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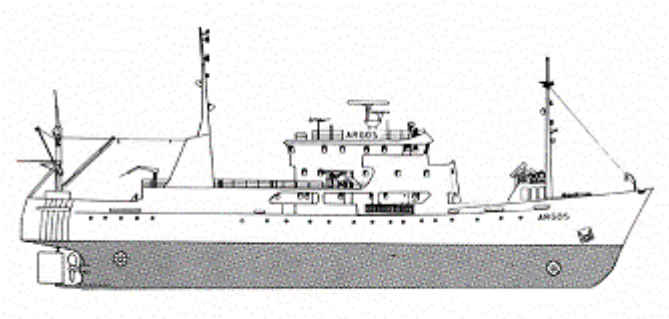
CRUISE REPORT FROM R/V ARGOS



Survey period: 2004-07-26 - 2004-07-31

Survey area: The Skagerrak, Kattegat, Sound, and 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. Due to problems with the CTD-sond, salinity values are uncertain.
Nutrient concentrations in the surface waters were normal for the season almost everywhere, with the exception of phosphate, that in the south-eastern Baltic showed clearly enhanced values, and silicate that in the eastern and western Gotland Basins also showed values above normal.
A cyanobacteria bloom was observed in several areas in the Baltic Proper. Significant surface accumulations were observed especially in the Arkona Basin and in the western Gotland Basin. On ship microscopy showed that the potentially toxic species Nodularia spumigena *was common.*
Oxygen concentrations below 2 ml/l were found in the whole Baltic Proper at depths exceeding 70 metres. Hydrogen sulphide was found at the Gotland Deep, in the Western Gotland Basin, the Hanö Bight and parts of the Bornholm Basin.
Next expedition is scheduled for August 23 to 28, 2004.

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PRELIMINARY RESULTS

The cruise, part of SMHI´s ordinary monitoring programme, began in Göteborg July 26 and ended in the same port July 31. The winds during the expedition were weak, mainly from south-west to north-west.

The Skagerrak

Surface water temperatures varied between 15.5 and 17°C, which is normal for the season. Surface salinity was normal, except at the station P2 in the south-east, where it was clearly higher.
Thermocline and halocline were found at depths between 10 and 20 metres.
Nutrient concentrations in the surface were normal for the season. Phosphate concentrations varied around 0.05 µmol/l and silicate between 0.7 and 1.2 µmol/l. Nitrite and nitrate were below detection limits (<0.02 and <0.10 µmol/l respectively).
The chlorophyll-fluorescence was low, with maximum at ca. 10 metres depth close to the coast and at 20 – 30 metres in the central parts.
On ship microscopy showed that the diatom *Cerataulina pelagica* was common. The dinoflagellates *Dinophysis norvegica* and *Ceratium* spp. were observed.

The Kattegat and the Sound

Surface water temperatures varied between 15.8 and 16.7°C, which is below normal for this time of year. Surface salinities were normal, 20 psu (in the Sound 8.7). The thermocline and halocline both began at depths between 10 and 15 metres.
All nutrients showed typical surface water concentrations for the season. Phosphate ca. 0.05 µmol/l, nitrite and nitrate were below the detection limit, and silicate ca. 1 µmol/l. In the Sound, phosphate and silicate concentrations were higher, 0.19 and 6.7 µmol/l respectively.
The chlorophyll-fluorescence was low with the highest values at ca. 15 metres depth. On ship microscopy showed that the diatom *Cerataulina pelagica* was common. The dinoflagellates *Dinophysis norvegica* and *Ceratium* spp. were observed.
In Kattegat the lowest bottom water oxygen concentration was found at Anholt E, 3.0 ml/l and in the Sound at W Landskrona, 2.71 ml/l corresponding to a saturation of 40%.

Baltic Proper

Surface water temperature varied between 16.5 and 18°C, which is typical for the time of year.
The thermocline was found at a depth of 15 to 20 metres. In the southern parts, the halocline was located at 20 to 30 metres depth and in the remaining parts, between 60 to 80 metres.
Phosphate concentrations, that earlier this year were strongly enhanced, especially in the eastern and western Gotland Basins, were now at normal levels (0.05-0.10 µmol/l), while concentrations in the south-eastern parts were clearly above normal (0.22-0.34 µmol/l). Silicate surface concentration in the Arkona and Bornholm Basins was ca 7 µmol/l, somewhat below normal. In the rest of the Baltic it varied between 9.5 and 11 µmol/l, which is above normal. The surface nitrate was consumed in the whole area.
The chlorophyll-fluorescence was low at all stations. The highest values were in general observed between the surface and 20 m. In the northern part of the western Gotland Basin the peak was found at 10 m. In the Arkona Basin, the Bornholm Basin and the northern part of the eastern Gotland Basin and especially in the western Gotland Basin surface accumulations of cyanobacteria were observed. On ship microscopy showed that the cyanobacteria (=blue green algae) *Nodularia spumigena* (potentially toxic), *Aphanizomenon* "*baltica*" and *Anabaena* spp. were common. In the south-eastern Baltic the diatom *Chaetoceros* was also common. The dinoflagellates *Dinophysis* spp. and *Heterocapsa triquetra* were also observed at several locations. Pennate diatoms were often observed as epiphytes on colonies of cyanobacteria. The cyanobacteria had floated to the surface in the calm weather.

Oxygen concentrations below 2 ml/l were measured at depths exceeding 60 to 70 metres in the whole area, and also at station BY1 in the Arkona Basin at a depth of 45 metres.

Hydrogen sulphide was found at BY15 (Gotland deep) below 235 metres and in the western Gotland Basin at depths exceeding 80 metres. Hydrogen sulphide was also present in the Hanö Bight below 78 metres and in the Bornholm Basin (BY4) below 91 metres.

PARTICIPANTS

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Lars Andersson	Chief scientist	SMHI Oceanographic lab.
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Sari Sipilä		-”-
Ann-Turi Skjevik		-”-

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
- On way data of temperature and salinity from a depth of ca. 4 m.
- Monthly average plots for selected stations
- Profiles for selected stations