ELISABETH MANN BORGESE-Berichte

Baltic Sea Long-term Observation Programme

Cruise No. EMB372

01.08.2025 – 16.08.2025
Rostock-Marienehe (Germany) – Rostock-Marienehe (Germany)
BalticObs

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2025

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1. Cruise summary

1.1 Summary in English

The cruise EMB372 was carried out in frame of the IOWs Baltic Sea long-term observation programme. The scientific programme is part of IOW's Baltic Sea long-term observation programme, related to the institutes research area 2 "Coastal Seas in Transition". The central task is a continuously ongoing data collection of time series at key stations spanning from the western to central Baltic Sea, initiated since 1969. The programme partly belongs to the national environmental monitoring in the German EEZ, which is performed in context with the Helsinki Commission (HELCOM) and federal programmes to evaluate the status of the Baltic Sea (BMP). This work package is based on a contract between the Federal Maritime Agency (BSH) and IOW as administrative agreement since 1991. The gathered data are the back bone of research on the natural variability of the Baltic Sea ecosystem and anthropogenic influences. During EMB372 135 CTD stations were measured for physical, chemical and biological parameters from the western to the central Baltic Sea. 63 of the CTD stations were measured along the so called "thalweg" transect describing the hydrographic and hydrochemical conditions on the pathway of saltwater inflows from the North Sea. The weather conditions during the cruise were mainly calm with low wind. However, from the afternoon of August 4 to the evening of August 6, the ship had to wait out strong winds in the port of Sassnitz. The stay in port was also used to supply the ship with provisions. The planned work of the cruise programme was realised.

1.2 Zusammenfassung

Die Expedition EMB372 wurde im Rahmen des IOW-Langzeitbeobachtungsprogramms der Ostsee durchgeführt. Das wissenschaftliche Programm ist Teil des Ostsee-Langzeitbeobachtungsprogramms des IOW, das sich auf den Forschungsbereich 2 „Küstenmeere im Wandel" bezieht. Zentrale Aufgabe ist die seit 1969 begonnene kontinuierliche Erfassung von Zeitreihen an Schlüsselstationen von der westlichen bis zur zentralen Ostsee. Das Programm beinhaltet auch die Felddatenerfassung für die nationale Umweltüberwachung in der deutschen AWZ, die im Rahmen der Helsinki-Kommission (HELCOM) und des nationalen Programmes zur Zustandsbewertung der Ostsee (BMP) durchgeführt wird. Diesem Arbeitspaket liegt ein Vertrag zwischen dem Bundesamt für Seeschifffahrt und Hydrographie (BSH) und dem IOW als Verwaltungsvereinbarung seit 1991 zugrunde. Seit 1997 wird das Programm durch permanente Verankerungen in der Gotland See ergänzt. Die gewonnenen Daten bilden die Basis der Forschung zur natürlichen Variabilität des Ökosystems und zu anthropogenen Einflüssen. Während der Reise EMB372 wurden 135 CTD-Stationen und 1 Scanfish-Transekt für physikalische, chemische und biologische Parameter von der westlichen bis zur zentralen Ostsee beprobt. 63 der CTD-Stationen wurden entlang des so genannten „Thalweg"-Transekts gemessen, der die hydrographischen und hydrochemischen Bedingungen auf dem Weg der Salzwasserzuflüsse aus der Nordsee beschreibt. Die Wetterbedingungen während der Fahrt waren hauptsächlich ruhig mit wenig Wind. Vom 4. August nachmittags bis zum 6. August abends musste das Schiff allerdings wegen starkem Wind im Hafen von Sassnitz abwettern. Der Hafenaufenthalt wurde gleichzeitig für die Versorgung des Schiffes mit Proviant genutzt. Das geplante Arbeitsprogramm wurde vollständig umgesetzt.

2. Participants

2.1 Principal Investigators

Name	Institution
Kube, Sandra, Dr.	IOW
Naumann, Michael, Dr.	IOW
Mohrholz, Volker, Dr.	IOW
Kuss, Joachim, Dr.	IOW
Joanna Waniek, Prof. Dr.	IOW
Kremp, Anke, Dr.	IOW
Dutz, Jörg, Dr.	IOW

2.2 Scientific Party

Name	Discipline	Institution
Kube, Sandra, Dr.	Biological Oceanography/ chief scientist	IOW
Köhn, Josef	Physical Oceanography/ deputy chief scientist	IOW
Lehnert, Gerhard	Marine Observations	IOW
Faber, Jens, Dr.	Physical Oceanography	IOW
Kurzweg, Kai	Marine Observations	
Schöne, Susanne	Marine Chemistry	IOW
Sadkowiak, Birgit	Marine Chemistry	IOW
Radisch, Jonas	Marine Chemistry	IOW
Burmeister, Christian	Biological Oceanography	IOW
Heyn, Lilo	Biological Oceanography	IOW
Musso, Marta	Marine Biology	DTU
Wegner-Repke, Johannes	Biological Oceanography (student)	IOW

2.3 Participating Institutions

IOW Leibniz Institute for Baltic Sea Research Warnemünde, Germany
DTU Technical University of Denmark

3. Research Programme

3.1 Description of the Work Area

The area under investigation of the cruise EMB372 covered the western and central Baltic Sea from the Kiel Bight to the northern Gotland Basin. An overview of the locations of CTD stations

and the cruise track is given in Figure 3.1. A station list with all measured parameters is given in Table 7.1. The majority of stations was located along the "thalweg" transect of the Baltic Sea, describing the hydrographic and hydrochemical conditions on the pathway of saltwater inflows from the North Atlantic via the Belt Sea, Arkona Sea, Bornholm Sea, along the Słupsk Furrow to the eastern Gotland Basin and further to the northern Gotland Sea as well as the changing biodiversity along the resulting horizontal and vertical salinity gradients. These inflows are the source for haline, oxygen rich water for the central deep basins (MATTHÄUS et al. 2008).

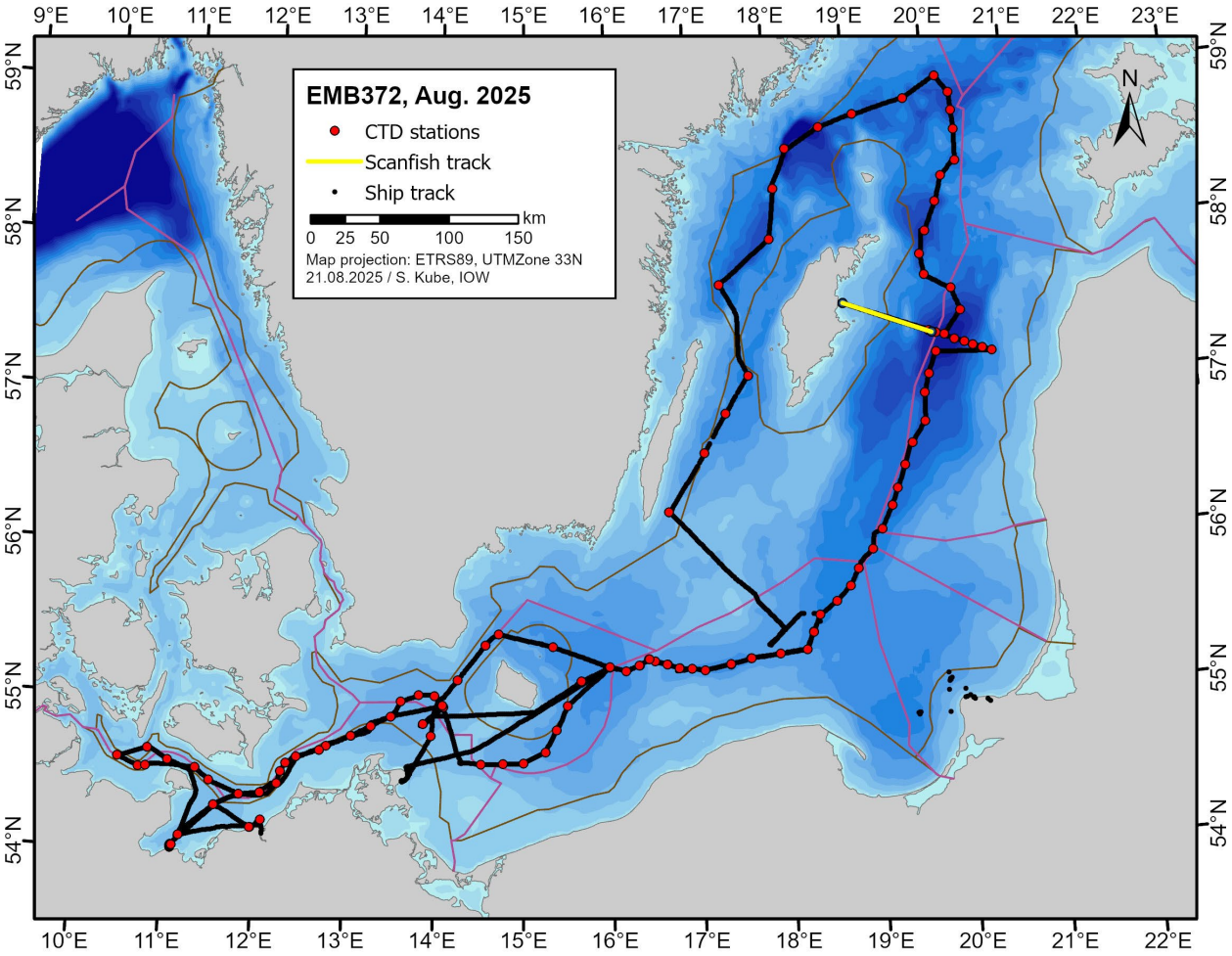

Fig. 3.1 Track chart of R/V ELISABETH MANN BORGESE of cruise EMB372 from 01. August – 16. August 2025. The bathymetry basemap was interpolated as 200x200 m grid from the dataset SEIFERT et al. 2008.

3.2 Aims of the Cruise

The cruise EMB372 was carried out to assess the meteorological, hydrographic, hydrochemical and biological conditions of the southwestern and central Baltic Sea in August 2025. It was the fourth cruise in a series of five expeditions performed annually as part of the long term environmental monitoring programme of the Leibniz-Institute for Baltic Sea Research Warnemünde (IOW) and the environmental monitoring programme of the Federal Maritime and Hydrographic Agency (BSH). The crucial aim is a continuously ongoing data collection of time series at key stations spanning from the southwestern to central Baltic Sea along the so called "thalweg", initiated since 1969. The gathered data from a dense grid of sampling stations are the

back bone of research on the natural variability of the Baltic Sea ecosystem and anthropogenic influences. The acquired data are used for regular national and international assessments of the state of the Baltic Sea (e.g. HELCOM 2023, Naumann et al. 2024, Dutz et al. 2025), are analysed in numerous scientific publications and provide the scientific basis for measures to be taken for the protection of the ecosystem Baltic Sea.

3.3 Agenda of the Cruise

The cruise started with the BSH environmental monitoring programme in the southwestern Baltic Sea, which was continued with the IOW's Baltic Sea long-term observation programme in the central Baltic Sea (Fig. 3.1).

The marine environment was less disturbed by performed scientific tasks during this cruise. Mainly sensor measurements and water sampling in the water column for chemical and biological parameters were performed. No chemicals were released in the water column, no devices were lost. Nets for plankton sampling were carefully cleaned with freshwater in between the hauls to avoid transfer of organisms between areas.

The programme at the stations consisted of CTD casts for oceanographic parameters, water sampling for oxygene/hydrogene sulfide, nutrient, chlorophyll and phytoplankton analyses as well as trace gas measurements. For biodiversity analyses net sampling of phytoplankton, WP2 and Apstein net sampling of mesozooplankton, as well as Multinet sampling for gelatinous macroplankton was conducted. Additionally, water samples for molecular microbiological analyses were collected. Additionally, a scanfish transect for oceanographic conditions were measured through the eastern Gotland Basin. Detailed station work is shown in Tables 7.1 and 7.2.

Additional programme:

- Long-term changes in the population dynamics of zooplankton

For the analysis of the long-term changes in the population dynamics of key copepod species in the Bornholm Basin, zooplankton nets (Apstein, mesh size 50 µm, WP-2 mesh size 100 µm) were deployed to quantitatively sample nauplii and copepodites (responsible scientist Jörg Dutz, IOW).

- Sampling of gelatinous macrozooplankton

To screen the distribution and abundance of jellyfish, the MultiPlanktonSampler (mesh size 500 µm) was used at 13 stations during the cruise. The samples were qualitatively and quantitatively analysed alive directly on board by using light tables and a stereomicroscope (responsible scientist Sandra Kube, IOW).

- Long-term observation of the microbiological habitat of the redoxcline

Insights into the changes of the microbial food web of the redoxcline is obtained by well resolved sampling of the range of the redoxcline at Gotland Deep (TF0271) and Landsort Deep (TF0284) stations on each monitoring cruise. In the redoxcline as well as 6 depths above and below, respectively, in depth intervals of 2 m, samples were taken by CTD/water sampling bottles and prepared for microbiological analysis (FISH and DNA) and determination of pigments (responsible scientist Klaus Jürgens, IOW).

- DNA sampling for microbiological analyses

Sampling was done for building up an DNA-archive of samples for analysis the microorganism community at 11 stations in the western Baltic Sea (responsible scientist Matthias Labrenz, IOW). Water samples were taken at the surface (2 l) and bottom (2 l) and filtered with mesh sizes of 0.45 µm Filter (Whatman), 0.45 µm filter from Sartorius and 0.2 µm (Isopore) and stored in Eppendorf safe-lock tubes and freeezed to -20 °C.

- Water sampling for organic pollutants

Surface water samples at 5 m water depths were retrieved at sites TFO5, TF0109, ABBoje, TF0012 and TF0010 and stored at 4 °C. At the IOW laboratory Organic Trace Substances the samples will be analyzed for the pharmaceuticals sulfamethoxazole, carbamazepine, caffeine, diclofenac, the UV filter compound benzophenone-4 and the estrogens estrone, 17beta-estradiol and 17alpha-ethinyl estradiol. This work is a research & development part within the working plan with the Federal Maritime and Hydrographic Agency (responsible scientist Marion Kanwischer, IOW).

- Multicorer sampling for porewater analyses

At stations MPA1 and REF two sediment cores were collected with the multicorer. The cores will be analyzed in the scope of the MGF-Ostsee II project which focuses on the possible impacts of marine ground-touching fisheries in the Baltic Sea. They will be processed by the GFZ Potsdam by measuring porosity and porewater anion concentrations in the uppermost 20 cm of sediment (responsible scientist Klaus Jürgens, IOW).

Equipment

Data acquisition was carried out using the following devices and measuring platforms.
At stations and transects:

- CTD SBE 911+ with rosette water sampler (CTD)
- Towed CTD Scanfish MKIII (SCF)
- Phytoplankton net, 10 µm mesh size (PLA)
- Zooplankton Apstein net, 55 µm mesh size (APNET)
- Zooplankton WP2 net, 100 µm mesh size (WP2)
- MultiPlanktonSampler, mesh size 500 µm (MPS)
- Secci desk (SD)
- Multicorer (MUC)

Continuous measurements:

- Underway measurements of surface water properties
- Ship weather station

This ship based data set consists of one minute averages of: time (UTC), latitude and longitude, ships heading, depth, air pressure, wind direction, wind speed, air temperature, humidity, global radiation, infrared radiation, surface conductivity, surface salinity, surface water temperature, surface chlorophyll-a fluorescence, surface turbidity.

4. Narrative of the Cruise

This paragraph is aimed to give an impression of the work on board during the campaign. It is a day-by-day report that includes the weather conditions and sea state.

Mobilisation and installation of the laboratory equipment for the Baltic Sea monitoring cruise EMB372 was done on Thursday, 31.07.2025.

The cruise started as planned on Friday, 1.08.2025 at 9 a.m.. The weather was calm with light west to southwesterly wind of 3 Bft during the day when we headed into Mecklenburg Bight. The first station of the cruise was the TFO5 off Warnemünde. A CTD cast with water sampling for oxygen determinations, inorganic nutrients as well as total dissolved nitrogen and phosphorus, and for natural organic matter analyses was done. Additionally, the IOW working group Environmental Biology was collecting eDNA samples at this station for analysing the bacterial community. Next, CTD measurement at station NHBoje was done for comparison with the autonomous station at Nienhagen Reef. In the central Mecklenburg Bay at the key monitoring station TF0012 a complex sampling programme, including oceanographic parameters recorded by CTD, biological parameters (phytoplankton, zooplankton, chlorophyll), chemical parameters (nutrients, total dissolved nitrogen and phosphorus, natural organic matter, oxygen) was carried out. At the evening, we measured a high resolution CTD transect off Boltenhagen. There we noticed a dense cyanobacteria bloom and we collected therefore an additional phytoplankton sample at D1 Boltenhagen to determine the bloom later in the lab. After finishing the Boltenhagen transect we continued to Lübeck Bight (TF0022). During a calm night the transfer to Kiel Bight was done with measuring TF0014 and TF0361. At TF0014 the first intercomparison measurements for oxygen, salinity, temperature, and pressure were done to secure the correctness and stability of the CTD sensors. These comparisons were repeated every day.

For Saturday, 2.08.2025, the DWD marine weather forecast predicted wind from southwest to south 3 - 4 Bft, with locally thundery gusts in the western Baltic Sea. The wave height in the morning was 0,5 m and air temperature 16 °C. In order to start the station TF0360 in Kiel Bight not before daylight, the ship's speed was reduced in the second half of the night. Sampling of station started at 6:30 a.m. with CTD casts for nutrients, oxygen, chlorophyll and phytoplankton sampling. Afterwards phytoplankton net sampling and zooplankton net sampling were done. Since the CTD profile showed a salinity stratification in 5 m depth two WP2 nets were sampled to distinguish zooplankton community between the 2 water layers. At two additional stations in the Fehmarn Belt area multicorer samples were taken. The cores will be analyzed in the scope of the DAM MGF project “Exclusion of mobile bottom-contact fishing in marine protected areas” which is coordinated at IOW and focuses on the possible impacts of marine ground-touching fisheries in the Baltic Sea. They will be processed by the GFZ Potsdam by measuring porosity and porewater anion concentrations in the uppermost 20 cm of sediment. Further, the sediment will also be incubated with radiolabeled sulphate tracer to evaluate sulfate reduction rates. These rates of sulphate reduction represent a key turnover process of sulphate reducing bacteria. Next, the Fehmarn Belt station TF0010 was sampled for nutrient analyses as well as for analysing the bacterial community. Afterwards we headed along the thalweg to the east, with CTD casts at TF0013, TF0017 and TF0041, to reach the key monitoring station TF0046 in the Kadet Trench in the evening of 2.08.2025. There the regular CTD, chemistry and biological plankton sampling was done as planned for the monitoring programme. Additionally, eDNA samples were taken. Late evening the ship headed further east along the thalweg, sampling TF0083, TF0033, TF0002. Afterwards TF0001 at Darss Sill was measured for comparison with the MARNET station Darss

Sill. Before midnight the monitoring station TF0030 was reached. Besides CTD measurement, sampling of nutrients, phytoplankton, as well as eDNA was done.

After midnight on Sunday, 03.08.2025, further stations along the thalweg were measured (TF0115, TF0114). The key monitoring station Arkona Basin (TF0113) was reached very early in the morning on 03.08.2025. The entire set of biological plankton and chemical sampling was done. The marine weather forecast predicted for the southern Baltic Sea wind from southwest to south about 4 Bft, locally shower squalls, sea 1,5 m. The cruise followed the thalweg in eastern direction with CTD stations TF0105, TF0104, TF0103 to the next key station TF0109. There again the entire set of nutrients, phytoplankton and zooplankton was sampled. The cruise then headed south to the Arkonaboje (ABBoje) station. There comparison measurements were carried out with the MARNET station. Furthermore, we deployed the Multi Plankton Sampler for the first time during the cruise to sample gelatinous plankton abundance in different water layers. The samples were analysed directly on board for species abundance and biovolume. This effort was jointly carried out with colleagues from the Danish Technical University to estimate jellyfish distribution and abundance and to collect samples for later genetical analyses.

After finishing this station the further cruise plan was changed taking into account the weather forecast which predicted strong winds for the next days in the southern Baltic Sea. To use the still good weather on Monday 04.08.2025, we headed directly to Bornholm Basin and sampled the key monitoring station TF0213 successfully at midnight 3./4.08.2025. At this station a comprehensive sampling for all disciplines was done, including the extra programme for analysing the Bornholm Basin zooplankton community with several extra net sampling. After finishing that we had to go back through Bornholmsgat, sampling CTD stations (TF200, TF0140, TF0142, TF0145, TF0112) to reach Sassnitz on Monday (4.08.2025) evening. This was necessary for the planned change of personnel in Sassnitz. The person responsible for the eDNA programme of the Environmental Microbiology group as well as one person of the CTD team left the cruise. We welcomed one new cruise participant as specialist for jellyfish taxonomy and sampling methodology from the University of Kopenhagen as well as one person for assisting the biological sampling for our longterm data programme during the remaining cruise. However, the Sassnitz stop meant that we could not leave the harbour during the next 2 days because of the predicted storm on Tuesday and Wednesday in the Arkona and Bornholm Basin with winds about 6 - 7 and sea increasing 2 – 3 m.

On Wednesday, 6.08.2025 at 8 p.m. we finally could leave the harbour heading back to the Bornholm Basin through the night. The weather conditions in terms of wind and waves had improved overnight to southwest 3 to 4 Bft and sea 1 m.

We repeated the CTD cast in the central Bornholm Basin at station TF0213 on 7.08.2025 at 8 a.m.. Furthermore, we were able to deploy the Multi Plankton Sampler again for jellyfish monitoring. We subsequently did all planned CTD measurements crossing the Slupsk Sill (TF0221, TF0225, TF0226, TF0224, TF0227). At station TF0228 we once more deployed the MPS for jellyfish monitoring and continued the CTD measurements along Slupsk Furrow to station TF0257.

On 8.08.2025 between 2 and 3 a.m., while heading to next monitoring key station TF0259, the GPS system of the ship was disrupted. We changed course to the southwest, towards the Polish coast, in order to receive GPS signals again. After stabilization of the GPS system, we decided to change the cruise plan to avoid the sensitive area. We crossed the Baltic Sea towards

northwest and decided to circle Gotland clockwise and in order to restart the thalweg again from the northern tip back through the eastern Gotland basin. Thus, we reached station TF223 near Öland were we deployed the Multi Plankton Sampler again before we continued north to Karlsö Deep key station TF0245.

The weather forecast for August 9th was again very suitable for scientific work. We had southwesterly winds about 3 and sea increasing 1 m. TF0242 and TF0240 were sampled in the morning. In the bottom water layer hydrogen sulfide was detected for the first time at this cruise. At station wGB-3 the MPS was used again to catch jellyfish in the north-western Gotland Basin. The extensive station programme at the monitoring key station Landsort Deep TF0284 was successfully done in the afternoon. We then headed further north (nGB-1, TF0283, nGB-2, TF0288) to start measuring the Thalweg from the northern tip with course to the Farö Deep and further to the central eastern Gotland Basin (TF0282 - TF0276) in the morning of August 10th. At two of these stations, jellyfish monitoring was included in the sampling programme. The weather remained pleasantly stable through the whole day, with westerly winds of 3 Bft.

We started the excessive sampling and measuring at the monitoring key station TF0271 in the eastern Gotland Basin at midnight until morning 11.08.2025. Measurements included nutrients, oxygen/hydrogen sulfide, gases (CO2, N2O, CH4) and eDNA across the redoxcline. The wind conditions of 3-4 Bft south to southwest allowed the deployment of the scanfish at the transect through the central Gotland Basin from east to west at August 11. The scanfish was working well until late afternoon. Close to TF0271 the communication with the device was lost. We tried to fix the electronical problem but failed. Thus, we decided to continue the track with CTD measurements from SF010EGB to station SF016EGB until midnight. In order not to lose too much time, we stopped the track at SF016EGB, especially since the deep basin had already been passed.

On 12.08.2025 at 02:00 a.m. we were back on the Talweg track (TF0275). Weather forecast for Tuesday 12.08.2025 predicted westerly winds 4 – 5 Bft, decreasing slowly about 3 Bft, sea 1,5 meter. We continued measurements as planned southwards to the southern part of the eastern Gotland basin according to the plan (TF0272 to TF0255). In between, on station TF0260, we again used the MPS for jellyfish sampling. In the late evening, we reached the southern part of the EGB and we sampled TF0259, which belongs to the monitoring key stations.

During the night and the morning of 13.08.2025 we took course to Slupsk Furrow, measuring Thalweg stations through the night. From around midnight until 6 a.m. the GPS systems were disrupted again. Manual navigation using the dship GPS allowed measurement of the CTD stations along Slupsk Furrow to TF0266 since the weather and sea stayed calm with light and variable winds, sea < 0,5 m. At the following TF0222 the GPS signal was stable again and we continued all planned station work to the Bornholm Basin key station TF0213. There the entire programme including extensive biological sampling of zooplankton could be successfully done. During the night we have taken the course south of Bornholm (TF0215-TF0152) and reached TF0109 in the Arkona Sea in the morning of August 14.

On a very calm and sunny day with southeasterly winds of 3-4 Bft we proceeded with sampling of the Arkona Sea (TF0113), were we besides zooplankton and phytoplankton sampling again used the MPS for jellyfish sampling. We continued the track across Darss Sill, Kadet Trench towards Mecklenburg Bight and Lübeck Bight by several CTD casts. At TF0012 and TF0022 we did additional MPS sampling for jellyfish monitoring. On our way back we

again measured the station NHBoje for comparison with the autonomous station at the artificial reef Nienhagen. There we finished the scientific observations of the cruise in the evening of 15.08.2025 and started the transit back to RFH. During the transit last measurements in the chemical lab as well as jellyfish counting from the Lübeck Bight catch were carried out. On 15.08.2025 at 9 p.m. we arrived at the Pier in Marienehe.

After custom procedure on Saturday 16.08.2025 we were packing and unloading the scientific equipment to transport all equipment to the IOW. The cruise was finished with the disembarking of scientific crew in the late afternoon.

5. Preliminary Results

The results presented in the following section are preliminary and not comprehensive, since they are based in most cases on unevaluated raw data. The aim of this section is to give a first impression on the collected data set. An advanced data analysis will be conducted after all validated data sets are available.

5.1 Meteorological Conditions

The weather during the cruise was, except of 2 days, characterized by calm weather conditions with wind speeds below 5 Bft which supported efficient station work (Figure 5.1). Differences in air pressure between low air pressure in the western Baltic Sea (1005 hPa) and higher pressure in the Bornholm Basin (1020 hPa) (Figure 5.2) resulted in strong winds on August 5/6 in the Bornholm Basin. Main wind direction was southwest, Sassnitz harbour provided perfect shelter. Altogether during almost 70% of the cruise time (excluding port time) the windspeed was ≤ 4 Bft, maximum windspeed was 6 Bft.

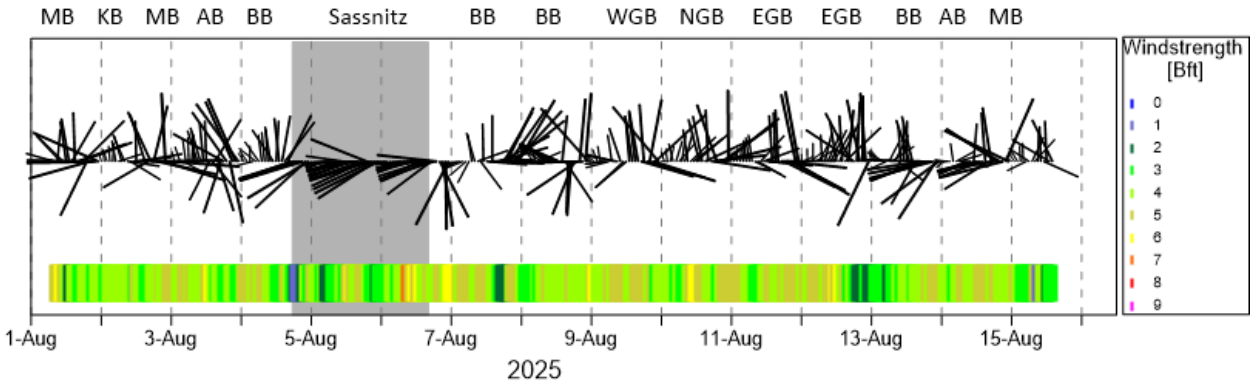

Fig. 5.1 Stick plot of wind vector measured by the ship weather station of RV ELISABETH MANN BORGESE (hourly values). The grey shaded areas indicate the stay in the port of Sassnitz. Abbreviations for the main sea area of each day are marked on top (MB – Mecklenburg Bight, KB – Kiel Bight, AB – Arkona Basin, BB – Bornholm Basin, EGB – Eastern Gotland Basin, NGB – Northern Gotland Basin, WGB – Western Gotland Basin).

The air temperature (excluding port time) ranged between 16 and 21 °C in the western Baltic Sea during the first part of the cruise (Figure 5.3). Only during port stay in Sassnitz air temperature dropped to 12 °C. During the second part of the cruise high air pressure and mean air temperatures around 18 °C characterized the weather. During the last days air temperatures reached 23°C in the western Baltic Sea. The humidity was constantly high and ranged between 60 and 90% (Figure 5.4).

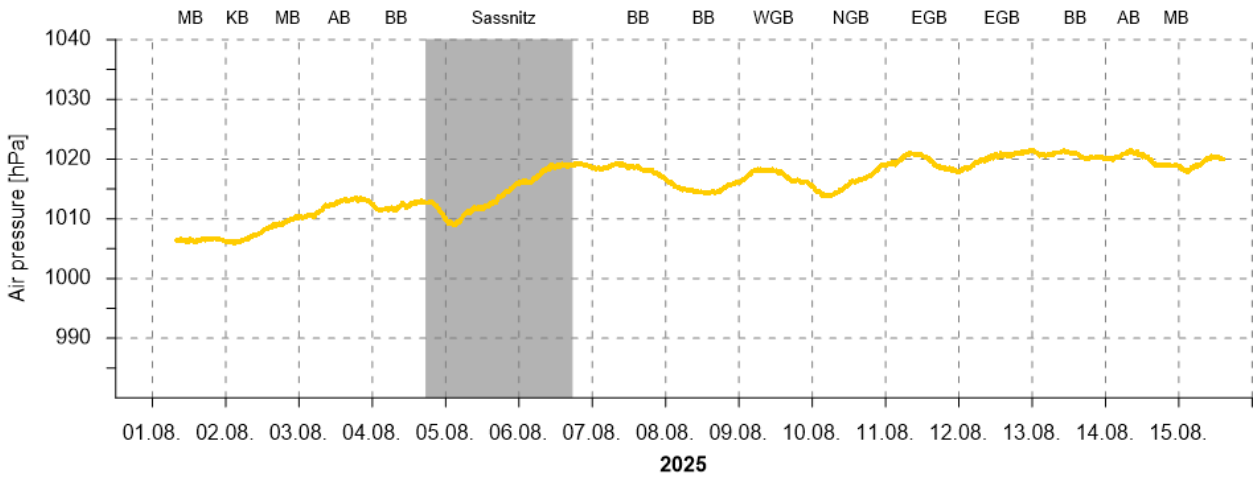

Fig. 5.2 Air pressure measured by the ship weather station of RV ELISABETH MANN BORGESE (1 min values). The grey shaded areas indicate the stay in the port of Sassnitz. Abbreviations for the main sea area of each day are marked on top (for abbreviations see Fig. 5.1).

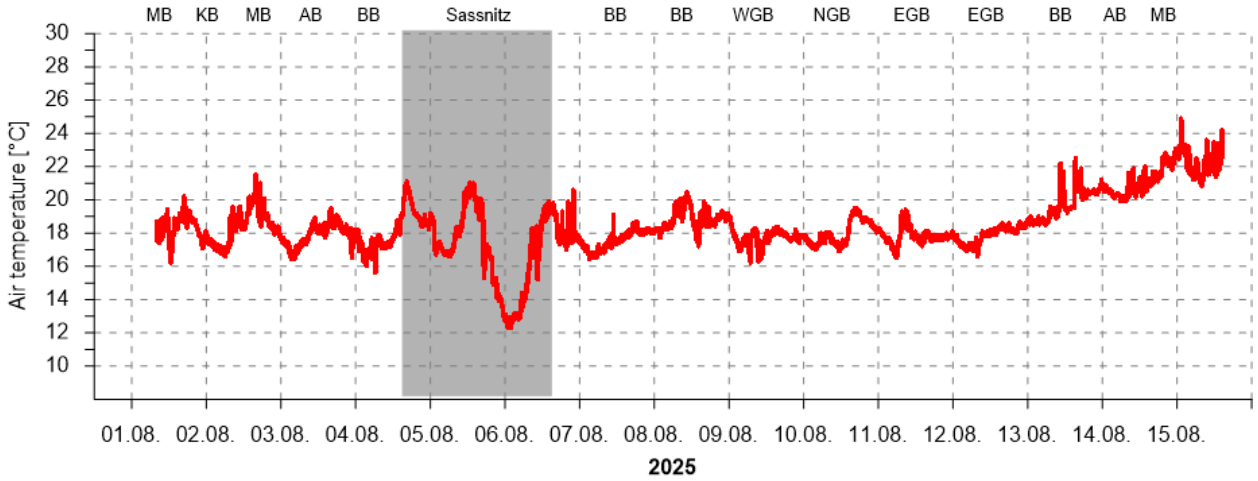

Fig. 5.3 Air temperature measured by the ship weather station of RV ELISABETH MANN BORGESE (1 min values). The grey shaded areas indicate the stay in the port of Sassnitz. Abbreviations for the main sea area of each day are marked on top (for abbreviations see Fig. 5.1).

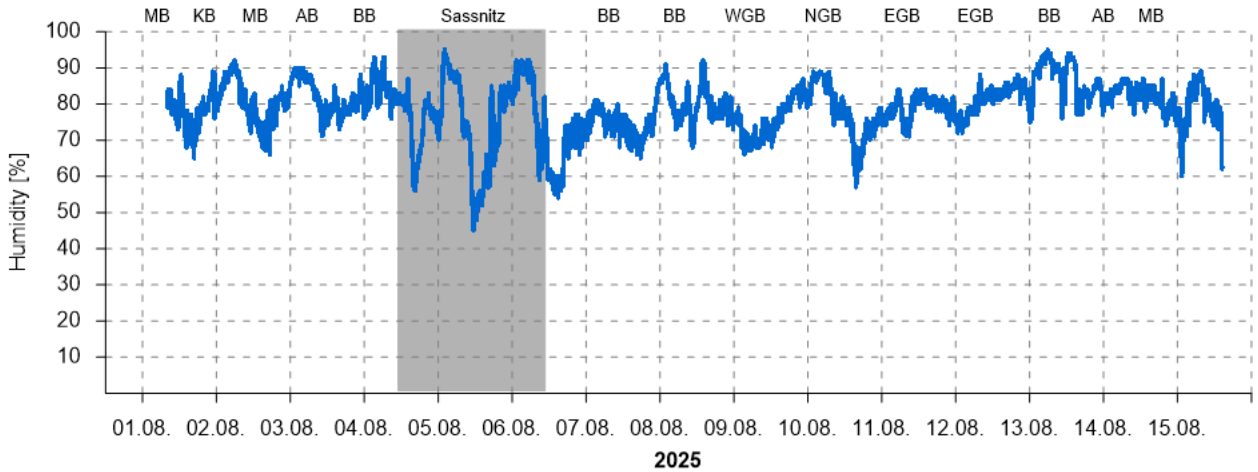

Fig. 5.4 Air humidity measured by the ship weather station of RV ELISABETH MANN BORGESE (1 min values). The grey shaded areas indicate the stay in the port of Sassnitz. Abbreviations for the main sea area of each day are marked on top (for abbreviations see Fig. 5.1).

5.2 Properties of Surface Waters

Sea surface temperature, salinity, chlorophyll-a fluorescence and turbidity distributions in the investigation area were compiled from data gathered with the Surface water Monitoring Box (JSMB). The values are shown in Fig. 5.5 to Fig. 5.10 are based on unvalidated data. The SMB was not working during following time periods: 01.08.2025 18:52 - 02.08.2025 13:31; 04.08.2025 1:15 - 04.08.2025 12:17; 08.08.2025 9:46 - 11.08.2025 10:18; 15.08.2025 8:55 - 15.08.2025 14:17.

The sea surface temperature (SST) distribution for the cruise track is shown in Fig. 5.5. The SST was stable about 20 °C from Kiel Bight to Mecklenburg Bight and Arkona Basin with daily variation < 0.5 °C. SST in Bornholm Basin was 18.3 – 19.3 °C on August 7 and had increased to about 19 – 20.5 °C on August 13. SST in eastern Gotland Basin ranged between 18.5 – 19.4 °C. During the last days the SST had increased to 21 °C in Mecklenburg Bight (Fig. 5.7).

The sea surface salinity (SSS) ranged between 12 – 8 PSU from Mecklenburg Bight to Arkona Basin. SSS in Bornholm Basin was constant at 7.5 PSU. In eastern Gotland Basin SSS was 7 (Fig. 5.6, Fig. 5.7).

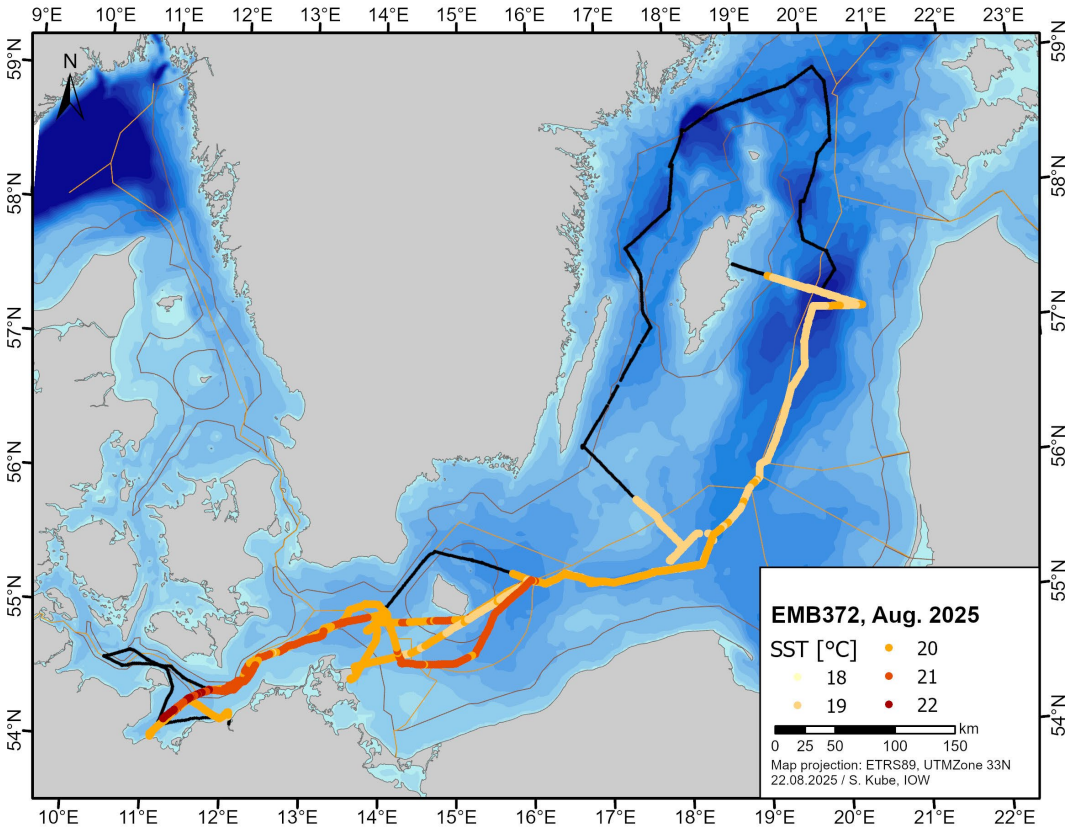

Fig. 5.5 Sea surface temperature distribution along the cruise track of EMB372 measured with the ship thermosalinograph (1 min values).

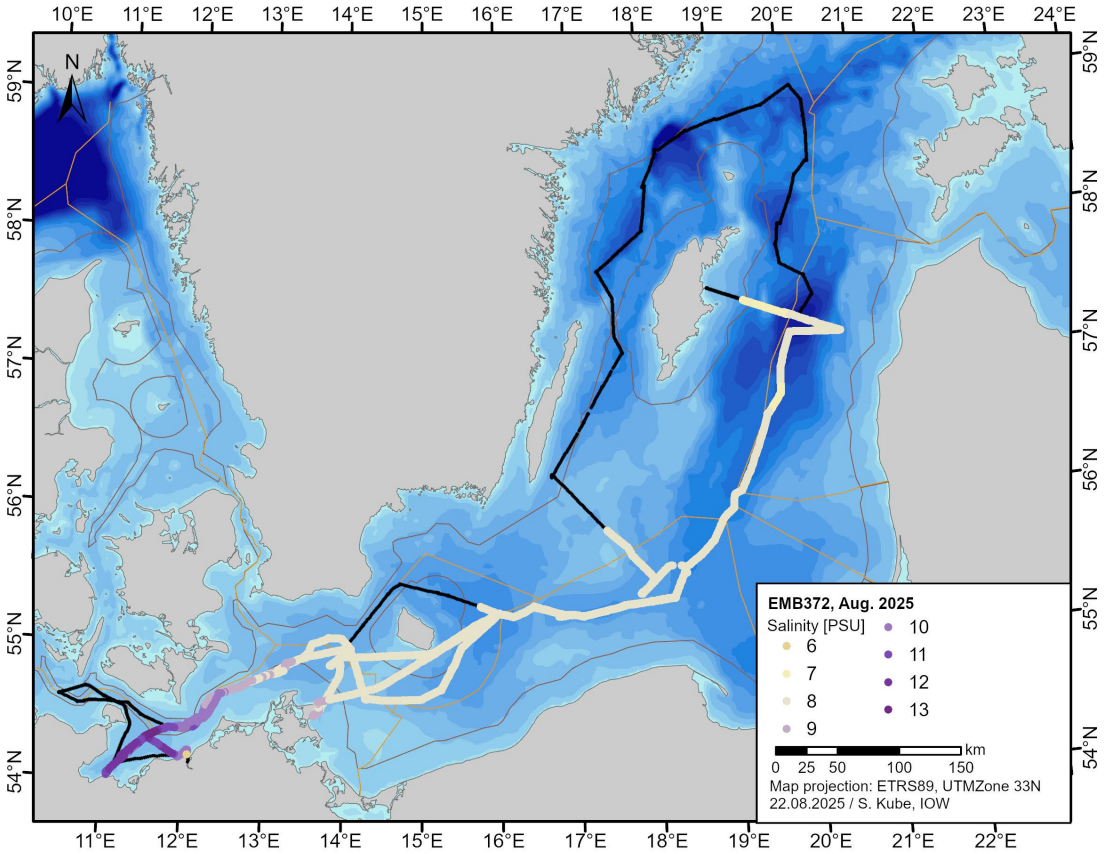

Fig. 5.6 Surface salinity distribution along the cruise track of EMB372 measured with the ship thermosalinograph (1 min values).

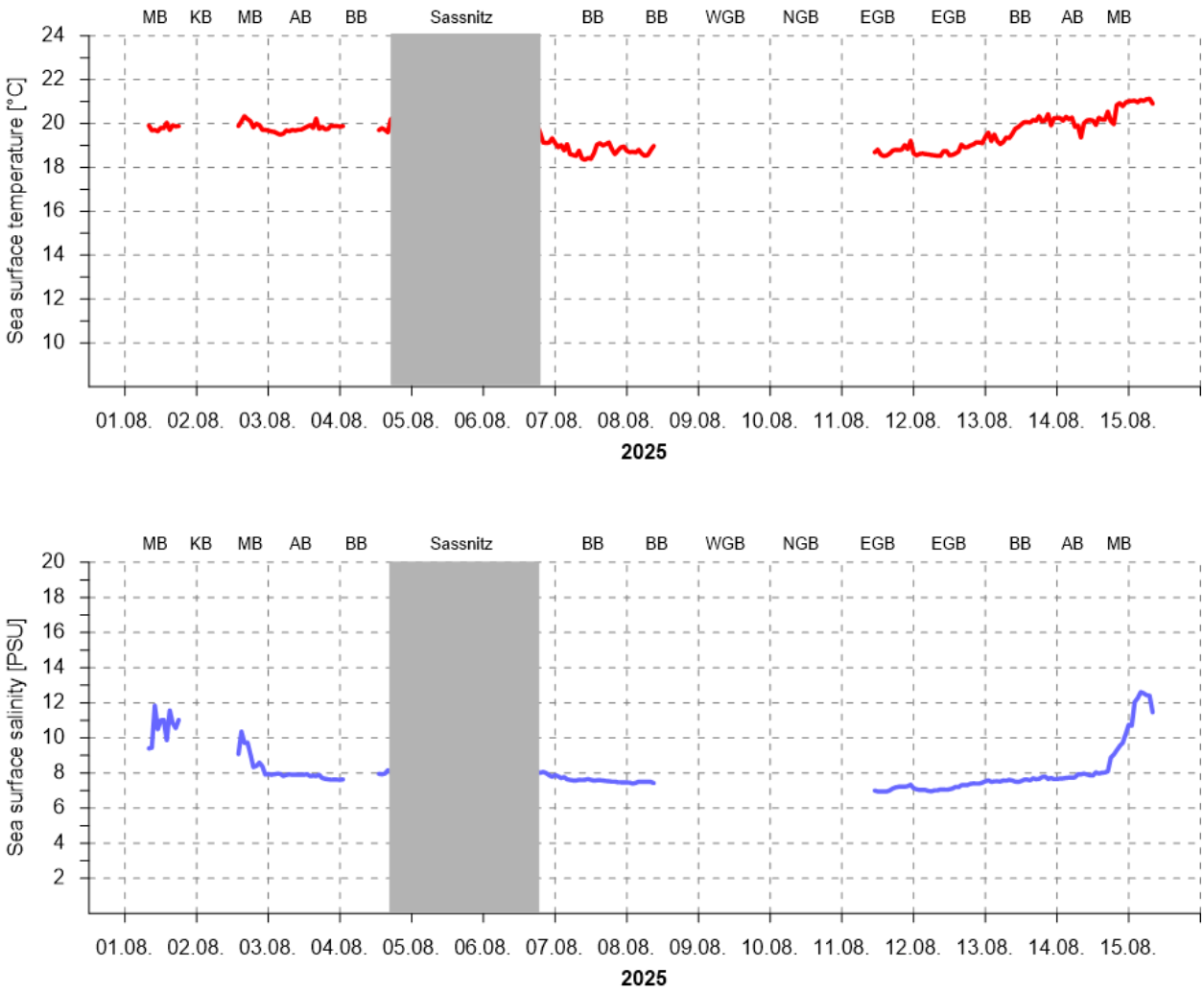

Fig. 5.7 Above: Surface temperature measured with the ship thermosalinograph of RV ELISABETH MANN BORGESE (1 min values). Below: Surface salinity measured with the ship thermosalinograph of RV ELISABETH MANN BORGESE (1 min values). The grey shaded areas indicate the stay in the port of Sassnitz. Abbreviations for the main sea area of each day are marked on top (for abbreviations see Fig. 5.1).

The fluorescence signal was very low in surface waters during the entire cruise, indicating no signs of phytoplankton primary production (Fig. 5.8, Fig. 5.10). This is related to generally low nutrient concentrations in summer following the spring phytoplankton bloom. However, a dense bloom of filamentous cyanobacteria was observed in the surface water from Kiel Bight to Arkona Basin. Low turbidity of surface waters reflected calm weather conditions during the first part of the cruise. Slightly higher values after the port stay in Sassnitz due to the storm might have been related to resuspension of sediment (Fig. 5.9, Fig. 5.10).

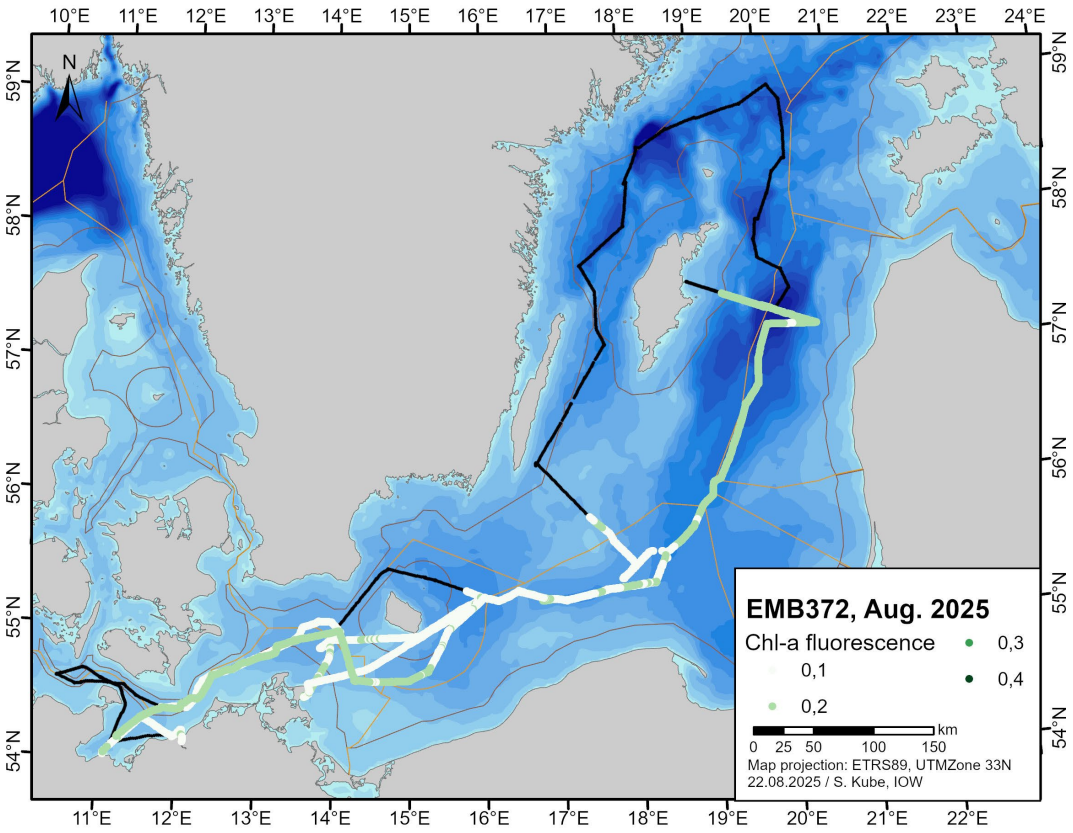

Fig. 5.8 Surface chlorophyll-a fluorescence along the cruise track of EMB372 measured with the ship thermosalinograph (1 min values).

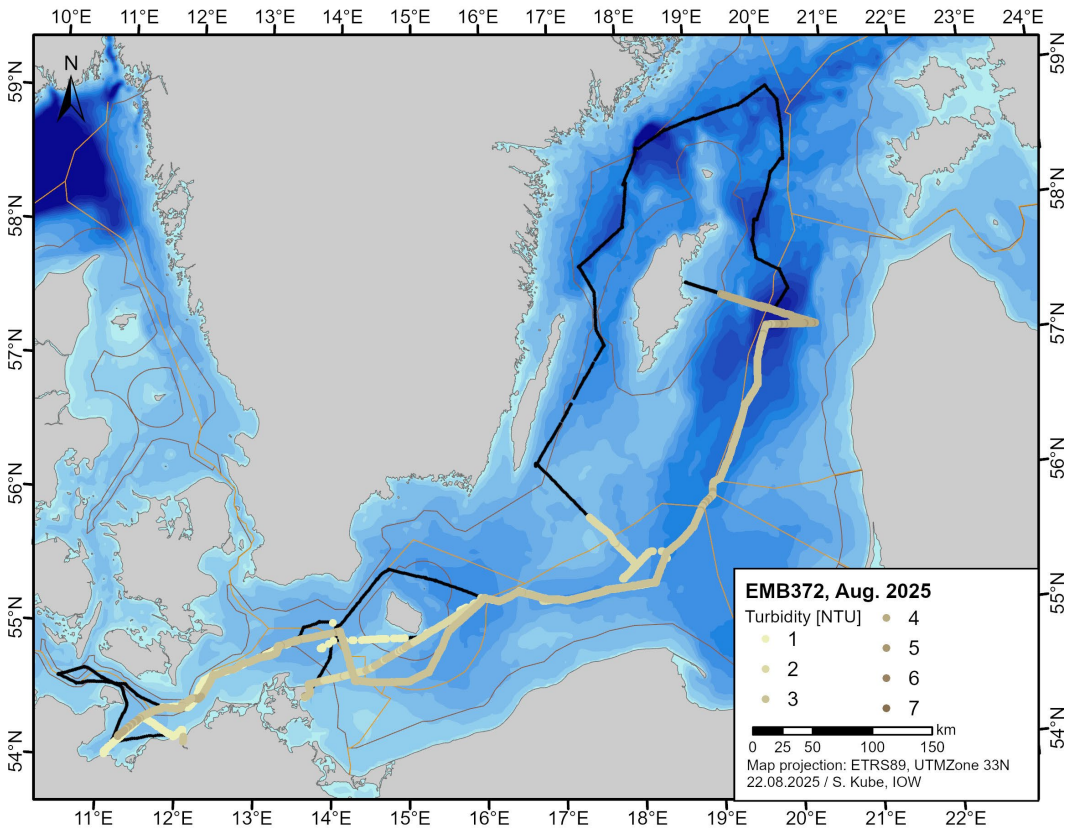

Fig. 5.9 Surface turbidity along the cruise track of EMB372 measured with the ship thermosalinograph (1 min values).

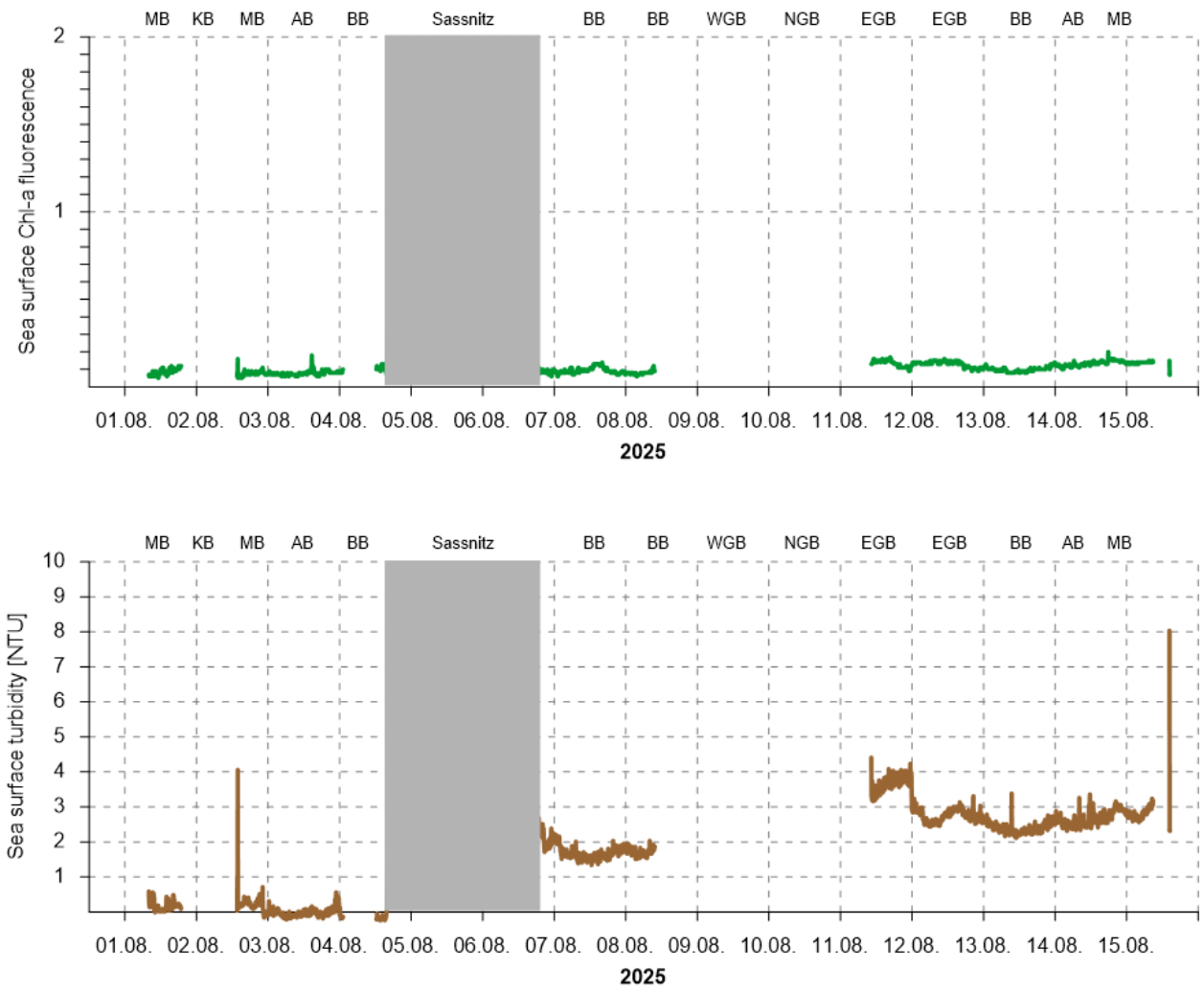

Fig.5.10 Above: Surface chlorophyll-a fluorescence measured with the flow through fluorometer of RV ELISABETH MANN BORGESE (1 min values). Below: Surface turbidity measured with the flow through fluorometer of RV ELISABETH MANN BORGESE (1 min values). The grey shaded areas indicate the stay in the port of Sassnitz. Abbreviations for the main sea area of each day are marked on top (for abbreviations see Fig. 5.1).

5.3 Observations at key Stations

The following Tables list the surface (Table 5.1) and bottom values (Table 5.2) of the most important hydrographic and chemical parameters measured at the key stations of the Baltic long term observation programme. For positions of the particular stations refer to Fig. 5.11 and Table 7.1. Blue colored values in the oxygen column are hydrogen sulfide concentrations.

Conversion factors:

µmol l^{-1} H_2S	* -0.0448	= negative oxygen equivalent ml l^{-1} O_2
µmol l^{-1} O_2	* 0.0224	= ml l^{-1} O_2

In the surface water layer, dissolved oxygen showed in all subregions high concentrations ranging from 275 – 302 µmol l^{-1} as a function of temperature. The spatial pattern of oxygen in the bottom water showed a good oxygenation from Kiel Bight to Arkona Basin (Fig. 5.11). However, severe oxygen deficiency was detected in the bottom water of Lübeck Bight in 21.5 m water depth (Table 5.2). The phenomenon of oxygen deficiency or even the presence of H_2S at

depths greater than 20 m occurs regularly in Lübeck Bight for about 50 years due to high nutrient input and stagnating oceanographic conditions in summer and autumn (Gosselck et al. 1987, Prena et al. 1997). As in the years before, the deep areas of the Bornholm Basin and the SE Gotland Basin were characterized by weak oxic conditions of 3-4 µmol l^{-1} oxygen. Slupsk Furrow between these two regions was oxygenated with 86 µmol l^{-1} oxygen in the bottom water. The deep basins of the central Baltic Sea were characterized by anoxic bottom waters with similar or even worse negative oxygen concentrations as in previous years (Table 5.3). At the key stations in Gotland Deep, Farö Deep, Landsort Deep and Karlsö Deep hydrogen sulphide was detected (Fig. 5.11).

Inorganic nitrogen was completely depleted in the surface water of the entire Baltic Sea after the nitrogen demanding spring bloom (Table 5.1). In the shallow and well mixed Kiel Bight phosphate was depleted as well due to primary production. Phosphate was still available in concentrations of 0.05 – 0.2 µmol l^{-1} from Lübeck Bight, Mecklenburg Bight to Arkona Basin. Thus, dense blooms of diazotrophic filamentous cyanobacteria could develop due to fixation of elemental nitrogen and were observed in the surface water of the western Baltic Sea during the cruise.

In the deep-water layer of the Bornholm Basin and the SE Gotland Basin nitrate was measured in concentrations of 8.7 µmol l^{-1} and 2.3 µmol l^{-1} respectively, which is in accordance with the presence of oxygen in these deep basins (3 - 4 µmol l^{-1}) in August 2025 (Table 5.2). In accordance with the oxygen depletion in the deep basins of the eastern and western Gotland Basins, nitrate was completely depleted in Gotland, Farö, Landsort and Karlsö Deeps. High ammonium concentrations in these deep basins showed that the remineralisation of organic nitrogen stopped at the level of ammonim.

Table 5.1 Sea-surface water values (1-2 m water depths) of main hydrographic and hydrochemical parameters at the key stations (< d.l.: below detection limit). Location of selected key stations see Fig. 5.11.

Area /Date	Station Name /No.*	Sampl. Depth [m]	Temp. [°C]	Sal. [PSU]	$O_{2\ (titration)}$ [µmol l^{-1}]	$O_{2\ (titration)}$ [ml l^{-1}]	$O_{2\ (sensor)}$ [ml l^{-1}]	PO_4 [µmol l^{-1}]	NO_3 [µmol l^{-1}]	NH_4 [µmol l^{-1}]	SiO_4 [µmol l^{-1}]
Kiel Bight 2025-08-02	TF0360 EMB372_13	1.4	19.3	12.4	274.7	6.15	5.8	< d.l.	< d.l.	0.22	2.7
Lübeck Bight 2025-08-01	TF0022 EMB372_10	1.5	19.1	11.1	283.1	6.34	6.1	0.05	< d.l.	0.29	8
Meckl. Bight 2025-08-01	TF0012 EMB372_3	1.1	19.2	11	280.0	6.27	6	0.06	< d.l.	0.22	7.2
Darss Sill 2025-08-02	TF0001 EMB372_24	1.3	19.4	8.6	288.1	6.45	6.2	0.08	< d.l.	not measured	13.1
Arkona Basin 2025-08-03	TF0113 EMB372_28	1.4	19	8	283.1	6.34	6.2	0.2	< d.l.	0.21	13.9
Bornholm Deep 2025-08-03	TF0213 EMB372_35	1.5	19.3	7.6	287.2	6.43	6.2	0.13	< d.l.	0.39	14.1
Slupsk Furrow 2025-08-07	TF0222 EMB372_49	1.7	18.5	7.6	281.4	6.3	6.1	0.15	< d.l.	0.21	15.5
SE Gotland Basin 2025-08-12	TF0259 EMB372_101	1.5	18.4	7.4	286.3	6.41	6.2	0.07	< d.l.	0.21	14.3
Gotland Deep 2025-08-10	TF0271 EMB372_78	1.6	17.9	7.1	287.6	6.44	6.3	0.03	< d.l.	0.28	14.3
Farö Deep 2025-08-10	TF0286 EMB372_73	1.2	18.4	6.6	302.3	6.77	6.5	0.03	< d.l.	0.32	14.7
Landsort Deep 2025-08-09	TF0284 EMB372_62	1.3	18.4	6.3	295.2	6.61	6.3	0.03	< d.l.	0.24	14.8
Karlsö Deep 2025-08-08	TF0245 EMB372_58	1.3	18.3	7.1	282.2	6.32	6.2	0.03	< d.l.	0.24	13.6

Table 5.2 Deep-water layer (near bottom depths) of main hydrographic and hydrochemical parameters at the key stations (< d.l.: below detection limit). Location of selected key stations see Fig. 5.11.

Area /Date	Station Name /No.	Sampl. Depth [m]	Temp. [°C]	Salinity [PSU]	$O_{2\ (titration)}$ [µmol l^{-1}]	$O_{2\ (titration)}$ [ml l^{-1}]	$O_{2\ (sensor)}$ [ml l^{-1}]	PO_4 [µmol l^{-1}]	NO_3 [µmol l^{-1}]	NH_4 [µmol l^{-1}]	SiO_4 [µmol l^{-1}]
Kiel Bight 2025-08-02	TF0360 EMB372_13	16.3	14.8	21.4	136.7	3.06	2.7	0.53	< d.l.	0.2	23.5
Lübeck Bight 2025-08-01	TF0022 EMB372_10	21.5	10	20.9	5.8	0.13	0.2	1.21	1.04	5.84	69.7
Meckl. Bight 2025-08-01	TF0012 EMB372_3	22.9	11.9	23.1	62.5	1.4	1.1	1.01	0.51	5.26	58.1
Darss Sill 2025-08-02	TF0001 EMB372_24	19.3	16.1	14.1	206.8	4.63	3.9	0.36	0.18	not measured	9.1
Arkona Basin 2025-08-03	TF0113 EMB372_28	44.9	8.7	14.9	77.3	1.73	1.3	1.32	6.19	0.41	42.7
Bornholm D. 2025-08-03	TF0213 EMB372_35	86.9	7.6	15.8	4.0	0.09	0.2	1.92	8.71	0.25	57.3
Slupsk Furrow 2025-08-07	TF0222 EMB372_49	88.3	7.1	13.3	85.7	1.92	1.8	1.76	8.64	0.18	49.9
SE Gotland B. 2025-08-12	TF0259 EMB372_101	87	6.5	10.6	3.1	0.07	0.16	2.72	2.27	0.3	54.9
Gotland Deep 2025-08-10	TF0271 EMB372_78	233	7.3	12.5	H_2S 285	neg O_2 -12.77	0.03	6.45	< d.l.	48.70	106
Farö Deep 2025-08-10	TF0286 EMB372_73	188.4	7.2	11.9	H_2S 149.9	neg O_2 -6.72	0.03	4.85	< d.l.	25.1	84
Landsort Deep 2025-08-09	TF0284 EMB372_62	435.8	6.7	10.9	H_2S 62	neg O_2 -2.78	0.02	3.87	< d.l.	14.13	69.5
Karlsö Deep 2025-08-08	TF0245 EMB372_58	106.1	5.9	10	H_2S 37.6	neg O_2 -1.68	0.05	4.13	< d.l.	15.99	69

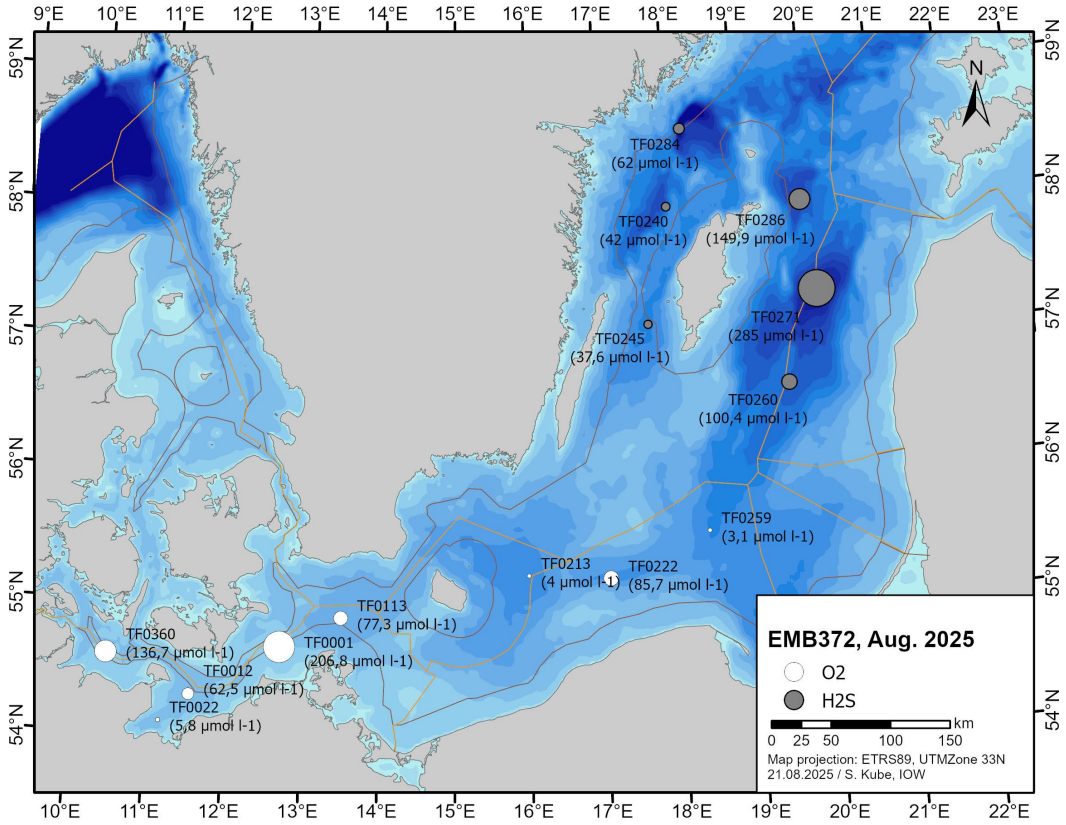

Fig. 5.11 Distribution of dissolved oxygen and hydrogen sulfide concentrations in the near bottom layer at key stations of the long-term observation programme (TF0360 – Kiel Bight; TF0012 – Mecklenburg Bight; TF0113 – Arkona Basin; TF0213 – Bornholm Deep; TF0222 – Slupsk Channel; TF0259 – SE Gotland Basin; TF0271 – Gotland Deep; TF0286 – Farö Deep; TF0284 – Landsort Deep; TF0245 – Karlsö Deep, for details see Table 5.2).

Table 5.3 Negative bottom water oxygen concentration (ml l^{-1}) at key stations in the central Baltic Sea in August 2025) compared to the summer values of previous years. Location of selected key stations see Fig. 5.11.

Area	Station	Aug 18	Aug 19	Aug 20	Aug 21	Aug 22	Aug 23	Aug 24	Aug 25
Gotland Deep	TF0271	-4.29	-6.15	-7.88	-7.17	-9.72	-9.42	-8.64	-12.77
Farö Deep	TF0286	-3.52	-4.68	-4.17	-4.91	-5.55	-5.37	-6.37	-6.72
Landsort Deep	TF0284	-0.82	-2.08	-1.74	-1.60	-2.87*	-2.06	-2.44	-2.78
Karlsö Deep	TF0245	-3.10	-2.93	-3.48	-2.43	-3.80	-2.79	-	-1.68

* Value measured at station 284a

5.4 Baltic Thalweg Transect

During EMB372 135 CTD stations were measured for physical, chemical and biological parameters from the western to the central Baltic Sea. 63 of the CTD stations were measured along the so called "Thalweg" transect describing the hydrographic and hydrochemical conditions on the pathway of saltwater inflows from the North Sea. The Thalweg was measured in three different sections and directions during the cruise: 1) Kiel Bight to Arkona Basin (01.08.2025 – 03.08.2025), 2) Bornholm Basin to Bornholmsgat (04.08.2025), 3) most northern tip (TF0288) to Bornholm Basin (10.08.2025 – 13.08.2025). On the way back to Mecklenburg Bight, several Thalweg stations were repeated.

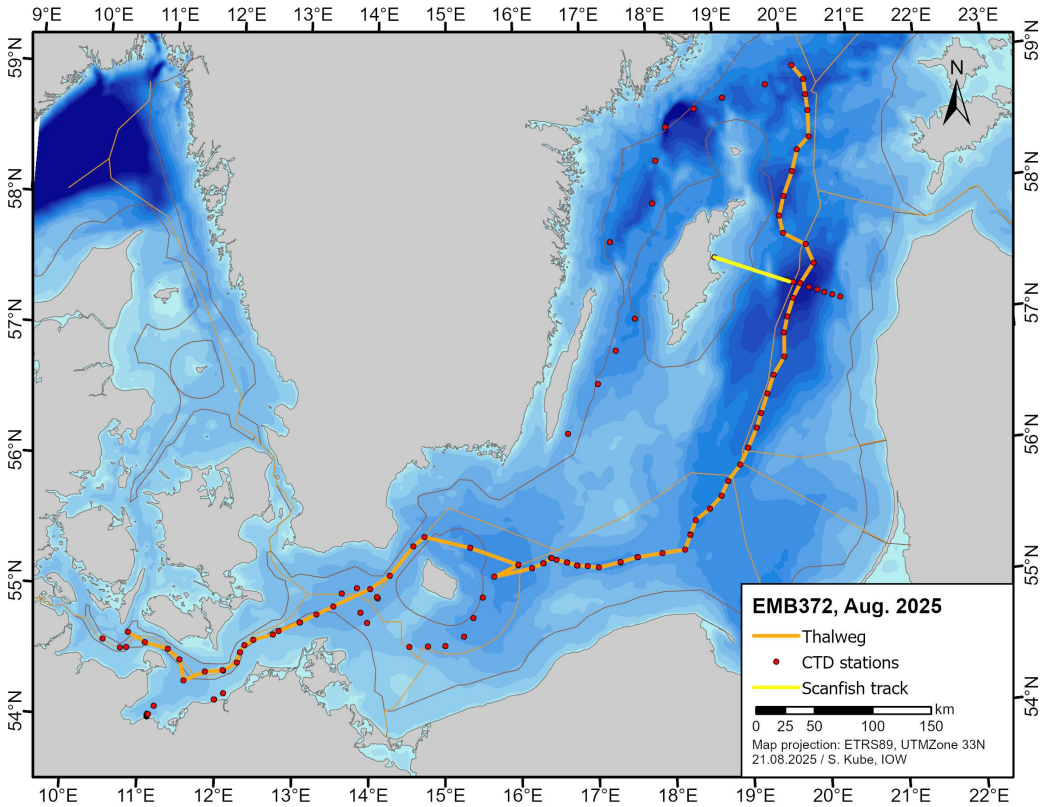

Fig. 5.14 Location of measured CTD stations (Table 7.1) and the "thalweg"-transect crossing all deep basins on the pathway of saltwater inflows (hydrographic parameters visualized as cross sections in Fig. 5.15 – 5.16).

The distribution of temperature, salinity and oxygen concentration along the thalweg transect is shown in Fig. 5.15. In the Danish Straits and the western Baltic Sea, the surface layer was covered by warm surface water of about 19.4 °C to 19.0 °C. Towards the central Baltic the surface temperature depicted a slight decrease to 18.5 °C to 17.9 °C (Slupsk Furrow to Northern Gotland Basin). The year 2025 was again a warm one in the meteorological records with air temperature anomalies of + 1.9 K in March and April and 0.7-1.2 K in May to July compared to the meteorological mean (1981-2010). Consequently, also the observed surface temperatures in the Baltic Sea were well above the climatological mean. The long-term climatological mean (1900-2005) of SST in the western and central Baltic varies regionally between 17.3 °C (Kiel Bight) to 17.02 °C in the northern Gotland Basin in August. Thus, the SST in August 2025 was about 2.2 K to 1 K warmer than usual. The thermocline was found bottom near in the western Baltic and at about 25-40 m depth further east and north. There are still significant amounts of winter water, with core temperatures of 4-5°C in the eastern Bornholm Basin to northern Gotland Basin in the depth range between 50 m and 70 m above the halocline.

Below the halocline deep water in the Slupsk Furrow temperatures of 7.1 °C were observed. The Deep water in the Eastern Gotland Basin depicted a low vertical gradient from about 8.0 °C near the halocline to 7.3 °C at the bottom (Gotland Deep).

In the Mecklenburg Bight a strong vertical salinity gradient was found, with 11.0 at the surface and 23.1 at the bottom. The thin saline bottom layer in the Arkona Basin depicted much lower maximum salinities of about 14.9 (TF0113). The maximum bottom salinity in the central Bornholm basin was 15.8 and the bottom salinity at the Gotland Deep was 12.5, which was more or less constant since autumn 2024 showing no signs of recent inflow activity. The surface layer east of the Darss Sill was covered with the usual brackish surface water. Its salinity ranged between 6.3 and 8, with an eastward directed decreasing gradient.

The dissolved oxygen situation (Fig. 5.15) in the upper layer of the Baltic Sea was slightly depleted like usual in summer, showing values between 270 µmol l^{-1} (western Baltic Sea) to 302 µmol l^{-1} (central Baltic Sea). It is controlled by the exchange with the atmosphere by wind mixing and the primary production, which is at high level during the summer season. The deep layer in the western Baltic Sea showed in bottom near depths a high depletion to values below the hypoxic limit with 5.8 µmol l^{-1} in the Lübeck Bight, 62.5 µmol l^{-1} in the Mecklenburg Bight and 77.3 µmol l^{-1} in the Arkona Basin. Farther east, the bottom near oxygen values showed as well hypoxic values, like usual for the deep central basins of the Baltic Sea. The entire deep layer below the halocline was still anoxic. In the basins around the isle of Gotland sulfidic values were found with a maximum of 285 µmol l^{-1} hydrogen sulphide at the Gotland Deep. This maximum value lowered a bit during the last year by inflow water from the wintertime 2023/2024 in the upper part of the deep-water layer, which ventilated a layer between 90 m to 140 m water depth. In comparison, the hydrogen sulphide concentration was at 355 µmol l^{-1} in May 2024. The density of inflowing water masses was not high enough to deliver new water to the bottom of the Gotland Deep since a decade.

The density distribution shown in Fig. 5.16 resembles the temperature and salinity patterns along the thalweg transect. It illustrates the increase of halocline depth from west to northeast with concurrently decreasing vertical density gradients.

The fluorescence measurement showed generally higher values in the surface water layer up to 30 m water depth, indicating phytoplankton primary production. The lower water layers showed very low values.

The turbidity was generally low along the transect. Only in the deep layer of the eastern to norther Gotland Basin some patches of enhance turbidity were found between 90 m to 140 m water depth. These patches are confined to either the bottom or to the redoxcline (Fig. 5.16).

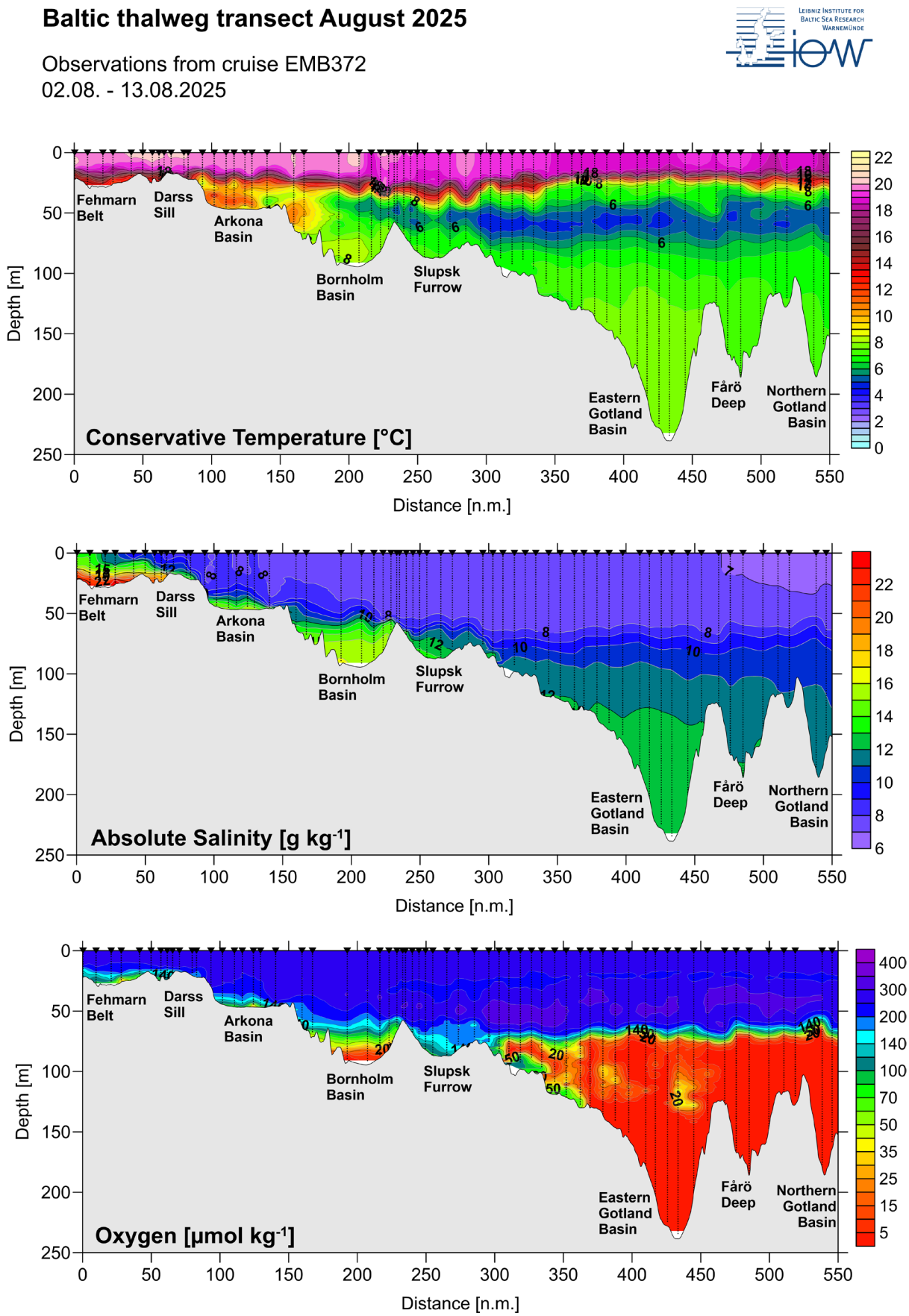

Fig. 5.15 Distribution of conservative temperature (above), absolute salinity (middle), and dissolved oxygen (below) along the thalweg of the Baltic Sea from the Kiel Bight to the Northern Gotland Basin. The figure is based on the preliminary CTD data gathered from 02.08.-13.08.2025.

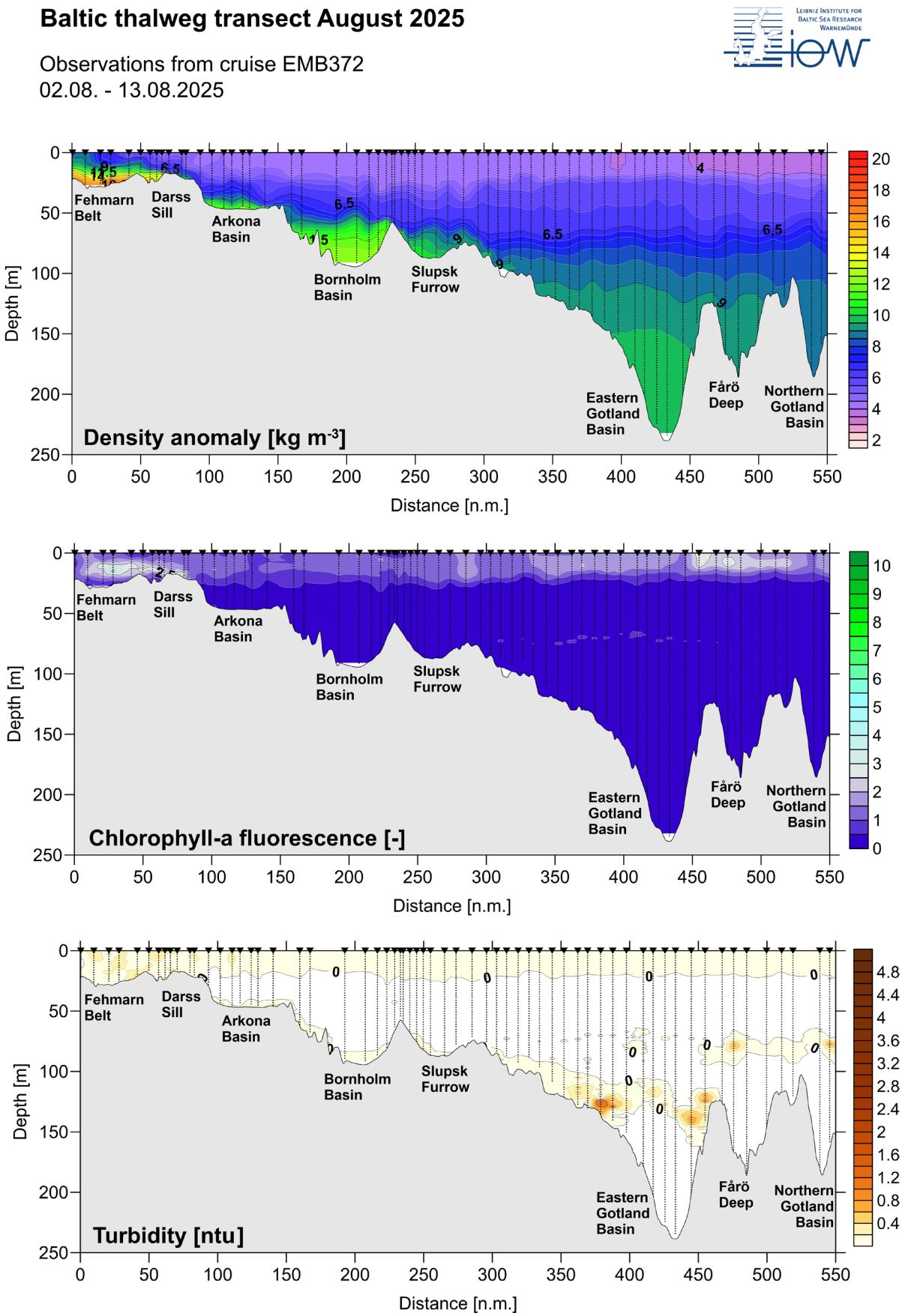

Fig. 5.16 Distribution of density anomaly (above), chlorophyll-a fluorescence (middle), and turbidity (below) along the thalweg of the Baltic Sea from the Kiel bight to the Northern Gotland Basin. The figure is based on the preliminary CTD data gathered from 02.08.-13.08.2025.

An overview of the hydrographic conditions at 9 key stations spanning from the southwestern to the central Baltic Sea is given by vertical profiles of temperature, salinity and dissolved oxygen concentration in Fig 5.17 and 5.18. These plots show the main characteristics of the different subregions. Temperature profiles show warm surface water of about 19 – 20 °C in the south western Baltic Sea. The thermocline was developed in increasing water depth from Kiel Bight to Arkona Basin (Fig. 5.17). A steep halocline in 20 m – 30 m water depth had developed from Bornholm Basin to the central and northern Basins (Fig. 5.18). The vertical salinity profiles showed a gradual increase of salinity with depths in the southwestern Baltic Sea and steep haloclines in 60 – 70 m depths in the deep Basins from Bornholm to central and northern Baltic Sea. Oxygenation in the shallow Baltic Sea was between 100 – 300 µmol kg^{-1} from surface to bottom. In the deep central basins oxygen vanished in 60 – 80 m water depths.

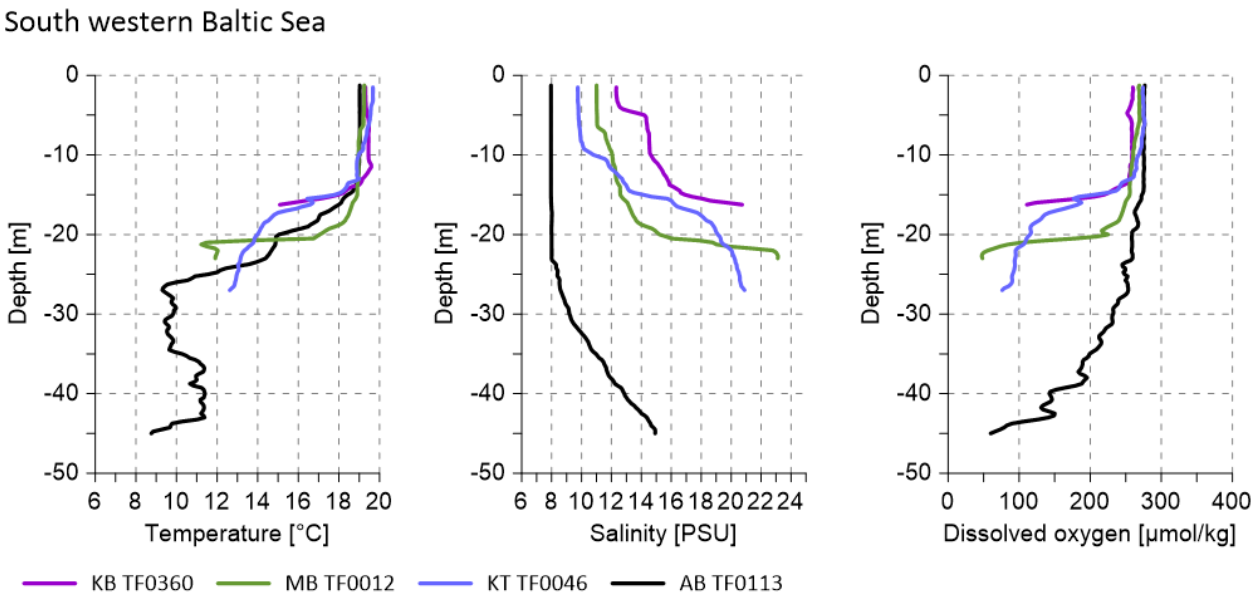

Fig. 5.17 Vertical profiles of temperature, salinity and oxygen concentration (CTD data) at the main stations in the south-western Baltic Sea. KB (TF0360) – Kiel Bight, MB (TF0012) – Mecklenburg Bight, KT (TF0046) – Kadet Trench, AB (TF0113) – Arkona basin.

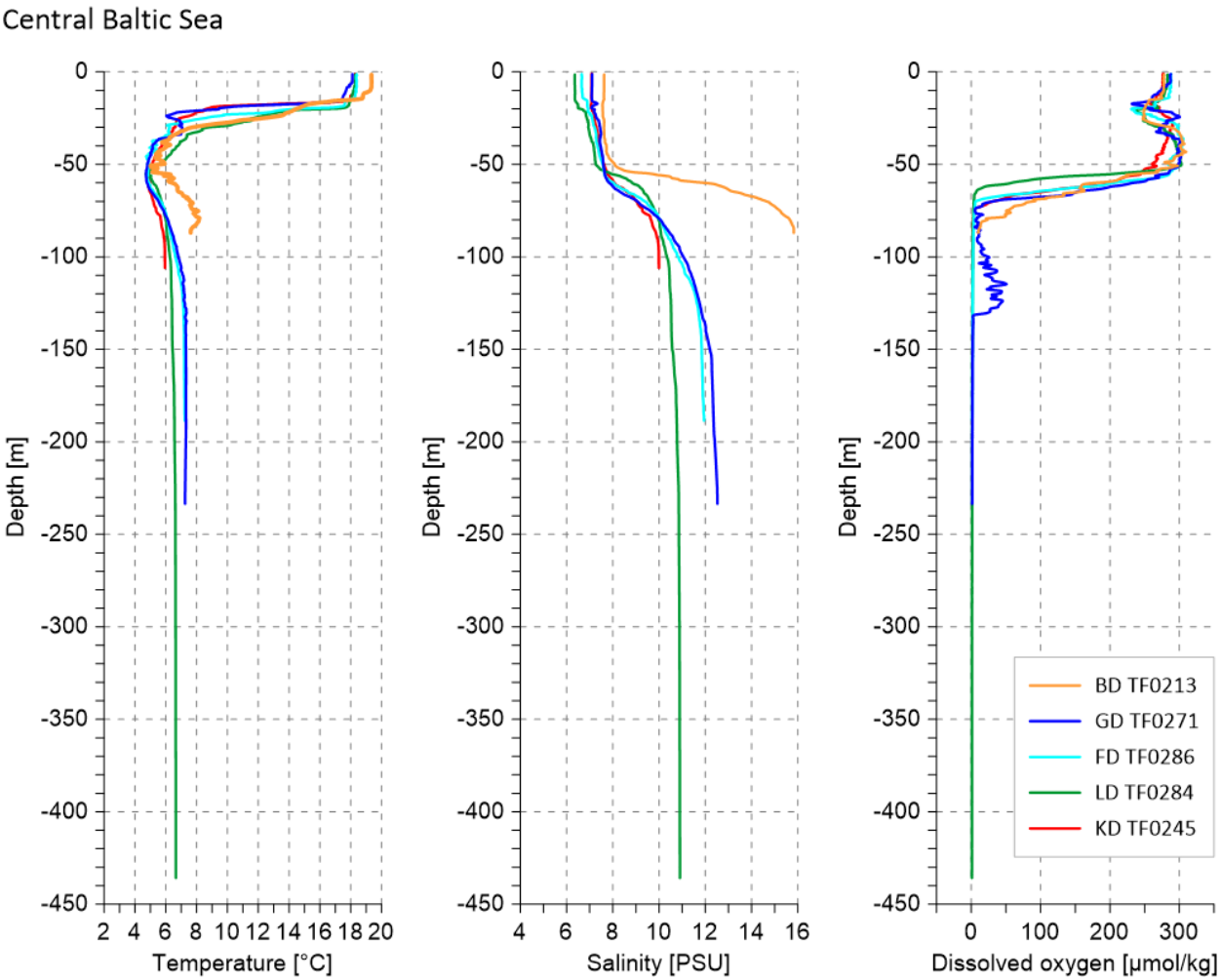

Fig. 5.18 Vertical profiles of temperature, salinity and oxygen concentration (CTD data) at the main stations in the central Baltic Sea. BD (TF0213) – Bornholm Deep, GD (TF0271) - Gotland Deep, FD (TF0286) - Farö Deep, LD (TF0284) - Landsort Deep, KD (TF0245) - Karlsö Deep.

5.5 Biological Investigations

Plankton:

Sampling for phytoplankton as well as chlorophyll analyses were collected from the rosette water sampler from different depths in the euphotic zone from surface to max. 20 m water depths. Additionally, phytoplankton net samples were taken (Table 7.2). Phytoplankton samples were preserved for later microscopic analyses of the species composition and chlorophyll samples were filtered and deep frozen.

The standard zooplankton WP2 net (mesh size 100 µm) was used to sample mesozooplankton above and below the halocline. Additional Apstein net samples (mesh size 55 µm) were collected for analyses of small developmental stages of zooplankton (Table 7.2). All samples were preserved for later microscopic analyses of the zooplankton community composition.

The Multi Plankton Sampler (mesh size 500 µm) was used for horizontal hauls in different water depths to collect macrozooplankton at 13 stations covering the entire Baltic Sea. Gelatinous plankton specimens were determined, measured and counted alive directly on board. Medusae of the Scyphozoa species *Aurelia aurita* were found at all sampling stations (Figure 5.19). This species was generally found in surface waters down to 20 m water depths and only

occasionally deeper. Highest abundances were measured in the northern Gotland Basin with up to 80 ind. 100 m^{-3}. In Arkona Basin a few ephyra were still found, and medusae measuring up to 18 cm in diameter were generally observed. The invasive comb jelly *Mnemiopsis leidyi* was only found in the western Baltic Sea. Distributed across the entire water column, abundances in Mecklenburg Bight and Lübeck Bay ranged between 110 and 280 ind. 100 m^{-3} (Figure 5.19).

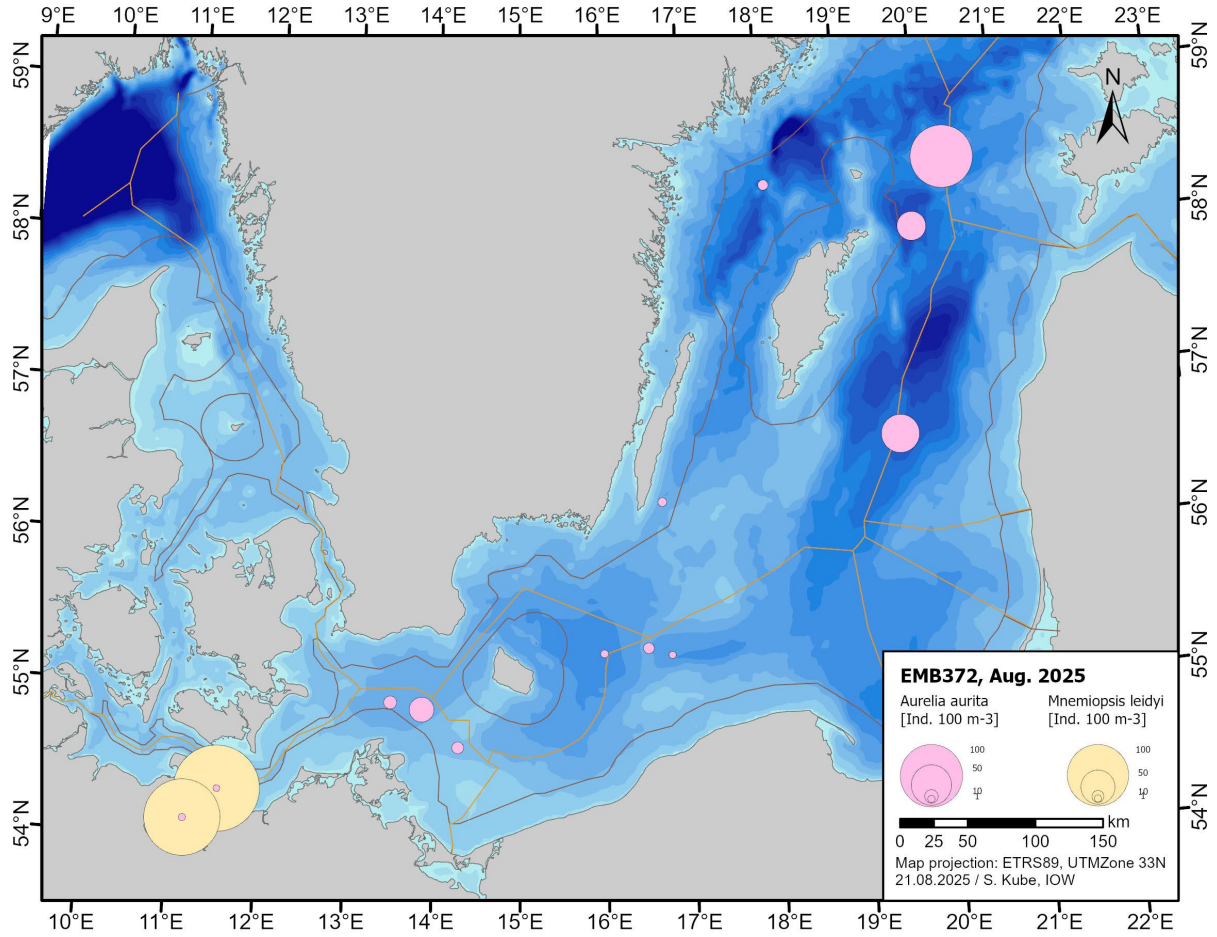

Fig. 5.19 Abundance (Ind. 100 m^{-3}) of the medusae of *Aurelia aurita* (Scyphozoa) and *Mnemiopsis leidyi* (Ctenophora) in the surface water layer (0 – 20 m) at 13 stations during the August cruise EMB372.

Bacterial communities:

Insights into the changes of the microbial food web of the redoxcline will be obtained by vertical high-resolution sampling of the range of the redoxcline at Gotland Deep (TF0271) and Landsort Deep (TF0284). Therefore, in the redoxcline as well as 6 depths above and below, respectively, in depth intervals of 2 m, samples were taken by CTD/water sampling bottles and prepared for microbiological analysis (FISH and DNA) and determination of pigments. Water samples for eDNA extraction were taken with the aim of building up a microbiological DNA archive. Samples were taken in the southwestern Baltic Sea at 11 stations.

6. Ship's Meteorological Station

Not applicable on EMB. The meteorological conditions during the cruise are described in section 5.1, based on data of the automatic weather station of the ship.

7. Station List EMB372

7.1 Overall Station List

Date / Time	Station No.	Station Name	Water Depth	Latitude	Longitude	Gear
[UTC]	EMB	IOW	[m]			
01.08.2025 08:16	EMB372_1-1	TF05	10	54° 13,9041' N	012° 04,6484' E	CTD
01.08.2025 08:35	EMB372_1-2	TF05	10	54° 13,8820' N	012° 04,5347' E	SD
01.08.2025 09:22	EMB372_2-1	NHBoje	8	54° 10,6969' N	011° 57,6678' E	CTD
01.08.2025 11:58	EMB372_3-1	TF0012	21	54° 18,8857' N	011° 33,0052' E	CTD
01.08.2025 12:19	EMB372_3-2	TF0012	21	54° 18,8863' N	011° 32,9674' E	SD
01.08.2025 12:24	EMB372_3-3	TF0012	22	54° 18,8631' N	011° 32,9779' E	PLA
01.08.2025 12:40	EMB372_3-4	TF0012	21	54° 18,8647' N	011° 32,9240' E	CTD
01.08.2025 13:00	EMB372_3-5	TF0012	22	54° 18,8759' N	011° 32,9734' E	WP2
01.08.2025 13:09	EMB372_3-6	TF0012	21	54° 18,8765' N	011° 32,9525' E	WP2
01.08.2025 16:10	EMB372_4-1	E1 Boltenhagen	7	54° 01,4920' N	011° 05,3256' E	CTD
01.08.2025 16:33	EMB372_5-1	D1 Boltenhagen	8	54° 01,7300' N	011° 05,4254' E	CTD
01.08.2025 17:01	EMB372_6-1	C1 Boltenhagen	11	54° 01,9984' N	011° 05,4464' E	CTD
01.08.2025 17:28	EMB372_7-1	B1 Boltenhagen	15	54° 02,2615' N	011° 05,4378' E	CTD
01.08.2025 17:50	EMB372_8-1	A1 Boltenhagen	23	54° 02,5617' N	011° 05,4705' E	CTD
01.08.2025 18:20	EMB372_9-1	A3 Boltenhagen	21	54° 02,5359' N	011° 06,4191' E	CTD
01.08.2025 19:16	EMB372_10-1	TF0022	20	54° 06,5871' N	011° 10,5624' E	CTD
02.08.2025 00:48	EMB372_11-1	TF0014	25	54° 35,6698' N	011° 00,9317' E	CTD
02.08.2025 02:55	EMB372_12-1	TF0361	21	54° 39,8907' N	010° 46,7002' E	CTD
02.08.2025 04:40	EMB372_13-1	TF0360	15	54° 35,9985' N	010° 27,0929' E	CTD
02.08.2025 04:53	EMB372_13-2	TF0360	15	54° 35,9974' N	010° 27,0803' E	SD
02.08.2025 04:56	EMB372_13-3	TF0360	15	54° 35,9958' N	010° 27,0770' E	PLA
02.08.2025 04:58	EMB372_13-4	TF0360	15	54° 35,9969' N	010° 27,0702' E	PLA
02.08.2025 05:07	EMB372_13-5	TF0360	15	54° 35,9998' N	010° 27,0657' E	WP2
02.08.2025 05:16	EMB372_13-6	TF0360	15	54° 35,9894' N	010° 27,0763' E	WP2
02.08.2025 05:24	EMB372_13-7	TF0360	15	54° 35,9893' N	010° 27,0762' E	WP2
02.08.2025 06:33	EMB372_14-1	REF1	20	54° 32,4904' N	010° 41,1990' E	CTD
02.08.2025 07:14	EMB372_14-2	REF1	20	54° 32,4862' N	010° 41,1766' E	MUC
02.08.2025 07:50	EMB372_15-1	MPA1	20	54° 32,8869' N	010° 46,2181' E	CTD
02.08.2025 08:03	EMB372_15-2	MPA1	20	54° 32,9066' N	010° 46,1387' E	MUC
02.08.2025 10:29	EMB372_16-1	TF0010	25	54° 33,0711' N	011° 19,3170' E	CTD
02.08.2025 11:49	EMB372_17-1	TF0013	23	54° 28,4432' N	011° 29,0248' E	CTD
02.08.2025 13:39	EMB372_18-1	TF0017	19	54° 23,4881' N	011° 49,4026' E	CTD
02.08.2025 14:57	EMB372_19-1	TF0041	16	54° 24,3544' N	012° 03,7207' E	CTD
02.08.2025 16:21	EMB372_20-1	TF0046	25	54° 28,2141' N	012° 14,5588' E	CTD
02.08.2025 16:35	EMB372_20-2	TF0046	25	54° 28,2059' N	012° 14,5490' E	SD
02.08.2025 16:37	EMB372_20-3	TF0046	25	54° 28,2103' N	012° 14,5491' E	PLA
02.08.2025 16:40	EMB372_20-4	TF0046	25	54° 28,2194' N	012° 14,5480' E	PLA
02.08.2025 16:51	EMB372_20-5	TF0046	25	54° 28,2282' N	012° 14,5782' E	WP2
02.08.2025 17:01	EMB372_20-6	TF0046	25	54° 28,2353' N	012° 14,5807' E	WP2
02.08.2025 17:48	EMB372_21-1	TF0083	23	54° 32,9983' N	012° 16,4872' E	CTD

Date / Time	Station No.	Station Name	Water Depth	Latitude	Longitude	Gear
[UTC]	EMB	IOW	[m]			
02.08.2025 18:37	EMB372_22-1	TF0033	17	54° 36,3017' N	012° 19,9348' E	CTD
02.08.2025 19:26	EMB372_23-1	TF0002	15	54° 39,0248' N	012° 27,0403' E	CTD
02.08.2025 20:44	EMB372_24-1	TF0001	18	54° 41,8044' N	012° 42,3632' E	CTD
02.08.2025 21:22	EMB372_25-1	TF0030	20	54° 43,4643' N	012° 47,0125' E	CTD
02.08.2025 21:39	EMB372_25-2	TF0030	20	54° 43,4240' N	012° 47,0095' E	PLA
02.08.2025 21:53	EMB372_25-3	TF0030	19	54° 43,4017' N	012° 46,9901' E	CTD
02.08.2025 23:20	EMB372_26-1	TF0115	27	54° 47,7184' N	013° 03,5460' E	CTD
02.08.2025 23:31	EMB372_26-2	TF0115	27	54° 47,7067' N	013° 03,5691' E	CTD
03.08.2025 00:56	EMB372_27-1	TF0114	42	54° 51,5982' N	013° 16,6795' E	CTD
03.08.2025 02:15	EMB372_28-1	TF0113	45	54° 55,4910' N	013° 30,0849' E	CTD
03.08.2025 02:33	EMB372_28-2	TF0113	44	54° 55,4907' N	013° 30,0687' E	PLA
03.08.2025 02:36	EMB372_28-3	TF0113	44	54° 55,4964' N	013° 30,0673' E	PLA
03.08.2025 02:49	EMB372_28-4	TF0113	44	54° 55,4881' N	013° 30,0671' E	WP2
03.08.2025 03:01	EMB372_28-5	TF0113	45	54° 55,4834' N	013° 30,0581' E	WP2
03.08.2025 03:10	EMB372_28-6	TF0113	45	54° 55,4975' N	013° 30,0512' E	WP2
03.08.2025 03:18	EMB372_28-7	TF0113	45	54° 55,4882' N	013° 30,0533' E	WP2
03.08.2025 03:24	EMB372_28-8	TF0113	44	54° 55,4891' N	013° 30,0550' E	WP2
03.08.2025 03:38	EMB372_28-9	TF0113	44	54° 55,4891' N	013° 30,0455' E	CTD
03.08.2025 04:47	EMB372_29-1	TF0105	44	55° 01,5060' N	013° 36,4700' E	CTD
03.08.2025 06:00	EMB372_30-1	TF0104	44	55° 04,1484' N	013° 48,8253' E	CTD
03.08.2025 07:00	EMB372_31-1	TF0103	44	55° 03,8552' N	013° 59,2869' E	CTD
03.08.2025 07:57	EMB372_32-1	TF0109	45	54° 59,5163' N	014° 05,7753' E	CTD
03.08.2025 08:11	EMB372_32-2	TF0109	45	54° 59,4683' N	014° 05,8121' E	SD
03.08.2025 08:14	EMB372_32-3	TF0109	45	54° 59,4638' N	014° 05,8286' E	PLA
03.08.2025 08:27	EMB372_32-4	TF0109	45	54° 59,4185' N	014° 05,8662' E	WP2
03.08.2025 08:39	EMB372_32-5	TF0109	45	54° 59,3792' N	014° 05,9164' E	WP2
03.08.2025 10:07	EMB372_33-1	ABBoje	43	54° 52,8489' N	013° 51,7103' E	CTD
03.08.2025 11:09	EMB372_33-2	ABBoje	43	54° 52,7572' N	013° 51,8195' E	MPS
03.08.2025 19:18	EMB372_34-1	TF0214	93	55° 09,5716' N	015° 39,6559' E	CTD
03.08.2025 21:01	EMB372_35-1	TF0213	89	55° 14,9828' N	015° 59,1263' E	CTD
03.08.2025 21:17	EMB372_35-2	TF0213	89	55° 14,9549' N	015° 59,0402' E	PLA
03.08.2025 21:50	EMB372_35-3	TF0213	89	55° 14,9730' N	015° 58,9480' E	CTD
03.08.2025 22:29	EMB372_35-4	TF0213	89	55° 14,9445' N	015° 58,9649' E	WP2
03.08.2025 22:40	EMB372_35-5	TF0213	89	55° 14,9898' N	015° 58,9674' E	WP2
03.08.2025 22:52	EMB372_35-6	TF0213	89	55° 14,9841' N	015° 58,9574' E	WP2
03.08.2025 23:04	EMB372_35-7	TF0213	89	55° 14,9732' N	015° 58,8398' E	WP2
03.08.2025 23:15	EMB372_35-8	TF0213	89	55° 14,9785' N	015° 58,7560' E	WP2
03.08.2025 23:23	EMB372_35-9	TF0213	89	55° 14,9750' N	015° 58,7766' E	APNET
03.08.2025 23:42	EMB372_35-10	TF0213	89	55° 14,9620' N	015° 58,7959' E	APNET
03.08.2025 23:58	EMB372_35-11	TF0213	89	55° 14,9700' N	015° 58,8377' E	APNET
04.08.2025 02:50	EMB372_36-1	TF0200	90	55° 23,0236' N	015° 20,1161' E	CTD
04.08.2025 06:12	EMB372_37-1	TF0140	68	55° 28,0482' N	014° 43,0450' E	CTD
04.08.2025 07:23	EMB372_38-1	TF0142	73	55° 23,6700' N	014° 33,9523' E	CTD
04.08.2025 09:32	EMB372_39-1	TF0145	44	55° 10,0355' N	014° 15,0683' E	CTD

Date / Time	Station No.	Station Name	Water Depth	Latitude	Longitude	Gear
[UTC]	EMB	IOW	[m]			
04.08.2025 12:55	EMB372_40-1	TF0112	38	54° 48,2058' N	013° 57,4914' E	CTD
04.08.2025 13:25	EMB372_40-2	TF0112	38	54° 48,1704' N	013° 57,4085' E	CTD
07.08.2025 06:05	EMB372_41-1	TF0213	89	55° 15,0321' N	015° 59,0164' E	CTD
07.08.2025 06:09	EMB372_41-2	TF0213	89	55° 15,0089' N	015° 58,9708' E	PLA
07.08.2025 06:36	EMB372_41-3	TF0213	89	55° 15,0012' N	015° 58,7902' E	MPS
07.08.2025 09:03	EMB372_42-1	TF0221	81	55° 13,3263' N	016° 10,0615' E	CTD
07.08.2025 10:06	EMB372_43-1	TF0225	64	55° 15,5762' N	016° 19,3037' E	CTD
07.08.2025 10:59	EMB372_44-1	TF0226	56	55° 17,8544' N	016° 25,8564' E	CTD
07.08.2025 11:40	EMB372_45-1	TF0224	61	55° 17,0443' N	016° 30,0402' E	CTD
07.08.2025 12:35	EMB372_46-1	TF0227	67	55° 15,7172' N	016° 38,4416' E	CTD
07.08.2025 13:34	EMB372_47-1	TF0228	76	55° 14,2448' N	016° 46,5787' E	CTD
07.08.2025 13:38	EMB372_47-2	TF0228	76	55° 14,2253' N	016° 46,5732' E	PLA
07.08.2025 13:54	EMB372_47-3	TF0228	75	55° 14,1537' N	016° 46,4507' E	MPS
07.08.2025 15:36	EMB372_48-1	TF0229	84	55° 13,7050' N	016° 54,8080' E	CTD
07.08.2025 16:37	EMB372_49-1	TF0222	90	55° 12,9710' N	017° 03,9852' E	CTD
07.08.2025 18:12	EMB372_50-1	TF0266	88	55° 15,0948' N	017° 21,6511' E	CTD
07.08.2025 19:31	EMB372_51-1	TF0267	83	55° 17,1408' N	017° 35,6655' E	CTD
07.08.2025 21:13	EMB372_52-1	TF0268	74	55° 18,4969' N	017° 55,7812' E	CTD
07.08.2025 23:05	EMB372_53-1	TF0256	76	55° 19,6400' N	018° 14,0574' E	CTD
08.08.2025 00:27	EMB372_54-1	TF0257	86	55° 26,5531' N	018° 19,1795' E	CTD
08.08.2025 13:20	EMB372_55-1	TF223n	55	56° 15,0757' N	016° 41,9609' E	CTD
08.08.2025 13:22	EMB372_55-2	TF223n	55	56° 15,0611' N	016° 41,9432' E	PLA
08.08.2025 13:46	EMB372_55-3	TF223n	56	56° 14,9198' N	016° 41,8503' E	MPS
08.08.2025 17:37	EMB372_56-1	GB_SW	77	56° 37,6370' N	017° 07,8960' E	CTD
08.08.2025 19:47	EMB372_57-1	wGB-1	95	56° 52,7382' N	017° 23,6039' E	CTD
08.08.2025 22:04	EMB372_58-1	TF0245	109	57° 06,9824' N	017° 40,1941' E	CTD
09.08.2025 03:00	EMB372_59-1	TF0242	141	57° 42,9765' N	017° 22,0535' E	CTD
09.08.2025 03:24	EMB372_59-2	TF0242	141	57° 42,9792' N	017° 21,9812' E	CTD
09.08.2025 06:38	EMB372_60-1	TF0240	171	58° 00,0303' N	017° 59,9510' E	CTD
09.08.2025 09:12	EMB372_61-1	wGB-3	148	58° 19,5502' N	018° 04,1643' E	CTD
09.08.2025 09:14	EMB372_61-2	wGB-3	152	58° 19,5472' N	018° 04,1421' E	PLA
09.08.2025 10:10	EMB372_61-3	wGB-3	163	58° 19,5056' N	018° 03,9588' E	MPS
09.08.2025 12:43	EMB372_62-1	TF0284	453	58° 35,0970' N	018° 14,1032' E	CTD
09.08.2025 13:04	EMB372_62-2	TF0284	453	58° 35,0046' N	018° 14,0368' E	SD
09.08.2025 14:05	EMB372_62-3	TF0284	453	58° 35,0122' N	018° 14,0052' E	CTD
09.08.2025 14:59	EMB372_62-4	TF0284	453	58° 35,0155' N	018° 14,0069' E	CTD
09.08.2025 16:01	EMB372_62-5	TF0284	453	58° 35,0212' N	018° 14,0297' E	CTD
09.08.2025 18:00	EMB372_63-1	nGB-1	241	58° 42,7352' N	018° 40,2911' E	CTD
09.08.2025 20:01	EMB372_64-1	TF0283	131	58° 47,0790' N	019° 06,0351' E	CTD
09.08.2025 22:36	EMB372_65-1	nGB-2	156	58° 51,9901' N	019° 44,8487' E	CTD
10.08.2025 00:36	EMB372_66-1	TF0288	142	58° 59,8561' N	020° 09,6990' E	CTD
10.08.2025 02:00	EMB372_67-1	TF0282	164	58° 53,0533' N	020° 19,0259' E	CTD
10.08.2025 02:37	EMB372_67-2	TF0282	165	58° 53,0167' N	020° 19,0116' E	CTD
10.08.2025 03:48	EMB372_68-1	TF0289	197	58° 46,0103' N	020° 19,8719' E	CTD

Date / Time	Station No.	Station Name	Water Depth	Latitude	Longitude	Gear
[UTC]	EMB	IOW	[m]			
10.08.2025 05:10	EMB372_69-1	TF0279	164	58° 38,5009' N	020° 20,7655' E	CTD
10.08.2025 06:52	EMB372_70-1	TF0285	123	58° 26,5017' N	020° 20,0625' E	CTD
10.08.2025 06:54	EMB372_70-2	TF0285	122	58° 26,5039' N	020° 20,0343' E	PLA
10.08.2025 07:28	EMB372_70-3	TF0285	123	58° 26,5387' N	020° 19,9479' E	MPS
10.08.2025 08:58	EMB372_71-1	TF0278	121	58° 20,9827' N	020° 08,9277' E	CTD
10.08.2025 10:32	EMB372_72-1	TF0277	163	58° 10,9950' N	020° 03,2387' E	CTD
10.08.2025 12:22	EMB372_73-1	TF0286	195	57° 59,9699' N	019° 54,1229' E	CTD
10.08.2025 12:23	EMB372_73-2	TF0286	195	57° 59,9669' N	019° 54,1270' E	SD
10.08.2025 13:29	EMB372_73-3	TF0286	196	58° 00,0102' N	019° 53,9720' E	CTD
10.08.2025 13:30	EMB372_73-4	TF0286	196	58° 00,0102' N	019° 53,9744' E	PLA
10.08.2025 13:46	EMB372_73-5	TF0286	198	58° 00,0209' N	019° 53,6613' E	MPS
10.08.2025 15:40	EMB372_74-1	TF0290	170	57° 51,0101' N	019° 49,0895' E	CTD
10.08.2025 17:10	EMB372_75-1	TF0287	129	57° 42,8887' N	019° 51,2459' E	CTD
10.08.2025 19:00	EMB372_76-1	TF0270	144	57° 36,9792' N	020° 10,0431' E	CTD
10.08.2025 20:32	EMB372_77-1	TF0276	209	57° 28,1919' N	020° 15,6886' E	CTD
10.08.2025 22:21	EMB372_78-1	TF0271	241	57° 19,1904' N	020° 03,0481' E	CTD
10.08.2025 23:30	EMB372_78-2	TF0271	241	57° 19,1816' N	020° 03,0067' E	CTD
11.08.2025 00:27	EMB372_78-3	TF0271	241	57° 19,1759' N	020° 03,0492' E	CTD
11.08.2025 01:18	EMB372_78-4	TF0271	241	57° 19,1867' N	020° 03,0105' E	CTD
11.08.2025 01:52	EMB372_78-5	TF0271	241	57° 19,1869' N	020° 02,9984' E	CTD
11.08.2025 01:53	EMB372_78-6	TF0271	241	57° 19,1878' N	020° 03,0017' E	PLA
11.08.2025 02:29	EMB372_78-7	TF0271	241	57° 19,1875' N	020° 03,0060' E	CTD
11.08.2025 07:03	EMB372_79-1	SF001EGB	20	57° 33,7560' N	018° 51,1272' E	CTD
11.08.2025 07:25	EMB372_80-1	SF001EGB	19	57° 33,7773' N	018° 51,0365' E	SCF start
11.08.2025 07:25	EMB372_80-1	SCF on deck	220	57° 20,3429' N	019° 53,8987' E	SCF on deck
11.08.2025 14:40	EMB372_81-1	SF010EGB	211	57° 21,1876' N	019° 51,9283' E	CTD
11.08.2025 15:43	EMB372_82-1	SF011EGB	230	57° 20,0390' N	019° 57,2215' E	CTD
11.08.2025 17:17	EMB372_83-1	SF012EGB	244	57° 17,1540' N	020° 09,9457' E	CTD
11.08.2025 18:22	EMB372_84-1	SF013EGB	194	57° 15,7424' N	020° 17,1108' E	CTD
11.08.2025 19:17	EMB372_85-1	SF014EGB	147	57° 14,3577' N	020° 23,1048' E	CTD
11.08.2025 20:12	EMB372_86-1	SF015EGB	87	57° 13,0161' N	020° 29,5587' E	CTD
11.08.2025 21:05	EMB372_87-1	SF016EGB	96	57° 11,6061' N	020° 36,3047' E	CTD
12.08.2025 00:20	EMB372_88-1	TF0275	231	57° 12,6181' N	019° 55,9582' E	CTD
12.08.2025 02:02	EMB372_89-1	TF0272	209	57° 04,3027' N	019° 49,8864' E	CTD
12.08.2025 03:35	EMB372_90-1	TF0273	184	56° 57,0986' N	019° 46,2632' E	CTD
12.08.2025 05:24	EMB372_91-1	TF0274	155	56° 46,0529' N	019° 45,1925' E	CTD
12.08.2025 07:02	EMB372_92-1	TF0260	145	56° 38,0058' N	019° 35,1100' E	CTD
12.08.2025 07:04	EMB372_92-2	TF0260	145	56° 37,9975' N	019° 35,0935' E	PLA
12.08.2025 07:33	EMB372_92-3	TF0260	145	56° 38,0022' N	019° 34,9616' E	MPS
12.08.2025 09:07	EMB372_93-1	TF0261	144	56° 29,5331' N	019° 28,9912' E	CTD
12.08.2025 10:33	EMB372_94-1	TF0263	134	56° 20,8139' N	019° 22,8411' E	CTD
12.08.2025 11:52	EMB372_95-1	TF0262	132	56° 14,0962' N	019° 18,1777' E	CTD
12.08.2025 12:17	EMB372_95-2	TF0262	132	56° 14,0889' N	019° 18,1200' E	CTD
12.08.2025 13:47	EMB372_96-1	TF0250	124	56° 05,0180' N	019° 10,1115' E	CTD

Date / Time	Station No.	Station Name	Water Depth	Latitude	Longitude	Gear
[UTC]	EMB	IOW	[m]			
12.08.2025 15:16	EMB372_97-1	TF0265	110	55° 57,5289' N	019° 02,9287' E	CTD
12.08.2025 16:42	EMB372_98-1	TF0253	99	55° 50,3633' N	018° 52,0148' E	CTD
12.08.2025 17:53	EMB372_99-1	TF0258	90	55° 43,5969' N	018° 45,9249' E	CTD
12.08.2025 19:06	EMB372_100-1	TF0255	95	55° 37,9515' N	018° 35,9601' E	CTD
12.08.2025 20:18	EMB372_101-1	TF0259	89	55° 32,9531' N	018° 23,9976' E	CTD
12.08.2025 20:19	EMB372_101-2	TF0259	89	55° 32,9593' N	018° 23,9931' E	PLA
12.08.2025 21:27	EMB372_102-1	TF0257	86	55° 26,4977' N	018° 19,2052' E	CTD
12.08.2025 22:42	EMB372_103-1	TF0256	77	55° 19,6392' N	018° 14,0890' E	CTD
13.08.2025 00:34	EMB372_104-1	TF0268	73	55° 18,5847' N	017° 55,8441' E	CTD
13.08.2025 02:15	EMB372_105-1	TF0267	83	55° 17,1998' N	017° 35,6860' E	CTD
13.08.2025 03:30	EMB372_106-1	TF0266	88	55° 15,1166' N	017° 21,6699' E	CTD
13.08.2025 05:02	EMB372_107-1	TF0222	90	55° 12,9931' N	017° 04,0224' E	CTD
13.08.2025 06:00	EMB372_108-1	TF0229	84	55° 13,7379' N	016° 54,7299' E	CTD
13.08.2025 06:55	EMB372_109-1	TF0228	75	55° 14,1920' N	016° 46,3153' E	CTD
13.08.2025 07:45	EMB372_110-1	TF0227	67	55° 15,6665' N	016° 38,2528' E	CTD
13.08.2025 08:36	EMB372_111-1	TF0224	59	55° 16,9808' N	016° 29,9079' E	CTD
13.08.2025 08:37	EMB372_111-2	TF0224	60	55° 16,9828' N	016° 29,9289' E	PLA
13.08.2025 08:54	EMB372_111-3	TF0224	60	55° 17,0004' N	016° 29,9195' E	MPS
13.08.2025 09:56	EMB372_112-1	TF0226	55	55° 17,8047' N	016° 25,7602' E	CTD
13.08.2025 10:48	EMB372_113-1	TF0225	64	55° 15,4788' N	016° 19,1802' E	CTD
13.08.2025 11:46	EMB372_114-1	TF0221	81	55° 13,2630' N	016° 09,9834' E	CTD
13.08.2025 12:52	EMB372_115-1	TF0213	89	55° 15,0621' N	015° 58,8967' E	CTD
13.08.2025 12:53	EMB372_115-2	TF0213	89	55° 15,0635' N	015° 58,8948' E	SD
13.08.2025 12:53	EMB372_115-3	TF0213	89	55° 15,0648' N	015° 58,8925' E	PLA
13.08.2025 13:21	EMB372_115-4	TF0213	89	55° 15,0357' N	015° 58,9519' E	WP2
13.08.2025 13:30	EMB372_115-5	TF0213	89	55° 15,0212' N	015° 58,9956' E	WP2
13.08.2025 13:40	EMB372_115-6	TF0213	89	55° 15,0266' N	015° 58,9961' E	WP2
13.08.2025 13:55	EMB372_115-7	TF0213	89	55° 15,0305' N	015° 58,9911' E	WP2
13.08.2025 14:05	EMB372_115-8	TF0213	89	55° 15,0313' N	015° 58,9917' E	WP2
13.08.2025 14:15	EMB372_115-9	TF0213	89	55° 15,0333' N	015° 58,9893' E	APNET
13.08.2025 14:30	EMB372_115-10	TF0213	89	55° 15,0278' N	015° 58,9904' E	APNET
13.08.2025 14:43	EMB372_115-11	TF0213	89	55° 15,0269' N	015° 58,9677' E	APNET
13.08.2025 17:23	EMB372_116-1	TF0215	75	55° 00,0142' N	015° 29,9368' E	CTD
13.08.2025 19:13	EMB372_117-1	TF0204	68	54° 50,7070' N	015° 22,3759' E	CTD
13.08.2025 21:17	EMB372_118-1	TF0202	63	54° 42,0399' N	015° 14,8139' E	CTD
13.08.2025 23:21	EMB372_119-1	TF0203	50	54° 37,7443' N	014° 59,9579' E	CTD
14.08.2025 01:21	EMB372_120-1	TF0154	45	54° 37,4273' N	014° 45,9986' E	CTD
14.08.2025 02:34	EMB372_121-1	TF0153	26	54° 37,2254' N	014° 31,1776' E	CTD
14.08.2025 03:41	EMB372_122-1	TF0152	28	54° 37,9930' N	014° 16,9776' E	CTD
14.08.2025 03:45	EMB372_122-2	TF0152	28	54° 37,9929' N	014° 16,9902' E	PLA
14.08.2025 04:00	EMB372_122-3	TF0152	28	54° 37,8820' N	014° 17,1043' E	MPS
14.08.2025 07:05	EMB372_123-1	TF0109	45	55° 00,0260' N	014° 04,8912' E	CTD
14.08.2025 07:08	EMB372_123-2	TF0109	46	55° 00,0237' N	014° 04,9106' E	SD
14.08.2025 07:10	EMB372_123-3	TF0109	45	55° 00,0228' N	014° 04,9144' E	PLA

Date / Time	Station No.	Station Name	Water Depth	Latitude	Longitude	Gear
[UTC]	EMB	IOW	[m]			
14.08.2025 07:27	EMB372_123-4	TF0109	45	54° 59,9910' N	014° 04,9743' E	WP2
14.08.2025 07:36	EMB372_123-5	TF0109	45	54° 59,9848' N	014° 04,9766' E	WP2
14.08.2025 10:08	EMB372_124-1	TF0113	45	54° 55,5079' N	013° 29,9979' E	CTD
14.08.2025 10:09	EMB372_124-2	TF0113	44	54° 55,5093' N	013° 30,0042' E	PLA
14.08.2025 10:09	EMB372_124-3	TF0113	45	54° 55,5094' N	013° 30,0064' E	SD
14.08.2025 10:31	EMB372_124-4	TF0113	45	54° 55,5186' N	013° 29,9424' E	WP2
14.08.2025 10:42	EMB372_124-5	TF0113	45	54° 55,5234' N	013° 29,9836' E	WP2
14.08.2025 10:59	EMB372_124-6	TF0113	45	54° 55,5235' N	013° 30,1214' E	MPS
14.08.2025 13:20	EMB372_125-1	TF0114	42	54° 51,6323' N	013° 16,5289' E	CTD
14.08.2025 14:50	EMB372_126-1	TF0115	27	54° 47,7101' N	013° 03,4025' E	CTD
14.08.2025 16:20	EMB372_127-1	TF0030	20	54° 43,4437' N	012° 46,9186' E	CTD
14.08.2025 17:06	EMB372_128-1	TF0001	18	54° 41,8625' N	012° 42,3208' E	CTD
14.08.2025 18:34	EMB372_129-1	TF0002	15	54° 38,9748' N	012° 26,9681' E	CTD
14.08.2025 20:29	EMB372_130-1	TF0046	25	54° 28,1605' N	012° 14,4522' E	CTD
14.08.2025 20:31	EMB372_130-2	TF0046	25	54° 28,1597' N	012° 14,4677' E	PLA
14.08.2025 20:48	EMB372_130-3	TF0046	25	54° 28,1602' N	012° 14,5428' E	WP2
14.08.2025 21:58	EMB372_131-1	TF0041	16	54° 24,4213' N	012° 03,6156' E	CTD
14.08.2025 23:16	EMB372_132-1	TF0017	19	54° 23,5137' N	011° 49,3841' E	CTD
15.08.2025 06:00	EMB372_133-1	TF0012	21	54° 18,9035' N	011° 33,0602' E	CTD
15.08.2025 06:01	EMB372_133-2	TF0012	22	54° 18,9036' N	011° 33,0628' E	SD
15.08.2025 06:03	EMB372_133-3	TF0012	21	54° 18,9031' N	011° 33,0752' E	PLA
15.08.2025 06:17	EMB372_133-4	TF0012	21	54° 18,8975' N	011° 33,0377' E	WP2
15.08.2025 06:32	EMB372_133-5	TF0012	21	54° 18,8801' N	011° 32,9738' E	WP2
15.08.2025 06:45	EMB372_133-6	TF0012	21	54° 18,8487' N	011° 32,9644' E	MPS
15.08.2025 09:20	EMB372_134-1	TF0022	20	54° 06,5958' N	011° 10,5517' E	CTD
15.08.2025 09:22	EMB372_134-2	TF0022	20	54° 06,5870' N	011° 10,5482' E	PLA
15.08.2025 10:00	EMB372_134-3	TF0022	20	54° 06,6467' N	011° 10,4066' E	MPS
15.08.2025 13:33	EMB372_135-1	NH Boje	10	54° 10,8741' N	011° 57,4854' E	CTD
07.11.2024 11:12	EMB353_2-1	TF0018	17	54° 10,9990' N	011° 45,8854' E	CTD

7.2 Water Sampling – Parameters and Number of Samples

Station No. EMB372_xxx	Station name	CTD quality assurance	O2	H2S measurement	PO4	NO3	NO2	SIO4	NH4	P+N-Total	P+N-Dissolved	POM	DOM	CH4_N2O	CO2	Pollutants	Mikrobiology eDNA (Filter)	Microbiology Proteomics	Mikrobiology DNA (Filter)	Mikrobiology (FISH Filter)	Cell counts (Flowcytometry)	Chlorophyll	Phytoplankton (Net)	Phytoplankton DNA-Filter	Phytoplankton (water sample)	Zooplankton (WP2-Net)	Zooplankton DNA-Filter	Zooplankton (Apstein Net)	Makrozooplankton (MultiPlanktonSampler)
1	TFO5		1		3	3	3	3	3	2	2	2	2			1	6												
2	NHBoje																												
3	TF0012		4		4	4	4	4	4	3	3	3	3	4	4		9	6				6	2	3	5	1	1		
4	E1																												
5	D1																								1				
6	C1																												
7	B1																												
8	A1																												
9	A3																												
10	TF0022		4		4	4	4	4	4					4	4														
11	TF0014	x	9														6												
12	TF0361																												
13	TF0360		3		3	3	3	3	3	3	3	3	3									4	2	3	5	2			
14	REF1																												
15	MPA1																												
16	TF0010		1		4	4	4	4								1	6												
17	TF0013																												
18	TF0017																												
19	TF0041		1		3	3	3	3																					
20	TF0046		1		4	4	4	4									6					6	2	3	4	2			
21	TF0083																												
22	TF0033																												
23	TF0002		3		3	3	3	3									6												

Station No. EMB372_xxx	Station name	CTD quality assurance	O2	H2S measurement	PO4	NO3	NO2	SIO4	NH4	P+N-Total	P+N-Dissolved	POM	DOM	CH4_N2O	CO2	Pollutants	Mikrobiology eDNA (Filter)	Microbiology Proteomics	Mikrobiology DNA (Filter)	Mikrobiology (FISH Filter)	Cell counts (Flowcytometry)	Chlorophyll	Phytoplankton (Net)	Phytoplankton DNA-Filter	Phytoplankton (water sample)	Zooplankton (WP2-Net)	Zooplankton DNA-Filter	Zooplankton (Apstein Net)	Makrozooplankton (MultiPlanktonSampler)
24	TF0001		4		4	4	4	4									6												
25	TF0030		1		4	4	4	4									9	6				6	2		4				
26	TF0115	x	13		4	4	4	4									6												
27	TF0114		1		5	5	5	5																					
28	TF0113		7		7	7	7	7	7	4	4	4	4	7	7		6					5	2	3	4	3	1		
29	TF0105		1		5	5	5	5																					
30	TF0104		1		5	5	5	5																					
31	TF0103		1		5	5	5	5																					
32	TF0109		1		5	5	5	5	5	4	4	4	4			1						6	2	3	4	2			
33	AB-Boje		2													1													5
34	TF0214		2	2	7	7	7	7																					
35	TF0213	x	19		10	10	10	10	10	6	6	6	6	10	10							5	2		4	5		3	5
36	TF0200		2		7	7	7	7																					
37	TF0140		1		6	6	6	6																					
38	TF0142		1		5	5	5	5																					
39	TF0145		1		5	5	5	5																					
40	TF0112		1		4	4	4	4									9	6											
41	TF0213																						1						
42	TF0221																												
43	TF0225		1																										
44	TF0226																												
45	TF0224																												
46	TF0227																												
47	TF0228		1																				1						5

Station No. EMB372_xxx	Station name	CTD quality assurance	O2	H2S measurement	PO4	NO3	NO2	SIO4	NH4	P+N-Total	P+N-Dissolved	POM	DOM	CH4_N2O	CO2	Pollutants	Mikrobiology eDNA (Filter)	Microbiology Proteomics	Mikrobiology DNA (Filter)	Mikrobiology (FISH Filter)	Cell counts (Flowcytometry)	Chlorophyll	Phytoplankton (Net)	Phytoplankton DNA-Filter	Phytoplankton (water sample)	Zooplankton (WP2-Net)	Zooplankton DNA-Filter	Zooplankton (Apstein Net)	Makrozooplankton (MultiPlanktonSampler)
48	TF0229																												
49	TF0222		7		7	7	7	7	7																				
50	TF0266																												
51	TF0267																												
52	TF0268	x	9																										
53	TF0256																												
54	TF0257																												
55	TF0223n		1																				1						5
56	GB_SW		1																										
57	wGB-1																												
58	TF0245		7	3	8	8	8	8	8																				
59	TF0242	x	9																										
60	TF0240		7	5	10	10	10	10	10																				
61	wGB-3																						1						5
62	TF0284		17	20	29	29	29	29	29	10	10	10	10						39	26	52								
63	nGB-1																												
64	TF0283		1	3																									
65	nGB-2																												
66	TF0288																												
67	TF0282	x	10	3																									
68	TF0289																												
69	TF0279																												
70	TF0285		1	3																			1						5
71	TF0278																												

Station No. EMB372_xxx	Station name	CTD quality assurance	O2	H2S measurement	PO4	NO3	NO2	SIO4	NH4	P+N-Total	P+N-Dissolved	POM	DOM	CH4_N2O	CO2	Pollutants	Mikrobiology eDNA (Filter)	Microbiology Proteomics	Mikrobiology DNA (Filter)	Mikrobiology (FISH Filter)	Cell counts (Flowcytometry)	Chlorophyll	Phytoplankton (Net)	Phytoplankton DNA-Filter	Phytoplankton (water sample)	Zooplankton (WP2-Net)	Zooplankton DNA-Filter	Zooplankton (Apstein Net)	Makrozooplankton (MultiPlanktonSampler)
72	TF0277																												
73	TF0286		11	8	16	16	16	16	16	6	6	6	6	16	16								1						5
74	TF0290																												
75	TF0287																												
76	TF0270		1	3																									
77	TF0276																												
78	TF0271		26	20	34	34	34	34	34	12	12	12	12	24	21				26	26	26	6	2		4				
79	SF001EGB																												
80	SF001EGB																												
81	SF010EGB																												
82	SF011EGB																												
83	SF012EGB																												
84	SF013EGB																												
85	SF014EGB																												
86	SF015EGB																												
87	SF016EGB																												
88	TF0275																												
89	TF0272		1	3																									
90	TF0273																												
91	TF0274																												
92	TF0260		9	4																			1						5
93	TF0261																												
94	TF0263																												
95	TF0262	x	9																										

Station No. EMB372_xxx	Station name	CTD quality assurance	O2	H2S measurement	PO4	NO3	NO2	SIO4	NH4	P+N-Total	P+N-Dissolved	POM	DOM	CH4_N2O	CO2	Pollutants	Mikrobiology eDNA (Filter)	Microbiology Proteomics	Mikrobiology DNA (Filter)	Mikrobiology (FISH Filter)	Cell counts (Flowcytometry)	Chlorophyll	Phytoplankton (Net)	Phytoplankton DNA-Filter	Phytoplankton (water sample)	Zooplankton (WP2-Net)	Zooplankton DNA-Filter	Zooplankton (Apstein Net)	Makrozooplankton (MultiPlanktonSampler)
96	TF0250																												
97	TF0265																												
98	TF0253		1																										
99	TF0258																												
100	TF0255																												
101	TF0259		7	2	7	7	7	7	7													5	2		4				
102	TF0257																												
103	TF0256	x	9																										
104	TF0268																												
105	TF0267																												
106	TF0266																												
107	TF0222		1																										
108	TF0229																												
109	TF0228																												
110	TF0227																												
111	TF0224																						1						5
112	TF0226																												
113	TF0225																												
114	TF0221																												
115	TF0213		7	1	7	7	7	7														6	2		4	5		3	
116	TF0215																												
117	TF0204		1																										
118	TF0202																												
119	TF0203	x	9																										

Station No. EMB372_xxx	Station name	CTD quality assurance	O2	H2S measurement	PO4	NO3	NO2	SIO4	NH4	P+N-Total	P+N-Dissolved	POM	DOM	CH4_N2O	CO2	Pollutants	Mikrobiology eDNA (Filter)	Microbiology Proteomics	Mikrobiology DNA (Filter)	Mikrobiology (FISH Filter)	Cell counts (Flowcytometry)	Chlorophyll	Phytoplankton (Net)	Phytoplankton DNA-Filter	Phytoplankton (water sample)	Zooplankton (WP2-Net)	Zooplankton DNA-Filter	Zooplankton (Apstein Net)	Makrozooplankton (MultiPlanktonSampler)
120	TF0154																												
121	TF0153																												
122	TF0152																						1						5
123	TF0109		1																			5	2		4	2			
124	TF0113		1																			6	3		4	2			5
125	TF0114																												
126	TF0115																												
127	TF0030		1																										
128	TF0001																												
129	TF0002																												
130	TF0046																					6	2		3	1			
131	TF0041																												
132	TF0017		1																										
133	TF0012																					5	3		3	2			5
134	TF0022																						1						5
135	NHBoje																												

8. Data and Sample Storage and Availability

The data gathered will be stored on a data repository in the IOW immediately after the cruise. The processed and validated data will be stored in the IOW data base (https://odin2.io-warnemuende.de). According to the IOW data policy and to facilitate the international exchange of data, all metadata will be made available under the international ISO 19115 standards for georeferenced metadata. Data from German waters will be stored additionally in the BSH MUDAB data base.

The access to the data itself will be restricted for three years after data acquisition to protect the research process, including scientific analysis and publication. After that period the data becomes openly available to any person or any organization who requests them, under the international Creative Commons (CC) data license of type CC BY 4.0 (https://creativecommons.org/licenses/by/4.0/). For further details refer to the IOW data policy document.

Table 8.1 Data availability and responsible scientists.

Type	Database	Available	Free Access	Contact
Hydrographic parameter	IOW DB, MUDAB, HELCOM, ICES	October 2025	December 2026	Naumann, Michael, Dr. michael.naumann@io-warnemuende.de
Nutrients	IOW DB, MUDAB, HELCOM, ICES	March 2026	January 2028	Kuss, Joachim, Dr. joachim.kuss@io-warnemuende.de
Phytoplankton, Chlorophyll	IOW DB MUDAB	June 2026	February 2028	Kremp, Anke, Dr. anke.kremp@io-warnemuende.de
Mesozooplankton	selected data in MUDAB	June 2026	Personal contact	Dutz, Jörg, Dr. joerg.dutz@io-warnemuende.de
Gelatinous plankton	IOW DB	June 2026	February 2028	Kube, Sandra, Dr. sandra.kube@io-warnemuende.de
Macrozoobenthos	MUDAB	August 2026	Personal contact	Zettler, Michael, Dr. joerg.dutz@io-warnemuende.de

9. Acknowledgements

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11. Abbreviations

Defined in the text.

12. Appendices

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