Washington State Enhanced Hazard Mitigation Plan

Annual Report 2019

January 2020

Our first annual report

This year marked the first full calendar year after the most recent update to the Washington State Enhanced Hazard Mitigation Plan (SEHMP) was completed in October 2018 (click here to read it). Although the 2018 SEHMP is still in its infancy, the work to maintain it, implement its mitigation strategy, and improve upon our hazard identification and risk assessments is always ongoing and evolving. In 2019, we accomplished important statewide and local-level mitigation goals toward implementing the SEHMP's mitigation strategy, continued development of multiple tools for improved hazard vulnerability analysis, kept our thumb on the pulse of hazard research throughout Washington and the US, and even updated a portion of the SEHMP.

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An early update to the 2018 SEHMP

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A new "risk portal" is in the works and should be rolled out in early 2020, plus new coastal erosion risk assessments

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A few examples of local mitigation successes

Mitigation activity in 2019

Our SEHMP has already been updated!

This year, EMD's Mitigation and Recovery team updated the SEHMP to include more information about the risk of dam failure in order to meet the eligibility requirements under the new Rehabilitation of High Hazard Potential Dams (HHPD) Grant Program (click here for more information). Among these eligibility requirements is a state-level hazard mitigation plan that includes all dam risks. Unfortunately, the 2018 SEHMP was written and approved before the official guidance was released. As a result, even though the 2018 SEHMP includes a chapter on dam failure hazards and risk, there were a few gaps in the SEHMP that needed to be filled.

We worked with the Dam Safety Office (within the Department of Ecology) throughout 2019 to gather and synthesize all that Washington State is doing to assess dam safety, monitor high hazard potential dams, rehabilitate and restore dams, and analyze the risk of dam failure. In November 2019, we submitted our revisions to FEMA for its review, which is expected to be complete sometime in early 2020. Once the revisions have been approved, we will publish the new 2018 SEHMP and conduct outreach across state and local partners to share the information. Once the new information is officially included in the SEHMP, counties can include dam failure considerations in hazard mitigation plans and become eligible for HHPD Grant Program funds.

Data collection and information gathering

Filling hazard gaps and improving communication

Ongoing data collection for use in the next comprehensive update to the SEHMP continued throughout 2019. We are constantly searching for the most rigorous and methodologically sound ways of determining hazard risk and vulnerability to ensure we have the most holistic assessment of statewide risk possible. As such, we began preliminary research into best management practices for the quantification or semi-quantification of hazard risk and vulnerability and the collection of data around natural hazards that may be included in future versions of the SEHMP. These include environmental toxicological hazards, extreme heat, and air quality.

In addition to filling gaps in hazard identification, we are also working to develop ways to improve the SEHMP as a communication and learning tool. Our hope is the SEHMP can be a top resource for the public, government agencies, researchers, and planners to learn about the various risks facing Washington and the state's goals for reducing those risks.

Natural hazard spatial data

We engaged with the Office of the Chief Information Officer (OCIO) and other State agencies on aggregating natural hazard-specific datasets for the Washington Geospatial Open Data website. EMD and other agencies went through spatial data and determined which are applicable to natural hazards and shared them with OCIO. They are now on the website for both public use and improved State agency use for natural hazard analysis. We see this as a big win for improving interagency coordination!

New lidar data from Department of Natural Resources

The Department of Natural Resources completed the Washington State Lidar Plan in 2019. Lidar (light detection and ranging) is topographic mapping technology using laser beams to produce three-dimensional elevations of the land surface. The result is high quality spatial data that can be used in numerous applications, not the least of which is better analysis of land surface changes that may manifest in natural hazards such as flooding, landslides, and erosion. For example, because lidar technology provides the ability to image the ground even through dense forest canopies, it can reveal changes in the land surface that may be hidden from traditional satellite imagery. A prime example of using bare-earth lidar models is found along the Cedar River (King County), where lidar revealed five landslides that could impact the flow of Cedar River and a better understanding of landslide potential in the area (Figure 1). Bare-earth models also allow closer study of river channel migration by seeing through the vegetation to sense the evidence of stream erosion. Knowing the evolution of stream channels can help us determine the full extent of floodplains and potential erosion risks. Lidar is also being used by Washington State geologists to map faults, to study volcanoes (e.g., lahar hazard zones and the extent of past lava flows), glaciers, and model tsunami inundation.

Figure 1. Landslides in the Cedar River valley revealed through lidar bare-earth models (Source: DNR, 2017)

Interagency coordination

Among our top goals of the 2018 SEHMP is to coordinate across multiple agencies for the purposes of improving communication around and implementation of risk reduction activity. A big part of that effort is accomplished via the Hazard Mitigation Working Group (HMWG). The HMWG met quarterly in 2019. Topics included:

- How we can improve coastal risk assessments through better modeling (e.g., bringing the CoSMoS model to WA)
- Updating the State's Geoportal with hazard-specific spatial data
- Lessons learned from the Regional Resiliency Assessment Program's assessment of Washington State transportation systems
- Improved understanding and assessment of wildfire smoke and its impact on public health
- Improved interagency coordination for statewide hazard identification and risk analysis
- Use of state agency subject matter expertise in local hazard mitigation plan review
- Updates on other hazard mitigation-related initiatives that can inform the SEHMP (e.g., the Disaster Resiliency Work Group facilitated by the Office of Insurance Commissioner)

In addition to the HMWG, we also worked with numerous other interagency groups in 2019. These included the Interagency Climate Adaptation Network, Coastal Hazards Resilience Network, Infrastructure Assistance Coordinating Council, and the Disaster Resiliency Work Group. Each of these groups (and others) are important vessels for hazard risk reduction and resilience, and we are happy to be contributing.

State-level mitigation projects

"Risk Portal"

We contracted in 2019 with the University of Washington's Institute for Hazard Mitigation Planning and Research to develop a "risk portal." The goal of this project is to improve the ability of local jurisdictions and other planners to conduct robust and reliable hazard risk assessments. The "risk portal" itself will be a web-based GIS application that virtually anyone can use to determine risk to various community assets under a range of scenarios. With the basic application built out, we are now working with the UW team to ensure GIS data used are accurate and as up-to-date as possible, as well as identifying areas for improvement and data gaps. The finished product is expected sometime in early 2020.

We are particularly excited about this work given its utility for anyone conducting hazard identification and determining the spatial extent of hazard exposure. In fact, we see it as aligning perfectly with the SEHMP goals of providing technical assistance to local jurisdictions, developing comprehensive assessments of hazard risk, and improving our own internal capacity for mitigating hazards.

Coastal erosion risk assessment

We also contracted with the Department of Ecology's Coastal Monitoring and Analysis Program (CMAP) this year to perform a coastal erosion risk assessment for the Outer Coast. Coastal erosion was identified as a significant natural hazard in the SEHMP for the first time in 2018, which also acknowledged a need for a comprehensive understanding of erosion risk. This project is intended to support the collection of data and analysis to determine risk from active changes in geomorphology in key areas, such as population centers. Although the CMAP research team experienced some difficulty in accomplishing their data collection goals in 2019, the project is still scheduled for completion in Spring 2020.

Tsunami Workgroup, Modeling, and Mapping

The Tsunami Workgroup held five meetings in 2019. These included two for the Outer Coast Tsunami Workgroup, two for the Inner Coast Tsunami Workgroup, and one joint meeting. The next joint meeting is planned for February 2020.

The Inner Coast group focused heavily this year on making inner coast stakeholders more aware of tsunami danger as an effort to improve mitigation activity there. We've seen some traction as a result, including the Port of Bellingham's ongoing development of a Maritime Response and Mitigation Strategy for the port and surrounding areas. We hope to target other inner coast ports for similar strategy development in future years.

The Tsunami Workgroup also worked with DNR's Washington Geological Survey, University of Washington, and the Pacific Marine Environmental Lab to conduct tsunami modeling and mapping this year. The team produced several great tsunami simulations for both statewide and localized scenarios, as well as tsunami hazard assessments for Island, Skagit, and south King County, published evacuation walk maps for Port Townsend, Ilwaco, Long Beach/Seaview, and Westport, and assisted Pacific County Fire District #1 with site selection for a proposed vertical evacuation structure.

Local-level mitigation projects

Pre-Disaster Mitigation Program in 2019

In 2019, we received 92 pre-applications for FEMA's Pre-Disaster Mitigation (PDM) grant program. These pre-applications are among the best information we have regarding local-level interest in implementing hazard mitigation projects across Washington. The 92 pre-applications come from every part of the state, from the Olympic Peninsula to the Cascades to the Palouse Prairie. The projects detailed in each of the pre-applications reflect a need by local governments to address the hazards of earthquakes, tsunamis, wildfires and floods, as well as updating county-level hazard mitigation plans. The estimated value of these proposed projects total more than $277 million, representing a significant need for mitigation funding opportunities across the state. In December 2019, we reviewed and evaluated the pre-applications to determine which will be invited to submit a full application. The full applications will be reviewed by the State for completeness and ability to compete nationally.

Hazard Mitigation Grant Program in 2019

This year saw fewer disaster declarations than others in recent memory, with only one declared disaster in March. The result was a relatively small HMGP round, but we were able to submit about $3.5 million in mitigation project proposals to FEMA. Additionally, no fire management assistance declarations were issued this year, so no HMGP-Post Fire funds were made available. However, we made steady progress on projects funded under previous years' declarations, some of which go back to 2015 or earlier.

More HMPs on the books

This year, one of our top priorities was to increase the number of FEMA-approved county-level hazard mitigation plans (HMP). For what may be the first time ever, all counties in the state now have either a FEMA-approved HMP or are currently working on one. Now a majority of Washington has done the hard work of identifying hazards, assessing risk, and developing mitigation strategies to reduce risk. The jurisdictions covered by these HMPs are (or will become) eligible for mitigations grants. This is great news, representing the forward-thinking nature of Washington jurisdictions and an understanding of the value of strategic mitigation planning. Congratulations, local partners!

Highlighted local projects

Douglas/Okanogan Fire District 15: Backup Generators

The Douglas/Okanogan County Fire District 15 installed backup generators at the Brewster EMS Station, Brewster Fire Station, Pateros Fire Station, Methow Fire Station and Rocky Butte Fire Station. These generators allow critical public facilities to fully function during emergency events. The generators also enable safe and efficient station operations during power outages, provide lights and power for station operations, the ability to rapidly fill water trucks, keep radio communication and equipment operational, and prevent freezing of water in fire trucks and EMS liquids.

City of Auburn: Seismic Retrofit

The City of Auburn installed a seismic control valve at its largest reservoir, preventing water from escaping the reservoir in case of an earthquake. The retrofit of Reservoir 1 ensures adequate water supply exists after an earthquake for both personal needs and continuous firefighting efforts. It benefits all retail customers served by the city with an estimated population of 56,000.

The Evergreen State College: Seismic Retrofit

The Evergreen State College, located in Olympia and serving nearly 4,000 students with 1,500 staff, completed a seismic retrofit of its Central Utility Plant to withstand a severe earthquake. This retrofit will reduce fatalities, prevent an uncontrolled boiler explosion, provide for continued operations, and avoid reconstruction. The College also took advantage of the construction project to provide teachable moments around disaster preparedness, increase campus understanding of the College's comprehensive emergency management plan, and promote disaster planning.

Thurston County: Home Elevations

Thurston County Emergency Management successfully elevated two homes this spring and fall in the Deschutes River floodplain. Both homes had suffered multiple instances of flood damage in recent years. Elevating these homes above the flood stage of the Deschutes River will ensure that potential future occurrences of flooding are prevented.

Graham Hill Mutual Water Company: Backup Generator

In unincorporated southeast Pierce County, Graham Hill Mutual Water Company serves approximately 1,100 residential customers, an elementary school, a recreational vehicle park and office, and a church. This project provided funding for emergency generators to provide uninterrupted water to the local community and school children as well as the adjacent 50 square miles of forested areas that has no other water supply for fighting fires. With these generators, Graham Hill Mutual Water Company has nearly full operability to provide water during loss of grid power from wildland-urban interface fires, as well as wind, snow, and ice storms and earthquakes.

Town of Skykomish: Critical Areas Survey and Geotechnical Analysis

Skykomish received a Phase I FEMA award to complete much-needed surveying, analysis, and project design for a stormwater infrastructure project that will reduce flood risk. The project will bring new diversion of stormwater to the South Fork Skykomish River floodplain and increase the stormwater storage capacity. After completion of Phase I, the Town will pursue funding for Phase II, which will include construction. Upon completion, the Town expects fewer instances of nuisance flooding, improved water quality, and improved longevity of stormwater infrastructure.

City of Seattle: Columbia Street Areaway

To counteract further settlement and potential collapse of the Columbia Street Areaway, the City of Seattle installed engineered fill beneath the road surface to provide structural support for the adjacent retaining wall. This brought the areaway up to seismic design standards.

Priorities for 2020

Looking toward 2023

In 2020, we plan to continue collecting data via our contracted efforts with University of Washington and the Coastal Monitoring and Analysis Program, the Hazard Mitigation Working Group, and in-house research to ensure the next comprehensive update to the SEHMP in 2023 is as robust as possible.

State- and local-level mitigation projects

Mitigation wise, we are focusing efforts on repetitive loss/severe repetitive loss properties in the state's floodplains and coastal areas by targeting these properties for acquisition or elevation through FEMA's Flood Mitigation Assistance grant program. We are also excited to see more interest at the local level in defensible spaces to protect from wildfire on both sides of the Cascades, especially given the results of the 2015 Blue Creek Fire loss avoidance study. Defensible space has proven to work, and we are seeing an increase in grant pre-applications from our local partners for wildfire mitigation. Furthermore, the recommendations from the Resilient Washington Subcabinet for improving seismic resilience are still a high priority for 2020, as they were for 2019.

We are also prioritizing the development of more GIS-based tools for hazard identification and risk analysis and ensuring all the data collected across state agencies is used to its full potential. This includes new data being collected, such as lidar and erosion risk, as well as data already in use.

Disaster Resiliency Work Group

Per SB 5106, which mandates the creation of a disaster resiliency work group, EMD is required to participate in this statewide effort to evaluate Washington's need for a disaster resiliency program of some kind. We are happy to be participating and will maintain this activity as a priority for 2020, seeing as how it has direct ties to the SEHMP and how it gets implemented. A final report from this group is due on December 1, 2020, so its conclusions will likely be a significant portion of next year's SEHMP Annual Report.

Stay tuned!

This report was developed by the Mitigation and Recovery Section of the Washington Emergency Management Division. For more information about the material presented in this report, please contact the State Mitigation Strategist, Kevin Zerbe, at kevin.zerbe@mil.wa.gov or (253) 512-7467.