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Not My Fault: Kilauea stirs again

Lori Dengler/For the Times-Standard
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It's been just over a year since I last wrote about volcanoes. In December 2019 a modest eruption on New Zealand's White Island caught tourists and guides, killing 22 people. 2020 has been relatively benign from the volcanic impact perspective. Only one volcano, the January eruption of Mt. Taal in the Philippines, caused fatalities. The Taal eruption tally would have been much lower if everyone one had heeded evacuation orders. Unfortunately 39 people died.

That doesn't mean there has been a lull in volcanic activity in 2020. According to the Smithsonian's Global Volcanism Program, 67 confirmed eruptions from 63 different volcanoes are noted in 2020 to date. That number is only slightly down from 2019 (74 eruptions) and 2018 (80). Forty-four volcanoes are erupting right now. Most of these volcanoes, like Karymsky in Russia and Semisopochnoi in the Aleutian Islands, are known to very few. Their remote locations far from populated areas mean their only risk is ash that could be hazardous to passing aircraft.

A week ago, a familiar character re-entered the volcanic stage. Kilauea, after 27 months of quiet, reawoke, producing streams of lava that poured into the summit crater Halema'uma'u. The reawakening coincided with a widely felt 4.4 earthquake on the northeast rift zone. So far, the new eruption is confined to Halema'uma'u. Lava has been entering the crater from two vents on the north and northwest walls. The lava boiled off the water in the bottom of the crater that had accumulated over the past year and has now replaced it with a pool of molten rock nearly 600 feet deep.

I am a volcanophile and like to keep an eye on Hawaii's volcanoes. For the past month I've been paying attention to Mauna Loa, Kilauea's much bigger and older sister. In July of last year, the Hawaii Volcano Observatory raised the alert level at Mauna Loa from Green (normal background), to Yellow (advisory) based on increased seismicity and slow inflation of the summit region. In the past month, a swarm of earthquakes on the volcano's northwest flank made me wonder if we were looking at the prelude to Mauna Loa's next eruptive phase.

The USGS uses colors to assess the status of US volcanoes. Green is normal or dormant level background, meaning in a non-eruptive state. Yellow is elevated unrest often characterized by small earthquakes and/or gas emissions and meaning an eruption probably isn't imminent but volcanologists are keeping a close eye on the activity. Orange is heightened unrest or a minor eruption is underway and means the volcano is could be closer to a more explosive eruption. The highest level, Red, means an explosive eruption may be imminent or underway. Kilauea had been in the Green since late August 2018 when the thirty-five year Pu'u O'o eruption ended.

This weeks' Kilauea activity took the Hawaii Volcano Observatory (HVO) scientists a little by surprise. Hawaiian volcanoes are well behaved by volcano standards and Kilauea is covered with instruments that can record tiny earthquakes, subtle changes in land level and measure gas emissions in near real time. As magma beneath the surface moves upwards or laterally, these instruments detect the changes. HVO had noticed a slight uptick in earthquakes and small elevation changes in the past few weeks and planned to raise Kilauea's status to Yellow this week. But last Sunday evening, a swarm of small earthquakes began beneath the summit followed by a bright glow and steam plume near the crater rim. When a magnitude 4.4 earthquake struck on the NE rift zone about 12 miles from the summit a little while later, HVO quickly bumped the status from Green to Red.

Red means that more explosive activity and ash ejection could happen soon. Hawaiian officials issued a Stay Indoors order because of the potential for falling volcanic debris. By the next day when it looked like activity was only in the summit area, the order was lifted and the color code lowered to Orange "eruption is underway but poses limited hazards." As of yesterday morning, lava continued to pour into Halema'uma'u and the status remains at Orange.

The longer-term Kilauea prognosis is that activity is likely to continue in the summit region and the primary concerns are high levels of volcanic gas, rockfall, minor explosions, and volcanic ash. The complex plumbing as lava flows in and out of Halema'uma'u creates an inherently unstable situation, and large explosions, like the ones that occurred repeatedly in the summer of 2018, are always a possibility. Daily activity reports are posted at https://www.usgs.gov/volcanoes/kilauea/volcano-updates .

How might the current activity at Kilauea affect Mauna Loa? The Mauna Loa summit is only 20 miles from

Halema'uma'u, and both are fueled by the same hotspot deep beneath the earth's surface. But they feed from different shallower magma pools. Mauna Loa is nearly half a million years older and has a distinctly different eruptive style and tends to more rapid and larger volume eruptions, posing a greater risk to populated areas. The 1950 eruption lasted for only 23 days, but poured out as much lava as about four years worth of the Kilauea Pu'u O'o rate. It took only three hours for lava from near the Mauna Loa summit to reach the sea. It takes several weeks for Kilauea flows to travel a similar distance.

Recent studies do suggest some links between the two volcanoes. In the past century, Kilauea has dominated the eruptive activity list, but in the 1800s, Mauna Loa was the more active. A 2012 study in Nature Geosciences proposed that the recent high level of activity at Kilauea might have acted as a pressure valve at Mauna Loa, muting its activity rate.

Mauna Loa is NOT erupting at the moment. Its current status is Yellow and the earthquake activity on the NW flank has abated for now. I am going to keep a close watch on what these two volcanoes will do in 2021.

Note: For a volcanologist's account of the new activity at Kilauea see https://www.bigislandvideonews.com/2020/12/25/volcano-watch-a-new-era-at-kilauea-volcano/ An easy-to read overview of the high speed Mauna Loa 1950 eruption is posted at https://www.usgs.gov/volcanoes/mauna-loa/1950-mauna-loas-fastest-high-volume-eruption

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