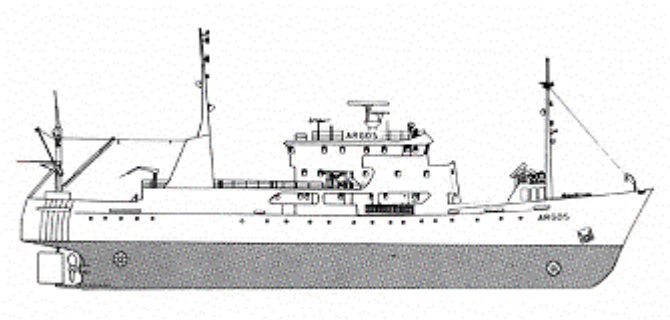
Bengt Yhlen

Swedish Meteorological and Hydrological Institute
Oceanographical Laboratory

2004-01-21
Dnr: Mg-2004-9

CRUISE REPORT FROM R/V ARGOS



Survey period: 2004-01-12 - 2004-01-21

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. Mapping of winter conditions was performed in the Kattegat. Hydrographic measurements around three offshore banks in the Baltic were completed.

This report is based on preliminary, part-quality controlled data.

Oxygen concentrations below 2 ml/l were found in the Baltic at depths exceeding 70 to 80 metres.

Hydrogen sulphide was found in the Northern and Western Gotland Basins at depths exceeding 90 to 125 metres.
Surface phosphate and silicate levels in the northern part of the Baltic were above normal values.
Bottom salinity in the Western Arkona Basin suggested that there had been a recent inflow.

Next expedition is scheduled for February 16th to23th 2004.

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PRELIMINARY RESULTS

The cruise, part of SMHI´s ordinary monitoring programme, began in Göteborg on January 12 and ended in the same port on January 21. Mapping of winter conditions was performed in the Kattegat and the Sound. Hydrographic measurements, for the Swedish Environmental Protection Agency, around three offshore banks in the Baltic: Norra och Södra Midsjöbankarna and Ölands södra grund, were completed.
The winds during the expedition were weak to moderate of different directions.

The Skagerrak

Surface water temperatures varied between 3 and 7 °C, lowest at the coast, highest in the central parts. Surface salinity was high and varied between 32.0 and 34.2 psu - except in the Baltic Current where 28 psu was recorded. The stratification in the high salinity water was weak.
Phosphate concentrations in the surface layer were 0.5-0.6, nitrate+nitrite 4.6-6.3 and silicate 3.3-9.0 µmol/l. Remarkably high nitrite concentrations of 1.2 µmol/l, were detected at the stations P2 and Å15. This is probably of southern North Sea origin.

The Kattegat and the Sound

Surface water temperatures were in the range 3.0-4.5°C, which is normal for this time of year. Surface water salinity was normal for the season. The bottom salinity in the Sound was high and a pronounced halocline was found at a depth of 7 metres, suggesting that an inflow event just had occurred. The bottom salinity in the southern part of the Sound was 18 psu.
Surface nutrient concentrations were typical for the winter: phosphate 0.4-0.6; nitrate+nitrite 4-6 and silicate 9.4-11,5 µmol/l.
The bottom water was well oxygenated.

Baltic Sea

The surface water temperature was in the range 3 to 4 °C, which is typical for the season. The thermocline and halocline were located at the same depths and began in the Arkona Basin at 25 to 35 metres depth. The bottom salinity in the western part was 20 psu due to an inflow from the Sound. In the remainder of the Baltic the stratification began at depths between 50 to 70 metres. On the offshore banks the water was mostly homogenous from surface to bottom due to the small depths.
In the Arkona Basin oxygen conditions were good. In the rest of the Baltic oxygen concentrations below 2 ml/l were observed at depths exceeding 70 to 80 metres.
The relatively large inflow, which occurred exactly one year ago, has renewed the bottom water in the Eastern Gotland Basin. Thus the oxygen minimum appears between 80 and 90 metres depth. Hydrogen sulphide is found in the Northern and Western Gotland Basins at depths exceeding 90 to 125 metres. The inflow continues into the Northern Gotland Basin leading to lower hydrogen sulphide concentrations at the bottom, though higher values are found further up in the water column.

The inflow has uplifted phosphate and silicate rich, but nitrate poor, bottom water, so phosphate and silicate concentrations in the surface water are above normal values in the northern parts of the Baltic. The phosphate and silicate levels were almost 0.9 and 17 µmol/l, respectively. In the southern parts these levels were lower than normal, at about 0.4 and 8 µmol/l respectively. The amount of nitrate + nitrite was lower than normal in the whole Baltic. The concentration was about 2 µmol/l.

PARTICIPANTS

Name		From
Bengt Yhlen	**chief scientist**	**SMHI Oceanographic lab.**
Tuulikki Jaako		**-"-**
Arne Sjökvist		**-"-**
Jan Szaron		**-"-**
Bodil Thorstensson		**-"-**
Anna-Kerstin Thell	**disembarked in Visby**	**-"-**

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