Bengt Yhlen

Swedish Meteorological and Hydrological Institute
Oceanographical Laboratory

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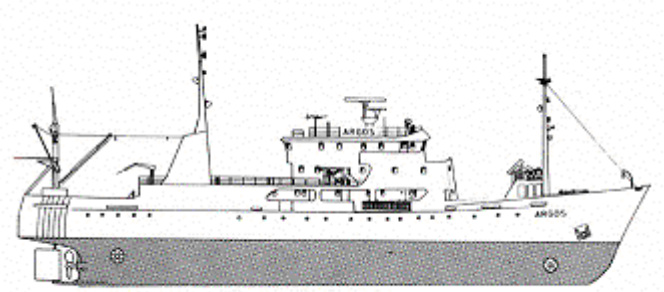
CRUISE REPORT FROM R/V ARGOS



Survey period: 2005-01-17 - 2005-01-23

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, Kattegat, Sound and Baltic Proper. Mapping of winter conditions was performed in the Kattegat.

Data presented in this report have been subject to preliminary quality control procedures only.

Very high surface phosphate concentrations were measured in the Baltic Proper. Silicate showed enhanced concentrations there though nitrogen compounds were normal. Nutrient concentrations in the Skagerrak and Kattegat were normal or almost normal.

In the Baltic Proper oxygen concentrations were below 2 ml/l at depths exceeding 70 to 100 metres. Hydrogen sulphide was found in the Gotland- and Landsort Deeps from 220 metres, and in the western Gotland Basin deeper than 80 to 90 metres.

Next expedition is scheduled for February 21 to February 27, 2005.

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PRELIMINARY RESULTS

The cruise, part of SMHI´s ordinary monitoring programme, began in Göteborg on January 17th and ended at the same place January 23rd. Mapping of winter conditions was performed in the Kattegat and the Sound. The wind speed during the expedition was seldom below 10 m/s.

The Skagerrak

Surface water temperatures were above normal in the whole area. They varied between 5.3°C at the coast and 7.2°C in the central part. Surface salinities were above 30 psu, except at Släggö, at the entrance of the Gullmar Fjord, where 28 psu was recorded. The stratification was weak.
Surface phosphate and silicate concentrations were normal for the season. Phosphate was between 0.6 and 0.7 µmol/l and silicate between ca 10 at the coast and 4 µmol/l westwards. Increased nitrate concentrations, above 13µmol/l, were found at depths between 20 to 50 metres at station P2 and at the surface at station Å13, This is probably of southern North Sea origin. In the remainder of the visited parts, normal surface nitrate concentrations were, ca. 6 µmol/l in the central parts and between 9 and 11 µmol/l at the coast.
The chlorophyll fluorescence indicated that phytoplankton activity was very low.

The Kattegat and the Sound

Surface water temperature in the Kattegat was between 5 and 6 °C and in the Sound ca 4.5 °C, which is several degrees above normal. Surface salinities in the Kattegat were high, about 30 psu and in the Sound, normal ca 10 psu.
Surface nutrient concentrations at the frequent stations in the eastern part of Kattegat were normal for the season. Phosphate concentrations were ca 0.65 µmol/l, silicate between 8 and 11 µmol/l and nitrate + nitrite about 7 µmol/l. In the north-eastern part higher nitrate + nitrite concentrations, between 12 and 14 µmol were measured. In the Sound phosphate and silicate concentrations were higher than normal, ca 0.7 and ca 13 µmol/l respectively while nitrate + nitrite were normal about 4 µmol/l.
The windy autumn and winter has led to the bottom water becoming very well oxygenated. The lowest oxygen saturation recorded was 94%.
Phytoplankton activity was very low.

Baltic Proper

Surface water temperature varied between 4 and 5°C, normal for the season or little above.
Thermocline and halocline were found at the same depth and began at 40 metres in the Arkona Basin. Bottom salinity in the western part (BY1) exceeded 20 psu due to an inflow of 30 km^3 through the Sound, which lasted from January 1 to January 13. In the reminder of the Baltic stratification began at a depth of 60 to 80 metres.
Surface phosphate concentration continues to increase and is now very high. It varied between 0.8 and 1.1 µmol/l, which is more than double normal winter values at most stations. Silicate concentrations are also above normal at all stations. They varied between 13 and 19 µmol/l. Nitrate + nitrite concentration in the surface was normal, between 3 and 4 µmol/l.
In the Arkona Basin, oxygen conditions were good. In the remainder of the Baltic Proper oxygen concentrations below 2 ml/l were found at depths exceeding 70 to 100 metres. Hydrogen sulphide was found below 220 metres in the Gotland- and Landsort Deeps and deeper than 80 to 90 metres in the Western Gotland Basin.
Phytoplankton activity was very low.

PARTICIPANTS

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Bengt Yhlen	Chief scientist	SMHI Oceanographic lab.
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Hans Olsson		-”-
Jan Szaron		-”-
Bodil Thorstensson		-”-

APPENDICES

Plots

Click on the button to open appendices. Note that this will only work when connected to Internet!

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