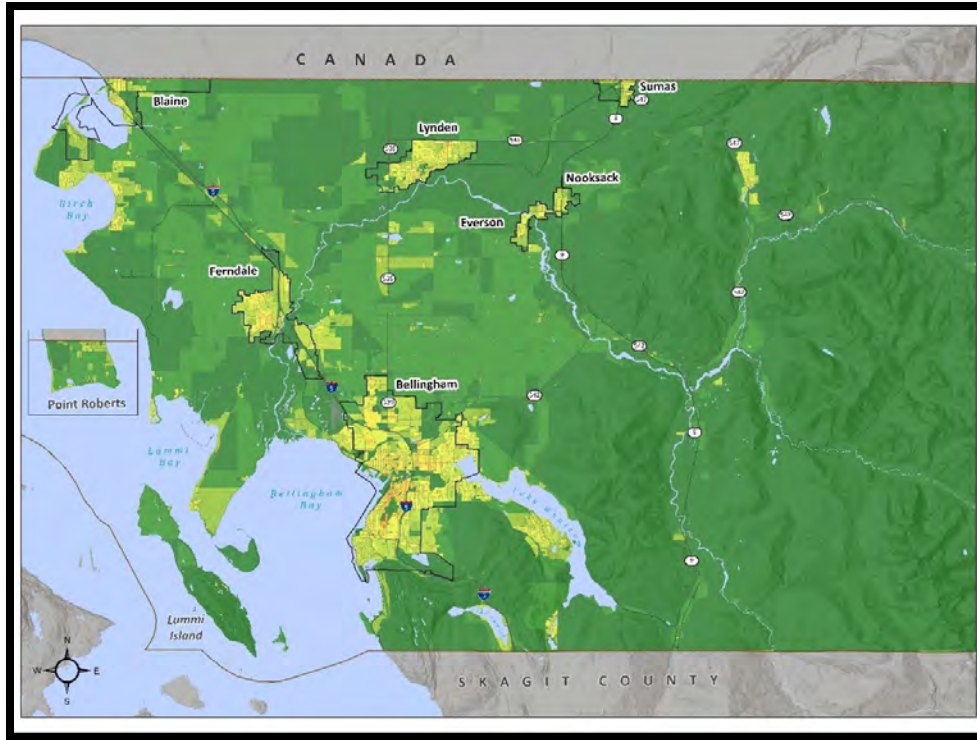




Whatcom County

Natural Hazards Mitigation Plan



**A MULTI-HAZARD, MULTI-JURISDICTIONAL PLAN DEVELOPED FOR
THE BENEFIT OF ALL CITIZENS AND GOVERNMENTAL
JURISDICTIONS WITHIN WHATCOM COUNTY**

**Prepared by:
Whatcom County Sheriff's Office Division of Emergency Management
and
The Resilience Institute of Western Washington University**

September 30, 2021

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Geographic Information Systems Maps

The maps for the 2021 update of the Plan were created by Western Washington University's Resilience Institute, with support from the university's Spatial Institute, unless indicated otherwise.

The datasets used in the maps in this Plan were from the following sources:

- Washington Department of Natural Resources – Wildland-Urban Interface (2019), Boulder Creek Fault Zone Seismic Scenario (2017), and Liquefaction Susceptibility (2010)
- Washington Geological Survey – Landslide Inventory (2020)
- Federal Emergency Management Agency – National Flood Hazard Layer (2019)
- Whatcom County – Tsunami Inundation (contour polygons, 2020)
- U.S. Geological Society – Mount Baker Volcano Lahar and Blast Zone Boundaries (1995)
- Whatcom County Planning and Development Services – City Limits, County Boundaries, Urban Growth Area
- Washington State Department of Transportation – Railroads, Roads, Highway
- Washington State Department of Natural Resources -- Tsunami Hazard maps for North Puget Sound (2021)



AUTHORITY

This Plan is adopted by:

| Entity | Approving Authority | Date Adopted | Ordinance |
|--|--|-------------------|------------|
| City of Bellingham | Mayor Seth Fleetwood & City Council Members | December 13, 2021 | 2021-35 |
| Port of Bellingham | Executive Director Rob Fix & Port Commission | November 16, 2021 | 1344-B |
| City of Blaine | Blaine City Council | November 11, 2021 | 1866-21 |
| City of Everson | Mayor John Perry & City Council Members | December 14, 2021 | 573-21 |
| City of Ferndale | Mayor Greg Hansen & City Council Members | February 22, 2022 | 22-02-22-A |
| Meridian School District | Dr. James Everett, Superintendent | February 2, 2022 | 1-22 |
| City of Lynden | Mayor Scott Korthuis & City Council Members | January 18, 2022 | 1045 |
| City of Nooksack | Mayor Jim Ackerman & City Council Members | November 11, 2021 | 316 |
| City of Sumas | Chamber President Ron Fadden & City Chamber Members | November 22, 2021 | 815 |
| Whatcom County | County Executive Satpal Sidhu & Whatcom County Council Members | December 7, 2021 | 2021-057 |
| Whatcom County Flood Control Zone District | County Executive Satpal Sidhu & Whatcom County Council Members | December 1, 2021 | 2021-058 |
| Lake Whatcom Water & Sewer District | District Board of Commissioners | November 10, 2021 | 878 |



INTRODUCTION

In 2021, Whatcom County Sheriff's Office, Division of Emergency Management (DEM) undertook the process of updating the *Whatcom County Natural Hazards Mitigation Plan* (cited herein as "Plan"). Natural hazards mitigation process was instigated by the Code of Federal Regulation (CFR) 201.6 (see Appendix A), enacted in October 2002 and amended in September 2004. The purpose of the Plan is to facilitate a net reduction in the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during immediate recovery from a disaster.

Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5165, as amended by the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390), provides for States, Tribes, and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning. The National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4001 *et seq*, reinforced the need and requirement for mitigation plans, linking flood mitigation assistance programs to State, Tribal and Local Mitigation Plans.

After a presidential major disaster declaration, mitigation funding becomes available. The amount is based on a percentage of the total federal grants awarded under the Public Assistance and Individuals and Households Programs for the entire disaster. Projects are funded with a combination of federal, state, and local funds. Information on this program and application process is disseminated at public briefings and by other means.

Section 322 of the amended Stafford Act essentially states that as a condition of receiving a disaster loan or grant:

"The state and local government(s) shall agree that natural hazards in the areas affected shall be evaluated and appropriate action taken to mitigate such hazards, including safe land-use and construction practices. For disasters declared after November 1, 2004, all potential applicants (sub-grantees) must have either their own, or be included in a regional, locally adopted and FEMA approved all hazard mitigation plan in order to be eligible to apply for mitigation grant funds."

The regulations governing the mitigation planning requirements for local mitigation plans are published under 44 CFR §201.6. Under 44 CFR §201.6, local governments must have a FEMA-approved Local Mitigation Plan in order to apply for and/or receive project grants under the following hazard mitigation assistance programs:

- **Hazard Mitigation Grant Program (HMGP).**

The Hazard Mitigation Grant Program (HMGP) provides funds to States, Territories,



Indian Tribal governments, local governments, and eligible private non-profits (PNPs) following a Presidential major disaster declaration.

- **Pre-Disaster Mitigation (PDM)**
- **Flood Mitigation Assistance (FMA)**

The Pre-Disaster Mitigation (PDM) Program and Flood Mitigation Assistance (FMA) programs provide funds annually to States, Territories, Indian Tribal governments, and local governments. Although the statutory origins of the programs differ, both share the common goal of reducing the risk of loss of life and property due to natural hazards.

Mitigation is the cornerstone of emergency management. It is an integral part of the ongoing effort to lessen the impacts disasters can have on people's lives and property through damage prevention and flood insurance. The impact on human lives and communities is lessened through measures such as building safely within the floodplain or removing homes from the floodplain altogether; engineering buildings and infrastructures to withstand earthquakes; and creating and enforcing effective building codes to protect properties from floods, hurricanes, and other natural hazards.

The mitigation plan contains a five-year action plan matrix, background on the purpose and methodology used to develop the mitigation plan, profiles of Whatcom County and participating jurisdictions, sections on the natural and technological that occur within the county, and multiple appendices.





WHATCOM COUNTY BACKGROUND

Whatcom County, the northwestern most county of Washington State, comprises an area of 2,120 square miles. It is bordered to the north by Canada and to the west by the Strait of Georgia, a deep-water ship transit, and another waterway called the Rosario Strait. The eastern half of Whatcom County is composed of the North Cascades Mountain range, which occupies roughly two-thirds of the entire County. No Whatcom County roads that originate in the western half of the County connect to the eastern half; towns in eastern Whatcom County can only be accessed by driving more than 60 miles through Skagit County to the south. An unusual characteristic of Whatcom County is that not all of its populated areas are contiguous with the mainland part of the County; these areas include Point Roberts and Lummi Island. Only 4.5% of the land area is incorporated, while the majority is unincorporated. According to the U.S. Census Bureau, the population of Whatcom County grew from an estimated 209,790 in 2015, to an estimated 228,000 in 2020, an 8% increase. Most of this growth, 70%, occurred within the incorporated areas of Whatcom County. Development has followed a similar pattern.

The Washington State Growth Management Act (GMA) was adopted by State Legislature in 1990 (Revised Code of Washington Chapter 36.70A) to address the threat that uncoordinated and unplanned growth posed to the environment, sustainable economic development, and the quality of life in Washington, including the minimizing the risks natural hazards pose to local communities. The GMA requires state and local governments to manage Washington's growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, preparing comprehensive plans and implementing them through capital investments and development regulations. According to the code, critical areas include frequently flooded areas and geologically hazardous areas, natural hazards specifically addressed in the Whatcom County Natural Hazard Mitigation Plan. The GMA regulates development in these areas and has the potential to affect hazard vulnerability and exposure at the local level. Whatcom County and its planning partners are in compliance with the provisions of the GMA and other regulations (e.g., Endangered Species Act, Clean Water Act, Shoreline Management Act, and the Washington State Building Code) that limit development in frequently flooded and geologically hazardous areas.

The Natural Hazard Mitigation Plan is constantly under review and efforts are made to reflect changes in priority. For example, in 2017 the Whatcom County Council added to its Critical Areas Chapter paragraph "16.16.350 Volcanic Hazard Areas-Standards." While not denying the construction of structures in a lahar zone, this paragraph requires deliberate evaluation of the possible lahar path and development of an emergency evacuation plan with life-saving action as the primary consideration.



The NHMP both informs and is informed by Whatcom County Planning and Development policies and regulations and other planning documents, including the Whatcom County Comprehensive Plan (November 2020; specifically, Chapter 2 Land Use and Chapter 10 Environment). While development has continued to occur within Whatcom County, the Natural Hazards Mitigation Plan has been used as one of the documents to determine the impacts that the hazard(s) may have in areas that are being developed.

An understanding of the geography, weather, industries, and characteristics of Whatcom County is critical to an ability to mitigate the natural hazards identified in this Plan. Some of these characteristics are discussed below.

A. CLIMATE

Annual precipitation varies greatly, depending on elevation, as follows:

1. Lowlands: rainfall varies from 30 to 40 inches
2. East toward the Cascade Mountains: precipitation increases
3. Near Mount Baker (elevation 10,778 feet): 140 inches, snow is possible year round

B. GEOGRAPHY

Major geographic features of Whatcom County are grouped as follows:

1. **Lowlands (West of Cascade Foothills):** These lowlands are part of the Fraser/Nooksack river-deltas system. This system runs north from the Chuckanut Mountains to the mouth of the Fraser River, where Vancouver, British Columbia (B.C.) is sited. To the south (beyond the Chuckanut Mountains, in Skagit County) is the delta of another great river, the Skagit River. These river deltas are important to Whatcom County because of their related flood, earthquake, and volcano hazards.
2. **Mount Baker Foothill Communities:** Scattered through the rural area along the Valley Highway (Highway 9) and up through the foothills along the Mount Baker Highway (State Route [SR] 542), crossing all three forks of the Nooksack River, are the Mount Baker Foothill communities of Van Zandt, Acme, Wickersham, Welcome, Kendall, Maple Falls, and Glacier.
3. **Nooksack River:** There are more than 1,325 miles of stream in the Nooksack River, its tributaries, and associated independent streams. The river originates in the mountains as three forks (North, Middle, and South) that converge near Deming. Its watershed



basin comprises most of the County's eastern lands. The river corridor links the various landscapes of Whatcom County.

4. **Coast and Islands:** There are 134 miles of seacoast in Whatcom County: 51% is steep, eroding sea bluff (such as the mountain view coast at Birch Point); 16% is rocky shoreline, which includes parts of Lummi Island; 17% is accreting (building up or extending shoreline); and 5% is estuarine shore.
5. **Lakes:** There are 245 lakes in Whatcom County: four large reservoirs inside the Federal Lands (Ross, Diablo, Gorge, and Baker Lakes) and two large natural lakes in the Chuckanut region (Lake Whatcom and Lake Samish). Seven lakes are more than 100 acres in size:
 - Whatcom (5,000 acres)
 - Samish (825 acres)
 - Terrell (440 acres)
 - Silver (185 acres)
 - Padden (150 acres)
 - Wiser (125 acres)
 - Judson (112 acres)
6. **The North Cascades Mountains:** Roughly two-thirds of eastern Whatcom County is federally managed land contained in the North Cascades Mountains, which is controlled by the U.S. Forest Service and the U.S. National Park Service. The Cascades extend from Canada's Fraser River south beyond Oregon. They shape the climate and vegetation over much of the Pacific Northwest.
 - The Mount Baker-Snoqualmie National Forest lies east of the foothills and west of the "North Unit" of North Cascades National Park.
 - The North Cascades National Park is located adjacent to the east portion of the Mount Baker-Snoqualmie National Forest.
 - East of the North Cascades National Park is the Pasayten Wilderness, administered through the Okanogan National Forest. This is a road-less area.
7. **National Forest and Parks.** There are about 460,000 acres of National Forest Lands and about 400,000 acres of National Park Lands within Whatcom County. Three roads



connect western Whatcom County with the federal lands:

- The Mount Baker Highway (SR 542) provides access to the Mount Baker Recreation Area.
- The Middle Fork Road (a secondary, more primitive entrance) leads to the hiking and camping region on the south and west sides of Mount Baker, including the Twin Sisters area.
- Highway 20 (through Skagit County) is the principal access to Baker Lake, as well as to North Cascades National Park.

Two parts of the North Cascades National Park Complex are located in Whatcom County:

- The North Unit (Picket Range) – roadless, primitive, high country .
- Ross Lake National Recreation Area – Seattle City Light with three dams on the Skagit River.

C. TRANSPORTATION

1. Major Roads

- Interstate 5 (I-5), which connects Mexico to Canada, runs north and south through Whatcom County.
- SR 9 traverses north and south, crossing the South and North Forks of the Nooksack River.
- Mount Baker Highway (SR 542), from Bellingham, intersects SR 9 and winds east to Mount Baker.
- Chuckanut Drive (SR 11), from Bellingham, south along the coast to Skagit County

2. Marinas

- In Bellingham, Squalicum Harbor is the second largest marina in Puget Sound. More than 1,800 pleasure craft, commercial boats, and fishing vessels are moored here.
- In Blaine, Drayton Harbor includes pleasure craft and a fishing fleet.



- Point Roberts is accessed by water from the Strait of Georgia or by land through Canada.
- Semiahmoo Marina contains approximately 300 slips and is located near the Canadian border.
- Private marinas are located along Bellingham Bay (including Fairhaven), Lummi Island, Gooseberry Point, Sandy Point, Birch Bay, and Eliza Island.

3. Rail

- Bellingham is on Amtrak routes from Seattle and Vancouver, B.C.
- Rail freight corridors along SR 9 and the Puget Sound shoreline (i.e., along Chuckanut Bay to Bellingham) connect freight from the south into Canada, with additional sidings that connect these two routes.
- There is rail along the I-5 corridor to Blaine and northwest to the Cherry Point vicinity.
- Rail from Cherry Point to Custer links with the I-5 rail corridor.

4. Vessel Traffic Lanes

- Deep Draft Commercial Vessels
- Barges
- Tug boats
- Commercial fishing vessels
- Recreation boats
- Federal Vessels
- Vessels accessing shipyards in Fairhaven and Bellingham Bay

5. Ferry Crossings

- The Alaska Marine Highway System Ferry departs from Bellingham to Alaska.
- The Whatcom County Ferry crosses Hales Pass from Gooseberry Point to Lummi Island (an approximately 8-minute transit time).
- Plover Passenger Ferry crosses from Blaine to Semiahmoo Spit; this ferry is open seasonally on the weekends from Memorial Day to Labor Day.
- Commercial sight-seeing ferries to the San Juan Islands and Victoria, Canada,



depart from the Bellingham Ferry Terminal.

- Canadian Ferries cross northwestern Whatcom County waterways: Tsawwassen through Strait of Georgia, to Channel Islands, and to Sidney on Vancouver Island, B.C.

6. Rivers

- The Nooksack River and many tributaries and independent streams are used by canoes, kayaks, small fishing boats, and for rafting float trips.

D. AIR TRANSPORTATION

- Bellingham International Airport: Commercial jets use a 6,700 X 150-foot asphalt runway
- Lynden Municipal Airport: 2425 X 40-foot asphalt runway
- Point Roberts Airport: 2400 X 150 turf runway
- Vancouver International Airport, an "air hub" with worldwide nonstop flights, is 45 miles north in Vancouver B.C.
- Sea-Tac International Airport is 90 miles south in Seattle, Washington

E. LAND TRANSPORTATION

- Whatcom Transportation Authority (WTA)
- Greyhound bus
- Private charters/shuttles
- Taxis
- Car rentals

F. SERVICES

1. Hospital

- Peace Health St. Joseph Medical Center, including its Outpatient Center, is the only hospital in Whatcom County.
- Several health clinics are found in Whatcom County, primarily in Bellingham.



2. Local Media

- Two television stations with out-of-state production: KVOS on Channel 12 is produced in Chicago with its primary market being lower BC and Vancouver Island. KBCB is an Illinois based Christian Television station, running only Christian programming, again mainly focused on lower mainland.
- Several companies provide television cable services
- Telephone companies:
 - Century Link Communications in Bellingham
 - Whidbey Telephone Company in Point Roberts
 - Frontier in the remainder of Whatcom County
 - Comcast (IP Service)
- Ten radio stations: AM/FM
- Emergency Alert System Station: KGMI (790 AM)
- One daily newspaper
- Seven weekly newspapers
- Two monthly publications

3. School Districts: Public Education, Kindergarten through 12th grade

- 35 elementary schools
- 11 middle schools
- Nine high schools
- Numerous private schools

4. Colleges/Universities

- Bellingham Technical College
- Northwest Indian College
- Western Washington University



- Whatcom Community College
- Washington State University Cooperative Extension – Whatcom County

5. Utilities

- Electricity: Puget Sound Energy, Public Utility District (PUD) #1, Blaine PUD, Sumas PUD, and Bonneville Power (to direct-service customers)
- Gas: Cascade Natural Gas supplies gas directly to customers; Williams Natural Gas Pipeline, Arco Natural Gas Pipeline, and Olympic Pipeline supply retailers.
- Water: approximately 350 public water systems in Whatcom County; Bellingham, Lynden, Blaine, Glacier, Nooksack, and Sumas have their own water districts; and some smaller communities rely on private wells and lakes
- Cogeneration plants: three natural gas-fired cogeneration plants are located in Whatcom County: Sumas Cogeneration Company LP in Sumas; - PSE Ferndale Generating Station in Ferndale; and Encogen Cogeneration Plant in Bellingham.

WHATCOM COUNTY PRESIDENTIAL DISASTER DECLARATIONS

When natural hazard event impacts are large, the state may request a Presidential Disaster Declaration. The table below lists the Presidential Disaster Declarations for Whatcom County from 2009 until the publication of this plan update in June 2021. Where available, dollar value represents the estimate Whatcom County public assistance per capita impacts, as established in the Preliminary Damage Assessment (PDA) Report for the event. Complete data is available through <https://www.fema.gov/disasters/disaster-declarations> database.

| Year | Level of Community Impact (Estimated) | Date | Disaster Types | Federal Disaster # |
|------|--|-------------|--|--------------------|
| 2009 | Whatcom County included in declaration as an amendment to the original declaration. No per capita impact available for Whatcom County at time of PDA | 30-Jan-2009 | Severe Winter Storm, Landslides, Mudslides, and Flooding | 1817 |



| | | | | |
|---------------|-----------------------------------|---------------------|--|------|
| 2008 | \$4.12 per capita impact | 2- Mar- 2009 | December 2008 Severe Winter Storm and Record and Near Record Snow | 1825 |
| 2010- 2014 | No Major Disaster Declarations | | | |
| 2015 | Below \$3.57 per capita threshold | 15- Oct- 2015 | Severe Windstorm | 4242 |
| 2015 | \$10.50 per capita impact | 20- Oct- 2015 | Wildfires and Mudslides | 4243 |
| 2017 | \$10.05 per capita impact | 21- Apr- 2017 | Severe Winter Storms, Flooding, Landslides, and Mudslides | 4309 |
| 2019 | \$25.71 per capita impact | | Straight-Line Winds, Flooding, Landslides, and Tornado | 4418 |
| 2020 | \$10.26 per capita impact | 23- Apr- 2020 | Severe Storms, Flooding, Landslides, and Mudslides | 4539 |
| 2020 | No per capita impact assessed | 22- Mar- 2020 | Covid-19 Pandemic | 4481 |



WHATCOM COUNTY STATE DECLARATIONS AND OTHER DISASTERS

Not all events that occur reach a Presidential Declaration. Whatcom County experiences many events that do not reach the threshold of even a gubernatorial declaration. This does not mean the events are not impactful or costly. It just means the threshold levels for the State have not been reached (\$780,000 for Whatcom County, \$10,750,000 for the State). In addition, Whatcom County, and Whatcom County response agencies, do not have a standardized cost and impact documentation methodology which makes it difficult to adequately track the full scope of an event. Understanding the actual costs and impacts of all natural hazard events is a goal of Whatcom County in the 2021-2025 timeframe. However, the following list of natural hazard events did occur between 2012 and 2020:

| Year | Designation | Title | Estimated COSTS |
|------|--------------------------|----------------------------------|---|
| 2016 | 2016 | Winter Storm | \$250,000 |
| 2016 | 3207 | Reese Hill Wildfire | \$350,000 |
| 2016 | 3764 | Wind and Rain | \$200,000 |
| 2017 | 0971 | 2500 Rock Slide | \$150,000 |
| 2017 | 1905 | June Ferndale Suspicious Oder | \$75,000 |
| 2017 | 4928 | December Ice Storm | \$600,000 (includes utility damages) |
| 2017 | | June Mudslide | \$50,000 |
| 2017 | 0347&0448 / FEMA 4309 | Feb 2017 Storms | \$1,500,000 |
| 2017 | 3957 | Winter Storms 2016/2017 | \$750,000 |
| 2018 | 0439 | 20 Shetland Court Landslide | \$25,000 |



| | | | |
|------|------------------|--------------------------------------|--|
| 2018 | 4434 | Flooding and Windstorm | \$575,000 |
| 2018 | 4615 / FEMA 4418 | December Storms | \$4,750,000 |
| 2018 | 05 | Fire and Dry Fuel Proclamation | \$25,000 |
| 2019 | 0410 | February Severe Storms | \$675,000 (includes utility damages) |
| 2020 | 0256 / FEMA 4539 | Super Bowl Flood | \$3,500,000 |
| 2020 | 0256 | January King Tide Event | \$150,000 |
| 2020 | 0265 | COVID-19 | \$50,000,000 (not calculated in total, on-going) |
| 2021 | 1379 | Mt Baker/Kelly Road Wildland Fire | \$25,000 |
| | | | (Total excluding COVID-19) \$13,650,000 or \$2,730,000 per year |



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