B Thorstensson
B Yhlen

Swedish Meteorological and Hydrological Institute
Oceanographical Laboratory

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CRUISE REPORT FROM R/V ARGOS

Survey period: **2004-11-28 - 2004-12-09**

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

Principal: **SMHI**

SUMMARY

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

The surface water nutrient concentrations were normal in almost all areas, with the exception of the phosphate and silicate concentrations, which were higher than normal in the Baltic Proper. Oxygen concentrations below 2 ml/l were found in the Baltic Proper at depths exceeding 60 to 80 metres. Hydrogen sulphide was found in the Bornholm and Gotland Deep, and at all stations in the Northern Baltic Proper and Western Gotland Basin.

In the Bothnian Bay, surface water temperatures were slightly higher than last year. This may delay sea ice formation, despite the very low air temperatures experienced during the cruise.

The next expedition is planned for week 3, 2005.

Address:
Byggnad 31 Nya Varvet
SE-426 71 V‰stra Frˆlunda
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 SMHIís ordinary monitoring programme, began in Karlskrona on 28 November and ended in Gothenburg on 09 December.

The dominant weather during the beginning of the expedition consisted of weak winds from southwest to northwest, to northeast with an air temperature a few degrees above zero. The freeze-up, which mainly had been found in the archipelago, was no obstruction to sampling. During the last week, winds were from southwest to northwest, and considerably stronger.

The Skagerrak

Surface water temperatures were almost 9 C in the open parts and about 7 C at the coast, both normal for the season. Surface salinity was above 33 psu, except at the coast where it was about 31, so the stratification was weak.

The nutrient concentrations in surface water showed normal levels: phosphate 0.4-0.5, nitrate+nitrite 4-6 and silicate 2.5-8 µmol/l.

The Kattegat and the Sound

Surface water temperatures were almost 7 C, which is normal for the season. Surface salinity was normal in the Kattegat, 25-28 psu and very much above normal in the central part of the Sound, 22.7psu with a southward current.

Nutrient concentration of the surface water was normal for the season: phosphate 0.4-0.5, silicate about 5 and nitrate+nitrite 2.8-5.7 µmol/l.

The lowest oxygen concentration in deep water was observed at W Landskrona, in the Sound, with 3.5 ml/l corresponding to a degree of saturation of 55%.

The Baltic Proper

Surface water temperatures were in the range 5.1 - 7.4 C, which is normal for the time of year. Thermocline and halocline were found at the same depth and began at 40-60 metres.

Surface phosphate concentration varied between 0.5 and 0.9 µmol/l, which is above normal throughout the study area. In the southern and southeastern Baltic Proper, concentrations were recorded more than double the normal value. Silicate concentrations were higher than normal, 8-16 µmol/l, at most stations. Nitrate + nitrite was normal or somewhat below normal for the time of year, 1.1-2.6 µmol/l.

In the Arkona Basin, oxygen conditions were good. In the remainder of the Baltic Proper oxygen concentrations below 2 ml/l were found at depths exceeding 60 to 80 metres.

Hydrogen sulphide was found at the bottom in the Bornholm Deep, from 225 metres in the Gotland Deep and deeper than 80 to 150 metres in the Northern Baltic Proper and Western Gotland Basin.

The Gulf of Bothnia

Surface water temperatures in the Bothnian Bay varied between 1.2 and 4.1 C (the coldest and the warmest in the north, RR1 and F2, Malˆren). In the Bothnian Sea surface temperatures were between 3.0 and 5.4 C, where the lowest temperature was measured outside the Swedish coast and the highest southwards near Finland. At Solovjeva, in the land Sea, the temperature was 4.5 C and at the Sill to the south of it, 5.4 C. Ice had mainly formed in the archipelago. In the Bothnian Bay, surface water temperatures were 1-2 C higher than last year. This can explain delayed sea ice formation, despite the current period of very low air temperature.

Surface water salinity in the Bothnian Bay was about 3 psu; in the Kvarken, 4 psu; in the Bothnian Sea 5.2-5.6 psu; and in the land Sea about 6 psu. In the central Bothnian Sea thermo- and halocline were at a depth of 45 meters, otherwise stratification was very weak, which is typical for the time of year.
The lowest oxygen saturation, 67%, was measured at the Ulvˆ Deep, 150 metres, where the water contains 6.1 ml/l oxygen.
Surface water in the Bothnian Sea had a phosphate concentration of 0.12-0.28 µmol/l (land Sea 0.4 µmol/l), a nitrate concentration of 1.3-2.6 µmol/l and a silicate concentration of 14-20 µmol/l. The Bothnian Bay had lower phosphate concentrations and higher nitrate concentrations, 0.06-0.13 and 3.8-6.2 µmol/l respectively. Silicate concentration was almost double (24-36 µmol/l) that found in the Bothnian Sea. Ammonia had the highest concentration in the north of the Bothnian Bay, where RR7 at the Finnish coast had the maximum value, 0.75 µmol/l.

PARTICIPANTS

Name		From			
Bodil Thorstensson,	chief scientist	v49	SMHI	Oceanographic	lab.
Bengt Yhlen	chief scientist	v50	-	î	-
Philip Axe	v50		-	î	-
Martin Hansson	v50		-	î	-
Tuulikki Jaako	v49		-	î	-
Eva Nyberg	v50		-	î	-
Hans Olsson	v49		-	î	-
Elisabeth Sahlsten	v50		-	î	-
Sari Sipil‰	v49		-	î	-
Arne Sjˆquist	v49		-	î	-

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