmstead, 1999a) and Special Paper 32, *Geologic Hazards: Reducing Oregon's Losses* (Beaulieu and Olmstead, 1999b). These publications have been widely distributed to local governments. Secondary effects also need to be incorporated into the multi-hazard framework. These effects include degradation or loss of habitat for endangered species (or species that may become endangered after a major eruption), the economic loss if timber resources are destroyed or made inaccessible, and the loss of surface water as a source of drinking water, irrigation, or for industrial needs. Each of these can have a long-lasting economic effect on Oregonians as well as create physical changes in the landscape made by an eruption. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-48** | Educate communities, workers, and the public about the role of proper tree pruning and care in preventing damage during windstorms | Arboricultural groups, public agencies, and utilities should cooperate in promoting proper tree pruning and care practices that can reduce the risk of tree failure and property damage. Common messages refined by state level entities such as the Oregon Department of Forestry (ODF) and OSU Extension can help provide continuity and efficiency across the state.<br>While implementation of this action largely takes place at the local government level, the state has a role in encouraging and providing incentives for best management practices. ODF maintains and implements a communication plan that includes educational initiatives aimed at improving tree health in cities. This includes a variety of products, including a bimonthly newsletter, a website, and brochures that help convey these messages. State and local cooperators should:<br>• Provide training to crews working on power lines in worker safety and the identification of trees to prune or remove;<br>• Review regulations and standards for easement and right of way maintenance, and provide training to foresters and logging crews; and<br>• Instruct homeowners in pruning of vegetation, tree care safety, and proper tree care for trees bordering utility corridors and public rights of way. | **146** | Continue to educate communities, workers, and the public about the role of proper tree pruning and care in preventing damage during windstorms. | Arboricultural groups, public agencies, and utilities should cooperate in promoting proper tree pruning and care practices that can reduce the risk of tree failure and property damage. Common messages refined by state level entities such as the Oregon Department of Forestry (ODF) and OSU Extension can help provide continuity and efficiency across the state.<br>While implementation of this action largely takes place at the local government level, the state has a role in encouraging and providing incentives for best management practices. ODF maintains and implements a communication plan that includes educational initiatives aimed at improving tree health in cities. This includes a variety of products, including a bimonthly newsletter, a website, and brochures that help convey these messages.<br>OSHA requires utilities to:<br>• Provide training to crews working on power lines in worker safety and the identification of trees to prune or remove; and<br>• Review regulations and standards for easement and right of way maintenance, and provide training to foresters and logging crews.<br>Utilities should instruct homeowners in pruning of vegetation, tree care safety, and proper tree care for trees bordering utility corridors and public rights of way. | Revised. Ongoing. |
| **EO-49** | Educate motorists on safe winter driving | Actions such as sanding, applying de-icing chemicals, and snowplowing do not make the road safe. Motorists must drive at speeds appropriate for the weather and road conditions. | **149** | Continue educating motorists on safe winter driving, including how to be prepared for traveling over snowy and icy mountain passes. | Actions such as sanding, applying de-icing chemicals, and snowplowing do not make the road safe. Motorists must drive at speeds appropriate for the weather and road conditions, and be prepared to handle adverse conditions. Many drivers do not carry chains and do not know how or simply do not install them when conditions warrant. Also, many drivers are not prepared for a long wait in their car. Education programs would help save lives on snowy and icy roads. | Revised. Ongoing. |
| **EO-50** | Encourage citizens to prepare and maintain 72-hour kits | State agencies should work with the American Red Cross and local emergency managers to encourage citizens to be prepared to survive on their own for 72 hours. | **88** | Encourage citizens to prepare and maintain at least two weeks' worth of emergency supplies. | State agencies should work with the American Red Cross and local emergency managers to encourage citizens to be prepared to survive on their own for at least two weeks. | Revised. Ongoing. |
| **EO-51** | Educate citizens about the different National Weather Service announcements | State agencies should work with the National Weather Service and local governments to educate the public about the meaning of the different National Weather Service announcements: winter storm watch, winter storm warning, ice storm warning, heavy snow warning, blizzard warning, severe blizzard warning, and high wind warning. | **95** | Educate citizens about the different National Weather Service announcements. | State agencies should work with the National Weather Service and local governments to educate the public about the meaning of the different National Weather Service announcements: winter storm watch, winter storm warning, ice storm warning, heavy snow warning, blizzard warning, severe blizzard warning, dust storm and high wind warning. | Ongoing. |
| **EO-52** | Educate citizens about safe emergency heating equipment | Improper use of alternate heat sources during winter storms can cause fires. Ongoing efforts of the Office of State Fire Marshal and it's work with local fire departments through the Life Safety Team (http://www.oregon.gov/OSP/SFM/CommEd_OLST.shtml) In addition, people can be killed by carbon monoxide emitted by fuels such as charcoal briquettes when used for heating homes. To reduce the threat of carbon monoxide poisoning, known as the silent killer, the 2009 Legislature passed HB3450A requiring landlords to install carbon monoxide alarms in rentals with a carbon monoxide source and homeowners must ensure they are installed in homes at the time of sale, if the home has a source. Sources include gas heating or fireplaces, woodburning fireplaces or stoves and attached garages. Partnerships for consistent public education messages and outreach are underway, and will include information on the dangers of introducing a carbon monoxide risk. | **148** | Educate citizens about safe emergency heating equipment. | Improper use of alternate heat sources during winter storms can cause fires. Ongoing efforts of the Office of State Fire Marshal and it's work with local fire departments through the Life Safety Team (http://www.oregon.gov/OSP/SFM/Pages/CommEd_OLST.aspx). In addition, people can be killed by carbon monoxide emitted by fuels such as charcoal briquettes when used for heating homes. To reduce the threat of carbon monoxide poisoning, known as the silent killer, the 2009 Legislature passed HB 3450A requiring landlords to install carbon monoxide alarms in rentals with a carbon monoxide source and homeowners must ensure they are installed in homes at the time of sale, if the home has a source. Sources include gas heating or fireplaces, wood-burning fireplaces or stoves and attached garages. Partnerships for consistent public education messages and outreach are underway, and will include information on the dangers of introducing a carbon monoxide risk. | Ongoing. |
| **EO-53** | Educate citizens about ways to weatherize their homes | Weatherization measures can help keep the cold out during winter. Energy audits, cash rebates, and tax credits are available to help homeowners. | **EO-53** | Educate citizens about ways to weatherize their homes. | Weatherization measures can help keep the cold out during winter. Energy audits, cash rebates, and tax credits are available to help homeowners. Energy audits, cash rebates, and education are also provided by the Energy Trust of Oregon to customers of the regulated energy utilities with oversight by the OPUC. | Revised. Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-54** | Educate citizens about the dangers of hypothermia, other winter health conditions | State agencies should work with the American Red Cross and local health authorities to educate citizens about the dangers of winter health conditions, including hypothermia, exhaustion, and heart attacks caused by overexertion. | **EO-54** | Educate citizens about the dangers of hypothermia and other winter health conditions. | State agencies should work with the American Red Cross and local health authorities to educate citizens about the dangers of winter health conditions, including hypothermia, exhaustion, and heart attacks caused by overexertion. | Removed. |
| **EO-55** | Educate homeowners about choosing ice and windstorm-resistant trees and landscaping practices to reduce tree-related hazards in future ice storms | Trees that don't stand up well to ice and wind, especially when planted near power lines, can cause power outages and other damage. Certain species of trees hold up better to winter's fury than others. Other factors, such as where a tree is planted and use of proper pruning techniques, can also help trees be more resistant to ice storm damage. | **99** | Educate homeowners about choosing ice and windstorm-resistant trees and landscaping practices to reduce tree-related hazards in future ice storms | Trees that don't stand up well to ice and wind, especially when planted near power lines, can cause power outages and other damage. Certain species of trees hold up better to winter's fury than others. Other factors, such as where a tree is planted and use of proper pruning techniques, can also help trees be more resistant to ice storm damage. | Ongoing. |
| **EO-56** | Educate motorists who plan to travel over mountain passes in winter about the need to be prepared | During the December 2003 closure of the Siskiyou Pass on Interstate 5, ODOT and Oregon State Police freed many drivers only to have them spin out and get stuck again. If drivers would have had tire chains, and installed them when conditions warranted, clearing the pass would have been completed hours earlier. Many drivers were not prepared for a long wait in their car. Each year ODOT finds stranded motorists who either do not have or do not know how to install chains. | **EO-56** | Educate motorists who plan to travel over mountain passes in winter about the need to be prepared | During the December 2003 closure of the Siskiyou Pass on Interstate 5, ODOT and Oregon State Police freed many drivers only to have them spin out and get stuck again. If drivers would have had tire chains, and installed them when conditions warranted, clearing the pass would have been completed hours earlier. Many drivers were not prepared for a long wait in their car. Each year ODOT finds stranded motorists who either do not have or do not know how to install chains. | Removed. |
| **EO-57** | Improve geotechnical report standards | Numerous local jurisdictions have upgraded the geotechnical report standards for assessing the risk and mitigation measures for development proposed in hazardous areas, and continue to encourage local governments to improve these standards. | **EO-57** | Improve geotechnical report standards for the coast. | Numerous local jurisdictions have upgraded the geotechnical report standards for assessing the risk and mitigation measures for development proposed in coastal hazard area. | Revised. Removed. |
| **EO-58** | Maintain an inventory of shoreline protection structures | Maintain an inventory of existing and new coastal engineering (shore protection) structures on the Oregon Coast. | **104** | Maintain the updated inventory of shoreline protection structures. | Maintain the inventory of existing and new coastal engineering (shore protection) structures on the Oregon Coast in order to provide local governments and applicable agencies an important coastal management tool to address anticipated increasing coastal erosion. It is anticipated that this inventory and information will assist in potential future policy changes to address a changing climate and associated coastal erosion impacts. | Revised. Ongoing. |
| **EO-59** | Improve coastal erosion hazard mapping and inventories | Coastal hazard mapping is a long-term program for four reasons. One is budgetary. It is expensive to research and map information for such a dynamic system. Another reason is the dynamic nature of the Oregon coast. Beaches, dunes, and headlands change over relatively short (and longer) time spans. As headlands recede, for example, new maps with new shorelines and erosion rates need to be developed. New technology is the third reason. For example, the tsunami maps issued by DOGAMI are created with the help of sophisticated computer models and high resolution digital elevation models that were not available until a few years ago. Finally, different uses require maps of different scales.<br>Mapping is one element needed in an inventory. Progress is being made by DOGAMI and DLCD to increase assistance to local governments in developing inventories based on sound technological research (Figure CE-6). While this process takes significant time to complete, there are a variety of strategies local governments and state agencies can use:<br>• Inventory and catalog existing coastal natural hazards, studies, maps, digital data, and other information available from city, county, state, federal, university, private, and other resources.<br>• Establish criteria and standards for collecting, reporting, and mapping information about chronic and catastrophic coastal natural hazards.<br>• Develop standardized, detailed coastal hazard maps for priority areas along the Oregon Coast. | **EO-59** | Improve coastal erosion hazard mapping and inventories | Coastal hazard mapping is a long-term program for four reasons. One is budgetary. It is expensive to research and map information for such a dynamic system. Another reason is the dynamic nature of the Oregon coast. Beaches, dunes, and headlands change over relatively short (and longer) time spans. As headlands recede, for example, new maps with new shorelines and erosion rates need to be developed. New technology is the third reason. For example, the tsunami maps issued by DOGAMI are created with the help of sophisticated computer models and high resolution digital elevation models that were not available until a few years ago. Finally, different uses require maps of different scales.<br>Mapping is one element needed in an inventory. Progress is being made by DOGAMI and DLCD to increase assistance to local governments in developing inventories based on sound technological research (Figure CE-6). While this process takes significant time to complete, there are a variety of strategies local governments and state agencies can use:<br>• Inventory and catalog existing coastal natural hazards, studies, maps, digital data, and other information available from city, county, state, federal, university, private, and other resources.<br>• Establish criteria and standards for collecting, reporting, and mapping information about chronic and catastrophic coastal natural hazards.<br>• Develop standardized, detailed coastal hazard maps for priority areas along the Oregon Coast. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **EO-60** | Better understand beach processes | As recent research has shown, ocean water levels and wave dynamics along the Oregon coast are changing. These will, in turn, affect beach sand budgets and rates of erosion. More research must be done on alternative shore protection methods, effects of hard shore protection structures, near-shore circulation processes and sediment budgets, sea cliff erosion processes, and other hazard processes. In addition to the state agencies below, NOAA and USACE will play a role in advancing this action. | **EO-60** | Better understand beach processes by developing a coastal geomorphic database. | Develop a coastal geomorphic database that describes the various morphological parameters of beaches, dunes, and bluffs present along the central to northern Oregon coast, specifically in Clatsop and Tillamook Counties. | Revised. Removed. |
| | | | **102** | Research the effects of changing ocean water levels and wave dynamics along the central and southern Oregon coast, and use that data to augment the coastal geomorphic database. | As recent research has shown, ocean water levels and wave dynamics along the Oregon coast are changing. These will, in turn, affect beach sand budgets and rates of erosion. More research must be done on alternative shore protection methods, effects of hard shore protection structures, near-shore circulation processes and sediment budgets, sea cliff erosion processes, and other hazard processes | Revised. Ongoing. |
| **EO-61** | Mandate review for site-specific seismic hazard reports | Independent peer review by qualified and registered geotechnical and engineering geologic professionals is one of the best methods of ensuring that site reports done for local governments, property owners, developers, and others are of an acceptable quality and adequately address site issues associated with earthquake faults and earthquake-caused ground failures. A mandatory review requirement and funding/cost recovery mechanism are needed. | **EO-61** | Mandate review for site-specific seismic hazard reports | Independent peer review by qualified and registered geotechnical and engineering geologic professionals is one of the best methods of ensuring that site reports done for local governments, property owners, developers, and others are of an acceptable quality and adequately address site issues associated with earthquake faults and earthquake-caused ground failures. A mandatory review requirement and funding/cost recovery mechanism are needed. | Removed. |
| **EO-62** | Install new Entering and Leaving Tsunami Hazard Zone signs in selected areas in the inundation zone along Highway 101. | Existing tsunami hazard zones signs are considered inadequate for placement along stretches of Highway 101, or on any roads, that are within the tsunami hazard zone. A single tsunami hazard zone sign will not indicate the boundaries of the inundation zone. Highway 101 often stays within the inundation zone for miles. Therefore ODOT, in collaboration with OEM, DOGAMI, and the coastal county emergency managers, designed the template for Entering and Leaving Tsunami Hazard Zone signs and placed the signs to identify the hazard zones. Resources for this project were limited, so signs are not present in every hazardous part of the coast highway system. A long-term goal is to complete this project and to reposition signs where new inundation mapping indicates a need. There is need for increased public education program to let the public, including motorists who are not local residents, know what the signs mean and what actions they should take. Additional/improved signage is proposed to reflect changes in maps by 2015. | **EO-62** | Install new Entering and Leaving Tsunami Hazard Zone signs in selected areas in the inundation zone along Highway 101. | Existing tsunami hazard zones signs are considered inadequate for placement along stretches of Highway 101, or on any roads, that are within the tsunami hazard zone. A single tsunami hazard zone sign will not indicate the boundaries of the inundation zone. Highway 101 often stays within the inundation zone for miles. Therefore ODOT, in collaboration with OEM, DOGAMI, and the coastal county emergency managers, designed the template for Entering and Leaving Tsunami Hazard Zone signs and placed the signs to identify the hazard zones. Resources for this project were limited, so signs are not present in every hazardous part of the coast highway system. A long-term goal is to complete this project and to reposition signs where new inundation mapping indicates a need. There is need for increased public education program to let the public, including motorists who are not local residents, know what the signs mean and what actions they should take. Additional/improved signage is proposed to reflect changes in maps by 2015. | Removed. |
| | | | **132** | Work with ODOT to replace or move existing Entering/Leaving Tsunami Hazard Zone signs to correspond with the XXL inundation line developed by DOGAMI. | Existing tsunami hazard zones signs are considered inadequate for placement along stretches of Highway 101, or on any roads, that are within the tsunami hazard zone. A single tsunami hazard zone sign will not indicate the boundaries of the inundation zone. Tsunami Hazard Zone signs should be located to correspond with the XXL inundation line developed by DOGAMI. | Revised. Ongoing. |
| | | | **133** | Work with ODOT to develop additional signage as needed to increase awareness of the tsunami hazard. | Existing tsunami hazard zones signs are considered inadequate for placement along stretches of Highway 101, or on any roads, that are within the tsunami hazard zone. A single tsunami hazard zone sign will not indicate the boundaries of the inundation zone. There is need for increased public education program to let the public, including motorists who are not local residents, know what the signs mean and what actions they should take. | New. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | | **134** | Work with Oregon Parks & Recreation Department and Oregon Travel Experience to increase the number of interpretive educational installations along Highway 101. | Existing tsunami hazard zones signs are considered inadequate for placement along stretches of Highway 101, or on any roads, that are within the tsunami hazard zone. There is need for increased public education program to let the public, including motorists who are not local residents, know what the signs mean and what actions they should take. | New. Ongoing. |
| | | | **113** | Monitor the effectiveness of the statewide strategy to encourage the purchase of flood insurance by demonstrating that the number of flood insurance policies held throughout the state continues to increase. | Despite the statewide availability of flood insurance, coverage in place in most communities in Oregon varies from 10% to 20% of the homes and businesses located in the Special Flood Hazard Area (100-year floodplain). Not only does flood insurance reduce the financial vulnerability of individuals, families, businesses, government agencies, other organizations, and the community to the costs posed by flooding, but through the "increased cost of compliance" provision of flood insurance, it also provides funding for the elevation, flood-proofing, demolition, or relocation of homes and businesses when required due to "substantial damage" to the structure. | New. Ongoing. |
| | | | **69** | Update the 2000 Guidelines for conducting site-specific geohazard investigations. | The state has guidelines for conducting site-specific seismic investigations. The guidelines date from 2000 and need to be updated. The update should expand the scope of the guidelines to cover site-specific investigations for all geohazards. This will improve local government implementation of development regulations in areas subject to geohazards. | New. Priority. |
| | | | **21** | Update the inventory of shoreline protective structures. | Update the inventory of existing and new coastal engineering (shore protection) structures on the Oregon Coast in order to provide local governments and applicable agencies an important coastal management tool to address anticipated increasing coastal erosion. | New. Priority. |
| | | | **E** | Refine coastal erosion risk mapping for Tillamook County and its cities to utilize a fully probabilistic approach. | Revise coastal erosion risk mapping and analysis for Tillamook County, and cities within the County, to utilize a fully probabilistic approach. Probabilistic modeling approaches will be used to better address uncertainty and allow local and state hazard managers to use the information to better manage uses based on relative risks. This will allow DLCD and DOGAMI to increase assistance to local governments in developing inventories based on sound technological research and in incorporating this information into their coastal management programs. | New. Removed. |
| | | | **F** | Establish Base Flood Elevation Determination Service | Establish state-approved service to provide Base Flood Elevations to surveyors for the purpose of completing Letters of Map Amendment under the National Flood Insurance Program. Base Flood Elevations are determined by DOGAMI by producing hydraulic models based on lidar topographic data. This is useful in areas where Base Flood Elevations have not been determined by FEMA, though Special Flood Hazard Areas have been mapped. | New. Removed. |
| | | | **14** | Create an informational website for the new Base Flood Elevation Determination Service. | Create website that describes the state's base Flood Elevation Determination Service. Website will include brochure, pricing, map of completed determinations, and data clearinghouse for completed determinations. | New. Priority. |
| | | | **28** | Establish a web page where building owners can register their interest in participating in acquisition programs for flood-damaged buildings. | FEMA funds can be used to buyout repetitive loss and severe repetitive loss properties in the floodplain. The paperwork and process to achieve a buyout are lengthy and complex. First and foremost, a property owner must be willing to sell. Buyout funds could be more efficiently and effectively spent if willing sellers were identified and paperwork prepared before funds became available. This registry would augment the state's current outreach efforts, making it easy for willing sellers to identify themselves and for the state to prepare for and execute buyouts. | New. Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | | **57** | Prepare model coordination protocols for local Floodplain Managers and Building Officials. | Local government Floodplain Managers and Building Officials are often unaware of the other's role in floodplain management and how they could work together to better manage floodplain development and mitigate flood hazards. Providing model protocols for the two positions to coordinate would increase each one's awareness of the other's role, ultimately enhancing local flood hazard mitigation. | New. Priority. |
| | | | **51** | Facilitate self-sustaining outreach programs staffed by Community Emergency Response Teams (CERT) in each coastal population center aimed at creating a culture of preparedness and response for both local Cascadia and distant tsunami events. | Establish Community Emergency Response Teams (CERT). These teams will work to save lives and restore communities following a major disaster. Encourage CERT to use outreach techniques tested in a 2005 pilot study of Seaside (#1 priority = door-to-door education; #2 priority = community evacuation drill; #3 = K-12 education supplemented by workshops targeted at specific user groups such as the lodging industry).<br>Create measures of sustainability and success. | New. Priority. |
| | | | **6** | Form an Oregon Landslide Workgroup. | An Oregon Landslide Workgroup will be created to prioritize areas for new mapping projects, to promote landslide hazard awareness through education & outreach, to develop and influence policy at the federal state, and local levels, and to assist in response & recovery efforts during disasters. | New. Priority. |
| | | | **9** | Upgrade the Oregon Landslide Warning System. | The current warning system needs updating to include rainfall thresholds from local rainfall gauges. A permanent real-time website will be constructed to show the areas under a landslide warning that will include guidance on what people should do to help protect their life and property from a landslide. | New. Priority. |
| | | | **100** | Each year, ask the Governor to designate October to be Earthquake and Tsunami Awareness Month. | Practicing to "Drop, cover, and hold" is critical in reducing injury and loss of life in the workplace and home during an earthquake. The more people practice the drill, the better they will respond to a real event. A gubernatorial declaration will promote increased participation in the Great Oregon ShakeOut, or other annual earthquake Drop, Cover, and Hold On drill. | New. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **CRITICAL INFRASTRUCTURE / ESSENTIAL PUBLIC FACILITIES** | | | | | | |
| **CI-1*** | Complete a statewide evaluation of the condition of levees, dikes, and dams built for flood control purposes | Several reports indicate a broad need to assess the capabilities, conditions, and maintenance of levees statewide to assess performance under flood conditions. As part of the FIRM modernization program, FEMA identified 12 levees in Oregon that are mapped as providing protection against flood waters, but may in fact be deficient. FEMA asked affected communities to complete an accreditation process to prove the levees are capable of controlling the 1% annual flood before they can be shown as providing protection against the 1% annual flood on the FIRM. Five communities managed to complete the accreditation The levees identified by FEMA by no means reflect the full inventory of levees in the state that provide flood protection, but which may be insufficiently or improperly maintained. Many of these levees are privately owned.<br>One of the challenges identified during FEMA accreditation process was confusion over what kind of vegetation is appropriate to allow on levees and how it should be maintained. This is not a new concern. DEQ, ODFW, USACE, and other agencies have been discussing development of a guidance document on preferred levee types and appropriate use of vegetation. At a minimum, the federal agencies NRCS and USACE should be involved with the state agencies noted below in implementing this action item.<br>Dams present another challenge. Regardless of whether a particular dam was designed and built for flood control, the presence of any large dam will serve to reduce the peak flow in the downstream river channel to some degree. Typically, the larger the structure, the greater the corresponding effects of reservoir flood routing and the greater the perceived reduction in short-term or periodic flooding. In Oregon, there are many examples of areas below such dams where development has encroached upon riparian areas that formerly were subject to periodic flooding. However, it is important to realize that long-term reduction in downstream flooding does not exist below most such dams. Runoff from large storms may need to be passed downstream to avoid the potential for dam failure. This sudden release of water may prove very damaging to downstream life and property.<br>All dams and reservoirs which would likely result in direct loss of life in the event of failure and the associated sudden release of water are defined as “high hazard” structures. Maps illustrating the zone of downstream inundation area are required to be produced for these structures. The inundation zone shows the physical boundaries, water depths, and arrival times associated with the projected flood wave. Existing “high hazard” dams that have inundation maps will be inventoried and copies of these maps provided to local emergency managers for incorporation into local mitigation plans. High priority must be given to inundation mapping for existing “high hazard” dams that do not currently have inundation maps. | **CI-1*** | Complete a statewide evaluation of the condition of levees, dikes, and dams built for flood control purposes | Several reports indicate a broad need to assess the capabilities, conditions, and maintenance of levees statewide to assess performance under flood conditions. As part of the FIRM modernization program, FEMA identified 12 levees in Oregon that are mapped as providing protection against flood waters, but may in fact be deficient. FEMA asked affected communities to complete an accreditation process to prove the levees are capable of controlling the 1% annual flood before they can be shown as providing protection against the 1% annual flood on the FIRM. Five communities managed to complete the accreditation The levees identified by FEMA by no means reflect the full inventory of levees in the state that provide flood protection, but which may be insufficiently or improperly maintained. Many of these levees are privately owned.<br>One of the challenges identified during FEMA accreditation process was confusion over what kind of vegetation is appropriate to allow on levees and how it should be maintained. This is not a new concern. DEQ, ODFW, USACE, and other agencies have been discussing development of a guidance document on preferred levee types and appropriate use of vegetation. At a minimum, the federal agencies NRCS and USACE should be involved with the state agencies noted below in implementing this action item.<br>Dams present another challenge. Regardless of whether a particular dam was designed and built for flood control, the presence of any large dam will serve to reduce the peak flow in the downstream river channel to some degree. Typically, the larger the structure, the greater the corresponding effects of reservoir flood routing and the greater the perceived reduction in short-term or periodic flooding. In Oregon, there are many examples of areas below such dams where development has encroached upon riparian areas that formerly were subject to periodic flooding. However, it is important to realize that long-term reduction in downstream flooding does not exist below most such dams. Runoff from large storms may need to be passed downstream to avoid the potential for dam failure. This sudden release of water may prove very damaging to downstream life and property.<br>All dams and reservoirs which would likely result in direct loss of life in the event of failure and the associated sudden release of water are defined as “high hazard” structures. Maps illustrating the zone of downstream inundation area are required to be produced for these structures. The inundation zone shows the physical boundaries, water depths, and arrival times associated with the projected flood wave. Existing “high hazard” dams that have inundation maps will be inventoried and copies of these maps provided to local emergency managers for incorporation into local mitigation plans. High priority must be given to inundation mapping for existing “high hazard” dams that do not currently have inundation maps. | Removed. |
| | | | **79** | Continue to refine statewide natural hazard identification and characterization. | The Oregon NHMP identifies the types of natural hazards affecting Oregon, their geographic extent, history and probability of occurrence, and as they may be affected by climate change. Throughout the life of the Plan, new and continuing research studies and projects provide new data and analysis, improving our ability to identify and understand Oregon’s natural hazards and their probability of occurrence. To advance hazard mitigation in Oregon, it is important for the State to plan, budget, and take advantage of opportunities that arise for continued research and new studies to enhance our knowledge of Oregon’s natural hazards. | Revised. Ongoing. |
| | | | **CI-1B** | Complete statewide tsunami hazard identification. | Identify local and distant tsunami inundation zones. | Revised. Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | | **80** | Continue to refine the State's risk assessment methodology and statewide assessments of natural hazard exposure, vulnerability, and potential losses. | At the core of the Oregon NHMP is a statewide risk assessment of exposure and vulnerability, and an estimate of potential dollar losses to State-owned/leased buildings, infrastructure, and critical or essential facilities from natural hazard events. Schools, emergency facilities, water and waste water, dams and levees, transportation, telecommunications, and energy facilities are examples of structures, infrastructure, and facilities that could be exposed and vulnerable to natural hazards. Other examples include populations, businesses, and industries. At this time, the state does not have a standardized risk assessment methodology across all hazards at the state and local levels. To advance hazard mitigation in Oregon, it is important for the State to plan, budget, and take advantage of opportunities that arise for continued enhancement of the risk assessment, better enabling limited mitigation resources to be directed to the areas that most need them. | Revised. Ongoing. |
| | | | **81** | Continue to refine statewide identification and prioritization of the greatest risks from and communities most vulnerable to Oregon's natural hazards. | Identifying and prioritizing the greatest risks from and communities most vulnerable to natural hazard events will enable the state to leverage its limited mitigation resources in ways that efficiently protect life, property, and the environment from natural hazard events and facilitate recovery. | Revised. Ongoing. |
| | | | **82** | Continue to develop and implement resilience initiatives statewide. | Natural hazard mitigation is a fundamental element of resilience. It is important for the state to plan, budget, and partner with other public and private entities to alleviate potential damage from natural hazard events before they occur by (a) improving the reliability of critical/essential facilities, services, and infrastructure during and after a natural hazard event; (b) developing evacuation routes and facilities; (c) informing the public; (d) planning for long-term recovery; and (e) taking other necessary actions. | Revised. Ongoing. |
| **CI-2*** | Continue to conduct and improve risk assessments for state owned properties | FEMA requires the state's plan to: 1) describe the types of state owned or operated critical facilities located in the identified hazard areas; and 2) present an estimate of the potential dollar losses to state owned or operated buildings, infrastructure, and critical facilities in the identified hazard areas. In addition, FEMA also requires that the state develop a comprehensive multi-year plan to mitigate the risks posed to existing buildings that have been identified as necessary for post-disaster response and recovery. Part of this risk assessment for state owned property should be to identify: 1) which facilities would be necessary for response and recovery efforts and 2) mitigation strategies for those priority facilities.<br>Currently, the State Plan's assessment of state owned properties consists of a 'low,' 'moderate,' or 'high' vulnerability ranking. Rankings are derived from county-wide hazard analysis scores that do not account for local variations in vulnerability. Likewise, the structural integrity and physical condition of the critical facilities are not yet considered. As such, the State IHMT will encourage the state to invest resources in performing more detailed vulnerability assessments for State-owned properties. The assessments may result in mitigation opportunities that reduce the state's vulnerability to natural hazards. | **CI-2*** | Continue to conduct and improve risk assessments for state owned properties | FEMA requires the state's plan to: 1) describe the types of state owned or operated critical facilities located in the identified hazard areas; and 2) present an estimate of the potential dollar losses to state owned or operated buildings, infrastructure, and critical facilities in the identified hazard areas. In addition, FEMA also requires that the state develop a comprehensive multi-year plan to mitigate the risks posed to existing buildings that have been identified as necessary for post-disaster response and recovery. Part of this risk assessment for state owned property should be to identify: 1) which facilities would be necessary for response and recovery efforts and 2) mitigation strategies for those priority facilities. Currently, the State Plan's assessment of state owned properties consists of a 'low,' 'moderate,' or 'high' vulnerability ranking. Rankings are derived from county-wide hazard analysis scores that do not account for local variations in vulnerability. Likewise, the structural integrity and physical condition of the critical facilities are not yet considered. As such, the State IHMT will encourage the state to invest resources in performing more detailed vulnerability assessments for State-owned properties. The assessments may result in mitigation opportunities that reduce the state's vulnerability to natural hazards. | Revised. Removed. |
| **CI-3*** | Promote the reduction of non-structural hazards in K-12 schools | Provide training to school officials and teachers in reducing non-structural hazards in schools such as unsecured bookcases, filing cabinets, and light fixtures, which can cause injuries and block exits. The program should include a procedure for periodic life safety inspections of non-structural seismic hazards in schools that can be implemented by local fire department inspectors. BCD will have an important role in providing technical assistance in the development of educational materials | **107** | Provide information and technical assistance to implement mitigation of non-structural hazards in K-12 schools. | Provide training to school officials and teachers in reducing non-structural hazards in schools such as unsecured bookcases, filing cabinets, and light fixtures, which can cause injuries and block exits. The program should include a procedure for periodic life safety inspections of non-structural seismic hazards in schools that can be implemented by local fire department inspectors. BCD will have an important role in providing technical assistance in the development of educational materials. | Revised. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **CI-4*** | Inventory and evaluate state owned and occupied buildings for seismic risk | Determine earthquake damage and losses expected to occur to the state owned building inventory including higher education buildings. Produce information to enable development of statewide priorities and strategies to guide mitigation of earthquake risk, to protect lives during an earthquake, and to preserve ongoing operations after an earthquake. Use accepted methods to determine building type, construction and occupancy, to estimate damage and losses due to various earthquake scenarios and probabilities relating to building codes. Prioritized results shall be factored into effective, routine decision processes for building occupancy, maintenance, use and potential mitigation treatments. Properly used, this information over time can provide for strategic and responsible voluntary seismic upgrade in areas of greatest need for reasonable cost as a part of broader facilities management. | **32** | Request and compile seismic and flood information for personnel-occupied buildings from other agencies. | Determine flood and earthquake damage and losses expected to occur to the State-owned building inventory including higher education buildings. Produce information to enable development of statewide priorities and strategies to guide mitigation of earthquake risk, to protect lives during an earthquake, and to preserve ongoing operations after an earthquake. Use accepted methods to determine building type, construction and occupancy, to estimate damage and losses due to various earthquake scenarios and probabilities relating to building codes. | Revised. Priority. |
| | | | **33** | Request seismic and flood information from landlords as part of analyzing potential leased spaces going forward in new leases and potential renewals. | Determine flood and earthquake damage and losses expected to occur to the state owned building inventory including higher education buildings. Produce information to enable development of statewide priorities and strategies to guide mitigation of earthquake risk, to protect lives during an earthquake, and to preserve ongoing operations after an earthquake. Use accepted methods to determine building type, construction and occupancy, to estimate damage and losses due to various earthquake scenarios and probabilities relating to building codes. | Revised. Priority. |
| | | | **35** | Investigate/inventory DAS-owned buildings for seismic risk. | Determine earthquake damage and losses expected to occur to the state owned building inventory including higher education buildings. Produce information to enable development of statewide priorities and strategies to guide mitigation of earthquake risk, to protect lives during an earthquake, and to preserve ongoing operations after an earthquake. Use accepted methods to determine building type, construction and occupancy, to estimate damage and losses due to various earthquake scenarios and probabilities relating to building codes. | Revised. Priority. |
| | | | **55** | Use DAS-CFO data and investigation/inventory of seismic and flood risk to DAS-owned/leased buildings in an effective, routine decision-making process for building occupancy, maintenance, use and potential mitigation treatments. | This information over time can provide for strategic and responsible voluntary flood and seismic upgrades in areas of greatest need for reasonable cost as a part of broader facilities management. | Revised. Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **CI-5*** | Strongly encourage voluntary relocation of essential facilities, hazardous facilities, and special occupancy structures that are in the tsunami inundation zone | A large tsunami (preceded by a locally devastating earthquake) would likely destroy many buildings in coastal communities that are located in the tsunami inundation zone. The damage would be from the combined effects of the forces from the tsunami surges, currents and debris as well as the earthquake hazards. Essential facilities and special occupancy structures, such as fire stations/hospitals and schools, and hazardous facilities are often located in the tsunami inundation zone. Because of the critical need of essential facilities during a disaster, the added danger from hazardous materials, and the importance of protecting children, these facilities and structures need to be relocated out of the inundation zone through some type of incentive program. A voluntary program can be implemented without statutory change; however, a mandatory program would require legislative support. After a tsunami disaster, the top priority would be to reconstruct essential facilities, special occupancy structures, and hazardous facilities out of the tsunami inundation zone as defined in the maps produced for ORS 455.466 and 455.467. Finally, when these facilities come up for replacement, they should be encouraged to build out of the tsunami inundation zone. | **CI-5*** | Strongly encourage voluntary relocation of existing essential facilities, hazardous facilities, and special occupancy structures that are in the tsunami inundation zone. | A large tsunami (preceded by a locally devastating earthquake) would likely destroy many buildings in coastal communities that are located in the tsunami inundation zone. The damage would be from the combined effects of the forces from the tsunami surges, currents and debris as well as the earthquake hazards. Essential facilities and special occupancy structures, such as fire stations/hospitals and schools, and hazardous facilities are often located in the tsunami inundation zone. Because of the critical need of essential facilities during a disaster, the added danger from hazardous materials, and the importance of protecting children, these facilities and structures need to be relocated out of the inundation zone through some type of incentive program. A voluntary program can be implemented without statutory change; however, a mandatory program would require legislative support. After a tsunami disaster, the top priority would be to reconstruct essential facilities, special occupancy structures, and hazardous facilities out of the tsunami inundation zone as defined in the maps produced for ORS 455.466 and 455.467. Finally, when these facilities come up for replacement, they should be encouraged to build out of the tsunami inundation zone. | Revised. Removed. |
| **CI-6** | Continue seismic rehabilitation of hospital, fire, and police facilities under the Seismic Rehabilitation Grant Program administered by OEM | Continue to rehabilitate to operational readiness in the event of an earthquake essential hospital buildings, fire, and police stations that pose a threat to occupant safety. Senate Bill 15 of the 2001 Legislative Session requires that rehabilitation or other actions to be completed by January 1, 2022. SJR 21 and 22 are bond measures (November 2002 election) which would provide funding to implement this proposed action.<br>Senate Bills 2 to 5 (2005) provided the mechanism to accomplish some of these legislatively mandated tasks. Under SB 2, Oregon Department of Geology and Mineral Industries developed a seismic needs assessment database of emergency response facilities buildings. These data are being used the SRGP to administer a grant program which provides for seismic rehabilitation of eligible buildings (SB 3). Senate Bill 5 allows the State Treasury to sell Government Obligation Bonds to fund the program. | **110** | Continue seismic rehabilitation of hospital, fire, and police facilities under the Seismic Rehabilitation Grant Program administered by Business Oregon's Infrastructure Finance Division. | Continue to rehabilitate to operational readiness in the event of an earthquake essential hospital buildings, fire, and police stations that pose a threat to occupant safety. Senate Bill 15 of the 2001 Legislative Session requires that rehabilitation or other actions to be completed by January 1, 2022.<br>Senate Bills 2 to 5 (2005) provided the mechanism to accomplish some of these legislatively mandated tasks. Under SB 2, Oregon Department of Geology and Mineral Industries developed a seismic needs assessment database of emergency response facilities buildings. These data are being used by the Seismic Rehabilitation Grant Program to provide funding for seismic rehabilitation of eligible buildings (SB 3). Senate Bill 5 allows the State Treasury to sell Government Obligation Bonds to fund the program. | Revised. Ongoing. |
| **CI-7** | Geo-survey the state's rights of way (ROW) to determine where seismic, landslide, and flood prone areas exist. | With this information, the state can develop a statewide right-of-way tenant plan that requires the construction of suitable utility supporting structures. This will improve utilities' resilience in seismic, flood, and landslide events. Cost subsidy for the studies could be an integral element in the utility permit fees, annual franchise fees or an additional tax levied against the utility's continuing property record. | **34** | Lidar survey the State's ROW (rights of way), west of the Cascade Range, to determine where landslide potential exists. | The acquired information can improve critical infrastructure resilience in the face of landslide events, by providing useful information to planners, design professionals and decision makers prior to delivery system construction. | Revised. Priority. |
| | | | **74** | Lidar survey the State's ROW (rights of way), west of the Cascade Range, to determine where seismic fault potential exists. | The acquired information can improve critical infrastructure resilience in the face of seismic events, by providing useful information to planners, design professionals and decision makers prior to delivery system construction. | Revised. Priority. |
| **CI-8** | Promote improved reliability and resiliency of critical infrastructure to operators. | Lifeline services, such as electricity, gas, telecommunications, water, and transportation, can be critical to a community's wellbeing. However, much of Oregon's infrastructure has not been designed to tolerate extreme conditions, such as severe storms, major earthquakes, or large landslides. Certain lifeline services should have reliable performance to ensure that the region can withstand future damage without crippling consequences. These items of critical infrastructure require vulnerability studies in order to understand potential damages and consequences. | **92** | Improve reliability and resiliency of critical infrastructure statewide by adopting industry-specific best practices, guidelines, and standards. | Lifeline Service Delivery Systems (critical infrastructure), including electric supply, natural gas, telecommunications, water/wastewater, hydraulic structures (e.g., dikes, levees, dams), transportation corridors, pipelines and petroleum fuels storage facilities, are all vital resources for a community's life-safety and economic viability. However, much of Oregon's existing critical infrastructure has not been designed or constructed to withstand the impact of severe natural disasters such as extreme wind & winter storms, major earthquakes, or large landslides. Lifeline Service Delivery Systems (critical infrastructure) should be evaluated statewide, and reliable and measurable performance objectives which insure the region's critical infrastructure can withstand future damage without crippling consequences should be instituted. | Revised. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **CI-9** | Continue seismic rehabilitation of public schools buildings under the Seismic Rehabilitation Grant Program administered by OEM. | Continue to rehabilitate to occupant life safety standards certain public school and community college buildings. Senate Bill 14 from the 2001 Session of the Oregon Legislature requires that the State Board of Education examine buildings used for both instructional and non-instructional activities, including libraries, auditoriums, and dining facilities in order to determine which buildings are in most need of additional analysis. Following the identification of high-risk buildings and additional analysis, high-risk buildings must be rehabilitated by January 1, 2032, subject to available funding. SJR 21 and 22 are bond measures (November 2002 election) which would provide funding to implement this proposed action.<br>SB 2 to 5 (2005) provided the mechanism to accomplish some of these legislatively mandated tasks. Under SB 2, Oregon Department of Geology and Mineral Industries developed a seismic needs assessment database of K-12 and Community College public school buildings. These data are being used the SRGP to administer a grant program for seismic rehabilitation of eligible buildings (SB 3). SB 4 allows the State Treasury to sell Government Obligation Bonds to fund the program. | **111** | Continue seismic rehabilitation of public schools buildings under the Seismic Rehabilitation Grant Program administered by Business Oregon's Infrastructure Finance Division. | Continue to rehabilitate to occupant life safety standards certain public school and community college buildings. Senate Bill 14 from the 2001 Session of the Oregon Legislature requires that the State Board of Education examine buildings used for both instructional and non-instructional activities, including libraries, auditoriums, and dining facilities in order to determine which buildings are in most need of additional analysis. Following the identification of high-risk buildings and additional analysis, high-risk buildings must be rehabilitated by January 1, 2032, subject to available funding. SJR 21 and 22 are bond measures (November 2002 election) which would provide funding to implement this proposed action.<br>SB 2 to 5 (2005) provided the mechanism to accomplish some of these legislatively mandated tasks. Under SB 2, Oregon Department of Geology and Mineral Industries developed a seismic needs assessment database of K-12 and Community College public school buildings. These data are being used the SRGP to administer a grant program for seismic rehabilitation of eligible buildings (SB 3). SB 4 allows the State Treasury to sell Government Obligation Bonds to fund the program. | Revised. Ongoing. |
| **CI-10** | Promote vulnerability studies of critical infrastructure | Promote vulnerability studies of critical infrastructure (lifelines) to operators. Lifeline services, such as electricity, gas, and telecommunications, can be critical to a community's well being. However, much of Oregon's infrastructure has not been designed to tolerate extreme conditions, such as severe storms, major earthquakes, or large landslides. Certain lifeline services should have reliable performance to ensure that the region can withstand future damage without crippling consequences. Critical infrastructure including energy and telecom utilities infrastructure require vulnerability studies in order to understand potential damages and consequences. Transportation, water, wastewater and other important services are also important. | **CI-10** | Promote vulnerability studies of critical infrastructure | Promote vulnerability studies of critical infrastructure (lifelines) to operators. Lifeline services, such as electricity, gas, and telecommunications, can be critical to a community's wellbeing. However, much of Oregon's infrastructure has not been designed to tolerate extreme conditions, such as severe storms, major earthquakes, or large landslides. Certain lifeline services should have reliable performance to ensure that the region can withstand future damage without crippling consequences. Critical infrastructure including energy and telecom utilities infrastructure require vulnerability studies in order to understand potential damages and consequences. Transportation, water, wastewater and other important services are also important. | Revised. Removed. |
| **CI-11** | Determine where additional aquifer studies might lead to greater water supplies and how to fund these studies | There are many areas in the state where the dynamics of the aquifers are not well understood. Studying these aquifers may reveal under-utilized water resources and other information useful to water managers. Determine which aquifers would benefit by detailed studies and how these studies can be funded. | **CI-11** | Determine where additional aquifer studies might lead to greater water supplies and how to fund these studies | There are many areas in the state where the dynamics of the aquifers are not well understood. Studying these aquifers may reveal under-utilized water resources and other information useful to water managers. Determine which aquifers would benefit by detailed studies and how these studies can be funded. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **CI-12** | Increase storage of water, especially off stream storage | The need to store water is very apparent to irrigators in Eastern Oregon who find creeks going dry during summer and early autumn. One way to avoid that common occurrence is by encouraging storage facilities where they are needed and where they are feasible to construct. In an initial study of potential reservoir locations, storage sites were identified that are very high in drainage basins so that the impact to anadromous fish would be minimal. High elevation, small stream type structures may be considered environmentally acceptable. ODA has also looked at diverting water away from streams through pipelines or canals into off-channel basins. These types of structures are more costly but don't have the impact on fish passage that are oftentimes associated with instream structures. Other ideas include development of aquifer storage and recovery projects. Surface water from streams is diverted during times of abundance and injected into underground aquifers for storage. WRD has developed an inventory of above ground and below ground storage opportunities: http://apps2.wrd.state.or.us/apps/planning/owsci/sw_project_search.aspx http://apps2.wrd.state.or.us/apps/planning/owsci/gw_project_search.aspx . These are also available from the following link, which includes introductory information: http://www.wrd.state.or.us/OWRD/LAW/owsci_info.shtml#Potential_Water_Storage_Sites . Land management practices that slow down or prevent runoff are also being employed by landowners such as creation of wetlands, catchment depressions, diversion dikes, or terraces. The idea is to simply retain water in the watershed. For additional information, see the following Oregon Department of Agriculture web site and the WRD web site: http://www.oregon.gov/ODA/NRD/water_quality_front.shtml www.oregon.gov/WRD ODA should work with private landowners and special districts to implement projects such as those described above. | **CI-12** | Increase storage of water, especially off stream storage | The need to store water is very apparent to irrigators in Eastern Oregon who find creeks going dry during summer and early autumn. One way to avoid that common occurrence is by encouraging storage facilities where they are needed and where they are feasible to construct. In an initial study of potential reservoir locations, storage sites were identified that are very high in drainage basins so that the impact to anadromous fish would be minimal. High elevation, small stream type structures may be considered environmentally acceptable. ODA has also looked at diverting water away from streams through pipelines or canals into off-channel basins. These types of structures are more costly but don't have the impacts on fish passage that are oftentimes associated with instream structures. Other ideas include development of aquifer storage and recovery projects. Surface water from streams is diverted during times of abundance and injected into underground aquifers for storage. OWRD has developed an inventory of above ground and below ground storage opportunities: http://apps2.wrd.state.or.us/apps/planning/owsci/sw_project_search.aspx http://apps2.wrd.state.or.us/apps/planning/owsci/gw_project_search.aspx. These are also available from the following link, which includes introductory information: http://www.wrd.state.or.us/OWRD/LAW/owsci_info.shtml#Potential_Water_Storage_Sites. Land management practices that slow down or prevent runoff are also being employed by landowners such as creation of wetlands, catchment depressions, diversion dikes, or terraces. The idea is to simply retain water in the watershed. For additional information, see the following Oregon Department of Agriculture web site and the OWRD web site: http://www.oregon.gov/ODA/NRD/water_quality_front.shtml www.oregon.gov/OWRD ODA should work with private landowners and special districts to implement projects such as those described above. | Removed. |
| **CI-13** | Encourage local governments to inter-tie water systems | The capital expense associated with this action needs to be carried mostly by local governments, perhaps with some grant or low-interest loan funding provided by the state or federal governments. The role of the state in this action is to encourage local governments located proximate to one another, yet with separate water systems, to develop the physical capability to send water from one system to the other. Oftentimes during drought situations, one local government will have a bit of water to spare while a nearby government is struggling to meet its needs. Transferring water by truck is expensive and inefficient when compared to transferring water via pipeline. Water inter-ties are also effective mitigation for the flood and earthquake hazards where one system can serve as back-up for another. | **94** | Provide technical assistance and funding to local governments to evaluate the need and opportunities for inter-tie projects in Local Natural Hazards Mitigation Plans. | The capital expense associated with this action needs to be carried mostly by local governments, perhaps with some grant or low-interest loan funding provided by the state or federal governments. The role of the state in this action is to encourage local governments located proximate to one another, yet with separate water systems, to develop the physical capability to send water from one system to the other. Oftentimes during drought situations, one local government will have a bit of water to spare while a nearby government is struggling to meet its needs. Transferring water by truck is expensive and inefficient when compared to transferring water via pipeline. Water inter-ties are also effective mitigation for the flood and earthquake hazards where one system can serve as back-up for another. | Revised. Ongoing. |
| **CI-14** | Maintain a roster of qualified post-earthquake, flood, and wind inspectors. Solicit those with ATC-45 flood & wind inspection training. Develop plans for rapid mobilization of inspectors for post disaster facility inspection | Continue to compile and maintain a list of individuals trained and certified for post-disaster inspection. Support the recruitment and training of qualified ATC-20 post earthquake inspectors and inspection teams. Create rapid communication networks to effectively alert necessary inspectors when disasters occur. Work with OEM, local government building officials, and emergency planners to establish an effective process for assigning inspection teams to needed areas and educating local governments regarding the circumstances and process for initiating BCD and state involvement | **96** | Continue to maintain the existing roster of qualified post-earthquake, flood, and wind inspectors with ATC-20 earthquake and ATC-45 flood & wind inspection training. | Continue to compile and maintain a list of individuals trained and certified for post-disaster inspection. Support the recruitment and training of qualified ATC-20 post earthquake inspectors and inspection teams. | Revised. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | | **76** | Establish process for assigning inspection teams to needed areas for post-disaster facility inspection. | Work with OEM, local government building officials, and emergency planners to establish an effective process for assigning inspection teams to needed areas and educating local governments regarding the circumstances and process for initiating BCD and state involvement. | Revised. Priority. |
| **CI-15** | Require fish passage at all new and replaced structures | ODFW statutes require fish passage at all artificial barriers to fish migration. New structures, such as dams and culverts, are currently required to provide fish passage. Old structures that are replaced need to provide fish passage as well. DLCD, ODFW and OEM will continue to integrate FEMA's 1999 "Policy on Fish Enhancement Structures in the Floodway" policy memorandum into fish passage projects and design guidelines. ODFW will continue to ensure that projects meet fish-passage standards and are also designed with consideration of the need to pass wood and sediment. Standards that provide for fish passage should also provide better passage for floodwaters and organic materials. Efforts to replace structures proactively to ensure passage of fish and floodwaters/debris will be supported as feasible. | **CI-15** | Require fish passage at all new and replaced structures | ODFW statutes require fish passage at all artificial barriers to fish migration. New structures, such as dams and culverts, are currently required to provide fish passage. Old structures that are replaced need to provide fish passage as well. DLCD, ODFW and OEM will continue to integrate FEMA's 1999 "Policy on Fish Enhancement Structures in the Floodway" policy memorandum into fish passage projects and design guidelines. ODFW will continue to ensure that projects meet fish-passage standards and are also designed with consideration of the need to pass wood and sediment. Standards that provide for fish passage should also provide better passage for floodwaters and organic materials. Efforts to replace structures proactively to ensure passage of fish and floodwaters/debris will be supported as feasible. | Removed. |
| **CI-16** | Evaluate expected earthquake damage and system interruptions to existing lifelines and hydraulic structures, including dams | Lifelines include all essential transportation facilities and the associated bridges, tunnels, locks, and ferries, including airports and railways, petroleum and natural gas pipelines, electric transmission lines, water and sewage systems, "emergency operations and telecommunications infrastructure.<br>The evaluation proposed would study the vulnerability of existing lifeline systems and hydraulic structures to a major seismic event, and estimate the expected damage and losses. Estimating the expected losses will include determining those systems that likely would experience a total loss of operation immediately following a major event, although the actual physical damage to the system may not be total or extensive.<br>In order to implement this action, the State of Oregon will need to work with several federal agencies which are involved in ownership, authority, or responsibility for some of the structures and facilities cited.<br>Detailed benefit-cost analyses (to include hazard damages to facilities, downstream impacts and economic loss of service) can be used to identify and prioritize potential mitigation projects (retrofits, intake relocations, or even new construction). | **CI-16** | Evaluate expected earthquake damage and system interruptions to existing lifelines and hydraulic structures, including dams | Lifelines include all essential transportation facilities and the associated bridges, tunnels, locks, and ferries, including airports and railways, petroleum and natural gas pipelines, electric transmission lines, water and sewage systems, "emergency operations and telecommunications infrastructure.<br>The evaluation proposed would study the vulnerability of existing lifeline systems and hydraulic structures to a major seismic event, and estimate the expected damage and losses. Estimating the expected losses will include determining those systems that likely would experience a total loss of operation immediately following a major event, although the actual physical damage to the system may not be total or extensive.<br>In order to implement this action, the State of Oregon will need to work with several federal agencies which are involved in ownership, authority, or responsibility for some of the structures and facilities cited.<br>Detailed benefit-cost analyses (to include hazard damages to facilities, downstream impacts and economic loss of service) can be used to identify and prioritize potential mitigation projects (retrofits, intake relocations, or even new construction). | Removed. |
| **CI-17** | Encourage/require public entities adopt and follow ANSI National Tree Care Standards | This action requires additional scoping to determine how best to encourage and require state and local agencies to adopt and routinely implement ANSI A300, Tree Care Operations Standards. These national standards were developed by a diverse committee of tree care professionals from the private and public sectors and cover proper tree pruning, fertilization, and tree support systems. These standards set forth the requirements and recommendations for satisfactory tree care maintenance. Public entities and tree care companies who perform work according to ANSI A300 standards are following accepted industry practices for proper tree care maintenance operations, resulting in healthier trees with reduced tree hazards.<br>For more information, see:<br>http://www.ansi.org/news_publications/media_tips/tree_care.aspx?menuid=7<br>This action may result in a legislative concept for a future session of the Oregon Legislature, and may include an incentive such as limited liability when the standards are implemented. Currently, the state has not adopted the ANSI A300 standards, though several state agencies follow them voluntarily. As a first step, the lead and support agencies noted below will better publicize the standards and persuade additional agencies to voluntarily adopt them. | **CI-17** | Encourage/require public entities adopt and follow ANSI National Tree Care Standards | This action requires additional scoping to determine how best to encourage and require state and local agencies to adopt and routinely implement ANSI A300, Tree Care Operations Standards. These national standards were developed by a diverse committee of tree care professionals from the private and public sectors and cover proper tree pruning, fertilization, and tree support systems. These standards set forth the requirements and recommendations for satisfactory tree care maintenance. Public entities and tree care companies who perform work according to ANSI A300 standards are following accepted industry practices for proper tree care maintenance operations, resulting in healthier trees with reduced tree hazards.<br>For more information, see:<br>http://www.ansi.org/news_publications/media_tips/tree_care.aspx?menuid=7<br>This action may result in a legislative concept for a future session of the Oregon Legislature, and may include an incentive such as limited liability when the standards are implemented. Currently, the state has not adopted the ANSI A300 standards, though several state agencies follow them voluntarily. As a first step, the lead and support agencies noted below will better publicize the standards and persuade additional agencies to voluntarily adopt them. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **CI-18** | Work to improve policies, procedures relevant to the construction and maintenance of overhead lines. | Experience with previous incidents and events has demonstrated that overhead utility systems are vulnerable to severe storms. The systems impacted by such an event create safety issues and outages that can cause serious problems for customers, communities, and the public in general as a result of the increasing dependency upon those systems and networks. As such, individuals, local government, communities and commercial enterprises should be encouraged to engage in preparedness efforts in support of service outage mitigation, including the installation of emergency electrical energy generation units. This effort is especially warranted at other critical infrastructure lifeline facilities, where additional health and environmental impacts are witnessed by the loss of commercial power (water and waste water treatment facilities).<br>The PUC, in collaboration with industry stakeholders, strives to improve the safety and reliability of overhead lines (ORS:758-210-270) through improved design, construction, maintenance and rights-of-way management. Additional consideration can be given to initial constructs, utilizing underground or buried techniques, as opposed to conversion of overhead lines. The latter, when unassociated to HMGP funding, has an extensive list of considerations, over and above the recurring and initial costs to the utility and the service delivery end-user, respectively. Including, but not limited to: maintenance, fault isolation and repair, capacity augmentation, facility rehabilitation and replacement. The latter activities entail expenses associated with excavation or trenching, select backfill, compaction, property restoration, all of these items are inclusive with the prudent decision to pursue deployments in the underground or buried configurations.<br>This action item involves ongoing development of relevant and concise policies and procedures relative to overhead line maintenance, inspection, engineering, and joint-use cooperation to ensure and improve the long-term safety and reliability of overhead line systems. | **CI-18** | Introduce legislation in 2015 requiring all overhead facility operators to mitigate service outages due to natural hazards by installing emergency electrical energy generation units; using underground or buried facilities for initial construction in areas where other hazards (e.g., landslide, earthquake, flood) are unlikely cause damage to them; and instituting other mitigation and preparedness measures. | Previous incidents and events demonstrate that overhead facilities are vulnerable to severe storms. The impact of such an event creates safety issues and system outages which can cause serious concerns to customers, communities, and the public in general as a result of the increasing dependency upon service delivery systems and networks. As such, individuals, local government, communities and commercial enterprises should be encouraged to engage in preparedness efforts in support of service outage mitigation, including the installation of emergency electrical energy generation units. This effort is especially warranted at other critical infrastructure lifeline facilities, where additional health and environmental impacts are witnessed by the loss of commercial power (i.e., medical facilities and water-waste water treatment facilities). The PUC, in collaboration with industry stakeholders, strives to improve the safety and reliability of overhead lines (ORS 758-010-035) through improved design, construction, maintenance, and rights-of-way management. Additional consideration should be given to initial constructs, utilizing underground or buried techniques, as opposed to conversion of overhead lines as a reactionary solution, keeping in mind that underground and buried constructs are vulnerable to geologic and flooding events that may cause the same result, and impact that the conversion of the same facilities was intended to resolve. | Revised. Removed. |
| **CI-19** | Develop evacuation plans for ports and harbors | Ports and harbors are the haven for commercial and recreational fishing and recreational boating industries. They are often the major centers of economic activity in coastal communities that have bays. To protect the vessels from tsunami damage requires a unique evacuation plan for both distant and local tsunamis. The plans should be integrated with community evacuation plans. The Oregon State University Extension Sea Grant Program has identified this as a major issue in their pilot project in Yaquina Bay. Their project is titled Reducing Earthquake and Tsunami Hazards in the Pacific Northwest Ports and Harbors.<br>For distant tsunami events and storm surge events that can occur during any winter, evaluate potential port and harbor mitigation retrofit projects that protect and strengthen floating and anchored infrastructure such as piers, bulkheads and landings. | **24** | Develop evacuation plans for ports and harbors at the rate of one per year. | Ports and harbors are the haven for commercial and recreational fishing and recreational boating industries. They are often the major centers of economic activity in coastal communities that have bays. To protect the vessels from tsunami damage requires a unique evacuation plan for both distant and local tsunamis. The plans should be integrated with community evacuation plans. The Oregon State University Extension Sea Grant Program has identified this as a major issue in their pilot project in Yaquina Bay. Their project is titled *Reducing Earthquake and Tsunami Hazards in the Pacific Northwest Ports and Harbors.*<br>For distant tsunami events and storm surge events that can occur during any winter, evaluate potential port and harbor mitigation retrofit projects that protect and strengthen floating and anchored infrastructure such as piers, bulkheads and landings. | Priority. |
| **CI-20** | Encourage windstorm mitigation techniques that reduce losses to electric utilities through existing state programs | Implement outreach efforts through existing safety-related programs managed by the PUC in coordination with private and public utilities | **147** | Use industry best practices to minimize impact and outages to service delivery system of overhead line operators, during windstorm events. | Implement outreach efforts through existing safety-related programs managed by the PUC in coordination with private and public utilities. Compliance with PUC administrative rules includes safety codes and vegetation management. The PUC provides administrative to support to the Oregon Utility Safety Committee where all utility operators (electric, natural gas, telecommunication & water) discuss safety issues and best practices. | Revised. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **CI-21** | Identify and implement tsunami mitigation projects to improve life safety by creating hardened and improved evacuation routes. | After a Cascadia Subduction Zone earthquake, a tsunami could arrive within minutes. It is essential that residents and visitors be able to quickly move to high ground on foot. This requires clearly marked and safe routes that pedestrians are able to navigate even in dark and stormy weather. Projects should be identified that will enable Oregon to establish new standards and guidelines for methods to harden and mark way-finding of tsunami evacuation routes to natural high ground. Where natural high ground is not within the expected evacuation time, evaluate the retrofit of existing facilities and/or construction of new facilities that rise above the level of tsunami inundation and can serve as safe haven refuges. | **40** | Implement better way-finding solutions for tsunami evacuation. Create hardened and improved evacuation routes to include elevated safe areas above the level of modeled inundation. | After a Cascadia Subduction Zone earthquake, a tsunami could arrive within minutes. It is essential that residents and visitors be able to quickly move to high ground on foot. This requires clearly marked and safe routes that pedestrians are able to navigate even in dark and stormy weather. Where high ground is available, projects should be identified that will enable Oregon to establish new standards and guidelines for methods to harden and mark way-finding of tsunami evacuation routes to natural high ground. Where natural high ground is not within the expected evacuation time, evaluate the retrofit of existing facilities and/or construction of new facilities that rise above the level of tsunami inundation and can serve as safe haven refuges. | Revised. Priority. |
| | | | **38** | Fund and provide technical assistance for local governments to engage in evacuation route planning and project implementation. | After a Cascadia Subduction Zone earthquake, a tsunami could arrive within minutes. It is essential that residents and visitors be able to quickly move to high ground. Some evacuation planning is already underway. Local governments need funding and technical assistance to begin or continue to engage in evacuation planning. | New. Priority. |
| | | | **56** | Identify, prioritize, and map areas susceptible to rapid channel migration | Identify areas susceptible to rapid channel migration. Prioritize those areas' susceptibility and rank their risk from a rapid channel migration event. Create channel migration zone and risk maps for the areas determined to have the highest risk for rapid channel migration. | New. Priority. |
| | | | **60** | Identify funding to support various public transportation providers and local jurisdictions to conduct comprehensive vulnerability assessments of their transportation facilities and services. | OSSPAC, in the Oregon Resilience Plan has identified an immediate near-term need to inventory and assess vulnerability and mitigation opportunities for local street networks, transit assets, ports, airports, and railroads. The Oregon Resilience Task Force in its October 2014 report to the Oregon Legislature suggested ongoing funding inventory, assessment, and mitigation. These activities would serve to reduce vulnerability to a Cascadia Subduction Zone event. | New. Priority. |
| | | | **65** | Prioritize mitigation and retrofit projects on seismic lifelines. | ODOT Seismic Lifelines Evaluation, Vulnerability Synthesis and Identification Report provides recommended priority corridors but does not provide sufficient detail to actually prioritize retrofit investment packages. Engineering evaluations and cost estimation are ongoing on a funding-available basis and will inform that prioritization process. | New. Priority. |
| | | | **91** | Continue to act upon opportunities to advance the State's lifeline mitigation investment practice. | Expand upon the State's mitigation investment practice by: (1) Supporting efforts by jurisdictions and transportation districts to develop mitigation policy and retrofit plans for lifeline assets and service facilities; (2) Continuing to advance design and maintenance standards and requirements for bridges and unstable slopes, transit, rail, ports, and priority lifeline airfields; (3) Developing a temporary bridge installation policy and standards; (4) Supporting research on retrofit methods and strategies for Cascadia subduction zone earthquake loads and tsunamis. | New. Ongoing. |
| | | | **16** | Complete a Climate Change Vulnerability Assessment and Adaptation Pilot for north coast highways. | The goal of ODOT's pilot is to conduct a regional vulnerability assessment and prepare options for adaptation actions and priorities. In coordination with ODOT Maintenance, the project will collect and map vulnerability and risk data based on climate science, asset conditions, and known and anticipated natural hazards. Hazard sites will be selected within a study corridor for more detailed analysis. Based on engineering and technical reviews, adaptation measures will be developed for vulnerable infrastructure and assembled into a coastal adaptation implementation plan. ODOT received a Federal Highway Administration grant to conduct the project, scheduled for completion in fall 2014. | New. Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

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| | | | **58** | Develop a database of non-State-owned critical/essential facilities and their property values. | FEMA requires the state's plan to: 1) identify critical facilities located in the identified hazard areas; and 2) estimate the potential dollar losses to those structures. Data for non-State-owned critical facilities is incomplete and lacks standardization, therefore creating a wide margin of error. Identifying local non-State-owned critical facilities and gathering descriptive data for these structures will help increase the quality of the data, resulting in a more precise understanding of state and regional vulnerabilities and mitigation priorities. | New. Priority. |
| | | | **31** | Improve state agency procedures for tracking data on State-owned/leased buildings and critical or essential facilities. | Create a policy standard for facilities data collection required from state agencies on an annual basis. Develop a facilities data framework standard that best enables hazard mitigation analysis; incorporate data into DAS-CFO DataMart and make available to partner agencies at will. | New. Priority. |
| | | | **77** | Develop an improved methodology for gathering data and identifying the communities most vulnerable to drought and related impacts. | Although we know that areas in Oregon have suffered from drought, there has not been a coordinated effort to systematically characterize how frequently droughts have occurred, or the impact on Oregonians and ecosystems. Communities are beginning to plan for worst case drought scenarios and need better information about the frequency, duration, and intensity of previous droughts in order to assess the appropriate response. Comprehensive information is not currently available by region, or statewide. | New. Priority. |
| | | | **105** | Implement the improved methodology for gathering data and identifying the communities most vulnerable to drought and related impacts. | Although we know that areas in Oregon have suffered from drought, there has not been a coordinated effort to systematically characterize how frequently droughts have occurred, or the impact on Oregonians and ecosystems. Communities are beginning to plan for worst case drought scenarios and need better information about the frequency, duration, and intensity of previous droughts in order to assess the appropriate response. Comprehensive information is not currently available by region, or statewide. | New. Ongoing. |
| | | | **78** | Establish a program for studying winter storms and their impacts statewide. As a part of that program, develop a system for gathering snowfall data statewide. | Establish a network of snow accumulation tracking stations at strategic locations throughout the state to provide data tracking of snow fall accumulation over the short term and long term in order to develop statistics for studying snow level trends across the state. | New. Priority. |
| **LAND USE/DEVELOPMENT** | | | | | | |
| **LU-1*** | Develop model risk reduction techniques and ordinances for landslide-prone communities | Techniques can involve requiring geological or geotechnical studies for new development, stormwater control for neighborhoods on hillslopes, strict land use ordinances for active landslides, working with infrastructure operators to increase reliability of services after storms, and more. | **5** | Develop model risk reduction techniques and ordinances for landslide-prone communities | Techniques can involve requiring geological or geotechnical studies for new development, stormwater control for neighborhoods on hillsides, strict land use ordinances for active landslides, working with infrastructure operators to increase reliability of services after storms, and more. | Priority. |
| **LU-2*** | Develop a process for implementing revised elements of Goal 7 | Goal 7 currently includes a process for notification to local governments of new hazard information. It also requires that local governments review any new hazard information brought to their attention and determine if a local land use response is needed. (LCDC adopted the revised goal in 2001. The revised Goal 7 became effective in June 2002.) Since the Goal's revision, several studies and reports on natural hazards have been published and disseminated. The process for determining which information should trigger local land use evaluations, however, remains untested. The State IHMT currently serves as an informal review board to examine new information on natural hazards and evaluate if or how to address this information via the Goal 7 planning process. DLCD, with the assistance of DOGAMI, and OEM, will determine the process by which 'new hazard information' designations will occur. This action is necessary to ensure that local governments evaluate and respond to information regarding natural hazards within their communities. | **18** | Develop a process for implementing Goal 7. | Under Goal 7, DLCD is responsible for notifying local governments if new hazard information requires a local response. The process for determining which information should trigger local land use evaluations and notifying local governments, however, remains untested. DLCD will implement the process, review the results, and determine whether any changes are necessary. This action is necessary to ensure that local governments evaluate new hazard information and take necessary action to protect life and property. | Revised. Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **LU-3*** | Enhance coordination of hazard mitigation planning with local comprehensive planning | Explore how to better connect hazard mitigation plans with local comprehensive/land use plans. Should hazard mitigation plans be incorporated into comprehensive/land use plans? How can comprehensive and land use plans become better vehicles for implementing hazard mitigation? Are changes needed in statute, rule, or goal to better incorporate hazard mitigation plans into comprehensive/land use plans? | **30** | Provide technical assistance to local governments to help integrate hazard mitigation plans with local comprehensive plans. | Local NHMPs are often adopted as an appendix to the comprehensive plan or separately and are therefore in practice not used to their full potential. By assisting local governments in integrating the two plans, hazard mitigation will be more easily and meaningfully implemented in local land use planning practice. | Revised. Priority. |
| **LU-4*** | Complete a model "Substantial Improvement/Substantial Damage" program to support local government regulation of floodplain development | DLCD and OEM are in the process of creating a Substantial Improvement/Substantial Damage (SI/SD) manual. The SI/SD Manual will include local ordinance language and companion guidance on administrative processes that can be used by local jurisdictions for cumulative tracking of substantial improvements. It will also address common implementation difficulties encountered at the local level, and suggest approaches that could be used by local governments to overcome those difficulties. The SI/SD Manual will be completed and integrated into Model Code and ongoing NFIP training. (See FL-22 for definitions of substantial improvement and substantial damage.) | **LU-4*** | Complete a model "Substantial Improvement/Substantial Damage" program to support local government regulation of floodplain development | DLCD and OEM are in the process of creating a Substantial Improvement/Substantial Damage (SI/SD) manual. The SI/SD Manual will include local ordinance language and companion guidance on administrative processes that can be used by local jurisdictions for cumulative tracking of substantial improvements. It will also address common implementation difficulties encountered at the local level, and suggest approaches that could be used by local governments to overcome those difficulties. The SI/SD Manual will be completed and integrated into Model Code and ongoing NFIP training. | Removed. |
| **LU-5** | Develop guidance on determination of mudslides/mudflow triggers and relation to rain/flood events | Work with FEMA Region 10, DOGAMI, and other interested parties to develop scientifically and legally-based guidance on when mudflows/mudslides are to be considered part of a rain/flood event pursuant to the NFIP. Address the definition of mudflow/mudslide, regulatory factors, scientific understanding of mudslides, and implications for flood insurance. | **68** | Develop guidance on determination of mudslides triggers and relation to rain or flood events | Work with FEMA Region 10, DOGAMI, and other interested parties to develop scientifically and legally-based guidance on when mudflows are to be considered part of a rain or flood event pursuant to the NFIP. Address the definition of mudflow, regulatory factors, scientific understanding of mudslides, and implications for flood insurance. | Priority. |
| **LU-6** | Implement the Oregon Forestland-Urban Interface Fire Protection Act ("Senate Bill 360") in all Oregon counties | The Oregon Forestland-Urban Interface Fire Protection Act, more commonly known as "Senate Bill 360," was enacted by the Oregon Legislature in response to the growing incidence of wildfire destroying homes and communities in Oregon's wildland-urban interface. The Act recognizes that individual property owners are in the best position to take mitigation actions which will have the most direct impact to whether or not a structure will survive a wildfire. Under this action item, the Act will be implemented county by county in those portions of the state, based on weather, fire incidence, fuels, or on the number of structures at risk. It has been Legislature's stated preference that implementation be accomplished with federal grant funds. | **141** | Implement the Oregon Forestland-Urban Interface Fire Protection Act ("Senate Bill 360") in all Oregon counties that meet criteria under the law. | The *Oregon Forestland-Urban Interface Fire Protection Act*, more commonly known as "Senate Bill 360," was enacted by the Oregon Legislature in response to the growing incidence of wildfire destroying homes and communities in Oregon's wildland-urban interface. The Act recognizes that individual property owners are in the best position to take mitigation actions which will have the most direct impact to whether or not a structure will survive a wildfire. Under this action item, the Act will be implemented county by county in those portions of the state, based on weather, fire incidence, fuels, or on the number of structures at risk. It has been Legislature's stated preference that implementation be accomplished with federal grant funds. | Revised. Ongoing. |
| **LU-7** | Update the Model Ordinance for Flood Damage Prevention | FEMA Region 10 has approved for use in Oregon a model ordinance for flood damage prevention. This model ordinance incorporates the NFIP minimum standards plus some elements of Oregon's state building codes. DLCD reviewed and updated the model ordinance in 2006 and again in 2008. DLCD views the model ordinance as a living document and will continue to work with Region 10 and other interested parties to develop model ordinance provisions that address issues such as "fish-friendly" floodplain management, reducing flood insurance costs, etc.<br>Model code language was developed in 2008 to guide habitat restoration projects in the floodway. Model code is based on FEMA Region X, "Policy on Fish Enhancement Structures in the Floodway" dated June 1999, and Portland District of the Army Corps of Engineers and the Oregon Department of State Lands jointly developed Regional General Permit (RGP) for Stream Habitat Restoration (ref NWP-2007-1023). The model code language was reviewed by FEMA and incorporated into Oregon Flood Hazard Reduction model ordinance. In 2010 the model ordinance was rewritten to incorporate Oregon Building Codes by reference and to include suggested administrative and permitting procedures. The model code language was reviewed by FEMA and published in 2011. DLCD will continue to modify the model ordinance in response to changing FEMA guidance, building code revisions and sound floodplain management experience. | **114** | Update the Model Ordinance for Flood Damage Prevention | FEMA Region 10 has approved for use in Oregon a model ordinance for flood damage prevention. DLCD views the model ordinance as a living document and will continue to work with Region 10 and other interested parties to develop model ordinance provisions that address issues such as "fish-friendly" floodplain management, reducing flood insurance costs, etc. | Revised. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **LU-8** | Identify buildings and cultural resources that would benefit from hazard mitigation by supporting buildable lands inventories that identify constrained lands | Identify funding in order to make grants to local governments for inventories of buildable lands, where lands impacted by hazards would be identified as non-buildable or at least highly constrained. Through this process, also work with local governments to identify buildings and other cultural resources that would benefit from flood proofing or other hazard mitigation activities. These inventories should include an identification of land uses, lifelines, critical/essential facilities, cleanup sites in the floodway or floodplain, hazardous and solid waste generators, etc. DEQ and EPA may be able to assist in providing some of this data.<br>Individual flood disasters have revealed the need for a comprehensive inventory of at-risk structures in all flood prone areas that could be subject to damage. These data could be the foundation for improved hazard mitigation programs that are based on priorities rather than addressing damaged properties after specific events. | **11** | Develop guidance for local governments on how to use Goal 7 together with other pertinent Statewide Land Use Planning Goals to classify lands subject to natural hazards in the buildable lands inventory and adjust urban growth boundaries in a manner that minimizes or eliminates potential damage to life, property, and the environment while continuing to provide for efficient development patterns. | Goal 7 discourages new development in areas subject to natural hazards. Goal 14 and other Statewide Land Use Planning Goals encourage development within urban growth boundaries. Local governments need guidance on how to classify lands subject to natural hazards in their buildable lands inventories and adjust urban growth boundaries to protect life, property, and the environment from natural hazards while providing for efficient development patterns within urban growth boundaries. This guidance will assist local governments in integrating local natural hazards mitigation plans with comprehensive plans. | Revised. Priority. |
| | | | **66** | Provide funding and technical assistance to local governments to use the new guidance on classifying lands subject to natural hazards in their buildable lands inventories and adjusting urban growth boundaries. | Local governments need funding and technical assistance to be able to use the new guidance on how to classify lands subject to natural hazards and adjust urban growth boundaries to protect life, property, and the environment from natural hazards while providing for efficient development patterns within urban growth boundaries. Comprehensive Plan amendments are likely to result. This funding and technical assistance will promote integration of local natural hazards mitigation plans with comprehensive plans. | Revised. Priority. |
| **LU-9** | Change state land use laws to better connect use of land with water supply | Occasionally land is developed in Oregon utilizing well water without regard to other nearby existing uses. Land developments can reduce recharging of the aquifer that is under them due to sending runoff largely away from the development. Farmers have lost well water or been forced to develop deeper wells due to loss of aquifer water to the newly developed land in the vicinity. Oregon land use law needs to require that new developments not create water hardships on existing land uses and other beneficial uses of water. | **LU-9** | Change state land use laws to better connect use of land with water supply | Occasionally land is developed in Oregon utilizing well water without regard to other nearby existing uses. Land developments can reduce recharging of the aquifer that is under them due to sending runoff largely away from the development. Farmers have lost well water or been forced to develop deeper wells due to loss of aquifer water to the newly developed land in the vicinity. Oregon land use law needs to require that new developments not create water hardships on existing land uses and other beneficial uses of water. | Revised. Removed. |
| **LU-10** | Work with the insurance industry to develop and apply a common standard of interface mitigation measures adjacent to dwellings | The Oregon Forestland-Urban Interface Fire Protection Act recognizes that individual property owners are in the best position to take mitigation actions which will have a direct relationship to whether or not their structures survive a wildfire. To that end, the Act required the development of standards that owners are to apply on their property. At the same time, some insurance companies have developed or adopted different standards which their customers must apply on their property in order to obtain or retain insurance coverage. Such a situation of "competing" standards is confusing to property owners and can hamper the application of effective mitigation measures. Under this action item, insurance companies will be encouraged to adopt the Act's standards or, rather than apply a different set of standards, that they will encourage their customers to comply with the Act. | **LU-10** | Work with the insurance industry to develop and apply a common standard of interface mitigation measures adjacent to dwellings | The *Oregon Forestland-Urban Interface Fire Protection Act* recognizes that individual property owners are in the best position to take mitigation actions which will have a direct relationship to whether or not their structures survive a wildfire. To that end, the Act required the development of standards that owners are to apply on their property. At the same time, some insurance companies have developed or adopted different standards which their customers must apply on their property in order to obtain or retain insurance coverage. Such a situation of "competing" standards is confusing to property owners and can hamper the application of effective mitigation measures. Under this action item, insurance companies will be encouraged to adopt the Act's standards or, rather than apply a different set of standards, that they will encourage their customers to comply with the Act. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **LU-11** | Strongly encourage the adoption of State Building Code standards (or other incentives) for retrofitting, upgrading, protecting, essential facilities, hazardous facilities, and special occupancy structures in coastal communities that are vulnerable to tsunamis | A large tsunami (and associated earthquake) would likely destroy many buildings in coastal communities that are located in the tsunami inundation zone. The damage would be from the combined effects of the forces from the tsunami surges, currents and debris, as well as the earthquake hazards. The State of Hawaii has adopted construction standards for buildings in tsunami zones. The National Tsunami Hazard Mitigation Program recently completed the document Designing for Tsunamis that outlines some of these issues. These documents could be evaluated and used as a starting point in developing standards. Although not under the jurisdiction of Building Code Standards, port and harbor facilities can benefit from lessons learned from DR-1964 and damages (distant generated tsunami impacts) at facilities in Brookings-Harbor, Depoe Bay, and Bandon. Such mitigation measure include strengthen pilings for floating docks, improved dock supports that facilitate unrestricted up-down movement during wave surges, and strengthened bulkhead walls that reduce scour from wave surges. | **LU-11** | Strongly encourage the adoption of State Building Code standards (or other incentives) for retrofitting, upgrading, protecting, essential facilities, hazardous facilities, and special occupancy structures in coastal communities that are vulnerable to tsunamis. | A large tsunami (and associated earthquake) would likely destroy many buildings in coastal communities that are located in the tsunami inundation zone. The damage would be from the combined effects of the forces from the tsunami surges, currents and debris, as well as the earthquake hazards. The State of Hawaii has adopted construction standards for buildings in tsunami zones. The National Tsunami Hazard Mitigation Program recently completed the document Designing for Tsunamis that outlines some of these issues. These documents could be evaluated and used as a starting point in developing standards. Although not under the jurisdiction of Building Code Standards, port and harbor facilities can benefit from lessons learned from DR-1964 and damages (distant generated tsunami impacts) at facilities in Brookings-Harbor, Depoe Bay, and Bandon. Such mitigation measure include strengthen pilings for floating docks, improved dock supports that facilitate unrestricted up-down movement during wave surges, and strengthened bulkhead walls that reduce scour from wave surges. | Removed. |
| **LU-12** | Establish and maintain a priority ranking system for properties for flood mitigation | The State's strategy for selecting properties for flood hazard mitigation projects is four-fold. It prioritizes projects that 1) are geographically balanced 2) are in communities with a FEMA-approved local hazard mitigation plan, 3) address properties with sustained substantial damages or repetitive losses, 4) provide communities with information and/or tools to evaluate properties suitable for mitigation, and to develop mitigation projects.<br>Repetitive flood loss properties (those which have experienced multiple flood insurance claims) have been identified as high priority hazard mitigation projects by the NFIP. Nationwide, 40% of all flood insurance claims are paid on just 2% of insured properties. In Oregon, repetitive loss (RL) properties represent about 1% of all insured properties, and account for about 14% of all claims paid (19% of the dollar amount paid). Most (80%) of Oregon's repetitive loss properties pre-date the FIRMs. These properties are referred to as "pre-FIRM"; they were built in floodplains before FEMA FIRMs became available. Because of this, the property owners do not pay the true, actuarial cost of flood insurance. The RL lists provided by FEMA can have value for hazard mitigation planning because their locations may be indicative of persistent flood or drainage problems that may or may not be reflected on a FIRM.<br>The state, working with local jurisdictions, will verify the FEMA-provided repetitive flood loss information at least once during this plan's term and establish a priority ranking for properties that would benefit most from hazard mitigation by means of acquisition, relocation, elevation, or demolition. The state will maintain and review this list annually as a basis for selecting and funding hazard mitigation projects that directly benefit homeowners and businesses. The review of the repetitive lost list is tied to the FMA Program guidance that is updated annually with the state grant allocations. Following a major disaster declaration, these properties could be pre-approved by FEMA for hazard mitigation to include post-disaster mitigation funding from the Hazard Mitigation Grant Program that can oftentimes be expedited.<br>Once the repetitive loss list is verified, DLCD and OEM will analyze and summarize the information in a geographical information system to discover spatial patterns associated with repetitive losses. Results will be shared with jurisdictions in which repetitive loss structures are located, with the recommendation that the loss areas be addressed in local hazard mitigation plans as potential mitigation action items (in concept but not by specific property address). DLCD will provide NFIP communities with RL properties the information necessary for them to identify and pre-qualify potential mitigation project opportunities that are cost-effective, environmentally sound and technically feasible. OEM will work with these communities in turning qualified | **LU-12** | Establish and maintain a priority ranking system for properties for flood mitigation | The State's strategy for selecting properties for flood hazard mitigation projects is four-fold. It prioritizes projects that 1) are geographically balanced 2) are in communities with a FEMA-approved local hazard mitigation plan, 3) address properties with sustained substantial damages or repetitive losses, 4) provide communities with information and/or tools to evaluate properties suitable for mitigation, and to develop mitigation projects.<br>Repetitive flood loss properties (those which have experienced multiple flood insurance claims) have been identified as high priority hazard mitigation projects by the NFIP.<br>The state, working with local jurisdictions, will verify the FEMA-provided repetitive flood loss information at least once during this plan's term and establish a priority ranking for properties that would benefit most from hazard mitigation by means of acquisition, relocation, elevation, or demolition. The state will maintain and review this list annually as a basis for selecting and funding hazard mitigation projects that directly benefit homeowners and businesses. The review of the repetitive lost list is tied to the FMA Program guidance that is updated annually with the state grant allocations. Following a major disaster declaration, these properties could be pre-approved by FEMA for hazard mitigation to include post-disaster mitigation funding from the Hazard Mitigation Grant Program that can oftentimes be expedited.<br>Once the repetitive loss list is verified, DLCD and OEM will analyze and summarize the information in a geographical information system to discover spatial patterns associated with repetitive losses. Results will be shared with jurisdictions in which repetitive loss structures are located, with the recommendation that the loss areas be addressed in local hazard mitigation plans as potential mitigation action items (in concept but not by specific property address). DLCD will provide NFIP communities with RL properties the information necessary for them to identify and pre-qualify potential mitigation project opportunities that are cost-effective, environmentally sound and technically feasible. OEM will work with these communities in turning qualified potential projects into sub-grant applications.<br>The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the National Flood Insurance Program (NFIP). As of May 2011, there are nine identified SRL properties in Oregon, eight of which are insured with the NFIP. The State has been working closely with the property owner of the property with the highest number of losses (7) to mitigate against future loss. This mitigation project is projected to come to completion in 2011 | Revised. Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | potential projects into sub-grant applications.<br>The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the National Flood Insurance Program (NFIP). As of May 2011, there are nine identified SRL properties in Oregon, eight of which are insured with the NFIP. The State has been working closely with the property owner of the property with the highest number of losses (7) to mitigate against future loss. This mitigation project is projected to come to completion in 2011 using SRL grant funds (pending FEMA approval). DLCD and OEM will develop a plan for addressing the remaining SRL properties based upon experience with the 2011 mitigation project. Cost effectiveness of mitigation must be proven for SRL properties and unfortunately the dollar losses suffered by the remaining SRL properties in Oregon may not allow mitigation to be funded using the SRL grant program (or Federal mitigation grant programs). FEMA's Greatest-Savings-to-the-Fund (GSTF) calculation does not provide sufficient benefits to mitigate any of Oregon's SRL properties. Mitigation costs will likely exceed the GSTF calculation in all cases. Consequently, DLCD and OEM will evaluate the remaining SRL properties, including conducting screening benefit-cost analysis, to determine whether the remaining SRL properties qualify for priority ranking for mitigation action. Results will be shared with FEMA and local jurisdictions. Any decision to move forward will be made in consultation with local jurisdictions and property owners. | | | using SRL grant funds (pending FEMA approval). DLCD and OEM will develop a plan for addressing the remaining SRL properties based upon experience with the 2011 mitigation project. Cost effectiveness of mitigation must be proven for SRL properties and unfortunately the dollar losses suffered by the remaining SRL properties in Oregon may not allow mitigation to be funded using the SRL grant program (or Federal mitigation grant programs). FEMA's Greatest-Savings-to-the-Fund (GSTF) calculation does not provide sufficient benefits to mitigate any of Oregon's SRL properties. Mitigation costs will likely exceed the GSTF calculation in all cases. Consequently, DLCD and OEM will evaluate the remaining SRL properties, including conducting screening benefit-cost analysis, to determine whether the remaining SRL properties qualify for priority ranking for mitigation action. Results will be shared with FEMA and local jurisdictions. Any decision to move forward will be made in consultation with local jurisdictions and property owners. | |
| **LU-13** | Maintain the Riparian Lands Tax Incentive Program | This program is administered by the ODFW. This program involves the preparation of a plan and agreement between the landowner and the ODFW. The plan details measures the landowner will implement to preserve, enhance, or restore the riparian areas. Landowners receive a complete property tax exemption for the riparian property (up to 100 feet from the top of stream bank or the edge of non-aquatic vegetation). This program helps reduce sediment and protect stream banks which helps reduce the filling of river and stream channels. | **115** | Maintain the Riparian Lands Tax Incentive Program | This program is administered by the ODFW. This program involves the preparation of a plan and agreement between the landowner and the ODFW. The plan details measures the landowner will implement to preserve, enhance, or restore the riparian areas. Landowners receive a complete property tax exemption for the riparian property (up to 100 feet from the top of stream bank or the edge of non-aquatic vegetation). This program helps reduce sediment and protect stream banks which helps reduce the filling of river and stream channels. | Ongoing. |
| **LU-14** | Develop additional littoral cell plans | The state intends to pursue development of plans for additional sections of coastline, based on need and the level of risk to development. | **LU-14** | Develop additional littoral cell plans | The state intends to pursue development of plans for additional sections of coastline, based on need and the level of risk to development. | Removed. |
| **LU-15** | Acquire existing homes and businesses seriously threatened by landslide hazards | When opportunities and funding become available (pre- and/or post-disaster) explore options for the acquisition of developed property, particularly homes, in areas of repetitive or ongoing landslide hazards. Acquired properties will be maintained as open space in perpetuity and may also provide a buffer for landslide movements and debris that could otherwise impact improvements such as transportation routes. | **124** | Acquire existing homes and businesses seriously threatened or damaged by landslide hazards | When opportunities and funding become available (pre- and/or post-disaster) explore options for the acquisition of developed property, particularly homes, in areas of repetitive or ongoing landslide hazards. Acquired properties will be maintained as open space in perpetuity and may also provide a buffer for landslide movements and debris that could otherwise impact improvements such as transportation routes. | Revised. Ongoing. |
| **LU-16** | Develop training and information packets and articles for local building officials informing them of their responsibilities and authority under ORS 455.446 and 455.447 and the State Building Code. | Statutes and the State Building Code limit construction of new essential facilities and special occupancy structures in the mapped tsunami inundation zone. Definitions of essential and special occupancy structures are in the Oregon State Structural Specialty Code. Training has not been provided to local building officials since the original adoption of SB 379 (1995 Oregon Legislative Session), codified as ORS 455.446 - .447. As personnel change and time passes, additional training and information for officials will be provided. | **131** | Continue to develop training and information packets and articles for local building officials informing them of their responsibilities and authority under ORS 455.446 and 455.447 and the State Building Code. | Statutes and the State Building Code limit construction of new essential facilities and special occupancy structures in the mapped tsunami inundation zone. Definitions of essential and special occupancy structures are in the Oregon State Structural Specialty Code. As personnel change and time passes, additional training and information for officials will be provided. | Revised. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **LU-17** | Organize a GIS tsunami database workshop | A GIS database of tsunami safe zones, evacuation routes, and evacuation sites is presently under construction (see short-term action item #1). Once completed, it is important to integrate the data into county databases. The workshop would not only assist counties with how to integrate the data, but also how the data can be used for tsunami evacuation planning. | **LU-17** | Organize a GIS tsunami database workshop | A GIS database of tsunami safe zones, evacuation routes, and evacuation sites is presently under construction. Once completed, it is important to integrate the data into county databases. The workshop would not only assist counties with how to integrate the data, but also how the data can be used for tsunami evacuation planning. | Removed. |
| | | | **25** | Integrate the GIS database of tsunami safe zones and assembly areas into local government databases. | Assist counties not only with how to integrate the data, but also how the data can be used for tsunami evacuation planning. | Revised. Priority. |
| **LU-18** | Assist local communities in securing funding to implement measures to mitigate damage to buildings exposed to or having experienced repetitive flood losses | The state maintains an inventory of high priority repetitively damaged buildings located in floodplains (also see short-term action #7). As funding opportunities arise, continue to acquire, elevate, or otherwise mitigate damage to buildings exposed to or having experienced unacceptable flood damages.<br>The flood event of December 2007 heavily impacted the City of Vernonia and the unincorporated Nehalem Valley. As a result of this flood, significant changes were made to flood hazard maps in the area, causing scores of buildings to be placed in the regulated flood hazard zone. DLCD and OEM have worked closely with these communities to secure funding to mitigate buildings now located in the flood hazard zone and to buyout properties now located in the floodway and will continue to provide such expertise statewide where needed. | **120** | Assist local communities in securing funding to mitigate damage to repetitive flood loss properties or those substantially damaged by flooding. | The state maintains an inventory of high priority repetitively damaged buildings located in floodplains. DLCD and OEM have worked closely with communities to secure funding to mitigate buildings located in the flood hazard zone and to buyout properties located in the floodway. These agencies will continue to provide such expertise statewide where needed. | Revised. Ongoing. |
| | | | **45** | Develop a system for prioritizing and ranking State-owned facilities, including critical facilities, for mitigation. | Create an evaluation framework for determining a comprehensive list of critical State-owned facilities in terms of local and regional service needs in the event of a natural disaster; prioritize these critical facilities based on mitigation needs by disaster type; and evaluate each critical facility on the basis of investment cost and potential relocation/decommission in locations with increased hazard risk. | New. Priority. |
| | | | **G** | Provide guidance to the maritime community for evacuation response for local Cascadia and distant tsunami events. | Tsunami model data including minimum flow depths and maximum flow velocities will be analyzed to determine port-specific maritime guidance. | New. Removed. |
| **MAINTENANCE/PLANNING** | | | | | | |
| **MP-1*** | State IHMT Agency Action Item Progress Reports | Prior to the April State IHMT meetings of each year, State IHMT priority functional category leads will submit progress briefs on all mitigation activities to OEM for review. Briefs will include a progress update on primary action item responsibilities, identification of agency success stories, suggestions for potential new action items and identification of any new or updated information that will be germane to the update of the state NHMP chapters or appendices. Leads will complete success stories for any completed actions at that time.<br>Priority functional categories for the 2012–2015 planning period include:<br>• Legislative/Policy<br>• Education/Outreach and<br>• Critical Infrastructure / Essential Public Facilities | **MP-1*** | State IHMT Agency Action Item Progress Reports | Prior to the April State IHMT meetings of each year, State IHMT priority functional category leads will submit progress briefs on all mitigation activities to OEM for review. Briefs will include a progress update on primary action item responsibilities, identification of agency success stories, suggestions for potential new action items and identification of any new or updated information that will be germane to the update of the state NHMP chapters or appendices. Leads will complete success stories for any completed actions at that time.<br>Priority functional categories for the 2012–2015 planning period include:<br>• Legislative/Policy<br>• Education/Outreach and<br>• Critical Infrastructure / Essential Public Facilities | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **MP-2*** | Develop post-disaster strategic reconstruction plans based on damage projections from a Cascadia Subduction Zone earthquake and tsunami. | A large Cascadia Subduction Zone earthquake/tsunami may destroy a significant percentage of the buildings in coastal communities, as well as much of the public and private infrastructure that ties them together. Reconstruction of buildings and associated infrastructure will be a massive, long-term undertaking, requiring a great deal of financial aid, planning, technical assistance and cooperation among agencies and the public. Although tragic, such a disaster will also present communities with an opportunity to physically redesign and reshape themselves, creating safer places for people to live and work.<br>A state post disaster planning and recovery task force would be established to plan for reconstruction and to oversee post disaster reconstruction. The Cascadia Region Earthquake Workgroup has recently developed a detailed damage scenario for a CSZ event using HAZUS (Hazards U.S. loss estimation software program) and other information to supplement the HAZUS data. For example, HAZUS does not take into account tsunami damage. This scenario could be used as the basis for developing reconstruction plans. | **MP-2*** | Develop post-disaster strategic reconstruction plans based on damage projections from a Cascadia Subduction Zone earthquake and tsunami. | A large Cascadia Subduction Zone (CSZ) earthquake/tsunami may destroy a significant percentage of the buildings in coastal communities, as well as much of the public and private infrastructure that ties them together. Reconstruction of buildings and associated infrastructure will be a massive, long-term undertaking, requiring a great deal of financial aid, planning, technical assistance and cooperation among agencies and the public. Although tragic, such a disaster will also present communities with an opportunity to physically redesign and reshape themselves, creating safer places for people to live and work.A state post disaster planning and recovery task force would be established to plan for reconstruction and to oversee post disaster reconstruction. The Cascadia Region Earthquake Workgroup has recently developed a detailed damage scenario for a CSZ event using HAZUS (Hazards U.S. loss estimation software program) and other information to supplement the HAZUS data. For example, HAZUS does not take into account tsunami damage. This scenario could be used as the basis for developing reconstruction plans. | Removed. |
| **MP-3*** | Monitor hazard mitigation implementation | It is recommended that OEM establish and maintain a formal process to ensure that actions in this plan are being properly implemented. By monitoring implementation of successful mitigation projects, important data can be obtained to support loss avoidance studies that quantify the benefits of mitigation. Monitoring of floodplain and landslide property acquisitions (funded by FEMA mitigation grants) is required and must be reported to FEMA every three years. Although not a federal requirement, monitoring of floodplain property elevations will ensure compliance with meeting NFIP flood insurance requirements.<br>Hazard mitigation implementation may also be reviewed and this plan revised following any Presidential emergency or major disaster declaration. At one time this was a requirement of federal law, but it now is simply a good idea, especially if interest in the event has provided both resources and opportunity for mitigation. | **MP-3*** | Monitor hazard mitigation implementation | It is recommended that OEM establish and maintain a formal process to ensure that actions in this plan are being properly implemented. By monitoring implementation of successful mitigation projects, important data can be obtained to support loss avoidance studies that quantify the benefits of mitigation. Monitoring of floodplain and landslide property acquisitions (funded by FEMA mitigation grants) is required and must be reported to FEMA every three years. Although not a federal requirement, monitoring of floodplain property elevations will ensure compliance with meeting NFIP flood insurance requirements.<br>Hazard mitigation implementation may also be reviewed and this plan revised following any Presidential emergency or major disaster declaration. At one time this was a requirement of federal law, but it now is simply a good idea, especially if interest in the event has provided both resources and opportunity for mitigation. | Removed. |
| **MP-4** | Maintain a statewide action item database | OPDR hosts a searchable action item database on its website that identifies the actions from existing local natural hazards mitigation plans. During the 2009 Oregon NHMP update, revisions were made to the action item database to allow for local actions to be categorized underneath the state plan goals. This will allow the state or FEMA to quickly sort local actions by the various state plan goals. This function will allow for easier reporting on the State of Oregon's progress toward reducing risk and can be organized under the six Oregon NHMP goals. OPDR is working to add the state plan goal references to actions that are currently listed and is also working to add the actions of new plans as they are developed. Maintaining this database is time and resource intensive; therefore, all local actions may not be categorized during this plan update. This will be an ongoing task for OPDR and OEM staff.<br>Action Item Database: http://csc.uoregon.edu/opdr/actionitems/ | **MP-4** | Maintain a statewide action item database | OPDR hosts a searchable action item database on its website that identifies the actions from existing local natural hazards mitigation plans. During the 2009 Oregon NHMP update, revisions were made to the action item database to allow for local actions to be categorized underneath the state plan goals. This will allow the state or FEMA to quickly sort local actions by the various state plan goals. This function will allow for easier reporting on the State of Oregon's progress toward reducing risk and can be organized under the six Oregon NHMP goals. OPDR is working to add the state plan goal references to actions that are currently listed and is also working to add the actions of new plans as they are developed. Maintaining this database is time and resource intensive; therefore, all local actions may not be categorized during this plan update. This will be an ongoing task for OPDR and OEM staff.<br>Action Item Database: http://csc.uoregon.edu/opdr/actionitems/ | Removed. |
| **MP-5** | Assure full implementation of NFIP map modernization program in Oregon | Work cooperatively with FEMA to ensure that the NFIP map modernization program is fully implemented in Oregon, giving high priority to remapping of coastal areas due to age of existing FIRM maps and potential severity of flooding and related erosion hazards. | **MP-5** | Complete implementation of NFIP Map Modernization program in Oregon. | Work cooperatively with FEMA to ensure that the NFIP map modernization program is fully implemented in Oregon, giving high priority to remapping of coastal areas due to age of existing FIRM maps and potential severity of flooding and related erosion hazards. | Revised. Removed. |
| | | | **121** | Continue implementation of FEMA's Risk MAP program in Oregon, including building effective community strategies for reducing risk. | Measurably increase the public's awareness of flood and other natural hazards through a combination of regulatory and non-regulatory products, tools, community outreach. Address gaps in flood hazard data, identifying areas of dated and/or inconsistent mapping and updating high-priority areas with new mapping and innovative natural hazard mapping techniques that lead to actions that reduce risk to life and property. Provide support to help manage the FEMA Map Modernization projects that remain to be completed. | New. Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| | | | **7** | Through FEMA's Risk MAP program, update 1,000 miles of streams with lidar-based flood mapping. | FEMA's Risk MAP program funds revisions of Flood Insurance Studies and Flood Insurance Rate Maps. The State should focus on updating these products so they are based on high quality topographic data (e.g., lidar). Lidar-derived streams are a by-product of high quality topographic data. These more accurately located streams will assist in the improvement of a community's flood maps to more accurately show flood risk to life and property. The State should continue to pursue Risk MAP funds for this purpose. | New. Priority. |
| **MP-6** | Establish a Silver Jackets Program | The State IHMT should consider establishing a joint state-federal flood mitigation subcommittee, which is tied to a national USACE initiative called "Silver Jackets" (Oregon is not required to adopt this name for the subcommittee). It would provide a forum where DLCD, DOGAMI, OEM, USACE, FEMA, USGS, and additional federal, state and sometimes local and Tribal agencies can come together to collaboratively plan and implement flood mitigation, optimizing multi-agency utilization of federal assistance by leveraging state/local/Tribal resources, including data/information, talent and funding, and preventing duplication among agencies.<br>Objectives of this subcommittee might include:<br>• Facilitate strategic life-cycle flood risk reduction,<br>• Create or supplement a continuous mechanism to collaboratively solve state-prioritized issues and implement or recommend those solutions,<br>• Improve processes, identifying and resolving gaps and counteractive programs,<br>• Leverage and optimize resources,<br>• Improve and increase flood risk communication and present a unified interagency message, and<br>• Establish close relationships to facilitate integrated post-disaster recovery solutions.<br>The State of Oregon will establish a "Silver Jackets", as a subcommittee to the IHMT, with the primary intents of strengthening interagency relationships and cooperation, optimizing resources, and improving risk communication and messaging. | **MP-6** | Establish a Silver Jackets Program | The State IHMT should consider establishing a joint state-federal flood mitigation subcommittee, which is tied to a national USACE initiative called "Silver Jackets" (Oregon is not required to adopt this name for the subcommittee). It would provide a forum where DLCD, DOGAMI, OEM, USACE, FEMA, USGS, and additional federal, state and sometimes local and Tribal agencies can come together to collaboratively plan and implement flood mitigation, optimizing multi-agency utilization of federal assistance by leveraging state/local/Tribal resources, including data/information, talent and funding, and preventing duplication among agencies.<br>Objectives of this subcommittee might include:<br>• Facilitate strategic life-cycle flood risk reduction,<br>• Create or supplement a continuous mechanism to collaboratively solve state-prioritized issues and implement or recommend those solutions,<br>• Improve processes, identifying and resolving gaps and counteractive programs,<br>• Leverage and optimize resources,<br>• Improve and increase flood risk communication and present a unified interagency message, and<br>• Establish close relationships to facilitate integrated post-disaster recovery solutions.<br>The State of Oregon will establish a "Silver Jackets", as a subcommittee to the State IHMT, with the primary intents of strengthening interagency relationships and cooperation, optimizing resources, and improving risk communication and messaging. | Removed. |
| **MP-7** | Revise OEM Hazard Analysis Methodology | Each county in Oregon is required to conduct a hazard analysis within their communities. As part of the hazard analysis, each county develops risk scores for the natural hazards that affect their communities. These scores range from 24 (low) to 240 (high), and reflect the county's perceived risk for each particular hazard. The hazard analysis methodology was first developed by the Federal Emergency Management Agency (FEMA) circa 1983, and gradually refined by the Oregon Office of Emergency Management (OEM) over the years. The current methodology could be improved upon to allow for the integration of more detailed risk assessment information. Currently, communities are tasked with determining whether hazards have a 'high,' 'moderate,' or 'low' probability of occurrence; likewise, communities are asked to determine whether their community has a 'high,' 'moderate,' or 'low' vulnerability to each hazard. When better probability or vulnerability data is available, communities should be able to reflect these data in their hazard analyses. Additionally, OEM will work with OPDR to integrate the hazard analysis methodology with the three-phase risk assessment used and taught by OPDR with respect to the development of local natural hazards mitigation plans. In the development of local mitigation plans, the county's hazard analysis scores are typically referenced. If, however, the planning steering committee believes the scores should be different, the scores are simply changed, and the perceived validity of the OEM hazard analysis methodology is weakened. The integration of the analysis with the three-phase risk assessment should therefore be refined. | **MP-7** | Revise OEM Hazard Analysis Methodology | Each county in Oregon is required to conduct a hazard analysis within their communities. As part of the hazard analysis, each county develops risk scores for the natural hazards that affect their communities. These scores range from 24 (low) to 240 (high), and reflect the county's perceived risk for each particular hazard. The hazard analysis methodology was first developed by the Federal Emergency Management Agency (FEMA) circa 1983, and gradually refined by the Oregon Office of Emergency Management (OEM) over the years. The current methodology could be improved upon to allow for the integration of more detailed risk assessment information. Currently, communities are tasked with determining whether hazards have a 'high,' 'moderate,' or 'low' probability of occurrence; likewise, communities are asked to determine whether their community has a 'high,' 'moderate,' or 'low' vulnerability to each hazard. When better probability or vulnerability data is available, communities should be able to reflect these data in their hazard analyses. Additionally, OEM will work with OPDR to integrate the hazard analysis methodology with the three-phase risk assessment used and taught by OPDR with respect to the development of local natural hazards mitigation plans. In the development of local mitigation plans, the county's hazard analysis scores are typically referenced. If, however, the planning steering committee believes the scores should be different, the scores are simply changed, and the perceived validity of the OEM hazard analysis methodology is weakened. The integration of the analysis with the three-phase risk assessment should therefore be refined. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **MP-8** | Track key performance measures toward a disaster resistant state. | State "benchmarks" for mitigation have been superseded by Key Performance Measures (KPMs), and are comprised of the following: DLCD KPM #9, "Percent of urban areas that have updated buildable land inventories to account for natural resource and hazard areas"; DOGAMI KPM #1, "Percent of communities and other stakeholders with hazard maps and risk studies for earthquake and landslide hazards"; DOGAMI KPM #2, "Percent target communities with official, reviewed evacuation map brochures"; DOGAMI KPM #3, "Percent target communities with standardized, 4-risk zone erosion hazard maps"; DOGAMI KPM #4, "Public awareness of geologic hazards and mitigation efforts"; DOGAMI KPM #9, "Percent of coastal communities provided with detailed tsunami inundation maps for local emergency planning"; OMD-OEM KPM #10, "Percent of Oregon coastal counties with complete evacuation plans"; and OMD-OEM KPM #12, "Percent of jurisdictions with approved hazard mitigation plans." In combination, these KPMs are moving Oregon toward the goal of developing a disaster resistant state, which institutionalizes hazard mitigation, including: the characterization of natural hazards; the presence of ordinances or standards at the local government level to mitigate natural hazards; and ongoing education on natural hazard mitigation. | **MP-8** | Track key performance measures toward a disaster resistant state. | State "benchmarks" for mitigation have been superseded by Key Performance Measures (KPMs), and are comprised of the following: DLCD KPM #9, "Percent of urban areas that have updated buildable land inventories to account for natural resource and hazard areas"; DOGAMI KPM #1, "Percent of communities and other stakeholders with hazard maps and risk studies for earthquake and landslide hazards"; DOGAMI KPM #2, "Percent target communities with official, reviewed evacuation map brochures"; DOGAMI KPM #3, "Percent target communities with standardized, 4-risk zone erosion hazard maps"; DOGAMI KPM #4, "Public awareness of geologic hazards and mitigation efforts"; DOGAMI KPM #9, "Percent of coastal communities provided with detailed tsunami inundation maps for local emergency planning"; OMD-OEM KPM #10, "Percent of Oregon coastal counties with complete evacuation plans"; and OMD-OEM KPM #12, "Percent of jurisdictions with approved hazard mitigation plans." In combination, these KPMs are moving Oregon toward the goal of developing a disaster resistant state, which institutionalizes hazard mitigation, including: the characterization of natural hazards; the presence of ordinances or standards at the local government level to mitigate natural hazards; and ongoing education on natural hazard mitigation. | Revised. Removed. |
| **MP-9** | Encourage GIS capability development | Assist local governments with GIS program development, including system planning, hardware/software costs, training, and data development in relation to all hazards mapping and regulation of coastal development. | **89** | Continue to assist local governments with GIS capability development | Assist local governments with GIS program development, including system planning, hardware/software costs, training, and data development in relation to all hazards mapping and regulation of coastal development. | Revised. Ongoing. |
| **MP-10** | Improve statewide earthquake hazard datasets, develop more accurate and detailed risk datasets, make hazard and risk information widely and easily available | In order to assess the likely impact of future earthquakes, improved shaking models are needed, along with more accurate and detailed mapping of the distribution of soils that might amplify shaking or liquefy, and mapping of areas susceptible to coseismic landslides. These data should be combined with improved asset information to do risk studies using HAZUS and exploring the use of GIS-based exposure analysis. Detailed hazard and risk mapping and modeling provides local and state governments with essential planning tools.<br>Hazard and risk information should be made widely and easily available to planners, decision makers, and most importantly the general public. Easy to use interactive web tools with comprehensive earthquake and multi-hazard information should be deployed statewide<br>. | **MP-10** | Improve statewide earthquake hazard datasets, develop more accurate and detailed risk datasets, make hazard and risk information widely and easily available | In order to assess the likely impact of future earthquakes, improved shaking models are needed, along with more accurate and detailed mapping of the distribution of soils that might amplify shaking or liquefy, and mapping of areas susceptible to coseismic landslides. These data should be combined with improved asset information to do risk studies using HAZUS and exploring the use of GIS-based exposure analysis. Detailed hazard and risk mapping and modeling provides local and state governments with essential planning tools.<br>Hazard and risk information should be made widely and easily available to planners, decision makers, and most importantly the general public. Easy to use interactive web tools with comprehensive earthquake and multi-hazard information should be deployed statewide. | Removed. |
| | | | **2** | Create a "Clearinghouse" for natural hazards data. | Emergency responders and community planners alike need access to the best and most current natural hazards data that is available. This project would be a cooperative effort between authoritative data sources -- DLCD, DOGAMI, OEM, OWRD, and federal partners (FEMA, USACE, NWS, USGS)—and would include:<br>Establishing a single point of online access to reliable data, maps, and information about natural hazards;<br>Developing, in conjunction with DAS-GEO, a "portal" to distribute this data;<br>Developing a multi-agency State of Oregon flood hazard website;<br>Providing an ongoing inventory and assessment of existing natural hazards data; and<br>Creating a central library for natural hazard risk assessments. | New. Priority. |
| **MP-11** | Survey coastline to monitor erosion | Continue to periodically measure and monitor the Oregon coastline in order to document the response of Oregon's beach and bluffs to changes in ocean water levels (sea level rise and storm surges), storms (frequency and intensity), precipitation patterns that may threaten lives and property. Maintain a long-term, permanent Oregon Beach and Shoreline Mapping and Analysis Program (OBSMAP). The program will be a partnership with local, state, and federal agencies that have responsibility over coastal and ocean activities. | **103** | Survey coastline to monitor erosion | Continue to periodically measure and monitor the Oregon coastline in order to document the response of Oregon's beach and bluffs to changes in ocean water levels (sea level rise and storm surges), storms (frequency and intensity), precipitation patterns that may threaten lives and property. Maintain a long-term, permanent Oregon Beach and Shoreline Mapping and Analysis Program (OBSMAP). The program will be a partnership with local, state, and federal agencies that have responsibility over coastal and ocean activities. | Ongoing. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **MP-12** | Analyze wildfire ignition probability statistics to better target prevention efforts at the leading causes of fires | There is currently no single database or common method of collecting fire cause information for wildfires occurring in Oregon. This results in different entities focusing their prevention and mitigation efforts on those causes which may not be the state's leading causes of fires. This likelihood can be lessened by developing a process to compare fire cause data collected by the Oregon Department of Forestry, the Office of State Marshal, and federal wildfire agencies.<br>It is also important to understand the ignition probability from homes within and adjacent to the wildland interface because of the ignition risk to nearby wildlands.<br>Under this action item, until a common database is developed, a process will be developed to identify the most common wildfire ignition causes, compile and analyze a list of those causes and trends, and distribute this information to agencies and organizations that can help to prevent such wildfires. Having data on the leading causes of ignitions, organized by county, will help establish a course of action for prevention programs. | **142** | Analyze wildfire ignition probability statistics to better target prevention efforts at the leading causes of fires. | There is currently no single database or common method of collecting fire cause information for wildfires occurring in Oregon. This results in different entities focusing their prevention and mitigation efforts on those causes which may not be the state's leading causes of fires. This likelihood can be lessened by developing a process to compare fire cause data collected by the Oregon Department of Forestry, the Office of the State Fire Marshal, and federal wildfire agencies.<br>It is also important to understand the ignition probability from homes within and adjacent to the wildland interface because of the ignition risk to nearby wildlands.<br>While there is no centralized database, wildland and structural fire agencies will continue to work collaboratively to determine leading fire causes and focus efforts statewide and locally to prevent future ignitions. | Revised. Ongoing. |
| **MP-13** | Develop a single, comprehensive statewide method or process to collect and analyze wildfire occurrence data in a timely manner | Currently, data concerning the causes of wildfire incidents is collected and analyzed by at least two state agencies, five federal agencies, and numerous local fire departments. These agencies have no database standardization or common reporting requirements. This results in great difficulty, when attempting to determine the number of wildfires that occur in Oregon, when identifying fire cause trends, and generally in obtaining information concerning wildfire trends in a timely manner. Under this action item, all agencies responsible for suppressing wildfires will be requested to report incident occurrence information to a central data repository, in a standard format, and within prescribed reporting time limits. Such a system would allow for the rapid identification of fire ignition trends and would permit the timely design and delivery of targeted prevention programs and activities. The State Fire Marshal's Oregon All Incident Reporting System (OAIRS) may be a key component in the solution. | **145** | Develop a single, comprehensive statewide method or process to collect and analyze wildfire occurrence data in a timely manner | Currently, data concerning the causes of wildfire incidents is collected and analyzed by at least two state agencies, five federal agencies, and numerous local fire departments. These agencies have no database standardization or common reporting requirements. This results in great difficulty, when attempting to determine the number of wildfires that occur in Oregon, when identifying fire cause trends, and generally in obtaining information concerning wildfire trends in a timely manner. Under this action item, all agencies responsible for suppressing wildfires will be requested to report incident occurrence information to a central data repository, in a standard format, and within prescribed reporting time limits. Such a system would allow for the rapid identification of fire ignition trends and would permit the timely design and delivery of targeted prevention programs and activities. The State Fire Marshal's Oregon All Incident Reporting System (OAIRS) may be a key component in the solution. | Ongoing. |
| | | | **143** | Collaborate through work groups within the Pacific Northwest Coordination Group (PNWCG) to continue collecting and analyzing wildfire occurrence data using the standardized statewide method and report to the state legislature as required. | Previously, data concerning the causes of wildfire incidents was collected and analyzed by at least two state agencies, five federal agencies, and numerous local fire departments. These agencies had no database standardization or common reporting requirements. A standardized data collection system has been developed and data collection and reporting continues collaboratively through work groups within the Pacific Northwest Coordination Group (PNWCG). The new system allows rapid identification of fire ignition trends and permits timely design and delivery of targeted prevention programs and activities. | New. Ongoing. |
| **MP-14** | Develop probabilistic risk maps for the Oregon Coast | Consider and examine combinations and permutations of multi-hazard risk exposure and maps for the entire Oregon Coast. | **73** | Develop probabilistic multi-hazard risk maps for the Oregon Coast | Consider and examine combinations and permutations of multi-hazard risk exposure and maps for the entire Oregon Coast. | Revised. Priority. |
| **MP-15** | Work to improve forecasting for warning and hazard mitigation | State agencies plan to continue to work with the State Climatologist and the National Weather Service to better understand the nature and frequency of windstorms, and to improve communication of long and short range forecasts in order to allow for improved warnings and lead time for local governments to take effective hazard mitigation actions. | **MP-15** | Work to improve forecasting for warning and hazard mitigation | State agencies plan to continue to work with the State Climatologist and the National Weather Service to better understand the nature and frequency of windstorms, and to improve communication of long and short range forecasts in order to allow for improved warnings and lead time for local governments to take effective hazard mitigation actions. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

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| | | | **10** | Implement the Rapid Assessment of Flooding Tool (RAFT) | The RAFT has been funded and developed by the US Army Corps of Engineers (USACE) through FY 14 for $115,000. The goal of the RAFT is to take real time flood forecasts and relate them to flood frequency curves from FEMA, USGS, and OWRD. This will help decision makers prioritize real-time flood fighting assistance. The tool will also incorporate other important decision-influencing factors, possibly including structures in danger of flooding, population affected, and likelihood of levee failure. The RAFT is intended to work in concert with and feed data to other emergency management tools, such as OEM's RAPTOR. The RAFT is in very early development, and the scope and schedule are under development. Once RAFT is completed, OEM will have operational oversight when the ECC is activated. | New. Priority. |
| | | | **53** | Add at least three new flood inundation forecast points to the National Weather Service's Flood Inundation Mapping website and the USGS's Flood Inundation Mapper before 2018. | The National Weather Service (NWS) Advanced Hydrologic Prediction Service (AHPS) has developed inundation mapping sites for various stream gage locations nationwide. Currently there are none in Oregon. This is a useful tool for understanding potential inundation areas based on NWS forecasts. NWS: http://water.weather.gov/ahps/inundation.php; USGS: http://wim.usgs.gov/fimi/) | New. Priority. |
| **MP-16** | Seek funding for the installation and operation of additional precipitation gauges | The state continues to participate in FEMA's national effort to update flood hazard maps, and through the 2004-2009 Map Modernization Program (Map Mod) the majority of flood maps for Oregon have now been issued in a new digital, countywide format. The state will continue to provide support to help manage the Map Mod projects that remain to be completed (Coos, Lane, Tillamook, and Washington Counties), and DLCD will continue to implement the map modernization management support strategy and activities by:<br>1. Establishing and maintaining a premier data collection and delivery system,<br>2. Achieving effective long-term management of flood hazard maps,<br>3. Building and maintaining mutually beneficial partnerships to accomplish mapping work, and<br>4. Expanding and better informing the flood map user community.<br>Risk MAP (Mapping, Assessment, and Planning) is FEMA's new multi-year mapping program. The program builds on flood hazard data and maps produced through Map Mod while including the vision of building effective community strategies for reducing risk. In partnership with DOGAMI, FEMA contractors, and other state and local agencies, the objectives in Oregon's Risk MAP business plan include:<br>1. Addressing gaps in flood hazard data, identifying areas of dated and/or inconsistent mapping and updating high-priority areas with new mapping (Coos (remap), Curry, Lincoln, Tillamook, Clatsop, and Klamath Counties, as well as the Silvies Watershed and the Lower Columbia-Sandy Watershed—most projects contracted with DOGAMI);<br>2. Acquire new lidar topographic data for precise flood hazard mapping;<br>3. Measurably increase the public's awareness of flood and other natural hazards through a combination of regulatory and non-regulatory products, tools, community outreach, and innovative natural hazard mapping techniques (such as those developed by DOGAMI) that lead to actions that reduce risk to life and property;<br>4. Lead effective engagement in flood mitigation planning through partnerships and shared datasets;<br>5. Provide a coordinated multi-agency digital platform that includes data, links to data, applications, strategies, a digital library of flood hazard maps, and a web map depicting the most recent statewide Special Flood Hazard Area layer;<br>6. Coordinate events, project status, and actions; and<br>7. Align risk analysis programs and develop synergies. | **MP-16** | Seek funding for the installation and operation of additional precipitation gauges | The availability of timely and accurate telemetered data from rain (precipitation) gauges is essential for flash flood and debris flow forecasting. State agencies plan to work with their federal counterparts to ensure adequate funding and support for existing gauges and for the installation of new gauging sites where required. It is recommended that state agencies leverage federal funding with state resources and local matching commitments to achieve a reliable network of rain gauges in those areas that are susceptible to flash flooding and rapidly moving landslides (debris flows). | Revised. Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **MP-17** | Develop statewide resiliency plan consistent with intent of HR 3 | The availability of timely and accurate telemetered data from rain (precipitation) gauges is essential for flash flood and debris flow forecasting. State agencies plan to work with their federal counterparts to ensure adequate funding and support for existing gauges and for the installation of new gauging sites where required. It is recommended that state agencies leverage federal funding with state resources and local matching commitments to achieve a reliable network of rain gauges in those areas that are susceptible to flash flooding and rapidly moving landslides (debris flows). | **MP-17** | Develop statewide resiliency plan consistent with intent of HR 3 | Set realistic and achievable, graduated resiliency goals. Evaluate existing weaknesses in structures, infrastructure, systems and institutions to identify critical vulnerabilities that will severely hinder response and recovery from a future megathrust earthquake. Develop prioritized and graduated levels of mitigation activity with estimates of costs and benefits. Identify needed mandates, regulations, codes, incentives and educational and cultural changes needed to reach resiliency goals. Prepare written plan and report for 2013-2015 legislatures. | Removed. |
| **MP-18** | Support the completion of updated, digital floodplain mapping projects initiated through the FEMA Map Modernization Program (previously short-term action #1) and transition to FEMA's current Risk MAP program. | Set realistic and achievable, graduated resiliency goals. Evaluate existing weaknesses in structures, infrastructure, systems and institutions to identify critical vulnerabilities that will severely hinder response and recovery from a future megathrust earthquake. Develop prioritized and graduated levels of mitigation activity with estimates of costs and benefits. Identify needed mandates, regulations, codes, incentives and educational and cultural changes needed to reach resiliency goals. Prepare written plan and report for 2013-2015 legislature. | **MP-18** | Support the completion of updated, digital floodplain mapping projects initiated through the FEMA Map Modernization Program (previously short-term action #1) and transition to FEMA's current Risk MAP program. | The state continues to participate in FEMA's national effort to update flood hazard maps, and through the 2004-2009 Map Modernization Program (Map Mod) the majority of flood maps for Oregon have now been issued in a new digital, countywide format. The state will continue to provide support to help manage the Map Mod projects that remain to be completed (Coos, Lane, Tillamook, and Washington Counties), and DLCD will continue to implement the map modernization management support strategy and activities by:<br>1. Establishing and maintaining a premier data collection and delivery system,<br>2. Achieving effective long-term management of flood hazard maps,<br>3. Building and maintaining mutually beneficial partnerships to accomplish mapping work, and<br>4. Expanding and better informing the flood map user community.<br>Risk MAP (Mapping, Assessment, and Planning) is FEMA's new multi-year mapping program. The program builds on flood hazard data and maps produced through Map Mod while including the vision of building effective community strategies for reducing risk. In partnership with DOGAMI, FEMA contractors, and other state and local agencies, the objectives in Oregon's Risk MAP business plan include:<br>1. Addressing gaps in flood hazard data, identifying areas of dated and/or inconsistent mapping and updating high-priority areas with new mapping (Coos (remap), Curry, Lincoln, Tillamook, Clatsop, and Klamath Counties, as well as the Silvies Watershed and the Lower Columbia-Sandy Watershed—most projects contracted with DOGAMI);<br>2. Acquire new lidar topographic data for precise flood hazard mapping;<br>3. Measurably increase the public's awareness of flood and other natural hazards through a combination of regulatory and non-regulatory products, tools, community outreach, and innovative natural hazard mapping techniques (such as those developed by DOGAMI) that lead to actions that reduce risk to life and property;<br>4. Lead effective engagement in flood mitigation planning through partnerships and shared datasets;<br>5. Provide a coordinated multi-agency digital platform that includes data, links to data, applications, strategies, a digital library of flood hazard maps, and a web map depicting the most recent statewide Special Flood Hazard Area layer;<br>6. Coordinate events, project status, and actions; and<br>7. Align risk analysis programs and develop synergies. | Revised. Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
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| **MP-19** | New maps of precipitation intensity | If not yet available, high-resolution lidar topographic data should be collected on all potentially active volcanoes in Oregon and all the way down the major drainages of each volcano. Lidar data should be used to improve volcano, landslide, flood, and earthquake hazard data. For an example, see the DOGAMI Multi-Hazard and Risk Study for the Mount Hood Region (Burns et al., 2011b). | **MP-19** | New maps of precipitation intensity | A basic study of precipitation intensity will be done, including twenty-four hour isopluvials (two, five, ten, fifty, and 100-year maps), as well as development of probable maximum precipitation coverages for Oregon. | Removed. |
| **MP-20** | Acquire high-resolution lidar data and map hazards | After a damaging tsunami, response and short-term recovery efforts may destroy any scientific evidence of the tsunami, such as surge heights and inundation distances. These data are critical in understanding the tsunami and helping to better prepare for future ones. Once lost it can never be retrieved. Therefore, it is imperative that data gathering be a part of the overall response and recovery plan. This effort should be coordinated with the scientific and technical clearinghouse discussed in the earthquake chapter (short-term #3) and emergency management response and recovery efforts. | **93** | Acquire statewide lidar coverage for the purpose of improving natural hazard mapping and infrastructure inventories. | Lidar is currently the best source of regional topographic data and allows for highly precise and accurate natural hazard mapping (landslide, flooding, volcanic hazards, channel migration zones, tsunami, geologic faults, etc.) and infrastructure inventories (buildings, utilities, lifelines, etc.). The state should continue to invest in lidar acquisition for the purpose of understanding risk to natural hazards at a local scale. | Revised. Ongoing. |
| **MP-21** | Develop a post-disaster tsunami scientific data recovery plan | A basic study of precipitation intensity will be done, including twenty-four hour isopluvials (two, five, ten, fifty, and 100-year maps), as well as development of probable maximum precipitation coverages for Oregon. | **MP-21** | Develop a post-disaster tsunami scientific data recovery plan | After a damaging tsunami, response and short-term recovery efforts may destroy any scientific evidence of the tsunami, such as surge heights and inundation distances. These data are critical in understanding the tsunami and helping to better prepare for future ones. Once lost it can never be retrieved. Therefore, it is imperative that data gathering be a part of the overall response and recovery plan. This effort should be coordinated with the scientific and technical clearinghouse discussed in the earthquake chapter (short-term #3) and emergency management response and recovery efforts. | Removed. |
| **MP-22** | Reconvene the committee that oversees the Mount Hood Coordination Plan | The committee, including the Oregon Office of Emergency Management, USDA Forest Service, U.S. Geological Survey, Oregon Department of Geology and Mineral Industries, Clackamas County, Multnomah County, Hood River County, Wasco County, the Confederated Tribes of the Warm Springs, Clark County, Skamania County, Washington Emergency Management Division, and the Federal Emergency Management Agency (Region X), should reconvene and incorporate new data from the recent DOGAMI Multi-Hazard and Risk Study for the Mount Hood Region (Burns and others, 2011). | **MP-22** | Reconvene the committee that oversees the Mount Hood Coordination Plan. | The committee, including Oregon Office of Emergency Management, USDA Forest Service, U.S. Geological Survey, Oregon Department of Geology and Mineral Industries, Clackamas County, Multnomah County, Hood River County, Wasco County, the Confederated Tribes of the Warm Springs, Clark County, Skamania County, Washington Emergency Management Division, and the Federal Emergency Management Agency (Region X), should reconvene and incorporate new data from the recent DOGAMI Multi-Hazard and Risk Study for the Mount Hood Region (Burns and others, 2011). | Removed. |
| **MP-23** | Assess hazards associated with active crustal faults newly discovered by statewide lidar program. | Multi-hazard and risk analysis should be performed at all potentially active volcanoes in Oregon. For an example see the DOGAMI Multi-Hazard and Risk Study for the Mount Hood Region (Burns et al., 2011b). | **75** | Assess hazards associated with active crustal faults newly discovered by statewide lidar program. | Particularly in central and eastern Oregon, the major earthquake hazards result from poorly known crustal faults. Lidar has greatly expanded the ability to find these faults, which should be systematically evaluated for their potential to generate damaging earthquakes using trenching, geophysical and field studies. This action would help communities prepare and mitigate for newly defined hazard areas in central and eastern Oregon. | Priority. |
| **MP-24** | Perform multi-hazard risk analysis at all potentially active volcanoes in Oregon | A warning system should be developed for volcano and weather-induced hazards like flood, channel migration, and landslides. | **MP-24** | Perform multi-hazard risk analysis at all potentially active volcanoes in Oregon | Multi-hazard risk analysis should be performed at all potentially active volcanoes in Oregon. For an example see the DOGAMI Multi-Hazard and Risk Study for the Mount Hood Region (Burns et al., 2011b). | Revised. Removed. |
| **MP-25** | Warning system | This action has been completed for Mount Hood. Some similar documents have been completed for other volcanoes in Oregon. | **MP-25** | Install a multi-function lahar warning system in areas of high vulnerability | A warning system should be developed for volcano and weather-induced hazards like flood, channel migration, and landslides. | Revised. Removed. |
| **MP-26** | Develop coordination plans for other volcanoes in Oregon | Particularly in central and eastern Oregon, the major earthquake hazards result from poorly known crustal faults. Lidar has greatly expanded the ability to find these faults, which should be systematically evaluated for their potential to generate damaging earthquakes using trenching, geophysical and field studies | **MP-26** | Develop coordination plans for other volcanoes in Oregon | This action has been completed for Mount Hood. Some similar documents have been completed for other volcanoes in Oregon. | Removed. |
| **MP-27** | Evaluation of Landslide Risk | DOGAMI will complete this evaluation in cooperation with local municipalities. Specific methods and priority locations are still to be determined. | **MP-27** | Evaluation of Landslide Risk | DOGAMI will complete this evaluation in cooperation with local municipalities. Specific methods and priority locations are still to be determined. | Removed. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
|---|---|---|---|---|---|---|
| **MP-28** | Update Special Paper 29 (Wang and Clark, 1999) | Update Special Paper 29, Earthquake Damage In Oregon: Preliminary Estimates of Future Earthquake Losses, a statewide damage and loss estimation study (Wang and Clark, 1999). This update should include preparing tsunami damage and loss estimates, and possibly better accounting for unreinforced masonry construction. | **72** | Update Special Paper 29 (Wang and Clark, 1999) | Update 1999 Special Paper 29, Earthquake Damage In Oregon: Preliminary Estimates of Future Earthquake Losses (Wang and Clark, 1999), a statewide damage and loss estimation study. This update, at a minimum, should incorporate damage and loss estimates for a magnitude 9 Cascadia earthquake, an exposure analysis of tsunami hazards, and probabilistic hazards including updated probabilistic earthquake ground motions and flooding zones. School and emergency facilities from the 2007 DOGAMI database should be incorporated. | Revised. Priority. |
| | | | **90** | Use lidar for statewide analysis of all natural hazards | Lidar is currently the best source of regional topographic data and allows for highly precise and accurate natural hazard mapping (landslide, flooding, volcanic hazards, channel migration zones, tsunami, geologic faults, etc.) and infrastructure inventories (buildings, utilities, lifelines, etc.). Many Oregon state agencies currently use lidar for natural hazard analyses and will continue to do so where lidar is available. | New. Ongoing. |
| | | | **122** | Continue developing Emergency Action Plans for all remaining high hazard dams in Oregon. | In Oregon, money from FEMA grants and state funds is used to help dam owners create Emergency Action Plans (EAP). An EAP helps identify situations where a dam failure might occur, actions to take that could save the dam, if possible, and evacuation routes for a dam failure situation. There is an Oregon-specific EAP template available, designed for owners of remote dams that have limited personnel. Approximately 75% of state-regulated high hazard dams have, or are currently developing EAPs. There are 67 state regulated high hazard dams, and another 65 federal high hazard dams in which OWRD plays a coordinating role. | New. Ongoing. |
| | | | **54** | Support and implement the actions in the February 2013 Oregon Resilience Plan and recommended in the Oregon Resilience Plan Task Force's October 2014 report. | The Oregon Resilience Task Force was established by Senate Bill 33. It was tasked to facilitate a comprehensive and robust plan to implement the strategic vision and roadmap of the Oregon Resilience Plan for responding to the consequences of naturally occurring seismic events associated with geologic shift along the Cascadia subduction zone. The Task Force's report was delivered to the legislature on October 1, 2014. | New. Priority. |
| | | | **70** | Conduct a pilot project on two coastal estuaries to develop a framework for modeling sea level rise and to assess the overall impact of sea level rise on the estuaries. | Implement sea level rise modeling for the pilot study areas. Study results will be used to guide a future, more comprehensive and coast-wide assessment of sea level rise impacts. Once completed, the results can be used minimize future damage or loss of property and the environment. | New. Priority. |
| | | | **63** | Identify areas on the coast that will be "islands", or cut off, from other cities or critical recovery resources following a Cascadia Subduction Zone earthquake & tsunami. | Produce GIS database of resources in each "island" expected to be isolated after a Cascadia Subduction Zone (CSZ) earthquake and resulting tsunami in order to preplan for response. Shape files are to be imported into RAPTOR, Oregon Explorer, and other GIS tools. This action item supports the local community's ability to prepare for and sustain or recover function following a CSZ earthquake and tsunami. | New. Priority. |
| | | | **12** | Assist one coastal community per year in considering vertical evacuation structures and improved evacuation routes due to evacuation constraints. | Use the anisotropic path modeling to measure the time needed to evacuate all parts of the maximum-considered Cascadia tsunami inundation zone in order to evaluate the need for vertical evacuation structures and improvements in evacuation routes. These actions will provide guidance to communities on the best locations to build vertical evacuation structures that will save lives in a catastrophic tsunami event. The results will also inform communities of priority evacuation routes needing additional signage or way-finding markers. The planned communities are:<br>2014 = Seaside<br>2015 = Warrenton<br>2016 = Rockaway Beach<br>2017 = Siletz Bay area<br>2018 = Pacific City | New. Priority. |

# 2012 to 2015 Mitigation Action Crosswalk

| 2012 Action # | 2012 Action Statement | 2012 Action Description | 2015 Action # | 2015 Action Statement | 2015 Action Description | Revised or New? Which 2015 Table? |
|---|---|---|---|---|---|---|
| | | | **48** | Evaluate the impact of climate change on landslides. | The precipitation-triggered landslides will increase or decrease with changes in climate. Evaluation of this change will be important for the future of Oregon. | New. Priority. |
| | | | **64** | Evaluate sediment impacts to Oregon's water resources. | Oregon has unique water resources, some of which are for drinking water. Landslides can have a great impact on this resource by input of large amounts of sediment. Evaluation of erosion potential by watershed would help the regulators and providers identify areas for mitigation. | New. Priority. |
| | | | **15** | Develop new standardized risk assessment methodology across all hazards, at the state and local levels. | Oregon does not have a clear and common methodology to identify the most vulnerable populations across all hazards at the state and local levels. In 2013, the State IHMT Risk Assessment Subcommittee in partnership with the OPDR and the U of O InfoGraphics Lab developed a model concept, work plan and budget. Pending funding, this model could be fully developed between 2014 and 2019 and then be used to inform the 2020 Oregon NHMP. Upon full development, the model will allow state and local governments to strategically target mitigation resources. | New. Priority. |
| | | | **61** | Install High Water Mark (HWM) signs after flood events and co-locate stage crest gages on select HWM signs. | HWM signs installed in high visibility areas increase the general public's awareness of flood risk and drive flood mitigation actions in communities. They spark conversations about past floods and are a good entry point for discussions promoting mitigation actions such as elevating buildings, purchasing flood insurance, and participating in FEMA's Community Rating System Program. Stage crest gages co-located with select HWM signs will capture new high-water data when floods occur. | New. Priority. |
| | | | **59** | Schedule three opportunities over the life of this plan for state-local dialogue on vulnerability assessments to improve consistency and mutual understanding. | Traditionally, local jurisdictions have used the OEM Hazard Analysis Methodology to update LNHMP vulnerability assessments. State agencies with hazard oversight use a wide range of methods to conduct statewide vulnerability assessments for the Oregon NHMP. The results are varying degrees of similarities and differences among local and state vulnerability scores. This dialogue is intended for the state and local governments to educate each other on the rationale behind the differing scores and to identify ways to better align local and state vulnerability assessments. | New. Priority. |

### 3.3.5 Mitigation Successes

Oregon maintains documentation of "mitigation success stories." These are completed mitigation actions that have shown to be successful by either 1) avoiding potential losses; or 2) demonstrating cost-effectiveness through benefit cost analysis or qualitative assessment, or both. Likewise, actions that support mitigation efforts, like risk or vulnerability assessment studies, are included. Mitigation success stories are completed by or with input from the action's coordinating agency.

### 3.3.5.1 Mitigation Success - State of Oregon, 2014

Best Practices Federal Emergency Management Agency / Region 10 2014

FEMA

Best practices

Disaster Mitigation Working in Oregon

# Mitigation Brings Enhanced Safety and Reduced Losses

***Oregon individuals, businesses and government agencies work together to promote safety and to invest in hazard mitigation actions that save lives and reduce or eliminate damage. As a result, a severe winter storm may become an emergency, but not necessarily a disaster.***

**Oregon** — A severe winter storm may bring extreme cold, wind, snow, ice, falling trees, or all of these and more. The result, at the very least, is major inconvenience. Emergency managers and others work throughout the year to limit the impacts of these storms.

During the hazardous event, transportation woes can be kept to a minimum when public warning systems and years of outreach education convince most people to stay off the roads. Schools may be closed and other activities canceled or postponed. With reduced traffic, emergency services crews are better able to respond quickly and efficiently.

There may or may not be electrical power outages associated with a storm. Electric utility officials work throughout the year to improve the reliability of their power distribution systems. They make ongoing investments in tree pruning, pole replacement and maintenance of equipment, as well as investing in strong, flexible and more durable insulators and other components. The experts must analyze and prioritize the investments to address the most trouble-prone sections of the distribution systems. In some instances these may be rerouted to safer areas or placed underground in buried conduit and waterproof vaults.

Additionally, electric utilities undertake projects that provide redundant power sources to critical facilities such as emergency services buildings, medical centers, communications towers, sewage treatment plants, water systems and so on. The investments often include automated power transfer switches, sensors, monitors and other sophisticated equipment.

The wide variety of mitigation investments that promote safety and prevent damage are funded, in part, through state and federal grant programs. Others are paid for by local governments, utilities, businesses and individuals.

The work and expense pay big dividends when a storm arrives and departs without generating a disaster. No news can really be very good news!

***Hazard mitigation is about taking action before the next disaster to reduce human and financial consequences later.***

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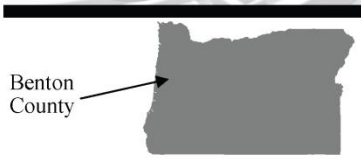
### 3.3.5.2 Mitigation Success - Benton County, 2014

Best Practices Federal Emergency Management Agency / Region 10 2014

FEMA

Best practices

Disaster Mitigation Working in Oregon




# Mitigation Investments Bring Safety and Reliable Power

***Effective mitigation can break the cycle of disaster damage, reconstruction and repeated damage. It lessens the financial impact on individuals, communities and society as a whole.***

***A recent study by the Multi-hazard Mitigation Council shows that each dollar spent on mitigation saves society an average of four dollars.***

**Benton County, Oregon—** Electrical power outages are a familiar experience when winter storms bring high wind, heavy snow, ice and falling trees. All of these can cause severe damage to transmission lines, poles and transformers.

Consumers Power Inc. (CPI) is a consumer-owned electric power cooperative that serves parts of Benton and five other Oregon counties. Director of Operations & Engineering Greg Pierce said he knows that prevention of storm damage and resulting service disruption requires continuous maintenance and investment in upgrades to the utility's electrical distribution system.

## Wind, snow, and ice cause damage to power systems

Pruning and removing "hazard trees" is part of the solution. Permanent system improvements can also be cost effective.

"These can sometimes include adding more poles to reduce spans and reduce stress on poles and arms," said Pierce. "Using new technology such as more flexible and durable insulators and fiberglass cross arms is another way to reduce storm damage."

Relocating the power lines to underground conduit, while expensive, can also sometimes be an excellent alternative. This approach has helped CPI to improve the reliability of power from its Corvallis substation to a major hospital and surrounding campus of 13 other buildings on Medical Hill just north of the city. The mitigation project was developed in partnership with Good Samaritan Hospital, Corvallis Clinic, and the Benton County Emergency Management Council.

As a consumer-owned utility, CPI was eligible to apply for financial assistance from the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) to replace a troublesome section of its

*continued on page 2…*

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**Good Samaritan Hospital**

12,470-volt feeder line that serves the health care complex. The project was approved and completed in 2003. Moving the wires underground has significantly reduced power outages caused by winter storms.

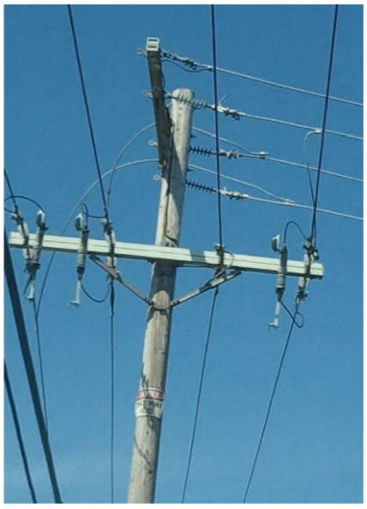
*HMGP funding is administered by the Oregon Office of Emergency Management FEMA. FEMA provides 75 percent of the eligible costs of approved projects.*

CPI is now in the pre-application process for HMGP funding to begin a similar project to further improve the reliability of electrical service to the hospital campus and surrounding area. A nearby section of the main overhead feeder line passes through a 4,330-foot right-of-way corridor that has no road access. Part of the densely wooded area is very wet and muddy, making it difficult during most of the year to make repairs, replace poles or prune trees. The CPI proposal is to move the transmission lines underground by digging a trench in part of the problem area, and to use horizontal boring equipment to install the line beneath the ground. This type of work requires "best management practices" to minimize disturbance of wildlife and other natural resources.

Approval of grant-funded hazard mitigation projects requires proof of a clear benefit to the community. An obvious fact is that critical medical facilities depend on reliable sources of electricity.

The grant application will include a benefit-versus-cost analysis that includes the history of power outages from this section of line along with associated repair expenses. Approximate costs to utility customers who lose power will also be considered. The proposal must also describe and analyze alternative solutions. An example would be rerouting the power around the entire problem area by using an existing road right of way. Detailed cost estimates of the proposed new work are another critical part of a successful grant application.

**The safety of utility workers is another important factor to be considered. Emergency repair work during bad weather is dangerous!**



**New insulator technology**

**"The cost of power failures and emergency repairs is just too much for our customers and our utility" said Pierce. "We've found that continuous improvements can bring safety, reliability and savings year after year."**

**Underground power conduit**

**Project site visit**

### 3.3.5.3 Mitigation Success - Lane County, 2014

Best Practices | Federal Emergency Management Agency / Region 10 | 2014

FEMA

Best practices

Disaster Mitigation Working in Oregon

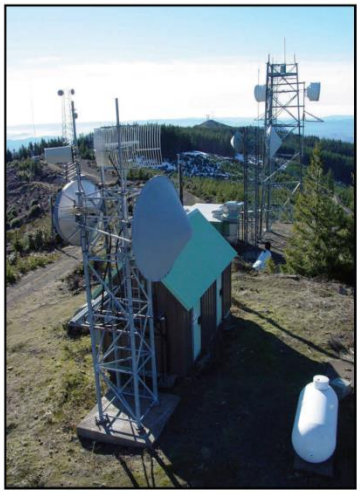
Lane County

# Protecting Critical Power and Communications Facilities

**Hazard mitigation benefits society by:**

- **Creatinig safer communities by reducing loss of life and property;**
- **Enabling individuals to recover more rapidly from floods and other disasters, and;**
- **Lessening the financial impact on the Federal Treasury, States, Tribes and communities.**

EPUD is in the preliminary stages of requesting Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Program (HMGP) cost-share-funding to replace the 2.3 mile overhead line with an underground power line along existing roads. This is expected to eliminate the outages caused by falling limbs, trees and lightning. It will also reduce fire danger by eliminating risk of dry weather tree contact with energized power lines.



**Previous and highly successful Harness Mountain project**

**Lane County, Oregon** — The Emerald People's Utility District (EPUD) provides electrical power to a remote mountaintop communications site on Badger Mountain, west of Veneta, Oregon. Over the years, the 12,000-volt overhead power line has been consistently subjected to prolonged outages during storm seasons while serving AT&T Cellular, Verizon, Nextel, Blachly Lane Electric Cooperative, and the Bonneville Power Administration communication tower. All are critical links to the cellular phone service and power transmission in the Lane County area.

**Buried power line vault**

**The consumer-owned utility district made a similar investment in 2002 that was also partially funded with HMGP funds. A 5.5-mile overhead line to Harness Mountain communications facilities was plagued with repetitive outages. Repair work sometimes took many hours- and even days- to restore because of deep snow, impassible roads and fallen trees. EPUD leaders have stated the project is a huge success.**

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### 3.3.5.4 Mitigation Success - City of Springfield, 2014

Best Practices Federal Emergency Management Agency / Region 10 2014

FEMA

Best practices

Disaster Mitigation Working in Oregon

# Electric Power Loss Mitigation: Invest in the Weak Links

***Hazard mitigation is about taking action before the next disaster to reduce human and financial consequences later.***

**Overhead to underground power transmission project**

**Springfield, Oregon -** The Emerald Circuit is a vital part of an electrical power transmission system that connects three Springfield-area substations to hundreds of homes, businesses, a shopping center, schools, a fire station, traffic signals and two water reservoirs.

Sections of the overhead line run through an area with numerous trees, making damage to the system almost inevitable when severe storms bring high wind, wet snow or freezing rain. A mitigation measure for one segment of circuit was implemented in 2002, when a particularly damage-prone 2,700-foot section of the overhead system was removed and replaced with wires installed in underground conduit and waterproof vaults.

The Springfield Utility Board worked closely with the Oregon Office of Emergency Management and the Federal Emergency Management Agency (FEMA) to secure Hazard Mitigation Grant Program (HMGP) funding to enable the $163,642 investment in greater system reliability.

The HMGP funding required that costs, benefits and alternatives were carefully analyzed to ensure the project was cost-effective and appropriate. The area's rugged and steeply sloping landscape meant that the estimated cost of replacing damaged poles and lines for the section was to be $144,000 to $180,000. Access issues added additional expenses and delay when past repairs were needed. Potential threats to public health and safety from a power outage, along with extremely high costs to utility customers, were also significant factors in the calculation of project benefits and losses that could be avoided.

*continued on page 2*

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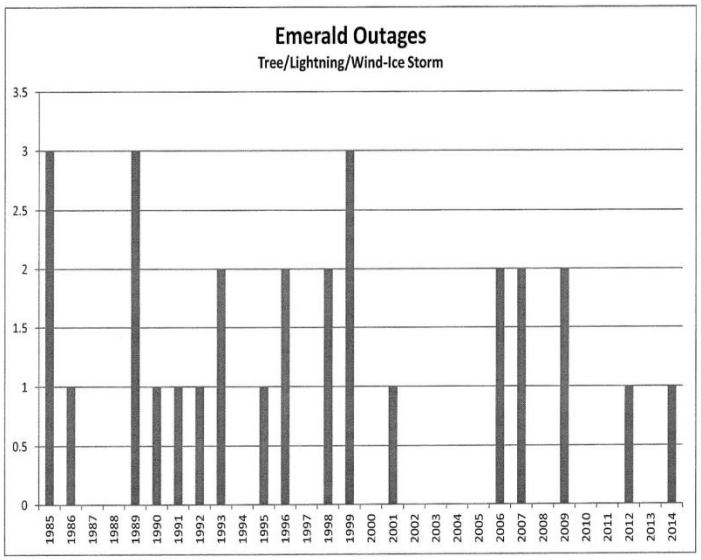
**Best Practices** **Disaster Mitigation Working in Oregon**

The 12 years since project completion have brought significant reduction of documented damage to the Emerald Circuit *(see chart on right)*. During this period, the Springfield Utility Board made various investments in equipment upgrades as well as two additional "undergrounding" projects.

Severe winter storms still cause occasional power outages along another section of the Emerald line. This residual "weak link" in the system is a vulnerable 1,450-foot stretch of overhead transmission line adjacent to the earlier project and similarly accessible only on foot or with track equipment. A pre-application for HMGP funding to help pay for the undergrounding of this troublesome section is currently under review.



**Power transmission easement bordered by 40-to 80-foot trees**

**The Federal Emergency Management Agency (FEMA), along with its state partners, administers the Hazard Mitigation Grant Program (HMGP) to assist states and local communities in implementing long-term hazard mitigation measures following a major disaster declaration.**

**Following 2012's Hurricane Sandy, the *Sandy Recovery Improvement Act* helped bring about a more streamlined HMGP process with an emphasis on more timely selection and implementation of projects.**

**State and local Hazard Mitigation Plans that are up to date and approved are critical to establishing eligibility and priorities in the selection of projects.**

**Build Stronger, Safer, Smarter** **2**

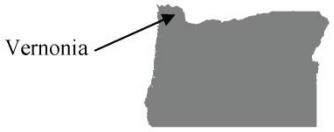
## 3.3.5.5 Mitigation Success - City of Vernonia, 2014

Best Practices Federal Emergency Management Agency / Region 10 2014

FEMA

Best practices

Disaster Mitigation Working in Oregon




# Vernonia's Whole Community Working for a Resilient Future

**Vernonia, Oregon** — This remote community of about 2,150 people is celebrating the relocation and replacement of its three school facilities. The success of the enormous project came after years of struggling to recover from the 2007 "flood of record," the worst of 27 flood events that are part of the town's history.

Among the many challenges that followed the flood was the need to replace the heart of their community, the elementary, middle and high schools that served more than 700 students. After an impressive investment of resources, and intense effort by the local communities, Vernonia now has a far brighter outlook. Its beautiful new school buildings are finally relocated out of the flood-plain and in full use.

**New school and community center facilities**

**A history of disaster damage:** The city of Vernonia has been plagued with severe, repetitive, highly damaging floods, typically from rain falling on snow in the Nehalem River and Rock Creek watersheds. A major event in 1996 was about three feet higher than the 1972 and 1974 floods. Residents and business owners cleaned up and made major efforts to rebuild stronger and safer, elevating many buildings above the floodplain. But disaster struck again in December of 2007, with an even more catastrophic "flood of record."

This time, infrastructure and property, including electrical substations, health care buildings, the senior center and many other critical facilities, were severely damaged or destroyed. More than 1,000 homes sustained damage and at least 100 were found to be beyond repair.

A final blow came when the wastewater treatment facility was inundated and five feet of sewage-contaminated water poured into the elementary, middle and high school buildings.

Oregonians and the nation provided emergency assistance, including more than 1 million hours of volunteer aid, but the nearly complete loss of Vernonia's school system cast an enormous shadow over the future of the community.

*continued on page 2*

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**Best Practices** **Disaster Mitigation Working in Oregon**

**The "Best Practices" story:**
The story of recovery and triumph over this disaster involves intense determination and cooperative effort that began in the local community. The challenges were taken up by virtually all of the local leaders, local and regional business owners and countless volunteers.

Oregon's governor appointed an **Oregon Solutions Task Force** of 36 agencies and organizations, and more than 50 individuals, to identify funding sources for a renewed school system and to develop a plan. **Their charge was to involve the community through a fair, open and participatory process that would earn the support of the whole community.**

After researching a variety of alternatives, the community agreed to build an entirely new K-12 campus and community center. The discussions led to the decision to locate the new facilities on higher ground that was partly occupied by Spencer Park. After demolition of the old school buildings, the plan specified that the park would be re-established at the flood-prone school property.

A daunting challenge was the need to raise an estimated $40 million to accomplish the ambitious goals. The search for financial resources would include potential State of Oregon contributions. One of the many successes was an eventual $3.8 million Oregon Department of Transportation grant.

The largest sources of funding for the school project, and for many other elements of Vernonia's overall disaster recovery, were made possible by the coordination and collaboration of the Oregon Office of Emergency Management and the Federal Emergency Management Agency (FEMA). These agencies were able to provide approximately

**2007 "flood of record" — hours before sewage-contaminated water rose two additional feet**

$20 million in FEMA Flood Mitigation Assistance and Hazard Mitigation Grant Program funds, along with many additional millions through the Public Assistance infrastructure repair funding, and Individual Assistance programs.

Other federal agencies, including the Department of Energy, also helped make it possible to invest in Leadership in Energy and Environmental Design Platinum-rated "state of the art" buildings. The energy-efficient, durable and sustainable new facilities are now compatible with the ambitious educational program goals of the Vernonia school district.

A major foundation challenge grant was matched by corporate, small business, foundation and individual contributions from all over the state.

In a critical 2009 vote, despite severe blows to the local economy from the flood and a more general recession, voters in Columbia County and Washington County who live within the Vernonia School District voted to approve a $13 million school construction bond measure. In addition, the school district secured a $5.6 million long-term, low-interest loan.

At a recent celebration of the completed school replacement project, donors and supporters who were responsible for achieving the ambitious goals were honored for their dedication. The superintendent of Vernonia schools summarized the spirit and motivation that brought success: **"We came together for a common purpose: Not just to build a school, but to strengthen the community."**

*Vernonia is an example of a resilient community, where people work together to anticipate and address future conditions and challenges. Investing in hazard mitigation can break the cycle of disaster damage, reconstruction and repeated damage.*

**Build Stronger, Safer, Smarter** **2**

### 3.3.5.6 Mitigation Success—City of Brookings Wastewater Treatement Plant, 2014

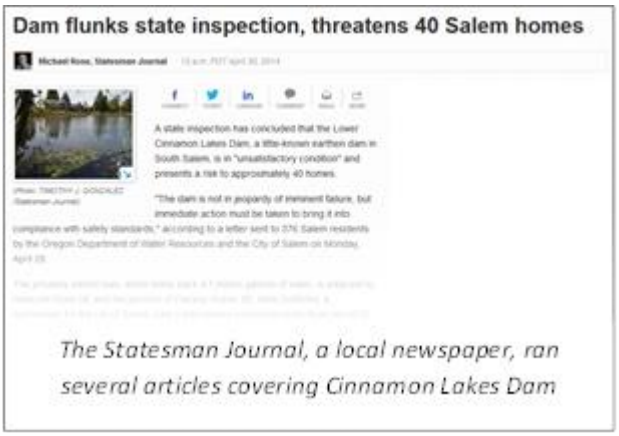
The Brookings Wastewater Treatment Plant (WWTP) serves a population of 10,380 people and is the sole treatment facility for the city of Brookings and the Brookings Harbor unincorporated area east of the city limits. The WWTP is located on a bluff adjacent to the Pacific Ocean where grade elevations at the plant range from about 85 to 90 feet; thus, the plant is above the tsunami hazard area.

The WWTP faced a severe, imminent risk from slope failure; the active slope-failure slip plane had been mapped by a site-specific geotechnical evaluation. Mapped tension cracks from downslope slip extend inland to the western wall of plant's tanks and piping infrastructure. This most likely landslide failure mode would destroy significant components of the WWTP rendering the plant non-operational.

The approved mitigation project is to stabilize the slope at the location of most acute slope failure risk—the area adjacent to the northwest side of the facility. By installing a system of "tied-back" solider piles, this mitigation project will significantly reduce the risk of slope failure which would otherwise be a catastrophic point of failure for the function of the WWTP. A lower-bound benefit-cost ratio greater than one demonstrates this mitigation project is a long-term, cost-effective solution to the slope failure risk. The mitigation project was competed in October 2014 prior to the onset of the winter rainy season.

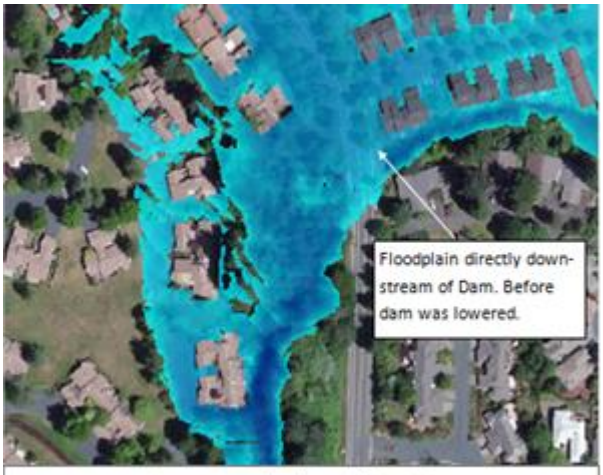
### 3.3.5.7 Mitigation Success—City of Salem, Lower Cinnamon Lake Dam Rehabilitation, 2014

Lower Cinnamon Lake is the last in a string of small lakes located in a residential neighborhood in Salem (Marion County, Oregon). The lake is permitted under the statutory size requirement. In other words, it does not fall under the oversight of the state's Dam Safety Program. Because of its smaller size, there was limited awareness to any potential hazard. A bathymetric survey and volume estimate provided by the Oregon Water Resources Department revealed the lake to be larger than previously thought, requiring it to come into alignment with the state's dam safety requirements. Due to its unsatisfactory condition, the dam posed a high hazard to downstream life and property.



*The Statesman Journal, a local newspaper, ran several articles covering Cinnamon Lakes Dam*

The Department worked with the dam owner and others to quantify the risk of a potential failure, soliciting the engineering expertise of Boatwright Engineering to assess needs and alternatives and regularly engaging with the media and community members. Design drawings for the dam were not available and the date the lake was initially filled was unknown, therefore standard engineering practices could not be assumed. Reliable inundation maps were produced. In May 2014, the Department held an informational public meeting for the community at risk to address concerns and answer questions.



*Dam Breach Floodplain Map*

The solution was to reduce the pool elevation by 3 feet, which reduced the lake's capacity and alleviated the risk. At this reduced level, flood depths in the event of a dam failure are not considered harmful. This also successfully brought the dam and its storage capacity into compliance with the authorized water right. Inundation maps were produced at the lower elevation, and a sensitivity analysis was completed to verify downstream safety. Upon lowering the reservoir, significant damage was observed where beavers had borrowed into the dam upstream. Another reason these small dams were edging closer to a catastrophe.

The Department's Dam Safety staff conducted the bathymetric analysis and dam breach model. The City of Salem, Boatwright Engineering, and the Water Resources Department worked collectively and quickly to restore this lake to continue providing aesthetic benefits to the community.

## 3.3.5.8 Mitigation Success—Oregon Coast, Tsunami Evacuation Wayfinding, 2014

**Context:** The people of the Oregon coast critically need accurate educational materials and effective mitigation tools to prepare for both distant tsunamis and the next great Cascadia earthquake and tsunami.

**Problem:** In the critical few moments between a Cascadia Subduction Zone earthquake and the arrival of the tsunami, residents and visitors to the coast need to have a clear, easily identifiable pathway to safety. Currently, tsunami evacuation routes are poorly marked.

**Solution:** This research study was the first step in re-evaluating how we do tsunami evacuation wayfinding. The University of Oregon's Portland Urban Architecture Laboratory (PUARL) was engaged to complete this stage of the project. They brought a unique viewpoint and methodology to the problem. PUARL made several field trips to the coast to meet with local stakeholders and conduct preliminary work. On August 29-30, a charrette was held in Astoria, Oregon to work through common evacuation problems and formulate a menu of innovative solutions

*Charrette participants provide feedback on tsunami evacuation route wayfinding. (A. Rizzo)*

*Creative ideas are displayed. (A. Rizzo)*

Pedestrian time and speed maps developed by DOGAMI were key products that aided visualization of evacuation problems. Charrette participants - mainly local government representatives from several coastal communities - developed creative solutions to common problems. All of the data collected by PUARL is being shared through the final report that is available on the Oregon Tsunami Clearinghouse.

The study utilized the development of a pattern language to solve problems and offer community-driven solutions. One of the most important recommendations was implementation of lighted evacuation routes utilizing solar technologies that will survive a local earthquake. Implementation of this technology will solve the problem of night time evacuation and greatly enhance the likelihood of successful daytime evacuation as well.

**Benefits:** This project, when completed will help to save lives after a Cascadia subduction zone earthquake and tsunami.

### 3.3.5.9 Mitigation Success –City of Portland, Johnson Creek Floodplain Acquisition and Restoration, 2013

Almost every year, whenever a large rainstorm event would pass through Portland, Johnson Creek would flood the flat, residential and commercial areas along Foster Rd and SE 100th, 106th, and 108th avenues if waters rose over 11 feet. Given the repeated flooding, the city of Portland invested $20 million to purchase homes and storing 70 acres of the Johnson Creek watershed.

A major storm in January 2013 tested the restoration efforts. Johnson Creek rose to 13 feet, and while it was close, homes and businesses were spared flooding. Water instead filled the restored floodplain that diverted floodways away from the roadway into 120 feet of new flood storage. The 60-acre site, called the Foster Floodplain Natural Area will be transferred to Portland Parks to be managed as a natural area. According to Maggie Skenderian, Johnson Creek Watershed manager for Portland Environmental Services, the city successfully addressed flood damage and made wildlife habitat improvements. “In the 1930’s, they thought if they moved water downstream it would alleviate flooding—it didn’t work,” she says.

Project funding for the property acquisitions was initially provided by the Hazard Mitigation Grant Program from DR-1099, February 1996 Oregon Flood Disaster. Floodplain restoration, to restore floodplain function and reduce the extent of the flooding, was provided by a Pre-Disaster Mitigation grant in 2005. Along with substantial city funding this project leveraged opportunities to reduce flood impacts in the community and eliminate future losses to the National Flood Insurance Program within the project area and reduce losses north of Foster Rd. A project celebration ceremony was held in April 2013 to recognize property acquisition, restoration of the floodplain function, and losses avoided during the winter of 2012-13.

Source: “East Lents Floodplain Project wraps up, creates 70-acre natural area in East Portland,” by Sara Hottman, The Oregonian, December 27, 2012. Accessed online at: http://www.oregonlive.com/gresham/index.ssf/2012/12/east_lents_floodplain_project.html on June 9, 2014

Source: Communications with Maggie Skenderian via email on July 9, 2014.

### 3.3.5.10 Mitigation Success—State of Oregon Base Flood Elevation Determination Service, 2013

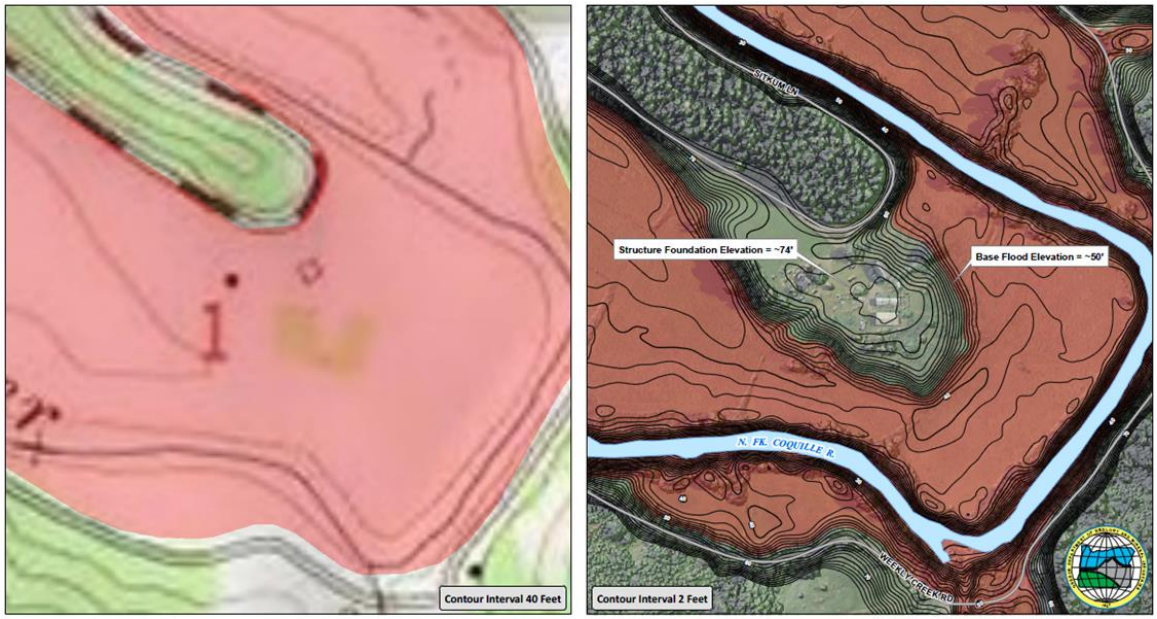
**Context/Background:** Flood Insurance Rate Maps (FIRMs) published by the Federal Emergency Management Agency (FEMA) depict special flood hazard areas (SFHAs) where flood insurance is typically required for structures with federally-backed mortgages. The SFHA represents inundation from a given flooding source (e.g. rivers, ocean, lakes) during a 1% annual chance probability (aka 100-year) flood event. The SFHA can be mapped by either detailed or approximate methods. While BFEs are published for detailed SFHAs (i.e. zones AE, VE, AH, A1-30, and V1-30), they are not published for approximate SFHAs (i.e. zones A, V).

**Problem:** The SFHA is mapped using the best information and technology available at the time, but unfortunately many FIRMs in Oregon have not been revised since the 1970's and 80's. FIRMs created several decades ago can be very inaccurate by today's standards and may incorrectly show homes or other insurable structures in the SFHA. In these cases it may be appropriate to submit a Letter of Map Amendment (LOMA) to FEMA that documents the structure is above the nearest Base Flood Elevation (BFE). While a professional surveyor can be hired to measure the structure's elevation, if the SFHA is a Zone A or V a BFE to compare to is not available.

**Solution:** DOGAMI is recognized by FEMA as an authoritative source of BFE determinations. In 2013 DOGAMI established the BFE Determination Service which can assist surveyors, local officials, or professional engineers in determining the BFE for a specific location in areas where lidar data are available. DOGAMI provides a study map, summary report, BFE determination letter(s), and a data analysis package in GIS format to the requester.

**Benefits:**

- The general public now has a prompt and affordable option to receive a BFE determination from a government agency.
- LOMAs are processed quickly because DOGAMI is recognized by FEMA as an authoritative source of BFE information, saving FEMA and the homeowner time.
- Each BFE determination is made for a minimum of two river miles and made publicly available so developers or nearby homeowners can use the information freely.
- All BFE determinations are made using highly accurate lidar topography so floodplain mapping can be performed with a high degree of certainty.




*A new lidar-based BFE determination along the North Fork Coquille River in Coos County shows a house is actually 24 feet above the BFE (right). The house was previously mapped in the SFHA on a FIRM from the 1980s (left).*

### 3.3.5.11 Mitigation Success—Lincoln County, Silver Sands Road District Downstream Culvert Upsizing, 2013

In unincorporated Lincoln County, Buckley Creek runs northward through a residential neighborhood and two culverts before draining into the Pacific Ocean. During Disaster DR-4055, the upstream culvert was washed out by heavy stream flow that continued downstream and flooded three residential properties. The damaged upstream culvert was replaced (and size upgraded as a 406 mitigation measure) by the Public Assistance (PA) program. Unfortunately, the downstream culvert (which was undamaged) became a flow constraint in the conveyance and would likely be the cause for continued residential flooding. In fact, the PA Project Worksheet noted that the deficient downstream culvert should be upgraded in tandem with the upstream culvert, but such mitigation was not eligible under the Public Assistance program. An HMGP project was developed to replace and upsize the downstream culvert to match the conveyance of the upstream culvert so water would pass unrestricted. The upsized, downstream culvert project was completed in October 2013 and is another example of two FEMA mitigation programs working in partnership

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### 3.3.5.12 Mitigation Success—Oregon Coast, Tsunami Hazard Identification, Mapping, and Evacuation, 2013

**Background:** One of the most important tasks for DOGAMI is helping coastal communities understand and mitigate for the risk of possible tsunamis. Communities located in exposed, low-lying areas along the Oregon coast face the risk of inundation by tsunamis produced by earthquakes around the Pacific Rim far from Oregon, as well as local earthquakes on the Cascadia subduction zone (CSZ). In the wake of the 2004 Indian Ocean tsunami, the state of Oregon advanced a new effort to reassess tsunami hazards for the entire length of the state's Pacific coastline. Reports of tsunami runup as high as 30-35m near the epicenter of the great Sumatra-Andaman Islands earthquake of 2004 raised the question: Could the Cascadia subduction zone produce a wave as large as the devastating Indian Ocean tsunami? The urgency for this reassessment was underscored by a study of Oregon's tsunami vulnerability (Wood, 2007) which indicated that the Oregon tsunami inundation zone on average, every day contains approximately 22,201 residents, 14,857 employees, and 53,714 Oregon State Parks visitors. DOGAMI then completed a tsunami hazard assessment at Cannon Beach, Oregon (Priest et al., 2009) that highlighted the potential severity of a future Cascadia event and showed that new maps were critically needed to reduce the loss of life and property threatened by tsunamis.

**Problem:** The state of Oregon has a beautiful coastline on the Pacific Ocean where thousands of people visit, live, work, and play each year. Prior to 2009, advanced hydrodynamic tsunami modeling had not occurred and therefore the tsunami hazard area was very poorly defined. Without the hazard being defined, it was also very difficult to create a culture of awareness and preparedness that would reduce the loss of life and property.

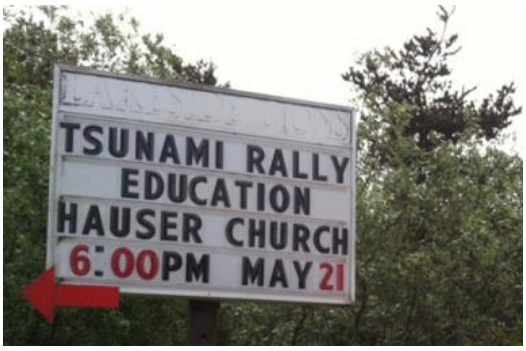
**Solution:** In 2009, DOGAMI was awarded a grant from NOAA to complete tsunami inundation modeling and mapping along the state's entire Pacific coastline, provide mitigation products that promote preparedness, and implement a sustainable, volunteer-driven education and outreach program. This five year project resulted in tsunami inundation data and maps for the entire Oregon coastline showing distant and local tsunami scenarios, evacuation brochures for populated areas along the coast, and an outreach and education program (Tsunami Outreach Oregon) that facilitated evacuation drills, training for local preparedness volunteers, the distribution of materials, and signs for evacuation routes and assembly areas.

**Benefits:**

- Hazard identification for the entire coastline has occurred. This is a monumental step toward effective planning and the creation of mitigation actions to reduce the loss of life and property.
- The GIS data of the tsunami scenarios and assembly areas are publicly available for anyone to use.
- Tsunami inundation maps for the entire coastline have been created. Evacuation brochures for 42 communities along the coast have been created and are publicly available from the Oregon Tsunami Clearinghouse web page. http://www.oregontsunami.org
- DOGAMI staff worked hand-in-hand with each community to create the evacuation brochures. Most communities did not have assembly areas identified that were outside of the inundation zones where people could temporarily assemble following a CSZ event. Establishing assembly

areas for communities can be an intensive process depending on factors like the availability of high ground options, determining the landowner of a location, and acquiring permission from private property owners. All 42 evacuation brochures created during this project have assembly areas established and shown on the maps. The outreach program also funded the purchase of 24”x36” assembly area signs that have been erected at these locations so that evacuees know when they’ve reached the designated locations.

- The evacuation brochures also highlight the best evacuation routes to take in order to reach high ground or an assembly area.




*Tsunami readiness rallies were held along the Oregon coast to educate the public on the earthquake and tsunami hazard, unveil the new inundation maps for the area, distribute new evacuation brochures to residents, and generate interest in the area’s evacuation drill.*

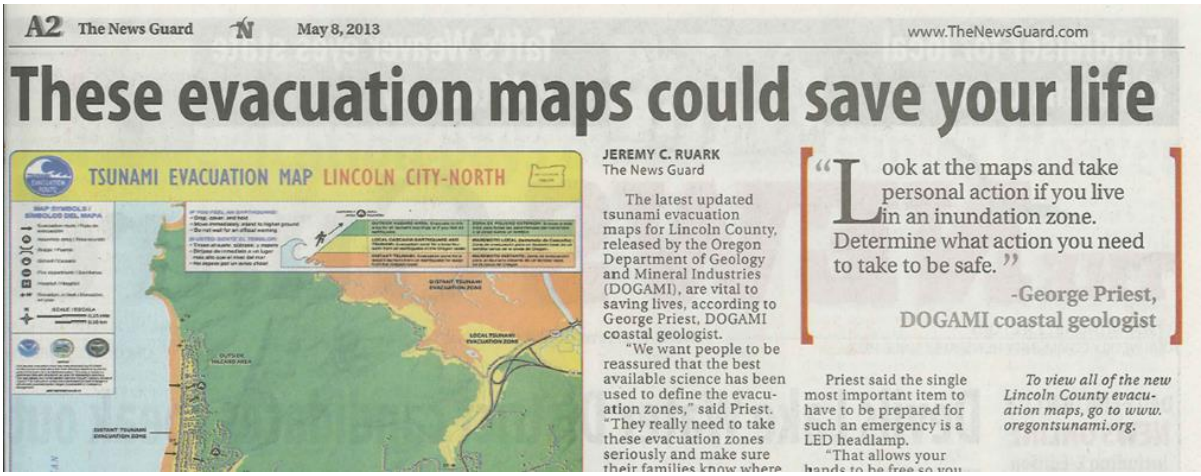
*DOGAMI staff meet with local emergency responders and planners to establish new assembly areas and review draft evacuation brochures.*

*In Gleneden Beach, a "Tsunami Stroll" attracted 97 participants, including many seniors who previously didn't think they could reach high ground on foot:*

*Mr. Lee Hood won the“Best Decorated Go Bag” prize.*

*Ms. Nellie Jaujou celebrates her arrival at an assembly area.*

*Residents in Lincoln City examine tsunami inundation maps, the basis of the evacuation brochures distributed for free in coastal communities and available online at www.oregontsunami.org.*



A2 The News Guard May 8, 2013 www.TheNewsGuard.com

# These evacuation maps could save your life

TSUNAMI EVACUATION MAP LINCOLN CITY-NORTH

JEREMY C. RUARK
The News Guard

The latest updated tsunami evacuation maps for Lincoln County, released by the Oregon Department of Geology and Mineral Industries (DOGAMI), are vital to saving lives, according to George Priest, DOGAMI coastal geologist.

"We want people to be reassured that the best available science has been used to define the evacuation zones," said Priest. "They really need to take these evacuation zones seriously and make sure their families know where

"Look at the maps and take personal action if you live in an inundation zone. Determine what action you need to take to be safe."

-George Priest, DOGAMI coastal geologist

Priest said the single most important item to have to be prepared for such an emergency is a LED headlamp.

"That allows your hands to be free so you

*To view all of the new Lincoln County evacuation maps, go to www.oregontsunami.org.*

*The News Guard newspaper was one of many media outlets that helped disseminate the important messaging of the outreach program and provided a reprint of the evacuation brochures.*

### 3.3.5.13 Mitigation Success—Tillamook Bay Repetitive Flood Loss Properties, 2012

As staff and funding resources allow, OEM conducts loss avoidance studies that quantitatively assess the effectiveness of hazard mitigation projects. The most recent loss avoidance study (Appendix 9.3.2 ) was completed in September 2009 and supported by FEMA's Hazard Mitigation Technical Assistance Program (HMTAP) under the auspices of DR-1824. The loss avoidance study was developed to evaluate the success of flood mitigation projects in Tillamook County which has experienced significant, repetitive flood losses beginning with Stafford Act assistance provided under DR-853 (January 1990) through DR-1824 (a total of four major declarations and at least another four significant flood events that were not declared). Flood Mitigation Assistance (FMA) program funding was also used to acquire and elevate flood-prone properties.

Low-lying areas between the Coast Range and the Pacific Ocean are particularly vulnerable to severe flooding. The City of Tillamook, which is located in this region, has repeatedly experienced severe floods, most recently on January 8, 2009 (post DR-1824). In response to these repetitive events, the City and County of Tillamook implemented a number of non-structural flood mitigation projects to reduce damages from future flooding. The projects consisted of the acquisition, elevation, and relocation of flood-prone buildings. The local governments completed the projects with assistance from FEMA, the State of Oregon, other public agencies, and private entities.

Multiple flood events have occurred since the completion of the mitigation projects; the floods could have damaged the buildings if the projects had not been completed. To evaluate losses avoided by the projects, FEMA offered HMTAP assistance to Oregon to support a study to evaluate losses avoided by nine of the projects, the elevation of three commercial buildings and the acquisition/demolition of six commercial buildings along U.S. Highway 101 in the City of Tillamook.

FEMA calculated the value of the losses avoided and compared the value to the cost of mitigation. The aggregate losses avoided were valued at $3.1 million, and the aggregate project cost was valued at approximately $4.7 million (both values in 2009 dollars), resulting in a return on investment of 66%. FEMA estimates that elevation projects are estimated to have an average useful life of 30 years, and that acquisition projects have a useful life of 100 years. The majority of the projects studied were implemented after 2003, which is only some 10 years into the useful life. It is anticipated that the value of the losses avoided, and therefore the return on investment will increase in the future as other flood events occur.

In late 2012, the acquisition of the former Safeway store was finalized (funded by a DR-1733 HMGP sub-grant) and restoration of the property to open space (and floodplain storage) completed.

# 3.4 Capability Assessment

**Requirement 44 CFR §201.4(c),** To be effective the plan must include the following elements:

(3) A Mitigation Strategy that provides the State's blueprint for reducing the losses identified in the risk assessment. This section shall include:

(ii) A discussion of the State's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: an evaluation of State laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas; a discussion of State funding capabilities for hazard mitigation projects; and a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.

## 3.4.1 State Capability Assessment

### 3.4.1.1 State Capability Changes Since Approval of the 2012 Oregon NHMP

After approval of the 2012 Oregon NHMP, DLCD accepted responsibility for the Oregon NHMP and in 2013 hired two full-time staff focused exclusively on natural hazard mitigation, with implementation of Goal 7 as one of their core activities. They also support the State Floodplain Coordinator and the State Risk MAP Coordinator. With this increased capacity, DLCD's Natural Hazards Program is initiating enhanced coordination among internal and external partners, and reaching out to local governments and other interested parties through web-based information sharing, seminars, and other means.

In May 2012, the Oregon Department of Transportation completed the *Oregon Seismic Lifeline Routes (OSLR) Identification* project. The OSLR project study recommends a specific list of highways and bridges that comprise the seismic lifeline network; and establishes a three-tiered system of seismic lifelines to help prioritize investment in seismic retrofits on State-owned highways and bridges.

Mitigation for the earthquake hazard specifically has continued to be a top legislative priority for Oregon. In February 2013, the Oregon Seismic Safety Policy Advisory Commission (OSSPAC) published the *Oregon Resilience Plan*, highlighting the state's vulnerabilities in the event of a Cascadia earthquake and tsunami and identifying mitigation actions. Following publication, the Oregon legislature demonstrated its continuing strong policy focus on earthquake and tsunami mitigation by appointing a Resilience Task Force to suggest which mitigation actions should be undertaken first. The Task Force reported to the legislature on October 1, 2014 (**Oregon Resilience Plan**).

Oregon has begun actively encouraging local governments to consider natural hazards in their land use planning processes. In January 2014, DLCD issued *Preparing for a Cascadia Subduction Zone Tsunami: A Land Use Guide for Oregon Coastal Communities* which provides information on planning techniques to mitigate loss from a Cascadia earthquake and tsunami event.

DLCD is also encouraging local governments to integrate NHMPs with comprehensive plans. In the first half of 2014, with leadership from OPDR and DLCD acting in an advisory capacity, the City of Madras undertook a pilot project to update the Goal 7 section of its comprehensive plan and integrate it with its recently updated NHMP. The project was completed successfully. Clatsop County is updating its NHMP

and integrating it with its comprehensive plan on its own. With new landslide susceptibility maps issued by DOGAMI in 2013 and 2014, Clackamas County and most of its cities, Coos and Curry Counties are positioned to do the same. DLCD's new natural hazards planners will be providing these communities with technical assistance, including a model code for mitigating landslide hazards, through the Goal 7 implementation process.

In the latter half of 2014, DLCD also applied for FEMA funding to assist Tillamook County and its cities, Albany, Beaverton, and Medford with NHMP updates, and will assist as well with integrating the updated NHMPs with comprehensive plans either during or after the NHMP updates.

Staff in ODF are also working toward integrating Community Wildfire Protection Plans with local NHMPs and comprehensive plans.

*The North Coast Resilience Project*, a cooperative endeavor of DLCD, OPDR, and Oregon Sea Grant is engaging north coast communities in hazard mitigation and resilience planning.

*The Regional Framework for Climate Adaptation* is taking place at the same time in Clatsop and Tillamook Counties. It is designed to align agency climate adaptation priorities and to build capacity at the state and local levels to plan for climate variability and change. This effort is being conducted as a proof of concept to develop a low-overhead, comprehensive, risk- and landscape-based approach to climate adaptation planning.

The Oregon Climate Change Research Institute and Oregon Climate Service joined the State IHMT and lent expertise to the 2015 Oregon NHMP in the areas of climate change, drought, and windstorms. This is a very important and exciting enhancement of the State's natural hazard mitigation capability.

New staff in DAS's Chief Financial Office are working to improve data on State-owned and –operated buildings and critical/essential facilities that we anticipate will improve the next Oregon NHMP's risk assessment.

In the latter half of 2014, DLCD initiated and continues to support two Community Rating System Users Groups (northern and southern Oregon) to encourage current participants to maintain their participation and increase their ratings, and to encourage non-participating communities to join the CRS Program. An online forum encourages communication and mutual support, as do regular meetings three times each year.

Oregon is actively pursuing opportunities to expand funding for local mitigation planning and projects. In 2013, the State augmented its capability by hiring two full-time staff in DLCD. In 2014, several state agencies are working on significantly increasing current funding levels and establishing stable funding for hazard mitigation beginning with the 2015-2017 budget cycle. These efforts include:

- Requests for additional staff;
- State funds to provide local governments with at least a portion of the non-federal cost-share required to obtain and use federal hazard mitigation grants through DLCD's Technical Assistance Grant Program; and
- Funding for hazard identification studies, improvements to the current risk assessment methodologies, and enhanced risk communication technology.

As with federal funding, appropriation of funds depends on budget priorities and politics, so the level of funding to support local hazard mitigation planning and projects will always fluctuate. With attention to hazards intensifying, state funding for natural hazard mitigation may begin to grow.

### 3.4.1.2 Policies, Programs, and Capabilities

#### Pre-Disaster Hazard Mitigation Policy Framework

Oregon maintains a robust pre-disaster natural hazard mitigation policy framework. The foundation of this framework is rooted in the Oregon statewide land use planning requirements passed in 1972. Goal 7, the natural hazard planning component of a community's comprehensive land use plan, provided an incentive for all of Oregon's flood-prone communities to participate in the National Flood Insurance Program. A number of Oregon communities have chosen to participate in the Community Rating System as well. Oregon updated Goal 7 in 2002, largely driven by the flooding and landslides of the February 1996 major disaster declaration (DR-1099). In its current form, Goal 7 directs communities to regulate development in hazard-prone areas through local comprehensive plans and implementing ordinances. At minimum, local comprehensive plans in Oregon must address floods (coastal and riverine), landslides, earthquakes and related hazards, tsunamis, coastal erosion, and wildfires where applicable. Thus, all of Oregon's cities and counties are required to plan for Oregon's major natural hazard events and to mitigate impacts through regulatory controls.

Table 3-5 provides an overview of the various policies and federal programs related to specific natural hazards in Oregon.

**Table 3-5. Policies and Federal Programs Related to Specific Natural Hazards in Oregon**

| Hazard | Oregon Statewide Planning Goals & Policies | Federal Programs & National Resources |
|---|---|---|
| Multi-Hazard | Local Comprehensive Plans | Pre-disaster mitigation planning grants (FEMA) |
| | Goal 2: Land Use Planning | |
| | Goal 7 Natural Hazards | American Planning Association (Resources on landslides, flooding, and post-disaster recovery) |
| | Oregon Building Codes | |
| Coastal Hazards | Goal 17: Coastal Shorelands | National Flood Insurance Program (NFIP) |
| | Goal 18: Beaches and Dunes | NFIP V-Zone Construction |
| | Ocean Shore Regulation | Army Corps of Engineers Permit Program |
| | Tsunamis—ORS 336.071, ORS 455.446, and ORS 455.448 | |
| Flood | Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces | National Flood Insurance Program (NFIP) |
| | Division of State Lands (DSL) Fill and Removal Permit Program | NFIP Community Rating System<br>Flood Mitigation Assistance Programs (includes Severe Repetitive Loss and Repetitive Flood Claims Programs as of 2013) |
| | The Oregon Plan for Salmon and Watersheds | FEMA Region X's Policy on Fish Enhancement Structures in the Floodway |
| | Oregon's Wetlands Protection Program | Army Corps of Engineers Permit Program |
| Landslide | Goal 17: Coastal Shorelands | American Planning Association: Landslide Hazards and Planning |
| | The Oregon Plan for Salmon and Watersheds | |
| | 1997 Senate Bill 12: Rapidly Moving Landslides | |
| Seismic | 2005 Senate Bill 2: Statewide seismic needs assessment for schools and emergency facilities | USGS Earthquake Hazards Program |
| | 2005 Senate Bill 3: Seismic earthquake rehabilitation grant program | |
| | 2005 Senate Bill 4 and 5: State bond authorization | |
| | 2001 Senate Bill 13: Seismic Event Preparation | |
| | 2001 Senate Bill 14: Seismic Surveys for School Buildings | |
| | 2001 Senate Bill 15: Seismic Surveys for Hospital Buildings | |
| | 1991 Senate Bill 96: Seismic Hazard Investigation | |
| | Tsunamis—ORS 336.071, ORS 455.446, and ORS 455.448 | |
| Fire–WUI | 1997 Senate Bill 360: Wildland/Urban Interface | National Fire Protection Agency Firewise Program |
| | Additional Criteria for Forestland Dwellings—ORS 215.730 | |
| | Urban Interface Fire Protection—ORS 477.015-061 | |

Source: OPDR

## *State Pre-Disaster Hazard Management Policies*

### *Multi-Hazard*

#### *Statewide Land Use Planning Goals Related to Natural Hazards*

In Oregon, every city and county has a comprehensive plan that includes inventories and implementation measures (e.g., laws and ordinances) to guide community land use decisions. Comprehensive plans are required to address local concerns and issues raised by each of the state's nineteen land use planning goals.

**GOAL 2: LAND USE PLANNING**

Statewide Land Use Planning Goal 2 establishes a land use planning process and policy framework as a basis for decisions and actions related to use of land. It also assures that an adequate factual base exists for such decisions and actions.

**GOAL 5: NATURAL RESOURCES, SCENIC AND HISTORIC AREAS, AND OPEN SPACES**

Statewide Land Use Planning Goal 5 requires local governments to adopt programs that will protect natural resources and conserve scenic, historic, and open space resources for present and future generations. Conservation of resources promotes a healthy environment and natural landscape that contributes to Oregon's livability.

**GOAL 7: AREAS SUBJECT TO NATURAL HAZARDS**

Statewide Land Use Planning Goal 7 aims to protect people and property from natural hazards. Local governments are required to adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards. Natural hazards for the purpose of this goal are: floods (coastal and riverine), landslides (including "rapidly moving landslides" regulated by ORS 195.250-275, 1999 edition), earthquakes and related hazards, tsunamis, coastal erosion, and wildfires. Local governments may also identify and plan for other natural hazards.

**GOAL 15: WILLAMETTE RIVER GREENWAY**

To protect, conserve, enhance and maintain the natural, scenic, historical, agricultural, economic and recreational qualities of lands along the Willamette River as the Willamette River Greenway.

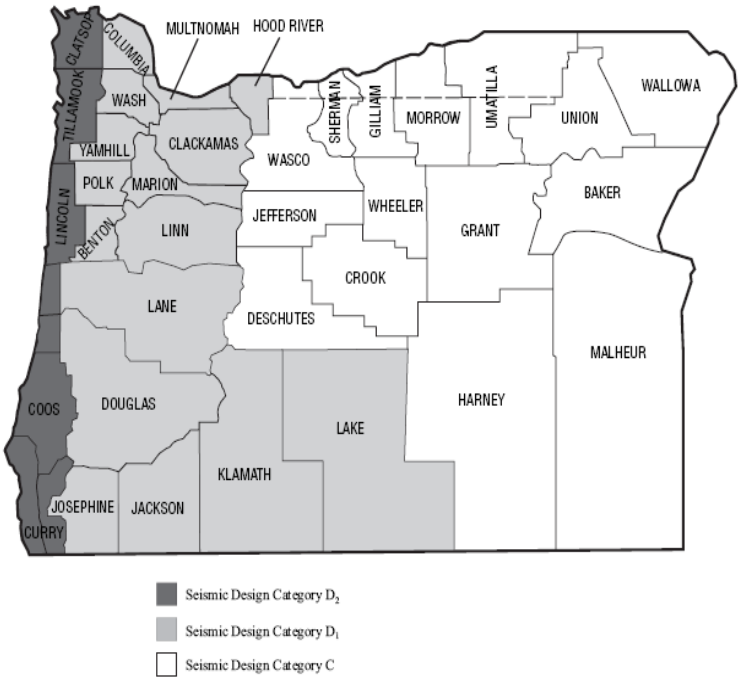
#### *Oregon Building Codes*

***Coastal and Flood Hazards.*** The 2014 Oregon Structural Residential Specialty Codes contain requirements for all new construction of buildings, structures, and portions of buildings and structures within flood hazard areas, including substantial improvement and restoration of substantial damage to buildings and structures. For example, the lowest floors of buildings and structures must be elevated at least one foot above the design flood elevation. Flood hazard areas are determined by flood hazard maps that include, at minimum, areas of special flood hazard as identified by the Federal Emergency Management Agency.

Coastal areas that are subject to wave heights in excess of three feet or subject to high-velocity wave action or wave-induced erosion are designated as high-hazard areas. Buildings and structures constructed in whole or in part in coastal high-hazard areas must be designated and constructed in accordance with building code requirements.

***Seismic Hazards.*** The 2014 Oregon Residential Specialty Code addresses seismic concerns by breaking the state up into the following zones. The code contains specific regulations for development within each zone.

**Figure 3-1. Oregon's Seismic Design Regions**




Unlike the Oregon Residential Specialty Code which assigns seismic categories, the Structural Specialty Code relies on a "seismic design load." The seismic design load is determined in accordance with an engineering calculation factoring peak ground acceleration of the site; use of the building; and soil conditions.

***Landslide Hazards.*** The 2010 Oregon Structural Specialty Code and the 2011 Oregon Residential Specialty Code contain provisions for lot grading and site preparation for the construction of building foundations. Both codes contain requirements for cut, fill and sloping of the lot in relationship to the location of the foundation. There are also building setback requirements from the top and bottom of slopes. The codes specify foundation design requirements to accommodate the type of soils, the soil bearing pressure, and compaction and lateral loads from soil and groundwater on sloped lots.

***Wildfire Hazards.*** The 2011 Oregon Residential Specialty Code provides minimum standards for dwellings and their accessory structures located in or adjacent to vegetated areas subject to wildfires, to reduce or eliminate hazards presented by such wildfires. Wildfire zones are determined using criteria established by the Oregon Department of Forestry.

***Windstorm Hazards.*** The 2011 Oregon Residential Specialty Code and the 2010 Oregon Structural Specialty Code provide design criteria for buildings and construction within "exposure classification" areas of the state. Within Oregon, there are three exposure categories. All areas with full exposure to ocean winds, for example, must be designed to accommodate 110 mph

winds. Design criteria include requirements related to protection of openings, and building height and wind load.

*Oregon's Wetlands Protection Program*

Oregon's Wetlands Program was created in 1989 to integrate federal and state rules concerning wetlands protection with the Oregon Land Use Planning Program. The Wetlands Program has a mandate to work closely with local governments and the Division of State Lands (DSL) to improve land use planning approaches to wetlands conservation. A Local Wetlands Inventory (LWI) is one component of that program. DSL also develops technical manuals, conducts wetlands workshops for planners, provides grant funds for wetlands planning, and works directly with local governments on wetlands planning tasks.

*The Oregon Plan for Salmon and Watersheds*

"The Oregon Plan" is the state's program to restore native salmon and trout populations and to improve water quality. The overall goal of the Oregon Plan is to restore fish populations to productive and sustainable levels that will provide substantial environmental, cultural, and economic benefits.

*Division of State Lands Fill and Removal Permit Program (ORS 196.800-990)*

The Division of State Lands (DSL) Fill and Removal Permit Program (ORS 196.800-990) requires individuals who remove or fill 50 cubic yards or more in "waters of the state" to obtain a permit from the DSL. In State Scenic Waterways or areas designated by DSL as essential indigenous anadromous salmonid habitat, most removal-fill activities require a permit, regardless of the number of cubic yards affected. In addition, the Oregon Department of Environmental Quality is responsible for water quality certification under section 401(a) of the Clear Water Act. This certification is required as part of the DSL permitting process.

In addition, the Removal/Fill Law and implementing regulations contain specific standards and requirements for riprap and other bank and shore stabilization projects in areas that extend from the Pacific Ocean shore to the line of established upland vegetation or the highest measured tide, whichever is greater. OPRD administers the removal/fill regulations jointly with the Ocean Shore Permit Authority. Activities permitted under these regulations are required to comply with the Statewide Planning Goals and be compatible with corresponding provisions of local comprehensive plans. Permits for shoreline protective structures may be issued only when development existed prior to January 1, 1977, as required under Goal 18. Foredune management plans, often implemented as hazard mitigation strategies, require a permit from OPRD because these strategies affect the structure of the shoreline. Other hazard mitigation strategies that require OPRD approval include: natural product (dirt) removal, re-sloping of a vertical bank below the statutory line of vegetation, and mitigating for erosion by altering the course of a stream that flows into the ocean.

## *Coastal Hazards*

*Statewide Land Use Planning Goals Related to Natural Hazards*

**GOAL 16: ESTUARINE RESOURCES**

To recognize and protect the unique environmental, economic, and social values of each estuary and associated wetlands; and To protect, maintain, where appropriate develop, and where appropriate restore the long-term environmental, economic, and social values, diversity and

benefits of Oregon's estuaries. Comprehensive management programs to achieve these objectives shall be developed by appropriate local, state, and federal agencies for all estuaries.

#### GOAL 17: COASTAL SHORELANDS

Statewide Land Use Planning Goal 17 is concerned with conservation and protection, as well as appropriate development of Oregon's coastal shorelands. It aims to reduce the hazard to human life and property, and the adverse effects upon water quality and fish and wildlife habitat resulting from the use and enjoyment of Oregon's coastal shorelands.

#### GOAL 18: BEACHES AND DUNES

The purpose of Statewide Land Use Planning Goal 18 is to conserve, protect, and where appropriate, to either develop on or restore resources and benefits of coastal beach and dune areas. It is also concerned with reducing the hazard to human life and property from natural or human-induced actions associated with these areas.

*Ocean Shore Regulation*

The Oregon Parks and Recreation Department (OPRD) is responsible for protecting the scenic, recreational, and natural resource values of the Oregon coast. OPRD accomplishes this through an extensive permitting program for shoreline protection under the authority of The Ocean Shore Law (ORS 390.605-390.770), also known as the "Beach Bill." While not responsible for activities above the statutory vegetation line, the survey line, or the line of established vegetation, OPRD is the permitting authority for actions affecting the ocean shorelands. This distinction can be seen visually at the line of established vegetation that backs the shoreline.

The Division of State Lands (DSL) has co-authority with the OPRD over rocky intertidal areas. The DSL manages the State-owned seabed within three nautical miles of low tide at the ocean shore. Specifically, the DSL regulates removal and filling of seabed and estuaries, including any dredged materials or seabed minerals. DSL may also issue leases for the harvest of Bull Kelp, a large seaweed in rocky areas of Oregon's coast. The Beach Bill requires that a permit be obtained from the OPRD for all "beach improvements" west of a surveyed beach zone line. Communities can check their comprehensive plan or contact OPRD to obtain the location of this surveyed line.

### *Earthquake/Tsunamis*

*Tsunamis—ORS 336.071, ORS 455.446, and ORS 455.448*

Fourteen earthquake-related bills were introduced during the 1995 session. Several passed, including a new requirement for earthquake education and tsunami drills to be conducted in public schools (ORS 336.071), a requirement for essential and special-occupancy structures to be built outside of tsunami inundation zones (ORS 455.446), provisions for the inspection and entrance of buildings damaged by earthquakes (ORS 455.448) and specific provisions for the abatement of buildings damaged by earthquakes. Senate Bill 1057 created a task force to evaluate the risks impacting existing buildings and make recommendations to the 1997 legislature.

*Senate Bill 96 (1991): Seismic Hazard Investigation*

The legislature passed Senate Bill 96 in 1991. This law requires site-specific seismic hazard investigations before the construction of essential facilities, hazardous facilities, major structures, and special-occupancy structures (e.g., hospitals, schools, utilities and public works, police and fire stations). These requirements are adopted into the State Building Code. The law

also provides for the installation of strong-motion sensors in selected major buildings and mandates that school officials in all public schools lead students and staff in earthquake drills.

*Senate Bill 13 (2001): Seismic Event Preparation*

Senate Bill 13, signed by the Governor on June 14, 2001, requires each state and local agency and persons employing 250 or more full-time employees to develop seismic preparation procedures and inform their employees about the procedures. Further, the bill requires agencies to conduct drills in accordance with Oregon Office of Emergency Management guidelines. These drills must include "familiarization with routes and methods of exiting the building and methods of duck, cover and hold during an earthquake."

*Senate Bill 14 (2001): Seismic Surveys for School Buildings*

The Governor signed Senate Bill 14 on July 19, 2001. The bill required the State Board of Higher Education to conduct seismic safety surveys of buildings that have a capacity of 250 or more persons and are routinely used for student activities by public institutions or departments under the control of the board. A seismic safety survey was not required for buildings that had previously undergone seismic safety surveys, or that had been constructed to meet state building code standards. For buildings that were found to pose an undue risk to life and safety during a seismic event, the bill required the State Board of Higher Education to develop plans for seismic rehabilitation or seismic risk reduction. Subject to available funding, all seismic rehabilitation or risk reduction activities must be completed before January 1, 2032.

*Senate Bill 15 (2001): Seismic Surveys for Hospital Buildings*

The Governor signed Senate Bill 15 on July 19, 2001. The bill required the Health Division to conduct seismic safety surveys of hospital buildings that contain acute inpatient care facilities. Subject to available funding, seismic surveys must also be conducted on fire stations, police stations, sheriffs' offices, and similar facilities. The surveys were completed in January, 2007.

A seismic survey was not required for buildings that had previously undergone seismic safety surveys, or that had been constructed to meet state building code standards. For buildings that were found to pose an undue risk to life and safety during a seismic event, the bill required building occupants to develop plans for seismic rehabilitation or seismic risk reduction. Subject to available funding, all seismic rehabilitation or risk reduction activities must be completed before January 1, 2022.

*Oregon Seismic Safety Policy Advisory Commission (OSSPAC)—ORS 401.337 to 401.353*

The Oregon Seismic Safety Policy Advisory Commission (OSSPAC), otherwise known as the Earthquake Commission, is a state advisory commission that was created in February 1990 through an executive order from Governor Neil Goldschmidt. The group is comprised of 18 individuals who represent a variety of interests concerned with the formulation of public policy regarding earthquakes. It is made up of six representatives of government, six representatives of the public interest, and six representatives of industries and stakeholders. This variety of interests helps direct the goals of the Commission for the benefit of all Oregon citizens.

The Earthquake Commission has the unique task of promoting earthquake awareness and preparedness through education, research, and legislation. OSSPAC seeks to positively influence decisions and policies regarding pre-disaster mitigation of earthquake and tsunami hazards, and to increase public understanding of hazards, risk, exposure, and vulnerability. In order to fulfill

the goals of the commission, OSSPAC members have developed five primary objectives. These objectives are to increase or improve:

- Earthquake awareness, education, and preparedness;
- Earthquake risk information;
- The earthquake safety of buildings and lifelines;
- Geoscience and technical information; and
- Emergency pre-disaster planning, response and recovery efforts.

For information on OSSPAC, contact the Oregon Office of Emergency Management.

*Senate Bill 2 (2005): Statewide Seismic Needs Assessment Using Rapid Visual Screening*

Oregon Senate Bill 2 directed DOGAMI, in consultation with project partners, to develop a statewide seismic needs assessment that includes seismic safety surveys of K-12 public school buildings and community college buildings that have a capacity of 250 or more persons, hospital buildings with acute inpatient care facilities, fire stations, police stations, sheriffs' offices and other law enforcement agency buildings.

The statewide needs assessment consisted of rapid visual screenings (RVS) of these buildings; information gathering to supplement RVS; and ranking of RVS results into risk categories. The results are posted on DOGAMI's website.

Senate Bill 2 (2005) provided the first step in a pre-disaster mitigation strategy that is further defined in Senate Bills 3-5 (2005).

### *Fire (Wildfire and Wildland-Urban Interface)*

*Oregon Forestland-Urban Interface Fire Protection Act (SB 360)*

The Oregon Forestland-Urban Interface Fire Protection Act, often referred to as Senate Bill 360, enlists the aid of property owners toward the goal of turning fire-vulnerable urban and suburban properties into less-volatile zones where firefighters may more safely and effectively defend homes from wildfires. Senate Bill 360 established Oregon's first comprehensive statewide policy regarding mitigation in wildland-urban interface areas. It broadly defined the WUI and set in place a process to identify and classify these areas. The legislation also required the development of standards, which WUI owners are to apply in order to manage and minimize wildfire hazards on their property. When work to implement Senate Bill 360 begins in a county, a committee of local representatives formally identifies and classifies WUI areas. Individual property owners in these areas are then contacted and informed of the standards they are required to meet. They have up to two years to bring their property into compliance with the standards and then to certify that they have done so. Owners who fail to certify become subject to a potential liability of up to $100,000 for certain costs of suppressing fires which start on their property.

The Oregon Forestland-Urban Interface Fire Protection Act is fully described in Oregon Revised Statutes 477.015 through 477.061, and Oregon Administrative Rules 629-044-1000 through 629-044-1110.

*Oregon Revised Statute 215.730: Additional Criteria for Forestland Dwellings*

ORS 215.730 (County Planning; Zoning, Housing Codes) pro-vides additional criteria for approving dwellings located on lands zoned for forest and mixed agriculture/forest use. Under its provisions, county governments must require, as a condition of approval, that single-family dwellings on lands zoned forestland meet the following requirements:

1. Dwelling has a fire retardant roof;
2. Dwelling will not be sited on a slope of greater than 40%;
3. Evidence is provided that the domestic water supply is from a source authorized by the Water Resources Department and not from a Class II stream as designated by the State Board of Forestry;
4. Dwelling is located upon a parcel within a fire protection district or is provided with residential fire protection by contract;
5. If dwelling is not within a fire protection district, the applicant provides evidence that the applicant has asked to be included in the nearest such district;
6. If dwelling has a chimney or chimneys, each chimney has a spark arrester; and
7. Dwelling owner provides and maintains a primary fuel-free break and secondary break areas on land surrounding the dwelling that is owned or controlled by the owner. If a governing body determines that meeting the fourth requirement is impractical, local officials can approve an alter-native means for protecting the dwelling from fire hazards.

This can include a fire sprinkling system, on-site equipment and water storage, or other methods that are reasonable, given the site conditions. If a water supply is required under this subsection, it must be a swimming pool, pond, lake or similar body of water that at all times contains at least 4,000 gallons or a stream that has a minimum flow of at least one cubic foot per second. Road access must be provided to within 15 feet of the water's edge for fire-fighting pumping units, and the road access must accommodate a turnaround for fire-fighting equipment.

*Oregon Revised Statute 477.015-061 Urban Interface Fire Protection*

These provisions were established through efforts of the Oregon Department of Forestry, the Office of the State Fire Marshal, fire service agencies from across the state, and the Commissioners of Deschutes, Jefferson, and Jackson Counties. It is innovative legislation designed to address the expanding interface wildfire problem within Oregon Department of Forestry Fire Protection Districts. Full implementation of the statute will occur on or after January 1, 2002. The statute does the following:

1. Directs the State Forester to establish a system of classifying forestland-urban interface areas;
2. Defines forestland-urban interface areas;
3. Provides education to property owners about fire hazards in forestland-urban interface areas. Allows for a forestland-urban interface county committee to establish classification standards;
4. Requires maps identifying classified areas to be made public;
5. Requires public hearings and mailings to affected property owners on proposed classifications;
6. Allows property owners appeal rights;

7. Directs the Board of Forestry to promulgate rules that set minimum acceptable standards to minimize and mitigate fire hazards within forestland-urban interface areas; and
8. Creates a certification system for property owners meeting acceptable standards. Establishes a $100,000 liability limit for cost of suppressing fires, if certification requirements are not met.

*Oregon Revised Statute Chapter 478: Rural Fire Protection Districts*

ORS 478, Rural Fire Protection Districts, includes the following provisions, among others, related to wildfire hazard mitigation:

*478.120 Inclusion of forestland in district.* The authority to include forestland within a rural fire protection district pursuant to ORS 478.010 (2)(c) applies to forestland within the exterior boundaries of an existing district and to forestland on which structures subject to damage by fire have been added after July 20, 1973.

*478.140 Procedure for adding land to district by consent of owner.* Any owner consenting to add the forestland of the owner to the district under ORS 478.010 (2)(c) shall do so on forms supplied by the Department of Revenue. The owner shall file the original with the district. The district shall forward a copy to the assessor of each county in which the land is located, within 20 days of receipt.

*478.910 Adoption of fire prevention code*. A district board may, in accordance with ORS 198.510 to 198.600, adopt a fire prevention code.

*478.920 Scope of fire prevention code*. The fire prevention code may provide reasonable regulations relating to:

1. Prevention and suppression of fires.
2. Mobile fire apparatus means of approach to buildings and structures.
3. Providing fire-fighting water supplies and fire detection and suppression apparatus adequate for the protection of buildings and structures.
4. Storage and use of combustibles and explosives.
5. Construction, maintenance and regulation of fire escapes.
6. Means and adequacy of exit in case of fires and the regulation and maintenance of fire and life safety features in factories, asylums, hospitals, churches, schools, halls, theaters, amphitheaters, all buildings, except private residences, which are occupied for sleeping purposes, and all other places where large numbers of persons work, live, or congregate from time to time for any purpose.
7. Requiring the issuance of permits by the fire chief of the district before burning trash or waste materials.
8. Providing for the inspection of premises by officers designated by the board of directors, and requiring the removal of fire hazards found on premises at such inspections.

*478.927 Building permit review for fire prevention code*. A district adopting a fire prevention code shall provide plan review at the agency of the city or county responsible for the issuance of building permits for the orderly administration of that portion of the fire prevention code that requires approval prior to the issuance of building permits.

### *Landslide*

*Senate Bill 12: Rapidly Moving Landslides*

Following the flood and landslide events of 1996, legislation was drafted to reduce risk from future landslide hazards. The legislature passed Senate Bill 1211 in 1997, which dealt with rapidly moving landslide issues around steep forestlands, and not in typical urban or community settings. Senate Bill 1211 granted authority to the State Forester to prohibit forest operations in certain landslide-prone locations, and created the Interim Task Force on Landslides and Public Safety. SB 1211 charged the Interim Task Force with developing a comprehensive, practicable, and equitable solution to the problem of risks associated with landslides.

The Interim Task Force developed the legislative concept that resulted in Senate Bill 12 in the 1999 session (ORS 195.250 et seq.). Senate Bill 12 directs state and local governments to protect people from rapidly moving landslides. The bill has three major components affecting local governments: detailed mapping of areas potentially prone to debris flows (i.e., "further review area maps"); local government regulating authority; and funding for a model ordinance. The legislature allocated funding to the Department of Geology and Mineral Industries (DOGAMI) to prepare the "further review area maps," and provided $50,000 for a grant to a local government to develop a model program to address rapidly moving landslides. Senate Bill 12 applies only to rapidly moving landslides, which are uncommon in many communities, but are very dangerous in areas where they do occur.

## Post-Disaster Hazard Mitigation Policy Framework

Following the Presidential Disaster Declaration for the December 2007 winter storm event (DR-1683), the Governor signed Executive Order 08-20 establishing the Governor's Emergency Recovery Framework. The Order established a Recovery Planning Cell (RPC) comprised of emergency recovery advisors, state agency leadership, and others as the situation requires. The RPC directs emergency recovery in Oregon, providing leadership and coordinating private and government sector recovery efforts. It is charged with the development and initial execution of a "day after" plan for recovery efforts. The Order also established the Governor's Recovery Cabinet to coordinate ongoing recovery efforts following the initial emergency response.

### *State Post-Disaster Hazard Management Policies*

#### *Earthquake/Tsunami*

More recently, the legislature passed House Resolution 3 following the 2011 Great Tohoku Earthquake in Japan and the resulting tsunami that impacted the Oregon coast (DR-1964). HR 3 recognizes risks and susceptibility of Oregon to catastrophic damage and loss of life resulting from megathrust earthquakes and tsunamis associated with Cascadia fault. Furthermore, it directed the creation and legislative consideration of an "Oregon Resilience Plan." The Oregon Seismic Safety Policy Advisory Committee published that Plan in February 2013. The plan identifies the state's vulnerabilities in the event of a Cascadia earthquake and tsunami, and contains mitigation actions. Following publication, the legislature appointed the Resilience Task Force to recommend which mitigation actions to take first. The Resilience Task Force's report is due to the legislature on October 1, 2014.

### *Flood*

*Substantial Damage Policy*

Under the NFIP, a building is considered to be substantially damaged when the total cost of repair equals or exceeds 50% of the pre-damage market value of the structure. A substantial damage determination provides opportunities for mitigation through acquisition, relocation, demolition, and elevation. For NFIP-insured properties, timely determinations of substantial damage is critical for meeting the application period for an **Increased Cost of Compliance (ICC)** mitigation claim. If approved for ICC, the ICC payment of up to $30,000 may be used as the property owner's non-federal cost share. Timely substantial damage determination is a standard protocol for all flood disaster declarations in Oregon.

*Repetitive Loss (RL) and Severe Repetitive Loss (SRL) Policy*

**Repetitive Losses** and **Severe Repetitive Losses** properties are defined in the State Risk Assessment.

RL and SRL properties are a top priority for mitigation in Oregon. However, several criteria must generally align for their mitigation to be executable. In addition to meeting the federal statutory criteria for mitigation projects—technically feasible, cost-effective, and environmentally sound—the state will vigorously pursue mitigation of RL and SRL properties if:

- The structure is substantially damaged and eligible for funding under the NFIP's Increased Cost of Compliance provision;
- The structure is located in a community with a FEMA-approved local NHMP;
- The structure is located in a community with ability to handle federal grant funds;
- The structure is located in a declared county (post-disaster) and post-disaster mitigation funding is available; and
- The owners of the structure are interested in mitigation through elevation, flood-proofing, relocation, or demolition.

In addition, geographic distribution of properties may play a role. It is the state's policy to distribute mitigation assistance and funding to impacted communities in different areas of the state whenever practicable.

## *Pre- and Post-Disaster Hazard Mitigation Programs and Capabilities Framework*

### *Oregon Lidar Consortium*

Formed by the Department of Geology and Mineral Industries, the Oregon Lidar Consortium (OLC) develops cooperative agreements for the collection of high-quality lidar that benefits the public at large, the business community, and agencies at all levels of government. The goal of the OLC is to provide high-quality lidar coverage for the entire state. The collection of lidar data can assist governments in better identifying hazardous areas.

### *Oregon Seismic Safety Policy Advisory Committee*

OSSPAC is a state advisory commission created in February 1990 through an executive order from Governor Neil Goldschmidt and established in statute by the 1991 Oregon Legislature (ORS 401.337). The purpose of the 18 member group is to reduce exposure to Oregon's earthquake hazards.

### *Hazard Mitigation Grant Review Board*

The Hazard Mitigation Grant Review Board is an intergovernmental body which, when convened, reviews, discusses, ranks, and recommends project selections for funding under Section 404 of the Stafford Act (aka Hazard Mitigation Grant Program or HMGP).

### *Drought Council*

The Drought Council is responsible for assessing the impact of drought conditions and making recommendations to the Governor's senior advisors.

Numerous additional agency-specific hazard mitigation programs and capabilities also exist or are under development. For example, OPDR is a coalition of public, private, and professional organizations working collectively toward the mission of creating a disaster resilient and sustainable state. Developed and coordinated by the Community Service Center at the University of Oregon, OPDR employs a service learning model to increase community capacity and enhance disaster safety and resilience statewide. Similarly, DLCD is currently working to incorporate the principles of FEMA's Risk Map program into an Oregon-specific initiative called Risk Plan. The Risk Plan program is conceptual at this point, but when implemented will offer an integrated state-wide framework for delivering information, guidance, technical assistance and other resources to local governments.

### *Agencies/Organizations*

#### *State Interagency Hazard Mitigation Team*

First convened by Governor Kitzhaber in 1996, the State Interagency Hazard Mitigation Team (IHMT) meets quarterly, and provides leadership in addressing natural hazards mitigation in Oregon. The State IHMT is an important state mechanism for interagency coordination. The team's focus is to understand losses arising from natural hazards, including secondary losses that occur when natural hazard events impact technological systems and critical infrastructure, and to coordinate recommended strategies to mitigate loss of life, property, economic and natural resources by maintaining the FEMA-approved and Governor-adopted *Oregon Natural Hazards Mitigation Plan*.

The State IHMT's goals are:

1. Coordinate hazard mitigation programs and activities at all levels in the state of Oregon.
2. Describe and evaluate the natural hazards to which the state of Oregon is vulnerable.
3. Describe and evaluate state, local government, and private sector hazard mitigation policies, programs, and capabilities, consistent with federal codes and regulations.
4. Identify sources of hazard mitigation funding and the procedures that must be followed to obtain such funding; make this information widely available.
5. Identify and evaluate proposed hazard mitigation strategies, projects, and legislation to ensure consistency and to proactively integrate natural resource goals into mitigation activities.
6. Continue to develop, implement, monitor, evaluate, and update the Oregon Natural Hazards Mitigation Plan.
7. Provide education and information about natural hazards and steps which can be taken to mitigate against their effects.

8. Facilitate integration of hazard mitigation into the activities and programs of state and local government agencies, and to the extent practical, into the activities of private sector organizations.
9. Strive to integrate into natural hazard mitigation: natural resource protection and restoration, stormwater management, ecosystem concerns, floodplain management, and protection of water quality for public use.
10. Promote and facilitate the concept of a disaster resistant economy in Oregon.

OEM houses the State Hazard Mitigation Officer who also serves as Chair of the IHMT. In addition, OEM provides overall staff support through routine communication with the membership, agenda development, and meeting logistics. Members of the State IHMT are called upon to assist with various mitigation activities outside of the scheduled State IHMT meetings to include such things as updating the Oregon NHMP, project identification and review, particularly following major disaster declarations.

State IHMT meetings are open to the public. Liaison representatives from non-State IHMT agencies and organizations can be added as needed. Descriptions of the state IHMT agencies' hazard mitigation roles, responsibilities, and authorities are provided in **Table 3-6**.

**Table 3-6. IHMT Agencies' Hazard Mitigation Roles, Responsibilities and Authorities**

| State IHMT Agency | Hazard Mitigation Roles and Responsibilities | Natural Hazards Mitigation Legal Authority |
|---|---|---|
| Department of Administrative Services (DAS), Chief Financial Office | Works to prepare state government offices for emergency evacuation planning using the State of Oregon's *Sound the Alarm RisKey* guide. DAS works to improve safety among the workplace by identifying risks and developing tools to manage risks. DAS also works to protect state owned property and buildings, and sets standards for leasing and constructing state buildings. | No legal authority for natural hazards mitigation, except that which may arise from a claim under self-insurance property coverage. |
| Oregon Department of Agriculture (ODA) | Works to exclude or eradicate certain insect pests from becoming established in the state. Using the Insect Pest Prevention and Management program (IPPM), the ODA works to protect Oregon's agriculture, horticulture and timber resources from damaging insect pests, thus preventing the defoliation of vast acreage of trees and reducing fire and erosion hazards; works with soil and water conservation districts to help landowners implement best management practices to reduce erosion, thereby preventing slides, floods, and erosion-related problems; actively involved in watershed health and maintaining natural resources through education, technical assistance, and regulatory programs for landowners. | ORS, Chapter 568 provides authority for water quality and soil conservation measures, and Chapter 570 provides authority for pest and disease control programs. |
| Department of Consumer and Business Services (DCBS), Building Codes Division (BCD) | Works to implement statewide building codes through a permitting program. BCD building codes have adopted construction standards that help create disaster resistant buildings. BCD administers the post-earthquake inspection program for damaged buildings and provides technical assistance and training for building inspectors, plans examiners, designers and contractors. A post-earthquake inspector carries out post-earthquake habitability assessments for all structures affected by an earthquake. BCD has compiled an active list of certified post-earthquake inspectors. BCD generally adopts nationally recognized model codes that include various standards to ensure building safety. Technical assistance is provided to designers, contractors, building officials, and the public through its code specialists, its web page, regular mailings to interested parties and local building officials, and its quarterly publication *Codelink*. | ORS, Chapter 455 provides legal authority for the Building Codes Division's (BCD) natural hazard mitigation activities including 455.020 (code adoption), .725 (training), .440 (site soil analysis), .446 (construction in tsunami zones), .447 (seismic site hazard analysis), and .448-.449 (entry and inspection of earthquake damaged buildings). |
| DCBS - Insurance Division (DCBS-ID) | Works to perform a major balancing role, protecting the public's interests through ensuring the financial soundness of insurers, the availability and affordability of insurance and the fair treatment of policyholders and claimants while maintaining a positive business climate. The DCBS Insurance Division helps home and business owners prepare for natural hazards through the provision of insurance-related educational material. The DCBS Insurance Division also works to help ensure insurance compensation to insurance holders in the wake of a natural disaster. | ORS Chapter 731 provides authority to DCBS insurance division. House Bill 3605 allows the director of the Department of Consumer and Business Services (DCBS) to modify insurance policy terms in times of emergency. |

| State IHMT Agency | Hazard Mitigation Roles and Responsibilities | Natural Hazards Mitigation Legal Authority |
|---|---|---|
| Business Oregon, Infrastructure Finance Authority (BusOR-IFA) | Works with the Governor and all state agencies to prioritize programs and modify services that help those affected by natural disasters. Works with current loan customers to address needs during recovery from a natural disaster. Works with communities to prioritize infrastructure needs resulting from a natural disaster, which is used to develop state and federal funding solutions for Oregon communities. Offers Emergency Response Funding Programs. Also supports hazard mitigation by promoting development of new facilities and infrastructure in appropriate locations. As of January 1, 2014, administers the Seismic Rehabilitation Grant Program. | ORS Chapter 285A-C provides authority to Oregon Business, including 285B.020 (infrastructure). |
| Oregon Climate Change Research Institute (OCCRI) and the Oregon Climate Service (OCS) | OCCRI, housed at Oregon State University, is authorized to:<br>1. Facilitate research by Oregon University System faculty on climate change and its effects on natural and human systems in Oregon<br>2. Serve as a clearinghouse for climate change information<br>3. Provide climate change information to the public in integrated and accessible formats<br>4. Support the Oregon Global Warming Commission in developing strategies to prepare for and to mitigate the effects of climate change on natural and human systems<br>5. Provide technical assistance to local governments to assist them in developing climate change policies, practices and programs<br><br>In addition, at least once each biennium, OCCRI assesses the state of climate change science as it relates to the state of Oregon, and the likely effects of climate change on the state and delivers the assessment to the Governor's Office and the Legislative Assembly.<br>OCS is part of the College of Earth, Ocean, and Atmospheric Sciences at OSU, and has been absorbed by OCCRI. OCS:<br>1. Collects, maintains and distributes Oregon weather and climate data;<br>2. Educates Oregonians on current and emerging climate issues; and<br>3. Performs research related to climate issues. | HB 3543 (2007) |
| Department of Environmental Quality (DEQ) | Works to protect and maintain waters of the state for public health and safety as well as for all future beneficial uses under EPA delegated programs from the Clean Water Act and Safe Drinking Water Act. Emergency actions related to natural hazards must meet environmental protection requirements. If a natural hazard were to result in hazardous materials being released into the environment, DEQ's Emergency Response Program is designed to respond. DEQ's Environmental Cleanup Division takes action should a release occur or the threat of a release. DEQ assists OEM, DLCD, and FEMA in conducting environmental assessments related to watershed restoration, hazard mitigation projects, and provides matching grants for projects under the Clean Water Act. DEQ plays a central role in the disposal of disaster debris. DEQ also works with Oregon Natural Events Action Plan for Wildfire Smoke. DEQ offers the Wildfire Air Quality Rating to monitor air pollution throughout the state to ensure that air quality standards are being met. | ORS, Chapter 468, water pollution control, enables DEQ to protect all future beneficial uses of waters of the state (surface and groundwater), and allows DEQ to act should there be a threat of release or a spill. ORS, Chapter 468a, enables the DEQ to regulate and monitor air quality. ORS, Chapters 465 and 466 enables the DEQ to respond to hazardous waste and materials that have been released into the environment. |

| State IHMT Agency | Hazard Mitigation Roles and Responsibilities | Natural Hazards Mitigation Legal Authority |
|---|---|---|
| Oregon Department of Fish and Wildlife (ODFW) | Has a primary role in determining the effects of potential hazard mitigation projects on fish and wildlife habitats and recommending measures that enhance or at least do not degrade such habitats; administers the state's Riparian Tax Incentive Program and Restoration and Enhancement Program, and can provide cost-share funding, grants and technical assistance. | ORS, Chapter 496 (application, administration and enforcement of wildlife laws), Chapter 497 (licenses and permits), Chapter 498 (hunting, angling and trapping) and Chapter 501 (refuges and closures). |
| Oregon Department of Forestry (ODF) | Works to protect communities from wildfires through the implementation of the Communities at Risk Assessment Program. ODF Identifies communities and assigns each a low, moderate, or high risk rating for the following categories: risk, hazard, protection, capability, value, and overall. ODF works with communities to create Community Wildfire Protection Plans (CWPP): a process involving collaboration between communities and agencies interested in reducing wildfire risk. ODF is responsible for all aspects of wildland fire protection on private, state and BLM forestlands. ODF administers regulations, including landslide mitigation, on non-federal lands. ODF does all of the following things which advance natural hazards mitigation: requiring landowners to control fires on their lands, controlling fires that other landowners cannot control, administering the industrial fire prevention program, investigating wildfires, administering the Forest Practices Act, coordinating with other agencies, maintaining technical expertise on wildfire sciences, geosciences, and hydrology, completing debris flow hazard mapping for Western Oregon, and leading many aspects of the *Oregon Plan for Salmon and Watersheds.* | ORS, Chapter 477 addresses the fire protection of forests and vegetation, including sections on urban interface fire protection, hazard abatement, fire abatement, fire prevention, and related sections. Chapter 527 contains provisions which pertain to timber harvest and road construction regulations in landslide areas. |
| Department of Geology and Mineral Industries (DOGAMI) | Works to develop geologic maps and data to enable Oregonians to understand geology and to mitigate the hazards resulting from earthquakes, tsunamis, landslides, and other hazards; works with project partners, to develop a statewide seismic needs assessment; focuses much effort on risk reduction, often in partnership with other federal, state, and local agencies, and the private sector; provides information which leads to the construction of safer buildings; works on sighting of natural gas cogeneration power plants, correctional facilities, gas pipelines using policy decisions related to geologic, seismic and coastal hazards; also works with local partners to develop systematic evaluations of risk to people and property so mitigation efforts can be prioritized. | ORS, Chapter 516 creates and defines the duties; Section 516.030(3) directs DOGAMI to administer on a cooperative basis studies and programs that will reduce the loss of life and property by understanding and mitigating geological hazards. |
| Oregon Health Authority—Public Health Division (OHA) | The Oregon Health Authority's Health Security, Preparedness and Response (HSPR) Program develops public health systems to prepare for and respond to major, acute threats and emergencies that impact the health of people in Oregon. The Program addresses eight of the 11 natural hazards in the Oregon NHMP, extreme heat, and bioterrorism. | ORS 431 provides authority for state and local administration and enforcement of health laws including public health emergency planning and response. |

| State IHMT Agency | Hazard Mitigation Roles and Responsibilities | Natural Hazards Mitigation Legal Authority |
|---|---|---|
| Department of Land Conservation and Development (DLCD) | Manages the statewide land use planning program; Goal 7 of which addresses development in places subject to natural hazards, requiring that jurisdictions apply "appropriate safeguards" when planning for development there. The goal requires local comprehensive plans to include inventories, policies, and ordinances which will reduce losses. DLCD supports local government efforts to address natural hazards through technical assistance during periodic plan review; provides workshops and responds to local government requests for information. As of 2013, DLCD is responsible for facilitating updates of the Oregon Natural Hazards Mitigation Plan. DLCD manages the National Flood Insurance Program (NFIP) in the State of Oregon through an agreement with FEMA. As part of the NFIP the DLCD manages the Risk MAP Program. DLCD also manages the Oregon Coastal Management Program, which implements a coastal hazards and assessment program. | ORS, Chapter 197 provides the basis for comprehensive land use planning in the State of Oregon, including provisions governing development in floodplains and in other areas subject to natural hazards, which are intended to mitigate the effects of such hazards. ORS, Chapter 476 provides the basis for the Conflagration Act. |
| Department of State Lands (DSL) | Responsible for a variety of service-related functions relating to land management and implementation of state removal-fill law. DSL's role in hazard mitigation is in the issuing of removal and fill permits or enforcement actions on wetlands waters of the state. | ORS 196 and 390 address wetlands, removal and fill permits or enforcement actions on the beds and banks of the waters of this state. Many of these provisions have a tangential effect on floodplain management and flood hazard mitigation. |
| Oregon Military Department, Office of Emergency Management (OEM) | Convenes the IHMT and provides overall coordination of natural hazards mitigation in the State of Oregon. The State Hazard Mitigation Officer (SHMO) is on the staff of the Oregon Office of Emergency Management. Among OEM's related responsibilities are chairing the Oregon Emergency Response System (OERS) Council, staffing the Oregon Seismic Safety Policy Advisory Commission (OSSPAC), developing and maintaining the State *Emergency Management Plan* and related documents, managing the Chemical Stockpile Emergency Preparedness Program and providing training and other assistance which help to mitigate hazards. | ORS, Chapter 401 Includes many of the state's emergency management statutes one section of which states that the general purpose of the law is to reduce the vulnerability of the State of Oregon to loss of life, injury to persons or property, human suffering, and financial loss resulting from emergencies. |
| Oregon State Police, Office of State Fire Marshal (OSFM) | Develop, promote, and maintain protection of life, property, and the environment from fire and other perils through leadership, direct action, and coordination of public safety resources; provides hazard mitigation through programs to educate, inspect, survey, investigate, respond to emergency incidents, and communicate with the public and emergency responders. The Conflagration Act and the State Fire Services Mobilization Plan are coordinated at all levels of state, county, and city government and they foster cooperation in responding to fires and emergency incidents. OSFM employs Regional HazMat Emergency Response Teams to help ensure public safety regarding hazardous materials incidents occurring throughout the state. OSFM provides education and programs, inspections, information, reports, data and brochures, training programs, and emergency responses to incidents for the schools, governments, and the public. | ORS, Chapters 453 and 476-480 authorize the State Fire Marshal to perform a wide variety of education and training programs, inspections, investigative and information reports and other activities related to fire prevention, safety, and management. |

| State IHMT Agency | Hazard Mitigation Roles and Responsibilities | Natural Hazards Mitigation Legal Authority |
|---|---|---|
| Public Utility Commission (OPUC) | A regulatory agency for certain electric, gas, telecommunication, and water utility companies; enforces the National Electrical Safety Code and the Federal Gas Pipeline Safety Regulations, which address utility operations under both normal and emergency conditions; monitors utilities' actions and infrastructure under a wide variety of conditions, including natural hazards, to ensure code compliance and prudent practices. OPUC promotes effective vegetation management practices to improve system safety and reliable service delivery by its ongoing enforcement of Oregon statutes and administrative rules, specifically in Chapter 860, Division 024. | ORS, Chapters 756-759, 772 and 774 authorize the PUC to carry out its purpose. |
| Oregon Department of Transportation (ODOT) | Is the road authority for all state highways in Oregon, including interstate highways; works to maintain drainage, open culverts, clean ditches, and perform hydraulic studies; helps prevent or reduce damage to the state highway system caused by floods or landslides. ODOT invites and works with local public works agencies to become participating parties in the Oregon Public Works Emergency Response Cooperative Assistance Agreement. ODOT and local agencies completed a seismic retrofit prioritization study of Oregon's bridges in 1997. As of January 1999, ODOT completed seismic retrofit projects on 124 state bridges. | ORS, Chapter 810 designates ODOT as the road authority for all state highways and specifies a wide range of maintenance, operations, and analysis activities related to hazard mitigation, for example: drainage maintenance, culvert inventory, and the bridge seismic retrofit program. |
| Water Resources Department (OWRD) | Responsible for allocation of the water that is produced by watersheds each year; quantifies and provides public notification of flows throughout the state, and insures safe operation of certain dams and other hydraulic structures. | ORS Chapter 540 provides OWRD statutory authorities for dam safety and a statewide hydrographic program for measuring river and stream flows. |
| Oregon Parks & Recreation Department (OPRD) | Works to provide and protect outstanding natural, scenic, cultural, historic and recreational sites for the enjoyment and education of present and future generations. OPRD is responsible for land stewardship, marine conservation / rocky shores, several permit programs, department-wide resource policies, and park plants and animals. OPRD strives to provide a safe environment while maintaining the natural beauty and historic importance of our parks. In certain areas providing a safe environment for park users involves planning for natural disasters. | ORS Chapter 390 provides deals with the role of OPRD in dealing with state and local parks, recreation programs, scenic waterways and recreation trails |
| Oregon Partnership for Disaster Resilience (OPDR) | OPDR is a coalition of public, private, and professional organizations working collectively toward the mission of creating a disaster resilient and sustainable state. Developed and coordinated by the Community Service Center at the University of Oregon, OPDR employs a service learning model to increase community capacity and enhance disaster safety and resilience statewide. Primary activities include community plan and project development support; applied research and technical resource development; training programs and capacity building, and the development of strategic alliances. | N/A |

*Cascadia Regional Earthquake Workgroup*

The Cascadia Region Earthquake Workgroup (CREW) is a coalition of private and public representatives working together to improve the ability of Cascadia Region communities to reduce the effects of earthquake events.

CREW's goals include the following:

- Promote efforts to reduce the loss of life and property damage from earthquakes.
- Educate and motivate decision makers, managers, and the general public to reduce risks associated with earthquakes.
- Foster productive linkages between scientists, critical infrastructure providers, businesses and governmental agencies in order to improve the viability of communities after an earthquake event.

*Drought Council*

The Drought Council is responsible for assessing the impact of drought conditions and making recommendations to the Governor's senior advisors. The Drought Council is, in turn, advised by the Water Availability Committee, a subcommittee of technical people who monitor conditions throughout the state and report these conditions monthly. In this manner the Drought Council keeps up-to-date on water conditions. Members combine this knowledge with information they bring from their organizations and differing geographic areas of the state in order to make recommendations for policy, response, and mitigation.

The Drought Council is chaired and facilitated by the Oregon Office of Emergency Management. Members of the Council include state and federal agencies, and private organizations involved in drought forecasting, assessment, response, or recovery. The goal of the Drought Council is to "strive to reduce the effects of an impending drought through a coordinated federal, state, local, and voluntary effort, consisting of the development of drought plans, policies, and procedures, and through coordinated state response." (Oregon Office of Emergency Management, 2014 rev.)

Specific tasks of the Drought Council include:

- Monitoring meteorological and hydrological conditions to determine the current and future severity of a drought;
- Estimating the severity of a drought and its impact on electric power consumption and generation, agricultural production, essential human needs, industrial output, fish and wildlife, state forests, and other areas as appropriate;
- Developing an inventory of physical, economic, or other resources available for responding to anticipated drought impacts;
- Determining potential conflicts between water users and electric power users, and initiating actions to minimize these conflicts;
- Coordinating drought response and recovery efforts;
- Acting as a clearinghouse for questions and requests for state and federal drought declarations;
- Assisting the Governor and the Oregon Office of Emergency Management in determining the need for various federal disaster declarations and other federal assistance;
- Reporting to the Governor's Natural Resource Advisor;

- Facilitating and coordinating development of water and power conservation plans; and
- Facilitating and coordinating public information processes that encourage voluntary conservation measures.

*Energy Facility Siting Council*

The Energy Facility Siting Council reviews proposed energy facilities for seismic vulnerability through its structural standard, Oregon Administrative Rule (OAR) 345-022-0020. This standard is a safety standard rather than a reliability standard. It ensures that structural failure at an energy facility will not endanger workers or the public. It does not require that energy facilities be proven to remain operable in a seismic event because the Council assumes that key safety facilities such as hospitals will have backup electricity.

The standard requires that:

- The applicant, through appropriate site-specific study, has adequately characterized the site as to appropriate seismic design category and expected ground motion and ground failure, taking into account amplification during the maximum credible and maximum probable seismic events;
- The applicant can design, engineer, and construct the facility to avoid dangers to human safety presented by seismic hazards affecting the site that are expected to result from all maximum probable seismic events (as used in the rule, "seismic hazard" includes ground shaking, landslide, liquefaction, lateral spreading, tsunami inundation, fault displacement, and subsidence);
- The applicant, through appropriate site-specific study, has adequately characterized the potential geological and soils hazards of the site and its vicinity that could, in the absence of a seismic event, adversely affect, or be aggravated by, the construction and operation of the proposed facility; and
- The applicant can design, engineer and construct the facility to avoid dangers to human safety presented by the hazards identified.

The Council reviews proposed energy facilities such as power plants, major electric transmission lines, major gas pipelines (greater than 16 inch diameter) for compliance with this standard. They do so in consultation with Oregon Department of Geology and Mineral Industries under an interagency agreement.

In response to an electricity shortage, the 2001 Oregon Legislature created an expedited review process for certain qualifying power plants. These power plants are generally not required to meet the structural standard; however, the Oregon Office of Energy, in consultation with Oregon Department of Geology and Mineral Industries, can still impose conditions on these plants related to the structural standard.

*Hazard Mitigation Grant Review Board*

The Hazard Mitigation Grant Review Board is an intergovernmental body which when convened reviews, discusses, ranks, and recommends project selections for funding under Section 404 of the Stafford Act (aka Hazard Mitigation Grant Program—HMGP).

With requirements for FEMA-compliant (201.6) local mitigation plans to be eligible for Section 404 grants, the need to convene the Hazard Mitigation Grant Review Board has been largely replaced by project actions and priorities identified in those local mitigation plans. In order to expedite the Section 404 grant offering early in the post-disaster recovery process, HMGP project funding is first prioritized to the disaster-declared counties (and all eligible applicant entities therein) on a pro rata share basis of their Public Assistance and Individual Assistance eligible costs as initially determined during the Preliminary Damage Assessment. The pro rata applicant share can be further refined at either the 12-month or 18-month HMGP lock-in. HMGP planning grant funding is available statewide from the onset of the program's availability.

During the PA and HMGP Applicant Briefing, the state promulgates broad priorities and project categories for Section 404 project pre-applications that tend to focus on the nature of the disaster and related mitigation opportunities. Representatives from the Hazard Mitigation Grant Review Board and the State IHMT are encouraged to provide their input into establishing the broad priorities and project categories for Section 404 project pre-applications early in the process. The Hazard Mitigation Grant Review Board plays a key role in selecting state 5% initiative projects as there are oftentimes many more "5%" projects than available funding.

Board Membership

- Director of the Oregon Office of Emergency Management or designee (most usually the Section Director, Mitigation and Recovery Services who is also the State Coordinating Officer for major disaster declarations), who chairs the Board;
- State Floodplain Program Coordinator (Natural Hazards Program Coordinator) of the Department of Land Conservation and Development or designee;
- President of the Oregon Emergency Management Association (OEMA) or designee;
- A representative of the Association of Oregon Counties (AOC) and/or the League of Oregon Cities (LOC); and
- For flood disasters and related projects, Chief of the Emergency Management Branch, Portland District, U.S. Army Corps of Engineers (USACE) or designee.

The State Hazard Mitigation Officer (SHMO) of the Oregon Office of Emergency Management provides staff and technical assistance, and presents hazard mitigation projects to the Board, but is not a voting member.

*Oregon Board of Geologist Examiners*

In 1990 the Oregon Board of Geologist Examiners adopted guidelines to assist professionals in preparing engineering geologic reports in the state. Then in 1996, the Board adopted additional guidelines for site-specific seismic hazard reports for essential and hazardous facilities, major structures and special occupancy structures as provided in ORS 455.447. A complete listing of all report elements is included in Section 1802.6.1 of the *Oregon Structural Specialty Code.* In 2001, the Board established a Memorandum of Understanding with the Engineering & Land Surveying Examiners Board to clarify the roles of Certified Engineering Geologists and Geotechnical Engineers.

*Oregon Emergency Management Association*

Oregon Emergency Management Association (OEMA) is the association for Oregon's emergency management professionals. OEMA provides over 200 public, private, and non-profit members with the following:

- A network for training, education, and preparedness information and professional development;
- A forum for the sharing of knowledge, ideas, processes and building partnerships; and
- A collective and unified voice for emergency management issues in Oregon.

OEMA promotes the efforts of Oregon's communities to plan for all natural and human caused hazards through improved mitigation, preparedness, response, and recovery capabilities.

*Oregon Lidar Consortium*

Formed by the Department of Geology and Mineral Industries, the Oregon Lidar Consortium (OLC) develops cooperative agreements for the collection of high-quality lidar that benefits the public at large, the business community, and agencies at all levels of government. The goal of the OLC is to provide high-quality lidar coverage for the entire state. The collection of lidar data can assist governments in better identifying hazardous areas.

*Oregon Seismic Safety Policy Advisory Committee*

OSSPAC is a state advisory commission created in February 1990 through an executive order from Governor Neil Goldschmidt and established in statute by the 1991 Oregon Legislature (ORS 401.337).

It is made up of 18 members with interests in earthquake safety: Building Codes Division, Oregon Office of Emergency Management, Department of Geology and Mineral Industries, Department of Land Conservation and Development, Oregon Department of Transportation, two representatives from the Oregon Legislature, one local government representative, one member from education, three from the general public and six members from affected industries, such as homebuilders and banking industries.

The purpose of the work of OSSPAC is to reduce exposure to Oregon's earthquake hazards by:

- Developing and influencing policy at the federal, state, and local government levels;
- Facilitating improved public understanding and encouraging identification of earthquake risk; and
- Supporting research and special studies, appropriate mitigation and response and recovery.

The Commission has proposed concepts to the Oregon Legislature on improving seismic safety in Oregon. They have prepared a document entitled *Oregon at Risk,* which outlines seismic hazards in the state. In 2004 the Commission provided a venue to the General Obligation (GO) Bond Task Force to develop policy recommendations for implementation of SB 14 & 15 (2001). These bills and general obligation bonds for funding of the grant program would improve the earthquake safety of public schools and emergency response facilities across the state.

*Oregon Sea Grant Extension*

The Oregon State University Extension Service conveys research-based knowledge to a variety of businesses owners, growers, foresters, youth and community leaders in an effort to improve their lives, their homes, their businesses and their communities. The Oregon Sea Grant program provides education regarding watershed health and creating hazard resilient coastal communities with particular attention placed to earthquake and tsunami hazards.

*Pacific Northwest Seismograph Network*

The Pacific Northwest Seismograph Network operates seismograph stations and locates earthquakes in Oregon and Washington. They are funded by the US Geologic Survey, the Department of Energy and the State of Washington. Their website provides information on Pacific Northwest earthquake activity and hazards.

*Pacific Northwest Wildfire Coordinating Group*

The Pacific Northwest Wildfire Coordinating Group provides leadership in interface and wildland fire management for local, tribal, state and federal agencies. The PNWCG is comprised of USDA-Forest Service, USDOI-Bureau of Land Management, Bureau of Indian Affairs, National Park Service, Fish and Wildlife Service, Oregon Department of Forestry, washing Department of Natural Resources, Washington Association of Fire Chiefs, The Oregon Fire Chiefs Association, The Oregon State Fire Marshall and the Washington State Fire Marshall.

### *State Pre-Disaster Hazard Mitigation Programs*

*Conservation Reserve Program*

CRP retires eligible cropland from agricultural production and plants the land to permanent grass cover that reduces erosion and benefits wildlife populations. CRP does a very good job of providing cover that reduces windblown dust and has been effective in reducing soil erosion in the areas most prone to wind erosion. However, silt soils easily stay suspended for long periods of time and thus can move great distances affecting visibility on roads away from the protected fields. The strategy to encourage a strip of CRP along the freeway has been determined to probably be ineffective at reducing dust storm intensity. Also, the fire hazard could be worse than the dust hazard. In Umatilla County, NRCS has designated an area near I-84 as a wind erosion priority area to influence enrollment into the Conservation Reserve Program.

*Community Rating System Users Groups*

The NFIP's Community Rating System (CRS) is a voluntary program that rewards communities for engaging in floodplain management activities that exceed the minimum NFIP requirements by discounting flood insurance premium rates to reflect the reduced flood risk resulting from those activities. Other benefits resulting from community participation in the CRS program include:

- Reduce flood damage to insurable property;
- Strengthen and support the insurance aspects of the NFIP, and
- Encourage a comprehensive approach to floodplain management.

Relatively few of Oregon's communities participate in the CRS Program. In 2014, DLCD convened two new CRS Users Groups (northern and southern) to encourage greater participation. The two groups are open to communities already participating in the CRS program and to any other community interested in floodplain management best practices. DLCD is the coordinating body. The State, FEMA, and FEMA's Insurance Support Organization provide technical support. Through CRS Users' Groups, participating CRS communities can obtain assistance in increasing their CRS classifications and new communities can find peer-to-peer support as they join the CRS program.

Each CRS Users' Group meets a minimum of three times per year in person or virtually. DLCD established and administers an online forum for both groups to use between meetings as a way to share documents, discuss ideas and post projects.

*Oregon Coastal Management Program*

The Oregon Coastal Management Program (OCMP) is the combined effort of 32 cities, seven counties, and a host of state agencies to carry out the statewide lad use program on the Oregon Coast. OCMP's mission is to work in partnership with coastal local governments, state and federal agencies, and other stakeholders to ensure that Oregon's coastal and ocean resources are managed, conserved, and developed consistent with statewide planning goals.

To accomplish this mission OCMP provides substantial financial and technical assistance to coastal local governments for planning, capacity building, and special projects. OCMP also coordinates and integrates programs of local, state, and federal agencies to support local planning and to protect and restore coastal natural resources, and reviews state and federal permits to ensure compliance with local, state, and federal program requirements. OCMP also utilizes the Internet to provide coastal data and information to a wide public through the Oregon Coastal Atlas.

*DOGAMI Partnership with U.S. Geological Survey National Landslide Hazard Program*

DOGAMI has entered into a collaborative partnership with this program, centered on three targeted goals for Western Oregon: 1) develop inventory maps and digital databases of existing deep-seated landslides, 2) develop predictive hazard maps of areas prone to rapidly moving landslides, and 3) develop susceptibility maps of deep-seated landslides for targeted developable areas. The second of these incorporates the mandates of Oregon Revised Statutes 195.260 (2003) to produce *further review areas* of rapidly moving landslide hazard. This will be conducted in cooperation with local governments and will provide some technical assistance to local governments to facilitate the use and application of this information. A Landslide Advisory Committee consisting of local government stakeholders and state and federal agencies will aid the agency in prioritizing projects.

*DOGAMI Earthquake Hazard Mitigation Program*

DOGAMI's organic statute gives the agency broad responsibility and authority for evaluating all geologic hazards statewide, including earthquake hazards. DOGAMI has published numerous maps and reports on the earthquake hazards of the state. The agency, in partnership with other state and federal agencies, has undertaken a wide-ranging program in Oregon to identify seismic hazards, including active fault identification, bedrock shaking, tsunami inundation zones, ground motion amplification, liquefaction, and earthquake induced landslides.

*DOGAMI Tsunami Hazard Mitigation Program*

The primary goal of the Oregon Tsunami Hazard Mitigation Program is to reduce loss of life and property damage from tsunamis. Additionally, the program aims to promote community preparedness through development of mitigation products and the implementation of a coast-wide, volunteer driven education and outreach initiation to support the National Weather Service's *TsunamiReady*™ program. Funding granted from the National Tsunami Hazards Mitigation Program is being used to complete the next generation of tsunami inundation maps along Oregon's 43 *TsunamiReady*™ communities.

*ODF National Fire Plan Implementation in Oregon*

Under the National Fire Plan (NFP), funding opportunities for local WUI planning, prevention and mitigation projects first became available in 2000. Since that time, Oregon has aggressively sought funding for a wide variety of projects, including fuels reduction work, education and prevention projects, community planning, and alternative uses of fuels. The majority of these monies have been used to fund fuels reduction projects on individual properties and to establish community fuel breaks in the most wildfire prone portions of the state. NFP funds have also been used to expand fire prevention efforts, to educate local officials about how they may help address the WUI situation, to implement Senate Bill 360, to improve public awareness about the wildfire problem, and to better identify areas especially exposed to wildland fire.

*ODFW Habitat Resources Program—Riparian Lands Tax Incentive*

The Riparian Tax Incentive Program, authorized by ORS 308A.350—308A.383, offers a property tax incentive to property owners for improving or maintaining qualifying riparian lands. Under this program, property owners receive complete property tax exemption for their riparian property. This can include land up to 100 feet from a stream.

When the Riparian Tax Incentive law was passed in 1981, the Oregon Legislative Assembly declared that "it is in the best interest of the state to maintain, preserve, conserve and rehabilitate riparian lands to assure the protection of the soil, water, fish and wildlife resources of the state for the economic and social well-being of the state and its citizens." Healthy riparian zones are important to the resource by providing: cooler water due to shading resulting in better habitat for salmon, trout and steelhead; more and better varieties of habitat for wildlife; increased water during summer low flow periods; erosion control by stabilizing stream banks with protective vegetation; and flood control.

*ODFW Fisheries Restoration and Enhancement Program*

The Fisheries Restoration and Enhancement Program is a comprehensive program to restore State-owned hatcheries, enhance natural fish production, expand hatchery production and provide additional public access to fishing waters. The R&E Program provides increased sport fishing opportunities, and also supports and improves the commercial salmon fishery.

The program was authorized by the Oregon Fisheries and Enhancement Act of 1989 and was renewed in 2009. The program focuses on projects that increase fish production (either hatchery or natural production), increase recreational or commercial opportunities or access to the fish resources, or improve fish management capabilities. Restoration projects that facilitate fish passage may also provide flood-control benefits.

*OEM Pre-Disaster Mitigation Planning and Project Activities*

State pre-disaster mitigation planning and project activities are an integral component of OEM's mission. OEM's Mitigation and Recovery Services Section provides oversight and administration of financial services and related funding that is passed-through to local governments. Specifically, the Section Director, SHMO, Alternate SHMO, Facilities Engineer (Public Assistance Officer), Seismic Grants Coordinator, and financial support staff work together closely on pre-disaster mitigation grant programs and project activities. Although OEM has limited staff support available for mitigation planning and project implementation activities, the state is able to effectively secure and manage FEMA's PDM and FMA grants.

The success of mitigation planning activities state-wide combines Oregon's past history of land use planning and goals with the integration of resources from FEMA's mitigation grants leveraged through the Oregon Partnership for Disaster Resilience. The concept of aggregating regional, jurisdictional mitigation planning needs that leverage and target financial and technical resources to geographic areas around the state has proven to be successful in securing funding and completing local mitigation plans.

*OPDR Pre-Disaster Mitigation Planning Program*

Despite the growing recognition of the need for long-term coordination to reduce risk from natural disasters, many communities in Oregon continue to experience difficulty in developing and implementing natural hazard risk reduction plans, policies and activities. Communities regularly suffer from a lack of technical and funding assistance, as well as insufficient coordination among public, private, and non-profit sectors at the local, regional, and statewide levels. OPDR works to address these challenges and offers a model of how increased communication, coordination and collaboration between diverse partners can assist communities in reducing their risk from natural hazards. The Pre-Disaster Mitigation (PDM) program is completely funded by nationally competitive federal grants with in-kind match coming from local communities and the University of Oregon. Mitigation planning occurs in partnership with the Oregon Office of Emergency Management, the Department of Land Conservation and Development, Department of Geology and Mineral Industries, FEMA Region X, and local governments throughout Oregon.

*OPDR Disaster Resilient University Initiative*

The Oregon Disaster Resilient University (Oregon-DRU) is a new initiative between University of Oregon Emergency Management, Oregon Partnership for Disaster Resilience and Oregon's post-secondary institutions. The concept is to build a collaborative service center model between campuses in Oregon to link the skills, expertise, resources, and innovation of post-secondary education, federal agencies, professional and trade organizations, and state agencies to reduce risk on Oregon campuses. The Oregon-DRU has five specific service areas geared to enhance and support emergency management and risk reduction efforts within post-secondary institutions in Oregon.

*ODF Community Wildfire Protection Plans*

A Community Wildfire Protection Plan (CWPP) is developed by a community in an area at-risk from wildfire. CWPs have three primary requirements: they must be developed collaboratively between local and state government representatives in consultation with federal agencies and other interested parties, they must identify and prioritize areas for hazardous fuels reduction treatments while also recommending methods for treatments that will protect at-risk communities and essential infrastructure, and lastly the must recommend measures that homeowners and communities can take to reduce ignitability of structure throughout the plan area. The statutory definition of a CWPP appears in Title I of the Healthy Forest Restoration Act of 2003. Oregon has 35 County CWPPs and 26 additional community CWPPs.

*Oregon Plan for Salmon and Watersheds—Covered in Policies*

"The Oregon Plan" is the state's program to restore native salmon and trout populations and to improve water quality. The overall goal of the Oregon Plan is to restore fish populations to productive and sustainable levels that will provide substantial environmental, cultural, and economic benefits.

*Statewide Land Use Planning Program*

Since 1973, Oregon has maintained a strong statewide program for land use planning. The foundation of that program is a set of 19 statewide planning goals. The goals express the State's policies on land use and related topics, such as citizen involvement, housing and natural resources. Oregon Statewide Planning Goal 7- *Areas Subject to Natural Hazards* was developed to protect people and property from natural hazards in Oregon. Goal 7 provides guidelines for local government planning officials to follow that can reduce their vulnerability to natural hazards. These guidelines include what factors local governments can consider in adopting policies and measures to protect people and property from natural hazards, and several ways in which local governments can implement mitigation measures more effectively.

*NFIP, Map Mod, Risk MAP, and Cooperating Technical Partners*

**NFIP**—The Oregon Department of Land Conservation and Development serves as the state NFIP coordinating agency, partnering with BCD and OEM. These agencies are responsible for existing flood mitigation strategies and programs. In addition to state programs, the NFIP of the FEMA is designed to help minimize flood losses through local floodplain management. The NFIP relies on flood hazard mapping, flood insurance, and floodplain development standards implemented at the local level to reduce flood losses. In Oregon, 259 cities and counties and two tribal nations participate in the NFIP (total of 259 "NFIP" communities) and thus play a key role in flood mitigation.

**Map Mod**—Map Modernization is responding to National Flood Insurance requirements and feedback provided by Federal, State, and Local Program stakeholders. Flood hazard conditions are dynamic, and many NFIP maps may not reflect recent development and/or natural changes in the environment. Map modernization is the cornerstone for helping community officials and citizens be better prepared for flood related disasters. In 2014, the Map Mod is almost complete with two communities' maps under appeal. The Map Mod program has progressed into the Risk MAP program.

**Risk MAP**—Risk Mapping, Assessment, and Planning (Risk MAP) is the Federal Emergency Management Agency (FEMA) Program that provides communities with flood information and tools they can use to enhance their mitigation plans and take action to better protect their citizens. Through more precise flood mapping products, risk assessment tools, and planning and outreach support, Risk MAP strengthens local ability to assess risks and identify actions to reduce vulnerability to those risks, enabling communities to enhance their mitigation plans and actions. In 2014 more than a dozen Risk MAP projects were active in Oregon.

**Cooperating Technical Partners**—The Map Modernization Management Support (MMMS) partnership mechanism provides the opportunity to pool resources and extend the productivity of limited public funds. MMMS partners include State or regional agencies and federally recognized tribes that serve communities participating in the National Flood Insurance Program (NFIP). MMMS partner activities include, but are not limited to, assessing mapping needs, reviewing hydrologic and hydraulic studies prepared for flood map revisions, and providing an inventory of base maps.

FEMA partners with State and regional organizations in the management of Risk MAP activities for the following reasons:

- Management participation will help to ensure that the products resulting from Risk MAP do not conflict and are complementary, not duplicative.
- MMMS provides a means to interject a tailored, local focus into a national program. Where unique conditions may exist, special approaches to communication, coordination, and compliance that may be necessary can be taken.
- The MMMS partnership mechanism provides the opportunity to combine resources and extend the productivity of limited public funds.

*Oregon Coastal Management Program*

Oregon's Coastal Management Program (OCMP) is the combined effort of 32 cities, seven counties, and a host of state agencies to carry out the statewide land use program on the Oregon coast. All statewide planning goals apply to the coast, but the OCMP emphasizes four coastal-related goals: Goal 16, Estuarine Resources; Goal 17, Coastal Shorelands; Goal 18, Beaches and Dunes; and Goal 19, Ocean Resources. The Department of Land Conservation and Development is the state's Coastal Management Agency and provides overall program administration and coordination. The OCMP assists coastal planners to identify and plan for costal hazards to prevent property damage and avoid loss of life. The OCMP also works with the Oregon Department of Geology and Mineral Industries and Oregon Sea Grant to identify and communicate natural hazards such as shoreline erosion and tsunami inundation.

*Oregon Emergency Response System*

Oregon's Emergency Response System coordinates and manages state resources in response to natural and technological emergencies and civil unrest involving multijurisdictional cooperation between all levels of government and the private sector. Established in 1972, OERS was the first state plan of its kind, it serves as the primary point of contact by which any public agency reports the state with notice of an emergency or disaster or from which they can request access to state or federal resources.

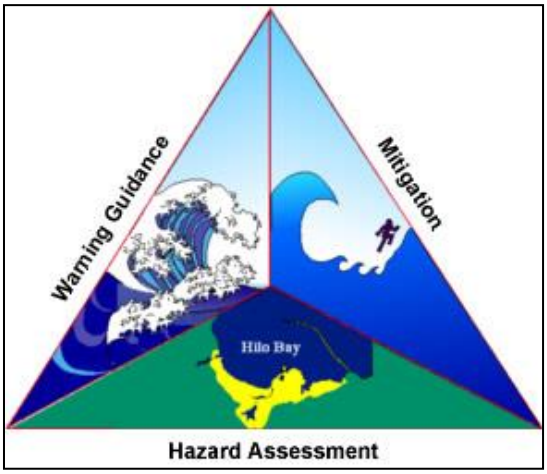
*Oregon's Wetlands Protection Program*

Oregon's Wetlands Program was created in 1989 to integrate federal and state rules concerning wetlands protection with the Oregon Land Use Planning Program. The Wetlands Program has a mandate to work closely with local governments and the Division of State Lands (DSL) to improve land use planning approaches to wetlands conservation. A Local Wetlands Inventory (LWI) is one component of that program. DSL also develops technical manuals, conducts wetlands workshops for planners, provides grant funds for wetlands planning, and works directly with local governments on wetlands planning tasks.

*National Tsunami Hazard Mitigation Program*

The National Tsunami Hazard Mitigation Program (NTHMP) is a state/federal partnership. The program's Coordinating Committee includes emergency management and geoscience representatives from the original five Pacific states (Alaska, California, Hawaii, Oregon, and Washington), emergency management representatives from the Atlantic and Gulf Coast states, the United States Geological Survey (USGS), the Federal Emergency Management Agency (FEMA), National Oceanographic and Atmospheric Administration (NOAA), and the National Science Foundation (NSF). Funds to administer the program are provided by NOAA and have been available every fiscal year since federal FY 1997.

**Figure 3-2. Tsunami Hazard Mitigation Program**




The 2006 *Tsunami Warning and Education Act* (PL 109-424) called for a Forecasting and Warning Program, a Tsunami Hazard Mitigation Program, and a Tsunami Research Program. These programs include the upgrade of seismic networks and installation of open ocean tsunami detection equipment designed to reduce the number of false alarms; development of tsunami inundation models and maps; and education, preparedness and mitigation work, including an implementation plan to insure that the goals of the program were met.

*Water Resources Department Dam Safety Program*

The Water Resources Department Dam Safety Program reviews design plans, reports and specifications and approves for construction, modification or enlargement all hydraulic structures greater than or equal to 10 feet height and 3,000,000 gallons reservoir capacity (ORS 540.350). Design approval for High Hazard hydraulic structures typically includes a satisfactory review of Emergency Action Plans and inundation maps.

The Dam Safety Program maintains for the National Inventory of Dams, a database of all Oregon dams and reservoirs that exceed statutory size criteria regardless of ownership. The program also performs regular inspections of all existing non-federal dams statewide. The OWRD dam safety program participates cooperatively with existing established federal dam safety programs such as U.S. Army Corps Engineers, U.S. Bureau Reclamation, Federal Energy Regulatory Commission and others in their design review and inspection of federal project dams, reservoirs and appurtenant works.

OWRD is the designated state agency and the Hydroelectric Licensing Program is the lead for review and license permitting for new and existing hydroelectric projects. OWRD's licensing program collects data and requests from other state agencies, negotiates settlements and assembles the state's criteria for power development and operation. When the process is completed, the conditions and requirements are incorporated into and apply concurrently with issuance of the federal license for all regulated hydroelectric projects statewide (ORS 543, ORS 543A).

*Wildfire Awareness Week*

Since 2001, when Governor John Kitzhaber proclaimed Oregon's first Wildfire Awareness Week, this interagency effort has grown with each passing year. That year, a coalition led by the Office of State Fire Marshal, and including the Department of Forestry, structural fire agencies, insurance industry representatives, and others developed and distributed a campaign tool kit with model proclamations and recorded pubic service announcements designed for distribution to media outlets. In 2008, the Keep Oregon Green Association became the caretaker of the annual campaign.

*OEM Statewide Earthquake & Tsunami Drills*

Earthquake and tsunami drills are conducted annually by OEM. On January 25, 2011 the first annual Great Oregon Shake Out occurred throughout Oregon with over 39,000 participants. In partnership with DOGAMI, OEM also conducts voluntary tsunami evacuation drills. The community-wide drills incorporate aircraft public address systems, in addition to the tsunami warning issued by the National Weather Service, in areas where sirens have limited coverage.

*ODOT Winter Maintenance Practices*

ODOT's winter maintenance practices include plowing, sanding and applying anti-icing liquids in order to increase efficiency of snow removal and to reduce motor vehicle crashes. To increase motorist safety in collaboration with local media, ODOT Region 5, publishes a special multi-page flyer known as the Winter Roadway Guide as an annual newspaper insert. Additionally, ODOT publishes winter driving tips and information on its website geared to motorists and bicyclists.

*Public Health Mitigation Planning*

The Oregon Public Health Emergency Preparedness Program is an effort to anticipate, detect, assess and understand health risks associated with an emergency. The mitigation aspect focuses on long-term measures for reducing or eliminating risk including technological and policy changes. The department promotes guidance from the National Health Security Strategy, Interim Implementation Guides, and Community Mitigation Strategies.

*Oregon Seismic Safety Policy Advisory Commission*

The Oregon Seismic Safety Policy Advisory Commission has the unique task of promoting earthquake awareness and preparedness through education, research, and legislation. The mission of OSSPAC positively influence decisions and policies regarding pre-disaster mitigation of earthquake and tsunami hazards, increase public understanding of hazard, risk, exposure, and vulnerability through education seminars, etc., and be responsive to the new studies and/or issues raised around earthquakes and tsunamis.

As a result of the Loma Prieta Earthquake in the Bay Area of California in 1989, Oregon residents wanted the State government to address the earthquake hazard and preparedness of the State. As a result, the Interagency Seismic Task Force recommended that a new state commission be formed in response to this need. OSSPAC was formed as a result of Senate Bill 96 in 1991. Since this time, OSSPAC has continued to increase Oregon 's awareness to earthquake hazards by supporting earthquake education, research, and legislation. Every two years, OSSPAC provides a summary report to the Governor of the Commission's activities. OSSPAC has also formed relationships with the Western States Seismic Policy Council (WSSPC) and the California Seismic Safety Commission which provides a persuasive advantage to affect federal policy for the West Coast.

## National Programs & Organizations

### *American Planning Association (APA)*

The APA's Hazards Planning Research Center brings together solutions from multiple disciplines into a single source. The center provides original and applied research to identify best practices that that protect communities from natural and man-made hazards. APAs efforts are accomplished through research, outreach, education, policy and resource guides and other publications. The APA is currently in the midst of an update of its 1998 PAS report, *Planning for Post-Disaster Recovery and Reconstruction* (No. 483/484). Updates on the project status and other news is provided on the websites blog, *Recovery News*.

### *Firewise*

Firewise is a program developed within the National Wildland/Urban Interface Fire Protection Program, and it is the primary federal program addressing interface fire. It is administered through the National Wildfire Coordinating Group whose extensive list of participants includes a wide range of federal agencies. The program is intended to empower planners and decision makers at the local level. Through conferences and information dissemination, Firewise increases support for interface wildfire mitigation by educating professionals and the general public about hazard evaluation and policy implementation techniques. Firewise offers online wildfire protection information and checklists, as well as listings of other publications, videos, and conferences.

### *FireFree Program—Bend, Oregon*

FireFree is a unique private/public program for interface wildfire mitigation involving partnerships between an insurance company and local government agencies. It is an example of an effective non-regulatory approach to hazard mitigation. Originating in Bend, the program was developed in response to the city's "Skeleton Fire" of 1996, which burned over 17,000 acres and damaged or destroyed 30 homes and structures. Bend sought to create a new kind of public education initiative that emphasized local involvement. Safeco Insurance Corporation was a willing collaborator in this effort. Bend's pilot program included:

- A short video production featuring local citizens as actors, made available at local video stores, libraries, and fire stations;
- Two city-wide yard debris removal events;
- A 30-minute program on a model FireFree home, aired on a local cable television station; and
- Distribution of brochures, featuring a property owner's evaluation checklist and a listing of fire-resistant indigenous plants.

The program continues to provide educational materials on fire risk reduction strategies and fire resistant plants.

### *National Flood Insurance Program (NFIP)*

The function of the NFIP is to provide flood insurance to homes and businesses located in floodplains at a reasonable cost, and to encourage the location of new development away from the floodplain. The program is based upon mapping areas of flood risk, and requiring local implementation to reduce that risk, primarily through restrictions on new development in floodplains. Elevation Certificates are forms published by FEMA required to be maintained by

communities participating in the NFIP. New development is required to be elevated or otherwise designed to protect against flooding. The NFIP requires local governments to obtain certificates for all new construction in floodplains and to keep the certificates on file. Local governments must insure that elevation certificates are filled out correctly for structures built in floodplains.

#### V-ZONE CONSTRUCTION

In many of Oregon's coastal communities, FEMA has mapped "V zones" (velocity zones), areas of special flood hazard that are subject to high velocity wave action from storm surges or seismic events. Because of the potential force associated with this wave action, special regulations apply for new construction and substantial improvements in "V zones."

#### COMMUNITY RATING SYSTEM (CRS)

Community Rating System (CRS) is a program operated by the NFIP that recognizes communities who go beyond the minimum requirements of the NFIP. CRS offers reduced flood insurance premiums for communities who adopt higher standards and encourages community activities that reduce flood losses, facilitate accurate insurance rating, and promote flood insurance awareness.

*FEMA Region 10 Policy on Fish Enhancement Structures in the Floodway*

Local communities regulate development in the floodway. The regulations require that a community prohibit encroachments (including fill, new construction, and other development) within the floodway unless it is demonstrated by engineering analysis that the proposed encroachment will not result in any increase in flood levels during the occurrence of a 100-year flood event. The recent designation of several northwest salmon and steelhead runs as threatened or endangered has resulted in an increased effort to restore fish habitat. Restoring habitat often involves placing structures in stream.

*Army Corps of Engineers Permit Program*

The U.S. Army Corps of Engineers is responsible for the protection and development of the nation's water resources, including navigation, flood control, energy production through hydropower management, water supply storage and recreation. The Corps administers a permit program to ensure that the nation's waters are used in the public interest, and requires any person, firm, or agency planning work in the waters of the United States to first obtain a permit from the Corps. Permits are required even when land next to or under the water is privately owned. It is a violation of federal law to begin work before a permit is obtained and penalties of fines and/or imprisonment may apply. Examples of activities in waters that may require a permit include: construction of a pier, placement of intake and outfall pipes, dredging, excavation and depositing of fill. Permits are generally issued only if the activity is found to be in the public interest. In Oregon, the Division of State Lands (DSL) and the U.S. Army Corps of Engineers jointly issue permits for development of these activities. As mentioned in the discussion of DSL permits, local planning agencies are required to sign off on any permits issued by DSL and the U.S. Army Corps of Engineers and water quality certification is required by the Department of Environmental Quality.

## *Pre-Disaster Hazard Mitigation Projects*

### *Tsunami Evacuation Signs*

The Oregon Department of Transportation (ODOT) collaborated with DOGAMI, OEM, and coastal counties to develop signs denoting tsunami hazard zones, evacuation routes, and evacuation sites. ODOT manufactures the signs and makes them available to local governments at cost. The signs also have been used in California, Washington, Alaska, the Philippines, and Japan.

A project started in 2003 with OEM, DOGAMI, and coastal counties involved the development of signs that tell motorists when they are entering or leaving a tsunami hazard zone. The new signs have been placed on U.S. 101, the Pacific Coast Highway, when local communities establish the locations of their tsunami evacuation routes.

As local tsunami evacuation plans are developed, ODOT will work with communities to develop corresponding alternate route plans for U.S. 101 and other state highways.

### *Wind Erosion Control Practices*

The Natural Resources Conservation Service (NRCS) and local soil and water conservation districts (SWCD) have long sought to reduce wind erosion of cropland. Farming practices commonly used in dryland cropping areas, such as reduced tillage and residue management, reflect this interest. However, occasionally after long periods with little or no precipitation any activities that disturb soil or reduce vegetation can lead to conditions conducive to dust storms.

Nationally, NRCS has developed quality criteria for wind erosion control practices and use a wind erosion equation model for predicting potential wind erosion under various farming systems.

Since 1985, to maintain eligibility for USDA Farm Program benefits, landowners have been required to meet minimum standards for control of erosion, both from water and wind. Participating farmers have developed and are responsible for implementing conservation plans for all farmland designated as highly erodible. Plans address practices such as residue management, tillage methods, and irrigation management.

At this time, wind erosion control is a requirement under the Federal Farm Bill for certain commodities such as wheat and corn, but depending on the rotation, may not be a requirement for other commodities such as potatoes or vegetables. USDA-NRCS is generally responsible for these programs.

Wind erosion is ranked high among concerns for funding under the Environmental Quality Incentive Program, the current USDA cost-share program available to landowners.

### *No-Till Cropping*

SWCDs have been actively promoting, through education and incentives, direct seeding methods. Direct seeding or no-till cropping systems utilize technology that places seed and fertilizer into undisturbed soil and residue from the previous crop. This results in minimal soil disturbance and reduced potential for wind and water erosion.

Research funded by the Cooperative State Research, Education, and Extension Service (CSREES) research on the Columbia Plateau has demonstrated that no-till cropping can reduce predicted dust emissions by 94% during severe wind events, compared to conventional wheat-fallow. Research continues on measuring dust emissions from fields on the Columbia Plateau, a 50,000 square-mile region in Washington, Oregon, and Idaho containing one of the driest, yet most productive, rain-fed wheat regions in the world. No-till only works for some crops under certain conditions, however, and even in situations where it does work, some farmers find that they need to till the soil periodically to reduce diseases and redistribute soil moisture.

*Trip Check*

TripCheck is an online travel planning resource, developed by the Oregon Department of Transportation (ODOT) to provide travelers with the latest travel conditions and information via road cameras, continuous winter travel updates, year-round highway construction details, and other valuable tips. Several projects were included in providing the public with this resource, including installation of closed circuit television cameras on remote state highways, installation of Road Weather Information Systems (RWIS) on state highways. The RWIS's are used to make winter road maintenance decisions, and data is shared with the public. Installation of Wind Warning Systems on state highways to alert drivers to hazardous wind conditions at bridge crossings and along coastal highways.

*Highway Advisory Radio*

ODOT has coordinated the installation of Highway Advisor Radio transmitters for Highway Advisory Radio in select travel corridors. Locations include; installation of radio transmitters along Interstate 84 in Morrow and Umatilla Counties for, and along the full length of US 101.

When an emergency occurs, the ODOT District 12 office selects the appropriate pre-recorded message on the system and transmits it via radio. At the same time, ODOT activates yellow flashing beacons. Motorists seeing the signs and flashing lights should tune to 1610 AM and comply with any messages. In the case of a dust storm, motorists are advised to slow down and exit the freeway as soon as possible. ODOT worked with OEM's Chemical Stockpile Emergency Preparedness Program office in Pendleton and local emergency management personnel on this project.

Also installed in the system is the ability to re-broadcast National Weather Service (NWS) weather information. NOAA Weather Radio is re-broadcast on a continuous basis unless there is an emergency. An emergency broadcast then overrides the NOAA Weather Radio service

*ODOT Mitigation Efforts*

ODOT has several implemented several hazard mitigation measures and increase motorists' safety, including:

- Installation of Debris Flow Warning Signs at designated locations on three at-risk highways: Oregon 38, Oregon 6, and I-84
- Installation of automated Flood Warning systems on some state highways - used to monitor water levels and to notify maintenance crews and the public of potentially hazardous conditions
- Installation of Snow Zone signs on state highways notifying motorists of chain and traction tire requirements ahead.

- Installation of Tsunami Zone signs on state highways.
- Installation of 511 statewide toll free telephone number - allows drivers to hear road and weather information by phone.

## *Publications/Studies*

*Energy Assurance Plan*

As the designated State Energy Office, the Oregon Department of Energy (ODOE) is responsible for developing and maintaining the State Energy Emergency Plan under the State Energy Program. ODOE was required to review and update the State Energy Emergency Plan annually for submission to USDOE as the state energy Plan of Record.

The September 2009 Oregon Energy Emergency Response Plan was revised and renamed the Oregon State Energy Assurance Plan as a result of a grant awarded to ODOE by the USDOE's Office of Electricity Delivery and Energy Reliability (USDOE-OE) to enhance state government energy assurance resiliency. As a result, new information was added to the state's 2009 plan.

The Plan includes information on seismic vulnerabilities and earthquake impacts on the critical energy infrastructure in Oregon from a magnitude nine Cascadia Subduction Zone earthquake. Furthermore, the state is considering the integration of new energy portfolios like alternative fuels as well as smart grid technologies into Oregon's response strategies to energy emergencies to improve energy assurance resiliency.

"Resiliency" is defined as the ability of a critical infrastructure to absorb, adapt to, and/or rapidly recover from a potentially severe and disruptive event. "Critical infrastructure" involve energy lifelines that, if disrupted, could significantly impact public health and safety, the economy, and/or national security. Any prolonged interruption of the supply of basic energy whether it is petroleum products, electricity, or natural gas - could do considerable harm. As a result, improving energy assurance and resiliency in Oregon's energy infrastructure is intended to help mitigate the impacts of an energy supply interruption and help the state return to normal conditions as quickly as possible, regardless of the cause of the interruption. Oregon's energy assurance and resiliency planning takes into account four key components. This includes: 1) understanding the energy infrastructure, Oregon's Energy Profile, and system interdependencies, 2) assessing potential risks and hazards threatening the state's critical energy infrastructure and considering short and long-term mitigation measures to reduce risk and vulnerability, 3) developing effective plans and procedures to help minimize the impacts of an energy supply interruption and rapidly restore the energy infrastructure should an emergency occur, and 4) increase public awareness. The Oregon State Energy Assurance Plan is designed to provide an overview of the first three components to help achieve the fourth component, which is to increase general awareness of the energy infrastructure, risks to the state energy lifelines, and the state's approach to restore fuel, power, and natural gas should an emergency occur.

The Oregon State Energy Assurance Plan is an introduction to how Oregon prepares for, responds to, and recovers from energy emergencies. The Oregon State Energy Assurance Plan complies with the National Association of State Energy Officials (NASEO) guidelines, the NASEO Energy Assurance Planning Framework, the National Response Framework, the National Infrastructure Protection Plan, and the National Incident Management System. The Oregon Energy Assurance Plan is also consistent with the Oregon Emergency Management Plan and

Oregon Revised Statute (ORS) 401 to "coordinate the activities of all public and private organizations providing emergency services within this state." ODOE will review and update the Oregon State Energy Assurance Plan annually or as needed to reflect changing response trends and strategies and to incorporate

*Oregon Climate Change Adaptation Framework (2010)*

This document provides a framework for state agencies to identify authorities, actions, research, and resources needed to increase Oregon's capacity to address the likely effects of a changing climate.

Given the broad range of expected changes to Oregon's climate in the coming decades, the breadth of state-level responsibilities, authorities, and programs that will likely need to respond to the effects of future climate conditions, and limited time, it has only been possible to begin the development of a climate change adaptation strategy for Oregon. This report constitutes a *framework* for the continued development of strategies and plans to address future climate conditions. This Climate Change Adaptation Framework provides context, identifies risks, lays out short-term priorities, and provides momentum and direction for Oregon to prepare for future climate change. The framework has been developed in parallel with the Oregon Climate Assessment Report (OCAR) by the Oregon Climate Change Research Institute (OCCRI). The OCAR and this framework are intended to complement each other. The OCAR identifies the most likely impacts from climate change, which will help the state prioritize resources to prepare for and adapt to a changing and variable climate. The OCCRI assisted in the development of this Framework.

This Framework lays out expected climate-related risks, the basic adaptive capacity to deal with those risks, short-term priority actions, and several steps that will evolve into a long-term process to improve Oregon's capacity to adapt to variable and changing climate conditions.

*Oregon Climate Assessment Report (2010)*

In 2007, the Oregon State Legislature charged the Oregon Climate Change Research Institute, via HB 3543, with assessing the state of climate change science including biological, physical and social science as it relates to Oregon and the likely effects of climate change on the state. This inaugural assessment report is meant to act as a compendium of the relevant research on climate change and its impacts on the state of Oregon. This report, published December 2010, draws on a large body of work on climate change impacts in the western US from the Climate Impacts Group at the University of Washington and the California Climate Action Team.

*State Emergency Management Plan*

This Natural Hazards Mitigation Plan is a document within Volume I, Preparedness and Mitigation, of the State Emergency Management Plan, administered by the Oregon Office of Emergency Management. The other volumes of the Emergency Management Plan are: Volume II, Emergency Operations Plan, and Volume III, Relief and Recovery.

Volume I: "Preparedness and Mitigation" includes the plans and guidance necessary for the state to prepare and mitigate the effects of a disaster. It includes the state disaster hazard assessment, exercise and training programs, and plans to lessen the physical effects of a disaster to citizens, the environment, and property. Volume I also includes this natural hazards mitigation plan.

Volume II: "Emergency Operations Plan," which is also referred to as the Basic Plan, describes in broad terms the organization used by the state to respond to emergencies and disasters. The EOP is supplemented by emergency Support Function Annexes, Support Annexes and Incident Annexes. It describes common management functions including areas common to most major emergencies or disasters such as communications, public information, and others.

Volume III: "Relief and Recovery" gives guidance, process and rules for assisting Oregonians with recovering from the effects of a disaster. It includes procedures to be used by government, business, and citizens.

*State Fire Services Mobilization Plan*

The State Fire Services Mobilization Plan is an all-hazard based plan used to mobilize fire resources to any incident beyond local fire service capabilities that are necessary to protect life, property, and the environment. It assumes the prior existence of mutual aid agreements that organize district and regional firefighting forces to cope with local emergencies.

The primary purpose of mutual aid is to supplement resources of a fire agency during a time of critical need. Mutual aid is based on reciprocal, non-reimbursed contributions for services rendered and is contingent upon a responding fire chief's approval. Mutual aid is given only when equipment and resources are available and dispatch will not jeopardize local firefighting capabilities.

Under the Emergency Conflagration Act, local firefighting forces will be mobilized when the state fire marshal believes that a fire or emergency is causing, or may cause, undue jeopardy to life and/or property and the Act is invoked by the governor.

For purposes of this plan, Oregon has been divided into fire defense districts. The Emergency Conflagration Act fire suppression resources of each fire defense district include the county, city and rural fire protection departments and districts, as well as any other resources available through mutual aid agreements.

The Mobilization Plan may be used separately from the Conflagration Act to mobilize local structural fire agencies for any emergency situation exceeding local mutual aid resources. However, reimbursement for responding resources is assured only when the governor invokes the Conflagration Act. Federal or state disaster assistance reimbursement may or may not apply to emergency services mobilizations.

The objectives of the Oregon Fire Service Mobilization Plan are:

- To provide organizational structure and operating guidelines for the expeditious mobilization and direction of Oregon fire service forces;
- To promote effective communication among agencies during the preparation for, progress of, and demobilization from a fire suppression operation or other emergency response activity;
- To effectively cooperate and coordinate the efforts of various participating agencies through the use of a common command structure and terminology;
- To ensure prompt, accurate and equitable apportionment of fiscal responsibility for fire suppression or other emergency response activity;

- To provide an OSFM Incident Management Team for effective support to local agencies and fire defense districts during major operations

*Oregon's Communities at Risk Assessment*

A statewide task force was formed in February 2004 as part of the Oregon Department of Forestry's Fire Program Review to develop a statewide assessment of *Communities at Risk*. The assessment was used to develop a statewide fuels strategy, and to help set large-scale priorities across geographic areas. A *Community at* Risk is a "geographic area within and surrounding permanent dwellings with basic infrastructure and services, under a common fire protection jurisdiction, government, or tribal trust or allotment, for which there is significant threat due to wildfire." The assessment identifies communities and assigns each a *low, moderate,* or *high* risk rating for *Risk, Hazard, Protection, Capability, Value,* and *Overall*.

The Water Quality Model Code and Guidebook is a companion to the Model Development Code and User's Guide for Small Cities. These documents were developed by the Department of Land Conservation and Development and the Department of Transportation under the Transportation and Growth Management Program (TGM). This guidebook integrates many of the "smart development" inspired code recommendations of the TGM project with recommended code language to achieve water quality objectives. The goal of this guidebook is to provide local communities, both small cities and counties, with a practical guide to protecting and enhancing water quality through improved land use regulations. The guidebook includes both model zoning code ordinances and comprehensive plan policies that are ready for implementation. It also provides references to other publications and resources which provide background information on the link between development activity and water quality.

While Goal 7 does not point specifically toward the issue of water quality, Goal 7 compliance entails measures that will help improve water quality. This goal notes that comprehensive plans "should consider as a major detriment, the carrying capacity of the air, land and water resources… (and) should not exceed the carrying capacity of such resources." In protecting against floods and other natural disasters, local governments may jointly address issues of water quality, such as limiting development within floodways and reducing impervious surfaces that increase runoff and flooding.

*DOGAMI Tsunami Evacuation Maps*

The Department of Geology and Mineral Industries has statutory authority to take a lead role in the mitigation of geologic hazards statewide and assists the BCD in administering ORS 455.446 and .447. Tsunamis can potentially cause the most loss of life of any geologic hazard in the state, so mitigation and assessment of these hazards has a high priority in the agency.

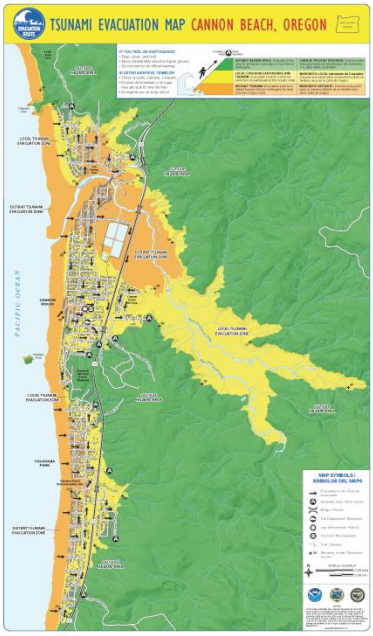
DOGAMI's Newport Coastal Field Office, in collaboration with OEM and DLCD, is developing tsunami evacuation maps for every coastal population center. These maps and evacuation routes are also being compiled into an online Geographic Information System that is being developed for the coast by DLCD. Strong ground shaking at the coast should trigger evacuation of the Cascadia zone, whereas the NOAA warning system will trigger evacuation of the distant tsunami zone.

DOGAMI, in collaboration with the Oregon Health and Science University and NOAA, has developed detailed tsunami inundation maps for several areas on the coast, including Gold

Beach, Coos Bay, Siletz Bay (southern Lincoln City), Alsea Bay (Waldport), Yaquina Bay (Newport), Cannon Beach, Seaside-Gearhart, and Warrenton/Astoria.

The Cascadia Subduction Zone earthquake sources developed for maps produced prior to 2008 were also used as standards for similar mapping in Washington State. These sources for the northern Oregon coast and Washington were updated in a 2008 pilot study of Cannon Beach by DOGAMI (**Figure 3-3**).

**Figure 3-3. Cannon Beach Tsunami Evacuation Map, 2013**




Source: DOGAMI website, http://www.oregongeology.org/tsuclearinghouse/pubs-evacbro.htm

These more detailed maps are used as guides for emergency response planning. DOGAMI plans to develop detailed inundation maps for other areas according to a priority list. Local steering groups established for each map project ensure that maps meet local needs. Local emergency officials review inundation and evacuation maps in the field to ensure that the boundaries are accurate and meet the practical necessities of local government.

DOGAMI also administers, in collaboration with local building codes officials, ORS 455.446 and ORS 455.447 that limit construction of critical/essential facilities in an official tsunami inundation zone. This regulatory zone was mapped along the entire coastline by DOGAMI in 1995. This zone is not appropriate for evacuation planning, but still gives some indication of the potential severity of tsunami flooding from a local earthquake on the Cascadia Subduction Zone.

The Public Education Team at DOGAMI develops and distributes numerous educational materials aimed at tsunami hazard mitigation. These materials can be obtained from them by contacting DOGAMI's retail outlet, the Nature of the Northwest Information Center (503-872-2750 or http://www.naturenw.org).

*DLCD Tsunami Land Use Guide*

DLCD released "Preparing for a Cascadia Subduction Zone Tsunami: A Land Use Guide for Oregon Coastal Communities" on January 15, 2014. Its purpose is to assist vulnerable communities as they incorporate tsunami resilience measures into their local land use programs. The guide can be tailored by communities for their individual risk and location. It includes information on map amendments, sample tsunami related comprehensive plan text and policies, a model tsunami hazard overlay zone, financing and incentive concepts, evacuation route planning assistance, and web links to other helpful information. The guide is designed to be used with the Department of Geology and Mineral Industries' Tsunami Inundation Maps (TIMs).

*DLCD Water Quality Model Code and Guidebook*

In Oregon it is no longer possible to ignore the connection between urban development and degraded water quality. Extensive findings demonstrate that our urban streams do not meet state water quality standards, and do not adequately support native salmon populations. The best way to reverse these trends is to think differently about land use planning at the local level. Local governments are already rethinking the connection between land use and transportation as it relates to air quality. The new challenge is to amend local plans and codes to protect water quality.

*Mount Hood Coordination Plan*

The Mount Hood Coordination Plan provides vital Mount Hood volcanic event response information for the areas that will be most affected by a volcanic event. The purpose of the Mount Hood Coordination Plan is to coordinate the actions that various agencies must take to minimize the loss of life and damage to property before, during, and after hazardous geologic events at Mount Hood volcano. The plan strives to ensure timely and accurate dissemination of warnings and public information.

*Planning for Natural Hazards: Oregon Technical Resource Guide, 2000*

Developed for DLCD by the Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon, the Technical Resource Guide (TRG) provides contacts, documents, and internet resources to assist planners, emergency managers, and citizens in mitigating earthquake hazards along with several other hazards.

*Natural Hazards Mitigation in Oregon: An Evaluation of Natural Hazards Mitigation Planning and Implementation in Oregon*

In January 2010, the Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Community Service Center received a grant from the Hazard Mitigation Grant Program (HMGP) to facilitate and document the State's Enhanced Natural Hazards Mitigation Plan update process. As part of the plan update process, OPDR and the Department of Land Conservation and Development (DLCD) were tasked with conducting a survey of natural hazards mitigation planning in Oregon. This report is a summary of the findings of the natural hazards mitigation planning survey.

The survey assessed: 1) the extent to which natural hazards mitigation strategies were being implemented at the local level; and 2) the availability and applicability of technical resources designed to assist jurisdictions in planning for or mitigating the effects of natural hazards.

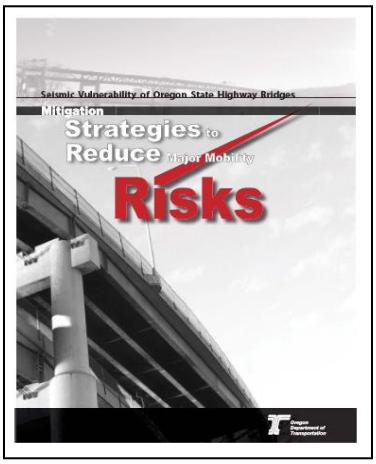
Additionally, the survey asked for suggestions on how to make hazards planning and mitigation more effective at both the state and local levels.

Where applicable, results are compared to a similar survey that was conducted by DLCD and the University of Oregon's Community Planning Workshop (CPW) in 1998. Survey results will be used to inform content within the State's Enhanced Natural Hazards Mitigation Plan and to develop more effective long-term statewide mitigation efforts.

*Seismic Vulnerability of Oregon State Highway Bridges, Mitigation Strategies to Reduce Major Mobility Risks, Oregon Department of Transportation, November 2009*

This report describes potential damage to state highway bridges from six representative earthquake scenarios that are thought most likely to occur in Oregon. The study found that highway mobility would be severely reduced after a major Cascadia Subduction Zone event, as well as after a significant crustal earthquake. The report also considers possible mitigation, including bridge retrofit and strengthening to withstand seismic damage.

**Figure 3-4. Seismic Vulnerability Report**




Source: ODOT, 2009

*Oregon Transportation Plan*

A sound transportation network is what enables Oregonians to reach jobs and recreation access goods and services, and meet daily needs. Due to the extent of the existing transportation infrastructure, and the importance of sustaining that infrastructure, there are numerous ways in which Oregon's transportation system could be adversely affected by any of Oregon's natural hazards. Just as other critical infrastructure can be vulnerable to natural hazards, so too can Oregon's transportation system. The Oregon Transportation Plan addresses the risk and vulnerability to natural hazards by outlining strategies for reducing risk, such as "Evaluate the impacts of geological hazards and natural disasters including earthquakes, floods, landslides and rockfalls, on the efficiency and sustainability of the location and design of new or improved transportation facilities as appropriate."

*Oregon Highway Plan*

Oregon's state highways are a critical component of the state's transportation network. Oregonians rely on highways to go between the state's widespread cities, towns, parks, forests, and businesses. Oregon's industries, including agriculture, timber, tourism, and technology, all depend on highways.

The Oregon Department of Transportation owns, operates, and maintains 7,483 miles (12,040 kilometers) of roads in every corner of Oregon. The state highway system is as diverse as Oregon itself–ranging from six-lane, limited access freeways with metered ramp entrances in the Portland area to the gravel road from Prineville to Brothers. The challenge facing Oregon is to efficiently and effectively guide this diverse highway system into the next millennium. Oregon will continue to grow. Forecasts predict that the state will have 1.2 million new residents by 2020. With limited funding, intelligent investment strategies must be devised to help Oregon meet its long-term goals. Intelligent investments include planning for, and reduce vulnerability to natural hazards. The Oregon Highway Plan addresses this issue by recommending actions and policy elements that include identifying hazards, and improving the safety of potentially hazardous sites and corridors. Mitigation measures listed within the recommended actions include advance maintenance, structural reinforcement, flood proofing, emergency response planning, and development of emergency alternative routes. These risk reduction efforts can also bolster the State of Oregon's emergency response and post-disaster recovery efforts.

*Drought Annex to the State Emergency Operations Plan*

Droughts occur within drainage basins (watersheds) that usually involve more than one city or county. Some cities and counties benefit by planning on a regional level. The state Drought Annex provides information to facilitate regional planning efforts, model water curtailment measures for water utilities, and other strategies. It describes the state system for addressing drought emergencies, but it does not carry the force of law. Its purpose is to coordinate local, state, and federal agency response to drought emergencies and to provide water supplies for human consumption and use under conditions of inadequate supply.

### *Post-Disaster Hazard Mitigation Programs and Capabilities*

*Hazard Mitigation Grant Program*

The state and local communities integrate mitigation into post-disaster recovery operations by taking advantage of Hazard Mitigation Grant Program (HMGP) dollars that become available after presidentially declared disasters.

*OEM Disaster Recovery and Post-Disaster Mitigation*

State post-disaster mitigation planning and project activities following disasters are an integral component of OEM's mission. OEM's Mitigation and Recovery Services Section provides oversight and administration of financial services and related funding that is passed through to local governments. Additionally, the Mitigation and Recovery Services Section manages disaster recovery activities for state and local governments in the event of a devastating emergency or disaster. Specifically, the Section Director, SHMO, Alternate SHMO, Facilities Engineer (Public Assistance Officer), Seismic Grants Coordinator, and financial support staff work together closely post-disaster mitigation grant programs and project activities. Although OEM has limited staff support available for post-disaster mitigation planning and project implementation activities, the state is able to effectively secure and manage FEMA's HMGP grants.

OEM also staffs county liaisons that are assigned specific counties to support operations both during and after disasters. By working closely with the state's Public Assistance Officer, the state is able to identify early mitigation opportunities immediately following a disaster declaration that can frequently be implemented quickly as a component of Section 406 disaster assistance.

*BCD Post-Earthquake Inspection Program*

BCD supports training to inspectors, architects, engineers, contractors and post-earthquake inspectors by providing funding to agencies that provide training. Various classes in seismic design and construction techniques have been sponsored by the division during the last several years Other classes covering subjects such as soils classification, excavation and grading and landslides, which are often related to earthquakes, have also been sponsored.

BCD maintains a roster of persons qualified to inspect buildings following an earthquake. As part of this program, the division adopted rules establishing qualifications and training required to be registered as a post-earthquake damage inspector.

*DEQ Emergency Response Program*

DEQ's Emergency Response Program is designed to carry out legislative direction to work with other agencies and industry to prevent and respond to spills of oil and hazardous materials. Oil and hazardous material spills pose a major potential threat to Oregon's waters, air, land, and wildlife. Large volumes of oil move along the Columbia River and along the coast. Hazardous materials are shipped along the highways and by rail. DEQ works with other agencies and industry to prevent and respond to spills of these materials. The program also coordinates removal of drug lab materials which would otherwise present a risk to the public.

*Office of State Fire Marshal—Conflagration Act*

OSFM works in a collaborative role in helping to respond to WUI fire issues. As part of its fire prevention program, OSFM provides statewide standardization and technical assistance to local fire agencies and to communities with no structural fire protection. Coordination of structural firefighting resources occurs pursuant to the *Conflagration Act.* When directed by the Governor, the Act allows the State Fire Marshal to mobilize structural firefighting personnel and equipment, when a significant number of structures or lives are threatened by fire, and the local capacity to provide structural protection has been exhausted.

The *Conflagration Act* was established as a civil defense measure to provide a mechanism to mobilize structural fire suppression resources for massive urban fires. It was first used in 1959 to coordinate aid resulting from the explosion of a dynamite filled truck in downtown Roseburg. The Act was not invoked again until 1972, when a wildland fire in Yamhill County exceeded the capacity of local structural agencies to protect isolated structures and agricultural lands. Since then, the Act has been invoked more and more frequently—and nearly always for lightning caused wildfires threatening structures in the WUI. In the decade after 1977, the average number of declared conflagrations was about one per year. In the decade after 1987 (a record year) the average number of declarations per year more than doubled. Since 1998, the average has doubled again.

Under this law, only the Governor may invoke the Act to mobilize fire suppression resources from the across the state, but only if local resources, including what is available under mutual aid agreements, has first been fully committed. The increasing frequency of *Conflagration Act*

utilization has caused funding concerns and challenges because no dedicated funds are set aside for this purpose. Especially troubling is the increasing frequency and public expectation to use the Act to protect structures in communities having minimal or nonexistent structural protection. Since 2002, with onset of stronger mitigation efforts, *Community Wildfire Protection Plans* along with ODF's surge in initial attacks on wildfires threatening structures, the use of the Act has dropped significantly.

*OPDR Post-Disaster Recovery Planning for Catastrophic Disasters*

In collaboration with the Cascadia Region Earthquake Workgroup (CREW), the United States Geological Survey (USGS), the City of Cannon Beach, and the Oregon Office of Emergency Management, OPDR developed a pilot long-term catastrophic post-disaster recovery planning process in the City of Cannon Beach. [2006]

OPDR developed a Post-Disaster Recovery Planning Forum: How-To Guide for communities desiring a framework to identify redevelopment issues they will face after a disaster. [2007]

OPDR assisted Douglas County in obtaining over $250,000 in grant funding from the Federal Emergency Management Agency to develop long-term, catastrophic post-disaster recovery plans for Coos, Curry, Douglas, and Lane Counties. [2009–2011]

### 3.4.1.3 Funding Sources

## Funding Overview

Oregon utilizes a number of local, state and federal funding sources to support natural hazard mitigation projects and planning. In general, FEMA Hazard Mitigation Assistance (HMA) grants figure prominently in the state's funding strategy. Several of the grant programs are available "pre-disaster" while others are available only after a federally declared disaster has occurred.

State funding to support hazard mitigation and risk reduction remains limited. However, Oregon has an excellent track record of leveraging limited local resources to successfully complete mitigation planning and projects throughout the state. State funding often consists of "General Fund" money that pays for the labor costs of state officials who are working to support local and statewide hazard mitigation activities. These labor costs are often used as non-federal cost-share for projects that are otherwise federally funded. For example, all of OEM's mitigation staff are funded in part by state dollars that are used to match other federal, homeland security based funding sources. Notably, the majority of state-level staff positions dedicated to hazard mitigation planning and implementation (and a growing number of those at the local level) are funded through federal programs or grants.

Chief among the federal funding sources used to support local mitigation planning in Oregon is FEMA's Pre-Disaster Mitigation Grant Program (PDM). PDM funds generally support one or more local mitigation projects each year as well. The Flood Mitigation Assistance Program (FMA) provides federal funds for flood flood mitigation projects. FEMA's Risk MAP Program also provides funding for hazard studies, flood mapping products, risk assessment tools, mitigation, and planning and outreach support.

Post-disaster, the Hazard Mitigation Grant Program (HMGP), Public Assistance (PA) Program, and Small Business Association's (SBA) Physical Disaster Loan Program each support varying levels and types of mitigation planning and projects. Oregon has experienced ten presidentially declared disasters over the past 10-years. Each of these disaster declarations has opened up funds through HMGP that Oregon has used to support local and statewide hazard mitigation planning as well as numerous local mitigation projects.

In addition, cities, counties and special districts utilize a variety of funding mechanisms to support local mitigation projects. Capital improvement funds, service fees, general funds, levies and local grants are used to support mitigation projects across Oregon. For example, Lincoln County voters have approved several bond measures that specifically supported the relocation of schools outside the tsunami inundation zone. In one case, local bond funds leveraged the first FEMA supported (PDM) tsunami school buy-out in the nation. These examples reflect the creative, innovative and pro-active methods communities in Oregon are using to support risk reduction.

## Federal Funding Sources Pre-Disaster

### *Unified Hazard Mitigation Assistance (HMA)*

According to the 2013 HMA Program Guidance, U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) HMA programs present a "...critical opportunity to reduce the risk to individuals and property from natural hazards while simultaneously reducing reliance on Federal disaster funds." HMA programs include the 1) Pre-Disaster Mitigation Grant Program; 2) Flood Mitigation Assistance Program; and 3) Hazard Mitigation Grant Program. Together, they fund hazard mitigation plans and projects and span pre- and post-disaster environments. HMA programs are intended to reduce community vulnerability to disasters. Specific information about each HMA grant program is presented below.

### *Pre-Disaster Mitigation Grant Program*

The annual Pre-disaster Mitigation Program grants funds for:

- Mitigation planning;
- Non-flood mitigation projects; and
- Flood mitigation projects

PDM funds support several local mitigation plan updates in Oregon each year. Like FMA, PDM is administered by OEM as the applicant (grantee when funded), who works with eligible sub-applicants and then as sub-grantees to implement their funded projects. The State IHMT has a long standing relationship with the University of Oregon's Partnership for Disaster Resilience, who has facilitated the creation and update of the majority of Oregon's local plans using PDM grants. OPDR will continue in this role into the future. PDM grants have sometimes been sub-awarded to individual cities and counties to complete their mitigation plans. Sub-awards to cities will continue to be made on a case-by-case basis. Sub-awards also have been made to DLCD for local plan updates. As the state's regulatory land-use planning agency, DLCD not only assists jurisdictions with their hazard mitigation plan maintenance, but also facilitates integration of plan action items into local comprehensive plans.

FEMA's Risk MAP program supplements these hazard mitigation plan efforts by providing funding for hazard studies, flood mapping products, risk assessment tools, mitigation, and planning and outreach support. DLCD is Oregon's Risk MAP coordinating agency. FEMA also has awarded Risk MAP funds to OPDR and the Department of Geology and Mineral Industries to complete specialized studies.

PDM can also be used to fund flood and non-flood mitigation projects. The state generally uses FMA to fund flood mitigation projects and PDM for non-flood hazard mitigation projects. However, the State may reconsider this position because of a FEMA Mitigation Policy Directive dated June 18, 2014 (FP 204-078-112-1) that allows PDM to be used for projects related to the construction, demolition, or improvement of dams, dikes, levees, floodwalls, seawalls, groins, jetties, breakwaters, and certain erosion control projects.

### *Flood Mitigation Assistance Program*

The Flood Mitigation Assistance (FMA) Program was authorized by the National Flood Insurance Reform Act of 1994 and amended by the Biggert-Waters Flood Insurance Reform Act of 2012. Among other provisions, the amendments dissolved the Severe Repetitive Loss and Repetitive Flood Claims Programs, incorporating their provisions into other existing programs. The FMA Program provides Federal grant funds to pay for up to 100% of the cost of eligible mitigation activities, such as acquiring and demolishing, or elevating SRL structures. In some cases, moving a structure out of the floodplain to high ground (relocation) is a practicable alternative. In addition, mitigated properties may qualify for reduced flood insurance rates.

The overall goal of the Flood Mitigation Assistance (FMA) Program is to fund cost-effective measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other National Flood Insurance Program (NFIP) insurable structures. As of this writing FMA prioritizes mitigation projects on SRL and RL properties. Examples include:

- Acquisition or relocation of at-risk structures and conversion of the property to open space;
- Elevation of existing structures;
- Relocation of structures out of the floodplain; or
- Dry floodproofing of historic properties.

The State of Oregon prefers, where possible, to acquire and demolish, or relocate SRL structures and RL structures, especially those located in the floodway.

The Oregon Military Department's Office of Emergency Management is the applicant for FMA Program grants; cities and counties are eligible sub-applicants. OEM submits project sub-applications for FEMA's consideration in accordance with FEMA and State priorities for the annual grant offering. FEMA's priorities are set forth each year in the grant solicitation. The State then ranks qualifying projects accordingly to ensure a high likelihood of grant award. OEM, with assistance from DLCD, annually reaches out to communities with FEMA-identified SRL and RL properties before FEMA's formal program announcement to make them aware of the program, to train potential sub-applicants on the application and grants management process, and to collect information necessary to develop projects, including owner's willingness to participate voluntarily. Once FEMA releases a formal program announcement, OEM and DLCD follow up with specific technical assistance to help develop sub-applications for projects that are both ready to proceed and most likely to receive grant funding

The FMA Program also offers funding for:

- Planning - to prepare flood mitigation plans (as part of a community's natural hazards mitigation plan); and
- Management Cost Funding - for the sub-grantee and grantee to help administer the FMA program and activities.

Although FMA can provide federal funds for flood hazard planning, Oregon generally does not pursue planning grants under FMA because funds can only be used to update the flood hazard chapter of a local mitigation plan and we are generally successful at developing and updating all-hazards mitigation plans through the annual Pre-Disaster Mitigation Program (PDM).

### *NOAA Coastal Zone Management Program*

Coastal Zone Management Program works with coastal states and territories to address a wide range of issues including climate change, coastal hazards, coastal development, public access, habitat protection, water quality, ocean governance and planning, and planning for energy facilities. Key elements of the program include:

- Protecting natural resources,
- Managing development in high hazard areas,
- Giving development priority to coastal-dependent uses,
- Providing public access for recreation,
- Prioritizing water-dependent uses, and
- Coordinating state and federal actions.

While the legislation includes basic requirements for state partners, it also allows the flexibility needed to design programs that best address local challenges and work within state and local laws and regulations. By using both federal and state funds, the program strengthens the capabilities of each partner to address coastal issues.

### *National Fire Plan*

Under the National Fire Plan (NFP), funding opportunities for local WUI planning, prevention and mitigation projects first became available in 2000. Since that time, Oregon has aggressively sought funding for a wide variety of projects, including fuels reduction work, education and prevention projects, community planning, and alternative uses of fuels. As of early 2007 the ODF had received approximately $25 million. The majority of these monies have been used to fund fuels reduction projects on individual properties and to establish community fuel breaks in the most wildfire prone portions of the state. NFP funds have also been used to expand fire prevention efforts, to educate local officials about how they may help address the WUI situation, to implement Senate Bill 360, to improve public awareness about the wildfire problem, and to better identify areas especially exposed to wildland fire.

## Federal Funding Sources Post-Disaster

### *Hazard Mitigation Grant Program*

FEMA's Hazard Mitigation Grant Program (HMGP) was created in November 1988 under the authority of the Stafford Act, Section 404. The HMGP assists states and local governments to implement long-term hazard mitigation measures following a Presidential major disaster declaration. Initially, the federal cost-share for projects was established at 50%; however, in 1993 that portion was increased to 75% of a project's total eligible costs. Objectives of HMGP include:

- preventing loss of lives and property due to disasters;
- implementing state and local hazard mitigation plans;
- enabling mitigation measures to be implemented during immediate recovery from a disaster; and
- providing funding for previously identified mitigation measures that benefit the disaster area.

Effective November 2004, the state and its applicants must minimally have a FEMA-approved natural hazards mitigation plan (44 CFR Section 201) to qualify for HMGP funding. Eligible applicants for the HMGP are the same as for the Public Assistance Program (Stafford Act, Section 406):

- state and local governments (including special districts);
- certain private nonprofit organizations or institutions; and
- Native American nations and authorized organizations (in Oregon these entities have a direct relationship with FEMA and do not apply through the state).
- Homeowners and businesses, whose properties can benefit from hazard mitigation measures, cannot apply directly for HMGP funding, but rather must be represented by an eligible applicant, such as the city or county where their project is located.

HMGP activities are managed by the Oregon Office of Emergency Management as grantee. The state develops a program administrative plan, solicits applicant interest and project applications, establishes priorities and selection criteria, reviews and selects projects. FEMA reviews all projects submitted by the state, conducts the required environmental reviews and benefit/cost analyses, and approves projects for funding.

The amount of HMGP funding available to the state is calculated at 15% of the federal funds spent on FEMA Public Assistance and Human Services Programs (minus administrative expenses) for each disaster. When a state has a FEMA-approved *enhanced* state hazard mitigation plan (Section 201.5), the calculated amount of HMGP funding increases to 20% of the federal funds spent on FEMA Public Assistance and Human Services Programs.

HMGP allows the state to set-aside up to 5% of the total obligation for projects that are not specifically hazard mitigation, such as warning systems. Another set-aside of 7% of the total HMGP obligation can be earmarked to state and local naturals hazards mitigation planning.

Although HMGP project funding is intended for use in the disaster-declared counties, it can be, at the state's request, used in non-declared counties for eligible hazard mitigation projects.

### *Public Assistance Program*

The FEMA Public Assistance (PA) Program (Stafford Act, Section 406) provides disaster response and recovery assistance to communities following a Presidential Disaster Declaration. PA primarily supports debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. However, PA also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process. Federal assistance is provided at 75% or more of the eligible costs with the balance of funds provided by the grantee/sub-grantee.

### *Physical Disaster Loan Program*

When Physical Disaster Loans are made to homeowners and businesses by the U.S. Small Business Administration (SBA) following disaster declarations, up to 20% of the loan amount can go toward specific measures taken to protect against recurring damage in similar future disasters.

### *Increased Cost of Compliance (ICC)*

The standard Flood Insurance Policy has a provision that will pay the policy holder to comply with a state or local floodplain management law or ordinance regulating repair or reconstruction of a structure that has suffered flood damage and meets other eligibility criteria, such as receiving a substantial damage or repetitive loss determination from a local official. Mitigation activities eligible for payment are: elevation, floodproofing, relocation, or demolition (or any combination of these activities) of the structure. The private-party premium payments are considered non-federal cost share as long as the claim is made within the timeframes allowed by the NFIP. In addition, if the ICC payment is being used as a sub-applicant's non-Federal cost share, the NFIP policy holder must assign the claim to the subapplicant (city or county). Policyholders may receive up to $30,000 under this coverage.

## Federal Funding Sources Pre- and Post-Disaster

### *Community Assistance Program—State Support Services Element (CAP-SSSE)*

The CAP-SSSE program is part of the NFIP. It provides grants to states at 75% with a 25% non-federal match to evaluate local governments' NFIP performance and provide technical assistance to help communities successfully implement the various facets of the NFIP. These funds cover the following activities and more:

- Strategic Planning
- Ordinance Assistance
- Community Assistance Visits
- Outreach, Workshops and Other Training
- General Technical Assistance
- Mapping Coordination Assistance
- Assistance to Communities in Responding to Disasters

### *Secure Rural Schools and Community Self-Determination Act*

Title III of the Rural Schools and Community Self-Determination Act (frequently referred to simply as "Title III") funds the Firewise and Community Wildfire Protection Plan Programs, by passing federal funding through the State of Oregon to its counties. Counties may also be reimbursed for search and rescue and other emergency services, including firefighting, that are performed on national forests.

## State Funding Sources

### *General Fund*

State general fund money pays for the labor costs of state officials who are working on mitigation projects for their agencies; these labor costs can be used as non-federal cost-share for projects that are otherwise federally funded. The state also occasionally contributes cash match through one of several funding mechanisms, such as portions of state agency budgets that are funded by a state source of revenue.

### *Seismic Rehabilitation Grant Program*

The Seismic Rehabilitation Grant Program (SRGP) provides state funds to strengthen public schools and emergency services buildings so they will be less damaged during an earthquake. Administration of the SRGP was transferred from the Oregon Office of Emergency Management (OEM) to Business Oregon's Infrastructure Finance Authority (BusOR-IFA) on January 1, 2014. The SRGP is a competitive grant program that provides state funds on a reimbursable basis for seismic rehabilitation of critical public buildings:

- Hospital buildings with acute inpatient care facilities;
- Fire stations;
- Police stations;
- Sheriffs' offices; and
- Other facilities used by state, county, or district municipal law enforcement agencies.

In addition, eligible school buildings must (a) have a capacity of 250 or more persons; (b) be routinely used for student activities by K-12 public schools, community colleges, education service districts (ESDs), and higher education institutions; and (c) be owned by the State Board of Higher Education, a school district, an education service district, a community college district, or a community college service district.

The SRGP program is subject to the availability of funding, as well as any directive or restriction made with respect to such funds. SRGP grants are awarded on a competitive basis, and the maximum grant award is $1.5 million.

### Table 3-7. SRGP Awarded Projects, 2009-2010

| School District/Entity | Project | Award Amount | Project Status |
|---|---|---|---|
| Linn Benton Community College | Science Technology Building | $565,016 | complete |
| Three Rivers School District | Applegate School | $826,018 | complete |
| Beaverton School District | Elmonica Elementary School | $200,200 | complete |
| Beaverton School District | Cooper Mountain Elementary School | $162,640 | complete |
| Beaverton School District | McKay Elementary School | $320,035 | complete |
| Beaverton School District | Oak Hills Elementary School | $120,600 | complete |
| Western Oregon University | Todd Hall | $1,190,895 | complete |
| Lake County School District | Lakeview High School | $589,700 | complete |
| Lake County School District | Fremont Elementary School | $398,100 | complete |
| Medford School District | Washington Elementary School | $271,000 | complete |
| Medford School District | Medford Opportunity High School | $200,926 | complete |
| David Douglas School District | Floyd Light Middle School | $1,489,766 | complete |
| Yamhill Carlton School District | Yamhill Carlton Intermediate School | $76,500 | complete |
| North Clackamas School District | Milwaukie Elementary School | $1,088,604 | complete |
| ***2009-2010 Schools SRGP Sub-Total*** | | *$7,500,000* | |
| **Emergency Services** | **Project** | **Amount Awarded** | **Project Status** |
| Tuality Healthcare | Tuality Hospital, Building A | $1,380,480 | complete |
| City of Dallas Fire Department | Dallas Fire Station | $887,725 | complete |
| City of Albany Fire Department | Station 12 | $280,023 | complete |
| City of Gresham Fire and Emergency Services | Stations 71 (Public Safety Bldg) and 72 | $273,866 | complete |
| Netarts Oceanside Fire District | Station 61 | $170,000 | complete |
| City of St. Helens Police Department | St. Helens Police Station | $20,000 | complete |
| Klamath County Fire District No. 1 | Station 6 | $1,311,704 | complete |
| City of Eugene | Danebo Fire Station Number 8 | $66,739 | complete |
| Silverton Fire District | Scotts Mills Station | $131,207 | complete |
| Oregon Health and Science University | University Hospital South | $1,478,256 | complete |
| City of Coos Bay | Coos Bay City Hall | $1,500,000 | complete |
| ***2009-2010 Emergency Services SRGP Sub-Total*** | | ***$7,500,000*** | |

Source: Business Oregon, Infrastructure Finance Authority

**Table 3-8. SRGP Awarded Projects, 2010-2011**

| | Project | Award Amount | Project Status |
|---|---|---|---|
| **School District/Entity** | | | |
| Greater Albany Public Schools | Central Elementary School | $1,500,000 | Open |
| Klamath Falls City Schools | Mills Elementary School Auditorium | $1,495,212 | complete |
| Tigard-Tualatin School District | Twality Middle School | $835,750 | complete |
| ***2010-2011 Schools SRGP Sub-Total*** | | ***$3,830,962*** | |
| **Emergency Services** | | | |
| Langlois RFPD | Langlois Fire Station | $249,894 | complete |
| City of Garibaldi | Garibaldi Fire Station | $270,000 | complete |
| City of Grants Pass | Hillcrest Public Safety Building | $477,024 | complete |
| City of Astoria | Public Safety Building | $1,500,000 | complete |
| Santa Clara Fire District | Station 1 | $570,000 | complete |
| City of Hood River | Hood River Fire Department | $291,225 | complete |
| Woodburn RFPD | Station 22 | $310,895 | complete |
| ***2010-2011 Emergency Services SRGP Sub-Total*** | | ***$3,669,038*** | |

Source: Business Oregon, Infrastructure Finance Authority

**Table 3-9. SRGP Awarded Projects, 2011-2012**

| School District/Entity | Project | Amount Awarded | Project Status |
|---|---|---|---|
| Portland Public Schools | Alameda Elementary School | $1,500,000 | complete |
| Lake County School District | Daly Middle School | $1,186,251 | complete |
| Rogue River School District | Rogue River Elementary School | $1,500,000 | complete |
| Lane Community College | Building 11 | $708,718 | open |
| Myrtle Point School District | Myrtle Point High School | $1,470,939 | complete |
| Philomath School District | Philomath Middle School | $284,920 | complete |
| Hillsboro School District | North Plains Elementary School | $593,623 | complete |
| Springfield Public Schools | Walterville Elementary School | $255,549 | complete |
| ***2011-2012 Schools SRGP Sub-Total*** | | ***$7,500,000*** | |

Source: Business Oregon, Infrastructure Finance Authority

Two projects remain open. The 2013–2015 state budget includes $30 million in voter-approved bonds that fund this program. No new SRGP projects were funded in 2013. The 2014 project application window was July 1 through September 30, 2014. SRGP project funds will be made available following bond sales expected in spring of 2015.

### *Community Development Block Grant*

Community Development Block Grants (CDBG) are made available to communities in the State of Oregon, usually via the Infrastructure Finance Authority with funding provided by the U.S. Department of Housing and Urban Development (HUD). While these grants originate with a federal agency, the funding is usually considered non-federal for matching grant purposes (i.e., CDBG can usually be utilized as non-federal match to other federal funding sources).

In 1981 Congress amended the Housing and Community Development Act of 1974 (HCD Act) to give each state the opportunity to administer CDBG funds for non-entitlement areas. These areas include those local governments that do not receive CDBG funds directly from HUD as part of the entitlement program (entitlement cities and urban counties). Non-entitlement areas are cities with populations of less than 50,000, and counties with populations of less than 200,000 although some entitlement cities have a population of less than 50,000 (cities that are designated central cities of metropolitan statistical areas).

The primary statutory objective of the CDBG Program is to develop viable communities by revitalizing neighborhoods, expanding affordable housing and economic opportunities, and improving community facilities and services, principally for persons of low and moderate income. The state must ensure that a specified percent of its CDBG grant funds are used for activities that benefit low and moderate-income persons over a three-year time period.

However, states may also use their funds to meet other urgent community development needs. A need is considered urgent if it poses a serious and immediate threat to the health or welfare of the community, has arisen in the past 18 months, and the project serves primarily low to moderate-income residents. For example, funds can be used as the non-federal match for eligible HMGP, PDM, and FMA Program projects.

### *Community Development Block Grant—Disaster Recovery*

In addition to CDBG funds made available to the state on an annual basis, special HUD funding can become available to the state as a result of natural disasters. This HUD assistance supplements assistance from FEMA and other federal agencies. Traditionally, funds provided via HUD disaster recovery initiatives can be used for long-term recovery efforts, property acquisitions, relocations, and other efforts to reduce future damage. The program is intended to give communities flexibility in meeting local needs quickly. Unless restricted by regulation, these funds can also be used as non-federal, local match for eligible HMGP, PDM, and FMA Program projects.

Congressional supplemental appropriations provide HUD disaster funds. For example, in late 1998, funds were provided to address unmet disaster-related needs in communities affected by recent Presidentially declared disasters. Unmet needs were those that were not addressed by federal disaster relief and recovery programs following these declared disasters. OECDD (now Business Oregon-Infrastructure Finance Authority) was directed to administer these supplemental funds in Oregon for the Crook County and Prineville floods of May and June 1998. These particular HUD funds carried a requirement for other non-federal match.

### *Oregon Watershed Enhancement Board*

Previously known as the Governor's Watershed Enhancement Board (GWEB), the Oregon Watershed Enhancement Board (OWEB) was created by the 1987 Oregon Legislature. OWEB is charged with supporting implementation of *The Oregon Plan for Salmon and Watersheds*, which includes the Oregon Coastal Salmon Restoration Initiative (OCSRI) and the Healthy Streams Partnership.

In 1995 the Legislature directed OWEB to provide support to watershed councils. OWEB directs a grant program through the Natural Resources Division of the Oregon Department of

Agriculture by which each of the state's 45 soil and water conservation districts may apply for funds for watershed enhancement projects.

While OWEB's primary responsibilities are implementing projects addressing coastal salmon restoration and improving water quality statewide, these projects can sometimes also benefit efforts to reduce flood and landslide hazards. In addition, OWEB conducts watershed workshops for landowners, watershed councils, educators, and others, and conducts a biennial conference highlighting watershed efforts statewide.

Funding for OWEB programs comes from the general fund, state lottery, timber tax revenues, license plate revenues, angling license fees, and other sources. OWEB awards approximately $20 million in funding annually.

### *Oregon Local Disaster Assistance Loan and Grant Account*

Through the Local Disaster Loan and Grant Account, the Oregon Legislature makes loans to local governments, special districts, and school districts to match federal disaster relief funding for federally declared disasters. It also provides loans and grants to the same entities for paying the costs of responding to disasters whether or not they are federally declared. The Oregon Military Department may use a small percentage of the loan amount to cover the cost of administering the loan. Prior to the 2012 legislative session, this account was a source of loans only. The 2012 Oregon Legislature amended the program to make this account a source of grant funds as well. In 2012, the Acount was used to provide grant funds assisting Columbia County with the Vernonia School District Acquisition Project and the City of Salem with financing a flood warning system on the Mill Creek Tributary.

### Table 3-10. Potential Hazard Mitigation Funding Programs

| Program Activity | Type of Assistance | Agency & Contact |
|---|---|---|
| Basic and Applied Research/Development | | |
| Community Resilience to Coastal Hazards and Climate Change | Physical and social science research aimed at better understanding ocean and coastal processes and the socio-economic barriers to hazard and climate change preparation. | Oregon State University—Oregon Sea Grant http://seagrant.oregonstate.edu/coastal-hazards-and-climate-change |
| Decision, Risk, and Management Science (DRMS) Program | **Funding** for research and related educational activities on risk, perception, communication, and management (primarily technological hazards) | **NSF—**Directorate for Social, Behavioral and Economic Science, Division of Social Behavioral and Economic Research, Decision, Risk, and Management Science Program (DRMS). http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5423 |
| Disaster Resilience for Rural Communities | Basic **research** in engineering and in the social, behavioral, and economic sciences on enhancing disaster resilience in rural communities. | **USDA**—National Institute of Food and Agriculture http://www.csrees.usda.gov/fo/disasterresilienceforruralcommunities.cfm |
| Disaster Resilient Oregon | Coalition of public, private, and professional organizations working collectively with graduate students and University of Oregon faculty toward the mission of creating a disaster resilient and sustainable state. | University of Oregon—Oregon Partnership for Disaster Resilience http://csc.uoregon.edu/opdr/ |
| Hazard Mitigation and Structural Engineering (HMSE) | Supports fundamental **research** to mitigate impacts of natural and anthropogenic hazards on civil infrastructure and to advance the reliability, resiliency, and sustainability of buildings and other structures. | National Science Foundation (NSF), Directorate for Engineering, Division of Civil, Mechanical and Manufacturing Innovation. www.nsf.gov/funding/pgm_summ.jsp?pims_id=13358&org=CMM |
| National Earthquake Hazard Reduction Program (NEHRP) in Earth Sciences | **Research** into basic and applied earth and building sciences. | **NSF—**Directorate for Geosciences, Division of Earth Sciences: (703) 306-1550 http://www.nehrp.gov/index.htm |
| Natural Hazards Gateway | **Research** into the natural hazards facing the nation. Additionally, provides education and real-time data on natural hazards. | **USDOI—**US Geological Survey (USGS) www.usgs.gov/hazards |
| Societal Dimensions of Engineering, Science, and Technology Program | **Funding** for **research** and related educational activities on topics such as ethics, values, and the assessment, communication, management and perception of risk | **NSF—**Directorate for Social, Behavioral and Economic Science, Division of Social, Behavioral and Economic Research, Societal Dimensions of Engineering, Science and Technology Program. http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5323&org=NSF |
| Science, Technology and Society Program | Funding for research into the historical, philosophical, and sociological questions that arise in connection with science, engineering, and technology, and their respective interactions with society. | |
| Technical and Planning Related Assistance | | |
| Coastal Management Training | Program provides **training** on subjects ranging from coastal hazards to climate adaptation. User selects training format (in-person, on-line, etc.) | NOAA Coastal Services Center (CSC) http://www.csc.noaa.gov/training/ |

| Program Activity | Type of Assistance | Agency & Contact |
|---|---|---|
| Community Assistance Grants | Grants to communities in Oregon and Washington for **planning** and projects related to wildfire. | Oregon Department of Forestry (via National Forest Service and the Pacific Northwest Wildfire Coordinating Group). http://www.fs.fed.us/r6/fire/fireplan/apply/ |
| Disaster Mitigation Planning and Technical Assistance | **Technical and planning assistance** grants for capacity building and mitigation project activities focusing on creating disaster resistant jobs, workplaces and economies. | US Department of Commerce (**USDOC**), US Economic Development Administration (USEDA) http://www.eda.gov/funding-opportunities/ http://csc.uoregon.edu/eda/ |
| Emergency Management / Mitigation Training | **Training** in disaster mitigation, preparedness, planning. | Federal Emergency Management Agency (FEMA) Emergency Management Institute (EMI) http://www.training.fema.gov/ |
| Environmental Quality Incentives Program (EQIP) | **Technical**, educational, and limited **financial assistance** to encourage environmental enhancement. | **USDA-NRCS** www.nrcs.usda.gov |
| National Dam Safety Program | **Technical assistance,** training, and grants to help improve State dam safety programs. | Federal Emergency Management Agency (FEMA) http://www.fema.gov/about-national-dam-safety-program |
| National Earthquake Hazard Reduction Program | **Technical and planning assistance** for activities associated with earthquake hazards mitigation. | **FEMA, USDOI-USGS** Earthquake Program Coordinator: http://www.nehrp.gov/ |
| National Flood Insurance Program | **Formula grants to States** to assist communities to comply with NFIP floodplain management requirements (Community Assistance Program). | FEMA http://www.fema.gov/business/nfip/ |
| Risk Mapping, Assessment, and Planning (Risk MAP) Program | Risk MAP provides technical assistance aimed at delivering quality data that increases public awareness and leads to action that reduces risk to life and property. | Federal Emergency Management Agency (FEMA) http://www.fema.gov/risk-mapping-assessment-planning Department of Land Conservation and Development http://www.oregonriskmap.com/ |
| Silver Jackets (Oregon) | Interagency team dedicated to establish and strengthen **intergovernmental partnerships** at the state level as a catalyst in developing comprehensive and sustainable solutions to state flood hazard challenges | US Army Corps of Engineers; Federal Emergency Management Agency; Oregon Interagency Hazard Mitigation Team. http://www.nfrmp.us/state/factOregon.cfm |
| Volcano Hazards Program | **Technical assistance**: Volcano hazard warnings and operation of four volcano observatories to monitor and assess volcano hazard risk. | **USDOI-USGS** Volcanic Hazards http://volcanoes.usgs.gov/ |
| Watershed Protection and Flood Prevention Program | Watershed and Flood Prevention Operations provides **technical and financial assistance** in authorized watershed projects which have public sponsors. | USDA-NRCS http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo/ |
| Hazard ID and Mapping | | |
| Climate Data, Products and Services | Provides science and information for a climate-smart nation. | NOAA http://www.climate.gov/maps-data |
| Conservation Gateway | The Gateway provides information on conservation planning and adaptive management, conservation topics and geographic implications. Includes the West Wide Wildfire Risk Assessment in addition to many other tools. | The Nature Conservancy https://www.conservationgateway.org/Pages/default.aspx https://www.conservationgateway.org/Files/Pages/west-wide-wildfire-risk-a.aspx |

| Program Activity | Type of Assistance | Agency & Contact |
|---|---|---|
| National Flood Insurance Program: Flood Mapping | **Flood insurance rate maps** and flood plain management maps for all NFIP communities; | FEMA https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1 |
| National Flood Insurance Program: Technical Mapping Advisory Council | **Technical guidance and advice** to coordinate FEMA's map modernization efforts for the National Flood Insurance Program. | USDOI-**USGS—**National Mapping Division: |
| National Digital Orthophoto Program | Develops **topographic quadrangles** for use in mapping of flood and other hazards. | USDOI-USGS—National Mapping Division: http://www.ndop.gov/ |
| National Earthquake Hazards Program | Seismic mapping for U.S. | USDOI-USGS http://www.nehrp.gov/ http://earthquake.usgs.gov/ http://earthquake.usgs.gov/earthquakes/map/ |
| National Geophysical Data Center (NGDC) | NGDC provides stewardship, products, and services for geophysical data from our Sun to Earth and Earth's sea floor and solid earth environment, including Earth observations from space. | http://maps.ngdc.noaa.gov/index.html http://maps.ngdc.noaa.gov/viewers/hazards/ |
| Oregon Hazard Mapping | Results of geologic studies presented in a variety of formats including CD-ROM disks, computer files, and publications such as maps, books, open-file reports, special papers and brochures. Includes the Oregon Lidar Consortium, Oregon HazView and other mapping resources. | Oregon Department of Geology and Mineral Industries http://www.oregongeology.org/sub/pub%26data/pub%26data.htm http://www.oregongeology.org/sub/hazvu/index.htm http://www.oregongeology.org/sub/projects/olc/ |
| Oregon Explorer | Information to help citizens, planners, and policymakers make more informed decisions about Oregon's natural resources and communities. | Oregon State University—Institute for Natural Resources http://oregonexplorer.info/northcoast/NaturalHazards |
| Risk Mapping, Assessment, and Planning (Risk MAP) Program | Risk MAP provides technical assistance aimed at delivering quality data that increases public awareness and leads to action that reduces risk to life and property. | Federal Emergency Management Agency (FEMA) http://www.fema.gov/risk-mapping-assessment-planning Department of Land Conservation and Development http://www.oregonriskmap.com/ |
| Sea Level Rise and Coastal Flooding Impacts Viewer | Tool visualizes potential impacts from sea level rise. | NOAA Digital Coast http://www.csc.noaa.gov/digitalcoast/tools/slrviewer |
| Soil Survey | **Maintains soil surveys** of counties or other areas to assist with farming, conservation, mitigation or related purposes. | USDA-NRCS http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm |
| Stream gauging and Flood Monitoring Network | Operation of a **network of over 7,000 stream gaging stations** that provide data on the flood characteristics of rivers. | USDOE, USGS http://water.usgs.gov/wid/FS_209-95/mason-weiger.html |
| US Drought Monitor | Maintains up to dare national and regional drought map resources. | Partnership between the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. http://droughtmonitor.unl.edu/ |

| Program Activity | Type of Assistance | Agency & Contact |
|---|---|---|
| Project Support | | |
| The Agricultural Conservation Easement Program (ACEP) | Provides **financial and technical assistance** to help conserve agricultural lands and wetlands and their related benefits. | USDA Natural Resources Conservation Service http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/easements/acep/?cid=stelprdb1242695 |
| Aquatic Ecosystem Restoration | **Direct support** for carrying out aquatic ecosystem restoration projects that will improve the quality of the environment. | DOD-USACE http://www.aquatics.org/ |
| Association of State Floodplain Managers | Promotes education, policies, and activities **(information)** that mitigate current and future losses, costs, and human suffering caused by flooding, and to protect the natural and beneficial functions of floodplains - all without causing adverse impacts. | ASFPM http://www.floods.org/ |
| Beneficial Uses of Dredged Materials | **Direct assistance** for projects that protect, restore, and create aquatic and ecologically-related habitats, including wetlands, in connection with dredging an authorized Federal navigation project. | DOD-USACE http://el.erdc.usace.army.mil/dots/budm/budm.cfm |
| Clean Water Act Section 319 Grants | **Grants to States** to implement nonpoint source programs, including support for non-structural watershed resource restoration activities. | Environmental Protection Agency http://water.epa.gov/polwaste/nps/cwact.cfm |
| Coastal Zone Management Program | **Grants** for planning and implementation of non-structural coastal flood and hurricane hazard mitigation projects and coastal wetlands restoration. | US Department of Commerce (**USDOC**) National Oceanic and Atmospheric Administration (**NOAA**) http://coastalmanagement.noaa.gov/funding/welcome.html |
| Coastal Services Center Grant Opportunities | **Formula and program enhancement grants** for implementing and enhancing Coastal Zone Management programs that have been approved by the Secretary of Commerce. | National Oceanic and Atmospheric Administration (NOAA) http://www.csc.noaa.gov/funding/ |
| Coastal Wetlands Conservation Grant Program | Matching **grants to states** for acquisition, restoration, management or enhancement of coastal wetlands. | US Fish and Wildlife Service http://www.fws.gov/Coastal/CoastalGrants/index.html |
| Community Assistance and Protection Program | Mitigation/prevention experts offer mitigation/prevention **support, education, and outreach** that addresses reduction of wildland fire threats and losses to communities and natural resources by taking actions before a fire starts. | Bureau of Land Management (BLM), Fire and Aviation http://www.blm.gov/nifc/st/en/prog/fire/community_assistance.html |

| Program Activity | Type of Assistance | Agency & Contact |
|---|---|---|
| Community Development Block Grant (CDBG) State Administered Program | **Grants to States** to develop viable communities (e.g., housing, a suitable living environment, expanded economic opportunities) in non-entitled areas, for low- and moderate income persons. Includes suite of relevant programs including Entitlement Communities, Section 108 Loan Guarantee Program, and Disaster Recovery Assistance. | US Department of Housing and Urban Development **(HUD)** http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs |
| Community Development Block Grant (CDBG) Disaster Recovery Assistance | Provides **flexible grants** to help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations | US Department of Housing and Urban Development http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs/drsi |
| Disaster Assistance for State Units on Aging (SUAs) | Provide disaster relief **funds** to those SUAs and tribal organizations who are currently receiving a grant under Title VI of the Older Americans Act. | Administration on Aging. http://www.aoa.gov/ |
| Economic Administration Grants | EDA provides support and funds post disaster (pending congressional approval) to support economic recovery and mitigation in disaster areas. | Economic Development Administration http://www.eda.gov/about/disaster-recovery.htm |
| Emergency Watershed Protection Support Services | **Funds** for public and private landowners to implement emergency measures in watersheds to relieve imminent hazards to life and property created by a natural disaster. | **USDA Natural Resources Conservation Service.** http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/ewp/ |
| Farm Service Agency Conservation Programs | Transfers title of certain inventory farm properties owned by FSA to Federal and State agencies for **conservation** purposes (including the restoration of wetlands and floodplain areas to reduce future flood potential) | US Department of Agriculture (**USDA**) –Farm Service Agency (**FSA**) http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=landing |
| Federal Land to Parks Program | Identifies, assesses, and transfers available Federal real property for acquisition for State and local parks and recreation, such as open space. | USDOI-National Park Service http://www.nps.gov/ncrc/programs/flp/index.htm |
| Firewise Communities Program | To save lives and property from wildfire, NFPA's Firewise Communities program **teaches** people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. | Firewise Communities http://www.firewise.org/ |
| Forest Stewardship Program | Helps family forestland owners with hazard reduction **training and funding** to assist with thinning and other actions to reduce wildfire hazard. | **USDA—US Forest Service** http://www.fs.fed.us/spf/coop/programs/loa/fsp.shtml |
| Hazard Mitigation Assistance | Grant programs designed to provide **funding** to protect life and property from future natural disasters. | Federal Emergency Management Agency (FEMA) http://www.fema.gov/hazard-mitigation-assistance |
| Highway Bridge Replacement and Rehabilitation | Deficient highway bridges on all public roads may be eligible for replacement or rehabilitation. | USDOT—Federal Highway Adminstration https://www.fhwa.dot.gov/bridge/hbrrp.cfm |

| Program Activity | Type of Assistance | Agency & Contact |
|---|---|---|
| HOME Investment Partnerships Program | Provides **formula grants to States** and localities to fund a wide range of activities including building, buying, and/or rehabilitating affordable housing for rent or homeownership. | US Department of Housing and Urban Development http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/affordablehousing/programs/home/ |
| Indian Housing Assistance (Housing Improvement Program) | **Project grants and technical assistance** to substantially eliminate sub-standard Indian housing. | HUD Office of Public and Indian Housing http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing |
| Land Trusts | Land trusts assist with the **preservation** of open spaces, scenic vistas, working landscapes and natural areas. | Coalition of Oregon Land Trusts (for more information) http://oregonlandtrusts.org/ |
| National Database of State and Local Wildfire Hazard Mitigation Programs | **Information clearinghouse** related to nonfederal policies and programs that seek to reduce the risk of loss of life and property through the reduction of hazardous fuels on private lands. | USDA—US Forest Service http://www.wildfireprograms.usda.gov/ |
| National Flood Insurance Program (NFIP) | Makes available **flood insurance** to residents of communities that adopt and enforce minimum floodplain management requirements. | FEMA http://www.fema.gov/business/nfip/ |
| National Tsunami Hazard Mitigation Program | Program provides a coordinated, national effort to assess tsunami threat, prepare community response, issue timely and effective warnings, and mitigate damage. | Coordinated by **NOAA**, **USGS,** and **FEMA**. http://nws.weather.gov/nthmp/ |
| Partners for Fish and Wildlife Program | Provides **financial and technical assistance** to **private landowners** interested in restoring degraded wildlife habitat. | US Fish and Wildlife Service http://www.fws.gov/partners/ |
| Public Assistance Program (Infrastructure) | **Grants to States and communities** to repair damaged infrastructure and public facilities, and help restore government or government-related services. Mitigation funding is available for work related to damaged components of the eligible building or structure. | Federal Emergency Management Agency (FEMA) http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit |
| Public Housing Modernization Reserve for Disasters and Emergencies | **Funding** to public housing agencies for modernization needs resulting from natural disasters (including elevation, floodproofing, and retrofit). (24 CFR 968.104) | Housing and Urban Development http://www.hud.gov/ http://www.gpo.gov/fdsys/granule/CFR-2011-title24-vol4/CFR-2011-title24-vol4-sec968-104 |
| Rural Fire Assistance and Volunteer Fire Assistance Grants | **Grants** to fund to improve firefighter skills and to purchase needed equipment; priority areas are located in or adjacent to WUI areas. | Oregon Department of Forestry http://www.oregon.gov/odf/pages/fire/grantopps.aspx |
| Rural Development Assistance --Utilities | USDA Rural Development provides **funding opportunities** in the form of payments, grants, loans, and loan guarantees, for the development and commercialization of vital utility services. | **USDA**-Rural Development http://www.rurdev.usda.gov/Utilities_Assistance.html |

| Program Activity | Type of Assistance | Agency & Contact |
|---|---|---|
| Rural Development Assistance –Housing | USDA Rural Development provides **funding** for single family homes, apartments for low-income persons or the elderly, housing for farm laborers, childcare centers, fire and police stations, hospitals, libraries, nursing homes, schools, and much more. | **USDA**-Rural Development http://www.rurdev.usda.gov/LP_Subject_HousingAndCommunityAssistance.html |
| Title III Funds | The Self-Determination Act (SRS Act) has recently been reauthorized and now includes specific language regarding the Firewise Communities program. Counties seeking funding under Title III must use the **funds** to perform work under the Firewise Communities program. | USDA Forest Service http://www.fs.usda.gov/wps/portal/fsinternet/!ut/p/c4/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gjAwhwtDDw9_AI8zPwhQoY6BdkOyoCAPkATlA!/?ss=119985&navtype=BROWSEBYSUBJECT&cid=FSE_003853&navid=091000000000000&pnavid=null&position=BROWSEBYSUBJECT&ttype=main&pname=Secure%20Rural%20Schools-%20Home |
| Watershed Protection and Flood Prevention Program | **Funds** for soil conservation; flood prevention; conservation, development, utilization and disposal of water; and conservation and proper utilization of land. | USDA Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo/ |
| Wetlands Protection—Development Grants | **Grants** support the development and enhancement of State and tribal wetlands protection programs. | US Environmental Protection Agency (**EPA**) http://www.epa.gov/owow/wetlands/initiative/#financial |
| Watershed Protection and Flood Prevention Program | Funds for soil conservation; flood prevention; conservation, development, utilization and disposal of water; and conservation and proper utilization of land. | USDA Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo/ |
| Financing and Loan Guarantees | | |
| Physical Disaster Loans and Economic Injury Disaster Loans | **Disaster loans** to non-farm, private sector owners of disaster damaged property for uninsured losses. Loans can be increased by up to 20% for mitigation purposes. | Small Business Administration (**SBA**) http://www.sba.gov/services/disasterassistance/ |
| Conservation Contracts | **Debt reduction** for delinquent and non-delinquent borrowers in exchange for conservation contracts placed on environmentally sensitive real property that secures FSA loans. | USDA-FSA http://www.fsa.usda.gov/FSA/webapp?area=home&subject=fmlp&topic=landing |
| Clean Water State Revolving Funds | **Loans** at actual or below-market interest rates to help build, repair, relocate, or replace wastewater treatment plants. | EPA Office of Water State Revolving http://water.epa.gov/grants_funding/cwsrf/cwsrf_index.cfm |
| Section 108 Loan Guarantee Program | **Loan guarantees** to public entities for community and economic development (including mitigation measures). | HUD http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs/108 |
| Section 504 Loans for Housing | **Repair loans, grants and technical assistance** to very low-income homeowners to repair, improve, or modernize their dwellings or to remove health and safety hazards. | US Department of Agriculture (**USDA**)—Rural Housing Service (**RHS**) http://www.rurdev.usda.gov/had-rr_loans_grants.html |

| Program Activity | Type of Assistance | Agency & Contact |
|---|---|---|
| Single Family Housing Loans and Grants | Provides **loans, loan guarantees, and technical assistance** to low- and moderate-income rural Americans through **several loan, grant, and loan guarantee** programs. The programs also make funding available to individuals to finance vital improvements necessary to make their homes decent, safe, and sanitary. | USDA-Rural Development http://www.rurdev.usda.gov/hsf_sfh.html |
| Community Facilities Direct Loan Program, Guaranteed Loan Program, and Grant Program | **Provide loans, grant and loan guarantee**s for essential community facilities in rural areas. Priority is given to health care, education and public safety projects. Typical projects are hospitals, health clinics, schools, fire houses, community centers and many other community based initiatives. | USDA—Rural Development http://www.rurdev.usda.gov/hcf_cf.html |
| Rural Development Assistance –Utilities | Provides funding opportunities in the form of **payments, grants, loans, and loan guarantee**s, for the development and commercialization of vital utility services. | **USDA**-Rural Development http://www.rurdev.usda.gov/utilities_assistance.html |
| Farm Service Agency Disaster Assistance Programs | **Provides assistance for natural disaster losses**, resulting from drought, flood, fire, freeze, tornadoes, pest infestation, and other calamities | USDA-Farm Service Agency http://www.fsa.usda.gov/FSA/webapp?area=home&subject=diap&topic=landing |
| Farm Ownership Loans | **Direct loans, guaranteed/insured loans, and technical assistance** to farmers so that they may develop, construct, improve, or repair farm homes, farms, and service buildings, and to make other necessary improvements. | USDA-Farm Service Agency http://www.fsa.usda.gov/FSA/webapp?area=home&subject=fmlp&topic=dflon |

Source: OPDR

## 3.4.2 Local Capability Assessment

### 3.4.2.1 Policies, Programs, and Capabilities

**Table 3-11. Local Policies, Programs, Capabilities, and Their Effectiveness**

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Comprehensive Land Use Planning (ORS 197; OAR 660-003, OAR 660-018)<br><br>Statewide Land Use Planning Goals (ORS 197.225; OAR 660-015, OAR 660-025)<br><br>Goal 7, Areas Subject to Natural Hazards (RE: Landslides—ORS195.250-195-275; OAR 629-623 | In Oregon, comprehensive planning is directed through 19 statewide land use planning goals. Goal 7 is entitled *Areas Subject to Natural Hazards.* Its stated goal is "To protect people and property from natural hazards." Goal 7 requires local governments to adopt inventories, policies, and implementing measures to reduce risk to people and property from floods, landslides, wildfires, earthquakes and related hazards, tsunamis, and coastal erosion, and allows communities to plan for protection from other natural hazards as well. It encourages local governments to use both regulatory and non-regulatory strategies to achieve risk reduction. | All cities and counties in Oregon must have a comprehensive plan acknowledged by the state as compliant. | Land use plans can be used to guide new development to a community's less hazardous areas. Additionally, they can identify opportunities for redevelopment projects that will improve hazard mitigation by adjusting current land uses, and by requiring up-to-date building codes and standards for rehabilitation of existing structures.<br><br>Compliance with Goal 7 is dependent on the availability of hazard inventory information. Many jurisdictions have not updated the Goal 7 section of their comprehensive plans in many years. Recently, there has been increased interest in addressing landslide hazards and the much anticipated Cascadia earthquake event and resulting tsunami. Landslide susceptibility maps based on lidar have been produced for a few areas of the state, and funding is being pursued to do additional studies, eventually covering the entire state. As these studies are completed, DLCD will be working with local governments to incorporate the new information into their comprehensive plans, development regulations, and other programs to improve loss reduction.<br><br>Several communities are updating the Goal 7 section of their comprehensive plans on their own initiative. The City of Madras is undertaking a pilot project to integrate its comprehensive plan and NHMP by update its comprehensive plan Goal 7 section and incorporating within it elements of its NHMP. The City of Eugene is undertaking another pilot project to explicitly align and integrate climate change considerations into its comprehensive plan, NHMP, and Climate & Energy Action Plan. |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Zoning (ORS 215, ORS 227) | Zoning consists of a map and text that outlines where and how development is to occur within a jurisdiction. Definitions, general provisions, zoning district regulations, special development standards and administration and enforcement are typical elements of a zoning ordinance. | All cities and counties in Oregon must have a zoning ordinance that implements provisions of the comprehensive plan. | Zoning is used to specify the type and location of development within a jurisdiction. In this respect, zoning is a very effective tool to reduce hazard risk in a community. Hazard overlay zones can prohibit or restrict certain types of development within areas known to contain hazards.<br><br>Hillside development, flood, tsunami and wildland urban interface zones are some examples of zoning regulations that can be used to control development on lands subject to natural hazards. Flood zones, which can be found in all of Oregon's NFIP participating jurisdictions, are the most commonly utilized hazard zone. Other types of local hazard zones found in Oregon include geologic hazard (e.g., Marion County), landslide (e.g., City of Salem), tsunami inundation (e.g., Douglas County), and wildfire safety (e.g., Jackson County) overlay zones. |
| Land Division Ordinances (ORS 92) | Land division ordinances (including partitions and subdivisions) govern the division of land into two or more parcels. Land development ordinances include both standards and procedures that must be followed in order to legally divide land. | All cities and counties in Oregon must have a land division ordinance that implements provisions of the zoning ordinance and comprehensive plan. | Land division ordinances are used to ensure that land is made ready for development in an orderly manner. In addition, the land division process ensures that public improvements are available to serve the area when development occurs. For example, subdivision regulations ensure that emergency service personnel have adequate access and infrastructure in place in order to respond to hazard events or other emergencies. Land division ordinances also provide jurisdictions with the opportunity to require site specific evaluations of potentially hazardous areas to ensure the area is suitable and safe to build on. All jurisdictions in Oregon have adopted land division regulations. |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Building Codes (ORS 445; OAR 918) | Oregon building codes establish uniform standards for all residential and commercial buildings in Oregon. The codes prohibit local governments from enacting conflicting regulations. The Oregon Building Codes Division (BCD) provides code development, administration, inspection, plan review, licensing, and permit services to ensure the safe and effective construction of structures in Oregon. | Building codes govern the construction, reconstruction, alteration and repair of buildings and other structures throughout Oregon. | The mission of the Building Codes Division is to work with Oregonians to ensure safe building construction while promoting a positive business climate. This mission is accomplished through: (1) adopting and administering uniform statewide building codes, (2) providing code and rule interpretation, (3) assisting local government building departments and facilitating dispute resolution, (4) enforcing license, code, and permit requirements, (5) certifying inspectors and licensing trade professionals, (6) facilitating economic development efforts around the state, and (7) conducting inspections where local entities do not.<br><br>At the local level, all jurisdictions have building codes. This allows cities and counties in Oregon to ensure that new construction is built to minimum standards. Certain provisions of the building code apply to the design and construction of buildings located in areas prone to natural hazards. For example, buildings in the Special Flood Hazard area are required to be constructed with a first floor elevation one-foot above the Base Flood Elevation (BFE). Several cities have taken this one step further by adopting regulations that supplement the building code and require first floors to be elevated two to three feet above the BFE or the flood of record, whichever is higher. |
| Tsunami Inundation Zone (ORS 455.446 and 455.447; OAR 632-005) | Senate Bill 379 restricts the construction of certain essential facilities, hazardous facilities, major structures and special occupancy structures in the tsunami inundation zone. | All incorporated and unincorporated land in Oregon westward of the statutorily identified building line. | ORS 455.446 and 455.447 restrict the construction of certain essential facilities, hazardous facilities, major structures and special occupancy structures in the tsunami inundation zone, with some exemptions. The zone is enforced through local building codes at the time of development. Certain structure types require additional review by and consultation with DOGAMI before development can proceed to the development phase. Provisions of the zone are enforced at the local level. Some coastal communities have proactively relocated critical facilities such as schools (e.g., City of Waldport) and fire stations (e.g., city of Cannon Beach) east of the statutory line. |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Open Space Preservation (ORS 197; OAR 660-16, 660-023, OAR 660-017, OAR 660-020; OAR 660-034) | In Oregon, comprehensive planning is directed through 19 statewide land use planning goals. Goal 5 is entitled Natural Resources, Scenic and Historic Areas and Open Space. Its stated goal is "To protect natural resources and conserve scenic and historic areas and open spaces." Goal 5 requires local governments to adopt inventories, policies, and implementing measures to protect natural resources and conserve scenic, historic, and open space resources for present and future generations. | All cities and counties in Oregon must have a comprehensive plan acknowledged by the state as compliant. | Land use plans can be used to ensure communities have adequate supply of and access to resources that promote healthy and safe environments. Resource areas and open spaces offer natural mitigation opportunities by buffering development from or absorbing the impacts of natural hazards. For example, riparian buffers along streams serve multiple functions from flood control and storage to habitat preservation and stormwater filtration.<br><br>Compliance with Goal 5 requires that communities: (1) Inventory local occurrences of resources listed in Goal 5 and decide which ones are important; (2) Identify potential land uses on or near each resource site and any conflicts that might result; (3) Analyze economic, social, environmental, and energy, (ESEE) consequences of such conflicts; (4) Decide whether the resource should be fully or partially protected and justify the decision; and (5) Adopt measures such as zoning to put that decision into effect. Resources inventoried under Goal 5 number more than a dozen resources, including threatened and endangered species, critical habitats, scenic and historic places and aggregate. Emphasis is placed on wetlands, riparian zones and wildlife habitats. Jurisdictions are required to update Goal 5 under Oregon Administrative Rule 660 during their next "periodic review" of the goal or "when they amend their current land-use plan or ordinances." |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Local Natural Hazards Mitigation Plans | Many Oregon cities and counties have prepared local NHMPs, in great measure through the state's Pre-Disaster Mitigation (PDM) program. The primary aim of the program is to help communities develop or update local natural hazards mitigation plans. It systematically provides funding and technical assistance targeted annually to local governments in specific planning regions identified by OEM for the purpose of developing or updating existing local natural hazards mitigation plans. The PDM planning program was established by OPDR and OEM in 2004 and is carried out in partnership with DLCD, DOGAMI, FEMA Region X, and local governments with FEMA funding. | Oregon cities and counties | Historically, OPDR has offered grant writing support, technical assistance, and human resource capacity to jurisdictions across the state. Recent administrative changes at the University of Oregon, where OPDR is housed, have made it more challenging for OPDR to maintain its current operational structure. It is unclear if or how these changes may impact OPDR's role in local natural hazards mitigation planning in the future.<br><br>While OPDR has provided the majority of this assistance to local governments, private consulting firms have also assisted local communities. As Clatsop County is currently doing, some jurisdictions undertake development or updates of NHMPs on their own. Until 2013, jurisdictions in the Portland Metro Region received varying degrees of Urban Area Security Initiative (UASI) support for mitigation planning.<br>Plans are tracked and inventoried at the county level (36 Oregon counties). **Table 3-12** shows the status of local NHMPs in Oregon. |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Capital Improvement Plans (ORS Chapter 223; OAR 660-011-0000, OAR 660—12-0000, OAR 660-013-0010) | Local jurisdictions maintain capital improvement plans/programs to ensure that infrastructure is developed and maintained at an adequate level to serve the needs of the community. | Oregon Cities, Counties and Special Districts | Many communities are directly or indirectly addressing hazard mitigation through their capital improvement plans. Such plans are generally maintained on a five to six-year basis. Capital Improvement Plans distribute the expense of major capital construction projects over time. Long-range infrastructure improvement projects are implemented annually through the jurisdictions standard budget process. In many cases, bonds are used to finance projects. In recent years, state and federal grants have been used to offset the costs of local infrastructure improvements.<br><br>The primary opportunity to mitigate projects comes when old infrastructure is improved in ways that eliminate or reduce hazard impacts. For example, bridges can be retrofitted to address seismic impacts; culverts can be upsized to reduce localized flood impacts; electrical lines can be buried to avoid impacts associated with snow, ice and wind storms. These efforts may not be seen by the community as mitigation, but by bringing the infrastructure/facilities up to code, they are reducing the vulnerability of those systems. For example, the Harney Electric Cooperative in south-central Oregon has planned or completed three power line undergrounding projects to offset impacts from winter storm events in that region. |
| Erosion Control Management Plans (ORS Chapter 568; OAR 340-041, OAR 603-095) | Erosion control aims to reduce soil loss from wind and water through a variety of control techniques including vegetative cover, buffer strips, contour plowing, riparian enhancements and windbreaks. | Erosion control plans can apply to any lands where erosion is a concern; wind erosion control is a requirement under the Federal Farm Bill for certain commodities such as wheat and corn, but depending on the rotation, may not be a requirement for other commodities such as potatoes or vegetables. | The Natural Resources Conservation Service (NRCS) and local soil and water conservation districts (SWCD) have long sought to reduce wind erosion of cropland. Specific requirements for erosion control plans apply to certain agricultural lands. Nationally, NRCS has developed quality criteria for wind erosion control practices and use a wind erosion equation model for predicting potential wind erosion under various farming systems.<br><br>Since 1985, USDA-NRCS has been responsible for agriculture programs that require wind and water erosion control as a requirement under the Federal Farm Bill for certain commodities such as wheat and corn. Participating farmers develop and implement conservation plans for all farmland designated as highly erodible. Plans address practices such as residue management, tillage methods, and irrigation management.<br><br>The Environmental Quality Incentive Program provides funds and technical assistance to agricultural producers and owners of non-industrial forest lands. Eligibility requires that applicants, “be in compliance with the highly erodible land and wetland conservation requirements.” |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Floodplain Management (ORS Chapter 536, ORS Chapter 549) | Floodplain management aims to reduce losses associated with flood events and encourage restoration and protection of natural floodplain function. | Oregon has 258 cities and counties that are subject to flooding, and all participate in the National Flood Insurance Program (NFIP) thereby making flood insurance available to their residents and businesses. | The NFIP has three basic components: - flood hazard mapping, floodplain insurance, and floodplain regulations. Does the combination of mapping, regulations, and insurance work to reduce flood damages? Yes! According to FEMA, flood insurance provides an alternative to publicly funded disaster assistance that reduces the ever escalating costs of repairing damage to buildings and their contents caused by floods. FEMA further reports that flood damages are reduced by nearly $1 billion a year nationally through communities implementing sound floodplain management requirements and property owners purchasing flood insurance. Newer buildings constructed in compliance with floodplain regulations suffer approximately 80% less damage annually than those not built to current standards.<br>Oregonians make use of floodplains for a variety of purposes. Floodplain management involves recognition that our use of floodplains can negatively impact floodplain functions and that communities will be faced with making choices about land uses in the floodplain. Water quality and endangered species benefits also result from proactive floodplain management.<br><br>Development within floodplains is generally not prohibited. Rather, floodplain management involves regulatory, construction, and public education measures designed to avoid and minimize potential risk to development from flood hazards. Floodplain management also entails implementation of specific actions intended to prevent future damages and threats to human life and public health.<br><br>Local floodplain programs are built upon statewide requirements for land use planning and implementation of building codes. Local governments implement flood damage prevention ordinances through floodplain development permits, and the state building codes via local building permits. Many local governments in Oregon adopt higher regulatory standards into their flood damage prevention ordinances. For example, some jurisdictions require two or three feet of freeboard (e.g., City of Scio), regulate an area larger than the floodplain shown on FEMA FIRMs, require balanced cut/fill in the floodplain, etc.<br><br>Table 3-12 shows the status of local jurisdiction participation in the NFIP in Oregon. |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Community Rating System (CRS) | The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. | All NFIP Communities in Oregon are eligible to participate. | The National Flood Insurance Program's (NFIP) Community Rating System (CRS) effectively addresses the flood hazard by discounting flood insurance premium rates. CRS participating communities (1) reduce flood damage to insurable property; (2) strengthen and support the insurance aspects of the NFIP, and (3) encourage a comprehensive approach to floodplain management.<br><br>Local governments in Oregon are encouraged to join CRS. The CRS provides an important avenue for Oregon's NFIP communities to obtain recognition for their local floodplain programs. With recent NFIP reforms (i.e., Biggert Waters), many communities in Oregon are interested in joining or enhancing their current participation in the CRS program. As of May 2014, 21 cities and seven counties participate in the CRS program. The City of Portland has the highest rating in the state at five; 18 other cities have ratings of six or 7 with the remainder falling at eight or above.<br><br>**Table 3-12** shows the status of local jurisdiction participation in the CRS program in Oregon. |
| CRS Users Groups | In 2014, DLCD convened two new CRS Users Groups (northern and southern Oregon) to encourage greater participation in the CRS Program. Through CRS Users' Groups, participating CRS communities can obtain assistance in increasing their CRS classifications and new communities can find peer-to-peer support as they join the CRS program.<br><br>Each CRS Users' Group meets a minimum of three times per year in person or virtually. An online forum allows both groups to share documents, discuss ideas and post projects between meetings. | The CRS Users Groups are open to communities already participating in the CRS program and to any other community interested in floodplain management best practices. | The CRS Users Groups were established in the latter half of 2014, so there is no data on their effectiveness at this time. Effectiveness will be measured by the level of local participation, CRS classification maintenance and increases, and new CRS membership over the life of the 2015 Oregon NHMP. |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Mitigation of Repetitive Loss and Severe Repetitive Loss Properties through FEMA's Flood Mitigation Assistance (FMA) Program | FEMA's FMA program provides funds each year for projects to elevate, acquire, or relocate NFIP-insured structures. The State focuses on helping local governments and homeowners or businesses access these funds for mitigation of structures that have been repeatedly damaged by floods. | Local governments may apply for funding on behalf of homeowners or business owners. | While these projects are almost always cost-effective, and FEMA covers 75-100% of the cost, other issues make it very difficult to successfully complete an acquisition or relocation project. First, the FMA grants are reimbursement grants, so the local government or property owner must be willing and able to finance the project and wait for reimbursement from FEMA. The property owner must also be willing to absorb up to 25% of the project cost. Further the local government must have staff with both federal grant management and project management expertise to successfully execute the project. |
| Leveraging Mitigation of Repetitive Loss and Severe Repetitive Loss Properties through partnerships with Community Action Teams (CATs) | Community Action Teams are non-profit organizations that provide a range of services and resources to address the needs of the economically disadvantaged. | Eligibility varies by program and service. | One of the services that CATs provide is home weatherization. When a Repetitive Loss or Severe Repetitive Loss property will be weatherized, the State and local governments assist the property owner with leveraging this opportunity to also elevate the property above the base flood elevation to avoid future flood damage. |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Community Wildfire Protection Planning (Related Statute: ORS 477; OAR 629-042, OAR 629-043; OAR 629-044; OAR 629-048) | A Community Wildfire Protection Plan (CWPP) is developed by a community in an area at-risk from wildfire. The CWPP establishes strategies aimed at reducing wildfire risk. | Primarily counties; plan boundaries may include sub-county regions (e.g., Fire Protection District, unincorporated communities, watersheds, etc.) as well as multi-jurisdictional plans. Certain types of federal funding require the adoption of a CWPP under the provision of the Healthy Forest Restoration Act. | The purpose of a CWPP is to establish a strategic vision (normally five-years in duration) for long-term wildfire risk reduction activities and public outreach. CWPPs outline wildfire mitigation goals, strategies, and activities and highlight other relevant plans and partnerships, including: land use, natural resource, capital improvement, and emergency operation plans. All 36 counties in Oregon have adopted a CWPP; the Oregon Department of Forestry identifies 28 additional sub-county CWPPs.<br><br>The statutory definition of a CWPP appears in Title I of the Healthy Forest Restoration Act of 2003 (HFRA). The HRFA decrees that communities which have a CWPP in place will be a priority for receiving hazardous fuels reduction funding administrated by the US Forest Service and Bureau of Land Management. Plans developed to address the requirements of the 2003 Healthy Forests Restoration Act (HFRA) must meet three minimum requirements:<br>• Collaboration: Local and state government representatives, in consultation with federal agencies and other interested parties, must collaboratively develop a CWPP.<br>• Prioritized Fuel Reduction: A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect at-risk communities and essential infrastructure.<br>• Treatment of Structural Ignitability: A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures.<br>The Healthy Forest Restoration Act (HFRA) requires that three decision-makers mutually agree to the final contents of the CWPP. The three are the applicable local government (i.e., counties or cities), the local fire department(s) and the state entity responsible for forest management (ODF). These three are directed to consult with and involve local representatives of the USFS and BLM and other interested parties or persons in the development of the CWPP. |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Local Emergency Planning Committees (OAR 104-040; OAR 837-085, OAR 837-120) | Under the Emergency Planning and Community Right-to-Know Act (EPCRA), Local Emergency Planning Committees (LEPCs) must develop an emergency response plan, review the plan at least annually, and provide information about chemicals in the community to citizens. | All designated emergency planning districts established under 42 U.S.C. 116§11001(c). | In 1986, the federal government established the Emergency Planning and Community Right to Know Act (EPCRA). The intent of this law was to give citizens the right to know what types of hazardous materials were in their communities, so they could be prepared to respond if a release occurred. Part of this law provided states with the opportunity to create Local Emergency Planning Committees (LEPCs). LEPCs work to understand chemical hazards in the community, develop emergency plans in case of an accidental release, and look for ways to prevent chemical accidents.<br><br>The Office of State Fire Marshal (OSFM) has created a State Emergency Response Commission Advisory Board, to help Oregon communities establish LEPCs and support them in their activities. OSFM currently recognizes 11 LEPCs in the state. In addition, OSFM is actively supporting Community Capability Assessments (a planning approach that, “aids emergency responders in evaluating, coordinating and enhancing the cohesiveness of their emergency response plans”) in communities with active LEPCs.<br><br>LEPC members include people from emergency management, police, fire, emergency medical services, transportation, health, broadcast and print media, industry, community groups, colleges, and the public. Notably, many of these organizations are also typically involved in the development of local natural hazards mitigation plans. |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Local Fire Prevention Cooperatives (ORS 447) | Fire prevention cooperatives are nonprofit interagency fire service groups engaged in fire prevention and public education within their communities. They promote an exchange of ideas, programs and resources in both wildland and structural fire prevention and public education. They also promote, coordinate, and actively support interagency participation in fire prevention activities. | Any collective group of agencies interested and engaged in fire prevention and education can form an LFPC. | A wide range of community-based fire prevention efforts exist across Oregon. Many of these efforts are developed and implemented by local fire prevention cooperatives. Since the mid-1970s, fire prevention cooperatives have been highly successful at the creation and delivery of cost effective fire prevention programs, developed to address specific local situations. Cooperatives multiply the effectiveness of community fire prevention efforts by identifying common needs among neighboring agencies, then developing a single, joint approach to addressing those needs. The cooperative concept recognizes that no single agency usually has the personnel, expertise, community recognition, or financial resources to develop, implement and deliver a comprehensive package of fire awareness, education and public safety needs for a local area. In addition to identifying, designing and implementing unique local programs, fire prevention cooperatives serve as highly effective distributors of materials and programs developed by others. One example is their increasing involvement in Wildfire Awareness Week programs.<br><br>ODF lists the following communities on the current LFPC roster:<br><br>• Baker County Interagency Fire Prevention Team<br>• Central Oregon Fire Prevention Cooperative<br>• Clackamas County Fire Prevention Cooperative<br>• Clatsop County Fire Fighter's Association<br>• Columbia County Fire Prevention Cooperative<br>• Douglas County Fire Prevention Cooperative<br>• Grant-Harney County Fire Prevention Cooperative<br>• Klamath Fire Prevention Cooperative<br>• Lane Fire Prevention Cooperative<br>• Northwest Passage Fire Prevention Cooperative<br>• Rogue Valley Fire Prevention Cooperative<br>• Southwest Oregon Public Safety Association<br>• Wallowa County Fire Prevention Cooperative |

| Local Policies, Programs, Capabilities and Their Effectiveness | | | |
|---|---|---|---|
| **Policy/Program/Capability** | **General Description** | **Applicability** | **Effectiveness** |
| Local Fire Departments and Fire Protection Districts (ORS 476) | City fire departments, rural fire protection districts, county special service districts, and commercial subscription based entities provide both structural and non-structural fire protection. | Authority to establish and maintain LFDs and FPDs is granted in ORS 476.060. | Most structural fire protection in Oregon is provided by city fire departments, rural fire protection districts, county special service districts, and commercial subscription based entities. Specialized agencies also provide structural protection, such as the Portland Airport Fire Department and the National Park Service. A variety of volunteer organizations also exist. In some locations, such as the area immediately west of Portland, structural fire agencies have complete responsibility for the prevention and suppression of all fires, both wildland and structural. Across much of the state, structural fire agencies and the ODF share jurisdiction in Wildland Urban Interface areas. In some parts of Oregon, property owners may be subject to the protection, assessment and taxation of both a local structural fire agency and ODF. In such areas, the structural fire department and ODF jointly protect properties, with the fire departments focused on protecting improvements and ODF focused on protecting the forest resources. To facilitate this joint responsibility, mutual aid agreements signed by both the structural district/department and ODF typically provide up to 24 hours of non-reimbursed firefighting assistance for fires that threaten each other's protected property and resources.<br><br>The Oregon State Fire Marshal's office currently lists 301 distinct local fire departments in Oregon. |
| Rangeland Fire Protection Associations (ORS 477) | Formed under ORS 477.315, RFPAs are nonprofit, locally governed and operated landowner associations organized to provide fire protection on rangeland areas of eastern Oregon which lack both structural and wildland fire protection. | RFPA membership is voluntary. | State law provides for the formation of these RFPAs under the authority of the Oregon Board of Forestry, with assistance from ODF. There are currently 14 RFPAs that collectively protect over 3.2 million acres of private land in Eastern Oregon. The RFPA's also protect approximately a half-million acres of State lands. These lands are primarily Department of State Lands, with lesser amounts of Department of Fish & Wildlife, and Parks & Recreation Department.<br><br>In 2005, the state established a Rangeland Fire Protection Coordinator position. Since that time, federal grants have supported state program administration. In addition, ODF contributes approximately $30,000 per biennium to support associations and reimburse, primarily to reimburse insurance and administration costs. ORS 477.317(2) limits state funding support for the program to, "50 percent of the total of budgeted operating costs and the cash equivalent of in-kind supplies and services of the association in any fiscal year." RFPAs also rely on a variety of additional federal grants for funding support. |

### 3.4.2.2 Local Hazard Mitigation Planning

**Table 3-12. Local Jurisdiction NHMP, NFIP, and CRS Participation Status through December 2014**

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| **1** | **Baker** | **Baker County** | NE Oregon - Region 7 HMP | **Jun-19** | | **Yes** | **—** | |
| 2 | Baker | Baker City | NE Oregon - Region 7 HMP | **Jun-19** | | **Yes** | **—** | |
| 3 | Baker | Greenhorn | | | No Plan | **No** | **—** | **Never mapped** |
| 4 | Baker | Haines | | | No Plan | **Yes** | **—** | |
| 5 | Baker | Halfway | NE Oregon - Region 7 HMP | **Jun-19** | | **Yes** | **—** | |
| 6 | Baker | Huntington | | | No Plan | **Yes** | **—** | |
| 7 | Baker | Richland | | | No Plan | **No** | **—** | **Never mapped** |
| 8 | Baker | Sumpter | | | No Plan | **Yes** | **—** | |
| 9 | Baker | Unity | | | No Plan | **No** | **—** | **Never mapped** |
| 10 | Benton | Benton County | Benton County Hazard Mitigation Plan | Feb-16 | Stand-alone County NHMP Update funded. | Yes | **6** | |
| 11 | Benton | Adair Village | | | No Plan | No | **—** | Has FIRM |
| 12 | Benton | Corvallis | Corvallis HMP | **Jan-13** | Stand-alone City NHMP Update funded. | **Yes** | **6** | |
| 13 | Benton | Monroe | | | No Plan | **Yes** | **—** | |
| 14 | Benton | Philomath | | | No Plan | **Yes** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| **15** | **Clackamas** | **Clackamas County** | Clackamas County HMP | **Apr-18** | | **Yes** | **6** | |
| 16 | Clackamas | Barlow | | | No Plan | **Yes** | **—** | |
| 17 | Clackamas | Canby | Clackamas County HMP | **Apr-18** | | **Yes** | **—** | |
| 18 | Clackamas | Damascus | Clackamas County HMP | **Apr-18** | | **Yes** | **—** | |
| 19 | Clackamas | Estacada | Clackamas County HMP | **Apr-18** | | **Yes** | **—** | |
| 20 | Clackamas | Gladstone | Clackamas County HMP | **Apr-18** | | **Yes** | **—** | |
| 21 | Clackamas | Happy Valley | Clackamas County HMP | **Apr-18** | | **Yes** | **—** | |
| 22 | Clackamas | Johnson City | Clackamas County HMP | **Apr-18** | | **No** | **—** | **All X zone** |
| 23 | Clackamas | Lake Oswego | Clackamas County HMP | **Apr-18** | | **Yes** | **—** | |
| 24 | Clackamas | Milwaukie | Clackamas County HMP | **Apr-18** | | **Yes** | **—** | |
| 25 | Clackamas | Molalla | Clackamas County HMP | | Approved Pending Adoption. Chose not to adopt. | **Yes** | **—** | |
| 26 | Clackamas | Oregon City | Clackamas County HMP | **Apr-18** | | **Yes** | **7** | |
| 27 | Clackamas | Rivergrove | | | No Plan | **Yes** | **—** | |
| 28 | Clackamas | Sandy | Clackamas County HMP | **Apr-18** | | **Yes** | **—** | |
| 29 | Clackamas | West Linn | Clackamas County HMP | **Apr-18** | | **Yes** | **—** | |
| 30 | Clackamas | Wilsonville | Clackamas County HMP | **Apr-18** | | **Yes** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| **31** | **Clatsop** | **Clatsop County** | Clatsop County HMP | **Nov-13** | Update in progress. | **Yes** | **—** | |
| 32 | Clatsop | Astoria | Clatsop County HMP | **Nov-13** | | **Yes** | **—** | |
| 33 | Clatsop | Cannon Beach | Clatsop County HMP | **Nov-13** | | **Yes** | **7** | |
| 34 | Clatsop | Gearhart | Clatsop County HMP | **Nov-13** | | **Yes** | **—** | |
| 35 | Clatsop | Seaside | | | No Plan. Working on addendum to County Plan. | **Yes** | **—** | |
| 36 | Clatsop | Warrenton | Clatsop County HMP | **Nov-13** | | **Yes** | **—** | |
| **37** | **Columbia** | **Columbia County** | Columbia County HMP | **Oct-19** | | **Yes** | **—** | |
| 38 | Columbia | Clatskanie | Columbia County HMP | **Oct-19** | | **Yes** | **—** | |
| 39 | Columbia | Columbia City | Columbia County HMP | **Oct-19** | | **Yes** | **—** | |
| 40 | Columbia | Prescott | | **Oct-19** | | **Yes** | **—** | |
| 41 | Columbia | Rainier | Columbia County HMP | **Oct-19** | | **Yes** | **—** | |
| 42 | Columbia | Scappoose | Columbia County HMP | **Oct-19** | | **Yes** | **7** | |
| 43 | Columbia | St Helens | Columbia County HMP | **Oct-19** | | **Yes** | **—** | |
| 44 | Columbia | Vernonia | Columbia County HMP | **Oct-19** | | **Yes** | **—** | |
| **45** | **Coos** | **Coos County** | Coos County Multi-Jurisdictional NHMP 2010 | **Aug-15** | Update funded. | **Yes** | **—** | |
| 46 | Coos | Bandon | Coos County 2005 HM Plan | **Jul-10** | | **Yes** | **—** | |
| 47 | Coos | Coos Bay | Coos County Multi-Jurisdictional NHMP 2010 | **Aug-15** | | **Yes** | **—** | |
| 48 | Coos | Coquille | Coos County 2005 HM Plan | **Jul-10** | | **Yes** | **—** | |
| 49 | Coos | Lakeside | Coos County 2005 HM Plan | **Jul-10** | | **Yes** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| 50 | Coos | Myrtle Point | Coos County Multi-Jurisdictional NHMP 2010 | **Aug-15** | | **Yes** | **—** | |
| 51 | Coos | North Bend | Coos County Multi-Jurisdictional NHMP 2010 | **Aug-15** | | **Yes** | **—** | |
| 52 | Coos | Powers | Coos County 2005 HM Plan | **Jul-10** | | **Yes** | **—** | |
| **53** | **Crook** | **Crook County** | Crook County NHMP | **Mar-16** | | **Yes** | **—** | |
| 54 | Crook | Prineville | Crook County NHMP | **Mar-16** | | **Yes** | **—** | |
| **55** | **Curry** | **Curry County** | Curry County HM Plan 2010 | **Sep-15** | Update funded. | **Yes** | **—** | |
| 56 | Curry | Brookings | Curry County HM Plan 2010 | **Sep-15** | | **Yes** | **—** | |
| 57 | Curry | Gold Beach | Curry County HM Plan 2010 | **Sep-15** | | **Yes** | **—** | |
| 58 | Curry | Port Orford | Curry County HM Plan 2010 | **Sep-15** | | **Yes** | **—** | |
| **59** | **Deschutes** | **Deschutes County** | Deschutes County HMP | **May-15** | Stand-alone County NHMP Update funded. | **Yes** | **—** | |
| 60 | Deschutes | Bend | | | No Plan | **Yes** | **—** | |
| 61 | Deschutes | La Pine | | | No Plan | **Yes** | **—** | |
| 62 | Deschutes | Redmond | | | No Plan | **Yes** | **—** | |
| 63 | Deschutes | Sisters | | | No Plan | **Yes** | **—** | |
| **64** | **Douglas** | **Douglas County (Inland)** | Douglas County 2010 HM Plan | **Apr-15** | Update funded. | **Yes** | **8** | |
| **65** | **Douglas** | **Douglas County (Coastal)** | | | Not Applicable | **Yes** | **—** | |
| 66 | Douglas | Canyonville | Douglas County 2003 HM Plan | **Dec-08** | | **Yes** | **—** | |
| 67 | Douglas | Drain | Douglas County 2003 HM Plan | **Dec-08** | | **Yes** | **—** | |
| 68 | Douglas | Elkton | Douglas County 2003 HM Plan | **Dec-08** | | **Yes** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| 69 | Douglas | Glendale | Douglas County 2003 HM Plan | **Dec-08** | | **Yes** | **—** | |
| 70 | Douglas | Myrtle Creek | Douglas County 2003 HM Plan | **Dec-08** | | **Yes** | **—** | |
| 71 | Douglas | Oakland | Douglas County 2003 HM Plan | **Dec-08** | | **Yes** | **—** | |
| 72 | Douglas | Reedsport | Douglas County 2010 HM Plan | **Apr-15** | | **Yes** | **—** | |
| 73 | Douglas | Riddle | Douglas County 2003 HM Plan | **Dec-08** | | **Yes** | **—** | |
| 74 | Douglas | Roseburg | Douglas County 2003 HM Plan | **Dec-08** | | **Yes** | **8** | |
| 75 | Douglas | Sutherlin | Douglas County 2003 HM Plan | **Dec-08** | | **Yes** | **—** | |
| 76 | Douglas | Winston | | | No Plan | **Yes** | **—** | |
| 77 | Douglas | Yoncalla | Douglas County 2003 HM Plan | **Dec-08** | | **Yes** | **—** | |
| **78** | **Gilliam** | **Gilliam County** | Gilliam County HMP | **Apr-18** | | **Yes** | **—** | |
| 79 | Gilliam | Arlington | Gilliam County HMP | **Apr-18** | | **Yes** | **—** | |
| 80 | Gilliam | Condon | Gilliam County HMP | **Apr-18** | | **Yes** | **—** | |
| 81 | Gilliam | Lonerock | Gilliam County HMP | **Apr-18** | | **No** | **—** | **Never mapped** |
| **82** | **Grant** | **Grant County** | NE Oregon - Region 7 HMP | **Jun-19** | | **Yes** | **—** | |
| 83 | Grant | Canyon City | | | No Plan | **Yes** | **—** | |
| 84 | Grant | Dayville | | | No Plan | **Yes** | **—** | |
| 85 | Grant | Granite | | | No Plan | **No** | **—** | **Never mapped** |
| 86 | Grant | John Day | NE Oregon - Region 7 HMP | **Jun-19** | | **Yes** | **—** | |
| 87 | Grant | Long Creek | | | No Plan | **Yes** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| 88 | Grant | Monument | | | No Plan | **Yes** | **—** | |
| 89 | Grant | Mt Vernon | | | No Plan | **Yes** | **—** | |
| 90 | Grant | Prairie City | | | No Plan | **Yes** | **—** | |
| 91 | Grant | Seneca | | | No Plan | **Yes** | **—** | |
| **92** | **Harney** | **Harney County** | Harney County HMP | **Jun-18** | | **Yes** | **—** | |
| 93 | Harney | Burns | Harney County HMP | **Jun-18** | | **Yes** | **—** | |
| 94 | Harney | Hines | Harney County HMP | **Jun-18** | | **Yes** | **—** | |
| 95 | Harney | *Harney Electric Co-op Special District* | Harney County HMP | **Jun-18** | | **N/A** | **—** | |
| **96** | **Hood River** | **Hood River County** | Hood River County HMP | **Dec-17** | | **Yes** | **—** | |
| 97 | Hood River | Cascade Locks | Hood River County HMP | **Jan-12** | | **Yes** | **—** | |
| 98 | Hood River | Hood River (City) | Hood River County HMP | **Jan-12** | | **Yes** | **—** | |
| **99** | **Jackson** | **Jackson County** | Jackson County HMP | **Feb-18** | | **Yes** | **7** | |
| 100 | Jackson | Ashland | Jackson County HMP | **Feb-18** | | **Yes** | **7** | |
| 101 | Jackson | Butte Falls | | | No Plan | **Yes** | **—** | |
| 102 | Jackson | Central Point | Central Point HMP | **Dec-16** | Stand-alone City NHMP | **Yes** | **6** | |
| 103 | Jackson | Eagle Point | Jackson County HMP | **Feb-18** | | **Yes** | **—** | |
| 104 | Jackson | Gold Hill | | | No Plan | **Yes** | **—** | |
| 105 | Jackson | Jacksonville | | | No Plan | **Yes** | **—** | |
| 106 | Jackson | Medford | Medford HMP | **Oct-15** | Stand-alone City NHMP Update funding pending. | **Yes** | **8** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| 107 | Jackson | Phoenix | | | No Plan | **Yes** | **—** | |
| 108 | Jackson | Rogue River | Jackson County HMP | **Feb-18** | | **Yes** | **7** | |
| 109 | Jackson | Shady Cove | Jackson County HMP | **Feb-18** | | **Yes** | **—** | |
| 110 | Jackson | *Southern Oregon University Special District* | Southern Oregon University | **Jul-17** | Stand-alone Special District Plan | **N/A** | **—** | |
| 111 | Jackson | Talent | | | No Plan | **Yes** | **9** | |
| **112** | **Jefferson** | **Jefferson County** | Jefferson County HMP | **Feb-19** | | **Yes** | **—** | |
| 113 | Jefferson | Culver | Jefferson County HMP | **Dec-13** | Expired. Declined participation in update. | **Yes** | **—** | |
| 114 | Jefferson | Madras | Jefferson County HMP | **Feb-19** | | **Yes** | **—** | |
| 115 | Jefferson | Metolius | Jefferson County HMP | **Feb-19** | | **No** | **—** | **Never applied** |
| **116** | **Josephine** | **Josephine County** | Josephine County HMP | **Jan-17** | | **Yes** | **—** | |
| 117 | Josephine | Cave Junction | | **Oct-09** | After partial participation in the 2011-12 process, decided not to finish. | **Yes** | **—** | |
| 118 | Josephine | Grants Pass | Josephine County HMP | **Jan-17** | | **Yes** | **9** | |
| **119** | **Klamath** | **Klamath County** | Klamath County HMP | **Nov-16** | | **Yes** | **—** | |
| 120 | Klamath | Bonanza | | | No Plan | **Yes** | **—** | |
| 121 | Klamath | Chiloquin | | | No Plan | **Yes** | **—** | |
| 122 | Klamath | Klamath Falls | Klamath County HMP | **Nov-16** | | **Yes** | **—** | |
| 123 | Klamath | Malin | | | No Plan | **No** | **—** | **No FIRM** |
| 124 | Klamath | Merrill | | | No Plan | **No** | **—** | **No FIRM** |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| 125 | Klamath | *Oregon Tech Special District* | Oregon Tech | **Mar-18** | Stand-alone Special District Plan | **N/A** | **—** | |
| **126** | **Lake** | **Lake County** | Lake County HMP | **Sep-18** | | **Yes** | **—** | |
| 127 | Lake | Lakeview | Lake County HMP | **Sep-18** | | **Yes** | **—** | |
| 128 | Lake | Paisley | Lake County HMP | **Sep-18** | | **Yes** | **—** | |
| **129** | **Lane** | **Lane County (Inland)** | Lane County HMP | **Mar-17** | Stand-alone County NHMP | **Yes** | **7** | |
| 130 | Lane | **Lane County (Coastal)** | | | Not Applicable | **Yes** | **—** | |
| 131 | Lane | Coburg | | | No Plan | **Yes** | **—** | |
| 132 | Lane | Cottage Grove | Cottage Grove HMP | **May-17** | Stand-alone City NHMP | **Yes** | **—** | |
| 133 | Lane | Creswell | | | No Plan | **Yes** | **—** | |
| 134 | Lane | Dunes City | Dunes City Addendum to the City of Florence NHMP | **Feb-14** | Stand-alone City NHMP - Addendum to City of Florence NHMP | **Yes** | **—** | |
| 135 | Lane | Eugene | Eugene-Springfield Multi-Jurisdictional NHMP | **Feb-15** | Stand-alone joint City NHMP - Eugene/Springfield NHMP Update funded. | **Yes** | **7** | |
| 136 | Lane | Eugene/Springfield Metro | | | Not Applicable | **N/A** | **—** | |
| 137 | Lane | Florence | City of Florence NHMP | **Feb-14** | Stand-alone City NHMP | **Yes** | **—** | |
| 138 | Lane | Junction City | | | No Plan | **Yes** | **—** | |
| 139 | Lane | Lowell | | | No Plan | **Yes** | **—** | |
| 140 | Lane | Oakridge | | | No Plan | **Yes** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| 141 | Lane | Springfield | Eugene-Springfield Multi-Juridictional NHMP | **Feb-15** | Stand-alone joint City NHMP - Eugene/Springfield NHMP Update funded. | **Yes** | — | |
| 142 | Lane | *University of Oregon Special District* | University of Oregon HMP 2011 | **Sep-16** | Stand-alone Special District Plan | **N/A** | — | |
| 143 | Lane | Veneta | | | No Plan | **Yes** | — | |
| 144 | Lane | Westfir | | | No Plan | **Yes** | — | |
| **145** | **Lincoln** | **Lincoln County** | Lincoln County HMP | **Jul-14** | Update funded. | **Yes** | — | |
| 146 | Lincoln | Depoe Bay | Lincoln County HMP | **Jul-14** | | **Yes** | — | |
| 147 | Lincoln | Lincoln City | Lincoln County HMP | **Jul-14** | | **Yes** | — | |
| 148 | Lincoln | Newport | Lincoln County HMP | **Jul-14** | | **Yes** | — | |
| 149 | Lincoln | Siletz | Lincoln County HMP | **Jul-14** | | **Yes** | — | |
| 150 | Lincoln | Toledo | Lincoln County HMP | **Jul-14** | | **Yes** | — | |
| 151 | Lincoln | Waldport | Lincoln County HMP | **Jul-14** | | **Yes** | — | |
| 152 | Lincoln | Yachats | Lincoln County HMP | **Jul-14** | | **Yes** | — | |
| **153** | **Linn** | **Linn County** | Linn County HMP 2010 | **Dec-15** | Update funded. | **Yes** | | |
| 154 | Linn | Albany | Albany HMP | **Feb-16** | Stand-alone City NHMP Update funding pending. | **Yes** | **6** | |
| 155 | Linn | Brownsville | | | No Plan | **Yes** | — | |
| 156 | Linn | Halsey | | | No Plan | **Yes** | — | |
| 157 | Linn | Harrisburg | | | No Plan | **Yes** | — | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| 158 | Linn | Lebanon | | | No Plan | **Yes** | **—** | |
| 159 | Linn | *Linn-Benton Community College Special District* | Linn-Benton Community College | **May-18** | Stand-alone Special District Plan | **N/A** | **—** | |
| 160 | Linn | Lyons | Linn County HMP 2010 | **Dec-15** | | **Yes** | **—** | |
| 161 | Linn | Mill City | | | No Plan | **Yes** | **—** | |
| 162 | Linn | Millersburg | | | No Plan | **Yes** | **—** | |
| 163 | Linn | Scio | Linn County HMP 2010 | **Dec-15** | | **Yes** | **—** | |
| 164 | Linn | Sodaville | Linn County HMP 2010 | **Dec-15** | | **No** | **—** | **Has FIRM** |
| 165 | Linn | Sweet Home | Sweet Home HMP | **Aug-14** | Stand-alone City NHMP | **Yes** | **—** | |
| 166 | Linn | Tangent | Linn County HMP 2010 | **Dec-15** | | **Yes** | **—** | |
| 167 | Linn | Waterloo | | | No Plan | **Yes** | **—** | |
| **168** | **Malheur** | **Malheur County** | Malheur County HMP | **May-19** | | **Yes** | **—** | |
| 169 | Malheur | Adrian | Malheur County HMP | **Sep-13** | Did not participate in update | **Yes** | **—** | |
| 170 | Malheur | Jordan Valley | Malheur County HMP | **Sep-13** | Did not participate in update | **Yes** | **—** | |
| 171 | Malheur | Nyssa | Malheur County HMP | **May-19** | | **Yes** | **—** | |
| 172 | Malheur | Ontario | Malheur County HMP | **May-19** | | **Yes** | **—** | |
| 173 | Malheur | Vale | Malheur County HMP | **May-19** | | **Yes** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| **174** | **Marion** | **Marion County** | Marion County HMP | **Jul-16** | Update funded. | **Yes** | **6** | |
| 175 | Marion | Aumsville | | | No Plan | **Yes** | **—** | |
| 176 | Marion | Aurora | Marion County HMP | **Jul-16** | | **Yes** | **—** | |
| 177 | Marion | Detroit | | | No Plan | **Yes** | **—** | |
| 178 | Marion | Donald | | | No Plan | **No** | **—** | **All X zone** |
| 179 | Marion | Gates | | | No Plan | **Yes** | **—** | |
| 180 | Marion | Gervais | | | No Plan | **Yes** | **—** | |
| 181 | Marion | Hubbard | | | No Plan | **Yes** | **—** | |
| 182 | Marion | Idanha | | | No Plan | **Yes** | **—** | |
| 183 | Marion | Jefferson (City) | | | No Plan | **Yes** | **—** | |
| 184 | Marion | Keizer | Marion County HMP | **Jul-16** | | **Yes** | **—** | |
| 185 | Marion | Mt Angel | | | No Plan | **Yes** | **—** | |
| 186 | Marion | Salem | Salem HMP | **Dec-17** | Stand-alone City NHMP | **Yes** | **6** | |
| 187 | Marion | Scotts Mills | | | No Plan | **Yes** | **—** | |
| 188 | Marion | Silverton | Marion County HMP | **Jul-16** | | **Yes** | **—** | |
| 189 | Marion | St Paul | | | No Plan | **Yes** | **—** | |
| 190 | Marion | Stayton | | | No Plan | **Yes** | **—** | |
| 191 | Marion | Sublimity | | | No Plan | **Yes** | **—** | |
| 192 | Marion | Turner | City of Turner | **Mar-18** | Stand-alone City NHMP | **Yes** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
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| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| 193 | Marion | Woodburn | Marion County HMP | **Jul-16** | | **Yes** | **—** | |
| **194** | **Morrow** | **Morrow County** | Morrow County HMP | **Dec-11** | | **Yes** | **—** | |
| 195 | Morrow | Boardman | Morrow County HMP | **Dec-11** | | **Yes** | **—** | |
| 196 | Morrow | Heppner | Morrow County HMP | **Dec-11** | | **Yes** | **8** | |
| 197 | Morrow | Ione | Morrow County HMP | **Dec-11** | | **Yes** | **—** | |
| 198 | Morrow | Irrigon | Morrow County HMP | **Dec-11** | | **Yes** | **—** | |
| 199 | Morrow | Lexington | Morrow County HMP | **Dec-11** | | **Yes** | **—** | |
| **200** | **Multnomah** | **Multnomah County** | Multnomah County HMP | **Jul-17** | Stand-alone County NHMP Update funded. | **Yes** | **—** | |
| 201 | Multnomah | Fairview | Fairview HMP | **Jan-16** | Stand-alone City NHMP | **Yes** | **—** | |
| 202 | Multnomah | Gresham | Gresham HMP | **Oct-18** | APA 08/02/13 | **Yes** | **—** | |
| 203 | Multnomah | Maywood Park | | | No Plan | **N/A** | **—** | |
| 204 | Clackamas, Multnomah, Washington | Metro Region | | | Not Applicable | **N/A** | **—** | |
| 205 | Clackamas, Multnomah, Washington | Metro Region | | | Not Applicable | **N/A** | **—** | |
| 206 | Multnomah | Mount Hood Community College Special District | Mount Hood Community College NHMP | **May-17** | Stand-alone Special District Plan | **N/A** | **—** | |
| 207 | Multnomah | Portland | Portland Hazard Mitigation Plan | **Feb-16** | Stand-alone City NHMP | **Yes** | **5** | |
| 208 | Multnomah | Troutdale | Troutdale HMP | **Jan-16** | Stand-alone City NHMP | **Yes** | **7** | |
| 209 | Multnomah | Wood Village | Wood Village HMP | **Jan-16** | Stand-alone City NHMP | **Yes** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
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| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| **210** | **Polk** | **Polk County** | Polk County HMP | **Oct-14** | Update funded. | **Yes** | **8** | |
| 211 | Polk | Dallas | Polk County HMP | | Did not adopt. | **Yes** | **—** | |
| 212 | Polk | Falls City | Polk County HMP | | No Plan. | **Yes** | **—** | |
| 213 | Polk | Independence | Polk County HMP | **Oct-14** | | **Yes** | **—** | |
| 214 | Polk | Monmouth | Polk County HMP | **Oct-14** | | **Yes** | **—** | |
| **215** | **Sherman** | **Sherman County** | Sherman County HMP | **Feb-19** | | **Yes** | **—** | |
| 216 | Sherman | Grass valley | Sherman County HMP | **Feb-19** | | **Yes** | **—** | |
| 217 | Sherman | Moro | Sherman County HMP | **Feb-19** | | **No** | **—** | **Never mapped** |
| 218 | Sherman | Rufus | Sherman County HMP | **Feb-19** | | **Yes** | **—** | |
| 219 | Sherman | Wasco (City) | Sherman County HMP | **Feb-19** | | **Yes** | **—** | |
| **220** | **Tillamook** | **Tillamook County** | Tillamook County HMP | **Apr-17** | Update funding pending. | **Yes** | **—** | |
| 221 | Tillamook | Bay City | Tillamook County HMP | **Apr-17** | | **Yes** | **—** | |
| 222 | Tillamook | Garibaldi | Tillamook County HMP | **Apr-17** | | **Yes** | **—** | |
| 223 | Tillamook | Manzanita | Tillamook County HMP | **Apr-17** | | **Yes** | **—** | |
| 224 | Tillamook | Nehalem | Tillamook County HMP | **Apr-17** | | **Yes** | **7** | |
| 225 | Tillamook | Rockaway Beach | Tillamook County HMP | **Apr-17** | | **Yes** | **—** | |
| 226 | Tillamook | Tillamook (City) | Tillamook County HMP | **Apr-17** | | **Yes** | **7** | |
| 227 | Tillamook | Wheeler (City) | Tillamook County HMP | **Apr-17** | | **Yes** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
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| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| **228** | **Umatilla** | **Umatilla County** | Umatilla County HMP | **May-19** | | **Yes** | **—** | |
| 229 | Umatilla | Adams | Umatilla County HMP | **Jul-14** | | **Yes** | **—** | |
| 230 | Umatilla | Athena | Athena Addendum to Umatilla County Plan | **Jul-14** | | **Yes** | **—** | |
| 231 | Umatilla | Echo | | | No Plan | **Yes** | **—** | |
| 232 | Umatilla | Helix | | | No Plan | **Yes** | **—** | |
| 233 | Umatilla | Hermiston | | | No Plan | **Yes** | **—** | |
| 234 | Umatilla | Milton-Freewater | | | No Plan | **Yes** | **—** | |
| 235 | Umatilla | Pendleton | | | No Plan | **Yes** | **—** | |
| 236 | Umatilla | Pilot Rock | Umatilla County HMP | **Jul-14** | | **Yes** | **—** | |
| 237 | Umatilla | Stanfield | | | No Plan | **Yes** | **8** | |
| 238 | Umatilla | Ukiah | | | No Plan | **Yes** | **—** | |
| 239 | Umatilla | Umatilla (City) | Umatilla County HMP | **Jul-14** | | **Yes** | **—** | |
| 240 | Umatilla | Weston | Weston Addendum to Umatilla County Plan | **Jul-14** | | **Yes** | **—** | |
| **241** | **Union** | **Union County** | NE Oregon - Region 7 HMP | **Jun-19** | | **Yes** | **—** | |
| 242 | Union | Cove | | | No Plan | **No** | **—** | **Never mapped** |
| 243 | Union | *Eastern Oregon University Special District* | Eastern Oregon University | **May-18** | Stand-alone Special District Plan | **N/A** | **—** | |
| 244 | Union | Elgin | | | No Plan | **Yes** | **—** | |
| 245 | Union | Imbler | | | No Plan | **No** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| 246 | Union | Island City | | | No Plan | **Yes** | — | |
| 247 | Union | La Grande | NE Oregon - Region 7 HMP | **Jun-19** | | **Yes** | — | |
| 248 | Union | North Powder | | | No Plan | **Yes** | — | |
| 249 | Union | Summerville | | | No Plan | **Yes** | — | |
| 250 | Union | Union (City) | | | No Plan | **Yes** | — | |
| **251** | **Wallowa** | **Wallowa County** | NE Oregon - Region 7 HMP | **Jun-19** | | **Yes** | — | |
| 252 | Wallowa | Enterprise | NE Oregon - Region 7 HMP | **Jun-19** | | **Yes** | — | |
| 253 | Wallowa | Joseph | | | No Plan | **Yes** | — | |
| 254 | Wallowa | Lostine | | | No Plan | **Yes** | — | |
| 255 | Wallowa | Wallowa (City) | | | No Plan | **Yes** | — | |
| **256** | **Wasco** | **Wasco County** | Wasco County HMP | **Jan-18** | | **Yes** | — | |
| 257 | Wasco | Antelope | | | No Plan | **No** | — | **Never mapped** |
| 258 | Wasco | Dufur | | | No Plan | **Yes** | — | |
| 259 | Wasco | Maupin | | | No Plan | **Yes** | — | |
| 260 | Wasco | Mosier | | | No Plan | **Yes** | — | |
| 261 | Wasco | Shaniko | | | No Plan | **No** | — | **Never mapped** |
| 262 | Wasco | The Dalles | | | No Plan. Participated with Wasco County but decided not to update. | **Yes** | — | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
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| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| **263** | **Washington** | **Washington County** | Washington County Hazard Mitigation Plan | **Feb-16** | Update funded. | **Yes** | **—** | |
| 264 | Washington | Banks | | | No Plan | **No** | **—** | **Never mapped** |
| 265 | Washington | Beaverton | Beaverton HMP | **Mar-16** | Stand-alone City NHMP Update funding pending. | **Yes** | **—** | |
| 266 | Washington | Cornelius | Washington County Hazard Mitigation Plan | **Feb-16** | | **Yes** | **—** | |
| 267 | Washington | Durham | | | No Plan | **Yes** | **—** | |
| 268 | Washington | Forest Grove | Washington County Hazard Mitigation Plan | **Feb-16** | | **Yes** | **—** | |
| 269 | Washington | Gaston | | | No Plan | **Yes** | **—** | |
| 270 | Washington | Hillsboro | Hillsboro HMP | **Apr-13** | Stand-alone City NHMP. Update underway. | **Yes** | **—** | |
| 271 | Washington | King City | | | No Plan | **Yes** | **—** | |
| 272 | Washington | North Plains | | | No Plan | **Yes** | **—** | |
| 273 | Washington | Sherwood | | | No Plan | **Yes** | **—** | |
| 274 | Washington | Tigard | Washington County Hazard Mitigation Plan | **Dec-09** | Tigard did not participate in Washington County's HMP update so its plan is expired. | **Yes** | **—** | |
| 275 | Washington | Tualatin | | | No Plan | **Yes** | **—** | |
| **276** | **Wheeler** | **Wheeler County** | Wheeler County HMP | **May-19** | | **Yes** | **—** | |
| 277 | Wheeler | Fossil | Wheeler County HMP | **May-19** | | **No** | **—** | |
| 278 | Wheeler | Mitchell | Wheeler County HMP | **May-19** | | **Yes** | **—** | |
| 279 | Wheeler | Spray | Wheeler County HMP | **May-19** | | **No** | **—** | |

| Local Jurisdiction Nhmp, Nfip, And Crs Status | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **#** | **County** | **Jurisdiction** | **Plan Title** | **Expiration Date** | **LNHMP Comments** | **NFIP?** | **CRS Level** | **NFIP Comments** |
| **280** | **Yamhill** | **Yamhill County** | Yamhill County HMP | **Nov-19** | | **Yes** | **—** | |
| 281 | Yamhill | Amity | Yamhill County HMP | **Nov-19** | | **Yes** | **—** | |
| 282 | Yamhill | Carlton | Yamhill County HMP | **Jul-14** | Did not update. | **Yes** | **—** | |
| 283 | Yamhill | Dayton | Yamhill County HMP | **Nov-19** | | **Yes** | **—** | |
| 284 | Yamhill | Dundee | Yamhill County HMP | **Nov-19** | | **Yes** | **—** | |
| 285 | Yamhill | Lafayette | Yamhill County HMP | **Nov-19** | | **Yes** | **—** | |
| 286 | Yamhill | McMinnville | | | No Plan | **Yes** | **—** | |
| 287 | Yamhill | Newberg | Yamhill County HMP | **Nov-19** | | **Yes** | **—** | |
| 288 | Yamhill | Sheridan | Yamhill County HMP | **Nov-19** | | **Yes** | **8** | |
| 289 | Yamhill | Willamina | Yamhill County HMP | **Nov-19** | | **Yes** | **—** | |
| 290 | Yamhill | Yamhill (City) | Yamhill County HMP | **Nov-19** | | **Yes** | **—** | |

# 3.5 Coordinating State and Local Mitigation Planning

(4) A section on the Coordination of Local Mitigation Planning that includes the following:

(i) A description of the State process to support, through funding and technical assistance, the development of local mitigation plans.

(ii) A description of the State process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan.

(iii) Criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include consideration for communities with the highest risks, repetitive loss properties, and most intense development pressures. Further, that for non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs.

## 3.5.1 Funding and Technical Assistance

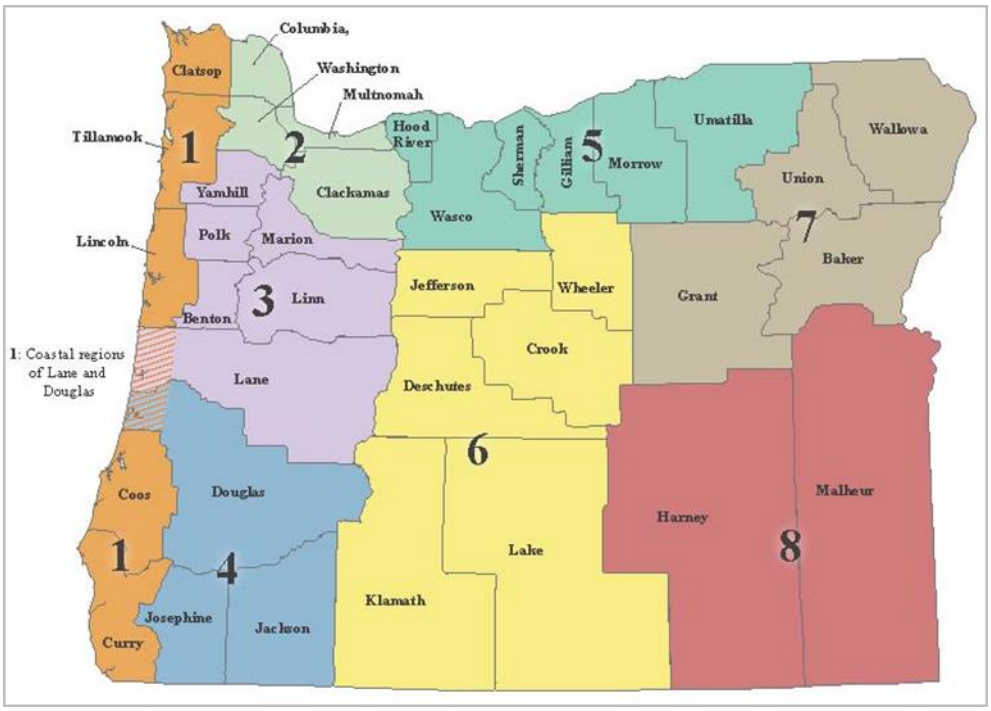
### 3.5.1.1 Funding and Technical Assistance Process

The State of Oregon continues to build local capacity in developing and implementing risk reduction strategies through plan development support, professional assistance, resource sharing, and technical assistance. Local mitigation planning continues to be accomplished in great measure through the state's Pre-Disaster Mitigation Planning Program, established in 2004 by the Oregon Office of Emergency Management (OEM) in partnership with the Oregon Partnership for Disaster Resilience (OPDR). The program systematically provides funding and technical assistance to local governments for the purpose of developing or updating existing local natural hazards mitigation plans with the goal of ensuring that each county and municipality in the State of Oregon maintains a FEMA-approved natural hazards mitigation plan.

Since local mitigation plans expire after five years, the state's strategy is to assist local jurisdictions with plan updates and new plan development on a five-year rotational basis. OEM has divided the state into eight hazard mitigation regions for mitigation planning and emergency resonse purposes (**Figure 3-5**). **Table 3-13** presents the model mitigation planning schedule as it rotates through the mitigation planning regions from 2012 through 2020. Note that while some local jurisdictions elect not to participate in the regional planning cycle as scheduled, all 36 counties in Oregon currently participate in the five-year local plan update process.

In 2014, OEM and OPDR developed a "pre-application" process to screen local communities interested in participating in regional FEMA PDM grant applications. The process consisted of 1) personal communication between the State Hazard Mitigation Officer and local NHMP leads in jurisdictions with plans coming due; 2) an invitation to participate in the pre-application process; and 3) a questionnaire designed to solicit local interest in participating and determine the jurisdiction's capability to participate. The first time through the pre-application process, OEM and OPDR received six completed pre-applications. Of those, five are applying for PDM 14 grant funds through OPDR and the sixth jurisdiction's plan will be developed with funding still available in the PDM 12 grant. Because it was so successful, the state intends to continue using the pre-application process.

**Figure 3-5. Oregon NHMP Natural Hazard Regions**




Source: OEM

**Table 3-13. Model 5-Year Rotational Mitigation Planning Schedule, 2012–2020**

| Planning Year | OEM Planning Region |
|---|---|
| 2011-12 | Region 5 |
| 2012-13 | Regions 7 and 8 |
| 2013-14 | Region 6 |
| 2014-15 | Regions 1 and 3 |
| 2015-16 | Region 2 |
| 2016-17 | Region 5 |
| 2017-18 | Regions 7 and 8 |
| 2018-19 | Region 6 |
| 2019-20 | Regions 1 and 3 |

Source: OPDR

### 3.5.1.2 Funding and Technical Assistance Provided

Direct State technical planning assistance for local NHMPs is provided primarily by OEM, DLCD, and DOGAMI. This assistance is funded by full or partial State support of FTE positions whose duties include providing technical assistance in mitigation planning and project implementation to local communities. Technical assistance is also provided indirectly, in the form of access to products and information.

At OEM, the State Hazard Mitigation Officer (SHMO) assists with mitigation project development, execution, and grant compliance. Others provide oversight of mitigation plans; assistance with

mitigation for natural, cultural, and historic resources; public information and outreach, particularly for earthquake and tsunami hazards; and tsunami evacuation planning.

DLCD staff provide local governments assistance in complying with Statewide Planning Goal 7 which requires planning for hazard mitigation; integrating local NHMPs with comprehensive plans and implementing programs and regulations; implementing the NFIP and participating in the NFIP's CRS Program; developing and providing access to hazard data through the Risk MAP Program; and beginning in 2014, with updating and developing local NHMPs.

Together, OEM and DLCD provide technical assistance to property owners and local governments for mitigating repetitive loss (RL) and severe repetitive loss (SRL) properties. DLCD visits each property FEMA has identified as RL or SRL to verify its address, geolocation, and situation to assess its mitigation potential, then works with OEM to determine which are the most likely candidates for mitigation according to state and federal criteria. DLCD contacts the affected local government(s) who in turn contact the RL or SRL property owners, and when all criteria have been met, OEM helps the community(ies) prepare(s) sub-applications. In addition to this routine work, Notice of Funding Availability letters will be sent directly to jurisdictions with validated RL and SRL properties whenever funding opportunities become available.

In addition to the Risk MAP Program's products, specific hazard information, risk and vulnerability assessment products are provided by DOGAMI on a funding contingent basis. When State funding is involved, it may come through DOGAMI itself or from other State agencies. One example is DOGAMI's study of statewide channel migration zone susceptibility which is fully supported with State funds. This is an important step forward in understanding the state's flood risk, and is expected to pave the way for further state and federal funding to support detailed channel migration zone delineations. Ultimately, these products will help save lives and reduce property damage from flooding. Another example is DOGAMI's recently launched flood hazard webpage, http://www.oregongeology.org/flood/default.htm.

Numerous other federal (e.g., FEMA, US Geological Survey, US Army Corps, etc.), State (e.g., ODF, ODOT, OHA, etc.) and local agencies (counties, cities, councils of governments, special districts, etc.) also contribute valuable technical information and support to local mitigation planning efforts.

A critical source of technical hazard mitigation planning assistance in Oregon, the Oregon Partnership for Disaster Resilience at the University of Oregon assists local jurisdictions with grant writing, local plan development, plan update, process facilitation, stakeholder engagement, public outreach, and hazard research services and serves as a liaison between local communities and state, federal and NGO partners during the mitigation planning process. OPDR strives to ensure that local communities 1) receive the tools and resources to successfully facilitate and document plan development or plan update processes; 2) establish regional partnerships to discuss collaborative projects and implementation strategies; and 3) engage with a variety of state and local agencies and organizations that can assist with local risk reduction strategies.

In June 2013 the agencies most actively involved in local mitigation planning and technical assistance (OEM, DLCD, DOGAMI and OPDR) began meeting between the regularly scheduled State IHMT meetings to foster closer coordination and collaboration on mitigation activities, leverage existing resources, and develop additional resources to support state and local mitigation planning and projects. Topics discussed at these meetings include local mitigation planning project updates and priorities, funding coordination, and agency-level alignment of natural hazard legislation and policy recommendations. The discussions have been successful in improving coordination of (a) funding and technical assistance

proposals for supporting local natural hazards mitigation planning, and (b) agency legislative and budget proposals, resulting in enhanced funding and technical assistance for local jurisdictions.

Funding for the State's Pre-Disaster Mitigation Planning Program comes primarily from FEMA's PDM and HMGP grants, supplemented by state and local general funds, University of Oregon in-kind match, and other in-kind matching sources (e.g., local stakeholder match).

## Focus on 2012-2014

Over the past three years, Oregon has used PDM funds to support plan updates in 21 of Oregon's 36 counties (Table 3-14). In addition, the state supported Yamhill County's NHMP update with state general funds through its Emergency Management Performance Grant (EMPG) Program. Other jurisdictions, such as Columbia County and the City of Central Point have funded NHMP updates with their own resources. Table 3-14, Table 3-15, and Table 3-16 show other projects for which the state provided funding and technical assistance within the last three years as well as projects and disasters that are still open.

**Table 3-14. Planning Grants Assistance Summary 2012–2014**

| Grant Program | Resource Offering | Assistance Title | Federal Share |
|---|---|---|---|
| PDM 11 | FY2012 | State of Oregon Local Plan Updates:<br>Region 2 (Clackamas County)<br>Region 5 (Hood River, Wasco, Sherman, Gilliam, Morrow, and Umatilla Counties)<br>Region 6 (Wheeler County) | $400,000 |
| PDM 12 | FY2013 | State of Oregon Local Plan Updates:<br>Region 6 (Lake, Jefferson, and Deschutes Counties)<br>Region 7 (Wallowa, Union, Baker, and Grant Counties)<br>Region 8 (Harney and Malheur Counties) | $400,000 |
| PDM 13 | FY2013 | State of Oregon Local Plan Updates:<br>Region 1 (Curry, Coos, Douglas, and Lincoln Counties)<br>Region 3 (Cities of Corvallis, Eugene, and Springfield) | $250,000 |
| | | Region 2 (City of Portland) | $266,000 |
| EMPG | FY2013 | Yamhill County—Plan Update | $10,000 |
| PDM 14 | FY 2014 | Linn, Multnomah, Polk, Washington Counties | $250,000 |
| | | Tillamook County, Cities of Beaverton, Albany, and Medford | $215,000 Pending |
| | | Oregon State University | $76,400 Pending |

Source: OEM, compiled by OPDR

All Flood Mitigation Assistance (FMA) Program grants prior to and including FY 2012 are completed and closed with the FY2009 offering closed-out with FEMA in December 2014. Although closed, of particular interest is the FY 2009 offering of the FMA grant program that included a supplemental allocation offered to the states on a first-come basis. Oregon seized this opportunity and received significant FMA funding for the projects listed in Table 3-15.

**Table 3-15. Flood Mitigation Assistance Projects and Funding 2009–2014**

| Project | FMA Funding | Date Completed |
|---|---|---|
| City of Lexington (Fire Station/ City Hall Flood Acquisition) | $103,281.00 | September 2014 |
| City of Vernonia Home Elevations | $ 532,366.50 | September 2014 |
| Vernonia School District Floodplain Acquisition | $11,287,267.39 | September 2014 |
| West Oregon Electric Co-op Headquarters Acquisition | $813,774.75 | September 2014 |
| City of Madras Police Station/City Hall Floodway Acquisition | $412,497.75 | September 2014 |
| Lake Oswego Dam Spillway Retrofit Project | $957,702.75 | September 2014 |

Source: OEM as reported in Federal share, EMS-2009-FM-E001

All PDM FY 2009 and previous year sub-grants are completed and closed-out. Sub-grants from FY 2010 and are on-going or awaiting close-out with a number of projects completed. Table 3-16 shows the history of FY 2006 and later sub-grants.

**Table 3-16. Open PDM Competitive Grant Applications**

| Project | Status |
|---|---|
| **FY10 PDM Competitive Grant Application** | |
| Deschutes/Crook/Klamath Counties WUI Project | pending EHP |
| Harney Electric (utility undergrounding) | ongoing |

Source: OEM

All past disaster HMGP sub-grant activities prior to 2007 and DR-1683 (declared in February 2007) have been completed. At the time of this 2015 plan update, there are seven actively open disasters, as shown in Table 3-17.

**Table 3-17. Status of Open Disaster Grants as of December 2014**

| Disaster | Status |
|---|---|
| DR-1683 | Project sub-grants completed |
| DR-1733 | Period of Performance ended 12/31/14 |
| DR-1824 | Period of Performance ending 3/31/15 |
| DR-1956 | Period of Performance ending 2/17/16 with approved one-year extension |
| DR-1964 | Period of Performance ending 3/25/16 with approved one-year extension |
| DR-4055 | Period of Performance ending 3/1/16 with approved one-year extension |
| DR-4169 | Period of Performance ending 4/4/19 with approved one-year extension |

Source: OEM

## Future Enhancements

Oregon is actively pursuing new resources through the State budget process to increase funding and enhance technical assistance for natural hazard planning.

### *Technical Assistance Grants*

DLCD has a Technical Assistance Grant program to support local planning efforts. Historically this program has been used primarily to support economic development, and natural hazard mitigation has not been identified as a priority for funding. DLCD's Grants Advisory Committee discussed the need for including natural hazard mitigation planning (both local NHMPs and Comprehensive Plan Goal 7) as a priority in September 2014, and will consider including it as a priority in the 2015-17 Grants Allocation Plan. The Committee will recommend the Grants Allocation Plan to the Land Conservation and Development Commission for approval in 2015. The amount of funding allocated to this program has continued to be significantly reduced in recent years. DLCD has requested restoration of previous funding levels for the 2015-17 biennium. This funding would be used to leverage federal funding, making it worth three times the amount provided. This is a significant request, and indicates DLCD's commitment to statewide mitigation planning at the local level.

### *New State Agency Positions*

For the 2015-17 biennium, DLCD, DOGAMI and OEM are all requesting new funding to support hazard mitigation related staff positions in their respective agencies. New positions would increase state's capacity to develop data useful for local hazard mitigation planning; provide access for local jurisdictions to that data; provide technical assistance to local jurisdictions for mitigation planning, projects, and integrating local NHMPs with comprehensive plans, implementing programs and regulations.

### *New Risk Assessment Methodology*

During the NHMP update process the State recognized that no standardized statewide risk assessment methodology is being used across all hazards. With HMGP funding from DR-1733, a subcommittee of the State IHMT developed a new risk assessment concept methodology. DLCD has requested funding to take the first steps in actualizing the new risk assessment model. When fully functional (which will take several years to achieve) the model will provide a standardized way to assess vulnerability to natural hazards in Oregon, allowing the state to strategically target mitigation resources. Once started, it is anticipated that additional state and potentially federal funding will be obtained to complete the model.

For additional information on funding sources used to support local mitigation planning, please refer to the **Funding Sources** section.

## 3.5.2 Prioritizing Local Jurisdictions for Mitigation Funding

### 3.5.2.1 Eligibility Criteria for Planning Grants

Grant proposals for developing initial local natural hazards mitigation plans or updating existing plans are evaluated on the basis of the following prioritized criteria:

1. The jurisdiction's plan status:
    - First Priority: Jurisdictions that have never developed a plan.
    - Second Priority: Jurisdictions that have expired plans.
    - Third Priority: Jurisdictions whose plans will expire within 18 months.
    - Fourth Priority: Jurisdictions whose plans will not expire within 18 months.
2. Jurisdictions located in declared county(ies);
3. Jurisdictions with the required 25% cost-share;
4. Jurisdictions with the highest risks;
5. Jurisdictions with repetitive loss or severe repetitive loss properties;
6. Jurisdictions with the most intense development pressures;
7. Jurisdictions that:
    - Have a local champion to ensure the process moves forward and the plan is completed; and
    - Can spend the grant funds quickly;
8. Jurisdictions located outside the declared county(ies) and geographically diverse with respect to the Oregon NHMP Natural Hazard Regions (**Figure 3-5**).

### 3.5.2.2 Eligibility Criteria and Ranking System for Project Grants

Proposed hazard mitigation projects, including those proposed under Section 404 of the Stafford Act, are evaluated for FEMA funding eligibility on the basis of federal and State criteria enumerated in **Section 5.4.1.1**.

Oregon implements a pre-application process through which information used to determine eligibility is collected. Eligible projects are ranked based on the policy framework developed by the State Interagency Hazard Mitigation Team. Communities with current FEMA-approved Natural Hazards Mitigation Plans have top priority, and their projects that meet the benefit-cost requirements and have minimal environmental issues can generally be selected and approved quickly. Mitigating homes substantially damaged from flooding is a high priority mitigation as well.

For detailed information on the ranking system see **Section 5.4.1.2**, and on the benefit-cost analysis see **Section 5.4.2**.

## 3.5.3 Local Plan Integration

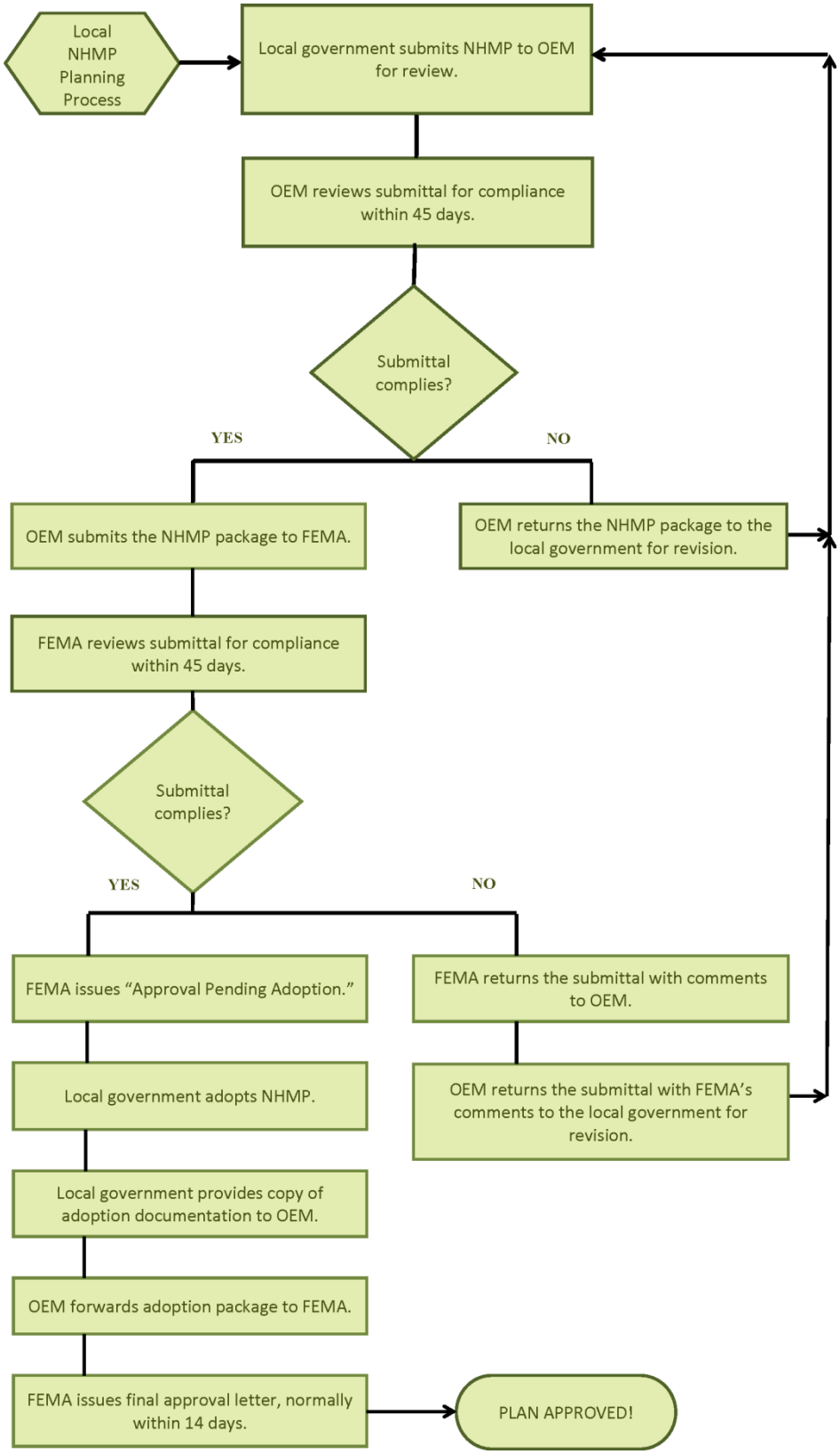
### 3.5.3.1 State Review of Local Mitigation Plans

Oregon is responsible for reviewing local jurisdictions' NHMPs prior to submittal to FEMA for review and approval (**Figure 3-6**). Once a local jurisdiction has completed a draft plan, it submits the plan to the OEM for review. If OEM finds that the draft plan does not meet all FEMA requirements, it returns the draft to the local jurisdiction for revision. Once OEM is satisfied that the draft plan is approvable, it forwards the draft to FEMA for review. Because of OPDR's extensive experience assisting local jurisdictions with developing NHMPs, the State delegates its review function to OPDR for those plans with which it assisted, and OPDR forwards approvable plans directly to FEMA for review.

If FEMA finds deficiencies, it returns the draft to OEM or OPDR which in turn returns it to the jurisdiction for revision. Once OEM or OPDR and FEMA is satisfied that the draft is approvable, FEMA issues *Approved Pending Adoption* (APA) status by letter to the highest elected official of the local jurisdiction. At this point, the local jurisdiction adopts its NHMP, usually by resolution, and sends a copy of the resolution and adopted NHMP to OEM or OPDR. OEM or OPDR verifies that the NHMP has not changed substantively since APA status was conferred, and forwards the adopted NHMP and resolution to FEMA. Upon receipt and verification that the NHMP has not changed substantively, FEMA issues final approval, again by letter to the highest elected official of the local jurisdiction.

In many cases, two or more local jurisdictions collaborate to develop a multi-jurisdictional NHMP. Most often this collaboration is among a county and some or all of its cities. In these cases, the county plan is primary, and the cities' plans are addenda to the county plan. The same process is followed, but the county adopts and receives final approval from FEMA first, then the cities follow suit. All jurisdictions that are parties to the plan receive the same effective date as the county.

**Figure 3-6. State Process for Reviewing Local Mitigation Plans**



## 3.5.3.2 Linking State and Local Plans

### Mitigation Action Tracker

Prior to 2012, OPDR hosted a searchable action item database on its website. The purpose of the database was to provide a central, searchable, online location for mitigation actions found within Oregon's local natural hazards mitigation plans. OPDR supported the development, maintenance and update of the database through FEMA Hazard Mitigation Grant Program grants that supported update of the Oregon Natural Hazards Mitigation Plan.

At the local level, communities used the database to gather ideas for actions, or to identify areas for potential intergovernmental partnerships. State agencies used the database to gain a better understanding of local mitigation needs and implement more effective mitigation actions on a statewide level.

In early 2012, FEMA developed and released a new *Mitigation Action Tracker* in conjunction with the FEMA Risk MAP program. The FEMA tool offers a web-based interface, custom reports and technical support from FEMA through a contractor. Also in 2012, the Oregon Department of Land Conservation and Development agreed to assume responsibility and the requisite grant funding needed to update the Oregon NHMP. The availability of FEMA's *Mitigation Action Tracker* and loss of grant funding led OPDR to discontinue support for the native database in late 2012.

Following conversations with FEMA Region X and state mitigation representatives, OPDR agreed to beta-test FEMA's *Mitigation Action Tracker* in the summer of 2012. OPDR uploaded one city and two county NHMP action sets into FEMA's *Mitigation Action Tracker* and provided FEMA Region X with recommendations for how to improve the tool. In its memo to FEMA Region X, OPDR concluded that *data entry will be more efficient and less subject to varying interpretations of data* using the FEMA database. The memo went on to state, *With the ability to edit and run reports in the FEMA database the database will be more user-friendly and more effective as a data storage and data reporting tool*.

FEMA's *Mitigation Action Tracker* is now functional and can accept local and state NHMP actions, but its output is reported to be somewhat lacking. Oregon will investigate the utility of FEMA's Mitigation Action Tracker and compare it to other options, such as borrowing another state's tracker software or developing a tracker of our own. Developing our own tracker would provide the opportunity to include more information to inform related programs and projects. FEMA's *Mitigation Action Tracker* provides the benefit of being connected directly to FEMA with access to mitigation actions from communities across the nation. Whichever course is ultimately selected and implemented, using a tracker will ensure that both local and state mitigation planning partners will have a central place to gather ideas for mitigation actions and coordinate local and state mitigation priorities.

## State and Local Natural Hazards Mitigation Plan Goals

In 2014, State and local NHMP goals were reviewed and the 2015 Oregon NHMP goals revised to improve the linkage between state and local NHMPs.

Oregon's 36 county-level NHMPs were reviewed to:

- Discern, if possible, whether the state NHMP goals were considered in developing local NHMP goals;
- Determine to what extent local and state NHMP goals are correlated; and
- Identify county-level goals that are not reflected in the Oregon NHMP.

At the local level, counties review the state's goals to inform their local goal identification. If a state goal is determined to be applicable it may be adopted into the local NHMP (often the wording of a goal is changed to account for local circumstances and needs). However, county NHMPs do not consistently explicitly reference their review of the state goals. **Table 3-18** shows which local NHMPs contain a direct textual reference to the state goals. Only 10 of 36 or 28% do make a direct reference.

**Table 3-18** also shows the linkage between state and local goals for all 36 counties. In some circumstances state goals are combined into a single goal at the local level (e.g., State Goals 1 and 2 are often combined at the local level.) When that is the case, both goals are shown in **Table 3-18** as appearing in the local plan.

Goal 1 appears in all 36 county NHMPs; Goal 2 in 35 (97%) and Goal 7 in 34 (94%). Goal 4 appears in 83% and Goal 3 in 56%. Goals 5, 6, and 8 appear in very few local NHMPs. Goal 5 has to do with the capability of the jurisdiction to carry out its Plan; Goal 6 concerns documenting and evaluating progress in achieving natural hazard mitigation; and Goal 8 promotes eliminating development in hazard areas where risk cannot be mitigated. A goal similar to Goal 8 was found in only one local NHMP.

There are several goals that appear in local NHMPs that were not reflected in the 2012 Oregon NHMP. The most relevant statewide are those with themes of protecting and mitigating risk to cultural and historic resources; enhancing partnerships and coordination among agencies at all levels of government; and integrating NHMPs with other plans. In its April 2014 meeting, the State IHMT decided to include three new goals addressing these themes to better coordinate state and local NHMPs (**Section 3.2.1**). Counties and cities should continue to be encouraged to review the Oregon NHMP goals when developing their NHMPs and to explicitly state their decisions to include or exclude state goal themes.

## Table 3-18. Correlation of State and County NHMP Goals

| Local Goals | | | State Goals | | | | | | | | Local & State Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|
| County | Plan Approve | # Goals | Goal 1 | Goal 2 | Goal 3 | Goal 4 | Goal 5 | Goal 6 | Goal 7 | Goal 8 | Goals Explicitly Linked? |
| | | | Protect life and reduce injuries resulting from natural hazards. | Minimize public and private property damages and the disruption of essential infrastructure and services from natural hazards. | Increase the resilience of local, regional, and statewide economies. | Minimize the impact of natural hazards while protecting and restoring the environment. | Enhance and maintain state capability to implement a comprehensive statewide hazard loss reduction strategy. | Document and evaluate Oregon's progress in achieving hazard mitigation. | Motivate the public, private sector, and government agencies to mitigate against the effects of natural hazards through information and education. | Eliminate development within mapped hazardous areas where the risks to people and property cannot be mitigated. | Are the local NHMP goals specifically linked with the Oregon NHMP goals? |
| Baker (NE Oregon) | 2014 | 4 | X | X | X | X | | | X | | N |
| Benton | 2011[b] | 5 | X | X | X | | | | X | | Y |
| Clackamas | 2013 | 5 | X | X | | X | | | X | | N |
| Clatsop | 2015[a] | 7 | X | X | X | X | | | X | | N |
| Columbia | 2014 | 4 | X | X | X | X | | | X | | N |
| Coos | 2010[b] | 6 | X | X | X | X | | | X | | Y |
| Crook | 2011 | 5 | X | X | | X | | | X | | N |
| Curry | 2010[b] | 6 | X | X | X | X | | | X | | Y |
| Deschutes | 2010[b] | 5 | X | X | | X | | | X | | N |
| Douglas | 2010[b] | 8 | X | X | | | X | | X | | N |
| Gilliam | 2013 | 3 | X | X | | | | | X | | N |
| Grant (NE Oregon) | 2014 | 4 | X | X | X | X | | | X | | N |
| Harney | 2013 | 6 | X | X | X | X | | | X | | N |
| Hood River | 2012 | 7 | X | X | X | X | X | | X | | N |
| Jackson | 2013 | 7 | X | X | | X | | | X | | N |
| Jefferson | 2014 | 6 | X | X | | X | | | X | | N |
| Josephine | 2012 | 6 | X | X | X | X | | | X | | Y |
| Klamath[c] | 2011 | 6 | X | X | X | X | X | X | | | N |
| Lake | 2013 | 4 | X | X | X | X | X | | X | | N |
| Lane | 2012 | 6 | X | X | X | X | | | X | | N |
| Lincoln | 2009[b] | 5 | X | | | X | | | X | | N |
| Linn | 2010[b] | 3 | X | X | | X | | | X | | N |
| Malheur | 2014 | 5 | X | X | X | X | | | X | | N |
| Marion | 2011[b] | 7 | X | X | X | X | | | X | | Y |
| Morrow | 2006 | 7 | X | X | | X | | | X | X | Y |
| Multnomah | 2012[b] | 5 | X | X | | X | X | | X | | Y |

*(table continued on next page)*

## Table 3-18. Correlation of State and County NHMP Goals *(continued)*

| Local Goals | | | State Goals | | | | | | | | Local & State Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|
| County | Plan Approve | # Goals | Goal 1 | Goal 2 | Goal 3 | Goal 4 | Goal 5 | Goal 6 | Goal 7 | Goal 8 | Goals Explicitly Linked? |
| | | | Protect life and reduce injuries resulting from natural hazards. | Minimize public and private property damages and the disruption of essential infrastructure and services from natural hazards. | Increase the resilience of local, regional, and statewide economies. | Minimize the impact of natural hazards while protecting and restoring the environment. | Enhance and maintain state capability to implement a comprehensive statewide hazard loss reduction strategy. | Document and evaluate Oregon's progress in achieving hazard mitigation. | Motivate the public, private sector, and government agencies to mitigate against the effects of natural hazards through information and education. | Eliminate development within mapped hazardous areas where the risks to people and property cannot be mitigated. | Are the local NHMP goals specifically linked with the Oregon NHMP goals? |
| **Polk** | 2009[a] | 6 | X | X | | X | | | X | | N |
| **Sherman** | 2014 | 4 | X | X | | | | | X | | Y |
| **Tillamook** | 2012[a] | 4 | X | X | X | X | | | X | | N |
| **Umatilla** | 2014 | 6 | X | X | | X | | | X | | N |
| **Union** (NE Oregon) | 2014 | 4 | X | X | X | X | | | X | | N |
| **Wallowa** (NE Oregon) | 2014 | 4 | X | X | X | X | | | X | | N |
| **Wasco** | 2013 | 7 | X | X | X | X | | | X | | N |
| **Washington** | 2011[a] | 3 | X | X | X | X | X | | | | Y |
| **Wheeler** | 2014 | 3 | X | X | | | | | X | | N |
| **Yamhill** | 2014 | 6 | X | X | | X | | X | X | | Y |
| **Percent Includ** | - | - | **100%** | **97%** | **56%** | **86%** | **17%** | **6%** | **94%** | **3%** | **28%** |

**Notes:** [a]Clatsop County's plan is in the process of being updated. It is expected to be adopted and approved before the 2015 Oregon NHMP is approved.

[b]These plans are funded for updates during the period 2014-2017.

[c]Klamath County is the only county in the state that directly imports Goals 1 - 6 of the 2012 Oregon NHMP into its Plan.