

CRUISE REPORT - HHUMTKT25

R/V Helmer Hanssen,
The Arctic University Museum of Norway,
Tromsø – Kirkenes – Tromsø,
April 16–21, 2025

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HHUMTKT25

R/V Helmer Hanssen

The Arctic University Museum of Norway

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Introduction

R/V Helmer Hanssen is a multipurpose research vessel owned by UiT The Arctic University of Norway, and the cruise 'HHUMTKT25' was organized and executed by The Arctic University Museum of Norway (units 'UM' and 'UMAK' at UiT).

The participating projects in this cruise were (1) Scalidophora of Norway, (2) Microfauna and macrofauna in Northern Norway, (3) Reconstruction of past ecosystems using sedimentary ancient DNA, (4) ArKoBi studying the population connectivity of *Arctica islandica* in Northern Norway, (5) DragonNest studying population genetics and distribution patterns of Kinorhyncha in the Arctic region and (6) NUDIST studying biogeography and taxonomy of nudibranchs in northern Norway and the Arctic.

Projects (1) 'Scalidophora of Norway' and (5) DragonNest aimed at sampling scalidophoran fauna in Northern Norway, primarily the phylum Kinorhyncha, using a box corer. Projects (2), (4) and (6) relied on a triangular dredge to obtain specimens, and project (3) utilized a gravity corer to capture a 5-m long sediment core.

Itinerary

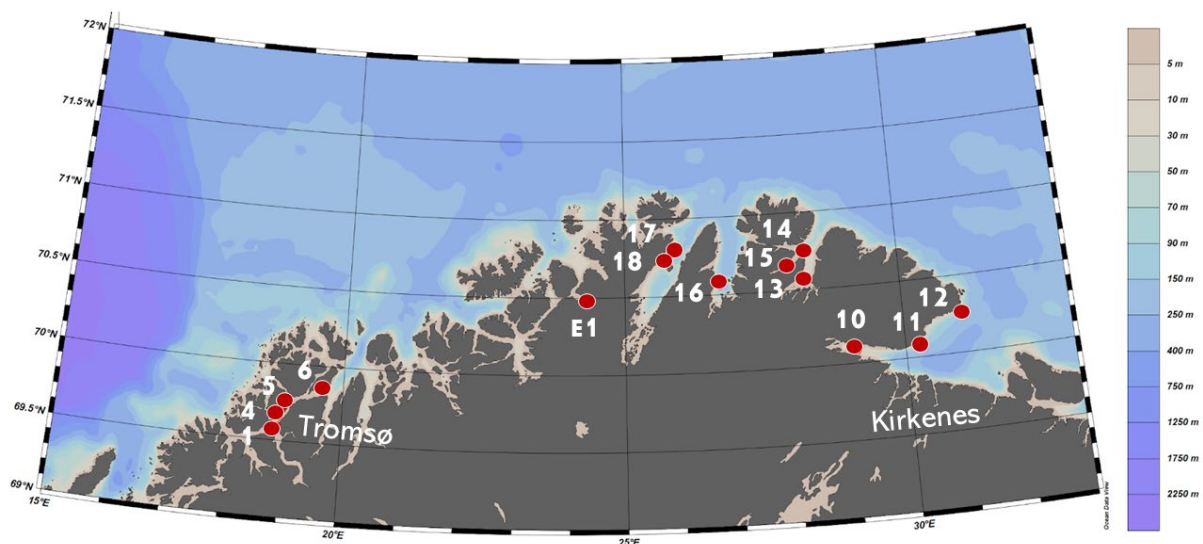


Fig. 0.1. An overview of sampled stations between Tromsø and Kirkenes.

Projects

Samples were collected for the following projects during the HHUMTKT25 cruise:

1. Scalidophora of Norway. Scalidophora includes the three animal phyla Kinorhyncha, Loricifera, and Priapulida. Kinorhyncha, are small animals, less than 1 mm in size, that live on the seabed. In Norway, 16 species of kinorhynchs have been found, but there are likely twice as many. Loricifera are also microscopic animals. The group has so far only been documented with two specimens in Norway, which is surprising considering that Norway has a long coastline with plenty of sandy seabeds where one might expect to find Loricifera. Priapulida is a group of marine worms known from the Norwegian coast and waters. They range from 5 mm to 20 cm in length and live on muddy seabeds. The main goal of the project is to map the diversity within Scalidophora in Norway, with a particular focus on Northern Norway and Svalbard.
2. Macrofaunal and megafaunal diversity in Northern Norway. Macrofauna comprises marine animals in the size range of 0.5 to 1 cm and megafauna is any animal larger than 1 cm. Northern Norway hosts Arctic and sub-Arctic ecosystems where macro- and megafaunal species are influenced by climate change. These species are often sensitive to climate change, making them valuable indicators of environmental shifts caused by rising temperatures. Additionally, many of these species are poorly studied, and establishing baseline data through monitoring is crucial for conservation and management. The region's biodiversity supports key industries such as fisheries, tourism, and aquaculture. Human activities like fishing, shipping, and pollution pose significant threats to these species, underscoring the need for regular monitoring to assess impacts and identify vulnerable habitats. Monitoring efforts not only aid in scientific discovery and understanding but also support policy development and management.
3. Reconstruction of past ecosystems using sedimentary ancient DNA: Coastal Arctic regions in Northern Norway are experiencing rapid climate change resulting in major shifts in ecosystem composition and function. Marine Arctic food webs and community dynamics are changing as boreal species migrate northward in response to ocean warming and implications remain largely unknown due to their understudied biodiversity. However, paleogenomic techniques are providing new insights. The Mid Holocene period (~7000 - 5000 yrs BP) was warmer than at present, and this study aims to map coastal metazoan diversity by using ancient environmental DNA extracted from sediments (sedaDNA) providing a DNA record from this time period. We use metabarcoding and shotgun sequencing to assess changes in biodiversity over time. This study contributes base-level

insights to understand changes in marine species composition in Northern Norway. Integrating high quality past and present community information has the potential of enabling better models of marine coastal ecosystem responses to projected climate scenarios.

4. Arkobi project: aims to investigate the contribution of *Arctica islandica* to carbon storage and biodiversity. The project is hosted by the Leibniz Institute for Baltic Sea Research Warnemünde (IOW) and funded by the German Federal Agency for Nature Conservation (Bundesamt für Naturschutz, BfN) with the objective of ascertaining the necessity for the protection of the species habitats within the Baltic Sea. During the cruise HHUMTKT25 specimens from the Northern Norwegian population will be sampled to study the population connectivity of the species *Arctica islandica* within its entire distribution area by 2b-RAD sequencing. The study of their population differentiation is of special importance to better understand the larval dispersal of the species.
5. DragonNest project: aims to assess the impact of climate change on Arctic meiofauna by investigating the population genetics, distribution patterns, and species boundaries of Kinorhyncha, commonly known as mud dragons. These microscopic invertebrates, ranging from 150 µm to 1 mm in size, are widespread in marine environments, yet their taxonomy and distribution, especially in the Arctic region, remain poorly understood. The research will combine traditional morphological analyses with molecular techniques to explore genetic diversity and population structure. This approach aims to uncover potential cryptic speciation and evaluate the resilience of Arctic kinorhynchs to environmental changes. By providing baseline genetic data and insights into species distributions, the project will contribute to a better understanding of Arctic marine biodiversity and inform conservation strategies in the face of ongoing climate change.
6. NUDIST (Nudibranch Distribution in Northern Norway) project. Nudibranchs constitute a diverse and abundant group of shell-less marine gastropods inhabiting a wide range of areas from the intertidal zone to deep sea environments. Knowledge on diversity, distribution and seasonal occurrence of nudibranchs in Norwegian waters is very fragmented. In particular, the northern part of Norway has been poorly studied despite its position as a geographical outermost limit of distribution of European species to the Arctic. The overall aim of the NUDIST project is to provide an updated taxonomic inventory of nudibranchs in the region of northern Norway and the Arctic. The project will also study long-term temporal variability in abundance of nudibranchs at different habitats in the region. Specimens collected within the project will be deposited in a collection that will be used for further taxonomic studies in collaboration with the wider research community.

Stations

Day 1, 16-04-2025

Station 1

Triangular dredge.

HH station 323. 08:13:11 - 08:27:39 UTC, 69° 35.695483 N 18° 53.741631 E, depth 53-m. Shelly gravel with a diverse fauna, dominated by holothurians (e.g., *Cucumaria frondosa*) and a wide variety of bivalves, brittle stars, sea urchins, gastropods, polychaetes and sea anemones. The bivalve *Arctica islandica* was frozen for the Leibniz Institute for Baltic Sea Research Warnemuende (IOW), and pycnogonids (sea spiders, *Nymphon* sp. and *Pycnogonum littorale*) were kept for the museum collection. Benthic animals were kept in one bucket of fresh water for freshwater shock, and in two buckets of seawater. They were then identified in the wet lab (Fig. 4). The fresh water was subsequently filtered through a 64µm mesh to search for Loriciferans, which were not found. The box corer was omitted due to the gravelly bottom. All polychaete species (*Eunicidae* sp. and *Polychaeta* sp.) were preserved in 96 % ethanol for Ekin Tilic (Senckenberg Institute). Furthermore, for the Leibniz Institute for Baltic Sea Research Warnemünde (IOW), amphipods (*Onisimus* sp.), gastropods (*Cylichna* sp., *Steromphala cineraria*, *Tectura* sp. and several unidentified species) and bivalves (*Ennucula* sp., *Nucula pusilla* and *Parvicardium* sp.) were fixed in 96% ethanol. A specimen of the brachiopod *Hemithiris psittacea* was flash frozen in liquid nitrogen and will be used for a genome project. Two nemerteans (*Micrura varicolor* and *Nemertopsis flavida*) were fixed and stored in the NUDIST-collection.

Station 2

Omitted due to shallow waters.

Station 3

Omitted because fishing gear was in the way.

Station 4

Triangular dredge was omitted at station 4 due to insufficient space to dredge.

Box core 4.1.

HH station 324, 09:38:31 UTC, 69° 40.531174 N 18° 51.345512 E, depth 16,7 m. Muddy bottom with the red algae *Lithothamnion*, brittle stars, the sea urchin *Strongylocentrotus droebachiensis* and various bivalves (Fig. 1). Qualitative samples of the upper sediment were collected for the Scalidophora of Norway

project. Three were preserved in absolute (100 %) ethanol (EtOH) and three were fixed in 10 % formalin. The remaining mud was kept for 'bubble-and-blotting' to extract kinorhynchs. For the museum collection, *Astarte* sp., *Nuculana pernula* and *Styela rustica* were preserved. Present Polynoidae were preserved in 96 % ethanol for Ekin Tilic (Senckenberg Institute). Furthermore, for the IOW gastropods (*Steromphala cineraria*, *Tritia* sp. and several unidentified species), and specimens of *Astarte* cf. *crenata* and Tanaididae were preserved in 96% EtOH.

Box core 4.2.

HH station 325, 10:25:57 UTC, 69°40'30.0"N 18°51'06.2"E, depth 18.4 m.

This box corer was processed by Maria and Kasia. Quantitative meiofauna for the DragonNest project (3x 10 % formalin, the upper 5-cm of the sediment in 50 mL vial, 2x sediment for Chlorophyll *a* analysis, upper 2-cm of the surface- frozen in -80C, 1x sediment for granulometric and CHN analyses- frozen in -20C), and remaining mud for 'bubble-and-blot' extraction of kinorhynchs. Initial examination showed a relatively abundant community of *Echinoderes peterseni* and other, yet unidentified, *Echinoderes* species.

Station 5

Triangular dredge.

HH station 329: Start 12:34:04, Stop 12:44:24 UTC, Start 69° 43.288733 N 018° 58.905638 E, Stop 69° 43.004352 N, 018° 58.601662 E, at 43-55-m water depth. Mud with broken shells and a relatively sparse faunal variety (Fig. 2 and 4). Finds included slender sea pens (*Virgularia mirabilis*), sea spider (Pycnogonida sp.), the sea star *Psilaster andromeda*, various brittle stars and *Astarte* sp., which were kept for the museum collection. A specimen of the nemertean *Cerebratulus* sp. was preserved in 96% EtOH by F. Broms for the NUDIST collection. Some of the mud was kept and specimen extractions were attempted using 'bubble-and-blot'. However, subsequent microscopy-examination by Joel showed a low quantity of specimens.



Fig. 1. Left: Box core 1 from station 4.

Fig. 2. Right: Triangular dredge content at Station 5.

Box core 5.1

HH station 327: 11:36:54 UTC, 69° 43.126004 N, 018° 58.533148 E, depth 22 m. The box core was taken but came up half-empty. Samples were still taken for Scalidophora of Norway project, (3x EtOH, 3x formalin, the upper 1 cm of Sediment in 50mL Falcon tube). The remaining mud was kept for 'bubble-and-blot' to extract kinorhynchs.

Box core 5.2

HH station 328: 11:40:52 UTC, 69° 43.103682 N 018° 58.571117 E, depth 41.2 m. The box core once again surfaced half-empty. This box core was processed by Maria and Kasia (Fig. 3, left). Quantitative meiofauna for DragonNest project (3x formalin, the upper 5 cm of the sediment in 50 mL vial, 2x sediment for Chlorofil_a analysis, upper 2 cm of the surface- frozen in -80°C, 1x sediment for granulometric and CHN analyses- frozen in -20°C), and remaining mud for 'bubble-and-blot' extraction of kinorhynchs (Fig. 3, right). In total there were found ~40 individuals from two different genera (*Echinoderes* and *Pycnophyidae*).



Fig. 3. Left: Maria and Kasia sampling box core 2 at station 5.

Right: Maria and Kasia using the 'bubble-and-blot'-technique at Station 5 to capture kinorhynchs, also known as 'mud dragons'. They are elusive marine invertebrates which live their lives submerged in the sediments. Upon stirring the sediment with water the kinorhynchs become trapped within air-bubbles, making them easier to catch on a sheet of A5-paper. This entrapment method is possible due to the unique hydrophobic cuticle of the mud dragons.



Fig 4. Wet-lab work. Vanessa, Ane and Fredrik sorting benthic fauna specimens collected by triangular dredge at Stations 1 and 5.

Station 6

Box coring was omitted due to the rocky seafloor.

CTD at 66 m depth (Fig. 5).

HH station 330: 14:32:46 start, 14:36:01 stopp UTC, 69° 50.830778 N 019° 36.829614 E start, 69° 50.839029 N 019° 36.858449 E stop.

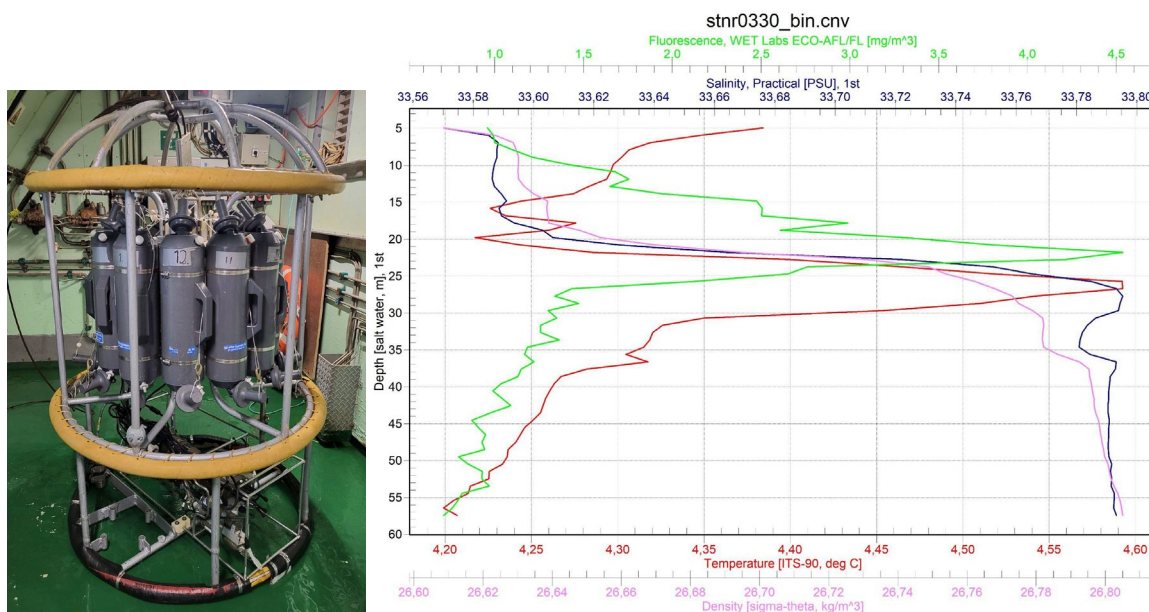


Fig. 5. Left: CTD device, operated by UiT technician Hans Dybvik. Right: CTD profile data from station 6.

Triangular dredge. HH station 331: start 14:43:40, stop 15:10:53. Start 69° 50.864210 N 019° 36.672417 E, stop 69° 50.849904 N 019° 36.585265 E, depth 59 - 63 m. The ship got stuck and had to move to get loose. Dredge content were rocks and hard bottom organisms like brachiopods (*Macandrevia cranium*), bivalves, barnacles (e.g. *Balanus balanus*), ascidians (*Dendrodoa* sp. and *Styela* sp.) and others. An Atlantic hagfish (*Myxine glutinosa*) as well as an American Plaice (*Hippoglossoides platessoides*) were caught as bycatch.

Day 2, 17-04-2025

In the cruise plan, day 2 was originally dedicated to transport without any sampling. However, we were ahead of schedule and would have arrived at our next station in Varangerfjorden 02:00 in the morning. Hence, it was decided to sample stations 17 and 18 on this day, instead of doing so during the return trip to Tromsø.

Station 17

CTD deployed at 220- 218 m depth.

HH station 332: 17-04-2025. start 07:49:56, stop 07:58:10, start 70° 43.195353 N 025° 44.695132 E, stop 70° 43.177276 N 025° 45.103166 E. (see SI.1).

Triangular dredge at 221 - 224 m water depth.

HH station 333: 17-04-2025. Start 08:24:39, stop 08:33:45, start 70° 43.493798 N 025° 46.728803 E, stop 70° 43.626772 N, 025° 47.103166 E. Soft bottom with muddy sediments sparse in fauna. We found mainly empty annelid tubes (*Spiochaetopterus* sp.) and empty mussel shells (Fig. 7). A sipunculid (*Golfingia* sp.) was kept for the collection, while polychaetes (*Nephtys* cf. *hombergii*, Terebellidae) were stored for Ekin Tilic (Senckenberg Institute). Some mud was used for bubble and blotting and examined for kinorhynchs by Joel but turned out to be poor in specimens, with only 3-4 individuals recovered from the extraction.

Box core 17.

HH station 334: 09:14:34 UTC, 70° 43.406795 N 025° 46.148457 E, depth 220m. Muddy sediments with sparse fauna (Fig. 8). Sanne took eDNA samples, stored in the freezer at -18°C. Maria and Kasia sampled for quantitative meiofauna and granulometry. Finally, Vanessa and Andreas took samples for the Scalidophora of Norway project (3x EtOH, 3x formalin, the upper 1 cm of Sediment in 50mL Falcon tube). Remaining mud from the box core surface layer (~5 cm) was used for 'bubble-and-blotting' and examined for kinorhynchs. Joel found it to be poor in specimens with only 3-4 individuals recovered from the extraction, similar to the

mud from the triangular dredge. However, Maria and Kasia retrieved approximately 30 individuals in 10 mL out of the 50 mL sample. A majority of the specimens belonged to the *Echinoderes* genus.



Fig. 7. From the left: Maria, Ane, Fredrik and Vanessa sorting benthic fauna from a triangular dredge haul containing soft sediment at station 17.

Fig. 8. Right: Box core on station 17.

Station 18

CTD measured at 207 m depth (see SI.2).

HH station 335: 2025-04-17, 10:27 UTC, 70° 47.418478 N 25° 53.163981 E.

Triangular dredge at 188 m.

HH station 336: 2025-04-17, 10:43-10:52 UTC, 70° 46.937406 N 25° 53.465499 E. The dredge contained muddy sediments and a great quantity of human litter. While faunal diversity was low, some polychaetes (notably *Maldane sarsi* and *Nephtys* sp.) were fairly abundant. The sea urchin *Brissopsis lyrifera* was also among the dominating taxa found in the dredge. Brittle stars (*Ophiura sarsii* and *Ophiopholis aculeata*) were also recorded. Some mud was used for bubble and blotting and examined for kinorhynchs by Joel, but turned out to be poor in specimens with only a few individuals recovered.

Box core 18 at 149 -207 m depth.

HH station 337-340: 11:36-12:04 UTC: 70° 48.820962 N 025° 55.383930 E. The first three attempts made with the box corer were unsuccessful at these sites. The last and fourth trial contained a small amount of gravelly sediments for faunal sampling. Such substrates are not suitable for eDNA however, and environmental DNA sampling was therefore omitted on this station. Some of the sediment was used for bubble and blotting and examined for kinorhynchs by Joel, Maria and Kasia, but turned out to be relatively poor in specimens with around 20 individuals recovered from the extraction.

Station 10

CTD taken at 169 m water depth (see SI.3). HH station 342, 08:14-08:20 UTC, 70° 05.080406 N 029° 07.812378 E.

Box core 10.1 at 160 m depth.

HH station 343: 08:42 UTC, 70° 05.215032 N 029° 07.488914 E: Sampling was done for eDNA in 3 replicates by Sanne and stored in the freezer at -18°C. Afterwards, Maria and Kasia sampled for quantitative meiofauna and granulometry (DragonNest project- 3x formalin, the upper 5 cm of the sediment in 50 mL vial, 2x sediment for Chlorofil_a analysis, upper 2 cm of the surface- frozen in -80°C, 1x sediment for granulometric and CHN analyses- frozen in -20°C). Vanessa and Andreas took samples for the Scalidophora of Norway project, (3x EtOH, 3x formalin, the upper 1 cm of Sediment in 50mL Falcon tube). Six open Falcon tubes were inserted into the mud for *in situ* incubation of meiofauna with subsequent µCT to be done in Tromsø. The remainder of the undisturbed surface mud was used for bubble-and-blotting by Joel and turned out to be very rich in kinorhynchs, with about 100 specimens (mostly cyclorhagids, but also allomalorhagids) recovered from one single extraction. Finds included slender sea pens (*Virgularia mirabilis*) which were kept for the museum collection.

Box core 10.2 at 147 m depth.

HH station 344: 09:31 UTC, 70°05'23.1"N 29°07'14.6"E. This box core was used entirely for bubble-and-blot extraction of kinorhynchs. The sample was very rich in mud dragons, estimating 300 individuals in 50 mL sample. 30 animals were stored in individual vials for further morphological and molecular studies.

Gravity core sampling at 188 m water depth. HH station 341: 07:28 UTC, 70° 04.843193 N 029° 08.326869 E. Multibeam echolocation was used to select an appropriate spot for sampling with the gravity corer. A site was selected close to the Mortensnes Historical Complex (a major archaeological excavation site where the oldest finds were dated to ~10,000 yr BP) for a chance to study faunal changes in land areas used by humans throughout the Holocene, as part of Sannes PhD project. The site also needed to be deep enough to yield a ~ 5 m sediment core, hence the deepest possible site near Mortensnes was chosen.

The first coring attempt was successful and the plastic liner was filled to 4,83 m length with sediment (Fig. 9, left). The work was done as cleanly as possible to avoid contamination of exposed sediment to foreign DNA. The core liner was cleaned from excess sediments with a synthetic cloth and 70% EtOH before ends

were sealed with plastic end-caps (Fig. 9, right; Fig. 10 left). The end caps were taped securely and the one-meter core sections were marked and cut with a sterilized saw (Fig. 10, right). Sterilization was done between each cut over the flame from a mini-burner. Each of the five core sections (four measuring 1 m in length and one 0.83 m) were capped, sealed, marked and stored refrigerated at 4°C.



Fig. 9. Left: The gravity corer being prepared to be deployed. Right: The 5 m long core is cleaned and capped, ready to be cut into smaller sections.



Fig. 10: Left: Taping the caps. Right: Cutting into 1 m sections.

Station 11

CTD deployed at 103 m depth.

HH station 345: 12:33-12:36 UTC, 70° 03.428191 N, 030° 14.764594 E (see SI.4).

Box core attempts. Two attempts at 101 m depth.

HH station 346: 12:41 UTC, 70° 03.457641 N 030° 14.938015 E. Hauls were unsuccessful due to the hard bottom at this station.

Triangular dredge at 90-94 m depth.

HH station 347: 13:08-13:17 UTC, 70° 03.784849 N 030° 14.501704 E. Hard-bottom fauna with large rocks. Findings included the brachiopod species *Terebratulina retusa*, cnidarians (*Tubularia indivisa* and *Virgularia* sp.), *Psolus squamatus* as well as a wide variety of molluscs and bivalves. The species *Astarte* cf. *crenata*, *Euspira pallida* and *Phascolion* (*Phascolion*) *strombus* were preserved for the collection. Polychaetes *Lanice conchilega*, *Nereis* sp. and Eunicidae sp. were stored for Ekin Tilic at Senckenberg Institute. For the IOW, gastropods (*Euspira* sp., *Lepeta caeca* and *Steromphala cineraria*), and juvenile specimens of *Arctica islandica* were fixed in 96% EtOH.

Station 12

CTD taken at 180 m depth (see SI.5).

HH station 348: 15:39 - 15:44 UTC, 70° 14.872067 N 031° 06.748457 E (see SI.5).

Box core attempt at 190 m depth.

HH station 349: 15:49 - 15:44 UTC, 70° 14.884060 N 031° 06.575595 E. The box core came up empty. Therefore we used the triangular dredge for a fauna overview.

Triangular dredge at 204 - 198 m depth.

HH station 350: 16:14:29 - 16:29:03 UTC, 70° 15.171376 N 031° 06.846944 E. The dredge contained stone and iron with epifauna (Fig. 12). Polychaetes dominated

the fauna, especially tube dwelling species such as *Hydroides norvegica*, *Spirobranchus triqueter* and *Placosteges tridentatus*. The sponge *Clathrina lacunosa* was found attached to a large rock and was documented by photography as the record constitutes the northernmost finding of the species. Several brachiopods and bryozoans were also found in the dredge. The iron might stem from a shipwreck. Following specimens were kept for the collection: *Alcyonidium* sp., *Halichondria* (*Halichondria*) *panicea* and *Macandrevia cranium*. For the IOW, *Steromphala cineraria* was fixed in 96% EtOH.

Day 4, 19-04-2025

Station 13

CTD at 172 m depth.

HH station 351: 06:05-06:16 UTC, 70° 33.152679 N 028° 17.379987 E (see SI.6).

Box core 13.1 taken at 180 m depth.

HH station 352: 07:07:16 UTC, 70° 32.634798 N 028° 16.585233 E. Sanne took eDNA samples, stored in the freezer at -18°C. Maria and Kasia sampled for quantitative meiofauna and granulometry (Fig. 13) (DragonNest project- 3x formalin, the upper 5 cm of the sediment in 50 mL vial, 2x sediment for Chlorofil_a analysis, upper 2 cm of the surface- frozen in -80°C, 1x sediment for granulometric and CHN analyses- frozen in -20°C).

Box core 13.2 taken at 180 m depth.

HH station 353: 07:07:32 UTC, 70° 32.632672 N 028° 16.582266 E. This box core was used for bubble-and-blot extraction of kinorhynchs. The sample was very rich and diverse in mud dragons, with three genera i.e. *Echinoderes*, Pycnophyidae, and *Semnoderes*. Among them, the dominant species is *Echinoderes arlis*. From 20 mL of the sample, more than 60 animals were stored in individual vials for further morphological and molecular analyses. Remaining sample will be processed in Poland by Kasia.



Fig 12. Left: Triangular dredge content at Station 12.

Fig. 13. Right: Box core content on station 13.

Station 14

CTD taken at 84 m depth. HH station 354: 08:47 UTC (see SI.7).

Box core 14 attempt at 83 m depth.

HH station 355: 08:54 UTC, 70° 43.553184 N 028° 16.513813 E. The box corer returned heavily damaged due to big stones in the mud-sediments (Fig. 14). A back-up box core is onboard which will be used for subsequent stations. We found the brachiopod *Novocrania anomala* on one of the stones, one specimen of which was flash frozen and will be used for a genome project.



Fig. 14. The damage done to the Box core on Station 14, HH station 355 due to heavy and big rocks getting stuck inside.

Triangular dredge at 97 - 128 m depth.

HH station 356: 09:38 - 9:53 UTC, 70° 43.802332 N 028° 16.416510 E: This was a hard bottom with rocks and stones (Fig. 15). The fauna was dominated by a wide variety of sponges. Many species were impossible to identify based on morphology, but notable species included *Tethya citrina* and *Craniella cranium*. No further box core attempts were made at this station. From this dredge, a brachiopod (*Macandrevia cranium*) and *Astarte* sp. will be added to the collection. Furthermore, *Lepeta caeca* was fixed in 96% EtOH for the IOW.



Fig. 15. Triangular dredge material from Station 14.

Station 15

CTD at 135 m depth. HH station 357: 10:47 - 10:53 UTC, 70° 40.352053 N, 028° 00.265144 E (see SI.8).

Triangular dredge taken at 133 m depth.

HH station 358: 10:56 - 11:15 UTC, 70° 40.349171 N 028° 00.281738 E. The dredge contained rocks and pebbles with sponges and bryozoans (Fig. 16). The sea cucumber *Psolus squamatus* and *Hormathia* sp. anemones were also common. The rarely encountered bryozoan *Defrancia lucernaria* was also recorded. Species that will be added to the collection from this dredge were octopus (*Rossia* sp.) and gastropod (*Euspira pallida*). Kept for Ekin Tilic (Senckenberg Institute) and fixed in 96% EtOH were polychaetes belonging to the taxa *Lagis* sp. and Lumbrineridae sp. Juvenile representatives of *Arctica islandica* were fixed in the same way for IOW. Two nudibranchs; one *Doris nobilis* (a species endemic to Norway and Sweden) and one unidentified nudibranch species were preserved by F. Broms and added to the NUDIST-collection (NUI-1526, 1528) for later molecular work. One sponge, *Polymastia* sp. was also preserved (NUI-1527) by F. B.



Fig. 16. Triangular dredge haul at Station 15.

Station 16

CTD at 239 m water depth.

HH station 359: 19:59- 20:07 UTC, 70° 34.153977 N, 026° 43.560909 E (see SI.9).

Triangular dredge at 241 m depth.

HH station 360, 20:17 - 20:42 UTC, 70° 33.653528 N 026° 43.492799 E. Very species poor muddy sediments with mainly empty worm (*Spiochaetopterus* sp.) tubes and empty mussel shells. (Fig. 17). While very few animals were found in the dredge, polychaetes were the dominating taxa and *Maldane sarsi* the most common species. One *Molpadia* sp. sea cucumber was also recorded.

Box core 16.1 at 240 m depth (Fig. 18).

HH station 361: 21:17 UTC, 70°33'19.2"N 26°43'59.5"E. Successful. Sampling was done for eDNA in 3 replicates by Sanne, and stored in the freezer at -18°C. Afterwards, Maria and Kasia sampled for quantitative meiofauna and granulometry for the DragonNest project- 3 x 10 % formalin, the upper 5 cm of the sediment in 50 mL vial, 2 x sediment for Chlorophyll *a* analysis, upper 2 cm of the surface- frozen in - 80°C, 1 x sediment for granulometric and CHN analyses- frozen in -20°C. Vanessa and Andreas took samples for the Scalidophora of Norway project, (3x EtOH, 3x formalin, the upper 1 cm of Sediment in 50mL Falcon tube). Six open Falcon tubes

were inserted into the mud for *in situ* incubation of meiofauna with subsequent μ CT to be done in Tromsø.



Fig. 17. Left: Triangular dredge on Station 16 and HH station 360.

Fig.18. Right: Box core 16.1 on HH station 361.

Box core 16.2 at 204 m depth.

HH station 362, 22:13 UTC, 70° 33.339670 N, 026° 45.357045 E. Unsuccessful haul.

Box core 16.3 at 241 m.

HH station 363, 22:36 UTC, 70° 33.499612 N 026° 43.312494 E. Successful haul. Mud was sampled for bubble-and-plot extraction of kinorhynchs. Preliminary examination by Maria and Kasia resulted in sorting around 35 individuals of *Echinoderes* and Pycnophyidae that will be studied further in Spain and Poland. Due to time limitations only 10 mL of the sample was examined.

Station 19

Omitted due to time constraints.

Extra stations in Repparfjorden. This is a former mine waste dumping site ([Hoff et al. 2024](#)). Stations E1 - E6 are influenced by mining activities, while station E7 serves as a reference station unaffected by the mining site.

Station E1 / E2

Triangular dredge at 51 m depth.

HH station 364: 10:09:43 UTC, 70° 27.777508 N 024° 17.619307 E. The fauna was dominated by the bivalves *Yoldia hyperborea* and *Nuculana pernula* as well as polychaetes (*Maldane sarsi*, *Nephtys* sp.) and *Ophiura sarsii* brittle stars. Among the polychaetes found at the station one *Aphrodita aculeata*, a few *Nephtys* sp., *Lagis* sp. and scale worms (*Polynoidae*) can also be mentioned. While not numerous, several molluscs such as *Euspira pallida*, *Boreotrophon truncatus*, *Lyonsia norvegica* and *Macoma calcareo* were also recorded.

Box core E1 / E2 at 57 m depth.

HH station 366: 11:15:45 UTC, 70° 28.016704 N 024° 17.407434 E.

Mud was sampled for eDNA by Sanne for eDNA and for the Scalidophora of Norway project (3x EtOH, 3x formalin, the upper 1 cm of Sediment in 50mL Falcon tube), and for the DragonNest project. Bubble-and-blot extraction of kinorhyncha by Maria and Kasia resulted in sorting around 35 individuals of *Echinoderes* and Pycnophyidae that will be studied further in Spain and Poland. Due to time limitations only 10 mL of the sample was examined.

In addition, a 17 x 17 x 3 cm area was sampled from the box core surface, sieved through a 250 µm mesh, and preserved in absolute molecular ethanol for Mari Eilertsen at the University of Bergen.

Station E3

Box-core E3 at 57 m depth.

HH station 367: 12:04:48 UTC, 70°28'01.1"N 24°17'25.9"E. Samples were taken for the Scalidophora of Norway project, (3x EtOH, 3x formalin, the upper 1 cm of Sediment in 50mL Falcon tube), and for the DragonNest project. Bubble-and-blot extraction was done and examined for kinorhynchs by Joel, who collected several specimens of both Cyclorhagida and Allomalorhagida.

In addition, a 17 x 17 x 3 cm area was sampled from the box core surface, sieved through a 250 µm mesh, and preserved in absolute molecular ethanol for Mari Eilertsen at the University of Bergen.

Station E5

Box core E5 at 60 m depth.

HH station 368: 13:07:56 UTC, 70°28'06.4"N 24°17'27.5"E. Failed attempt.

Station E6

Box-core E6 at 58 m depth.

HH station 369: 13:13:40 UTC, 70°28'03.8"N 24°17'28.2"E. Samples were taken for the Scalidophora of Norway project (3x EtOH, 3x formalin, the upper 1 cm of Sediment in 50mL Falcon tube), and for the DragonNest project. Bubble-and-blot extraction was done and examined for kinorhynchs by Joel, who collected several specimens of both Cyclorhagida and Allomalorhagida. In addition, a 17 x 17 x 3 cm area was sampled from the box core surface, sieved through a 250 µm mesh, and preserved in absolute molecular ethanol for Mari Eilertsen at the University of Bergen.

Station E7 reference station not influenced by mining activities

Box-core 7 at 62 m depth.

HH station: 370: 13:48:28 UTC, 70°29'49.8"N 24°15'25.4"E. Samples were taken for the Scalidophora of Norway project, (3x EtOH, 3x formalin, the upper 1 cm of Sediment in 50mL Falcon tube), and for the DragonNest project. Bubble-and-blot extraction was done and examined for kinorhynchs by Joel, who collected several specimens of both Cyclorhagida and Allomalorhagida. In addition, a 17 x 17 x 3 cm area was sampled from the box core surface, sieved through a 250 µm mesh, and preserved in absolute molecular ethanol for Mari Eilertsen at the University of Bergen.

Station 8

Omitted due to time constraints.

Station 9

Omitted due to time constraints.

Day 6, 21-04-2025

Packed, cleaned and disembarked R/V Helmer Hanssen at 12:00 in Tromsø.

Participants & Schedule

Name	Role	Cabin
Andreas Altenburger	Cruise leader	505
Vanessa Pitusi	Technician	210
Hans Dybvik	Instrument manager	404
Joel Vikberg Wernström	PhD student	213
Sanne Bergman	PhD student	214
Katharina Kniesz	Post-Doc	209
Fredrik Broma	Researcher	322
Maria Herranz	Researcher	211
Kasia Grzelak	Researcher	212
Ane Myrvold	Research Assistant	215

Daily schedule	Time
Breakfast	07:30
Meeting with captain	08:00
Cake	10:00
Lunch	13:30
Cake	17:00
Group meeting	17:00
Dinner	19:30

Permits

No permits were required for the work done during this cruise.

Acknowledgements

We thank the crew of R/V Helmer Hanssen for excellent support throughout the cruise. The UArctic Thematic Network on Arctic Marine Biodiversity and the Norwegian Biodiversity Information Centre (NBIC, Artsdatabanken) have provided financial support.

Supplementary Information

CTD graphs

The following figures show continuous measurements of salinity, fluorescence, density, temperature and depth of the water column from the cruise stations.

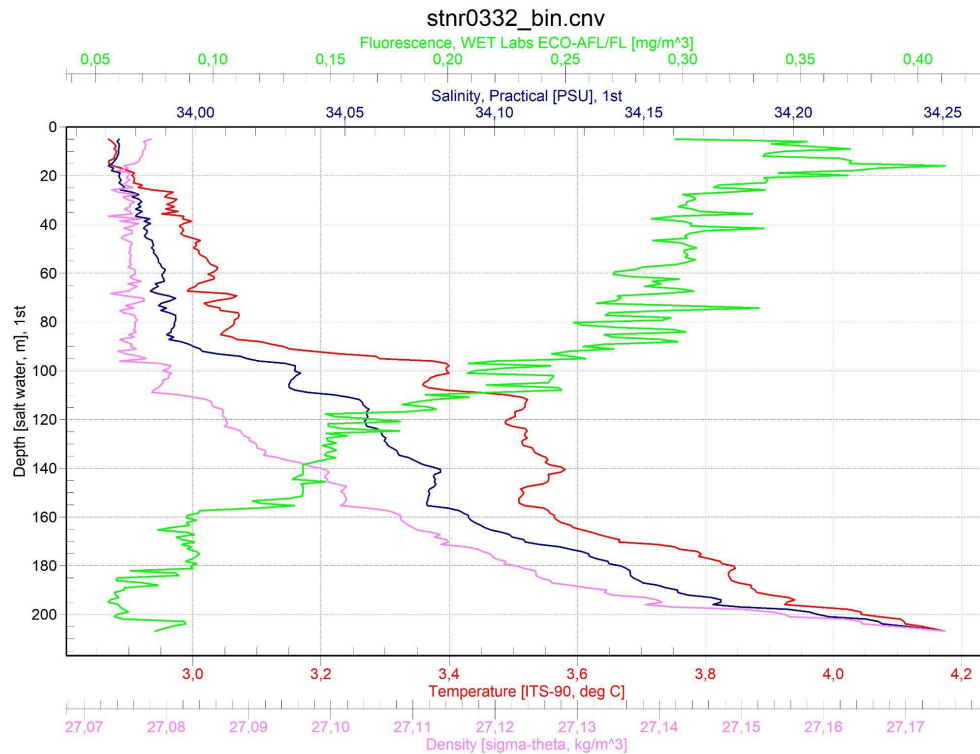


Fig.SI.1. CTD profile from Station 17. This profile shows a mixed layer from 0 m, down to 90-100 m water depth followed by a rise in temperature and salinity to ~ 200 m depth.

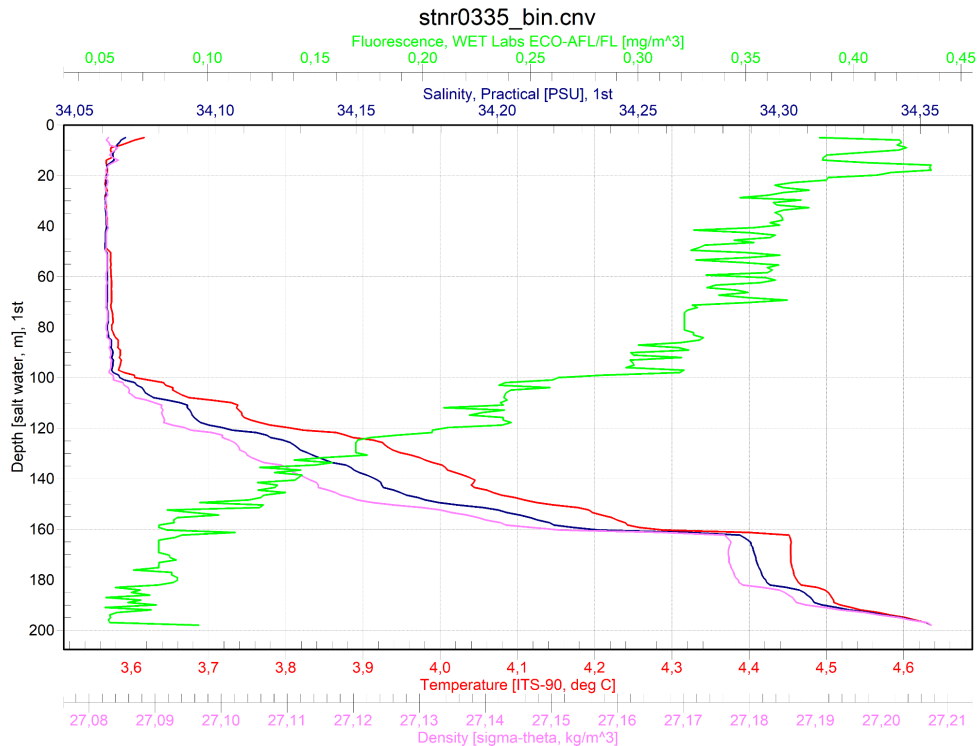


Fig. SI.2. CTD graph for station 18. This profile shows a mixed layer from 0 to 90-100 m and then there is a rise in temperature and salinity the rest of the profile down to little more than 200 m.

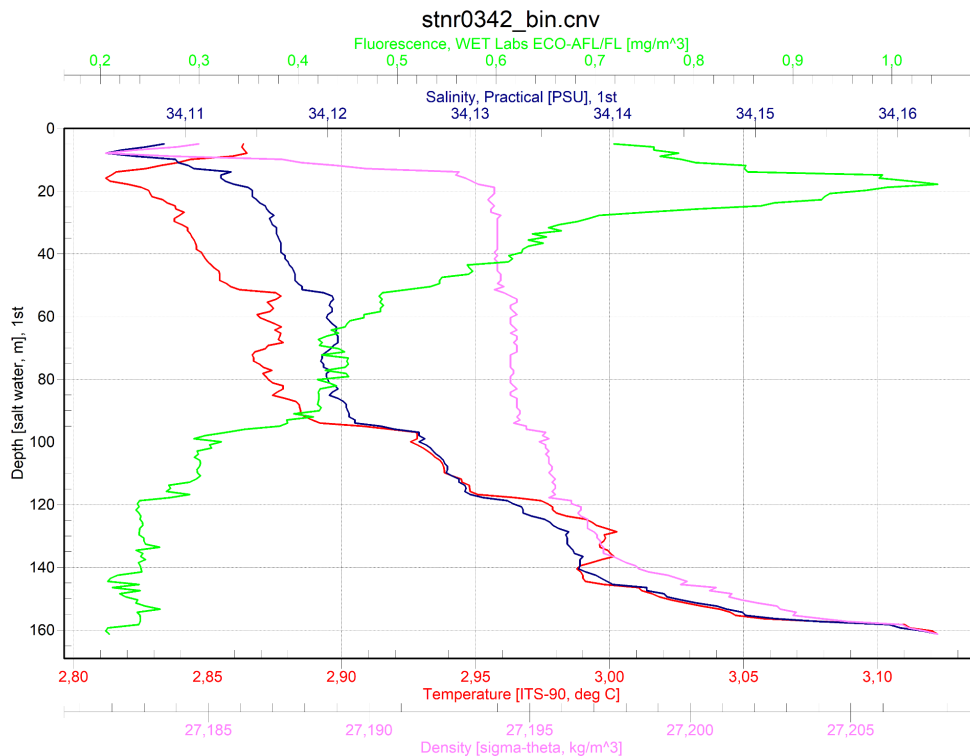


Fig. SI.3. CTD profile at Station 10. There was fresher (less saline) and less dense water from the sea surface- and down to 20 m depth, followed by a mixed layer with medium dense water down to 120 m. After which, a rise in temperature and salinity gradually increased the density of the rest of the profile down to 150 m.

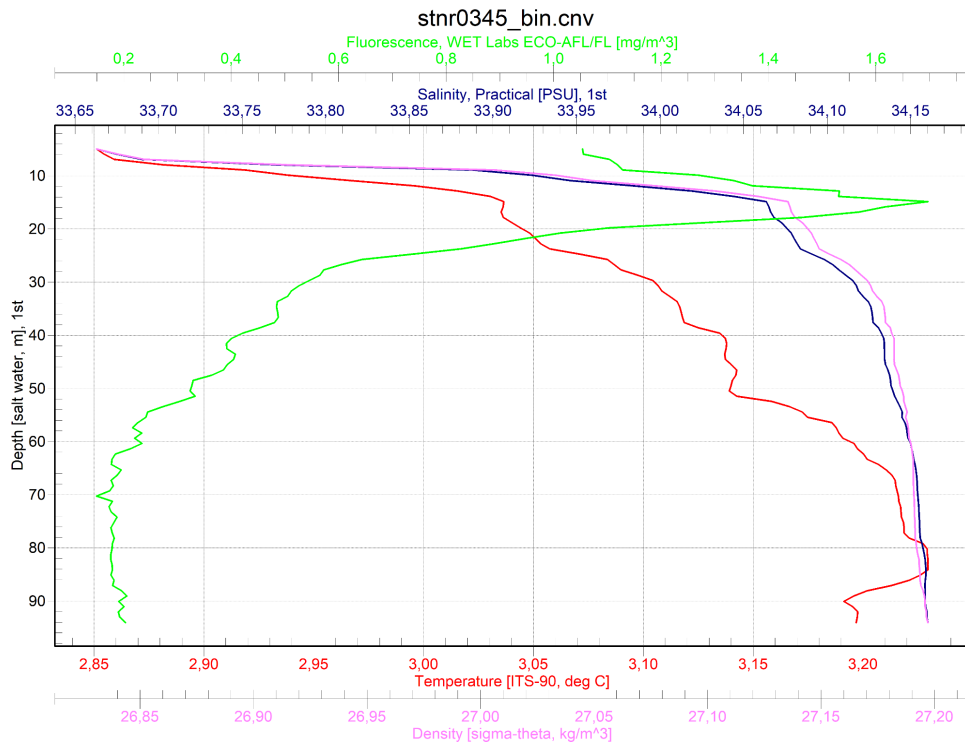


Fig. SI.4. CTD graph of station 11. A fresh water layer at the top 15 m with constant salinity levels, and a gradual increase in temperature down to the bottom at 95 m depth.

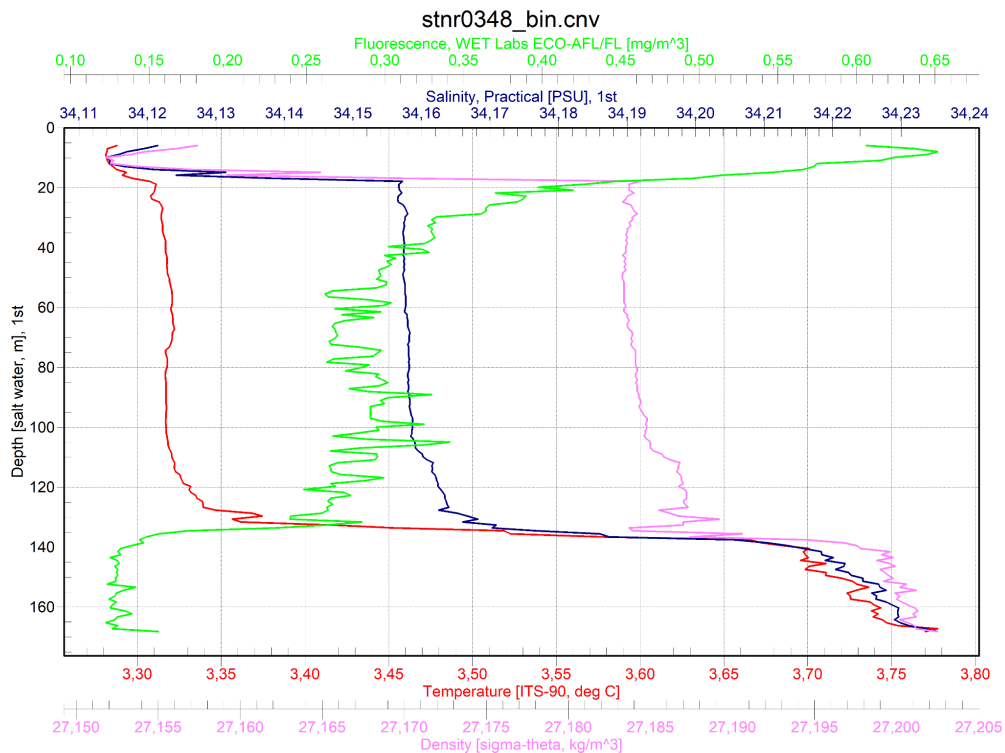


Fig. SI.5. CTD profile at Station 12. A fresh and less dense water at the upper most 20 m followed by a mixed layer of medium dense water down to 130 m. From 130-170 m a denser layer was observed.

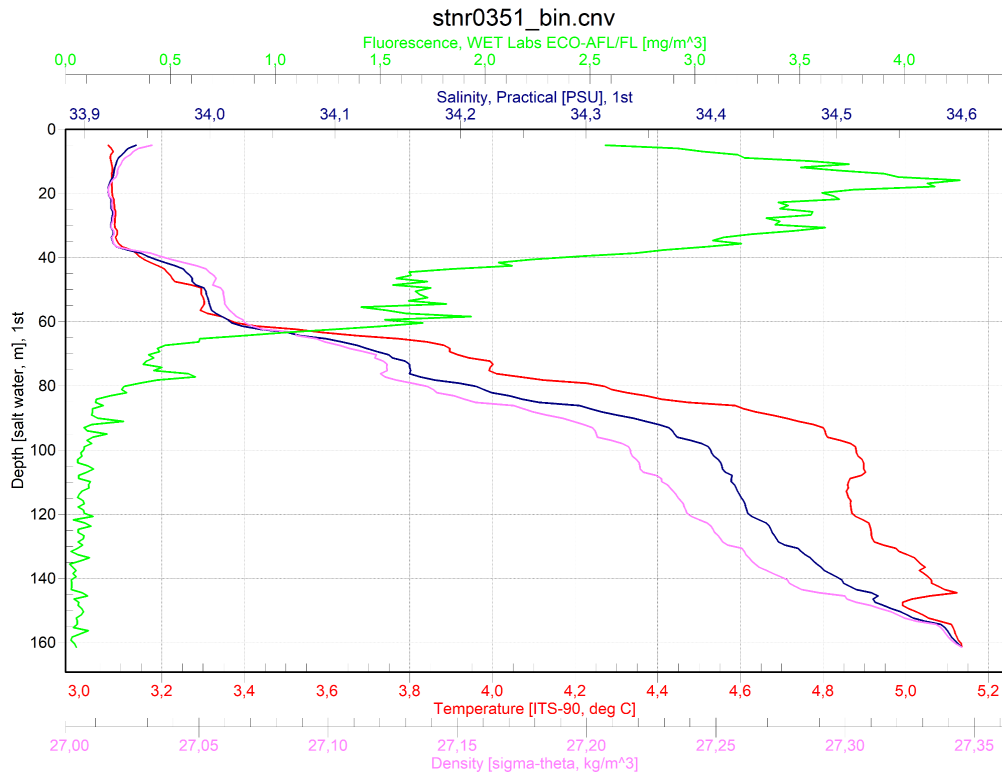


Fig. SI.6. CTD profile for Station 13. A cold fresh water layer at the top 40 m was followed by a layer of gradually increasing temperature and salinity and density all the way 160 m depth.

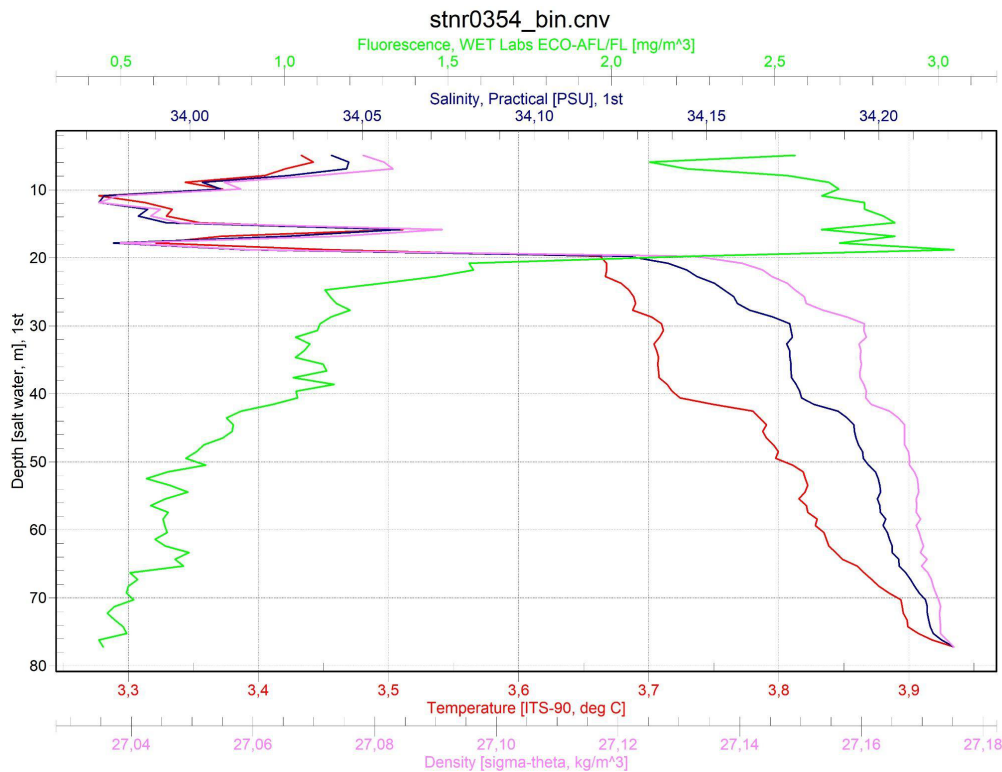


Fig. SI.7. CTD profile for Station 14. A shallow profile down to 75 m. The top 20 m layer was a cold and fresher water mix, while the bottom layer profile showed more dense, saline and warm water.

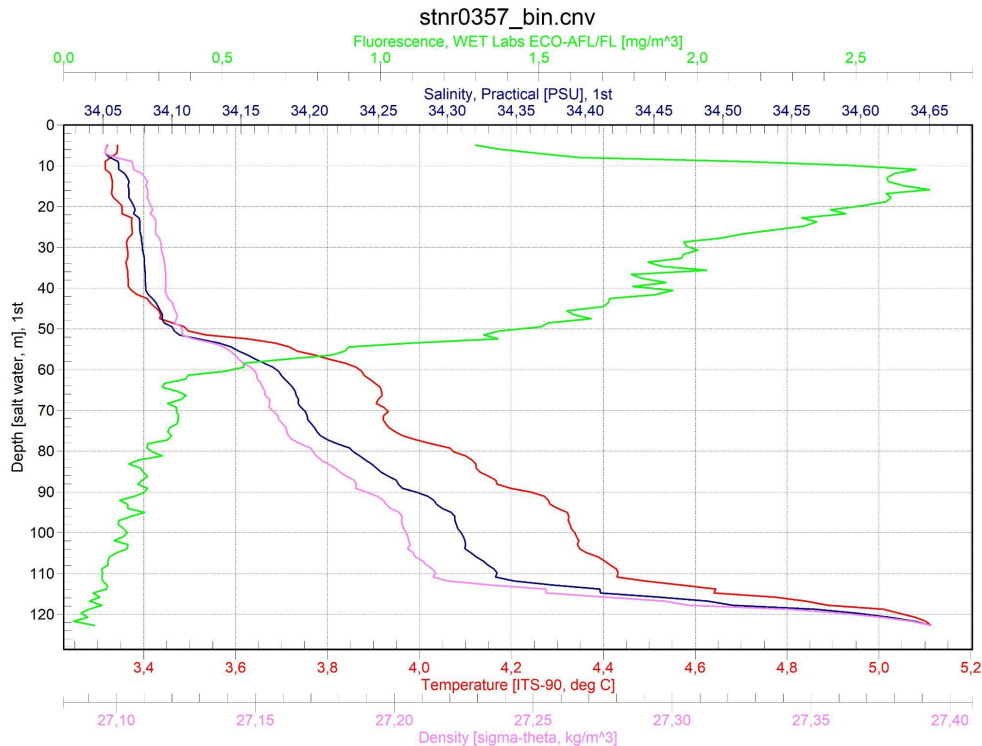


Fig. SI.8. CTD profile for Station 15. In this profile, a cold and fresh water layer was seen on the top 50 m. A new layer gradually increased in density until the final layer was registered at 110 m - 120 m depth with drastically increasing density with depth.

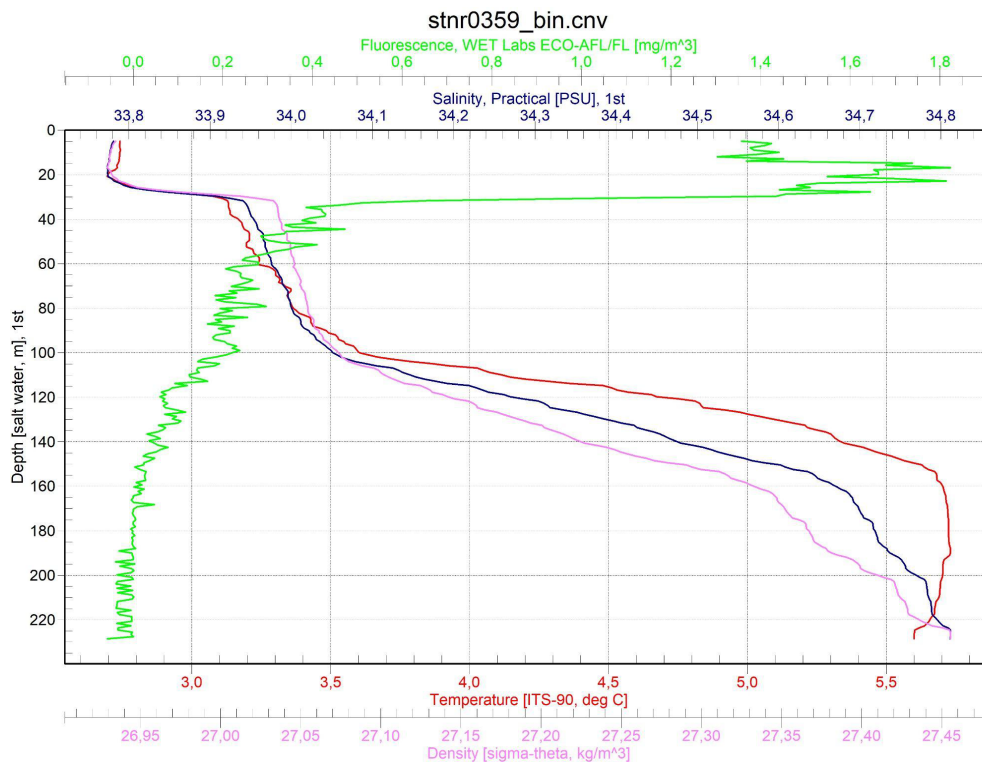


Fig. SI.9. CTD profile for Station 16. The fresher layer of water was observed in the first 25 m before the denser mixed layer down to 100 m. After which, an increasingly dense layer was seen over the rest of the profile down to 250 m.

Dataset publications

GBIF - the Global Biodiversity Information Facility
[Sampling event dataset](#) (Broms et al. 2025).

Scalidophora of Norway - Artsdatabanken
[Specimen images](#).

Specimens collected for the Zoological Collection at the Arctic University Museum of Norway

Table SI.1. Overview of the 29 specimens that were collected during the HHUMTKT25 cruise, which will be added to the zoological collection at the Arctic University Museum of Norway, UiT. All specimens, apart from the octopus *Rossia* sp. and an unidentified flatworm, were preserved in 70 % ethanol. *Rossia* sp. and the unidentified flatworm were fixated in 4 % formaldehyde due to their fragile and soft-bodied nature.

scientificName	fieldNumber	samplingProtocol	eventDate
<i>Pycnogonum littorale</i>	Station 1 HH StNr 323	Triangular dredge	16.04.2025
<i>Nymphon</i> sp.	Station 1 HH StNr 323	Triangular dredge	16.04.2025
Pycnogonida	Station 5 HH StNr 329	Triangular dredge	16.04.2025
<i>Virgularia mirabilis</i>	Station 5 HH StNr 329	Triangular dredge	16.04.2025
<i>Golfingia</i> sp.	Station 17 HH StNr 333	Triangular dredge	17.04.2025
<i>Virgularia mirabilis</i>	Station 10 HH StNr 343	Box corer	18.04.2025
<i>Terebratulina retusa</i>	Station 11 HH StNr 347	Triangular dredge	18.04.2025
<i>Virgularia</i> sp.	Station 11 HH StNr 347	Triangular dredge	18.04.2025
<i>Tubularia indivisa</i>	Station 11 HH StNr 347	Triangular dredge	18.04.2025
<i>Phascolion</i> (<i>Phascolion</i>) <i>strombus</i>	Station 11 HH StNr 347	Triangular dredge	18.04.2025

<i>Astarte cf. crenata</i>	Station 11 HH StNr 347	Triangular dredge	18.04.2025
<i>Euspira pallida</i>	Station 11 HH StNr 347	Triangular dredge	18.04.2025
<i>Styela rustica</i>	Station 4 HH StNr 324	Box corer	16.04.2025
<i>Astarte</i> sp.	Station 4 HH StNr 324	Box corer	16.04.2025
<i>Nuculana pernula</i>	Station 4 HH StNr 324	Box corer	16.04.2025
<i>Halichondria</i> (<i>Halichondria</i>) <i>panicea</i>	Station 12 HH StNr 350	Triangular dredge	18.04.2025
<i>Polymastia</i> <i>grimaldii</i>	Station 12 HH StNr 350	Triangular dredge	18.04.2025
<i>Infundibulipora</i> <i>lucernaria</i>	Station 14 HH StNr 356	Triangular dredge	19.04.2025
Flatworm	Station 14 HH StNr 356	Triangular dredge	19.04.2025
<i>Tethya norvegica</i>	Station 14 HH StNr 356	Triangular dredge	19.04.2025
<i>Euspira pallida</i>	Station 15 HH StNr 358	Triangular dredge	19.04.2025
<i>Rossia</i> sp.	Station 15 HH StNr 358	Triangular dredge	19.04.2025
<i>Molpadia</i> sp.	Station 16 HH StNr 360	Triangular dredge	19.04.2025
<i>Yoldia hyperborea</i>	Station E1 HH StNr 364	Triangular dredge	20.04.2025
<i>Nuculana pernula</i>	Station E1 HH StNr 364	Triangular dredge	20.04.2025
<i>Apporhais</i> <i>pespelicani</i>	Station E1 HH StNr 364	Triangular dredge	20.04.2025
<i>Boreotrophon</i> <i>clathratus</i>	Station E1 HH StNr 364	Triangular dredge	20.04.2025
Anthozoa 2	Station E1 HH StNr 364	Triangular dredge	20.04.2025
<i>Ascidrella aspersa</i>	Station E1 HH StNr 364	Triangular dredge	20.04.2025

Sailed route

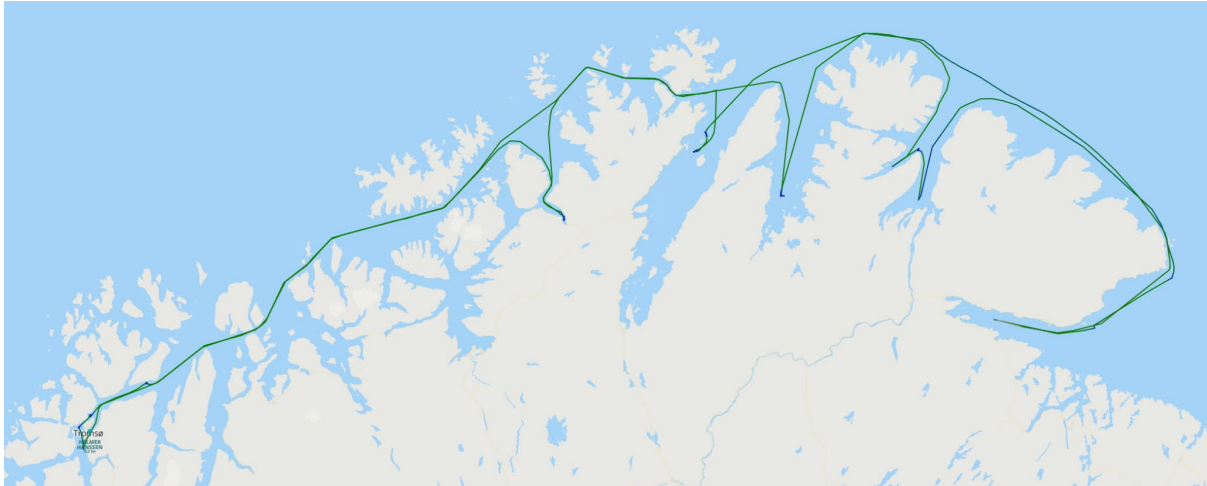


Fig. SI.10. Logged sailing route from Tromsø to Kirkenes and back to Tromsø.

References

Broms F, Kniesz K, Wernström J V, Pitusi V, Bergman S, Herranz M, Grzelak K, Altenburger A. (2025). Species recorded during the HHUMTKT25 cruise on R/V Helmer Hanssen from April 16 to April 21, 2025, in Northern Norway. UiT The Arctic University of Norway. <https://doi.org/10.15468/gytcm>.

Hoff M, Argentino C, Huljek L, Fiket Ž, Mun Y, Barrenechea Angeles I, Strmic Palinkas S, Panieri G. (2024). Biogeochemical impact of historical submarine mine tailings on benthic ecosystems in the Repparfjord (Northern Norway). *Science of The Total Environment*, Volume 924: 171468, <https://doi.org/10.1016/j.scitotenv.2024.171468>

Station log

Cruise Nr	Date UTC	Time UTC	Log (nm)	Station type	HH st. Nr	Speed	Lat	Long	Depth (m)	Air Temp (°C)	Water Temp (°C)	Wind Speed (m/s)	Humidity (%)	Wind Dir (deg)	Light SPAR
HHUMLT25	16.04.2025	08:13:11	9998	Triangular dredge START	323	1,5	69° 35.695483 N	018° 53.741631 E	53,61	3,4	3,8	1,7	87,3	198	464
HHUMLT25	16.04.2025	08:27:39	9998	Triangular dredge STOP	323	1	69° 35.414591 N	018° 54.118192 E	53,11	3,5	3,9	0,8	87,8	170	351
HHUMLT25	16.04.2025	09:38:31	4	Box core (BC)	324	0,4	69° 40.531174 N	018° 51.345512 E	16,76	3,9	3,9	6,8	81,3	36	421
HHUMLT25	16.04.2025	10:25:57	5	Box core (BC)	325	0,1	69° 40.499560 N	018° 51.103194 E	18,41	4,1	4,3	6,6	78,8	39	430
HHUMLT25	16.04.2025	11:09:49	9	Box core (BC)	326	0,2	69° 43.270626 N	018° 58.317850 E	21,86	4,7	4,9	5,5	78,6	61	676
HHUMLT25	16.04.2025	11:36:54	9,2	Box core (BC)	327	0,4	69° 43.126004 N	018° 58.533148 E	44,79	4,5	4,6	6,9	79,3	54	571
HHUMLT25	16.04.2025	11:40:52	9,2	Box core (BC)	328	0,5	69° 43.103682 N	018° 58.571117 E	41,2	4,6	4,9	6,5	79,3	55	617
HHUMLT25	16.04.2025	12:34:04	10	Triangular dredge START	329	2,1	69° 43.288733 N	018° 58.905638 E	55,32	5	5	7,8	76,2	61	427
HHUMLT25	16.04.2025	12:44:24	10	Triangular dredge STOP	329	1,5	69° 43.004352 N	018° 58.601662 E	42,67	5,3	4,5	5,8	73,3	58	585
HHUMLT25	16.04.2025	14:32:46	26	CTD START	330	0,3	69° 50.830778 N	019° 36.829614 E	65,71	6,2	5,1	1	69,1	251	404
HHUMLT25	16.04.2025	14:36:01	26	CTD STOPP	330	0,7	69° 50.839029 N	019° 36.858449 E	63,95	6,5	5,2	1,9	69	263	394

HHUMLT25	16.04.2025	14:43:40	26	Triangular dredge START	331	1	69° 50.864210 N	019° 36.672417 E	59,47	6,1	4,4	1,4	66,9	248	416
HHUMLT25	16.04.2025	15:10:53	27	Triangular dredge STOP	331	1	69° 50.849904 N	019° 36.585265 E	63,1	6,5	4,9	0,5	68	153	285
HHUMLT25	17.04.2025	07:49:56	201	CTD START	332	1,5	70° 43.195353 N	025° 44.695132 E	220,54	1,4	3	14,9	82	126	103
HHUMLT25	17.04.2025	07:58:10	201	CTD STOPP	332	1,1	70° 43.177276 N	025° 45.103166 E	218,42	1,6	2,9	14,7	82,4	126	92
HHUMLT25	17.04.2025	08:24:39	202	Triangular dredge START	333	1,4	70° 43.493798 N	025° 46.728803 E	221,37	1,5	2,8	11,9	83,1	129	140
HHUMLT25	17.04.2025	08:33:45	202	Triangular dredge STOP	333	1,5	70° 43.626772 N	025° 47.103166 E	224,17	1,5	2,8	14,5	82,6	133	164
HHUMLT25	17.04.2025	09:14:34	204	Box core (BC)	334	1,3	70° 43.406795 N	025° 46.148457 E	220,11	1,7	2,7	10,1	82,4	131	164
HHUMLT25	17.04.2025	10:10:40	210	CTD START	335	0,5	70° 47.418478 N	025° 53.163981 E	207,19	2,4	3,7	6,3	80,7	130	87
HHUMLT25	17.04.2025	10:27:21	210	CTD STOPP	335	3	70° 47.459139 N	025° 53.014098 E	209,4	2,2	3,8	6,4	78,1	101	102
HHUMLT25	17.04.2025	10:43:59	210	Triangular dredge START	336	1,7	70° 46.937406 N	025° 53.465499 E	188,22	2,2	3,7	7	81,4	125	89
HHUMLT25	17.04.2025	10:52:38	211	Triangular dredge STOP	336	0,9	70° 46.758871 N	025° 53.600142 E	164,7	2,2	3,7	6,8	81,1	130	94
HHUMLT25	17.04.2025	11:36:16	212	Box core (BC)	337	0,6	70° 47.472983 N	025° 52.575825 E	206,8	2,6	3,8	7,6	82,4	143	124

HHUMLT25	17.04.2025	11:36:26	212	Box core (BC)	338	0,3	70° 47.472649 N	025° 52.572065 E	206,74	2,5	3,8	7,2	82,6	140	125
HHUMLT25	17.04.2025	11:52:14	212	Box core (BC)	339	3,7	70° 47.529023 N	025° 52.409946 E	201,33	2,8	3,6	5,4	80,3	138	121
HHUMLT25	17.04.2025	12:04:29	214	Box core (BC)	340	10,6	70° 48.820962 N	025° 55.383930 E	149,89	2,7	3,4	6,5	80,2	155	93
HHUMLT25	18.04.2025	07:28:58	390	Gravity core (GC)	341	0,5	70° 04.843193 N	029° 08.326869 E	187,64	2,3	3,1	6,6	96,1	99	94
HHUMLT25	18.04.2025	08:14:03	390	CTD START	342	0,4	70° 05.080406 N	029° 07.812378 E	169,36	2,3	3,3	6	95,8	91	61
HHUMLT25	18.04.2025	08:20:07	390	CTD STOPP	342	0,4	70° 05.110128 N	029° 07.735712 E	174,35	2,4	3,3	6,4	95,7	99	59
HHUMLT25	18.04.2025	08:42:50	390	Box core (BC)	343	0,3	70° 05.215032 N	029° 07.488914 E	160,15	2,4	3,2	5,9	95,3	967	59
HHUMLT25	18.04.2025	09:31:31	390	Box core (BC)	344	0,1	70° 05.385172 N	029° 07.243492 E	147,37	2,4	3,3	2,4	95,1	81	58
HHUMLT25	18.04.2025	12:33:33	414	CTD START	345	0,7	70° 03.428191 N	030° 14.764594 E	103,53	1,8	2,9	8,6	94,5	12	60
HHUMLT25	18.04.2025	12:36:41	414	CTD STOPP	345	1,1	70° 03.411044 N	030° 14.877111 E	103,24	1,7	3,2	9,4	94,4	9	58
HHUMLT25	18.04.2025	12:41:34	414	Box core (BC)	346	1	70° 03.457641 N	030° 14.938015 E	100,62	1,8	3,3	9,3	94,3	12	58
HHUMLT25	18.04.2025	13:08:09	414	Triangular dredge START	347	1,3	70° 03.784849 N	030° 14.501704 E	94,62	1,4	3,4	10,4	94,4	11	62

HHUMLT25	18.04.2025	13:17:00	415	Triangular dredge STOP	347	1	70° 03.917661 N	030° 14.604589 E	90,11	1,3	3,4	7,8	94,5	12	53
HHUMLT25	18.04.2025	15:39:15	436	CTD START	348	0,4	70° 14.872067 N	031° 06.748457 E	179,57	1	3,5	12,1	97	17	30
HHUMLT25	18.04.2025	15:44:03	436	CTD STOPP	348	0,6	70° 14.889450 N	031° 06.660557 E	190,42	1,1	3,5	12	96,9	25	32
HHUMLT25	18.04.2025	15:49:41	436	Box core (BC)	349	0,5	70° 14.884060 N	031° 06.575595 E	189,51	1,2	3,4	14	96,7	23	36
HHUMLT25	18.04.2025	16:14:29	436	Triangular dredge START	350	1,7	70° 15.171376 N	031° 06.846944 E	204,92	1,1	3,6	14,7	96,2	17	18
HHUMLT25	18.04.2025	16:29:09	436	Triangular dredge STOP	350	0,7	70° 15.410896 N	031° 07.077003 E	198,43	1,1	3,4	15,8	95,9	18	14
HHUMLT25	19.04.2025	06:05:39	526	CTD START	351	0,8	70° 33.152679 N	028° 17.379987 E	172,44	-0,1	3,4	5,3	65,1	349	167
HHUMLT25	19.04.2025	06:16:23	526	CTD STOPP	351	0,6	70° 33.064806 N	028° 17.223957 E	170,7	-0,1	3,4	4,5	63	340	176
HHUMLT25	19.04.2025	07:07:16	526	Box core (BC)	352	0,7	70° 32.634798 N	028° 16.585233 E	180,23	0,1	3,3	4,1	61	9	242
HHUMLT25	19.04.2025	07:07:32	526	Box core (BC)	353	0,5	70° 32.632672 N	028° 16.582266 E	180,33	0,1	3,5	3,7	61	9	242
HHUMLT25	19.04.2025	08:36:32	538	CTD START	354	0,6	70° 43.538714 N	028° 16.757153 E	85,49	-0,6	3,4	3,1	72	359	401
HHUMLT25	19.04.2025	08:47:41	538	CTD STOPP	354	0,6	70° 43.553058 N	028° 16.517863 E	83,82	-0,3	3,5	2,8	72,1	39	386

HHUMLT25	19.04.2025	08:47:51	538	Box core (BC)	355	0,5	70° 43.553184 N	028° 16.513813 E	83,43	-0,4	3,1	2,1	72,1	36	381
HHUMLT25	19.04.2025	09:38:24	539	Triangular dredge START	356	2	70° 43.489040 N	028° 15.820509 E	97,4	-0,1	3,6	5,5	72	298	443
HHUMLT25	19.04.2025	09:53:08	539	Triangular dredge STOP	356	1,3	70° 43.802332 N	028° 16.416510 E	128,35	0	3,7	5,2	69,4	293	461
HHUMLT25	19.04.2025	10:47:44	546	CTD START	357	0,1	70° 40.337084 N	028° 00.229311 E	135,47	-0,1	3,5	2,1	64,3	265	402
HHUMLT25	19.04.2025	10:53:57	546	CTD STOPP	357	0,3	70° 40.352053 N	028° 00.265144 E	132,78	-0,1	3,7	2	63,5	267	377
HHUMLT25	19.04.2025	10:56:26	546	Triangular dredge START	358	0,9	70° 40.349171 N	028° 00.281738 E	132,6	-0,1	3,8	1,6	63,4	264	362
HHUMLT25	19.04.2025	11:15:20	546	Triangular dredge STOP	358	1,5	70° 40.024662 N	027° 59.167950 E	153,11	-0,2	3,6	1,9	67	295	366
HHUMLT25	19.04.2025	19:59:59	635	CTD START	359	0,3	70° 34.150985 N	026° 43.440148 E	239,91	-1,2	3,1	6,2	80,4	270	0,19
HHUMLT25	19.04.2025	20:07:09	635	CTD STOPP	359	0,3	70° 34.153977 N	026° 43.560909 E	239,07	-1,1	3	8,1	81,5	259	0,07
HHUMLT25	19.04.2025	20:17:50	635	Triangular dredge START	360	0,9	70° 34.121560 N	026° 43.735717 E	241,01	-0,9	3,2	8,2	85,2	258	0,04
HHUMLT25	19.04.2025	20:42:25	635	Triangular dredge STOP	360	1,2	70° 33.653528 N	026° 43.492799 E	242,18	-0,3	3,1	9,7	77,7	273	0,005
HHUMLT25	19.04.2025	21:17:34	636	Box core (BC)	361	0,7	70° 33.319585 N	026° 43.991472 E	240,16	-0,1	2,9	7,7	65,9	276	- 0,001 2

HHUMLT25	19.04.2025	22:13:05	637	Box core (BC)	362	0,7	70° 33.339670 N	026° 45.357045 E	203,59	0,1	3,1	7,8	66	239	- 0,007
HHUMLT25	19.04.2025	22:36:39	638	Box core (BC)	363	0,7	70° 33.499612 N	026° 43.312494 E	241,6	0,1	3,1	8,4	66,1	237	- 0,008
HHUMLT25	20.04.2025	10:09:43	748	Triangular dredge START	364	1,9	70° 27.777508 N	024° 17.619307 E	50,97	-2,3	3,7	5,4	83,8	294	501
HHUMLT25	20.04.2025	10:20:21	748	Triangular dredge STOP	364	1,6	70° 28.092967 N	024° 17.467936 E	59,96	-1,2	3,9	6,3	77	286	661
HHUMLT25	20.04.2025	11:15:45	749	Box core (BC)	366	0,5	70° 28.016704 N	024° 17.407434 E	56,82	-1,9	3,8	8,4	86,9	317	96
HHUMLT25	20.04.2025	12:04:48	749	Box core (BC)	367	0,3	70° 28.019026 N	024° 17.432240 E	56,92	-2,2	3,7	7,6	85,1	268	451
HHUMLT25	20.04.2025	13:07:56	751	Box core (BC)	368	1,1	70° 28.106954 N	024° 17.458222 E	60,06	-1,2	3,9	8,3	71,7	281	643
HHUMLT25	20.04.2025	13:13:40	751	Box core (BC)	369	0,3	70° 28.063279 N	024° 17.470310 E	58,44	-1,3	3,8	9,3	70,1	281	264
HHUMLT25	20.04.2025	13:48:28	753	Box core (BC)	370	0,2	70° 29.830317 N	024° 15.422539 E	62,06	-2,8	3,9	6,7	93,5	330	192