

## CRUISE REPORT FROM R/V ARGOS

**Survey period:** 001204-001216

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

**Principal:** SMHI

### SUMMARY

*The expedition was performed within SMHI's annual marine monitoring program and covered the Skagerrak, the Kattegat, the Sound, the Baltic Proper and the Bay of Bothnia. The surface temperatures varied from 9.5°C in the Skagerrak to 5°C Bothnian Bay. Due to the very mild autumn the surface temperature in the Kattegat exceeded the normal values with 2°C and in the Baltic with 3.5°C. The nutrient concentrations were generally normal for the season with a few exceptions.*

*The oxygen situation in the Baltic bottom water has not been improved since last expedition and hydrogen sulphide was still present in the whole area except in the Arkona Basin and at station BCSIII-10.*

## **PRELIMINARY RESULTS**

The expedition, which was a part of the SMHI regular monitoring program, began in Göteborg on the 4<sup>th</sup> of December and ended at the same place on the 16<sup>th</sup>. Moderate to strong winds from south dominated the weather for the first part of the expedition. The second part began with weak variable winds and ended in a moderate gale from south-west.

### **The Skagerrak**

The sea surface temperature varied between 9 and 9.5°C. The surface salinity was over 30 psu at all of the visited stations.

The insitu-fluorescens indicated low primary production and the chlorophyll concentrations were between 0.7 and 1.4 µg/l. The nutrient concentrations were normal for the season. Above the pycnocline the phosphate concentration was 0.7 µmol/l at the stations close to the coast and about 0.5 µmol/l in the open sea.

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

The sea surface temperature was recorded to between 8.2 and 8.7°C which, due to the mild autumn, exceeded the normal with 2°C. The surface salinity in the middle of the Sound was above normal and bottom salinity at station Oskarsgrundet in the Sound was recorded to over 30 psu.

Phosphate concentration in the surface varied between 0.6 and 0.3 µmol/l and nitrate between 0.6 and 6 µmol/l respectively. The lowest nitrate values were recorded at station Anholt E where the chlorophyll concentration was very high for the season, 7-8 µg/l. The bloom consisted of several species of diatoms.

The bottom water of the Kattegat is now again fully oxygenated. The lowest oxygen concentration, 4.5 ml/l, corresponding to 75% saturation, was recorded in the central part of the Sound.

### **The Baltic Sea**

The sea surface temperature varied between 8.3 and 9°C which is up to 3.5°C above the normal.

In the Arkona and Bornholm Basins the surface phosphate and nitrate content were 0.4 and slightly more than 1 µmol/l respectively which were normal for the season. East and south-east of Gotland phosphate and the nitrogen compounds of the surface were lower than normal, down to 0.15 and about 3 °C respectively. Towards north the concentrations mentioned again raised to for the season and area normal concentrations, i.e. 0.3 for phosphate and about 3 µmol/l for nitrate.

From the Arkona Basin up to south-east of Gotland the chlorophyll concentration varied between 1.5 and 3 µg/l. The plankton flora consisted mainly of diatoms.

Oxygen concentrations below 2 ml/l occurred at the bottom in the eastern Arkona Basin and from varying depths, from 60 to 90m, in all of the other Basins.

The hydrogensulphide situation has not been improved since last expedition but still occurred in the deep-water of all the Basins except the Arkona.

### **The Bay of Bothnia**

The sea surface temperature in the Bothnian Bay was about °C and varied between 4.6 and 7°C in the Bothnian Sea. The highest

temperature (7°C) in the area was recorded near Sundsvall and the lowest (4.3°C) in the northern Quark. The surface salinity in the Bothnian Sea was about 5 and decreased to almost 3 psu in the Bothnian Bay.

The phosphate concentration in the surface diminished from about 0.25 in the far south to about 0.05 µmol/l in the Bothnian Bay. Nitrate and silicate content decreased, as it should, from north to south, from about 6 and 33 µmol/l respectively in the Bothnian Bay to 2-4 and 10-15 µmol/l respectively in the Bothnian Sea.

## PARTICIPANTS

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## 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