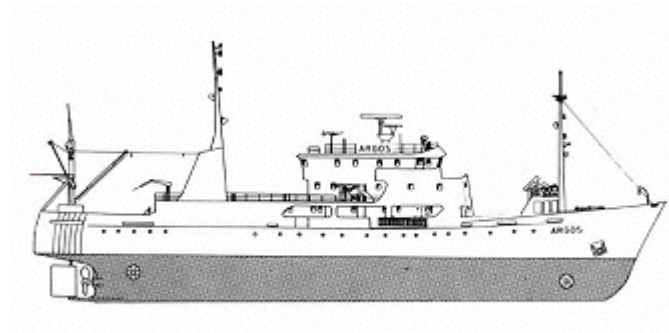


## CRUISE REPORT FROM R/V ARGOS



**Survey period:** 2007-09-30 - 2007-11-01

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

**Principal:** SMHI and the National Board of Fisheries

### SUMMARY

The cruise, part of SMHI's ordinary monitoring programme, was performed in co-operation with the National Board of Fisheries Baltic International Acoustic Survey (BIAS) in the Bothnian Sea and the Baltic Proper. It also covered the Skagerrak, the Kattegat, the Sound at the end of the expedition.

Data presented in this report have been subject to preliminary quality control procedures only.

Surface water temperatures were normal throughout the investigated area.

Surface nutrient concentrations were mostly normal.

Oxygen concentrations below 2 ml/l were observed at depths exceeding 60 to 80 metres throughout the Baltic Proper and from 40 metres in the eastern part of the Arkona Basin. In the bottom water of the sound oxygen concentration was 2 ml/l. In the bottom water of south-eastern Kattegat the oxygen deficiency for this year is over and the lowest recording made was 4.2 ml/l. The oxygen content at the bottom in the south-eastern Skagerrak was below normal but at the level 4.7 ml/l. Hydrogen sulphide was found at bottom in the Bornholm Basin where bottom depths exceeded 70 to 85 metres and in large volumes north, west and east of Gotland.

In the northern and western Gotland Basins the oxygen/hydrogen sulphide conditions were as bad as last year.

The next expedition is scheduled for November 12 to 16, 2006

## PRELIMINARY RESULTS

The cruise, part of SMHI's ordinary monitoring programme, was performed in co-operation with the National Board of Fisheries Baltic International Acoustic Survey (BIAS) in the Baltic and the Bothnian Sea. The Skagerrak, Kattegat and the Sound were visited on the way to the home port in Göteborg. The expedition began in Sundsvall on September 30<sup>th</sup> and ended in Göteborg on November 1<sup>st</sup>. Weekends were spent in Gävle, Västervik twice, and Karlskrona.

### Bothnian Sea

Surface water temperatures varied between 9 and 12 °C. A more or less pronounced thermocline began at depths between 25 and 40 metres. Surface phosphate content was ca. 0.05 µmol/l, except in the northern Kvark and towards the Finnish side where it was 0.10 µmol/l. Nitrate concentration in the surface layer was slightly more than 0.10 µmol/l, except in the north and north-east where it did not exceed 0.7 µmol/l. Surface silicate concentrations were between 9 and 12.3 µmol/l.

### Baltic Proper

Surface water temperatures were normal for the season. Phosphate varied between 0.08 and 0.46 µmol/l and silicate between 5–15 µmol/l. Nitrite+ nitrate varied from 0.79 µmol/l to below 0.10 µmol/l.

### Northern Basin

Surface water temperatures were between 10.2 and 12.1 °C. Nutrient concentrations in the surface were normal for the season. The distinct thermocline was found at a depth of ca. 30 metres while the halocline, which was much weaker, was between 30 and 60 metres. Oxygen concentrations below 2 ml/l were found at depths exceeding 60 to 80 metres, while hydrogen sulphide was present already at depths of 70 to 80 metres.

### Eastern Gotland Basin

Surface water temperatures were between 10.2 and 12.1 °C. Silicate concentration in the surface was a little below normal in the northern part. A pronounced thermocline was also found here, between 30 to 40 metres, with the halocline at depths between 50 and 80 metres. Oxygen concentrations below 2 ml/l were present at depths exceeding 70 to 80 metres, while hydrogen sulphide was deeper than in the north, between 90 and 140 metres.

### Western Gotland Basin

Surface water temperatures were between 9.0 and 11.3 °C. Silicate concentration in the surface was slightly higher than normal for the time of year. A sharp thermocline was found between 30 to 40 metres, and the halocline at depths between 50 and 90 metres. Oxygen concentrations below 2 ml/l were present at depths exceeding 70 to 80 metres and hydrogen sulphide from 80 to 90 metres.

### Bornholm Basin

Surface water temperatures were between 9.7 and 11.7 °C. Nutrient concentrations in the surface were normal for the season. The thermocline began at depths between 35 and 40 metres and the halocline at 50 metres. Oxygen concentrations below 2 ml/l were present at depths exceeding 70 metres, and hydrogen sulphide was found at the bottom where depths exceeded 70 to 85 metres.

### Arkona Basin

Surface water temperatures were ca. 11 °C. Phosphate concentrations in the surface were higher than normal. Thermocline and halocline coincided at depths of 35 to 40 metres. Oxygen concentration at the bottom in the eastern part (BY2) was low, 0.8 ml/l. In the western part it was high, at 5.5 ml/l.

## The Sound

Water temperature (10.2 °C), salinity (12.5 psu) and nutrients (phosphate 0.46, silicate 10.6 and nitrate 0.7 µmol/l) were normal in the surface. Thermocline and halocline coincided at a depth of 10 metres. Oxygen content in bottom water was increasing after the summer and had reached 2 ml/l.

## The Kattegat and the Sound

Surface water temperatures were normal for the season. They were between 9 and 10.5 °C. Surface salinities were low: 15.5 psu outside Falkenberg and 21.5 at Fladen. The halocline and thermocline were found together at depths between 15 to 20 metres. Surface nutrient concentrations were normal throughout the investigated area: phosphate 0.2 – 0.3 µmol/l and silicate 2 to 6 µmol/l, while nitrate was close to 0 µmol/l. In the bottom water of the southeastern Kattegat the autumn oxygen deficiency was over. The lowest oxygen concentration was 4.2 ml/l.

## The Skagerrak

Surface water temperatures, c:a 10°C, as well as surface nutrient concentrations were normal for the season: phosphate between 0.1 and 0.2 µmol/l, silicate 0.6 and 3.4 µmol/l and nitrate 0.1 and 0.4 µmol/l. Surface salinities were lower than normal at the coast: ca. 24 psu. They were normal, ca. 30 psu in the central parts. A pronounced thermocline and halocline coincided at depths less than 10 metres in the eastern parts. In the central parts stratification was weak.

## 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