

CRUISE REPORT FROM R/V ARGOS

Survey period: 990927-991002

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. Surface temperatures varied between 15.2 and 16.8 degrees C. Nutrient concentrations were normal for the season in almost all areas. High fluorescence values were measured at the Å section in the Skagerrak, as well as in the northern part of the Sound. Hydrogen sulphide was found at depths greater than 70-80 meters in the southern Baltic, 100 meters in the Karlsö Deep and at depths greater than 150 meters in the eastern Gotland Basin and in the northern and western Baltic.

A detailed algal situation report for the survey period is available on <http://www.smhi.se/sgn0102/nodc/reports/>.

PRELIMINARY RESULTS

The expedition, which was a part of the SMHIs ordinary monitoring programme, began in Göteborg on the 27th of September and ended in Västervik on the 2nd of October. During the main part of the expedition the winds were westerly to southerly with velocities between 8-12 m/s. The weather was mostly fair.

The Skagerrak

The surface water temperature varied between 15.6 and 16.8°C. At station P2 the thermocline was located at 55 m and the temperature at 50 m was 16.7°C. The salinity of the surface water was 33 psu and thus higher than normally. At the Å section near the coast the thermocline was located at a depth of 25 m, and further out at 15 m. At the station Å13 the Baltic current could be seen in the surface layer down to 5 meters. In this layer of lower salinity, 27 psu, there was an algae bloom, which could be detected by the increased fluorescence.

The nitrate concentration of the surface water was normal for the season that is lower than the limit of detection. The phosphate concentration of the surface water at the Å section was rather low, 0.05-0.15 µmol/l, though higher than normally at the station P2, 0.30-0.35 µmol/l. Silicate was found in concentrations between 0.9 and 1.4 µmol/l.

The Kattegat and the Sound

The surface water temperatures were between 16.1 and 16.4°C. The halocline of the eastern Kattegat was distinct and was located at a depth of 10-20 meters. The thermocline was weaker. At Kullen and W Landskrona both the thermo- and halocline were well developed, and was located at 10 m at Kullen and at 7 m in the Sound, where the fluorescence also was high. The oxygen concentration in the southern Kattegat and in the Sound was noticeably lower under the halocline. The saturation was changed from 100% to 50%. The lowest oxygen concentration was measured in the bottom water at Kullen, 1.8 ml/l. This gave a saturation of 28%.

The nutrients showed concentrations typical of the season, that is the nitrate concentration was lower than the limit of detection, the phosphate concentration was low, 0.03-0.07 µmol/l and the silicate concentration 1-2 µmol/l.

The Baltic Sea

The surface water temperatures were between 15.2 and 16.5°C. The thermocline was located at depths between 20 and 30 meters. At the station BY1 in the Arkona Basin there had been an inflow of saline water at a depth of 40 meters, where the salinity was measured to 21 psu. Water with this salinity was not yet seen at the station BY2. The oxygen saturation of the surface water that was lower than 100% depends on sudden cooling.

Low oxygen concentrations (<2 ml/l) were found at depths greater than 40 m at the station BY2 in the Arkona Basin, at depths greater than 60 m in the Hanö Bight, at depths greater than 70 in the Bornholm Basin and in the western Baltic, and at depths greater than 85 in the southeastern Baltic. In the eastern and northern parts of the Baltic Proper the oxygen concentrations <2 ml/l were found at depths exceeding 80 meters. Hydrogen sulphide were present in the Hanö Bight and the Bornholm Basin at depths greater than 70 and 80-85 meters, at the Karlsö Deep at depths

greater than 100 meters and in the Eastern Gotland Basin and in the northern and western Baltic from 150 meters and downwards. All nutrients showed, for the season, typical values, i.e. nitrite and nitrate around the detection limits, phosphate between 0.02 and 0.09 $\mu\text{mol/l}$ (exception: Arkona and southeastern Baltic about 0.20 $\mu\text{mol/l}$) and silicate between 5 and 12 $\mu\text{mol/l}$.

PARTICIPANTS

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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