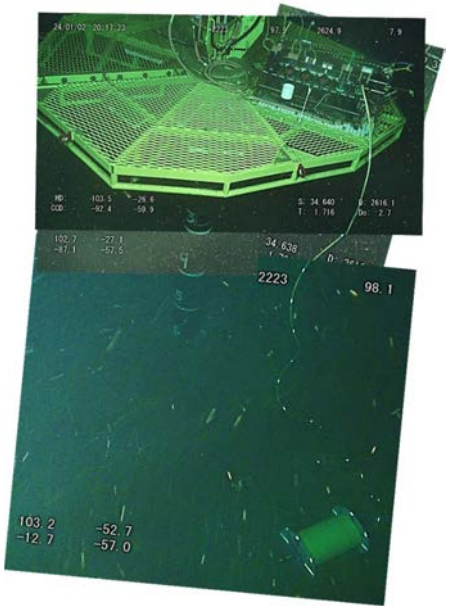
doi : 10.17596/0003870

R/V Shinsei-maru Cruise Report
KS-23-J11

Real-time ocean bottom crustal movement observation
&
Maintenance of the DONET



Kumanonada Sea, Off Kiisuido Strait, off Cape Muroto
East off Izu Oshima Island and Sagami Bay

Dec. 28th, 2023 – Jan. 11th, 2024

R&D Group for Seafloor Observatory
R&D Center for Earthquake and Tsunami Forecasting
Research Institute for Marine Geodynamics
Japan Agency for Marine-Earth Science and Technology

Contents

1. Cruise Information

Cruise ID:	KS-23-J11
Name of vessel:	Shinsei-maru
Title of cruise:	Real time ocean bottom crustal movement observation

Chief Scientist:	Affiliation	Duration
Shuhei Nishida	JAMSTEC	Dec. 28th – Jan. 11th

Boarding Scientist:	Affiliation	Duration
Takashi YOKOBIKI	JAMSTEC	Dec. 28th – Jan. 5th
Shuhei Tsuji	JAMSTEC	Dec. 28th – Jan. 5th
Yuya Machida	JAMSTEC	Jan. 6th – Jan. 11th
Morifumi TAKAESU	NME	Dec. 28th – Jan. 11th
Yousuke KAWAMURA	NME	Dec. 28th – Jan. 11th
Wataru Tokunaga	NME	Dec. 28th – Jan. 11th

Cruise period:	Leg1: Dec. 28th – Jan. 5th Leg2: Jan. 6th – Jan. 11th
Ports of departure/call/arrival:	JAMSTEC Yokosuka HQ / Wakayama / Wakayama
Research area:	Kumanonada Sea, Off Kiisuido Strait, off Cape Muroto

2. Research Proposal and Science Party

Science Party List:	
Eiichiro Araki	JAMSTEC
Takashi Yokobiki	JAMSTEC
Hiroyuki Matsumoto	JAMSTEC
Shuhei Nishida	JAMSTEC
Yuya Machida	JAMSTEC
Shuhei Tsuji	JAMSTEC
Satoru Baba	JAMSTEC
Takane Hori	JAMSTEC
Shuichi Kodaira	JAMSTEC

3. Activity and Results

Subject 1: Real-time ocean bottom crustal movement observation

A) The health check of the sensors (pore-pressure sensor and optical fiber strainmeter) a brand-new Long-Term Borehole Measurement System (LTBMS) at DN2F-1 called C9038B installed in CK23-03 cruise was carried out. And a DAS and a TW-COTDR measurements were taken using optical fiber installed in the borehole.

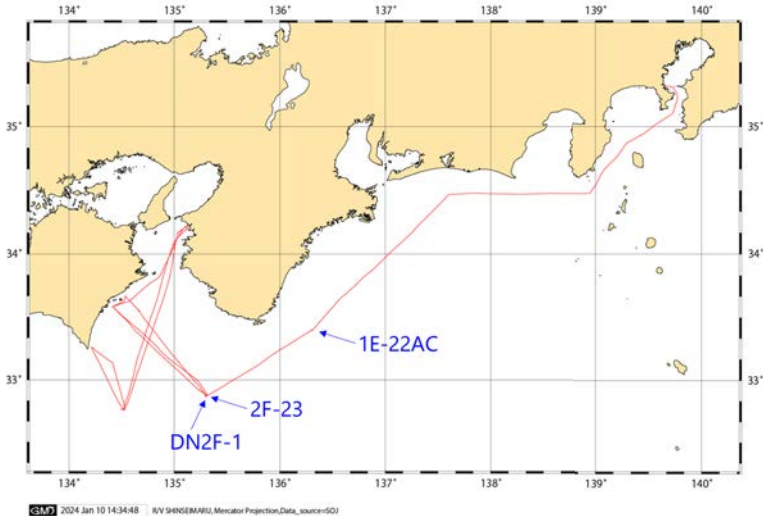
B) A thin submarine cable was laid by ROV from DONET node 2F to LTBMS "C9038B" along an approximately 8.5 km section, and both instruments were connected. After the cable was connected, power was supplied from the land station, and the sensors were confirmed to be working. Real-time observation has been in operation.

C) In-situ calibration was conducted at observatory 2G-26 using the mobile water pressure calibrator. This is the first time we have performed on-site calibration here. We will conduct multiple calibrations in the future to estimate the drift of the bottom pressure gauge and to estimate the vertical crustal deformation rates.

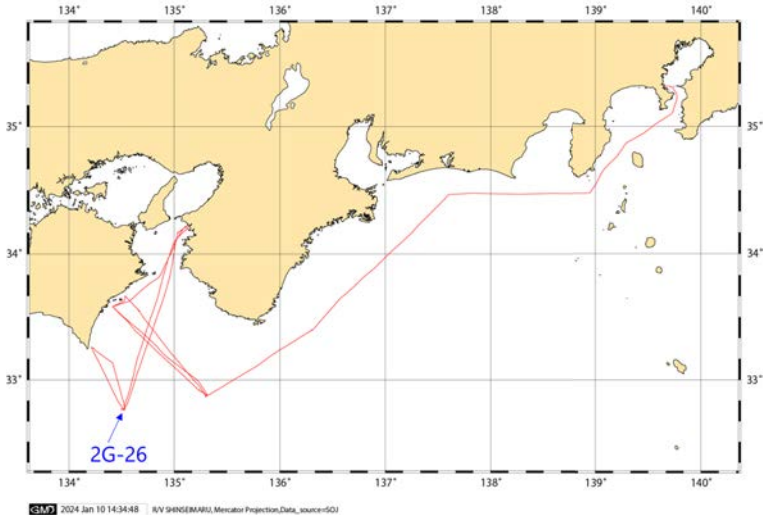
Subject 2: Maintenance of the DONET

D) We disconnected the junction point of the thin submarine cable that connects DONET Node1E to observatory 1E-22. This work is intended to reduce the likelihood of disturbance to the collection of equipment to be conducted in the next fiscal year.

E) The ground motion sensor system at DONET observatory 2F-23 was backfilled with sand, in order to improve the observation quality.



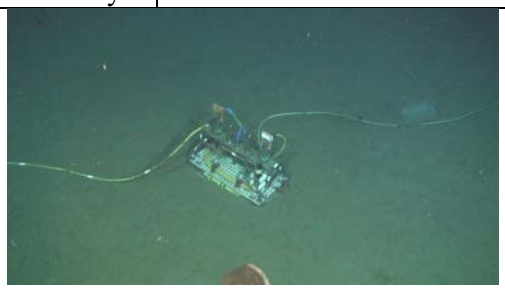
vessel tracks during KS-23-J11 Leg1

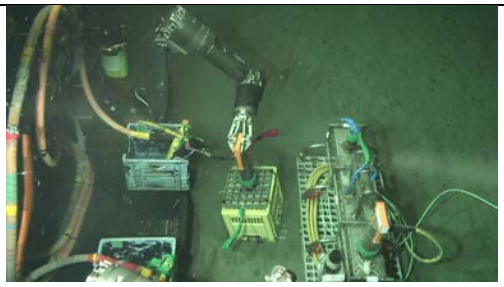


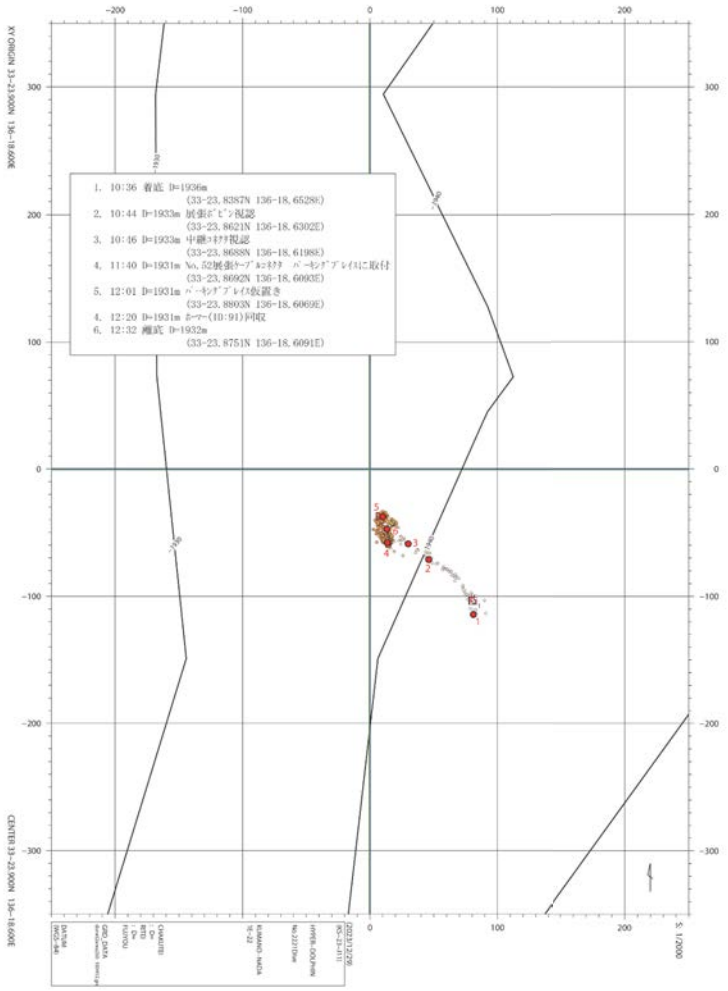
vessel tracks during KS-23-J11 Leg2

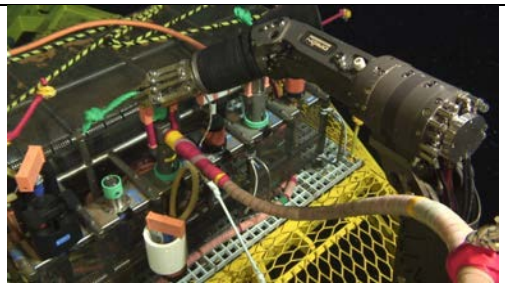
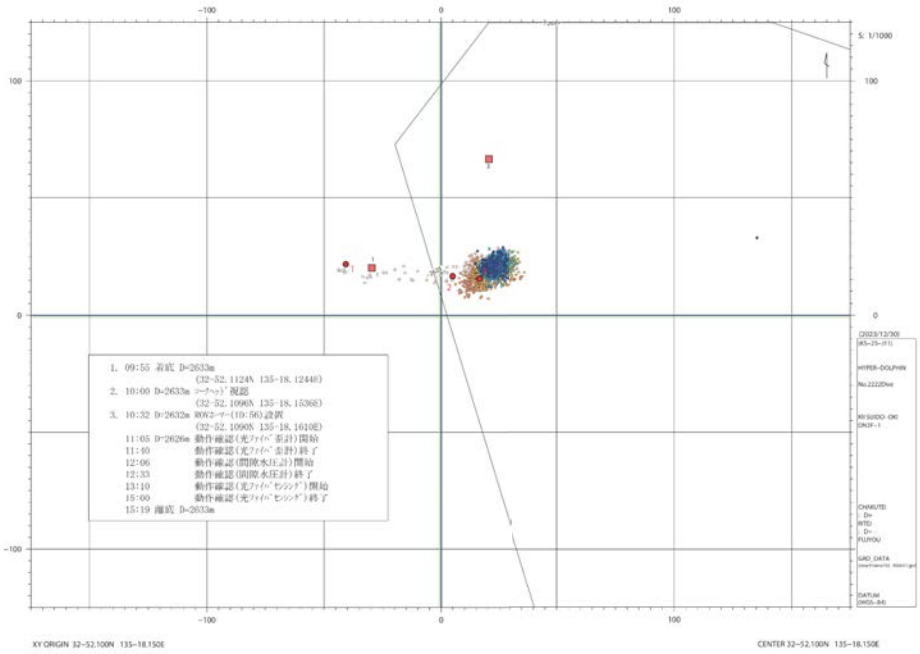
4. Dive Log

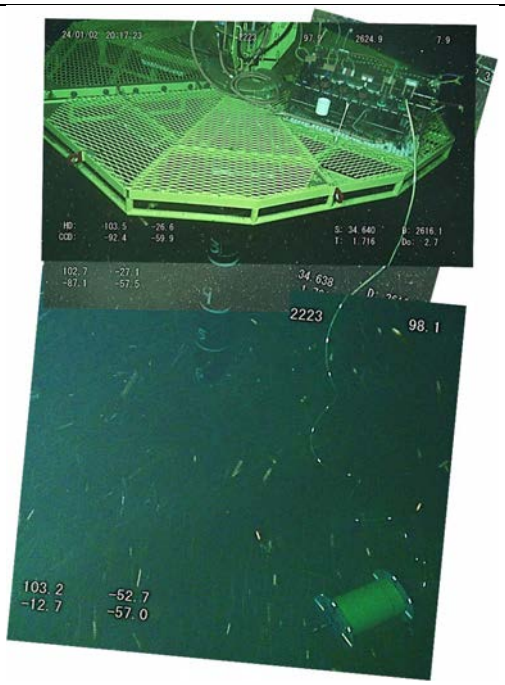
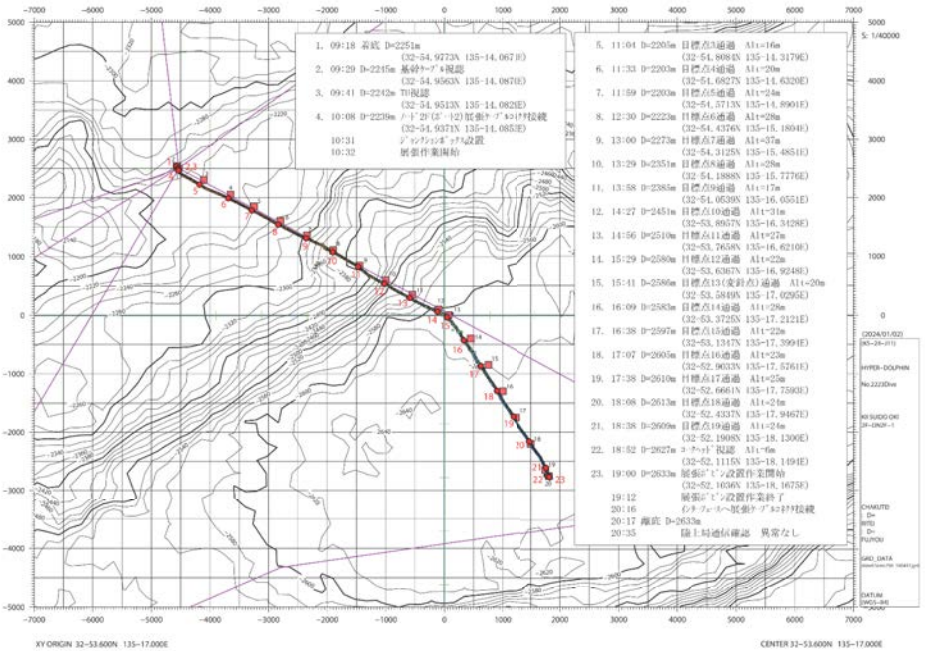
No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
1	HPD2221 2023/12/29	1E-22AC	10:36	33-23.8387N	136-18.6528E	1936
			12:32	33-23.8751N	136-18.6091E	1932
	Work Summary	In 1E-22AC, the connector was disconnected and the HOMER (ID: 91) was recovered.				

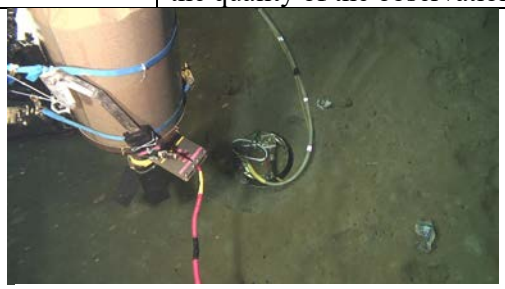
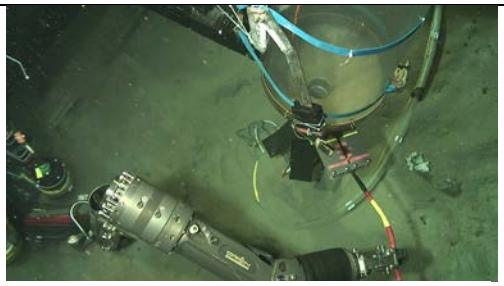
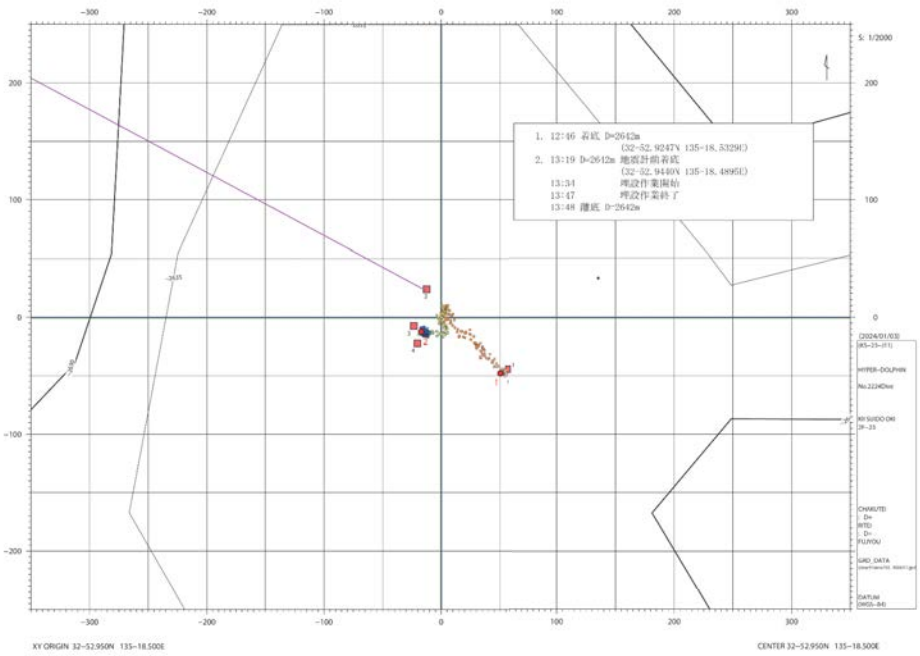


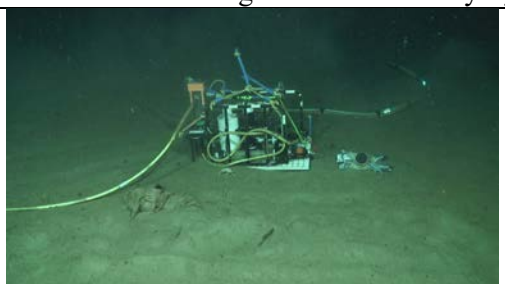
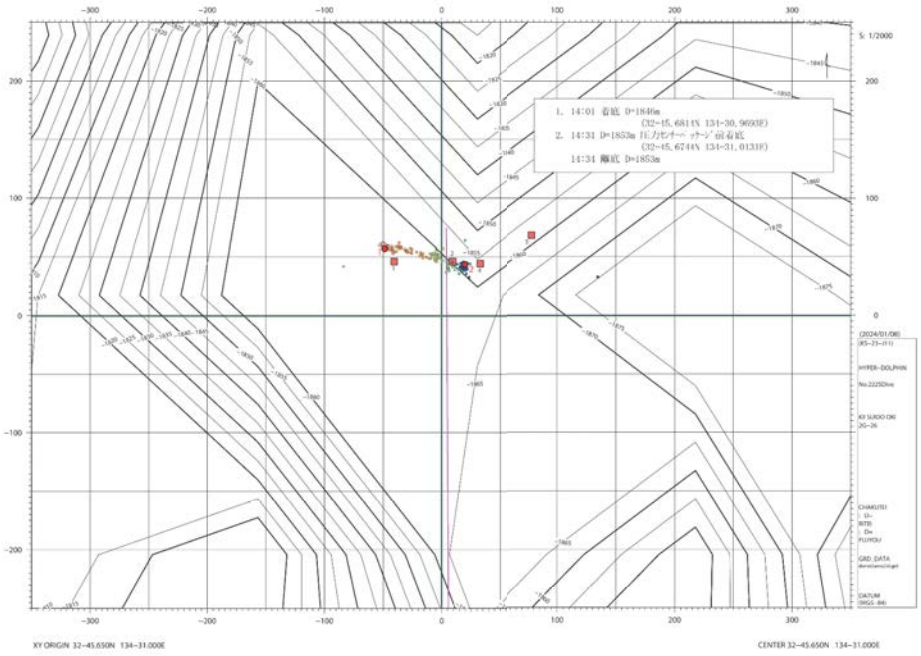


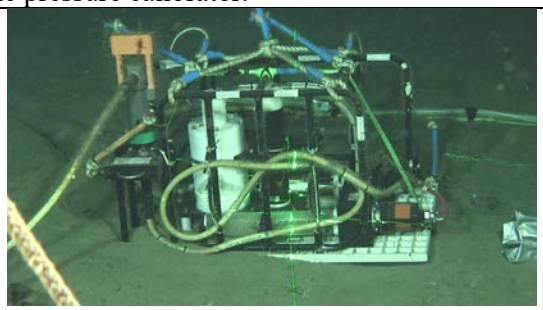
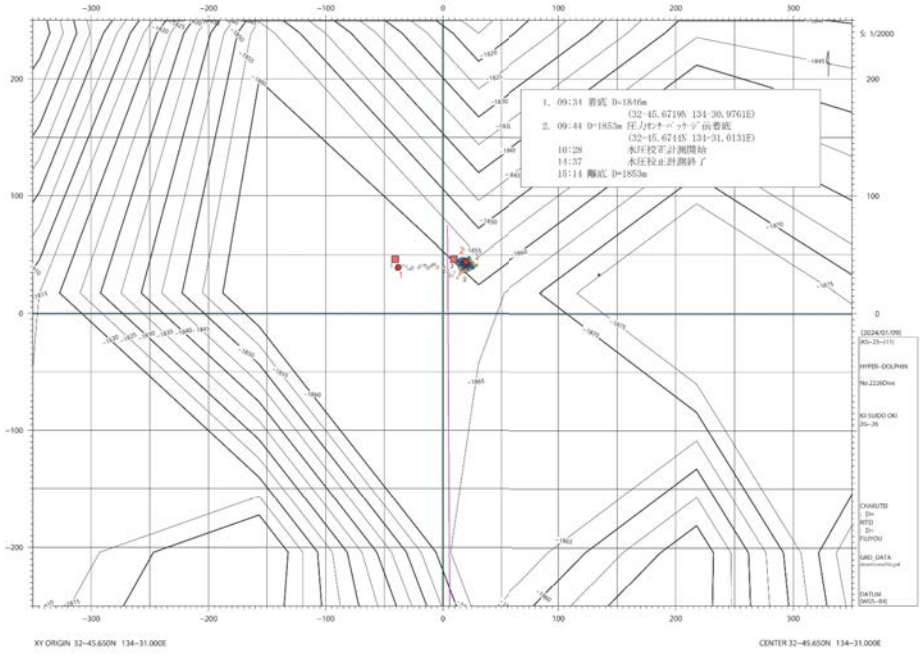


No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
2	HPD2222 2023/12/30	DN2F-1	9:55	32-52.1124N	135-18.1244E	2633
			15:19	32-52.1090N	135-18.1610E	2633
	Work Summary	After the ROV homer (ID: 56) was installed at the planned location of the extension cable drum, the ROV landed on the ROV platform mounted on the CORK head (C9038B). And then, the operation of the optical fiber strainmeter and the pore water pressure sensor were checked, and both were confirmed to be in working. Finally, fiber-optic sensing (DAS, TW-COTDR) was performed by connecting to the optical fiber in the borehole from the vessel via the ROV.				
	  					

No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
3	HPD2223 2024/1/2	DN2F-1	9:18	32-54.9773N	135-14.0671E	2251
			20:17	32-52.1036N	135-18.1675E	2633
	Work Summary	An extension cable was laid from node 2F to DN2F-1 and connected to LTBMS. After leaving the bottom, it was confirmed that power supply and communication from the land station to the LTMBS were possible.				
	 					

No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
4	HPD2224 2024/1/3	2F-23	12:46	32-52.9247N	135-18.5329E	2642
			13:48	32-52.9440N	135-18.4895E	2642
	Work Summary	The ground motion sensor system at DONET 2F-23, which is located inside the casing within the sediment, was backfilled with sand to enhance the quality of the observations.				
	  					

No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
5	HPD2225 2024/1/8	2G-26	14:01	32-45.6814N	134-30.9693E	1846
			14:34	32-45.6744N	134-31.0131E	1853
	Work Summary	At observation point 2G-26, the ROV landed in front of the pressure sensor system, observed its surroundings, and then lifted off. The scheduled "fly-by calibration" could not be performed because of a communication failure of the payload during the descent and it could not be recovered. A post-cruise survey confirmed poor contact between the ROV and the underwater cable connecting the ROV to the fly-by calibration system.				
						
						

No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
6	HPD2226 2024/1/9	2G-26	9:34	32-45.6719N	134-30.9761E	1846
			15:14	32-45.6744N	134-31.0131E	1853
	Work Summary	The ROV was landed in front of the pressure sensor system at DONET observatory 2G-26 and an in-situ calibration was performed using the mobile pressure calibrator.				
						
						

5. Notice on Using

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