

Report from SMHI's monitoring cruise on board KBV001 Poseidon



Survey period: 2012-10-16 to 2012-10-20
Survey area: Skagerrak, Kattegat, the Sound and parts of the southern Baltic Proper.
Principal: SMHI

SUMMARY

The expedition, part of SMHI's regular marine monitoring programme, covered Skagerrak, Kattegat, the Sound and the southern part of the Baltic Proper. Data presented in this report have been subject to preliminary quality control procedures only.

A new agreement with the Swedish Coastguard meant that only the Swedish west coast and south western Baltic Proper (Arkona and Bornholm Basins) were sampled.

In Skagerrak and Kattegat, nutrient conditions were normal for the season. In the south western parts of the Baltic Proper concentrations of phosphate and silicate were still high, while inorganic nitrogen showed normal values. Plankton activity was principally low in all areas.

Oxygen concentrations below 2 ml/l (hypoxia) were found in the bottom water in the Sound and at depth exceeding 60 metres in the Bornholm Basin as well as in the Hanö Bight.

The next expedition is scheduled for November.

PRELIMINARY RESULTS

The cruise, part of SMHI's ordinary monitoring programme, began in Göteborg on October 16th and ended in the same port October 20th. Winds during the beginning of the expedition were strong but abated during the later part. Wind directions were mainly between south and west.

A new agreement with the Swedish Coastguard means that SMHI's expeditions for the remainder of 2012 will be split, making use of the two ships KBV001 for the west Coast and the south western parts of the Baltic Proper, and KBV002 for remaining areas. There will be no expedition in the remainder of the Baltic Proper during October due to logistics problems.

Skagerrak

Surface water temperatures were normal for the season and varied from 13.1°C in the western parts to 11.3°C at the coast. Also surface salinities were normal, between 26 and 33 psu, with the lowest values in the south-east and the highest in the western parts. The thermocline was located at a depth of 20 metres close to the coast, but deeper, at 60 metres in the west. The halocline was weakly developed.

Due to bad weather conditions, water sampling had to be cancelled at some stations, but CTD measurements were carried out as planned.

Nutrient concentrations in the surface layer were typical for the season. Concentration of phosphate varied from 0.18 to 0.30 µmol/l. The sum of nitrite/nitrate varied between 0.11 and 60 µmol/l, lowest in the south-east and highest in the west. Silicate concentrations varied between 2.0 and 3.5 µmol/l.

Plankton activity, based on fluorescence and oxygen saturation, was low.

The lowest oxygen value in the deep water, 2.8 ml/l was measured at the coastal station Släggö, while oxygen concentrations in the outer parts were good.

Kattegat and the Sound

Surface water temperatures were normal, between 11 and 12°C. Surface salinity in the central Kattegat was about 24 psu. In the Sound, surface salinity was 9 psu, which is below normal. Thermocline and halocline were located at depths between 15 and 25 metres in Kattegat. In the Sound, thermocline and halocline coincided at a depth of 12 metres. The halocline here was very distinct.

All nutrients showed typical values for the season in the Kattegat surface layer. Phosphate concentrations varied between 0.17 and 0.23 µmol/l, silicate between 2.5 and 3.0 µmol/l while the concentration of nitrite+nitrate was below the detection limit (<0.10 µmol/l). In the Sound, phosphate concentration was 0.64 µmol/l, silicate 14.6 µmol/l and nitrite/nitrate 0.32 µmol/l. The high values of phosphate and silicate were due to an outflow from the Baltic.

Plankton activity, based on fluorescence and oxygen saturation, was relatively low in the area.

The lowest oxygen concentration in the deep water of Kattegat was measured at the station Anholt E, 3.8 ml/l. In the bottom water of the Sound the concentration was only 1.73 ml/l, corresponding to a saturation of 28%.

Arkona, Hanö Bight and the Bornholm Basin

The temperature in the surface water was somewhat below normal for the season, varying between 8.6 and 12.5°C. Surface salinities varied from 7.2 to 8.1 psu. The halocline was located at depths between 35 and 40 metres in the Arkona Basin and between 50 and 60 metres in the Bornholm Basin and Hanö Bight. The effects of an inflow, which occurred in early October, were clearly seen

at the station BY1 in the Arkona Basin, were the salinity in the bottom water was 16 psu and the oxygen conditions were good.

Concentrations of nitrite+nitrate were below the detection limit, which is normal for the season. Phosphate showed clearly elevated levels, 0.4 to 0.7 $\mu\text{mol/l}$. Also silicate concentrations were enhanced and varied between 11 and 14 $\mu\text{mol/l}$.

Oxygen conditions in the bottom water of the Arkona basin varied, at BY1 a concentration of 5.7 ml/l were measured, while the concentration at BY2 was only 2.3 ml/l. In the Bornholm Basin as well as in the Hanö Bight, oxygen was almost depleted in the deep water and concentrations between 0.2 and 0.5 ml/l were measured.

Plankton activity was low in the investigated area.

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