

Long-term evolution of Koolau volcano, Oahu Island, Hawaii

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In order to understand the growth history of Koolau volcano, Oahu Island, Hawaii, we studied both its subaerial and deep submarine exposures on the giant Nuuuanu landslide blocks. Reconstructed Koolau volcano before the landslide records three-magmatic stages with different tholeiites (Kilauea-type, Mauna-Loa type and Koolau type). The transition from the Mauna-Loa type to Koolau type is exposed near the base of the steep cliffs on Oahu. Although no unconformity was found at the transition, all isotopes as well as major and trace elements change abruptly. The growth history of Koolau volcano provides very important clue to understand the magma genesis in the Hawaiian mantle plume. The abrupt change may correspond with the onset of melting of large eclogite blocks in the plume head.