

Evidence on the Koseda coast of Yakushima Island of a tsunami associated with the 7.3 ka Kikai caldera eruption

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Many researchers have noted that Yakushima Island, southwestern Japan, may have been struck by a huge tsunami before the arrival of the Koya pyroclastic flow (K-Ky) during the 7.3 ka Kikai caldera eruption, but there is currently no clear evidence of this. We undertook sedimentological analyses and radiocarbon dating of gravel and tephra deposits along a shore-normal profile across the Koseda coast of northeastern Yakushima Island, and compiled a local Holocene sea-level curve, seeking firm evidence of a tsunami deposit there. Of three gravel units we identified, one (Unit TG) was a poorly sorted, 30-cm-thick gravel bed deposited on a wave-cut bench and overlain by the K-Ky tephra. We dated wood fragments in Unit TG at 7416–7167 cal yr BP. Unit TG is of similar composition to the modern beach and river gravels on the Koseda coast, but contains fibrous pumice derived after the initial plinian eruption at Kikai caldera and before the deposition of the Koya pyroclastic flow, and unlike the beach and river gravels appears to have been transported under a lamina flow regime from the NNW. On the basis of our analyses, we infer that Unit TG was deposited at 7.3 ka when a tsunami associated with the Kikai caldera eruption moved beach and river gravel inland in a stony debris flow, just before the arrival of the Koya pyroclastic flow at the Koseda coast.

Keywords: Tsunami evidence, 7.3 ka Kikai caldera eruption, Koya pyroclastic flow, Koseda coast, Yakushima Island