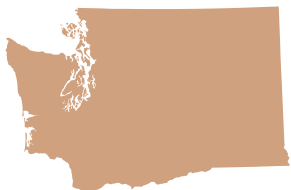


Volcanic Hazards

in Washington State



WASHINGTON
GEOLOGICAL SURVEY

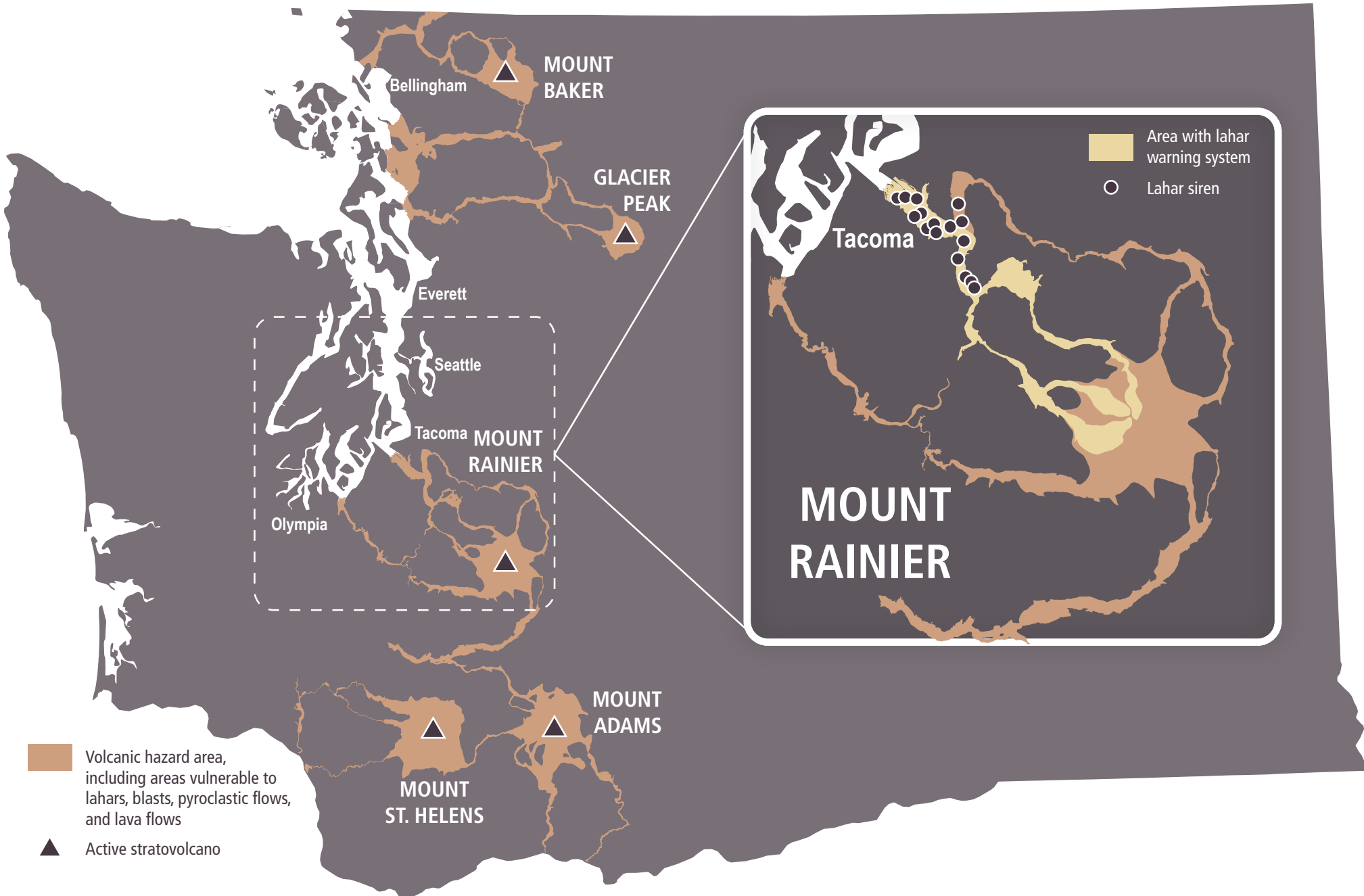


WHAT HAZARDS DO VOLCANOES POSE?

Washington State has five active stratovolcanoes, capable of significantly altering daily life for months to years after eruption.

The main hazards associated with volcanoes are lahars (volcanic mudflows) and volcanic ashfall. Lahars can travel a significant distance from the volcano and fill valleys with mud tens of feet thick. Ashfall eruptions pose a significant hazard to aircraft and human respiratory health. This document provides information on volcanic hazards and preparedness.

VOLCANIC HAZARD AREAS AND LAHAR SIRENS





Mount St. Helens, 1980

The five major stratovolcanoes in Washington State are all capable of producing lava flows, lahars, ashfall, and other hazards. Lava flows typically don't reach very far from the volcano's summit. Ashfall can also arrive in Washington from the Pacific Northwest's other Cascade volcanoes in Oregon, California, and British Columbia.

LAHARS

When enough water mixes with loose volcanic ash and rock on the side of a volcano, the mixture flows downhill and forms a lahar. These mudflows can travel more than 50 miles from the volcano, and commonly at speeds of 40 miles per hour.

Lahars usually form from the melting of snow and ice during volcanic eruptions, and after intense rain on fresh ash fall. At volcanoes with weak and unstable rock, landslides and resulting lahars can occur at almost any time, even without a volcanic eruption.

Lahars are the deadliest eruptive hazard because of their destructiveness, unpredictability, and because of the severe impact they make on communities far downstream of a volcano.

ASHFALL

Eruption columns and ash clouds can become enormous and extend for hundreds of miles. The 1980 eruption of Mount St. Helens covered more than 22,000 square miles with ash, yet this is considered to be a relatively small volcanic eruption.

Large eruption columns pose a hazard to health and aviation. Small particles of rock dust and volcanic glass—called ash—can cause lung damage.

VOLCANO MONITORING & NOTIFICATION

Scientists continuously monitor the volcanoes, looking for evidence of a reawakening. Officials and scientists work together to prepare for eruptions. If a volcano shows signs of unusual activity, they will notify the public.

If an eruption or lahar is detected, officials will trigger notifications that are issued on TV and radio, NOAA weather radio, and the lahar siren system in Pierce County (see inset map on page 3). Volcano notifications are also available at *USGS Volcanoes* on social media.



ALERT LEVEL

DEFINITION

NORMAL	Volcano is in typical background, non-eruptive state OR, after a change from a higher level, volcanic activity has ceased and volcano has returned to non-eruptive background state.
ADVISORY	Volcano is exhibiting signs of elevated unrest above known background level OR, after a change from a higher level, volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase.
WATCH	Volcano is exhibiting heightened or escalating unrest with increased potential of eruption; timeframe uncertain, OR eruption is underway but poses limited hazards.
WARNING	Hazardous eruption is imminent, underway, or suspected.

WHAT TO DO BEFORE AN ERUPTION

SIGN UP FOR EMERGENCY ALERTS

Many communities have emergency alert systems in place that will automatically notify you of hazardous events either by phone, radio, or text message. Learn about alert systems in your community.

VOLCANO NOTIFICATION SERVICE (VNS)

The U.S. Geological Survey provides the **Volcano Notification Service** that alerts subscribed users of significant volcanic activity or alert-level changes through email. Get signed up to stay informed at: <https://volcanoes.usgs.gov/vns2/>.

WHAT ARE THE EMERGENCY RADIO FREQUENCIES?

Find the radio frequencies of your alert weather radio here: <http://www.nws.noaa.gov/nwr/coverage/stations.php?State=WA>



Prepare emergency kits for your home, car, and work

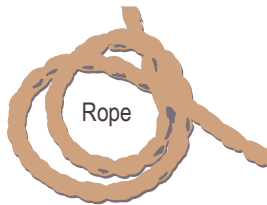


WHAT SHOULD I HAVE IN MY EMERGENCY KIT?

You should prepare an emergency kit with a two-week supply of necessary items for each member of your family, including pets. The kit should be adapted to your needs, but keep it light and manageable in case you must evacuate on foot. Have it ready to go for immediate evacuation. Possible supplies are shown on the next page.



Cell phone and charger



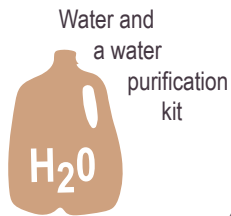
Rope



Important documents



Non-perishable food and cooking and eating utensils, including can opener



Water and a water purification kit



First-aid kit and prescriptions



Goggles and face mask

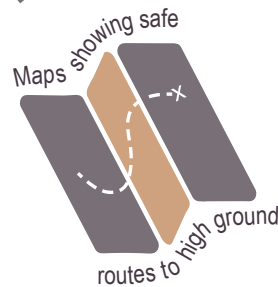


Dental and personal hygiene items

EMERGENCY KIT



Plastic bags for water storage & waste

shoes, clothes
sleeping bag & tent / tarp

Maps showing safe routes to high ground



duct tape



matches



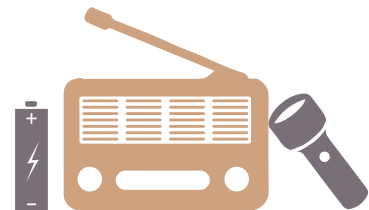
whistle



pocket knife



gloves



Radio, headlamp/flashlight, and batteries

WHAT TO DO DURING A VOLCANIC EVENT

- Follow evacuation orders from authorities
- Gather your emergency supplies
- Plan to evacuate on foot, not with your car
- Become familiar with the location of lahar hazard zones. If you are in a river valley at risk from lahars, move to high ground
- If you are safe from lahars, shelter from ash in a building or vehicle
- If there are signed evacuation routes, follow them



PROTECT YOU & YOUR FAMILY FROM ASH

- Remain indoors. Close doors, windows, and ventilation systems until the ash settles.
- Protect your lungs. Wear a respirator, face mask, or use a damp cloth across your mouth. People with existing respiratory difficulties require extra precautions.
- Use goggles, and wear eyeglasses instead of contact lenses.
- Avoid driving in heavy ash fall. If you must drive, reduce your speed significantly.
- Avoid operating engines of any kind. Ash can clog engines, damage parts, and stall vehicles.
- Wear long-sleeved shirts and long pants if you must go outside. Remove outdoor clothing before entering a building.
- Keep roofs free of ash in excess of four inches.
- Ensure that ash does not contaminate your water. If it does, use bottled water.



AFTER A VOLCANIC EVENT

- Stay out of closed areas. They are closed for your safety.
- Be prepared to stay indoors and avoid downwind areas.
- Be aware of additional lahars and landslides. Areas impacted by lahars are often flooded repeatedly by mud long after the initial event.

Tree blow-down after the Mount St. Helens eruption, 1980



DOES MY COMMUNITY HAVE ANY PLANS IN PLACE?

Check with your city, county, or tribal emergency management agency to find out if there are emergency plans for your area.

MAKE A COMMUNICATION PLAN FOR YOU AND YOUR FAMILY

Check with your city, county, or tribal emergency management agency to find out if there are emergency plans for your area. Here are a few pieces of information that are important to know ahead of time:

TWO OUT-OF-AREA CONTACTS

Name:	Name:
Phone Number(s):	Phone Number(s):

WHERE TO MEET IF EVACUATION IS REQUIRED

Meetup location:

SCHOOL OR WORKPLACE PLANS

OTHER TOOLS OR PLANS

For More Information

KEYS TO VOLCANO SAFETY

- Know the hazards to your community.
- Prepare your emergency communication plan and survival kits.
- Obtain volcano updates from USGS and linked resources.
- During emergency, if lahars are present or predicted, get to high ground off of valley floors; find shelter from heavy ashfall.
- Follow the instructions of officials.

VOLCANO RESOURCES

WASHINGTON GEOLOGICAL SURVEY

Volcanoes and Lahars

<http://www.dnr.wa.gov/volcano>

Geologic Information Portal

https://geologyportal.dnr.wa.gov/#natural_hazards

U.S. GEOLOGICAL SURVEY CASCADES VOLCANO OBSERVATORY

Volcano Hazards in the Cascade Range

<https://volcanoes.usgs.gov/observatories/cvo/hazards.html>

PIERCE COUNTY EMERGENCY MANAGEMENT DIVISION

Are You Volcano Ready?

<https://www.piercecountywa.gov/3730/Mount-Rainier-Active-Volcano>

WASHINGTON STATE EMERGENCY MANAGEMENT DIVISION

Volcano

<https://mil.wa.gov/volcano>



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