Abstract: The summit magma storage reservoir of Kilauea Volcano is one of the most important components of the volcano's magmatic plumbing system, but its geometry is poorly known. We will (1) present a summary of previous views on the size, shape, and number of magma bodies that make up Kilauea's summit reservoir, and (2) use high-precision Pb isotopic analyses of historical Kilauea summit lavas (1823-2010) to define the minimum number of magma bodies within the summit reservoir and their volumes. The $^{206}\text{Pb}/^{204}\text{Pb}$ ratios of these lavas display a systematic temporal fluctuation characterized by low values in 1823, an increase to a maximum in 1921, an abrupt drop to relatively constant intermediate values from 1929 to 1959, and a rapid decrease to 2010. These variations indicate that Kilauea's summit reservoir is being supplied by rapidly changing parental magmas derived from a mantle source that is heterogeneous on a small scale. Analyses of multiple lavas from some individual eruptions reveal small but significant differences in $^{206}\text{Pb}/^{204}\text{Pb}$. The extra-caldera lavas from Aug. 1971 and Jul. 1974 display significantly lower Pb isotope ratios and higher MgO contents (10 wt. %) than the intra-caldera lavas (MgO ~7-8 wt. %) from each eruption. From 1971 to 1982, the $^{206}\text{Pb}/^{204}\text{Pb}$ ratios of the lavas define two separate decreasing temporal trends. The intra-caldera lavas from 1971, 1974, 1975, Apr. 1982 and the lower MgO lavas from Sep. 1982 have higher $^{206}\text{Pb}/^{204}\text{Pb}$ ratios at a given time (compared to the extra-caldera lavas and the higher MgO lavas from Sep. 1982). These trends require that the intra- and extra-caldera lavas (and the Sep. 1982 lavas) were supplied from two separate magma bodies. Numerous studies by scientists at the Hawaiian Volcano Observatory (e.g., Fiske and Kinoshita, 1969; Klein et al., 1987) have long identified the locus of Kilauea's summit reservoir ~2 km southeast of Halemaumau (HMM) at a depth of ~2-7 km, but more recent investigations have discovered a second magma body located <1 km below the southeast rim of HMM (e.g., Battaglia et al., 2003; Johnson et al., 2010). The association between the vent locations of the extra-caldera lavas near the southeast rim of the caldera and their higher MgO contents suggest that these lavas tapped the deeper magma body. In contrast, the lower MgO intra-caldera lavas were likely derived from the shallow magma body beneath HMM. Residence time modeling based on the Pb isotope ratios of the lavas suggests that the magma volume of the deeper body is ~0.2 km³, whereas the shallow body holds a minimum of ~0.04 km³ of magma. These estimates are much smaller than our previous calculation of ~2-3 km³ for Kilauea's summit reservoir based on trace element ratios (Pietruszka and Garcia, 1999), but are similar to the volume of the magma body that underlies Piton de la Fournaise Volcano on Réunion Island (Albarède, 1993).