

## Report from the SMHI monitoring cruise with KBV001 Poseidon



**Survey period:** 2013-10-06 - 2013-11-26  
**Survey area:** Skagerrak, Kattegat and the South-Western part of the Baltic Proper  
**Principal:** SMHI and the Swedish Agency for Marine and Water Management

### SUMMARY

The expedition was part of the Swedish regular marine monitoring programme and covered the Skagerrak, the Kattegat and the south-western part of the Baltic Proper. Data presented in this report have been subject to preliminary quality control procedures only.

The surface water temperatures were normal for the season in all investigated areas. All nutrients in the surface layer in the southern Baltic Proper were lower than normal. The oxygen concentrations at the bottom in the Sound and in the eastern Kattegat were higher than normal, but lower than normal in the central and northern parts. Due to the inflows during the autumn to the Baltic Proper the oxygen situation had improved in the Arkona Basin, the Hanö Bight and the western parts of the Bornholm Basin. In the eastern parts of the Bornholm Basin, low oxygen concentrations, just above 0 ml/l, were still present. Hence, the inflow had not reached this area.

The next expedition is planned to take place November 29 to December 8, when the Gulf of Bothnia and the Baltic Proper will be investigated.

## **PRELIMINARY RESULTS**

The cruise began in Göteborg on November 22<sup>nd</sup> and ended in the same port on November 26<sup>th</sup>. Winds were weak during the initial part of the cruise but on November 24<sup>th</sup> the wind rapidly increased to storm. During the end of the cruise winds weakened to moderate. The air temperature varied between 1.0 and 6.9°C.

### **The Skagerrak**

The cooling of the surface layer had now started and a distinct thermocline could be found at varied depths between 5-30 meters. The surface temperatures were normal for the season and varied between 6.7 and 9.0°C. The halocline coincided with the thermocline and the salinity in the surface water was 26.8 psu at the coast and 32.9 in the offshore parts.

Generally, all nutrients in the surface layer had increased but the concentrations were still normal. Though, the silicate concentration at Å13 was still higher than normal. The phosphate concentration was between 0.23 and 0.49 µmol/l and the sum of nitrite + nitrate were between 0.10 and 1.00 µmol/l. Silicate concentrations varied between 2.5 and 4.6 µmol/l.

Some plankton activity, based on CTD fluorescence measurements, was found in the southern parts but in the remaining areas the activity was low. The oxygen situation in the bottom water was good in the whole area, which is normal.

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

In Kattegat, the cooling of the surface water was not as distinct as in Skagerrak. But also in this area the surface water temperatures were normal for the season and varied between 7.9 and 8.2 °C. A strong thermocline could be found at 10 meters depth in the northern parts, while the thermocline was less developed in the southern parts and was found deeper, at 15-20 meters depths. The salinity in the surface layer was normal in the whole area and decreased from 26.8 psu in the north to 29.4 psu in the Sound. The halocline could be found at the same depths as the thermocline.

The concentration of nutrients was normal for the season. In Kattegat the sum of nitrite + nitrate was 0.41-2.4 µmol/l and phosphate 0.19-0.41 µmol/l. At Anholt E, the silicate concentration was higher than normal, 8.2 µmol/l, otherwise the concentrations varied between from 2.9 – 8.3 µmol/l, highest in the Sound.

The oxygen concentrations in the deep water were higher than normal in the Sound and at N14 Falkenberg, while the concentrations were lower than normal at Anholt E and Fladen. The lowest concentrations were found at Anholt E, 3.94 ml/l which correspond to 61% oxygen saturation.

The plankton activity was low, but some activity could be seen, based on CTD fluorescence measurements, at 0-10 meters depths.

### **The southern part of the Baltic Proper**

The surface temperatures were normal for the season, 8.4-8.8°C. The thermocline and halocline was located at depths of 25-40 metres. In the western parts of the Baltic Proper, the surface salinity was lower than normal, 26.5 psu. All nutrients in the surface water showed lower values than normal. Phosphate, 0.23-0.25 µmol/l, the sum of nitrite+nitrate varied between 0.19-0.46 µmol/l and the concentration of silicate varied from 3.9-4.8 µmol/l.

The inflows that have occurred during this autumn had now reached the Arkona Basin, the Hanö Bight and the western parts of the Bornholm Basin. The oxygen concentrations had increased from the previous measurement in October from 3.1 to 5.1 ml/l in the Arkona Basin, in Hanö Bight from almost 0 ml/l to 4.0 ml/l and from almost 0 ml/l to 2.8 ml/l in the western parts of the Bornholm Basin. The inflow had not yet reached the eastern parts of the Bornholm Basin since the oxygen in the bottom water at BY5 was almost depleted.

The plankton activity was low in the whole investigated area.

## PARTICIPANTS

Anna-Kerstin Thell	cruise leader	SMHI Oceanographic lab.
Kristin Andreasson		- ” -
Martin Hansson		- ” -
Sara Johansson		- ” -
Vivi Månsson		- ” -

## 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