Oregon Natural Hazards Mitigation Plan
2015 ANNUAL REPORT

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Introduction

The current Oregon Natural Hazards Mitigation Plan (NHMP) was approved by FEMA on September 24, 2015 as an Enhanced Plan and is effective through September 23, 2020. This report is the first of three annual plan monitoring reports. The approved Oregon NHMP contains data and information current through December 2014; this report covers the period from January 1 through December 31, 2015.

Risk Assessment

Hazard Events

Oregon experienced a number of natural hazard events in 2015 including a series of winter storms from December 6th through December 23rd with damage from straight-line winds, floods, landslides, and mudslides severe enough to merit a Presidential Disaster Declaration (FEMA-4258-DR). Initially President Obama's declaration on February 17, 2016 covered 12 counties: Clatsop, Columbia, Coos, Curry, Lane, Lincoln, Linn, Multnomah, Polk, Tillamook, Washington, and Yamhill. Two amendments in March 2016 added Douglas County then Clackamas County for a total of 14 counties that suffered severe damage – all of the coastal counties, the Portland Metro counties, and the Willamette Valley counties. The measurable flooding and erosion impacts in Curry and Douglas Counties led the state to develop an application for HUD's National Disaster Resilience Competition to fund a suite of mitigation and resilience projects in Brookings and Reedsport (more information later in this report). While Benton and Marion counties were also impacted by the disaster event, they did not meet the threshold criteria for FEMA assistance.

The declared winter storms along with several high surf events associated with El Nino and coinciding with king tides caused significant coastal erosion in several locations in Clatsop, Tillamook, and Lincoln Counties. More than 50 landslides took a serious toll, killing one person in Florence and significantly damaging ten homes in Newport. Landslides also damaged roads and infrastructure in many locations.

In addition, the summer of 2015 saw several severe wildfires. Luckily for Oregon, in 2015 FEMA piloted a program (FMAG/HMGP) that made Hazard Mitigation Grant Program (HMGP) funds available after Fire Mitigation Assistance Grant (FMAG) declarations, specifically emphasizing their use in burned areas for reduction of the post-event increased risk of future wildfires, floods, and erosion. Oregon received six FMAG declarations in 2015 for wildfires in Baker, Douglas, Grant, Josephine, and Wallowa Counties. All but one (Krauss Lane) were also Governor-declared conflagrations. The County Line 2 wildfire was located on the Warm Springs Reservation in Jefferson County and therefore was not an officially declared conflagration. However, because it was supported by the Office of the State Fire Marshal and the Incident Management Team, data is available and presented in Table 1.

Lightning and humans each caused three of the FMAG-declared wildfires. The human caused fires burned 44,333 acres and the lightning-caused fires burned 296,807 acres for a total of 341,140 acres burned. The largest of these fires was the lightning-caused Canyon Creek Complex which burned 110,261 acres and cost the State just under $14.6M. The lightning-caused Cornet-Windy Ridge Complex was a close second in terms of acres burned – 103,887 – but cost the State quite a bit less, coming in at just over $4.7M. Conversely, the human-caused Stouts Creek Fire burned a relatively few 26,452 acres, but cost the State the most of any wildfire in 2015, over $38.7M. No one was killed as a result of the FMAG-declared fires, but more than 50 residences and more than 50 outbuildings were lost.

Two of the FMAG-declared wildfires impacted Oregon's transportation system and resulted in Federal Highway Administration Emergency Relief declarations to assist with the costs of repairs to the transportation system. The Cornet-Windy Ridge Complex impinged directly on Highway 245, causing trees to fall on the road, and threatening landslides (http://inciweb.nwcg.gov/incident/4478/). The Canyon Creek Complex did the same on Highway 395 and also damaged culverts, drainage areas, and wooden access bridges. These impacts together with fire suppression efforts caused multi-day road closures (http://inciweb.nwcg.gov/incident/4495/).

Other wildfires impacted Oregon's transportation system as well. The Cable Crossing Fire near Highway 138 in Douglas County had to be closed or restricted on several occasions due to fire suppression activities and threats to the highway (http://inciweb.nwcg.gov/incident/article/4424/26547/). The National Creek Complex near Crater Lake Highway caused several road closures on Highway 230, and the north entrance to the Crater Lake Park was closed for an extended period of time (http://inciweb.nwcg.gov/incident/4463/). The Soda Wildfire burned primarily in Idaho near Oregon's eastern border. It caused the closure of a portion of US 95 for an extended period due to threats from the fire (http://inciweb.nwcg.gov/incident/4475/).

Table 1. Official State Conflagrations in 2015

	Stouts	County Line 2	Cornet-Windy Ridge Complex	Canyon Creek Complex	Grizzly Bear	Dry Gulch
Conflagration Date	07.30.15	08.12.15	08.13.15	08.14.15	08.20.15	09.14.15
Communities Threatened	Milo (Douglas County)	Warm Springs (Jefferson County)	Durkee (Baker County)	John Day (Grant County)	Flora (Wallowa County)	Richland (Baker County)
Structures Threatened	158 residences 5 other	959 residences 125 other	187 residences 300 other	193 residences 10 other	405 residences 98 other	150 residences 0 other
Structures Saved	158 residences 5 other	955 residences 122 other	183 residences 279 other	150 residences 0 other	400 residences 70 other	150 residences 0 other
Structures Lost	0 residences 0 outbuildings	4 residences 3 outbuildings	4 residences 21 outbuildings	43 residences 10 outbuildings	5 residences 28 outbuildings	0 residences 0 outbuildings
Conflagration Mobilization Cost Estimate	$1,584,010.00	$1,344,877.00	$976,115.00	$3,831,372.00	$783,188.00	$166,175.00
Cause	Human	Human	Lightning	Lightning	Lightning	Under Investigation

Source: Office of the State Fire Marshal (OSFM)

A severe drought that impacted almost the entire state in 2015 was responsible, in part, for the intense fire season. For the three-month period of May through July 2015, Oregon recorded the warmest average temperatures since recording began in 1895. Governor Brown issued state drought declarations for 25 of Oregon's 36 counties and an executive order directing state agencies to plan for drought. (See Table 2.)

Repetitive Loss and Severe Repetitive Loss Properties

One severe repetitive loss property located in Linn County was acquired and the building demolished in 2015. The property will be converted to open space and function as a county park.

Climate Change

Winter 2014-2015 was marked on the coast by winter storms and high surf events associated with an exceptionally strong El Nino. Inland it was characterized by extremely low snowpack caused by a combination of lower than average precipitation and much higher than average temperatures. Spring and Summer 2015 were hot and dry with periods of record high temperatures in May, June, and July. Overall, June was the hottest on record for most of Oregon and July was one of the hottest on record.

Research is progressing on coastal issues associated with climate change. The Oregon Department of Geology and Mineral Industries (DOGAMI) has updated Summer and Fall 2015 beach survey data for Rockaway, Neskowin, Clatsop Plains, Columbia River south jetty, and the Elk River spit. The updated data have been posted to the Northwest Association of Networked Ocean Observing Systems (NANOOS) beach mapping portal: http://nvs.nanoos.org/BeachMapping. These data document seasonal to inter-annual variability at multiple sites, including analyses of shoreline trends.

DOGAMI, Oregon State University (OSU), and University of Washington (UW) researchers developed new ocean weather climatology products and posted them to the NANOOS Climatology portal: http://nvs.nanoos.org/Climatology. These data depict climatologies of ocean waves and meteorological conditions.

Table 2. Gubernatorial Drought Declarations, Official State Conflagrations, and Presidential Major Disaster Declarations by County in 2015

Disaster	Incident Period	Disaster Type	Baker	Benton	Clackamas	**CLATSOP**	Columbia	Coos	Crook	Curry	Deschutes	**DOUGLAS**	Gilliam	Grant	Harney	Hood River	Jackson	Jefferson	Josephine	Klamath	Lake	Lane	**LINCOLN**	Linn	Malheur	Marion	Morrow	Multnomah	Polk	Sherman	Siletz IR*	**TILLAMOOK**	Umatilla	Union	Wallowa	Warm Springs IR*	Wasco	Washington	Wheeler	**YAMHILL**
	2015	State Drought Declarations	x					x	x	x	x	**X**	x	x	x	x	x	x	x	x	x	x		x	x	x	x			x			x	x		x			x	
	2015	State Conflagrations	x									**X**		x				x																	x						
FMAG-5114**	Sep. 13, 2015	wildfire: Dry Gulch Fire	x																																					
FMAG-5107**	Aug. 21, 2015	wildfire: Grizzly Bear Fire Complex																																	x					
FMAG-5102**	Aug. 15, 2015	wildfire: Canyon Creek Fire Complex												x																										
FMAG-5097**	Aug. 13, 2015	wildfire: Cornet & Windy Ridge Fire Complex	x																																					
FMAG-5096**	Aug. 9, 2015	wildfire: Krauss Lane Fire																	x																					
FMAG-5092**	July 31, 2015	wildfire: Stouts Creek Fire										**X**																													
DR-4258	Dec. 6–23, 2015	severe winter storms / flooding / landslides / mudslides / straight-line winds			x	**X**	x	x		x		**X**										x	**X**	x				x	x			**X**					x			**X**

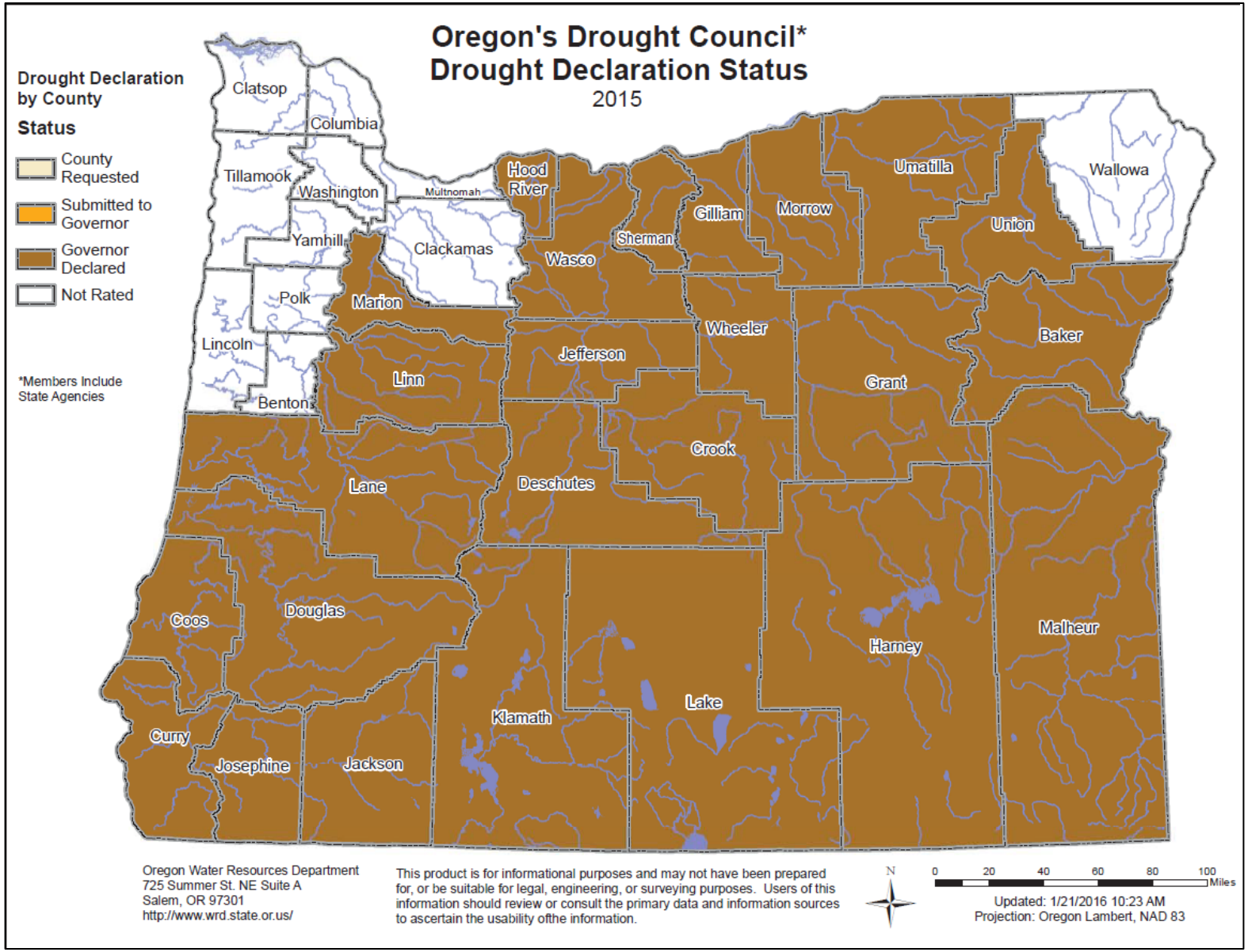
*IR = Indian Reservation

** = FMAG/HMGP Pilot

Bold "X" and **bolded**, **ALL-CAPS** county names = **COUNTY** that has been impacted by 10 or more federally declared non-fire related disasters

Source: FEMA https://www.fema.gov/disaster/4258 and Oregon Department of Water Resources https://www.oregon.gov/owrd/Pages/wr/drought_Historical.aspx, accessed 07/13/16 and Office of the State Fire Marshal (2016)

Figure 1. Drought Declaration Status 2015



Hazard-Related Research

DLCD applied for National Oceanic and Atmospheric Administration (NOAA) grants for tsunami land use strategy development and time/distance modeling. If awarded, DOGAMI would be subcontracted to perform the important time/distance modeling. DOGAMI also plans to modify the tsunami zone boundary line in the coming months.

State Assets

A State-owned restroom and retaining wall at D River Wayside in Lincoln City suffered some damage from apparent ground movement during the last few months of 2015.

The Oregon Parks and Recreation Department (OPRD) acquired two new coastal properties in 2015. One is 382 acres valued at about $1.2M at the Beltz Farm in Sand Lake. The other is 585 additional acres for Brian Booth State Park in Seal Rock valued at about $1.8M. Both properties have limited vulnerability to floods and tsunamis.

Oregon's Department of Administrative Services' Real Estate Services Program staff has begun requesting seismic and floodplain information from landlords when considering new leases and renewals.

Changes in Development

In 2015, the Census Bureau reported that between 2013 and 2014, the seven-county Portland Metro area added 33,500 people increasing its estimated population to about 2.35 million. The area now ranks 15th fastest growing of the 50 largest metro areas in the US. About half of that growth came from people moving to the Portland Metro area from other parts of the US.

On the coast, OPRD issued one new permit for riprap to mitigate shoreline recession and landslides. Several other permits to repair existing riprap damaged by high surf events were issued for properties in Clatsop, Tillamook, and Lincoln Counties.

Coos County adopted polices and tsunami maps in its first phase of comprehensive plan revisions relating to land use and tsunamis.

Tillamook County adopted the Neskowin Coastal Erosion Adaptation Plan and associated comprehensive plan and development code amendments to address chronic coastal erosion and increase resilience.

The Portland Metropolitan Area, and the City of Portland in particular, is experiencing a critical shortage of housing, leaving many homeless. Social equity is a central focus of the City's NHMP update. All tasks are undertaken with consideration to accessibility and the equitable distribution of burdens and benefits, particularly among Portland's most vulnerable populations.

Mitigation Strategy

Mitigation Action Status

The status of mitigation actions, both Priority and Ongoing, is recorded in detail on the Mitigation Action Status Table provided as Appendix A to this report. A summary of the status of priority mitigation actions is provided in

Table 3. Action was taken on over half the priority actions in 2015: eight were completed and 34 got underway in 2015. Several of the 34 that were counted as progressing are multi-part actions with some parts completed, some moving along, and some not started. More than two-thirds of those not started are targeted for accomplishment during the second half of the life of this Plan.

Table 3. Priority Mitigation Action Status Summary

Done	Progressing	Not Started & Target Date						Not Pursuing	No Info	Move to Ongoing	Total
		2015	2016	2017	2018	2019	2020				
		4	1	3	7	1	13				
		8			21						
8	34	29						1	3	3	78

Source: Department of Land Conservation and Development (DLCD)

Mitigation Successes

Completed portions of broad, long-term, or multi-part mitigation actions are indeed mitigation successes. In 2015, these portions of mitigation actions were completed:

- Completed roughly 50 miles of new lidar-based floodplain mapping through FEMA's Risk MAP program.
- Created a new lidar-based statewide landslide susceptibility overview map.
- Implemented the Rapid Assessment of Flooding Tool (RAFT).
- Completed detailed evacuation route and "Beat the Wave" speed analyses for Seaside and Gearhart.
- Produced new lidar-based flood hazard maps for the Lower Columbia-Sandy Watershed, and Tillamook, Lincoln, Curry, Lane, and Douglas Counties.
- Created an informational website for the new Base Flood Elevation Determination Service (http://www.oregongeology.org/flood/bfe.htm).
- The Land Conservation and Development Commission (LCDC) added local NHMP planning and integration with comprehensive plans as third priority of five for awarding state-funded Technical Assistance Grants.
- Developed an inventory of shoreline protective structures for the entire Oregon coast (http://www.coastalatlas.net/oceanshores/).
- Issued *Facility Planning Guidelines for Development with Natural Hazards* for state owned or leased buildings.
- Completed velocity modeling and an evacuation plan for Yaquina Bay maritime operations. Help a public workshop in Newport.
- Completed lidar surveys of Highway 101 in Curry County and Bull Run Watershed access roads to determine where landslide potential exists.
- Used a FEMA Pre-Disaster Mitigation Grant to raze Waldport High School and bond funds to build a new, seismically sound school outside the Tsunami Inundation Zone.
- Installed 20 new state-operated stream gages equipped with real-time telemetry between 2013 and 2015.
- Improved evacuation route signage for Clatsop County and the Cities of Rockaway Beach and Bandon.
- In partnership with Business Oregon's Infrastructure Finance Authority, the Office of Emergency Management activated the State Disaster Loan and Grant Account to fund relocation of the Westfir water intake.

- Created new lidar-based landslide inventory and susceptibility maps for Bull Run Watershed.
- Opened and filled the newly-created position of *Seismic Resilience Officer* in 2015. (The position was vacated shortly thereafter and re-filled in 2016.)
- Completed the first statewide channel migration susceptibility study.
- Installed high water mark signs after flooding in the Cities of Albany, Oregon City, and Turner.
- Evaluated potential sediment impacts from landslides to Bull Run Watershed, Siuslaw Creek, and Big Elk Creek.
- Collected lidar in large areas of Lane and Douglas Counties.

After several failed attempts over the past decade, DAS-GEO has successfully initiated stakeholder discussions and began to define statewide framework data requirements.

As a result of DAS-GEO assistance, at least four counties and two cities have begun using GIS for several business processes.

A severe repetitive loss property in Linn County was acquired and demolished in 2015. The property will be converted to open space and function as a county park.

Detailed evacuation route and "Beat the Wave" speed analyses for Seaside and Gearhart were completed.

Seasonal beach surveys in Rockaway Beach, Neskowin, Clatsop Plains, Columbia River south jetty, and the Elk River spit in were completed in Summer and Fall 2015.

In February 2015 a landslide/erosion event threatened a home near South Beach. OPRD issued an Emergency Permit to construct a riprap structure on the ocean shore that would provide protection until a permanent riprap authorization could be granted. On November 13, 2015 OPRD issued an Ocean Shore Alteration Permit to allow a permanent shorefront protection structure for the home.

LCDC included natural hazard mitigation planning and integration of natural hazard mitigation plans with comprehensive plans and other planning documents as the third priority out of 5 for Technical Assistance Grants. The state awarded three of these competitive grants in 2015. One went to the Town of Canyon City to develop an NHMP for the first time to mitigate additional wildfire, flood, and landslide risks following the Canyon Creek Complex wildfire of 2015. Another went to Wallowa County to update and integrate its NHMP and Community Wildfire Protection Plan (CWPP), then integrate the NHMP with its comprehensive plan. A third went to the City of Scio to investigate the extent of the flood hazard from potential dam failure and identify potential mitigation actions to determine if changes to its urban growth boundary would be necessary.

The Neskowin Coastal erosion Adaptation Plan and associated land use amendments adopted by Tillamook County became effective.

> Neskowin is, and will continue to be, impacted by increasing coastal erosion events. The Plan and associated land use amendments will safeguard people and property; protect coastal resources in accordance with Statewide Planning Goals 7 and 18; provide a level of confidence for property owners and beach recreation users facing an uncertain future; and help the community become more resilient to increasing coastal erosion hazards.
>
> Community members, as part of the Neskowin Coastal Hazards Committee (NCHC), implemented an extensive and effective education and outreach effort to the Neskowin community and beyond to insure that the NCHC and the community as a whole were informed throughout the process. The effort included

numerous well-attended public meetings, community wide mailings and emails, ongoing information distributed on the community website, informal community member discussions, and more.

Upon completion of the NCHC's work, the Neskowin Citizen Advisory Committee, as part of initial steps toward county adoption, held additional meetings with the community and at the conclusion of that process recommended adoption of the amendments to the County. Because of this effort the community in general was informed and supportive and the amendments were adopted with very few dissenting comments.

The amendments were adopted in the fall of 2014 and were appealed by two development interests to the Land Use Board of Appeals (LUBA). In 2015 LUBA determined that the amendments were legally sound and decided in favor of the County and the Neskowin community.

Neskowin's was an excellent approach to implementing the requirements of Goals 7 and 18, and will be valuable to other coastal communities addressing coastal hazards issues.

Flooding from the Nehalem River and Rock Creek, although not to record levels, inundated many low-lying areas in and around Vernonia. The relocation of the Vernonia Public Schools Campus to high ground along with other residential floodplain acquisitions and elevations were 100% effective in eliminating disaster losses from this event. Also, the conversion from overhead to underground placement of power lines proved to be very effective for West Oregon Electric and Columbia River Public Utility District.

With restoration of the Johnson Creek floodplain south of Foster Road fully implemented and with a record flood on Johnson Creek, inundation was significantly reduced during the December 2015 event. Foster Road was only minimally impacted by the flooding; previously acquired residential floodplain properties provided open space for floodplain storage.

Near record flooding from the Wilson River once again impacted North Highway 101 in Tillamook. Business properties in the floodplain that were previously acquired and are now open space, and those that were elevated, once again showcased the effective nature of these floodplain mitigation actions.

State Capability

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 primary recommendation in its report of October 1, 2014 was to hire a Resilience Policy Advisor to the Governor. The Legislature created a position and the Governor's Office began the hiring process during 2015.

Directed by the Governor's Office in coordination with the Director of the Department of Administrative Services (DAS) and its Chief Financial Office (DAS-CFO), the state undertook a massive interagency effort to develop an application for the HUD National Disaster Resilience Competition (NDRC). The Phase I application for resilience activities in Brookings and Reedsport was accepted and Oregon was invited to submit a more detailed proposal in Phase II. The Phase II application was unsuccessful. Nevertheless, the effort was a positive collaboration among a number of state agencies and raised awareness of the need for funding for resilience measures throughout the state.

Oregon's HUD NDRC application requested a total of $122M—$94M from HUD and $28M from Oregon partnerships—to invest in 11 projects and programs targeted at Reedsport and Brookings Harbor, which are rural

communities vulnerable to tsunami damage, severe winter storms, chronic flooding, loss of timber and fishing industries, and the outmigration of workers. Oregon proposed to launch the Rural Resilience Oregon Incubator (Rural ROI) to focus on mitigating risks in areas of rural poverty—those most vulnerable to impacts—and improve the readiness for future disasters, including frequent flooding, Cascadia earthquakes, and changing climate conditions. Rural ROI is a holistic, scalable and replicable model to build resilience in vulnerable rural communities. Rural ROI seeks and leverages rural community input and capacity for developing and implementing solutions that work. Rural ROI focuses on community engagement to develop and implement effective, locally-appropriate solutions that best leverage federal and state government and partner resources. FEMA Region X provided significant support on this effort. Oregon was the top finalist in Phase 2 with national scores just below the HUD pay line.

While many of the natural hazards-related state funding proposals made in 2015 went unrealized, the Legislature continued to fund the very successful State Seismic Rehabilitation Grant Program (SRGP). The SRGP is a competitive grant program that provides state funds for seismic rehabilitation of critical public buildings (hospital buildings with acute inpatient care facilities, fire stations, police stations, and sheriffs' offices) and K-12 public schools, community colleges and education service districts that have a capacity of 250 and are routinely used for student activities. The maximum grant award for any building is $1.5 million.

The 2015-2017 state budget includes $205 million in voter-approved bonds that will fund the program. The first bond sale will be in spring 2016 for $50 million for school projects only. The application period for these funds closed December 31, 2015. The Oregon Business Development Department received 107 applications requesting $123.3 million in funding.

Another bond sale is scheduled for spring 2017 for $155 million which includes an additional $125 million for school projects and $30 million for emergency services projects. The application deadline for these funds is anticipated to be September 30, 2016.

OWRD has a new funding program that offers grants for feasibility studies and projects. Many of the applicants cite that the funding will help build redundant water systems that are more resilient to extreme weather events. OWRD funded 17 feasibility studies just recently, and another 9 or so projects.

Using state funds, the Department of Administrative Services' Chief Financial Office (DAS-CFO) developed and funded a pilot program among the Oregon Liquor Control Commission, the Oregon Youth Authority and itself to screen facilities larger than 10,000 gross square feet and worth over more than $1M for seismic and flood risk. DAS-CFO modified the SRGP's benefit/cost analysis tool for state agency use.

DAS-CFO also issued guidelines for state agencies developing parcels subject to natural hazards. The guidelines focus on avoidance and mitigation.

Under the cooperative guidance of the Department of Land Conservation and Development (DLCD) and the Oregon Parks and Recreation Department (OPRD), a NOAA Coastal Fellow produced two complete inventories: (1) shore protective structures for the outer Oregon coast; and (2) oceanfront parcels with a determination of their eligibility for shore protection under Statewide Planning Goal 18 rules. The inventories are viewable through the "Ocean Shores" viewer (http://www.coastalatlas.net/oceanshores/) and are downloadable. These inventories will help both the state and local governments make informed decisions about coastal development and resilience.

The Oregon Partnership for Disaster Resilience (OPDR) in 2015 continued to assist many communities statewide with updating their natural hazard mitigation plans, but began to redefine its role. DLCD, for the first time,

undertook the same with a few communities: the Cities of Albany, Beaverton, and Medford, and Tillamook County and its cities. Due to delays in federal and state funding processes, Albany updated its NHMP on its own.

Even without the funding requested of the Legislature for the 2015-17 biennium, State agencies are continuing to tackle natural hazard mitigation with the same high level of energy and commitment. Continued work from DR-4169 in late 2014 combined with work on the HUD NDRC application and the six FMAG/HMGP awards in Summer 2015 strained Oregon Emergency Management's small hazards mitigation staff. The additional workload created by the December 2015 winter storms stretched it taut.

DLCD's Natural Hazards Team continues to reach out to and engage DLCD's Regional Representatives in NHMP updates and Risk MAP projects. Their knowledge of the communities in which they work, their understanding of local land use issues and politics, and their positive relationships with local leaders and individuals from all sectors of those communities has proven invaluable in making hazards mitigation projects and their integration with local land use policies, regulations, and programs as successful as possible.

Local Capability

OPDR, and now DLCD, are building local capability by assisting local governments with updating NHMPs, including identifying mitigation actions and resources for accomplishing them. In addition, both are assisting local governments in integrating NHMPs with comprehensive plans and other planning documents, raising awareness of natural hazards, mitigation, and resilience issues in every local planning effort. OPDR directly supported the following local and tribal governments' NHMP update projects during 2015 with funding from FEMA's Pre-Disaster Mitigation (PDM) Grant Program:

Table 4. OPDR-Supported NHMP Updates by PDM Funding Cycle

PDM Fiscal Year Funding Cycle	Local Governments Served by OPDR	Local Governments to be Served by OPDR Pending Funding Obligation
PDM 12	Deschutes County and its cities	
PDM 13	• Confederated Tribes of Warm Springs • Curry County and participating cities • Coos County and participating cities • Douglas County and participating cities • Lincoln County and participating cities • City of Corvallis	
PDM 14	• Multnomah County • Washington County and participating cities • Marion County and participating cities • Linn County and participating cities • Benton County and participating cities • University of Oregon	• Polk County and participating cities • City of Salem
PDM 15		• Jackson County and participating cities • Josephine County and participating cities

Source: Oregon Partnership for Disaster Resilience (OPDR)

DLCD received PDM 14 funding in 2015 to support NHMP updates in Tillamook County and its cities, and the Cities of Albany, Beaverton, and Medford. Because the federal funding process took so long and then the state financial process was still not complete at the end of 2015, Albany forged ahead and had almost completed its NHMP update on its own at the end of 2015.

OPRD's Heritage Commission staff (OPRD-HC) with State funding hired two summer interns who updated historic site inventories in Carlton and Florence.

OPRD-HC also hired a contractor who completed a disaster plan and desktop training exercise for the Sheldon-McMurphy-Johnson House, owned by the City of Eugene.

In addition, OPRD-HC conducted a session at the Heritage Conference with a presentation by staff from Oregon's Office of Emergency Management, DOGAMI, Coos County Emergency Management, and the Southern Oregon Historical Society.

Together with the Oregon Chapter of the American Planning Association, OPRD-HC conducted a workshop in Gresham in September 2015 that included training related to cultural and historic resource identification and preservation.

OPRD provided technical assistance to local planning officials by communicating the likelihood that coastal erosion would threaten existing structures and infrastructure along the ocean shore and making them aware of the Statewide Planning Goal 18 rules for eligibility for shorefront protection structures.

Oregon's Department of Consumer and Business Services' Insurance Division (DCBS-ID) continued to offer information about earthquake insurance on its website and provide 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. Even so, there remains an unmet need for greater outreach to impress upon Oregonians the importance of carrying earthquake insurance.

The state engaged in a massive interagency effort to develop an application for the HUD National Disaster Resilience Competition which, had it been successful, would have provided funding for resilience projects in Brookings and Reedsport.

The State NFIP Coordinator provided technical support to NFIP communities by:

- Providing resources and answering questions from developers and landowners
- Provided training to real estate agents, surveyors, and city and county planners

In 2015, OEM provided technical assistance with PDM 12, 13, and 14 grants to Curry County, Douglas County, and the City of Portland. OEM offered PDM grant funding to Klamath County, but no local, non-federal cost share was available.

City of Portland and Enhabit (formerly Clean Energy Works Oregon) partnered on a seismic strengthening and earthquake preparedness project. OEM assisted them with a PDM 15 grant application. The grant would be matched 50% by homeowners.

> Because of the high risk of damage to the City's structures and potential for loss of life, an earthquake is characterized as the most severe of Portland's hazards in its FEMA-approved NHMP. It also has a high probability of recurrence. Portland was hit by a magnitude 5.6 earthquake in 1993, and the probability model in the 2011 FEMA-approved NHMP shows a 30% likelihood that Portland will experience another earthquake of magnitude 6.5 or greater in the next 30 years. The plan documents that the severity and probability of future events is high, and actions that reduce the severity of impacts from earthquakes reflect the City's commitment to mitigate risk from this particular hazard. The 2011 NHMP lists seven mitigation goals, which

the City intends to achieve in its long-term risk reduction efforts. The residential seismic strengthening project for single-family homes in Portland aligns with at least three of the seven mitigation goals:

- Implement actions to prepare, protect, and preserve and restore life, property, and natural systems
- Promote public outreach to a variety of city populations
- Commit to continuously reducing the City's natural hazards vulnerability.

Portland's NHMP is currently up for review and update. This update will expand on considerations of seismic risks for the City, and fold in data from recent research including updated scenarios and risk assessments. Recognizing Portland's risk from seismic events, the City is focusing the Natural Hazard Mitigation Plan update more specifically on seismic hazards, and is undertaking an in-depth assessment of Portland's vulnerability from this particular hazard. This project will protect the property of homeowners in Portland, preserving each eligible family's biggest financial investment, and even potentially their lives.

Over 100,000 homes in Portland were built before 1970 and do not conform to current seismic building codes. These homes are characterized by unreinforced masonry construction or wooden structures that aren't securely anchored to their foundations. This puts them at risk from severe damage or collapse during an earthquake, putting anyone inside at risk of injury or death. The residential seismic strengthening project will reduce the likelihood of severe damage to these older homes during an earthquake, protecting the home's integrity and the lives of those inside.

Enhabit has partnered with the City of Portland to communicate broadly to residents about the seismic strengthening project and earthquake preparedness in general. Through Clean Energy Works' outreach and recruitment process, a wide cross-section of Portland's homeowners will be informed of the opportunity to receive federal funding for seismic retrofit of their homes. News releases and press coverage of the project will promote awareness of natural hazard risks on a broader scale, and encourage residents to implement structural retrofits and other non-structure mitigation strategies to improve their resilience. This residential seismic strengthening project is the second of its kind in Portland, and will play a role in reducing the City's vulnerability to natural hazards over time. By physically strengthening its housing stock, Portland is improving its resilience starting with the most vulnerable single-family homes. Using lessons learned from a similar project in 2014, the City is also refining the process for outreach, recruitment, and project management that can be used in future projects to reduce citywide vulnerability to natural hazards.

State/Local Coordination

State/local coordination is taking place through local NHMP updates, during which the Oregon NHMP is consulted for background and technical information, goals and mitigation actions. It is also taking place through the State-funded Seismic Rehabilitation Grant Program, LCDC-sponsored Technical Assistance Grant program and many other outreach and assistance initiatives in which State agencies are engaged.

One way that the State has and still does envision coordination with local governments is by developing a mitigation action tracker that would interface with FEMA's Risk MAP Action Tracker, but be accessible by local governments and potentially incorporate other information to enhance State/local coordination. In 2015, the State did not made progress on this project.

Planning Process

In 2015, State agencies worked to engage each other and the whole community in various aspects of natural hazard mitigation using a variety of methods including participating planning processes and coordination meetings, trainings, workshops, presentations, and outreach events.

Public Outreach Efforts

DCBS-ID is active in outreach activities, partnering with other agencies and organizations to bring insurance information to the public. The Insurance Division conducted several highly successful trainings on risk management and earthquake insurance in Portland and Gresham.

DOGAMI consulted with OEM and local emergency managers to coordinate tsunami outreach. DOGAMI presented to and conducted an online discussion with the Oregon Tsunami Advisory Council in November 2015 about proposed public "Beat the Wave" mapping products and entering and leaving tsunami area signs.

In 2015, OEM executed 39 public outreach events related to awareness, understanding, preparation for, and mitigation of earthquake and tsunami hazards.

Table 5. OEM-Executed Earthquake and Tsunami-Related Outreach Events in 2015

DATE	LOCATION	EVENT	# Attendees
12/17/2015	Seaside	Presentation about Tsunami Safe	15
11/6/2015	Brookings	Tsunami Safe Presentation	1
11/5/2015	Coos Bay	Tsunami Safe Presentation	4
11/4/2015	Florence	Tsunami Safe Presentation	16
11/3/2015	Lincoln City	Tsunami Safe Presentation	3
11/2/2015	Astoria	Tsunami Safe Presentation	19
10/1/2015	Pendleton	Earthquake Workshop	32
10/13/2015	Corvallis	Earthquake Workshop	75
10/15/2015	PDX	Earthquake Workshop	400
10/22/2015	Newport	Earthquake Workshop	60
	Ashland	Ashland is Ready	450
9/14/2015	Medford	City Crisis Management Team	12
	Grants Pass	Earthquake Prep Talk	45
	Grants Pass	Earthquake Prep Talk	20
9/15/2015	Ashland	City Council	30
		NBC interview, Channel 12	
9/16/2015		Interview: Channel 10	
	Medford	Earthquake Prep Talk	45
	Medford	Earthquake Prep Talk	125
	Medford	NBC 2 Interview	
9/17/2015	City of Talent	Earthquake Prep Talk	22
	Harry and David	Talk with Management	24

DATE	LOCATION	EVENT	# Attendees
9/18/2015	Green Springs	Earthquake Prep Talk	32
9/20/2015	Klamath Falls	Earthquake Prep Talk Anniversary of 1993 EQ	3
9/20/2015	Klamath Falls	Earthquake Prep Talk Anniversary of 1993 EQ	16
7/30/2015	Corvallis	Public Works and City Employees	130
6/19/2015	Pendleton	Impacts of CSZ on Central and Eastern OR	30
6/18/2015	Baker City	Impacts of CSZ on Central and Eastern OR	30
6/17/2015	Bend	Impacts of CSZ on Central and Eastern OR	40
6/16/2015	The Dalles	Impacts of CSZ on Central and Eastern OR	12
6/15/2015	Hood River	Impacts of CSZ on Central and Eastern OR	12
5/21/2015	Salem	SAIF - State Agency Representative	40
5/18/2015	Portland	Building Code Conference	20
4/14/2015	Warrenton	Wayfinding Charrette	20
4/9/2015	Lake Oswego	Public Workshop	100
4/9/2015	Lake Oswego	Public workshop	100
3/31/2015	Bend	Cascadia @OEM Conference	300
2/27/2015	Bend	Central Cascades Volcano Coordination	30
2/2/2015	Monmouth	WOU Emeritus Society	30

Source: Office of Emergency Management (OEM)

The State NFIP Coordinator also provided a number trainings on flood-related issues for real estate agents, surveyors, and city and county planners, some of which carried professional education credits for Certified Flood Managers.

Table 6. Flood-Related Outreach and Training Events in 2015

DATE	LOCATION	EVENT
General Outreach		
1/21/15	Salem	Update and review of Elevation Certificates and Letter of Map Change (LOMC) forms Professional Land Surveyors of Oregon Annual Conference
2/16/15	Eugene	Elevation Certificate Workshop Willamette Valley Chapter of the Professional Land Surveyors of Oregon
2/17/15	North Albany	Draft Letter of Map Revision (LOMR) Public Open House presentation
5/1/15	Brownsville	League of Oregon Cities
9/16	Medford	NFIP permitting class Oregon Planners Network Meeting
Presentations to Real Estate Agents		
4/9/15	Portland	ReMax
4/14/15	Portland	Living Room Realty
4/15/15	Sisters	First American Title Company

DATE	LOCATION	EVENT
4/15/15	Redmond	Housing Works
4/16/15	Sunriver	First American Title Company
4/16/15	Bend	First American Title Company
4/30/15	Eugene	First American Title Company
5/8/15	Springfield	ReMax
7/22/15	Tigard	First American
8/26/15	Portland	ReMax
9/18/15	Salem	First American
9/19/15	Newberg	First American
9/19/15	McMinnville	First American
Endangered Species Act and NFIP		
5/21/15	Statewide	Virtual workgroup meeting to share draft interim measures and discuss concerns
5/27/15	Statewide	Virtual workgroup meeting to share draft interim measures and discuss concerns
5/28/15	Statewide	Virtual workgroup meeting to share draft interim measures and discuss concerns
7/20/15	Pendleton	Local Government Focus Group
7/21/15	Salem	Local Government Focus Group

Source: Department of Land Conservation and Development (DLCD)

ODF also publishes a number of brochures, flyers, fact sheets, newsletters, and bulletins, and issues numerous media releases about wildfires each year. One example is located in Appendix B. Others can be found on ODF's *Publications* web page (http://www.oregon.gov/ODF/Pages/Publications.aspx) and on its *News* web page (http://oregonforestry.wpengine.com/archives/category/wildfire/page/2).

OPRD staff attended the DLCD-sponsored Coastal Planners Meeting to remind local planning officials about the inventory of properties eligible for shorefront protection structures under the Statewide Planning Goal 18 rules.

Since March 2015, OWRD has issued a weekly or bi-weekly "Drought Conditions Report." It was so popular the agency has decided to continue issuing it bi-weekly whether or not Oregon is experiencing drought. The report has been re-titled, "Water Conditions Report" and is available to the public.

OEM reached out to emergency managers and elected officials in Baker, Douglas, Grant, Union, and Wallowa Counties about the FMAG-HMGP pilot project.

OEM also worked with local governments to gather data on burned areas and the December 15 storms to mitigate the increased risk of additional flooding and landslides in the burned areas.

OEM worked with the City of Portland on its NHMP update which includes a significant social equity element focusing on inclusivity and diversity. All tasks are undertaken with consideration to accessibility and the equitable distribution of burdens and benefits, particularly among Portland's most vulnerable populations.

OEM reached out to the Tribal Nations to research potential mitigation projects in the declared FMAG-HMGP counties.

Milestones

- Enhanced Plan status was reinstated on February 27, 2015.
- Some PDM 14-funded planning efforts got underway at various times during 2015.
- HMA and PDM 2015 grant offerings opened in May 2015.
- LCDC decided to include NHMP updates and integration with comprehensive plans as the 3rd out of five priorities for Technical Assistance Grants in May 2015.
- All close-out documentation for HMGP DR-1683 was submitted to FEMA.
- The liquidation period for HMGP DR-1733 closed on June 29, 2015. All sub-grants and overall state close-out paperwork was submitted on time. Oregon received approximately $15M federal share for hazard mitigation planning, projects, and management costs.
- Oregon NHMP was re-approved as an enhanced plan on September 24, 2015.
- The first state Technical Assistance Grants for NHMP updates and integration with comprehensive plans were awarded in October 2015.

Interagency Coordination

With 25 counties listed under a state drought declaration, OWRD did quite a bit of communication and coordination with local, state, and federal partners. As an example, the State Drought Coordinator presented four trainings to members of the Oregon Association of Water Utilities. OWRD has also been leading implementation of Governor Brown's 2015 executive order on drought which asks state agencies to reduce their water usage by the year 2020. The agency has helped coordinate development of more than 70 water conservation plans for various state agencies, boards, and commissions. OWRD is continuing to work with these agencies to develop the data to measure and report progress toward meeting the Governor's 15 percent reduction goal.

The Department of Administrative Services' Geospatial Enterprise Office (DAS-GEO) engaged infrastructure and cultural resources stakeholders in meetings with representatives from all State agencies that own or lease buildings to begin the process of defining Framework data standards. The process was halted temporarily to allow DAS-CFO to better understand data requirements for DataMart.

Under Oregon Department of Environmental Quality's (DEQ's) leadership, the Preparedness Framework Implementation Team met in September 2015 to continue their work organizing and gathering emergency response data needed by the public safety community at all levels of government.

In the last half of 2015, the Land Use Framework Implementation Team, led by the Lane Council of Governments, was in communication with a wide variety of stakeholders in preparation for an initial organizational meeting.

Directed by the Governor's Office in coordination with the Director of the (DAS) and DAS-CFO, the State undertook a massive, interagency effort to prepare an application for the HUD National Disaster Resilience Competition. DAS-CFO collaborated with stakeholders with responsibility for infrastructure. The State Hazard Mitigation Officer (SHMO) was actively involved in this effort.

DAS-CFO also collaborated with stakeholders with responsibility for hazards data on the Oregon NHMP update, Central Facilities Planning Committee, and Capital Planning Advisory Board.

Moreover, DAS-CFO collaborated with stakeholders with responsibility for land use and development, as well as with the State Interagency Hazard Mitigation Team, to generate guidelines for state development on properties

subject to seismic or flood hazards. The guidelines emphasize avoidance and mitigation. They can be found at http://www.oregon.gov/das/Financial/CapFin/Documents/FP%20Guidelines.pdf.

OEM and OPRD-HC coordinated an HMGP DR-4169 grant proposal to proactively support pre-disaster awareness and protection of cultural and historic resources by providing quality-assured GIS information about cultural and historic sites in Lane, Linn, and Benton Counties.

OEM also has been working with federal, state, and local partners on wildfire damage assessments, including working with the Silver Jackets to implement the City of Mitchell's HMGP award for a flash flood warning system and Grant County's application for FMAG/HMGP assistance following the Canyon Creek Complex Wildfire.

OWRD worked with OEM during 2015 to update the drought incident annex of the state's Emergency Operations Plan which will be finalized in 2016. Having a good response plan in place, which clearly lays out the roles and responsibilities of state agencies during a drought, is indeed a mitigation action as it helps reduce risk and avoid confusion when a disaster strikes.

The Interagency Hazards Mitigation Team continued to meet quarterly throughout 2015, sharing information and expertise about natural hazards mitigation. This regular forum helps create and strengthen relationships among agencies involved in mitigation and other aspects of the disaster cycle, and has enhanced coordination, cooperation, and collaboration among them.

Enhanced Plan

Integration with State and Regional Planning Initiatives

OWRD staff are participating in development of a drought early warning system for the Pacific Northwest. This is being led by our federal partners, NIDIS and the National Drought Mitigation Center, and involves drought-planning colleagues from our neighboring states: Washington, Idaho, Montana. The project began in mid-2015 with an official kick-off scheduled for February 2016. Kathie Dello of the Oregon Climate Change Research Institute and the Oregon Climate Service is leading this effort with her federal partners.

DOGAMI is a member of and participates in the Central Cascades Volcano Coordination Plan Advisory Group hosted by USGS. The Advisory Group includes interested parties from USGS, USFS, BLM, DOGAMI, County Sheriffs, OEM, State Patrol, Fire Departments, FEMA, and County Emergency Managers.

DCBS-ID provided training on insurance consumer rights and protections and earthquake insurance for the Red Cross.

OPRD-HC has engaged in periodic consultations with OEM and DLCD about pre-disaster planning to mitigate damage from natural hazards to cultural and historic resources.

OPRD participated in meetings with DLCD's Ocean and Coastal Management Program staff and attended the Coastal Planners Meeting in Fall 2015.

OPRD and local government staff collaborated on reviewing permits for remedial sand removal from oceanfront properties in the communities of Pacific City and Waldport.

OPRD requested comments on ocean shore permit applications from the Oregon Department of Fish and Wildlife and the Coquille and Siletz Tribes.

OEM is working with the City of Portland on its NHMP update, particularly supporting through a PDM grant a program for seismic strengthening of single-family homes. OEM is also supporting the social equity element of Portland's NHMP update.

The Oregon Department of Forestry (ODF) is working closely with DLCD, OEM, and OPDR to develop a methodology for coordinating Community Wildfire Protection Plan (CWPP) updates with NHMP updates, integrating CWPPs with NHMPs, and integrating them both into comprehensive plans and other planning documents.

A number of state programs promote interagency coordination, cooperation, and collaboration on various aspects of natural hazard mitigation.

- The Interagency Hazards Mitigation Team (IHMT) meets quarterly to share information on hazard mitigation plans and projects and to oversee the implementation, maintenance, and update of the State's Natural Hazards Mitigation Plan.
- The Oregon Seismic Safety Policy Advisory Commission (OSSPAC) promotes earthquake awareness and preparedness through education, research, and legislation. It influences State decisions and policies on pre-disaster mitigation of earthquake and tsunami hazards; sponsors educational activities that promote public understanding of seismic hazards, risk, exposure, and vulnerability; and responds to new earthquake and tsunami studies and issues.
- The Oregon Climate and Health Program engages state agencies in working to reduce or prevent injuries, illness and death that could result from climate change; improve the quality of life in Oregon; decrease health disparities; and advance the practice of climate and health adaptation planning.
- The Oregon Solutions program is based in the Governor's Office and helps coordinate solutions to issues of regional significance, including various levee issues related to mitigating flood hazards.
- Oregon Geospatial Enterprise Office's Framework Implementation Teams (FITs) collaborate to develop and adopt standards for statewide GIS data sets, share them openly, and maintain them through a voluntary, collaborative, community-based effort in which local, regional, and state level agencies throughout Oregon participate.

DLCD is advancing several interagency programs to implement and enhance the Oregon NHMP.

- Working through the Land Use/Land Cover FIT, DLCD is advancing the development of a land use/land cover geodatabase that will provide baseline land use information and a system for tracking changes over time so we will be better able to assess changes in land use over time, a requirement for NHMPs.
- DLCD is researching design and development of a mitigation action tracker that would enhance state and local mitigation planning. Criteria include local government access and compatibility with FEMA's Risk MAP action tracker.
- DLCD is working on an interagency agreement with OEM and the University of Oregon's Scholars Bank to ensure that all final FEMA-approved local mitigation plans are uploaded and available to the public.
- To encourage and facilitate maintenance and update of the Oregon NHMP, DLCD is researching platforms on which it could host the Oregon NHMP and allow access to all contributors, both internal and external, to update the Plan as new information becomes available.

Integration with FEMA Programs and Initiatives

Oregon natural hazards mitigation staff make full use of FEMA Grant Programs; attend FEMA webinars; participate in the annual FEMA Summit; and coordinate with FEMA to bring its training classes to Oregon's local governments.

Through the State Hazards Mitigation Officer (SHMO), Oregon submitted successful applications for HMA, FMAG/HMGP, and PDM grants in 2015. OEM continued to work with FEMA in 2015 to secure funding for previously selected PDM 2014 sub-applications.

The SHMO also submitted the final group of sub-applications for HMGP DR-4169 to FEMA in 2015. They are being reviewed and considered for funding obligation.

On April 29-30, DLCD and OEM hosted a Local Mitigation Planning Workshop (FEMA G-318) in the Oregon Emergency Operations Center. The workshop was taught by FEMA staff. Seventeen students from local and state governments and a fire district including planners, emergency managers, and a first responder attended the successful two-day training.

DLCD has been taking steps to encourage inter-program coordination to eliminate duplication, streamline processes, and improve service. In particular, we are trying to better coordinate local NHMP updates with Risk MAP processes and products. We had a discussion with FEMA about this at the 2015 FEMA/State Summit meeting and continue to discuss how to better coordinate these programs. We have highlighted some issues that need to be resolved for this to occur successfully:

- Aligning new Risk MAP projects with NHMP updates such that the Risk Report is ready when the NHMP update begins (Tillamook County);
- Where Risk MAP processes have begun after NHMP updates, adjusting the Risk MAP process or substituting Risk MAP Cooperating Technical Partner (CTP) projects, so that FEMA can bring its resources to bear on enhancing areas of weakness or closing gaps in the NHMP rather than duplicating planning exercises (Curry County);
- Aligning the extent of watersheds studied under Risk MAP with NHMP community boundaries;
- Continuing to address all natural hazards, not only flood hazards, in the Risk Report;
- Using existing flood data for NHMP updates rather than focusing on coordinating them with flood mapping processes because the latter's timelines are notoriously unreliable (Tillamook); and
- Developing Discovery and Multi-Hazard Risk Reports independent of flood mapping processes to maintain project momentum (Tualatin Watershed and Tillamook County).

We have had success to varying degrees in a few projects. In Curry County, the NHMP update is being completed and transitioning to a CTP project to integrate the updated NHMP with the County's comprehensive plan just as a formal Risk MAP project is beginning. Therefore, the Risk MAP process will be mostly redundant with the NHMP update process. Not only will any new information developed through the Risk MAP process not be included in the updated NHMP or the comprehensive plan, but by the next update, the Risk MAP data will be stale. And because the flood mapping products are delayed, they will not be useful for the NHMP update, nor will the two very similar processes be coordinated. Curry County staff and citizens are confused about why they need to essentially repeat a planning exercise they are just finishing.

In the Tualatin Watershed Risk MAP project, the flood mapping was delayed after the Discovery meeting, so the entire process came to a halt for several years. The project's momentum and community's good will were

squandered. Had the flood mapping process been decoupled from assessment of other natural hazards the Risk MAP project could have continued to move forward, engaging the community and providing useful data.

A third and final example is Tillamook County. In Tillamook County, the Risk MAP process again was significantly delayed by flood mapping (levee) issues. In this case, though, the process continued to move forward by isolating the problem area so that updated preliminary flood mapping could be issued for the rest of the County. The Risk MAP Discovery meeting was held and the Risk Report is being developed with the best available data prior to the NHMP update process beginning. Because of this innovative solution, the projects are able to be well-aligned, and the Risk Report will provide much of the data for the NHMP's risk assessment. Also, OPDR is executing a study of Tillamook County's hazard mitigation codes to determine how they could be revised to better protect people and property from natural hazards. The report is due in Summer 2016 and will inform the mitigation actions included in the NHMP update.

Another area where discussion of FEMA/State program interaction has been actively moving forward is in integration of Community Wildfire Protection Plans (CWPPs) with NHMPs. ODF, DLCD, OEM, and the OPDR have been working together and with FEMA to develop a protocol for integrating and streamlining the CWPP and NHMP planning processes such that CWPPs could provide the NHMP's wildfire risk assessment and mitigation actions. This will be tested in Wallowa County pursuant to a State-funded Technical Assistance Grant and again in Tillamook County's PDM-funded NHMP update.

Effectiveness of Mitigation Actions

No loss avoidance studies were done during 2015.

A severe repetitive loss property in Linn County was acquired and demolished in 2015. The property will be converted to open space and function as a county park.

OPRD has been monitoring Ocean Shore Alteration Permit (#BA-700-15) bi-weekly since it was approved to ensure that it is providing adequate protection of the endangered home on the subject property. Visual assessment and monitoring has verified that the mitigation of erosion and landslide hazard appears to be effective. Monitoring will continue into 2016.

Effective Use of Mitigation Funding

Oregon natural hazards mitigation staff make full use of FEMA grant funding. In 2015, DLCD fulfilled its HMGP grant obligation by successfully updating the Oregon NHMP as an enhanced plan. All project activities including the complete spend-down of the sub-grant budget were accomplished and closed out. The NFIP Coordinator successfully fulfilled the CAP-SSSE grant work plan.

Table 7. Effective Use of Mitigation Funding

Funding Source	Amount ($)	How the State has Made Full Use of Available Funding
HMGP	$936,869 (FS)	Most recent disaster DR-4169 HMGP lock-in at 12-month (April 2015). Closed application period (rolling obligations throughout the year).
FMAG-HMGP	6 x $441,555	Six declarations in Summer 2015.
PDM2014	$580,943 (FS)	Four sub-grants selected for funding; pending obligation: OPDR, DLCD, OSU and OMD/OEM.
PDM2015	pending	Four sub-applications selected for funding; pending obligation.
FMA14	$334,720 (FS)	For SRL property acquisition in Linn County

Source: Office of Emergency Management (OEM)

Conclusion

Oregon was impacted by severe winter storms that in December 2014 brought snow and ice and in December 2015 flooding, landslides, mudslides, and straight-line winds. In between them, Oregon suffered a series of extensive summer wildfires. These disasters and the workloads they created stretched thin Oregon's small natural hazards mitigation staff, especially the State Hazards Mitigation Officer and others in OEM.

Even with minimum staffing in some agencies and legislative support primarily for the Seismic Rehabilitation Grant Program in 2015, Oregon is making strides in natural hazards mitigation. Fully half of the 78 priority mitigation actions are either done or progressing. Most of the rest are targeted for the second half of the life of Oregon's NHMP. And this with two presidentially declared disasters and six FMAG/HMGP declarations!

LCDC for the first time made state Technical Assistance Grant funding for NHMP updates and integration with comprehensive plans a priority, and awarded several such grants.

Oregon is also maintaining its active and positive relationship with FEMA Region X. Internally, Oregon agencies are interacting more closely than ever before. The HUD NDRC application process brought a number of agencies together to produce the initial and second, more detailed application. DAS-CFO issued proactive guidelines for state development on land subject to seismic and flooding hazards. DAS's Real Estate Services Program picked up the cue and is now asking landlords for flood and seismic information on new and renewing leases. Staff from DLCD's Ocean and Coastal Management Program, DLCD's Natural Hazards Program, and OPDR are working together to assist local governments on the coast with NHMP updates and integration of NHMPs into comprehensive plans. ODF, DLCD, OEM, and OPDR are collaborating on developing a method for coordinating CWPP and NHMP updates, and integrating them with each other and with comprehensive plans and other planning documents.

Many state agencies are also active in public outreach. The Insurance Division takes hazard mitigation messages to its trainings, especially trumpeting the need for homeowners to purchase earthquake insurance. While the Seismic Grant Rehabilitation Program addresses the seismic safety of schools, first responder facilities, and hospitals, more needs to be done to catch the attention of homeowners. OEM is helping the City of Portland address that problem with PDM funding for an innovative partnership with Enhabit (formerly Clean Energy Works Oregon) that will help single-family home owners seismically retrofit their homes. The State NFIP Coordinator is in great demand for presentations on flood hazard issues to surveyors, real estate agents, and local government staff. OEM's two outreach agents do a singular job of making people, businesses and their employees aware of earthquake and tsunami hazards, how to prepare for them, and how to evacuate at any hour of the day or night. They also coordinate with DOGAMI and ODOT, bringing DOGAMI's research to life and ensuring that tsunami evacuation way-finding strategies are current and effective.

OEM staff and the State Hazards Mitigation Officer are working diligently to retain enhanced plan status by practicing excellent grant and program management. Other state agencies and OPDR join them in maintaining the state's commitment to a comprehensive mitigation program and implementation of mitigation actions; integrating with state and federal planning programs and initiatives; and making effective use of state and local mitigation programs and funding.

Overall, while underfunding remained an issue in 2015, Oregon has maintained and in some ways even enhanced its commitment to a comprehensive natural hazards mitigation program.

Appendices

A. *Excerpt from ODF Fire Protection Division's 2015 Fire Season Report*
B. *ODF Media Release: Storms and Trees in Our Cities: Planning Ahead for Winter Weather*
C. *Mitigation Action Table: Priority*
D. *Mitigation Action Table: Ongoing*
E. *Mitigation Action Table: Removed*

Appendix A: Excerpt from ODF Fire Protection Division's *2015 Fire Season Report*

The full report can be accessed at http://www.oregon.gov/ODF/Fire/Pages/default.aspx under the heading, *Annual Fire Season Report*.

2015 WILDFIRE SEASON

2015 fire season was characterized by multiple destructive and challenging large wildfires that have displayed extreme fire behavior and exponential growth, and resulted in significant losses to public infrastructure, private property and structures, commercial timberlands, and other forestland. These fires have disrupted life in southwest and eastern Oregon and produced significant impacts to air quality, water quality, recreation and scenic values, and wildlife habitat. This is the third year of significant fire activity in a row, brought on in part by elevated statewide drought conditions, lightning, and an increase in human-caused fires.

Stouts Creek Fire Pyrocumulus cloud on July 31, 2015. Photo from Douglas Forest Protective Association.

Oregon has experienced three of the most expensive and challenging fire seasons in more than half a century. All facets of Oregon's complete and coordinated fire protection system were tested and exercised. This included Oregon's unique funding structure for suppression of both small and large fires, the use of severity resources, landowner partnerships, contractors, cooperators and other agreements, which ultimately brought firefighting support from around the country, the National Guard, and from the Canadian provinces.

The Dry Gulch Fire in ODF's Northeast Oregon District burned 17,000 acres in 3 days, illustrating the explosive fire growth in receptive fuels. Photo Courtesy Jeffery Apple and Rod Nichols.

We've also seen several fires with high public profiles, due to their proximity to population centers, threats to homes, structures burned, and values at risk that have included air and water quality, recreation and scenic values, and habitat - as well as losses of standing timber.

By the end of August, the Northwest Coordination Center (NWCC) reported that Oregon and Washington had already hosted 37 incident management teams, and more than 10,000 firefighters working 93 large fires that have burned a combined 1.4 million acres of forest and range land. These fires resulted in

the death of three wildland firefighters in north central Washington, had burned more than 100 primary residences, and resulted in evacuation notices for 16,500 homes. National Guard members from both states were deployed, and active duty Army troops were integrated into fire operations in north-central and northeast Washington. The National Preparedness Level had been set at the highest possible rating (PL5), meaning that the commitment of all resources was in effect, with little to no availability for new resources to enter Oregon or Washington. By September 30, NWCC reported 2,273 fires burned nearly 632,000 acres in Oregon.

This year, three battalions of 250 Oregon National Guard (NG) troops trained and deployed as firefighters. One battalion was deployed to Canyon Creek Complex for 8 days and two were deployed to Grizzly Bear Complex for 9 days. NG helicopters were also deployed to Cornet, Eagle Complex, and the Canyon Creek Complex fires this year.

To close out the year, NWCC reported 4,299 fires for Oregon and Washington. 2,524 of these fires were in Oregon, which burned a total of 633,048 acres. 43 of 102 large fires, where at least 100 acres timber or 300 acres grass or brush were burned, were in Oregon. The largest was the Canyon Creek Complex at 110,422 acres. NWCC reported that 11,450 firefighter and support personnel were active in Oregon and Washington this fire season. The Preparedness Level (PL) reached PL4 for 24 days and peaked at PL5 for 23 days.

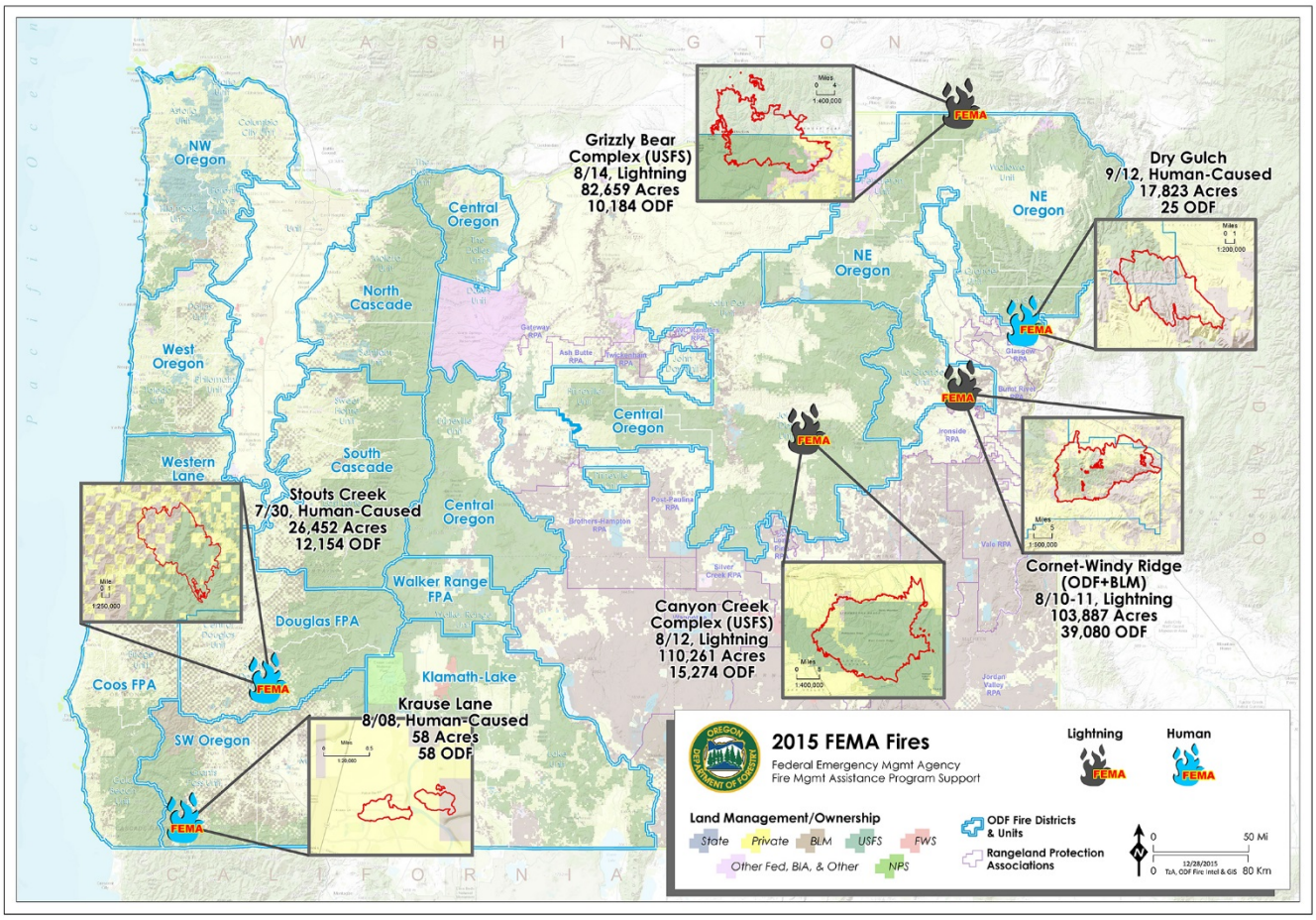
ODF reported 1,080 statistical fires this year and 86,629 protected acres burned. Taking 2015 data into account, our 10-year average has risen. From 2005-2014 the average number of fires was 987 and average acres burned was 27,599. For 2006-2015, the 10-year average is now 1,013 fires and 35,101 acres burned.

FEMA FIRES

Fire management Assistance Grant (FMAG) Program:
Under this program, FEMA provides financial assistance in the form of grants to assist in reimbursement for equipment, supplies, and personnel to any State, Indian tribal government for the mitigation, management, and control of any declared fire on public or private forest land or grassland that threatens such destruction as would constitute a major disaster.

- FMAG Designations in 2015:
- Canon Creek, Grant County
- Grizzly Bear, Wallowa County
- Kraus Lane, Josephine County
- Stouts Cree, Douglas County
- Cornet-Windy Ridge, Baker County

2015 FMAG-Hazard Mitigation Pilot Program (HMGP):
FEMA has pilot projects tied to the 6 Fire Management Assistance Grants (FMAG) fire declarations in 2015. This new funding source is through the Hazard Mitigation Grant Program (HMGP), and is being managed by OEM as grantee, to the effected Counties as primary sub-grantees.



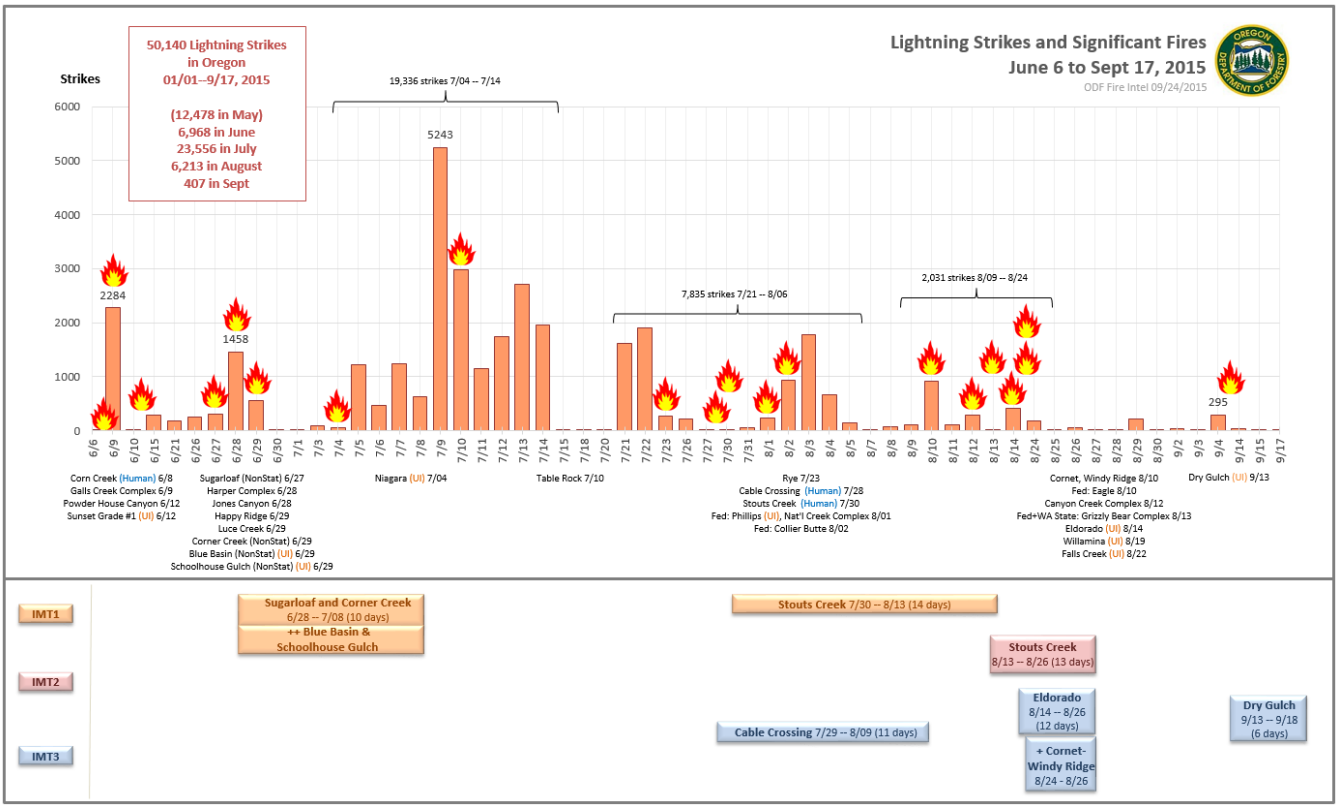
▪ RECEPTIVE FUELS - INFLUENCE OF DROUGHT

The *National Significant Wildland Fire Potential Outlook* for the entire state of Oregon was predicted to be above normal for July and August 2015. It was as well for most of Washington, Idaho and California, which created challenges due to the drawdown of firefighting resources across the region at the height of the season. For the three-month period of May through July 2015, Oregon recorded the warmest average temperatures since 1895. Receptive fuels under prolonged drought conditions produced extreme fire behavior and rapid fire growth requiring large commitments of resources to control.

▪ CAUSES AND PREVENTION

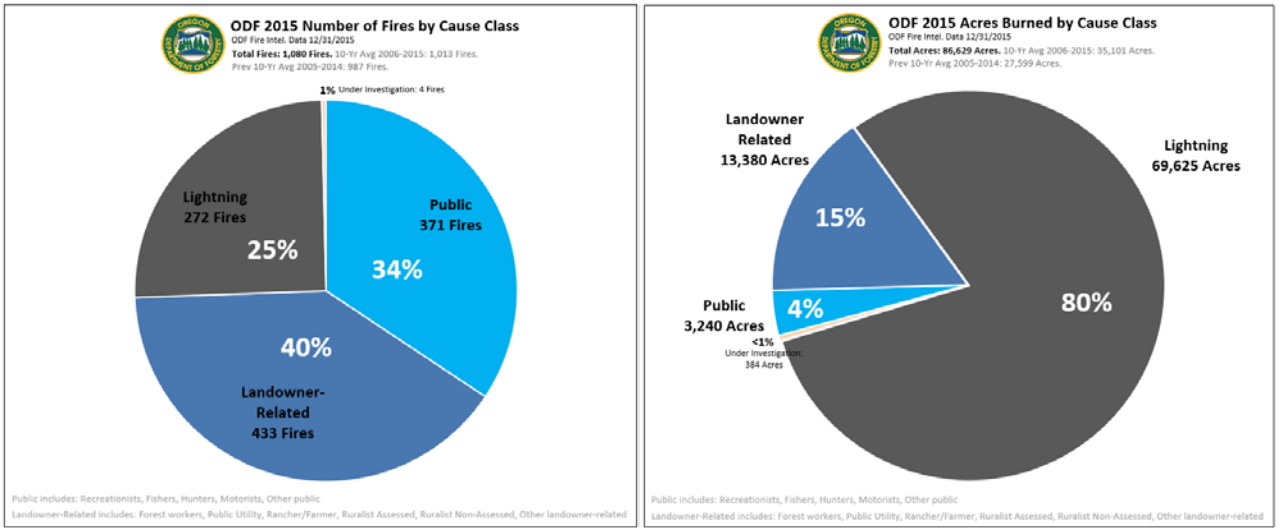
Oregon experienced ongoing lightning activity, sometimes prolonged and very intense, for much of the summer. In early July, there were over 19,000 lightning strikes, although these were accompanied by trace precipitation, eluding the potential for large fire growth. On August 10th, Oregon experienced about 1,000 lightning strikes, but these resulted in our largest fires across the landscape, including the Cornet-Windy Ridge, Canyon Creek, Eldorado, Eagle and the Grizzly Bear Complex fires. Even during these high-intensity lightning periods, the

agency had aggressively searched for and attacked new fire starts, simultaneously continuing large fire operations.



Lightning Strikes, Large Oregon Fires, and ODF IMT Deployments in 2015.

In addition to lightning fires, the state has experienced a number of devastating human-caused fires, the most significant being the Stouts Creek Fire outside of Days Creek, Oregon, east of Canyonville. The Stouts Creek Fire was ignited on July 30, and burned more than 26,000 acres of forestland, with total costs surpassing $34 Million. Preventing human-caused fires posed many challenges during the 2015 fire season. Drought and severe fire danger conditions plagued the state for the third consecutive year. The slightest spark, no matter how large or small, carried with it the potential of igniting a fire and quickly spreading out of control. The number of human-caused fires this year were 116 more than the standing 10-year average (2005-2014), the **17,004** acres burned were **more than three times the average**, proof positive that multiple years of severe fire conditions fueled extreme fire behavior.



Number of Fires and Acres Burned in 2015 by General Cause Class

This year's extreme fuel conditions and fire weather prompted industrial and public fire prevention closures that had not been seen in decades. Industrial Fire Precaution Level IV was imposed in five districts west of the Cascades on two different occasions in August for a total of 19 days. IFPL III was in place in various areas from June 7 through August 30 and then again from September 10 through September 15 for a total of 71 days. While forest workers were kept out of the woods, many operators proved essential to the fire suppression effort providing manpower and equipment on many of the large fires burning across the state.

In addition to regulating industrial and public activities during these severe conditions, prevention messaging emphasized caution that the public must take when working or recreating outdoors. Collaboration with our partners such as Keep Oregon Green, PNWCG, Oregon State Fire Marshal, Oregon Department of Fish and Wildlife, Oregon Department of Transportation, and others was key throughout the summer.

A significant campaign took place in the Northwest Oregon Area "targeting" recreational shooting. What was at one time considered low risk in fire ignition, target shooting had grown into a reliable fire starter in 2015. News releases and flyers were developed with the help of Keep Oregon Green to heighten awareness, especially on State Forest lands, where a large contingency of target shooters frequented. A legislative concept is currently under development that would give the department authority to regulate target shooting under high fire danger.

The extreme fire conditions were not pinpointed in one particular area. The entire state was feeling the heat. Through a request by State Forester Doug Decker, the Oregon Department of Transportation joined the effort by using large electronic reader boards on major state highways and freeways that read, "CAUTION, HIGH FIRE DANGER."

ODF would like to extend thanks and appreciation to ODOT and all other agencies and cooperators who joined the prevention effort.

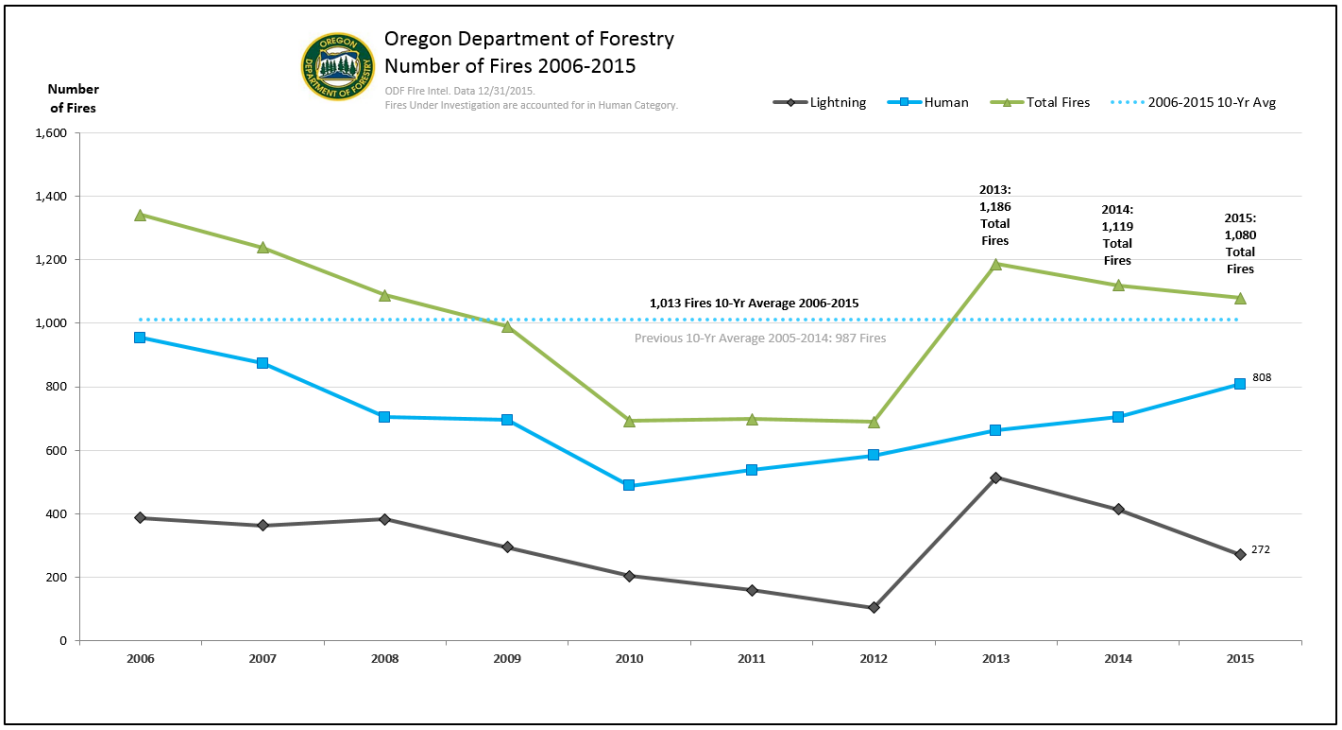
▪ FIRE STATISTICS

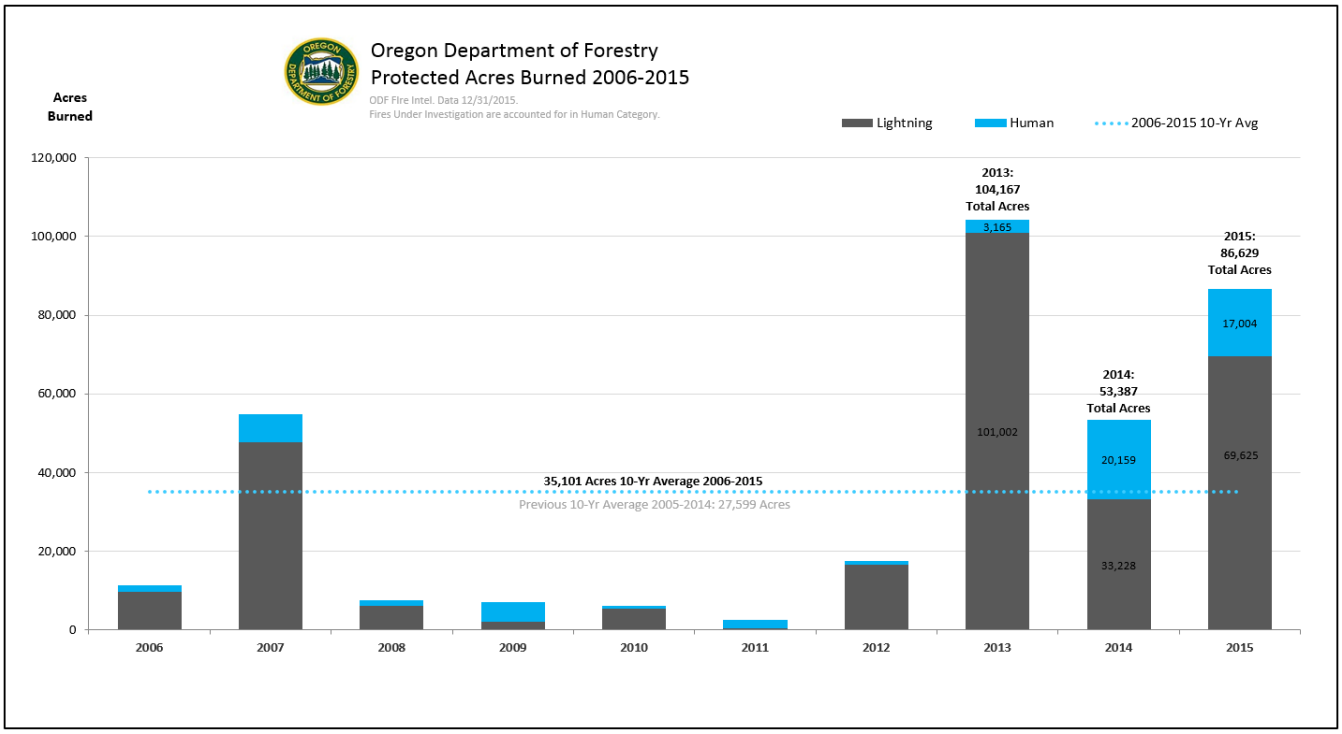
ODF recorded **1,080** statistical fires in 2015, **93** more than our previous 10-year average from 2005-2014 (987 fires). In 2014, there were 1,119 fires, and in 2013, there were 1,186 fires.

A total of **86,625** acres were burned on ODF-protected lands. This is **59,026** acres or 3 times greater than our ten-year average (27,599 acres). In 2014, 53,387 protected acres were burned. In 2013, 104,167 acres were burned.

Lightning-caused fires spread quickly in central and eastern Oregon; **50,000** lightning strikes in Oregon from May through mid-September accounted for **272** fires which burned **69,625 acres**, or **80%** of the total ODF-protected acres burned this year. This is **47,094** acres, or more than twice above the ten-year average for lightning fires (296 fires, 22,531 acres).

Despite an aggressive media campaign to minimize human-caused fires with partnerships including Keep Oregon Green, human-caused fires were also a significant driver this year, with **808** fires totaling **17,004** acres burned; this is **115** more fires and over **11,936** more, or well over twice the acres burned than our ten-year average (692 fires, 5,068 acres).





To close 2015 and start 2016, we have a higher 10-year average as baseline. From 2006-2015, our new average number of fires is 1,013 (26 more than our previous 10-yr average), and 35,101 protected acres burned (7,502 acres more than our previous 10-yr average). These values include 310 lightning fires for 29,180 acres burned, and 703 human fires for 5,922 acres burned, respectfully.
Overall since the start of Fire Season 2013, Oregon has been experiencing drought impacts that produced an increase protected acres burned.

2015 Large Fires (>1,000 Acres)

Fire Name	Location	Acres	Date	Cause	Primary Suppression Agency
Canyon Creek Complex	Malheur National Forest & Private Landowners	110,261	August 12th, 2015	Lightning	USFS, ODF, BLM
Eagle Complex	Wallowa Whitman National Forest	12,763	August 11th, 2015	Lightning	USFS
Grizzly Bear Complex	Umatilla National Forest & Private Landowners	82,659	August 13th, 2015	Lightning	USFS, ODF, Washington DNR
National Creek Complex	Crater Lake National Park, Rogue River-Siskiyou National Forest, Umpqua National Forest, Private Landowners	20,960	August 1st, 2015	Lightning	USFS/ODF
Phillips Creek Fire	Umatilla National Forest	2,601	August 20th, 2015	Human-caused	USFS
Dry Gulch	Northeast Oregon Private Landowners, BLM, Wallowa Whitman National Forest	17,823	September 12th, 2015	Under Investigation	ODF, USFS
Cornet-Windy Ridge	Northeast Oregon Private Landowners, Wallowa Whitman National Forest	103,887	August 10th, 2015	Lightning	ODF, USFS
West Fork Fire	Malheur National Forest	928	June 29th, 2015	Lightning	USFS
Stouts Creek Fire	Private Landowners in Douglas County, BLM, Umpqua National Forest	26,452	July 30th, 2015	Human-caused	Douglas Forest Protective Association, ODF, USFS, BLM
Collier Butte	Rogue River-Siskiyou National Forest	11,800	September 10th, 2015	Lightning	USFS
County Line 2 Fire	Confederated Tribes of Warm Springs	67,207	September 3rd, 2015	Under Investigation	Warm Springs, SFMO
Eldorado	Private lands, Vale BLM and Wallowa-Whitman National Forest lands	20,635	September 1st, 2015	Unknown	ODF, USFS, BLM
Bendire Complex	BLM Vale District	44,397	August 21, 2015	Lightning	BLM
Cable Crossing	Private Landowners in Douglas County	1,857	July 28th, 2015	Under Investigation	Douglas Forest Protective Association, ODF
Windy Ridge	Private Landowners in Baker County, BLM	22,862	August 11th, 2015	Lightning	ODF, BLM
Corner Creek	Prineville District, BLM	29,660	June 29th, 2015	Lightning	ODF, BLM
Sugarloaf	Prineville District, BLM	4,740	June 27th, 2015	Lightning	ODF, BLM
Buckskin	Rogue River-Siskiyou National Forest	5,345	September 30th, 2015	Lightning	USFS, ODF

Appendix B: ODF Media Release: *Storms and Trees in Our Cities: Planning Ahead for Winter Weather*

Storms and trees in our cities: planning ahead for winter weather

Dec. 14, 2015

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We are currently experiencing the strongest El Niño in the equatorial Pacific Ocean since the winter of 1997-98. That should result in a mild winter for the Pacific Northwest, but the precipitation forecast is less certain. A strong El Niño can also produce quite stormy periods, like we have recently seen and may experience again later this week.

Some communities in western Oregon have recently been seeing problems with flooding and tree failures. Oregonians know that high winds, rain, snow and ice can hit us here in the Pacific Northwest, taking quite a toll on our landscape trees.

How can you determine if a tree can withstand the onslaught of a blustery winter? Just because a tree is large, doesn't mean that it is unsafe, or safe for that matter. After all, look at all the trees

that made it through *last* winter relatively unscathed. The key is to keep trees healthy – which isn't a reflection of size.

Start with understanding a few basic risk factors related to tree risk: canopy structure, root health and saturated soils. Here are some guidelines:

Wind-firmness
The ways a tree responds to wind, rain and snow are often determined by its structure and natural taper, formed in relation to solar access and to being buffeted by weather through its life. Well-structured trees do better in wintery conditions, and, research from the University of Florida shows trees with a strong central leader do better withstanding hurricane-force winds. If you're concerned about your trees' structure, an ISA-certified arborist may be able to improve it.

If you have a new tree, *loosely* staking it can encourage it to form good taper by allowing it to move but not break in wind gusts. *For all staked trees, please remember to remove the stakes after one year.*

Trees with a significant lean, broken branches or decay
Some trees – especially Oregon white oaks that have been growing on edges of groves – naturally develop lean that is not especially hazardous. However, if you notice newly-exposed roots around the base of your tree, or notice that the tree has recently started to lean, a prompt professional evaluation of the situation is warranted. Additionally, look for hollow or decayed areas on the tree which can indicate structural weakness, and watch for hanging or broken branches still lodged in the tree that can harm people or property if blown loose by a strong gust.

Trees that have been topped in the past may have weakly-attached regrowth or columns of decay inside of their larger branches below the topping cuts.

Saturated soil
While it's true that trees can fall over when soil is extremely saturated, most do not. Tree failure in saturated soils usually happens when trees have had their roots damaged, removed, or compromised due to construction damage, restricted rooting space, or disease. Past topping of trees can also adversely affect root health and tree stability.

Urban tree care best practices
Taking the right action after trees have been damaged can make the difference between giving trees a good chance of survival and losing them unnecessarily.

Monitor and observe changes
If you are walking around your neighborhood, driving to the store, or taking your dog to the park, get into the habit of looking at trees, noticing how they move, and if they exhibit some of the risk indicators mentioned above. If a tree on public property causes you concern, do not hesitate to call your city's parks or public works department and let them know where it is and why you are concerned.

Don’t “save” trees with extreme damage, and don’t over-prune: What are the two most common mistakes people make when trying to clean up after a storm? The first is trying to save trees that have sustained too much damage and are likely to become hazardous. The second is using harmful pruning techniques on a tree that perhaps only needs a light pruning.

“After a storm, people naturally become anxious to have their trees examined so they can prune or take other actions,” observes Paul Ries, an urban forester who manages the Oregon Department of Forestry’s urban and community forests program. “However, it’s often the case that more trees become damaged as a result of improper post-storm activities, than were damaged directly by a storm.”

Don’t (ever) top your trees
Pruning a tree incorrectly can weaken it, setting it up for big problems. Topping – the practice of removing large branches and tops of trees – creates trees that are likely to be hazardous in the future. That's because a topped tree is much more likely to break or uproot in a storm than a tree with normal branch structure.

Don’t ignore your tree
The opposite problem – ignoring a tree that should be removed – is another post-storm mistake.

Properly selecting a qualified, professional, experienced arborist is key.

- If possible, hire an International Society of Arboriculture-Certified Arborist – someone who has demonstrated the knowledge and expertise to care for your trees. Since this qualification is highly sought, most ISA-Certified arborists will mention this credential in their business advertising. However, it is always wise to ask if the credential is up-to-date, and if the tree worker is ISA-certified.
- During and after a storm, tree care companies will be at their busiest, so have your trees evaluated for risk during calm days.
- Beware of people or companies that show up at your door - their low prices may ultimately cost you more money in the long run. Most reputable companies have business cards, truck signs and even uniforms that represent a professional level of service. Take your time selecting a reputable company; ask for and call references.

When in doubt about an arborist’s ISA-certification, go to the International Society of Arboriculture’s website, at http://www.isa-arbor.com, click on the “professional credentials” tab, and then choose “verify a credential” from the list. From here, you will be able to either find a certified arborist near you or determine an arborist’s certification status.

Lastly, Ries offers this perspective: “It is natural for most people to feel nervous around large trees during stormy weather, even when the risk of tree failure is relatively low. Winter is the time to remember all of the environmental benefits large trees bring to our cities at other times of the year such as cooling and shading and cleaning up air-borne pollution when it is warm. Evergreen trees also play huge roles during winter in redirecting storm water runoff, lessening soil erosion, and reducing the energy consumption needed to warm our homes. It is best to think of managing tree risk rather than eliminating it altogether by removing a large healthy stable tree.”

For more information:

- **Tree Hazard Prevention Page:** www.pnwisa.org/media/htp/index.html
- **Homeowner's Guide to Tree Care:** www.oregon.gov/ODF/Documents/ForestBenefits/HomeownersGuidetoTreeCare.pdf

# # #

The mission of Oregon's Urban and Community Forestry Assistance Program is to help Oregonians improve their quality of life by promoting community investment in our urban forests

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Appendix C: *Mitigation Action Status through 2015: PRIORITY*

MITIGATION ACTION STATUS THROUGH 2015
PRIORITY

Action Item			Implementation				
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Target Date	Status
~~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.~~	~~DLCD~~	~~OEM~~	~~State-OEM, DLCD~~	~~2015~~	~~**Done**. Not approved by the legislature in 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: • Establishing a single point of online access to reliable data, maps, and information about natural hazards; • Developing, in conjunction with DAS-GEO, a "portal" to distribute this data; • Developing a multi-agency State of Oregon flood hazard website; • Providing an ongoing inventory and assessment of existing natural hazards data; and • Creating a central library for natural hazard risk assessments.	DLCD	DAS-GEO, DEQ, DOGAMI, OWRD, OEM, FEMA, USACE, NDWS, USGS	FEMA, State-DAS-GEO	2016	**Progressing**. • DAS-GEO and the Oregon Institute for Natural Resources are revising the Spatial Data Library for more coordinated and "discoverable" natural hazards data. • OPRD-HC hired two summer interns to update historic site inventories in Carlton, Florence, and St. Paul. • OPRD-SOS's and DLCD's shared NOAA Fellow developed a Goal 18 inventory for the entire coast and created GIS data for mapping. Data still needs to be added to the State GIS database. • OPRD-HC gathered 2 disaster plans from organizations participating in an IMLS grant program, and established temporary incentives to encourage more preparedness and disaster plans.
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.	OEM	DOGAMI	NOAA	2018	**Not started.**
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.	OEM	State IHMT Agencies	State-OEM	2015	**Not started.**
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.	DLCD	DOGAMI	State-DLCD	2015	**Not started**. Legislature denied funding. Plan to request grant funding in 2016.
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.	DOGAMI		State-DOGAMI	2015	**Not started**. Plan to begin in 2016.
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.	DLCD, DOGAMI		FEMA	2016	**Progressing:** Roughly 50 miles of new lidar-based floodplain mapping have been completed.
~~8~~	~~Create a new lidar-based statewide landslide susceptibility overview 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.~~	~~DOGAMI~~		~~DAS-GEO~~	~~2015~~	~~**Done.**~~

MITIGATION ACTION STATUS THROUGH 2015
PRIORITY

Action Item			Implementation				
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Target Date	Status
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.	DOGAMI		DOGAMI, USGS	2020	**Progressing.** Request for funding unsuccessful. Researching other funding opportunities.
~~**10**~~	~~Implement the Rapid Assessment of Flooding Tool (RAFT)~~	~~The RAFT has been funded and developed by the U.S. 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.~~	~~Silver Jackets~~	~~DLCD, OEM, DOGAMI, OWRD~~	~~FEMA, USACE~~	~~2016~~	~~**Done.**~~
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.	DLCD	DOGAMI, ODF	State-DLCD	2020	**Not started**.
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: 2014 = Seaside 2015 = Warrenton 2016 = Rockaway Beach 2017 = Siletz Bay area 2018 = Pacific City	DOGAMI	OEM	NOAA	2018	**Completed**: Detailed evacuation route and "Beat the Wave" speed analyses for Seaside and Gearhart. **Progressing**: Detailed evacuation route and "Beat the Wave" speed analyses for Cannon Beach and Warrenton. **Not Started**: Detailed evacuation route and "Beat the Wave" speed analyses for Rockaway Beach.
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: • Silvies Watershed • Lower Columbia River/Sandy River Watershed • Clatsop County • Tillamook County • Lincoln County • Curry County • Lane County • Douglas County	DOGAMI	DLCD	FEMA, Local Gov'ts	2018	**Done:** Lower Columbia-Sandy Watershed, Tillamook County, Lincoln County, Curry County, Lane County, and Douglas County. **Progressing:** Silvies Watershed, Clatsop County
~~**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.~~	~~DOGAMI~~	~~DLCD~~	~~State-DOGAMI~~	~~2015~~	~~**Done.**~~

MITIGATION ACTION STATUS THROUGH 2015
PRIORITY

Action Item			Implementation				
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Target Date	Status
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.	DLCD	DEQ, OEM, DOGAMI, OHA, UO, BusOR-IFA, FEMA	FEMA, State-DLCD, OEM, DOGAMI, OHA, UO, BusOR-IFA	2019	**Not started**. Researching funding and partnership opportunities.
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.	ODOT	OCCRI, DOGAMI, DLCD	FHWA	2015	**Progressing**. 02/13/15 Review group organized to review proposed flood risk standards. 03/19/15 comments submitted to FHWA for review. 05/22/15 Final report on North Coastal Regional Framework for Climate Adaptation received. 06/22/15 Adaptation Working group met to discuss proposed work on Sea Level Rise Arc GIS Mapping Tool, Coastal Landslide Monitoring Priorities and Detour Route Gap Analysis for the Oregon Coast. 07/24/15 received AASHTO briefing on Climate Change for working group review. 08/06/15 Action plan developed and submitted for immediate 2015, short term 2016 and long term action goals 2017 and beyond. 09/16-18/15 participated in FHWA Climate resilience webinar. 10/22/15 working group to work with Region and Tech Services on Sea Level Rise mapping proposal prior to bringing it to HMT.
~~**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.~~	~~DLCD~~		~~State-DLCD~~	~~2015~~	~~**Done**. LCDC included as Priority #3 out of 5 for state-funded Technical Assistance Grants, intended to assist with creating local natural hazard mitigation plans or incorporating new hazards data, and the response to the data, into comprehensive plans and zoning regulations.~~
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.	DLCD	DOGAMI	State-DLCD	2017	**Progressing**. DLCD has established a process for triggering and implementing Goal 7. Criteria for determining whether new information would require a local response have not been established.
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.	BusOR-IFA	OEM	State-SRGP	2015	**Not being pursued** by BusOR-IFA.
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. The state has also started CRS Users' Groups (#C, Removed and #112, Ongoing) to encourage greater participation in the CRS program.	DLCD		FEMA-CAP-SSSE	2020	**Not started**.
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.	OPRD	DLCD	NOAA, State-OPRD	2015	**Progressing**. OPRD-SOS and DLCD jointly sponsored a NOAA Fellow who developed a Goal 18 inventory of shoreline protective structures for the entire coast and created GIS data for mapping. The data still needs to be added to the State GIS database.

MITIGATION ACTION STATUS THROUGH 2015
PRIORITY

Action Item			Implementation				
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Target Date	Status
~~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.~~	~~DAS-CFO~~	~~DLCD~~	~~State-DAS-CFO~~	~~2020~~	~~**Done**. Facility Planning Guidelines for Development with Natural Hazards issued 6/15/15. Discussed with the Interagency Hazard Mitigation Team, Governor's Policy Directors, Agency Facility Directors, and DAS Risk Management.~~
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. 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.	OWRD	ODOT OEM	State-OWRD	2020	**Progressing**. The revised bulletin is called 17C. A first draft of 17C was completed and distributed for review in April 2015. A draft of Bulletin 17C was released for a 45-day public comment period on February 22, 2016.
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.* 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.	DOGAMI	DLCD, OPDR	NOAA	2018	**Progressing**. Velocity modeling and evacuation plan for Yaquina Bay maritime operations completed in 2015. Public workshop held at Central Coast Community College in Newport.
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.	OEM	DOGAMI	NOAA, State, Local Gov'ts	2015	**Progressing** in 2015. (Data is available through Raptor for local governments to access as of July 2016.)
~~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.~~ ~~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.~~	~~ODFW, DSL~~	~~OEM, DLCD~~	~~USFWS, State-ODFW, DSL, OEM, DLCD, DEQ, OHA~~	~~2015~~	~~**Done and Ongoing**. *(Move to Ongoing table.)* This occurs continually as natural resource agency documents are reviewed and updated.~~
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.	DLCD	OEM	FEMA-CAP-SSSE	2020	**Not started**.
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.	OEM	DLCD	FEMA-CAP-SSSE, State-OEM, DLCD	2015	**Not started**.

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Action Item			Implementation				
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Target Date	Status
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.	DLCD		FEMA- CAP-SSSE	2020	**Not started**.
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.	DLCD, OPDR		FEMA-PDM, Risk MAP, State-DLCD	2015	**Progressing**. OPDR has provided NHMP/Comp Plan crosswalks to more than a dozen communities. OPDR and DLCD are working together on this in coastal communities. DLCD is encouraging local governments to integrate NHMPs with other plans and programs through NHMP updates and State Technical Assistance Grant awards. DLCD will provide technical assistance for integration upon request by a local government as part of its Goal 7 implementation program.
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.	DAS-CFO, DAS-CIO	DOGAMI	State-DAS-CFO, DAS-CIO	2016	**Progressing**. DAS-GEO engaged infrastructure and cultural resources stakeholders in meetings with reps from all State agencies that own or lease buildings to begin the process of defining Framework data standards. The process was halted temporarily while DAS-CFO gets a better handle on data requirements for DataMart. Detailed data for pilot agencies (DAS, Oregon Youth Authority, and Oregon Liquor Control Commission) complete. Department of Corrections in process.
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 and provide advice on 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.	DAS-CFO	DOGAMI	State-DAS-CFO, Local Gov'ts	2020	**Progressing**. Compiling seismic and flood info for personnel-occupied and other agency-critical buildings.
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.	DAS-EAM	DOGAMI	State-DAS-EAM, Local Gov'ts	2020	**Progressing**. Leasing agents have begun requesting floodplain and seismic information from landlords on new leases and renewals.
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.	DOGAMI	ODOT	State-ODOT	2015	**Progressing**. To be completed on a project-by-project basis. Completed Curry County along Hwy 101 and Bull Run Watershed access roads.
35	Investigate/inventory DAS-owned buildings for seismic risk.	Determine earthquake damage and losses expected to occur to the state-owned building inventory and provide advice on 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.	DAS-CFO	DOGAMI	State-DAS-CFO	2016	**Progressing**. Performed rapid visual screening, benefit/cost analysis, and prioritization. Almost done with DAS-owned buildings. Beginning work on other state-owned buildings. Plan to work on university buildings after other state-owned buildings.
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.	OEM	DOGAMI	State-OEM	2018	**Not started**.

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Action Item			Implementation				
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Target Date	Status
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.	OEM		NEHRP, State-EMPG	2018	**Progressing**. Had approximately 50% participation in 2015 up from 2014 participation.
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.	DOGAMI	OEM, DLCD	NOAA	2016	**Progressing**. Waldport HS project completed in 2015. HS was in tsunami inundation zone and not seismically sound. Used PDM grant to tear down the building and bond money to build a new school. (Safe Haven Hill project completed in March 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.	OWRD		State-OWRD	2020	**Progressing**. The state has installed 20 new gages during 2013-2015. All new gages are equipped with real-time telemetry. When existing stations are modernized, real-time telemetry will be added.
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.	OEM	DOGAMI	NOAA- NTHMP, Local Gov'ts	2015	**Progressing**. Completed signage with Clatsop County and the cities of Rockaway Beach and Bandon to improve signage for evacuation routes in 2015. (Working on Blue Line project in 2016. Will continue as funding is available.)
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.	OEM	BusOR-IFA	FEMA, Local Gov'ts	2018	**Not started.**
~~**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.~~	~~OEM~~	~~BusOR-IFA~~	~~State-EMPG~~	~~2015~~	~~**Done**. In 2015 the Oregon Disaster Assistance Loan and Grant account was activated twice: (1) to fund the state's contribution to the demolition costs for the Vernonia Schools project; and (2) to assist the City of Westfir in relocating its water intake (OEM in partnership w/BusOR-IFA).~~
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.	OEM	OPDR, DLCD, DOGAMI	State-EMPG	2017	**Not started**.
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.	OEM	OPDR, DLCD, DOGAMI	State-EMPG	2017	**Not started**.
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.	DOGAMI, DLCD, OEM	DAS-CFO	State-DAS-CFO	2020	**Not started**.

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Action Item			Implementation				
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Target Date	Status
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.	DLCD	OPDR, OEM	FEMA, State-DLCD	2020	**Not started**. Even though this mitigation action is ranked as higher priority than Action Item #50, "Update *Planning for Natural Hazards: Oregon Technical Resource Guide,"* Action Item #50 must be completed before this action can be started.
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.	DLCD	DOGAMI, OPRD	NOAA, FEMA, State-DLCD	2020	**Progressing**. DLCD has developed a coastal erosion model land use code and associated plan policies. They were used in the Neskowin Coastal Erosion Adaptation Plan adopted by Tillamook County in June 2013 and both would be included in a *Coastal Development Handbook* as well as the updated *Technical Resource Guide* (Action Item #50).
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.	DOGAMI		NOAA, State-DOGAMI	2016	**Progressing**. Collaborating with NASA which has a grant to work on this. To be completed by 2018.
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.	DOGAMI		State-DOGAMI, Local Gov'ts	2020	**Done:** Clackamas County and cities, Washington County, Curry County and cities, Columbia County, Astoria, Silverton, Portland, Mt. Hood National Forest, Bull Run watershed, and various BLM properties statewide. **Progressing**: Multnomah County and Eugene-Springfield
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.	DLCD, OPDR	OPDR	FEMA, NOAA, State-DLCD	2020	**Not started**. The updated Technical Resource Guide would include the coastal erosion model land use code and associated policies developed by DLCD and used in the *Neskowin Coastal Erosion Adaptation Plan* adopted by Tillamook County in June 2013. It would also include the landslide guide anticipated to be started in 2016.
~~**51**~~	~~Facilitate self-sustaining outreach programs staffed by Community Emergency Response Teams (CERT) and other similar groups 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).~~ Create measures of sustainability and success.	~~OEM~~	~~DOGAMI~~	~~NEHRP, NOAA~~	~~2018~~	**~~Ongoing~~**. (Move to Ongoing table.)
~~**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, OEM and OSPOERS 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.~~	~~ODOT, OSP, OEM, OERS~~	~~OEM~~	~~NOAA, State-ODOT, OSP, Local Gov'ts~~	~~2017~~	**~~Ongoing.~~** (Move to Ongoing table.)
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/)	DOGAMI	OWRD	USGS, USACE, NOAA-NWS	2017	**Progressing**: DOGAMI is working with USACE to produce flood inundation maps for Creswell, Albany, and Pacific City areas.
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.	OEM	BCD, ODE, DOGAMI, ODF, OHA, DLCD, ODOT, OPDR, PUC, UO, OSU, PSU	State-OEM	2017	**Progressing**. Opened recruitment for Seismic Resilience Officer in 2015. Filled the position in 2016.
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.	DAS-CFO	DAS-EAM, DOGAMI	State-DAS-CFO	2020	**Progressing**. Using inventory (Action #35) for 10-year capital plan development and other facility management decision-making processes.

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Action Item			Implementation				
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Target Date	Status
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.	DOGAMI		State-DLCD	2015	**Progressing**. DOGAMI performed the following: ▪ Classified first-order streams into segments of high, medium, and low channel migration susceptibility for each of the 86 sub-basins (8-digit hydrologic unit) within or intersecting Oregon. ▪ Recommended further mapping and assessment based on classifications. ▪ Developed a geodatabase containing the classified stream segments and associated metadata. ▪ Documented methodology and results in a technical report (final report not yet published). A total of 6,913 stream miles were evaluated. 2,553 miles (37%) were classified as having high channel migration susceptibility, 1,542 miles (22%) as moderate susceptibility, and 2,818 miles (41%) as low susceptibility. Further study of the stream segments with high channel migration susceptibility is still needed.
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.	DLCD	DCBS-BCD	FEMA	2016	**Not started**.
58	Develop a database of non-state-owned critical/essential facilities and their property values.	FEMA requires the state's plan to: (a) identify critical facilities located in the identified hazard areas, and (b) estimate the potential dollar losses to those structures. Data for non-state-owned critical facilities are incomplete and lack 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.	OEM, DAS-GEO	DOGAMI	FEMA, State-OEM, DAS-GEO	2020	**Not started**. At the direction of the Legislature, OEM is focused on several other priorities and not ready to begin.
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.	OEM	DLCD	State-OEM, DLCD	2020	**Not started**.
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.	ODOT	DOGAMI	FEMA, State-ODOT	2016	**Progressing**. Budget request denied by Legislature. Continuing to work on identifying funding.
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.	Silver Jackets	OEM, DLCD	USACE, FEMA	**2020**	**Done:** Signs installed in Albany, Oregon City, and Turner. **Progressing:** USACE is working with Vernonia to install a HWM sign for the 2006 flood event.
62	Develop incentives to increase the rate of replacement of seismically deficient buildings	Develop tax incentives, permit facilitation, and other means to increase the natural rate of building turnover.	OEM		State-OEM	2017	**Not started**. State's SRGP only pays for retrofits; law should be changed to allow acquisitions in the tsunami inundation zone.

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Action Item			Implementation				
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Target Date	Status
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.	OEM	DOGAMI	NOAA, State and Local Gov'ts	2018	**Progressing** in 2015. Started in 2013. No funding in 2014 or 2015. (Finished; to be published Summer 2016).
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.	DOGAMI	DEQ, OHA	Federal, State-DEQ, OHA, and Local Gov'ts	2018	**Progressing**. Bull Run Watershed, Siuslaw, and Big Elk Creek completed. Progressing with various BLM lands in the Coast Range.
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.	ODOT		FHWA, STATE-ODOT	2020	**Progressing**. ODOT submitted to the Oregon Transportation Commission the Oregon Highways Seismic Plus report in 2015. The ODOT Bridge Section has since evaluated a variety of options for blending the seismic mitigation effort with other bridge structural needs. Retrofitting bridges in poor health does not make good sense, so ODOT has looked for opportunities where it is more cost-effective in the long term to replace aging bridges, as well as for cases where retrofits can be combined with repair projects to extend a bridge's life. This report lays out a comprehensive program that will address seismic vulnerability, as well as mitigate structural deficiencies. The Seismic Plus Program presents the most economical option for mitigating several bridge deficiencies at once, including seismic vulnerability. This program will deliver longer lasting bridges and a seismically resilient transportation network and economy for Oregon. However, there is no funding to complete this action at this time.
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.	DLCD		State-DLCD	2018	**Not started**. Cannot be started before Action Item #11 is completed.
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.	OEM	DOGAMI	State-OEM	**2020**	**Not started.**
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.	DLCD, DOGAMI		FEMA, State-DOGAMI, DLCD	2018	**Not started**.
~~**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.~~	~~DOGAMI~~	-	~~State-DOGAMI~~	~~2018~~	~~**Done**. The Board of Geologist Examiners updated the guidelines for geologic and engineering geologic reports in 2014:~~ ~~Geology report~~ ~~www.oregon.gov/osbge/pdfs/Publications/GeologicReports_5.2014.pdf~~ ~~Engineering Geology report~~ ~~www.oregon.gov/osbge/pdfs/Publications/EngineeringGeologicReports_5.2014.pdf~~
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.	DOGAMI	DLCD	NOAA through OSU	2016	**Progressing**. Working on Tillamook Bay and Coos Bay.

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Action Item			Implementation				
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Target Date	Status
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.	DOGAMI	OEM, DLCD	FEMA, USGS, USACE, NOAA, State-DOGAMI, OEM	2018	**Not started**.
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.	DOGAMI		State-DOGAMI	2018	**Not started**. Funding for this state-level needs to be obtained to be able to compare potential losses across counties. Work in progressing at the county level in 11 counties: Clatsop, Tillamook, Lincoln, Coos, Curry, Clackamas, Multnomah, Washington, Jackson, Harney, and Grant.
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.	DOGAMI		NOAA, State-DOGAMI	2020	**Progressing:** Funding in place from the FEMA Risk MAP program to perform multi-hazard risk assessments for all coastal counties. Assessments will be completed in 2016-17.
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.	DOGAMI	ODOT	State-ODOT	2018	**Progressing**: Large areas of lidar were collected in 2015 in Lane and Douglas counties. Nearly all of western Oregon now has lidar coverage. No systematic effort has been made yet to evaluate lidar collected in western Oregon for faults that might threaten highways.
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.	DOGAMI		USGS, State-DOGAMI	2020	**Not started**.
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.	DLCD	OEM	FEMA-CAP-SSSE	2020	**Not started.**
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.	OWRD, OCCRI	OEM	State-OWRD, OEM, OCCRI	2017	**Progressing**. 2015 was an unprecedented year for drought in Oregon. The Governor's Office convened a Drought Action Team in 2015 that met several times to share information about drought-related impacts. OWRD met with its regional staff on a weekly basis to track and monitor water supply conditions and areas that have experienced water supply shortages in the past. Due to a lack of programmatic funding, the state is not currently able to complete a comprehensive assessment of droughts, past or present, and its impact on Oregon communities. However, OWRD hired a graduate intern in spring 2016 to summarize the water conditions in 2015, note or highlight any impacts, and describe response strategies taken. OWRD also initiated a drought survey in June 2016 to capture how drought affected various communities, what steps were taken by various users, and to solicit ideas for how the state could better improve drought preparedness and water management across the state.
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 snowfall accumulation over the short term and long term in order to develop statistics for studying snow level trends across the state.	ODOT	OEM, NOAA-NWS	NOAA-NWS, State-OCCRI	2020	**Not started**. Funding and other resources for this work are currently unavailable in Oregon.

Appendix D: *Mitigation Action Status through 2015: ONGOING*

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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. 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.	ODFW, DSL	OEM, DLCD	USFWS, State-ODFW, DSL, OEM, DLCD, DEQ, OHA	**Ongoing**. This occurs continually as natural resource agency documents are reviewed and updated.
51	Facilitate self-sustaining outreach programs staffed by Community Emergency Response Teams (CERT) and other similar groups 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). Create measures of sustainability and success.	OEM	DOGAMI	NEHRP, NOAA	**Ongoing**.
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, OEM and ~~OSP~~OERS 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.	ODOT~~, OSP~~, OEM, OERS	~~OEM~~	NOAA, State-ODOT, OSP, Local Gov'ts	**Ongoing.**

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	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.	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** **Flood**: In 2015 new two-dimensional hydraulic modeling tools (HEC-RAS 2D) were introduced by USACE to more accurately and efficiently estimate flood inundation. These tools will be employed by federal, state, and private entities to improve flood inundation prediction. **Channel Migration**: DOGAMI employed new approaches developed by the Washington Department of Ecology to characterize channel migration susceptibility for all major rivers in Oregon. **Volcanoes**: Lidar-based geologic mapping and research started in 2014 and scheduled to be completed in 2017 is focused around and east of Mount Hood to identify and age-date young volcanic vents and their flows which may pose hazards to nearby communities. **Wildfires**: The Oregon Department of Forestry (ODF) received Western States Fire Manager's and Western Competitive Grant Funds through the USFS State and private Forestry program to develop a web-based Wildfire Risk Explorer Tool designed to provide immediate on-line access to Wildfire Risk data. ODF is uniquely positioned to align the delivery of this data with an existing statewide natural resources digital library, the Oregon Explorer (OE) housed by Oregon State University (OSU). In partnership with OSU, ODF will create a Wildfire Risk Explorer Tool to provide immediate, on-line access to Oregon-calibrated WWA data. This project will enhance the OE (www.oregonexplorer.info) to display new data about Oregon's wildfire risks, and will include new and upgraded tools for reporting and mapping wildfire risks at the regional, state, and local scale by professional users as well as the general public. These tools will enhance public awareness, build local capacity for CWPP efforts, & inform fuels treatment priorities.
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.	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** **Earthquake, Flood**: DOGAMI has developed new tools based FEMA's Hazus methodology to perform building-specific loss estimation and population displacement. **Volcanoes**: No new information this period. **Wildfires**: The Wildfire Risk Explorer Tool (see Action Item #79) will enable the user to access multiple natural resources, natural hazards and demographic data layers to more effectively assess risk and vulnerability to wildfire hazards across Oregon. **Transportation Vulnerability**: In 2015 ODOT evaluated and submitted a report regarding risk assessment of bridges in the state and provided a proposal for prioritizing the retrofit and replacement of bridges to make them more resilient. ODOT presented a comprehensive transportation package to the Legislature in 2015 which did not make it through during this session. The package will probably be considered for resubmission for the next full legislative session.

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	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** **Coastal Erosion, Earthquake, Flood, Landslide, Tsunami**: DOGAMI has been funded through FEMA's Risk MAP program to develop building-specific risk assessments for all coastal counties. The results will provide a quantitative basis for prioritizing communities at greatest risk. **Volcanoes**: No new information this period. **Wildfires**: Through the development of the Wildfire Risk Explorer Tool (see Action Item #79), a new data layer for Oregon's Communities at Risk to Wildfire will be developed. This data layer will be used for prioritizing funding and resource allocations to the highest priority areas. The West Wide Risk Assessment data, which will be showcased on the Oregon Explorer is a robust dataset, but it is static in nature. Wildfires are unique among other hazards because they are condition-based rather than location-based. In an effort to assess risk in a more predictive and real time manner, ODF is working with Oregon State University to utilize a Wildfire Suitability Modeling framework for predicting where the highest risk communities are on more of a daily/weekly basis. *The Large Wildfire Probability Modeling and Mapping Project (Davis, et al. 2011, Yang et al, in revision) studied spatial patterns of fire suitability and used three statistical modeling techniques to produce predictive maps of potential future fire occurrence in the forested regions of Oregon (and Washington). A beta dynamic map viewer shows daily large wildfire suitability conditions for model results viewing and evaluation. A 2016 Joint Fire Sciences Program proposal, if funded, will extend the utility of the project and model, with an assessment of land cover change and impacts of climate on the suitability of large fires and fire severity.* *Citation:* *Davis, R.J. et al. 2011. Large wildfires within the owl's range. In 'Northwest Forest Plan-the first 15 years (1994-2008): status and trends of northern spotted owl populations and habitats,' 63-85 USDA Forest Service, Northwest USA Research Station, Gen. Tech. Rep. PNW-GTR-850 (Portland, OR).* **Transportation Vulnerability**: 08/06/15 Action plan developed and submitted by the ODOT Climate Change Working group for immediate 2015, short-term 2016, and long-term action goals 2017 and beyond.

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	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** • **Coastal Erosion, Earthquake, Flood, Landslide, Tsunami**: DOGAMI has been funded through FEMA's Risk MAP program to develop building-specific risk assessments for all coastal counties. The results will be used to identify critical/essential facilities at risk and inform the public of relative risks across communities. • **Drought**: In July 2015, the Governor directed OWRD to incorporate drought resiliency in a change climate into the state next Integrated Water Resources Strategy, due in 2017. • **Volcanoes**: The Central Cascades Volcano Coordination Plan Advisory Group discussed planning for long-term recovery at its February 2015 meeting. • **Floods**: Phase II application to HUD NDRC for Reedsport and Brookings resilient infrastructure projects. • **Wildfires:** Oregon has been chosen to implement two Cohesive Wildfire Strategy (CWS) Pilot Projects in the Blue Mountains of Northeast Oregon and in Jackson & Josephine Counties in Southwest Oregon. The intent of these federally-funded pilot projects is to demonstrate the three tenets of the CWS and provide a model for other communities nationwide. ▪ These CWS pilot projects paved the way for additional investment in landscape resiliency, with two Joint Chiefs (NRCS and USFS) designations. This designation results in at least $1 million investment in fuels treatments on federal land, and $1 million investment in fuels treatments on adjacent private land through the NRCS Environmental Quality Incentives Program (EQIP) cost share program. ▪ Oregon is also host to two Fire Adapted Communities Learning Networks in Deschutes County and Southwest Oregon. These networks provide a venue for connecting practitioners engaged in wildfire prevention, mitigation and response activities. ▪ Management of federal lands has been a significant issue in terms of wildfire occurrence and intensity. In an effort to support our federal partners, the state legislature has designated $5 million to help achieve resiliency on federal lands. Funds are distributed through a grant program led by the Oregon Watershed Enhancement Board to support collaborative groups, project planning and implementation, and innovations in streamlining more effective NEPA processes. ▪ The last three severe fire seasons have really tested ODF's complete and coordinated wildfire protection system. In an effort to apply adaptive management, ODF has launched a Fire Review and Sustainability Initiative to explore the effectiveness of all of our programs, practices and partnerships. ▪ In addition, ODF continues to promote resilience and planning activities, such as a 2015 urban forestry conference where 140 heard a talk on preparing the urban forest to withstand storms. • **Transportation Resilience**: ODOT submitted to the Oregon Transportation Commission the Oregon Highways Seismic Plus report in 2015. The ODOT Bridge Section has since evaluated a variety of options for blending the seismic mitigation eff ort with other bridge structural needs. Retrofitting bridges in poor health does not make good sense, so ODOT has looked for opportunities where it is more cost-effective in the long term to replace aging bridges, as well as for cases where retrofits can be combined with repair projects to extend a bridge's life. This report lays out a comprehensive program that will address seismic vulnerability, as well as mitigate structural deficiencies. The Seismic Plus Program presents the most economical option for mitigating several bridge deficiencies at once, including seismic vulnerability. This program will deliver longer lasting bridges and a seismically resilient transportation network and economy for Oregon.
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.	DLCD	OPDR, OEM	FEMA, State-DLCD	**ONGOING - Not started**. Cannot be started until Action Items #50 and 46 are completed.

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	DLCD	OPDR, OEM	FEMA, State-DLCD	**ONGOING- Not started.** Cannot be started until Action Items #50 and 46 are completed and #83 is 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.	OEM	DLCD, OPDR, DOGAMI	FEMA-PDM, HMGP, State-DLCD, Local Gov'ts	**ONGOING** DLCD is working with the City of Medford and Tillamook County to update their NHMPs. OPDR is working with over 20 communities to update their NHMPs. Beginning in 2016, OPDR will no longer be providing this service.
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.	OEM, DOGAMI	State IHMT Agencies	DOGAMI, NOAA, FEMA, USGS, STATE-EMPG, Local Gov'ts	**ONGOING** Held 39 public workshops in 2015 as well as COOP and safety training. Developed an online training module for hotel employees to learn how to respond when a tsunami strikes. The training is available in English and Spanish. A certificate of completion is issued. Developed a state-funded video on how to do a tsunami evacuation plan available on the web at TsunamiSafe.info.
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.	DAS-CFO	DOGAMI	State-DAS-CFO	**ONGOING** Performed rapid visual screening, benefit/cost analysis, and prioritization. Almost done with DAS-owned buildings. Beginning work on other state-owned buildings. Plan to work on university buildings after other state-owned buildings.
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.	OEM	OERS agencies	NEHRP, State-EMPG	**ONGOING** Started to develop an outreach program in 2015. 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.	DLCD, DAS-GEO	DOGAMI	FEMA-Risk MAP, State-DAS-GEO	**ONGOING** DAS-GEO has offered web-based GIS software to local governments in exchange for data sharing. DAS-GEO has also provided training and web development services. As a result of DAS GEO assistance, at least 4 counties and 2 cities have begun using GIS for several business processes.

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	DOGAMI	DAS-GEO	State-DOGAMI and Local Gov'ts	**ONGOING** Lidar collected in the Mid-Columbia Basin during 2014 is being used to support geologic mapping and identification of young volcanic vents and flows located north and east of Mount Hood. It is also being used to identify areas of volcanic landslides and structures controlling the location of young and ancient volcanic vents.
91	Continue to act upon opportunities to advance the State's lifeline mitigation investment practice.	Expand upon the State's mitigation investment practice by (a) supporting efforts by jurisdictions and transportation districts to develop mitigation policy and retrofit plans for lifeline assets and service facilities; (b) continuing to advance design and maintenance standards and requirements for bridges and unstable slopes, transit, rail, ports, and priority lifeline airfields; (c) developing a temporary bridge installation policy and standards; (d) supporting research on retrofit methods and strategies for Cascadia subduction zone earthquake loads and tsunamis.	ODOT	OEM, DOGAMI, DLCD	FHWA, FTA, STATE-ODOT, OEM, DOGAMI, DLCD	**ONGOING** Continue to seek state funding to improve the seismic resiliency of the State's transportation system.
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.	OPUC, OWRD, ODOT	Other State IHMT Agencies	FEMA, State-OWRD, State Highway Fund, Private Utility Fees, Private Property Owners	**ONGOING** ODOT: Transportation infrastructure best practices, guidelines and standards are reviewed annually and updated as needed. OWRD: In March 2015, OWRD modified and updated its Dam Safety administrative rules. The Division 20 Dam Safety rules were updated because of major changes in the understanding of Oregon's earthquake and flood risk, and also major changes in national engineering practice regarding design and monitoring of dams. These changes are intended to provide clear and specific objective-based rules for both engineers and also for dam owners in Oregon. They are also intended to clarify the process for dam breach inundation analysis; these new rules were added in 2010.
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.	DOGAMI	State IHMT Agencies	FEMA, USGS, NRCS, BLM, State-DOGAMI and Local, Gov'ts	**ONGOING** Lidar acquisition in Lane, Douglas, and Wasco counties was completed in 2015.
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. Often 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 backup for another.	OWRD		State- OWRD, Local Gov'ts	**ONGOING** OWRD did not receive any funding applications in 2015 specifically for intertie projects. However, OWRD did provide grants for feasibility studies to explore several reuse projects, where treated municipal or industrial wastewater would be delivered to agricultural lands via an irrigation district in eastern Oregon. Feasibility study funds were provided for the City of Echo and West Extension Irrigation District involving reuse water from Hermiston, Umatilla, Port of Morrow, and the Port of Umatilla.

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	Silver Jackets		NOAA-NWS, USGS	**ONGOING** Implemented in Grant County in 2015.
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.	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.	OWRD		USFWS, State-OWRD, OWEB	**ONGOING** In mid-2015, OWRD began development of a new Monitoring Strategy. The Strategy was finalized in February 2016. Through this Monitoring Strategy, the Department has developed several objectives, such as installing new sites that support climate change research, water management, water supply planning, groundwater management, instream needs, and a better understanding of extreme events, such as floods and droughts. For the 2013-15 biennium, OWRD received funding to install new stream gages and dedicated monitoring wells. To date, approximately 20 new gaging stations have been installed across the state. Our state-network provided real-time data for 83 percent of gages in operation today.
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.	ODF	ODA, DEQ, ODFW, DSL, NRCS, OWEB	ODF, NRCS	**ONGOING** Juniper encroachment is a serious wildfire hazard, and also threatens sage grouse habitat. This species was not listed as an endangered species due in large part to the great effort on behalf of state agencies and landowners (Sage Grouse Conservation Partnership) to be proactive with regard to reducing threats such as juniper to sage grouse habitat through a the Sage Grouse Management Plan. Significant investments have been made at the local, state and federal levels to accomplish the tasks associated with the Plan. This effort will assist in reducing the concentration of junipers in the larger portion of eastern Oregon. ODF also partnered with the Pacific Northwest Coordinating Group on a sage grouse habitat fire prevention campaign.
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.	ODF	PUC, OSU Ext.	ODF, OSU Ext.	**ONGOING** ODF and partners continue to promote proper tree care that includes preventing tree hazards through proper selection, planting and pruning. OSU recently completed a new e-book: *Selecting, Planting, and Caring for a New Tree.* The Oregon Department of Forestry also issued an informational bulletin: Storms and Trees in Our Cities: Planning Ahead for Winter Weather on December 14, 2015.

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Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	OEM	Governor's Office	NEHRP, State-EMPG	**ANNUALLY** Done in 2015. (Requested for 2016.)
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.	DLCD, OPRD		NOAA, State-OPRD	**ONGOING** Goal 18 inventory (see #21) still needs to be added to the State GIS database.
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	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.	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. Completed seasonal beach surveys in Rockaway Beach, Neskowin, Clatsop Plains, Columbia River south jetty, and the Elk River spit in Summer and Fall 2015.
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.	OPRD		Permit Fees	**ONGOING - Will begin after 21 (Priority) is completed.** Inventory was completed in April 2015. Data still needs to be added to the State GIS database. Maintenance has not yet begun.
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.	OWRD	OEM	State-OWRD, OEM	**ONGOING**

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Action Item			Implementation			
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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: • Increase the number of educational opportunities by working with FEMA to offer courses from the National Earthquake Technical Assistance Program. • 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.	OEM	BCD	State-EMPG, Local Gov'ts	**ONGOING** No activity in 2015. (July 2016 training in Grants Pass on non-structural seismic mitigation for homes.)
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.	OEM	OSSPAC, BCD, OSFM, ODE	NEHRP, State-SRGP	**ONGOING** No current activity.
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.	OEM	Governor's Office	NEHRP, State-EMPG	**ANNUALLY** Done in 2015. Scheduled for 10/20/16.
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.	DCBS-ID	DOGAMI, OEM	State-DCBS-ID	**ONGOING** DCBS-ID conducted trainings on risk management and earthquake insurance in Portland and Gresham. DCBS-ID has done several education spots and events where earthquake insurance was a topic of discussion. Links to two news articles: http://www.opb.org/news/article/earthquake-insurance-policy-coverage/ http://nbc16.com/news/local/do-you-need-earthquake-insurance DCBS-ID also did the following outreach activities where earthquake insurance coverage was discussed: ▪ April 23, DCBS Child to Work Day (12 people) ▪ June 2, Lions Club of Gresham (25 people) ▪ August 11. Financial Beginnings Educators Conference, Portland (6 people) ▪ November 13, Springfield Rotary (35 people) By educating Oregonians that earthquake insurance coverage is not part of regular homeowner or tenant policies, we strive to help them understand that purchasing this additional coverage is necessary to protect their property, retain their equity investment, and rebuild more quickly in the case of an earthquake event.

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Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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. 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.	BusOR-IFA	OSSPAC, DOGAMI, BCD, OSFM (SB 3). OEM, OHD	State-BusOR-IFA	**ONGOING** The 2015-2017 state budget includes $205 million in voter-approved bonds that will fund the Seismic Rehabilitation Grant Program. A bond sale is scheduled for spring 2017 for $155 million which includes $30 million for emergency services projects and $125 million for school projects. The application deadline for these funds is anticipated to be September 30, 2016.
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. 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.	BusOR-IFA	OSSPAC, DOGAMI, BCD, ODE	State-BusOR-IFA	**ONGOING** The 2015-2017 state budget includes $205 million in voter-approved bonds that will fund the Seismic Rehabilitation Grant Program. The first bond sale will be in spring 2016 for $50 million for school projects only. The application period for these funds closed December 31, 2015. The Oregon Business Development Department received 107 applications requesting $123.3 million in funding. Another bond sale is scheduled for spring 2017 for $155 million which includes an additional $125 million for school projects and $30 million for emergency services projects. The application deadline for these funds is anticipated to be September 30, 2016.
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.	DLCD	FEMA, Local Gov'ts	FEMA, CAP-SSSE	**ONGOING** No activity between June and December 2015.

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Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	DLCD	DCBS-ID	FEMA	**ONGOING - Start Date 2015** **Not started**. This is to monitor the effectiveness of Action Item #27 which has not started.
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.	DLCD	BCD	FEMA—CAP-SSSE, State DLCD, BCD	**ONGOING** No activity between June and December 2015.
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.	ODFW	ODR	State-ODFW	**ONGOING** There is continuing landowner interest in this program, most recently on the coast and in Clackamas County.
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.	OEM	ODOT	USACE, State-EMPG	**ONGOING** OEM endeavors to hold an annual pre-winter flood meeting with state agencies and local emergency managers every fall. OEM is working with the US Army Corps of Engineers on providing technical and potentially direct assistance with prospective flood measures in Grant County pursuant to the 2015 Canyon Creek Complex Wildfire.

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#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	DLCD		FEMA	**ONGOING** Used two listservs to notify floodplain managers and Natural Hazards News subscribers of program changes.
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.	DLCD		FEMA	**ONGOING** Provided NFIP training to city and county planners in Medford and Fairview and the Association of Oregon Counties. Provided NFIP training to the Professional Land Surveyors of Oregon, Pioneer Chapter. Provided NFIP training to real estate agents in Salem, Tigard, Portland, Newberg, and McMinnville.
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.	DLCD		FEMA	**ANNUALLY** State NFIP Coordinator worked with OEM's Public Information Officer to prepare PSAs during the December 2015 winter storm event.
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.	OEM, DLCD	State IHMT Agencies	FEMA—CAP-SSSE, Local Gov'ts	**ONGOING** SHMO and State NFIP Coordinator reached out to communities with RL and SRL properties for FMA15. None chose to participate. Following the December 2015 disaster event, OEM began assessing flood damage to homes in preparation for developing the Preliminary Damage Assessment with FEMA in January 2016.
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.	DLCD	DOGAMI, OPDR, SILVER JACKETS	FEMA-Risk MAP	**ONGOING** In 2015 developed a Business Plan to coordinate all CTP activities in Oregon. State Risk MAP Coordinator works with OPDR, DLCD, and DOGAMI on coordinating and integrating Risk MAP activities with NHMP and Goal 7 work. Coordinates with the Silver Jackets on flood-related projects and programs. Currently engaged in flood mapping projects in more than 60 communities statewide. Each project is in a different stage of the process.

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Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	OWRD	Silver Jackets	FEMA, State-OWRD	**ONGOING** Seven Emergency Action Plans were completed in 2015.
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.	DAS-EAM	DLCD	State-DAS-EAM	**2020** **Progressing**. Began Implementing on a case-by-case basis. Implementation will be ongoing. (Move to Ongoing table.)
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.	OEM	DOGAMI, ODF, DLCD	FEMA-HMGP, Local Resources	**ONGOING - and as opportunities (funding and project needs) arise** There were more than 50 landslides in the winter storm disaster of November and December 2015. Ten homes were significantly damaged and one life was lost. Most other damage was to roads and infrastructure. Several of the ten significantly damaged homes are expected to be bought out using HMGP funds. Following the December 2015 disaster event, OEM began assessing landslide damage to homes in preparation for developing the Preliminary Damage Assessment with FEMA in January 2016.
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.	DLCD		NOAA, State-DLCD	**ONGOING** The OCMP staff has been working with a number of coastal communities to provide education and outreach regarding the DLCD tsunami land use guidance. In addition, OCMP staff have worked with Clatsop and Coos Counties in more formal processes which we anticipate will lead to adoption of land use plan text, policy and map amendments as well as development code implementation language. Coos County has adopted a first phase of this work which includes adoption of tsunami land use policies and tsunami inundation maps.
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.	DLCD		NOAA, State-DLCD	**ONGOING—Start Date 2015** OCMP staff have worked with Clatsop and Coos Counties in more formal processes which we anticipate will lead to adoption of land use plan text, policy and map amendments as well as development code implementation language. Coos County has adopted a first phase of this work which includes adoption of tsunami land use policies and tsunami inundation maps. In addition, we are monitoring successes and alternative approaches and options.
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.	OEM	DLCD, DOGAMI	NOAA, State-EMPG	**ONGOING** Because Tsunami-Ready guidelines were being revised, there was no activity in 2015. (The guidelines are being finalized in 2016, and the Tsunami-Ready Program will pick up again in 2017.)
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.	OEM, DOGAMI	DLCD, ODOT	NOAA, State-EMPG, DOGAMI	**ONGOING** Continued this outreach in 2015. (Will continue in 2016.)

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Action Item			Implementation			
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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.	OEM, DOGAMI	DLCD, ODOT	NOAA, State-EMPG, DOGAMI	**ONGOING** Done in 2015. (Ongoing in 2016.)
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.	OEM, DOGAMI	DLCD, ODOT	FEMA, NOAA, State-EMPG, DOGAMI	**ONGOING** Successful "Race the Wave" in Cannon Beach in 2015. (Successful "Walkout" in March 2016.)
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.	BCD, DLCD	DOGAMI, OEM	State-BCD, DLCD	**ONGOING** No activity 2015.
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 US-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.	OEM	ODOT	NOAA, Local Gov'ts	**ONGOING** Working with ODOT to establish new Entering and Leaving tsunami hazard signs along Highway 101. These signs will help to increase awareness of the tsunami hazard. Initial focus is on the northern Oregon coast (District 1).
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 US-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.	OEM	ODOT	NOAA, Local Gov'ts	**ONGOING** No activity in 2015.
134	Work with Oregon Parks & Recreation Department and Oregon Travel Experience to increase the number of interpretive educational installations along US-101.	Existing tsunami hazard zones signs are considered inadequate for placement along stretches of US-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.	OEM	OPRD, DOGAMI	NOAA, State–DOGAMI, Local Gov'ts	**ONGOING** No activity in 2015.

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Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	DOGAMI	ODOT, OEM	DOGAMI, USGS	**ONGOING** **Not started**. No new information this report period.
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.	OEM	Governor's Office	NEHRP, State-EMPG	**ANNUALLY** No activity in 2015. (In planning stage for 2016.)

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Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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: (a) collaborate with agencies and organizations to promote consistency in the development and application of fire prevention standards,(b) work to make individuals aware of their personal accountability and responsibility for wildfire safety, (c) determine local resources and capacity, and (d) define needs and solutions required to increase capacity.	ODF	OSFM, BCD, DCBS-ID, DLCD, KOG, OSU Ext.	BLM-Title III, ODF, OSFM	**ANNUALLY** **Firewise** Oregon has a robust Firewise Program that continues to grow. In 2015, Oregon added about 20 new communities to the Firewise Roster, for a total of 93 nationally recognized Firewise Communities. In addition, the USAA insurance company is piloting a new insurance premium discount program in Oregon. In order to support this, ODF worked with the NFPA to map all of our Firewise Community boundaries. It is anticipated that homeowners using USAA services will see a reduction of their premiums in 2016. **Wildfire Awareness Month Proclamation** Wildfire Awareness Week/Month occurs in May to raise awareness of the upcoming fire season and encourages the public to focus on wildfire safety around the home and while visiting/recreating on public land. Some western states have elevated this to the highest level, issuing a proclamation from the Governors. Since states aren't able to rally around the same topic or conduct the observance at the same time (some states still have snow on the ground in May), they choose their own time period for a wildfire awareness campaign. The proclamation sends a loftier, more general message of prevention while allowing the individual states to raise awareness of their own unique wildfire issues, and do it within a timeframe of their choice. **For the region:** ▪ Started in 2009, repeated again in 2010 with three states and week-long observance (**OR, NV** and **CA**) ▪ In 2011 and 2012, **ID** joined and it became a month-long observance. ▪ In 2013, **WA** joined ▪ In 2014, **UT** joined ▪ In 2015, **MT** joined and **SD** joined, WA was out (Oso landslide) ▪ In 2016 we will have everyone from 2015 plus **WA** for a new total of 8, another milestone! **Benefits:** ▪ Opportunity to show unity and coordination. Sends a message that the western states are working together to address wildfire issues. ▪ Good media/publicity opportunity. FEMA and NFPA highlighted our efforts in their newsletters/blogs in 2014. ▪ Educational/awareness campaign with events and involvement statewide. The Proclamation says "Wildfire Awareness Month," but states and local jurisdictions can opt for any campaign timeframe they choose. **Other prevention activities in which ODF has been engaged:** ▪ Partnered with Keep Oregon Green (KOG) on updating the television/internet prevention messages from the University of Oregon and Oregon State University football coaches. Three video PSA's were developed focusing on defensible space, debris burning and campfires. ▪ Partnered with the Pacific Northwest Wildfire Coordinating Group (PNWCG) in developing timely prevention messages throughout fire season. ▪ We supported and provided fire prevention messages for national fire prevention teams that were sponsored by our federal partners over the course of fire season. ▪ Developed television PSA's for the "Ready Set Go" program for southern Oregon emergency management organizations. ▪ Partnered with ODOT to display prevention messages on Oregon's major freeways and highways during extreme fire danger. The signs read, "EXTREME FIRE DANGER, USE CAUTION". ▪ Developed an interactive map for the internet that informed the public of fire restrictions and area closures due to fire danger.

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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 used 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.	ODF, BCD	OSFM	BLM-Title III, State-ODF	**ONGOING** Wallowa County is working with DLCD and local CWPP planning partners to utilize the Wildfire Hazard Zone process to strengthen fire siting construction standards in the WUI across the entire County.
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. Because 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.	ODF	OSFM	BLM-Title III, USDA-USFS & USDOI-National Fire Plan, FEMA-PDM	**ONGOING** CWPP updates are occurring throughout the State as funding is available. ODF and DLCD have been working together to develop CWPP/NHMP integration tools to assist local jurisdictions with combining these processes. The Oregon Wildfire Risk Explorer will include tools to assist local jurisdictions in developing the risk assessment as well as other components of CWPP's, and also includes funding to assist three pilot CWPP updates using the Wildfire Risk Explorer tools.
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.	ODF	OSFM	National Fire Plan, State-ODF	**ONGOING** In 2015, ODF successfully competed for about $2 million in federal grants (Western States Fire Managers and Community Assistance). This is typically the amount ODF is able to secure to assist private landowners. ODF also partners with the Natural Resource Conservation Service (NRCS) to provide technical assistance in administering the forestry component of their Environmental Quality Incentives Program (EQIP) program.
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.	ODF	OSFM	State-ODF	**ONGOING** ODF has implemented SB 360 in 17 counties.

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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. 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.	ODF	OSFM, KOG	State-ODF, OSFM	**ONGOING** ODF currently analyzes internally collected data to target prevention efforts. For example, in response to an increase in target shooting fire ignitions, ODF developed a target shooting fire prevention campaign in the northwest Oregon area. ODF, USFS, BLM, and the State Fire Marshal's Office are working to agree on a common reporting system. Integrated Reporting of Wildfire Information (IRWIN) is a potential vehicle. It is activated but is in a demonstration mode and is designed to aggregate and de-conflict fire ignition data (ODF is hoping to participate.)
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.	ODF	PNWCG	State-ODF	**ONGOING** ODF is still working with agencies to improve this. ODF internally has reliable reporting.
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.	ODF	OSFM	USFS	**ONGOING** No progress this reporting period.

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	Lead	Support	Current or Potential Funding Source(s)	Progress & Comments
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.	OSFM, ODF		State-OSFM, ODF	**ONGOING** ODF is still working with agencies to improve this. ODF internally has reliable reporting.
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. 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. OSHA requires utilities to: • Provide training to crews working on power lines in worker safety and the identification of trees to prune or remove; and • Review regulations and standards for easement and right of way maintenance, and provide training to foresters and logging crews. 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.	ODF	PUC, OEM, OSU Ext.	ODF, OSU Ext.	**ONGOING** ODF and OSU have partnered on educational courses and that address these issues.
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.	PUC	ODF, ODOT, OR-OSHA	State-OPUC, Public and Private Utilities	**ONGOING**

MITIGATION ACTION STATUS THROUGH 2015
ONGOING

Action Item			Implementation			
#	Statement	Description	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.	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.	ODOT	OSP	State-ODOT	**ONGOING** These efforts include a variety of programs throughout ODOT. The Public Information Officers in each region assist the media with providing timely and accurate information to the public regarding impacts to the transportation system including news releases, announcements of projects and closures, hazards conditions such as snow and flooding conditions on the highways. Advisories for requirements for the use of chains or traction tires during severe weather conditions in the winter season. Driver safety publications and brochures are distributed through the DMV and available at Highway Rest areas. ODOT has permanent and moveable variable message signs that are utilized for emergency messaging for the traveling public during any type of hazardous conditions such as Dust, Fog, Smoke, Snow, Ice and Fire. ODOT also utilizes social media for sharing information with the public including Facebook, Twitter and YouTube.

Appendix E: *Mitigation Action Status through 2015: REMOVED*

MITIGATION ACTION STATUS THROUGH 2015
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
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.																									State-OEM, DLCD	**Done**. Not approved by the legislature in 2015.
8	Create a new ~~lidar-based~~ statewide landslide susceptibility <u>overview</u> 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.																									DAS-GEO	**Done.**
10	Implement the Rapid Assessment of Flooding Tool (RAFT)	The RAFT has been funded and developed by the U.S. 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.																									FEMA, USACE	**Done.**
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.																									State-DOGAMI	**Done.**
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.																									State-DLCD	**Done**. LCDC included as Priority #3 out of 5 for state-funded Technical Assistance Grants, intended to assist with creating local natural hazard mitigation plans or incorporating new hazards data, and the response to the data, into comprehensive plans and zoning regulations.

MITIGATION ACTION STATUS THROUGH 2015
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
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.																									State-DAS-CFO	**Done**. Facility Planning Guidelines for Development with Natural Hazards issued 6/15/15. Discussed with the Interagency Hazard Mitigation Team, Governor's Policy Directors, Agency Facility Directors, and DAS Risk Management.
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.																									State-EMPG	**Done**. In 2015 the Oregon Disaster Assistance Loan and Grant account was activated twice: (1) to fund the state's contribution to the demolition costs for the Vernonia Schools project; and (2) to assist the City of Westfir in relocating its water intake (OEM in partnership w/BusOR-IFA).
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.																									State-DOGAMI	**Done**. The Board of Geologist Examiners updated the guidelines for geologic and engineering geologic reports in 2014: Geology report www.oregon.gov/osbge/pdfs/Publications/GeologicReports_5.2014.pdf Engineering Geology report www.oregon.gov/osbge/pdfs/Publications/EngineeringGeologicReports_5.2014.pdf

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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. 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. 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).

MITIGATION ACTION STATUS THROUGH 2015
REMOVED

Action Item			Goal												Hazard												Implementation	
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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.**

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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.**

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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.

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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. 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. 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. 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. 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		X		X		X					3	X	X	X	X	X	X	X	X	X	X	11	N/A	**REPLACED** by #46 and 50 (Priority), 83, 84, and 85 (Ongoing).

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		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. 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: ▪ 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. ▪ 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? ▪ Technology — Is new technology needed to accomplish the task contemplated? 4 Liability — Would adding such protocols unnecessarily contribute to potential liability for PSAPs? 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.

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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: (a) Provide dust storm driving information in safety rest area kiosks. (b) 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. (c) 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 (a) residue management, including no-till or direct seed farming; (b) cover crops and other BMPs (see below); (c) field strip cropping systems; and (d) 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, because the trees/scrubs would likely need irrigation, 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.**

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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.**

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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 reduce that risk.	X	X	X	X			X					5									X			1	N/A	**COVERED** by #137 (Ongoing).

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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.**

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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. 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. 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.**
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.**

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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.
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.

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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 I-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).
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. 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: • 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. • Establish criteria and standards for collecting, reporting, and mapping information about chronic and catastrophic coastal natural hazards. • 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.**

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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.**
EO-62	Install new Entering and Leaving Tsunami Hazard Zone signs in selected areas in the inundation zone along US-101.	Existing tsunami hazard zones signs are considered inadequate for placement along stretches of US-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. US-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 use a fully probabilistic approach.	Revise coastal erosion risk mapping and analysis for Tillamook County, and cities within the County, to use 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.**

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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. 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. 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. 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.**

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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: (a) describe the types of state-owned or -operated critical facilities located in the identified hazard areas, and (b) 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 (a) which facilities would be necessary for response and recovery efforts and (b) 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	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	11	N/A	**COVERED** by #34 and 74 (**Priority**), and 92 (**Ongoing**).

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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-used 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 often 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.
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.**

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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. 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. 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).
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. For more information, see: http://www.ansi.org/news_publications/media_tips/tree_care.aspx?menuid=7 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.**

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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.
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.**

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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.
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 fourfold. It prioritizes projects that (a) are geographically balanced, (b) are in communities with a FEMA-approved local hazard mitigation plan, (c) address properties with sustained substantial damages or repetitive losses, and (d) provide communities with information and/or tools to evaluate properties suitable for mitigation, then to develop mitigation projects. Repetitive flood loss properties (those which have experienced multiple flood insurance claims) have been identified as high priority hazard mitigation projects by the NFIP. 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	X	X			X					X		4					X							1	FEMA- CAP-SSSE, State-DLCD, OEM	**DONE.**

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		Hazard Mitigation Grant Program that can often be expedited. Once the repetitive loss list is verified, DLCD and OEM will analyze and summarize the information in a geographic 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. 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.																											
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.

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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: • Legislative/Policy • Education/Outreach and • 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.**
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 3 years. Although not a federal requirement, monitoring of floodplain property elevations will ensure compliance with meeting NFIP flood insurance requirements. 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.**

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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. 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.**
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 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. Objectives of this subcommittee might include: • Facilitate strategic life-cycle flood risk reduction, • Create or supplement a continuous mechanism to collaboratively solve state-prioritized issues and implement or recommend those solutions, • Improve processes, identifying and resolving gaps and counteractive programs, • Leverage and optimize resources, • Improve and increase flood risk communication and present a unified interagency message, and • Establish close relationships to facilitate integrated post-disaster recovery solutions. 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, State-OEM, DLCD	**DONE.**

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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.**

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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.**

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		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: 1. Establishing and maintaining a premier data collection and delivery system, 2. Achieving effective long-term management of flood hazard maps, 3. Building and maintaining mutually beneficial partnerships to accomplish mapping work, and 4. Expanding and better informing the flood map user community. 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: 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); 2. Acquire new lidar topographic data for precise flood hazard mapping; 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; 6. Lead effective engagement in flood mitigation planning through partnerships and shared datasets; 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; 8. Coordinate events, project status, and actions; and 9. Align risk analysis programs and develop synergies.																											
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.		X	X	X		X							4				X							1	N/A	**COVERED** by #121 (Ongoing)**.**

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MP-19	New maps of precipitation intensity	A basic study of precipitation intensity will be done, including 24-hour isopluvials (2-, 5-, 10-, 50-, 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.**
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).