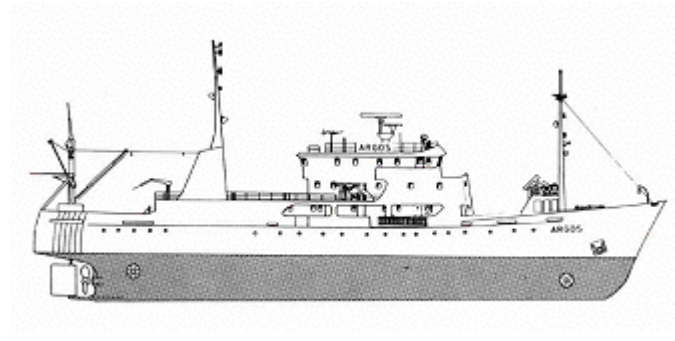


## CRUISE REPORT FROM R/V ARGOS



**Survey period:** 2005-12-04 - 2005-12-15

**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, Kattegat, Sound, Baltic Proper and Gulf of Bothnia.*

*This report is based on preliminary, part-quality controlled data.*

*The surface water nutrient concentrations were normal or lower than normal in most areas, with the exception of the phosphate and silicate in the Baltic Proper. Phosphate levels were above normal throughout the Baltic Proper. Silicate levels were above normal only in the southern Baltic Proper.*

*Oxygen concentrations below 2 ml/l were found in the Baltic Proper at depths exceeding 70 to 90 metres.*

*Hydrogen sulphide was found at depths greater than 90 to 100 metres, at the Gotland Deep and the Landsort Deep from 150 metres and deeper.*

*The next expedition is scheduled for January 16-22, 2006.*

## **PRELIMINARY RESULTS**

The cruise, part of the SMHI's ordinary monitoring programme, began in Kalmar on December 4 and ended in Gothenburg on December 15.

The dominant weather during the first half of expedition consisted of moderate to weak winds from southeast to northeast. Air temperature was a few degrees above zero, except in the Bothnian Bay, where it was below zero. The second week started and ended with gale force winds from west to northwest. During the days in between, winds were weak to moderate. Air temperature was ca. 7° centigrade.

During this expedition a widespread sampling of humic substances was carried out with frequent sampling stations distributed over the whole screening area.

### **The Skagerrak**

Surface water temperatures were ca. 7°C in the whole area. Surface salinity varied between 28 and 30 psu and the halocline was found at a depth of 10 metres.

Nutrient concentrations in surface water showed normal levels: phosphate ca.0.5, nitrate+nitrite 3.5-5 and silicate 4.5-7.5 µmol/l. High concentrations of ammonia were measured at the station P2 in the southeast, and at intermediate depths at station Å17 in the central part.

### **The Kattegat and the Sound**

Surface water temperatures were around 5°C, which is normal for the season. Halocline and thermocline was found at the same depth, at 15-20 metres. In the Sound these were shallower, at about 10 metres. Surface salinity was normal in the Kattegat, just above 20 psu. It was above normal in the Sound, ca. 19.5psu at Drogden in the southernmost part, due to a southward current. Phosphate concentrations in the surface layer were somewhat below normal, between 0.25 and 0.40 µmol/l. The sum of nitrate and nitrite varied from 0.2 to 1.5 µmol/l and silicate between 2 and 8 µmol/l. For both parameters, these concentrations are clearly below normal.

High chlorophyll fluorescence was detected in the homogeneous surface layer in the whole area. The lowest oxygen concentration in deep water was observed at W Landskrona, in the Sound, with 3.3 ml/l, corresponding to saturation of slightly more than 50%.

### **The Baltic Proper**

Surface water temperatures were in the range 5 to 7°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 0.4 and 0.8 µmol/l, lowest in the north and highest in the Bornholm Basin. These concentrations are above normal, especially in the southern parts. Silicate concentrations varied between 8.5 and 13.5 µmol/l, lowest in the east, highest in the north and southwest. This is higher than normal for the Arkona and Bornholm areas but typical for the rest of the area. Nitrate + nitrite concentrations were just below normal or normal for the time of year: 1 to 2.9 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 70 to 90 metres.

Hydrogen sulphide was found in an intermediate layer at 80 metres in the Bornholm Deep. Close to the bottom oxygen concentrations were 1.8 ml/l. In the Western, Northern and Eastern Gotland Basins, hydrogen sulphide was found at depths exceeding 90 to 100 metres, with the exception of the Landsort and Gotland Deeps, where it was found from 150 metres.

### **The Gulf of Bothnia**

Surface water temperatures in the Bothnian Bay varied between 3.6 and 5.3°C (RR7 on the Swedish side and RR1 on the Finnish side respectively). In the Bothnian Sea surface temperatures were between 3.1 and 6.0°C, where the lowest temperature was measured at the Swedish side (SR3) and the highest in southeast near the Finnish coast (SR8). At Solovjeva, in the Åland Sea, the temperature was 3.8°C and at the Sill to the south of it, 5.6°C.

Surface water salinity in the Bothnian Bay was about 3 psu, in the Bothnian Sea 5.0-5.6 psu and at the Sill to the Åland Sea 6.2 psu. In the central Bothnian Sea thermo- and halocline were at a depth of 45-55 metres. Elsewhere stratification was very weak, which is typical for the time of year. The lowest oxygen saturation, 60%, was measured at the Ulvö Deep, 175-195 metres, where the water contained 5.4 ml/l oxygen.

Surface water in the Bothnian Sea had a phosphate concentration of 0.15-0.25  $\mu\text{mol/l}$ , a nitrate concentration of 1.5-2.6  $\mu\text{mol/l}$  and a silicate concentration of 11-17  $\mu\text{mol/l}$ . The Bothnian Bay had lower phosphate concentrations and higher nitrate+nitrite concentrations than the Bothnian Sea. Phosphate concentrations were 0.07-0.09  $\mu\text{mol/l}$  and nitrate+nitrite was 5.4-6.8  $\mu\text{mol/l}$ . Silicate concentration was double (32-34  $\mu\text{mol/l}$ ) that found in the Bothnian Sea. Ammonia had the highest concentration in the north of the Bothnian Bay at F2 (Malören) had the maximum value of 0.75  $\mu\text{mol/l}$ .

## PARTICIPANTS

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## APPENDICES



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