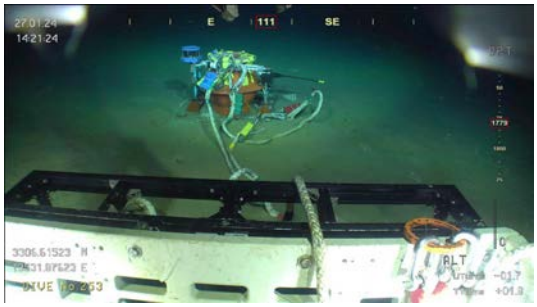
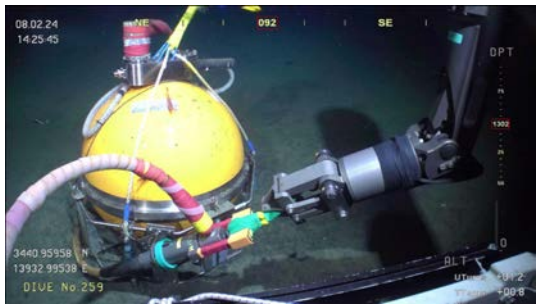
doi : 10.17596/0003872

R/V Kaimei Cruise Report
KM24-01

Real-time ocean bottom crustal movement observation



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

Jan. 25th, 2024 – Feb. 9th, 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:	KM24-01
Name of vessel:	Kaimei
Title of cruise:	Real time ocean bottom crustal movement observation

Chief Scientist:	Affiliation	Duration		
Shuhei NISHIDA	JAMSTEC	Jan. 25th	–	Feb.9th
Boarding Scientist:	**Affiliation**	**Duration**		
Takashi YOKOBIKI	JAMSTEC	Jan. 25th	–	Feb.9th
Shuhei TSUJI	JAMSTEC	Jan. 25th	–	Feb.9th
Aki ITO	JAMSTEC	Jan. 25th	–	Jan.31st
Makiko SATO	Tohoku University	Jan. 25th	–	Jan.31st
Morifumi TAKAESU	NME	Jan. 25th	–	Feb.9th
Yousuke KAWAMURA	NME	Jan. 25th	–	Feb.9th
Kazuho YOSHIDA	NME	Jan. 25th	–	Jan.31st
Hideki SHIBATA	NME	Feb. 2nd	–	Feb.9th

Cruise period:	Leg1:	Jan. 25th	–	Jan. 31st
	Leg2:	Feb. 2nd	–	Feb.9th
Ports of				
departure:	JAMSTEC Yokosuka HQ			
call:	JAMSTEC Yokosuka HQ			
arrival:	JAMSTEC Yokosuka HQ			
Research area:	Kumanonada Sea, Off Kiisuido Strait, off Cape Muroto East off Izu Oshima Island and Sagami Bay			

2. Research Proposal and Science Party

Science Party List:		Affiliation:
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
Yusaku	OHTA	Tohoku University
Makiko	SATO	Tohoku University
Takashi	TONEGAWA	JAMSTEC
Aki	ITO	JAMSTEC
Koichiro	OBANA	JAMSTEC

3. Activity and Results

A) The self-floating type broadband ocean bottom seismometer (BBOBS), installed deployed near LTBMS C0010 in the Kumano-nada Sea, was recovered by self-floating.

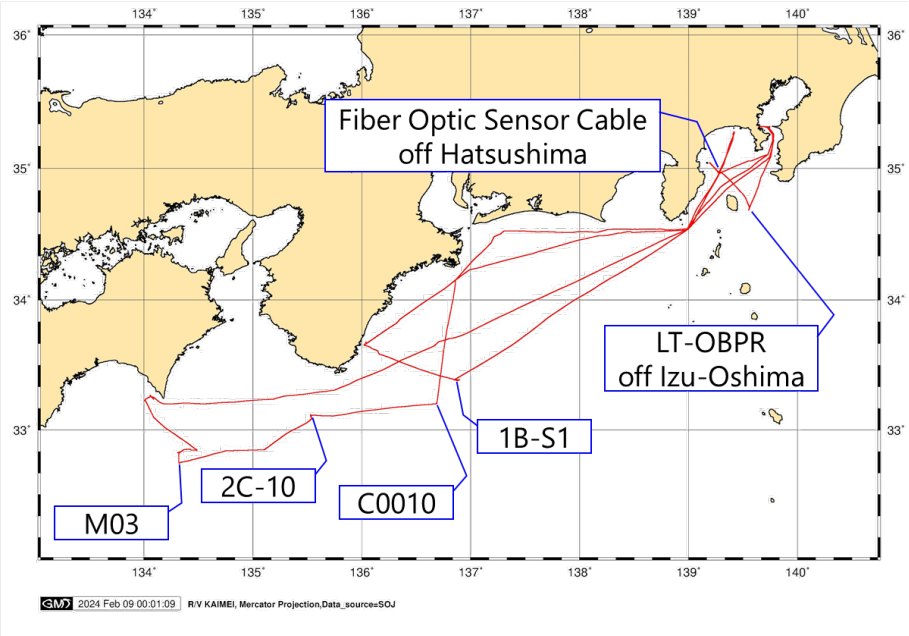
B) The self-floating type ocean bottom pressure gauge (OBP) with a self-calibration function deployed near DONET2C-10, off Kiisuido Strait, was recovered. This OBP did not respond to acoustic commands during the KS-23-J07 cruise, so the ROV was used to dive and recovered it.

C) A thermometer (self-recording type) was replaced at the M03 area near submarine cable off Cape Muroto.

D) The bottom pressure sensor was deployed and connected to the submarine cable system at the bottom crustal movement observatory 1B-S1. The bottom pressure observation has started in addition to the real-time tilt observation in the borehole at same area.

E) A visual survey of the coupling between the fiber optic sensor cable installed off Hatsushima Island and the sediment was conducted for approximately 1700 m. When a visual survey was conducted on June 1, 2023, on a section of approximately 600 m from the end of this cable, there were many places where the cable was floating. However, during the current survey, the cable was almost on the seafloor. Especially, in a low sensitivity section of approximately 100 m, six sandbags were placed on top of the sensor cable to improve the coupling between the cable and the sediment.

F) The Data from long-term bottom pressure recorder (LT-OBPR) which installed on Izu Oshima Island was collected with a wired connection via ROV. The downloaded data was about one year, and in-situ calibration was performed before and after this period. Therefore, we plan to remove instrument drift from the water pressure data and extract the amount of crustal deformation.

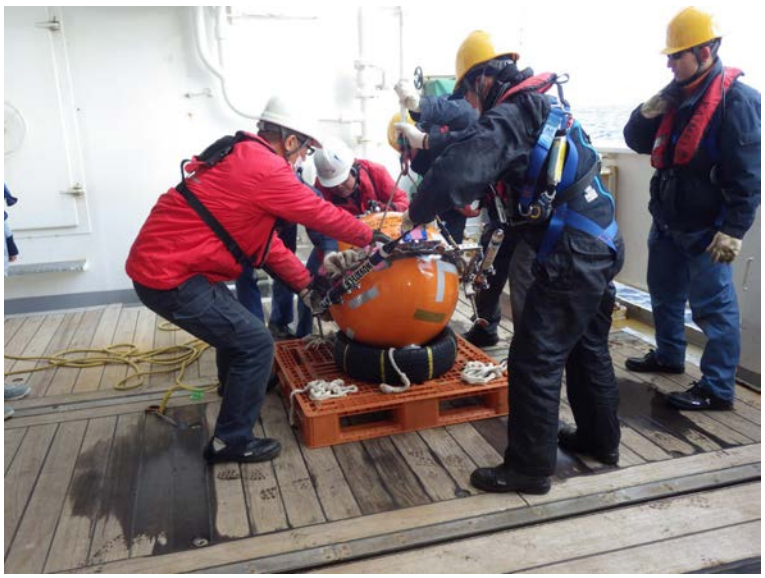


vessel tracks during KM24-01

4. Dive Log

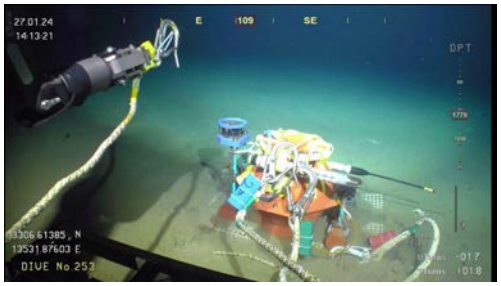
No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
1	--- 2024/1/26	C0010	08:04	33-12.4462N	136-41.3354E	2564
			09:09	33-12.4068 N	136-41.1542E	2564
	Work Summary	A command to release the weight was sent to the BBOBS installed on C0010 on September 30, 2023, and the BBOBS was recovered by self-floating.				

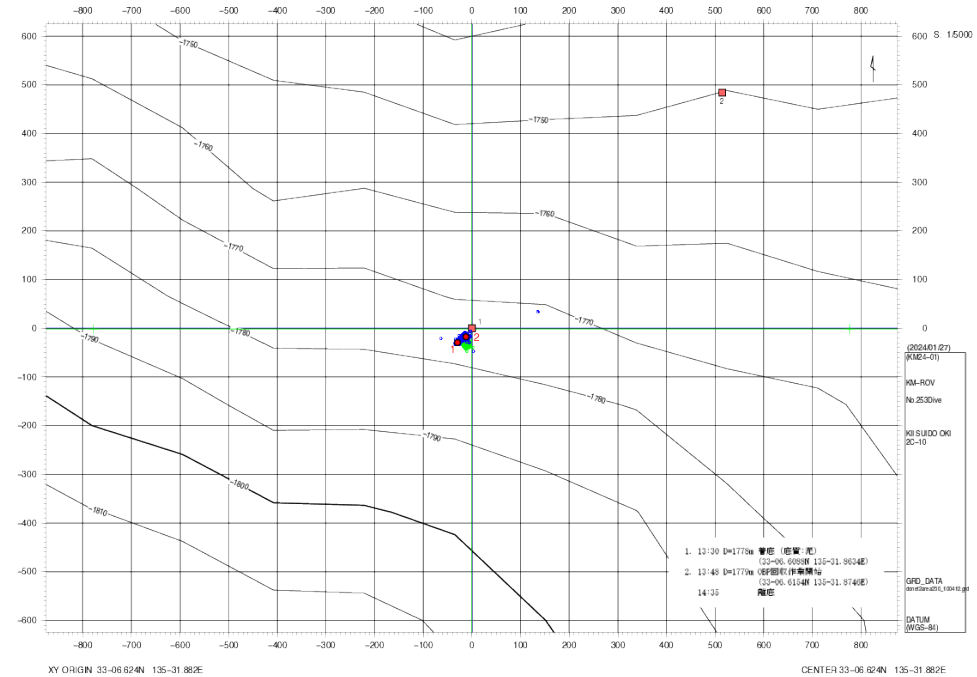
Acoustic communication equipment on board

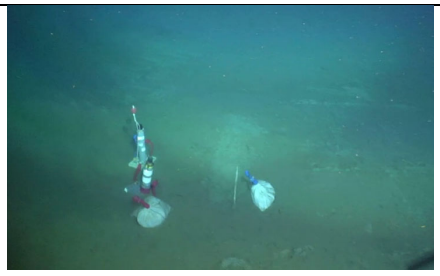
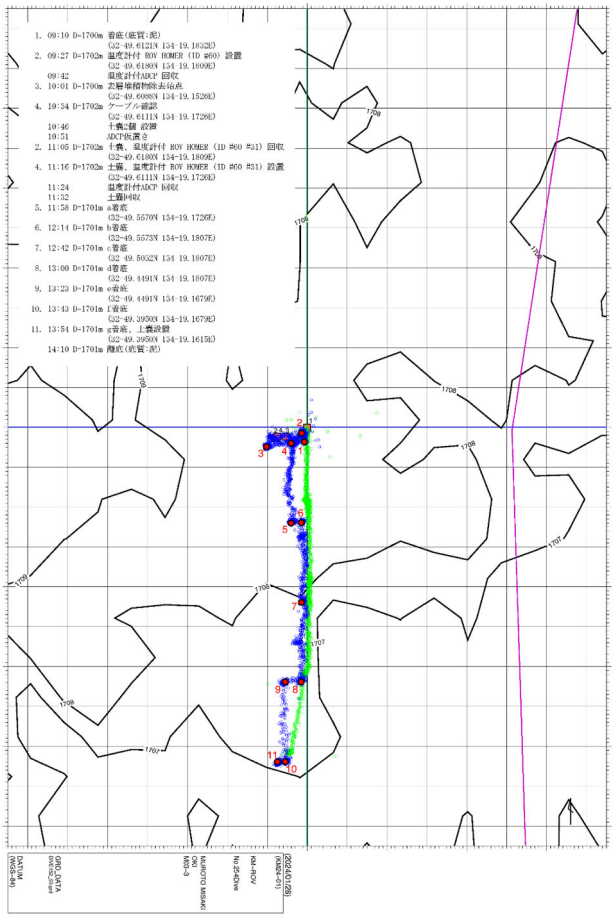


BBOBS recovered after surfacing from the seafloor

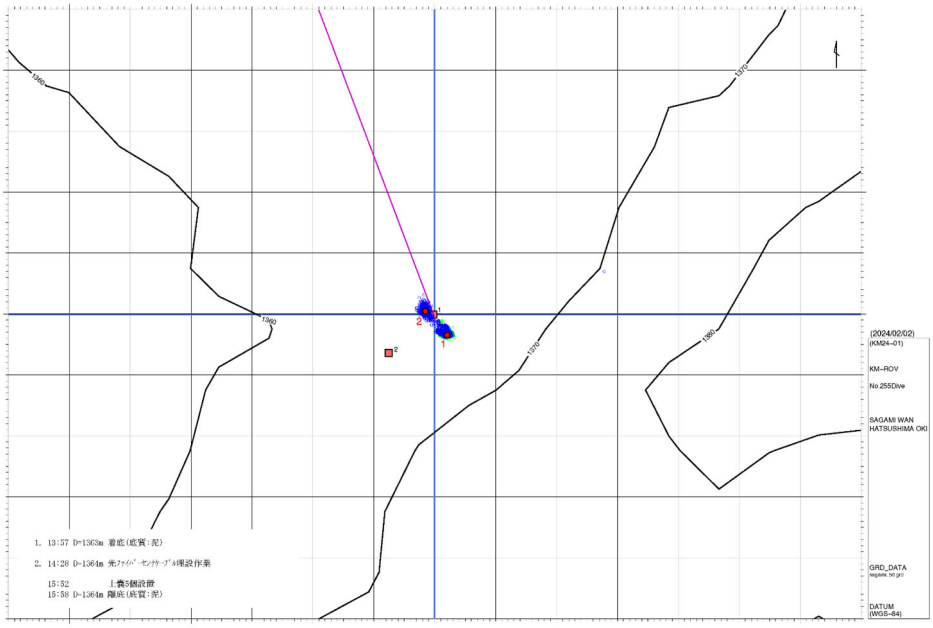
No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
2	KM-ROV253 2024/1/27	2C-10 OBP	13:30	33-06.6088N	135-31.8634E	1778
			13:48	33-06.6154N	135-31.8746E	1779
	Work Summary	The self-floating type ocean bottom pressure gauge (OBP) with a self-calibration function deployed near DONET2C-10, off Kiisuido strait, was recovered. This OBP did not respond to acoustic commands during the KS-23-J07 cruise, so the ROV was used to dive and recovered it.				



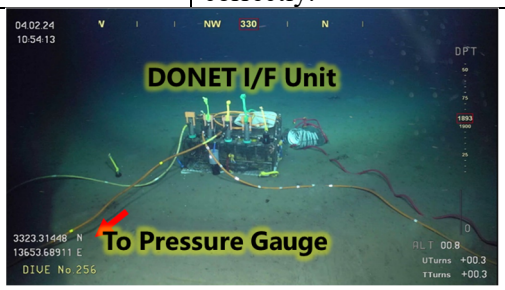


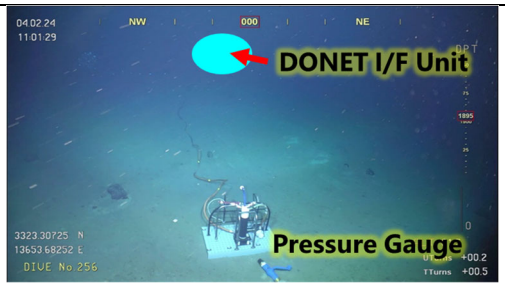
<table>
<tr><th>No.</th><th>Dive Num.
Date</th><th>Site</th><th>Staying Time</th><th>Latitude</th><th>Longitude</th><th>Depth</th></tr>
<tr><td rowspan="4">3</td><td rowspan="2">KM-ROV254
2024/1/28</td><td rowspan="2">M03</td><td>9:10</td><td>32-49.6121N</td><td>134-19.1832E</td><td>1700</td></tr>
<tr><td>14:10</td><td>32-49.3950N</td><td>134-19.1615E</td><td>1701</td></tr>
<tr><td>Work Summary</td><td colspan="4">The submarine cable off Cape Muroto was visually confirmed as a result of a search using the observation data from the DAS conducted on this cable as a reference.
After that, the thermometer and current meter that had been installed at point M03-3 were recovered, and two thermometers were installed at M03-4, which is closer to the cable than M03-3, and observation was started.</td></tr>
<tr><td colspan="6"> 
The white line in the center of the photo is the submarine cable off Cape Muroto
  </td></tr>
</table>

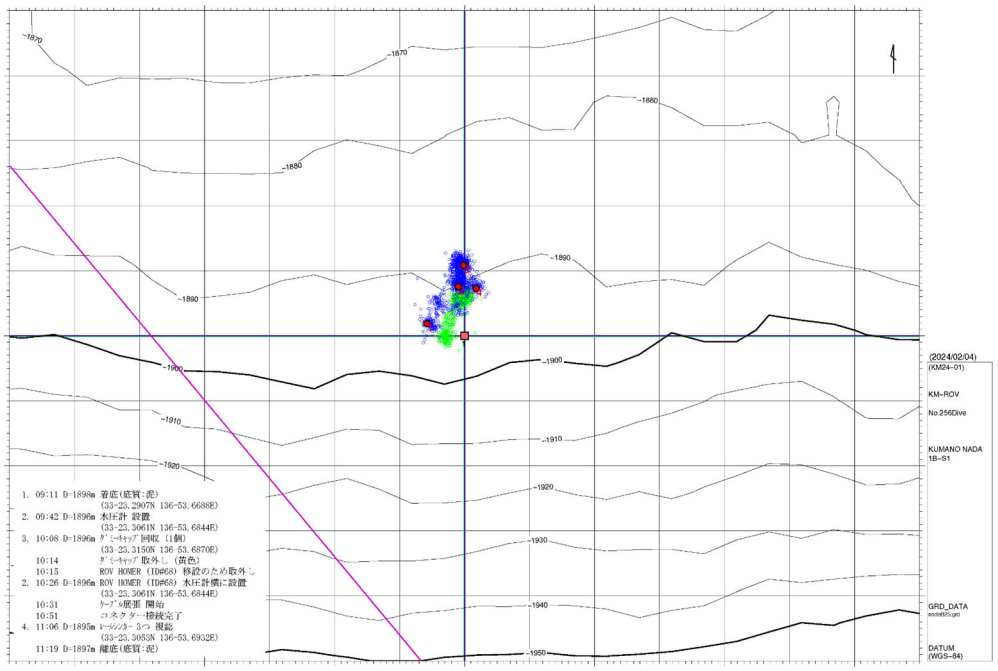
No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
4	KM-ROV255 2024/2/2	HF-P3	13:57	34-57.6105N	139-16.7510E	1363
			15:58	34-57.6212N	139-16.7392E	1364
	Work Summary	This visual survey was conducted from the end (HF-P3) to in a section about 50 m the fiber-optic sensor cable laid off Hatsushima Island in Sagami Bay. Sandbags were placed where the cable was raised off the seafloor to improve contact with the seafloor.				



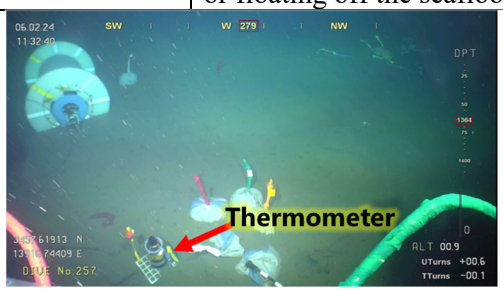
No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
5	KM-ROV256 2024/2/4	1B-S1	9:11	33-23.2907N	136-53.6688E	1898
			11:19	33-23.3053N	136-53.6932E	1897
	Work Summary	A pressure gauge for crustal deformation observation was installed 17 m south of the DONET I/F unit at 1B-S1, and its connecting cable was connected to the DONET I/F unit. After the connection was completed, it was confirmed that power supply and communication from the land station was working correctly.				

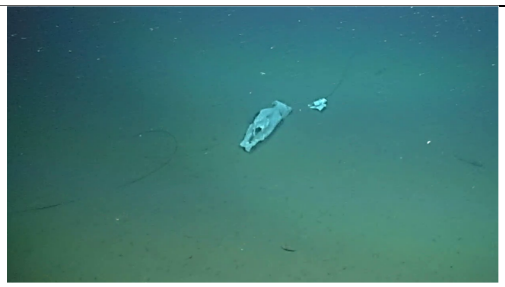


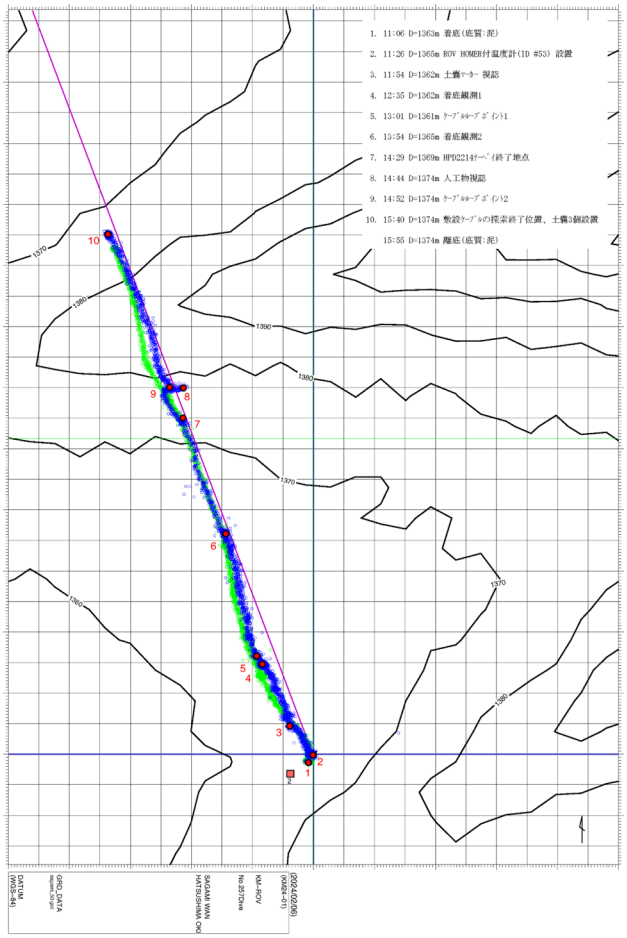




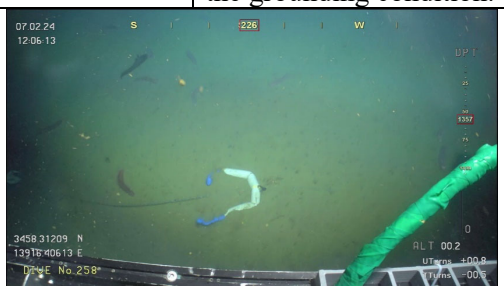
No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
6	KM-ROV257 2024/2/6	HF-P3 ~ 900m	11:06	34-57.6125N	139-16.7389E	1363
			15:55	34-58.0805N	139-16.5229E	1374
	Work Summary	A thermometer was installed at the end of the optical fiber sensor cable. The grounding of the fiber-optic sensor cable was then visually checked at a section of approximately 900 m from the end point. The cables were almost entirely on top of the sediment. On the other hand, there were many sections where the cables were tangled in plastic bags or floating off the seafloor.				



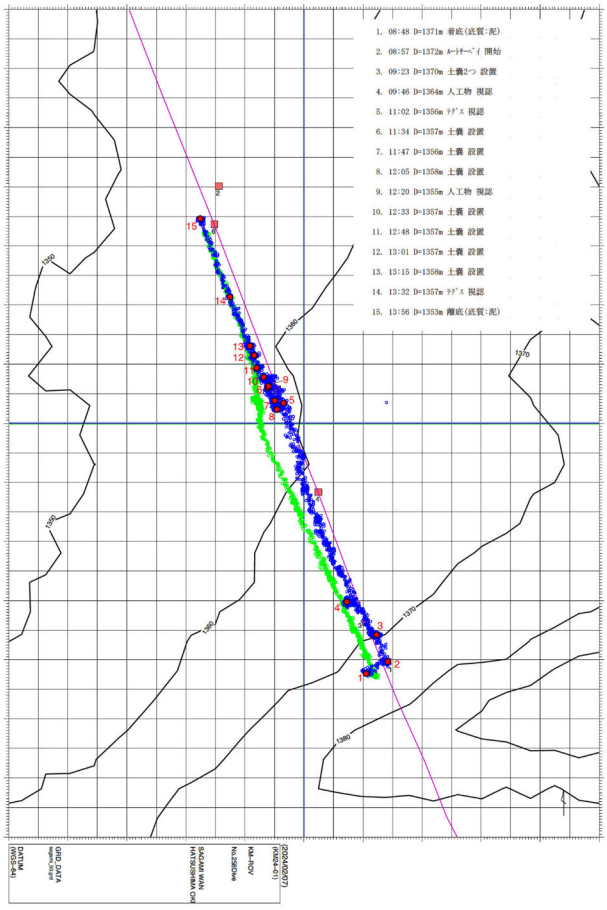




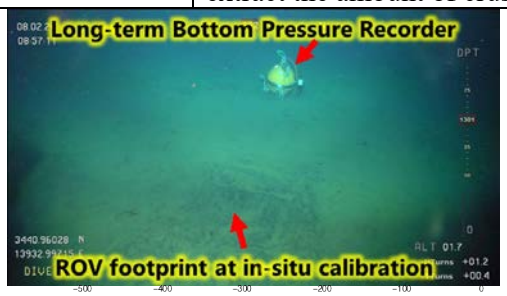
No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
7	KM-ROV258 2024/2/7	HF-P8	8:48	34-58.0696N	139-16.4986E	1371
			13:56	34-58.4864N	139-16.3139E	1353
	Work Summary	A visual inspection of the cable grounding was conducted in a section 800 m from the end position of the previous dive "KM-ROV257". (It is not possible to go northward anymore because of the cables laid by other organizations.) As in the previous dive survey, the cable was almost on the sediment, but the fiber optic sensing observation data suggested that the grounding was poor. Therefore, sandbags were put on the cable at 25 m intervals in a section of about 100 m to improve the grounding condition.				

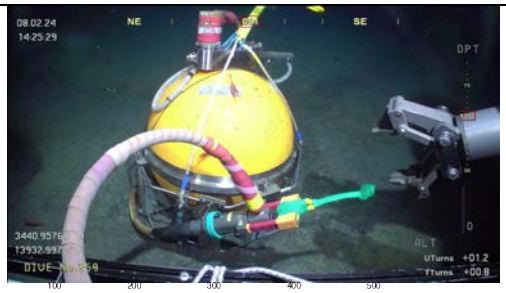


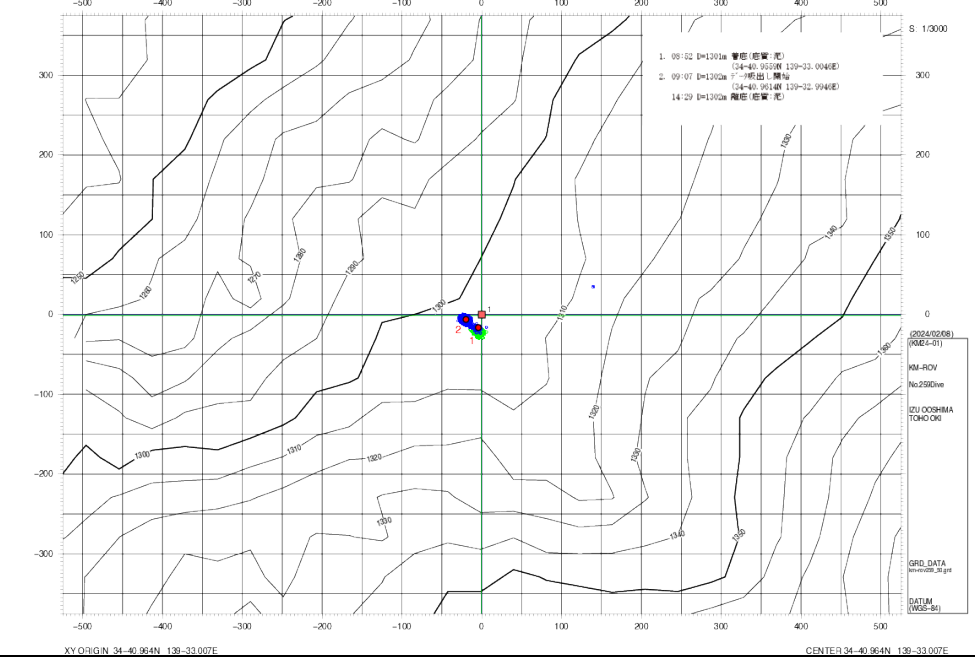
The long thin sandbags were used, to reduce the height from the seafloor.



No.	Dive Num. Date	Site	Staying Time	Latitude	Longitude	Depth
8	KM-ROV259 2024/2/8	East off Izu Oshima	8:52	34-40.9559N	139-33.0046E	1301
			14:29	34-40.9614N	139-32.9946E	1302
	Work Summary	The Data from long-term bottom pressure recorder (LT-OBPR) which installed on Izu Oshima Island was collected with a wired connection via ROV. The downloaded data was about one year, and in-situ calibration was performed before and after this period. Therefore, we plan to remove instrument drift from the water pressure data and extract the amount of crustal deformation.				







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.

http://www.godac.jamstec.go.jp/darwin/explain/1/e#report
E-mail: submit-rv-cruise@jamstec.go.jp