

Mauna Loa Eruption

December 8, 2022

[Mauna Loa](#), a volcano on the island of Hawaii, began erupting on November 27, 2022, with an outbreak of [lava](#) at the Mokoaweoweo summit [caldera](#) at an elevation of 13,681 feet within the [Hawaii Volcanoes National Park](#). The eruption has caused aviation restrictions and some facilities and road closures; traffic congestion and illegal parking on the few narrow roads to the summit by sightseers; and unhealthy air quality. The hazards from the Mauna Loa eruption include [lava flows](#), [earthquakes](#), [fractures and subsidence](#), [volcanic gas](#) emissions, hazardous volcanic smog called [vog](#), and [explosive eruptive activity](#). Congress may be interested in the U.S. Geological Survey's (USGS's) efforts to monitor the eruption (see [USGS Mauna Loa Eruption Updates](#)) and reduce the risks from volcanic hazards.

Mauna Loa Eruption

[Mauna Loa](#) is a large [shield volcano](#) that dominates the central part of the island. The summit and some southern parts of the volcano are located in the national park. Outside the national park, the volcano is covered by areas of barren lava, forest preserves, wildlife refuges, agricultural lands, a few facilities, and coastal communities. Early on in the eruption, [lava flows](#) along the [Southwest Rift Zone](#) extended west and southwest. On November 28, the activity moved to the Northeast Rift Zone. Several [fissures](#) opened and spewed [volcanic gases](#) with [lava fountains](#) followed by lava flows moving northeast down the gentle slope of the volcano (**Figure 1**).

Activity at the summit and along the Southwest Rift Zone had stopped by November 28. Fissures on the Northeast Rift Zone are now the dominant source of the largest lava flows. These flows are moving slowly down the mountain and may block the Daniel K. Inouye Highway (Saddle Road, a major highway between volcanoes connecting the east side and west side of the island) in the near future (**Figure 1**).

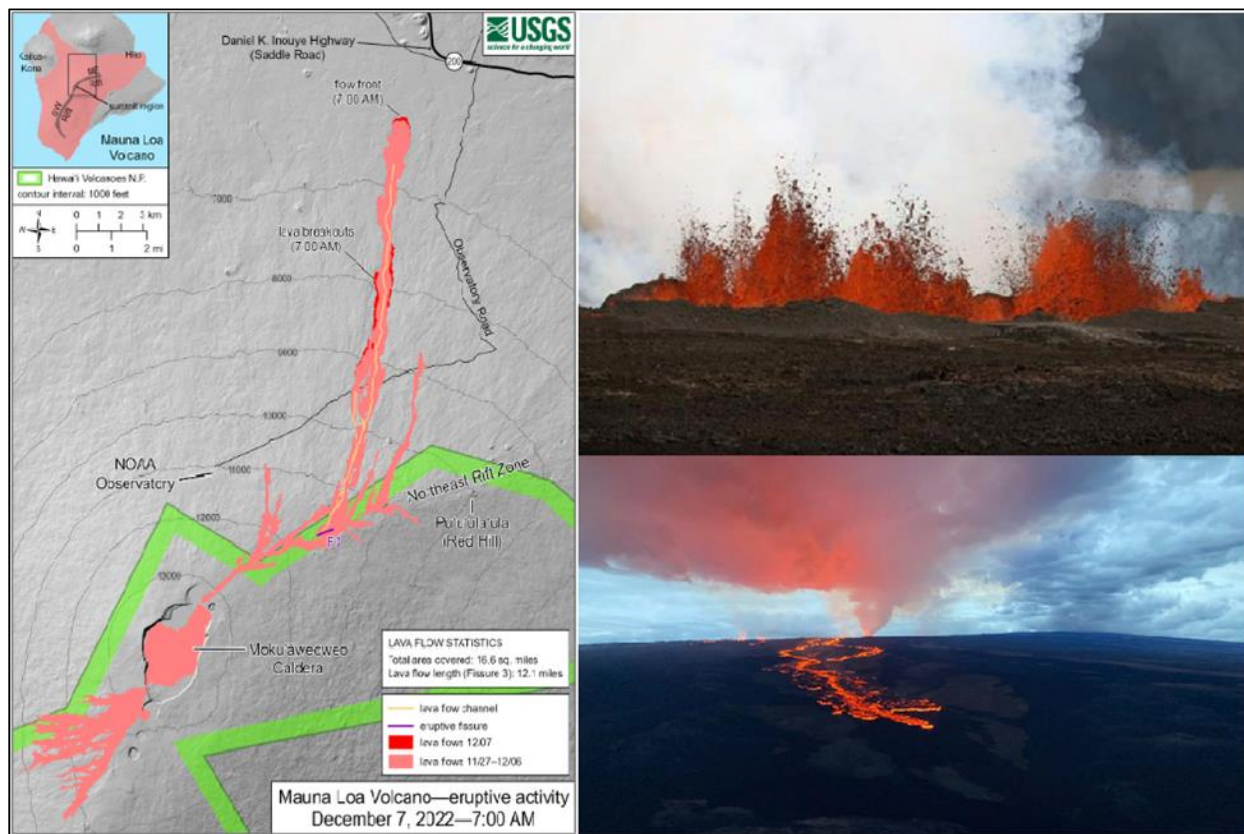
Congressional Research Service

<https://crsreports.congress.gov>

IN12059

Figure I. Mauna Loa Eruption: Map and Images

November 29 and 30, 2022



Source: Left side map - USGS, [November 30, 2022 – Mauna Loa Eruption Map](#). Top image USGS, [Mauna Loa Fissure Erupting, November 29, 2022](#). Bottom image USGS, [Mauna Loa Northeast Rift Zone Eruption, November 29, 2022](#).

Notes: Top right image shows an erupting fissure high on Mauna Loa's Northeast Rift Zone. Fountain heights of 20-25 meters (65-82 feet) were measured by Hawaiian Volcano Observatory field crews on the morning of November 29, 2022. Bottom right image shows an aerial view of the lava flows on the northeast flank of Mauna Loa, taken during a morning overflight on November 29, 2022. These lava flows are moving in a northeast direction, fed by fissure vents on the Northeast Rift Zone. For the latest, see [Mauna Loa Volcano Updates](#) and [USGS Mauna Loa images of eruption, field activity and more](#).

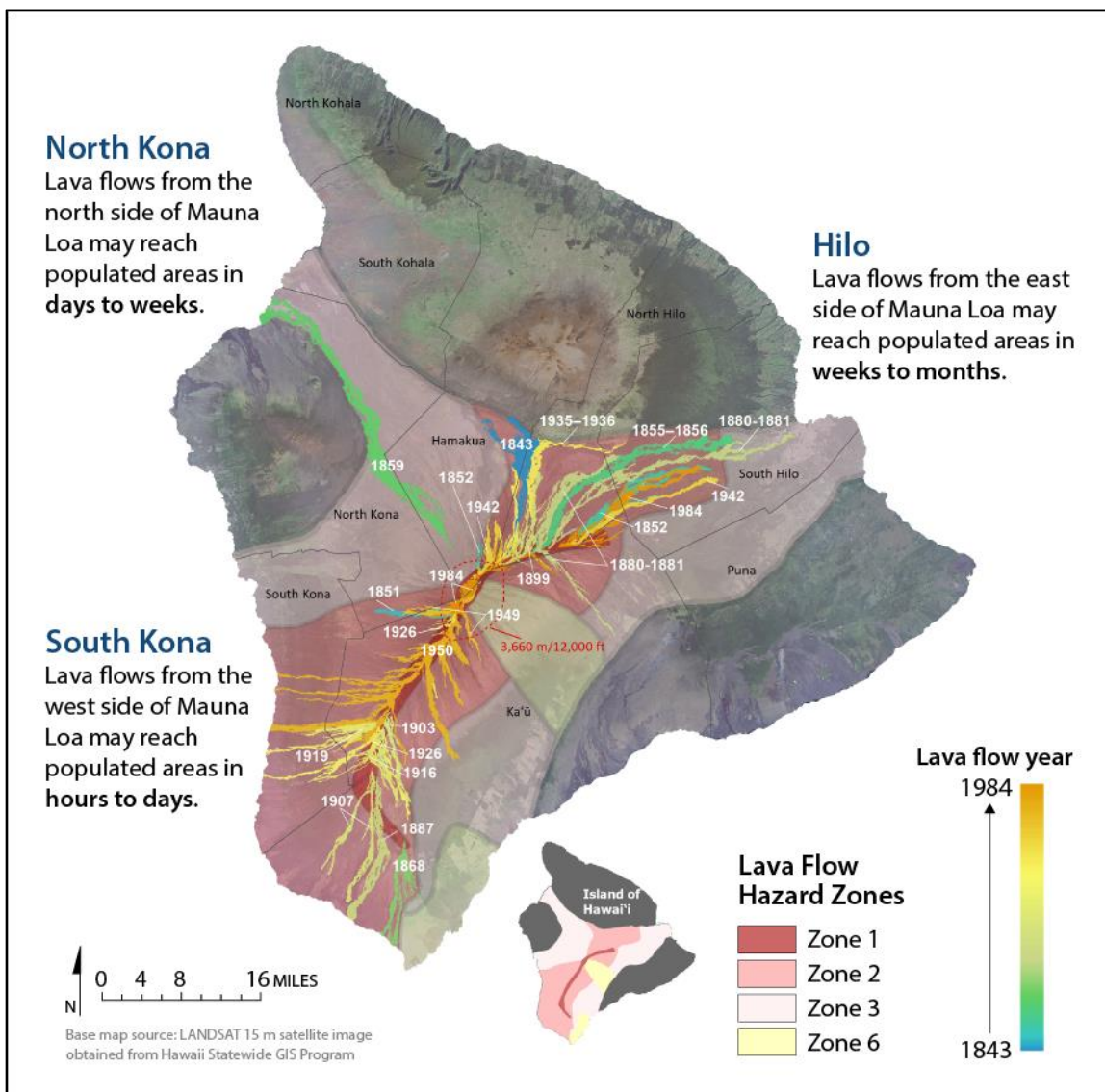
Impacts of Mauna Loa Eruption

Volcanic eruptions may affect people, property, and the environment in numerous ways. Hawaii Volcanoes National Park has closed some roads, but the park remains open to visitors, and the National Park Service (NPS) is working to keep visitors safe amidst eruptive activity on Mauna Loa and Kilauea. NOAA's [Mauna Loa Observatory](#) is closed because a lava flow blocked the observatory access road and took out power lines to the facility. The [U.S. Army Pohakuloa Training Center](#) on the northeast slope and the [Mauna Kea Observatories](#) and a weather center on the summit of nearby Mauna Kea are not threatened by the current eruption, but if the lava flows continue down the volcano, the flows may block road access to these facilities.

Most communities on the island are on or near the coasts, far from the Mauna Loa summit. Some communities are vulnerable to unhealthy air quality depending on weather conditions and volcanic gas emissions. USGS has provided [forecasts of the lava flow hazards](#) to communities using past eruptions between 1843 and 1984 (the last time Mauna Loa erupted) and the likely path of new lava flows based on

topography (**Figure 2**). The **Hamakua** and **Hilo** districts on the northeastern and eastern coasts, respectively, are most at risk from hazardous lava flows from the current eruption (**Figure 2**). The **Kona** and **Kau** districts on the western coast are most at risk from lava flows that start on the Southwest Rift Zone (currently not active).

Figure 2. Mauna Loa Lava Flow Hazards



Source: USGS, [Mauna Loa, Geology and History](#). Information about lava flow arrival times from [USGS Mauna Loa Factsheet](#). Modified by CRS.

Notes: The lava flow hazard zones displayed on both maps and listed in the legend include Zone 1 (most hazardous)—the summit and rift zones, where lava and volcanic gases have repeatedly erupted; Zone 2 (hazardous)—slopes of the volcano adjacent to the summit and rift zones where recorded lava flows have repeatedly flowed down slope; Zone 3 (less hazardous)—less likely to have lava flows because of greater distance from the summit and rift zones or because the topography does not allow easy downslope flow; Zone 6 (no hazard)—protected from lava flows by topographic features or barriers. The dashed red circle around the summit is the 12,000 foot elevation contour. Historic lava flows from eruptions between 1843 and 1984 are displayed in colors with blues the oldest and oranges the youngest.

U.S Geological Survey Hawaiian Volcano Observatory Monitoring and Alerts

The U.S. Geological Survey [Hawaiian Volcano Observatory](#) (HVO) is tracking Mauna Loa's eruption using a [network of monitoring instruments](#) (such as [cameras](#), [thermal \(heat measuring\) cameras](#), [seismometers](#), [tiltmeters](#), [geodetic instruments \(Global Positioning System\)](#), and gas measuring instruments). In addition, USGS scientists and other geoscientists are deployed in the field to sample the lava and air and make other measurements. HVO noted heightened unrest at Mauna Loa in September when the number of earthquakes increased and the summit began to inflate ([Update 9/29/22](#)). Since then, HVO established a [24/7 monitoring campaign](#), added more cameras and other instruments to the network, and added staff from other [USGS Volcano Observatories](#). HVO is providing information about volcanic hazards from the Mauna Loa eruption and the continuing [Kilauea eruption](#) to federal, state, and local authorities. HVO is able to forecast some volcanic hazards to reduce the risks to people and property because of research, historical data on past eruptions, and long-term monitoring. HVO forecasts that the current Mauna Loa eruption may last a few weeks and be contained to lava flows on the Northeast Rift Zone and northeast slope. HVO is working with the [Hawaii County Civil Defense Agency](#), the [Hawaii Interagency Vog Information Dashboard](#), the [Hawaii Emergency Management Agency](#), the Federal Emergency Management Agency, the [Federal Aviation Administration](#), the National Weather Service, NPS, and others to communicate the hazards and reduce the volcanic risks.

Considerations for Congress

In 2019, Congress authorized a [National Volcano Early Warning and Monitoring System](#) (NVEWS; Section 5001 of [P.L. 116-9](#); 43 U.S.C. 31k, see also [CRS InFocus on NVEWS](#)) to improve monitoring and reduce risks. In 2020, the USGS submitted a five-year plan for establishing and managing NVEWS to Congress. The plan identified 34 very-high- or high-threat volcanoes, including Mauna Loa and Kilauea, from the 2018 volcanic threat assessment that would be prioritized for additional monitoring. Congress appropriated \$33.3 million for the [Volcanic Hazards Program \(VHP\)](#) in FY2022 (see [Explanatory Statement](#) accompanying [P.L. 117-103](#)), which included \$2.2 million to begin implementation of NVEWS and \$1.8 million for an Early Warning System. In addition, Congress provided supplemental appropriations in FY2019 to repair the volcano monitoring network and establish new HVO facilities after the ones at Kilauea summit were destroyed by intense eruptions in 2018 ([P.L. 116-20](#) and [USGS supplemental appropriations information](#)). Congress may be interested in the USGS monitoring and response to the Mauna Loa and Kilauea eruptions and could consider whether recent legislation and appropriations are sufficient to achieve the goals of improving monitoring and reducing volcanic risks as envisioned by the NVEWS.

Author Information

Linda R. Rowan
Analyst in Natural Resources and Earth Sciences

Disclaimer

This document was prepared by the Congressional Research Service (CRS). CRS serves as nonpartisan shared staff to congressional committees and Members of Congress. It operates solely at the behest of and under the direction of Congress. Information in a CRS Report should not be relied upon for purposes other than public understanding of information that has been provided by CRS to Members of Congress in connection with CRS's institutional role. CRS Reports, as a work of the United States Government, are not subject to copyright protection in the United States. Any CRS Report may be reproduced and distributed in its entirety without permission from CRS. However, as a CRS Report may include copyrighted images or material from a third party, you may need to obtain the permission of the copyright holder if you wish to copy or otherwise use copyrighted material.