

## CRUISE REPORT FROM R/V ARGOS

**Survey period:** 20000807-20000812

**Survey area:** The Skagerrak, the Kattegat,  
the Sound, and the Baltic Proper

**Principal:** SMHI

### SUMMARY

*The expedition was performed within SMHI's regular marine monitoring programme and covered the Skagerrak, the Kattegat, the Sound, and the Baltic Proper. The surface temperatures were between 14.3 and 17.7°C. Nutrient concentrations were normal for the season in mainly all areas.*

*In the Skagerrak the surface salinity was <30 psu at the coastal stations and >32 at the western stations of the Å transect. In the Kattegatt the surface salinity ranged between 20 and 21 psu.*

*Oxygen concentrations below 2 ml/l were found below 30 m depth in the western part of the Arkona Basin and from 70 m in the Bornholm Basin and the Hanö Bight and generally at depths exceeding 80 - 90 metres in the other parts of the Baltic Proper.*

*Hydrogen sulphide was found near the bottom at the Bornholm Depth and from 125 meter in the Eastern Gotland Basin and at depths below 150 meter at the Norrköping Depth.*

## **PRELIMINARY RESULTS**

The expedition, which was a part of the SMHI ordinary monitoring programme, began in Göteborg on the 7<sup>th</sup> of August and ended at the same place on the 12<sup>th</sup>. The air temperature varied between 14 and 18°C. In the beginning of the expedition the wind was north-westerly with a velocity of more than 15 m/s. In the Baltic the wind decreased successively and turned to a westerly direction. At the same time the wind speed decreased. At the same time the cloudiness decreased. From the 10<sup>th</sup> of August and on the sun was occasionally shining and the wind speed was 6 m/s.

### **The Skagerrak**

Surface temperature was about 16.5°C at the coastal stations south of the Å transect. Along the Å transect it decreased to 14.2°C at Å16. Further west there was an increase to about 15.4°C. At the coastal stations P2, Släggö, Å13 and Å14 the salinity in the upper 5 meters <30 psu. Further west it was >32 psu. At the coastal stations the thermocline was found at 30-40 meters depth. Further west into the open Skagerrak it was found at 15-20 meters depth. All stations in the Skagerrak showed an oversaturation of oxygen in the upper 10-15 meters. At the outer stations there were also subsurface fluorescens peaks at depths below 20 meters. Chlorophyll concentrations in the surface layers ranged between 2 and 5.5 µg/l. At Släggö there was a bloom of Ceratians, resulting in chlorophyll values of 13.6 µg/l. Nutrient levels in the surface layer were typical for the season, nitrate below the detection level <0.10 µmol/l, phosphate 0.04 µmol/l and silicate close to the detection level at 0.2 µmol/l

### **The Kattegat and the Sound**

Surface temperature was between 17°C at Anholt E and och 17.7°C in the northern part of the Sound. The thermo- and halocline were found at 10-15 meters depth. At Anholt E they wer located somewhat deeper, between 15 and 20 meters depth. Here the salinity increased 9.8 psu in 5 meters. The bottom water of the eastern Kattegat had an oxygen saturation of 50-65 % and that of the Sound less than 50 % or 2.1 ml/l. In the Kattegat the nutrient levels in the surface layer were typical for the season, nitrate <0.10 µmol/l, phosphate 0.06 µmol/l and silicate 0.2-0.5 µmol/l, whereas the phosphate and silicate values of the Sound were somewhat higher, 0.09 and 3.5 µmol/l respectively. Chlorophyll in the surface layer varied between 2.6 and 4.4 µg/l in the Kattegat and between 2.0 and 2.9 in the Sound. At Anholt E a subsurface chlorophyll maximum of 5.5 µg/l was situated at 20 meters depth.

### **The Baltic Sea**

Surface temperature varied from 15.6 and 17,6°C, but in general it was around 16.4°C. The thermocline was situated at about 20 meters. Oxygen concentrations below 2 ml/l were found below 30 meters depth in the western Arkona Basin and below 70 meters depth in the Bornholm Basin and the Hanö Bight and generally from 80 meters and deeper in the whole Baltic Proper. Hydrogen sulphide was present in the Bornholm Basin (90m) and in the eastern Gotland Basin from 125 meters. Also at the Norrköping Deep, in the western Gotland Basin, there was hydrogen sulphide below 150 meters depth. In the Hanö Bight there was a strong halocline at about 60 meters depth.

In the water below the halocline the oxygen concentration was 0.04-0.31 ml/l.

Also in the Baltic all nutrients in the surface layer, showed typical values. Phosphate concentrations in the southern Baltic were 0.1-0.3  $\mu\text{mol/l}$  and in the other parts  $<0.10 \mu\text{mol/l}$ . Nitrate concentrations were  $<0.10 \mu\text{mol/l}$  and silicate 8-11  $\mu\text{mol/l}$ . Chlorophyll concentrations in the upper 20 meters varied between 2 and 5  $\mu\text{g/l}$ . The higher values were recorded at the northern stations. Due to the high wind speeds no surface accumulations of blue-green algae were present. However, large amounts of *Nodularia spumigena* and *Aphanizomenon* sp. were dispersed in the water column.

## **PARTICIPANTS**

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## **APPENDICES**

- Track chart
- Table over stations, parameters and sampling depths
- Map showing bottom oxygen concentrations
- Monthly average plots for selected stations
- Profiles for selected stations