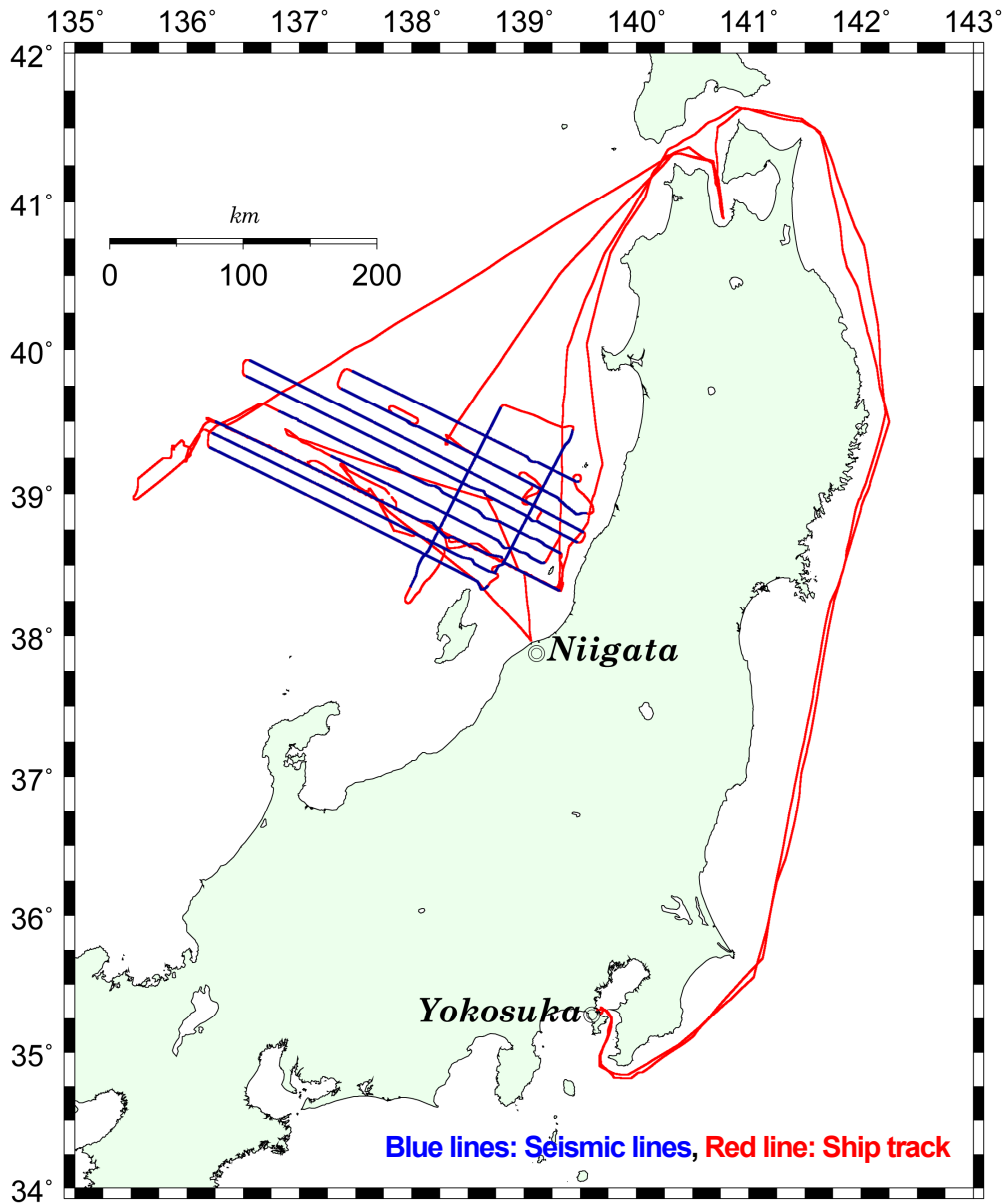


## Cruise summary

### 1. Cruise Information :

- (1) Cruise number, Ship name: KR10-10, R/V Kairei
- (2) Title of the cruise: 2010FY “Seismic intensive study around the deformed zone in the eastern margin of the Japan Sea”
- (3) Chief Scientist [Affiliation]: Narumi TAKAHASHI, Tetsuo NO [JAMSTEC]
- (4) Representative of Science Party [Affiliation]: Yoshiyuki KANEDA [JAMSTEC],
- (5) Title of proposal: Seismic intensive study around the deformed zone in the eastern margin of the Japan Sea
- (6) Cruise period, Port call: 2010/8/3 - 9/6, Yokosuka port to Yokosuka headquarters
- (7) Research Area: The eastern margin of the Japan Sea
- (8) Research Map:



## 2. Overview of Observation :

### (1) Objectives :

Recently, large earthquakes of magnitude M7 have occurred along the “strain concentration areas” located at the eastern margin of the Japan Sea and the western part of the Tohoku region. However, this area has not been identified as one of the priority areas to be investigated. Therefore, seismic studies have been performed to understand active faults and fold structures at the eastern margin of the Japan Sea and the western part of the Tohoku region in collaboration with Japanese research institutions as part of the Special Coordination Funds for Promoting Science and Technology, “priority investigations of strain concentration areas”, since 2008. The objectives of this cruise are to reveal the structural characteristics of the strain concentration areas using a multichannel seismic reflection survey system (MCS) on R/V KAIREI.

### (2) List of observation instruments :

#### 1) Multichannel seismic reflection survey (MCS)

In August-September 2010, we conducted a MCS survey around the area near Sado Island and off Sakata in the eastern margin of the Japan Sea using the R/V KAIREI (Fig.2). MCS data was acquired along 11 lines (EMJS1001, EMJS1002, EMJS1003, EMJS1004, EMJS1005, EMJS1006, EMJS1007, EMJS1008, EMJS1009, EMJS10A, and EMJS10B) with a total length of approximately 2,680 km. Survey lines were crooked to avoid the many fishing operations and equipment in the survey area. We shot a tuned airgun array with a spacing of 50 m. This array has a total capacity of 7,800 cubic inches (about 130 liters). The standard air pressure was 2,000 psi (about 14 MPa). During the shooting, we towed a 444-channel hydrophone streamer cable with a 5600-m maximum offset, and the group interval was 12.5 m. The towing depth of the streamer cable was maintained at 12 m below the sea surface using depth controllers. The sampling rate was 2 ms, and the recording length was 15 s.

#### 2) Refraction survey using ocean bottom seismographs (OBSs)

We deployed 58 OBSs at the Line EMJS1003, and a refraction survey using an airgun array with a spacing of 200 m. The interval of the OBS deployment was about 5 km. An OBS is deployed by free fall and retrieved by melting releaser composed of stainless steel plates connecting the OBS with a weight when a transponder system receives acoustic signal sent from a vessel. This acoustic communication between the OBS and the vessel was performed using transducers installed on the vessel. Positions of OBSs on sea bottom are estimated by SSBL of the vessel's positioning system during the cruise.

#### 3) Bathymetry, magnetics and gravity observation

Bathymetry, magnetic, and gravity data were recorded continuously during the survey.