Bengt Yhlen

Swedish Meteorological and Hydrological Institute
Oceanographical Laboratory

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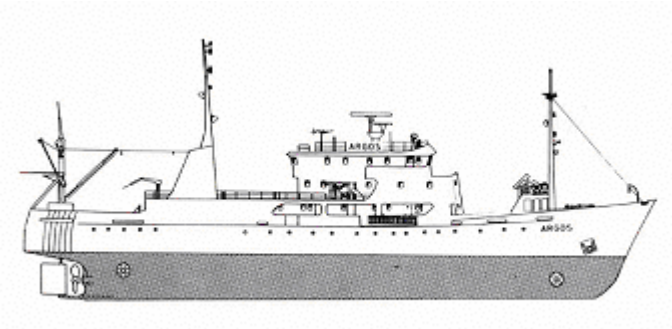
CRUISE REPORT FROM R/V ARGOS



Survey period: 2010-01-17 - 2010-01-23

Survey area: The Skagerrak, Kattegat, Sound, and 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. Winter conditions were mapped in the Kattegat and the Sound.
Data presented in this report have been subject to preliminary quality control procedures only.

Surface water temperatures were very low in the Skagerrak but normal in the remainder of the area. Surface nutrient concentrations were very low in the Skagerrak: otherwise surface nutrients were normal in most areas with the exceptions of phosphate and silicate, which were above normal in the Arkona- and Bornholm Basins. Silicate was also somewhat higher than normal in the western and northern Baltic.
In the Baltic Proper, with the exception of the Hanö Bight and Bornholm Basin, oxygen concentrations below 2 ml/l were found at depths exceeding 60-70 metres. Hydrogen sulphide was found in the eastern and northern – Gotland Basin, and parts of the western Gotland Basin.
A plankton bloom was ongoing in the Skagerrak and Kattegat.

The next expedition is scheduled for February 14 to 21, 2010.

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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. Winter conditions were mapped in the eastern Kattegat and the Sound. Permission to work in Danish EEZ was unavailable.
Two scientists from the University of Gothenburg studied the occurrence of the comb jelly Mnemiopsis. A buoy system was deployed in the vicinity of BY4 on behalf of Nord Stream AG,
Winds during the expedition were mainly weak to moderate from various directions. Air temperatures were below zero.

The Skagerrak

Surface water temperatures were very low (below zero) in the whole area. Surface salinities were also much below normal. They increased from 21 psu in the Baltic current close to coast to 28 psu in the central part. The thermocline was well defined and coincided with the halocline; both starting at 10 metres.
Surface nutrient concentrations were low due to an ongoing algal bloom, which was especially strong in the Baltic current. Phosphate concentrations varied between 0.1 and 0.3 µmol/l; silicate between 0.1 and 2.8 µmol/l and the sum of nitrite + nitrate from below 0.1 to 2.8 µmol/l.

The Kattegat and the Sound

Surface water temperatures were normal and decreased from 1.3°C in the northern Kattegat to 0.1°C at Kullen. In the Sound they varied between –0.2°C and 0.8°C. Surface salinities were low and increased from 14.3 psu at Kullen to 20.2 psu in the northern Kattegat. In the Sound they varied between 7.9 and 12.1 psu. Halocline and thermocline both started at ca. 15 metres in the Kattegat and at ca. 7 metres in the Sound.
Surface nutrient concentrations were mostly normal in the Kattegat, with nitrite + nitrate between 2.2 and 5.7 µmol/l, phosphate between 0.4 and 0.7 µmol/l and silicate between 5.2 and 11.6 µmol/l. Surface phosphate and silicate were high in the Sound, at 0.7 and 14 µmol/l respectively, while surface nitrite+nitrate was normal, ca. 5.5 µmol/l.
The lowest oxygen concentration in the bottom water was observed in the southern part of the Sound: 3.4 ml/l corresponding to a saturation of 50%.
A phytoplankton bloom was ongoing in the Kattegat, but not in the Sound.

Baltic Proper

Surface water temperature was normal for the season and varied between 1.7 and 3.1°C. The halocline began at 50 to 75 metres. At most stations there were winter thermoclines had formed at 15 to 30 metres.
Surface phosphate varied between 0.6 and 0.7 µmol/l: somewhat higher than normal in the Arkona- and Bornholm Basins but otherwise normal. Surface nitrite + nitrate were normal and were between 2.4 and 4.0 µmol/l. Surface silicate was slightly above normal in the Arkona- and Bornholm Basins and in the western and northern Baltic at 13.4-16.0 µmol/l. Concentrations were normal in the eastern Baltic, at 10,5-11,6 µmol/l.
The bottom water of the Arkona Basin was well oxygenated with concentrations exceeding 6 ml/l. In the remainder of the Baltic Proper, except for the Hanö Bight and the Bornholm Basin, oxygen concentrations below 2 ml/l were found at depths exceeding 60 to 70 metres.
Hydrogen sulphide was found deeper than 90 metres in the western Gotland Basin. However in the Karlsö Deep the water was oxygenated all the way to the bottom (0.25 ml/l at 110 metres depth). In the northern- and eastern Gotland Basins, hydrogen sulphide began at a depth of 90 to 100 metres and ca. 125 metres respectively.
Phytoplankton activity was low throughout the study area.

PARTICIPANTS

Name		From
Bengt Yhlen	Chief Scientist	SMHI Oceanographic laboratory
Hans Olsson		-”-
Sari Sipilä		-”-
Arne Svensson		-”-
Anna-Kerstin Thell		-”-
Matilda Haraldsson		University of Gothenburg
Linda Svanberg		-”-

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