

NT12-13 Cruise Summary

1. Cruise Information

1.1 Cruise ID

NT12-13

1.2 Ship Name

R/V Natsushima

1.3 Title of the Cruise

In-situ bio-CCS experiment by guest molecular replacement method with methane hydrate

1.4 Chief Scientist

Hideaki Machiyama (JAMSTEC)

1.5 Title of the Proposal & Representative of the Science Party

1. Fumio Inagaki (JAMSTEC)

In-situ bio-CCS experiment by guest molecular replacement method with methane hydrate

2. Taiyo Kobayashi (JAMSTEC)

A comprehensive field test of a deep profiling float developed in Japan

1.6 Cruise Period

May 24 – June 5, 2012

1.7 Ports of Call

Naoetsu (Niigata Pref.) – Yokosuka (Kanagawa Pref.)

1.8 Research Area

Japan Sea – western Joetsu Basin and off Yamagata – (Fig. 1)

2. Overview of the Observation

2.1 Research proposal #1

1) Background and Objectives

Joetsu Gas Hydrate Field of the western Joetsu Basin in the eastern margin of the Japan Sea is one of the best fields for gas hydrate studies. There are many methane plumes and active methane seeps associated with gas hydrate blocks in the several mounds on the Umitaka Spur and Joetsu Knoll.

The purpose of this research proposal is 1) to understand the occurrence of methane hydrate on sea-floor, 2) to select the best location for in-situ bio-CCS experiment, and 3) to obtain the bathymetric data off Yamagata for a methane hydrate study.

2) Observation summary

We conducted two ROV diving surveys on the Umitaka Spur (#1386 & 1388) and four diving surveys on the Joetsu Knoll (#1387, #1389 ~ 1391). Three candidate locations for in-situ bio-CCS experiment were selected in the survey area. We recovered a water temperature data logger deployed in NT10-10 Leg2 Cruise, and sampled many sediment cores and two pressure-keeping cores. We also obtained the bathymetric data off Yamagata area.

2.2 Research proposal #2

1) Purpose of the field test

Control system of the deep profiling float, which has been developed by JAMSTEC and TSK, was examined in the actual ocean.

2) Details of the field test

A prototype of the deep profiling float was deployed from the ship and then it operated repeatedly preset sequence of observation cycles including descend, drift at a preset depth, ascend, observation by CTD, GPS positioning and data transition at the sea surface. At the end of the test the prototype was drifted on the sea surface and then recovered.

Main parameters of the test are follows:

Period of the observation cycle: 18 hours

Drifting depth: 400 dbar

Profile depth: 800 dbar at odd cycle and 700 dbar at even cycle

3) Results of the field tests – summary –

The results of the field test clarified that the control system of the deep float worked as well as it was expected before. This is the first field test in which the deep float can move freely in water because of no tied line connecting a surface buoy and it is clarified that the float is apt to descent to deeper depth than the target depth very much. Thus, some parameters should be examined again and adjusted. After the adjustment, we expected that the deep float can be examined in deep water.

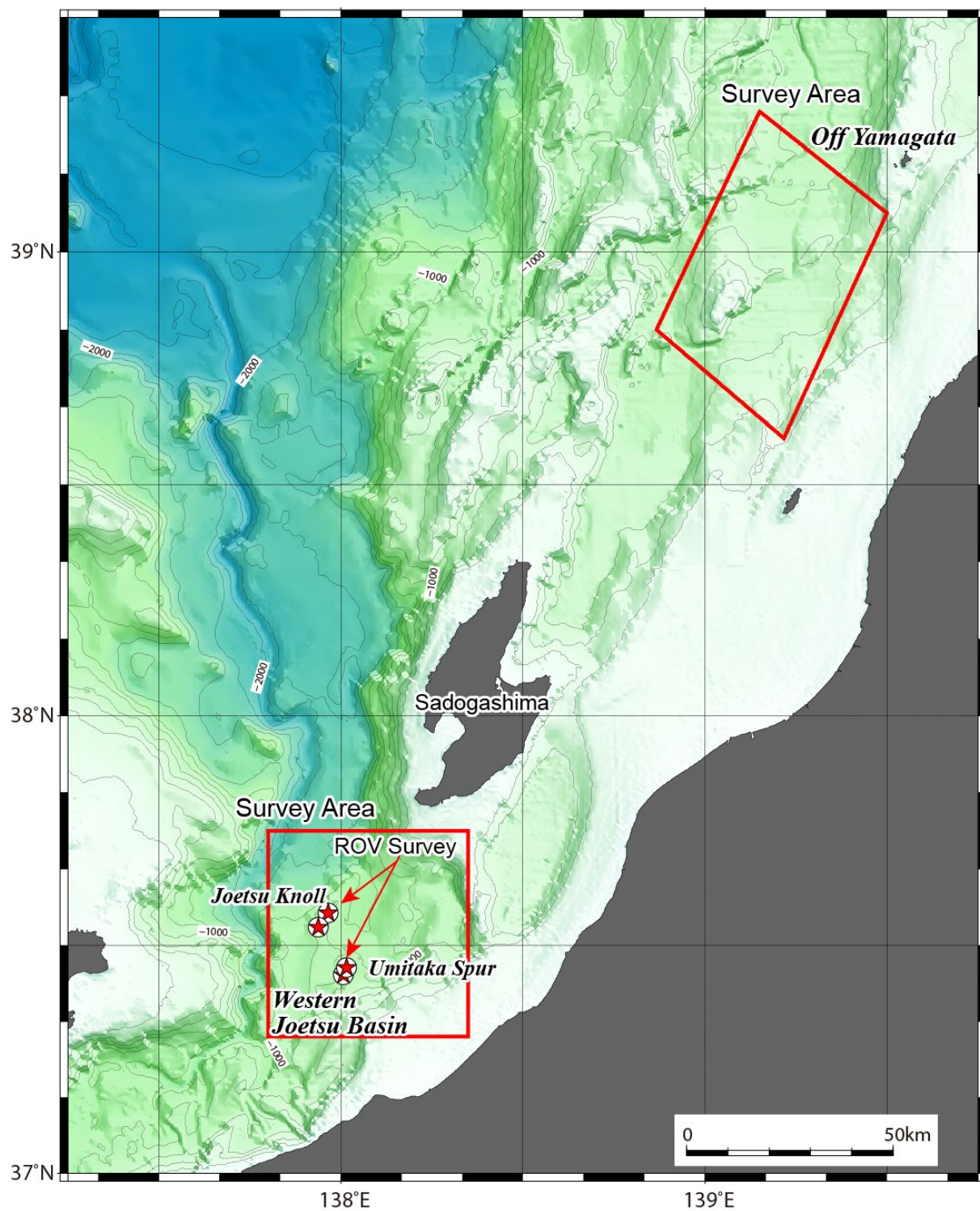


Fig. 1 Index map of the research area and the dive points in the NT12-13 Cruise.