

CRUISE REPORT FROM R/V ARGOS

Survey period: 20000324-20000328

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. The lowest temperature of the surface water was 2.5°C and the highest was 4.7°C. Hydrogen sulphide was found only in the eastern Gotland Basin, from 125 and 130 meters in the Fårö and the Gotland Deep respectively. In the Skagerrak, the Kattegat, the Sound and in the southern Baltic (BY1 and the Bornholm Deep) the spring bloom was confirmed by the high fluorescence, the oversaturation of oxygen and the decrease of nutrients of the surface water.

PRELIMINARY RESULTS

The expedition, which was a part of the SMHI ordinary monitoring programme, began in Kalmar on the 24th of March and ended in Lysekil on the 28th. The weather was rather calm with varying winds and some sunshine. There was only one day with stronger winds from northeast, when we were sampling in the Kattegat.

Two persons from the Great Britain took part of this expedition and tested a dragline sond.

During this expedition the northerly stations, the Landsort Deep (BY31) and BY29 were not visited. From March to October SMF, The Centre of Marine Research, University of Stockholm, will include these stations in their sampling programme.

The Skagerrak

Surface water temperatures varied between 3.5°C and 4.7°C. The lowest temperature was measured at P2 in the south and the highest at Å17 further north of the Skagerrak. At Å17 there was an evident thermocline at 20 m. At P2 the halocline at 10 m was more pronounced.

A slight oversaturation of oxygen and a decrease of nutrients indicated the beginning of a plankton bloom at all stations in the Skagerrak. The concentration of nitrate of the surface water was 2-3 µmol/l and that of phosphate 0.1-0.2 µmol/l. The station Släggö in the near of Lysekil however showed higher nitrate concentrations in the surface and the bottom water, 4 and 11-13 µmol/l. The concentration of silicate at the station Å17 was extremely low, 0.1 µmol/l, down to 20 meters.

The Kattegat and the Sound

Surface water temperatures varied from 3.8°C to 4.3°C, measured at Fladen(Anholt E) and W Landskrona respectively.

At W Landskrona in the Sound the halocline was marked. The salinity increased from 9 psu to 25.8 psu between 15 and 20 meters. The temperature here decreased from 4.3°C to 3.7°C. A great contrast could be seen in the distribution of ammonia, nitrate and nitrite. In the surface layer the concentrations of these were under the limit of detection, while in the deeper layer they still had winter concentrations. Especially the ammonia concentration was very high, 1.5 µmol/l. The phosphate concentration of the surface water was 0.15 µmol/l. The concentrations of all nutrients of the surface water this month were even lower than the decade means of these.

A distinct limited surface layer accelerates a spring bloom. In the Sound and at Kullen the plankton bloom was in progress. Besides the low nutrient values this was further shown by the oversaturation of oxygen and by the high fluorescence. At Fladen in the north of the Kattegat the bloom was declining.

The Baltic Sea

Surface water temperatures varied between 2.5°C and 3.9°C. The lowest temperature was registered in the Norrköping Deep and the highest in the southwestern Baltic at BY 1. The thermocline and the halocline were situated at the same depth, 65 meters, in the western and eastern Baltic, though at 70 m in the Gotland Deep. In the southern Baltic they were at 50 meters and in the southwestern at 20 meters.

There was an oxygen concentration lower than 2 ml/l from 100 m in the Gotland Deep, from 90 m in the western Gotland Basin and at BY10, from 80 m in the southeastern Baltic and in the Fårö and Bornholm Deep, from 70 m at Christiansö (BY4) and in the Hanö Bight.

Hydrogen sulphide was found only in the eastern Gotland Basin. Thus there was hydrogen sulphide from 125 m in the Fårö Deep, from 130 m in the Gotland Deep and in the bottom water of BY10.

The concentrations of the nutrients were of winter levels (0.6-0.7 $\mu\text{mol/l}$ phosphate, 4.3-5.0 $\mu\text{mol/l}$ nitrate), except where the spring bloom had begun. This was evident in the southwestern Baltic at station BY1, where the fluorescence of the upper layer was high down to 20 meters. Here the concentrations of phosphate and nitrate were 0.4 and 1.2 $\mu\text{mol/l}$ respectively. In the Bornholm Deep as well the spring bloom had started as could be seen from increased fluorescence and decreased nitrate concentration, 2.7 $\mu\text{mol/l}$, of the surface water down to 15 meters.

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