

Douglas County

Natural Hazards Mitigation Plan

Appendix A:

Hazard Analysis For Douglas County, Oregon

(Douglas County hazard analysis not available in electronic format. Please contact Douglas County Planning Department at 541-440-4289 for a paper copy sent to you)

Douglas County

Natural Hazards Mitigation Plan

Appendix B:

Natural Hazard Plan Development Timeline

Project List	Draft Douglas County Natural Hazards Mitigation Plan Schedule 2002-2003												Staff Lead	Product	STATUS		
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct				Nov	Dec
Phase 1: Project Organization and Start-Up																	
1 Clarify Project Objectives & Tasks	●														County / ONHW	Revised Work Program	☀️
2 Develop Douglas County Mitigation Plan Framework	●	●	●												County	Draft Mitigation Plan Framework	☀️
3 Staff development regarding the background, location and issues surrounding natural hazards in Douglas County	●	●	●												County	County & Hazard-Specific Profiles	☀️
4 Organize Project Steering Committee	●	●	●												County	Steering Committee Roster	☀️
5 Gather Participant Input on Hazards and Mitigation Actions		●	●	●	●	●	●	●	●						County	Summary of Participant Input	☀️
6 Conduct site visits			●	●	●	●									County / ONHW	Summary of Site Visits/ Public Survey	☀️
7 Public Workshop on Douglas County Natural Hazards & Public Feedback on Project						😊									County	Initial Public Workshop	☀️
						24-Apr											
Phase 2: Inventory and Analysis																	
8 Gather and evaluate data for the hazard assessment			●	●	●	●									County	Hazard Identification Information	☀️
9 Conduct county-wide vulnerability assessment			●	●	●	●	●	●							County	Vulnerability Assessment (where data is available)	☀️
Phase 3: Action Plan																	
10 Identify goals and action items			●	●	●	●	●	●							County	Draft Goals and Action Items	☀️
11 Conduct Central County Steering Committee Meetings			★		★		★		★		★		★		County	Steering Committee Meetings/Minutes	☀️
12 Conduct Coastal County Steering Committee Meetings					★		★		★		★		★		County	Steering Committee Meetings/Minutes	☀️
13 Preliminary Recommendations/Action Items Identification						●	●	●	●						County	Action Items & Implementation Strategies	☀️
14 Central County Workshop To Receive Public Input on Recommendations.						😊									County	Final Public Workshop	☀️
15 Coastal County Workshop To Receive Public Input on Recommendations.							😊								County	Coastal Public Workshop	☀️
16 Prepare Natural Hazards Mitigation Plan								●	●	●	●	●	●	●	County	Final Mitigation Plan	☀️
17 Submit Completed Plan to OEM/FEMA for Review (45 days)													●	●	County	Approved Mitigation Plan	☀️
18 Submittal of Plan to Governing Bodies for Plans Acceptance														★	County	Finished Project	☀️
Project Timeline																	

Douglas County

Natural Hazards Mitigation Plan

Appendix C:

Hazard Specific Agency Contact Information

Resource Directory List

The following resource directory lists the resources and programs that can assist Douglas County communities and organizations. The resource directory will provide contact information for local, county, regional, state and federal programs that deal with specific natural hazards.

Flood Resource Directory

County Resources

Watershed Councils

Umpqua Basin Watershed Council

Contact: Chair

Address: 1758 NE Airport Rd, Roseburg OR 97470

Phone: (541) 673-5756

Website: <http://www.ubwc.org/>

Elk Creek Watershed Council

Contact: Chair

Phone: (541) 849-2719

Smith River Watershed Council

Contact: Chair

Phone: (541) 271-5848

State Resources

Oregon's Wetlands Protection Program

Oregon's Wetlands Program was created in 1989 to integrate federal and state rules concerning wetlands protection with the Oregon Land Use Planning Program. The Wetlands Program has a mandate to work closely with local governments and the Division of State Lands (DSL) to improve land-use planning approaches to wetlands conservation. A Local Wetlands Inventory (LWI) is one component of that program. DSL also develops technical manuals, conducts wetlands workshops for planners, provides grant funds for wetlands planning, and works directly with local governments on wetlands planning tasks.

Contact: Division of State Lands

Website: <http://statelands.dsl.state.or.us/>

Oregon Department of Fish and Wildlife (ODFW)

ODFW's mission is to protect and enhance Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations. ODFW regulates stream activity and engages in stream enhancement activities.

Contact: ODFW

Address: 2501 SW First Avenue, PO Box 59, Portland, OR 97207

Phone: (503) 872-5268

Website: <http://www.dfw.state.or.us/>

Email: odfw.info@state.or.us

Oregon Division of State Lands (DSL)

DSL is a regulatory agency, responsible for administration of Oregon's Removal-Fill Law. This law is intended to protect, conserve, and make the best use of the state's water resources. It generally requires a permit from DSL to remove, fill, or alter more than 50 cubic yards of material within the bed or banks of waters of the state. Exceptions are in state scenic waterways and areas designated essential salmon habitat, where a permit is required for all instream activity, regardless of size. DSL and the US Army Corps of Engineers may issue these permits jointly.

Contact: Division of State Lands

Address: 775 Summer Street NE, Suite 100, Salem, OR 97301-1279

Phone: (503) 378-3805

Fax: (503) 378-4844

Website: <http://statelands.dsl.state.or.us/>

Oregon Water Resources Department (WRD)

The WRD's mission is to serve the public by practicing and promoting wise long-term water management.

The WRD provides services through 19 watermaster offices throughout the state. In addition, five regional offices provide services based on geographic regions. The Department's main administration is performed from the central office in Salem.

Contact: WRD

Address: 158 12th ST. NE, Salem, OR 97301-4172

Phone: (503) 378-8455

Website: <http://www.wrd.state.or.us/index.shtml>

Federal Resources and Programs

Federal Emergency Management Agency (FEMA)

FEMA provides maps of flood hazard areas, various publications related to flood mitigation, funding for flood mitigation projects, and technical assistance. FEMA also operates the National Flood Insurance Program. FEMA's mission is to reduce loss of life and property and protect the nation's critical infrastructure from all types of hazards through a comprehensive, risk-based, emergency management program of mitigation, preparedness, response and recovery. FEMA Region X serves the northwestern states of Alaska, Idaho, Oregon, and Washington.

Contact: FEMA, Federal Regional Center, Region 10

Address: 228th St. SW, Bothell, WA 98021-9796

Phone: (425) 487-4678

Website: <http://www.fema.gov>

To obtain FEMA publications: **Phone:** (800) 480-2520

To obtain FEMA maps, Contact: Map Service Center

Address: P.O. Box 1038, Jessup, Maryland 20794-1038

Phone: (800) 358-9616

Fax: (800) 358-9620

National Flood Insurance Program (NFIP)

Oregon has 256 flood-prone communities. Flood insurance is available to citizens in communities that adopt and implement NFIP building standards. The standards are applied to development that occurs within a delineated floodplain, a drainage hazard area, and properties within 250 feet of a floodplain boundary. These areas are depicted on federal Flood Insurance Rate Maps available through the county. Oregon's Department of Land Conservation and Development is the state's NFIP coordinating agency.

Contact: National Flood Insurance Program

Website: <http://www.fema.gov/nfip/>

The Community Rating System (CRS)

The Community Rating System (CRS) recognizes community floodplain management efforts that go beyond the minimum requirements of the NFIP. Property owners within the county would receive reduced NFIP flood insurance premiums if the county implements floodplain management practices that qualify it for a CRS rating

Contact: National Flood Insurance Program

Website: <http://www.fema.gov/nfip/crs.htm>

The Floodplain Management Association

The Floodplain Management website was established by the Floodplain Management Association (FMA) to serve the entire floodplain management community. It includes full-text articles, a calendar of upcoming events, a list of positions available, an index of publications available free or at nominal cost, a list of associations, a list of firms and consultants in floodplain management, an index of newsletters dealing with flood issues (with hypertext links if available), a section on the basics of floodplain management, a list of frequently asked questions about the Website, and a catalog of Web links.

Contact: Floodplain Managers Association

Website: <http://www.floodplain.org> **Email:** admin@floodplain.org

The Association of State Floodplain Managers

The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning, and recovery. ASFPM fosters communication among those responsible for flood hazard activities, provides technical advice to governments and other entities about proposed actions or policies that will affect flood hazards, and encourages flood hazard research, education, and training. The ASFPM Web site includes information on how to become a member, the organization's constitution and bylaws, directories of officers and committees, a publications list, information on upcoming conferences, a history of the association, and other useful information and Internet links.

Contact: The Association of State Floodplain Managers
Address: 2809 Fish Hatchery Road, Madison, WI 53713
Phone: (608) 274-0123
Website: <http://www.floods.org>

Northwest Regional Floodplain Managers Association (NORFMA)

This site is a resource for floodplains, fisheries, and river engineering information for the Northwest. This site provides technical information, articles, and Internet links in the field of floodplain and fisheries management.
Contact: Northwest Regional Floodplain Managers Association
Website: <http://www.norfma.org/>

FEMA's List of Flood Related Websites

This site contains a long list of flood related Internet sites from "American Heritage Rivers" to "The Weather Channel," and is a good starting point for flood information on the Internet.
Contact: Federal Emergency Management Agency.
Phone: (800) 480-2520
Website: <http://www.fema.gov/nfip/related.htm>

National Weather Service, Medford Bureau

The National Weather Service provides flood watches, warnings, and informational statements for rivers in Douglas County. The Coastal County falls in the NWS "South Central Oregon Coast" region. The eastern portions of the County fall in the "Eastern Douglas County Foothills" region, with the far eastern portion falling in the "South Central Oregon Cascades" Region. The remainder of the county falls in the "Central Douglas County" Region. The NWS Medford office provides river level information online and by phone.
Contact: National Weather Service, Medford Bureau
Address: 4003 Cirrus Drive Medford, OR 97504-4198
Phone: (541) 776-4303
Website: <http://www.wrh.noaa.gov/Medford/index.html>

Office of Hydrology, National Weather Service

The National Weather Service's Office of Hydrology (OH) and its Hydrological Information Center offer information on floods and other aquatic disasters. This site offers current and historical data including an archive of past flood summaries, information on current hydrologic conditions, water supply outlooks, an Automated Local Flood Warning Systems Handbook, Natural Disaster Survey Reports, and other scientific publications on hydrology and flooding.
Contact: Office of Hydrology, National Weather Service
Website: <http://www.nws.noaa.gov/oh>

Farm Services Agency, US Department of Agriculture Douglas County FSA

Stabilizing farm income, helping farmers conserve land and water resources, providing credit to new or disadvantaged farmers and ranchers, and helping farm operations recover from the effects of disaster are the missions of the USDA Farm Service Agency (FSA).
Contact: County Executive Director
Address: 251 NE Garden Valley Blvd., Roseburg, Oregon 97470
Phone: (541) 673-6071
Website: <http://www.fsa.usda.gov/pas/default.asp>

National Resources Conservation Service (NRCS), US Department of Agriculture

NRCS provides a suite of federal programs designed to assist state and local governments and landowners in mitigating the impacts of flood events. The Watershed Surveys and Planning Program and the Small Watershed Program provide technical and financial assistance to help participants solve natural resource and related economic problems on a watershed basis. The Wetlands Reserve Program and the Flood Risk Reduction Program provide financial incentives to landowners to put aside land that is either a wetland resource, or that experiences frequent flooding. The Emergency Watershed Protection Program (EWP) provides technical and financial assistance to clear debris from clogged waterways, restore vegetation, and stabilizing riverbanks. The measures taken under EWP must be environmentally and economically sound and generally benefit more than one property.
Contact: Resource Conservationist
Address: 251 NE Garden Valley Blvd., Roseburg, Oregon 97470
Phone: (541) 673-6071
Website: <http://www.nrcs.usda.gov/>

United States Geological Survey (USGS)

The USGS website provides current streamflow conditions at USGS gauging stations in Oregon and throughout the Pacific Northwest. The Oregon USGS office is responsible for water-resources investigations for Oregon and part of southern Washington. Their office cooperates with more than 40 local, state, and federal agencies in Oregon. Cooperative activities include water-resources data collection and interpretive water-availability and water-quality studies.

Contact: USGS Oregon District Office
Address: 10615 S.E. Cherry Blossom Dr., Portland, OR 97216
Phone: (503) 251-3200 **Fax:** (503) 251-3470
Website: <http://oregon.usgs.gov/> **Email:** info-or@usgs.gov

USGS Water Resources

This web page offers current US water news; extensive current (including real-time) and historical water data; numerous fact sheets and other publications; various technical resources; descriptions of ongoing water survey programs; local water information; and connections to other sources of water information.

Contact: USGS Water Resources
Phone: (503) 251-3200
Website: <http://water.usgs.gov/> **Email:** info-or@usgs.gov

Bureau of Reclamation

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Contact: Bureau of Reclamation, Pacific Northwest Region
Address: 1150 N. Curtis Road, Boise, ID 83706
Phone: (208) 378-5012
Website: <http://www.pn.usbr.gov/contact/index.shtml>

Army Corps of Engineers

The Corps of Engineers administers a permit program to ensure that the nation's waterways are used in the public interest. Any person, firm, or agency planning to work in waters of the United States must first obtain a permit from the Army Corps of Engineers. In Oregon, joint permits may be issued with the Division of State Lands. The Corps is responsible for the protection and development of the nation's water resources, including navigation, flood control, energy production through hydropower management, water supply storage and recreation.

Contact: US Army Corps of Engineers-Portland District, Floodplain Information Branch
Address: P.O. Box 2946, Portland, OR 97208-2946
Phone: (503) 808-4874 **Fax:** (503) 808-4875
Website: <http://www.nwp.usace.army.mil/>

Publications

Planning for Natural Hazards: The Oregon Technical Resource Guide, Department of Land Conservation and Development (July 2000).

Produced by the Community Planning Workshop for the Department of Land Conservation and Development, this is a natural hazards planning and mitigation resource for Oregon cities and counties. It provides hazard-specific resources and plan evaluation tools. The document was written for local government employees and officials. The Technical Resource Guide includes a natural hazards comprehensive plan review, a hazard mitigation legal issues guide, and five hazard specific technical resource guides, including: flooding, wildfires, landslides, coastal hazards, and earthquakes.

Contact: Natural Hazards Program Manager, DLCD
Address: 635 Capitol St. NE, Suite 200, Salem, OR 97301-2540
Phone: (503) 373-0050
Website: <http://www.lcd.state.or.us/hazards.html>

NFIP Community Rating System Coordinator's Manual. FEMA/NFIP. Indianapolis, IN.

This informative brochure explains how the Community Rating System works and what the benefits are to communities. It explains in detail the CRS point system, and what activities communities can pursue to earn points. These points then add up to the "rating" for the community, and flood insurance premium discounts are calculated based upon that "rating." The brochure also provides a table on the percent discount realized for each rating (1-10). Instructions on how to apply to be a CRS community are also included.

Contact: NFIP Community Rating System
Phone: (800) 480-2520 or (317) 848-2898
Website: <http://www.fema.gov/nfip/crs.htm>

Floodplain Management: A Local Floodplain Administrator's Guide to the NFIP. FEMA-Region 10. Bothell, WA.

This document discusses floodplain processes and terminology. It contains floodplain management and mitigation strategies, as well as information on the NFIP, CRS, Community Assistance Visits, and floodplain development standards.

Contact: National Flood Insurance Program

Phone: (800) 480-2520

Website: <http://www.fema.gov/nfip/>

Flood Hazard Mitigation Planning: A Community Guide, (June 1997), Massachusetts Department of Environmental Management.

This informative guide offers a 10-step process for successful flood hazard mitigation. Steps include: map hazards, determine potential damage areas, take an inventory of facilities in the flood zone, determine what is or is not being done about flooding, identify gaps in protection, brainstorm alternatives and actions, determine feasible actions, coordinate with others, prioritize actions, develop strategies for implementation, and adopt and monitor the plan.

Contact: Massachusetts Flood Hazard Management Program

Phone: (617) 626-1250

Website: <http://www.magnet.state.ma.us/dem/programs/mitigate>

Reducing Losses in High Risk Flood Hazard Areas: A Guidebook for Local Officials, (February 1987), FEMA-116.

This guidebook offers a table on actions that communities can take to reduce flood losses. It also offers a table with sources for floodplain mapping assistance for the various types of flooding hazards. There is information on various types of flood hazards with regard to existing mitigation efforts and options for action (policy and programs, mapping, regulatory, non-regulatory). Types of flooding which are covered include alluvial fan, areas behind levees, areas below unsafe dams, coastal flooding, flash floods, fluctuating lake level floods, ground failure triggered by earthquakes, ice jam flooding, and mudslides.

Contact: Federal Emergency Management Agency

Phone: (800) 480-2520

Website: <http://www.fema.gov>

Oregon Model Flood Damage Prevention Ordinance, (January 1999).

This is an example of how to write an ordinance that complies with NFIP/FEMA standards. Communities can simply adopt this ordinance, word for word, filling in the blanks specific to their community or jurisdiction.

Contact: Department of Land Conservation and Development

Phone: (503) 373-0050

Website: <http://www.lcd.state.or.us/hazards.html>

Severe Winter Storm Resources

State Resources

Oregon Climate Service

The Oregon Climate Service (OCS) collects, manages, and maintains Oregon weather and climate data. OCS provides weather and climate information to those within and outside the state of Oregon and educates the citizens of Oregon on current and emerging climate issues. OCS also performs independent research related to weather and climate issues.

Contact: Oregon Climate Service

Address: Oregon Climate Service, Oregon State University Strand Ag Hall Room 316, Corvallis, OR 97331-2209

Phone: (541) 737-5705

Website: **Email:** oregon@oce.orst.edu

Federal Resources

National Weather Service, Medford Bureau

The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure, which can be used by other governmental agencies, the private sector, and the public.

Contact: National Weather Service, Medford Bureau

Address: 4003 Cirrus Drive Medford, OR 97504-4198
Phone: (541) 776-4303
Website: <http://www.wrh.noaa.gov/Medford/index.html>

National Oceanic and Atmospheric Administration (NOAA)

NOAA's historical role has been to predict environmental changes, protect life and property, provide decision makers with reliable scientific information, and foster global environmental stewardship.

Contact: National Oceanic and Atmospheric Administration

Address: 14th Street & Constitution Avenue, NW, Room 6013, Washington, DC 20230

Phone: (202) 482-6090 **Fax:** (202) 482-3154

Website: <http://www.noaa.gov/> **Email:** answers@noaa.gov

Additional Resources

Public Assistance Debris Management Guide, Federal Emergency Management Agency (July 2000).

The Debris Management Guide was developed to assist local officials in planning, mobilizing, organizing, and controlling large-scale debris clearance, removal, and disposal operations. Debris management is generally associated with post-disaster recovery. While it should be compliant with local and county emergency operations plans, developing strategies to ensure strong debris management is a way to integrate debris management within mitigation activities. The *Public Assistance Debris Management Guide* is available in hard copy or on the FEMA website.

Contact: FEMA Distribution Center

Address: 130 228th Street, SW, Bothell, WA 98021-9796

Phone: (800) 480-2520 **Fax:** (425) 487-4622

Website: <http://www.fema.gov/r-n-r/pa/dmgtoc.htm>

Earthquake/Tsunami Resource Directory

State Resources

Northwest GeoData Clearinghouse, Department of Geology – Portland State University

Portland State University conducts geologic research and prepares inventories and reports for communities throughout Oregon. The GeoData Clearinghouse provides geologic information on earthquakes in the Northwest. It is especially useful for finding earthquake-related maps or links to geospatial mapping sites around the nation.

Contact: Department of Geology

Address: Portland State University P.O. Box 751, Portland OR 97207-0751

Phone: (503) 725-3022 **Fax:** (503) 725-3025

Website: <http://www.metro.dst.or.us/metro/growth/gms.html>

Oregon Department of Geology and Mineral Industries (DOGAMI)

The mission of the Department of Geology and Mineral Industries is to serve a broad public by providing a cost-effective source of geologic information for Oregonians and to use that information in partnership to reduce the future loss of life and property due to potentially devastating earthquakes, tsunamis, landslides, floods, and other geologic hazards. The Department has mapped earthquake hazards in most of western Oregon.

Contacts: Deputy State Geologist, Seismic, Tsunami, and Coastal Hazards Team Leaders

Address: 800 NE Oregon St., Suite 965, Portland, OR 97232

Phone: (503) 731-4100 **Fax:** (503) 731-4066

Website: <http://sarvis.dogami.state.or.us/homepage>

Oregon Department of Consumer & Business Services-Building Codes Division

The Building Codes Division (BCD) sets statewide standards for design, construction, and alteration of buildings that include resistance to seismic forces. BCD is active on several earthquake committees and funds construction related continuing education programs. BCD registers persons qualified to inspect buildings as safe or unsafe to occupy following an earthquake and works with OEM to assign inspection teams where they are needed.

Contact: Building Codes Division

Address: 1535 Edgewater St. NW, P.O. Box 14470, Salem, OR 97309

Phone: (503) 378-4133 **Fax:** (503) 378-2322

Website: <http://www.cbs.state.or.us/external>

State Earthquake Legislation

Senate Bill 13: Seismic Event Preparation

Senate Bill 13, signed by the Governor on June 14, 2001, requires each state and local agency and persons employing 250 or more full-time employees to develop seismic preparation procedures and inform their employees about the procedures. Further, the bill requires agencies to conduct drills in accordance with Office of Emergency Management guidelines. These drills must include “familiarization with routes and methods of exiting the building and methods of duck, cover and hold during an earthquake.” Each state and local agency and employer with 250 or more full-time employees shall maintain a file that documents the date the earthquake drill was conducted.

Senate Bill 14: Seismic Surveys For School Buildings

The Governor signed Senate Bill 14 on July 19, 2001. It requires the State Board of Higher Education to provide for seismic safety surveys of buildings that have a capacity of 250 or more persons and are routinely used for student activities by public institutions or departments under the control of the board. A seismic safety survey is not required for any building that has previously undergone a seismic safety survey or that has been constructed to the state building code standards in effect for the seismic zone classification. Subject to available funding, if a building is found to pose an undue risk to life and safety during a seismic event, a plan shall be developed for seismic rehabilitation or other seismic risk reducing activities. All seismic rehabilitation or other actions to reduce seismic risk must be completed before January 1, 2032, subject to available funding.

Senate Bill 15: Seismic Surveys for Hospital Buildings

The Governor signed Senate Bill 15 on July 19, 2001. It requires the Health Division to provide for seismic safety surveys of hospital buildings that contain an acute inpatient care facility. Seismic surveys shall also be conducted on fire stations, police stations, sheriffs’ offices, and similar facilities subject to available funding. The surveys should be completed by January 1, 2007.

A seismic survey is not required for any building that has undergone a survey or that has been constructed to the state building code standards in effect for the seismic zone classification at the site. Subject to available funding, if a building is evaluated and found to pose an undue risk to life and safety during a seismic event, the acute inpatient care facility, fire department, fire district or law enforcement agency using the building shall develop a plan for seismic rehabilitation of the building or for other actions to reduce the risk. All seismic rehabilitations or other actions to reduce the risk must be completed before January 1, 2022, subject to available funding.

Federal Resources**US Geological Survey (USGS)**

The USGS is an active seismic research organization that also provides funding for research. (For an example of such research, see Recommended Seismic Publications below).

Contact: USGS, National Earthquake Information Center

Address: Box 25046; DFC, MS 967; Denver, CO 80225

Phone: (303) 273-8500 **Fax:** (303) 273-8450

Website: <http://neic.usgs.gov>

Building Seismic Safety Council (BSSC)

The Building Seismic Safety Council (BSSC), established by the National Institute of Building Sciences (NIBS), deals with complex regulatory, technical, social, and economic issues and develops and promotes building earthquake risk mitigation regulatory provisions for the nation.

Address: 1090 Vermont Avenue, NW, Suite 700, Washington, DC 20005

Phone: (202) 289-7800 **Fax:** (202) 289-109

Website: <http://www.bssconline.org/>

National Weather Service Pacific Tsunami Warning Center

As the Operational Center for the Tsunami Warning System in the Pacific, PTWC provides warnings for Pacific basin teletsunamis (tsunamis that can cause damage far away from their source) to almost every country around the Pacific Rim and to most of the Pacific island states. This function is carried out under the guidance of the UNESCO/IOC International Coordination Group for the Tsunami Warning System in the Pacific (ITSU). A few destructive teletsunamis are generated each century by great earthquakes around the Pacific Rim.

Address: 91-270 Ft. Weaver Rd, Ewa Beach, HI 96706

Website: <http://www.prh.noaa.gov/ptwc/>

West Coast & Alaska Tsunami Warning Center

The U.S. West Coast/Alaska Tsunami Warning Center (WC/ATWC) was established in Palmer, Alaska in 1967 as a direct result of the great Alaskan earthquake that occurred in Prince William Sound on March 27, 1964. This earthquake alerted State and Federal officials to the need for a facility to provide timely and effective tsunami warnings and information for the coastal areas of Alaska. In 1982, the WC/ATWC's area of responsibility (AOR) was enlarged to include the issuing of tsunami warnings to California, Oregon, Washington, and British Columbia, for potential tsunamigenic earthquakes occurring in their coastal areas. In 1996, the responsibility was again expanded to include all Pacific-wide tsunamigenic sources, which could affect the California, Oregon, Washington, British Columbia and Alaska coasts.

Address: 910 S. Felton St., Palmer, AK 99645 USA

Phone: (907)745-4212 **FAX:** (907)745-6071

Website: <http://wcatwc.gov/main.htm>

Additional Resources

Cascadia Region Earthquake Workgroup (CREW)

The Cascadia Region Earthquake Workgroup provides information on regional earthquake hazards, facts, and mitigation strategies for homes and businesses. CREW is a non-profit coalition of private and public representatives working together to improve the ability of Cascadia Region communities to reduce the effects of earthquake events.

Members are from Oregon, Washington, California, and British Columbia. CREW's goals are to:

- Promote efforts to reduce the loss of life and property;
- Conduct education efforts to motivate key decision makers to reduce risks associated with earthquakes; and
- Foster productive linkages between scientists, critical infrastructure providers, businesses, and governmental agencies in order to improve the viability of communities after an earthquake event.

Contact: CREW, Executive Director

Address: 1330A S. 2nd Street, #105; Mount Vernon, WA 98273

Phone: (360) 336-5494 **Fax:** (360) 336-2837

Website: <http://www.crew.org>

Western States Seismic Policy Council Earthquake Program Information Center (WSSPC)

WSSPC is a regional earthquake consortium funded mainly FEMA. Its website is a great earthquake resource, with information clearly categorized – from policy to engineering to education.

Contact: Western States Seismic Policy Council

Address: 125 California Avenue, Suite D201, #1, Palo Alto, CA 94306

Phone: (650) 330-1101 **Fax:** (650) 326-1769

E-mail: wsspc@wsspc.org **Website:** <http://www.wsspc.org/home.html>

Publications

Environmental, Groundwater and Engineering Geology: Applications for Oregon – Earthquake Risks and Mitigation in Oregon, Yumei Wang,

(1998) Oregon Department of Geology and Mineral Industries, Star Publishing

This paper deals with earthquake risks in Oregon, what is being done today, and what policies and programs are in action to help prevent loss and damage from seismic events. This article also gives a good list of organizations that are doing work in this field within the state. This article provides vital information to communities around the state.

Contact: DOGAMI

Address: 800 NE Oregon St., Suite 965, Portland, Oregon 97232

Phone: (503) 731-4100 **Fax:** (503) 731-4066

Website: <http://sarvis.dogami.state.or.us/homepage>

Land Use Planning for Earthquake Hazard Mitigation: A Handbook for Planners, Wolfe, Myer R. et al., (1986) University of Colorado, Institute of Behavioral Science, National Science Foundation.

This handbook provides techniques that planners and others can utilize to help mitigate for seismic hazards. It provides information on the effects of earthquakes, sources on risk assessment, and effects of earthquakes on the built environment. The handbook gives examples on application and implementation of planning techniques to be used by local communities.

Contact: Natural Hazards Research and Applications Information Center

Address: University of Colorado, 482 UCB, Boulder, CO 80309-0482

Phone: (303) 492-6818 **Fax:** (303) 492-2151

Website: <http://www.colorado.edu/UCB/Research/IBS/hazards>

Public Assistance Debris Management Guide, FEMA (July 2000).

The Debris Management Guide was developed to assist local officials in planning, mobilizing, organizing, and controlling large-scale debris clearance, removal, and disposal operations. Debris management is generally associated with post-disaster recovery. While it should be compliant with local and county emergency operations plans, developing strategies to ensure strong debris management is a way to integrate debris management within mitigation activities. The *Public Assistance Debris Management Guide* is available in hard copy or on the FEMA website.

Contact: FEMA Distribution Center

Address: 130 228th Street, SW, Bothell, WA 98021-9796

Phone: (800) 480-2520

Fax: (425) 487-4622

Website: <http://www.fema.gov/r-n-r/pa/dmgtoc.htm>

Windstorm Resource Directory

State Resources

Oregon Climate Service

The Oregon Climate Service (OCS) collects, manages, and maintains Oregon weather and climate data. OCS provides weather and climate information to those within and outside the state of Oregon and educates the citizens of Oregon on current and emerging climate issues. OCS also performs independent research related to weather and climate issues.

Contact: Oregon Climate Service

Address: Oregon Climate Service, Oregon State University, Strand Ag Hall Room 316
Corvallis, OR 97331-2209

Phone: (541) 737-5705

Website: <http://www.ocs.orst.edu> **Email:** oregon@oce.orst.edu

National Weather Service, Medford Bureau

The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters, and ocean areas for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure, which can be used by other governmental agencies, the private sector, the public, and the global community.

Federal Resources

National Oceanic and Atmospheric Administration (NOAA)

NOAA's historical role has been to predict environmental changes, protect life and property, provide decision makers with reliable scientific information, and foster global environmental stewardship.

Contact: National Oceanic and Atmospheric Administration

Address: 14th Street & Constitution Avenue, NW, Room 6013,
Washington, DC 20230

Phone: (202) 482-6090

Fax: (202) 482-3154

Website: <http://www.noaa.gov>

Email: answers@noaa.gov

Additional Resources

Public Assistance Debris Management Guide, Federal Emergency Management Agency (July 2000).

The Debris Management Guide was developed to assist local officials in planning, mobilizing, organizing, and controlling large-scale debris clearance, removal, and disposal operations. Debris management is generally associated with post-disaster recovery. While it should be compliant with local and county emergency operations plans, developing strategies to ensure strong debris management is a way to integrate debris management within mitigation activities. The *Public Assistance Debris Management Guide* is available in hard copy or on the FEMA website.

Contact: FEMA Distribution Center

Address: 130 228th Street, SW, Bothell, WA 98021-9796

Phone: (800) 480-2520

Fax: (425) 487-4622

Website: <http://www.fema.gov/r-n-r/pa/dmgtoc.htm>

Wildfire Resource Directory

County Resources

Douglas Forest Protective Association

Contact: District Manager

Address: 1758 NE Airport Rd, Roseburg, OR 97470

Phone: (541) 672-6507

Fax: (541) 440-3424

Website: <http://www.odf.state.or.us/AREAS/southern/douglas/aboutdouglas.asp>

Coos Forest Protective Association

Contact: District Manager

Address: 63612 fifth Rd, Coos Bay, OR 97420

Phone: (541) 267-3161 **Fax:** (541) 269-2027

Website: <http://www.odf.state.or.us/AREAS/southern/coosfpa/aboutcfpa.asp>

State Resources

Oregon Department of Forestry (ODF)

ODF's Fire Prevention Unit is involved in interface wildfire mitigation and provides information about Oregon's Wildfire Hazard Zones. The Protection From Fire section of the ODF website includes Oregon-specific fire protection resources. Wildfire condition reports can be accessed on the website as well. ODF's Protection from Fire Program works to do the following:

- Clarify roles of ODF, landowners, and other agencies in relation to wildland fire protection in Oregon;
- Strengthen the role of forest landowners and the forest industry in the protection system;
- Understand and respond to needs for improving forest health conditions and the role/use of prescribed fire in relation to mixed ownerships, forest fuels and insects and disease; and
- Understand and respond to needs for improving the wildland/urban interface situation.

Contact: Oregon Department of Forestry, Fire Prevention Unit

Address: 2600 State Street, Salem, Oregon 97310

Phone: (503) 945-7440

Website: <http://www.odf.state.or.us/fireprot.htm>

Office of the State Fire Marshal (OSFM)

The Prevention Unit of Oregon's Office of the State Fire Marshal contains 19 Deputy State Fire Marshals located in various regions. The responsibilities of these deputies include public education for local fire districts and inspection of businesses, public assemblies, schools, daycare centers, and adult foster homes. The State Fire Marshal's Community Education Services unit works to keep Oregonians safe from fires and injury by providing them with the knowledge to protect themselves and their property.

Contact: Oregon State Fire Marshal

Address: 4760 Portland Road NE, Salem, Oregon 97305-1760

Phone: (503) 378-3473

Fax: (503) 373-1825

Email: oregon.sfm@state.or.us

Federal Resources and Programs

Federal Wildland Fire Policy, Wildland/Urban Interface Protection

This is a report describing federal policy and interface fire. Areas of needed improvement are identified and addressed through recommended goals and actions.

Website: <http://www.fs.fed.us/land/wdfire7c.htm>

National Fire Protection Association (NFPA)

NFPA has information on the Initiative's programs and documents. Other members of the initiative include: the National Association of State Foresters, the US Department of Agriculture Forest Service, the US Department of the Interior, and the United States Fire Administration.

Contact: Public Fire Protection Division

Address: 1 Battery March Park, P.O. Box 9101, Quincy, MA 02269-9101

Phone: (617) 770-3000

National Interagency Fire Center (NIFC)

The NIFC in Boise, Idaho is the nation's support center for wildland firefighting. Seven federal agencies work together to coordinate and support wildland fire and disaster operations. These agencies include the Bureau of Indian Affairs, Bureau of Land Management, Forest Service, Fish and Wildlife Service, National Park Service, National Weather Service, and Office of Aircraft Services.

Contact: National Interagency Fire Center

Address: 3833 S. Development Avenue, Boise, ID 83705-5354
Phone: (208) 387-5512
Website: <http://www.nifc.gov/>

United States Fire Administration (USFA) of the Federal Emergency Management Agency (FEMA)

As an entity of the Federal Emergency Management Agency, the mission of the USFA is to reduce life and economic losses due to fire and related emergencies through leadership, advocacy, coordination, and support.

Contact: USFA, Planning Branch, Mitigation Directorate
Address: 16825 S. Seton Ave., Emmitsburg, MD 21727
Phone: (301) 447-1000
Website: <http://www.fema.gov/mit/wfmit.htm> - Wildfire Mitigation Planning
<http://www.usfa.fema.gov/index.htm> - USFA Homepage
<http://www.usfa.fema.gov/wildfire/> - USFA Resources on Wildfire

Additional Resources

FireFree Program to Promote Home Safety

In a pioneering effort to address wildfire danger in Bend, Oregon, four local agencies and a Fortune 500 corporation joined together to create "FireFree! Get In The Zone," a public education campaign designed to increase resident participation in wildfire safety and mitigate losses.

Contact: FireFree
Address: 63377 Jamison St., Bend, OR 97701
Phone: (541) 318-0459
E-mail: dcrfpd2@dcrfpd2.com **Website:** <http://www.firefree.org>

Firewise – The National Wildland/Urban Interface Fire program

Firewise maintains a Website designed for people who live in wildfire-prone areas, but it also can be of use to local planners and decision makers. The site offers online wildfire protection information and checklists, as well as listings of other publications, videos, and conferences.

Contact: Firewise
E-mail: firewise@firewise.org **Website:** <http://www.firewise.org/>

Publications

National Fire Protection Association Standard 299: Protection of Life and Property from Wildfire. National Wildland/Urban Interface Fire Protection Program, (1991). National Fire Protection Association, Washington, D.C.

This document, developed by the NFPA Forest and Rural Fire Protection Committee provides criteria for fire agencies, land use planners, architects, developers, and local governments to use in the development of areas that may be threatened by wildfire. To obtain this resource:

Contact: National Fire Protection Association Publications
Phone: (800) 344-3555
Website: <http://www.nfpa.org>

Wildland/Urban Interface Fire Hazard Assessment Methodology. National Wildland/Urban Interface Fire Protection Program, (1998), NFPA, Washington, D.C. To obtain this resource:

Contact: Firewise (NFPA Public Fire Protection Division)
Phone: (617) 984-7486
Website: <http://www.firewise.org>

Fire Protection in the Wildland/Urban Interface: Everyone's Responsibility. National Wildland/Urban Interface Fire Protection Program. (1998). Washington, D.C.: Author. To obtain this resource:

Contact: Firewise (NFPA Public Fire Protection Division)
Phone: (617) 984-7486
Website: <http://www.firewise.org>

Planning for Natural Hazards: The Oregon Technical Resource Guide, Department of Land Conservation and Development (July 2000). Produced by the Community Planning Workshop for the Department of Land Conservation and Development, this is a natural hazards planning and mitigation resource for Oregon

cities and counties.

Contact: Natural Hazards Program Manager

Address: 635 Capitol St. NE, Suite 200, Salem, OR 97301-2540

Phone: (503) 373-0050

Fax: (503) 378-6033

Website: <http://www.lcd.state.or.us/hazards.html>

Landslide Resource Directory

State Resources

Oregon State Building Codes Division

The Oregon Building Codes Division adopts statewide standards for building construction that are administered by state and local municipalities throughout Oregon. The One and Two-Family Dwelling Code and Structural Specialty Code contain provisions for lot grading and site preparation for the construction of building foundations. Both codes contain requirements for cut, fill, and sloping of the lot in relationship to the location of the foundation. There are also building setback requirements from the top and bottom of slopes. The codes specify foundation design requirements to accommodate the type of soils, the soil bearing pressure, and the compaction and lateral loads from soil and ground water on sloped lots. The building official has the authority to require a soils analysis for any project where it appears the site conditions do not meet the requirements of the code or special design considerations must be taken. ORS 455.447 and the Structural Code require a seismic site hazard report for projects that include essential facilities such as hospitals, fire and police stations, emergency response facilities, and special occupancy structures, such as large schools and prisons.

Contact: Oregon State Building Codes Division

Address: 1535 Edgewater St. NW, P.O. Box 14470, Salem, OR 97309

Phone: (503) 373-4133

Website: <http://www.cbs.state.or.us/external/bcd>

Oregon Department of Geology and Mineral Industries (DOGAMI)

DOGAMI is an important agency for landslide mitigation activities in Oregon. Some key functions of DOGAMI are development of geologic data, and identifying geologic hazards. The agency also provides technical resources for communities and provides data and geologic information to local, state, and federal natural resource agencies, industry, and private groups.

Contact: DOGAMI

Address: 800 NE Oregon Street, Suite 965, Portland, Oregon 97232

Phone: (503) 731-4100

Fax: (503) 731-4066

Website: <http://sarvis.dogami.state.or.us> **Email:** info@naturenw.org

Oregon Department of Forestry (ODF)

The mission of the Oregon Department of Forestry is to serve the people of Oregon through the protection, management, and promotion of a healthy forest environment, which will enhance Oregon's livability and economy for today and tomorrow. ODF regulates forest operations to reduce the risk of serious injury or death from rapidly moving landslides related to forest operations, and assists local governments in the siting review of permanent dwellings on and adjacent to forestlands in further review areas. As part of the requirements of Senate Bill 12, ODF is currently administering the deferral of certain forest operations on landslide prone sites above homes and roads. The Department's policy is that timber harvesting or road construction operations will be prohibited on land where landslides or debris flows pose a significant threat to human safety. Exceptions for salvage or other purposes are considered on an individual basis, but have been infrequent in keeping with the intent of preventing significant risks to human life.

Oregon Debris Flow Warning Page

The Oregon Debris Flow Warning page provides communities with up to-date access to information regarding potential debris flows. The Debris Flow Warning system was initiated in 1997 and involves collaboration between ODF, DOGAMI, the Oregon Department of Transportation (ODOT), local law enforcement agencies, NOAA Weather Radio, and local media. The ODF is responsible for forecasting and measuring rainfall from storms that may trigger debris flows. Advisories and warnings are issued as appropriate. Information is broadcast over NOAA weather radio and provided to emergency services on the Law Enforcement Data System. DOGAMI provides additional information on debris flows to the media that convey the information to the public. ODOT also provides warnings to motorists during periods determined

to be of highest risk for rapidly moving landslides along areas on state highways with a history of being most vulnerable. Information is available on the ODF website.

Contact: ODF

Address: 2600 State Street, Salem, OR, 97310

Phone: (503) 945-7200 **Fax:** (503) 945-7212

Website: <http://www.odf.state.or.us/>

Oregon Department of Transportation (ODOT)

ODOT provides warnings to motorists during periods determined to be of highest risk of rapidly moving landslides along areas on state highways with a history of being most vulnerable to rapidly moving landslides. ODOT also monitors for landslide activity and responds to slide events on state highways.

Contact: ODOT Transportation Building

Address: 355 Capitol St. NE, Salem, OR 97310

Phone: (888) 275-6368

Website: <http://www.odot.state.or.us>

Federal Resources and Programs

Federal Emergency Management Agency (FEMA), Landslide Fact Sheet

FEMA's website contains information on strategies to reduce risk and prevent loss from landslides and debris flows.

Contact: Federal Regional Center, Region 10

Address: 130-228th St. SW, Bothell, WA 98021-9796

Phone: (425) 487-4678

Website: <http://www.fema.gov/library/landslif.htm>

Natural Resource Conservation Service (NRCS)

The NRCS produces soil surveys. These may be useful to local governments who are assessing areas with potential development limitations including steep slopes and soil types. They operate many programs dealing with the protection of natural resources.

Contact: Resource Conservationist

Address: 251 NE Garden Valley Blvd., Roseburg, Oregon 97470

Phone: (541) 673-6071

Website: <http://www.nrcs.usda.gov/>

US Geological Survey, National Landslide Information Center (NLIC)

The NLIC website provides good information on the programs and resources regarding landslides. The page includes information on the National Landslide Hazards Program Information Center, a bibliography, publications, and current projects. USGS scientists are working to reduce long-term losses and casualties from landslide hazards through better understanding of the causes and mechanisms of ground failure both nationally and worldwide.

Contact: National Landslide Information Center

Phone: (800) 654-4966

Website: <http://landslide.usgs.gov>

Additional Resources

Oregon State Senate Bill 12

The 1997 Legislature passed Senate Bill 12 to address problems caused by landslides and debris flows. Provisions include:

- Allowing the Oregon State Forester to prevent timber harvest or road construction in or below areas identified by the Department of Forestry as "high risk sites" and where homes or highways are in precarious locations;
- Allowing road officials to close roads that pose risk to human life because of landslides;
- Requiring State agencies to develop, and local officials to distribute, information about hazards of construction on sites that are vulnerable to landslides;

Establishing a 10-member Task Force on Landslides and Public Safety to assess the problem and develop a solution. It includes legislators and representatives from state natural resource agencies, boards of commissions, local government, and the public

Douglas County

Natural Hazards Mitigation Plan

Appendix D:

Natural Hazard Preparedness Survey and Focus Group Report For Douglas County

(Natural Hazard Preparedness Survey and Focus Group Report for Douglas County is not available in Electronic Format, for a copy please contact the Douglas County Planning Department at 541-440-4289, or contact the Oregon Natural Hazards Workgroup at onhw@uoregon.edu.)

Douglas County

Natural Hazards Mitigation Plan

Appendix E:

Douglas County Incorporated Areas Sample Natural Hazard Mitigation Plan Template

Incorporated Jurisdiction Natural Hazards Mitigation Plan Addendum

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Section 1: Planning Process

The **Incorporated Jurisdiction** Natural Hazards Mitigation Plan includes resources and information to assist city residents, public and private sector organizations, and others interested in participating in planning for natural hazards. The mitigation plan provides a list of activities that may assist **Incorporated Jurisdiction** in reducing risk and preventing loss from future natural hazard events.

Who Participated in Developing the Plan?

The **Incorporated Jurisdiction** Natural Hazards Mitigation Plan is the result of a collaborative effort between **Incorporated Jurisdiction public agencies, non-profit organizations, the private sector, and regional and state organizations**. A project Steering Committee guided the process of developing the plan. The Steering Committee was comprised of representatives from:

- **List Steering Committee Members**

Public Participation

Public participation is a key component to strategic planning processes. Citizen participation offers citizens the chance to voice their ideas, interests, and opinions. **Insert local public involvement process here.**

What is the Plan Mission?

Incorporated Jurisdiction agrees with the mission statement developed during the Douglas County planning process. Insert mission if different from county.

What are the Plan Goals?

Incorporated Jurisdiction agrees with the goals developed during the Douglas County planning process. Insert Goals if different from county.

How Will the Plan be Implemented, Monitored, and Evaluated?

The plan maintenance process includes a schedule for implementing, monitoring, evaluating, and reviewing this plan addendum. It is essential to have this process to ensure plan sustainability.

Plan Adoption

The **Municipality Governing Body** will be responsible for adopting the **Municipality** Natural Hazards Mitigation Plan. This governing body has the authority to promote sound public policy regarding natural hazards.

Coordinating Body

Insert coordinating body for plan implementation: steering committee.

Implementation through Existing Programs

Incorporated Jurisdiction addresses statewide planning goals and legislative requirements through its Comprehensive Land Use Plan, Capital Improvement Plans, and Building Codes. The Natural Hazard Mitigation Plan provides a series of recommendations that are closely related to the goals and objectives of these existing planning programs. **Incorporated Jurisdiction** will have the

opportunity to implement recommended mitigation action items through existing programs and procedures.

Economic Analysis of Mitigation Projects

The Federal Emergency Management Agency’s accepted methods for determining the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into two general categories: benefit/cost analysis and cost-effectiveness analysis. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards can provide decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Given federal funding, the **Incorporated Jurisdiction** will use a FEMA-approved benefit/cost analysis approach to identify and prioritize mitigation action items. For other projects and funding sources, the **Incorporated Jurisdiction** may use other approaches to understand the costs and benefits of each action item and develop a prioritized list.

Formal Review Process

The **Incorporated Jurisdiction** Addendum to the Douglas County Natural Hazards Mitigation Plan will be evaluated on an **insert time-frame** basis to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. This addendum will be submitted to FEMA every five years for review and approval.

Continued Public Involvement

Special Service Districts

The following special service districts, associations, and agencies provide services within to **Incorporated Jurisdiction** residents. These districts will have an opportunity to provide feedback on the Plan during the public participation process. Contact information for the following can be found in the Resource Directory portion of this document.

Section 2: Community Profile

Geography and the Environment

Major Rivers

Climate


Minerals and Soils

Other Significant Geologic Features

Population and Demographics

Land and Development

Housing and Community Development

Employment and Industry 

Transportation and Commuting Patterns

Section 3: Hazard Assessment

What is a Hazard Assessment?

Conducting a risk assessment can provide information on the location of hazards, the value of existing land and property in hazard locations, and an analysis of risk to life, property, and the environment that may result from natural hazard events. Hazard assessments are subject to the availability of hazard-specific data. **Incorporated Jurisdiction** conducted a hazard assessment for all of the hazards for which data was available. The three levels of a risk assessment are as follows:

- 1) **Hazard Identification** identifies the geographic extent and intensity of the hazard, the intensity of the hazard, and the probability of its occurrence. Maps are frequently used to display hazard identification data. **Incorporated Jurisdiction** identified seven major hazards that consistently affect this geographic area. These hazards – floods, landslides, wildfires, earthquakes, severe winter storms, windstorms, and Tsunami – were identified through an extensive process that utilized input from the Douglas County Natural Hazard Mitigation Steering Committee
- 2) **Vulnerability Assessment/Inventorying Assets** combines hazard identification with an inventory of the existing (or planned) property and population exposed to a hazard. Additionally, a more detailed description of the vulnerability of these assets is located in the specific hazard sections.
- 3) **Risk Analysis/Estimating Potential Losses** involves estimating the damage, injuries, and financial losses likely to be sustained in a geographic area over a given period of time. This level of analysis involves using mathematical models. The two measurable components of risk analysis are magnitude of the harm that may result and the likelihood of the harm occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets. Unfortunately, there is insufficient data for conducting a risk analysis for the natural hazards affecting Incorporated Jurisdiction. However, this need is identified in our action plan, and will complete a risk assessment will be conducted when the resources are available.

Federal Requirements for Hazard Assessment

Recent federal regulations for hazard mitigation plans outlined in 44 CFR Part 201 include a requirement for hazard assessment. This risk assessment requirement is intended to provide information that will help communities to identify and prioritize mitigation activities that will reduce losses from the identified hazards. There are seven hazards profiled in the mitigation plan, including floods, landslides, wildfires, earthquakes, winter storms, windstorms, and volcanic eruptions. The Federal criterion for risk assessment and information on how the **Incorporated Jurisdiction** Natural Hazard Mitigation Plan meets those criteria is outlined in Table 3-1 below.

Table 3-1. Federal Criteria for Hazard Assessment

Section 322 Requirement	How is this addressed?
Identifying Hazards	Each hazard section includes a map illustrating the geographic extent of the hazards affecting Incorporated Jurisdiction using the best available data.
Profiling Hazard Events	The hazard sections of the Douglas County Natural Hazard Mitigation Plan provide documentation for all of the large-scale hazard events affecting the region. Where data is available, Incorporated Jurisdiction has provided local impacts from historical hazard events.
Assessing Vulnerability: Identifying Assets	Table 3.3 documents the community assets that are vulnerable to natural hazards. A more detailed description of the vulnerability of these assets is located in the specific hazard sections.
Assessing Vulnerability: Estimating Potential Losses	Using the best available data, an estimate of potential losses from natural hazards is located in the hazard specific sections.
Assessing Vulnerability: Analyzing Development Trends	The Community Profile Section of this plan provides a description of the development trends in Incorporated Jurisdiction .

Community Assets and Vulnerability Assessment

This section outlines the resources, facilities and infrastructure that, if damaged, could significantly impact public safety, economic conditions, and environmental integrity of **Incorporated Jurisdiction**. The community assets were defined as follows:

Critical Facilities: Those facilities and infrastructure necessary for emergency response efforts.

- **Insert Local Critical Facilities Here**

Essential Facilities: Those facilities and infrastructure that supplement response efforts.

- **Insert Local Essential Facilities Here**

Infrastructure: Infrastructure that provides services for **Incorporated Jurisdiction**.

- **Insert Local Infrastructure Here**

Vulnerable Populations: Locations serving populations that have special needs or require special consideration.

- **Insert Vulnerable Populations Here**

Cultural or Historical Assets: Those facilities that augment or help define community character, and if lost, would represent a significant loss for the community.

- **Insert Local Cultural or Historical Assets Here**

Economic Assets/ Population Centers: **Economic Centers** are those businesses that employ large numbers of people, and provide an economic resource to **Incorporated Jurisdiction**. If damaged, the loss of these economic centers could significantly affect economic stability and prosperity. **Population Centers** usually are aligned with economic centers, and will be if particular concern for evacuation/notification during a hazard event.

- [Insert Local Economic Assets/ Population Centers Here](#)

Environmental Assets: Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic and functional service for the community.

- [Insert Local Environmental Assets Here](#)

Hazardous Materials: Those sites that store, manufacture, or use potentially hazardous materials.

- [Insert Local Haz Mat Sites here](#)

Section 4: Natural Hazards

Flooding

[Incorporated Jurisdiction](#) has several large rivers and smaller tributaries that are susceptible to annual flooding events. Flooding poses a threat to life and safety, and can cause severe damage to public and private property.

Flooding History

The historical large-scale flooding events have been described in the county plan, and are applicable to [Incorporated Jurisdiction](#). As such, the events will not be repeated here.

[Insert local history if information and data available.](#)

Flooding Hazard Assessment

[Insert best available hazard assessment data here. If the county plan contains the hazard assessment data that is applicable to your jurisdiction, note that here.](#)

Hazard Identification

Vulnerability Assessment

Risk Analysis

Existing Flood Mitigation Activities

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by [Incorporated Jurisdiction](#) agencies or organizations.

Incorporated Jurisdiction Codes Pertaining to Flooding

Flood Mitigation Projects

Flood Mitigation Action Items



The flood mitigation action items provide direction on specific activities that organizations and residents in [Incorporated Jurisdiction](#) can undertake to reduce risk and prevent loss from flood events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

Action Item 1

Ideas for Implementation

Coordinating

Organization:

Timeline:

Plan Goals Addressed:



Landslide

Landslide History

The historical landslide events have been described in the county plan, and are applicable to **Incorporated Jurisdiction**. As such, the events will not be repeated here. Insert local history if information and data available.

Landslide Hazard Assessment

Insert best available hazard assessment data here. If the county plan contains the hazard assessment data that is applicable to your jurisdiction, note that here.

Hazard Identification

Vulnerability Assessment

Risk Analysis

Existing Landslide Mitigation Activities

Landslide mitigation activities listed here include current mitigation programs and activities that are being implemented by **Incorporated Jurisdiction** agencies or organizations.



Incorporated Jurisdiction Codes Pertaining to Landslides

Landslide Mitigation Projects

Landslide Mitigation Action Items

The landslide mitigation action items provide direction on specific activities that organizations and residents in **Incorporated Jurisdiction** can undertake to reduce risk and prevent loss from landslide events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

Action Item 1

Ideas for Implementation

Coordinating

Organization:

Timeline:

Plan Goals Addressed:



Wildfire

Wildfire History

The historical landslide events have been described in the county plan, and are applicable to **Incorporated Jurisdiction**. As such, the events will not be repeated here. Insert local history if information and data available.

Wildfire Hazard Assessment

Insert best available hazard assessment data here. If the county plan contains the hazard assessment data that is applicable to your jurisdiction, note that here.



**Hazard Identification
Vulnerability Assessment
Risk Analysis**

Existing Wildfire Mitigation Activities

The Incorporated Jurisdiction Fire Department works to mitigate problems regarding wildfire issues when they arise.

**Incorporated Jurisdiction Codes Pertaining to Wildfires
Local Fire Prevention/education Programs**

Wildfire Mitigation Action Items

The wildfire mitigation action items provide direction on specific activities that organizations and residents in Incorporated Jurisdiction can undertake to reduce risk and prevent loss from wildfire events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

Action Item 1

Ideas for Implementation

**Coordinating
Organization:
Timeline:
Plan Goals Addressed:**



Severe Storm: Wind & Winter

Severe Storm History

The historical severe storm events have been described in the county plan, and are applicable to Incorporated Jurisdiction. As such, the events will not be repeated here. Insert local history if information and data available.

Severe Storm Hazard Assessment:

Insert best available hazard assessment data here. If the county plan contains the hazard assessment data that is applicable to your jurisdiction, note that here.

**Hazard Identification
Vulnerability Assessment
Risk Analysis**

Existing Severe Wind & Winter Storm Mitigation Activities

**Water Districts
Utilities**



Severe Storm Mitigation Action Items

The severe winter storm mitigation action items provide direction on specific activities that organizations and residents in Incorporated Jurisdiction can undertake to reduce risk and prevent loss from storm events. Each action item

is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

Action Item 1:

Ideas for Implementation

Coordinating Organization:
Timeline:
Plan Goals Addressed:



Earthquake

Earthquake History

The historical windstorm events have been described in the county plan, and are applicable to **Incorporated Jurisdiction**. As such, the events will not be repeated here. **Insert local history if information and data available.**

Earthquake Hazard Assessment

Insert best available hazard assessment data here. If the county plan contains the hazard assessment data that is applicable to your jurisdiction, note that here.

Hazard Identification

Vulnerability Assessment

Risk Analysis

Existing Earthquake Mitigation Activities

Incorporated Jurisdiction Codes
Businesses/School Preparedness



Earthquake Mitigation Action Items

The earthquake mitigation action items provide direction on specific activities that organizations and residents in **Incorporated Jurisdiction** can undertake to reduce risk and prevent loss from earthquake events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

Action Item 1:

Ideas for Implementation

Coordinating Organization:
Timeline:
Plan Goals Addressed:



Tsunami

Tsunami History

The historical windstorm events have been described in the county plan, and are applicable to **Incorporated Jurisdiction**. As such, the events will not be repeated here. **Insert local history if information and data available.**

Tsunami Hazard Assessment

Insert best available hazard assessment data here. If the county plan contains the hazard assessment data that is applicable to your jurisdiction, note that here.

Hazard Identification

Vulnerability Assessment

Risk Analysis

Existing Tsunami Mitigation Activities

Probably will not have any locally: refer to county plan.

Tsunami Mitigation Action Items

The Tsunami mitigation action items provide direction on specific activities that organizations and residents in **Incorporated Jurisdiction** can undertake to reduce risk and prevent loss from tsunami events. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

Action Item 1:

Ideas for Implementation

Coordinating

Organization:

Timeline:

Plan Goals Addressed:



Multi-Hazard

Multi-Hazard Action Items

Multi-hazard action items are those activities that pertain to all seven hazards in the mitigation plan: flood, landslide, wildfire, severe winter storm, windstorm, earthquake, and Tsunami, sudden unexpected disasters (Acts of God) would also be in this section

Action Item 1:

Ideas for Implementation

Coordinating

Organization:

Timeline:

Plan Goals Addressed:

Section 5:

Mitigation Planning Priority System

Action Item Prioritization Methodology

As **Incorporated Jurisdiction** works toward action item implementation, the Hazard **Incorporated Jurisdiction** has prioritized the identified mitigation strategies in order to better allocate resources for implementation. The criteria used for prioritizing the action items are the plan goals, hazards addressed, criticality of need, population served, and likelihood of success.

Although this methodology provides a guide for the **Incorporated Jurisdiction** in terms of implementation, the **Incorporated Jurisdiction** has the option to implement any of the action items at any time. This option to consider all action items for implementation allows the committee to consider mitigation strategies as new situations arise, such as capitalizing on funding sources that could pertain to an action item that is not the highest priority.

Step 1: Prioritize Plan Goals

The **Incorporated Jurisdiction** mitigation goals were considered during each phase of the mitigation planning process. As the mitigation action items were developed, the **Incorporated Jurisdiction** identified which plan goals were addressed by each action item. The **Incorporated Jurisdiction** ranked the plan goals to determine the priorities for Incorporated Jurisdiction, and each goal ranked, in ascending order.

Step 2: Prioritize Hazards

The natural hazards addressed by the **Incorporated Jurisdiction** Natural Hazard Mitigation Plan were prioritized using the FEMA-accepted hazard analysis methodology for Emergency Operations Plans. This methodology considers the history of the hazard, the vulnerability to the hazard, the maximum threat of the hazard (worst case scenario), and the probability of the hazard. Each of these criteria are weighted, and the final score was used for prioritizing the hazards. The following is a full description of the methodology used:

Categories Considered:

HISTORY:	The record of occurrences of previous major emergencies or disasters (weight factor = 2).
LOW	0 - 1 event per 100 years
MEDIUM	2 - 3 events per 100 years
HIGH	4 + events per 100 years
VULNERABILITY:	The percentage of population and property likely to be affected (weight factor = 5).
LOW	< 1% affected
MEDIUM	1 - 10% affected
HIGH	> 10% affected

MAXIMUM THREAT: The maximum percentage of population and property that could be impacted under a worst case scenario (weight factor = 10).

- LOW < 5% affected
- MEDIUM 5 - 25% affected
- HIGH > 25% affected

PROBABILITY: The likelihood of occurrence within a specified period of time (weight factor = 7).

- LOW > 1 chance per 100 years
- MEDIUM > 1 chance per 50 years
- HIGH > 1 chance per 10 years

Severity Ratings:

- LOW = 1 - 3 points
- MEDIUM = 4 - 6 points
- HIGH = 7 - 10 points

Although the methodology used allows the **Incorporated Jurisdiction** to quantify and compare natural hazards, it is flawed in that it compares hazards with high probabilities and relatively low consequences with hazards that have high probabilities and low consequences.

Table 5-1. Natural Hazard Prioritization Score

Hazard	History	Vulnerability	Max. Threat	Probability	Total
Earthquake	Score: Weight:	Score: Weight:	Score: Weight:	Score: Weight:	
Flood	Score: Weight:	Score: Weight:	Score: Weight:	Score: Weight:	
Wildfire	Score: Weight:	Score: Weight:	Score: Weight:	Score: Weight:	
Landslide	Score: Weight:	Score: Weight:	Score: Weight:	Score: Weight:	
Severe Winter Storm	Score: Weight:	Score: Weight:	Score: Weight:	Score: Weight:	
Windstorm	Score: Weight:	Score: Weight:	Score: Weight:	Score: Weight:	
Tsunami	Score: Weight:	Score: Weight:	Score: Weight:	Score: Weight:	

Step 3: Incorporate Criticality of Need, Large Number of Population Served, Likelihood of Success

The final score for each action items was computed by summing the plan goal score and the hazard score.

Table 5-2. Action Item Prioritization Score

<i>Existing Resources</i>		<i>Funding Required</i>	

**Section 6:
Resource Directory**

Insert any local agencies, organizations, and departments that may deal with natural hazard mitigation, and could be potential partners in implementation of mitigation action items.

Suggestions:

- Fire**
- Utilities**
- Planning**
- Building**
- Geographic Information Systems**
- Emergency Services**
- Watershed Councils**
- Neighborhood Organizations**
- Chamber of Commerce**
- Media**