

## CRUISE REPORT FROM R/V ARGOS

**Survey period:** 20010709-20010714

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

**Principal:** SMHI

### SUMMARY

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

*The surface water temperatures were higher than normal in all areas with the exception of the western Gotland Basin. The temperature was between 19 and 20.8°C in the Kattegat – Skagerrak and between 16.4 and 19°C in the Baltic. The nutrient concentrations in the surface layer were normal for the season in all areas with the exception of some lower silicate concentrations in the western Gotland Basin.*

*Hydrogen sulphide was present at depths from 125 metres in the eastern Gotland Basin, from 90 metres in the western Gotland Basin, at Christiansö and in the Hanö Bight from 80 and 70 metres respectively. Oxygen concentrations below 2 ml/l was found at depths from 80 metres in almost the whole Baltic Proper.*

*High fluorescence peaks (chlorophyll) were measured at some regions in the Kattegat-Skagerrak and the Sound. Sometimes combined with supersaturation of oxygen.*

## **PRELIMINARY RESULTS**

The cruise, part of the SMHI ordinary monitoring programme, began in Göteborg on the 9<sup>th</sup> of July and ended in Göteborg on the 14<sup>th</sup>. The weather was at the beginning of the expedition extremely hot and calm. A westerly wind was increasing to 9-10 m/s. The wind turned to the south and increased later to a southwestern gale.

### **The Skagerrak**

The lowest surface water temperature was 18.9°C in the central Skagerrak and the highest 20.8°C near the coast in the southeast. These temperatures were higher than normal of the season.

The salinity of the coastal zone was lower than normal, so it was 19.2 psu at the station P2.

The thermocline and halocline were at coastal stations both located close to the surface, 2-3 metres, and in the central Skagerrak at a depth of about 10 metres. In the outer part of the Å cross section high fluorescence values were registered. At a somewhat lower depth, 15-20 metres, of this area the oxygen saturation was 125 %, that is a high supersaturation. Both high fluorescence (chlorophyll concentration) and high oxygen concentration indicate that there was an active algae production. Nutrient concentrations were normal for the season. The phosphate-, nitrite- and nitrate concentrations were below the limit of detection in the open part of the Skagerrak, while the corresponding concentrations near the mouth of the Gullmar's fjord were 0.1, 0.04, 0.2 µmol/l respectively. The silicate concentration was below the limit of detection in all areas.

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

Surface water temperatures varied between 19.4 and 20.3°C. These values were measured at W Landskrona and Fladen respectively. The temperatures were higher than normal for the season. The thermocline and halocline were both located at a depth of 5-8 metres.

The nutrient concentrations were normal; the nitrite concentrations were in the range of the limit of detection, 0.02, nitrate, 0.1-0.2 and phosphate, 0.05-0.14 µmol/l. The silicate concentration in the Sound was 4 µmol/l and in the Kattegat it was below the limit of detection, <0.2 µmol/l.

High fluorescence maxima were recorded in the Sound at a depth of 10-20 metres, at Anholt E at 30-40 metres and at Fladen at 25 metres.

The lowest oxygen concentration of the deep water was measured at W Landskrona in the Sound, 4.16 ml/l, which gave a saturation of 60 %.

### **The Baltic Sea**

Surface water temperatures varied from 16.4°C at the Karlsö Deep to 19.0°C in the southern Baltic. The temperature was higher than normal in all areas with the exception of the western Gotland Basin. The thermocline was located in the whole area at about 10 metres. The halocline was at a depth of 30-50 metres in the southern Baltic and at 60 meters in the central Baltic. East of Gotland the salinity of the surface water was lower than normal, so it was 6.58 psu at the Gotland Deep. High fluorescence was

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recorded in the eastern Gotland Basin and at the Karlsö- and Bornholm Deep.

Hydrogen sulphide was present in the eastern Gotland Basin at a depth from 125 metres, in the western from 90 metres, at Christiansö and in the Hanö Bight from 80 metres and 70 metres respectively. An oxygen concentration below 2 ml/l was found at depths from 80 metres in almost the whole Baltic Proper. At Karlsö and Christiansö this limit was from 70 metres.

The nitrate concentration was below the limit of detection in all areas of the Baltic. Nitrite had a concentration between 0.02 - 0.06  $\mu\text{mol/l}$ , phosphate between 0.05 - 0.10  $\mu\text{mol/l}$  and silicate between 4-6  $\mu\text{mol/l}$ . All values of the nutrients were normal for the season with the exception of some lower silicate concentrations in the western Gotland Basin.

## **PARTICIPANTS**

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|-------------------------------------|---------------------------|
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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
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