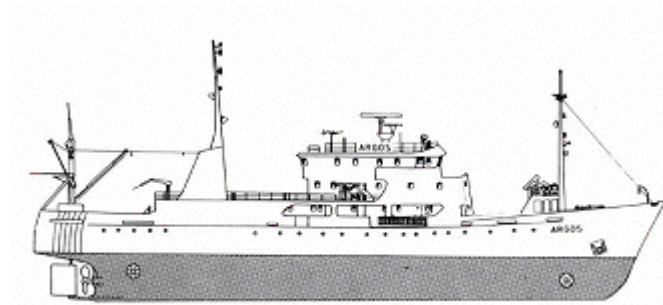


## CRUISE REPORT FROM R/V ARGOS



**Survey period:** 2006-04-24 - 2006-04-29

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

**Principal:** SMHI

### SUMMARY

The expedition occurred within SMHI's regular marine monitoring programme and covered the Skagerrak, the Kattegat, the Sound and Baltic Proper. Data presented in this report have been subject to preliminary quality control procedures only.

Surface water temperatures were lower than normal throughout the study area (some degrees lower at W Landskrona). Phosphate values in the surface water of the Kattegat, the Sound and the southern Baltic remain higher than normal. Silicate concentrations in the Bornholm Basin were normal, while values in the Kattegat, the Sound and Arkona remain higher than normal. In the Skagerrak, phosphate and silicate concentrations had decreased to normal. Nitrate concentration was at the limit of detection at all stations with the exception of Släggö (see Skagerrak).

In the Baltic Proper, oxygen concentrations below 2 ml/l were found at depths exceeding 70 to 90 metres. Hydrogen sulphide was found in the bottom waters of the Eastern and Western Gotland Basins from 125-145 metres. Chlorophyll fluorescence maxima were observed at 10 metres depth in the Fårö Deep and in the western Gotland Basin, where algal bloom was going on. Nitrate was below the limit of detection in the whole Baltic, so in other areas bloom was over. In the central Skagerrak, a fluorescence maximum occurred at a depth of 20 metres. At Släggö, outflow from land led to an enhanced algal bloom. On return to Anholt E, an algal bloom was observed on the last day of expedition.

The next expedition is scheduled for May 15 to May 20, 2006.

## **PRELIMINARY RESULTS**

The cruise, part of SMHI's ordinary monitoring programme, began in Göteborg on April 24<sup>th</sup> and ended in Göteborg on April 29<sup>th</sup>. During the whole expedition the winds were weak. The air temperature was between 4–9°C. The weather was frequently foggy, though later in the week there was some sunshine.

### **The Skagerrak**

Surface water temperatures were normal throughout the investigated area. They varied between 6.4°C and 7.1°C (Släggö). At Släggö, run-off from land was causing remarkable conditions: Surface salinity was much lower than normal, at 12 psu, while the surface water was unusually brown. Secchi depth was just 2 metres. A prominent chlorophyll fluorescence maximum was found at 3 metres, indicating an algal bloom. Concentrations of nitrate and silicate were higher than normal, at 6.8 and 13 µmol/l respectively.

In the offshore Skagerrak, surface salinity varied from 26 to 31 psu. The halocline was at a depth of 10-15 metres in the central Skagerrak. Phosphate and silicate concentrations were normal, 0.05-0.1 µmol/l and <0.1-0.4 µmol/l, respectively. The nitrate concentration was below the limit of detection (0.1 µmol/l) which is normal for this time of year.

Chlorophyll fluorescence maxima were observed at a depth of 20 metres in the central Skagerrak. Oxygen saturation was (generally) over 100 %. This could be caused by a rapid temperature increase. Släggö had the lowest oxygen saturation, 78% at a depth 50 metres.

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

In the Kattegat, surface water temperatures were normal, 6-7.3°C, and just below normal in the Sound, 5.3°C. Surface salinities in the northern Kattegat was 23 psu, and in the Sound, 8 psu. This is normal. Salinity in the southern Kattegat at Anholt E - 13.5 psu - was lower than normal.

In the Sound the halocline was well defined and found at a depth of 10 metres. The lowest oxygen saturation – 78% - was found at W Landskrona directly below this stratified layer. A small fluorescence maximum was also observed at these depths. Despite this, the bottom water was well oxygenated. On return to Anholt E, an algal bloom was observed at the surface (0-5 metres). Calm weather has led to the development of the thermo- and halocline.

Phosphate and silicate concentrations in the surface layers of the Kattegat and the Sound were higher than is normal for the season. Phosphate concentrations were 0.14 and 0.4 µmol/l (Kattegat and Sound, respectively) and silicate 3.5 and 9.5 µmol/l, respectively. Nitrate was below the limit of detection (<0.10 µmol/l) in the Kattegat and slightly higher in the Sound, 0.2 µmol/l.

### **Baltic Proper**

Surface water temperature varied between 3.2 and 4.6°C, which was normal for the season. The halocline was found at 20-25 metres in the Arkona Basin and about 40 metres in the Bornholm Basin. In the deeper basins, stratification began at 50 to 60 metres. Generally there was no thermal stratification of importance except at the Fårö Deep, where a fluorescence maximum was observed confined to the stratified region at 10 metres. Fluorescence maxima were also seen at the Norrköping and Karlsö Deeps.

Surface phosphate concentrations in the southern Baltic were significantly higher than normal, 0.4-0.5 µmol/l. In the remainder of the Baltic, phosphate concentrations were normal at 0.25-0.3 µmol/l. Silicate concentrations varied between 5.9-11.4 µmol/l and were close to normal, except for in the Arkona Basin in the south. In the south-eastern Baltic the values were actually lower than normal. Nitrate in the surface water was normal, with a concentration below the limit of detection, (0.1 µmol/l) throughout the whole Baltic. This indicates that algal bloom already was over in most areas and was going on where fluorescence peaks could be seen.

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. The oxygen situation at BCS-III-10 was worse than normal. Hydrogen sulphide was found in the deep waters of the Eastern and Western Gotland Basins from 125-145 metres. Secchi depths were between 5 and 10 m.

## PARTICIPANTS

Name		From
Bodil Thorstensson	Chief scientist	SMHI Oceanographic lab.
Philip Axe		-”-
Johan Håkansson		-”-
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Anna-Kerstin Thell		-“-

## APPENDICES

A rectangular button with a grey gradient and a thin border, containing the word "Plots" in bold black text.

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