Mats Ohlson

**Swedish Meteorological and Hydrological Institute**
**Oceanographical Laboratory**

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# CRUISE REPORT FROM R/V ARGOS

**Survey period:** 991206-991216

**Survey area:** The Gulf of Bothnia, the Baltic Proper, the Sound, the Kattegat, and the Sakgerrak.

**Principal:** SMHI

## SUMMARY

*The expedition was performed within SMHIs regular marine monitoring program and covered the Gulf of Bothnia, the Baltic Proper, the Sound, the Kattegat, and the Skagerrak. The weather was windy, from 4 m/s to 34 m/s.*
*The surface water temperatures were between 2.1 and 4.8°C in the Gulf of Bothnia, 4.7 and 6.8°C in the Baltic proper, 5.0 and 5.9°C in the Sound and the Kattegatt, and 4.4 and 8.4 in the Skagerrak.*
*Oxygen concentrations below 2 ml/l were found at 125 m and deeper in both the eastern and the western Gotland basins. New incoming dense water was found at BY4 and BY5 in the Bornholm basin.*
*A detailed algal report is soon available on http://www.smhi.se/nodc/reports/ for the survey period.*

**Address:**
Byggnad 31 Nya Varvet
SE-426 71 Västra Frölunda
SWEDEN

**T Telephone:**
+46 11 495 80 00
**Telefax:**
+46 31 751 89 80

**E-mail:**
shark@smhi.se
**WWW:**
http://www.smhi.se/nodc/

## PRELIMINARY RESULTS

The expedition, which was part of SMHIs regular marine monitoring programme, started in Västervik the 6th of December and ended in Göteborg the 16th of December. The weather conditions during the cruise were windy. The first day the wind velocity was 34 m/s. During the cruise period several low pressures past over the Baltic Sea area.

**The Gulf of Bothnia**

The water surface temperature varied from 2.1°C to 4.8°C. The northern Bothnian Bay was colder than the southern Bothnian Sea and it was colder toward shore than in the open sea. The oxygen saturation varied between 92 to 97% in the surface layer. The nutrients concentrations were low. The silicate concentrations were from 7 to 19 µmol/l, the lower values toward the Finnish shore. The nitrite values were about 0.05 µmol/l, the phosphate 0.3 µmol/l or lower, the ammonia 0.3 µmol/l or lower, and the nitrate varied between 2 and 4.5 µmol/l.

**The Baltic proper**

The water surface temperatures were 5.5°C in the area, expect in the south were it was about 6.8°C.
In the eastern Gotland basin the surface layer was well mixed down to 50 meter and in the western part down to 60 meter. In the bottom water at the Norrköping and Landsort depths it were hydrogen sulphide. In the western Gotland basin the hydrogen sulphide were present in the bottom waters from BY29 in north to BY10 in south.
About 40 $km^3$, with a salinity of 25 PSU, flow in through the Sound to the Arkona basin, during the period from the 25th November to 5th December. Another 10 $km^3$ with a salinity of 23 PSU flow in during 7th to 11th December. This oxygenated incoming dense water was tracked at the stations BY4 and BY5 in the Bornholm basin, where the oxygen concentrations at the bottom were 1.70 ml/l respectively 2.09 ml/l.

**The Sound and Kattegatt**

The water surface temperature was a little bit more than 5°C.
The whole water column was well mixed, with a weak marked Baltic surface stream. The oxygen concentrations were good in the hole area with 5.5 ml/l, which corresponds to 83% saturation, or higher values.
In the Kattegatt the nutrients values were 0.5 µmol/l for phosphate, 4 µmol/l for nitrate, 0.5 µmol/l for ammonium, and 5 µmol/l for silicate.

**The Skagerrak**

The surface water temperature varied between 4.4°C to 8.4°C at the most western station, Sjöbergs tillägg.
The Baltic surface current was recognised at the station Å16 and in to the coast. Outside the Å16 station the water column was well mixed. The nutrients concentrations in the Baltic surface current were; phosphate 0.5 µmol/l, nitrite 0.5 µmol/l, nitrate 5 µmol/l, ammonium 0.5 µmol/l, and silicate 5 µmol/l.

## PARTICIPANTS

| Name | From |
|---|---|
| Björn Sjöberg, chief scientist (w49) | SMHI Oceanographical lab. |
| Mikael Andersson (w49) | SMHI |
| Bo Juhlin (w49) | SMHI |
| Jan Szaron (w49-50) | SMHI Oceanographical lab. |
| Bodil Thorstensson (w49) | - ″ - |
| Jorge Valderrama (w49) | - ″ - |
| Mats Ohlson, chief scientist (w50) | - ″ - |
| Lars Edler (w50) | - ″ - |
| Tuulikki Jaako (w50) | - ″ - |
| Mikael Krysell (w50) | SMHI |

## APPENDICES

Plots

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

- Cruise track
- Table over stations, parameters and sampling depths
- Map showing bottom water oxygen concentrations
- Monthly average plots for selected stations