

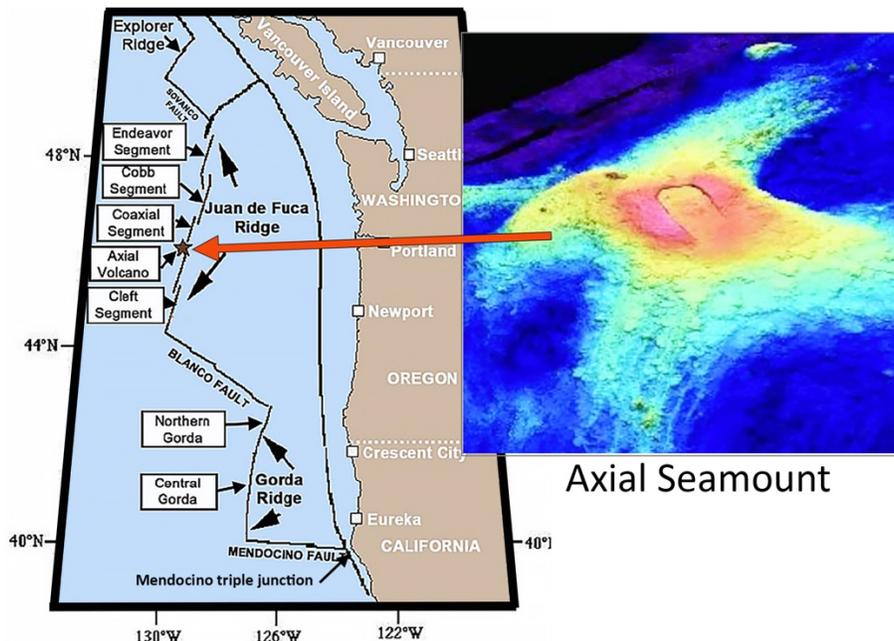
# Times Standard

## Not My Fault: A look at Volcano unrest near and far

Lori Dengler for the Times-Standard

Posted January 18, 2025

<https://www.times-standard.com/2025/01/18/lori-dengler-a-look-at-volcano-unrest-near-and-far/>



*Location map of Axial Seamount and a NOAA illustration of the volcano. Other locations noted on the Gorda and Juan de Fuca ridges are also sites of frequent small submarine eruptions.*

There are roughly two dozen or so volcanoes in a state of “unrest” or erupting somewhere on the planet. 2025 has been no different, but some activity has attracted media attention, and one is in our own back yard.

The Smithsonian collaborates with the USGS to publish a weekly summary of global volcanism ([https://volcano.si.edu/reports\\_weekly.cfm](https://volcano.si.edu/reports_weekly.cfm)). The most recent report includes five new eruptive sites and 21 continuing eruptions. Most of these are in remote spots and unlikely to have significant impact.

Locations range from Russia’s remote Kamchatka Peninsula to southern Chile. Almost all the places that come to mind when thinking of volcanoes are on the list – Iceland, Hawaii, Japan, Central America, Papua New Guinea, the Aleutians, Indonesia, and the Philippines. Indonesia almost always has the most eruptive sites. This week is no different with six different Indonesian eruptions currently in progress.

This activity has impacted people. More than 10,000 people have been advised to stay away from Kanlaon volcano in the Philippines which began its current eruption last

October. Indonesia raised its alert level for Mt. Ibu to 4, the highest level and ordered 3,000 people in six villages near the volcano to evacuate. Mt. Ibu has been erupting since 2008, and it has been challenging for officials to get people to evacuate when many perceive the threat as something they can live with.

The Mt. Ibu eruption is typical of many on the Smithsonian list, in an active status for more than a decade. Two of the eruptions extend back into the 20<sup>th</sup> century. The current activity at Sheveluch in Kamchatka dates to 1999 and the longest site of continuing activity is Santa Maria in Guatemala where the current eruptive phase began in 1922.

I became interested in revisiting volcanoes this week because of an earthquake in Ethiopia two weeks ago. I compile a daily recording of earthquake activity every day (707-826-2020) and pay attention when unusual earthquakes pop up. On January 3, the USGS reported magnitude 5.5 and 5.7 earthquakes in the Rift Valley of central Ethiopia. Since then, 88 earthquakes of magnitude 4.5 or larger have occurred concentrated along a 100-mile-long zone of the rift zone.

Earthquakes are an important tools to detect potential eruptions. When magma moves upwards, it pushes the rocks producing swarms of earthquakes. Often these earthquakes are small, in the magnitude 3 and smaller range. But it isn't unusual for a few 5s to herald the re-awakening of long dormant volcanic regions. Iceland's current eruptive phase on the Reykjanes Peninsula began with small land level changes in 2020, followed by seismic unrest in early 2021 including six earthquakes in the magnitude 5 range. The Peninsula's first eruption in 800 years began 23 days after a magnitude 5.6.

I wasn't the only one who took notice of the Ethiopian Rift Valley earthquake swarm. The Ethiopian government has ordered the evacuation of 80,000 people in areas near Dofen and Fentale volcanoes over concerns that the seismic unrest is leading to a major eruption. About 30,000 people have been displaced so far. No new lava flows or ash so far, but a hydrothermal explosion and increased geothermal activity has been observed. The earthquakes have already caused damage to structures in the region and there are concerns that the Kesem dam could fail if seismic activity continues.

Fentale and Dofen volcanoes are in Ethiopia's Afar triangle. It is a fascinating geologic region where the African, Indian, and Arabian plates meet and marks the northward end of the Rift Valley. The spreading in the region not only causes volcanic activity, but the rifting has exposed some of the most important hominid fossil locations and is considered by some paleontologists to be the cradle of human evolution. Alas it is also the site of long-standing civil conflict that further complicates the evacuations.

It is not unusual for Iceland to show up in the weekly report. The re-awakening of volcanic activity on the Reykjanes Peninsula has produced ten eruptions since 2021, the most recent in December of last year. The Sundhnúkur eruptive cycle will likely resume in a month or two but was not featured in last week's summary. Two new and much larger volcanic systems may be re-awakening, both centered on Iceland's eastern rift zone more than 100 miles away and both with the potential to cause much greater impact not only in Iceland but globally.

Bárdarbunga, and Grímsvötn are in south central Iceland beneath Vatnajökull glacier, the largest icecap in Europe covering 8% of Iceland's surface. In the past week, earthquake swarms and tremor have been observed beneath each of them. The Reykjanes eruptions are in an area long devoid of glaciers and don't pose the same risk of glacial outburst floods or explosive atmospheric ejecta as these two much larger volcanoes.

Bárdarbunga last erupted in 2014 producing relatively effusive lava flows but in 1477, it erupted violently producing what is considered the largest eruption in Iceland's recorded history. Grímsvötn about 20 miles to the south, erupted in 2011. It has produced the most frequent eruptions of any of Iceland's major volcanoes. Eruptions between 1783 – 1785 affected global climate, causing widespread crop failures, and the resulting famine is argued by some historians as a factor leading to the French Revolution.

Eruptions of both of these volcanoes often result in glacial outburst floods, known as jökulhlaups. It doesn't take a major eruption to produce glacial ice melt. Seismic signals typical of jökulhlaup have been detected in the in the current Grímsvötn activity. Of bigger concern in both of these systems is interaction of glacial melt water and magma that could result in an explosive eruption blasting fragments of rock and ash high into the atmosphere. We experienced that scenario in 2010 when the eruptive cloud from Eyjafjallajökull disrupted air traffic to Europe for a week. I'll be keeping my eye on both of these volcanoes while the unrest continues.

One volcanic area not in this week's report still made the news. At last December's meeting of the American Geophysical Union, a group of scientists led by William Chadwick of Oregon State presented a paper on Axial Seamount, an underwater volcano located on the Juan de Fuca ridge 280 miles west of the Oregon – Washington border.

Axial Seamount is a small shield volcano composed of basaltic lava that rises over 3,600 feet above the ocean floor. It is still far below the ocean surface and would be unknown if not for remote sensing and submersible exploration. Pressure recorders were installed on its surface in 1997 allowing scientists to monitor inflation and deflation episodes.

Eruptions on Axial Seamount were detected in 1998, 2011, and 2015. Each eruption lasted no more than a few weeks as measured by the accompanying small earthquakes and caused no disruptions to human activity. Chadwick's team announced that the current rates of inflation have reached 95% of the value before the 2015 eruption and conclude that the next eruption is likely before the end of this year.

Don't hold your breath or rush to the coast to watch. These eruptions are modest – no tsunami potential, no explosions, and invisible without sensitive instrumentation. The best kind of eruption in my book – way cool scientifically and no hazard.

-----  
Lori Dengler is an emeritus professor of geology at Cal Poly Humboldt, and an expert in tsunami and earthquake hazards. The opinions expressed are hers and not the Times--Standard's. All Not My Fault columns are archived online at <https://kamome.humboldt.edu/taxonomy/term/5> and may be reused for educational purposes. Leave a message at (707) 826-6019 or email [Kamome@humboldt.edu](mailto:Kamome@humboldt.edu) for questions and comments about this column or to request copies of the preparedness magazine "Living on Shaky Ground."