



Leibniz Institute for Baltic Sea Research Warnemünde


Cruise Report


r/v "Heincke"

Cruise- No. 06HE0901

This report is based on preliminary data

Institut für Ostseeforschung Warnemünde
an der Universität Rostock
Seestraße 15
D-18119 Rostock- Warnemünde
GERMANY

 +49-381-5197-0

 +49-381-5197 440

1. **Cruise No.:** 06HE0901 / HE315
2. **Dates of the cruise:** from 30.Oct.2009 to 03.Nov.2009
3. **Particulars of the research vessel:**
Name: Heincke
Nationality: Germany
Operating Authority: Alfred-Wegener-Institut für Polar- und Meeresforschung
Sektion Biologische Anstalt Helgoland,

4. **Geographical area in which ship has operated:**
Western and Southern Baltic Sea between Kiel Bight and Bornholm Sea

5. **Dates and names of ports of call**

6. **Purpose of the cruise**
Monitoring in the frame of the COMBINE Programme of HELCOM

7. **Crew:**
Name of master: N. Hechler
Number of crew: 12
8. **Research staff:**
Chief scientist: Dr. Martin Schmidt

Participants:
Jan Donath
Nadine Keiser
Svenja Zimmermann
Ingo Schuffenhauer
Uwe Hehl
Ines Hand
Jan Kreuzer
Christian Heene

9. **Co-operating institutions:**
All institutions dealing with HELCOM monitoring programmes.

10. **Scientific equipment**

CTD SBE 911+ with doubled sensors, SBE oxygen sensor
and WETLABS Fluorometer
SBE 35 Deep Sea Thermometer
Rosette with water samplers
Plankton nets, WP2 net, filtration set
Van Veen grab, dredge
Titrimo 716
Ships weather station (WERUM)

11. General remarks and preliminary result (ca. 2 pages)

The cruise was carried out in the Baltic Sea from Kiel Bight to Bornholm Sea, (see the attached station maps). The meteorological, hydrographical, chemical and biological investigations were performed according to the COMBINE Programme of HELCOM. Each station started with a CTD cast measuring pressure, temperature, conductivity (salinity), photosynthetic active radiation, oxygen concentration, fluorescence and turbidity, at most stations combined with water sampling for oxygen and nutrient determination and other biochemical measurements. In total 33 hydrographic stations were worked. For quality control of the hydrographic data the CTD is equipped with a double set of sensors. The oxygen sensors are calibrated with bottle data measured with a Titrino 716.

At several stations plankton was sampled with WP2 nets, sample depth are chosen according to the measured temperature and salinity profiles. Chlorophyll-a samples are filtrated and frozen, other phytoplankton samples are conserved with Lugol. Secchi depths of 7-8 m in the southern and western Mecklenburg Bight indicated that no bloom occurred here during the cruise. However, at station TF0046 (Kadet Channel), Secchi depth was only 4.5 m. At all investigated biological stations, the *Ctenophore Mnemiopsis* could be found that is new in this area. It was especially large (about 3 cm) at station O5 in front of Warnemünde.

Between Kiel Bight and Arkona Basin (TF0360, TF0012, TF0010, TF0018, TF0030, TF0109, TF0152, TF0160) benthos is sampled with a grab and by dredging with drifting ship. At each station three parallel grab samples are taken supplemented by an additional sample for sediment type determination in the laboratory. Prevailing sediment type is fine sand, sand with silt and silt and the corresponding typical spectrum of species is found. Compared with previous years, nothing special could be noticed. Frequently found species are *mytilus edulis*, *arcatica islandica*, *astarte borealis*, *diastylis rathkei*, *corbula gibba*, *abra alba*, *asterias rubens* and *lages koreni*.

The cruise started after a period of calm weather. Hydrographic conditions are dominated by long lasting outflow. Accordingly, surface salinity in the Arkona Basin and Mecklenburg Bight does not exceed 8, at the entrance of Kiel Bight surface salinity was below 15. **West off the Darß Sill** bottom salinity varies between 22.5 and 18. **East off Darß Sill** a warm saline bottom layer exists with salinity of about 18 at depth below 35 m. This water mass is warmer than (14.5°C) the saline water west of Darss Sill and is most probably a relict of earlier weak warm inflows. The upper 20 m surface layer reveals as completely mixed.

Phosphate concentration in the surface layer already shows relatively high values due to mineralization but nitrate+nitrite concentration is still low leading to a remarkably low N/P – ratio, especially in the Lübeck and Kiel Bight. The bottom water is oxygenated but far from being saturated.

At Nov. 1th station work was interrupted by galeforce winds going along with high sea state. Several monitoring stations had to be skipped. The mooring near the Arkona Sea buoy could not be exchanged. Stations in the Pommeranian Bight were worked after slackening of the strong winds.

Attachments

Tables 1 - 2: Preliminary results for selected parameters in the surface layer and the near bottom layer (unvalidated results)

Fig. 1: The station grid

Fig. 2: Oxygen concentrations in the near bottom layer for selected stations

Fig. 3: Transect from the Kiel Bight to the Arkona Basin for temperature, salinity and oxygen (unvalidated data)

Table 1: Surface layer (0 - 10m)

Area	Station	Temperature	Salinity	PO ₄ ³⁻	NO ₂₃ ^{- *}
Date	Name/ No. **	°C	PSU	µmol/l	µmol/l
Kiel Bight	TF0360/08	9.60	15.24	0.35	0.08
Meckl. Bight	TF0012/03	10.4	9.76	0.37	0.50
Lübeck Bight	TF0022/06	9.88	15.93	0.40	0.16
Arkona Basin	TF0113/18	9.67	8.01	0.32	0.30
Pom. Bight	TF0160/29	8.30	6.86	0.32	2.02

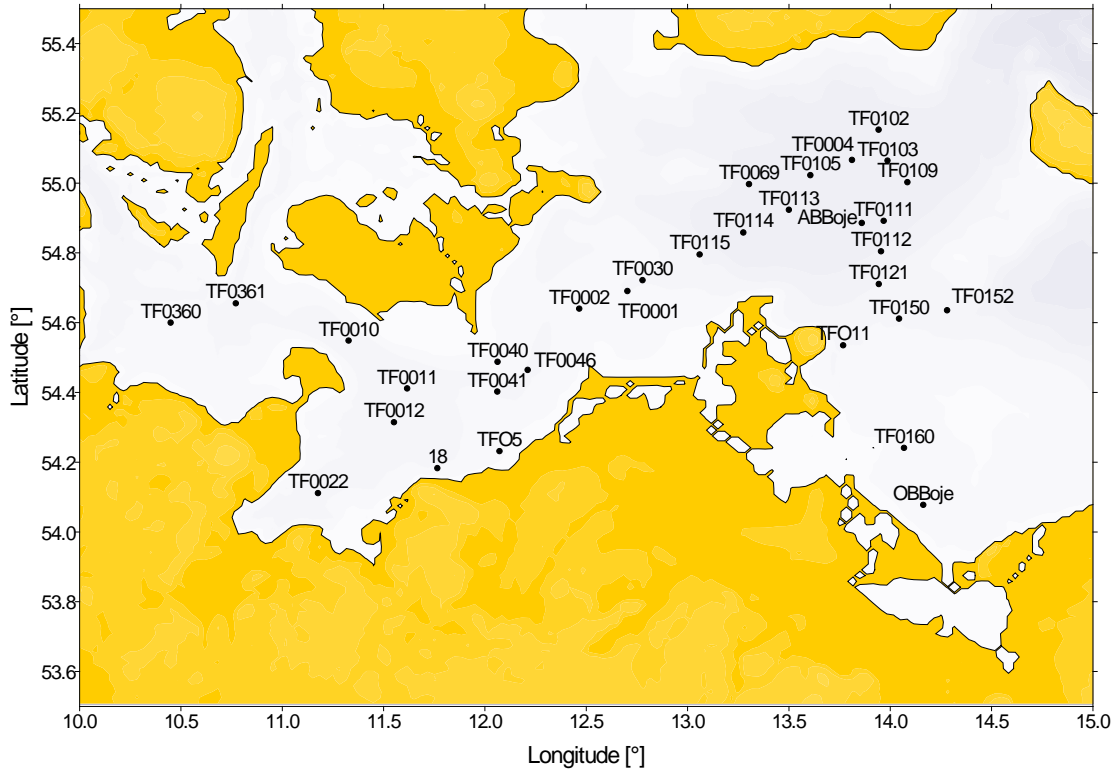
* $\Sigma \text{NO}_2^- + \text{NO}_3^-$; NO₂ was present only in traces in most areas under investigation

** See maps

Table 2: Bottom-near water layer

Area	Station	Depth	Temp.	Salinity	O ₂	PO ₄ ³⁻	NO ₂₃ ^{- *}
Date	Name/ No. **	m	°C	PSU	ml/l	µmol/l	µmol/l
Kiel Bight	TF0360/08	17.7	11.95	22.33	4.34	1.05	5.08
Meckl. Bight	TF0012/03	24.2	12.90	17.77	4.16	1.01	4.26
Lübeck Bight	TF0022/06	23.0	10.74	14.96	4.86	1.11	3.70
Arkona Basin	TF0113/18	46.2	13.81	16.03	2.71	1.40	8.50
Pom. Bight	TF0160/29	12.7	8.31	6.86	7.87	0.30	2.00

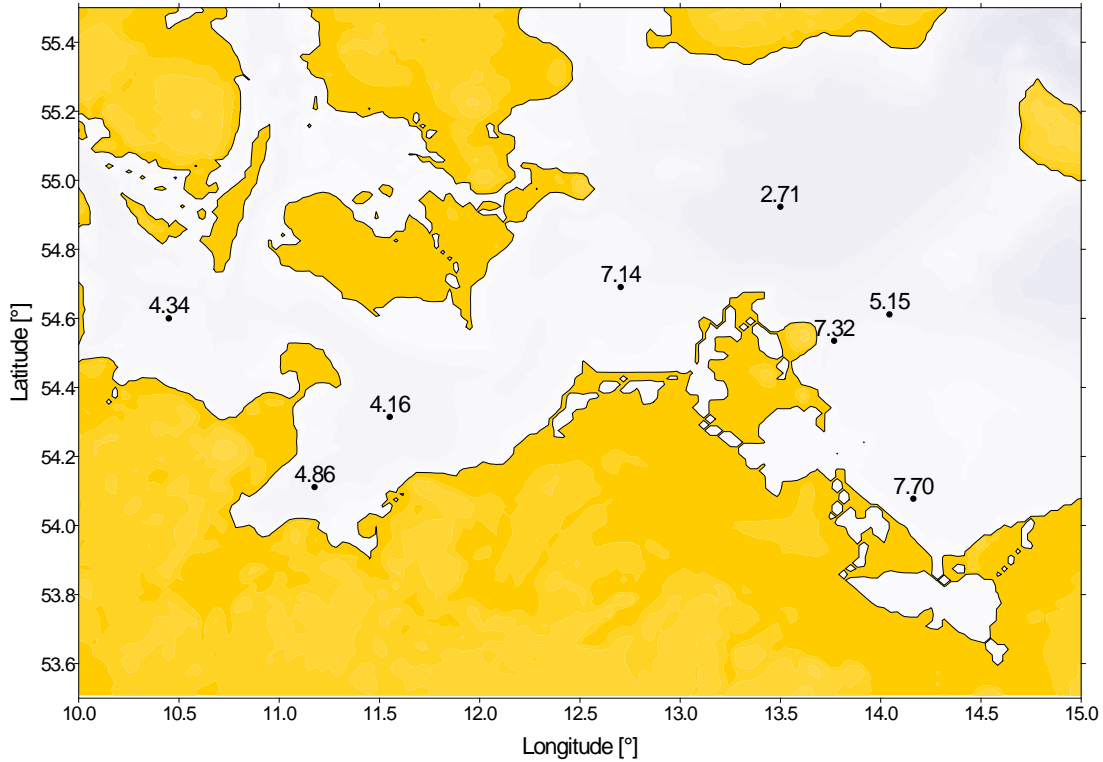
stationmap 06HE0901
 station 32 / repeated station 1
 monitoring 30.10.2009 - 03.11.2009



MAP.srf

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06HE0901
 monitoring
 30.10.2009 - 03.11.2009
 oxygen bottom - concentration [m/l]



O2.srf

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monitoring
30.10.2009 13:44 - 03.11.2009 05:04 UTC

