Bodil
Thorstensson

Swedish Meteorological and Hydrological Institute
Oceanographical Laboratory

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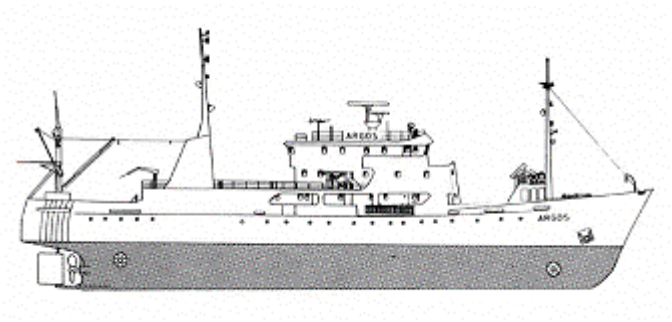
CRUISE REPORT FROM R/V ARGOS



Survey period: 2004-04-19 - 2004-04-24

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

This report is based on preliminary quality controlled data.
Surface water salinity of the central Skagerrak was much lower than normal, 24psu.
Oxygen concentrations below 2 ml/l were found in the eastern and western Gotland Basins at depths exceeding 80 metres and at Christiansö at depths exceeding 70 metres. In the Bornholm Basin the bottom water was anoxic, which was worse than normal.
Hydrogen sulphide was found in the Western Gotland Basin at depths exceeding 100 metres.
Surface phosphate and silicate concentrations in the western part of the Baltic were higher than normal.

Next expedition is scheduled for May 15th to 20th 2004.

Address:
Nya Varvet 31
SE-426 71 Vastra Frolunda
SWEDEN

Telephone:
+46 11 4958000
Telefax:
+46 31 7518980

E-mail:
shark@smhi.se
WWW:
http://www.smhi.se/

PRELIMINARY RESULTS

The cruise, part of SMHI´s ordinary monitoring programme, began in Göteborg April 19 and ended in the same port April 24. The weather during the expedition was very calm and mostly sunny with the exception of some shower of rain. The wind was weak and had varying directions. Periodically there was fog during the latter part of the expedition.

The Skagerrak

Surface water temperatures varied between 7.2 and 7.7°C. Surface salinity was exceptional low, 24 psu, in the central Skagerrak (Å17). The current was strong and had a southern direction. The thermo- and halocline were found at 5 metres, which means there was a thin surface layer. This layer could not be found at the Å-stations further eastwards, where the surface salinity was more than 30 psu. Near the coast at Å13, Släggö and P2 the water again was stratified at a depth of 5-10 metres. From these data and the underway temperature and salinity data, it appears that the Baltic current had formed a bight returning southwards west of E 10° 40. See colour plot of surface salinity!
Phosphate concentrations in the surface layer varied between 0.03 and 0.15 µmol/l, nitrate and nitrite between <0.1 and 1.7 µmol/l and silicate between 0.3 and 3.2 µmol/l.
The surface layer had a supersaturation of oxygen, partly effect of an increase in temperature. The lowest oxygen values were found at Släggö below the halocline as well as in the bottom water, 86%.

The Kattegat and the Sound

Surface water temperatures were in the range from 6.6 to 8.2°C, both the lowest and the highest in the Sound. The last day there was a second sampling at Anholt E, when a reading of temperature showed 8.7°C. In the whole region the temperature was slightly higher than normal..
Surface water salinity was low, within normal variation, however. The thermocline and the halocline were found at about 5 metres.
In the surface water the phosphate concentration was between 0.07 and 0.12 µmol/l, the silicate concentration between 0.5 and 2.5 µmol/l and the sum of nitrite and nitrate was 0.1 µmol/l or lower. Fluorescence peaks were recorded at 12-16 metres and at 20-25 metres, which indicates algae bloom in this region. The bottom water was well oxygenated. The water below the thermo- and halocline at W Landskrona had the lowest saturation, 77%, which was better than normal.

Baltic Sea

The surface water temperature was in the range 3.9 to 6.2°C. The lowest temperature was measured at the Norrköping Deep and the highest at Arkona, which was higher than normal. The thermocline in the Baltic, that not always was distinct, was in the southern part at 5-10 metres, in the western and eastern at 15-20 metres. The halocline was in the southern Baltic at 40-50 metres, in the eastern Gotland Basin at 60-65 and in the western at 55-60 metres.
Hydrogen sulphide was found in the western Baltic from 100 metres and deeper. In the Bornholm Basin the oxygen condition was worse than normal. The bottom water was almost anoxic and further deterioration results in the formation of hydrogen sulphide. An oxygen concentration below 2 ml/l was observed at depths exceeding 80 metres in the whole eastern and western Gotland Basin and at depths exceeding 70 metres at Christiansö.
An algae bloom in progress could be verified at the Gotland and Karlsö Deep through the recording of fluorescence, which showed high values of the surface water. Furthermore there was a supersaturation of oxygen (114%) in the surface water.
The phosphate level of the surface water varied between 0.15 and 0.65 µmol/l, the low concentration in the southern Baltic (Arkona) and the high in the western Gotland Basin (higher than normal). Similarly the silicate concentration varied with the lowest value at Arkona, 2.7 µmol/l (lower than normal), and the highest value, 12.8 µmol/l, in the western Gotland Basin. In the whole

region the concentration of nitrite and nitrate was below the limit of detection, <0.1 µmol/l, which was normal for this time of the year.

PARTICIPANTS

Name		From
Bodil Thorstensson	chief scientist	SMHI Oceanographical lab.
Martin Hansson		-"-
Sari Sipilä		-"-
Anna-Kerstin Thell		-"-
Bengt Yhlen		-"-

APPENDICES

Figurer

Klicka på knappen för att öppna bilagor.
Observera att denna länk enbart fungerar om Ni är uppkopplade mot 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