

## Evidences of a tsunami during the 7.3 ka Kikai caldera eruption

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### **Abstract**

Previous researches indicate that Southern Kyushu Island, southwestern Japan, may have been struck by a huge tsunami during the 7.3 ka caldera-forming Kikai eruption, but this has not yet been confirmed. This paper describes sedimentological and chronostratigraphic evidence showing a tsunami during the 7.3 ka Kikai caldera eruption for examples from Yakushima Island and Miyazaki plain.

Unit TG, one of gravel beds exposed on the Kosedo coast of northeast Yakushima Island and investigated here, is a tsunami deposit. Unit TG is a poorly sorted, 30-cm-thick gravel bed overlying a wave-cut bench and underlying a Koya pyroclastic flow deposit (K-Ky). The constituent gravel clasts of Unit TG are similar in composition to those of modern beach and river deposits. Unit TG also contains pumice clasts whose chemistry is identical to that of pumice derived from the 7.3 ka eruption at Kikai caldera. Unit TG was deposited by a tsunami run-up flow during the 7.3 ka Kikai caldera eruption, just before the arrival of the major Koya pyroclastic flow at the Kosedo coast.

Strata deposited in the incised Ishizaka River valley before and after the 7.3 ka Kikai caldera eruption were examined in the Ukishima specimens acquired in the river valley in 1996 by staff of the Miyazaki Prefectural Museum of Nature and History. At about 9 ka, the post-glacial (Jomon) transgression began to inundate the river valley producing an estuarine environment that reached water depths of 4–5 m just before the 7.3 ka K-Ah ash fall. Rapid accumulation of the K-Ah secondary deposit (Unit Ah), which overlies a likely tsunami deposit (Unit Ptd) produced a rapid decrease of water depth to about 2 m. Sea level rose after deposition of the K-Ah ash fall, reaching 7.8 m above present sea level at 5.7 ka. Unit Ptd accumulated abruptly under high-velocity flow conditions.

Although it could be interpreted as a flood-related hyperpycnal flow deposit, it is difficult to invoke local flooding at that time in the regional context of the Oita and Sukumo plains. We therefore interpret it to have been deposited by a large tsunami generated by a trench-type earthquake in the Nankai Trough or the northern part of the Ryukyu Trench. The 7.3 ka tsunami occurred during the early climax stage of the Kikai caldera eruption.