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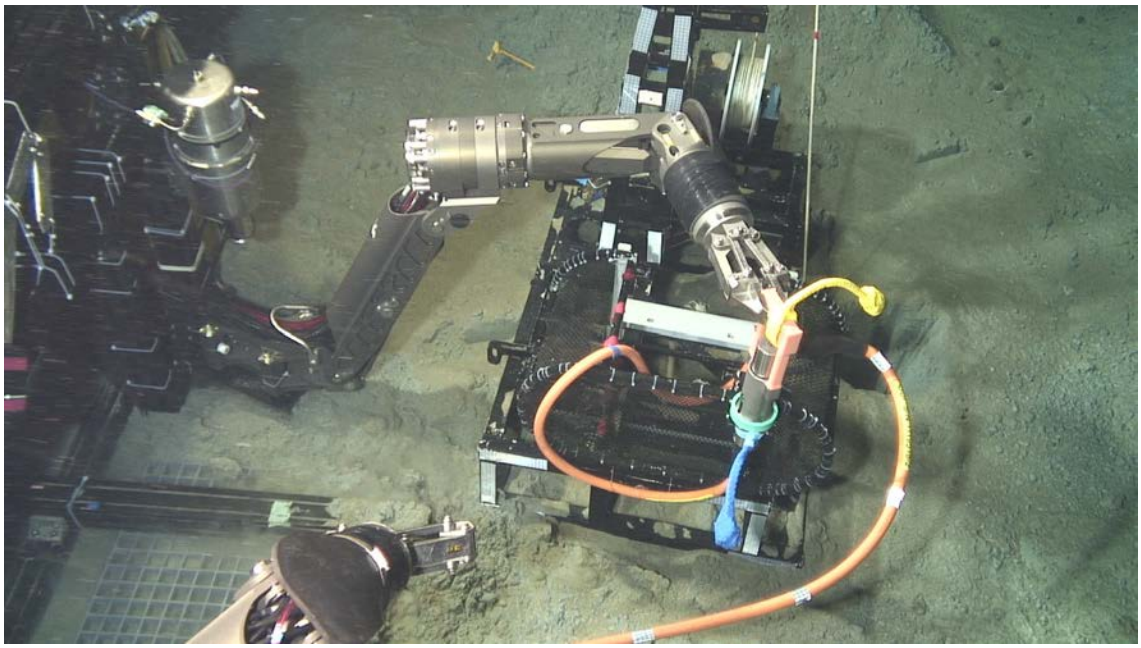
Shinseimaru+ “Cruise Report”
KS-21-J03



Real time ocean bottom crustal movement observation

Kumano-nada, off Kii Channel

Feb.10th,2021 - Feb.18th,2021

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

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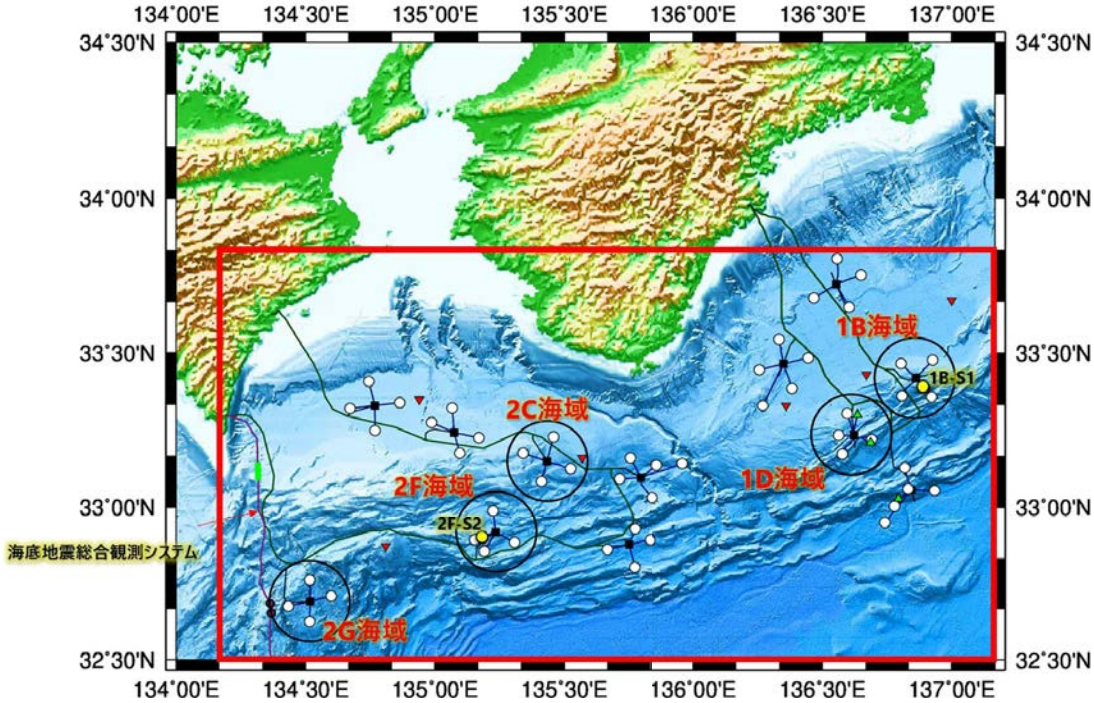
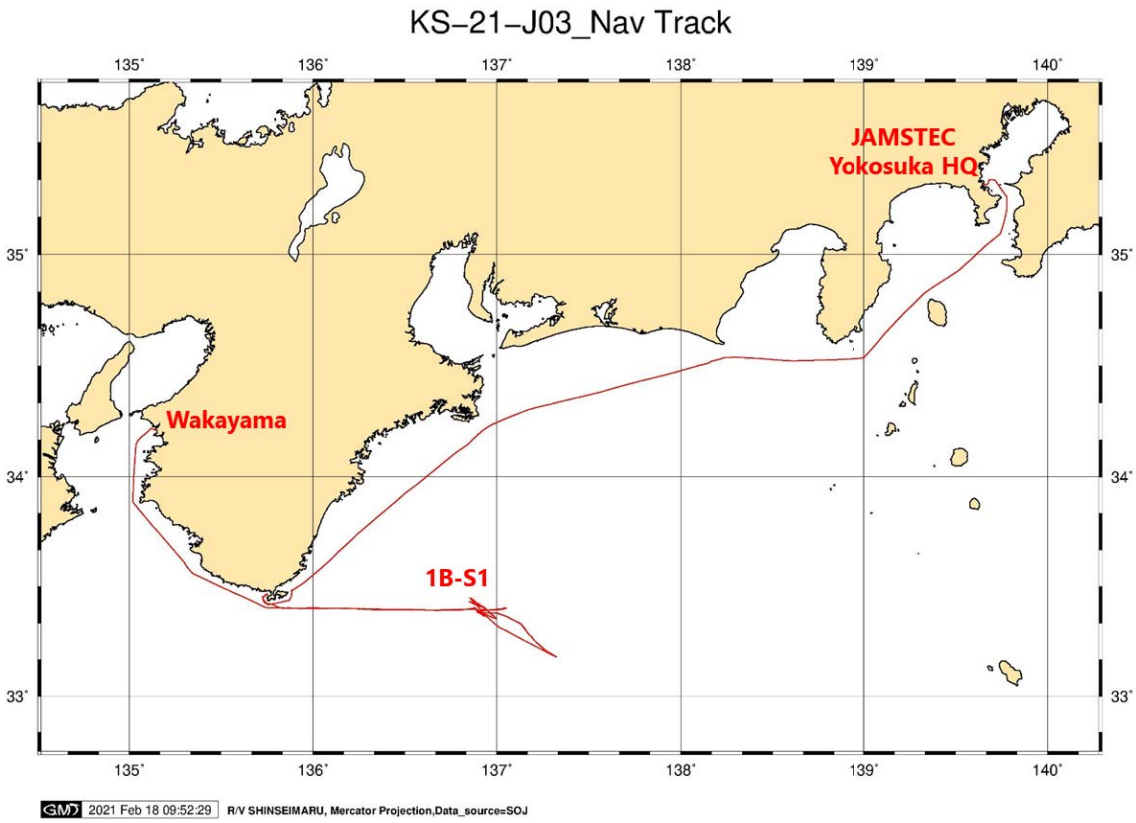
1. Cruise Information

Cruise ID:	KS-21-J03
Name of vessel:	Shinsei-maru
Title of cruise:	Real time ocean bottom crustal movement observation
Representative of the Science Party [Affiliation]	Eiichiro Araki [JAMSTEC]
Chief Scientist [Affiliation]:	Shuhei Nishida [JAMSTEC]
Boarding Scientist	Yuya Machida [JAMSTEC] Toshinori Kimura[JAMSTEC] Masayuki Toizumi [Nihon Marine Enterprise] Toshimasa Nasu [Nihon Marine Enterprise] Kenya Yamanaka [Nihon Marine Enterprise]
Cruise period:	February, 10th, 2021 - February, 18th, 2021
Ports of departure / call / arrival:	Wakayama Port / JAMSTEC Yokosuka HQ
Research area:	Kumano-nada

● Research map





2. Research Proposal

JAMSTEC has been implementing the "Observation Project on the wide area variation of the ocean floor for building national resilience" since FY2017 in order to achieve the national mission of toughening the national land, securing people's safety and security. In this project, (1) development and deployment of ocean bottom crustal deformation observation technology based on the submarine cabled observation and monitoring system for earthquake and tsunami (DONET), using a pressure gauge, an inclinometer, a long-term borehole observation system installed in a borehole of "CHIKYU" deployed in the Nankai Trough. (2) High precision wide area survey of active submarine faults using a three-dimensional seismic survey system of the ocean floor wide area research ship "KAIMEI" and etc., in Nankai Trough segment area, which is important for the evaluation of interactivity, and the Japan Trench outer rise area that may cause a tsunami earthquake. (3) Development and evaluation of more realistic simulation and transition prediction methods incorporating new survey and observation results obtained in (1) and (2) will be conducted. Through this, the prediction of the occurrence of huge earthquakes (Evaluation of urgency, scale and distribution) was imploded. In addition, the accuracy of tsunami inundation immediate prediction is improved by accurately estimating the epicenter area, its size, and the tsunami source immediately after the earthquake occurrence. The purpose is to realize disaster prevention and mitigation through these efforts.

3. Activities and Results

The purpose of this cruise is the real time sea floor observation for crustal deformation based on submarine cabled monitoring system for the earthquake and tsunami (DONET) deployed in the Nankai Trough using pressure gauges, tiltmeters, strainmeters and borehole observation system.

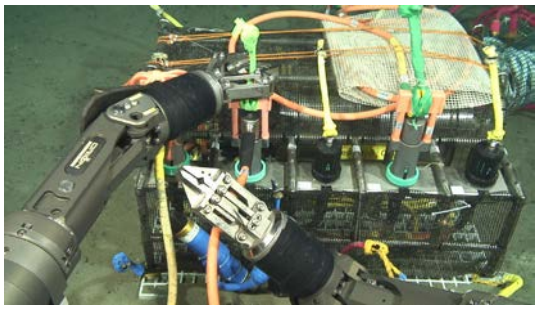
In this cruise, following works was carried out.

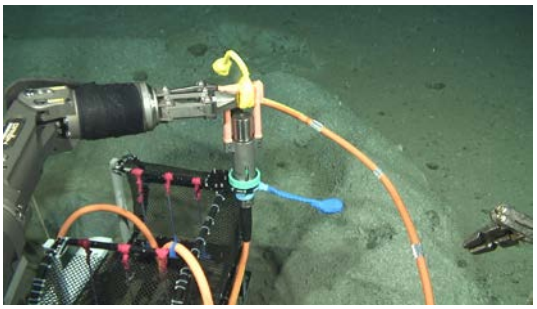
1. A dead weight type tiltmeter into the borehole (BMS#13-1) and DONET I/F was connected. The realtime observation of the dead weight type tiltmeter was started.

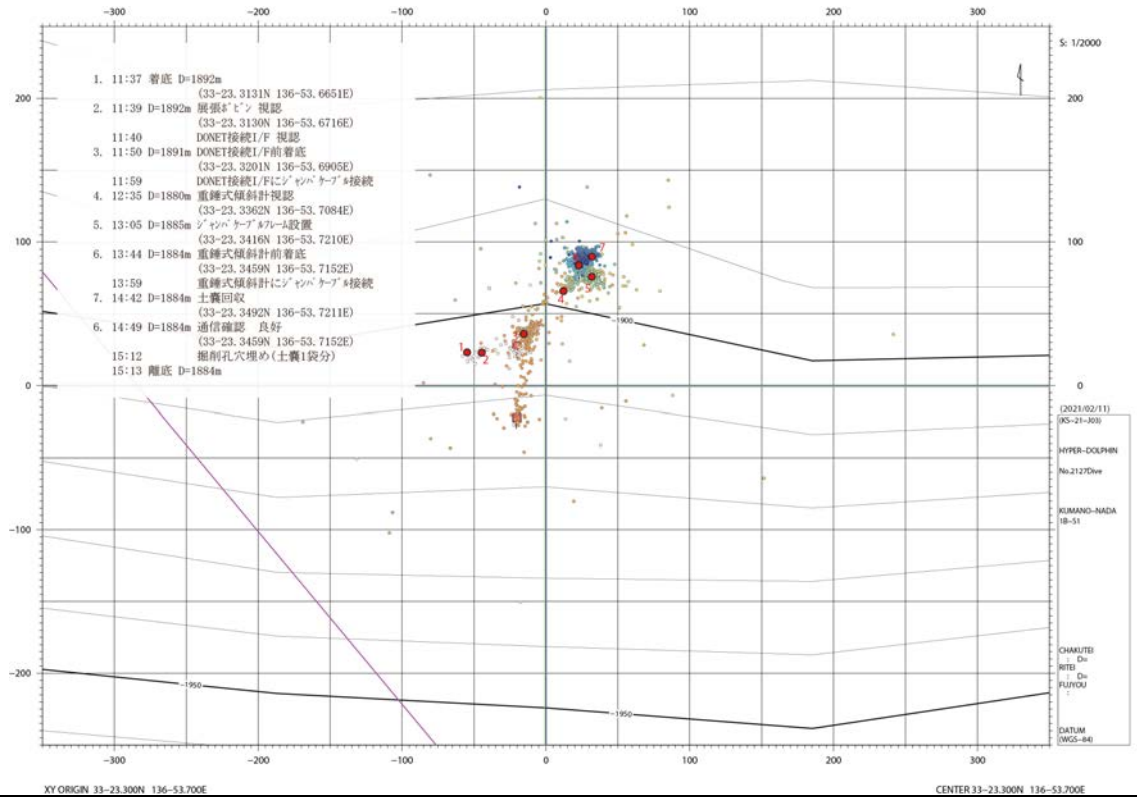
2. To improve the observation quality of the tiltmeter, the back filling of the sand was carried out. About 200L sand was installed into the borehole BMS#13-1.

4. Operation Summary

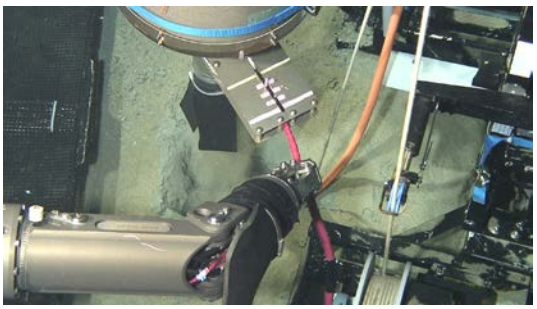
No.	Date Dive Num.	Start Time End Time	Site	Latitude Latitude	Longitude Longitude	Depth Depth
1	2021/02/11	11:37	Kumano-nada 1B-S1	33-23.3131N	136-53.6651E	1892m
	HPD2127	15:13		33-23.3459N	136-53.7152E	1884m
	Work Summary		The DONET connection I/F and the deadweight inclinometer were connected by a jumper cable which was expanded about 80m. We energized the deadweight inclinometer from the shore station via the submarine cable, confirmed the communication, and started the inclination observation.			

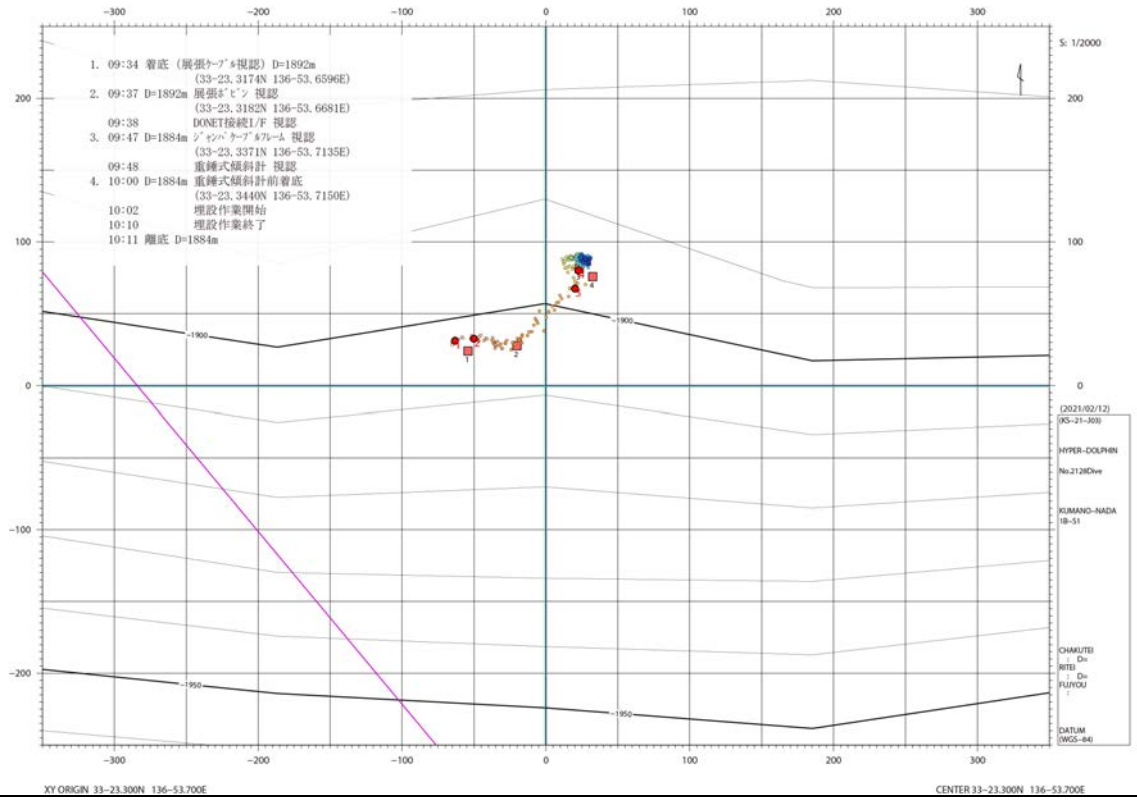




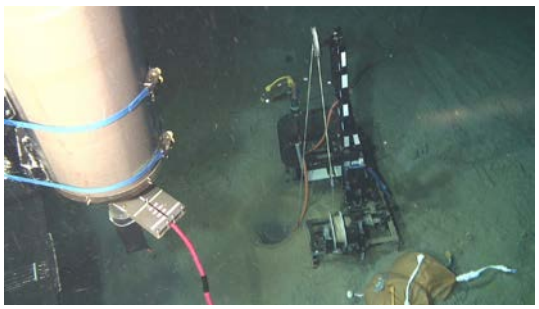


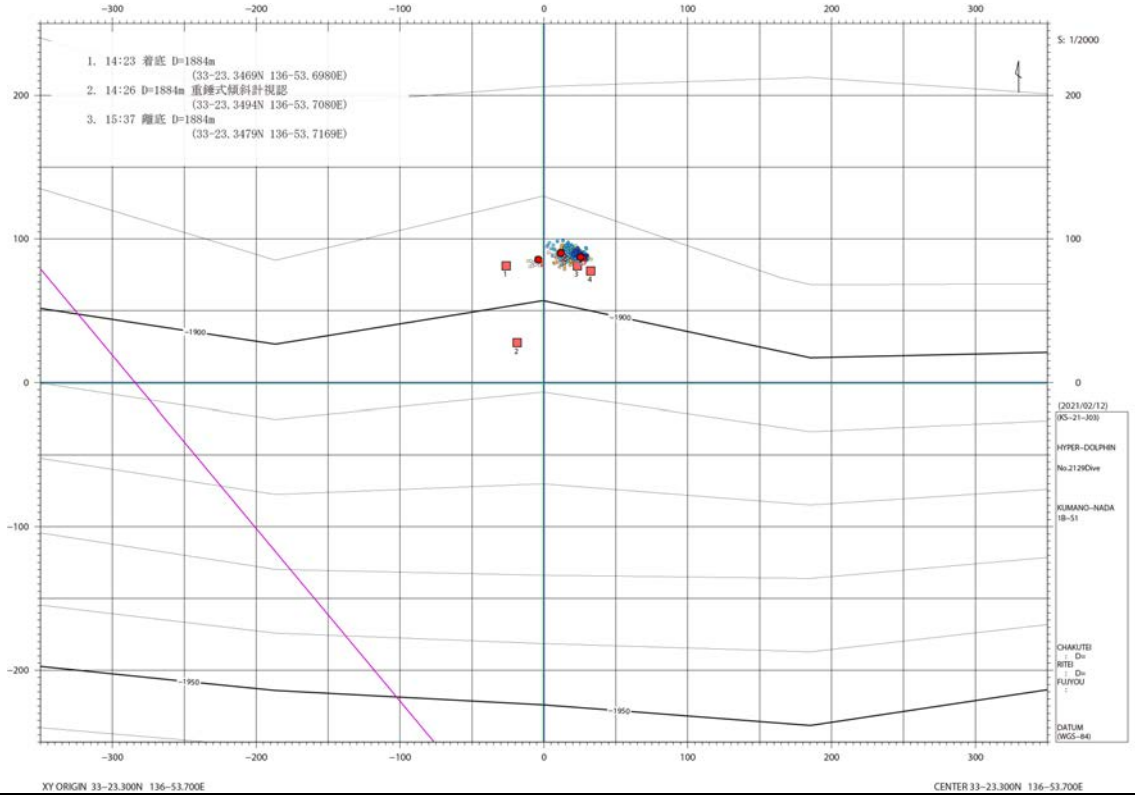
No.	Date Dive Num.	Start Time End Time	Site	Latitude Latitude	Longitude Longitude	Depth Depth
2	2021/02/12	09:34	Kumano-nada 1B-S1	33-23.3174N	136-53.6596E	1892m
	HPD2128	10:11		33-23.3440N	136-53.7150E	1884m
	Work Summary		At observation point 1B-S1, we observed the installation of cables from the DONET I/F to the dead-weight inclinometer, and backfilled the 19 m borehole where the dead-weight inclinometer is installed with sand for about 2 m.			



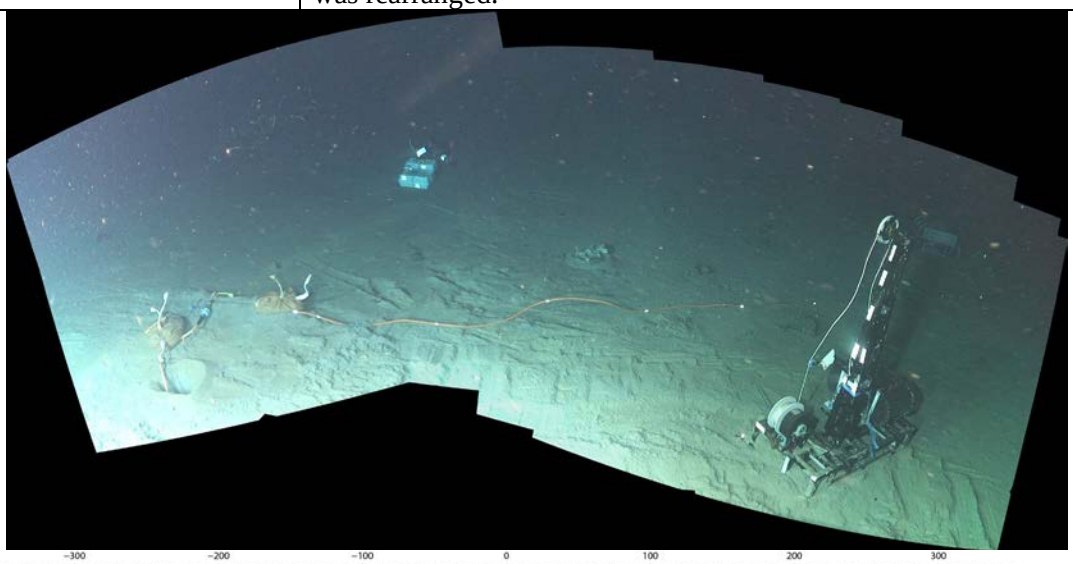


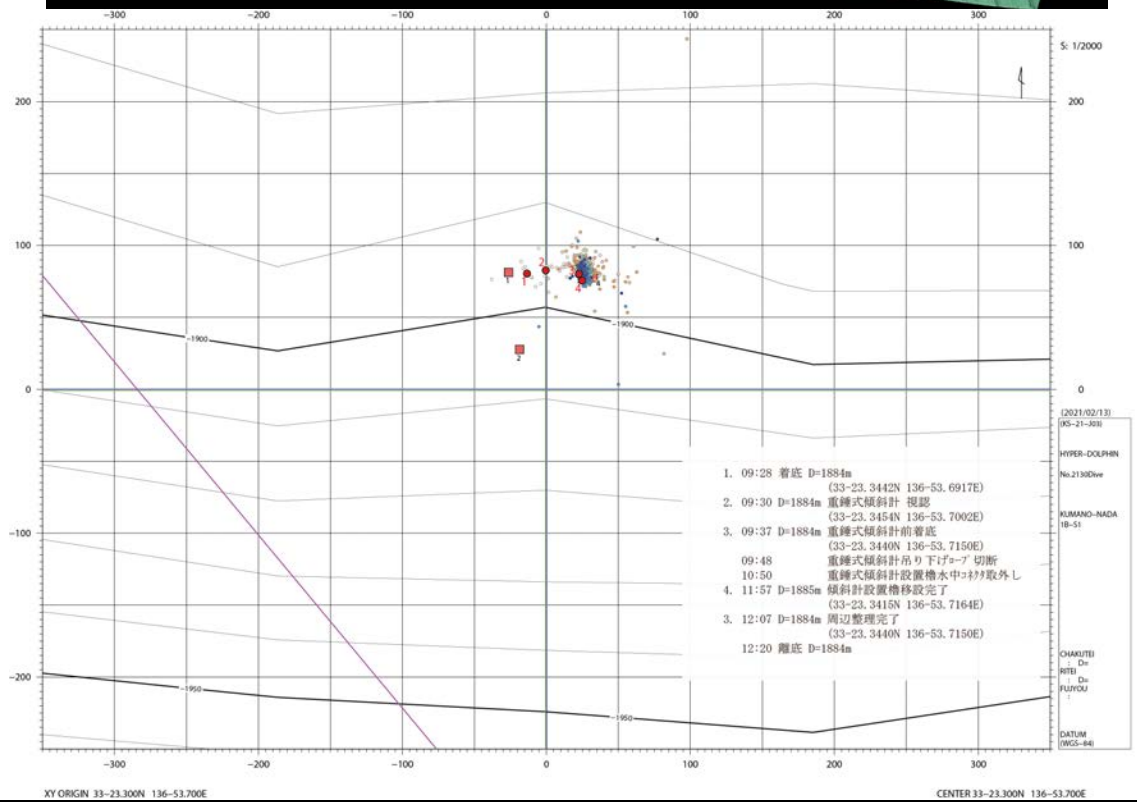
No.	Date Dive Num.	Start Time End Time	Site	Latitude Latitude	Longitude Longitude	Depth Depth
3	2021/02/12	14:23	Kumano-nada 1B-S1	33-23.3469N	136-53.6980E	1884m
	HPD2129	15:37		33-23.3479N	136-53.7169E	1884
	Work Summary		At observation point 1B-S1, we tried to backfill the 19-meter borehole. However, due to poor visibility caused by strong currents, the operation was abandoned and the ship was lifted.			



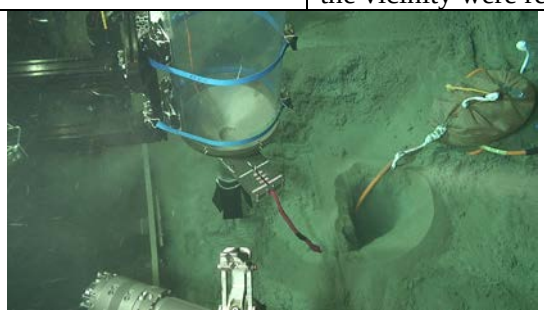


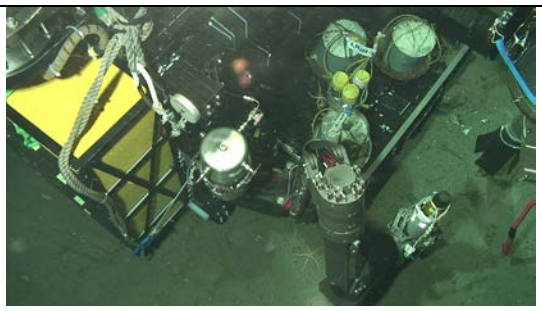
No.	Date Dive Num.	Start Time End Time	Site	Latitude Latitude	Longitude Longitude	Depth Depth
4	2021/02/13	14:23	Kumano-nada 1B-S1	33-23.3469N	136-53.6980E	1884m
	HPD2130	15:37		33-23.3479N	136-53.7169E	1884m
	Work Summary		At the observation point 1B-S1, the installation system of the dead-weight inclinometer was relocated and the surrounding area was rearranged.			

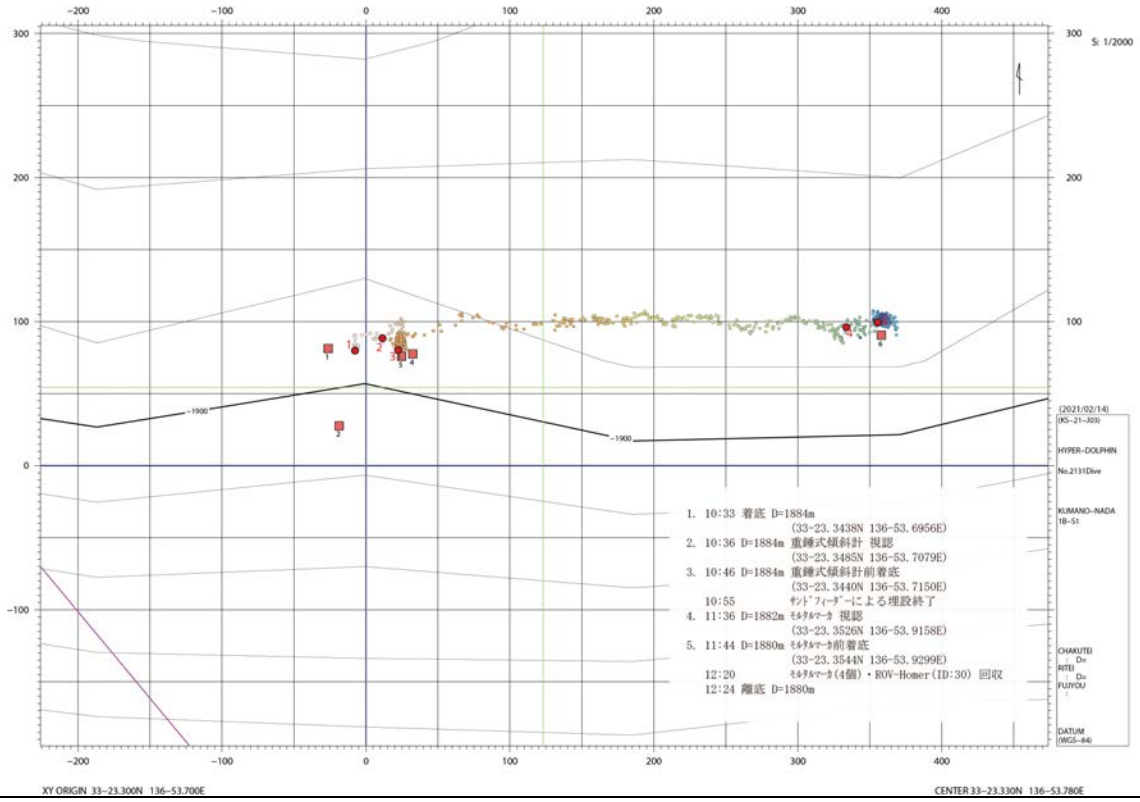




No.	Date Dive Num.	Start Time End Time	Site	Latitude Latitude	Longitude Longitude	Depth Depth
5	2021/02/14	10:33	Kumano-nada 1B-S1	33-23.3438N	136-53.6956E	1884m
	HPD2131	12:24		33-23.3544N	136-53.9299E	1880m
	Work Summary		At observation point 1B-S1, a 19-meter borehole was backfilled by 2 meters, and ROV-HOMER-ID30 and mortar markers installed in the vicinity were recovered.			







5. 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 JAMSTEC.

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