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Geofacts

VOLCANOES IN SOUTHWESTERN BRITISH COLUMBIA

What Is A Volcano?

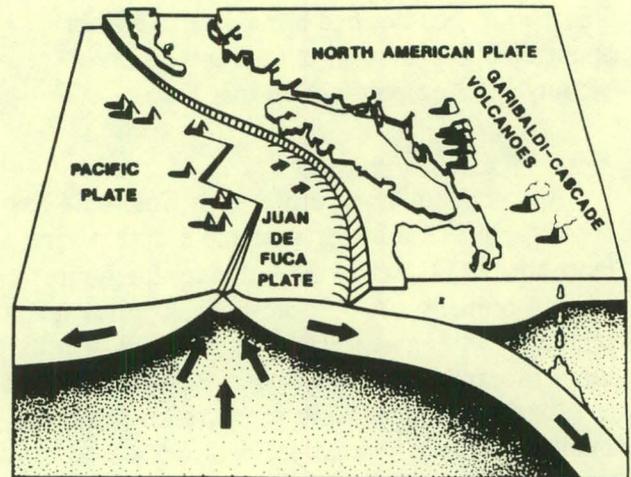
When gas and molten rock flow from the earth's interior to its surface, a volcano is created. Usually a mountain is built up around the vent by the accumulation of rock materials emitted by the volcano.

Where Do They Occur?

Volcanoes occur in three kinds of environments:

- where the earth's crust is being stretched and pulled apart, and new crust is formed, such as along the undersea Juan de Fuca ridge west of Vancouver Island;
- where there is an upwelling of molten material in the earth's mantle called a "hot spot", as in Hawaii;
- or where a segment of the earth's crust is forced under the edge of another, such as in southwestern British Columbia.

The volcanoes of the Garibaldi and Cascade Volcanic Belts stretch for 1000 km from southern British Columbia to northern California and are examples of the third type. The oceanic plate is forced under the continental plate, causing molten rock to rise to the surface and form a volcano. Volcanoes in the northern end of the chain include Mount Garibaldi and Mount Meager, both north of Vancouver, and Mount St. Helens, Mount Baker and Mount Rainier in Washington State.



How Do They Work?

Volcanoes erupt, in part, because of pressure from dissolved gas, much as dissolved gases will drive the cork out of a bottle of champagne. Inside the volcano, liquid magma rises through cracks and channels in the earth's crust. If the magma is fairly fluid, gases can escape readily and the eruption will be in the form of a lava flow. If the magma is thick and viscous, however, it impedes the gradual escape of the gases and an explosive eruption occurs depositing volcanic ash over a wide area.

Some Recent Examples

Mount St. Helens erupted violently in 1980 — the most recent event in the Garibaldi-Cascade chain. Closer to Canada, Mount Baker,



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which is cooling from a minor eruption in 1870, still lets off steam near its top. In 1975 a marked increase in hydrothermal activity at Mount Baker included several small steam explosions which hurled previously erupted ash out of the summit crater.

Some 2400 years ago (recent in geological time) Mount Meager, just 180 km north of Vancouver, erupted in a huge explosion that dumped volcanic ash as far away as southern Alberta. Mount Garibaldi, 50 km north of Vancouver, has not had a major eruption in about 10 000 years but other vents in the vicinity have erupted within that time.

What Are The Dangers?

Although southwestern British Columbia has not experienced a major volcanic eruption for more than 2000 years, the potential for future activity remains. A volcano may sleep for many centuries while gas pressure slowly builds in its subterranean magma chambers. However, before an eruption the increasing pressure creates many small earthquakes which are detected at seismograph stations and warn of the eruption to come.

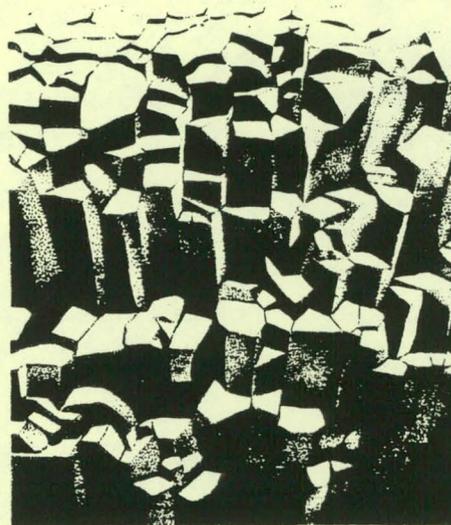
Lava flows and burning hot projectiles are hazards only in the immediate vicinity of a volcano. Mudflows and clouds of volcanic ash are also dangerous. When a large volcano erupts, the snow and ice on its slopes melt immediately and sweep down the mountain in a slurry of meltwater and debris. These mudflows can follow valleys and river beds for hundreds of kilometres, carrying away anything in their path. In November 1985, a mudflow from the Ruiz volcano wiped out the Columbian village of Armero, 50 km away. When Mount St. Helens erupted on May 18, 1980, its mudflows followed the Toutle and Cowlitz rivers as far south as the Columbia River, 120 km downstream.

In an explosive eruption, volcanic ash may be hurled high enough into the atmosphere to be carried with the prevailing winds. The town of Yakima, 130 km northeast of Mount St. Helens, received 30 cm of ash after the 1980 eruption. During a heavy ash fallout visibility is restricted, disrupting air and ground transportation. It can also damage crops, contaminate water supplies, and pose a health risk to people with respiratory problems.

Where Can You See Them?

Mount Baker, in the United States, can be seen from several spots on the lower mainland and southern Vancouver Island. Just north of Vancouver, Mount Garibaldi can be viewed from the road leading to the resort town of Whistler. From the viewpoint on Highway 99 North, five kilometres south of Squamish, the volcano's prominent twin peaks are easily recognized.

Lava flows, recognizable by their well defined columnar jointing, can be spotted from several places along the roads to the Whistler and Mount Baker ski areas. In Brandywine Falls Provincial Park enroute to Whistler, Brandywine Creek has carved a canyon through lava flows 35 000 years old, forming a spectacular waterfall at the head of the canyon.



Columnar Jointing

For further information on volcanoes, please contact:

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