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Oceanographical Laboratory

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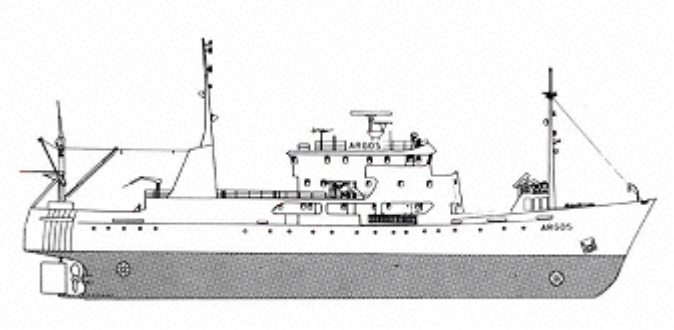
CRUISE REPORT FROM R/V ARGOS



Survey period: 2010-07-19 - 2010-07-24

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.
Surface water temperatures were normal in the Skagerrak, while it was above normal in the Kattegat and Baltic Proper. Nutrient levels in surface water were normal throughout the investigated area.
In the main part of the Baltic Proper oxygen concentrations below 2 ml/l were observed at depths exceeding 70 to 80 meters. Hydrogen sulphide was found, in the Western Gotland Basin, deeper than 70-80 meters. In the Eastern Gotland Basin hydrogen sulphide began at depths between 125 and 150 meters.
Blooms of cyanobacteria in the surface layer took place in the Baltic Proper but in the Skagerrak and Kattegat a typical summer situation with low cell numbers and few species of phytoplankton prevailed. Surface accumulations of cyanobacteria, (blue-green algae) were observed in the southern parts of the Baltic Sea and the eastern Gotland Basin. A more detailed report on the algae situation can be found at:
http://www.smhi.se/oceanografi/oce_info_data/reports/havmiljoarkiv/oce_reportarcive10.html

Data presented in this report have been subject to preliminary quality control procedures only.
Next expedition will take place August 16- 21.

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PRELIMINARY RESULTS

The cruise, part of SMHI´s ordinary monitoring programme, began in Göteborg on July 19 and ended in the same port July 24. The winds during most of the expedition were weak to moderate. A scientist from Uppsala University, Department of Earth Sciences, collected samples for determination of radioactive iodine.

The Skagerrak

Surface temperatures were normal for the season and varied between 16.4 and 18.8^{o}C. Surface salinity was somewhat below normal in southeast, 20 psu, but normal in the remaining parts, just above 30 psu. Thermocline and halocline were found at depths between 10 and 20 metres.
Nutrient concentrations in the surface layer showed, for the season, typical values. Inorganic nitrogen components were consumed (< 0.10 µmol/l), phosphate concentrations varied from below detection limit (<0.02 µmol/l) to 0.04 µmol/l and silicate between 0.1 and 1.1 µmol/l.
Oxygen saturation and fluorescence measurements indicated that the plankton activity was low.

The Kattegat and the Sound

Surface water temperatures were above normal, varying from 19.3°C in the north to ca. 21°C in the south. Surface salinities were somewhat below normal, in the northern Kattegat 16.5 psu, in the southern parts 15.2 psu, while it was normal in the Sound 9.3 psu. Halocline and thermocline were well developed and found at 10 to 20 metres depth, in the Sound very sharp at 10 to 15 metres.
All nutrients showed normal concentrations, inorganic nitrogen below detection limit in the whole area, phosphate in the Kattegat 0.05 µmol/l and in the Sound 0.19 µmol/l. Silicate concentrations in the Kattegat below detection limit <0.1 µmol/l, while the concentration in the Sound was 6.9 µmol/l. A marked fluorescence peak was found a depth of 15 metres in the Sound.
The lowest oxygen concentration was recorded in an intermediate layer in the Sound, 2.13 ml/l at a depth of 20 metres, corresponding to a saturation of 32 %.

Baltic Proper

Surface temperatures were above normal for the time of year, and varied between 20.3° and 22.0°C. Halocline began at 40 to 60 metres, while the thermocline was found at about 10 metres.
All nutrients, in the surface layer, showed normal concentrations in the whole investigated area. Phosphate varied between 0.05 and 0.09 µmol/l, the sum of nitrite and nitrate was below the detection limit (< 0.10 µmol/l), except in the southeast where the concentrations were 0.21 µmol/l. throughout the study area. Silicate levels ranged between 6.2 and 7.8 µmol/l.
Super saturation of oxygen was measured in the surface layer, in the Eastern Gotland Basin high above normal an ongoing bloom. Part of this super saturation can however be explained by temperature increase. Marked fluorescence peaks were found at depths between 10 and 20 metres probably caused by sinking cyanobacteria.
In the western part of the Arkona Basin, the oxygen concentration in the bottom water was only 0.37 ml/l, while the eastern part the oxygen content was 2.96 ml/l. In the remainder of the Baltic Proper, oxygen concentrations below 2 ml/l were found below 70 to 80 metres, in the western Gotland Basin already from 60 metres. Hydrogen sulphide was found from 70 to 80 metres in the Western Gotland basin, while in the East Gotland Basin, hydrogen sulphide started below 125 and 150 metres.

PARTICIPANTS

Name		From
Lars Andersson	Chief scientist	SMHI Oceanographic laboratory.
Ann-Turi Skjevik		-"-
Jan Szaron		-"-
Anna-Kerstin Thell		-"-
Bodil Thorstensson		-”-
Bengt Yhlen		-"-
Peng He		Uppsala University

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