Submission date: March 19, 2012

Cruise Summary

1. Cruise Information

● Cruise ID: KR12-01

● Name of vessel: R/V *Kairei*/ROV *Kaiko 7000II*

● Title of the cruise: Diving research using ROV *Kaiko 7000II* in the Nansei Shoto Trench

● Chief scientist [Affiliation]: Yoshihiro FUJIWARA [JAMSTEC]

● Representative of the Science Party [Affiliation]:
Florence PRADILLON [JAMSTEC], Yoshihisa SHIRAYAMA [JAMSTEC]

○ Title of proposal:

"Organic substrates as stepping stones for the colonization of deep-sea chemosynthesis-based ecosystems?" (FP)

"Food-web structures of sunken wood ecosystems in deep sea" (YS)

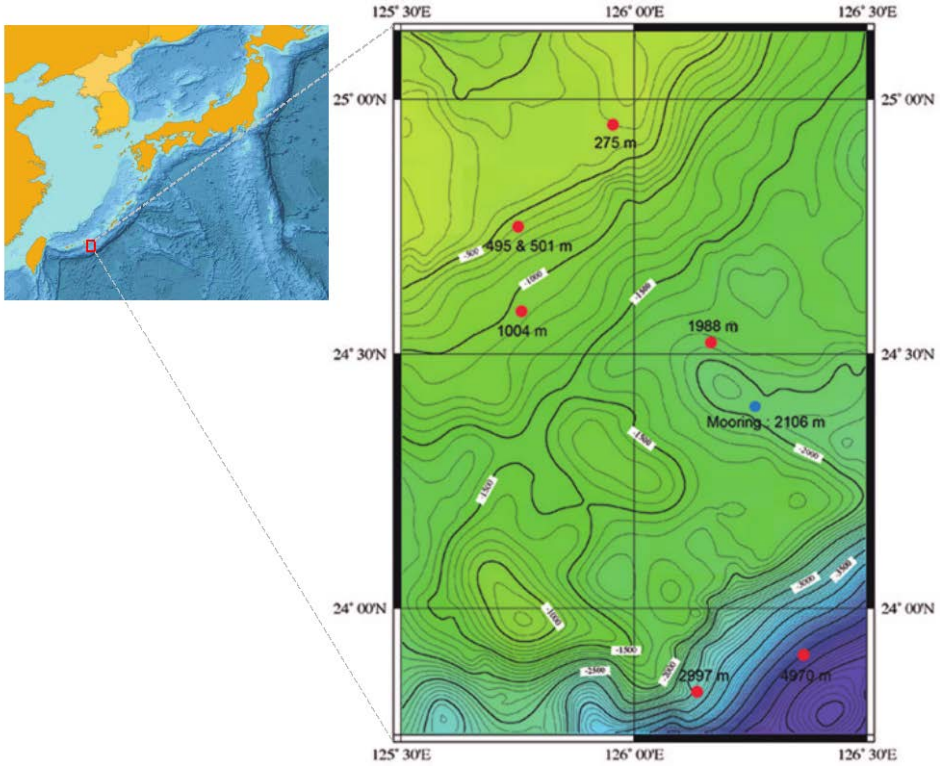
● Cruise period: January 7, 2012 - January 21, 2012

● Ports of call: from Harumi Port (Tokyo) to Naha Port (Okinawa)

● Research area: Nansei Shoto Trench

○ Research map

Dive site (except 275m site): ●, Mooring: ●



２. Overview of the Observation

● Overview of the observation

Large accumulations of organic materials on the deep-sea bottom (such as plants and wood remains or carcasses of large marine mammals) produce reducing environments and create biodiversity hotspots and habitats sustaining specific organisms (Smith & Baco 2003, Smith 2006). Such reducing environments are thought to be important for dispersal of organisms inhabiting earth-driven reducing environments such as hydrothermal vents and hydrocarbon seeps as well as for evolution of these animals, especially chemo-symbiotic invertebrates (Smith et al., 1989; Distel et al., 2000; Fujiwara et al., 2010; Shinozaki et al., 2010). However, understanding of biological communities surrounding the biogenic reducing substrates is quite limited because of its rareness of discovery in deep sea.

Therefore, we have deployed some biogenic substrates including terrestrial plants, whale vertebrae and land animal bones at 6 depths in the Nansei Shoto Trench in 2008 using the ROV *Hyper-Dolphin* and R/V *Natsushima* for understanding of biodiversity, succession and food-web structures. We have also deployed a mid-water mooring system for testing a hypothesis of larval dispersal in the deep sea in 2010 using R/V *Natsushima*.

During the KR12-01 cruise, 9 ROV dives were conducted using ROV *Kaiko 7000II* at depths of 500m, 1,001m, 2,997m and 4,964m and the mooring system was retrieved using R/V *Kairei*. A new morphotype of *Osedax* polychaetes and fungal ascomata were discovered from a bone and a wood log, respectively at a depth of 500m. A large shark devouring fresh whale vertebrae was recorded using a time-lapse video camera at the same depth. No invertebrate endemic to reducing environments was found from the biogenic substrates deployed at depths from 1,000m to 4,964m. Additionally, two possible new species of vesicomyid clams were discovered from seeps and xenophyophores were collected from soft sediments in the 5,000m site. The mooring experiments showed no evidence to test the hypothesis of larval dispersal.