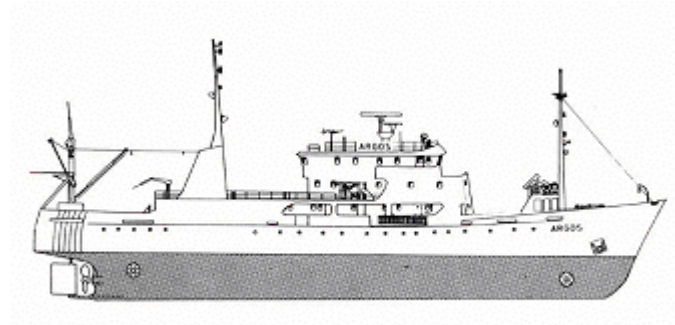


## CRUISE REPORT FROM R/V ARGOS



**Survey period:** 2009-09-13 - 2009-09-20

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

**Principal:** SMHI

### SUMMARY

The expedition was part of SMHI's regular marine monitoring programme and covered the Skagerrak, Kattegat, Sound, Baltic Proper and Åland Sea.

Data presented in this report have been subject to preliminary quality control procedures only. Surface water temperatures were normal between the Skagerrak and the Sound and were above normal in the Baltic.

Nutrient concentrations were, with few exceptions, normal throughout the investigated area.

In the western part of the Arkona Basin the water below the halocline was well oxygenated with levels exceeding 4 ml/l. In the rest of the Baltic Proper oxygen concentrations below 2 ml/l were observed at depths exceeding 70 to 80 meters.

In the West Gotland Basin and Northern Baltic Proper, hydrogen sulphide was found below 70-90 metres. In the East Gotland Basin hydrogen sulphide began at depths between 125 and 150 metres. A plankton bloom was in progress at intermediate depths in the Kattegat. Phytoplankton activity was relatively low in the remainder of the area.

The next expedition will take place October 4-10.

## **PRELIMINARY RESULTS**

The cruise, part of SMHI's ordinary monitoring programme, began in Göteborg on September 13 and ended in Härnösand on September 20. The winds during most of the expedition were weak to moderate. Zooplankton samples to study the occurrence of the comb jelly *Mnemiopsis* were taken as part of the Bazooca project. In the Skagerrak a new ADCP (Acoustic Doppler Current Profiler) system was taken into operation.

### **The Skagerrak**

Surface temperatures were normal for the season and varied between 15.6-16.5°C. Surface salinity was normal; decreasing from 33.9 psu in the west to 26.7 psu at the coast. Thermocline and halocline were weakly developed and found at depths between 5 and 30 metres.

Nutrient concentrations in the surface layer were normal throughout the area. Inorganic nitrogen components were consumed (< 0.10 µmol/l). Phosphate concentrations varied from 0.03 to 0.11 µmol/l and silicate between 1.1 and 2.9 µmol/l. A pronounced fluorescence peak was observed at P2 in the south-east of the area. Phytoplankton activity was relatively low in the remainder of the area.

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

Surface water temperatures were also normal for the season here, at ca. 16.4°C. Surface salinities were normal: from 21.8 psu in the southern Kattegat to 23.1 psu in the northern part. Salinity in the Sound was 10.4 psu. The halocline and thermocline were found at 10 to 20 metres depth in the Kattegat and at 12 to 25 metres in the Sound.

All surface nutrients showed normal concentrations with the exception of phosphate, which was above normal in the Sound. Inorganic nitrogen was below 0.1 µmol/l in the whole area. In the Kattegat phosphate was 0.05 µmol/l and silicate ca. 1 µmol/l. Phosphate concentration in the Sound was 0.4 µmol/l and silicate 9 µmol/l. A pronounced peak in chlorophyll fluorescence was found at all stations in the Kattegat at depths between 20 and 25 metres.

The lowest oxygen concentration recorded was from the bottom water in the Sound, at 2.1 ml/l, which corresponds to a saturation of 30 %.

### **Baltic Proper**

Surface temperatures were slightly above normal for the time of year, varying between 14.5 and 17.4°C. The halocline started at 60 to 70 metres in the central Baltic; at 40 to 50 metres in the Bornholm Basin, and at 25 to 35 metres in the Arkona Basin. The thermocline was found between 25 and 30 metres.

Phosphate concentrations in the surface water varied between 0.08 and 0.34 µmol/l; slightly above normal in the western part of the Arkona Basin, normal elsewhere. The sum of nitrite and nitrate in the surface waters was normal, being under the detection limit (< 0.10 µmol/l) throughout the study area. Silicate levels, also normal except in the north-west, varied between 8.4 and 10.5 µmol/l.

Fluorescence measurements indicated that phytoplankton activity was relatively low.

Below the halocline in the western part of the Arkona Basin, the water was well oxygenated, with oxygen concentrations of 4.3 ml/l but in the eastern part of the same basin concentrations were below 2 ml/l. In the remainder of the Baltic Proper, oxygen concentrations below 2 ml/l were found below 70 to 80 metres. Hydrogen sulphide was found below 70 – 90 metres in the West Gotland Basin and Northern Baltic Proper, while in the East Gotland Basin, hydrogen sulphide started below 125 to 150 metres.

### **Coastal stations**

Temperature at Ref M1V1 in the Kalmar Sound was lower than normal, at 10°C. Phosphate was higher at 0.6 µmol/l. Silicate at Släggö (at the entrance to Gullmarfjord) was higher than normal, at 8 µmol/l.

## PARTICIPANTS

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## 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