Tairiku Project: from Nishinoshima to the ultra-deep drilling (IBM-4)

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What is raw and juvenile continental crust? Furthermore, how does it form and evolve into mature continental crust? The continental crust we observe on the surface of the earth has been deformed, metamorphosed, and otherwise processed perhaps several times from its creation in subduction zones to the present. Although there are many examples of accreted arc crust on the margins of continents, during- and/or post-collision geochemical changes are widespread. However, we may have the ability to observe active crust-forming processes in modern arcs through what we can infer from eruptions at the surface.
Nishinoshima, one of the submarine volcanoes in the Ogasawara Arc, ~1,000 km south of Tokyo, Japan, suddenly erupted in November 2013, after 40 years of dormancy. The Nishinoshima volcano might represent the missing link between the mantle and the continental crust because (1) Nishinoshima, whose underlying crust is only 21 km thick, is one of the world's closest volcanoes to the mantle, and (2) the lavas have been andesites and were similar in composition to the continental crust. Nishinoshima was visited twice in 2015. Firstly knolls on the submarine flanks were sampled during cruise NT15-E02 of JAMSTEC's R/V. *Natsushima* in June using a DEEP TOW deep ocean floor towed survey system equipped with a camera and dredger. Dredges were conducted along the tracks on the seafloor. Then on July 3rd the current eruption was sampled by an unmanned helicopter operated from the R/V *Daisan Kaiyomaru*. Olivine-bearing phenocryst-poor andesites have been recovered from the Nishinoshima volcano. We suggest that the Nishinoshima andesites are mantle-derived and that their origin is strongly influenced by its thin overlying crust. Specifically, continental crust-like magmas (andesitic magmas) are readily produced in the mantle wedge at sites where the overlying crust is thin.
I'd like to discuss the relationship between our study in Nishinoshima and the proposed "ULTRA-DEEP DRILLING INTO ARC CRUST (IBM-4)", which is still the best way to sample unprocessed juvenile continental-type crust, to observe these active processes that produce the nuclei of new continental crust, and to examine the nature of juvenile continental crust as first generated at intra-oceanic arcs.

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