

Internet Resources

Living with a **VOLCANO** in Your Backyard
MOUNT RAINIER



APPENDIX 5.

INTERNET RESOURCES

The Internet Resource List provides guidance for acquisition of additional resources that pertain to the subjects in this educator guide. The parent Internet address is listed as well as some specific links to educational resources. The list consists of selected government and organization websites. Authors do not intend that this list to comprehensive.

PLATE TECTONICS

Obtain additional information that is germane to the following activities:

Surrounded by Volcanoes

Riding the Magma Elevator

Cascade Volcano Timeline

U.S. Geological Survey (USGS) This Dynamic Earth: The Story of Plate Tectonics

<http://pubs.usgs.gov/gip/dynamic>

This publication provides an overview of the concept of plate tectonics and the scientific studies that led to our understanding of the concept. Originally published in hard copy, it is now available in .pdf and .html versions on-line. The publication is the source of many commonly published graphics about plate tectonics, and can be a resource for individual educators.

Smithsonian Global Volcanism Program

<http://www.volcano.si.edu/>

This website lists the volcanoes of the world that have been active during the past 10,000 years, and tabulates their eruption histories. Also found are regional volcano maps; global maps of tectonic plates; volcanoes and earthquakes; volcanic activity reports and special announcements; photo examples of volcano types and processes; frequently asked questions; and products for sale. Educators should take particular note of items in Mapping and Products pages, such as the interactive version of This Dynamic Planet—World Map of Volcanoes, Earthquakes, Impact Craters and Plate Tectonics, and the Earthquake and Eruptions CD-ROM. These and other products are available for purchase by mail at the Products webpage.



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Pacific Northwest Seismic Network (PNSN)

<http://www.pnsn.org>

This website posts real-time data and statistics about earthquakes in Washington and Oregon including: latest earthquakes; earthquakes specific to volcanoes; hazards from earthquakes; emergency preparations; research and operations projects; and links to educational products and services. Educators, note the News webpage, *webicorders* that display real-time earthquake signatures including Cascade volcanoes, and links to the USGS World Earthquakes map at <http://earthquake.usgs.gov/>, and the *Did You Feel It?* website, <http://earthquake.usgs.gov/eqcenter/dyfi.php>, where people experiencing shaking from an earthquake can report their observations.

National Oceanic and Atmospheric Administration (NOAA) Pacific Marine Environmental Laboratory (PMEL)

<http://www.pmel.noaa.gov/>

Visit these webpages for information about submarine volcanism off the coast of the Pacific Northwest. See *NOAA's New Millennium Observatory (NeMO)*, <http://www.pmel.noaa.gov/vents/>, a seafloor observatory at Axial volcano, located 450 kilometers (250 miles) off Oregon's coast and 1.6 kilometers (1 mile) underwater on the Juan de Fuca Ridge. Note curriculum materials on the *NeMO* pages; interactive dives to a submarine volcano; expedition results; text and photographs about tools and technology and underwater volcanic features.

CASCADE VOLCANOES GENERAL INFORMATION

Obtain additional information that is germane to the following activities:

Fire, Flood and Fury

Cascade Volcano Timeline

Volcano Hall of Fame

Planning your Trip to Mount Rainier

Living Well with a Volcano in Your Backyard

Nineteenth-Century Newspaper Accounts of an Eruption at Mount Rainier

Cascade Volcano Timeline

A String of Volcanoes

Perilous Beauty

The Next Eruption of Mount Rainier

A Volcano Tussle





U.S. Geological Survey (USGS) Volcano Hazards Program

<http://volcanoes.usgs.gov>

The USGS-Volcano Hazards Program website provides news reports about volcanic unrest within the United States and its territories, and describes the work of volcanologists in the program. Find detailed descriptions of volcano hazard types, volcano monitoring, methods to reduce volcanic risk, and warning schemes. Educators should visit the web pages about volcanic ash and the Photoglossary. Look for publications and other materials highlighted for educators.

U.S. Geological Survey (USGS) Cascades Volcano Observatory

<http://vulcan.wr.usgs.gov>

This website contains Cascade Range histories, hazards and current activity updates, hazards assessment reports and maps, information about glaciers on volcanoes, volcano monitoring techniques, maps, photographs and movies, and educational outreach materials. Teachers and students who wish to stay apprised of current volcanic unrest in the Cascades will find of interest the *Cascade Range Volcano Summaries* http://vulcan.wr.usgs.gov/Volcanoes/Cascades/volcanoes_cascade_range.html and *Current Activity Updates* found at http://vulcano.wr.usgs.gov/cvo/current_updates.php. Of particular interest to educators will be the comprehensive background material, geologic timelines, maps, and photographs. Under Mount Rainier Publications find a variety of scientific reports about Mount Rainier <http://vulcan.wr.usgs.gov/Volcanoes/Rainier/Publications/framework.html>, including the 1994 National Academy of Science-National Research Council (NAS/NRC) authored report entitled *Mount Rainier – Active Cascade Volcano*, which summarizes the regional geologic setting, history and hazards of Mount Rainier volcano, volcanic monitoring, mitigation, and recommended processes for implementation. The report was written in response to a United Nations designation of the 1990s as the International Decade for Natural Disaster Reduction that labeled Mount Rainier as one of 16 “Decade Volcanoes” worthy of focused research. It received this designation because at that time it required updated research, and because Mount Rainier exists in a geologically active and densely populated region.

Smithsonian Global Volcanism Program

<http://www.volcano.si.edu/>

This website, described in detail in the Plate Tectonics section of this list, includes information about Cascade volcanoes, as well as volcanoes and current volcanic activity around the world.

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How Volcanoes Work

Obtain additional information that is germane to the following activities:

Magma Mash

Riding the Magma Elevator

Volcanic Processes

Tephra Explorer

Rock Stars, Lahar in a Jar

Fire and Ice

Earth Blocks

Soda Bottle Volcano

Understanding Volcanic Hazards

Tephra Popcorn

Volcano Fan Club

Rock Rubble Review

Shoebox Geologist

*Lava—Building Blocks of Mount
of Mount Rainier*

Volcano World

<http://volcano.und.nodak.edu/>

Volcano World, aimed at grade school students, provides information about current eruptions, maps of volcanoes by region, video clips of erupting volcanoes, virtual field trips to volcanoes around the world, legends about volcanoes, information about visiting volcanic parks and monuments, and links to volcano observatories around the world. It provides photographs and instructions for making many types of classroom volcano models. Post your students' volcano artwork on the *Kids' Volcano Art Gallery page* <http://volcano.und.edu/vwdocs/kids/art/newart.html>. Students can observe changes in physical conditions during a volcanic eruption when they visit the *Strombolian Eruption Simulation* posted within Games and Fun Stuff <http://volcano.und.edu/vwdocs/kids/fun/fun.html>. Volcano World is a collaborative higher education, K-12, and public outreach project developed and maintained by the North Dakota and Oregon Space Grant Consortia and administered by the Department of Geosciences at Oregon State University. Open the page wide enough to see the choices column on the right, because they disappear when the page is too narrow.

U.S. Geological Survey (USGS) Volcano Hazards Program

<http://volcanoes.usgs.gov>

See information about volcano processes and hazards with in-depth descriptions, photographs, case studies, discussions of effects on communities, and links to other pertinent Internet sites.

U.S. Geological Survey (USGS) Cascades Volcano Observatory

<http://vulcan.wr.usgs.gov>

See *Glossary of Hazards, Features, and Terminology* under *Menus of Interest* for descriptions of volcanic features and hazards.



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San Diego State University—How Volcanoes Work

<http://www.geology.sdsu.edu/>

Educational resources at http://www.geology.sdsu.edu/how_volcanoes_work/ describe the science behind volcanoes and volcanic processes. It is appropriate for university-level geology students and Earth science teachers. Each menu section builds upon previous segments. For users who lack fundamental knowledge of volcanological principles and terms, it is best to make a stepped progression through the website material. More advanced users will find each section self-contained and easily navigable. The site is sponsored by NASA and maintained under the auspices of *Project ALERT (Augmented Learning Environment and Renewable Teaching)*.

GLACIERS

Obtain additional information that is germane to the following activities:

Fire and Ice

Lahar in a Jar

Mount Rainier National Park

<http://www.nps.gov/mora/>

Find information about glaciers and glacier change at this site and its linked webpages

<http://www.nps.gov/mora/siteindex.htm>.

U.S. Geological Survey (USGS) Cascades Volcano Observatory

<http://vulcan.wr.usgs.gov/>

See Mount Rainier Washington, Glaciers and Glaciations.

TOPOGRAPHIC MAPS

Obtain additional information that is germane to the following activities:

Planning Your Trip to Mount Rainier

Topographic Maps at Mount Rainier

Play-dough Topo

U.S. Geological Survey (USGS) Map Information

<http://www.usgs.gov/pubprod/maps.html>

Order topographic maps, find locations of local map dealers, learn about different types of maps, view maps and images on line. Download the four-page color booklet *Topographic Map Symbols*, which provides a key to symbols published on topographic maps, such as buildings, streams, streets and woods. Find booklet at <http://erg.usgs.gov/isb/pubs/booklets/symbols/>.



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MONITORING VOLCANOES

Obtain additional information that is germane to the following activities:

Perilous Beauty-Video

The Next Eruption of Mount Rainier

Reducing Volcanic Risk-Video

Don't Be Scared – Be Prepared

A Volcano Tussle

Volcano Fan Club

University of Alaska WebPUFF Volcanic Ash Tracking Model (Use WebPUFF for Volcano Fan Club activity extension)

http://puff.images.alaska.edu/index_ie.shtml

Explore a wide variety of fascinating animations that show projected and previous paths of volcanic ash plumes. View information about current ash advisories posted by the Volcanic Ash Aviation Centers (VAACs), which track the path of airborne ash around the world. The WebPUFF animation is a volcanic ash tracking model that uses near-real time weather data to calculate the speed, trajectory, and projected areas of volcanic ash movement away from any of a broad selection of volcanoes. For the activity extension, begin by creating and entering an ID for your class on the first page of WebPUFF.

American Meteorological Society (AMS) (Use for Volcano Fan Club activity extension)

<http://www.ametsoc.org/>

This website contains weekly weather and climate news, weather maps and summaries, weather data, and weather education information. To obtain real-time data for the Volcano Fan Club activity extension, visit <http://www.ametsoc.org/amsedu/dstreme> and click the *Upper Air* box to obtain maps that indicate wind barbs and the chosen pressure in millibars (850, 700 or 500) in height above the surface.

U.S. Geological Survey (USGS) Cascades Volcano Observatory

<http://vulcan.wr.usgs.gov>

See *Real-Time Monitoring* for general monitoring techniques. See *Monitoring* for information about work at specific volcanoes, including the Mount Rainier Lahar Detection System.



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U.S. Geological Survey (USGS) Volcano Hazards Program

<http://volcanoes.usgs.gov>

In addition to earlier mentioned material about volcanic processes and hazards, the website contains information about hazards, monitoring strategies, alert levels, warning schemes and general strategies for reducing volcanic risk. Visit the U.S. Geological Survey's technical report that describes aerial and satellite monitoring of Mount Rainier at <http://pubs.usgs.gov/of/2000/ofr-00-0027>.

COMMUNITY PREPAREDNESS

Obtain additional information that is germane to the following activities:

The Next Eruption of Mount Rainier

Volcano Tussle

Don't Be Scared – Be Prepared

Living Well with a Volcano in Your Backyard

American Red Cross (ARC)

<http://www.redcross.org/>

See *Disaster Services, Publications* and *Get Prepared* for general information about personal and community disaster preparedness, emergency preparedness kits and how to help children cope with disasters.

Federal Emergency Management Agency (FEMA)

<http://www.fema.gov/>

The FEMA website contains general information about hazard preparedness and some volcano information for kids.

Pierce County Department of Emergency Management (PCDEM)

<http://www.co.pierce.wa.us/pc/abtus/ourorg/dem/abtusdem.htm>

See *Plans* for the Mount Rainier Volcanic Hazards Response Plan, hazard and also for vulnerability assessments, lahar evacuation plan and other links.

U.S. Geological Survey (USGS) Volcano Hazards Program

<http://volcanoes.usgs.gov/ash>

See *Volcanic Ash—What it can Do and How to Prevent Damage* for practical information about living with volcanic ash. These web pages contain detailed information about the effects of volcanic ash on human health, agriculture, buildings, communication systems, power supplies, transportation, water supply, and wastewater facilities. It describes actions to be taken for preparedness and recommended methods for ash cleanup.



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Washington Military Emergency Management Division (WaEMD)

<http://www.emd.wa.gov>

See *Plans, Publications and Preparedness* pages. Find emergency response plans for people at risk in the vicinity of volcanoes, volcano educational publications and volcanic ash cleanup brochures. See recommendations for school, community and home preparedness.

VISITING MOUNT RAINIER

Obtain additional information that is germane to the following activities:

Rock Stars

Journey Back in Time (Appendices)

Planning Your Trip to Mount Rainier

Living Well with a Volcano in Your Backyard

National Park Service (NPS) Mount Rainier National Park

<http://www2.nature.nps.gov/geology/tour/index.htm>

See *Geology* and click on *Park Geology Tours* for a complete list of volcanoes within the National Park Service system and general geology information about each location. Obtain general information, such as regulations and current road and trail conditions at the Mount Rainier National Park Mount website <http://www.nps.gov/mora>. Educators should take note of recommendations for field trips, teacher workshops and curriculum, and information about the Junior Ranger Program. For a virtual visit, view the photo gallery.

U.S. Geological Survey (USGS) Cascades Volcano Observatory

<http://vulcan.wr.usgs.gov>

See *Volcanoes*, and Mount Rainier, and then choose *Visit a Volcano – Mount Rainier National Park*.



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OTHER TEACHER RESOURCES

Obtain additional information that is germane to all of the activities.

U.S. Geological Survey (USGS) homepage

<http://www.usgs.gov>

See Education to obtain earth science news and information, online geology curriculum, and the USGS Store. See Maps, Products and Publications to reach the Publications Warehouse, where thousands of agency publications are posted. Search for Mount Rainier scientific publications, fact sheets, and volcano hazards assessments.

U.S. Geological Survey (USGS) Cascades Volcano Observatory

<http://vulcan.wr.usgs.gov>

See the *Educational Outreach* button for educational resources. Under *Useful Links*, find *CVO's BIG-List of Volcano* and *Earth-Science-Oriented Websites and related topics*.

Digital Library for Earth Science Information (DLESE)

<http://www.dlese.org>

DLESE is a National Science Foundation digital online library of earth science educational materials. The website serves as a resource for information, teaching boxes, curriculum links, digital models and other products useful for teaching of earth sciences. Guided inquiry is used throughout, and where possible, authors seek to have students replicate the discoveries of science that have led to our understanding of geologic processes.

International Association for Volcanology and Chemistry of the Earth's Interior (IAVCEI)

<http://www.iavcei.org>

IAVCEI is a primary international volcano science organization for volcanologists and serious volcano enthusiasts. The website provides information about upcoming meetings, commission activities, and publications. The *Other Links* pages connect you to websites that contain education resources, and information about volcano observatories and data centers, professional associations, research groups, image databases, photo/slide sets, online journals and upcoming events designed for educators.