

KS-24-4 R/V Shinsei-maru

Cruise Report

Relationship of seismic turbidite distribution and strong motion around Amami Island

奄美大島周辺海域における地震性タービダイトの分布 と震度分布の関係性についての研究



March 11, 2024 (Yokosuka) – March 20, 2024 (Yokosuka)

Acknowledgements

We are grateful to Captain Y. Nakamura and the crew of R/V Shinsei-maru for their professional work to make the cruise successful. We also thank the staff of the Center for Cruise Coordination at the Atmosphere and Ocean Research Institute (AORI), the University of Tokyo and members of Institute for Marine-Earth Exploration and Engineering (MarE3), Japan Agency for Marine-Earth Science and Technology (JAMSTEC).

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1. Cruise Summary

1.1. Cruise Information

Cruise ID: KS-24-4

Ship: R/V Shinsei-maru

Period: 11 March 2024 (Yokosuka) – 20 March 2024 (Yokosuka)

Area: Amami

Theme: Relationship of seismic turbidite distribution and strong motion around Amami Island

Chief scientist: NAKANISHI, Ryo (Kyoto University)

1.2. Background and Objectives

The Ryukyu Trench is a subduction zone that has generated M7-8 earthquakes that have caused significant damage in historic periods. Studies of tsunami deposits and tsunami boulders around the Nansei Islands suggest the existence of paleo-tsunamis with intervals of 100-400 years in the past 2500 years. On the other hand, no traces of paleo-tsunami have been found in the geological records around Okinawa Island and Amami Island. The reasons for this are the difference in the mode of occurrence of earthquakes, the erosion of tsunami deposits by storm waves, and the lack of wetland deposits suitable for analysis due to the development of coral reefs. In this study, we use ocean floor cores to compare the areal distribution and depositional age of tsunami event sediments with the earthquake history estimated from the Kikai Island uplifts, aiming to improve the estimation of earthquake magnitude and recurrence intervals.

1.3. Summary of Operations

KS-24-4 cruise started from Yokosuka on 11 March 2024. Multibeam bathymetry data were collected throughout the entire schedule and the sub-bottom profiles (SBPs) were done along the selected lines. The sea condition was good during the SBP and coring works, and we conducted 1 piston coring, 7 multiple coring with water sampling and compact CTD measuring. The cruise ended successfully at Yokosuka on 20 March 2024. The daily schedules of these operations are summarized in Table 1.1. Sampling sites were planned in the forearc slope basin off Amami Island. Figures 1.1 and 1.2 show all track lines and stations. The location of each station is listed in Table 1.2. We unexpectedly encountered a Mw 5.6 earthquake off the east coast of Amami Island on March 15 (Fig. 1.2). Fortunately, we were able to conduct exploration and coring immediately after the earthquake, and we will study the geomorphic changes and sediments related to this earthquake.

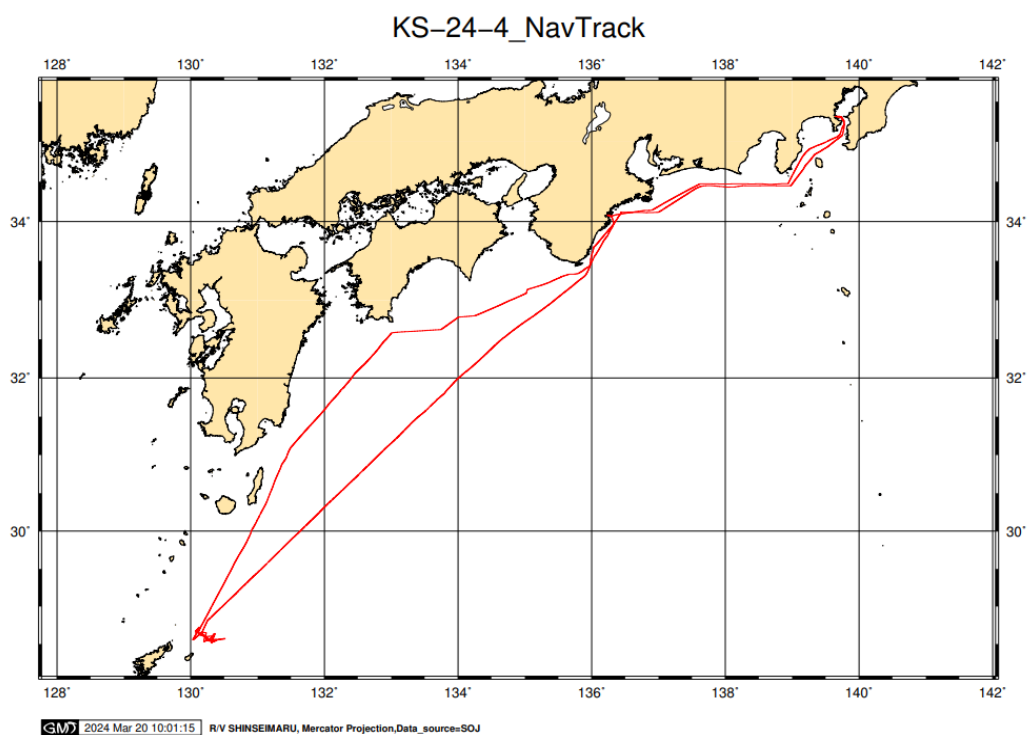


Fig. 1.1 Summary of the cruise track.

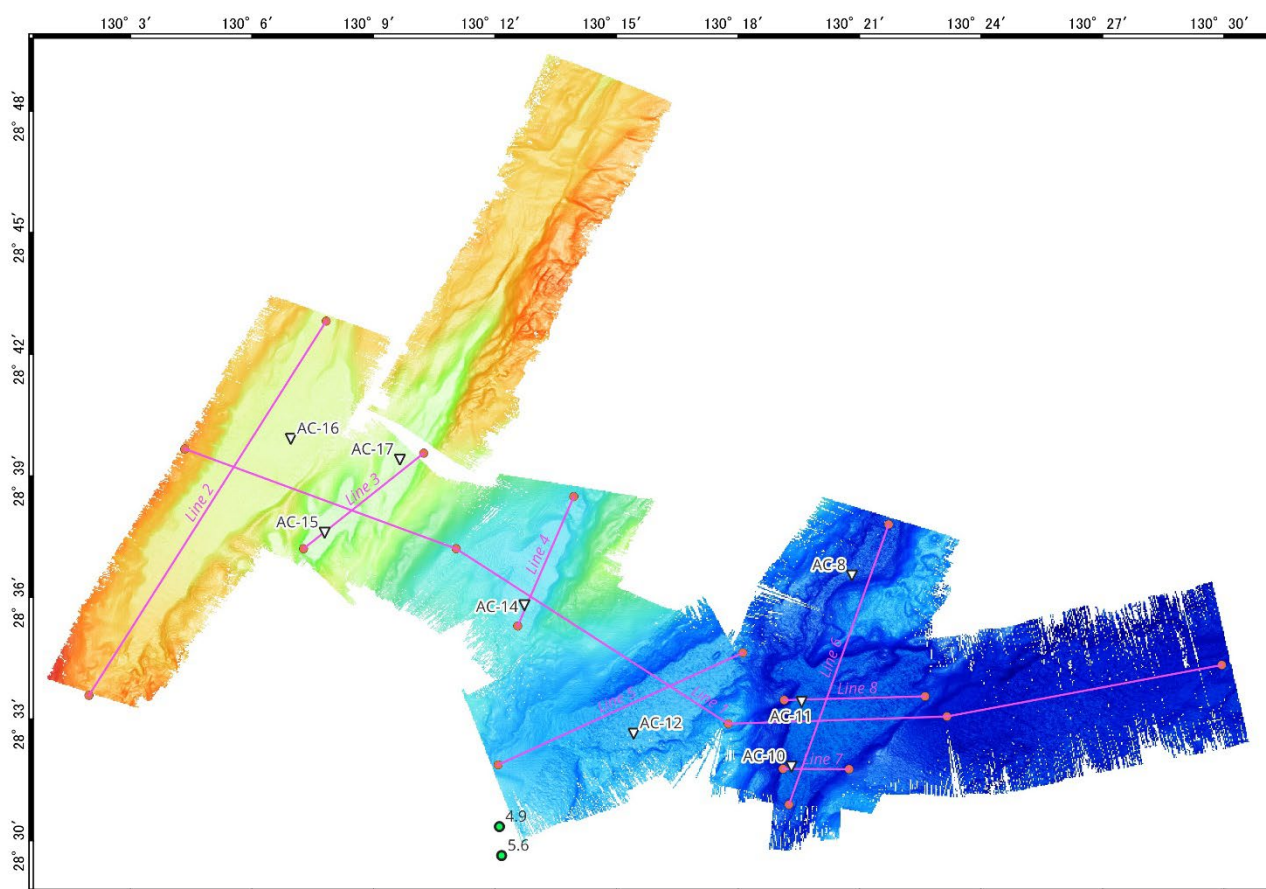


Fig. 1.2 Survey lines and coring sites. Green dots indicate the epicenters occurred during this cruise observation.

Table 1.1 Work Schedule of KS-24-4. Date/time is JST (+9)

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
11-Mar																								
12-Mar																								
13-Mar																								
14-Mar																								
15-Mar																								
16-Mar																								
17-Mar																								
18-Mar																								
19-Mar																								
20-Mar																								
Transit																								
SBP & MBES																								
Coring																								

Table 1.2. Station List

Station		AC-16	AC-15	AC-14	AC-8	AC-11	AC-10	AC-12	AC-17
Day and time (JTC)	Day	Mar. 15	Mar. 15	Mar. 15	Mar. 15	Mar. 15	Mar. 16	Mar. 16	Mar. 16
	Time	7:28	9:20	11:22	14:06	16:23	8:09	11:45	14:07
Latitude	deg	28	28	28	28	28	28	28	28
	min	39.9085	37.5937	35.8037	36.5366	33.417	31.8155	32.6324	39.3965
	N/S	N	N	N	N	N	N	N	N
Longitude	deg	130	130	130	130	130	130	130	130
	min	6.9562	7.7924	12.7242	20.8136	19.5724	19.3193	15.4228	9.6505
	E/W	E	E	E	E	E	E	E	E
Latitude (N)	deg	28.6651417	28.6265617	28.5967283	28.6089433	28.55695	28.5302583	28.5438733	28.6566083
Longitude (E)	deg	130.115937	130.129873	130.21207	130.346893	130.326207	130.321988	130.257047	130.160842
Core number		MC01	MC02	MC03	MC04	MC05	PC01	MC06	MC07
Type of position		Ship	Ship	Ship	Ship	Ship	Transponder	Ship	Ship
Water Depth (m)		1347	1461	1886	2400	2487	2469	2219	1445
Total core length (m)							2.99		
section number		1 (75.5 cm)	1 (72.5 cm)	1 (25.0 cm)	1 (82.0 cm)	1 (75.0 cm)	+ ASC (18 cm)	1 (75.0 cm)	1 (63.9 cm)
Pore Water			✓			✓	✓	✓	✓
Water sampling		✓	✓	✓	✓	✓	✓	✓	✓
CTD		✓	✓	✓				✓	✓

1.4. Contact information

- Geophysical data: KIOKA, Arata (Kyushu University)
- CTD data and water samples: IJIRI, Akira (Kobe University)
- Piston and Multiple core samples: NAKANISHI, Ryo (Kyoto University)

KS-24-4 Onboard Scientist Team

Chief Scientist

中西 諒	京都大学	Ryo Nakanishi	Kyoto University
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Vice Chief Scientist

成瀬 元	京都大学	Hajime Naruse	Kyoto University
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喜岡 新	九州大学	Arata Kioka	Kyushu University
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竹内 誠	東京大学大気海洋研究所	Makoto Takeuchi	AORI
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照井 孝之介	東京大学大気海洋研究所	Konosuke Terui	AORI
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Charlotte Pizer	Innsbruck University
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Markus Niederstätter	Innsbruck University
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山田 貫太郎	神戸大学	Kantaro Yamada	Kobe University
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吉崎 結衣	神戸大学	Yui Yoshizaki	Kobe University
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宮島 英冴	九州大学	Eigo Miyajima	Kyushu University
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山崎 孝太郎	九州大学	Koutaro Yamasaki	Kyushu University
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佐藤 瑠晟	京都大学	Ryusei Sato	Kyoto University
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藤島 誠也	京都大学	Seiya Fujishima	Kyoto University
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波多野 泰成	高知大学	Taisei Hatano	Kochi University
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On-shore participants

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芦 寿一郎	東京大学大気海洋研究所	Juichiro Ashi	AORI
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井尻 暁	神戸大学	Akira Ijiri	Kobe University
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Assignment

Coring

Naruse

Takeuchi

Sato

Pizer

Niederstätter

Hatano

Fujishima

Katayama

Hydroacoustics

Kioka

Terui

Miyajima

Yamasaki

Water sampling and CTD

Yamada

Yoshizaki

2. Hydroacoustics

Author: Arata Kioka

2.1. Multibeam Echo Sounder (MBES)

2.1.1. Properties & Acquisition

- Model: SeaBeam 3020 (ELAC SONAR)
- Swath: Auto
- Operation frequency: 20 kHz
- Sounding pattern: Equi-Angle
- Sound velocity profiles were determined by a XBT (Probe type: T-5) measurement (Table 2.1)

a CTD measurement (AC-14 site) in the Muroto and Amami study areas, respectively.

- Lateral resolution of processed data: 50 m

2.1.2. Acquired Data

The pinging and recording of MBES were continuously done within the survey areas and transits from/to JAMSTEC Yokosuka port. The data quality was good. Editing and cleaning the raw MBES data were done using the CARIS HIPS and SIPS software available onboard R/V Shinsei-Maru. We also exported the acoustic backscatter data to characterise seafloor conditions. The survey lines that acquired MBES data are: Lines Muroto, AL101, AL5, AL14, AL16, AL17, AL8, Across AC-10, Across AC-11, and B (starting from AC-17 site travelling towards north). Figures 2.1 and 2.2 show bathymetry maps in the Muroto and Amami study areas, respectively.

2.2. Sub-bottom profiler (SBP)

2.2.1. Properties & Acquisition

- Frequency: A hull-mounted TOPAS PS 18 uses a primary frequency of 15–21 kHz, and a secondary frequency of 0.5–6.0 kHz. The secondary low frequency is used for subseafloor imaging.
- Transmit: single pulse.
- Ship speed: ~8 knot.
- Ping interval: 3000 ms (Muroto area) and 4000 ms (Amami area).
- Pulse: A linearly coded chirp pulse wavelet (LFM), where the frequency changes linearly with time, of frequencies of 2.0–6.0 kHz with a chirp length of 20 ms was used during the KS-24-4 cruise.
- Primary & secondary beam widths: ~4.5 deg & ~5.5 deg.
- Beam offset pitch: 0.0 deg.
- Beam offset roll: 0.0 deg.
- HRP Stabilization (for heave-roll-pitch compensation): YES.
- Delay time: mostly within 1000–1400 ms (Muroto area) and 1600–3250 ms (Amami area), depending on water depth.
- Sampling rate: 50.0 kHz.
- Trace length: 200 ms (positions within basins in Amami area) and 500 ms (Muroto Area and positions other than basins in Amami area).
- Gain: 18.0 dB (Muroto Area) and 10.0 dB (Amami area).
- Data format: TOPAS.raw format files (TOPAS SW software version 1.9.2) were combined and converted into *.sgy files. Shot point (SP) number, X- and Y-coordinates, and delay recording time are stored respectively in byte 17–20, 73–76, 77–80, and 109–110 of the SEG-Y header.

2.2.2. Acquired Data

We acquired SBP data in the Amami and Muroto study areas. Survey lines in the Amami area were Lines AL101, AL5, AL14, AL16, AL17, AL8, Across AC-10, Across AC-11, and B. Most of the SBP lines were selected for the purpose of better characterising of the basins in the Amami area. The Muroto area was surveyed for studying the lineament that is likely related to fault activity. After converting RAW format files into SEG-Y files, the data quality check was checked during the cruise using CWP/SU. A list of survey lines in their SEG-Y file names is below:

- Line AL101 (Long longitudinal line): 20240315091202, 20240315091858, 20240315095343, 20240315101050, 20240315102130, 20240315103857, 20240315104954, 20240315111838, 20240315114117, 20240315115009, 20240315115729, and 20240315121129.
- Line AL5 (Along-basin line running near AC-16 site): 20240315125933 (Figure 2.3)
- Line AL14 (Line running two basins through AC-15 and -17 sites): 20240315150857
- Line AL16 (Line running a basin through AC-13 and -14 sites): 20240315160218
- Line AL17 (Line running a basin through AC-12 site): 20240315165906

- Line AL8 (Line running two basins through AC-8, -10, -11 sites): 20240315182411
- Line Across AC-10 (Across-basin line running through AC-10 site): 20240315193331
- Line Across AC-11 (Across-basin line running through AC-11 site): 20240315200923
- Line B (starting from AC-17 site travelling towards north): 20240316055027
- Muroto area: 20240313140932

The overall quality of the SBP-TOPAS data was good even for deep and narrow basins while that along the slopes was significantly low. Most of the SBP data within basins imaged laterally continuous reflection signals down to ~40 – 90 ms two-way travel time (TWT) below the seafloor in the basins. In the Amami study area, several acoustically-transparent bodies of ~3 to ~4 ms TWT in thickness are interbedded in the laterally continuous, parallel reflection pattern within the basins (Figure 2.3). On the other hand, SBP data along Lines Across AC-10 and AL17 had less signal penetration up to ~20 ms and ~30 ms TWT below the seafloor, respectively. Also, Lines AL16 and AL17 showed relatively strong reflections between the seafloor and 10 ms TWT below the seafloor. In the Muroto area, SBP could image the reflection pattern down to ~100 ms TWT below the seafloor. Our newly acquired SBP images help not only better characterization of studied basins but also understanding older event deposits and fault activities along with the post-cruise data integration.

Figures and Tables in Section 2. Hydroacoustics:

Table 2.1: XBT measurement (Probe type: T-5) during the KS-24-4 cruise.

Time (JST)	Lat.	Lon.	WD (m)	SST (degree)	Sr. No.
2024/03/13 21:47:50	32-48.3259 N	134-15.9851 E	1610	20.1	051973

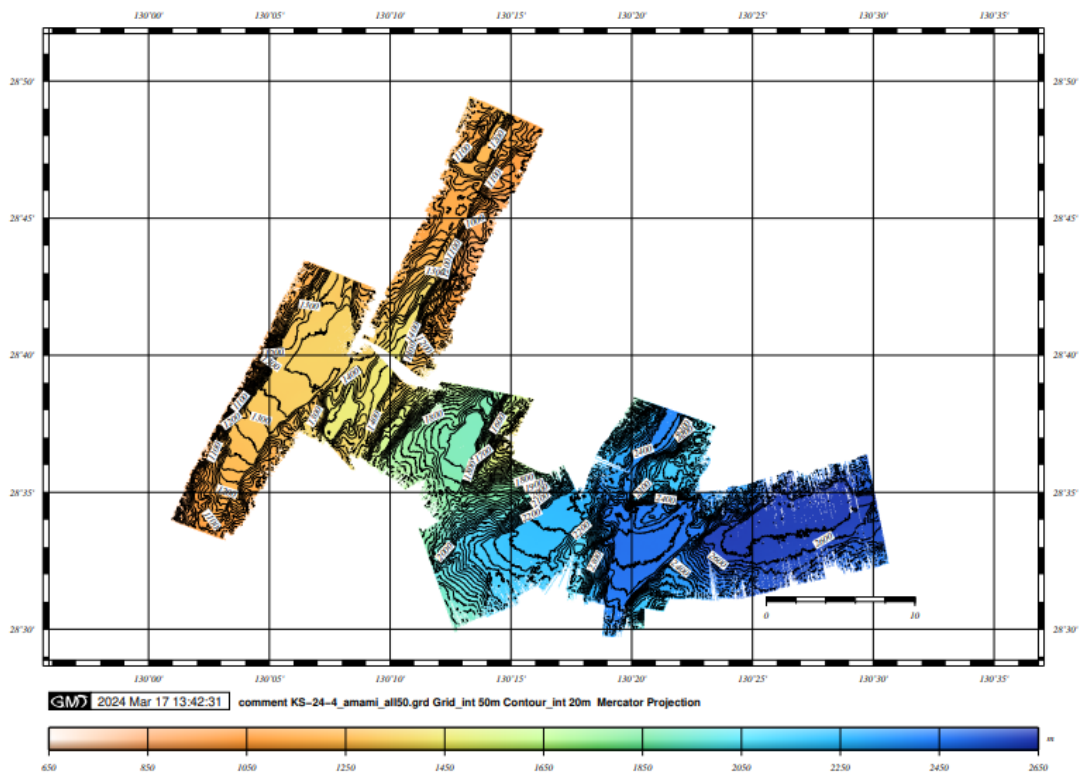


Figure 2.1: Bathymetry map in the Amami area.

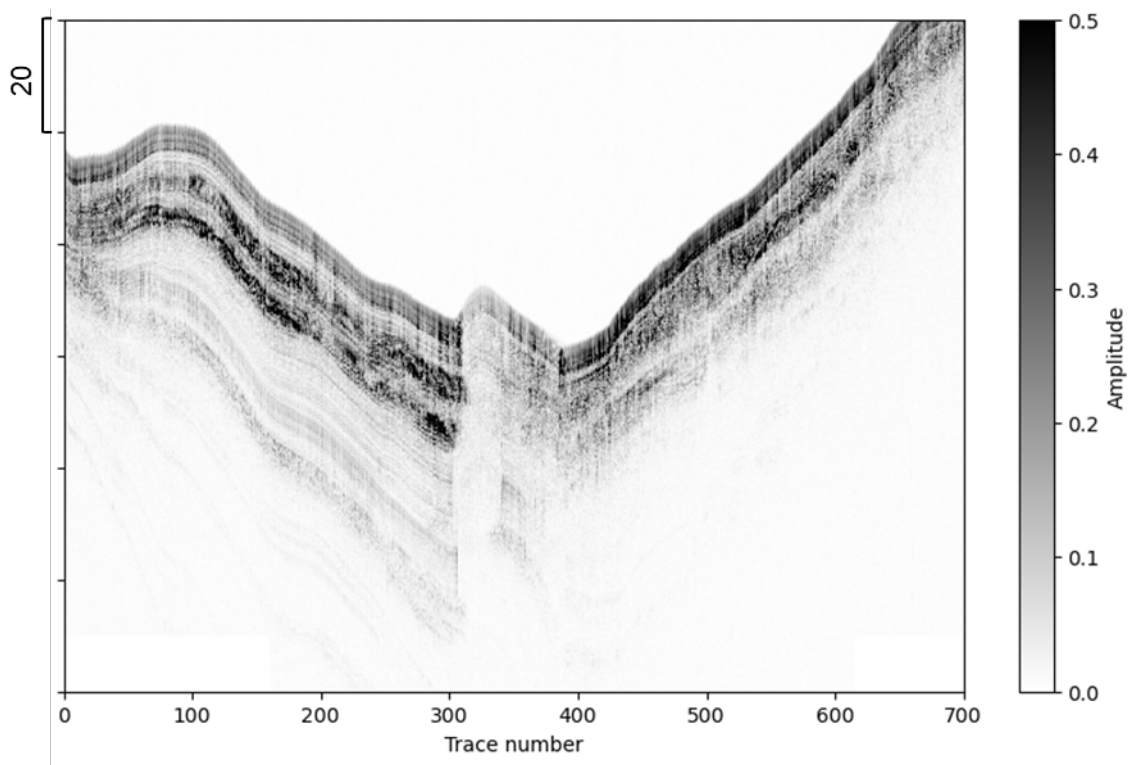


Figure 2.2:
SBP image along AL5 line in Amami area (Line: 20240315125933_1_1). Horizontal axis in shot point (SP) number; vertical axis in two-way travel time (ms).

3. CTD profiling and Water Sampling

Author: Yui Yoshizaki

3.1 Objective

Investigation of dissolved organic carbon concentration around Amami area to understand the emission of dissolved organic carbon from submarine mud volcanoes.

3.2 Water Sampling method (Dissolved organic carbon)

The multiple corer equipped with a Niskin bottle was used to measure the physical properties of water column and to collect the seawater samples (Fig. 3.1). The CT and DT sensor were additionally installed on the multiple corer when the survey site is deeper than 2000 m in a water depth (Table 1.2, Fig. 3.2). About 100 ml of seawater were collected by the multiple corer at 1~2 m above the seafloor (Table 1.2). The seawater samples collected by Niskin bottles will be analyzed for dissolved organic carbon (DOC) concentration (DOC-conc.) at the University of Kobe. The samples for DOC and POC were filtered using pre-combusted (450 degrees) GF/F filters immediately in the laboratory. After filtration, all DOC samples were frozen at ~ -20 °C immediately.

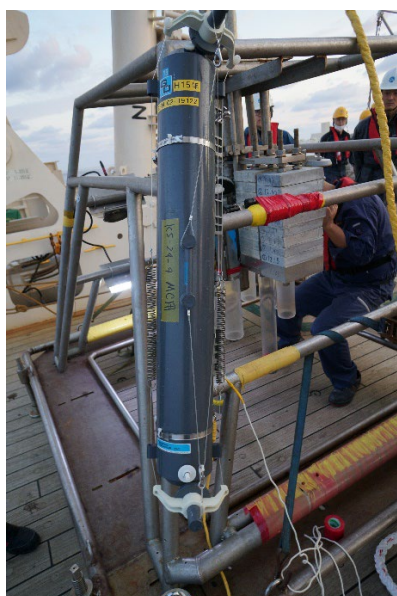


Fig. 3.1 CTD and Niskin bottles attached to multiple corers.

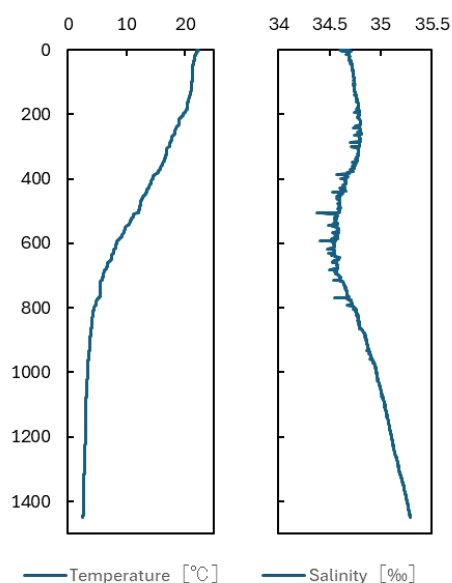


Fig. 3.2 Example of CTD data at AC-17.

4. Sediment core sampling

Author: Seiya Fujishima, Naruse Hajime

4.1 Piston coring

4.1.1 Methods

On this cruise, sediment sampling was conducted using a 10 m (6 m + 4 m) piston corer. The piston corer consisted of a 500 kg weight, a stainless-steel outer pipe, a polyvinyl chloride inner pipe, and a piston with 13 m of main wire attached to it. A 13 m pilot wire and an “Ashura” corer (with flaps) were attached to the trigger arm.

The winch wire was continuously veered out at 1 m/s, and a transponder was attached 50 m above the piston corer. The wire was stopped at 100 m above the seafloor for 3 minutes and then the wire veered out at 0.3 m/s. After landing on the seafloor, the wire was immediately unloaded at 0.3 m/s. When the length of the wire became shorter than the water depth, the wire was rolled up at 1.0 m/s. After lifting the corer, the outer and inner pipes were cut using a band saw because the pipes were bent, and sediment samples were collected.

4.1.2. Coring sites and Description

We collected sediment sample using piston corer at PC-01 (Fig. 1.2, Table. 1.2). Site PC-01 is located at basin at east of the Amami Island (AC-10: 28.5302583°N, 130.321988°E). PC-01 was sampled after the earthquake on March 15, 2024, 19:32 (Mw 5.6).

Section 10-9 consisted of silty clay to silt layer and interbedded graded sand and homogeneous mud layer (Fig. 4.1). Section 8 pushed sediment out of the inner pipe because the inner pipe could not be pulled out it from the outer pipe. Sediment in section 8 consisted of graded sand layer (fine to medium). The sediments upper than Section 8 were flowed out from the pipe. ASC01 consisted of silty clay to silt and were bioturbated.

4.2 Multiple coring

4.2.1 Methods

The multiple corer was equipped with a 600 kg weight, four 0.6 m pipes, two 0.6 m pipes for porewater sampling, and two 1 m pipes. Longer tubes used flaps as a core catcher and shorter ones used a lid with an arm.

After the multiple corer was deployed, the winch wire was started at 1.0 m/s. At 50 m above the seafloor, the wire was stopped for 1 minute. After that, the wire was unreeled at 0.3 m/s. After reaching the sea floor, winch wire was further unreeled 6 m. After that, 20~40 s of unreeling was stopped, and the wire was started to wind up at 0.3 m/s. When the wire length became shorter than the water depth, the winding speed was switched to 1.0 m/s.

After lifting, two 1 m pipes and two 0.6 m pipes with longer core lengths were collected. One 1 m pipe was transferred to a PVC pipe, split in half, and the other split to 1 cm and placed in a polybag. One 60 cm tube was subsampled into a smaller tube and the another was used for pore water sampling.

4.2.2 Coring sites and Description

We collected sediment samples using multiple corer at AC-16, AC-15, AC-14, AC-8, AC-11, AC-12, and AC-17 (Table 4). AC-12 and AC-17 were sampled after the earthquake on March 15, 2024, 19:32 (Mw 5.6).

AC-16, AC-15, AC-8, and AC-11 samples show calcareous clayey silt to silty clay. On the other hand, the sediment sample at AC-12 consisted of clayey silt and graded sand layer. At AC-14 site, bedforms were observed on the seafloor surface and sediment sample was consists of sand (Fig. 4.2). In some cores, pore water in sediments was collected for an effect of a mud volcano (see Table 1.2). No clear turbidity was observed in the deep-sea camera images before or after the earthquake (Fig. 4.2).

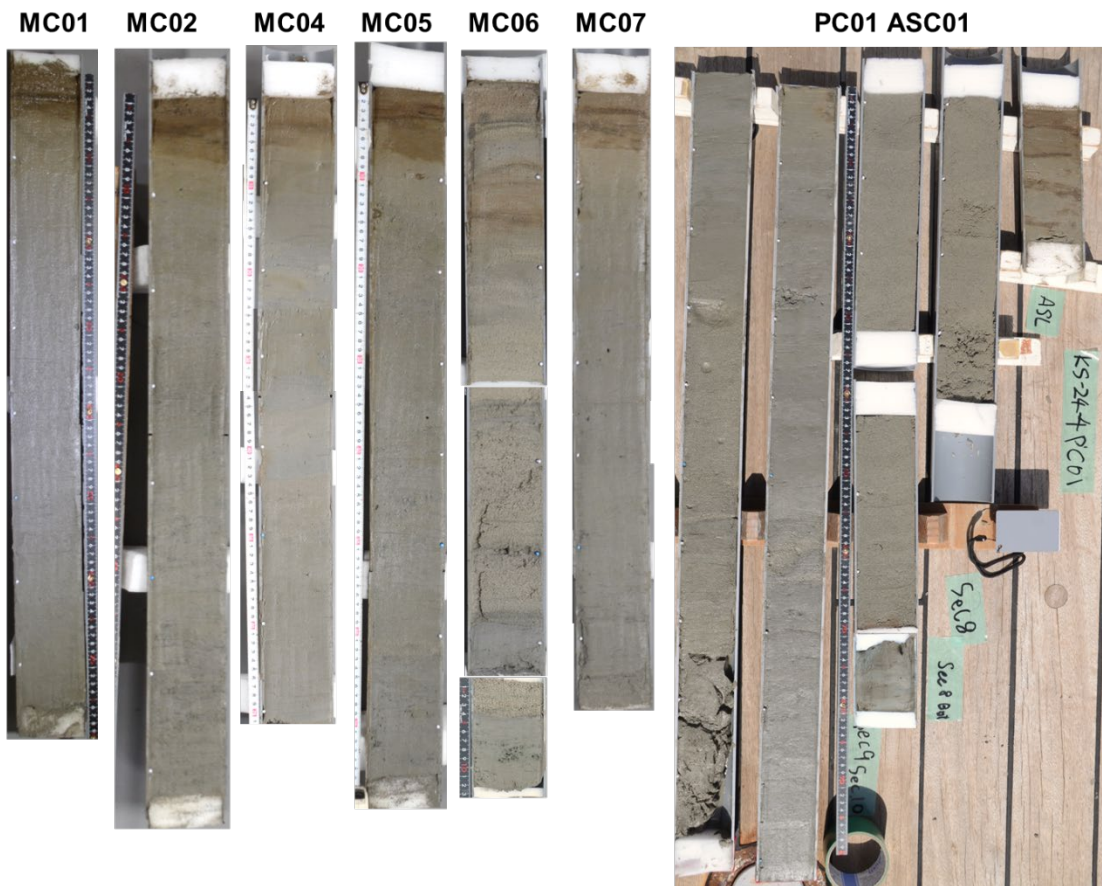


Fig. 4.1 Multiple and piston core sample photos on board.



Fig. 4.2 Captures of deep-sea camera image (Upper: AC-14, Lower: AC-12).

Notice on Using

This cruise report is a preliminary documentation as of the end of cruise.
This report is not necessarily corrected even if there is any inaccurate description (i.e. taxonomic classifications). This report is subject to be revised without notice. Some data on this report may be raw or unprocessed. If you are going to use or refer the data on this report, it is recommended to ask the Chief Scientist for latest status.
Users of information on this report are requested to submit Publication Report to Cooperative Research Cruise office.

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新青丸共同利用研究航海報告書

- * 航海番号 KS-24-4次研究航海
- * 航海名称 奄美大島周辺海域における地震性タービダイトの分布と震度分布の
関係性についての研究
Relationship of seismic turbidite distribution and
strong motion around Amami Island
- * 観測海域 奄美大島周辺海域
Off Amami Island
- * 航海期間 令和6年 3月 11日（月）～令和6年 3月 20日（水）
- * 出港日時・場所 3月 11日 14時 横須賀港
- * 入港日時・場所 3月 20日 10時 横須賀港
- * 寄港期間・場所 なし
- * 研究課題 奄美大島周辺海域における地震性タービダイトの分布と震度分布の
関係性についての研究
- * 主席研究員（氏名・所属・職名）
中西諒・京都大学・特定研究員
- * 研究内容、主調査者、観測項目
 1. 採泥による堆積物観察・サンプリング, 中西諒, ピストンコア・マルチプルコア
 2. 物理探査, 喜岡新, マルチビーム音響測深機・サブボトムプロファイラによる海底探査
 3. 採水・CTD 測定, 井尻暁, ニスキン採水・小型 CTD 測定
- * 乗船研究者氏名・所属・職名
 - 中西 諒・京都大学・特定研究員
 - 成瀬 元・京都大学・准教授
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藤島 誠也・京都大学・大学院生
波多野 泰成・高知大学・大学院生

* 航跡・測点図

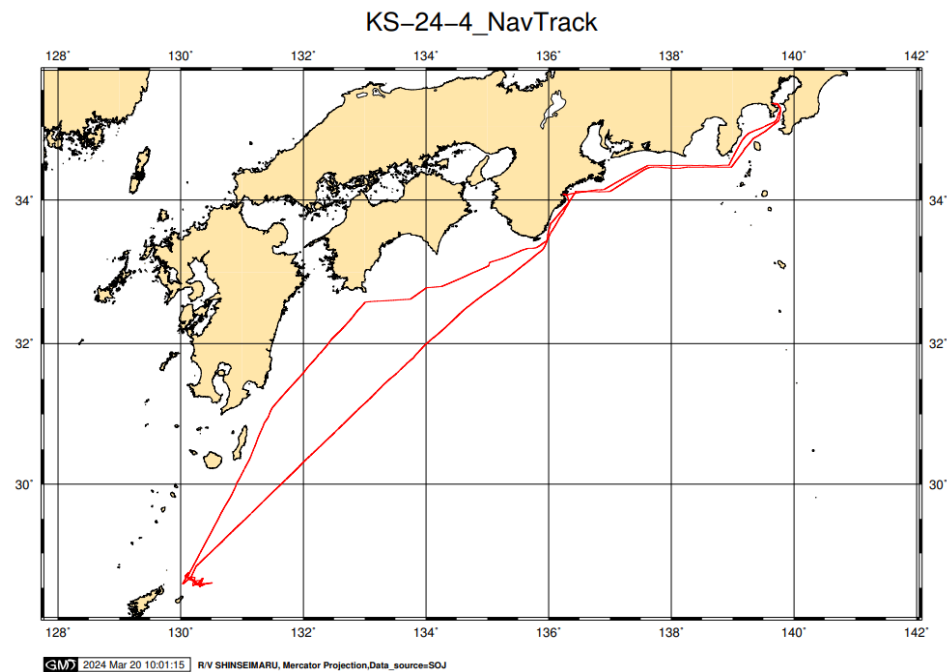


図 1 航跡図

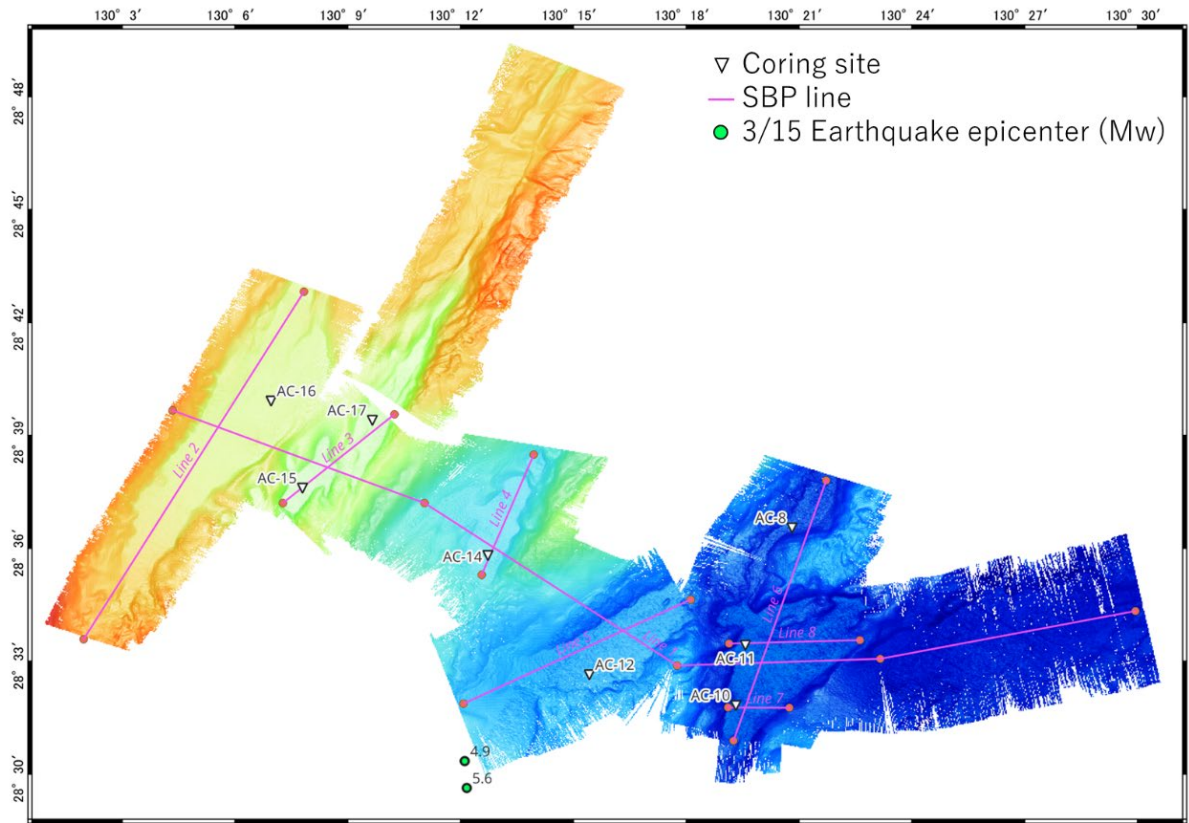


図 2 測線・採泥点

●調査研究の概要

琉球海溝北部に位置する喜界島は日本周辺で最大の隆起速度を示すことから、地震活動に伴う地殻変動が示唆されている。しかしながら、諸島からなる奄美大島周辺では陸上における津波痕跡調査が難しいことから、本地域の古地震履歴は明らかになっていない。本研究は奄美大島周辺で高密度に採泥サンプリングを行うことで、有史時代の地震性タービダイト分布とその形成プロセスを解明し、琉球海溝での古地震履歴と規模推定を目指す。

●実施内容

- (1) マルチビーム測深器による海底地形観測
- (2) ピストンコアラによる堆積物採取
- (3) マルチプルコアラ（カメラ付き）による表層堆積物採取、CTD 観測及び採水
- (4) サブボトムプロファイラーによる表層地質構造観測

●観測内容

観測については以下の表の通り実施された。主に喜界島から北東に位置する7つの海盆を観測対象とした。西から東にかけて水深が大きくなる。マルチプルコアはアーム付き60cm採泥管が6本、フラップ付き100cm採泥管が2本仕掛けられた。60cm採泥管の内2本は穴あきのものを採用し、間隙水採取を行った。マルチプルコアラには深海カメラ×1、ニスキン採水器（12L）×1および水深2000m以深では小型CT・Dセンサー各1機を取り付けた。

表1 採泥位置情報および観測項目

Station	Day and time of touch bottom (JTC)		Latitude			Longitude			Core number	Water Depth (m)	Pore Water	Water sampling	CTD
	Day	Time	deg	min	N/S	deg	min	E/W					
AC-16	Mar. 15, 2024	7:28	28	39.9085	N	130	6.9562	E	MC01	1347		✓	✓
AC-15	Mar. 15, 2024	9:20	28	37.5937	N	130	7.7924	E	MC02	1461	✓	✓	✓
AC-14	Mar. 15, 2024	11:22	28	35.8037	N	130	12.724	E	MC03	1886		✓	✓
AC-8	Mar. 15, 2024	14:06	28	36.5366	N	130	20.814	E	MC04	2400		✓	
AC-11	Mar. 15, 2024	16:23	28	33.417	N	130	19.572	E	MC05	2487	✓	✓	
AC-10	Mar. 16, 2024	8:09	28	31.8155	N	130	19.319	E	PC01	2469	✓	✓	
AC-12	Mar. 16, 2024	11:45	28	32.6324	N	130	15.423	E	MC06	2219	✓	✓	✓
AC-17	Mar. 16, 2024	14:07	28	39.3965	N	130	9.6505	E	MC07	1445	✓	✓	✓

●観測結果

2024. 03. 15

観測点 AC-16

喜界島北部に位置する比較的水深の浅い海盆においてマルチプルコアラ採泥を行った。コア試料（MC01）は75cmで、基本的に泥質の堆積物であった。目立った砂層は見られなかった。

観測点 AC-15

喜界島北部に位置する比較的水深の浅い小規模で閉鎖的な海盆においてマルチプルコアラ採泥

を行った。コア試料（MC02）は72cmで、基本的に泥質の堆積物であった。目立った砂層は見られなかった。

観測点 AC-14

喜界島北東部に位置する小規模な海盆においてマルチプルコアラ採泥を行った。MC03は回収できたのが1本だけで、採取長は25cmであった。基本的に中～細粒砂の砂質堆積物であった。深海カメラでは複数の流向を示すリップルが観察された。

観測点 AC-8

喜界島東部に位置し喜界島側の海盆よりやや水深が浅いセッティングである小規模な海盆においてマルチプルコアラ採泥を行った。コア試料（MC04）は82cmで、基本的に泥質の堆積物であった。目立った砂層は見られなかった。

観測点 AC-11

喜界島東部に位置する海盆においてマルチプルコアラ採泥を行った。コア試料（MC05）は75cmで、基本的に泥質の堆積物であった。最表層にシルトの薄層、62cm付近に砂の薄層が確認できる。

18:00-翌5:00 物理探査

採泥地点を設定した海盆を8notで航走し、MBESおよびSBP観測を行った。MBESでは海底地形探査および反射強度データを取得した。SBPでは海底下の浅部堆積構造を取得した。測線は各海盆を十字に切るように設定した。観測開始日の3/15 19:32には喜界島沖を震源とするMw5.6の地震が発生した。そのため、Line 1の途中からは地震後の地形および浅部構造を収録したことになる。

2024. 03. 16

観測点 AC-10

AC-11と同じ海盆の南側の地点においてアシュラコアラをパイロットとしたピストンコアラ（10m）採泥を行った。コア試料（PC01）は着底時にステンレス管が曲がったため、裁断しながらの回収となった。Sec. 10とSec. 9は接合部を取り外したのちステンレス管を切断し、引き出し回収した。より上位についても30cm台に切断し、堆積物を押し出すことで、最終的に約300cmの回収に成功した。Sec. 10とSec. 9はシルト質堆積物に複数の砂層が介在していた。Sec. 9より上位は砂質堆積物からなる。パイロットコア（ASC01）は塩ビ管を内蔵した採泥管（キャッチャーなし）が30cm程度、フラップをキャッチャーとした採泥管は19cm程度の堆積物を取得した。表層堆積物は深度3cmほどにパッチ上の砂が確認された他は泥質堆積物からなる。

観測点 AC-12

喜界島北東部の喜界島に近い海盆においてマルチプルコアラ採泥を行った。コア試料（MC06）は75cmで、砂層と泥層の互層堆積物が確認された。明瞭な地層境界、級化構造、ラミナ構造が観察された。3/15の震源からの距離は7kmほどであり、本航海の採泥点では最も近い地点であった。

観測点 AC-17

AC-15の東側に位置する海盆においてマルチプルコアラ採泥を行った。コア試料（MC07）は64cmで、基本的に泥質の堆積物であった。最表層にシルトの薄層がみられたものの目立った砂層は見られなかった。

コア試料は船内では冷蔵保存され、常温トラック輸送で高知コアセンターに運ばれた。PC01は高

知大学学術コアレポジトリとして、半裁されたマルチプルコア（MC03を除く）は高知大学に保管されている。

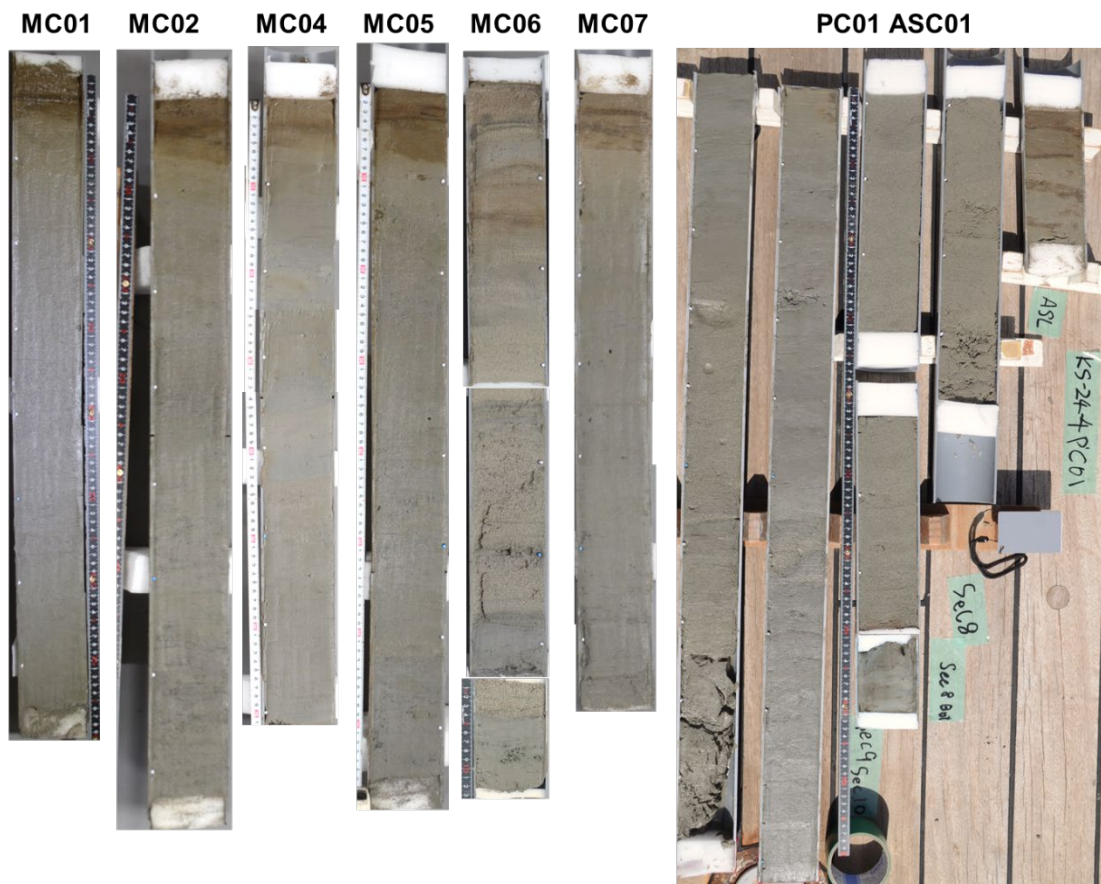


図3 コア試料写真