

The earliest stage of Izu rear arc volcanism revealed by drilled cores at Site U1437, IODP Expedition 350

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The present Izu arc system consists of three types of volcanic structures, which are (1) the Quaternary volcanic front, (2) the rear-arc seamount chains and (3) bimodal rift-type volcanoes in a back-arc knoll zone and an active rift area, situated between the volcanic front and the rear-arc seamount chains. Ishizuka et al. (2003) show that the Izu rear arc volcanism migrated from eastward after the cessation of the Shikoku Basin opening (25-15 Ma; Okino et al., 1999). The rear-arc seamount chains volcanism began at 17 Ma and continued until 3 Ma, and was followed by rift type volcanism from 2.8 Ma to present (Ishizuka et al., 2003).

IODP Expedition 350 Site U1437 is located in the boundary area of the back-arc knoll zone and rear-arc seamount chains and drilled between the Enpo and Manji rear-arc chains. The first complete sequence of rear-arc rocks dated <15 Ma (Schmitt et al., in preparation) were recovered at this Site (Tamura et al., 2015), and develop over Unit I (top) to Unit VII (bottom).

The major and trace element compositions collected from the deepest parts of the Hole (Unit V and VII) show different types of magmatism. The lowermost Unit VII (~15 Ma) shows rift-type magmatism which have a relatively flat REE patterns, and Unit V (8 Ma) shows rear-arc seamount chains type with LREE-enriched patterns. This suggests that the area around Site U1437 used to be an extensional zone following the Shikoku Basin opening. At 17-8 Ma, volcanism in the Izu back-arc side occurred only in the western part of the seamount chains (Ishizuka et al., 2003) and in the eastern part of the Shikoku Basin (e.g. Kinan Escarpment; Ishizuka et al., 2009). Simultaneously rift-type volcanism occurred in the eastern part of the present seamount chains region.

The difference between the Unit VII and V indicates the temporal change of the subduction components with time. It is suggested that the subducting slab below Site U1437 had deepened with time.