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# KAIMEI / KM-ROV Cruise Report

# KM20-11

## Understanding the actual condition of marine pollutants and their impact on marine ecosystems

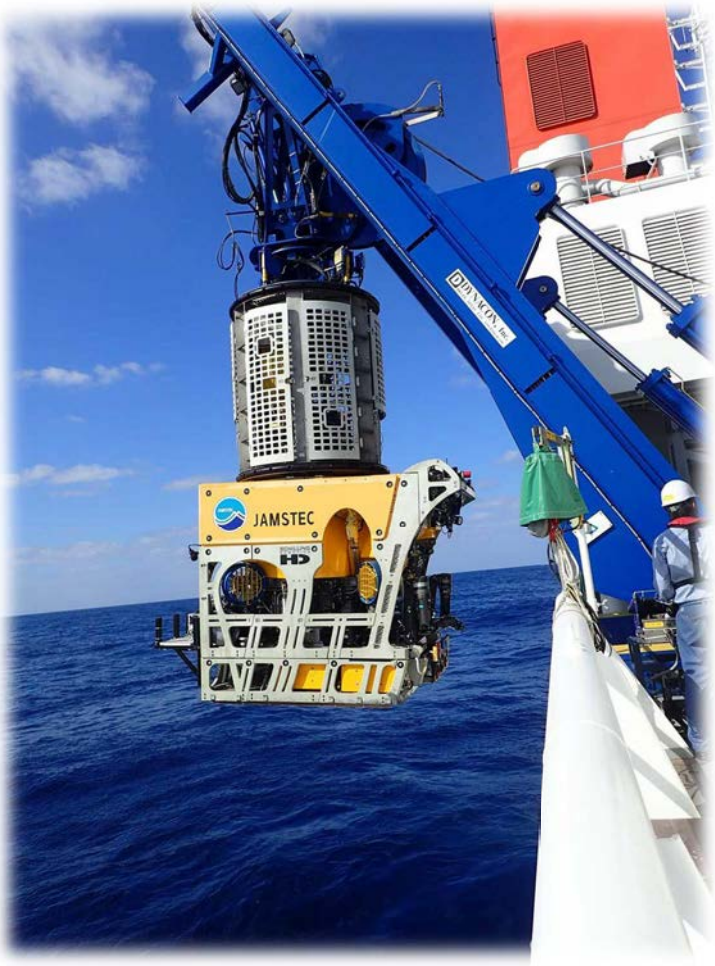
< Izu-Ogasawara islands surrounding waters >

December 12th, 2020 – December 25th, 2020

Japan Agency for Marine-Earth Science and Technology

(JAMSTEC)

# KM20-11 Cruise Report Contents



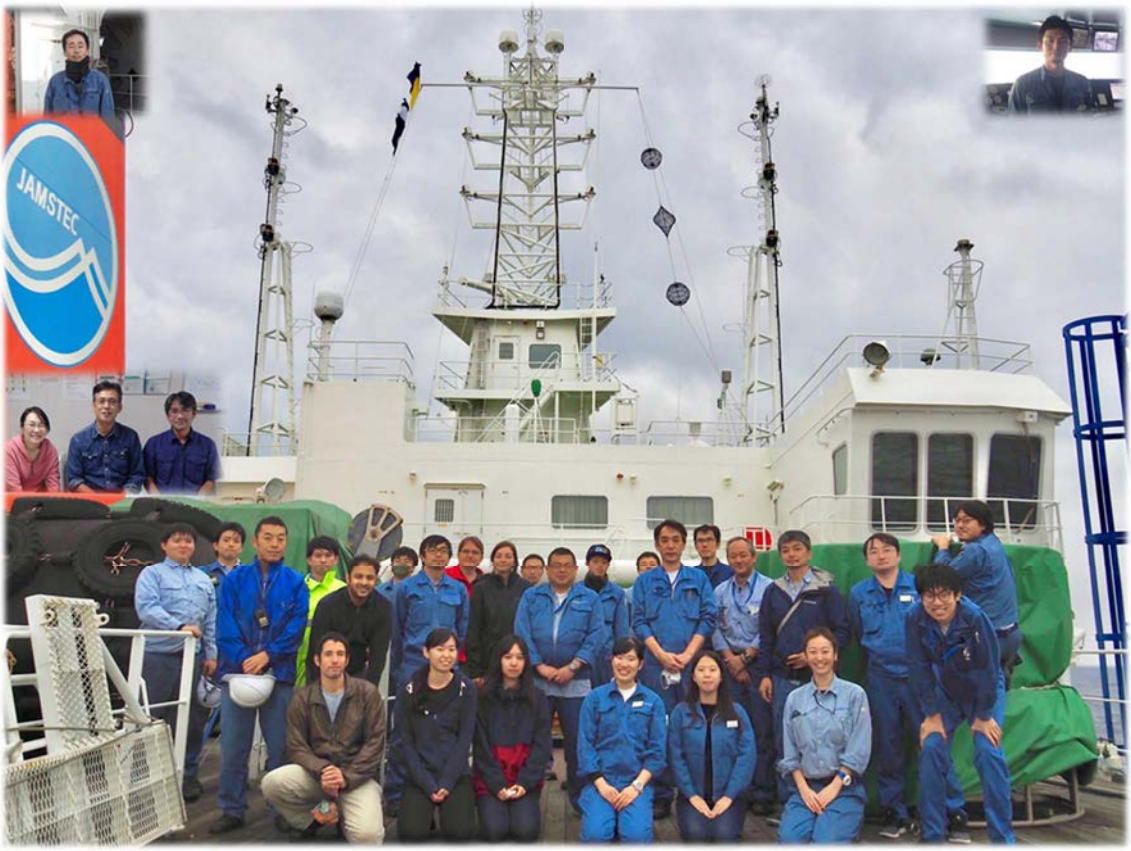
## 0 Acknowledgements

We are grateful to Captain Mr. Naoto Kimura, Chief Officer Mr. Takeshi Muramatsu and Chief Engineer Mr. Shuichi Hashide for their safe navigation and their skillful handling of “R/V KAIMEI”.

Great thanks are due to Commander Mr. Tetsuya Ishitsuka and “KM-ROV” operation team for their operations in sampling.

We also thank Mr. Morifumi Takaesu and Ms. Kimiko Serizawa, Nippon Marine Enterprises, Ltd., and Mr. Shungo Oshitani, Ko Morita and Tun Htet Aung, Marine Works Japan, Ltd., for his attentive supports.

Finally, we would like to appreciate all persons who supported directly or indirectly this cruise.



## 1 Cruise Information

1.1 Cruise ID : KM20-11

1.2 Name of vessel : R/V KAIMEI / KAIMEI-ROV

1.3 Title of the cruise :

Understanding the actual condition of marine pollutants and their impact on marine ecosystems

1.4 Chief scientist : Yasuo Furushima [JAMSTEC]

1.5 Representative of the science party : Katsunori Fujikura [JAMSTEC]

1.6 Research titles :

Understanding the actual condition of marine pollutants and their impact on marine ecosystems

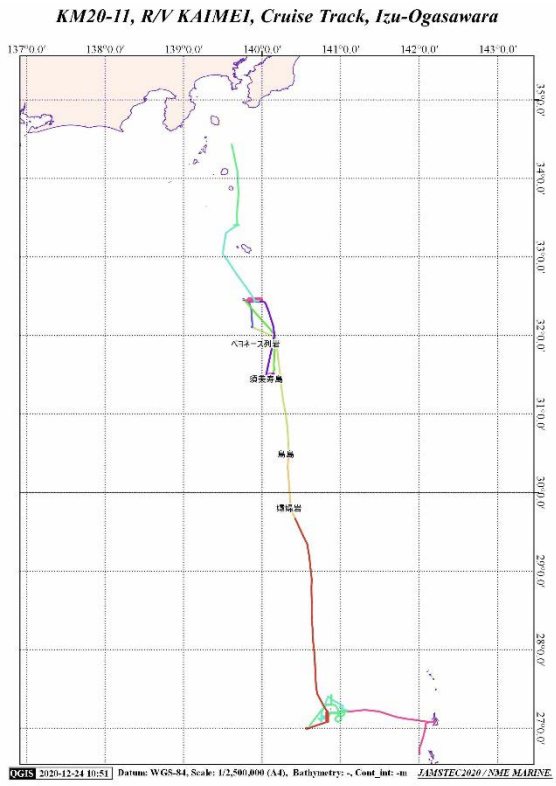
1.7 Cruise period: December 12th, 2020 - December 25th, 2020

1.8 Ports of call: off Futami Port on Chichijima (Ogasawara) – Yokosuka (JAMSTEC)

1.9 Research area: Izu-Ogasawara islands surrounding waters

(Nishinoshima island surrounding waters, Sumisu caldera, Myoujin Knoll, Higashi-aogashima caldera and Kurose hole)

1.10 Cruise track (Research Map)




**Track charts of the R/V KAIMEI research cruise KM20-11. (Dec. 12th – Dec. 25th, 2020)**

## 1.11 Cruise log

R/V "KAIMEI" KM20-11 Cruise Log

| Date & Time | Description | Weather / Wind / Sea Condition |
|---|---|---|
| 2020/12/12 Sat. | Noon Position: 27-04.9N, 142-09.4E (Off FUTAMI port, CHICHIJIMA) | c / SSE-4 / 3 |
| 14:00 | Onboard "KAIMEI" at off FUTAMI Port, CHICHIJIMA | |
| 14:30 | Research meeting | |
| 15:00 | Cruise meeting about research schedule at bridge | |
| 16:00-16:45 | Carried out education & training for scientists | |
| | | |
| 2020/12/13 Sun. | Noon Position: 27-16.1N, 140-59.6E (NISHINO SHIMA) | bc / North-3 / 3 |
| 02:30 | Sail out, proceeding to research area from NISHINO SHIMA | |
| 08:15 | Arrived at St.NS16, south off NISHINO SHIMA | |
| 08:24 | Released XCTD at 27-11.9769N, 140-57.3164E | |
| 10:00-10:30 | Carried out calibration of VTM at St.NS19 | |
| 11:05 | Released XCTD at 27-14.7170N, 141-02.0113E | |
| 11:33-11:34 | Carried out MBES site survey at St.NS15 | |
| 12:00-12:10 | Carried out calibration of VTM at St.NS15, but no answer | |
| 12:32 | Hoisted up "KM-ROV" | |
| 12:42 | Launched "KM-ROV", then it done & commenced her operation #136 | |
| 13:44 | "KM-ROV" landed on the sea bottom (D=2,035m) | |
| 15:45 | "KM-ROV" left the sea bottom (D=2,052m) | |
| 16:47 | Hoisted up "KM-ROV" | |
| 16:55 | Recovered "KM-ROV" & finished above dive operation | |
| 18:00 | Research meeting | |
| 20:40-21:49 | Carried out calibration of VTM at St.NS18, but no answer | |
| | | |
| 2020/12/14 Mon. | Noon Position: 27-11.7N, 140-52.3E (NISHINO SHIMA) | bc / WSW-4 / 2 |
| 00:48 | Finished calibration for VTM at St.NS21 | |
| 02:23-02:36 | Launched transducer for communication to OBEM at St.NS22, but no answer | |
| 03:13-03:26 | Launched transducer for communication to OBEM at St.NS22, but no answer | |
| 05:55 | VTM at St.NS21 left the sea bottom | |
| 07:44 | VTM at St.21 floated on the surface | |
| 07:54 | Hoisted up VTM | |
| 07:55 | Recovered VTM | |
| 08:39-08:50 | Carried out MBES site survey at St.NS16 | |
| 09:27 | Hoisted up "KM-ROV" | |
| 09:35 | Launched "KM-ROV", then it done & commenced her operation #137 | |
| 10:06 | "KM-ROV" landed on the sea bottom (D=993m) | |
| 12:06 | "KM-ROV" left the sea bottom (D=1,023m) | |
| 12:40 | Hoisted up "KM-ROV" | |
| 12:48 | Recovered "KM-ROV" & finished above dive operation | |
| 14:27 | Sent out release command to VTM at St.NS19 | |
| 15:53 | VTM floated on the surface | |
| 16:04 | Recovered VTM | |
| 16:13 | Deployed MERMAID near NS19 calibrated point | |
| 18:00 | Research meeting | |
| 22:44-22:58 | Launched transducer for communication to OBEM at St.NS20, but no answer | |
| | | |

R/V "KAIMEI" KM20-11 Cruise Log

| Date & Time | Description | Weather / Wind / Sea Condition |
|---|---|---|
| 2020/12/15 Tue. | Noon Position: 27-00.0N, 140-33.7E (NISHINO SHIMA) | bc / WNW-3 / 3 |
| 01:20 | Carried out MBES mapping survey | |
| 05:23 | Finished MBES mapping survey | |
| 09:00 | Deployed MERMAID at St.MMN2 | |
| 09:59-11:23 | Carried out CTD & VPR operation | |
| 11:36-11:59 | Carried out eight figure running | |
| 13:46 | Carried out MBES mapping survey | |
| 16:56 | Finished MBES mapping survey, then proceeding to MYOJIN KNOLL | |
| 18:00 | Research meeting | |
| | | |
| 2020/12/16 Wed. | Noon Position: 29-47.2N, 140-21.3E (East ward Sofu Gun) | bc / WNW-7 / 4 |
| 10:00 | Arrived at off East ward Sofu Gan, commenced fish sampling | |
| 12:00 | Finished sampling, proceeding to research area | |
| 16:30 | Arrived at off South East ward Tori Shima | |
| | | |
| 2020/12/17 Thu. | Noon Position: 30-27.6N, 140-20.0E (South East ward Tori Shima) | bc / NW-7 / 4 |
| ~18:00 | Stay off South East ward Tori Shima due to avoiding bad sea condition | |
| 18:00 | Research meeting | |
| 19:00 | Proceeding to MYOJIN KNOLL | |
| | | |
| 2020/12/18 Fri. | Noon Position: 32-06.3N, 139-52.1E (MYOJIN KNOLL) | r / NW-5 / 4 |
| 06:30 | Arrived at MYOJIN KNOLL | |
| 06:54 | Released XCTD at 32-05.4N, 139-54.3E | |
| 08:21 | Hoisted up "KM-ROV" | |
| 08:29 | Launched "KM-ROV", then it done & commenced her operation #138 | |
| 09:12 | "KM-ROV" landed on the sea bottom (D=1,369m) | |
| 15:48 | "KM-ROV" left the sea bottom (D=1,351m) | |
| 16:34 | Hoisted up "KM-ROV" | |
| 16:43 | Recovered "KM-ROV" & finished above dive operation | |
| 17:35 | Proceeding to off AOGASHIMA | |
| 18:00 | Research meeting | |
| 19:35 | Arrived at East ward AOGASHIMA | |
| | | |
| 2020/12/19 Sat. | Noon Position: 32-26.3N, 139-48.1E (South East ward AOGASHIMA) | bc / WNW-7 / 5 |
| 08:24-09:54 | Carried out towing NEUSTON NET sampling ( 4 cast ) | |
| 10:56-11:38 | Carried out towing PLANKTON NET sampling | |
| 18:00 | Research meeting | |
| | | |
| 2020/12/20 Sun. | Noon Position: 31-30.6N, 140-08.4E (SUMISU Caldera) | bc / NW-6 / 4 |
| 00:00 | Commenced proceeding to SUMISU Caldera | |
| 04:45 | Arrived at SUMISU Caldera | |
| 06:25 | Released XCTD at 31-33.4353N, 140-09.0925E | |
| 08:17-10:02 | Carried out CTD & VPR operation | |
| 13:00-13:45 | Shifted to next CTD & VPR point | |
| 13:52-15:30 | Carried out CTD & VPR operation | |
| 16:00 | Released XCTD at 31-28.1395N, 140-04.4954E | |
| 16:11-16:22 | Carried out small PLANKTON NET sampling | |
| 16:51 | Carried out MBES mapping survey | |
| 18:00 | Research meeting | |
| | | |

R/V "KAIMEI" KM20-11 Cruise Log

| Date & Time | Description | Weather / Wind / Sea Condition |
|---|---|---|
| 2020/12/21 Mon. | Noon Position: 31-28.2N, 140-04.8E (SUMISU Caldera) | bc / WNW-5 / 4 |
| 02:50 | Finished MBES mapping survey | |
| 08:23-09:09 | Carried out CTD & VPR operation | |
| 09:45 | Shifted to dive point | |
| 10:17 | Hoisted up "KM-ROV" | |
| 10:31 | Launched "KM-ROV", then it done & commenced her operation #139 | |
| 12:25 | "KM-ROV" landed on the sea bottom (D=903m) | |
| 12:49 | "KM-ROV" left the sea bottom (D=901m) | |
| 15:45 | Hoisted up "KM-ROV" | |
| 15:52 | Recovered "KM-ROV" & finished above dive operation | |
| 15:59-17:34 | Carried out towing NEUSTON NET sampling ( 3 cast ) | |
| 17:55 | Proceeding to off AOGASHIMA | |
| 18:30 | Research meeting | |
| 23:55 | Arrived at off AOGASHIMA | |
| 23:57 | Released XCTD at 32-25.4376N, 140-01.6374E | |
| | | |
| 2020/12/22 Tue. | Noon Position: 32-26.7N, 139-54.4E (HIGASHI AOGASHIMA KNOLL) | bc / WNW-5 / 3 |
| 00:18-04:34 | Carried out MBES mapping survey | |
| 08:18 | Hoisted up "KM-ROV" | |
| 08:23 | Launched "KM-ROV", then it done & commenced her operation #140 | |
| 09:29 | "KM-ROV" landed on the sea bottom (D=767m) | |
| 09:45 | "KM-ROV" left the sea bottom (D=770m) | |
| 11:25 | Hoisted up "KM-ROV" | |
| 11:31 | Recovered "KM-ROV" & finished above dive operation | |
| 11:34-11:54 | Carried out towing NEUSTON NET sampling ( 1 cast ) | |
| 13:02 | Hoisted up "KM-ROV" | |
| 13:10 | Launched "KM-ROV", then it done & commenced her operation #141 | |
| 14:23 | "KM-ROV" landed on the sea bottom (D=757m) | |
| 14:41 | "KM-ROV" left the sea bottom (D=744m) | |
| 16:48 | Hoisted up "KM-ROV" | |
| 16:56 | Recovered "KM-ROV" & finished above dive operation | |
| 18:10 | Research meeting | |
| 17:39-18:02 | Carried out eight figure running | |
| 18:55-22:19 | Carried out MBES mapping survey | |
| | | |

R/V "KAIMEI" KM20-11 Cruise Log

| Date & Time | Description | Weather / Wind / Sea Condition |
|---|---|---|
| 2020/12/23 Wed. | Noon Position: 32-26.5N, 139-57.5E (HIGASHI AOGASHIMA KNOLL) | bc / NNW-6 / 4 |
| 05:35 | Proceeding to today point | |
| 06:20 | Arrived at above point | |
| 07:07-07:58 | Carried out CTD & VPR operation | |
| 08:27 | Hoisted up VMP-X(Expendable Vertical Microstructure profiler) | |
| 08:28 | Launched VMP-X | |
| 09:04 | Refloated VMP-X | |
| 09:15 | Hoisted up VMP-X | |
| 09:16 | Recovered VMP-X | |
| 10:34 | Hoisted up VMP-X | |
| 10:35 | Launched VMP-X | |
| 11:11 | Refloated VMP-X | |
| 11:23 | Hoisted up VMP-X | |
| 11:24 | Recovered VMP-X | |
| 13:26 | Hoisted up "KM-ROV" | |
| 13:33 | Launched "KM-ROV", then it done & commenced her operation #142 | |
| 14:56 | "KM-ROV" landed on the sea bottom (D=752m) | |
| 15:45 | "KM-ROV" left the sea bottom (D=753m) | |
| 16:13 | Hoisted up "KM-ROV" | |
| 16:19 | Recovered "KM-ROV" & finished above dive operation | |
| 16:45 | Proceeding to KUROSE HOLE | |
| 18:00 | Research meeting | |
| 21:30 | Arrived at above area | |
| 22:08 | Released XCTD at 32-24.1499N, 139-40.9353E | |
| 22:56-23:21 | Carried out MBES mapping survey | |
| | | |
| 2020/12/24 Thu. | Noon Position: 33-24.4N, 139-40.7E (KUROSE Hole) | c / SW-5 / 3 |
| 08:05 | Hoisted up "KM-ROV" | |
| 08:12 | Launched "KM-ROV", then it done & commenced her operation #143 | |
| 09:29 | "KM-ROV" landed on the sea bottom (D=791m) | |
| 10:49 | "KM-ROV" left the sea bottom (D=770m) | |
| 13:58 | Hoisted up "KM-ROV" | |
| 14:04 | Recovered "KM-ROV" & finished above dive operation | |
| 16:45 | Completaed KM20-11 works , then left research area for YOKOSUKA | |
| 18:00 | Research meeting | |
| | | |
| 2020/12/25 Fri. | Arrived at JAMSTEC | |
| 09:00 | Arrived at JAMSTEC YOKOSUKA | |
| 16:00 | Disembarked scientist group & completed KM20-11 | |
| | | |

## 2 Cruise Abstract

Marine biodiversity is one of the important indicators of global environmental change. Therefore, understanding changes in biodiversity and obtaining knowledge that contributes to the evaluation of the impact of human activities on ecosystems is an urgent issue that can lead to an understanding of the global environmental change system.

In particular, for deep-sea ecosystems, there is little information on the effects of changes in the marine environment, so it is necessary to carry out comprehensive biological surveys using multiple methods and perform integrated analyses with environmental data.

Therefore, in order to obtain knowledge that contributes to understanding, evaluation, and conservation of the impacts of human activities on deep-sea ecosystems, it is necessary to upgrade and optimize impact assessment methods for marine plastic waste surveys and seabed resource development.

In this observation cruise, a survey as detailed below was conducted to acquire the baseline data necessary for developing tools for improvement and optimization of impact assessment methods.

- The KM-ROV was equipped with a 4KVPR stereo video camera and a 4KGoPro stereo camera, and the distributions of suspended particles and zooplankton communities in the vertical direction from the surface layer to the deep sea were investigated in the mesopelagic to deep sea bottom ecosystem.
- A VPR (as an alternative to a small shadowgraph camera) was attached to the CTD water sampling system to display not only vertical environmental data (depth, water temperature, salt content, dissolved oxygen concentration, turbidity), but also the distribution of suspended particles and zooplankton communities. Water samples were collected to examine the particle composition of organic substances, inorganic substances, microplastics, etc. from the Raman signal.
- In order to evaluate the suspension and redeposition of suspended particles near the sea bottom, an acoustic Doppler current meter (ADV) was installed on the seafloor to measure high-definition three-dimensional flow near the bottom. In addition, an Expendable Vertical Microstructure Profiler (VMP-X) was used to measure turbulence flow from the surface layer just above the seafloor.
- In order to understand the actual distribution of marine plastics and the effects of deep-sea ecosystems, we conducted seafloor observation by KM-ROV, core sampling, water sampling, biological collection, and installation and recovery of microparticle capture experimental equipment. In addition, a Neuston net was towed to collect microplastics on the sea surface.

- As an urgent survey of the Research Institute for Marine Geodynamics (IMG), recovery of the ocean bottom electromagnetometer (OBEM) and vector tsunameter (VTM) was carried out at waters surrounding Nishinoshima Island. Two Mobile Earthquake Recorders in Marine Areas by Independent Divers (MERMAID) were also installed.

## 3 Participants aboard

### 3.1 Research group

| | |
|---|---|
| Chief scientist | Yasuo Furushima (JAMSTEC) |
| Associate chief scientist | Dhugal Lindsay (JAMSTEC) |
| Co-Associate chief scientist | Tetsuo Ikuta (JAMSTEC) |
| Scientist | Masashi Tsuchiya (JAMSTEC) |
| Scientist | Masayuki Obayashi (JAMSTEC) |
| Scientist | Noriko Tada (JAMSTEC) |
| Scientist | Tomoko Takahashi (JAMSTEC) |
| Scientist | Sangekar Mehul Naresh (JAMSTEC) |
| Scientist | Gerlien Berte Verhaegen (JAMSTEC) |
| Scientist | Javier Montenegro (JAMSTEC) |
| Scientist | Kiyoshi Baba (ERI Univ. of Tokyo) |
| Scientist | Yuuka Amari (JAMSTEC) |
| Scientist | Eri Ogura (JAMSTEC) |
| Observation Engineer | Morifumi Takaesu (NME Ltd) |
| Observation Engineer | Kimiko Serizawa (NME Ltd) |
| CTD Water Sampling Operator | Shungo Oshitani (NWJ Ltd) |
| CTD Water Sampling Operator | Ko Morita (NWJ Ltd) |
| CTD Water Sampling Operator | Tun Htet Aung (NWJ Ltd) |

### 3.2 Operation team of the KM-ROV

| | |
|---|---|
| Operation Manager | ISHITSUKA TETSUYA |
| 2nd ROV Operator | CHIDA YOSUKE |
| 2nd ROV Operator | KUMAGAI SHINNOSUKE |
| 2nd ROV Operator | GOTO TAKUMA |
| 3rd ROV Operator | KOGUMA ATSUSHI |
| 3rd ROV Operator | OKUHIRA YUTO |

3.3 Captain and crew of the R/V KAIMEI

| | |
|---|---|
| Captain | KIMURA NAOTO |
| Chief Officer | MURAMATSU TAKESHI |
| 2nd Officer | YAMAGUCHI RYO |
| 3rd Officer | KIKUCHI ASAMI |
| Chief Engineer | HASHIDE SHUICHI |
| 1st Engineer | KUROSE WATARU |
| 2nd Engineer | YASUE YOICHI |
| 3rd Engineer | KAINO YUNA |
| Chief Electronic Operator | KOMAKI YOSUKE |
| 2nd Electronic Operator | MATSUI RYOSUKE |
| 3rd Electronic Operator | ISHIWATA MINAMI |
| Boat Swain | OHATA MASANORI |
| Able Seaman | OKADA MASASHIGE |
| Able Seaman | TAMOTSU HIDEAKI |
| Able Seaman | OHJIRI YUTA |
| Sailor | YOSHIMI YUDAI |
| Sailor | ISOBE KEISUKE |
| Sailor | NAKANISHI RYO |
| No.1 Oiler | UEDA MASANORI |
| Oiler | SUZUKI RYOTA |
| Assistant Oiler | ISHIDA MASAKAZU |
| Assistant Oiler | SAITO RUKI |
| Chief Steward | CHIKUBA YUKIHIDE |
| Steward | YAMAMOTO YOSHITAKA |
| Steward | OHYU SHINOBU |
| Steward | KASHIWAGI KOICHIRO |

# 4 Results

## 4.1 Dive survey results of KM-ROV

### 4.1.1 Dive list (Furushima)

| Dive No. | Date | Time | Site | Latitude (N) | Longitude (E) | Depth (m) | Main purposes |
|---|---|---|---|---|---|---|---|
| | | Landing / Leaving | | | | | |
| #136 | 2020/12/13 | 13:44 | Nishinosima | 27-16.051 | 140-59.654 | 2035 | Recovery of OBEM and observation of seafloor at the settled point |
| | | 15:45 | | 27-16.104 | 140-59.775 | 2052 | |
| #137 | 2020/12/14 | 10:06 | Nishinosima | 27-11.778 | 140-52.357 | 993 | Recovery of OBEM and observation of seafloor at the settled point |
| | | 12:06 | | 27-11.683 | 140-52.206 | 1023 | |
| #138 | 2020/12/17 | 09:12 | Myojin Knoll | 32-06.344 | 139-52.050 | 1369 | Deployment and recovery of observation apparatus and sampling of organisms |
| | | 15:48 | | 32-06.325' | 139-52.075' | 1351 | |
| #139 | 2020/12/21 | 11:57 (Transects Start) | Sumisu Caldera | 31-28.110 | 140-04.769 | 751 | Observation and sampling of plankton inside the caldera using a 4K VPR stereo camera. |
| | | 12:25 | | 31-28.095 | 140-04.752 | 903 | |
| | | 12:49 | | 31-28.095 | 140-04.752 | 901 | |
| | | 15:21 (Transects End) | | 31-28.166 | 140-04.888 | 502 | |
| #140 | 2020/12/22 | 08:47 (Transects Start) | Higash-aogashima Caldera | 32-26.494 | 139-54.493 | 390 | Observation and sampling of plankton inside the caldera using a 4K VPR stereo camera. |
| | | 09:29 | | 32-26.426 | 139-54.426 | 767 | |
| | | 09:45 | | 32-26.447 | 139-54.406 | 770 | |
| | | 10:55 (Transects End) | | 32-26.419 | 139-54.359 | 600 | |
| #141 | 2020/12/22 | 13:30 (Transects Start) | Higash-aogashima Caldera | 32-26.509 | 139-57.321 | 403 | Observation and sampling of plankton outside the caldera using a 4K VPR stereo camera. |
| | | 14:23 | | 32-26.445 | 139-57.388 | 757 | |
| | | 14:41 | | 32-26.472 | 139-57.349 | 741 | |
| | | 16:16 (Transects End) | | 32-26.395 | 139-57.294 | 550 | |
| #142 | 2020/12/23 | 13:59 (Transects Start) | Higash-aogashima Caldera | 32-26.380 | 139-53.887 | 500 | Observation and sampling of plankton and vent fauna inside the caldera using a 4K VPR stereo camera. |
| | | 14:56 | | 32-26.387 | 139-53.822 | 752 | |
| | | 15:45 | | 32-26.373 | 139-53.842 | 755 | |
| | | 15:45 (Transects End) | | 32-26.373 | 139-53.842 | 755 | |
| #143 | 2020/12/24 | 08:33 (Transects Start) | Kurose Caldera | 33-24.417 | 139-40.765 | 500 | Observation and sampling of plankton inside the caldera using a 4K VPR stereo camera. |
| | | 09:29 | | 33-24.385 | 139-40.773 | 791 | |
| | | 10:49 | | 33-24.483 | 139-40.761 | 770 | |
| | | 13:30 (Transects End) | | 33-24.431 | 139-40.679 | 485 | |

Note: In Dive 139 to Dive 143, although observations started from surface waters, horizontal transects were only possible after the KM-ROV detached from the TMS and so information of the transect survey start (Transects Start) and the transect survey end (Transects End) is also shown.

4.1.2 Preliminary results

# Dive Report KM-ROV#136

***Date:*** December 13, 2020

***Site:*** NS15 on the eastern flank of Nishinoshima volcano, ***Depth:*** 2021 m

***Landing (Lat., Lon., Time, Depth):*** 27°16.051'N, 149°59.654'E, 13:44, 2035 m

***Leaving (Lat., Lon., Time, Depth):*** 27°16.104'N, 140°59.775'E, 15:45, 2052 m

***Observer:*** TADA, Noriko

***Theme:*** Recovery of an ocean bottom electromagnetomter (OBEM)

***Purpose of dive:***

1. Recovery of OBEM
2. Observation of seafloor at the settled point of the OBEM

***Dive Summary***

An OBEM is a self-pop-up type seafloor instrument. Because we failed to recover two OBEMs at NS15 and NS16 in a previous cruise (Keifu-maru of JMA), we tried to search and rescue them by KMROV. We landed at a depth of 2035 m around NS15 on the eastern flank of Nishinoshima volcano and searched the OBEM by using a sonar but we could not find the OBEM. We moved to east, deeper part of Nishinoshima volcano about 300 m while searching the OBEM by using the sonar every 50 m. We could not find the OBEM and left the seafloor. The seafloor was covered with sands. We sometimes saw rocks at seafloor.

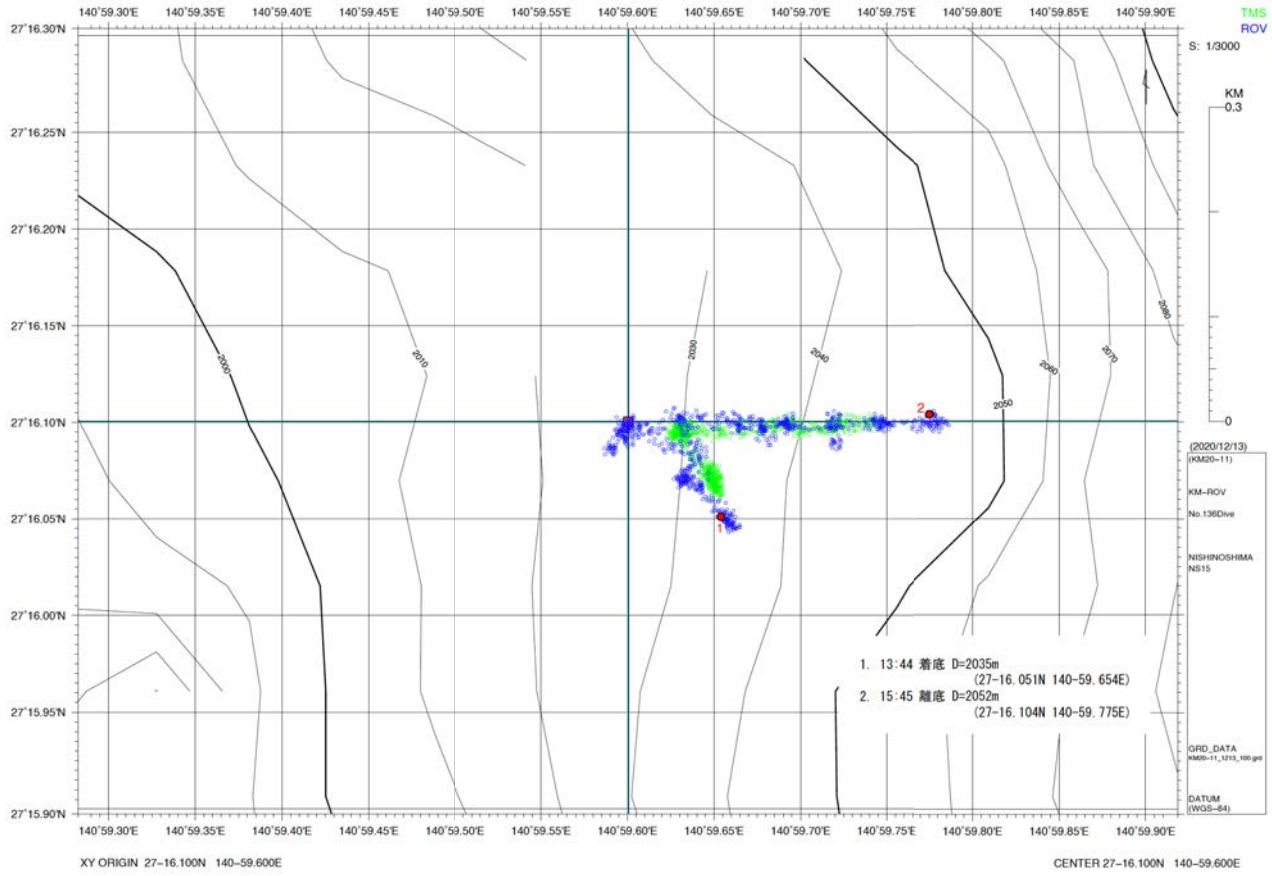
Seafloor

Rocks at seafloor

***Payload Equipment:***

1. Recovery rope

***Dive track KM-ROV#136***



# Dive Report KM-ROV#137

***Date:*** December 14, 2020

***Site:*** NS16 on the southern flank of Nishinoshima, ***Depth:*** 994 m

***Landing (Lat., Lon., Time, Depth):*** 27°11.778'N, 140°52.357'E, 10:06, 993 m

***Leaving (Lat., Lon., Time, Depth):*** 27°11.683'N, 140°52.206'E, 12:06, 1023 m

***Observer:*** TADA, Noriko

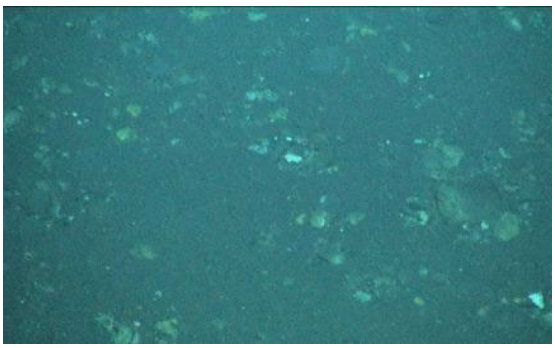
***Theme:*** Recovery of an ocean bottom electromagnetomter (OBEM)

***Purpose of dive:***

1. Recovery of OBEM
2. Observation of seafloor at the settled point of the OBEM

***Dive Summary***

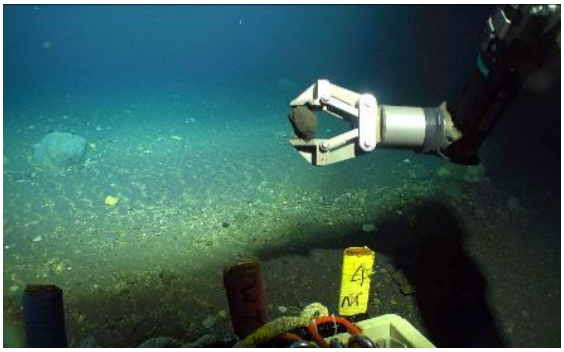
An OBEM is a self-pop-up type seafloor instrument. Because we failed to recover two OBEMs at NS15 and NS16 in a previous cruise (Keifu-maru of JMA), we tried to search and rescue them by KMROV. We landed at a depth of 993 m near NS16 on the southern flank of Nishinoshima volcano and searched the OBEM by using a sonar but we could not find the OBEM. We sampled one rock at NS16. We moved to southwest, deeper part of Nishinoshima volcano over 400 m while searching the OBEM by using the sonar every 50 m. We could not find the OBEM. The seafloor was covered with sands and gravels. Manipulator could push in the sediments about 5 cm. We sampled two rocks and left the seafloor.



Seafloor

Checking the thickness of sediments

Sampling rocks



Sampling rocks

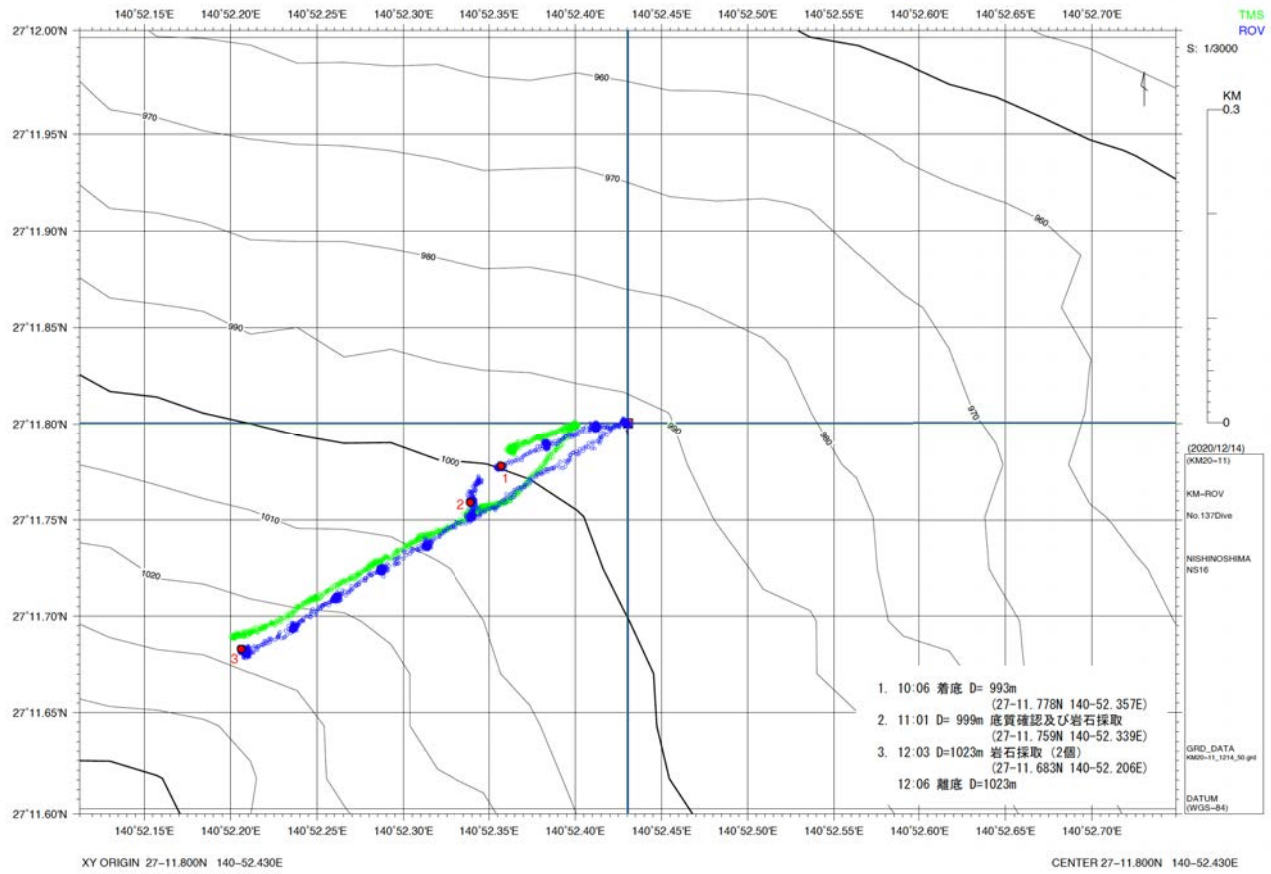
***Payload Equipment:***

1. Recovery rope

***Sampling Points and Markers:***

| Time | Position | Depth(m) | Events |
|---|---|---|---|
| 11:01 | 27°11.778’N, 140°52.339’E | 999 | One rock sampling |
| 12:03 | 27°11.683’N, 140°52.206’E | 1023 | Two rocks sampling |

***Dive track KM-ROV#137***



# Dive Report KM-ROV#138

***Date:*** December 18, 2020

***Site:*** Myojin Knoll, Izu-Ogasawara Arc, ***Depth:*** 1369 m

***Landing (Lat., Lon., Time, Depth):*** 32°06.344'N. 139°52.050'E, 09:12, 1369 m

***Leaving (Lat., Lon., Time, Depth):*** 32°06.325'N. 139°52.075'E, 15:48, 1351 m

***Main Observer:*** IKUTA, Tetsuro

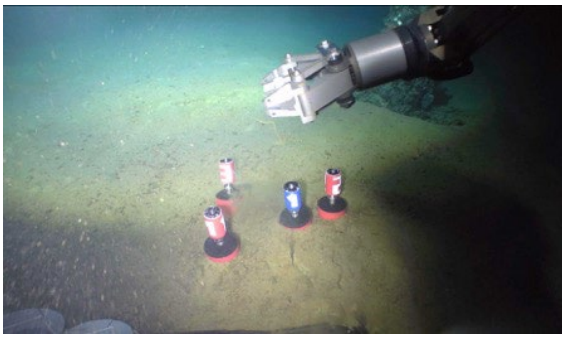
***Theme:*** Marine pollution baseline study and environmental impact assessment

***Purpose of dive:***

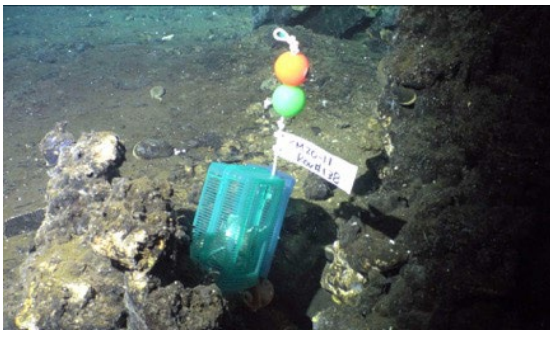
1. Deployment and retrieving of the acoustic doppler velocimeter and fine particles uptaking experimental cages
2. Sampling of organisms, sediment cores, rocks and water

***Dive Summary***

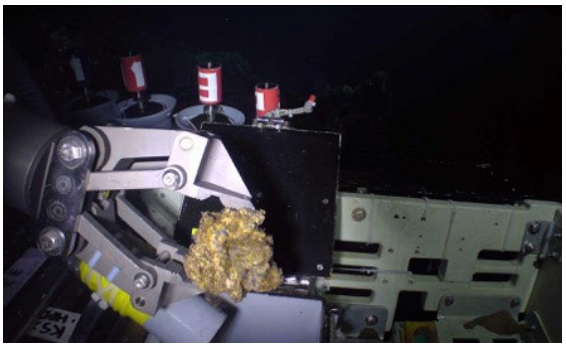
At the first observation point, we deployed the acoustic doppler velocimeter (ADV), and sampled sediments using H-type push corers. We moved to the second observation point, retrieved a set of fine particles uptaking experimental cages, which was deployed during KS-20-1 cruise, and installed another set of cages. Also, we sampled a rock on the seafloor with the manipulator, *Bathymodiolus* mussels and tiny annelids on the surface of chimneys with the suction sampler. Then, we moved to the third observation point, and sampled a part of chimney with the manipulator as well as seawater with the Niskin-sampler. After observation of the big chimney, Dai-Myojin, and some planktons, finally we returned to the first observation point, retrieved the ADV, and left the bottom.



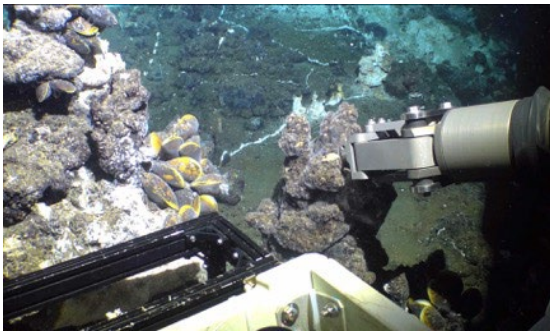
Sediment core sampling



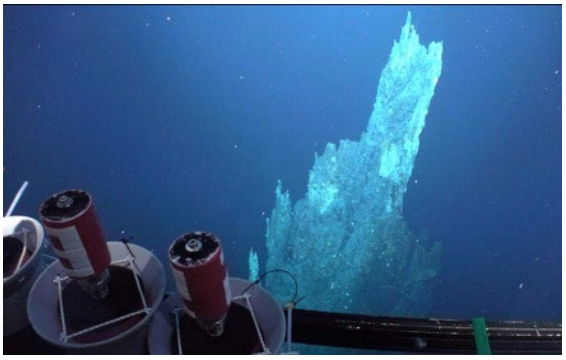
Fine particles uptaking experimental cages



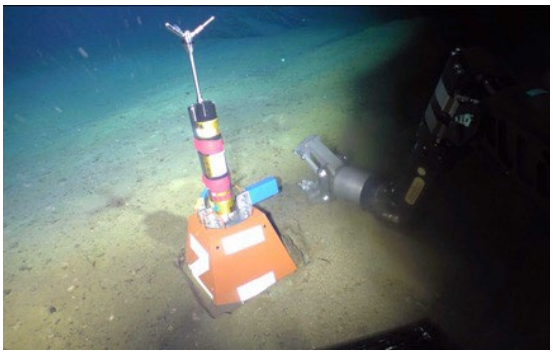
Sampling of a rock



Sampling of chimney



Dai-Myojin

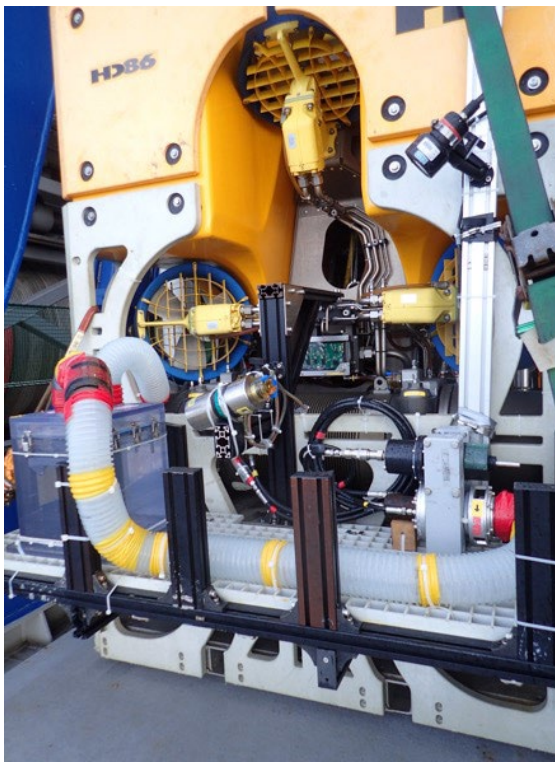


Retrieving of ADV

***Payload Equipment:***

1. Acoustic doppler velocimeter
2. H-type push corer x4 (front)
3. Sample box x2 (front)
4. Fine particles uptaking experimental cages (front)
5. Niskin water sampler x1 (front)
6. GoPro housing x1 (front)
7. Stereo-Camera (front)
8. Suction sampler and single-bottled canister x1 (rear)

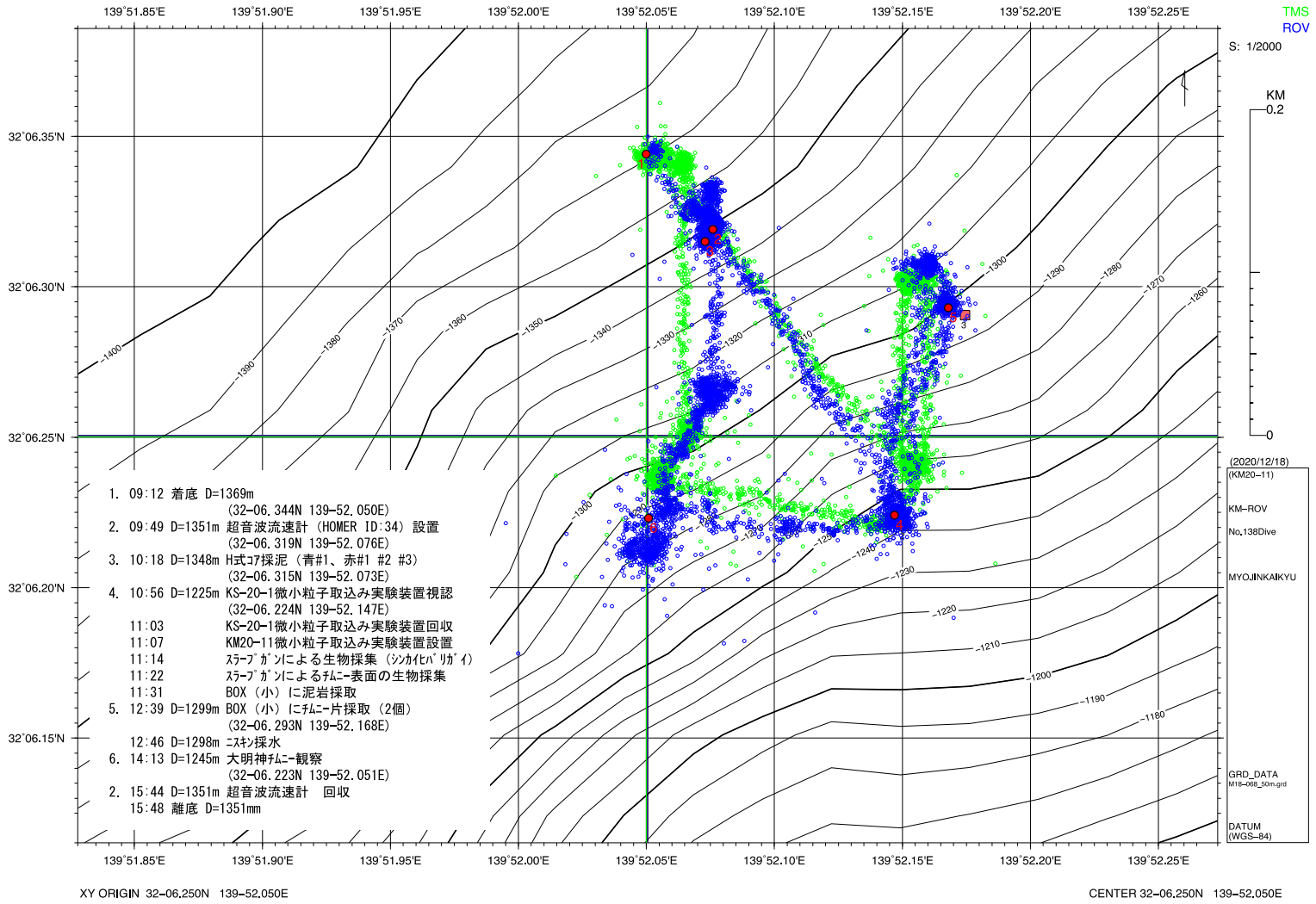
Front payload



Rear Payload

***Sampling Points and Events:***

| Time | Position | Depth | Events |
|---|---|---|---|
| 9:51 | 32°06.318'N, 139°52.077'E | 1349 | ADV deployment |
| 10:18 | 32°06.315'N, 139°52.073'E | 1347 | Sediment core sampling |
| 11:04 | 32°06.223'N, 139°52.151'E | 1225 | Cage deployment |
| 11:16 | 32°06.223'N, 139°52.151'E | 1226 | Mussel sampling |
| 11:20 | 32°06.225'N, 139°52.147'E | 1225 | Biological sampling on the chimney surface |
| 11:31 | 32°06.221'N, 139°52.148'E | 1224 | Rock sampling |
| 12:46 | 32°06.292'N, 139°52.170'E | 1297 | Chimney sampling |
| 12:46 | 32°06.293'N, 139°52.163'E | 1298 | Water sampling with Niskin |
| 14:08 | 32°06.212'N, 139°52.050'E | 1245 | Dai-Myojin observation |
| 15:43 | 32°06.323'N, 139°52.076'E | 1350 | ADV retrieving |


139°51.85'E
139°51.90'E
139°51.95'E
139°52.00'E
139°52.05'E
139°52.10'E
139°52.15'E
139°52.20'E
139°52.25'E
32°06.35'N
32°06.30'N
32°06.25'N
32°06.20'N
32°06.15'N
TMS
ROV
S: 1/2000
KM
0.2
0
1. 09:12 着底 D=1369m
(32-06.344N 139-52.050E)
2. 09:49 D=1351m 超音波流速計（HOMER ID:34）設置
(32-06.319N 139-52.076E)
3. 10:18 D=1348m H式ｺｱ採泥（青#1、赤#1 #2 #3）
(32-06.315N 139-52.073E)
4. 10:56 D=1225m KS-20-1微小粒子取込み実験装置視認
(32-06.224N 139-52.147E)
11:03 KS-20-1微小粒子取込み実験装置回収
11:07 KM20-11微小粒子取込み実験装置設置
11:14 ｽﾗｰﾌﾟｶﾞﾝによる生物採集（ｼﾝｶｲﾋﾊﾞﾘｶﾞｲ）
11:22 ｽﾗｰﾌﾟｶﾞﾝによるﾁﾑﾆｰ表面の生物採集
11:31 BOX（小）に泥岩採取
5. 12:39 D=1299m BOX（小）にﾁﾑﾆｰ片採取（2個）
(32-06.293N 139-52.168E)
12:46 D=1298m ﾆｽｷﾝ採水
6. 14:13 D=1245m 大明神ﾁﾑﾆｰ観察
(32-06.223N 139-52.051E)
2. 15:44 D=1351m 超音波流速計　回収
15:48 離底 D=1351mm
(2020/12/18)
(KM20-11)
KM-ROV
No.138Dive
MYOJINKAIKYU
GRD_DATA
M18-068_50m-grd
DATUM
(WGS-84)
XY ORIGIN 32-06.250N 139-52.050E
CENTER 32-06.250N 139-52.050E

# Dive Report KM-ROV#139

***Date:*** December 21, 2020 JST
***Site: inside*** Sumisu, Izu-Ogasawara Arc, ***Depth:*** 1369 m
***Landing (Lat., Lon., Time, Depth):*** 32°06.344'N. 139°52.050'E, 09:12, 1369 m
***Leaving (Lat., Lon., Time, Depth):*** 32°06.325'N. 139°52.075'E, 15:48, 1351 m
***Main Observer:*** Dhugal Lindsay

***Theme:*** Testing of newly-developed technologies for environmental impact assessment studies

***Purpose of dive:***

1. Testing the 4K stereo VPR system in situ with respect to video recording quality and codec choice and lighting.
2. Recording images of midwater organisms for training machine learning algorithms
3. Sampling of organisms for correct identifications for images in machine learning image training set

***Dive Summary***

The KM-ROV entered the water at 01:31 (10:31 JST), lighting for survey mode was stabilized at 01:34 and 33m depth, and the ROV was detached from the tether management system (TMS) at 02:01 (11:01 JST) and 302 m depth. It reached the seafloor at 03:25 (12:25 JST) and 903 m depth, and left the seafloor at 03:49. Ten minutes transects every 50 m were conducted during the ascent, between the depths of 850 and 500 m. The ROV was reattached to the TMS at 06:29 (15:29 JST) and 391 m depth and left the water at 06:45.

Ctenophores were the most abundant taxa during this dive and were observed at depths below 580m all the way to the bottom of the caldera. Most were Lobates (e.g., mainly "*Llyria*" sp. Fig. 1, *Bathocyroe* sp., *Kiyohimea* sp., and *Lampocteis* sp.) and a few Cydippids (e.g., *Bathyctena* sp., and "Ctenoceros"). Other organisms included Siphonophores (e.g., *Algama okeni*, *Rudjakovia* sp, *Bargmannia* sp., *Forskalia* sp., *Prayidae* sp., and Clausophyidae), Narcomedusae (e.g., *Solmissus* sp. Fig. 2), Hydromedusae (e.g., *Colobonema sericeum*), Scyphomedusae (e.g., Ulmaridae), Appendicularia (e.g., Oikopleuridae), and Cephalopoda (e.g., Oegopsida). In the upper layers krill, copepods (Sapphirinidae), lanternfishes (Myctophidae), and pteropod snails

(Clionidae) were observed.

The suction sampler on the KMROV139 was used to collect five specimens; Two cnidarians, two ctenophora and one rhizarian. Remarkably, three undescribed species were collected, two Medusozoans in the orders Semaeostomeae and Narcomedusae, and one Ctenophora in the order Lobata (“Llyria” below).

Collected Material:
211220_1_1 (SS4), *Solmissus* sp., 547m.
211220_1_2 (SS1), Ulmaridae, 750m.
211220_1_3 (SS4), Radiolarian, 547m.
211220_1_5 (SS2),"Llyria", 748.
211220_1_6 (SS3),"Llyria", 707.

Notes: two additional samples were collected by a neuston-net deployed on the same date; *Velella velella* (ID# 211220_1_4) and *Hippopodius hippopus* (ID# 211220_1_7).

Fig. 1 "*Llyria*" sp. lobate ctenophore observed at 657 m.

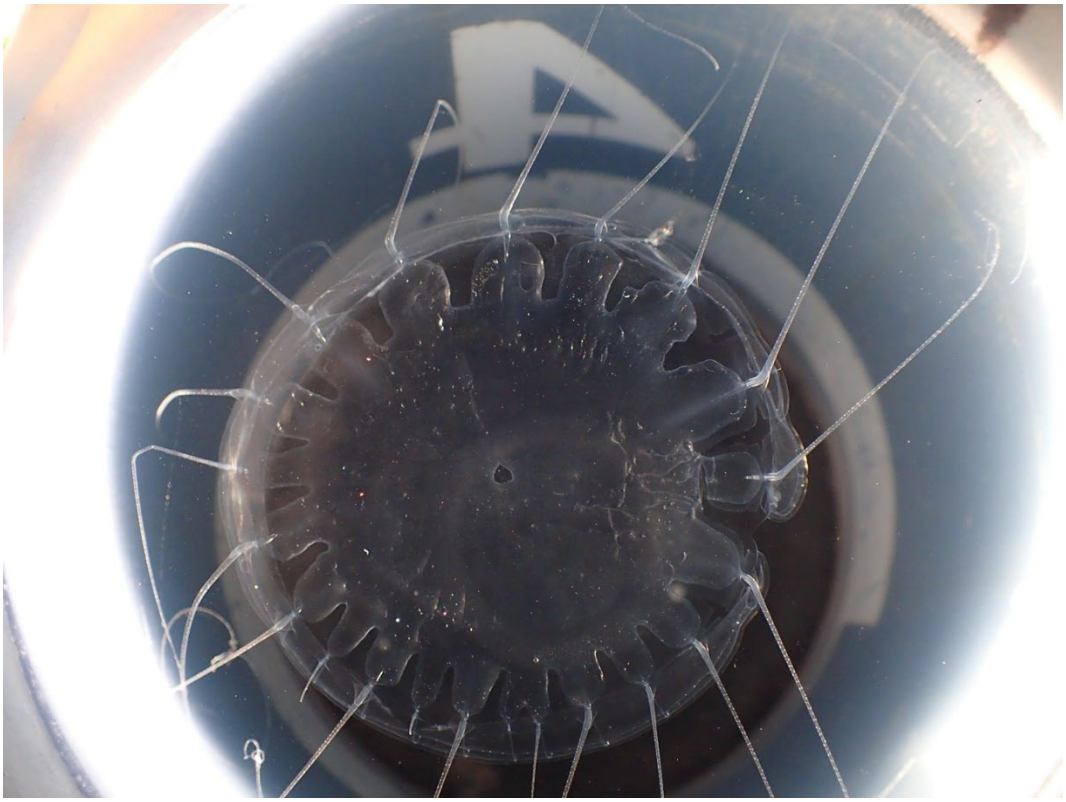
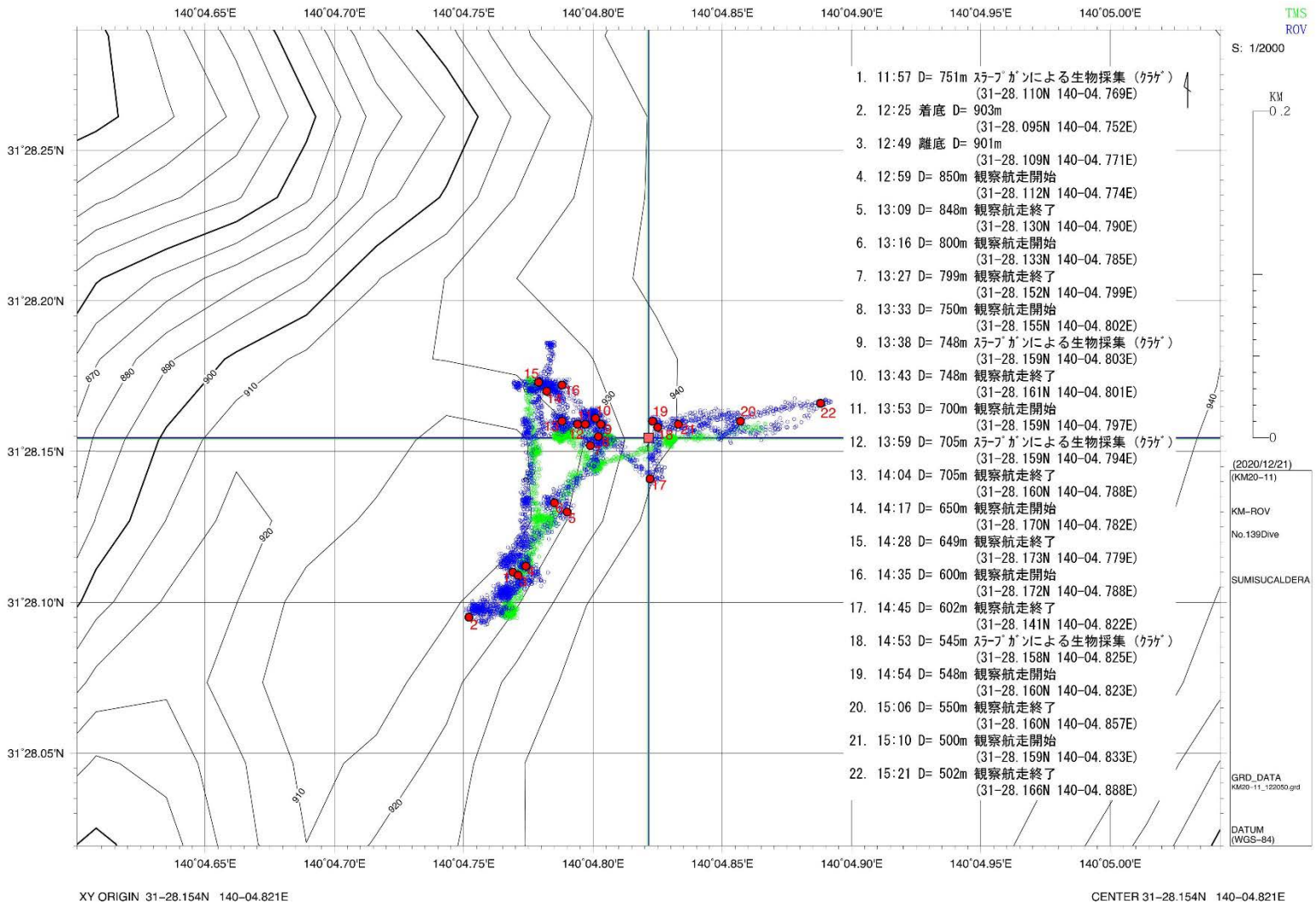


Fig 2. *Solmissus* sp. Narcomedusae collected at 545 m (KM0139SS4)


140°04.65'E
140°04.70'E
140°04.75'E
140°04.80'E
140°04.85'E
140°04.90'E
140°04.95'E
140°05.00'E
31°28.25'N
31°28.20'N
31°28.15'N
31°28.10'N
31°28.05'N
870
880
890
900
910
920
930
940
TMS
ROV
S: 1/2000
KM
0
.2
1. 11:57 D= 751m ｽﾃｰﾌﾞｶﾞﾝによる生物採集 (ｸﾗｹﾞ)
(31-28.110N 140-04.769E)
2. 12:25 着底 D= 903m
(31-28.095N 140-04.752E)
3. 12:49 離底 D= 901m
(31-28.109N 140-04.771E)
4. 12:59 D= 850m 観察航走開始
(31-28.112N 140-04.774E)
5. 13:09 D= 848m 観察航走終了
(31-28.130N 140-04.790E)
6. 13:16 D= 800m 観察航走開始
(31-28.133N 140-04.785E)
7. 13:27 D= 799m 観察航走終了
(31-28.152N 140-04.799E)
8. 13:33 D= 750m 観察航走開始
(31-28.155N 140-04.802E)
9. 13:38 D= 748m ｽﾃｰﾌﾞｶﾞﾝによる生物採集 (ｸﾗｹﾞ)
(31-28.159N 140-04.803E)
10. 13:43 D= 748m 観察航走終了
(31-28.161N 140-04.801E)
11. 13:53 D= 700m 観察航走開始
(31-28.159N 140-04.797E)
12. 13:59 D= 705m ｽﾃｰﾌﾞｶﾞﾝによる生物採集 (ｸﾗｹﾞ)
(31-28.159N 140-04.794E)
13. 14:04 D= 705m 観察航走終了
(31-28.160N 140-04.788E)
14. 14:17 D= 650m 観察航走開始
(31-28.170N 140-04.782E)
15. 14:28 D= 649m 観察航走終了
(31-28.173N 140-04.779E)
16. 14:35 D= 600m 観察航走開始
(31-28.172N 140-04.788E)
17. 14:45 D= 602m 観察航走終了
(31-28.141N 140-04.822E)
18. 14:53 D= 545m ｽﾃｰﾌﾞｶﾞﾝによる生物採集 (ｸﾗｹﾞ)
(31-28.158N 140-04.825E)
19. 14:54 D= 548m 観察航走開始
(31-28.160N 140-04.823E)
20. 15:06 D= 550m 観察航走終了
(31-28.160N 140-04.857E)
21. 15:10 D= 500m 観察航走開始
(31-28.159N 140-04.833E)
22. 15:21 D= 502m 観察航走終了
(31-28.166N 140-04.888E)
(2020/12/21)
(KM20-11)
KM-ROV
No.139Dive
SUMISUCALDERA
GRD_DATA
KM20-11_122050.grd
DATUM
(WGS-84)
XY ORIGIN 31-28.154N 140-04.821E
CENTER 31-28.154N 140-04.821E

# Dive Report KM-ROV#140

***Date:*** December 22, 2020 JST

***Site: inside*** Higashi-aogashima , ***Depth:*** 1369 m

***Landing (Lat., Lon., Time, Depth):*** 32°06.344'N. 139°52.050'E, 09:12, 1369 m

***Leaving (Lat., Lon., Time, Depth):*** 32°06.325'N. 139°52.075'E, 15:48, 1351 m

***Main Observer:*** Dhugal Lindsay

***Theme:*** Testing of newly-developed technologies for environmental impact assessment studies

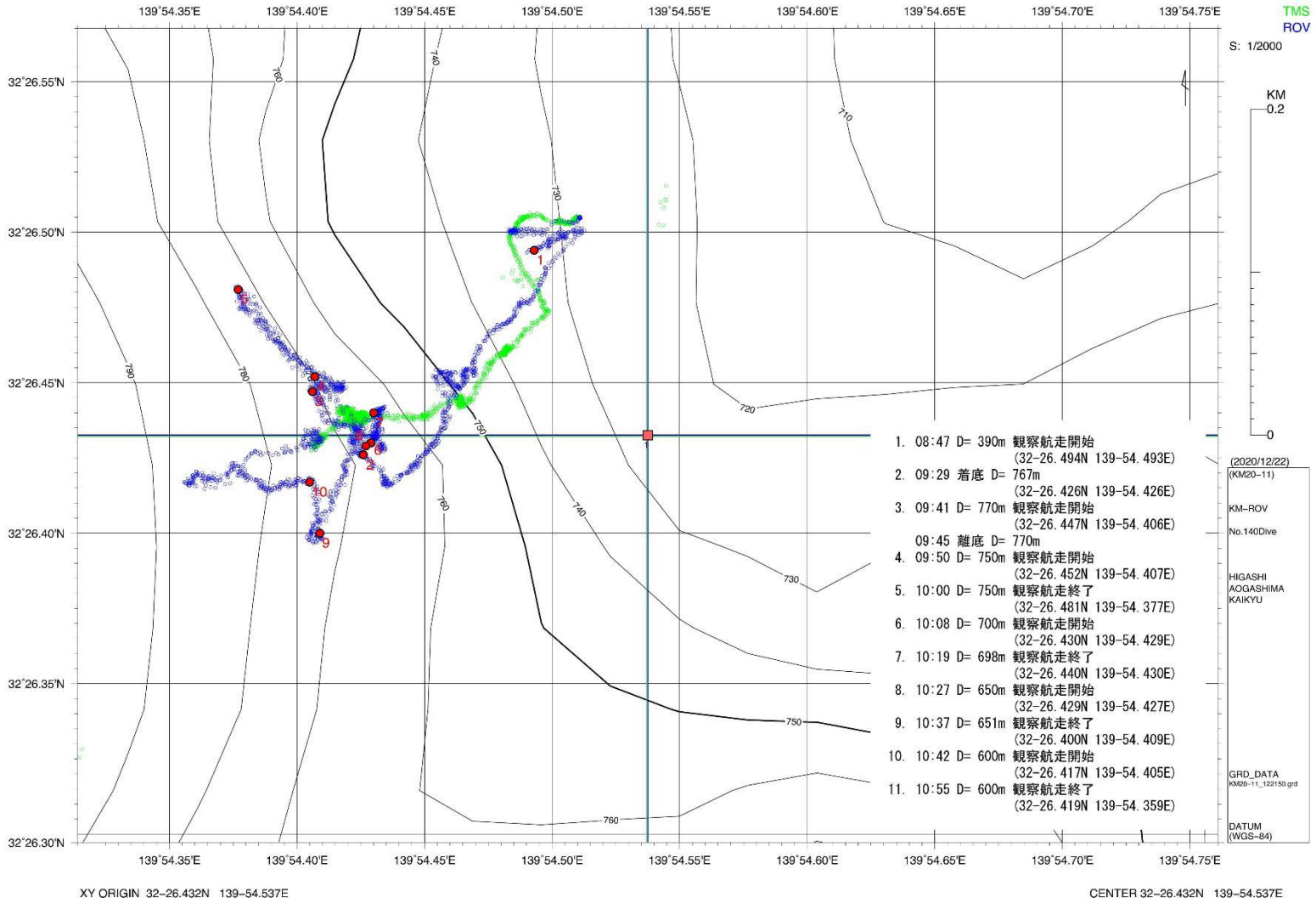
***Purpose of dive:***

1. Testing the 4K stereo VPR system in situ with respect to video recording quality and codec choice and lighting.
2. Recording images of midwater organisms for training machine learning algorithms
3. Sampling of organisms for correct identifications for images in machine learning image training set

***Dive Summary***

The KM-ROV entered the water at 23:23 on 21 December (UTC) (20201222T0823 JST), lighting for surveys was stabilized at 23:28 and 114 m depth, and the ROV detached from the TMS at 23:35 and 252 m depth. It reached the seafloor at 00:29 on 22 December (UTC) (20201222T0929 JST) and 767 m depth, and left the seafloor at 00:45. Ten minute transects every 50 m were conducted during the ascent, between the depths of 750 and 600 m. The ROV was reattached to the TMS at 02:07 and 465 m depth, and left the water at 02:25 (11:25 JST).

This half-day dive dive had the least observations of all conducted dives. The few observations included, among others, Narcomedusae (e.g., *Solmissus* sp., *Bathykorus* sp., and *Aeginura grimaldii*), Siphonophores (e.g., Physonectae, Clausophyidae, and *Marrus orthocanna*), Hydromedusae (e.g., *Colobonema sericeum*), Scyphomedusae (e.g., *Atolla* sp.), Trachymedusae, ctenophores, salps, and pyrosomes. No material was collected.


139°54.35'E
139°54.40'E
139°54.45'E
139°54.50'E
139°54.55'E
139°54.60'E
139°54.65'E
139°54.70'E
139°54.75'E
32°26.55'N
32°26.50'N
32°26.45'N
32°26.40'N
32°26.35'N
32°26.30'N
TMS
ROV
S: 1/2000
KM
0.2
0
1. 08:47 D= 390m 観察航走開始
(32-26.494N 139-54.493E)
2. 09:29 着底 D= 767m
(32-26.426N 139-54.426E)
3. 09:41 D= 770m 観察航走開始
(32-26.447N 139-54.406E)
09:45 離底 D= 770m
4. 09:50 D= 750m 観察航走開始
(32-26.452N 139-54.407E)
5. 10:00 D= 750m 観察航走終了
(32-26.481N 139-54.377E)
6. 10:08 D= 700m 観察航走開始
(32-26.430N 139-54.429E)
7. 10:19 D= 698m 観察航走終了
(32-26.440N 139-54.430E)
8. 10:27 D= 650m 観察航走開始
(32-26.429N 139-54.427E)
9. 10:37 D= 651m 観察航走終了
(32-26.400N 139-54.409E)
10. 10:42 D= 600m 観察航走開始
(32-26.417N 139-54.405E)
11. 10:55 D= 600m 観察航走終了
(32-26.419N 139-54.359E)
(2020/12/22)
(KM20-11)
KM-ROV
No.140Dive
HIGASHI
AOGASHIMA
KAIKYU
GRD_DATA
KM20-11_122150.grd
DATUM
(WGS-84)
XY ORIGIN 32-26.432N 139-54.537E
CENTER 32-26.432N 139-54.537E

# Dive Report KM-ROV#141

***Date:*** December 22, 2020 JST

***Site: outside*** Higashi-aogashima, ***Depth:*** 1369 m

***Landing (Lat., Lon., Time, Depth):*** 32°06.344'N. 139°52.050'E, 09:12, 1369 m

***Leaving (Lat., Lon., Time, Depth):*** 32°06.325'N. 139°52.075'E, 15:48, 1351 m

***Main Observer:*** Dhugal Lindsay

***Theme:*** Testing of newly-developed technologies for environmental impact assessment studies

***Purpose of dive:***

1. Testing the 4K stereo VPR system in situ with respect to video recording quality and codec choice and lighting.
2. Recording images of midwater organisms for training machine learning algorithms
3. Sampling of organisms for correct identifications for images in machine learning image training set

***Dive Summary***

The KM-ROV entered the water at 04:10 (13:10 JST), lighting for surveys was stabilized at 04:13 and 40 m depth, and the ROV detached from the TMS at 04:24 and 302 m. It reached the seafloor at 05:23 and 757 m depth, and left the seafloor at 05:41. Ten minutes transects were conducted during the ascent at the following depths: 725, 700, 650, 600, and 550m. The ROV was reattached to the TMS at 07:31 and 425 m depth, and left the water at 07:48 (16:48 JST).

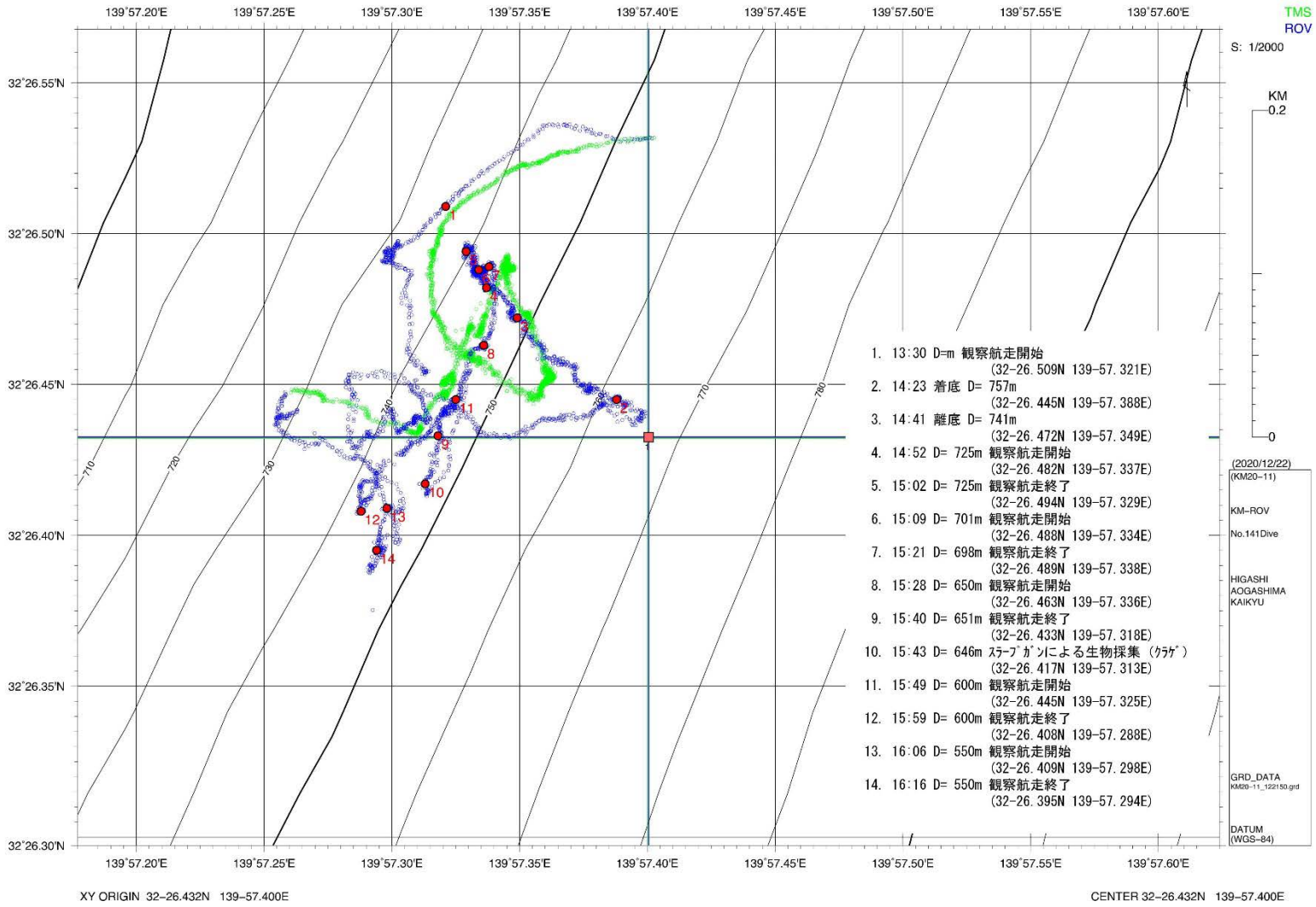
The current was relatively strong as the dive was conducted outside the caldera, especially above 600 m. *Bathykorus* sp. were common around 700 m depth and many shrimps were observed near the bottom. Other organisms observed during the dive included Siphonophores (e.g., Physonectae, Prayidae, and *Apolemia* sp.), Narcomedusae (e.g., *Solmissus* sp.), Hydromedusae (e.g., *Colobonema sericeum*), Lobata (e.g., *Bathocyroe* sp, and *Kiyohimea* sp.), pyrosomes, salps, and Appendicularia. Three samples were collected using the KMROV141 suction sampler; One Amphicaryon, one gastropod veliger larva, and one tunicate.

Collected Material:

221220KMR0V141_SS1a, gastropod veliger larvae, 0-756m.

KM0141SS1A, *Amphicaryon acaule* / eudoxid", 505-756m.

KM0141SS1B, Doliolid phorozoid, 505-756m.


139°57.20'E
139°57.25'E
139°57.30'E
139°57.35'E
139°57.40'E
139°57.45'E
139°57.50'E
139°57.55'E
139°57.60'E
32°26.55'N
32°26.50'N
32°26.45'N
32°26.40'N
32°26.35'N
32°26.30'N
TMS
ROV
S: 1/2000
KM
0.2
0
710
720
730
740
750
760
770
780
1. 13:30 D=m 観察航走開始
(32-26.509N 139-57.321E)
2. 14:23 着底 D= 757m
(32-26.445N 139-57.388E)
3. 14:41 離底 D= 741m
(32-26.472N 139-57.349E)
4. 14:52 D= 725m 観察航走開始
(32-26.482N 139-57.337E)
5. 15:02 D= 725m 観察航走終了
(32-26.494N 139-57.329E)
6. 15:09 D= 701m 観察航走開始
(32-26.488N 139-57.334E)
7. 15:21 D= 698m 観察航走終了
(32-26.489N 139-57.338E)
8. 15:28 D= 650m 観察航走開始
(32-26.463N 139-57.336E)
9. 15:40 D= 651m 観察航走終了
(32-26.433N 139-57.318E)
10. 15:43 D= 646m ｽﾗｰﾌﾟｶﾞﾝによる生物採集 (ｸﾗｹﾞ)
(32-26.417N 139-57.313E)
11. 15:49 D= 600m 観察航走開始
(32-26.445N 139-57.325E)
12. 15:59 D= 600m 観察航走終了
(32-26.408N 139-57.288E)
13. 16:06 D= 550m 観察航走開始
(32-26.409N 139-57.298E)
14. 16:16 D= 550m 観察航走終了
(32-26.395N 139-57.294E)
(2020/12/22)
(KM20-11)
KM-ROV
No.141Dive
HIGASHI
AOGASHIMA
KAIKYU
GRD_DATA
KM20-11_122150.grd
DATUM
(WGS-84)
XY ORIGIN 32-26.432N 139-57.400E
CENTER 32-26.432N 139-57.400E

# Dive Report KM-ROV#142

***Date:*** December 23, 2020

***Site: inside*** Higashi-aogashima, ***Depth:*** 1369 m

***Landing (Lat., Lon., Time, Depth):*** 32°06.344'N. 139°52.050'E, 09:12, 1369 m

***Leaving (Lat., Lon., Time, Depth):*** 32°06.325'N. 139°52.075'E, 15:48, 1351 m

***Main Observer:*** Dhugal Lindsay

***Theme:*** Testing of newly-developed technologies for environmental impact assessment studies

***Purpose of dive:***

1. Testing the 4K stereo VPR system in situ with respect to video recording quality and codec choice and lighting.
2. Recording images of midwater organisms for training machine learning algorithms
3. Sampling of organisms for correct identifications for images in machine learning image training set

***Dive Summary***

The KM-ROV entered the water at 04:33 (13:33 JST), lighting for surveys was stabilized at 04:37 and 76 m depth, and the ROV was detached from the TMS at 04:49 and 402 m depth. It reached the seafloor at 05:56 and 752 m depth, undertook a seafloor survey, and left the seafloor at 06:45. The ROV was reattached to the TMS at 06:52 and 616 m depth, and left the water at 07:13 (16:13 JST). No midwater transects were conducted.

The highlight of this dive was certainly a 38 m tall active chimney, which was filmed for the first time (Fig. 3). Large numbers of fish were observed during the entirety of the dive. Between 200 and 500 m depth, krill, salps and Siphonophores were observed. Below 500m depth, Narcomedusae (e.g., *Bathykorus* sp. Fig. 4, and *Solmissus* sp.), Siphonophores (e.g., *Forskalia formosa*, *Agalma okeni*, Clausophyidae, and Physonectae), lobate ctenophores, and *Sternoptyx* hatchetfish were observed.

Five specimens were collected using the suction sampler of KMROV142; two medusoids, two crustaceans, and one sea spider. Remarkably the two specimens of medusoids collected were found to be undescribed species; *Solmissus* sp. and *Bathykorus* sp.

Collected Material:KM0143SS1, *Solmissus* sp., 593m.

KM0142SS2, *Bathykorus* sp., 704m.

KM0142SS3A, Cirripedia, 755m.
KM0142SS3B, Gammaridea, 755m.
KM0142SS3C, Pycnogonida sp, 755m.

Fig. 3 Top of the 38 m tall chimney inside of the Higashi-Aogashima Caldera.

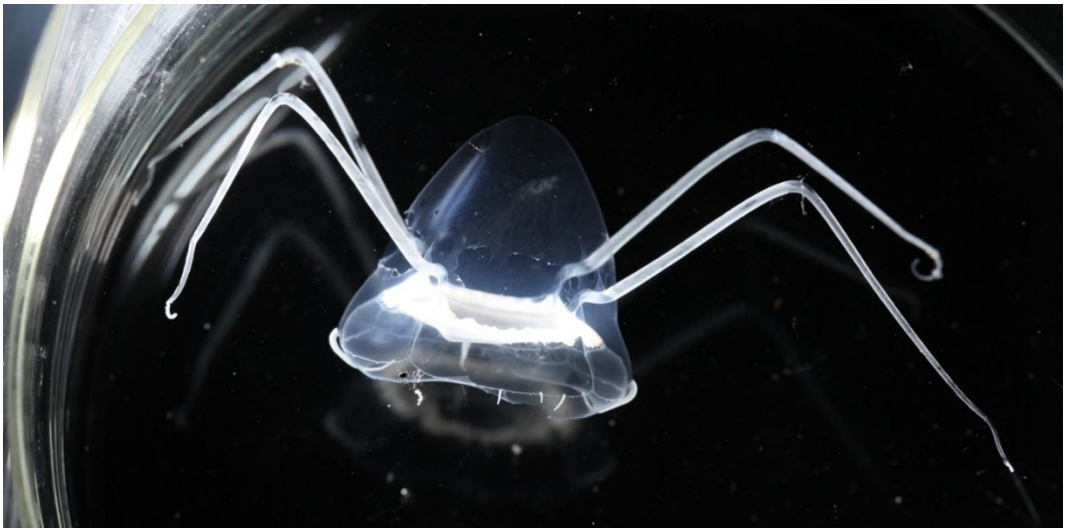
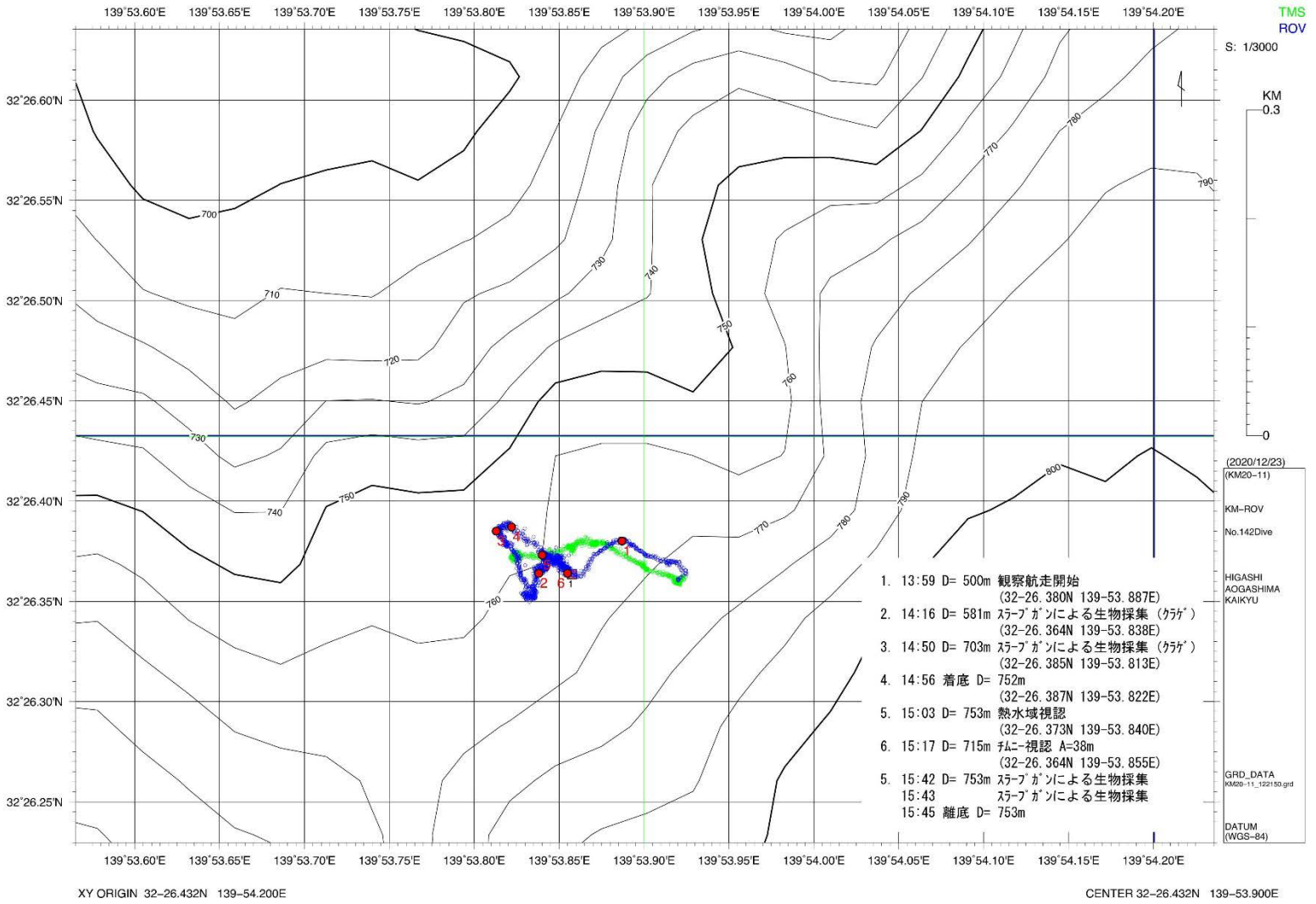


Fig. 4 *Bathykorus* sp. sampled at 704 m (KM0142SS2).


139°53.60'E
139°53.65'E
139°53.70'E
139°53.75'E
139°53.80'E
139°53.85'E
139°53.90'E
139°53.95'E
139°54.00'E
139°54.05'E
139°54.10'E
139°54.15'E
139°54.20'E
32°26.60'N
32°26.55'N
32°26.50'N
32°26.45'N
32°26.40'N
32°26.35'N
32°26.30'N
32°26.25'N
TMS
ROV
S: 1/3000
KM
0.3
0
1. 13:59 D= 500m 観察航走開始
(32-26.380N 139-53.887E)
2. 14:16 D= 581m ｽﾗｰﾌﾟｶﾞﾝによる生物採集 (ｸﾗｹﾞ)
(32-26.364N 139-53.838E)
3. 14:50 D= 703m ｽﾗｰﾌﾟｶﾞﾝによる生物採集 (ｸﾗｹﾞ)
(32-26.385N 139-53.813E)
4. 14:56 着底 D= 752m
(32-26.387N 139-53.822E)
5. 15:03 D= 753m 熱水域視認
(32-26.373N 139-53.840E)
6. 15:17 D= 715m ﾁﾑﾆｰ視認 A=38m
(32-26.364N 139-53.855E)
5. 15:42 D= 753m ｽﾗｰﾌﾟｶﾞﾝによる生物採集
15:43 ｽﾗｰﾌﾟｶﾞﾝによる生物採集
15:45 離底 D= 753m
(2020/12/23)
(KM20-11)
KM-ROV
No.142Dive
HIGASHI
AOGASHIMA
KAIKYU
GRD_DATA
KM20-11_122150.grd
DATUM
(WGS-84)
XY ORIGIN 32-26.432N 139-54.200E
CENTER 32-26.432N 139-53.900E

# Dive Report KM-ROV#143

***Date:*** December 24, 2020

***Site: inside*** Kurose hole, ***Depth:*** 1369 m

***Landing (Lat., Lon., Time, Depth):*** 32°06.344'N. 139°52.050'E, 09:12, 1369 m

***Leaving (Lat., Lon., Time, Depth):*** 32°06.325'N. 139°52.075'E, 15:48, 1351 m

***Main Observer:*** Dhugal Lindsay

***Theme:*** Testing of newly-developed technologies for environmental impact assessment studies

***Purpose of dive:***

1. Testing the 4K stereo VPR system in situ with respect to video recording quality and codec choice and lighting.
2. Recording images of midwater organisms for training machine learning algorithms
3. Sampling of organisms for correct identifications for images in machine learning image training set

***Dive Summary***

The survey started on 23/12/2020 (UTC), the video beginning at time 23:09:36 (UTC) and depth 0 (meters). Lighting for survey mode stabilized at time 23:15:32 and depth 36m; the KM-ROV was detached from the tether management system (TMS) at time 23:29:47 and depth 411m. Benthic transect began on 24/12/2020 at time 00:02:74 (UTC) and depth 790m and ended at time 01:52:40 depth 769m. Several squid, typically *Cranchiidae* spp., were observed in the midwater. Large numbers of fishes in the family Stomiidae, most commonly *Chauliodus* spp, and shrimp, *Pasiphaeidae* spp., were observed throughout the transect, particularly near the seafloor. The following species and groups were also frequently observed: Trichiuridae, *Hoplostethus* spp, *Tetronarce tokionis*, and *Pentaceros japonicus*. Ten minutes transects every 25 m were conducted during the ascent between the depths of 775 and 650 m, and at every 50m between 650 and 500 m. Video feed ended at 04:58:19 (13:58 JST) at depth 0m on 24/12/2020.

Multiple specimens of crustaceans, one polychaete, and one Medusozoan were collected using the suction sampler of KMROV143.

Collected Material:

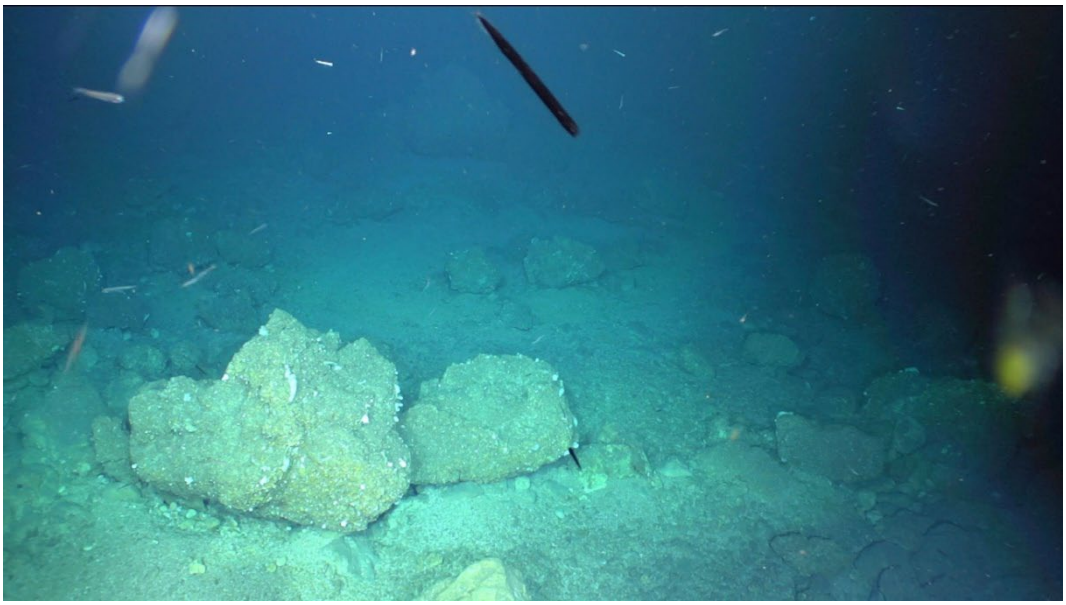
KM0143SS1H, Copepods, 777m.

KM0143SS1G, Krill "Assorted", 777m.

KM0143SS1I, Amphipods, 777m.
KM0143SS1E, Shrimp, 777m.
KM0143SS1K, Assorted Plankton, 777m.
KM0143SS1F, Polychaetes, 777m.
KM0143SS1D, Krill "Red head", 777m.
KM0143SS1A, Jelly, 777m.
KM0143SS1J, Copepods, 777m.

Notes: Additionally, one specimen of *Phronima sedentaria*, and multiple Isopods specimens were collected using the suction sampler of KMROV143 at 777m.

Family Stomiidae, *Chauliodus sloani*
00:20:43 UTC 738.879m

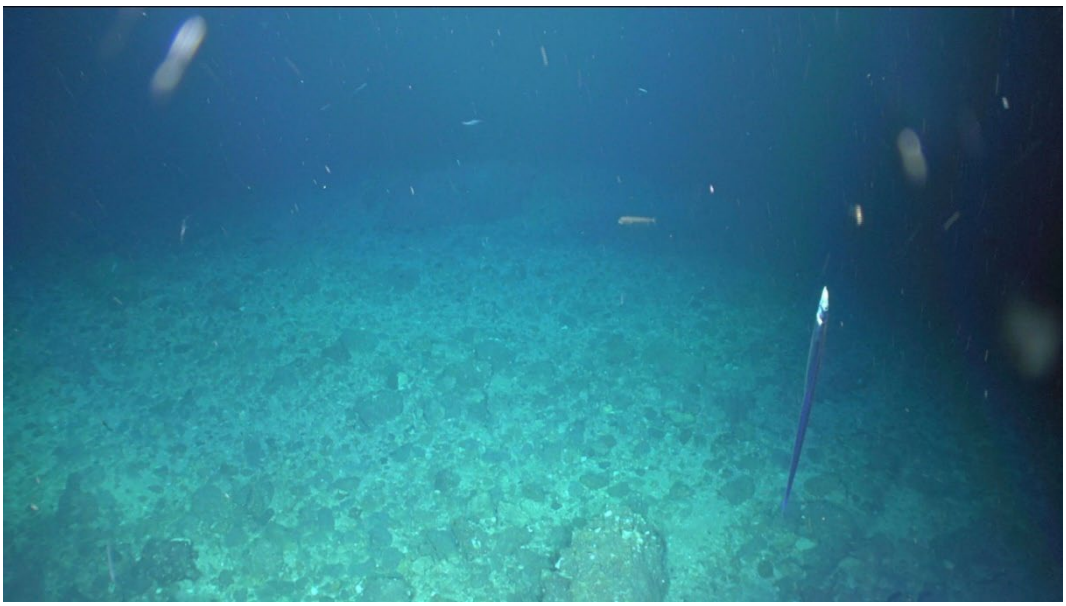


Family Stomiidae, *Tactostoma macropus*

01:03:40 UTC 785.294m

Family Cranchidae

00:16:55 UTC 721.413m



Family Trichiuridae, *Benthodesmus tennuis*

00:28:16 UTC 785.833m

Family Trachichthyidae, *Hoplostethus crassipinus*

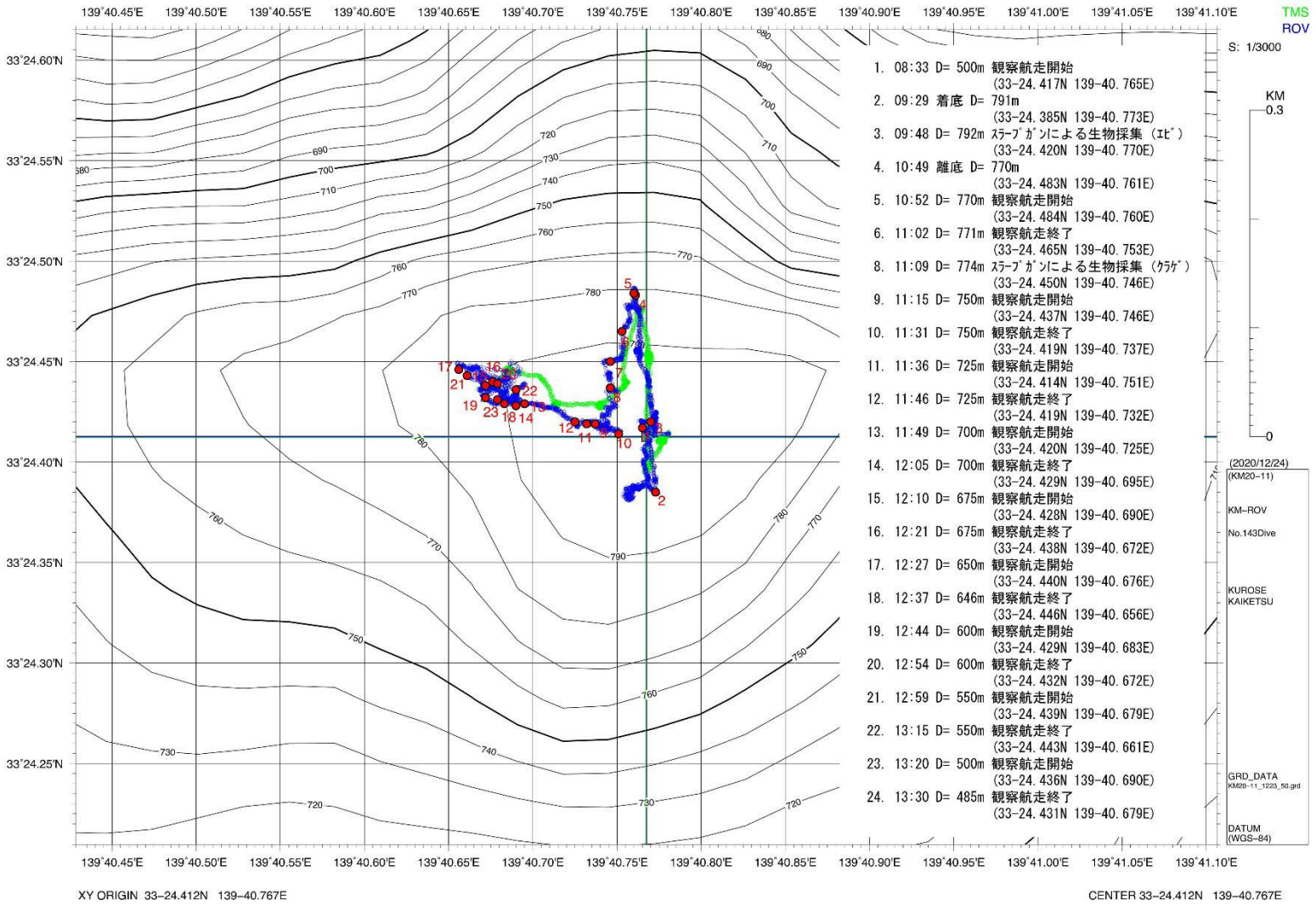
00:32:24 UTC 786.765m

Family Pentacerotidae, *Pentaceros japonicus*

01:07:21 UTC 784.155m

Family Torpedinidae, *Tetronarce tokionis*

00:42:15 UTC 786.247m


139°40.45'E 139°40.50'E 139°40.55'E 139°40.60'E 139°40.65'E 139°40.70'E 139°40.75'E 139°40.80'E 139°40.85'E 139°40.90'E 139°40.95'E 139°41.00'E 139°41.05'E 139°41.10'E
33°24.60'N
33°24.55'N
33°24.50'N
33°24.45'N
33°24.40'N
33°24.35'N
33°24.30'N
33°24.25'N
TMS
ROV
S: 1/3000
KM
0.3
0
1. 08:33 D= 500m 観察航走開始 (33-24.417N 139-40.765E)
2. 09:29 着底 D= 791m (33-24.385N 139-40.773E)
3. 09:48 D= 792m ｽﾗｰﾌﾞｶﾞﾝによる生物採集（ｴﾋﾞ） (33-24.420N 139-40.770E)
4. 10:49 離底 D= 770m (33-24.483N 139-40.761E)
5. 10:52 D= 770m 観察航走開始 (33-24.484N 139-40.760E)
6. 11:02 D= 771m 観察航走終了 (33-24.465N 139-40.753E)
8. 11:09 D= 774m ｽﾗｰﾌﾞｶﾞﾝによる生物採集（ｸﾗｹﾞ） (33-24.450N 139-40.746E)
9. 11:15 D= 750m 観察航走開始 (33-24.437N 139-40.746E)
10. 11:31 D= 750m 観察航走終了 (33-24.419N 139-40.737E)
11. 11:36 D= 725m 観察航走開始 (33-24.414N 139-40.751E)
12. 11:46 D= 725m 観察航走終了 (33-24.419N 139-40.732E)
13. 11:49 D= 700m 観察航走開始 (33-24.420N 139-40.725E)
14. 12:05 D= 700m 観察航走終了 (33-24.429N 139-40.695E)
15. 12:10 D= 675m 観察航走開始 (33-24.428N 139-40.690E)
16. 12:21 D= 675m 観察航走終了 (33-24.438N 139-40.672E)
17. 12:27 D= 650m 観察航走開始 (33-24.440N 139-40.676E)
18. 12:37 D= 646m 観察航走終了 (33-24.446N 139-40.656E)
19. 12:44 D= 600m 観察航走開始 (33-24.429N 139-40.683E)
20. 12:54 D= 600m 観察航走終了 (33-24.432N 139-40.672E)
21. 12:59 D= 550m 観察航走開始 (33-24.439N 139-40.679E)
22. 13:15 D= 550m 観察航走終了 (33-24.443N 139-40.661E)
23. 13:20 D= 500m 観察航走開始 (33-24.436N 139-40.690E)
24. 13:30 D= 485m 観察航走終了 (33-24.431N 139-40.679E)
(2020/12/24)
(KM20-11)
KM-ROV
No.143Dive
KUROSE
KAIKETSU
GRD_DATA
KM20-11_1223_50.grd
DATUM
(WGS-84)
XY ORIGIN 33-24.412N 139-40.767E
CENTER 33-24.412N 139-40.767E

4.1.3 Dive methodology and data management

**Dhugal Lindsay, Sangekar Mehul Naresh s(JAMSTEC)**

Imaging Payload Equipment

Stereo GoPro

- Stereo pair using Hero5 GoPro Cameras
- Underwater housing rated 3000 m
- Dimensions 250 mm W x 71 mm D x 144 mm H
- Standalone housing with additional battery inside

Data is recorded on an SD card which is downloaded at the end of each dive onto an external storage unit.

Single GoPro

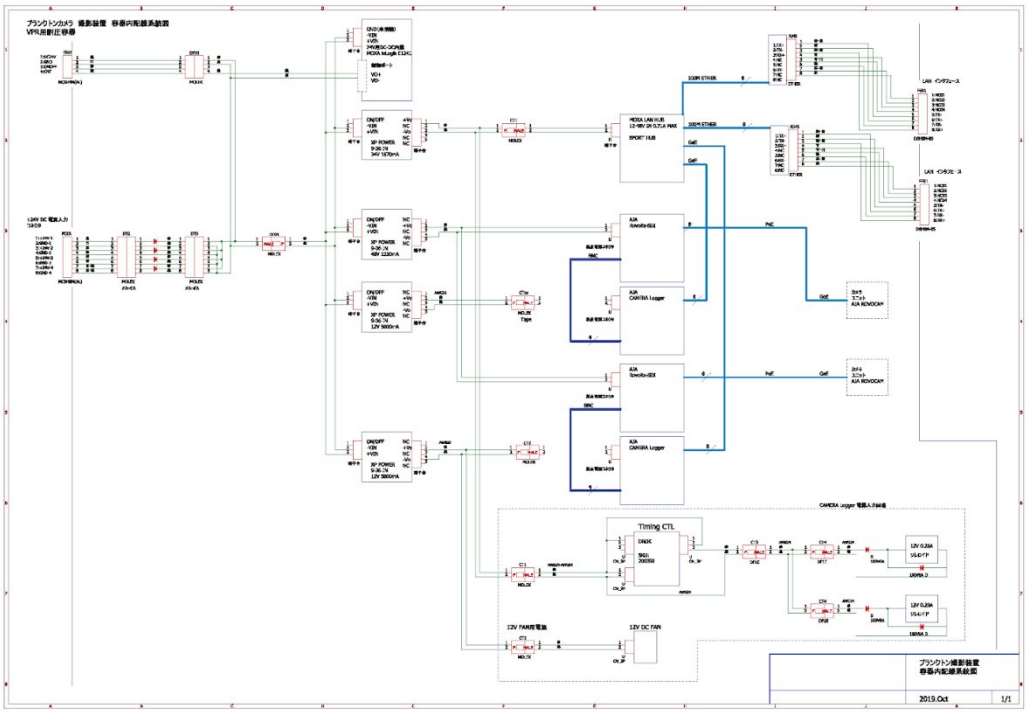
- Hero4+ GoPro Camera
- Underwater housing rated 3000 m
- Dimensions 162 mm W x 71 mm D x 144 mm H
- Standalone housing with additional battery inside

Data is recorded on an SD card which is downloaded at the end of each dive onto an external storage unit.

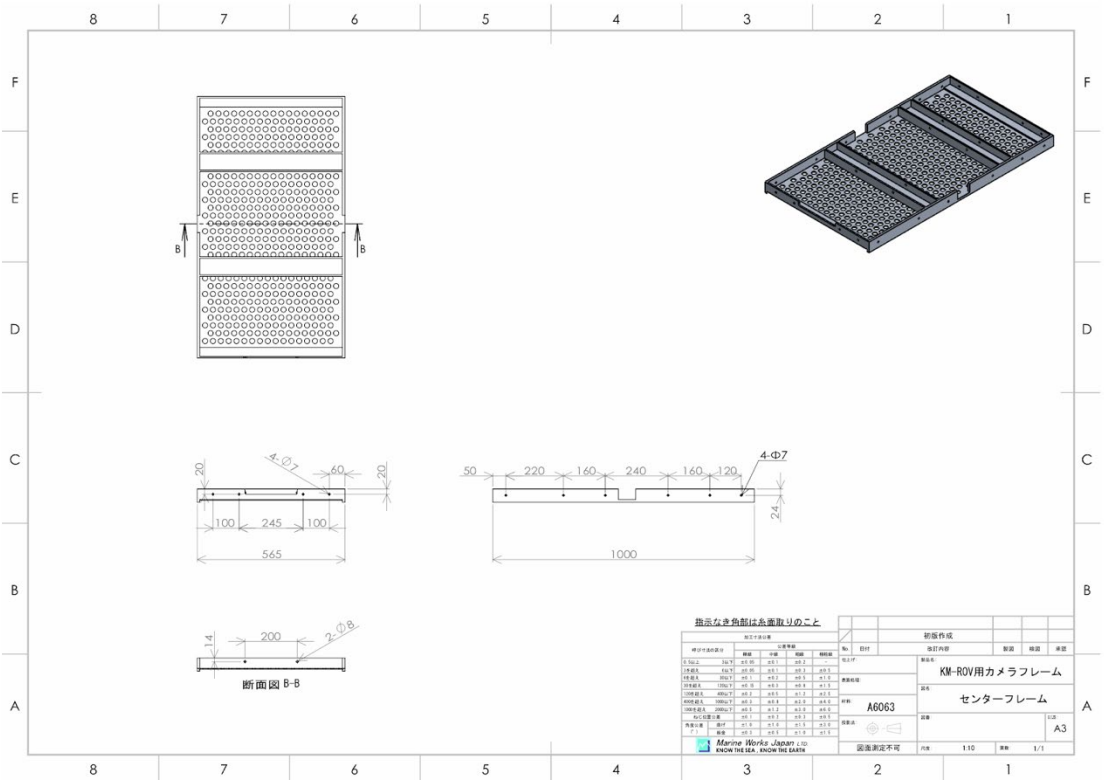
Stereo 4K VPR

- Stereo pair using AJA Rovocam Cameras
- Underwater housing rated 2400 m
- Dimensions 270 mm diameter x 910 mm long (1000 mm incl. connectors)
- needs 8 pin ethernet cable to ROV to start and stop recording

Data is recorded on two 1 GB AJA Pak SSD cards which need to be removed from the AJA Ki Pro Quad recorders after detaching the forward portion of the pressure housing at the end of each dive. The files then need to be copied onto an external storage unit.

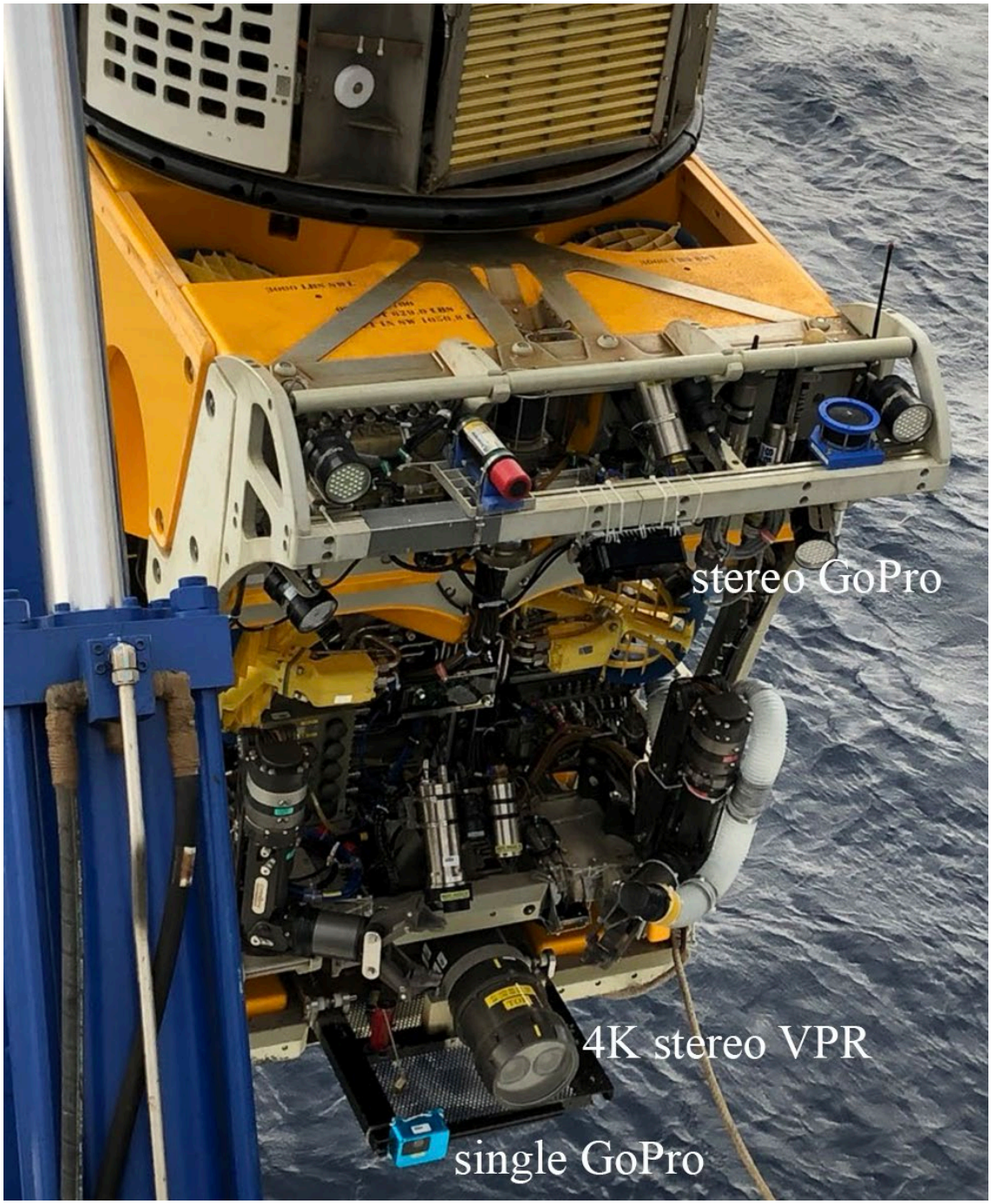



Schematic circuit diagram of 4K Stereo VPR

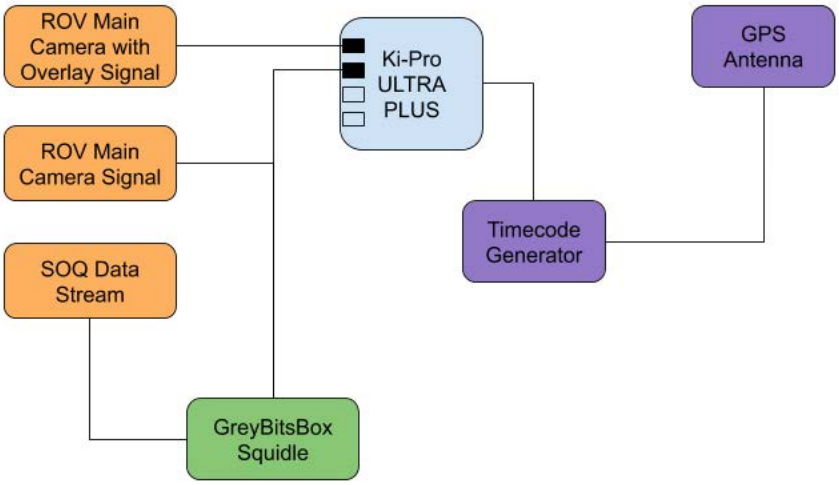



Schematic of frame built to hold Imaging Payload

Equipment Setup



# Data Management




ROV Main HD Camera (SDI) was recorded on Channel 1 of the Ki-Pro QUAD recorder. ROV Main HD Camera with Overlay (SDI) was recorded on Channel 2 of the Ki-Pro QUAD recorder. The data was recorded on Ki-Pro SDD Cards which were copied after each dive to an external data storage. Linear TimeCode (LTC) was supplied to all video recording equipment via LTC In by a timecode generator (HD-488E/GPS/NTP, ESE) that extracted time from the GPS satellite feed via a GPS antenna (GPA-019, Furuno) and supplied it as Coordinated Universal Time (UTC) timecode.

## Real-time Annotations

The GreyBitsBox system running the Squidle live annotation software was setup for performing real-time annotations of the ROV Main Camera. The ROV Main HD Camera (SDI) was connected to the video card of the GreyBitsBox and the card data source was configured.

To assign the vehicle latitude and longitude and depth for every annotation, the SOQ live data stream was fed into the GreyBitsBox. A python script at first converts the SOQ data stream into a format which the Squidle Framegrabber was configured to parse.

# Offline Data Munching

## ROV CSV Navi Data

The depth, altitude and orientation of the ROV during the dive is logged in a CSV file which is available at the end of each dive.

UTC 日時, (example: 2020/12/23 04:33:00)

日時 (+09:00), (example: 2020/12/23 13:33:00)

時刻(ROV 【入力】),

ROV 深度 [m](ROV 【入力】),

ROV ヘディング [deg](ROV 【入力】),

ROV ロール [deg](ROV 【入力】),

ROV ピッチ [deg](ROV 【入力】),

ROV 海底高度 [m](ROV 【入力】),

ねじれ(Umbilical) [turn](ROV 【入力】),

TMS 深度 [m](ROV 【入力】),

ねじれ(Tether) [turn](ROV 【入力】),

ROV データ(ROV 【入力】)

## ROV CNV-CTD Data

The CTD data from the ROV is logged in a file which is available at the end of each dive. The data is recorded in a .CNV file which is generated by the ROV team from a .hex file recorded by the Sea-Bird SBE 49.

# name 0 = timeJ: Julian Days (example: 358.190313)

# name 1 = depSM: Depth [salt water, m], lat = 34.90

# name 2 = prdM: Pressure, Strain Gauge [db]

# name 3 = t4990C: Temperature [ITS-90, deg C]

# name 4 = c0S/m: Conductivity [S/m]

# name 5 = sal00: Salinity, Practical [PSU]

# name 6 = svDM: Sound Velocity [Delgrosso, m/s]

# name 7 = sigma-t00: Density [sigma-t, kg/m^3 ]

# name 8 = flag:  0.000e+00

## SOQ Data

The position SOQ data is available in real-time along with a file at the end of each day. Each string of SOQ received data is as follows:

SOQ:20201223000013DGP1400.2025.3-0.2322.2V00000.000_00.0000N 000_00.0000E 00_00.0000N 000_00.0000E 00_00.0000N 000_00.0000E 00_00.0000N 000_00.0000E 00_00.0000N 000_00.0000E 00_00.0000N 000_00.0000E V00_00.0000N 000_00.0000E VDD_MM.MMMMN DDD_MM.MMMME V00_00.0000N 000_00.0000E V00_00.0000N 000_00.0000E V00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E IDD_MM.MMMMN DDD_MM.MMMME I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E I00_00.0000N 000_00.0000E 000.7,W8400000.0 00000.0 00000.0 00000.0 XXXXX.X 00000.0 00000.0 00000.0 00000.0 00000.0 00000.0 00000.0 00000.0 00000.0M

The data extracted from SOQ:
SOQ date and time bytes 4:18
ROV latitude bytes 382:393
ROV longitude bytes 394:406
ROV depth bytes 718:725

## NPD ROV Position file

The NPD file has additional vehicle navigation information such as position and velocities

Speed Made Good (SMG),Time,End Of Line (EOL),Position: Vessel Ref (Priority 1):

East,North,Lat,Long,Gyro: NMEA1 Gyro,Position: Filtered vessel position: East,North,Lat,Long,Events,Heave correction,Position: ROV Comb Kalman: East,North,Lat,Long,Gyro: CDL Tokimec2 Gyro,Motion: CDL Tokimec2 RP R, P, H,Wx,Wy,Wxy,Bx,By,Bxy,Alt1,Alt2,Alt3,Alt4,Corr1,Corr2,Corr3,Corr4,Int1,Int2,Int3,Int4,Temp,Depth,Position: ROV: East,North,Lat,Long,Position: ROV Comb: East,North,Lat,Long,Position: Digiquartz: dept: East,North,Lat,Long,Position: Digiquartz: pressure: East,North,Lat,Long,Data: Digiquartz Depth {Digiquartz: dept},Data: Digiquartz Depth {Digiquartz: pressure},

The data extracted from NPD file:

- Position: Filtered vessel position: East,North,Lat,Long - filtered position of the ship
- Position: ROV Comb Kalman: East,North,Lat,Long- Kalman filtered position of the ROV. The position error spirals exponentially after the DVL loses bottom lock generating bad ground velocity readings.
- Position: ROV: East,North,Lat,Long - same as SOQ position
- Position: ROV Comb: East,North,Lat,Long - same as SOQ position
- Digiquartz Depth {Digiquartz: dept} - ROV depth

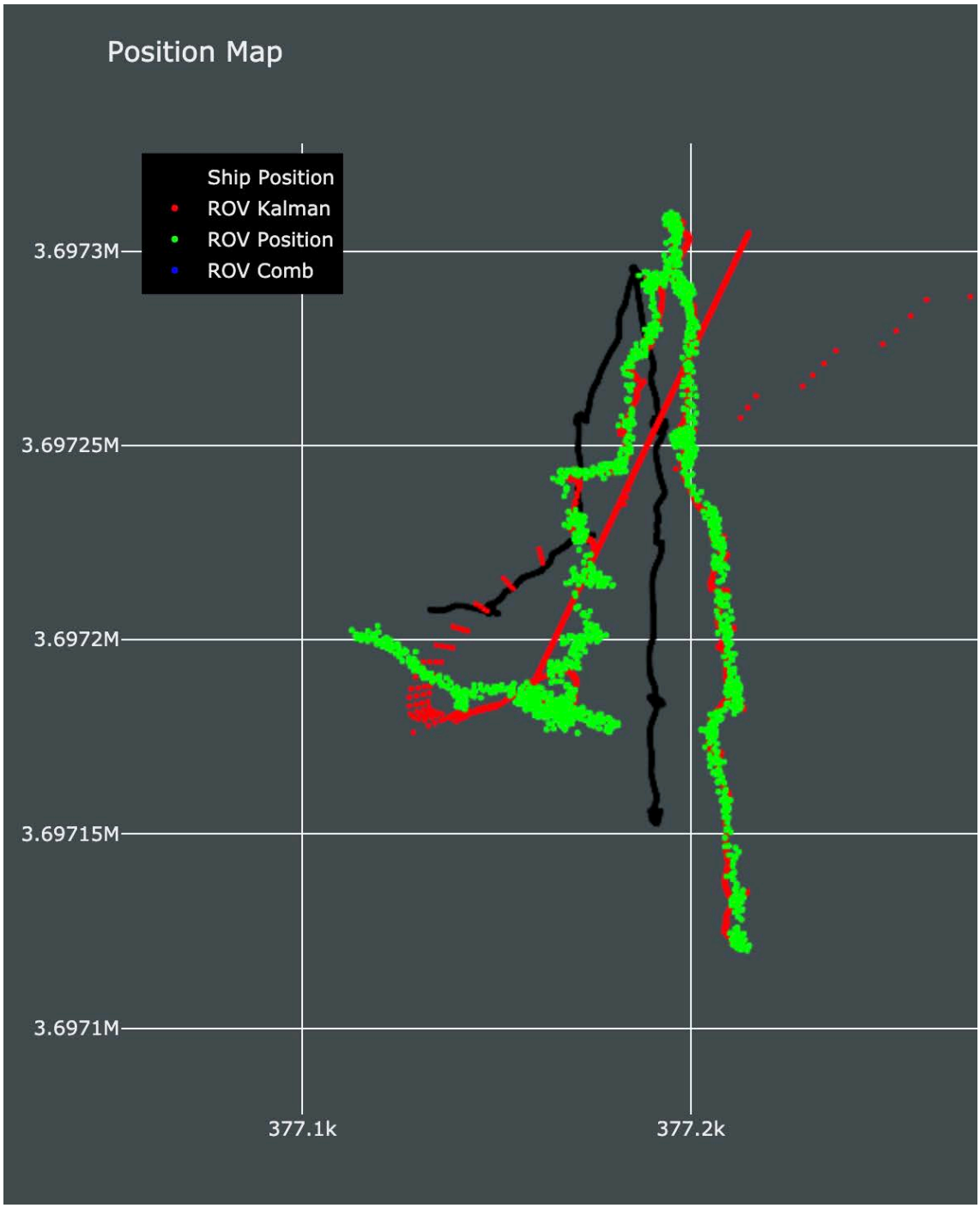



Fig: NPD file for Dive. KMROV143. The axis units are in meters from a preset latitude and longitude. Position: ROV and Position: ROV Comb are identical to SOQ data. Kalman filtered output tracks the SOQ for the duration when DVL has bottom lock after which the error increases exponentially.

Since the Kalman filtered ROV position is not available for the entire duration of the dive, especially in the mid-waters, the SOQ position is used in the final GBB-CSV file. A new filter should be implemented which switches between ground and water column velocity measurements after the DVL loses bottom lock.

## Combined GBB-CSV File

The program to combine the different data sources to generate a GBB-CSV file used by Squidle
is written as a Jupyter Notebook:
**Legacy_Jupyter_Notebook_KaimeiROV_to_GBBCSV**

The CSV Navi file depth data has been rounded off to the nearest decimal point. The SOQ depth data is rounded to the first decimal point. The CNV-CTD depth data has the most precision and is used as the main data source for the GBB file. The time stamp for GBB file entries is taken as the time CSV-CTD data for ease of comparison with ROV main camera with Overlay.

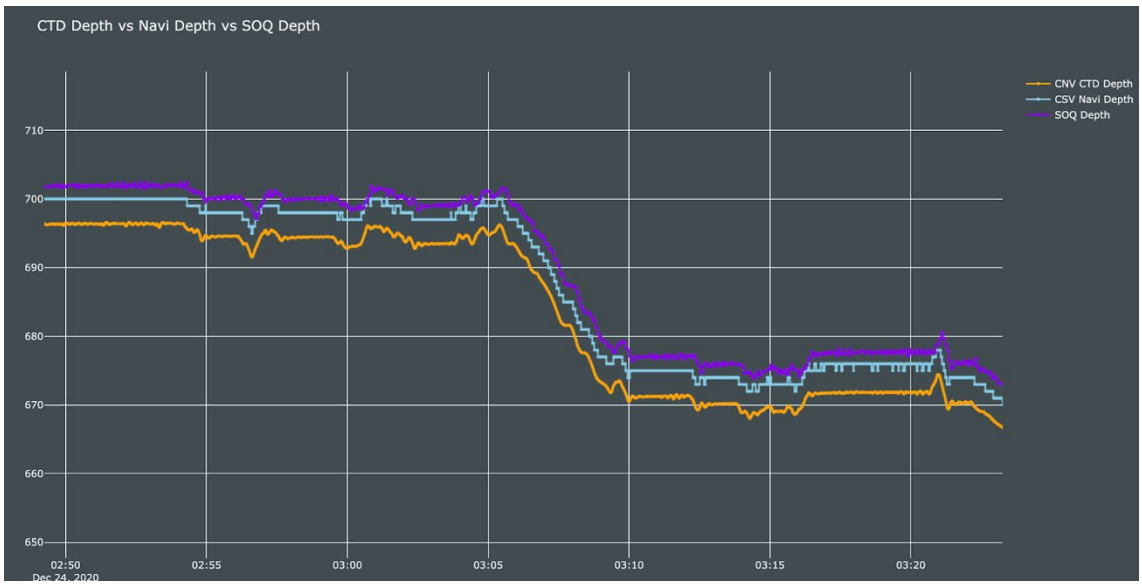


Fig: Small portion of Depth data from different sources taken from dive KMROV143 for comparison

The different sources which are used to generate the file are as follows.
datetime, - CSV Navi file format: YYYY-MM-DDTHH:MM:SS.SSSSSS+00:00
datetime_utc, - CSV Navi file format: YYYYMMDDHHMMSS.SSSZ
datetime_local, - CSV Navi file format: YYYYMMDDHHMMSS.SSSL
lat, - SOQ file
lon, - SOQ file
dep, - CNV CTD file
alt, - CSV Navi file
roll, - CSV Navi file
pitch, - CSV Navi file
heading, - CSV Navi file
temperature_degC, - CNV CTD file
salinity, - CNV CTD file
density_SigmaT, - CNV CTD file
depth_ROVNavi, - CSV Navi file
depth_SOQ, - SOQ file
conductivity_ROVCTD - CNV CTD file

## 4.2 Marine pollution baseline study and environmental impact assessment

### 4.2.1 CTD water sampling (MWJ)

(1) Personnel

| | | |
|---|---|---|
| Dhugal Lindsay | (JAMSTEC) | |
| Yasuo Furushima | (JAMSTEC) | |
| Tomoko Takahashi | (JAMSTEC) | |
| Shungo Oshitani | (MWJ) | *Operation leader |
| Ko Morita | (MWJ) | |
| Tun Htet Aung | (MWJ) | |

(2) Objective

Investigation of oceanic structure and water sampling

(3) Parameters

Temperature (Primary and Secondary)
Salinity (Primary and Secondary)
Pressure
Dissolved Oxygen
Fluorescence
Beam Transmission
Turbidity
Photosynthetically Active Radiation (PAR)
Altimeter

(4) Instruments and Methods

CTD/Carousel Water Sampling System, which is a 36-position Carousel Water Sampler (CWS) with Sea-Bird Electronics, Inc. CTD (SBE9plus), was used during this cruise. 12-liter sample bottles were used for sampling seawater. The sensors attached on the CTD were to measure temperature (primary and secondary), conductivity (primary and secondary), pressure, dissolved oxygen, fluorescence, beam transmission, turbidity, and photosynthetically active radiation. Salinity was calculated by measured values of pressure, conductivity and temperature. The CTD/CWS was deployed from starboard on working deck. Visual plankton recorder (VPR) was attached to CTD frame in all of the casts.

Specifications of the sensors used are listed below.
CTD: SBE911plus CTD system
Under water unit:
SBE9plus (S/N: 09P84583-1235, Sea-Bird Electronics, Inc.)
Pressure sensor: Digiquartz pressure sensor (S/N: 134402)
Calibrated Date: 04 Mar. 2020

Carousel water sampler:

SBE32 (S/N: 324510-1086, Sea-Bird Electronics, Inc.)

Temperature sensors:
Primary: SBE03Plus (S/N: 03P2730, Sea-Bird Electronics, Inc.)
Calibrated Date: 28-Dec-2019

Secondary: SBE03Plus (S/N: 034818, Sea-Bird Electronics, Inc.)
Calibrated Date: 27-Dec-2019

Conductivity sensors:
Primary: SBE04C (S/N: 044450, Sea-Bird Electronics, Inc.)
Calibrated Date: 10-Jan-2020

Secondary: SBE04C (S/N: 041172, Sea-Bird Electronics, Inc.)
Calibrated Date: 10-Jan-2020

Dissolved Oxygen sensors:
Primary: RINKOIII (S/N: 0221, JFE Advantech Co., Ltd.)

SBE43(S/N: 430205, Sea-Bird Electronics, Inc.)
Calibrated Date: 13-Dec-2019

Fluorescence sensor:
Chlorophyll Fluorometer (S/N: 3701, Seapoint Sensors, Inc.)
Gain setting: 30X, 0-5 ug/l
Offset: 0.000

Transmission meter:
C-Star (S/N CST-1727DR, WET Labs, Inc.)
Calibrated Date: 03 Jun. 2015

Turbidity:
Turbidity Meter (S/N: 14954)
Gain setting: 100X
Scale factor: 1.000
Calibrated Date: None

Photosynthetically Active Radiation (PAR) sensor
PAR-Log ICSW (S/N: 1026, Satlantic, Inc.)
Calibrated Date: 6-Jul-2015

Altimeter:
Benthos PSA-916T (S/N: 52396, Teledyne Benthos, Inc.)

Submersible Pumps:

Primary: SBE5T (S/N: 058145, Sea-Bird Electronics, Inc.)

Secondary: SBE5T (S/N: 058088, Sea-Bird Electronics, Inc.)

Bottom contact switch: (Sea-Bird Electronics, Inc.)

Deck unit: SBE11plus (S/N 90876-1033, Sea-Bird Electronics, Inc.)

The CTD raw data were acquired in real time using the Seasave (ver.7.26.7.121) provided by Sea-Bird Electronics, Inc. and stored on the hard disk of the personal computer.

The bottle was fired after waiting from the stop for more than 30 seconds. 6 casts of CTD measurements were conducted (Table 1).

Data processing procedures and used utilities of SBE Data Processing-Win32 (ver.7.26.7.114) and SEASOFT were as follows:

(The process in order)

DATCNV: Converted the binary raw data to engineering unit data. DATCNV also extracts bottle information where scans were marked with the bottle confirm bit during acquisition. The duration was set to 3 seconds, and the offset was set to 0.0 seconds.

RINKOCOR (original module): Corrected the time dependent, pressure induced effect (hysteresis) of the RINKOIII profile data.

RINKOCORROS (original module): Corrected the time dependent, pressure induced effect (hysteresis) of the RINKOIII bottle information data by using the hysteresis corrected profile data.

BOTTLESUM: Created a summary of the bottle data. The data were averaged over 3 seconds.

ALIGNCTD: Converted the time-sequence of sensor outputs into the pressure sequence to ensure that all calculations were made using measurements from the same parcel of water. Dissolved oxygen data are systematically delayed with respect to depth mainly because of the long time constant of the dissolved oxygen sensor and of an additional delay from the transit time of water in the pumped pluming line.

This delay was compensated by 6 seconds advancing dissolved oxygen sensor (SBE43) output (dissolved oxygen voltage) relative to the temperature data. RINKOIII voltage (User polynomial 0) was advanced 1 second.

WILDEDIT: Marked extreme outliers in the data files. The first pass of WILDEDIT obtained the accurate estimate of the true standard deviation of the data. The data were read in blocks of 1000 scans. Data greater than 10 standard deviations were flagged. The second pass computed a standard deviation over the same 1000 scans excluding the flagged values. Values greater than 20 standard deviations were marked bad. This process was applied to pressure, depth, temperature (primary and secondary) and conductivity (primary and secondary) dissolved oxygen voltage (SBE43).

CELLTM: Removed conductivity cell thermal mass effects from the measured conductivity. Typical values used were thermal anomaly amplitude alpha = 0.03 and the time constant 1/beta = 7.0.

FILTER: Performed a low pass filter on pressure and depth data with a time constant of 0.15 second. In order to produce zero phase lag (no time shift) the filter runs forward first then backward.

WFILTER: Performed a median filter to remove spikes in the fluorescence data, transmission data, transmission beam attenuation, transmission voltage and turbidity. A median value was determined by 49 scans of the window.

SECTIONU (original module of SECTION): Selected a time span of data based on scan number in order to reduce a file size. The minimum number was set to be the starting time when the CTD package was beneath the sea-surface after activation of the pump. The maximum number was set to be the end time when the package came up from the surface.

LOOPEDIT: Marked scans where the CTD was moving less than the minimum velocity of 0.0 m/s (traveling backwards due to ship roll).

DESPIKE (original module): Removed spikes of the data. A median and mean absolute deviation was calculated in 1-dbar pressure bins for both down and up cast, excluding the flagged values. Values greater than 4 mean absolute deviations from the median were marked bad for each bin. This process was performed twice for temperature, conductivity and dissolved oxygen (RINKOIII and SBE43) voltages.

DERIVE: Computed dissolved oxygen data (SBE43).

BINAVG: Averaged the data into 1 decibar bins and 1 second bins.

BOTTOMCUT (original module): Deleted discontinuous scan bottom data, when it's created by BINAVG.

DERIVE: Computed salinity, potential temperature, and density (sigma-theta).

SPLIT: Separated the data from the input .cnv file into down cast and up cast files.

(5) Station list

During this cruise, 6 casts of CTD observation were carried out. Date, time and locations of the CTD casts are listed in Table 1.

(6) Preliminary Results

During this cruise, we judged noise or shift in the data of some casts. These were as follows:

002M001: Secondary Salinity
d:237-278db: shift in data

003M002: PAR sensor
d:302-303db: noise in data

During 003M002 cast, modulo error occurred at 260db and MEC increased to 17 counts between 260db and 616db. CTD was stopped at 616db and recovered without water sampling. Total modulo error count after cast was 91.

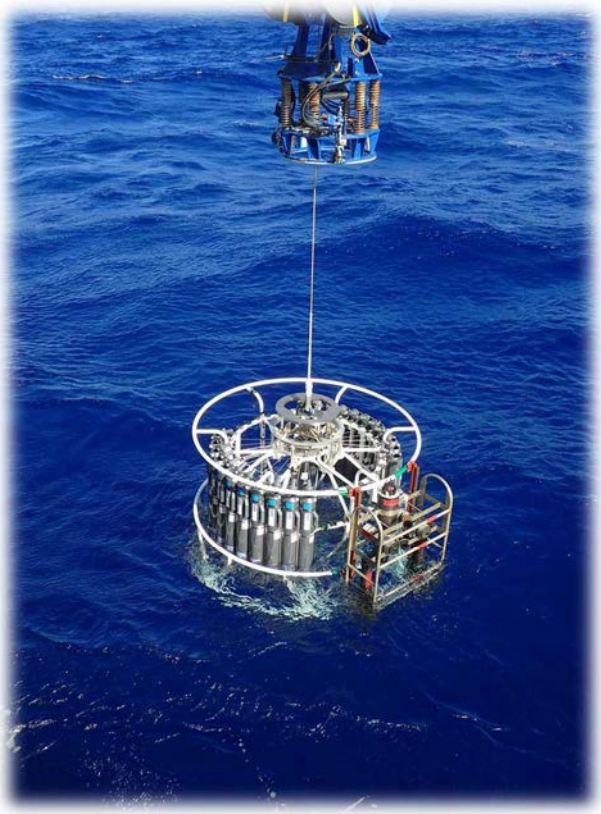
(7) Data archive

These data obtained in this cruise will be submitted to the Data Management Group of JAMSTEC, and will be opened to the public via "Data Research System for Whole Cruise Information in JAMSTEC (DARWIN)" in JAMSTEC web site.

<http://www.godac.jamstec.go.jp/darwin/e>

Table 1: KM20-11 CTD cast table

| Stnnbr | Castno | Date(UTC) | Time(UTC) | | BottomPosition | | Depth | Wire | HT Above | Max | Max | CTD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (mmddyy) | Start | End | Latitude | Longitude | (m) | Out (m) | Bottom (m) | Depth | Pressure | Filename |
| 001 | 1 | 121520 | 01:03 | 02:23 | 27-00.28N | 140-33.71E | 3025.5 | 1008.8 | - | 1000.9 | 1010.0 | 001M001 |
| 002 | 1 | 121920 | 23:21 | 01:01 | 31-30.86N | 140-08.52E | 960.5 | 967.2 | 5.4 | 959.1 | 968.0 | 002M001 |
| 002 | 2 | 122020 | 04:55 | 06:30 | 31-28.14N | 140-04.80E | 915.3 | 919.0 | 11.0 | 912.6 | 921.0 | 002M002 |
| 002 | 3 | 122020 | 23:27 | 00:08 | 31-30.93N | 140-08.40E | 961.4 | 954.6 | 10.0 | 945.2 | 954.0 | 002M003 |
| 003 | 1 | 122220 | 22:10 | 22:57 | 32-26.42N | 139-54.51E | 737.9 | 718.6 | 10.0 | 714.7 | 721.0 | 003M001 |
| 003 | 2 | 122320 | 02:40 | 03:11 | 32-26.46N | 139-57.48E | 778.6 | 613.0 | - | 610.8 | 616.0 | 003M002 |



### 4.2.2 Neuston net sampling for surface microplastic analysis

**Masashi Tsuchiya (onboard), JAMSTEC**
**Ryota Nakajima, Tomo Kitahashi (not onboard), JAMSTEC**

The distribution of microplastic in the open ocean of the western Pacific is largely undocumented. Substantial numbers of studies on floating microplastics have been reported in the Eastern Pacific and Atlantic Ocean, yet very few data are available in the Western Pacific. In the present study, we conducted microplastic surveys at south off Honshu, along Izu-Ogasawara Is. to fill gaps in the Western Pacific.

From December 12th to December 25th 2020, a total of 6 surface net tows were carried out. Floating microplastic samples were collected using a neuston net with a rectangular mouth opening of 75 cm height and 100 cm width, equipped a 333 μm mesh opening net with a collecting bottle at the cod-end. The net without cod-end was rinsed from the outside with seawater prior to use. At each station, the net was towed four times, three for microplastic counting and one for RamaCam observation, at ca. 1 knot for 20 min from the starboard side. A flow meter was installed at the net mouth to estimate the volume of water filtered during each tow. The collected samples were fixed with 3-5% formalin and stored at room temperature until analysis excluding a sample for RamaCam observation.

### 4.2.3 Floating macro-debris observation

Macro-debris floating on the surface water were recorded using a digital camera (GoPro) from the starboard side of the vessel throughout the cruise. The GoPro was installed to a handrail of the ship at 7.7 m height from the sea surface with a camera angle of ca. 60 degree. The GoPro was connected to the electricity of the ship allowing a continuous recording. The video was taken during daytime for 7-9 hours at each site.

### 4.2.4 H-type push core sampling - Microplastic and meiofaunal analysis

**Masashi Tsuchiya (onboard), JAMSTEC**
**Tomo Kitahashi (not onboard), JAMSTEC**

Sediment samples were collected by the H-type push corer (covering 52.8 $cm^2$ seafloor surface area) at Myojin Knoll. We used two types of the core, polycarbonate and aluminum-made core tubes. Aluminum-made tubes were used for microplastic analysis to prevent plastic contamination. Three sediment cores collected with aluminum-made core tube were used for microplastic analysis, and one sediment core collected with polycarbonate core tubes were used for meiofaunal analysis at the station. On board, sediment samples were sliced every 1 cm down to 10 cm or 20 cm below surface for microplastic analysis. For meiofauna analysis, on board, sediment samples were sliced into 6 layers (0–0.5, 0.5–1, 1–2, 2–3, 3–4, 4–5 cm) and fixed with formalin.

Sediment samples will be treated according to the procedure described by Nakajima et al. (2019) and extracted microplastics will be counted under a fluorescence microscope of FTIR microscopy. Sediment samples will be treated according to the procedure described by Danovaro (2010) and meiofauna specimens will be counted and identified under a binocular stereoscopic microscope.

4.2.5 RamaCam observation

**Tomoko Takahashi, Dhugal Lindsay (onboard), JAMSTEC**
**Zonghua Liu (not onboard), The University of Tokyo**
**Thanga Thevar, Nick Burns, John Watson (not onboard), University of Aberdeen**
**Blair Thornton (not onboard), University of Southampton**

*Introduction*

Suspended particles and organisms in the ocean are important for understanding ocean nutrient cycles [1]. Microplastics, which cause serious pollution on a global scale [2], behave similar as the organic particles and transported to all parts of the oceans, and have become a threat to marine ecosystems. Deep-sea minerals are the focus of much attention recently, while impacts of deep-sea mining on ecosystems needs to be assessed thoroughly, particularly those of scattering mineral particles which contain hazardous materials such as arsenic and mercury. However, very little is known about suspended and sinking particles particularly in the deep ocean due to their extremely low abundance, and currently with most knowledge based on pointwise measurements from sediment traps with accumulated information over long time periods.

The aim of the whole project is development of "RamaCam", an in-situ marine sensor for identification of particles. RamaCam can analyse a particle trapped in a 20 cm water channel by holography and Raman spectroscopy simultaneously/successively. By complementary combining morphological information from holography and chemical composition from Raman spectroscopy, accurate particle identification and classification is possible. During this cruise, we performed a pre survey of possible sites for RamaCam deployment by collecting various kinds of particles using the surface water sampling system, CTD water samplers, neuston net, and KM-ROV. Collected particles were measured using the onboard RamaCam system, and the data will be used for supervised machine learning for classification of particles.

*Particle sampling from CTD water samples*

From 13th to 24th of December, the surface water was continuously pumped in the surface water analysis room and particles were filtered using a 300 μm mesh stainless sieve. The particles were collected every 2 days.

*Continuous surface water sampling*

CTD water sampling was performed at the following locations:

2020.12.15: 27 00.48 N, 140 33.75 E (Nishinoshima)

Sampling depth: 1000 m, 78 m (Fluorescence peak) , 69 m (pycnocline), 28 m (pycnocline)

2020.12.20 AM: 31 30.91 N, 140 08.64 E (Outer Smith Caldera)

Sampling depth: 958 m, 425 m (pycnocline), 172 m (pycnocline), 64 m (Fluorescence peak)

PM: 31 28.14 N, 140 04.78 E (Inner Smith Caldera)

Sampling depth: 912 m, 269 m (pycnocline), 189 m (pycnocline), 67 m (Fluorescence peak)

2020.12.23 AM: 32 26.41 N, 139 54.50 E (Inner East Aogashima)

Sampling depth: 714 m, 462 m (pycnocline), 220 m (pycnocline), 84 m (Fluorescence peak)

*Neuston net sampling for surface microplastic analysis*

The detail of neuston net sampling is described in 4.2.2.

*Rock sampling by KM-ROV*

During the dive #138, chimney rocks were recovered. The seawater which contains particles around a chimney was recovered in a Niskin water sampler mounted on KM-ROV.

*Preliminary results*

Collected particles were measured using the onboard RamaCam system. Figure 1 shows an example of reconstructed holographic image and Raman spectrum of a collected organic matter. The left image in Figure 1 indicates a bright field microscopic image of the same sample. Holography tells silhouette with the resolution of 20 μm. While it is difficult to identify a particle type only from the holographic image, the Raman spectrum shows a broad fluorescence peak which stems from organic matters. Figure 2 shows a reconstructed holographic image of plankton (Doliolida). While the Raman spectrum was not able to be collected due to the size and limited amount of Raman-active structure, the structure is clearly seen in the holographic image and it is possible to identify the species only from the image. Therefore, holography and Raman spectroscopy work complementary and it can be expected that simultaneous/successive measurements of both holography and Raman will increase the accuracy of particle identification.

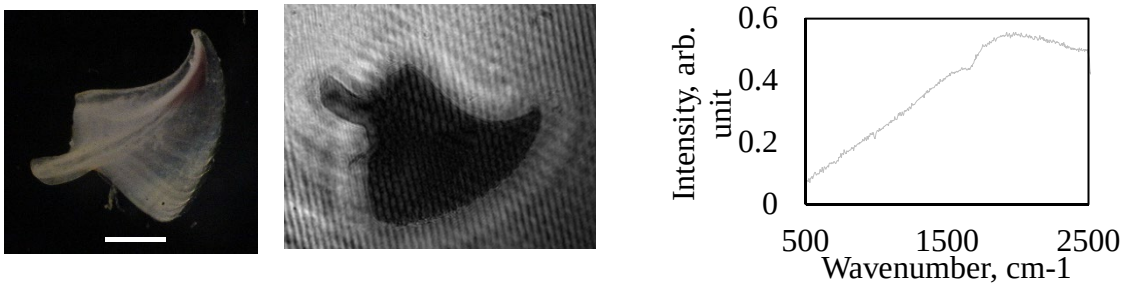



Figure 1 Example of RamaCam analysis data. (left) microscopic image, (middle) holographic image, (right) Raman spectrum. The sample was collected from the surface water. The scalebar indicate 1mm.

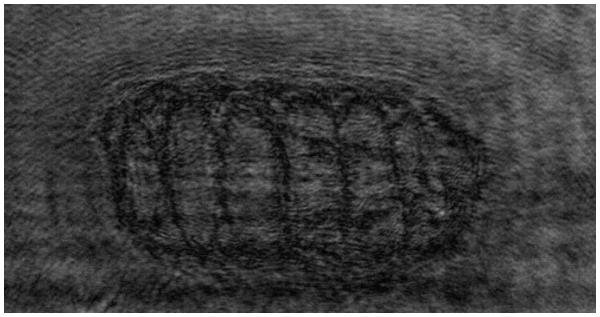


Figure 2 Holographic image of Doliolida collected during an ROV dive. The size of Doliolida is ~2mm.

*Summary and Future directions*

Various types of marine particles at different depths were collected during this cruise, and preliminary analysis was performed using the onboard RamaCam system on the ship. Holographic images and Raman spectrum taken for collected samples will be used for supervised machine learning algorithms for classification and identification of particle types. Based on the data of particle types and density collected during this cruise, parameters for an in-situ version of RamaCam, such as flow rate, shutter speed of the holographic camera, integration time of Raman measurements, will be decided. In future works, in-situ RamaCam system will be developed, which is suitable for different observation platforms, such as CTD water samplers, floats, remotely operated vehicles and autonomous underwater vehicles.

References:

[1] IOCCP, Essential Ocean Variable (EOV): Particulate Matter (2017).

[2] A. L. Andrady, Marine Poll. Bull. 62 (2011), 1596-1605.

### 4.2.6 Physiological impacts of microplastics on deep-sea megabenthic animals

**Tetsuro Ikuta (JAMSTEC)**

**Yuka Amari (JAMSTEC)**

The presence of microplastics in the marine environment has become an emerging threat to marine ecosystems. Due to their small size, microplastics may be ingested or uptaken by megabenthic or mega-planktonic animals. The animals living in the deep-sea will be no exception. However, the distribution of microplastics in deep-sea animals and the physiological effects of microplastics on them have been poorly understood. To address this issue, in this cruise, we collected some megabenthic animals. After the cruise, content of microplastics as well as the amount of persistent organic pollutants (POPs) will be analyzed. In addition, the uptaking mechanisms of microplastics and other fine particles including microbes into the animal bodies will be investigated.

### 4.2.7 Flow observation

**Yasuo Furushima (JAMSTEC)**

In order to evaluate the suspension and redeposition of suspended particles near the sea bottom, an Acoustic Doppler Velocimeter (ADV, Nortek AS) was installed on the seafloor to measure high-definition three-dimensional flow near the bottom. In addition, an Expendable Vertical Microstructure Profiler (VMP-X, Rockland Scientific International Inc. ) was used to measure turbulence flow from the surface layer just above the seafloor.

**ADV Observation**

In order to measure highly accurate 3D velocity near the seafloor, ADV was installed on the seafloor of Myojin Knoll (depth; 1351m) using KM-ROV.

The measurement period was during the dive survey by KM-ROV, and during that time, flow data was acquired at 1-second intervals (continuous mode).

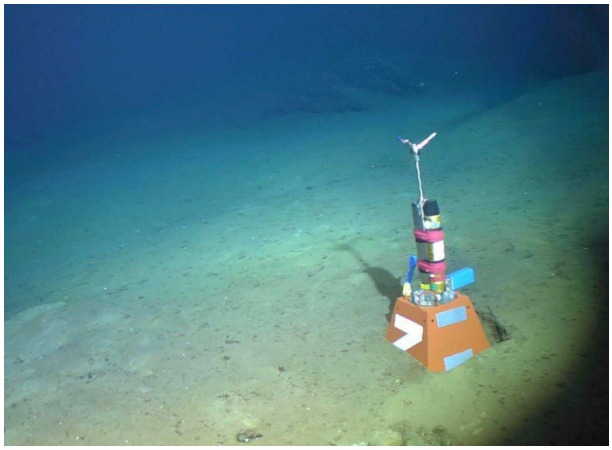


**Photo 1 ADV was installed on Myojin knoll.**

The results obtained here will be used for small-scale turbulence estimation and understanding of the flow environment just above the seafloor.

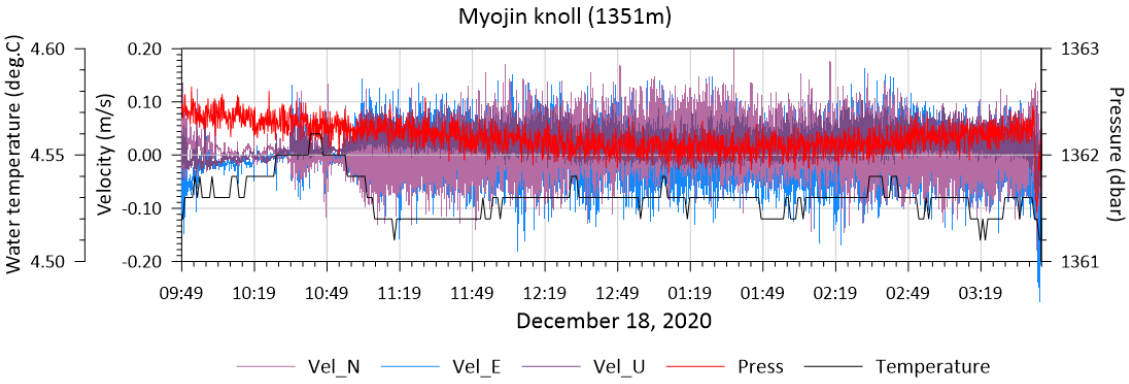



**Fig. 1 Horizontal and vertical velocity, pressure (Depth index) and water temperature fluctuations**

Figure 1 shows the fluctuations of horizontal velocity, vertical velocity, water depth, and water temperature just above the seafloor of the Myojin Knoll. It was suggested that the area near the seabed after the installation of ADV was in a quiet state. After that, it was also inferred that the fluctuation of the flow included noise.

**VMP-X survey**

Turbulence observation around the hydrothermal field (Higashi-Aogashima caldera) was carried out using the expandable vertical microstructure profiler (VMP-X) that can be used to measure turbulence from the sea surface to the bottom. Turbulence measurement was performed once with VMP-X inside and outside the Higashi-Aogashima caldera (depth 750 m).

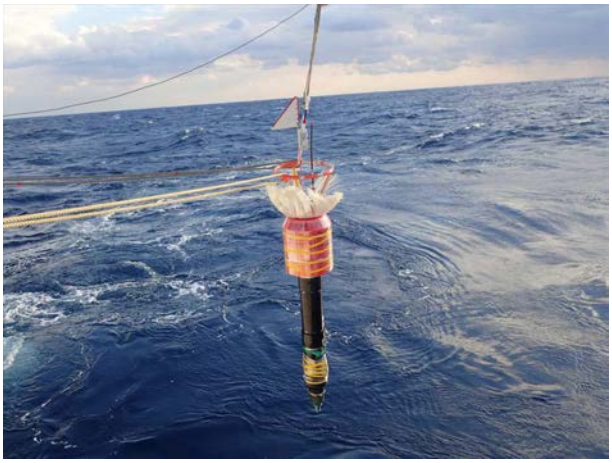


**Photo 2 Release of VMP-X in the R/V KAIMEI**

The vertical distributions of water temperature and turbulent flow intensity (turbulent energy dissipation rate; ε) inside and outside the caldera are shown in Figure 2 and 3, respectively.

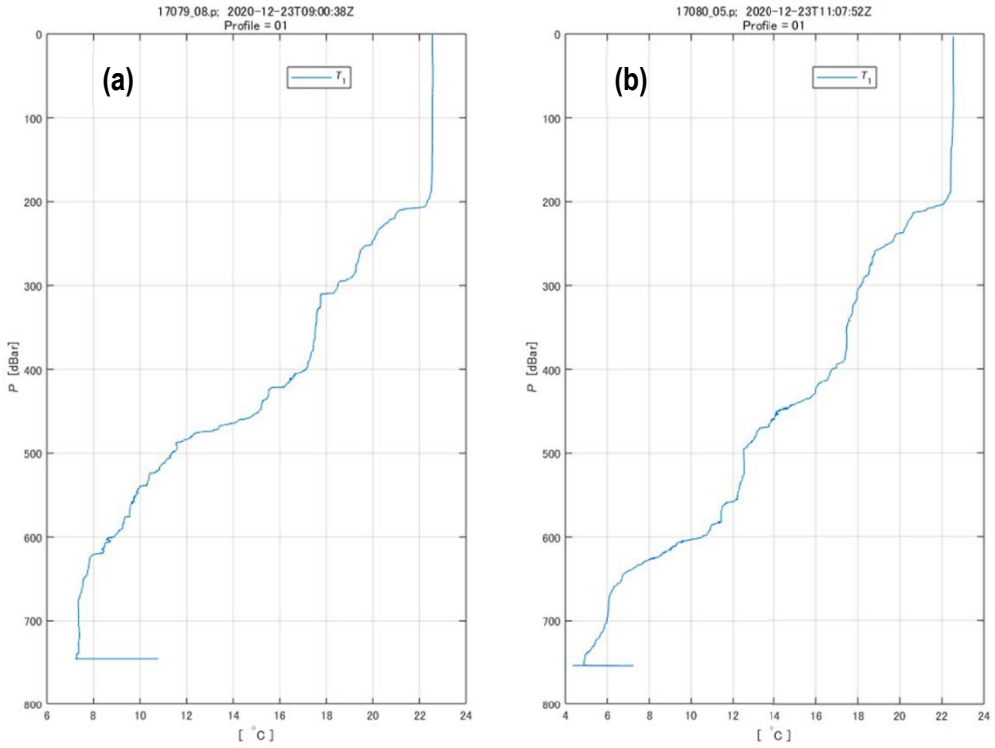



**Fig.2 Vertical distribution of water temperature at the observation points (a) inside and (b) outside the Higashi-Aogashima caldera.**

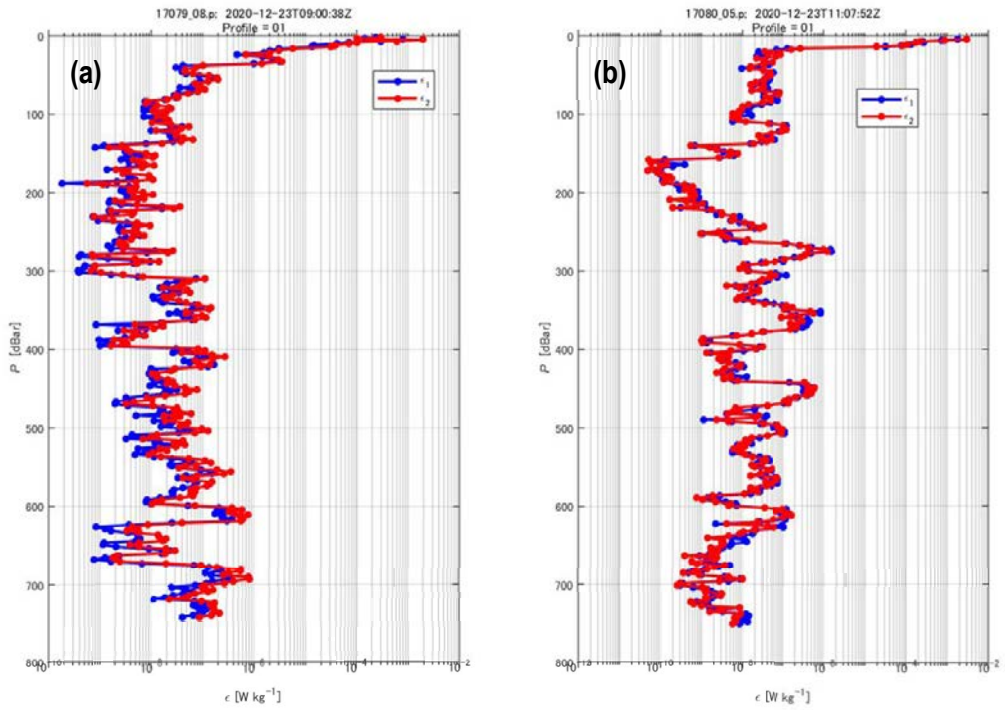


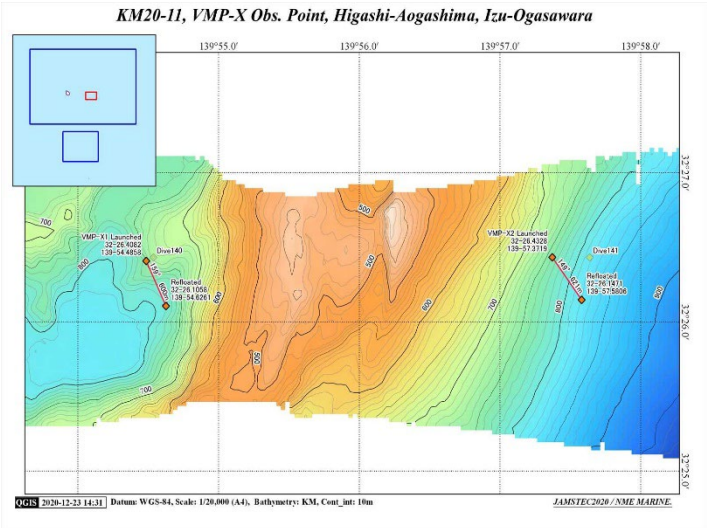

**Fig.3 Vertical distribution of turbulent flow intensity (turbulent energy dissipation rate; ε) at the observation points (a) inside and (b) outside the Higashi-Aogashima caldera.**

Higashi-Aogashima caldera rim exists near a depth of 500m. In addition, there is a hydrothermal vent inside the caldera. It was shown that the water temperature distribution inside the caldera (Fig. 2 (a)) was slightly higher than that outside (Fig. 2 (b)). This result suggests that the water temperature distribution in the caldera is affected by hydrothermal vents. Therefore, the turbulent flow intensity in the caldera may also be stronger (Fig. 3).

Detailed analysis will be carried out in the future.


Reference

VMP-X drop point and recovery point

### 4.2.8 Environmental impact assessment baseline

**Javier Montenegro, Gerlien Berte Verhaegen, Eri Ogura (JAMSTEC)**

In addition to material from the ROV-collected specimens being preserved for DNA barcoding, the following specimens were also collected and preserved. These samples will be sequenced to enable future eDNA-based environmental impact assessments.

Date: 17-12-20

Shallow plankton nets were deployed between 0-5m depth for 30min (10min bottom time) Off the South East ward of Tori Shima between 15:00h to 15:30h. Seven specimens were collected and preserved for further molecular analyses. Remarkably a siphonophore Bassia bassenesis was collected, and while it was not possible to identify the remaining samples to species level one snail in genus Clio and five Rhizarians were found. All samples were preserved for further molecular analyses.

Collected Material:

171220_1_1, Radiolarian, 0-5m.
171220_1_2, Clio sp., 0-5m.
171220_1_3, Bassia bassensis, 0-5m.
171220_1_4, Acantharia, 0-5m.
171220_1_5, Collodaria, 0-5m.
171220_1_6, Acantharia, 0-5m.
171220_1_7, Spumellaria, 0-5m.

Date: 19-12-20

A mesopelagic plankton-net was deployed between 0 to 200m depth for 45min (10min bottom time) between 13:55h to 14:41h. Seven specimens were collected and identified to species level. Six of the specimens were cnidarians in the orders Siphonophorae and Trachymedusae. Remarkably a parasitic hyperiid amphipod, Phronima sedentaria was collected.

Collected Material:

191220_1_1, Abylopsis tetragona, 0-200m.
191220_1_2, Agalma okeni, 0-200m.

191220_1_3, Rhopalonema velatum, 0-200m.
191220_1_5, Lensia subtilis, 0-200m.
191220_1_6, Eudoxoides mitra, 0-200m.
191220_1_8, Prayinae cf. Craseoa lathetica, 0-200m.
191220_1_4, Phronima sedentaria, 0-200m.

Notes: One individual of Velella velella (ID# 191220_1_7) was collected by a neuston-net tow on the same date.

## 4.3 Understanding of the activity and structure of Nishinoshima volcano

### 4.3.1 Recovery OBEMs / VTMs

**Noriko Tada (onboard), JAMSTEC**

**Kiyoshi Baba (onboard), ERI**

Nishinoshima volcano is an oceanic island arc volcano constituting Izu-Ogasawara (Bonin) island arc, which locates about 1,000 km south of Honshu island in Japan. The eruption since 2013 produced huge amount of andesite lava and formed a new island that connected to the original land.

Because the electrical conductivity is sensitive to temperature, melt and water contents, high electrical conductivity anomalies would be detected where magma exists beneath Nishinoshima. We have conducted a marine magnetotelluric (MT) survey since 2016 to reveal electrical conductivity structures beneath Nishinoshima. We installed ocean bottom electromagnetometers (OBEMs) and vector tsunami-meters (VTMs) around Nishinoshima, which are self-pop-up type seafloor instruments and can measure three components of magnetic fields, two components of electric fields and two components of tilt of the instruments itself. VTMs have a differential pressure gauge (DPG) or an absolute pressure gauge (APG) and can also measure pressure as well as the electromagnetic field and tilt.

We iterated deployment and recovery of the instruments by several cruises since 2016. In the previous cruise in 2019 ("Keifu-maru" KS19-05 cruise of JMA), we failed to recover two OBEMs (at sites NS15 and NS16) and settled new two OBEMs (at NS20 and NS22) and three VTMs (at NS18, NS19 and NS21). In this cruise, we planned to search and rescue OBEMs at NS15 and NS16 by KMROV and recover the others by self-pop-up. Just after we arrived at each site, we sent a signal to OBEM/VTM to confirm the existence of it. But, only two VTMs at NS19 and NS21 answered to the signal (Table 3.3.-1). We measured the locations of VTMs at NS19 and NS21 by using the SSBL system of "Kaimei" and found that they moved to about 3,500 m east and to about 2,700 m south from the original location, respectively (Figure 3.3.-1).

We tried to search and rescue OBEMs at NS15 and NS16 by using KMROV (dive numbers 136 and 137), but we could not find them (see the dive reports for details).

We recovered VTMs at NS19 and NS21 on 14th December 2020. Both VTMs recorded data until the end of September 2019. We will search any signal related to the movement of VTMs and will study electrical conductivity structures beneath Nishinoshima volcano.

For two OBEMs at NS20 and NS22 and one VTM at NS18, we did not send release commands and did not recover them.

Table 4.3.-1 Summary of locations of each OBEM and VTM

| Site ID | Location in KS19-05 | | | Location in KM20-11 | | |
|---|---|---|---|---|---|---|
| | Longitude | Latitude | Depth | Longitude | Latitude | Depth |
| NS15 | 140-59.6E | 27-16.1N | 2,021 m | NA | NA | NA |
| NS16 | 140-52.4E | 27-11.8N | 994 m | NA | NA | NA |
| NS18 | 140-51.6E | 27-23.1N | 2,462 m | NA | NA | NA |
| NS19 | 141-03.1E | 27-13.7N | 2,606 m | 141-05.2E | 27-13.3N | 2,880 m |
| NS20 | 140-58.3E | 27-11.1N | 1,906 m | NA | NA | NA |
| NS21 | 140-50.1E | 27-09.1N | 1,726 m | 140-49.7N | 27-07.7N | 1,972 m |
| NS22 | 140-45.2E | 27-10.1N | 1,876 m | NA | NA | NA |

* NA: we could not get any answer from transponder attached to OBEMs or VTMs.

4.3.2 Installation of MERMAID Floats

**Masayuki Obayashi (onboard), JAMSTEC**

**Junko Yoshimitsu (not onboard), JAMSTEC, Hiroko Sugioka (not onboard), Kobe University**

It is difficult to monitor seismic activities of Nishinoshima volcanic island in real time because even the closest seismic station in Chichijima is about 130 km southeast away from it. A MERMAID float which is a drifting buoy equipped with a hydrophone measuring water pressure change converted from seismic P-wave at seafloor enable to monitor seismic activities. The MERMAID float drifts passively at 1,500 – 2,000 m depth until an earthquake signal is detected. If this is identified as a strong P-wave, the buoy ascends at speed of 10 cm/s for transmission of the recorded waveform within time window of a hundred seconds before and after the P-wave arrival as well as its global positioning system (GPS) coordinates at the surface. After transmitting the data via satellite links, the buoy descends at speed of 5 cm/s to monitor earthquake signals at 1,500 – 2,000 m depth again.

To investigate seismic activities of Nishinosima nearby, we injected two MERMAID floats to the east (MMN1) and southwest (MMN2) of Nishinoshima on December 14th and 15th respectively (Table 3.3.-2) and started data acquisition through a satellite communication system. In the next 5 years, we will obtain seismic activity change data that can be related to volcanic events, connecting to prediction of volcanic eruptions. And we will compute seismic structures beneath

Nishinoshima using data from the MEMAID floats with other data such as ocean bottom seismometers deployed around the island to understand where the magma comes from.

Table 4.3.-2 MERMAID float launch points.

| Site ID | Longitude | Latitude | Depth |
|---|---|---|---|
| MMN1 (Same as NS19) | 141-05.2E | 27-13.3N | 2,880 m |
| MMN2 | 140-37.6E | 26-59.7N | 2,973 m |

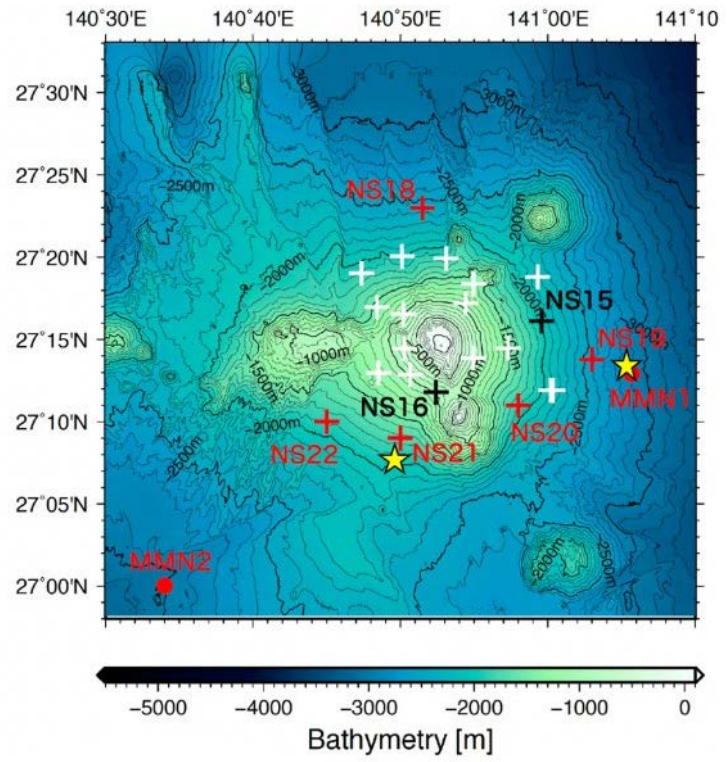



Figure 4.3.-1 Site locations of OBEMs and VTMs with bathymetry (provided by JCG) around Nishinoshima volcano. Red crosses and black crosses were the locations of OBEMs/VTMs calibrated in KS19-05. Stars were the locations of VTMs that we recalibrated in this cruise. We deployed two MERMAID floats at red dots. White crosses were the locations of OBEMs/VTM which we had already recovered.

## Notice on Using

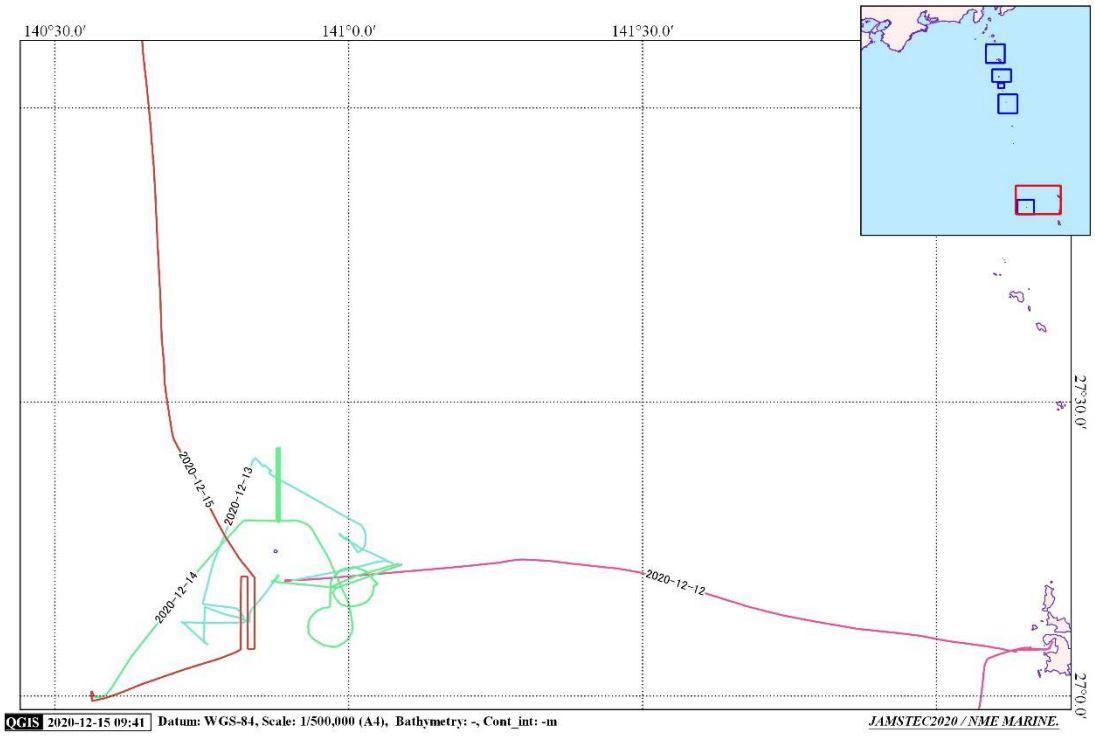
This cruise report is a preliminary documentation as of the end of cruise.
This report is not necessarily corrected even if there is any inaccurate description (i.e. taxonomic classifications). This report is subject to be revised without notice. Some data on this report may be raw or unprocessed. If 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

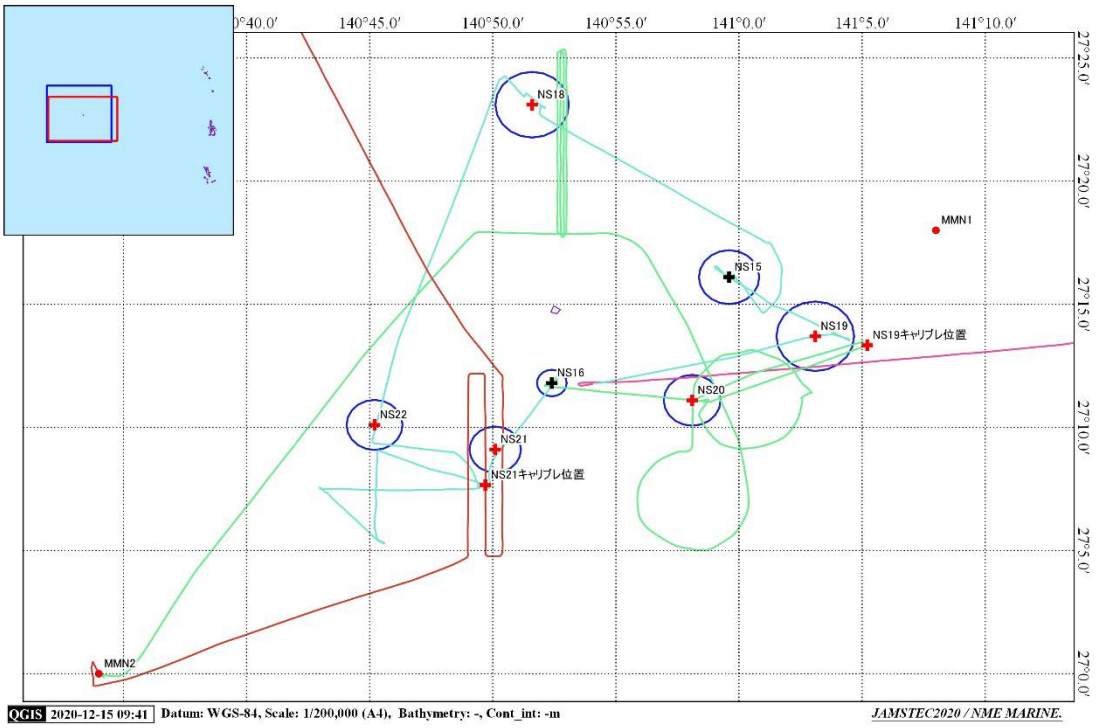
# Appendix

## I. Ship track (NME)

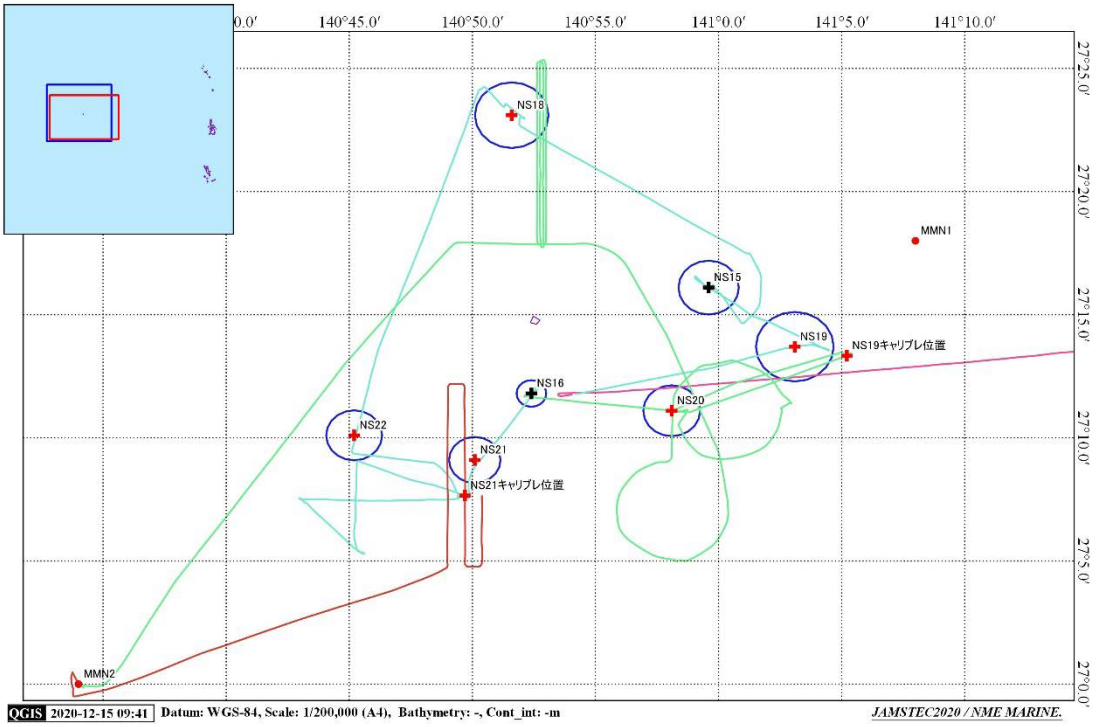
***KM20-11, R/V KAIMEI, Cruise Track, NISHINOSHIMA,Izu-Ogasawara***



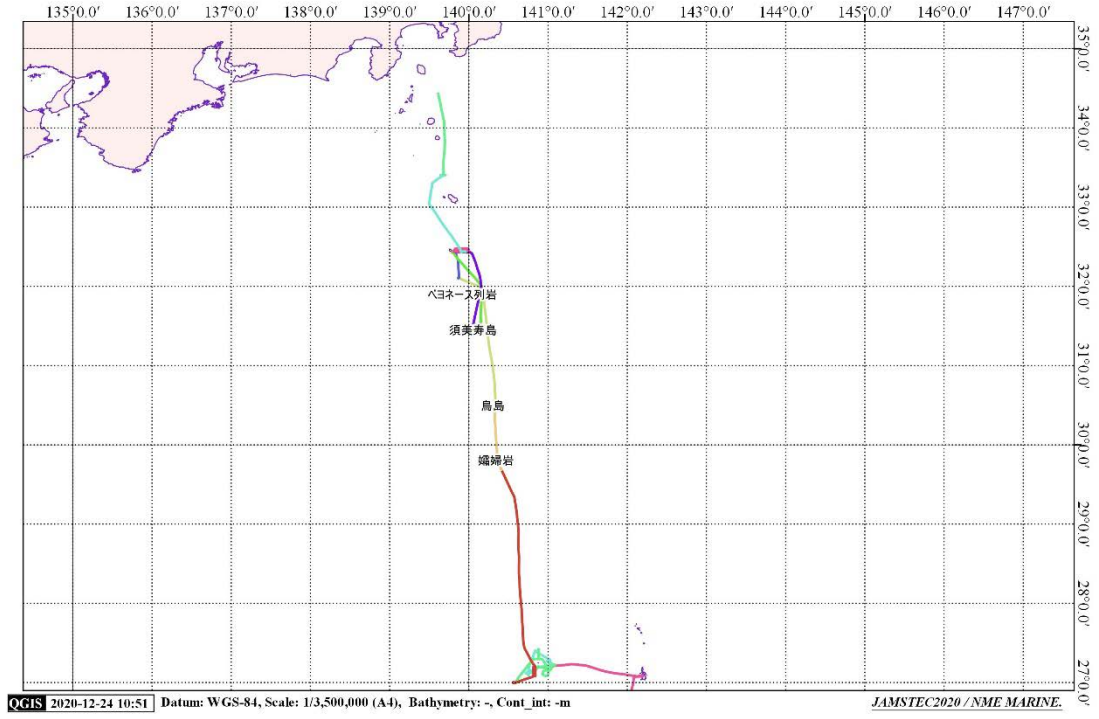

***KM20-11, R/V KAIMEI, Cruise Track, NISHINOSHIMA,Izu-Ogasawara***



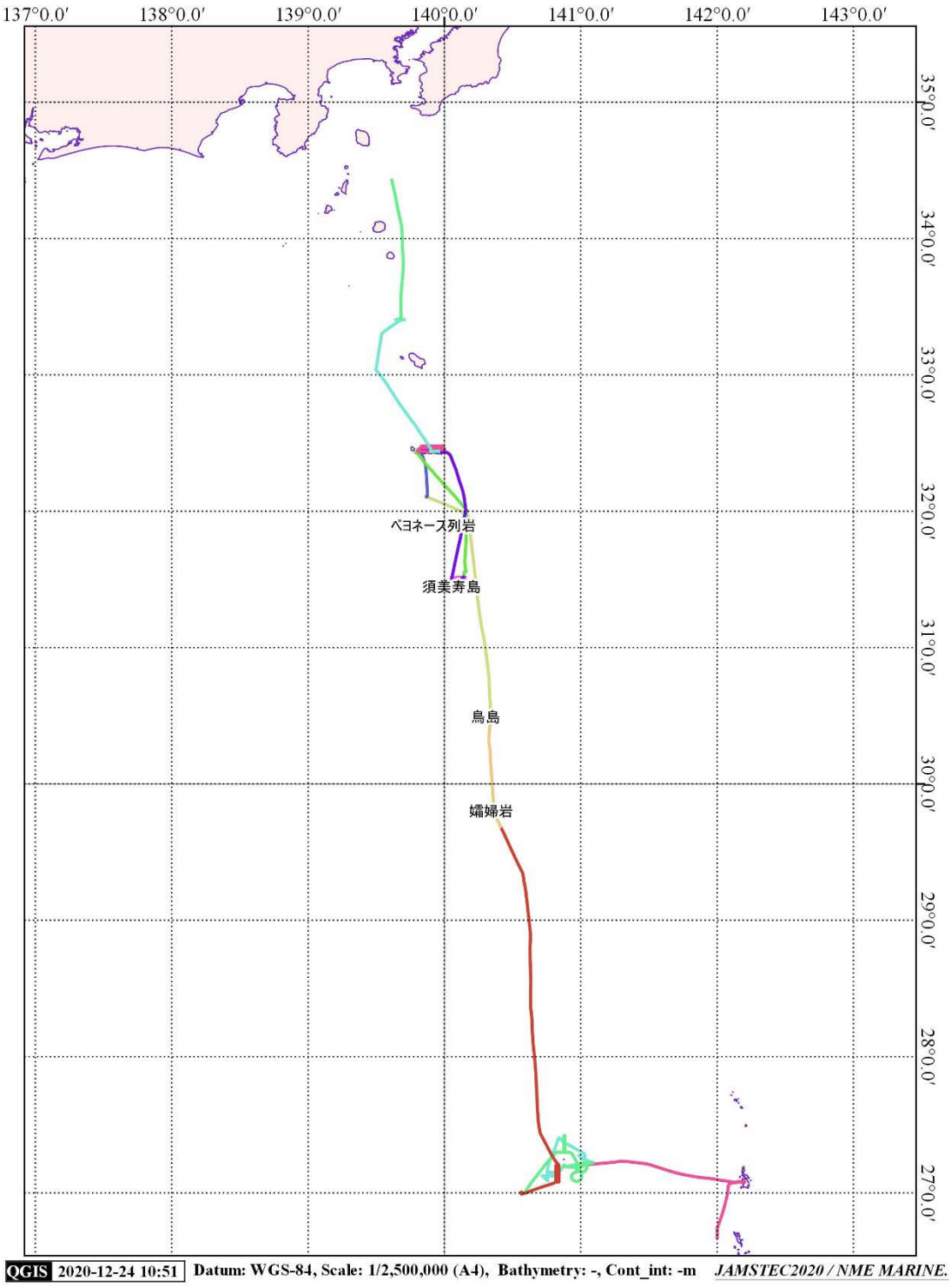
***KM20-11, R/V KAIMEI, Cruise Track, NISHINOSHIMA,Izu-Ogasawara***



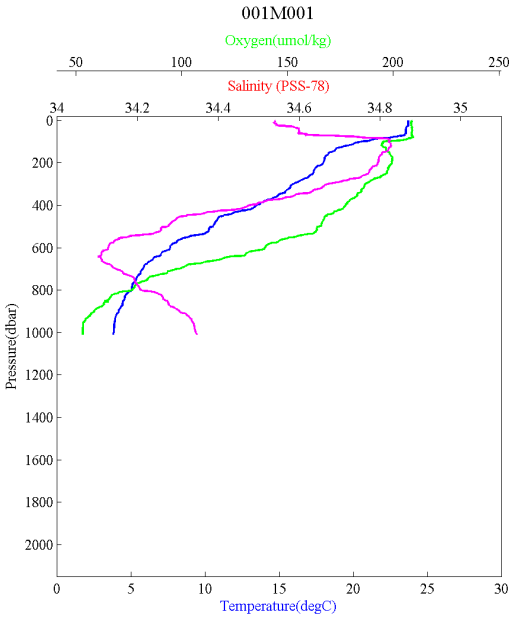

***KM20-11, R/V KAIMEI, Cruise Track, Izu-Ogasawara***

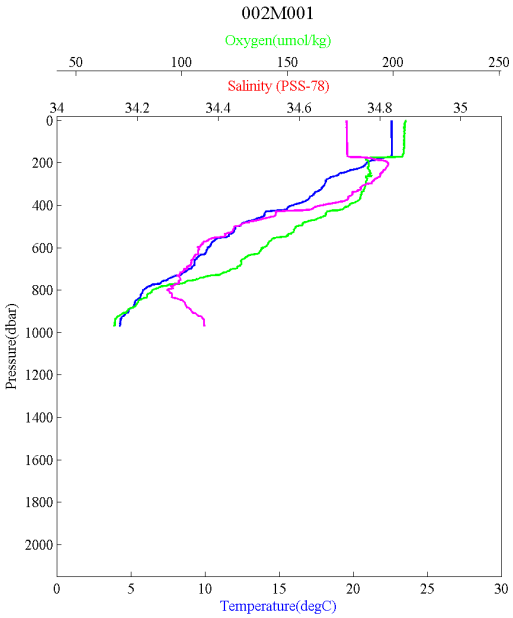


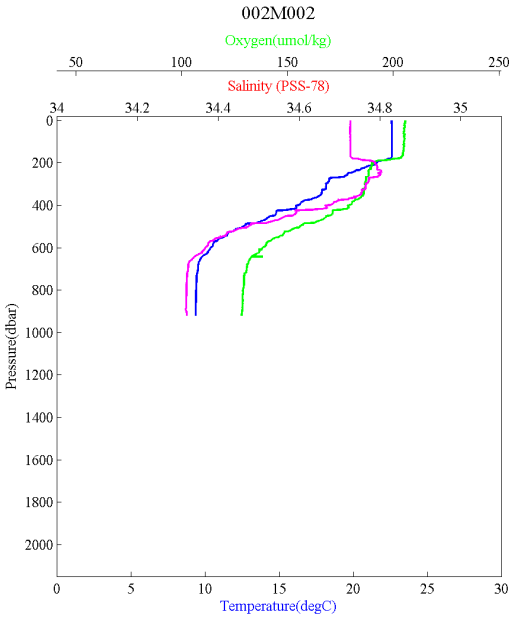
## *KM20-11, R/V KAIMEI, Cruise Track, Izu-Ogasawara*

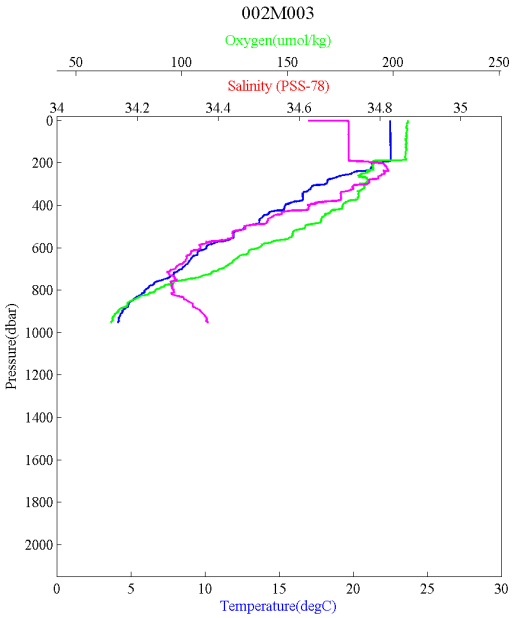


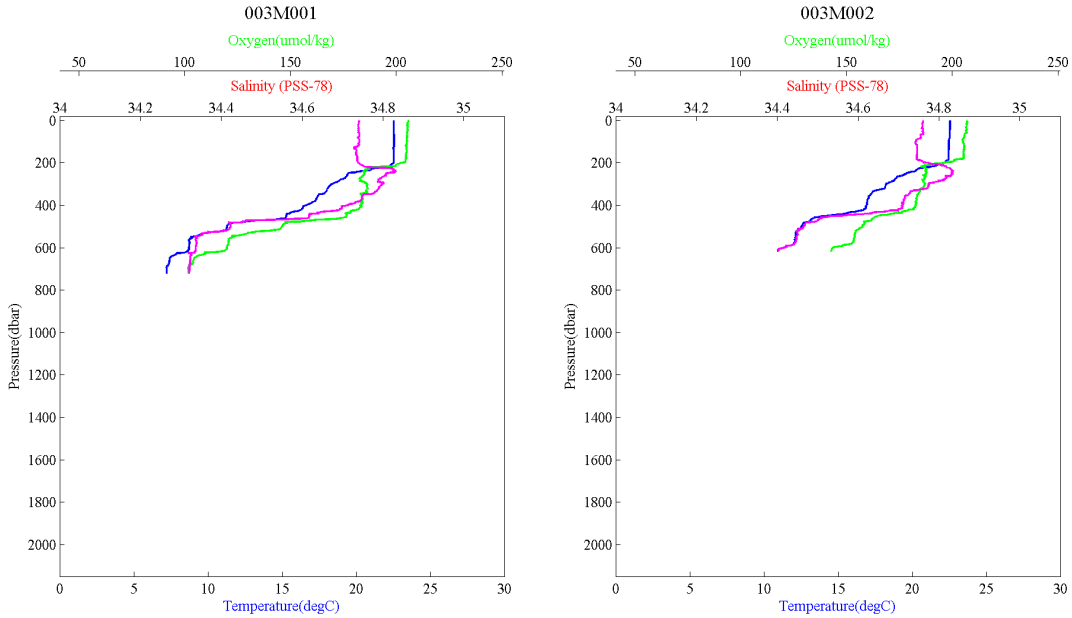
# II. CTD/DO profiles_ Water Sampler profile and KM-ROV



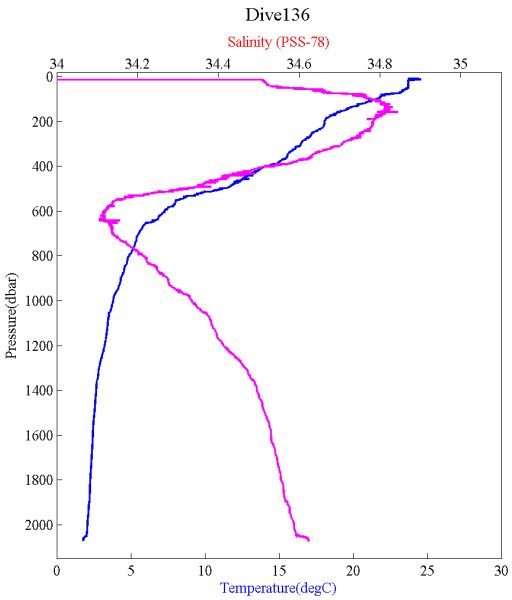



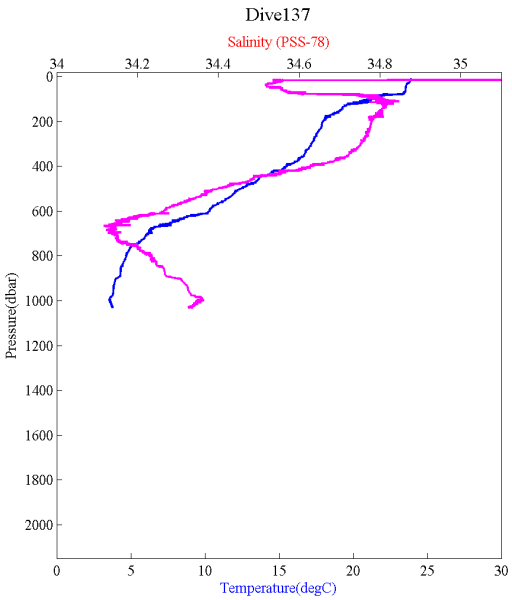



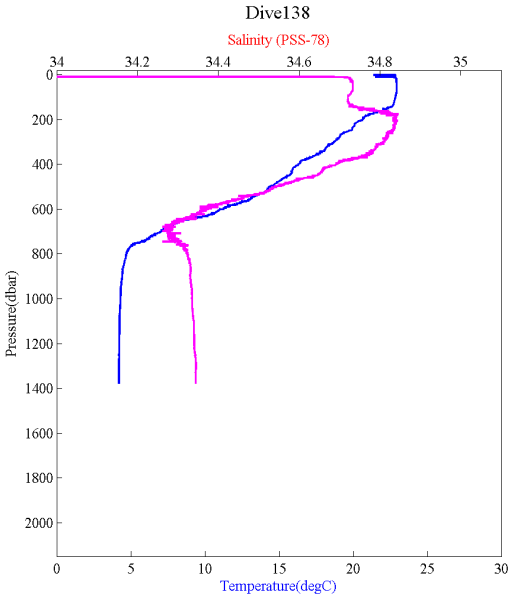


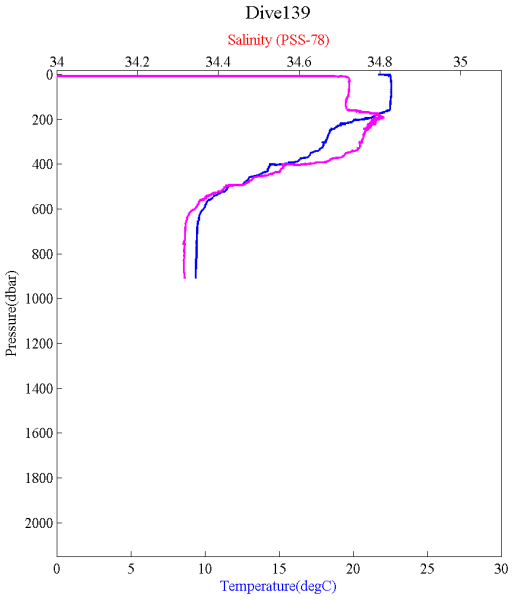

CTD Water Sampler profile

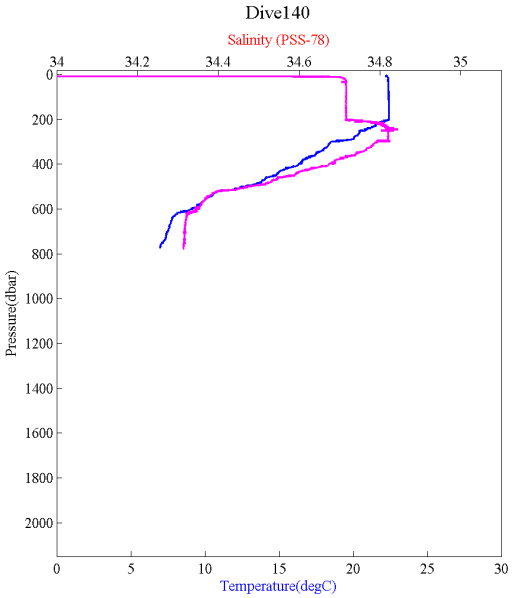
(15th Dec 2020 – 23th Dec 2020. 001M001 - 003M002)

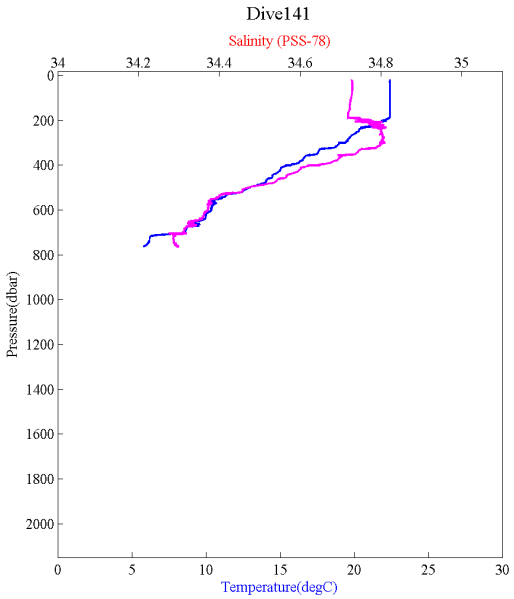

Dive136
Salinity (PSS-78)
34
34.2
34.4
34.6
34.8
35
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Pressure(dbar)
0
5
10
15
20
25
30
Temperature(degC)

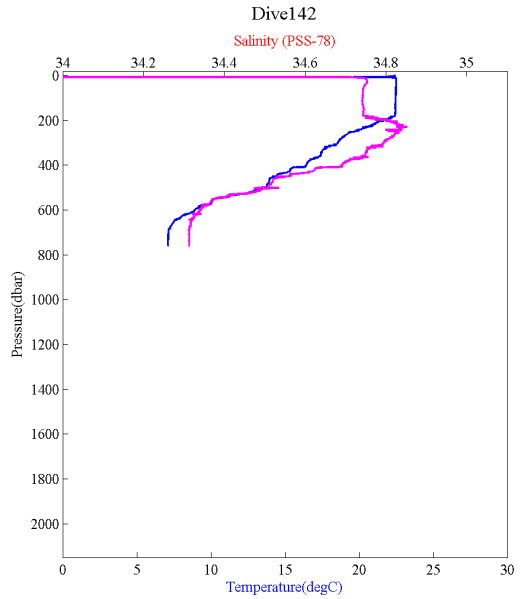

Dive137
Salinity (PSS-78)
34
34.2
34.4
34.6
34.8
35
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Pressure(dbar)
0
5
10
15
20
25
30
Temperature(degC)

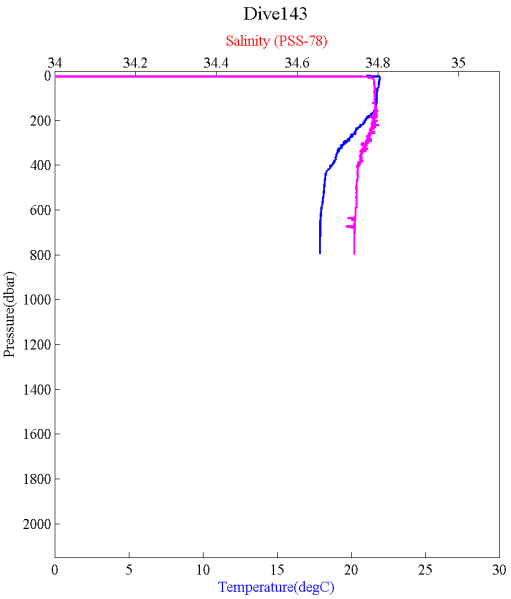

Dive138
Salinity (PSS-78)
34
34.2
34.4
34.6
34.8
35
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Pressure(dbar)
0
5
10
15
20
25
30
Temperature(degC)


Dive139
Salinity (PSS-78)
34
34.2
34.4
34.6
34.8
35
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Pressure(dbar)
0
5
10
15
20
25
30
Temperature(degC)




KM-ROV CTD profile

(13th Dec 2020 – 24th Dec 2020. Dive 136 - 143)

## III. XBT/XCTD profiles

XBT/XCTD measured water depth, temperature, and conductivity.

**Equipment Specification**

| | |
|---|---|
| Digital Converter | TS-MK-130 |
| Hand Launcher | LM-3A |
| Auto Launcher | AL-12B |
| Software | MK-150L (for Hand Launcher) |
| | AL-12 (for Auto Launcher) |

**XBT Probe**

| | | | |
|---|---|---|---|
| Temperature Range | -2.22 to 35.55 degreeC | | |
| Accuracy | ±0.2 degreeC | | |
| Depth Range | T-5 | 1830m | less than 6knot (water speed) |
| | T-6 | 460m | less than 15knot (water speed) |
| | T-7 | 760m | less than 15knot (water speed) |
| | T-10 | 300m | less than 10knot (water speed) |
| Duration | T-5 | 291 second | |
| | T-6 | 70 second | |
| | T-7 | 118 second | |
| | T-10 | 48 second | |

**XCTD Probe**

| | | | |
|---|---|---|---|
| Temperature Range | -2.0to 35.0 degreeC | | |
| Accuracy | ±0.2 degreeC | | |
| | ±0.03mS/cm (Conductivity) | | |
| Depth Range | XCTD-1 | 1000m | less than 12knot (water speed) |
| | XCTD-2 | 1850m | less than 3.5knot (water speed) |
| | XCTD-3 | 1000m | less than 20knot (water speed) |
| | XCTD-4 | 1850m | less than 6knot (water speed) |
| Duration | XCTD-1 | 300 second | |
| | XCTD-2 | 600 second | |
| | XCTD-3 | 200 second | |
| | XCTD-4 | 600 second | |

TSK XBT/XCTD-SYSTEM AL-12 Tsurumi-Seiki CO.,Ltd （Ver.1.1.7）

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時刻：23:24:39
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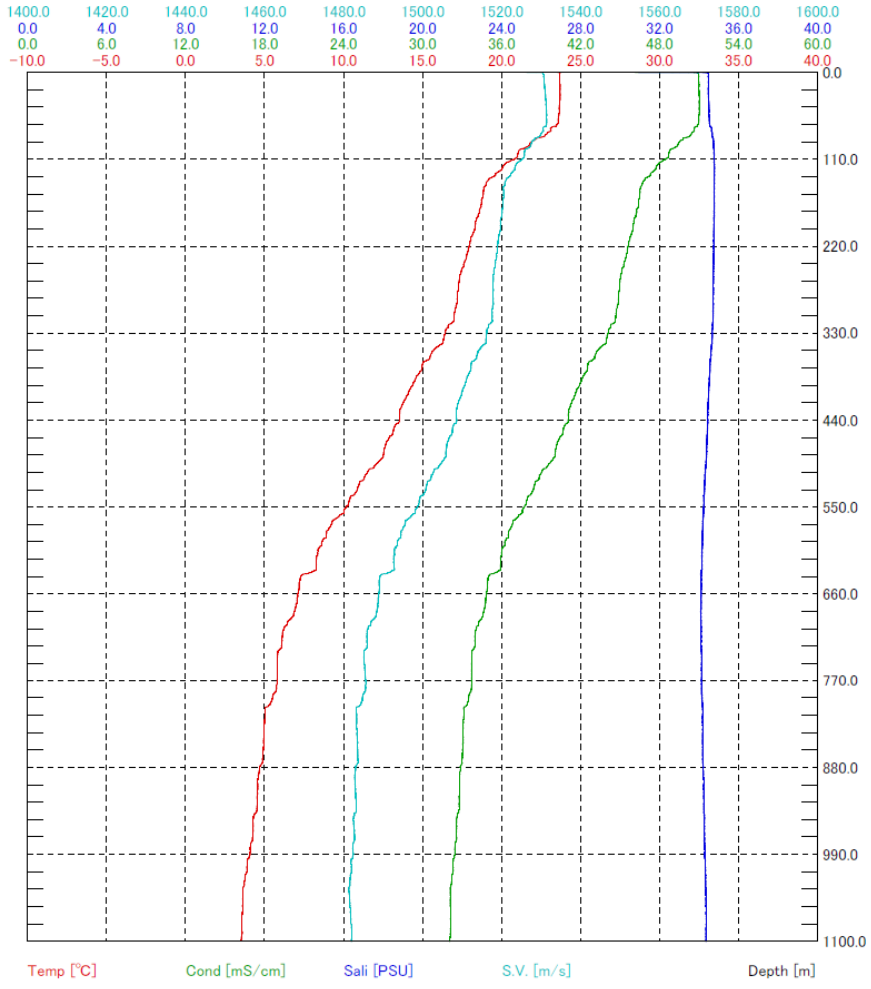
経度：140-57.3164E　　データ数：8419　　深度ステップ：ALL

TSK XBT/XCTD-SYSTEM AL-12 -鉛直分布図印刷-　（Ver.1.1.7）



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データナンバー：242　　プローブタイプ：XCTD-2　　BATHY処理器：**
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時刻：02:05:33
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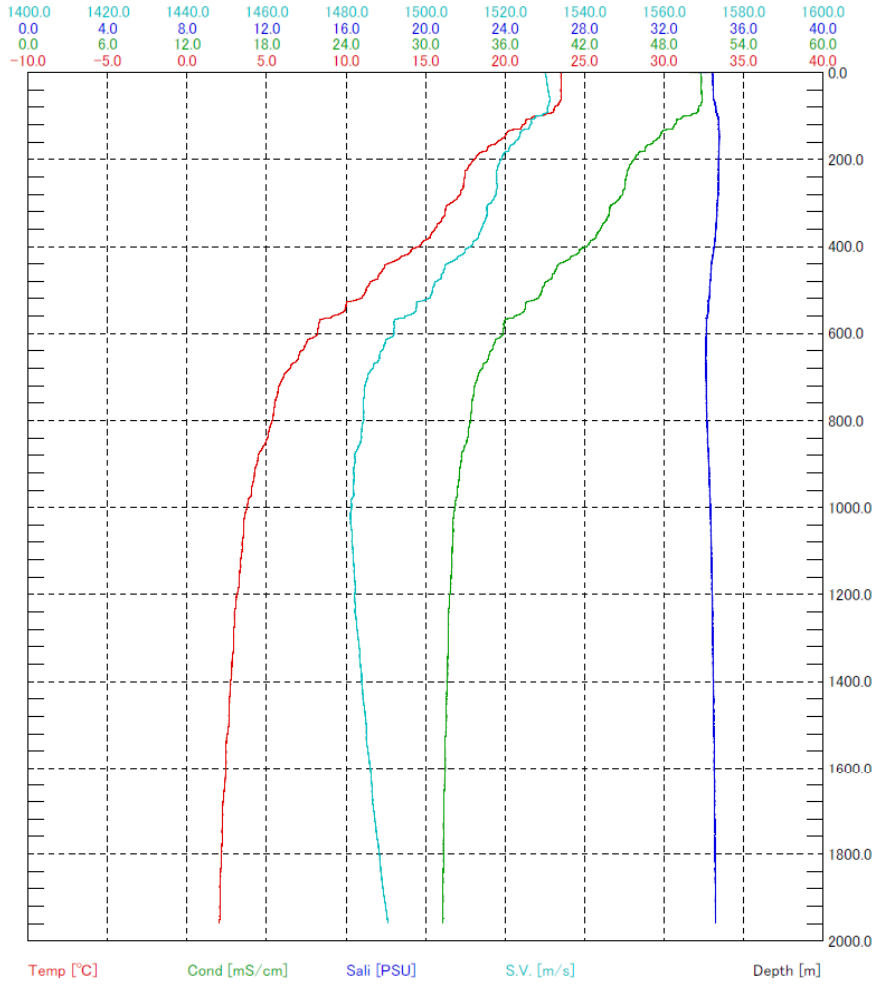

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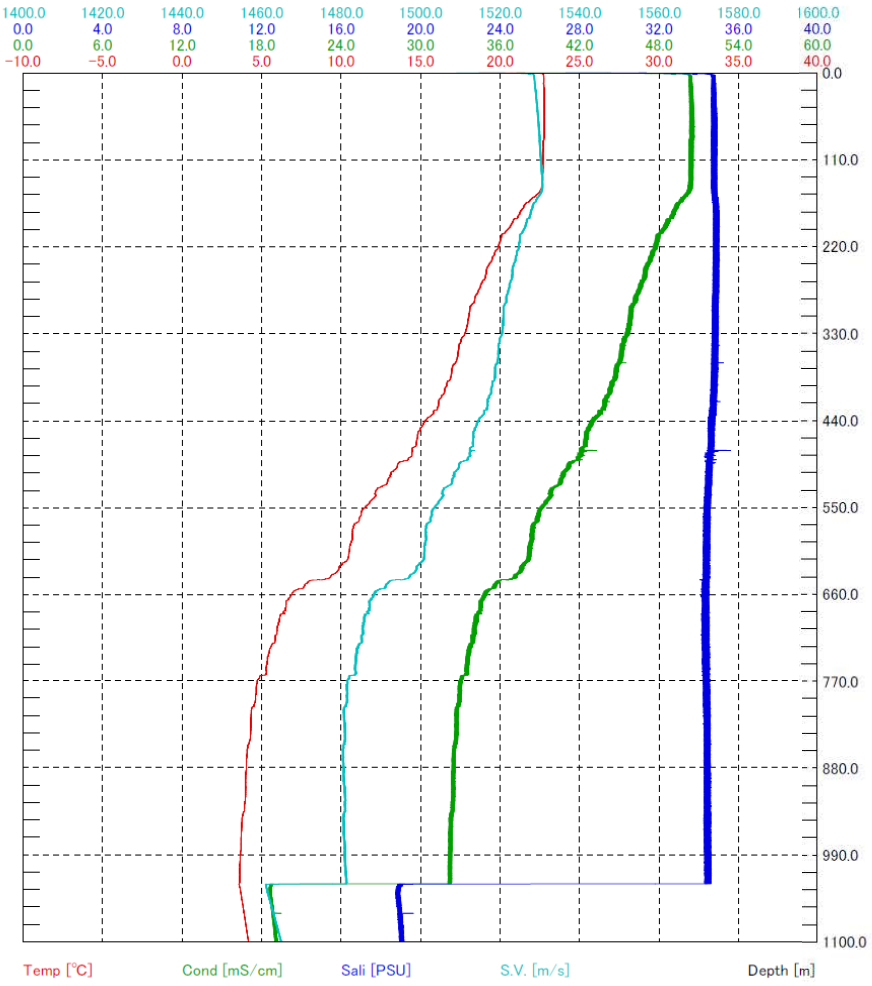
経度 : 139-54.2955E　　データ数 : 8419　　深度ステップ : ALL

TSK XBT/XCTD-SYSTEM AL-12 -鉛直分布図印刷-　（Ver.1.1.7）



TSK XBT/XCTD-SYSTEM TS-MK150 Tsurumi-Seiki CO.,Ltd (Ver.1.42)

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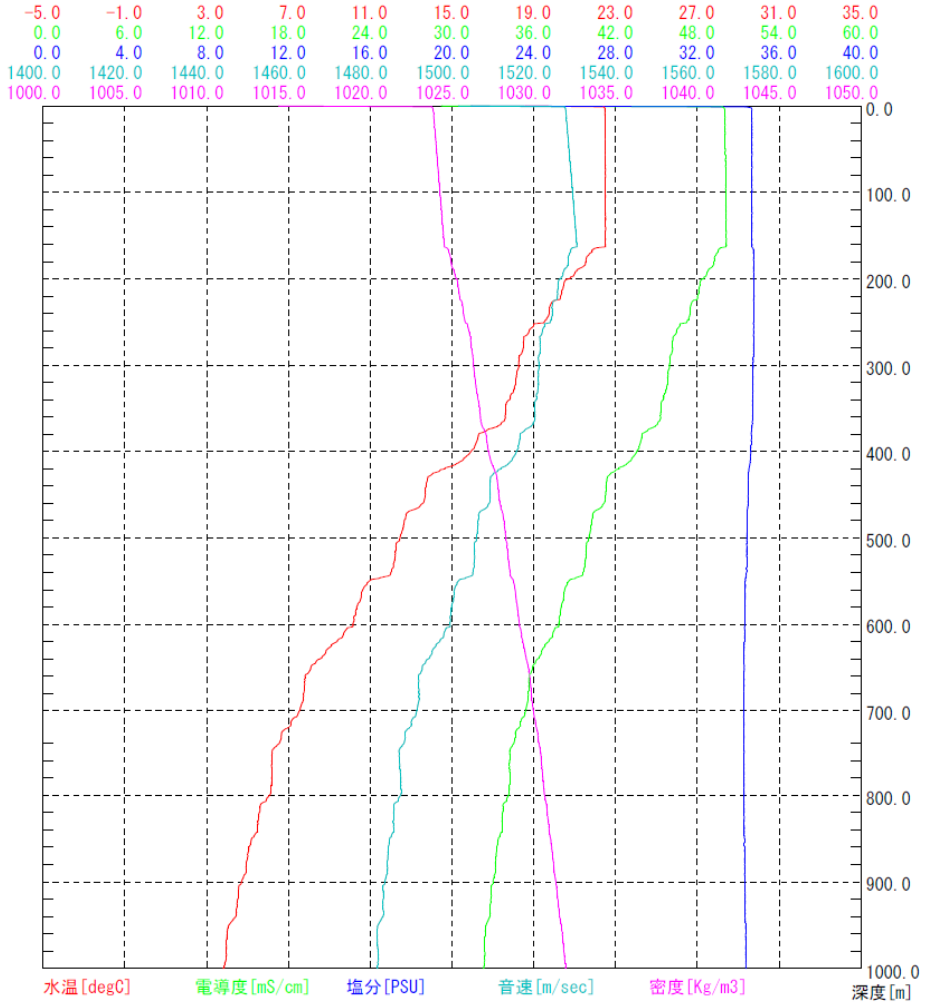
シリアル番号 : 14110395 プローブ名 : XCTD1 BATHY処理器 : **
日付 : 2020/12/19
時刻 : 21:25:47
緯度 : 31-33.4353N 最大深度(m) : 1000
経度 : 140-09.0925E データ数 : 8400 深度ステップ : RAW
メモ :

TSK XBT/XCTD-SYSTEM TS-MK150 -鉛直分布図印刷- (Ver.1.42)



TSK XBT/XCTD-SYSTEM TS-MK150 Tsurumi-Seiki CO.,Ltd (Ver.1.42)

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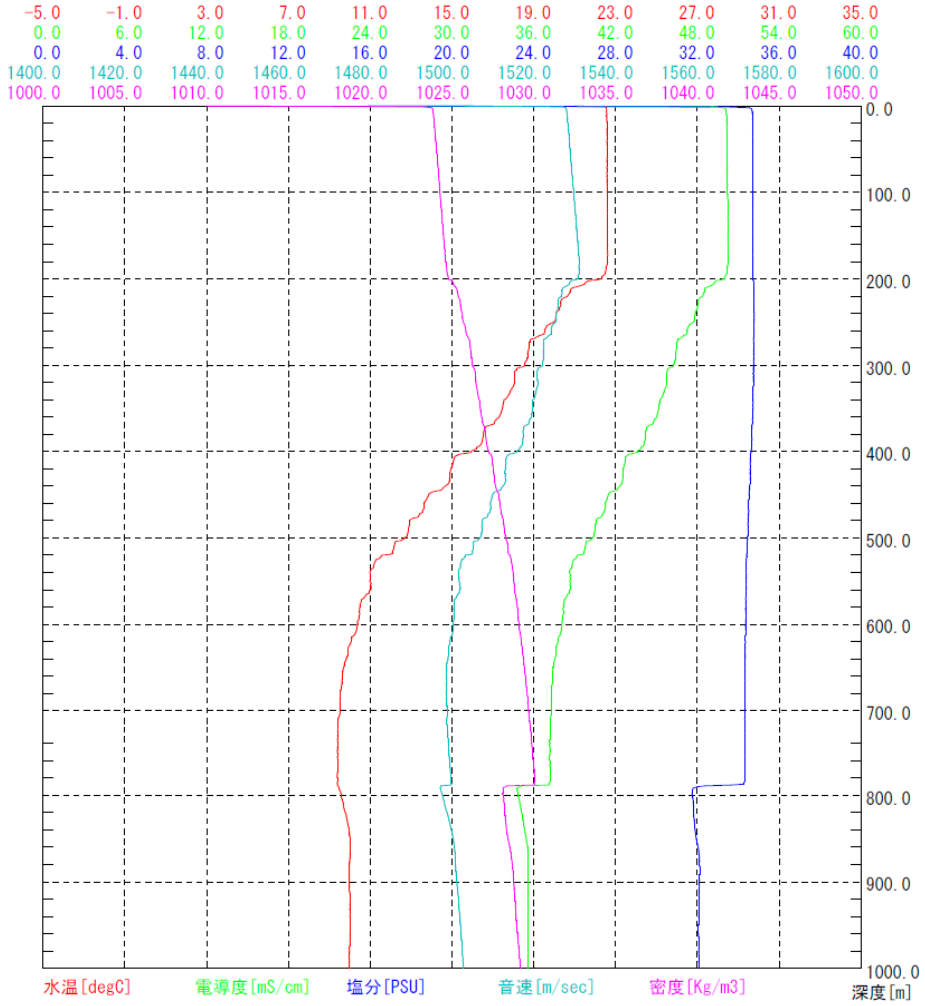

TSK XBT/XCTD-SYSTEM AL-12 Tsurumi-Seiki CO.,Ltd （Ver.1.1.7）

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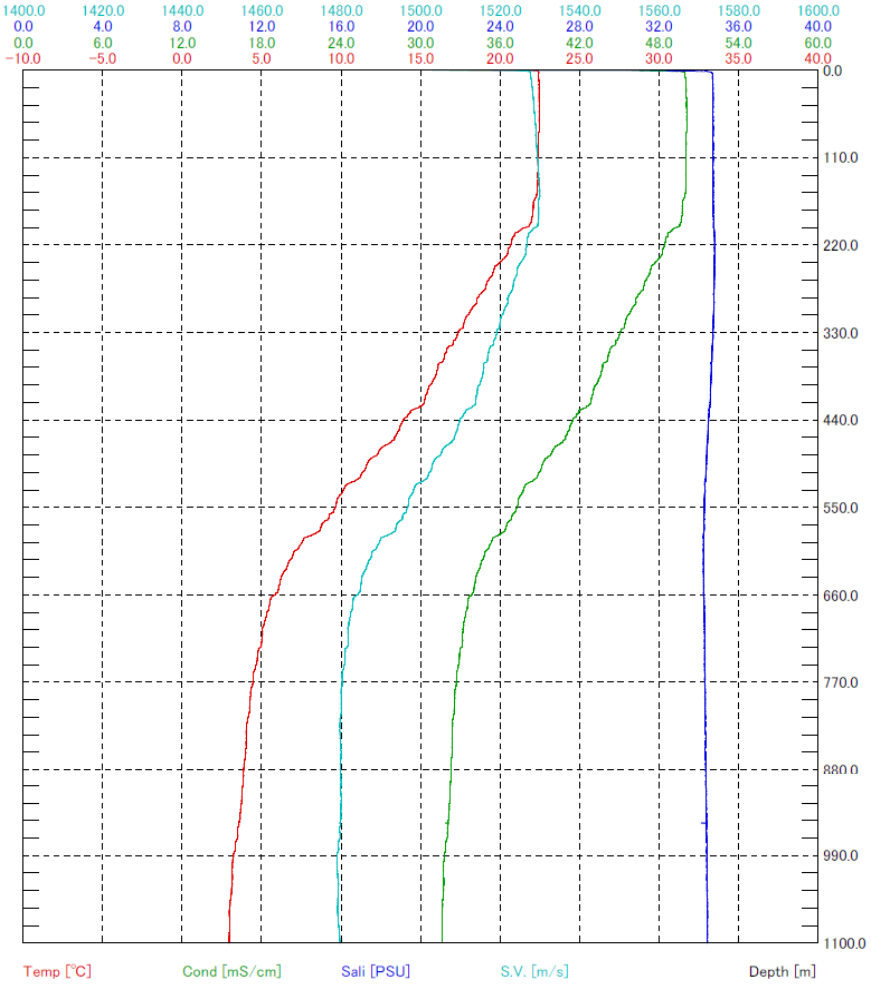
日付 : 2020年12月21日
時刻 : 14:57:27
緯度 : 32-25.4376N
経度 : 140-01.6374E

デバイス名 : XCTD
プローブタイプ : XCTD-1
最大深度[m] : 1100.1
データ数 : 8419

BATHYﾌﾟﾛｰﾌﾞ : 741
BATHY処理器 : **
深度ステップ : ALL

TSK XBT/XCTD-SYSTEM AL-12 -鉛直分布図印刷- （Ver.1.1.7）



TSK XBT/XCTD-SYSTEM AL-12 Tsurumi-Seiki CO.,Ltd （Ver.1.1.7）

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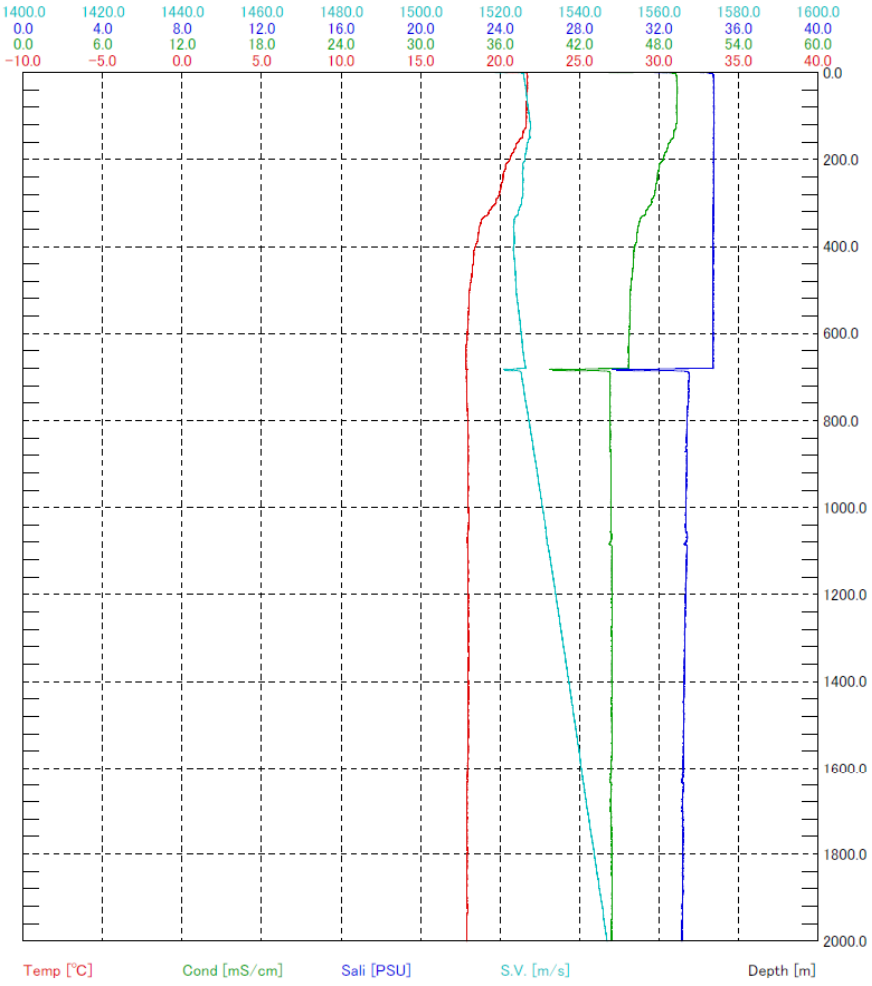
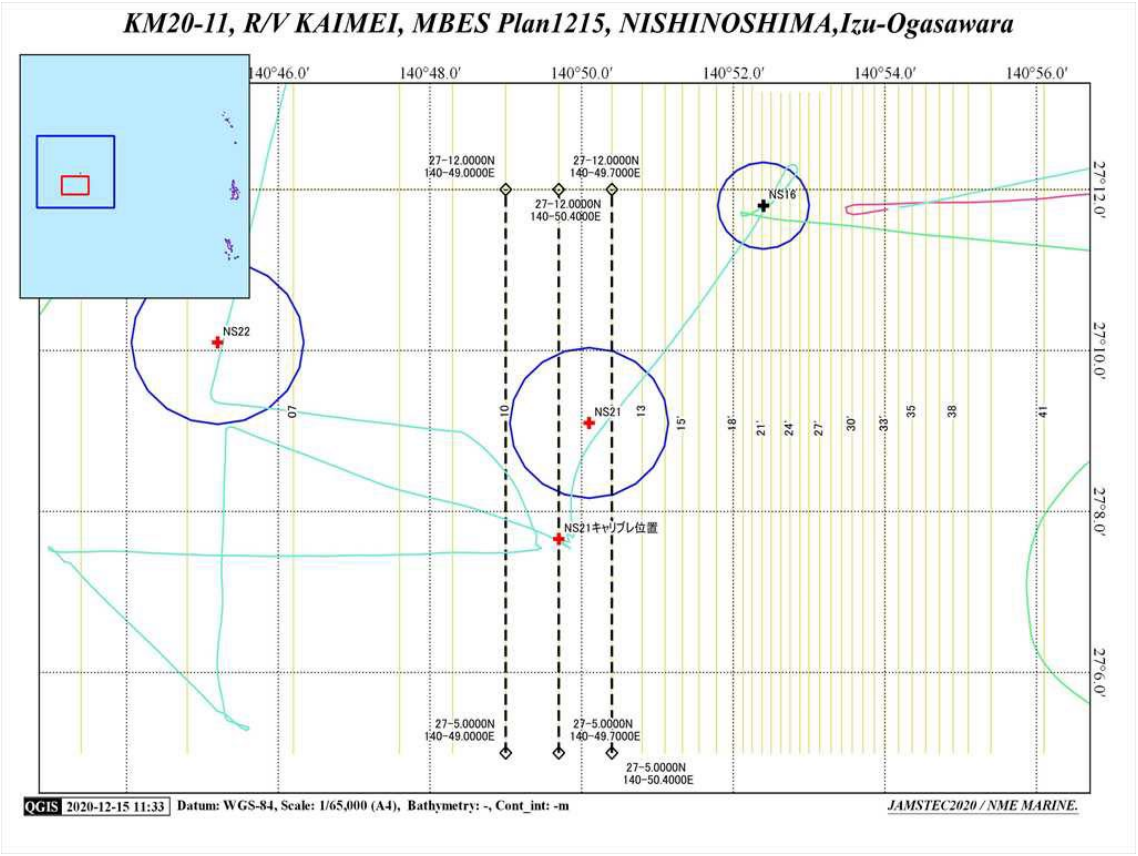
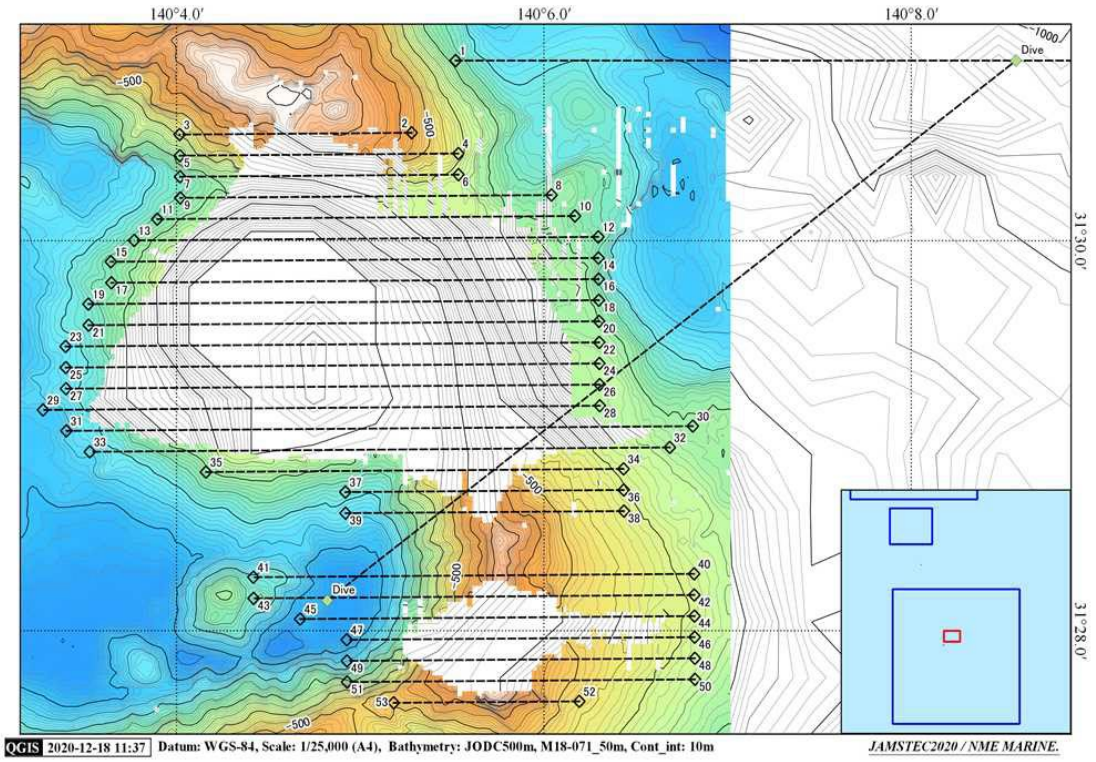
TSK XBT/XCTD-SYSTEM AL-12 -鉛直分布図印刷-　（Ver.1.1.7）



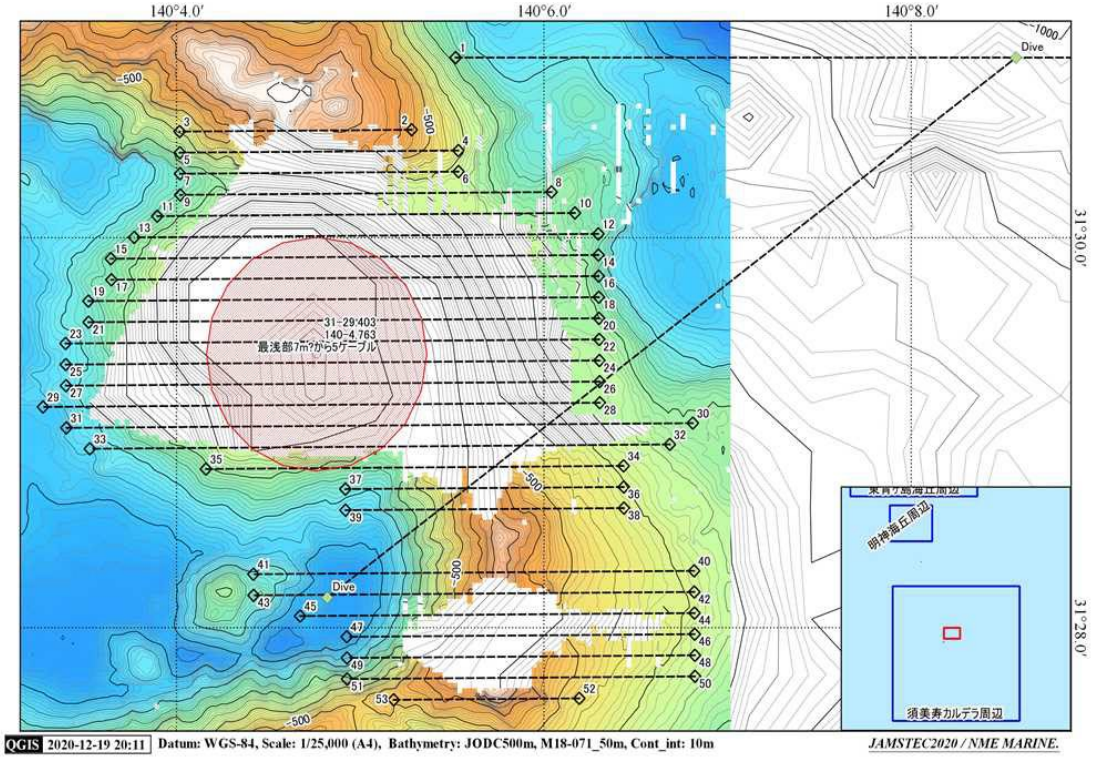
## IV. Bottom topography survey (NME)



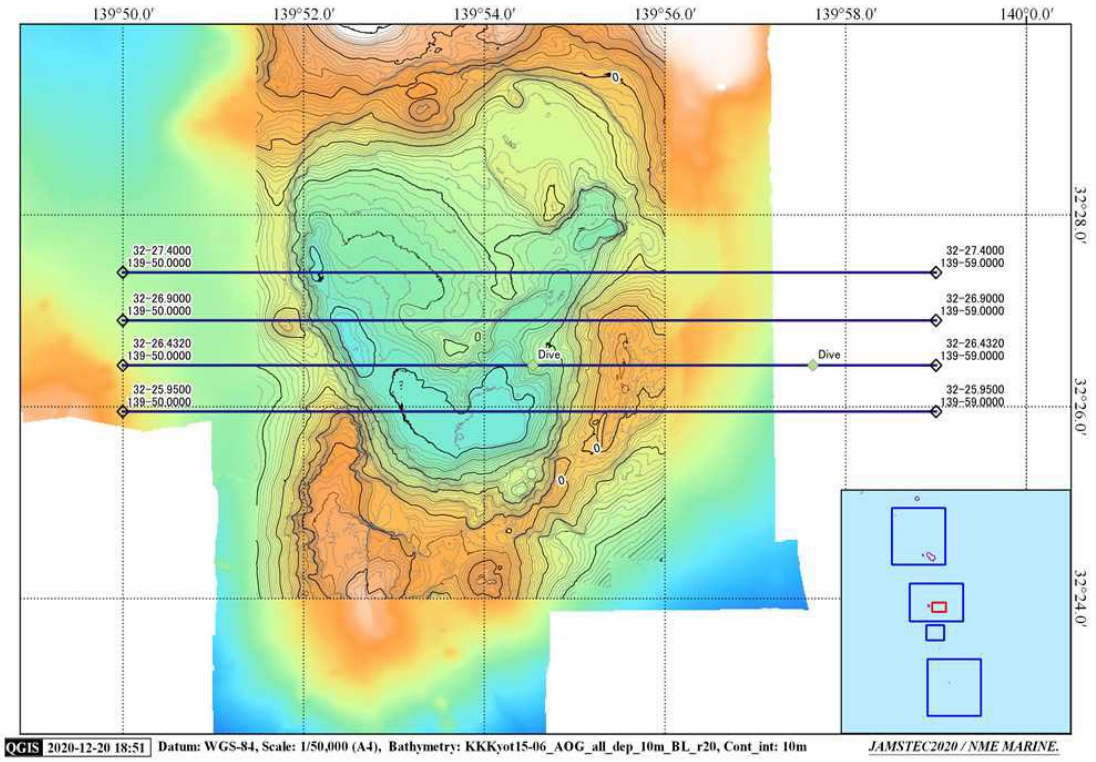
***KM20-11, R/V KAIMEI, MBES Plan1220, Sumith Caldera, Izu-Ogasawara***



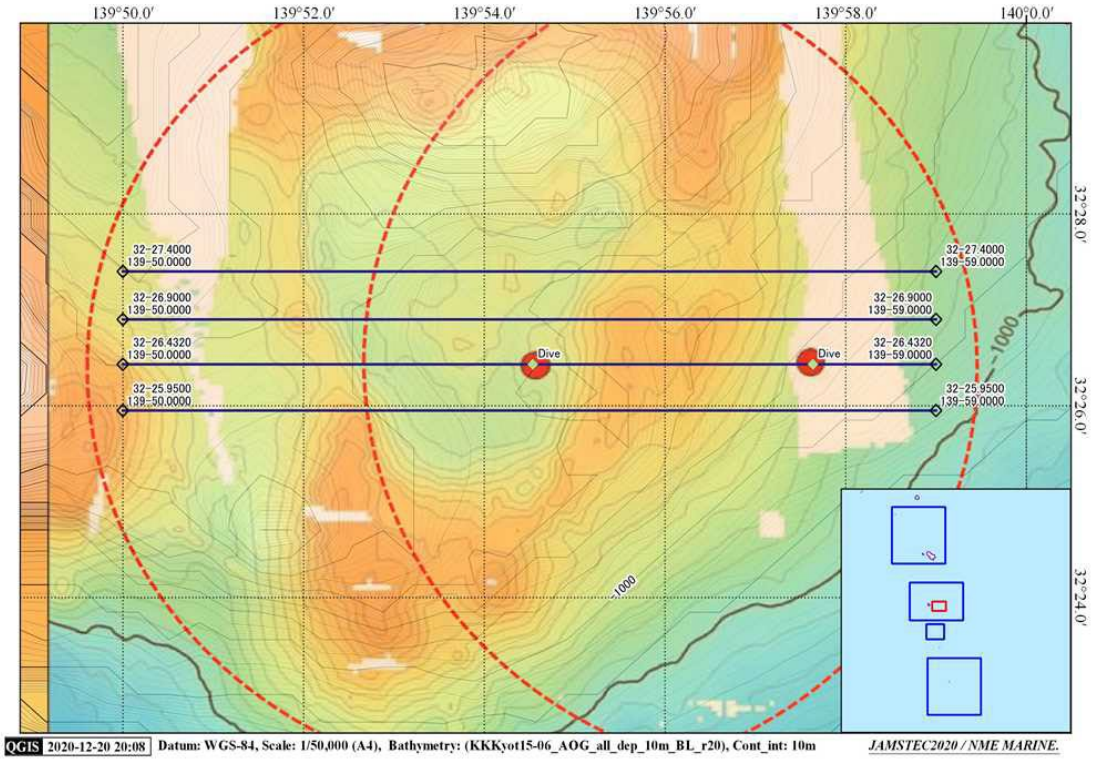

***KM20-11, R/V KAIMEI, MBES Plan1220, Sumith Caldera, Izu-Ogasawara***

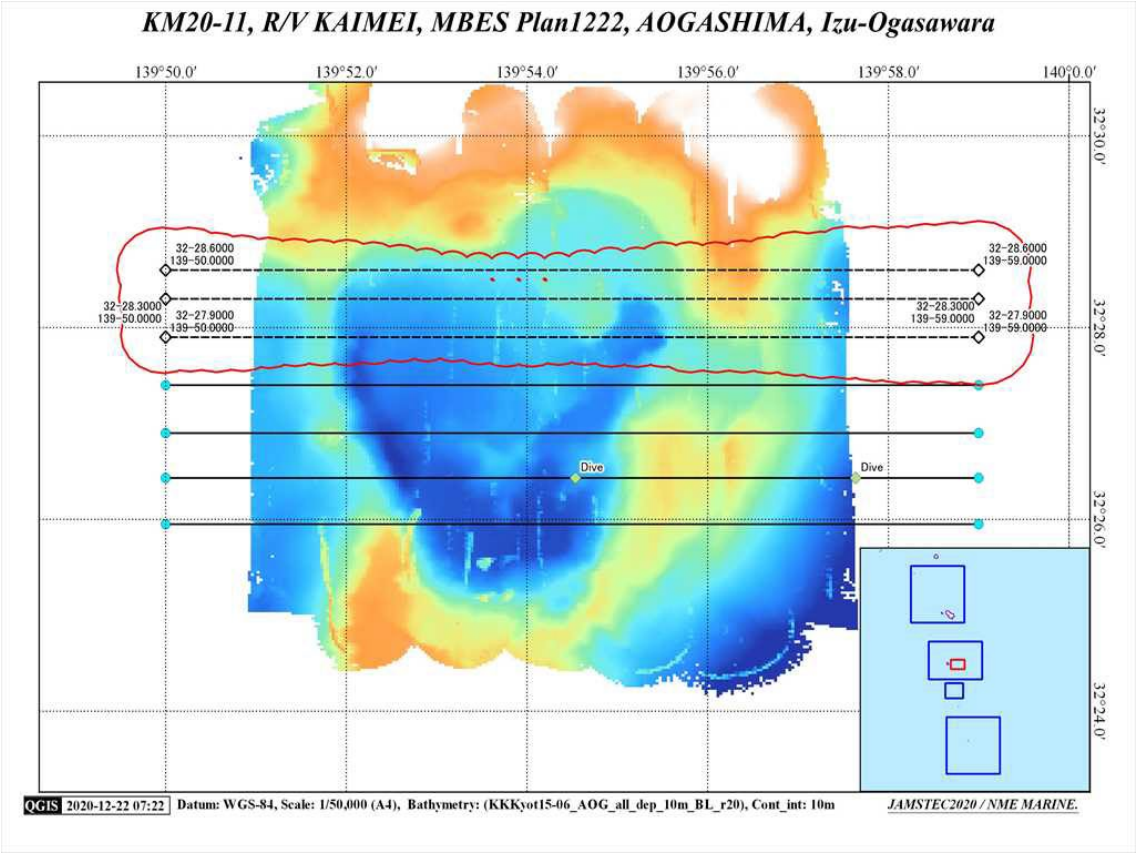


***KM20-11, R/V KAIMEI, MBES Plan122x, AOGASHIMA, Izu-Ogasawara***

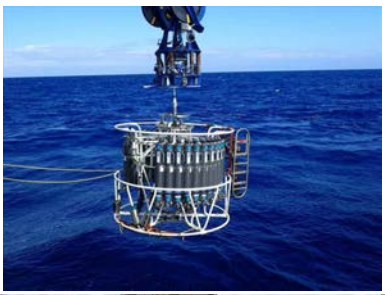


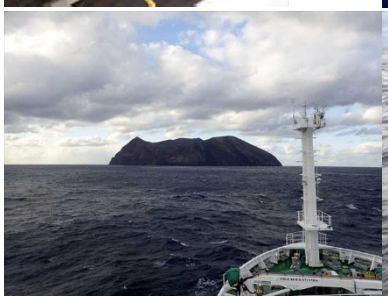

***KM20-11, R/V KAIMEI, MBES Plan1223, AOGASHIMA, Izu-Ogasawara***

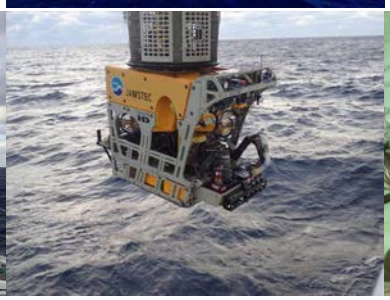



KM20-11, R/V KAIMEI, MBES Plan1222, AOGASHIMA, Izu-Ogasawara
139°50.0′
139°52.0′
139°54.0′
139°56.0′
139°58.0′
140°0.0′
32°30.0′
32°28.0′
32°26.0′
32°24.0′
32-28.6000
139-50.0000
32-28.6000
139-59.0000
32-28.3000
139-50.0000
32-27.9000
139-50.0000
32-28.3000
139-59.0000
32-27.9000
139-59.0000
Dive
Dive
QGIS 2020-12-22 07:22
Datum: WGS-84, Scale: 1/50,000 (A4), Bathymetry: (KKKyot15-06_AOG_all_dep_10m_BL_r20), Cont_int: 10m
JAMSTEC2020 / NME MARINE.

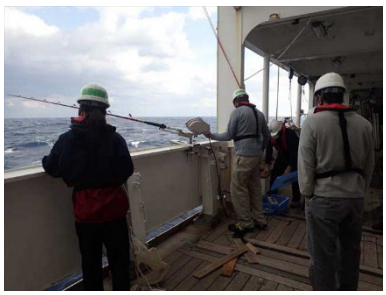
## V. Research equipment photo (Ogura, Amari)





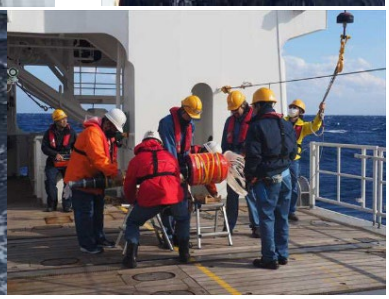


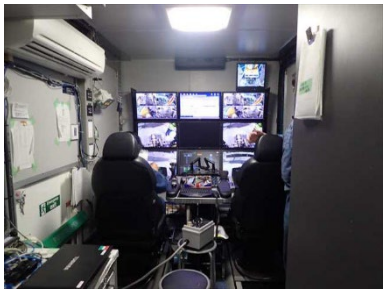












# VI. Dive Log (Dive136 – Dive143)

## <Dive 136>

**Dive Log of KM-ROV Dive # 136** — 2020/12/13 — Area Name; NS|6, Nishino-shima

| Time (UTC) | Time (Local) | Vehicle Dep.(m) | Vehicle Pos. Lat | | | | Vehicle Pos. Lon | | | | TMS Dep.(m) | TMS Pos. Lat | | | | TMS Pos. Lon | | | | Vehicle Alt(m) | Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3:59:48 | 12:59:48 | 627.7 | 27 | - | 16.0904 | N | 140 | - | 59.6091 | E | 624.5 | 27 | - | 16.0886 | N | 140 | - | 59.6103 | E | | | |
| 4:00:49 | 13:00:49 | 671.9 | 27 | - | 16.0886 | N | 140 | - | 59.6198 | E | 670.3 | 27 | - | 16.0875 | N | 140 | - | 59.6191 | E | | | |
| 4:01:21 | 13:01:21 | 695.8 | 27 | - | 16.0886 | N | 140 | - | 59.6201 | E | 693.3 | 27 | - | 16.0865 | N | 140 | - | 59.6204 | E | | fish | |
| 4:03:07 | 13:03:07 | 767.9 | 27 | - | 16.0916 | N | 140 | - | 59.6227 | E | 765.8 | 27 | - | 16.0897 | N | 140 | - | 59.6237 | E | | siphonore | |
| 4:03:47 | 13:03:47 | 797.1 | 27 | - | 16.0909 | N | 140 | - | 59.6245 | E | 794.1 | 27 | - | 16.0904 | N | 140 | - | 59.6252 | E | | bagmania, wrong metadata | |
| 4:04:07 | 13:04:07 | 810.4 | 27 | - | 16.0924 | N | 140 | - | 59.6244 | E | 808.1 | 27 | - | 16.0909 | N | 140 | - | 59.6256 | E | | poralia | |
| 4:05:24 | 13:05:24 | 863.6 | 27 | - | 16.0899 | N | 140 | - | 59.6299 | E | 862.3 | 27 | - | 16.0889 | N | 140 | - | 59.6322 | E | | solmissus? | |
| 4:06:11 | 13:06:11 | 898.1 | 27 | - | 16.0903 | N | 140 | - | 59.6309 | E | 896 | 27 | - | 16.0892 | N | 140 | - | 59.6313 | E | | fish | |
| 4:08:20 | 13:08:20 | 989.5 | 27 | - | 16.0823 | N | 140 | - | 59.6284 | E | 0 | 27 | - | 16.0812 | N | 140 | - | 59.6321 | E | | na | |
| 4:10:08 | 13:10:08 | 1059.2 | 27 | - | 16.078 | N | 140 | - | 59.6302 | E | 0 | 27 | - | 16.0801 | N | 140 | - | 59.6301 | E | | jellyfish | |
| 4:10:50 | 13:10:50 | 1091.9 | 27 | - | 16.0788 | N | 140 | - | 59.6278 | E | 0 | 27 | - | 16.0789 | N | 140 | - | 59.6309 | E | | jelly? | |
| 4:13:00 | 13:13:00 | 1180 | 27 | - | 16.0784 | N | 140 | - | 59.6288 | E | 1178.4 | 27 | - | 16.0791 | N | 140 | - | 59.6304 | E | | black | |
| 4:13:48 | 13:13:48 | 1214.5 | 27 | - | 16.0736 | N | 140 | - | 59.6249 | E | 1211.3 | 27 | - | 16.0737 | N | 140 | - | 59.6289 | E | | hydrozoan | |
| 4:14:16 | 13:14:16 | 1230.4 | 27 | - | 16.0759 | N | 140 | - | 59.6284 | E | 0 | 27 | - | 16.0732 | N | 140 | - | 59.6265 | E | | hydrozoan | |
| 4:15:08 | 13:15:08 | 1269 | 27 | - | 16.0722 | N | 140 | - | 59.6282 | E | 0 | 27 | - | 16.0737 | N | 140 | - | 59.629 | E | | jellyfish | |
| 4:16:27 | 13:16:27 | 1324.9 | 27 | - | 16.0744 | N | 140 | - | 59.6318 | E | 0 | 27 | - | 16.0759 | N | 140 | - | 59.6358 | E | | jellyfish | |
| 4:18:40 | 13:18:40 | 1413.4 | 27 | - | 16.0745 | N | 140 | - | 59.6324 | E | 0 | 27 | - | 16.0759 | N | 140 | - | 59.6358 | E | | jelly? | |
| 4:19:52 | 13:19:52 | 1461.5 | 27 | - | 16.072 | N | 140 | - | 59.6353 | E | 0 | 27 | - | 16.0759 | N | 140 | - | 59.6358 | E | | solmissus? | |
| 4:21:12 | 13:21:12 | 0 | 27 | - | 16.0645 | N | 140 | - | 59.6293 | E | 0 | 27 | - | 16.0759 | N | 140 | - | 59.6358 | E | | larvacean? | |
| 4:22:43 | 13:22:43 | 1581.9 | 27 | - | 16.0686 | N | 140 | - | 59.6318 | E | 0 | 27 | - | 16.0649 | N | 140 | - | 59.6314 | E | | squid | |
| 4:23:02 | 13:23:02 | 1591.4 | 27 | - | 16.0677 | N | 140 | - | 59.6268 | E | 0 | 27 | - | 16.0649 | N | 140 | - | 59.6314 | E | | cyddipid | |
| 4:24:26 | 13:24:26 | 1651 | 27 | - | 16.0718 | N | 140 | - | 59.6236 | E | 0 | 27 | - | 16.0649 | N | 140 | - | 59.6314 | E | | jelly | |
| 4:25:22 | 13:25:22 | 1690.9 | 27 | - | 16.069 | N | 140 | - | 59.6237 | E | 0 | 27 | - | 16.0649 | N | 140 | - | 59.6314 | E | | mesochordius | |
| 4:28:51 | 13:28:51 | 1830.8 | 27 | - | 16.0635 | N | 140 | - | 59.6363 | E | 0 | 27 | - | 16.0652 | N | 140 | - | 59.6284 | E | | jelly | |
| 4:29:23 | 13:29:23 | 1851.1 | 27 | - | 16.0669 | N | 140 | - | 59.6374 | E | 0 | 27 | - | 16.0652 | N | 140 | - | 59.6284 | E | | jelly | |
| 4:29:59 | 13:29:59 | 1871.4 | 27 | - | 16.0615 | N | 140 | - | 59.638 | E | 0 | 27 | - | 16.0652 | N | 140 | - | 59.6284 | E | | jelly | |
| 4:43:41 | 13:43:41 | 2025.6 | 27 | - | 16.0478 | N | 140 | - | 59.6577 | E | 1876.4 | 27 | - | 16.0615 | N | 140 | - | 59.6482 | E | | sea floor | |
| 4:45:54 | 13:45:54 | 2030.6 | 27 | - | 16.0491 | N | 140 | - | 59.6574 | E | 1876.5 | 27 | - | 16.0616 | N | 140 | - | 59.6505 | E | | jellyfish | |
| 4:51:45 | 13:51:45 | 2031.3 | 27 | - | 16.0488 | N | 140 | - | 59.6573 | E | 1878.4 | 27 | - | 16.0671 | N | 140 | - | 59.6499 | E | | Poralia | |
| 4:53:14 | 13:53:14 | 2032.1 | 27 | - | 16.0494 | N | 140 | - | 59.6558 | E | 1883.9 | 27 | - | 16.0632 | N | 140 | - | 59.6514 | E | | shrimp? | |
| 4:55:16 | 13:55:16 | 2030.2 | 27 | - | 16.0537 | N | 140 | - | 59.6496 | E | 1885.7 | 27 | - | 16.0632 | N | 140 | - | 59.6479 | E | | fish | |
| 4:56:36 | 13:56:36 | 2029.1 | 27 | - | 16.0597 | N | 140 | - | 59.643 | E | 1885.9 | 27 | - | 16.0707 | N | 140 | - | 59.649 | E | | rock | |
| 4:57:15 | 13:57:15 | 2029.6 | 27 | - | 16.0655 | N | 140 | - | 59.6429 | E | 1885.5 | 27 | - | 16.068 | N | 140 | - | 59.6475 | E | | fish | |
| 5:00:12 | 14:00:12 | 2028.1 | 27 | - | 16.0711 | N | 140 | - | 59.6374 | E | 1886.3 | 27 | - | 16.0719 | N | 140 | - | 59.6507 | E | | sigieedellie不動明王クラゲ | |
| 5:04:53 | 14:04:53 | 2027.8 | 27 | - | 16.068 | N | 140 | - | 59.6307 | E | 1885.6 | 27 | - | 16.0721 | N | 140 | - | 59.6482 | E | | OBMソナーで発見 | |
| 5:10:36 | 14:10:36 | 2028.8 | 27 | - | 16.0768 | N | 140 | - | 59.6353 | E | 1886.3 | 27 | - | 16.0689 | N | 140 | - | 59.6493 | E | | jelly | |
| 5:12:57 | 14:12:57 | 2029.2 | 27 | - | 16.0815 | N | 140 | - | 59.6448 | E | 1885.4 | 27 | - | 16.069 | N | 140 | - | 59.6502 | E | | 岩だった | |
| 5:14:13 | 14:14:13 | 2028.5 | 27 | - | 16.0884 | N | 140 | - | 59.6395 | E | 1885.8 | 27 | - | 16.0764 | N | 140 | - | 59.6487 | E | | Shrimp | |
| 5:16:10 | 14:16:10 | 2028 | 27 | - | 16.0828 | N | 140 | - | 59.6326 | E | 1885.4 | 27 | - | 16.0713 | N | 140 | - | 59.6445 | E | | ゴカイ | |
| 5:16:51 | 14:16:51 | 2027.5 | 27 | - | 16.0869 | N | 140 | - | 59.6312 | E | 1885.6 | 27 | - | 16.0747 | N | 140 | - | 59.6512 | E | | fish | |
| 5:17:47 | 14:17:47 | 2026.4 | 27 | - | 16.086 | N | 140 | - | 59.6251 | E | 1885.8 | 27 | - | 16.0736 | N | 140 | - | 59.6431 | E | | fish | |
| 5:19:58 | 14:19:58 | 2025.7 | 27 | - | 16.0956 | N | 140 | - | 59.6125 | E | 1886 | 27 | - | 16.0755 | N | 140 | - | 59.6436 | E | | ソナーに影映る | |
| 5:23:38 | 14:23:38 | 2023.3 | 27 | - | 16.0906 | N | 140 | - | 59.5981 | E | 1885.4 | 27 | - | 16.0864 | N | 140 | - | 59.6385 | E | | 白い岩？視認 | |
| 5:24:32 | 14:24:32 | 2022.4 | 27 | - | 16.0893 | N | 140 | - | 59.5938 | E | 1885.7 | 27 | - | 16.0889 | N | 140 | - | 59.6336 | E | | 岩視認 | |
| 5:28:03 | 14:28:03 | 2022.4 | 27 | - | 16.0931 | N | 140 | - | 59.5934 | E | 1886.4 | 27 | - | 16.092 | N | 140 | - | 59.632 | E | | イベントマーク1へ出発 | |
| 5:29:33 | 14:29:33 | 2024.7 | 27 | - | 16.0987 | N | 140 | - | 59.6051 | E | 1885.3 | 27 | - | 16.0916 | N | 140 | - | 59.6333 | E | | イベントマーク1に到着 | |
| 5:30:18 | 14:30:18 | 2023.8 | 27 | - | 16.0967 | N | 140 | - | 59.6035 | E | 1886 | 27 | - | 16.0945 | N | 140 | - | 59.6333 | E | | fish? | |
| 5:32:08 | 14:32:08 | 2023.8 | 27 | - | 16.0896 | N | 140 | - | 59.5982 | E | 1885.7 | 27 | - | 16.0893 | N | 140 | - | 59.6283 | E | | 2 fish | |
| 5:32:53 | 14:32:53 | 2024 | 27 | - | 16.0922 | N | 140 | - | 59.6025 | E | 1885.5 | 27 | - | 16.0929 | N | 140 | - | 59.6301 | E | | red fish | |
| 5:33:18 | 14:33:18 | 2024 | 27 | - | 16.0981 | N | 140 | - | 59.5974 | E | 1886.1 | 27 | - | 16.0943 | N | 140 | - | 59.6293 | E | | jelly | |
| 5:35:24 | 14:35:24 | 2023.6 | 27 | - | 16.0922 | N | 140 | - | 59.597 | E | 1885.8 | 27 | - | 16.0929 | N | 140 | - | 59.6299 | E | | fish? | |
| 5:36:23 | 14:36:23 | 2023.2 | 27 | - | 16.0943 | N | 140 | - | 59.5947 | E | 1886.2 | 27 | - | 16.0943 | N | 140 | - | 59.6272 | E | | fish | |
| 5:37:22 | 14:37:22 | 2024.1 | 27 | - | 16.0963 | N | 140 | - | 59.6001 | E | 1886.2 | 27 | - | 16.0937 | N | 140 | - | 59.6315 | E | | fish?jelly? | |
| 5:39:59 | 14:39:59 | 2023 | 27 | - | 16.1006 | N | 140 | - | 59.6015 | E | 1885.8 | 27 | - | 16.097 | N | 140 | - | 59.6273 | E | | camera1 red fish | |
| 5:41:10 | 14:41:10 | 2024.8 | 27 | - | 16.0934 | N | 140 | - | 59.6121 | E | 1885.7 | 27 | - | 16.092 | N | 140 | - | 59.627 | E | | 岩視認 | |
| 5:42:49 | 14:42:49 | 2027.5 | 27 | - | 16.1071 | N | 140 | - | 59.6268 | E | 1885.7 | 27 | - | 16.0992 | N | 140 | - | 59.6282 | E | | fish | |
| 5:43:10 | 14:43:10 | 2027 | 27 | - | 16.1019 | N | 140 | - | 59.6245 | E | 1885.9 | 27 | - | 16.0972 | N | 140 | - | 59.6278 | E | | fish | |
| 5:44:42 | 14:44:42 | 2027.9 | 27 | - | 16.0979 | N | 140 | - | 59.6337 | E | 1886.1 | 27 | - | 16.0968 | N | 140 | - | 59.6299 | E | | big jelly | |
| 5:44:58 | 14:44:58 | 2028 | 27 | - | 16.0952 | N | 140 | - | 59.6309 | E | 1885.7 | 27 | - | 16.0951 | N | 140 | - | 59.6288 | E | | shrimp | |
| 5:45:10 | 14:45:10 | 2028.2 | 27 | - | 16.0961 | N | 140 | - | 59.631 | E | 1885.7 | 27 | - | 16.0967 | N | 140 | - | 59.6305 | E | | jelly | |
| 5:49:47 | 14:49:47 | 2029 | 27 | - | 16.1028 | N | 140 | - | 59.6426 | E | 1886.3 | 27 | - | 16.0949 | N | 140 | - | 59.632 | E | | 生き物がふわふわしている | |
| 5:51:37 | 14:51:37 | 2031 | 27 | - | 16.1045 | N | 140 | - | 59.6551 | E | 1886.3 | 27 | - | 16.0933 | N | 140 | - | 59.6325 | E | | ソナー正面に物体確認 | |
| 5:55:03 | 14:55:03 | 2031.7 | 27 | - | 16.0977 | N | 140 | - | 59.6657 | E | 1892.6 | 27 | - | 16.1 | N | 140 | - | 59.6354 | E | | fish | |
| 5:55:32 | 14:55:32 | 2032 | 27 | - | 16.0939 | N | 140 | - | 59.6597 | E | 1895.5 | 27 | - | 16.0948 | N | 140 | - | 59.6311 | E | | jelly | |
| 5:58:40 | 14:58:40 | 2033.6 | 27 | - | 16.0995 | N | 140 | - | 59.6702 | E | 1895.4 | 27 | - | 16.0988 | N | 140 | - | 59.6351 | E | | fish | |
| 5:59:28 | 14:59:28 | 2034.7 | 27 | - | 16.1028 | N | 140 | - | 59.672 | E | 1895.2 | 27 | - | 16.0988 | N | 140 | - | 59.6356 | E | | 白い物が貼りついた岩視認 | |
| 6:01:10 | 15:01:10 | 2034.4 | 27 | - | 16.0941 | N | 140 | - | 59.6779 | E | 1894.5 | 27 | - | 16.0907 | N | 140 | - | 59.6401 | E | | 北からにごりの流れあり | |
| 6:03:30 | 15:03:30 | 2034.6 | 27 | - | 16.0915 | N | 140 | - | 59.6815 | E | 1895.3 | 27 | - | 16.0941 | N | 140 | - | 59.642 | E | | 岩視認 | |
| 6:05:48 | 15:05:48 | 2034.9 | 27 | - | 16.0972 | N | 140 | - | 59.6817 | E | 1895.5 | 27 | - | 16.0913 | N | 140 | - | 59.6522 | E | | 岩多い | |
| 6:06:43 | 15:06:43 | 2035.9 | 27 | - | 16.0975 | N | 140 | - | 59.6861 | E | 1895.5 | 27 | - | 16.093 | N | 140 | - | 59.6527 | E | | プラゴミ(袋)視認 | |
| 6:10:01 | 15:10:01 | 2034.9 | 27 | - | 16.0993 | N | 140 | - | 59.6898 | E | 1894.5 | 27 | - | 16.097 | N | 140 | - | 59.665 | E | | fish | |
| 6:10:20 | 15:10:20 | 2035.1 | 27 | - | 16.0986 | N | 140 | - | 59.6891 | E | 1895.1 | 27 | - | 16.0936 | N | 140 | - | 59.6677 | E | | can? | |
| 6:15:25 | 15:15:25 | 2038.3 | 27 | - | 16.0964 | N | 140 | - | 59.7068 | E | 1894.5 | 27 | - | 16.1011 | N | 140 | - | 59.6833 | E | | ソナーにOBM？岩？の影 | |
| 6:16:55 | 15:16:55 | 2039.4 | 27 | - | 16.1032 | N | 140 | - | 59.7228 | E | 1895.9 | 27 | - | 16.0987 | N | 140 | - | 59.6883 | E | | 魚 | |
| 6:17:31 | 15:17:31 | 2039.2 | 27 | - | 16.1042 | N | 140 | - | 59.7152 | E | 1896 | 27 | - | 16.0985 | N | 140 | - | 59.6899 | E | | えび | |
| 6:19:50 | 15:19:50 | 2039.4 | 27 | - | 16.0953 | N | 140 | - | 59.7185 | E | 1896.1 | 27 | - | 16.1042 | N | 140 | - | 59.691 | E | | 岩だった | |
| 6:26:01 | 15:26:01 | 2042.4 | 27 | - | 16.1 | N | 140 | - | 59.7369 | E | 1895.7 | 27 | - | 16.0963 | N | 140 | - | 59.7046 | E | | 魚 | |
| 6:27:22 | 15:27:22 | 2043.7 | 27 | - | 16.101 | N | 140 | - | 59.7408 | E | 1895.5 | 27 | - | 16.0964 | N | 140 | - | 59.7071 | E | | 魚 | |
| 6:28:30 | 15:28:30 | 2043.7 | 27 | - | 16.0983 | N | 140 | - | 59.7492 | E | 1895.8 | 27 | - | 16.0948 | N | 140 | - | 59.7123 | E | | 魚 | |
| 6:33:10 | 15:33:10 | 2043.9 | 27 | - | 16.0984 | N | 140 | - | 59.749 | E | 1894.9 | 27 | - | 16.0989 | N | 140 | - | 59.7244 | E | | 魚 | |
| 6:34:07 | 15:34:07 | 2043.6 | 27 | - | 16.1007 | N | 140 | - | 59.7475 | E | 1898.4 | 27 | - | 16.1005 | N | 140 | - | 59.7202 | E | | 岩だった | |
| 6:34:42 | 15:34:42 | 2045.7 | 27 | - | 16.099 | N | 140 | - | 59.7483 | E | 1901.9 | 27 | - | 16.1005 | N | 140 | - | 59.715 | E | | 魚、くらげ | |
| 6:36:26 | 15:36:26 | 2047.2 | 27 | - | 16.1007 | N | 140 | - | 59.7656 | E | 1905.7 | 27 | - | 16.0995 | N | 140 | - | 59.7247 | E | | 魚 | |
| 6:38:58 | 15:38:58 | 2047.5 | 27 | - | 16.0987 | N | 140 | - | 59.7801 | E | 1906 | 27 | - | 16.0988 | N | 140 | - | 59.732 | E | | 魚 | |
| 6:40:52 | 15:40:52 | 2048.2 | 27 | - | 16.0997 | N | 140 | - | 59.7824 | E | 1905.3 | 27 | - | 16.098 | N | 140 | - | 59.7367 | E | | くらげ？？ | |
| 6:44:45 | 15:44:45 | 2048.8 | 27 | - | 16.0992 | N | 140 | - | 59.7834 | E | 1905.6 | 27 | - | 16.0973 | N | 140 | - | 59.7478 | E | | スキャン完了、見つからないので諦め | |
| 6:45:14 | 15:45:14 | 2047.3 | 27 | - | 16.098 | N | 140 | - | 59.777 | E | 1906.3 | 27 | - | 16.1021 | N | 140 | - | 59.7416 | E | | 作業終了 | |
| 6:45:32 | 15:45:32 | 2047.8 | 27 | - | 16.1044 | N | 140 | - | 59.7746 | E | 1906.4 | 27 | - | 16.1038 | N | 140 | - | 59.7407 | E | | 離底 | |

## <Dive 137>

**Dive Log of KM-ROV Dive # 137** — **Area Name; NS15, Nishino-shima** — **2020/12/14**

| Time (UTC) | Time (Local) | Vehicle Dep.(m) | Vehicle Pos. Lat | Vehicle Pos. Lon | TMS Dep.(m) | TMS Pos. Lat | TMS Pos. Lon | Vehicle Alt(m) | Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 0:27:49 | 9:27:49 | 2007.1 | 27 - 12.0222 N | 140 - 52.6714 E | 1015.1 | 27 - 12.0228 N | 140 - 52.3792 E | | | |
| 0:28:21 | 9:28:21 | 2007.1 | 27 - 12.0222 N | 140 - 52.6714 E | 1015.1 | 27 - 12.0228 N | 140 - 52.3792 E | | | |
| 0:31:06 | 9:31:06 | 2007.1 | 27 - 12.0222 N | 140 - 52.6714 E | 1015.1 | 27 - 12.0228 N | 140 - 52.3792 E | | ROVつり上げ | |
| 0:35:09 | 9:35:09 | 2007.1 | 27 - 12.0222 N | 140 - 52.6714 E | 1015.1 | 27 - 12.0228 N | 140 - 52.3792 E | | 着水 | |
| 0:42:15 | 9:42:15 | 116.9 | 27 - 11.771 N | 140 - 52.3172 E | 0 | 27 - 12.0228 N | 140 - 52.3792 E | | | |
| 0:42:33 | 9:42:33 | 166.6 | 27 - 11.7879 N | 140 - 52.3574 E | 0 | 27 - 12.0228 N | 140 - 52.3792 E | | | |
| 0:46:40 | 9:46:40 | 344.5 | 27 - 11.7806 N | 140 - 52.3596 E | 341.8 | 27 - 11.7812 N | 140 - 52.3602 E | | クラゲ | |
| 0:46:54 | 9:46:54 | 356.2 | 27 - 11.7805 N | 140 - 52.3584 E | 353.4 | 27 - 11.7808 N | 140 - 52.3593 E | | | |
| 0:49:36 | 9:49:36 | 471.1 | 27 - 11.7869 N | 140 - 52.3516 E | 468.3 | 27 - 11.7865 N | 140 - 52.353 E | | 魚 | |
| 0:50:13 | 9:50:13 | 496.5 | 27 - 11.7879 N | 140 - 52.3463 E | 493.6 | 27 - 11.7877 N | 140 - 52.3474 E | | appendicleria | |
| 0:52:17 | 9:52:17 | 585.1 | 27 - 11.7932 N | 140 - 52.3434 E | 582.3 | 27 - 11.7917 N | 140 - 52.3437 E | | sternoptyx | |
| 0:57:51 | 9:57:51 | 823.6 | 27 - 11.7854 N | 140 - 52.371 E | 820.7 | 27 - 11.7854 N | 140 - 52.3701 E | | physonectae | |
| 1:01:54 | 10:01:54 | 843.8 | 27 - 11.7848 N | 140 - 52.3696 E | 0 | 27 - 11.7848 N | 140 - 52.3685 E | | TMS離脱 | |
| 1:03:54 | 10:03:54 | 903.2 | 27 - 11.7771 N | 140 - 52.3583 E | 840.5 | 27 - 11.7817 N | 140 - 52.3625 E | | physonectae | |
| 1:06:07 | 10:06:07 | 986.7 | 27 - 11.779 N | 140 - 52.3555 E | 840.4 | 27 - 11.7844 N | 140 - 52.3628 E | | sea floor | |
| 1:17:09 | 10:17:09 | 989.9 | 27 - 11.7888 N | 140 - 52.3832 E | 840.1 | 27 - 11.7859 N | 140 - 52.3629 E | | close up of sea floor | |
| 1:24:01 | 10:24:01 | 988.1 | 27 - 11.7976 N | 140 - 52.4111 E | 839.7 | 27 - 11.7868 N | 140 - 52.3645 E | | oikopleura | |
| 1:29:19 | 10:29:19 | 988.1 | 27 - 11.7976 N | 140 - 52.412 E | 839.3 | 27 - 11.7922 N | 140 - 52.3789 E | | shark | |
| 1:34:12 | 10:34:12 | 986.6 | 27 - 11.7998 N | 140 - 52.4303 E | 839.7 | 27 - 11.7971 N | 140 - 52.3948 E | | fish | |
| 1:37:40 | 10:37:40 | 987 | 27 - 11.8002 N | 140 - 52.4288 E | 839.8 | 27 - 11.7995 N | 140 - 52.3983 E | | 白い岩？ | |
| 1:43:23 | 10:43:23 | 991.8 | 27 - 11.7762 N | 140 - 52.3872 E | 849.8 | 27 - 11.7988 N | 140 - 52.3998 E | | 赤ちょうちんクラゲ？ | |
| 1:44:18 | 10:44:18 | 992.9 | 27 - 11.7719 N | 140 - 52.3771 E | 852.1 | 27 - 11.7964 N | 140 - 52.3978 E | | 魚 | |
| 1:48:01 | 10:48:01 | 1000.6 | 27 - 11.7517 N | 140 - 52.3408 E | 860.6 | 27 - 11.7836 N | 140 - 52.3858 E | | 目標地点到達 | |
| 1:52:20 | 10:52:20 | 1000.2 | 27 - 11.7515 N | 140 - 52.3402 E | 860.2 | 27 - 11.7662 N | 140 - 52.3679 E | | えび、さがな | |
| 1:52:49 | 10:52:49 | 1000.5 | 27 - 11.7528 N | 140 - 52.3401 E | 860.3 | 27 - 11.7646 N | 140 - 52.3654 E | | ソナーの反応に向かってみる | |
| 1:55:00 | 10:55:00 | 999.1 | 27 - 11.7595 N | 140 - 52.3391 E | 859.7 | 27 - 11.7592 N | 140 - 52.3594 E | | 着底 | |
| 1:55:31 | 10:55:31 | 1000.2 | 27 - 11.7595 N | 140 - 52.3382 E | 859.5 | 27 - 11.758 N | 140 - 52.3578 E | | 海底(底質)の観察 | |
| 1:56:33 | 10:56:33 | 1001 | 27 - 11.7587 N | 140 - 52.3401 E | 859.8 | 27 - 11.7573 N | 140 - 52.3563 E | | まにぴ入るのはつま先だけ(5cmくらい)、すぐ硬い | |
| 1:57:19 | 10:57:19 | 1000.2 | 27 - 11.7589 N | 140 - 52.3392 E | 859.5 | 27 - 11.7585 N | 140 - 52.3554 E | | 泥岩掘りつぶした | |
| 1:59:14 | 10:59:14 | 1000.2 | 27 - 11.7595 N | 140 - 52.3408 E | 859.3 | 27 - 11.7569 N | 140 - 52.3533 E | | 岩採取 | |
| 2:01:14 | 11:01:14 | 1000.4 | 27 - 11.7586 N | 140 - 52.3394 E | 858.7 | 27 - 11.7563 N | 140 - 52.3499 E | | 航走再開 | |
| 2:02:41 | 11:02:41 | 998.2 | 27 - 11.7642 N | 140 - 52.3388 E | 858.6 | 27 - 11.7557 N | 140 - 52.3481 E | | くらげ | |
| 2:03:15 | 11:03:15 | 997.4 | 27 - 11.7664 N | 140 - 52.3415 E | 858.5 | 27 - 11.7561 N | 140 - 52.3473 E | | 反応は岩だった | |
| 2:05:27 | 11:05:27 | 999 | 27 - 11.7595 N | 140 - 52.3392 E | 858.7 | 27 - 11.756 N | 140 - 52.3466 E | | えび、 | |
| 2:06:36 | 11:06:36 | 1000.4 | 27 - 11.75 N | 140 - 52.3393 E | 858.4 | 27 - 11.7563 N | 140 - 52.3451 E | | 移動してスキャン | |
| 2:09:40 | 11:09:40 | 1002.7 | 27 - 11.744 N | 140 - 52.3245 E | 858.2 | 27 - 11.7555 N | 140 - 52.3452 E | | 反応なし、また移動 | |
| 2:15:04 | 11:15:04 | 1006.1 | 27 - 11.7365 N | 140 - 52.3144 E | 868.1 | 27 - 11.754 N | 140 - 52.3408 E | | スキャン | |
| 2:27:13 | 11:27:13 | 1009.5 | 27 - 11.7226 N | 140 - 52.2852 E | 867.9 | 27 - 11.7416 N | 140 - 52.3133 E | | 反応なし、航走再開 | |
| 2:28:54 | 11:28:54 | 1011.4 | 27 - 11.7138 N | 140 - 52.2699 E | 867.8 | 27 - 11.7402 N | 140 - 52.309 E | | ヒカリボヤ | |
| 2:33:44 | 11:33:44 | 1013.4 | 27 - 11.7106 N | 140 - 52.2604 E | 869 | 27 - 11.7324 N | 140 - 52.2944 E | | スキャン | |
| 2:47:24 | 11:47:24 | 1023.1 | 27 - 11.6805 N | 140 - 52.2088 E | 877.2 | 27 - 11.7088 N | 140 - 52.2487 E | | スキャン | |
| 2:50:09 | 11:50:09 | 1023.3 | 27 - 11.6815 N | 140 - 52.2079 E | 878.6 | 27 - 11.7075 N | 140 - 52.2432 E | | 反応なし、回収作業終了 | |
| 2:50:30 | 11:50:30 | 1023.5 | 27 - 11.6818 N | 140 - 52.2088 E | 878.9 | 27 - 11.7064 N | 140 - 52.2425 E | | 着底 | |
| 2:55:12 | 11:55:12 | 1022.6 | 27 - 11.6782 N | 140 - 52.2096 E | 877.9 | 27 - 11.6948 N | 140 - 52.2224 E | | 底質調査作業開始 | |
| 3:00:46 | 12:00:46 | 1023 | 27 - 11.6809 N | 140 - 52.2076 E | 875.3 | 27 - 11.6912 N | 140 - 52.2083 E | | 岩回収 | |
| 3:03:05 | 12:03:05 | 1023.5 | 27 - 11.682 N | 140 - 52.2082 E | 874.8 | 27 - 11.689 N | 140 - 52.2041 E | | 岩回収 | |
| 3:04:23 | 12:04:23 | 1023.8 | 27 - 11.6828 N | 140 - 52.206 E | 874.7 | 27 - 11.6892 N | 140 - 52.2013 E | | 作業終了 | |
| 3:06:07 | 12:06:07 | 1023.6 | 27 - 11.6818 N | 140 - 52.2063 E | 874.8 | 27 - 11.6899 N | 140 - 52.2011 E | | 離底 | |

## <Dive 138>

**Dive Log of KM-ROV Dive # 138** — **2020/12/18** — **Area Name; Myojin Knoll**

| Time (UTC) | Time (Local) | Vehicle Dep.(m) | Vehicle Pos. Lat | | Vehicle Pos. Lon | | TMS Dep.(m) | TMS Pos. Lat | | TMS Pos. Lon | | Vehicle Alt(m) | Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23:29:40 | 8:29:40 | 2005.7 | 32 - 6.5017 | N | 139 - 52.3255 | E | 1014.7 | 32 - 6.5024 | N | 139 - 52.0191 | E | | 着水 | |
| 23:38:37 | 8:38:37 | 231.2 | 32 - 6.3452 | N | 139 - 52.045 | E | 0 | 32 - 6.5024 | N | 139 - 52.0191 | E | | 下降中 | |
| 23:39:42 | 8:39:42 | 279.9 | 32 - 6.3479 | N | 139 - 52.0462 | E | 0 | 32 - 6.5024 | N | 139 - 52.0191 | E | | くらげ | |
| 23:43:43 | 8:43:43 | 450.2 | 32 - 6.3342 | N | 139 - 52.0378 | E | 447.3 | 32 - 6.3344 | N | 139 - 52.0382 | E | | ステレオGoProライトOFF | |
| 23:46:53 | 8:46:53 | 587.5 | 32 - 6.3352 | N | 139 - 52.0485 | E | 584.7 | 32 - 6.3356 | N | 139 - 52.0486 | E | | なにかの生物 | |
| 23:49:04 | 8:49:04 | 678.5 | 32 - 6.336 | N | 139 - 52.0541 | E | 675.6 | 32 - 6.3355 | N | 139 - 52.0548 | E | | きよひめくらげ | |
| 23:53:48 | 8:53:48 | 878.2 | 32 - 6.3351 | N | 139 - 52.0465 | E | 875.2 | 32 - 6.3348 | N | 139 - 52.047 | E | | むらさきかもめウくらげ | |
| 23:54:44 | 8:54:44 | 917.3 | 32 - 6.3368 | N | 139 - 52.0438 | E | 914.6 | 32 - 6.336 | N | 139 - 52.045 | E | | えび？ | |
| 23:56:27 | 8:56:27 | 990.2 | 32 - 6.3384 | N | 139 - 52.0445 | E | 988 | 32 - 6.3377 | N | 139 - 52.0451 | E | | べにまんじゅうウ | |
| 23:56:59 | 8:56:59 | 1012.8 | 32 - 6.336 | N | 139 - 52.0422 | E | 1010.6 | 32 - 6.3371 | N | 139 - 52.0443 | E | | くらげ | |
| 0:03:30 | 9:03:30 | 1243.1 | 32 - 6.3406 | N | 139 - 52.0458 | E | 1239.9 | 32 - 6.3391 | N | 139 - 52.0436 | E | | アンビリカルケーブル修正 | |
| 0:05:36 | 9:05:36 | 1243 | 32 - 6.3416 | N | 139 - 52.0454 | E | 1239.7 | 32 - 6.3419 | N | 139 - 52.0479 | E | | 離脱 | |
| 0:09:41 | 9:09:41 | 1322.7 | 32 - 6.3433 | N | 139 - 52.0541 | E | 1239 | 32 - 6.3453 | N | 139 - 52.0518 | E | | むらさきかもみウくらげ | |
| 0:11:39 | 9:11:39 | 1363.1 | 32 - 6.3472 | N | 139 - 52.0556 | E | 1239.6 | 32 - 6.3457 | N | 139 - 52.0483 | E | | 海底視認 | |
| 0:12:17 | 9:12:17 | 1366.5 | 32 - 6.3436 | N | 139 - 52.0498 | E | 1239.1 | 32 - 6.345 | N | 139 - 52.0492 | E | | 着底、底質泥 | |
| 0:14:45 | 9:14:45 | 1367.2 | 32 - 6.3441 | N | 139 - 52.0534 | E | 1239.4 | 32 - 6.3407 | N | 139 - 52.0482 | E | | イベント1へ航走開始 | |
| 0:16:31 | 9:16:31 | 1362.5 | 32 - 6.3393 | N | 139 - 52.0506 | E | 1239.8 | 32 - 6.3445 | N | 139 - 52.0453 | E | | 海底に黄色い斑点 | |
| 0:17:02 | 9:17:02 | 1361.7 | 32 - 6.3339 | N | 139 - 52.0557 | E | 1239.6 | 32 - 6.3418 | N | 139 - 52.0475 | E | | 岩山 | |
| 0:18:23 | 9:18:23 | 1353.1 | 32 - 6.327 | N | 139 - 52.0611 | E | 1239.7 | 32 - 6.3422 | N | 139 - 52.0482 | E | | くろとがヂギス | |
| 0:18:56 | 9:18:56 | 1351.6 | 32 - 6.3236 | N | 139 - 52.0639 | E | 1239.8 | 32 - 6.3401 | N | 139 - 52.0488 | E | | 砂地に岩 | |
| 0:19:35 | 9:19:35 | 1352 | 32 - 6.3239 | N | 139 - 52.0609 | E | 1239.7 | 32 - 6.3432 | N | 139 - 52.0461 | E | | ハイパーのシンカー | |
| 0:21:46 | 9:21:46 | 1355.9 | 32 - 6.3262 | N | 139 - 52.0677 | E | 1239.5 | 32 - 6.3423 | N | 139 - 52.0472 | E | | 着底 | |
| 0:22:26 | 9:22:26 | 1356.4 | 32 - 6.3252 | N | 139 - 52.067 | E | 1239.6 | 32 - 6.341 | N | 139 - 52.0485 | E | | 右手で海底を剥してみる | |
| 0:23:00 | 9:23:00 | 1356.3 | 32 - 6.3264 | N | 139 - 52.0651 | E | 1239.7 | 32 - 6.3412 | N | 139 - 52.05 | E | | ささる、もうちょっと前進したところでやる | |
| 0:25:19 | 9:25:19 | 1353.7 | 32 - 6.3244 | N | 139 - 52.0728 | E | 1239.4 | 32 - 6.3417 | N | 139 - 52.0517 | E | | 着底して態勢をととのえる | |
| 0:27:55 | 9:27:55 | 1353.9 | 32 - 6.324 | N | 139 - 52.0696 | E | 1239.7 | 32 - 6.3406 | N | 139 - 52.0521 | E | | 右手で流速計をつかむ | |
| 0:28:41 | 9:28:41 | 1353.6 | 32 - 6.3239 | N | 139 - 52.0749 | E | 1239.2 | 32 - 6.3433 | N | 139 - 52.0567 | E | | もちあげる | |
| 0:30:39 | 9:30:39 | 1353.7 | 32 - 6.3227 | N | 139 - 52.0696 | E | 1240 | 32 - 6.3406 | N | 139 - 52.0537 | E | | 流速計をおいた、倒れた | |
| 0:31:36 | 9:31:36 | 1354.4 | 32 - 6.3226 | N | 139 - 52.0714 | E | 1239.5 | 32 - 6.3406 | N | 139 - 52.0548 | E | | 流速計を持ち直す | |
| 0:32:34 | 9:32:34 | 1353.9 | 32 - 6.3244 | N | 139 - 52.073 | E | 1239.4 | 32 - 6.3431 | N | 139 - 52.0561 | E | | もったまますこし前進する | |
| 0:33:26 | 9:33:26 | 1352.6 | 32 - 6.3227 | N | 139 - 52.0695 | E | 1239.4 | 32 - 6.3429 | N | 139 - 52.0565 | E | | 前進 | |
| 0:33:43 | 9:33:43 | 1352.2 | 32 - 6.3226 | N | 139 - 52.0739 | E | 1239.4 | 32 - 6.3422 | N | 139 - 52.055 | E | | ハイパーのシンカー視認 | |
| 0:38:51 | 9:38:51 | 1348.6 | 32 - 6.3182 | N | 139 - 52.0741 | E | 1220.6 | 32 - 6.3411 | N | 139 - 52.052 | E | | 位置調整 | |
| 0:40:35 | 9:40:35 | 1349.7 | 32 - 6.3189 | N | 139 - 52.0744 | E | 1220.2 | 32 - 6.3434 | N | 139 - 52.0515 | E | | 流速計をおこうとする | |
| 0:41:47 | 9:41:47 | 1349.6 | 32 - 6.3178 | N | 139 - 52.0703 | E | 1220.4 | 32 - 6.3397 | N | 139 - 52.0533 | E | | 仮置き | |
| 0:43:35 | 9:43:35 | 1349.5 | 32 - 6.3213 | N | 139 - 52.0739 | E | 1220.4 | 32 - 6.3437 | N | 139 - 52.0533 | E | | 左手で待つ | |
| 0:45:39 | 9:45:39 | 1349.5 | 32 - 6.3173 | N | 139 - 52.0779 | E | 1220.2 | 32 - 6.3426 | N | 139 - 52.0542 | E | | 左手で海底に置く | |
| 0:47:16 | 9:47:16 | 1349.9 | 32 - 6.3187 | N | 139 - 52.0755 | E | 1220.4 | 32 - 6.3401 | N | 139 - 52.0537 | E | | 左手で流速計の体勢を整える | |
| 0:49:58 | 9:49:58 | 1349.9 | 32 - 6.3207 | N | 139 - 52.0742 | E | 1220.3 | 32 - 6.3419 | N | 139 - 52.0548 | E | | 流速計設置完了(1351m) | |
| 0:50:16 | 9:50:16 | 1349.6 | 32 - 6.3167 | N | 139 - 52.0715 | E | 1220.9 | 32 - 6.3391 | N | 139 - 52.051 | E | | ホーマーID34通信確認、通信取れる | |
| 0:51:09 | 9:51:09 | 1349.2 | 32 - 6.3178 | N | 139 - 52.0769 | E | 1220.1 | 32 - 6.3421 | N | 139 - 52.0549 | E | | イベントマーカー：流速計設置 | |
| 0:51:15 | 9:51:15 | 1349.9 | 32 - 6.3212 | N | 139 - 52.0741 | E | 1220.9 | 32 - 6.3463 | N | 139 - 52.0509 | E | | コア開始 | |
| 0:52:13 | 9:52:13 | 1348.8 | 32 - 6.3181 | N | 139 - 52.0785 | E | 1220 | 32 - 6.344 | N | 139 - 52.0547 | E | | コア青1探る | |
| 0:53:19 | 9:53:19 | 1349.4 | 32 - 6.3216 | N | 139 - 52.0777 | E | 1220.4 | 32 - 6.3446 | N | 139 - 52.0559 | E | | ピークル右前前進（流速計設置で底泥乱れたため） | |
| 0:54:43 | 9:54:43 | 1349.5 | 32 - 6.3208 | N | 139 - 52.0729 | E | 1220.9 | 32 - 6.3423 | N | 139 - 52.0522 | E | | ピークル着底、濁り明け待ち | |
| 0:57:17 | 9:57:17 | 1347.4 | 32 - 6.3192 | N | 139 - 52.074 | E | 1220.6 | 32 - 6.3428 | N | 139 - 52.0517 | E | | ピークル浮く、コア青1落とす | |
| 0:58:50 | 9:58:50 | 1350 | 32 - 6.3172 | N | 139 - 52.0723 | E | 1221 | 32 - 6.3402 | N | 139 - 52.0527 | E | | コア青1拾う | |
| 1:00:05 | 10:00:05 | 1350.1 | 32 - 6.3158 | N | 139 - 52.0731 | E | 1220.6 | 32 - 6.3377 | N | 139 - 52.0545 | E | | コア青1いったんしまう | |
| 1:02:27 | 10:02:27 | 1346.9 | 32 - 6.3155 | N | 139 - 52.0772 | E | 1220.3 | 32 - 6.3413 | N | 139 - 52.0559 | E | | 岩みたいの視認 | |
| 1:03:33 | 10:03:33 | 1346.3 | 32 - 6.3113 | N | 139 - 52.0745 | E | 1220.1 | 32 - 6.34 | N | 139 - 52.0565 | E | | デッドチムニー？ | |
| 1:04:29 | 10:04:29 | 1346.7 | 32 - 6.3143 | N | 139 - 52.0704 | E | 1220.7 | 32 - 6.3392 | N | 139 - 52.0524 | E | | コアサンプリング開始 | |
| 1:04:46 | 10:04:46 | 1346.9 | 32 - 6.3157 | N | 139 - 52.0754 | E | 1220.5 | 32 - 6.3422 | N | 139 - 52.0544 | E | | 青1番(アクリル) | |
| 1:05:59 | 10:05:59 | 1347 | 32 - 6.3173 | N | 139 - 52.0752 | E | 1220.2 | 32 - 6.3434 | N | 139 - 52.0536 | E | | 青1サンプリング開始、いったん挿したまま | |
| 1:07:19 | 10:07:19 | 1346.6 | 32 - 6.3131 | N | 139 - 52.073 | E | 1220.4 | 32 - 6.3406 | N | 139 - 52.0558 | E | | 赤1コアサンプリング開始、いったん挿したまま | |
| 1:08:50 | 10:08:50 | 1346.6 | 32 - 6.3154 | N | 139 - 52.0709 | E | 1220.6 | 32 - 6.342 | N | 139 - 52.0496 | E | | 赤2コアサンプリング開始、いったん挿したまま | |
| 1:10:33 | 10:10:33 | 1346.8 | 32 - 6.3171 | N | 139 - 52.0726 | E | 1220.3 | 32 - 6.3445 | N | 139 - 52.0539 | E | | 赤3コアサンプリング開始、いったん挿したまま | |
| 1:12:21 | 10:12:21 | 1346.6 | 32 - 6.3157 | N | 139 - 52.0726 | E | 1220.4 | 32 - 6.3435 | N | 139 - 52.0522 | E | | 青1番コア採集 | |
| 1:14:29 | 10:14:29 | 1345.9 | 32 - 6.3175 | N | 139 - 52.0732 | E | 1220.2 | 32 - 6.3473 | N | 139 - 52.053 | E | | 赤1番コア採集 | |
| 1:16:08 | 10:16:08 | 1346.3 | 32 - 6.3156 | N | 139 - 52.0733 | E | 1220.3 | 32 - 6.3423 | N | 139 - 52.0529 | E | | 赤3番コア採集 | |
| 1:18:18 | 10:18:18 | 1346.9 | 32 - 6.3148 | N | 139 - 52.0725 | E | 1220.5 | 32 - 6.3418 | N | 139 - 52.0543 | E | | 赤2番コア採集 | |
| 1:20:16 | 10:20:16 | 1346.8 | 32 - 6.3154 | N | 139 - 52.0723 | E | 1220.7 | 32 - 6.3418 | N | 139 - 52.0512 | E | | デッドチムニー観察 | |
| 1:20:50 | 10:20:50 | 1347.2 | 32 - 6.3137 | N | 139 - 52.0746 | E | 1220.4 | 32 - 6.3415 | N | 139 - 52.0562 | E | | コシオリエビ、ソフトコーラルなど | |
| 1:22:32 | 10:22:32 | 1346.3 | 32 - 6.3167 | N | 139 - 52.075 | E | 1220.5 | 32 - 6.3489 | N | 139 - 52.0489 | E | | デッドチムー撮影 | |
| 1:22:46 | 10:22:46 | 1347.4 | 32 - 6.3186 | N | 139 - 52.0726 | E | 0 | 32 - 6.3433 | N | 139 - 52.0532 | E | | 航走開始 | |
| 1:25:28 | 10:25:28 | 1344.3 | 32 - 6.3158 | N | 139 - 52.0747 | E | 1220.1 | 32 - 6.3422 | N | 139 - 52.0569 | E | | Goproカメラの泥取り | |
| 1:26:35 | 10:26:35 | 1344 | 32 - 6.3166 | N | 139 - 52.0753 | E | 1213 | 32 - 6.3422 | N | 139 - 52.058 | E | | Head145、イベントマーク2に向け航走開始 | |
| 1:28:04 | 10:28:04 | 1342.8 | 32 - 6.3143 | N | 139 - 52.0804 | E | 1210.4 | 32 - 6.34 | N | 139 - 52.0569 | E | | イソギンチャク視認 | |
| 1:30:02 | 10:30:02 | 1334.1 | 32 - 6.3063 | N | 139 - 52.0892 | E | 1200.1 | 32 - 6.3418 | N | 139 - 52.0617 | E | | 海底が岩、割れ目視認 | |
| 1:30:49 | 10:30:49 | 1330.3 | 32 - 6.3007 | N | 139 - 52.0869 | E | 1200.3 | 32 - 6.3383 | N | 139 - 52.0614 | E | | エゾ視認 | |
| 1:30:59 | 10:30:59 | 1330.5 | 32 - 6.3021 | N | 139 - 52.0886 | E | 1200.4 | 32 - 6.3367 | N | 139 - 52.0591 | E | | イソギンチャク視認 | |
| 1:32:57 | 10:32:57 | 1327.2 | 32 - 6.3031 | N | 139 - 52.0901 | E | 1194.9 | 32 - 6.3349 | N | 139 - 52.0761 | E | | 大きなイソギンチャク視認 | |
| 1:33:28 | 10:33:28 | 1325.8 | 32 - 6.3001 | N | 139 - 52.0916 | E | 1192.5 | 32 - 6.3313 | N | 139 - 52.0649 | E | | イソギンチャクいっぱいの岩 | |
| 1:34:12 | 10:34:12 | 1319.7 | 32 - 6.2947 | N | 139 - 52.095 | E | 1190.2 | 32 - 6.3282 | N | 139 - 52.0721 | E | | 底質泥に変化 | |
| 1:35:39 | 10:35:39 | 1317.7 | 32 - 6.2913 | N | 139 - 52.101 | E | 1190.2 | 32 - 6.3247 | N | 139 - 52.0756 | E | | エゾウ | |
| 1:35:54 | 10:35:54 | 1314.5 | 32 - 6.292 | N | 139 - 52.1001 | E | 1190.1 | 32 - 6.3263 | N | 139 - 52.0771 | E | | 底質が岩に変化 | |
| 1:37:42 | 10:37:42 | 1305.4 | 32 - 6.2836 | N | 139 - 52.1029 | E | 1182.5 | 32 - 6.32 | N | 139 - 52.0746 | E | | 変色域、イソギンチャク | |
| 1:38:28 | 10:38:28 | 1302.6 | 32 - 6.278 | N | 139 - 52.1075 | E | 1177.3 | 32 - 6.3155 | N | 139 - 52.0787 | E | | イソギンチャクなど視認 | |
| 1:39:26 | 10:39:26 | 1296.6 | 32 - 6.2753 | N | 139 - 52.1158 | E | 1171.1 | 32 - 6.3135 | N | 139 - 52.08 | E | | クラスとで覆われてるエリア | |
| 1:39:48 | 10:39:48 | 1295.7 | 32 - 6.2731 | N | 139 - 52.1104 | E | 1170.2 | 32 - 6.3122 | N | 139 - 52.0817 | E | | ところどころに白色域視認 | |
| 1:40:50 | 10:40:50 | 1291.3 | 32 - 6.2697 | N | 139 - 52.1147 | E | 1165 | 32 - 6.3077 | N | 139 - 52.0899 | E | | ヒバリガイ、熱水噴出？ | |
| 1:41:51 | 10:41:51 | 1287 | 32 - 6.2674 | N | 139 - 52.114 | E | 1161 | 32 - 6.3044 | N | 139 - 52.0902 | E | | 多くのチムニー群 | |
| 1:43:02 | 10:43:02 | 1282.6 | 32 - 6.262 | N | 139 - 52.1159 | E | 1150.1 | 32 - 6.3006 | N | 139 - 52.0903 | E | | 熱水視認 | |
| 1:44:54 | 10:44:54 | 1273.1 | 32 - 6.2614 | N | 139 - 52.1234 | E | 1149.6 | 32 - 6.2888 | N | 139 - 52.1002 | E | | チムニー、白色域続く | |
| 1:47:16 | 10:47:16 | 1264 | 32 - 6.2529 | N | 139 - 52.1332 | E | 1140.1 | 32 - 6.2799 | N | 139 - 52.1108 | E | | ヤギ | |
| 1:47:55 | 10:47:55 | 1260.3 | 32 - 6.2518 | N | 139 - 52.1312 | E | 1136.5 | 32 - 6.2867 | N | 139 - 52.1185 | E | | イソギンチャク、ヤギなど | |
| 1:48:57 | 10:48:57 | 1255.3 | 32 - 6.249 | N | 139 - 52.136 | E | 1128 | 32 - 6.2748 | N | 139 - 52.1157 | E | | 白色域(バクテリアマットウ) | |
| 1:49:23 | 10:49:23 | 1248.7 | 32 - 6.2412 | N | 139 - 52.1387 | E | 1126.6 | 32 - 6.2721 | N | 139 - 52.117 | E | | 筋状の白色域 | |
| 1:50:05 | 10:50:05 | 1243.3 | 32 - 6.2376 | N | 139 - 52.1425 | E | 1122.7 | 32 - 6.2722 | N | 139 - 52.1169 | E | | 白色域視認 | |
| 1:51:51 | 10:51:51 | 1233.3 | 32 - 6.2295 | N | 139 - 52.1446 | E | 1111.5 | 32 - 6.2664 | N | 139 - 52.1261 | E | | ユノハナガニ | |
| 1:53:46 | 10:53:46 | 1225.1 | 32 - 6.2374 | N | 139 - 52.1526 | E | 1101.7 | 32 - 6.259 | N | 139 - 52.1279 | E | | かご付きマーカー視認 | |
| 1:54:03 | 10:54:03 | 1222.7 | 32 - 6.214 | N | 139 - 52.1534 | E | 1100.8 | 32 - 6.258 | N | 139 - 52.1352 | E | | かご付きマーカー撮影 | |
| 1:54:46 | 10:54:46 | 1224.3 | 32 - 6.2239 | N | 139 - 52.1373 | E | 1100.6 | 32 - 6.2538 | N | 139 - 52.1283 | E | | ヒバリガイ、ハイパーチェーン | |
| 1:58:12 | 10:58:12 | 1224.5 | 32 - 6.2219 | N | 139 - 52.1452 | E | 1101.2 | 32 - 6.242 | N | 139 - 52.1478 | E | | ヒバリガイかご回収設置作業開始 | |
| 2:01:04 | 11:01:04 | 1224.7 | 32 - 6.2205 | N | 139 - 52.1458 | E | 1100.9 | 32 - 6.2416 | N | 139 - 52.1499 | E | | ボックス蓋オープン | |
| 2:02:44 | 11:02:44 | 1224.4 | 32 - 6.221 | N | 139 - 52.1402 | E | 1100.8 | 32 - 6.2372 | N | 139 - 52.1532 | E | | ヒバリガイかご回収(KS20-1 HPD2100) | |
| 2:03:20 | 11:03:20 | 1224.5 | 32 - 6.2226 | N | 139 - 52.15 | E | 1100.2 | 32 - 6.2399 | N | 139 - 52.1546 | E | | サンプルボックス蓋閉じ | |
| 2:04:24 | 11:04:24 | 1224.7 | 32 - 6.2229 | N | 139 - 52.1505 | E | 1100.6 | 32 - 6.2413 | N | 139 - 52.1584 | E | | ヒバリガイかかご設置 | |
| 2:06:17 | 11:06:17 | 1225 | 32 - 6.2283 | N | 139 - 52.1596 | E | 1100.7 | 32 - 6.2457 | N | 139 - 52.161 | E | | 設置ヒバリガイかごクローズアップ | |
| 2:07:31 | 11:07:31 | 1224.3 | 32 - 6.2265 | N | 139 - 52.1488 | E | 1100.6 | 32 - 6.2425 | N | 139 - 52.1538 | E | | 設置場所手前のヒバリガイコロニー | |
| 2:08:11 | 11:08:11 | 1223.5 | 32 - 6.221 | N | 139 - 52.147 | E | 1100.8 | 32 - 6.2415 | N | 139 - 52.1503 | E | | チェーン先端のハナカゴ | |
| 2:12:46 | 11:12:46 | 1225.5 | 32 - 6.2232 | N | 139 - 52.1473 | E | 1101 | 32 - 6.2394 | N | 139 - 52.1535 | E | | ヒバリガイコロニー確認・着底 | |
| 2:13:59 | 11:13:59 | 1225.9 | 32 - 6.2235 | N | 139 - 52.1465 | E | 1100.9 | 32 - 6.2414 | N | 139 - 52.1525 | E | | スラープガン ヒバリガイ採取 | |
| 2:16:29 | 11:16:29 | 1225.9 | 32 - 6.225 | N | 139 - 52.1434 | E | 1101.1 | 32 - 6.2427 | N | 139 - 52.1495 | E | | スラープガン ヒバリガイ採取終了（15個体程度） | |
| 2:20:28 | 11:20:28 | 1224.6 | 32 - 6.2251 | N | 139 - 52.1474 | E | 1100.5 | 32 - 6.2404 | N | 139 - 52.1574 | E | | チムニー表面をスラープガンで吸い取り | |
| 2:23:09 | 11:23:09 | 1224.2 | 32 - 6.2193 | N | 139 - 52.1427 | E | 1100.8 | 32 - 6.2426 | N | 139 - 52.1528 | E | | チムニーの破片採取 | |
| 2:31:14 | 11:31:14 | 1223.9 | 32 - 6.2214 | N | 139 - 52.1482 | E | 1100.7 | 32 - 6.2413 | N | 139 - 52.1532 | E | | チムニーの破片をサンプルボックス(ハ)に回収 | |
| 2:32:26 | 11:32:26 | 1224.8 | 32 - 6.2233 | N | 139 - 52.1481 | E | 1100.8 | 32 - 6.2423 | N | 139 - 52.154 | E | | イベント5に向けて航走開始準備 | |
| 2:36:38 | 11:36:38 | 1222.7 | 32 - 6.2276 | N | 139 - 52.1529 | E | 1100.3 | 32 - 6.2425 | N | 139 - 52.1561 | E | | クロクラゲ | |
| 2:38:09 | 11:38:09 | 1222.5 | 32 - 6.2475 | N | 139 - 52.1543 | E | 1100.6 | 32 - 6.2416 | N | 139 - 52.1526 | E | | クロクラゲ | |
| 2:48:26 | 11:48:26 | 1223.1 | 32 - 6.3068 | N | 139 - 52.1548 | E | 1100.8 | 32 - 6.2688 | N | 139 - 52.1491 | E | | 5パン到着 | |
| 2:54:07 | 11:54:07 | 1241.9 | 32 - 6.3074 | N | 139 - 52.1559 | E | 1119.9 | 32 - 6.2947 | N | 139 - 52.1509 | E | | Hydrozoa | |
| 2:59:14 | 11:59:14 | 1259.7 | 32 - 6.305 | N | 139 - 52.1597 | E | 1119.6 | 32 - 6.302 | N | 139 - 52.1496 | E | | オニハダカ | |
| 3:06:59 | 12:06:59 | 1306.9 | 32 - 6.3074 | N | 139 - 52.1602 | E | 1146.4 | 32 - 6.3024 | N | 139 - 52.1517 | E | | 海底視認、変色域 | |
| 3:07:25 | 12:07:25 | 1307.6 | 32 - 6.3059 | N | 139 - 52.161 | E | 1150.1 | 32 - 6.3011 | N | 139 - 52.153 | E | | 3番へ向けて航走開始 | |
| 3:11:38 | 12:11:38 | 1299.5 | 32 - 6.2994 | N | 139 - 52.1658 | E | 1159.9 | 32 - 6.3008 | N | 139 - 52.1515 | E | | チムニー群観察 | |
| 3:12:49 | 12:12:49 | 1298.5 | 32 - 6.2975 | N | 139 - 52.1657 | E | 1160.1 | 32 - 6.3014 | N | 139 - 52.151 | E | | チムニー先端ズーム | |
| 3:19:33 | 12:19:33 | 1298.1 | 32 - 6.2945 | N | 139 - 52.1661 | E | 1159.7 | 32 - 6.3004 | N | 139 - 52.1511 | E | | チムニー採取 | |
| 3:23:41 | 12:23:41 | 1298.2 | 32 - 6.294 | N | 139 - 52.1652 | E | 1159.5 | 32 - 6.3023 | N | 139 - 52.15 | E | | バスケットにチムニー落とした | |

**Dive Log of**
**KM-ROV Dive # 138**

**2020/12/18**

**Area Name; Myojin Knoll**

| Time (UTC) | Time (Local) | Vehicle Dep.(m) | Vehicle Pos. Lat | Vehicle Pos. Lon | TMS Dep.(m) | TMS Pos. Lat | TMS Pos. Lon | Vehicle Alt(m) | Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 3:24:00 | 12:24:00 | 1297.9 | 32 - 6.2913 N | 139 - 52.1688 E | 1159.3 | 32 - 6.3011 N | 139 - 52.1537 E | | ヘッド調整 | |
| 3:29:31 | 12:29:31 | 1298 | 32 - 6.2927 N | 139 - 52.1666 E | 1159.7 | 32 - 6.3003 N | 139 - 52.1516 E | | チムニー採集トライ中 | |
| 3:32:02 | 12:32:02 | 1298.4 | 32 - 6.292 N | 139 - 52.1675 E | 1159.7 | 32 - 6.3003 N | 139 - 52.152 E | | チムニー採集トライ中 | |
| 3:34:10 | 12:34:10 | 1298.3 | 32 - 6.291 N | 139 - 52.1699 E | 1159.5 | 32 - 6.3002 N | 139 - 52.1531 E | | チムニー掴んだ | |
| 3:35:20 | 12:35:20 | 1297.7 | 32 - 6.2919 N | 139 - 52.1669 E | 1159.4 | 32 - 6.3007 N | 139 - 52.1534 E | | キャプチャ撮影 | |
| 3:37:31 | 12:37:31 | 1297.6 | 32 - 6.293 N | 139 - 52.1664 E | 1160 | 32 - 6.2995 N | 139 - 52.1505 E | | ボックスにチムニー入れた | |
| 3:38:58 | 12:38:58 | 1298 | 32 - 6.293 N | 139 - 52.1665 E | 1159.9 | 32 - 6.3003 N | 139 - 52.1554 E | | 落したチムニー拾ったがボックス内で砕いた | |
| 3:46:18 | 12:46:18 | 1297.2 | 32 - 6.2917 N | 139 - 52.1703 E | 1159.6 | 32 - 6.3019 N | 139 - 52.1616 E | | チムニー破壊 | |
| 3:46:23 | 12:46:23 | 1297.5 | 32 - 6.2928 N | 139 - 52.1625 E | 1159.9 | 32 - 6.3006 N | 139 - 52.1567 E | | ニスキン採水 | |
| 3:47:23 | 12:47:23 | 1298.4 | 32 - 6.2999 N | 139 - 52.1519 E | 1159.8 | 32 - 6.3049 N | 139 - 52.1508 E | | 2番に向け航走開始 | |
| 3:51:32 | 12:51:32 | 1290.5 | 32 - 6.2812 N | 139 - 52.1617 E | 1159.5 | 32 - 6.2989 N | 139 - 52.1566 E | | CROSSOTA | |
| 3:56:47 | 12:56:47 | 1274.7 | 32 - 6.2637 N | 139 - 52.1469 E | 1158.9 | 32 - 6.2807 N | 139 - 52.1589 E | | イソギンチャクだらけ | |
| 4:00:32 | 13:00:32 | 1255.5 | 32 - 6.2527 N | 139 - 52.1415 E | 1139.6 | 32 - 6.2635 N | 139 - 52.1543 E | | ツコイワシ | |
| 4:02:11 | 13:02:11 | 1245.2 | 32 - 6.2481 N | 139 - 52.1458 E | 1131 | 32 - 6.2525 N | 139 - 52.1546 E | | JUJU | |
| 4:02:57 | 13:02:57 | 1242.8 | 32 - 6.2457 N | 139 - 52.1457 E | 1125.3 | 32 - 6.2506 N | 139 - 52.1457 E | | お玉坊や | |
| 4:05:42 | 13:05:42 | 1231.2 | 32 - 6.2292 N | 139 - 52.1465 E | 1098.5 | 32 - 6.2386 N | 139 - 52.1597 E | | ヒバリガイ群集視認 | |
| 4:06:42 | 13:06:42 | 1230.6 | 32 - 6.229 N | 139 - 52.1454 E | 1098.4 | 32 - 6.2378 N | 139 - 52.1567 E | | MUNNOPSIDAE | |
| 4:08:14 | 13:08:14 | 1227.3 | 32 - 6.2271 N | 139 - 52.1503 E | 1097.5 | 32 - 6.236 N | 139 - 52.1576 E | | ヤムシ | |
| 4:08:40 | 13:08:40 | 1225.8 | 32 - 6.2257 N | 139 - 52.1522 E | 1097.5 | 32 - 6.2271 N | 139 - 52.1576 E | | 2番マーカー視認 | |
| 4:11:34 | 13:11:34 | 1223.2 | 32 - 6.2202 N | 139 - 52.142 E | 1097.9 | 32 - 6.2272 N | 139 - 52.1519 E | | 大明神へ向け出発 | |
| 4:14:38 | 13:14:38 | 1247.1 | 32 - 6.2175 N | 139 - 52.1229 E | 1098.9 | 32 - 6.2191 N | 139 - 52.1422 E | | イベントマーク7(6番北30m)へ向け航走 | |
| 4:26:00 | 13:26:00 | 1262 | 32 - 6.2212 N | 139 - 52.0738 E | 1119.2 | 32 - 6.2275 N | 139 - 52.1099 E | | SQUALOGADUS、バケダラ | |
| 4:27:13 | 13:27:13 | 1264.5 | 32 - 6.227 N | 139 - 52.0715 E | 1119.3 | 32 - 6.2257 N | 139 - 52.1069 E | | CORYPHAENOIDES | |
| 4:36:10 | 13:36:10 | 1264.6 | 32 - 6.2311 N | 139 - 52.0522 E | 1119.7 | 32 - 6.2369 N | 139 - 52.0641 E | | RUDJAKOVIA | |
| 4:36:43 | 13:36:43 | 1263.4 | 32 - 6.2217 N | 139 - 52.0713 E | 1118.8 | 32 - 6.231 N | 139 - 52.0718 E | | CORYPHAENOIDES | |
| 4:37:10 | 13:37:10 | 1263.5 | 32 - 6.2309 N | 139 - 52.0746 E | 1119.8 | 32 - 6.2322 N | 139 - 52.0619 E | | ATOLLA | |
| 4:37:46 | 13:37:46 | 1264.2 | 32 - 6.2273 N | 139 - 52.0587 E | 1119.2 | 32 - 6.2357 N | 139 - 52.0628 E | | Lobata(LLYRIA) | |
| 4:38:57 | 13:38:57 | 1264.1 | 32 - 6.2231 N | 139 - 52.0587 E | 1119.8 | 32 - 6.2353 N | 139 - 52.0593 E | | FISH | |
| 4:39:35 | 13:39:35 | 1264.5 | 32 - 6.2193 N | 139 - 52.0592 E | 1119.6 | 32 - 6.2358 N | 139 - 52.0588 E | | チムニーふもと視認 | |
| 4:40:50 | 13:40:50 | 1263.9 | 32 - 6.2138 N | 139 - 52.0577 E | 1119.2 | 32 - 6.2358 N | 139 - 52.0588 E | | 大明神の壁がはっきり見える | |
| 4:41:27 | 13:41:27 | 1263.7 | 32 - 6.2112 N | 139 - 52.0575 E | 1119.9 | 32 - 6.2339 N | 139 - 52.0568 E | | 大明神えぐれあり | |
| 4:47:05 | 13:47:05 | 1250.1 | 32 - 6.2018 N | 139 - 52.0519 E | 1119.7 | 32 - 6.2494 N | 139 - 52.0531 E | | アクティブチムニー視認 | |
| 4:48:59 | 13:48:59 | 1247 | 32 - 6.2097 N | 139 - 52.0479 E | 1120.2 | 32 - 6.2333 N | 139 - 52.0553 E | | 大明神チムニー頂上視認 | |
| 4:51:47 | 13:51:47 | 1244.2 | 32 - 6.213 N | 139 - 52.0445 E | 1119.7 | 32 - 6.2357 N | 139 - 52.0542 E | | チムニー観察開始 | |
| 4:53:27 | 13:53:27 | 1245.8 | 32 - 6.2452 N | 139 - 52.0335 E | 1119.6 | 32 - 6.2574 N | 139 - 52.0553 E | | チムニー頂上別角度からズーム観察 | |
| 4:55:28 | 13:55:28 | 1247.8 | 32 - 6.2115 N | 139 - 52.0421 E | 1120.3 | 32 - 6.2335 N | 139 - 52.0501 E | | 壁面ひばり目ズーム観察 | |
| 4:56:50 | 13:56:50 | 1247 | 32 - 6.2137 N | 139 - 52.0437 E | 1120 | 32 - 6.237 N | 139 - 52.0513 E | | 熱水ゆらぎ視認 | |
| 5:01:14 | 14:01:14 | 1246.8 | 32 - 6.2074 N | 139 - 52.0521 E | 1119.9 | 32 - 6.2337 N | 139 - 52.0541 E | | Jelly | |
| 5:02:56 | 14:02:56 | 1247.3 | 32 - 6.2111 N | 139 - 52.0535 E | 1119.8 | 32 - 6.2381 N | 139 - 52.0555 E | | チムニー壁面ズーム観察 | |
| 5:04:37 | 14:04:37 | 1244.9 | 32 - 6.209 N | 139 - 52.0556 E | 1119.4 | 32 - 6.2324 N | 139 - 52.0584 E | | マーカーらしきもの視認(違った) | |
| 5:04:57 | 14:04:57 | 1244.4 | 32 - 6.2176 N | 139 - 52.0542 E | 1119.6 | 32 - 6.2379 N | 139 - 52.0564 E | | FISH | |
| 5:08:10 | 14:08:10 | 1244.5 | 32 - 6.2123 N | 139 - 52.0504 E | 1119.4 | 32 - 6.2375 N | 139 - 52.0562 E | | チムニー頂上別角度からズーム観察 | |
| 5:12:20 | 14:12:20 | 1244.2 | 32 - 6.2187 N | 139 - 52.0418 E | 1120 | 32 - 6.2352 N | 139 - 52.0543 E | | 中層観察航走練習 | |
| 5:13:58 | 14:13:58 | 1243.1 | 32 - 6.2209 N | 139 - 52.0486 E | 1120.5 | 32 - 6.2345 N | 139 - 52.0487 E | | 1230mまで上昇開始 | |
| 5:21:38 | 14:21:38 | 1230 | 32 - 6.2338 N | 139 - 52.0622 E | 1094.1 | 32 - 6.2316 N | 139 - 52.0748 E | | Head northで航走開始 | |
| 5:25:41 | 14:25:41 | 1231.8 | 32 - 6.2445 N | 139 - 52.0612 E | 1095.9 | 32 - 6.2371 N | 139 - 52.0553 E | | クラゲ発見 | |
| 5:28:42 | 14:28:42 | 1227.4 | 32 - 6.2459 N | 139 - 52.0588 E | 1096.2 | 32 - 6.2356 N | 139 - 52.0519 E | | クラゲ発見 | |
| 5:30:20 | 14:30:20 | 1226.4 | 32 - 6.2504 N | 139 - 52.0657 E | 1095.6 | 32 - 6.2378 N | 139 - 52.055 E | | クラゲ発見 | |
| 5:36:20 | 14:36:20 | 1225.7 | 32 - 6.2577 N | 139 - 52.0716 E | 1095.6 | 32 - 6.2431 N | 139 - 52.0586 E | | クラゲ眼練習中！ | |
| 5:37:05 | 14:37:05 | 1226.8 | 32 - 6.2587 N | 139 - 52.0715 E | 1096.1 | 32 - 6.2422 N | 139 - 52.0585 E | | クラゲ発見 | |
| 5:37:10 | 14:37:10 | 1227.2 | 32 - 6.2604 N | 139 - 52.0744 E | 1095.6 | 32 - 6.2449 N | 139 - 52.0615 E | | クラゲ発見 | |
| 5:53:55 | 14:53:55 | 1227.4 | 32 - 6.2621 N | 139 - 52.0708 E | 1095.6 | 32 - 6.2496 N | 139 - 52.0647 E | | クラゲ眼練習中！ | |
| 6:00:07 | 15:00:07 | 1227.7 | 32 - 6.2603 N | 139 - 52.0751 E | 1095.8 | 32 - 6.2473 N | 139 - 52.0605 E | | くらげ | |
| 6:01:15 | 15:01:15 | 1227.5 | 32 - 6.2592 N | 139 - 52.0782 E | 1095.7 | 32 - 6.2451 N | 139 - 52.0668 E | | 正面にくらげ | |
| 6:03:22 | 15:03:22 | 1229.2 | 32 - 6.2627 N | 139 - 52.0771 E | 1096.1 | 32 - 6.248 N | 139 - 52.0642 E | | 目標物を正面→違った | |
| 6:05:12 | 15:05:12 | 1229.9 | 32 - 6.2607 N | 139 - 52.0796 E | 1095.9 | 32 - 6.2489 N | 139 - 52.066 E | | くらげを追う | |
| 6:07:44 | 15:07:44 | 1226.9 | 32 - 6.2652 N | 139 - 52.0809 E | 1096 | 32 - 6.2498 N | 139 - 52.0647 E | | くらげを正面にとらえる | |
| 6:10:09 | 15:10:09 | 1226.3 | 32 - 6.2659 N | 139 - 52.0803 E | 1096.1 | 32 - 6.2498 N | 139 - 52.0635 E | | 今日のくらげ練習、終了 | |
| 6:10:40 | 15:10:40 | 1226.1 | 32 - 6.2643 N | 139 - 52.0782 E | 1096.1 | 32 - 6.2511 N | 139 - 52.0665 E | | ホーマーON | |
| 6:11:13 | 15:11:13 | 1236.2 | 32 - 6.2431 N | 139 - 52.0708 E | 1096.1 | 32 - 6.2526 N | 139 - 52.0664 E | | 高度をとったままイベント4へ移動 | |
| 6:20:33 | 15:20:33 | 1265.7 | 32 - 6.3198 N | 139 - 52.0745 E | 1125.6 | 32 - 6.2784 N | 139 - 52.0654 E | | イベントマーク4に到着 | |
| 6:23:43 | 15:23:43 | 1268.1 | 32 - 6.3352 N | 139 - 52.0769 E | 1129.7 | 32 - 6.2992 N | 139 - 52.0652 E | | 左回頭 | |
| 6:26:35 | 15:26:35 | 1269.3 | 32 - 6.3316 N | 139 - 52.0729 E | 1142.2 | 32 - 6.3143 N | 139 - 52.0627 E | | ホーマーまで85m左 | |
| 6:27:30 | 15:27:30 | 1269.5 | 32 - 6.3281 N | 139 - 52.0754 E | 1145.1 | 32 - 6.3159 N | 139 - 52.0633 E | | 左回頭、ピークルヘッドサウスまで | |
| 6:34:40 | 15:34:40 | 1334.6 | 32 - 6.3339 N | 139 - 52.0765 E | 1184.5 | 32 - 6.3424 N | 139 - 52.066 E | | ホーマーまで27m左 | |
| 6:36:06 | 15:36:06 | 1350.2 | 32 - 6.332 N | 139 - 52.0716 E | 1197.3 | 32 - 6.3426 N | 139 - 52.0635 E | | 海底視認 | |
| 6:36:44 | 15:36:44 | 1351.9 | 32 - 6.3295 N | 139 - 52.0731 E | 1199.2 | 32 - 6.34 N | 139 - 52.0635 E | | ヘッド175で航走開始 | |
| 6:37:33 | 15:37:33 | 1352 | 32 - 6.331 N | 139 - 52.0743 E | 1198.9 | 32 - 6.3425 N | 139 - 52.0653 E | | 左側にチムニー | |
| 6:37:51 | 15:37:51 | 1352.3 | 32 - 6.3283 N | 139 - 52.0754 E | 1198.8 | 32 - 6.3423 N | 139 - 52.066 E | | 流速計視認 | |
| 6:39:18 | 15:39:18 | 1350.4 | 32 - 6.3233 N | 139 - 52.0758 E | 1198.3 | 32 - 6.3441 N | 139 - 52.0641 E | | 流速計前に着底 | |
| 6:40:00 | 15:40:00 | 1349.4 | 32 - 6.3135 N | 139 - 52.0746 E | 1199.6 | 32 - 6.3356 N | 139 - 52.0646 E | | 右手を前に突き出す | |
| 6:40:59 | 15:40:59 | 1349.9 | 32 - 6.32 N | 139 - 52.0764 E | 1199.1 | 32 - 6.3398 N | 139 - 52.0635 E | | 流速計を右手で掴む | |
| 6:41:53 | 15:41:53 | 1350.2 | 32 - 6.324 N | 139 - 52.076 E | 1199.1 | 32 - 6.3426 N | 139 - 52.0638 E | | バスケットを出す | |
| 6:43:08 | 15:43:08 | 1350.1 | 32 - 6.3228 N | 139 - 52.0763 E | 1198.8 | 32 - 6.3434 N | 139 - 52.0636 E | | 流速計をバスケットに入れる | |
| 6:44:18 | 15:44:18 | 1349.8 | 32 - 6.32 N | 139 - 52.0777 E | 1199.1 | 32 - 6.3403 N | 139 - 52.0621 E | | バスケットに置いた | |
| 6:44:32 | 15:44:32 | 1350.1 | 32 - 6.3193 N | 139 - 52.0754 E | 1199.2 | 32 - 6.3424 N | 139 - 52.0632 E | | バスケットをしまう | |
| 6:45:13 | 15:45:13 | 1349.7 | 32 - 6.319 N | 139 - 52.0744 E | 1199 | 32 - 6.3399 N | 139 - 52.0624 E | | 流速計を右手で抱える | |
| 6:47:02 | 15:47:02 | 1350.4 | 32 - 6.3229 N | 139 - 52.0721 E | 1199.6 | 32 - 6.3408 N | 139 - 52.0611 E | | 左手はコアの上にのせる | |
| 6:48:27 | 15:48:27 | 1351 | 32 - 6.3246 N | 139 - 52.0746 E | 1198.8 | 32 - 6.3429 N | 139 - 52.0625 E | | 離底 | |
| | | | | | | | | | 以下余白 | |

## <Dive 139>

**Dive Log of KM-ROV Dive # 139** — **Area Name; Sumith Caldera** — **2020/12/21**

| Time (UTC) | Time (Local) | Vehicle Dep.(m) | Vehicle Pos. Lat | Vehicle Pos. Lon | TMS Dep.(m) | TMS Pos. Lat | TMS Pos. Lon | Vehicle Alt(m) | Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 1:57:14 | 10:57:14 | 304.5 | 31 - 28.1718 N | 140 - 4.777 E | 301.3 | 31 - 28.1706 N | 140 - 4.7769 E | | マニピュレーターを使ってカメラのキャリブレーション | |
| 2:01:56 | 11:01:56 | 303.8 | 31 - 28.1691 N | 140 - 4.7749 E | 300.7 | 31 - 28.1686 N | 140 - 4.776 E | | TMC離脱 | |
| 2:27:27 | 11:27:27 | 574.5 | 31 - 28.1605 N | 140 - 4.7735 E | 472.1 | 31 - 28.1617 N | 140 - 4.7749 E | | solmissus | |
| 2:30:17 | 11:30:17 | 596.7 | 31 - 28.1534 N | 140 - 4.7759 E | 495 | 31 - 28.1517 N | 140 - 4.779 E | | ニジクラゲ | |
| 2:57:37 | 11:57:37 | 752.2 | 31 - 28.1101 N | 140 - 4.77 E | 641.6 | 31 - 28.1125 N | 140 - 4.7745 E | | santjordia pagesi をサンプリングした | |
| 3:02:29 | 12:02:29 | 774.4 | 31 - 28.1007 N | 140 - 4.7658 E | 657.8 | 31 - 28.1118 N | 140 - 4.7727 E | | Lobata | |
| 3:04:46 | 12:04:46 | 790.7 | 31 - 28.1021 N | 140 - 4.7614 E | 670.1 | 31 - 28.1118 N | 140 - 4.7709 E | | bathyctina stellata | |
| 3:11:13 | 12:11:13 | 820.9 | 31 - 28.0979 N | 140 - 4.7628 E | 702.8 | 31 - 28.0974 N | 140 - 4.7669 E | | squit | |
| 3:11:48 | 12:11:48 | 825.1 | 31 - 28.0943 N | 140 - 4.7597 E | 705.7 | 31 - 28.0965 N | 140 - 4.7662 E | | squit ogopsidae | |
| 3:49:48 | 12:49:48 | 902.3 | 31 - 28.1068 N | 140 - 4.7761 E | 762.3 | 31 - 28.097 N | 140 - 4.7694 E | | sea floor | |
| 4:03:07 | 13:03:07 | 853.4 | 31 - 28.1184 N | 140 - 4.7686 E | 696.7 | 31 - 28.0998 N | 140 - 4.7687 E | | squit ogopsidae | |
| 4:04:36 | 13:04:36 | 852.8 | 31 - 28.1193 N | 140 - 4.7743 E | 696.1 | 31 - 28.1048 N | 140 - 4.7717 E | | solmissus | |
| 4:08:22 | 13:08:22 | 853 | 31 - 28.1274 N | 140 - 4.7871 E | 696 | 31 - 28.1127 N | 140 - 4.7736 E | | fish bathyluidae | |
| 4:10:25 | 13:10:25 | 844.1 | 31 - 28.1323 N | 140 - 4.7891 E | 696.3 | 31 - 28.1149 N | 140 - 4.7742 E | | calusophyiidae | |
| 4:16:38 | 13:16:38 | 800.3 | 31 - 28.1356 N | 140 - 4.7856 E | 688.2 | 31 - 28.1268 N | 140 - 4.7833 E | | unagui serrivomer | |
| 4:23:06 | 13:23:06 | 802.5 | 31 - 28.1458 N | 140 - 4.8013 E | 687 | 31 - 28.1295 N | 140 - 4.7853 E | | cikopleura | |
| 4:25:59 | 13:25:59 | 805.1 | 31 - 28.1524 N | 140 - 4.8029 E | 686.5 | 31 - 28.1392 N | 140 - 4.7907 E | | cikopleura | |
| 4:30:55 | 13:30:55 | 773.9 | 31 - 28.1533 N | 140 - 4.7992 E | 664.3 | 31 - 28.1487 N | 140 - 4.8003 E | | euiiria | |
| 4:38:12 | 13:38:12 | 749.2 | 31 - 28.1594 N | 140 - 4.8038 E | 632 | 31 - 28.1536 N | 140 - 4.8042 E | | Sampling lobata_SS2 | |
| 4:45:24 | 13:45:24 | 735.9 | 31 - 28.1614 N | 140 - 4.7981 E | 628.3 | 31 - 28.1523 N | 140 - 4.8056 E | | Lobata | |
| 4:45:48 | 13:45:48 | 732.6 | 31 - 28.1628 N | 140 - 4.7981 E | 628.3 | 31 - 28.1524 N | 140 - 4.8053 E | | lampocteis | |
| 4:49:31 | 13:49:31 | 722 | 31 - 28.1623 N | 140 - 4.7965 E | 619.5 | 31 - 28.1536 N | 140 - 4.8024 E | | lobata | |
| 4:56:33 | 13:56:33 | 702.2 | 31 - 28.1602 N | 140 - 4.7945 E | 581.4 | 31 - 28.1544 N | 140 - 4.8071 E | | Lobata | |
| 4:59:37 | 13:59:37 | 706.9 | 31 - 28.1592 N | 140 - 4.7927 E | 581.7 | 31 - 28.1535 N | 140 - 4.8065 E | | Sampling lobata_SS3 | |
| 5:10:55 | 14:10:55 | 669.5 | 31 - 28.159 N | 140 - 4.7862 E | 531.2 | 31 - 28.1552 N | 140 - 4.7876 E | | Kyohimea | |
| 5:13:19 | 14:13:19 | 660.3 | 31 - 28.1613 N | 140 - 4.7862 E | 531.3 | 31 - 28.1527 N | 140 - 4.7873 E | | colobonema | |
| 5:18:43 | 14:18:43 | 652.7 | 31 - 28.1699 N | 140 - 4.7843 E | 531.4 | 31 - 28.1546 N | 140 - 4.7864 E | | solmissus | |
| 5:29:20 | 14:29:20 | 650.6 | 31 - 28.1725 N | 140 - 4.7799 E | 530.6 | 31 - 28.155 N | 140 - 4.7872 E | | bathoceroy | |
| 5:34:35 | 14:34:35 | 600.7 | 31 - 28.1719 N | 140 - 4.7845 E | 481.1 | 31 - 28.1558 N | 140 - 4.7884 E | | thenoceros | |
| 5:37:12 | 14:37:12 | 602.6 | 31 - 28.1618 N | 140 - 4.7972 E | 481.1 | 31 - 28.1561 N | 140 - 4.7904 E | | colobonema | |
| 5:37:55 | 14:37:55 | 602.9 | 31 - 28.1604 N | 140 - 4.7975 E | 481.3 | 31 - 28.157 N | 140 - 4.7887 E | | hebi kurage | |
| 5:41:14 | 14:41:14 | 602.1 | 31 - 28.1522 N | 140 - 4.8104 E | 480.8 | 31 - 28.157 N | 140 - 4.79 E | | colobonema | |
| 5:43:01 | 14:43:01 | 603.5 | 31 - 28.1468 N | 140 - 4.8159 E | 481.4 | 31 - 28.1556 N | 140 - 4.7886 E | | ctenaphore | |
| 5:49:41 | 14:49:41 | 546.3 | 31 - 28.1492 N | 140 - 4.8239 E | 431.7 | 31 - 28.1443 N | 140 - 4.7995 E | | solmissus | |
| 5:53:29 | 14:53:29 | 547.1 | 31 - 28.159 N | 140 - 4.8256 E | 431.3 | 31 - 28.1454 N | 140 - 4.8023 E | | sampled solmissus_SS4 | |
| 5:55:35 | 14:55:35 | 551.4 | 31 - 28.1604 N | 140 - 4.8232 E | 431.1 | 31 - 28.1452 N | 140 - 4.8017 E | | rudjakovia | |
| 5:56:41 | 14:56:41 | 554.2 | 31 - 28.1577 N | 140 - 4.8284 E | 431.4 | 31 - 28.1435 N | 140 - 4.7994 E | | agalma | |
| 6:01:09 | 15:01:09 | 556.5 | 31 - 28.1581 N | 140 - 4.8414 E | 431.2 | 31 - 28.1453 N | 140 - 4.8041 E | | colobonema | |
| 6:02:42 | 15:02:42 | 551.1 | 31 - 28.1574 N | 140 - 4.8469 E | 431.1 | 31 - 28.1473 N | 140 - 4.8105 E | | Prayide | |
| 6:15:36 | 15:15:36 | 502.2 | 31 - 28.1624 N | 140 - 4.8555 E | 385.3 | 31 - 28.1546 N | 140 - 4.8301 E | | Cliione | |
| 6:16:13 | 15:16:13 | 502.8 | 31 - 28.1607 N | 140 - 4.8593 E | 382.4 | 31 - 28.1533 N | 140 - 4.8312 E | | siphonophora | |
| 6:17:17 | 15:17:17 | 502.5 | 31 - 28.1613 N | 140 - 4.8642 E | 381 | 31 - 28.1535 N | 140 - 4.8301 E | | colobonema | |
| 6:19:21 | 15:19:21 | 504.1 | 31 - 28.1634 N | 140 - 4.8755 E | 381.7 | 31 - 28.1518 N | 140 - 4.8281 E | | forskalia | |
| 6:20:41 | 15:20:41 | 507.1 | 31 - 28.1642 N | 140 - 4.8828 E | 381.6 | 31 - 28.1527 N | 140 - 4.83 E | | lobata | |
| 6:29:42 | 15:29:42 | 375.9 | 31 - 28.1584 N | 140 - 4.8666 E | 372 | 31 - 28.1581 N | 140 - 4.8672 E | | reached TMS | |
| 6:38:31 | 15:38:31 | 141.7 | 31 - 28.1664 N | 140 - 4.9003 E | 0 | 31 - 28.1636 N | 140 - 4.896 E | | lights_off | |
| 6:45:56 | 15:45:56 | 0 | 31 - 28.1728 N | 140 - 4.939 E | 0 | 31 - 28.1656 N | 140 - 4.9102 E | | left water | |

## <Dive 140>

**Dive Log of KM-ROV Dive # 140** — **Area Name; Higashi-Aogashima Caldera** — **2020/12/22**

| Time (UTC) | Time (Local) | Vehicle Dep.(m) | Vehicle Pos. Lat | Vehicle Pos. Lon | TMS Dep.(m) | TMS Pos. Lat | TMS Pos. Lon | Vehicle Alt(m) | Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 0:13:26 | 9:13:26 | 627.9 | 32 - 26.4454 N | 139 - 54.4602 E | 480.2 | 32 - 26.4605 N | 139 - 54.4817 E | | bathykorus | |
| 0:15:06 | 9:15:06 | 645.3 | 32 - 26.4393 N | 139 - 54.4566 E | 492.9 | 32 - 26.4594 N | 139 - 54.4807 E | | paralepide | |
| 0:21:41 | 9:21:41 | 698 | 32 - 26.4216 N | 139 - 54.4448 E | 551.1 | 32 - 26.4559 N | 139 - 54.4748 E | | clyo | |
| 0:21:56 | 9:21:56 | 700.8 | 32 - 26.4217 N | 139 - 54.4444 E | 554.1 | 32 - 26.456 N | 139 - 54.4743 E | | trachiomedusa + physionectidae | |
| 0:24:53 | 9:24:53 | 726.2 | 32 - 26.4157 N | 139 - 54.4366 E | 580.7 | 32 - 26.4459 N | 139 - 54.4701 E | | ceraboma | |
| 0:28:02 | 9:28:02 | 761.9 | 32 - 26.4228 N | 139 - 54.4295 E | 613.9 | 32 - 26.4416 N | 139 - 54.4634 E | | sea floor visible | |
| 0:29:18 | 9:29:18 | 767.4 | 32 - 26.4257 N | 139 - 54.4244 E | 628.9 | 32 - 26.4431 N | 139 - 54.4637 E | | macrouridae | |
| 0:31:32 | 9:31:32 | 768.4 | 32 - 26.4294 N | 139 - 54.4201 E | 635.9 | 32 - 26.4439 N | 139 - 54.4626 E | | Aegiura gimaldii | |
| 0:33:48 | 9:33:48 | 767.9 | 32 - 26.4346 N | 139 - 54.4224 E | 636.2 | 32 - 26.4447 N | 139 - 54.4635 E | | Paraphylina | |
| 0:39:04 | 9:39:04 | 770.4 | 32 - 26.4433 N | 139 - 54.4078 E | 636.4 | 32 - 26.4381 N | 139 - 54.4465 E | | start 1st transect | |
| 0:48:06 | 9:48:06 | 758.9 | 32 - 26.448 N | 139 - 54.4142 E | 625.5 | 32 - 26.4385 N | 139 - 54.4214 E | | cycloptone | |
| 0:49:48 | 9:49:48 | 750 | 32 - 26.451 N | 139 - 54.4103 E | 610.5 | 32 - 26.4391 N | 139 - 54.4196 E | | pantachogon | |
| 0:58:47 | 9:58:47 | 748.8 | 32 - 26.4745 N | 139 - 54.3776 E | 609.7 | 32 - 26.4391 N | 139 - 54.4157 E | | Oikopleura | |
| 1:00:45 | 10:00:45 | 750.2 | 32 - 26.4791 N | 139 - 54.3789 E | 609.6 | 32 - 26.4403 N | 139 - 54.4171 E | | vampyroctina (mertenside) | |
| 1:07:37 | 10:07:37 | 700.8 | 32 - 26.4267 N | 139 - 54.4336 E | 580.8 | 32 - 26.4391 N | 139 - 54.4205 E | | syphonophore | |
| 1:09:01 | 10:09:01 | 698.3 | 32 - 26.4293 N | 139 - 54.4328 E | 580.3 | 32 - 26.4397 N | 139 - 54.4223 E | | Oikopleura | |
| 1:09:28 | 10:09:28 | 697.2 | 32 - 26.4286 N | 139 - 54.4322 E | 580.2 | 32 - 26.4383 N | 139 - 54.4228 E | | marrus orthoccana | |
| 1:16:46 | 10:16:46 | 700.4 | 32 - 26.4373 N | 139 - 54.4327 E | 580.5 | 32 - 26.4389 N | 139 - 54.4224 E | | clausophydae | |
| 1:41:00 | 10:41:00 | 607.7 | 32 - 26.4107 N | 139 - 54.4083 E | 495.8 | 32 - 26.4359 N | 139 - 54.4255 E | | colobonema | |
| 1:42:53 | 10:42:53 | 601.1 | 32 - 26.4167 N | 139 - 54.4027 E | 480.9 | 32 - 26.4363 N | 139 - 54.4217 E | | bathocyroe (ctenophore) | |
| 1:45:48 | 10:45:48 | 601.6 | 32 - 26.4165 N | 139 - 54.3933 E | 481.1 | 32 - 26.4372 N | 139 - 54.4217 E | | salpa | |
| 1:48:53 | 10:48:53 | 600.3 | 32 - 26.417 N | 139 - 54.3839 E | 481.2 | 32 - 26.4366 N | 139 - 54.4217 E | | bathykorus | |
| 1:49:51 | 10:49:51 | 598.5 | 32 - 26.4195 N | 139 - 54.3782 E | 480.9 | 32 - 26.4374 N | 139 - 54.4198 E | | bathyctena stellata | |
| 1:51:37 | 10:51:37 | 601.5 | 32 - 26.4202 N | 139 - 54.3739 E | 480.2 | 32 - 26.4368 N | 139 - 54.4188 E | | halitrephes | |
| 1:55:45 | 10:55:45 | 608.1 | 32 - 26.4175 N | 139 - 54.3588 E | 481 | 32 - 26.4299 N | 139 - 54.4088 E | | pyrosoma | |
| 2:07:39 | 11:07:39 | 462.3 | 32 - 26.4281 N | 139 - 54.4079 E | 459.4 | 32 - 26.4286 N | 139 - 54.4082 E | | Dock to the reel | |

## <Dive 141>

Dive Log of KM-ROV Dive # 141 | シートのコピー | LOG | Area Name; Higashi-Aogashima Caldera | 2020/12/22

| Time (UTC) | Time (Local) | Vehicle Dep.(m) | Vehicle Pos. Lat | Vehicle Pos. Lon | TMS Dep.(m) | TMS Pos. Lat | TMS Pos. Lon | Vehicle Alt(m) | Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 4:09:58 | 13:09:58 | 33.2 | 32 - 26.48 N | 139 - 54.4336 E | 0 | 32 - 26.4409 N | 139 - 54.425 E | | ROV into water | |
| 4:25:09 | 13:25:09 | 328.5 | 32 - 26.5311 N | 139 - 57.3857 E | 300.9 | 32 - 26.5302 N | 139 - 57.3923 E | | off the TMS | |
| 4:28:34 | 13:28:34 | 401.5 | 32 - 26.5225 N | 139 - 57.3398 E | 300.5 | 32 - 26.5264 N | 139 - 57.3673 E | | Salpa | |
| 4:30:08 | 13:30:08 | 402.8 | 32 - 26.5117 N | 139 - 57.3234 E | 300.5 | 32 - 26.5252 N | 139 - 57.3619 E | | Radiolarian | |
| 4:34:05 | 13:34:05 | 434.6 | 32 - 26.4902 N | 139 - 57.2961 E | 323.8 | 32 - 26.5223 N | 139 - 57.3518 E | | Lobata | |
| 4:38:26 | 13:38:26 | 486.5 | 32 - 26.4935 N | 139 - 57.2974 E | 353.2 | 32 - 26.5153 N | 139 - 57.3379 E | | Radiolarian | |
| 4:40:02 | 13:40:02 | 506.6 | 32 - 26.4898 N | 139 - 57.299 E | 365.9 | 32 - 26.5119 N | 139 - 57.3306 E | | suction pomp continuous start | |
| 4:41:39 | 13:41:39 | 523.8 | 32 - 26.4844 N | 139 - 57.3063 E | 374.1 | 32 - 26.5082 N | 139 - 57.3256 E | | syphonophore | |
| 4:45:24 | 13:45:24 | 546.3 | 32 - 26.4538 N | 139 - 57.3139 E | 397.9 | 32 - 26.4999 N | 139 - 57.3193 E | | pyrosoma | |
| 4:47:16 | 13:47:16 | 552.3 | 32 - 26.4445 N | 139 - 57.3116 E | 411.2 | 32 - 26.4961 N | 139 - 57.3175 E | | hormiphera (ctenophora) | |
| 4:49:02 | 13:49:02 | 560.4 | 32 - 26.4371 N | 139 - 57.3129 E | 426.1 | 32 - 26.4936 N | 139 - 57.3142 E | | halistenide | |
| 4:50:04 | 13:50:04 | 564.8 | 32 - 26.4386 N | 139 - 57.3105 E | 435.3 | 32 - 26.4929 N | 139 - 57.3159 E | | ctenoceros | |
| 4:50:39 | 13:50:39 | 567.5 | 32 - 26.4389 N | 139 - 57.3091 E | 441.1 | 32 - 26.4917 N | 139 - 57.3161 E | | kyohimea | |
| 4:51:47 | 13:51:47 | 573.4 | 32 - 26.4383 N | 139 - 57.3083 E | 451.6 | 32 - 26.4897 N | 139 - 57.3148 E | | Salpas | |
| 4:55:13 | 13:55:13 | 590.4 | 32 - 26.4341 N | 139 - 57.3016 E | 480.3 | 32 - 26.4781 N | 139 - 57.3147 E | | Clio | |
| 5:02:02 | 14:02:02 | 640 | 32 - 26.4442 N | 139 - 57.2861 E | 520.7 | 32 - 26.4631 N | 139 - 57.3241 E | | colobonema | |
| 5:02:54 | 14:02:54 | 637.3 | 32 - 26.4478 N | 139 - 57.283 E | 527.7 | 32 - 26.4605 N | 139 - 57.3249 E | | colobonema | |
| 5:03:01 | 14:03:01 | 637.3 | 32 - 26.4496 N | 139 - 57.2831 E | 528.4 | 32 - 26.4621 N | 139 - 57.3253 E | | solmissus | |
| 5:03:30 | 14:03:30 | 644.8 | 32 - 26.4506 N | 139 - 57.2816 E | 532.8 | 32 - 26.4586 N | 139 - 57.3252 E | | Apolemia | |
| 5:04:19 | 14:04:19 | 648.9 | 32 - 26.4528 N | 139 - 57.2878 E | 539 | 32 - 26.4589 N | 139 - 57.3271 E | | physonecte | |
| 5:04:42 | 14:04:42 | 650.4 | 32 - 26.4539 N | 139 - 57.2955 E | 542.5 | 32 - 26.4605 N | 139 - 57.329 E | | Clio | |
| 5:04:52 | 14:04:52 | 651 | 32 - 26.4534 N | 139 - 57.2966 E | 543.6 | 32 - 26.4598 N | 139 - 57.3284 E | | physonecte | |
| 5:05:05 | 14:05:05 | 651 | 32 - 26.4527 N | 139 - 57.3006 E | 545.9 | 32 - 26.4601 N | 139 - 57.3293 E | | colobonema | |
| 5:05:54 | 14:05:54 | 662.8 | 32 - 26.4485 N | 139 - 57.3095 E | 552.4 | 32 - 26.4591 N | 139 - 57.3293 E | | praydae | |
| 5:06:18 | 14:06:18 | 667.6 | 32 - 26.4459 N | 139 - 57.3148 E | 555.9 | 32 - 26.4597 N | 139 - 57.3296 E | | Bathilagus | |
| 5:10:53 | 14:10:53 | 711.1 | 32 - 26.4316 N | 139 - 57.3459 E | 589.3 | 32 - 26.4578 N | 139 - 57.3301 E | | psedusa | |
| 5:12:11 | 14:12:11 | 723.5 | 32 - 26.4366 N | 139 - 57.3561 E | 597.3 | 32 - 26.457 N | 139 - 57.3313 E | | physonecte | |
| 5:12:34 | 14:12:34 | 724.1 | 32 - 26.4382 N | 139 - 57.3601 E | 597.7 | 32 - 26.4576 N | 139 - 57.3322 E | | Oikopleura | |
| 5:13:09 | 14:13:09 | 724.3 | 32 - 26.4379 N | 139 - 57.3628 E | 598 | 32 - 26.4575 N | 139 - 57.3327 E | | Desmophys pimatagasca | |
| 5:14:47 | 14:14:47 | 725.8 | 32 - 26.4385 N | 139 - 57.3718 E | 599.6 | 32 - 26.4562 N | 139 - 57.3324 E | | bathykorus | |
| 5:19:04 | 14:19:04 | 740.7 | 32 - 26.4359 N | 139 - 57.3939 E | 615 | 32 - 26.4472 N | 139 - 57.3446 E | | clausophies | |
| 5:20:27 | 14:20:27 | 742.6 | 32 - 26.4388 N | 139 - 57.3962 E | 615.5 | 32 - 26.4467 N | 139 - 57.3489 E | | bathykorus | |
| 5:21:09 | 14:21:09 | 751.4 | 32 - 26.4406 N | 139 - 57.3949 E | 615.6 | 32 - 26.4461 N | 139 - 57.3536 E | | bathykorus | |
| 5:21:37 | 14:21:37 | 757 | 32 - 26.441 N | 139 - 57.3899 E | 615.9 | 32 - 26.4457 N | 139 - 57.3525 E | | sea floor | |
| 5:28:46 | 14:28:46 | 753.3 | 32 - 26.448 N | 139 - 57.3772 E | 615.9 | 32 - 26.449 N | 139 - 57.3582 E | | shrimp peracardia | |
| 5:33:09 | 14:33:09 | 751.7 | 32 - 26.4551 N | 139 - 57.3722 E | 616.1 | 32 - 26.4508 N | 139 - 57.36 E | | stone on the seafloor | |
| 5:34:02 | 14:34:02 | 750.7 | 32 - 26.4568 N | 139 - 57.3682 E | 616.1 | 32 - 26.4513 N | 139 - 57.3605 E | | Octocorallia on the stone | |
| 5:37:45 | 14:37:45 | 747.7 | 32 - 26.4623 N | 139 - 57.3578 E | 615.9 | 32 - 26.4522 N | 139 - 57.3611 E | | fish - macrouride | |
| 5:42:13 | 14:42:13 | 740.1 | 32 - 26.4714 N | 139 - 57.3485 E | 614.9 | 32 - 26.4519 N | 139 - 57.3621 E | | fish - telostei | |
| 5:44:59 | 14:44:59 | 725.3 | 32 - 26.4726 N | 139 - 57.3465 E | 600 | 32 - 26.4518 N | 139 - 57.3611 E | | reached 725m going straight line | |
| 5:45:52 | 14:45:52 | 724.1 | 32 - 26.4736 N | 139 - 57.3465 E | 599.7 | 32 - 26.4526 N | 139 - 57.3613 E | | pasiphaeidae white shrimp | |
| 5:49:42 | 14:49:42 | 714.6 | 32 - 26.4829 N | 139 - 57.3368 E | 600.2 | 32 - 26.4528 N | 139 - 57.361 E | | lobnate bathyceroie | |
| 6:00:39 | 15:00:39 | 722.9 | 32 - 26.4925 N | 139 - 57.3292 E | 599.8 | 32 - 26.4712 N | 139 - 57.354 E | | Bathyceroie | |
| 6:03:38 | 15:03:38 | 715.4 | 32 - 26.494 N | 139 - 57.3311 E | 593.2 | 32 - 26.4721 N | 139 - 57.3528 E | | Bathyceroie | |
| 6:12:59 | 15:12:59 | 699.7 | 32 - 26.4866 N | 139 - 57.331 E | 570.8 | 32 - 26.4862 N | 139 - 57.344 E | | haliscicra | |
| 6:14:26 | 15:14:26 | 699 | 32 - 26.4872 N | 139 - 57.3336 E | 570.9 | 32 - 26.4874 N | 139 - 57.3444 E | | clausophiede | |
| 6:17:25 | 15:17:25 | 699 | 32 - 26.4873 N | 139 - 57.3369 E | 571 | 32 - 26.4887 N | 139 - 57.3449 E | | phaeoderian | |
| 6:18:12 | 15:18:12 | 699.4 | 32 - 26.4877 N | 139 - 57.3346 E | 571.1 | 32 - 26.4875 N | 139 - 57.3442 E | | beroi fuscalis | |
| 6:20:28 | 15:20:28 | 699.1 | 32 - 26.4872 N | 139 - 57.3356 E | 570.9 | 32 - 26.4886 N | 139 - 57.3448 E | | lobata | |
| 6:27:48 | 15:27:48 | 651 | 32 - 26.4632 N | 139 - 57.3358 E | 524.3 | 32 - 26.488 N | 139 - 57.346 E | | solmissus | |
| 6:28:01 | 15:28:01 | 650.5 | 32 - 26.4624 N | 139 - 57.3373 E | 521.8 | 32 - 26.488 N | 139 - 57.3467 E | | lobate | |
| 6:30:27 | 15:30:27 | 652 | 32 - 26.4596 N | 139 - 57.3305 E | 520.4 | 32 - 26.4905 N | 139 - 57.3453 E | | solmissus | |
| 6:34:26 | 15:34:26 | 652.1 | 32 - 26.4417 N | 139 - 57.3218 E | 520.8 | 32 - 26.4893 N | 139 - 57.3429 E | | Salpida | |
| 6:35:51 | 15:35:51 | 651.3 | 32 - 26.4395 N | 139 - 57.3203 E | 520.5 | 32 - 26.4847 N | 139 - 57.3418 E | | Oikopluridae | |
| 6:37:33 | 15:37:33 | 650.6 | 32 - 26.4399 N | 139 - 57.3198 E | 520.5 | 32 - 26.4797 N | 139 - 57.3393 E | | Siphonlphore | |
| 6:39:36 | 15:39:36 | 651.7 | 32 - 26.4335 N | 139 - 57.319 E | 520.7 | 32 - 26.4761 N | 139 - 57.3383 E | | Salpida | |
| 6:40:24 | 15:40:24 | 651.8 | 32 - 26.4327 N | 139 - 57.3183 E | 520.8 | 32 - 26.4724 N | 139 - 57.3361 E | | solmissus | |
| 6:44:15 | 15:44:15 | 644.8 | 32 - 26.4143 N | 139 - 57.3135 E | 520.3 | 32 - 26.4678 N | 139 - 57.3351 E | | sample SS1 piece of solmissus | |
| 6:43:58 | 15:43:58 | 646.9 | 32 - 26.4164 N | 139 - 57.3132 E | 520.6 | 32 - 26.4678 N | 139 - 57.3346 E | | kyohimea | |
| 6:53:18 | 15:53:18 | 601 | 32 - 26.4296 N | 139 - 57.3098 E | 470.7 | 32 - 26.466 N | 139 - 57.329 E | | Bathyceroie | |
| 6:55:45 | 15:55:45 | 601.3 | 32 - 26.426 N | 139 - 57.3034 E | 471 | 32 - 26.4606 N | 139 - 57.328 E | | tetraphalia (mentensidae) | |
| 6:57:16 | 15:57:16 | 601.1 | 32 - 26.4157 N | 139 - 57.2943 E | 470.8 | 32 - 26.4539 N | 139 - 57.3247 E | | colobonema | |
| 6:58:37 | 15:58:37 | 601.7 | 32 - 26.4112 N | 139 - 57.2891 E | 470.6 | 32 - 26.4506 N | 139 - 57.3209 E | | Atolla | |
| 7:03:48 | 16:03:48 | 558.2 | 32 - 26.4168 N | 139 - 57.293 E | 441.8 | 32 - 26.4523 N | 139 - 57.3225 E | | narcomeduse | |
| 7:04:17 | 16:04:17 | 556.3 | 32 - 26.4171 N | 139 - 57.2994 E | 438.1 | 32 - 26.4529 N | 139 - 57.3228 E | | ceroboma | |
| 7:06:51 | 16:06:51 | 552 | 32 - 26.4075 N | 139 - 57.2971 E | 424.5 | 32 - 26.4515 N | 139 - 57.3237 E | | bakmania | |
| 7:07:15 | 16:07:15 | 551.9 | 32 - 26.4042 N | 139 - 57.2959 E | 422.4 | 32 - 26.4505 N | 139 - 57.3238 E | | colobonema | |
| 7:08:12 | 16:08:12 | 551.9 | 32 - 26.3977 N | 139 - 57.2947 E | 420.8 | 32 - 26.4484 N | 139 - 57.3227 E | | Oikopleura | |
| 7:08:33 | 16:08:33 | 552.4 | 32 - 26.3971 N | 139 - 57.2944 E | 420.7 | 32 - 26.4474 N | 139 - 57.3219 E | | colobonema | |
| 7:11:47 | 16:11:47 | 549.8 | 32 - 26.3959 N | 139 - 57.2973 E | 420.9 | 32 - 26.4469 N | 139 - 57.321 E | | patoceroi | |
| 7:14:04 | 16:14:04 | 549.1 | 32 - 26.3938 N | 139 - 57.293 E | 420.8 | 32 - 26.4431 N | 139 - 57.3153 E | | prayidae | |
| 7:14:59 | 16:14:59 | 548.8 | 32 - 26.3936 N | 139 - 57.2933 E | 420.8 | 32 - 26.4406 N | 139 - 57.3134 E | | agalma elegans | |
| 7:16:34 | 16:16:34 | 548.7 | 32 - 26.3946 N | 139 - 57.2941 E | 420.5 | 32 - 26.4349 N | 139 - 57.3107 E | | pyrosoma | |
| 7:17:32 | 16:17:32 | 543.4 | 32 - 26.3985 N | 139 - 57.2957 E | 420.5 | 32 - 26.4343 N | 139 - 57.3099 E | | physonectae | |
| 7:31:18 | 16:31:18 | 425.9 | 32 - 26.4467 N | 139 - 57.2583 E | 420.9 | 32 - 26.4473 N | 139 - 57.2585 E | | Docked at the TMS | |
| 7:42:42 | 16:42:42 | 92.8 | 32 - 26.5201 N | 139 - 57.2971 E | 89.6 | 32 - 26.5196 N | 139 - 57.297 E | | Lights off | |
| 7:48:46 | 16:48:46 | 0 | 32 - 26.5584 N | 139 - 57.3242 E | 0 | 32 - 26.5267 N | 139 - 57.3024 E | | out of the water | |

## <Dive 142>

Dive Log of KM-ROV Dive # 142 | シートのコピー | LOG | Area Name; Higashi-Aogashima Caldera | 2020/12/23

| Time (UTC) | Time (Local) | Vehicle Dep.(m) | Vehicle Pos. Lat | Vehicle Pos. Lon | TMS Dep.(m) | TMS Pos. Lat | TMS Pos. Lon | Vehicle Alt(m) | Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| 4:33:23 | 13:33:23 | 0 | 32 - 26.5584 N | 139 - 57.3242 E | 1013.6 | 32 - 26.664 N | 139 - 57.3591 E | | ROV entered water | |
| 4:41:57 | 13:41:57 | 251 | 32 - 26.3401 N | 139 - 53.9203 E | 248.2 | 32 - 26.3393 N | 139 - 53.9208 E | | agalma ukina | |
| 4:43:46 | 13:43:46 | 329 | 32 - 26.3465 N | 139 - 53.9165 E | 325.8 | 32 - 26.3455 N | 139 - 53.9174 E | | Salpa | |
| 4:44:05 | 13:44:05 | 339.5 | 32 - 26.3468 N | 139 - 53.9174 E | 336.6 | 32 - 26.3465 N | 139 - 53.9178 E | | lobata | |
| 4:44:52 | 13:44:52 | 373.6 | 32 - 26.3525 N | 139 - 53.9151 E | 370.7 | 32 - 26.3526 N | 139 - 53.9153 E | | agalma okini | |
| 4:48:25 | 13:48:25 | 403.4 | 32 - 26.3614 N | 139 - 53.9183 E | 400.2 | 32 - 26.361 N | 139 - 53.9187 E | | Euphausia | |
| 4:49:27 | 13:49:27 | 403 | 32 - 26.3601 N | 139 - 53.9202 E | 400.1 | 32 - 26.3603 N | 139 - 53.9199 E | | ROV left TMS | |
| 4:53:48 | 13:53:48 | 500.1 | 32 - 26.3695 N | 139 - 53.9099 E | 400 | 32 - 26.358 N | 139 - 53.9206 E | | Stereo calibration | |
| 4:54:58 | 13:54:58 | 501.9 | 32 - 26.3719 N | 139 - 53.9036 E | 400.3 | 32 - 26.3587 N | 139 - 53.9204 E | | stop calibration | |
| 4:55:18 | 13:55:18 | 501.6 | 32 - 26.3721 N | 139 - 53.9017 E | 400 | 32 - 26.3586 N | 139 - 53.9196 E | | Salpa | |
| 4:56:00 | 13:56:00 | 502 | 32 - 26.3733 N | 139 - 53.8995 E | 400.3 | 32 - 26.358 N | 139 - 53.9203 E | | mertensidae | |
| 5:00:42 | 14:00:42 | 516.8 | 32 - 26.3781 N | 139 - 53.8808 E | 409 | 32 - 26.3597 N | 139 - 53.9196 E | | Salpa | |
| 5:01:54 | 14:01:54 | 520.9 | 32 - 26.3747 N | 139 - 53.8744 E | 415.8 | 32 - 26.3597 N | 139 - 53.9174 E | | Oikopleura | |
| 5:04:40 | 14:04:40 | 542.7 | 32 - 26.3619 N | 139 - 53.8621 E | 427.2 | 32 - 26.3625 N | 139 - 53.9087 E | | cyclotone | |
| 5:05:38 | 14:05:38 | 559.1 | 32 - 26.3625 N | 139 - 53.8578 E | 434.3 | 32 - 26.3645 N | 139 - 53.9029 E | | Froskalia formaosa | |
| 5:07:16 | 14:07:16 | 569.5 | 32 - 26.3657 N | 139 - 53.8537 E | 443.3 | 32 - 26.3656 N | 139 - 53.9014 E | | lobata | |
| 5:07:30 | 14:07:30 | 569.1 | 32 - 26.3653 N | 139 - 53.8528 E | 443.8 | 32 - 26.3652 N | 139 - 53.9004 E | | Froskalia formaosa | |
| 5:07:35 | 14:07:35 | 568 | 32 - 26.3687 N | 139 - 53.8514 E | 443.5 | 32 - 26.3682 N | 139 - 53.8997 E | | agalma okini | |
| 5:08:56 | 14:08:56 | 572.2 | 32 - 26.3691 N | 139 - 53.8496 E | 451.8 | 32 - 26.367 N | 139 - 53.8986 E | | agalma okini | |
| 5:11:50 | 14:11:50 | 580.3 | 32 - 26.3702 N | 139 - 53.8482 E | 469.6 | 32 - 26.3715 N | 139 - 53.8878 E | | cyclotone | |
| 5:12:48 | 14:12:48 | 584.9 | 32 - 26.3692 N | 139 - 53.8462 E | 475.2 | 32 - 26.3745 N | 139 - 53.8834 E | | solmissus | |
| 5:13:56 | 14:13:56 | 584.3 | 32 - 26.3694 N | 139 - 53.8412 E | 483.1 | 32 - 26.377 N | 139 - 53.8788 E | | lobata | |
| 5:16:12 | 14:16:12 | 583 | 32 - 26.3637 N | 139 - 53.8368 E | 487.2 | 32 - 26.3786 N | 139 - 53.8753 E | | Solmissus in SS1 | |
| 5:19:08 | 14:19:08 | 590.9 | 32 - 26.3658 N | 139 - 53.8421 E | 492.5 | 32 - 26.378 N | 139 - 53.8714 E | | lobata | |
| 5:24:48 | 14:24:48 | 641.6 | 32 - 26.3591 N | 139 - 53.8382 E | 517.3 | 32 - 26.3789 N | 139 - 53.8633 E | | collobenema | |
| 5:26:17 | 14:26:17 | 642 | 32 - 26.3559 N | 139 - 53.8325 E | 523.1 | 32 - 26.3782 N | 139 - 53.8598 E | | clausophiidae | |
| 5:28:21 | 14:28:21 | 653.1 | 32 - 26.3535 N | 139 - 53.8349 E | 532.4 | 32 - 26.3767 N | 139 - 53.8571 E | | bathykorus | |
| 5:32:13 | 14:32:13 | 670.1 | 32 - 26.3523 N | 139 - 53.8333 E | 549.3 | 32 - 26.3767 N | 139 - 53.8578 E | | bathykorus | |
| 5:33:03 | 14:33:03 | 670.2 | 32 - 26.3512 N | 139 - 53.8305 E | 554.1 | 32 - 26.3767 N | 139 - 53.8548 E | | ctenocerus | |
| 5:39:42 | 14:39:42 | 688.8 | 32 - 26.3686 N | 139 - 53.8251 E | 574.9 | 32 - 26.3707 N | 139 - 53.8424 E | | physonectae | |
| 5:43:33 | 14:43:33 | 690.9 | 32 - 26.3769 N | 139 - 53.8211 E | 585.6 | 32 - 26.3709 N | 139 - 53.8431 E | | mertensiidae (Vampairotina) | |
| 5:45:13 | 14:45:13 | 701.1 | 32 - 26.3773 N | 139 - 53.818 E | 592.3 | 32 - 26.3699 N | 139 - 53.8422 E | | stenopsis | |
| 5:48:45 | 14:48:45 | 705 | 32 - 26.3828 N | 139 - 53.8157 E | 599.9 | 32 - 26.3692 N | 139 - 53.8434 E | | bathycorus | |
| 5:50:06 | 14:50:06 | 704.4 | 32 - 26.3846 N | 139 - 53.8133 E | 599.4 | 32 - 26.3723 N | 139 - 53.8425 E | | bathycorus in SS2 | |
| 5:55:53 | 14:55:53 | 750.1 | 32 - 26.3844 N | 139 - 53.8233 E | 599.4 | 32 - 26.3716 N | 139 - 53.8316 E | | reached sea floor | |
| 6:02:09 | 15:02:09 | 754.3 | 32 - 26.37 N | 139 - 53.8409 E | 609.3 | 32 - 26.3714 N | 139 - 53.8237 E | | starfish (daithona) | |
| 6:03:41 | 15:03:41 | 754.2 | 32 - 26.3733 N | 139 - 53.8408 E | 609.6 | 32 - 26.3716 N | 139 - 53.8238 E | | hoplostiphus | |
| 6:07:38 | 15:07:38 | 753.9 | 32 - 26.3709 N | 139 - 53.8488 E | 609.6 | 32 - 26.3711 N | 139 - 53.8242 E | | scorpionfish | |
| 6:10:08 | 15:10:08 | 747.8 | 32 - 26.3682 N | 139 - 53.8482 E | 609.2 | 32 - 26.3702 N | 139 - 53.8252 E | | halicreatidae | |
| 6:17:51 | 15:17:51 | 715.2 | 32 - 26.363 N | 139 - 53.8564 E | 609.3 | 32 - 26.373 N | 139 - 53.8247 E | | reached the vents | |
| 6:23:21 | 15:23:21 | 726.4 | 32 - 26.3647 N | 139 - 53.8502 E | 609.2 | 32 - 26.3704 N | 139 - 53.8226 E | | bathycorus | |
| 6:28:01 | 15:28:01 | 752.4 | 32 - 26.3711 N | 139 - 53.8452 E | 609.6 | 32 - 26.3719 N | 139 - 53.8247 E | | Moridae | |
| 6:37:15 | 15:37:15 | 755 | 32 - 26.3711 N | 139 - 53.8407 E | 609.6 | 32 - 26.3726 N | 139 - 53.824 E | | sampling SS3 sponge barnacles | |
| 6:38:50 | 15:38:50 | 755.1 | 32 - 26.3721 N | 139 - 53.841 E | 609.4 | 32 - 26.3729 N | 139 - 53.8242 E | | crossota | |
| 6:41:52 | 15:41:52 | 754.4 | 32 - 26.3737 N | 139 - 53.8407 E | 609.4 | 32 - 26.3748 N | 139 - 53.8231 E | | slurpgun rotate | |
| 6:43:10 | 15:43:10 | 754.8 | 32 - 26.3718 N | 139 - 53.8412 E | 609.8 | 32 - 26.3733 N | 139 - 53.8248 E | | barnacles samples SS4 | |
| 6:44:00 | 15:44:00 | 754.9 | 32 - 26.3731 N | 139 - 53.8415 E | 609.7 | 32 - 26.3735 N | 139 - 53.8262 E | | Spider crab | |
| 7:00:27 | 16:00:27 | 410.5 | 32 - 26.3858 N | 139 - 53.8199 E | 407 | 32 - 26.3858 N | 139 - 53.82 E | | lobata | |
| 7:09:36 | 16:09:36 | 53.6 | 32 - 26.4594 N | 139 - 53.8846 E | 0 | 32 - 26.4575 N | 139 - 53.8841 E | | lights off | |
| 7:13:54 | 16:13:54 | 34.4 | 32 - 26.5112 N | 139 - 53.906 E | 463.2 | 32 - 26.1974 N | 139 - 53.9104 E | | out of water | |

## <Dive 143>

Dive Log of KM-ROV Dive # 143 | シートのコピー | LOG | 2020/12/24 | Area Name; Kurose Hole

| Time (UTC) | Time (Local) | Vehicle Dep.(m) | Vehicle Pos. Lat | | | | | Vehicle Pos. Lon | | | | | TMS Dep.(m) | TMS Pos. Lat | | | | | TMS Pos. Lon | | | | | Vehicle Alt(m) | Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23:09:58 | 8:09:58 | 0 | 32 | - | 26.5112 | N | 139 | - | 53.906 | E | 1019 | 33 | - | 24.6267 | N | 139 | - | 40.7391 | E | | ROV in the water | |
| 23:17:58 | 8:17:58 | 0 | 33 | - | 24.4153 | N | 139 | - | 40.7715 | E | 0 | 33 | - | 24.6267 | N | 139 | - | 40.7391 | E | | maybe jellyfish | |
| 23:20:30 | 8:20:30 | 231.4 | 33 | - | 24.4189 | N | 139 | - | 40.773 | E | 228.4 | 33 | - | 24.4188 | N | 139 | - | 40.7737 | E | | event switching to SS1 | |
| 23:27:27 | 8:27:27 | 404.2 | 33 | - | 24.4135 | N | 139 | - | 40.7796 | E | 401.1 | 33 | - | 24.4136 | N | 139 | - | 40.7799 | E | | chaetognate | |
| 23:29:17 | 8:29:17 | 404.1 | 33 | - | 24.4135 | N | 139 | - | 40.7798 | E | 400.9 | 33 | - | 24.4134 | N | 139 | - | 40.7799 | E | | chaetognate and euphausia | |
| 23:30:56 | 8:30:56 | 435 | 33 | - | 24.4136 | N | 139 | - | 40.7736 | E | 401.1 | 33 | - | 24.413 | N | 139 | - | 40.7795 | E | | oegopsidia | |
| 23:33:16 | 8:33:16 | 503.3 | 33 | - | 24.4158 | N | 139 | - | 40.7651 | E | 401 | 33 | - | 24.4104 | N | 139 | - | 40.7761 | E | | siphonophorae | |
| 23:33:43 | 8:33:43 | 502.9 | 33 | - | 24.4166 | N | 139 | - | 40.7652 | E | 401.8 | 33 | - | 24.4106 | N | 139 | - | 40.7771 | E | | squid ink | |
| 23:34:34 | 8:34:34 | 508.1 | 33 | - | 24.4185 | N | 139 | - | 40.7648 | E | 407.2 | 33 | - | 24.4108 | N | 139 | - | 40.7775 | E | | rhopalonematidae | |
| 23:36:29 | 8:36:29 | 524.5 | 33 | - | 24.4194 | N | 139 | - | 40.7648 | E | 421 | 33 | - | 24.4105 | N | 139 | - | 40.7768 | E | | Segestidae | |
| 23:37:21 | 8:37:21 | 531.3 | 33 | - | 24.4195 | N | 139 | - | 40.7662 | E | 428.2 | 33 | - | 24.4106 | N | 139 | - | 40.7756 | E | | fish | |
| 23:39:14 | 8:39:14 | 541.6 | 33 | - | 24.4196 | N | 139 | - | 40.7716 | E | 439.8 | 33 | - | 24.4108 | N | 139 | - | 40.7773 | E | | oikopleuridae | |
| 23:40:15 | 8:40:15 | 548.3 | 33 | - | 24.4216 | N | 139 | - | 40.7711 | E | 445.6 | 33 | - | 24.4105 | N | 139 | - | 40.7754 | E | | siphonophorae cordagalma | |
| 23:42:24 | 8:42:24 | 558.6 | 33 | - | 24.4241 | N | 139 | - | 40.7727 | E | 454.7 | 33 | - | 24.41 | N | 139 | - | 40.7741 | E | | sergestes | |
| 23:44:55 | 8:44:55 | 570.9 | 33 | - | 24.4212 | N | 139 | - | 40.7725 | E | 469.2 | 33 | - | 24.4096 | N | 139 | - | 40.7756 | E | | narcomedusae | |
| 23:45:35 | 8:45:35 | 571.5 | 33 | - | 24.4213 | N | 139 | - | 40.7733 | E | 472.1 | 33 | - | 24.4108 | N | 139 | - | 40.7758 | E | | jellyfish | |
| 23:47:11 | 8:47:11 | 582.6 | 33 | - | 24.416 | N | 139 | - | 40.7718 | E | 479.2 | 33 | - | 24.4112 | N | 139 | - | 40.7757 | E | | chauliodus | |
| 23:47:49 | 8:47:49 | 588.1 | 33 | - | 24.416 | N | 139 | - | 40.7712 | E | 483.1 | 33 | - | 24.4108 | N | 139 | - | 40.7753 | E | | physonectae | |
| 23:48:21 | 8:48:21 | 591.6 | 33 | - | 24.415 | N | 139 | - | 40.7722 | E | 487.9 | 33 | - | 24.4105 | N | 139 | - | 40.7761 | E | | alepisaurus | |
| 23:48:53 | 8:48:53 | 592.7 | 33 | - | 24.4142 | N | 139 | - | 40.7721 | E | 492.2 | 33 | - | 24.4106 | N | 139 | - | 40.7751 | E | | jellyfish | |
| 23:49:21 | 8:49:21 | 588.3 | 33 | - | 24.4157 | N | 139 | - | 40.7724 | E | 493.2 | 33 | - | 24.4105 | N | 139 | - | 40.7752 | E | | | |
| 23:50:43 | 8:50:43 | 600.5 | 33 | - | 24.4134 | N | 139 | - | 40.7723 | E | 498.2 | 33 | - | 24.4094 | N | 139 | - | 40.7742 | E | | alepisaurus | |
| 23:54:36 | 8:54:36 | 621 | 33 | - | 24.4022 | N | 139 | - | 40.7671 | E | 517.9 | 33 | - | 24.41 | N | 139 | - | 40.7749 | E | | squid | |
| 23:57:14 | 8:57:14 | 631.3 | 33 | - | 24.3971 | N | 139 | - | 40.7651 | E | 530.2 | 33 | - | 24.4096 | N | 139 | - | 40.7755 | E | | coleodus | |
| 0:00:56 | 9:00:56 | 645.9 | 33 | - | 24.3908 | N | 139 | - | 40.7685 | E | 543.1 | 33 | - | 24.4101 | N | 139 | - | 40.7783 | E | | avocettina | |
| 0:02:07 | 9:02:07 | 643.8 | 33 | - | 24.3887 | N | 139 | - | 40.7652 | E | 544.2 | 33 | - | 24.4104 | N | 139 | - | 40.7773 | E | | same avocettina | |
| 0:03:32 | 9:03:32 | 649.8 | 33 | - | 24.387 | N | 139 | - | 40.7637 | E | 548.5 | 33 | - | 24.4098 | N | 139 | - | 40.7767 | E | | coleodus | |
| 0:04:10 | 9:04:10 | 651.9 | 33 | - | 24.3865 | N | 139 | - | 40.7631 | E | 550.6 | 33 | - | 24.4091 | N | 139 | - | 40.7783 | E | | sepiolidae | |
| 0:06:31 | 9:06:31 | 662.5 | 33 | - | 24.3868 | N | 139 | - | 40.7599 | E | 559.4 | 33 | - | 24.4094 | N | 139 | - | 40.7771 | E | | fish | |
| 0:07:08 | 9:07:08 | 666.4 | 33 | - | 24.3871 | N | 139 | - | 40.76 | E | 563.6 | 33 | - | 24.4101 | N | 139 | - | 40.7768 | E | | jellyfish | |
| 0:08:02 | 9:08:02 | 673.6 | 33 | - | 24.3869 | N | 139 | - | 40.7599 | E | 567.1 | 33 | - | 24.4071 | N | 139 | - | 40.7754 | E | | Sergestidae | |
| 0:10:19 | 9:10:19 | 675 | 33 | - | 24.3866 | N | 139 | - | 40.759 | E | 570.8 | 33 | - | 24.4018 | N | 139 | - | 40.7715 | E | | gonostomatidae | |
| 0:10:54 | 9:10:54 | 677.2 | 33 | - | 24.3869 | N | 139 | - | 40.7578 | E | 572.8 | 33 | - | 24.4007 | N | 139 | - | 40.7696 | E | | | |
| 0:11:19 | 9:11:19 | 678.3 | 33 | - | 24.386 | N | 139 | - | 40.757 | E | 574.3 | 33 | - | 24.399 | N | 139 | - | 40.7689 | E | | ctenophora | |
| 0:11:36 | 9:11:36 | 676.5 | 33 | - | 24.3857 | N | 139 | - | 40.7552 | E | 574.4 | 33 | - | 24.3985 | N | 139 | - | 40.768 | E | | | |
| 0:12:37 | 9:12:37 | 686.7 | 33 | - | 24.3848 | N | 139 | - | 40.7555 | E | 580.3 | 33 | - | 24.3968 | N | 139 | - | 40.7673 | E | | trachulus | |
| 0:14:51 | 9:14:51 | 719.6 | 33 | - | 24.3814 | N | 139 | - | 40.7573 | E | 609.6 | 33 | - | 24.3957 | N | 139 | - | 40.7677 | E | | squid | |
| 0:16:10 | 9:16:10 | 718.2 | 33 | - | 24.3804 | N | 139 | - | 40.7578 | E | 619.5 | 33 | - | 24.3957 | N | 139 | - | 40.7678 | E | | trachulus | |
| 0:16:28 | 9:16:28 | 720.6 | 33 | - | 24.3814 | N | 139 | - | 40.7569 | E | 619.2 | 33 | - | 24.3969 | N | 139 | - | 40.7675 | E | | myctophid | |
| 0:16:58 | 9:16:58 | 725.6 | 33 | - | 24.3816 | N | 139 | - | 40.7565 | E | 622.5 | 33 | - | 24.3964 | N | 139 | - | 40.7679 | E | | cranchidae | |
| 0:17:10 | 9:17:10 | 727.8 | 33 | - | 24.3823 | N | 139 | - | 40.7557 | E | 624.1 | 33 | - | 24.3964 | N | 139 | - | 40.7681 | E | | | |
| 0:17:33 | 9:17:33 | 731 | 33 | - | 24.3826 | N | 139 | - | 40.7558 | E | 626.9 | 33 | - | 24.396 | N | 139 | - | 40.7677 | E | | chauliodus | |
| 0:17:53 | 9:17:53 | 734.7 | 33 | - | 24.3826 | N | 139 | - | 40.7552 | E | 630.4 | 33 | - | 24.3957 | N | 139 | - | 40.7674 | E | | chauliodus | |
| 0:19:13 | 9:19:13 | 739.2 | 33 | - | 24.383 | N | 139 | - | 40.7562 | E | 639.2 | 33 | - | 24.3951 | N | 139 | - | 40.7673 | E | | fish | |
| 0:19:34 | 9:19:34 | 739.2 | 33 | - | 24.3836 | N | 139 | - | 40.7555 | E | 641.3 | 33 | - | 24.395 | N | 139 | - | 40.7668 | E | | **cranchidae** | |
| 0:20:15 | 9:20:15 | 743 | 33 | - | 24.3837 | N | 139 | - | 40.7567 | E | 643.7 | 33 | - | 24.3945 | N | 139 | - | 40.7672 | E | | pyrosoma | |
| 0:20:45 | 9:20:45 | 742.9 | 33 | - | 24.3846 | N | 139 | - | 40.7583 | E | 645.7 | 33 | - | 24.3948 | N | 139 | - | 40.7661 | E | | chauliodus | |
| 0:22:51 | 9:22:51 | 756.1 | 33 | - | 24.387 | N | 139 | - | 40.7625 | E | 651.1 | 33 | - | 24.3967 | N | 139 | - | 40.7684 | E | | idacanthus | |
| 0:23:37 | 9:23:37 | 758.2 | 33 | - | 24.3879 | N | 139 | - | 40.7622 | E | 651.1 | 33 | - | 24.3978 | N | 139 | - | 40.7685 | E | | fish | |
| 0:24:44 | 9:24:44 | 765 | 33 | - | 24.388 | N | 139 | - | 40.7664 | E | 651.2 | 33 | - | 24.3972 | N | 139 | - | 40.7685 | E | | avocettina | |
| 0:26:06 | 9:26:06 | 773.7 | 33 | - | 24.3871 | N | 139 | - | 40.7679 | E | 651.1 | 33 | - | 24.3964 | N | 139 | - | 40.7677 | E | | Sergestes | |
| 0:26:22 | 9:26:22 | 774.9 | 33 | - | 24.3867 | N | 139 | - | 40.7688 | E | 651.2 | 33 | - | 24.3963 | N | 139 | - | 40.7677 | E | | ctenophore | |
| 0:26:52 | 9:26:52 | 777.4 | 33 | - | 24.3856 | N | 139 | - | 40.7702 | E | 651 | 33 | - | 24.3963 | N | 139 | - | 40.7685 | E | | bathocyroe longigula | |
| 0:27:41 | 9:27:41 | 784.1 | 33 | - | 24.3854 | N | 139 | - | 40.7725 | E | 651 | 33 | - | 24.3964 | N | 139 | - | 40.7679 | E | | seafloor | |
| 0:28:17 | 9:28:17 | 789.1 | 33 | - | 24.3842 | N | 139 | - | 40.7713 | E | 650.9 | 33 | - | 24.3958 | N | 139 | - | 40.7674 | E | | fish | |
| 0:29:48 | 9:29:48 | 789.9 | 33 | - | 24.3835 | N | 139 | - | 40.7738 | E | 651 | 33 | - | 24.3959 | N | 139 | - | 40.7684 | E | | pasiphaea | |
| 0:31:45 | 9:31:45 | 790.6 | 33 | - | 24.3887 | N | 139 | - | 40.7716 | E | 651 | 33 | - | 24.3968 | N | 139 | - | 40.7681 | E | | Botrynema | |
| 0:32:33 | 9:32:33 | 790.2 | 33 | - | 24.3908 | N | 139 | - | 40.7719 | E | 651 | 33 | - | 24.3979 | N | 139 | - | 40.769 | E | | Hoplostethus | |
| 0:33:35 | 9:33:35 | 790.6 | 33 | - | 24.3903 | N | 139 | - | 40.772 | E | 650.9 | 33 | - | 24.3982 | N | 139 | - | 40.7684 | E | | Sergestes | |
| 0:35:54 | 9:35:54 | 791.7 | 33 | - | 24.4012 | N | 139 | - | 40.7702 | E | 651.1 | 33 | - | 24.3978 | N | 139 | - | 40.7677 | E | | Hoplostethus | |
| 0:36:20 | 9:36:20 | 791.2 | 33 | - | 24.4036 | N | 139 | - | 40.7697 | E | 651.2 | 33 | - | 24.397 | N | 139 | - | 40.7682 | E | | fish | |
| 0:38:06 | 9:38:06 | 789.8 | 33 | - | 24.41 | N | 139 | - | 40.7678 | E | 651 | 33 | - | 24.3968 | N | 139 | - | 40.7677 | E | | pet bottle | |
| 0:38:35 | 9:38:35 | 790 | 33 | - | 24.41 | N | 139 | - | 40.7686 | E | 650.8 | 33 | - | 24.3972 | N | 139 | - | 40.7683 | E | | lobata | |
| 0:40:12 | 9:40:12 | 790.2 | 33 | - | 24.4134 | N | 139 | - | 40.7671 | E | 650.9 | 33 | - | 24.3985 | N | 139 | - | 40.7685 | E | | ray | |
| 0:44:32 | 9:44:32 | 789.9 | 33 | - | 24.4197 | N | 139 | - | 40.7714 | E | 650.9 | 33 | - | 24.3967 | N | 139 | - | 40.7679 | E | | lot of shrimps | |
| 0:48:10 | 9:48:10 | 789.8 | 33 | - | 24.4201 | N | 139 | - | 40.7721 | E | 650.9 | 33 | - | 24.4089 | N | 139 | - | 40.7686 | E | | trachymedusae | |
| 0:51:44 | 9:51:44 | 790.1 | 33 | - | 24.4199 | N | 139 | - | 40.7702 | E | 650.8 | 33 | - | 24.413 | N | 139 | - | 40.767 | E | | | |
| 0:55:21 | 9:55:21 | 789.5 | 33 | - | 24.4253 | N | 139 | - | 40.7698 | E | 650.9 | 33 | - | 24.4129 | N | 139 | - | 40.7686 | E | | fish | |
| 0:55:38 | 9:55:38 | 789.8 | 33 | - | 24.4281 | N | 139 | - | 40.7697 | E | 651 | 33 | - | 24.413 | N | 139 | - | 40.7689 | E | | big fish | |
| 0:56:35 | 9:56:35 | 789.7 | 33 | - | 24.4268 | N | 139 | - | 40.7694 | E | 651 | 33 | - | 24.4124 | N | 139 | - | 40.7678 | E | | tomopteris | |
| 1:00:31 | 10:00:31 | 788.6 | 33 | - | 24.4372 | N | 139 | - | 40.7673 | E | 651.2 | 33 | - | 24.4129 | N | 139 | - | 40.767 | E | | synaphobranched | |
| 1:02:04 | 10:02:04 | 789.2 | 33 | - | 24.4408 | N | 139 | - | 40.7675 | E | 651 | 33 | - | 24.4119 | N | 139 | - | 40.7665 | E | | shark | |
| 1:02:56 | 10:02:56 | 788.9 | 33 | - | 24.4399 | N | 139 | - | 40.7684 | E | 650.9 | 33 | - | 24.4129 | N | 139 | - | 40.7678 | E | | broken piece of coral | |
| 1:07:15 | 10:07:15 | 787.5 | 33 | - | 24.4508 | N | 139 | - | 40.7628 | E | 651 | 33 | - | 24.43 | N | 139 | - | 40.7683 | E | | fish | |
| 1:11:33 | 10:11:33 | 787 | 33 | - | 24.4547 | N | 139 | - | 40.7619 | E | 650.9 | 33 | - | 24.4385 | N | 139 | - | 40.7684 | E | | squid | |
| 1:23:29 | 10:23:29 | 787.2 | 33 | - | 24.4545 | N | 139 | - | 40.7624 | E | 650.9 | 33 | - | 24.4527 | N | 139 | - | 40.7684 | E | | red fish | |
| 1:28:29 | 10:28:29 | 786.8 | 33 | - | 24.4546 | N | 139 | - | 40.7612 | E | 650.9 | 33 | - | 24.4522 | N | 139 | - | 40.7665 | E | | ligning test finish, starting transect | |
| 1:31:17 | 10:31:17 | 784.7 | 33 | - | 24.4626 | N | 139 | - | 40.763 | E | 651.1 | 33 | - | 24.4529 | N | 139 | - | 40.7677 | E | | Squaliolus | |
| 1:33:09 | 10:33:09 | 780.5 | 33 | - | 24.4702 | N | 139 | - | 40.7643 | E | 651.1 | 33 | - | 24.4535 | N | 139 | - | 40.7695 | E | | fish | |
| 1:34:53 | 10:34:53 | 776.5 | 33 | - | 24.4734 | N | 139 | - | 40.7623 | E | 649.5 | 33 | - | 24.4534 | N | 139 | - | 40.7671 | E | | symaphobranchus | |
| 1:35:45 | 10:35:45 | 776 | 33 | - | 24.4743 | N | 139 | - | 40.7625 | E | 646.2 | 33 | - | 24.453 | N | 139 | - | 40.7673 | E | | crab | |
| 1:40:50 | 10:40:50 | 777.3 | 33 | - | 24.4756 | N | 139 | - | 40.7621 | E | 641.4 | 33 | - | 24.4529 | N | 139 | - | 40.7681 | E | | slope surface of crab | |
| 1:44:20 | 10:44:20 | 776.7 | 33 | - | 24.4752 | N | 139 | - | 40.7616 | E | 641.3 | 33 | - | 24.4532 | N | 139 | - | 40.7677 | E | | Trachymedusae | |
| 1:47:18 | 10:47:18 | 771.7 | 33 | - | 24.4819 | N | 139 | - | 40.7608 | E | 641.3 | 33 | - | 24.4613 | N | 139 | - | 40.7675 | E | | string | |
| 1:48:20 | 10:48:20 | 769.3 | 33 | - | 24.4845 | N | 139 | - | 40.7602 | E | 641.5 | 33 | - | 24.4652 | N | 139 | - | 40.7659 | E | | fishing net | |
| 1:50:29 | 10:50:29 | 769.1 | 33 | - | 24.4842 | N | 139 | - | 40.7605 | E | 641.3 | 33 | - | 24.4727 | N | 139 | - | 40.764 | E | | mapping of rock with fishing nets | |
| 1:51:23 | 10:51:23 | 768.4 | 33 | - | 24.4857 | N | 139 | - | 40.7588 | E | 641.4 | 33 | - | 24.4734 | N | 139 | - | 40.7628 | E | | ascend to depth at 770m | |
| 1:52:58 | 10:52:58 | 768.9 | 33 | - | 24.4809 | N | 139 | - | 40.7597 | E | 641.3 | 33 | - | 24.4733 | N | 139 | - | 40.7628 | E | | Cranchidae | |
| 1:53:47 | 10:53:47 | 768.6 | 33 | - | 24.4775 | N | 139 | - | 40.7582 | E | 641.4 | 33 | - | 24.4736 | N | 139 | - | 40.7615 | E | | Lobata | |
| 1:56:06 | 10:56:06 | 768.8 | 33 | - | 24.4764 | N | 139 | - | 40.757 | E | 641.5 | 33 | - | 24.476 | N | 139 | - | 40.763 | E | | Algama okeni | |
| 1:58:40 | 10:58:40 | 769.8 | 33 | - | 24.4695 | N | 139 | - | 40.7562 | E | 641.2 | 33 | - | 24.4746 | N | 139 | - | 40.7633 | E | | Lobata | |
| 1:59:47 | 10:59:47 | 769.8 | 33 | - | 24.4689 | N | 139 | - | 40.7559 | E | 641.3 | 33 | - | 24.475 | N | 139 | - | 40.7633 | E | | Tomopteris | |
| 2:00:40 | 11:00:40 | 770.8 | 33 | - | 24.4669 | N | 139 | - | 40.7541 | E | 641.3 | 33 | - | 24.4747 | N | 139 | - | 40.7629 | E | | Bathyceroe | |
| 2:01:38 | 11:01:38 | 766.3 | 33 | - | 24.4649 | N | 139 | - | 40.7533 | E | 641.2 | 33 | - | 24.4753 | N | 139 | - | 40.7636 | E | | Agalma elegans | |
| 2:01:49 | 11:01:49 | 766.2 | 33 | - | 24.4648 | N | 139 | - | 40.7529 | E | 641.5 | 33 | - | 24.476 | N | 139 | - | 40.7636 | E | | Tomopteris | |
| 2:04:53 | 11:04:53 | 770 | 33 | - | 24.4515 | N | 139 | - | 40.7521 | E | 641.3 | 33 | - | 24.4738 | N | 139 | - | 40.7631 | E | | Lobata | |
| 2:05:29 | 11:05:29 | 769.9 | 33 | - | 24.4509 | N | 139 | - | 40.7522 | E | 641.4 | 33 | - | 24.4728 | N | 139 | - | 40.7618 | E | | Sergestes | |
| 2:06:04 | 11:06:04 | 770 | 33 | - | 24.4508 | N | 139 | - | 40.7513 | E | 641.7 | 33 | - | 24.4703 | N | 139 | - | 40.7607 | E | | | |
| 2:08:46 | 11:08:46 | 773.8 | 33 | - | 24.4496 | N | 139 | - | 40.7464 | E | 641.1 | 33 | - | 24.4558 | N | 139 | - | 40.7549 | E | | Hydrozoan ss1 | |
| 2:09:43 | 11:09:43 | 773.2 | 33 | - | 24.4495 | N | 139 | - | 40.7441 | E | 641.4 | 33 | - | 24.4531 | N | 139 | - | 40.7538 | E | | Bathocyroe | |
| 2:10:17 | 11:10:17 | 771.1 | 33 | - | 24.4496 | N | 139 | - | 40.7448 | E | 641.2 | 33 | - | 24.4524 | N | 139 | - | 40.7541 | E | | Siphonophora | |
| 2:10:42 | 11:10:42 | 770.6 | 33 | - | 24.4492 | N | 139 | - | 40.7426 | E | 641.4 | 33 | - | 24.452 | N | 139 | - | 40.7535 | E | | Phronima sedentaria | |
| 2:13:10 | 11:13:10 | 764.2 | 33 | - | 24.4428 | N | 139 | - | 40.7449 | E | 631.5 | 33 | - | 24.4523 | N | 139 | - | 40.7528 | E | | Agalma okeni | |
| 2:17:19 | 11:17:19 | 750.2 | 33 | - | 24.4341 | N | 139 | - | 40.7508 | E | 621 | 33 | - | 24.455 | N | 139 | - | 40.7548 | E | | Earleria? | |
| 2:19:07 | 11:19:07 | 751.3 | 33 | - | 24.4351 | N | 139 | - | 40.7452 | E | 620.6 | 33 | - | 24.4522 | N | 139 | - | 40.753 | E | | Leptomedusae | |
| 2:21:13 | 11:21:13 | 749.2 | 33 | - | 24.4263 | N | 139 | - | 40.7483 | E | 620.9 | 33 | - | 24.4418 | N | 139 | - | 40.7534 | E | | Earleria | |
| 2:23:10 | 11:23:10 | 749.9 | 33 | - | 24.427 | N | 139 | - | 40.7436 | E | 620.8 | 33 | - | 24.4401 | N | 139 | - | 40.7533 | E | | Lobata | |
| 2:23:54 | 11:23:54 | 748.9 | 33 | - | 24.4261 | N | 139 | - | 40.7431 | E | 621.1 | 33 | - | 24.4401 | N | 139 | - | 40.7534 | E | | Bathocyroe | |
| 2:25:19 | 11:25:19 | 750 | 33 | - | 24.4229 | N | 139 | - | 40.7433 | E | 621 | 33 | - | 24.439 | N | 139 | - | 40.7551 | E | | Narcomedusae | |
| 2:26:10 | 11:26:10 | 750.5 | 33 | - | 24.4228 | N | 139 | - | 40.7404 | E | 621.2 | 33 | - | 24.4389 | N | 139 | - | 40.7555 | E | | Lobata | |
| 2:28:31 | 11:28:31 | 749.1 | 33 | - | 24.4188 | N | 139 | - | 40.7435 | E | 621 | 33 | - | 24.4366 | N | 139 | - | 40.7533 | E | | Pyrosoma | |
| 2:31:48 | 11:31:48 | 749.2 | 33 | - | 24.4188 | N | 139 | - | 40.737 | E | 620.9 | 33 | - | 24.4322 | N | 139 | - | 40.7477 | E | | Lobata | |
| 2:32:03 | 11:32:03 | 748.8 | 33 | - | 24.4194 | N | 139 | - | 40.7376 | E | 619.7 | 33 | - | 24.4324 | N | 139 | - | 40.747 | E | | Solmissus | |
| 2:32:15 | 11:32:15 | 746.8 | 33 | - | 24.4186 | N | 139 | - | 40.7373 | E | 618 | 33 | - | 24.4317 | N | 139 | - | 40.7458 | E | | Lobata | |
| 2:33:22 | 11:33:22 | 736.8 | 33 | - | 24.4177 | N | 139 | - | 40.7372 | E | 604.7 | 33 | - | 24.4302 | N | 139 | - | 40.743 | E | | Bathocyroe | |
| 2:33:36 | 11:33:36 | 735.7 | 33 | - | 24.4181 | N | 139 | - | 40.7372 | E | 602.9 | 33 | - | 24.43 | N | 139 | - | 40.7418 | E | | Bathocyroe | |
| 2:34:33 | 11:34:33 | 731.9 | 33 | - | 24.4166 | N | 139 | - | 40.744 | E | 594.4 | 33 | - | 24.4274 | N | 139 | - | 40.7405 | E | | Bathocyroe | |
| 2:44:13 | 11:44:13 | 725.7 | 33 | - | 24.4158 | N | 139 | - | 40.738 | E | 591 | 33 | - | 24.4265 | N | 139 | - | 40.7394 | E | | Halicreatidae | |

Dive Log of KM-ROV Dive # 143 シートのコピー LOG 2020/12/24

Area Name; Kurose Hole

| Time (UTC) | Time (Local) | Vehicle Dep.(m) | Vehicle Pos. Lat | | | | Vehicle Pos. Lon | | | | TMS Dep.(m) | TMS Pos. Lat | | | | TMS Pos. Lon | | | | Vehicle Alt(m) | Description | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2:49:09 | 11:49:09 | 701.9 | 33 | - | 24.4183 | N | 139 | - | 40.7262 | E | 573.6 | 33 | - | 24.4272 | N | 139 | - | 40.7399 | E | | transect start | |
| 2:49:31 | 11:49:31 | 701.8 | 33 | - | 24.4175 | N | 139 | - | 40.7258 | E | 571 | 33 | - | 24.4277 | N | 139 | - | 40.739 | E | | fish | |
| 2:50:02 | 11:50:02 | 701.8 | 33 | - | 24.4172 | N | 139 | - | 40.7259 | E | 566.4 | 33 | - | 24.4275 | N | 139 | - | 40.7388 | E | | algama | |
| 2:54:50 | 11:54:50 | 700.9 | 33 | - | 24.4256 | N | 139 | - | 40.715 | E | 566.5 | 33 | - | 24.4283 | N | 139 | - | 40.7394 | E | | Lobata | |
| 2:56:37 | 11:56:37 | 698.3 | 33 | - | 24.428 | N | 139 | - | 40.7117 | E | 566.4 | 33 | - | 24.4283 | N | 139 | - | 40.7396 | E | | Lobata | |
| 2:56:48 | 11:56:48 | 697.1 | 33 | - | 24.4259 | N | 139 | - | 40.7101 | E | 566.7 | 33 | - | 24.4271 | N | 139 | - | 40.7386 | E | | algama | |
| 2:57:03 | 11:57:03 | 699.8 | 33 | - | 24.4272 | N | 139 | - | 40.7101 | E | 566.4 | 33 | - | 24.4287 | N | 139 | - | 40.7387 | E | | Lobata | |
| 3:01:20 | 12:01:20 | 701.4 | 33 | - | 24.4281 | N | 139 | - | 40.7032 | E | 566.2 | 33 | - | 24.4282 | N | 139 | - | 40.7196 | E | | Lobata | |
| 3:02:33 | 12:02:33 | 698.5 | 33 | - | 24.4282 | N | 139 | - | 40.7011 | E | 566.4 | 33 | - | 24.4286 | N | 139 | - | 40.7152 | E | | Ctnophora | |
| 3:05:54 | 12:05:54 | 699 | 33 | - | 24.4292 | N | 139 | - | 40.6933 | E | 564.5 | 33 | - | 24.4287 | N | 139 | - | 40.7132 | E | | Lobata | |
| 3:07:30 | 12:07:30 | 690.3 | 33 | - | 24.4315 | N | 139 | - | 40.6903 | E | 557.2 | 33 | - | 24.4286 | N | 139 | - | 40.7136 | E | | Tomopteris | |
| 3:09:47 | 12:09:47 | 679.3 | 33 | - | 24.4276 | N | 139 | - | 40.6892 | E | 542.3 | 33 | - | 24.4279 | N | 139 | - | 40.7124 | E | | Agalma elegans | |
| 3:12:06 | 12:12:06 | 677.3 | 33 | - | 24.4297 | N | 139 | - | 40.6859 | E | 541.1 | 33 | - | 24.4281 | N | 139 | - | 40.7143 | E | | Lobata | |
| 3:14:36 | 12:14:36 | 674.9 | 33 | - | 24.4343 | N | 139 | - | 40.6806 | E | 541.2 | 33 | - | 24.4284 | N | 139 | - | 40.7137 | E | | Phronima sedentaria | |
| 3:15:36 | 12:15:36 | 675.2 | 33 | - | 24.435 | N | 139 | - | 40.6787 | E | 541.1 | 33 | - | 24.4285 | N | 139 | - | 40.7128 | E | | Lobata | |
| 3:16:04 | 12:16:04 | 674.2 | 33 | - | 24.4348 | N | 139 | - | 40.6778 | E | 541.3 | 33 | - | 24.4278 | N | 139 | - | 40.7121 | E | | Narcomedusae | |
| 3:18:12 | 12:18:12 | 677.6 | 33 | - | 24.4367 | N | 139 | - | 40.6765 | E | 541 | 33 | - | 24.4277 | N | 139 | - | 40.7132 | E | | euplokam | |
| 3:32:01 | 12:32:01 | 653.7 | 33 | - | 24.4446 | N | 139 | - | 40.6677 | E | 510.6 | 33 | - | 24.4457 | N | 139 | - | 40.6865 | E | | agalma okeni | |
| 4:22:19 | 13:22:19 | 496.7 | 33 | - | 24.4329 | N | 139 | - | 40.6896 | E | 372.1 | 33 | - | 24.4445 | N | 139 | - | 40.6863 | E | | kyohime | |
| 4:24:10 | 13:24:10 | 500.7 | 33 | - | 24.4323 | N | 139 | - | 40.6885 | E | 371.7 | 33 | - | 24.4444 | N | 139 | - | 40.6867 | E | | squit | |
| 4:28:39 | 13:28:39 | 495.4 | 33 | - | 24.4326 | N | 139 | - | 40.6816 | E | 371.7 | 33 | - | 24.4451 | N | 139 | - | 40.6861 | E | | Oikupleura | |
| 4:29:03 | 13:29:03 | 496.1 | 33 | - | 24.4317 | N | 139 | - | 40.6815 | E | 371.7 | 33 | - | 24.4452 | N | 139 | - | 40.687 | E | | siphonophore | |
| 4:30:15 | 13:30:15 | 487.6 | 33 | - | 24.4305 | N | 139 | - | 40.6798 | E | 372.1 | 33 | - | 24.4451 | N | 139 | - | 40.6867 | E | | transect stop | |
| 4:31:03 | 13:31:03 | 487.2 | 33 | - | 24.4307 | N | 139 | - | 40.6786 | E | 371.9 | 33 | - | 24.4449 | N | 139 | - | 40.6858 | E | | turn of slup gun, stopedat ss4 | |
| 4:39:13 | 13:39:13 | 398.1 | 33 | - | 24.4392 | N | 139 | - | 40.6788 | E | 371.6 | 33 | - | 24.4374 | N | 139 | - | 40.6767 | E | | Agalma okine | |
| 4:40:11 | 13:40:11 | 373.7 | 33 | - | 24.4367 | N | 139 | - | 40.674 | E | 369 | 33 | - | 24.4363 | N | 139 | - | 40.6743 | E | | docked to the TMS | |
| 4:57:57 | 13:57:57 | 35.1 | 33 | - | 24.5133 | N | 139 | - | 40.5797 | E | 0 | 33 | - | 24.464 | N | 139 | - | 40.6291 | E | | out off the water | |