

Krakatau caldera deposits: revisited and verification by geophysical means

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Abstract

One of the differences between volcanic craters and calderas is that the latter bottoms are flatways filled with caldera deposit with lower density in comparison to country rocks. The 1883 Krakatau eruption affords us important knowledge on caldera formation even if it was not observed with modern sophisticated instruments. First, volcanic activities of the Krakatau Islands before and after the 1883 eruption are reexamined: previous suppositions involving a caldera-forming eruption of the proto-Krakatau prior to 1883 proved to be unsupported by the bathymetric topographies and gravity anomalies on and around the Krakatau Islands. Then, Anak Krakatau is interpreted as a parasitic cone of the main Krakatau volcano. As supplementary knowledge to discussion of caldera deposits, the results of drillings at several calderas in Japan and Mexico are introduced. Mass deficiency of the caldera deposit at Krakatau caldera is estimated by the gravity anomaly observed there and converted to probable volume with suitable density. For quantitative examination of the subsurface structure beneath the Krakatau complex, spatial distributions of seismic S-wave attenuation and V_p/V_s ratios have been already studied by temporary seismological observations and their results have been published. The high ratios of V_p/V_s observed approximately at Krakatau caldera may be attributable to the caldera deposit that is low density and contain much water. As additional remarks, a zone having both the characters, S-wave attenuation and zones of relatively high V_p/V_s ratio, may be a probable magma reservoir centering at a depth of about 10 km.

Keywords

Krakatau caldera; Parasitic cones; Caldera deposit; Drillings at calderas; S-wave attenuation; V_p/V_s ratio

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References

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
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