INSTITUT FÜR OSTSEEFORSCHUNG WARNEMÜNDE
an der Universität Rostock BALTIC SEA RESEARCH INSTITUTE

Leibniz Institute for Baltic Sea Research Warnemünde

C r u i s e R e p o r t

r/v "Alkor"

Cruise-No. 06AK / 09/ 05

Monitoring Cruise
22 July – 25 July 2009
Kiel Bight to Bornholmgat

This report is based on preliminary data

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1. **Cruise No.:** 06AK / 09 / 05

2. **Dates of the cruise:** from 22 July to 25 July

3. **Particulars of the research vessel:**
   Name: "Alkor"
   Nationality: Germany
   Operating Authority: Leibniz Inst.of Marine Sciences at Kiel University (IFM-GEOMAR)

4. **Geographical area in which ship has operated:**
   Kiel Bight to Bornholmgat

5. **Dates and names of ports of call**
   no port of call

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

7. **Crew:**
   Name of master: Norbert Hechler
   Number of crew: 10

8. **Research staff:**
   Chief scientist: Dr. N. Wasmund

   Participants: Donath, Jan
   Weinreben, Stefan
   Hennings, Ursula
   Trost, Erika
   Zimmermann, Svenja
   Voigt, Janet
   Bachmann, Anja
   Jaschek, Jenny

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

10. **Scientific equipment**
CTD, water samplers, plankton nets

11. **General remarks and preliminary results**
The area under investigation extended from Kiel Bight to the area north-west of Bornholm (Bornholmgat) and Pomeranian Bight (station map see Fig. 1). On the way back, selected HELCOM stations in the Bornholm Sea, Arkona Sea and Mecklenburg Bight were sampled a second time. The meteorological, hydrographical, chemical and biological investigations were performed according to the Manual of the COMBINE Programme of HELCOM.

The air pressure increased during the cruise from 1000 hPa on 23.7.09 to 1014 hPa on 25.7.09. The air temperature varied between 15 and 21 °C and the surface water temperature between 16.5 and 18.5 °C. The wind speed was lowest at the beginning of the cruise (southerly winds of 3-8 m s^{-1}), when it was mostly sunny. On 25 July, wind blew from west with up to 10 m s^{-1} whereas it was cloudy and rainy, but it became sunny in the afternoon. A storm forecasted for the 25 July did not show up in that area.

As wind-induced mixing was weak at the beginning of the cruise, there was almost no homogenous surface layer found in sheltered areas (Lübeck Bight). In open areas of Kiel Bight and Mecklenburg Bight, the mixed layer extended to 7-10 m depth, and in the central Arkona Sea to almost 20 m.

The surface water temperatures of selected stations of this cruise are compared with long-term mean values (1971-1990) collected during our summer cruises (end of July-beginning of August) in earlier decades in the table below. The recent water temperature data are in most but not all cases higher. The long-term trend of increasing water temperature is best seen in the deep water layers.

Sea area (station)	Surface water temperature (°C) (about 2 m depth)		Near-bottom water temperature (°C)	
	22.-23.7.09	1971-1990	22.-23.7.09	1971-1990
Mecklenburg Bight (stat. TF0012)	18.34	17.66	20 m: 15.46	12.59
Lübeck Bight (stat TF0023/TFO22)	17.98	17.45	20 m: 12.34	8.26
Arkona Sea (stat. TF0113)	16.97	17.00	20 m: 13.46	11.27

The salinity reached 28 PSU at the bottom of the deepest regions of Kiel Bight (Stat. 361) and 23 PSU in the deep water of Mecklenburg Bight. A sharp halocline was not found at most stations. If present, it started at a depth of 14.5 m in Kiel Bight (stat. TF0360) and 15-16 m in the western Arkona Sea (TF0115, TF 0001).

As expected, no oxygen depletion (H_2S) was found in the investigated area. The oxygen concentrations in deeper water layers were even higher than long-term means of earlier decades at some stations (see Table below). In surface water, oxygen concentrations were slightly reduced in comparison with the 1971-1990 period.

Sea area (station)	Surface oxygen conc. (ml/l) (about 2 m depth)		Near-bottom water oxygen conc. (ml/l)	
	22.-23.7.09	1971-1990	22.-23.7.09	1971-1990
Mecklenburg Bight (stat. TF0012)	5.91	6.74	20 m: 3.21	3.86
Lübeck Bight (stat TF0023/TFO22)	5.95	6.49	20 m: 3.18	1.75
Arkona Sea (stat. TF0113)	6.27	6.70	20 m: 4.45	3.87

Blooms of nitrogen-fixing cyanobacteria (*Nodularia, Aphanizomenon*) were not found during the cruise. Also Ctenophores (e.g. the invading *Mnemiopsis leidyi*) were virtually not found in the net hauls.

Attachments

Fig. 1: Station map
Fig. 2: Transsect from Kiel Bight to the Bornholmgat for temperature, salinity and oxygen (unvalidated data)

Dr. Norbert Wasmund
Scientist in charge

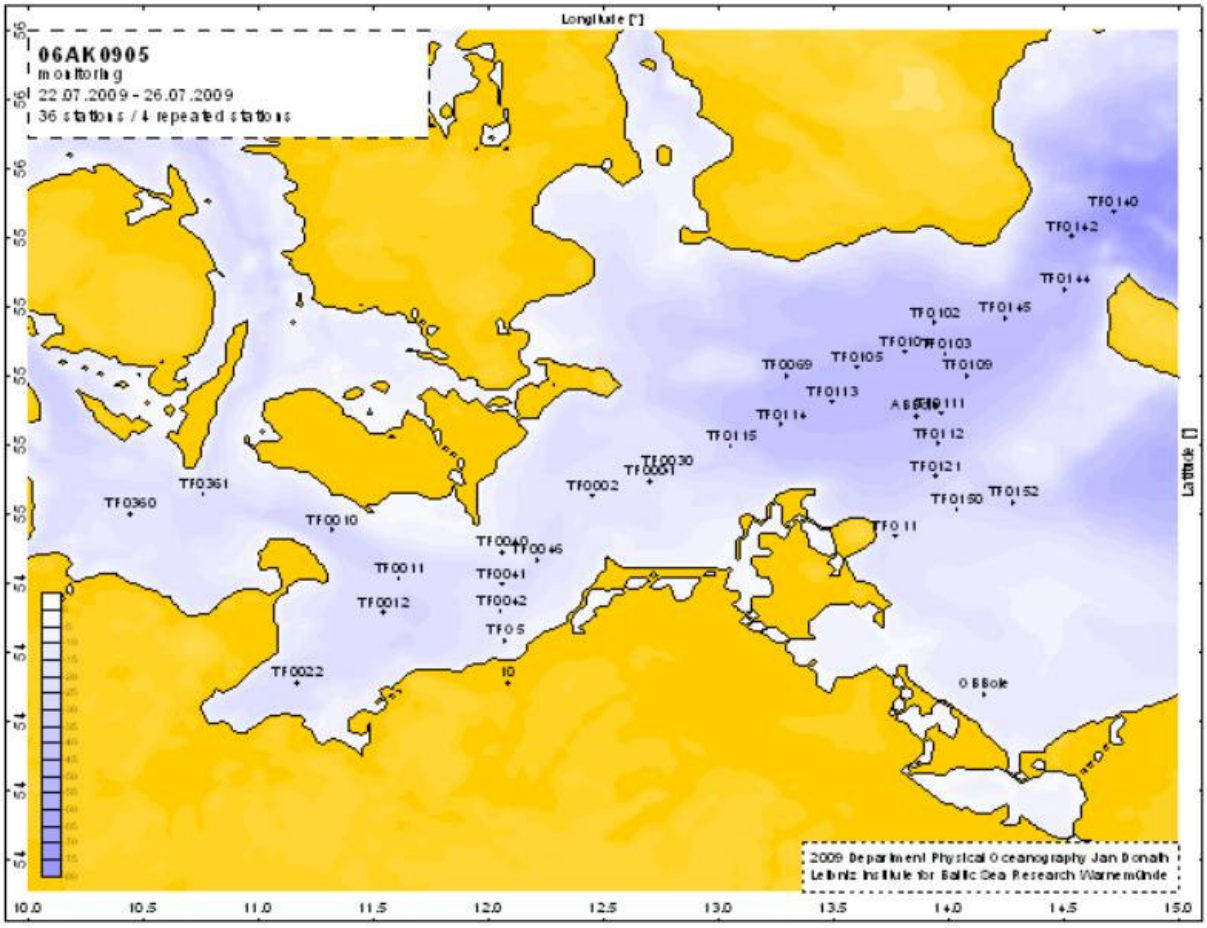

Fig. 1: Station map

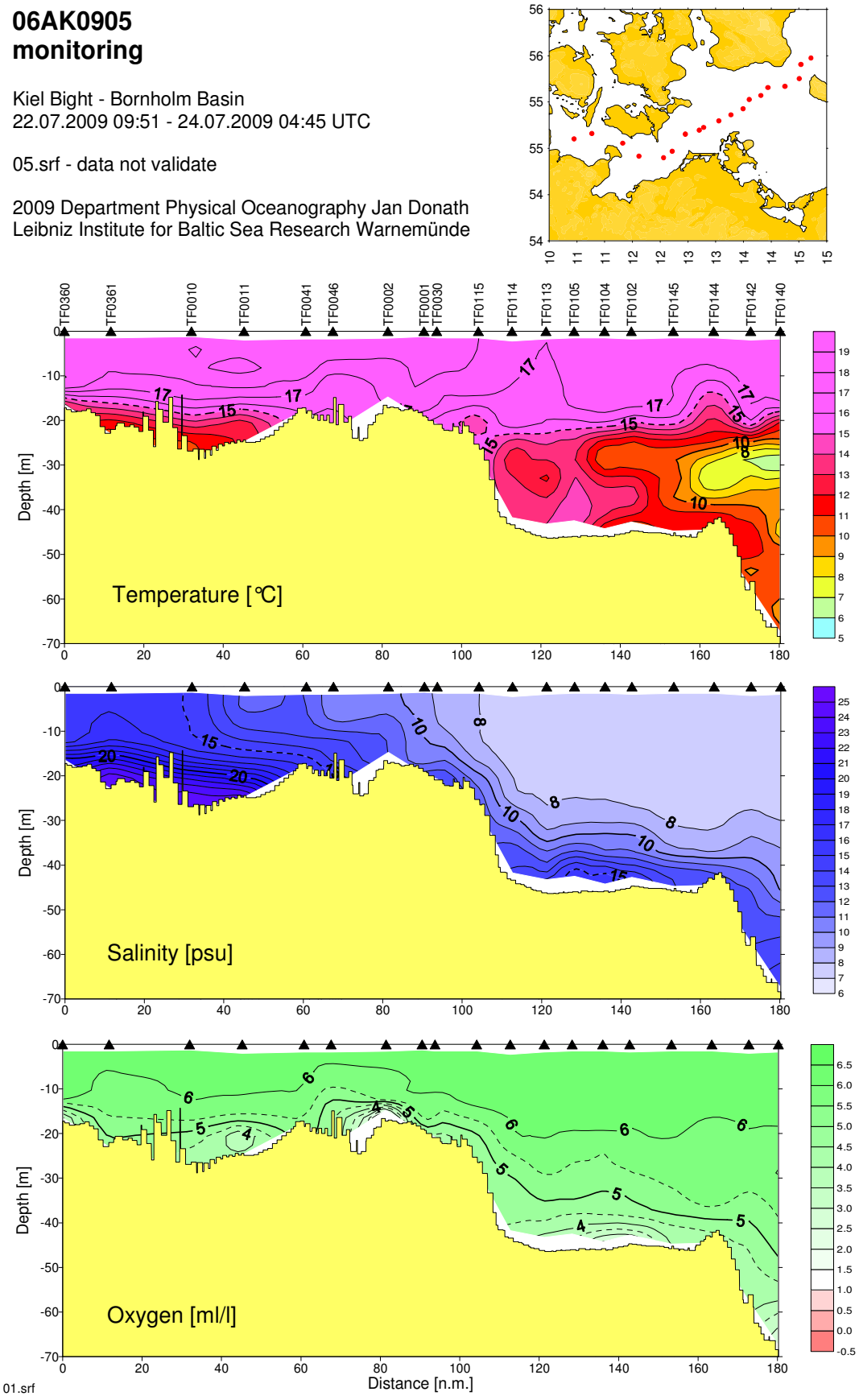

Fig. 2: Transsect from Kiel Bight to the Bornholmgat for temperature, salinity and oxygen (unvalidated data)