CITY OF SISTERS ADDENDUM

Introduction

This document serves as the City of Sisters' Addendum to the Deschutes County Natural Hazards Mitigation Plan (NHMP). The City's Addendum is considered part of the County's multi-jurisdictional plan, and meets the following requirements: (1) Multi-jurisdictional Plan Adoption §201.6(c)(5), (2) Multi-jurisdictional Participation §201.6(a)(3), (3) Multi-Jurisdictional Risk Assessment §201.6(c)(2) (iii), and (4) Multi-jurisdictional Mitigation Strategy §201.6(c)(3)(iv).

A description of the city specific planning and adoption process follows, along with detailed community specific action items; for detailed information see Volume IV, Appendix B. Information about the city's risk relative to the County's risk to natural hazards is documented in this addendum's Hazard Analysis and Issue Identification section. The section considers how the city's risk differs from or matches that of the County's; additional information on the Risk Assessment is provided within Volume I, Section 2 of this NHMP.

How was the Plan Developed?

The NHMP was developed by the Deschutes County Natural Hazards Mitigation Plan steering committee, while this addendum was created by the City of Sisters steering committee. The Deschutes County Emergency Manager was designated as the NHMP's convener and will take the lead in implementing, maintaining and updating the plan. Locally, the City of Sisters convened a steering committee for the purpose of developing the city's addendum.

The local steering committee was closely involved throughout the development of the plan and served as the local oversight body for the plan's development. The local steering committee met on one occasion: April 9th, 2021 (see Appendix B for more information). Steering committee members contributed data and reviewed, and provided guidance towards the community profile, risk assessment, mitigation strategy (action items), and implementation and maintenance plan. The addendum reflects effort from the formal meeting and during subsequent informal meetings between members of the steering committee and with Central Oregon Intergovernmental Council (COIC).

An open public involvement process is essential to the development of an effective plan. In order to develop a comprehensive approach to reducing the effects of natural disasters, the planning process should include opportunities for the public, neighboring communities, local and regional agencies, as well as, private and nonprofit entities to comment on the plan.[1] COIC provided a publicly accessible project webpage for the general public in order to make meeting materials and contact information available throughout the update process. In

[1] Code of Federal Regulations, Chapter 44. Section 201.6, subsection (b). 2015

addition, Deschutes County and the City of Sisters provided press releases on their websites to encourage the public to offer feedback on the plan update.

In addition, COIC administered a public opinion survey to obtain additional input from the public regarding the County's risks, vulnerabilities, hazards history, and mitigation strategies. See Volume IV, Appendix F for more information.

Updating the mitigation plan is a requirement to gain eligibility for the Federal Emergency Management Agency's Pre-Disaster Mitigation, Hazard Mitigation, and Flood Mitigation Assistance grant Programs. This project is funded through the Federal Emergency Management Agency's (FEMA) FY12 Pre-Disaster Mitigation Competitive Grant Program (PDMC – PL-10-OR-2012-002).

The Sisters Addendum to the Deschutes County NHMP was adopted on [DATE] and approved by FEMA on [DATE]. The Deschutes MNHMP was approved by FEMA on [DATE], the plan is effective for Deschutes County and Sisters through [DATE].

For more information on the composition of the steering committee and the process see this NHMP's Volume I, Acknowledgements and Executive Summary, and Volume IV, Appendix B.

Action Item Matrix

The City's action items were first developed through a two-stage process in 2015 by the local steering committee, facilitated by Oregon Partnership for Disaster Resilience (OPDR). In 2021, the local steering committee, facilitated by COIC, updated the status of existing action items and added one new action item. In addition, there are 25 County Action Items that include Sisters as an "Affected Jurisdiction." For additional information see the discussion near the end of this document.

The City's actions are listed below in matrix format. For more detailed information on each action, see the action forms within Attachment 1 of this addendum.

Table SA-1 City of Sisters Action Items

2021 Action Item	High Priority	Mitigation Action Title	Lead Organization	Partner Organization(s)	Timeline	Status
Multi-Hazard #1	X	Identify and remove hazardous trees which pose a potential threat of coming into contact with overhead elctric transmission or distibution lines during a high wind event.	Public Works	Internal: - External: Central Electric Cooperative	Ongoing	New
Flood #1		Explore options to replace pressure sewer line at Locust Street Bridge or construct temporary emergency bypass.	Public Works	Internal: - External: USFS, USACE, Silver Jackets, OWRD, ODOT, UDWC, DRC	Long-Term	Complete
FL #2		Increase dimensions of drainage culverts in flood-prone areas.	Public Works	Internal: Community Development External: USACE, Silver Jackets, OWRD, ODOT, DRC, UDWC	Long-Term	Remove
FL #3		Conduct a viability study for an early warning system for Whychus Creek flooding.	Deschutes County Emergency Services	Internal: City of Sisters, Sisters-Camp Sherman Fire External: OWRD, OEM, USFS, USGS	Medium-Term	New
FL #4		Pursue updated information to inform innundation mapping and flood risk along Whychus Creek.	Deschutes County	Internal: Community Development, Public Works, Sisters Community Development and Public Works External: USGS, USACE, FEMA, DOGAMI, OEM, DLCD, OSU-Cascades	Short-Term	New
Wildfire #1	X	Explore adoption of updated defensible space and enhanced building code requirements like R327.4.	City of Sisters	Internal: Sisters-Camp Sherman Fire; Deschutes County; Cities of Bend, La Pine, and Redmond External: USFS, ODF	Short-Term	New
WF #2	X	Increase participation of community members in fire insurance and maintaining defensible space to maintain eligibility.	Deschutes County Emergency Services	Internal: City of Sisters, Sisters-Camp Sherman Fire; Project Wildfire External: USFS, ODF	Short-Term	New
WF #3		Increase water storage to account for increased growth/wildfire	Public Works	Internal: Sisters-Camp Sherman Fire External: USFS	Medium-Term	New

Source: City of Sisters NHMP Steering Committee, 2021

How Will the Plan be Implemented?

The City Council will be responsible for adopting the City of Sisters addendum to the Deschutes County NHMP. This addendum designates a coordinating body and a convener to oversee the development and implementation of action items. Because the city addendum is considered part of the County plan, the city will look for opportunities to partner with the County to maintain the plan, and coordinate mitigation efforts through the implementation of action items, etc. The City's steering committee will convene after re-adoption of the City of Sisters addendum annually with the County every fall. For more details on the meeting schedule and process, see Volume I, Section 4. The City's Community Development Director will serve as the convener and will be responsible for convening the local steering committee. The convener will also remain active in the County's planning process. The steering committee will seek to involve senior staff and decision makers throughout the duration of the five-year implementation and maintenance of the NHMP addendum.

Implementation through Existing Programs

Many of the Natural Hazards Mitigation Plan's recommendations are consistent with the goals and objectives of the city's existing plans and policies. Where possible, the City of Sisters will implement the NHMP's recommended actions through existing plans and policies. Plans and policies already in existence have support from local 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.

The City of Sisters currently has the following plans that relate to natural hazard mitigation:

Table SA-2 Existing Plans

Jurisdiction	Document	Year
City of Sisters	Comprehensive Plan	2021
City of Sisters	Transportation System Plan	2018
City of Sisters	Development Code (Flood, Section 2.10)	2020
City of Sisters	Greater Sisters Area Emergency Operations Plan	2009
City of Sisters	Greater Sisters Country CWPP*	2020
City of Sisters	Water System Master Plan	2017
City of Sisters	Water Management and Conservation Plan	2016
City of Sisters	Wastewater System Capital Facilities Plan	2016

Source: City of Sisters Steering Committee, 2021

The steering committee and the community's leadership have the option to add or implement action items at any time. This allows the steering committee to consider mitigation strategies as new opportunities arise, such as funding for action items that may not be of the highest priority. When new actions are identified, they should be documented using an action item form (see Attachment 2). Once a proposed action form has been submitted to the convener, the action will become part of the City's addendum.

Continued Public Participation

Keeping the public informed of the city's efforts to reduce the city's risk to future natural hazards events is important for successful plan implementation and maintenance. The city is committed to involving the public in the plan review and updated process. The City Addendum along with the County Plan will be posted on-line on COIC's website (https://www.coic.org/emergency-preparedness/natural-hazard-mitigation-plans/deschutes-County-nhmp/), as well as the County and City websites, so that the public may view the plan at any time.

In addition, natural hazards information dissemination is conducted throughout the year when opportunities present themselves via the city offices and website.

Plan Maintenance

The Deschutes County Natural Hazards Mitigation Plan will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County plan update process, the city will also review and update its addendum. The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state, or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the plan was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the plan accurately address the impacts of this event?

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the plan.

The remainder of this addendum includes three sections:

1. Community Profile and Asset Identification,
2. Hazard Identification and Risk Assessment, and
3. Mitigation Strategy section.

COMMUNITY PROFILE
ASSET IDENTIFICATION

This section provides city specific asset identification. For information on the characteristics of Sisters, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume IV, Appendix C, *Community Profile*. Many of these community characteristics can affect how natural hazards impact communities and how communities choose to plan for natural hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation.

We live in a place with a varied geography and communities. We would like to recognize and acknowledge the indigenous land of the Confederated Tribes of Warm Springs, Molalla, Paiute, Klamath, Modok, Yahooskin Band of Snake Indians, and Tribes of Middle Oregon. We want to recognize the people that came before us and honor their traditions and stewardship of the land. Acknowledgement is a simple, powerful way of showing respect for Indigenous People's history and culture.

Asset Identification

The following assets were identified by the steering committee in 2021:

Critical and Essential Facilities

- Deschutes County Sheriff's Office Emergency Management has access to an inventory of critical and essential facilities.

Deschutes County, State, and Federal Critical and Essential Facilities (located in Sisters):

- Deschutes County Sheriff's Office Substation – 703 N Larch Avenue
- Oregon Department of Forestry – 16721 Pine Tree Lane
- United States Forest Service – Pine Street and US 20
- Oregon Department of Transportation maintenance station – 16415 HWY 126
- Sisters Post Office – 694 N Larch Street

Special Districts in Sisters

- Sisters-Camp Sherman Rural Fire Protection District – 301 S Elm Street
- Sisters Parks and Recreation District – 1750 W. McKinney Butte Road
- Three Sisters Irrigation District – 68000 Hwy 20
- Deschutes Public Library – 11 N. Cedar Street

Sisters School District

- Sisters Elementary School – 611 E Cascade Avenue
- Sisters Middle School – 15200 McKenzie Highway
- Sisters High School – 1700 McKinney Butte Road
- Sisters School District – 525 East Cascade Avenue
- Bus Maintenance Facility – 15100 McKenzie Highway

Social Service Providers

- Please see https://www.thrivecentraloregon.org/services for a comprehensive list of resource providers throughout Central Oregon, including Sisters.

Population

Sisters' estimated population is 3,220 people. The city's population has grown an estimated 1,182 people or 58% since the 2010 Census.[2] Sisters' acknowledged Coordinated Population Forecast is 5,169 people by the year 2043, which represents an increase of 1,899people or 58% between 2020 and 2043.[3]

Land Use

The City of Sisters' acknowledged comprehensive plan is the "Sisters Urban Area Comprehensive Plan." The Oregon Land Conservation and Development Commission first acknowledged the plan in 1982. The City last completed a major update of the plan in 2005. The City is currently updating the Comprehensive Plan, and expects to adopt it in fall of 2021. The City implements the plan through the Sisters Development Code, which was last comprehensively updated in 2021.

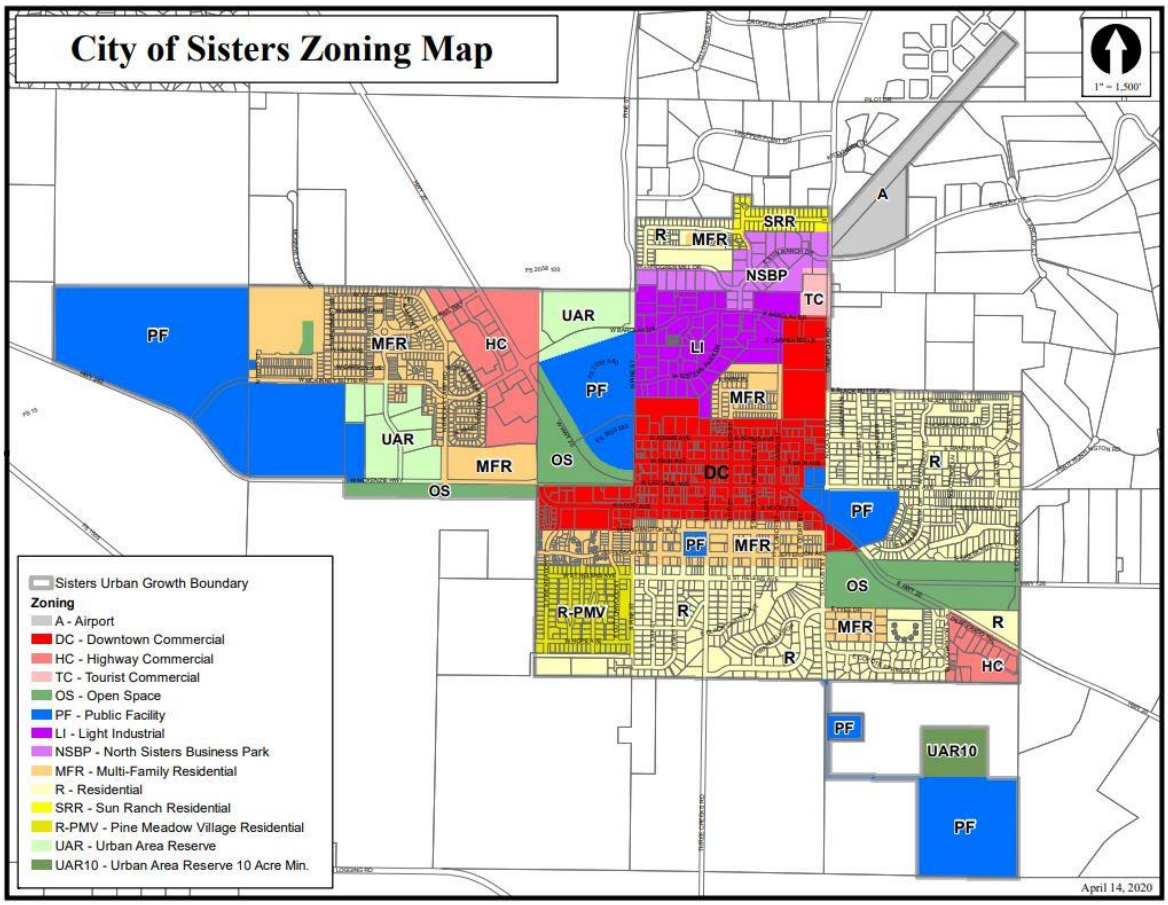
The City continues to grow at a steady pace with most residential construction being developed as single-family detached homes. Existing master planned subdivisions are experiencing new construction as well infill construction occurring on historically platted lots in Sisters. There is a strong interest by the community and a recognized need for more affordable housing units to be constructed and recently there has been an increase in the construction of multi-family units.

Figure SA-1 below shows the city's zoning map (April 2020):

[2] Portland State University, Population Research Center, "Annual Population Estimates", 2020.

[3] 2004 Coordinated Population Forecast for Deschutes County – updated 2018

Figure SA-1 Zoning Map



Source: City of Sisters (2020)

Parks and Open Space

The City of Sisters owns and manages a variety of parks to serve different functions and needs in the community. The existing parks system provides a range of park types and recreation opportunities. The City currently owns and maintains nine developed park facilities, which comprise 14.01 acres of developed parkland, and three undeveloped parcels, which comprise 5.59 acres of undeveloped parkland. Two new parks of 0.5 and 1.8 acres each have been dedicated by private developers. In addition, the Sisters planning area contains 33.76 linear miles of trails and 28.65 acres of open space.

Economy

Sisters is the second smallest city in Deschutes County, however, it has more than doubled its population since 2010 and is expected to grow by another 63% by 2043. The Community

has a growing trade-sector economy[4]. The table below demonstrates the top ten industries in the City of Sisters based on total and export employment.

Table SA-3 Top Ten Industries City of Sisters

Industry	Total Employment
Accomodation and Food Services	432
Retail Trade	388
Agriculture, Forestry, Fishing, and Hunting	140
Educational Services	138
Health Care and Social Assistance	127
Construction	120
Professional, Scientific, and Technical Services	92
Other Services	90
Wood Manufacturing	78
Food Manufacturing	76
Industry	**Export Employment**
Accomodation and Food Services	273
Retail Trade	189
Agriculture, Forestry, Fishing, and Hunting	128
Educational Services	75
Wood Manufacturing	73
Food Manufacturing	43
Other Services	23
Construction	13
Arts, Entertainment, and Recreation	12
Transportation	10

Source: City of Sisters Economic Opportunities Analysis

The seasonally adjusted unemployment rate for Deschutes County was 8.6% for 2020.

Cultural and Historic Resources

The sites and structures listed below (Table SA-3) represent the city's official list of historic places compiled by the city and County, and approved by the Oregon Land Conservation and Development Commission.

[4] Economic Development for Central Oregon website, https://www.edcoinfo.com/, accessed April 2021.

Table SA-4 Historic Sites – City of Sisters

Historic Site/ Name	Location
Aitkens Building (Drugstore)	101 E Cascade Avenue
Hotel Sisters	190 E Cascade Avenue
Leithauser Store	251 E Cascade Avenue
Hardy Allen House	401 E Main Avenue

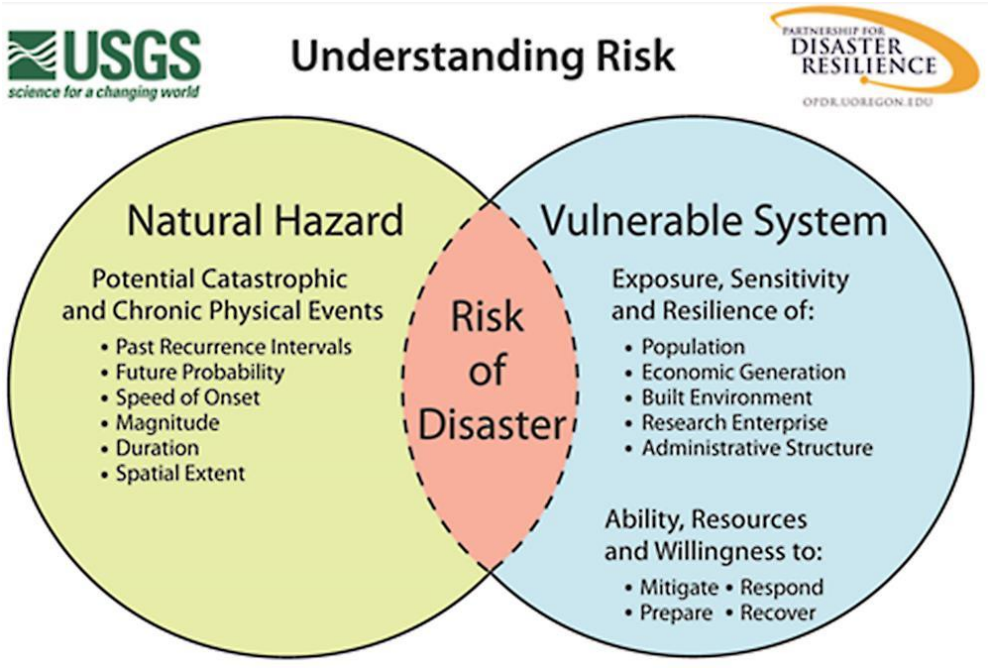
Source: Deschutes County and City of Sisters Historic Preservation Program: 2015-2020 Strategic Plan

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 information presented below, along with hazard specific information presented elsewhere in this addendum, within the Hazard Annexes (Volume II), and community characteristics presented in the Community Profile (Appendix C), will be used as the local level rationale for the risk reduction actions identified in this addendum. The risk assessment process is graphically depicted in Figure SA-2 below. Ultimately, the goal of hazard mitigation is to reduce the area where hazards overlap vulnerable systems.

Figure SA-2 Understanding Risk



Source: Oregon Partnership for Disaster Resilience

Hazard Analysis Methodology

This NHMP utilizes a hazard analysis methodology that was first developed by FEMA circa 1983, and gradually refined by the Oregon Military Department's Office of Emergency Management over the years.

The methodology produces scores that range from 24 (lowest possible) to 240 (highest possible). Vulnerability and probability are the two key components of the methodology. Vulnerability examines both typical and maximum credible events, and probability endeavors to reflect how physical changes in the jurisdiction and scientific research modify the historical record for each hazard. Vulnerability accounts for approximately 60% of the total score, and probability approximately 40%.

This method provides the jurisdiction with a sense of hazard priorities, or relative risk. It doesn't predict the occurrence of a particular hazard, but it does "quantify" the risk of one hazard compared with another. By doing this analysis, planning can first be focused where the risk is greatest.

In this analysis, severity ratings, and weight factors, are applied to the four categories of history, vulnerability, maximum threat (worst-case scenario), and probability as shown in the table below. See Volume I, Section (3 Risk Assessment) for more information.

Hazard Analysis

On April 9th, 2021, the City of Sisters addendum steering committee developed their hazard vulnerability assessment (HVA), using the County's HVA 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 the City of Sisters, which are discussed throughout this addendum.

Table SA-5 shows the HVA matrix for Sisters showing 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 sense of hazard priorities, but does not predict the occurrence of a particular hazard.

Table SA-5 Hazard Analysis Matrix – City of Sisters

Hazard	History	Vulnerability	Maximum Threat	Probability	Total Threat Score	Hazard Rank
Wildfire	20	50	100	70	240	# 1
Winter Storm	20	50	100	70	240	# 1
Windstorm	20	50	90	70	230	#3
Flood	16	50	90	63	219	#4
Volcano	2	40	100	21	163	#5
Earthquake (Cascadia)	2	40	100	7	149	#6
Drought	8	15	70	56	149	#6
Earthquake (Crustal)	2	20	80	14	116	#8
Landslide	2	5	20	7	34	#9

Source: City of Sisters NHMP Steering Committee, 2021

Three chronic hazards (wildfire, winter storm, and windstorm) rank as the top three hazard threats to the city (Top Tier). The flood, volcano, Cascadia Earthquake, and drought comprise the next highest ranked hazards (Middle Tier), while crustal earthquake and landslide hazards comprise the lowest ranked hazards (Bottom Tier).

Table SA-6 categorizes the probability and vulnerability scores from the hazard analysis for the city and compares the results to the assessment completed by the Deschutes County NHMP Steering Committee (areas of differences are noted with **bold** text within the city ratings).

Table SA-6 Probability and Vulnerability Comparison

	Sisters		County	
Hazard	Probability	Vulnerability	Probability	Vulnerability
Drought	High	Low	High	Low
Earthquake (Cascadia)	Low	High	Low	High
Earthquake (Crustal)	Low	Moderate	Low	Moderate
Flood	High	**High**	High	Low
Landslide	Low	Low	Low	Low
Volcano	Low	High	Low	High
Wildfire	High	High	High	High
Windstorm	High	High	High	High
Winter Storm	High	High	High	High

Source: City of Sisters NHMP Steering Committee and Deschutes County NHMP Steering Committee, 2021

Drought

A drought is a period of drier than normal conditions that results in water-related problems. Drought occurs in virtually every climatic zone, but its characteristics vary significantly from one region to another. Drought is a temporary condition; it differs from aridity, which is restricted to low rainfall regions and is a permanent feature of climate. The extent of drought events depends upon the degree of moisture deficiency, and the duration and size

of the affected area. Typically, droughts occur as regional events and often affect more than one city and County.

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

The city has ample high quality groundwater supplies fed by four production wells four and has a 1.6 million gallon reservoir for storage.[5] There are no issues with groundwater supply and the annual recharge to the aquifer is high, however, long-term water level trends show supply (based on existing water rights of 5.8 mgd) will be limited for expected population growth and water usage by the year 2030 (estimated). The city's total pumping capacity is 6.6 mgd, which is estimated to provide enough production water until 2035. The City also has 3 emergency back-up generators, for a total emergency pumping capacity of 3060 gpm or 4.4 mgd. Exceeding the current available water supply at the Average Daily Demand projection is estimated to be year 2050.[6] In addition, the city has one 12-inch transmission mains that provide water to the city from the reservoirs and a total of 40.1 miles of transmission and distribution mains (4" to 16") mostly built after 1993[7]. The city currently provides information to residents on how to conserve water and also has a four-stage water curtailment plan that progresses from voluntary to mandatory and minor to major depending on the severity of the water shortage (see Section 4 of the Sisters Water Management and Conservation Plan, 2016).

For more information on the Drought Hazard (including history and extent) see the Drought Annex in Volume II.

Earthquake

Oregon and the Pacific Northwest in general are susceptible to earthquakes from four sources: 1) the off-shore Cascadia Fault Zone; 2) deep intra-plate events within the subducting Juan de Fuca Plate; 3) shallow crustal events within the North American Plate; and 4) earthquakes associated with volcanic activity.[8]

The areas most susceptible to ground amplification and liquefaction have young, soft alluvial sediments, found along river and stream channels. The extent of the damage to structures and injury and death to people will depend upon the type of earthquake, proximity to the epicenter and the magnitude and duration of the event.

The steering committee HVA evaluated both crustal earthquakes and a Cascadia earthquake. The steering committee determined that the city's probability of experiencing a crustal earthquake is **low** (which is the same as the County's rating) and that their

[5] City of Sisters Website, accessed April 28, 2015.

[6] Sisters Water System Master Plan Update (2017) and Sisters Water Management and Conservation Plan (2016).

[7] Ibid.

[8] Taylor, George H. and Chris Hannan. The Oregon Weather Book. Corvallis, OR: Oregon State University Press, 1999.

vulnerability to a crustal earthquake is **moderate** (which is the same as the County's rating). The steering committee determined that the city's (and State's) probability of experiencing a Cascadia earthquake is **low** (which is the same as the County's rating) and that their vulnerability to a Cascadia earthquake is **high** (which is the same as the County's rating).

Two-thirds of Sisters' buildings were built after 1990 and the codification of seismic codes. Sisters is not particularly susceptible to liquefaction, and is not expected to experience very strong to violent shaking in an earthquake event (see Volume II, Tables II-5 and II-6). As such, the city's vulnerability to earthquakes is reduced because of its relatively new infrastructure and buildings in combination with the particular geology of the area. However, the city considers itself to have high vulnerability to a Cascadia earthquake event due to secondary effects of the hazard, including access to transportation routes, energy resources, communications, and the need to assist with refugees from the damage that is expected west of the Cascades.

Information on specific buildings' estimated seismic resistance, determined by DOGAMI in 2007, is shown in Tables SA-7 below. The table displays the rankings of all facilities within the city's jurisdiction; each "X" represents one building within that ranking category. It is important to note that these assessments have not continued beyond 2007. Therefore, some buildings have been added, moved, changed, etc. since the assessment but are not reflected in the scores. However, buildings completed after 2007 would likely score low risk given new earthquake standard codes.

Of the school facilities evaluated by DOGAMI using RVS, two (2) have very high (100% chance) collapse potential; Sisters Elementary School is considered among the most vulnerable to seismic collapse. Of the public safety facilities evaluated, none have very high (100% chance) collapse potential; however, four (4) buildings have high (greater than 10% chance) collapse potential; including the Sisters-Camp Sherman RFPD, which also functions as the city's Emergency Coordination Center (ECC).

Table SA-7 Rapid Visual Survey Scores

Facility	Level of Collapse Potential			
	Low (< 1%)	Moderate (>1%)	High (>10%)	Very High (100%)
Schools				
Sisters Elementary School (611 E Cascade, Sisters)	XX			X
Sisters Middle School (15200 McKenzie Hwy, Sisters)				X
Sisters High School (1700 W McKinney Butte Rd, Sisters)	X			
Public Safety				
Black Butte RFPD (13511 Hawks Beard, Sisters)			XX	
Sisters-Camp Sherman RFPD (301 S Elm, Sisters)			XX	
Sisters-Camp Sherman RFPD (17233 Buffalo Dr, Sisters)	X			
Sisters-Camp Sherman RFPD (69351 Lariat, Sisters)	X			
Deschutes County Sheriff's Office (703 N Larch, Sisters)	X			

Source: DOGAMI 2007. Open File Report 0-07-02. Statewide Seismic Needs Assessment Using Rapid Visual Assessment.

For more information on the Earthquake Hazard (including history and extent) see the Earthquake Annex in Volume II.

Flood

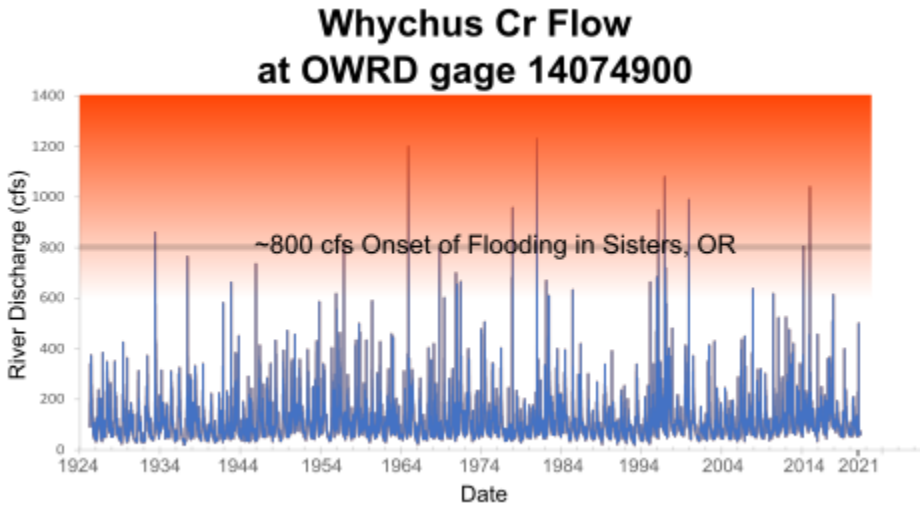
Flooding results when rain and snowmelt creates water flow that exceeds the carrying capacity of rivers, streams, channels, ditches, and other watercourses. In Oregon, flooding is most common from October through April when storms from the Pacific Ocean bring intense rainfall. Flooding can be aggravated when rain is accompanied by snowmelt and frozen ground; the spring cycle of melting snow is the most common source of flood in the region. The principal types of flood that occur in Sisters include: spring/snow melt flooding, warm winter rain-on-snow flooding, ice jams, flash floods, and dam failure.

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

The City's principle flood concern is from Whychus Creek, which has a flood season that extends from November through April (all of the large events have occurred in November and December). The largest flood event occurred on December 25, 1980 with a peak discharge of 2,000 cfs; the next largest flood event occurred in December 1964, with a peak discharge of 1,980 cfs.[9] Another major flooding event occurred in November 1968, with a peak discharge of 1,840 cfs. All of these flood events caused property damage, bank erosion, and flooding and debris deposition on agricultural land.

Figure SA-3 below shows the river discharge history of Whychus Creek at OWRD gage 14074900, approximately 4 miles upstream from the city of Sisters, OR. Flooding in Sisters has been known to begin at discharges of around 800 cfs. The recurrence of floods of this magnitude are approximately every ten years.

Figure SA-3 River Discharge History of Whychus Creek



Source: OWRD, April 2021

[9] Deschutes County Flood Insurance Study (2007)

The Elm Street Bridge within Sisters is susceptible to overtopping by a 100-year flood event.[10] Obstructions to flood flows within Whychus Creek also create an additional hazard, which could lead to bank overtopping and flooding of land that is at the same or lower elevations.[11] Sisters has a portion of its community that is developed near the special flood hazard area that is susceptible to damage (see Figures SA-3 and SA-4 below); future updates will provide analysis of the properties impacted by flood including studies conducted as part of County Action Flood #7.

Particular infrastructure potentially impacted by flood includes the: Sisters Fire Station, area schools, Sisters commercial/residential district, and the public works facility.

Figure SA-4 Sisters Floodway/Floodplain Area

Source: http://dial.deschutes.org/, accessed April 21, 2021

Because the city of Sisters is located at the base of the Three Sisters Volcanoes, it is particularly vulnerable to any catastrophic events triggered on the slopes of the Cascade Mountains. Carver Lake, located at 7,800 feet on the east slope of South Sister volcano, contains about 740 acre-feet (900,000 cubic meters or 32 million cubic feet) of water and poses a unique, though very low hazard to the city. In the event of a hypothetical large slope failure off of South Sister (Note: geological mapping has not identified that significant portions of South Sisters is susceptible to failure), the landslide material could

[10] Ibid.

[11] Ibid.

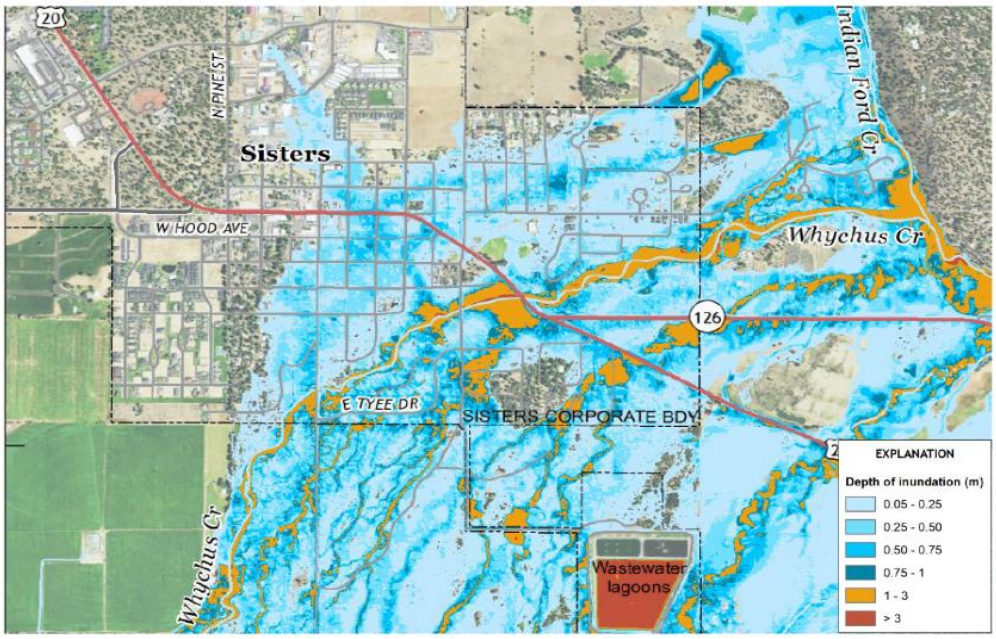
catastrophically “splash” Carver Lake contents into Whychus Creek headwaters and inundate parts of Sisters.

Much of the initial concern that Carver Lake poses a significant natural hazard to the city of Sisters came from a now-debunked hypothesis that the moraine partially supporting Carver Lake is unstable and could catastrophically fail, similar to other moraine-dammed lakes in the Cascades.[12] A 2018 USGS study discusses the newer conclusion that the material holding in Carver Lake is stable and does not pose a failure risk, but because Carver Lake sits in a precarious position above Sisters, the USGS revisited the study with more modern modelling techniques.

The 2-dimensional flood modeling analysis used a hypothetical landslide to evacuate all the waters of Carver Lake (since moraine failure was no longer considered a viable trigger to Carver Lake flooding). The 2-D model leads to “clear water” flow into Sisters (George, Addendum to 2018 paper), not factoring in entrainment of debris and sediment (which would undoubtedly occur and slow down/attenuate the flood). The model results are a “worst-case scenario” of 0.05-0.25 m (2-10 inches) flooding in most of Sisters. In and directly adjacent to the main channel (approximately the 100-year floodplain), there could be as much as 1-3 m (3.3-9.9 feet) of flooding, noting that the higher depth values are from the bottom of Whychus Creek bed to its banks (i.e., the model is not predicting ~10 feet of water at residential properties).

[12] Launen, USGS 1987, Source: Hydrologic Hazards Along Whychus Creek From a Hypothetical Failure of the Glacial Moraine Impacting Carver Lake Near Sisters, Oregon—USGS Open File Report 87-41; O’Connor, J.E., Hardison, J.H., and Costa, J.E., 2001, Debris flows from failures of Neoglacial-age dams in the Three Sisters and Mount Jefferson wilderness areas, Oregon, U.S. Geological Survey Professional Paper 1606.

Figure SA-5 USGS 2-dimensional modeling results for flooding triggered by a hypothetical landslide of off South Sister landing in Carver Lake and evacuating all of its contents



Source: George et al, Seamless numerical simulation of a hazard cascade in which a landslide triggers a dam-breach flood and consequent debris flow, 7th International Conference on Debris-Flow Hazards Mitigation, 2018

If an event of this magnitude happened, locally high velocities, damming, erosion, and sediment deposition could cause considerable property damage and possible loss of life in Sisters.

Action items are included to address the concerns with flooding in Sisters; in addition, County Action Flood #7 impacts the city and concerns the flood potential on Whychus Creek (see Appendix A for more information).

National Flood Insurance Program (NFIP)

The Deschutes County Flood Insurance Rate Maps (FIRMs) were modernized in 2007. The table below shows that as of April 2021, Sisters has 31 National Flood Insurance Program (NFIP) policies in force and zero (0) paid claims. The city's last Community Assistance Visit (CAV) was April 26, 2004. The city is not a member of the Community Rating System (CRS). The table displays the number of policies by building type and shows that the majority of residential structures that have flood insurance policies are single-family homes (31) and that there are no non-residential structures with flood insurance policies. Additionally, there are two (2) properties that are minus rated A-zone properties.

The community repetitive flood loss record for Sisters does not include any repetitive flood loss, or severe repetitive flood loss buildings and has not had any repetitive loss claims.

Table SA-8 Flood Insurance Detail

Jurisdiction	Current FIRM Date	Initial FIRM Date	Total Policies	Pre-FIRM Policies	Policies by Building Type				Minus Rated A Zone
					Single Family	2 to 4 Family	Other Residential	Non-Residential	
Sisters	9/28/2007	9/29/1986	31	2	31	0	0	0	2

Jurisdiction	Insurance in Force	Total Paid Claims	Pre-FIRM Claims Paid	Substantial Damage Claims	Repetitive Loss Buildings	Severe Repetitive Loss Buildings	Total Paid Amount	CRS Class Rating	Last CAV
Sisters	$9,689,200	0	0	0	0	0	$0	NP	4/26/2004
* Portion of entire county under county jurisdiction									
NP - Not Participating NA - Information not Available/ Not Applicable									

Source: Information compiled by Department of Land Conservation and Development, April 2021.

For more information on the Flood Hazard (including history and extent) see the Flood Annex in Volume II.

Landslide

A landslide is any detached mass of soil, rock, or debris that falls, slides or flows down a slope or a stream channel. Landslides are classified according to the type and rate of movement and the type of materials that are transported. In a landslide, two forces are at work: 1) the driving forces that cause the material to move down slope, and 2) the friction forces and strength of materials that act to retard the movement and stabilize the slope. When the driving forces exceed the resisting forces, a landslide occurs.

The steering committee determined that the city's probability for landslide is **low** (which is the same as the County's rating) and that their vulnerability to landslide is **low** (which is the same as the County's rating).

The city has had no problems with landslides within city limits in known history and is located in a generally stable area.

For more information on the Landslide Hazard (including history and extent) see the Landslide Annex in Volume II.

Volcano

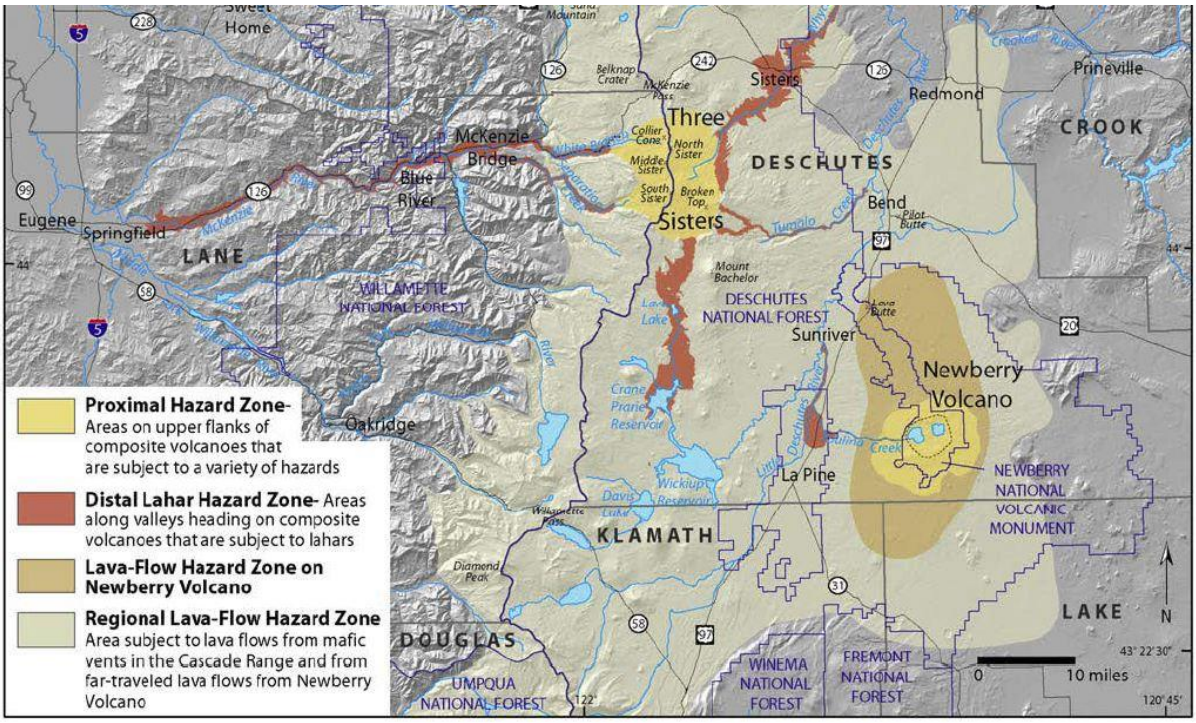
The Pacific Northwest lies within the "ring of fire,' an area of very active volcanic activity surrounding the Pacific Basin. Volcanic events occur regularly along the ring of fire, in part because of the movement of the Earth's tectonic plates. Volcanic events have the potential to coincide with numerous other hazards including ash fall, earthquakes, lava flows, pyroclastic flows, lahars, and debris flows, and landslides.

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

Were a volcanic event to occur in the Cascades region of Oregon, Sisters could be at risk for ash fall, regional lava flows, and lahars, depending on the severity of the event and the

direction of the wind. Due to Sisters' proximity to the Three Sisters, in relation to other areas within eastern Oregon, the effects of a volcanic event may be more disruptive to normal business, economic activity, and health than to other regions of the County. Figure SA-6 shows the regional volcano hazards that indicate that Sisters is within a moderate hazard zone; see also Figure II-16 within Volume II, *Hazard Annexes*.

Figure SA-6 Volcano Hazards



Source Central Cascades Volcano Coordination Plan, 2018.

For more information on the Volcano Hazard (including history and extent) see the Volcano Annex in Volume II.

Wildfire

Wildfires occur in areas with large amounts of flammable vegetation that require a suppression response due to uncontrolled burning. Fire is an essential part of Oregon's ecosystem, but can also pose a serious threat to life and property particularly in the state's growing rural communities. Wildfire can be divided into three categories: interface, wildland, and firestorms. The increase in residential development in interface areas has resulted in greater wildfire risk. Fire has historically been a natural wildland element and can sweep through vegetation that is adjacent to a combustible home. New residents in remote locations are often surprised to learn that in moving away from built-up urban areas, they have also left behind readily available fire services providing structural protection.

The steering committee determined that the city'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).

Wildfires occur regularly in the vicinity of Sisters including the Black Crater (9,412 acres) and the Lake George (5,652 acres) fires in 2006, the GW fire (8,570 acres) in 2007, The Pole Creek fire (26,795 acres) in 2012, and the Milli fire (24,079 acres) in 2017. (For a complete list of recent large wildfires see Table II-7 and Figure II-19 within Volume II, Hazard Annex and the Greater Sisters CWPP.) The Greater Sisters Country Community Wildfire Protection Plan (CWPP, 2020) relies upon (1) The Oregon Wildfire Risk Explorer tool (https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning) and (2) local knowledge and input to determine fire risk within the Greater Sisters Wildland-Urban Interface (WUI). For more information on wildfire risk and fuels reduction projects see the Greater Sisters Country CWPP and visit the Project Wildfire website: http://www.projectwildfire.org/.

For more information on the Wildfire Hazard (including history and extent) see the Wildfire Annex in Volume II and the Greater Sisters Country CWPP.

Windstorm

A windstorm is generally a short duration event involving straight-line winds and/or gusts in excess of 50 mph. Although windstorms can affect the entirety of Deschutes County, they are especially dangerous in developed areas with significant tree stands and major infrastructure, especially above ground utility lines. A windstorm will frequently knock down trees and power lines, damage homes, businesses, public facilities, and create storm related debris.

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

Sisters is a relatively windy place due to its location close to the Cascade peaks and passes. As tall trees in Sisters age and weaken with the stress of a changing climate and development, we may see more than the "normal" number of trees come down during wind events. Many trees have fallen in the last few years during wind events, luckily with no injuries. As population density rises however, the chances of injury and death increase. Windstorms are often associated with microbursts (thunderstorms). Regionally, windstorms have been coupled with wildfires, with wind pushing an existing fire or toppling trees onto power lines starting new fires - or both simultaneously. The community is vulnerable to damage to utility lines, including fiber optics, which are key to the economic sectors of the community.

For more information on the Windstorm Hazard (including history and extent) see the Windstorm Annex in Volume II.

Winter Storm

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 Deschutes County typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

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

Sisters is located at a higher elevation east of the Cascades, which is a major contributor to winter storms. Major winter storms are frequent in the Sisters area and have been known to cause damage. Two major winter storms in 2017 and 2019 created massive snow loads that caused multiple roof cave-ins throughout the County.

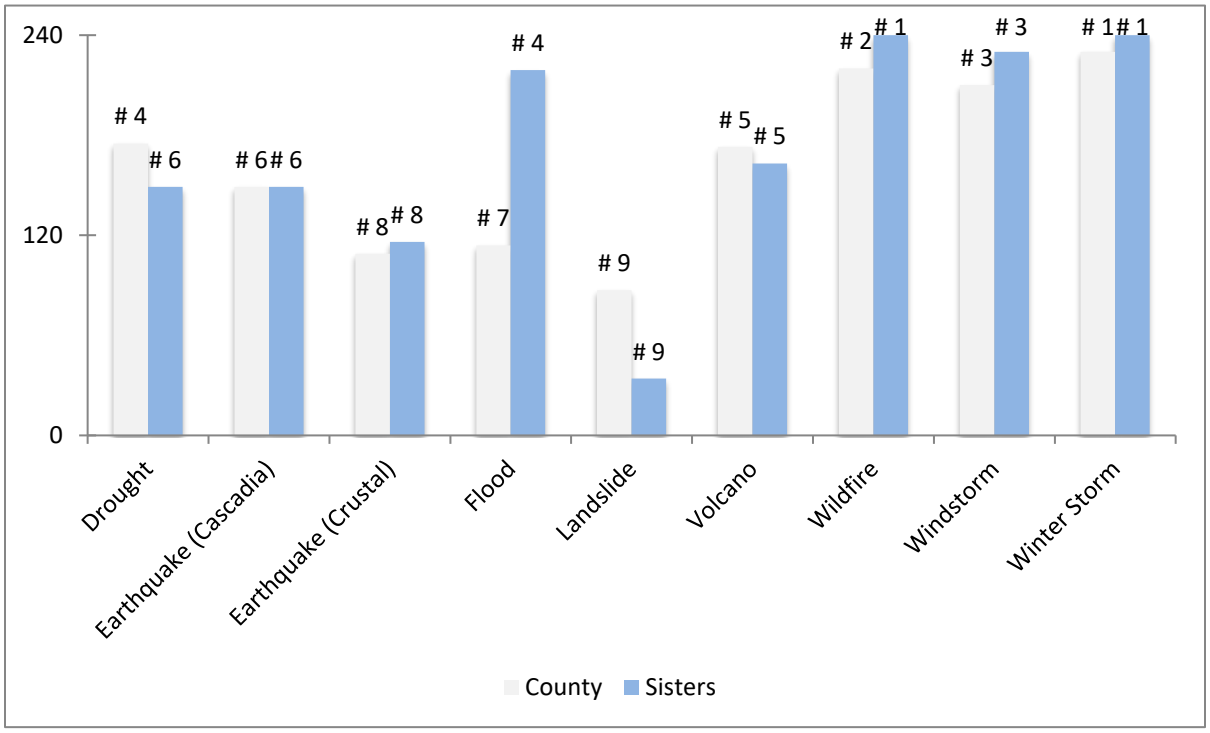
Major winter storms also have the potential to impact economic activity. Road closures on Highway 97, or the passes to the Willamette Valley (Highways 58 and 20/126), due to winter weather are a common occurrence and can interrupt commuter and large truck traffic. The city budgets funds for seasonal winter storm needs, such as clearing roads. *For more information on the Winter Storm Hazard (including history and extent) see the Winter Storm Annex in Volume II.*

Summary

The figure below presents a summary of the hazard analysis for the City of Sisters and compares the results to the assessment completed by the Deschutes County NHMP Steering Committee.

In terms of history, probability, vulnerability, and maximum threat, the hazard analysis for the city overall rated their threat to the flood and wildfire hazards higher than the County, and rated their threat to drought less than the County. All other hazards were rated the same as the County's ratings. The top three hazards for the city and the County are wildfire, windstorm, and winter storm.

Figure SA-7 Overall Hazard Analysis Comparison – Sisters and Deschutes County



Source: City of Sisters NHMP Steering Committee and Deschutes County NHMP Steering Committee, 2021.

MITIGATION STRATEGY

Mitigation Plan Mission

The plan mission states the purpose and defines the primary functions of Deschutes County's NHMP. It is intended to be adaptable to any future changes made to the plan and need not change unless the community's environment or priorities change.

The mission of the Deschutes County NHMP is:

To promote sound public policy designed to protect people, critical facilities, infrastructure, private property, and the environment from natural hazards.

This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the County towards building a safer, more disaster resistant community.

The Sisters steering committee reviewed the 2021 NHMP plan mission statement and agreed it accurately describes the overall purpose and intent of this plan. The Steering Committee believes the concise nature of the mission statement allows for a comprehensive approach to mitigation planning.

Mitigation Plan Goals

Mitigation plan goals are more specific statements of direction that Deschutes County citizens, and public and private partners can take while working to reduce the County's risk from natural hazards. These statements of direction form a bridge between the broad mission statement and particular action items. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items.

The Sisters Addendum steering committee reviewed and agreed to the 2021 Deschutes County NHMP plan goals. All the plan goals are important and are listed below in no particular order of priority. Establishing community priorities within action items neither negates nor eliminates any goals, but it establishes which action items to consider to implement first, should funding become available. Below is a list of the 2021 NHMP goals:

Goal 1 - Protect life and reduce injuries resulting from natural hazards.

Goal 2 - Minimize property damage from natural hazards.

Goal 3 - Minimize damage to critical or essential infrastructure and services from natural hazards.

Goal 4 - Enhance the ability of Deschutes County's economy to rebound quickly from the effects of natural hazard events.

Goal 5 - Minimize project impacts to the environment and utilize natural solutions to protect people and property from natural hazards.

Goal 6 - Enhance the County's capability to implement a comprehensive County wide natural hazards mitigation strategy.

Goal 7 - Motivate the "whole community" to build resilience and mitigate against the effects of natural hazards through engagement, listening, learning, information-sharing, and funding opportunities.

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

Goal 9 - Minimize damage to historic and cultural resources from natural hazards.

Goal 10 - Enhance communication, collaboration, and coordination among agencies at all levels of government, sovereign tribal nations, and the private sector to mitigate natural hazards.

Goal 11 - Mitigate the inequitable impacts of natural hazards by prioritizing and directing resources and investments to build resilience in the most vulnerable populations and the communities least able to respond and recover.

Goal 12 - Develop, integrate, and align natural hazards mitigation and climate adaptation efforts based on the evolving understanding of the interrelationships between climate change and climate-related natural hazard events.

Goal 13 - Reduce repetitive and severe repetitive flood losses.

Goal 14 - Minimize or eliminate potential impacts from dams posing the greatest risk to people, property, and infrastructure.

(Note: although numbered the goals are not prioritized.)

Mitigation Plan Action Items

Short- and long-term action items identified through the planning process are an important part of the mitigation plan. Action items are detailed recommendations for activities that local departments, citizens and others could engage in to reduce risk. They address both multi-hazard (MH) and hazard-specific issues. Action items can be developed through a number of sources such as steering committee work sessions, stakeholder input, etc. A description of how the plan's mitigation actions were developed is provided below.

Action Item Worksheets

Each action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described within Volume I, Section 3 (Mitigation Strategy). The City specific action item worksheets are located in Attachment 1, *Action Item Forms*.

The City is also a party to several actions described in the County NHMP; each jurisdiction listed on the County Action Item forms as an "Affected Jurisdiction" will contribute to and work towards completion of that action as it pertains to their jurisdiction. **There are 25 County Action Items that include Sisters as an "Affected Jurisdiction."** For detailed information on each County level action item form see Volume I, Section 3, *Mitigation Strategy* and Volume IV, Appendix A, *Action Item Forms*.

Action Item Development Process

Development of action items was a multi-step, iterative process that involved brainstorming, discussion, review, and revisions by the steering committee. A number of actions identified by the County steering committee include the City as an affected jurisdiction; these actions are broad actions that include implementation components at both the County and city level. All actions were reviewed by the committee and revised as necessary before becoming a part of this document.

ATTACHMENT 1: ACTION ITEM FORMS

Action Item Forms

The action item forms portray the overall action plan framework and identify linkages between the plan goals, partnerships (coordination and partner organizations), and actions. Table SA-9 provides a list of actions for the city. The pages that follow include individual forms for each mitigation action.

Table SA-9 Mitigation Actions

Action Item	High Priority	Timeline	Status	Related Hazards							
				Drought	Earthquake	Flood	Landslide	Volcano	Wildfire	Windstorm	Winter Storm
MH #1	x	Ongoing	New						x	x	
FL #1		Long-Term	Completed			x					
FL #2		Long-Term	Removed			x					
FL #3		Medium-Term	New			x					
FL #4		Short-Term	New			x					
WF #1	x	Short-Term	New						x		
WF #2	x	Short-Term	New						x		
WF#3		Medium-Term	New						x		

Source: City of Sisters NHMP Steering Committee

Action Item: MH#1 (Sisters) **(What do we want to do?)**	**Alignment with Plan Goals:**	**High Priority Action Item?**
Identify and remove hazardous trees which pose a potential threat of coming into contact with overhead electric transmission or distribution lines during a high wind event	1☒ 2☐ 3☒ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐ 11☐ 12☐ 13☐ 14☐	☒ Yes

Alignment with Existing Plans/Policies:

Rationale for Proposed Action Item (why is it important?):
Identify and remove hazardous trees, as defined by the U.S. Forest Service, which could contact the electric utility's transmission or distribution lines during a high wind event. High wind events can blow nearby hazardous trees and their branches into power lines, sparking fires. Removing the hazardous trees reduces the threat of fire ignition.

Ideas for Implementation (how will it get done?):	**Action Status Report**
Have the city's contract arborist survey existing trees to identify those which pose a potential threat of coming into contact with overhead electric transmission or distribution lines during a high wind event.	New in 2021

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Local	TBD	☒ Ongoing ☐Long (6+ years) ☐Medium (2-5 years) ☐Short (0-2 years)
Coordinating/Lead Organization:	City of Sisters Public Works	

Internal Partners:	**External Partners:**
	Central Electric Cooperative
Form Submitted by:	Brent Ten Pas (CEC), 2021
Action Item Status:	NEW

Mitigation Action: Flood #1 **(What do we want to do?)**	**Alignment with Plan Goals:**	**High Priority Action Item?**
Explore options to replace pressure sewer line at Locust Street Bridge or construct temporary emergency bypass.	☒1 ☒2 ☒3 ☐4 ☒5 ☐6 ☐7 ☐8 ☒9 ☒10 ☐11	☐Yes

Alignment with Existing Plans/Policies:
Wastewater System Capital Facilities Plan (2016)
Rationale for Proposal (Why is this important?):
Sewer line on upstream side of bridge is a pressure line, if impacted by floodwaters/ debris the sewer for the entire town would be shut down. The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community, particularly to buildings and infrastructure [201.6(c)(3)(ii)].

Ideas for Implementation (How will it get done?):	**Action Status Report**
Replace sewer line with a system that goes under the creek. Collaborate with USFS to remove debris that collects within the creek. Install emergency temporary bypass piping connections and vaults and purchase bypass equipment.	Added in 2015 and completed in 2021

Champion/ Responsible Organization:	Public Works

Internal Partners:	**External Partners:**
	U.S. Forest Service, USACE, OWRD, Silver Jackets, Deschutes River Conservancy, Upper Deschutes Watershed Council

Potential Funding Sources:	**Estimated cost:**	**Timeline:**
Local Funding Resources, Silver Jackets, FEMA		☐Ongoing ☐Short Term (1-2 years) ☒Long-Term (3-5 years)

Form Submitted by:	2015 NHMP Committee
Action Item Status:	Complete

Mitigation Action: Flood #2 **(What do we want to do?)**	**Alignment with Plan Goals:**	**High Priority Action Item?**
Increase dimensions of drainage culverts in flood-prone areas.	☐1 ☐2 ☒3 ☐4 ☐5 ☐6 ☒7 ☐8 ☐9 ☒10 ☐11	☐Yes

Alignment with Existing Plans/Policies:
Capital Improvement Plan
Rationale for Proposal (Why is this important?):
A number of stormwater facilities within the community need to be increased in dimension to dispose of stormwater and limit flooding.

Ideas for Implementation (How will it get done?):	**Action Status Report**
Develop local stormwater BMPs to address flooding issues in flood susceptible areas in the city.	Added in 2015 and removed in 2021 because Larger culverts were installed just north of Sisters to help mitigate localized flooding from the Trout Creek drainage. No other culvert replacements or expansions within Sisters appear to be necessary at this time to address any localized potential flood impacts.

Champion/ Responsible Organization:	Public Works

Internal Partners:	**External Partners:**
Community Development	USACE, OWRD, Silver Jackets, ODOT, Deschutes River Conservancy, Upper Deschutes Watershed Council

Potential Funding Sources:	**Estimated cost:**	**Timeline:**
Local Funding Resources, Silver Jackets, FEMA		☐Ongoing ☐Short Term (1-2 years) ☒Long-Term (3-5 years)

Form Submitted by:	2015 NHMP Committee
Action Item Status:	Removed

Action Item: FL#3 (Sisters) **(What do we want to do?)**	**Alignment with Plan Goals:**	**High Priority Action Item?**
Conduct a Viability Study for an early warning system for Whychus Creek flooding.	1☒ 2☐ 3☐ 5☐ 6☐ 7x☒ 9☐ 10☒ 11☐ 12☐ 13☐ 14☒	☐Yes

Alignment with Existing Plans/Policies:
County EOP, Sisters Country EOP

Rationale for Proposed Action Item (why is it important?):
Whychus Creek is subject to flooding as a result of rain-on-snow events and failure of moraine dam at Carver Lake (Three Sisters Wilderness). Whychus Creek flows through the City of Sisters as well as unincorporated Deschutes County. Flooding has the potential to impact homes, businesses, recreational areas and critical infrastructure.

Ideas for Implementation (how will it get done?):	**Action Status Report**
Initiate feasibility study of an early warning system on Whychus Creek.	New in 2021

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Local, state, federal	$50,000	☐Ongoing ☐Long (6+ years) ☒ Medium (2-5 years) ☐Short (0-2 years)
Coordinating/Lead Organization:	DCSO EM	

Internal Partners:	**External Partners:**
City of Sisters, Sisters-Camp Sherman Fire District	OWRD, OEM, USFS, USGS
Form Submitted by:	Nathan Garibay, 2021
Action Item Status:	NEW

Action Item: WF #1 (Sisters) **(What do we want to do?)**	**Alignment with Plan Goals:**	**High Priority Action Item?**
City of Sisters explore adoption of updated defensible space and enhanced building code requirements like R327.4	1☒ 2☐ 3☒ 4☒ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐ 11☐ 12☐ 13☐ 14☐	☒ Yes

Alignment with Existing Plans/Policies:
R327.4 is included within the Oregon Residential Specialty Code as an optional code for local adoption.

Rationale for Proposed Action Item (why is it important?):
Expanding development within the wildland urban interface coupled with increasing fire frequency and severity are resulting in increasing risk to the community. Home to home ignitions in the wildland urban interface is a growing problem in Oregon. In the Labor Day fires of 2020, 38% of the homes destroyed were located within incorporated cities.

Ideas for Implementation (how will it get done?):	**Action Status Report**
Deschutes County should work with other counties and cities to support statewide adoption of enhanced defensible space and building standards for communities identified as high or extreme wildfire risk. Deschutes County and local cities should also consider adoption of more stringent local rules where appropriate.	New in 2021

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Local	No Cost	☐Ongoing ☐Long (6+ years) ☐Medium (2-5 years) ☒Short (0-2 years)
Coordinating/Lead Organization:	City of Sisters	

Internal Partners:	**External Partners:**
	Sisters-Camp Sherman Fire District, Deschutes County, City of Bend, City of La Pine, City of Redmond, USFS, ODF
Form Submitted by:	Roger Johnson, 2021

Action Item Status:	NEW

Action Item: WF #2 (Sisters) **(What do we want to do?)**	**Alignment with Plan Goals:**	**High Priority Action Item?**
Increase participation of community members in fire insurance and maintaining defensible space.	1☒ 2☐ 3☐ 4☒ 5☐ 6☐ 7☒ 8☐ 9☐ 10☐ 11☐ 12☐ 13☐ 14☐	☒ Yes

Alignment with Existing Plans/Policies:
Future Recovery Plan

Rationale for Proposed Action Item (why is it important?):
Other events in Oregon have identified the challenge that many community members are uninsured or underinsured, which limits their ability to recover from wildfire.

Ideas for Implementation (how will it get done?):	**Action Status Report**
Public Education regarding the importance of adequate insurance coverage and creating defensible space to maintain coverage.	New in 2021

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Local	TBD	☐Ongoing ☐Long (6+ years) ☐Medium (2-5 years) ☒Short (0-2 years)

Coordinating/Lead Organization:	Deschutes County Sheriff's Office Emergency Management

Internal Partners:	**External Partners:**
City of Sisters Administration, Sisters-Camp Sherman Fire District, Project Wildfire	ODF, USFS
Form Submitted by:	Nathan Garibay, 2021

Action Item Status:	NEW

Action Item: WF #3 (Sisters) **(What do we want to do?)**	**Alignment with Plan Goals:**	**High Priority Action Item?**
Increase water storage to account for increased growth/wildfire	1☒ 2☐ 3☒ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐ 11☐ 12☐ 13☐ 14☐	☐Yes

Alignment with Existing Plans/Policies:
City of Sisters 2017 Water System Master Plan

Rationale for Proposed Action Item (why is it important?):
Due to the larger than anticipated growth since the City's Water System Master Plan was last updated there is a need to construct a new 2-million-gallon water storage reservoir to provide increased firefighting flows and standby water supply in case of catastrophic failures to the City's production wells.

Ideas for Implementation (how will it get done?):	**Action Status Report**
Update existing Water Master Plan Perform preliminary design Procure Grants/Loans Develop final design and CMGC contract Construct the facility	New in 2021

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
Water SDC's FHMA Grant OSR Grant	$2,500,000	☐Ongoing ☐Long (6+ years) ☒Medium (2-5 years) ☐Short (0-2 years)
Coordinating/Lead Organization:	City of Sisters Public Works	

Internal Partners:	**External Partners:**
	Sisters Camp Sherman Rural Fire Dept; USFS
Form Submitted by:	Paul Bertagna, 2021
Action Item Status:	NEW

ATTACHMENT 2:
ACTION ITEM FORM TEMPLATE

Action Item: **(What do we want to do?)**	**Alignment with Plan Goals:**	**High Priority Action Item?**
	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐ 11☐ 12☐ 13☐ 14☐	☐Yes

Alignment with Existing Plans/Policies:

Rationale for Proposed Action Item (why is it important?):

Ideas for Implementation (how will it get done?):	**Action Status Report**

Potential Funding Sources:	**Estimated Cost:**	**Timeline:**
		☐Ongoing ☐Long (6+ years) ☐Medium (2-5 years) ☐Short (0-2 years)

Coordinating/Lead Organization:	

Internal Partners:	**External Partners:**

Form Submitted by:	
Action Item Status:	