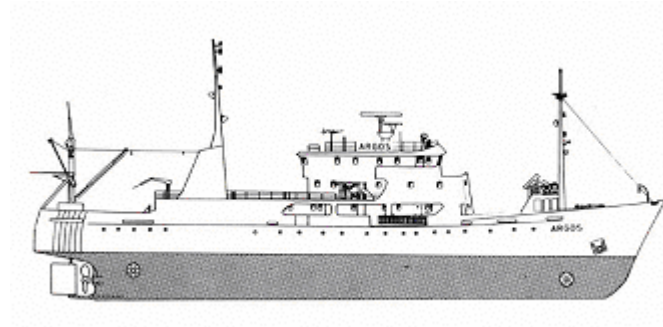


## CRUISE REPORT FROM R/V ARGOS



**Survey period:** 2007-08-06 2007-08-11

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

**Principal:** SMHI

### SUMMARY

The expedition took place within SMHI's regular marine monitoring programme and covered the Skagerrak, Kattegat, Sound and Baltic Proper.

Surface temperatures were normal throughout the area. Nutrient concentrations in the surface layer were normal for the season, except in the Arkona and Bornholm Basins where phosphate and silicate levels were higher than normal. At the Fårö Deep and western Gotland Basin, silicate concentrations were high. In the Sound and the Arkona Basin, bottom water oxygen concentrations were about 1.7 ml/l. Oxygen concentrations in the Baltic Proper were below 2 ml/l everywhere at depths exceeding 60 – 80 metres. Hydrogen sulphide was found at the bottom in the Bornholm Deep, below 125 metres in the eastern Gotland Basin and from 70 - 80 metres in the western Gotland Basin. Surface accumulations of cyanobacteria were observed in the western Baltic Proper.

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

*The next expedition is scheduled for Aug 27<sup>th</sup> to September 1<sup>st</sup>, 2007.*

## PRELIMINARY RESULTS

The cruise, part of SMHI's ordinary monitoring programme, began in Gothenburg on August 6<sup>th</sup> and ended in the same port on August 11<sup>th</sup>.

The weather during the first part of the cruise was typical summer weather, with weak winds and no rainfall. Thunderstorms, mist and high humidity dominated the latter part of the cruise. The daytime air temperature was well over 20 °C.

### The Skagerrak

Surface water temperatures varied between 17.9 °C in the central part of the area and 18.9°C in the coastal areas. Surface salinities were normal. The thermocline was found at 50 metres depth.

All nutrients in the surface waters of the central part of the area exhibited typically low summer values. Phosphate and nitrite+nitrate were close to or below the detection limit. Slightly enhanced silicate values (4.7 µmol/l) were found at the coastal station **Släggö**. In the rest of Skagerrak silicate was between 0.2 µmol/l and 1.1 µmol/l.

Secchi depths varied between 10 and 15 metres in the open sea. At **Släggö**, Secchi depth was 5 metres.

In the Skagerrak, the phytoplankton stock was rather poor both in species diversity and cell densities. Dinoflagellates were more common than diatoms. In the Kattegat the situation was similar. *Dinophysis acuta*\* was found in both regions but in small numbers (50 cells/l).

### The Kattegat and the Sound

Surface water temperatures were slightly lower than normal: 18°C in Kattegat and between 18 and 19°C in the Sound. Sea surface salinity was lower than normal in the Kattegat and the Sound, decreasing from 24.4 psu in the north to 8.6 psu in the Sound. At Fladen in the northern Kattegat, sea surface salinity was 23.9 psu, which is higher than normal. The halocline was between 10 and 15 metres.

Surface nutrient concentrations in the Kattegat were also low, as is normal during summer. Surface phosphate concentrations were between 0.04 µmol/l and 0.16 µmol/l. At **W Landskrona** in the Sound, phosphate concentrations were high, at 0.39 µmol/l. Silicate levels ranged from 1.3 µmol/l and 3.1 µmol/l in Kattegat to 6.8 µmol/l in the Sound.

Oxygen concentrations just below 2 ml/l were found just above the bottom at **W Landskrona** in the Sound. Elsewhere, oxygen conditions were normal

Secchi depths ranged from 7 to 8 metres.

In the Kattegat the situation was similar to the Skagerrak, with both poor species diversity and low cell numbers. *Dinophysis acuta*\* was found in both the Kattegat and Sound regions, though in small numbers (50 cells/l).

In the samples collected from Öresund, diatoms were common and were mostly represented by *Cerataulina pelagica*, *Skeletonema costatum* and *Pseudo-nitzschia* spp. Only few filaments of *Nodularia spumigena*\* were observed. The density of *Nodularia* spp increased in Drodgen without forming a bloom. At this station other phytoplankton species were rare.

## **Baltic Proper**

Surface water temperature varied from 17.5 °C to 19.3°C, which is normal for the season. The thermocline began between 15 and 30 metres. The halocline began at 30 metres in the Arkona Basin and at 50 – 70 metres in the remainder of the Baltic.

Surface phosphate and silicate concentrations were elevated in the Arkona and Bornholm Basins. The values were about 0.2 and 12 µmol/l respectively. Silicate concentrations were also higher than normal at the Fårö Deep and in the western Gotland Basin. In the remainder of the Baltic, surface nutrient concentrations were typical for the summer: phosphate 0.1; silicate 10 and the sum of nitrite and nitrate ca. 0.1 µmol/l. Secchi depths varied between 5 and 7 metres.

Oxygen concentration in the bottom water of the Arkona Basin was 1.7 ml/l. This is lower than the level observed during the previous cruise. Oxygen concentrations below 2 ml/l were found deeper than 60 – 80 metres at all other stations in the Baltic. Hydrogen sulphide was found at the bottom in the Bornholm Deep, below 125 metres in the eastern Gotland Basin, and from 70 to 80 metres in the Fårö Deep and the western Gotland Basin.

Although *Nodularia spumigena* density increased at BY1, it did not form a bloom. Other potentially harmful cyanobacteria filaments were present (*Aphanizomenon* sp. and *Anabaena* sp.) although only in small numbers. The diatom *Chaetoceros danicus* was common. None of the samples taken in the southern Baltic Proper (Arkona basin to station BCS III-10 in the south eastern Baltic Proper) showed signs of a cyanobacterial bloom. Cyanobacteria densities were constant. The bloom appeared at BY10 with high densities of *Nodularia spumigena* which formed distinct isolated patches. The bloom extended as far as BY15 in the east Gotland Basin, after which it disappeared. At 57° 59'N, 19° 25'E, *Nodularia* patches appeared again and could be seen for extending for many kilometres, though not along the vessel path. *Dinophysis norvegica*\* was present with variable cell numbers, and reached its highest cell density (640 cells/l) in the sample from 10 metres at BY38

## **PARTICIPANTS**

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**Plots**

Click on the button to open appendices.  
Note that this will only work when  
connected to Internet!

## **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