Submission date 0000/00/00

Cruise Summary

1. Cruise Information :

(1) **Cruise number, Ship name**

KR16-05, R/V Kairei

(2) **Title of the cruise**

2016FY Acquisition of deep seismic, shallow sub-surface and seafloor bathymetry Survey Data for the Lord Howe Rise (MCS, OBS)

(3) **Title of proposal**

IODP related site survey study : 1. Lord Howe Rise project

(4) **Cruise period, Port call**

Leg1: 23/March/2016 - 30/March Brisbane to Brisbane

Leg2: 2/April/2016 - 20/April, Brisbane to Brisbane

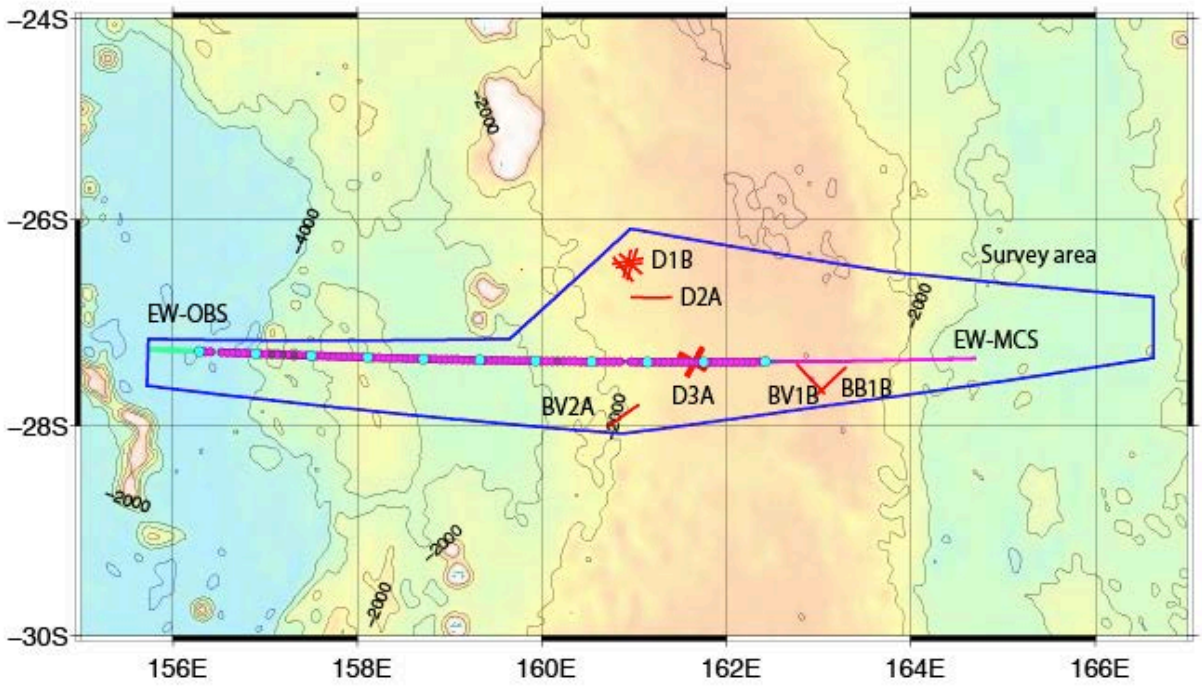
Leg3: 22/April/2016 - 11/May, Brisbane to Brisbane

(5) **Research Area**

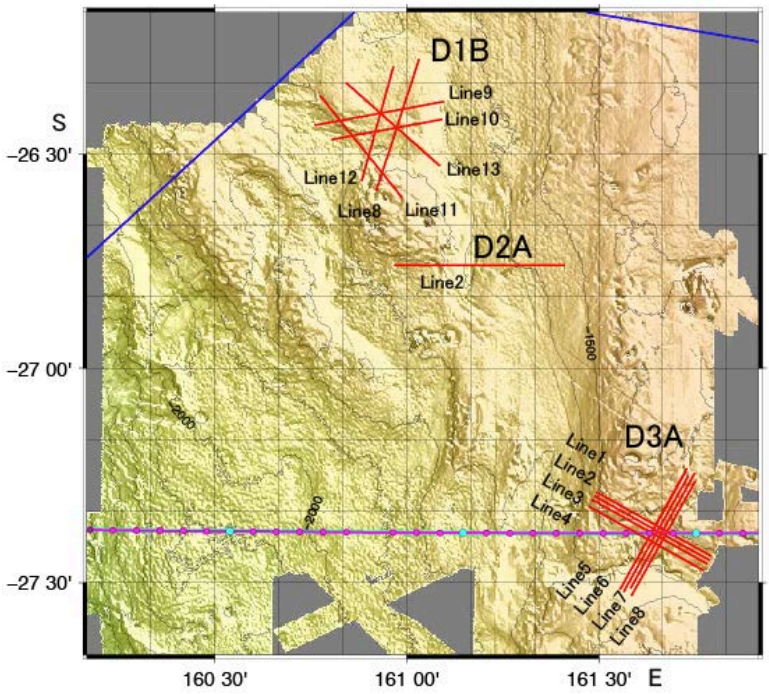
Lord Howe Rise, offshore of eastern Australia

(6) **Research Map**

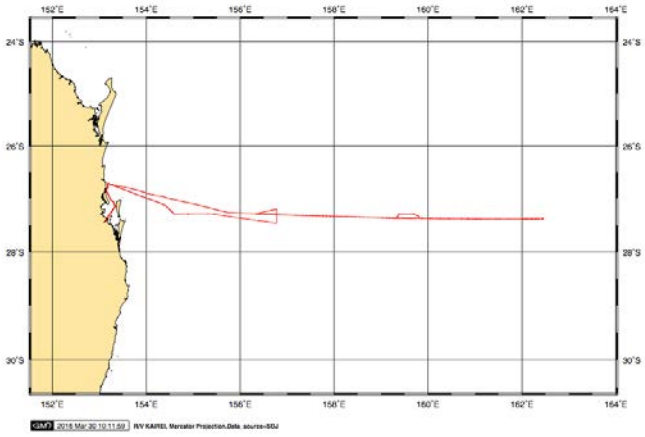
Survey area:



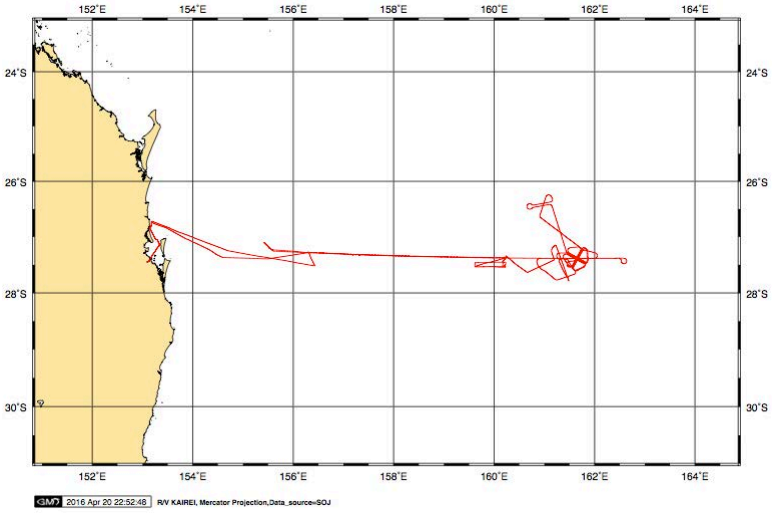
Riser drill sites area:



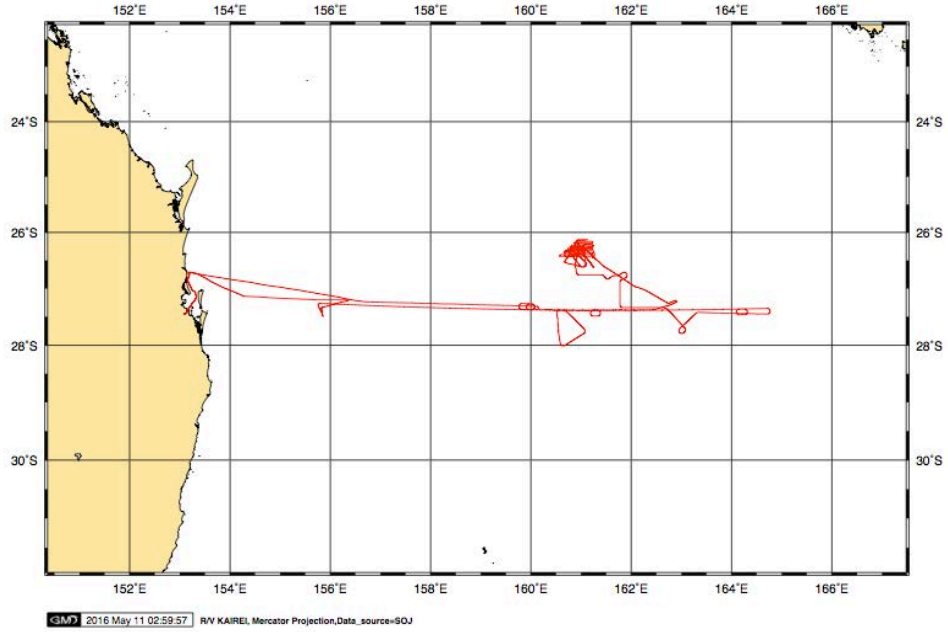
Leg1 ship track:



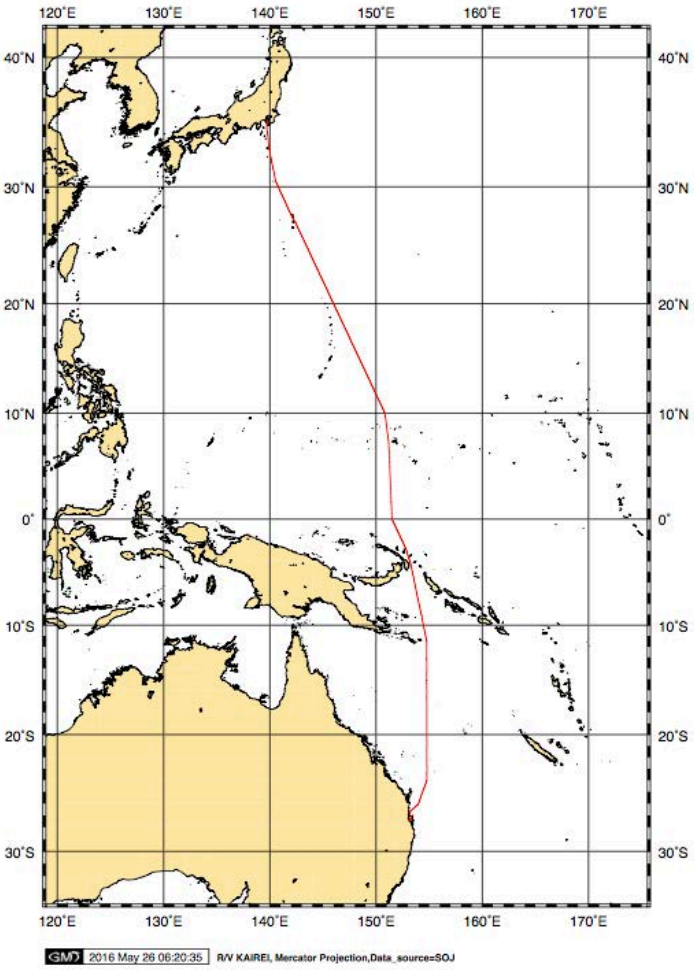
Leg2 ship track:



Leg3 ship track:



Transit:



2. Researchers

(1) Chief scientist

Leg1: Shuichi KODAIRA [JAMSTEC]

Leg2: Gou FUJIE [JAMSTEC]

Leg3: Yuka KAIHO [JAMSTEC]

(2) Representative of Science Party

Shuichi KODAIRA [JAMSTEC]

(3) Science party list:

Shuichi KODAIRA [JAMSTEC]

Seiichi MIURA [JAMSTEC]

Yasuyuki NAKAMURA [JAMSTEC]

Gou FUJIE [JAMSTEC]

Yuka KAIHO [JAMSTEC]

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Mikiya YAMASHITA [JAMSTEC]

Taro SHIRAI [JAMSTEC]

Ryuta ARAI [JAMSTEC]

Ayako NAKANISHI [JAMSTEC]

Koichiro OBANA [JAMSTEC]

Tsutomu TAKAHASHI [JAMSTEC]

Yojiro YAMAMOTO [JAMSTEC]

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Yasuhiro YAMADA [JAMSTEC]

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Kazuya SHIRAISHI [JAMSTEC]

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Yoshihiko TAMURA [JAMSTEC]

Ron HACHNEY [GA]

Scott NICHOL [GA]

George BERNARDEL [GA]

Andrew CARROLL [GA]

Aki NAKAMURA [GA]

Simon WILLIAMS [Sydney UNIV.]

Bayley TBA [Sydney UNIV.]

Wanda STRATFORD [GNS]

3. Overview of Observation

(1) Objectives

This survey was designed to collect Survey Data to support a site assessment at

locations being considered for deep stratigraphic drilling on the Lord Howe Rise, offshore eastern Australia. Drilling will be undertaken as part of the International Ocean Discovery Program Proposal 871-CPP titled "First Deep Stratigraphic Record for the Cretaceous Eastern Gondwana Margin: Tectonics, paleoclimate and deep life on the Lord Howe Rise high-latitude continental ribbon."

Survey Data to be collected on the survey includes 2D seismic reflection data, ocean bottom seismometer data, multibeam sonar bathymetry, sub-bottom profiles, gravity and magnetic data. These Data will be used to characterize the overall geological structure of the Lord Howe Rise, including sediment thickness, crustal architecture, distribution of faults, and seismic velocities of the upper and lower crust and of the mantle.

(2) Observations

1) Deployment and retrieval of Ocean bottom seismometers (OBSs)
   One hundred OBSs were deployed along the EW- regional line and 96 OBSs were retrieved.
2) Air-gun shooting along the EW_OBS line towing a hydrophone streamer cable
   We shot the air-gun array along EW_OBS line while all the OBSs were deployed. The shot interval was 200m. The streamer cable was about 6 km-long and had 444-ch hydrophone (group interval was 12.5m). The recording length of streamer data was 35 second. Around the D3A site, we reshot the air-gun with an interval of 50 m towing the same streamer cable, but the recording length was 15 second. The air-gun depth was 10 m and the streamer depth was 12 m.
3) MCS survey around the proposed drill sites (D1B, D2A, D3A, BB1B, BV1B, BV2A, EW_MCS)
   We conducted multi-channel seismic reflection survey (MCS) by using the same air-gun array and the same streamer cable, but the air-gun depth was 6 m and the streamer depth was 8 m. The shot interval was 50 m.
4) Bathymetry, sub-bottom profile, gravity and magnetic observations
   We collected bathymetric data, sub-seafloor acoustic reflection data and gravity and magnetic data across all the survey lines using multi-beam echo-sounder (MBES), sub-bottom profiler, gravity meter and three-component magnetometer.

(3) Cruise log:

Leg 1:

Date		Remarks
2016/3/23	Wed.	Departure from Brisbane, transit
2016/3/24	Thu.	OBS Deployment
2016/3/25	Fri.	OBS Deployment
2016/3/26	Sat.	OBS Deployment
2016/3/27	Sun.	OBS Deployment

2016/3/28	Mon.	OBS Deployment
2016/3/29	Tue.	OBS Deployment, Transit
2016/3/30	Wed.	Arrival at Brisbane

Leg 2:

Date		Remarks
2016/4/2	Fri.	Departure from Brisbane, transit OBS Deployment
2016/4/3	Sat.	MCS-Airgun EW_OBS
2016/4/4	Sun.	MCS-Airgun EW_OBS
2016/4/5	Mon.	MCS-Airgun EW_OBS
2016/4/6	Tue.	MCS-Airgun EW_OBS
2016/4/7	Wed.	MCS-Airgun EW_OBS
2016/4/8	Thu.	MCS-Airgun EW_OBS
2016/4/9	Fri.	MCS-Airgun D3A_Line2,7
2016/4/10	Sat.	MCS-Airgun D3A_Line4,5
2016/4/11	Sun.	MCS-Airgun D1B_Line8,9
2016/4/12	Mon.	MCS-Airgun D1B_Line 10, D3A_Line3,6
2016/4/13	Tue.	MCS-Airgun D3A_Line1,8
2016/4/14	Wed.	MCS-Airgun EW_MCS
2016/4/15	Thu.	Standby due to weather condition
2016/4/16	Fri.	OBS Retrieval
2016/4/17	Sat.	OBS Retrieval
2016/4/18	Sun.	OBS Retrieval
2016/4/19	Mon.	OBS Retrieval, Transit
2016/4/20	Tue.	Arrival at Brisbane

Leg 3:

Date		Remarks
2016/4/22	Fri.	Departure from Brisbane, transit
2016/4/23	Sat.	OBS Retrieval
2016/4/24	Sun.	OBS Retrieval
2016/4/25	Mon.	OBS Retrieval
2016/4/26	Tue.	MBES,Standby due to weather condition
2016/4/27	Wed.	Standby due to weather condition, MBES
2016/4/28	Thu.	Standby due to weather condition, MBES
2016/4/29	Fri.	MCS-Airgun D1B_Line13
2016/4/30	Sat.	MCS-Airgun D1B_Line9,11,12
2016/5/1	Sun.	MCS-Airgun D2A_Line2
2016/5/2	Mon.	MCS-Airgun BB1B, BV1B
2016/5/3	Tue.	MCS-Airgun EW_MCS
2016/5/4	Wed.	MCS-Airgun EW_MCS
2016/5/5	Thu.	MCS-Airgun EW_MCS
2016/5/6	Fri.	MCS-Airgun EW_MCS, BV2A
2016/5/7	Sat.	MCS-Airgun EW_MCS
2016/5/8	Sun.	MCS-Airgun EW_MCS
2016/5/9	Mon.	MCS-Airgun EW_MCS, Transit
2016/5/10	Tue.	MCS-Airgun EW_MCS, MBES, Transit
2016/5/11	Wed.	Arrival at Brisbane

(4) Survey lines

	Start		End		Total Length	Shot interval	Note
	Latitude	Longitude	Latitude	Longitude	km	m	
EW_OBS Regional line	27_15.57921'S	155_44.29178'E	27_22.90896'S	162_34.65093'E	677.00	200	OBS
EW_MCS0	27_23.07043'S	161_22.12993'E	27_23.07359'S	161_56.59841'E	56.85	50	OBS
EW_MCS Regional line	27_15.74638'S	155_48.28904'E	27_21.16863'S	164_39.87704'E	877.35	50	Include EW_MCS0
D1B-Line8	26_32.76218'S	160_56.09821'E	26_16.58920'S	161_01.92622'E	31.40	50	
D1B-Line9	26_25.91714'S	160_45.59383'E	26_23.05075'S	161_03.04574'E	29.50	50	
D1B-Line10	26_27.48610'S	160_51.02199'E	26_25.09127'S	161_05.57754'E	24.60	50	
D1B-Line11	26_23.75151'S	160_48.25019'E	26_36.06539'S	160_59.22631'E	29.15	50	
D1B-Line12	26_33.66383'S	160_52.98207'E	26_20.09693'S	160_57.16332'E	26.00	50	
D1B-Line13	26_19.93191'S	160_50.49882'E	26_29.89058'S	161_02.99616'E	27.75	50	
D2A-Line2	26_45.56725'S	161_00.95118'E	26_45.56347'S	161_24.65321'E	39.30	50	
D3A-Line1	27_18.56746'S	161_32.10953'E	27_26.31276'S	161_47.67917'E	29.40	50	
D3A-Line2	27_19.12369'S	161_31.83099'E	27_26.84633'S	161_47.34665'E	29.30	50	
D3A-Line3	27_19.65440'S	161_31.49887'E	27_27.37330'S	161_47.01811'E	29.30	50	
D3A-Line4	27_20.53813'S	161_30.87657'E	27_28.28814'S	161_46.44794'E	29.40	50	
D3A-Line5	27_28.68319'S	161_34.73950'E	27_14.82923'S	161_43.31875'E	29.25	50	
D3A-Line6	27_28.97417'S	161_35.32397'E	27_15.14925'S	161_43.96256'E	29.25	50	
D3A-Line7	27_30.72	161_35.000	27_16.85	161_43.674	29.35	50	

	869'S	80'E	797'S	45'E			
D3A-Line8	27_29.56 750'S	161_36.516 57'E	27_15.73 589'S	161_45.142 02'E	29.25	50	
BB1B	27_41.53 810'S	163_03.928 08'E	27_26.03 834'S	162_47.619 66'E	39.30	50	
BV1B	27_40.52 160'S	163_00.329 02'E	27_26.07 277'S	163_17.801 94'E	39.30	50	
BV2A	27_58.90 512'S	160_42.896 40'E	27_47.68 492'S	161_03.207 79'E	39.25	50	

4. Notice on using:

This cruise report is a preliminary documentation as of the end of the cruise.

This report may not be corrected even if changes on contents (i.e. taxonomic classifications) may be found after its publication. This report may also be changed without notice. Data on this cruise report may be raw or unprocessed. If you are going to use or refer to the data written on this report, please ask the Chief Scientist for latest information. Users of data or results on this cruise report are requested to submit their results to the Data Management Group of JAMSTEC.