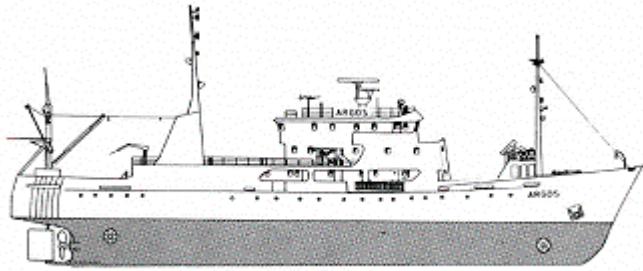


CRUISE REPORT FROM R/V ARGOS



Survey period: 2003-09-22 - 2003-09-26

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

Principal: SMHI

SUMMARY

This report is based on preliminary data.

The expedition was carried out within SMHI's regular marine monitoring programme and covered the Skagerrak, the Kattegat, the Sound and the Baltic Proper. Nutrient concentrations were normal for the season in all areas. An inflow event was observed in the Sound, on the 23rd September.

In the southern Kattegat and in the Sound, the oxygen concentration below 20 metres was less than 2 ml/l. In the southern and south-western Baltic, oxygen values were low at all stations, except in the Arkona Basin and Hanö Bight. The lowest oxygen value was 0.22 ml/l, observed between BY1 and BY3.

In the Baltic Proper and east of Gotland, oxygen concentrations were below 2ml/l. BY5 was the only station where values over 2 ml/l were measured.

Hydrogen sulphide was present at BY20 and at both stations in the western Gotland Basin. The next expedition is scheduled for October 20th to 26th.

PRELIMINARY RESULTS

The cruise, part of SMHI's ordinary monitoring programme, began in Göteborg on September 22nd and ended in Västerås on September 26th. During the first part of the expedition, there were southerly and south westerly winds up to 17 m/s. Midweek, the wind veered west - north west and decreased to 7-8 m/s. Towards the end of the week the wind backed south west again, and increased in strength.

An inflow to the Baltic was observed in the Sound. The final samples for the EU-project HABILE were taken at Fladen, Anholt E and BY5.

The Skagerrak

The surface water temperature was around 16°C in the central part of the Skagerrak. All temperatures in the area were slightly higher than normal. The salinity of the surface water varied between 27.3 psu at Släggö and 31.9 psu at P2.

Nutrient concentrations in the surface layer were still low in the Skagerrak, although normal for the season. Phosphate concentrations were 0.04-0.10 µmol/l. Silicate concentrations were between 0.7-1.0 µmol/l. Nitrite + nitrate was near the detection limit (0.1 µmol/l) throughout the area.

The Kattegat and the Sound

The surface water temperature in Kattegat was around 16°C. In the Sound it was about 15.5°C. Surface water salinities at Anholt E and W Landskrona were higher than normal, 22.1 and 19.9 psu respectively. The latter was caused by an ongoing inflow of water to the Baltic. Even Drogden, the most southerly station in the Sound, was influenced by the inflow, with a salinity 16 psu. The halocline in the area was located between 10 and 15 metres under the surface. The thermocline was found at about 12 metres in the south of Kattegat and in the Sound. In the rest of the area, the temperature gradually decreased with increasing depth.

Nutrient concentrations were low, which is normal for the season. The phosphate concentration was 0.07-0.2 µmol/l. The sum of the nitrite and nitrate concentration was below the limit of detection, <0.1 µmol/l. The silicate concentration in the Sound was below normal at 4.0 µmol/l. The other stations in the area had low silicate values for the time of year. The oxygen concentration at Anholt E was slightly better than in August, but still below what is normal for the season. The lowest oxygen value in the Kattegat, 1.9 ml/l, was found at Kullen, the southernmost station. At W Landskrona, in the Sound, the oxygen concentration was already low (2.11 ml/l) at 15 metres. The value decreased through the water column, falling to 1.89 ml/l at the bottom.

Baltic Sea

The surface water temperature was fairly constant, at around 15.5 ± 0.2°C. Surface salinity varied between 6.5 and 7.7 psu. The thermocline was at 20 metres or slightly deeper in the whole area. In the southern part, the halocline was at about 30 metres at all stations except at BY5 where it was at 50 metres. In the remainder

of the Baltic Proper, the halocline was found at 60-70 metres below the surface.

Nutrient concentrations were low in the whole area. Concentrations of nitrite + nitrate in the surface water were below the detection limit ($<0.1 \mu\text{mol/l}$). The phosphate level was $0.06-0.14 \mu\text{mol/l}$ and silicate $8.5-9.5 \mu\text{mol/l}$.

In the Southern Baltic proper, oxygen concentrations below 2 ml/l were observed at BY1 and BY3 from 45 metres, so additional samples were taken at an extra station located between the two. At this station, the lowest oxygen concentration in the area was observed, (0.22 ml/l) while in the Bornholm basin values below 2 ml/l occurred from 85 metres to the bottom. In the East Gotland Basin, station BCS III-10 had oxygen values below 2 ml/l from 70 metres.

BY10 had values below 2 ml/l at 80 and 90 metres. The concentration then rose to 2.5 ml/l before declining once again to below 2 ml/l near the bottom (at 140 metres). There was an intermediate layer with low oxygen concentration at the Gotland Deep (BY15). This layer was found between 80-125 metres.

At the Fårö Deep (BY20), low oxygen concentrations were observed from 70 metres. At 125 metres depth, there was total oxygen depletion, and hydrogen sulphide was present. At the Norrköping Deep (BY32), the oxygen concentration was below 2 ml/l from 60 metres and at the Karlsö Deep (BY38) from 70 metres. Hydrogen sulphide was present from 90 and 80 metres at each station respectively.

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