

# Cruise Summary

## 1. Cruise Information

Cruise ID:	YK10-06
Vessel Name:	R/V Yokosuka
Cruise Title:	Site Survey for an IODP Expedition in the Kumanonada and the Northern Izu-Bonin Area
Chief Scientist:	Kan Aoike (CDEX, JAMSTEC)
Representative of Science Party:	Takashi Agatsuma (CDEX, JAMSTEC)
Cruise Period:	13 June 2010 ~ 20 June 2010
Ports of call:	Yokosuka (JAMSTEC Quay) – Yokosuka (JAMSTEC Quay)
Survey Area:	1) About 70 km southeast of Shingu City, Wakayama Prefecture 2) About 60 km east of Aogashima Island, northern Izu-Bonin arc

## 2. Overview of the Survey

### 2.1. Objectives

This cruise was planned as site surveys for scientific drilling campaigns in the Integrated Ocean Drilling Program (IODP). We had two missions in this cruise. The first mission was to set mooring systems for observing the Kuroshio Current at a site on which a deep riser drilling with D/V *Chikyu* toward the seismogenic zone of Nankai Trough (Site C0002/NT3-01) is planned. The second mission was a seafloor condition survey to acquire data of high-resolution seafloor bathymetry, side scan seafloor acoustic imaging and subbottom profiling by using AUV Urashima around the site in the northern Izu-Bonin arc where a deep riser drilling is also proposed (Site IBM-4). The data obtained in the first and second missions shall be used for analysis on riser behavior in high current conditions and for shallow hazard assessment in the two IODP drilling programs to be implemented with D/V *Chikyu* in near future, respectively.

## 2.2. Results

### 1) Chronicle

The vessel departed the quay of JAMSTEC, Yokosuka HQ at 14:00 on 13<sup>th</sup> June and got into WOW in the Suruga Bay. She left for the Mikawa Bay at 04:00 on 14<sup>th</sup>, arrived at 09:35 and then got into WOW again. She left for Owase at 17:25, arrived at 22:00 and then got into WOW again. She left for the Kumano-nada at 01:00 on 15<sup>th</sup>, engaged in the mooring retrieval operations from 06:00, left for Hachijo-jima at 12:45 and then got into WOW off Hachijo-jima. She left for the IBM-4 area at 23:30 on 16<sup>th</sup> and arrived at 04:00. After being engaged in the surveys by AUV Urashima and the ship-mounted multi-beam system, she left for Yokosuka at 13:00 on 19<sup>th</sup> and then came alongside the quay of JAMSTEC, Yokosuka HQ, at 09:00 on 20<sup>th</sup> June.

### 2) Mooring Installation

Installation of the mooring systems was carried out on 15 June after one-day WOW. Two sets of mooring systems were placed successfully to the planned sites in the Nankai Trough area, CM03 and CM04, of which expected water depths are 1947 m and 1784 m, respectively, located 12 km east and 8 km southeast from Site C0002, upstream along the Kuroshio Current. Each mooring system consisted of one Acoustic Doppler Current Profiler (ADCP), four Doppler current meters (RCM 11), three conductivity-temperature-depth recorders and two acoustic releasers. The ADCP for Site CM03 was a long-range type (LR-ADCP), while that for Site CM04 was a broad-band type. These mooring systems shall be retrieved after a four-month observation.

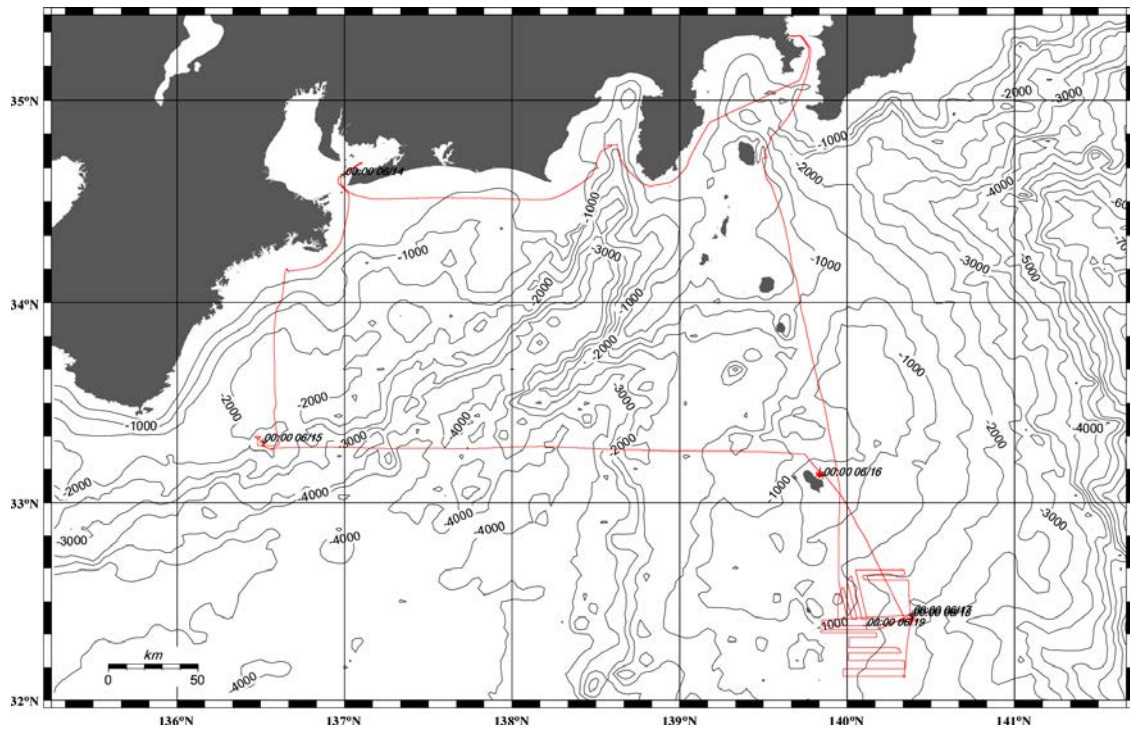
### 3) AUV Urashima Survey

Survey by means of AUV Urashima for acquiring high resolution topography, sidescan images and subbottom seismic profiles was carried out in an area of the northern Izu-Bonin arc from 17 to 18 June after the mooring system installation operation and another one-day WOW. On the first day the survey was suspended due to a mechanical trouble, which occurred to the back-forth thruster on the way to the seafloor during both the two dives conducted on the day. Upon replacing the parts that are considered to be potentially the causes of the trouble, third dive was conducted on the second day. The trouble of the day before did not appear; however, navigation mode of the vehicle was changed to a semi-manual one because the automatic navigation got to be inoperative not long after coming into the first survey line. Five and half lines

were surveyed finally. Sidescan and sub bottom seismic data could be extracted properly from the data loggers; however, no bathymetry data was unfortunately recorded because the data logger of the SeaBat system was turned off probably when the thruster was s once topped for setting the trim to horizontal. Therefore, another survey is needed in future for acquiring the data of high resolution bathymetry.

#### 4) Multibeam Survey

Multibeam bathymetry survey, besides that of the steady observation outside the planned survey area, was carried out in an area of the northern Izu-Bonin arc, in the nighttime on 17 and 18, and until 13 o'clock on 19 June. The areas from north-northwest through west to south-southwest of the proposed riser drill site were surveyed.



The ship track of YK10-06