

[Home](#)

[About/contact](#)

[membership](#)

[links](#)

[photo gallery](#)

[site credits](#)

## INFORMATION ABOUT MAUNA LOA

■ [ERUPTION HISTORY](#) ■

■ [PLANTS AND CLIMATE](#) ■

■ [MAUNA LOA HOME](#) ■



Follow site author [@kenrubin](#) on Twitter

On this page..

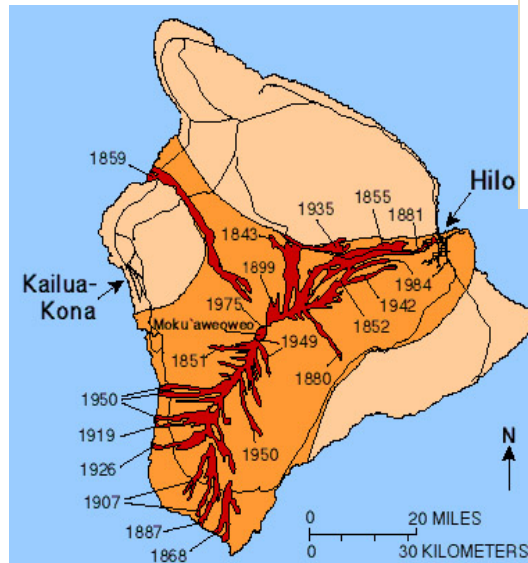
[ [General Information](#) | [1950 Eruption](#) | [1984 Eruption](#) | [Prehistoric Eruptions](#) | [Some Other Recent Large Recent Eruptions](#) ]

## General Info

(This section is based upon data discussed by Walther Barnard of SUNY College of Fredonia and Frank Trusdell of HVO in separate papers within "Mauna Loa Revealed", American Geophysical Union Monograph 92 (1994).

Mauna Loa has erupted 33 times since 1843 (with other less well-dated eruptions going back to 1832 and before). These historical flows cover 806 km<sup>2</sup> of the volcano's surface. Typically, these eruptions began in the summit caldera, Moku'aweoweo, with a curtain of fire (which is a 1 to 2 km line of lava fountains). Eruptions may consist solely of summit activity or they progress down- flank via rift zone dike propagation (in the subsurface) to feed flank vents. In the historic period, the Northeast Rift Zone has been the eruptive locus for 31% of the eruptions and covered 202 km<sup>2</sup> of land. The northwest quadrant has been the source of 6% of the eruptions (covering 130 km<sup>2</sup>),

the Southwest Rift Zone has been the source for 25% of the eruptions (covering 233 km<sup>2</sup> of the land), and the summit region has been the site of 38% of the eruptions (many of the latter have remained in the summit caldera and thus covered little land, although others have spilled out into the northwest and northeast quadrants of the volcano). The oldest Mauna Loa eruption in written history is said to have taken place in 1780. Testimony was taken from Keaweehu, a Hawaiian guide in the Wilkes party who occupied and mapped the summit from 1840 to 1841. It



Simplified map of historical lava flows at Mauna Loa volcano from [USGS-HVO](#). Collectively these flows cover 806 km<sup>2</sup>, nearly 16% of the volcano's surface. Dates are provided for the ones that are easy to display at this scale (19 of 33 total historical eruptions).

## Volcano Quick Links

- [\[Ioihi\]](#)
- [\[Kilauea\]](#)
- [\[Mauna Loa\]](#)
- [\[Hualalai\]](#)
- [\[Waianae\]](#)
- [\[Mauna Kea\]](#)

## General Reference

Hawaiian volcano info:

- [\[Geography\]](#)
- [\[Islands' Formation\]](#)
- [\[Active Volcanoes\]](#)

Links

- [USGS-HVO](#)
- [UHM-GG](#)
- [SOEST](#)
- [CSAV](#)
- [VOG Forecast](#)
- [HVO volunteer program](#).

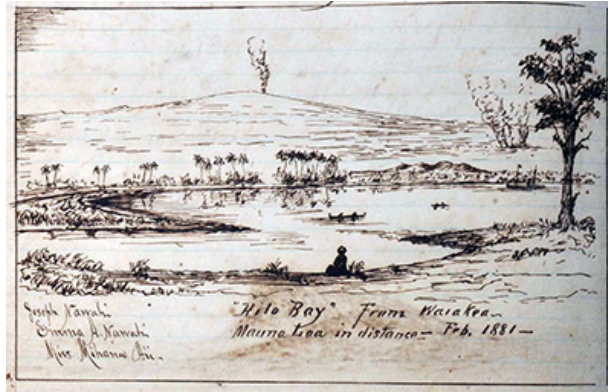
was said to have taken place not long after Captain Cook's visit to the islands. In 1868, and an eruption from Mauna Loa caused the largest earthquake in Hawaii, registering as a magnitude 8 by modern methods. The lava flow of 1855-1856 is said to be one of the greatest flows ever seen by modern observers.

---

## 1881 Eruption

(This account provided by HVO VOLCANO WATCH via [Big Island Now](#); *Volcano Watch* is a weekly column provided by scientists at the Hawaiian Volcano Observatory headquartered at the summit of Kilauea Volcano.)

Read the full account of the 1881 Mauna Loa lava flow entering Hilo at [this link](#). The history is in part based on an account by Titus Coan, whose [autobiography](#) is proudly hosted on our HCV website.



short summary: Hilo was threatened by lava during an eruption that began in May 1880 from vents on the northeast rift zone and eventually advanced toward Hilo in 1881, reaching it in August of that year. A few lobes came into town, one reaching just 70 m upslope of Komohana Street and another crossing Komohana Street and stalling near the intersection of Mohouli and Popolo Streets, just 1.7 km from Hilo Bay.

*click on the image for a larger version.*

The sketch at left is by Joseph Nawahi. It shows the 1881 lava flow approaching Hilo on February 21. Image courtesy of National Park Service, Hawaii Volcanoes National Park, HAVO 394, Volcano House Guest Register 1873 to 1885 via Big Island News. (Color and contrast balance in Photoshop from the original by K. Rubin, HCV)

---

## 1855-56 Eruption

(This account provided by HVO VOLCANO WATCH via [Big Island Now](#))

Read the full account of the 1855-56 Mauna Loa lava flow entering Hilo at [this link](#). The history is in part based on an account by Titus Coan, whose [autobiography](#) is proudly hosted on our HCV website.

short summary: The eruption began with high fountaining and a lava flow in 1855, continued downslope through early 1856. By mid year it had stalled six miles from Hilo Bay (just above what is now Kaumana City subdivision) although the eruption at the vent continued.

## 1950 Eruption

(This account provided by Prof. Michael Rhodes of the Univ. of Massachusetts, Amherst, who has studied the details of this and other Mauna Loa Eruptions)

The 1950 eruption of Mauna Loa began on June 1 and continued until June 23. Fissures opened up along the Southwest Rift Zone for a distance of over 12 miles. First, floods of liquid lava poured out of the vents and a cloud of fume rose two miles into the air. That activity lasted about four hours. Then, another set of fissures opened up lower on the rift. While activity on the upper portion of the lower fissures lasted a week, the lower portion remained active for about three weeks. A total of seven large lava flows poured out southward and westward. Three of the western flows even reached the ocean. The volume of lava produced

(above sea level) by the eruption is estimated at over 376 million m<sup>3</sup>.

Although the 1950 Mauna Loa flow was quite unlike any other historical Mauna Loa eruption, it was unfortunately not well observed during the eruption. This is partly due to the fact that the volcano was covered in cloud at high elevation and helicopters were not in use; so, most of the information we have comes from what happened on Highway 11 during the eruption. In the months and years following the eruption, the vents and flows have been examined and mapped extensively, however.

The eruption occurred along almost the entire length of the SW rift zone (from 8000 to 13,000 ft) and opened up almost simultaneously (like a zipper) from an essentially continuous vent system. Consequently, lava flows poured down at numerous places on both the west and east side of the rift.

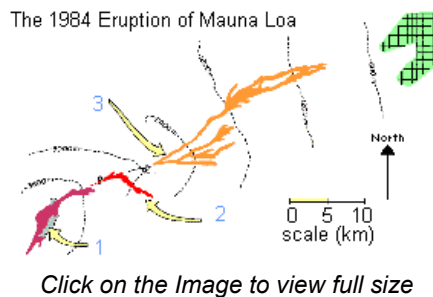
The eruption lasted only two weeks. So, given that the flow volume is 4 to 5 times greater than the 1984 eruption (which lasted 3 weeks) it must have been a spectacular eruption. In places the flows were obviously very fluid and flowing rapidly, since they eroded the bases of prehistoric spatter cones during emplacement. It must have been coming downhill like gangbusters!

The lava flow was compositionally very heterogeneous, with the upper part of the rift erupting evolved magmas (MgO 7 wt. %). Compositions became more primitive (MgO up to 10 wt. %) down rift. However, the lowest elevation flows were the somewhat more evolved (MgO 8 wt. %). The data are consistent with mixing of a relatively primitive magma with an evolved magma that may have been residing in the rift zone (this older magma has compositions very similar to the lava produced by the 1949 summit eruption).

---

## 1984 Eruption

(This account from Rhodes (1988), *Journal of Geophysical Research*, vol 93, pages 4453-4466)



Mauna Loa erupted most recently in 1984. The eruption started at the summit (in Moku'aweoweo crater, which is the grey oblong area in the lower-left corner of the image to the left), extended in to the upper Southwest Rift Zone, and then migrated to the Northeast Rift Zone on the first day of the eruption. Volcanic activity remained in the northeast rift for 21 days. This sequence of events resulted in three flow units (shades of red to the left); the flows are numbered 1, 2 and 3 in the image. The a'a flow system from the lower vents achieved a maximum length of 27 km within a few days of inception of the eruption. The total lava flow was near 220 million m<sup>3</sup>. As eruption rates declined, the main a'a flow evolved from a simple narrow lobe with an efficient channel that delivered virtually the entire vent output to within 1 km of the flow toe, to an upright-stagnating channel system characterized by levees, blockages, ponds, and complexly branching overflows.

---

## Prehistoric Eruptions

(This account based upon data present by Dr. J. Lockwood in USGS Professional Paper 1350 (1987))

Radiocarbon dating of charcoal from beneath lava flows of Mauna Loa has provided the most detailed prehistoric eruptive history of any volcano on Earth. After accounting for contradictory dates and averaging multiple dates on single flows, there are at least 170 "reliable" ages on separate lava flows (Lockwood,

USGS Professional Paper 1350). This number of dated flows makes up about 35% of the total number of mapped prehistoric Mauna Loa flows, which is a very significant proportion.

The distribution of these ages has revealed fundamental variations in the time and place of Mauna Loa eruptive activity, particularly for Holocene time. As lava flow activity from Mauna Loa's summit waxes, activity on the rift zones wane. A cyclic model has been proposed (by Lockwood, *ibid.*) which involves a period of concentrated summit, shield-building activity associated with long-lived lava lakes and frequent overflows of pahoehoe lavas on the north and southeast flanks. During these periods, compressive stresses across Mauna Loa's rift zones are relatively high, inhibiting eruptions in these areas. These periods are then followed by a relaxation of stresses across Mauna Loa's rift zones and a long period of frequent rift zone eruptions as magma migrates downrift. This latter eruptive style is marked by summit caldera collapse (possibly associated with massive eruptions of picritic lavas low on the rift zones). Concurrent with this increased rift zone activity, the summit caldera is gradually filled by repeated smaller summit eruptions; then, stress across the rift zone increases, magma rises more easily to the summit, rift activity wanes, and the cycle repeats itself.

Two such cycles have been recognized within the late Holocene, each lasting 1,500-2,000 years. However, evidence for earlier such cycles is obscure. Mauna Loa appears to have been quiescent between 6-7 ka, for unknown reasons. A period of increased eruptive activity marked the period of 8-11 ka, coincident with the Pleistocene-Holocene boundary. Other volcanoes on the island of Hawaii for which (limited) radiocarbon data are available show no evidence of similar cyclicity or repose.

---

[ [General Information](#) | [1950 Eruption](#) | [1984 Eruption](#) | [Prehistoric Eruptions](#) | [Some Other Recent Large Recent Eruptions](#) ]

---

### Some of Mauna Loa's larger eruptions

<i>Year</i>	<i>Volume x 10<sup>6</sup> m<sup>3</sup></i>	<i>Area km<sup>2</sup></i>	<i>Eruption Source</i>
1843	202	45	North Flank
1852	182	33	Northeast Rift
1855- 1856	280	66	Northeast Rift
1859	383*	91*	North Flank
1868	123*	24*	Southwest Rift
1873	630	5	Summit
1880- 1881	130	57	Northeast Rift
1887	128*	29*	Southwest Rift
1907	121	28	Southwest Rift
1919	183*	28*	Southwest Rift
1926	121*	35*	Southwest Rift
1933	100	6	Summit
1940	110	13	Summit
1942	176	34	Northeast Rift

1949	116	22	Summit
1950	370*	112*	Southwest Rift
1975	30	13	Summit
1984	220	48	Northeast Rift

\* denotes flows erupted above and below sea level. The numbers given are for the above sea level parts of these flows only.

Eyewitness Accounts of these Mauna Loa eruptions can be found in various chapters of our on-line version of [Life in Hawai'i](#) by the Rev. Titus Coan (originally published in 1882)

[ [1843](#) | [1852](#) | [1855-1856](#) | [1868 & 1877](#) | [1880](#) ]



This page created by Ken Rubin with assistance from Rochelle Minicola;

maintained by [Ken Rubin](#) ©,

Rochelle contributed her work in the late 1990s under the auspices of the Kailua High School Community Quest work experience program, in cooperation with the Hawaii Center for Volcanology.

Other [credits](#) for this web site.

[SOEST Home](#) | [Search](#) | [Directory](#) | [News](#) | [Academic Departments](#) | [Research at the School](#) | [Education](#) | [Resources](#) | [Public Outreach](#) | [The School](#) | [Site Map](#) | [Contact SOEST](#)



Send comments or questions about this page to [krubin@soest.hawaii.edu](mailto:krubin@soest.hawaii.edu).

Last updated May 13th, 2018. © 2018 Ken Rubin