

CRUISE REPORT FROM R/V ARGOS

Survey period: 990822-990828

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 program and covered the Skagerrak, the Kattegat, the Sound and the Baltic Proper. Beginning with this expedition, the western Skagerrak and the western Kattegat will be excluded.

During the expedition, the weather was mainly calm and sunny. The surface water temperatures were between 14.8-18.9°C in the whole area.

Oxygen concentrations below 2 ml/l were found at depths greater than 70m in the Bornholm Basin, at the Landsort and the Karlsö Deep, greater than 80 m in the eastern Gotland Basin and in the southeastern Baltic. Hydrogen sulphide was present from 140-150 m in the eastern Gotland Basin, from 80 m in the Bornholm Basin, from 70 m in the Hanö Bight and also in the bottom water of the Landsort and the Norrköping Deep (440 and 195m).

In the surface water the nitrate concentrations were below the limit of detection and the phosphate concentrations were at the most stations about 0.05 µmol/l, somewhat higher in the Sound and the southern Baltic.

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

PRELIMINARY RESULTS

The expedition, which was one of SMHI's ordinary expeditions within the marine monitoring program, started in Göteborg the 22nd of August and ended there on the 28th of August. The weather was calm and sunny during the main part of the expedition. From now on only the eastern part of the Skagerrak will be examined. In the central Skagerrak samples will regularly be taken by Denmark (HS5) and by Norway, visiting the TH section, which is situated west of M6 from Torungen to Hirtshals. In a similar way our sampling in the Kattegat is concentrated to the eastern part. Denmark will continue to visit the Läsö Ränna.

The Skagerrak

The surface water temperatures varied between 16.7°C and 17.5°C, with the lowest temperature at Å17, which is the most westerly station on the Å section. This station differed from the rest, in that no high concentrations of nitrite or ammonia were found here. At Å13 there was a surface layer of 20 psu. The Baltic current here touched the section. There was a salinity increase to 30 psu over a few meters. Water of 35 psu was found at Å14 from 75m, and further west, from 40m and deeper. At the Å section and at P2 the concentration of nitrate of the surface water down to 20m (40m) was less than the detection limit. The phosphate concentration was low here, 0.05-0.06 µmol/l. At P2 in the southern Skagerrak the silicate concentration, 3 µmol/l, was much high in comparison with measurements from the beginning of this month and in comparison with the mean.

The Kattegat and the Sound

The temperatures of the surface water in the Kattegat varied between 18.6°C and 18.9°C. It is somewhat higher than normal. At W Landskrona in the Sound the temperature of the surface water was 17.7°C. The halocline, that was lying between 10 and 15m, was strong in the southern Kattegat (16 to 32 psu) and in the Sound (14 to 31 psu). The oxygen saturation was about 50% or somewhat lower from 40m in the southern Kattegat and from 15m in the Sound. The lowest oxygen concentration was 2.86 ml/l. The nitrate concentration was below the detection limit, <0.1 µmol/l, in the surface layer 0-10 m. The phosphate concentration was about 0.05 µmol/l in the Kattegat and more than 0.1 µmol/l in the Sound. In the Sound high fluorescence (chlorophyll) was registered, an indication of ongoing phytoplankton production.

The Baltic Sea

The surface water temperatures in the Baltic varied between 14.8°C and 18.5°C. The lowest temperature was measured at BY1 in the Arkona Basin and the highest at BY10 in the eastern Baltic. In comparison with the Skagerrak and the Kattegat the temperature differences were large. The thermocline, which was situated between about 15 and 20 meters, was strong in the greater part of the Baltic. The temperature change at the Gotland Deep was greater than 10°C. Below the thermocline from about 20m the oxygen saturation was lower than further down, about 70%. The surface layer had some oversaturation. Oxygen concentrations <2ml/l were found from 70m in the Bornholm Basin, at the Landsort and the Karlsö Deep and from 80m in the east Gotland Basin and in the southeastern Baltic.

Hydrogen sulphide was found from 70m in the Hanö Bight, from 80m in the Bornholm Basin, from 100m at the Karlsö Deep, from 140-150m in the east Gotland Basin and near the the bottom at the Norrköping (195m) and the Landsort Deep (440m).

The nitrate concentrations were below the detection limit in the surface water at all stations in the Baltic. In the southern and northern Baltic there was no nitrate down to 20m, in the southeastern to 40m and in the eastern to 30m. The phosphate concentrations were low, slightly more than 0.1 $\mu\text{mol/l}$ in the Arkona Basin, 0.06-0.08 $\mu\text{mol/l}$ in the Bornholm Basin and 0.04-0.06 $\mu\text{mol/l}$ in the southeastern and eastern Baltic and just over the detection limit at the Landsort Deep.

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