Bodil Thorstensson

Swedish Meteorological and Hydrological Institute
Oceanographical Laboratory

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CRUISE REPORT FROM R/V ARGOS

Survey period: 2002-09-23 - 2002-09-28

Survey area: The Skagerrak, the Kattegat, the Sound, and the Baltic Proper

Principal: SMHI

SUMMARY

The expedition was carried out within SMHI's regular marine monitoring programme and covered the Skagerrak, the Kattegat, the Sound and the Baltic Proper. Nutrients were at normal levels for the time of year, with the exception of silicate, which showed enhanced concentrations in the eastern Skagerrak, and phosphate and silicate in the southern Baltic.

Oxygen concentrations below 2 ml/l were detected in the bottom water in the southern Kattegat, at depths greater than 10 metres at W Landskrona in the Sound, greater than 40 metres in the Arkona Basin, greater than 70 – 90 metres in the Baltic Proper, and greater than 125 metres in the eastern Gotland Basin. Hydrogen sulphide was present at depths greater than 125 metres in the eastern Gotland Basin and at the Norrköping Deep, from 100 metres at the Karlsö Deep and from 80 metres in the Bornholm Basin.

The surface water temperature in the Baltic was about one degree higher than normal.

Address:
Byggnad 31 Nya Varvet
SE-426 71 Västra Frölunda
SWEDEN

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

E-mail:
shark@smhi.se
WWW:
http://www.smhi.se/sgn0102/nodc/

PRELIMINARY RESULTS

The cruise, part of the SMHI ordinary monitoring programme, began in Gothenburg on September 23 and ended in the same port September 28. During the expedition the weather was dominated by weak to moderate winds, westerly in the first part of the cruise, and north-easterly later. The weather was sunny at the beginning and end of the cruise. Sampling for the EU-project HABILE was carried out at Fladen and BY5, and twice at Anholt E. Because of the low oxygen levels in the Kattegat bottom water, extra samples were taken in the southern Kattegat.

The Skagerrak

The surface water temperature varied between 15.2°C (at P2, in the south-east) and 16.6°C (at Å17, in the central Skagerrak). The thermocline and halocline, which were most prominent at the inshore stations, were located at a depth of 4-8 metres. In the central Skagerrak, this increased to a depth of about 20 metres. A fluorescence maximum was observed at the inshore stations Släggö and P2. Enhanced silicate concentrations (of 3-3.5 µmol/l) were found in the surface layer at station P2, near the Swedish coast, where the salinity was also low (23 psu). Silicate levels in the rest of the Skagerrak were 0.2-0.9 µmol/l. Nitrate levels were below the detection limit (0.10 µmol/l), which is normal for this time of year. Phosphate levels were also normal, varying between 0.05 and 0.12 µmol/l.

The Kattegat and the Sound

Surface water temperatures varied between 15.2°C (Fladen) to 16.6°C (Drogden, in the Sound). The thermocline and halocline lay at a depth of 7-10 metres.

Nutrient concentrations in the Kattegat surface water were normal for the time of year. Phosphate concentrations varied between 0.05 and 0.07 µmol/l in the Kattegat, and were 0.2 µmol/l in the Sound. Nitrate was below detection limit (0.10 µmol/l) and silicate levels were between 2.5 and 3.5 µmol/l in the Kattegat, and were 6.8 µmol/l in the Sound.

Oxygen levels in the deep waters of the southern Kattegat and the Sound were lower than the 10 year average for this time of year. At the station Anholt E, the oxygen levels were less than 2 ml/l at 40 metres and deeper. In the Sound the oxygen concentration was only 1.18 ml/l at depths as shallow as 15 metres. This is equivalent to an oxygen saturation of 19%. In the Laholm Bight and Skälderviken the oxygen levels at the bottom were 0.8 and 1.9 ml/l respectively.

The Baltic Sea

Surface water temperatures varied between 15.4 and 17.4°C, which is some degree above normal. The lowest temperature was measured in the Fårö Deep, and the highest in the southwestern Baltic. The continuous underway monitoring showed a large area of low temperature water north of Fårö, which indicates upwelling.
The thermocline was very distinct throughout the Baltic outside of the Arkona Basin, and was found between 20 and 30 metres deep. In

the Arkona Basin, the halocline was found between 20 and 30 metres deep, in the Bornholm Basin around 30-40 metres deep, and in the southeastern Baltic at 60 metres. In the Gotland Basin and Norrköping Deep, the halocline and thermocline were coincident.

Nutrient concentrations were mostly normal for the season. Phosphate varied between 0.07 and 0.27 µmol/l and silicate between 6 and 12 µmol/l. Both parameters showed the highest values in the south, and at Arkona and Christiansö were higher than the ten-year average for this month. Also at BY10 the silicate concentration was enhanced. Nitrate concentrations were below detection limit (0.10 µmol/l) in the whole area, with the exception of the Fårö Deep, where the surface value was 0.22 µmol/l.

In the deep waters of the Baltic Proper the oxygen situation is still very bad. Oxygen levels below 2 ml/l were found at depths from 70-90 metres in the whole area, in the Arkona Basin already at depths from 40 metres. Hydrogen sulphide was found from 80 metres deep in the Bornholm Basin, from 100 metres at the Karlsö Deep, from 125 at the Norrköping Deep and the Eastern Gotland Basin.

PARTICIPANTS

Name	From
Bodil Thorstensson, chief scientist	SMHI Oceanographical lab.
Philip Axe	- ″ -
Sara Kollberg	- ″ -
Sari Sipilä	- ″ -
Jan Szaron	- ″ -
Bengt Yhlen	- ″ -

Figurer

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Observera att denna länk enbart fungerar om Ni är uppkopplade mot 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