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Oceanographical Laboratory

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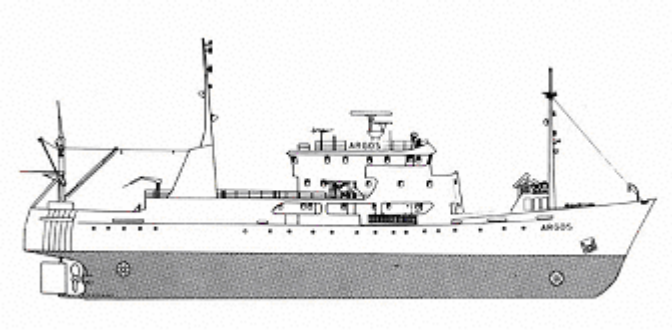
CRUISE REPORT FROM R/V ARGOS



Survey period: 2009-06-08 - 2009-06-13

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

Principal: SMHI

SUMMARY

The expedition was part of SMHI's regular marine monitoring programme and covered the Skagerrak, the Kattegat, the Sound and the Baltic Proper.
Data presented in this report have been subject to preliminary quality control procedures only.
Surface water temperatures were normal in the whole area.
Nutrient concentrations were normal in the whole investigated area, with the exception of phosphate that showed elevated levels in the southern part of the Baltic Proper.
The water below the halocline in the Arkona Basin was well oxygenated with levels of ca. 5 ml/l. In the rest of the Baltic Proper oxygen concentrations below 2 ml/l were observed at depths exceeding 70 to 80 meters.
Hydrogen sulphide was found, in the Western Gotland Basin, deeper than 80-90 meters. In the Eastern Gotland Basin hydrogen sulphide began at depths between 125 and 150 meters.
A plankton bloom was ongoing in the Baltic Proper as well as in intermediate layers in Skagerrak, while it was almost over in the Kattegat.
Next expedition will take place June 29-July 4.

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PRELIMINARY RESULTS

The cruise, part of SMHI´s ordinary monitoring programme, began in Göteborg on June 8 and ended in the same port June 13. The winds during most of the expedition were weak to moderate, with the exception of the two last days when the wind speed was fresh, 11-17 m/s.
Zooplankton samples were taken as part of the Bazooca project, studying the occurrence of the comb jelly Mnemiopsis.

The Skagerrak

Surface temperatures were normal for the season and varied between 12.5-14.5°C. Surface salinity was normal in the central and western parts, at between 27 and 31 psu. Salinity was higher than normal close to the coast, at ca. 30.5 psu. Thermocline and halocline were weakly developed and found at depths between 5 and 25 metres.
Nutrient concentrations in the surface layer were normal throughout the area. Inorganic nitrogen components were consumed (< 0.10 µmol/l), phosphate concentrations varied from below detection limit (<0.02 µmol/l) to 0.03 µmol/l and silicate between 0.2 and 0.4 µmol/l. Observations of chlorophyll fluorescence indicated an algal bloom at between 15 and 20 metres depth.

The Kattegat and the Sound

Surface water temperatures were also normal for the season here, at ca. 14°C in the Kattegat and 13.1°C in the southern part of the Sound. Surface salinities were normal: from 18.5 psu in the southern Kattegat to 24.3 psu in the northern part; salinity in the Sound was 8.5 psu. The halocline and thermocline were found at 10 to 20 metres depth.
All nutrients showed normal concentrations: inorganic nitrogen was below detection limit while phosphate was 0.05 µmol/l in the Kattegat and 0.16 µmol/l in the Sound. Silicate concentrations varied between 1.1 and 2.3 µmol/l in the Kattegat, while the concentration in the Sound was about 7.5 µmol/l. There was a weak algal bloom in the surface layer.
The lowest oxygen concentration in the bottom water was recorded in the bottom water in the Sound, at 5.0 ml/l, which corresponds to a saturation of ca. 70 %.

Baltic Proper

Surface temperatures were normal for the time of year, and varied between 10.2° and 11.5°C. The halocline started at 60 to 70 metres in the central Baltic, at 40 to 50 metres in the Bornholm Basin, and at 35 to 40 metres in the Arkona Basin. The thermocline was found between 25 and 30 metres. Phosphate concentrations in the surface water varied between 0.07 and 0.24 µmol/l – highest in the Arkona Basin, normal elsewhere. The sum of nitrite and nitrate in the surface waters were normal, being under the detection limit (< 0.10 µmol/l) throughout the study area. Silicate levels varied between 7.1 and 10.5 µmol/l: lowest in Arkona and highest (and higher than normal) in the eastern and western Gotland Basin. Flourescence measurements, combined with oxygen supersaturation, indicated that an algal bloom was underway from the surface down to 20-25 metres depth.
Below the halocline in the Arkona Basin, the water was well oxygenated, with oxygen concentrations of 4.5 to 5 ml/l. In the remainder of the Baltic Proper, oxygen concentrations below 2 ml/l were found below 70 to 80 metres. Hydrogen sulphide was found below 80 – 90 metres in the West Gotland basin, while in the East Gotland Basin, hydrogen sulphide started below 125 and 150 metres.

Coastal stations

Temperature at Ref M1V1 in the Kalmar Sound was higher than normal. Salinity at Släggö (at the entrance to Gullmarfjord) was much higher than normal, while at N14, offshore of Falkenberg, the salinity was lower than normal. Other parameters were normal for the time of year.

PARTICIPANTS

Name		From
Lars Andersson	Chief scientist	SMHI Oceanographic laboratory.
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Sari Sipilä		-”-
Bodil Thorstensson		-”-
Bengt Yhlen		-”-
Matilda Haraldsson		Göteborgs Universitet
Cornelia Jaspers		Köpenhamns Universitet

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