Times-Standard
Times-Standard / Humboldt Beacon

Not My Fault: Getting the facts straight on Hawaii

Lori Dengler/For the Times-Standard
Posted May 23, 2018

There is a disjunct between media reports and what is actually happening on the ground in Hawaii. "Hawaii's Kilauea volcano massively erupts," screams the heading from the Google News section on the eruption while USA Today blared "Hawaii's Big Island braces for major volcano eruption."

Fact: The Island of Hawaii is made up of five major volcanoes. Kilauea is the youngest volcano in the Hawaiian chain above the ocean. It is so young that it hasn't built up a mountain like its older sister Mauna Loa, but it still covers about 700 square miles along Hawaii's SE coast and accounts for about 17% of the island's area. It's deceptive – much of this land is relatively flat and vegetated with towns and subdivisions built on its young surface. Unfortunately, this can be a risky proposition. Between 1986 and 1991 the towns of Kalapana and Kaimu and the subdivisions of Kālapana Gardens and Royal Gardens were overrun by lava.

Fact: Kilauea volcano has been erupting nearly continuously since 1983. During this time it has had periods of increased activity and quieter ones and the eruptive centers have moved considerably – starting at the Puʻu ʻŌʻō cone 11 miles to the east of the Kilauea summit, then shifting a couple of miles further east creating the Kūpaʻianahā vent. Then activity jumped back to Puʻu ʻŌʻō where it has continued intermittently to the present. It's a complex plumbing system with lava levels fluctuating in the summit lake and other eruptive centers as the eruption continues to evolve. The current eruptive outburst is called the Lower East Rift Zone event and is the 62nd pulse of eruptive activity since 1983.

Fact: As eruptions go, Hawaiian volcanoes are among the least violent. Explosiveness is described by the Volcanic Explosivity Index (VEI), a measure of how high volcanic materials are ejected and how much volume of material is produced. Most Hawaiian eruptions are in the zero to one category, described as "gentle" or "effusive." The primary component of magma (molten rock underground), and lava (molten rock on the surface) is silica. Silica (silicon dioxide) makes magma and lava very sticky. Basalt, the lava that is pouring out of Kilauea, is low in silica and flows readily. Gasses can escape and can't build up the pressure to create a Mt. St. Helens or a Krakatoa. There is, however, an exception. Water. When water interacts with molten rock, it can quickly flash to boiling and blast material into the air. These steam-driven explosions are one of the biggest hazards of Hawaiian eruptions. The largest in the current outburst occurred on May 17th when a blast from the Kilauea summit area ejected ash up to heights of 30,000 feet. Other blasts have reached a few thousand feet. As impressive as this seems, it pales compared to the silica-rich 1980 Mt. St. Helens' 12 mile-high ash column (VEI 4) and the 1815 eruption of Mt. Tambora (VEI 7) that blasted material into the stratosphere and cooled the planet for several years.

Fact: Volcanic activity emits gas. Gasses include sulfur dioxide, sulfide particles, hydrogen sulfide, and traces of others. The venting material may also include ash particles from burning vegetation and structures. It's not good to breathe. When combined with water vapor, a mixture called 'vog' results (volcanic smog/fog). The location and concentration of vog is a function of supply and wind direction, both of which are carefully monitored by the Hawaii Volcano Observatory. During the current eruptive period, its effects have mainly affected the southern part of the island, with little impact on the Kona coast, Hilo or other vacation destinations. Vog reports are included in the daily monitoring reports (link below).

Fact: Volcanoes and earthquakes go together. As magma moves underground it pushes rock causing small quakes. It also causes the ground to swell in some areas and deflate in others also causing quakes. And the voluminous outpouring of lavas that have built the islands over millennia create instabilities that also produce earthquakes. This latter category was the cause of the May 4 M6.9 earthquake that was felt as far away as Oahu. Since 1900, 11 Hawaiian earthquakes have topped the magnitude 6 level. For comparison, the North Coast has experienced 33 earthquakes of this size in the same time period.

Fact: Large earthquakes in Hawaii can cause tsunamis. Two damaging local tsunamis have occurred in historic times (1868 and 1975). Water heights on the island of Hawaii reached 40 to 45 feet. According to the USGS, "There is no geologic evidence for past catastrophic collapses of Kīlauea Volcano that would lead to a major Pacific tsunami, and such an event is extremely unlikely in the future based on monitoring of surface deformation. Kīlauea tends to "slump", which is a slower type of movement that is not associated with tsunamis…" Any tsunami generated from Hawaii would take about five hours to reach the US West Coast, about the same

amount of time as the much more likely tsunami coming towards us from Alaska.

So should you change your Hawaiian vacation plans? If your main destination is Hawaii Volcanoes National Park, you should probably wait awhile until the park reopens and the hazards abate. But if you are headed to Oahu, Maui or other popular vacation locales, your risk is really no greater than any other parts of our active planet. With many people bailing on their travel plans, I'm thinking Hawaii may be the perfect place to go in the next few months.

Note: Much of the above information comes from the USGS and the Hawaii Volcano Observatory. A credible summary of the current and past eruptions and the hazards posed by Kilauea is at https://volcanoes.usgs.gov/observatories/hvo/activity_2018.html

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