

## CRUISE REPORT FROM R/V ARGOS

**Survey period:** 2002-06-09 - 2002-06-15

**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.*

*Surface temperatures in the Skagerrak, the Kattegat and in the Baltic except the southern Baltic were higher than normal.*

*The nutrients showed, for the season, mostly normal values.*

*Oxygen concentrations below 2 ml/l were found at depths greater than 80 metres in the whole Baltic Proper. Hydrogen sulphide was present at depths greater than 125 metres in the eastern Gotland Basin, from 100 metres at the Karlsö Deep and from 150 metres at the Norrköping Deep.*

## **PRELIMINARY RESULTS**

The cruise, part of the SMHI's ordinary monitoring programme, started in Göteborg on June 9 and ended in the same port June 15. The expedition began with very warm and calm weather. The temperature at night during sampling in the Skagerrak was about 18 degrees. The fine weather was interrupted the day after by thunder and a low pressure of short duration. During the later part of the expedition there was a gale from the Southwest.

Sampling for the EU-project HABILE was carried out at Fladen, Anholt E and at BY5.

Because of a special sport event that would be seen via TV, the route was changed to be opposite the ordinary.

### **The Skagerrak**

The surface water temperatures varied between 16.8° and 18.2°C. This temperature was much higher than normally, up to 4-5 degrees. The highest temperature was measured in the southeastern Skagerrak. The thermocline and halocline was close to the surface, at depths less than 10 metres. As earlier during this spring the surface salinity was extremely low, ca. 10 psu lower than normal. In the central Skagerrak, however, the salinity now was normal. The nutrient concentrations in the surface layer were normal for the season. Phosphate had concentrations near the limit of detection, 0.02 µmol/l. The nitrate concentration was below the limit of detection (0.1 µmol/l) except in the central Skagerrak, where it was 0.15 µmol/l. Silicate varied between <0.2 (in the central Skagerrak) and 2.7 µmol/l (at P2). The surface layer had a saturation of oxygen from 110 to 125%, which means a super saturation depending on primary production together with an increase in temperature.

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

Surface water temperatures varied between 15.5° and 17.8°C. For the Kattegat it means about 3-4 degrees and for the Sound about 1-2 degrees above normal. The thermocline and halocline was located at a depth of less than 10 metres. At Fladen the surface salinity still was lower than normal, about 8 psu lower.

The phosphate concentration was 0.03-0.06 µmol/l, in the Sound higher than normal, 0.24 µmol/l. Nitrate concentrations were about 0.2 µmol/l and silicate in the Kattegat about 1.4 µmol/l, while in the Sound the level was several times higher, that is almost 8 µmol/l.

The oxygen saturation of the surface layer was in this area 105 to 120%. The bottom water was well oxygenated with the lowest value, 4.5 ml/l, in the Sound.

### **The Baltic Sea**

Surface water temperatures varied between 12.3° and 17.0°C, which is above normal of the season in great parts of the Baltic with exception of the southern Baltic. The thermocline was located at 10 meters except in the southern Baltic, where it was somewhat deeper, 15-20 metres. The halocline was located at 35 metres in the Arkona Basin, in the western and southern Baltic at 50-60 metres and in the eastern and western Gotland Basins at 60-70 m.

Nutrient concentrations were mostly normal for the season; phosphate varied between 0.03 and 0.33  $\mu\text{mol/l}$ , while the nitrate concentrations were below the limit of detection (0.10  $\mu\text{mol/l}$ ) in almost the whole Baltic and the silicate concentrations were within the interval 6-13  $\mu\text{mol/l}$ . The higher phosphate values were measured in the Hanö Bight, the Bornholm Basin and the Western Gotland Basin. These were on a comparison somewhat higher than normal. Oxygen saturation in the surface layer was between 108 and 120%.

The oxygen situation in the deep waters of the Baltic Proper was still very bad. Oxygen concentrations below 2 ml/l were found at depths from 70-90 metres in the whole area. Hydrogen sulphide was found at depths from 100 metres at the Karlsö Deep, from 150 at the Norrköping Deep, from 125 metres in the Eastern Gotland Basin, and near the bottom in the Bornholm Basin.

## **PARTICIPANTS**

| Name                                | From                      |
|-------------------------------------|---------------------------|
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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