

Cruise summary

- 1. Cruise number / ship name:** YK10-13 Leg2 / S/V Yokosuka
- 2. Title of the cruise:** 2010 Deep Sea Research / Shinkai 6500 scientific dives: Izu-Ogasawara (Bonin) area
- 3. Chief Scientist / affiliation:** Hayato Ueda / Hirosaki University
- 4. Representative of scientific proposal / affiliation:** Hayato Ueda / Hirosaki University
- 5. Proposal number and title**

S10-53 Subduction channel and its exhumation dynamics of the IBM subduction zone.

- 6. Port calls**

Departure: Guam (October 8, 2008)

Arrival: Kobe (October 15, 2008)

- 7. Investigation area**

Ohmachi Seamount (2200 - 3500 m bsl): 28°30.0' – 30°00.0'N, 140°00.0'E - 141°30.0'E

- 8. Onboard Scientists**

Hayato UEDA: Faculty of Education, Hirosaki University (Chief Scientist / Representative of the proposal).

Tadashi USUKI: Institute of Earth Sciences, Academia Sinica (Co-chief scientist).

Ken-ichi HIRAUCHI: Department of Earth and Planetary Systems Science, Graduate School of Science, Hiroshima University.

Sosuke IWAI: Faculty of Education, Hirosaki University.

Mio MIURA: Faculty of Education, Hirosaki University.

Yu KANO: Faculty of Education, Hirosaki University.

Yuji KUMASAWA: Faculty of Education, Hirosaki University.

Juliane TIEDT: Institute of Geography and Geology, University of Greifswald.

Shusuke MACHIDA: Nippon Marine Enterprises ,Ltd (Marine technician).

- 9. Background and summary of the research**

Serpentinite bodies accompanied by high-pressure (HP) metamorphic rocks exposed on the southwestern slope of the Ohmachi Seamount is regarded as exhumed parts of subduction channels of mantle depths as the interface shear zones of upper and lower plates, where material transports were channelized. Based on previous geological surveys, we have interpreted that the serpentinite – HP metamorphic complex consist of hanging-wall massive serpentinite of wedge mantle origin and the underlying serpentinite schist containing fragments of HP metabasites representing an exhumed subduction channel. This hypothesis is, however, to be tested by *in situ* observation of contact relations between serpentinite schist and HP metabasites, and by more comprehensive geological mapping covering the entire serpentinite – HP metamorphic complex, both of which had not been successfully achieved during previous surveys. This cruise mainly aimed to complete these two subjects, together with obtaining metabasite samples of enough quantity for radiometric dating, and completing bathymetric mapping covering the entire seamount, by Shinkai 6500 dives and MBES mapping.

SeaBeam acquired bathymetric data mostly covering the Ohmachi Seamount. To combine with previously mapped areas, detailed bathymetry of the entire seamount has been completed.

Dive 6k#1239 tried to revisit localities of amphibole schist experienced the eclogite facies. Shinkai 6500 approached a landslide scarp, the foot of which was a locality of amphibole schist as a float stone. Collected samples here in 6K#1239 were serpentinite (antigorite schist). Shinkai then climbed up the slope looking for another locality of amphibole schist. However, it could not find the same locality, because many small-scale ridges and gullies, which were not expressed on MBES bathymetric maps, obstructed to identify the outcrop. The submersible collected many serpentinite and sedimentary rock samples.

Dive 6k#1240 performed seafloor geologic mapping on the southern extension of serpentinite exposure. Many rock exposures were observed especially on the lower slope. These outcrops consisted solely of volcaniclastic sandstone presumably of Paleogene horizons, and no serpentinite was exposed. This result indicates that the serpentinite body does not extend to the south of previously confirmed southern terminal (KT04-28D09: 29°03'30"). Presence of a fault is inferred between 29°03'00-30", to the south of which the Paleogene cover sequence was relatively dropped.

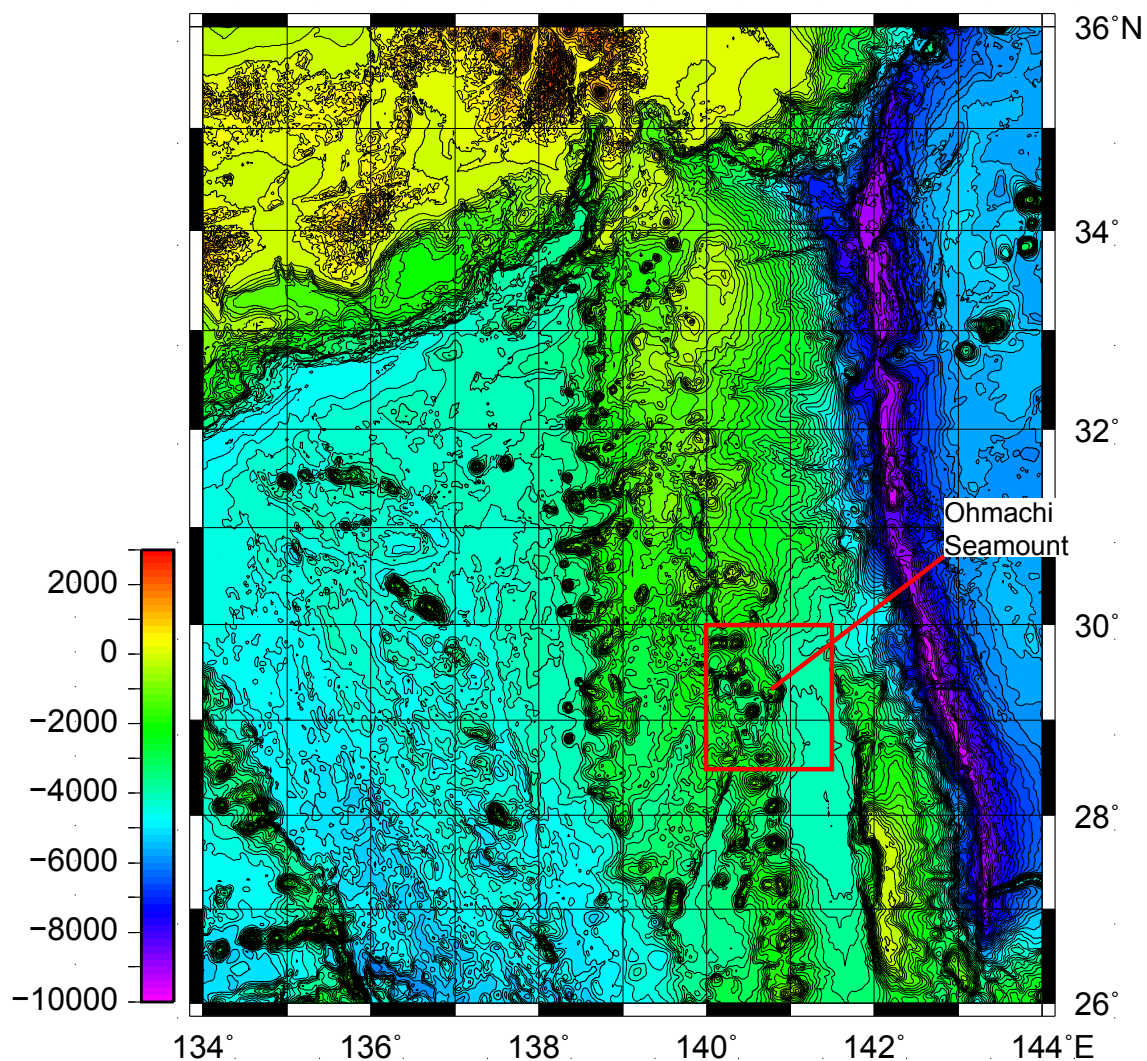


Fig. 1 Research areas of YK10-13 Leg2 Cruise.

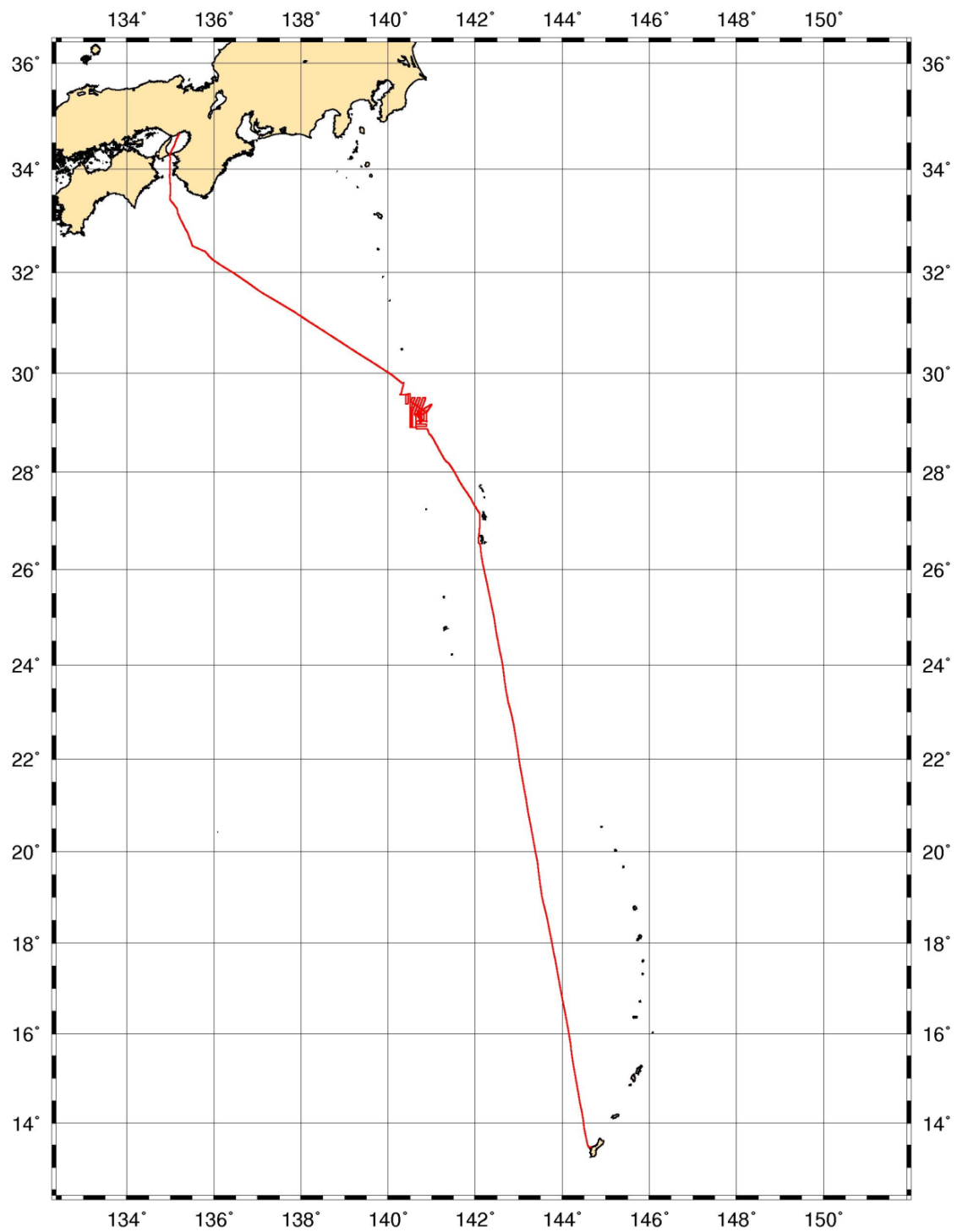


Fig. 2 S/V Yokosuka track during the YK10-13 Leg2 cruise.