

Cruise Summary

1. Cruise Information

Cruise ID: NT13-02

Name of vessel: NATSUSHIMA

Title of the cruise: Tsunami Prediction system: Research Cruise in Japan Trench

Chief scientist [Affiliation]: Toshiya Kanamatsu [IFREE-JAMSTEC]

Lead proponent [Affiliation] : Toshiya Kanamatsu [IFREE-JAMSTEC]

Title of proposal: Tsunami Prediction system: Research Cruise in Japan Trench: Coring research cruise

Cruise period: 21th, Jan – 9th, Feb 2013

Ports of call: JAMSTEC, Yokosuka -JAMSTEC, Yokosuka

Research area: Off Tohoku

Research map: Figure 1

2. Overview of the Observation

- Background and purpose

A long term prediction for earthquake in a subduction zone should be based on its recurrence interval and past displacements of a megathrust. Unfortunately no such research has been conducted in the deep Japan Trench subduction zone before the 2011 Tohoku earthquake. The recurrence of earthquakes could be understood by evaluating timing of event deposits in the sequences. In this study, not only in the trench axis where the most prominent displacement occurred, in the forearc basin and the landward slope areas. We first aim to document the evidence of the 2011 Tohoku-oki earthquake in the surface sediment, and then establish the earthquake recurrence in Tohoku-oki by identifying similar evidences in the past strata.

-Observations, Activities

Sampling and analyzing of event deposits formed by submarine landslides, displacement of faults, and strong motion during earthquakes, were planed to understand distribution of event deposit to know damaged zone, and recurrence of earthquake. Sampling sites for piston coring operations were planed with referring to bathymetric and subbottom image records previously acquired. Due to bad weather, only eight coring operations were made. We also conducted bathymetric survey within the research area as much as possible. We took 2 cores (PC01 & PC02) from the upper middle terrace of water depth ca. 2,300m at 39°N, and 4 cores (PC03 - PC06) from the forearc basin of water depth 1000-2000m at 38°N-39°N, 2 cores (PC07 & PC08) from the upper slope of 600m-800m water depth at 38°N. Major

lithology of PC01-PC06 is diatomous bioturbated silt including foraminifera test with frequent interbedding with tephra layers. The tephra layers might be correlated to previously reported tephra sampled in the area. The lithology of the other cores (PC7 and PC8) are characterized by sandy layer in the upper, and silty layer in the lower. Bathymetric surveys were conducted in three areas, which are shallower than 2000m water depth.

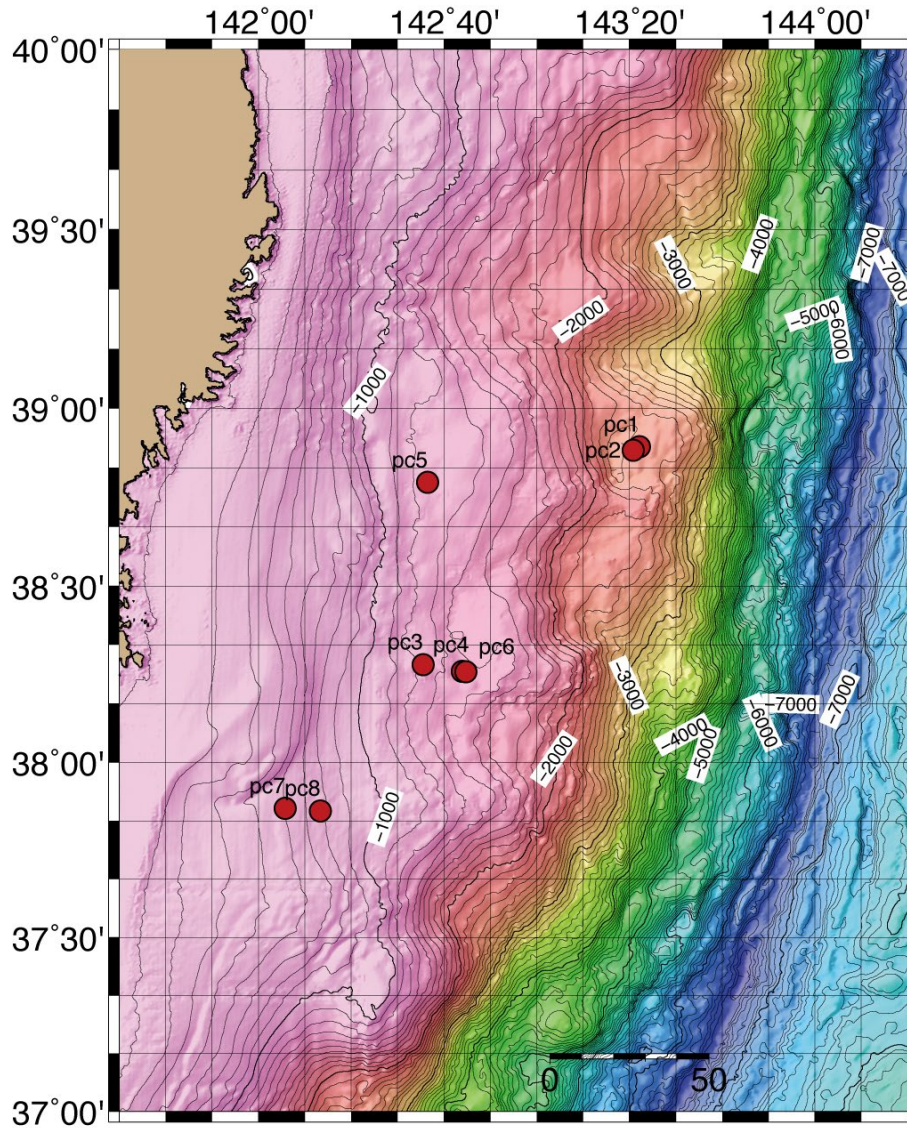


Figure1: Sites for piston coring during NT13-02 cruise