

Cruise report - HHUMTBT26

R/V Helmer Hanssen

The Arctic University Museum of Norway

Tromsø–Bergen–Tromsø

May 2–10, 2026

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Introduction

HHUMTBT26 (Helmer Hanssen, University Museum, Tromsø–Bergen–Tromsø, 2026) was a research cruise conducted aboard the R/V Helmer Hanssen, a multi-purpose research vessel owned by UiT The Arctic University of Norway (Fig. 1). The cruise was organised and carried out by The Arctic University Museum of Norway, in cooperation with the UArctic Thematic Network on Arctic Marine Biodiversity and Artsdatabanken, and with participation from several research projects aimed at advancing our understanding of marine biodiversity, taxonomy, and ecosystem history in northern and central Norway.

The cruise covered a latitudinal transect along the Norwegian coast from Tromsø to Bergen and back, encompassing sub-Arctic, and boreal marine environments. This region includes a wide range of benthic habitats and strong environmental gradients, making it particularly suitable for studies of marine biodiversity, taxonomy, and ecosystem change. Despite a long history of marine research along the Norwegian coast, many benthic invertebrate groups remain insufficiently documented, particularly small-bodied meiofauna and taxonomically challenging groups such as Kinorhyncha, Platyhelminthes, Acanthocephala, Ostracoda, and Bivalvia. New, well-documented material from targeted sampling is therefore essential for taxonomy, biodiversity mapping, genomic studies, and long-term museum collections.

An important aim of the cruise was to obtain biological material for deposition in the museum collection, thereby supporting future taxonomic, morphological, molecular and biogeographical studies. By combining contemporary biodiversity sampling with sediment core analyses, the cruise aimed to generate material for both

present-day taxonomic studies and reconstructions of past ecosystem dynamics.

The primary objectives of the cruise were to collect marine fauna and sediment cores in support of six distinct research projects:

- 1. Scalidophora of Norway**, focusing on the diversity and distribution of scalidophoran fauna, particularly the phylum Kinorhyncha.
- 2. The diversity of benthic fauna in northern and central Norway**, with a special focus on Bivalvia and the enhancement of the museum's marine invertebrate collections.
- 3. Ecosystem reconstruction based on sediment ancient DNA (sedaDNA)**, using sediment cores to investigate past ecosystems.
- 4. Kinorhynch taxonomy**, aimed at improving the classification and understanding of Kinorhyncha.
- 5. Fish parasitic helminths of Norwegian waters**: a preliminary survey of Monogenea, Cestoda, Digenea, and Acanthocephala
- 6. Genome sequencing of the ostracod *Vargula norvegica* (Baird, 1860)**, to support genomic studies of this bioluminescent species.

Sampling was carried out at selected stations along the cruise track, targeting benthic habitats and sedimentary environments relevant to the six research projects. A box corer was used to collect sediment samples for studies of Scalidophora and kinorhynch taxonomy, while a triangular dredge was used to collect benthic fauna, including bivalves. Bottom trawling along the seabed

was used to catch fish. In addition, a gravity corer was deployed to obtain sediment cores for sedaDNA-based ecosystem reconstruction, and a handmade trap was used to collect ostracods for genomic studies of *Vargula norvegica*. The samples collected

during the cruise are expected to generate new species records, voucher specimens, genomic resources, sediment archives, and environmental data relevant to biodiversity research, ecosystem history, and conservation management.



Figure 1. R/V Helmer Hanssen in Tromsø harbour on May 2nd, 2026

The GBIF dataset of species recorded during the cruise can be found here:
<https://doi.org/10.15468/fdgeqy>

Itinerary

The cruise followed the planned route from Tromsø to Bergen and back to Tromsø. The actual ship track together with the planned sampling stations is shown in Fig. 2. Not

all planned stations were successfully sampled, due to weather conditions and time limitations.

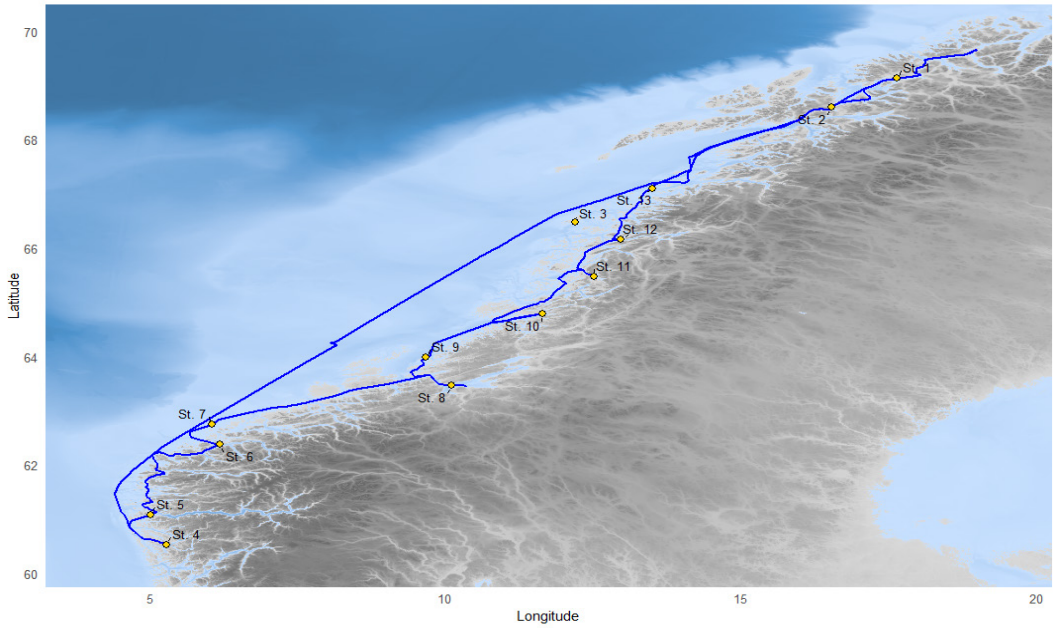


Figure 2. Ship track with planned stations marked. Not all planned sampling methods were used at every station, and Station 3 was omitted due to poor weather conditions.

Day 1, 02.05.2026

08:50 All participants were on board.

09:10 Departure from Tromsø.

09:15 Safety briefing.

10:00 Unpacking, laboratory preparation, and settling in on board.

17:00 Group meeting in the lecture hall.

Station 1

14:30 Cancelled. The station was cancelled due to strong winds of approximately 20 m s^{-1} , which would have caused excessive ship drift and made deployment of the box corer unsafe.

Station 2

18:57 **Station 2. CTD** (Fig. 3).

Depth: 86 m. Coordinates: $68.5945431^\circ \text{ N}$, $16.53237753^\circ \text{ E}$. Ship station: 333.

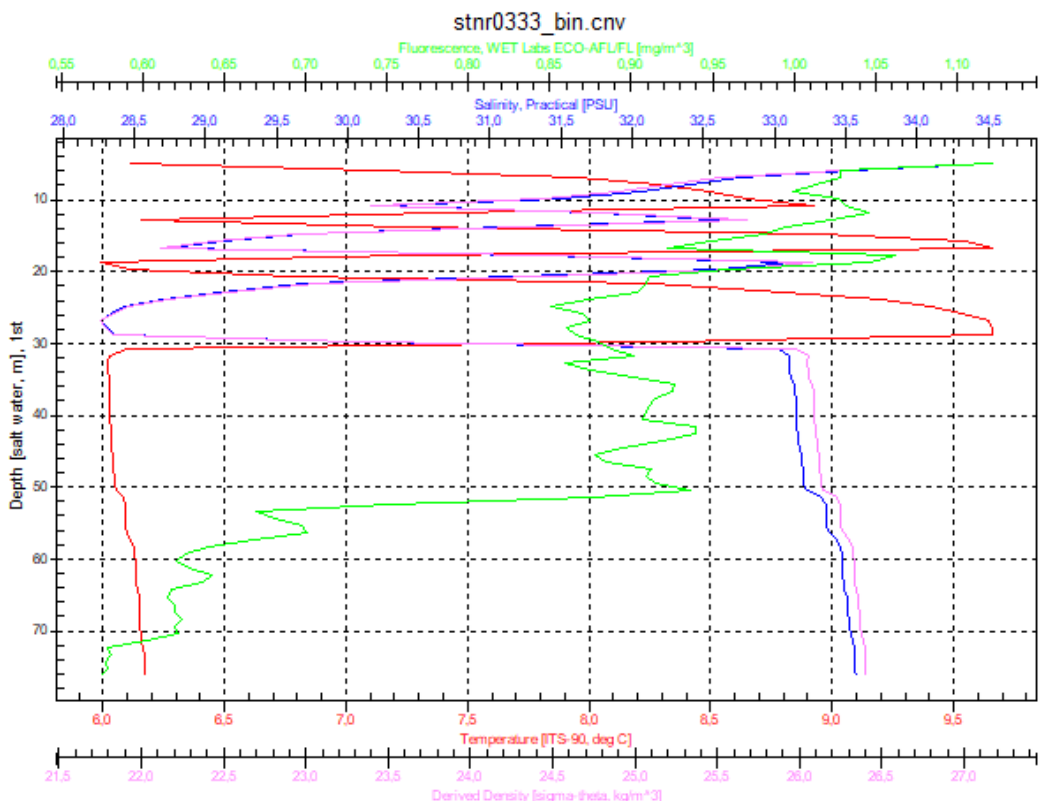


Figure 3. Station 2 CTD profile showing a stratified water column. The upper 30 m consisted of mixed water masses, ranging from warmer, relatively saline water to colder, less saline water, with moderate plankton abundance throughout this layer. This mixing was probably caused by tidal currents. From approximately 30 m depth, the temperature decreased rapidly and density increased, forming a distinct boundary layer. Fluorescence remained moderate in this zone, indicating the presence of plankton down to around 50 m depth. Below approximately 50 m, the water became denser and plankton levels decreased. Overall, the profile indicates a typical stratified system, with most phytoplankton activity concentrated just below the surface mixed layer.

19:08 Station 2. Triangular dredge.

Depth: 82 m. Coordinates: 68.59878° N, 16.534983° E. Ship station: 334.

The sediment was sandy and contained numerous holothurians (*Psolus phantapus*), sea urchins (*Briaster fragilis*, *Echinocardium cordatum*, and *Spatangus purpureus*), brittle stars (*Ophiura ophiura*, *Ophiopholis aculeata*, and *Amphilepis norvegica*), and bivalves (Figs. 5-6).

The bivalves collected included approximately 88 Anomiidae indet., approximately 50 *Arctica islandica*, two *Acanthocardia echinata*, one *Timoclea ovata*, and one *Clausinella fasciata*. One specimen of each spe-

cies, excluding Anomiidae, was flash-frozen in liquid nitrogen and stored at -80 °C. One specimen of *Acanthocardia echinata* and nine specimens of *Arctica islandica* were preserved in 96% ethanol.

From the triangular dredge sample, the following specimens were retained for the marine invertebrate collections at The Arctic University Museum of Norway: *Amphilepis norvegica*, three *Briaster fragilis*, *Echinocardium cordatum*, two *Psolus phantapus*, one *Epitonium* sp., and 11 scaphopods. All specimens were anaesthetised in 7% magnesium chloride and subsequently preserved in 75% ethanol.



Figure 4. Dredging in progress at Station 2.

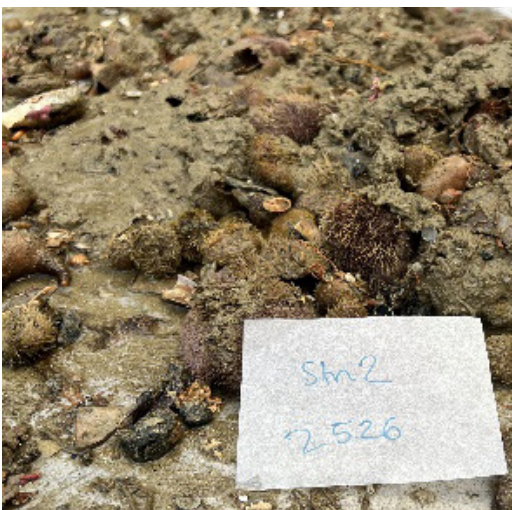


Figure 5. The catch at station 2, consisting of many holothurians, sea urchins, and bivalves.



Figure 6. Ane and Chahinez sorting the catch.



Figure 7. Sanne and Kerstin sorting specimens for subsequent species identification.



Figure 8. Environmental DNA sampling of box core #2 at Station 2.

~19:00–20:00 Station 2. Box core #1.

The core was retrieved without a complete seal. Water poured out during recovery, leaving the sediment surface slightly disturbed. The surface sediment was retained for bubble-and-blot treatment but was subsequently discarded.

20:11 Station 2. Box core #2.

Depth: 89 m. Coordinates: 68.59508327° N, 16.53743913° E. Ship station: 335.

Only the second box corer deployment was recorded in the ship log, as the first attempt was considered unsuccessful. Both box corer deployments shared the same coordinates and depth.

This coring attempt encountered a similar issue to box core #1, as the box corer was not completely sealed; however, the sample was considered satisfactory. The surface sediment was sampled for eDNA by Sanne (Fig. 8), and for meiofauna by Kasia, Federica, and Andreas. All remaining surface

sediment was collected for bubble-and-blot processing. Meiofauna samples were fixed in molecular-grade ethanol and 10% formalin.

After bubble-and-blot treatment, the remaining material was screened using a stereomicroscope. All adult kinorhynchs, commonly referred to as ‘mud dragons’, were picked out and fixed for further taxonomic and molecular analyses. In total, 44 mud dragon individuals belonging to Pycnophyidae, as well as two individuals of *Campyloides* (most likely, although this needs confirmation) were identified.

Part of the material was fixed in 99% ethanol for molecular analyses, while the remaining material was fixed in 10% formalin, equivalent to approximately 4% formaldehyde, for light microscopy (LM) and Scanning Electron Microscopy (SEM) investigations.

Other observations at Station 2.

Puffin (*Fratercula arctica*) and black-legged kittiwake (*Rissa tridactyla*) were observed.



Figure 9. Box core #2 after eDNA and meiofauna sampling.



Figure 10. Kasia sampling for meiofauna.



Figure 11. Stereomicroscope view showing representatives of kinorhynchans (mud dragons).

Day 2, 03.05.2026

No sampling activities were performed on Day 2 due to adverse weather conditions, including strong winds of up to 23 m s^{-1} and rough seas (Fig. 12). Most of the scientific crew were seasick.



Figure 12. Rough weather conditions led to the decision to omit Station 3.

Day 3, 04.05.2026

On the third day, two trawls were carried out.

11:30 Trawl 1.

Depth: 130 m. Start coordinates: 64.6329296° N, 8.71638067° E. Stop coordinates: 64.62235802° N, 8.7062474° E. Ship station: 336.

The first trawl (Figs. 13-16) yielded a catch of approximately 100 specimens. The parasitological survey was executed by C. Bouguerche, and the tasks spanned dissection, inspection of organs and collection of visible helminths, along with parasites identification. The sampled material included Norway redfish (*Sebastes viviparus*), pollock (*Pollachius virens*), and haddock (*Melanogrammus aeglefinus*). Upon retrieval, fish were rapidly sorted prior to processing. Specimens were humanely euthanised by a cranial blow followed by pithing to ensure immediate death and minimise tissue degradation. Standard external examination was performed prior to dissection. Following confirmation of death, gills and entire

intestinal tracts were excised, placed in individual containers, and preserved in 96% ethanol to ensure optimal fixation for subsequent morphological and molecular parasitological analyses.

Across the sampled hosts, a typical North Atlantic marine helminth fauna can be expected. Norway redfish commonly harbors digeneans such as *Brachyphallus crenatus* and *Derogenes varicus*, as well as larval nematodes (including the pathogenic *Anisakis simplex* and *Contracaecum* spp.), with occasional trypanorhynch cestode plerocercoids and rare acanthocephalans. Pollock is often more heavily infected and typically hosts a broad spectrum of helminths, including stomach and intestinal digeneans, abundant anisakid nematode larvae, trypanorhynch cestode larvae, and acanthocephalans. Haddock shows a similarly diverse assemblage, frequently including digeneans, nematode larvae, trypanorhynch cestodes, and intestinal acanthocephalans, with parasite transmission largely driven by trophic interactions within benthic and pelagic food webs.



Figure 13. Deployment and retrieval of a bottom trawl net on board the research vessel.



Figure 14. Freshly caught demersal fish sorted in onboard collection trays.



Figure 15. Dissection of fish on board carried out by C. Bouguerche.

15:29 Trawl 2.

Depth: 356 m. Start coordinates: 64.2266631° N, 8.14329553° E. Stop coordinates: 64.2185989° N, 8.16558618° E. Ship station: 337.

This trawl for fish parasitic survey yielded a diverse assemblage of teleosts, elasmobranchs, and chimaeras (Figs. 17-20). The teleost component comprised 12 Atlantic argentine (*Argentina silus*), 3 common ling (*Molva molva*), 2 saithe (*Pollachius virens*), and 1 Norway redfish (*Sebastes viviparus*), while the elasmobranch component included 9 velvet belly lanternsharks (*Etmopterus spinax*) and 6 blackmouth catsharks (*Galeus melastomus*). The capture of chimaeras was a notable success of this trawling station, a representative of an enigmatic subclass of Chondrichthyes and hosts to phylogenetically ancient parasite lineages found exclusively in this group, notably the Chimaericolidae (Monogenea) and Gyrocotylidae (Cestoda), both of which were observed



Figure 16. Internal organs (digestive tract and associated tissues) removed for parasitological examination and preservation. Arrows indicate helminth parasites visible to the naked eye within the tissues: right arrows indicate nematodes, and left arrows indicate trematodes.

during fish dissection by C. Bouguerche. All teleosts, elasmobranchs, and chimaeras were euthanized by a percussive blow to the head followed by pithing.

All specimens are to be examined for helminth parasites through systematic inspection of gills, oral cavity, stomach, intestines, liver, and body cavity, with the spiral valve intestine of elasmobranchs dissected separately as the primary site for cestode recovery. For elasmobranchs and chimaeras, the olfactory rosettes (nostrils) were additionally examined and processed as a potential site for monogenean recovery. Prior to dissection, each olfactory rosette was thoroughly rinsed to dislodge loosely attached parasites and other material, and the resulting washings were collected and preserved separately for subsequent examination under a stereomicroscope. After rinsing, the olfactory rosettes themselves were preserved and later screened for attached monogeneans. The olfactory tissues were collected and processed



Figure 17. The catch from Trawl 2, obtained for parasitological sampling, comprising a diverse deep-water assemblage of teleosts, elasmobranchs, and chimaeras, alongside *Funiculina quadrangularis* sea pens.

according to the same protocols used for other host organs.

Further helminth fauna of this catch is expected to reflect the diversity typical of northeast Atlantic deep-water assemblages; nematodes of the genus *Anisakis* are anticipated to be the most prevalent across all teleost species, alongside *Hysterothylacium aduncum* and *Pseudoterranova decipiens*, while digeneans such (*Derogenes* spp. and *Hemiurus* spp., several of which were observed during dissection) are likely to occur in the stomach and intestines of the teleosts. In the elasmobranchs, trypanorhynch



Figure 18. C. Bouguerche with a specimen of *Chimaera monstrosa* (rabbitfish) recovered from the trawl.

tapeworms of the genera *Grillotia* and *Ditrachybothridium* are expected to dominate, particularly in the blackmouth catshark, alongside *Otodistomum* spp., and monogeneans of the genus *Erpocotyle* may additionally be recovered from the gill surfaces of the sharks.

From this trawl, the following specimens were retained and preserved for the collections at The Arctic University Museum of Norway: four *Asteronyx loveni*, two *Parastichopus tremulus*, and five sea pens (*Funiculina quadrangularis*). All specimens were preserved in 75% ethanol.



Figure 19. Laboratory processing of *Funiculina quadrangularis* specimens, with *Asteronyx loveni* brittle stars visible in the foreground, collected in association with the sea pens.



Figure 20. Specimens of elasmobranchs and chimaeras laid out prior to parasitological dissection for parasite recovery, during which the olfactory rosettes (nostrils) were examined as a potential site for monogenean (Platyhelminthes) parasites.

Day 4, 05.05.2026



Figure 21. Calmer seas and better weather on Day 4.

Station 4

18:52 Station 4. CTD #1.

Depth: 469 m. Coordinates: 60.5320309° N, 5.3043479° E. Ship station: 338.

Due to a technical error, no data were recorded.

19:19 Station 4. Gravity corer.

Depth: 521 m. Coordinates: 60.5322133° N, 5.3063418° E. Ship station: 339.

The 5 m-long gravity corer was prepared and deployed by the ship's crew (Fig. 22). A 3.9 m sediment core was successfully retrieved on the first attempt from a water depth of 521 m.

The sediment core was subsequently split into four sections (Figs. 23-25), ranging in length from 90 cm for Section 1 to 100 cm for Sections 2–4. Filip cut the sections using

a clean and disinfected saw. The saw blade was cleaned with seawater between each cut and disinfected using the flame from a hand-held mini burner. The core liners were cleaned, and the section ends were capped, labelled, and sealed with elastic electrical tape and sturdy gaffa-tape. The sediment consisted of fine clay.

Andreas was responsible for correct core labelling, using Bergen, BG, for the locality and Kerstin Glaus, KG, to indicate the project/responsible researcher, as well as marking the orientation of the core. Sanne cleaned and sealed the core liners together with Kerstin, who capped the core liners. Each section was labelled and stored in the cold room at approximately 4 °C until transport to, and later processing at, the ancient DNA laboratory at Tromsø Museum.



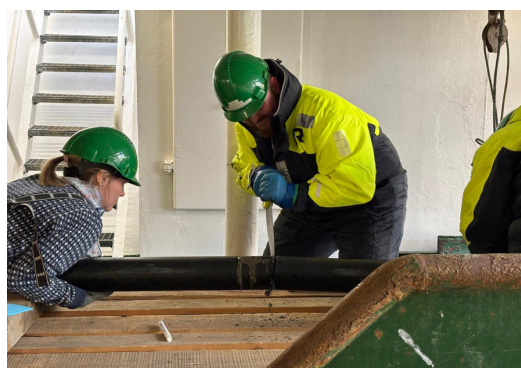
Figure 22. The crew prepares for gravity core sampling outside Bergen.



Figure 23. Processing of gravity core.



Figure 24. Planning of workflow prior to cutting.



←Figure 25. Cutting the core into ~1 m segments using a sterilized saw.



Figure 26. Secure storage solution for storing core segments vertically on board.

19:51 Station 4. CTD #2 (Fig. 27).

Depth: 509 m. Coordinates: 60.5323295° N,
5.3054230° E. Ship station: 340.

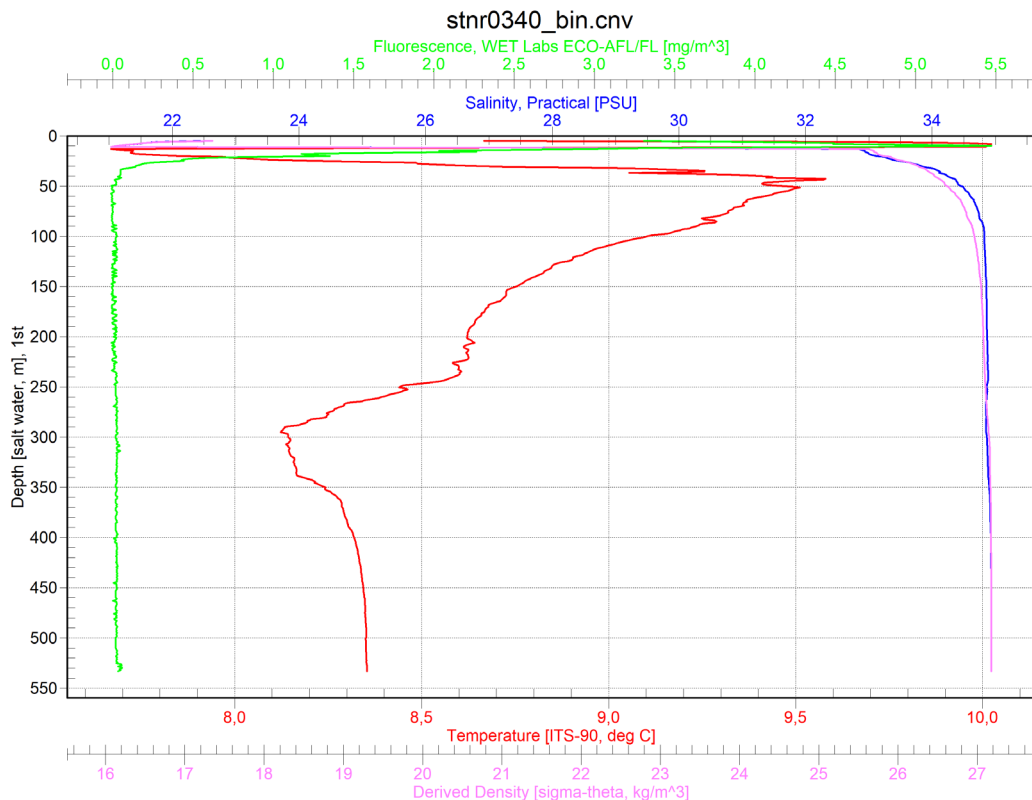


Figure 27. Station 4 CTD #2 profile showing a strongly stratified water column with a warm surface layer overlying cooler, more homogeneous deep water. Temperature decreases from about 10 °C at the surface to ~8.3°C below 300 m, forming a pronounced thermocline between roughly 50 and 200 m; salinity is relatively low at the surface (~32 PSU). Fluorescence (a proxy for chlorophyll) displays a clear subsurface maximum around 20–30 m, suggesting a phytoplankton layer positioned just below the surface where light is still available and nutrients are more accessible, while values drop sharply below ~40 m. The profile is consistent with stratified, Atlantic-influenced conditions with a shallow mixed layer, and a distinct subsurface chlorophyll maximum.

21:15 Station 4. Box corer.

Depth: 509 m. Coordinates: 60.5323295° N, 5.3054230° E. Ship station: not logged.

Deployment of the box corer was successful; it was retrieved full and undisturbed. The sediment was, however, very dark and slimy (Fig. 30). The surface sediment was sampled for eDNA by Sanne, and for meiofauna by Kasia, Federica, and Andreas. All remaining surface sediment was collected for bubble-and-blot processing. Meiofauna

samples were fixed in molecular-grade ethanol and 10% formalin.

After bubble-and-blot treatment, the remaining material was screened using a stereomicroscope, but very few meiofaunal organisms were present, including nematodes. Only two kinorhynch individuals, most probably belonging to *Campyloderes* — although this will be checked and confirmed later — were found. These were fixed in 99% ethanol for further molecular analyses.

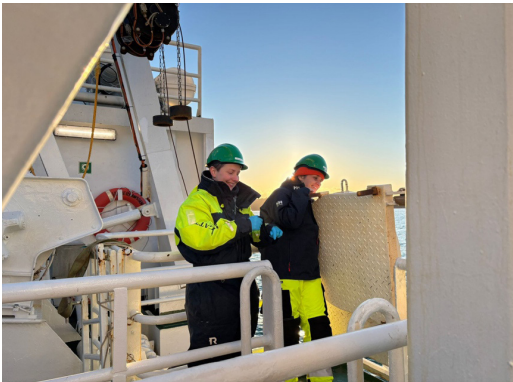


Figure 28. Kasia and Federica waiting for the box corer at Station 4.



Figure 29. Label preparation at Station 4.



Figure 30. Surface appearance of box core at Station 4, showing dark colour and loose texture.

A single individual of the sipunculid *Golfingia vulgaris* was found in the sediment from the box core at Station 4. This specimen was anaesthetised with 7% magnesium chloride and preserved in 75% ethanol for the marine invertebrate collection at The Arctic University Museum of Norway.

Other observations at Station 4.

A flock of seven male and two female eider ducks (*Somateria mollissima*) was observed.

Station 4. Triangular dredge.

Cancelled. The triangular dredge was omitted at Station 4 due to the water depth.

Day 5, 06.05.2026

Station 5

02:29 Station 5. CTD (Fig. 31).

Depth: 178 m. Coordinates: 61.0776960° N,
5.0405193° E. Ship station: 341.

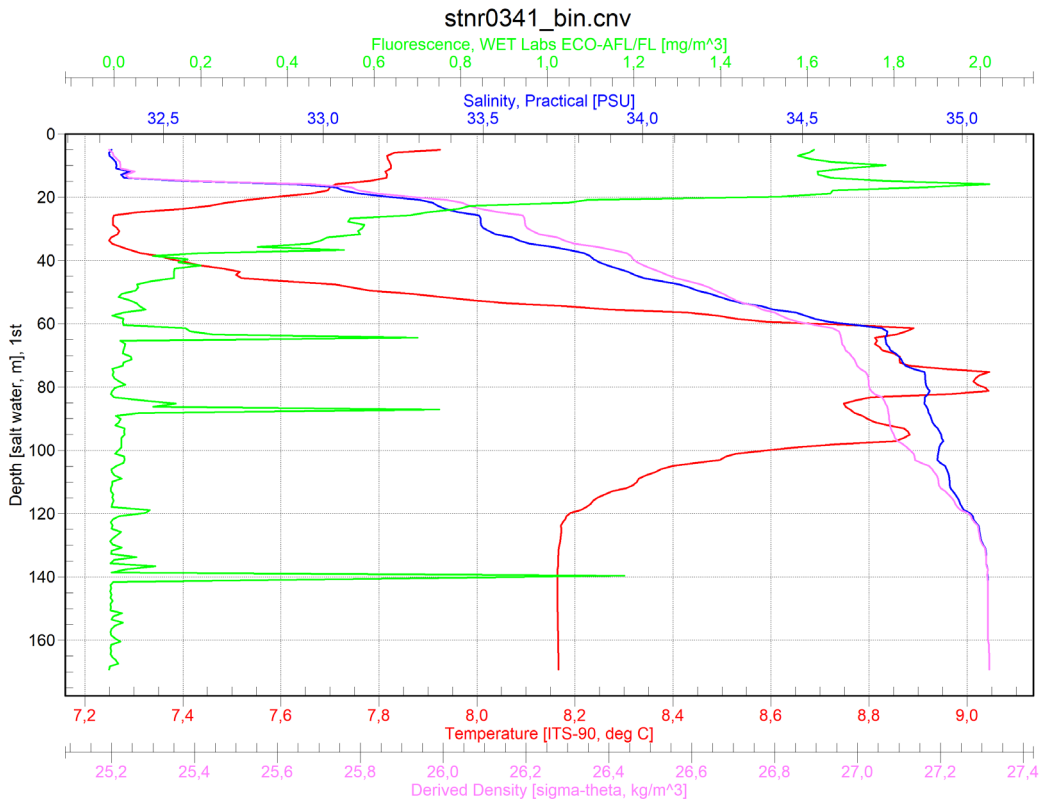


Figure 31. Station 5 CTD profile showing a moderately stratified water column with a shallow mixed layer (~0–20 m). Salinity increases with depth from ~32.5 PSU at the surface to ~35 PSU below ~100 m, producing a halocline and corresponding density gradient. Fluorescence is relatively low overall but shows small subsurface peaks around ~20 m, indicating limited phytoplankton biomass concentrated near the base of the mixed layer.

02:43 Station 5. Box corer.

Depth: 178 m. Coordinates: 61.0781293° N, 5.0410809° E. Ship station: 342.

Deployment of the box corer was successful; it was retrieved full and undisturbed. The surface was covered with pebbles and larger stones (Fig. 32). The upper few centimetres of sediment were very coarse and loose, while the deeper sediment was highly compacted, sticky, and clay-like.

The surface sediment was sampled for eDNA by Sanne, and for meiofauna by Kasia, Federica, and Andreas. The upper stony layer was processed separately using freshwater shock treatment. All remaining surface sediment was collected for bubble-and-

blot processing. Meiofauna samples were fixed in molecular-grade ethanol and 10% formalin.

After bubble-and-blot treatment, the remaining material was screened using a stereomicroscope. As at the previous station, very few meiofaunal organisms were present, except for a few ostracods and copepods. Only four mud dragon individuals were found: two Pycnophyidae and two *Campyloderes*. These were fixed in 99% ethanol for further molecular analyses.

A very small bivalve (~1 mm) was found in the meiofauna sample. It was identified by Filip as *Bathyarca* sp. and flash-frozen in liquid nitrogen for storage at -80 °C.



Figure 32. Surface appearance of box core at Station 5, showing rocks and pebbles.

Station 6

14:51 Station 6. CTD (Fig. 33).

Depth: 429 m. Coordinates: 62.3780230° N,
6.2014257° E. Ship station: 343.

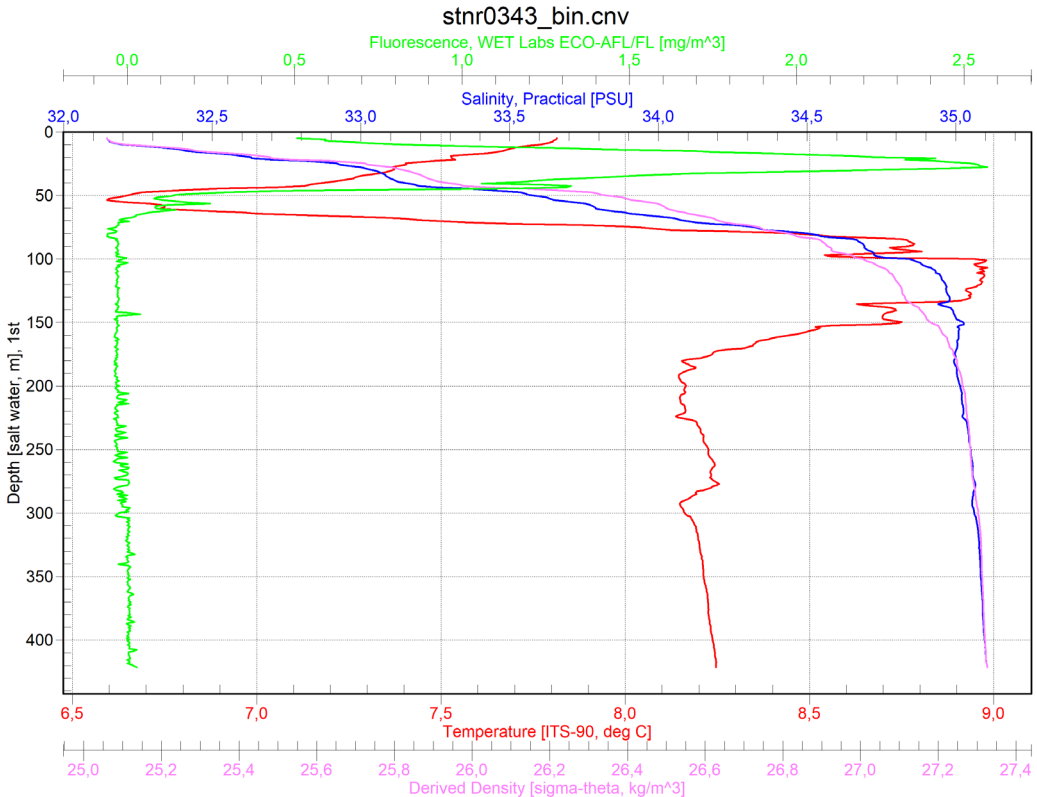


Figure 33. Station 6 CTD profile showing a stratified water column with a shallow, relatively fresh and cooler surface layer (0–50 m; ~32–33 PSU, ~7.5–7.8 °C) overlying warmer, more saline Atlantic Water below. Below ~120 m, the water column is relatively homogeneous, consisting of warm, saline, and dense Atlantic-type water. Fluorescence is highest in the upper ~50 m and declines rapidly with depth, indicating surface-confined phytoplankton production.

15:09 Station 6. Box corer.

Depth: 429 m. Coordinates: 62.378376° N, 6.200638° E. Ship station: 344.

The box core was retrieved successfully. The sediment was relatively loose and well hydrated (Fig. 34). Samples were collected for meiofauna and eDNA analyses (Fig. 35). The surface sediment was also collected, and Kinorhyncha specimens were extracted using the bubble-and-blot method.

The meiofauna and eDNA samples were preserved accordingly, and the extracted material was further processed under a stereomicroscope. A total of 35 Kinorhyncha specimens were found, mostly belonging to

the genus *Echinoderes*, although representatives of other genera were also present. Part of the material was preserved in 99% ethanol for further molecular analyses, while the remaining specimens were designated for taxonomic studies using light microscopy and scanning electron microscopy.

A single individual of the sipunculid *Golfingia vulgaris* was found in the sediment from the box core at Station 6. This specimen was anaesthetised with 7% magnesium chloride and preserved in 75% ethanol for the marine invertebrate collection at The Arctic University Museum of Norway.

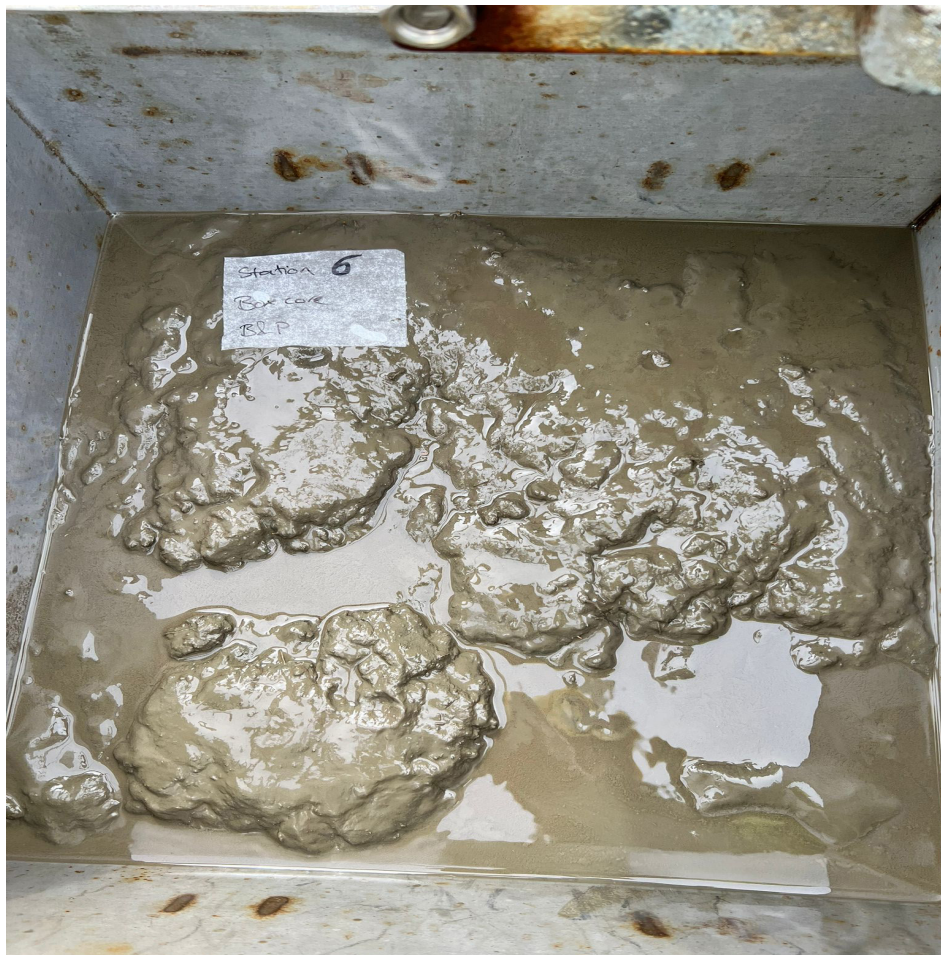


Figure 34. Surface appearance of box core at Station 6, showing loose, hydrated sediment.



Figure 35. Sampling for eDNA at the box core.



Figure 36. Sampling for meiofauna.



Figure 37. Sample processing at the box core.



Figure 38. Sample processing at the box core.



Figure 39. Cruising onwards after Station 6. Picture taken at 15:37.

Station 6. Triangular dredge.

Cancelled. Due to the great water depth at station 6, it was decided to omit dredging and instead save time by cruising to the next station.

Station 7

18:54 Station 7. CTD (Fig. 40).
Depth: 65 m. Coordinates: 62.7424113° N,
6.0776419° E. Ship station: 345.

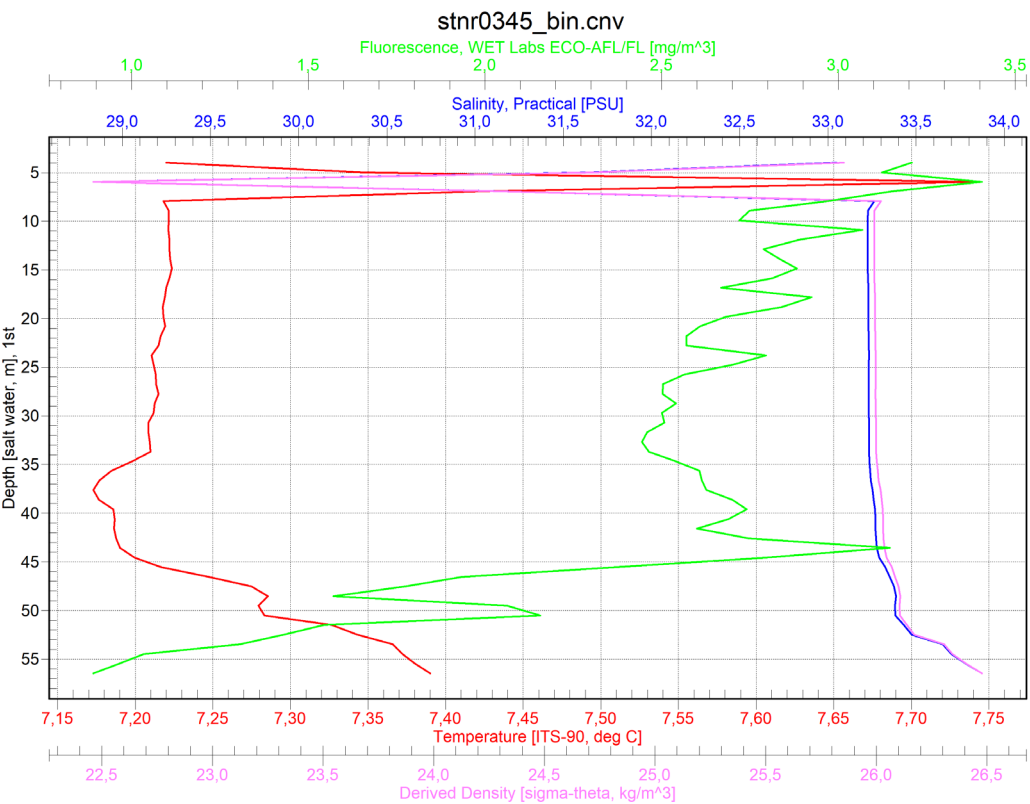


Figure 40. Station 7 CTD profile showing a shallow, weakly stratified water column with fresh surface water overlying more saline water below. Fluorescence shows a subsurface maximum (~10–40 m) and declines below ~50 m, indicating reduced productivity at depth.

19:04 Station 7. Triangular dredge.

Depth: 65 m. Coordinates: 62.740380° N, 6.076694° E. Ship station: 346.

The substrate consisted of hard bottom with stones varying in size from small pebbles to approximately fist-sized cobbles (Figs. 41-42). The fauna was sparse, but the organisms recorded included starfish, tunicates, worms, bryozoans, and red algae. At

this station the brachiopods *Terebratulina retusa*, and *Novocrania anomala* were taken and flash frozen in liquid nitrogen for potential genome sequencing.

Three living bivalves were found at this station, one Anomiidae indet., one *Parvicardium pinnulatum*, and one *Palliolium tigrinum*. The latter two were flash-frozen in liquid nitrogen and stored at -80 °C.



Figure 41. Content of the triangular dredge at Station 7.

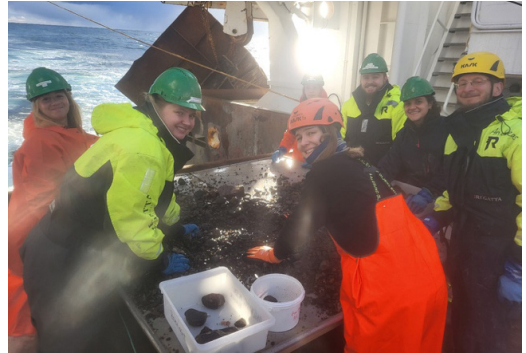


Figure 42. The team searching through the rocky contents of the triangular dredge for macrofauna at Station 7.

Station 7. Box corer.

Cancelled. The box corer was omitted at Sta-

tion 7 due to hard-bottom conditions, with rocks and no fine sediment present.

Day 6, 07.05.2026

08:00 Sanne leaves the ship in Trondheim (Fig. 43).



Figure 43. Sanne leaves the cruise at Trondheim as planned, transported aboard a Polarcirkel workboat.

Station 8

10:37 Station 8. CTD (Fig. 44).
Depth: 496 m. Coordinates: 63.4721469° N,
10.1032958° E. Ship station: 347.

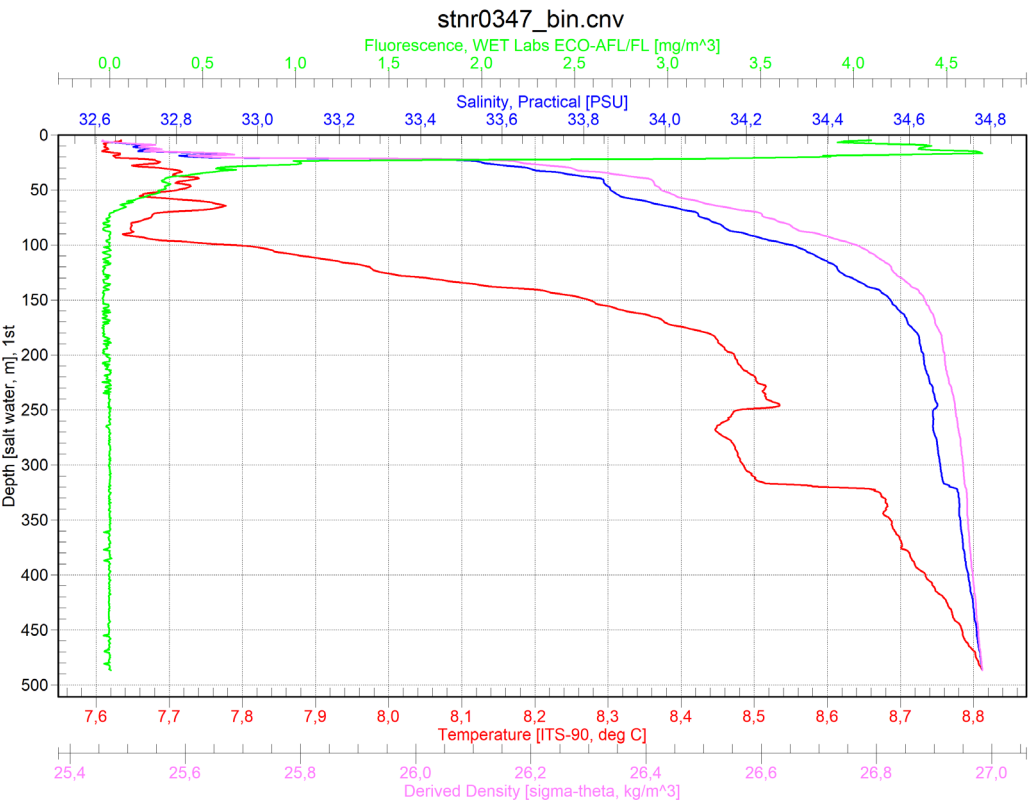


Figure 44. Station 8 CTD profile showing a stratified water column with a relatively fresh and cooler surface layer (~32.6–33.2 PSU; ~7.6–7.8 °C). Below ~150 m, warm, saline Atlantic-type water dominates (T ~8.5–8.8 °C; S ~34.5–34.8 PSU) with weak vertical gradients. Fluorescence is confined to the upper ~50 m.

10:38 Station 8. Box corer.

Depth: 495 m. Coordinates: 63.4721766° N, 10.1036319° E. Ship station: 348.

Deployment of the box corer at Station 8 was successful, and the box corer was recovered full, with a largely undisturbed sediment surface. The sediment consisted of very dark grey-brown, fine-grained mud with a soft and slimy consistency (Fig. 45). A thin layer of overlying water was present, and only minor surface irregularities were observed along the margins of the core.

Surface sediment was subsampled for meiofauna analyses by Kasia, Federica, and

Andreas. The remaining surface sediment was retained for bubble-and-blot processing. Meiofauna samples were fixed in molecular-grade ethanol and 10% formalin.

After bubble-and-blot treatment, the samples were screened under a stereomicroscope. Only representatives of *Echinoderes* were found. The most common species were *Echinoderes unispinosus* and *Echinoderes higginsii*. In total, more than 60 individuals were found. Part of the material was fixed for further molecular analyses, and part was fixed for taxonomic analyses using light microscopy and scanning electron microscopy.



Figure 45. Surface subsampling of box core at Station 8.

11:05 Station 8. Triangular dredge.

Depth: 496 m. Coordinates: 63.472728° N, 10.126276° E. Ship station: 349.

The substrate consisted of thick mud with very little benthic fauna (Fig. 46). Only one sea urchin (*Brisaster fragilis*), a damaged sipunculid, and polychaete fragments were

found in the mud. Two helmet jellyfish (*Periphylla periphylla*) were also found, likely caught in the water column during dredge recovery.

The sea urchin, *Brisaster fragilis*, was taken for the marine invertebrate collection at The Arctic University Museum of Norway.



Figure 46. Contents of triangular dredge at Station 8, showing thick mud.



Figure 47. The team sorting through the sediment for benthic invertebrates.

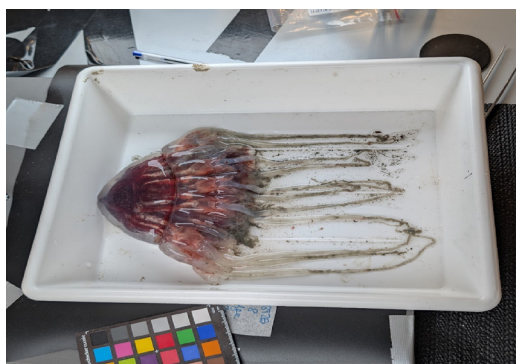


Figure 48. A helmet jellyfish (*Periphylla periphylla*) found in the mud, likely caught in the dredge on the way up.

Station 9

16:17 Station 9. CTD 1 (Fig. 49).
Depth: 35 m. Coordinates: 63.978853° N,
9.688374° E. Ship station: 350.

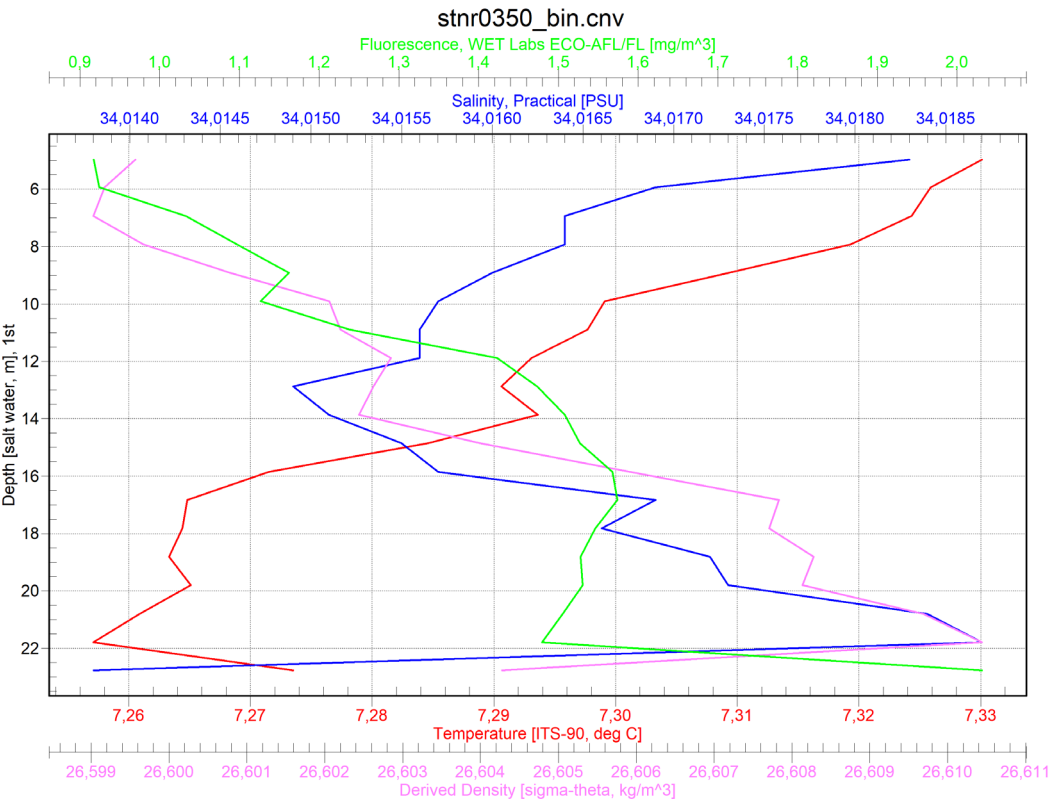


Figure 49. Station 9 CTD profile 1 showing a shallow water column with nearly uniform temperature throughout. Salinity is also relatively constant, indicating well-mixed conditions. Density varies only slightly with depth, reflecting the minimal vertical gradients. Fluorescence exhibits a small subsurface maximum.

16:32 Station 9. Triangular dredge.

Depth: 41 m. Coordinates: 63.977333° N, 9.688836° E. Ship station: 351.

The dredge contained no substrate material, indicating a hard seafloor consisting of smooth rock (Figs. 50-52). A rich echinoderm fauna was found at this location, including three large common sea urchins (*Echinus esculentus*) and a variety of starfish:

Henricia sp., *Asterias rubens*, *Leptasterias muelleri*, and *Stichastrella rosea*. Other fauna included the brittle star *Ophiopholis aculeata*, the bryozoan *Reteporella* sp., and an unidentified tunicate.

The starfish *Stichastrella rosea* was retained for the marine invertebrate collection at The Arctic University Museum of Norway and preserved in 75% ethanol.



Figure 50. The contents of the triangular dredge at Station 9, showing a complete lack of substrate material and conspicuous large sea urchins (*Echinus esculentus*).



Figure 51. Ane and Vanessa labelling parts of the catch.



Figure 52. A variety of echinoderms and other invertebrates found at this station.

17:08 Station 9. CTD 2 (Fig. 53).

Depth: 458 m. Coordinates: 64.027528° N,
9.762433° E. Ship station: 352.

Because of the hard substrate at station 9, we
moved to the next potential soft-sediment
site for box coring.

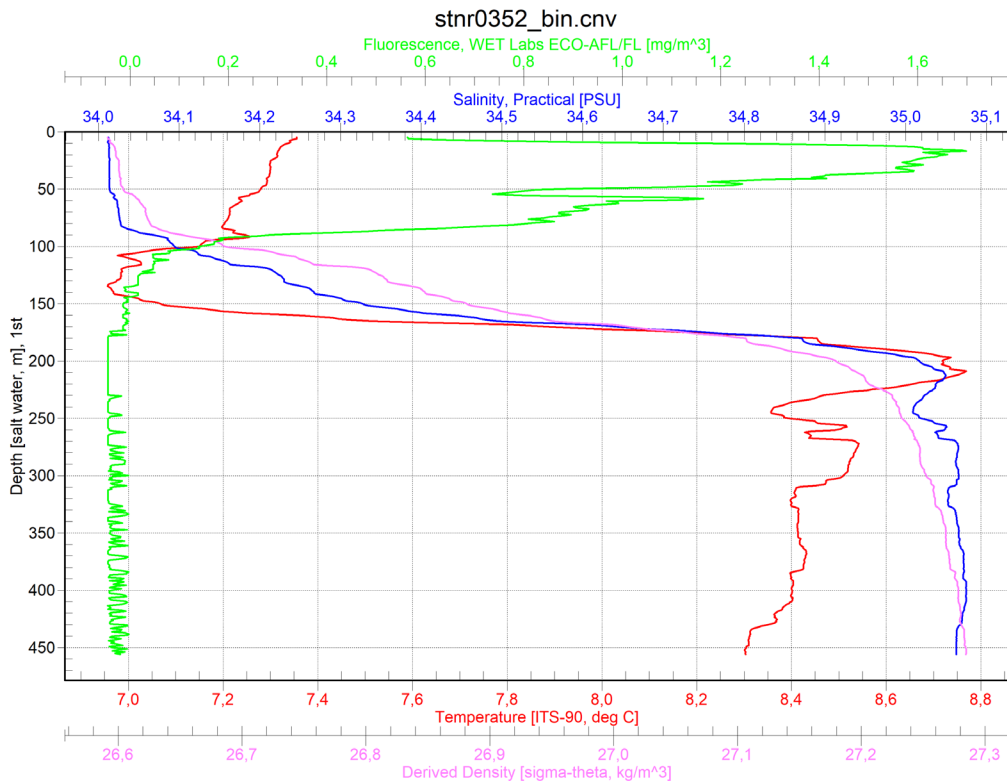


Figure 53. Station 9 CTD profile 2 showing a stratified water column with a cooler, fresher surface layer (~34.0–34.3 PSU; ~7.0–7.3 °C). A pronounced halocline and pycnocline extend from ~50 to 200 m, with steadily increasing salinity, temperature, and density. Below ~170 m, warm, saline Atlantic-type water dominates (T ~8.4–8.8 °C; S ~34.8–35 PSU) with weaker gradients. Fluorescence is confined to the upper ~100 m, showing a subsurface maximum.

17:25 Station 9. Box corer.

Depth: 454 m. Coordinates: 64.027597° N, 9.761815° E. Ship station: 353.

The CTD and box corer were deployed and retrieved at the nearest possible position with soft sediment. The surface sediment was sampled for eDNA and meiofauna. All remaining surface sediment was collected for bubble-and-blot processing. Meiofauna samples were fixed in molecular-grade ethanol and 10% formalin.

After bubble-and-blot treatment, the remaining material was screened using a stereomicroscope, and all adult kinorhynchs were picked out and fixed for further

taxonomic and molecular analyses. In total, approximately 60 mud dragon individuals were found, belonging mostly to *Echinoderes* (Fig. 54-55). Preliminary examination of several specimens under the microscope indicated that the material contained at least five species, including *Echinoderes unispinosus*, *E. peterseni*, *E. higginsii*, *E. juliae* aff., and an unidentified species morphologically similar to *E. drogoni*.

Part of the material was fixed in 99% ethanol for further molecular analyses, while the remaining material was fixed in 4% formalin for light microscopy and scanning electron microscopy investigations.



Figure 54. Example *Echinoderes* kinorhynchs found at Station 9. Here: *Echinoderes juliae* aff.



Figure 55. Example *Echinoderes* kinorhynchs found at Station 9. Here: *Echinoderes higginsii*.



Figure 56. Cruising on after station 9. Picture taken at 18:38

Day 7, 08.05.2026

Station 10

00:50 Station 10. CTD (Fig. 57).

Depth: 222 m. Coordinates: 64.7841457° N,
11.6518193° E. Ship station: 354.

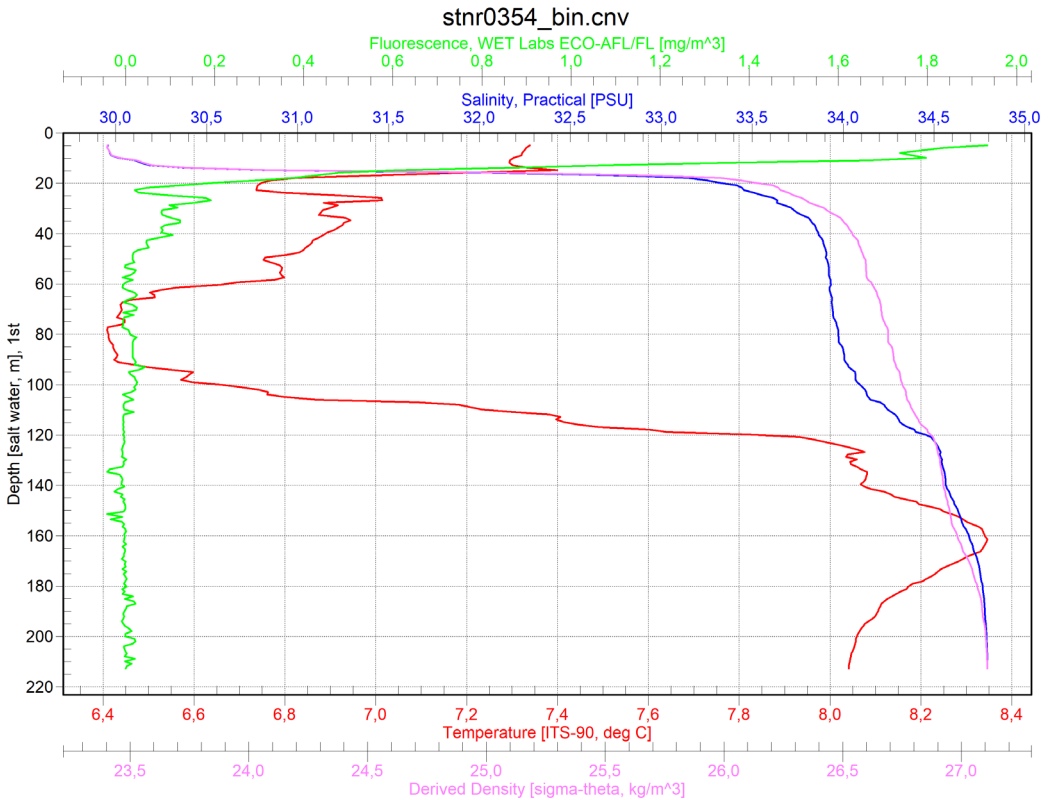


Figure 57. Station 10 CTD profile showing a stratified water column with a fresh and relatively cool surface layer (~30–31 PSU; ~6.8–7.4 °C) in the upper ~20 m. Below ~120 m, warm, saline Atlantic-type water dominates (T ~8.0–8.3 °C; S ~34–34.5 PSU) with weaker vertical gradients. Fluorescence is confined to the upper ~40 m, indicating surface-enhanced productivity and low biomass in deep, light-limited waters.

01:11 Station 10. Box corer.

Depth: 223 m. Coordinates: 64.784498° N, 11.651376° E. Ship station: 355.

An alternative location was chosen for the planned Station 10 to ensure a safe distance from three nearby aquaculture facilities. The box corer was retrieved successfully and processed immediately (Figs. 58-59). Sediment samples were collected upon retrieval of the box core for sorting of benthic material and associated marine fauna.

As at previous stations, the sediment was sampled for eDNA and meiofauna, and the remaining surface sediment was pro-

cessed using the bubble-and-blot method to extract mud dragons. In the morning, the samples were examined for kinorhynchs using a stereomicroscope. This proved to be the most abundant station for kinorhynchs so far, with a total of approximately 70 specimens found. As at Station 9, representatives of *Echinoderes* were dominant, but members of Pycnophyidae were also present. Among the *Echinoderes*, a similar species composition to that of the previous station can be expected, with a relatively high proportion of *E. juliae* aff. and *E. higginsi*.



Figure 58. Smooth sediment surface of box core at Station 10.



Figure 59. Processing of surface sediment for kinorhynch extraction.

01:50 — Station 10. Triangular dredge.

Depth: 225 m. Coordinates: 64.784374° N, 11.638930° E. Ship station: 356.

The successful triangular dredge sample was sorted on deck during the night. The benthic catch included several sea cucumbers (*Parastichopus tremulus*) (Figs. 60-61), sea pens (*Pennatula phosphorea*), the starfish *Psilaster andromeda*, and various gastropods, including *Aporrhais serresiana* and *Scaphander punctostriatus*.

From the triangular dredge sample, the following specimens were retained for the marine invertebrate collection at The Arctic University Museum of Norway: two *Psilaster andromeda*, seven *Aporrhais serresiana*, one *Scaphander punctostriatus*, and several individuals of *Pennatula phosphorea*. All specimens, apart from *P. phosphorea*, were anaesthetised with 7% magnesium chloride and preserved in 75% ethanol.



Figure 60. The contents of the triangular dredge at Station 10, with little to no substrate material, and many sea cucumbers (*Parastichopus tremulus*).



Figure 61. Team at the sorting table of station 10.



Figure 62. Fine field work conditions. Picture taken at 09:20.

11:57 Station 11. Ostracod trap.

Depth: 430 m. Coordinates: 65.560013° N, 12.367899° E. Ship station: 357.

The ostracod trap (Fig. 63) was deployed in Velfjorden at a depth of 430 m. and recovered later that day after Station 11 was done (see below).



Figure 63. Ostracod trap (the grey tube with attached bottles and chain) before deployment. →

13:07 Station 11. CTD (Fig. 64).

Depth: 250 m. Coordinates: 65.486166° N,
12.511696° E. Ship station: 358.

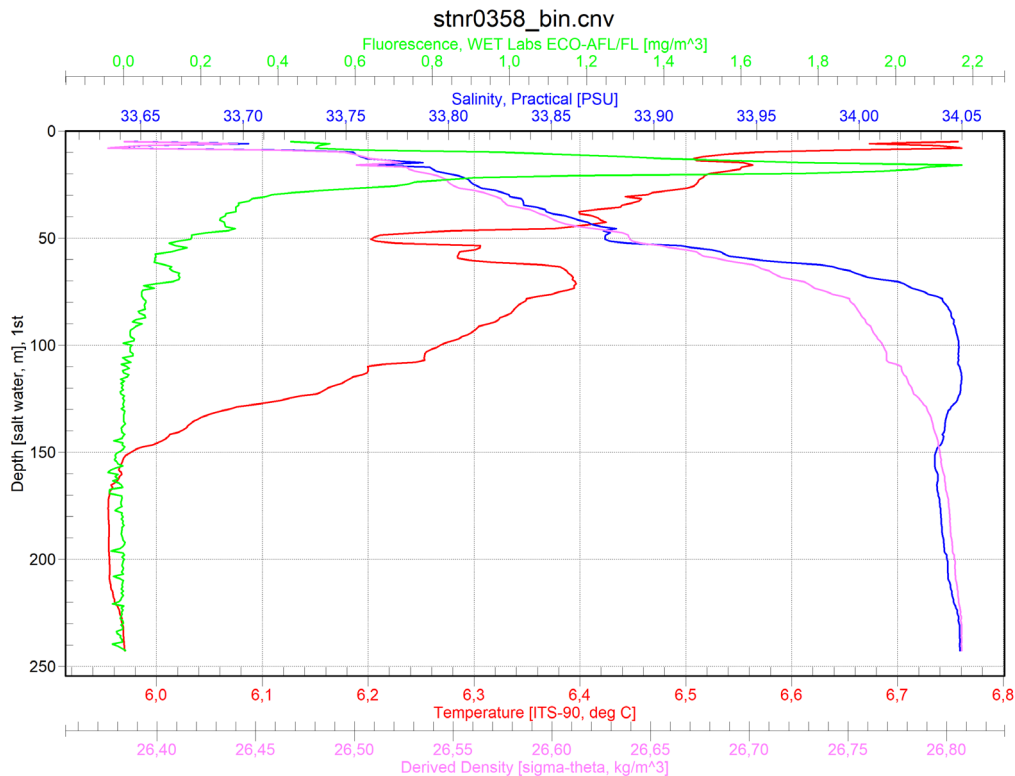


Figure 64. Station 11 CTD profile showing a moderately stratified water column with a relatively fresh surface layer (~33.65–33.8 PSU; ~6.6–6.7 °C). A clear halocline and pycnocline occur between ~30 and 80 m, with increasing salinity, temperature, and density. Below ~80–100 m, warmer, more saline and denser Atlantic-type water dominates, becoming relatively uniform with depth. Fluorescence is highest in the upper ~50 m, with a clear peak at ~20 m.

14:22 Station 11. Box corer.

Depth: 271 m. Coordinates: 65.489473° N, 12.503926° E. Ship station: 359.

The first deployment attempt encountered a problem with the box corer, which had to be fixed before sampling could continue. The box corer was eventually retrieved successfully. The box was almost full and contained muddy sediment that was relatively loose and light brown in colour (Figs. 65-67).

A standard set of samples were collected, as at the previous stations. Meiofauna sam-

ples were preserved in ethanol and formalin, while eDNA samples were frozen immediately after collection. In the sediment processed using the bubble-and-blot method, just under 40 Kinorhyncha specimens were found, belonging in roughly similar proportions to the genus *Echinoderes* and to Pycnophyidae. Fifteen specimens were designated for molecular analyses, while the remaining specimens were used for taxonomic studies using light microscopy (LM) and scanning electron microscopy (SEM).



Figure 65. Preparation of box corer at Station 11.



Figure 66. Deployment of box corer at Station 11.



Figure 67. Surface appearance of box core at station 11, consisting of loose, light brown sediment.

15:04 Station 11. Triangular dredge.

Depth: 407 m. Coordinates: 65.496579° N, 12.477579° E. Ship station: 360.

The triangular dredge sample was sorted on deck after collection. The haul contained mixed seafloor material, including algae, sediment, shell fragments, and benthic invertebrates recovered from the seabed (Fig. 68). The catch included five different types of sponges, all of which were retained for the marine invertebrate collection at The Arctic

University Museum of Norway. Other invertebrates preserved for the museum included one polychaete of the family Scalibregmatidae and one shrimp of the genus *Pasiphaea*. One specimen of *Macandrevia cranium* was dissected and soft tissue flash frozen for genome sequencing (Andreas).

Living bivalves found at this station were two *Nucula nitidosa* and five *Astarte sulcata*. They were all flash-frozen in liquid nitrogen and kept at -80 °C.



Figure 68. Contents of triangular dredge at Station 11, with visible sponges and polychaete tubes.

15:59 Station 11. Ostracod trap retrieval.

Depth: 433 m. Coordinates: 65.560979° N, 12.365660° E. Ship station: 361.

The ostracod trap deployed earlier at Station 11 was retrieved successfully. More than 20 individuals of *Vargula norvegica* were successfully sampled (Fig. 70) and subsequently starved before fixation in liquid nitrogen.

Two hagfish specimens were also recovered from the ostracod trap (Fig. 69). Both

specimens were transported to the laboratory and dissected by C. Bouguerche shortly after collection. A complete examination was conducted, during which the body cavity was opened, and the internal organs were removed to be inspected for parasites individually. Particular attention was given to organs commonly harbouring endoparasitic helminths, including the digestive tract, liver, gall bladder, and other visceral organs that were carefully removed and preserved in ethanol 96%.



Figure 69. Contents of the ostracod trap after retrieval. The hagfish are clearly visible.

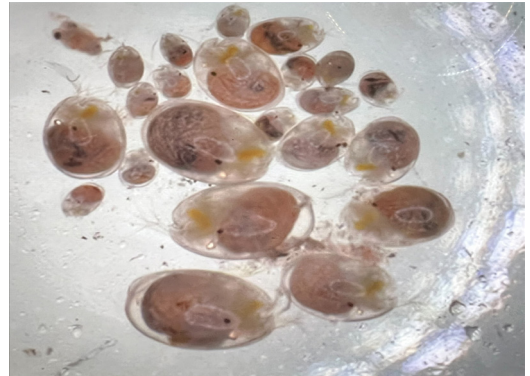


Figure 70. Specimens of the ostracod *Vargula norvegica* caught with the ostracod trap at Station 11. The large individuals are females, while the smaller individuals are males and juveniles.

Station 12

20:46 Station 12. CTD (Fig. 71).
Depth: 439 m. Coordinates: 66.157282° N,
12.979805° E. Ship station: 362.

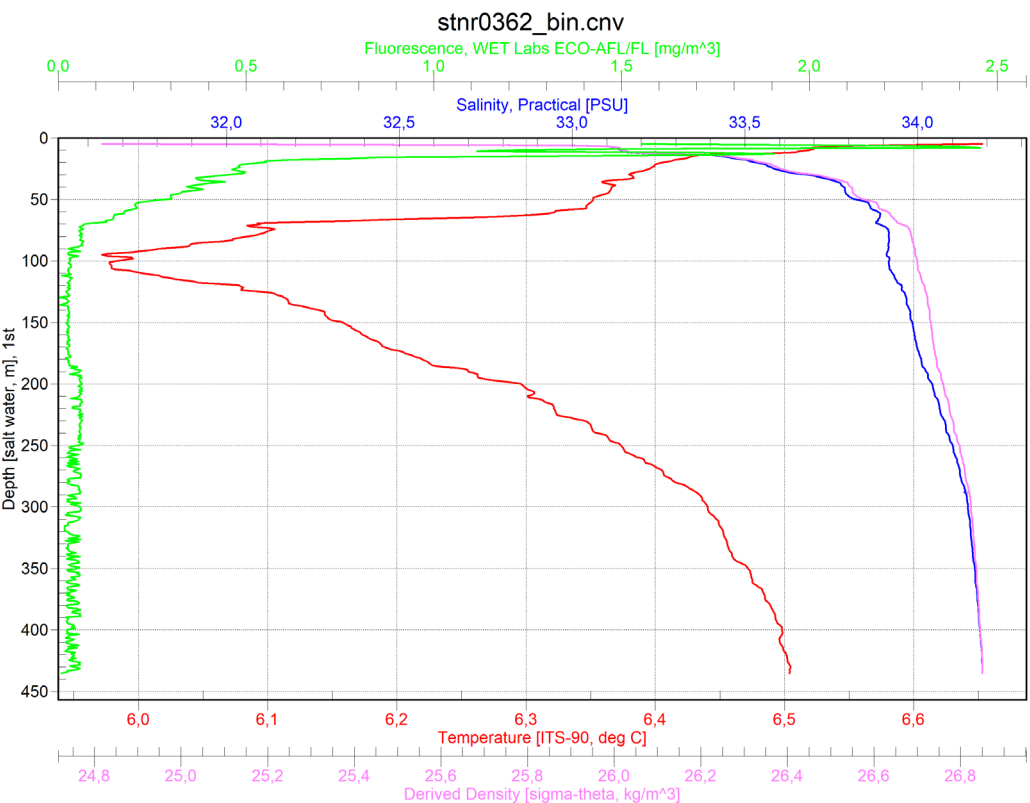


Figure 71. Station 12 CTD profile showing a moderately stratified water column with a relatively fresh and cool surface layer (~33.65–33.8 PSU; ~6.6–6.7 °C). Below ~80–100 m, warmer, more saline and denser Atlantic-type water dominates, becoming relatively uniform with depth. Fluorescence is highest in the upper ~50 m.

21:27 Station 12. Box corer.

Depth: 436 m. Coordinates: 66.157258° N, 12.980035° E. Ship station: 363.

The box core contained fine muddy substrate, recovered intact from the seafloor for examination of benthic organisms and sediment characteristics (Fig. 72).

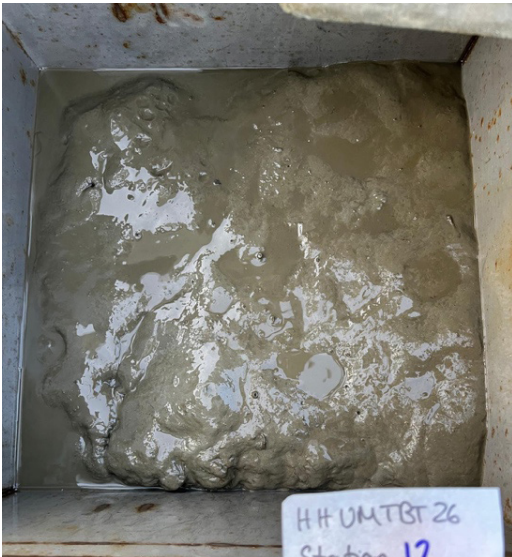


Figure 72. Surface appearance of box core at Station 12, showing fine muddy substrate.

Station 12. Triangular dredge.

Depth: approximately 430 m. Coordinates: 66.157258° N, 12.980035° E. Ship station: not logged.

The triangular dredge deployment was not recorded in the ship log; therefore, the coordinates are based on those of the Station 12 box core.

The triangular dredge contained modest amounts of sediment, and many sea stars (*Ctenodiscus crispatus*) (Fig. 73). Two species of sea pens, *Virgularia mirabilis* and *Pennatula phosphorea*, were retained for the marine invertebrate collection at The Arctic University Museum of Norway, together with seven polychaetes of the family Scalibregmatidae. The polychaetes were anaesthetised with 7% magnesium chloride before preservation in 75% ethanol. In addition, tissue samples of *Virgularia mirabilis* and *Pennatula phosphorea* were flash frozen in liquid nitrogen for potential genome sequencing.

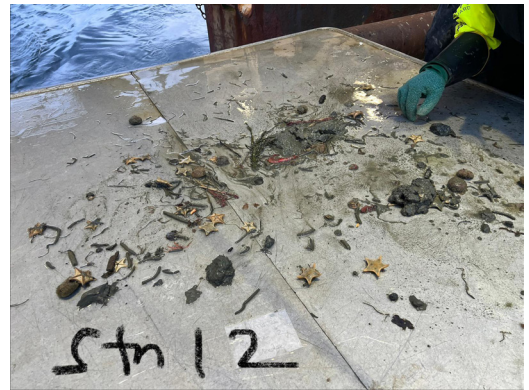


Figure 73. Contents of triangular dredge at Station 12, showing sea pens and sea stars (*Ctenodiscus crispatus*).

Day 8, 09.05.2026

12:41–12:51 Trawl.

Depth: approximately 620 m. Ship station: 364.

Start: 12:40:52, Coordinates: 68.223105° N, 15.678379° E. Depth: 622 m.

Stop: 12:51:04, Coordinates: 68.227581° N, 15.698579° E. Depth: 621 m.

The bottom trawl conducted in the Lofoten area formed part of a deep-sea sampling survey designed to investigate the parasitic fauna of demersal and bathydemersal fishes, and to support broader biodiversity assessments of the deep North Atlantic ecosystem. The trawl yielded a large catch (Figs. 75-80) for *C. Bouguerche*, providing a diverse assemblage of deep-sea species spanning different ecological guilds and trophic levels. The material included roundnose grenadier (*Coryphaenoides rupestris*), rabbitfish likely representing young-of-the-year or juvenile individuals, velvet belly lanternshark (*Etmopterus spinax*), and skates belonging to the common skate species complex (*Dipturus* spp.; $n = 2$). This catch provided valuable comparative material for examining host transmission pathways in deep-sea environments (especially for cestodes), where biological interactions remain poorly documented and sampling opportunities are limited. This trawl yielded an important collection of rare deep-water fishes. Thanks to the invaluable assistance of Filip Morin and Ane Myrvold with fish dissections, a substantial number of organs became available for inspection, greatly en-

hancing the scope of the parasitological survey (Fig. 80).

Gills, oral cavity, stomach, intestines, liver, and body cavity were preserved, with the spiral valve intestine of elasmobranchs dissected separately as the primary site for cestode recovery for examination. For elasmobranchs, the olfactory rosettes (nostrils) were also inspected and preserved for parasites per the protocol mentioned above for elasmobranchs.

The fish were euthanised by a blow to the head followed by pithing. Elasmobranchs were euthanised by pithing, involving insertion of a spike through the brain and severing of the spinal cord at the craniovertebral junction. Once the specimens were confirmed dead, the gills and intestines were removed and preserved in 96% ethanol for later analysis of potential parasite infections. In *C. rupestris* digenean trematodes such as *Hemiuridae* (observed during dissections) are likely to occur primarily in the stomach and intestinal tract of teleost fishes. In elasmobranchs, including *Etmopterus spinax* and *Dipturus* spp., trypanorhynch cestodes are expected to be common, particularly in the lanternshark and skate hosts, alongside digeneans such as *Otodistomum* spp., while monogeneans of the genus *Erpocotyle* may additionally be recovered from the gill surfaces of the sharks.

In addition, 10 male and 10 female specimens of *Etmopterus spinax* were retained for Professor Nicolas Straube, University of Bergen, for his research.



Figure 74. Weather conditions during trawling south of Lofoten.

One male and one female *E. spinax* were retained for the fish collection at The Arctic University Museum of Norway. One adult and one juvenile specimen of *Coryphaenoides rupestris* were also retained for the fish collection. The selected individuals were euthanised, photographed, and frozen.

Additionally, 11 glacier lanternfish (*Benthosema glaciale*) were taken from the trawl catch and preserved in 96% ethanol. They were already dead at the time of preservation. Although they had lost their scales during the trawling process, they were retained for the fish collection, as this species is not commonly represented in the museum collection.

The third trawl also brought up numerous interesting invertebrates, which were

retained for the marine invertebrate collections at The Arctic University Museum of Norway.

The specimens retained included nine bamboo corals (*Isidella lofotensis*) and four rugose squat lobsters (*Munida rugosa*). The rugose squat lobsters were anaesthetised with 7% magnesium chloride before preservation in 75% ethanol. Kerstin collected 12 tissue samples of *Chimaera monstrosa* for future population genetic or kinship analyses, to be determined. Specimens and samples are stored at -20°C . Photographs of each sampled individual were taken next to a measuring tape to enable future cross-referencing. Tissue samples of *Funiculina quadrangularis* were flash frozen in liquid nitrogen for potential genome sequencing.



Figure 75. Partial overview of the diverse catch used for examination of helminth parasites and host-parasite associations, including skates, velvet belly lanternsharks, and roundnose grenadiers.



Figure 76. Young-of-the-year or juvenile *Chimaera monstrosa* and skates (*Dipturus* spp.) collected during the trawl, representative of key deep-sea host taxa for parasitological investigation.



Figure 77. Overview of deep-sea fish assemblage collected during a bottom trawl in the Lofoten area



Figure 78. Researchers sorting the trawl catch for the parasitological survey of deep-sea fishes, selecting specimens for subsequent dissection and helminth examination. Fish were euthanized prior to parasitological processing, and excess catch was discarded at the stern of the vessel.



Figure 79. Processing of the catch on board.



Figure 80. Storage of individually bagged fish and tissue samples collected during a deep-sea parasitological survey, prior to laboratory processing and dissection.

Station 2 revisited

16:35 Station 2. CTD (Fig. 81).

Depth: 85 m. Coordinates: 68.5947966° N,
16.5313294° E. Ship station: 365.

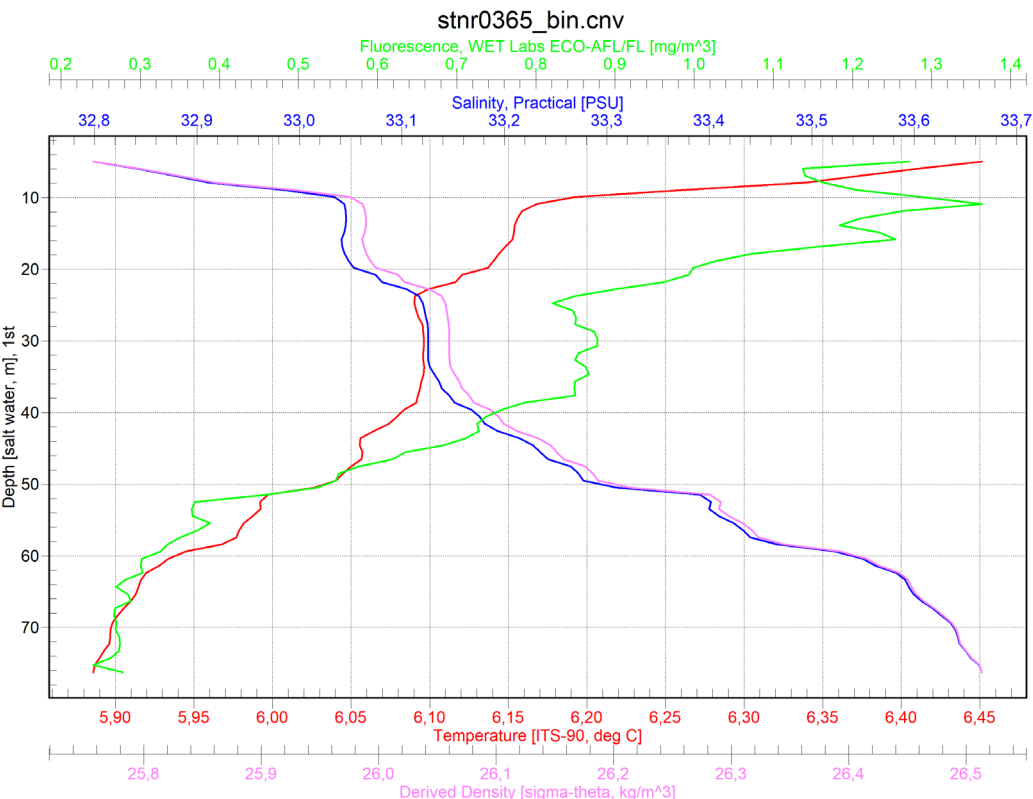


Figure 81. Station 2 CTD profile showing a moderately stratified, shallow water column with relatively fresh surface water (~32.8–33.1 PSU). A distinct pycnocline occurs between ~20 and 50 m, where salinity and density increase rapidly. Below ~50 m, the water becomes more homogeneous, with more saline, and denser conditions. Fluorescence is highest in the upper ~40 m.

16:40 Station 2. Box corer.

Depth: 85 m. Coordinates: 68.5947966° N, 16.5313294° E. Ship station: 366.

The box core was taken at the same coordinates as the CTD cast and appeared to be intact. The surface sediment was sampled for eDNA by Sanne, and for meiofauna by Kasia, Federica, and Andreas. All remaining

surface sediment was collected for bubble-and-blot processing (Fig. 82).

The sediment was processed using the bubble-and-blot method to extract kinorhynchs. Approximately 20 specimens of Pycnophyidae were collected and flash-frozen for genome sequencing.



Figure 82. Sediment surface of final box core taken while returning to Station 2.



Figure 83. Sediment ready for bubble-and-blot processing.

18:00 Group meeting. A short detour was planned to deploy the ostracod trap, with an estimated stay of approximately two hours at the site before continuing towards Tromsø. The estimated time of arrival in Tromsø was around 08:00 on 10.05.2026.

Andreas described the cruise as highly successful. During the cruise, several species were found that had either not previously been represented in the museum collections or had last been collected approximately 100 years ago.

18:19 Ostracod trap deployment.

Depth: 361 m. Coordinates: 68.728563° N, 17.076591° E. Ship station: 367.

22:09 Ostracod trap retrieval. Depth: 361 m. Coordinates: 68.728563° N, 17.076591° E. Ship station: 367.

Ostracods, as well as several hagfish, were caught in the trap (Fig. 84). From the ostracod trap, one male, one female, and several juvenile specimens of *Vargula norvegica* were retained for the marine invertebrate collection at The Arctic University Museum of Norway. They were preserved in 75% ethanol.



Figure 84. Several hagfish (*Myxine glutinosa*) found in the same trap.



Figure 85. Ostracods *Vargula norvegica* caught in the second ostracod trap.

Day 9, 10.05.2026

06:40 Arrival in Tromsø.

Following arrival in Tromsø, the scientific crew cleaned and packed the laboratories, offloaded equipment and samples, handled

and transferred samples to the museum, and prepared the ship for demobilisation (Fig. 86). All participants had left the ship by 10:00.



Figure 86. Cruise equipment from The Arctic University Museum of Norway, cleaned and packed for return to the museum.

Participants & Schedule

Participants	Cabin
1. Andreas Altenburger – cruise leader, researcher	505
2. Vanessa Pitusi – technician	209
3. Sanne Bergmann – PhD student	216
4. Chahinez Bouguerche – researcher	214
5. Federica Franco – PhD student	212
6. Kasia Grzelak – researcher	210
7. Ane Myrvold – research assistant	215
8. Filip Morin – MSc student	213
9. Kerstin Glaus – Postdoc	211
10. Kunuk Olsen Lennert – ship technician	404
11. Markus Imanuel Opdal – ship technician	411

Daily Schedule	
Breakfast	07:30-08:00
Cake Part I	10:00
Lunch	13:30-14:00
Group meeting (you can bring cake :-))	17:00
Cake Part II	17:00
Dinner	19:30-20:00



SOKKELDIREKTORATET

UiT,
Norges arktiske universitet

Ved: Andreas Altenburger

Deres ref.
HHUMBT26

Vår ref. (bes oppgitt ved svar)
SODIR 26/334 /JR

Dato
24.4.2026

Oversendelse – Vitenskapelig undersøkelsestillatelse med FF Helmer Hanssen i perioden 2.5.2026 – 10.5.2026

./ . Vedlagt oversendes vitenskapelig undersøkelsestillatelse nr. 953/2026.

Søknaden er blitt sendt til instansene på vår høringsliste, og Sokkeldirektoratet har ikke mottatt høringssvar.

Straks etter endt undersøkelse skal toktrapport sendes Sokkeldirektoratet. Når det gjelder artikkel 9 i undersøkelsestillatelsen, gjør Sokkeldirektoratet på nåværende tidspunkt unntak fra kravet om å motta data fra dette spesifikke vitenskapelige forskningstoktet.

Det vises ellers til standardvilkårene i tillatelsen.

Ukentlige rapporter og toktrapport sendes:

- a) Sokkeldirektoratet: postboks@sodir.no
- b) Fiskeridirektoratet: postmottak@fiskeridir.no
- c) Forsvaret: csc@coss.mil.no

Med hilsen

Janka Nakken Rom e.f.
Seniorgeolog

Universitetet i Tromsø - Norges Arktiske
Universitet
Att: Simon Sagelv Bjørvik
Postboks 6050 Stakkevollan
9037 Tromsø

Tråltillatelse i perioden 02.05.2026-10.05.2026 for FF Helmer Hanssen

Fiskeridirektoratet viser til søknad om tråltillatelse fra Norges arktiske universitet (UiT) datert 16. april d.å.

Bakgrunn

Formålet med trålhalene er å samle inn forskjellige fiskearter for å undersøke tilknyttede parasitter. Forskningen på parasitter gjøres i samarbeid med Naturhistoriska Riksmuseet i Stockholm som del av prosjektet «Systematics and integrative taxonomy of Monogenea parasitizing fishes of Sweden».

Det søkes om tillatelse til å tråle mellom Tromsø og Bergen i perioden 02.-10. mai med forskningsfartøyet Helmer Hanssen. Søker opplyser om at hvert trålhal vil vare i opptil 15 minutter og det er behov for inntil åtte trålhal. Videre fartøyet akusikkutstyr brukes for å sikre at tråling ikke skjer i områder der fiskeforekomster overstiger innsamlingsbehovet på 30 individer per art.

Hjemmel

Fiskeridirektoratet kan gi dispensasjon fra regler i medhold av havressurslova dersom det er nødvendig for gjennomføring av havforskning eller praktiske forsøk til utvikling av redskaper, fangstmetoder eller lignende i henhold til havressurslova § 66

Vedtak

Fiskeridirektoratet gir med dette UiT tillatelse til å gjennomføre aktiviteten som beskrevet i søknaden med fartøyet FF Helmer Hanssen, jf. havressurslova § 66.

Vilkår

Fangsten fra trålhalene kan ikke omsettes.

Fiskeridirektoratets seksjon for fiskerikontroll og veiledning skal varsles før aktivitet starter. Meldinger til Fiskeridirektoratet sendes til postmottak@fiskeridir.no.

Ved brudd på vilkårene kan Fiskeridirektoratet tilbakekalle tillatelsen med øyeblikkelig virkning.

Acknowledgements

We sincerely thank the captain and crew of R/V Helmer Hanssen for their professionalism, technical support, and excellent assistance throughout cruise HHUMTBT26. Their expertise, flexibility, and commitment were essential for the safe and successful completion of the cruise, particularly during challenging weather conditions and demanding sampling operations.

We also thank The Arctic University Museum of Norway, UiT The Arctic University of Norway, the UArctic Thematic Network on Arctic Marine Biodiversity, and Artsdatabanken for their support and collaboration. We are grateful to all scientific participants and collaborators for their contributions to sampling, specimen processing, data collection, and discussions during the cruise.

Station log

CruiseNr	Date (UTC)	Time (UTC)	Logg (nm)	Stasjonstype	StNr	Kommentar	Speed	Latitude	Longitude	Depth (m)	Air (°C)	Water (°C)	Wind (m/s)	Humidity(%)	Wind-dir(deg)	Light SPAR
25042026	02.05.2026	16:57:19	1566.565	CTD m/u vann START	333		0.8	6835.672586 N	01631.942652 E	86.04	3.3	6.0	4.7	60.4	213.6	115.6164
25042026	02.05.2026	17:07:38	1567.086	CTD m/u vann STOPP	333		1.1	6835.943159 N	01632.082233 E	77.83	3.3	6.1	6.7	59.3	241.4	115.9531
25042026	02.05.2026	17:08:41	1567.105	Trekantskrappe START	334		0.9	6835.926811 N	01632.099001 E	82.40	3.3	6.2	8.4	58.6	234.9	104.8368
25042026	02.05.2026	17:24:24	1567.534	Trekantskrappe STOPP	334		1.6	6835.516173 N	01631.808855 E	78.72	3.1	6.2	6.9	62.3	228.6	78.4002
25042026	02.05.2026	18:11:30	1568.402	Box core (BC)	335		0.5	6835.704996 N	01632.246348 E	89.41	2.7	6.4	8.0	63.8	218.6	58.5498
25042026	04.05.2026	09:21:25	1885.556	Bunn trålstasjon START	336		3.3	6437.975776 N	00842.982840 E	129.78	4.3	7.9	4.5	75.2	245.8	865.8579
25042026	04.05.2026	09:36:00	1886.242	Bunn trålstasjon STOPP	336		3.9	6437.341481 N	00842.374844 E	136.40	4.7	8.1	5.9	71.2	261.2	456.9582
25042026	04.05.2026	13:29:45	1916.720	Bunn trålstasjon START	337		2.2	6413.599786 N	00808.597732 E	375.18	3.9	7.6	10.8	87.4	1.3	195.7752
25042026	04.05.2026	14:34:50	1917.478	Bunn trålstasjon STOPP	337		2.6	6413.115934 N	00809.935171 E	366.61	3.6	7.5	10.6	87.3	0.1	305.8974
25042026	05.05.2026	16:52:01	2179.396	CTD m/u vann START	338	Ingen data	0.3	6031.921855 N	00518.260874 E	468.81	5.6	9.5	4.6	69.7	301.3	186.5604
25042026	05.05.2026	17:09:50	2179.440	CTD m/u vann STOPP	338	Ingen data	0.1	6031.923482 N	00518.261066 E	487.45	6.1	8.8	5.6	63.8	257.4	203.2416
25042026	05.05.2026	17:19:33	2179.501	Gravity core (GC)	339		0.2	6031.932800 N	00518.380508 E	521.12	6.3	8.4	5.1	62.4	265.9	298.9262
25042026	05.05.2026	17:51:11	2179.570	CTD m/u vann START	340		0.2	6031.939769 N	00518.325382 E	509.13	5.6	8.4	6.3	67.5	284.6	158.7004
25042026	05.05.2026	18:11:43	2179.604	CTD m/u vann STOPP	340		0.2	6031.942842 N	00518.289477 E	510.02	5.6	8.4	6.0	68.9	285.5	144.8214
25042026	06.05.2026	00:29:17	2227.466	CTD m/u vann START	341		0.3	6104.661762 N	00502.431157 E	178.04	3.2	8.1	3.1	88.1	274.2	-0.0069
25042026	06.05.2026	00:36:12	2227.480	CTD m/u vann STOPP	341		0.1	6104.668084 N	00502.462216 E	177.81	3.2	7.9	3.3	88.1	236.6	-0.0088
25042026	06.05.2026	00:43:22	2227.498	Box core (BC)	342		0.3	6104.687759 N	00502.464852 E	177.57	3.2	8.0	6.4	85.1	207.4	-0.0057
25042026	06.05.2026	12:51:10	2351.246	CTD m/u vann START	343		0.6	6222.681379 N	00612.085545 E	428.63	6.3	7.9	7.3	57.5	196.9	892.1231
25042026	06.05.2026	13:05:05	2351.320	CTD m/u vann STOPP	343		0.3	6222.690144 N	00612.053213 E	428.71	6.2	8.1	4.2	54.1	204.9	458.4828
25042026	06.05.2026	13:09:44	2351.335	Box core (BC)	344		0.1	6222.702547 N	00612.038295 E	428.52	5.7	7.9	4.0	59.1	243.4	664.2630
25042026	06.05.2026	16:54:18	2386.327	CTD m/u vann START	345		0.5	6244.544678 N	00604.658516 E	65.21	4.1	7.3	12.5	81.7	240.1	105.8131
25042026	06.05.2026	16:56:11	2386.345	CTD m/u vann STOPP	345		0.6	6244.542604 N	00604.698361 E	65.52	3.4	7.5	10.0	82.6	241.5	60.8507
25042026	06.05.2026	17:04:47	2386.487	Trekantskrappe START	346		1.5	6244.422829 N	00604.601656 E	64.01	3.5	7.5	7.7	86.9	221.1	501.5930
25042026	06.05.2026	17:15:01	2386.728	Trekantskrappe STOPP	346		1.3	6244.273007 N	00604.190932 E	69.20	4.4	7.3	6.7	83.5	202.1	469.5408
25042026	07.05.2026	07:39:19	2534.461	CTD m/u vann START	347		0.5	6328.341688 N	01006.889460 E	495.84	4.7	7.9	0.9	63.7	251.1	535.3155
25042026	07.05.2026	08:37:55	2535.063	CTD m/u vann STOPP	347		2.0	6328.328816 N	01006.197745 E	494.96	4.9	7.9	2.5	68.5	46.7	226.0582
25042026	07.05.2026	08:38:12	2535.072	Box core (BC)	348		1.9	6328.330595 N	01006.217915 E	495.07	4.9	7.7	3.1	68.0	32.9	229.6016
25042026	07.05.2026	08:54:29	2535.393	Trekantskrappe START	349		1.5	6328.368100 N	01006.927383 E	495.95	5.1	7.6	3.1	68.6	50.5	325.2407
25042026	07.05.2026	09:05:40	2535.683	Trekantskrappe STOPP	349		1.6	6328.363690 N	01007.576584 E	496.61	5.0	7.8	3.0	71.0	60.1	334.4377
25042026	07.05.2026	14:16:31	2584.874	CTD m/u vann START	350		0.2	6358.730314 N	00941.299032 E	35.49	6.1	7.5	5.1	70.4	263.1	346.5744
25042026	07.05.2026	14:17:19	2584.875	CTD m/u vann STOPP	350		0.3	6358.731165 N	00941.302433 E	34.89	6.1	7.3	6.1	68.8	271.7	336.0533
25042026	07.05.2026	14:31:52	2585.186	Trekantskrappe START	351		1.2	6358.643144 N	00941.336681 E	41.33	5.6	7.4	7.1	76.0	292.0	789.3661
25042026	07.05.2026	14:32:03	2585.190	Trekantskrappe STOPP	351		1.3	6358.639975 N	00941.330136 E	40.67	5.6	7.5	7.2	76.2	294.8	797.7835
25042026	07.05.2026	15:08:37	2589.191	CTD m/u vann START	352		0.4	6401.626102 N	00945.659624 E	457.51	6.3	7.5	5.8	72.0	258.6	541.0157
25042026	07.05.2026	15:22:55	2589.276	CTD m/u vann STOPP	352		0.4	6401.651696 N	00945.745948 E	459.55	6.3	7.6	5.5	72.0	253.0	509.7828
25042026	07.05.2026	15:25:47	2589.293	Box core (BC)	353		0.3	6401.655816 N	00945.708909 E	454.22	6.3	7.5	6.4	70.0	272.7	502.7870
25042026	07.05.2026	22:50:06	2660.569	CTD m/u vann START	354		0.2	6447.074933 N	01139.150300 E	222.31	3.9	7.3	3.6	87.5	79.5	-0.0042
25042026	07.05.2026	22:57:40	2660.602	CTD m/u vann STOPP	354		0.2	6447.048741 N	01139.109159 E	222.59	4.3	7.4	3.9	87.2	81.2	-0.0035
25042026	07.05.2026	23:11:44	2660.644	Box core (BC)	355		0.3	6447.069887 N	01139.082567 E	223.18	4.3	7.6	4.1	83.6	87.7	-0.0023
25042026	07.05.2026	23:41:43	2661.218	Trekantskrappe START	356		1.8	6447.041707 N	01138.901042 E	225.35	3.6	7.2	2.8	88.1	67.0	-0.0050
25042026	07.05.2026	23:50:17	2661.460	Trekantskrappe STOPP	356		1.6	6447.062454 N	01138.335814 E	165.78	3.5	7.3	3.8	88.8	79.1	-0.0000
25042026	08.05.2026	09:57:53	2763.901	Annen stasjon-Singel	357	Ostracod trap (430 m dyp)	0.3	6533.600759 N	01222.073940 E	430.46	8.8	7.0	3.6	37.2	141.5	881.0826
25042026	08.05.2026	10:54:59	2770.099	CTD m/u vann START	358		0.2	6529.163120 N	01230.651599 E	250.04	8.9	7.3	5.6	45.1	110.6	813.8094
25042026	08.05.2026	11:07:32	2770.110	CTD m/u vann STOPP	358		0.1	6529.169972 N	01230.701757 E	254.04	8.9	7.3	6.2	42.7	98.9	679.5572
25042026	08.05.2026	12:22:23	2770.438	Box core (BC)	359		0.3	6529.368367 N	01230.235587 E	271.36	9.6	7.1	6.4	43.7	103.9	580.1263
25042026	08.05.2026	12:53:56	2771.037	Trekantskrappe START	360		1.3	6529.674097 N	01229.196414 E	406.95	9.8	7.5	6.6	45.1	110.2	522.8504
25042026	08.05.2026	13:04:23	2771.292	Trekantskrappe STOPP	360		1.5	6529.794757 N	01228.654720 E	411.32	9.8	7.3	4.4	46.4	111.8	509.0461
25042026	08.05.2026	13:59:02	2776.280	Annen stasjon-Singel	361	Ostracod	0.8	6533.658748 N	01221.939622 E	432.54	11.4	7.5	8.6	36.6	118.5	369.4687
25042026	08.05.2026	18:28:34	2820.878	CTD m/u vann START	362		0.1	6609.425989 N	01258.776919 E	439.22	10.4	7.2	8.2	43.5	92.4	65.5718
25042026	08.05.2026	18:46:01	2820.901	CTD m/u vann STOPP	362		0.1	6609.436940 N	01258.788310 E	437.78	9.9	6.8	7.0	48.1	98.0	51.7770
25042026	08.05.2026	19:27:20	2821.261	Box core (BC)	363		0.6	6609.435489 N	01258.802113 E	435.58	9.6	7.2	8.2	46.7	84.5	21.0488
25042026	09.05.2026	10:40:52	2974.151	Bunn trålstasjon START	364		3.0	6813.386300 N	01540.702724 E	622.37	8.5	6.6	6.3	72.1	274.2	653.0371
25042026	09.05.2026	10:51:04	2974.674	Bunn trålstasjon STOPP	364		3.7	6813.654883 N	01541.914730 E	621.64	8.5	6.5	4.5	74.3	282.6	632.5452
25042026	09.05.2026	14:35:19	3006.324	CTD m/u vann START	365		0.8	6835.660970 N	01631.872471 E	84.34	11.3	6.8	4.5	50.4	220.0	282.8358
25042026	09.05.2026	14:37:37	3006.343	CTD m/u vann STOPP	365		0.2	6835.679171 N	01631.874291 E	84.18	11.3	6.7	5.7	50.4	217.3	285.1044
25042026	09.05.2026	14:40:22	3006.348	Box core (BC)	366		0.1	6835.685213 N	01631.878154 E	84.44	11.4	6.4	5.7	49.4	237.6	288.1735
25042026	09.05.2026	16:19:51	3021.576	Annen stasjon-Singel	367	Ostracod 360 m dyp	0.6	6843.829784 N	01704.529037 E	361.08	11.2	7.2	2.6	49.4	202.2	147.0085

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