# Seismic facies and distribution of submarine pyroclastic deposits originated from multiple large-scale eruptions of Kikai caldera

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Kikai submarine caldera located to the south of Kyusyu Island, southwest Japan, caused multiple eruptions including three major eruptions at 140, 95, and 7.3 ka. The recent two eruptions, well-known as Kikai-Tozurahara and Akahoya eruption possibly lead to the caldera collapse and formed the present-day double caldera structure, distributed widespread tephra in and around Japan. These eruptions should also generate voluminous pyroclastic flows around the caldera, but these products to be deposited on the seafloor around the caldera are less recognized.

High resolution marine seismic surveys, which Kobe University has been conducting from 2016 with T/S Fukae-Maru around Kikai caldera, reveal submarine geological structure including possible candidates of the pyroclastic deposits of these large-scale eruptions of Kikai caldera. The uppermost unit, thought to be the pyroclastic deposits of the Akahoya eruption, has unique facies of subparallel and hummocky strong internal reflections recognized widely around Kikai caldera. This uppermost unit has been also examined by sub-bottom profiling and piston core sampling with R/V Shinsei-Maru (KS-19-17 cruise). We present a finer characteristic of the seismic facies of the uppermost unit obtained by the parametric sub-bottom profiler, compared with the high-resolution seismic images, and preliminary result of the piston core sampling which can petrologically support that the unit is originated from the Akahoya eruption. The subsequent possible pyroclastic unit shown in the seismic images, which underlies the well stratified unit interpreted as depositional system built by fluvial transport from Kyusyu and proximal islands, might be the products of the Tozurahara eruption. This unit characterized by slump structure is distributed in a large area around Kikai caldera, which infers this eruption also supplied a large amount of pyroclastic products in the seawater. These results should be able to show more precise volume of the pyroclastic products and scale of the series of the eruptions caused at Kikai submarine volcano, which can help to understand the mechanism of catastrophic eruptions and caldera formation.

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