Cruise summary

1. Cruise Information :

(1) Cruise number, Ship name: KR14-08, R/V *KAIREI*

(2) Title of the cruise: 2014FY "Integrated Research Project on Seismic and Tsunami Hazards Around the Sea of Japan"

(3) Chief Scientist [Affiliation]: Tetsuo NO [JAMSTEC]

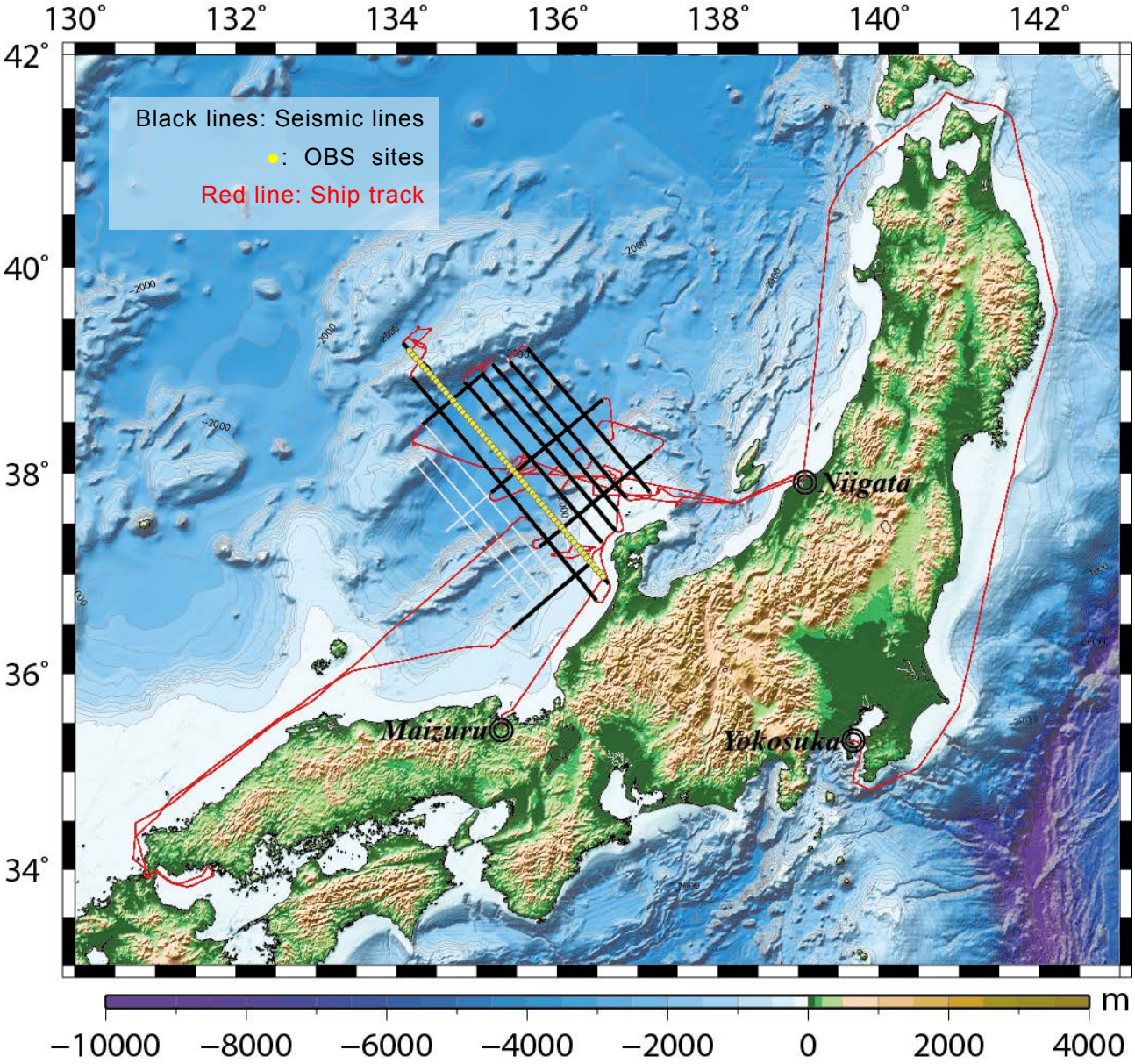
(4) Representative of Science Party [Affiliation]: Shuichi KODAIRA [JAMSTEC],

(5) Title of proposal: Integrated Research Project on Seismic and Tsunami Hazards Around the Sea of Japan

(6) Cruise period, Port call: 2014/7/22 - 8/30, Maizuru port to Yokosuka port (JAMSTEC)

(7) Research Area: Japan Sea

(8) Research Map:



2. Overview of Observation：

(1) Objectives：

The relationship between crustal structure and the earthquakes that have occurred along the eastern margin of the Japan Sea has been revealed recently by seismic survey as part of the research project "Multidisciplinary research project for construction of fault model in the high strain rate zone" (Sato et al., 2014; No et al., 2014). Elucidation of the crustal structure is essential in understanding the seismotectonics of the Japan Sea. However, many areas in the Japan Sea have not yet been conducted to seismic survey to clarify the crustal structure. Therefore, we have participated in "Integrated Research Project on Seismic and Tsunami Hazards Around the Sea of Japan" conducted by the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) of Japan; in particular, we have performed seismic surveys from the R/V Kairei in the Japan Sea since 2014.

In July-August 2014, we conducted a marine seismic survey to study the crustal structure around area off Ishikawa. The survey covered the areas from the continental shelf to the Yamato Basin and the Yamato Rise. Using an improved seismic acquisition technology for deep seismic imaging, we are able to obtain data so as to clarify the detail crustal structure such as those presented by No et al. (2014) and Sato et al. (2014) for the eastern Japan Sea. Therefore, we will clarify more detail crustal structure than that reported previously by Ludwig et al. (1975), Katao (1988), and Hirata et al. (1989) in this area. Such data is important for studies of seismotectonics in the survey area and for understanding of the formation of the Japan Sea. Moreover, since an onshore-offshore seismic survey was conducted in the south extension of the survey area in previous study (Kodaira et al. 2004), we obtain the crustal structure imaging of the central Japan ranging from the Nankai Trough to the Japan Sea in the present study. In addition, the line SJ1405 was connected to the onshore-offshore seismic survey by the Earthquake Research Institute, University of Tokyo which was conducted in the same period.

(2) List of observation instruments：

We conducted a MCS survey around the areas off Ishikawa in the Japan Sea using the R/V *KAIREI*. MCS data were acquired along 11 lines with a total length of approximately 2,278 km. Some seismic lines were crooked to avoid the many fishing operations and equipment in the survey area. To obtain high-quality MCS data, we shot an air gun array at a spacing of 50 m, which corresponds to a spacing of 20 to 30 s depending on the vessel speed (average of 4 kn). The tuned air gun array had a maximum capacity of 7,800 cu.in. (approximately 130 l) and consisted of 32 air guns. The standard air pressure was 2,000 psi (approximately 14 MPa). During the experiment, the air gun array depth was maintained at 10 m below the sea surface. During the shooting, we towed a 444-channel hydrophone streamer cable with a group interval of 12.5 m. The towing depth of the streamer cable was maintained at 12 m below the sea surface by depth controllers. The sampling rate and record length were 2 ms and 16 s, respectively.

2) Refraction survey using OBSs:

We deployed 60 OBSs along the line SJ1405, and performed a refraction survey using an airgun array with a spacing of about 100 or 200 m. The airgun array in the OBS survey used the same configuration as in the MCS survey. The interval of the OBS deployment was about 5.5 km.

3) Bathymetry, magnetic, and gravity observations:

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