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Report from the SMHI monitoring cruise with KBV001 Poseidon

Survey period: 2013-12-15 - 2013-12-19
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, except silicate, showed normal concentrations.
The oxygen concentrations in the bottom water of the Sound and Kattegat were higher than normal, but lower than normal in the central and northern parts. The inflows during the autumn to the Baltic Proper had now reached the Arkona Basin and the Bornholm Basin.

The next expedition is planned to take place at the end of January and the beginning of February 2014 and will cover both the Baltic Proper and the Skagerrak/Kattegat areas. The cruise will take place onboard the Finnish research vessel Aranda.

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SMHI

PRELIMINARY RESULTS

The cruise began in Göteborg on December 15th and ended in the same port on December 19th. Due to working environment concerns, no ammonia measurements were carried out.
During the initial part of the cruise winds were fresh, and then they increased to strong, thereafter weakening to moderate. Wind directions were mainly from west to southwest. Air temperature varied between 7 and 10°C.

The Skagerrak

The surface temperatures were normal for the season and varied between 7.4 and 8.5°C. Salinity varied from 31.5 psu close to the coast, which is above normal, to 33.7 psu in the central part of Skagerrak. Both thermocline and halocline were weakly developed or completely missing.
Generally, the concentrations of all nutrients in the surface layer had increased since the last measurements in November. However, all shoved levels typical for the season. Phosphate concentration were between 0.34 and 0.48 µmol/l, the sum of nitrite + nitrate varied between 4.0 and 5.3 µmol/l, while silicate concentrations varied from 3.4 to 5.8 µmol/l.
Plankton activity based on CTD fluorescence measurements and oxygen saturation was low.
Oxygen situation in the bottom waters were good in the whole area.

The Kattegat and the Sound

Also in this area the surface water temperatures were normal for the season and varied between 5.9 and 6.7°C. The thermocline was located at a depth of 10 to 15 meters, but was weakly developed.
Salinity in the surface water of Kattegat was higher than normal, ca. 29 psu, but in the Sound, below normal, ca. 11 psu. The halocline in Kattegat was found at the same depth as the thermocline and also very weak. In the Sound a very sharp halocline was found at a depth of 5 meters.
The concentrations of nutrients in the surface waters were normal for the season. Phosphate concentrations were about 0.4 µmol/l, in the Sound, 0.6 µmol/l. In Kattegat the sum of nitrite + nitrate was 3.5 to 4.5, while in the Sound ca. 3 µmol/l. Silicate concentration varied from 5 µmol/l in the Kattegat to 10 µmol/l in the Sound.
The oxygen concentrations in the deep water were higher than normal, with the lowest value at the station Anholt E in the southern Kattegat, 6.01 ml/l, corresponding to a saturation of ca. 90 %.
The plankton activity was low, but some activity could be seen, based on CTD fluorescence measurements, at the station N14 outside Falkenberg.

The southern part of the Baltic Proper

Surface temperatures were normal for the season, 5.8 to 6.7°C. Salinity in the surface layer in the Arkona Basin was elevated, 9 psu, otherwise normal, 7.5 psu. The thermocline and halocline coincided and was located at depths of 40-50 metres.
All nutrients in the surface water showed normal values, except for silicate which was lower than normal in the Arkona Basin. Phosphate concentrations varied from 0.5 to 0.7 µmol/l, the sum of nitrite+nitrate varied between 1.9 and 2.3 µmol/l while the concentration of silicate were between 6.5 and 11.5 µmol/l.

Three inflows to the Baltic have taken place during this autumn. In the beginning of October 15 km^3 came in through the Sound, in the end of the month 40 km^3 and in December, again, 15 km^3. The effect of the latest inflow was seen during the expedition at the station BY1 in the Arkona Basin, where oxygen concentrations had increased from 4.7 ml/l in November till 6.9 ml/l, but not at the station BY2 where the conditions were similar to last month. The previous inflows had reached the Bornholm Basin where oxygen rich water was found in thin layers at several different depths in the deep water. In the western part of the Bornholm Basin oxygen concentrations were similar to those in November, while oxygen levels in the eastern part had increased from 0.2 to 1.9 ml/l. In the Hanö Bight, were effects of the first inflows where seen during the visit November, oxygen concentrations in the deep water had again dropped from 4 ml/l down to below 2 ml/l.

The plankton activity was low in the whole investigated area.

PARTICIPANTS

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Daniel Bergman-Sjöstrand		- ” -
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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