

## Morphometric study of pahoehoe lava entered to the sea: 1990 Kaimu Bay flow of Kilauea, Hawaii

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[http://www.shizuoka.ac.jp/~geo/Staff/Umino\\_j.html](http://www.shizuoka.ac.jp/~geo/Staff/Umino_j.html)

The Pu'u 'O'o-Kupaianaha eruption of Kilauea Volcano has been active since 1983 and effused 2.3 cubic kilometers of lava by September 2002. These lava include tube-fed lava flows which entered to the sea and covered Kalapana-Kaimu Bay in 1990. In this report, we describe structures and textures of lava lobes, growth of the flow field and estimated supply rates of lava to Kaimu Bay.

In June 1990, lava fed by woodchip lava tube from Kupaianaha vent and started to move toward Kalapana community along Hakuma horst, burying Kalapana village under pahoehoe sheet flows from March 1990 to January 1991. Kaimu Bay was covered with inflated lava lobes called main lobes and uninflated pahoehoe lava called outflows filling between the main lobes. Main lobes are often covered on their edges and surfaces with thin pahoehoe lobes. Main lobes have inflation cracks and pits formed after setting of each lobe. Depths of inflation pits indicate the minimum height of the host lava lobe before inflation. The surface of a lava lobe is holohyaline with sporadic varioles of clinopyroxene. Toward the core of a lobe, the amount of plagioclase and clinopyroxene dramatically increase, showing an intersertal texture.

We utilized observations of lava flows from land and air by Hawaiian Volcano Observatory to determine daily outlines of expanding flow lobes. Based on these, supply rates of lava to Kaimu Bay were estimated. Given the top of lava lobes being 5.7 m above sea level on average and the depth of the Kaimu Bay before burial by lava being 6.0 m, the thickness of lava lobe is 11.7 m. Total area covered by lava from August 6 to October 26 (for 87 days) is 450,000 square meters. Total volume of lava is then estimated to be 5,300,000 cubic meters/minute, which gives supply rate of lava of 61,000 cubic meters/day or 42 cubic meters/minute and corresponds with the general index in Hawaii.