

NEWS

Small Explosion From New Vent at Kilauea's Summit

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At 0258 Hawaii-Aleutian Standard Time (HST) on 19 March 2008, a small explosion scattered altered and fresh lithic debris across a 40-hectare area at the summit of Kilauea volcano. This explosion, the first recorded there since 1924, issued from a vent about 35 meters wide along the east wall of Halema'uma'u Crater. Ballistic fragments—the largest measuring nearly 1 meter across—were propelled upward more than 70 meters onto the Halema'uma'u crater rim. Coarse ash and centimeter-size lithic debris covered part of Crater Rim Drive, and fine ash was deposited farther than 30 kilometers to the southwest.

Seismic tremor levels, which began rising steadily in early November 2007, reached nearly 5 times the background level by early 2008, coincident with ongoing deflation of the summit magma system as measured by tiltmeters. By late December, Kilauea summit sulfur dioxide (SO_2) emission rates had risen above normal rates of less than 400 tons per day, and the rates just prior to the March explosion were the highest recorded since regular measurements began, in 1979. Carbon dioxide emission rates, commonly associated with magma supply from depth, varied only slightly before the explosion. This suggests that shallow magmatic processes were responsible for the SO_2 increase.

On 11–12 March, tiltmeters recorded an episode of deflation and then inflation, followed by a swarm of shallow earthquakes at a depth of a few hundred meters near the Halema'uma'u east rim. Later on 12 March, a vigorous new fuming source appeared on the east wall of Halema'uma'u, pushing the SO_2 emission rate to nearly 1600 tons per day. By 15 March, the fuming vent exhibited an ever growing expanse of incandescence until the 19 March eruption.

Since then, the vent has produced a relentless ash-bearing plume with high SO_2 emission rates. The plume's appearance is

white but has briefly turned to dusty brown as its lithic ash content increases.

On 23 March, Hawaiian Volcano Observatory (HVO) geologists began observing juvenile ejecta falling as Pele's hair, Pele's tears, and small clots of spatter on the rim of Halema'uma'u, indicating the rise of magma to near-surface depth. This lava,

though small in volume, is the first erupted at Kilauea's summit since September 1982.

Seismic tremor levels and SO_2 emissions currently remain high at Kilauea's summit, and the magma system continues to feed the eruption on the volcano's east rift zone. Two additional smaller explosions have occurred, at 2308 HST on 9 April and at 0357 HST on 16 April. HVO is monitoring the ever changing activity. More information is available at <http://hvo.wr.usgs.gov>.

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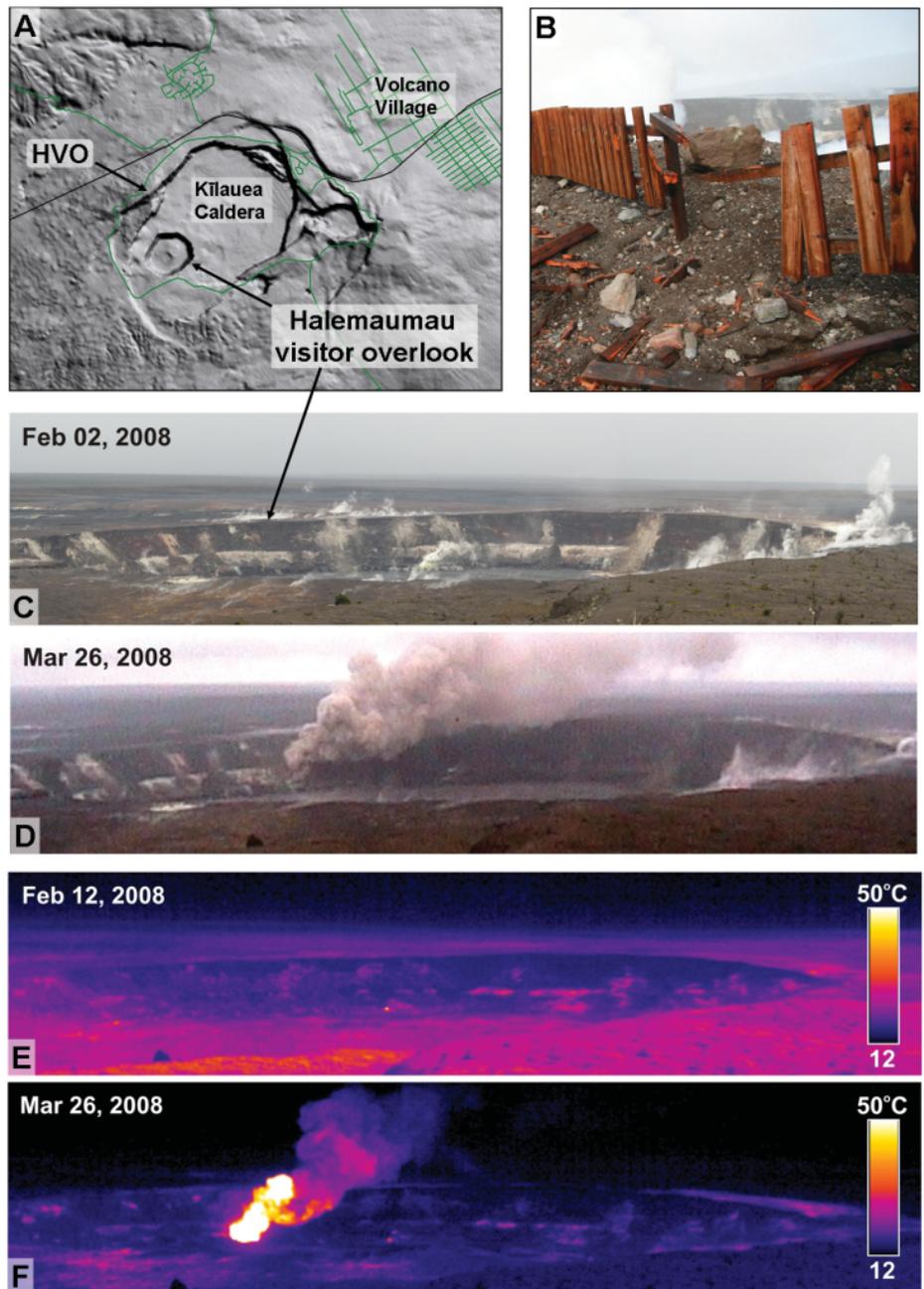


Fig. 1. Kilauea's summit area. (a) Overview map. (b) Fence at the Halema'uma'u visitors' overlook damaged by ballistic blocks. (c and d) Photographs of Halema'uma'u before and after explosion; view looks south from HVO. (e and f) Infrared imagery from the same vantage point. Temperature scale shows saturation at 50°C; hottest parts approach 500°C.