

Chapter 5 Mitigation Strategy

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5.1 Introduction

This chapter contains Oregon’s goals for mitigating natural hazards, a prioritized list of mitigation actions supporting those goals, and the status of progress on mitigation actions in the 2020 Oregon NHMP.

The goals are purposefully aspirational, providing the foundation for Oregon’s overall mitigation strategy. Oregon has often led in developing innovative and progressive strategies to address issues that impact our residents, economy, natural environment, and built environment. The Oregon Beach Bill (1967), the Oregon Bottle Bill (1971) and the Oregon Land Use Program (1973) are but three historical examples of Oregon’s visionary spirit.

Oregon is no less visionary in natural hazard mitigation. The state adopted its first natural hazards mitigation plan in 1992, then updated the plan in 2000, 2004, 2006, 2009, 2012, 2015, 2020, and now 2025. Hazard mitigation planning is a foundation for risk reduction projects and is a high priority for Oregon for state funding, post-disaster FEMA mitigation grants, and non-disaster FEMA grants. Oregon will continue planning for mitigation and implementing mitigation projects to reduce losses from natural disasters.

5.2 Mitigation Goals

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

1. Develop and implement a comprehensive, statewide natural hazards mitigation program and strategy.
2. Prioritize and direct state mitigation resources and investments to build resilience in the populations and communities indicated by the risk assessment to be the most vulnerable.
3. Align natural hazards mitigation and climate adaptation efforts based on the evolving understanding of the relationships between climate change and climate-related natural hazard events.
4. Minimize loss of life and reduce injuries resulting from natural hazards or high hazard potential dams.¹
5. Minimize property damage from natural hazards and significant or high hazard potential dams.
6. Minimize damage to historic and cultural resources from natural hazards.
7. Reduce “repetitive” and “severe repetitive” flood losses as defined by the National Flood Insurance Program (NFIP).^{2,3}
8. Eliminate development within mapped hazardous areas where the risks to people and property cannot be practicably mitigated.
9. Minimize mitigation project impacts to the environment.
10. Facilitate adoption of the most informative, reliable natural hazards mapping and other information available into local and tribal government planning policy.
11. Increase the resilience of critical or essential conventional (gray) and green infrastructure and services, whether publicly, privately, or investor-owned or non-profit, from natural hazards.
12. Integrate natural features and processes into natural hazard risk reduction actions where possible and practicable to protect people, property, and the environment from natural hazards.
13. Assist local and tribal governments to diversify and strengthen their economies in ways that will make their communities more resilient to natural hazards.
14. Develop and strengthen relationships among governments, community-based organizations, businesses, and others to ensure that people, especially those most vulnerable, can access goods and services during and after natural hazard events.
15. Motivate the whole community⁴ to build resilience and mitigate against the effects of natural hazards through engagement, listening, learning, information-sharing, and funding opportunities. Use engagement tools and best practices to reach the people and communities indicated by the risk assessment to be the most vulnerable.
16. Enhance communication, collaboration, and coordination among agencies at all levels of government, sovereign tribal nations, the private sector, community-based organizations, and non-

profits to mitigate natural hazards in the communities indicated by the risk assessment to be the most vulnerable.

¹“Dams assigned the **high hazard potential classification** are those where failure or mis-operation will probably cause loss of human life.” ([Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams, FEMA and Interagency Committee on Dam Safety, 2024](#))

²“**Repetitive loss structure** means a structure covered under an NFIP flood insurance policy that (1) has incurred flood-related damage on two occasions, in which the cost of repair, on average, equaled or exceeded 25% of the value of the structure at the time of each such flood event; and (2) at the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage. ([44 CFR 77.2, Definitions](#)).” ([State Mitigation Planning Policy Guide, FEMA. \(2022, eff. 04/19/2023\)](#))

³“**Severe repetitive loss structure** means a structure covered under an NFIP flood insurance policy and has incurred flood-related damage (1) for which four or more separate claims have been made under flood insurance coverage, with the amount of each claim (including building and contents payments) exceeding \$5,000 and with the cumulative amount of such claims payments exceeding \$20,000; or (2) for which at least two separate flood insurance claims payments (building payments only) have been made, with the cumulative amount of such claims exceeding the value of the insured structure ([44 CFR 77.2, Definitions](#)).” ([State Mitigation Planning Policy Guide, FEMA. \(2022, eff. 04/19/2023\)](#)).

⁴FEMA defines “**whole community**” as: “[A] focus on enabling the participation in national preparedness activities of a wider range of players from the private and nonprofit sectors, including nongovernmental organizations and the general public, in conjunction with the participation of all levels of government in order to foster better coordination and working relationships.” ([State Mitigation Planning Policy Guide, FEMA. \(2022, eff. 04/19/2023\)](#)).

5.3 Prioritized Five-Year Mitigation Actions

The State Interagency Hazard Mitigation Team (IHMT) updated the status of the mitigation actions in the 2020 Oregon NHMP, retaining actions that are in progress or intended for completion. This constituted the initial list of mitigation actions for the 2025 Oregon NHMP. DLCD invited a large group of people – those who indicated interest or participated in the Risk Assessment Upgrade project, IHMT members, tribal representatives, and others – to participate in meetings to review and revise the initial list. The group subjected the list to a number of criteria to yield a final list that meets FEMA requirements and could potentially be accomplished within the five-year life of the Plan. DLCD invited the same large group to prioritize the final list of actions. The result is the following table of prioritized mitigation actions and the hazards they address.

These actions would help mitigate the statewide risk from natural hazards. They focus on actions that would benefit the entire state, a large region, or areas throughout the state. They do not include specific local actions listed in natural hazard mitigation plans adopted by tribes, counties, cities, and special districts. The priority ranking in this list does not preclude an agency from implementing a lower ranked project based on available funding, agency mission, or updated information.

See Chapter 7, Planning Process for further detail about the process of developing the following mitigation action table. See Chapter 3, Risk Assessment for descriptions of each hazard.

Table 5.3.1 Oregon NHMP Five-Year Mitigation Actions

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS					
Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
1	Conduct an earthquake risk analysis that focuses on natural hazards' impacts on sites containing hazardous materials. The state does not understand the risks that earthquakes, whether originating inside or outside of Oregon's boundaries, pose to sites with hazardous materials, and the state does not have location specific awareness or emergency plans. The State Mitigation Planning Policy Guide, effective 4/19/23, indicates that the NHMP must address hazardous materials (one of the Federal Emergency Management Agency (FEMA) Lifelines). Integration through Oregon Resilience Plan (ORP).	Determining potential impacts and risk of earthquakes destabilizing hazardous materials would advance Goals 4 and 5 by providing the information necessary to determine appropriate mitigation actions to minimize loss of life, injuries, and property damage. This action would advance Goal 11 by providing the information necessary to increase the resilience of critical or essential infrastructure such as tank farms, warehouses, ports and railyards. Further it would advance Goal 16 because mitigation of the risk(s) identified would require communication, collaboration, and coordination among, at minimum, agencies at all levels of government, sovereign tribal nations, and the private sector.	DOGAMI/ DEQ, ODOT, DSL	HMGP, BRIC, NEHRP, US EPA Pollution Prevention Grants, US DOT Pipeline and Hazardous Materials Safety Administra- tion Grants	2030
2	Prioritize mitigation and retrofit projects on seismic lifelines. Oregon Department of Transportation (ODOT) Seismic Lifelines Evaluation, Vulnerability Synthesis and Identification Report provides recommended priority corridors but does not provide sufficient detail to prioritize retrofit investment packages. Engineering evaluations and cost estimation are ongoing on a funding-available basis and will inform that prioritization process. Initiatives for integration include the Oregon Highway Plan (OHP) and the Oregon Resilience Plan (ORP).	Goals 4 & 5 would be met by minimizing loss of life and property damage in seismic lifeline corridors. Prioritizing mitigation and retrofit projects on seismic lifelines advance Goal 6 by reducing the extent of damage to our infrastructure by a high magnitude earthquake, especially historic structures. Goal 11 is advanced by increasing the resiliency of essential infrastructure. Goal 16 is met by integrating multiple plans in coordination of this mitigation action with the potential to bring in local stakeholders in the priority corridor.	ODOT/ OEM, OSSPAC	BRIC, HMGP, PDM, NEHRP, ISEA	2030
3	Update the Statewide Hazards-United States (HazUS or HAZUS) analyses for earthquakes. The state needs an updated analysis to understand and improve its resilience. The state conducted the last analysis in 2013 for the Oregon Resilience Plan. Conduct a probabilistic analysis and a magnitude 9 Cascadia Subduction Zone (CSZ) earthquake and tsunami analysis that includes soil types, co-seismic landslides, and liquefaction.	Updating HazUS analysis for earthquakes could meet Goal 8 with work towards eliminating development within a hazardous area when considering tsunamis, landslides, and liquefaction. Goal 10 can be achieved by the development of updated mapping of earthquake hazards.	DOGAMI/ DLCD	ISEA, NEHRP	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
4	Identify funding to support public transportation providers, counties, cities, special districts, and Tribes in conducting comprehensive vulnerability assessments of their transportation facilities and services. In the 2013 Oregon Resilience Plan, the Oregon Seismic Safety Policy Advisory Council (OSSPAC) identified a 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 reduce vulnerability to a CSZ event. Integration through the Oregon Highway Plan (OHP) and Oregon Resilience Plan. DLCD's Wildfire Adapted Communities Recommendations Report to the legislature (SB 762, 2021) includes an action related to inventory of transportation infrastructure for safe and efficient evacuation and response.	Conducting a comprehensive vulnerability assessment of transportation facilities would be a strong leg in developing a statewide natural hazard mitigation program, Goal 1 . Goals 4 & 5 would be addressed by reducing vulnerability, and thus loss of life and property, by reducing transportation and access vulnerability in a CSZ event. Goal 13 is met through strengthening economies during natural hazard. Goal 14 & 16 can be advanced through strong collaboration amongst stakeholders and governments.	OEM/ ODOT	ISEA, PDM, BRIC, FTA Emergency Relief Program	2030
5	Create lidar-based channelized debris flow hazard maps in five communities and assist those communities with post-fire landslide risk reduction. After a wildfire there is an increased potential for landslides, especially life-threatening debris flows. The Oregon Department of Geology and Mineral Industries (DOGAMI) is modeling areas of potential channelized debris flow hazards. The Oregon Department of Land Conservation and Development (DLCD) is assisting the communities with using the mapping to determine mitigation actions they can take to reduce risk.	Goal 2 is met by this action through investing resources into communities that have already been affected by wildfire with the opportunity of resilience investments based off the mapping. Goal 3 is met by advancing adaptation actions with the understanding that wildfire, and post-wildfire debris flow and landslide can build resilience based on the evolving understanding from the lidar mapping. Goal 8 can be advanced by reducing redevelopment in areas that show to be high-hazard debris flow. Debris flow hazard maps in wildfire affected communities can achieve Goal 9 by reducing redevelopment in areas prone to landslides, thereby reducing debris flow impacts to the environment. Goal 10 will be aided by the development of flow hazard mapping.	DOGAMI/ DLCD, ODF	PDM, BRIC	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
6	Provide technical assistance to tribes, counties and cities to integrate hazard mitigation plans with comprehensive plans. Counties and cities often adopt NHMPs separately or as an appendix to the comprehensive plan and therefore in practice do not use the NHMPs to their full potential. By integrating the two plans, hazard mitigation will be more easily and meaningfully implemented in local land use planning under Statewide Planning Goal 7.	Providing technical assistance, such as directing state resources and staff capacity to local jurisdictions to integrate Natural Hazards Mitigation Plans (NHMPs) with comprehensive plans would build community resilience by advancing Goal 2 . As NHMPs include the most informative and reliable data and mapping this action will also advance Goal 10 . By enhancing collaboration and coordination at all levels of government, especially through technical assistance relationships between state government and city, county, special district, and tribal governments, this action supports Goal 16 .	DLCD/ OEM	DLCD Technical Assistance Grants, DLCD Voluntary Periodic Review Grants, DLCD Coastal Grants, Oregon Metro, League of Oregon Cities	2030
7	Evaluate the impact of climate change on landslides. Climate change may have multiple effects on landslides in Oregon including increased probability after wildfire and increased intensity and duration of rainfall. Understanding these factors better will help us understand the change to the landslide hazard and how to mitigate. Precipitation-triggered landslides will increase or decrease with changes in climate. Evaluation of this change will be important for the future of Oregon. Integration may be through the Climate Change Adaptation Framework and the Oregon Climate Change Research Institute.	Goal 3 is directly related to how climate change impacts landslides. Goal 4 & 5 can be addressed with greater landslide awareness, understanding, and action. Goal 9 could be addressed regarding how landslides affect the natural environment, particularly green infrastructure, along with water and wastewater facilities (Goal 11).	DOGAMI/ OCCRI, DLCD	USGS- CLHMAP, HMA	2030
8	Update DOGAMI's Rapid Visual Survey database on emergency service buildings. Update the Rapid Visual Survey data for the emergency service buildings in DOGAMI 2007 statewide seismic needs assessment. Include data to assist with conducting benefit cost analyses and for prioritization of mitigation. Integration through Oregon Resilience Plan.	Updating DOGAMI's Rapid Visual Survey database on emergency service buildings will support Goal 4 and 5 as it identifies where potential risk of injury/death and damage exist, so mitigation action can be taken. It will also advance Goal 10 by producing more informative, reliable, and comprehensive earthquake risk information which can provide support when applying for mitigation funds and projects, and can be incorporated into local planning policies and guidance. By updating the database on emergency service buildings, it will support Goal 11 by identifying the buildings that need enhanced resilience.	DOGAMI	CTP, NEHRP	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
9	Assess hazards associated with active crustal faults newly discovered by the 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; the state should systematically evaluate them using trenching, geophysical and field studies for their potential to generate damaging earthquakes. This action would help communities prepare and mitigate for newly defined hazard areas in central and eastern Oregon. Integration through Oregon Resilience Plan.	Assessing hazards associated with identified active crustal faults can help meet Goal 4, 5, and 8 as it identifies where risk exists, which can show hazardous area where development can be minimized or eliminated, which can also minimize risk of injury/death and property damage. Goal 10 can be advanced as this new mapping and information can be integrated/adopted into local and tribal government planning policies.	DOGAMI	CTP, NEHRP	2030
10	Provide technical assistance, funding, and alternative pathways and mechanisms to facilitate county, city, special district, and tribal adoption of new hazards mapping and other products and information into their planning policies.	Directing state resources, investments, and state staff efforts toward directly helping local and tribal governments integrate/adopt new hazard mapping and information into planning policies would advance Goals 2 and 10 , and contribute to more resilient and informed communities.	DLCD/ OEM	DLCD Technical Assistance Grants, DLCD Voluntary Periodic Review Grants, DLCD Coastal Grants, Oregon Metro, League of Oregon Cities	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
11	<p>Create a clearinghouse for storing and sharing perishable data collected during natural hazard events according to the state's Perishable Data Plan(s). Emergency responders and community planners alike need access to the best and most current natural hazards data. This project would be a cooperative effort between authoritative data collection and analysis agencies — DLCD, DOGAMI, Oregon Department of Emergency Management (OEM), Oregon Department of Water Resources (OWRD), and federal partners (FEMA, US Army Corps of Engineers, National Weather Service, US Geological Survey) — and would include:</p> <ul style="list-style-type: none"> Establishing a single point of online access to reliable data, maps, and information about natural hazards (internal). Developing, in conjunction with Oregon Department of Administrative Services-Geospatial Enterprise Office (DAS-GEO), a portal to distribute these data (external). Developing a multi-agency State of Oregon flood hazard website. <p>Integration may be through Risk Mapping, Analysis, and Planning (Risk MAP), Risk Plan, Framework Implementation Teams, OEM's Master Data Set, county city, special district, and Tribal NHMPs, Governor's interagency collaboration initiative, Goal 7 implementation, National Flood Insurance Program (NFIP), Oregon Department of Environmental Quality's (DEQ's) IRIS database, etc.</p>	<p>Goal 1 is advanced by creating and establishing a clearinghouse to store and share perishable data that aligns with and supports the statewide mitigation program and strategy. Creating a clearinghouse to store and share perishable data would support Goal 7 because storing and sharing perishable data, such as flooding, is important to understanding areas of flood risk and pose a risk for future potential repetitive and severe repetitive loss properties. A clearinghouse would support Goal 15 by providing a site and resources for information-sharing and learning. Goal 16 would also be advanced by enhancing collaboration and data sharing between government agencies and with the public.</p>	DOGAMI/ DLCD, OEM, OWRD, FEMA, USACE, NWS, USGS	HMGP, BRIC, USACE (Silver Jackets), NOAA-NWS, USGS	2030
12	<p>Evaluate earthquake hazards in Bend region and in other major population centers statewide as resources allow. Systematically map and evaluate faults in the Bend-Sisters area for evidence of recent activity to assess the earthquake hazards for Central Oregon communities. Consider the intersecting hazards associated with both earthquakes and volcanic processes when carrying out these studies. Integration through Oregon Resilience Plan.</p>	<p>Evaluating and assessing earthquakes hazards in the identified areas can help meet Goal 4, 5, and 8 as it identifies where risk exists, which can show hazardous area where development can be minimized or eliminated, which can also minimize risk of injury/death and property damage, as well as identify properties that need seismic upgrades. Goal 10 can be advanced as this new mapping and information can be integrated/adopted into local and tribal government planning policies and support future land use planning.</p>	DOGAMI	HMGP, BRIC, CTP, NEHRP, USGS, CVO	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
13	Aid and support community participation in the National Flood Insurance Program (NFIP) and encourage existing Community Rating System (CRS) communities to improve their programs, with emphasis on coastal cities and counties, during the life of each Oregon NHMP. See the CRS Information Center at: http://training.fema.gov/EMIWeb/CRS/ for more information. Each year, DLCD encourages qualified jurisdictions to participate in the CRS program or strengthen their CRS ratings. Integration through the Silver Jackets and Risk MAP programs.	This action supports Goal 7 , by reducing repetitive and severe repetitive flood losses. It also advances Goals 4 and 5 by preventing exposure to flood hazards through flood mitigation planning. This mitigation action supports mitigation Goal 15 because of the CRS program's emphasis on taking action to reduce flood losses and on education and building partnerships to reduce flood losses.	DLCD/ USACE (Silver Jackets), OEM	NFIP, Risk MAP, USACE	2030
14	Upgrade the Oregon Landslide Warning System consistent with next steps and recommendations in the 2021 Oregon Landslide Warning System report. Upgrades should include rainfall thresholds from local rain gauges and a permanent real-time website showing areas under a landslide warning, and providing guidance on what people can do to protect their lives and property from a landslide.	Upgrading the Oregon Landslide Warning System would advance Goals 4 and 5 by improving advanced warning of landslides and making warnings more accessible so affected people are aware and can evacuate more quickly and protect their property from landslides. It would advance Goal 15 because landslide warning information would be shared with the whole community using a real time landslide warning website with guidance for protecting lives and property from landslides.	DOGAMI/ OEM, ODF, ODOT	HMGP, BRIC, CTP, USGS, ODOT, NHSA	2030
15	Collaborate on a landslide workshop to increase the State's understanding of climate change effects on landslide hazards in Oregon. Climate change may have multiple effects on landslides in Oregon, including rainfall events of increased intensity or duration, some of which will occur not long after wildfires. Understanding these factors better will increase understanding of changes to the landslide hazard and how to mitigate the hazard. Workshops are productive and efficient venues for exchanging information among professionals in the field.	Collaborating on a landslide and climate change workshop will advance Goal 3 because it will provide information on how climate change affects landslides and align it with mitigating landslide hazard. It will advance Goal 15 by engaging the community in understanding the effects of climate change on landslides using a workshop as a method of engagement. It will advance Goal 16 by providing a space for communication and collaboration among agencies to mitigate and better understand landslide hazards.	DOGAMI/ OCCRI, ODF, DLCD, OEM	Professional Associations	2030
16	Increase availability and distribution of air conditioning systems for the most vulnerable people in areas most at risk to extreme heat events. Continuing efforts to increase availability and distribution of air conditioning systems, particularly in manufactured homes in Cooling Zone 3 and in multifamily homes and apartments across the state, would help alleviate adverse impacts from extreme heat events. OHA has dedicated staff who plan to fund and install air conditioning units in communities most affected by extreme heat, such as manufactured homes and multifamily homes and apartments. Work continues to establish a consistent supply chain of air conditioning units.	Increasing availability and distribution of air conditioning systems will advance Goal 2 by directing state mitigation resources, specifically OHA staff, funding, and installation resources, toward providing air conditioning units to populations that are most vulnerable to and affected by extreme heat. It will advance Goal 4 by providing air conditioning units to manufactured homes, multifamily homes, and apartments to prevent heat related death and injury.	OHA	OHA, ODHS	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
17	Add climate change modeling, prescribed fire, and Communities at Risk data into Oregon Wildfire Risk Explorer (OWRE). Integrate data and assessment information from OSU Extension projects. In 2019 ODF and Oregon State University (OSU) completed the Oregon Wildfire Risk Explore (OWRE) through federal grant funding to make the most up-to-date information on wildfire risk available to homeowners, communities, local managers, and planners. The OWRE shows current large fire perimeters and where historical ignitions have occurred. The Quantitative Wildfire Risk assessment developed by the US Forest Service provided the base data for the OWRE. Local governments have used the assessment in updating Community Wildfire Protection Plans (CWPPs), and it provides guidance and educational resources for the public. Since its roll-out, ODF has added a Wildland Urban Interface (WUI) layer to the OWRE and plans to add a new Communities at Risk layer. ODF and OSU will make other updates as data becomes available. Integration through Climate Change Adaptation Framework.	The addition of climate change modeling, prescribed fire, Communities at Risk, and OSU Extension project data into the OWRE supports mitigation Goals 3, 4, 5, 6, and 9 . Increasingly robust and diverse data and related analysis can inform local CWPP updates and the identification of mitigation actions that reduce impacts from wildfire to people, property, historic and cultural resources, and the natural environment. Additionally, the integration of climate change modeling furthers the understanding of climate change and wildfire, helping to advance Goal 3 .	ODF/OSU	USFS, BLM, FEMA, OSU, ODF	2030
18	Create new lidar-based Landslide Inventory and Susceptibility Maps, especially near population centers. DOGAMI has issued numerous publications and will continue to inventory population centers until all have inventoried. DOGAMI will create these maps in cooperation with local jurisdictions. Specific methods and priority locations are still to be determined. The Oregon Landslide Workgroup will determine the locations. These new maps will enable communities to introduce development restrictions or recommend mitigation strategies in areas highly susceptible to landslides. Once completed, DOGAMI will continue to inventory less populated areas to cover the entire state. Integration may be through Statewide Planning Goal 7.	Creating new lidar-based landslide inventory and susceptibility maps will advance Goal 8 by providing a more updated understanding of where landslides are likely to occur near populated areas and provide an understanding of where continued development may be impracticable. It will advance Goal 10 by creating more informative, reliable, and comprehensive landslide inventory and susceptibility mapping. It will advance Goal 16 by fostering collaboration between DOGAMI and local jurisdictions as they work together to create landslide maps.	DOGAMI	CTP, HMGP, BRIC	2030
19	In coordination with the Emergency Coordination Center, review and maintain the state's established Perishable Data Plan(s). Perishable Data Plans establish protocols for the consistent collection and study of impacts on pre-event data collection instruments and post-event landscape impacts.	Reviewing and maintaining the state's perishable data plans will advance Goal 7 because perishable data plans include flooding, and maintaining perishable flood data is important to understanding areas of flood risk and potential repetitive and severe repetitive loss properties. It will advance Goal 16 by enhancing collaboration and data sharing between government agencies and with the public.	OEM	US ACOE (Silver Jackets), DOGAMI	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
20	Develop guidance for local cities and counties on how to use Statewide Planning Goal 7, Areas Subject to Natural Hazards, 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. This guidance will help cities and counties integrate local natural hazards mitigation plans with comprehensive plans and will enhance consistency in buildable lands inventories. Integration is through Statewide Planning Goals including Goal 7, Areas Subject to Natural Hazards discourages new development in areas subject to natural hazards. Goal 14, Urbanization, and other Statewide Land Use Planning Goals encourage development within urban growth boundaries.	Developing guidance for local entities on how to use Statewide Land Use Planning Goal 7 will contribute to Goal 1 because it will help counties and cities across the state to understand Goal 7 better and it will be a step forward in a more comprehensive application of Goal 7 across the state. It will contribute to Goal 8 by giving cities and counties tools to identify which portions of their jurisdictions are not fit for development or require further mitigation because of potential for harm to people and property.	DLCD	CTP, State Funding	2030
21	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. Use study results to guide a future, more comprehensive and coast-wide assessment of sea level rise impacts. Once completed, use the results to minimize future damage or loss of property and the environment. In 2024, DLCD completed an updated version of the Sea Level Rise Guide for local governments based on this work. Integration through the Climate Change Adaptation Framework.	Conducting a pilot project to develop a framework for modeling sea level rise in estuaries will contribute to Goal 1 by informing a potential future comprehensive and coast wide assessment that could inform a coastwide strategy. It will contribute to Goal 10 by providing improved natural hazard information with the potential to be adopted statewide.	DLCD/ DOGAMI	National Estuary Program Watersheds Grant	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
22	Fund climate change adaptation and resilience-building activities. Local and Tribal governments are best positioned to develop and implement projects that promote climate change adaptation and build local resilience to climate change. The state can contribute to these efforts by establishing grant programs, and by facilitating local ability to learn about and apply for federal and philanthropic grants.	Adaptation- and resilience-building at the local level will work towards a comprehensive hazard mitigation program (Goal 1). Developing a fund for such activities will meet Goal 2 when addressing vulnerable communities. Goal 3 is in direct relationship with building a climate change adaptation funding program. Increasing funding availability for climate adaptation projects will have a direct effect on Goal 11 through supporting grey and green infrastructure. Local economies can be diversified through climate change adaptation (Goal 13). Accessing funds at the local and tribal level can motivate the whole community to build resilience (Goal 15). Addressing climate change adaptation at the local and tribal level with available funding will enhance general communication, collaboration, and coordination amongst all agencies and groups by working together in establishing, applying for, and implementing such funding programs (Goal 16).	OEM/ DLCD	Oregon Legislation	2030
23	Provide technical assistance to the counties, cities, and Tribes with the greatest vulnerabilities identified by the risk assessment to undertake resilience activities for the hazards to which they are most vulnerable. Many of the most vulnerable jurisdictions require technical support to understand how to best improve their resilience. A priority region for mitigation against a Cascadia Subduction Zone event is the coast, and should include critical facilities, such as hospitals, healthcare facilities, vulnerable populations, and lifeline infrastructure, such as water and power.	Providing technical assistance to most vulnerable counties, cities, and tribes would advance Goal 2 by directing state resources and state staff effort toward directly helping local and tribal governments mitigate for hazards that they are most vulnerable to. It would advance Goal 16 by enhancing collaboration and coordination at all levels of government, especially through technical assistance relationships between state government and local, county, and tribal governments.	DLCD	FEMA BRIC Grants, FEMA HMGP, EPA Community Change Grants	2030
24	Install real-time capability on the remaining 7 state-operated stream gauges to make the state's stream gauge network 100% real-time in the year 2025. The availability of timely and accurate data from stream gauges is essential for flood forecasting, for prediction of imminent flood hazards, and for response to flood emergencies. Today, 248 gages provide real-time data; 7 remain to be updated. Other initiatives for integration include the Oregon Integrated Water Resource Strategy and Silver Jackets.	Updating the remaining stream gauges to real-time assessments can minimize loss of life and property damage (Goals 4 & 5). Depending on the streams' locations, Goal 7 could be achieved to reduce repetitive and severe repetitive flood loss. Goal 11 will be met by increasing resilience of gray infrastructure.	OWRD/ Silver Jackets. DLCD	USGS-GWSIP; BRIC; Clean Water State Revolving Fund (EPA); CDBG	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
25	Provide outreach to county, city, special district, and tribal governments so they can help residents understand hazards and how to better prepare for the hazard events to which they are most vulnerable. Most of these governments require educational and learning opportunities to understand how to best improve their resilience. Use engagement tools and best practices to equitably engage Oregonians about natural hazard risks. Through the Risk Assessment Upgrade project, DLCDC developed a risk assessment tool in a geospatial environment that uses a multiple-criteria decision analysis technique called PROMETHEE. DLCDC used the results of this study to identify most vulnerable areas throughout the state and develop dedicated outreach and technical assistance strategies.	Hazard outreach and education would advance Goals 4, 14, and 15 . Communities that are informed of hazards risks are more resilient to hazard events, reducing risk of loss of life during a hazard event. Thus, community education advances Goal 4 . Outreach and education also strengthen relationships, which advances Goal 14 . Finally, identifying most vulnerable areas supports Goal 15 , to motivate the whole community to build resilience and mitigate against the effects of natural hazards.	DLCDC/ OEM	BRIC	2030
26	Undertake inner bay total water level modeling to assess flooding impacts from sea level rise, tides, and storms. Modeling would incorporate inner bay and outer coast processes, similar to modeling performed in Grays Harbor, WA.	Inner bay total water level modeling would advance Goal 10 by providing informative and up to date information on sea level rise, tides, and storms that can be used in local and tribal government planning policy.	DOGAMI/ DLCDC	NOAA	2030
27	Conduct research on the impact of climate change on flood conditions in Oregon. Flood risk is strongly associated with the dominant form of precipitation in a basin, with mixed rain-snow basins in Oregon already seeing increases in flood risk. Precipitation amount and intensity both impact the type of flooding. Generally, western Oregon basins are projected to experience increased precipitation, and therefore flood risk, in future decades. Increased access to information about the potential impacts of climate change on flood conditions in Oregon by federal and state agencies will help counties, cities, special districts, and Tribes identify mitigation actions that will reduce the potentially increased risk. DOGAMI's risk assessments have provided qualitative statements about the impacts of climate change on flood conditions but do not quantitatively assess these impacts. DOGAMI has incorporated the findings from the Oregon Climate Change Research Institute (OCCRI) on future climate conditions into its studies but will need additional resources to produce a detailed understanding of the impact of climate change on floods in Oregon. Integration through Oregon Climate Change Research Institute and Climate Change Adaptation Framework.	This action advances Goal 10 because it facilitates refined mapping of one of Oregon's dominant hazards – flood. It also supports Goal 16 , which seeks to increase communication, coordination, and collaboration between all levels of government.	OCCRI/ DOGAMI, DLCDC	State funds, NOAA, Risk MAP, other research grants	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
28	Adopt implementing rules for Statewide Planning Goal 7 that require counties and cities to adopt new or updated hazard mapping. Such rules will help protect people and property from the impacts of natural hazards. They also will provide more certainty for developers, especially with respect to housing production and needed infrastructure development or redevelopment.	Adopting rules that require counties and cities to adopt new or updated hazard mapping for Statewide Planning Goal 7 would advance Goals 4 and 5 by identifying locations of hazard risk to comprehensively protect from loss of life, injury, and property damage. It would advance Goal 10 by leading to the adoption of informative, reliable, and up to date mapping that would directly apply to planning policy through Statewide Planning Goal 7.	DLCD	State funds	2030
29	Establish a climate adaptation and resilience workgroup within the Oregon Climate Action Commission. The 2025 Oregon Climate Action Commission's workplan recommends that a climate change adaptation and resilience work group be established to produce recommendations to improve resilience and to produce materials to help agencies consider how their programs and projects might contribute to or reduce carbon emissions or increase resilience to climate change. This recommendation came from the informal Climate Change Adaptation Framework Implementation Team, a group of 25 state agencies that developed the Climate Change Adaptation Framework (DLCD, 2021)	This mitigation action supports mitigation Goals 1 and 3 by providing a comprehensive climate change strategy that aligns with natural hazards mitigation programs.	OHA/ DLCD	OHA	2030
30	Mitigate risks at the Critical Energy Infrastructure (CEI) hub. Align with mitigation occurring under the Oregon Department of Environmental Quality's (DEQ's) Fuel Tank Seismic Stability Program.	Mitigating risks at the CEI Hub would advance Goal 2 by aligning with and supporting mitigation work being done through DEQ's fuel tank seismic stability program. It would advance Goals 4 and 5 because the CEI Hub poses a large amount of risk during an earthquake and mitigating seismic hazards will reduce risk to life and property. It advances Goal 11 by improving the resilience of critical energy infrastructure and services.	DEQ/ DOGAMI, OEM	DEQ	2030
31	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 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. DLCD Technical Assistance Grants, US Department of Housing and Urban Development (HUD) Community Development Block Grant (CDBG), and FEMA's Safeguarding Tomorrow through Ongoing Risk Mitigation (STORM) Act may be initiatives for integration.	Requesting that the legislature fund the State Disaster Loan and Grant Account after a disaster will advance Goal 2 by prioritizing state funding for disaster recovery and mitigation measures. It will advance Goal 14 by ensuring that disaster recovery funding is available after a natural hazard event.	OEM	DLCD, HUD, CDBG, FEMA STORM Act	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
32	Develop a proposal to the United States Geological Survey (USGS) to rectify mapping of faults along Oregon's borders with Nevada, Idaho, California and Washington. The USGS fault database includes numerous discontinuous faults, particularly in Eastern Oregon, so that the probabilistic national seismic hazard maps underestimate the hazard. DOGAMI is proposing to create an Oregon-specific Quaternary Faults Database (ORQ-Faults). Part of the ORQ-Faults development would include collaboration with Nevada, Idaho, California and Washington to ensure that faults align across state boundaries. Once that is done, the USGS will be able to use this information.	Working with the USGS to rectify mapping of faults along the Southern and Eastern borders of Oregon will advance Goal 10 by improving seismic fault mapping and understanding of seismic hazards in these parts of the state which can be applied to mitigation planning policy. It will advance Goal 16 by facilitating communication and coordination between the USGS and Oregon government agencies.	DOGAMI	USGS, NEHRP	2030
33	Add Snow Telemetry (SNOTEL) gauges in Zig Zag near Mt. Hood and in Douglas County. SNOTEL is an automated near real-time data collection network that provides mid- to high-elevation hydroclimatic data from mountainous regions of the western United States. A standard SNOTEL station provides snow water equivalent, snow depth, precipitation, and temperature data. The SNOTEL network is maintained by the United States Department of Agriculture (USDA) Natural Resources Conservation Service Snow Survey and Water Supply Forecasting Program. (NRCS SNOTEL and Snow Course Data Drought.gov) This information provides data about precipitation and Oregon's water regime that is important for climate assessments, drought, and flood mitigation.	Adding SNOTEL gauges in Zig Zag and in Douglas County will advance Goal 10 by providing additional data on snowfall and hydroclimatic data for areas where data is not currently being gathered.	OWRD/ OCCRI, USACE (Silver Jackets)	USDA's NRCS Snow Survey and Water Supply Forecasting Program	2030
34	Complete a hazard mitigation policy legislative needs assessment in collaboration with IHMT agencies. The Oregon NHMP contains specific policy recommendations. In addition, the state of Oregon maintains policies related to natural hazards and the mitigation thereof. It is unclear at this time what legislative action would be needed 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. Integration may be through Statewide Planning Goal 7 and the National Flood Insurance Program (NFIP).	A hazard mitigation policy legislative needs assessment in collaboration with IHMT agencies will advance Goal 1 by using a coordinated approach across state agencies to implement a comprehensive approach to legislative priorities for natural hazard mitigation. It will advance Goal 2 by coordinating between state agencies to develop legislative priorities for how state mitigation resources and investments can best build resilience across the state.	OEM/ State IHMT	State funds	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
35	Develop an improved methodology for gathering data on drought and related impacts in the areas most vulnerable to drought as identified through the risk assessment. Include tests of the robustness of drought indicators across future climate scenarios and the frequency of re-evaluation. Although there are areas in Oregon that have suffered from drought, there has not been a coordinated effort to systematically characterize the impact of droughts 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 to assess the appropriate response.	An established methodology for gathering data on drought impacts, duration, and frequency would help direct mitigation resources to those drought-affected areas (Goal 2) and further align natural hazard mitigation work with climate change adaptation (Goal 3). Water and green infrastructure are directly affected by drought impacts (Goal 11).	DLCD/ OWRD, OWEB, OCCRI	NOAA-NIDIS; WaterSMART- DRP; Bureau of Reclamation; OWEB Drought Relief Grants	2030
36	Inventory and evaluate state owned buildings most important to state function (excluding schools, hospitals, and fire stations identified in DOGAMI's 2007 analysis.). Because the state does not have a policy standard for collecting this data, complete information with which to assess the potential for damage to state buildings and critical facilities is not available.	By inventorying and evaluating state owned buildings most important to state function, information necessary to identify appropriate mitigation actions to minimize property damage is provided, which supports Goal 5 . Goal 11 is also advanced by providing information needed to increase the resilience of critical/essential infrastructure and services that are state-owned and operated.	DOGAMI	CTP, Risk MAP, HMGP, State funds	2030
37	Conduct seismic mitigation of five coastal facilities that provide medical care and shelter. The coast will experience the strongest shaking and a tsunami from a Cascadia Subduction Zone event, resulting in injuries and displaced people. Residents and visitors will require medical attention. Tsunami refugees will require sheltering. Many of the hospitals on the coast are too small to have inpatient services and space for sheltering; they typically have a small emergency room or clinic and then transport patients to larger facilities. It is very difficult to financially retrofit a hospital. The Business Oregon Seismic Rehabilitation Program awarded funds to Samaritan Pacific Communities Hospital in Newport in 2017 and Peace Harbor Medical Center in Florence in 2019. Hospitals may not apply due to need for a local match; the grant program requires a full seismic retrofit and it can be hard to segment off areas of buildings. Integration through Oregon Resilience Plan.	Conducting seismic mitigation of coastal facilities that provide medical care and shelter would advance Goal 2 , as it would prioritize and direct mitigation resources and investments to enhance resilience of these essential coastal facilities. Goal 5 and 11 are supported as these facilities would be more resilient and incur less damage in the event of a natural hazard event, and which would also contribute towards advancing Goal 4 , as more people would be able to receive medical care and shelter in the event of a natural disaster.	DOGAMI/ DLCD, OHA, ODHS, OEM	NTHMP, NEHRP, HMGP, BRIC, OHA, ODHS- OREM, Local funds, Private funds	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
38	For each hazard addressed in the Oregon NHMP, develop guidance that includes example comprehensive plan policy and code language to assist local and tribal governments in planning effectively for resilience to natural hazards. County, city, and Tribal governments often lack up-to-date policies and codes to ensure public safety and increase resilience to natural hazard events, as well as staff capacity and expertise to take on these issues. Such guidance is often requested but the state has not provided funding to support this type of technical assistance for county, city, and tribal governments.	Developing guidance for each addressed hazard advances Goal 1 by supporting the development of a comprehensive statewide natural hazards mitigation guidance and strategy for each addressed hazard that affects Oregon. Goal 2 is advanced as mitigation technical assistance resources are provided to assist and guide communities in building resilience to natural hazards and minimizing overall damage, which also helps meet Goals 4, 5, 6, 7, and 11 . This information could be incorporated into and inform local and tribal planning policies, which advances Goal 10 . These guides could also enhance communication, collaboration, and coordination across planning entities, which supports Goal 16 .	DLCD	CTP, HMGP, BRIC, State funds	2030
39	Standardize data sources used by the risk assessment tool to create authoritative data layers maintained by the Oregon Geospatial Enterprise Office's Framework Implementation Team (FIT) program. Rather than data being privately held by state agencies, the FIT will make the data available to other state agencies, counties, cities, special districts, Tribes, and the public.	Coordinating and standardizing data to create authoritative data layers advances Goals 10 and 16 . Fulfilling this goal would support adoption of authoritative hazards information into local planning policy documents, advancing Goal 10 . Further, standardizing and maintaining data sources can support streamlined identification of vulnerable areas, thus advancing Goal 16 .	DLCD/ DAS-EIS	State funds	2030
40	Collaborate on a landslide workshop to increase the state's understanding of co-seismic landslides. Many co-seismic landslides will likely be triggered in the next major earthquake. However, the most likely locations and magnitude of risk are unclear. The co-seismic landslides will be a significant portion of the earthquake hazard and understanding them will help with disaster mitigation both in the absence of and after a disaster.	Collaborating to host a landslide workshop would support the enhancement of communication, coordination, and collaboration between agencies at all levels of government, which would advance Goal 16 .	DOGAMI/ DLCD	Professional Associations, NEHRP	2030
41	Re-evaluate extreme precipitation potential. Two studies to evaluate the magnitude of extreme precipitation events in Oregon are in progress and will be complete by the end of 2026. The state will use this information to evaluate extreme flooding in Oregon.	Re-evaluating extreme precipitation potential would contribute to reducing RL and SRL flood loss properties, Goal 7 . It could also increase resiliency toward our stormwater facility infrastructure, aligning with Goal 11 .	OWRD/ OCCRI, OCS	FMA, BRIC	2030
42	Continue to analyze interdependencies between lifelines and energy: assess and plan for backup power needs for critical facilities, such as water/wastewater, fire stations, and hospitals). Provide support for energy resilience at certain facilities. See the Oregon Energy Security Plan for further background.	Interlinking lifelines with critical energy infrastructure directly relates to Goal 1 . Addressing backup plans for water/wastewater connects to Goal 11 . Focusing energy support on critical facilities should indicate moving away from development in areas that can't be properly mitigated from natural hazard damage (Goal 8)	ODOE/ DEQ, DLCD, Business Oregon, ODOT	Water/Waste-water Financing Program; Capital Projects Fund (CPF); USDA Community Facilities Grant Program	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
43	Track loss of life during and after natural hazard events.	Tracking loss of life during and after a natural hazard event is an integral part of minimizing loss of life and reducing injuries during future or subsequent hazards. This would support Goal 4 .	OHA/ OEM	OHA, OEM	2030
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. The Oregon Department of Emergency Management (OEM) has recommended that the State IHMT be formally and officially established as an advisory body. Integration initiatives may be through the Governor's Office and the Oregon Seismic Safety Policy Advisory Council (OSSPAC).	Establishing the State IHMT as a formal and official authority will advance the implementation comprehensive, statewide NH mitigation program and strategy, which supports Goal 1 . As an advisory body, it can help advance Goal 16 by providing enhancing communication, collaboration, and coordination among agencies to mitigate natural hazards.	OEM	State funds	2030
45	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 (https://water.usgs.gov/osw/bulletin17b/dl_flow.pdf). The U.S. Geological Survey (USGS) has updated this bulletin to 17c (tm4b5.pdf - Guidelines for Determining Flood Flow Frequency—Bulletin 17C). The Oregon Water Resources Department (OWRD) needs to update its methodology to reflect the more recent guidelines. Initiatives for integration are through the Oregon Integrated Water Resources Strategy. Other actions involve education about flood frequency, especially in the aftermath of a flood.	With the prevalence of larger storm systems and precipitation events, Goals 4, 5, & 7 would all be assisted through updating the state's Peak Discharge Estimation Program.	OWRD/ Silver Jackets, DLCD	USGS-GWSIP; BRIC; Clean Water State Revolving Fund (EPA); CDBG; FMA	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
46	Fund the Oregon Climate Change Research Institute (OCCRI) and the Oregon Climate Service (OCS) to provide state agencies with the data and technical support necessary to increase resilience, promote adaptation to, and reduce risk from climate-related natural hazards. OCCRI and OCS are Oregon's premier agencies producing climate science. The work they do is important not only for managing the state's farms, forests, and fish and wildlife habitats, but also for understanding and mitigating climate-related natural hazards. Their work is foundational to providing for public health, safety, and welfare.	Increasing state and local resilience in climate adaptation by funding OCCRI and OCS directly relates to Goal 3 . Mitigating climate-related effects on our natural environment through the work of these groups fulfills Goal 9 .	OEM/ OCCRI, OCS	State funds	2030
47	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 delivering large amounts of sediment to surface waters. Evaluation of erosion potential by watershed will help water regulators and providers identify areas for mitigation. Initiatives for integration include the Oregon Department of Environmental Quality (DEQ) and the Oregon Department of Forestry (ODF).	Studying erosion potential near watersheds is foundational to understanding the variety of potential impacts on Oregon's water resources and supports mitigation Goals 8 and 11 . Such studies will inform development patterns, thus fulfilling Goal 8 by minimizing or eliminating development in hazardous areas. Additionally, evaluating sediment impacts to water resources, particularly potential landslide impacts on drinking water sources supports Goal 11 by increasing the resilience of such critical facilities.	DOGAMI/ DEQ, ODF, OWEB	OWEB	2030
48	Pursue Enhanced Plan status as a collaborative statewide strategy led by the State Interagency Hazard Mitigation Team (State IHMT) and others. Oregon lost enhanced plan status in September 2020 due in large measure to budget and capacity issues. Studies have definitively demonstrated that investing in mitigation generates a significant return on investment (ROI) and reduces the need for costly response and recovery activities. OEM and State IHMT agencies need non-federal financial support for additional staff to match federal mitigation dollars and to engage in non-federally supported yet necessary mitigation activities. These activities include but are not limited to implementation of related state programs; integration among related state programs; integration with county, city, special district and Tribal programs; and technical assistance, both financial and non-financial, for counties, cities, special districts, and tribes. Other initiatives may involve Business Oregon-IFA, NFIP, Climate Change Adaptation Framework, and DCBS-DFR.	Maintaining and enhancing the state's Natural Hazard Mitigation Plan supports the fulfillment of mitigation Goal 1 by supporting the development of a comprehensive statewide natural hazards mitigation strategy.	OEM/ DLCD	HMGP, BRIC, State funds	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
49	Use LIDAR to assess landslide hazards along rights of way. Such data will 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. Integration may be through Statewide Planning Goal 7.	Using the best available technology to assess landslide susceptibility along right of ways supports the fulfillment of mitigation Goal 11 by supporting the resilience of critical infrastructure.	DOGAMI/ ODOT	CTP, HMGP, BRIC, FHWA	2030
50	Strengthen fuel resilience including: 1) geographic diversification of fuel storage and strategic fuel storage facilities and 2) backup power at fuel stations. See the Oregon Energy Security Plan for further background.	Strengthening fuel resilience, such as diversifying fuel storage facilities and ensuring backup power, across the state will contribute towards meeting Goal 5 , by minimizing potential property damage to the facilities themselves and surrounding properties. It also advances Goal 11 by enhancing the resilience of these critical/essential infrastructure and services from natural hazards, which also helps ensure people have continued access during and after natural hazard events, which supports Goal 14 .	ODOE	ODOE, US DOE, HMGP, BRIC	2030
51	Improve instrumentation and methods for identifying and projecting different aspects of drought and identifying the communities most vulnerable to drought and its impacts. The Oregon Climate Change Research Institute (OCCRI) assessed drought frequency, duration, intensity, etc., in Oregon as part of the seventh Oregon Climate Assessment. Impacts and vulnerability can be assessed to some extent if objective, quantitative metrics of impact and vulnerability are identified. The Risk Assessment Upgrade is evaluating vulnerability, but more could be done to improve the area covered by ground observations and to incorporate climate instability into drought projections. Other initiatives for integration include the Oregon Integrated Water Resources Strategy.	Goal 2 is met by using the updated risk assessment to prioritize building resilience against drought in communities indicated to be most vulnerable. Goal 3 is met by working to implement the Oregon Climate Assessment research into drought vulnerability. Using OCCRI's research directly informs Goal 10 as it begins to hit the ground in policymaking and/or informing local government decision-making. Goal 15 would be met through using best practices in OCCRI's evaluation.	OWRD/ OWEB. OCCRI, DLCD	NOAA-NIDIS; WaterSMART- DRP; Bureau of Reclamation; OWEB Drought Relief Grants	2030
52	Install landslide mitigation measures along transportation corridors that impact five most vulnerable areas. ODOT will install landslide mitigation measures, such as rock bolts, rock nets, catchment basins, benched slopes, horizontal drains, and retaining walls along key corridors as time, funding, and resources allow to reduce the risk of landslide hazards and improve transportation reliability.	Installation of landslide mitigation measures supports mitigation Goal 11 by enhancing the resilience of critical infrastructure such as roads and bridges. This action also supports mitigation Goals 15 and 16 by supporting whole community resilience and enhancing collaboration to identify areas most vulnerable to natural hazards.	ODOT	ODOT, FHWA	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
53	Implement actions recommended in the Oregon Resilience Plan that OSSPAC identifies as highest priority and that the state can accomplish within the five-year life of this plan to prepare Oregon's residents to survive and recover from a Cascadia Subduction Zone earthquake and ensuing tsunami.	The Oregon Resilience Plan and its recommended actions are about building resilience and prioritizing mitigation resources and investments for the CSZ event and resulting tsunami, which contributes towards Goal 2 . These recommended actions aim to minimize injury/death and property damage for the CSZ and tsunami event, which supports Goals 4 and 5 . The Oregon Resilience Plan and recommended actions can also help to identify hazardous and high-risk areas where to eliminate or minimize development, which advances Goal 8 . The Plan encourages strong community relationships to ensure that essential goods and services are resilient and remain accessible both during and after a CSZ and tsunami event, which supports Goal 14 . Goal 16 is advanced through the enhancement of communication, collaboration, and coordination between government and public entities to mitigate against CSZ and tsunami event.	OEM/ OSSPAC	HMGP, BRIC, NEHRP	2030
54	Implement climate change adaptation policies and priorities as set forth in the Climate Change Adaptation Framework (DLCD, 2021). The Climate Change Adaptation Framework, developed in consultation with 25 state agencies, outlines strategic climate change adaptation actions. A Climate Change Adaptation Framework Implementation Team reviews progress toward implementing the strategies. Changes, if any, will be made to the Framework roughly every five years.	This mitigation action supports Goals 1 and 3 by providing a comprehensive climate change strategy that aligns with natural hazards mitigation programs.	DLCD	HMGP, BRIC, NOAA, State funds	2030
55	Develop a plan to create a lifelines backbone for the 11 coastal communities with hospitals. Coastal hospitals will require fuel, electricity, and water to operate after a Cascadia Subduction Zone event. Currently, power and water infrastructure is extremely vulnerable. The coast urgently needs cost-effective methods to ensure reliable power and water. The Oregon Department of Geology and Mineral Industries developed the Coastal Hospital Resilience Project (DOGAMI, 2019) to improve disaster resilience to a Cascadia Subduction Zone earthquake. It includes guidance to be locally self-sufficient for three weeks; evaluates seismic vulnerabilities of hospitals and identifies alternate care sites; and develops a hospital resilience plan. Integration through Oregon Resilience Plan.	Developing a plan to create a lifelines backbone for coastal communities with hospitals would fold into the comprehensive strategy of Goal 1 . Goals 4 and 5 would be met by concentrating mitigation and CSZ adaptation around coastal hospitals. Goals 14, 15, & 16 would be achieved as this action would require a large-scale and wide-ranging effort of multiple forms of governments, community groups, private institutions, and invested individuals on how to organize and sustain resilience of care in such a disaster scenario.	ODOT/ ODOE, DEQ, DLCD, Business Oregon, OEM	Capital Projects Fund (CPF); USDA Community Facilities Grant Program; HSGP; HMA; BRIC	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
56	Provide ongoing funding for the expansion of the Oregon Resilience Hubs and Networks Initiative. Resilience Hubs provide shelter, technical support, supplies, and education for all four elements of the disaster cycle: preparation, mitigation, response and recovery. Their presence, access, and activities build community cohesion, establishing and advancing community resilience. Resilience Networks provide the active foundation of the resilience hubs. The Network groups collaborate to support the purposes and activities of a resilience hub.	Providing ongoing funding for the expansion of the Oregon Resilience Hubs and Networks Initiative advances Goal 2 by directing mitigation resources and investments towards building resilience. This initiative also advances Goal 3 by aligning and coordinating natural hazards mitigation and climate adaptation efforts to enhance community resilience. Goals 14, 15, and 16 are advanced by using collaboration, communication, and coordination across governments and communities to build resilience and enhance mitigation efforts through information, funding, and resource sharing, which will also contribute towards ensuring that goods and essential services can be accessed during and after natural hazard events.	ODHS/ OHA, OEM, DLCD	OHA, ODHS, HMGP, BRIC	2030
57	Pursue funding for developing data to support assessments of probability, vulnerability, and risk for drought, windstorms, and winter storms. Drought, windstorms, and winter storms are significant hazards in Oregon. Projections of future drought and, depending on the definition or metric, winter storms are available. Projections of high winds are available but have considerable uncertainty. To better protect the public, Oregon must find funding to develop additional necessary data. Through the Risk Assessment Upgrade, the state continues to gather and use data to better assess these hazards. Other initiatives for integration include United States Department of Agriculture's Natural Resources Conservation Service.	Pursuing funding to develop data for drought, windstorm, and winter storm hazard risks throughout the state supports mitigation Goals 1, 3, and 10 . Creating and implementing best available data concerning these hazards fulfills a statewide mitigation strategy outlined in Goal 1 . This effort also supports Goal 10 by creating and maintaining reliable, informative datasets that are available for integration into local planning policy. Finally, this effort supports Goal 3 by enhancing both instruments and methods for assessing hazards influenced by climate change to holistically understand climate impacts on hazard predictions.	DLCD/ OWRD, OCCRI, OEM	USDA's NRCS, HMGP, State funds	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
58	Install High Water Mark (HWM) signs after flood events and co-locate stage crest gauges 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 (CRS) program. Stage crest gauges co-located with select HWM signs will capture new high-water data when floods occur. Collection of HWM is essential to continued education around flood risk. Use the Silver Jackets perishable data plan as a framework for collecting data across state and federal agencies. Develop a framework to collect HWM data at a community level, which allows for collection of additional flood information. The Silver Jackets team will also provide a collaborative approach to providing flood outreach for flood education from this database of collected high water marks. This action will also require integration through the National Flood Insurance (NFIP) within DLCD's program.	High Water Mark (HWM) signs after flood events increase the public's general awareness of flood risk, thus reducing result of loss of life and property damage (Goals 4 & 5). Increasing HWM data and locations will reduce repetitive and severe repetitive flood losses (Goal 7). The indirect benefits from HWM signs can strengthen relationships and resilience amongst local governments and groups have access to goods and services by understanding previous impacts and extents, helping communities appropriately assess and prepare for future events (Goal 14).	Silver Jackets/ DLCD; OWRD	USGS-GWSIP; BRIC; Clean Water State Revolving Fund (EPA); CDBG; FMA	2030
59	DFR will teach classes about wildfire insurance coverage between 2025 and 2030. Wildfires have displaced thousands of Oregonians over the last few years. Homeowner's and renter's insurance is a vital tool to financially withstand the impacts of wildfires. DFR hosts information about insuring against wildfire on its website and will continue to lead outreach classes to the public about the value of homeowner's and renter's insurance. DFR utilizes social media and publications.	Consumer education related to fire insurance is a key component of increasing resilience of the whole community, supporting mitigation Goal 15 . Outreach in communities identified by the risk assessment to be the most vulnerable helps to ensure people have financial resources to withstand the impacts of wildfires.	DCBS-DFR	DFR	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
60	Implement improved tsunami way-finding signage solutions to assist with tsunami evacuation under all conditions (day or night). Hardened and improved evacuation routes may include the use of elevated safe areas (vertical evacuation structures) 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 move to high ground quickly on foot. This requires clearly marked evacuation routes that pedestrians can navigate even in dark and stormy weather. Where high ground is available, the state should identify projects that will enable Oregon to establish new standards and guidelines for methods to harden and mark wayfinding of tsunami evacuation routes to natural high ground. Where natural high ground is unavailable within the expected evacuation time, evaluate the retrofitting existing facilities or constructing new vertical evacuation structures that rise above the level of tsunami inundation and can serve as safe refuges. DOGAMI has completed Beat the Wave tsunami evacuation analyses for every community on the Oregon Coast over the past 10 years. Improvements include hardening existing routes, developing new evacuation trails, retrofitting bridges, and constructing one or more vertical evacuation structures, where applicable. Integration through the Oregon Resilience Plan.	Tsunamis present unique hazard mitigation opportunities. Implementing improved way-finding signage supports mitigation Goals 4, 14, and 15 . Effective signage is critical to reducing loss of life during a hazard event, thus fulfilling Goal 4 . Improving wayfinding and encouraging Beat the Wave activities also supports mitigation Goal 14 by strengthening local relationships among governments, community-based organizations, and businesses. Identifying projects that will enable Oregon to establish new standards and guidelines for methods to harden and mark wayfinding routes, as well as retrofitting existing facilities supports mitigation Goal 15 by encouraging whole community resilience through information sharing.	OEM/ DOGAMI, ODOT, DLCD	CTP, HMGP, BRIC, NEHRP, NTHMP	2030
61	Strengthen wildfire and winter storm resilience of electrical transmission and distribution systems focusing on small utilities and energy providers without internal or other resources to build resilience features into systems (before and after disasters). See the Oregon Energy Security Plan for further background.	Strengthening the electrical transmission and distribution systems of small utility and energy providers supports mitigation Goals 2, 5, and 11 . Small providers often serve rural areas of the state, which may overlap with communities that are most vulnerable and in need of prioritized resources and investments in support of Goal 2 . More resilient electrical transmission and distribution systems are less likely to fail or cause damage to surrounding property due to power outage and wildfires, thus supporting Goal 5 . Goal 11 is supported through increased resilience of critical electrical infrastructure and the services it provides and supports.	ODOE/ OPUC	USDA Rural Development Electric Program, US DOE, FEMA	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
62	Develop an improved methodology for gathering data on channel migration and related impacts in the communities most vulnerable to channel migration. The methodology would include collecting data during and after major storm events. Although areas in Oregon have been impacted by channel erosion and migration, there has not been a coordinated effort to systematically characterize how frequently, where, or how much this hazard has cost Oregonians. Individual communities respond to this hazard, but a statewide understanding is needed to plan for future channel migration and develop outreach materials and a coordinated response.	Coordinating an effort to systematically characterize temporal and geographic variability of channel migration supports mitigation Goals 7 and 16 . Mapping channel migration areas supports mitigation Goal 7 to reduce flood losses. Coordinating such efforts supports Goal 16 , enhances communication, collaboration, and coordination at all levels of government.	DOGAMI/ USACE (Silver Jackets)	CTP, USGS, USACE (Silver Jackets)	2030
63	Identify metrics for measuring community resilience.	This mitigation action supports mitigation Goal 15 , motivating whole community resilience through engagement, listening, learning, information sharing, and funding opportunities. Identifying metrics to measure community resilience requires engaging communities across each of Goal 15's activities.	DLCD/ OHA	OHA, NOAA, CTP	2030
64	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. Other initiatives include Oregon Resilience Plan and NFIP.	Producing and compiling flood and earthquake information will help guide related statewide priorities and strategies, which advances Goal 1 . Information will support efforts to protect lives and structures, which support Goals 4 and 5 . Goal 7 is supported as compiled flood information will help identify and reduce flood losses across the state. Determining hazard risk to state-owned buildings and identifying potential mitigation actions will help advance Goal 11 .	DOGAMI/ DAS	State funds	2030
65	Develop a statewide strategy to encourage the purchase of flood insurance. The state regularly recommends flood insurance as a mitigation strategy as part of public outreach during flood studies and individual NFIP community outreach. It's known that well-insured communities recover faster. A strategy will help the state direct information to underinsured areas thereby reducing vulnerability, facilitating recovery, and increasing access to "increased cost of compliance" funding. Private flood insurance in Oregon (and nationwide) is growing and is estimated at approximately 20% of the market share currently in Oregon. Integration is through the NFIP and CRS.	This strategy would implement Goal 1 as part of a comprehensive, statewide natural hazards mitigation program and strategy.	DLCD/ USACE (Silver Jackets)	NFIP, USACE	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
66	Update hazard probabilities in NHMP for all hazards. The Risk Assessment Upgrade for the 2025 NHMP included updating hazard probabilities. Continue to incorporate the best scientific methods available to develop hazard probabilities in the 2030 NHMP.	Updating hazard probabilities within the risk assessment for use in the state NHMP will support mitigation Goal 1, 2, and 4 . Evaluating and updating probabilities will advance Goal 1 by supporting the implementation of a comprehensive mitigation strategy. Completing this update will support Goal 2 by more accurately identifying vulnerable populations and communities and clarifying where state resources should be shared to reduce these vulnerabilities to natural hazards. Finally, updating hazard probabilities supports Goal 4 by reducing loss of life during a hazard event.	DLCD/ IHMT Agencies	HMGP, BRIC, State funds	2030
67	Establish an online platform and procedure for collecting and sharing mitigation actions from state, local, and tribal NHMPs. Currently there is no easy way for governments to research and share mitigation actions. Having an online “mitigation action tracker” would facilitate communication, cooperation, collaboration among state, local, and tribal governments, enhancing mitigation planning statewide. Initiatives for integration include local governments’ and tribes’ natural hazards mitigation programs, and FEMA Region 10’s Mitigation Division	Establishing an online platform and procedure to collect and share mitigation actions from NHMPs across the state will enhance mitigation planning and strategies across the state, which supports Goal 1 . The online platform will also facilitate and encourage communication, collaboration, and coordination among all levels of governments and tribal nations, and encourage, which advances Goal 16 .	OEM	CTP, State funds	2030
68	Provide funding and technical assistance to local governments to use the new guidance on classifying lands subject to natural hazards in their buildable lands inventories and adjusting urban growth boundaries. Local 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 through the Statewide Planning Goals and local natural hazards mitigation plans with comprehensive plans.	Goal 2 is advanced as funding and technical assistance will be directed towards local governments for mitigation and resilience building efforts. Using new guidance to classify lands subject to natural hazards and adjusting UGBs will help protect life, property, and the environment, which supports Goals 4, 5, and 9 . Applying the guidance will help local governments to provide more efficient and safe development patterns in and around lands subject to natural hazards, which advances Goal 8 . Additionally, by providing funding and technical assistance to local governments to use and apply new guidance will promote the integration of Statewide Planning Goals and mitigation planning into local comprehensive planning, which advances Goal 10 .	DLCD	DLCD Technical Assistance Grants, DLCD Voluntary Periodic Review Grants, Other State funds	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
69	Establish an online repository and procedure for storing finalized, FEMA-approved local and tribal NHMPs as well as the Oregon NHMP. Currently there is no single repository for local and tribal NHMPs and very few can be found online in their final format. Assisting local governments and tribes with finalizing their NHMPs after FEMA's final approval (inserting FEMA's final approval letter and effective dates) and uploading them to a single, online repository in a timely manner will provide opportunities for collaboration and improving state and local coordination in mitigation planning. The Climate Change Adaptation Framework and Oregon Explorer are other integration initiatives.	Establishing an online repository and procedure to store NHMPs from across the state will enhance mitigation planning and strategies across the state, which supports Goal 1 , as well as provide support to local and tribal governments in this process, which supports Goal 2 . The repository will also provide opportunities to collaborate and coordinate with state, local, and tribal entities in mitigation planning, which advances Goal 16 .	OEM	CTP, HMGP, BRIC, State funds	2030
70	Establish the Oregon NHMP as a living document. Establish a platform for housing the Oregon NHMP and a procedure for continually updating and enhancing it. Other initiatives for integration could include the Climate Change Adaptation Framework.	Continued maintenance of the Oregon NHMP advances mitigation Goal 1 and 16 by supporting a comprehensive statewide mitigation strategy through ongoing maintenance and updates to the NHMP, thus advancing Goal 1 . This action also supports the collaboration of state and local agencies by creating and maintaining a venue to evaluate risks and identify most vulnerable populations and communities, thus supporting Goal 16 .	OEM/ DLCD	State funds	2030
71	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. Continue to pursue this through the Risk Assessment Upgrade. 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. Integration through the Oregon Resilience Plan.	Improving state agency procedures for tracking data on state-owned/leased and critical or essential buildings or facilities advances Goal 5 by maintaining a more updated and comprehensive inventory of buildings owned and leased by the state and critical and essential buildings and facilities so buildings within hazard zones can be identified and damage can be minimized. It advances Goal 6 by allowing for the identification of any state-owned or -leased historic and cultural resources and minimize their damage from hazards. It advances Goal 10 by allowing for the adoption of updated building and facilities data for the best understanding of what assets are exposed to hazards. It advances Goal 11 by developing a better dataset that includes critical and essential infrastructure that can lead to increased resilience. It advances Goal 16 through collaboration and communication between state agencies to develop improved procedures and to collect data.	DOGAMI/ DAS	State funds	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
72	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. These data were developed for previous versions of the Oregon NHMP and have been updated not as a database, but as a data layer to be used in the tool developed through the Risk Assessment Upgrade project. Integration may be through The Oregon Resilience Plan.	Developing a database of non-state-owned critical/essential facilities and their property values advances Goal 5 by improving knowledge of locations of critical facilities in identified hazard areas so property damage can be minimized. It advances Goal 10 by facilitating a more comprehensive database of critical and essential facilities that are not owned by the state. It advances Goal 11 by improving knowledge of locations and values of non-state owned critical and essential facilities so their resilience can be increased.	DOGAMI/ DAS	State funds	2030
73	Conduct critical infrastructure vulnerability analysis in "most vulnerable jurisdictions" for the hazards to which they are most vulnerable. Most vulnerable jurisdictions require analyses and technical support to improve their resilience.	Conducting critical infrastructure vulnerability analysis in the most vulnerable jurisdictions advances Goal 2 by directing vulnerability analysis toward the communities that are indicated to be the most vulnerable and in need of technical support. It advances Goal 11 by focusing analysis and technical support toward critical and essential facilities.	DOGAMI	CTP, HMGP, BRIC, NEHRP, NTHMP	2030
74	Identify metrics for tracking whether infrastructure is being built or upgraded to withstand hazard events.	Identifying metrics for tracking whether infrastructure is being built or upgraded to withstand hazard events advances Goal 11 by enhancing the ability to understand if resilience of critical and essential infrastructure is being increased.	DLCD/ DCBS-BCD, OEM	State funds	2030
75	Institutionalize interagency bodies that work to advance natural hazards mitigation and climate change adaptation and mitigation.	Institutionalizing mitigation and climate adaptation work will advance mitigation Goal 3 and 16 . Institutionalizing this work will advance Goal 3 by supporting further collaboration and alignment of hazards mitigation and climate adaptation policy work occurring across agencies. Additionally, this action will support Goal 16 by designating a central venue to support interagency coordination to more efficiently address issues and policy concerns.	DLCD/ OEM	State funds	2030
76	Fill risk assessment data gaps. Some indicators that would have been informative for the risk assessment upgrade could not be used because the data were unavailable or required expensive subscriptions. Ongoing funding would be needed to access the most up-to-date data necessary for local, tribal, and state risk assessment updates into the future.	Risk assessment is the foundation of natural hazard mitigation planning. Thus, eliminating data gaps within the statewide risk assessment fulfills mitigation Goal 2 by producing accurate results identifying communities most vulnerable to natural hazards impacts.	DLCD/ DOGAMI, OCCRI	State funds	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
77	Create a plan to ensure communication continues during public safety power shutoffs and other power loss events. Currently there is no plan for continuing communications requiring power during natural hazard events.	Creating a plan to ensure communication is not disrupted due to hazard-related power loss events would help contribute to communication infrastructure protection and resilience, which supports Goals 5 and 11 .	ODOE/ OPUC	State funds	2030
78	Request seismic and flood information from landlords of state-leased spaces as part of analyzing potential new leases and potential renewals. Determine flood and earthquake damage and losses expected to occur to the state-owned/leased 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. Other Initiatives for integration include Oregon Resilience Plan and NFIP.	Compiling flood and seismic risk information will support efforts to protect lives and structures, which support Goals 4 and 5 . Goal 7 is supported as compiled flood information will help identify and reduce flood losses across the state for state-leased spaces. Determining hazard risk to state-owned buildings and identifying potential mitigation and resilience building actions and strategies will help advance Goal 11 .	DAS/ DOGAMI	State funds	2030
79	Use DAS-CFO data and investigation of seismic and flood risk to DAS-owned and -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. Other Initiatives for integration include Oregon Resilience Plan and NFIP	Using DAS-CFO data and investigation of seismic and flood risk in relation to building occupancy, maintenance and use to identify potential mitigation treatments can help reduce loss of life and structures, which supports Goals 4 and 5 . This could also identify where flood risk is and where to mitigate flood risk, which advances Goal 7 . This could help identify how and where to increase the resilience of essential structures owned and leased by DAS, which supports Goal 11 .	DAS/ OEM, DOGAMI, DLCD	State funds	2030
80	Collaborate and workshop with other professionals to increase understanding of co-seismic landslides that can cause tsunamis. Some of these can occur underwater. New high resolution bathymetry data would increase understanding of what happened in past earthquakes and thus better understand possible future events. Initiatives for integration include Oregon Resilience Plan.	This mitigation action would further mitigation Goal 11 by increasing agency understanding of co-seismic landslide susceptibility and potential impacts on surrounding communities and infrastructure.	DOGAMI	Professional Associations, NTHMP, NEHRP	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
81	Document the economic, social, cultural, and environmental impacts of drought, especially in the most vulnerable jurisdictions. Documenting past drought conditions and effects, especially impacts on people and the environment, is one component of understanding and preparing for future droughts. Oregon does not have the resources to conduct a thorough analysis of drought's impact to various sectors. Today, most impact-related data are anecdotes. Include in the drought assessments summaries of past drought frequency, distribution, intensity, and duration and projections of future drought conditions. Doing so is critical, especially as climate projections indicate that the Pacific Northwest will more regularly experience warmer temperatures and population projections suggest that human needs for water will increase. Part of this project has been completed through the Risk Assessment Upgrade and the other completed through the 2025 Oregon NHMP Update. Other initiatives for integration include USDA Natural Resources Conservation Service.	Documenting the impacts of drought will advance Goal 2 by promoting better understanding of drought hazard and what communities are most vulnerable. It will advance Goal 10 by improving drought data and providing more information on drought that can contribute to local and tribal planning policy.	OWRD/ OHA	NOAA-NIDIS; WaterSMART- DRP; Bureau of Reclamation; OWEB Drought Relief Grants	2030
82	Support Risk MAP flood hazard map update initiatives throughout the state. FEMA produces new flood hazard maps through the Risk MAP program with support from DOGAMI, USGS, and USACE. The Risk MAP program operates out of OEM. The Risk MAP program prioritizes areas of Oregon for study that have older data, updated LiDAR data, and an interest in new hazard information, resilience and mitigation conversations. DLCD will support the Risk MAP process by helping communities update local floodplain ordinances, and the Risk MAP program will remain responsive to natural hazard mapping and mitigation needs through integration with Silver Jackets and partner outreach.	The Risk MAP program and the multiple agencies supporting and directing local efforts to update flood hazard maps and local floodplain ordinances to build community resilience against flooding advances Goal 2 . By updating flood hazard maps, new flood hazard information and concerns may arise, which can help in identifying at-risk areas that may require mitigation efforts, which supports Goal 7 . This updated flood hazard data and information can be used to inform and update local floodplain ordinances, which supports Goal 10 .	OEM	Risk MAP	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
83	Provide education on use of state-of-the-art atmospheric river classification and science in flood resilience. Recent years have seen an increase in understanding of and the science around atmospheric rivers. The Center for Western Weather and Weather Extremes (CWWWE) developed an extensive library of outreach material around these impactful climatic phenomena. The intent of CWWWE's work is to provide practitioners with the necessary tools to be aware of and prepared for flooding. This work by the CWWWE is meant to supplement the National Weather Service's forecasts in a way that provides a longer window of potentially impactful weather patterns. Since atmospheric rivers are a major component of Oregon's flood risk, it is important to educate communities on available information that can supplement existing monitoring activities. Because much of this science is new, the state needs to educate practitioners on these new tools which are meant to build resilience throughout the State.	Clarifying the appropriate use of atmospheric river science and corresponding data in risk assessments and in community outreach supports the advancement of mitigation Goals 3, 7, 10, and 16 . Providing education on atmospheric rivers data collection instruments and the appropriate use of this new science can clarify the link between natural hazards and climate change risks and adaptation, thus furthering mitigation Goal 3 . Use of this data in mitigation planning advances mitigation Goal 7 by reducing development within areas at risk of repetitive and severe repetitive flood losses. Use of these data in planning purposes can further mitigation Goal 10 . Finally, outreach amongst local jurisdictions supports mitigation Goal 16 by enhancing the coordination and collaboration amongst jurisdictions to mitigate risks of natural hazards.	USACE (Silver Jackets)/ DLCD, OCCRI	NFIP, USACE, NOAA-NWS	2030
84	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. Where feasible, expand the network of snow observation stations at strategic locations throughout the state to provide data on snow water content, snow depth, and snowmelt throughout winter and spring across major environmental gradients. Integration through Climate Change Adaptation Framework and the Oregon Climate Change Research Institute.	Tracking weather patterns, including snowfall, supports mitigation Goals 3 and 7 by systematically gathering weather pattern data and expanding monitoring stations which can support the alignment of hazards risks and projected climate change risks. Additionally, this mitigation action supports mitigation Goal 7 by clarifying potential flood risks resulting from snow melt.	ODOT/ OWRD, ACOE (Silver Jackets) OPUC, ODOE, OCCRI	FHWA, State funds	2030
85	Through the Risk Assessment Upgrade, DLCD developed a risk assessment tool in a geospatial environment that uses a multiple-criteria decision analysis technique called PROMETHEE. DLCD used the results of this study to prioritize communities and develop dedicated outreach strategies. To better protect the public, Oregon must find funding to develop additional necessary data. Other initiatives for integration include USDA Natural Resources Conservation Service.	Goal 2 would be met through strengthening the risk assessment tool. Continual upgrades to the risk assessment tool could strengthen relationships among governments by sharing and disseminating increased risk assessment data (Goal 14). Goals 15 & 16 would be met by using the upgraded risk assessment model in more planning-based scenarios.	DLCD/ State IHMT Agencies, DAS-GEO	USDA-NRCS, DAS-GEO, Other State funds	2030
86	Undertake needed updates to coastal erosion hazard zones developed for the Oregon Coast. DOGAMI developed existing erosion hazard maps between 2001 and 2007 and in many places on the coast, are now being exceeded by contemporary coastal processes. In some cases, no mapping has been produced.	Goal 3 would be met through increased coastal erosion updates. Goal 8 would likely be addressed as developable areas decrease from coastal erosion.	DOGAMI	CTP, HMGP, NOAA, NTHMP, NEHRP	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
87	Implement probabilistic tsunami hazard analyses (PTHA) inundation modeling on the Oregon Coast to enable the development of the next generation of tsunami products for coastal communities. Previous DOGAMI tsunami modeling relied on deterministic (scenario-based) Cascadia earthquake rupture processes, and further did not consider friction in the modeling. PTHA allows for consideration of potentially many thousands of scenarios, which helps to better constrain uncertainty levels (e.g., understanding of the rupture process, and short paleoseismic history). Furthermore, PTHA enables the production of inundation products that are risk-based that reflect a range of commonly used average return periods (ARPs), such as the 100, 475, 975, 2,475-year, and either the 4,975-year or potentially an even lower probability event. Such data are critically important in the design of vertical evacuation structures, highway bridges on the coast, and evacuation zones.	Goals 4 and 5 would be addressed through implementing stronger tsunami hazard analysis modeling. Goal 8 would likely be strengthened through greater tsunami hazard and inundation awareness, as the modeling could generate stronger development mapping and structural reinforcement. Reinforcement design would be more tailored and effectuated through stronger scenario-based data informing where to design, increasing the resilience of grey and green infrastructure (Goal 11). The resilience of such structures would assist those most vulnerable to tsunami inundation scenarios, accomplishing Goal 14 .	DOGAMI	CTP, HMGP, NOAA, NTHMP, NEHRP	2030
88	Fund coastal change monitoring. DOGAMI initiated a coastal monitoring program in 2004 and currently re-surveys core sentinel sites on a seasonal basis. The data generated from this effort have been used in coastal flood risk modeling, in the development of coastal erosion hazard zones and site-specific geotechnical applications. Furthermore, state agencies use the data produced to support decision making (e.g., OPRD). These data are essential for understanding existing and future coastal hazards, and are thus essential for increasing community resilience, promoting adaptation to, and reducing risk from coastal-related hazards (erosion and flooding).	Continual funding of the coastal change monitoring program would add a strong coastal element towards Goal 1 , the development of a statewide hazard mitigation program. RL and SRL flood losses would be directly mitigated through the implementation of data gathered from this program (Goal 7). Unique coastal environments (dunes, eelgrass, scrub shrub, swamp forests) could have mitigation actions established based on the data acquired from this program (Goal 9). Most mitigation actions attributed from this program would utilize natural features and systems, meeting Goal 12 . In the event of catastrophic coastal events, the coastal monitoring program could produce greater coordination outcomes by identifying critical resources and routes (Goal 14).	DOGAMI	CTP, NOAA	2030
HHPD-1	Continue assessing risk for state-regulated high hazard potential dams (HHPDs).	This mitigation action supports mitigation Goals 4 and 5 by providing the basis for action to study and evaluate risks resulting from high hazard potential dams. Continued monitoring and assessment of state-regulated high hazard potential dams (HHPDs) is essential to supporting Goal 4 , and reducing loss of life from natural hazards and high hazard potential dams. Additionally, continued monitoring and assessment supports Goal 5 , minimizing property damage from natural hazards and high hazard potential dams.	OWRD	FEMA's HHPD Program, State funds	2030

2025 OREGON NHMP FIVE-YEAR MITIGATION ACTIONS

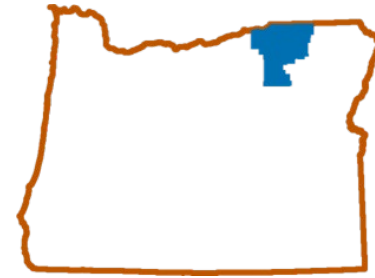
Priority	Mitigation Action	Contribution to Goal(s)	Lead/ Support Agencies	Potential Funding	Target Date
HHPD-2	Support an initiative to develop funding for rehabilitation efforts for high hazard potential dams (HHPDs).	Rehabilitating high hazard potential dams supports mitigation Goals 4 and 5 by reducing risks to people and property. Rehabilitation of known high hazard dams is critical to achieving Goal 4 , protecting people, and Goal 5 , protecting property.	OWRD	State funds	2030
HHPD-3	Complete floodplain management plans for inundation areas below priority high hazard potential dams (HHPDs).	Completing floodplain management plans supports mitigation Goals 4, 5, and 7 . Completing floodplain management plans supports Goal 4 , protect people, and Goal 5 , protect property, as robust management supports holistic hazard mitigation. Additionally, completing floodplain management plans reduces flood losses as defined by the NFIP, supporting mitigation Goal 7 .	OWRD	FEMA's HHPD Program, State funds, Local funds, Private funds	2030
HHPD-4	Re-evaluate extreme precipitation potential for high hazard potential dams (HHPDs).	Updated evaluation of extreme precipitation potential supports mitigation Goals 4 and 5 by contributing an up-to-date and robust knowledge of the risks presented by high hazard potential dams.	OWRD/ OCCRI, OCS	NOAA, State funds	2030

5.4 Mitigation Success Stories

5.4.1 Umatilla Flood Mapping Upgrades

Hazard: Flood

Location: Pendleton, Oregon – Umatilla River



Quick Facts

Goals:

- 4 – Protect Life
- 5 – Protect Property
- 8 – Eliminate development in hazardous areas

Mitigation Actions:

39, 62, 85

Lead Agency:

OWRD

Project Type:

Elevation, Mapping, HWM

Project Start:

02/05/2020

Project End:

12/31/2024

Project Cost:

\$200,000

Funded By:

FEMA

US Army Corps of Engineers

Context – Beginning on

Wednesday, February 5, 2020, several strong weather systems passed through northeastern Oregon resulting in heavy rain combined with snowmelt. This caused historic flooding along the Umatilla River through the City of Pendleton. This flood, coupled with flooding along tributaries to the Umatilla River in previous years, elevated flood concerns in Umatilla County.

Problem – Migration of the Umatilla River resulted in flooding adjacent property and invalidating effective flood maps. The impacted area consisted of a large watershed and the City of Pendleton and County had no significant expertise or funding to accomplish a remapping of the watershed.

Solution/Benefits – After the flood, the Oregon Silver Jackets team (a subcommittee of the Interagency Hazard Mitigation Team (IHMT)) leveraged programs of federal/state partners to assist the local communities. The USGS, OWRD, and the Corps performed site visits after flooding to collect high water marks. The high-water marks were used by OWRD to assess the frequency of floods and fill in missing information from the gaged data. The Corps levee safety program inspected levees and provided technical support to the communities. FEMA and the Corps partnered to scope out a flood study that collected survey data and models that will be used for a

remapping study through FEMA's risk map program. DOGAMI will be receiving funding to assess channel migration zones. The Corps floodplain management program was leveraged to model McKay Creek from McKay Reservoir to the Umatilla River.



Figure 1: Umatilla River flood of 2020.



Figure 2: Collection of HWM by OWRD staff.



Figure 3: USGS Surveying HWM data in a flooded development adjacent to the Umatilla River.

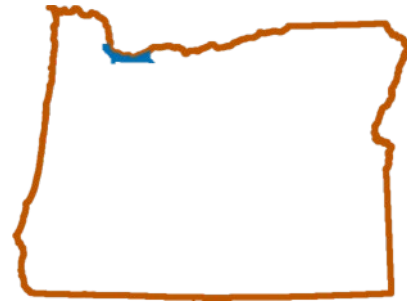


Figure 4: Collection of HWM along a riprap bank protection along the Umatilla River.

5.4.2 Willamette River Flood Mapping

Hazard: Flood

Location: City of Portland, Oregon



Context – The Oregon Silver Jackets group, a flood sub-committee to the State’s Interagency Hazard Mitigation Team (IHMT), takes advantage of available federal programs to meet state and local objectives. The Corps of Engineers Floodplain Management Program was leveraged to help the City of Portland develop a model that can be used to manage floodplain along the Lower Willamette River.

Problem – The current effective model for the Lower Willamette River from Willamette Falls to the Columbia River Confluences is based on an outdated model developed in 1980. The City of Portland

requires a “no-rise” analysis be performed for any activity within the channel. Superfund sites located along the Willamette River as subject to these No-Rise analysis; however, the current effective model is not suitable for these analyses.

Solution/Benefits – The Corps of Engineers in partnership with the Oregon Silver Jackets Team received funding to develop a flood model for the Lower Willamette River from Willamette Falls to the Columbia River confluence. This model is based on the best available LiDAR data and a bathymetric dataset developed by the City of Portland. This bathymetry is based on a compilation of the best available data and current survey of bridges along the Willamette. The resulting model was accepted by the City of Portland and FEMA to facilitate no-rise analyses by the superfund projects.

Quick Facts

Goals:

- 8 – Eliminate development in hazardous areas
- 9 – Minimize mitigation project impacts to the environment
- 12 – Integrate natural features and processes into risk reduction actions to protect people, property, and the environment from natural hazards.

Mitigation Actions:

39, 62, 85

Lead Agency:

DLCD

US Army Corps of Engineers

Project Type:

Elevation, Mapping

Project Start:

05/02/2020

Project End:

01/01/2025

Project Cost:

\$100,000

Funded By:

US Army Corps of Engineers

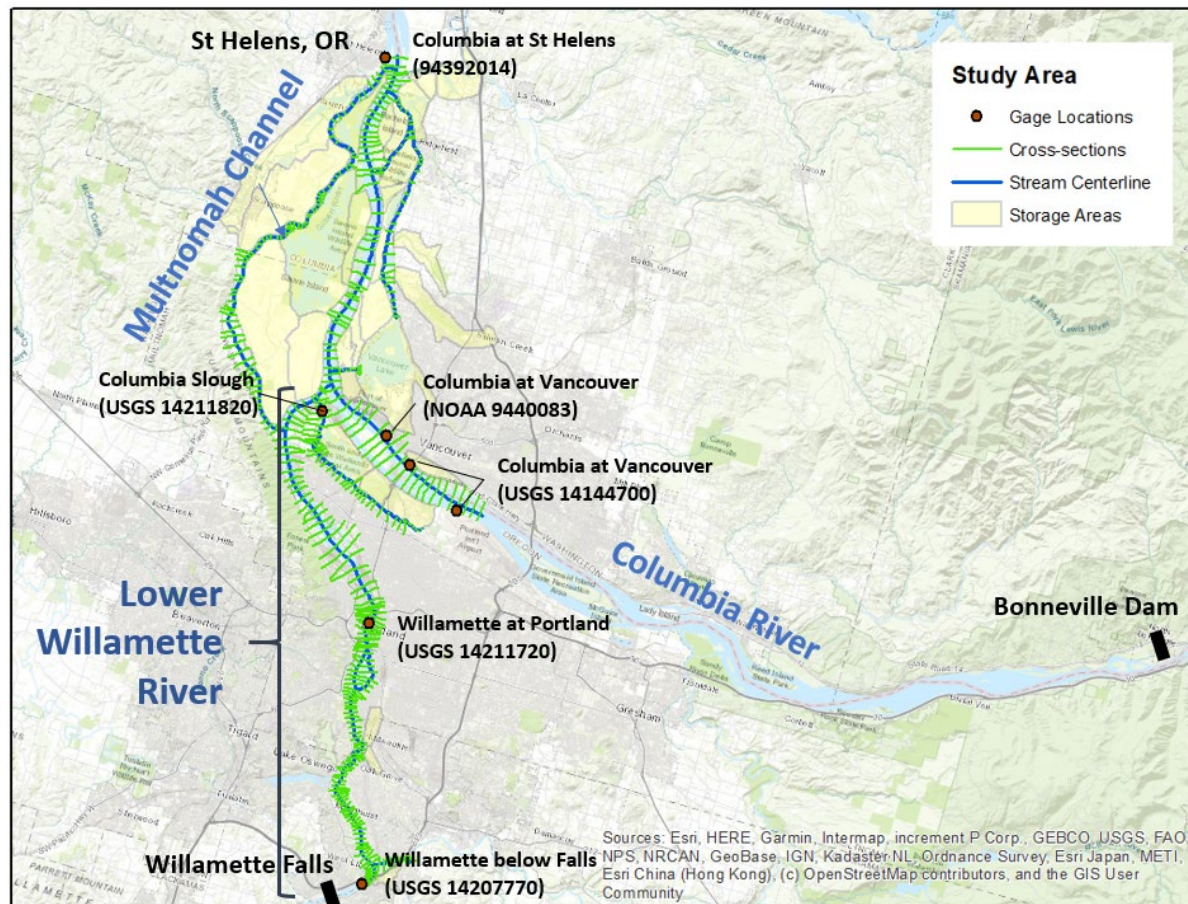


Figure 1. Study area and hydraulic model extents.

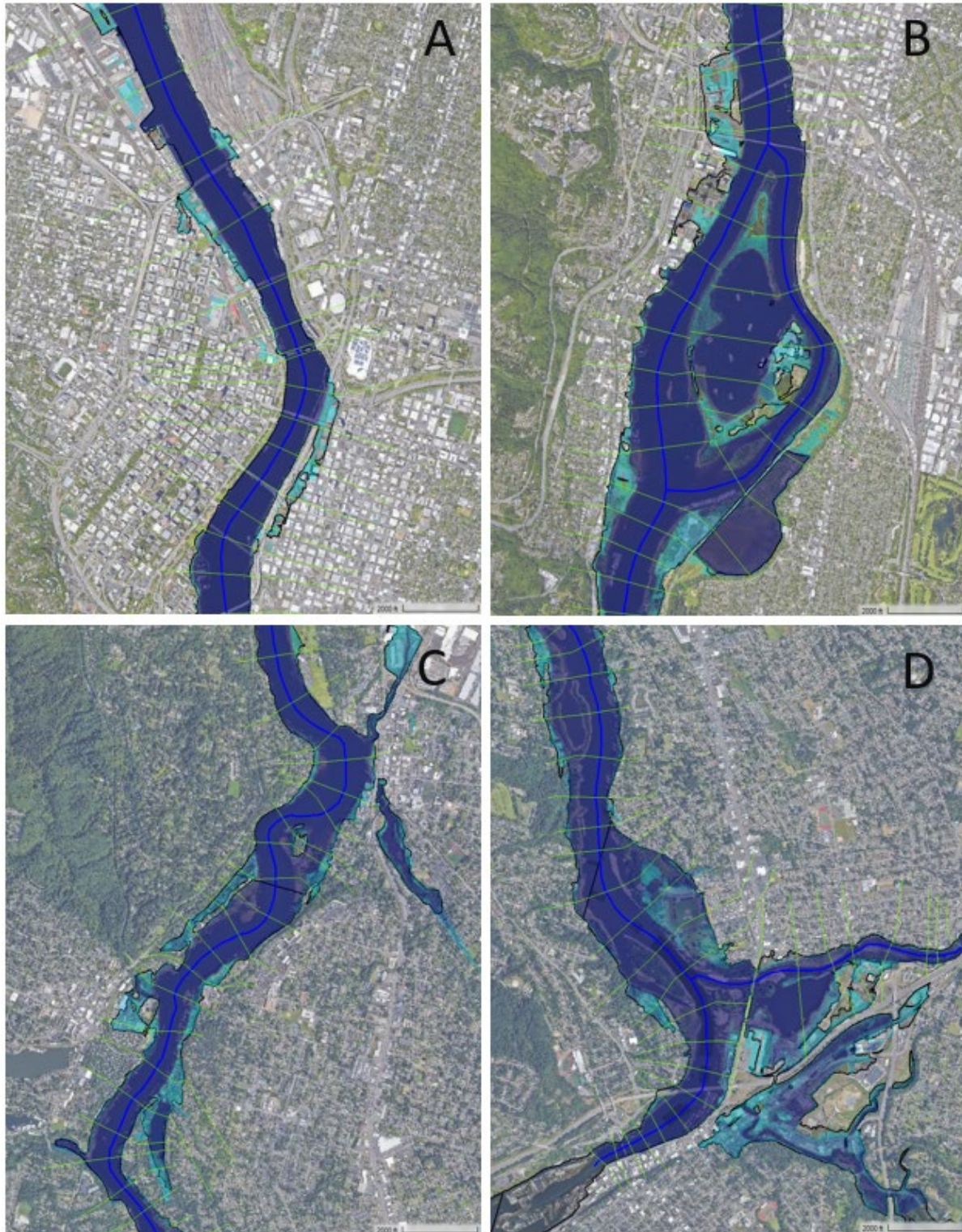
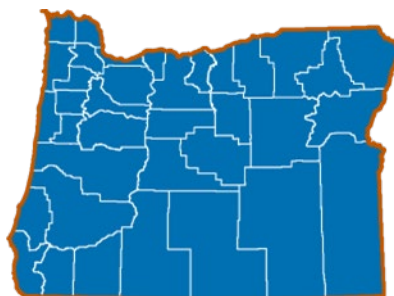


Figure 2: Comparison of modeled and observed inundation extents along the Willamette River for the February 1996 event

5.4.3 Oregon Energy Security Plan

Hazard: Winter and Windstorms

Location: Statewide



Context – The Oregon Department of Energy published the Oregon Energy Security Plan in September 2024 following direction from the federal government and SB 1567. The plan finds risks to electricity, liquid fuel, and natural gas/propane systems, and proposes ways to mitigate those risks.

Problem – The state found a need to comprehensively evaluate risks to energy systems across the state and bring together existing relevant threat information for electricity, liquid fuels, and natural gas systems and collected new data to fill data gaps.

Quick Facts

Goals:

11 - Increase the resilience of critical or essential infrastructure

Mitigation Actions:

42, 64, 75, 88

Lead Agency:

ODOE

Project Type:

Energy security planning

Project Start:

2023

Project End:

2024

Funded By:

Infrastructure Investment and Jobs Act (IIJA)

Solution – Using funding from the federal government’s Infrastructure Investment and Jobs Act (IIJA), the Oregon Department of Energy led a coordinated effort with other state agencies, the U.S. DOE, county and local governments, tribal governments, citizen groups, utilities, nonprofit organizations, businesses and industry leaders, and the public to develop and implement Oregon’s Energy Security Plan.

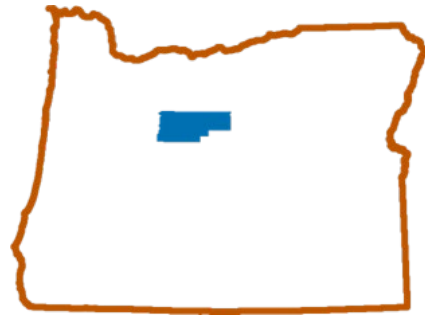
Benefits – The Oregon Department of Energy included an energy risk assessment and mitigation measures in the plan. improve Oregon's energy security. State, local governments, and Tribes — in collaboration with energy providers, nonprofit organizations, and all Oregonians — can use the information in the plan to better prepare for supply disruptions and make more informed decisions related to energy systems and infrastructure investments, resilience and hardening strategies, and asset management.

ODOE also developed, with support from partners and project contractors, a geospatial screening tool to assess the viability of existing fuel storage sites as potential candidates for fuel diversification and increased storage.

5.4.4 Flood Mapping Updates

Hazard: Flood

Location: City of Madras, Oregon



Context – Property owners and residents have stated that the current effective Flood Insurance Rate Maps (FIRM) for the City of Madras is not accurate. Often, they report that specific properties are not inundated with floodwaters during flood events. In response to this concern the City of Madras obtained a grant from the Army Corps of Engineers to re-map the floodplain. The city derived the original 1989 Flood Insurance Study from surveys, topographic maps, and other available tools at the time. The re-mapped floodplain was prepared primarily with Light Detection and Ranging (LiDAR) and was supplemented with surveys. LIDAR is accurate to +/- .10 inches, which is much more accurate than the tools used in the 1989 study.

Quick Facts

Goals:

- 4 – Protect life
- 5 – Protect property
- 8 - Eliminate development in hazardous areas

Mitigation Actions:

39, 62, 85

Lead Agency:

US Army Corps of Engineers

Project Type:

Mapping study

Project Start:

10/01/2017

Project End:

12/31/2024

Project Cost:

\$70,000 (\$4.5 million Bridge Replacement)

Funded By:

US Army Corps of Engineers –
Floodplain Management
Madras/County (Bridge Repair)

Problem – This study revealed several new findings. Most importantly, that the bridge over Willow Creek on J Street was not constructed to allow flood water to pass the bridge and would cause other areas of the city, such as The Pines subdivision, to be inundated with floodwater during a 100-year flood event.

Solution/Benefits – As a result of the flood study, the City and Jefferson County funded the expansion of the J Street bridge so that no additional properties would be included in the Special Flood Hazard Area because of the J Street bridge being undersized.

The bridge expansion was completed in 2023, and no additional properties will be included in the Special Flood Hazard Area because the J Street bridge being undersized.

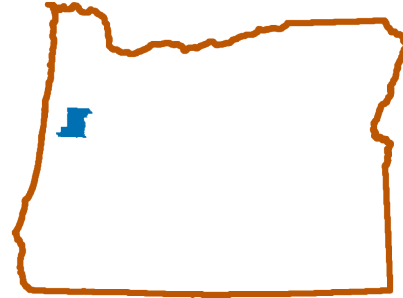


Figure 1: Old J Street Bridge.

5.4.5 Oregon Silver Jackets Flood Risk Assessment

Hazard: Flood

Location: Benton County, Oregon



Quick Facts

Goals:

- 4 – Protect life
- 5 – Protect property
- 8 – Eliminate development in hazardous areas
- 9 – Minimize mitigation project impacts to the environment
- 12 – Integrate natural features and processes into risk reduction actions to protect people, property, and the environment

Mitigation Actions:

17, 39, 85

Lead Agency:

Oregon Silver Jackets
Benton County, Oregon
DLCD

Project Type:

Training, Collaboration Initiative

Project Start:

05/15/2023

Project End:

09/30/2023

Project Cost:

\$40,000

Funded By:

Oregon Silver Jackets
Benton County Planning

Context/Background – There is a plethora of flood map products available for planners to use in their planning activities. Have you ever wondered what flood map product to use during a flood event or how to bring staff together to discuss all the tools and maps available for a day? The Oregon Silver Jackets team, the flood hazard sub-committee to the Interagency Hazard Mitigation Team (IHMT), helped clarify this in the summer of 2023. The Silver Jackets focused on the Willamette River through Benton County and worked with several partners from the Federal Emergency Management Agency (FEMA), Department of Land Conservation & Development (DLCD), USGS, Oregon Department of Emergency Management (OEM), the Weather Service, U.S. Army Corps of Engineers (USACE). The event was hosted by a local planner and floodplain staff from the community in Benton County, Oregon.

Problem – The County was reviewing its hazard mitigation plan. This meeting attempted to bridge the gap between emergency management and floodplain management departments found in many Oregon counties and cities. A goal of the flood risk assessment meeting was to help community staff understand the myriad of flood risk mapping products available and help the county integrate the products or lessons learned into their hazard mitigation plan and local floodplain management ordinance.

Solution – Floodplain Management is a team effort. This one-day training event brought together many staff to make connections, have conversations, and to receive instruction on the many products available to respond to and recover from a widespread flood event.

Benefits – Silver Jackets played an active role in helping staff understand the available maps and tools used to evaluate flood mapping and risk assessments for improved flood recovery and response actions overall.

Lessons Learned – There are many flood map products that have a unique purpose. Staff expressed that there needs to be more training around flooding and how to access the myriad of map products.



Figure 1: Corps of Engineers discussing flood maps.



Figure 2: The Corps Dam Safety discussing the National Inventory of Dams.

BRINGING EVERYONE TOGETHER: LET'S HAVE A CONVERSATION

Objectives:

- **Learn** about existing and newly available flood map products.
- **Practice** applying the maps to common flood and hazard scenarios.
- **Discuss** the utility of these products and how they can be improved.
- **Create** connections with agency and regional professionals.
- **Inspire** Future Collaboration

<https://arcg.is/19uqOz1>



Agenda

9:00 – Introduction and Information Sharing

Presenting agencies:

- Federal Emergency Management Agency (FEMA)
- Corps Dam Safety and Floodplain Management (USACE)
- National Weather Service (NWS)
- Department of Geology and Mineral Industries (DOGAMI)

12:00 – Networking Lunch

Get to know new colleagues, catch up with acquaintances, and ask questions of presenters. It's all about making connections!

1:00 – Practical Drill

Put your knowledge from the morning presentations to use by participating in a series of quick scenarios. Identify which map products will be helpful for each scenario and possible actions to take.

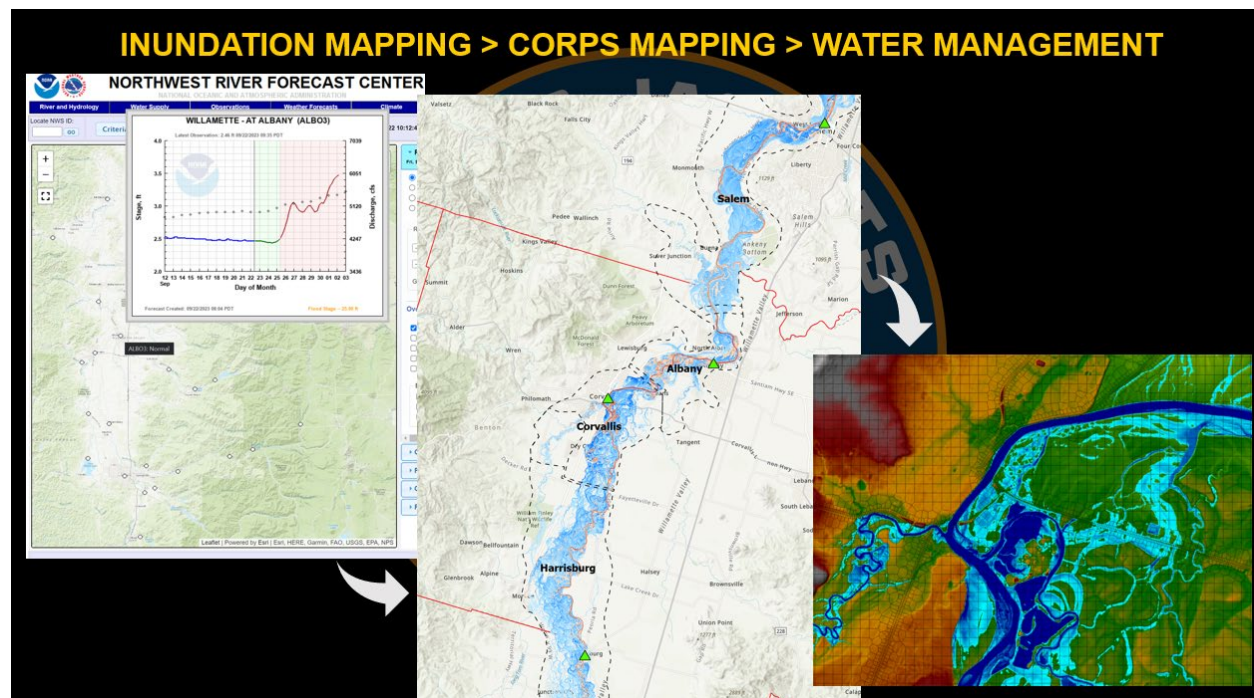
2:00 – Discussion and Feedback Session

Conclude the afternoon with a review of responses to scenarios followed by a collaborative discussion. No single agency or profession has all the answers!

Talk about practical application and use of the map products, ideas for improving flood mapping tools, and opportunities for collaboration on current and future projects.

4:00 – Adjourn

Inundation Mapping Slide:

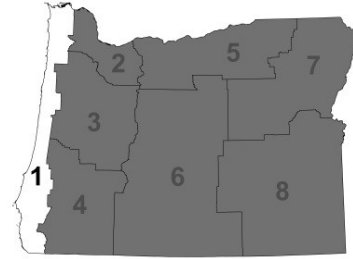


5.4.6 King Tide Signage

Hazard: Flood

Location: Oregon Coast

King Tide Signage



Context/Background – The king tides are the highest tides of the year. While “king tides” is not a scientific term, it describes a high tide event when the sun, moon, and earth are aligned causing higher than typical gravitational pull on the tides. When high tides occur coupled with other rain events, such as atmospheric rivers, the water level rise can cause flooding, erosion, and inundation to low lying coastal areas and may impact structures and property and cause risks for people in coastal areas.

Quick Facts

Goals:

- 4 – Protect life
- 9 – Minimize mitigation project impacts to the environment
- 12 – Integrate natural features and processes into risk reduction actions to protect people, property, and the environment from natural hazards

Mitigation Actions:

29

Lead Agency:

DLCD
Oregon Silver Jackets

Project Type:

Outreach, Signage

Project Start:

10/01/2022

Project End:

09/30/2024

Project Cost:

\$25,000

Funded By:

Oregon Silver Jackets

Observing king tides can provide us insight into what future sea level rise may look like in our coastal communities. Each year we see on average three (3) king tide events that can cause temporary narrowing of the shoreline along the Oregon coast.

Problem – Oregon is facing the effects of changing climate and ocean conditions. Sea levels are expected to continue to rise, causing more erosion and flooding in coastal areas. This is especially true during king tide events coupled with winter storms in Oregon. The Oregon Coastal Management Program (OCMP) have published a set of tools to plan for these changes. OCMP’s focus is to educate coastal communities on how to use these tools to build coastal resilience. Signage and video production helped OCMP achieve some of these goals.

Solution/Benefit – Installing interpretative King Tide Signage is one way for outreach and educating the public about king tides. Accessible signage was created with partnerships between DLCD Coastal group and Oregon Silver Jackets to produce signage that coastal planning staff could install within their community around the topic of king tides. The signage includes a modern QR code and illustrations to educate the public about the king tides. Additionally, the signage is intended as a flood risk reduction outreach as the king tides attract many residents and visitors to the coast every year to view this phenomenon. DLCD shared the signs with those coastal communities interested in installing signage in their communities. A supporting video was produced to provide additional training information for coastal communities.



King Tides Signage in Taft, Lincoln City (Rhiannon Bezore, 2024)



King Tides Signage in Warrenton (Warrenton staff, 2021)

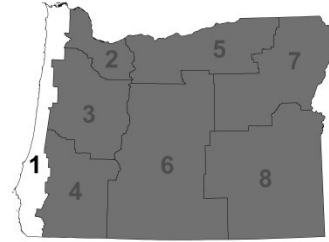


Reduced beach access at Tolavana Park, Cannon Beach (Kerry Burg, 2024)



Reduced beach access at Tillicum Beach State Park, Yachats (S. Thompson, 2024)

5.4.7 CTUI Reservation Property Acquisition and Demolition Project



Hazard: Flood

Location: The Confederated Tribes of the Umatilla Indian Reservation

Context/Background – The Umatilla Indian Reservation (UIR) is approximately 172,000 acres (273 square miles) in northeast Oregon established by an 1855 treaty with the Walla Walla, Cayuse and Umatilla Tribes, who make up the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). This treaty ceded approximately 6.4-million acres to the U.S. government in return for a promised 520,000

acres, though a subsequent government survey halved this reservation to 265,000 acres. Oregon’s Slater Act of 1885 and the U.S. General Allotment Act of 1887 reduced the reservation again to 172,000 acres and split the land into individual allotments. Under the allotment system, the U.S. government gave CTUIR men 160 acres, women 80 acres, and children 40 acres. The rest was considered “excess” and sold to non-Native American immigrants coming West, creating a checkerboard of Indian and non-Indian ownership across the UIR: CTUIR-owned trust, allotted trust, CTUIR-owned fee, and non-Indian-owned fee.

The CTUIR is governed by an elected non-member Board of Trustees under a 1949 Constitution and Bylaws. The CTUIR has land use jurisdiction on all lands within the UIR external boundaries regardless of ownership under a 1990 Memorandum of Agreement with Umatilla County. In the mid-1990s, CTUIR developed a land-acquisition program with a goal of ensuring over 50% of the land on the reservation is Indian-owned. The UIR land currently is 52% trust acres and in Individual Indian/Tribal ownership, including trust and fee, while 48% of the land is owned by non-Indians.

The UIR currently has a total population of 3,069; approximately 1,500 are enrolled CTUIR Tribal Members, 300 are enrolled with other federally recognized Tribes, and the remaining population is non-Indian. CTUIR has over 3,100 enrolled Tribal Members,

Quick Facts
<p>Goals:</p> <ul style="list-style-type: none"> 4 – Protect Life 8 – Eliminate development in hazardous areas. 9 – Minimize mitigation project impacts to the environment 12 – Integrate natural features and processes into risk reduction actions to protect people, property, and the environment from natural hazards <p>Mitigation Actions:</p> <ul style="list-style-type: none"> 17 <p>Lead Agency:</p> <ul style="list-style-type: none"> OEM CTUIR <p>Project Type:</p> <ul style="list-style-type: none"> Property buyout and restoration <p>Project Start:</p> <ul style="list-style-type: none"> March 2022 <p>Project End:</p> <ul style="list-style-type: none"> December 2024 <p>Project Cost:</p> <ul style="list-style-type: none"> \$3,285,000 <p>Funded By:</p> <ul style="list-style-type: none"> FEMA HMGP

with about half living on or near the UIR.

A significant portion of the Umatilla River watershed is located on the UIR. Topographical features of the UIR include lower elevation (1,200') agricultural/grazing lands and higher elevation forested lands of the Blue Mountains (4,500'). Higher elevation land receives significant annual snowfall, which drains into the Umatilla River. The UIR has experienced a significant increase of flood events due to rapid weather changes, high temperature and rain, which cause quick melt of the snowpack.

In early February 2020, Eastern Oregon experienced an unusually wet Spring when an atmospheric river transported moisture from the Pacific Ocean. This resulted in moderate to heavy snow that transitioned to rain in Umatilla County's Blue Mountains. The heavy rain combined with snowmelt runoff resulted in one of the worst flood events in the region. The peak flow on the Umatilla River at Pendleton on February 6 was estimated to be around 19,000 cubic feet per second (cfs), eclipsing the previous high flows of 13,300 cfs in February 1996 and 15,500 cfs in January 1965. This flood also permanently altered the Umatilla River's course. The 2020 Umatilla River Flood damaged or destroyed a number of homes on the UIR, as well as downriver in the cities of Pendleton, Echo, and other areas within the watershed. The Oregon Governor and U.S. President made disaster declarations for the area.

Problem – Over 15 tax lots on the UIR were directly impacted by the 202 Umatilla River Flood. All structures were within the National Flood Insurance Program (NFIP) Special Flood Hazard Area (SFHA). Residential structures were substantially damaged; they either sustained major damage or were destroyed.

Solution – Through FEMA's Hazard Mitigation Grant Program (HMGP), local communities and Tribes may purchase flood-prone properties, remove the buildings, and maintain the land as open space. Acquisition is voluntary and can help mitigate flood risk after a Presidential Disaster Declaration. The UIR applied for and received three HMPG grants to acquire and remove structures, septic tanks and drain fields, utilities, wells, and all unnatural debris from over 15 properties in the SFHA.

The CTUIR proposed to phase this project, to allow adequate time to address environmental and historic preservation (EHP) requirements (at least 25 structures needed historic built environment evaluations), which must be completed prior to demolition; and to prevent further delay of the property acquisitions. Phase 1 included pre-award costs, acquisition, EHP review, and property boundary surveys. Phase 2 included demolition, decommissioning, and closeout.

Benefits – CTUIR purchased the properties at pre-flood fair market value with the applicable deed restriction for the properties to remain in open space without future development except as prescribed under HMGP provisions. Following acquisition and environmental clearance, the CTUIR requested FEMA approval to submit fee-to-trust conversion applications to the US Department of Interior for these properties to be held in trust for the CTUIR.

The CTUIR Cultural Resources Protection Program within the Department of Natural Resources employs archaeologists and the Tribal Historic Preservation Officer (THPO). This program conducted an archaeological pedestrian survey of all properties which revealed the requirement for additional EHP reviews. Many of these properties were original Indian allotments that had been sold into non-Indian ownership and removed from trust status to fee. In addition to mitigating future flood damages, this project also contributed to the CTUIR mission to reacquire land on the UIR that is owned by non-Indians.

Below are some before and after photos of one property.



Figure 1: Caldwell Property pre-demolition



Figure 2: ADU on Caldwell property, pre-demolition.



Figure 3: Shop/bar pre-demolition



Figure 4: Cleared property



Figure 5: Cleared property and hydroseed

5.4.8 Sea Level Rise Vulnerability Toolkit

Hazard: Coastal Hazards

Location: Clatsop County



Context – The Oregon Coastal Management Program (OCMP) has created several tools to help communities plan for a changing coastline.

Problem – Climate change is causing global sea levels to rise. Oregon’s coastlines and coastal communities are vulnerable to the impacts of sea level rise. The Oregon Coastal Management Program (OCMP) has developed tools to assist local communities in planning for the impacts of sea level rise.

Solution – The OCMP in partnership with a NOAA Coastal Management Fellow created several tools to address these vulnerabilities.

Quick Facts

Goals:

- 5 – Protect property
- 8 – Eliminate development in hazardous areas.
- 15 - Motivate whole community resilience

Mitigation Actions:

29

Lead Agency:

DLCD

Project Type:

Sea level rise mapping

Project Start:

2022

Project End:

2024

Funded By:

NOAA Coastal Management Program

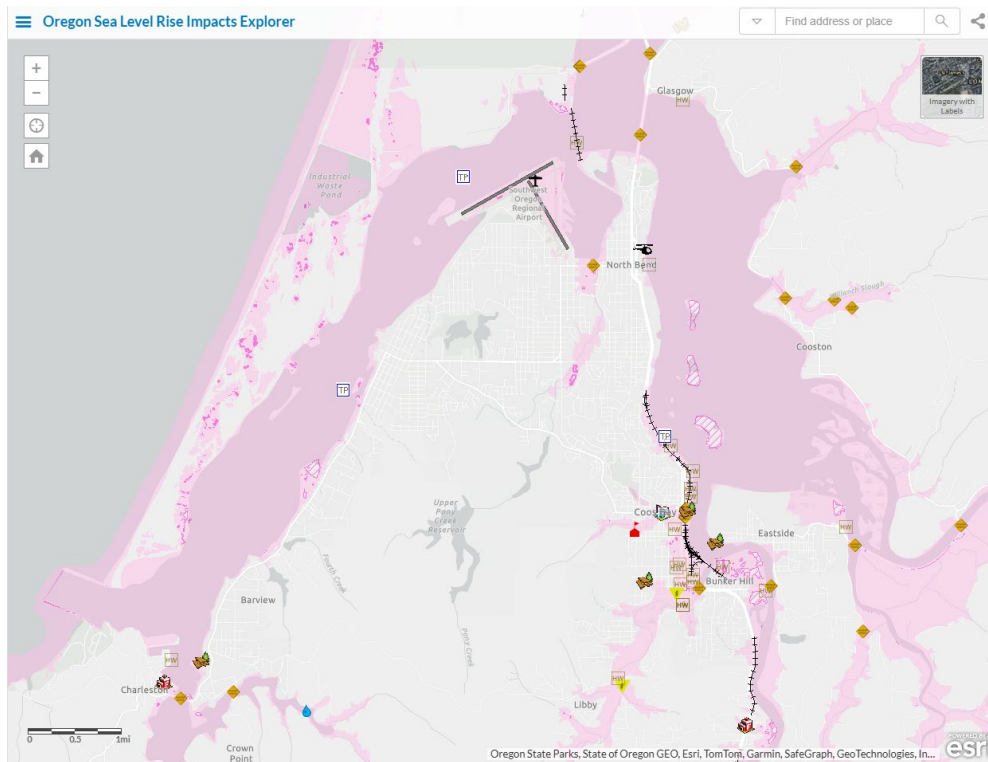
OCMP staff developed a toolkit for local governments and communities to assess and address the impacts of sea level rise, which consists of three parts:

1. [Sea Level Rise Impact Explorer](#) is a combination of multiple data sources and is meant to serve as a planning tool. The dataset is not regulatory unless a jurisdiction adopts it. There are three main geographies covered by the sea level rise planning area: outer coast, estuaries, and Columbia River. A mix of datasets are displayed for these three geographies and are meant to approximate the areas that will be impacted by sea level rise, using the current best available data. Inclusion of an area in the SLR planning area could mean permanent inundation or that the area will be impacted by high tide flooding, storm surge, or erosion events.
2. [Sea Level Rise Impact Assessment Tool](#) is a set of spreadsheets designed to help users inventory what activities take place within affected areas, assess vulnerability to harm, and prioritize further investigation into remedial and adaptive actions. This process can serve as the jurisdiction’s or organization’s vulnerability assessment. [Instructions for the Impact Assessment worksheets](#).
3. [Sea Level Rise Planning Guide for Coastal Oregon](#) is a toolkit that provides a suggested approach to evaluate the assets at risk from the impacts of sea level rise and offer potential adaptation strategies to adapt to those impacts. This document is intended to guide local planning and development decisions on the Oregon Coast to support community resilience and ensure effective coastal management actions.

A 2022-2024 NOAA Coastal Management Fellow joined the Oregon Coastal Management Program team to focus on sea level rise adaptation planning and help implement the tools described above.

Benefits

The fellowship project provided direct capacity to advance sea level rise adaptation planning at the local level in Clatsop County. This will involve hosting community outreach and open house events to identify community assets at risk from sea level rise and working with communities to prioritize and develop sea level rise adaptation measures.

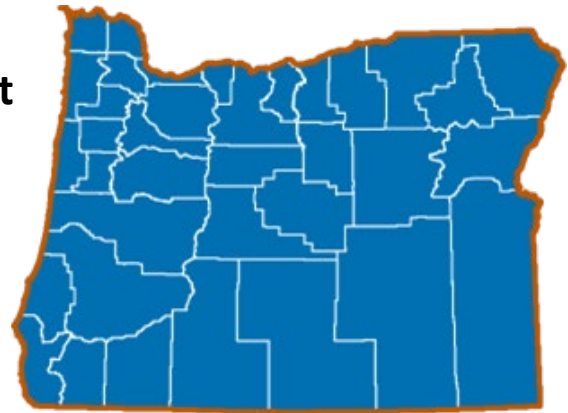


Snapshot of the Oregon Sea Level Rise Impacts Explorer tool. Community assets are mapped within potential sea level rise areas, illustrating areas for future mitigation investment.

5.4.9 Statewide Climate Change Social Vulnerability Assessment

Hazard: Climate Change

Location: State of Oregon



Context/Background – Climate change is disrupting our natural and built environments, our health, livelihoods, and sense of place. The Department of Land Conservation and Development (DLCD) conducted a survey and in-person workshops in the fall of 2022 and spring of 2023 to learn more about how the effects of climate change impact Oregonians. DLCD learned that people across the state value access to the outdoors, community gatherings, clean air and water, high-quality food, and local decision-making power. Many Oregonians are concerned about how climate change might impact their wellbeing, livelihoods, and sense of place. Workshop and survey participants want their state government and local governments to support and facilitate locally relevant climate change adaptation actions intended to strengthen the built and social environment.

Problem – Effective climate change adaptation actions are as varied and complex as the communities in which they are deployed. This project found that Oregonians are ready to begin climate change adaptation, and they want adaptation actions to be in sync with local values.

Solution – One of the predominant themes is the request for true partnership — that state technical and financial support is welcome if local voices are included in project design, implementation, and management. Furthermore, Oregonians want state agencies to integrate what they are already doing into a comprehensive climate change adaptation program.

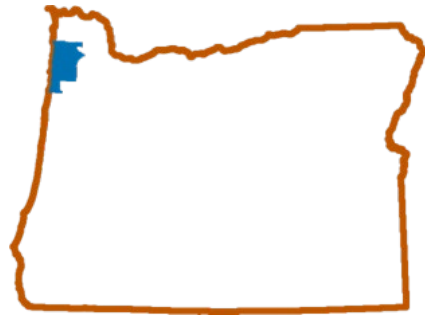
Benefits – The multi-agency Climate Change Adaptation Framework Team offered key recommendations that are intended to be updated and adjusted with each 5-year update.

The Climate Change Adaptation Framework has been appended to Oregon’s Natural Hazard Mitigation Plan, to support efficient and timely update cycles and synchronicity between these two plans.

5.4.10 Southern Flow Corridor tidal wetland habitat restoration

Hazard: Coastal flooding

Location: Tillamook, Oregon



Context/Background – The Southern Flow Corridor (SFC) was designed to create salmon habitat and decrease flooding. This project, completed in 2017, now has a new report detailing the economic and social benefits and successes of the project.

Problem – In Tillamook, Oregon, construction of dikes and channels has led to significant local declines in wetlands (Brophy 2019). Loss of wetland habitat has led to negative long-term effects on both developed areas nearby such as nuisance flooding, and overall ecosystem function of estuaries such as dwindling vital habitats for native fish and wildlife. In 2006 a storm event caused flooding, erosion, and landslides around the town of Tillamook resulting in millions of dollars in damages.

Solution – To respond to the 2006 storm event and mitigate future coastal hazards, a formal Declaration of Collaboration was signed by 24 local, state, and federal agencies, public organizations, members of legislative and executive government, and local farmer associations to address this flood risk. The SFC restoration effort was the result of this collaboration. Restoration areas included tidal wetlands, which protect against storms and flooding, supporting fish and wildlife populations, providing scenic views, cleaning water, and providing a buffer against sea level rise (Barbier et al. 2011).

Benefits –

- **Water Quality:** The SFC restoration site is likely trapping sediment flowing into it from the Wilson and Trask Rivers, decreasing the amount of sediment settling in Tillamook Bay. This may decrease the frequency and/or amount of dredging needed to maintain shipping lanes, saving approximately \$1,500 to \$8,000 per year. Continued monitoring is recommended to quantify and value potential additional ecosystem service benefits associated with improvements in water temperature and dissolved oxygen levels. New research on abated nutrient loads is suggested as restored wetlands hold large potential to reduce agricultural runoff.
- **Flood Mitigation:** Under a set of assumptions, it is estimated that reductions in flooding on Highway 101 may produce benefits associated with avoided travel costs of approximately \$7,200 per flood event. No conclusion could be drawn from a comparison of flood insurance claims comparing moderate flood events before and after site restoration. Post-project modeling exercises suggest the restoration may reduce flooding significantly in the adjacent communities. There were large annual benefits from restoration found in the housing market analysis (see below) that likely can be attributed to reducing flood risk. Future studies are recommended to (i) quantify the flood reduction benefits as more events occur post-restoration and (ii) to investigate the potential benefits of the SFC site in mitigating the impacts of local sea level rise.
- **Salmon Habitat:** Restoration of tidal wetland habitat led to an observed increase in the number of sub-yearling Chinook salmon and staghorn sculpin using the SFC site. Millions of dollars in economic benefits through use (recreational fishing) and non-use (existence value) values may

be possible if the site contributes to increasing the abundance of returning adult salmon populations in Tillamook Bay. Further monitoring and research are needed to evaluate potential changes in both sub-yearling and returning adult populations of Chinook, coho and other species as the SFC site matures to realize and estimate these benefits of habitat restoration.

- **Carbon Storage:** Estimates suggest the SFC site may store up to 27,000 tons of carbon through organic material accretion and burial. Using simplifying assumptions and current social cost of carbon estimates, the net present value of carbon storage is estimated to range from \$530,000 to \$736,000. The site has potential to emit greenhouse gases as the wetlands mature, so continued monitoring efforts are needed to track the net carbon fluxes at the restoration site in the future.
- **Benefits to the Community:** Although no primary data were collected on recreation or other social and cultural benefits provided by the SFC restoration, this report provides examples of economic values for benefit flows that recreational fishing, hiking, or kayaking at the site may generate. Surveys soliciting information about site usage will be necessary to quantify the economic benefits of the site to the local community, indigenous peoples, and the state of Oregon.
- **Housing Market Analysis:** A difference-in-differences hedonic pricing model suggests that housing prices in residential areas near the SFC restoration increased by 10 percent after completion of the project relative to homes further from the project. This represents an average benefit of \$19,000 per home within $\frac{3}{4}$ of a mile of the site. Aggregated by the number of residential homes near the site, the total range of benefits resulting from the SFC restoration estimated from the econometric model is between \$5.2 to \$32.9 million, suggesting the housing market benefits alone may be greater than project costs (\$11.2 million).
- **Economic Impact Analysis:** During the four years of the SFC restoration (2013-16), an IMPLAN analysis conducted by NOAA estimates that the project supported 108 jobs and \$14.6 million in total economic output in the state of Oregon.

5.4.11 Wildfire Defensible Space

Hazard: Wildfire

Location: Ashland, Oregon

Wildfire Defensible Space

Context/Background – Defensible space is the buffer you create between a building on your property and the grass, trees, shrubs, or any wildland area that surrounds it.

Managing the vegetation around your home plays an important role in reducing the risk of losing your home to wildfire by allowing firefighters to safely defend it in the event of a fire. By managing the vegetation around your property, you can significantly reduce the risk of losing your home.

During large wildfire events, with the likelihood of only a limited number of resources being available for home protection in many neighborhoods, defensible space can increase an individual home's chances of surviving without firefighter intervention.

Problem – Ashland's setting, history of wildfires, and increasingly long, hot, and dry summers put us at high fire risk each year. In 2018, the entire City of Ashland was designated as a Wildfire Hazard Zone.

Solution – Ashland Fire and Rescue and the City of Ashland were awarded a \$3 million Federal Emergency Management Agency (FEMA) grant as a part of its Pre-Disaster Mitigation Grant Program.

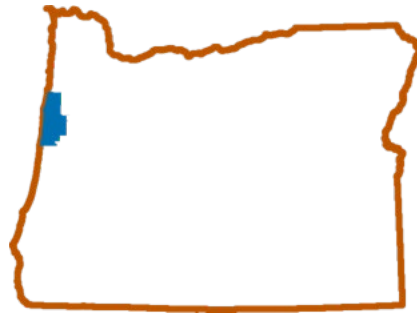
Benefits – This grant aims to create wildfire-defensible space around 1,100 homes throughout the city. The objective of the Pre-Disaster Mitigation (PDM) program is to reduce overall risk to the population and structures from future hazard events as well as reduce reliance on federal funding from future disasters. Specifically, the purpose of this proposed PDM project is to slow the spread of wildfire within the City of Ashland and reduce the likelihood of wildfire impacts on people and property.



5.4.12 Coastal Resilience Conservation Project

Hazard: Coastal Hazards

Location: Confederated Tribes of the Siletz Indians (CTSI) in Lincoln County



The Oregon Department of Land Conservation and Development's (DLCD) Coastal Management Program and the Confederated Tribes of Siletz Indians (CTSI) announce \$4.85 million in Bipartisan Infrastructure Law funding for the conservation of an iconic property along Oregon's coastal shoreline. This project aims to protect a 42-acre property on the central coast of Oregon, safeguarding its unique ecological and cultural significance.

Quick Facts

Lead Agency:

DLCD Coastal Management Program
Confederated Tribes of Siletz Indians (CTSI)
Lincoln County

Project Type:

Land preservation for cultural stewardship

Project Start:

May 2024

Project End:

Ongoing

Project Cost:

\$4.85 million

Funded By:

Bipartisan Infrastructure Law funding

The National Oceanic and Atmospheric Administration (NOAA) recently announced 22 award recommendations nationwide, totaling \$59.8 million in funding for coastal management programs. This funding is intended to increase resilience through landscape-scale habitat restoration and conservation projects. The \$4.85 million awarded to Oregon will provide funding necessary for CTSI to acquire the property which supports some of the rarest and most ecologically-significant habitats on the Oregon coast, rich marine and terrestrial species diversity, and unique habitat corridors — from the ocean to upland rainforest — critical for species migration and connectivity. These unique habitat qualities are of equal cultural importance to CTSI, bolstering the resilience of the Tribe and coastal community.

With its nearshore and marine protected habitats, freshwater streams, diverse shoreline shrub and forest habitat, and unique Sitka spruce wetlands, this property will be the centerpiece of a regional tribal effort focused on invigorating cultural traditions. The property is located within a region that was historically (pre-contact) heavily settled by the Alsea band of CTSI. The Alsea people were seal and sea lion hunters

who fished the nearshore habitats.

While the Siletz people have been stewarding Oregon's central coast since time immemorial, CTSI experienced a loss of over 100 miles of coastal shoreline ownership nested within 1.1 million acres of original reservation land. With this funding, CTSI will regain ownership of this 42-acre property and conserve the land as an anchor for cultural resilience and regional collaboration in nearshore, forest, and wetland conservation and education. The Siletz people will provide opportunities for education and outreach about the richness of the Oregon coast, the central role of the tribes in its stewardship, and the value of conserving lands and waters.

Oregon’s central coast region, known for its pristine landscapes and vital ecosystems, faces increasing threats from development and climate change. Partners invested in this work are building on the conservation of this land towards a central coast conservation and education program that strengthens community resilience. Lincoln County, the Lincoln County Board of Commissioners, and the Lincoln County Department of Planning and Development have been strong supporters of this project and CTSI. With established relationships and shared goals, the County and CTSI leveraged their initial investments to move this project forward.



Photo Credit: Lincoln County.