

## CRUISE REPORT FROM R/V ARGOS

**Survey period:** 980821-980827

**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. During the expedition the weather was rather cloudy and windy, especially during the first half part. Winds from the west were dominating.*

*The surface water temperatures were between 15-16 °C in the whole area with exception of a region with upwelling south Utklippan, where the temperature was only 7 °C in the surface.*

*Oxygen concentrations below 2 ml/l were found at depths greater than 70m in the Bornholm Basin, greater than 80m in the eastern Gotland Basin, greater than 90m in the Landsort Deep. Hydrogen sulphide was present from 150m in the eastern Gotland Basin and from 80m in the Bornholm Basin and in the Hanö Bight.*

*In the surface water the nitrate concentrations were below the limit of detection and the phosphate concentrations were of the level 0.1-0.2 µmol/l.*

*A detailed algal situation report is available on <http://www.smhi.se/sgn0102/nodc/reports/>.*

## **PRELIMINARY RESULTS**

The expedition, which was one of SMHI's ordinary expeditions within the marine monitoring programme, started in Göteborg the 21th of August and ended there on the 27th of August. A stop was done in Frederikshavn the 21th of August. The weather was most of the time cloudy. The winds were during the first half part of the expedition mainly western with varying strength between 8-15 m/s. Then followed a period with weak winds. At the end of the expedition again there was an increasing wind from the west. A detailed algal situation report is available on <http://www.smhi.se/sgn0102/nodc/reports/>.

### **The Skagerrak**

Surface water temperature was 15-16°C. In the eastern Skagerrak at the station Å16 the thermocline could be seen at a depth of 30-50m, in the central part at 10m, and in the southern Skagerrak much weaker at 70-80m.

The halocline in the eastern Skagerrak was located at 15-20m, in the central part at 10m, while the halocline in the southern part was weaker. Thus the water at the station M6 in the central part of the Skagerrak had two separated layers, a surface layer of 10m with a salinity of 29 psu and a temperature of 15°C and a deeper layer of 34.3-35.1 psu and 6-7°C.

The phosphate and silicate concentrations of the surface water were low, 0.1-0.2µmol/l respectively 0.3-1.8µmol/l, while the nitrate concentrations were almost zero.

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

The temperature of the surface water in the western Kattegat was 15.6°C and in the eastern 16.1°C. In the Sound the temperature of the northern respectively the southern part was 16.0°C and 15.6°C. At the station W Landskrona in the Sound the thermocline was located at 10-15m.

The salinity of the surface water in the Kattegat was about 21-23 psu. In the Sound, where the current was going to the south, the salinity of the surface water was 16-17 psu. The halocline was located at 15-20m in the eastern Kattegat, at 8-10m in the western Kattegat and at 10-15m in the Sound.

The lowest oxygen concentrations of the area, which were analysed to 2.6 ml/l, were found from 10m and deeper at the station W Landskrona in the Sound. That corresponds to a saturation of 40 %.

The nitrate concentration of the the surface water in the whole area was below the limit of detection, <0.1 µmol/l. The phosphate concentration was low, about 0.12 µmol/l, but at the station Läsö rånna and in the Southern Sound somewhat higher values were measured, 0.23-0.25 µmol/l. A similar regional distribution gave the concentration of silicate, that is 1.1-1.5 respectively 4.8-6.8 µmol/l.

## The Baltic Sea

The surface water temperatures in the Baltic were between 15 and 16°C. The lowest temperature was measured at Arkona and the highest southeast of Gotland. On the journey back a temperature that deviated from the normal level was registered. A region south of Utklippan had the temperature of about 7°C. Winds from the west here give upwelling.

In the Bornholm Basin the thermocline was located at 30-40m and the halocline at 50-70m, where the salinity increased from 7 to 15 psu. Both the thermo- and halocline in the Arkona Basin were located at 25-30m. In the rest of the Baltic the beginning of the thermocline was located at 20m, while the halocline was at 60-80m.

Hydrogen sulphide was found in the Bornholm Basin and in the Hanö Bight at about 80 and 70m, in the eastern Gotland Basin at BY 10, BY 15 and BY 20, from 140, 150 resp.175m. The oxygen concentration was < 2ml/l in the Bornholm Basin and in the eastern Gotland Basin at 70 respectively 80m or deeper. At the Landsort Deep this limit of oxygen concentration, <2 ml/l, was at 90m.

The nitrate concentration of the surface water was below the limit of detection at all stations in the Baltic. The phosphate concentration in this region was uniform too, that is 0.12-0.15 µmol/l. The silicate concentration was 9.1-9.3 µmol/l in the southern Baltic, while the eastern Gotland Basin had lower values 6.3-7.9 µmol/l. The deep water at the Karlsö Deep and BY 29 had high nitrite concentrations, >1.5 µmol/l. This indicates that anoxic conditions can develop.

## **PARTICIPANTS**

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## **APPENDICES**

- Track chart
- Table of stations, parameters and sampling depths
- Map showing bottom oxygen concentrations
- Depth profiles of selected stations
- Monthly average and presently observed values of selected stations