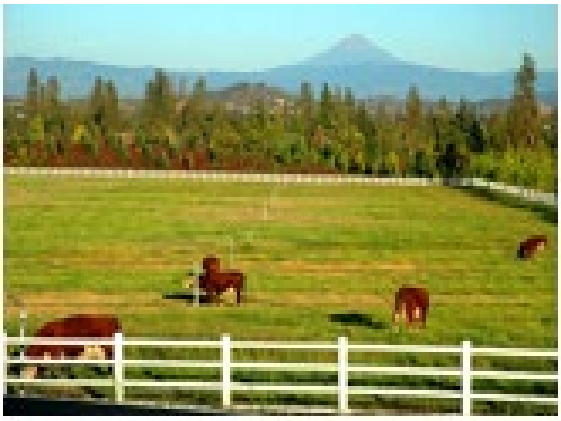
Medford Water Addendum

to the Jackson County NHMP



Photos courtesy of Oregon State Archives

Effective: February 12, 2024 through February 11, 2029

Prepared for
Medford Water
420 6th Avenue
Medford Water, OR 97525

Prepared by
The University of Oregon
Institute for Policy Research & Engagement
School of Planning, Public Policy, and Management

UNIVERSITY OF OREGON | Institute for Policy Research and Engagement

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U.S. Department of Homeland Security
FEMA Region 10
130 228th Street, SW
Bothell, WA 98021-8627

FEMA

April 10, 2024

The Honorable Rick Dyer, Chair
Jackson County Board of Commissioners
10 South Oakland Ave.
Medford, Oregon 97501

Reference: Approval of the Jackson County Multi-jurisdictional Hazard Mitigation Plan

Dear Chair Dyer:

In accordance with applicable[1] laws, regulations, and policy, the United States Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10 has approved the Jackson County multi-jurisdictional hazard mitigation plan for the following jurisdictions:

City of Butte Falls	City of Phoenix	Jackson County
City of Talent	City of Gold Hill	City of Shady Cove
City of Rogue River	City of Eagle Point	Jackson County Fire District #3
Medford Water Commission	City of Ashland	City of Jacksonville
City of Central Point		

The approval period for this plan is from February 12, 2024 through February 11, 2029.

In addition, Jackson County met the requirements for addressing all dam risks listed in the multi-jurisdictional hazard mitigation plan.

An approved hazard mitigation plan is one of the conditions for applying for and receiving FEMA mitigation grants from the following programs:

- Hazard Mitigation Grant Program (HMGP)
- Hazard Mitigation Grant Program Post-Fire (HMGP-PF)
- Building Resilient Infrastructure and Communities (BRIC)
- Flood Mitigation Assistance (FMA)
- High Hazard Potential Dams Grants Program (HHPD)

To avoid a lapsed plan, the next plan update must be approved before the end of the approval period, including adoption by the participating jurisdiction(s). Before the end of the approval period, please allow sufficient time to secure funding for the update, including the review and approval process. Please include time for any revisions, if needed, and for participating jurisdictions to formally adopt

[1] Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and National Dam Safety Program Act, as amended; Title 44 Code of Federal Regulations (CFR) Part 201, Mitigation Planning; and Local Mitigation Planning Policy Guide (FP-206-21-0002).

the plan after the review, if not adopted prior to submission. This will enable each jurisdiction to remain eligible to apply for and receive funding from FEMA's mitigation grant programs with a hazard mitigation plan requirement. Local governments, including special districts, with a plan status of "Approvable Pending Adoption" are not eligible for FEMA's mitigation grant programs with a hazard mitigation plan requirement.

If you have questions regarding your plan's approval or FEMA's mitigation program, please contact Joseph Murray, Mitigation Planner with the Oregon Department of Emergency Management at (503) 378-2911 or joseph.murray@oem.oregon.gov, who coordinates these efforts for local entities.

Sincerely,

Wendy Shaw, P.E.
Risk Analysis Branch Chief
Mitigation Division

Enclosures

cc: Stephen Richardson, Oregon Department of Emergency Management

JF:JG:ws

RESOLUTION NO. 1924

A RESOLUTION Adopting the Medford Water Representation in the Updates to the *Jackson County Multi-Jurisdictional Natural Hazards Mitigation Plan*

WHEREAS, Medford Water recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

WHEREAS, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, Medford Water has fully participated in the FEMA prescribed mitigation planning process to prepare the *Jackson County, Multi-Jurisdictional Natural Hazards Mitigation Plan*, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

WHEREAS, Medford Water has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of Medford Water to the impacts of future disasters within the *Jackson County, Multi-Jurisdictional Natural Hazards Mitigation Plan*; and

WHEREAS, these proposed projects and programs have been incorporated into the Jackson County, Multi-Jurisdictional Natural Hazards Mitigation Plan that has been prepared and promulgated for consideration and implementation by the participating cities and special districts of Jackson County; and

WHEREAS, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the *Jackson County, Multi-Jurisdictional Natural Hazards Mitigation Plan* and pre-approved it (dated, January 9, 2024) contingent upon this official adoption of the participating governments and entities;

WHEREAS, the Natural Hazards Mitigation Plan is comprised of three volumes: Volume I -Basic Plan, Volume II – Appendices, and Volume III – Jurisdictional Addenda, collectively referred to herein as the Natural Hazards Mitigation Plan; and

WHEREAS, the Natural Hazards Mitigation Plan is in an on-going cycle of development and revision to improve its effectiveness; and

WHEREAS, Medford Water adopts the Natural Hazards Mitigation Plan and directs the General Manager to develop, approve, and implement the mitigation strategies and any administrative changes to the Natural Hazards Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF WATER COMMISSIONERS OF THE CITY OF MEDFORD, OREGON, AS FOLLOWS:

SECTION 1. That the Board of Water Commissioners adopts the *Jackson County Multi-Jurisdictional Natural Hazards Mitigation Plan* as an official plan.

SECTION 2. That Medford Water will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the *Jackson County Multi-Jurisdictional Natural Hazards Mitigation Plan*.

PASSED at a regular meeting of the Board of Water Commissioners and signed by me in authentication thereof this 7th day of February 2024.

ATTEST: _____ _____

Amber Furu, Asst. Clerk of the Commission

Bob Strosser, Chair

Introduction

Purpose

This is the first iteration of the Medford Water addendum to the Jackson County Multi-Jurisdictional Natural Hazard Mitigation Plan (MNHMP, NHMP). This addendum supplements information contained in Volume I (Basic Plan), which serves as the NHMP foundation and Volume II (Appendices), which provide additional information. This addendum meets the following requirements:

- Multi-Jurisdictional **Plan Adoption** §201.6(c)(5),
- Multi-Jurisdictional **Participation** §201.6(a)(3),
- Multi-Jurisdictional **Mitigation Strategy** §201.6(c)(3)(iv) and
- Multi-Jurisdictional **Risk Assessment** §201.6(c)(2)(iii).

Medford Water adopted their addendum to the Jackson County Multi-jurisdictional NHMP on February 7, 2024. FEMA Region X approved the Jackson County NHMP on Febraury 12, 2024 and Medford Water's addendum on May 16, 2024. With approval of this NHMP, Medford Water is now eligible for non-disaster and disaster mitigation project grants through February 11, 2029.

NHMP Process, Participation and Adoption

This section of the NHMP addendum addresses 44 CFR 201.6(c)(5), *Plan Adoption* and 44 CFR 201.6(a)(3), *Participation.*

In addition to establishing a comprehensive mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in Title 44 CFR Part 201, require that jurisdictions maintain an approved NHMP to receive federal funds for mitigation projects. Local adoption, and federal approval of this NHMP ensures that Medford Water will gain eligiblility for non-disaster and disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) partnered with the Oregon Department of Emergency Management (OEM), Jackson County, and Medford Water to develop this NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program. Members of the Medford Water NHMP steering committee also participated in the County NHMP update process (Volume II, Appendix B).

By creating a NHMP, locally adopting it, and having it approved by FEMA, Medford Water will gain eligibility for FEMA Hazard Mitigation Assistance grant program funds.

The Jackson County NHMP and Medford Water addendum are the result of a collaborative effort between residents, public agencies, non-profit organizations, the private sector, and regional organizations. A project steering committee guided the process of developing the NHMP.

Convener and Committee

The Engineering Manager served as the designated convener of the NHMP development and the Engineering Manager (or designee) will take the lead in implementing, maintaining, and updating the addendum to the Jackson County NHMP in collaboration with the designated convener of the Jackson County NHMP (Emergency Manager).

Representatives from the Medford Water steering committee met formally and informally, to discuss development of their addendum (Volume II, Appendix B). The steering committee reviewed and developed Medford Water's addendum, with particular focus on the NHMP's risk assessment (hazards, community vulnerabilities, and capabilities) and mitigation strategy (action items).

The addendum reflects decisions made at the designated meetings and during subsequent work and communication with Jackson County Emergency Management and the OPDR.

The Medford Water Steering Committee was comprised of the following representatives:

- Convener (Implementation and Maintenance), Brian Runyen Engineering Manager
- Rachel Lanigan (Plan Development), Senior Engineer
- Brad Taylor, General Manager
- Aaron Ott, City of Medford, Emergency Manager
- Delaney Huerta, Jackson County, Emergency Management

The Medford Water Leadership Team (steering committee) was closely involved throughout the development of the NHMP and served as the local oversight body for the NHMP's development.

NHMP Implementation and Maintenance

The Board of Water Commissioners will be responsible for adopting the Medford Water addendum to the Jackson County NHMP. This addendum designates a Steering Committee and a convener to oversee the development and implementation of action items. Because Medford Water addendum is part of the County's multi-jurisdictional NHMP, Medford Water will look for opportunities to partner with the County. Medford Water's steering committee will convene after adoption of the Medford Water NHMP addendum on an annual schedule. The County is meeting on a semi-annual basis and will provide opportunities for each participating jurisdiction to report on NHMP implementation and maintenance during their meetings. The convener will be responsible for assembling the steering committee.

The steering committee will be responsible for:

- Reviewing existing action items to determine suitability of funding;
- Reviewing existing and new risk assessment data to identify issues that may not have been identified at NHMP creation;
- Educating and training new steering committee members on the NHMP and mitigation actions in general;

- Assisting in the development of funding proposals for priority action items;
- Discussing methods for continued public involvement;
- Evaluating effectiveness of the NHMP at achieving its purpose and goals (use Table 4-1, Volume I, Section 4, as one tool to help measure effectiveness); and
- Documenting successes and lessons learned during the year.

The convener will also remain active in the County's implementation and maintenance process (Volume I, Section 4).

The steering committee will be responsible for activities outlined in Volume I, Section 4.

Medford Water will utilize the same action item prioritization process as the County (Volume I, Section 4 and Volume II, Appendix D).

Implementation through Existing Programs

Many of the Natural Hazard Mitigation Plan's recommendations are consistent with the goals and objectives of Medford Water's existing plans and policies. Where possible, Medford Water will implement the NHMP's recommended actions through existing plans and policies. Plans and policies already in existence have support from residents, businesses, and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, allowing them to adapt to changing conditions and needs. Implementing the NHMP's action items through such plans and policies increases their likelihood of being supported and implemented.

Medford Water currently has the following plans and programs that relate to natural hazard mitigation. For a complete list visit Medford Water's website.

- Water Distribution System Facility Plan (2017)
- Big Butte Springs and Robert A. Duff Water Treatment Plant Facility Plan (2016)
- Forest Management Plan: Big Butte Springs Watershed (2020)
- Water Management and Conservation Plan (2016)
- Rogue Valley Water Supply Resiliency Program

During the development of this NHMP plans, including the strategic and facility plans, were reviewed to identify possible natural hazard mitigation strategies (action items).

Capability Assessment

The Capability Assessment identifies and describes the ability of Medford Water Commission to implement the mitigation strategy and associated action items. Capabilities can be evaluated through an examination of broad categories, including existing authorities, policies, programs, funding, and resources.

Existing Authorities

Hazard mitigation can be executed at a local scale through three (3) methods: integrating hazard mitigation actions into other local planning documents (i.e., plan integration), adopting building and/or fire codes that account for best practices in structural hardening and fire resistance, and

codifying land use regulations and zoning designations that prescribe mitigation into development requirements. The extent to which a municipality, commission, or multi-jurisdictional effort leverages these approaches is an indicator of that community's capabilities.

The Engineering Division of Medford Water advises the Board of Water Commissioners on technical matters, advances in the water industry, and government laws and regulations that will influence the operation of the system. This division also monitors water supply and demand, factors used in considering future expansion and maintenance of the water system.

Regulations Governing Water Service
Medford Water operates under the provisions as set forth in the *Regulations Governing Water Service*. These regulations were updated on October 1, 2023.These include policies on billing, water service availability (including curtailments, shortages and outages), prevention of contamination, water use and conservation, etc.

Policies and Programs

This Plan directs Medford Water Commission and Jackson County to explore integration into other planning documents and processes. Medford Water Commission has made significant progress in integrating the NHMP into its portfolio of planning processes and programs over the last five years.

Water Distribution System Facility Plan (2017)
The Water Distribution System Facility Plan covers supply sources and community demands. This document, last amended in 2017, is scheduled to be updated every 5 years.

Capital Improvement Plan (CIP)
The CIP outlines the scheduling and implementation of the capital projects necessary to maintain and improve the water system and is updated every year. Capital improvements related to water facility and distribution projects average $5 million per year. These improvements include the upgrade of facilities such as the Robert A. Duff Water Treatment Plant (Duff WTP), reservoir and pump station construction, as well as programs for the relaying and relining of water mains, the replacement of older or defective hydrants and the placement of meters. The latest CIP plan was approved by the Medford Water Board of Water Commissioners on June 7, 2023.

Big Butte Springs and Robert A. Duff Water Treatment Plant Facility Plan (2016)
The Big Butte Springs and Duff Water Treatment Facility Plan describes current and projected needs and lists recommended capital improvements for Medford Water Commission's two drinking water supply systems, the Big Butte Springs (BBS) and the Rogue River/Duff Water Treatment Plant (WTP). The plan was prepared in parallel to the 2016 Distribution System Facility Plan and the 2016 Water Management and Conservation Plan.[1]

Water Management and Conservation Plan (2017)
The 2017 Water Management and Conservation Plan contains projections for the next 50 years, will be reviewed in five years and updated in 10. This plan identifies conservation and

[1] *Big Butte Springs and Robert A. Duff Water Treatment Plant Facility Plan, CH2M, 2016.*

curtailment measures for the City of Medford, as well as retail customers within the unincorporated community of White City.

Rogue Valley Water Supply Resiliency Program
A recently granted EPA Water Infrastructure Finance and Innovation Act (WIFIA) loan will fund over $200 million in projects over the next 10 years, including expanded treatment and storage capacity and building a seismically resilient Water Campus to house administration and operational functions.

Community Wildfire Protection Plan
The Rogue Valley Integrated Community Wildfire Protection Plan (RVIFP) assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk. Medford Water is included in the RVIFP. The RVIFP will be incorporated into this Plan as a functioning annex. The NHMP will also be integrated into the Commission's Capital Improvement Plan.

Administration
The Medford Water Board of Water Commissioners has the responsibility of developing and adopting the annual department budget. Integrating hazard mitigation goals and projects into the annual budget is key to implementing the plan. The Board tries to broadly address resilience needs while it determines departmental priorities and looks for multiple-impact projects wherever possible. They also work with staff to apply for federal and state grant funding to pursue larger projects that are outside of general funding capacity.

Personnel

The following Medford Water Commission personnel have assignments related to natural hazard mitigation planning and implementation:

Emergency Management: Administration (General Manager) and Operations Department

Public Information Officer: Customer Service (Communications Coordinator)

Grant writing (for Public Works or emergency management): Engineering Department with support of consultants

Capital improvement planning: Engineering Department & Finance Department

Capital improvement execution: Engineering Department

These personnel integrate hazard mitigation and resilience planning into their greater work programs to the best of their abilities. However, there is limited capacity to expand upon their capabilities or work loads.

Capital Projects

Medford Water Commission has implemented recommendations from the last NHMP into its capital improvement projects over the last 5 years, including:

- Capital Hill Reservoir Replacement Project (in-process)

- Foothill Road Waterlines Relocation (under construction)
- Academy Place Waterline Relocation Project (construction completed 2023)
- Table Rock Road Pipeline Project (under construction)
- SCADA Project (in-process)
- Crater Lake Ave Transmission Main (in planning)
- Duff Water Treatment Plant Expansion (under construction)
- Martin Control Station Backup Power (in-process)

Upcoming:

- 10-yr Capital Improvement Plan (CIP) annual update (in progress)
- Southeast Medford Facilities Plan completion November 2023
- Martin Control Station Evaluation

Capital Resources

Medford Water is responsible for the construction and maintenance of more than 476 miles of water mains, not including the Big Butte Springs lines. The distribution system consists of these water mains and service lines plus valves, fire hydrants, and meters. Pipeline materials consist primarily of ductile iron and cast iron. New pipelines are constructed of ductile iron only.

The Commission also maintains 16 covered reservoirs, two treatment plants (Big Butte Springs and Robert A. Duff Water Treatment Plant on the Rogue River), and 12 pump stations.

Capital resources with additional resilience capacity include:

Communication towers:

- Roxy Ann hub (shared facility)
- Capital Reservoir
- Service Center
- Lausmann Annex
- SCADA antennas at pump stations and reservoirs
- AMI towers at Justice Rd, Southwest Reservoir, Highland Reservoir, and Capital Reservoir

Critical facilities with power generators:

- Duff Water Treatment Plant and Reservoir
- Big Butte Springs facility
- Lone Pine Pump Station
- Archer Pump Station
- Barneburg Pump Station
- Lausmann Annex
- Medford Water Service Center

Findings

Several important findings from this capability assessment informed the design of the Plan's mitigation strategy and aided in prioritizing action items.

Staffing Limitations and Capacity
Medford Water Commission staff are assigned hazard mitigation responsibilities as a part of their larger job responsibilities. Limited capacity reduces the breadth of the programming the Commission can undertake in any year. The Commission relies upon its relationships with the County and cities within its region to expand its operations.

Reliance upon outside funding streams and local match requirements
Medford Water Commission operates on a restricted budget. Grants, loans, and revenue from water rates and system development charges (SDCs) are directed to sustain resilience programs. But there are few opportunities for using local financial resources to implement more extensive hazard mitigation work. They lean heavily upon state and federal grant funds and loans as the primary means for securing mitigation funding.

Leveraging Partnerships with Public and Nonprofit Entities
Regional planning displayed in Community Wildfire Protection Planning process demonstrates the Commission's ability to effectively share information and identified priority needs.

Mitigation Strategy

This section of the NHMP addendum addresses 44 CFR 201.6(c)(3(iv), *Mitigation Strategy*.

Medford Water's mitigation strategy (action items) was developed during the NHMP update planning process. The steering committee assessed Medford Water's risk, identified potential issues, and developed a mitigation strategy (action items). Medford Water developed actions specific to their community after first reviewing a list of recommended actions developed by the County or recommended by OPDR.

Mitigation Successes

Medford Water has several examples of hazard mitigation including the following projects funded through FEMA Hazard Mitigation Assistance.

FEMA Funded Mitigation Successes

- None to date

Other Mitigation Successes

- Capital Hill Reservoir Replacement Project (in-process, $37 million, Medford Water and Water Infrastructure Finance and Innovation Act (WIFIA))
- Foothill Road Waterlines Relocation (in-process, $37 million, Medford Water)
- Academy Place Waterline Relocation Project (2023, $1.2 million, Medford Water)
- Table Rock Road Pipeline Project (ongoing, $30million, Medford Water & WIFIA
- SCADA Project (in-process, $19 million, Medford Water)
- Crater Lake Ave Transmission Main (in planning, $12 million, Medford Water)
- Duff Water Treatment Plant Expansion (under construction, $64 million, Medford Water & WIFIA)
- Martin Control Station Backup Power (in-process, $0.9 million, Medford Water)

Action Items

Table MW-1 documents the title of each action along with, the lead organization, partners, timeline, cost, and potential funding resources.

Table MW-1 Action Items

Action Item #	Mitigation Actions	Potential Funding Resources	Lead	Partners	Timeline	Cost
Multi-Hazard Mitigation Strategies						
1.1	Continue to construct and improve water transmission pipelines, including the Crater Lake Avenue transmission line.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	City of Medford Public Works	O	H
1.2	Secure funding for and implement projects identified in the 2022 Medford Water Distribution System Resilience Backbone Study.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Partner Cities	O	M-H
1.3	Provide back-up power throughout water distribution system.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Partner Cities	S	M
1.4	Continue to expand and build resilience at the Duff Water Treatment Plant.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County	O	L
1.5	Secure permits and begin construction on Medford Water's second Rogue River raw water intake facility.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County	S	H
1.8	Coordinate emergency response planning efforts with the City of Medford and Jackson County.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, City of Medford	M	L
1.9	Implement improvements for Medford Water's Supervisory Contral and Data Acquisition (SCADA) system following recommendations from the 2023 SCADA Master Plan.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Partner Cities	S	H

Action Item #	Mitigation Actions	Potential Funding Resources	Lead	Partners	Timeline	Cost
1.10	Continue to coordinate the water rights strategy with wholesale customer Partner Cities.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Partner Cities	O	L
1.11	Work with partnering jurisdictions (e.g., Jackson County and cities in the county) on continued climate action coordination.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	M	L
1.12	Incorporate resilience in maintenance and training strategies for staff.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	S	L
1.13	Update the Medford Water Distribution System Master Plan by 2025, including developing an Oregon State required Seismic Risk Assessment and Mitigation Strategy.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County, Partner Cities	M	M
1.14	Review and update the EPA-required Water System Risk and Resilience Assessment by 2026. Implement recommendations from 2020 Plan.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	M	M-H
1.15	Participate in joint training and exercises for emergency training and response.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	O	L
1.16	Plan and prepare valve exercising program.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	O	L
1.17	Continue to develop new policies and construction standards to mitigate the impact of natural hazards.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	O	L

Action Item #	Mitigation Actions	Potential Funding Resources	Lead	Partners	Timeline	Cost
1.18	Continue water testing to ensure water quality before, during, and after a natural hazard event.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	DEQ, OHA, DWS	O	L
1.19	Finalize and publish Source Water Protection Plan to inform Medford Water's spill response strategy.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	DEQ, OHA, DWS	S	M
1.20	Sustain a public awareness and education campaign about water and natural hazards through online and mail communications, as well as in-person events.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	OEM, FEMA, Jackson County Emergency Management	O	L
Air Quality Mitigation Strategies						
2.0	The steering committee did not profile this hazard. During future updates the steering committee will consider adding this hazard.					
Drought Mitigation Strategies						
3.1	**Complete the Rogue Valley Water Supply Resiliency Program by 2033.**	**Medford Water Funding Resources, FEMA HMA**	**Medford Water Administration**	**DEQ, OHA, DWS**	**L**	**H**
3.2	**Complete the Big Butte Springs Enhancement Project in order to improve water supply during droughts.**	**Medford Water Funding Resources, FEMA HMA**	**Medford Water Administration**	**DEQ, OHA, DWS**	**S**	**M-H**
3.3	Continue to maintain an active Water Curtailment Plan	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	O	L
3.4	Implement annual pipeline renewal and replacement program to reduce leaks and conserve water.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	O	H

Action Item #	Mitigation Actions	Potential Funding Resources	Lead	Partners	Timeline	Cost
3.5	Continue to implement action items from Medford Water's Water Management and Conservation Plan including: Performing annual water audits; documenting unmetered water use; replacing all meters to AMI; continuing large meter calibrations; adjusting the rate structure to encourage conservation; maintain leakage to less than 10%; minimize customer side leakage; update conservation materials and improve promotion; improve educational materials; expand outdoor water use conservation efforts; providing technical and financial assistance programs; retrofitting and replacing inefficient fixtures; new construction conservation methods.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	S-L	L-H
3.6	Build Asset Management Preventative Maintenance Program	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	S	L-H
Earthquake Mitigation Strategies						
4.0	The steering committee, using available local resources, will study this hazard further during the implementation and maintenance phase of this NHMP, seeking to identify cost effective actions that might be implemented to reduce community vulnerability.					
Emerging Infectious Disease Mitigation Strategies						
5.0	The steering committee did not profile this hazard. During future updates the steering committee will consider adding this hazard.					
Flood Mitigation Strategies						
6.1	Participate in floodplain management in coordination with other Rogue River entities.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	S	L
Landslide Mitigation Strategies						
7.0	The steering committee, using available local resources, will study this hazard further during the implementation and maintenance phase of this NHMP, seeking to identify cost effective actions that might be implemented to reduce community vulnerability.					

Action Item #	Mitigation Actions	Potential Funding Resources	Lead	Partners	Timeline	Cost
Severe Weather (Extreme Heat, Windstorm, Winter Storm) Mitigation Strategies						
8.1	Educate customers on pipe maintenance to prevent freezing.	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	S	L
Volcanic Event Mitigation Strategies						
9.0	The steering committee, using available local resources, will study this hazard further during the implementation and maintenance phase of this NHMP, seeking to identify cost effective actions that might be implemented to reduce community vulnerability.					
Wildfire Mitigation Strategies						
10.1	**Continue to implement the Medford Water's 30-year Forest Management Plan.**	**Medford Water Funding Resources, FEMA HMA**	**Medford Water Administration**	**Jackson County, Partner Cities**	**O**	**H**
10.2	**Map and assess Wildfire Vulnerability in the next Risk and Resilience Assessment update.**	**Medford Water Funding Resources, FEMA HMA**	**Medford Water Administration**	**OEM, FEMA, Jackson County Emergency Management**	**O**	**L**
10.3	Continue to implement a Fire Hydrant Testing and Replacement Plan	Medford Water Funding Resources, FEMA HMA	Medford Water Administration	Jackson County, Partner Cities	O	L-H

Source: Medford Water NHMP Steering Committee, 2023
Cost: L – Low (less than $50,000), M - Medium ($50,000-$100,000), H - High (more than $100,000)
Timing: O-Ongoing (continuous), S-Short (1-2 years), M-Medium (3-5 years), L-Long (5 or more years)
Priority Actions: Identified with **bold** text and **orange** highlight

Risk Assessment

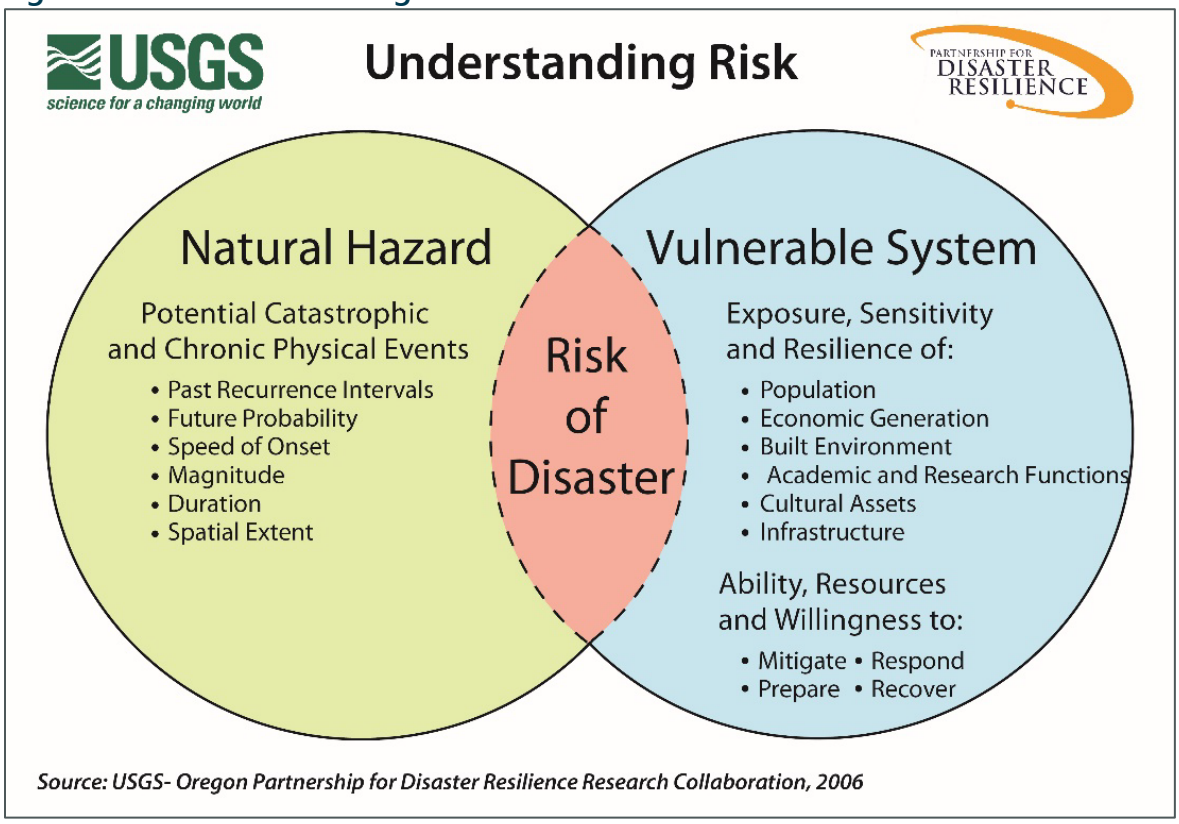
This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) - Risk Assessment. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

Assessing natural hazard risk has three phases:

- Phase 1: Identify hazards that can impact the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.
- Phase 2: Identify important community assets and system vulnerabilities. Example vulnerabilities include people, businesses, homes, roads, historic places and drinking water sources.
- Phase 3: Evaluate the extent to which the identified hazards overlap with or have an impact on, the important assets identified by the community.

The local level rationale for the identified mitigation strategies (action items) is presented herein and within Volume I, Sections 2 and 3. The risk assessment process is graphically depicted in Figure MW-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure MW-1 Understanding Risk



Hazard Analysis

The Medford Water steering committee developed their hazard vulnerability assessment (HVA), using the County's HVA (Volume II, Appendix C) as a reference. Changes from the County's HVA were made where appropriate to reflect distinctions in vulnerability and risk from natural hazards unique to Medford Water, which are discussed throughout this addendum.

Table MW-2 shows the HVA matrix for Medford Water listing each hazard listed in order of rank from high to low. For local governments, conducting the hazard analysis is a useful step in planning for hazard mitigation, response, and recovery. The method provides the jurisdiction with a sense of hazard priorities but does not predict the occurrence of a particular hazard.

Three chronic hazards (wildfire, drought, winter storm) and a catastrophic hazard (Cascadia Subduction Zone earthquake) rank as the top hazard threats to Medford Water (Top Tier). Flood, extreme heat event, and crustal earthquake comprise the next highest ranked hazards (Middle Tier), while windstorm, landslide, and volcanic event hazards comprise the lowest ranked hazards (Bottom Tier). *Note: air quality and emerging infectious disease were not profiled in this hazard, see Volume I, Sections 2 and 3 for applicable countywide vulnerability and mitigation strategies for these hazards.*

Table MW-2 Hazard Analysis Matrix

Hazard	History	Vulnerability	Maximum Threat	Probability	Total Threat Score	Hazard Rank	Hazard Tiers
Wildfire	16	45	100	70	231	#1	*Top Tier*
Drought	20	45	100	63	228	#2	
Earthquake - Cascadia	2	50	100	49	201	#3	
Winter Storm	20	20	100	56	196	#4	
Flood	12	30	80	49	171	#5	*Middle Tier*
Extreme Heat Event	20	5	70	70	165	#6	
Earthquake - Crustal	2	40	100	21	163	#7	
Windstorm	12	5	70	49	136	#8	*Bottom Tier*
Landslide	6	30	40	28	104	#9	
Volcanic Event	2	5	50	7	64	#10	

Source: Medford Water NHMP Steering Committee, 2023.

Community Characteristics

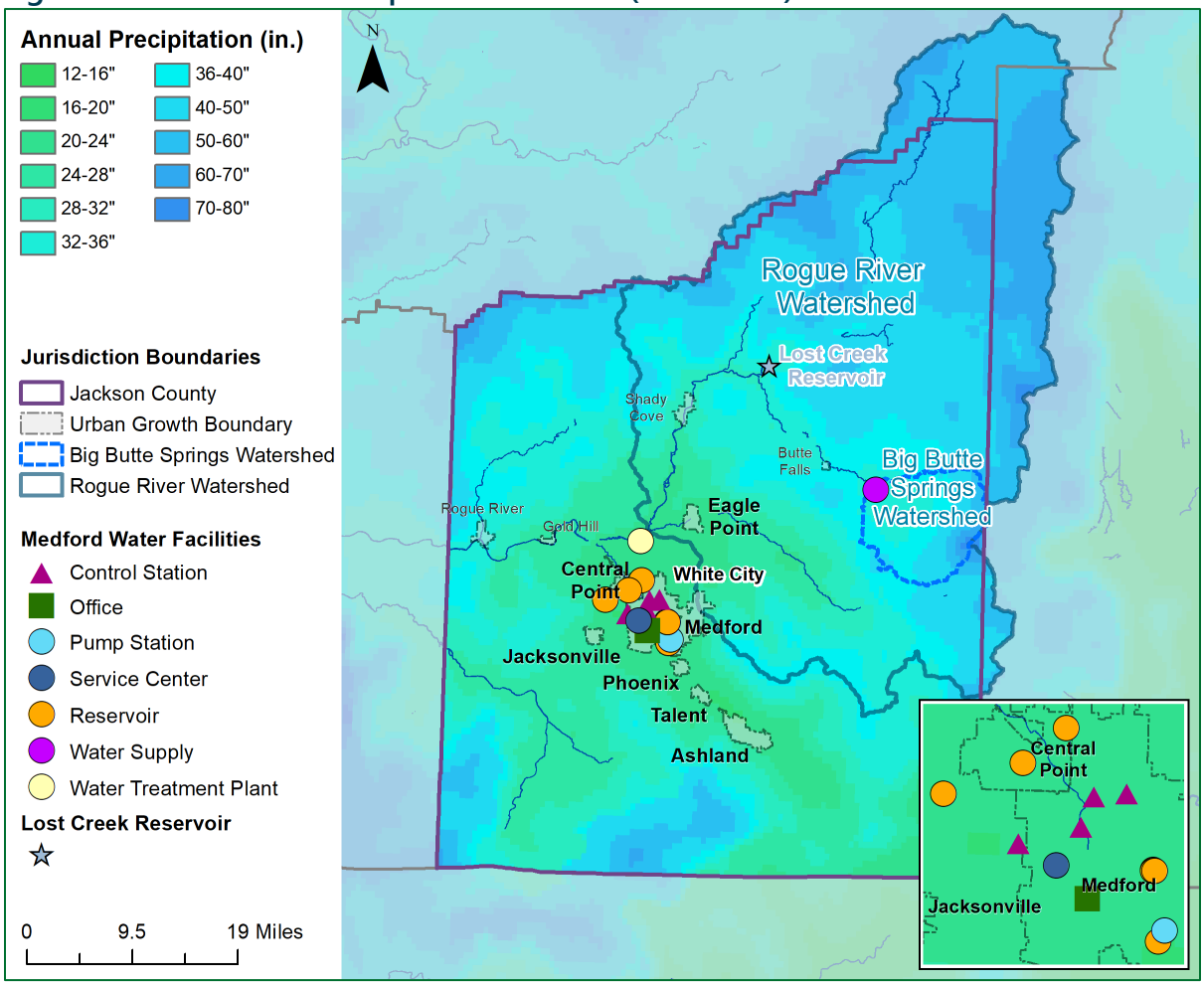
Medford Water directly services approximately 140,000 people within the Rogue Valley including customers in Medford, unincorporated White City, other unincorporated areas, and the Elk City Water District. Treated water is provided to Ashland, Central Point, Eagle Point, Jacksonville, Phoenix, and Talent on a wholesale basis (Figure MW-3).

Medford Water sources customer water from the Rogue River Watershed (surface water source) and Big Butte Springs Watershed (groundwater source). The Rogue River Watershed spans from just outside of Medford to the Cascades to the northeast near Crater Lake. The

Big Butte Springs Watershed (a smaller watershed within the Rogue River Watershed) is in the southeastern portion of the Rogue River Watershed near the base of Mt. McLoughlin and 30 miles east of Medford. Since 1923, Medford Water, has provided water from Big Butte Springs. The springs provide enough water to meet the demands of Medford Water's customers for much of the year, during the remainder of the year water is pumped from the Rogue River. Additionally, Jacksonville, Phoenix, and Talent have water rights to water stored in Lost Creek Reservoir which is treated by Medford Water for use during summer months.

Medford Water's territory experiences a relatively mild climate with four distinct seasons that comes from its position on the west coast of North America and within the Cascade Range mountains. The average daily high temperature in the area is between 45- and 55-degrees Fahrenheit (F) in the winter and between 80- and 95-degrees Fahrenheit (F) in the summer. The Rogue Valley has the lowest precipitation among Oregon's western interior valleys and ranges from about 25 inches in the valley to about 80 inches in the Cascades (Figure MW-2). October through May are the wettest months.

Figure MW-2 Normal Precipitation: Annual (1991-2020)



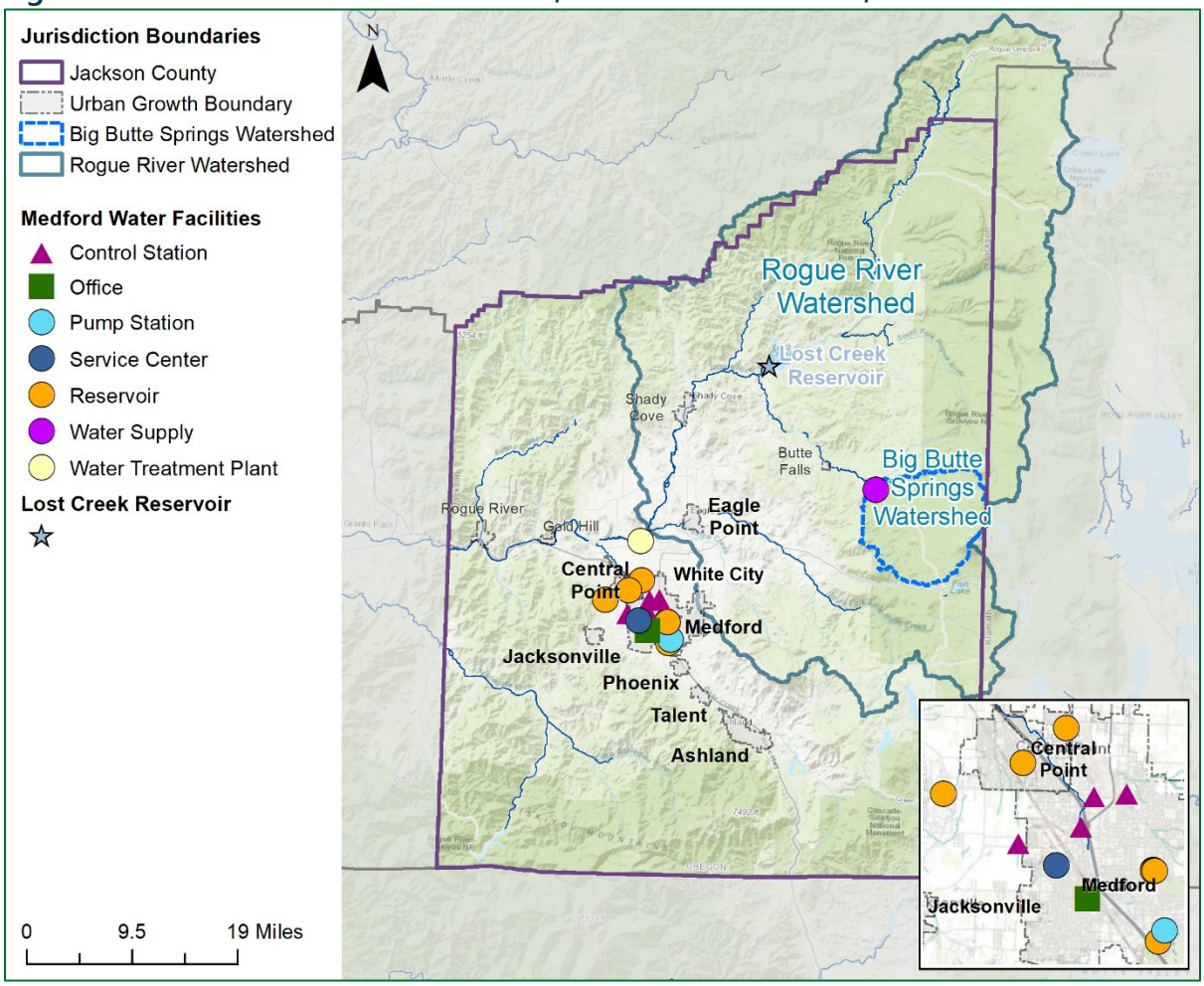
Source: OPDR, data PRISM Climate Group

For more information on the characteristics of each partner jurisdiction (Jackson County, Ashland, Central Point, Eagle Point, Jacksonville, Phoenix, and Talent) please review Volume II, Appendix C and the applicable city addenda in Volume III.

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of Medford Water. Medford Water Facilities are shown in Figure MW-3 and Table MW-3. Medford Water includes about 510 miles of pipeline (distribution plus transmission pipelines), 12 pump stations, and 16 distribution reservoirs.[2]

Figure MW-3 Medford Water Facilities, Partner Jurisdictions, and Watersheds



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu

[2] *Medford Water. Water Management and Conservation Plan. 2017.*

Table MW-3 Medford Water Facilities

Facility Name	Community Lifeline Category	Lifeline Type	Earthquake-Liquefaction Hazard	Flood Hazard	Landslide Hazard	Wildfire Hazard
181 Vilas Water Storage	food, water, and shelter	reservoir	low	minimal	low	moderate
3007 Old Stage Rd Water Storage	food, water, and shelter	reservoir	none	minimal	low	moderate
399 S 5th Street Water Storage	food, water, and shelter	reservoir	low	minimal	low	low
Barneburg Pump Station	food, water, and shelter	pump station	none	minimal	low	low
Barneburg Reservoir	food, water, and shelter	reservoir	none	minimal	moderate	low
Big Butte Springs	food, water, and shelter	water supply	none	minimal	moderate	moderate
Capital Hill 1 Reservoir	food, water, and shelter	reservoir	none	minimal	moderate	low
Capital Hill 2 Reservoir	food, water, and shelter	reservoir	none	minimal	moderate	low
Capital Hill 3 Reservoir	food, water, and shelter	reservoir	none	minimal	moderate	low
Coalmine Control Station	food, water, and shelter	control station	low	minimal	low	low
Conrad Control Station	food, water, and shelter	control station	low	500-Year	low	low
Duff Treatment Plant and Reservoir	food, water, and shelter	water treatment plant	low	minimal	low	low
Lausmann Annex - Medford Water Commission Main Office	food, water, and shelter	office	low	minimal	low	low
Martin Control Station	food, water, and shelter	control station	low	minimal	low	low
Medford Water Service Center	food, water, and shelter	service center	low	minimal	low	low
Rossanley Control Station	food, water, and shelter	control station	low	minimal	low	low

Source: Oregon Department of Geology and Mineral Industries, Medford Water NHMP Steering Committee

Community Lifelines are fundamental services that enable all other aspects of society to function. FEMA developed the Community Lifelines construct for objective-based response to prioritize the rapid stabilization of these facilities after a disaster. Mitigating these facilities will increase the community's resilience.

Note: Medford Water is developing a new campus, expected to be completed in 2026. The next update of this NHMP will include more information on this site. The campus is expected to have minimal to low exposure to the hazards identified above.

Hazard Profiles

The following sections briefly describe relevant information for each profiled hazard. For more information on the vulnerabilities of each partner jurisdiction (Jackson County, Ashland, Central Point, Eagle Point, Jacksonville, Phoenix, and Talent) please review Volume I, Section 2 and the applicable city addenda in Volume III. More information on Jackson County Hazards can be found in Volume 1 Section 2 *Risk Assessment* and in the Risk Assessment for Region 4, Southwest Oregon, Oregon SNHMP (2020). *Note: air quality and emerging infectious disease were not profiled in this hazard, see Volume I, Sections 2 and 3 for applicable countywide vulnerability and mitigation strategies for these hazards.*

Drought

The steering committee determined that Medford Water's probability for drought is **high** (which is the same as the County's rating) and that their vulnerability to drought is **high** (which is higher than the County's rating).

Volume I, Section 2 describes the characteristics of drought hazards, their history, and how they relate to future climate projections (see OCCRI report), as well as the location, extent, and probability of a potential event. Due to the climate of Jackson County, past and present weather conditions have shown an increasing potential for drought.

Medford Water receives its high-quality water supply from both the Rogue River and Big Butte Springs. Up to 25-35 million gallons per day (mgd) can be obtained from Big Butte Springs, however, the pipeline capacity limits withdrawal to a maximum of 26.4mgd.[3] In addition, Medford Water holds one water right for 100 cfs (64.6 mgd) for surface water from the Rogue River.[4] For more information on the future of Medford Water's water supply visit their website and/or review their Water Management and Conservation Plan.

Future Projections

According to the Oregon Climate Change Research Institute "Future Climate Projections, Jackson County,"[5] drought, as represented by low summer soil moisture, low spring snowpack, low summer runoff, and low summer precipitation, is projected to become more frequent in Jackson County by the 2050s.

Increasingly frequent droughts will have economic and social impacts upon those who depend upon predictable growing periods (ranches, farms, vineyards, gardeners) as well as upon the price and availability of fresh vegetables. It may also stress local jurisdictions' ability to provide water for irrigation or commercial and household use and for firefighting.

[3] *Ibid.*

[4] *Ibid.*

[5] *Oregon Climate Change Research Institute, Future Climate Projections, Jackson County, Oregon. February 2023.*

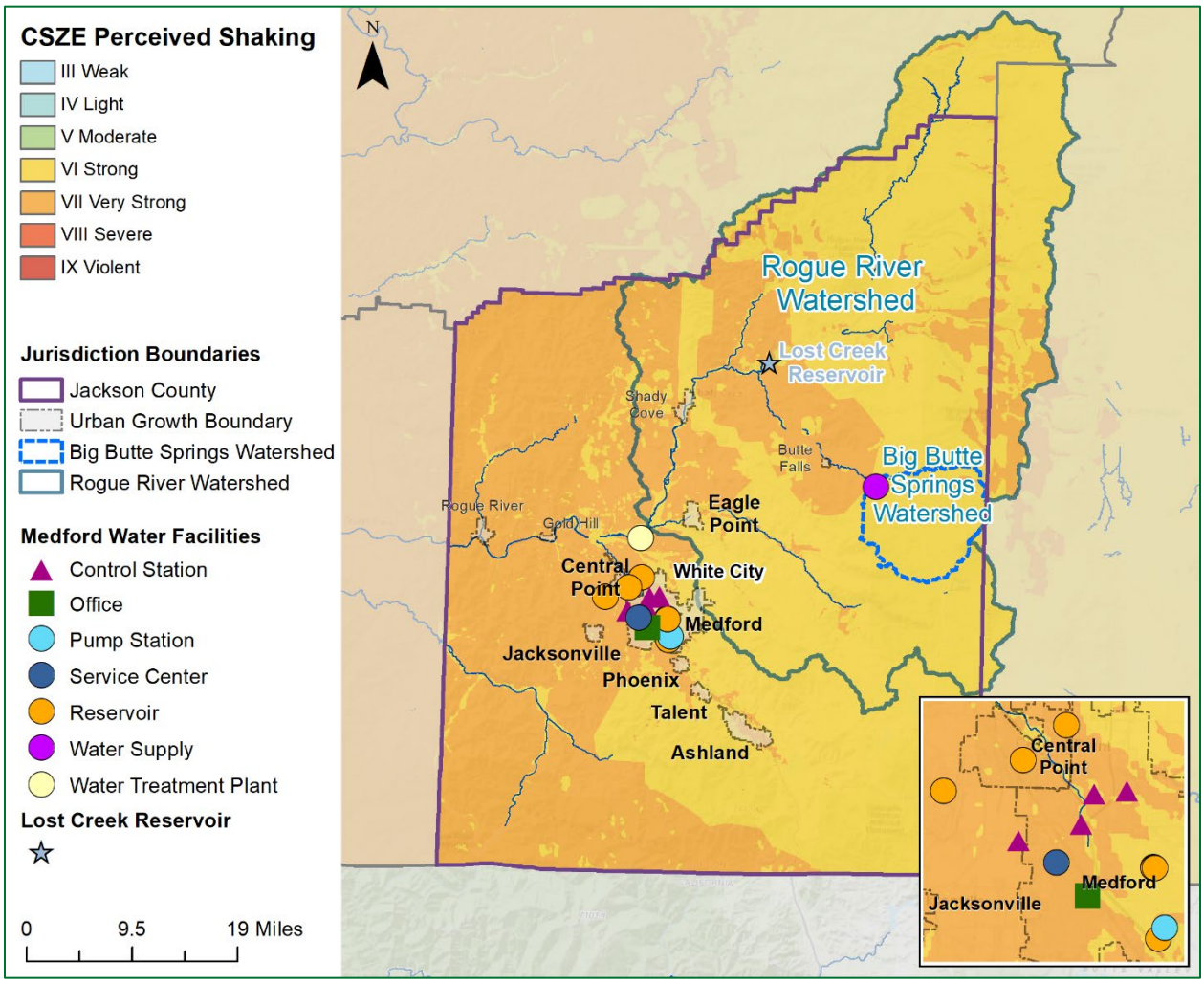
Please review Volume I, Section 2 for additional information on this hazard.

Earthquake (Cascadia)

The steering committee determined that Medford Water's probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** (which is the same as the County's rating) and that their vulnerability to a CSZ earthquake is **high** (which is the same as the County's rating).

Figure MW-4 displays perceived shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure below, the areas of greatest concern within Medford Water are near populated areas and the Big Butte Springs water supply (darker areas).

Figure MW-4 Cascadia Subduction Zone Perceieved Shaking



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Volume I, Section 2 describes the characteristics of earthquake hazards and their history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Medford Water as well. The causes and characteristics of an earthquake

event are appropriately described within Volume I, Section 2, as well as the location and extent of potential hazards. Previous occurrences are well documented within Volume I, Section 2 and the community impacts described by the County would generally be the same for Medford Water as well.

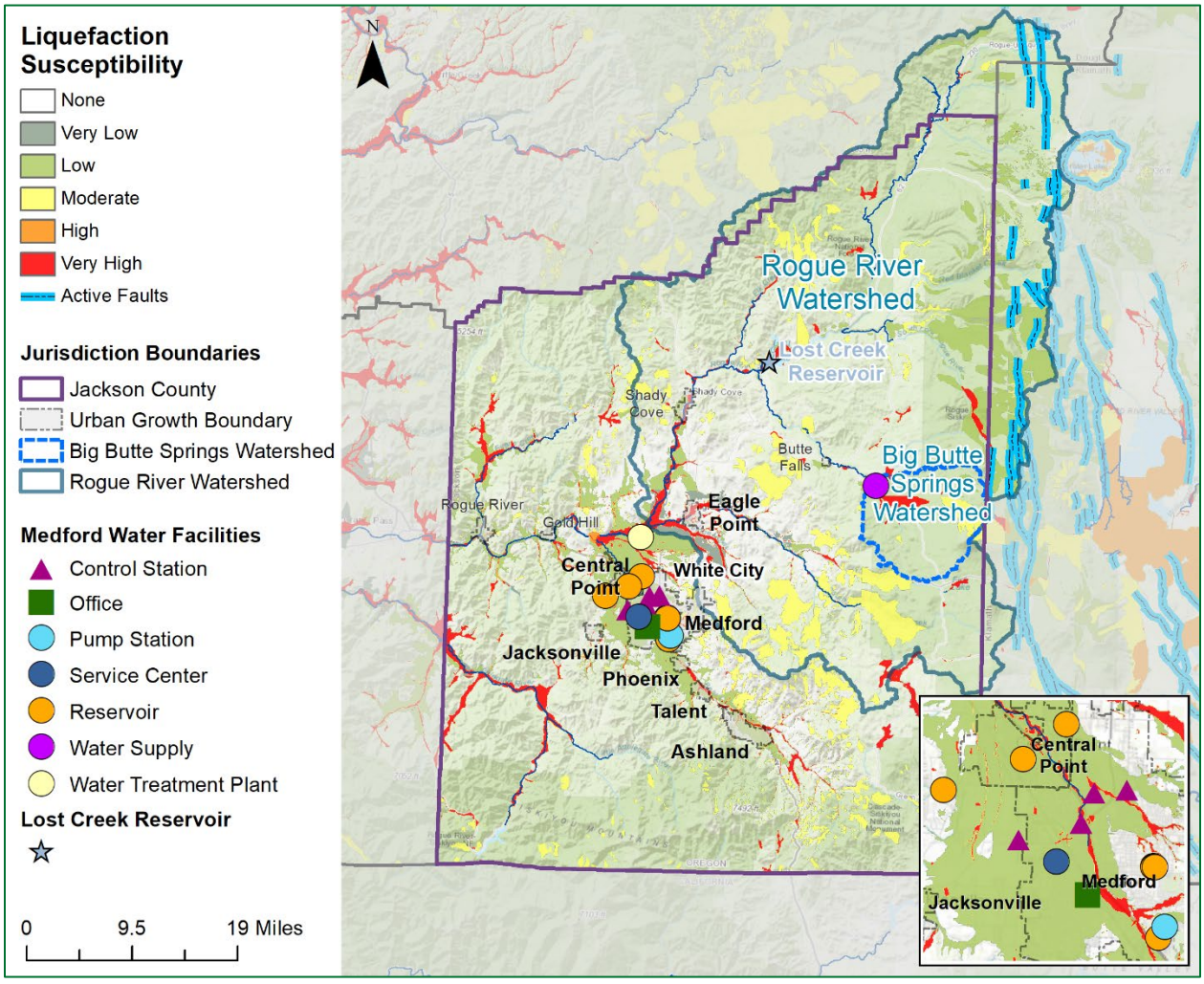
Please review Volume 1, Section 2 for additional information on this hazard.

Earthquake (Crustal)

The steering committee determined that Medford Water's probability for a crustal earthquake is low (which is the same as the County's rating) and that their vulnerability to crustal earthquake is high (which is higher than County's rating).

Figure MW-5 shows the liquefaction risk to the community lifelines that are identified in more detail in Table MW-3. As shown in the figure, the area of greatest concern near Medford Water (liquefaction hazard orange to red areas) are near populated areas.

Figure MW-5 Liquefaction Susceptibility



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Medford Water as well. The causes and characteristics of an earthquake event are appropriately described within Volume I, Section 2, as well as the location and extent of potential hazards. Previous occurrences are well-documented within Volume I, Section 2 and the community impacts described by the County would generally be the same for Medford Water as well.

Earthquake-induced damages are difficult to predict and depend on the size, type, and location of the earthquake, as well as site-specific building and soil characteristics. Presently, it is not possible to accurately forecast the location or size of earthquakes, but it is possible to predict the behavior of soil at any site. In many major earthquakes, damages have primarily been caused by the behavior of the soil.

Vulnerability Assessment
Due to insufficient data and resources, Medford Water is currently unable to perform a quantitative risk assessment for this hazard, however an exposure assessment was conducted. Identified Community Lifelines that are exposed to this hazard are shown in Table MW-3. Note that even if a facility has exposure*, it does not mean there is a high risk (vulnerability).* In addition, pipelines (distribution and transmission pipelines), pump stations, and distribution reservoirs are vulnerable to earthquakes.

Future Projections
Future development (residential, commercial, or industrial) within Jackson County will be at risk to earthquake impacts, although this risk can be mitigated by the adoption and enforcement of high development and building standards. Reducing risks to vulnerable populations should be considered during the redevelopment of existing properties.

Please review Volume I, Section 2 for additional information on this hazard.

Flood

The steering committee determined that Medford Water's probability for flood is **moderate** (which is lower than the County's rating) and that their vulnerability to flood is **moderate** (which is the same as the County's rating).

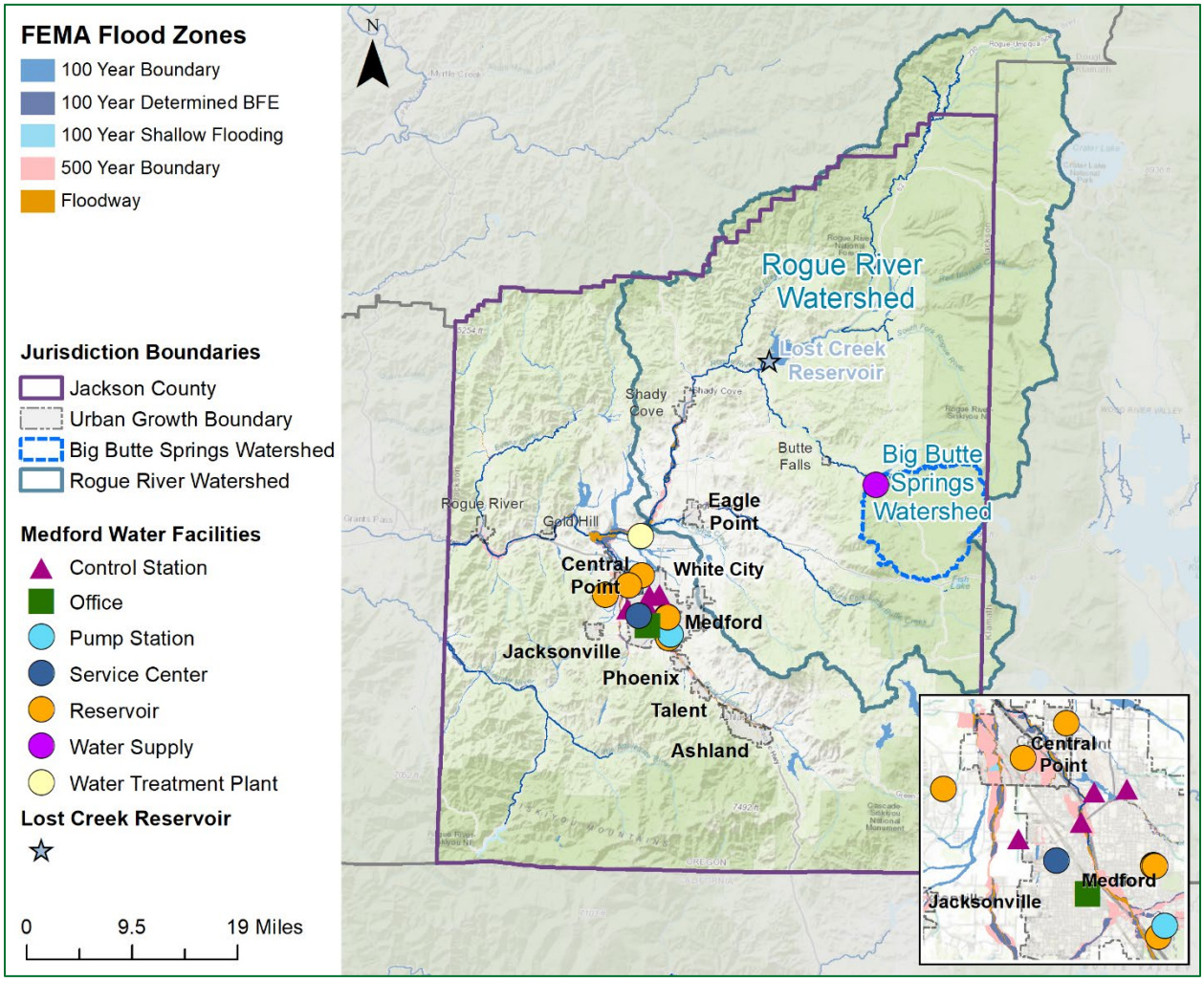
Volume I, Section 2 describes the characteristics of flood hazards, their history, and how they relate to future climate projections (see OCCRI report), as well as the location, extent, and probability of a potential event. Portions of Medford Water have mapped FEMA flood zones (Figure MW-6). Other portions of Medford Water could be subject to flooding from local storm water drainage; however, areas of known flood hazard do not impact development or infrastructure.

The two main water sources for Medford Water are the Rogue River and Big Butte Springs. Additional water is sourced from Lost Creek Reservoir for Jacksonville, Phoenix, and Talent. The Rogue River is the chief source of flooding in the Medford Water area, however, the Rogue River Watershed encompasses many of the flood sources described in the Jackson County Flood Insurance Study (2018). The Rogue River is studied with detailed methods for communities with development that is potentially impacted by its flood waters. The Lost Creek Dam was built in part to regulate flows on the Rogue River. Big Butte Creek, near Big Butte Springs, is studied with approximate methods due to a lack of development in proximity to the creek. Medford Water is above the river and has had minimal recorded flood damage. There is a low potential for flood from this water source. The major flood concern for Medford Water is the condition of the two bridges over the Rogue River that supply transportation access to Medford Water.

Medford Water generally has low to minimal risk from two types of flooding: riverine and urban. Riverine flooding occurs when streams overflow their banks and inundate low-lying areas. This is a natural process that adds sediment and nutrients to fertile floodplain areas. It usually results from prolonged periods of precipitation over a wide geographic area. Most areas are generally flooded by low velocity sheets of water. Urban flooding occurs as land is converted to impervious

surfaces and hydrologic systems are changed. Precipitation is collected and transmitted to streams at a much faster rate, causing floodwaters that rise rapidly and peak with violent force. During urban flooding, storm drains can back up and cause localized flooding of streets and basements. For more information on flood vulnerability see applicable city addenda in Volume III.

Figure MW-6 FEMA Flood Zones



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Vulnerability Assessment

Due to insufficient data and resources, Medford Water is currently unable to perform a quantitative risk assessment for this hazard, however an exposure assessment was conducted. Identified community lifelines that are exposed to this hazard are shown in Table MW-3. Note that even if a facility has exposure*, it does not mean there is a high risk (vulnerability).*

Floods can have a devastating impact on almost every aspect of the community, including private property damage, public infrastructure damage, and economic loss from business

interruption. It is important for Medford Water to be aware of flooding impacts and assess its level of risk.

The economic losses due to business closures often total more than the initial property losses that result from flood events. Business owners and their employees are significantly impacted by flood events. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business.

The Jackson County Flood Insurance Study (January 19, 2018) has a brief history of flooding in Jackson County (Volume I, Section 2). The Conrad Control Station is within the 500-year chance flood zone while other Medford Water facilities are at minimal flood risk.

Floodwaters can affect building foundations, seep into basements or cause damage to the interior, exterior, and contents of buildings, dependent upon the velocity and depth of the water and by the presence of floating debris.

Future Projections
According to the Oregon Climate Change Research Institute (OCCRI report) "Future Climate Projections, Jackson County,"[6] winter flood risk at mid-elevations in Jackson County, where temperatures are near freezing during winter and precipitation is a mix of rain and snow, is projected to increase as winter temperatures increase. The temperature increase will lead to an increase in the percentage of precipitation falling as rain rather than snow. The projected increases in total precipitation, and in rain relative to snow, likely will increase flood magnitudes in the region. Vulnerable populations adjacent to floodways (including the unhoused, manufactured home communities, and campground occupants) will be more at risk as the winter flood risk increases.

National Flood Insurance Program (NFIP)
FEMA updated the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) in 2018 (effective January 19, 2018). Medford Water is not a community which has authority to adopt and enforce floodplain management regulations for the areas within its jurisdiction. All partner jurisdictions (Jackson County and cities) participate in the National Flood Insurance Program (NFIP). For more information on the NFIP see applicable county (Volume I, Section 2) and city addenda (Volume III).

Please review Volume I, Section 2 for additional information on this hazard.

Landslide

The steering committee determined that Medford Water's probability for landslide is moderate (which is lower than the County's rating) and that their vulnerability to landslide is moderate (which is higher than the County's rating).

[6] *Oregon Climate Change Research Institute, Future Climate Projections, Jackson County, Oregon. February 2023.*

Volume I, Section 2 describes the characteristics of landslide hazards, history, how they relate to future climate projections (see OCCRI report), as well as the location, extent, and probability of a potential event within the region.

Landslide susceptibility exposure for Medford Water is shown in Figure MW-7. Most of Medford Water demonstrates a low susceptibility to landslide exposure, with corridors of moderate and high susceptibility concentrated around the upper areas of the watershed. The chief concern for landslide is along rural transportation corridors and waterways within the watershed.

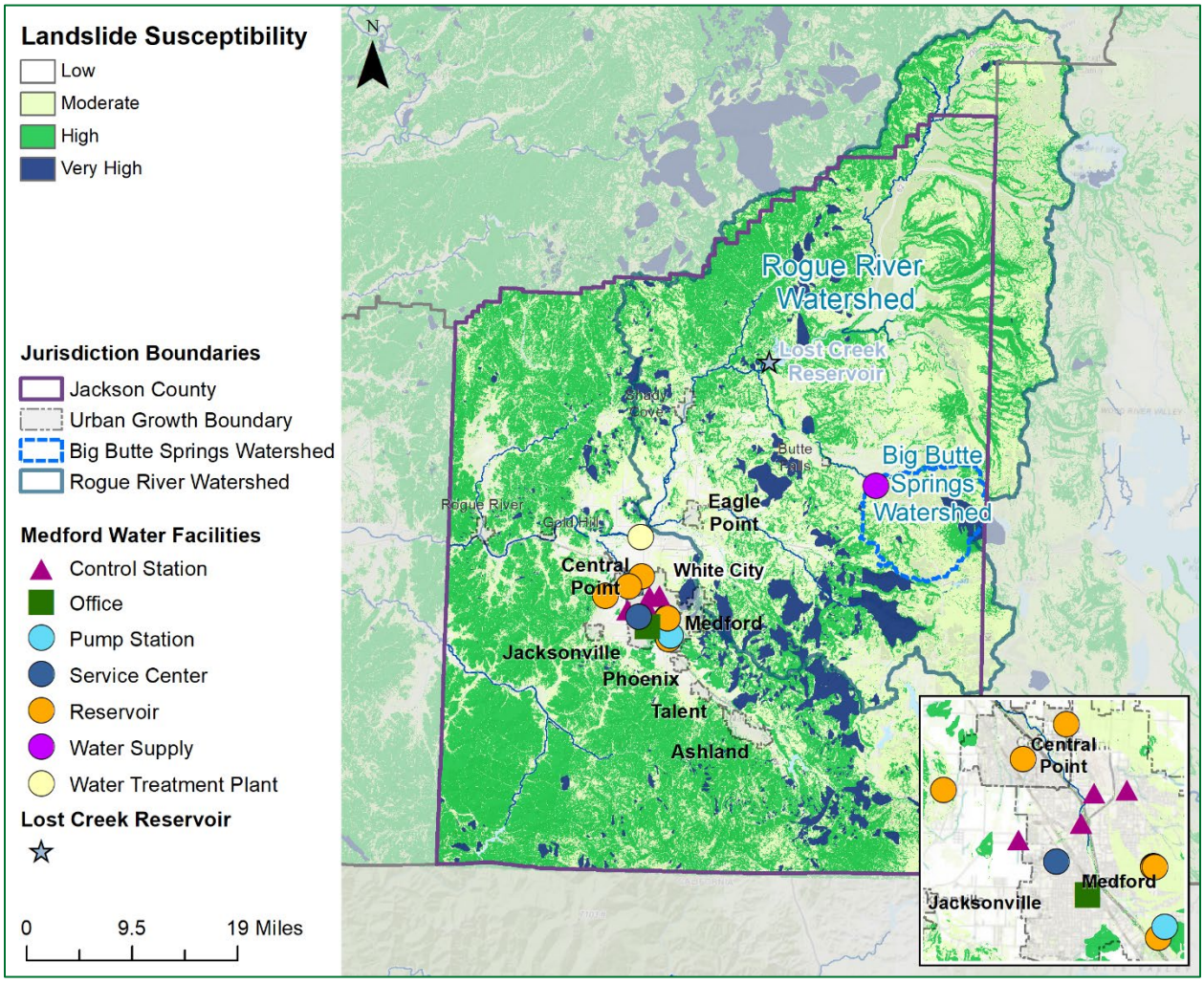
Vulnerability Assessment

Due to insufficient data and resources, Medford Water is currently unable to perform a quantitative risk assessment for this hazard, however an exposure assessment was conducted. Identified community lifelines that are exposed to this hazard are shown in Table MW-3. *Note that even if an area has a high percentage of land in a high or very high landslide exposure susceptibility zone, that does not mean there is a high risk (vulnerability), because risk is the intersection of a hazard and assets.*

Future Projections

Landslides are often triggered by rainfall when the soil becomes saturated. As a surrogate measure of landslide risk, the Oregon Climate Change Research Institute (OCCRI report) report presents a threshold based on recent precipitation (cumulative precipitation over the previous 3 days) and antecedent precipitation (cumulative precipitation on the 15 days prior to the previous 3 days). By the 2050s under the higher emissions scenario, the average number of days per year in Jackson County on which the landslide risk threshold is exceeded is projected to remain about the same, with an increase of 0.2 days. However, landslide risk depends on multiple factors, and this metric, which is based on precipitation, does not reflect all aspects of the hazard. Additional triggers, such as earthquakes, wildfires, or development, can increase risks of landslides. Future development along slopes or adjacent to riverbanks will be a greater risk of impact from this hazard.

Figure MW-7 Landslide Susceptibility Exposure



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.
Note: To view detail click this link to access Oregon HazVu.

Severe Weather

Severe weather can account for a variety of intense and potentially damaging weather events. These events include windstorms and winter storms. The following section describes the unique probability and vulnerability of each identified weather hazard. Other more abrupt or irregular events such as hail are also described in this section.

Extreme Heat Event

The steering committee determined that Medford Water's probability for extreme heat event is high (which is the same as the County's Rating) and that their vulnerability to an extreme heat event is low (which is lower than the County's Rating).

Jackson County's NHMP Volume I, Section 2, adequately describes the causes and characteristics of extreme heat, as well as the history, location, extent, and probability of a potential event and

how it relates to future climate projections (see OCCRI report). Generally, an event that affects the County is likely to affect Medford Water as well. A severe heat episode or "heat wave" occurs about every two to three years, and typically lasting two to three days but can last as many as five days. A severe heat episode can be defined as consecutive days of temperatures in the high 90s and above 100. Severe heat hazard in Southern Oregon can be described as the average number of days with temperatures greater than or equal to 90-degrees Fahrenheit.[7]

Extreme heat events can and have occurred in Medford Water, and while they typically do not cause loss of life, they are becoming more frequent and have the potential to impact economic activity as well as quality of life and have caused threat to life in some cases.

Future Projections

According to the Oregon Climate Change Research Institute (OCCRI report) "Future Climate Projections, Jackson County,"[8] average temperature is expected to continue increasing during the twenty-first century if global emissions of greenhouse gases continue. The number, duration, and intensity of extreme heat events will increase as temperatures continue to warm. In Jackson County, the number of extremely hot days (days on which the temperature is 90°F or higher) and the temperature on the hottest day of the year are projected to increase by the 2020s and 2050s. The number of days per year with temperatures 90°F or higher is projected to increase by an average of 28 days (range 12–38 days) by the 2050s, relative to the 1971–2000 historical baselines. The temperature on the hottest day of the year is projected to increase by an average of about 7°F (range 3–8°F) by the 2050s. Higher temperatures and longer/more extreme heat events will have negative impacts upon vulnerable populations such as those over 65+, children, those living in older or temporary housing, and field workers.

See the Risk Assessment (Volume I, Section 2) for additional information on this hazard.

Windstorm

The steering committee determined that Medford Water's probability for windstorm is moderate (which is lower than the County's rating) and that their vulnerability to windstorm is low (which is lower than the County's rating).

Volume I, Section 2 describes the characteristics of windstorm hazards, their history, and how they relate to future climate projections (see OCCRI report), as well as the location, extent, and probability of a potential event within the region. Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and snow. Other severe weather events that may accompany windstorms, including thunderstorms, hail, and lightning strikes are standard for Medford Water.

Volume I, Section 2 describes the impacts caused by windstorms, including power outages, downed trees, heavy precipitation, building damages, and storm-related debris. Additionally,

[7] *DLCD. Oregon State Natural Hazard Mitigation Plan. 2020.*

[8] *Oregon Climate Change Research Institute, Future Climate Projections, Jackson County, Oregon. February 2023.*

transportation and economic disruptions result as well. Medford Water regularly experiences high winds. Pacific Power has mitigated the risk of power loss by trimming trees near their above ground infrastructure.

Damage from high winds generally has resulted in downed utility lines and trees but has minimal impact upon Medford Water. Electrical power can be out anywhere from a few hours to several days. Outdoor signs have also suffered damage. If the high winds are accompanied by rain (which they often are), blowing leaves, and debris clog drainage-ways, which in turn causes localized urban flooding.

Future Projections
Limited research suggests little if any change in the frequency and intensity of windstorms in the Northwest as a result of climate change. Those impacted by windstorms at present, including older residential or commercial developments with above-ground utilities, poor insulation or older construction, heavy tree canopies, or poor storm drainage, will continue to be impacted by windstorms in the future.

Please review Volume I, Section 2 for additional information on this hazard.

Winter Storm (Snow/Ice)

The steering committee determined that Medford Water's probability for winter storm is **high** (which is the same as the County's rating) and that their vulnerability to winter storm is **moderate** (which is the same as the County's rating).

Volume I, Section 2 describes the characteristics of winter storm hazards, their history, and how they relate to future climate projections (see OCCRI report), as well as the location, extent, and probability of a potential event within the region. Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting Medford Water typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

Major winter storms can and have occurred in the Medford Water area and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity. Road closures due to winter weather are an uncommon occurrence but can interrupt commuter and commercial traffic.

Future Projections
According to the Oregon Climate Change Research Institute (OCCRI report) "Future Climate Projections, Jackson County,"[9] cold extremes will become less frequent and intense as the climate warms. In Jackson County, the number of cold days (maximum temperature 32°F or lower) per year is projected to decrease by an average of 3 days (range -2– -5 days) by the 2050s, relative to the 1971–2000 historical baselines, under the higher emissions scenario. The

[9] *Oregon Climate Change Research Institute, Future Climate Projections, Jackson County, Oregon. February 2023.*

temperature on the coldest night of the year is projected to increase by an average of 6°F (range 3–9°F) by the 2050s. The intensity of extreme precipitation is expected to increase as the atmosphere warms and holds more water vapor. In Jackson County, the number of days per year with at least 0.75 inches of precipitation is not projected to change substantially. However, by the 2050s, the amount of precipitation on the wettest day and wettest consecutive five days per year is projected to increase by an average of 15% (range -3–32%) and 11% (range -3–34%), respectively. If these precipitation events occur in the winter, heavier winter storms with larger impacts upon transportation routes, vulnerable populations, and economic activity can be expected.

Please review Volume I, Section 2 for additional information on this hazard.

Volcanic Event

The steering committee determined that Medford Water's probability for a volcanic event is low (which is the same as the County's rating) and that their vulnerability to a volcanic event is low (which is the same as the County's rating).

Volume I, Section 2 describes the characteristics of volcanic hazards and their history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the County is likely to affect Medford Water as well. Medford Water is very unlikely to experience anything more than volcanic ash during a volcanic event.

Future Projections
Although the science of volcano predictions is improving, it remains challenging to predict a potential volcanic event. Ash fall, which will be the greatest impact, will impact the entire County. Impacts will be felt hardest by property managers (ranches, farmers, etc.) and by those relying upon clean surface water (for drinking water production and irrigation).

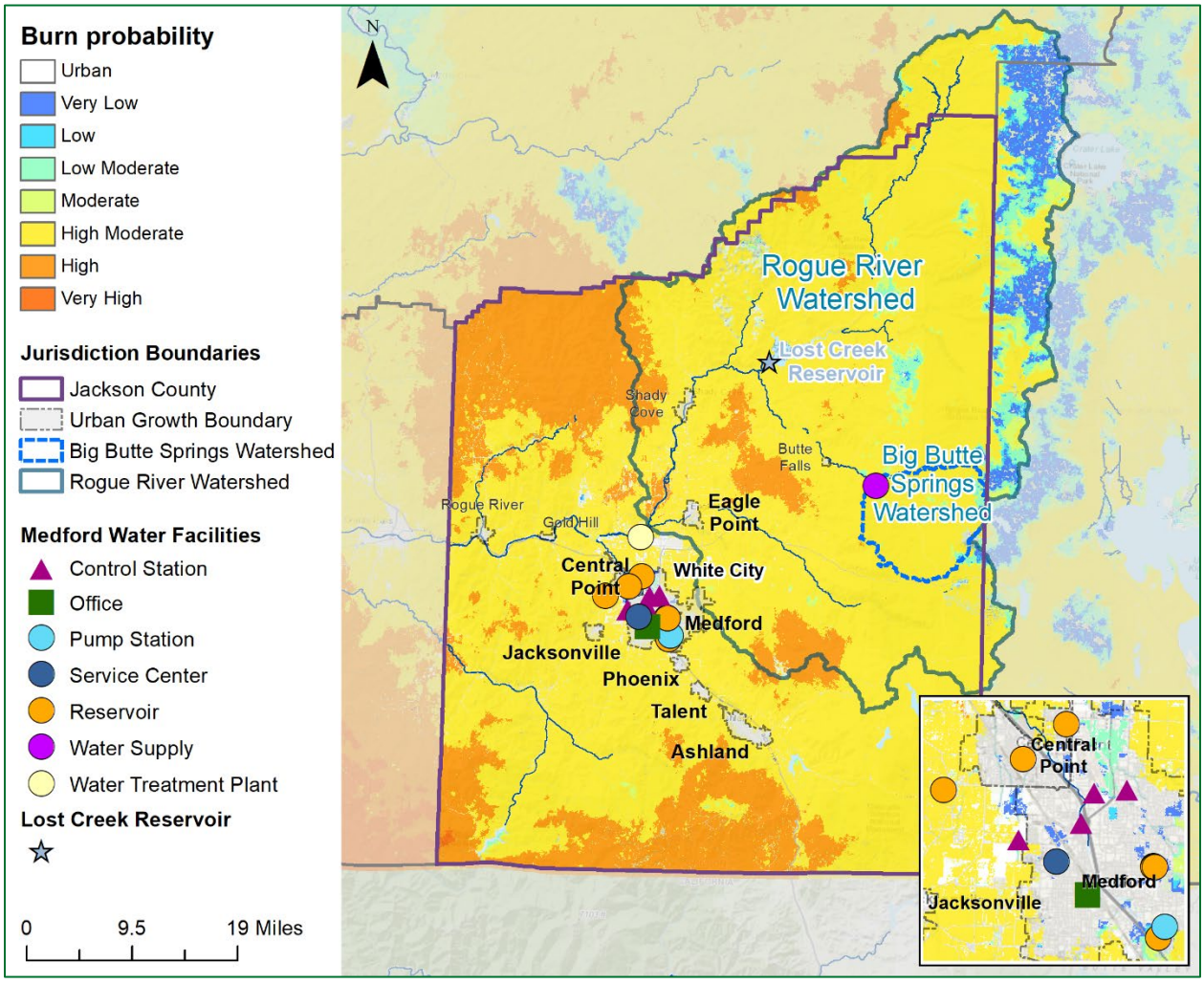
Please review Volume I, Section 2 for additional information on this hazard.

Wildfire

The steering committee determined that Medford Water's probability for wildfire is high (which is the same as the County's rating) and that their vulnerability to wildfire is high (which is the same as the County's rating).

Volume I, Section 2 describes the characteristics of wildfire hazards, their history, and how they relate to future climate projections (see OCCRI report), as well as the location, extent, and probability of a potential event within the region. The location and extent of a wildfire vary depending on fuel, topography, and weather conditions. Weather and urbanization conditions are primarily at cause for the hazard level. Wildfires near Medford Water in recent times have included Almeda Drive (2020), South Obenchain Fire in 2020, Miles (2018), Sugar Pine (2018), Blanket Creek (2017), Broken Lookout (2017), Spruce Lake (2017), Bybee Creek (2016), Crescent (2015), Middle Fork (2008), Nichols Gap (2006), and Timbered Rock (2002). Figure MW-8 shows burn probability in Medford Water.

Figure MW-8 Burn Probability



Source: Oregon Partnership for Disaster Resilience. USFS Pacific Northwest Region Wildfire Risk Assessment (PNRA)
Note: To view detail click this link to access Oregon Explorer's CWPP Planning Tool.

The potential community impacts and vulnerabilities described in Volume I, Section 2 are generally accurate for Medford Water as well. The Rogue Valley Integrated Community Wildfire Protection Plan (RVIFP, updated 2019) assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk. Medford Water is included in the RVIFP and will update Medford Water's wildfire risk assessment if the RVIFP presents better data during future updates (an action item is included within Volume I, Section 4 to participate in updates to the integrated fire plan and to continue to maintain and update their RVIFP). The forest service and Medford Water are actively reducing fuels in and around the watershed but anticipate an increase in wildfire risk with maturation of the forest. Medford Water hereby incorporates the RVIFP into this addendum by reference to provide greater detail to sensitivity and exposure to the wildfire hazard.

Property can be damaged or destroyed with one fire as structures, vegetation, and other flammables easily merge to become unpredictable and hard to manage. Other factors that affect

ability to effectively respond to a wildfire include access to the location and to water, response time from the fire station, availability of personnel and equipment, and weather (e.g., heat, low humidity, high winds, and drought).

Vulnerability Assessment

Due to insufficient data and resources, Medford Water is currently unable to perform a quantitative risk assessment for this hazard, however an exposure assessment was conducted. Identified community lifelines that are exposed to this hazard are shown in Table MW-3. Note that even if a facility has exposure*, it does not mean there is a high risk (vulnerability).* The southern portion of the Cascades are generally drier and have relatively frequent lightning caused fires that can be severe. Additionally, fuel loads are relatively high in the Big Butte Springs Watershed due to higher precipitation that create better growing conditions for vegetation that is at risk during the dry summer season. Fire protection for the Big Butte Springs Watershed is provided by the Oregon Department of Forestry while the United States Forest Service provides additional forest management. Medford Water has a Forest Management Plan that is intended to actively manage dense understory vegetation that is present in parts of the watershed and Big Butte Springs property. The primary objective of management is to maintain and/or enhance existing conditions to reduce risk from fires and other stressors. For more information see the Forest Management Plan (2020). Applicable mitigation strategies are identified in Table MW-1.

Future Projections

According to the Oregon Climate Change Research Institute "Future Climate Projections, Jackson County*,"*[10] wildfire frequency, intensity, and area burned are projected to continue increasing in the Northwest. Wildfire risk, expressed as the average number of days per year on which fire danger is very high, is projected to increase in Jackson County by 13 days (range -6– 29) by the 2050s, relative to the historical baseline (1971–2000), under the higher emissions scenario. Similarly, the average number of days per year on which vapor pressure deficit is extreme is projected to increase by 29 days (range 12–42) by the 2050s. Communities at risk to wildfire include those within the urban wildfire interface or along river or creek corridors, like Bear Creek, where fire can travel quickly. Communities will need to address growing wildfire risks if populations are not restricted from expanding further into higher risk areas.

Please review Volume I, Section 2 for additional information on this hazard.

[10] *Oregon Climate Change Research Institute, Future Climate Projections, Jackson County, Oregon. February 2023.*

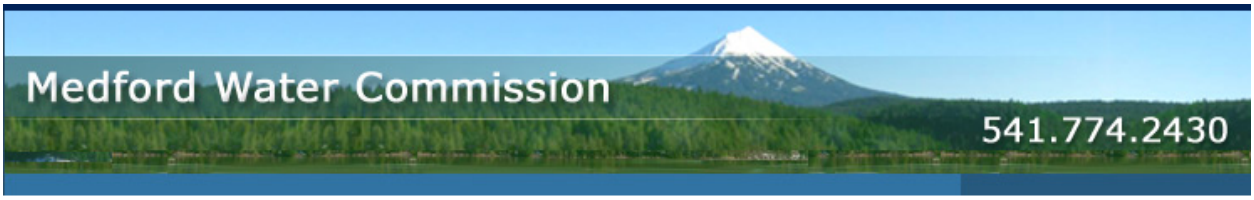
Attachment A: Public Involvement Summary

Members of the steering committee provided content and edits to the NHMP prior to the public review period as reflected in the final document. In addition, a survey was distributed that included responses from residents within Medford Water boundaries (Volume III, Appendix F).

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see below) was provided from October 4, 2023 through November 14, 2023 on Medford Water's website. There were no public comments provided. Additional opportunities for stakeholders and the public to be involved in the planning process are addressed in Volume II, Appendix B.

A diverse array of agencies and organizations were provided an opportunity to provide input to inform the plan's content through a variety of mechanisms including the opportunity for comment on the draft plan. The agencies and organizations represent local and regional agencies involved in hazard mitigation activities, those that have the authority to regulate development, neighboring communities, representatives of businesses, academia, and other private organizations, and representatives of nonprofit organizations, including community-based organizations, that work directly with and/or provide support to underserved communities and socially vulnerable populations. For more information on the engagement strategy see Volume II, Appendix B.

Website Posting



Natural Hazard Mitigation Plan Update – Notice and Opportunity for Public Comment

Medford Water is in the process of developing a Natural Hazard Mitigation Plan (NHMP). This work is being performed in cooperation with the University of Oregon's Institute for Policy Research and Engagement - Oregon Partnership for Disaster Resilience and the Oregon Department of Emergency Management utilizing funds obtained from the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program. With adoption of the plan, our organization will gain eligibility to apply for federal funding towards natural hazard mitigation projects. This local planning process includes a wide range of representatives from local governments, emergency management personnel, and outreach to members of the public in the form of an electronic survey.

A natural hazard mitigation plan provides communities with a set of goals, action items, and resources designed to reduce risk from future natural disaster events. Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities, and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

An electronic version of the draft NHMP addendum is available for formal public comment; to view the draft, please see the file below.

PUBLIC COMMENT NOTICE

To provide public comment, please describe the feedback and reference page number, table, or figure of concern:

1. Send an email to brian.runyen@medfordwater.org
2. Send a fax to 541-774-2555
3. Mail or drop-off hard copies: 200 S. Ivy Street - Room 177, Medford, OR 97501

If you have any questions regarding the NHMP addendum or the update process in general, please contact: Brian Runyen, Engineering Manager, at (541) 774-2428 or brian.runyen@medfordwater.org, or Michael Howard, Director for the Oregon Partnership for Disaster Resilience at mrhoward@uoregon.edu.

Medford Water Steering Committee

Steering committee members possessed familiarity with the communities within Medford Water and how it is affected by natural hazard events. The steering committee guided the development process through several steps including goal confirmation and prioritization, action item development, and information sharing, to make the NHMP as comprehensive as possible. The steering committee met formally on the following date:

Meeting #1: Medford Water steering committee, May 3, 2023 (via Zoom)
During this meeting, the steering committee was provided information on hazard mitigation planning, the NHMP process, and project timeline. The steering committee:

- Reviewed history of hazard events in Medford Water.
- Reviewed and confirmed the NHMP's mission and goals.
- Discussed the NHMP public outreach strategy.
- Discussed development activity and community lifelines.
- Reviewed and provided feedback on the draft risk assessment including community vulnerabilities and hazard information.
- Developed mitigation strategy (actions).
- Reviewed their implementation and maintenance program.

Meeting Attendees:

- Convener, Rachel Lanigan, Senior Engineer
- Brad Taylor, General Manager
- Aaron Ott, City of Medford, Emergency Manager
- Delaney Huerta, Jackson County, Emergency Management