Bengt Yhlen

Swedish Meteorological and Hydrological Institute
Oceanographical Laboratory

2003-01-20
Dnr: Sh-2003-6

CRUISE REPORT FROM R/V ARGOS

Survey period: 2003-01-13 - 2002-01-19

Survey area: The Skagerrak, the Kattegat, the Sound and the Baltic proper

Principal: SMHI

SUMMARY

The expedition was performed within SMHI's regular marine monitoring programme and covered the Skagerrak, the Kattegat, the Sound and the Baltic Proper.

Nutrient conditions in the surface layer were mostly normal for the season, in all areas. Surface temperature was slightly below normal.

Oxygen concentrations below 2 ml/l, were found at depths exceeding 70 to 80 metres in the Bornholm Basin and in the western, eastern and northern Gotland Basins. Hydrogen sulphide was found deeper than 100 metres in the western parts of the Baltic Proper, and below 125 metres in the northern and eastern parts.

Saltwater inflow through the Sound continued for the duration of the expedition.

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PRELIMINARY RESULTS

The first cruise of 2003, part of the SMHI's ordinary monitoring programme, began in Göteborg January 13 and ended at the same place January 19. Intensive depressions moving across Scandinavia brought moderate to strong winds from the west. Mapping of winter conditions was performed in the Kattegat. An inflow through the Sound occurred during the expedition.

The Skagerrak

Surface water temperatures varied between –0.5 and 2.3 °C, lowest at the Swedish coast, highest in the central parts. Surface salinity in the area was homogeneous, about 28 psu.
Surface nutrients also showed little variation. Phosphate concentration was about 0.5 µmol/l, nitrate about 5 and silicate varied between 5 and 6 µmol/l.

The Kattegat and the Sound

Surface water temperatures varied between 0.4 and 4.0 °C. At most stations the halocline and thermocline started above 10 metres. In the surface layer all nutrients showed normal values for the season. Phosphate concentration was ca. 0.5 µmol/l. The sum of nitrate plus nitrite was ca. 6 µmol/l and silicate varied between 6 and 11 µmol/l.
The bottom water was well oxygenated.
An inflow to the Baltic, which began on Sunday, 12th January 2003, continued throughout the expedition. Surface salinity along the whole Sound exceeded 25 psu both on the way out and back. This is considerably higher than normal values. Forty cubic kilometres of inflow were measured by the 20th January 2003.

The Baltic Proper

Surface water temperatures varied between 1 and 3 °C. This is somewhat below normal for the season. The thermocline and halocline were coincident and began in the Arkona Basin at a depth of ca. 20 metres. In the remainder of the Baltic Proper they began at depths between 40 and 60 metres.
Surface nutrient concentrations were typical for winter, with negligible differences from normal. Phosphate concentration varied between 0.5 and 0.7 µmol/l. The sum of nitrate plus nitrite decreased from ca. 6 in the Arkona Basin to 3 µmol/l in the north. Silicate varied from 12-14.5 µmol/l.
The bottom water in the Arkona Basin was well oxygenated. In the remainder of the Baltic, oxygen levels below 2 ml/l occurred deeper than 70 to 80 metres. In the Bornholm Basin the effect of last autumn's 20 km^3 inflow had abated and bottom oxygen concentrations were close to zero.
Hydrogen sulphide was found deeper than ca. 125 metres in the eastern and northern and already from ca. 100 metres in the western Gotland Basin.
By Wednesday (15th January 2003) the present inflow had reached station BY1, where bottom salinity exceeded 21 psu in a 10 metre thick layer. By Saturday 18th January, on the return leg of the cruise, the inflow had reached all the way along the southern coast of Skania (Skåne). Almost 21 psu was measured in a 5 metre thick layer covering the bottom between station BY2 and BY3 (the Sound of Hamrarne).

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Plots

Click on the button to open appendices.
Note that this will only work when
connected to Internet!

APPENDICES

- Track chart
- Table over stations, parameters and sampling depths
- Map showing bottom oxygen concentrations
- Monthly average plots for selected stations
- Profiles for selected stations

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