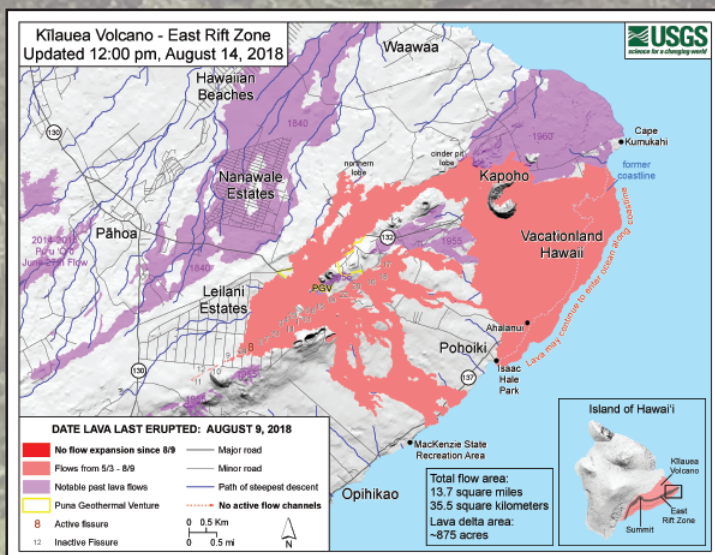


# Preliminary summary of Kīlauea Volcano's 2018 lower East Rift Zone eruption and summit collapse

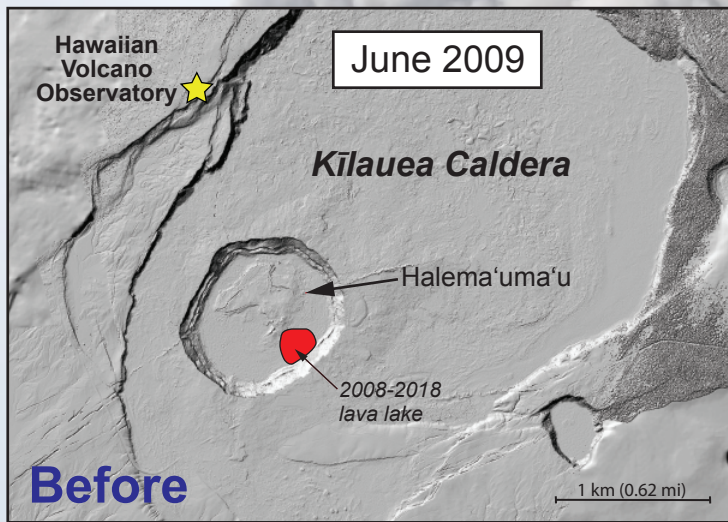
## Chronology

April 30	Long-term Pu'u 'Ō'ō eruptive vent collapses; magma begins moving downrift toward Puna
May 1	HVO issues notice of potential eruptive activity on Kīlauea's lower East Rift Zone (LERZ) Deflation of Kīlauea's summit begins; Halema'uma'u lava lake starts to drop
May 2	First ground cracks open on LERZ in and adjacent to Leilani Estates subdivision
May 3	Onset of LERZ fissure eruptions; Kīlauea Volcano Alert Level raised to WARNING
May 4	Magnitude-6.9 earthquake on south flank of Kīlauea
May 9	HVO issues notice of potential explosions at summit of Kīlauea
May 9-12	Lull in lower East Rift Zone fissure activity
May 10	Halema'uma'u lava lake disappears from view
May 11	Hawai'i Volcanoes National Park closes to the public
May 15	Aviation Color Code for Kīlauea elevated to RED in anticipation of summit explosions
May 16	Onset of Kīlauea summit explosive events (ash up to 30,000 ft asl); HVO building vacated
May 19	Lava enters ocean near Mackenzie State Recreation Area (lasts about 10 days)
May 25-26	New pit opens on floor of Halema'uma'u at summit; fissure 8 reactivates on LERZ
May 29	Caldera downdrop accelerates; onset of near-daily summit collapse events, with each event releasing energy equivalent to that of a ~M5 earthquake
June 3	Lava erupted from fissure 8 reaches the ocean at Kapoho Bay
June 24	Aviation Color Code lowered to ORANGE (collapse events no longer producing ash)
Aug. 2	Kīlauea summit collapse events end
Aug. 4	LERZ fissure 8 activity significantly decreases; summit deflation stops
Aug. 17	Eruptive pause at fissure 8; Kīlauea Volcano Alert Level lowered to WATCH
Aug. 21	Ocean entries no longer active
Sept. 1-4	Weak lava activity observed within the fissure 8 cone (last LERZ lava activity?)
Sept. 22	Hawai'i Volcanoes National Park partially reopens

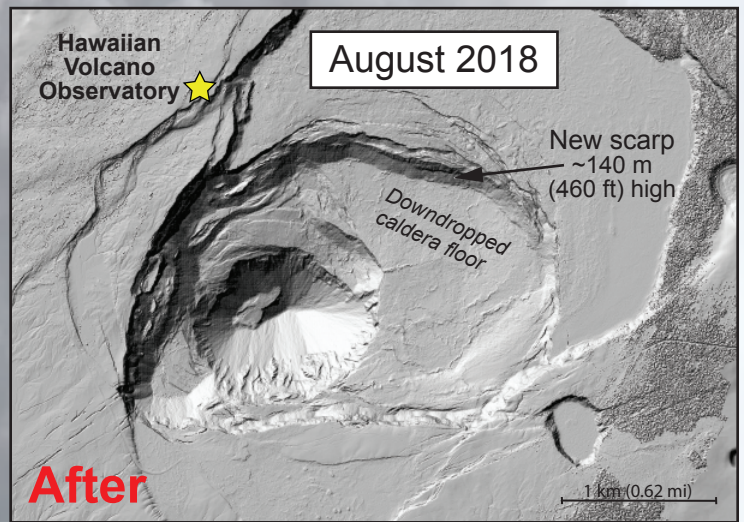


Lava flow coverage as of August 14, 2018. Red denotes May-September 2018 lava flows; purple denotes flows erupted in 1840-1960.

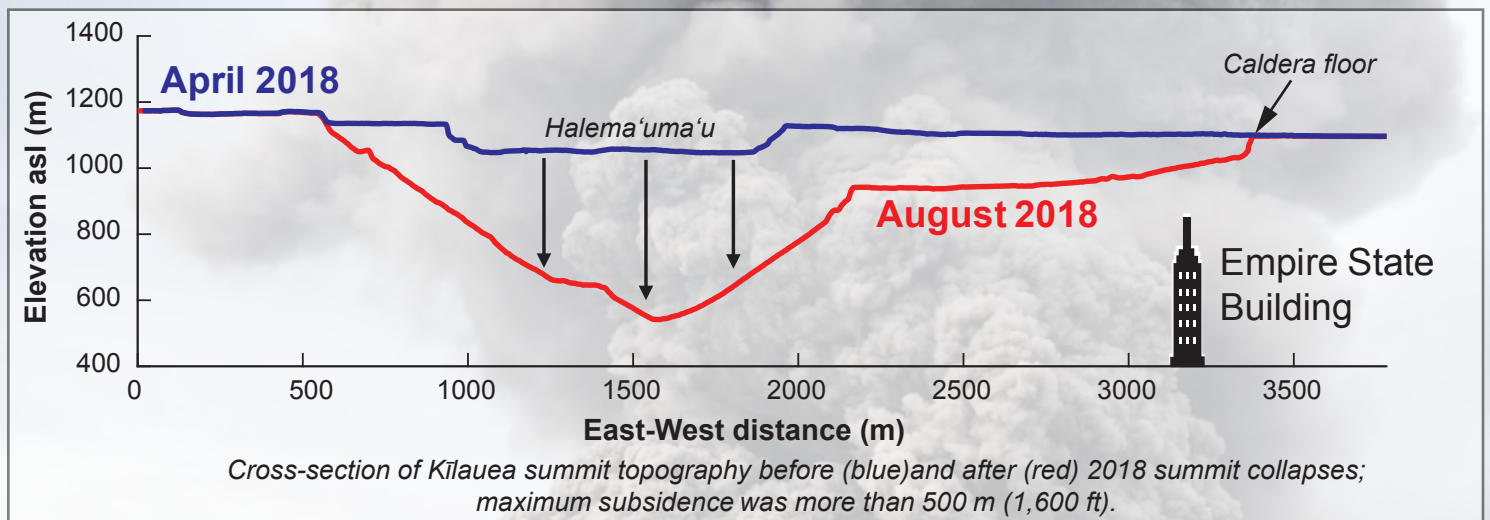
Fissure 8 lava entered Kapoho Bay on June 3, 2018. Hundreds of lower Puna homes were inundated by lava as it advanced to the ocean.



The volume of Halema'uma'u was around 54-60 million cubic meters (70-78 million cubic yards) prior to the 2018 events.



The volume of the inner collapse crater is now about 885 million cubic meters (1.2 billion cubic yards). Subsidence of the adjacent caldera floor created the new scarp (arrow).



## 2018 Statistics

- 13.7 square miles of land inundated by lava (lava thickness varies across area, up to 30-80 feet in places)
- 875 acres of new land created by ocean entries
- 716 dwellings destroyed by lava (per Hawai'i County)
- ~30 miles of roads covered by lava
- ~1 billion cubic yards of lava erupted (enough to fill at least 320,000 Olympic-size swimming pools)
- ~60,000 earthquakes April 30–August 4, 2018 (4,400 were magnitude-3 and higher; largest: M6.9 on May 4)

In addition to the USGS Hawaiian Volcano Observatory's 29 full-time staff, the response to Kīlauea's 2018 lower East Rift Zone eruption and summit collapse involved more than 90 employees from other USGS offices, including Unmanned Aircraft Systems flight crews, and numerous university collaborators and volunteers. HVO greatly appreciates the support provided during this unprecedented event on the Island of Hawai'i.



In mid-May 2018, USGS Hawaiian Volcano Observatory staff had to vacate their office building on the rim of Kīlauea's caldera due to damage caused by earthquake shaking and ground tilting associated with the summit collapse events. The future of the building is uncertain. HVO staff are presently working from temporary office space in Hilo.