

Southern Knipovich Ridge

19.10-31.10 - 2023

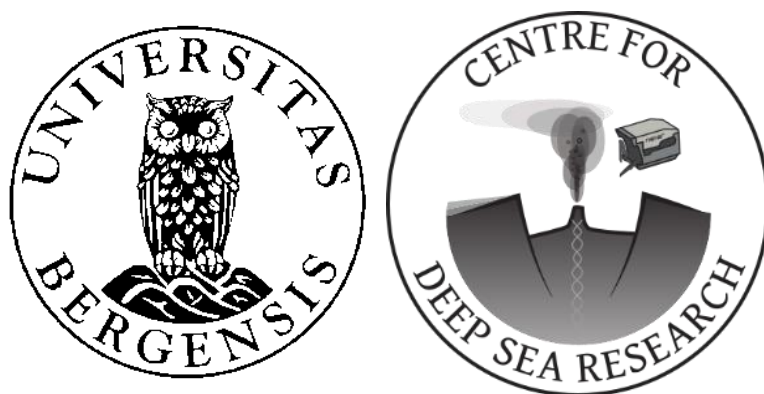
Cruise report



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Compiled by Ingvild Aarrestad

Image on front page: Radially fractured basalt (NORMAR/Ægir 6000)

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OLJEDIREKTORATET

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Cruise overview and main objective

Introduction

The southern part of the Knipovich ridge (fig.1) is a unique geological setting due to its mode of spreading (oblique/transtensional) as well as high sedimentation rate due to its location close to Svalbard and the Bjørnøya fan. The oblique spreading appears to have caused the formation of several side-stepping basins with bridges/transverse ridges of remnant pre-rift rocks separating the basins (fig.2). In addition, the magmatic activity appears to be relatively low, as several of the basins lack the typical axial volcanic ridges as seen on the Mohns ridge. Some axial volcanic ridges/volcanic features are present and were investigated during this cruise. In addition, a few ancient hydrothermal deposits were located, but no signs of active hydrothermal processes were identified. Trying to locate mineral deposits on the seafloor can be challenging. However, ongoing research and surveys aim to find a more efficient way to locate such deposits.

Firstly, bathymetrical maps are key to understanding the geology of various seafloor structures and to plan further investigation of selected sub-areas. Knowing the topography of an area with a resolution of up to 1 m makes it possible to interpret small geological features at the seafloor. Additionally, the use of self-potential (SP) is proposed as a method for locating sulfide deposits. Further, water column anomalies (like increased methane concentration) may be used to identify active hydrothermal venting. Thus, high-resolution bathymetric maps and detected anomalies are essential when planning targeted ROV dives and to navigate during ROV surveys. Most ROV dives as well as gravity coring stations on this cruise were based on a dataset of high-resolution maps, SP-, and methane anomalies, collected by the Norwegian Petroleum Directorate with the Autonomous Underwater Vehicles “Fenris” and “Neri”. For all ROV dives the ROV was used to visually investigate, photograph and video the geology of the area, and samples were collected using the ROV manipulators.

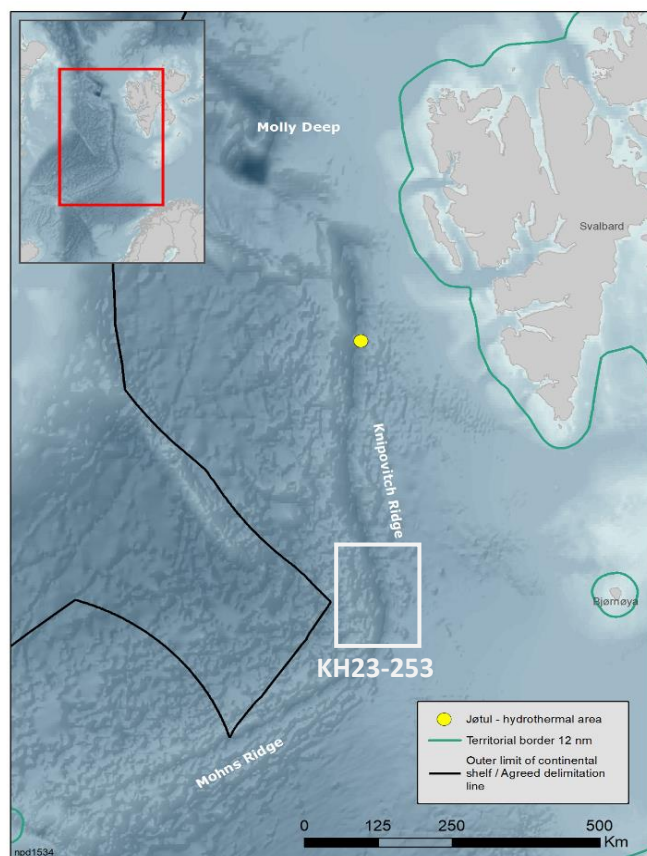


Fig. 1: Overview of the Knipovich ridge, west of Svalbard and Jan Mayen. The white box indicates the approximate extent of this cruise. Modified from NPD (2022).

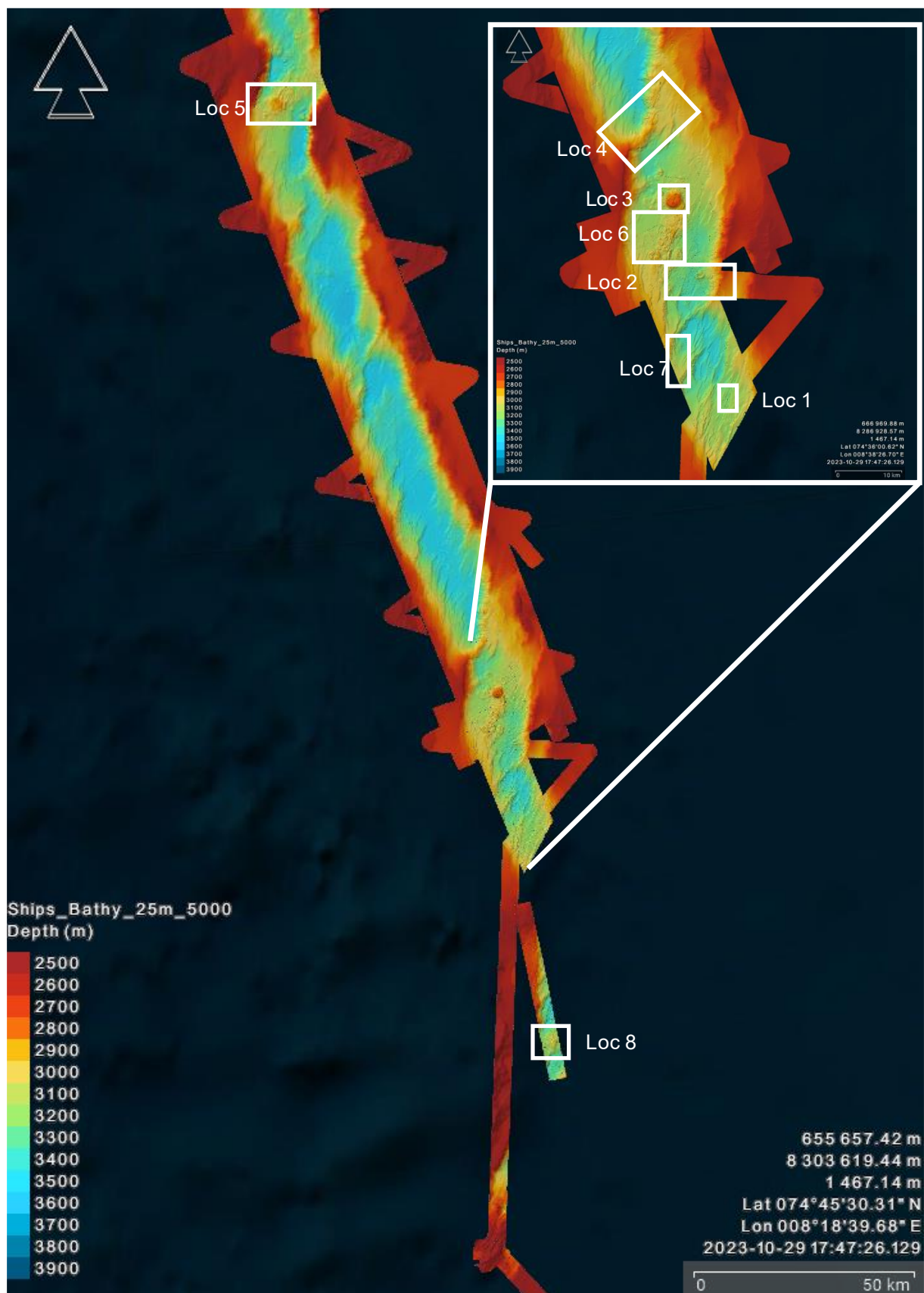


Figure 2: Overview of the bathymetry of the area with localities 1-8. Each location is further described later in this report

Dataset collected by the Norwegian Petroleum Directorate

High resolution mapping, self-potential (SP) and water column anomalies were collected by NPD using the Autonomous Underwater Vehicles (AUVs) “Fenris” and “Neri” in August-September 2023. The resolution of the collected bathymetric maps is 1 m, compared to standard ship-based bathymetry that generally has a resolution of 25 m. In addition, some selected SP anomalies as well as one methane anomaly were selected from this dataset as locations of interest to investigate. Unless stated otherwise, all further references to maps/dataset/anomalies are referring to this survey carried out by the NPD.

Methods and equipment

R/V Kronprins Haakon

The polar class 3 ice breaker research vessel Kronprins Haakon has a total length of 100 meters and weighs above 10.000 ton. It is equipped with the very latest high-tech equipment, enabling us to perform more complex studies, such as ROV operations and gravity coring. The ship has 15 laboratories and the capacity of 55 passengers including 15-17 deck crew.

The ROV system is launched through a moonpool located on the 3rd deck of the ship, enabling the launch of the ROV in the ice as well as in rougher seas compared to the standard launch over the side of the vessel. In addition, the R/V Kronprins Haakon is equipped with an EM302 multibeam echo sounder capable of mapping a swath width up to 3.5 times the water depth with a resolution of up to 25 m. During transit, the multibeam system is continuously recording bathymetry. R/V Kronprins Haakon has a cruising speed of 15 knots and can break through ice up to one meter thick. Kronprins Haakon represents a state-of-the-art research vessel. More details about the ship can be found here:

<https://kronprinshaakon.hi.no/en/projects/kronprins-haakon/about-the-vessel/world-class-vessel>

Remotely Operated Vehicle (ROV) Ægir 6000

The ROV Ægir 6000 is a Kystdesign working class vehicle connected to a Kystdesign tether management system (TMS) capable of submerging down to 6000 m. The ROV is equipped with one ATLAS manipulator and one Schilling T4 manipulator, telemetry sensors, 4 horizontal and 3 vertical thrusters, a high precision positioning system, one HD camera, and one 4K camera.

Positioning

Positioning of the ROV is obtained from a combination of: (1) a High Precision Acoustic Positioning system (HiPAP), (2) a Doppler Velocity Logger, and (3) an Inertial Navigation System. The HiPAP system uses the ship's GPS position and a transducer that receives acoustic signals from transponders mounted on the ROV and TMS. The Doppler system gives additional information on the direction in which the ROV is moving and its speed. A gyroscope and an accelerometer in the Inertial Navigation System provide information on 9 rotation, velocity,

altitude, and horizontal position. This combination of systems provides a position of the ROV within 5-20 m accuracy.

Cameras

Ægir 6000 is equipped with several cameras including two pan-and-tilt HD cameras for video recording, positioned at the center and top of the ROV. The center camera is a 4K camera, used for high quality imaging both as still photos and video recording. LED lights provide adequate background lighting.

Sample collection

Scientific equipment used for sampling with the ROV during this cruise include manipulators for rock sampling, a custom designed shovel (Frankenstein) to use with the manipulators, as well as 10 push cores for sediment collection mounted to the TMS. Push cores were taken with the manipulators using 1-meter-long core barrels, being pushed in the bedding of the seafloor to collect sediments. To maintain a vacuum within the cores, a valve allowing water to expel and maintaining vacuum within the core is mounted to the top. The cores were secured in plastic holsters attached to the outside of the TMS (Tether Management System) with the use of metallic hose clamps, allowing for sampling up to 10 push cores for each dive (fig. 3).



Figure 3: The 10 push cores (A-J) attached to the TMS by metallic hose clamps.

Gravity coring

During this cruise, 4 sediment cores were obtained using a gravity corer. The corer consists of a 6-meter-long steel barrel with a plastic tube inserted and a load of 800 kg. To collect the sediment, the sampler is lowered by a winch and is pushed into the sediment using gravity. The sediments are pushed into the inner tube and are secured in place by a spring-based mechanism known as a “core catcher” at the base, ensuring that the sediments remain inside the tube as the core is lifted from the seabed. Additionally, a one-way closure is located inside the head to prevent water from entering the barrel during retrieval. To ensure the sampler penetrates vertically into the sediment, it is stabilized approximately 20-30 meters above the seabed before being lowered further. Stabilization allows gravity to work more effectively and often results in deeper penetration into the sediment. The first core (KH23-253-01GC) was lowered into the sediments at a speed of 0.5 m/s but was over-penetrated. Thus, the next three gravity core samples were taken with a speed of 0.2 m/s going into the sediments. More information about the gravity core samples can be found in the appendix.

TOKTBILDE FIG 4

List of participants

Rolf Birger Pedersen	Cruise leader, professor, UiB
Ingunn Thorseth	Professor, UiB
Jan Stenløkk	Norwegian Petroleum Directorate (NPD)
Kristoffer Solvi	Norwegian Petroleum Directorate (NPD)
Ingvild Aarrestad	PhD candidate, UiB
Maja Lian Jæger	Master student, UiB
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Frode Evensen	ROV pilot, BSA
Andreas Storebø	ROV pilot, BSA
Jonas Broberg	ROV pilot, DWS
Kenneth Fosse	ROV pilot, DWS
Johan Sköld	ROV pilot, Saga subsea
Björn Löfqvist	ROV pilot, Saga subsea

Thank you very much to everyone who contributed to this report. Thanks to all the scientists, engineers, students, ROV pilots and to all the crew members on R/V Kronprins Haakon. We look forward to the next cruise already!

Location 1 (ROV01+ROV02)

Objective

The objective was to investigate a series of tectonic faults located in the oblique extension regime of the southern Knipovich ridge (fig. 5). The main goal at this location was to uncover the geology of the area and to look for signs of hydrothermal activity related to the faults.

Map

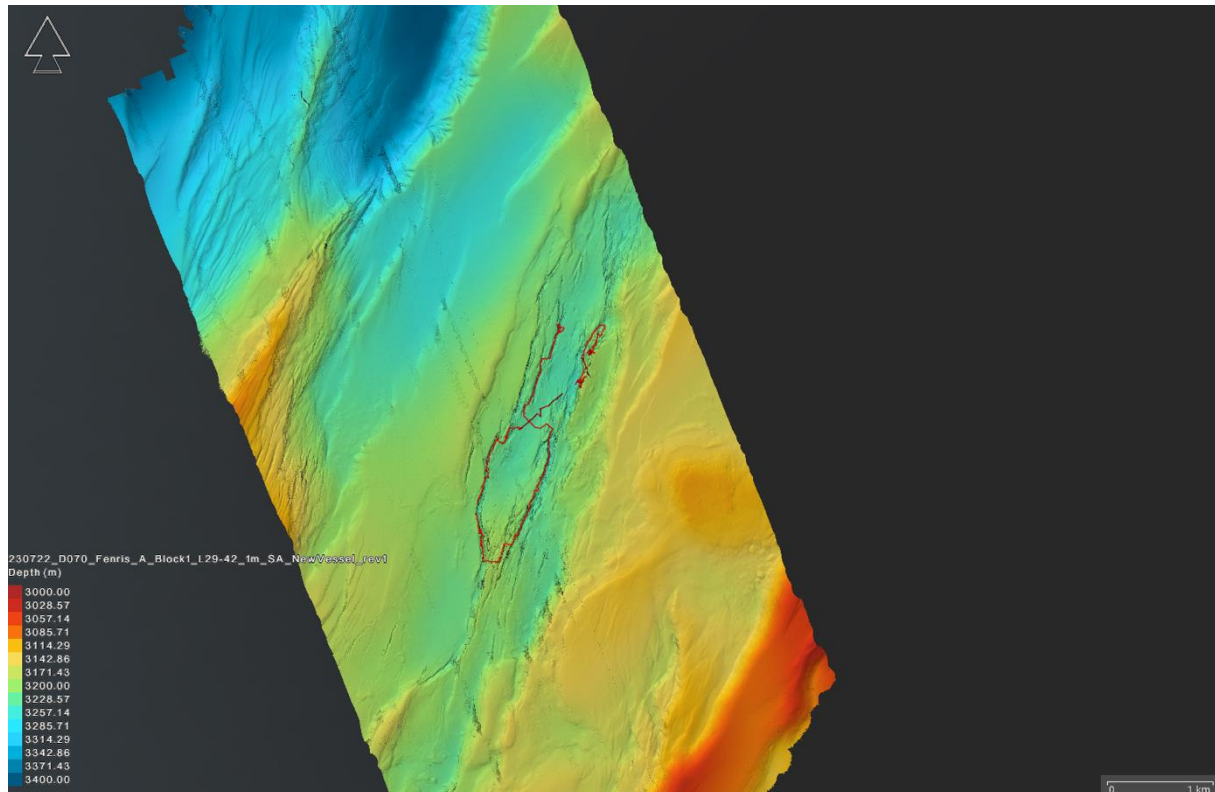


Figure 5: Dive ROV01 and ROV02, following two main faults, oriented NNE-SSE

Preliminary results

Basalts of variable eruptive characteristics were observed along all the investigated faults. Outcrops showing alternating layers of pillows, sheets, brecciated, and more massive, several tens of meters thick layers of basalts were interlayered over the entire investigated area. The exposed outcrops were steep, and flat surfaces were covered by sediments. Most of the pillow basalts display a typical radial fracture pattern (fig.6). A few hollow pillows, or sheet flows, were also observed, creating small cave-like structures were only a few centimeters of the structure remains (fig.7) commonly displaying solidified lava drips under the drained pillow/sheet flows (fig.8). The meters to tens of meters thick massive basalt layers were fractured, occasionally resembling columnar fracturing. No obvious pattern on the repetitive order of basalt morphologies were possible to define, suggesting that the area likely represents several eruptive episodes resulting in the layered variations in morphology. A total of 14 rock

samples were collected during two ROV dives (ROV01 and ROV02). The samples were all basalt from different eruption characteristics; pillows with glassy rims; sheet flows with rope-like flow patterns; coarser grained basalt from massive basalt layers and some weathered basalts. All sample descriptions can be found in the appendix. No signs of hydrothermal activity were uncovered. Based on the visual investigation, rock samples, and tectonic features identified on the map (fig.5), this location is interpreted to represent the extensional regime of the Knipovich ridge, exposing volcanic rocks due to the faulting.



Figure 6: Large pillow basalt with radial fracture pattern



Figure 7: Hollowed out basalt structure



Figure 8: A dumbo octopus inside a basaltic structure, note the solidified drips of lava inside the structure and thinner sheet flows underneath.

Location 2 (ROV03)

Objective

The objective at location 2, dive ROV03, was to investigate some features in the map including the eastern rift valley flank where a small SP anomaly was previously identified, a caldera structure, and several tectonic faults in the oblique extension regime of the Southern Knipovich ridge (fig. 9). The main goal for this area was to uncover the geology of the flank and caldera, investigate the SP anomaly in the dataset, and look for signs of hydrothermal activity related to these features.

Map

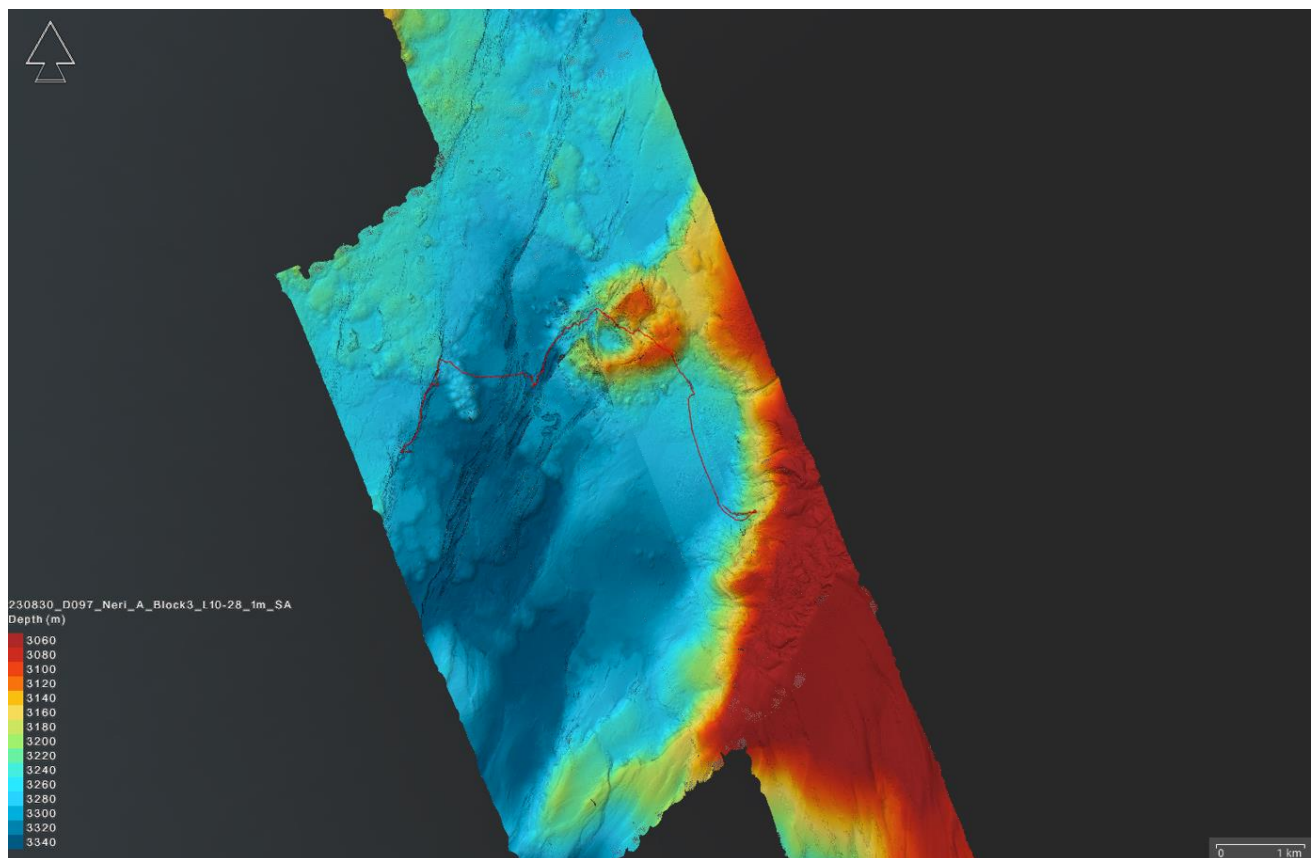


Figure 9: ROV track showing dive R03 at location 2, starting at the flank of the rift valley in SE, crossing the caldera and ending at a fault toward the center of the rift valley.

Preliminary results

Along the flank mostly sediments were observed in canyons and slides. Some fragmented rocks were visible in rockfalls but otherwise only sediments and bioturbation were visible in the area. One SP anomaly was investigated during the dive; however, the anomaly appears to be an artefact in the dataset, as nothing of interest was found at the anomaly site. Such anomalies in the dataset can occur when the AUV turns and is likely what has occurred at the investigated anomaly. The caldera was covered in sediments with some visible rocks and a ridge in the

middle containing basalts with different structures like flow structures and radial fracture patterns. A total of 19 rocks were collected during one ROV dive (ROV03). The first four samples were collected from the canyons and the bottom of the caldera. The first sample was not recovered to deck, while the other three samples were siltstones. Some of them having a reddish/brown surface colour, indicating oxidation. Samples from along the fault were mostly basalts with different characteristics, like glassy rims, thin (<1 mm) manganese crust, and signs of oxidation. Fine grained matrix and light phenocrysts were observed in most of the basalt samples. The sample descriptions can be found in the appendix. No signs of hydrothermal activity were uncovered during the dive, nor the recovered rock samples. Visual examinations of the geological map, analysis of rock samples, and investigations conducted using ROV support the interpretation of this location as indicative of extensional rifting and past volcanic activity. The volcano has experienced a collapse, resulting in a caldera structure with a southeast diameter of approximately 1200 meters and a northwest diameter of approximately 1400 meter. A fault on the western flank of the rift valley extending circa 2.5 km in a north-northeast to south-southwest direction was identified, consisting mainly of pillow basalt and sediments (fig.10). Along the eastern flank of the rift valley, at the initial point, samples from canyons containing both avalanched and consolidated sediments were both observed and sampled.



Figure 10: Basalt structure with eroded sediments on top.

Location 3 (ROV04)

Objective

At this location the aim was to investigate a large flat-topped volcanic feature and a main fault cutting approximately NNE-SSE through the volcanic feature. Several smaller features of interest were also decided from the map in EIVA NaviModel. These features included smaller faults, ridges, and mounds. The main goal was to investigate the lithology, geological features, structural history, and potential sulfide deposits or other hydrothermal activity.

Map

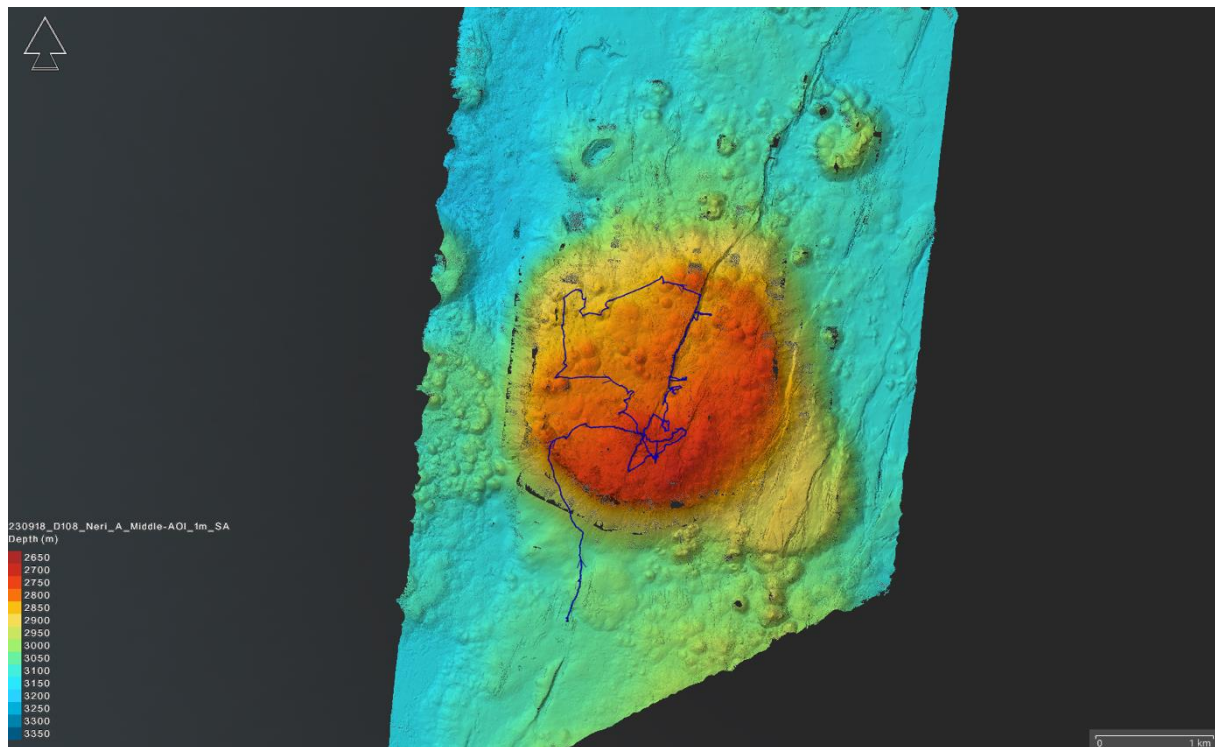


Figure 11: ROV04 track crossing the flat-topped volcanic structure, starting in the south.

Preliminary results

Quite sedimented and loads of avalanched volcanic rocks up the side of the volcanic structure. More benthic life towards the top. The edge of the volcano consisted of pillows and pillow fragments. We visited a ridge structure within the flat-topped volcano. It appears to be a volcanic feature, with relatively large pillows on top, avalanched basalts on the southern flank and the crest were covered in sediments. Smaller fault features were mostly covered by avalanched material making it difficult to identify any proof of faulting.

We tracked the primary fault running from the south to the north of the volcano. In this region, we primarily encountered basalt and sediment-covered terrain. Numerous loose rocks resulting from previous avalanches were scattered along the fault. Upon further examination

of the west side of the fault, we observed a predominance of basalt, with no indications of hydrothermal activity.

Many small round mound features were visited. Most were likely noise in the bathymetry dataset, but we found three small hydrothermal sulfide mounds. The mounds were located in approximately the same area, south on the volcano and to the east of the main fault. on the east side of the main fault, south on the volcano. No particularly clear ancient chimneys were observed, and no signs of ongoing hydrothermal activity/venting.

A total of 11 rock samples were collected, mainly from the three sulfide mounds. The sulfides appeared to be black, porous, and exhibit signs of weathering. Several of the samples displayed crystal precipitation and had undergone a silicification process. Sulfides collected from the top of the mound structure were more weathered compared to samples collected from further down on the structure.



Figure 12: First sulfide mound encountered.

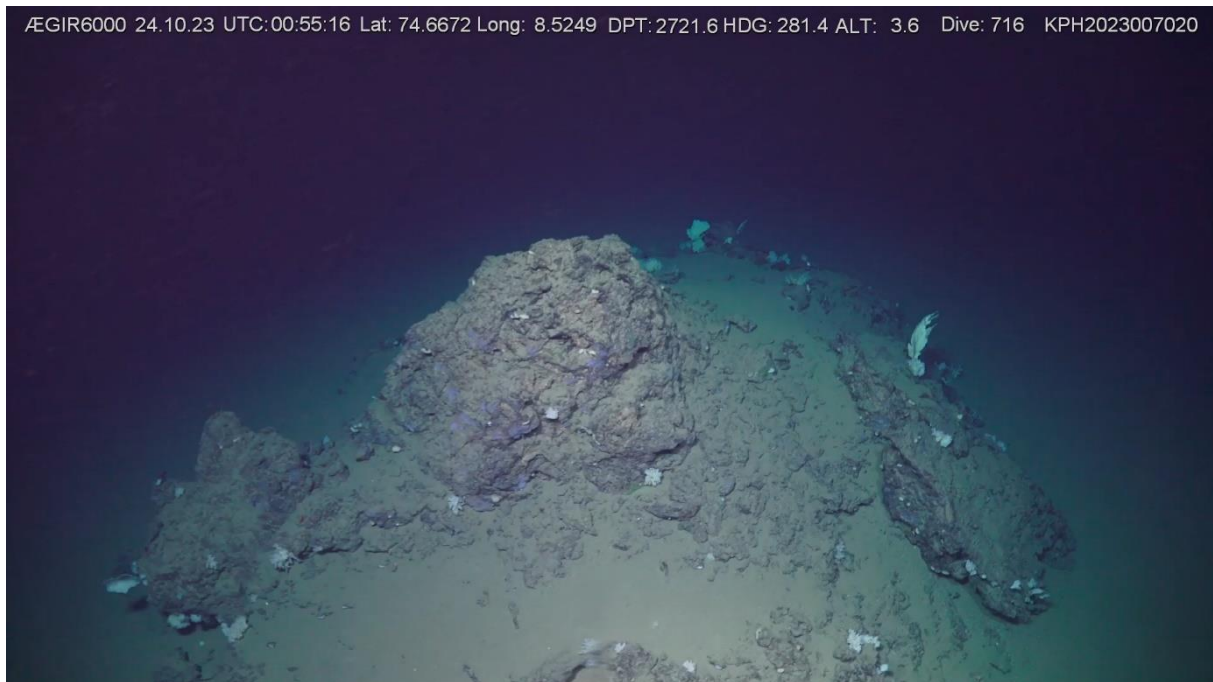


Figure 13: Second sulfide mound encountered.



Figure 14: Third sulfide mound encountered.

Location 4 (ROV05 + ROV08)

Objective

At this location the objective was to investigate the transverse ridge bridging between the flanks of the rift valley, i.e. separating two basins. The goal for dive ROV05 was to determine the lithology of the ridge, verifying the observations with an additional dive on the southern side of the ridge (ROV08).

Map

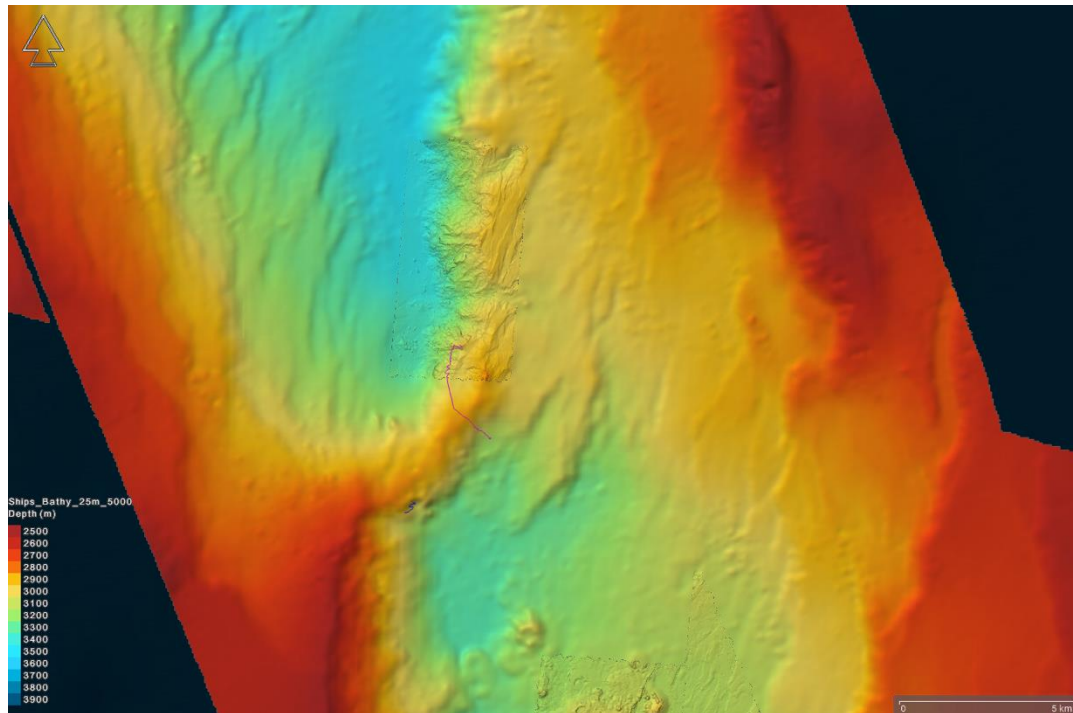


Figure 15: Red ROV track showing dive ROV05, starting at the south side of the ridge, moving in the north direction. Blue track on the SW side of ridge shows dive ROV08. This area was not mapped by AUV and is only based on ship bathymetry.

Preliminary results

We collected a total of 13 rock samples during the two dives. All rock samples were relatively fine-grained siltstones with various degree of lithification (fig.16 and fig.17). The samples exhibited greater consolidation at the ridge's center, with consolidation decreasing as you moved further north. We discovered the least consolidated samples on the ridge's southern side.

The first four samples (ie. from the deepest parts) from dive ROV05 are harder/more consolidated than the rest of the samples. Some of the samples showed red colorization on surfaces that had been in contact with seawater, indicating oxidized iron. During dive ROV08, only scooped sediments and one semi-consolidated rock sample were collected. These samples were also fine grained (silt).

The areas proximity to Bjørnøya fan has most likely contributed to a great amount of sediment deposits and high sedimentary rates. While the transverse ridge separating the two basins might be a result of several rift-movements. The sediments on both sides will therefore represent the material from the flanks, deposited before the rifting occurred.

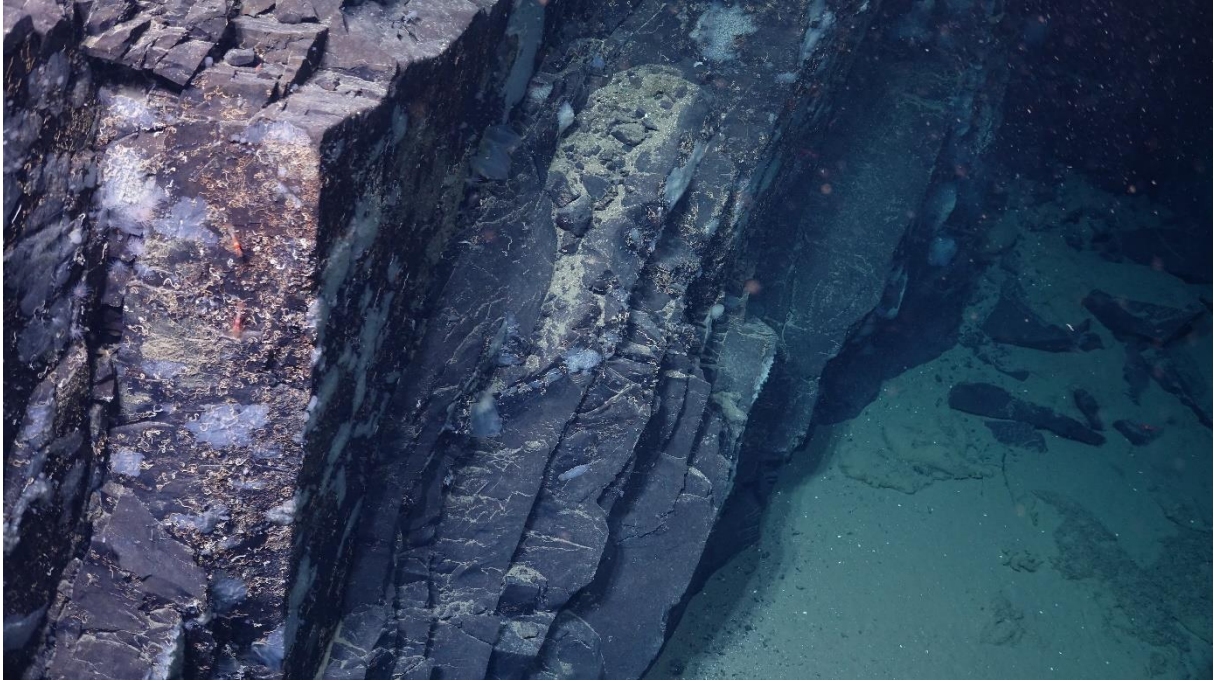


Figure 16: Sedimentary structure with parallel fracturing.



Figure 17: Sedimentary structure displaying signs of oxidation on exposed surfaces.

Location 5 (ROV06 + ROV07)

Objectives

The object of the first dive at location 5 (ROV06) was to investigate SP and water column anomalies identified in the western rift flank. In the rift valley, a volcanic feature mapped with lower resolution (25 meter) by ship multibeam (EM302) was also visited to learn more about this feature. The second dive at this location (ROV07) was focused on the eastern rift flank area.

Map

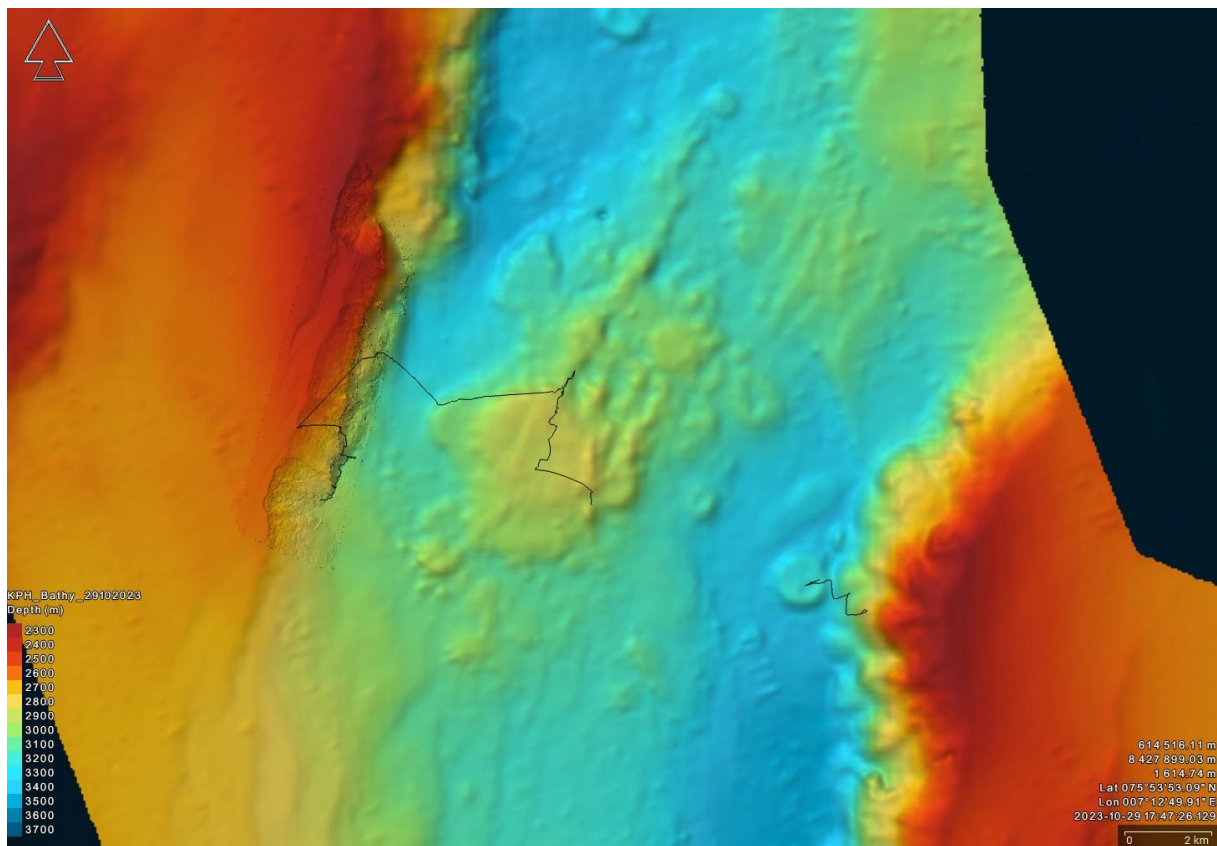


Figure 18: Dive ROV06 (western black stripe) and ROV07 (eastern black stripe) track.

Preliminary results

After further investigation of two of the anomalies, we concluded that the most likely cause was disturbances from the AUV itself, and not the seafloor.

The eastern and western rift flanks are separated by a volcanic feature. In the regions between these flanks and the volcano, the seafloor was covered with sediment. Notably, there were visible ripple marks and bioturbation on the sedimented seafloor. The primary volcanic structure was covered with fragmented pillow basalt and extensive, elongated lava flows. Within the volcanic feature, a substantial rift system was identified, featuring parallel rifts of

varying dimensions, ranging from just a few meters to tens of meters in width, and depths reaching up to 10 meters. This system exhibited an overall orientation from NNE to SSW.

The ROV was brought up on deck, and we extracted 15 samples from ROV06. These samples comprised consolidated mud and basalts with and without volcanic glass of which were covered by a thin layer of manganese crust. Additionally, we collected some basalts displaying signs of alteration, as well as a drop stone that likely originated from IRD. Thereafter, ROV07 initiated its sampling collection with basalt samples obtained from the southeast side of the volcano. It then moved south along the sediment floor to the point where we started our ascent up the cliff that had an approximate 1000 m elevation difference from the base to the summit. In this area, we discovered consolidated mud, various basalt samples with and without volcanic glass. The ROV collected a total of 16 samples in this region. Between these sample collections, we encountered layers with distinct colors. All the layers contain avalanche material, but they originated from separate events, resulting in distinct appearances that formed the layers (fig. 18). Furthermore, we observed large basalt structures alongside altered basalt formations.

Following the fault along the foot of the cliff, moving up the cliff some places. The cliff was steep, almost vertical, and consisted of massive basalt. The cliff developed more rose structures towards the top. Consolidated sediments on top of the cliff, (fig. 19).



Figure 19: Avalanche layers on the eastern rift flanks.



Figure 20: Erosional contact between sediments on top of basalt.

Further investigation of the area shows that there is around 200 meters of sediments on top of the basalt cliff. The sediments are most likely not of hemipelagic origin, which raises a question about where the sediments come from. Given the considerable thickness of this sediment layer, we can assume that there has been an uplift. By comparing layer measurements and sediment accumulation rates we can determine the time aspect of this incident.

Two push core (PC) samples were also collected at this locality to further investigate sediment composition and foraminifera prevalence in the area.

Location 6 (ROV09 + ROV10 + ROV11)

Objective

Investigate volcanic terrain south of location 3 (large flat-topped volcano). Visiting several mounds of various sizes to see if they are extinct hydrothermal deposits. Following that, the ROV will move west and explore of the caldera, and subsequently, move further west to the outer caldera area for the extraction of a push core to study the sediments.

Map

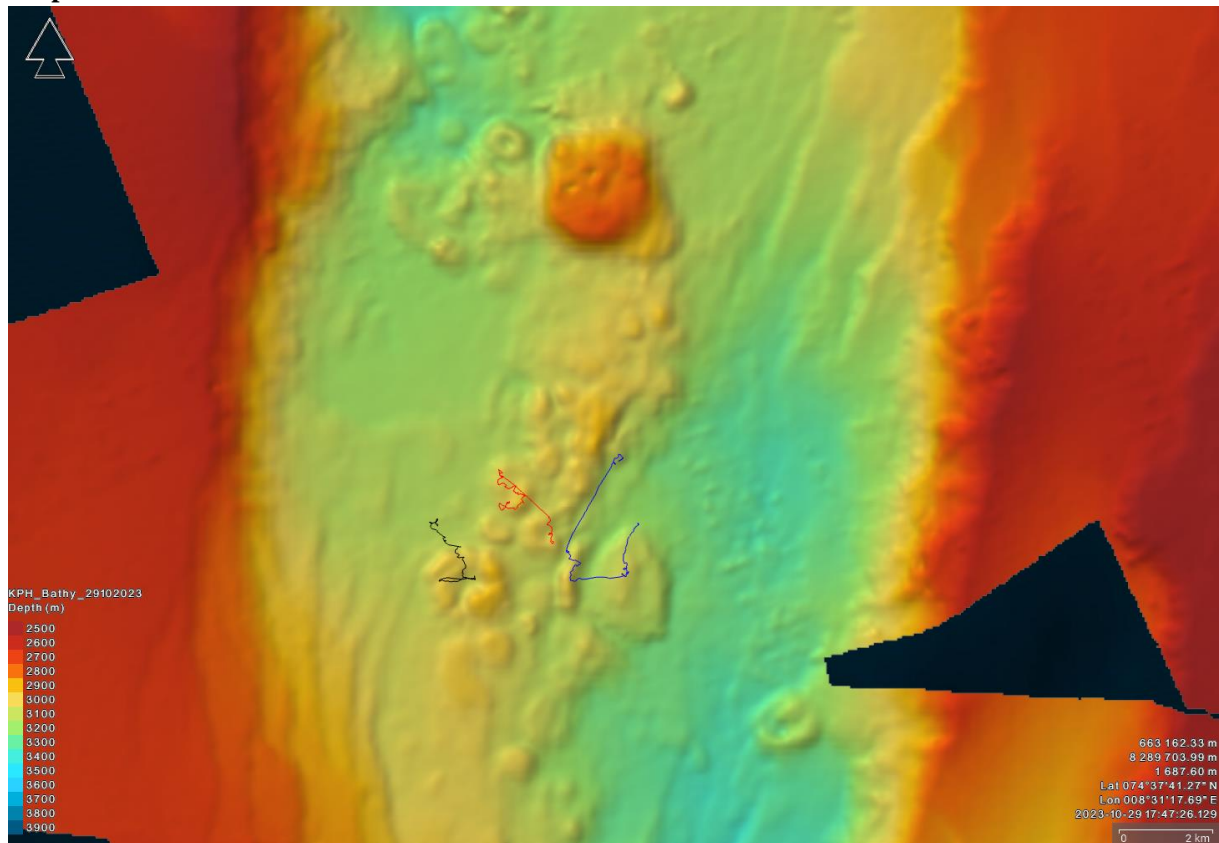


Figure 21: ROV09 track (red), ROV10 track (blue) and ROV11 track (black).

Preliminary results

There was in total three ROV dives on location six with a total of 30 various rock samples. ROV09 investigated several mounds, all these mounds seemed to have the same characteristics. There was a lot of sediments on the seafloor, then along the slopes of the mounds there was lots of basalt fractures accumulated in an avalanche with lava flows running over (fig. 22). The top of the mounds consisted of fractured basalt. Further on we investigated the caldera, which consisted of mostly pillow basalts and sediments. We moved along a V-valley cutting through the caldera NW towards plain field and lobate streams. Further on a small volcano structure covered in sediments were checked out, and push cores

were taken on top. We ended ROV10 by following a crack (fig. 23) and took several basalt samples.

On the last of the three dives we observed two ancient chimneys sticking up from the sediments, one quite tall (approx. 4-5 meters) and one smaller (fig. 24). There was taken several sulfide samples from the chimneys. We ended the dives at location six after checking out the center of a volcanic feature, there was only sediments to be seen. Push cores were taken inside the volcano.



Figure 22: Lava flows running over fractures of basalt.

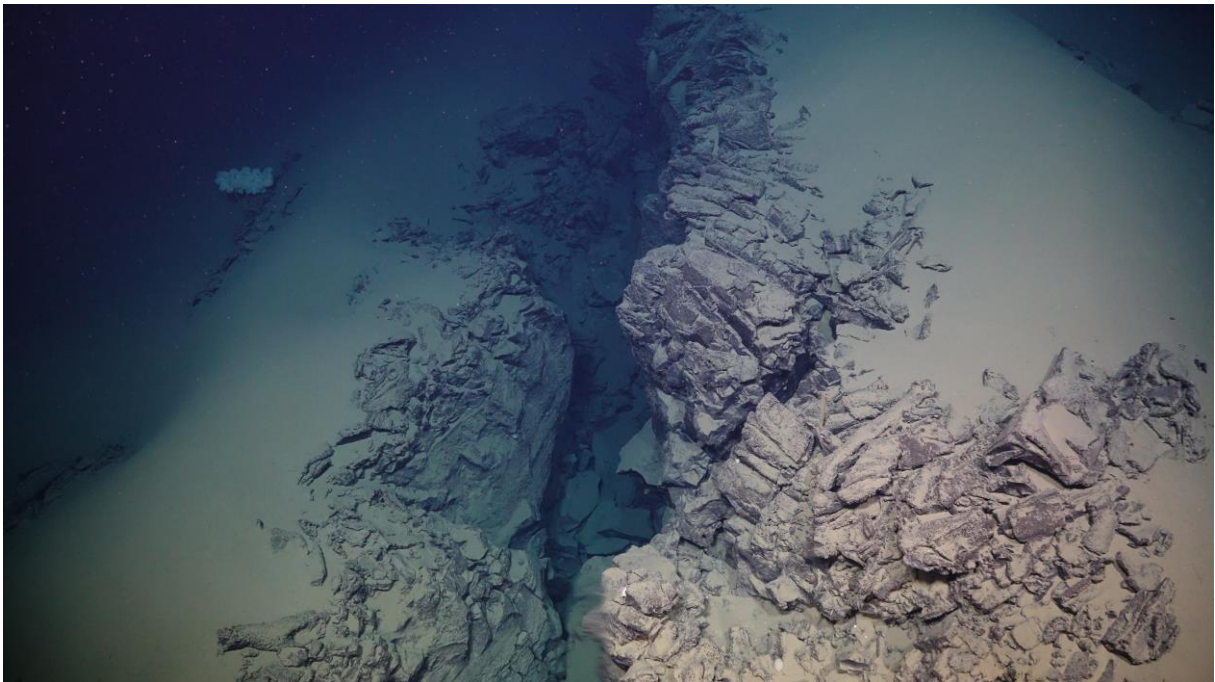


Figure 23: Crack observed at ROV10.

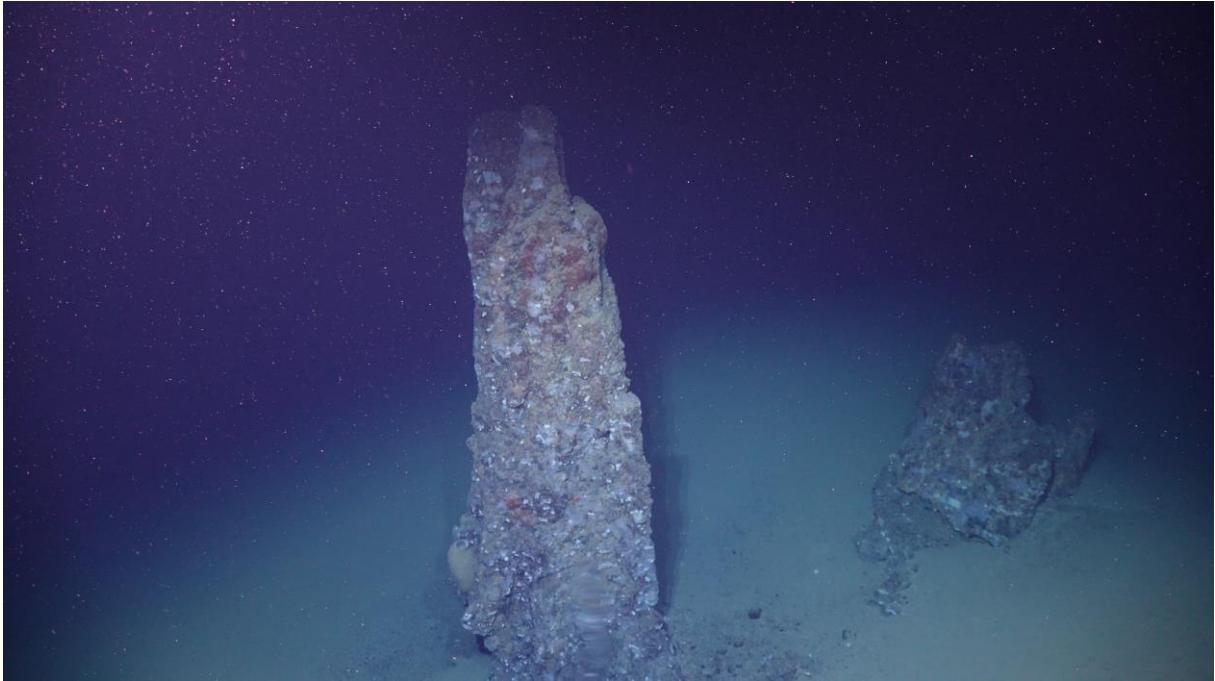


Figure 24: Extinct chimney, 4-5m tall.

Location 7 (ROV12 + ROV13)

Objective

The objective at location 7 was to investigate SP and methane anomalies and attempt to collect samples that exhibited signs of anything other than sedimentation, such as volcanic activity. The main goal was to confirm that these areas were characterized by sedimentation rather than the presence of volcanic structures.

Map

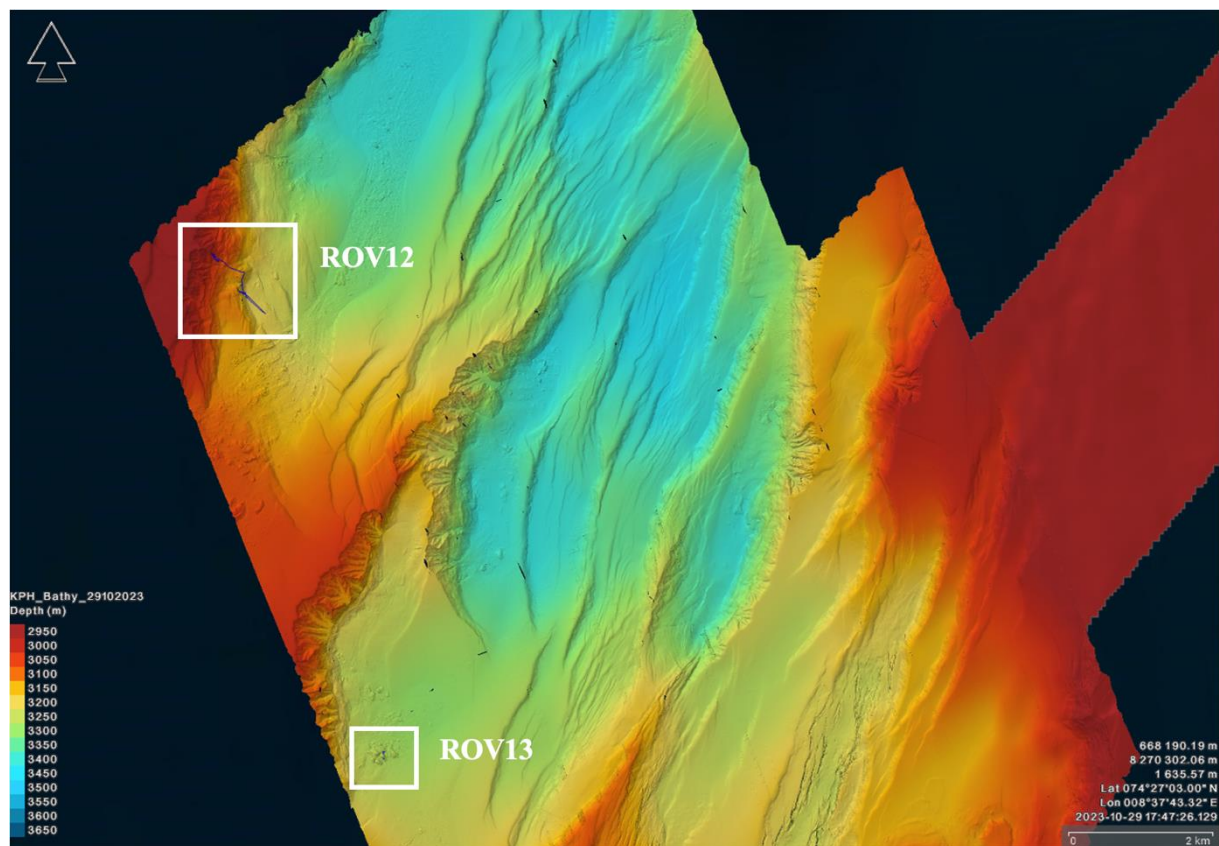


Figure 25: An overview map over location 7, track lines of ROV12 and ROV13 marked with white squares.

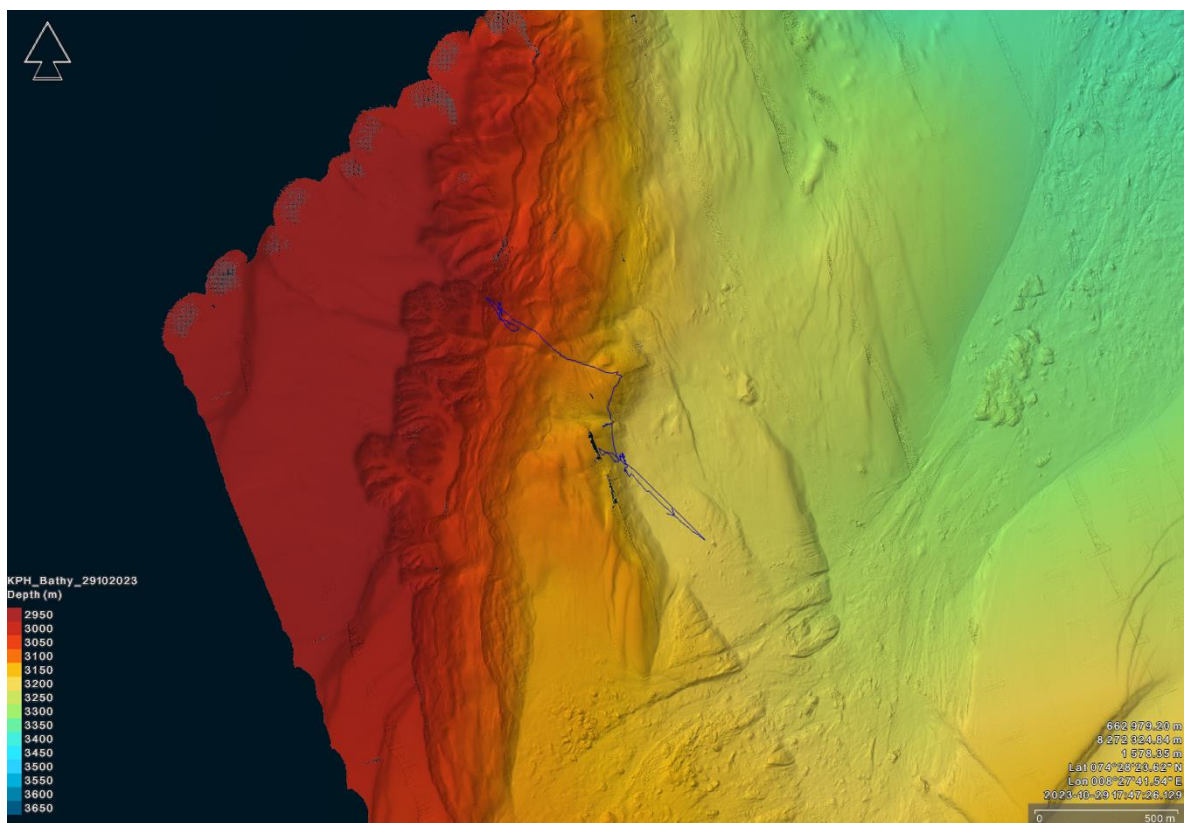


Figure 26: Map showing blue track for dive ROV12.

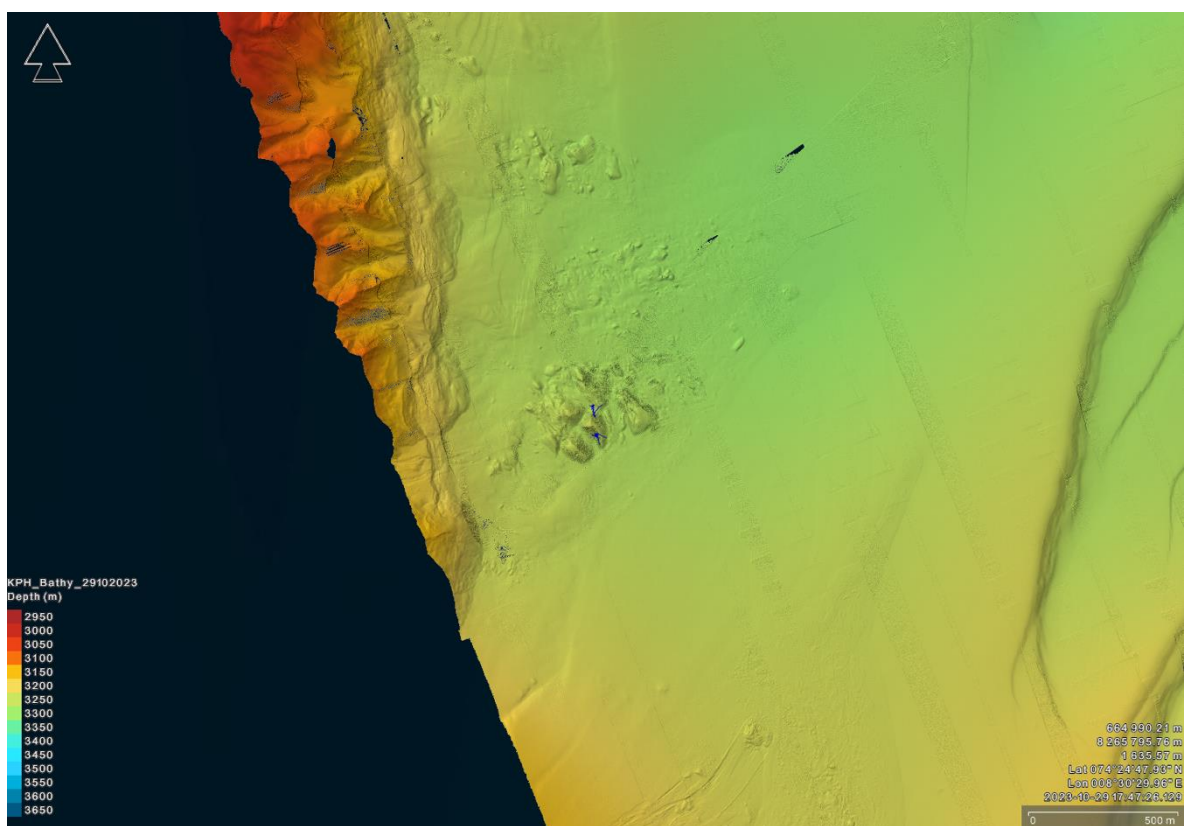


Figure 27: Map showing blue track for dive ROV13.

Preliminary results

Upon investigation, it was concluded that the observed anomalies were a result of interference, most likely stemming from inaccurate sensor measurements. The areas consisted mainly of loose sediment, with little to no consolidation. There were no indications of any volcanic structures. Both dives, ROV12 and ROV13, were unable to retrieve any samples, as the sediments were not sufficiently consolidated for sampling.

Location 8 (ROV14)

Objective

Only maps multibeam data from ship, no detailed structures to follow. The objective of the dive was to explore the large volcanic feature. The main goal was to investigate the lithology, geological features, structural history, and potential sulfide deposits or other hydrothermal activity.

Map

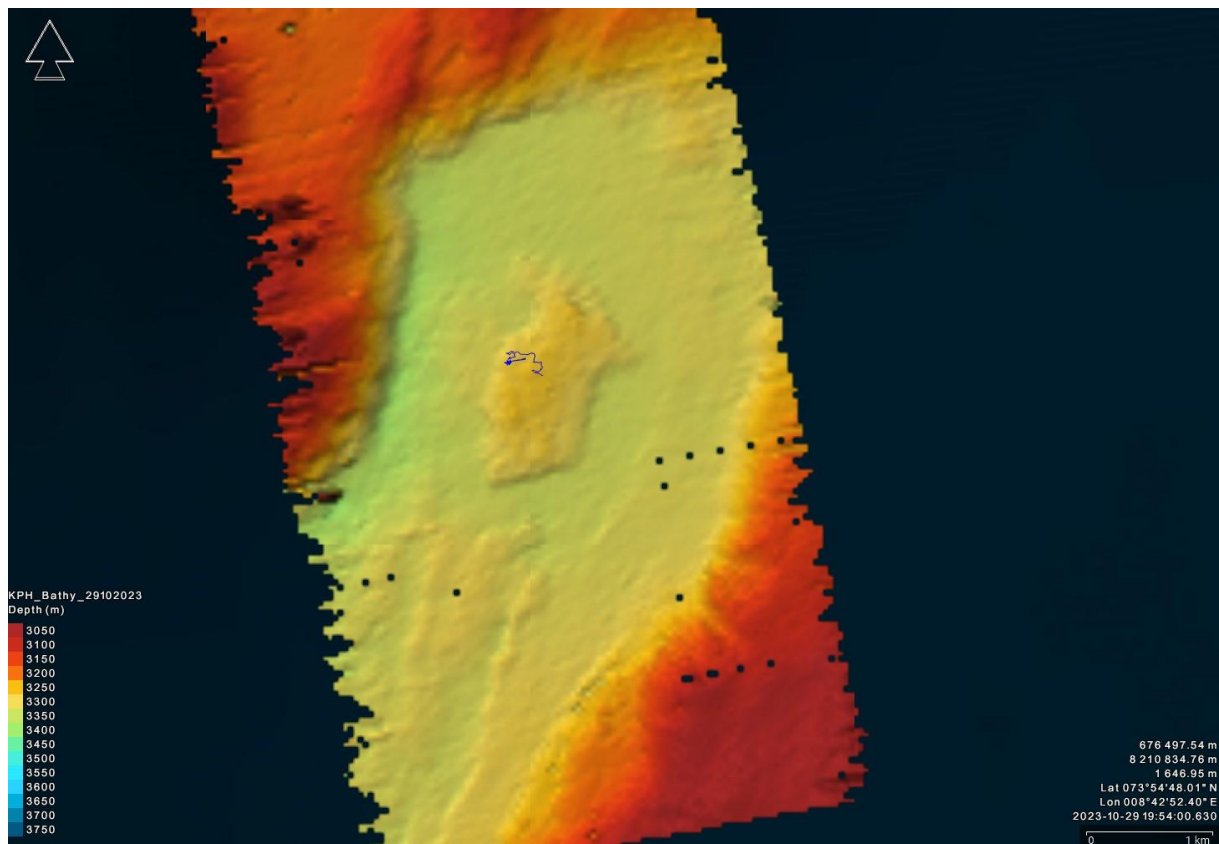


Figure 28: An overview map over location 8, track lines of ROV14 marked with blue line.

Preliminary results

We encountered sulfide deposits almost immediately after arriving at the seabed at the western side of the structure. The sulfide structures were up to seven meters tall and consisted of rocks with green mineral grains that easily crumbles. Moving around on the top of the volcanic structure there was avalanches of fractured pillow basalt and large fragments of pillow basalt laying around. Push-Cores were taken of sediments near the sulfide structures.

Dive 1 : 22.10.23

KH23-253-ROV01-R01

Location: Southern Knipovich Ridge

Latitude: 74.4061

Longitude: 8.7198

Depth: 3190

Measurements (l/w/h): 15cm/10cm/14cm

Description:

Volcanic sample – basalt.

Dark, massive and fine grained.

Surface with weathering (rust-colored) and a manganese crust less than 1mm.

Cracks appear more weathered.



KH23-253-ROV01-R02

Location: Southern Knipovich Ridge

Latitude: 74.4067

Longitude: 8.7221

Depth: 3206

Measurements (l/w/h): 16cm/11cm/12cm

Description:

Volcanic sample – basalt.

Color varies from dark grey/purple/red on surface to dark/black on fracture structures.

Fine grained texture with an observable weathered outer rim, ranging between 1mm and 2mm in thickness.

Areas with visible iron oxyhydroxides (rust-colored).

Surfaces with weathering and a manganese crust less than 1mm.



KH23-253-ROV01-R03

Location: Southern Knipovich Ridge

Latitude: 74.4071

Longitude: 8.7224

Depth: 3203

Measurements (l/w/h): 26cm/27cm/21cm

Description:

Volcanic sample – basalt.

Dark red/purple/black in color with a dull luster.

Fine grained texture with a fining upwards towards exposed surface.

Weathered areas with visible iron oxyhydroxides (rust-colored).

Surface with a manganese crust less than 1mm and weathered volcanic glass (palagonite).

**KH23-253-ROV01-R04**

Location: Southern Knipovich Ridge

Latitude: 74.4079

Longitude: 8.7252

Depth: 3214

Measurements (l/w/h): 13cm/9cm/9cm

Description:

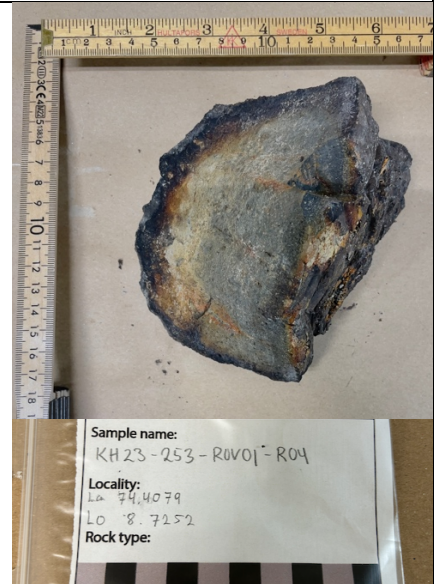
Volcanic sample – basalt.

Darker color on exposed surfaces, lighter on fracture surfaces.

Fine grained texture.

Areas with weathering (iron oxyhydroxides).

Surface with a manganese crust less than 1mm and volcanic glass.

**KH23-253-ROV01-R05**

Location: Southern Knipovich Ridge

Latitude: 74.4056

Longitude: 8.7177

Depth: 3196

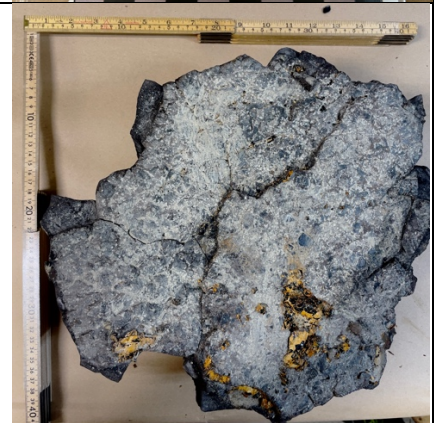
Measurements (l/w/h): 33cm/32cm/15cm

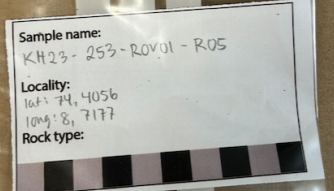
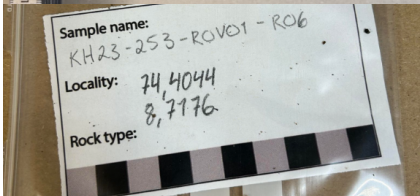
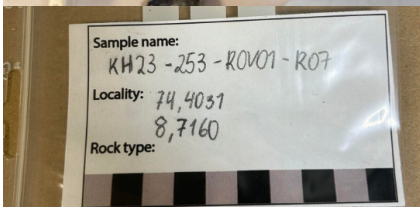
Description:

Volcanic sample – basalt.

Massive and dark with a dull luster.

Surface with weathered volcanic glass (palagonite), less than 1mm in thickness, and a manganese crust.



	 Sample name: KH23-253-ROV01-R05 Locality: lat: 74, 4056 long: 8, 7177 Rock type:
KH23-253-ROV01-R06 Location: Southern Knipovich Ridge Latitude: 74.4044 Longitude: 8.7176 Depth: 3197 Measurements (l/w/h): 13cm/9cm/8cm Description: Volcanic sample – basalt. Color is dark with a dull luster. Fine grained with a fining upwards towards exposed surface. Botryoidal surface with weathered volcanic glass (palagonite) and a manganese crust.	  Sample name: KH23-253-ROV01-R06 Locality: 74, 4044 8, 7176 Rock type:
KH23-253-ROV01-R07 Location: Southern Knipovich Ridge Latitude: 74.4031 Longitude: 8.7160 Depth: 3194 Measurements (l/w/h): 28cm/24cm/18cm Description: Volcanic sample – basalt. Grey in color, with a surface of manganese crust less than 1mm thick. Typical basaltic solidification pattern on surface of sample. Fine grained.	  Sample name: KH23-253-ROV01-R07 Locality: 74, 4031 8, 7160 Rock type:

Dive 2 : 23.10.23

KH23-253-ROV02-R01

Location: Southern Knipovich Ridge

Latitude: 74.3997

Longitude: 74.3997

Depth: 3218

Measurements (l/w/h):

Description:

Volcanic sample – basalt.

Light grey to brown in color.

Aphanitic and dark on the inside.

Weathered surface.

No visible cleavage points.



KH23-253-ROV02-R02

Location: Southern Knipovich Ridge

Latitude: 74.3997

Longitude: 8.6912

Depth: 3222

Measurements (l/w/h):

Description:

Volcanic sample – basalt.

Black on the inside, with a weathered surface in various colors of brown.

Sheetflows on the top.

Fine grained.



KH23-253-ROV02-R03

Location: Southern Knipovich Ridge

Latitude: 74.3999

Longitude: 8.6911

Depth: 3219

Measurements (l/w/h):

Description:

Volcanic sample – basalt with alteration zone.

Black colored with spots of reddish-brown. Hard brown sediments on outside. One of the sample components contains fragments of vitreous volcanic glass crystals on outside, no more than 1mm thick.

Massive texture.

Fine grained.

**KH23-253-ROV02-R04**

Location: Southern Knipovich Ridge

Latitude: 74.3994

Longitude: 8.6908

Depth: 3220

Measurements (l/w/h):

Description:

Volcanic sample – basalt.

Black/dark gray on inside.

Outer shell is darker.

Thin layer of manganese crust.

Calcareous tubeworms on outside.

Massive texture.

Fine grained.

**KH23-253-ROV02-R05**

Location: Southern Knipovich Ridge

Latitude: 74.3991

Longitude: 8.6872

Depth: 3218

Measurements (l/w/h):

Description:

Volcanic sample – basalt with alteration zone.

Black with dark and light brown spots on different sides of surface.

The light brown is a loose layer.

Massive texture.



Fine grained.

Observable weathered outer rim with varying thickness ranging from 1cm to 2 cm.

KH23-253-ROV02-R06

Location: Southern Knipovich Ridge

Latitude: 74.3976

Longitude: 8.6840

Depth: 3214

Measurements (l/w/h):

Description:

Volcanic sample - basalt.

Grey colored, with black outer shell on top consisting of volcanic glass.

Massive texture.

Fine grained.

Layers that vary from gray to brown.

Fragmented inside.

Vesicles observed in sample.



	
KH23-253-ROV02-R07 Location: Southern Knipovich Ridge Latitude: 74.3945 Longitude: 8.6802 Depth: 3218 Measurements (l/w/h): Description: Volcanic sample - weathered basalt. Black colors with various tones of brown on the outside. Massive texture. Inside is greyish and fine grained.	
KH23-253-ROV02-R08 Location: Southern Knipovich Ridge Latitude: 74.3920 Longitude: 8.6931 Depth: 3210 Measurements (l/w/h): Description: Volcanic sample - basalt. Black vitreous volcanic glass with brown weathering spots (palagonite). Fractured smooth texture.	

No visible grains.

KH23-253-ROV02-R09

Location: Southern Knipovich Ridge

Latitude: 74.4043

Longitude: 8.7030

Depth: 3227

Measurements (l/w/h):

Description:

Volcanic sample – weathered basalt.

Black coloration with different tones of brown on the outside.

Black and brown tubeworms covered in a thin manganese crust less than 1mm thick.

Grey and fine grained on the inside.



KH23-253-ROV02-R10

Location: Southern Knipovich Ridge

Latitude: 74.4081

Longitude: 8.7106

Depth: 3226

Measurements (l/w/h):

Description:

Volcanic sample – pillow basalt.

Black, with spots of brown.

Vitreous outer shell ranging from 1m to 5mm in thickness.

Reminiscent of volcanic glass which gradually shifts to having an aphanitic/massive texture in towards the center of the sample.



KH23-253-ROV02-R11

Location: Southern Knipovich Ridge

Latitude: 74.4081

Longitude: 8.7110

Depth: 3234

Measurements (l/w/h):

Description:

Volcanic sample – pillow basalt.

Black, with spots of brown.

Vitreous outer shell ranging from 1m to 5mm in thickness.

Reminiscent of volcanic glass which gradually shifts to having an aphanitic/massive texture in towards the center of the sample.

**Dive 3 : 23.10.23****KH23-253-ROV03-R01**

Location: Southern Knipovich Ridge

Latitude: 74.5489

Longitude: 8.6634

Depth: 3212

Measurements (l/w/h):

Description:

Sample lost in transit.

KH23-253-ROV03-R02

Location: Southern Knipovich Ridge

Latitude: 74.5489

Longitude: 8.6652

Depth: 3198

Measurements (l/w/h):

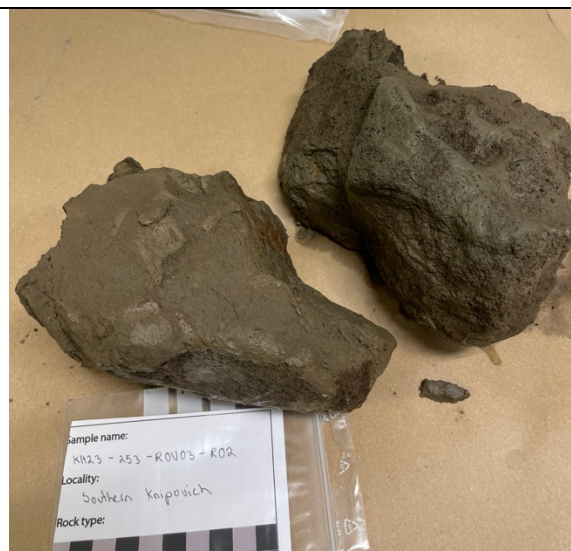
Description:

Sedimentary sample - Siltstone.

Grey, brown/reddish-brown.

Dull to earthy texture.

Fine grained.

**KH23-253-ROV03-R03**

Location: Southern Knipovich Ridge

Latitude: 74.5489

Longitude: 8.6666

Depth: 3194

Measurements (l/w/h):

Description:

Sedimentary sample - Siltstone.

Grey, brown/reddish-brown.

Dull to earthy texture.

Fine grained.

**KH23-253-ROV03-R04**

Location: Southern Knipovich Ridge

Latitude: 74.5523

Longitude: 8.6522

Depth: 3292

Measurements (l/w/h):

Description:

Sedimentary sample - Siltstone.

Grey, brown/reddish-brown.

Dull to earthy texture.

Fine grained.



KH23-253-ROV03-R05

Location: Southern Knipovich Ridge

Latitude: 74.5648

Longitude: 8.6428

Depth: 3193

Measurements (l/w/h):

Description:

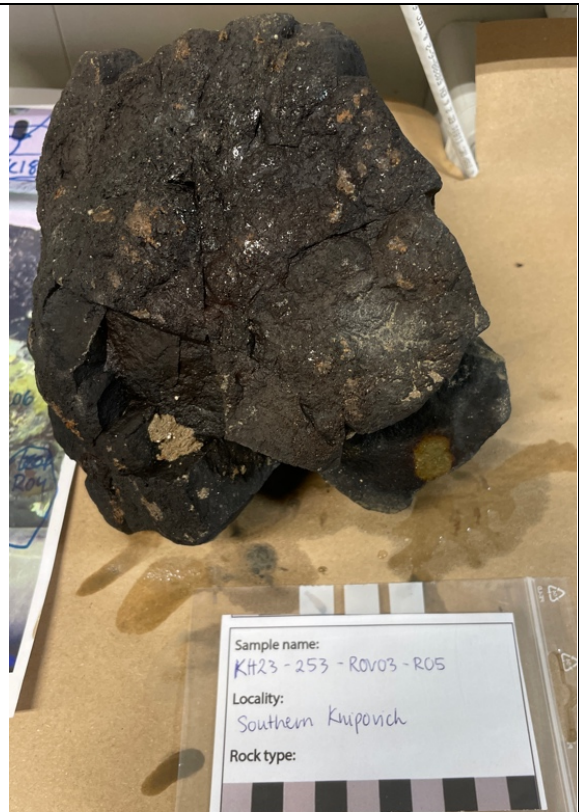
Volcanic sample – Pillow basalt.

Black with brown spots.

Massive texture.

Fine grained.

Typical radial structures formed under deposition and solidification of subsea lava streams and pillow basalts observed in sample.

**KH23-253-ROV03-R06**

Location: Southern Knipovich Ridge

Latitude: 74.5653

Longitude: 8.6423

Depth: 3156

Measurements (l/w/h): 18cm/15cm/16cm

Description:

Volcanic sample –basalt with alteration zone.

Color varies from brown to orange, with prominent rust-color.

Massive texture.

Fine grained.

Typical basaltic solidification pattern on surface consisting of weathered volcanic glass (palagonite), less than 1mm in thickness.



KH23-253-ROV03-R07

Location: Southern Knipovich Ridge

Latitude: 74.5655

Longitude: 8.6422

Depth: 3127

Measurements (l/w/h): 15cm/6cm/6cm

Description:

Volcanic sample – basalt.

Black with gradual shift to yellow coloration.

Massive texture.

Fine grained.

Weathered surface.

Visible phenocrysts in cut.

**KH23-253-ROV03-R08**

Location: Southern Knipovich Ridge

Latitude: 74.5696

Longitude: 8.6210

Depth: 3172

Measurements (l/w/h): 33cm/13cm/20cm

Description:

Volcanic sample - basalt.

Dark/black in color.

Massive texture.

Fine grained.

Surface with organic matter and a manganese crust thinner than 1mm.

Visible phenocrysts in cut.

**KH23-253-ROV03-R09**

Location: Southern Knipovich Ridge

Latitude: 74,5700

Longitude: 8,6195

Depth: 3163

Measurements (l/w/h): 34cm/30cm/17cm

Description:

Volcanic sample - basalt.

Dark/black in color

Massive texture.

Fine grained.



Some surface weathering and a manganese crust less than 1mm thick.
Drain-out structures with three levels observed in sample.

Sample name:
KH23-253-ROV03-R09
Locality:
Southern Knipovich
Rock type:

KH23-253-ROV03-R10

Location: Southern Knipovich Ridge
Latitude: 74.5698
Longitude: 8.6084
Depth: 3232
Measurements (l/w/h): 12cm/15cm/9cm
Description:

Volcanic sample – altered basalt.
Dark/black with gradual shift to yellow/brown coloration on surface.
Massive texture.
Fine grained.

Visible phenocrysts inside sample.
Iron oxyhydroxides and volcanic glass on surface varying between 1mm and 2mm in thickness.



Sample name:
KH23-253-ROV03-R10
Locality:
Southern Knipovich
Rock type:

KH23-253-ROV03-R11

Location: Southern Knipovich Ridge
Latitude: 74.5694
Longitude: 8.6031
Depth: 3243
Measurements (l/w/h): 12cm/11cm/8cm
Description:

Volcanic sample –basalt with alteration zone.
Dark/black with gradual shift to yellow/orange/brown coloration on surface.
Massive texture.
Fine grained.

Visible phenocrysts inside sample.
Iron oxyhydroxides and volcanic glass on surface varying between 1mm and 2mm in thickness.



KH23-253-ROV03-R12

Location: Southern Knipovich Ridge

Latitude: 74.5982

Longitude: 8.5982

Depth: 3282

Measurements (l/w/h): 12cm/10cm/6cm

Description:

Volcanic sample – basalt with alteration zone.
Predominantly brown/orange color on surface with black spots/areas.

Massive texture.

Fine grained.

Visible phenocrysts inside sample.

Some iron oxyhydroxides and volcanic glass on surface varying from 1mm to 4mm in thickness.

**KH23-253-ROV03-R13**

Location: Southern Knipovich Ridge

Latitude: 74.5678

Longitude: 8.5971

Depth: 3293

Measurements (l/w/h): 21cm/21cm/15cm

Description:

Volcanic sample –basalt with alteration zone.
Near white/light brown color on surface.

Massive texture.

Fine grained.

Visible phenocrysts inside sample.

Iron oxyhydroxides and some volcanic glass on surface varying between 1mm and 3mm in thickness.



KH23-253-ROV03-R14

Location: Southern Knipovich Ridge

Latitude: 74.5673

Longitude: 8.5973

Depth: 3293

Measurements (l/w/h): 17cm/11cm/4cm

Description:

Volcanic sample –basalt with alteration zone.
Near white surface color with some orange/brown areas.

Massive texture.

Fine grained.

Visible phenocrysts inside sample.

Weathered surface with some volcanic glass less than 1mm thick.

**KH23-253-ROV03-R15**

Location: Southern Knipovich Ridge

Latitude: 74.5669

Longitude: 8.5947

Depth: 3311

Measurements (l/w/h): 32cm/15cm/25cm

Description:

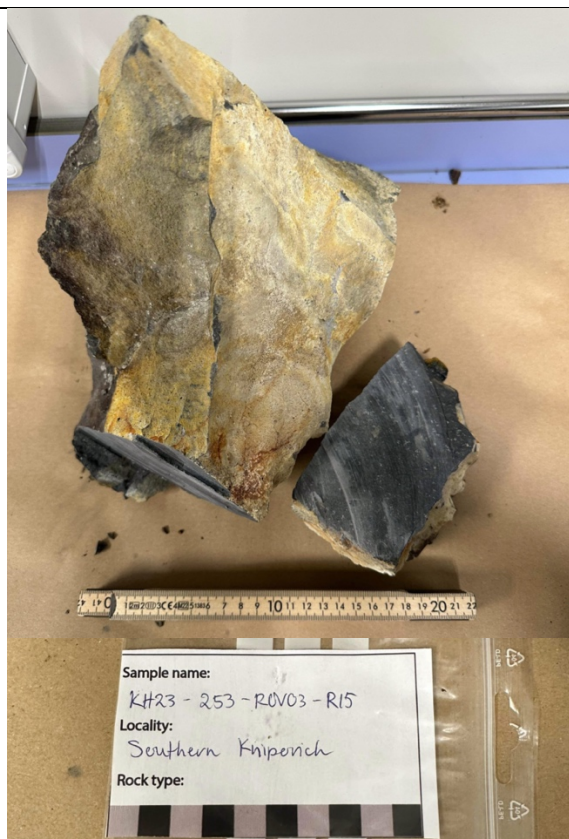
Volcanic sample –basalt with alteration zone.
Light yellow, near white surface color.

Massive texture.

Fine grained.

Visible phenocrysts inside sample, and black phenocrysts on surface.

Weathering and some volcanic glass manganese crust on the surface less than 1mm thick.



KH23-253-ROV03-R16

Location: Southern Knipovich Ridge

Latitude: 74.566381

Longitude: 8.5938

Depth: 3313

Measurements (l/w/h): 27cm/15cm/21cm

Description:

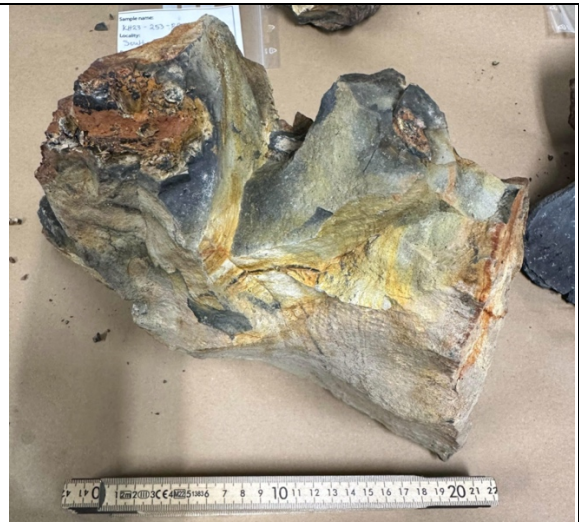
Metamorphic sample – slightly metamorphic basalt (amphibolite or greenschist?).

White, brown, orange, yellow, black coloration on sample surface.

Massive texture.

Fine grained.

Uneven weathered surface and a manganese crust less than 1mm thick.

**KH23-253-ROV03-R17**

Location: Southern Knipovich Ridge

Latitude: 74.5664

Longitude: 8.5939

Depth: 3312

Measurements (l/w/h): 10cm/7cm/10cm

Description:

Metamorphic sample – slightly metamorphic basalt (amphibolite or greenschist?).

Dark/black with beige and brown areas of coloration on surface.

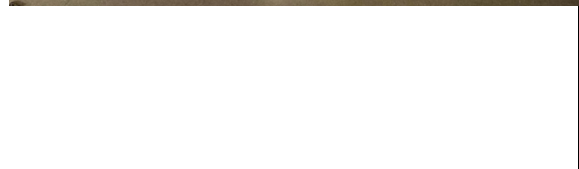
Massive texture.

Fine grained.

Fragmented metamorphic basalt.

Botryoidal surface with volcanic glass between 1mm and 2mm thick, and rust.

Visible phenocrysts inside sample.



KH23-253-ROV03-R18

Location: Southern Knipovich Ridge

Latitude: 74.5644

Longitude: 8.5881

Depth: 3313

Measurements (l/w/h): 16cm/13cm/18cm

Description:

Volcanic sample – altered basalt.

Dark/black with beige and brown areas of coloration on surface.

Massive texture.

Fine grained.

Botryoidal surface with volcanic glass

between 1mm and 2mm thick, and rust.

Visible phenocrysts inside sample.

**KH23-253-ROV03-R19**

Location: Southern Knipovich Ridge

Latitude: 74.6574

Longitude: 8.5880

Depth: 3319

Measurements (l/w/h): 25cm/23cm/19cm

Description:

Volcanic sample –basalt with alteration zone.

Dark/black with beige and brown areas of coloration on surface.

Massive texture.

Fine grained.

Botryoidal surface with volcanic glass

between 1mm and 2mm thick.

Zones of heavy weathering on surface.

Visible phenocrysts inside sample.



KH23-253-ROV04-R01

Location: Southern Knipovich Ridge

Latitude: 74.6671

Longitude: 8.5246

Depth: 2723

Measurements (l/w/h): 29cm/31cm/23cm

Description:

Volcanic sample – basalt.

Dark/black color.

Massive texture.

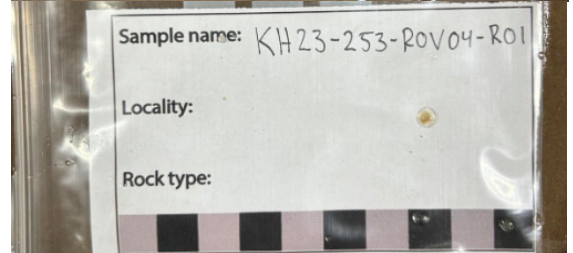
Fine grained.

Porous sample with uneven surface. Breaks easily.

Vesicles observed inside sample.

Large amount of red and orange areas.

Precipitation - small areas with white crystals.

**KH23-253-ROV04-R02**

Location: Southern Knipovich Ridge

Latitude: 74.6671

Longitude: 8.5246

Depth: 2723

Measurements (l/w/h): 31cm/38cm/19cm

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

Coarse texture reminiscent of sandstone.

Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.

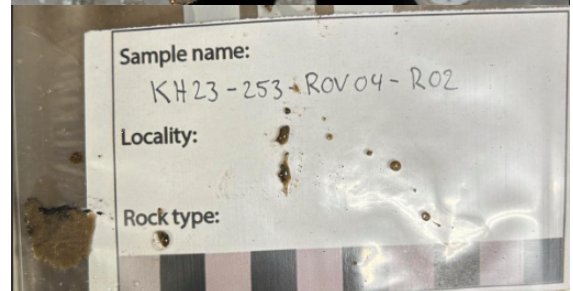
Weathered - red and orange areas.

Large dark black/grey areas with shimmer.

Precipitation of white crystals observed in sample.

Sample consists of an orange/brown colored layer between 3cm and 7cm thick covering the sample's surface and wrapped around an entirely black "core".

Mineral identification: amorph silica, pyrite, baryte, manganese (thin layer), sphalerite, iron oxyhydroxide



KH23-253-ROV04-R03

Location: Southern Knipovich Ridge

Latitude: 74.6671

Longitude: 8.5246

Depth: 2723

Measurements (l/w/h): 32cm/22cm/23cm

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

Coarse texture reminiscent of sandstone.

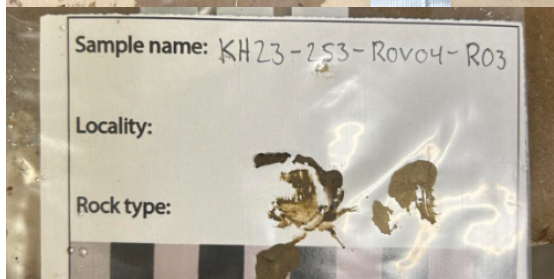
Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.

Some weathering - red and orange areas.

Large dark black/grey areas with shimmer.

Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).

**KH23-253-ROV04-R04**

Location: Southern Knipovich Ridge

Latitude: 74.6671

Longitude: 8.5247

Depth: 2722

Measurements (l/w/h): 19cm/13cm/12cm

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

Coarse texture reminiscent of sandstone.

Grain size equivalent to medium-coarse sand.

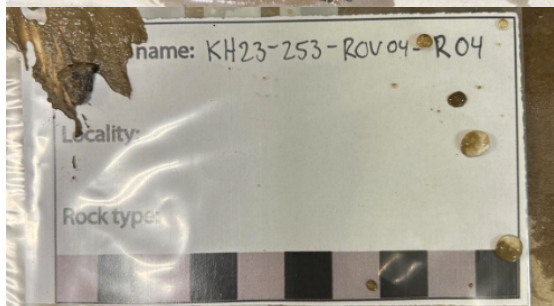
Porous sample. Breaks easily.

Some oxidation – areas with heavy weathering.

Large dark areas.

Precipitation - small areas with white crystals.

Mineral identification: silica, iron oxyhydroxide, sphalerite? manganese (thin layer).



KH23-253-ROV04-R05

Location: Southern Knipovich Ridge

Latitude: 74.6671

Longitude: 8.5247

Depth: 2722

Measurements (l/w/h): 31cm/22cm/11cm

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

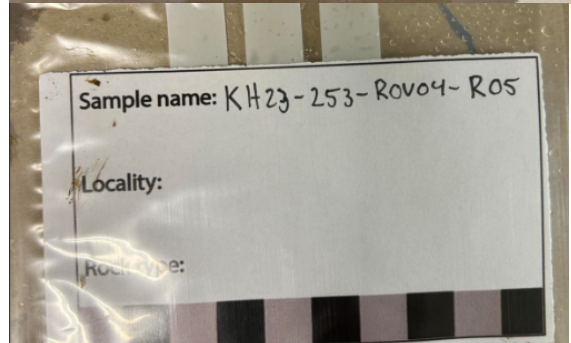
Coarse texture reminiscent of sandstone.

Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.

Predominantly dark in color with some oxidation – areas with heavy weathering.

Mineral identification: amorph silica, pyrite, baryte, manganese (thin layer), sphalerite, iron oxyhydroxide.

**KH23-253-ROV04-R06**

Location: Southern Knipovich Ridge

Latitude: 74.6691

Longitude: 8.5288

Depth: 2721

Measurements (l/w/h): 25cm/16cm/24cm

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

Coarse texture reminiscent of sandstone.

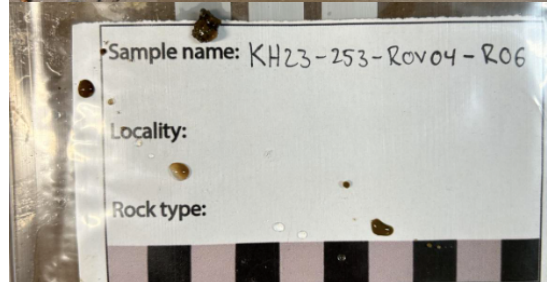
Grain size equivalent to medium-coarse sand.

Porous sample with “flaky” texture. Breaks easily.

Large areas with heavy weathering.

Precipitation - small areas with white quartz crystals.

Mineral identification: baryte, iron oxyhydroxide, manganese (thin layer), anhydrite?



KH23-253-ROV04-R07

Location: Southern Knipovich Ridge

Latitude: 74.6691

Longitude: 8.5288

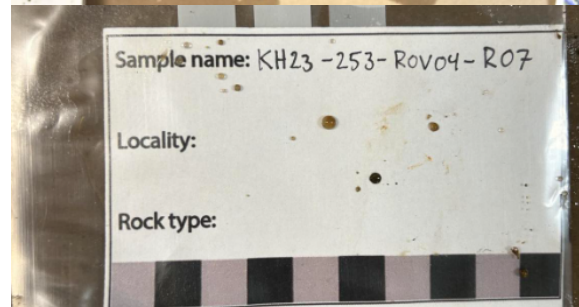
Depth: 2721

Measurements (l/w/h): 20cm/11cm/13cm

Description:

Sulfide sample – hydrothermal deposit.
Orange/brown and black color.
Coarse texture reminiscent of sandstone.
Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.
Mainly dark in color with heavy weathering.
Mineral identification: baryte, pyrite,
sphalerite, iron oxyhydroxide, manganese
(thin layer).

**KH23-253-ROV04-R08**

Location: Southern Knipovich Ridge

Latitude: 74.6691

Longitude: 8.5288

Depth: 2721

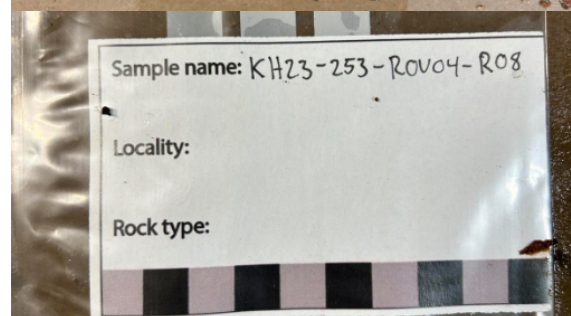
Measurements (l/w/h): 27cm/12cm/14cm

Description:

Sulfide sample – hydrothermal deposit.
Orange/brown and black color.
Coarse texture reminiscent of sandstone.
Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.
Weathering – large areas with red color.

Mineral identification: baryte, silica,
sphalerite, manganese (thin layer).



KH23-253-ROV04-R09

Location: Southern Knipovich Ridge

Latitude: 74.6672

Longitude: 8.5246

Depth: 2723

Measurements (l/w/h): 35cm/33cm/20cm

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

Coarse texture reminiscent of sandstone.

Grain size equivalent to medium-coarse sand.

Silicified.

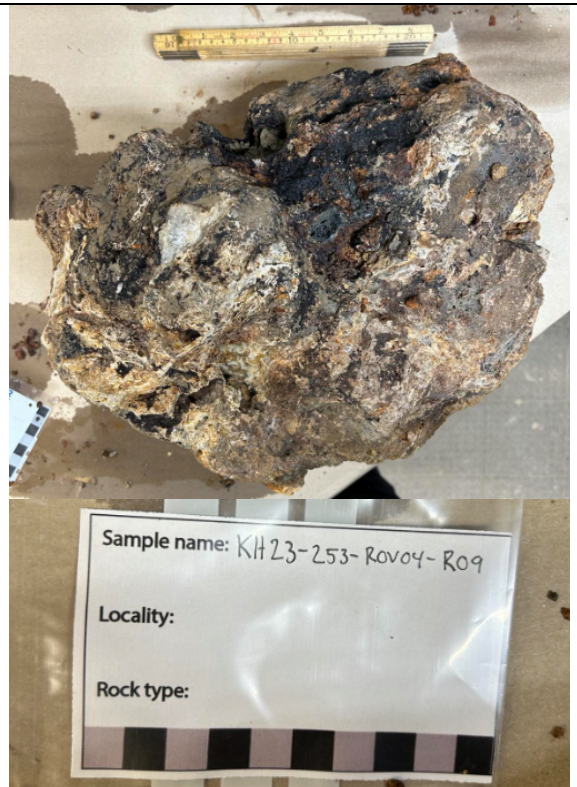
Porous sample. Fragile surface.

Weathering (red/orange/brown spots).

Dark areas with some shimmer.

Structures resembling silica precipitation.

Mineral identification: pyrite, baryte, sphalerite, manganese (thin layer).

**KH23-253-ROV04-R10**

Location: Southern Knipovich Ridge

Latitude: 74.6672

Longitude: 8.5256

Depth: 2723

Measurements (l/w/h): 35cm/33cm/20cm

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

Coarse texture reminiscent of sandstone.

Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.

Weathering – large areas with red/orange/brown color.

Sample consists of an orange/brown colored layer between 3cm and 7cm thick covering the sample's surface and wrapped around an entirely black "core".

Mineral identification: amorph silica, sphalerite, iron oxyhydroxide, baryte, manganese (thin layer).



KH23-253-ROV04-R11

Location: Southern Knipovich Ridge

Latitude: 74.6672

Longitude: 8.5256

Depth: 2723

Measurements (l/w/h): 26cm/19cm/16cm

Description:

Sulfide sample – hydrothermal deposit.

Porous sample. Breaks easily.

Weathering – areas with red/orange/brown color.

Structures resembling silica precipitation.

Mineral identification: sphalerite, iron oxyhydroxide, amorph silica, manganese (thin layer).

**Dive 5****KH23-253-ROV05-R01**

Location: Southern Knipovich Ridge

Latitude: 74.7639

Longitude: 8.4441

Depth: 3069

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.



KH23-253-ROV05-R02

Location: Southern Knipovich Ridge

Latitude: 74.7641

Longitude: 8.4436

Depth: 3047

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.

**KH23-253-ROV05-R03**

Location: Southern Knipovich Ridge

Latitude: 74.7643

Longitude: 8.4427

Depth: 3026

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.



KH23-253-ROV05-R04

Location: Southern Knipovich Ridge

Latitude: 74.7645

Longitude: 8.4420

Depth: 3002

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.

**KH23-253-ROV05-R05**

Location: Southern Knipovich Ridge

Latitude: 74.7648

Longitude: 8.4408

Depth: 2967

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.



KH23-253-ROV05-R06

Location: Southern Knipovich Ridge

Latitude: 74.7829

Longitude: 8.4224

Depth: 3096

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.

**KH23-253-ROV05-R07**

Location: Southern Knipovich Ridge

Latitude: 74.7828

Longitude: 8.4227

Depth: 3091

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.



KH23-253-ROV05-R08

Location: Southern Knipovich Ridge

Latitude: 74.7828

Longitude: 8.4225

Depth: 3091

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.

**KH23-253-ROV05-R09**

Location: Southern Knipovich Ridge

Latitude: 74.7851

Longitude: 8.4256

Depth: 3091

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.



KH23-253-ROV05-R10

Location: Southern Knipovich Ridge

Latitude: 74.7856

Longitude: 8.4311

Depth: 3033

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.

**KH23-253-ROV05-R11**

Location: Southern Knipovich Ridge

Latitude: 74.7856

Longitude: 8.4311

Depth: 3033

Measurements (l/w/h):

Description:

Sedimentary sample – siltstone.

black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

No signs of organic remains in sample except for on its surface.

Samples saturated with water, indicating high porosity.



KH23-253-ROV06-R01

Location: Southern Knipovich Ridge

Latitude: 75.8875

Longitude: 6.9687

Depth: 2922

Measurements (l/w/h): 21/10/11

Description:

Volcanic sample – basalt.

Black surface with more grey/dark grey inside with some orange/rusty coloring. Mostly massive and fine grained but with visible white phenocrysts inside. Manganese crust varies in thickness from 1mm to 8mm.

Along fracture plane there is a visible weathered color. Cracks in sawed pieces shows orange coloring.

**KH23-253-ROV06-R02**

Location: Southern Knipovich Ridge

Latitude: 75.8888

Longitude: 6.9751

Depth: 2966

Measurements (l/w/h): 24/20/15

Description:

Sedimentary sample – consolidated mud.

Black, dark grey, brown, orange color.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

Dull to earthy texture. One surface showing holes/porous texture.



KH23-253-ROV06-R03

Location: Southern Knipovich Ridge

Latitude: 75.8903

Longitude: 6.9741

Depth: 2838

Measurements (l/w/h): 29/16/9.5

Description:

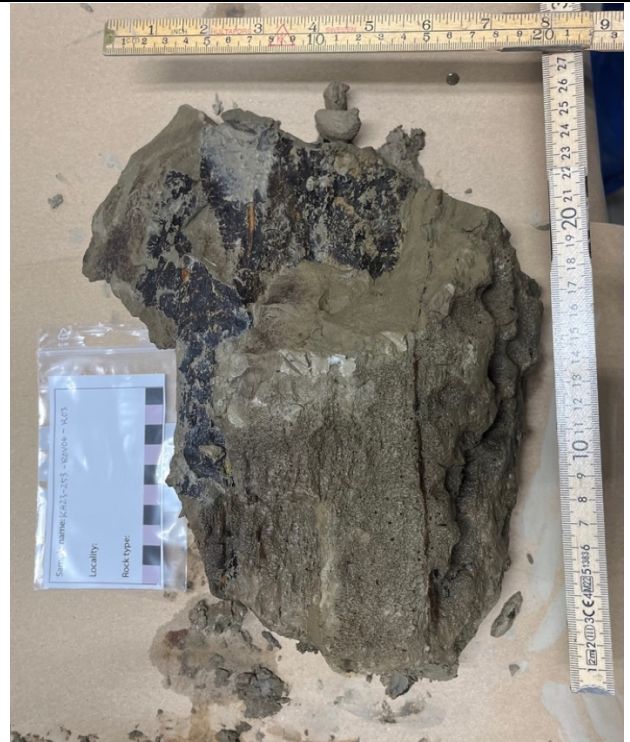
Sedimentary sample – consolidated mud. Mostly grey colored with some surfaces showing darker (black to reddish) coloring.

Dull to earthy texture.

Grain size: Clay (<0.004mm).

Dull to earthy texture. One surface showing holes/porous surface.

One clearly visible layer with different coloring than the rest of the sample (black to reddish in color) and different hardness.

**KH23-253-ROV06-R04**

Location: Southern Knipovich Ridge

Latitude: 75.9019

Longitude: 6.9848

Depth: 2685

Measurements (l/w/h): 20/15/14

Description:

Volcanic sample – basalt.

Dark gray to black color.

Massive texture.

Fine grained with visible phenocrysts inside sample.

No visible manganese crust but somewhat red-brown coloring in cracks. Organic material on top (white parts).



KH23-253-ROV06-R05

Location: Southern Knipovich Ridge

Latitude: 75.9023

Longitude: 6.9834

Depth: 2704

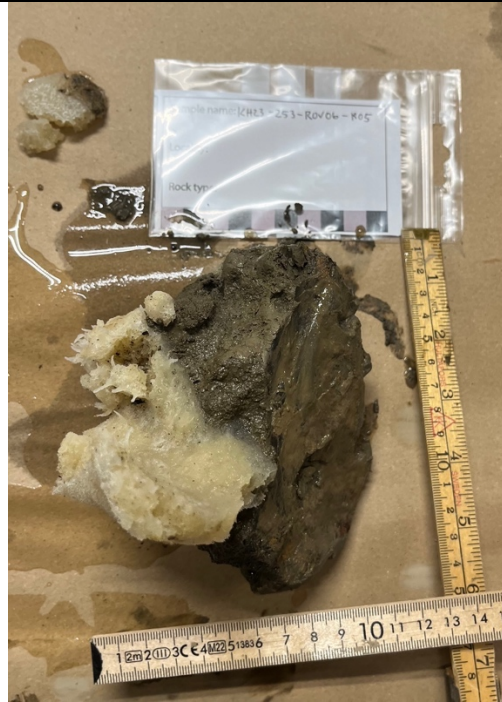
Measurements (l/w/h): 12/8/7

Description:

Sedimentary sample – consolidated mud.
Mostly gray colored with some surfaces showing darker (black to reddish) color.
Dull to earthy texture.
Grain size: Clay (<0.004mm).

Dull to earthy texture. One surface showing holes/porous texture.

Large parts of sample covered by organic material/fauna.

**KH23-253-ROV06-R06**

Location: Southern Knipovich Ridge

Latitude: 75.9112

Longitude: 7.0499

Depth: 3223

Measurements (l/w/h): 21/21/14

Description:

Volcanic sample – basalt.
Dark gray to black color.
Massive texture.
Fine grained.

No visible manganese crust but somewhat red-brown coloring visible.
Organic material on top (white parts).



KH23-253-ROV06-R07

Location: Southern Knipovich Ridge

Latitude: 75.9055

Longitude: 7.0680

Depth: 3100

Measurements (l/w/h): 40/28/25

Description:

Volcanic sample – basalt.

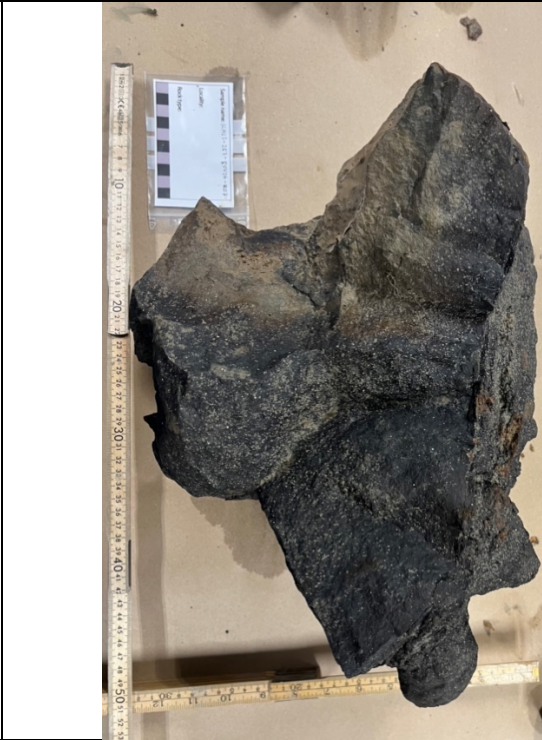
Dark gray to black color.

Massive texture.

Fine grained.

Somewhat red-brown coloring visible.

Thick manganese crust with varying thickness (from ca. 5mm to 10mm)

**KH23-253-ROV06-R08**

Location: Southern Knipovich Ridge

Latitude: 75.9054

Longitude: 7.0693

Depth: 3092

Measurements (l/w/h): 13/10/13

Description:

Volcanic sample – pillow basalt.

Dark gray coloring on the inside and a darker outside.

Massive very fine grained with no visible phenocrysts.

Glass covered by manganese crust. The crust is hard to measure because of the glass layers. Seems like the glass and manganese crust peels off in one layer. Mostly showing orange-red color in/around manganese crust.

Visible worms on crust-layer.



KH23-253-ROV06-R09

Location: Southern Knipovich Ridge

Latitude: 75.9054

Longitude: 7.0693

Depth: 3088

Measurements (l/w/h): 14/9/6

Description:

Volcanic sample – basalt

Dark gray coloring on the inside and a darker outside surface.

Massive very fine grained with no visible phenocrysts.

Whole rock covered by thick layer of class (thickest point ca. 6mm) which is covered by manganese crust (1mm).

The sample has a coral-like structure. Manganese crust has some orange coloring.

Visible tubeworms on the observed manganese crust.

**KH23-253-ROV06-R10**

Location: Southern Knipovich Ridge

Latitude: 75.9054

Longitude: 7.0693

Depth: 3088

Measurements (l/w/h): 11/9/7

Description:

Volcanic sample – basalt.

Dark gray coloring on the inside and a darker outside surface.

Fractured smooth texture on surface, and massive texture underneath.

Fine grained with no visible phenocrysts.

Whole rock covered by thick layer of class (thickest point ca. 4mm) which is covered by manganese crust (1mm). Surface shows spots of orange coloring on the manganese crust.

Visible tubeworms on manganese crust.



KH23-253-ROV06-R11

Location: Southern Knipovich Ridge

Latitude: 75.9054

Longitude: 7.0693

Depth: 3088

Measurements (l/w/h): 19/7/6.5

Description:

Volcanic sample – basalt.

Dark gray coloring on the inside and a darker outside surface.

Massive very fine grained with no visible phenocrystals.

Whole rock covered by thick layer of glass (thickest point ca. 5mm) which is covered by manganese crust (1mm).

Surface shows spots of orange coloring on the manganese crust.

Visible tubeworms on manganese crust.

**KH23-253-ROV06-R12**

Location: Southern Knipovich Ridge

Latitude: 75.9054

Longitude: 7.0693

Depth: 3079

Measurements (l/w/h): 13/11/11

Description:

Volcanic sample – basalt.

Dark gray coloring on the inside and a darker outside surface.

Massive very fine grained with no visible phenocrystals.

Whole sample is covered by thick layer of volcanic glass (thickest point ca. 6mm) which is covered by manganese crust (2mm).

Surface shows spots of orange coloring on the manganese crust.

Visible tubeworms on manganese crust.



KH23-253-ROV06-R13

Location: Southern Knipovich Ridge

Latitude: 75.9061

Longitude: 7.0980

Depth: 3064

Measurements (l/w/h): 9/7/7

Description:

Sample - red granite.

Red pinkish with big visible light grey to white crystals.

Phaneritic texture with rounded edges.

Likely a drop stone (Ice rafted debris).

**KH23-253-ROV06-R14**

Location: Southern Knipovich Ridge

Latitude: 75.9077

Longitude: 7.1766

Depth: 2970

Measurements (l/w/h): 9/7/10

Description:

Volcanic sample – basalt.

Dark grey coloring on the inside and a darker outside surface.

Massive fine grained with no visible phenocrystals.

Whole sample covered by thick layer of volcanic glass (thickest point ca. 6mm) which is covered by manganese crust (2mm).

Surface shows spots of orange coloring on the manganese crust. Visible tubeworms on manganese crust and some other unidentified white organisms/organic material.

Hollow opening in the middle, with some manganese crust near the opening (<1mm thick).



KH23-253-ROV06-R15

Location: Southern Knipovich Ridge

Latitude: 75.8850

Longitude: 7.1917

Depth: 2862

Measurements (l/w/h): 31/18/16

Description:

Volcanic sample - altered basalt.

Grey, black color.

Massive texture.

Fine grained.

Observed layer of orange/red coloration on surface of sample with darker layers towards the center.

Covered by volcanic glass (6mm), very little manganese crust found, not possible to measure.

Visible vesicles near surface (ca. 5mm – 10mm).



Dive 7

KH23-253-ROV07-R01

Location: Southern Knipovich Ridge

Latitude: 75.8633

Longitude: 7.3735

Depth: 3202

Measurements (l/w/h): 12/07/07

Description:

Volcanic sample – pillow basalt.

Surface is black and a little brown.

Inside is brown and grey.

Massive texture.

Fine grained.

Black volcanic glass on the surface.

Under the surface there is a brown weathered area, further inside it's dark grey.



KH23-253-ROV07-R02

Location: Southern Knipovich Ridge

Latitude: 75.8633

Longitude: 7.3734

Depth: 3202

Measurements (l/w/h): 30/26/17

Description:

Volcanic sample - pillow basalt.

Surface is black and brown. Inside is brown and black.

Texture is massive and fine grained.

Black volcanic glass on the surface.

Under the surface there is a brown weathered area, further inside its black.

**KH23-253-ROV07-R03**

Location: Southern Knipovich Ridge

Latitude: 75.8633

Longitude: 7.3736

Depth: 3205

Measurements (l/w/h): 28/12/10

Description:

Volcanic sample - pillow basalt.

Surface is black and a little brown.

Inside is black.

Texture is massive and fine grained.

Black volcanic glass on the surface.

Under the surface its dark grey.

**KH23-253-ROV07-R04**

Location: Southern Knipovich Ridge

Latitude: 75.8633

Longitude: 7.3736

Depth: 3206

Measurements (l/w/h): 22/8/12

Description:

Volcanic sample - pillow basalt.

Surface is black and a little brown.

Inside is black.

Texture is massive and fine grained.

Black volcanic glass on the surface.

Under the surface its dark grey.



KH23-253-ROV07-R05

Location: Southern Knipovich Ridge

Latitude: 75.8632

Longitude: 7.3797

Depth: 3194

Measurements (l/w/h): 14/10/4

Description:

Sedimentary sample.

Brown all way thru.

Dull to earthy texture.

Semi consolidated fine grained sediments.



KH23-253-ROV07-R06

Location: Southern Knipovich Ridge

Latitude: 75.8615

Longitude: 7.3887

Depth: 3229

Measurements (l/w/h): 30/25/28

Description:

Volcanic sample - pillow basalt.

Black on the outside.

Massive structure.

Fine grained.

Black matrix with larger white minerals.



KH23-253-ROV07-R07

Location: Southern Knipovich Ridge

Latitude: 75.8609

Longitude: 7.3886

Depth: 3230

Measurements (l/w/h): 22/10/5

Description:

Sedimentary sample – siltstone.

Brown all way through.

Dull to earthy texture.

Semi consolidated fine grained sediments.



KH23-253-ROV07-R08

Location: Southern Knipovich Ridge

Latitude: 75.8598

Longitude: 7.3928

Depth: 3185

Measurements (l/w/h): 17/14/8

Description:

Volcanic sample – Basalt.

Reddish-brown color on the outside.

Dark grey inside.

Fine grained matrix with a few larger phenocrysts.

**KH23-253-ROV07-R09**

Location: Southern Knipovich Ridge

Latitude: 75.8563

Longitude: 7.4001

Depth: 3097

Measurements (l/w/h): 40/32/21

Description:

Volcanic sample – Basalt.

Reddish-brown surface. Grey inside.

Massive texture.

Fine grained.



KH23-253-ROV07-R10

Location: Southern Knipovich Ridge

Latitude: 75.8563

Longitude: 7.4022

Depth: 3055

Measurements (l/w/h): 28/22/12

Description:

Volcanic sample – basalt.

Dark brown outside with red spots.

Inside is grey, reddish-brown with black spots.

Massive structure.

The black minerals have a dendritic, rusty red banding. Vertical veins of transparent minerals.

**KH23-253-ROV07-R11**

Location: Southern Knipovich Ridge

Latitude: 75.8563

Longitude: 7.4035

Depth: 3037

Measurements (l/w/h): 25/24/16

Description:

Sedimentary sample – mudstone/siltstone.

Black on inside and outside.

Massive structure.

Very fine grained.



KH23-253-ROV07-R12

Location: Southern Knipovich Ridge

Latitude: 75.8561

Longitude: 7.4074

Depth: 2963

Measurements (l/w/h): 16/13/12

Description:

Sedimentary sample –
mudstone/siltstone.

Dark grey on inside. Dark grey and rusty
red on outside.

Massive structure.

Very fine grained.

Consolidated/lithified silt and mud
sediment.

**KH23-253-ROV07-R13**

Location: Southern Knipovich Ridge

Latitude: 75.8562

Longitude: 7.4088

Depth: 2926

Measurements (l/w/h): 13/7/6

Description:

Volcanic sample – altered basalt.

Dark/black with beige and brown areas
of coloration on surface.

Massive texture.

Fine grained.



KH23-253-ROV07-R14

Location: Southern Knipovich Ridge

Latitude: 75.8563

Longitude: 7.4090

Depth: 2923

Measurements (l/w/h): 16/8/11

Description:

Volcanic sample – basalt.

Brown, light-grey color.

Massive texture.

Fine grained.

Fine grained light-grey matrix
containing larger black phenocrysts.
Multiple veins/cracks in sample filled
with precipitated mineral crystals.

**KH23-253-ROV07-R15**

Location: Southern Knipovich Ridge

Latitude: 75.8562

Longitude: 7.4101

Depth: 2898

Measurements (l/w/h): 12/9/9

Description:

Metamorphic sample – greenstone.

Green and grey color.

Aphanitic, slightly crystalline texture.

Fine grained.

Visible minerals with differing
composition in sample.
Green basaltic appearance – indicating
slight metamorphic origin equivalent to
greenschist metamorphic facies.



KH23-253-ROV07-R16

Location: Southern Knipovich Ridge

Latitude: 75.8564

Longitude: 7.4122

Depth: 2844

Measurements (l/w/h): 16/16/15

Description:

Sedimentary sample –

mudstone/siltstone.

Dark grey/black color.

Massive texture.

Fine grained.

Uniform massive appearance with no variation in crystal size.

Consists exclusively of a dark grey/black fine-grained matrix.



Dive 8

KH23-253-ROV08-R01

Location: Southern Knipovich Ridge

Latitude: 74,7449

Longitude: 8,3688

Depth: 2970

Measurements (l/w/h): Too many broken pieces.

Description:

Sedimentary sample – consolidated silt.

Mostly light gray colored with some.

Dull to earthy texture.

Grain size: ($<0.004\text{mm}$).



KH23-253-ROV08-R02-R08

Location: Southern Knipovich Ridge

Latitude: 74,7477

Longitude: 8,3719

Depth: 2993

Measurements (l/w/h): Too many broken pieces.

Description:

Sedimentary sample – consolidated mud.

Mostly light gray colored with some.

Dull to earthy texture. Harder than R01.

Fragments collected with loose sediments that have been washed away.

Grain size: ($<0.004\text{mm}$).



Dive 9

KH23-253-ROV09-R01

Location: Southern Knipovich Ridge

Latitude: 74.6089

Longitude: 8.5327

Depth: 3144

Measurements (l/w/h): 19/18/24

Description:

Volcanic sample - basalt.

Black, brown spots.

Massive texture.

Fine grained.

Aphanitic sample with uniform black coloration inside. Surface is also black with brown spots in certain areas.



KH23-253-ROV09-R02

Location: Southern Knipovich Ridge

Latitude: 74.6078

Longitude: 8.5287

Depth: 3110

Measurements (l/w/h): 12/12/10

Description:

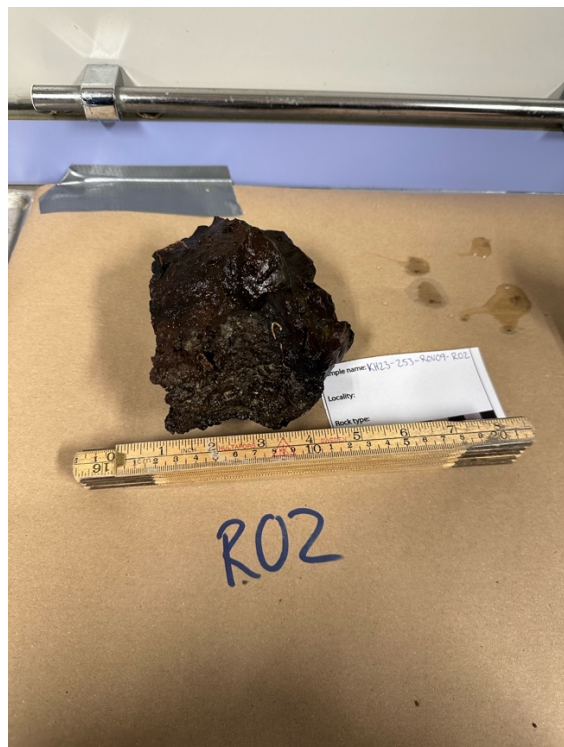
Volcanic sample - pillow basalt.

Black, dark brown color.

Massive to grainy texture.

Fine grained.

Vesicles observed inside sample.



KH23-253-ROV09-R03

Location: Southern Knipovich Ridge

Latitude: 74.6035

Longitude: 8.5201

Depth: 3041

Measurements (l/w/h): 40/20/13

Description:

Volcanic sample - basalt.

Black, dark brown color.

Massive to grainy texture.

Sample covered in vitreous black outer layer between 5mm and 10mm thick.

**KH23-253-ROV09-R04**

Location: Southern Knipovich Ridge

Latitude: 74.6016

Longitude: 8.4829

Depth: 2973

Measurements (l/w/h): 18/13/10

Description:

Volcanic sample - basalt.

Brown, dark green surface color, black on inside.

Massive texture.

Fine grained.



KH23-253-ROV09-R05

Location: Southern Knipovich Ridge

Latitude: 74.6059

Longitude: 8.4884

Depth: 3047

Measurements (l/w/h): 28/23/6

Description:

Volcanic sample – basalt.

Black, dark brown color.

Massive texture.

Fine grained.

Inside consists of white phenocrysts enclosed within a fine black uniform matrix.

Fossilized fauna on surface of sample.

**KH23-253-ROV09-R06**

Location: Southern Knipovich Ridge

Latitude: 74.6219

Longitude: 8.5263

Depth: 3074

Measurements (l/w/h): 23/23/20

Description:

Volcanic sample - pillow basalt.

Black, brown, grey color.

Smooth, vitreous, black outer layer and massive grey uniform inside.

Fine grained.



KH23-253-ROV10-R01

Location: Southern Knipovich Ridge

Latitude: 74.6029

Longitude: 8.4045

Depth: 3006

Measurements (l/w/h):

Description:

Volcanic sample - basalt

Black all way through with some black and grey areas on the outside.

Very fine grained with vesicles. Tube worms on the surface, mostly black because of manganese crust.

**KH23-253-ROV10-R02**

Location: Southern Knipovich Ridge

Latitude: 75.6033

Longitude: 8.4041

Depth: 2984

Measurements (l/w/h):

Description:

Volcanic sample - basalt

Inside is dark grey. Surface is black on one side and brown on the other side.

Massive texture.

Very fine grained with vesicles.

Tube worms on the surface. There are black spots on the brown surface. The brown color seems to be a result of weathering. The inside has a weathering rim that varies in thickness along the edge. Thicker against the black side.



KH23-253-ROV10-R03

Location: Southern Knipovich Ridge

Latitude: 75.6034

Longitude: 8.4041

Depth: 2991

Measurements (l/w/h):

Description:

Volcanic sample – basalt.

Grey on the inside with brown in various colors on the surface.

Massive texture.

Very fine grained with some vesicles.

There are some small white spots inside, maybe vesicles filled with fine dust after sawing.

**KH23-253-ROV10-R04**

Location: Southern Knipovich Ridge

Latitude: 74.6088

Longitude: 8.3954

Depth: 3084

Measurements (l/w/h):

Description:

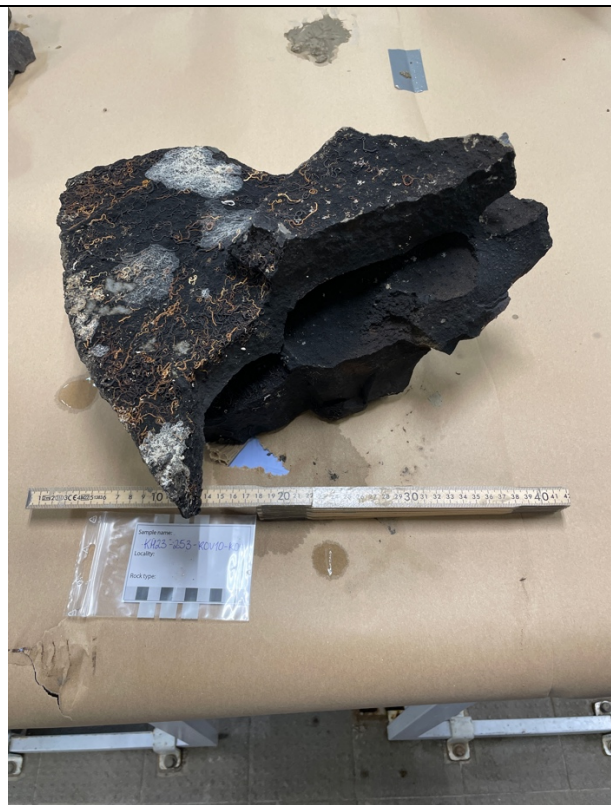
Volcanic sample – basalt.

Black on the outside with hints of brown underneath. Grey on the inside.

Massive texture.

Fine grained.

The sample is divided in the middle by tunnels that sometimes go all the way through it. The top contains a lot of tube worms with black, brown, and white color.



KH23-253-ROV10-R05

Location: Southern Knipovich Ridge

Latitude: 74.6093

Longitude: 8.3932

Depth: 3087

Measurements (l/w/h):

Description:

Volcanic sample - basalt

Grey on the inside and black with reddish brown on the surface.

Massive texture.

Very fine grained.

Tube worms on the surface in colors black, brown, and white. Black may be caused of manganese crust. Volcanic glass on top.

**KH23-253-ROV10-R06**

Location: Southern Knipovich Ridge

Latitude: 74.6121

Longitude: 8.3845

Depth: 3099

Measurements (l/w/h):

Description:

Volcanic sample – pillow basalt.

Surface is black and a little brown. Inside is brown and grey.

Massive texture.

Fine grained.

Black volcanic glass on the surface. Under the surface its dark grey. Areas underneath the crust are hollow.



KH23-253-ROV10-R07

Location: Southern Knipovich Ridge

Latitude: 74.6127

Longitude: 8.3850

Depth: 3100

Measurements (l/w/h):

Description:

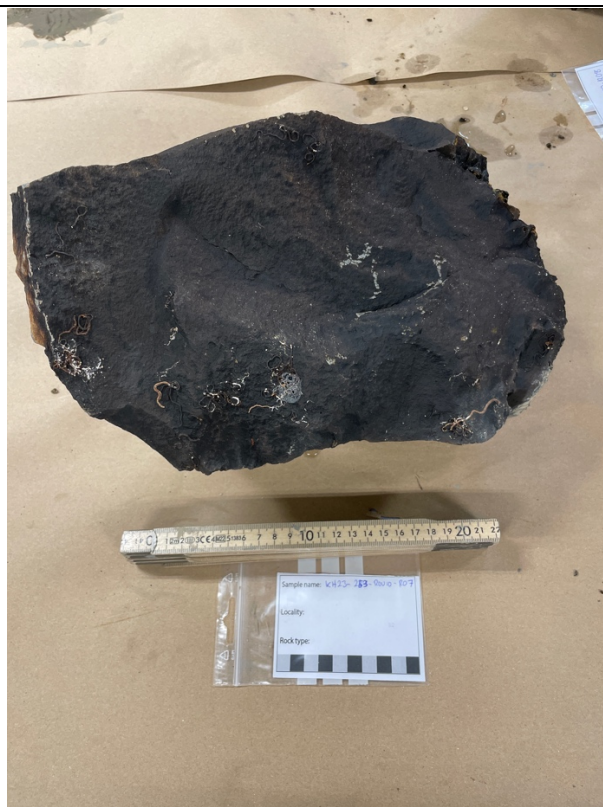
Volcanic sample – basalt.

Grey on the inside and black with brown on the surface.

Massive texture.

Very fine grained.

Tube worms on the surface in colors black, brown, and white. Black may be caused of manganese crust. Volcanic glass on one of the surfaces, relatively thick layers of glass, approximately 15mm.



KH23-253-ROV10-R08

Location: Southern Knipovich Ridge

Latitude: 74.6127

Longitude: 8.3850

Depth: 3100

Measurements (l/w/h):

Description:

Volcanic sample – basalt.

Grey on the inside and black with reddish brown on the surface.

Massive texture.

Fine grained.

Inside contains few but big vesicles.

There is glass on one of the surfaces, and drip structures on the other side.

Elongated flow structure on one on side.

**KH23-253-ROV10-R09**

Location: Southern Knipovich Ridge

Latitude: 74.6130

Longitude: 8.3978

Depth: 3100

Measurements (l/w/h):

Description:

Volcanic sample – basalt.

Grey on the inside with black and brown in various colors on the surface.

Massive texture.

Fine grained with some vesicles.

There are some small white spots inside, may be vesicles filled with fine dust after the saw. The inside has a weathering rim that varies in thickness along the edge.



Dive 11

KH23-253-ROV11-R01

Location: Southern Knipovich Ridge

Latitude: 74.6157

Longitude: 8.4425

Depth: 2970

Measurements (l/w/h): 23/17/9

Description:

Volcanic sample – pillow basalt.

Black, brown, and beige color.

Massive texture.

Fine grained.

Sample consists of smooth, vitreous black outer layer and dark grey uniform inner mass. Outer layer varies between 5mm and 7mm in thickness.



KH23-253-ROV11-R02

Location: Southern Knipovich Ridge

Latitude: 74.6156

Longitude: 8.4407

Depth: 2979

Measurements (l/w/h): 13/9/6

Description:

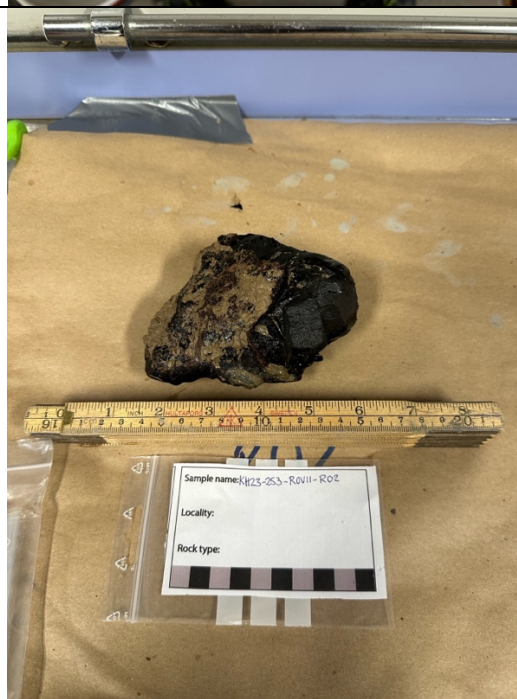
Volcanic sample – pillow basalt.

Black, light brown color.

Massive texture.

Fine grained.

Sample consists of smooth, vitreous black outer layer and dark grey uniform inner mass. Outer layer varies between 3mm and 5mm in thickness.



KH23-253-ROV11-R03

Location: Southern Knipovich Ridge

Latitude: 74.6142

Longitude: 8.4357

Depth: 3014

Measurements (l/w/h): 6/5/3

Description:

Volcanic sample – basalt.

Black, dark grey color.

Massive texture.

Fine grained.

Sample consists of one continuous layer with a clear boundary between black and grey color.

**KH23-253-ROV11-R04**

Location: Southern Knipovich Ridge

Latitude: 74.6141

Longitude: 8.4452

Depth: 2952

Measurements (l/w/h): 20/20/13

Description:

Volcanic sample – pillow basalt.

Black, dark grey color.

Massive texture.

Fine grained.

Sample consists of smooth, vitreous black outer layer and dark grey uniform inner mass. Outer layer varies between 10mm and 20mm in thickness.



KH23-253-ROV11-R05

Location: Southern Knipovich Ridge

Latitude: 74.6154

Longitude: 8.4511

Depth: 2923

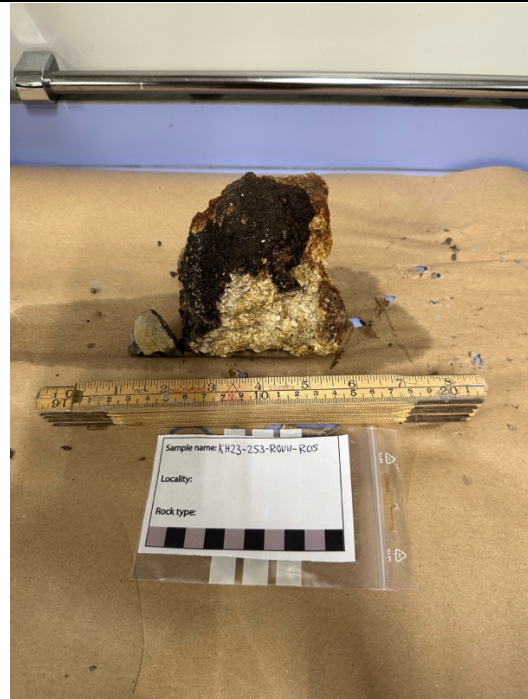
Measurements (l/w/h): 10/9/10

Description:

Sulfide sample – hydrothermal deposit.
Orange/brown and black color.
Coarse texture reminiscent of sandstone.
Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.
Some weathering - red and orange areas.
Large dark black/grey areas with shimmer.

Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).

**KH23-253-ROV11-R06**

Location: Southern Knipovich Ridge

Latitude: 74.6154

Longitude: 8.4511

Depth: 2923

Measurements (l/w/h): 18/8/10

Description:

Sulfide sample – hydrothermal deposit.
Orange/brown and black color.
Coarse texture reminiscent of sandstone.
Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.
Some weathering - red and orange areas.
Large dark black/grey areas with shimmer.

Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).



KH23-253-ROV11-R07

Location: Southern Knipovich Ridge

Latitude: 74.6154

Longitude: 8.4511

Depth: 2923

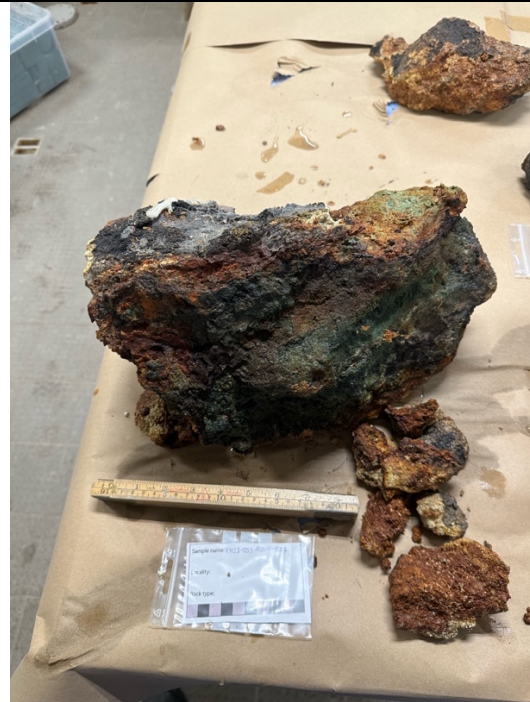
Measurements (l/w/h): 35/20/20

Description:

Sulfide sample – hydrothermal deposit.
Orange/brown, black, and green color.
Coarse texture reminiscent of sandstone.
Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.
Some weathering - red and orange areas.
Large dark black/grey areas with shimmer.

Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).

**KH23-253-ROV11-R08**

Location: Southern Knipovich Ridge

Latitude: 74.6154

Longitude: 8.4511

Depth: 2923

Measurements (l/w/h): 25/12/10

Description:

Sulfide sample – hydrothermal deposit.
Orange/brown and black color.
Coarse texture reminiscent of sandstone.
Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.
Some weathering - red and orange areas.
Large dark black/grey areas with shimmer.

Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).



KH23-253-ROV11-R09

Location: Southern Knipovich Ridge

Latitude: 74.6165

Longitude: 8.4542

Depth: 2930

Measurements (l/w/h): 24/21/12

Description:

Volcanic sample – pillow basalt.

Black, dark grey color.

Massive texture.

Fine grained.

Sample consists of smooth, vitreous black outer layer and dark grey uniform inner mass. Outer layer varies between 10mm and 20mm in thickness.

**KH23-253-ROV11-R10**

Location: Southern Knipovich Ridge

Latitude: 74.6186

Longitude: 8.4463

Depth: 2986

Measurements (l/w/h): 11/6/6

Description:

Volcanic sample – pillow basalt.

Black, dark grey color.

Massive texture.

Fine grained.

Sample consists of smooth, vitreous black outer layer and dark grey uniform inner mass. Outer layer varies between 5mm and 10mm in thickness.



KH23-253-ROV11-R11

Location: Southern Knipovich Ridge

Latitude: 74.6186

Longitude: 8.4394

Depth: 2973

Measurements (l/w/h): 11/8/8

Description:

Volcanic sample – pillow basalt.

Black, dark grey color.

Massive texture.

Fine grained.

Sample consists of smooth, vitreous black outer layer and dark grey uniform inner mass. Outer layer varies between 3mm and 6mm in thickness.

**KH23-253-ROV11-R12**

Location: Southern Knipovich Ridge

Latitude: 74.6097

Longitude: 8.4708

Depth: 3012

Measurements (l/w/h): 38/28/32

Description:

Volcanic sample – basalt.

Black color.

Massive texture.

Fine grained.



KH23-253-ROV11-R13

Location: Southern Knipovich Ridge

Latitude: 74.6073

Longitude: 8.4712

Depth: 2981

Measurements (l/w/h): 38/15/13

Description:

Volcanic sample – basalt.

Black color.

Massive texture.

Fine grained.



No samples were collected from dive 12 and dive 13 (ROV12, ROV13)

Dive 14

KH23-253-ROV14-R01

Location: Southern Knipovich Ridge

Latitude: 73.9187

Longitude: 8.6899

Depth: 3269

Measurements (l/w/h): 19/10/8

Description:

Sulfide sample – hydrothermal deposit.
Orange/brown and black color.
Coarse texture reminiscent of sandstone.

Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.
Some weathering - red and orange areas.

Large dark black/grey areas with shimmer.

Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).



KH23-253-ROV14-R02

Location: Southern Knipovich Ridge

Latitude: 73.9187

Longitude: 8.6890

Depth: 3269

Measurements (l/w/h): 19/15/7

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

Coarse texture reminiscent of sandstone.

Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.

Some weathering - red and orange areas.

Large dark black/grey areas with shimmer.

Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).

**KH23-253-ROV14-R03**

Location: Southern Knipovich Ridge

Latitude: 73.9187

Longitude: 8.6902

Depth: 3270

Measurements (l/w/h): 22/19/11

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

Coarse texture reminiscent of sandstone.

Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.

Some weathering - red and orange areas.

Large dark black/grey areas with shimmer.



Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).	
KH23-253-ROV14-R04 Location: Southern Knipovich Ridge Latitude: 73.9187 Longitude: 8.6902 Depth: 3699 Measurements (l/w/h): 24/14/17 Description: Sulfide sample – hydrothermal deposit. Orange/brown and black color. Coarse texture reminiscent of sandstone. Grain size equivalent to medium-coarse sand. Porous sample. Breaks easily. Some weathering - red and orange areas. Large dark black/grey areas with shimmer. Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).	

KH23-253-ROV14-R05

Location: Southern Knipovich Ridge

Latitude: 73.9187

Longitude: 8.6897

Depth: 3273

Measurements (l/w/h): 8/8/5

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

Coarse texture reminiscent of sandstone.

Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.

Some weathering - red and orange areas.

Large dark black/grey areas with shimmer.

Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).

**KH23-253-ROV14-R06**

Location: Southern Knipovich Ridge

Latitude: 73.9187

Longitude: 8.6899

Depth: 3274

Measurements (l/w/h): 36/15/16

Description:

Volcanic sample – pillow basalt.

Black, dark grey, brown color.

Massive texture.

Fine grained.

Sample consists of smooth, vitreous black outer layer and dark grey uniform inner mass. Outer layer varies between 5mm and 15mm in thickness. Sample also consists of several vesicles.



KH23-253-ROV14-R07

Location: Southern Knipovich Ridge

Latitude: 73.9187

Longitude: 8.6899

Depth: 3274

Measurements (l/w/h): 29/24/19

Description:

Sulfide sample – hydrothermal deposit.
Orange/brown, black, green color.
Coarse texture reminiscent of sandstone.
Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.
Some weathering - red and orange areas.
Large dark black/grey areas with shimmer.

Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).

**KH23-253-ROV14-R08**

Location: Southern Knipovich Ridge

Latitude: 73.9187

Longitude: 8.6892

Depth: 3274

Measurements (l/w/h): 11/6/7

Description:

Volcanic sample – pillow basalt.
Black, dark grey, brown color.
Massive texture.
Fine grained.

Sample consists of smooth, vitreous black outer layer and dark grey uniform inner mass. Outer layer varies between 2mm and 4mm in thickness.
Sample also consists of several vesicles.



KH23-253-ROV14-R09

Location: Southern Knipovich Ridge

Latitude: 73.9187

Longitude: 8.6892

Depth: 3275

Measurements (l/w/h): 20/11/10

Description:

Sulfide sample – hydrothermal deposit.

Orange/brown and black color.

Coarse texture reminiscent of sandstone.

Grain size equivalent to medium-coarse sand.

Porous sample. Breaks easily.

Some weathering - red and orange areas.

Large dark black/grey areas with shimmer.

Mineral identification: amorph silica, pyrite, sphalerite, baryte, iron oxyhydroxide, manganese crust (thin layer).

**KH23-253-ROV14-R10**

Location: Southern Knipovich Ridge

Latitude: 73.9190

Longitude: 8.6898

Depth: 3267

Measurements (l/w/h): 23/17/22

Description:

Volcanic sample – pillow basalt.

Black, dark grey, brown color.

Massive texture.

Fine grained.

Fauna covering certain areas of sample.



KH23-253-ROV14-R11

Location: Southern Knipovich Ridge

Latitude: 73.9190

Longitude: 8.6912

Depth: 3270

Measurements (l/w/h): 28/13/21

Description:

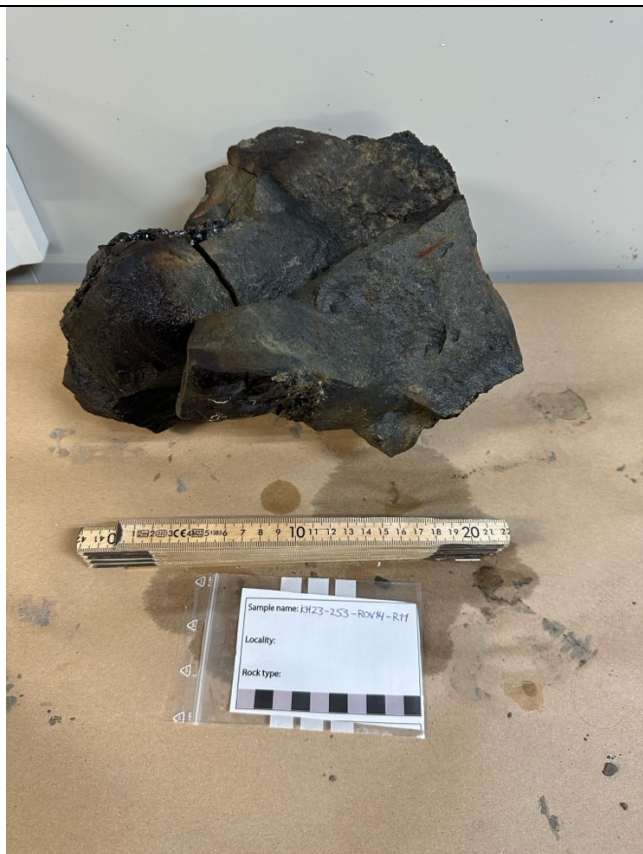
Volcanic sample – pillow basalt.

Black, dark grey, brown color.

Massive texture.

Fine grained.

Surface of sample covered in orange/brown weathering spots in certain areas.

**KH23-253-ROV14-R12**

Location: Southern Knipovich Ridge

Latitude: 73.9187

Longitude: 8.6885

Depth: 3281

Measurements (l/w/h): 26/17/12

Description:

Volcanic sample – pillow basalt.

Black, dark grey, brown color.

Massive texture.

Fine grained.

Sample consists of smooth, vitreous black outer layer and dark grey uniform inner mass. Outer layer varies between 5mm and 15mm in thickness. Sample also consists of several vesicles.



KH23-253-ROV14-R13

Location: Southern Knipovich Ridge

Latitude: 73.9187

Longitude: 8.6885

Depth: 3281

Measurements (l/w/h): 17/9/17

Description:

Volcanic sample – pillow basalt.

Black, dark grey, brown color.

Massive texture.

Fine grained.

Sample consists of smooth, vitreous black outer layer and dark grey uniform inner mass. Outer layer varies between 5mm and 15mm in thickness.

Sample also consists of several vesicles and calcareous tubeworms.



ROV LOG - Centre for Deep Sea Research									
KH23-253		2023/253	HI toknummer:						
Dive Name	Syst. Dive #	Date	Time (UTC)	Latitude (°dec)	Longitude (°dec)	Depth (m)	Sample ID (NPD)	Sample ID	Comments and observations
CTD		10/22/2023	05:12:23	74.4063	8.7217	0			Start CTD.
CTD		10/22/2023	07:05:23	74.4060	8.7217	3165			End CTD.
ROV01	713	22.10.2023	08:41:00	74.4061	8.7215	3138			TMS at 3138 m depth.
ROV01	713	22.10.2023	08:47:00	74.4061	8.7215	3138			ROV out of TMS.
ROV01	713	22.10.2023	09:07:27	74.4061	8.7198	3190		KH23-253-ROV01-R01	Covered by sediments. Loose basalt, part of the upper layer.
ROV01	713	22.10.2023	09:20:19	74.4067	8.7221	3206		KH23-253-ROV01-R02	Below another loose basalt that fell down.
ROV01	713	22.10.2023	09:28:42	74.4071	8.7224	3203		KH23-253-ROV01-R03	Basalt, ripped from the top of the slope.
ROV01	713	22.10.2023	09:51:50	74.4079	8.7252	3214		KH23-253-ROV01-R04	Loose rock, apparently from avalanche. Red color.
ROV01	713	22.10.2023	10:52:10	74.4056	8.7177	3196		KH23-253-ROV01-R05	Basalt ripped from slope/top.
ROV01	713	22.10.2023	11:08:16	74.4044	8.7176	3197		KH23-253-ROV01-R06	Relatively loose basalt, from top.
ROV01	713	22.10.2023	11:18:39	74.4031	8.7180	3194		KH23-253-ROV01-R07	Ripped from the top, basalt.
ROV02	714	22.10.2023	15:06:00			0			ROV02 launched.
ROV02	714	22.10.2023	17:13:00	74.3997	8.6912	3218		KH23-253-ROV02-R01	Loose rock, angular, orange.
ROV02	714	22.10.2023	17:16:40	74.3997	8.6912	3222		KH23-253-ROV02-R02	Large, angular, orange/yellow, loose.
ROV02	714	22.10.2023	17:19:00						Moving upwards against steep slope.
ROV02	714	22.10.2023	17:19:40	74.3997	8.6911	3214			At the plateau.
ROV02	714	22.10.2023	17:21:00						Moving down again.
ROV02	714	22.10.2023	17:28:00	74.3999	8.6911	3219		KH23-253-ROV02-R03	Vertical structure, looks like iron oxyhydroxide. Very soft, difficult to grab. Used Frankenstein. Sample consists as many small parts.
ROV02	714	22.10.2023	17:32:00	74.3995	8.6913				Moving downwards.
ROV02	714	22.10.2023	17:37:00	74.3994	8.6908	3220		KH23-253-ROV02-R04	Digging in vertical wall. It is solid. Two small black rocks broken off. Might be basaltic sheet flow.
ROV02	714	22.10.2023	17:48:00	74.3995	8.6886	3216			Moved over a sedimented flat area to the western ridge.
ROV02	714	22.10.2023	17:51:00	74.3994	8.6880	3215			Basaltic shell with fragmented basalt underneath.
ROV02	714	22.10.2023	17:52:50	74.3993	8.6876	3215			Basaltflow at the top of ridge, more fragmented basalt underneath.
ROV02	714	22.10.2023	17:55:00						Moving further down the ridge. More massive basalt at bottom.
ROV02	714	22.10.2023	18:01:20	74.3991	8.6872	3218		KH23-253-ROV02-R05	Squared rock, dark, medium size. Broken off the outcrop of massive basalt.
ROV02	714	22.10.2023	18:03:00			3218			Small bush-looking plant hanging on wall.
ROV02	714	22.10.2023	18:11:58	74.3982	8.6853	3218			Moving south along an exposure of 8 m, mostly columnar basalt.
ROV02	714	22.10.2023	18:17:17	74.3973	8.6842	3215			Collapsed lavaflow tube, around 5 m high.
ROV02	714	22.10.2023	18:20:00	74.3976	8.6840	3214		KH23-253-ROV02-R06	Keysample, basalt from top off sheetflow/structure.
ROV02	714	22.10.2023	18:23:51	74.3969	8.6840	3213			Following a new fault.
ROV02	714	22.10.2023	18:24:53	74.3968	8.6843	3216			Tall structure, about 10 m.
ROV02	714	22.10.2023	18:29:51	74.3963	8.6833	3209			Basalt/package of 14 m, with pillow structures. Moving south along a faultplane.
ROV02	714	22.10.2023	18:44:11	74.3951	8.6816	3212			Sponges.
ROV02	714	22.10.2023	19:02:00	74.3945	8.6802	3218		KH23-253-ROV02-R07	Small piece of basalt which was laying on top of a flat basalt shelf.
ROV02	714	22.10.2023	19:08:00	74.3940	8.6799	3227			ROV moving along wall of massive basalt.
ROV02	714	22.10.2023	19:18:00	74.3930	8.6794	3215			Pillow basalts visible along entirety of the fault wall.
ROV02	714	22.10.2023	19:25:00	74.3922	8.6796	3208			More massive basalts.
ROV02	714	22.10.2023	19:30:00	74.3917	8.6800	3211			Gradually going over to more oxidized/red basaltic bedrock.
ROV02	714	22.10.2023	19:30:00	74.3918	8.6801	3212			White sheets of plastic sitting on seafloor.
ROV02	714	22.10.2023	19:34:00	74.3915	8.6807	3208			ROV moved to bottom of fault surface and perhaps the top of a hanging wall. Many larger blocks of basalt chaotically arranged on surface.
ROV02	714	22.10.2023	19:36:00	74.3906	8.6802	3199			ROV level with top of a tall off. Approx 30 m down.
ROV02	714	22.10.2023	19:54:00	74.3906	8.6803	3199			Some basalt pillars surrounded by otherwise massive basalts.
ROV02	714	22.10.2023	19:59:00	74.3899	8.6802	3210			Possible boundary between layer of basalt pillars and massive basalt. Massive basalt lays on top of layer with pillar basalts.
ROV02	714	22.10.2023	20:10:00	74.3892	8.6838	3181			ROV moving to another site.
ROV02	714	22.10.2023	20:16:00	74.3891	8.6849	3191			ROV arrived at new site.
ROV02	714	22.10.2023	20:20:00	74.3892	8.6851	3193			Thick layer of pillow basalt overlying a bed of massive basalt.
ROV02	714	22.10.2023	20:31:00	74.3895	8.6858	3196			Layer of massive basalt over layer of pillow basalt.
ROV02	714	22.10.2023	20:39:00	74.3901	8.6867	3197			Sheet flow observed in the basalt.
ROV02	714	22.10.2023	20:46:00						Moving across sedimented flat to get to another outcrop further east.
ROV02	714	22.10.2023	20:47:00	74.3904	8.6896	3202			At new exposure, pillow basalt and brecciated basalt.
ROV02	714	22.10.2023	20:50:00	74.3905	8.6898	3203			Taking some still images of a large radially fragmented basalt.
ROV02	714	22.10.2023	20:55:00	74.3910	8.6909	3202			Nice large pillows on top of each other.
ROV02	714	22.10.2023	20:56:00	74.3910	8.6909	3202			Start 4k video of pillows.
ROV02	714	22.10.2023	21:00:00						Continue moving north/northeast to locate continuation of exposure.
ROV02	714	22.10.2023	21:09:00	74.3920	8.6931	3210		KH23-253-ROV02-R08	Poking in some reddish/yellowish rocks, they are very fragile. Samples an elongated, yellowish rock (altered?).
ROV02	714	22.10.2023	21:15:00	74.3923	8.6938	3213			The rocks look more reddish and yellowish in this area, and also slightly more life here.
ROV02	714	22.10.2023	21:23:00	74.3928	8.6953	3222			Basalt is quite massive here. Less pillows and sheet flows.
ROV02	714	22.10.2023	21:41:00	74.3948	8.6994	3216			Large basalt structure, 12 m high. Looks like it could be a ridge going approx north-south next to a fault.
ROV02	714	22.10.2023	21:56:00	74.3959	8.7013	3216			Dumbo octopus in hollowed out pillow basalt.
ROV02	714	22.10.2023	22:03:00	74.3961	8.7016	3214			3 sponges.
ROV02	714	22.10.2023	22:07:00	74.3966	8.7024	3216			More pillow basalt while moving northwards.
ROV02	714	22.10.2023	22:15:00	74.3975	8.7041	3221			Layers of sheet basalt.
ROV02	714	22.10.2023	22:23:00	74.3983	8.7041	3227			Cave, hollowed out pillow basalt.
ROV02	714	22.10.2023	22:28:40	74.3988	8.7044	3229			Sphere-shaped rock.
ROV02	714	22.10.2023	22:34:00	74.3993	8.7048	3223			Sponge.
ROV02	714	22.10.2023	22:36:30	74.3995	8.7051	3222			Large sponge.
ROV02	714	22.10.2023	22:37:00						Red algae?
ROV02	714	22.10.2023	22:40:00			3219			Moving north-west over flat sedimented area.
ROV02	714	22.10.2023	23:06:00	74.4016	8.6974	3228			Arrived at outcrop. A lot of pillow basalt.
ROV02	714	22.10.2023	23:21:00	74.4036	8.7018	3228			Massive basalt.
ROV02	714	22.10.2023	23:32:00	74.4043	8.7036	3227		KH23-253-ROV02-R09	Broken from outcrop of massive basalt. Large, relatively flat rock. Yellow dust appeared when broken off.
ROV02	714	22.10.2023	23:40:00	74.4045	8.7033	3225			Outcrop of massive basalt covered calcareous tube-worms that were with white and different shades of red.
ROV02	714	23.10.2023	00:26:00	74.4081	8.7106	3226		KH23-253-ROV02-R10	Collecting small pillow from top of structure.
ROV02	714	23.10.2023	00:35:00	74.4081	8.7110	3234		KH23-253-ROV02-R11	Collecting glass-rose from top of pillow basalt.
ROV02	714	23.10.2023	00:41:00	74.4083	8.7125	3234			Checking out two depressions in the ground. One of them contained some plastic.
ROV02	714	23.10.2023	00:43:00	74.4084	8.7112	3234			Checking out two small piles. Both are columnar basalt.
ROV02	714	23.10.2023	00:55:00						End of dive.
ROV02	714	23.10.2023	02:13:00						ROV on deck.
ROV03	715	23.10.2023	03:29:00	74.5506	8.6538	0			ROV03 launched.
ROV03	715	23.10.2023	05:04:44	74.5506	8.6538	3297			ROV arrived destination at seafloor. Low sight, only sediments at seafloor is visible.
ROV03	715	23.10.2023	05:13:00	74.5494	8.6579	3279			Different marks on seafloor, looks like sediment covering boulders.
ROV03	715	23.10.2023	05:15:40	74.5492	8.6586	3272			Visible ripples on surface.
ROV03	715	23.10.2023	05:19:00	74.5490	8.6603	3254			Bigger clasts of rocks, darker in color than the sediment laying around.
ROV03	715	23.10.2023	05:21:00	74.5498	8.6612	3336			Moving upward slope E/NE.
ROV03	715	23.10.2023	05:26:00	74.5489	8.6633	3213			Firm rock-ground, some loose materials too. Thin layer of sediments, mudstones?
ROV03	715	23.10.2023	05:27:29	74.5489	8.6634	3212		KH23-254-ROV03-R01	Rock from canyon valley in fractured ground area.
ROV03	715	23.10.2023	05:31:05	74.5489	8.6648	3198			Sheetflow.
ROV03	715	23.10.2023	05:33:00	74.5489	8.6651	3198			Moving further east along the slope.
ROV03	715	23.10.2023	05:35:17	74.5489	8.6652	3196			Human pollution, rusty bits and netting (fishing equipment?).
ROV03	715	23.10.2023	05:35:17	74.5489	8.6652	3198		KH23-254-ROV03-R02	Rock from slope collected. Serpentina?
ROV03	715	23.10.2023	05:39:00	74.5490	8.6657	3194			Above fractured area, only sand is visible.
ROV03	715	23.10.2023	05:43:00	74.5489	8.6662	3193			Very visible ripples in fractured area, looks like the area a few meters down, covered by a thin layer of sediments.
ROV03	715	23.10.2023	05:45:00	74.5489	8.6666	3194		KH23-254-ROV03-R03	Area looks red from where rock was sampled, consolidated mudstone, broke apart.
ROV03	715	23.10.2023	05:48:00	74.5489	8.6667	3195			Looks like a yellow rock, but it was too fragile to be sampled, not in situ. drop rock.
ROV03	715	23.10.2023	05:50:00	74.5489	8.6671	3194			Lost rock sample, yellow dust cloud, seems to be fragile, not in situ (same as the rock at 05:48).
ROV03	715	23.10.2023	05:56:00	74.5490	8.6684	3178			Mostly sediments, nothing worth mentioning.
ROV03	715	23.10.2023	06:03:00	74.5490	8.6684	3230			ROV transit to volcano.
ROV03	715	23.10.2023	06:14:00	74.5483	8.6610	3250			Signs of bioturbation (crawling/bending traces).
ROV03	715	23.10.2023	06:18:49	74.5486	8.6597	3261			A lot of visible bioturbation (crawling/feeding).
ROV03	715	23.10.2023	06:26:00	74.5489	8.6580	3278			Salamander-fish?? Fish with weird arms.
ROV03	715	23.10.2023	06:50:00	74.5523	8.6522	3292		KH23-254-ROV03-R04	Rocksample from the seafloor, consolidated rock.
ROV03	715	23.10.2023	07:34:00	74.5614	8.6486	3254			Cephalopoda DUMBO.
ROV03	715	23.10.2023	08:00:00	74.5644	8.6432	3220			Moving up the caldera.
ROV03	715	23.10.2023	08:04:00	74.5648	8.6428	3193		KH23-254-ROV03-R05	Rock collected from lower parts of the caldera, most likely volcanic. Looks like parts from avalanche.
ROV03	715	23.10.2023	08:10:36	74.5651	8.6425	3161			Visible big boulders covered with thin layer of sediments.
ROV03	715	23.10.2023	08:11:00	74.5653	8.6423	3156		KH23-254-ROV03-R06	Visible red stained rock.
ROV03	715	23.10.2023	08:14:00	74.5653	8.6423	3150			Visible pillow lava in big amounts, fractured.
ROV03	715	23.10.2023	08:18:49	74.5655	8.6422	3127		KH23-254-ROV03-R07	Yellow/orange colored, fell down. Basaltic rock, very small almost square shape.
ROV03	715	23.10.2023	08:23:00	74.5655	8.6423	3119			Sediment covering the top of the volcano.
ROV03	715	23.10.2023	08:36:00	74.5662	8.6390	3169			Crater (like a dump) in sediments (3 in the vicinity of this, seen on map).
ROV03	715	23.10.2023	09:09:00	74.5683	8.6289	3108			Moving from the eastern crater to the western, bigger crater over the ridge-like structure.
ROV03	715	23.10.2023	09:16:00						

STATION	- 01GC	KH23-253-01GC
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Date:	26.10.2023	UTC time:	23:30
Latitude:	75° 05.273' N	Longitude:	008° 03.904'E
Water depth:	3515 m	Location:	Southern Knipovich

Core number:	01GC	Core Barrel length:	600 cm
		Apparent penetration:	600 cm (overpenetrated)
		Core length:	590 cm

Observations:		
Total No of section: 4		
Box No:	Labelling	Length:
1	KH23-253-01GC – SEC1	150
1	KH23-253-01GC – SEC2	150
1	KH23-253-01GC – SEC3	150
1	KH23-253-01GC – SEC4	140
Weather report: Calm		

Done on the boat with the core:
Labeled, sealed, and cut into sections.
Core-catcher sediments + sediments that fell out from the bottom were collected in a zip bag.
This core was over-penetrated into the sediments.
Winch speed into the sediments: 0,5 m/s

STATION	- 02GC	KH23-253-02GC
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Date:	27.10.2023	UTC time:	03:00
Latitude:	75° 05.273' N	Longitude:	008° 03.904'E
Water depth:	3515 m	Location:	Southern Knipovich

Core number:	02GC	Core Barrel length:	600 cm
		Apparent penetration:	600 cm
		Core length:	535 cm

Observations:		
Total No of section: 4		
Box No:	Labelling	Length:
1	KH23-253-02GC – SEC1	150
1	KH23-253-02GC – SEC2	150
1	KH23-253-02GC – SEC3	150
1	KH23-253-02GC – SEC4	85
Weather report: Calm		

Done on the boat with the core:
Labeled, sealed, and cut into sections.
Core-catcher sediments were collected in a zip bag.
Winch speed into the sediments: 0,2 m/s

Winch speed into the sediments: 0,2 m/s

STATION	- 04GC	KH23-253-04GC
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Date:	29.10.2023	UTC time:	02:37
Latitude:	74° 31.372' N	Longitude:	008° 37.827'E
Water depth:	3228 m	Location:	Southern Knipovich

Core number:	04GC	Core Barrel length:	600 cm
		Apparent penetration:	600 cm
		Core length:	441 cm

Observations:		
Total No of section: 3		
Box No:	Labelling	Length:
1	KH23-253-04GC – SEC1	150
1	KH23-253-04GC – SEC2	150
1	KH23-253-04GC – SEC3	141
Weather report: Calm		

Done on the boat with the core:
Labeled, sealed, and cut into sections.
Winch speed into the sediments: 0,2 m/s
Top may be a disturbed as there was a lid laying inside the tube.