

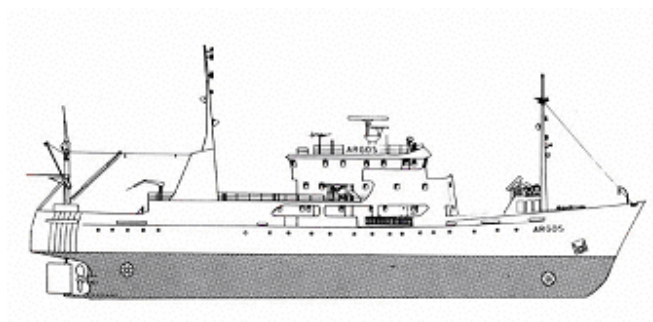


Bodil
Thorstensson

Swedish Meteorological and Hydrological Institute
Oceanographical Laboratory

2008-03-20
Dnr: Mo-2008-041

CRUISE REPORT FROM R/V ARGOS



Survey period: 2008-03-16 - 2008-03-20

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.

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

Surface water temperature in the Baltic was slightly above normal. It was normal in all other areas.

Nutrient concentrations were higher than normal for the season in the central Skagerrak. Phosphate and silicate concentrations were enhanced in the southern Baltic and in the Sound. Measurements of fluorescence and oxygen saturation indicated that the spring bloom was underway in the Kattegat and southeastern Baltic.

In the Baltic Proper, oxygen concentrations were below 2 ml/l at depths exceeding 80 metres. The oxygen situation in the Arkona and Bornholm Basins was good however, because of the salt water inflows during the first months this year. Hydrogen sulphide was found in the eastern and western Gotland Basin.

The next expedition is scheduled for April 14 to 19, 2008.

PRELIMINARY RESULTS

The cruise, part of SMHI's ordinary monitoring programme, began in Karlskrona on March 16th and ended in Göteborg March 20th. During the expedition, wind speed varied between 4 and 11 m/s with a short period of gales. The wind direction was initially variable, before becoming northwesterly. The weather was sunny with little rain. Air temperature decreased from 4°C to 0.5°C between the first sampling occasion and the end of expedition.

Sampling for national screening of substances according to the Water Framework Directive was carried out in Skagerrak and Kattegat.

The Skagerrak

Surface water temperatures were normal of the season and increased from 4.7°C at P2 in the south to about 5°C in the central Skagerrak. Normal surface salinities of 30-31.5 psu were measured between P2 and Å17. Släggö had the highest surface salinity: 32 psu, which was higher than normal. The stratification was weak near the coast. In the central parts the thermo- and halocline was at 5-10 metres.

Nutrients showed normal concentrations in the coast area with exception of high silicate in the surface water at Släggö. Concentrations were as follows: nitrate 9.2 – 11.5 µmol/l, phosphate 0.3 -0.5 µmol/l and silicate 5-18 µmol/l. In the open sea all nutrient concentrations were higher than normal. The sum of nitrate and nitrite varied from 9.2 – 10.2 µmol/l. Phosphate was 0.4 µmol/l and silicate 6-7 µmol/l.

The lowest oxygen concentration was 5.7 ml/l, corresponding to 85 % saturation, at 125 metres in the central Skagerrak.

Phytoplankton activity, based on fluorescence measurements and oxygen saturation, was low.

The Kattegat and the Sound

Surface water temperatures were normal for the season and varied between 4.4 and 4.6°C. There was no thermocline. Surface salinities across the whole area were normal: 23.3 – 24.6 psu in the Kattegat and about 11 psu in the Sound. The halocline was found between a depth of 5 and 20 metres in the Kattegat and about 10 metres in the Sound. In the Sound, phosphate and silicate concentrations were higher than normal in the surface water: 0.5 and 10.6 µmol/l, respectively. The corresponding values of the Kattegat were 0.04-0.07 and 0.6-0.9 µmol/l, respectively. The concentrations of nitrite + nitrate were normal throughout the area: 0.3-0.6 µmol/l in the Kattegat; 3.0 µmol/l in the Sound. The lowest oxygen concentration in the bottom water was measured at W Landskrona in the Sound: 6.08 ml/l corresponding to a saturation of 83%.

In the Kattegat, the surface water was supersaturated at 105 %, and prominent fluorescence maxima were observed, indicating plankton activity.

Baltic Proper

Surface water temperatures were slightly above normal. They varied between 3.7- 4.4°C, lowest at Fårö in the north and highest at Arkona. Surface salinities were normal in the whole area, 7.1 to 8.5 psu, again with the minimum observed at Fårö, and the maximum in the Arkona basin. Halocline and thermocline were found at depths between 60 and 65 metres. In the southern Baltic however, they were found at 40-45 metres. In the Arkona Basin the halocline was at 30 metres. There was no thermocline.

Phosphate and silicate concentrations were higher than normal for the season in the southern areas and at the Gotland Deep. At BCS III-10 and the Gotland Deep, nitrate was lower than normal. Phosphate varied between 0.61 and 0.87 µmol/l, the sum of nitrate and nitrite from 1.1 to 3.6 µmol/l and silicate between 11.7 and 17.8 µmol/l.

In the Bornholm Basin the inflows earlier this year had now even improved the oxygen situation at BY5, where the bottom water concentration was 3 ml/l. Other parts of southern Baltic still had more than 5 ml/l, with exception of the Hanö Bight where the oxygen concentration was less than 1 ml/l. In the remainder of the Baltic Proper oxygen concentrations below 2 ml/l were found at depths exceeding 70 to 80 metres.

Hydrogen sulphide was found at depths from 90-100 metres in the western Gotland Basin. In the eastern Gotland Basin, hydrogen sulphide began at a depth of 125 to 130 meters.

Fluorescence measurements showed phytoplankton activity in the area of BCS III-10 at a depth of 15-20 metres. Oxygen analyses showed a slight supersaturation, which also suggests an algal bloom.

PARTICIPANTS

Name		From
Bodil Thorstensson	Chief scientist	SMHI Oceanographic laboratory.
Philip Axe		”-
Johan Håkansson		”-
Sari Sipilä		”-
Jan Szaron		“-



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

APPENDICES

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