

Report from SMHI's monitoring cruise December 2012



Survey area: The Baltic Proper and the Gulf of Bothnia
Survey period: 2012-12-07 to 2012-12-15
Vessel: KBV002 Triton

Principal: SMHI and Swedish Agency for Marine and Water Management

SUMMARY

In the investigated parts of the Baltic Proper, concentrations of phosphate were higher than normal, while inorganic nitrogen and silicate showed normal values. Oxygen concentrations below 2 ml/l (hypoxia) were found at depth exceeding 55 to 80 metres, while total lack of oxygen (anoxia) was found deeper than 80 to 100 metres in the Baltic Proper. All parameters in the Gulf of Bothnia showed normal values and the oxygen conditions in the deep water were good.

Data presented in this report have been subject to preliminary quality control procedures only.

PRELIMINARY RESULTS

The expedition, part of the Swedish regular marine monitoring programme covered the Baltic Proper and the Gulf of Bothnia. The cruise began in Visby on December 7th and ended in Oskarshamn December 14th. Winds during the expedition were mainly weak to moderate, of varying directions. The air temperature varied between 0 and -9°C. Due to a ship collision, the station BY15 had to be excluded, since KBV002 was needed at the site of the accident.

The Baltic Proper

The temperature as well as the salinity in the surface layer showed normal values for the season and varied between 4.7-7.5°C and 6.6-7.2 psu respectively. The surface layer was well mixed down to depths between 35-80 meters, deepest in the north. In the northern parts there were also a secondary, weaker stratification at a depth of 10-15 meters, with colder and more saline water emanating from the Bothnian Sea.

Concentrations of phosphate, in the surface water, were somewhat elevated and varied between 0.42 and 0.54 µmol/l. The concentrations of inorganic nitrogen and silicate showed, for the season, normal values. Nitrite + nitrate varied between 0.7 and 3.3 µmol/l, highest in the north and lowest in the southeast, while concentrations of silicate varied from 7.6 to 12 µmol/l.

Hypoxia, oxygen concentration lower than 2ml/l, was found at depth exceeding 55 to 80 meters. Anoxic conditions, no oxygen but hydrogen sulphide present, were found at depth deeper than 80-100 meters.

The plankton activity, based on oxygen saturation and fluorescence was low in the whole investigated area.

The Gulf of Bothnia

Both surface temperature and surface salinity showed typical values for the season. Temperature varied between 2.1 and 4.1°C. The salinity in the surface layer of the Bothnian Sea was about 5.5 psu, while it in the Bothnian Bay was ca. 3 psu.

All nutrients showed normal values for this time of the year. Phosphate concentrations in the Bothnian Sea varied between 0.26 and 0.35 µmol/l, and were in the Bothnian Bay about 0.07 µmol/l. Concentrations of inorganic nitrogen in the Bothnian Sea were from 1.9 to 3.5 µmol/l and in the Bothnian Bay between 5.8 and 6.5 µmol/l. Silicate concentrations varied from 14 to 21 µmol/l in the Bothnian Sea and was about 38 µmol/l in the Bothnian Bay.

The lowest oxygen concentration in the bottom water was measured at the station US3 in the northern part of the Bothnian Sea, 5.16 ml/l, corresponding to a saturation of 57%. In the Bothnian Bay the water column was well mixed and no low oxygen values was measured.

Also in this area, plankton activity was low.

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