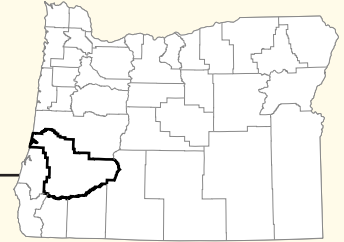




# Douglas County

## Comprehensive Hazard Analysis

Prepared for: Douglas County Emergency Management





# Douglas County

## Comprehensive Hazard Analysis

### Report for:

**Douglas County Emergency Management**

Emergency Management Division

Douglas County Sheriff's Office

1036 SE Douglas Ave.

Roseburg, Oregon 97470

### Prepared by:

**University of Oregon's Community Service Center:**

**Oregon Partnership for Disaster Resilience**

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**June 2012**



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# Special Thanks & Acknowledgements

Douglas County developed this Comprehensive Risk Assessment utilizing funding through the Department of Homeland Security's Emergency Management Preparedness Grant program. Communities that develop accurate, objective and comprehensive risk assessments reduce duplicative efforts and enhance data gathering, interpretation and application capabilities across emergency management related planning activities (i.e. training, plan development, exercises, etc.). The Douglas County Hazard Analysis is the result of a collaborative effort between the County, public agencies, the private sector and regional organizations.

State level project partners include:

- Oregon Emergency Management
- Oregon Public Health
- Department of Geology and Mineral Industries
- Department of Land Conservation and Development
- Oregon Partnership for Disaster Resilience at the University of Oregon's Community Service Center

## **Project Stakeholder Committee:**

A stakeholder committee guided the hazard identification and risk assessment analysis. The stakeholder committee included representatives from the following organizations.

- Douglas County Emergency Management
- Douglas County Health and Social Services
- Douglas County Risk Manager
- Douglas County Planning Department
- Oregon Department of Transportation
- Oregon Health Authority
- The Cow Creek Band of the Umpqua Tribe of Indians
- Mercy Medical Center
- City of Roseburg Fire
- Pacific Power

Douglas County Emergency Management convened the analysis process and will take the lead in incorporating and updating the plan. Emergency Management will be responsible for ensuring the hazard analysis is incorporated and used as a tool for informing other Emergency Management plans within Douglas County.

## **Project Manager:**

Wayne Stinson, Emergency Manager, Douglas County

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## **About the Community Service Center**

The Community Service Center (CSC), a research center affiliated with the Department of Planning, Public Policy, and Management at the University of Oregon, is an interdisciplinary organization that assists Oregon communities by providing planning and technical assistance to help solve local issues and improve the quality of life for Oregon residents. The role of the CSC is to link the skills, expertise, and innovation of higher education with the transportation, economic development, and environmental needs of communities and regions in the State of Oregon, thereby providing service to Oregon and learning opportunities to the students involved.

## **About the Oregon Partnership for Disaster Resilience**

The Oregon Partnership for Disaster Resilience (OPDR) is a coalition of public, private, and professional organizations working collectively toward the mission of creating a disaster-resilient and sustainable state. Developed and coordinated by the Community Service Center at the University of Oregon, the OPDR employs a service-learning model to increase community capacity and enhance disaster safety and resilience statewide.

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# Executive Summary

Douglas County Emergency Management developed this comprehensive hazard analysis in an effort to identify and assess the threats posed by natural, technologic and man-made hazards. This assessment meets state and federal emergency management and public health grant requirements and will serve as an important guide in planning for and prioritizing future preparedness, response, mitigation and recovery activities. It is impossible to predict exactly when hazard events will occur, or the extent to which they will affect the community. However, identifying natural, technological and man-made hazards make it is possible for the community to plan for potential disasters before they occur.

The Department of Homeland Security defines a hazard as “a natural or man-made source or cause of harm or difficulty, which can be actual or potential.” The hazard analysis covers three types of hazards: natural, terrorism, and technological. Every community is affected by different hazards and to varying degrees.

## Who Participated in the Hazards Analysis?

Douglas County Hazard Analysis is the result of a collaborative effort between the County, public agencies, the private sector and regional organizations. A stakeholder committee guided the hazard identification and risk assessment analysis. The stakeholder committee included representatives from the following organizations.

- Douglas County Emergency Management
- Douglas County Health and Social Services
- Douglas County Risk Manager
- Douglas County Planning Department
- Oregon Department of Transportation
- Oregon Health Authority
- The Cow Creek Band of the Umpqua Tribe of Indians
- Mercy Medical Center
- City of Roseburg Fire
- Pacific Power

Douglas County Emergency Management convened the analysis process and will take the lead in ensuring that the information is appropriately incorporated into county planning, training, exercising and related emergency management activities.

## Threat Summary

The Douglas County Stakeholder Committee assessed vulnerability and risk for hazards in three geographic designations: the coast, central section, and countywide. The Coast

Region has several unique hazards that only affect the coast and is affected by hazards that occur countywide differently than the central section. The unique hazards include local and distant tsunamis and coastal erosion. The Central section of Douglas County has a concentrated population along the I-5 corridor, which is the main focus of the Central section analysis. Countywide hazards include terrorism and technological risk.

Table i.1 below shows the threat score analysis for each hazard in the three planning sections as determined by the stakeholder committee. Douglas County established the threat scores by assigning sub-scores to four separate categories (history, vulnerability, max threat, and probability). The county then totaled the sub-scores to establish a total threat score and determine which hazards pose the greatest threat to Douglas County.

**Table i.1: Hazard Analysis Summary**

Oregon Emergency Management Threat Analysis Matrix					
Threat Event/Hazard	History	Vulnerability	Max. Threat	Probability	Total Threat Score
<b>Central Section</b>					
Winter Storm	18	40	70	63	191
Wildfire (WUI)	20	40	60	70	190
Windstorm	16	30	80	56	182
Flood	20	40	50	70	180
Earthquake	4	25	100	35	164
Landslide/Debris Flow	20	20	30	63	133
<b>Coastal Section</b>					
Earthquake	4	50	100	49	203
Local Tsunami	2	45	100	49	196
Windstorm	20	25	80	70	195
Winter Storm	20	25	80	70	195
Flood	18	30	60	70	178
Landslide/Debris Flow	18	20	60	70	168
Distant Tsunami	20	20	50	70	160
Wildfire (WUI)	8	35	50	49	142
Coastal Erosion	18	5	10	56	89
<b>Countywide</b>					
Animal / Eco-terrorism	18	10	20	63	111
Cyber terrorism	4	10	80	14	108
Explosive Device	8	10	20	14	52

Source: Douglas County Hazard Analysis Stakeholder Committee, Oregon Partnership for Disaster Resilience, May 2012

## Priority Core Capabilities

As part of this process, Douglas County selected and prioritized core capabilities in accordance with FEMA’s Threat and Hazard Identification and Risk Assessment methodology. The priority mission areas and core capabilities identified by Douglas County stakeholders are shown in Table i.2.

**Table i.2 – Focused Mission Areas and Core Capabilities for Douglas County**

Mission Area	Mitigation	Response
Core Capabilities	Planning	Planning
	Threat and Hazard Identification	Operation Coordination
	Community Resilience	Infrastructure Systems

Source: Douglas County

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# Section I:

## Hazard Analysis Introduction

Hazard analyses inform a variety of Emergency Management related activities including, but not limited to: grant development and justification; plan preparation; training activity prioritization, mitigation project prioritization; exercise development; and local, regional and state resource coordination. Oregon Emergency Management has asked that Douglas County update its local hazard analysis by June 30, 2012; additionally, Oregon Public Health has requested an updated hazard vulnerability assessment (HVA) for public health planning purposes.

Ideally, one comprehensive hazard analysis would provide the foundation for all local emergency management planning activities, including public health preparedness initiatives. Communities that develop accurate, objective and comprehensive hazard analyses reduce duplicative efforts and enhance data gathering, interpretation and application capabilities across emergency management related planning activities. Additionally, a comprehensive hazard analysis approach aligns with the Emergency Management Accreditation Program (EMAP) and National Fire Protection Administration (NFPA) 1600 Standard on Disaster/Emergency Management and Business Continuity Programs, which both place value on comprehensive, multi-purpose hazard analyses.

Douglas County approached OPDR at the University of Oregon's Community Service Center to develop a comprehensive, enhanced hazard analysis document for the county. This hazard analysis addresses the following primary objectives:

1. Update the 2008 Douglas County Risk Analysis as required by OEM;
2. Provide baseline information for the Public Health HVA
3. Organize all hazard analysis information into a format that will serve hazard planning needs for the next five years.

### What is a hazard?

A hazard is an actual or potential source of natural, man-made or technical harm or difficulty. A hazard differs from a threat in that a threat is specifically directed at an entity, asset, system, network, or geographic area, while a hazard is not directed.<sup>1</sup> A hazard can be viewed as a situation or event having the potential for doing damage to life, property, resources, and the environment. Hazards can be classified as natural, human, technological and terrorist-related. They can be isolated incidents or chronic, recurring events. A community's level of risk in the face of a hazard is assessed according to that community's vulnerability (see Figure 1.1). The

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<sup>1</sup> United States. Department of Homeland Security. *DHS Risk Lexicon: 2010 Edition*. Washington, D.C.: Risk Stakeholder Committee, 2010. Print.

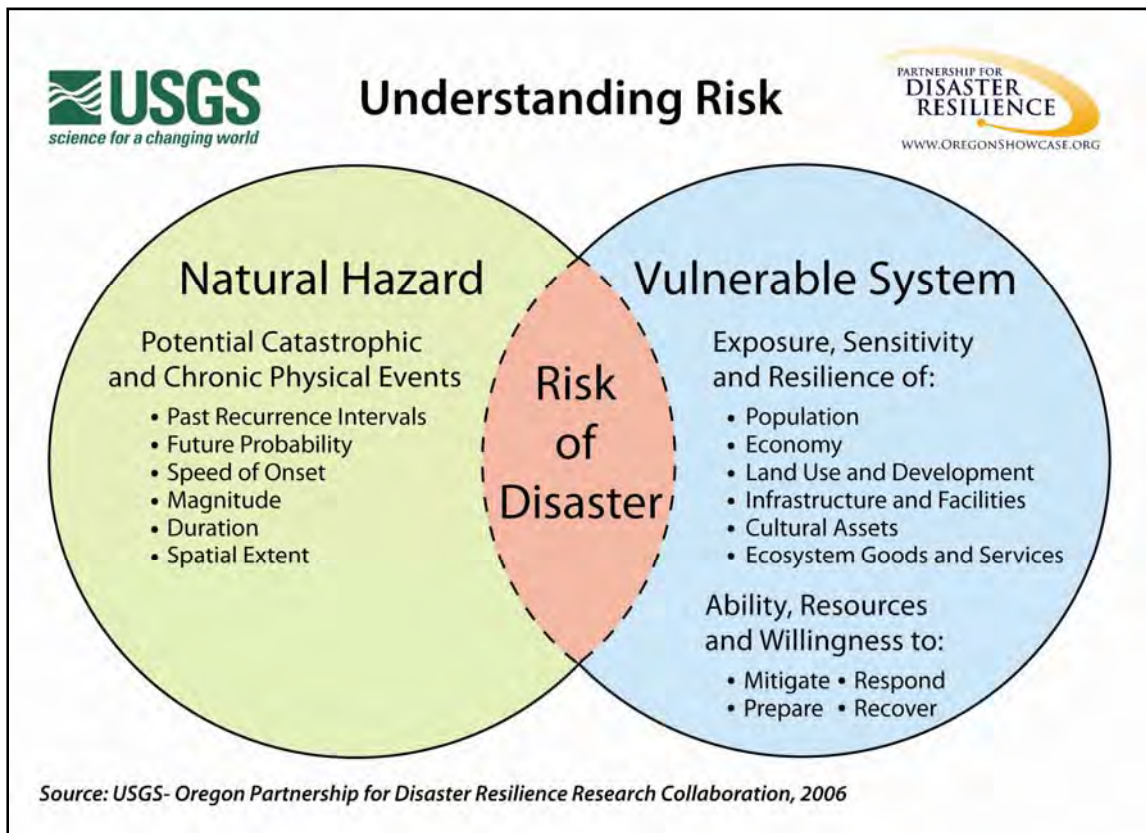
level of potential risk a community may be exposed to depends on the community's exposure, sensitivity and resiliency to a potential hazard.

## What is a hazard analysis?

A hazard analysis is a planning process that is essential to insure effective and efficient preparation, response, mitigation and recovery for and from disaster events. The hazard analysis provides information, assists in management decisions, and is designed to encourage local governments to meet previously unmet emergency management procedures. Further, a hazard analysis strives to inform local officials and citizens about the threats, vulnerabilities and risks posed by hazards thereby supporting the development of measures to prevent or mitigate hazard events.

At its most basic level, hazard analysis (1) identifies and characterizes potential hazards, (2) assesses community level vulnerabilities to those hazards, and (3) determines the expected impacts (or risks). Figure 1.1 illustrates these process components using natural hazards as an example.

**Figure 1.1 – Understanding Risk**



Source: Oregon Partnership for Disaster Resilience

Hazard Analysis can take many different forms, names, and definitions. What constitutes a hazard analysis, what it contains, and what it is called will depend on which government agency's methods are used to conduct a hazard analysis. Table 1.1, below, demonstrates three separate government agencies and their definitions of hazard analysis.

**Table 1.1 – Hazard Analysis Definitions**

<b>Risk Assessment and Hazard Analysis Definitions</b>	
<b>FEMA</b>	
Risk	The probability an event will occur, and consequences of its occurrence.
Risk Assessment	Determines: asset values, threat rating value, vulnerability rating value, and relative risk for each threat against each asset.
Hazard Analysis	Process used to anticipate hazards; likelihood, frequency, damage, impact, and community vulnerability.
<b>Department of Homeland Security</b>	
Consequence Assessment	Process of identifying or evaluating the potential or actual effects of an event, incident, or occurrence.
Probabilistic Risk Assessment	Type of quantitative risk assessment that considers possible combinations of occurrences with associated consequences, each with an associated probability or probability distribution
Risk Assessment	Product or process which collects information and assigns values to risks for the purpose of informing priorities, developing or comparing courses of action, and informing decision making
Threat Assessment	Process of identifying or evaluating entities, actions, or occurrences, whether natural or man-made, that have or indicate the potential to harm life, information, operations and/or property
Vulnerability Assessment	Process for identifying physical features or operational attributes that render an entity, asset, system, network, or geographic area susceptible or exposed to hazards
<b>Department of Energy, Office of Emergency Management</b>	
Hazard Assessment	The identification and characterization of hazardous materials specific to a facility/site, analyses of potential accidents or events, and evaluation of potential consequences. The Hazards Assessment also includes a determination of the size of the geographic area surrounding the site, known as the Emergency Planning Zone (EPZ), within which special planning and preparedness activities are required to reduce the potential health and safety impacts from an event involving hazardous materials.
Risk Assessment	An investigation of the potential risk to human health or the environment posed by a specific action or substance.

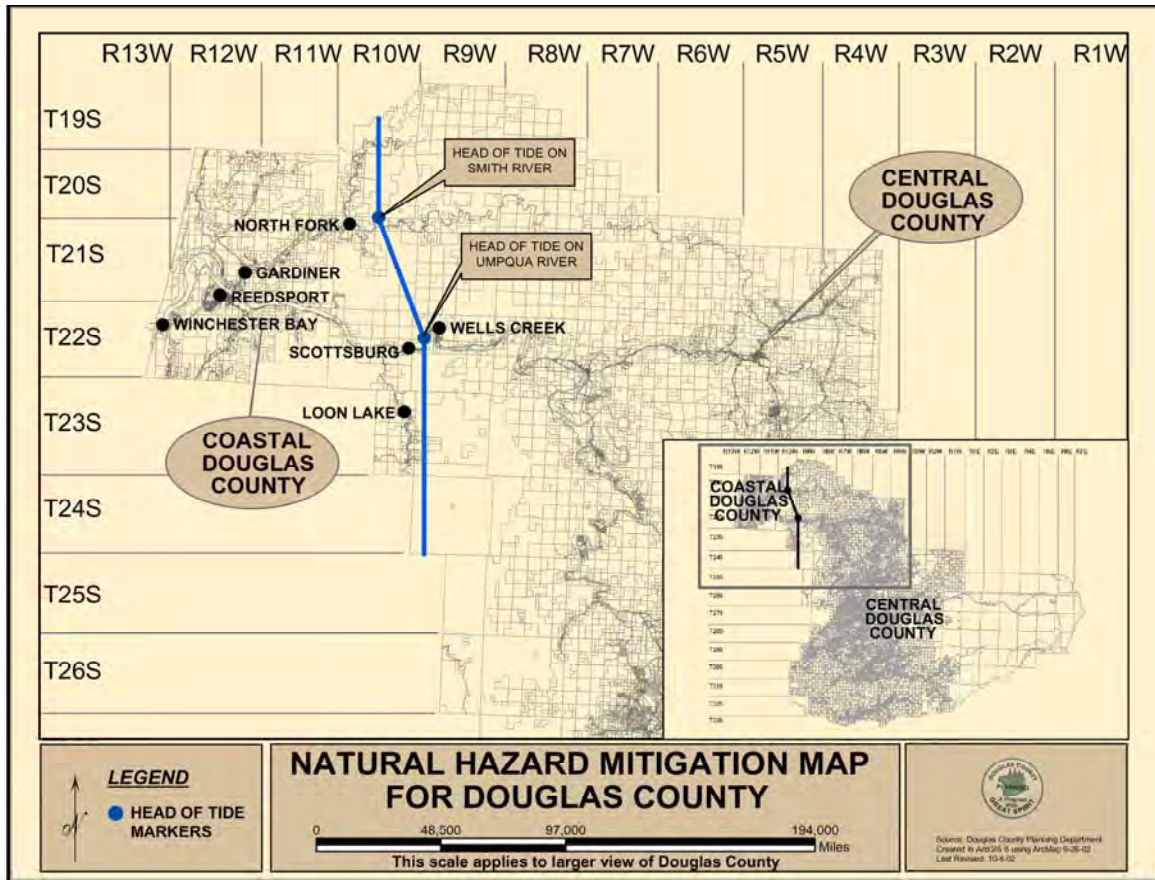
Sources: FEMA, DHS, DOE

## **History of Douglas County Hazard Analysis**

Douglas County first developed a hazard analysis in July 1984 as part of a joint effort between the Douglas County Sheriff's Office, Emergency Management Division and the Douglas County Planning Department. The county subsequently updated and revised the hazard analysis in February 1991, June 1995, March 2003, and February 2008.

The 2003 and 2008 revisions established two separate hazard analysis zones for assessing natural hazards in the county: the first covers the central portion of Douglas County (east from a point near of Scottsburg) and is called the Central Douglas County Hazard Analysis zone. The second analysis zone covers the coastal section of Douglas County (from the coast to a point just west of Scottsburg) and is called the Coastal Douglas County Hazard Analysis zone. The dividing line for the two zones is essentially the head of tide line of both the Smith River and the Umpqua River (see Map 1.1 below).

**Map 1.1 – Douglas County Natural Hazard Planning Zones**



Source: Douglas County Planning Department

Douglas County separated the coastal and central hazard analyses after a review of the hazard ratings did not accurately reflect the risk posed by location specific natural hazards. Specifically, the county determined that while coastal hazards were severe to the coastal population, these hazards ended up with very low rankings when aggregated at the county level. Because the population from the central area was not directly at risk from hazards such as coastal erosion and tsunami, for example, the results skewed the hazard rankings down in favor of only the central area.

The 2008 update also contained a Public Health Vulnerability Assessment (PHVA) which was reviewed by community health partners. The PHVA included hazard values for potential health hazards that state and local health departments had determined to have a potential negative impact on the health of the citizens in the state. The PHVA adopted the same total scores for



natural hazards that were determined by the Douglas County Emergency Management review process.

This 2012 update to the Douglas County Hazard Analysis update retains the coastal and central planning zones for the purposes of evaluating natural hazard impacts to the county. The analysis also includes a county-wide assessment of threats (for example terrorism) that the county should consider uniformly across the entire country. During the 2012 update process OPDR proposed subdividing the county further by separating the central planning section into a central section and a forest planning section. The committee rejected the proposal citing data challenges associated with maintaining three sections as well as current and future planning resource constraints as their primary rationale.

### **North Umpqua River at near flood stage over Winchester Dam in Roseburg, 2012**



Source: Robin Loznak Photography, LLC.

[http://robinloznakphotography.blogspot.com/2012\\_01\\_01\\_archive.html](http://robinloznakphotography.blogspot.com/2012_01_01_archive.html)

## **Douglas County Hazards Overview**

Douglas County is regularly impacted by several natural hazards due to its geography, climate and topography. Natural hazards result from acts of nature, and include flood, wildfire, and severe winter storms. Others, such as earthquake, tsunami, and technological or terrorism-related hazards, are less frequent but still represent potentially significant risks for the county and its residents. Some of these hazards are specific to the Coastal Planning Section, and some are possible throughout the entire county. Terrorist threats or human-caused incidents result from the intentional actions of an adversary, such as a threatened or actual chemical or biological attack or cyber event. Technological hazards result from accidents or the failures of systems or structures, such as hazardous materials spills or dam failures. The hazards identified by the County Stakeholders as most applicable to Douglas County, including their general location and types, are identified in Table 1.2 below.

**Table 1.2 – Douglas County Hazards Overview**

Hazard	Location	Extent
Coastal Erosion	Coastal Region	Douglas County contains minimal shorelands around in and around Reedsport.
Earthquake	Countywide	A crustal event may be localized to a specific area of the county. A Cascadia event would have region wide impacts.
Flood	Countywide	The county is mainly affected by riverine flooding and minimal tidal flooding.
Landslide/Debris Flow	Countywide	The interstate and highways are very susceptible to landslides. Minimal housing is located in hazard areas.
Local Tsunami	Coastal Region	A Cascadia event could cause a substantial tsunami to affect the coastal region.
Distant Tsunami	Coastal Region	Past history shows minimal tsunami waves occurring from distant events.
Wildfire (WUI)	Countywide	Events tend to be more severe in the coastal region, but occur countywide.
Windstorm	Countywide	Windstorms affect the county every year.
Winter Storm	Countywide	Winter storms affect the county every year.
Animal / Eco-terrorism	Countywide	The county has a history of eco-terrorism focused on the timber industry.
Cyber terrorism	Countywide	The county has no history of cyber terror events, but infrastructure is widely located throughout the county.
Explosive Device	Countywide	The county has a history of threats but no detonations. The county contains a few major targets of opportunity.
Energy Failure	Countywide	Due to severe storms the County typically experiences no more than 2 major energy failure events per annum.
Water Supply Disruption	Countywide	The County contains minimal Urban areas which rely on outside water source.
Communication Systems Failure	Countywide	Communication loss occurs occasionally across the County due to severe weather and technical issues.
Sewer Treatment Failure	Countywide	The County experiences minimal sewer issues frequently.
Dam Failure	Countywide	The County has no history of dam failure but there are numerous and aging dams across the County.
Fire - Large Scale Urban Conflagration	Countywide	Minimal threat of large scale urban fires exist.
HAZMAT Release	Countywide	The County experiences multiple HAZMAT incidents a year, few are major spills.
Public Facilities Violence	Countywide	The County has a history of minor threats to public facilities.

Source: OPDR, Douglas County Hazard Analysis Update 2012

## FEMA Disaster Declarations

President Dwight D. Eisenhower approved the first federal disaster declaration in May 1953 following a tornado in Georgia. Since then, federally declared disasters have been approved within every state. As of March 2012, FEMA has approved a total of 28 federal disaster declarations, two emergency declarations and 49 fire management assistance declarations in

Oregon.<sup>2</sup> When requesting a presidential declaration for a major disaster or emergency, governors provide detailed information about the amount of value of public and private property damage resulting from the event. FEMA uses these damage assessments to determine if the event meets the disaster declaration threshold. In addition, FEMA uses the information to determine the amount of federal public and private assistance being made available as well as the specific counties being included in the declaration.

Disaster declarations can help inform hazard mitigation project priorities, by demonstrating and documenting which hazards historically have caused the most significant damage to the county. Table 1.3 below summarizes the major disasters declared for Douglas County by FEMA since 1994. The table shows that all of the recent major disaster declarations in Douglas County have been flood, fire and weather related.

**Table 1.3 – FEMA Major Disaster Declarations for Douglas County**

Declaration Number:	Declaration Date:	Incident(s):	Incident(s) Period:	Individual Assistance:	Public Assistance Categories:
DR-184	24-Dec-64	Flood	24-Dec-64	Douglas County	PA, IA, HM
DR-319	21-Jan-72	Flood	21-Jan-72	Douglas County	PA, IA, HM
DR-413	25-Jan-74	Flood	25-Jan-74	Douglas County	PA, IA, HM
DR-1036	2-Aug-94	El Nino Effects	1-May-1994 to 31-Oct-1994	None	None
DR-1099	9-Feb-96	Severe Storms, Flooding	4-Feb-1996 to 21-Feb-1996	Douglas County	None
DR-1107	19-Mar-96	Severe Storms, High Winds	10-Dec-1996 to 12-Dec-1996	None	A, B, C, D, E, F, G
DR-1149	23-Dec-96	Severe Storms, Flooding	17-Nov-1996 to 11-Dec-1996	None	A, B, C, D, E, F, G
DR-1160	23-Jan-97	Sever Winter Storms, Flooding	25-Dec-1996 to 6-Jan-1997	Douglas County	None
DR-1405	12-Mar-02	Severe Winter Windstorm with High Winds	7-Feb-2002 to 8-Feb-2002	None	A, B, C, D, E, F, G
DR-1510	19-Feb-04	Sever Winter Storms	26-Dec-2003 to 14-Jan-2004	None	A, B, C, D, E, F, G
FM-2549	21-Aug-04	Bland Mountain #2 Fire	20-Aug-2004 to 5-Sep-2004	None	B
EM-3228	7-Sep-05	Hurricane Katrina Evacuation	29-Aug-2005 to 1-Oct-2005	None	B
DR-1632	20-Mar-06	Severe Storms, Flooding, Landslides, Mudslides	18-Dec-2005 to 21-Jan-2006	None	A, B, C, D, E, F, G
DR-1956	17-Feb-11	Severe Winter Storm, Flooding, Mudslides, Landslides, Debris Flows	13-Jan-2011 to 21-Jan-2011	None	A, B, C, D, E, F, G
DR-4055	2-Mar-12	Severe Winter Storm, Flooding, Landslides, Mudslides	17-Jan-2012 to 21-Jan-2012	None	A, B, C, D, E, F, G

Source: FEMA, Oregon Disaster History, Major Disaster Declarations

<sup>2</sup> FEMA. Declared Disasters by Year or State.

[http://www.fema.gov/news/disaster\\_totals\\_annual.fema#markS](http://www.fema.gov/news/disaster_totals_annual.fema#markS). Accessed March 8, 2012

## Oregon Emergency Response System

The Oregon Emergency Response System (OERS) is a statewide agency that tracks emergency reporting of hazards, disasters and emergency operations. Table 1.3 below lists the Douglas County incidents recorded by OERS for the years 2007 through May of 2012.

**Table 1.4 – Douglas County OERS Hazard Summary 2007-2012**

OERS Reporting by Year					
	CBT	NH	NWS	RAD	TECH
2007	278	10	7	1	6
2008	60	4	0	0	3
2009	41	1	0	0	4
2010	51	0	0	0	3
2011	51	1	2	0	7
2012 (to May)	36	2	5	0	3

Source: Oregon Emergency Response System

Table Notes: Table excludes exercises, search and rescue, and "other" events.

CBT = Chemical, Biological, Technological; NH = Natural Hazard; NWS = National Weather Service; RAD= Radiological; TECH = Technical issues associated with 911 service outages.

## 2012 Hazard Analysis Update Process

To complete this comprehensive hazard analysis, Douglas County used several hazard analysis methods. Each method is described further below. Collectively, the results from each analysis contribute to an overall understanding of hazard impacts and community risk in Douglas County. These results can be used as needed to inform emergency operations, natural hazard mitigation, and recovery and preparedness activities in Douglas County.

### Oregon Emergency Management Hazard Analysis Methodology<sup>3</sup>

Oregon Emergency Management (OEM) Hazard Analysis Methodology is one of many tools counties in Oregon use to identify and plan for threat events and hazards within a county. For local governments, conducting the hazard analysis described in this document is a useful early step in planning for hazard mitigation,

#### Successful Fire Abatement in Douglas County



Source: Douglas County Emergency Management

<sup>3</sup> Oregon Emergency Management (OEM) Hazard Analysis Methodology, May 2008; [http://www.oregon.gov/OMD/OEM/docs/library/oem\\_hazard\\_analysis\\_methodology\\_5\\_08.pdf?ga=t](http://www.oregon.gov/OMD/OEM/docs/library/oem_hazard_analysis_methodology_5_08.pdf?ga=t)

response, and recovery. This method provides a generalized sense of hazard priorities within the jurisdiction. While it does not predict the occurrence of a particular hazard, it does "quantify" the risk of one hazard compared with another. By doing this analysis, planning, equipment and training resources can be focused where the risk is greatest.

The OEM methodology produces scores that range from 24 (lowest possible) to 240 (highest possible), one order of magnitude from lowest to highest. Vulnerability and probability are the two key components of the methodology. **Vulnerability** examines both typical and maximum credible events; **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%.

In connection with Emergency Management Performance Grant funding administered by OEM, there is a requirement that hazard analyses must be current and updated within the past ten years, and include a written synopsis (narrative) of the most credible events possible to occur within a jurisdiction. Having a current local hazard analysis is also one element in meeting Oregon Progress Board Benchmark #67, "Emergency Preparedness."

### **CALCULATING SEVERITY RATINGS FOR THE MATRIX**

In this analysis, "severity ratings" are applied to the four categories of history, vulnerability, maximum threat (worst-case scenario), and probability as follows:

LOW = choose the most appropriate number between 1 to 3 points

MEDIUM = choose the most appropriate number between 4 to 7 points

HIGH = choose the most appropriate number between 8 to 10 points

*(Weight factors also apply to each of the four categories as shown below.)*

### **HISTORY (WEIGHT FACTOR FOR CATEGORY = 2)**

History is the record of previous occurrences. Events to include in assessing history of a hazard in your jurisdiction are events for which the following types of activities were required:

- The EOC or alternate EOC was activated;
- Three or more EOP functions were implemented, e.g., alert & warning, evacuation, shelter, etc.;
- An extraordinary multi-jurisdictional response was required; and/or
- A "Local Emergency" was declared.

LOW – score at 1 to 3 points based on... 0 - 1 event past 100 years

MEDIUM – score at 4 to 7 points based on... 2 - 3 events past 100 years

HIGH – score at 8 to 10 points based on... 4 + events past 100 years

### **VULNERABILITY (WEIGHT FACTOR FOR CATEGORY = 5)**

Vulnerability is the percentage of population and property likely to be affected under an "average" occurrence of the hazard.

LOW – score at 1 to 3 points based on... < 1% affected

MEDIUM – score at 4 to 7 points based on... 1 - 10% affected

HIGH – score at 8 to 10 points based on... > 10% affected

**MAXIMUM THREAT (WEIGHT FACTOR FOR CATEGORY = 10)**

Maximum threat is the highest percentage of population and property that could be impacted under a worst-case scenario.

LOW – score at 1 to 3 points based on... < 5% affected

MEDIUM – score at 4 to 7 points based on... 5 - 25% affected

HIGH – score at 8 to 10 points based on... > 25% affected

**PROBABILITY (WEIGHT FACTOR FOR CATEGORY = 7)**

Probability is the likelihood of future occurrence within a specified period of time.

LOW – score at 1 to 3 points based on... one incident likely within 75 to 100 years

MEDIUM – score at 4 to 7 points based on... one incident likely within 35 to 75 years

HIGH – score at 8 to 10 points based on... one incident likely within 10 to 35 years

**TOTAL SCORE**

The sub-scores from each category produce a total threat score for each hazard when added up. The total score isn't as important as how it compares with the total scores for other hazards Douglas County faces. By comparing scores, Douglas County can determine priorities: Which hazards should the County be most concerned about? Which ones less so?

## **Relative Risk**

While the OEM Hazard Analysis produces an overall threat prioritization score by hazard, the data inputs are relatively coarse. For example, the definition of vulnerability only addresses two community asset categories: population and property. In an effort to expand the risk assessment conversation to include a wider range of relevant asset categories, OPDR partnered with University of Oregon Emergency Management to develop a “relative risk” assessment tool. The primary purpose of the tool is to stimulate evaluation of a wider range of community assets and vulnerabilities. Toward that end, the Relative Risk Assessment Matrix poses a series of questions about the relative impact on community systems of various hazards. The result of the compiled responses is a relative ranking of hazards by their severity of impact on the County, its residents, and the economic and physical resilience of the community systems. These impact severity scores are then multiplied by the probability of the hazard to create a relative risk score.

The ranking and ordering of hazards and community assets is primarily a qualitative exercise in comparing relative risk of particular places or assets to natural hazards. Note that the assessment makes no direct accounting of the dollar values of capital investments, revenue, tax generation, replacement costs, or intangible value of County characteristics.

OPDR asked stakeholder committee members to score the questions posed in the Relative Risk exercise on five point scales from low impact to high impact. The questions included the following:

- If this event has occurred in the past 100 years in Douglas County, what was the extent of injuries and deaths that occurred?
- Consider the future potential for injuries or deaths from past events or from similar events in other communities, and any changes or trends that would affect future injuries and deaths from this type of event. Estimate the number of injuries and deaths that could result from this event in Douglas County.
- Consider the vulnerability of coastal Douglas County to this event. Estimate the extent of damage.
- Considering the extent of damage, estimate the total cost to respond to the event and repair or replace all damaged facilities.
- If this event occurred in Douglas County, estimate the duration of interruption to commercial business.
- If this event occurred in Douglas County, estimate the percentage of commercial business that would be interrupted.
- Consider the future potential for injuries or deaths from past events or from similar events in other communities, and any changes or trends that would affect future injuries and deaths from this type of event. Estimate the number of injuries and deaths that could result from this event in Douglas County.
- Consider the vulnerability of coastal Douglas County to this event. Estimate the extent of damage.
- Considering the extent of damage, estimate the total cost to respond to the event and repair or replace all damaged facilities.
- If this event occurred in Douglas County, estimate the duration of interruption to commercial business.
- If this event occurred in Douglas County, estimate the percentage of commercial business that would be interrupted.

A copy of the relative risk questionnaire and matrix is included in Appendix A.

## **FEMA's Threat Hazard Identification and Risk Assessment**

The Threat and Hazard Identification and Risk Assessment, or THIRA, is a new set of guidelines laid out by FEMA (Federal Emergency Management Agency) and the Department of Homeland Security. At the time of this analysis, the extent to which THIRA implementation at the local level will be required to be eligible for the Homeland Security Grant Program and Emergency Management Performance Grants is uncertain. One potential outcome is that Douglas County will be required to complete and submit a THIRA to OEM and the Regional Federal Preparedness Coordinator no later than December 31, 2012. Given the level of uncertainty tied to the THIRA process and because the county is already in the process of updating the county hazard assessment, this assessment addresses the THIRA requirements.

According to FEMA, THIRA is intended to broaden the factors considered in the hazard planning process. One important component is incorporation of the "whole community" throughout the assessment process and by accounting for important community-specific factors. The THIRA process includes the five-steps presented in Figure 1.2 below:

**Figure 1.2 – Five-Step THIRA Process Diagram**



Source: FEMA THIRA Guide 2012

Each of the five THIRA assessment steps can be summarized as follows:

**1. IDENTIFY THE THREATS AND HAZARDS OF CONCERN**

Based on past experience, forecasting, expert judgment, and available resources, identify a list of the threats and hazards of concern to the community.

**2. GIVE THREATS AND HAZARDS CONTEXT**

Using the list of threats and hazards, develop context that assesses vulnerability and shows how those threats and hazards may affect the community.

**3. EXAMINE THE CORE CAPABILITIES USING THE THREATS AND HAZARDS.**

Using the threat and hazard context, identify impacts to the community through the lens of the core capabilities.

**4. SET CAPABILITY TARGETS.**

Looking across the estimated impacts to the community, in the context of each core capability and coupled with a jurisdiction's desired outcomes, set capability targets. The greatest impact, coupled with desired outcomes, sets the target for each capability.

**5. APPLY THE RESULTS.**

Plan for the ability to deliver the targeted level of capability with either community assets or through mutual aid, identify mitigation opportunities, and drive preparedness activities.

The THIRA guidelines identify five Mission Areas (Prevention, Protection, Mitigation, Response, and Recovery), and 30 Core Capabilities within these mission areas (see Table 1.5 below). These core capabilities and their definitions are taken from the first edition of the *National Preparedness Goal*, which was issued in September 2011.<sup>4</sup>

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<sup>4</sup><http://www.fema.gov/pdf/prepared/npg.pdf>  
<http://www.fema.gov/pdf/prepared/crosswalk.pdf>  
<http://www.fema.gov/pdf/government/training/tcl.pdf>



**Table 1.5 – THIRA Mission Areas and Core Capabilities**

Prevention	Protection	Mitigation	Response	Recovery
Planning				
Public Information and Warning				
Operational Coordination				
Forensics and Attribution	Access Control and Identify Verification	Community Resilience	Critical Transportation	Economic Recovery
Intelligence and Information	Intelligence and Information Sharing	Longterm Vulnerability Reduction	Environmental Response/ Health and Safety	Health and Social Services
Interdiction and Disruption	Interdiction and Disruption	Risk and Disaster Resilience Assessment	Infrastructure Systems	Housing
Screening, Search and Detection	Physical Protective Measures	Threats and Hazard Identification	Mass Care Services	Infrastructure Systems
	Risk Management for Protection Programs and Activities		Mass Search and Rescue Operations	Natural and Cultural Resources
	Screening, Search and Detection		On-Scene Security and Protection	
	Supply Chain Integrity and Security		Operational Communications	
	Cybersecurity		Public and Private Services and Resources	
			Public Health and Medical Services	
			Situational Awareness	

Source: FEMA THIRA Guide 2012

Based on the needs of the community, these are used to develop Capability Targets, which can further identify functional improvements within the five Mission Areas (see Table 1.6 below for examples). The THIRA process requires communities to identify the mission areas and core capabilities that they think should receive priority attention for future planning.

**Table 1.6 – THIRA Capability Target Examples**

<b>Core Capability</b>	<b>Desired Outcome</b>
Screening, Search and Detection	Screen 100% of targeted cargo, mail and people associated with an imminent terrorist threat.
<b>Capability Target:</b> Screen 67,500 people associated with an imminent terrorist threat.	
Access Control and Identity Verification	Ensure 100% verification of identity to authorize, grant, or deny physical and cyber access to specific locations, information, and networks.
<b>Capability Target:</b> Verify 2,500 identities to authorize, grant, or deny physical and cyber access.	
Infrastructure Systems	Within 15 days of an incident, restore and sustain essential services (public and private) to maintain community functionality.
<b>Capability Target:</b> Within 15 days of an incident, restore power to 350,000 customers.	

Source: FEMA THIRA Guide 2012

## Stakeholder Committee Meetings

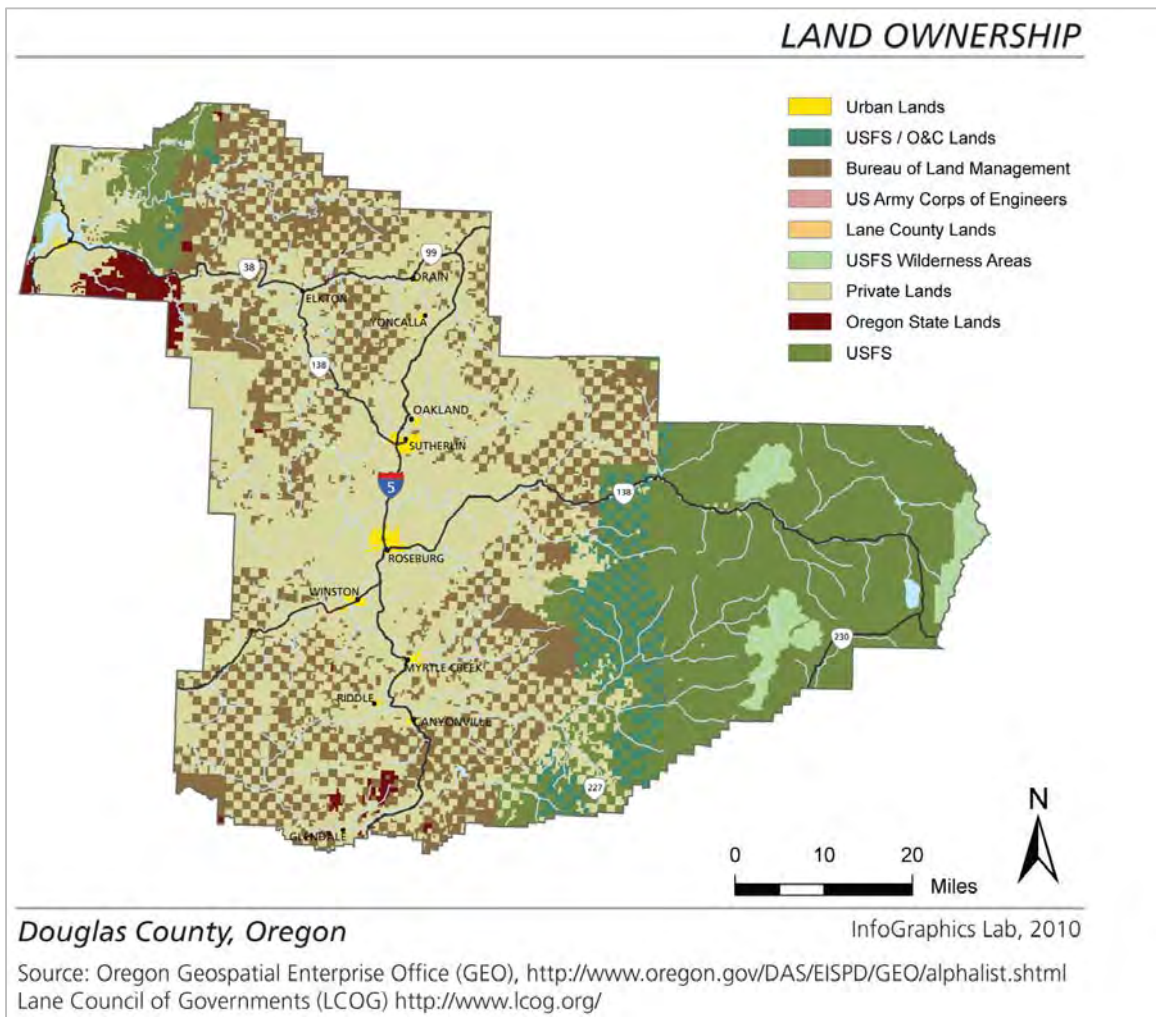
OPDR facilitated two stakeholder committee meetings with members of the Douglas County hazard planning community, including Douglas County Emergency Management, Douglas County Health and Social Services, Pacific Power, Douglas County Planning, City of Roseburg Fire Department, and Oregon Health Authority, among others. The first meeting included discussions regarding the planning zones, which hazards to include in the analysis, and scoring of those hazards based on the OEM criterion. These scores are presented in Sections 3 through 5. The second meeting included discussions regarding relative risk scoring, the determination of priority mission areas and core capabilities, and the setting of capability targets. These determinations are presented in Section 6. These meetings refined the scope of this hazard analysis and narrowed the THIRA categories in order to meet the specific needs of Douglas County emergency planning.

# Section 2: County Asset Overview

## County Location, Size and Physiography

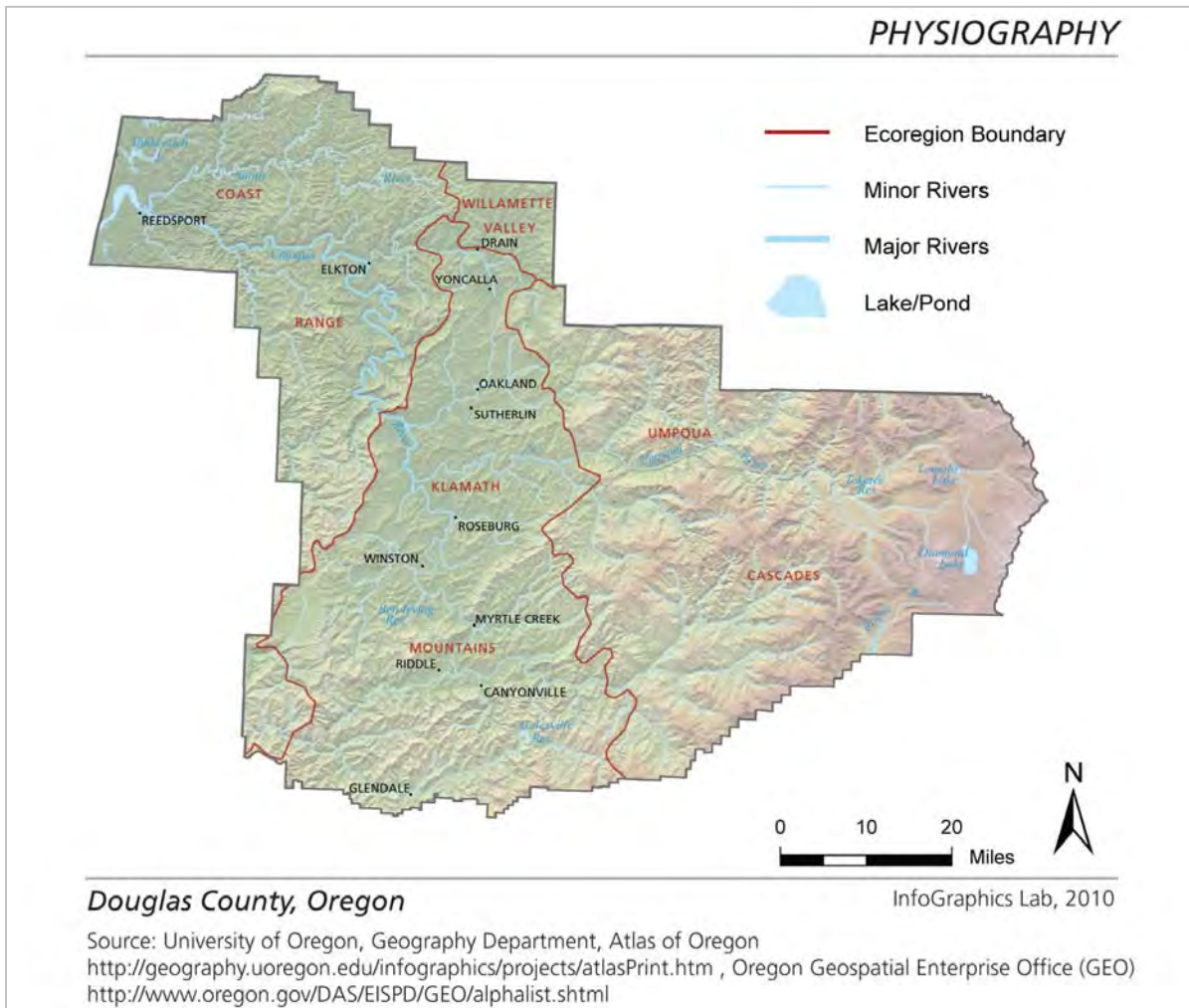
Douglas County is located in Southwest Oregon and runs from the Pacific Ocean to the crest of the Cascade Mountain Range. Douglas County comprises 3,240,360 acres (5,071 square miles) and is the fifth largest county in Oregon. Timberlands, farm forest and agricultural lands comprise 98% of the county, of which 50% is owned by the federal government. Residential, industrial or land within urban growth boundaries make up the other 2% of land within Douglas County.

Map 2.1 – Douglas County Land Ownership



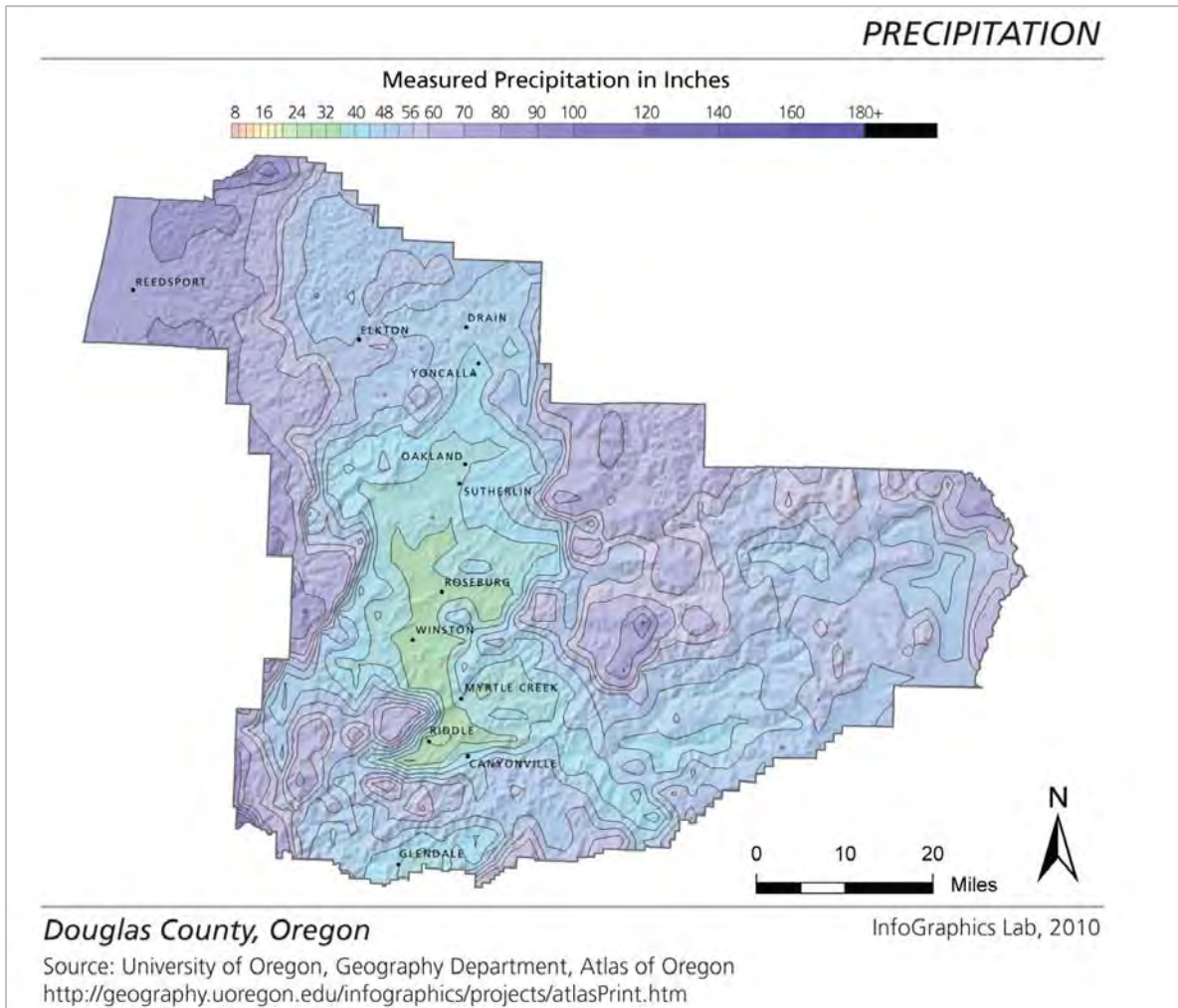
Douglas County is part of four geologic provinces which are characterized by complex and rugged topography, unique soils groups, deep and narrow valleys, which impact all activities of residents of the county. The physical setting of the county plays an important role in the hazard analysis process. The county is bordered on the west by Coos County and the Pacific Ocean; to the north by Lane County; Klamath County to the east; and Josephine and Jackson counties to the south. Major cities in the region are Roseburg; Eugene, seventy miles to the north and Medford, ninety miles to the south, both out of the county.

**Map 2.2 – Douglas County Physiography**



Douglas County is one of only two counties in Oregon that reach from sea level at the Pacific Ocean to over 9,000 feet at the crest of the Cascades (Mount Thielsen is the County’s highest peak at 9,182 feet). The geography, topography, climate, and other natural attributes such as vegetation vary markedly with location in Douglas County. The climatologic and hydrologic patterns differ across the large area of Douglas County as shown in Map 2.3 below.

**Map 2.3 – Douglas County Precipitation**



## Vulnerabilities

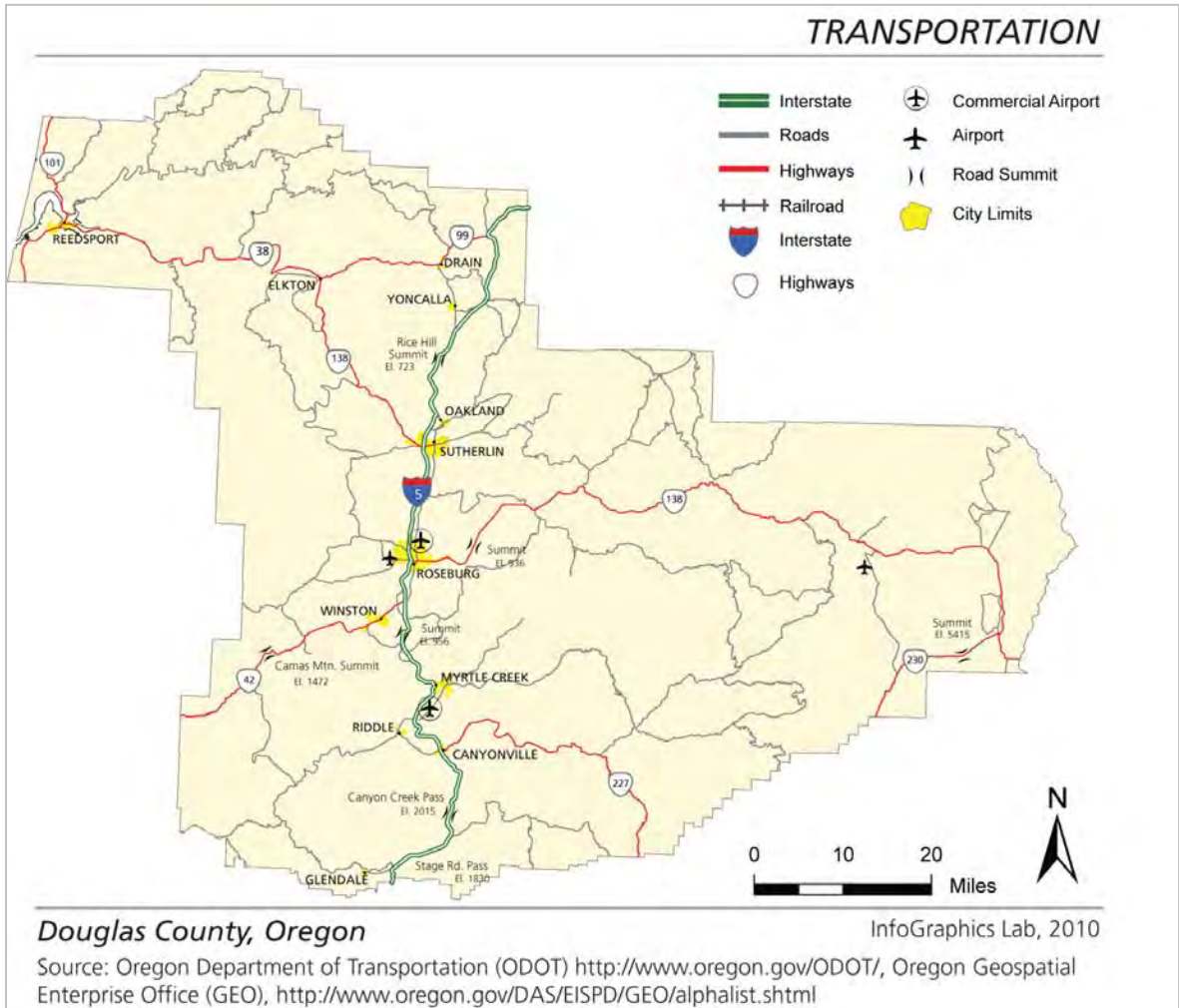
Vulnerability is a measure of the exposure of the built environment to hazards. Understanding the exposure of community assets to hazards is critical in the assessment of the degree of risk a community has to each hazard. Identifying the facilities and infrastructure at risk from various hazards can assist the county in prioritizing resources for mitigation, and can assist in directing damage assessment efforts after a hazard event has occurred. It is not always possible to predict exactly when natural disasters will occur or the extent to which they may impact the community. However, communities can minimize losses from disaster events through deliberate planning and mitigation, as well as by identifying distinct vulnerabilities.<sup>4</sup> These vulnerabilities can include populations (such as the elderly, the young, the disabled visitors, , and non-English speakers), the economy, the environment, and land-use and developments. As for the built

<sup>4</sup> Source: State of Oregon Emergency Management Plan, NHMP Region 5: Mid-Columbia, February 2012

environment, a major vulnerability for Douglas County is critical facilities and infrastructure, which will be discussed in further detail below.

Douglas County is traversed by Interstate 5 and the Central Oregon & Pacific Railroad in a north south direction. Other major highways in Douglas County are State Highways 38, 42, 99, 138, and County Road 1. The boundaries of the county coincide with the Umpqua Basin Watershed. The Umpqua River System runs throughout the county and often parallel to the major road network. The largest collections of population are also along or near the road and river network.

**Map 2.4 – Douglas County Transportation**

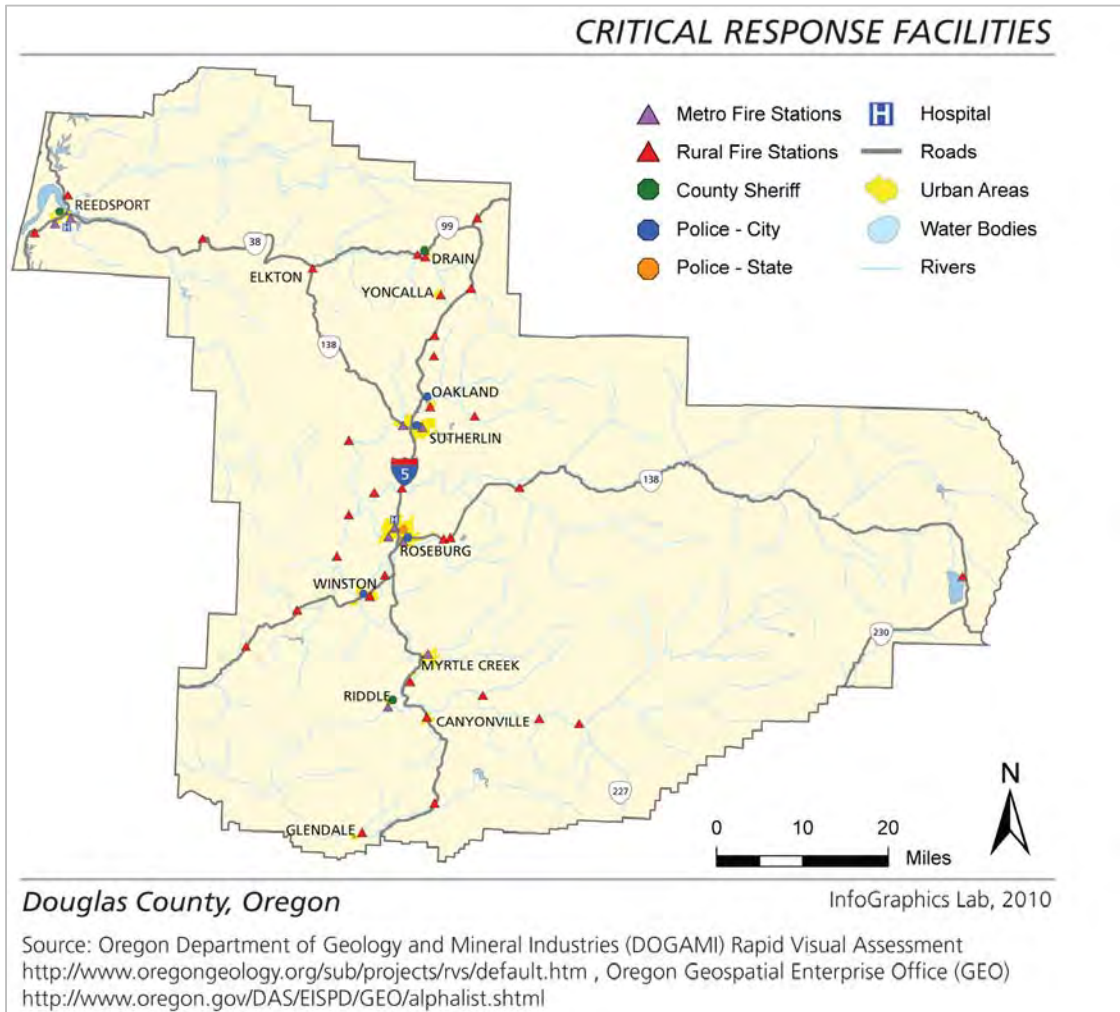


According to the 2010 U.S. Census, the population of Douglas County is 107,667. The county seat is Roseburg, which is centrally located in the central valley of the county. With a population of 21,181, it is the largest city in the county. However, over one-half of the county population lives outside of the 12 incorporated cities. Unincorporated populations are clustered across Douglas County in 41 communities. The vulnerability of the county’s population to specific hazards depends on a variety of circumstances, including frequency and severity of events, probability of occurrence, and location of specific populations in relation to hazards. These factors are reflected in the scores in this hazard assessment, and are discussed in the Planning Section sections later in the report.

## Critical Facilities and Infrastructure

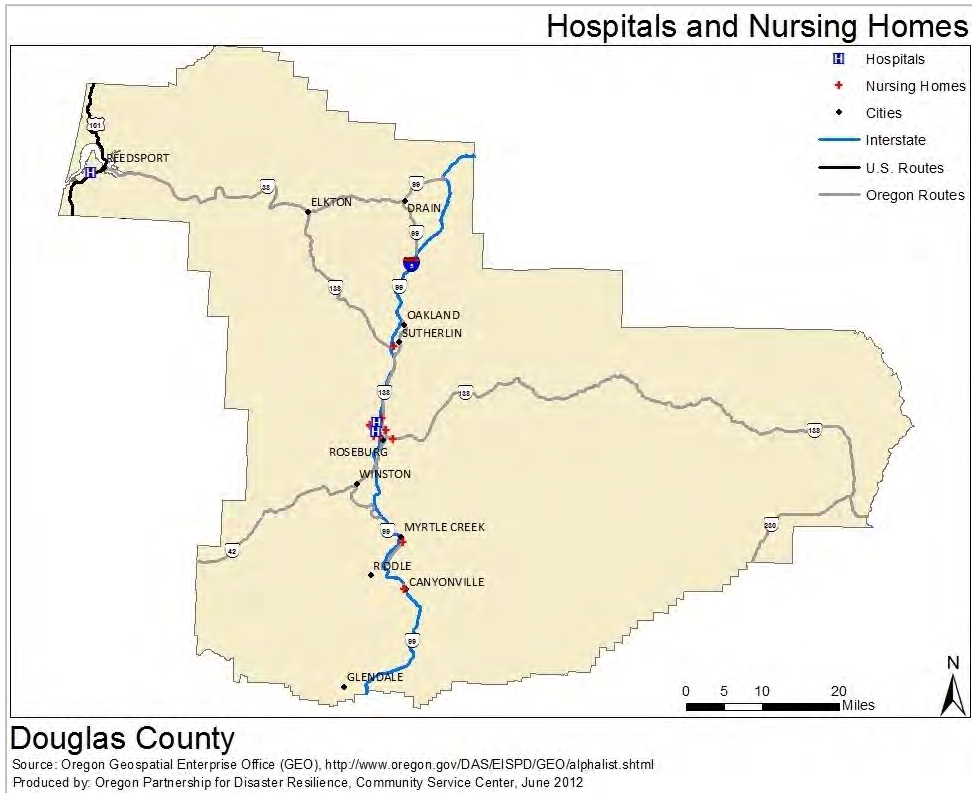
Transportation networks, systems for power transmission, and critical facilities such as hospitals and police stations are all vital to the functioning of a county. Due to the fundamental role that infrastructure plays both pre- and post-disaster, it deserves special attention in the context of creating more resilient communities.<sup>5</sup> Maps 2.5 through 2.10 below show the location of county-wide critical infrastructure and service assets. The critical infrastructure includes the location of critical facilities, hospitals and nursing homes, public schools, communication sites and dams.

**Map 2.5 – Douglas County Critical Facilities**

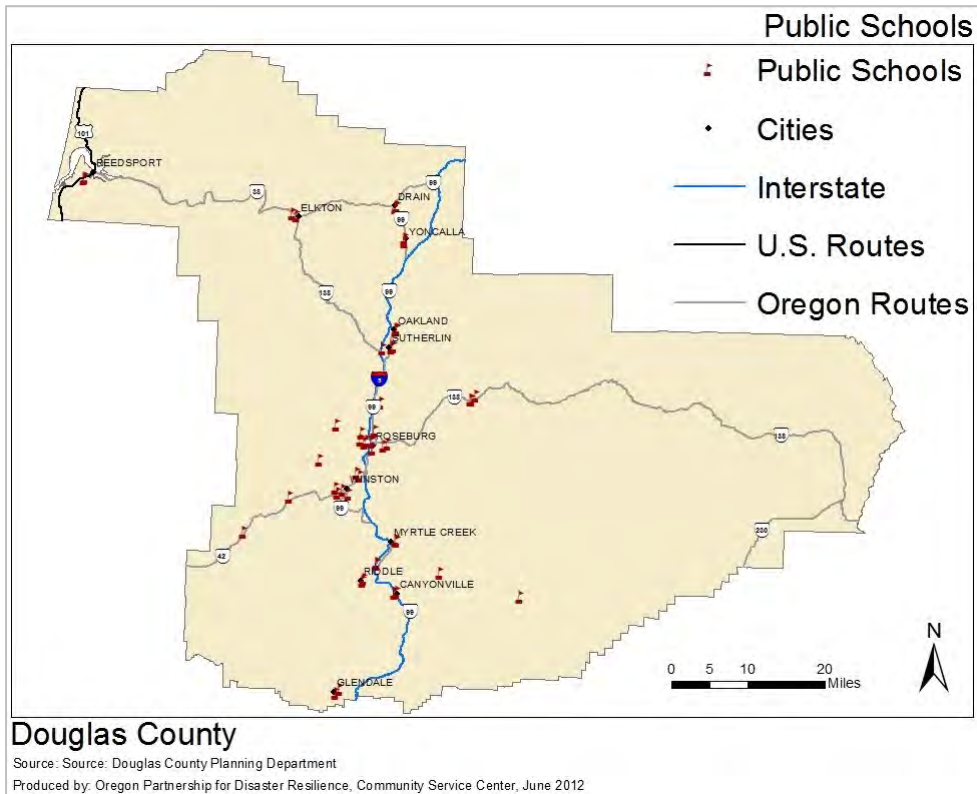


<sup>5</sup> Source: State of Oregon Emergency Management Plan, Region 5: Mid-Columbia Regional Profile, February 2012

**Map 2.6 – Douglas County Hospitals and Nursing Homes**



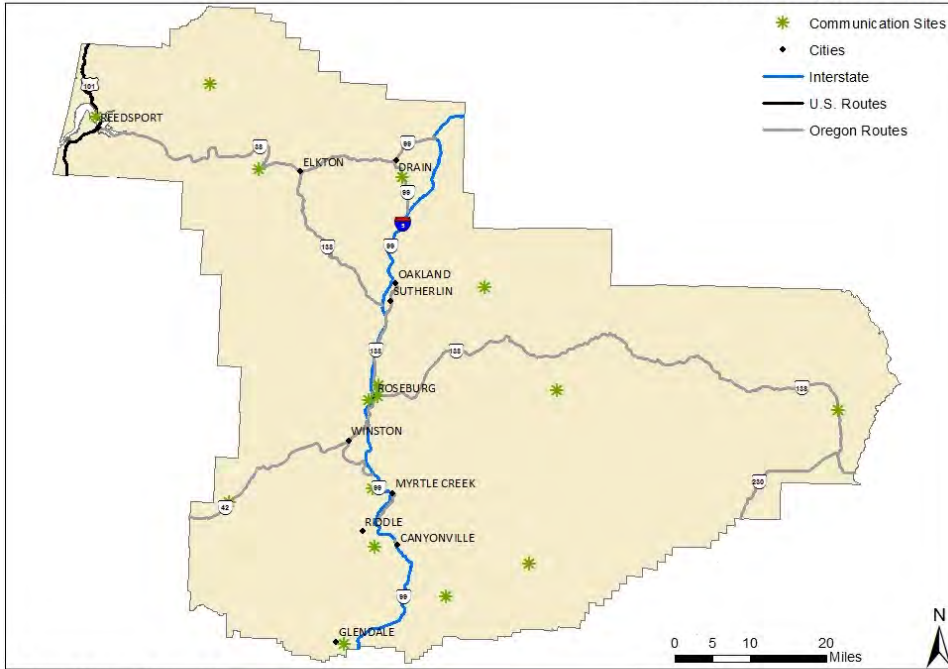
**Map 2.7 – Douglas County Public Schools**





## Map 2.8 – Douglas County Communication Sites

### Communication Sites



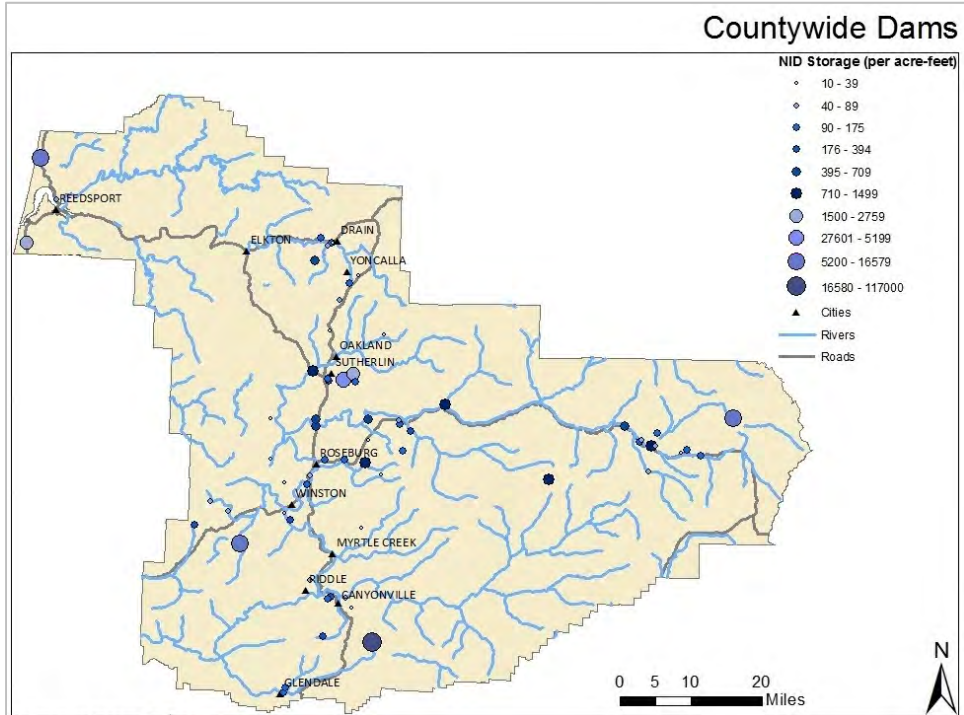
### Douglas County

Source: Douglas County, Planning Department

Produced by: Oregon Partnership for Disaster Resilience, Community Service Center, June 2012

## Map 2.9 – Douglas County Dams

### Countywide Dams



### Douglas County

Source: Oregon Geospatial Enterprise Office (GEO), <http://www.oregon.gov/DASEISPD/GEO/alphalist.shtml>

Produced by: Oregon Partnership for Disaster Resilience, Community Service Center, June 2012

In the summers of 2004 and 2005, the Douglas County Board of County Commissioners directed the County Planning Department to work with state and federal agencies, fire protection agencies and the County Emergency Management Director to develop a Community Wildfire Protection Plan (CWPP) for Douglas County's at-risk communities. The county initiated the countywide effort to reduce wildfire risk to citizens, improve forest health, and quality of life within Douglas County. Map 2.10 shows the CWPP planning areas.

Since the beginning of the CWPP planning process, wildfire professionals, county staff, emergency responders, state and federal agency representatives and Douglas County Citizens at Risk (CARs) located throughout Douglas County.

**Map 2.10 – Douglas County CWPP Planning Boundaries**

Source: Douglas County Community Wildfire Protection Plan

# Section 3: Central Planning Section

## Introduction

The Central Planning Section for Douglas County includes the majority of the county (refer to Figure 1.2 in Section 1). The Central Planning Section is comprised of the eastern most part of the county, which is primarily federally owned forest land and mountainous terrain Cascades; the central part of the county including the Umpqua Valley and the county’s population centers and main transportation corridors; and the Coast Range mountain area west of the valley, up to the heads of tides of the Umpqua and Smith rivers. This planning section includes the majority of the resources, residents, and critical infrastructure in the county, and is vulnerable to a majority of the hazards that can occur. What follows includes a condensed scoring table for the identified hazards of the Central Planning Section, based on Oregon Emergency Management evaluation criteria (discussed in the Methodology section, pg. 1-8 to 1-10). Also included are descriptions of the specific hazards of this section, as well as recent history for each hazard and some potential effects of a hazard event.

## Condensed Scoring Table

Douglas County stakeholders and OPDR reviewed and updated scores for history, vulnerability, maximum threat, probability, and total threat, based on guidelines from Oregon Emergency Management. Table 3.1 below shows the results of those calculations, and the total threat scores for the major hazards identified for the Central Section of the county. Accordingly, winter storms and wildfires represent the highest threats to the central county using this methodology.

**Table 3.1 – Central Section Threat Matrix**

OEM Threat Matrix: Central Section					
Threat Event/Hazard	History	Vulnerability	Max. Threat	Probability	Total Threat Score
Winter Storm	18	40	70	63	191
Wildfire (WUI)	20	40	60	70	190
Windstorm	16	30	80	56	182
Flood	20	40	50	70	180
Earthquake	4	25	100	35	164
Landslide/Debris Flow	20	20	30	63	133

Source: OPDR, Douglas County Hazard Analysis Update 2012

## Specific Hazards for Central Section

The following subsections describe the specific natural hazards that can impact Central Douglas County.

## **WINTER STORM**

Winter storms usually occur between the months of November and March. This hazard generally involves storms of snow, ice, wind or extreme cold, which result in area-wide or localized losses. The variable character of this hazard is determined by a variety of meteorological factors including snowfall, snowpack, rainfall, temperature, and wind. Destruction to life, property, trees, power lines and transportation corridors can cause disruptions for days or even weeks. Some cities have combination sewer/water systems that experience sewer bypass and overflow into waterways during storms. Years 1969, 1971 and 1989 brought exceptional amounts of snowfall to valley areas.

## **WILDFIRE (WILDLAND/URBAN INTERFACE)**

With 90% of land covered in forests, the major threat of fire in Douglas County comes from wildland/urban interface fires. With continued building in the interface zone, combined with the popularity of the rural lifestyle, the threat of wildland interface fires will increase. The other threat comes from the vast amount of forest land in the county, both federal and private. The majority of interface lands in the Central area are protected by the Douglas Forest Protective Association (DFPA). DFPA has averaged 105 fires and 4,093 acres burned per year since 1912. In 2007, DFPA reported 195 fires, but only 72 acres burned.

Significant Douglas County Wildland Fires:

- 1951 Four Major Fires: 40,000 acres, one death
- 1961 Clarks Branch Fire: 5,000 acres, one death
- 1973 Doe Creek Fire: 2,300 acres
- 1979 Cougar Ridge Fire: 259 acres, one death.
- 1980 Tyee Mountain Fire: 1,056 acres
- 1987 Bland Mountain Fire: 10,300 acres
- 2002 Apple Fire: 17,600 acres
- 2002 Tiller Complex: 68,862 acres 2004 Bland Mountain Fire: 4,700 acres

Source: Douglas County Community Wildfire Protection Plan 2012, pg. 2

Despite the fact that the county EOC has not been activated for wildfire, each year forest fire fighting agencies have activated their respective response and command systems. These wildfires have not caused large numbers of evacuations, but the potential and conditions for a catastrophic wildfire exist each year. According to DFPA 2008 estimates, there are 10,839 improved forest surcharge lots in their protection area of Douglas County plus the 25% (16) of the Western Lane lots equals 10,855. Of those improved forest lots, DFPA estimates that 98% of the lots are improved with a residence, for a total of 10,637 homes. Multiplying that by 2.48 people per household, we estimate that over 26,000 people (approximately 25% of the Douglas County population) live within the forested area of central Douglas County.

## **WINDSTORM**

Windstorms can strike communities throughout Douglas County, resulting in area-wide or localized losses. Debris can be carried by extreme winds, and destruction to life, property, trees, power lines and roads can cause disruptions for days or even weeks. Historical windstorms of January 1880, January 1921, April 1931, November 1951, December 1951, November 1958,

October 1962, October 1967, December 1995, and February 2002 were all listed as "exceptionally destructive wind storms."

### **Windstorm damage in Douglas County**



Source: Douglas County Emergency Management

### **FLOOD**

Flooding represents the most common and broadest range of characteristics among the county's natural hazards. Flooding can have a slow or quick onset. There are over 320 miles of river or major streams that flow through Douglas County (see Map 3.1 below). The best estimate is that there are approximately 24,396 acres of land in the 100-year floodplain in the county, with at least a portion of most population centers located within the flood plain. The County currently has 1,316 National Flood Insurance Program (NFIP) policies on record. Floods occurred in 1861, 1890, 1893, 1907, 1909, 1927, 1931, 1942, 1945, 1948, 1950, 1953, 1955, 1956, 1958, 1961, 1964, 1971, 1974, 1981, 1983, 1996, 1998, 2005, and 2011 representing moderate to major flooding.

### **1996 Elkton Flooding**



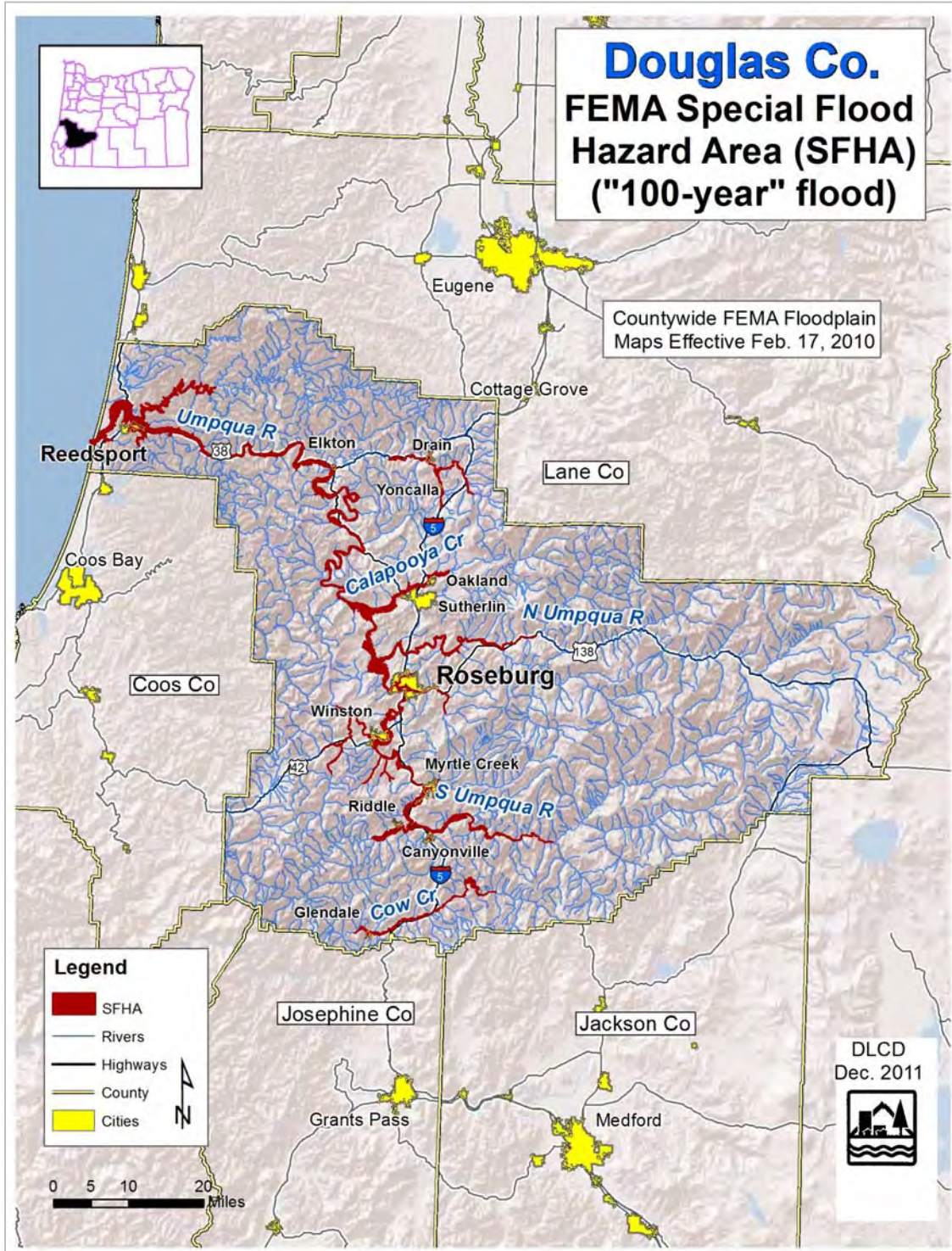
© 1996 Elkton floods

Source: News-Review File Photo

An estimated 7,700 people live in the floodplains in the central county area. This is approximately 7% of the population. Most are rural settlements, often adjacent to a river. Many

residents purchase flood insurance, but have to rebuild in the same flood-prone areas. Of the 1,863 NFIP insurance policies in Douglas County, 1,391 are located in the Special Flood Hazard Area.

**Map 3.1 – Douglas County Flood Plain Map**



Source: Department of Land Conservation and Development

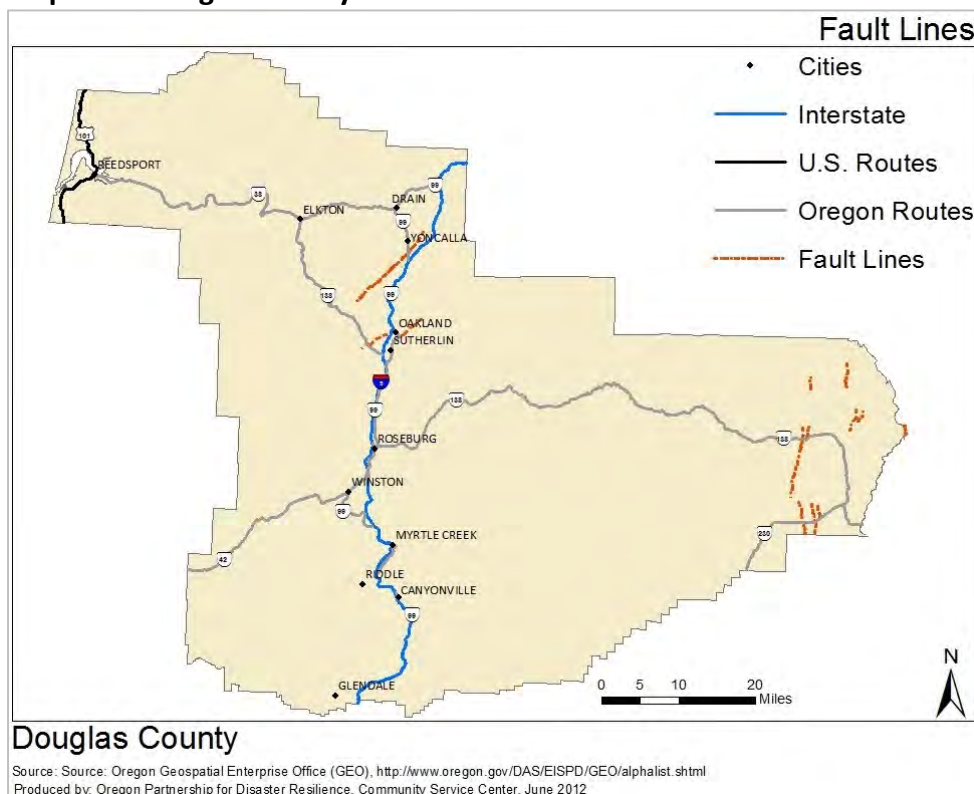
## **EARTHQUAKE**

An understanding of the history of earthquakes in Oregon is rapidly growing. With organizations like DOGAMI, Oregon is working to reduce its risk to crustal, volcanic, interpolate and Cascadia Subduction Zone earthquakes (See Figure 3.2 below). Recent quakes in Oregon include the March 1993, Mw5.6 Scotts Mills quake and the Sept. 1993 Mw6.0 and Mw5.9 Klamath County quakes. Despite their relatively small size and rural epicenters, both caused property damage.

The greatest risk from earthquakes would be from an offshore Cascadia Subduction Zone earthquake, with a maximum credible event ranging from Mw8.0 to Mw9.5 depending on how much of the zone ruptures at once. This type of event would equate, most likely, to a Mw6.0 to Mw6.5 in the Roseburg area (this would only be an estimate dependent upon location of quake, size, soil conditions, etc.). Other reports estimate earthquake recurrence intervals range from 340 to 590 years; the last large quake was about 300 years ago, placing the probability of another event in the next 50 years at 10 to 20 percent.

While there is no recent history of earthquake epicenters in Douglas County proper, earthquakes some distance from Douglas County have been felt by county residents. Even with this lack of history, geology clearly shows that the county has been impacted by significant events in the last 500 years. It is this 500-year history that Oregon Department of Geology and Mineral Industries based the 1999 damage estimates on. The State of Oregon increased building code requirements for western Oregon in 1993 from a seismic zone 2b to 3 for the area in the Central County.

**Map 3.2 – Douglas County Fault Lines**



### **LANDSLIDE/DEBRIS FLOW**

Landslides or debris flows occur when soils become unstable and give way, usually on a slope or hillside, and usually after a heavy rain or earthquake event. Landslides can affect property, transportation corridors, and energy and communication facilities. Landslides can be consequences of steep hills, extreme road-cuts, and eroding riverbanks. Landslides can be rapidly moving or slow moving. During the winter storms of 1996, rapidly moving landslide debris killed four people in Douglas County. An estimated 2400 people live in a potential landslide hazard area in the Central County area. This is about 2.5% of the population.

### **Landslide on highway in Douglas County**



Source: Douglas County Emergency Management\

### **Central Douglas County Fatalities Due to Landslides:**

- 1953 – Three workers killed in a landslide, Toketee
- 1974 – Nine employees killed in a landslide near Canyonville
- 1996 – Four people killed in a landslide (known as the Hubbard Creek landslide) near Tyee; an additional four people killed and several injured as a result of other landslides over the following 13-day period

Source: <http://www.oregon.gov/ODF/privateforests/docs/LandslidesPublicSafety.pdf?ga=t> page 36/37

### **OERS REPORTING**

Table 3.2 summarizes natural hazard and weather events reported by Oregon Emergency Response System (OERS) for the last five years in Douglas County are presented in below.

**Table 3.2 – OERS Reporting for Douglas County 2007 - 2012**

OERS Reporting by Year		
Year	NH	NWS
2007	10	7
2008	4	0
2009	1	0
2010	0	0
2011	1	2
2012 (to May)	2	5

Source: Oregon Emergency Response System  
NH – Natural Hazard; NWS – National Weather Service (extreme weather)



# Section 4: Coastal Planning Section

## Introduction

The Coastal Planning Section includes the westernmost portion of the county (refer to Figure 1.2 in Section 1). This section is comprised of all county lands from the coastline of the Pacific Ocean, east to the heads of tide for the Umpqua and Smith Rivers. A line drawn between the two heads of tide, and lines drawn north and south from the respective heads of tide, determines the eastern boundary of the Coastal Planning Section. This section is unique compared to the Central Planning Section due to its risk of earthquake and tsunami hazards originating from either the Cascadia Subduction Zone off the coast, or from earthquakes and tsunamis originating farther offshore. This planning section is also vulnerable to a number of the same hazards as the Central Section. What follows includes a condensed scoring table for the identified hazards of the Coastal Planning Section, based on Oregon Emergency Management evaluation criteria (discussed in the Methodology section, pg. 1-8 to 1-10). Also included are descriptions of the specific hazards of this section, as well as recent history for each hazard and some potential effects of a hazard event.

## Condensed Scoring Table

Douglas County stakeholders and OPDR developed scores for history, vulnerability, maximum threat, probability, and total threat, based on guidelines from Oregon Emergency Management. Table 4.1 below shows the results of those calculations, and the total threat scores for the major hazards identified for the Central Section of the county. Accordingly, earthquake and a local tsunami represent the highest threats to the coast using this methodology.

**Table 4.1 – Coastal Section Threat Matrix**

OEM Threat Matrix: Coastal Section					
Threat Event/Hazard	History	Vulnerability	Max. Threat	Probability	Total Threat Score
Earthquake	4	50	100	49	203
Local Tsunami	2	45	100	49	196
Windstorm	20	25	80	70	195
Winter Storm	20	25	80	70	195
Flood	18	30	60	70	178
Landslide/Debris Flow	18	20	60	70	168
Distant Tsunami	20	20	50	70	160
Wildfire (WUI)	8	35	50	49	142
Coastal Erosion	18	5	10	56	89

Source: OPDR, Douglas County Hazard Analysis Update 2012

## Specific Hazards for Coastal Section

### EARTHQUAKE

An understanding of the history of earthquakes in Oregon is rapidly growing. With organizations like DOGAMI, Oregon is working to reduce its risk to crustal, volcanic, interpolate and Cascadia Subduction Zone earthquakes, Recent the March 1993, Mw5.6 Scotts Mills quake and the Sept. 1993 Mw6.0 and Mw5.9 Klamath County quakes. Despite their relatively small size and rural epicenters, both caused property damage.

The greatest risk from earthquakes would be from an offshore Cascadia Subduction Zone earthquake, with a maximum credible event ranging from Mw8.0 to Mw9.5 depending on how much of the zone ruptures at once. Other reports estimate earthquake recurrence intervals range from 340 to 590 years; the last large quake was about 300 years ago, placing the probability of another event in the next 50 years at 10 to 20 percent. Oregon Department of Geology and Mineral Industries' *Special Paper 29, Earthquake Damage in Oregon, 1999*, estimates that a 8.5 Cascadia Subduction Zone event would injure 151 people, displace 255 households, create \$275 million in economic loss to buildings and disable about 50% of critical facilities (police and fire stations, schools, and bridges) in Douglas County.

Douglas County coastal communities will be cut off from assistance coming from I-5 and central Douglas County. The coastal areas will most likely be isolated into four distinct areas due to damaged bridges and roadways (Winchester Bay, South Reedsport, North Reedsport and Gardiner). These isolated communities will be without emergency support until communications and transportation between them is reestablished. The coastal section of Douglas County will most likely be isolated from assistance north/south as well. Not only will be isolation between these sub areas but the coastal area will most likely be isolated from the Interstate 5 (I-5) corridor where the most quantity of services and resources are located.

Emergency services will be immediately overwhelmed. Communities will likely be isolated for a time period much greater than 72 hours.

Salmon Harbor, which is one of the larger recreational facilities on the Oregon Coast, would be severely impacted and possible loss of life would be significant. Debris would be significant and hinder response into the area.

While there is no recent history of earthquakes in Douglas County, earthquakes some distance from Douglas County have been felt by county residents. As recently as April 11, 2012, a 5.9-magnitude quake struck 160 miles off the coast, west of Bandon. Even with this lack of history, geology clearly shows that the county has been impacted by significant events in the last 500 years. It is this 500-year history that Oregon Department of Geology and Mineral Industries based the 1999 damage estimates on. In the mid-nineties, the State of Oregon increased building code requirements for the southern coast of Oregon from seismic zone 3 to zone 4, the highest seismic design standards in the country.

### TsunamiS

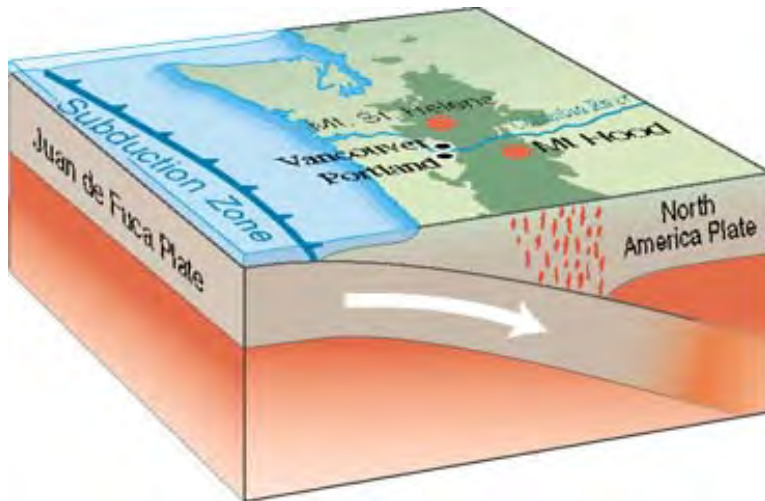
A tsunami is a series of ocean waves (which act like massive risings of the tide as opposed to breaking waves) most often caused by ocean floor earthquakes. The 2004 Indian Ocean tsunami killed over 230,000 people in 14 countries, and the recent Japan tsunami caused massive destruction and a nuclear meltdown. The coast of Oregon is subject to tsunamis originating

locally, after an earthquake on the Cascadia Subduction Zone, and distant, originating from across the Pacific Ocean. A tsunami's effects on coastal communities depends on the size and frequency of the waves, the orientation of the coastline, the nature of the built environment in the tsunami's inundation zone, and the evacuation response of the threatened community. DOGAMI has begun mapping the Oregon coast, with inundation zones for both local and distant tsunami worst-case scenarios.

### **LOCAL TSUNAMI**

Lying just 50 miles from the Douglas county coastline, the Cascadia Subduction Zone is a fault line stretching from Vancouver to California, caused by the Juan de Fuca plate moving under the North American Plate (see Figure 4.1 below). An eruption along this fault could result in a massive tsunami arriving on shore in 10-15 minutes, causing destruction that could strand communities for weeks. Historically, the last Cascadia quake was in 1700, with at least 7 quakes in the last 3,500 years. Currently, there is a 10% to 14% probability that there will be a magnitude 9 quake within the next 50 years, resulting in significant destruction to the Pacific Northwest coast. DOGAMI's inundation map for the City of Reedsport shows that there will be significant loss of buildings, including critical services such as schools, fire and police departments. Exit routes inland could be cut off, and evacuation routes blocked.

**Figure 4.1 – Cascadia Subduction Zone**



Source: DOGAMI

### **WINDSTORM**

Windstorms can strike communities throughout Douglas County, resulting in area-wide or localized losses. Debris can be carried by extreme winds, and destruction to life, property, trees, power lines and roads can cause disruptions for days or even weeks. Historical windstorms of January 1880, January 1921, April 1931, November 1951, December 1951, November 1958, October 1962, October 1967, December 1995 and February 2002 were all listed as "exceptionally destructive wind storms."

### **WINTER STORM**

Winter storms usually occur between the months of November and March. This hazard generally involves storms of snow, ice, wind or extreme cold, which result in area-wide or

localized losses. The variable character of this hazard is determined by a variety of meteorological factors including snowfall, snowpack, rainfall, temperature, and wind. Destruction to life, property, trees, power lines and transportation corridors can cause disruptions for days or even weeks. Some cities have combination sewer/water systems that experience sewer bypass and overflow into waterways during storms. While the coast of Oregon rarely receives snow and ice, these storms coming off the Pacific can still cause much damage, primarily from extreme winds.

### **FLOOD**

There are over 320 miles of river or major streams that flow through Douglas County. Best estimate is that there are approximately 24,396 acres of land in the floodplain in the county, with at least a portion of most population centers located within the flood plain. The County currently has 1,316 National Flood Insurance Program (NFIP) policies on record. Floods occurred in 1861, 1890, 1893, 1907, 1909, 1927, 1931, 1942, 1945, 1948, 1950, 1953, 1955, 1956, 1958, 1961, 1964, 1971, 1974, 1981, 1983, and 1996 representing moderate to major flooding.

In the coastal section, the floods of 1964 stand out. The City of Reedsport experienced six-feet of water downtown resulting from over 22-inches of rainfall in December. Widespread transportation impacts were reported throughout the region with 17 deaths attributed to the flooding statewide.

### **LANDSLIDE/DEBRIS FLOW**

Landslides or debris flows occur when soils become unstable and give way, usually on a slope or hillside, and usually after a heavy rain or earthquake event. Landslides can affect property, transportation corridors, and energy and communication facilities. Landslides can be consequences of steep hills, extreme road-cuts, and eroding riverbanks. Landslides can be rapidly moving or slow moving. During the winter storms of 1996, rapidly moving landslide debris killed four people in Douglas County. An estimated 360 people live in a potential landslide hazard area in the Coastal Section area.

Fatalities due to landslides:

- 1996 – 1 person killed as her car was swept off Hwy 38, near Scottsburg
- 1997 – 3 people killed in a car that was stopped for a landslide and hit by another car (not a direct impact from the landslide)
- Feb. 1999 – Two timber fallers killed in a landslide near Ada

Source: [http://www.oregon.gov/ODF/privateforests/docs/LandslidesPublicSafety.pdf?ga=t\\_page\\_36/37](http://www.oregon.gov/ODF/privateforests/docs/LandslidesPublicSafety.pdf?ga=t_page_36/37)

### Landslide damage in Douglas County



Source: Douglas County Emergency Management

### **DISTANT TSUNAMI**

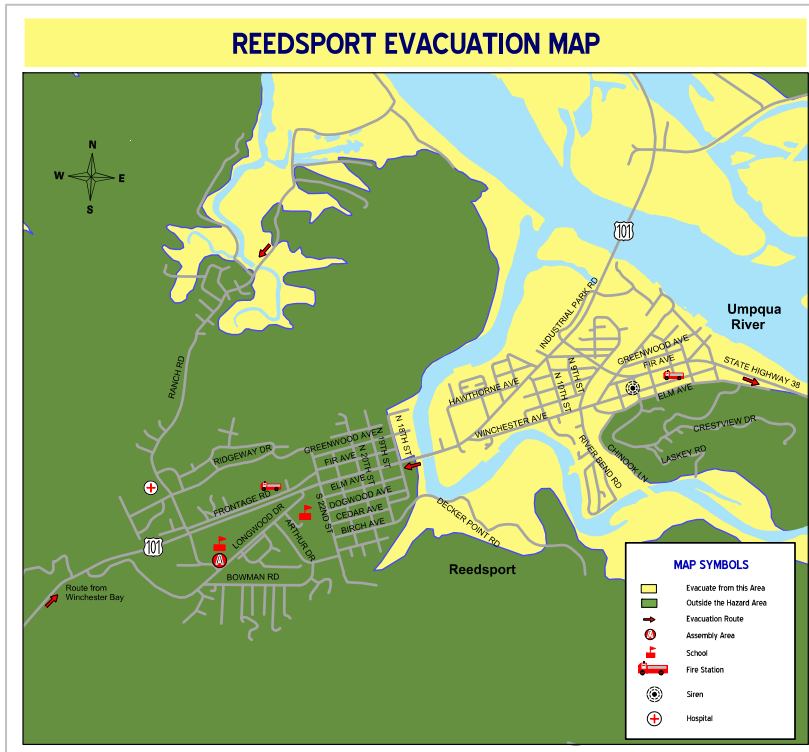
Distant Tsunamis originate from quakes occurring in other areas of the Pacific Ocean's "Ring of Fire", from Alaska to Chile to Japan. Since 1812, ten of Oregon's 12 tsunamis have generated by distant earthquakes, the worst of which was 1964's Alaskan earthquake. After this event, the Pacific Tsunami Warning System was deployed to provide advance warning for people in coastal communities to evacuate to higher ground. On March 11<sup>th</sup>, following the Japan quake, parts of the Oregon coast were evacuated in anticipation of waves. The first waves arrived at 7:45am, but the most destructive waves did not occur until hours later. The Port of Brookings Harbor was hard hit, causing over \$7 million in damages to docks and boats. Depoe Bay suffered over \$300,000 in damages. For Douglas County, places like Reedsport and Winchester Bay should be considered at risk from both distant and local tsunamis (See figures 4.2 and 4.3 below).

**Port of Brookings after tsunami caused by March 11, 2011 Japanese earthquake**



Source: Jamie Francis, The Oregonian

**Figure 4.2 – Reedsport Evacuation Map**



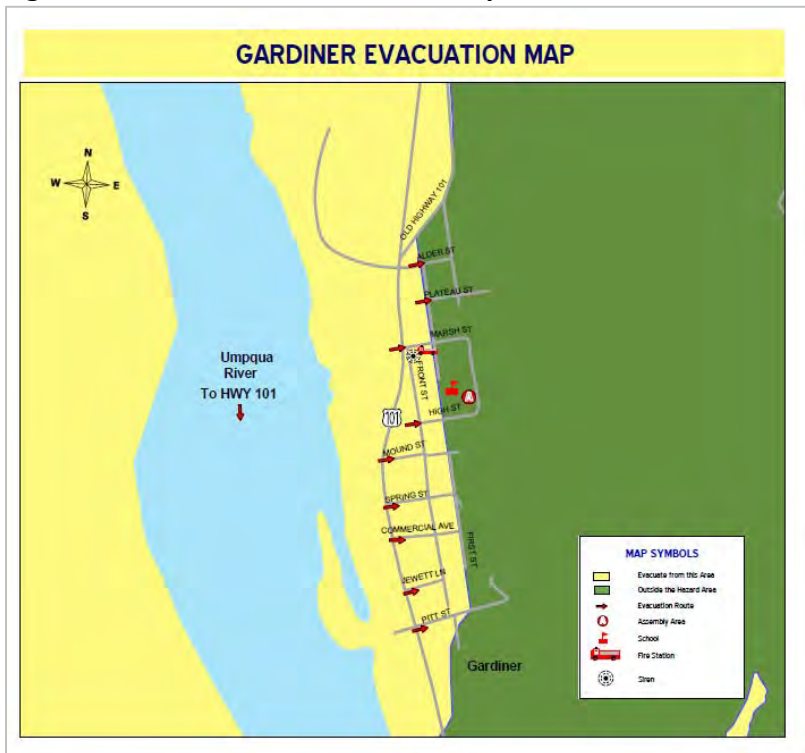
Source: DOGAMI

Figure 4.3 – Winchester Bay-Salmon Harbor Evacuation Map



Source: DOGAMI

Figure 4.4 – Gardiner Evacuation Map



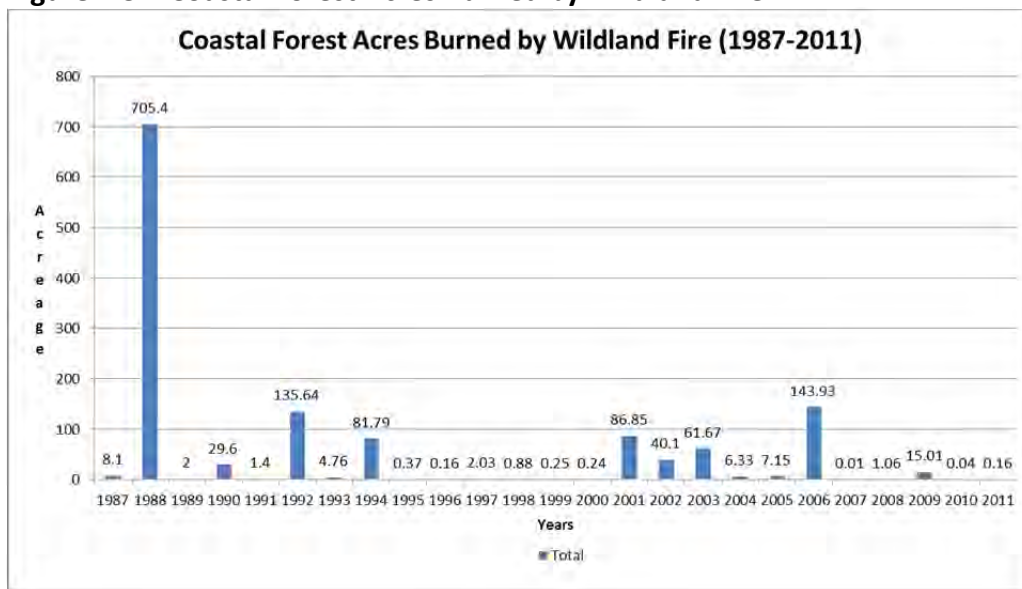
Source: DOGAMI

## **WILDFIRE**

With 90% of land covered in forests, the major threat of fire in Douglas County comes from wildland/urban interface fires. With continued building in the interface zone, combined with the popularity of the rural lifestyle, the threat of wildland interface fires will increase. The other threat comes from the vast amount of forest land in the county, both federal and private.

Despite the fact that the county EOC has not been activated for wildfire, each year forest fire fighting agencies have activated their respective response and command systems. These wildfires have not caused large numbers of evacuations, but the potential and conditions for a catastrophic wildfire exist each year. According to DFPA 2008 estimates, there are 641 improved forest surcharge lots in the coastal portion of their Douglas County protection area; Western Lane Fire Protective Association estimates that they cover an additional 51 improved lots in the coastal portion of Douglas County for a total estimate of 692 surcharge lots in the coastal area. Of those improved forest lots, DFPA estimates that 98% of the lots are improved with residences, for a total of 678 homes. Multiplying that by 2.48 people per household, we estimate that approximately 1,681 people (approximately 1.5% of the Douglas County population) live within the forested area of coastal Douglas County.

**Figure 4.5 – Coastal Forest Acres Burned by Wildland Fire**



Source: Douglas County, Emergency Management, 25 Years of Fire Statistics

## **COASTAL EROSION**

The erosion of coastal land is caused by tidal flows, as well as wind, rain and earthquake events. Some amount of annual coastal erosion is common and expected in certain areas. Extreme coastal erosion, especially from storm surges, tsunamis or shifting weather patterns, becomes a hazard when developments such as homes, marinas, or recreation areas are threatened. Most of Douglas County's coastline is restricted to development. However, areas, such as Winchester Bay near Reedsport, remain vulnerable to threats from coastal erosion.



# Section 5: County-Wide Planning Section

## Introduction

The County-wide Planning Section includes hazards that can be expected in any area of the county, specifically terrorist-related hazards (such as explosives or cyber terrorism), and technological or man-made hazards (such as energy failures or hazardous material releases). What follows includes a condensed scoring table for the identified hazards of the County-wide Planning Section, based on Oregon Emergency Management evaluation criteria (discussed in the Methodology section above). Also included are descriptions of the specific hazards of this section, as well as recent history for each hazard and some potential effects of a hazard event.

## Condensed Scoring Table

Douglas County stakeholders and OPDR developed scores for history, vulnerability, maximum threat, probability, and total threat, based on guidelines from Oregon Emergency Management. Table 5.1 below shows the results of those calculations, and the total threat scores for the major terrorist threats identified for the county. Accordingly, animal/eco-terrorism and cyber terrorism represent the highest threats to the coast using this methodology.

**Table 5.1 – County-wide Terrorism Threat Matrix**

OEM Threat Matrix: Terrorism					
Threat Event/Hazard	History	Vulnerability	Max. Threat	Probability	Total Threat Score
Animal / Eco-terrorism	18	10	20	63	111
Cyber terrorism	4	10	80	14	108
Explosive Device	8	10	20	14	52

Source: OPDR, Douglas County Hazard Analysis Update 2012

## Specific Hazards for County-wide Section

### TERRORISM

Terrorism is a real and ever present threat across the United States. Terrorism takes many forms and can affect regions differently. Douglas County has identified three forms of terrorism that are or have been a threat to the County in the past. The Stakeholder Committee identified three threats of terrorism for the County: explosive devices, cyber terrorism, and animal/ eco-terrorism.

### ANIMAL / ECO-TERRORISM

Douglas County's main industry for decades now has been based around natural resources extraction. The County's number one natural resource has and continues to be timber. As a result Douglas County has had to deal with several incidents of eco-terrorism targeted at private and public lands and infrastructure within the timber industry. In January 2001 members of the

Earth Liberation Front and Animal Liberation Front were arrested and convicted of arson and terrorism acts for burning and destroying up to \$100 million in private and government property. One of these properties was the Superior Lumber Office in Glendale in southern part of Douglas County. Superior Lumber lost an office building causing an estimated \$400,000 in damage to the company. Timber continues to be of important economic and commercial value within Douglas County while environmental activism continues to rise in Oregon and throughout the United States. The continued and future threat of animal and eco-terrorism will affect Douglas County for the foreseeable future.

### **2001 Superior Lumber arson, Glendale, Oregon**



Source: Roy Milburn/www.ifatreefallsfilm.com

### **CYBER TERRORISM**

Douglas County currently has no known history of acts of cyber terrorism within the County. Douglas County civic government does employ firewalls. The County firewalls blocks several 1000 of probes and attacks against their IP addresses daily. In an age of ever increasing reliance on computer and communication networks and infrastructure, there is a real threat to all levels of public and private industry across the United States. The size, location, and remoteness of communities and businesses become increasingly irrelevant. The real damage that can be caused by a cyber-attack is extraordinary even in a more remote and rural county like Douglas County.

### **EXPLOSIVE DEVICE**

Douglas County has a history of bomb threats, both real and fake. There is no history of devices exploding in the county. Douglas County includes some major targets of opportunities; however, infrastructure within the county, both private and public, is widely spread. An explosive device would, in the worst case scenario, cause minimal to moderate amounts of damage. In

December, 2011, Mercy Medical Center in Roseburg was faced with a pipe bomb located in women's bathroom. In Sutherlin, northern part of the county, January 2012 Douglas County Sheriff's Deputies arrested two men in whose house contained 8 active pipe bombs. The bombs were created using stolen materials from a local lumber company.

Based on a review of Computer Aided-Dispatch (CAD) Call records using the words "bomb," and "explosive" as search criteria, The Douglas County Emergency Communications 911 Division determined that the county received 249 explosive device calls between 2007 and 2011. The results by year were:

- 2007 - Total 53
- 2008 - Total 77
- 2009 - Total 23
- 2010 - Total 33
- 2011 - Total 63

## Technological and Human Hazards

The Stakeholder Committee identified additional hazards that affect or potential could affect Douglas County. Although, the hazards were listed as hazards for Douglas County to be aware of, the hazards were not accounted for in any of the scoring matrices. Natural Hazards and terrorism threats were deemed more important for the intent of the countywide risk analysis. The county may want to consider further scoring and analysis of the other identified hazards at a later date. The additional hazards and a brief description are listed in further detail in the sections below.

### **ENERGY FAILURE**

Energy Failure includes the loss or disruption of any primary energy sources needed to maintain living conditions within Douglas County. Energy includes: electricity, natural gas, and oil and gas supply. Disruption or loss includes the damage of power and gas lines and supply chain disruption to the county. Due to severe storms Douglas County typically experiences no more than 2 major energy failure events per annum. Public utility disruptions can be declared federal disasters depending on value of damage to infrastructure.

City of Roseburg Power Outtages:

- 2008 – 2
- 2009 – 1
- 2012 – 1 (Due to Winter Storm)

Source: Pacific Power

Note: Prior to 2012, the County applied a major power outage to events where more than 10% of customers simultaneously experienced interrupted service for more than five minutes.

## Repairing downed power lines in Douglas County



Source: Douglas County Emergency Management

### **WATER SUPPLY DISRUPTION**

Water supply disruption refers to an interruption in the county's access to drinkable and/or potable water. Water supply disruption can take many forms to include: contaminated water, water pipe damage, water treatment facility malfunction, and depleted water tables.

### **COMMUNICATIONS SYSTEM FAILURE**

Communications systems failure refers to the inability of areas of the county to communicate outside of their community. Communication failure can be caused by multiple factors including: downed landlines, damaged cell towers, disruption to internet connectivity, and downed satellites.

### **SEWER TREATMENT FAILURE**

Sewer treatment failure refers to some sort of disruption to the sewer treatment process. Treatment failure could involve damage to the treatment facility itself or damage to sewage lines. Some cities have combination sewer/water systems that experience sewer bypass and overflow into waterways during winter storms.

### **DAM FAILURE**

In reportable history there have been no dam failures in Douglas County. Within the county there are eight dams that could have adverse downstream effects if a catastrophic failure were to occur. The consequence of a catastrophic failure of one of these dams would have similar impacts as a major flood.

### **FIRE – LARGE SCALE URBAN CONFLAGRATION**

Douglas County contains little area considered to be urban. However, communities such as Roseburg and Reedsport do have historic and older downtown buildings and areas that could be affected by an urban fire that could spread to a large area of the urban areas of these communities.

Notably, in 1959, a small urban fire resulted in one of the deadliest single incidents in Roseburg history. Known simply as the Blast, a small fire behind a Roseburg building supply store resulted in the deaths of 14 people when a truck filled with explosives detonated. The incident left a 20-foot deep 52-foot diameter crater. In addition to the fatalities, the blast injured 125 others and caused \$10 million in damage.

## **HAZARDOUS MATERIAL (HAZMAT) RELEASE**

With Oregon's spill reporting requirements, any type of spilled petroleum products are required to be reported. The hazard from the use of products which pose a threat to life, property and the environment is continually increasing. Products, which are used in all facets of daily living and manufacturing are becoming increasingly complex and varied; these often are harmless in their original state but become dangerous when altered by fire, water, heat, air, etc. Spills involving release of hazardous material can occur during any stage of packaging, shipping, use or disposal. The following reported incident numbers include: chemical, biological, technological (CBT), Radiological (RAD), and Technical (TECH, related to 911 services outages).

- 1997 9 spills reported to OERS
- 1998 26 reports, 1 which required a Haz/Mat team response.
- 1999 27 reports, 1 which required a team response.
- 2000 7 reports, 6 which required a team response.
- 2001 18 reports, 2 which required a team response
- 2002 No data available
- 2003 15 reports
- 2004 16 reports
- 2005 14 reports
- 2006 25 reports
- 2007 285 reports
- 2008 63 reports
- 2009 45 reports
- 2010 54 reports
- 2011 58 reports
- 2012 39 reports (to end of May 2012)

## **OERS REPORTING**

Hazardous material release events reported by OERS for the last five years in Douglas County are presented in Table.2 below.

**Table 5.2 – OERS Hazardous Materials**

OERS Reporting by Year			
	CBT	RAD	TECH
2007	278	1	6
2008	60	0	3
2009	41	0	4
2010	51	0	3
2011	51	0	7
2012 (to May)	36	0	3

Source: Oregon Emergency Response System (OERS)  
CBT = Chemical, Biological, Technological;  
RAD= Radiological;  
TECH = Technical issues associated with 911 service outages.

Hazmat reports cover a broad range of events; sewage spills, petroleum product spills (ranging from one gallon to hundreds of gallons), sheens of oil on waterways, unknown substances and

many others. None of the incidents noted above required an EOC activation or evacuation of residents.

**PUBLIC FACILITIES VIOLENCE**

Public facility violence refers to an active shooter event. A single or multiple shooters is a real threat to Douglas County especially in facilities such as schools and hospitals located throughout the county.

# Section 6: Hazard Analysis Summary

## Threats, Impact Severity, and Relative Risk

As shown by the OEM total threat scores, the Central and the Coast planning sections have different priorities when it comes to considering the greatest threat to an area. The Central Section should be most concerned with winter storms, wildfires, and windstorms, followed by floods, earthquakes and landslides. The Coast Section, by contrast, should be most concerned with earthquakes and local tsunamis, followed by wind and winter storms, floods, and landslides.

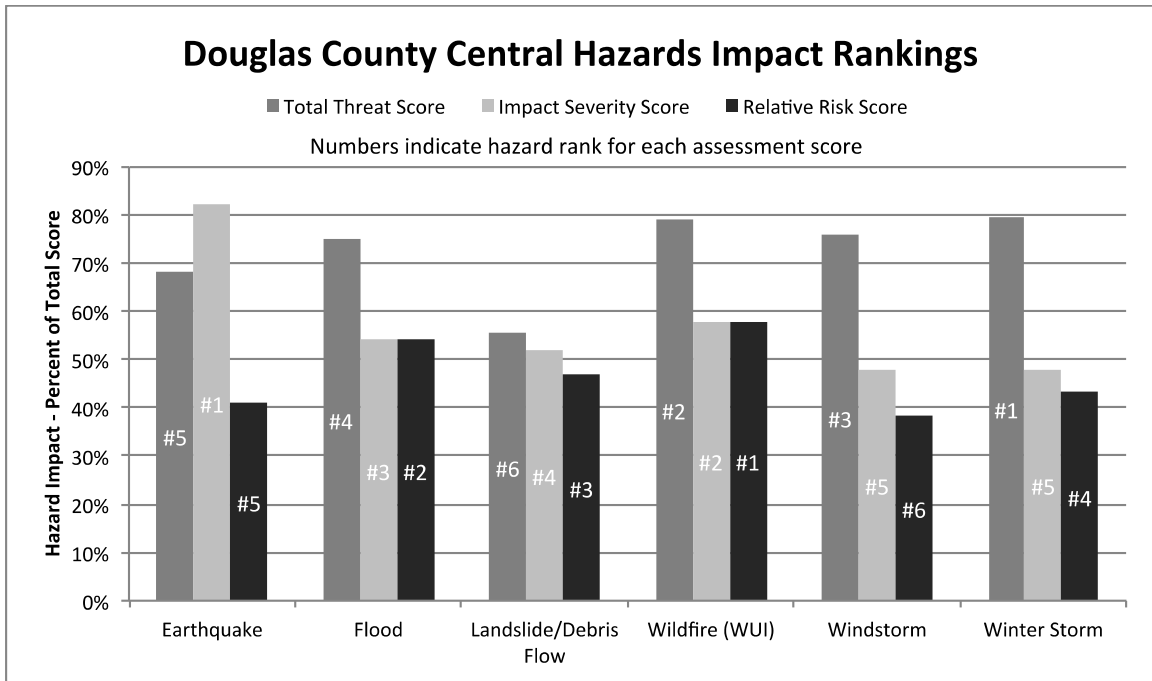
However, total threat scores do not tell the entire story of risk. This Hazard Analysis update also includes scores for impact severity and relative risk. For instance, when looking at the impact severity scores for the central section, earthquakes and wildfires score the highest. Impact severity scores for the Coast Section show earthquakes and local tsunamis as still the highest threats to consider.

These two extra metrics speak to an area's ability to prepare and respond to threats, and consider the social and economic impacts relative to an area's resiliency. With all three scores, planners and emergency managers can better judge how to prepare, mitigate and plan for response and recovery for each identified hazard, depending on their focus.

## Hazard Impact Rankings by Category

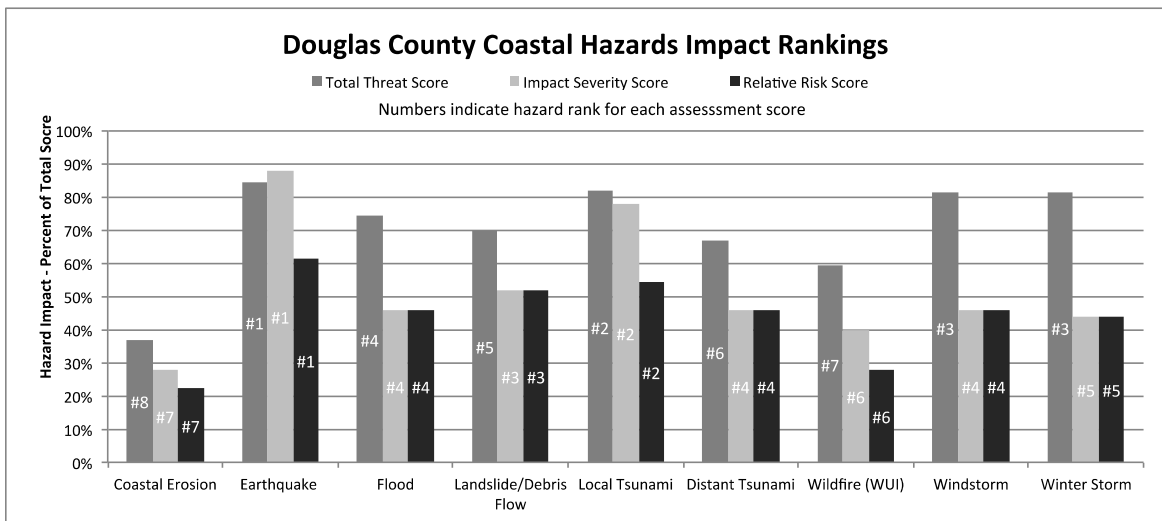
The following figures compare the impact rankings across the three types of hazard analysis: total threat, impact severity, and relative risk. Each chart reflects the hazards and scores for Central or Coast Sections, as well as a chart showing the scores for Terrorist threats.

**Figure 6.1 – Central Section Impact Rankings**



Source: Douglas County Stakeholder Committee with additional analysis and figure development by OPDR

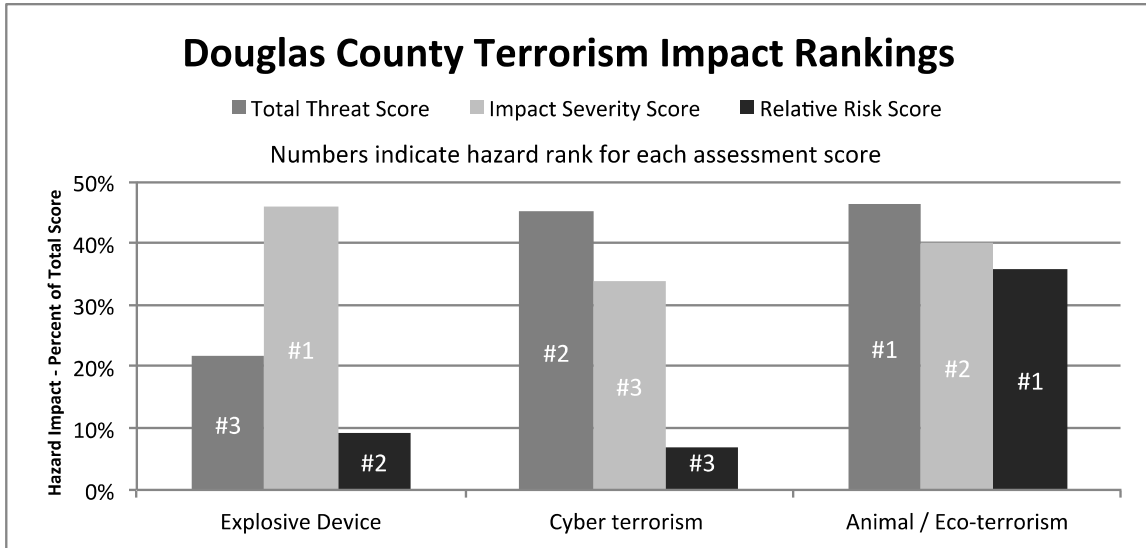
**Figure 6.2 – Coast Section Impact Rankings**



Source: Douglas County Stakeholder Committee with additional analysis and figure development by OPDR



**Figure 6.3 – County-wide Terrorism Impact Rankings**



Source: Douglas County Stakeholder Committee with additional analysis and figure development by OPDR

## Priority Mission Areas

At the May 22, 2012 hazard assessment meeting, the Douglas County Stakeholder Committee established priorities for the core planning Mission Areas, in accordance with FEMA requirements and THIRA planning guidelines. Mission Areas to choose from included: Prevention, Protection, Mitigation, Response, and Recovery (refer to Table 1.4 in Section 1). Prevention and Protection are areas that focus primarily on terrorist-related threats, as well as large-scale human-caused and technological disasters, and so were determined to be outside the main focus of the hazards affecting the county. Lack of time and resources focused efforts on mitigation and response instead of recovery planning.

The stakeholders at the meetings therefore chose to focus Douglas County’s hazard planning efforts on the core Mission Areas of **Mitigation and Response**. Mitigation refers to activities and efforts aimed at preventing a disaster or reducing the impact of disasters on vulnerable areas or populations. Mitigation reduces risk, and can be both short-term and long term efforts, including education, building and infrastructure upgrades or relocation, and technological improvements. Response refers to the efforts immediately following a disaster, in which emergency services and first responders are coordinated and deployed to a stricken area. Increasing organizational communications and supply coordination, as well as training skilled people to be part of the first phase of response efforts can help lead to a more effective recovery.

## Priority Core Capabilities

As the next step in the THIRA planning process, Douglas County stakeholders were asked to consider developing core capabilities for the two chosen mission areas of mitigation and response. Each of these mission areas contain capabilities that help focus planning and action efforts (refer to Table 1.4 in Section 1). THIRA guidelines list seven possible core capabilities for mitigation, and 14 possible core capabilities for response. OPDR asked the stakeholders to identify three core capabilities for each mission area to further focus their planning efforts. To

help identify these capabilities, OPDR asked stakeholders to consider core capability definitions, listed in Appendix C, and worst-case disaster scenarios, listed in Appendix D. The core capabilities identified by Douglas County stakeholders are listed in Table 6.1.

**Table 6.1 – Focused Mission Areas and Core Capabilities for Douglas County**

Mission Area	Mitigation	Response
Core Capabilities	Planning	Planning
	Threat and Hazard Identification	Operation Coordination
	Community Resilience	Infrastructure Systems

Source: Douglas County

## Capability Targets

With the core capabilities identified, Douglas County stakeholders and OPDR developed targets for each capability. Capability targets are specific actions that relate to the core capability and reflect a desired outcome based on a worst-case scenario event (refer to Table 1.5 in Section 1). Capability targets can be bounded by time, have a percentage-based outcome, or can be about skill and capacity building within an area. The capability targets listed take no priority over one another.

### Douglas County Capability Targets

#### **PLANNING**

- Increase ability to engage the appropriate private and public partners.
- Identify gaps and opportunities between public and private sector plans and response capabilities
- Develop a clear understanding public sector, private sector and community level planning capabilities. Employ a liaison within Douglas County Emergency Management to act as a link between the private and public sectors during and EOC activation.
- Maintain, implement and update county hazard mitigation plans every five years.
- Update Douglas County Natural Hazards Mitigation Plan to address worst case scenario hazard events. The current NHMP is only a framework for if a hazard or threat occurs, with no level of severity indicated.
- Develop capacity to consistently implement and address top priority county-wide emergency planning actions.
- Establish clear county-level policy(ies) for a Cascadia subduction zone earthquake event in the Douglas County Comprehensive Plan.

#### **THREATS AND HAZARD IDENTIFICATION**

- Systematically identify locations of risk for different hazards (assessment), including a complete inventory of critical infrastructure in risk areas. Use the OEM matrix to help identify threats and hazards.

- Sell the reality of a future Cascadia event and the need to address. Develop a clear message of risk and threat and need to plan/mitigate/prepare. Get public official buy-in and participation in outreach and education.
- Leverage the Multi-state Cascadia group’s findings and plans to dialogue with public officials.

**COMMUNITY RESILIENCE**

- Encourage communities to articulate priorities in terms of life safety, etc.
- Focus on long-term progress (20-year regulations)

**Capability Targets for Response**

**PLANNING**

- Develop a strategic plan/guidance document for local emergency management for integration of agencies.

**OPERATIONAL COORDINATION**

- Develop intergovernmental agreements
- Build operational awareness
- Increase information sharing (now lacking due to regulations). Share situational reports and public vs. governmental information.
- Formalize the ad hoc processes that currently exists. Get important information out into the ‘public’ and not just in individual’s or governmental files—especially for multi-county events. Keep it simple and easy to understand.

**INFRASTRUCTURE SYSTEMS**

- Close gaps in communication, goals and objectives of utilities and transportation, and communications companies, as well as whole government efforts.
- Build operational awareness (in-person representation in EOC for coordination purposes and joint operational systems).
- Address response systems that are centralized, especially within private companies (e.g. Wal-Mart) that may be able to assist in an emergency.

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# Appendix A: Hazard Analysis Score Tables

## Total Threat Assessment

Enterprise-wide		OEM Hazard Analysis																
DOUGLAS COUNTY HAZARD RISK/THREAT ASSESSMENT MODEL		History				Vulnerability				Maximum Threat				Probability				
Revised: February, 2012																		
Threat Event / Hazard		Severity	Weight Factor	Subtotal	Severity	Weight Factor	Subtotal	Severity	Weight Factor	Subtotal	Severity	Weight Factor	Subtotal	Severity	Weight Factor	Subtotal	Total Threat Score	
<b>Coastal Section</b>																		
Natural Hazards	Coastal Erosion	9	2	18	1	5	5	1	10	10	8	7	56				89	
	Earthquake	2	2	4	10	5	50	10	10	100	7	7	49				203	
	Flood	9	2	18	6	5	30	6	10	60	10	7	70				178	
	Landslide/Debris Flow	9	2	18	4	5	20	6	10	60	10	7	70				168	
	Local Tsunami	1	2	2	9	5	45	10	10	100	7	7	49				196	
	Distant Tsunami	10	2	20	4	5	20	5	10	50	10	7	70				160	
	Wildfire (WUI)	5	2	10	7	5	35	5	10	50	7	7	49				144	
	Windstorm	10	2	20	5	5	25	8	10	80	10	7	70				195	
	Winter Storm	10	2	20	5	5	25	8	10	80	10	7	70				195	
<b>Inland Section</b>																		
Natural Hazards	Earthquake	2	2	4	5	5	25	10	10	100	5	7	35				164	
	Flood	10	2	20	8	5	40	5	10	50	10	7	70				180	
	Landslide/Debris Flow	10	2	20	4	5	20	3	10	30	9	7	63				133	
	Wildfire (WUI)	10	2	20	8	5	40	6	10	60	10	7	70				190	
	Windstorm	8	2	16	6	5	30	8	10	80	8	7	56				182	
	Winter Storm	9	2	18	8	5	40	7	10	70	9	7	63				191	
<b>County Wide</b>																		
Terrorism	Explosive Device	4	2	8	2	5	10	2	10	20	2	7	14				52	
	Cyber terrorism	2	2	4	2	5	10	8	10	80	2	7	14				108	
	Animal / Eco-terrorism	9	2	18	2	5	10	2	10	20	9	7	63				111	

# Mitigation Plan Risk Assessment

Enterprise-wide			
DOUGLAS COUNTY HAZARD RISK/THREAT ASSESSMENT MODEL	NHMP Risk Assessment Scores		
Revised: February, 2012			
Threat Event / Hazard	Probability	Vulnerability	
<b>Natural Hazards</b>	<b>Coastal Section</b>		
	Coastal Erosion	High	Low
	Earthquake	Medium	High
	Flood	High	Medium
	Landslide/Debris Flow	High	Medium
	Local Tsunami	Medium	High
	Distant Tsunami	High	Medium
	Wildfire (WUI)	Medium	Medium
	Windstorm	High	Medium
	Winter Storm	High	Medium
	<b>Inland Section</b>		
	Earthquake	Medium	Medium
	Flood	High	High
	Landslide/Debris Flow	High	Medium
	Wildfire (WUI)	High	High
	Windstorm	High	Medium
	Winter Storm	High	High
<b>Terrorism</b>	<b>County Wide</b>		
	Explosive Device	Low	Low
	Cyber terrorism	Low	Low
	Animal / Eco-terrorism	High	Low

# Relative Risk Assessment

Enterprise-wide		SEVERITY = MAGNITUDE of IMPACTS											SEVERITY IMPACTS	RELATIVE RISK
DOUGLAS COUNTY HAZARD RISK/THREAT ASSESSMENT MODEL		HEALTH AND SAFETY		FACILITIES IMPACT		COMMUNITY IMPACT								
Revised: February, 2012		Relative probability this event will occur	Potential deaths or injuries		Physical damage & costs		Economic interruption		Ecologic Interruption		Social interruption		Overall Impact (Average)	Probability x Impact Severity
Threat Event / Hazard		1= Implausible 2 = Very Rare 3 = Rare 4 = Likely 5 = Almost Certain	Question 1	Question 2	Question 1	Question 2	Question 1	Question 2	Question 1	Question 2	Question 1	Question 2	1= Lowest 5 = Highest	1= Lowest 25 = Highest
Natural Hazards	<b>Coastal Section</b>													
	Coastal Erosion	4	1	2	1	1	1	1	1	1	1	1	1.10	4.40
	Earthquake	4	1	5	5	3	5	5	5	5	5	5	4.30	15.05
	Flood	5	1	4	3	1	2	2	1	3	2	2	2.00	10.00
	Landslide/Debris Flow	5	5	5	4	1	2	1	1	2	1	1	2.20	11.00
	Local Tsunami	4	1	5	5	3	5	5	2	4	5	5	3.95	13.83
	Distant Tsunami	5	2	3	3	2	2	1	2	3	1	2	1.95	9.75
	Wildfire (WUI)	4	1	4	1	1	4	1	4	3	1	2	2.00	7.00
	Windstorm	5	3	4	3	1	2	1	1	1	1	2	1.75	8.75
	Winter Storm	5	3	4	3	1	2	1	1	1	1	2	1.75	8.75
	<b>Inland Section</b>													
	Earthquake	3	2	5	4	4	5	5	5	4	3	4	4.10	10.25
	Flood	5	4	4	3	2	2	2	3	3	1	3	2.70	13.50
	Landslide/Debris Flow	5	5	5	4	3	3	1	1	2	1	1	2.60	11.70
Wildfire (WUI)	5	5	5	2	2	3	2	4	3	1	2	2.90	14.50	
Windstorm	4	4	4	3	2	2	2	2	2	1	2	2.40	9.60	
Winter Storm	5	4	4	3	2	2	2	2	2	1	2	2.40	10.80	
Terrorism	<b>County Wide</b>													
	Explosive Device	1	1	4	3	2	4	1	1	2	1	4	2.30	2.30
	Cyber terrorism	1	1	2	1	3	4	1	1	1	1	2	1.70	1.70
	Animal / Eco-terrorism	5	1	3	4	2	3	1	1	2	1	2	2.00	9.00

# Public Health HVA Scores

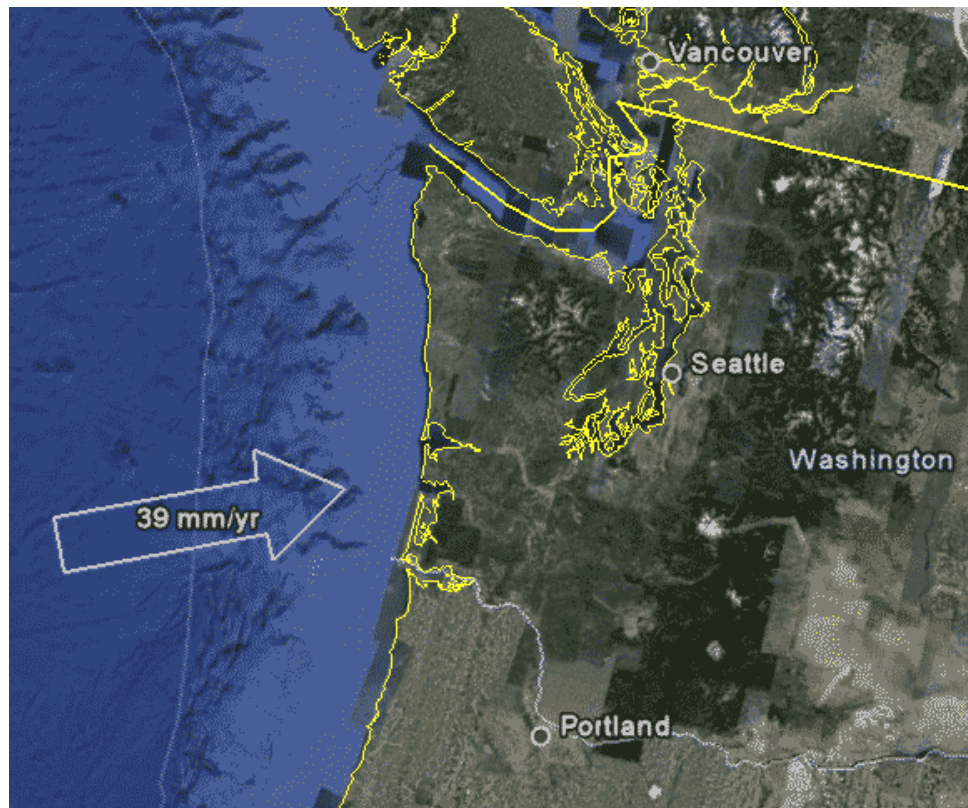
Enterprise-wide		Worksheet B: Public Health Consequences																Public Health Consequence	Public Health Risk
HAZARD RISK ASSESSMENT MODEL		HEALTH AND SAFETY										RESPONSE CAPACITY			PUBLIC HEALTH INFRASTRUCTURE				
Revised: Nov 2011		Potential injuries and deaths										Ability to respond			Service Interruption	Overall Impact (Average)	Probability x Consequences		
Hazards		Probability of Occurrence	Fatalities	Outpatient Injuries	Respiratory Illness	Chronic Disease	Communicable Disease	Mental Health	Vulnerable Populations	Food Security	Water Security	Hospital Beds	Primary Care Providers	Pharmacies	Ambulance	Staffing	Interagency Partners	1=Lowest 5=Highest	1=Lowest 50=Highest
Natural	Earthquake - Cascadia (3-5min) Local Tsunami	6	4	5	4	4	2	5	5	5	5	5	5	5	5	4	5	4.53	27.20
Natural	Riverine Flood	6	1	2	2	2	1	2	7	4	3	2	2	1	2	3	1	2.33	14.00
Human	Public Health Emergency	6	2	3	4	4	1	1	5	1	1	4	4	2	2	3	1	2.53	15.20



# **Appendix B: Public Health Hazard Vulnerability Assessment**

### Attachment 3 Douglas County Hazards: Public Health Consequences Analysis

July 13, 2012  
Version 1.00



## Record of Changes

Summary of Changes	Date of Change	Page(s) Affected	Changes made by (signature)

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## Attachments

Douglas County Hazard Analysis 2012, prepared by Douglas County Sheriff's Office.  
(When it is completed.)

Douglas County Hazard Analysis 2012 List

Scoring Criteria Public Health Consequences Analysis

Worksheet B: Public Health Consequences

## **Introduction**

The public health consequences of a disaster are felt long after the event. Not only are there immediate fatalities and injuries as a result of a disaster, but there is also potential for communicable disease outbreaks, an increase of acute respiratory illnesses, worsening of chronic illnesses and behavioral health issues, and increased vulnerabilities for marginalized populations. Understanding, characterizing and anticipating the likely consequences of common hazards can be a useful planning practice. The knowledge gained can be applied to prevent or mitigate some risks as well as develop realistic response and recovery plans. Used in conjunction with the local Hazard Analysis, a Public Health Consequences Analysis can help to strategically target resources to strengthen and improve the capabilities of the local public health system.

In Oregon, multiple agencies and organizations undertake hazard risk assessments to assist with planning. In order to reduce redundancies, the Oregon Health Authority has coordinated with Oregon Emergency Management and the Oregon Partnership for Disaster Resilience to streamline hazard risk assessment tools and processes. The planning tools applied for this analysis are the result of that partnership. At the local level, a similar partnership exists between the Douglas County Office of Emergency Management and Douglas County Health & Social Services. This document is a result of that partnership and it describes the results of a joint planning process. It meets local, state and federal planning requirements.

## **Purpose**

The purpose of this document is to describe the methods, results, and conclusions of a public health consequences analysis conducted by Douglas County Health & Social Services and Douglas County Emergency Management. This document discusses an analysis that was conducted to assist with prioritizing hazards and understanding their risk and likely health consequences. 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. Among other things, this analysis can:

- help establish priorities for planning, capability development, and hazard mitigation;
- serve as a tool in the identification of hazard mitigation measures;
- be one tool in conducting a hazard-based needs analysis;
- serve to educate the public and public officials about hazards and vulnerabilities;
- help communities make objective judgments about acceptable risk.

## **Community Health Profile**

## **Demographics**

With a population of 107,667, Douglas County accounts for almost 2.9 percent of the Oregon population. The Roseburg is the largest urban area in the county. It is the home of roughly 20% of all residents of the County, while the remaining 80% of residents live in scattered small towns, rural communities and rural residents.

Douglas County includes a significant population with special needs, including elderly, physically and mentally disabled and low-income residents, among others. 49,520 of Douglas County's residents between 5 and 64 years old, have a disability. Fifteen percent of the County's residents are 65 or older. The County is also diversifying in terms of its population demographics. Latinos now make up over 4.5% of Douglas County's population and another 5.5% of the population is non-white, non-Hispanic. For roughly 4.5% of households in Douglas County, the primary language spoken at home is other than English.

Poverty and unemployment are robust predictors of health status, and they are all linked. Approximately 15.6 percent of resident live below the poverty level. The percentage of students in Douglas County who are eligible for free or reduced cost school lunch is about 53%, and unemployment has fallen to 12%.

## **Health Indicators**

The two leading causes of death in Douglas County are cancer, at 273 deaths per 100,000 population and heart disease, at 237 deaths per 100,000 population. Other leading causes of death include unintentional injury, chronic lower respiratory disease and cerebrovascular disease. As with many areas of the country, large segments of the populations live with chronic conditions. Among the most common in Douglas County are arthritis (36.8%), high blood pressure (31.4%), high blood cholesterol (35.1%) and obesity (30.6 %). The rate of obesity in both children and adults has increased parallel to the national rates.

Although a smaller portion of the health burden, communicable diseases are also of concern. Gastroenteritis outbreaks are by far the most commonly reported outbreaks in Oregon, accounting for 84% of the 1,500 outbreaks investigated from 2003–2010. In 2010, forty outbreaks were foodborne, seven respiratory, three due to animal contact, and two waterborne; however, there were a number of outbreaks of other bacterial and viral pathogens, such as small clusters of pertussis (4), varicella (2), and meningococcal disease (1).

Many common illnesses are vaccine preventable. At 67%, the immunization rate for Douglas County 2-year-olds receiving a full series of recommended vaccines is significantly lower than the national Healthy People 2020 standard of 80%. The child vaccine exemption rate in Douglas County has risen for 12 straight years, and puts the

community at significant risk for a major outbreak of measles, whooping cough, or other preventable disease. Religious exemption rates are not at all evenly distributed across the population. Multiple schools in distinct geographic areas of the County have much higher religious exemption rates, putting the population affiliated with these schools at significantly increased risk of an outbreak of a vaccine preventable disease such as measles.

Depression, alcohol and substance abuse have significant negative impacts on individual health, family well-being, and broader social and economic issues including public safety and worker productivity. In Douglas County, 9% of adults have experienced a major depressive episode, and 12% have experienced serious psychological distress within the past year. While the percentage of Douglas County 8<sup>th</sup> graders who drank in the last month as gone down since Fiscal Year 08-09 to 23%, it is almost twice the national average of 13%. These youth numbers are particularly important, because 90% of Americans who meet the medical criteria for addiction started drinking, smoking, or using other drugs before age 18.

### **Public Health and Medical Infrastructure**

In Douglas County, there are several government agencies and private organizations which have the capability to provide medical care, treatment, and support. This includes local hospitals, Douglas County Health & Social Services, and local fire and EMS services.

In the County, most pharmacies 16 of 20, surgical centers and clinics are located in Roseburg. Three hospitals are located in the County, Mercy Medical Center (141 staffed beds), Lower Umpqua Hospital (16 staffed beds), and the Roseburg Veterans Administration Hospital. In addition there are 520 assisted living facility beds, and 585 residential care facility beds in Douglas County. The ratio of primary care physicians is relatively high, with one physician available per 1006 local residents.

Several fire agencies provide medical response and transport, with a combined force of 25 ground ambulances.

As the local public health authority, Douglas County Health & Social Services (DCHSS) is responsible for assuring the essential services of public health for all of Douglas County, Oregon. DCHSS central office is located in Roseburg, Oregon, there are three health annexes that are located in Reedsport, Drain and Canyonville. DCHSS is a moderate size local governmental health department of approximately 177 employees. Douglas County Health & Social Services manages following major program areas: Environmental Health, Communicable Disease, Maternal and Child Health, Women Infants and Children (WIC), Chronic Disease Policy and Prevention, Mental Health, Developmentally Disables, Senior Services, Special Transportation, CERT and Public Health Preparedness.

## Methods

This Attachment describes the public health consequences of the some probable hazards in Douglas County as rated in the 2011 Douglas County Hazards Analysis. The 2011 Douglas County Hazard Analysis identifies the likelihood of a variety of hazards, and then matches that with an assessment of how each hazard could affect social and economic systems if it were to occur. Threats that are evaluated include natural hazards (earthquakes, wildfires, and floods) and terrorism. For Douglas County, the hazard analysis compares hazards across two major geographic areas: Coastal Douglas County, and Central Douglas County.

Vulnerability and probability are the two key components of the Hazard Analysis 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. It is the probability score (likelihood of future occurrence within a specified period of time) that forms the basis of the Public Health Consequences Analysis. The scale is as follows:

### Hazard Probability of Occurrence

Score		Time Frame
Low	1 – 3	One incident likely within 75 to 100 years
Medium	4 - 7	One incident likely within 35 to 75 years
High	8 – 10	One incident likely within 10 to 35 years

Since the Douglas County Hazard Vulnerability Analysis was not completed at the time of this evaluation the task force was presented with three hazards to complete a Public Health Consequences analysis. A task force of twelve members completed the analysis. The task force included:

Peggy Madison	DCHSS Administrator
Jeremiah Elliott	DCHSS Business Services
Karen Vian	Public Health
Nancy Hudson	Senior and Veteran Services
Julie Meil	Mental Health
Cindy Wolford	State Seniors
Mike Lane	Roseburg Fire
Luann Urban	Douglas County Emergency Management
Wayne Stinson	Douglas County Emergency Manager
Shelly Prater	Physicians of Douglas County
Elizabeth Miglioretto	Health Security, Preparedness and Response Program
Eugene Regan	DCHSS Preparedness Coordinator



In order to understand how each hazard might affect the public’s health, the task force considered several factors including the County’s current health status, injuries likely to result from the event, and illness and injuries that could happen in the aftermath of an incident. Ratings were arrived at by group consensus. To provide context for the agreed upon ratings, underlying assumptions and reasoning was documented for each rating when relevant.

The analysis consider 15 consequences grouped into three major categories: 1) potential injuries and deaths; 2) healthcare system response capacity; and 3) public health service capacity. Each consequence (fatalities, out-patient injuries, etc.) was rated on a scale of 1 to 5, with 1 indicating no impact and 5 indicating the highest level of impact. Two scores were then calculated using the 15 ratings: an average public health consequences score (range 1 to 5); and 2) a “risk score” based on the equation of probability x consequence.

### Hazards Public Health Consequences Profile

Hazard	Impact (Average)	Central Douglas		Coastal Douglas	
		Probability	Risk	Probability	Risk
<b>Public Health Emergency (Pandemic Influenza)</b>	2.6	6	15.6	6	15.6
<b>Flood – Riverine</b>	2.33	6	14.00	6	14.00
<b>Cascadia Earthquake and Local Tsunami</b>	4.53	6	27.20	6	27.20

**Public Health Emergency                      Public Health Consequence 2.6**  
**Public Health Risk 15.6**

For the purposes of this analysis, “Public Health Emergency” has been defined as influenza pandemic or other pandemic caused by a novel respiratory illness. The 2009

H1N1 flu was selected as the disease to evaluate for the public health emergency because the flu offered a real epidemic that DCHSS has experience with. Having a real event provide the attendees the opportunity to recall their experience and apply that real life knowledge to the risk analysis.

Novel or highly infectious respiratory illnesses will require a public health response to provide for preventive measures, vaccination, public education, community mitigation, surveillance, and the coordination of support throughout affected areas. Some services normally provided by Douglas County Health & Social Services may be reduced or suspended depending upon the number of people affected by the novel or highly infectious respiratory illness, or as staff is reassigned to work on emergency issues related to the illness. It was learned that fewer public health staff and trained volunteers are needed when vaccination can be given by pharmacists, EMTs, doctor offices, professional vaccinators and nurses in assisted living facilities.

At all agencies, businesses, and emergency response organizations, staffing levels could be affected by employees not showing up for work due to fear of becoming sick; employees could also have sick children at home that need to be taken care of and/or employees are sick themselves and are unable to report to work. During the 2009 H1N1 flu DCHSS staff used an average of 101 hour of sick leave from 9-1-2009 to 4-30-10. During the same time period 9-1-11 to 4-30-12 the DCHSS staff averaged 44 hours of sick leave.

Hospitals and other healthcare systems may experience similar impacts. Mercy Medical Center intensive care was at capacity for several weeks. Mercy Medical Center identified the need for more staff to be trained on ventilator use. The SNS provides a training video when a ventilator is requested.

Important community services may need to be curtailed, consolidated, or suspended because of widespread absenteeism in the workplace. This will impact all residents of Douglas County, but may have a greater impact on more vulnerable populations. Examples include those who have disabilities; live in institutionalized settings; are from diverse cultures; have limited English proficiency or are non-English speaking; are transportation disadvantaged; have chronic medical disorders; or have pharmacological dependency.

Physical illness is not the only effect of a large scale health emergency, including an influenza pandemic. The psychological impact on the public will likely be significant. Some individuals enduring mental illnesses may lose continuity of care for an undetermined period of time. They may run out of medications. They may miss the comfort of regular contact with case managers, counselors and friends or family members who may be sick.

Many people may also deeply feel the loss of any friends or caregivers who may die in the pandemic. All people affected by a disaster, such as a pandemic, must adjust to major changes in their lives. People may be grieving for friends or family members and may have to deal with personal or family crises. Many people will need to talk about their feelings and experiences and learn how to face the challenges of an unknown future.

It was stated that a low behavioral health response was because the SPMI (Most Seriously Mental Ill) were not watching television and did not become aware of the need to get vaccinated until they were asked if they had received the vaccine. It was observed that it was hard to do social distancing with Mental Health clients. The mental health staff have small offices for counseling. Mental health staff were not fit tested for N95 masks. DCHSS did not make provisions to provide surgical masks to clients with symptoms. Hand sanitizer dispensing stations were installed throughout the health department and in many other county offices.

There was an increase in phone calls at medical provider's offices related to vaccine availability for high risk group eligibility and from the worried well. Proactive medical providers reviewed their patient files and contacted many that were in high risk groups. Providing vaccine to the local physicians require them to refresh their knowledge in vaccine care and procedure.

**Riverine Flood                      Public Health Consequence 2.3**  
**Public Health Risk 14**

Douglas County contains the entire drainage of the Umpqua River system. There are over 320 miles of river and major streams in Douglas County. The topography and geology of the Umpqua River Basin are conducive to runoff, and peak flows on many of the tributaries occur within hours of passage of weather fronts. Historically, the highest flows usually occur during the period from November through March as a result of heavy rains augmented by snow melts. However, flooding presents a number of risks to health, drowning being the most obvious. Serious injury can be caused by falling into fast flowing water or from hidden dangers under the water, such as missing manhole covers. The National Weather Service, NWS, monitors the 14 stream gages on the rivers and streams in Douglas County. The NWS efforts at forecasting storms and monitoring the stream levels has lead to very low fatality rates from flooding.

During severe floods there may be an increase in respiratory illness due to mold during cleanup. The storms may contribute addition problems by causing lost of electrical power that takes several days to be restored

During floods tetanus vaccination usually increase due to the publicity of working in contaminated water and concern for deep cuts or puncture wounds. Debris can increase the risk of puncture wounds and resultant tetanus in unimmunized individuals. Preparing for and recovering from flooding can also result in increase injuries and exacerbation of existing health conditions, such as asthma, and cardiovascular conditions. Some individuals with chronic conditions may experience complications if they do not evacuate with their medications, or if they are isolated and unable to access their medications in a timely manner. Chronic diseases patients may have problems getting medication and oxygen due to transportation disruptions.

There is no apparent increase in the chronically homeless or behavioral health challenged, to seek out treatment because of flooding. They just move to another location for the duration of the event. The effects on the vulnerable populations that are in care facilities are low for most flooding events. There are at least two care facilities located in the 100 year floor zone, that have a total of 163 patients, that would could increase the risk to high. There are many small care facilities located throughout the county that may be affected by loss of power and ability to transport their clients to medical care.

According to the 2010 Census the poverty level in Douglas County is 15.6%. In 2008, 25,342 individuals received relief from hunger and food insecurity through the Supplemental Nutrition Assistance Program. It can be anticipated that severe flooding will exacerbate existing food insecurity and undernutrition for some households in affected areas.

Water security has affected the county public drinking water systems during floods or high water. Contamination of drinking water sources and sanitation are important public health concerns. The large public drinking water systems use filtered river water and they shut down their filtering operation during times of high turbidity. The water intake at Glendale was washed away during the 1996 flood and Glendale was unable to make clean water for several weeks. Safeway supplied bottled water to Glendale residents for drinking and a water tender was provided for bulk water needs.

Power outages increase the risk of foodborne illnesses. There is also increased risk for carbon monoxide poisoning from improper ventilation of generators, portable stoves, grills and heaters. Power outages also pose risk to individuals who rely upon certain medical devices, oxygen concentrators, who may not be able to use their devices for a period of time. Shelters, when established, also pose potential health risks due to crowding and communal food and sanitation practices; however, historically in Douglas County shelters established during flooding tend to be poorly utilized and generally are needed no more than 24-48 hours.

Once displaced from their home, many individuals have few resources to return home and make repairs. The financial impacts can have important behavioral health and physical health consequences. The stress and strain of being flooded and cleaning up can have a notable impact on mental health and wellbeing. The incident can impact behavioral health throughout the community, including impacts on those with loved ones who are effected (e.g. due to death and injury); financial loss or displacement from work or home; added stressors at places of employment due to absence of other employees; and vicarious stress from exposure to media. DCHSS has a policy that allows staff to report to one of the three county health annexes if they cannot report to work in their assigned office due to damaged roads or bridges.

**Earthquake (Cascadia Subduction) Reedsport (Tsunami)**  
**Public Health Consequence 4.53**  
**Public Health Risk 27.2**

This hazard was selected because it is a catastrophic disaster and will damage most of the infrastructure, transportation routes, power, gas, fires, and buildings and overwhelm most public health services. The coastal area of Douglas County will receive the most damage and require the most assistance to protect the lives of the citizens and tourists. The DC Emergency Management and DCHSS staff will have to immediately take care of family members and then attempt to organize a command structure. Shortly after the establishment of some communication systems it will be necessary to collect situation reports and then submit resource request, to the state ECC, to meet the basic needs for survival of the population. At the same time the DC EOC will need to staff up to receive and distribute the resources that will come. DCEM and DCHSS will be involved in a long term, several years, recovery effort that will take increased money and staffing.

For the 2009 Cascadia earthquake exercise the DOGAMI HAZUS program predicted 200 or more fatalities and 2000 or more injured depending on the time of the year and day. With 2000 or more injured the hospital beds in Lower Umpqua Hospital, if it is still usable, will be inadequate. Mercy Medical Center and the Roseburg VA Hospital are also expected to be above capacity. There will be a need to identify suitable locations to stage several DMAT teams and FMS in the affected area. Douglas County has identified several locations in Roseburg that may be useable for a FMS. Professional medical capacity would be reduced do to the professionals not being able to access their facilities. DCIPA electronic medical records can be secured, but not accessed locally if systems are down. All hospitals have backup generators that can supply electricity for 5-10 days. The hospitals will need continuous resupply of fuel an a large amount of potable water to continue to operate. Most of the pharmacies are in the Roseburg area. For pharmacies to be effective they will need their staff, power and resupply of inventory. There are 27 ambulances in Douglas County. Currently the Roseburg EMS, 10 vehicles, is at 75% of capacity daily. At present Reedsport has

insufficient number of trained staff to operate the two ambulance vehicles. A Cascadia earthquake event will require additional vehicles and staff. It will also require helicopters to move patients and supplies. The Douglas County Forest Protection Agency has a contracted helicopter stationed at the Roseburg Airport during the summer.

There may be a major increase of respiratory illness due to dust from damaged buildings, lack of medication, high stress and lack of oxygen for patients. High incidence of illness or symptoms and fatalities may be expected due to lack of access to medication, increase stress and infrastructure damage. Typically during disaster there is usually not an increase detectable communicable disease. However, during a catastrophic event it is reasonable to anticipate and increase in gastrointestinal illness due to crowded shelters, or contaminated food and water.

Behavioral health services will be overwhelmed high during the first few months after the earthquake. Behavioral health staff are trained in Psychological First Aid, however, there will be a need for increased staff to deal with the increase need due to loss of property, deaths of family and friends. Long term behavior health need will increase do to post traumatic shock for the disaster.

It is expected that the number of vulnerable people will skyrocket. Many people will have difficulty dealing with the loss of power, communication devices, shelter, etc. There will be a high demand to relocate current assisted living facility clients and other injured survivors to undamaged care facilities. The receiving care facilities may be in other states and the burden will be in transporting and keeping track of the client's locations. Survivors in the coastal area may insist on remaining in their communities thereby complicating the response and long term recovery efforts.

The availability of safe food will be critical for several days or longer. There are 12 food pantry distribution sites in Douglas County that may be used as point of distribution site during the event. These site locations are known by the local residents and responders. These volunteers are already familiar with distribution protocol. In some disasters major chain stores have assumed the logistics function for supply and distribution of food, water and building materials. Ninety percent of the population relies on public water system for their water needs. Most of these systems may be expected to be affected by the earthquake and will need to be immediately inventoried and tested to determine their ability to supply their customers and capacity to supply water to neighboring destroyed water systems. Transportation issues, available power, storage container capacity will also need to be determined for resource requests..

DCHSS has a policy that allows staff to report to one of the three county health annexes if they cannot report to work in their assigned office due to damaged roads or bridges. The staff are aware that they are considered essential workers and are expected to report to work after taking care of family members.

Emergency vehicles will be able to communicate vehicle to vehicle in Roseburg. They will not be able to communicate from Roseburg to other communities in the county. DCHSS has 23 radios that are part of a trunked radio system, the Parks Department, Public Works, and DC Jail are also on the system. There is an active Amateur Radio Emergency Service (ARES) group in the county that will respond to establish HAM radio communication. The ARES have e-mail and packet system capability. The health department, Mercy Medical Center, Roseburg VA Hospital, DC EOC, and DC Western EOC have HAM radios.

It was discovered that there are many agencies that have satellite phone. Keeping the batteries charged and testing the phones is a maintenance issue. Satellite phone numbers will be given to 911 to share among critical providers. The following agencies were identified as having satellite phones:

- DCIPA - Douglas County Independent Physicians Association have 1 satellite phone and buying another,
- Roseburg Fire has 1 satellite phone,
- Mercy Medical Center has 1 satellite phone,
- Western EOC has 1 satellite phone
- DC EOC has 1 satellite phone
- DCHSS has 1 satellite phone
- Roseburg VA Hospital has 1 satellite phone
- HPP Region 3 Liaison has 1 satellite phone

In many parts Douglas County, weathering and the decomposition of geologic materials produces conditions conducive to landslides. Usually landslide events tend to be relatively limited in geographic impact, and therefore tend to affect a relatively small percentage of the local population. A Cascadia earthquake will create numerous landslides along all the major highways and county roads. Landslides will impede the ability of response personnel for days or weeks, especially in the rural portions of the county.

## **Plan Maintenance**

The DCHSS Preparedness Coordinator will be responsible for ensuring a review of the assessment at least every five years. The DCHSS Preparedness Coordinator ensures that necessary changes and revisions to the plan are prepared, coordinated, published and distributed. The plan will undergo revision whenever:

- The Douglas County Hazard Analysis is updated
- Plan evaluations reveal deficiencies or “oversites”
- Relevant Local, State or Federal requirements change
- Any other condition occurs that causes need for revision

The Public Health Preparedness Coordinator will maintain a list of individuals or organizations which have controlled copies of the plan. Only those with controlled copies will automatically be provided updates and revisions. Plan holders are expected to post these changes. Revised copies will be dated, assigned a version number, and marked to show where changes have been made.

## Glossary

**Chronic Disease:** A human health condition or disease that is persistent or otherwise long-lasting in its effects. The term chronic is usually applied when the course of the disease lasts for more than three months. Common chronic diseases include arthritis, asthma, cancer, diabetes and HIV/AIDS.

**Communicable Disease:** An illness resulting from the infection, presence and growth of pathogenic biological agents in an human or other organism.

**Gastroenteritis:** A medical condition characterized by inflammation of the gastrointestinal tract that involves both the stomach and the small intestine, resulting in some combination of diarrhea, vomiting, and abdominal pain and cramping.

**Hazard:** any situation, natural, technological or deliberate which poses a risk of loss of life, damage to property, or damage to the environment.

**Hazard Analysis:** A systematic scoring method that is used to assist with prioritizing hazards and understanding risk. It doesn't predict the occurrence of a particular hazard, but it does "quantify" the risk of one hazard compared with another.

**Outbreak:** The confirmed presence of disease or infection of one or more cases in a defined epidemiological unit (e.g., flock, herd, farm or village) and during a specific period of time.

**Probability:** The likelihood of future occurrence of an event within a specified period of time



**Public Health Consequences Analysis:** A systematic rating system used to understanding, characterizing and anticipating the likely public health consequences (e.g. communicable disease outbreaks, an increase of acute respiratory illnesses, worsening of chronic illnesses and behavioral health issues, and increased vulnerabilities for marginalized populations) of common hazards relative to one another.

**Vulnerability:** A rating reflecting the percentage of population and property likely to be affected under an “average” occurrence of a given hazard.

## **References**

*Douglas County Hazard Analysis 2012*, prepared by Douglas County Sheriff’s Office.  
(When it is completed.)

Douglas County Hazard Analysis 2012 List

Scoring Criteria Public Health Consequences Analysis

Worksheet B: Public Health Consequences

**Scoring Criteria**  
**Public Health Consequences Analysis**  
**Douglas County Health & Social Services**

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**Fatalities**

- 1) None
- 2) Excess fatality rate of less than 30
- 3) Excess fatality rate of 31 to 160
- 4) Excess fatality rate of 161 to 320
- 5) Excess fatality rate of more than 321

Average 5 year average Total Deaths: 1307  
Natural 1200, Accident 107, Suicide 20,

**Top 3 Causes of Death in Oregon: # for Douglas County**

- Disease of the Circulatory System 27%, 324/y
- Malignant Neoplasm 28%, 325/y
- Chronic Lower Respiratory Diseases 22%, 264/y

**Oregon Death Rate**

Heart	149/100000
Infant Death	5.2/1000
Children	17/100000
Teen	53/100000
Influenza	12/100000

---

**Outpatient Injuries**

Potential for injuries that would require triage and care by a healthcare provider

- 1) None
- 2) Cases are adequately handled using existing resources
- 3) Capacity or existing resources are stretched
- 4) Need exceeds local capacity
- 5) Needs far exceeds local capacity

Potential for injuries that would require triage and care by a healthcare provider

Data from:

Northridge Earthquake – 172/100,000

Grand Forks Flood – none or unable to determine from available data

Hurricane Andrew – 3.4/100,000

Oklahoma City Bombing – 46.04/100,000

Japan Earthquake

Dead & Missing	20,448
Injured	5,888
Buildings destroyed	111,871
Buildings partially destroyed	139,000
Partially damaged Buildings	498,177

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### Respiratory Illnesses

Consider the exacerbation of respiratory illness such as asthma and chronic obstructive pulmonary disease that could be influenced by: stress, reduction in air quality, and limited access

- 1) None
- 2) Minor increase in exacerbated respiratory illnesses
- 3) Minor-medium increase in exacerbated respiratory illnesses
- 4) Medium increase in exacerbated respiratory illnesses
- 5) Major increase in exacerbated respiratory illnesses

Hospital rates <5 5-14 15-24 25-34 35-44 45-54 55-64 65+

Douglas/1000 27.9 7.2, 4.2, 5.8, 12.1, 12.3, 13.1, 16.4

Smoker 27.1% = 29177

Asthma (adult): 13.1% = 6,698

Asthma (children): 9.5% = 1,132

Number of days in 2010 that air quality was 50 (0-50=Good) or above 2,

---

### Chronic Diseases

Consider the exacerbation of chronic health conditions that could be influenced by: lack of access to medication, disruption of care, dietary restrictions, and reduced mobility.

- 1) None
- 2) Minor increase in exacerbated chronic conditions
- 3) Minor-medium increase in exacerbated chronic conditions
- 4) Medium increase in exacerbated chronic conditions
- 5) Major increase in exacerbated chronic conditions  
(healthcare services needed)

Arthritis:	36.8 = 39,621
Heart Attack:	4.4% = 4737
Stroke:	3.8% = 4091
Diabetes: (2006)	10.1% = 10,874
High Blood Pressure:	28.5% = 14,571
High Blood Cholesterol:	41.8% = 21,371
Overweight:	33.3% = 35,853
Obese:	30.6% = 32,946

---

### Communicable Disease

Estimate the increase in communicable disease outbreaks related to each hazard:

- 1) None
- 2) Similar to season flu with an above-average transmission rate - excess fatality rate of 16
- 3) Similar to the 1957 influenza pandemic (U.S. ~70,000 deaths) - excess fatality rate of 19-93
- 4) Excess fatality rate of 93-186
- 5) Excess fatality rate of or more than 186

Immunization Rates:

Two Year Olds Up-to Date Rate

2010, **74.9%** (DTap, IPV, MMR, Hib, HepB, Varicella, PCV)

2010, **93.9%** (HepA)

2010, **60.3%** (Rota)

Adults age 65 and over:

2007, Influenza shot within the past year, **67.4**

2007, Ever had a pneumococcal shot, **71.8%**

HIV 6, AIDS, 33 = 39 HIV/AIDS (2011)

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## **Behavioral Health Issues**

Estimate the demand for behavioral health services that could result from each hazard:

- 1) None
- 2) Excess services needed for less than 54
- 3) Excess services needed for 55 to 215
- 4) Excess services needed for 215 to 430
- 5) Excess services needed for more than 430

33% Americans have MH problems per year

Percent of Persons with Serious Psychological Distress in the Past Year: 11.5%

Percent of Persons with Drug Dependence or Abuse:

- 12-17 years: 5.2%
- 18-25 years: 9%
- 26 or older: 1.9%

Percent of Persons with Alcohol Dependence or Abuse in the Past Year:

- 12-17 years: 6.4%
- 18-25 years: 20%
- 26 or older: 6%

Estimated population in need of CMHS: 4,222 adults and 2,469 youth Addictions and Mental Health (2009)

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## **Vulnerable Populations**

Before, during, and after an incident, members of at-risk populations may have additional needs for: communications, medical care, maintaining independence, supervision, and transportation.

Estimate the demand for increased services that could result for this population from each hazard:

- 1) None
- 2) Excess services needed for less than 54
- 3) Excess services needed for 55 to 215
- 4) Excess services needed for 215 to 430

5) Excess services needed for more than 430

Languages spoken other than English no very well: 2480

Persons below poverty level (2006-2010) = 10.6%

Adults without Health Insurance: 22.4%

Children without Health Insurance: 7.0%

Seniors without Health Insurance: 1.5%

- Population 5-20 years with a disability,  $25,176 \times 10.9\% = 2,744$
- Population 21-64 years with a disability,  $60,480 \times 22.7\% = 13,729$
- Population >65 years with a disability,  $21,550 \times 45.8\% = 9,870$

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### **Food Security**

Estimate the level of food insecurity that could result from each hazard:

- 1) None
- 2) Few households are food insecure
- 3) Multiple households are food insecure
- 4) Multiple households are food insecure with some malnutrition
- 5) Multiple households are food insecure with severe malnutrition

Eligible for Free or Reduced School Meals: 46-54%

Summer Food Program Eligible and Participate: 35%

12 Douglas County food pantries served by UCAN's Food Bank

SNAP - Supplemental Nutrition Assistance Program 6939 -10,533 households

Food Boxes Distributed: 21,311

WIC - Women Infants and Children

5,517 Individuals served

1596 pregnant, breastfeeding, and postpartum women

3,921 infants and children under the age of 5

\$2.34 Million in food vouchers were issued locally

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**Water Security**

Estimate the lack of access to potable water that could result from each hazard:

- 1) None
- 2) Few households are without potable water service
- 3) Multiple households are without potable water service
- 4) Multiple households are without potable water service, and bottled water is scarce
- 5) Most households are without potable water service, and bottled water is scarce

Douglas County Public Health has oversight of 79 smaller public water systems that served four or more connections or <3,000 users, total population 10,061

State Drinking Water program has oversight for 34 systems, total population 85,562

(The Health Department does not have any regulatory role with private water systems that use private wells and springs) total population 12,054

The Dept. of Agriculture is the regulating agency for 6 systems serving 613 people

<b>City/Town</b>	<b>Populations</b>	<b>Water connections</b>
Roseburg	21,181	11,525
Reedsport	4154	2500
Gardiner	248	
Winchester Bay	382	
Elkton	195	112
Canyonville	1884	605
Myrtle Creek	3439	1450
Days creek	272	
Winston	5379	2283
Glendale	874	384
Riddle	1185	620
Sutherlin	7810	2,773
Oakland	927	435
Yoncalla	1047	525
Drain	1151	540
Glide	1795	500

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## Hospital Beds

Those that need in-patient care. Estimate the extent of demand for hospital beds resulting from each hazard:

- 1) None
- 2) Demand for hospital beds is less than hospital capacity
- 3) Demand for hospital beds is equal to capacity
- 4) Demand for hospital beds exceed capacity
- 5) Demand for hospital beds far exceeds capacity

### Mercy Medical Center

Staffed beds	141
Total Acute discharges	7,377
Total Acute pat. Days	7,869
Ave day census	76
Length of stay	3.78
Occupancy	54.15%

### Lower Umpqua Hospital

Staffed beds	16
Total Acute discharges	551
Total Acute pat. Days	1575
Ave day census	4
Length of stay	2,86
Occupancy	26.97%

Roseburg VA            Information not available

### Long Term Care Facilities

	Facilities	Units	Vacant
Class II =	56	280	39 vacant
Assisted Living=	7	240	not available
Residential Care =	9	255	not available
Nursing Facilities =	4	330	not available
Senior Retirement =	4	?	not available

In 2009, 430 at-risk children were provided safe haven in foster care.



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**Primary Care Providers**

Estimate the additional demand for primary care services resulting from each hazard:

- 1) None
- 2) Demand for services is less than capacity
- 3) Demand for services is equal to capacity
- 4) Demand for services exceeds capacity
- 5) Demand for services far exceeds capacity

See attached Douglas County Health Care Practitioners

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**Pharmacies**

Estimate the extent of demand for pharmaceutical medications resulting from each hazard:

- 1) None
- 2) Demand for services is less than capacity
- 3) Demand for services is equal to capacity
- 4) Demand for services exceeds capacity
- 5) Demand for services far exceeds capacity

**19 pharmacies**

BiMart-3, Gordons-1, Harvard Ave-1, Home Town Drug-1, K-Mart-1, Northwest Compounding-1, Rite Aid-2, Safeway-1, Sav-On-1, Walgreen-2, Hospital-3, Fred Meyer-1, Rays 1

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**Basic Emergency Medical Services**

Estimate the extent of demand for emergency medical care and ambulances resulting from each hazard:

- 1) None
- 2) Demand for services is less than capacity
- 3) Demand for services is equal to capacity
- 4) Demand for services exceeds capacity
- 5) Demand for services far exceeds capacity

**Ground Ambulances**

- Fire District 2: 12
- Drain: 4
- Glendale: 2
- Glide: 2
- Lower Umpqua, Reedsport: 2
- Winston: 3

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**Staffing**

Estimate the percentage of your current staff that will be available to work during and after each hazard:

- 1) None
- 2) 100% of personnel will be available to respond
- 3) 75% of personnel will be available to respond
- 4) 25% of personnel will be available to respond
- 5) 0% of personnel will be available to respond

Mental Health:	102.3 FTE
Public Health:	34.9 FTE
Senior & Veteran:	10.3 FTE
Transportation:	.9 FTE
Administration:	29.0 FTE
Total:	177.4 FTE

Approximately 200 DHS/OHA staff work in Douglas County.

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**Interagency Partnerships**

Estimate the percentage of interagency partners you can immediately communicate with during each hazard:

- 1) Greater than 75%
- 2) 50-75%
- 3) 30-50%
- 4) 10-30%
- 5) Less than 10%

2 Satellite Phones, 23 Trunk Radio, 324 HAM Radio Operators in Roseburg  
 49 radio frequencies licensed for use in Douglas County

**ENERGY**

**Heating Type Services**

Natural gas	10,892
Electric	22,636
Propane	880
Oil	1,273
Wood	7,169
Other	950

Total houses 43,916      US Census Bureau      American Fact Finder

**ORES Report**

2007-2012 in DC there were:

25	TECH	power, phone, 911 outages
1	RAD	request to dispose of a pin head radiation source
17	NWS	Floods and flood/severe weather warnings
290	CBT	Sewage spills, Hazmat spills,

**You want to keep moving to the answers to the following questions:**

**What can we envision the impact on human health will be?**

**What can we envision the impact on Public Health services will be?**

**What can we envision the impact on Medical services will be?**

**What can we envision the impact on Mental Health services will be?**

**What can we envision the impact on community partners that will require DCHSS Assistance or coordination?**

**What can be done to prevent or mitigate these impacts?**

## Douglas County Hazard Analysis 2012 Resource List

Easy Time DCHSS Payroll data base

[http://www.co.douglas.or.us/planning/Natural\\_Hazard/default.asp](http://www.co.douglas.or.us/planning/Natural_Hazard/default.asp)

Douglas County Long Term Care Facilities for Adults

[http://www.ucancap.org/\\_files/Community\\_Needs\\_Assessment-DC.pdf](http://www.ucancap.org/_files/Community_Needs_Assessment-DC.pdf)

DOGAMI

- <http://www.crew.org/sites/default/files/CREWCascadiaFinal.pdf>
- [ftp://ftp.odot.state.or.us/Bridge/bridge\\_website\\_chittirat/2009\\_Seismic\\_Vulnerability\\_final.pdf](ftp://ftp.odot.state.or.us/Bridge/bridge_website_chittirat/2009_Seismic_Vulnerability_final.pdf)



final ground truth  
document 3-23-09.dc

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Oregon Public Health

- [http://public.health.oregon.gov/DiseasesConditions/InjuryFatalityData/Documents/douglas\\_deaths11a.pdf](http://public.health.oregon.gov/DiseasesConditions/InjuryFatalityData/Documents/douglas_deaths11a.pdf)
- <http://public.health.oregon.gov/PreventionWellness/VaccinesImmunization/Documents/county/Douglas.pdf>
- [http://public.health.oregon.gov/HealthyPeopleFamilies/wic/Documents/annual/annual\\_douglas.pdf](http://public.health.oregon.gov/HealthyPeopleFamilies/wic/Documents/annual/annual_douglas.pdf)
- <http://public.health.oregon.gov/DiseasesConditions/InjuryFatalityData/Documents/2009report.pdf>
- Ambulances  
<http://public.health.oregon.gov/ProviderPartnerResources/EMSTraumaSystems/AmbulanceServiceLicensing/Documents/cntydoc/doug.pdf>
- Drinking Water <http://170.104.63.9/>

Senior and Disability <http://www.oregon.gov/DHS/spd/data/data2011-12.pdf>

US Census <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

Kaiser Family <http://facts.kff.org/>

City population <http://www.wikipedia.org/>

Radio frequencies <http://www.radioreference.com/apps/db/?ctid=2214&tab=ham>

Professional Medical Providers

<http://oregonhwi.org/documents/Final.2010.Oregon.Health.Profession.Profiles.pdf>



# Appendix C: Hazard Scenarios

A list of threats and hazards for Douglas County was developed using the OEM Threat Analysis Worksheet. It is important to put each hazard in context for the Douglas County community. For each threat and hazard on the list, scenarios for conditions ranging from minor to extreme are suggested. These scenarios consider the when and where for each threat or hazard, and may pertain to more than one county section. This context will help identify impacts and core capabilities, as well as outcome and capability targets, in order to develop mitigation and response plans.

## Natural Hazards

1. Coastal Erosion
  - a. A tsunami causes major coastal erosion along multiple areas during the tourist season.
  - b. An extreme high tide event causes substantial coastal erosion during tourist season.
  - c. Sea-level rise due to climate change causes certain coastal areas to erode significantly over time.
  - d. High tides cause normal erosion along only certain areas of the coast during non-tourist seasons.
  
2. Earthquake
  - a. A major Cascadia event (9+ on Richter scale) causes significant shaking and structural damage to multiple coastal areas during the summer tourist season.
  - b. A major crustal earthquake causes significant shaking and structural damage to major population centers around county during the night.
  - c. A medium earthquake causes some shaking and structural damage to a single town during the day.
  
3. Flood
  - a. Major flooding occurs along multiple major and minor rivers and streams throughout the entire county over the course of a week.
  - b. Major flooding occurs along multiple minor rivers and streams in certain portions of the county for several days.
  - c. Minor flooding occurs along several minor streams in certain areas of the county for one or two days.
  
4. Landslide/Debris Flow
  - a. Major landslides/debris flows occur during the night, damaging multiple towns and settlements, roads and bridges.
  - b. A major landslide/debris flow occurs during tourist season, damaging or blocking a major transportation corridor.

- c. A minor landslide/debris flow occurs during November, causing traffic delays and minor damage in a localized are.
- 5. Local Tsunami
  - a. A major Cascadia event triggers a large tsunami that inundates multiple coastal areas and population centers, causing mass evacuation and major property damage.
  - b. A medium Cascadia event triggers a medium tsunami that inundates multiple coastal areas and population centers, causing mass evacuation and minor property damage.
  - c. A small Cascadia event triggers a minor tsunami that threatens certain coastal areas and population centers, causing minor property damage, and a variety of evacuations, both major and minor.
- 6. Distant Tsunami
  - a. A distant tsunami inundates multiple coastal areas and population centers, causing major damage and mass evacuations.
  - b. A distant tsunami threatens multiple coastal areas and population centers, causing minor damage and isolated evacuations.
  - c. A distant tsunami causes isolated evacuations but no property damage.
- 7. Wildfire
  - a. Multiple major wildfires spread throughout the county, causing evacuation of residences and population centers, shutting down of transportation corridors, and major property damage.
  - b. A single major wildfire causes isolated evacuations, property damage and occasional detours for transportation corridors.
  - c. A minor wildfire causes isolated evacuations in forested areas and poor air quality and visibility due to smoke.
- 8. Windstorm
  - a. A major and sustained windstorm causes widespread collapse of trees, utility poles, and antennas in population centers. Some buildings are damaged and transportation corridors are shut down. Storm results in major property damage, utility outages, and personal injuries or deaths.
  - b. An unexpected, localized windstorm occurs during a summer event, causing evacuations, collapse of trees, utility poles and antennas. Some property damage occurs, as well as isolated utility outages, personal injuries and closures to transportation routes.
  - c. A minor windstorm causes minor damage to property and some trees in a localized area.
- 9. Winter Storm
  - a. A county-wide winter storm causes damage to trees and major utility operations, closures of transportation corridors, water-related issues such as lines bursting and flooding, and disruptions to essential services and delivery of assistance. Some people are stranded in isolated locations and search and rescue units are unable to respond. Schools are closed for an extended period.



- b. A major winter storm affects portions of the county, causing isolated utility damages, temporary road closures, and tree and property damage. Schools are closed for several days.
- c. A minor winter storm affects both rural and urban areas, causing temporary road and school closures, some tree and property damage.

## **Terrorism Hazards**

1. Explosive Device
  - a. An explosive device is detonated at the Seven Feathers Casino & Resort that results in 500 casualties, 200 dead and 300 wounded. The casino and half the hotel has been leveled with possible victims trapped in the debris. Debris from the explosion is scattered across surrounding properties and roads, including I-5. As a result of the explosion, debris, and safety issues I-5 is shut down to all north and south bound traffic traveling through Canyonville.
  - b. A cluster of pipe bombs is discovered within a court room of the Roseburg County Courthouse. It is 1000 AM on a Tuesday morning with most employees working in the Courthouse and several courts in session.
  - c. A bomb threat is called in on a local area high school, during a Friday night football game.
2. Cyber-terrorism
  - a. A hacker deploys a virus into Pacific Power's computer systems that shuts down the power grids, shutting down half the power to the County.
  - b. A small group of individuals hacks into local broadcast stations and takes control of the stations airwaves to broadcast an anti-government message.
  - c. A local high school student hacks into the school computer networks to play a prank.
3. Animal/Eco-terrorism
  - a. The Earth Liberation Front (ELF) breaks into a lumber mill and sabotages all of the heavy equipment. The damage stops lumber mill operations for 2 weeks and costs the company several million dollars in losses.
  - b. A group of animal rights activists break in and release the wild animals from the Wildlife Safari park located in Winston, OR. There are several potentially dangerous wild animals now loose in the Winston area.
  - c. A group of environmental activists start a "tree sit" to stop logging operations. The activists chain themselves to trees and refuse to leave until operations are stopped. The "tree sit" stops logging operations for several days.

## **Technological Hazards**

1. Energy Failure
  - a. Due to a computer malfunction the electrical power grid of Douglas County is shut down, cutting off power to all County residents.

- b. A natural gas pipeline explodes and disrupts natural gas supply to Douglas County. The County only has 1 week of natural gas reserves and the pipeline may take up to 2 weeks to repair.
  - c. Severe winds cause a tree to fall on a transformer disrupting electrical power to 50 users.
2. Water Supply Disruption
- a. Local water tables begin to drop rapidly and current usage rates will leave community without local water source in several months.
  - b. Roseburg water-supply becomes contaminated cutting off the supply of drinkable water to the City. Decontamination of water supply could take up to a week.
  - c. Water treatment facility has minor technical difficulties and shuts down for 1 day.
3. Sewer Treatment Failure
- a. Sewer treatment facility experiences an explosion that shuts treatment facility down. Facility will take several days to repair and get back up and running.
  - b. Local construction crew working on major street repairs accidentally damages sewage pipe causing sewage back-ups in 25 residential homes and 5 retail businesses.
  - c. Residential sewage system becomes clogged and begins to backup causing sewage back-ups in 5 residential homes.
4. Dam Failure
- a. Unusually heavy rainfall within Douglas County results in the failure of several dams that result in heavy flooding, power failure, and large sections of the populations in danger. The heavy flooding results in heavy debris flow and structural damages to bridges downstream.
  - b. A single minor dam fails and breaks open causing minor flooding down river. The river levels rise by 1 foot.
  - c. The flood gates on a dam stop functioning and will not open. Water levels behind the dam begin to slowly rise.
5. Information Technology Disruption
- a. Due to a major server crash all County Courthouse computers have no access to County records or files for up to a week.
  - b. Due to cell phone tower being damaged in severe winter winds all cell phone communication is disrupted on the Douglas County coastal zone.
  - c. A minor server glitch causes internet access to be disrupted for an entire day in Roseburg.
6. Fire-Large Scale Urban Conflagration
- a. A small fire starts in a downtown Roseburg business that spreads up into the attic and quickly spreads to other nearby connected buildings. An entire Roseburg city block is engulfed in flames.
  - b. A local gas station just off of I-5 experiences an explosion. All the gas in underground reserves is burning up and several surrounding buildings are in danger of catching fire.
  - c. A small fire begins in a vacant home in a residential area during the night. Due to unchecked lawn care the fire begins to spread across yards and igniting other homes on fire.

7. Hazmat Release
  - a. Chemical production facility experiences a mechanical malfunction in production line that causes a chemical agent spill that runs off into a local river.
  - b. A train derailed carrying radioactive waste material. The train car appears to be severely damaged; shipping containers appear to be intact.
  - c. A semi-truck carrying 8000 gallons of gas tips over on I-5 outside Canyonville spilling and releasing all contents of the tank onto the road.

## Human-Caused Hazards

1. Public Health Emergency
  - a. A pandemic influenza strain strikes Douglas County and quickly begins to spread throughout the County and beyond.
  - b. The local cattle industry is affected by a strain of Mad Cow Disease that infects large herds of cattle within Douglas County.
  - c. Several local grocery stores are found to have tampered bottles of acetaminophen laced with poison.
2. Public Facilities Violence
  - a. A bullied teen takes a weapon to school and begins shooting students and faculty on school grounds. The event leads to 4 deaths and several wounded including the suicide of the shooter.
  - b. A veteran experiencing PTSD holds several medical personnel hostage at the Roseburg VA Hospital.
  - c. A disgruntled ex-employee of a hospital walks into the hospital emergency room and begins firing a weapon at staff and patients. The ex-employee then retreats from the facility before the police can respond and is at large within the community armed and dangerous.

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