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Report from SMHIs monitoring cruise with KBV 001 Poseidon

Survey period: 2013-03-20 - 2013-03-26
Survey area: The Skagerrak, Kattegat, Sound and the Baltic Proper.
Principal: SMHI and the Swedish Agency for Marine and Water Management

SUMMARY

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

Surface water temperatures were below normal in all investigated areas. Nutrients in the surface layer were almost completely consumed in the Skagerrak and Kattegat and the spring bloom was in progress. In the Baltic Proper winter conditions still prevailed and nutrient concentrations were above mean for the season, especially in the southern parts.
The bottom water in the Arkona Basin was well oxygenated. Oxygen concentrations below 2 ml/l were found at depths exceeding 80 to 90 metres in the main part of the area.
Hydrogen sulphide was measured in the Eastern and Western Gotland Basins from a depth of 125 metres.

The next expedition will take place in the beginning of April.

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PRELIMINARY RESULTS

The cruise, part of the Swedish regular marine monitoring programme, began in Göteborg on March 20 and ended in the same port March 26. Due to permit not granted to enter Latvian water, two stations (BY10 and BY15) were moved to the west into Swedish EEZ.
Winds during the expedition were moderate to strong, mainly from northeast, however during the last day the wind abated. Air temperatures varied from -5°C to ca. +2°C.

The Skagerrak

Surface water temperatures were below normal and varied between 0.2 and 0.4°C. Also, surface salinities were lower than normal, varying between 20.6 to 24.4 psu. The halocline and thermocline coincided at depths between of 10 to 20 metres.
All nutrients, in the surface layer, showed concentrations below or just above detection limits, which is normal for the season. Phosphate concentrations were between 0.04 and 0.10 µmol/l. The sum of nitrite + nitrate was below detection limit (<0.10 µmol/l) in the whole area, while silicate concentrations varied from <0.1 to 0.2 µmol/l.
Strong peaks in fluorescence were detected at depths between 15 and 20 metres.

The Kattegat and the Sound

Surface water temperatures were below normal and varied in Kattegat between 0.63 and 0.86°C, while in the Sound the surface temperature was 0.15°C. Surface salinity, also lower than normal, varied between 18.5 and 20.3 psu. In the Sound the surface salinity was 8 psu. The halocline and thermocline, both very sharp, were found at 15 metres depth in the Kattegat, and at about 10 metres in the Sound.
In Kattegat, all nutrients showed, for the season, normal values in the surface layer. Inorganic nitrogen varied from below detection limit (< 0.10 µmol/l) to 0.25 µmol/l. Phosphate concentrations were between 0.11 and 0.21 µmol/l, while silicate varied between 0.4 and 3.6 µmol/l. All parameters with the highest values in the south. In the Sound, concentrations of inorganic nitrogen were normal, 3.7 µmol/l, while both phosphate and silicate showed, for the season, elevated levels, 0.6 µmol/l and 15.3 µmol/l respectively. These facts, together with the low salinity, indicate a clear influence of outflowing Baltic water.
Oxygen conditions in the deep water were good. The lowest concentration measured was found at a depth of 50 metres in the Sound, 5.54 ml/l, corresponding to a saturation of about 80%. Plankton activity, based on fluorescence measurements and oxygen saturation, was high in the surface layer in Kattegat, but low in the Sound.

Baltic Proper

Surface water temperatures were slightly below normal for the season and varied between 1.0 and 1.8°C. Surface salinities were normal, increasing from ca. 6.8 psu in the northwest to 7.6 psu in the south. The thermocline and halocline coincided and were found at 40 metres depth in the Arkona Basin, at ca. 60 metres in the Bornholm Basin and Hanö Bight and at 60 to 80 metres in the remaining areas.
All nutrients in the surface layer showed, for the season, concentrations above normal. Concentrations of nitrite+nitrate were just above normal, between 3.0 and 3.9 µmol/l. Phosphate and silicate were clearly elevated in the Arkona- and Bornholm Basins, ca. 0.7 and 15 µmol/l respectively. In remaining areas concentrations of phosphate varied between 0.64 and 0.69 µmol/l, which is above normal, while silicate showed normal values, 12-14 µmol/l.
The bottom water of the Arkona Basin was well oxygenated, with concentrations over 7.5 ml/l. Also in the Bornholm Basin the oxygen situation was good, with concentrations above 3.5 ml/l. In the

Hanö Bight there was an oxygen minimum at a depth of 70 metres, 1.76 ml/l. Oxygen concentrations below 2 ml/l were measured at depths exceeding 80 to 90 metres in the Eastern and Western Gotland Basins, were also hydrogen sulphide was present from a depth of 125 metres. Plankton activity was very low and there were no signs of a spring bloom.

PARTICIPANTS

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Anna-Kerstin Thell	Cruise leader	SMHI Oceanographic laboratory
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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