



**KAIMEI Cruise Report  
KM25-02 Leg2  
“Research cruise investigating  
the marine volcanoes in the Izu-Bonin arc”**



**Nishinoshima, Sofu Seamount, Miyakejima  
March 12-29, 2025**

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

## 1. Cruise Information

- Cruise ID: KM25-02 Leg2
- Name of vessel: RV Kaimei
- Title of cruise: Research cruise investigating the marine volcanoes in the Izu-Bonin arc
- Chief Scientist: Kenta Yoshida [JAMSTEC]
- Cruise period: Mar. 12-Mar. 29, 2025
- Ports of departure & arrival: Yokosuka HQ
- Research area: Nishinoshima, Sofu seamount, Off Sumisujima, Miyakejima
- Research map

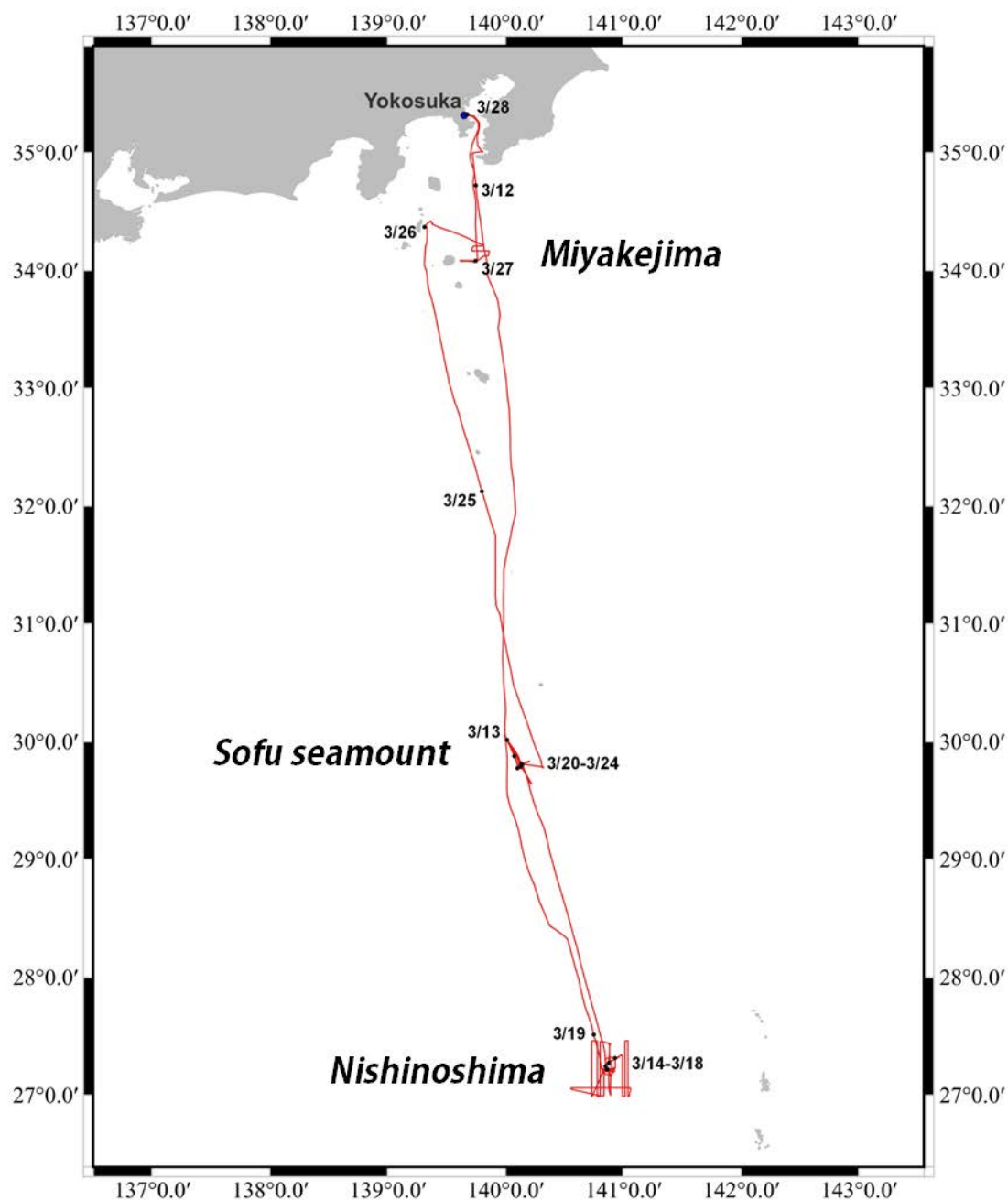


Figure 1. Research map of this cruise.

## 2. Research Proposal and Science Party

- Title of proposal: Research cruise investigating the marine volcanoes in the Izu-Bonin arc
- Representative of Science Party: Kenta Yoshida [JAMSTEC]

### Science Party

|                    |             |                                                             |
|--------------------|-------------|-------------------------------------------------------------|
| ● Shigeaki Ono     | IMG         | Lead Proponent                                              |
| ● Kenta Yoshida    | IMG         | Lead Proponent, sampling and analyses of geological samples |
| ● Yoshihiko Tamura | IMG         | Petrology of volcanic rocks                                 |
| ● Osamu Ishizuka   | IMG         | Petrology of volcanic rocks                                 |
| ● Morihisa Hamada  | IMG         | Petrology of volcanic rocks                                 |
| ● Takeshi Hanyu    | IMG         | Petrology of volcanic rocks                                 |
| ● Tomoki Sato      | IMG         | Petrology of volcanic rocks                                 |
| ● Yuya Akamatsu    | IMG         | Petrology of volcanic rocks                                 |
| ● Noriko Tada      | IMG         | Geomagnetic survey of volcanoes                             |
| ● Masaru Nakano    | IMG         | Geophysical survey of volcanoes                             |
| ● Aki Ito          | IMG         | Geophysical survey of volcanoes                             |
| ● Toshiya Fujiwara | IMG         | Bathymetric survey of volcanoes                             |
| ● Kazuya Kitada    | X-star      | Geomagnetic survey of volcanoes                             |
| ● Erika Tanaka     | Kochi U.    | Geochemical analysis of volcanic sediments                  |
| ● Takashi Toyofuku | X-star      | Foraminifera study around volcanoes                         |
| ● Yukiko Nagai     | X-star      | Foraminifera study around volcanoes                         |
| ● Yutaka Yoshimura | NIPR        | Geomagnetic survey of volcanoes                             |
| ● Hidemi Ishibashi | Shizuoka U. | Petrology of volcanic rocks                                 |
| ● Hiroshi Ichihara | Nagoya U.   | Geomagnetic survey of volcanic rocks                        |
| ● Fukashi Maeno    | U. Tokyo    | Petrology of volcanic rocks                                 |
| ● Hideaki Mori     | JWRC        | Biology in Nishinoshima Island                              |

### Scientific Personnel onboard Kaimei

- Kenta Yoshida, Chief Scientist
- Morihisa Hamada, Vice-chief Scientist
- Noriko Tada
- Takeshi Hanyu
- Tomoki Sato
- Yuya Akamatsu
- Hiroshi Ichihara
- Masaru Nakano
- Iona McIntosh
- Yuuki Hagiwara
- Manaka Kuroda (supervised by H. Ichihara)
- Kazunori Zushida (supervised by F. Maeno)
- Katsuya Noguchi (JDRONE)
- Katsuya Iwama (JDRONE)
- Yuzuki Nakajima (JDRONE)
- Louis-Maxime Gautreau (GEOMAR)
- Katharina Margarete Pank (GEOMAR)
- Yuki Miyajima (MWJ)
- Yuta Shinomiya (MWJ)
- Ritsuko Sawada (MWJ)
- Mariko Sano (MWJ)
- Nahoko Adachi (MWJ)
- Seika Takai (NME)
- Mitsuyasu Katagiri (NME)
- Ikumasa Terada (NME)
- Taro Shirai (NME)

### KM-ROV Operation team

- TETSUYA ISHITSUKA Submersible Operation Manager

- TAKUMA GOTO 2nd Submersible Technical Officer
- ATSUSHI OGUMA 2nd Submersible Technical Officer
- YUTO OKUHIRA 2nd Submersible Technical Officer
- KOTA FUJII
- YOSUKE KUWAHARA

#### **R/V Kaimei**

- MURAMATSU TAKESHI Captain
- SUZUKI AKIRA Chief Officer
- ITO SHUN 2nd Officer
- TSURUMAKI AOI 3rd Officer
- MIYAMAE Toshihiko Jr.3rd Officer
- KANEDA KAZUHIKO Chief Engineer
- MORI TAKAHIRO 1st Engineer
- SHIMADA KEITO 2nd Engineer
- FUJII KOTA Jr.2nd Engineer
- IKEGAMI So 3rd Engineer
- FUKAGAWA SHUNSUKE Chief Electronic Operator
- MATSUI RYOSUKE 2nd Electronic Operator
- YOKOI Seiya 3rd Electronic Operator
- YOSHINO YUKI Boat Swain
- KUWAHARA YOSUKE Able Seaman
- MIYASHITA TAKUYA Able Seaman
- UEHARA SHOHEI Able Seaman
- OHJIRI YUTA Able Seaman
- NASU KENTA Able Seaman
- MIURA TAKUMI Able Seaman
- YAMADA Ryoya Sailor
- OISHI HIROYUKI No.1 Oiler
- YOSHIDA KATSUYUKI Oiler
- MANNA Shota Assistant Oiler
- SARAMOTO KOITARO Assistant Oiler
- KUBO KIYOYUKI Assistant Oiler
- HIRAYAMA KAZUHIRO Chief Steward
- KASHIWAGI KOICHIRO Steward
- FUJIMOTO YUMA Steward
- KATO TAKU Steward

### **3. Research/Development Activities**

#### **Purpose of the cruise**

The activity of the volcanoes in the Izu-Ogasawara (Bonin) arc is high in recent years. It has been recently recognized that not only direct hazard of the proximal area, but also some serious effects to the distant area, such as pumice rafting and volcanic tsunamis, can be caused by the large-scale eruption of the oceanic volcanoes (volcanic island and submarine volcano).

The purpose of this cruise is to understand the current condition of the active volcanoes which showed significant eruptions in recent tens of years. The target volcanoes include Nishinoshima that shows intermittent eruptions since 2013, Sofu seamount that showed possible eruption-related earthquake and tsunamis in 2023, and Miyakejima that showed an eruption in 2000, along with the sub-target of Izu-Oshima and Fukutoku-Oka-no-Ba.

This cruise mainly performed sampling using KM-ROV, piston coring, and dredge. In the Nishinoshima area, unmanned aerial vehicle (UAV) observation was also performed. In the Sofu seamount area, we recovered OBSs that have been installed during another cruise, KM25-02 Leg1.

#### **Results**

Samples collected by dredge, piston coring, and ROV dives are listed as Appendix 1. Photos of the collected samples and cores are provided in Appendix 2. Results of each procedure are briefly described in the following section.

### *Nishinoshima*

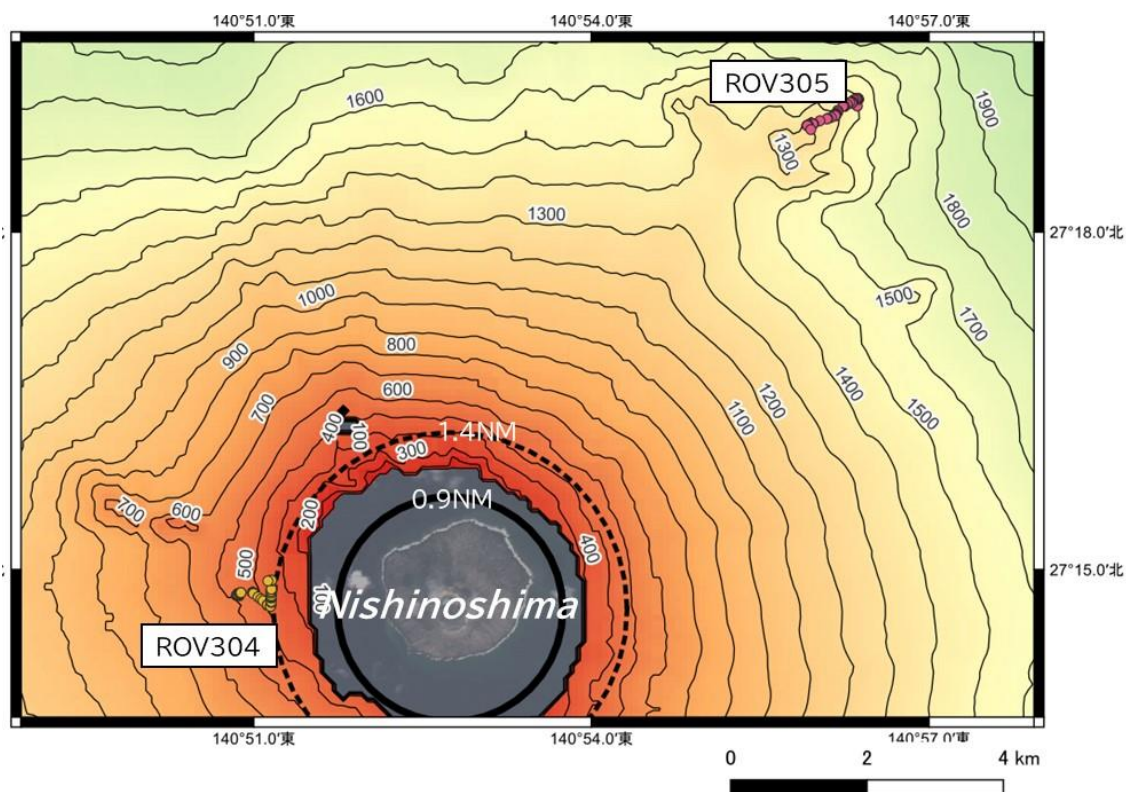


Figure 2. Closed map of the Nishinoshima area. Locations of ROV surveys KMROV#304 and #305 are shown. Black and black-dashed lines indicate certain distance from the central crater.

#### KMROV#304

Date: 16 March 2025

Location: Western flank of Nishinoshima

Landing (depth/latitude/longitude): 588.6m/27-14.7791N/140-50.8528E

Leaving (depth/latitude/longitude): 467m/27-14.9064N/140-51.1581E

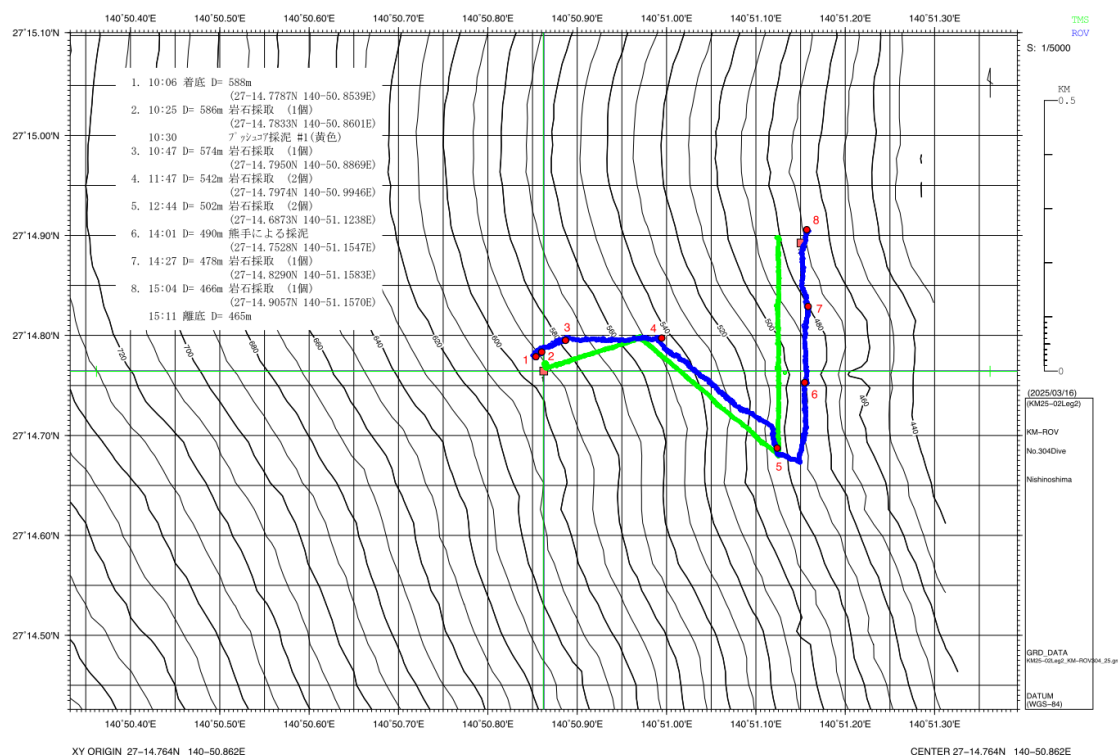


Figure 3. Survey route map of KMROV#304. Blue and green lines indicate the vehicle and ship positions, respectively.

The dive aimed to observe the characteristic water column signal recorded in the western flank of volcano and collected rock and sediment samples. The landing site (589 m b.s.l.) was sandy with significant ripple marks (Figure 4a). Lava blocks occurred in the slope, some of which were covered with white-yellow alteration (or deposits). Several organisms, such as *pachylasma*, were occasionally observed on the lava blocks (Figure 4). Representative photo of the collected samples. (a)Whitely-coated large block which could not be collected. We collected alternative sample from the nearby area. (b) Loose block on the sandy volcanic ash. (c) Large aggregate of the altered rocks. R03 and R04 were collected from this aggregate. (d-e) Samples occurring in the large aggregate of the altered rocks. (f-g) R05 was collected around the large volcanic block partly covered white-yellow coating. (h-i) R07 and R08 were collected around the large volcanic blocks associated with a number of *pachylasma*. (j) S01 collected the sandy volcanic ash. Figure 4h). During this dive, we collected eight rock samples including andesitic lava block and tuff breccia and one sediment sample collected by a shovel (Figure 4j).

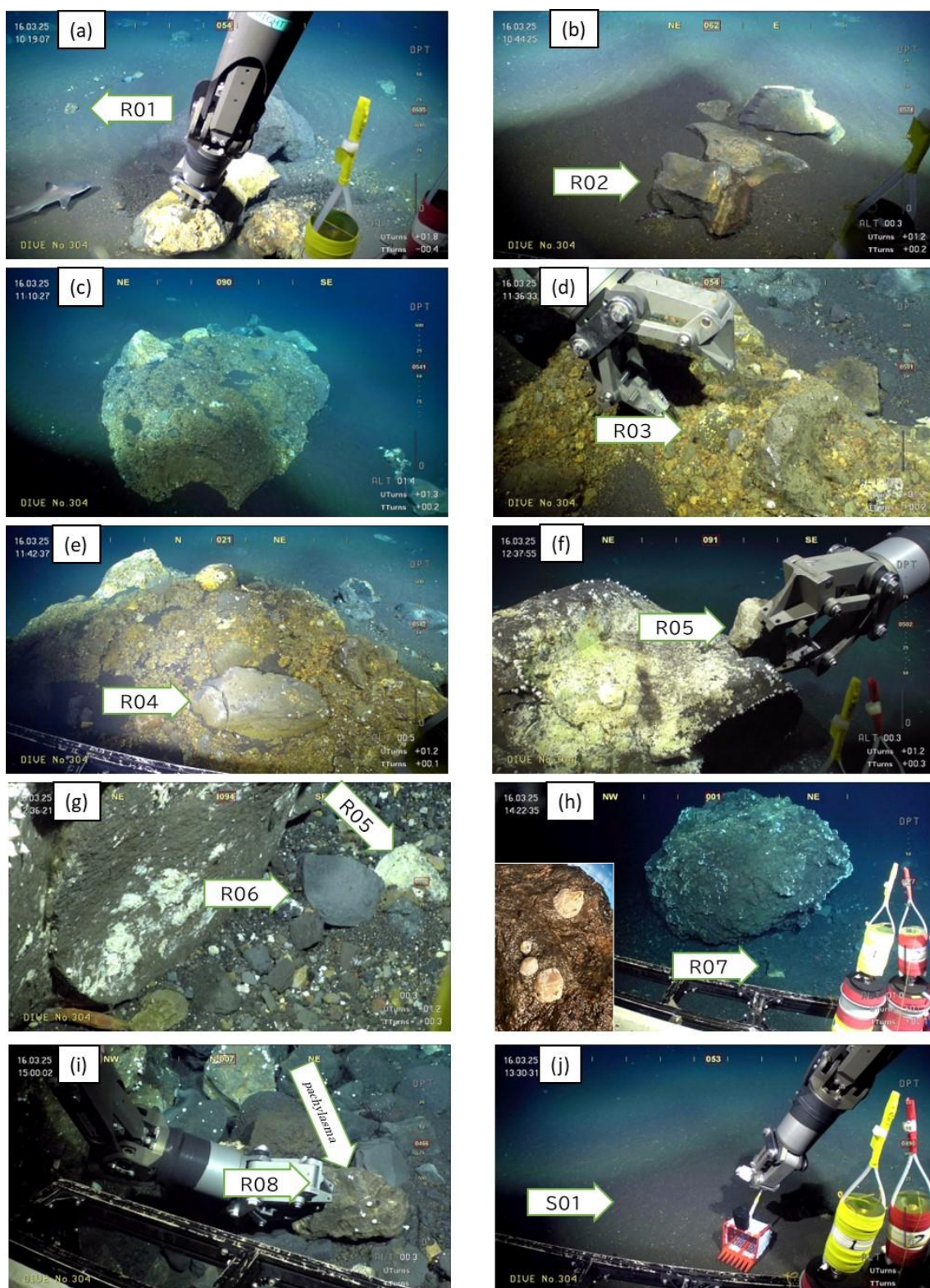


Figure 4. Representative photo of the collected samples. (a)Whitely-coated large block which could not be collected. We collected alternative sample from the nearby area. (b) Loose block on the sandy volcanic ash. (c) Large aggregate of the altered rocks. R03 and R04 were collected from this aggregate. (d-e) Samples occurring in the large aggregate of the altered rocks. (f-g) R05 was collected around the large volcanic block partly covered white-yellow coating. (h-i) R07 and R08 were collected around

the large volcanic blocks associated with a number of *pachylasma*. (j) S01 collected the sandy volcanic ash.

**KMROV#305**

Date: 17 March 2025

Location: Northeastern flank volcano of Nishinoshima

Landing (depth/longitude/latitude): 1510.4m/27-19.1847N/140-56.3646E

Leaving (depth/longitude/latitude): 1241.1m/27-18.947N/140-55.9201E

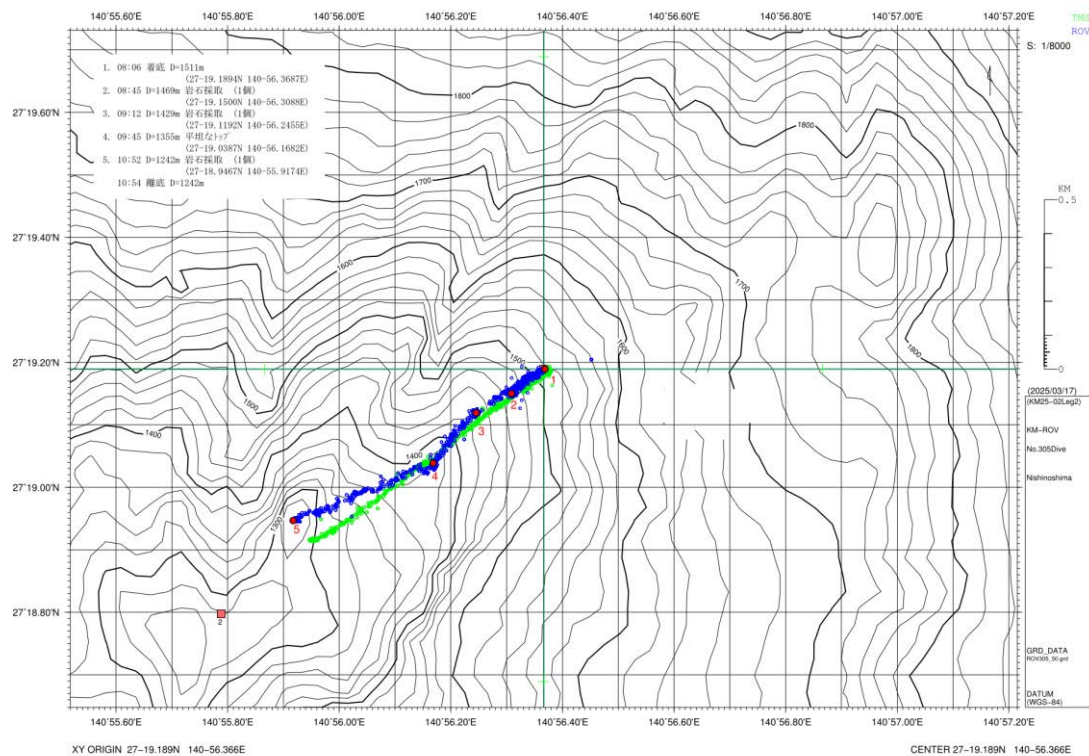


Figure 5. Survey route map of KMROV#305. Blue and green lines indicate the vehicle and ship positions, respectively.

The dive aimed at watching the topography and geology of the relevant area. In particular, looking for the candidate of BMS drilling.

The northeastern flank volcano turned out to be basaltic knoll during the KM-ROV #252 observation. The landing site was sandy. The knoll had moderate slopes and some flat areas can be candidates for the BMS drilling.

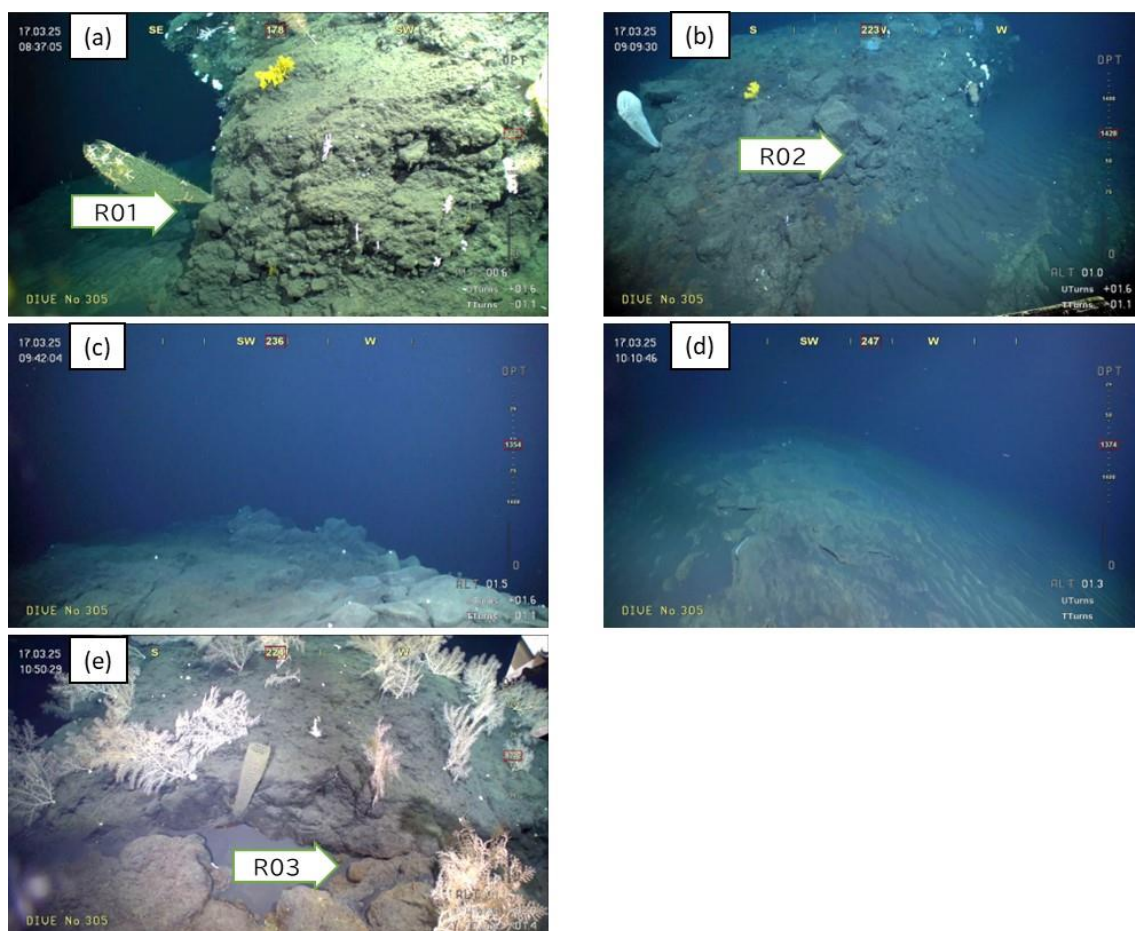


Figure 6. Representative photos during the dive KMROV#305. (a) The sample R01 was collected from relatively large outcrop. (b) The sample R02 was collected from the aggregate of the angular rocks on the seafloor. (c-d) Relatively flat area occurred near the top of the topographic high, which possibly can be target for the future BMS drilling. (e) At the top of the topographic high, we collected a sample with reddish coating (R03).

#### Aerial geomagnetic survey

Geomagnetic distribution of Nishinoshima and surrounding area was investigated using an unmanned helicopter (YAMAHA R G2) piloted via satellite communications (Figure 7a, b).

Takeoff and landing operations were piloted directly by the onboard scientists. Subsequently, the helicopter switched to remote-operation via satellite communications from Minamisoma, Fukushima Prefecture. This type of unmanned helicopters can be used for the observation of remote island where the mother ship cannot approach to efficiently-short distance.

Considering the conditions of wind and tides, we performed 8 flights in 3 days, resulting in covering the whole area of the island and some extent to the surrounding area that overlaps with the ship geomagnetic survey.

#### Water sampling & Logger installation

During the helicopter geomagnetic survey, we performed UAV (unmanned aerial vehicle) observation using small to medium sized UAVs.

Water sampling targeting the discolored water around Nishinoshima was performed (Figure 8a-c). We took 2 flights for 1 sampling site. Sampling was done for two discolored water sites and one reference sites. The locations were listed in Appendix.

One logger was installed in collaboration with JWRC (Figure 8d).

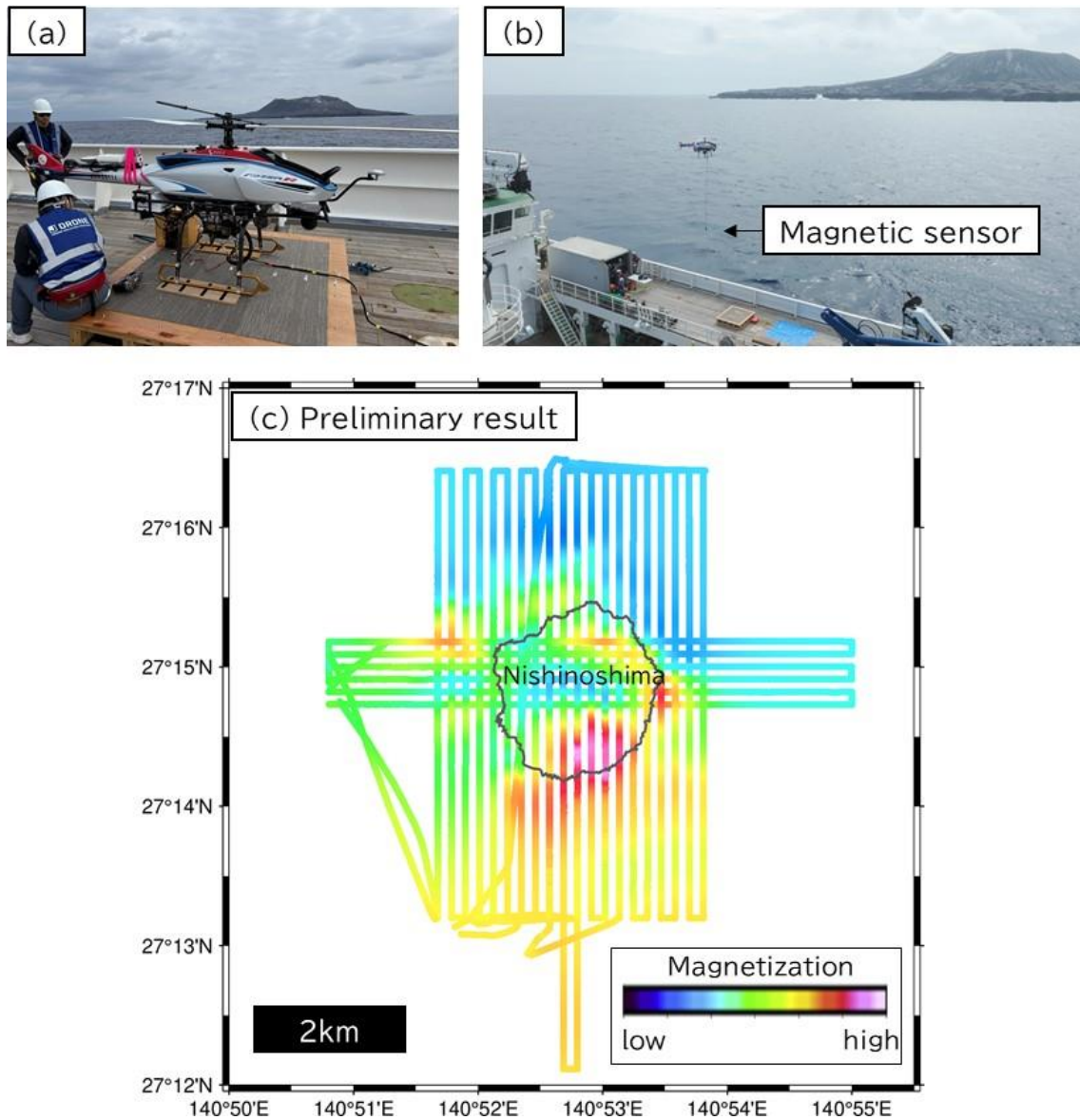


Figure 7. Outline of the aerial geomagnetic survey. (a) YAMAHA FAZER R G2, an unmanned helicopter, employed for this study. (b) The helicopter was taking off from the deck of the ship, piloted directly by the onboard scientist. Subsequently, the helicopter switched to the remote piloting via satellite communications. (c) Preliminary result of the geomagnetic survey performed in this study. The data were taken by a total of 8 flights in 3 days.

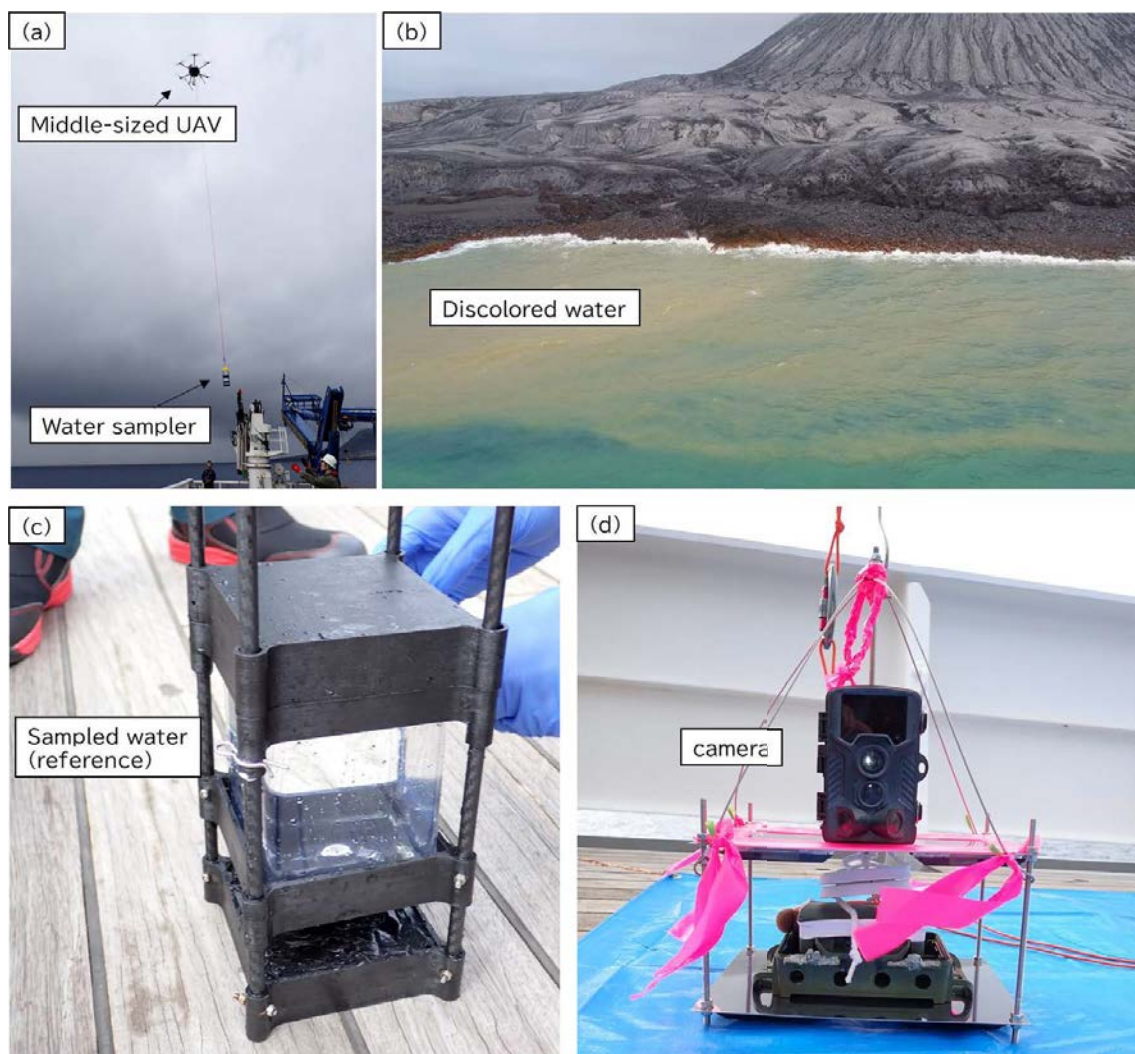


Figure 8. (a) Water sampling was performed using an in-house water sampler towed by a middle-sized UAV. (b) Water samples were collected from two sites of discolored water and one reference (point that took enough distance from the discolored water distribution). (c) An in-house water sampler collected reference water. (d) A data-logger installed in the island.

### *Sofu Seamount*

Around the Sofu Seamount, we performed four ROV dives, two dredges, two piston coring, and OBS recovery.

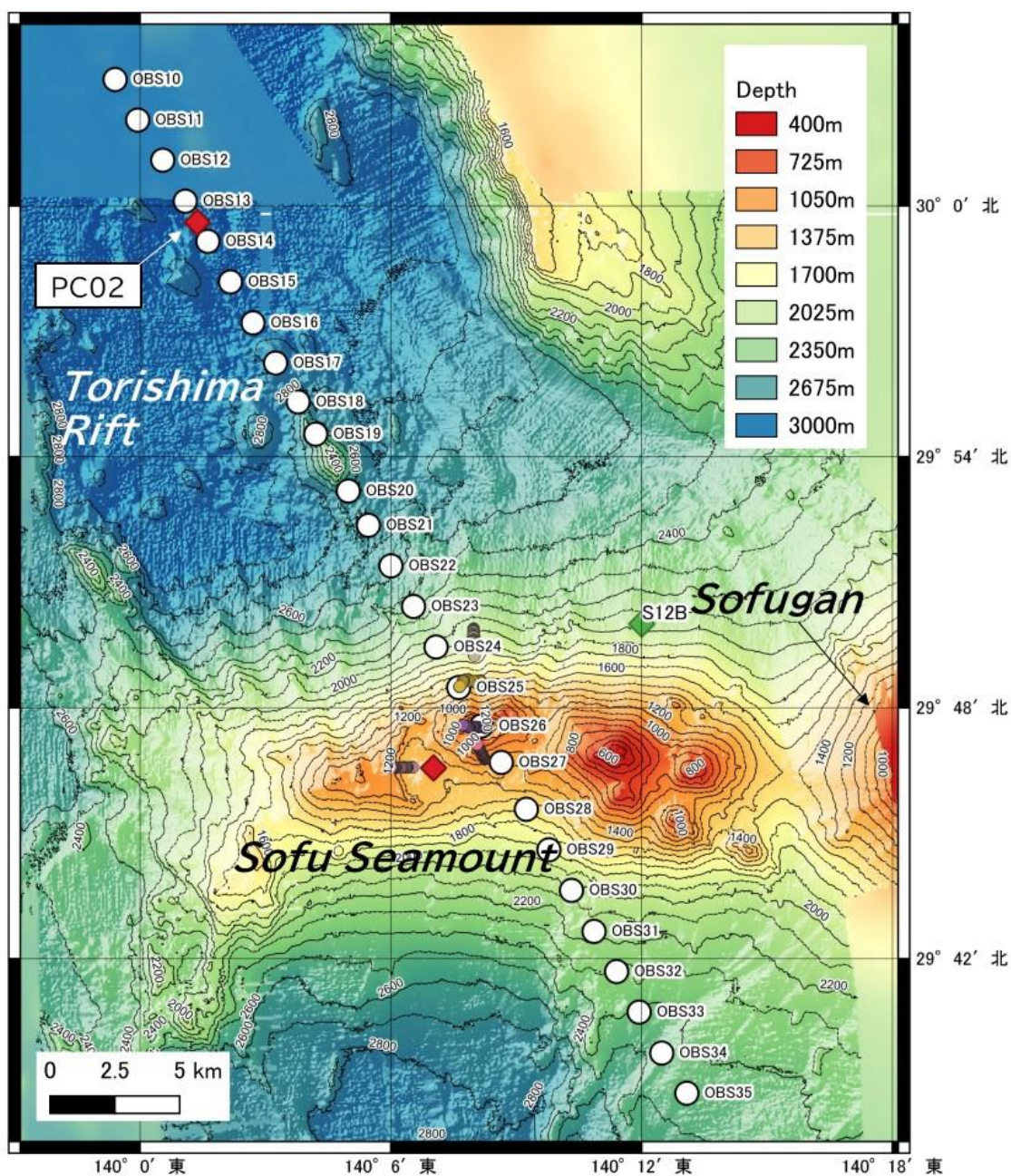


Figure 9. Bathymetric map of the Sofu Seamount area. Location of the site PC02 and OBSs are shown. OBS S12B was not recovered during the cruise while others were recovered.

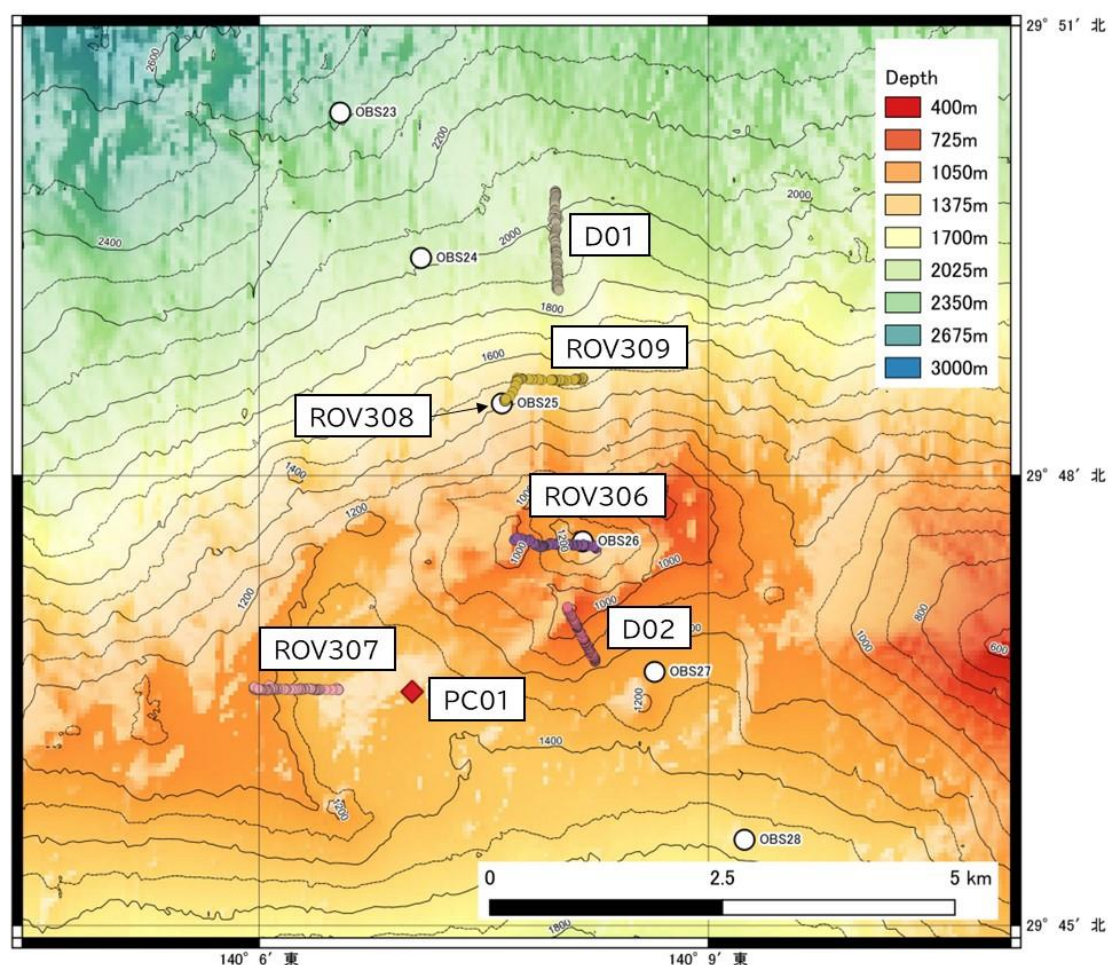


Figure 10. Closed map of the main research area of the Sofu Seamount. Survey line of KMROV#306-309 are shown (KMROV#308 dive did not move along a line). Locations of dredges (D01 and D02) and PC01 are also shown in addition to the nearby OBS sites.

#### KM25-02 D01

The dredge number KM25-02 D01 hauled a line along the valley on the north flank of the Sofu Seamount.

A total of 38.6 kg of rocks were recovered, most of which are moderately-vesiculated black rocks. Typically, four types of rocks were identified: vesiculated aphyric rock, vesiculated crystal-rich rock, plagioclase-megacryst-bearing rock, and dense aphyric rock. Small amount of light-colored (gray) rocks were also recognized.

#### KM25-02 D02

The dredge number KM25-02 D02 hauled the south flank of the central crater of the Sofu Seamount. A total of 508.8 kg of rocks and coarse-grained sediments were recovered, where rocks contain black colored ones and white- to gray-colored altered ones.

Typical black rocks were well vesiculated and contained considerable amount of plagioclase-phenocryst. Some altered rocks contained pyrite on the gray groundmass.

#### *Piston core*

#### KM25-02 PC01

The piston coring KM25-02 PC01 was performed on the middle part of the caldera of the Sofu Seamount.

A total of 127 cm core was recovered where the record of azimuth and inclinometer recorded

penetration of the core reached 125 cm. Approximately 10 cm from the top was alternating layers of fine and medium grained ash. Lower part is composed of medium to coarse grained ash with lapilli up to 4 cm.

#### KM25-02 PC02

The piston coring KM25-02 PC02 was performed at the middle part of the Torishima Rift, where OBS13 and OBS14 were once stacked on the seafloor.

A total of 152 cm main core and 25 cm of pilot core sediments were recovered where the azimuth and inclinometer indicate the penetration reached ~3.6 m. During the uprooting of the main core, the lower part of the sediment deemed to have remained on the seafloor, producing a strong negative pressure in the inner tube to evoke implosion. The upper part of the inner was severely deformed and the sediments inside could not be collected. Therefore, the uppermost part (seafloor) was not recovered as the main core. However, the pilot core successfully collected upper 25 cm of the seafloor sediment.

The collected core was mainly composed of silt-size and fine volcanic ash of brown to gray colors. The uppermost part recovered by the pilot core show normally-graded volcanic ash of black color sedimented on the silt-sized gray ash.

#### KMROV#306

Date: 21 March 2025

Location: Central crater of the Sofu Seamount

Landing (depth/longitude/latitude): 1206.3m/29-47.5155N/140-8.2498E

Leaving (depth/longitude/latitude): 967.8m/29-47.5696N/140-7.7052E

The dive aimed to observe the inside of the topographic concave at the former top of the central cone of the Sofu seamount. The concave was not observed by the previous bathymetric surveys (1987, 2022; Fujiwara et al., 2024; Minami & Tani, 2024), but occurred after the swarm earthquakes in October 2023. At the bottom of the concave, we found the anchor of the OBS26 installed during KM25-02 Leg1 and recovered during our cruise (Figure 12b).

The bottom of the concave was covered by sand-sized volcanic ash with several yellow-colored materials (Figure 12a-b: possible sulfur). We collected rock samples from outcrops and boulders. Several outcrops and sediment cliffs were covered with yellow- to white-colored materials.

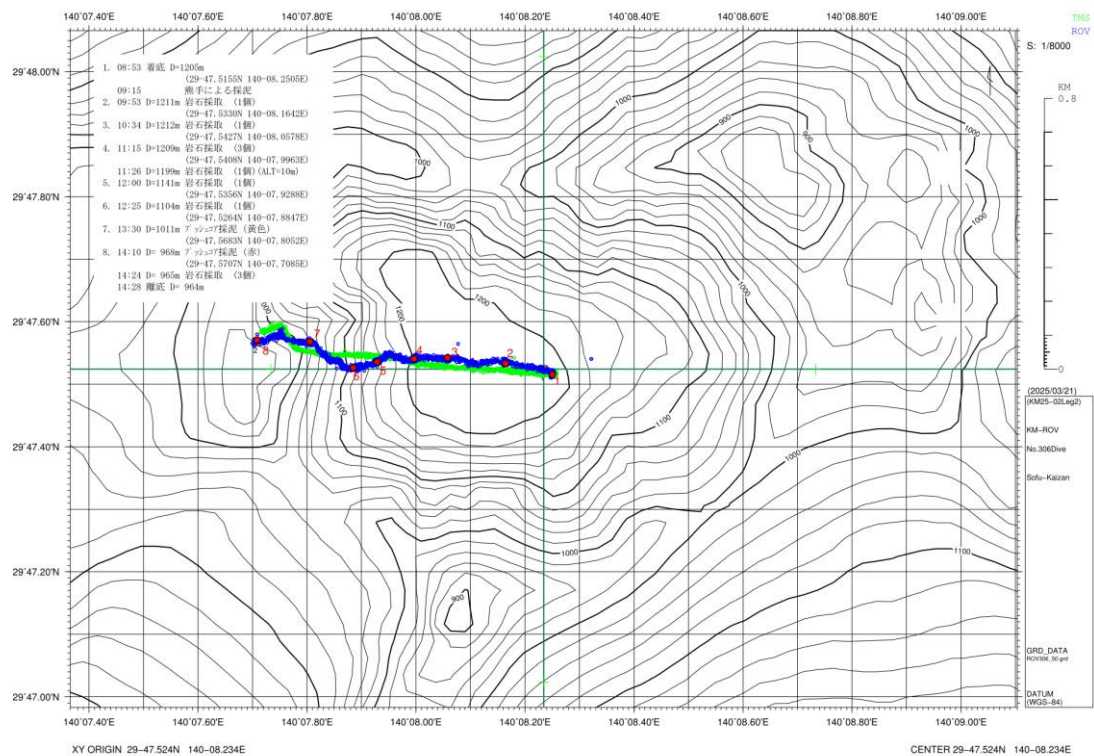


Figure 11. Survey route map of KMROV#306. Blue and green lines indicate the vehicle and ship positions, respectively.

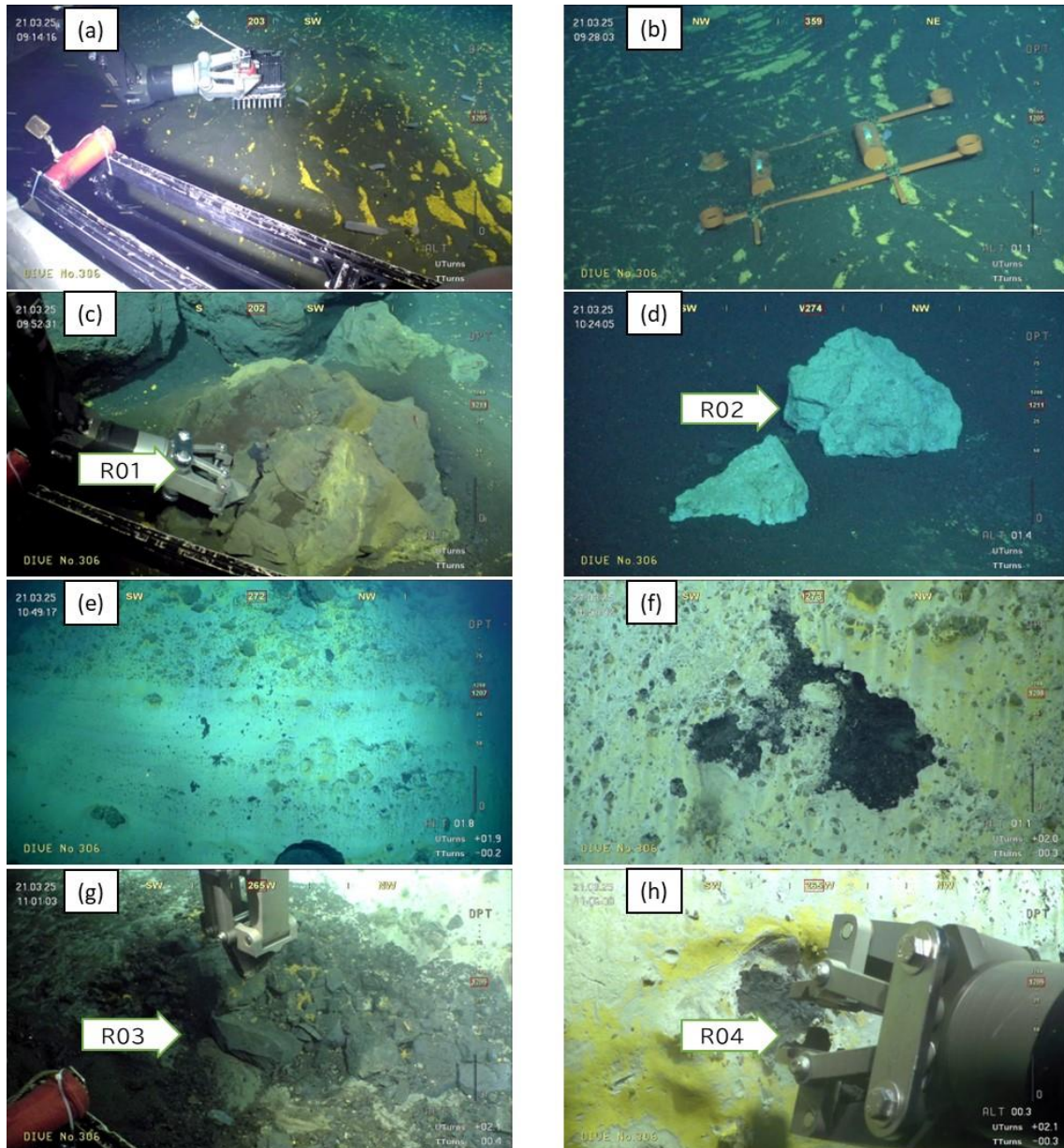


Figure 12. Representative photos of the dive KMROV#306. (a) On the seafloor of the crater inside, yellow lines (possibly sulfur deposits) sporadically occur on the black sandy seafloor. (b) The sinker of the recovered OBS25 sitting on the sandy seafloor. (c-d) Possible large boulder of the samples R01 and R02. (e-f) White cliff wall composed of thick (~ mm scale) white coating and black sandy ash layers. (g-h) Samples R03, R04, and R05 were collected from the nearby area of the white cliff wall.

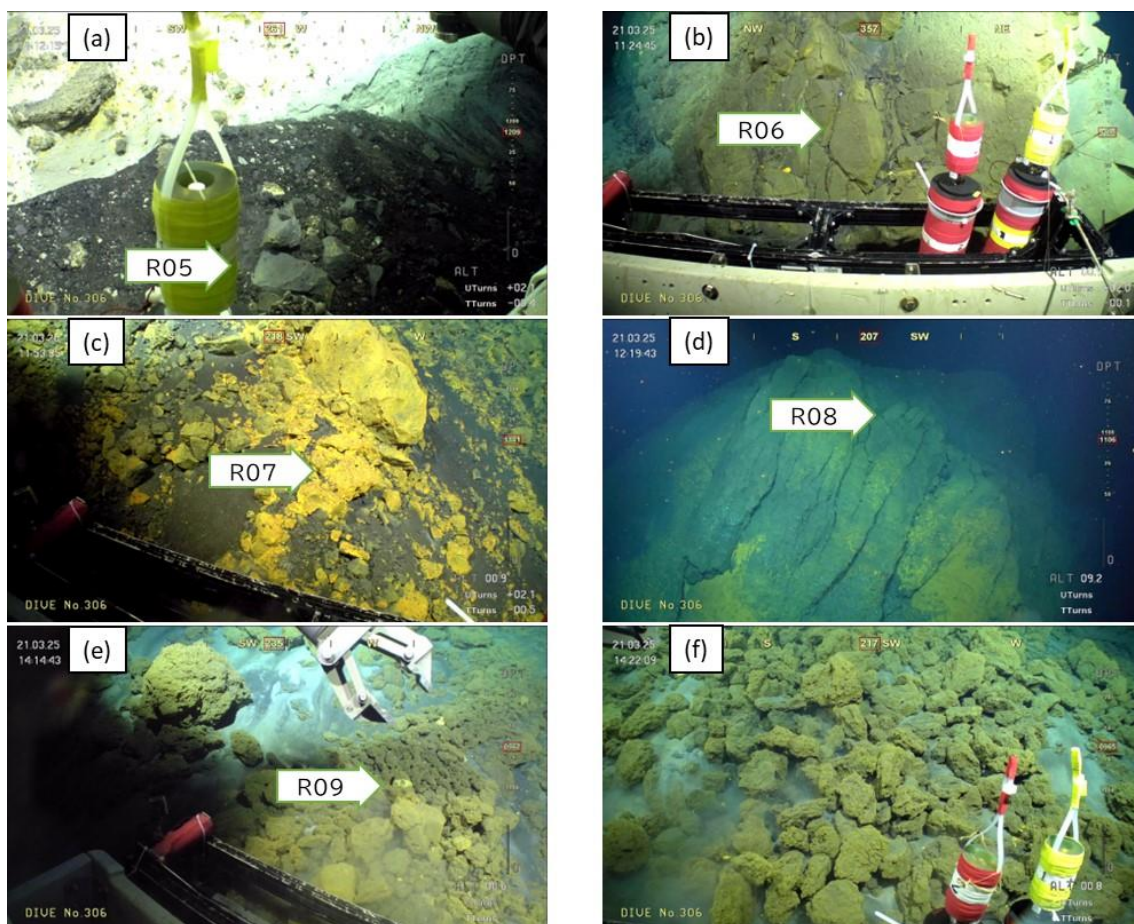


Figure 13. Representative photos during the dive KMROV#306. (a) Dark gray rock collected from the front of the white cliff wall. (b) Outcrop showing layered structure, collected as R06. (c-e) Severely-colored rocks. Their inside was fresh and black. (f) Sampling locality of R10 and R11, showing yellow-colored surface, but the inside was vesiculated black rocks.

#### KMROV#307

Date: 22 March 2025

Landing (depth/latitude/longitude): 1351m/29-46.5718N/140-6.528E

Leaving (depth/latitude/longitude): 1134.6m/29-46.5886N/140-5.9674E

The dive aimed at observation of the inner wall of the outer caldera of the Sofu seamount. Bathymetric survey conducted in KM23-14 indicated that this area gained increase in the bathymetric height, suggesting certain amount of sediments was feed possibly from the volcanic activities.

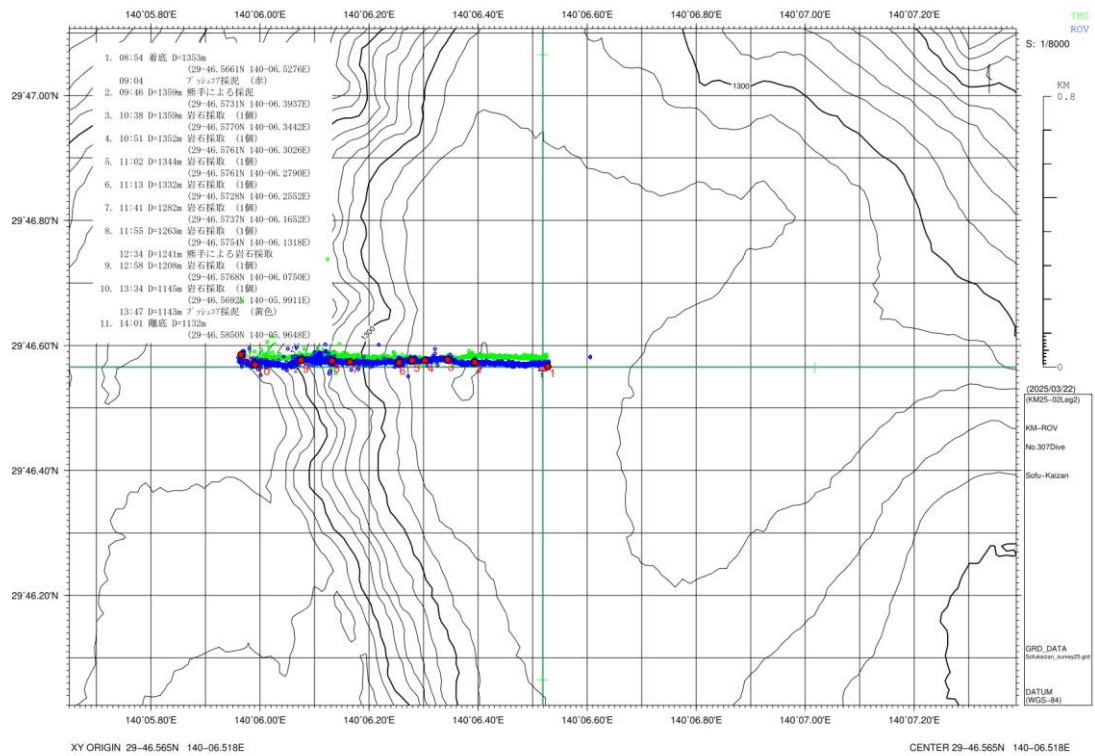


Figure 14. Survey route map of KMROV#307. Blue and green lines indicate the vehicle and ship positions, respectively.

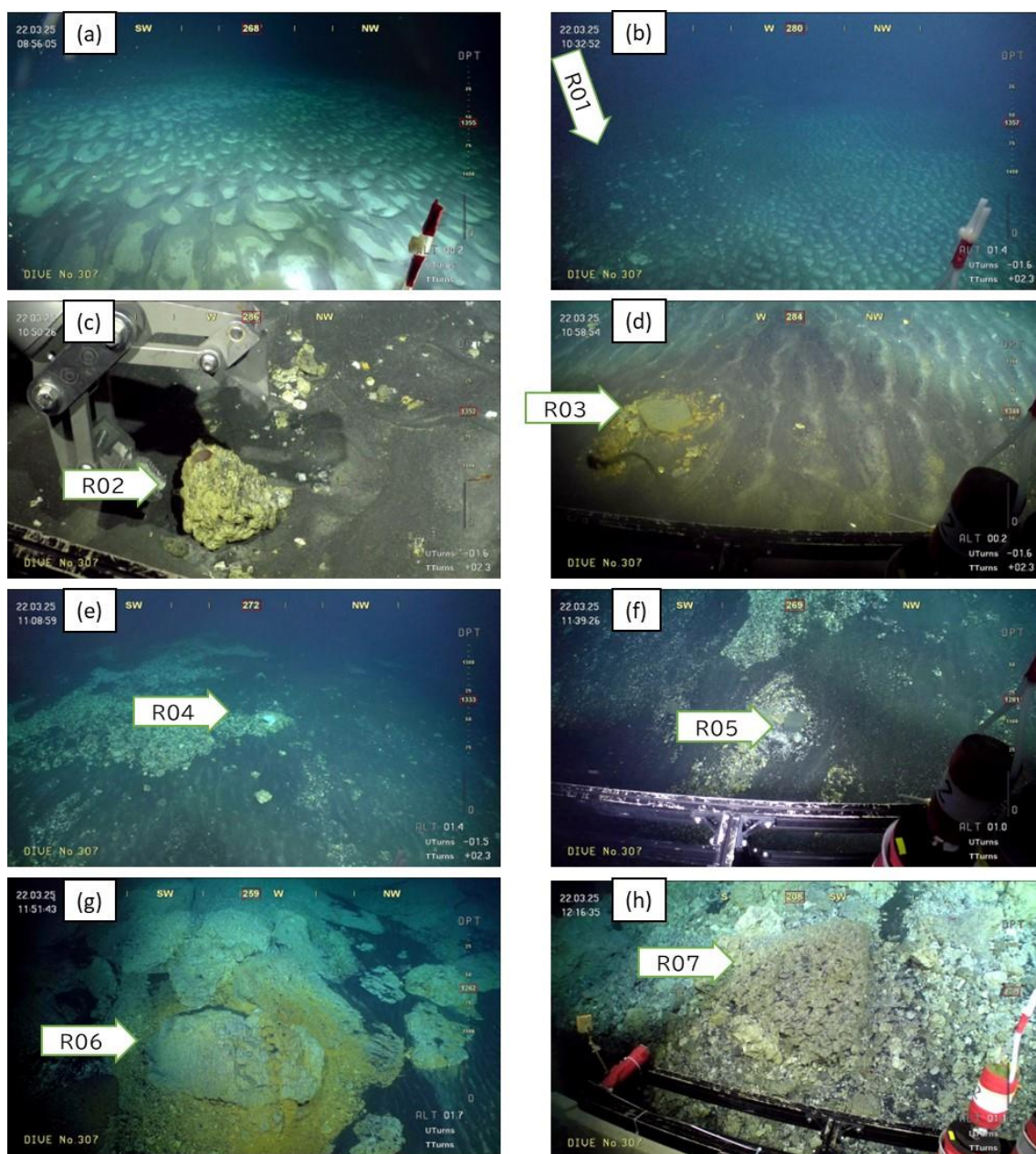


Figure 15. Representative photos of KMROV#307, part 1. (a) The bottom of the outer caldera covered with thick ash. (b) On the sandy seafloor, several trails of white rocks were observed. R01 was collected from such trail. (c-d) Occurrence of the samples R02 and R03. (e-f) R04 and R05 were collected from the white band that occurred on the seafloor. (g-h) R06 and R07 were part of large boulders.

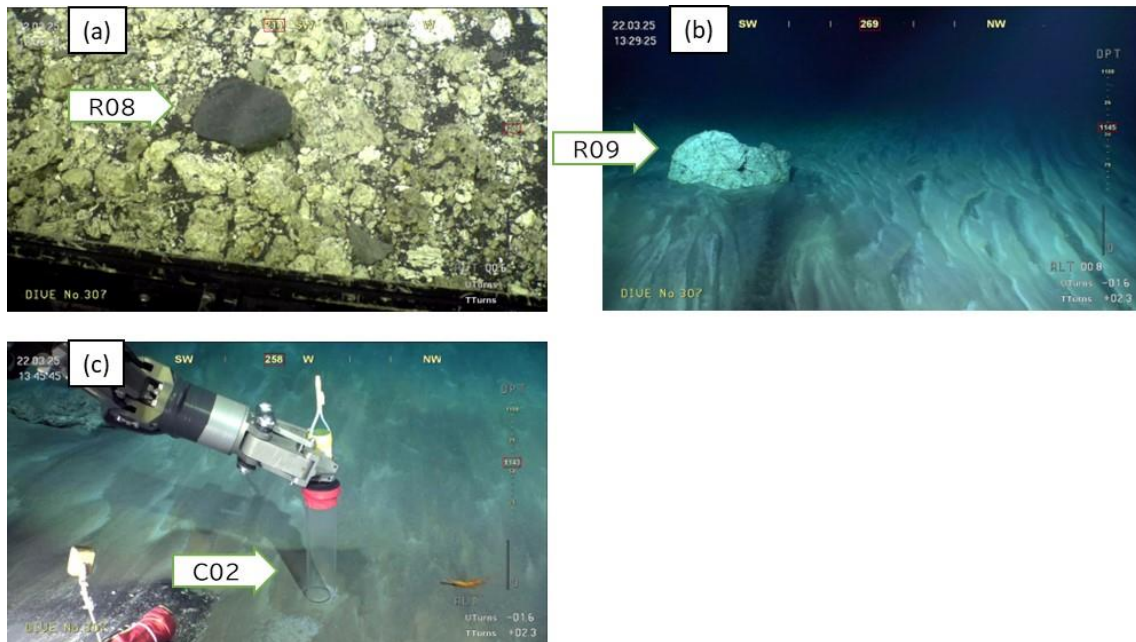


Figure 16. Representative photos of KMROV#307, part 2. (a) R08 was a small rock occurring among the white sandy mat. (b) R09 was collected from a large boulder. (c) C02 tried to collect white-colored part of the sediments.

#### KMROV#308

Date: 24 March 2025

Landing (depth/latitude/longitude): 1435.5m/29-48.4983N/140-7.6428E

Leaving (depth/latitude/longitude): 1435.9m/29-48.4978N/140-7.6433E

The dive aimed at recovering the installed OBS (OBS25) that did not recover by itself.

During the diving, we arrived just above the installed OBS. We set appropriate weights to the OBS and tied them to the ROV.

The OBS was recovered successfully within several tens of minutes.

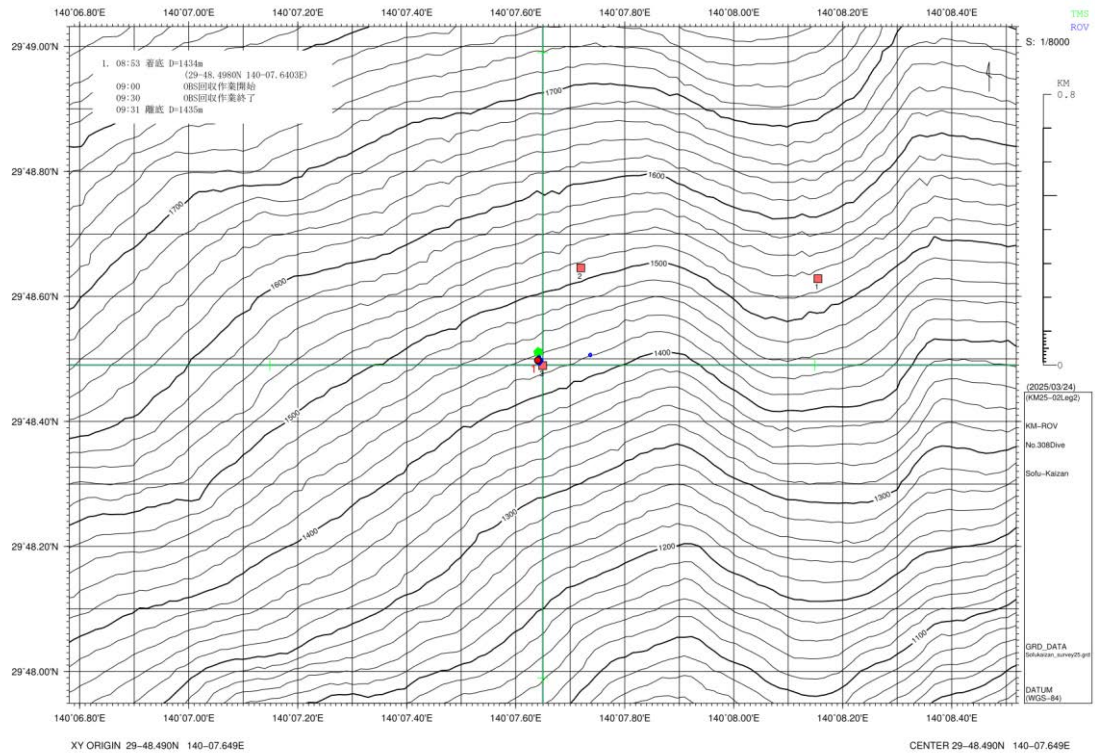


Figure 17. Survey route map of KMROV#308. Blue and green lines indicate the vehicle and ship positions, respectively. Note that lateral move was not done.

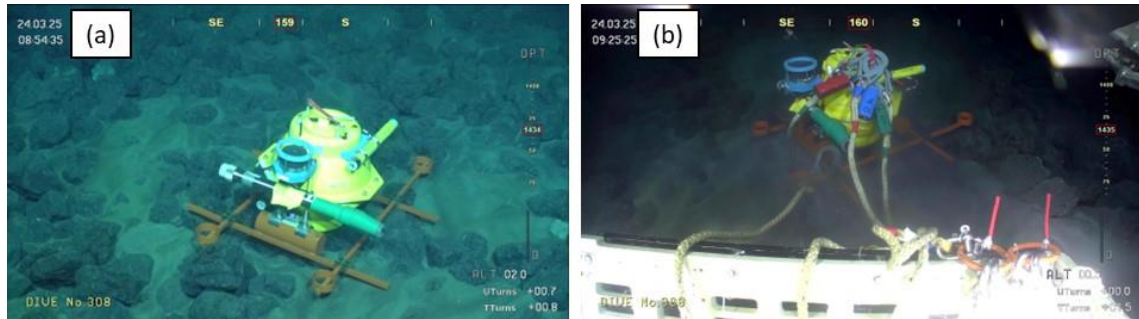


Figure 18. The OBS recovered by this dive. (a) The OBS was located on the rocky seafloor. (b) The OBS was tied to the ROV and recovered.

### KMROV#309

Date: 24 March 2025

Landing (depth/latitude/longitude): 1543.2m/29-48.6488N/140-8.1603E

Leaving (depth/latitude/longitude): 1437.1m/29-48.4983N/140-7.6431E

The dive aimed at observing the seafloor of the bathymetric concave and convex according to Minami & Tani (2024). The landing point was a middle part of the valley where bathymetric lowering was observed after October 2023.

We moved from the valley, through the edge, to the places where depths were decreased. Finally, we arrived at the position of dive #308 where the OBS was installed.

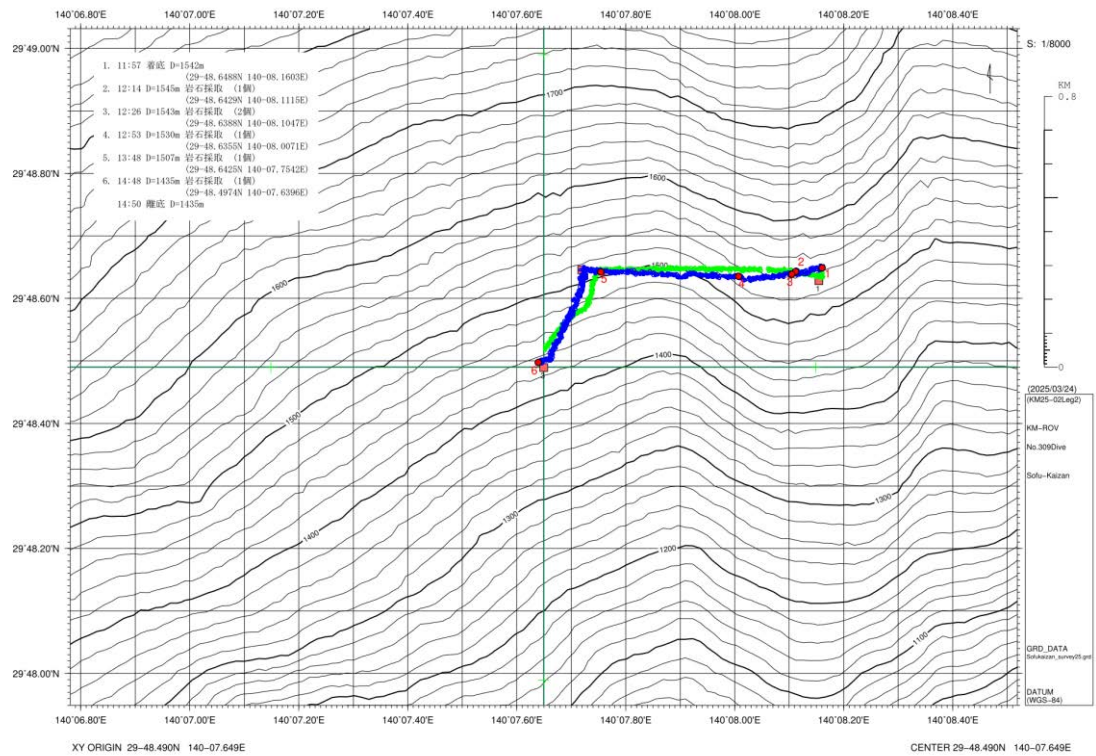


Figure 19. Survey route map of KMROV#309. Blue and green lines indicate the vehicle and ship positions, respectively.

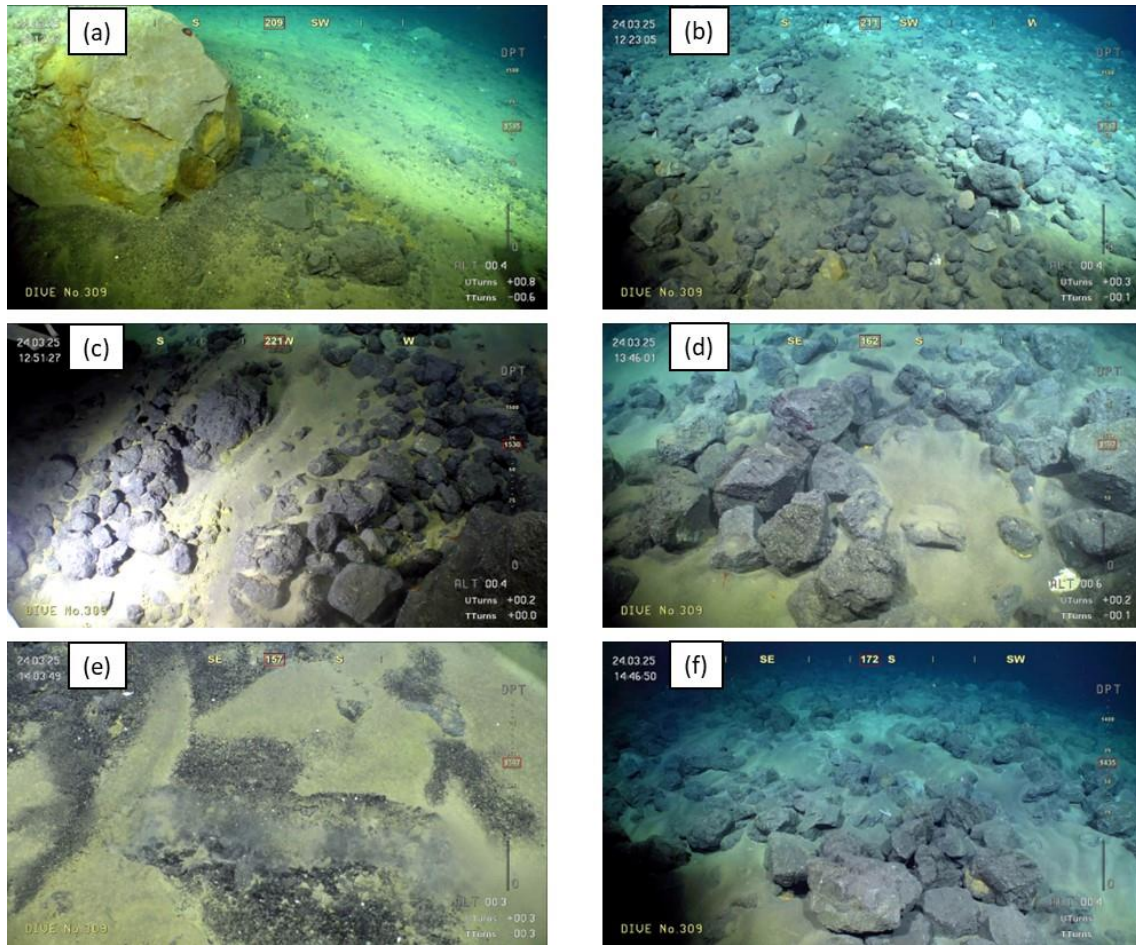


Figure 20. Representative photos of KMROV#309. (a) Sample location of R01, around the large boulder, several small pieces of black rocks were found. (b) R02 and R03 were collected from the rocky seafloor. (c-d) R04 and R05 were collected from these boulders, respectively. (e) The light-brown surface of the seafloor was the thin layer located on the black sandy floor. (f) This position is where the OBS was installed. The rock sample was collected from the exact position.

#### OBS recovery

During the cruise, we recovered OBSs that were installed during the cruise KM25-02 Leg1. OBS10-35, except for OBS25, were recovered following the ordinary OBS recovery procedures (Figure 21a). However, some OBSs, mainly those in the northern area, have not started self-rising at the first call although they return acoustic signal. We spared a couple of hours to some days for such OBSs and tried calling again. Finally, most OBSs rise to surface by themselves and were recovered safely.

The OBSs which did not rise at a first call accompanied considerable amount of dark-colored muddy ash even though they have been washed during rising up, which were sampled as ash samples (Figure 21b, listed in the Appendix sample list).

OBS25 was installed at the northern flank of the Sofu seamount, and was recovered by using KMROV as described in the section KM-ROV#308. We have expected that this OBS was stacked due to the muddy sediments; however, the OBS site was rocky and it seemed there is no problem in the site. After recovery, the OBS releasing instruments were checked and possible rare mechanical error was inferred, though the exact reason remained unclear.

The OBS S12B which was installed during the cruise in December 2023, was not recovered. The OBS lost its signal during installation (in December 2023). We assumed the position of the OBS based on the results of OBS installation done in the same cruise, and called the OBS for a couple of hours, but the OBS did not answer.



Figure 21. (a) OBS recovered during this cruise. (b) After OBS recovery, dark-colored muddy ash occasionally appeared on the stage where OBS was once placed.

### ***Miyakejima***

At the Miyakejima area, we performed piston coring at two sites.

On the southern side of Miyakejima island, the Kuroshio Current, a strong ocean current, is passing in an eastern direction. This makes strong current around the target area and sometimes makes the submersible operation difficult.

We consider the ocean current of the coring sites using ADCP, in addition to the sub-bottom profiler survey performed in prior to the coring.

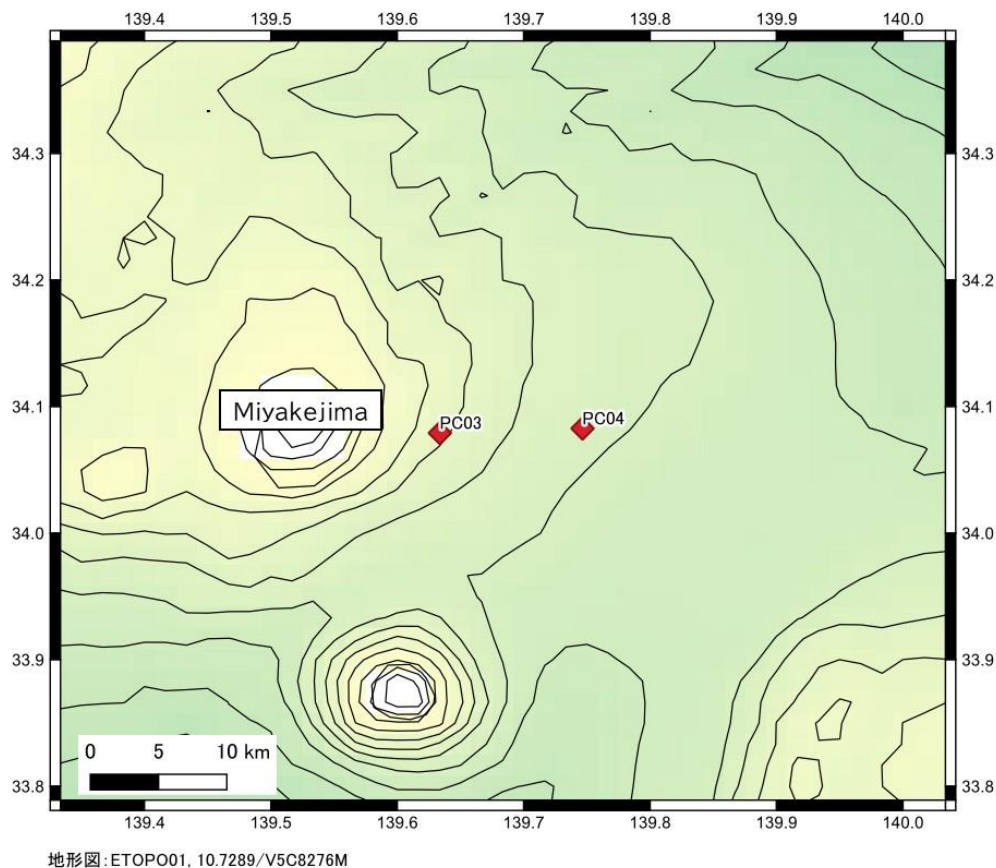


Figure 22. Locations of piston coring operation around Miyakejima island.

#### **KM25-02 PC03**

PC03 was performed at the east of Miyakejima island.

We recovered about 233cm core; however, the inclinometer indicates the penetration of only 45 cm.

The recovered core contained approximately 40 cm of poorly-sorted medium-grained ash with lapilli, and coarse-grained ash with abundant lapilli. The former part is considered to preserve the original sedimentary structure. In contrast, the latter was sucked during uprooting like vacuum-cleaner.

#### **KM25-02 PC04**

PC04 was performed at the east of the site of PC04.

The inclinometer indicated that the core penetrated to <30 cm and the recovered core contained few amounts of black lapilli.

The core sample was probably escaped during its uprooting and lifting up.

#### 4. Cruise Log

| Date        | Local Time | Description                                     | Position / Weather / Wind, Sea condition (Noon)                               |
|-------------|------------|-------------------------------------------------|-------------------------------------------------------------------------------|
| Wed. 12.Mar | 09:00      | Departured from Yokosuka                        | East ward off IZU OOSHIMA                                                     |
|             | 10:00      | Onboard lecture for evacuation and onboard life | 34-43.2N,139-44.8E                                                            |
|             | 13:00      | Emergency Drill                                 | Overcast                                                                      |
|             |            |                                                 | SSE-4 (Moderate breeze)<br>3 (Sea Slight)<br>2 (Low Swell Long)<br>Visibly: 2 |
| Thu. 13.Mar | 09:30      | Arrived at research area (SOFU Seamount)        | NW ward off SOFUGAN                                                           |
|             | 09:38      | Com'ced OBS recovery                            | 30-01.1N,140-00.7E                                                            |
|             | 18:01      | Finished OBS recovery                           | Fine but Cloudy                                                               |
|             | 18:01      | Departured for research area (NISHINOSHIMA)     | WSW-4 (Moderate breeze)<br>3 (Sea Slight)<br>2 (Low Swell Long)<br>Visibly: 8 |
| Fri. 14.Mar | 07:00      | Arrived at research area (NISHINOSHIMA)         | South ward off NISHINOSHIMA                                                   |
|             | 08:38      | Com'ced drone survey                            | 27-13.1N,140-52.0E                                                            |
|             | 09:27      | Finished drone survey                           | Fine but Cloudy                                                               |
|             | 09:45      | Com'ced Unmanned helicopter survey              | SSW-4 (Moderate breeze)                                                       |
|             | 14:12      | Finished Unmanned helicopter survey             | 3 (Sea Slight)                                                                |
|             | 15:24      | Com'ced towing cesium magnetometer              | 1 (Low Swell Short or Average)                                                |
|             | 15:47      | Com'ced cesium magnetometer survey              | Visibly: 8                                                                    |
|             | 17:44      | Finished cesium magnetometer survey             |                                                                               |
|             | 18:06      | Recovered cesium magnetometer                   |                                                                               |

|             |       |                                                  |                                |
|-------------|-------|--------------------------------------------------|--------------------------------|
| Sat. 15.Mar | 08:05 | Released XCTD                                    | North ward off NISHINOSHIMA    |
|             | 08:26 | Commenced towing cesium magnetometer             | 27-16.4N,140-52.6E             |
|             | 09:03 | Com'ced cesium magnetometer survey               | Overcast                       |
|             | 11:00 | Finished cesium magnetometer survey              | East-6 (Strong breeze)         |
|             | 11:15 | Recovered cesium magnetometer                    | 4 (Sea Moderate)               |
|             | 12:17 | Com'ced drone survey                             | 2 (Low Swell Long)             |
|             | 13:05 | Com'ced Unmanned helicopter survey               | Visibly: 8'                    |
|             | 16:51 | Finished drone survey                            |                                |
|             | 16:57 | Finished Unmanned helicopter survey              |                                |
|             | 17:30 | Com'ced towing cesium magnetometer               |                                |
|             | 17:57 | Com'ced cesium magnetometer survey               |                                |
|             | 18:51 | Com'ced Calibration for magnetometer             |                                |
|             | 19:13 | Finished Calibration for magnetometer            |                                |
| Sun. 16.Mar | 06:10 | Finished cesium magnetometer survey              | West ward off NISHINOSHIMA     |
|             | 07:10 | Recovered cesium magnetometer                    | 27-14.8N,140-51.0E             |
|             | 07:49 | Com'ced MBES site survey                         | Fine but Cloudy                |
|             | 07:58 | Finished MBES site survey                        | South-4 (Moderate breeze)      |
|             | 09:39 | KM-ROV dove & started her operation#304          | 3 (Sea Slight)                 |
|             | 09:58 | KM-ROV TMS/V breakaway                           | 1 (Low Swell Short or Average) |
|             | 10:06 | KM-ROV vehicle landed on the sea bottom (D=588m) | Visibly: 8                     |
|             | 15:11 | KM-ROV vehicle left the sea bottom (D=465m)      |                                |
|             | 15:22 | KM-ROV TMS/V combined                            |                                |
|             | 15:35 | Hoisted up KM-ROV                                |                                |
|             | 15:43 | Recovered KM-ROV & finished #304 operation       |                                |
|             | 16:46 | Com'ced MBES site survey                         |                                |
|             | 17:06 | Finished MBES site survey                        |                                |
| Mon. 17.Mar | 07:09 | KM-ROV dove & started her operation#305          | NW ward off NISHINOSHIMA       |

|             |       |                                                   |                          |
|-------------|-------|---------------------------------------------------|--------------------------|
|             | 08:01 | KM-ROV TMS/V breakaway                            | 27-18.9N,140-55.9E       |
|             | 08:06 | KM-ROV vehicle landed on the sea bottom (D=1511m) | Cloudy                   |
|             | 10:54 | KM-ROV vehicle left the sea bottom (D=1242m)      | West-6 (Strong breeze)   |
|             | 11:04 | KM-ROV TMS/V combined                             | 5 (Sea Rough)            |
|             | 11:37 | Hoisted up KM-ROV                                 | 2 (Low Swell Long)       |
|             | 11:44 | Recovered KM-ROV & finished #305 operation        | Visibly: 8               |
| <hr/>       |       |                                                   |                          |
| Tue. 18.Mar | 08:08 | Com'ced drone survey                              | South off NISHINOSHIMA   |
|             | 09:12 | Com'ced Unmanned helicopter survey                | 27-13.1N,140-51.7E       |
|             | 10:24 | Finished drone survey                             | Overcast                 |
|             | 14:20 | Finished Unmanned helicopter survey               | NNW-3 (Gentle breeze)    |
|             | 15:04 | Com'ced towing cesium magnetometer                | 2 (Sea Smooth)           |
|             | 15:30 | Com'ced cesium magnetometer survey                | 2 (Low Swell Long)       |
|             |       |                                                   | Visibly: 8               |
| <hr/>       |       |                                                   |                          |
| Wed. 19.Mar | 09:54 | Finished cesium magnetometer survey               | NW ward off NISHINOSHIMA |
|             | 10:13 | Recovered cesium magnetometer                     | 27-30.5N,140-44.9E       |
|             | 10:20 | Departured for research area (SOFU Seamount)      | Fine but Cloudy          |
|             |       |                                                   | West-6 (Strong breeze)   |
|             |       |                                                   | 4 (Sea Moderate)         |
|             |       |                                                   | 4 (Moderate Average)     |
|             |       |                                                   | Visibly: 8               |
| <hr/>       |       |                                                   |                          |
| Thu. 20.Mar | 04:00 | Arrived at research area (SOFU Seamount)          | West ward off SOFUGAN    |
|             | 06:00 | Carried out communication with OBS                | 29-48.3N,140-08.4E       |
|             | 08:22 | Com'ced dredge sampling                           | Overcast                 |

|       |                           |                          |
|-------|---------------------------|--------------------------|
| 11:26 | Finished dredge sampling  | West-4 (Moderate breeze) |
| 13:19 | Com'ced dredge sampling   | 3 (Sea Slight)           |
| 16:08 | Finished dredge sampling  | 2 (Low Swell Long)       |
| 17:32 | Com'ced OBS recovery      | Visibly: 8               |
| 21:17 | Finished OBS recovery     |                          |
| 21:45 | Com'ced MBES site survey  |                          |
| 22:01 | Finished MBES site survey |                          |

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|             |       |                                                   |                         |
|-------------|-------|---------------------------------------------------|-------------------------|
| Fri. 21.Mar | 08:11 | KM-ROV dove & started her operation#306           | West ward off SOFUGAN   |
|             | 08:44 | KM-ROV TMS/V breakaway                            | 29-47.5N,140-08.0E      |
|             | 08:53 | KM-ROV vehicle landed on the sea bottom (D=1205m) | Fine but Cloudy         |
|             | 14:28 | KM-ROV vehicle left the sea bottom (D=964m)       | WNW-4 (Moderate breeze) |
|             | 14:33 | KM-ROV TMS/V combined                             | 4 (Sea Moderate)        |
|             | 14:59 | Hoisted up KM-ROV                                 | 2 (Low Swell Long)      |
|             | 15:05 | Recovered KM-ROV & finished #306 operation        | Visibly: 8              |
|             | 16:42 | Com'ced OBS recovery                              |                         |
|             | 21:11 | Finished OBS recovery                             |                         |

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|             |                                       |                                                   |                      |
|-------------|---------------------------------------|---------------------------------------------------|----------------------|
| Sat. 22.Mar | 08:08                                 | KM-ROV dove & started her operation#307           | NW ward off SOFUGAN  |
|             | 08:45                                 | KM-ROV TMS/V breakaway                            | 29-52.7N,140-03.7E   |
|             | 08:54                                 | KM-ROV vehicle landed on the sea bottom (D=1353m) | Fine but Cloudy      |
|             | 14:01                                 | KM-ROV vehicle left the sea bottom (D=1132m)      | WSW-5 (Fresh breeze) |
|             | 14:10                                 | KM-ROV TMS/V combined                             | 4 (Sea Moderate)     |
|             | 14:40                                 | Hoisted up KM-ROV                                 | 3 (Moderate Short)   |
|             | 14:45                                 | Recovered KM-ROV & finished #307 operation        | Visibly: 8           |
|             | 15:15                                 | Com'ced SBP site survey                           |                      |
|             | 16:23                                 | Finished SBP site survey                          |                      |
|             | 18:04                                 | Com'ced Calibration for magnetometer              |                      |
| 18:26       | Finished Calibration for magnetometer |                                                   |                      |

|             |       |                                                   |                                  |
|-------------|-------|---------------------------------------------------|----------------------------------|
|             | 19:21 | Com'ced OBS recovery                              |                                  |
|             | 00:55 | Finished OBS recovery                             |                                  |
| Sun. 23.Mar | 09:22 | Com'ced Piston Corer sampling                     | North ward off NISHINOSHIMA      |
|             | 11:05 | Finished Piston Corer sampling                    | 29-52.7N,140-03.7E               |
|             | 13:24 | Com'ced Piston Corer sampling                     | Fine but Cloudy                  |
|             | 15:47 | Finished Piston Corer sampling                    | WSW-5 (Fresh breeze)             |
|             | 17:37 | Com'ced OBS recovery                              | 4 (Sea Moderate)                 |
|             | 23:00 | Finished OBS recovery                             | 3 (Moderate Short)<br>Visibly: 8 |
| Mon. 24.Mar | 08:10 | KM-ROV dove & started her operation#308           | West ward off SOFUGAN            |
|             | 08:48 | KM-ROV TMS/V breakaway                            | 29-48.6N,140-08.1E               |
|             | 08:53 | KM-ROV vehicle landed on the sea bottom (D=1434m) | Fine but Cloudy                  |
|             | 09:31 | KM-ROV vehicle left the sea bottom (D=1435m)      | SW-4 (Moderate breeze)           |
|             | 09:40 | KM-ROV TMS/V combined                             | 3 (Sea Slight)                   |
|             | 10:18 | Hoisted up KM-ROV                                 | 2 (Low Swell Long)               |
|             | 10:23 | Recovered OBS                                     | Visibly: 8                       |
|             | 10:26 | Recovered KM-ROV & finished #308 operation        |                                  |
|             | 11:11 | KM-ROV dove & started her operation#309           |                                  |
|             | 11:51 | KM-ROV TMS/V breakaway                            |                                  |
|             | 11:57 | KM-ROV vehicle landed on the sea bottom (D=1542m) |                                  |
|             | 14:50 | KM-ROV vehicle left the sea bottom (D=1435m)      |                                  |
|             | 14:55 | KM-ROV TMS/V combined                             |                                  |
|             | 15:34 | Hoisted up KM-ROV                                 |                                  |
|             | 15:40 | Recovered KM-ROV & finished #309 operation        |                                  |
|             | 21:00 | Departured for research area (SUMISU Island)      |                                  |
| Tue. 25.Mar | 05:35 | Released XBT                                      | South ward off AOGASHIMA         |

|             |       |                                           |                          |
|-------------|-------|-------------------------------------------|--------------------------|
|             | 06:20 | Arrived at research area (SUMISU Island)  | 32-08.2N,139-48.1E       |
|             | 06:20 | Com'ced MBES site survey                  | Fine but Cloudy          |
|             | 10:01 | Finished MBES site survey                 | SW-5 (Strong breeze)     |
|             | 10:01 | Departured for waitnig area (NIIJIMA)     | 4 (Sea Moderate)         |
|             | 23:20 | Arrived at waitnig area (NIIJIMA)         | 2 (Moderate Average)     |
|             |       |                                           | Visibly: 8               |
| <hr/>       |       |                                           |                          |
| Wed. 26.Mar | 21:00 | Departured for research area (MIYAKEJIMA) | East ward off NIIJIMA    |
|             | 23:55 | Arrived at research area (MIYAKEJIMA)     | 34-22.2N,139-18.7E       |
|             | 23:59 | Released XBT                              | Blue sky                 |
|             |       |                                           | West-7 (Near gale)       |
|             |       |                                           | 5 (Sea Rough)            |
|             |       |                                           | 2 (Low Swell Long)       |
|             |       |                                           | Visibly: 6               |
| <hr/>       |       |                                           |                          |
| Thu. 27.Mar | 00:27 | Com'ced SBP site survey                   | East ward off MIYAKEJIMA |
|             | 04:22 | Finished SBP site survey                  | 34-04.7N,139-44.4E       |
|             | 08:40 | Com'ced Piston Corer sampling             | Cloudy                   |
|             | 09:40 | Finished Piston Corer sampling            | SW-3 (Gentle breeze)     |
|             | 11:34 | Com'ced Piston Corer sampling             | 2 (Sea Smooth)           |
|             | 12:50 | Finished Piston Corer sampling            | 2 (Low Swell Long)       |
|             | 13:10 | Departured for Yokosuka                   | Visibly: 5               |
| <hr/>       |       |                                           |                          |
| Fri. 28.Mar | 11:50 | Arrived at Yokosuka sec.4                 | Yokosuka sec.4           |
|             |       |                                           | 35-19.6N,139-40.6E       |
|             |       |                                           | Fine but Cloudy          |
|             |       |                                           | NW-3 (Gentle breeze)     |
|             |       |                                           | 2 (Sea Smooth)           |
|             |       |                                           | 0 (No Swell)             |

Visibly: 8

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|             |       |                     |
|-------------|-------|---------------------|
| Sat. 29.Mar | 09:00 | Arrived at Yokosuka |
|-------------|-------|---------------------|

## 5. Notice on Using

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

This report is not necessarily corrected even if there is any inaccurate description (i.e. taxonomic classifications). This report is subject to be revised without notice. Some data on this report may be raw or unprocessed. If you are going to use or refer the data on this report, it is recommended to ask the Chief Scientist for latest status.

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E-mail: [submit-rv-cruise@jamstec.go.jp](mailto:submit-rv-cruise@jamstec.go.jp)

Contact information of Chief scientist

Kenta Yoshida, [yoshida\\_ken@jamstec.go.jp](mailto:yoshida_ken@jamstec.go.jp)

## Appendix

### 1. Dredge, Piston core, UAV operation, and collected sample information

Table A1. Information of dredges

| Date<br>(LST) | Dredge<br>number | Location         | On the bottom   |                  |                 |                  | Off the bottom  |                  |                 |                  | Depth (m)        |                   | Tension<br>max.<br>(t) | Survey<br>time |
|---------------|------------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|------------------|-------------------|------------------------|----------------|
|               |                  |                  | Lat.<br>(SOQ*)  | Lon.<br>(SOQ*)   | Lat.<br>(SOJ*)  | Lon.<br>(SOJ*)   | Lat.<br>(SOQ*)  | Lon.<br>(SOQ*)   | Lat.<br>(SOJ*)  | Lon.<br>(SOJ*)   | On the<br>bottom | Off the<br>Bottom |                        |                |
| 2025/3/20     | KM25-02<br>D01   | Sofu<br>seamount | 29-<br>49.9022N | 140-<br>07.9837E | 29-<br>49.8084N | 140-<br>07.9553E | 29-<br>49.3160N | 140-<br>07.9913E | 29-<br>49.1306N | 140-<br>07.9546E | 2,038            | 1,837             | 1.9                    | 50<br>min.     |
| 2025/3/20     | KM25-02<br>D02   | Sofu<br>seamount | 29-<br>46.8290N | 140-<br>08.1005E | 29-<br>46.7982N | 140-<br>08.1571E | 29-<br>47.1191N | 140-<br>08.0500E | 29-<br>47.1984N | 140-<br>07.9431E | 1,211            | 1,020             | 2.9                    | 81<br>min.     |

\*SOQ = KAIYO-DENSHI Transponder's position

\*SOJ = Ship's position

Table A2. Information of Piston cores

| Date (UTC) | Core ID | Location      | Water Depth (m) | Positon     |              |             | Corer type |        |     |    | Core length (m) |    |   |      | Tension MAX (t) | K value** |
|------------|---------|---------------|-----------------|-------------|--------------|-------------|------------|--------|-----|----|-----------------|----|---|------|-----------------|-----------|
|            |         |               |                 | Latitude    | Longitude    | Type        | Type*      | Wegiht |     | PC |                 | PL |   |      |                 |           |
| 2025/3/23  | PC01    | Sofu Seamount | 1,329           | 29-46.4728N | 140-07.0030E | Transponder | IN         | PC     | 592 | kg | 1.25            | /  | 4 | 0.00 | 0.8             | 0.11      |
| 2025/3/23  | PC02    | Sofu Seamount | 2,983           | 29-59.6051N | 140-01.3959E | Transponder | IN         | PC     | 592 | kg | 1.55            | /  | 4 | 0.23 | 1.6             | 0.51      |
| 2025/3/27  | PC03    | Miyakejima    | 541             | 34-04.7539N | 139-38.0181E | Transponder | IN         | PC     | 592 | kg | 0.45            | /  | 4 | 0.00 | 0.7             | 0.09      |
| 2025/3/27  | PC04    | Miyakejima    | 933             | 34-04.9710N | 139-44.7864E | Transponder | IN         | PC     | 592 | kg | 0.00            | /  | 4 | 0.00 | 1.1             | 0.83      |

\* "IN" is Inner type corer.

\*\* "K value" is the strength barometer of the sea floor sediment; K value = pure pull out load / (outer diameter of outer pipe \* penetration length).

Table A3. Information of UAV operations.

|                        | YYYY | MM | DD | hh:mm |     | Latitude |         |   | Longitude |         |   |
|------------------------|------|----|----|-------|-----|----------|---------|---|-----------|---------|---|
| Water sampling         |      |    |    |       |     |          |         |   |           |         |   |
| KM25-02 Leg2 NW        | 2025 | 03 | 14 | 9:19  | JST | 27       | 15.264  | N | 140       | 52.434  | E |
| KM25-02 Leg2 Reference | 2025 | 03 | 14 | 14:05 | JST | 27       | 13.392  | N | 140       | 52.104  | E |
| KM25-02 Leg2 West      | 2025 | 03 | 16 | 13:37 | JST | 27       | 14.802  | N | 140       | 52.182  | E |
| Logger installation    |      |    |    |       |     |          |         |   |           |         |   |
| Kamisama-daichi        | 2025 | 03 | 14 | -     | JST | 27       | 15.0100 | N | 140       | 52.2667 | E |

Table A4. Recovered sample list.

| No. | On board ID        | Date Collected |    |    | Latitude  |         |     | Longitude |         |     | Depth [m] | Size on Board [cm] | Weight on Board [kg] | Description                                                | Rock Name               |
|-----|--------------------|----------------|----|----|-----------|---------|-----|-----------|---------|-----|-----------|--------------------|----------------------|------------------------------------------------------------|-------------------------|
|     |                    | YYYY           | MM | DD | Deg.      | Min.    | N/S | Deg.      | Min.    | E/W |           |                    |                      |                                                            |                         |
|     | 船上 ID<br>(サンプル ID) | 採取日時           |    |    | 緯度(60 進法) |         |     | 経度(60 進法) |         |     | 採取水深      | 採取時サイズ             | 採取時重量                | 船上岩石記載                                                     | 岩石名                     |
| 1   | KMROV#304-R01      | 2025           | 3  | 16 | 27        | 14.7841 | N   | 140       | 50.8572 | E   | 586.4     | 12x11x7            | 0.9                  | angular, weakly altered, mixed, with phenocryst –          | tuff breccia            |
| 2   | KMROV#304-R02      | 2025           | 3  | 16 | 27        | 14.7961 | N   | 140       | 50.8866 | E   | 575.7     | 40x40x27           | 42.0                 | angular, fresh, black, with phenocryst px5%, pl5%          | andesite                |
| 3   | KMROV#304-R03      | 2025           | 3  | 16 | 27        | 14.7966 | N   | 140       | 50.9921 | E   | 542.9     | 9x10x3             | 0.4                  | angular, weakly altered, gray, with phenocryst px10%, pl5% | andesite w/tuff         |
| 4   | KMROV#304-R04      | 2025           | 3  | 16 | 27        | 14.7972 | N   | 140       | 50.991  | E   | 542.2     | 19x13x6            | 1.7                  | angular, weakly altered, gray, with phenocryst px5%, pl5%  | andesite                |
| 5   | KMROV#304-R05      | 2025           | 3  | 16 | 27        | 14.687  | N   | 140       | 51.1243 | E   | 502.5     | 10x10x9            | 1.1                  | angular, weakly altered, black-gray, with phenocryst –     | tuff breccia            |
| 6   | KMROV#304-R06      | 2025           | 3  | 16 | 27        | 14.6878 | N   | 140       | 51.123  | E   | 502.6     | 11x8x9             | 1.3                  | subrounded, fresh, gray, with phenocryst pl5%              | andesite                |
| 7   | KMROV#304-R07      | 2025           | 3  | 16 | 27        | 14.8284 | N   | 140       | 51.1583 | E   | 479.6     | 39x26x21           | 26.0                 | angular, fresh, black, with phenocryst px5%, pl10%         | andesite                |
| 8   | KMROV#304-R08      | 2025           | 3  | 16 | 27        | 14.9057 | N   | 140       | 51.1571 | E   | 467.5     | 31x23x23           | 17.5                 | subangular, fresh, black, with phenocryst px5%, pl15%      | andesite                |
| 9   | KMROV#304-S01      | 2025           | 3  | 16 | 27        | 14.7525 | N   | 140       | 51.1548 | E   | 491.9     | –x–x–              | 6.0                  | –, –, –, with phenocryst –                                 | sandy tuff with breccia |
| 10  | KMROV#305-R01      | 2025           | 3  | 17 | 27        | 19.1478 | N   | 140       | 56.3159 | E   | 1467.8    | 9x7x4.5            | 0.2                  | angular, fresh, black, with phenocryst ol–px–pl            | basalt                  |
| 11  | KMROV#305-R02      | 2025           | 3  | 17 | 27        | 19.119  | N   | 140       | 56.2454 | E   | 1427.6    | 15x13x10           | 1.5                  | angular, fresh, black, with phenocryst ol–px–pl            | basalt                  |
| 12  | KMROV#305-R03      | 2025           | 3  | 17 | 27        | 18.9481 | N   | 140       | 55.9185 | E   | 1241.8    | 13x12x8            | 0.9                  | subrounded, weakly altered, black                          | basalt                  |
| 13  | KM25-02D01R01      | 2025           | 3  | 20 | 29        | 49.9022 | N   | 140       | 7.9837  | E   | 2038      | 12x13x8            | 1.0                  | subrounded, fresh, black, with phenocryst pl               | basalt                  |
| 14  | KM25-02D01R02      | 2025           | 3  | 20 | 29        | 49.9022 | N   | 140       | 7.9837  | E   | 2038      | 11x6x5             | 0.3                  | subrounded, fresh, black                                   | basalt                  |
| 15  | KM25-02D01R03      | 2025           | 3  | 20 | 29        | 49.9022 | N   | 140       | 7.9837  | E   | 2038      | 15x11x12           | 1.7                  | subangular, fresh, black, with phenocryst pl               | basalt                  |

|    |               |      |   |    |    |         |   |     |        |   |      |        |     |                                                               |        |
|----|---------------|------|---|----|----|---------|---|-----|--------|---|------|--------|-----|---------------------------------------------------------------|--------|
| 16 | KM25-02D01R04 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 10x7x5 | 0.3 | subrounded, fresh, black                                      | basalt |
| 17 | KM25-02D01R05 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 9x6x5  | 0.3 | subrounded, fresh, black,<br>with phenocryst pl               | basalt |
| 18 | KM25-02D01R06 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 8x5x4  | 0.2 | subrounded, fresh, black                                      | basalt |
| 19 | KM25-02D01R07 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 10x7x6 | 0.5 | subangular, fresh, dark gray,<br>with phenocryst pl           | basalt |
| 20 | KM25-02D01R08 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 5x3x2  | 0.0 | subangular, fresh, dark gray                                  | basalt |
| 21 | KM25-02D01R09 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 3x2x2  | 0.0 | subrounded, fresh, dark<br>gray, with phenocryst ol-<br>px-pl | basalt |
| 22 | KM25-02D01R10 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 7x6x5  | 0.2 | subrounded, fresh, dark<br>gray                               | basalt |
| 23 | KM25-02D01R11 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 6x3x3  | 0.1 | subangular, fresh, dark gray,<br>with phenocryst pl           | basalt |
| 24 | KM25-02D01R12 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 5x4x3  | 0.1 | subrounded, fresh, dark<br>gray                               | basalt |
| 25 | KM25-02D01R13 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 5x5x3  | 0.1 | subrounded, fresh, dark<br>gray, with phenocryst p            | basalt |
| 26 | KM25-02D01R14 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 2x2x1  | 0.0 | subangular, fresh, dark gray                                  | basalt |
| 27 | KM25-02D01R15 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 5x4x3  | 0.1 | subangular, fresh, black,<br>with phenocryst –                | basalt |
| 28 | KM25-02D01R16 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 9x4x5  | 0.2 | subangular, fresh, black                                      | basalt |
| 29 | KM25-02D01R17 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 8x5x5  | 0.2 | subangular, fresh, black,<br>with phenocryst pl               | basalt |
| 30 | KM25-02D01R18 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 6x5x5  | 0.1 | subangular, fresh, black                                      | basalt |
| 31 | KM25-02D01R19 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 6x4x3  | 0.1 | subangular, fresh, black,<br>with phenocryst –                | basalt |
| 32 | KM25-02D01R20 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 4x4x2  | 0.1 | subangular, fresh, black                                      | basalt |
| 33 | KM25-02D01R21 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 2x2x3  | 0.0 | angular, fresh, black, with<br>phenocryst –                   | basalt |
| 34 | KM25-02D01R22 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 6x3x3  | 0.1 | subangular, fresh, black                                      | basalt |
| 35 | KM25-02D01R23 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 8x6x4  | 0.2 | subangular, fresh, black,<br>with phenocryst –                | basalt |
| 36 | KM25-02D01R24 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 4x3x2  | 0.0 | subrounded, fresh, black                                      | basalt |
| 37 | KM25-02D01R25 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 3x2x2  | 0.0 | subrounded, fresh, black,<br>with phenocryst –                | basalt |
| 38 | KM25-02D01R26 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 5x2x1  | 0.0 | subrounded, fresh, black                                      | basalt |

|    |               |      |   |    |    |         |   |     |        |   |      |        |     |                                                      |                                                          |
|----|---------------|------|---|----|----|---------|---|-----|--------|---|------|--------|-----|------------------------------------------------------|----------------------------------------------------------|
| 39 | KM25-02D01R27 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 7x3x2  | 0.1 | subrounded, fresh, black, with phenocryst –          | basalt                                                   |
| 40 | KM25-02D01R28 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 7x6x6  | 0.5 | subangular, fresh, black                             | basalt                                                   |
| 41 | KM25-02D01R29 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 11x8x6 | 0.6 | subrounded, fresh, black, with phenocryst pl         | basalt                                                   |
| 42 | KM25-02D01R30 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 8x6x6  | 0.2 | subrounded, fresh, black                             | basalt                                                   |
| 43 | KM25-02D01R31 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 3x2x2  | 0.0 | subrounded, fresh, black, with phenocryst pl         | basalt                                                   |
| 44 | KM25-02D01R32 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 6x4x4  | 0.1 | subrounded, weakly altered, gray                     | andesite                                                 |
| 45 | KM25-02D01R33 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 4x4x3  | 0.1 | subrounded, weakly altered, gray, with phenocryst pl | andesite                                                 |
| 46 | KM25-02D01R34 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 5x4x3  | 0.1 | subrounded, moderately altered, pale gray            | tuff                                                     |
| 47 | KM25-02D01R35 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 5x5x2  | 0.1 | angular, altered, gray, with phenocryst –            | hydrothermally altered magmatic rock with mineralization |
| 48 | KM25-02D01R36 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 5x4x3  | 0.1 | subangular, altered, pale gray                       | hydrothermally altered magmatic rock with mineralization |
| 49 | KM25-02D01R37 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 6x4x3  | 0.1 | subangular, altered, gray, with phenocryst –         | hydrothermally altered magmatic rock with mineralization |
| 50 | KM25-02D01R38 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 5x6x4  | 0.2 | angular, fresh, black, with phenocryst ol-px-pl      | mafic with xenolith                                      |
| 51 | KM25-02D01R39 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 3x2x2  | 0.0 | angular, fresh, black                                | pumice or lava crust fragment                            |
| 52 | KM25-02D01R40 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 3x3x2  | 0.1 | angular, fresh, black, with phenocryst ol-pl         | scoriaceous fragments                                    |
| 53 | KM25-02D01R41 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 9x7x6  | 0.3 | subangular, fresh, black                             | porphyritic mafic rock                                   |
| 54 | KM25-02D01R42 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 7x5x5  | 0.2 | angular, fresh, black, with phenocryst pl            | mafic                                                    |
| 55 | KM25-02D01R43 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | –      | 0.1 | sub, altered, gray/pale gray                         | altered igneous rock                                     |

|    |                   |      |   |    |    |         |   |     |        |   |      |          |     |                                                           |                                |
|----|-------------------|------|---|----|----|---------|---|-----|--------|---|------|----------|-----|-----------------------------------------------------------|--------------------------------|
| 56 | KM25-02D01R44     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 4x3x1    | 0.0 | subrounded, altered, gray/pale gray, with phenocryst –    | altered magmatic rocks         |
| 57 | KM25-02D01R45     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 4x3x2    | 0.1 | subangular, altered, pale gray                            | altered magmatic rocks         |
| 58 | KM25-02D01R46     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | –        | 0.1 | angular, moderately altered, dark gray, with phenocryst – | altered magmatic rocks         |
| 59 | KM25-02D01R47     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 6x4x3    | 0.1 | subangular, altered, gray                                 | altered magmatic rocks         |
| 60 | KM25-02D01R48     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 15x10x9  | 1.5 | angular, fresh, black, with phenocryst pl                 | basalt                         |
| 61 | KM25-02D01R49     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 11x8x7   | 0.6 | subrounded, fresh, dark gray                              | basalt                         |
| 62 | KM25-02D01R50     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 12x7x6   | 0.5 | subangular, fresh, black, with phenocryst pl              | basalt                         |
| 63 | KM25-02D01R51     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 10x9x8   | 0.8 | subrounded, fresh, black                                  | basalt                         |
| 64 | KM25-02D01R52     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 8x7x6    | 0.3 | subrounded, fresh, dark gray, with phenocryst pl          | basalt                         |
| 65 | KM25-02D01R53     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 6x9x3    | 0.2 | subangular, fresh, black                                  | basalt                         |
| 66 | KM25-02D01R54     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 7x8x7    | 0.4 | subangular, fresh, black, with phenocryst –               | basalt                         |
| 67 | KM25-02D01R55     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 6x7x6    | 0.3 | subrounded, fresh, black                                  | basalt                         |
| 68 | KM25-02D01R56     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 6x6x3    | 0.3 | subangular, fresh, black, with phenocryst pl              | basalt                         |
| 69 | KM25-02D01R57     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 3x3x2    | 0.0 | subangular, fresh, black                                  | mafic containing cpx megacryst |
| 70 | KM25-02D01R58     | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 | 7x5x3    | 1.5 |                                                           | –                              |
| 71 | KM25-02D01-others | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837 | E | 2038 |          | 0.5 |                                                           | –                              |
| 72 | KM25-02D02R01     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211 | 15x27x13 | 4.7 | angular, fresh, black                                     | pl-andesite                    |
| 73 | KM25-02D02R02     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211 | 15x21x10 | 2.2 | subangular, fresh, black                                  | possible basalt                |
| 74 | KM25-02D02R03     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211 | 15x15x10 | 1.6 | rounded, fresh, black                                     | pl-basalt                      |
| 75 | KM25-02D02R04     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211 | 13x15x10 | 1.7 | rounded, fresh, black                                     | pl-basalt                      |
| 76 | KM25-02D02R05     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211 | 16x20x13 | 3.3 | angular, fresh, dark gray                                 | pl-andesite                    |
| 77 | KM25-02D02R06     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211 | 9x9x6    | 0.5 | rounded, fresh, black                                     | pl-basalt                      |
| 78 | KM25-02D02R07     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211 | 8x10x5   | 0.3 | subrounded, fresh, gray                                   | pl-andesite                    |
| 79 | KM25-02D02R08     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211 | 10x15x7  | 0.9 | rounded, altered, pale gray                               | altered andesite               |

|     |               |      |   |    |    |        |   |     |        |   |      |             |     |                                           |                                           |
|-----|---------------|------|---|----|----|--------|---|-----|--------|---|------|-------------|-----|-------------------------------------------|-------------------------------------------|
| 80  | KM25-02D02R09 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 15x19x10    | 2.5 | angular, fresh, dark gray                 | pl-andesite                               |
| 81  | KM25-02D02R10 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 13x24x12    | 4.3 | angular, weakly altered, dark gray        | altered andesite                          |
| 82  | KM25-02D02R11 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 14x15x12    | 2.2 | subangular, altered, dark gray            | altered andesite                          |
| 83  | KM25-02D02R12 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 9x9x7       | 0.5 | angular, fresh, black                     | pl-basalt                                 |
| 84  | KM25-02D02R13 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 6x9x4       | 0.3 | rounded, fresh, black                     | pl-basalt                                 |
| 85  | KM25-02D02R14 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 12x16x9     | 2.0 | rounded, fresh, pale gray                 | dense gray rock                           |
| 86  | KM25-02D02R15 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 7x7x4       | 0.2 | angular, fresh, gray                      | andesite                                  |
| 87  | KM25-02D02R16 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 4x5x4       | 0.1 | rounded, fresh, dark gray                 | pl-andesite                               |
| 88  | KM25-02D02R17 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 4x5x2       | 0.1 | subrounded, fresh, pale gray              | diorite?                                  |
| 89  | KM25-02D02R18 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 4x2x2       | 0.1 | rounded, altered, pale gray               | py-bg altered rock                        |
| 90  | KM25-02D02R19 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 2x5x2       | 0.1 | angular, fresh, dark gray                 | pl-andesite                               |
| 91  | KM25-02D02R20 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 7x8x4       | 0.3 | angular, fresh, black                     | basalt with xenolith                      |
| 92  | KM25-02D02R21 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 10x8x6      | 0.6 | subrounded, fresh, dark gray              | andesite                                  |
| 93  | KM25-02D02R22 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 6x4x3.5     | 0.1 | subangular, fresh, dark gray              | mafic-intermediate volcanic rock          |
| 94  | KM25-02D02R23 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 12x10x6     | 0.9 | subangular, fresh, black                  | mafic volcanic rock                       |
| 95  | KM25-02D02R24 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 4x3x4.5     | 0.0 | subangular, fresh, black                  | mafic volcanic rock                       |
| 96  | KM25-02D02R25 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 10x10x9     | 1.2 | -, fresh, black                           | dark mafic volcanic rock                  |
| 97  | KM25-02D02R26 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 7.5x5x4     | 0.2 | subangular, fresh, dark gray              | porphyritic andesite                      |
| 98  | KM25-02D02R27 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 5x3x3       | 0.1 | subangular, altered, dark gray            | altered mafic rock with native sulfur     |
| 99  | KM25-02D02R28 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 3x2x0.5     | 0.0 | subangular, moderately altered, dark gray | altered volcanic rock with mineralization |
| 100 | KM25-02D02R29 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 4x3x2       | 0.2 | -, moderately altered, gray               | altered volcanic rock                     |
| 101 | KM25-02D02R30 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 8x7x4.5     | 0.3 | -, moderately altered, gray               | fresh-altered volcanic mafic rock         |
| 102 | KM25-02D02R31 | 2025 | 3 | 20 | 29 | 46.829 | N | 140 | 8.1005 | E | 1211 | 8.5x7.5x5.5 | 0.3 | -, moderately altered, dark gray          | breccia of altered volcanic rocks         |

|     |                   |      |   |    |    |         |   |     |        |   |        |             |      |                                           |                                  |
|-----|-------------------|------|---|----|----|---------|---|-----|--------|---|--------|-------------|------|-------------------------------------------|----------------------------------|
| 103 | KM25-02D02R32     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211   | 5.5x4x1     | 0.1  | -, weakly altered, gray-pale gray         | altered rock with mineralization |
| 104 | KM25-02D02R33     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211   | 6x5.5x2.5   | 0.1  | subangular, moderately altered, dark gray | specific mineralized rocks       |
| 105 | KM25-02D02R34     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211   | 5.5x3.5x2.5 | 0.1  | -, altered, pale gray                     | very altered volcanic rock       |
| 106 | KM25-02D02R35     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211   | 8x6x6       | 0.5  | -, fresh, black                           | lava with glassy crust           |
| 107 | KM25-02D02R36     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211   | 6x5x3       | 0.1  | subangular, fresh, black                  | scoriaceous                      |
| 108 | KM25-02D02S01     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211   | xx          | 0.1  | -, -, black                               | sediment                         |
| 109 | KM25-02D02S01t    | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211   | xx          | 0.5  | -, -, black                               | sediment                         |
| 110 | KM25-02D02S02     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211   | xx          | 1.5  | -, fresh, black                           | different kind, mostly mafic     |
| 111 | KM25-02D02S03     | 2025 | 3 | 20 | 29 | 46.829  | N | 140 | 8.1005 | E | 1211   | xx          | 0.0  | -, -, black                               | fine sediment                    |
| 112 | KMROV#306-R01     | 2025 | 3 | 21 | 29 | 47.539  | N | 140 | 8.1635 | E | 1213.5 | 18x8x10     | 1.3  | angular, fresh, black                     | aphyric mafic rock               |
| 113 | KMROV#306-R02     | 2025 | 3 | 21 | 29 | 47.5391 | N | 140 | 8.0584 | E | 1214.5 | 20x13x13    | 2.7  | angular, -, pale gray                     | tuff                             |
| 114 | KMROV#306-R03     | 2025 | 3 | 21 | 29 | 47.5395 | N | 140 | 7.9951 | E | 1211.6 | 15x23x23    | 4.0  | angular, fresh, black                     | aphyric mafic rock               |
| 115 | KMROV#306-R04     | 2025 | 3 | 21 | 29 | 47.5397 | N | 140 | 7.9996 | E | 1210.8 | 3x2x1       | 0.1  | angular, fresh, black                     | mafic rock                       |
| 116 | KMROV#306-R05     | 2025 | 3 | 21 | 29 | 47.5408 | N | 140 | 7.9963 | E | 1211.1 | 20x8x8      | 1.2  | angular, fresh, black                     | aphyric mafic rock               |
| 117 | KMROV#306-R06     | 2025 | 3 | 21 | 29 | 47.5388 | N | 140 | 7.996  | E | 1200.8 | 20x18x10    | 3.5  | angular, fresh, black                     | pl-andesite                      |
| 118 | KMROV#306-R07     | 2025 | 3 | 21 | 29 | 47.5349 | N | 140 | 7.9291 | E | 1143.8 | 15x22x13    | 4.3  | angular, weakly altered, dark gray        | pl-andesite                      |
| 119 | KMROV#306-R08     | 2025 | 3 | 21 | 29 | 47.5245 | N | 140 | 7.8911 | E | 1107.4 | 20x26x18    | 11.0 | subangular, fresh, black                  | mafic rock                       |
| 120 | KMROV#306-R09     | 2025 | 3 | 21 | 29 | 47.5691 | N | 140 | 7.7042 | E | 970.1  | 5x8x4       | 0.2  | angular, weakly altered, pale green       | tuff breccia with black clast    |
| 121 | KMROV#306-R10     | 2025 | 3 | 21 | 29 | 47.5699 | N | 140 | 7.7042 | E | 968.7  | 24x14x13    | 2.4  | angular, fresh, black                     | scoria                           |
| 122 | KMROV#306-R11     | 2025 | 3 | 21 | 29 | 47.5677 | N | 140 | 7.705  | E | 969.2  | 14x15x10    | 1.9  | angular, fresh, black                     | mafic rock                       |
| 123 | KMROV#306-S01     | 2025 | 3 | 21 | 29 | 47.5159 | N | 140 | 8.2506 | E | 1207   | xx          | 3.5  | , , black                                 | sediment                         |
| 124 | KMROV#306-others1 | 2025 | 3 | 21 | 29 | 47.5696 | N | 140 | 7.7052 | E | 967.8  | 7.5x5x4     | 0.1  | subangular, fresh, black                  | broken piece of R10-11           |
| 125 | KMROV#307-R01     | 2025 | 3 | 22 | 29 | 46.5772 | N | 140 | 6.3421 | E | 1359.6 | 17x9x11     | 0.7  | subangular, fresh, pale gray              | pumice                           |
| 126 | KMROV#307-R02     | 2025 | 3 | 22 | 29 | 46.5766 | N | 140 | 6.3026 | E | 1354.3 | 13x12x11    | 0.7  | subangular, fresh, pale gray              | pumice                           |
| 127 | KMROV#307-R03     | 2025 | 3 | 22 | 29 | 46.572  | N | 140 | 6.2811 | E | 1345.9 | 24x15x15    | 4.9  | angular, fresh, dark gray                 | aphyric mafic rock               |
| 128 | KMROV#307-R04     | 2025 | 3 | 22 | 29 | 46.573  | N | 140 | 6.2553 | E | 1334   | 15x14x11    | 1.9  | subangular, fresh, pale gray              | pumice                           |
| 129 | KMROV#307-R05     | 2025 | 3 | 22 | 29 | 46.574  | N | 140 | 6.1641 | E | 1283.8 | 12x10x10    | 1.9  | subangular, fresh, black                  | mafic rock                       |
| 130 | KMROV#307-R06     | 2025 | 3 | 22 | 29 | 46.5739 | N | 140 | 6.1224 | E | 1265.1 | 8x9x7       | 1.3  | angular, fresh, pale gray                 | tube pumice                      |

|     |                   |      |   |    |    |         |   |     |         |   |        |          |     |                                  |                |
|-----|-------------------|------|---|----|----|---------|---|-----|---------|---|--------|----------|-----|----------------------------------|----------------|
| 131 | KMROV#307-R07     | 2025 | 3 | 22 | 29 | 46.5781 | N | 140 | 6.1136  | E | 1243.8 | 13x12x13 | 0.9 | angular, fresh, pale gray        | tube pumice    |
| 132 | KMROV#307-R08     | 2025 | 3 | 22 | 29 | 46.574  | N | 140 | 6.0751  | E | 1211.2 | 11x9x3   | 0.5 | subrounded, fresh, black         | mafic rock     |
| 133 | KMROV#307-R09     | 2025 | 3 | 22 | 29 | 46.5717 | N | 140 | 6.002   | E | 1146.7 | 20x15x15 | 2.0 | angular, fresh, pale gray        | fibrous pumice |
| 134 | KMROV#307-S01     | 2025 | 3 | 22 | 29 | 46.5721 | N | 140 | 6.3942  | E | 1360.2 | xx       | 2.0 | -, -, dark gray                  | sediment       |
| 135 | KMROV#307-S01-pm  | 2025 | 3 | 22 | 29 | 46.5721 | N | 140 | 6.3942  | E | 1360.2 | 2x2x2    | 0.0 | angular, fresh, white            | aphyric pumice |
| 136 | KMROV#309-R01     | 2025 | 3 | 24 | 29 | 48.6432 | N | 140 | 8.1122  | E | 1545.3 | 8x8x6    | 0.4 | subrounded, fresh, black         | basalt         |
| 137 | KMROV#309-R02     | 2025 | 3 | 24 | 29 | 48.6378 | N | 140 | 8.1038  | E | 1542.7 | 16x18x14 | 5.0 | subangular, fresh, dark gray     | mafic          |
| 138 | KMROV#309-R03     | 2025 | 3 | 24 | 29 | 48.6397 | N | 140 | 8.1027  | E | 1544.2 | 13x11x10 | 1.3 | rounded, fresh, black            | basalt         |
| 139 | KMROV#309-R04     | 2025 | 3 | 24 | 29 | 48.6349 | N | 140 | 8.0049  | E | 1530.4 | 16x11x11 | 2.1 | rounded, fresh, black            | basalt         |
| 140 | KMROV#309-R05     | 2025 | 3 | 24 | 29 | 48.6456 | N | 140 | 7.7549  | E | 1507.9 | 22x18x18 | 7.7 | subrounded, fresh, black         | basalt         |
| 141 | KMROV#309-R06     | 2025 | 3 | 24 | 29 | 48.4966 | N | 140 | 7.6374  | E | 1436.5 | 30x21x20 | 9.3 | angular, fresh, black            | basalt         |
| 142 | KM25-02D01camera1 | 2025 | 3 | 20 | 29 | 49.9022 | N | 140 | 7.9837  | E | 2038   | 8x5x5    | 0.2 | angular, fresh, black            | mafic rock     |
| 143 | OBS Site 10       | 2025 | 3 | 22 | 30 | 3.0237  | N | 139 | 59.4064 | E | 2996   |          |     | black fine ash                   | mafic ash      |
| 144 | OBS Site 11       | 2025 | 3 | 22 | 30 | 2.0529  | N | 139 | 59.9479 | E | 3004   |          |     | black fine ash                   | mafic ash      |
| 145 | OBS Site 12       | 2025 | 3 | 22 | 30 | 1.1038  | N | 140 | 0.5395  | E | 2999   |          |     | black fine ash                   | mafic ash      |
| 146 | OBS Site 13       | 2025 | 3 | 22 | 30 | 0.0858  | N | 140 | 1.0655  | E | 2992   |          |     | black fine ash                   | mafic ash      |
| 147 | OBS Site 14       | 2025 | 3 | 22 | 29 | 59.1289 | N | 140 | 1.6035  | E | 2967   |          |     | black fine ash                   | mafic ash      |
| 148 | OBS Site 15       | 2025 | 3 | 22 | 29 | 58.1716 | N | 140 | 2.1764  | E | 2973   |          |     | black fine ash                   | mafic ash      |
| 149 | OBS Site 16       | 2025 | 3 | 22 | 29 | 57.1553 | N | 140 | 2.6409  | E | 2961   |          |     | black fine ash                   | mafic ash      |
| 150 | OBS Site 17       | 2025 | 3 | 21 | 29 | 56.1626 | N | 140 | 3.0111  | E | 2899   |          |     | black fine ash                   | mafic ash      |
| 151 | OBS Site 18       | 2025 | 3 | 21 | 29 | 55.2817 | N | 140 | 3.7055  | E | 2843   |          |     | black fine ash                   | mafic ash      |
| 152 | OBS Site 20       | 2025 | 3 | 21 | 29 | 53.1774 | N | 140 | 5.0419  | E | 2663   |          |     | black fine ash plus pumice grain | mafic ash      |
| 153 | OBS Site 21       | 2025 | 3 | 23 | 29 | 52.3758 | N | 140 | 5.5001  | E | 2705   |          |     | black fine ash                   | mafic ash      |
| 154 | OBS Site 32       | 2025 | 3 | 13 | 29 | 41.6993 | N | 140 | 11.3999 | E | 2301   |          |     | black fine ash                   | mafic ash      |
| 155 | OBS Site 33       | 2025 | 3 | 13 | 29 | 40.713  | N | 140 | 11.9508 | E | 2442   |          |     | black fine ash plus pumice grain | mafic ash      |
| 156 | OBS Site 34       | 2025 | 3 | 13 | 29 | 39.7622 | N | 140 | 12.4705 | E | 2441   |          |     | black fine ash                   | mafic ash      |
| 157 | OBS Site 35       | 2025 | 3 | 13 | 29 | 38.784  | N | 140 | 13.0842 | E | 2453   |          |     | black fine ash                   | mafic ash      |

## 2. Sample photos

**KMROV#304**







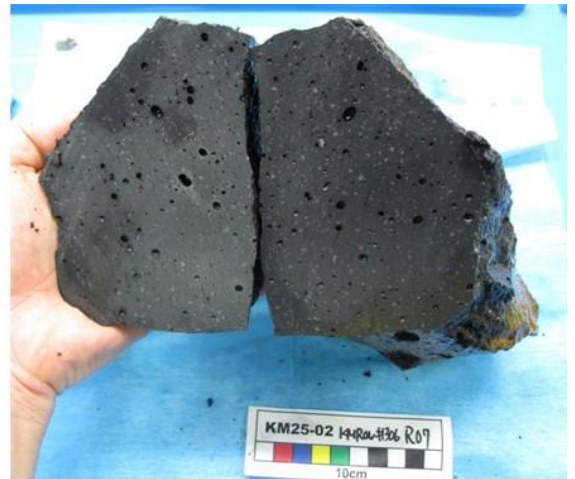
**KMROV #305**



**KMROV #306**



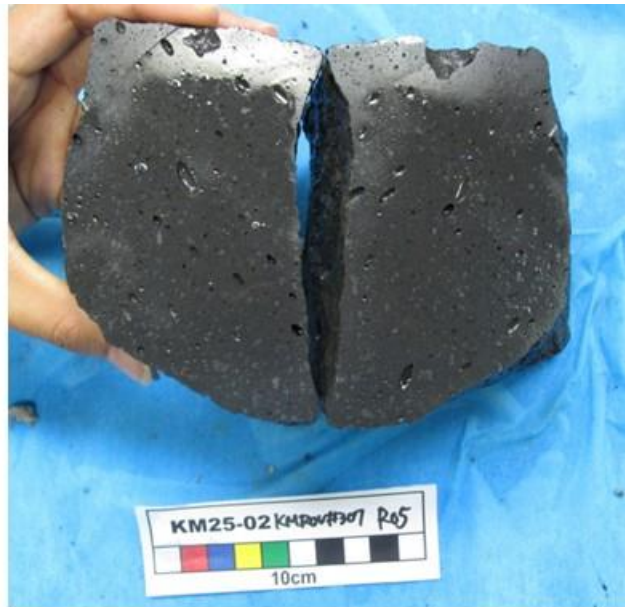






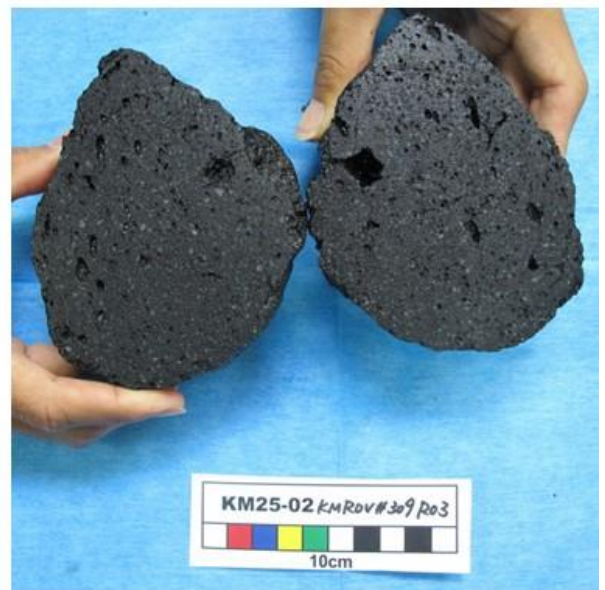
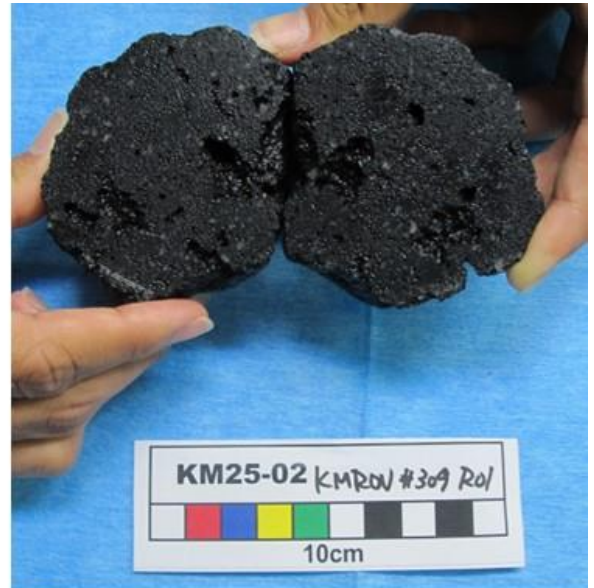
**KMROV #307**

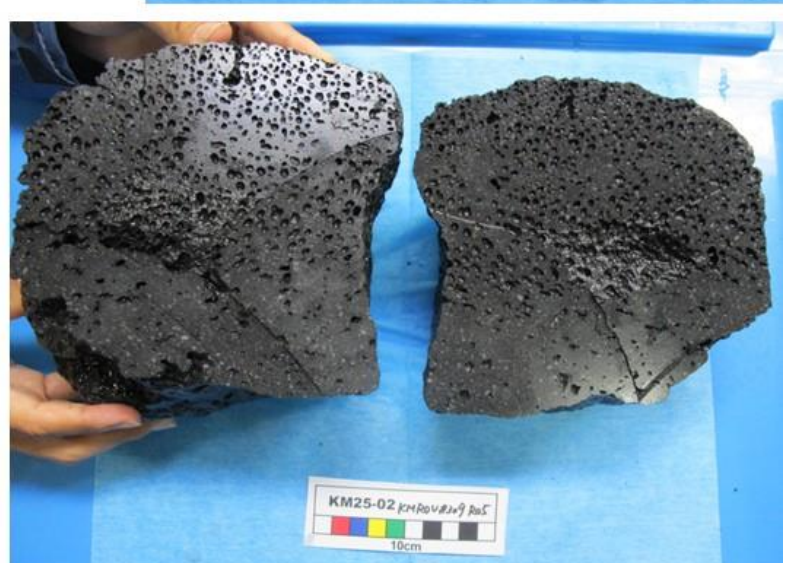






KMROV #309



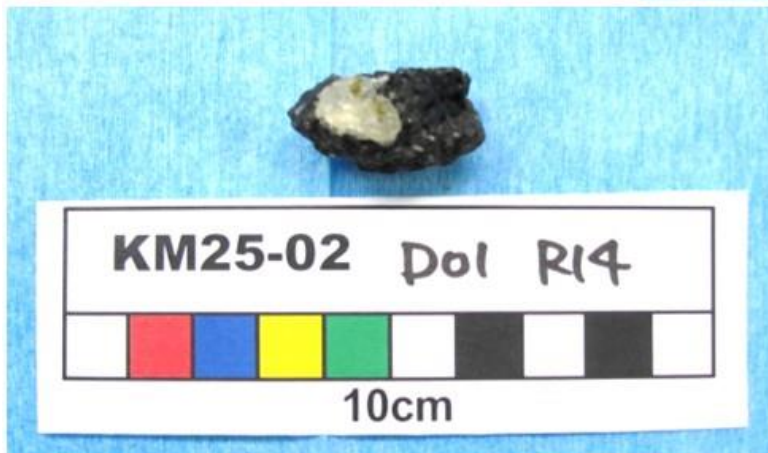


D01

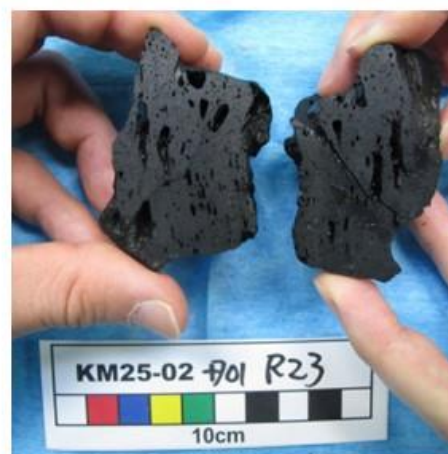


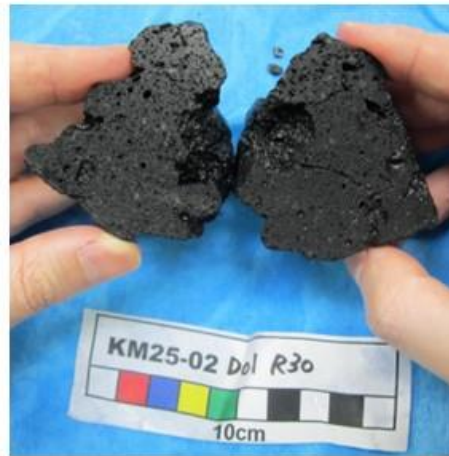




















D02













