

Cruise information and summary of MR12-E01 cruise

Cruise information

Cruise number MR12-E01
Ship name R/V MIRAI
Chief scientist Takafumi Kasaya (IFREE, JAMSTEC)
Proposal title The Survey and Observation for Earthquakes and Tsunamis off the Pacific Coast of Tohoku
Date 20 Feb. 2012 – 3 Mar. 2012
Ports of call Sekinehama (JAMSTEC) – Yokohama
Research Area Fig.1

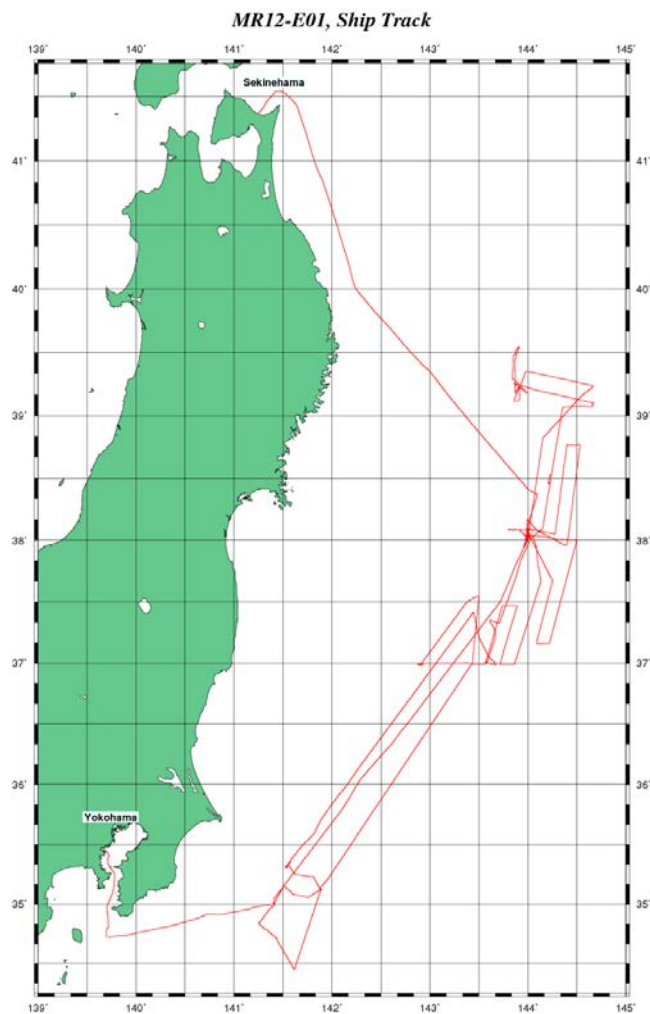


Fig 1. Ship track of this cruise.

Cruise summary

On 11 March 2011, Tohoku, northeast Japan, experienced a great earthquake (Mw 9.0, Mt 9.1) called the 2011 off the Pacific coast of Tohoku earthquake. Seismic and tsunami inversion analyses have shown that tsunami waves with a maximum run-up height of 38 m were generated after the main shock by topographic changes on the seafloor in the toe region of the Japan Trench slope off Sendai. These inversion analyses (Maeda et al., 2011) and bathymetric surveys (Fujiwara et al., 2011) indicate that the toe region slipped about 50 m along the thrust. If the thrust fault rapidly deformed the seafloor, as suggested by Ide et al. (2011), the basic theory of tsunami-genesis would predict the generation of tsunamis all along the axis of the Japan Trench.

To investigate many phenomena related with the earthquake, research program “The Survey and Observation for Earthquakes and Tsunamis off the Pacific Coast of Tohoku” supported by MEXT has been started in FY 2011.

In this cruise, we carried out bathymetric and geophysical surveys, a piston coring around the Japan Trench axis and two type OBSs deployments. The most prominent result is supplied by a piston coring around the Japan Trench at 38 degrees North. We succeed to obtain six piston core samples with pilot core samples. Longest sample was about 9.5 meters using 10 meters piston coring system. According to the onboard analysis, we could observe turbidite layer, some mud and sand layers related with some past earthquakes and volcanic arch layers. Using the collected bathymetrical data around the Japan Trench area at from 37.5 to 39 degrees North. Preliminary bathymetry map was obtained after velocity corrections and outlier removal operation on board. Moreover, we could set up six Broad band OBSs and eight short period OBSs off the Boso peninsula.