



KAIREI “Cruise Report”

KR21-20

Nankai Trough

Dec. 14th - Dec. 27th, 2021

Japan Agency for Marine-Earth Science and Technology

(JAMSTEC)

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1. Cruise Information

Cruise ID:KR21-20

Name of vessel: R/V KAIREI

Chief scientist [Affiliation]: Toshiya Kanamatsu [IMG JAMSTEC]

Representative of the Science Party [Affiliation]: Toshiya Kanamatsu [IMG JAMSTEC]

Proposal representative [affiliation]: Toshiya Kanamatsu [IMG JAMSTEC]

Cruise period: Dec. 14th, 2021-Dec. 27th, 2021

Ports of departure / arrival: JAMSTEC pier

Research area: Nankai Trough (**Figure 1**)

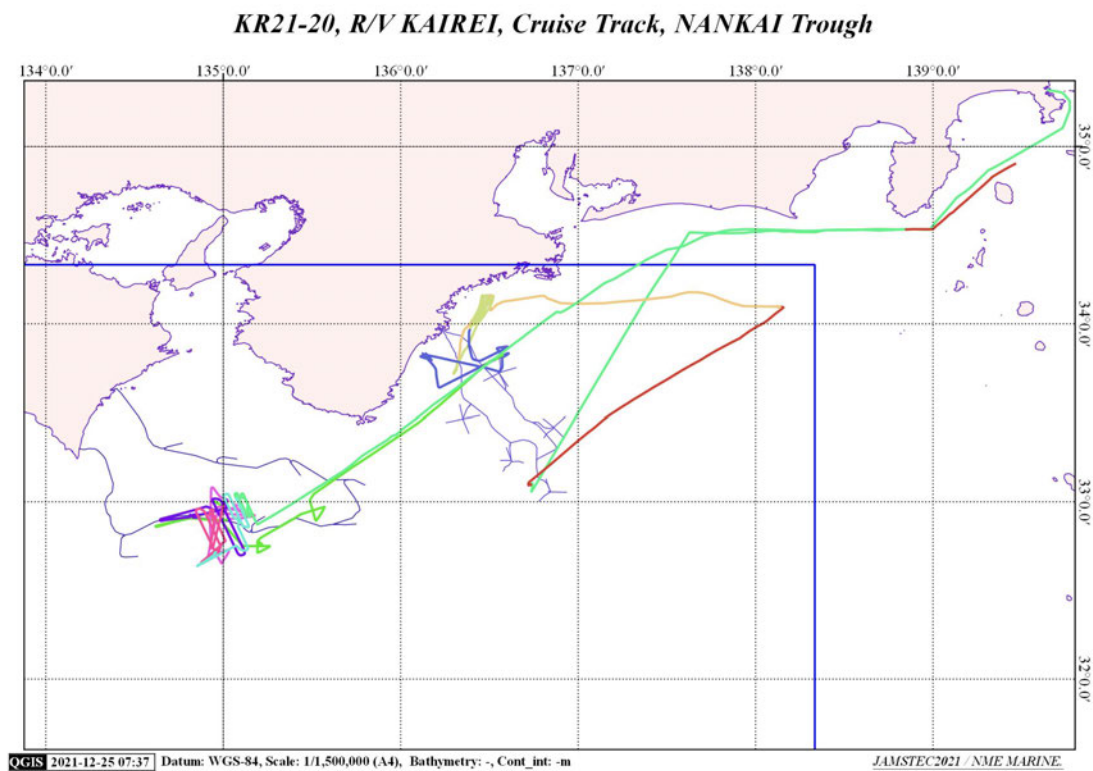


Figure 1: Ship track of KR21-20
Blue line: KR21-20 research area

2. Participant list

R/V KAIREI CREW

Master	TAKAFUMI AOKI
Chief Officer	HIROYUKI KATO
2nd Officer	AKIRA SUZUKI
3rd Officer	TAIGA YAMAMOTO
Chief Engineer	EIJI SAKAGUCHI
1st Engineer	TAKAHIRO MORI
2nd Engineer	YOSHINOBU HIRATSUKA
3rd Engineer	KEITO SHIMADA
Chief Electronics Operator	TOKINORI NASU
2nd Electronics Operator	RYUJI ONIKUBO
3rd Electronics Operator	KOHEI MAEDA
Boat Swain	YOSHIAKI MATSUO
Quarter Master	SHUICHI YAMAMOTO
Quarter Master	KAZUMI OGASAWARA
Quarter Master	SAIKAN HIRAI
Quarter Master	AKIRA KURIHARA
Quarter Master	TOSHIYA SAGA
Sailor	MIZUKI NAKANO
No.1 Oiler	YUKIHIRO YAMAGUCHI
Oiler	SHINYA SUGI
Oiler	DAIKI SATO
Assistant Oiler	KOTA MATSUMURA
Assistant Oiler	FUMIYA NAKASHIMA
Chief Steward	KAZUHIRO HIRAYAMA
Steward	TSUYOSHI NAGATOMO
Steward	MASARU SUGIYAMA
Steward	YUTA HANGAI
Steward	HAYATO OKADA

Scientist Party

Chief scientist	TOSHIYA KANAMATSU
Co-Chief scientist	TOSHIYA FUJIWARA
Scientist	KAN-HSI HSIUNG
Scientist	KEN IKEHARA

Piston / Multiple Coring Operation Team

Party Chief	YOHEI KATAYAMA
Marine Technician	HIROAKI MURAKI
Marine Technician	KAZUMA TAKAHASHI
Marine Technician	YHUTA SHINOMIYA
Marine Technician	YASUSHI HASHIMOTO
Marine Technician	YUKIHIKO NAKANO

Seismic Survey Operation Team

Party Chief	MORIFUMI TAKAESU
Co-party Chief	TOSHIMASA NASU
Chiefs Mechanic	HIDENORI SHIBATA
Observer	YUKI OHWATARI
Navigator	KAZUHO YOSHIDA
Processing Operator	MISAKI HIRIUCHI

3. Cruise Log

<i>Date & Time</i>	<i>Description</i>	<i>Weather / Wind / Sea Condition</i>
2021/12/14 <i>Tue.</i>	Noon Position: 34-53.5N, 139-21.8E (North-ward off IZU-OSHIMA)	r / North-5 / 3
08:00	Onboard "KAIREI" at JAMSTEC	
09:00	Let go all shore lines & left JAMSTEC for research area, KUMANONADA	
10:00-10:40	Carried out education & training for scientists	
13:00	Practiced boat station drill	
14:00	Meeting for research work	
2021/12/15 <i>Wed.</i>	Noon Position: 33-05.7N, 136-44.0E (Off KII Peninsula)	bc / WNW-5 / 3
05:00	Arrived at research area, Off, KII Peninsula	
06:50	Released XBT at 33-05.8486N, 136-44.5012E	
08:00	Started deploying concrete platform	
08:40	Launched concrete platform	
10:26	Concrete platform landed on the sea bottom (D=3586m)	
10:33	Released concrete platform	
11:52	Recovered releaser	
13:00	Restarted deploying concrete platform	
13:21	Launched concrete platform	

14:58	Landed on the sea bottom, but tiltmeter response NG, then shift west-ward	
15:18	Re-landed on the sea bottom (D=3475m)	
15:26	Released concrete platform	
16:41	Recovered releaser	
17:00	Commenced proceeding to next research area, Off OMAESAKI	
2021/12/16 Thu.	Noon Position: 34-05.7N, 138-07.9E (Off OMAEZAKI)	bc / NW-4 / 3
05:00	Arrived at research area (Off OMAEZAKI)	
06:37	Released XBT at 34-05.8706N, 138-07.4099E	
08:22	Launched multiple corer	
09:22	Multiple corer landed at the sea bottom (W.O.=2431m)	
10:14	Recovered multiple corer	
10:56	Launched multiple corer	
11:59	Multiple corer landed at the sea bottom (W.O.=2422m)	
12:50	Recovered multiple corer	
13:00	Commenced proceeding to Off OWASE	
2021/12/17 Fri.	Noon Position: 33-58.4N, 136-22.2E (KUMANO Nada)	bc / West-6 / 4
	Heave to due to bad sea condition.	
2021/12/18 Sat.	Noon Position: 33-52.1N, 136-36.3E (Off OWASE)	bc / NNW-6 / 4
10:00	Arrived at off OWASE	
10:30-14:50	Carried out SBP and MBES mapping survey	
17:00	Commenced heave to.	
2021/12/19 Sun.	Noon Position: 33-49.3N, 136-34.2E (Off OWASE)	bc / West-5 / 3
06:30	Arrived at multiple corer sampling point	
08:31	Launched multiple corer	
09:21	Multiple corer landed at the sea bottom (W.O.=2042m)	
10:04	Recovered multiple corer	
10:20	Launched multiple corer	
11:11	Multiple corer landed at the sea bottom	
11:59	Recovered multiple corer	
13:00	Left research area, Off OWASE	
17:50	Arrived at research area, KII Peninsula	
17:58	Commenced MBES and SBP mapping survey	
2021/12/20 Mon.	Noon Position: 32-55.5N, 135-08.1E (Off KII Peninsula)	bc / NNW-4 / 3
04:46	Finished MBES mapping survey and SBP mapping survey	
08:04-09:28	Carried out streamer cable towing test	
10:37-11:24	Carried out streamer cable towing test	
11:45	Commenced MBES and SBP mapping survey	
14:21	Finished MBES mapping survey and SBP mapping survey	
16:16	Commenced MBES and SBP mapping survey	
18:49	Finished MBES mapping survey and SBP mapping survey	

2021/12/21 Tue.	Noon Position: 32-57.0N, 134-57.2E (Off KII Peninsula)	bc / WNW-5 / 3
06:30	Arrived at piston corer sampling point MK8	
08:47	Launched piston corer	
09:43	Piston corer landed on the sea bottom (D=2010m)	
10:44	Recovered piston corer	
15:05	Commenced veered out streamer cable	
15:09	Launched Lead-In cable	
15:11	Finished deploying streamer cable	
15:15	Launched Air-Gun	
15:18-15:20	Carried out filled up Air-Gun	
15:23	Finished deploying Air-Gun system	
15:27-15:35	Carried out shooting test	
16:00	Commenced S.C.S survey (KR SCS SS15_0)	
18:50	Finished S.C.S survey	
20:20	Commenced S.C.S survey (KR SCS SS16_0)	
2021/12/22 Wed.	Noon Position: 32-58.4N, 134-59.9E (Off KII Peninsula)	bc / NNW-4 / 3
00:17	Finished S.C.S survey (KR SCS SS16_0)	
01:20	Commenced S.C.S survey (KR SCS SS41_0)	
07:08	Finished S.C.S survey	
08:01-08:06	Recovered streamer cable	
08:10-08:14	Recovered Air-Gun	
09:20	Launched piston corer at point MK31	
10:10	Piston corer landed on the sea bottom (D=1900m)	
11:30	Recovered piston corer	
15:07	Launched Air-Gun	
15:08	Carried out filled up Air-Gun	
15:09	Finished deploying Air-Gun system	
15:15	Commenced veered out streamer cable	
15:22	Finished deploying streamer cable	
16:00	Commenced S.C.S survey (KR SCS SS42_0)	
18:30	Finished S.C.S survey	
18:59	Commenced S.C.S survey (KR SCS SS43_0)	
22:20	Finished S.C.S survey	
23:06	Commenced S.C.S survey (KR SCS SS44_0)	
2021/12/23 Thu.	Noon Position: 32-42.7N, 134-57.4E (Off KII Peninsula)	bc / NNE-4 / 3
02:52	Finished S.C.S survey (KR SCS SS44_0)	
08:02-08:07	Recovered streamer cable	
08:10-08:14	Recovered Air-Gun system	
09:42	Launched piston corer at point MK9	
12:56	Recovered piston corer	
15:00	Launched Air-Gun	
15:01	Carried out filled up Air-Gun	
15:02-15:03	Carried out shooting test, then finished deploying Air-Gun system	
15:05	Commenced veered out streamer cable	
15:14	Finished deploying streamer cable	
15:32	Commenced S.C.S survey (KR SCS SS17_0)	
18:50	Finished S.C.S survey	

20:10	Commenced S.C.S survey (KR SCS SS45_0)	
2021/12/24 Fri.	Noon Position: 32-56.6N, 135-08.4E (Off KII Peninsula)	bc / SSE-5 / 3
01:50	Finished S.C.S survey (KR SCS SS45_0)	
02:37	Commenced S.C.S survey (KR SCS SS46_0)	
04:54	Finished S.C.S survey	
05:38	Commenced S.C.S survey (KR SCS SS48_0)	
09:05	Finished S.C.S survey	
09:40	Commenced S.C.S survey (KR SCS SS49_0)	
11:08	Finished S.C.S survey	
11:42	Commenced S.C.S survey (KR SCS SS50_0)	
13:45	Finished S.C.S survey	
14:07	Commenced S.C.S survey (KR SCS SS51_0)	
15:59	Finished S.C.S survey	
16:03-16:05	Recovered Air-Gun	
16:12-16:16	Recovered streamer cable	
16:18	Released XBT	
16:30	Commenced proceeding to YOKOSUKA	
2021/12/25 Sat.	Noon Position: 34-54.7N, 139-28.9E (NE off IZI-OHSHIMA)	bc / NW-3 / 2
14:40	Let go anchor, arrived at YOKOSUKA port Section No.4	
2021/12/26 Sun.	Noon Position: 35-19.1N, 139-39.0E (JAMSTEC)	- / --- / -
09:10	Heaving anchor, left YOKOSUKA port Section No.4	
09:50	Sent out 1st shore line, arrived at JAMSTEC	
2021/12/27 Mon.	Noon Position: 35-19.1N, 139-39.0E (JAMSTEC)	- / --- / -
12:00	Scientists disembarked, then completed voyage KR21-20.	

4. Research objectives

Occurrence properties of past Nankai Trough Earthquakes are studied using sedimentary records. This cruise surveyed Off Cape-Muroto-Kii peninsula, Off Owase, Off Omaezaki area. Regarding deep-sea turbidite as earthquake proxy, their spatio-temporal distribution will be studied for understanding rupture zone and recurrence. Sediment collection using piston corer and multi-corer, sub-bottom profiling for refined coring point. Single-channel seismic was conducted the deeper structure of the coring point. The concrete platforms for gravity measurements were installed in the seafloor of the DONET1 area.

5. Instruments and Operations

5-1. Research Vessel KAIREI

R/V KAIREI is the exclusive support ship for the 7,000m class remotely operated vehicle "KAIKO7000II", R/V KAIREI is equipped with geophysical instruments such as a multi-channel seismic profiler. The major instruments installed in KAIREI are a multi-beam bathymetric mapping system (Sea Beam3012), an integrated sub-bottom profiler, a gravity meter, a proton magnetometer, three components magnetometer, and various kinds of sampling devices such as piston corer and dredge. There are several onboard laboratories for data recording, and data and sample analysis. These are the Research Room, Mission Control & Computer Room, Wet laboratory (chemistry and biology), Dry laboratory (Geophysics), Gravimeter room, KAIKO Operation's Center, Rocks and sediment laboratory, Library, Video Room and Personal computer Room. The ship also has an aft wheelhouse that overlooks the entire aft operations deck for the operation of the vessel, winches, A-frame, and cranes during station work such as dredge hauls, piston coring and sampling, launch and recovery operations.

The general specifications of R/V KAIREI

Length overall	106.0 m
Beam overall	16.0 m
Depth	7.3 m
Draft	4.5 m
Gross tonnage	4,517 tons
Service speed	16.7 knot
Main propulsion system	Diesel engines 2,206kW x 2
Main propulsion method	Controllable pitch propeller x 2

5-2. Multi-beam Echo-sounder System and Sub-bottom Profiler

The specifications of SeaBeam 3012

Technical Data	
Operating frequency	12 kHz
min. depth	50m below transducers
max. depth	11,000 m (full ocean depth)
number of Beams	301 equi-distance
Accuracy	< 1 % of water Depth (Average Across Swath)
Side scan	12-Bit Resolution to maximum 2000 pixels
Average Footprint Resolution	2° x 1.6°
Max. Vessel Speed	6 knots (100 % Coverage @ 140° swath) 12 knots (100 % Coverage @ 120° swath)
Workstations	Computer with Windows 7 operating system
measurement method	Swept beam technique
Environmental limits for compensation	
Roll	±10°
Pitch	±7°

Yaw $\pm 5^\circ$

The specifications of BATHY-2010

Depth Ranges	10, 20, 40, 80, 150, 300, 500, 750, 1000, 2000, 5000, 12000 Meters
Strata Resolution	Up to 6 cm with 200 Meter of bottom penetration bottom type dependent
Depth Resolution	0.1 Meters
Depth Accuracy	$\pm 0.3\%$ to 6000 m
Frequency Output	3.5 KHz

5-3. Concrete Platform (CP)

The CP will be used as a station of repeated seafloor gravity and water pressure measurement. The circular truncated cone-shaped CP has a bottom diameter of 1.6 m, a top diameter of 0.8 m, and a height of 0.35 m (Fig. 5-3-1). The weight of the CP is 895 kg in air and 514 kg in water. Additional yellow square marks were put on the top, which would be beneficial to know its orientation, and reflective tapes were put on the sidewall to make it easier to find by an ROV.

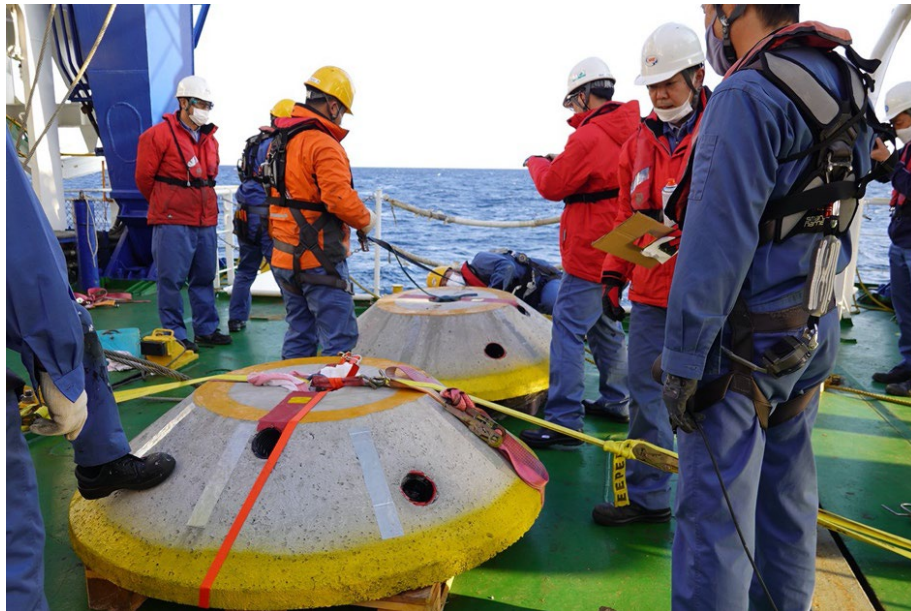


Fig. 5-3-1: Concrete platform.

5-4. XBT (eXpendable Bathy Thermograph)

The sound velocity profile of the local water column, which was used for calibration of depth data for the bathymetry, was estimated from a temperature profile based on an in-situ Expendable Bathythermograph (probe type T05).



Fig.5-4-1: Release of XBT probe using XBT Launcher

5-5. Single Channel Seismic Equipment

The single channel seismic survey equipment and specification is as follows and Fig 5-5-1.

Streamer	All Line(s)
Manufacturer	S.I.G Multi-Channel Streamer
Active section length	60m (Hydrophone section 30m)
Hydrophone Interval	0.41m
Type of Hydrophone	S.I.G.16
Hydrophone output	-183 dB, re 1V/ μ bar, ± 1 dB
Frequency	flat ± 1 dB, over the frequency range 10 to 1000 Hz
Depth sensor	None
Preamp Gain	26 dB (Unvariable)
Power Supply Unit Gain	0 dB
Lead in cable length	135m

Source	Sercel
Manufacturer	GI Gun
Type of airgun	(G:45 cu.in, I:105 cu.in), 1 array
Volume 150 cu.in	1 3.5MPa
Air pressure	2 m
Source depth	Hotshot ver. 3.3000
Gun Controller	

Air Compressor

Manufacturer	Leobersdorfer Maschinenfabrik Ag Wien
Type of machine	LMF 24/150-E60
Air supply Capacity	24m ³ /min.× 3 Units (Use one unit)

Recording System

Manufacturer	GEOMETRICS
Type of system	Geode ver. 11.1.69.0
Recording format	SEG-D 8058 Rev.1 Promax
Recording length	4000msec ,7000msec
Water Delay	0msec
Sample rate	1msec
Analog Gain (12dB or 24dB)	12dB
High cut filter	None
Low cut filter	3Hz
Recording media	Hard Disk

GPS System

Manufacturer	Fugro
Type of system	Star Pack
DGPS Reference Station	Best Position Reference Station (OCSAT)

NAVIGATION SYSTEM

Manufacturer	MARIMEX JAPAN
Type of system	NAVLOG ver. 2.2.8

Air-Gun Shot

Time mode shooting	true mode
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Shot interval

- 7 sec :SS15_0, SS46_0, SS48_0, SS49_0, SS50_0, SS51_0
- 10sec :SS16_0 ,SS17_0 ,SS41_0 ,SS42_0 ,SS43_0 ,SS44_0, SS45_0

Geodetic Parameter

eroid	WGS84
Semi-major Axis	6,378,137m
Inverse Flattening	298.26
Projection	U.T.M Zone53

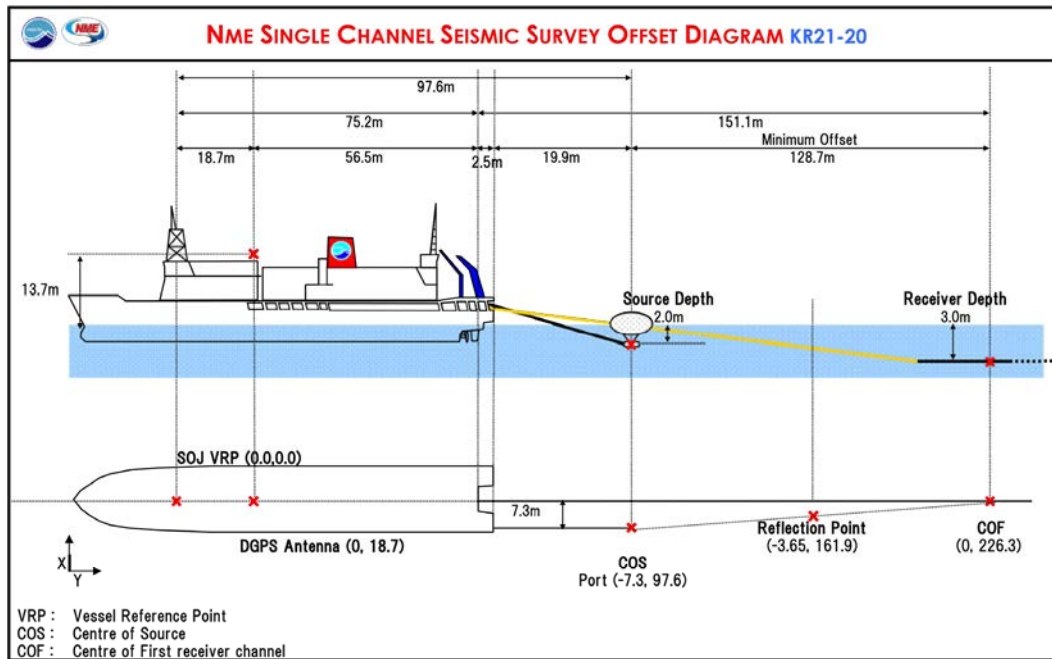


Fig. 5-5-1: The single channel seismic survey equipment and specification.

5-6. Piston corer and Multiple corer

Piston corer (PC)

Piston core sampler system consists of 0.59-ton weight, 4 m or 6 m long stainless-steel barrels trigger which works as the balance and a pilot core sampler (**Fig. 5-6-1**). In addition, the polyvinyl chloride (PVC) liner tube is inside the stainless steel barrel. The inner diameter (I.D.) of the liner tube is 75 mm. The total weight of the system is approximately 0.8 tons. The piston is composed of two O-rings (size: P63). For a pilot core sampler, we used a “74 mm diameter long-type pilot corer” which is 112 kg weight, 70 cm long of the stainless-steel pipe, and the Poly-carbonate liner tube. The transponder (KAIYO DENSHI Co., Ltd.) was attached to the winch wire above 50 m from the PC to monitor the PC position. At the beginning of the operation of the PC, a speed of wire out was set to 20 m/min, and then increased lowering speed up to 60 m/min gradually. Wire out was stopped at a depth about 100 m above the seafloor for about 3 minutes to stabilize some pendulum motion of the system. After the wire tension was stable, the wire out was restarted at a speed of 20 m/min, and we carefully watched a tension meter to observe the reaching of the PC to the seafloor. When the corer reached the seafloor, wire tension abruptly decreased by the loss of the corer weight. Wire out was stopped immediately when the corer hit the seafloor. Winding of the wire was started at a speed of 20 m/min until the tension gauge indicates that the corer was lifted off the seafloor. After leaving the PC from the seafloor, the winch wire was wound at maximum speed.

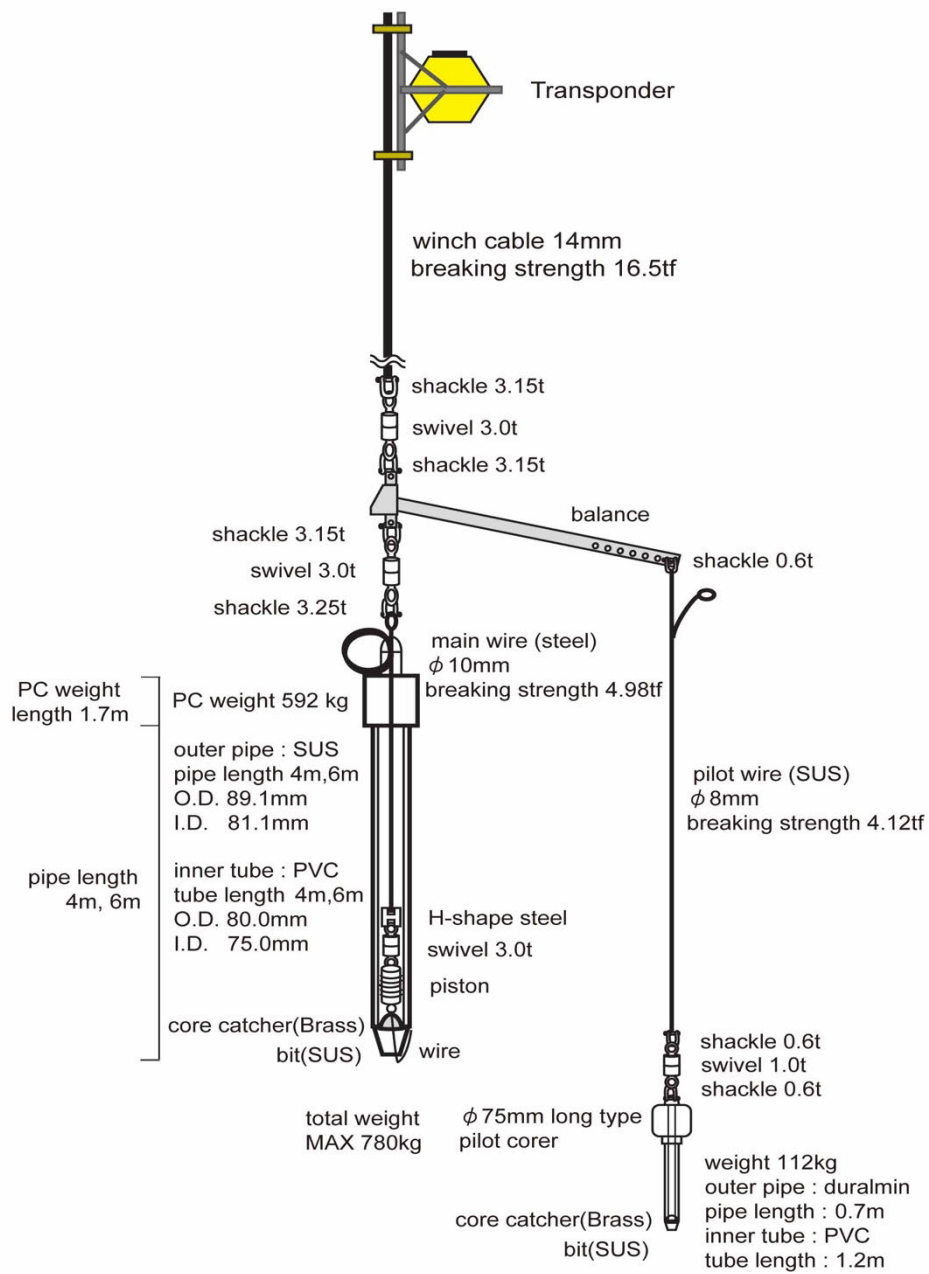
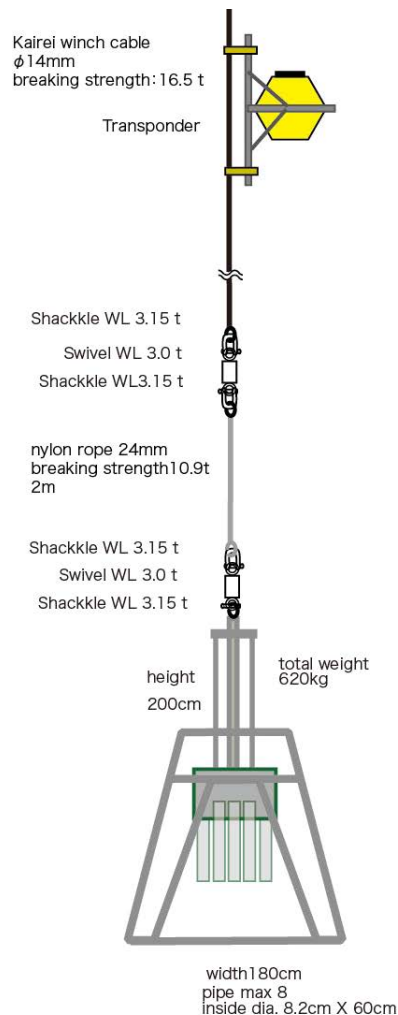


Fig. 5-6-1. Piston coring system used in this cruise

Multiple Corer (MC)

Multiple Corer consists of a frame (620 kg in weight) and eight sub-corer attachments. The sub-corer attachments are made of pipes from acryl or polycarbonate, these are used for the sediment coring. These pipes are 60 cm in length, and the diameter is 74 mm. The construction of the MC system is shown in **Fig. 5-6-2**. The wire out speed is up to 60 m/min. The MC is stopped at the depth about 50 m above the seafloor, and then it is kept for 3 minutes. After that, the wire is run out in 18 m/min. It is estimated by the changes of wire tension value whether MC arrive at or leave from the seafloor.



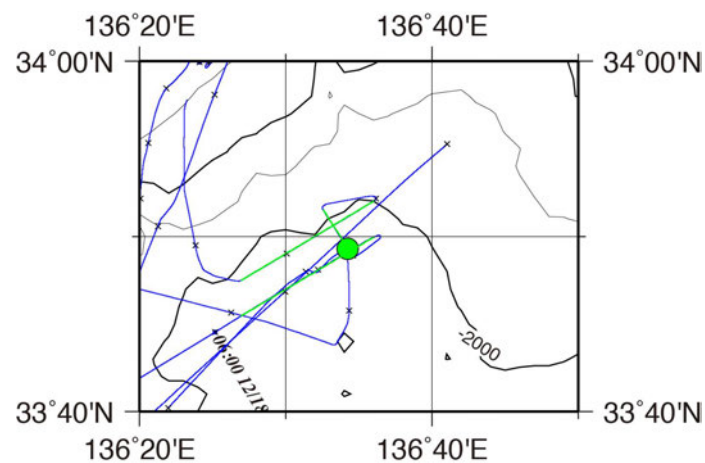
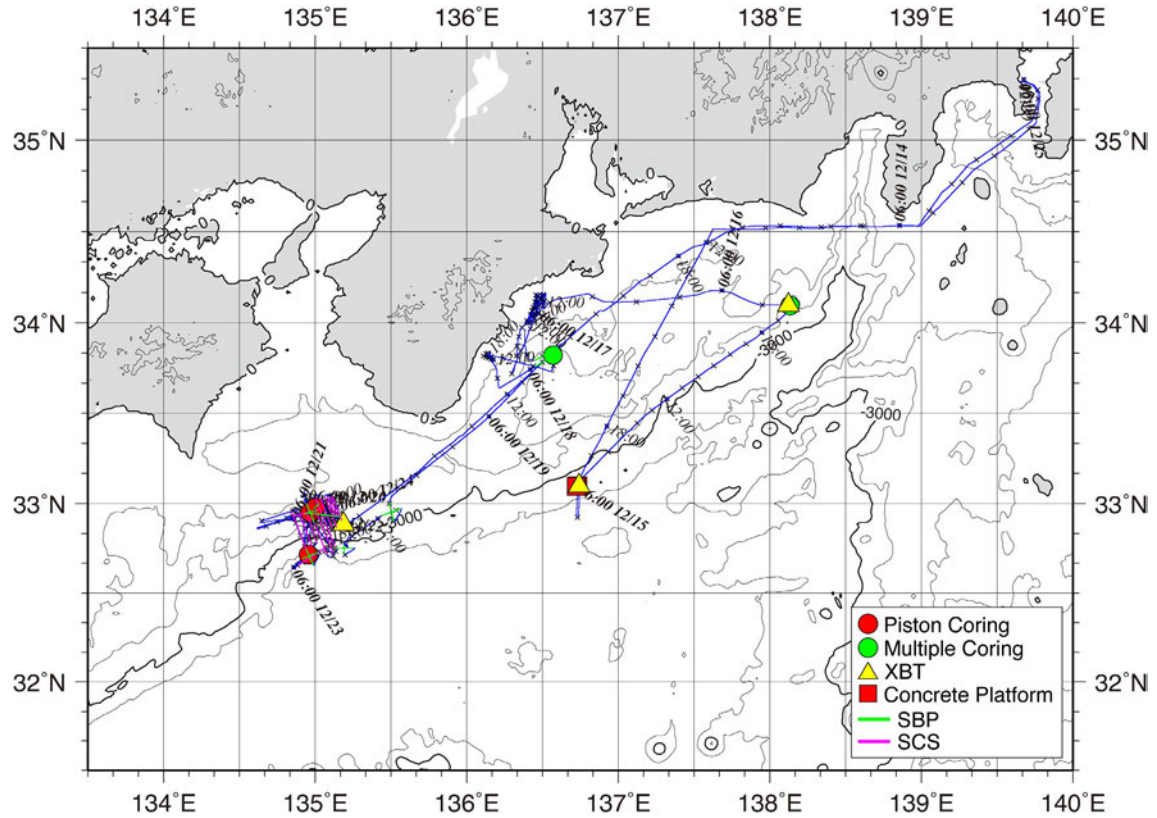
multiple corer

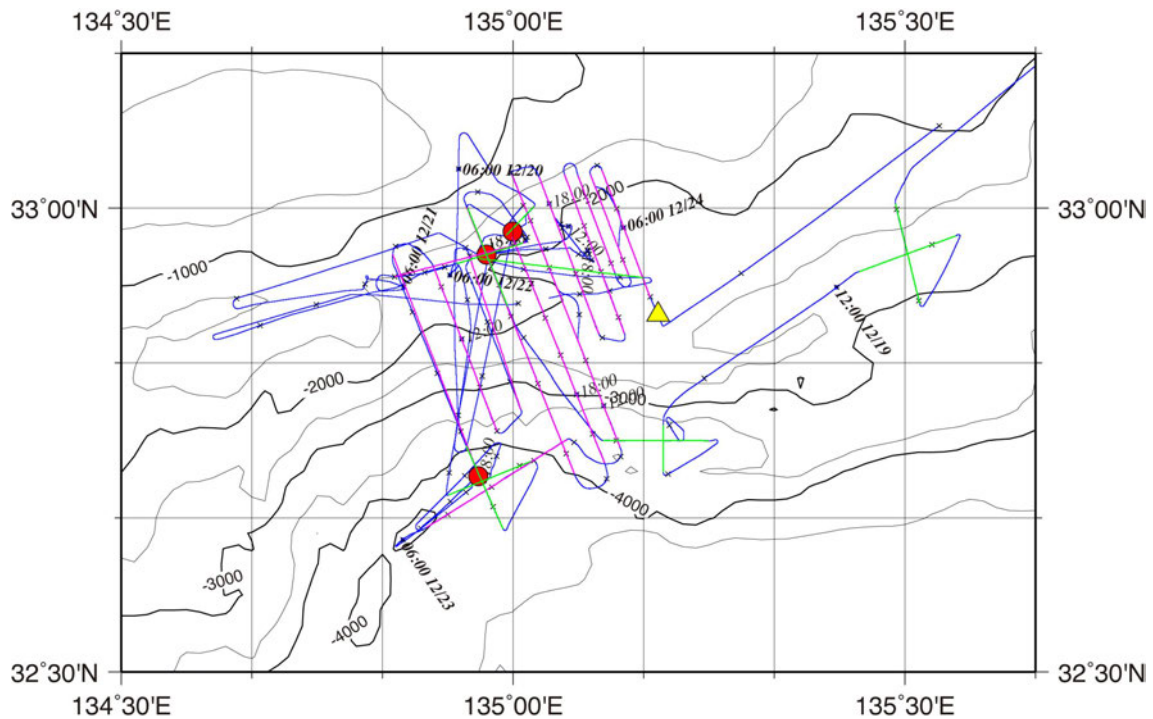
Fig. 5-6-2 MC system

6. Preliminary results

6-1. Ship track

Survey ship tracks are shown in the flowing figures (Figs. 6-1-1, 6-1-2, 6-1-3).





6-2. Deployment of Concrete Platform (CP)

6-2-1. Deployment of Concrete Platform (CP)

In the KR21-20 cruise, two concrete platforms were deployed on the seafloor off-Kumano in the landward slope in the Nankai Trough. The deployment operation was carried out on December 15, 2021 (See Cruise Log).

6-2-2. Selection of the Location

The location of two CP stations was selected in the vicinity of the DONET1-C nodes. The criteria for selection of the location are that the two stations are ~1 km apart and have a larger difference in depths. The distance of ~1 km enables an ROV to round trip measurement in one dive. A larger depth difference allows for calibration of the scale factor of the gravimeters during the survey.

However, the CP stations must be placed away from currently operated submarine cables at a distance greater than the water depth of the CP stations. Because many submarine cables are laid in this area, it is difficult to find an ideal location.

6-2-3. Operational Procedure

The CP was connected to the ship winch cable with an acoustic release system, a wire, a nylon rope, and a weight of 350 kg. A transponder (13.5 kHz) was attached to the ship winch cable at 50 m from its end for SSBL positioning (**Figs. 6-2-3-1 and 6-2-3-2a**). The acoustic release system consists of a frame, a tilt meter, a transducer, and a releaser (**Fig. 6-2-3-2b**). The releaser is connected to the ring in the central hole of the CP.

The CP was touched down on the seafloor using the ship winch. The tiltmeter measured tilt angles and determined if the angle was within 7° . The transducer was used for communication with the tiltmeter and the releaser. The CP was released from the frame by the releaser via acoustic release commands. In the second CP deployment, the tilt angle was greater than 7° at the first touchdown. In that case, the CP was taken off the seafloor, moved about 100 m, and touched down again. The CP was deployed on the seafloor after the confirmation of the tilt angle within 7° .

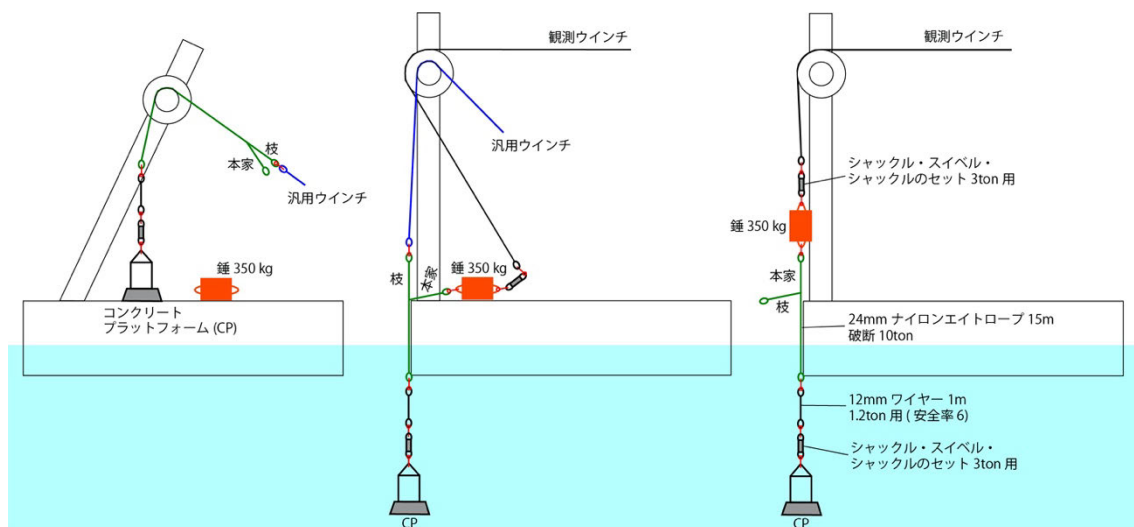




Fig. 6-2-3-2: (a) Cable connection of the CP release system. (b) Acoustic release system.

The resultant locations and depths measured by the cable transponder are as follows (Table 6-2-3-1, Fig. 6-2-3-2). The depth difference between the two CP locations is about 90 m.

Table 6-2-3-1: Locations of concrete platform deployment.

KR2120CP1	136° 44.0169'E	33° 05.7857'N	3496.49 m*
KR2120CP2	136° 43.3000'E	33° 05.6662'N	3406.15 m*

* Depth of the cable transponder (Sound velocity was referred to the XBT measurement prior to the operation). To estimate the seafloor depths, 70 m will be added to the transponder depths in consideration of 50 m from the end of the winch cable to the transponder and 20 m from the end of the winch cable to the bottom of the CP.

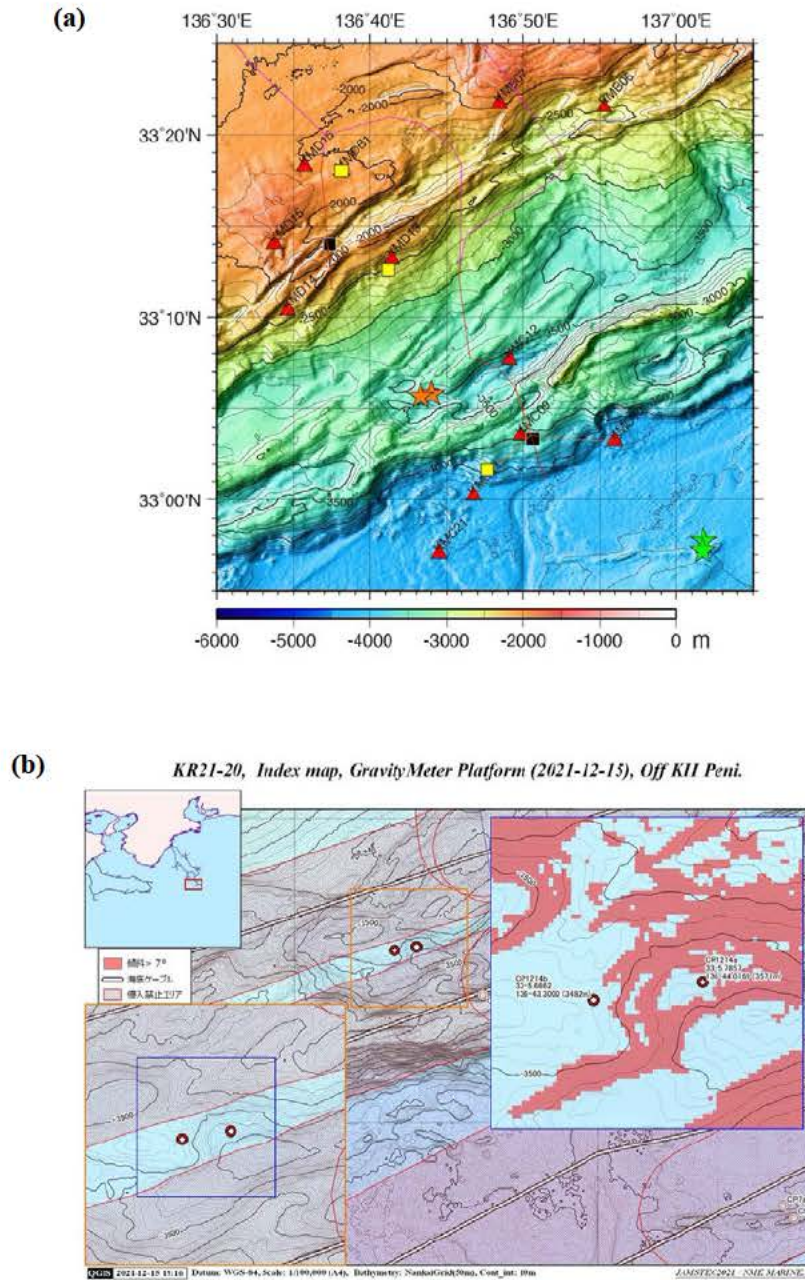


Fig. 6-2-3-2: (a) Orange stars show the location of the CP deployment. Green stars show the location of the CP deployment in the KR20-09 cruise in 2020. Red triangles and black squares show the DONET1-C nodes, and yellow squares show IODP drilling sites. (b) Marks of red circles with white rhombuses point to the location of the CP deployment. Red hatched area indicates restricted areas due to submarine cables. Red-colored areas in the inset show areas with a slope angle of $>7^\circ$. Contour interval is 10 m.

6-3. XBT

Locations of XBT measurements and temperature depth profile are shown in **Table 6-3-1** and **Fig. 6-3-1**.

Table 6-3-1: Positions of XBT measurements.

Num	Date	time	Lat.	Long.	Probe Type	Max depth (m)
0115	2021/12/14	21:50:29	33-05.8486N	136-44.5012E	T05	1830
0116	2021/12/15	21:37:35	34-05.8706N	138-07.4099E	T05	1830
0117	2021/12/24	07:18:09	32-53.1136N	135-11.0857E	T05	1830

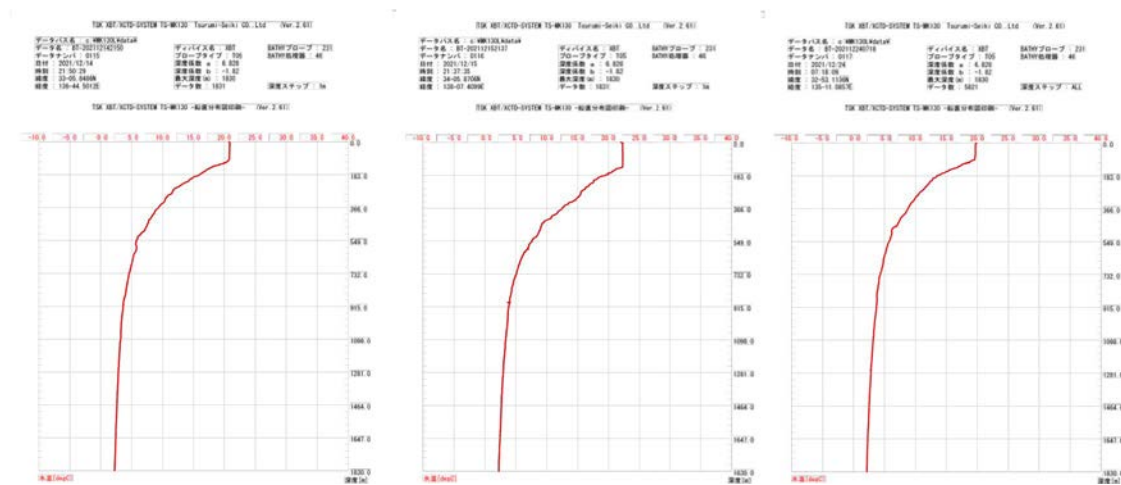


Fig. 6-3-1: Temperature profiles obtained by XBT measurement on 2021/12/14, 2021/12/15, and 2021/12/24 from left to right.

6-4. MBES and SBP surveys

6-4-1. Multibeam Bathymetric Survey

Multibeam bathymetric data were collected using a SeaBeam 3012 echo sounder with a 12 kHz frequency and a $2^{\circ} \times 1.6^{\circ}$ (T×R) beamwidth. Sound velocity profiles in the water column were calculated using measurements from XBT measurements using a TS-MK-30 digital converter at 3 locations (See 5-3). Note that the XBT measurements were not made during December 16-24. Therefore, sound velocity corrections may be needed for the bathymetric data during the period. The bathymetric surveys were conducted at ship speeds of 4-6 knots along the tracks simultaneously single-channel seismic reflection or sub-bottom profile data were acquired. The bathymetry in the survey area is shown in **Fig. 6-4-1** and **Table 6-4-1**.

Table 6-4-1 MBES survey line list

	Time (UTC)	Lat	Long	Depth (m)	File	Ship heading	Remark (Velocity)
2021/12/18							
OWSb2_in	01:30:06	33-47.4923N	136-26.9497E	2043	20211218013020.xse	70.0	20211215xibt.ssv
					20211218024605.xse		
OWSb2_out	02:57:57	33-52.0313N	136-36.0339E	1991	20211218025759.xse	58.0	
OWSb3_in	03:30:09	33-51.5212N	136-32.5601E	1983	20211218033003.xse	148.0	
OWSb3_out	03:59:37	33-48.9373N	136-34.5553E	2042	20211218035925.xse	153.0	
OWSb1_in	04:23:00	33-49.9712N	136-36.0326E	2033	20211218042251.xse	249.0	
					20211218053521.xse		
OWSb1_out	05:50:29	33-45.4513N	136-26.9267E	2046	20211218055004.xse	241.0	
2021/12/19							
KR23_in	08:56:16	33-00.2695N	135-29.2863E	2342	20211219085611.xse	175.0	20211214xibt.ssv
KR23_out	10:01:49	32-53.8372N	135-31.1256E	3120	20211219100200.xse	161.0	
KR22_in	10:43:35	32-58.2097N	135-33.9105E	2894	20211219104323.xse	258.0	
KR22_out	11:48:31	32-55.8949N	135-26.5076E	2920	20211219114900.xse	257.0	
					20211219131425.xse		
KR21_in	13:26:45	32-45.9932N	135-11.4989E	3740	20211219132500.xse	183.0	
KR21_out	13:55:42	32-42.9922N	135-11.4957E	3579	20211219135553.xse	179.0	
KR20_in	14:33:07	32-44.9914N	135-14.9749E	3784	20211219143236.xse	281.0	
KR20_out							
Off the line (fishing ship)	14:51:55	32-45.0238N	135-12.7294E	3742	20211219145215.xse	304.0	
KR20_in							
Return to the line.	15:18:29	32-44.9922N	135-12.8804E	3692	20211219151816.xse	276.0	
KR20_out	16:08:06	32-45.0133N	135-06.9020E	3512	20211219160755.xse	276.0	
KR15_in	17:18:13	32-53.6416N	134-59.5802E	1810	20211219171807.xse	346.0	
KR15_out	18:27:25	33-00.0181N	134-56.5097E	1264	20211219182646.xse	348.0	

KR14_in	19:02:22	32-57.7441N	135-00.7727E	1872	20211219190224.xse	251.0	
KR14_out	19:46:56	32-56.3940N	134-55.6509E	1876	20211219194639.xse	255.0	
					20211219194639.xse		
					20211219205002.xse		
					20211219215139.xse		
					20211219225820.xse		
2021/12/20					20211220001503.xse		
					20211220013402.xse		
KR31_in	02:45:50	32-55.5040N	135-09.9805E	2260	20211220024509.xse	281.0	
					20211220040118.xse		
KR31_out	04:28:35	32-56.7296N	134-57.4169E	2032	20211220042831.xse	286.0	
KR30_in	04:53:26	32-58.2568N	134-59.4934E	1905	20211220045310.xse	63.0	With Avoiding drifting ship IN
KR30_out	05:21:23	33-00.1065N	135-01.6008E	1871	20211220052119.xse	45.0	
KR17_in	07:14:30	32-44.8961N	134-56.2985E	3697	20211220071419.xse	156.0	
KR17_out	08:15:37	32-39.2957N	134-59.2245E	4055	20211220081528.xse	148.0	
KR16_in	08:52:16	32-43.6530N	135-01.3729E	4148	20211220085245.xse	250.0	
KR16_out	09:49:26	32-41.4810N	134-55.0602E	4186	20211220094916.xse	250.0	
2021/12/21							
KRSCS14_in	08:17:19	32-56.4342N	134-55.8027E	1891	20211221081652.xse	62.0	
					20211221093226.xse		
KRSCS14_out	10:08:35	32-58.5388N	135-00.7487E	1885	20211221100845.xse	329.0	
					20211221111240.xse		
KRSCS15long_in	11:21:30	32-59.9865N	134-56.4830E	1255	20211221112035.xse	152.0	

					20211221122941.xse		
					20211221134544.xse		
KRSCS15lon g_out suspended	15:17:51	32-42.8363N	135-04.7035E	3979	20211221151743.xse	153.0	
SS41_in	16:09:49	32-43.0111N	135-07.1786E	3590	20211221160945.xse	339.0	16:20 start
					20211221175300.xse		
					20211221191522.xse		
					20211221203342.xse		
					20211221214703.xse	352.0	
SS41_out	22:08:21	32-58.1199N	134-59.9423E	1882	20211221221506.xse		finish
2021/12/22							
SS42_in	07:00:54	32-56.8373N	134-56.6786E	1902	20211222070110.xse	166.0	07:00 start
					20211222081523.xse		
SS42_out	09:31:14	32-46.9995N	135-00.6028E	3423	20211222093250.xse	122.0	09:31finish
SS43_in	09:59:23	32-45.6118N	134-58.7780E	3655	20211222095918.xse	9.0	09:59start
					20211222113142.xse		
					20211222124622.xse		
SS43_out	13:18:34	32-56.0133N	134-53.9975E	1801	20211222132113.xse	356.0	13:20 finish
SS44_in	14:19:59	32-56.0201N	134-51.0195E	1480	20211222141939.xse	142.0	14:06 start
					20211222153921.xse		
					20211222171109.xse		
SS44_out	17:53:40	32-42.5513N	134-57.4877E	4327	20211222175334.xse	127.0	17:53 finish
2021/12/23							
SS17_in	06:34:22	32-39.4200N	134-53.4740E	3798	20211223063409.xse	61.0	06:32 start
					20211223082406.xse		
SS17_out	09:51:27	32-45.0834N	135-04.1476E	3857	20211223095158.xse	53.0	09:50 finish
SS45_in	11:16:43	32-44.9360N	135-08.0252E	3615	20211223111131.xse	347.0	11:10 start

					20211223124539.xse		
SS45_out off the line	13:28:25	32-51.4785N	135-04.9642E	2295	20211223132836.xse	13.0	
SS45 return to the line	14:35:27	32-54.8067N	135-03.3967E	1940	20211223143523.xse	352.0	
					20211223155042.xse		
SS45_out	16:57:44	33-02.1665N	134-59.9110E	1233	20211223165737.xse	346.0	16:56 finish
SS46,47_in	17:33:11	33-02.2212N	135-01.8794E	1383	20211223173304.xse	147.0	17:37 start
					20211223184625.xse		
SS46,47_out	19:55:01	32-51.8472N	135-06.5792E	2367	20211223195507.xse	137.0	19:54 finish
SS48_in	20:38:36	32-51.9087N	135-08.5153E	2394	20211223203829.xse	0.0	20:40 start
					20211223215720.xse		
					20211223231420.xse		
SS48_out	00:05:27	33-02.1459N	135-03.9493E	1523	20211224000517.xse	354.0	00:05 finish
SS49_in	00:40:18	33-02.1041N	135-04.9677E	1651	20211224004013.xse	153.0	00:40:00 start
					20211224015519.xse		
SS49_out	02:08:22	32-55.8774N	135-07.7598E	2229	20211224020827.xse	148.0	02:08 finish
SS50_in	02:42:28	32-55.6747N	135-08.8477E	2335	20211224024232.xse	349.0	02:42 start
SS50.0_out off the line	03:12:46	32-57.3535N	135-08.0984E	2130	20211224031256.xse	353.0	
					20211224043020.xse		
SS50_return to the line	04:34:46	33-01.5149N	135-06.2103E	1860	20211224043442.xse	345.0	
SS49_out	04:46:08	33-02.1820N	135-05.9214E	1722	20211224044604.xse	344.0	13:45 finish
SS51_in	05:06:30	33-02.5048N	135-06.7858E	1679	20211224050623.xse	158.0	14:07 start
					20211224062202.xse		
SS51_out	07:00:27	32-54.2233N	135-10.5035E	2302	20211224070023.xse	158.0	

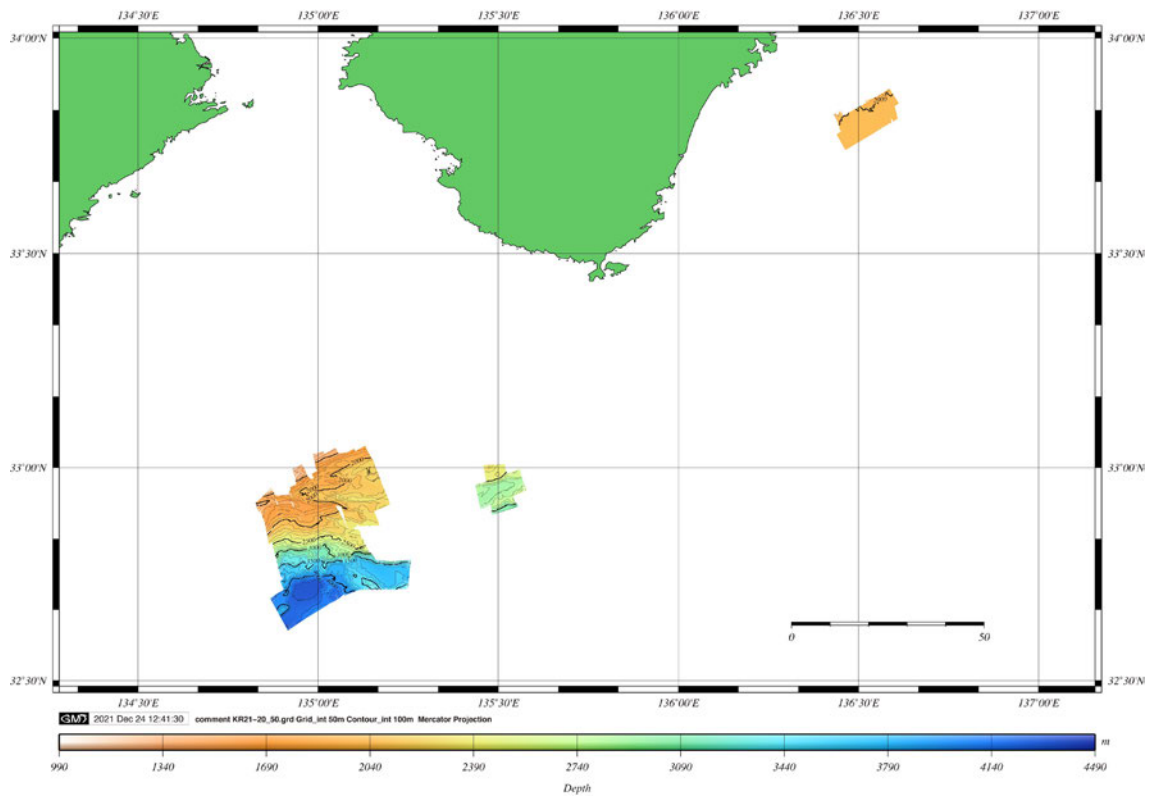


Fig. 6-4-1: Bathymetry of the survey area. Contour interval is 100 m.

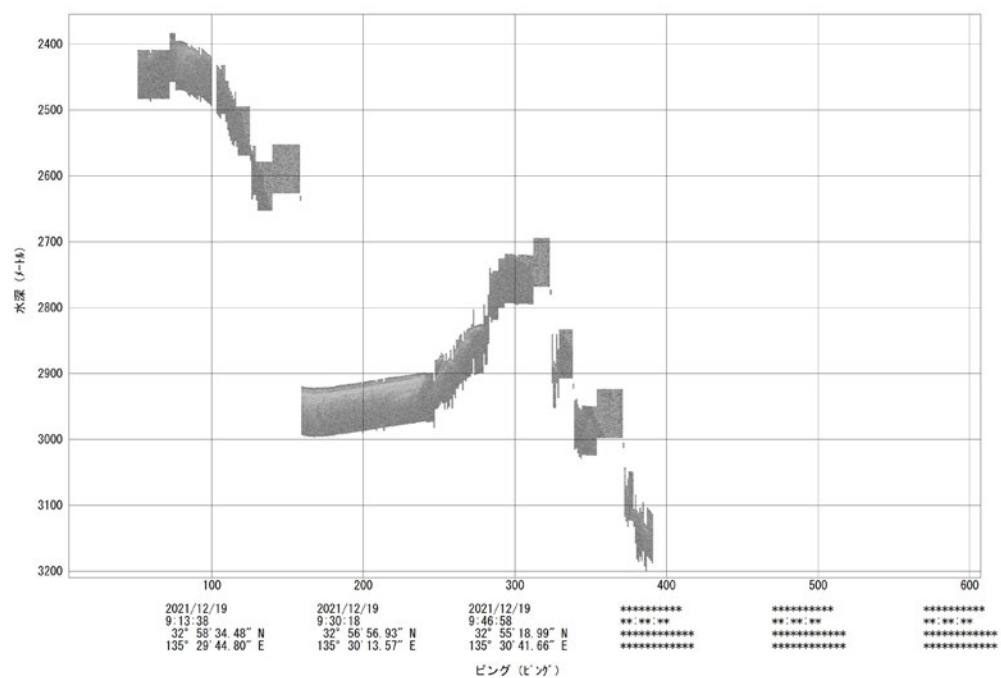
6-4-2. Sub-Bottom Profiler Survey

Sub-Bottom Profiler data were collected using a Bathy 2010 sub-bottom profiler with a 3.5 kHz frequency and a $<36^\circ$ beamwidth. Survey ship speeds were 5-6 knots. The survey was conducted to inspect piston coring and multiple coring sites for deposition in slope sedimentary basins in the landward slope of the Nankai Trough (**Table 6-4-2, Figs. 6-3-2a – j**).

Table 6-4-2: SBP survey line list

	Time (UTC)	Latitude	Longitude	Water depth (m)	File name	heading	power	gain
Dec. 18th					20211218011002P-LF.seg			
OWSb2_in	01:30:06	33-47.4923N	136-26.9497E	2043	20211218013017P-LF.seg	70.0	-12	3
	02:10:00				-			3→6
	02:26:00				-		-12→-6	
	02:35:00				-		-6→-12	
	02:43:00				-			6→3
OWSb2_out	02:57:57	33-52.0313N	136-36.0339E	1991	-	58.0		
OWSb3_in	03:29:41	33-51.5591N	136-32.5308E	1981	20211218032927P-LF.seg	150.0		3→6
	03:38:01	33-50.8166N	136-33.0943E	2004	-	153.0		6→9
OWSb3_out	03:59:40	33-48.9330N	136-34.5588E	2042	-	152.0		
OWSb1_in	04:22:42	33-49.9816N	136-36.0615E	2033	20211218042238P-LF.seg	251.0		9→6
OWSb1_out	05:50:12	33-45.4666N	136-26.9556E	2052	-	240.0		
Dec. 19th								
KR23_in	08:56:16	33-00.2695N	135-29.2863E	2342	20211219085640P-LF.seg	175.0		
KR23_out	10:01:54	32-53.8290N	135-31.1286E	3126	20211219100215P-LF.seg	162.0		
KR22_in	10:44:08	32-58.1900N	135-33.8572E	2894	20211219104349P-LF.seg	259.0	-6	9
KR22_out	11:48:31	32-55.8949N	135-26.5076E	2920	-	257.0		
KR21_in	13:26:45	32-45.9932N	135-11.4989E	3740	20211219132602P-LF.seg	183.0	0	12
KR21_out	13:55:42	32-42.9922N	135-11.4957E	3579	-	179.0		
KR20_in	14:33:07	32-44.9914N	135-14.9749E	3784	20211219143240P-LF.seg	281.0	0	12
KR20_out 漁船避航	14:51:55	32-45.0238N	135-12.7294E	3742	-	304.0		
KR20_in 再開	15:18:29	32-44.9922N	135-12.8804E	3692	20211219151810P-LF.seg	276.0	0	12
KR20_out	16:08:06	32-45.0133N	135-06.9020E	3512	-	276.0		
KR15_in	17:18:13	32-53.6416N	134-59.5802E	1810	20211219171648P-LF.seg	346.0	-6	12
	17:40:40	32-55.6577N	134-58.6154E	1989	-	345.0	ping200 0→5000	
	17:57:05	32-57.1873N	134-57.8717E	1990	-	342.0	ping500 0→2000	
KR15_out	18:27:16	32-59.9985N	134-56.5184E	1268	-	344.0		
KR14_in	19:02:22	32-57.7441N	135-00.7727E	1872	20211219190233P-LF.seg	251.0		
KR14_out	19:46:50	32-56.3973N	134-55.6624E	1875	-	255.0		
					20211219194714P-LF.seg			
Dec. 20th							-6	12
KR31_in	02:45:50	32-55.5040N	135-09.9805E	2260	20211220024518P-LF.seg	281.0		
KR31_out	04:28:39	32-56.7308N	134-57.4108E	2032	-	286.0		
					20211220044507P-LF.seg		-6	12
KR30_in	04:53:26	32-58.2568N	134-59.4934E	1905	20211220045318P-LF.seg	63.0	ping200 0m	ドリフト 船を避けて IN
KR30_out	05:21:23	33-00.1065N	135-01.6008E	1871	-	45.0		
							-6	
KR17_in	07:16:49	32-44.6744N	134-56.4084E	3864	20211220071437P-LF.seg	152.0	ping500 0m	15→ 12
KR17_out	08:15:37	32-39.2957N	134-59.2245E	4055	-	148.0		
					20211220081944P-LF.seg			
KR16_in	08:52:21	32-43.6503N	135-01.3639E	4148	20211220085235P-LF.seg	250.0		
KR16_out	09:49:21	32-41.4843N	134-55.0693E	4193	-	250.0		

(a)



(b)

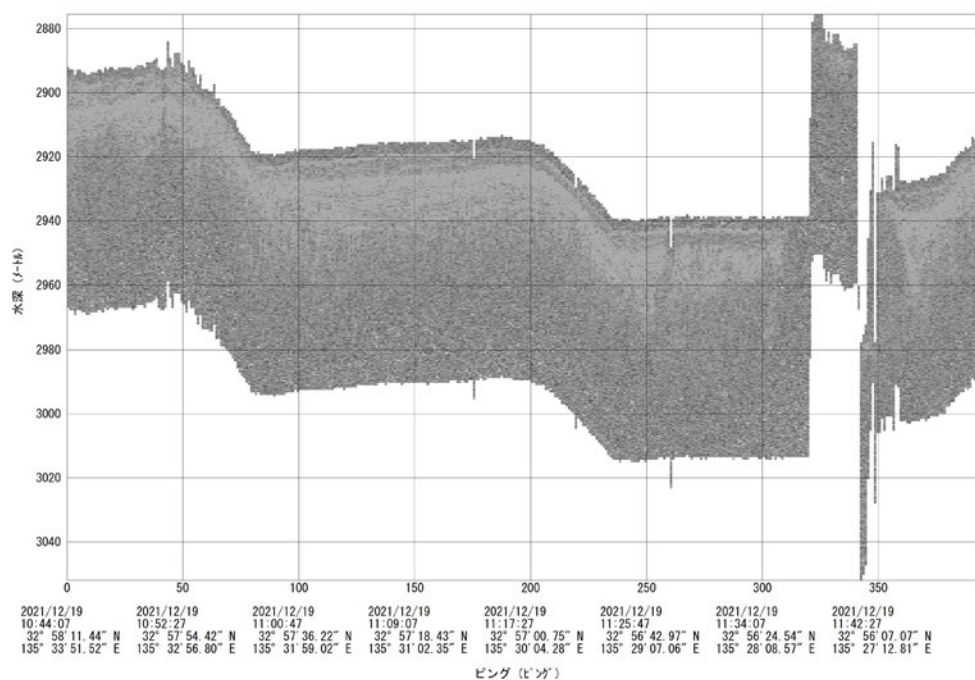
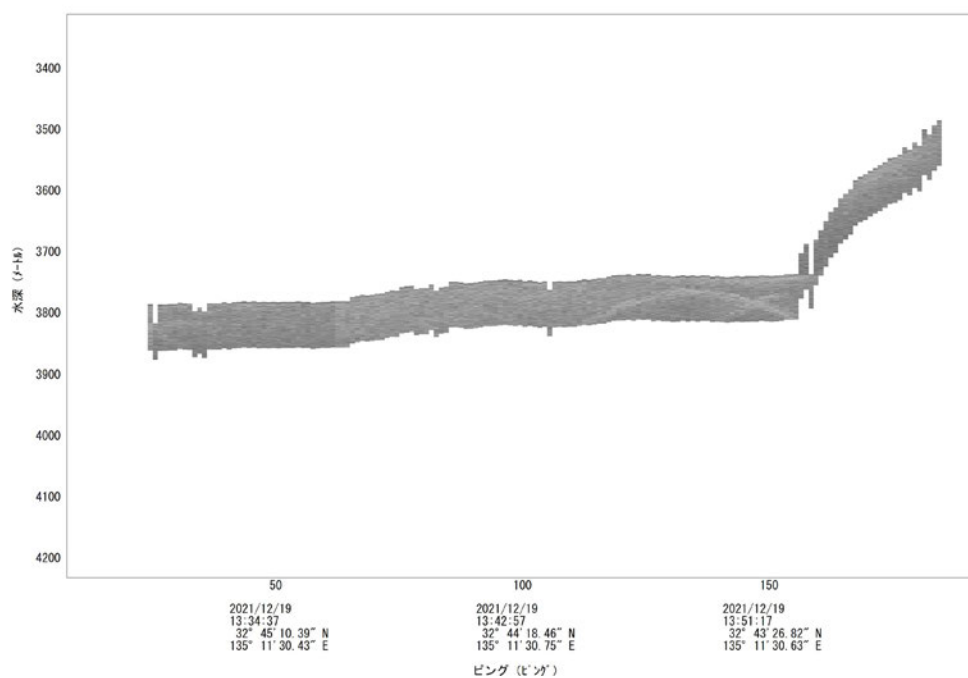


Fig. 6-4-2 (a): Image of SBP KR23 line; **(b):** Image of SBP KR22 line.

(c)



(d)

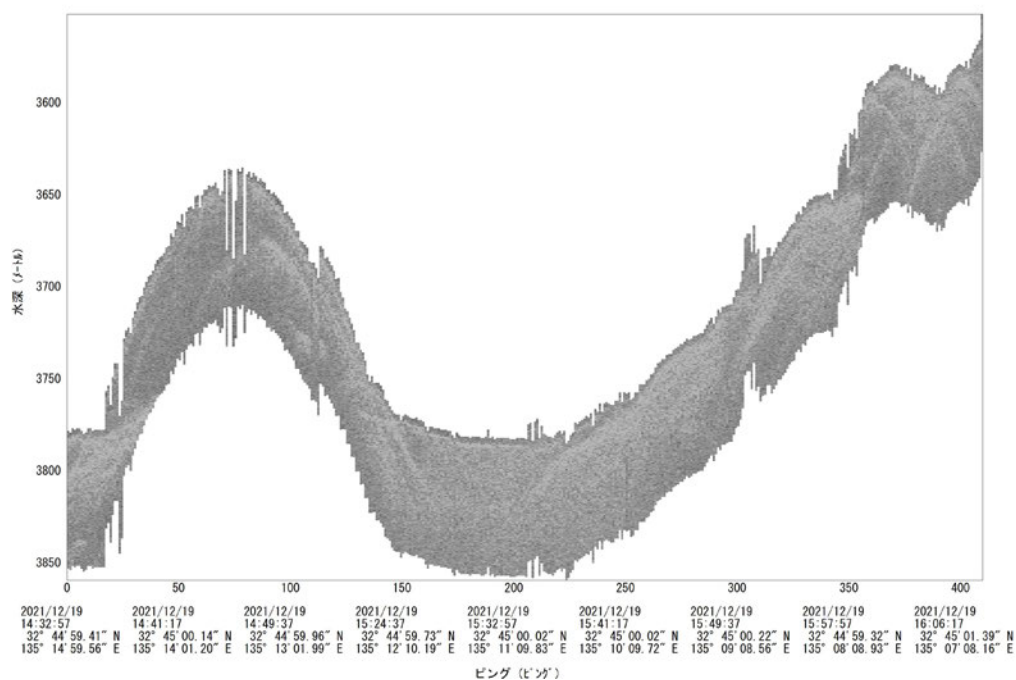
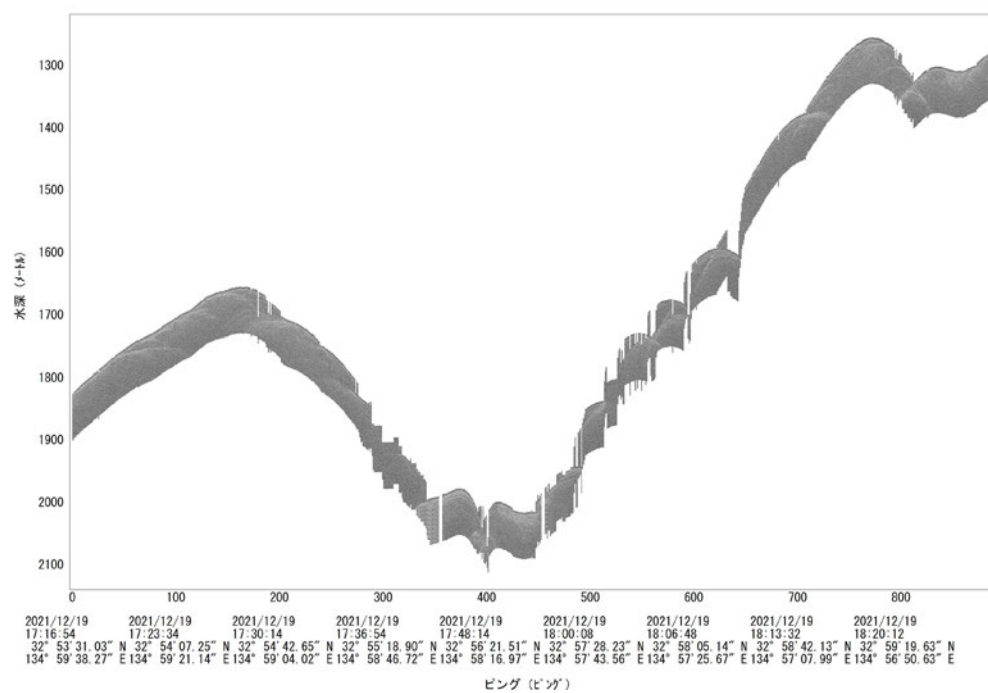


Fig. 6-4-2 (c): Image of SBP KR21 line; (d): Image of SBP KR20 line.

(e)



(f)

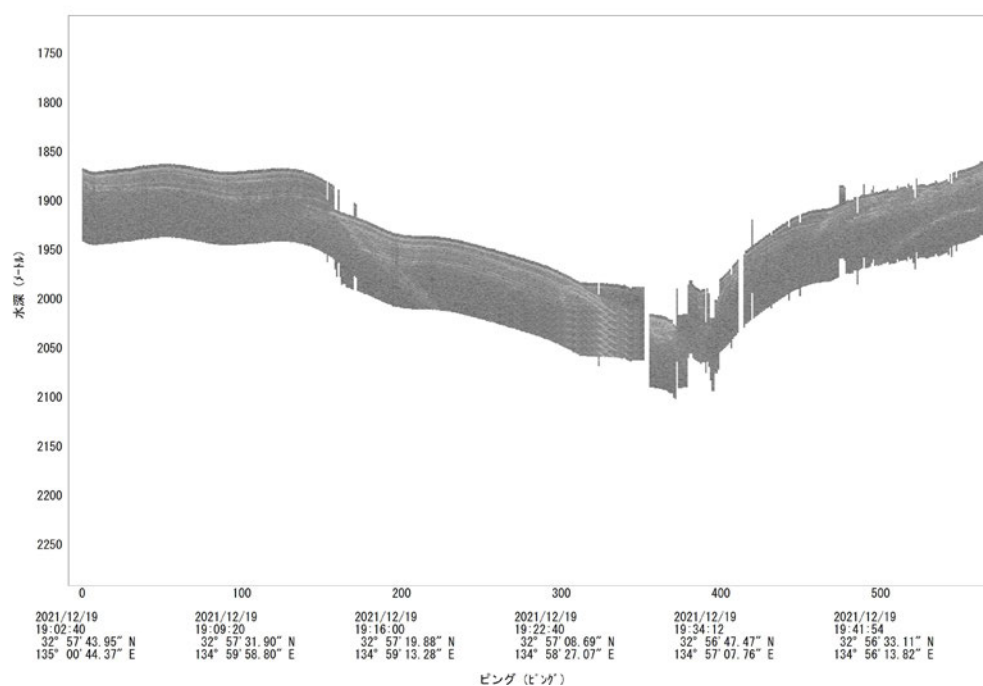
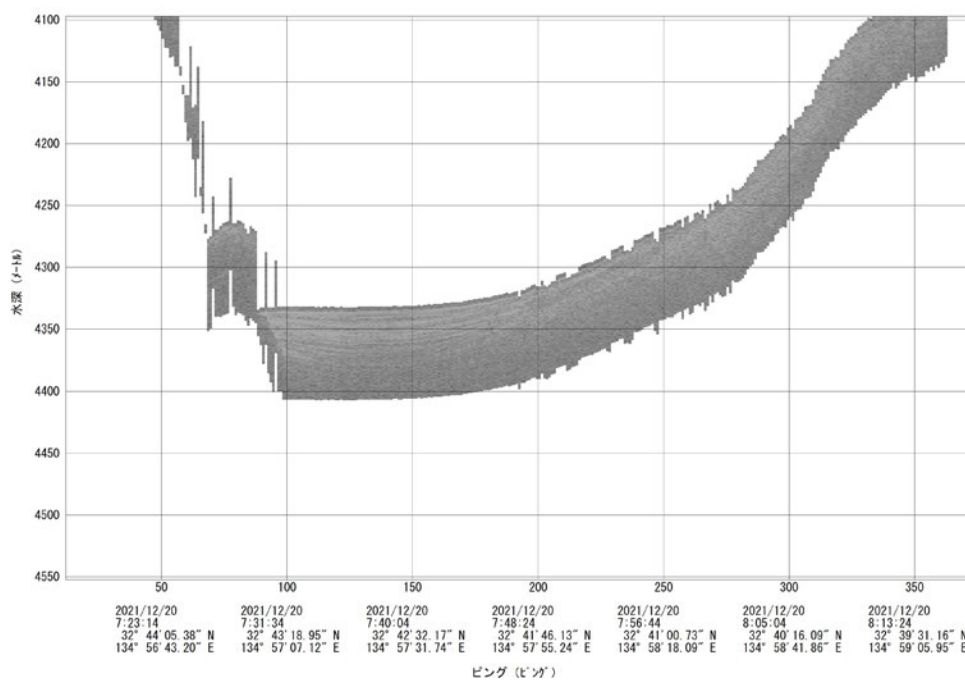


Fig. 6-4-2 (e): Image of SBP KR15 line; (f): Image of SBP KR14 line

(g)



(h)

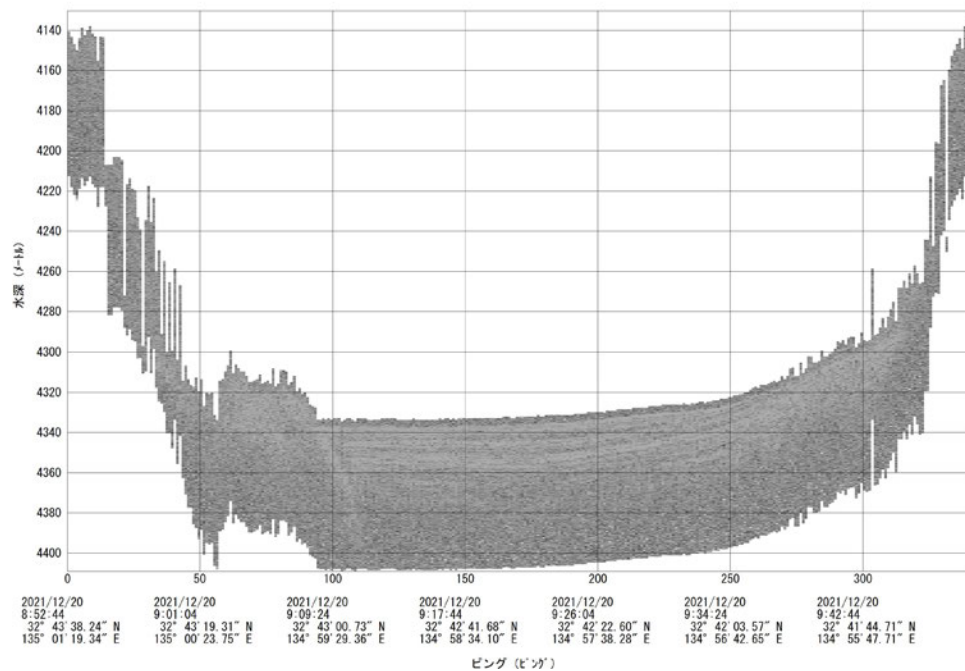
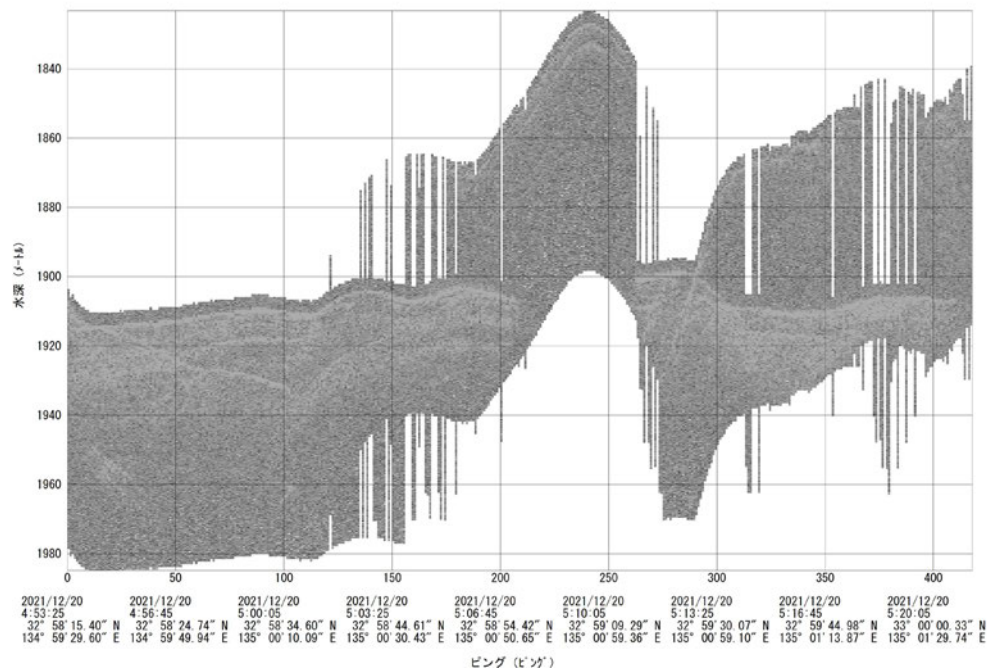


Fig. 6-4-2(g): Image of SBP KR17 line; **(h):** Image of SBP KR16 line.

(i)



(j)

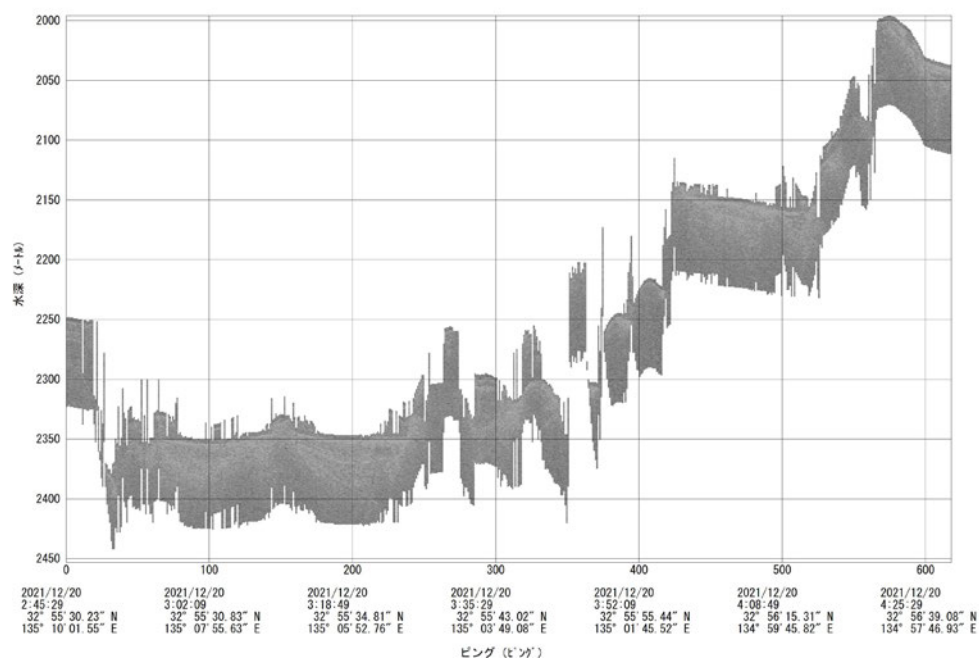


Fig. 6-4-2 (i): Image of SBP KR30 line; (j): Image of SBP KR31 line.

6-5. SCS survey

6-5-1. Data Correction

A GI gun (Sercel) with an air-pressure of 13.5 MPa was used for a seismic source. Chamber size of 150 cu in. (Generator: 45 cu in., Injector: 105 cu in.) was chosen to generate a higher frequency seismic signal. The GI gun was towed 20 m behind the ship from the port side and towing depth was ~2 m. A 12-channel streamer (S.I.G), which consists of a 60 m active section (hydrophone section 30 m) and a 135 m lead-in cable, was towed behind the ship. Towing depth of the streamer was ~3 m. Survey ship speed was ~4 knots, and shots were fired at a time spacing of 10 seconds (~20 m spacing) or 7 seconds (~14 m spacing). The record lengths were 7 seconds (SS16, SS41, SS42, SS43, SS44, SS17, SS45) and 4 seconds (SS15, SS46, SS48, SS49, SS50, SS51), respectively. Detailed information of the survey is described in APPENDIX.

SCS Box Survey area was laid out to reveal the sub-surface structure of the landward slopes of the Nankai Trough in the 135°E area. Some survey tracks are winding to avoid net fisheries and ships traffic (**Fig. 6-5-1**). Information of survey lines is in **Table 6-5-1**. The obtained seismic profiles are shown in **Figs. 6-5-2a - m**.

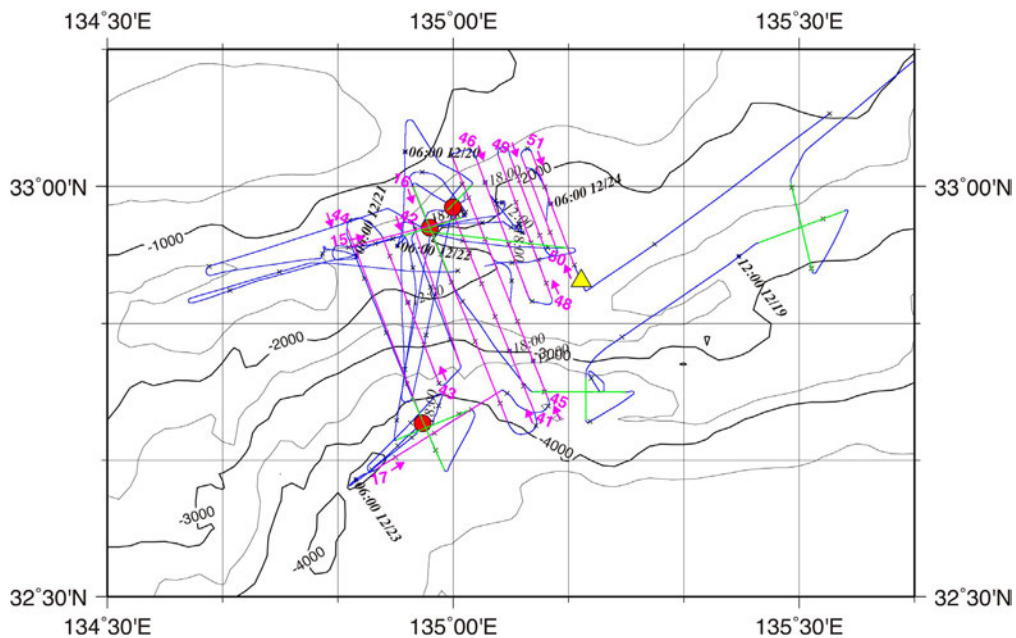


Table 6-5-1 SCS line list

  NME SCS SURVEY LINE LIST KR21-20								
Line No.	Date (UTC)	Time (UTC)	Passing Point	Shot No.	Vessel Position		Length [m]	Direction [deg]
					Lat.	Lon.		
SS15_0	2021/12/21	7:00:07	F.S.P = F.G.S.P	1001	32-55.57205N	134-50.93536E	16,183	72.8
	2021/12/21	9:50:20	L.S.P = L.G.S.P	2436	32-57.78648N	135-00.93750E		
SS16_0	2021/12/21	11:20:20	F.S.P = F.G.S.P	1001	33-00.06752N	134-56.44501E	34,291	158.1
	2021/12/21	15:17:22	L.S.P = L.G.S.P	2410	32-42.87025N	135-04.68567E		
SS41_0	2021/12/21	16:20:20	F.S.P = F.G.S.P	1001	32-43.53035N	135-07.02026E	29,195	337.6
	2021/12/21	22:08:37	L.S.P = L.G.S.P	3066	32-58.13232N	134-59.93591E		
SS42_0	2021/12/22	7:00:50	F.S.P = F.G.S.P	1001	32-56.84120N	134-56.67847E	19,506	159.0
	2021/12/22	9:30:42	L.S.P = L.G.S.P	1887	32-47.02744N	135-00.58594E		
SS43_0	2021/12/22	9:59:31	F.S.P = F.G.S.P	1001	32-45.61707N	134-58.77502E	20,889	338.9
	2021/12/22	13:20:45	L.S.P = L.G.S.P	2191	32-56.15547N	134-53.93280E		
SS44_0	2021/12/22	14:06:21	F.S.P = F.G.S.P	1001	32-56.98036N	134-50.78796E	28,633	157.9
	2021/12/22	17:52:42	L.S.P = L.G.S.P	2341	32-42.60063N	134-57.45300E		
SS17_0	2021/12/23	6:32:52	F.S.P = F.G.S.P	1001	32-39.37386N	134-53.38165E	19,808	57.9
	2021/12/23	9:50:52	L.S.P = L.G.S.P	2177	32-45.06638N	135-04.11713E		
SS45_0	2021/12/23	11:10:47	F.S.P = F.G.S.P	1001	32-44.59740N	135-08.17291E	35,719	338.3
	2021/12/23	16:56:58	L.S.P = L.G.S.P	3057	33-02.12791N	134-59.92950E		
SS46_0	2021/12/23	17:37:10	F.S.P = F.G.S.P	1001	33-01.97365N	135-02.00867E	19,958	159.2

	2021/12/23	19:54:32	L.S.P = L.G.S.P	2160	32-51.88156N	135-06.56250E		
SS48_0	2021/12/23	20:38:22	F.S.P = F.G.S.P	1001	32-51.89758N	135-08.51990E	20,309	339.2
	2021/12/24	0:05:32	L.S.P = L.G.S.P	2742	33-02.15012N	135-03.94775E		
SS49_0	2021/12/24	0:40:30	F.S.P = F.G.S.P	1001	33-02.09015N	135-04.97314E	12,288	159.2
	2021/12/24	2:08:26	L.S.P = L.G.S.P	1745	32-55.87189N	135-07.76276E		
SS50_0	2021/12/24	2:42:11	F.S.P = F.G.S.P	1001	32-55.65674N	135-08.85498E	13,705	339.2
	2021/12/24	4:45:45	L.S.P = L.G.S.P	2036	33-02.15973N	135-05.93079E		
SS51_0	2021/12/24	5:07:21	F.S.P = F.G.S.P	1001	33-02.44629N	135-06.80603E	16,185	159.2
	2021/12/24	6:59:57	L.S.P = L.G.S.P	1953	32-54.25987N	135-10.48462E		

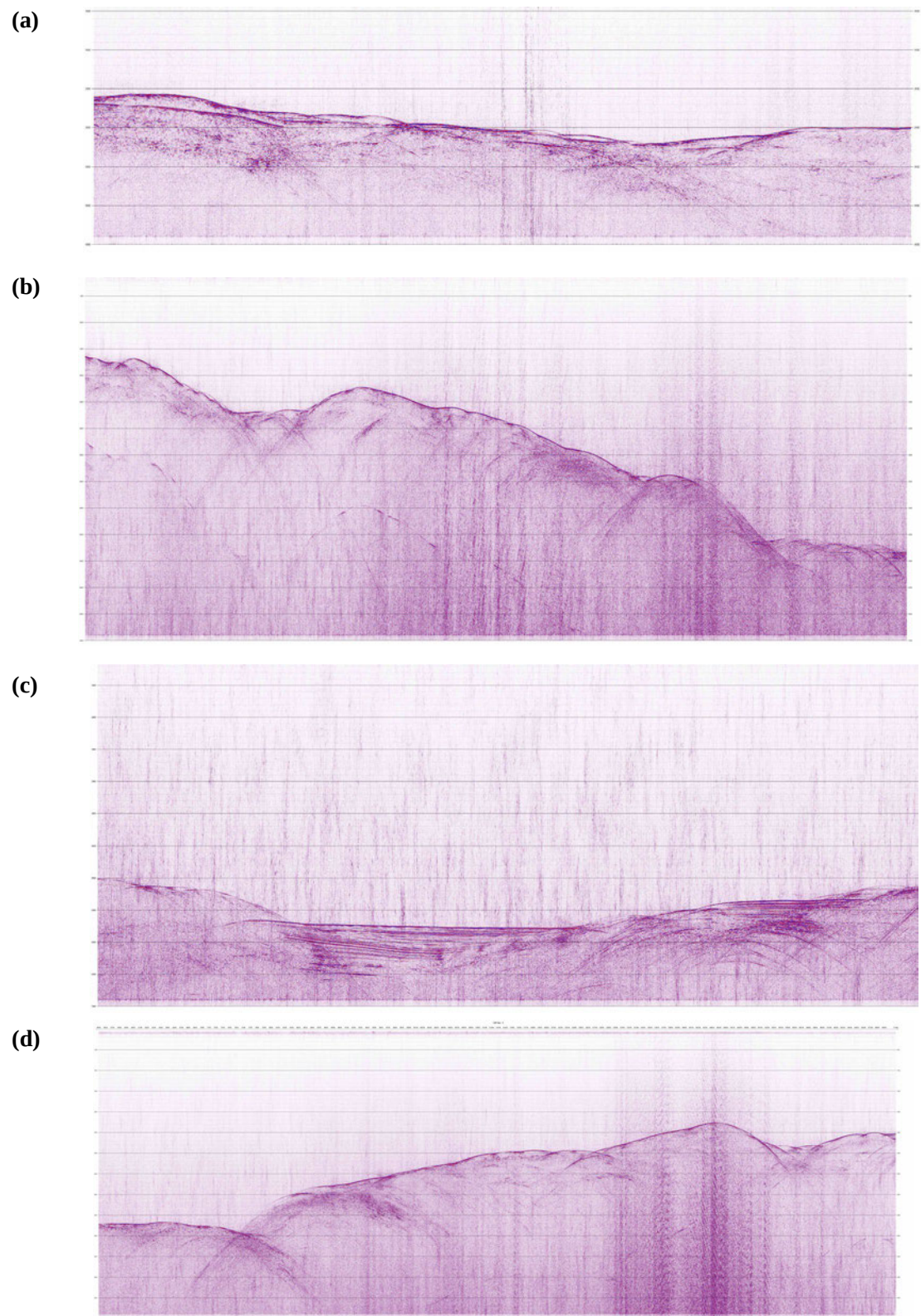


Fig. 6-5-2(a): Survey track of Line SS15; **(b)** Line SS16; **(c)** Line SS17; **(d)** Line SS41.

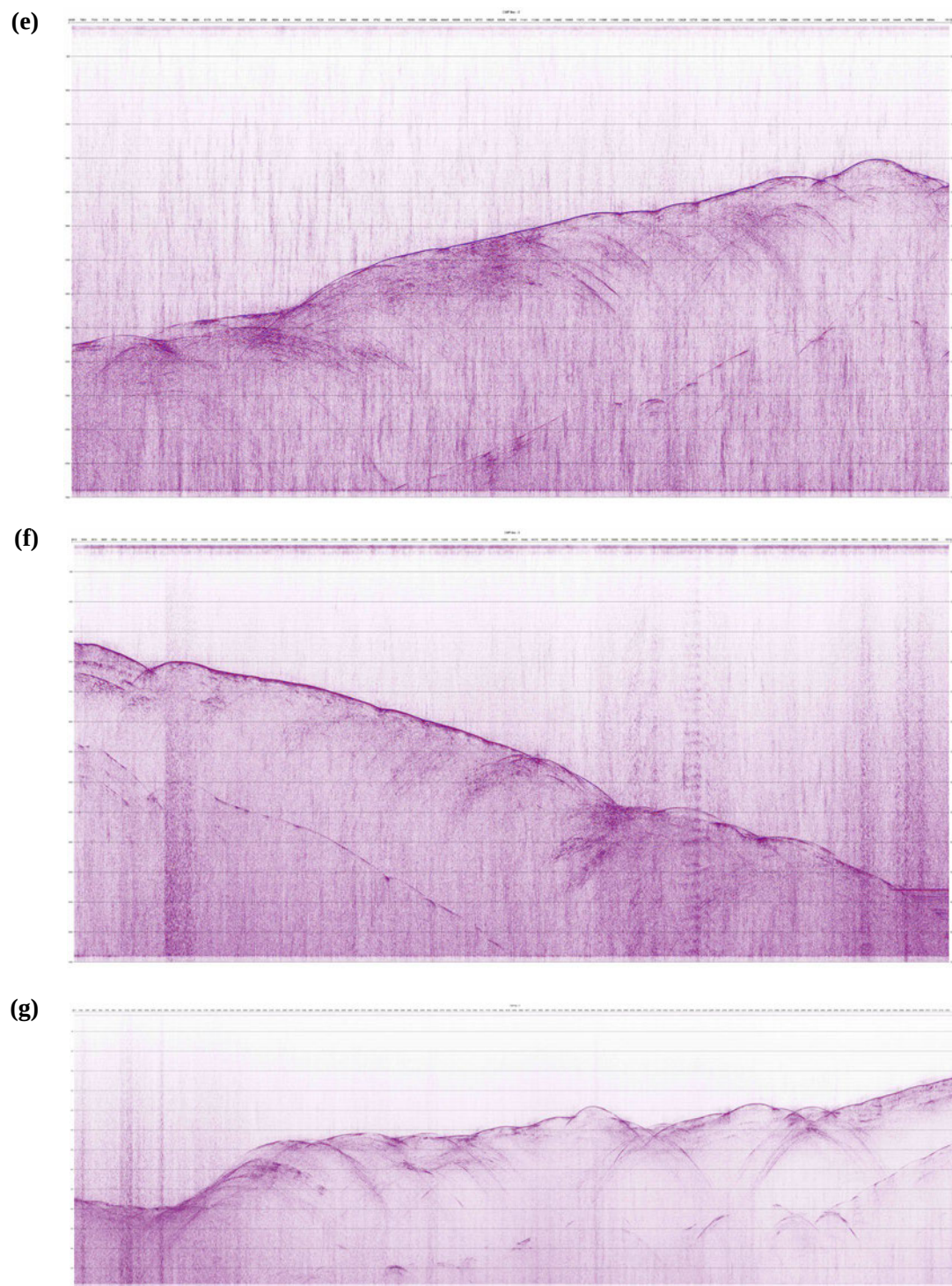


Fig. 6-5-2(e): Line SS42; **(f)** Line SS43; **(g)** Line SS44.

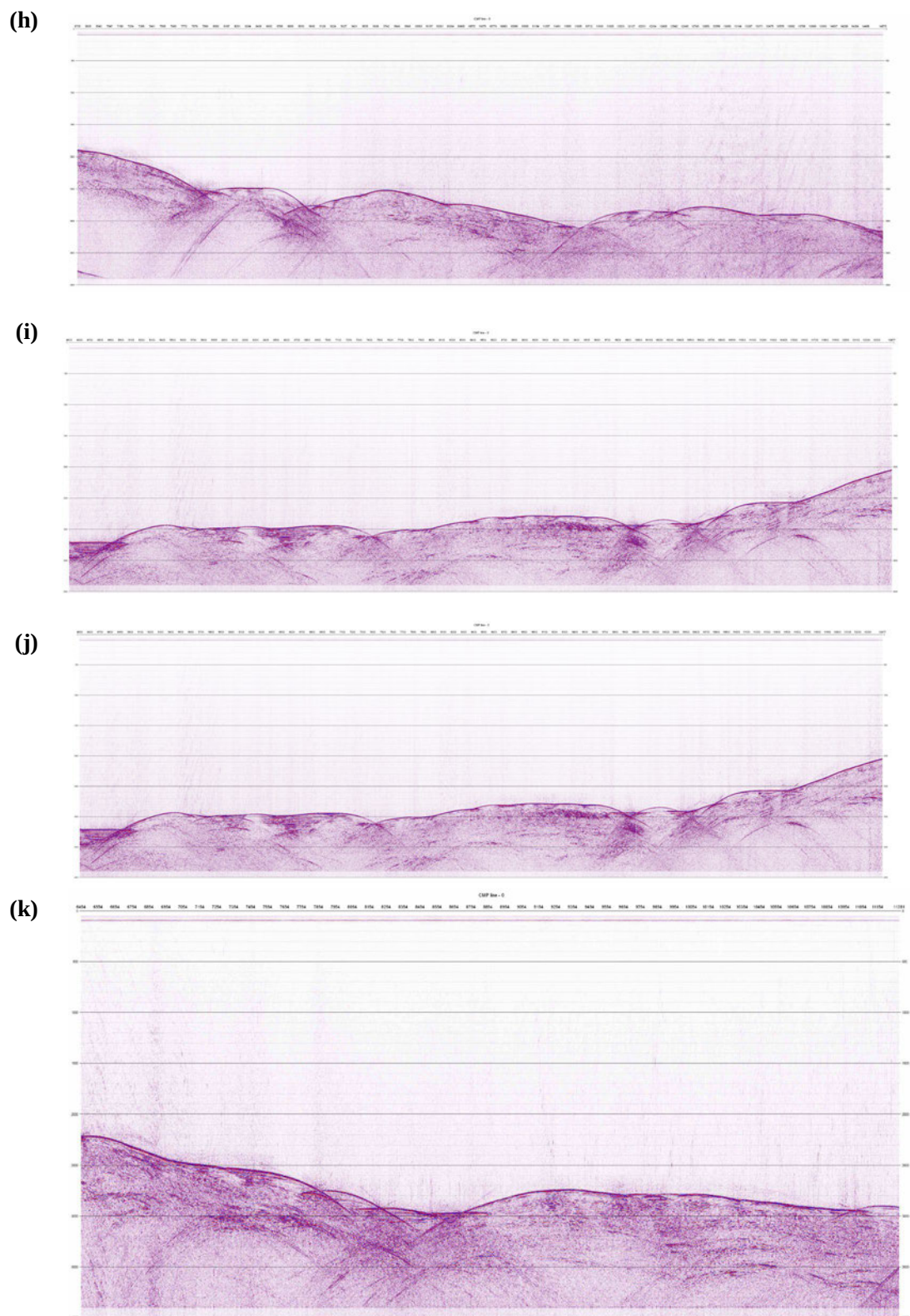
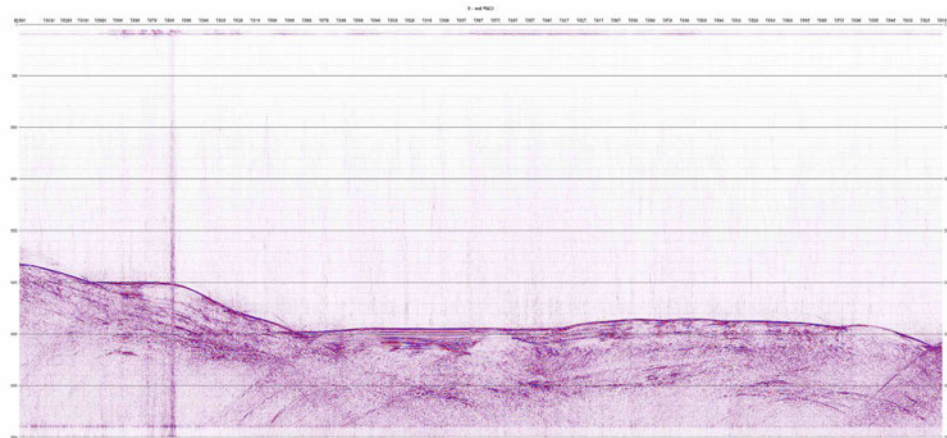


Fig. 6-5-2(h): Line SS45; **(i)** Line SS46; **(j)** Line SS48; **(k)** Line SS49.

(l)



(m)

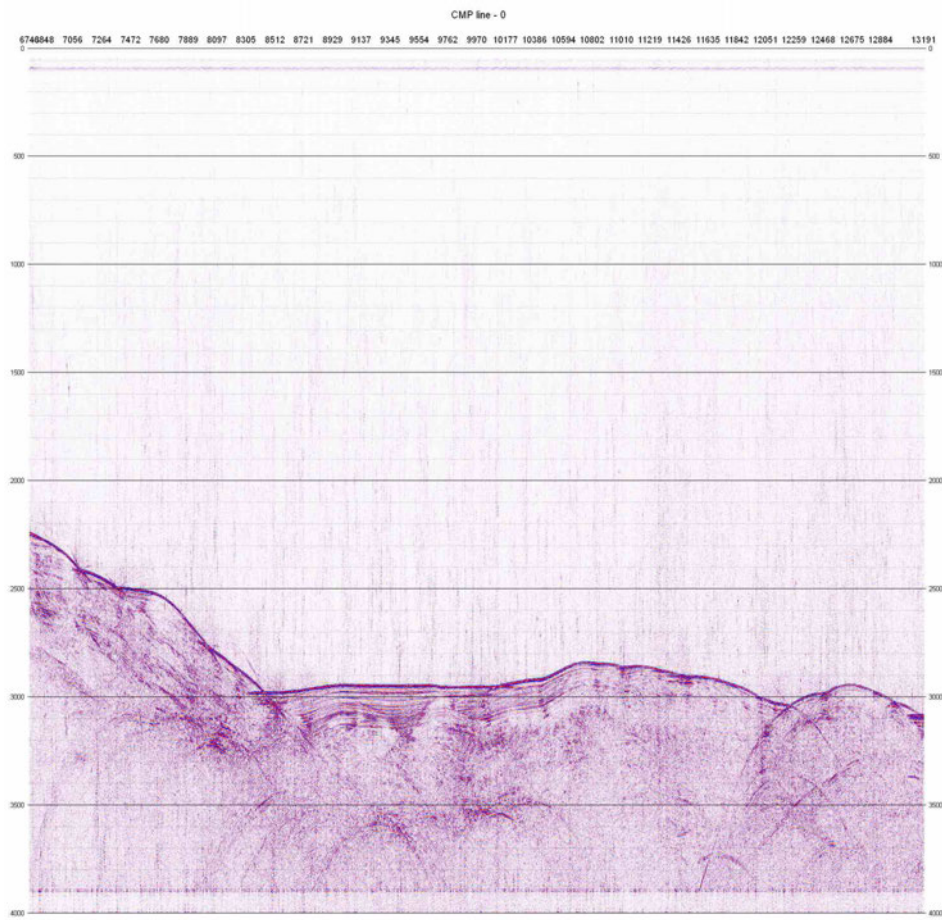


Fig. 6-5-2: (l) Line SS50; (m) Line SS51.

6-6. Magnetic Survey

The geomagnetic field was measured using a shipboard three-component magnetometer Tierra Tecnica SFG-1214. The magnetic data were collected throughout the cruise at a rate of 1/8 seconds. "Figure-8" sailings (clockwise and counterclockwise 360° turns) for data calibration were not made during this cruise.

6-7. PC and MC operations

Two MC coring and three piston coring were carried out during this cruise. Information for their locations is summarized in **Tables 6-7-1-1**, and **6-7-1-2** respectively. Operation inventory records are attached to APPENDIX.

Table 6-7-1-1 Results of the MC coring during KR21-20

Date (UTC) Location	Core ID	Lat.	Lon.	Depth (m)	HAND No.	Core length(cm)	Tension max. (kN)	Remarks
2021/12/16 Off Omaezaki	MC01- (B)	34- 05.6976 N	138- 07.9734 E	2,422	HAND1	48.0	27.0	The coring site position was recorded by transponder.
					HAND2	47.0		
					HAND3	48.0		
					HAND4	48.0		
					HAND5	47.0		
					HAND6	47.0		
					HAND7	46.0		
					HAND8	47.0		
2021/12/19 Off Owase	MC02- (B)	33- 49.2896 N	136- 34.2459 E	2,039	HAND1	40.0	29.8	The coring site position was recorded by transponder.
					HAND2	41.0		
					HAND3	41.0		
					HAND4	41.0		
					HAND5	41.0		
					HAND6	40.0		
					HAND7	40.0		
					HAND8	40.0		

Table 6-7-1-2 Results of the piston coring during KR21-20

*K value is the strength barometer of the sea bed sediment, which is expressed by the following formula: K value = pure pull out load / (outer diameter of outer pipe x penetration length)

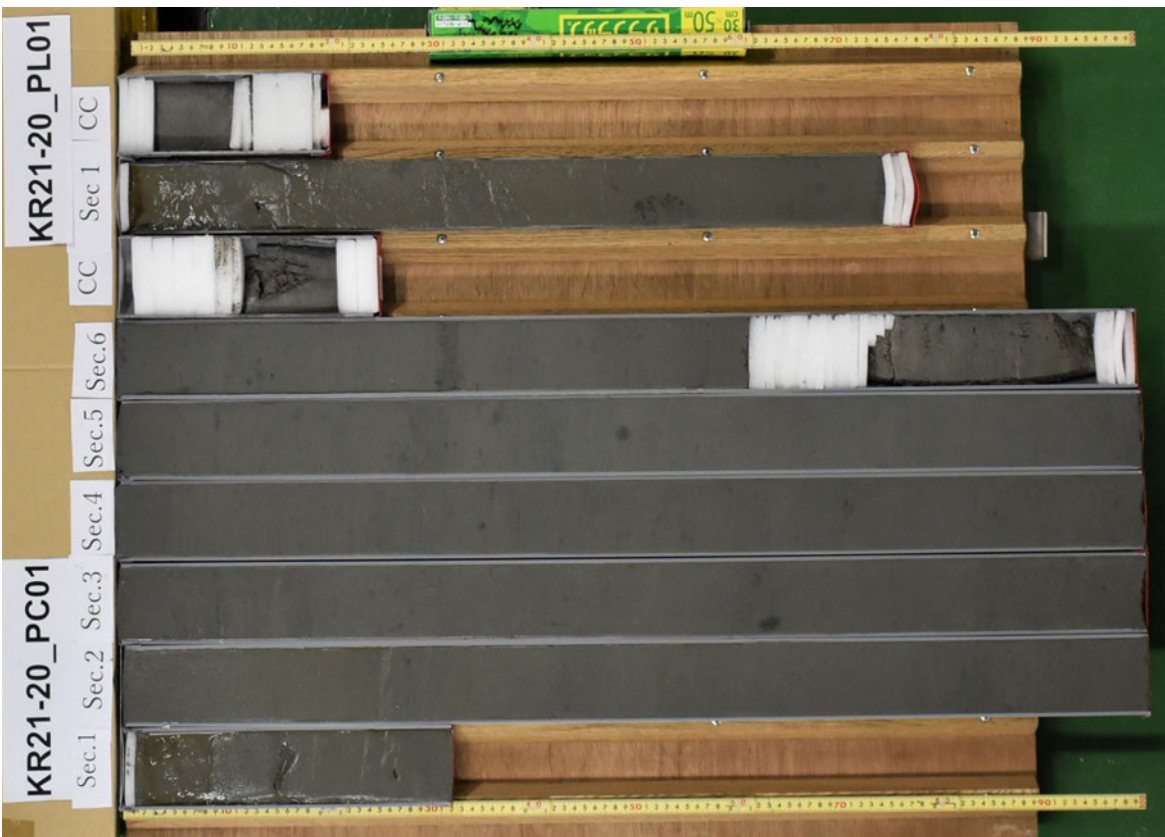
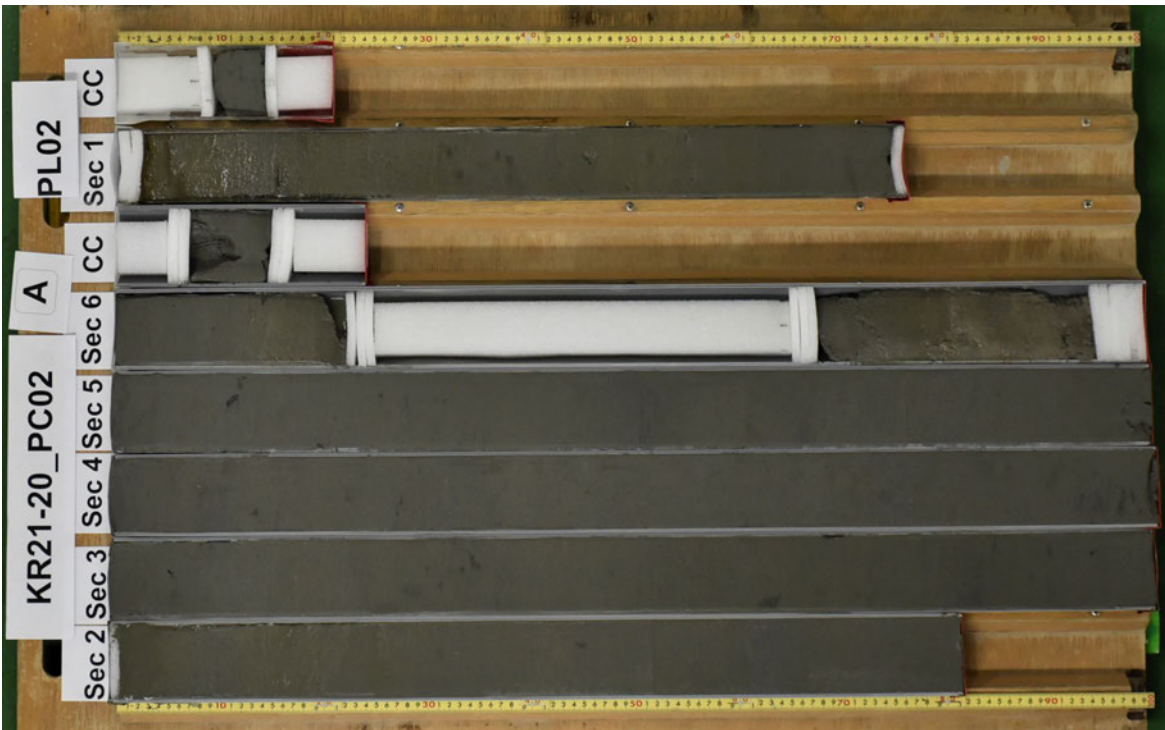
Date (UTC)	Core ID	Water Depth (m)	Position (Transponder)		Recovery (m)		Tension MAX (kN)	K value
			Latitude	Longitude	PC	PL		
20211221	PC01	2,011	32-56.9827N	134-57.9724E	5.43 / 6	0.82	43.4	0.46
20211222	PC02	1,906	32-58.4965N	134-59.9575E	4.56 / 6	0.79	48.2	0.66
20211223	PC03	4,332	32-42.7085N	134-57.3443E	5.17 / 6	0.96	44.0	0.16

6-7-2. piston cores

Section length of the obtained cores are summarized in **Table 6-7-2**. Core photos are listed in **Fig. 6-7-2**.

Table 6-7-2 List of section core length of the obtained cores

Core	Sec. 1	Sec. 2	Sec. 3	Sec. 4	Sec. 5	Sec. 6	CC	Total (cm)	Remarks
PC01	30.3	99.8	100.3	100.4	100.0	96.0	14.5	541.3	Sec. 1: 0.0-1.7 cm void, Sec. 6: 61.5-72.5 cm archive half void, 96.0-100.0 cm void, Sec. CC: 0.0-5.0 cm & 19.5-25.0 cm void, archive half 0.0-11.5 cm void
PL01	74.9						8.5	83.4	Sec. 1: 0.0-0.6 cm & 75.5-77.5 cm void, Sec. CC: 0.0-4.0 cm & 12.5-20.0 cm void
PC02		81.0	100.0	100.5	100.0	63.5	7.5	452.5	Sec. 2: 0.0-0.9 cm void, Sec. 6: 22.0-53.3 cm & 94.8-99.7 cm void, archive half 22.5-67.5 cm void, Sec. cc: 0.0-6.5 cm & 14.0-24.0 cm void
PL02	73.5						5.5	79.0	Sec. 1: 0.0-2.0 cm & 75.5-76.5 cm void, Sec. CC: 0.0-9.5 cm & 15.0-21.0 cm void
PC03	10.6	99.5	99.9	98.2	99.7	100.5	10.5	518.9	Sec. 1: 0.0-0.7 cm void, Sec. 6: 100.5-102.4 cm void, Sec. CC: 0.0-2.0 cm & 13.5-24.6 cm void
PL03	89.8						8.0	97.8	Sec. 1: 0.0-4.2 cm void, Sec. CC: 0.0-1.0 cm & 7.0-9.0 cm void



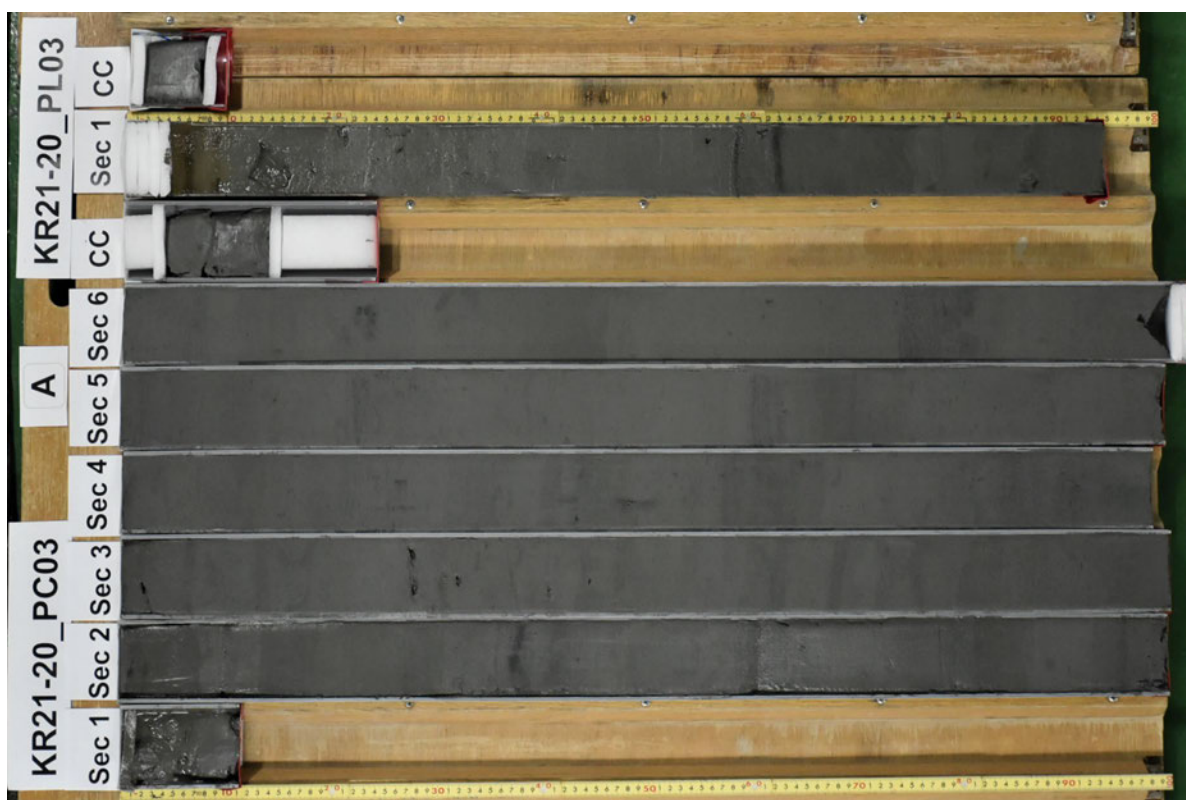


Fig. 6-7-2: lithology of PC01(PL01) to PC03(PL03).

7. Acknowledgement

We are grateful for the efforts of Captain Aoki and his crews during the cruise. We thank all the support from staffs in JAMSTEC. Especially thanks to Mr. Sanada in the Research Fleet Department for his considerable efforts.

8. Notice on Using

Notice on using: Insert the following notice to users regarding the data and samples obtained.

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.

<http://www.godac.jamstec.go.jp/darwin/explain/1/e#report>

E-mail: submit-rv-cruise@jamstec.go.jp

APPENDIX

SCS Data Acquisition Parameters



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

GENERAL					RECEIVER		REMARKS
CLIENT	JAMSTEC				RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 3.0 knot
CRUISE	KR21-20				HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.1 knot
AREA	NANKAI Trough				NUMBER OF CHANNEL	12	
LINE	SS15_0				NO. OF HYD./GROUP	5	Weak channel was moved(Near1ch→Far12ch),due to the air spot in the streamer active section moved.
DIRECTION (°)	72.8				SENSITIVITY	-183 dB, re 1V/ μ bar, $\pm$ 1dB	
DATE	2021/12/21				CABLE DEPTH	3m	(SP No.1380 - 1814)
WEATHER	Fine but Cloudy				ACTIVE SECTION	30.0 m	
WIND	WNW, Fresh breeze				LEAD-IN Towing Length	135m	A little value of Air Leak (SP No.1610~LSP)
SEA CONDITION	Sea moderate						
FIRST SHOT POINT	SP No.	1001	FF No.	1001			Cross point of SS16 (SP No.1639-1640)
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001	RECORDING		
	N		32-55.57205				
	E		134-50.93536		RECORDING SYSTEM	Geode ver 11.1.69.0	Cross point of SS41 (SP No.2318)
	Time (UTC)		7:00:07		SAMPLE FREQUENCY	1,000Hz	No Fire due to no navigation trigger received.
	Water Depth (m)		1588		RECORDING LENGTH	4,000 msec	(SP No.1772)
LAST SHOT POINT	SP No.	2436	FF No.	2436	WATER DELAY	0 msec	
LAST GOOD SHOT POINT	SP No.	2436	FF No.	2436	RECORDING FORMAT	SEG-D 8058 Rev.1 Promax	SP No.1507, 2086, 2349 = SOJ depth data missing
	N		32-57.78648		ANALOG / PREAMP	26 dB / 12 dB	
	E		135-00.93750		HICUT FILTER	None	
	Time (UTC)		9:50:20		LOWCUT FILTER	3 Hz	
	Water Depth (m)		1866		SYSTEM DELAY	100ms (from start recording to gun firing)	
					GPS SYSTEM	Best Position Reference Station (OCSAT)	
SOURCE					NAVIGATION SYSTEM	Navlog ver 2.2.8	PROCESSING



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

GUN TYPE	GI Gun	DATA	Static Correction	96.7msec
SHOT TYPE	True Mode		Time Variant Bandpass Filter	20-25-400-500 Hz
SHOT MODE	Time		Spherical Divergence Correction	T ^{1.6}
SHOT INTERVAL	7 sec		Time Variant Bandpass Filter	20-25-240-250 Hz
NUMBER OF STRINGS	1	NAVIGATION DATA	SS15_0_Shot.csv	
TOTAL VOLUME	150 cu.in		SS15_0_LOG.csv	
CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1			
GUN DEPTH	2.0 m	OBSERVER	Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,	
AIR PRESSURE	13.5 MPa			
GUN CONTROLLER	Hotshot ver 3.300			
GUN TOWING WIRE LENGTH	20.0m			

GENERAL					RECEIVER		REMARKS
CLIENT	JAMSTEC				RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 4.7 knot
CRUISE	KR21-20				HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.2 knot
AREA	NANKAI Trough				NUMBER OF CHANNEL	12	
LINE	SS16_0				NO. OF HYD./GROUP	5	A little value of Air Leak (SP No.FSP~LSP)
DIRECTION (°)	158.1				SENSITIVITY	-183 dB, re 1V/μbar, ±1dB	
DATE	2021/12/21				CABLE DEPTH	3m	Cross point of SS15 (SP No.1253)
WEATHER	Fine but Cloudy				ACTIVE SECTION	30.0 m	
WIND	WNW, Fresh breeze				LEAD-IN Towing Length	135m	SP No.1381 = SOJ depth data missing
SEA CONDITION	Sea slight						
FIRST SHOT POINT	SP No.	1001	FF No.	1001			
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001			
	N		33-00.06752		RECORDING		



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

		E	134-56.44501		RECORDING SYSTEM	Geode ver 11.1.69.0	
		Time (UTC)	11:20:20		SAMPLE FREQUENCY	1,000Hz	
		Water Depth (m)	1247		RECORDING LENGTH	7,000 msec	
LAST SHOT POINT	SP No.	2410	FF No.	2410	WATER DELAY	0 msec	
LAST GOOD SHOT POINT	SP No.	2410	FF No.	2410	RECORDING FORMAT	SEG-D 8058 Rev.1 Promax	
		N	32-42.87025		ANALOG / PREAMP	26 dB / 12 dB	
		E	135-04.68567		HICUT FILTER	None	
		Time (UTC)	15:17:22		LOWCUT FILTER	3 Hz	
		Water Depth (m)	3529		SYSTEM DELAY	100ms (from start recording to gun firing)	
					GPS SYSTEM	Best Position Reference Station (OCSAT)	
SOURCE					NAVIGATION SYSTEM	Navlog ver 2.2.8	
					PROCESSING		
GUN TYPE	GI Gun				Static Correction		96.7msec
SHOT TYPE	True Mode				Time Variant Bandpass Filter		20-25-400-500 Hz
SHOT MODE	Time				Spherical Divergence Correction		T^1.6
SHOT INTERVAL	10 sec				Time Variant Bandpass Filter		20-25-240-250 Hz
NUMBER OF STRINGS	1						
TOTAL VOLUME	150 cu.in						
CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1						
GUN DEPTH	2.0 m				OBSERVER Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,		
AIR PRESSURE	13.5 MPa						
GUN CONTROLLER	Hotshot ver 3.300						
GUN TOWING WIRE LENGTH	20.0m						

GENERAL	RECEIVER	REMARKS
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NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

CLIENT	JAMSTEC				RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 2.7 knot		
CRUISE	KR21-20				HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 3.9 knot		
AREA	NANKAI Trough				NUMBER OF CHANNEL	12			
LINE	SS41_0				NO. OF HYD./GROUP	5	A little value of Air Leak (SP No.FSP~LSP)		
DIRECTION (°)	337.6				SENSITIVITY	-183 dB, re 1V/μbar, ±1dB			
DATE	2021/12/21				CABLE DEPTH	3m	Cross point of SS15 (SP No.2996-2997)		
WEATHER	Cloudy				ACTIVE SECTION	30.0 m			
WIND	NW, Moderate breeze				LEAD-IN Towing Length	135m			
SEA CONDITION	Sea slight								
FIRST SHOT POINT	SP No.	1001	FF No.	1001					
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001					
	N		32-43.53035		RECORDING				
	E		135-07.02026				RECORDING SYSTEM	Geode ver 11.1.69.0	
	Time (UTC)		16:20:20				SAMPLE FREQUENCY	1,000Hz	
	Water Depth (m)		3529				RECORDING LENGTH	7,000 msec	
LAST SHOT POINT	SP No.	3066	FF No.	3066	WATER DELAY	0 msec			
LAST GOOD SHOT POINT	SP No.	3066	FF No.	3066	RECORDING FORMAT	SEG-D 8058 Rev.1 Promax			
	N		32-58.13232		ANALOG / PREAMP	26 dB / 12 dB			
	E		134-59.93591		HICUT FILTER	None			
	Time (UTC)		22:08:37		LOWCUT FILTER	3 Hz			
	Water Depth (m)		1883		SYSTEM DELAY	100ms (from start recording to gun firing)			
					GPS SYSTEM	Best Position Reference Station (OCSAT)			
SOURCE					NAVIGATION SYSTEM	Navlog ver 2.2.8	PROCESSING		
GUN TYPE	GI Gun				DATA		Static Correction	96.7msec	
SHOT TYPE	True Mode						Time Variant Bandpass Filter	20-25-400-500 Hz	



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

SHOT MODE	Time	SEISMIC DATA	1001.sgd - 3066.sgd(2066 Files)	Spherical Divergence Correction	T^1.6
SHOT INTERVAL	10 sec		(Folder name : KR21-20_SS41_0)	Time Variant Bandpass Filter	20-25-240-250 Hz
NUMBER OF STRINGS	1	NAVIGATION DATA	SS41_0_Shot.csv		
TOTAL VOLUME	150 cu.in		SS41_0_LOG.csv		
CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1				
GUN DEPTH	2.0 m	OBSERVER Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,			
AIR PRESSURE	13.5 MPa				
GUN CONTROLLER	Hotshot ver 3.300				
GUN TOWING WIRE LENGTH	20.0m				

GENERAL					RECEIVER		REMARKS
CLIENT	JAMSTEC				RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 4.2 knot
CRUISE	KR21-20				HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.0 knot
AREA	NANKAI Trough				NUMBER OF CHANNEL	12	
LINE	SS42_0				NO. OF HYD./GROUP	5	A little value of Air Leak (SP No.FSP~LSP)
DIRECTION (°)	159.0				SENSITIVITY	-183 dB, re 1V/μbar, ±1dB	
DATE	2021/12/22				CABLE DEPTH	3m	SP No.1467, 1723 = SOJ depth data missing
WEATHER	Fine but Cloudy				ACTIVE SECTION	30.0 m	
WIND	North, Fresh breeze				LEAD-IN Towing Length	135m	
SEA CONDITION	Sea slight						
FIRST SHOT POINT	SP No.	1001	FF No.	1001			
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001	RECORDING		
	N		32-56.84120				
	E		134-56.67847				
	Time (UTC)		7:00:50				
					RECORDING SYSTEM	Geode ver 11.1.69.0	
					SAMPLE FREQUENCY	1,000Hz	



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

		Water Depth (m)		1895		RECORDING LENGTH		7,000 msec			
LAST SHOT POINT		SP No.	1887	FF No.	1887	WATER DELAY		0 msec			
LAST GOOD SHOT POINT		SP No.	1887	FF No.	1887	RECORDING FORMAT		SEG-D 8058 Rev.1 Promax			
		N		32-47.02744		ANALOG / PREAMP		26 dB / 12 dB			
		E		135-00.58594		HICUT FILTER		None			
		Time (UTC)		9:30:42		LOWCUT FILTER		3 Hz			
		Water Depth (m)		3413		SYSTEM DELAY		100ms (from start recording to gun firing)			
						GPS SYSTEM		Best Position Reference Station (OCSAT)			
SOURCE						NAVIGATION SYSTEM		Navlog ver 2.2.8		PROCESSING	
GUN TYPE		GI Gun				DATA		Static Correction		96.7msec	
SHOT TYPE		True Mode						Time Variant Bandpass Filter		20-25-400-500 Hz	
SHOT MODE		Time				SEISMIC DATA		1001.sgd - 1887.sgd(887 Files)		Spherical Divergence Correction	
SHOT INTERVAL		10 sec						(Folder name : KR21-20_SS42_0)		T^1.6	
NUMBER OF STRINGS		1				NAVIGATION DATA		SS42_0_Shot.csv		Time Variant Bandpass Filter	
TOTAL VOLUME		150 cu.in						SS42_0_LOG.csv		20-25-240-250 Hz	
CONFIGURATION		(Generator:45 + Injector:105 cu.in) x 1									
GUN DEPTH		2.0 m				OBSERVER					
AIR PRESSURE		13.5 MPa									
GUN CONTROLLER		Hotshot ver 3.300									
GUN TOWING WIRE LENGTH		20.0m									
						Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,					

GENERAL		RECEIVER		REMARKS
CLIENT	JAMSTEC	RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 3.7 knot
CRUISE	KR21-20	HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 3.9 knot



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

AREA	NANKAI Trough				NUMBER OF CHANNEL	12	
LINE	SS43_0				NO. OF HYD./GROUP	5	A little value of Air Leak (SP No.FSP~LSP)
DIRECTION (°)	338.9				SENSITIVITY	-183 dB, re 1V/μbar, ±1dB	
DATE	2021/12/22				CABLE DEPTH	3m	
WEATHER	Fine but Cloudy				ACTIVE SECTION	30.0 m	
WIND	NNE Moderate breeze				LEAD-IN Towing Length	135m	
SEA CONDITION	Sea slight						
FIRST SHOT POINT	SP No.	1001	FF No.	1001			
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001			
	N		32-45.61707		RECORDING		
	E		134-58.77502				
	Time (UTC)		9:59:31				
	Water Depth (m)		3669				
LAST SHOT POINT	SP No.	2191	FF No.	2191	RECORDING SYSTEM	Geode ver 11.1.69.0	
LAST GOOD SHOT POINT	SP No.	2191	FF No.	2191	SAMPLE FREQUENCY	1,000Hz	
	N		32-56.15547		RECORDING LENGTH	7,000 msec	
	E		134-53.93280		WATER DELAY	0 msec	
	Time (UTC)		13:20:45		RECORDING FORMAT	SEG-D 8058 Rev.1 Promax	
	Water Depth (m)		1794		ANALOG / PREAMP	26 dB / 12 dB	
SOURCE					HICUT FILTER	None	
					LOWCUT FILTER	3 Hz	
					SYSTEM DELAY	100ms (from start recording to gun firing)	
					GPS SYSTEM	Best Position Reference Station (OCSAT)	
					NAVIGATION SYSTEM	Navlog ver 2.2.8	
					DATA		
					PROCESSING		
GUN TYPE	GI Gun				Static Correction		96.7msec
SHOT TYPE	True Mode				Time Variant Bandpass Filter		20-25-400-500 Hz
SHOT MODE	Time				Spherical Divergence Correction		T^1.6
SHOT INTERVAL	10 sec				Time Variant Bandpass Filter		20-25-240-250 Hz



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

NUMBER OF STRINGS	1	NAVIGATION DATA	SS43_0_Shot.csv		
TOTAL VOLUME	150 cu.in		SS43_0_LOG.csv		
CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1				
GUN DEPTH	2.0 m	OBSERVER Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,			
AIR PRESSURE	13.5 MPa				
GUN CONTROLLER	Hotshot ver 3.300				
GUN TOWING WIRE LENGTH	20.0m				

GENERAL					RECEIVER		REMARKS
CLIENT	JAMSTEC				RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 4.1 knot
CRUISE	KR21-20				HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.2 knot
AREA	NANKAI Trough				NUMBER OF CHANNEL	12	
LINE	SS44_0				NO. OF HYD./GROUP	5	A little value of Air Leak (SP No.FSP~LSP)
DIRECTION (°)	157.9				SENSITIVITY	-183 dB, re 1V/μ bar, ±1dB	
DATE	2021/12/22				CABLE DEPTH	3m	SP No.1072,1906,2161,2167,2175 = SOJ depth data missing
WEATHER	Fine but Cloudy				ACTIVE SECTION	30.0 m	
WIND	NNE, Fresh breeze				LEAD-IN Towing Length	135m	
SEA CONDITION	Sea slight						
FIRST SHOT POINT	SP No.	1001	FF No.	1001			
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001	RECORDING		
	N		32-56.98036				
	E		134-50.78796			RECORDING SYSTEM	Geode ver 11.1.69.0
	Time (UTC)		14:06:21			SAMPLE FREQUENCY	1,000Hz
	Water Depth (m)		1274			RECORDING LENGTH	7,000 msec
LAST SHOT POINT	SP No.	2341	FF No.	2341		WATER DELAY	0 msec



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

LAST GOOD SHOT POINT	SP No.	2341	FF No.	2341	RECORDING FORMAT	SEG-D 8058 Rev.1 Promax			
	N		32-42.60063		ANALOG / PREAMP	26 dB / 12 dB			
	E		134-57.45300		HICUT FILTER	None			
	Time (UTC)		17:52:42		LOWCUT FILTER	3 Hz			
	Water Depth (m)		4336		SYSTEM DELAY	100ms (from start recording to gun firing)			
					GPS SYSTEM	Best Position Reference Station (OCSAT)			
SOURCE					NAVIGATION SYSTEM	Navlog ver 2.2.8		PROCESSING	
GUN TYPE		GI Gun			DATA		Static Correction		96.7msec
SHOT TYPE		True Mode					Time Variant Bandpass Filter		20-25-400-500 Hz
SHOT MODE		Time			SEISMIC DATA	1001.sgd - 2341.sgd(1341 Files)		Spherical Divergence Correction	T^1.6
SHOT INTERVAL		10 sec				(Folder name : KR21-20_SS44_0)		Time Variant Bandpass Filter	20-25-240-250 Hz
NUMBER OF STRINGS		1			NAVIGATION DATA	SS44_0_Shot.csv			
TOTAL VOLUME		150 cu.in				SS44_0_LOG.csv			
CONFIGURATION		(Generator:45 + Injector:105 cu.in) x 1							
GUN DEPTH		2.0 m			OBSERVER				
AIR PRESSURE		13.5 MPa							
GUN CONTROLLER		Hotshot ver 3.300							
GUN TOWING WIRE LENGTH		20.0m							
					Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,				

GENERAL		RECEIVER		REMARKS
CLIENT	JAMSTEC	RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 3.2 knot
CRUISE	KR21-20	HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.0 knot
AREA	NANKAI Trough	NUMBER OF CHANNEL	12	
LINE	SS17_0	NO. OF HYD./GROUP	5	Delta Error (Refet to HOTSHOT File : SS17_0.rtf)



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

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DIRECTION (°)		57.9				SENSITIVITY		-183 dB, re 1V/ μ bar, ±1dB			
DATE		2021/12/23				CABLE DEPTH		3m		SP No.1005 = SOJ depth data missing	
WEATHER		Fine but Cloudy				ACTIVE SECTION		30.0 m			
WIND		NNE, Generate breeze				LEAD-IN Towing Length		135m			
SEA CONDITION		Sea smooth									
FIRST SHOT POINT		SP No.	1001	FF No.	1001						
FIRST GOOD SHOT POINT		SP No.	1001	FF No.	1001						
		N		32-39.37386		RECORDING					
		E		134-53.38165				RECORDING SYSTEM		Geode ver 11.1.69.0	
		Time (UTC)		6:32:52				SAMPLE FREQUENCY		1,000Hz	
		Water Depth (m)		4330				RECORDING LENGTH		7,000 msec	
LAST SHOT POINT		SP No.	2177	FF No.	2177	WATER DELAY		0 msec			
LAST GOOD SHOT POINT		SP No.	2177	FF No.	2177	RECORDING FORMAT		SEG-D 8058 Rev.1 Promax			
		N		32-45.06638		ANALOG / PREAMP		26 dB / 12 dB			
		E		135-04.11713		HICUT FILTER		None			
		Time (UTC)		9:50:52		LOWCUT FILTER		3 Hz			
		Water Depth (m)		3864		SYSTEM DELAY		100ms (from start recording to gun firing)			
						GPS SYSTEM		Best Position Reference Station (OCSAT)			
SOURCE						NAVIGATION SYSTEM		Navlog ver 2.2.8		PROCESSING	
GUN TYPE		GI Gun				DATA		Static Correction		96.7msec	
SHOT TYPE		True Mode						Time Variant Bandpass Filter		20-25-400-500 Hz	
SHOT MODE		Time				SEISMIC DATA		1001.sgd - 2177.sgd(1177 Files)		Spherical Divergence Correction T^1.6	
SHOT INTERVAL		10 sec						(Folder name : KR21-20_SS17_0)		Time Variant Bandpass Filter 20-25-240-250 Hz	
NUMBER OF STRINGS		1				NAVIGATION DATA		SS17_0_Shot.csv			
TOTAL VOLUME		150 cu.in						SS17_0_LOG.csv			



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1				
GUN DEPTH	2.0 m	OBSERVER Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,			
AIR PRESSURE	13.5 MPa				
GUN CONTROLLER	Hotshot ver 3.300				
GUN TOWING WIRE LENGTH	20.0m				

GENERAL					RECEIVER		REMARKS
CLIENT	JAMSTEC				RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 3.3 knot
CRUISE	KR21-20				HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.1 knot
AREA	NANKAI Trough				NUMBER OF CHANNEL	12	
LINE	SS45_0				NO. OF HYD./GROUP	5	Delta Error (Refet to HOTSHOT File : SS45_0.rtf)
DIRECTION (°)	338.3				SENSITIVITY	-183 dB, re 1V/ μ bar, $\pm$ 1dB	
DATE	2021/12/23				CABLE DEPTH	3m	No Fire due to no navigation trigger received.
WEATHER	Fine but Cloudy				ACTIVE SECTION	30.0 m	(SP No.1468, 1944, 2401, 2500, 2628, 2666, 3006)
WIND	NNE, Light air				LEAD-IN Towing Length	135m	
SEA CONDITION	Sea rippled calm						
FIRST SHOT POINT	SP No.	1001	FF No.	1001			
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001	RECORDING		
	N		32-44.59740				
	E		135-08.17291				
	Time (UTC)		11:10:47				
	Water Depth (m)		3580		RECORDING SYSTEM	Geode ver 11.1.69.0	
					SAMPLE FREQUENCY	1,000Hz	
					RECORDING LENGTH	7,000 msec	
LAST SHOT POINT	SP No.	3057	FF No.	3057	WATER DELAY	0 msec	
LAST GOOD SHOT POINT	SP No.	3057	FF No.	3057	RECORDING FORMAT	SEG-D 8058 Rev.1 Promax	
	N		33-02.12791		ANALOG / PREAMP	26 dB / 12 dB	



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

	E	134-59.92950	HICUT FILTER	None		
	Time (UTC)	16:56:58	LOWCUT FILTER	3 Hz		
	Water Depth (m)	1242	SYSTEM DELAY	100ms (from start recording to gun firing)		
			GPS SYSTEM	Best Position Reference Station (OCSAT)		
SOURCE			NAVIGATION SYSTEM	Navlog ver 2.2.8	PROCESSING	
GUN TYPE	GI Gun		DATA		Static Correction	96.7msec
SHOT TYPE	True Mode				Time Variant Bandpass Filter	20-25-400-500 Hz
SHOT MODE	Time		SEISMIC DATA	1001.sgd - 3057.sgd(2057 Files)	Spherical Divergence Correction	T^1.6
SHOT INTERVAL	10 sec			(Folder name : KR21-20_SS45_0)	Time Variant Bandpass Filter	20-25-240-250 Hz
NUMBER OF STRINGS	1		NAVIGATION DATA	SS45_0_Shot.csv		
TOTAL VOLUME	150 cu.in			SS45_0_LOG.csv		
CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1					
GUN DEPTH	2.0 m		OBSERVER			
AIR PRESSURE	13.5 MPa					
GUN CONTROLLER	Hotshot ver 3.300					
GUN TOWING WIRE LENGTH	20.0m					
			Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,			

GENERAL		RECEIVER		REMARKS
CLIENT	JAMSTEC	RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 4.7 knot
CRUISE	KR21-20	HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.0 knot
AREA	NANKAI Trough	NUMBER OF CHANNEL	12	
LINE	SS46_0	NO. OF HYD./GROUP	5	No Fire due to no navigation trigger received.
DIRECTION (°)	159.2	SENSITIVITY	-183 dB, re 1V/μbar, ±1dB	(SP No.1016, 1356, 1388, 1495, 2087)
DATE	2021/12/23	CABLE DEPTH	3m	



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

WEATHER		Cloudy			ACTIVE SECTION		30.0 m					
WIND		East, Light breeze			LEAD-IN Towing Length		135m					
SEA CONDITION		Sea rippled calm										
FIRST SHOT POINT	SP No.	1001	FF No.	1001								
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001								
		N		33-01.97365		RECORDING						
		E		135-02.00867				RECORDING SYSTEM	Geode ver 11.1.69.0			
		Time (UTC)		17:37:10				SAMPLE FREQUENCY	1,000Hz			
		Water Depth (m)		1428				RECORDING LENGTH	4,000 msec			
LAST SHOT POINT		SP No.	2160	FF No.	2160			WATER DELAY	0 msec			
LAST GOOD SHOT POINT		SP No.	2160	FF No.	2160	RECORDING FORMAT	SEG-D 8058 Rev.1 Promax					
		N		32-51.88156		ANALOG / PREAMP	26 dB / 12 dB					
		E		135-06.56250		HICUT FILTER	None					
		Time (UTC)		19:54:32		LOWCUT FILTER	3 Hz					
		Water Depth (m)		2360		SYSTEM DELAY	100ms (from start recording to gun firing)					
						GPS SYSTEM	Best Position Reference Station (OCSAT)					
SOURCE					NAVIGATION SYSTEM		Navlog ver 2.2.8		PROCESSING			
GUN TYPE	GI Gun				DATA		Static Correction		96.7msec			
SHOT TYPE	True Mode						Time Variant Bandpass Filter		20-25-400-500 Hz			
SHOT MODE	Time				SEISMIC DATA		1001.sgd - 2160.sgd(1160 Files)		Spherical Divergence Correction		T^1.6	
SHOT INTERVAL	7 sec						(Folder name : KR21-20_SS46_0)		Time Variant Bandpass Filter		20-25-240-250 Hz	
NUMBER OF STRINGS	1				NAVIGATION DATA		SS46_0_Shot.csv					
TOTAL VOLUME	150 cu.in						SS46_0_LOG.csv					
CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1											
GUN DEPTH	2.0 m											



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

AIR PRESSURE	13.5 MPa	OBSERVER Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,
GUN CONTROLLER	Hotshot ver 3.300	
GUN TOWING WIRE LENGTH	20.0m	

GENERAL					RECEIVER		REMARKS
CLIENT	JAMSTEC				RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 3.2 knot
CRUISE	KR21-20				HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.1 knot
AREA	NANKAI Trough				NUMBER OF CHANNEL	12	
LINE	SS48_0				NO. OF HYD./GROUP	5	No Fire due to no navigation trigger received.
DIRECTION (°)	339.2				SENSITIVITY	-183 dB, re 1V/ μ bar, $\pm$ 1dB	(SP No.1691, 2105, 2353, 2694)
DATE	2021/12/23				CABLE DEPTH	3m	
WEATHER	Cloudy				ACTIVE SECTION	30.0 m	SP No.1001 = Shot timing error.
WIND	East, Light breeze				LEAD-IN Towing Length	135m	
SEA CONDITION	Sea rippled calm						
FIRST SHOT POINT	SP No.	1001	FF No.	1001			
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001	RECORDING		
	N		32-51.89758				
	E		135-08.51990			RECORDING SYSTEM	Geode ver 11.1.69.0
	Time (UTC)		20:38:22			SAMPLE FREQUENCY	1,000Hz
	Water Depth (m)		2396			RECORDING LENGTH	4,000 msec
LAST SHOT POINT	SP No.	2742	FF No.	2742	WATER DELAY	0 msec	
LAST GOOD SHOT POINT	SP No.	2742	FF No.	2742	RECORDING FORMAT	SEG-D 8058 Rev.1 Promax	
	N		33-02.15012		ANALOG / PREAMP	26 dB / 12 dB	
	E		135-03.94775		HICUT FILTER	None	
	Time (UTC)		0:05:32		LOWCUT FILTER	3 Hz	



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

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	Water Depth (m)	1521	SYSTEM DELAY	100ms (from start recording to gun firing)		
			GPS SYSTEM	Best Position Reference Station (OCSAT)		
SOURCE			NAVIGATION SYSTEM	Navlog ver 2.2.8	PROCESSING	
GUN TYPE	GI Gun		DATA		Static Correction	96.7msec
SHOT TYPE	True Mode				Time Variant Bandpass Filter	20-25-400-500 Hz
SHOT MODE	Time		SEISMIC DATA	1001.sgd – 2742.sgd(1742 Files)	Spherical Divergence Correction	T ^{1.6}
SHOT INTERVAL	7 sec			(Folder name : KR21-20_SS48_0)	Time Variant Bandpass Filter	20-25-240-250 Hz
NUMBER OF STRINGS	1		NAVIGATION DATA	SS48_0_Shot.csv		
TOTAL VOLUME	150 cu.in			SS48_0_LOG.csv		
CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1					
GUN DEPTH	2.0 m		OBSERVER			
AIR PRESSURE	13.5 MPa					
GUN CONTROLLER	Hotshot ver 3.300		Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,			
GUN TOWING WIRE LENGTH	20.0m					

GENERAL		RECEIVER		REMARKS
CLIENT	JAMSTEC	RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 4.5 knot
CRUISE	KR21-20	HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.0 knot
AREA	NANKAI Trough	NUMBER OF CHANNEL	12	
LINE	SS49_0	NO. OF HYD./GROUP	5	No Fire due to no navigation trigger received.
DIRECTION (°)	159.2	SENSITIVITY	-183 dB, re 1V/μbar, ±1dB	(SP No.1081, 1414, 1690, 1745)
DATE	2021/12/24	CABLE DEPTH	3m	
WEATHER	Overcast	ACTIVE SECTION	30.0 m	
WIND	ENE, Genelate breeze	LEAD-IN Towing Length	135m	



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

SEA CONDITION	Sea rippled calm						
FIRST SHOT POINT	SP No.	1001	FF No.	1001			
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001	RECORDING		
	N	33-02.09015					
	E	135-04.97314		RECORDING SYSTEM	Geode ver 11.1.69.0		
	Time (UTC)	0:40:30		SAMPLE FREQUENCY	1,000Hz		
	Water Depth (m)	1650		RECORDING LENGTH	4,000 msec		
LAST SHOT POINT	SP No.	1745	FF No.	1745	WATER DELAY	0 msec	
LAST GOOD SHOT POINT	SP No.	1745	FF No.	1745	RECORDING FORMAT	SEG-D 8058 Rev.1 Promax	
	N	32-55.87189		ANALOG / PREAMP	26 dB / 12 dB		
	E	135-07.76276		HICUT FILTER	None		
	Time (UTC)	2:08:26		LOWCUT FILTER	3 Hz		
	Water Depth (m)	2229		SYSTEM DELAY	100ms (from start recording to gun firing)		
				GPS SYSTEM	Best Position Reference Station (OCSAT)		
SOURCE				NAVIGATION SYSTEM	Navlog ver 2.2.8		PROCESSING
GUN TYPE	GI Gun			DATA		Static Correction	96.7msec
SHOT TYPE	True Mode					Time Variant Bandpass Filter	20-25-400-500 Hz
SHOT MODE	Time			SEISMIC DATA	1001.sgd - 1745.sgd(745 Files)	Spherical Divergence Correction	T^1.6
SHOT INTERVAL	7 sec				(Folder name : KR21-20_SS49_0)	Time Variant Bandpass Filter	20-25-240-250 Hz
NUMBER OF STRINGS	1			NAVIGATION DATA	SS49_0_Shot.csv		
TOTAL VOLUME	150 cu.in				SS49_0_LOG.csv		
CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1						
GUN DEPTH	2.0 m			OBSERVER			
AIR PRESSURE	13.5 MPa						
GUN CONTROLLER	Hotshot ver 3.300						
				Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,			



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

GUN TOWING WIRE LENGTH	20.0m
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GENERAL					RECEIVER		REMARKS
CLIENT	JAMSTEC				RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 3.6 knot
CRUISE	KR21-20				HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.1 knot
AREA	NANKAI Trough				NUMBER OF CHANNEL	12	
LINE	SS50_0				NO. OF HYD./GROUP	5	No Fire due to no navigation trigger received.
DIRECTION (°)	339.2				SENSITIVITY	-183 dB, re 1V/μbar, ±1dB	(SP No.1179)
DATE	2021/12/24				CABLE DEPTH	3m	
WEATHER	Fine but cloudy				ACTIVE SECTION	30.0 m	go away from survey Line due to avoiding drifted tanker.
WIND	SSE, Fresh breeze				LEAD-IN Towing Length	135m	(SP No.1255 ~ 1931, Max DC Offset 1576m : SP No. 1619)
SEA CONDITION	Sea slight						
FIRST SHOT POINT	SP No.	1001	FF No.	1001			SP No.1001 = Shot timing error(+1.7msec)
FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001	RECORDING		
	N		32-55.65674				
	E		135-08.85498				
	Time (UTC)		2:42:11				
	Water Depth (m)		2336				
LAST SHOT POINT	SP No.	2036	FF No.	2036	RECORDING SYSTEM	Geode ver 11.1.69.0	
LAST GOOD SHOT POINT	SP No.	2036	FF No.	2036	SAMPLE FREQUENCY	1,000Hz	
	N		33-02.15973		RECORDING LENGTH	4,000 msec	
	E		135-05.93079		WATER DELAY	0 msec	
	Time (UTC)		4:45:45		RECORDING FORMAT	SEG-D 8058 Rev.1 Promax	
	Water Depth (m)		1724		ANALOG / PREAMP	26 dB / 12 dB	
					HICUT FILTER	None	
					LOWCUT FILTER	3 Hz	
					SYSTEM DELAY	100ms (from start recording to gun firing)	
					GPS SYSTEM	Best Position Reference Station (OCSAT)	



NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

SOURCE		NAVIGATION SYSTEM	Navlog ver 2.2.8	PROCESSING	
GUN TYPE	GI Gun	DATA	1001.sgd - 2036.sgd(1036 Files) (Folder name : KR21-20_SS50_0)	Static Correction	96.7msec
SHOT TYPE	True Mode			Time Variant Bandpass Filter	20-25-400-500 Hz
SHOT MODE	Time			Spherical Divergence Correction	T ^{1.6}
SHOT INTERVAL	7 sec			Time Variant Bandpass Filter	20-25-240-250 Hz
NUMBER OF STRINGS	1	NAVIGATION DATA	SS50_0_Shot.csv		
TOTAL VOLUME	150 cu.in		SS50_0_LOG.csv		
CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1				
GUN DEPTH	2.0 m	OBSERVER			
AIR PRESSURE	13.5 MPa				
GUN CONTROLLER	Hotshot ver 3.300				
GUN TOWING WIRE LENGTH	20.0m				
		Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,			

GENERAL					RECEIVER		REMARKS
CLIENT	JAMSTEC				RECEIVER TYPE	S.I.G Multi-Channel Streamer	SHIP SPEED AGAINST GROUND : 4.7 knot
CRUISE	KR21-20				HYDROPHONE	S.I.G.16	SHIP SPEED AGAINST WATER : 4.0 knot
AREA	NANKAI Trough				NUMBER OF CHANNEL	12	
LINE	SS51_0				NO. OF HYD./GROUP	5	No Fire due to no navigation trigger received.
DIRECTION (°)	159.2				SENSITIVITY	-183 dB, re 1V/ μ bar, $\pm$ 1dB	(SP No.1005, 1412, 1707, 1781)
DATE	2021/12/24				CABLE DEPTH	3m	
WEATHER	Overcast				ACTIVE SECTION	30.0 m	SP No.1001 = Shot timing error(+1.4msec)
WIND	South, Strong breeze				LEAD-IN Towing Length	135m	
SEA CONDITION	Sea moderate						
FIRST SHOT POINT	SP No.	1001	FF No.	1001			

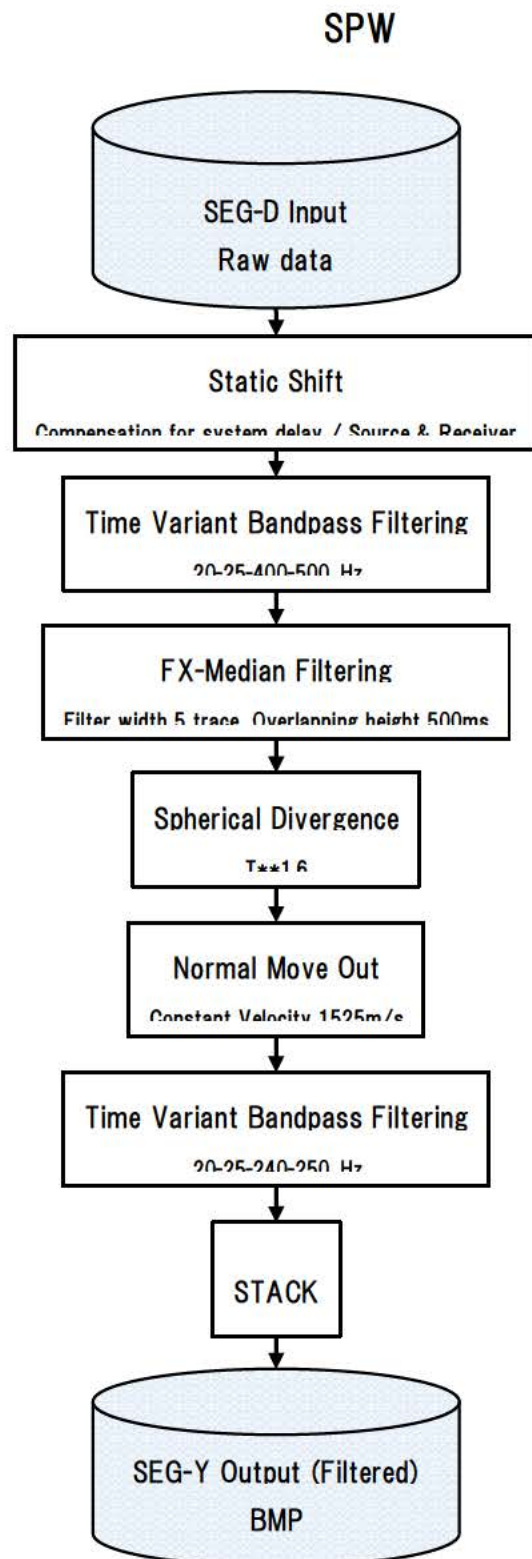


NME SINGLE CHANNEL SEISMIC SURVEY GENERAL INFORMATION

KR21-20

FIRST GOOD SHOT POINT	SP No.	1001	FF No.	1001	RECORDING				
	N		33-02.44629						
	E		135-06.80603						
	Time (UTC)		5:07:21						
	Water Depth (m)		1690		RECORDING SYSTEM	Geode ver 11.1.69.0			
LAST SHOT POINT	SP No.	1953	FF No.	1953	SAMPLE FREQUENCY	1,000Hz			
LAST GOOD SHOT POINT	SP No.	1953	FF No.	1953	RECORDING LENGTH	4,000 msec			
	N		32-54.25987		WATER DELAY	0 msec			
	E		135-10.48462		RECORDING FORMAT	SEG-D 8058 Rev.1 Promax			
	Time (UTC)		6:59:57		ANALOG / PREAMP	26 dB / 12 dB			
	Water Depth (m)		2301		HICUT FILTER	None			
					LOWCUT FILTER	3 Hz			
					SYSTEM DELAY	100ms (from start recording to gun firing)			
					GPS SYSTEM	Best Position Reference Station (OCSAT)			
SOURCE					NAVIGATION SYSTEM	Navlog ver 2.2.8		PROCESSING	
GUN TYPE	GI Gun				DATA		Static Correction	96.7msec	
SHOT TYPE	True Mode						Time Variant Bandpass Filter	20-25-400-500 Hz	
SHOT MODE	Time				SEISMIC DATA	1001.sgd - 1953.sgd(953 Files)		Spherical Divergence Correction	T^1.6
SHOT INTERVAL	7 sec					(Folder name : KR21-20_SS51_0)		Time Variant Bandpass Filter	20-25-240-250 Hz
NUMBER OF STRINGS	1				NAVIGATION DATA	SS51_0_Shot.csv			
TOTAL VOLUME	150 cu.in					SS51_0_LOG.csv			
CONFIGURATION	(Generator:45 + Injector:105 cu.in) x 1								
GUN DEPTH	2.0 m				OBSERVER				
AIR PRESSURE	13.5 MPa								
GUN CONTROLLER	Hotshot ver 3.300								
GUN TOWING WIRE LENGTH	20.0m								
					Morifumi Takaesu, Toshimasa Nasu, Yuki Oowatari, Kazuho Yoshida, Misaki Horiuchi,				

Seismic Data Processing Flow to Filtered Section for KR21-20



PC and MC operation log

Coring Inventory

< Observation info.>

Cruise name	KR21-20	Operator	四宮
Date (UTC) Y/M/D	2021/12/15~16	Recorded by	村木-中野
Core Number	MC 01 (A)	Transponder	0-NATS-6K (SGK.1号)
Area	御前山崎沖	Inclinometer	-
Sampling Site	MC 01	others	-

< Corer info.>

Corer type	Corer only / with the water sampling system
Pipe Length	0.6 m
Number of pipes	8 pipes
Nylon rope	φ24 mm 15 m

< Condition>

Weather	晴れ	Wave height	1.0 m
Wind direction	310 deg.	Current direction	100 deg.
Wind speed	10 m/s	Current speed	2.0 knt

< Operation>

Time			
12/15			
Start operation	23:00		
	Latitude	Longitude	Depth
12/16	(TP) 34-05.7026N	138-07.9767E	2339 m
Hit the bottom	0:21:43		
	(Ship) 34-05.7289N	138-07.9009E	2424 m
Finish operation	01:15		

MEMO

トリガー作動せずに揚収した

enter by 村木

[illegible]

Coring Inventory

< Observation info.>

Cruise name	<u>KR21-20</u>	Operator	<u>四宮</u>
Date (UTC) Y/M/D	<u>2021/ 12 / 16</u>	Recorded by	<u>村木・中野</u>
Core Number	<u>MC01 (B)</u>	Transponder	<u>0-NATS-6K (SGK-1号)</u>
Area	<u>御前崎沖</u>	Inclinometer	<u>-</u>
Sampling Site	<u>MC01</u>	others	<u>-</u>

< Corer info.>

Corer type	<u>Corer only / with the water sampling system</u>
Pipe Length	<u>0.6 m</u>
Number of pipes	<u>8 pipes</u>
Nylon rope	<u>φ24 mm 15 m</u>

< Condition>

Weather	<u>晴れ</u>	Wave height	<u>1.0</u> m
Wind direction	<u>310</u> deg.	Current direction	<u>90</u> deg.
Wind speed	<u>5.0</u> m/s	Current speed	<u>2.6</u> knt

< Operation>

Time			
Start operation	<u>01:54</u>		
	Latitude	Longitude	Depth
	(TP) <u>34-05.6776N</u>	<u>138-07.9734E</u>	<u>2340</u> m
Hit the bottom	<u>2:56:25</u>		
	(Ship) <u>34-05.7125N</u>	<u>138-07.8878E</u>	<u>2422</u> m
Finish operation	<u>03:50</u>		

MEMO

トリガー作動

Coring Inventory

< Observation info.>

Cruise name	KR21-20	Operator	四宮
Date (UTC)	Y/M/D 2021/12/18~19	Recorded by	村木
Core Number	MC-02(A)	Transponder	0-NATS-6K (SGK-18)
Area	尾鷲沖	Inclinometer	-
Sampling Site	MC02	others	-

< Corer info.>

Corer type	Corer only / with the water sampling system
Pipe Length	0.6 m
Number of pipes	8 pipes
Nylon rope	φ24 mm 15 m

< Condition>

Weather	晴れ	Wave height	1.0 m
Wind direction	170 deg.	Current direction	315 deg.
Wind speed	8.0 m/s	Current speed	0.4 knt

< Operation>

Time			
Start operation	23:00		
	Latitude	Longitude	Depth
12/9	(TP) 33-49.2822N	136-34.2391E	1958 2957.5 m
Hit the bottom 0-20=31	(Ship) 33-49.2888N	136-34.1837E	2041 m
Finish operation	1204		

MEMO

トリガーが作動せず揚収

Time (UTC.)	Water depth (m)	Wire out length (m)	Tension (kN)	Wire speed (m/min)	Wire out / in (↓ / ↑)	Remarks
12/18 23:00	2.40	—	—	—	—	作業開始
20	—	—	—	—	—	作動確認, 良好.
29	—	—	—	—	↑	投入作業開始
30	—	—	—	—	↑	ストップ-脱.
31	2.39	0	6.0	20	↓	MC水面.
32	—	0	—	—	—	ケーブル長リセット, トラホソム
34	2.41	50	7.0	—	↓	トラホソム取付.
38	—	"	"	16	↓	操出再捕.
40	2.40	100	6.7	21	↓	
48	2.41	500	10.0	60	↓	
56	2.40	1000	12.0	60	↓	
12/19 0:05	2.39	1500	18.4	60	↓	
13	2.40	1980	24.0	—	—	一旦停止 19.7mトラホソム
17	2.40	"	23.9	18	↓	操出再捕
18	2.41	2000	23.6	"	↓	
20.31	—	2037	—	"	↓	着底
49	—	2042	—	—	—	停止. 16.6kN 最少
21.42	—	"	—	18	↑	巻上再捕. 29.98kN 最大
22.56	—	2027	—	18	↑	離底確認 300kN
23.43	—	2010	—	60	↑	増速
0:26	—	2000	26.0	60	↑	
32	—	1500	22.3	60	↑	
40	2.78	1000	15.8	65	↑	
48	"	500	12.6	65	↑	
56	2.39	52	6.7	—	—	トラホソム切断. ワイヤー停止.
58	—	"	—	—	—	トラホソム取外し
1:02	—	—	—	—	↑	MC水切り.
04	—	—	—	—	—	MC ON Deck.

Coring Inventory

< Observation info.>

Cruise name	KR21-20	Operator	田中
Date (UTC)	Y/M/D 2021/12/19	Recorded by	村本
Core Number	MC-02 (B)	Transponder	0-NATS-6K (SGK-13)
Area	尾鷲	Inclinometer	-
Sampling Site	MC02	others	-

< Corer info.>

Corer type	Corer only / with the water sampling system
Pipe Length	0.6 m
Number of pipes	8 pipes
Nylon rope	φ24 mm 15 m

< Condition>

Weather	晴れ	Wave height	1.5 m
Wind direction	251 deg.	Current direction	359.3 deg.
Wind speed	8.8 m/s	Current speed	0.3 knt

< Operation>

Time			
Start operation	晴れ 12:18		
	Latitude	Longitude	Depth
	(TP) 33-49.2896'N	136-34.2459'E	1961. m
Hit the bottom	2:11:05		
	(Ship) 33-49.2896'N	136-34.1998'E	2039 m
Finish operation	2259		

MEMO

トリガー作動。

Time (UTC)	Water depth (m)	Wire out length (m)	Tension (KN)	Wire speed (m/min)	Wire out/ in (I/I)	Remarks
1=18	2.39	—	—	—	—	作業開始
19	—	—	—	—	—	ストッパ・脱
20	2.42	—	1.3	16	↓	MC水面
21	2.39	0	6.9	—	—	トラホソ ON, ウインチ作止
25	2.38	50	7.0	—	—	トラホソ 取付.
27	2.39	"	"	20	↓	ウインチ巻出し
37	2.40	500	10.0	60	↓	
45	2.38	1000	12.7	60	↓	
54	"	1500	18.5	60	↓	
2=04	2.38	1980	23.9	—	—	一旦停止
07	"	"	"	18	↓	援生再用.
11.05	2.39	2039	16.4	18	↓	首尾 最小 17.5 kN
11.45	"	2044	"	—	—	停止
12.25	"	2046	14.3	—	—	2m 追加巻出し
13.27	"	2047	17.5	—	—	巻上げ 1m 追加巻出し
15.25	"	2049		18	↑	最大 29.8 kN
17.01	"	2024	25.2	"	↑	断在確認
2=27	2.38	1500	22.4	63	↑	
35	2.39	1000	13.8	65	↑	
43	2.38	500	13.3	65	↑	
50	2.37	52	6.8	—	—	トラホソ 水切
54	"	—	—	—	—	トラホソ 取外し
58	"	—	—	—	—	MC水面
59	—	—	—	—	—	MC ON Deck

Coring Inventory

別紙12
PC インベントリシート

< Observation info.>

Cruise name KR21-20
Date (UTC) Y/M/D 2021 / 12 / 20 ~ 21
Core Number PC 01
Area 糸伊半島沖
Sampling Site MK5
Operator 片山
Recorded by 村木-中野
Transponder 0-NATS-6K (SGK-13)
Inclinometer APC-USB002
others -

< Corer info.>

Corer type Inner / Outer Riston / Gravity
Weight 640 ~~392~~ kg
Pipe Length AL / 8US 6 m
Main wire ϕ 10mm X 12.8 m
Free Fall 3.4 m
Pilot type 74233-
Pilot Weight 112 kg
Pilot Pipe Length 0.7 m
Pilot Wire 12.6 m

< Condition>

Weather 晴れ
Wave height 1.5 m
Wind direction 279 deg.
Current direction 293.9 deg.
Wind speed 9.2 m/s
Current speed 0.8 knt

< Operation>

Time
12/20 23:00
Start operation 23:00
Latitude 32-56.9827'N
Longitude 134-57.9724'E
Depth 1935.1 m
Hit the bottom 0:43:18
(TP) 32-57.
(Ship) 32-57.0422'N 134-57.9764'E 2011 m
Finish operation 1:44

MEMO

Cruise Name

KR21-20

Core Name

PC01

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2021/12/20~21

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Recorded by

村木-中野

Time (UTC)	Water depth (m)	Wire out length (m)	Tension (kN)	Wire speed (m/min)	Wire out/in (↓/↑)	Remarks
12/20 23:00	—	—	—	—	—	作業開始.
45	—	—	—	—	—	ハイドロメーター取付. 安全ヒューズ.
47	2010	—	—	—	↓	PC 着水
51	2011	50	—	—	—	
54	"	"	—	—	—	トラホーン取付
55	2011	35	8.5	16	↓	" 着水
56	"	75	8.3	—	—	一旦停止. 巻出再開.
57	2009	100	8.7	30	↓	
12/21 0:04	2012	300	11.3	40	↓	
09	2011	500	12.6	60	↓	
18	2012	1000	15.0	60	↓	トラホーン 947.2.
26	2010	1500	20.8	60	↓	
33	2011	1900	25.4	—	—	一旦停止. トラホーン 1822.
36	2011	"	25.8	18	↓	巻出再開 " 1822
0:41:49	"	1990	25.0	"	↓	
42:12	"	2000	25.3	"	↓	
43:18	"	2021			↓/-/↑	着底. 最小 15.3 kN
43:35	"			18	↑	最大 43.4 kN
44:24	"	2007	27.5	18	↑	離底確認
0:53	"	1500	23.7	60	↑	
1:01	"	1000	16.3	60	↑	
09	2012	500	14.7	60	↑	
15	2009	200	9.6	60	↑	
17	2011	100	8.4	—	↑	減速
"	"	52	"	—	—	ワイヤー停止. トラホーン水面
20	—	49	8.8	—	—	トラホーン取外し
38	—	—	8.0	10	↑	PC 離水面
44	—	—	—	—	—	PC 揚収

※1t ≒ 9.8kN

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Marine Works Japan LTD.

Coring Inventory

別紙12
PC インベントリシート

< Observation info.>

Cruise name	KR21-20	Operator	橋本
Date (UTC)	Y/M/D 2021/12/21~22	Recorded by	村木・中野
Core Number	PC02	Transponder	O-NATS-6K(SGK-13)
Area	紀伊半島沖	Inclinometer	APC-USB002
Sampling Site	MK31	others	-

< Corer info.>

Corer type	Inner / Outer	Piston / Gravity	Pilot type	74 コーラ -
Weight	640	kg	Pilot Weight	112 kg
Pipe Length	AL / SUS	6 m	Pilot Pipe Length	0.7 m
Main wire	φ 10mm X 12.8	m	Pilot Wire	12.6 m
Free Fall	3.4	m		

< Condition>

Weather	晴れ	Wave height	1.0 m
Wind direction	341 deg.	Current direction	222.8 deg.
Wind speed	6.9 m/s	Current speed	1.4 knt

< Operation>

Time			
Start operation	12/21 23:45	Latitude	Longitude
			Depth
	12/22 (TP) 32-58.4965'N	134-59.9575'E	1828 m
Hit the bottom	01:10:48	(Ship) 32-58.5525'N	135-00.0227'E
			1906 m
Finish operation	02:31		

MEMO

目標点: 32-58.5 N. 135-00.0 E 水深 1903 m

Cruise Name

KR21-20

Core Name

PC 02

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Recorded by

村木中野

Time (UTC)	Water depth (m)	Wire out length (m)	Tension (kN)	Wire speed (m/min)	Wire out / in (t/t)	Remarks
23:45	—	—	—	—	—	作業開始
0:07	—	—	—	—	—	投入作業開始
1:15	19.7	—	8.2	—	—	ハイドロット着水
19	19.6	—	10.0	11	↓	安全ヒック脱
20	19.7	0	8.5	—	—	PC着水, ケーブルリセト
23	19.6	50	8.6	—	—	一旦停止, トラホック取付
26	19.3	—	8.8	10	↓	繰り出し再開
28	19.3	86	8.1	—	—	一旦停止
"	"	"	"	25	↓	繰出再開
29	19.3	100	8.2	30	↓	
40	19.3	500	13.0	60	↓	
49	19.3	1000	14.6	60	↓	
57	19.6	1500	20.7	60	↓	
1:03	19.1	1840	24.5	—	—	ウインチ停止, トラホック1760m
01:06:31	19.1	"	24.7	18	↓	繰出再開
01:10:48	"	1914	12.8	—	—	着底 最少13.8kN
01:11:35	"	1902	48.2	18	↑	離底確認 最大48.2kN
1:15	"	1700	20.9	60	↑	
19	19.3	1560	23.4	60	↑	
26	19.6	1000	17.2	60	↑	
34	19.4	500	14.8	60	↑	
40	"	188	8.9	—	—	ウインチ一旦停止, 繰出
41	19.1	195	9.3	10	↑	巻き上げ再開
42	"	185	9.2	—	—	一旦停止, 乱巻き調整(ウインチ)
2:00	19.5	150	9.7	30	↑	
2:03	19.4	52	8.9	—	—	トラホック外
25	19.3	—	7.6	20	↑	PC着水
31	19.08	—	—	—	—	PC on deck

※1t ≒ 9.8kN

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Marine Works Japan LTD.

Coring Inventory

別紙12
PC インベントリシート

< Observation info.>

Cruise name	KR21-20	Operator	<u>橋本 片山</u>
Date (UTC)	Y/M/D <u>2021 / 12 / 22 - 23</u>	Recorded by	<u>村木・中野</u>
Core Number	<u>PC 03</u>	Transponder	<u>0-NATS-6K(SGK-13)</u>
Area	<u>紀伊半島沖</u>	Inclinometer	<u>APC-USB002</u>
Sampling Site	<u>Mk 9</u>	others	<u>-</u>

< Corer info.>

Corer type	<u>Inner / Outer</u>	<u>Piston / Gravity</u>	Pilot type	<u>74133-</u>	
Weight	<u>640</u>	kg	Pilot Weight	<u>112</u> kg	
Pipe Length	AL / <u>6US</u>	<u>6.0</u>	m	Pilot Pipe Length	<u>0.7</u> m
Main wire	ϕ <u>10mm</u> $\times$ <u>12.0</u>	m	Pilot Wire	<u>12.6</u> m	
Free Fall	<u>3.4</u>	m			

< Condition>

Weather	<u>晴水</u>	Wave height	<u>1.0</u> m
Wind direction	<u>10</u> deg.	Current direction	<u>290</u> deg.
Wind speed	<u>6.0</u> m/s	Current speed	<u>0.7</u> knt

< Operation>

Time			
Start operation	<u>12/22</u> <u>23:45</u>	Latitude	Longitude
			Depth
Hit the bottom	<u>12/23</u> <u>02:01:46</u>	(TP) <u>32-42.7085'N</u>	<u>134-57.3443'E</u> <u>4268</u> m
		(Ship) <u>32-42.7287'N</u>	<u>134-57.4440'E</u> <u>4332</u> m
Finish operation	<u>3:55</u>		

MEMO

Cruise Name

KR21-20

Core Name

PC 03

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2021/12/22 ~ 23

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Recorded by 村木・中野

Time (UTC)	Water depth (m)	Wire out length (m)	Tension (kN)	Wire speed (m/min)	Wire out / in (1/1)	Remarks
12/22 2345	4332	-	-	-	-	作業開始
0:05	4331	-	-	-	-	投入れ作業開始
013	4331	-	-	-	-	PC吊上げ、注水
18	4331	-	-	-	-	PL吊上げ、着水
21	4331	-	-	-	-	PL取り完了
22	4330	-	9.6	-	-	安全ピン脱
24	4332	0	8.7	-	-	天秤着水 ケーブルを1メートル
26	4330	50	8.5	-	-	ウインチ一旦停止
31	4331	"	8.7	-	-	トラボンを取付完了、巻出再開
32	4330	60	7.8	30	↓	トラボンを着水
33	-	-	-	-	-	ウインチ一旦停止、巻出再開
34	4329	100	8.2	29	↓	
38	-	-	-	-	-	ウインチ一旦停止、
39	-	-	-	-	-	巻出再開、
44	4330	300	11.3	40	↓	
48	"	500	12.6	60	↓	
56	4329	1000	13.9	"	↓	
1:13	4332	2000	24.5	"	↓	
29	"	3000	32.7	"	↓	トラボン 2921
46	"	4000	41.5	"	↓	" 3903
51	"	4250	44.0	-	-	一旦停止、トラボン 4145
54	4272	"	"	18	↓	巻出再開、
02:01:46	4332 4332	4379	30.7	-	-	着底 w.o. 4379 最少 31.5kN
02:58	4332 4332	4362	44.0	18	↑	離底確認 w.o. 4362 最大 48.0kN
05	4332	4250	44.0	~60	↑	増速
06	4332	4188	44.2	0	-	ウインチ停止
12	4332	4188	45.7	~30	↑	巻上げ
18	4332	4000	43.7	40	↑	

※1t ≡ 9.8kN

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Marine Works Japan LTD.

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Recorded by 村木・中野

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Tension record of MC and PC operations

0:48 W.D. 1000m 14.7kN
↑ 60m/min

0:32 W.D. 2000m 27.6kN
↑ 60m/min

KR21-20
MC01-(A)
2021/12/16
(UTC)

0:23:39 離陸確認 W.D. 2420

0:22:57 上昇中 ↑ 18m/min M: 16.2kN
W.D. 2431m 16.2kN

0:21:43 着底 W.D. 2428m ↓ 18m/min
W.D. 2424m

0:17 上昇中 ↓ 18m/min 21.7kN

↑ 10m/min

0:13 W.D. 2355m 上昇中 21.7kN
W.D. 2424m

3:15 w.o. 1500m 22.0kN

2:59 船底確認 w.o. 2418m ^{max} 27.0kN

2:57 ウィンチ1m<1.5L. w.o. 2434m ^{min} 16.5kN

2:56 ウィンチ停止 w.o. 2433m ^{min} 16.9kN

2:56:25 着底 w.o. 2428m
w.d. 2422m

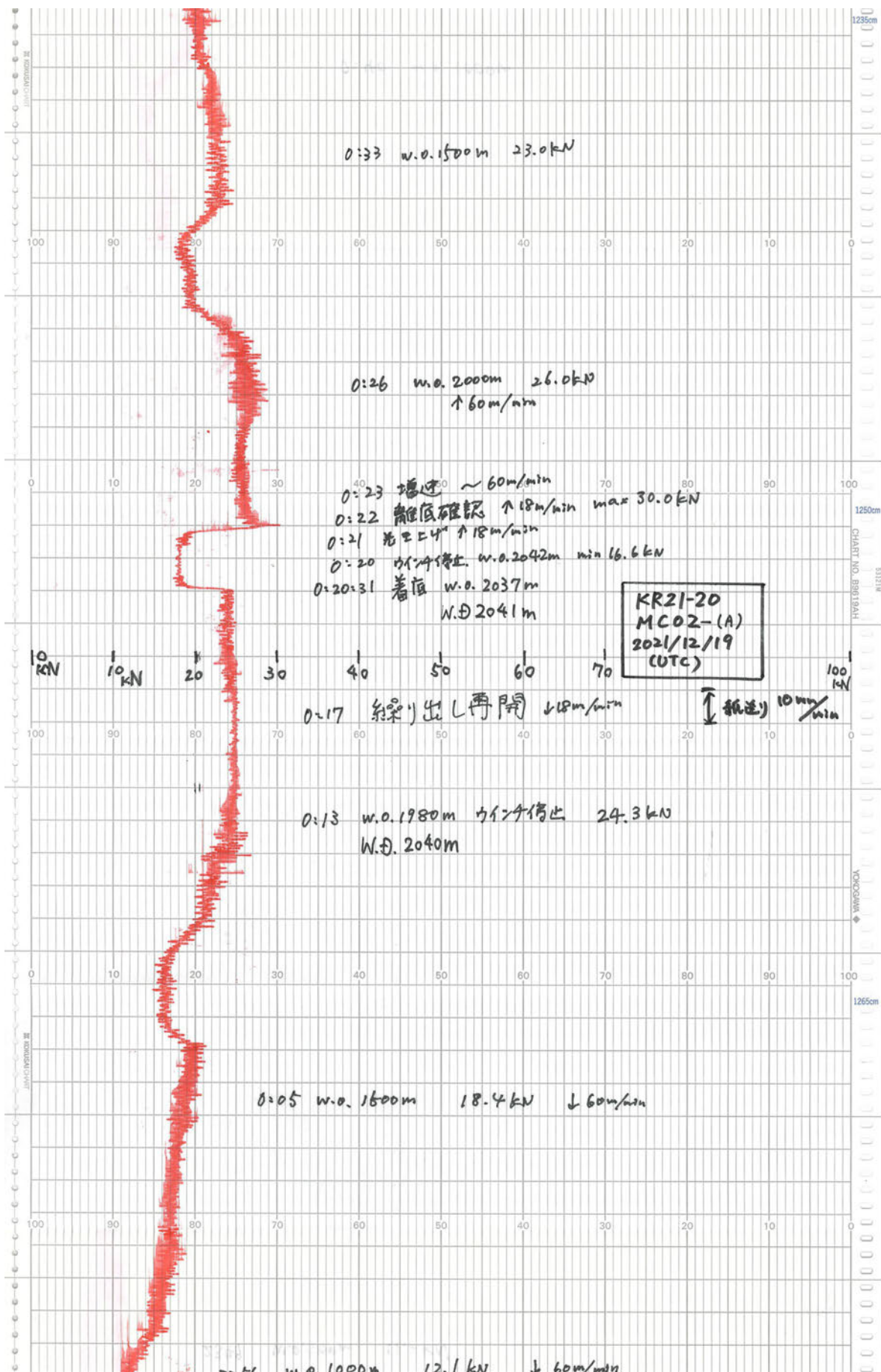
KR21-20
MC01-(8)
2021/12/16
(UTC)

2:51
~~5:5~~ <1.5L ↓ 187mm 21.6kN

↑ (針速) 10mm/min

2:48 w.o. 2355m ウィンチ停止 21.7kN
w.d. 2423m

2:40 w.o. 2000m 22.5kN



1115cm

2:35 w.o. 1000m 13.8kN

2:27 w.o. 1500m 21.5kN

KR21-20
MC02-(B)
2021/12/19
(UTC)

↑ 振速 ↓
10mm/min

2:17 離床確認 w.o. 2024m max 29.8kN

2:15 振速上げ ↑ 18mm/min

2:13 ウィンチ 1m 上昇 w.o. 2047m

2:12 ウィンチ 2m 上昇 w.o. 2046m

2:11 ウィンチ停止 w.o. 2044m min 17.5kN

2:11:05 着床 w.o. 2039m max 20.4kN
w.d. 2039m

0kN 10 20 30 40 50 60 70 80 90 100kN

2:07 上昇 18mm/min

W.D. 2038m
2:04 w.o. 1980m 23.8kN
ウィンチ停止

1130cm

5127W

CHART NO. B9115AH

YOKOGAWA

1145cm

