Cruise Summary

1. General cruise information

Cruise ID and ship name: YK13-08, R/V Yokosuka

Title of the cruise (this cruise consisted of the following two proposals):
1. A Shinkai 6500 study on the serpentinite-hosted ecosystem in the Southern Mariana Forearc (PI = Yasuhiko Ohara)
2. Tectonic reconstruction of initial stages of Philippine Sea Plate formation (PI = Osamu Ishizuka)

Chief-Scientist: Yasuhiko Ohara (Hydrographic and Oceanographic Department of Japan, and JAMSTEC)

List of participants:
Yasuhiko Ohara (Hydrographic and Oceanographic Department of Japan, and JAMSTEC)
Osamu Ishizuka (Geological Survey of Japan/AIST and JAMSTEC)
Ken Takai (JAMSTEC)
Hiromi Watanabe (JAMSTEC)
Uta Konno (JAMSTEC)
Teruaki Ishii (Fukada Geological Institute)
Sherman H. Bloomer (Oregon State University)
Genki Ozawa (Kitasato University and JAMSTEC)
Yuji Onishi (Okayama University)
Yumiko Harigane (Geological Survey of Japan/AIST)
Yuki Kusano (Kanazawa University)
Masakazu Fujii (University of Tokyo)
Masatoshi Yagi (Tokai University)
Masashi Ito (Nippon Marine Enterprises, Ltd.)

Investigation area (Fig. 1): Palau Basin and Kyushu-Palau Ridge, and Mariana Trench

Cruise period and port calls: August 27 to September 15, 2013 (Yokosuka to Guam)

Shinaki 6500 dive list:
6K-1358: Osamu Ishizuka (Mindanao Fracture Zone)
6K-1359: Yuki Kusano (Mindanao Fracture Zone)
6K-1360: Yumiko Harigane (Kyushu-Palau Ridge)
6K-1361: Osamu Ishizuka (Kyushu-Palau Ridge)
6K-1362: Hiromi Watanabe (Shinkai Seep Field)
6K-1363: Yasuhiko Ohara (Shinkai Seep Field)
6K-1364: Teruaki Ishii (Shinkai Seep Field)
6K-1365: Uta Konno (Shinkai Seep Field)
6K-1366: Sherman H. Bloomer (Shinkai Seep Field)

2. Overview of the results

In YK13-08 cruise, we successfully conducted an extensive DSV Shinkai diving and geophysical mapping program, which was consisted of two individual scientific projects. In

more detail, one was led by Yasuhiko Ohara as PI to study the Shinkai Seep Field (SSF), whereas the other was led by Osamu Ishizuka as PI to study the Mindanao Fracture Zone and southern Kyushu-Palau Ridge area (Fig. 1). Because of the cruise logistical reasons, the Ishizuka Leg was done as the first part of the cruise (4 dives; 6K-1358 to 6K-1361; Fig. 2), followed by the Ohara Leg as the second part (5 dives; 6K-1362 to 6K-1366; Fig. 3).

- **Ishizuka Leg:** 6K-1358 and 6K-1359 were conducted at the Mindanao Fracture Zone, observing a relatively lower part of the upper crust of the Palau Basin ocean crust. On the other hand, 6K-1360 and 6K-1361 were conducted at eastern steep slopes of the southern Kyushu-Palau Ridge, confirming that Kyushu-Palau Ridge here is composed of thick sections of metamorphic rocks.

- **Ohara Leg:** We successfully revisited the SSF, obtaining core samples for investigation of faunal composition, microbial and geochemical analyses in sediments, Niskin and pressure-tight water samples for geochemical analyses, and DO and temperature measurements to characterize the environments, and discovering and collecting carbonate chimneys in 6K-1362, 6K-1365 and 6K-1366. On the other hand, 6K-1363 and 6K-1364 were conducted along a slope ~4 miles west of the SSF, confirming that the landward slope of the southern Mariana Trench here is composed entirely of serpentinized harzburgites.

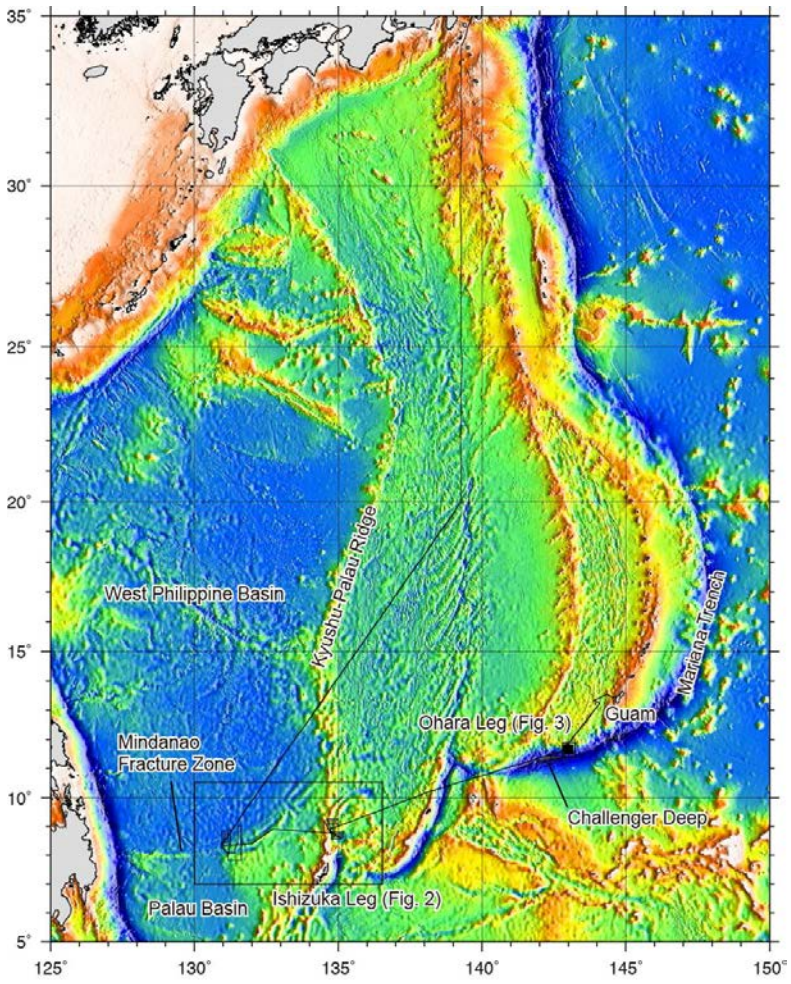

Fig. 1. Index map showing the locations of studied area during YK13-08 cruise. Two boxes indicate the locations of Ishizuka and Ohara Legs (Figs. 2 and 3). Cruise track lines are also shown.

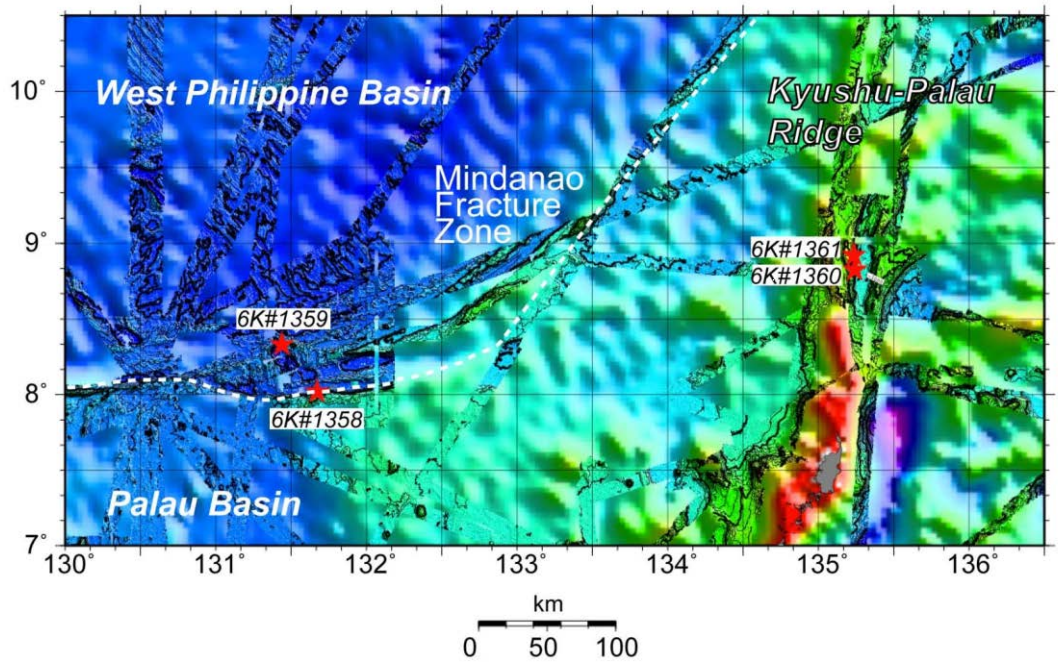

Fig. 2. Locations of the dives during the Ishizuka Leg.

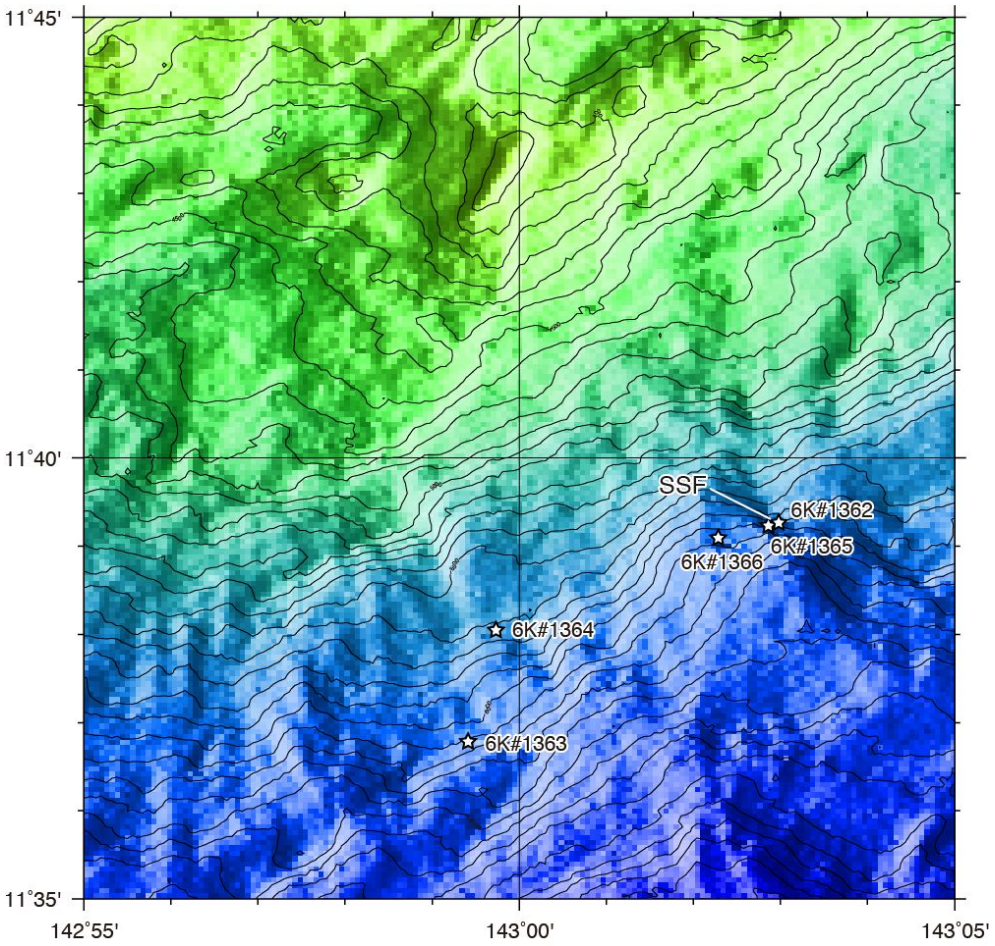

Fig. 3. Locations of the dives during the Ohara Leg. Contours in 100 m. SSF = Shinkai Seep Field.