Press Releases

April 26, 2018
JAMSTEC

International Ocean Discovery Program Expedition 376
"Brothers Arc Flux: Gateway to the subarc mantle: volatile flux, metal transport, and conditions for early life" to Start

The International Ocean Discovery Program (IODP[*1]) will begin Expedition 376, "Brothers Arc Flux: Gateway to the subarc mantle: volatile flux, metal transport, and conditions for early life" aboard the *JOIDES Resolution*[*2] on May 5, 2018.

This expedition will drill and log three sites: two caldera sites, one on the caldera rim and one inside the caldera, and a third site at the summit of a volcanic cone, located inside the caldera at Brothers (figure 1). These sites were picked as they host hydrothermal systems which are strongly influenced by magmatic fluid, and are therefore characterized by high metal content and very acidic fluids. The resultant water chemistry and mineralization is suspected to strongly inflence the biota associated with these systems and provide analogs for porphyry copper and epithermal gold deposits found on land.
The specific objectives of Expedition 376 are to: 1) characterize the subvolcano, magma chamber–derived volatile phase; 2) determine the subseafloor distribution of base and precious metals and metalloids and the reactions that have taken place along pathways to the seafloor; 3) quantify the mechanisms and extent of fluid-rock interaction and consequences for mass transfer of metals and metalloids into the ocean and the role of magmatically derived carbon and sulfur species in mediating these fluxes; and 4) assess the diversity, extent, and metabolic pathways of microbial life in an extreme, metal-toxic, and acidic volcanic environment.

The shipboard researchers are comprised of 30 members, including three scientists from JAMSTEC (Ken Takai, Tatsuo Nozaki, and Iona M. McIntosh) and also from the U.S., Europe, Canada, Australia, New Zealand, Brazil, China, and South Korea.
For more details, please refer to IODP Expedition 376 website:
https://iodp.tamu.edu/scienceops/expeditions/brothers_arc_flux.html

*1 The International Ocean Discovery Program (IODP) is a multinational cooperative project that was started in October 2013. The scientific drilling vessel (D/V), *Chikyu*, operated by Japan, and the *JOIDES Resolution*, operated by the U.S., are utilized for expeditions. There is also an option for European countries to charter mission-specific platforms. The IODP's mission is to shed light on global environmental changes, the mantle and crust dynamics and tectonics of the Earth, and the biosphere beneath the seafloor. IODP took over the Integrated Ocean Drilling Program conducted from October 2003 to 2013.

*2 The *JOIDES Resolution* is the U.S. drilling vessel that participates in the IODP. Compared to the Deep-sea Scientific Drilling Vessel *Chikyu* by JAMSTEC, the *JOIDES Resolution* is used more often for drilling in shallow waters.

JOIDES Resolution ©IODP

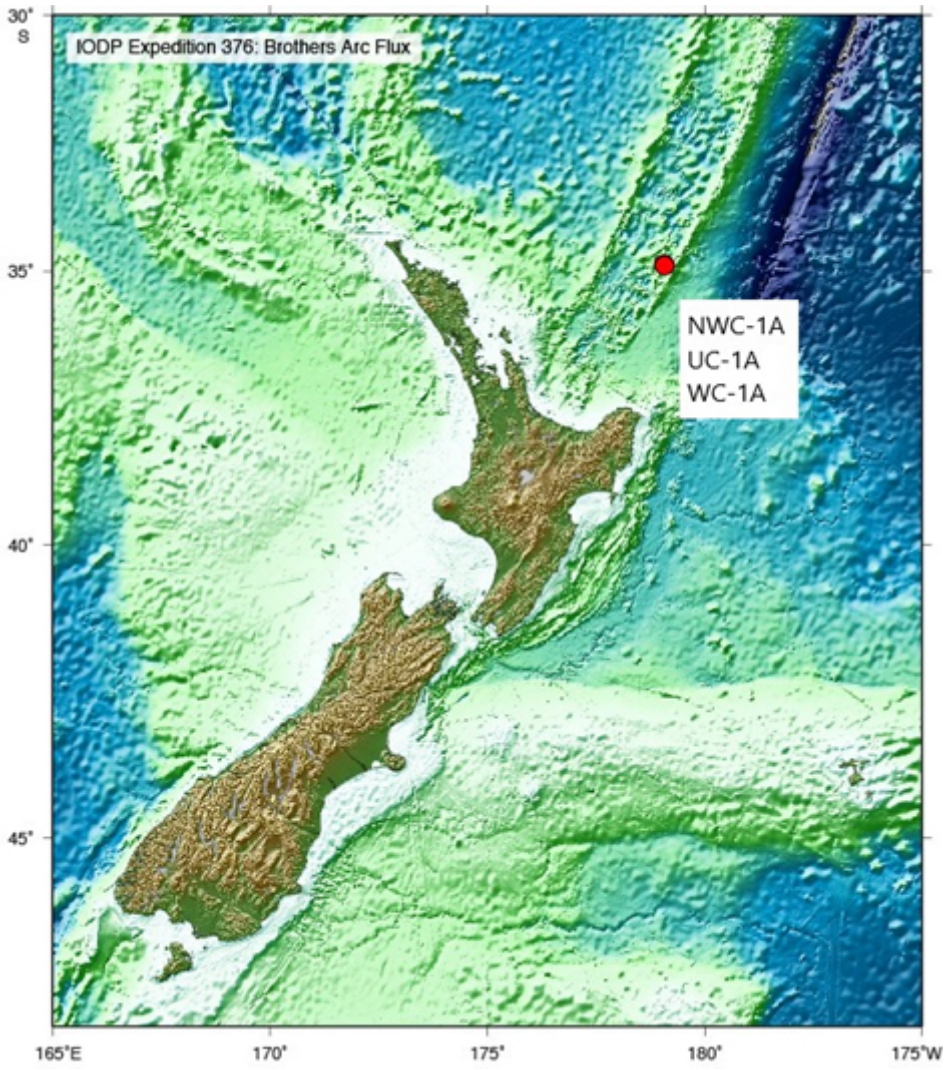

Figure 1. IODP Expediction 376 Drilling Sites©IODP

Table 1 Overview of Drilling Sites (order of drilling)

Site	Water depth	Depth of penetration	Estimated working days (days)
NWC-1A	1,464m	405m	13.0days
UC-1A	1,232m	800m	19.8days

WC-1A	1,765m	565m	16.8days

(These drilling sites are subject to change depending on cruise prepartion, climate conditions, research progress and expedition time constraints.)

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