



Shinsei-maru Cruise Report KS-19-J03

Development of continuous real-time observation system
for crustal deformation

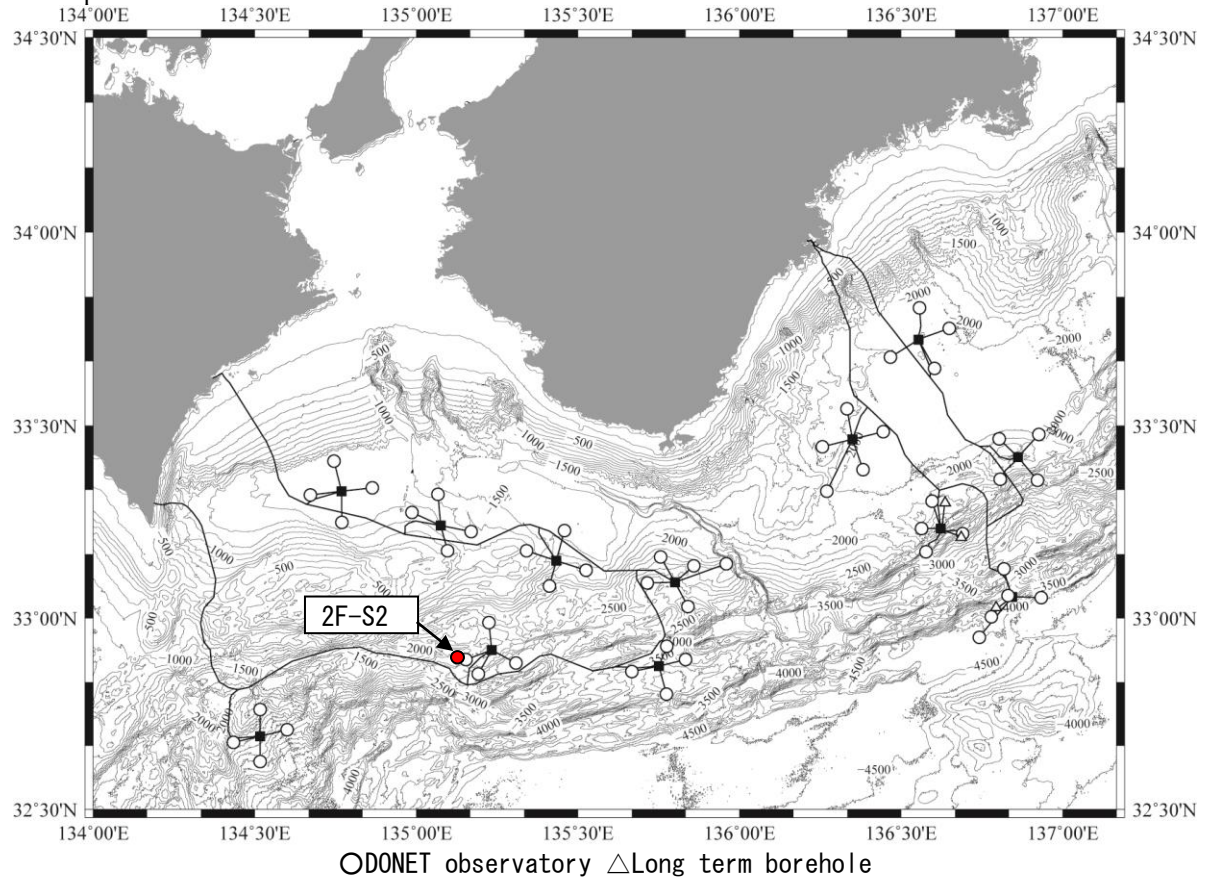
Kumano-nada
Off Kii-channel

May 29, 2019 – June 6, 2019

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

1. Cruise Information

- Cruise ID KS-19-J03
- Name of vessel R/V Shinsei-maru
- Title of cruise Development of continuous real-time observation system for crustal deformation
- Chief Scientist [Affiliation] Takashi YOKOBIKI [JAMSTEC]
- Cruise period 29 May 2019 – 6 June 2019
- Ports of departure / arrival Wakayama port – JAMSTEC Yokosuka
- Research map



Observatory No.	Latitude	Longitude	Depth [m]
2F-S2	32-53.821°N	135-11.030°E	2,305

2. Research Proposal and Science Party

- Title of proposal Development of continuous real-time observation system for crustal deformation
- Representative of Science Party Shuichi KODAIRA [JAMSTEC]
Takashi YOKOBIKI [JAMSTEC]
- Science Party Shuhei NISHIDA [JAMSTEC]
Toshikatsu NASU [NME]
Ryou OYAMA [NME]
Keita SUZUKI [NME]

3. Dive summary (Research/Development Activities)

3.1 DIVE#2093 on 30 May 2019: Installation of the DONET Interface at the Observatory Site 2F-S2.

In this dive, The ROV Hyper-Dolphin (HPD) with the cable extension system dived to install the DONET Interface in the observatory site 2F-S2. After the HPD arrived at position 1 in the figure 3-1.1 on the sea floor, she moved from position 3 to 4 to confirm the flatness of the sea floor where the optical strain meter will be laid in next dive. The flatness measured by depth meter and altimeter was less than 50cm.

Then, she returned to position 3 and installed the DONET Interface. (Red square 4 in figure 3-1.1).

The position of the DONET Interface; 32°53.908'N 135°11.030'E.

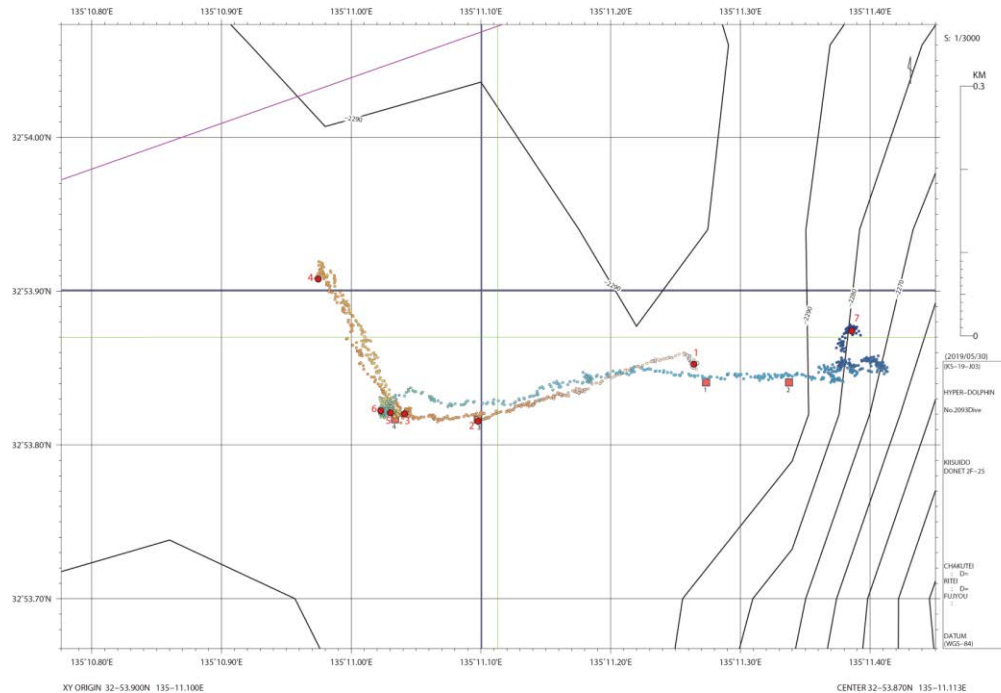


Fig.3-1.1 Time series of HPD position in Dive#2093

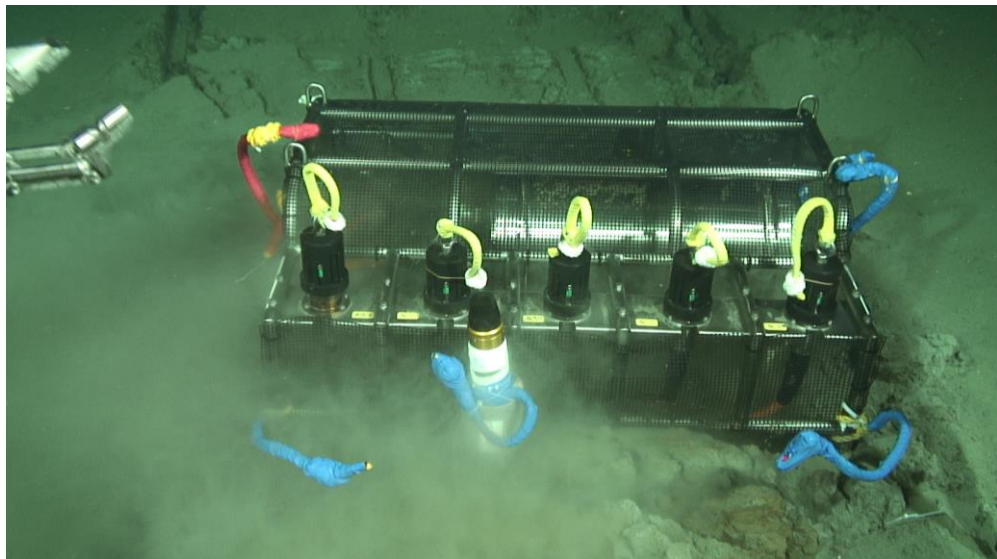


Fig.3-1.2 DONET Interface (2F-S2 observatory)

3.2 DIVE#2094 on 1 June 2019: Extension cable laying operation from Node 2F to DONET Interface of 2F-S2 observatory
The cable laying operation from Node 2F to 2F-S2 observatory was conducted in this dive. The HPD started to dive at 6:59, and landed near Node 2F at 8:20. The upper end of the extension cable was connected to Port 7 of Node 2F (Fig3-2.1, Fig3-2.2), and the cable-laying operation was started at 9:05 after placed the junction box. The HPD arrived at the observatory site 2F-S2, the cable bobbin was placed at 16:04. (Fig.3-2.3) The lower end of the extension cable was connected to the DONET interface at 16:36. (Fig.3-2.4) It was confirmed that the communication line and electric power line between the DONET interface and the MAZENO-OKA landing station. After receiving the report from the MAZENO-OKA landing station, the HPD left the sea floor.

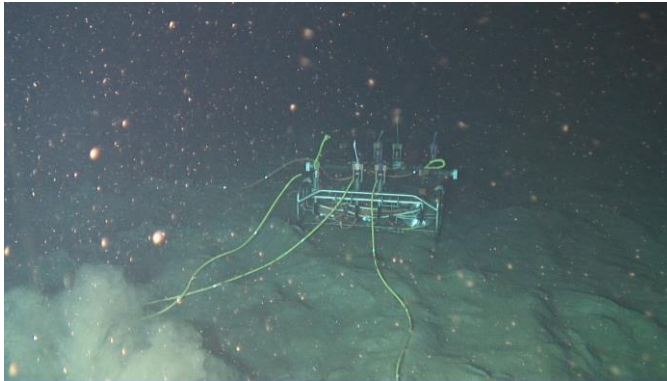


Fig. 3-2.1 Node 2F

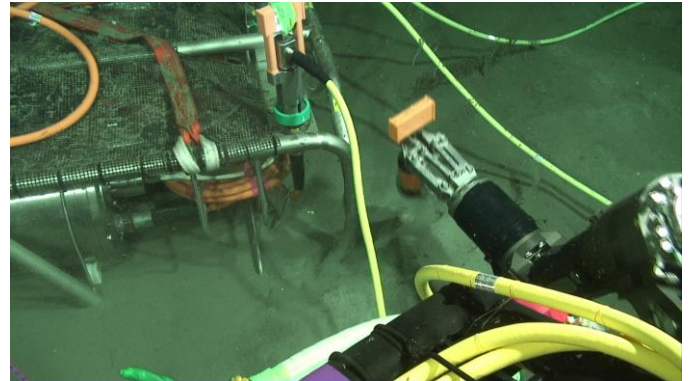


Fig.3-2.2 Upper end was connected to Port 7

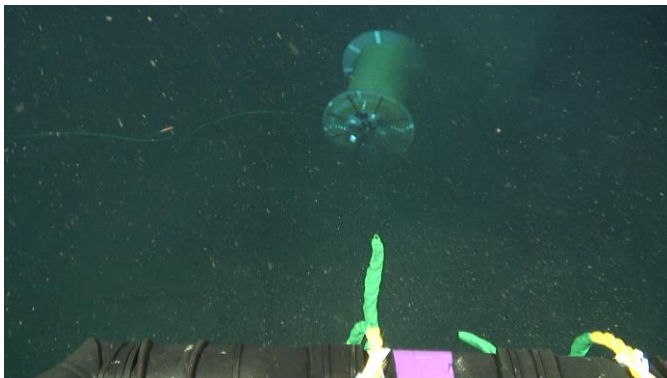


Fig. 3-2.3 Cable bobbin

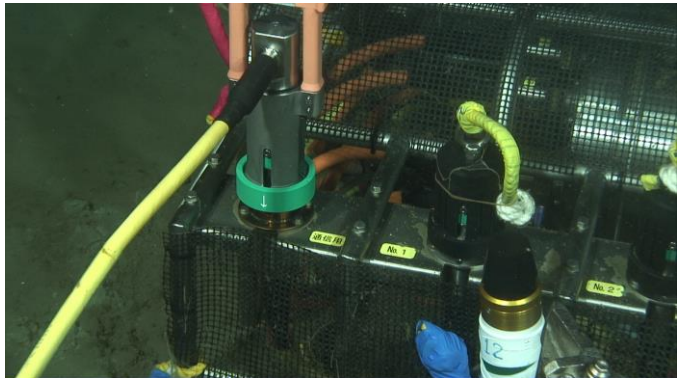


Fig. 3-2.4 Lower end was connected to DONET Interface

3.3 Dive#2095 on 3 June 2019: Connection of the optical fiber strain meter to the DONET interface

The optical strain meter is composed of a 200m optical cable as a sensing unit and a logger in a container. In this dive, HPD brought the optical strain meter set on the laying device to seabed and connected to the sensor port No.1 of the DONET interface. Then, she left from seabed at 18:11.



Fig. 3-3.1 Optical strain meter on the laying device

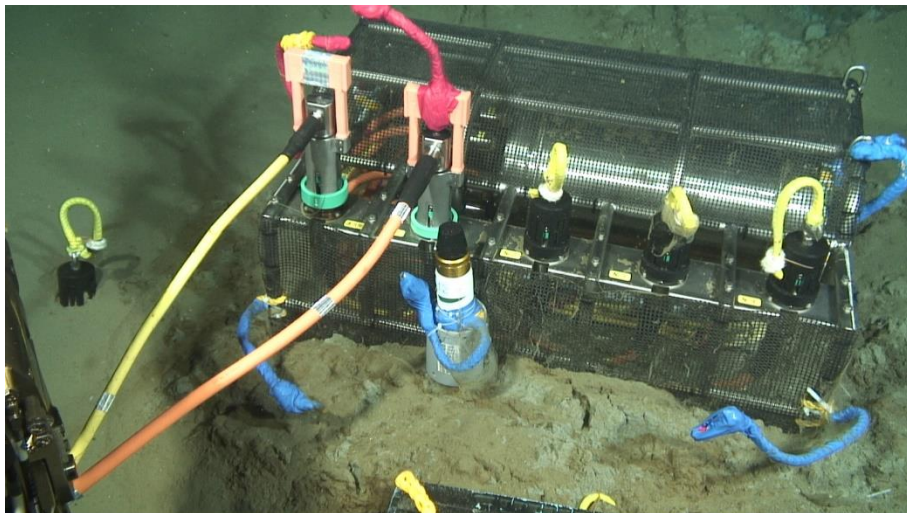


Fig. 3-3.1 The optical strain meter was connected Port No.1 on the DONET interface

3.4 Dive#2096 on 4 June 2019: Laying operation of the optical fiber strain meter

In this dive, HPD towed the laying device to lay the optical strain meter. At first, HPD landed near the laying device that was put on seabed in the former dive, and she connected a towline and the laying device. Then, she moved in the direction of 335 degrees. When the full length of the strain meter had been laid, she stopped moving and cut the towline and she strain meter was took off from the laying device. While keeping in touch with the researcher in the landing station about the extended length of the strain meter, we carefully pulled the spring scale attached on the end. The end was fixed to the seabed while maintaining the elongation required for observation. Returning to the opposite end of the strain meter, the container of the logger was embedded using Dorothy (Suction pump) and then she raised up.

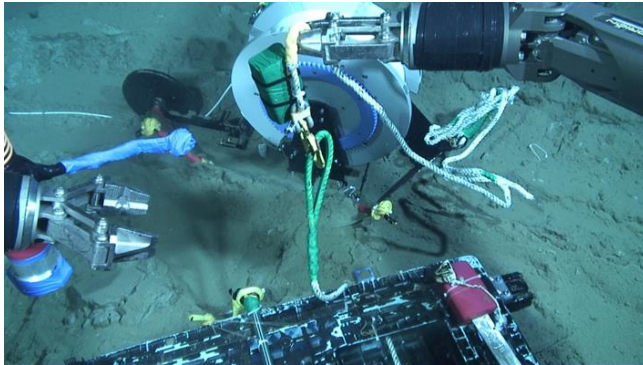


Fig. 3-4.1 Connection of towline

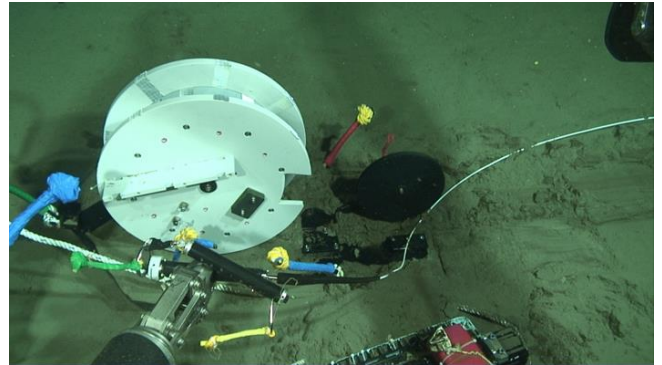


Fig. 3-4.2 Removing the end of strain meter

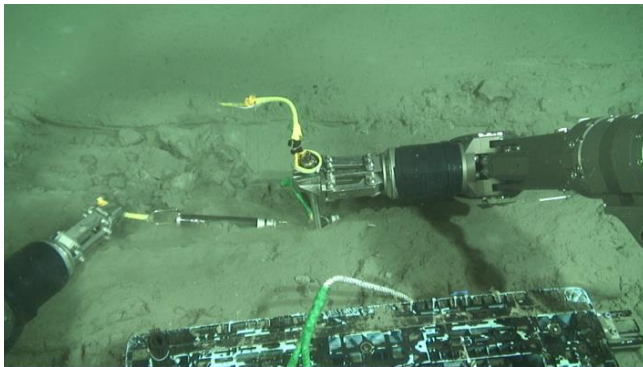


Fig. 3-4.3 Fix the end on the seabed



Fig.3-4.4 Strain meter laid on seabed

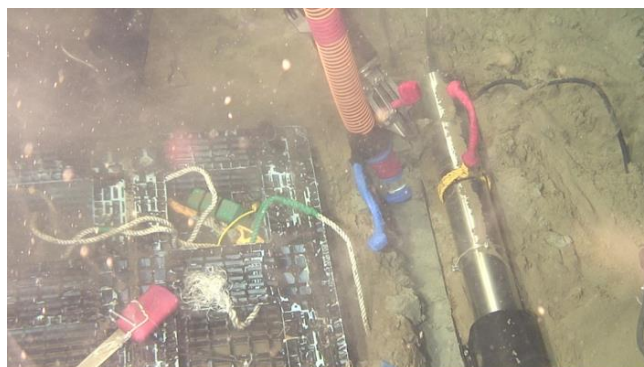


Fig3-4.5 Embedding the container of the logger

4. Notice on Using

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