

## Cruise Summary

### 1. Cruise Information

(1) **Cruise ID:** KR15-21

(2) **Name of vessel:** Kairei

(3) **Title of the cruise:**

2015FY “Research project for compound disaster mitigation on the great earthquakes and tsunamis around the Nankai trough region”

(4) **Chief scientist [Affiliation]:** Tsutomu Takahashi [JAMSTEC]

(5) **Representative of the Science Party [Affiliation]:** Shuichi Kodaira [JAMSTEC]

(6) **Title of proposal:**

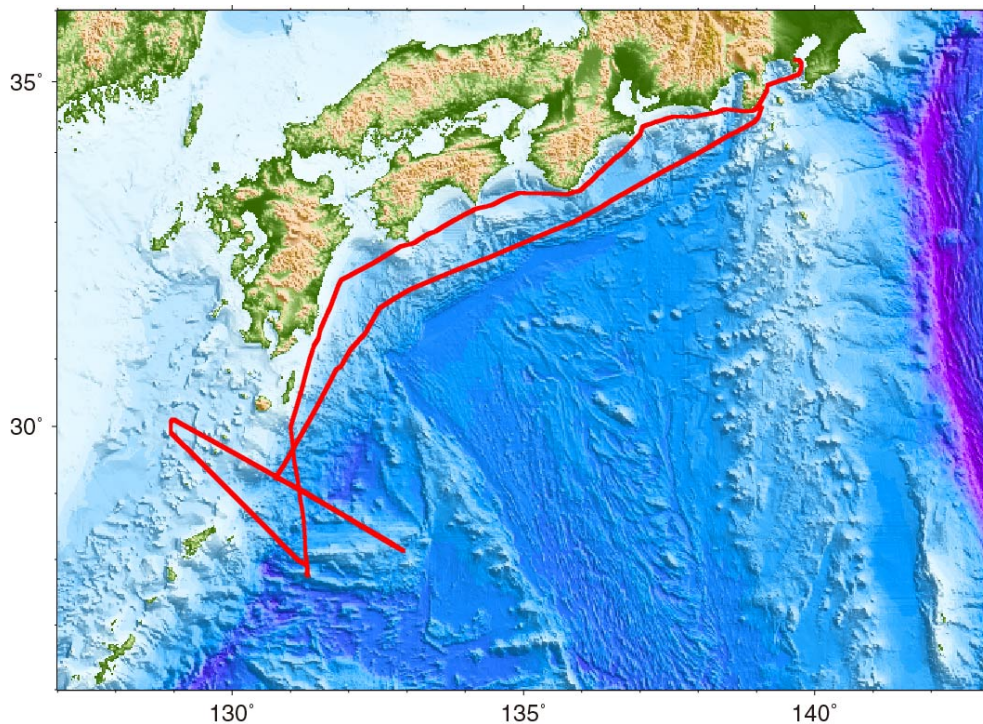
Research project for compound disaster mitigation on the great earthquakes and tsunamis around the Nankai trough region

(7) **Cruise period:** 2015/12/27 -2016/1/5,

(8) **Ports of departure / call / arrival:** Yokosuka port (JAMSTEC) to Yokosuka port (JAMSTEC)

(9) **Research area:** Northern Ryukyu arc

(10) **Research map**



### 2. Overview of the Observation

## **(1) Objectives**

Seismic studies in Ryukyu subduction zone are usually based on the seismic data on islands, and therefore island distribution causes a significant restriction of estimations of seismicity and underground structures in this area. To elucidate details of seismicity, lithospheric structures and plate geometry of this arc, we launched a series of passive and active seismic surveys around Ryukyu arc, as a part of research project “Research project for compound disaster mitigation on the great earthquakes and tsunamis around the Nankai trough region” funded by Ministry of Education, Culture, Sports, Science and Technology (MEXT) of Japan. In 2013FY, we have conducted a seismic survey in southern part of Ryukyu arc. This observation successfully clarified high seismicity in the crust and precise geometry of subducting Philippine Sea plate. In 2015FY, we will conduct active-source seismic surveys in northern part of Ryukyu arc that is adjacent to the mega-thrust fault zone of Nankai trough. This study conducts a Multi-channel seismic surveys in northern Ryukyu arc to clarify the plate geometry and crustal structure.

## **(2) List of observation**

### **(a) Multi channel seismic reflection (MCS) survey**

We conducted a MCS survey at northern Ryukyu arc using the R/V KAIREI. MCS data were acquired along 2 lines. 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 liters) 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.

### **(b) OBS recovery**

We tried to recover one OBS (site S27) that was deployed during KR15-11 cruise. However, the OBS was not recovered due no responses to acoustic calls and release commands from onboard.

### **(c) Sub bottom profile, bathymetry, magnetic, and gravity observations:**

Sub bottom profile was acquired during the MCS survey. Bathymetry, magnetic, and gravity data were recorded continuously throughout this cruise.