



R/V Kairei Cruise Report
KR13-12

Seismic survey and observations in Japan Trench region

Aug. 01, 2013 – Aug. 17, 2013

Japan Agency for Marine-Earth Science and Technology
(JAMSTEC)

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1. Cruise Information

(1) Cruise Number, Ship name : KR13-12, R/V Kairei

(2) Title of the Cruise

FY2013 Seismic survey and observations in Japan Trench region

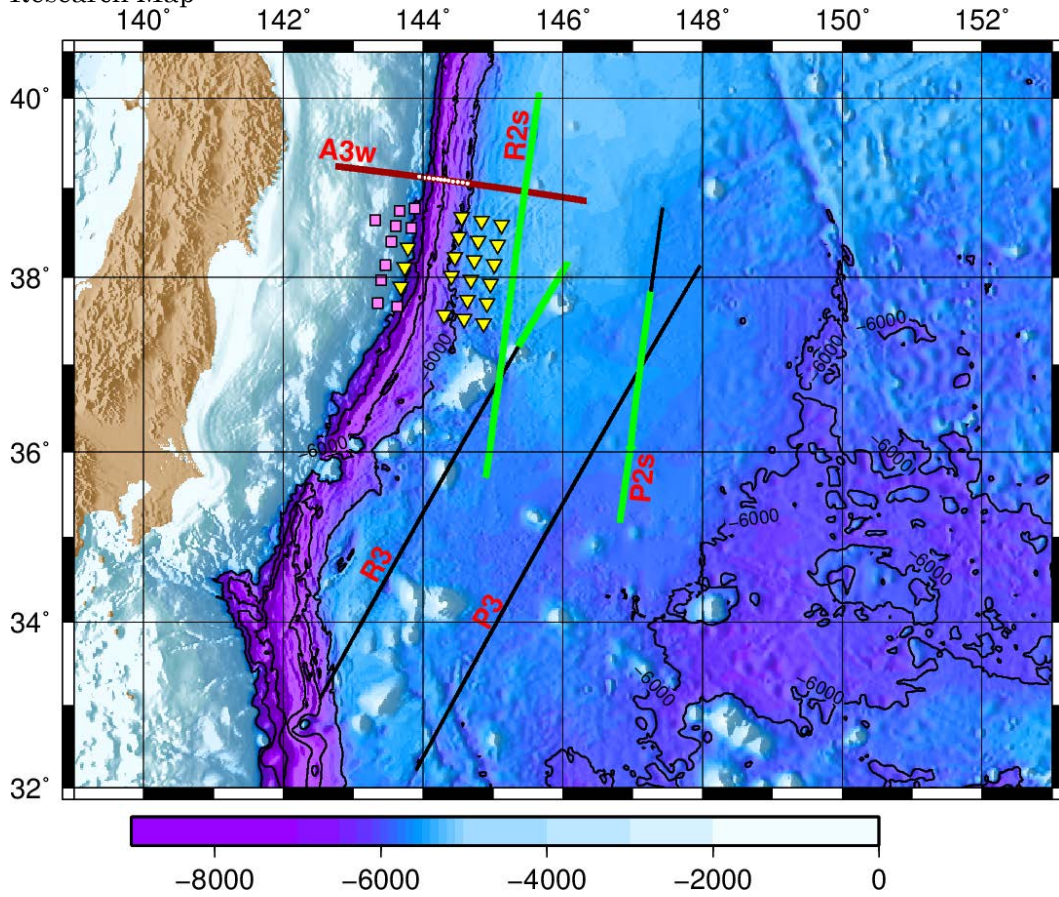
(3) Cruise period, Port call

2013/08/01 – 2013/08/17, Hachinohe-Yokosuka

(4) Research Area

Japan Trench region

(5) Research Map



2. Researchers

- (1) Chief Scientist [Affiliation] : FUJIE Gou [JAMSTEC]
- (2) Representative of Science Party [Affiliation] : Shuichi Kodaira [JAMSTEC]
- (3) Science party list
 - 1) Narumi TAKAHASHI [JAMSTEC],
 - 2) Ayako NAKANISHI [JAMSTEC],
 - 3) Koichiro OBANA [JAMSTEC],
 - 4) Yuka KAIHO [JAMSTEC],
 - 5) FUJIE Gou [JAMSTEC],
 - 6) Seiichi MIURA [JAMSTEC]
 - 7) Yasuyuki Nakamura [JAMSTEC],
 - 8) Takeshi SATO [JAMSTEC]
 - 9) Mikiya YAMASHITA [JAMSTEC]
 - 10) Tsutomu TAKAHASHI [JAMSTEC]
 - 11) Tetsuo NO [JAMSTEC]

3. Overview of Observation

(1) Objectives

On 11 March 2011, the great 2011 Tohoku-oki earthquake (Mw 9.0) was occurred in the Japan Trench region. This was the greatest earthquake that has been observed in Japan, and it caused devastating damages in the eastern Japan. To evaluate the hazard of the large interplate and outer rise earthquakes next to the rupture zones of the 2011 Tohoku-oki earthquake, we conducted seismic structure survey in the Japan Trench region. In addition, to reveal the precise distribution of aftershocks in the main shock region and outer rise region, we deployed 30 OBSs for short-term and long-term observation in the vicinity of the main shock region.

(2) Observations

1) OBS deployment.

We deployed 13 OBSs along A3w line for wide-angle seismic reflection and refraction survey, and 30 OBSs for the aftershock observation.

2) Air-gun shooting.

We shot the air-gun array of R/V Kairei along A3w at an interval of 200m.

3) OBS recovery.

We recovered 11 OBSs along A3w line; we could not recover 2 of the deployed OBSs. The 30 OBSs for the aftershock observation are going to be recovered in the future.

4) Multi-channel seismic (MCS) reflection survey

We conducted MCS survey along R2s/P2s/R3 lines (green lines in the map) using a tuned air-gun array of Kairei. The shooting interval was 50m for the MCS survey.

5) Bathymetry, magnetics and gravity observation.

During the cruise, bathymetry, magnetics and gravity data have been recorded continuously by SEABEAM2112.004, three component magnetometer and gravity meter, respectively. However, the SEABEAM system was broken down and we could not obtain the bathymetry data along the last two lines.

4. List of observation instruments

- (1) Ocean bottom seismometer (OBS)
- (2) 444-ch hydrophone streamer
- (3) SEABEAM2112.004
- (4) three component magnetometer
- (5) gravity meter.

5. Cruise log

| Date | Remarks |
|------------|--|
| 2013/08/01 | Departure from Hachinohe, OBS deployment |
| 2013/08/02 | OBS deployment |
| 2013/08/03 | OBS deployment |
| 2013/08/04 | OBS deployment (A3w), air-gun shooting (A3w) |
| 2013/08/05 | air-gun shooting (A3w) |
| 2013/08/06 | air-gun shooting (A3w) |
| 2013/08/07 | OBS recovery (A3w) |
| 2013/08/08 | OBS recovery (A3w), MCS survey (R2s) |
| 2013/08/09 | MCS survey (R2s) |
| 2013/08/10 | MCS survey (R2s) |
| 2013/08/11 | MCS survey (R2s) |
| 2013/08/12 | MCS survey (P2s) |
| 2013/08/13 | MCS survey (P2s) |
| 2013/08/14 | MCS survey (P2s), MCS survey (R3) |
| 2013/08/15 | MCS survey (R3) |
| 2013/08/16 | Transit to Yokosuka |
| 2013/08/17 | Arrival at Yokosuka |

6. OBS position (deploy position)

| Site | Cast | | | |
|--------|------------------|-----------------|-------------|----------|
| | Time UTC | Vessel position | | |
| | | Lat(S) | Lon(E) | Depth(m) |
| W01 | 2013/08/03 09:31 | 39-03.3002 | 144-37.8328 | 6,086 |
| W02 | 2013/08/03 12:04 | 39-03.7524 | 144-33.7519 | 6,168 |
| W03 | 2013/08/03 14:25 | 39-04.1753 | 144-29.5487 | 6,273 |
| W04 | 2013/08/03 16:10 | 39-04.6145 | 144-25.4279 | 6,452 |
| W05 | 2013/08/03 18:20 | 39-05.0185 | 144-21.6306 | 6,969 |
| W06 | 2013/08/03 20:17 | 39-05.3788 | 144-18.1918 | 6,818 |
| W07_1 | 2013/08/03 22:09 | 39-05.7116 | 144-15.0960 | 7,303 |
| W07_2 | 2013/08/03 22:24 | 39-05.6977 | 144-15.1220 | 7,295 |
| W08 | 2013/08/04 01:03 | 39-05.9881 | 144-12.4682 | 7,416 |
| W09 | 2013/08/04 03:45 | 39-06.3591 | 144-08.8869 | 7,003 |
| W10 | 2013/08/04 05:46 | 39-06.7933 | 144-04.7476 | 6,261 |
| W11 | 2013/08/04 07:17 | 39-07.2111 | 144-00.6152 | 5,651 |
| W12 | 2013/08/04 08:58 | 39-07.6400 | 143-56.4830 | 5,393 |
| JMLA | 2013/08/02 03:12 | 38-20.0311 | 143-46.9429 | 5,558 |
| JMLB | 2013/08/02 04:19 | 38-06.7282 | 143-43.8661 | 5,543 |
| JMLC | 2013/08/02 07:35 | 37-53.4886 | 143-40.9191 | 5,792 |
| JOR01C | 2013/08/02 15:41 | 38-13.8355 | 144-27.3592 | 5,871 |
| JOR02C | 2013/08/02 14:31 | 38-00.6981 | 144-24.2655 | 5,968 |
| JOR03C | 2013/08/02 12:25 | 37-34.1884 | 144-18.0795 | 5,921 |
| JOR05C | 2013/08/02 21:34 | 38-11.2962 | 144-44.0480 | 5,560 |
| JOR06C | 2013/08/02 22:43 | 37-57.9055 | 144-41.0758 | 5,659 |
| JOR07C | 2013/08/02 23:48 | 37-44.6046 | 144-37.8938 | 5,863 |
| JOR08C | 2013/08/03 00:55 | 37-31.3441 | 144-34.9845 | 5,947 |
| JOR11C | 2013/08/03 05:35 | 38-08.6490 | 145-00.9427 | 5,260 |
| JOR12C | 2013/08/03 04:25 | 37-55.4143 | 144-57.8866 | 5,484 |
| JOR13C | 2013/08/03 03:14 | 37-42.0983 | 144-54.6190 | 5,609 |
| JOR14C | 2013/08/03 02:00 | 37-28.6723 | 144-51.8650 | 5,651 |
| JOR21C | 2013/08/02 18:03 | 38-40.5466 | 144-32.9893 | 5,887 |
| JOR22C | 2013/08/02 16:52 | 38-27.2787 | 144-30.4792 | 5,896 |
| JOR23C | 2013/08/02 19:18 | 38-37.9199 | 144-50.2780 | 5,522 |
| JOR24C | 2013/08/02 20:26 | 38-24.6158 | 144-47.1286 | 5,492 |
| JOR25C | 2013/08/03 08:01 | 38-35.3453 | 145-07.4940 | 5,392 |
| JOR26C | 2013/08/03 06:46 | 38-21.8616 | 145-04.0208 | 5,327 |

| | | | | |
|-------|------------------|------------|-------------|-------|
| JMS01 | 2013/08/01 22:03 | 38-45.0409 | 143-40.0426 | 3,546 |
| JMS02 | 2013/08/01 23:02 | 38-46.6381 | 143-52.9930 | 5,939 |
| JMS03 | 2013/08/01 20:28 | 38-38.5917 | 143-19.1886 | 2,243 |
| JMS04 | 2013/08/02 01:09 | 38-34.5829 | 143-36.3703 | 3,398 |
| JMS05 | 2013/08/02 00:10 | 38-33.2956 | 143-49.8783 | 5,678 |
| JMS06 | 2013/08/02 02:10 | 38-24.1015 | 143-32.8506 | 3,195 |
| JMS07 | 2013/08/02 05:29 | 38-08.5121 | 143-27.5581 | 3,546 |
| JMS08 | 2013/08/02 06:22 | 37-58.0328 | 143-24.0502 | 3,826 |
| JMS09 | 2013/08/02 09:05 | 37-42.6565 | 143-21.1464 | 4,145 |
| JMS10 | 2013/08/02 10:13 | 37-40.2025 | 143-37.9538 | 5,960 |

7. Airgun lines (end points)

| Line | Lat. | Lon. |
|----------|---------------|----------------|
| A3wobs_0 | 39_14.51700'N | 142_44.93125'E |
| | 39_03.37978'N | 144_36.94960'E |
| A3wobs_2 | 39_03.72876'N | 144_33.65288'E |
| | 38_51.37321'N | 146_20.35397'E |
| P2s_0 | 35_12.10497'N | 146_48.83585'E |
| | 36_03.16750'N | 146_57.24467'E |
| P2s_1 | 36_03.55267'N | 146_57.28348'E |
| | 37_50.11400'N | 147_15.43007'E |
| R2s_0 | 40_02.28539'N | 145_39.15464'E |
| | 39_17.01463'N | 145_30.80790'E |
| R2s_1 | 39_19.20933'N | 145_31.20434'E |
| | 35_41.96483'N | 144_53.45796'E |
| R3_0 | 38_08.78293'N | 146_03.24627'E |
| | 37_12.77447'N | 145_21.75724'E |

8. Notice on using

This cruise report is a preliminary documentation as of the end of the cruise. It may not be corrected even if changes on content (i.e. taxonomic classifications) are found after publication. It may also be changed without notice. Data on the cruise report may be raw or not processed. Please ask the PI(s) for the latest information before using. Users of data or results of this cruise are requested to submit their results to Data Integration and Analysis Group (DIAG), JAMSTEC.