

Thème 1 – La Terre dans l'Univers, la vie, l'évolution du vivant

1-B – Le domaine continental et sa dynamique

Volcano Hazards in the Cascade Range.

Use the documents to explain why geologists feel concerned about Cascade volcanoes.

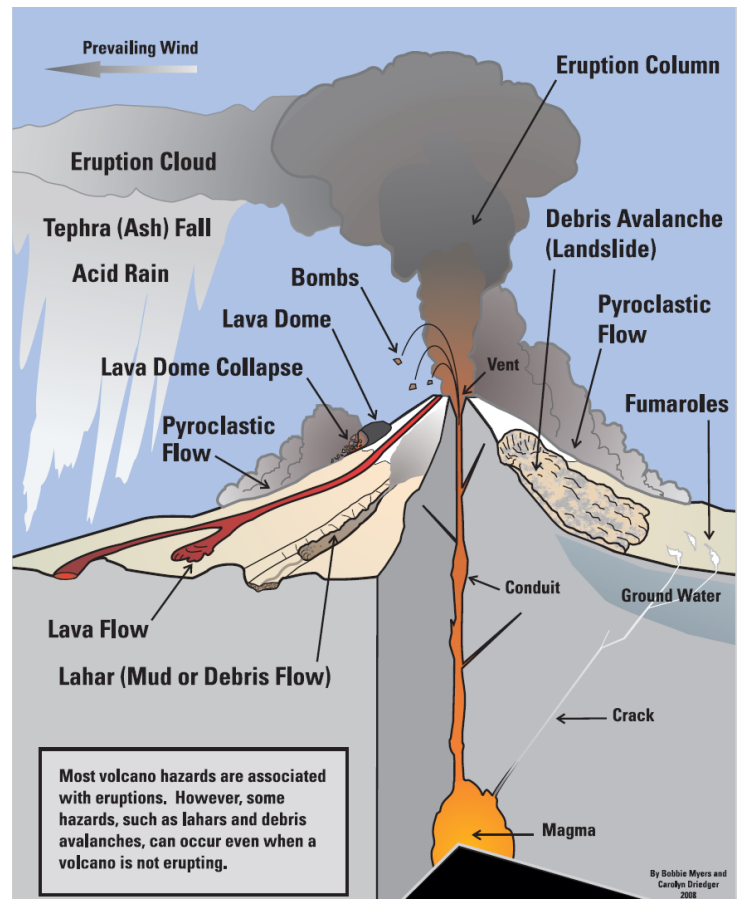
Document 1: Expanding populations near volcanoes put more people at risk.

In Cascade Range vicinity, the number of people at immediate risk during eruptions is greater than in any other volcanic area within the United States. The 2010 census notes that more than 10 million people live in Washington and Oregon alone, and populations are increasing in areas at risk for volcanic hazards. Additionally, aviation air space between the Canadian border and Mount Shasta accommodates almost 2,000 flights daily. The next eruption near a Cascade volcano could upset the lives of hundreds of thousands of people and disrupt many others.

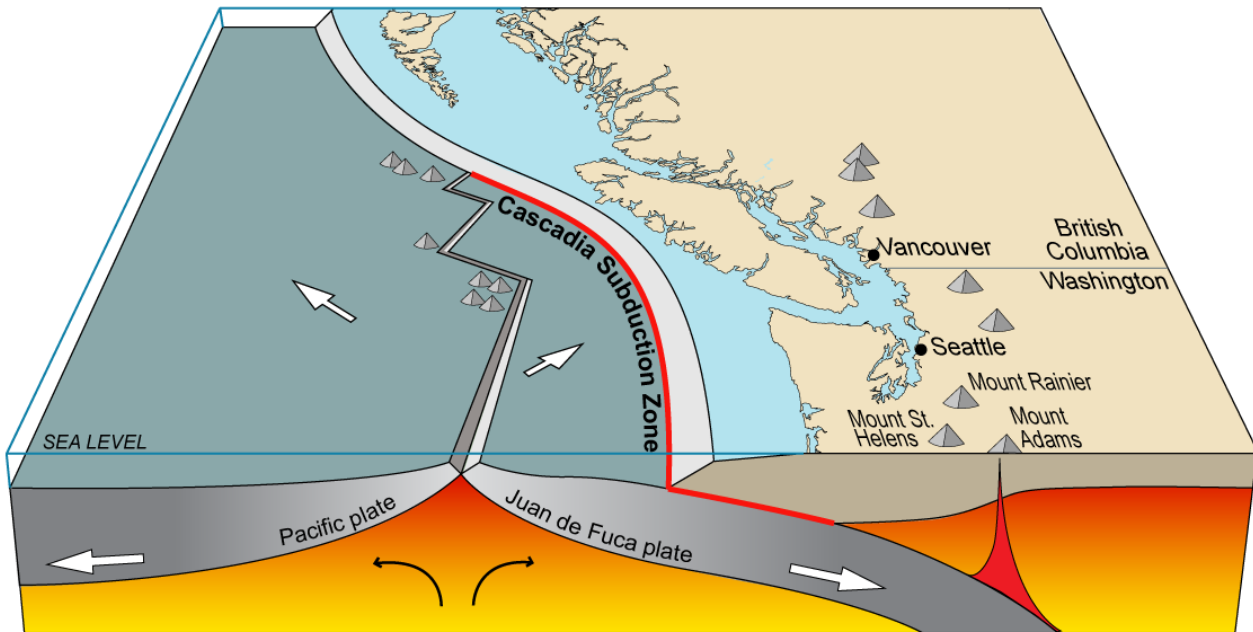
When Cascade volcanoes erupt, a common sequence of events unfolds. Explosive eruptions of tephra are followed by the effusion of lava flows. High-speed avalanches of hot rock and gas (pyroclastic flows) can accompany both of those events. Finally, when the erupted material mixes with river water or melts snow and ice, volcanic mudflows (lahars) sweep down valleys and can devastate areas more than 50 miles downstream. Rivers can continue to carry volcanic sediment downstream and force flooding for decades to hundreds of years. The most significant threats are from volcanic ash and from the slurry of mud and debris within lahars.

Even in the absence of eruption, the flanks of Cascade volcanoes can collapse, which result in landslides and debris avalanches that can destroy areas downslope from the collapse location.

Volcanoes pose multiple types of hazards and the initiation and duration of eruptions is relatively uncertain. Therefore, authorities and populations at risk, both close to and far from the volcano, must be knowledgeable about volcanic hazards so that they can be flexible and prepared in their response.



Document 2: Modern Cascade volcanism



*figure modified from USGS Cascadia earthquake graphics at <http://geomaps.wr.usgs.gov/pacnw/pacnweq/index.html>

For the last 40 million years, the subduction and melting of the oceanic Juan de Fuca Plate beneath the continental North American Plate has generated the magma that spurs volcanic eruptions in the Cascades Volcanic Arc. The most recent chapter of volcano building began ~500,000 years ago. Mount Rainier, Mount St. Helens, and Mount Adams are products of this period. Evidence of repeated eruptions from these volcanoes exists in the geologic record.