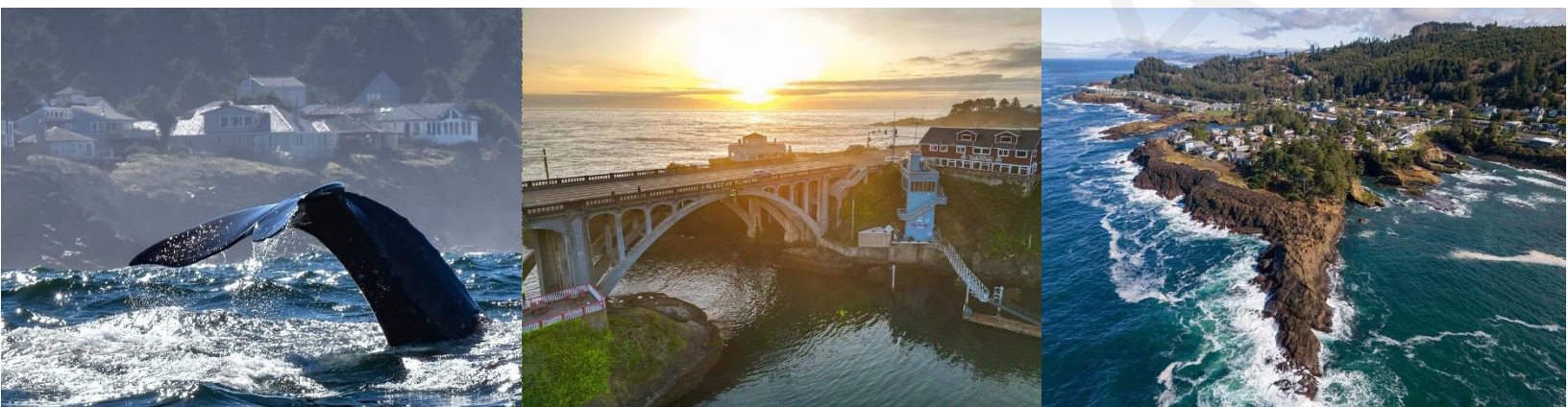


Depoe Bay Addendum to the Lincoln County Multi-Jurisdictional NHMP



Photos courtesy of Depoe Hills

Effective:

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Depoe Bay
Oregon

Prepared for
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Prepared by
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Introduction

Purpose and Adoption

This is the Depoe Bay addendum to the Lincoln County Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP). This addendum is not intended to be a standalone document, rather information contained herein supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation and Volume II (Appendices), which provides additional information. This addendum meets the following requirements:

- Multi-jurisdictional **Plan Requirements: Participation** §201.6(a)(4),
- Multi-Jurisdictional **Plan Content: Risk Assessment** §201.6(c)(2)(iii),
- Multi-jurisdictional **Plan Content: Mitigation Strategy** §201.6(c)(3)(iv), and
- Multi-jurisdictional **Plan Content: Documentation** §201.6(c)(5).

The City of Depoe Bay's original addendum to Lincoln County's NHMP was completed and approved by FEMA in 2009.

For planning purposes, this addendum provides additional information specific to the jurisdiction, with a focus on providing greater details on the risk assessment and mitigation strategy. A description of the jurisdiction specific planning and adoption process follows, along with detailed community specific action items. Information about the jurisdiction's risk relative to the county's risk to natural hazards is documented in the addendum's Hazard Analysis and Issue Identification section. The section considers how the city's risk differs from or matches that of the county's; additional information on Risk Assessment is provided within the Lincoln County NHMP's Section 2 – Risk Assessment.

Process, Participation, and Adoption

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

The City of Depoe Bay adopted their addendum to the Lincoln County Multi-jurisdictional NHMP on [Month DAY], 2025. FEMA Region X approved the Lincoln County NHMP on [Month DAY], 2025 and the city's addendum on [Month DAY], 2025. With approval of this NHMP the district is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through [Month DAY], 2030.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in 44 CFR 201, require that jurisdictions maintain an approved NHMP to receive federal funds for mitigation projects. Local adoption, and federal approval of this NHMP ensures that the city will remain eligible for pre- and post-disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) collaborated with the Oregon Department of Emergency Management (OEM), Lincoln County, and City of Depoe Bay to update their NHMP. Members of the NHMP steering committee also participated in the County NHMP update process (Attachment B and Volume II, Appendix B).

Convener and Committee

The Depoe Bay City Administrator/Recorder serves as the NHMP addendum convener. The convener of the NHMP will take the lead in implementing, maintaining, and updating the addendum to the Lincoln County NHMP in collaboration with the designated convener of the Lincoln County NHMP.

Representatives from the City of Depoe Bay formally, and informally, to discuss updates to their addendum. The steering committee reviewed and revised the city's addendum, with focus on the plan's risk assessment and mitigation strategy (action items).

This addendum reflects decisions made at the designated meetings, and during subsequent work, and communication with OPDR. Other documented changes include revisions to the city's risk assessment and mitigation strategies (action items).

The Depoe Bay Steering Committee was comprised of the following representatives:

- Kimberly Wollenburg, City Administrator/Recorder
- Brady Weidner, Public Works Director
- Paul Carver, Public Works Supervisor
- Emergency Preparedness Committee

Implementation and Maintenance

The City Council will be responsible for adopting the addendum to the Lincoln County NHMP. This addendum designates a steering committee and a convener to oversee the development and implementation of action items. Because the city is part of the county's multi-jurisdictional NHMP, the city will look for opportunities to partner with the county. The city's steering committee will convene after re-adoption of the addendum on an annual schedule; the county is meeting on a quarterly basis and will provide opportunities for participating jurisdictions (cities and special districts) to report on NHMP implementation and maintenance during their meetings. The steering committee will be responsible for:

- Reviewing existing action items to determine suitability of funding;
- Reviewing existing, and new risk assessment data to identify issues that may not have been identified at NHMP creation;
- Educating, and training new steering committee members on the NHMP, and mitigation actions in general;
- Assisting in the development of funding proposals for priority action items;
- Discussing methods for continued public involvement;

- Evaluating effectiveness of the NHMP at achieving its purpose and goals (use Table 4-1, Volume I, Section 4, as one tool to help measure effectiveness); and documenting successes, and lessons learned.

The city will remain active in the county's implementation and maintenance process and utilize the process internally (Volume I, Section 4).

The city will provide continued public participation during the plan maintenance process through periodic presentations to elected officials, public meetings, postings on social media, and/or through interactive content on the jurisdiction's website.

The city will utilize the same action item prioritization process as the county (Volume I, Section 4 and Volume II, Appendix D).

Implementation through Existing Programs

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

Capability Assessment

The Capability Assessment identifies and describes the ability of Depoe Bay to implement the mitigation strategy and associated action items. This is a key component of the Natural Hazard Mitigation Plan (NHMP) update. Capabilities can be evaluated through an examination of broad categories, including existing authorities, policies, programs, funding, resources, and past mitigation successes.

Existing Authorities

Hazard mitigation can be executed at a local scale through three (3) methods: integrating hazard mitigation actions into other local planning documents (i.e., plan integration), adopting building codes that account for best practices in structural hardening, and codifying land use regulations and zoning designations that prescribe mitigation into development requirements. The extent to which a municipality or multi-jurisdictional effort leverages these approaches is an indicator of that community's capabilities.

Existing Mitigation Activities

Existing mitigation activities include current mitigation programs and activities that are being implemented by the community to reduce the community's overall risk to natural hazards. Documenting these efforts can assist participating jurisdictions better understand risk and can assist in documenting successes. The following efforts have occurred or are on-going within Depoe Bay:

- The Depoe Bay City Council adopted an Emergency Operations Plan (EOP) in June 2013. The EOP outlines the city's approach to emergency response and enhances the city's ability to protect the safety, health, and welfare of its citizens. It outlines the city's emergency response structure, assigns roles for key functions, defines lines of authority and coordination, and provides the legal framework for emergency planning. The EOP:
 - Includes all hazards and types of emergencies likely to impact the city.
 - Provides a framework for multi-discipline, multi-jurisdictional coordination and cooperation.
 - Addresses all phases of a disaster through mitigation, preparedness, response, and recovery activities.
 - Designates the National Incident Management System (NIMS) as the framework within which all emergency management activities occur.
 - Directs use of the Incident Command System (ICS) for managing incident response.
 - Identifies roles and responsibilities of city departments, offices, and personnel in emergency operations, as well as those of cooperating public- and private-sector agencies.
 - Establishes life safety followed by protection of property and the environment as emergency response priorities.
 - Provides a common framework within which the city, Lincoln County, special districts, and other agencies/organizations can integrate their emergency planning and response and recovery activities.
- The city has an Emergency Preparedness Locations Map (within their EOP) that identifies evacuation routes and short-term assembly areas for neighborhoods throughout Depoe Bay. The map also identifies long-term assembly areas (updated with new Tsunami Evacuation Maps provided by DOGAMI).
- The city enforces a building setback requirement for all development located along the oceanfront and harbor frontage. A primary purpose of the setback is to reduce property damages related to coastal erosion, windstorms, and flooding. The setback requirements also serve to meet the city's natural hazard goals, as defined in the Depoe Bay Comprehensive Plan:
 - To protect life and property from natural disasters and hazards.
 - To provide adequate safeguards for land uses in areas of natural hazards.
- The City Comprehensive Plan and Zoning Ordinance reflect state legislation (SB 378, implemented as Oregon Revised Statutes (ORS) 455.446 and 455.447) which restricts construction of new essential facilities and special occupancy structures in tsunami inundation zones.
- In addition, the city has tsunami and storm maps and is designated a TsunamiReady and StormReady community by the National Weather Service.
- The city leverages Lincoln County's EverBridge Emergency Notification System to deliver timely alert to its residents, businesses, and visitors during emergencies.
- The city has an Emergency Preparedness Committee that actively prepares the city and its community for emergencies through communication and annual events.

Comprehensive Plan

Oregon's Statewide Planning Goal 7 requires comprehensive planning within every jurisdiction that is designed to reduce risks to people and property from natural hazards. The Depoe Bay Comprehensive Plan provides the policy and regulatory foundation for all land use management. It integrates policies and recommendations to meet the Oregon Statewide Planning Goals, including Statewide Planning Goal 7, Natural Hazards.

The [Depoe Bay Comprehensive Plan \(1991\)](#) chapter 7, Natural Hazards, implements Statewide Planning Goal 7. The two goals of the chapter are to protect life and property from natural disasters and provide adequate safeguards for land uses in areas of natural hazards. The policies in support of goal 7 are the city will regulate development in areas of known or suspected natural hazards through provision of safeguards, maintain current mapping of hazards for overlay zones, and require National Flood Insurance Program (NFIP) compliance for developments in flood areas.

Land Use Regulations

Existing land use policies that define zoning and address hazardous conditions provide another source of mitigation capability.

Land Use Codes

The [Depoe Bay Code of Ordinances](#) Title XV, Land Usage, Chapter 152, Zoning is the city's zoning regulation. Section 152.040 is the city's Flood Hazard Overlay Zone. The purpose of this ordinance is to promote public health, safety, general welfare, and minimal public and private loss due to flooding. Paragraph 'E' outlines provisions of flood hazard reduction, which includes requirements for anchoring, materials, water systems, and watercourse alterations. This subsection says the city's freeboard requirements for residential constructions is one (1) foot or more above the base flood elevation. There are additional provisions for flood hazard reduction in Riverine Flood Zones, Coastal High Hazard Areas, and Shallow Flooding Areas (AO Zones).

Regarding the FEMA Pre-Implementation Compliance Measures (PICM) in response to the National Marine Fisheries Service Biologic Opinion (BiOp), Depoe Bay decided to permit regulation in flood zones on a case-by-case basis. The purpose of the PICM is ensure city compliance with the Endangered Species Act (ESA).

Wildfire Safety

Section 152.037 is the city's Timber Conservation Zone (T-C) regulations. Paragraph 'F' details siting and fire protection standards for buildings. One outcome of these standards are that the risks associated with wildfire are minimized.

The City of Depoe Bay and the Depoe Bay Rural Fire Protection District is included in the Lincoln County Community Wildfire Protection Plan (2024). The CWPP helps communicate jurisdictional priorities regarding the protection of life, property, and critical infrastructure in the wildland–urban interface on both public and private land.

The [Community Wildfire Protection Plan \(CWPP, 2024\)](#) helps the city communicate its priorities for the protection of life, property, and critical infrastructure in the wildland–urban

interface on both public and private land. Local fire service organizations help define issues that may place the county, communities, and/or individual homes at risk. The Depoe Bay Fire District has their own profile in the CWPP, in which issues of concern, collaboration with other fire districts, and areas of response are addressed.

Structural Building Codes

The Oregon Legislature adopted updated building codes for both residential (2021 adoption) and commercial structures (2022) since the last update of the NHMP. These building codes are based on the 2021 version of the International Building Code, International Fire Code, and International Existing Building Code.

Depoe Bay adopts the State Building Code as defined in ORS 455 as the Depoe Bay Building Code.

Policies and Programs

City Plans

The [Depoe Bay Emergency Operations Plan \(2013\)](#) ensures coordination of protection, prevention, mitigation, response, and recovery activities. Authorities are listed by what Emergency Support Function (ESF) they are responsible for.

The Lincoln County Evacuation Plan (2024) has a priority area plan for Depoe Bay. The purpose of the priority area plan is to help the community prepare for disasters and to help facilitate any needed evacuations. The priority area plan outlines the city's natural disaster risks, the current emergency response system, different evacuation routes, and recommendations

The [Depoe Bay Water System Master Plan \(2009\)](#) is a technical document that gives the city information needed to administer and manage the water system. The plan makes recommendations for the city to improve its water system. One recommendation is that the city install mobile emergency backup generators at each of the three existing booster stations on Collins Street, Bechill Street, and View of the Bay. For all recommendations, the plan outlines total costs and funding strategies. One strategy using Emergency Community Water Assistance Grants (ECWAC), which is administered by the United States Department of Agriculture (USDA) Rural Utilities Service (RUS) Water and Waste Disposal programs.

The [Depoe Bay Transportation System Plan: Volumes I & II \(TSP, 2017\)](#) prepares Depoe Bay for accommodating traffic within the urban growth boundary (UGB) until 2035. The TSP services as the transportation element of the city's comprehensive plan. Volume I contains the entirety of the plan, while volume II represents the iterative process and refinements that went into developing the TSP. Objective 5d of the TSP is to improve and maintain tsunami evacuation and Seismic Lifeline routes. The Seismic Lifeline routes are not named in the TSP. The TSP also recommends adding traffic calming measures to streets. Traffic calming projects must coordinate with emergency services to ensure the project does not impede disaster response.

National Flood Insurance Program (NFIP)

Depoe Bay participates in the [National Flood Insurance Program \(NFIP\)](#). The program is managed by the Planning Department. The program makes flood insurance available to all property owners. To maintain eligibility for the NFIP, Depoe Bay has adopted and enforces special building and development restrictions for lands that are subject to flooding.

Depoe Bay is not a Community Rating System (CRS) community. The CRS system is a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the National Flood Insurance Program.

Oregon Department of Transportation (ODOT) Seismic Lifelines

According to the Oregon Department of Transportation, Depoe Bay has one highway that is considered a Seismic Lifeline. Highway 101 is a tier 1 lifeline. These routes are a part of the state's overall network of streets, highways, and bridges that will facilitate emergency service response and support during a seismic event.

Government Structure

The City Council is the policy making body for Depoe Bay. As the elected legislative body in Depoe Bay, the City Council has overall responsibility for the scope, direction and financing of city services. Council members serve four-year terms. The mayor serves two-year terms. Additional departments within the city include the following:

City Administrator/Recorder: The city administrator/recorder assures the timely presentation of formal communications from the public, other agencies and city staff to the City Council. The city administrator/recorder prepares City Council meeting agendas; maintains official city records which reflect the action of the governing body; maintains depository of contracts, agreements and official Council actions and ensures the timely availability of these records to the Council, public, other agencies and staff.

Public Works Department: The public works department provides responsive community services related to planning, design, construction, operation, maintenance and management of public infrastructure, including streets, sewer, water treatment, wastewater treatment, public buildings, harbor, and other facilities. Services provided by the department contribute to the public health, safety, economic diversity, environmental quality, and citizen convenience.

Land Use Planning: The city provides services and information to the general public regarding all phases of community development and land use planning. Staff implements city ordinances, administers the local comprehensive plan and land use code, and advises the City Council and Planning Commission on all land use and special project matters.

Although not a city department, the Depoe Bay Rural Fire Protection District provides structural fire protection for the City of Depoe Bay.

Other commissions exist in Depoe Bay and assist in facilitating public services in the following areas: Harbor Commission, Planning Commission, Emergency Preparedness Committee,

Parks & Recreation Commission, Salmon Enhancement Commission, Energy Advisory Committee, and the Urban Renewal Agency.

Mitigation Successes

This is a list of funding that Depoe Bay has sought out or received, as well as recently completed projects to improve mitigation.

- Fire Station 2300 (2013-14 SRGP grant award, \$831,418).
- \$2,500 county grant for cache supplies.
- \$97,000 community renewable energy grant to explore alternate energy sources for City Hall, which is the Emergency Operations Center.
- OHA drinking water source protection grant (conservation easements, etc. to buffer logging).

Mitigation Strategy

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

Depoe Bay follows the mission and hazard mitigation goals described in Volume I.

The city's action items were first developed through a two-stage process during the 2009 NHMP development and revised in 2015 and 2020. In stage one, OPDR facilitated a work session with the steering committee to discuss the city's risk and to identify potential issues. In the second stage, OPDR, working with the local steering committee, developed potential actions based on the hazards and the issues identified by the steering committee. During the 2025 update process OPDR re-evaluated the Action Items with the county and local steering committees and updated actions, noting what accomplishments had been made and if the actions were still relevant; any new action items were identified at this time (Table DA-1). For additional information see Attachment B.

The steering committee opted to not include mitigation strategies for low vulnerability and low probability hazards including: tornado, air quality, crustal earthquake, and riverine flood. The steering committee will study these hazards further during the implementation and maintenance phase of this NHMP, seeking to identify cost effective actions that might be implemented to reduce community vulnerability.

Priority Action Items

Table DA-1 presents a list of mitigation actions. The steering committee decided to modify the prioritization of action items in this update to reflect current conditions (risk assessment), needs, and capacity. High priority actions are shown with orange highlight. The city will focus their attention, and resource availability, upon these achievable, high leverage, activities over the next five years. Although this methodology provides a guide for the steering committee in terms of implementation, the steering committee has the option to implement any of the action items at any time. This option to consider all action items for

implementation allows the committee to consider mitigation strategies as new opportunities arise, such as capitalizing on funding sources that could pertain to an action item that is not currently listed as the highest priority.

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Table DA-1 Action Items

Mitigation Strategies		Impacted Hazard												Implementation and Maintenance			
Action Item #	Statement	Air Quality	Coastal Erosion	Drought	Earthquake	Extreme Heat	Flood	Landslide	Tsunami	Volcanic Event	Wildfire	Windstorm*	Winter Storm	Potential Funding Resources	Lead	Timeline	Cost
1	Conduct a comprehensive assessment of high-risk coastal erosion areas using existing DOGAMI (Oregon Department of Geology and Mineral Industries) data and implement targeted mitigation strategies.		X											Local funding resources (e.g., general fund), HMA, DLCD Technical Assistance	Public Works	L	L to H
2	Ensure continuity of emergency response and community mobility in the event of bridge collapse due to a major earthquake or tsunami by identifying, evaluating, and preparing over-water transportation alternatives.				X				X					Local funding resources (e.g., general fund), HMA	Public Works	L	L
3	Reduce landslide risk to life, property, and infrastructure by acquiring high-resolution LiDAR data, creating updated landslide inventories and susceptibility maps, and integrating them into local planning, zoning, and development regulations. Use the 2019 Landslide Hazards Land Use Guide to inform policy language and development review procedures.							X						Local funding resources (e.g., general fund), HMA, DLCD Technical Assistance	City of Depoe Bay	S	L to M
4	Enhance the seismic and tsunami resilience of critical public facilities—including city hall, water treatment plants, and wastewater treatment plants—by conducting comprehensive structural and non-structural assessments, implementing prioritized retrofits, and adopting land use and building policies that reduce long-term vulnerability. Use the 2015 Preparing for a Cascadia Subduction Zone Tsunami: A Land Use Guide for Oregon Coastal Communities to inform policy language.				X				X					Local funding resources (e.g., general fund), HMA, DLCD Technical Assistance	Public Works/ Planning	M	M
5	Locate and supply emergency caches within identified assembly areas and potential islands				X		X	X	X		X	X	X	Local funding resources (e.g., general fund), HMA	City of Depoe Bay	S	L to M
6	Develop backup power supply systems for gas stations and local churches. Assist in acquiring adapters to connect the gas pumps to a generator to ensure that the city has access to fuel when the power is out.				X				X		X	X	X	Local funding resources (e.g., general fund), HMA	City of Depoe Bay, Lincoln County Emergency Management	M	M to H
7	Increase the percentage of households in that are '2 Weeks Ready'—equipped with at least 14 days of food, water, medications, and emergency supplies—through a coordinated public outreach campaign, resource distribution events, and readiness assessments.				X				X		X	X	X	Local funding resources (e.g., general fund), HMA	City of Depoe Bay, Emergency Preparedness Committee	S	M

Mitigation Strategies		Impacted Hazard												Implementation and Maintenance			
Action Item #	Statement	Air Quality	Coastal Erosion	Drought	Earthquake	Extreme Heat	Flood	Landslide	Tsunami	Volcanic Event	Wildfire	Windstorm*	Winter Storm	Potential Funding Resources	Lead	Timeline	Cost
8	Identify and retrofit existing public buildings (e.g., community centers, libraries, schools) with HEPA filtration systems to serve as clean air shelters during periods of poor air quality due to wildfire smoke. Ensure shelters are accessible, well-publicized, and stocked with necessary supplies (e.g., masks, water, first aid).	X												Local funding resources (e.g., general fund), HMA	City of Depoe Bay, Emergency Preparedness Committee	S	M

Source: NHMP steering committee, 2025.
Cost: L (less than \$50,000), M (\$50,000-\$499,999), H (\$500,000-\$5 million), VH (more than \$5 million),
Potential Funding Sources: HMA=FEMA’s Hazard Mitigation Assistance disaster and non-disaster grant programs
Timing: Ongoing (continuous), Short (1-4 years), Medium (4-10 years), Long (10 or more years)
Priority Actions: Identified with orange highlight
* - the windstorm hazard includes tornadoes (water spouts)
Dark Grey highlight indicates that the hazard does not impact the jurisdiction.

Risk Assessment

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

Phase 1: Identify hazards that can impact the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.

Phase 2: Identify important community assets and system vulnerabilities. Example vulnerabilities include people, businesses, homes, roads, historic places and drinking water sources.

Phase 3: Evaluate the extent to which the identified hazards overlap with, or have an impact on, the important assets identified by the community.

The local level rationale for the identified mitigation strategies (action items) is presented herein, and within Volume I, Section 2, and Volume III, Appendix C.

Hazard Analysis

The NHMP steering committee updated the city’s previous [hazard analysis](#) to reflect current conditions. Where appropriate, changes were made to distinguish the city’s risks from those in the County’s hazard analysis, as detailed throughout this addendum.

Table DA-2 shows the hazard analysis matrix listing each hazard in rank from high to low. For local governments, conducting hazard analysis is a useful step in planning for hazard mitigation, response, and recovery. The method provides the jurisdiction with a sense of hazard priorities but does not predict the occurrence of a particular hazard. See Volume I, Section 2 for methodology details.

Windstorm, winter storm (snow/ice), landslide, and Cascadia Subduction Zone earthquake are the **high hazard threats** to the city. Coastal erosion, wildfire, local tsunami, and distant tsunami are the **moderate hazard threats**. Tornado, air quality/smoke, crustal earthquake, and riverine floods are the **low hazard threats**.

The city is not affected by drought, extreme heat events, coastal floods, or volcanic events, as such the hazards are not profiled and not included in their hazard analysis.

Table DA-2 Hazard Analysis Matrix

Hazard	History	Vulnerability	Maximum Threat	Probability	Total Threat Score	Hazard Rank	Hazard Tiers
Windstorm	20	50	100	70	240	#1	Top Tier
Winter Storm	18	35	90	70	213	#2	
Landslide	20	35	80	70	205	#3	
Earthquake (Cascadia)	2	50	100	49	201	#4	
Coastal Erosion	20	20	70	70	180	#5	Middle Tier
Wildfire	16	25	70	56	167	#6	
Local Tsunami	2	25	80	49	156	#7	
Distant Tsunami	10	15	50	35	110	#8	
Air Quality/Smoke	6	10	50	35	101	#9	Bottom Tier
Earthquake (Crustal)	10	20	40	21	91	#10	
Tornado	8	10	30	28	76	#11	
Flood (Riverine)	16	5	10	42	73	#12	

Source: City of Depoe Bay NHMP Steering Committee (2025)

Community Characteristics

Table DA-3 and the following section provide information on city specific demographics and assets. For additional information on the characteristics of the city, in terms of geography, environment, population, demographics, employment, and economics, as well as housing and transportation, see Volume II, Appendix C. Many of these community characteristics can affect how natural hazards impact communities and how communities choose to plan for natural hazard mitigation. Considering the city-specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation.

Unless otherwise specified, data in this section comes from: Social Explorer: American Community Survey 5-Year Estimates (2018-2022). U.S. Census Bureau.
<https://www.socialexplorer.com/explore-tables>.

Location and environment

Depoe Bay is located on the central Oregon Coast in Lincoln County, approximately 12 miles south of Lincoln City and 100 miles from the Portland metropolitan area. Depoe Bay sits at an average elevation of 58 feet above sea level. The city limits cover a land area of approximately 1.80 square miles and is adjacent to a small natural navigable harbor consisting of six square miles. The city is known for having the world's smallest natural harbor at six acres in size.

The climate in Depoe Bay is moderate. Average monthly temperatures range from lows of 39-40° F (December through February) to highs of 65° F (July through September). The driest months are July and August (average about 0.8 inches of precipitation per month) the wettest months are November through January (average more than ten inches of precipitation per month). Depoe Bay has an average annual precipitation of approximately 67.5 inches.

71% of that, or 47.6 inches, falls November through March. The city is bound to the north by Boiler Bay State Park and to the south by Whale Cove.

Population, housing, and development

Between 2019 and 2023 the city grew by 124 people (9%). According to the State's official coordinated population forecast (preliminary), between 2023 and 2045 the city's population is forecast to grow by 18% to 1,858. The city has an educated population with 99% of residents 25 years and older holding a high school degree, and 36% have a bachelor's degree or higher. As of 2023-24, Taft High School in Lincoln City (the nearest school) and the Lincoln County School District have 86% and 82% graduation rates, respectively.¹ Depoe Bay includes industrial and commercial development but is zoned primarily residential.

Development in Depoe Bay spreads mostly north to south along US Highway 101. Dense commercial areas in Depoe Bay exist along US Highway 101 and are centrally located in the downtown area and around the harbor. Residential development is located north, south, and east of downtown along US Highway 101, and west along the Pacific Ocean. The city's Comprehensive Plan identifies land use needs within the city and its urban growth boundary. Depoe Bay is expanding to the east, has an aging population, and has an expanding number of second/rental homes in the community.

Several housing developments are currently underway across the city, each at different stages of construction. Among them are The Hills, Whale Watch, Cedar Hills, and View of the Bay. These projects represent ongoing growth and investment in the community, contributing to the city's expanding residential landscape.

Despite this growth, the city does not anticipate any Urban Growth Boundary expansions to happen soon. The city finds the currently available population growth estimates to be low. Depoe Bay has had more population growth than expected in the last couple of years, but recognizes that many of these are short-term rental properties, which increases the transient population.

Economy

Just over 51% of the resident population 16 and over is in the labor force (1,044 people) and 4% are unemployed. Top occupations include service jobs (33%), management and professional (29%), and sales and office (23%). The median household income in the city is \$66,667, a 5% increase since 2017.

Most workers residing in the city (85%, 1,437 people) travel outside of the city for work primarily to Newport.² A significant population of people travel to the city for work, (77% of the workforce, 856 people) primarily from Newport and Corvallis.

¹ Lincoln Chronicle, Graduation rate for Lincoln County's class of 2024 improves to 82%, reaching state's average, January 30, 2025.

² U.S. Census Bureau. LEHD Origin-Destination Employment Statistics (2002-2022). Longitudinal-Employer Household Dynamics Program, accessed on May 29, 2025 at <https://onthemap.ces.census.gov>.

Table DA-3 Community Characteristics

Population Characteristics		Population
2019 Population Estimate	1,445	Growth
2023 Population Estimate	1,569	9%
2045 Population Forecast*	1,858	18%
Race		
American Indian and Alaska Native		0%
Asian		< 1%
Black/ African American		0%
Native Hawaiian and Other Pacific Islander		0%
White		93%
Some Other Race		1%
Two or More Races		1%
Hispanic or Latino/a (of any race)		
Limited or No English Spoken	0	0%
Vulnerable Age Groups		
Less than 5 Years	82	4%
Less than 15 Years	183	9%
65 Years and Older	640	31%
85 Years and Older	39	2%
Age Dependency Ratio		0.66
Disability Status (Percent age cohort)		
Total Disabled Population	360	17%
Children (Under 18)	5	< 1%
Working Age (18 to 64)	173	8%
Seniors (65 and older)	182	9%
Income Characteristics		
Households by Income Category		
Less than \$15,000	64	8%
\$15,000-\$29,999	148	17%
\$30,000-\$44,999	90	11%
\$45,000-\$59,999	110	13%
\$60,000-\$74,999	88	10%
\$75,000-\$99,999	151	18%
\$100,000-\$199,999	156	18%
\$200,000 or more	49	6%
Median Household Income		\$66,667
Gini Index of Income Inequality		0.43
Poverty Rates (Percent age cohort)		
Total Population	145	7%
Children (Under 18)	16	8%
Working Age (18 to 64)	75	6%
Seniors (65 and older)	54	8%
Housing Cost Burden (Cost > 30% of household income)		
Owners with a Mortgage		22%
Owners without a Mortgage		4%
Renters		18%
Household Characteristics		
Housing Units		
Single-Family (includes duplexes)	1,269	79%
Multi-Family	116	7%
Mobile Homes (includes RV, Van, etc.)	216	14%
Household Type		
Family Household	162	16%
Married couple (w/ children)	116	11%
Single (w/ children)	46	5%
Living Alone 65+	207	20%
Year Structure Built		
Pre-1970	218	14%
1970-1989	467	29%
1990-2009	814	51%
2010 or later	102	6%
Housing Tenure and Vacancy		
Owner-occupied	739	46%
Renter-occupied	285	18%
Seasonal	492	31%
Vacant	577	36%
Vehicles Available (Occupied Units)		
No Vehicle (owner occupied)	21	2%
Two+ vehicles (owner occupied)	544	53%
No Vehicle (renter occupied)	4	1%
Two+ vehicles (renter occupied)	97	34%
Employment Characteristics		
Labor Force (Population 16+)		
In labor Force (% Total Population)	1,044	51%
Unemployed (% Labor Force)	137	13%
Occupation (Top 5) (Employed 16+)		
Management, Professional, and Related	384	42%
Sales and Office	255	28%
Service	170	19%
Product., Transport., & Material Moving	48	5%
Constr., Extraction, and Maintenance	41	5%
Health Insurance		
No Health Insurance	80	4%
Public Health Insurance	883	43%
Private Health Insurance	1,486	72%
Transportation to Work (Workers 16+)		
Drove Alone	657	74%
Carpooled	77	9%
Public Transit	20	2%
Motorcycle	0	0%
Bicycle/Walk	44	5%
Worked at Home	96	11%

Source: Social Explorer: American Community Survey 5-Year Estimates (2018-2022). U.S. Census Bureau.

<https://www.socialexplorer.com/explore-tables>; Population Research Center. (2023, April). *Annual Population Estimates*.

Portland State University. <https://www.pdx.edu/population-research/>.

*Source for 2045 Population Estimate: Population Research Center. (2025, March 15). *Region 4: Northwest Oregon Results (Proposed) – Lincoln County*. Portland State University Oregon Population Forecast Program. <https://www.pdx.edu/population-research/population-forecasts>.

Note: The U.S. Census Bureau American Community Survey 2018-2022 data used for this analysis has varying levels of reliability depending on geographic area, demographic group, and types of data. These figures are primarily used for estimation and to develop a general understanding of the demographics of a location and should not be mistaken for precise figures.

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of the city (site map). Mitigating risk to these facilities will increase the community's resilience.

Critical Facilities & Infrastructure

Critical facilities are those that support government and first responders' ability to act in an emergency. They are a top priority in any comprehensive hazard mitigation plan. Individual communities should inventory their critical facilities to include locally designated shelters and other essential assets, such as fire stations, and water and wastewater treatment facilities.

Depoe Bay has the following critical facilities (**bold** indicates facility was included in the Risk Report [DOGAMI, O-20-11](#)):

- **City Hall** (570 Shell Avenue)
- Community Hall (220 SE Bay St)
- Wastewater Treatment Plant (212 South Point St)
 - See [Utility Lifelines](#) for additional system details
- Water Treatment Plant (455 Collins St)
 - See [Utility Lifelines](#) for additional system details
- **Depoe Bay Rural Fire Protection District Station 2300** (325 SW Hwy 101)
- Marine Fueling Bunker and Boats (Depoe Bay Harbor, Coast Guard Dr)
- **Samaritan Depoe Bay Clinic** (531 Hwy 101, Suite A)
- **U.S. Coast Guard Depoe Bay Station** (240 Coast Guard Dr)
- Fuel Bunker at Harbor – Controlled by Public Works
- Central Lincoln Public Utilities (2129 North Coast Highway Newport, OR 97365)
- Otter Rock Lattice Tower (4690 South Hwy 101)
- Depoe Bay Fire Station Cell Tower (325 Hwy 101)
- Gleneden Beach Fire Station Cell Tower (6445 Gleneden Beach Loop)
- Northwest Natural (1405 SE Hwy 101)
- Bayside Chapel (145 NE Collins St)
- Little Whale Cove Recreation Center (15 SW Singing Tree)
- Neighbors for Kids (634 Hwy 101)
- Samaritan Depoe Bay Clinic (531 Hwy 101 A)
- Shell Gas Station (20 SE Schoolhouse St)
- Chevron Gas Station (466 Hwy 101)

In addition, Neighbors for Kids Building, the park building, and sea wall (built of lava rock) are considered important community assets.

Transportation

Mobility in Depoe Bay plays an important role in the daily experience of its residents and businesses. Motor vehicles represent the dominant mode of travel through and within the city. Depoe Bay is also served by Lincoln County Transit Route 495 with service running seven days a week with stops in Depoe Bay. Caravan Airport Transportation also provides service from the city to Portland International Airport.

Roads/Seismic lifelines

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.³

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system; it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

Highway 101 (Tier I) is the major north-south transportation route through the city ([ODOT Map](#)). Highway 18 (Tier I, north of Lincoln City), and Highway 20 (Tier III, Newport) are the major east-west transportation routes connecting the coast to the Willamette Valley.

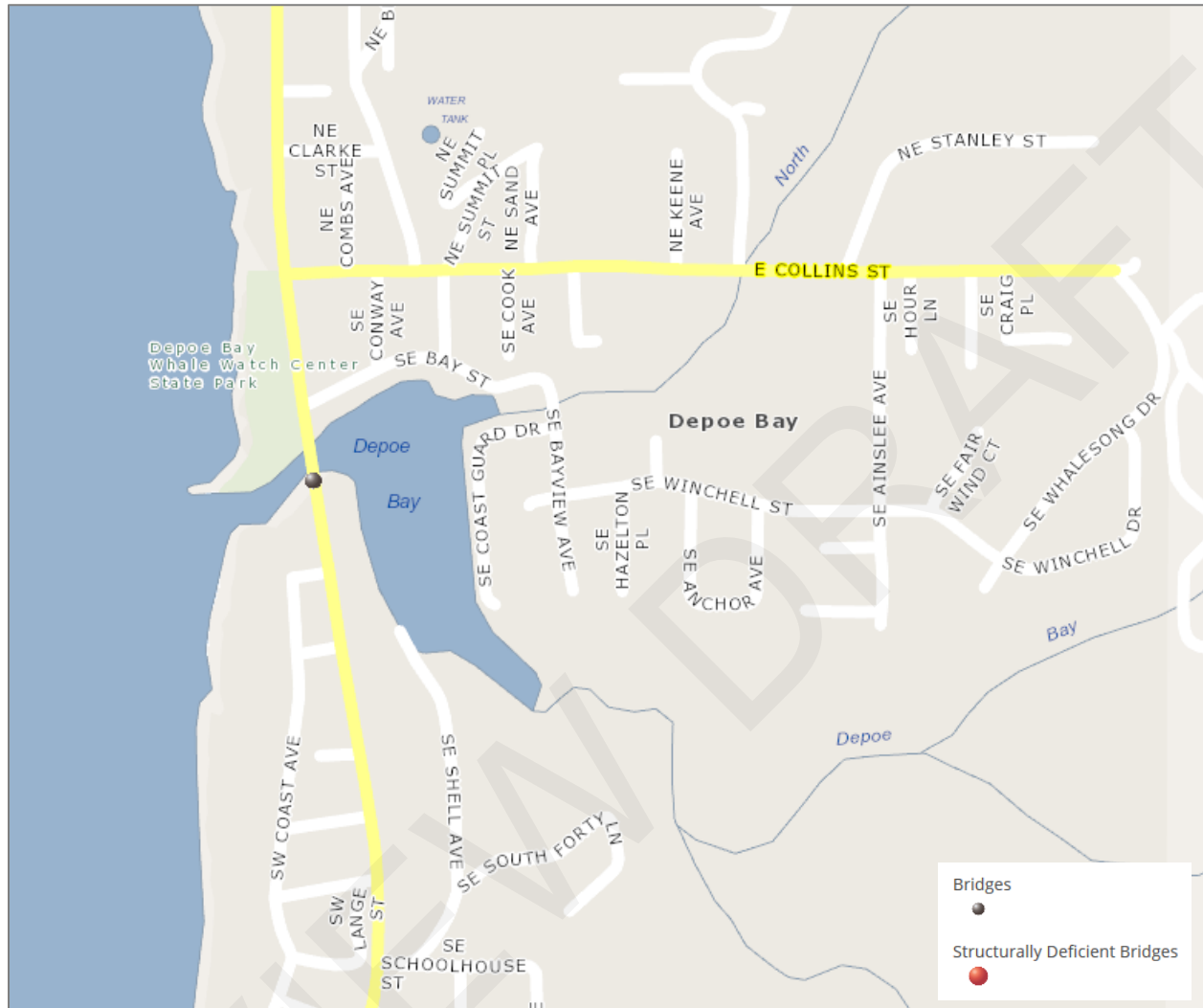
Bridges

Because of earthquake risk, the seismic vulnerability of the city's bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. Bridges within the city that are critical or essential include (see **Error! Reference source not found.**):

- Depoe Bay Bridge (ca. 1927), US 101 (Hwy 9) (Bridge ID 02459)

³ Oregon Department of Transportation. Oregon Seismic Lifeline Evaluation, Vulnerability Synthesis, and Identification, *Oregon Seismic Lifeline Routes*, May 15 2012.

Map DA-1 Oregon Bridges and Structurally Deficient Bridges



Source: Oregon Department of Transportation, ODOT TransGIS, accessed June 11, 2025

More information on Seismic Design of bridges is on the ODOT website:

<https://www.oregon.gov/odot/Bridge/Pages/Seismic.aspx>

Railroads

There are no railroads in Depoe Bay.

Airports

There are no public airports in Depoe Bay. The Siletz Bay State Airport is the nearest airport (about 6 miles north of the city). The city has no commercial service airports. The nearest commercial airports are in Eugene and Portland.

Utility Lifelines

Utility lifelines are the resources that the public relies on daily such as electricity, fuel and communication lines. If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructures, like dams and power plants, as they transmit the power generated from these facilities.

Generally, the network of electricity transmission lines running throughout the city is operated by Central Lincoln PUD. The Williams Gas Pipeline provides natural gas that is delivered to customers in the city by Northwest Natural Gas. These lines may be vulnerable as infrequent natural hazards, like earthquakes, could disrupt service to natural gas consumers across the region.

The city water and wastewater systems include the following:

Water Infrastructure

- Raw Water Reservoir
- Well
- Water Treatment Plant (455 Collins St)
 - 5 Water Pump Stations
 - 2 Water Storage Tanks (1.6 million gallons)
 - Water Mains and Distribution Lines

Wastewater Infrastructure

- Wastewater Treatment Plant (212 South Point St)
 - 5 Sewer Pump Stations
 - 14.7 miles of Sewer Mains

Cultural and Historic Resources

Completion of the Roosevelt Highway and Depoe Bay Bridge in 1927 made Depoe Bay more accessible to tourists, new residents and those seeking to invest in the area. The natural beauty of the rugged coastline, rich marine life and abundant natural resources made Depoe Bay a popular destination early on. In 1927, the Depoe Bay Aquarium was built and remained one of the only privately-owned aquariums in the United States until its closure in 1998. Given its proximity to the Pacific Ocean, Depoe Bay is a coastal fishing community where whale watching is also a popular activity.

Historic and cultural resources such as historic structures and landmarks can help to define a community and may also be sources of tourism dollars. Because of their role in defining and supporting the community, protecting these resources from the impact of disasters is important. The National Register of Historic Places lists one historic site within the City of Depoe Bay while the State Historic Preservation Office includes several other properties.⁴ The following list includes the seven sites that are listed on the National Register of Historic Places:

- Archeological Site (35-LNC-68), Address Restricted (vicinity) (eligible/significant)

⁴ Oregon Historic Sites Database, <http://heritagedata.prd.state.or.us/historic/>, accessed February 18, 2025

- Boiler Bay Site (35-LNC-45), Address Restricted (vicinity) (eligible/significant)
- Government Point Site (35-LNC-44), Address Restricted (vicinity) (eligible/significant)
- Rocky Creek Site (35-LNC-43), Address Restricted (vicinity) (eligible/significant)
- Depoe Bay Bridge, Hwy 101, 1927 (eligible/significant)
- Depoe Bay Ocean Wayside, 119 SW Hwy 101, 1956 (eligible/significant)

The following list includes two (2) other properties listed on the State Historic Preservation Office website:

- Depoe Bay City Hall (former elementary school), 570 SE Shell Ave, c.1933 (eligible/significant)
- Bower-Chambers Landmark, Depoe Bay Ocean, 1936 (eligible/contributing)

Depoe Bay has many festivals and community events throughout the year, including the Easter Egg Hunt, Crab Feed, Fleet of Flowers Memorial Day Ceremony, Christmas Lighting, and National Night Out. Other local attractions include clamming, crabbing, deep sea fishing, watching spouting horns, whale watching, hiking, beachcombing, and tide pooling. Recreational amenities include the Depoe Bay Whale Watch Center, the Depoe Bay City Park and numerous pocket parks and nature trails, Rocky Creek Scenic Area, Boiler Bay Scenic Area, and a wide range of restaurants, galleries and shops.

Community Organizations and Programs

Social systems can be defined as community organizations and programs that provide social and community-based services, such as health care or housing assistance, to the public. In planning for natural hazard mitigation, it is important to know what social systems exist within the community because of their existing connections to the public. Often, actions identified by the plan involve communicating with the public or specific subgroups within the population (e.g. elderly, children, low income). The county and cities can use existing social systems as resources for implementing such communication-related activities because these service providers already work directly with the public on several issues, one of which could be natural hazard preparedness and mitigation. The countywide community organizations that are active within the city and county and may be potential partners for implementing mitigation actions can be found in Appendix C: Community Profile.

Lincoln County School District

The Lincoln County School District and schools in Lincoln City serve Depoe Bay students approximately 10 miles north of Depoe Bay. For more information on School District assets see their addendum in Volume III.

Hazard Profiles

The following sections briefly describe relevant information for each profiled hazard. More information on Lincoln County hazards and future projections can be found in Volume I, Section 2. Note that these hazards are sorted alphabetically and not by hazard tier as determined in the city's Hazard Analysis Matrix.

In addition, the city incorporates by reference the Oregon Department of Geology and Mineral Industries (DOGAMI) multi-hazard risk assessment (Risk Report, [DOGAMI, O-20-11](#)) for Lincoln County that includes economic and population loss estimates for coastal erosion, Cascadia Subduction Zone earthquake and tsunami, flood, landslide, and wildfire (summarized herein).

Development forecasts are expected to increase or decrease the impact of the profiled hazards. New housing development in hilly areas of city have increased the city's vulnerability to landslides. Additionally, the population of adults aged 65 and older is increasing within this jurisdiction. As a result, the impact of the air quality hazard may increase.

Air Quality

The Steering Committee rated the city's **probability of occurrence for air quality/smoke events as "moderate" and their vulnerability as "low"**. *This hazard was not assessed in the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of air quality hazards, history, and how they relate to future climate projections as well as the location, extent, and probability of a potential event. Increases in wildfire conditions have shown an increasing potential for air quality hazards.

Additional information can be found on the Lincoln County website:
<https://www.co.lincoln.or.us/742/Hazards-Air-Quality>.

Lincoln County has limited capacity to monitor air quality. Development forecasts are not expected to increase or decrease the impact of this hazard. However, the population of adults aged 65 and older is increasing within this jurisdiction. As a result, the impact of this hazard may increase.

Future Climate Projection:

According to OCCRI report *"Future Climate Projections: Lincoln County"* ([Link](#)) the probability of Under future climate change, the risk of wildfire smoke exposure is projected to increase in Lincoln County. In Lincoln County, the number of "smoke wave" days is projected to decrease by 7% while the intensity of "smoke waves" is projected to increase by 89% by 2046–2051 under a medium emissions scenario compared with 2004–2009.

Coastal Erosion

The Steering Committee rated the city's **probability of occurrence for coastal erosion events as "high" and their vulnerability as "moderate"**. *These ratings have not changed since the previous NHMP.*

Volume I, Section 2 describes the characteristics of coastal erosion hazards, as well as the history, location, extent, and probability of a potential event. Coastal erosion is a natural process that continually affects coastal areas; in Depoe Bay and elsewhere along the Pacific, coastal erosion becomes a hazard when lives and properties are at risk of death, injury, or damage. Coastal erosion is typically a gradual process, which can be greatly accelerated in the event of a storm or climate factors that increase the potential for coastal erosion.

Future Climate Projection:

According to OCCRI report "*Future Climate Projections: Lincoln County*" ([Link](#)) the risk of coastal erosion is expected to increase due to sea level rise and changing wave dynamics.

Vulnerability Assessment

Depoe Bay has many high cliffs, as well as developments that are very close to the ocean. The city rests on a combination of basalt and sandstone. Aside from oceanfront properties, one area identified as particularly vulnerable to coastal erosion is the north side of the Depoe Bay harbor. The north side of the harbor consists of very high, steep, vertical sandstone cliffs where a condominium complex and several homes are located. Additional residential developments have been built in the hills since 2020 which has put more people at risk of landslides. The city also has a main sewer line located in Bay Street at the top of the cliff. Some erosion has occurred in these areas. The county identified areas along Highway 101 that have sustained erosion-induced damages. Within the City of Depoe Bay, however, the highway is safe. To mitigate the effects of coastal erosion, the city requires new development to comply with setback restrictions.

Potential community-related impacts, including shoreline reduction, economic (tourism-related) impacts, and property/infrastructural damage, are adequately described within the Volume I, Section 2 of the NHMP. See Map DA-2 for locations of the city's coastal erosion hazard along coastal bluffs on the city's western edge.

Natural Hazard Risk Report for Lincoln County

The **Risk Report** ([DOGAMI, O-20-11](#)) provides hazard analysis summary tables that identify populations and property within Lincoln County that are vulnerable to coastal erosion. The Risk Report provides a distinct profile for Depoe Bay.

The Risk Report provides an analysis of dune-backed beaches and bluff-backed shorelines to identify the general level of susceptibility due to storm-induced erosion, sea level rise, and subsidence due to CSZ earthquake event. The Risk Report performed an analysis of buildings, including critical facilities, to determine exposure for each community. According to the Risk Report the following resident population and property (public and private) within Depoe Bay may be impacted by profiled coastal erosion scenario (Table DA-4).

Approximately three percent of the city’s population (45 people) may be displaced by coastal erosion. These people are expected to have mobility or access issues and/or may have their residences impacted by coastal erosion. Properties that are most vulnerable to the coastal erosion hazard are those that are developed in an area of steep dunes or cliffs. Just under five percent (64 buildings) of all buildings (residential, commercial, industrial) are exposed to the high coastal erosion hazard zone. The value of exposed buildings is \$12.8 million (about 5% of total building value). It is important to note that impact from coastal erosion may vary depending on areas that are impacted during an event.

Table DA-4 Potentially Displaced Residents and Exposed Buildings, Coastal Erosion

Community Overview: Depoe Bay						
Population		Buildings		Critical Facilities	Total Building Value (\$)	
1,398		1,337		4	257,610,000	
Exposure Analysis: Coastal Erosion High Hazard Scenario						
Potentially Displaced Residents		Exposed Buildings			Exposed Building Value	
Number	Percent	Number	Percent	Critical Facilities	Value (\$)	Percent
45	3.2%	64	4.8%	0	12,820,000	5.0%

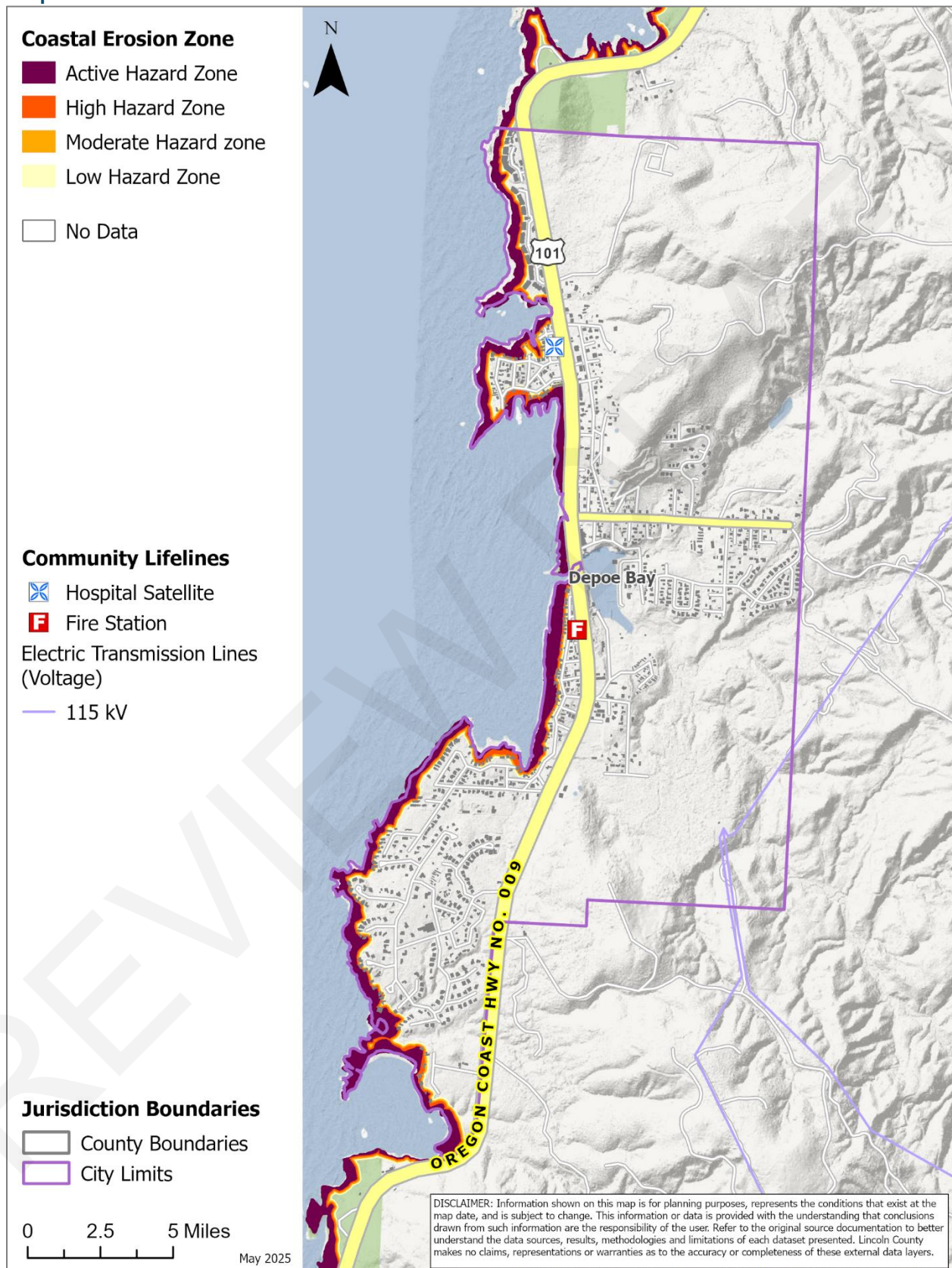
Source: IPRE. Data adapted from DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020). Table A-14. Note: city population based on the 2010 Census population.

Critical Facility Vulnerability⁵

There are no critical facilities exposed to the profiled coastal erosion scenario.

⁵ DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-15.

Map DA-2 Coastal Erosion Hazard



Source: [Oregon Explorer: Map Viewer](#) – To view map detail click hyperlink to left.

Drought

The city does not experience drought conditions; as such, drought is not considered to be a hazard within the community.

Earthquake

The Steering Committee rated the city's **probability of occurrence for Cascadia Subduction Zone (CSZ) Earthquake events as "moderate" and their vulnerability as "high"**. *These ratings have not changed since the previous NHMP.*

The Steering Committee rated the city's **probability of occurrence for crustal earthquake events as "low" and their vulnerability as "moderate"**. *These ratings have not changed since the previous NHMP.*

Volume I, Section 2 of Lincoln County's NHMP adequately describes the causes and characteristics of earthquake hazards, as well as the history, location, extent, and probability of a potential event. Earthquake-induced damages are difficult to predict and depend on the size, type, and location of the earthquake, as well as site-specific building and soil characteristics. Presently, it is not possible to accurately forecast the location or size of earthquakes, but it is possible to predict the behavior of soil at any site. In many major earthquakes, damages have primarily been caused by the behavior of the soil.

Additional information can be found on the Lincoln County website:

<https://www.co.lincoln.or.us/749/Hazards-Earthquake>

The Pacific Northwest experienced a subduction zone earthquake estimated at magnitude 9 on January 26, 1700. The earthquake generated a tsunami that caused damage as far away as Japan. Cascadia subduction zone earthquakes and associated tsunamis have occurred on average every 500 years over the last 3,500 years in the Pacific Northwest. The time between events has been as short as 100 to 200 years and as long as 1,000 years. The geologic record indicates that over the last 10,000 years approximately 42 tsunamis have been generated off the Oregon Coast in connection to ruptures of the CSZ (19 of the events were full-margin ruptures and arrived approximately 15-20 minutes after the earthquake).⁶

A primary mitigation objective of the city is to construct or upgrade critical and essential facilities and infrastructure to withstand future earthquake events. Although the city has not made use of the seismic retrofit grant awards per the [Seismic Rehabilitation Grant Program](#)⁷ the Depoe Bay RFPD has been funded to retrofit the Fire Station 2300 (2013-14 grant award, \$831,418). Additionally, the School District has retrofitted at risk schools in Lincoln City, that serve Depoe Bay students, through the SRGP program and local resources (see the Lincoln County School District addendum for more information).

⁶ DLCD. *Oregon State Natural Hazard Mitigation Plan*. 2020.

⁷ The Seismic Rehabilitation Grant Program (SRGP) is a state of Oregon competitive grant program that provides funding for the seismic rehabilitation of critical public buildings, particularly public schools and emergency services facilities.

The Oregon Department of Geology and Mineral Industries (DOGAMI), in partnership with other state and federal agencies, has undertaken a rigorous program in Oregon to identify seismic hazards, including active fault identification, bedrock shaking, tsunami inundation zones, ground motion amplification, liquefaction, and earthquake induced landslides.

The city faces several earthquake-related risks, including soft soil and liquefaction hazards (Map DA-3) and a moderate to very high probability over the next 50 years of experiencing shaking strong enough to damage weak buildings (Map DA-4).

- Liquefaction risk is highest along the waterfront and ocean cliffs, where soft, wet soils can lose strength during shaking.
- Damaging shaking—strong enough to affect weak buildings—is more likely near the coast and river areas.
- Inland areas generally face lower liquefaction risk.

Vulnerability Assessment

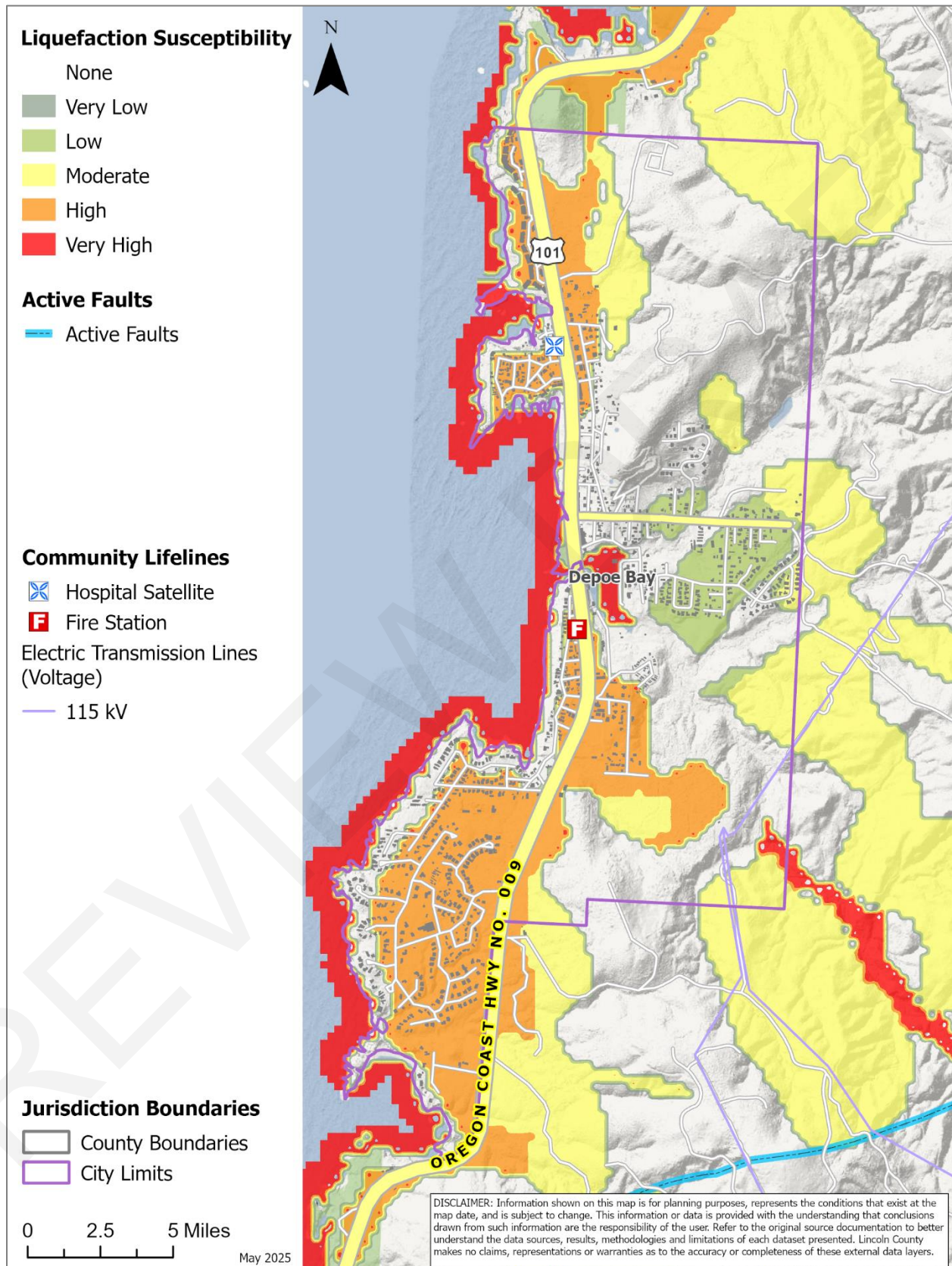
See *Earthquake and tsunami impact analysis for coastal Lincoln County, Oregon* (2021, [O-21-02](#)) and *Earthquake and tsunami impact analysis for the Oregon coast* (2025, [O-25-01](#)) for additional information.

The city's concentrated population and resources, as well as the soil characteristics and relative earthquake hazards described above are cause for significant effort toward mitigating the earthquake hazard. There is considerable development on steep slopes within the city. The Highway 101 Bridge crossing the Bay was built in 1927 and is extremely vulnerable to damage from a high magnitude earthquake. In the event of bridge failure, north Depoe Bay would be isolated from south Depoe Bay. Likewise, transportation throughout the region and along the coast would be impacted if the Depoe Bay Bridge closed. A "park" bridge was constructed ca. 2015 at the southeast corner of the harbor area. It will likely withstand an earthquake of considerable magnitude but may not survive a large tsunami flow. The bridge can support heavy weight equipment such as a fire apparatus truck. The city's infrastructure is highly vulnerable to a severe earthquake event. Sewer lines, water lines, power lines, water tanks, the Fire Station, and City Hall were identified by the steering committee as vulnerable assets. The city would also expect damage to roads following a CSZ event, as well as deaths and severe injuries region wide. Education and outreach regarding the CSZ is an on-going endeavor in Depoe Bay.

To help communities better prepare for earthquakes, DOGAMI released the Oregon Seismic Hazard Database in 2021.⁸ It includes maps showing areas most at risk for hazards like ground shaking and movement. Key map highlight potential damage from rare but severe earthquakes (Map DA-5), expected shaking and damage from large Cascadia subduction zone earthquakes (Map DA-6), and likelihood of damaging shaking (Map DA-4). The extent of the damage depends on the earthquake's type, location, magnitude, and duration.

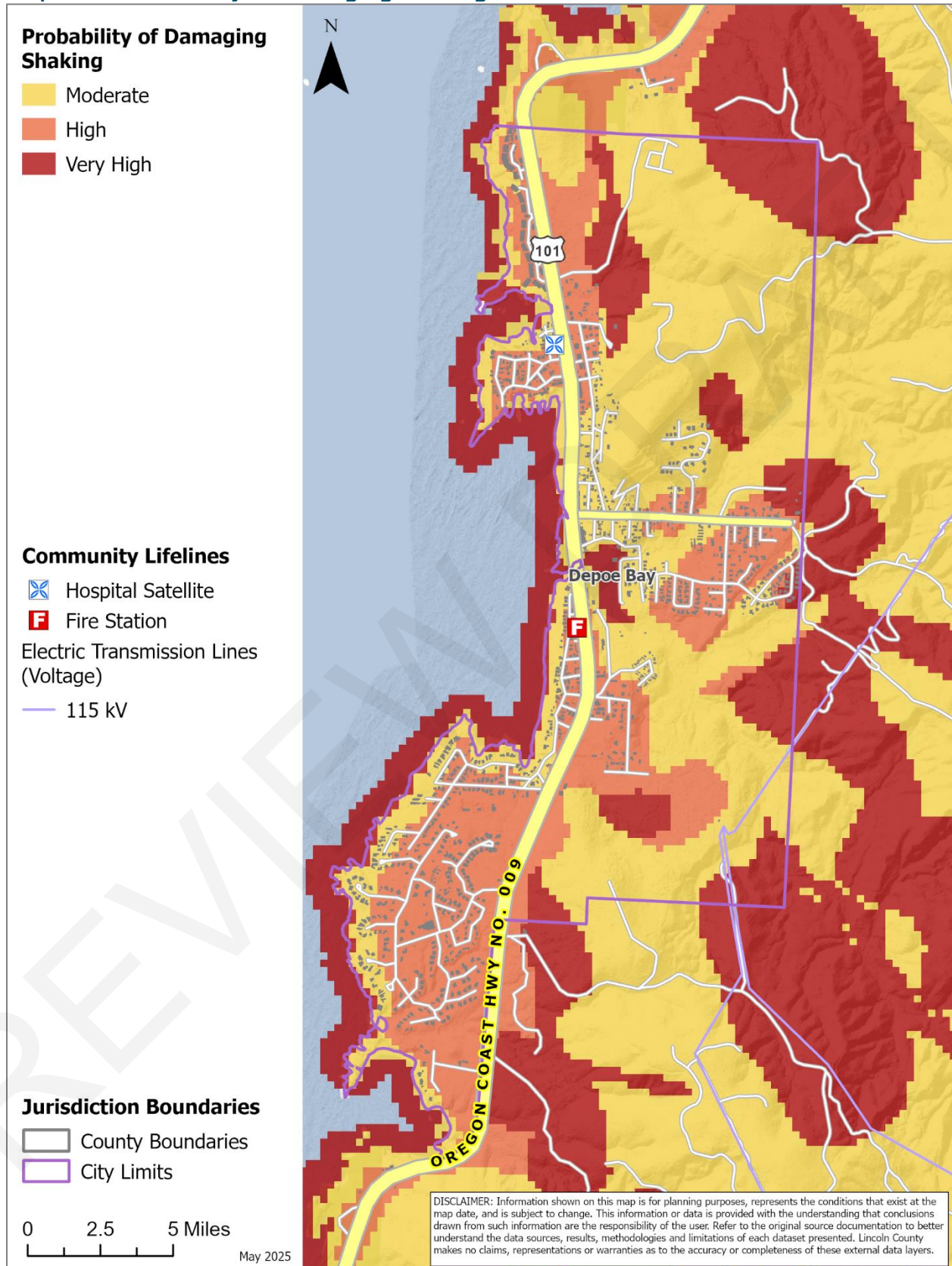
⁸Oregon Department of Geology and Mineral Industries (DOGAMI). (2021). Oregon Seismic Hazard Database, Release 1.0 (OSHD-1). By Ian P. Madin, Jon J. Franczyk, John M. Bauer, and Carlie J.M. Azzopardi. Available at: <https://pubs.oregon.gov/dogami/dds/p-OSHD-1.htm>

Map DA-3 Earthquake Liquefaction (Soft Soil) Hazard and Active Faults



Source: [Oregon Explorer: Map Viewer](#) – To view map detail click hyperlink to left.

Map DA-4 Probability of Damaging Shaking



Source: [Oregon Explorer: Map Viewer](#) – To view map detail click hyperlink to left.

2007 Rapid Visual Survey

Building codes were implemented in Oregon in the 1970s, however, stricter standards did not take effect until 1991 and early 2000s. As noted in the community characteristics section (Table DA-3), approximately 43% of residential buildings were built prior to 1990, which increases the city's vulnerability to the earthquake hazard. Information on specific public buildings' (schools and public safety) estimated seismic resistance was determined for Lincoln County by DOGAMI in 2007. For more information click this link [O-07-02](#).

Natural Hazard Risk Report for Lincoln County

The Risk Report ([DOGAMI, O-20-11](#)) provides hazard analysis summary tables that identify populations and property within Lincoln County that are vulnerable to earthquake. The Risk Report provides a distinct profile for Depoe Bay.

According to the Risk Report the following resident population and property (public and private) within the study area may be impacted by the profiled magnitude 9.0 Cascadia Subduction Zone (CSZ) event. *Note: Due to the simultaneous nature of a CSZ earthquake and tsunami, loss estimates have been separated in the following tables to avoid double counting. Building losses within the tsunami zone are considered total. See the tsunami section for additional information.*

The Risk Report performed an analysis of buildings, including critical facilities, to determine exposure for each community. According to the Risk Report the following resident population and property (public and private) within Depoe Bay may be impacted by the profiled earthquake scenarios (Table DA-5). *Note: Due to the simultaneous nature of a CSZ earthquake and tsunami, loss estimates have been separated in the following tables to avoid double counting. Building losses within the tsunami zone are considered total. See the tsunami section for additional information.*⁹

Approximately 23% of the city's population (314 people) may be displaced by a magnitude 9.0 CSZ earthquake and tsunami event. Of those, approximately 3% will be impacted by the accompanying tsunami. *Note: The data does not include potentially impacted visitor populations that may be lodging or at a public venue during a CSZ earthquake and tsunami event.*

Earthquakes will impact every building in the city, to some degree, by a CSZ magnitude 9.0 earthquake and tsunami. Building damage (loss) estimates are reported for buildings expected to be damaged by the earthquake outside of the tsunami inundation zone (medium-sized). Additional exposure information is provided for buildings within the tsunami inundation zone to obtain the combined total damage (loss) estimate. Buildings reported as "damaged" in the area *outside* the tsunami zone include yellow tagged (extensive, limited habitability) and red tagged (complete, uninhabitable) buildings, while 100% of buildings exposed *inside* the tsunami inundation area are considered "damaged" (complete, uninhabitable). The city has 491 buildings that are expected to be damaged by the CSZ earthquake and tsunami event. The combined (earthquake and tsunami) value of building damage losses are \$63.6 million.

The Risk Report estimated losses show that the age of the building stock is the primary metric of earthquake vulnerability. Communities with older building stock are expected to have higher

⁹ DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-14.

losses. However, if buildings were retrofitted to at least “moderate code” standards the impact of the event would be reduced. The Risk Report concludes that loss estimates for the city drop from 19.7% to 14% (\$13.5 million decrease in loss) when all buildings are upgraded to at least moderate code level.¹⁰ *Note: earthquake vulnerability retrofit benefits are minimized in areas of liquefaction and landslide where additional geotechnical mitigation would be needed.*

Table DA-5 Potentially Displaced Residents and Exposed Buildings, Earthquake

Community Overview: Depoe Bay						
Population		Buildings		Critical Facilities	Total Building Value (\$)	
1,398		1,337		4	257,610,000	
Exposure Analysis: Earthquake CSZ M9.0 (Deterministic) Scenario						
Potentially Displaced Residents		Damaged Buildings			Exposed Building Value	
Number	Percent	Number	Percent	Critical Facilities	Loss Estimate (\$)	Loss Ratio
269	19.2%	427	31.9%	3	50,750,000	19.7%
Exposure Analysis (within Tsunami Zone - Medium)						
45	3.2%	64	4.8%	1	12,820,000	5.0%
Total Exposure						
314	22.5%	491	36.7%	4	63,570,000	24.7%

Source: IPRE. Data adapted from DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-14. Note: city population based on the 2010 Census population.

Critical Facility Vulnerability¹¹

- Depoe Bay City Hall
- Depoe Bay RFPD Fire Station 2300 (seismic retrofit ca. 2019; SRGP 2013-2014)
- Samaritan Depoe Bay Clinic
- U.S. Coast Guard Depoe Bay Station; also exposed to tsunami (medium-sized)

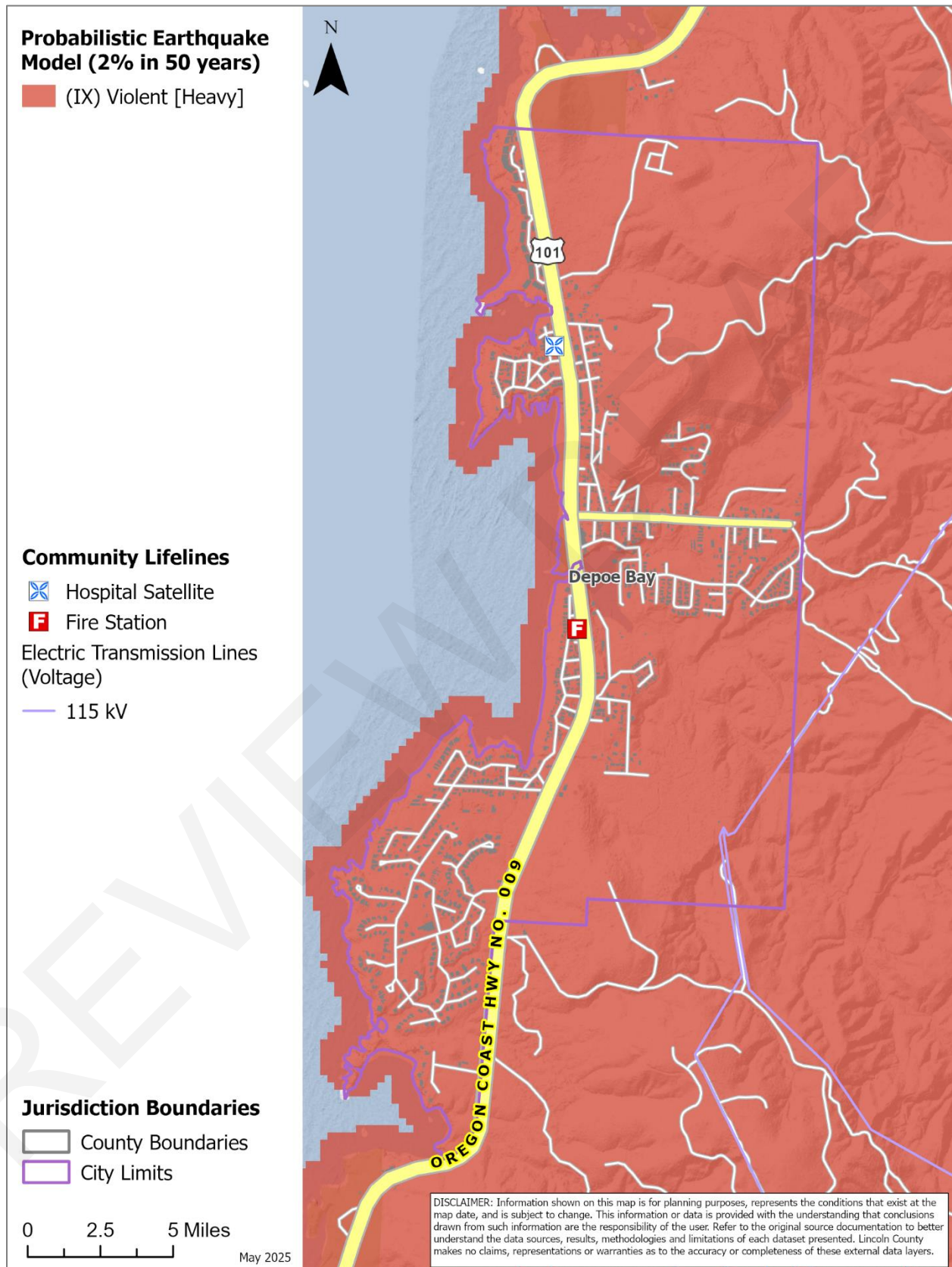
For more information, see the following DOGAMI reports:

- Analysis of earthquake and tsunami impacts for people and structures inside the tsunami zone for five Oregon coastal communities: Gearhart, Rockaway Beach, Lincoln City, Newport, and Port Orford (2020, [O-20-03](#))
- Oregon Coastal Hospital Resilience Project (2020, [O-20-02](#))
- Earthquake and tsunami impact analysis for coastal Lincoln County, Oregon (2021, [O-21-02](#))
- Earthquake and tsunami impact analysis for the Oregon coast (2025, [O-25-01](#))

¹⁰ Ibid, Table B-2.

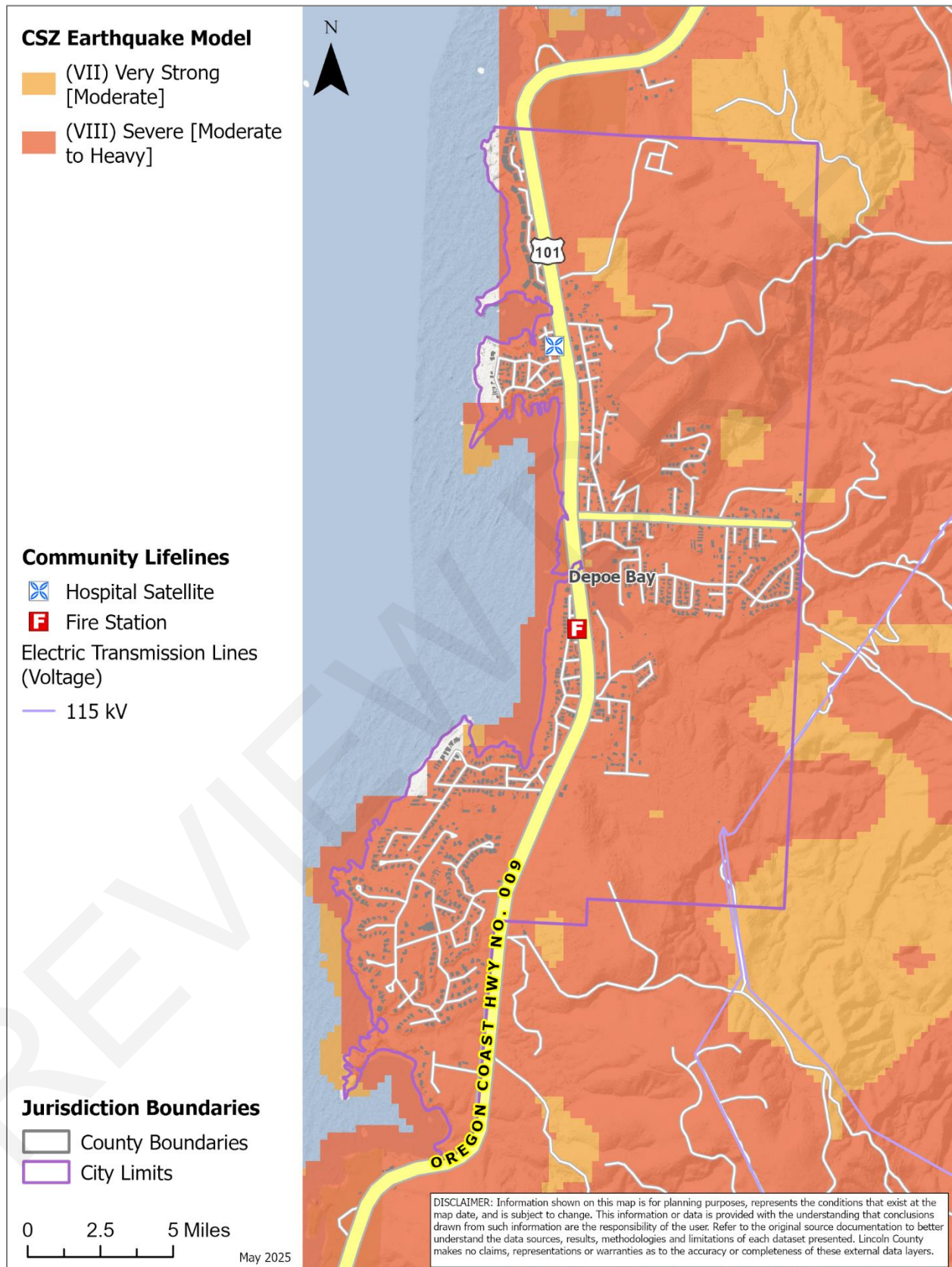
¹¹ Ibid, Table A-15.

Map DA-5 Perceived Shaking and Damage Potential, Probabilistic Earthquake Model



Source: [Oregon Explorer: Map Viewer](#) – To view map detail click hyperlink to left..

Map DA-6 Perceived Shaking and Damage Potential, CSZ Earthquake Model



Source: [Oregon Explorer: Map Viewer](#) – To view map detail click hyperlink to left.

Tsunami

The Steering Committee rated the city's **probability of occurrence for a local tsunami events as "moderate" and their vulnerability as "moderate"**. *These ratings have not changed since the previous NHMP.*

The Steering Committee rated the city's **probability of occurrence for distant tsunami events as "moderate" and their vulnerability as "low"**. *These ratings have not changed since the previous NHMP.*

Volume I, Section 2 of Lincoln County's NHMP adequately describes the causes and characteristics of tsunami hazards, as well as the history, location, extent, and probability of a potential event. The Pacific Northwest experienced a subduction zone earthquake estimated at magnitude 9.0 on January 26, 1700. The earthquake generated a tsunami that caused damage as far away as Japan. Cascadia subduction zone earthquakes and associated tsunamis have occurred on average every 500 years over the last 3,500 years in the Pacific Northwest. The time between events has been as short as 100 to 200 years and as long as 1,000 years. The geologic record indicates that over the last 10,000 years approximately 42 tsunamis have been generated off the Oregon coast in connection to ruptures of the CSZ (19 of the events were full-margin ruptures and arrived approximately 15-20 minutes after the earthquake).¹² Distant tsunamis happen more regularly than CSZ related local tsunamis.

Additional information can be found on the Lincoln County website:
<https://www.co.lincoln.or.us/772/Hazards-Tsunamis>

It is difficult to predict when the next tsunami will occur. According to the Oregon NHMP the coast has experienced 25 distant tsunamis in the last 145 years with only three causing measurable damage. Thus, the average recurrence interval for tsunamis on the Oregon coast from distant sources would be about six years. However, the time interval between events has been as little as one year and as much as 73 years. Since only a few tsunamis caused measurable damage, a recurrence interval for distant tsunamis does not have much meaning for the city.

A 9.0 magnitude earthquake originating from Japan caused approximately \$7.1 million worth of damages along the Oregon coast. Particularly, there was extensive damage to the Port of Brookings (Curry County; \$6.7 million), as well as Depoe Bay Harbor (Lincoln County; \$182,000), and Charleston Harbor (Coos County; \$200,000); Salmon Harbor on Winchester Bay (Douglas County) and the South Beach Marina in Newport (Lincoln County) were also affected. On March 15, 2011 Governor Kitzhaber declared a State of Emergency was declared by Executive Order in Curry County. Approximately 40% of all docks at the Port of Brookings were destroyed or rendered unusable (including a dock leased by the U.S. Coast Guard) compromising commercial fishing and U.S. Coast Guard operations. Along the Oregon coast local officials activated the Emergency Alert System and sirens, implemented "reverse 9-1-1" and conducted door-to-door notices in order to evacuate people from the tsunami inundation zone. Local governments

¹² DLCD. Oregon Natural Hazards Mitigation Plan. 2020.

activate their Emergency Operations Centers and the state activated its Emergency Coordination Center. For more information view Volume I, Section 2.

In 1995, the Department of Geology and Mineral Industries (DOGAMI) conducted an analysis resulting in extensive mapping along the Oregon coast. The maps depict the expected inundation for tsunamis produced by a magnitude 8.8 to 8.9 undersea earthquake. The tsunami maps were produced to help implement Senate Bill 379 (SB 379); digitized in 2014 ([O-14-09](#)). SB 379, implemented as Oregon Revised Statutes (ORS) 455.446 and 455.447, and Oregon Administrative Rules (OAR) 632-005, limit construction of new essential facilities and special occupancy structures in tsunami flooding zones. Map DA-7 shows expected tsunami inundation, indicating that much of the residential development west of Highway 101 and areas in, and adjacent to, the harbor are vulnerable to tsunami. Note: HB 3309 (2019) effective January 1, 2020 repealed the ban on building “new essential facilities, hazardous facilities, major structures, and special occupancy structures” inside the tsunami inundation zone (SB 379 line):¹³

Tsunami inundation maps were created by the Department of Geology and Mineral Industries (DOGAMI) to be used for emergency response planning for coastal communities. Maps were created for local and distant source tsunami events. The local source tsunami inundation maps display the output of computer modeling showing five tsunami event scenarios shown as “T-shirt” sizes S, M, L, XL, and XXL (Map DA-7). Distant source tsunami inundation maps show the potential impacts of tsunamis generated by earthquakes along the “Ring of Fire” (the Circum-Pacific belt, the zone of earthquake activity surrounding the Pacific Ocean). The distant tsunami inundation maps model the 1964 Prince William Sound event (Alaska M9.2 and a hypothetical Alaska Maximum event scenario; only the Alaska Maximum Wet/ Dry Zone is shown within the [Oregon Explorer: Map Viewer](#). Both the local and distant source tsunami inundation maps show simulated wave heights and inundation extents for the various scenarios.

For more information on the regulatory and non-regulatory maps visit the Oregon Tsunami Clearinghouse resource library: Regulatory (SB 379) -

<https://www.oregon.gov/dogami/tsuclearinghouse/pages/default.aspx>

(Note: HB 3309, effective January 1, 2020, repealed ban on building essential facilities within the tsunami inundation zone, SB 379 line.)

Non-Regulatory Tsunami-Inundation Maps:

<http://www.oregongeology.org/tsuclearinghouse/pubs-inumaps.htm>

Evacuation maps (brochures) are available for the populated areas of Lincoln County. The Department of Geology and Mineral Industries (DOGAMI) developed the evacuation zones in consultation with local officials; local officials developed the routes that were reviewed by the Oregon Department of Emergency Management (OEM). The maps show the worst-case scenario for a local source and distant source tsunami event and are not intended for land-use planning or engineering purposes.

¹³ Oregon Legislature. HB 3309 (2019). <https://olis.leg.state.or.us/liz/2019R1/Downloads/MeasureDocument/HB3309>

For more information on the evacuation brochures visit the Oregon Tsunami Clearinghouse resource library:

<http://www.oregongeology.org/tsuclearinghouse/pubs-evacbro.htm>

A free application is also available that displays the evacuation routes in coastal areas of Oregon:

http://www.nanoos.org/mobile/tsunami_evac_app.php

Vulnerability Assessment

See *earthquake and tsunami impact analysis for coastal Lincoln County, Oregon* (2021, [O-21-02](#)) and *earthquake and tsunami impact analysis for the Oregon coast* (2025, [O-25-01](#)) for additional information.

In 2013, DOGAMI produced new Tsunami Inundation Maps (TIMs) for the entire Oregon coast. The TIMs identify both local and distant Tsunami Inundation Zones (TIZs) by event size. The maps also tabulate the affected buildings located within the local and distant source tsunami inundation zones. The Risk Report section below provides detailed information on the impact to the city from a CSZ earthquake and medium tsunami.

Population vulnerability is characterized in terms of exposure, demographic sensitivity, and short-term resilience of at-risk individuals. Nate Wood, et al. (USGS) performed a cluster analysis of the data for coastal communities in the Pacific Northwest to identify the most vulnerable communities in the region.¹⁴ Wood, et al. conducted a comprehensive analysis to derive overall community clusters based on (1) the number of people and businesses in the tsunami hazard zone, (2) the demographic characteristics of residents in the zone, and (3) the number of people and businesses that may have insufficient time to evacuate based on slow and fast walking speeds. According to the study Lincoln County (including Depoe Bay) has relatively low numbers of “residents, employees, or customer-heavy businesses” inside the tsunami hazard zones and will likely have enough time to reach high ground before a tsunami wave arrives.

Severe damage could occur to low-lying areas of the city in a local source tsunami event, including roads, bridges, communication systems, and infrastructure within Depoe Bay, particularly surrounding, and including facilities within, the harbor, among other assets described in the county’s plan. Damage is also expected in a large distant source tsunami event (such as the 2011 Tohoku tsunami). The City of Depoe Bay recognizes the importance of continuing education and outreach, especially to the transient populations (i.e., tourists), and plans to implement greater outreach in the future.

Natural Hazard Risk Report for Lincoln County

The **Risk Report** ([DOGAMI, O-20-11](#)) provides hazard analysis summary tables that identify populations and property within Lincoln County that are vulnerable to tsunami. The Risk Report provides a distinct profile for Depoe Bay.

¹⁴ Nathan J. Wood, Jeanne Jones, Seth Spielman, and Mathew C. Schindtlein. “Community clusters of tsunami vulnerability in the US Pacific Northwest”, PNAS 2015 112 (17) 5354-5359.

The Risk Report performed an analysis of buildings, including critical facilities, to determine exposure for each community. According to the Risk Report the following resident population and property (public and private) within Depoe Bay may be impacted by the profiled tsunami scenario (Table DA-6).

Less than one percent the city's population (8 people) may be displaced by a magnitude 9.0 CSZ tsunami event (note there are additional people that will be displaced by the earthquake). This is slightly fewer people than those exposed within the Senate Bill 379 line (9 people). *Note: The data does not include potentially impacted visitor populations that may be lodging or at a public venue during a CSZ earthquake and tsunami event.* Building damage (loss) estimates are reported for buildings expected to be damaged by the tsunami inundation zone (medium-sized and SB 379). All 13 buildings exposed *inside* the tsunami inundation area are considered "damaged" (complete, uninhabitable); the number of buildings damaged is slightly higher under the SB 379 scenario (20). One critical facility is expected to be damaged under the CSZ M9.0 scenario, none are expected to be damaged under the SB 379 scenario.

Table DA-6 Potentially Displaced Residents and Exposed Buildings, Tsunami

Community Overview: Depoe Bay						
Population		Buildings		Critical Facilities	Total Building Value (\$)	
1,398		1,337		4	257,610,000	
Exposure Analysis: Tsunami CSZ M9.0 (Deterministic) Scenario						
Potentially Displaced Residents		Exposed Buildings			Exposed Building Value	
Number	Percent	Number	Percent	Critical Facilities	Value (\$)	Percent
8	0.6%	13	1.0%	1	1,177,000	0.5%
Exposure Analysis: Tsunami SB 379 Regulatory Line						
9	0.6%	20	1.5%	0	3,818,000	1.5%

Source: IPRE. Data adapted from DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-14. Note: city population based on the 2010 Census population.

Critical Facility Vulnerability¹⁵

- U.S. Coast Guard Depoe Bay Station

Earthquake and Tsunami Impact Analysis

DOGAMI developed two Earthquake and Tsunami Impact Analysis for Coastal Lincoln County, Oregon ([O-21-02](#)) and Earthquake and Tsunami Impact Analysis for the Oregon Coast ([O-25-01](#)) include economic and population impact assessments for the city. The model's results show the following building loss estimates from a Cascadia Subduction Zone (deterministic) magnitude 9.0 earthquake:

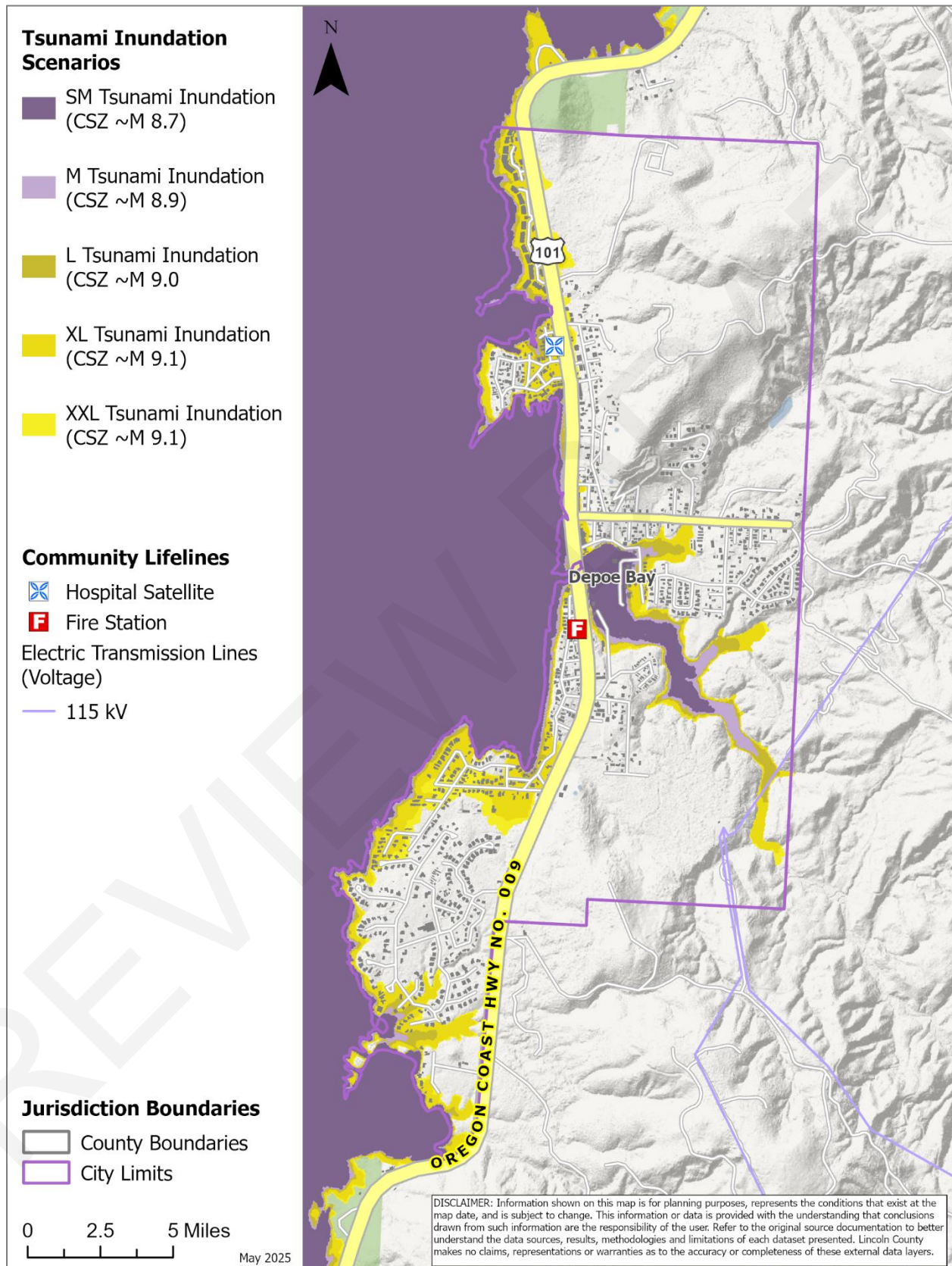
¹⁵ DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-15.

Table DA-7 Earthquake and Tsunami Impact Analysis

Resident Population (Total)	2,166		
Temporary Population (Total)*	2,399		
	M1	L1	XXL1
Earthquake Injuries:	80	80	80
Tsunami injuries (Permanent + Temporary):			
Tsunami fatalities (Permanent):			
Tsunami fatalities (Temporary @ 100% occupancy):			10
Displaced population (P):	330	360	810
Displaced population (P+T):	490	570	1,960
Numbers of buildings in tsunami zone	12	29	348
Building replacement cost (millions)	\$3.9	\$8.1	\$140.2
Debris weight (tons)	996	1,606	21,342

Source: IPRE. Data adapted from DOGAMI, Open-File Report O-25-01, Earthquake and Tsunami Impact Analysis for the Oregon Coast (2025). Note: Estimates of the permanent population in the tsunami inundation zone are derived from U.S. Census data collected in 2020 and ACS data maintained by the U.S. Census Bureau . * - Assumes 100% occupancy of second homes, vacation rentals, condominium units, bed and breakfast facilities, hotels, motels, and campgrounds.

Map DA-7 Tsunami Inundation Scenarios



Source: [Oregon Explorer: Map Viewer](#) – To view map detail click hyperlink to left.

Flood

The Steering Committee rated the city's **probability of occurrence for riverine flood events as "moderate" and their vulnerability as "low"**. *These ratings have not changed since the previous NHMP.*

Coastal flood "VE" zones do not occur in Depoe Bay, as such, tidal flood is not considered to be a hazard within the community.

Volume I, Section 2 of Lincoln County's NHMP adequately describes the causes and characteristics of coastal and riverine flood hazards, as well as the history, location, extent, and probability of a potential event. Coastal flooding and North and South Depoe Creeks are the primary sources of flooding. Coastal related flood events happen because of storms and tides. River-related flood events are also caused by storms, as well as rain on snow / snowmelt. There are no records of sustained damage or serious impacts associated with major flood events.

Additional information can be found on the Lincoln County website:

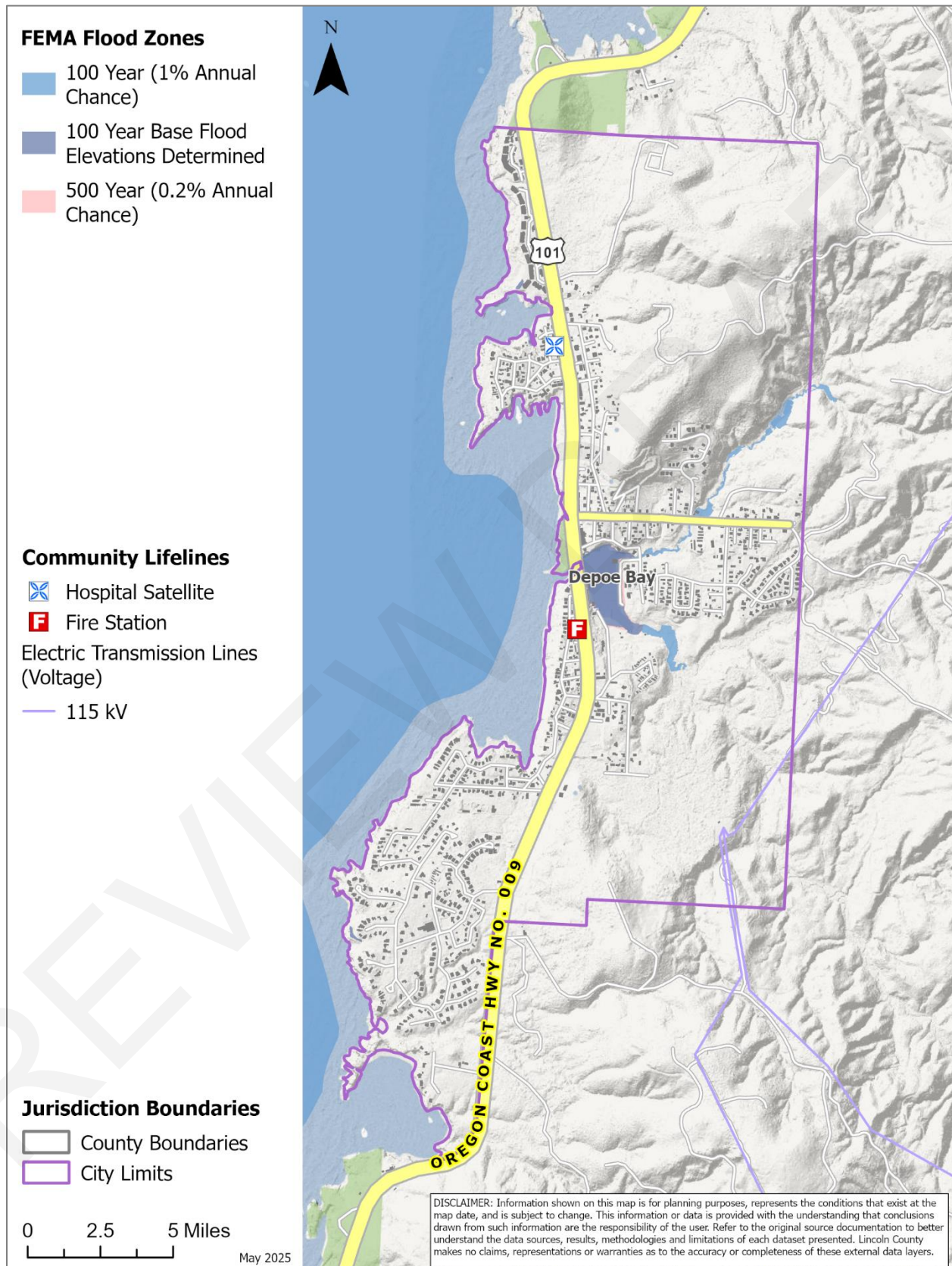
<https://www.co.lincoln.or.us/757/Hazards-Flooding-River-Levels>

FEMA has mapped most of the flood-prone streams in Oregon for 100- and 500-year flood events. A 100-year flood (a flood with a one percent (1%) probability of occurring within any given year) is used as the standard for floodplain management in the United States and is referred to as a base flood; also known as the Special Flood Hazard Area (SFHA). The SFHA is the area where the National Flood Insurance Program's (NFIP's) floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies. Flood Insurance Rate Maps (FIRMs) prepared by FEMA provide the most readily available source of information for 100-year floods (insert map reference DA-6). These maps are used to support the NFIP. FIRMs delineate 100- and 500-year (a flood with a 0.2-percent probability of occurring within any given year) floodplain boundaries for identified flood hazards. These maps represent a snapshot in time, and do not account for later changes which occurred in the floodplains. According to Oregon Explorer slightly more than 7% of the city is within the 100-year floodplain, including the areas in the southern part of the city that includes several residential properties. In addition, less than 2% of the city is within the 500-year floodplain.

Future Climate Projection:

According to OCCRI report "*Future Climate Projections: Lincoln County*" ([Link](#)) the intensity of extreme precipitation is expected to increase as the atmosphere warms. The magnitude of the wettest days and the wettest consecutive five days is expected to increase by about 13% (range 4% to 28%) by the 2050s under the higher emissions scenario relative to historical baselines. The probability of winter flood risk will increase within coastal rain-dominated watersheds (such as the Siletz River) due to projected greater winter precipitation and warmer winter temperatures that will cause precipitation to fall more as rain than snow. There will also be an increase in atmospheric river events. Additionally, coastal flooding is expected to increase due to sea level rise (SLR) and changing wave dynamics. Sea level is projected to rise by 1.7 to 5.7 feet by 2100. Tidal wetlands and estuaries throughout the county are also expected to experience changes to their composition and area, thereby impacting their ability to naturally mitigate flood events.

Map DA-8 Flood Hazard Zones (100- and 500-year floodplain)



Source: [Oregon Explorer: Map Viewer](#) – To view map detail click hyperlink to left.

Vulnerability Assessment

A floodplain vulnerability assessment combines the floodplain boundary, generated through hazard identification, with an inventory of the property within the floodplain. Understanding the population and property exposed to natural hazards will assist in reducing risk and preventing loss from future events.

Natural Hazard Risk Report for Lincoln County

The **Risk Report** ([DOGAMI, O-20-11](#)) provides hazard analysis summary tables that identify populations and property within Lincoln County that are vulnerable to flood. The Risk Report provides a distinct profile for Depoe Bay.

The Risk Report provides a flood analysis for four flood scenarios (10-, 50-, 100-, and 500-year). The 100-year flood scenario is used for reporting since it is commonly used as a reference level for flooding and is the standard FEMA uses for regulatory purposes. In addition to the riverine flood scenarios coastal flooding information is available for the 100-year flood scenario for the city. The Risk Report only analyzed buildings within a flood zone, or within 500 feet of a flood zone. First-floor building height and presence of basements was also considered. Buildings with a first-floor height above the flood level were not included in the flood loss estimate, however, their assumed building occupants (residents) were counted as potentially displaced. According to the Risk Report the following resident population and property (public and private) within Depoe Bay may be impacted by the profiled flood scenario (Table DA-8).

Few residents are exposed or potentially displaced by the flood hazard in the city. Less than 1% of the city's population (2 people) may be displaced by flooding. These people are expected to have mobility or access issues due to surrounding water. Less than 1% of the city's buildings (9 buildings) are exposed to the flood hazard and may be damaged. The loss estimate for exposed buildings is \$20,000 (less than 1% of total building value).

Table DA-8 Potentially Displaced Residents and Exposed Buildings, Flood

Community Overview: Depoe Bay						
Population		Buildings		Critical Facilities	Total Building Value (\$)	
1,398		1,337		4	257,610,000	
Exposure Analysis: Flood (1% Annual Chance)						
Potentially Displaced Residents		Damaged Buildings			Exposed Building Value	
Number	Percent	Number	Percent	Critical Facilities	Loss Estimate (\$)	Loss Ratio
2	0.1%	9	0.7%	1	20,000	< 1%

Source: IPRE. Data adapted from DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-14. Note: city population based on the 2010 Census population.

Critical Facility Vulnerability¹⁶

There are no critical facilities exposed to the profiled flood scenario.

National Flood Insurance Program (NFIP)

FEMA updated the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) in 2019 (effective October 10, 2019). The city does not participate in the CRS and, therefore, does not receive discounted flood insurance premiums for residents in a special flood hazard zone.

The city complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program. Their flood prevention code section is based on the Oregon Model Flood Hazard Prevention code, which includes provisions addressing substantial improvement/substantial damage.

The city has 10 National Flood Insurance Program (NFIP) policies in force, representing almost \$2.3 million in coverage. The Community Repetitive Loss record for the city identifies zero (0) Repetitive Loss Properties¹⁷ and zero (0) Severe Repetitive Loss Properties¹⁸.

No development or population changes affected the jurisdiction's overall vulnerability to this hazard. In addition, development and population forecasts are not expected to increase or decrease the impact of this hazard.

Landslide

The Steering Committee rated the **city's probability of occurrence for landslide events as "high" and their vulnerability as "high"**. *The vulnerability rating increased since the previous NHMP.*

Volume I, Section 2 of Lincoln County's NHMP adequately describes the causes and characteristics of landslide hazards, as well as the history, location, extent, and probability of a potential event. No records for city-specific landslides have been kept, but the steering committee identified that the Army Corps of Engineers installed 72 pilings, 40-60 feet deep to prevent landslides from occurring east of the harbor.

Additional information can be found on the Lincoln County website:
<https://www.co.lincoln.or.us/762/Hazards-Landslides>

¹⁶ DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-15.

¹⁷ A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP.

¹⁸ A Severe Repetitive Loss (SRL) property is a single family property (consisting of 1 to 4 residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which 4 or more separate claims payments have been paid under flood insurance coverage, with the amount of each claim payment exceeding \$5,000 and with cumulative amount of such claims payments exceeding \$20,000; or for which at least 2 separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property. Repetitive Flood Loss information provided by FEMA correspondence on September 10, 2020.

The severity or extent of landslides is typically a function of geology and the landslide triggering mechanism. Rainfall initiated landslides tend to be smaller and earthquake-induced landslides may be very large. Even small slides can cause property damage, result in injuries or take lives. Landslide susceptibility exposure for Depoe Bay is shown in (Map DA-9). Approximately 54% of the city has very high or high and 26% moderate, landslide susceptibility exposure.¹⁹ In general, the areas of greater risk are located adjacent to rivers and creeks and indicate potential areas of erosion; there is portion of the city in the west hills that has high landslide susceptibility. *Note that even if a city has a high percentage of area in a high or very high landslide exposure susceptibility zone, this does not mean there is a high risk, because risk is the intersection of hazard and assets.*

Future Climate Projection:

According to OCCRI report “*Future Climate Projections: Lincoln County*” ([Link](#)) the intensity of extreme precipitation is expected to increase as the atmosphere warms. The magnitude of the wettest days and the wettest consecutive five days is expected to increase by about 13% (range 4% to 28%) by the 2050s under the higher emissions scenario relative to historical baselines. Landslide risk is not expected to change significantly.

Vulnerability Assessment

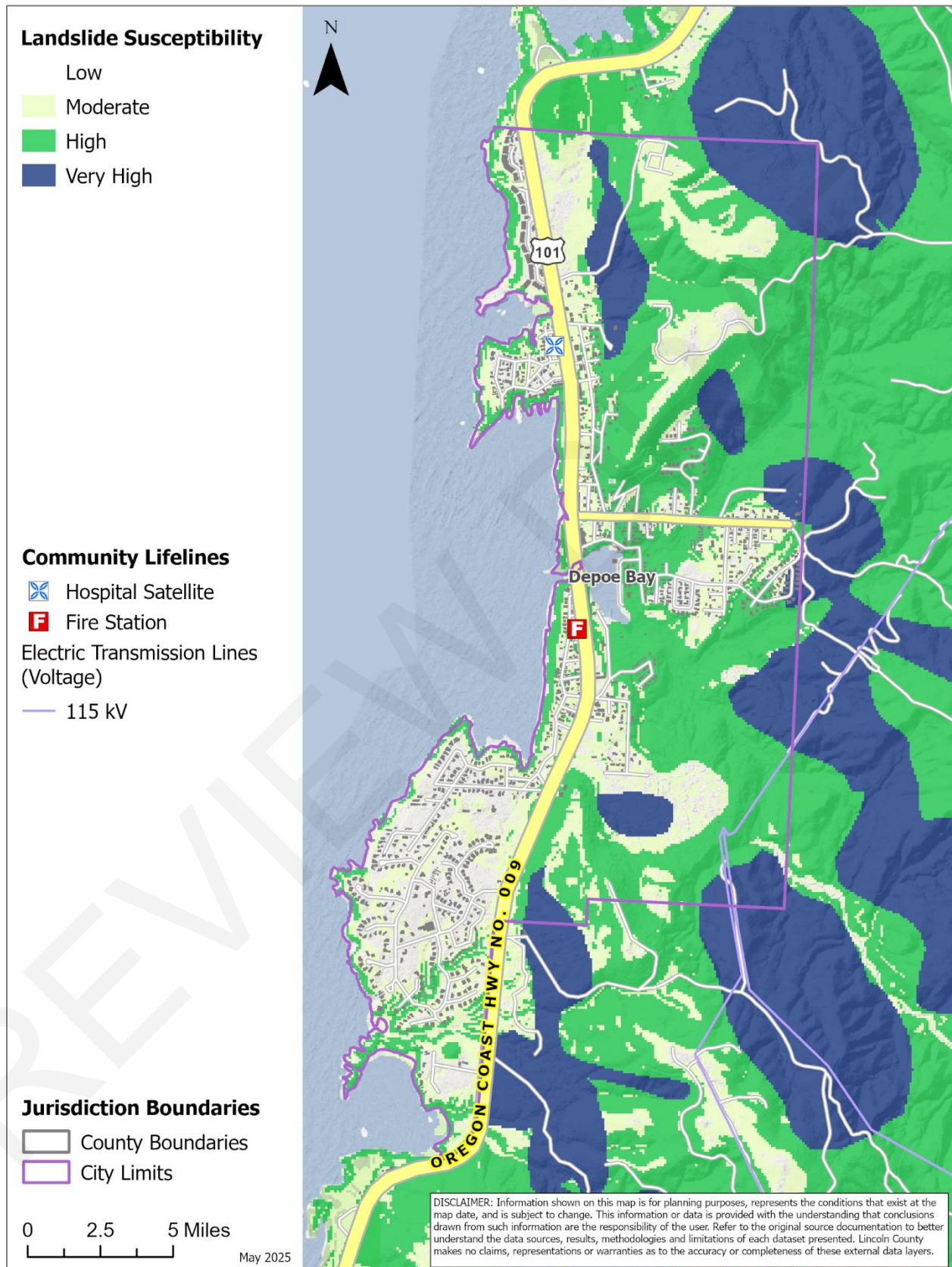
In general, the east/northeastern portion of the city consists of steep slopes where development pressure exists. Road cracking has occurred in some areas, but no significant losses are documented. The city’s water reservoir and a water tank are in the eastern part of the city. Depoe Bay rebuilt the water tank in accordance with modern seismic and building code requirements to prevent damages from occurring in both earthquake and landslide events.

Additionally, as described in the coastal erosion hazard section, the north side of the harbor consists of very high, steep, vertical sandstone cliffs where a condominium complex and several homes are located. The city also has a main sewer line located in Bay Street at the top of the cliff. More detailed landslide hazard assessment at specific locations requires a site-specific analysis of the slope, soil/rock and groundwater characteristics at a specific site. Such assessments are often conducted prior to major development projects in areas with moderate to high landslide potential, to evaluate the specific hazard at the development site.

Potential landslide-related impacts are adequately described within the county’s plan, and include infrastructure damages, economic impacts (due to isolation and/or arterial road closures), property damages, and obstruction to evacuation routes. Rain-induced landslides and debris flows can potentially occur during any winter in Lincoln County, and thoroughfares beyond city limits are susceptible to obstruction as well. As such, Depoe Bay is vulnerable to isolation for an extended period.

¹⁹ DOGAMI. [Open-File Report, O-16-02](#), *Landslide Susceptibility Overview Map of Oregon* (2016)

Map DA-9 Landslide Susceptibility Exposure



Source: [Oregon Explorer: Map Viewer](#) – To view map detail click hyperlink to left..

Natural Hazard Risk Report for Lincoln County

The Risk Report ([DOGAMI, O-20-11](#)) provides hazard analysis summary tables that identify populations and property within Lincoln County that are vulnerable to landslide. The Risk Report provides a distinct profile for Depoe Bay.

The Risk Report provides an analysis of landslide susceptibility to identify the general level of susceptibility to landslide hazards, primarily shallow and deep landslides. The Risk Report performed an analysis of buildings, including critical facilities, to determine exposure for the city. According to the Risk Report the following resident population and property (public and private) within the city may be impacted by the profiled landslide scenario (Table DA-9).

Approximately 25% of the city's population (348 people) may be displaced by landslides. These people are expected to have mobility or access issues and/or may have their residences impacted by a landslide. It is important to note that impact from landslides may vary depending on the specific area that experiences landslides during an event. Properties that are most vulnerable to the landslide hazard are those that are developed in an area of, or at the base of, moderate to steep slopes. Approximately 24% of all buildings (319 buildings) within the city are exposed to the High or Very High landslide susceptibility zones (Map DA-9). The value of exposed buildings is \$42 million (about 16% of total building value).

Table DA-9 Potentially Displaced Residents and Exposed Buildings, Landslide

Community Overview: Depoe Bay						
Population		Buildings		Critical Facilities	Total Building Value (\$)	
1,398		1,337		4	257,610,000	
Exposure Analysis: Landslide High & Very High Susceptibility						
Potentially Displaced Residents		Exposed Buildings			Exposed Building Value	
Number	Percent	Number	Percent	Critical Facilities	Value (\$)	Percent
348	24.9%	319	23.9%	2	42,048,000	16.3%

Source: IPRE. Data adapted from DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-14. Note: city population based on the 2010 Census population.

Critical Facility Vulnerability²⁰

- Depoe Bay RFPD Fire Station 2300
- U.S. Coast Guard Depoe Bay Station

Housing developments in the hilly areas of the city have increased the vulnerability of Depoe Bay to landslides.

²⁰ DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-15.

Severe Weather

Severe wind events may occur throughout Oregon during all seasons. Often originating in the Pacific Ocean, westerly winds pummel the coast, slowing as they cross the Coastal mountain range and head into the inland valleys.²¹ Similarly, severe winter storms consisting of rain, freezing rain, ice, snow, cold temperatures, and wind originate from troughs of low pressure offshore in the Gulf of Alaska or in the central Pacific Ocean that ride along the jet stream during fall, winter, and early spring months.²² In summer, the most common wind directions are from the west or northwest; in winter, they are from the south and east. Local topography, however, plays a major role in affecting wind direction.

Additional information can be found on the Lincoln County website:

<https://www.co.lincoln.or.us/765/Hazards-Severe-Weather>

Future Climate Projections

Oregon and the Pacific Northwest experience a variety of extreme weather incidents ranging from severe winter storms and floods to drought and dust storms, often resulting in morbidity and mortality among people living in the impacted regions. According to the Oregon Climate Change Research Institute, climate change is expected to increase the frequency and intensity of some weather incidents.²³

Climate change poses risks for increased injuries, illnesses and deaths from both direct and indirect effects. Incidents of extreme weather (such as floods, droughts, severe storms, heat waves and fires) can directly affect human health as well as cause serious environmental and economic impacts. Indirect impacts can occur when climate change alters or disrupts natural systems.

According to OCCRI report “*Future Climate Projections: Lincoln County*” ([Link](#)) windstorm events are not expected to increase, however, air temperatures on the coldest day of the year will increase by about 5°F by the 2050s under the higher emissions scenario relative to historical baselines.

Extreme Heat

The city experiences milder temperatures compared to inland areas, as such, extreme heat is not considered to be a hazard within the community.

The Steering Committee rated the city’s **probability of occurrence for windstorm events as “high” and their vulnerability as “high”**. *These ratings have not changed since the previous NHMP.*

²¹ US Department of Agriculture. <http://www.fsa.usda.gov/or/Notice/Flp104.pdf>.

²² Interagency Hazard Mitigation Team. 2000. State Hazard Mitigation Plan. Salem, OR: Oregon Office of Emergency Management.

²³ Oregon Climate Change Research Institute <http://occri.net/wp-content/uploads/2011/04/chapter9ocar.pdf> Page 412.

The Steering Committee rated the city's **probability of occurrence for tornado events as "moderate" and their vulnerability as "low"**. *These ratings have not changed since the previous NHMP.*

Volume I, Section 2 of Lincoln County's NHMP adequately describes the causes and characteristics of windstorm hazards, as well as the history, location, extent, and probability of a potential event. Because coastal windstorms typically occur during winter months, ice, freezing rain, flooding, and very rarely, snow sometimes accompany them. More than likely, however, the coast's winter will just be windy, cold, and wet.

Vulnerability Assessment

Due to insufficient data and resources, a quantitative risk assessment or exposure analysis for this hazard cannot currently be performed. In Depoe Bay, power outages are the greatest concern during windstorms. Building codes now require new developments to place power lines below ground. Without power, communication is lost, and fuel and food stores shut down. In the December 2007 windstorm, the water treatment plant nearly used up its diesel supply, and the city lost its primary communications route (provided through Telecommunication Utility-owned Fiber Optic routes). Depoe Bay city patrons were unable to access 911.

No development or population changes affected the jurisdiction's overall vulnerability to this hazard. In addition, development and population forecasts are not expected to increase or decrease the impact of this hazard.

Winter Storm (Snow/ Ice)

The Steering Committee rated the city's **probability of occurrence for winter storm events as "high" and their vulnerability as "moderate"**. *These ratings have not changed since the previous NHMP.*

Volume I, Section 2 of Lincoln County's NHMP adequately describes the causes and characteristics of winter storm hazards, as well as the history, location, extent, and probability of a potential event. Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting the city typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from October through March. More than likely, however, the coast's winter will just be windy, cold, and wet.

Vulnerability Assessment

Due to insufficient data and resources, a quantitative risk assessment or exposure analysis for this hazard cannot currently be performed. Major winter storms can and have occurred in the Depoe Bay area, and while they typically do not cause significant damage; they are frequent and have the potential to impact economic activity. Road closures on Highway 101, or the passes to the Willamette Valley (Hwy 18 and 20), due to winter weather are an uncommon occurrence, but can interrupt commuter and large truck traffic.

No development or population changes affected the jurisdiction's overall vulnerability to this hazard. In addition, development and population forecasts are not expected to increase or decrease the impact of this hazard.

Volcanic Event

The city experiences westerly winds and the nearest volcanoes are in the Cascade Range to the east, as such, volcanic events (lahar, tephra) are not considered to be a hazard within the community.

Wildfire

The Steering Committee rated the city's **probability of occurrence for wildfire as "moderate" and their vulnerability as "moderate"**. *These ratings have not changed since the previous NHMP.*

The [Lincoln County Community Wildfire Protection Plan \(CWPP\)](#) was last completed in 2024. The CWPP is hereby incorporated into this NHMP addendum by reference, and it will serve to supplement the wildfire section in this addendum.

Volume I, Section 2 of Lincoln County's NHMP adequately describes the causes and characteristics of wildfire hazards, as well as the history, location, extent, and probability of a potential event. The location and extent of a wildfire vary depending on fuel, topography, and weather conditions. Wildfires in 1849 and 1936 were particularly devastating in Lincoln County, but since then, there have been few large events. In 2016, the 2500 Road fire burned over 200 acres 2 miles east of the city. The burn probability and wildfire history (1992-2022) for the city is shown in Map DA-10. Most of the city has "very low" to "low" burn probability. Due to increased drought conditions, human activity (tourism), and the threat of east-wind conditions, the city elevated the probability of occurrence in their HVA.

Additional information can be found on the Lincoln County website:

<https://www.co.lincoln.or.us/770/Hazards-Wildfire>

Future Climate Projection:

According to OCCRI report *"Future Climate Projections: Lincoln County"* ([Link](#)) wildfire risk is expected to increase as the frequency of higher fire danger days per year increases by 37% by the 2050s under the higher emissions scenario compared with the historical baseline.

Vulnerability Assessment

Potential wildfire impact is shown using integrated conditional net value change from the Pacific Northwest Quantitative Wildfire Risk Assessment (2023, Map DA-11).²⁴ Overall Potential Impact measures the potential consequences of wildfire on valuable assets and resources—such as infrastructure, housing, forests, and wildlife habitat—without considering the likelihood (probability) of fire occurring. It reflects a spectrum from very negative impacts (e.g., damage to

²⁴ Full documentation of methods for the 2023 update to the Pacific Northwest QWRA can be found here: https://oe.oregonexplorer.info/externalcontent/wildfire/PNW_QWRA_2023Methods.pdf

structures or sensitive ecosystems) to positive impacts (e.g., ecological benefits like improved vegetation or habitat conditions). Not all resources are present everywhere, so the map displays risk only for what's within the mapped area. Most of the city lies within “neutral” to “very high” loss areas.

The forested areas have the potential for large wildfires and a wildfire within the watershed could impact the city’s water supply and quality. Areas of concern include the eastern side of the city (where forestland borders development) and some of the open spaces within the city’s limits. Due to the prevailing wind patterns (i.e., from the north or south), the city’s Steering Committee felt that the east and south ends of the city might be the most vulnerable. Power, natural gas, and phone lines run through the forest to the east of the city and would be affected in the event of wildfire. Likewise, active commercial logging occurs just outside the city, and slash burns are a potential wildfire concern.

Property can be damaged or destroyed with one fire as structures, vegetation, and other flammables easily merge to become unpredictable and hard to manage. Other factors that affect ability to effectively respond to wildfire include access to the location, and to water, response time from the fire station, availability of personnel, and equipment, and weather (e.g., heat, low humidity, high winds, and drought).

Exposed infrastructure including wastewater main lines, major water lines, natural gas pipeline and fiber optic lines are buried, decreasing their vulnerability to damage from wildfire hazards. However, wildfire conditions could potentially limit or delay access for the purposes of operation or repair.

Natural Hazard Risk Report for Lincoln County

The **Risk Report** ([DOGAMI, O-20-11](#)) provides hazard analysis summary tables that identify populations and property within Lincoln County that are vulnerable to wildfire. The Risk Report provides a distinct profile for Depoe Bay.

The Risk Report provides an analysis of the West Wide Wildfire Risk Assessment’s Fire Risk Index (FRI) High Hazard category to identify the general level of susceptibility to the wildfire hazard. The Risk Report performed an analysis of buildings, including critical facilities, to determine exposure for the city. According to the Risk Report the following resident population and property (public and private) within the city may be impacted by the profiled wildfire scenario (Table DA-10).

Approximately two percent of the city’s population (21 people) may be displaced by wildfires. These people are expected to have mobility or access issues and/or may have their residences impacted by wildfire (more people may also be impacted by smoke and traffic disruptions that are not accounted for within this analysis). It is important to note that impact from wildfires may vary depending on the specific area that experiences a wildfire. The value of exposed buildings (32 buildings) is \$16.3 million (about 6% of total building value).

Table DA-10 Potentially Displaced Residents and Exposed Buildings, Wildfire

Community Overview: Depoe Bay						
Population		Buildings		Critical Facilities	Total Building Value (\$)	
1,398		1,337		4	257,610,000	
Exposure Analysis: Wildfire High-Hazard						
Potentially Displaced Residents		Exposed Buildings			Exposed Building Value	
Number	Percent	Number	Percent	Critical Facilities	Value (\$)	Percent
21	1.5%	32	2.4%	0	16,336,000	6.3%

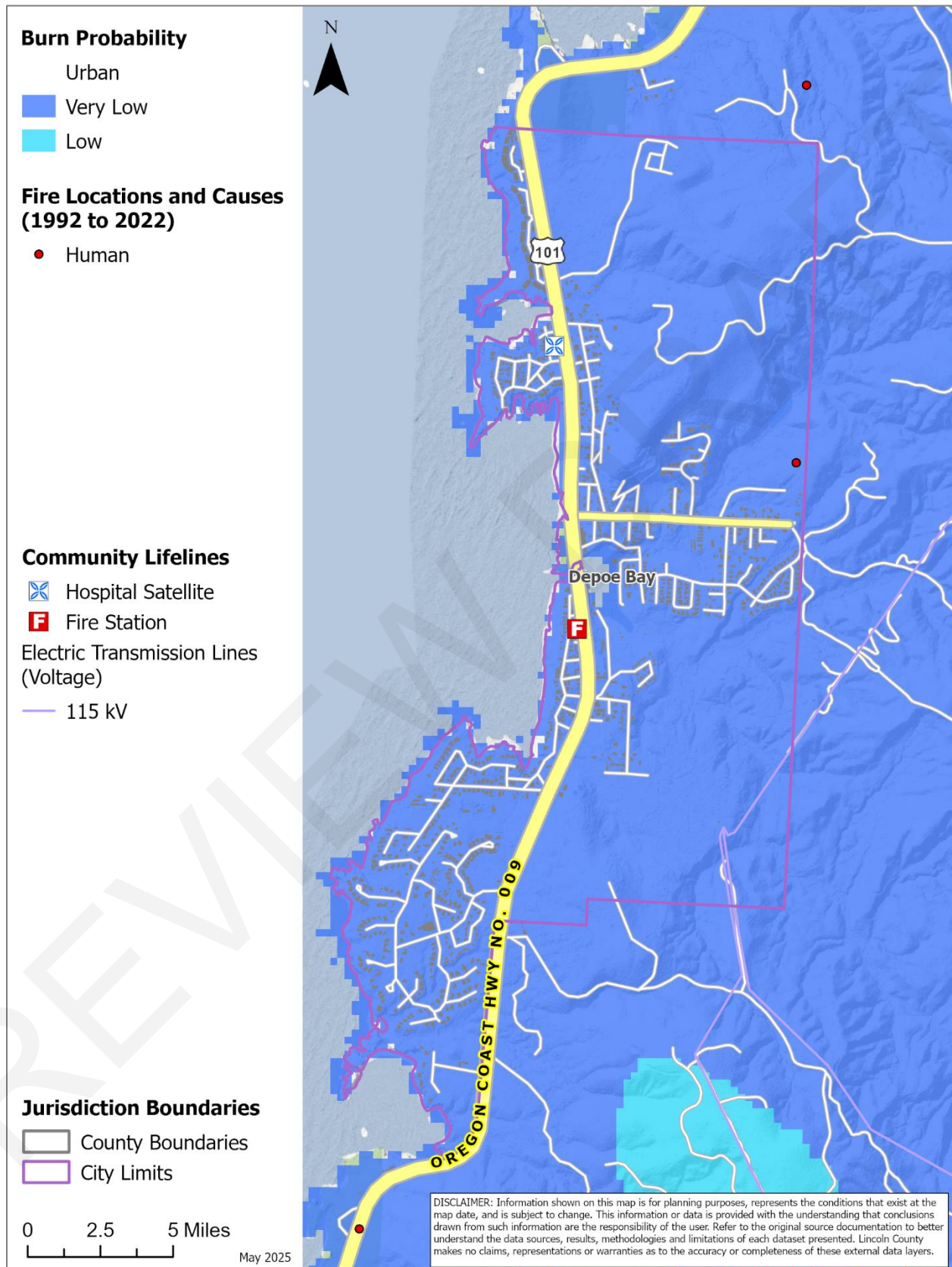
Source: IPRE. Data adapted from DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-14. Note: city population based on the 2010 Census population.

Critical Facility Vulnerability²⁵

There are no critical facilities exposed to the profiled wildfire scenario.

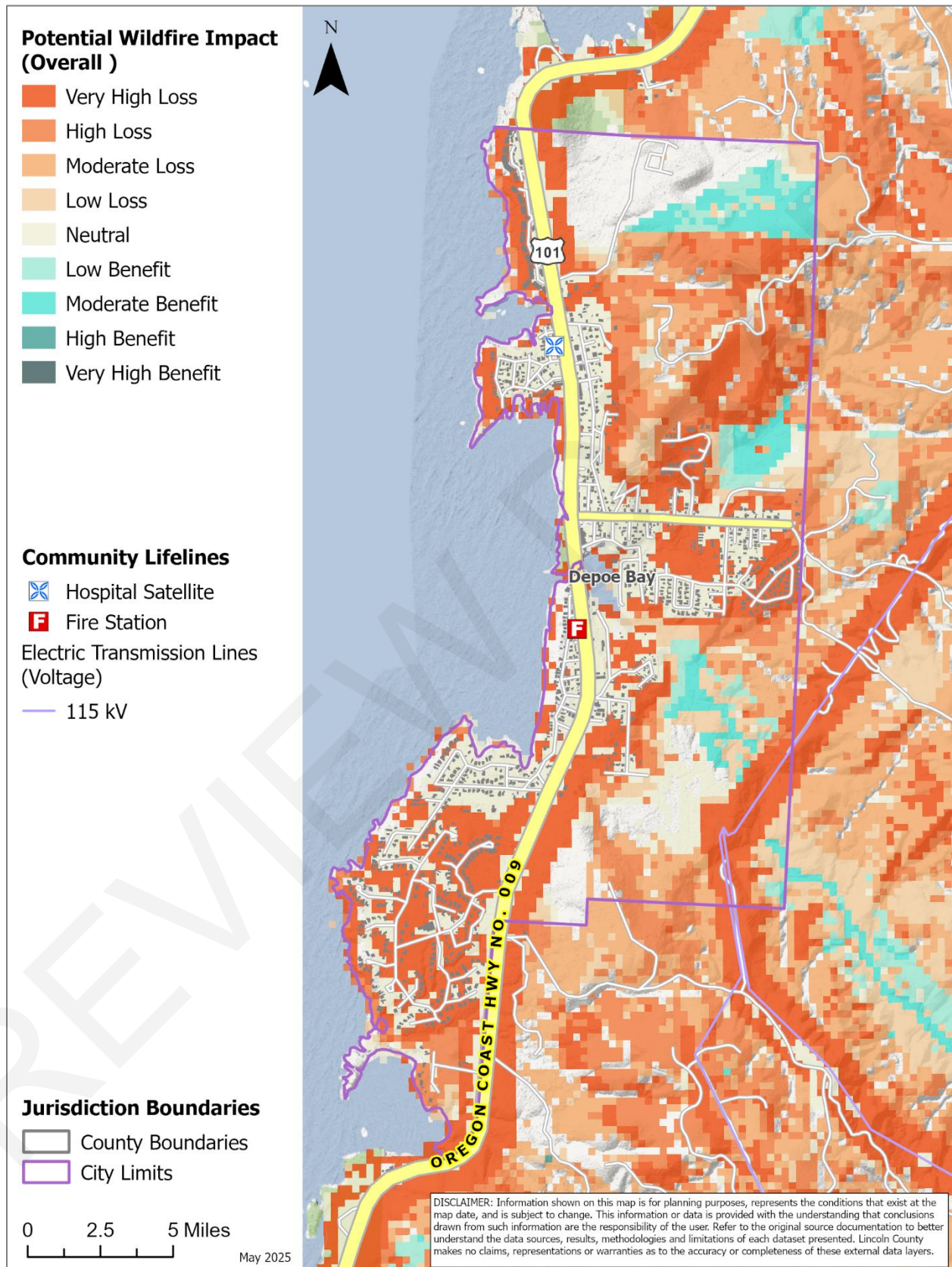
²⁵ DOGAMI, Open-File Report O-20-11, Lincoln County Natural Hazard Risk Report (2020), Table A-15.

Map DA-10 Burn Probability and Fire History (1992-2022)



Source: [Oregon Explorer: Map Viewer](#) – To view map detail click hyperlink to left.

Map DA-11 Potential Wildfire Impact (Overall)



Source: [PNW Quantitative Wildfire Risk Assessment](#) (2023, layer name = icNVC), To view map detail click hyperlink to left..

Attachment A:

Action Items

Table DA-11 is an accounting of the status (complete or not complete) and major changes to actions since the previous NHMP. All actions were renumbered in this update to be consistent with other jurisdictions that are participating in the multi-jurisdictional NHMP. Actions identified as still relevant are included in the updated action plan (Table DA-1).

Previous NHMP Actions that are Complete:

Depoe Bay #3: *Continue to educate citizens about earthquake, tsunami, windstorm, winter storm, and other natural hazards.* This action is part of normal business for the city.

Depoe Bay #5: *Evaluate and implement mitigation projects for areas east of harbor that are threatened by a slow-moving landslide.* Site evaluated and determined that the area is not moving fast enough to be a concern. city may opt to purchase property.

Previous NHMP Actions that are Not Complete and No Longer Relevant:

None

Table DA-11 Status of All Hazard Mitigation Actions in the Previous Plan

2020 Action Item	2025 Action Item	Status	Still Relevant? (Yes/No)
Depoe Bay #1	Depoe Bay #1	Not Complete	Yes
Depoe Bay #2	Depoe Bay #2	Not Complete	Yes
Depoe Bay #3	-	Complete	-
Depoe Bay #4	Depoe Bay #3	Not Complete	Yes
Depoe Bay #5	-	Complete	-
-	Depoe Bay #4	New	-
-	Depoe Bay #5	New	-
-	Depoe Bay #6	New	-
-	Depoe Bay #7	New	-
-	Depoe Bay #8	New	-

Attachment B:

Public Involvement Summary

Members of the Steering Committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document. In addition, a survey was distributed that included responses from residents of the district (Volume II, Appendix F).

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement was provided from August 7 through 21, 2025 on the County's website and publicized by the city. Comments were reviewed and integrated into the NHMP as applicable. Additional opportunities for stakeholders and the public to be involved in the planning process are addressed in Volume II, Appendix B.

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

Steering Committee

Steering Committee members possessed familiarity with the city and how it is affected by natural hazard events. The Steering Committee guided the update process through several steps including goal confirmation and prioritization, action item review and development, and information sharing, to update the NHMP and to make the NHMP as comprehensive as possible. The Steering Committee met formally on the following dates:

Meeting #1: March 19, 2025 (virtually via Zoom)

During this meeting, the Steering Committee reviewed the previous NHMP, and were provided updates on hazard mitigation planning, the NHMP update process, and project timeline. The Steering Committee:

- Updated recent history of hazard events in the city.
- Reviewed and confirmed the County NHMP's mission and goals.
- Discussed the NHMP public outreach strategy.
- Reviewed and provided feedback on the draft risk assessment update including community vulnerabilities and hazard information.

- Reviewed and updated their existing mitigation strategy (actions).
- Reviewed and updated their implementation and maintenance program.

Meeting Attendees:

- Convener, Kimberly Wollenburg, City Administrator/Recorder