FACT SHEET

Key Facts About Volcanic Eruptions

You can do many things to protect yourself and your family from the dangers a volcanic eruption can cause. The best way to protect yourself and your family is to follow the advice of local officials.

Major health threats from a volcanic eruption

Volcanoes spew hot, dangerous gases, ash, lava, and rock that are powerfully destructive. People have died from volcanic blasts. The most common cause of death from a volcano is suffocation. Volcanic eruptions can result in additional threats to health, such as floods, mudslides, power outages, drinking water contamination, and wildfires. Health concerns after a volcanic eruption include infectious disease, respiratory illness, burns, injuries from falls, and vehicle accidents related to the slippery, hazy conditions caused by ash. When warnings are heeded, the chances of adverse health effects from a volcanic eruption are very low.

Volcanic ash

Exposure to ash can be harmful. Infants, elderly people, and people with respiratory conditions such as asthma, emphysema, and other chronic lung diseases may have problems if they breathe in volcanic ash. Ash is gritty, abrasive, sometimes corrosive, and always unpleasant. Small ash particles can abrade (scratch) the front of the eye. Ash particles may contain crystalline silica, a material that causes a respiratory disease called silicosis.

Gases

Most gases from a volcano quickly blow away. However, heavy gases such as carbon dioxide and hydrogen sulfide can collect in low-lying areas. The most common volcanic gas is water vapor, followed by carbon dioxide and sulfur dioxide. Sulfur dioxide can cause breathing problems in both healthy people and people with asthma and other respiratory problems. Other volcanic gases include hydrogen chloride, carbon monoxide, and hydrogen fluoride. Amounts of these gases vary widely from one volcanic eruption to the next.

Although gases usually blow away rapidly, it is possible that people who are close to the volcano or who are in the low-lying areas downwind may be exposed to levels that may affect health. At low levels, gases can irritate the eyes, nose, and throat. At higher levels, gases can cause rapid breathing, headache, dizziness, swelling and spasm of the throat, and suffocation.

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FACT SHEET

Key Facts About Preparing for a Volcanic Eruption

You can do many things to protect yourself and your family from the dangers a volcanic eruption can cause. The best way to protect yourself and your family is to follow the advice of local officials. Local authorities will give you information on how to prepare for a volcanic eruption, and if necessary, on how to evacuate (leave the area) or take shelter where you are.

How to prepare

Develop an evacuation plan for yourself, your family, and others in your household. Review the plan and make sure that everyone understands it. If you haven't already done so, put together an emergency supply kit (see www.ready.gov/portable_kit.html). Supplies should include the following:

- Flashlight and extra batteries
- First aid kit and manual
- Emergency food and water
- Manual (nonelectric) can opener
- Essential medicines
- Sturdy shoes
- Respiratory (breathing) protection
- Eye protection (goggles)
- Battery-powered radio

Exposure to ash can harm your health, particularly the respiratory (breathing) tract. To protect yourself while you are outdoors or while you are cleaning up ash that has gotten indoors, use an N-95 disposable respirator (also known as an "air purifying respirator"). N-95 respirators can be purchased at businesses such as hardware stores. It is important to follow directions for proper use of this respirator. For more information, see "NIOSH-Approved Disposable Particulate Respirators (Filtering Facepieces)" (www.cdc.gov/niosh/npptl/topics/respirators/disp_part). If you don't have an N-95 respirator, you can protect yourself by using a nuisance dust mask as a last resort, but you should stay outdoors for only short periods while dust is falling. Nuisance dust masks can provide comfort and relief from exposure to relatively non-hazardous contaminants such as pollen, but they do not offer as much protection as an N-95 respirator. Cleanup or emergency workers may need a different type of breathing protection.

If you are told to evacuate

Follow authorities' instructions if they tell you to leave the area. Though it may seem safe to stay at home and wait out an eruption, doing so could be very dangerous. Volcanoes spew hot, dangerous gases, ash, lava, and rock that are powerfully destructive.

Preparing to evacuate

- Tune in the radio or television for volcano updates.
- Listen for disaster sirens and warning signals.
- Review your emergency plan and gather your emergency supplies. Be sure to pack at least a 1-week supply of prescription medications.
- Prepare an emergency kit for your vehicle with food, flares, booster cables, maps, tools, a first aid kit, a fire extinguisher, sleeping bags, a flashlight, batteries, etc.
- Fill your vehicle's gas tank.

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- If no vehicle is available, make arrangements with friends or family for transportation, or follow authorities' instructions on where to obtain transportation.
- Place vehicles under cover, if at all possible.
- Put livestock in an enclosed area. Plan ahead to take pets with you, but be aware that many emergency shelters cannot accept animals.
- Fill your clean water containers.
- Fill sinks and bathtubs with water as an extra supply for washing.
- Adjust the thermostat on refrigerators and freezers to the coolest possible temperature. If the power goes out, food will stay cooler longer.

As you evacuate

- Take only essential items with you, including at least a 1-week supply of prescription medications.
- If you have time, turn off the gas, electricity, and water.
- Disconnect appliances to reduce the likelihood of electrical shock when power is restored.
- Make sure your automobile's emergency kit is ready.
- Follow designated evacuation routes—others may be blocked—and expect heavy traffic and delays.

If you are told to take shelter where you are

- Keep listening to your radio or television until you are told all is safe or you are told to evacuate. Local authorities may evacuate specific areas at greatest risk in your community.
- Close and lock all windows and outside doors.
- Turn off all heating and air conditioning systems and fans.
- Close the fireplace damper.
- Organize your emergency supplies and make sure household members know where the supplies are.
- Make sure the radio is working.
- Go to an interior room without windows that is above ground level.
- Bring your pets with you, and be sure to bring additional food and water supplies for them.
- It is ideal to have a hard-wired (non-portable) telephone in the room you select. Call your emergency contact—a friend or family member who does not live near the volcano—and have the phone available if you need to report a life-threatening condition. Remember that telephone equipment may be overwhelmed or damaged during an emergency.

Sources

For more information on volcanoes and health, see the following sources:

- **American Red Cross**
  - "Volcano": www.redcross.org/services/disaster/0,1082,0_593_,00.html
- **Federal Emergency Management Agency**
  - "Fact Sheet: Volcanoes": www.fema.gov/hazards/volcanoes/volcanof.shtm
  - "Volcanoes: Are You Ready?": www.fema.gov/areyouready/volcanoes.shtm
- **U.S. Geological Survey**
  - "What To Do if a Volcano Erupts": http://vulcan.wr.usgs.gov/Hazards/Safety/framework.html
  - "Volcanic Ash and Mudflows": http://vulcan.wr.usgs.gov/Hazards/Safety/what_to_do_EIB.html
  - "Volcanic Gas": http://vulcan.wr.usgs.gov/Projects/Emissions/vgas_fsheet.html
- **Washington State Department of Health**
  - "Volcanoes": www.doh.wa.gov/phepr/handbook/volcano.htm (also available in Spanish: www.doh.wa.gov/phepr/handbook/spanish_pdf/volcan_spanish.pdf)

For more information, visit www.bt.cdc.gov/disasters/volcanoes,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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FACT SHEET

Key Facts About Protecting Yourself During a Volcanic Eruption

You can do many things to protect yourself and your family from the dangers a volcanic eruption can cause. The best way to do protect yourself and your family is to follow the advice of local officials. Local authorities will provide you with information on how to prepare for a volcanic eruption, and if necessary, on how to evacuate (leave the area) or take shelter where you are.

If you are indoors

- Close all windows, doors, and fireplace or woodstove dampers.
- Turn off all fans and heating and air conditioning systems.
- Bring pets and livestock into closed shelters.

If you are outdoors

- Seek shelter indoors.
- If caught in a rockfall, roll into a ball to protect your head.
- If near a stream or river, be aware of rising water and possible mudflows in low-lying areas. Move up-slope as quickly as possible.
- Seek care for burns right away. Immediate care can be life saving.
- If your eyes, nose, and throat become irritated from volcanic gases and fumes, move away from the area immediately. Your symptoms should go away when you are no longer in contact with the gases or fumes. If the symptoms continue, consult your doctor.

Protecting yourself during ashfall

- Stay inside, if possible, with windows and doors closed.
- Wear long-sleeved shirts and long pants.
- Use goggles to protect your eyes.
- Exposure to ash can harm your health, particularly the respiratory (breathing) tract. To protect yourself while you are outdoors or while you are cleaning up ash that has gotten indoors, use an N-95 disposable respirator (also known as an “air purifying respirator”). N-95 respirators can be purchased at hardware stores. It is important to follow directions for proper use of this respirator. For more information, see “NIOSH-Approved Disposable Particulate Respirators (Filtering Facepieces)” (www.cdc.gov/niosh/npptl/topics/respirators/disp_part). If you don’t have an N-95 respirator, you can protect yourself by using a nuisance dust mask as a last resort, but you should stay outdoors for only short periods while dust is falling. Nuisance dust masks can provide comfort and relief from exposure to relatively non-hazardous contaminants such as pollen, but they do not offer as much protection as an N-95 respirator.
- Keep your car or truck engine switched off. Avoid driving in heavy ashfall. Driving will stir up ash that can clog engines and stall vehicles. If you do have to drive, keep the car windows up and do not operate the air conditioning system. Operating the air conditioning system will bring in outside air and ash.

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Key Facts About Protecting Yourself After a Volcanic Eruption

You can do many things to protect yourself and your family after a volcanic eruption:

- Pay attention to warnings, and obey instructions from local authorities. For example, stay indoors until local health officials tell you it is safe to go outside.
- Listen to local news updates for information about air quality, drinking water, and roads.
- Turn off all heating and air conditioning units and fans, and close windows, doors, and fireplace and woodstove dampers to help keep ash and gases from getting into your house.
- Exposure to ash can harm your health, particularly the respiratory (breathing) tract. To protect yourself while you are outdoors or while you are cleaning up ash that has gotten indoors, use an N-95 disposable respirator (also known as an "air purifying respirator"). N-95 respirators can be purchased at businesses such as hardware stores. It is important to follow directions for proper use of this respirator. For more information, see "NIOSH-Approved Disposable Particulate Respirators (Filtering Facepieces)" (www.cdc.gov/niosh/npptl/topics/respirators/disp_part). If you don't have an N-95 respirator, you can protect yourself by using a nuisance dust mask as a last resort, but you should stay outdoors for only short periods while dust is falling. Nuisance dust masks can provide comfort and relief from exposure to relatively non-hazardous contaminants such as pollen, but they do not offer as much protection as an N-95 respirator.
- Stay away from ashfall areas, if possible. Avoid contact with ash as much as you can. Keep your skin covered to avoid irritation from contact with ash.
- Wear goggles to protect your eyes from ash.
- Do not travel unless you have to. Driving in ash is hazardous to your health and your car. Driving will stir up more ash that can clog engines and stall vehicles.
- Replace disposable furnace filters or clean permanent furnace filters frequently.
- If your drinking water has ash in it, use another source of drinking water, such as purchased bottled water, until your water can be tested.
- Clear roofs of ash. Ash is very heavy and can cause buildings to collapse. Be very cautious when working on a roof. Ash can be slippery and make it easy to fall. Information about injuries and mass trauma events can be found in "Injuries and Mass Trauma Events: Information for the Public" (www.bt.cdc.gov/masstrauma/injuriespub.asp).

Volcanic eruptions may result in floods, landslides and mudslides, power outages, and wildfires. For information on protecting yourself against these hazards, visit the following:

- **Earthquakes:** www.bt.cdc.gov/disasters/earthquakes
  Includes information on preparing for, surviving, and recovering from an earthquake.
- **Floods:** www.bt.cdc.gov/disasters/floods
  Includes information on making sure food and water are safe, cleaning up, and emergency supplies.
- **Landslides and mudslides:** www.bt.cdc.gov/disasters/landslides.asp
  Includes information on protective measures to take before, during, and after a landslide or debris flow.

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- **Power outages:** www.bt.cdc.gov/poweroutage
  Includes information on carbon monoxide poisoning, alternative heat and energy sources, downed power lines, and food and water safety.
- **Wildfires:** www.bt.cdc.gov/firesafety
  Includes information on smoke inhalation and other wildfire hazards.

Sources

For more information on volcanoes and health, see the following sources:

- **American Red Cross**
  - "Volcano": www.redcross.org/services/disaster/0,1082,0_593_,00.html
- **Federal Emergency Management Agency**
  - "Fact Sheet: Volcanoes": www.fema.gov/hazards/volcanoes/volcanof.shtm
  - "Volcanoes: Are You Ready?": www.fema.gov/areyouready/volcanoes.shtm
- **U.S. Geological Survey**
  - "What To Do if a Volcano Erupts": http://vulcan.wr.usgs.gov/Hazards/Safety/framework.html
  - "Volcanic Ash and Mudflows": http://vulcan.wr.usgs.gov/Hazards/Safety/what_to_do_EIB.html
  - "Volcanic Gas": http://vulcan.wr.usgs.gov/Projects/Emissions/vgas_fsheet.html
- **Washington State Department of Health**
  - "Volcanoes": www.doh.wa.gov/phepr/handbook/volcano.htm (also available in Spanish: www.doh.wa.gov/phepr/handbook/spanish_pdf/volcan_spanish.pdf)

Volcanoes: Related Links

Additional volcano resources

- **American Red Cross**
  - "Volcano": www.redcross.org/services/disaster/0,1082,0_593_,00.html
- **Federal Emergency Management Agency**
  - "Fact Sheet: Volcanoes": www.fema.gov/hazards/volcanoes/volcanof.shtm
  - "Volcanoes: Are You Ready?": www.fema.gov/areyouready/volcanoes.shtm
- **Mt. St. Helens**
  - Washington State Emergency Management Division: www.emd.wa.gov
  - United States Geological Survey Volcano Observatory: http://vulcan.wr.usgs.gov/Volcanoes/Cascades/CurrentActivity/current_updates.html
- **Pan American Health Organization**
  - "Video on Volcanoes": www.paho.org/English/DD/PED/volcano.htm
- **U.S. Geological Survey**
  - "What To Do if a Volcano Erupts": http://vulcan.wr.usgs.gov/Hazards/Safety/framework.html
  - "Volcanic Ash and Mudflows": http://vulcan.wr.usgs.gov/Hazards/Safety/what_to_do_EIB.html
  - "Volcanic Gas": http://vulcan.wr.usgs.gov/Projects/Emissions/vgas_fsheet.html
- **Washington State Department of Health**
  - "Volcanoes": www.doh.wa.gov/phepr/handbook/volcano.htm (also available in Spanish: www.doh.wa.gov/phepr/handbook/spanish_pdf/volcan_spanish.pdf)

Related issues

- **Earthquakes:** www.bt.cdc.gov/disasters/earthquakes
  Includes information on preparing for, surviving, and recovering from an earthquake.
- **Floods:** www.bt.cdc.gov/disasters/floods
  Includes information on making sure food and water are safe, cleaning up, and emergency supplies.
- **Landslides and mudslides:** www.bt.cdc.gov/disasters/landslides.asp
  Includes information on protective measures to take before, during, and after a landslide or debris flow.
- **Power outages:** www.bt.cdc.gov/poweroutage
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USGS
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The National Volcano Early Warning System (NVEWS)

Within the United States, numerous volcanoes threaten people, property, and infrastructure on the ground, as well as aircraft in the skies. Many hazardous volcanoes currently are undermonitored, have antiquated monitoring systems, or have no ground-based monitoring at all.

NVEWS aims to reduce vulnerability to volcanic hazards by providing:

- Robust, real-time monitoring of the most threatening of the Nation's volcanoes
- A 24/7 Volcano Watch Office
- Improved research collaboration between Federal and academic scientists
- A National Volcano Data Center
- High-quality data sets for volcanological research

NVEWS addresses the disaster reduction goals articulated by the Subcommitee on Disaster Reduction of the National Science and Technology Council[1] :

- Providing hazard and disaster information where and when it is needed
- Understanding the natural processes that produce hazards
- Developing hazard mitigation strategies and technologies
- Recognizing and reducing vulnerability of infrastructure
- Assessing disaster resilience
- Promoting risk-wise behavior

[1]National Science and Technology Council, 2005, Grand challenges for disaster reduction: A report of the Subcommittee on Disaster Reduction: Washington, D.C., 21 p. (*http://www.sdr.gov/SDRGrandChallengesforDisasterReduction.pdf*)

March 8, 2005, eruption of Mount St. Helens. After 18 years of quiet, Mount St. Helens reawakened in September 2004 with a swarm of earthquakes and rapid deformation of the crater floor. Within days, the volcano was producing minor steam and ash eruptions; after only 18 days, the first lava reached the surface. Although monitoring instrumentation was sufficient to detect the obvious onset of seismic unrest, much of the equipment and telemetry had been installed more than 20 years previously, and their limitations soon became evident. For example, as earthquake activity increased, many seismic signals went off scale, limiting diagnostic capabilities. Telemetered deformation instruments could not be installed quickly enough to capture the deformation signal as magma rose to the surface. Additional monitoring instrumentation had to be installed quickly as the USGS Cascades Volcano Observatory and CUSVO partner University of Washington/Pacific Northwest Seismic Network reacted to the escalating activity while a potentially hazardous situation rapidly unfolded.

Volcanic Threat and Monitoring Capabilities in the United States

The National Volcano Early Warning System (NVEWS) is a proposed national-scale effort by the U.S. Geological Survey (USGS) Volcano Hazards Program and its affiliated partners in the Consortium of U.S. Volcano Observatories (CUSVO) (http://www.cusvo.org) to ensure that volcanoes are monitored at a level commensurate with the threats they pose. Roughly half of the Nation's 169 young volcanoes are dangerous because of the manner in which they erupt and the communities and infrastructure within their destructive reach. Most U.S. volcanoes are located on sparsely populated Federal lands, but it is the threat to communities and infrastructure downstream and downwind, including to military and commercial aviation, that drives the need to properly monitor volcanic activity and provide forecasts and notifications of expected hazards.

Waiting until unrest escalates at a volcano then reacting to improve sparse monitoring arrays results in the loss of precious time and data as scientists, civil authorities, citizens, and businesses play "catch up" with a dangerous force of nature. NVEWS is a proposal to address monitoring needs at potentially dangerous volcanoes that have inadequate ground-based monitoring or none at all and to move beyond a reactive approach to mitigating volcanic risk. The most hazardous volcanoes would be properly monitored well in advance of the onset of activity, making it possible for scientists to improve the timeliness and accuracy of hazard forecasts and for citizens to take proper and timely action to reduce risk.

The first step in developing NVEWS was a systematic assessment of (1) threats posed by U.S. volcanoes to human life and enterprise, (2) current monitoring capabilities at each volcano, and (3) improvements necessary to fill the worst monitoring gaps. The NVEWS assessment, published in 2005 (http://pubs.usgs.gov/of/2005/1164/), shows that a few volcanoes are relatively

well monitored with telemetered instrument arrays of various types. Many other volcanoes are monitored primarily by a network of sparsely distributed seismic instruments that lack the sensitivity to detect the subtle earthquakes that commonly characterize the earliest stages of unrest. Some hazardous volcanoes have no ground-based monitoring whatsoever.

The overall result of the NVEWS assessment is the identification of 57 priority volcanoes that are undermonitored for the threats posed and thus targets for improved monitoring networks (see table).

Framework for a National Volcano Early Warning System

An effective monitoring and hazard-warning system will generate timely and accurate identification of the hazards and provide mechanisms to inform people so that they can take action to mitigate the impact of the hazardous phenomena. More than a network of instruments, NVEWS connects the monitoring and research efforts of scientists to the emergency managers and general public at both national and local levels to minimize the impact of volcanic activity on the Nation. NVEWS provides a common framework for coordinating the collection and dissemination of data among all relevant Federal agencies, academic partners, and the general public.

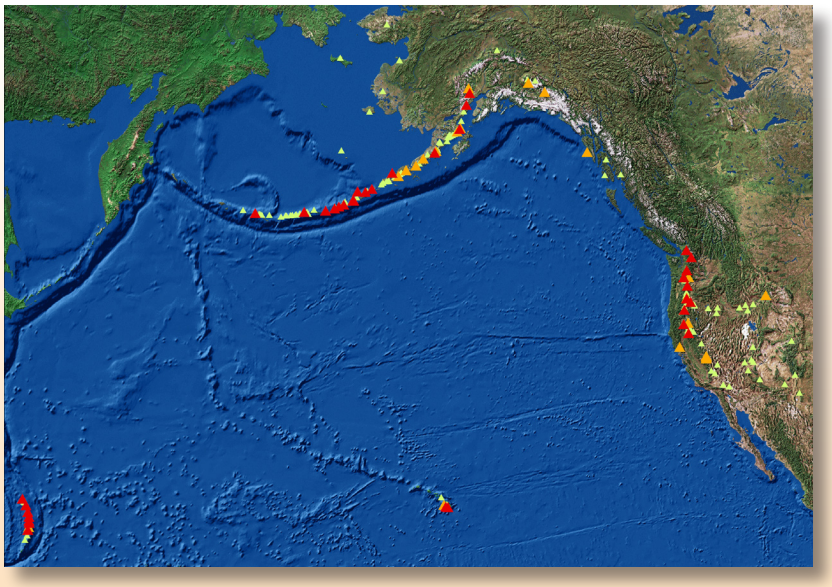
Expanded Volcano Monitoring. An increase in the scope and scale of volcano monitoring in the United States will form the basis of more reliable eruption forecasts and warnings. The much richer body of observations and data on volcanic activity that would become available with NVEWS will foster innovative and multidisciplinary research that provides the scientific underpinnings of accurate forecasts of volcanic behavior.

External Grants Program. Under NVEWS, an external grants program administered by the USGS Volcano Hazards Program would fund needed research on hazardous phenomena and risk mitigation. Such a program would enhance collaboration between USGS and external researchers and increase the breadth of expertise brought to bear on reducing volcanic risk.

National Volcano Data Center. A system for organizing and sharing diverse data related to volcano hazards would be established so that pertinent information will be accessible for researchers and response managers.

24/7 Volcano Watch Office. A USGS Volcano Watch Office operating 24 hours a day 7 days a week would extend the capabilities of the five U.S. Volcano Observatories to provide forecasts, alerts, and authoritative information on volcanic unrest and eruptive activity throughout the United States and selected regions abroad. Establishing a Watch Office would put the U.S. Volcano Observatories on the same round-the-clock operational footing as important partners and clientele.

Reducing Community Vulnerability. A major objective of NVEWS is to build on the current level of community outreach, including creating information-delivery systems that will allow customers, partners, cooperators, and the public to find and understand the information that they need about volcanic hazards.



US VOLCANOES and NVEWS Targets The United States has the largest number of young volcanoes capable of erupting of any country in the world. In the past 26 years, 47 eruptions and at least 17 episodes of significant unrest have occurred at 34 different volcanoes. The United States has five volcano observatories (Alaska, Cascades, Hawaiian, Long Valley, and Yellowstone) supported primarily by the USGS Volcano Hazards Program that relies on staff and facilities of the USGS and affiliated academic institutions and State and Federal agencies. Red triangles are the 35 highest-priority NVEWS targets; orange triangles are the 22 high-priority targets; small green triangles are other U.S. volcanoes.

	Highest Priority	High Priority
Alaska	Akutan, Amak, Amukta, Augustine, Boboslof, Cleveland, Fourpeaked, Kasatochi, Kiska, Makushin, Recheschnoi, Redoubt, Seguam, Vsevidof, Yantarni, Yanuska	Black Peak, Chiginagak, Churchill, Dana, Douglas, Dutton, Edgecumbe, Hayes, Kaguyak, Kupreanof, Mount Spurr, Wrangell
Washington	Glacier Peak, Mount Baker, Mount Rainier, Mount St. Helens	Mount Adams
Oregon	Crater Lake, Mount Hood, Newberry, South Sister	North Sister Field
California	Lassen Peak, Mount Shasta	Clear Lake, Inyo Craters, Mono Craters, Mono Lake Field, Medicine Lake
Wyoming		Yellowstone
Hawaii	Kilauea, Mauna Loa	Hualalai
Commonwealth of N. Mariana Islands	Agrigan, Alamagan, Anatahan, Asuncion, Farallon de Pajaros, Guguan, Pagan	Sarigan

If fully implemented, NVEWS promises to provide hazard information where and when it is needed as well as improve understanding of the natural processes that produce volcanic hazards.

John Ewert, Marianne Guffanti, Peter Cervelli, and James Quick

For more information contact:
U.S. Geological Survey
Volcano Hazards Program Office
12201 Sunrise Valley Drive
Reston, VA 20192
Tel.: (703) 648-6711 Fax: (703)648-5483
http://volcanoes.usgs.gov

Volcanoes

Volcanic dangers include not only an eruption of a mountain and associated lava flows, but also ashfall and debris flows. If you are near a mountain range, be familiar with the following:

Before a volcanic eruption:

- Plan ahead. Have emergency supplies, food and water stored.
- Plan an evacuation route away from rivers or streams that may carry mud or debris flow.
- Keep a battery-operated radio available at all times.
- If there is an eruption predicted, monitor the radio or TV for evacuation information. Follow the advice given by authorities.

After a volcanic eruption:

- Do not approach the eruption area.
- Be prepared to stay indoors and avoid downwind areas if ashfall is predicted.
- Evacuate if advised to do so by authorities.
- Be aware of stream and river channels when evacuating.
- Move toward higher ground if mudflows are approaching.
- Follow the evacuation signs posted along roads and highways.

If there is ashfall in your area:

- Protect your lungs. Infants and the elderly, and those who have respiratory conditions such as asthma, bronchitis, emphysema or other chronic lung and heart diseases should be particularly careful to avoid breathing ash. If ash is present:
  - Stay inside. Close doors, windows and dampers. Place damp towels at door thresholds and other draft sources.
  - When outside, wear a single-use (disposable) facemask. Remember that these masks may not fit small children properly. (*Note:* Masks may make breathing more difficult for people with respiratory conditions.)
  - Those most at risk should limit outdoor activities. Keep children and pets indoors.
  - If you have asthma or another respiratory condition – or have a child with asthma – pay attention to symptoms such as wheezing and coughing, or more severe symptoms such as chest pain or tightness, shortness of breath and severe fatigue. Stay indoors and follow your asthma management plan. Contact your doctor if you have trouble breathing.
  - Replace disposable furnace filters or clean permanent furnace filters frequently.
- If you wear contact lenses, protect your eyes by wearing glasses or protective goggles or by removing your contacts.
- If you find ash in your drinking water, use an alternate source of drinking water such as purchased bottled water.
- Put stoppers in the tops of your drainpipes.
- Protect dust-sensitive electronics.
- Keep roofs free of ash in excess of 4 inches.
- Remove outdoor clothing before entering a building.
- Wash vegetables from the garden before eating.
- Minimize travel — ash may be harmful to your vehicle.
- Frequently change oil and air filters in your automobile.

Washington State Department of Health

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Web site: **www.doh.wa.gov**