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Oceanographical Laboratory

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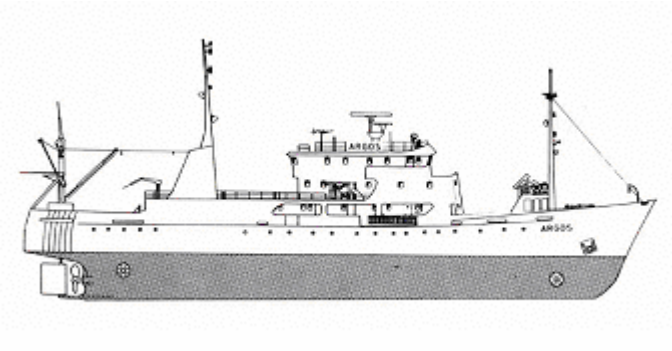
CRUISE REPORT FROM R/V ARGOS



Survey period: 2007-03-18 - 2007-03-23

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

Principal: SMHI

SUMMARY

The expedition was part of SMHI's regular marine monitoring programme and covered the Skagerrak, the Kattegat, the Sound and the Baltic Proper.
Data presented in this report have been subject to preliminary quality control procedures only.

In the Southern Baltic Proper, concentrations of phosphate and silicate in surface waters remain high, while nitrate concentrations were normal. Nutrient concentrations in the Skagerrak and the Kattegat were normal for the season throughout the study area. There was an algal bloom along the Swedish west coast as well as in the central Skagerrak. In the Baltic no algal activity could be seen.

In the Baltic Proper oxygen concentrations were below 2 ml/l at depths exceeding 70 to 80 metres. Hydrogen sulphide was found in the eastern Gotland Basin deeper than 145 metres, and in the western Gotland Basin deeper than 90 metres.

The next expedition is scheduled for April 15 to 20, 2007.

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PRELIMINARY RESULTS

The cruise, part of SMHI´s ordinary monitoring programme, began in Kalmar March 18 and ended in Göteborg March 23.
A gale warning was issued for Southern Sweden the same evening as expedition started. The observed air pressure was 955 hPa, a record for March in southern Sweden. There was a strong wind from the southwest, but the mean wind speed did not reach storm force (25 m/s). After one day with normal winds, the cruise experienced wind speeds of 20 m/s from the northeast. These weakened very slowly, before increasing again the last day. Air temperature was about 4-6°C.
Extra samples were taken at some mapping stations in the Southern Baltic sampling, as the expedition in February had to be shortened because of severe ship icing. Water samples were taken for analysis of oxygen- and carbon isotopes for the University of Göteborg (FRISBEE-project).

The Skagerrak

Surface water temperatures were normal in the whole area with a variation from 5^{o}C at the entrance of Gullmar fjord to 5.6°C at Å13. The halocline was at a depth of less than 5 metres at the coast and at 10 metres in the central Skagerrak The thermocline was not evident.
Algae concentrations were evident at P2 and Måseskär, and at Å17 in the central Skagerrak At Släggö at the mouth of Gullmarfjord, there was no fluorescence peak. The spring algal bloom resulted in a pronounced supersaturation of oxygen (up to 119%).
Nutrient concentrations were normal level, except for at Å13 where they were slightly higher than normal. Phosphate concentration was between 0.03 and 0.35 µmol/l and silicate varied from 0.3 to 11.8 µmol/l. At Å17 nitrite+nitrate had a concentration of 0.9µmol/l and at Släggö 11.5 µmol/l.
The bottom water at Släggö was less oxygenated than normal. Saturation was 70%, corresponding to an oxygen content of 4.8 ml/l.

The Kattegat and the Sound

Surface water temperatures in the area were between 4.0 and 4.6 °C, which are normal for the season. The halocline was found at a depth of circa 5 metres, although at Anholt E it was more developed at 20 metres. The thermocline was still weak
All nutrients showed normal concentrations. At Anholt E levels from surface to the halocline were near the limit of detection. These levels were due to an active algal bloom. The level of phosphate in the Kattegat was 0.04µmol/l, of silicate 0.2-0.9 µmol/l. The nitrate concentration varied from the limit of detection to 0.7 µmol/.
In the Sound, lowest nutrient concentrations were found at a depth of 10-15 metres, where fluorescence measurement of chlorophyll indicated an algal bloom. The photosynthesis gives a super saturation of oxygen, which resulted in a saturation of 103 % in these layers. The lowest oxygen value in the bottom water was measured at W Landskrona in the Sound, 5.5 ml/l corresponding to a saturation of 80%.

Baltic Proper

Surface water temperature was normal for the season. It decreased from 4°C in the south to just below 3°C in the north. Surface salinity in the Arkona Basin was extremely high as a result of the hurricane Per.
In the southern and south-eastern Baltic surface phosphate concentrations were above normal, between 0.8 and 0.9µmol/l. In the remainder of the Baltic Proper these concentrations were normal, between 0.65 and 0.7 µmol/l. Silicate concentrations were also were high in Arkona, Christansö and BY32, where the concentration was between 13.5 and 15.6 µmol/l. Other areas had values between 10.8 and 15.1 µmol/l. Nitrate concentrations in the surface were normal: 2.9 to 3.8 µmol/l.
In the southern and western Baltic oxygen concentrations were below 2 ml/l at depths exceeding 70m and in the remainder of the Baltic Proper at depths exceeding 80 metres.

Hydrogen sulphide was found in the Western Gotland Basin at depths from 90 metres and in the Eastern Gotland Basin at depths from 145 metres.
Phytoplankton activity was very low. At BY10 the Secchi depth was measured to 20 metres and in the Western Gotland Basin to 10 metres.
The halo- and thermocline in the Eastern Gotland Basin was at a depth of 60-70 metres, in the Western Gotland Basin and in southern Baltic at 40-50 metres. At Arkona the halocline was at 25-30 metres and the thermocline had not developed.

PARTICIPANTS

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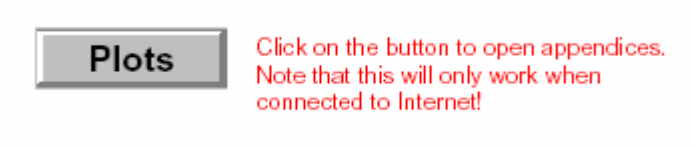
APPENDICES



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