
Press Releases



February 9, 2016
JAMSTEC

***Chikyu* Okinawa Drilling Expedition "Hydrothermal Sediments in Okinawa Trough II"**

The Japan Agency for Marine-Earth Science and Technology (JAMSTEC: Asahiko Taira, President) will carry out scientific drilling research, "*Chikyu* Okinawa Drilling Expedition: Hydrothermal Sediments in Okinawa Trough II" from February 2016. It forms part of "Scientific Research on Genesis of Marine Resources" for "Next-generation Technology for Ocean Resources Exploration," an initiative that is part of the "Cross-ministerial Strategic Innovation Promotion Program (SIP)"^{*1}

1. Schedule & Area

- February 11, 2016: Departure from Shimizu Port, Shizuoka Prefecture March 17, 2016: Disembark at Shimizu Port, Shizuoka Prefecture (A total of 36 days) The schedule is subject to change depending on weather conditions and research progress.
- Area: Iheya South Small Ridge and Iheya North Knoll ([figure 1](#))

2. Expedition Team

Co-chief Scientists:

- Hidenori Kumagai, Deputy Group Leader, Resource Generation Environment Research Group, Research and Development (R & D) Center for Submarine Resources, JAMSTEC
 - Tatsuo Nozaki, Scientist, Resource Generation Environment Research Group, Research and Development (R & D) Center for Submarine Resources, JAMSTEC
 - Jun-ichiro Ishibashi, Associate Professor, Faculty of Science, Kyushu University
- Other members include scientists from Institute of Advanced Industrial Science and Technology, Kyushu University's research team, and Project Team for Development of New-generation Research Protocol for Submarine Resources with Research and Development (R & D) Center for Submarine Resources at JAMSTEC.

3. Expedition Overview

This expedition will drill hydrothermal fields recently discovered in the Iheya Small Ridge (Noho site: as reported in the JOGMEC news release on December 4, 2014) using logging-while-drilling (LWD) and geothermal tools. It aims to examine 1) generalities in the distribution of subseafloor hydrothermal reservoir and sedimentary mineral deposits; and 2) continuity of subseafloor hydrothermal reservoir and mineral deposits throughout Iheya North Knoll. In addition, samples of mineral deposits and peripheral rocks and sediments will be collected to obtain chemical data for elucidating genesis of inactive hydrothermal deposits and subseafloor mineral deposits. Long-term monitoring system will also be installed in boreholes where hot fluids have been releasing in both areas.

4. Research Background and Purpose

In the Japanese coastal waters, the Okinawa Trough and Izu-Ogasawara arc are known as areas where large-scale hydrothermal deposits are the most likely to exist. In addition to inactive hydrothermal deposits, there seems to be yet-to-be discovered seafloor mineral deposits on a larger scale. They are drawing considerable attentions as high potential areas for drilling aimed at industrial or business utilization.

However, the genesis of hydrothermal sulfide deposits is not fully understood. With absence of a well-established exploration technology, the detail of distributions of inactive hydrothermal deposits and seafloor mineral deposits are not known. Even if targeted areas are limited to the Okinawa Trough and Izu-Ogasawara arc, it is not feasible to cover such vast areas by exploration because it requires a vast amount of money and cost. To narrow down focus areas and clarify the genesis of such deposits, it is, therefore, necessary to identify items to be observed. It will also help formulate more efficient and effective exploration protocols using vessels and platforms.

On the other hand, the Integrated Ocean Drilling Program (IODP) ^{*2} Expedition 331 discovered the huge and deep expanse of the hydrothermal fluid reservoir at the Iheya North Knoll in the Okinawa Trough. The scale is estimated to be at least several hundred meters (as reported on October 5, 2010). Then, the 2012-2013 scientific expedition found another two new hydrothermal fields in the central and southern parts of the Iheya North Knoll (Iheya North Natsu and Iheya North Aki Sites: as reported on March 4, 2014). Moreover, a scientific drilling carried out by D/V *Chikyu* in 2014 under the "Next-generation Technology for Ocean Resources Exploration (Zipangu in the Ocean)" as an initiative of the SIP (as reported on June 25, 2014) suggested that these three hydrothermal sites may be derived from a single large hydrothermal fluid reservoir across the Iheya North Knoll (as reported on July 26, 2014). The scale is estimated to be two kilometers from east to west and three kilometers from south to north, which is considered as the largest hydrothermal fields that have found in Okinawa.

In this expedition, we aim to elucidate these seafloor hydrothermal circulations with their geological structures and genesis models by collecting core samples for descriptions and analysis of chemical and physical properties. Findings from this expedition will be utilized for systematic development of exploration systems, leading to build exploration techniques such as sensors necessary for effective and efficient research for inactive hydrothermal mineral deposits and seafloor mineral deposits.

*1 Cross-ministerial Strategic Innovation Promotion Program (SIP)

In 2014, the Cross-ministerial Strategic Innovation Promotion Program (SIP) was established with a 5-year plan as a national project for science, technology, and innovation, spearheaded by the Council for Science, Technology and Innovation (CSTI) as it exercises its headquarters function to accomplish its role in leading science, technology and innovation beyond the framework of government ministries and traditional disciplines. A total of 11 issues has been identified by the CSTI. JAMSTEC is responsible for the "Next-generation Technology for Ocean Resources Exploration (Zipangu in the Ocean: Tetsuro Urabe acting as Program Director, Professor Emeritus at Graduate School of Science, the University of Tokyo / Advisor at Japan Mining Engineering & Training Center), carrying out scientific research on ocean resource genesis, development of ocean resource exploration technology and ecosystem research with its long-term monitoring technology. The plan thus far is that these technologies will be directly applicable to private sectors.

*2 Integrated Ocean Drilling Program: IODP

The Integrated Ocean Drilling Program (IODP) is a multinational cooperative project carried out from 2003 to 2013 at the initiatives of Japan and the U.S. The scientific drilling vessels D/V *Chikyu* operated by Japan and the JOIDES Resolution by the U.S, and the option to charter mission-specific platforms by Europe were utilized for expeditions. The research aimed to shed light on global environmental changes, the earth's mantle and crust dynamics and tectonics, and the biosphere beneath the seafloor. In October 2013, it was taken over to the International Ocean Discovery Program (IODP).

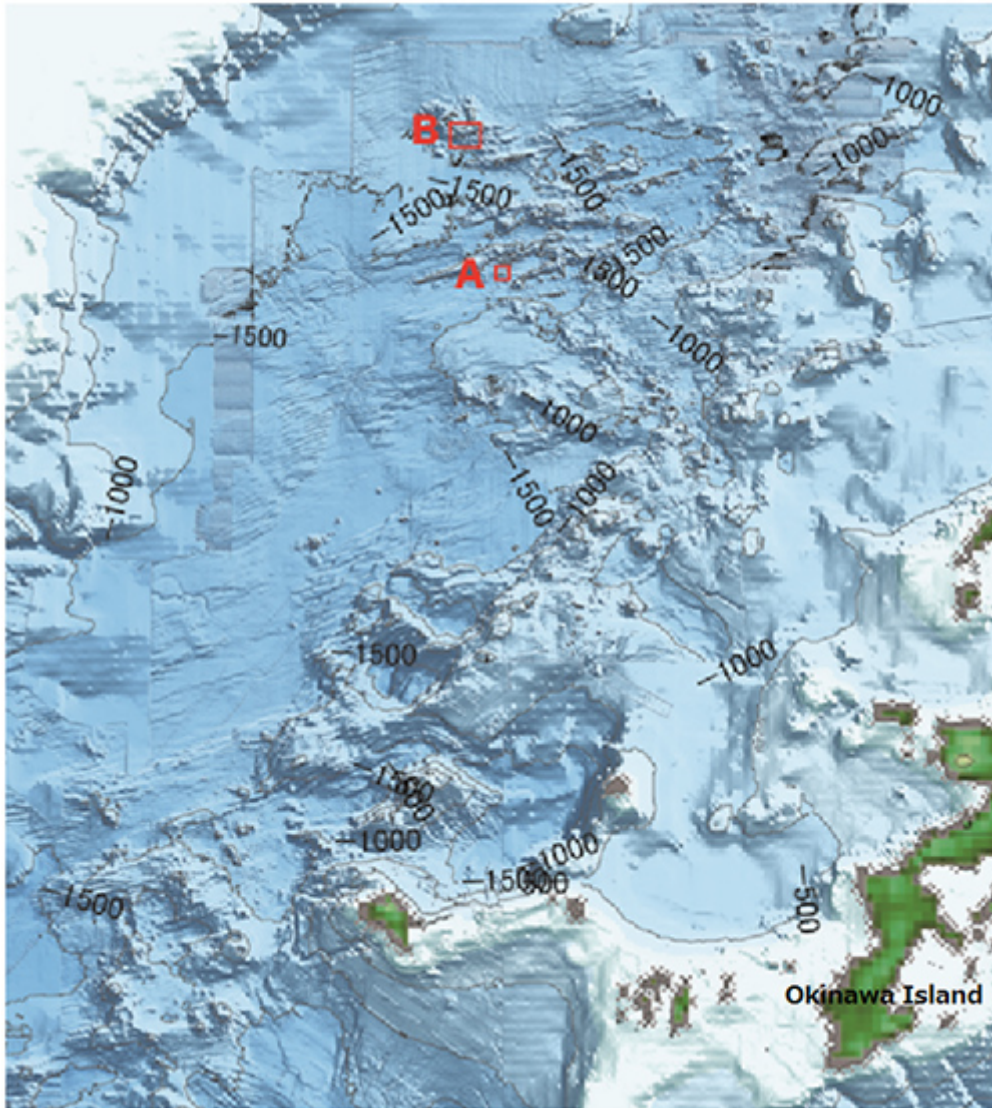


Figure 1: Bathymetric charts in the central Okinawa Trough
A. South of the Iheya Small Ridge; B. Iheya North Knoll

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