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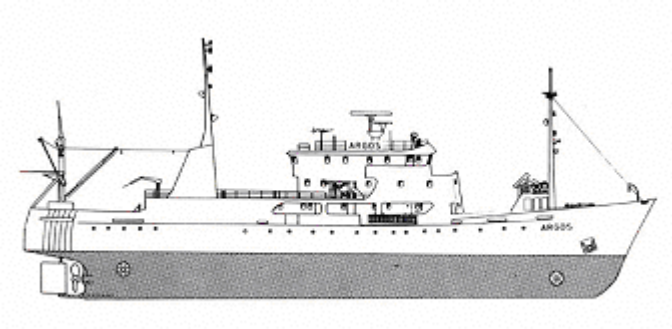
CRUISE REPORT FROM R/V ARGOS



Survey period: 2010-11-28 - 2010-12-08

Survey area: The Skagerrak, Kattegat, Sound, Baltic Proper and the Gulf of Bothnia.

Principal: SMHI

SUMMARY

The expedition was part of SMHI's regular marine monitoring programme and covered the Skagerrak, Kattegat, Sound, Baltic Proper and Gulf of Bothnia. This report is based on preliminary, part-quality controlled data.

Surface water temperatures, from the Skagerrak to Gulf of Bothnia, were lower than normal.

Above normal phosphate and silicate concentrations were recorded in the surface waters of the Western Gotland Basin, in the Bornholm Basin and in the Gulf of Bothnia.

Oxygen concentrations below 2 ml/l were observed at depths exceeding 80 metres in the Western Baltic and at depths exceeding 60 to 70 metres in the remainder of the Baltic.

Hydrogen sulphide was found in the Western and Northern Gotland Basins from 90 to 100 metres and below, and in the Eastern Gotland Basin from 80 to 135 metres and below.

The next expedition is scheduled for January 16-23, 2010.

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PRELIMINARY RESULTS

The cruise, part of the SMHI's ordinary monitoring programme, began in Karlskrona on November 28th and ended in Gothenburg on December 8th. Samples were taken south of Gotland at the Hoburg Bank and at the Northern Midsjö Bank as part of work on behalf of NordStream.
Weather during the expedition was dominated by strong and even gale winds of varying directions - from northeast – northwest and southeast – southwest. Air temperatures varied from -4 to +3°C. In the Gulf of Bothnia frost and strong wind led to icing problems. Some sea ice had formed in the coastal waters of the Gulf of Bothnia, particularly around the Northern Quark.

The Skagerrak

Surface water temperatures were below normal for the time of year, varying from 0.8°C at Släggö to 2.5°C in the centre of the Skagerrak. Surface salinity was below normal and decreased from 28.2 psu in the central parts to 22.5 psu at the entrance of Gullmar Fjord (Släggö).
Surface phosphate and nitrite+nitrate concentrations were lower than normal. Phosphate was 0.2-0.33 µmol/l, nitrite+nitrate 1.7-2.5 µmol/l and silicate 3.1-5.1 µmol/l.

The Kattegat and the Sound

Surface water temperatures were below normal and were within the interval 1.8-2.3°C. Surface salinities were 20 psu in the Kattegat and 16 psu in the Sound. Thermo- and halocline were found between 5-10 metres.
Surface nutrient concentrations were normal. Phosphate concentration was about 0.33-0.38 µmol/l, nitrite+nitrate 2.1 to 2.2 µmol/l and silicate 5.3-5.9 µmol/l. In the Sound, phosphate concentration was 0.33 µmol/l, nitrite+nitrate 2.8 µmol/l and silicate 7.6 µmol/l.
Lowest oxygen concentration, 3.9 ml/l with a saturation of 61 %, was measured from 20 metres and deeper in the Sound.

The Baltic Proper

Surface water temperature varied from 4.4 to 5.8°C throughout almost the whole Baltic Proper. This is lower than normal for the season. The strong winds and cold weather had led to the surface layer being very well mixed down to 50 - 60 metres in almost all of the Baltic Proper. The principle halocline and thermocline were found immediately below this surface layer. An exception was in the Arkona Basin, where the halocline and thermocline were found at 35 metres.
Surface phosphate concentrations varied between 0.26 and 0.68 µmol/l. They were higher than normal, especially in the Western Gotland and in Bornholm basins. Silicate concentrations in the surface water were higher than normal in the Western Gotland Basin and in the southern Baltic, varying from 5.5 to 17 µmol/l. Concentrations of nitrite+ nitrate in the surface layer were normal, from 0.94 to 3.1 µmol/l throughout the area.
Oxygen concentrations below 2 ml/l were observed at depths exceeding 60 to 70 metres.
Hydrogen sulphide was found in the Western and Northern Gotland Basins from 90 to 100 metres and below. In the Eastern Gotland Basin hydrogen sulphide started from depths of 80 to 135 metres.

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The Gulf of Bothnia

Surface water temperatures in the Bothnian Sea varied between 0.6 and 4.3°C and in the Bothnian Bay between 0.5°C and 3.1°C. Surface water temperatures were noticeably lower than normal. Surface water salinity in the Bothnian Sea was between 3 and 6.4 psu and in the Bothnian Bay 2.8-3.3 psu.
The lowest oxygen concentration at the bottom was recorded at F26, in the middle of the Bothnian Sea, with 4.9 ml/l corresponding to 56% saturation. Surface water in the Bothnian Sea had phosphate concentrations of 0.2-0.5 µmol/l, nitrate+nitrite concentrations of 1.9 -3.8 µmol/l and silicate concentrations of 15.8-22.9 µmol/l. As normal, the Bothnian Bay had lower phosphate concentrations, > 0.1 µmol/l, and higher nitrate concentrations 5.7-6.3 µmol/l than the Bothnian Sea. Silicate concentrations were 15 – 20 µmol/l in the Bothnian Sea and 32-36 µmol/l in the Bothnian Bay. Silicate and phosphate concentrations were higher than normal at several stations in the Bothnian Sea (e.g. US5B and SR5).

PARTICIPANTS

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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