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2010-09-18
RefNr: M/Gbg 2011-167

CRUISE REPORT FROM KBV001 – M/V Poseidon

Survey period: 2011-09-12 - 2011-09-18

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.

The weather during the first part of the expedition was very rough with gale and heavy seas.

At the visited stations in Kattegat, Skagerrak and the Sound nutrient concentrations showed normal values for the season. Lower silicate concentrations was found in south eastern and eastern Baltic proper.

At the visited stations west of Gotland low oxygen values were found from 60 metres depth. At all other visited stations in western, eastern and northern Baltic Proper low oxygen values were found from 70 metres depth. Hydrogen sulphide was found from 80 to 100 metres and deeper in north-eastern and western Baltic Proper and from 125 metres and deeper in eastern Baltic Proper.

The next expedition is scheduled for October 14th to October 20th, 2011.

Data presented in this report have been subject to preliminary quality control procedures only

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PRELIMINARY RESULTS

The cruise, part of SMHI´s ordinary monitoring programme, began in Gothenburg on September 12th and ended in same port on September18th.

The cruise started at the same time as the remainder of the tropical storm Katia arrived at the Swedish West Coast. Wind-force up to 42 m/s was recorded on the vessel. During the following days the wind varying between 16 and 25 m/s. Wave height over 6 metres was common during the first days. There was heavy rain falls during the first days. Air pressure varied between 989 hPa and 1014 hPa. Air temperature was between 12 °C and 16 °C.

At 23 visited stations full hydrography sampling was performed. CTD-sampling was made at 4 stations. Sampling were made at all stations as planned despite of the rough weather.

The Skagerrak

The sea surface temperature, at visited stations in Skagerrak, was normal or for the season, lowest measured temperature was 14.2 °C (**Å15**) and highest temperature was 16.2 °C (**P2**).

Sea surface salinities were at the normal. The lowest value measured was at **Släggö** and was found to be 22.8 psu. The highest value, 32.6 psu was found at **Å15**.

All nutrients from the surface layer, analyzed from stations just outside the Swedish coast (**P2** and **Släggö**), were normal for the season except for silicate, which was slightly enhanced at **Släggö** and at **Å13**. Offshore stations in central parts of Skagerrak (**Å13-Å17**) also showed normal values.

At the coastal area stations (**P2** and **Släggö**) phosphate concentrations near surface were 0.07 µmol/l and 0.06 µmol/l respectively. At stations in the central parts of Skagerraks lowest value was found to be 0.04 µmol/l (**Å15 and Å17**) and the highest value 0.10 µmol/l (**Å17**).

Near surface ∑ nitrite+nitrate concentrations at the coastal stations **P2 and Släggö** were below detection limit (0.10 µmol/l). At the offshore stations **Å13**, **Å15** and **Å17**, ∑ nitrite+nitrate concentrations between 0.13 µmol/l and 1.18 µmol/l was found.

Silicate levels at coastal **P2** was found to be 1.6 µmol/l and at **Släggö** silicate level were 3.2 µmol/l. Samplings analyzed from the remainder of Skagerrak stations showed silicate concentrations varying between 1.1 µmol/l (**Å15** and **Å17**) and 4.8 µmol/l (**Å13**).

Secchi depth at **Å13** and **Å15** was found to be 7 m.

The Kattegat the Sound

Sea surface temperature at visited stations in Kattegat was normal or slightly enhanced, the lowest recorded value was 15.7°C (**N14 Falkenberg**) and the highest value was 16.0°C (**Anholt E**). In the Sound (**W Landskrona**) sea surface temperature was normal for season and was found to be 14.4C.

Sea surface salinities at the Kattegat stations were above the normal. Highest value was 26.5 psu at **Fladen** and the lowest was 21.2 psu at **Anholt E**. In the Sound (**W Landskrona**) the value was 18.5 psu.

In Kattegat and in the Sound both the halocline and the thermocline were situated between 15 and 25 metres.

All analyzed nutrients taken from the surface layer in Kattegat and in the Sound indicated levels near the normal for the season.

Concentration of phosphorus in the Kattegat surface waters was 0.1 µmol/l (**Anholt E**, **Fladen** and **N14**). At **W Landskrona** phosphorus concentration in the surface water was 0.3 µmol/l.

Near surface ∑ nitrite+nitrate concentrations values were below detection limit (0.10 µmol/l) in the whole area. At **W Landskrona** the values was found to be 0.9 µmol/l

Finally, silicate levels at stations **Fladen** and **Anholt E** were 2.2 µmol/l and 1.9 µmol/l respectively. At **N14** Falkenberg silicate level was found to be 1.6 µmol/l. In the Sound at **W Landskrona** silicate levels was 7.7 µmol/l.

The oxygen values were found to be normal in the deepwater of the area. Lowest oxygen values (2.7 ml/l) was observed in the deep waters of the Sound (**W Landskrona**). The concentration is equal to an oxygen saturation of 35 %.

Secchi depth at **W Landskrona** was 7 metres.

*Mean and standard deviation for **N14 Falkenberg** is **not** based on data from SMHI.*

The Baltic Proper

At visited stations in Baltic Proper, sea surface temperature was normal for the season. Lowest recorded value was 11.1°C (**Hanöbukten**) and highest value was 15.0°C (**BY4 and BY5**).

Salinity measured in the surface water was below normal at stations **BY4**, **BY20** and at **Hanöbukten**. At all other visited stations in Baltic proper values were found to be normal.

A strong thermocline was found between 15 and 20 metres at stations in southern and north-western Baltic Proper.

In Arkona basin (**BY1** and **BY2**) the halocline was found between 30 and 40 metres, in the remainder of the Baltic proper it was found between 60 and 80 metres.

The silicate concentration was below normal in north-western and western Baltic proper. The rest of the stations in the Baltic Proper showed normal levels. The other nutrients analyzed showed normal values throughout the whole area.

Phosphorus concentration in near surface waters in Baltic Proper showed values between 0.1 µmol/l (**BY20 and BY38**) and 0.3 µmol/l (**Hanöbukten**). At the costal station **REF M1V1** the value was 0.3 µmol/l.

Near surface ∑ nitrite+nitrate concentrations values were near or below detection limit (0.10 µmol/l) in the area.

Silicate concentration at the near shore station **REFM1V1** was found to be 11.8 µmol/l. Sea surface samples analyzed for silicate concentrations from all other visited stations in the Baltic Proper showed values from 6.7 µmol/l (**BCSIII-10**) to 10.2 µmol/l (**BY38**).

Higher than normal concentrations of hydrogen sulphide were found at stations in southern Baltic Proper (**BY2**), in eastern Baltic proper at stations **BY10**, **BY15** and **BY20** and in western Baltic Proper (**BY32** and **BY38**) as well.

Oxygen values below 2 ml/l were found from 60 metres at stations west of Gotland (**BY32** och **BY38**). At all other visited stations in Baltic Proper with bottom depth greater than 70 to 90 metres. Oxygen values below 2 ml/l were found from 70 metres depth. Hydrogen sulphide was found from 100 metres at BY20 northeast of Gotland and from 125 metres and deeper in eastern Baltic Proper (**BY10**, **BY15**) and finally from 80 to 90 metres and deeper in western (**BY32**) and south-western Baltic Proper (**BY38**).

The Secchi depth never exceeded 7 metres in the area. The lowest value was found to be 6 metres at (**BY32**).

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PARTICIPANTS

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We are grateful to the crew on the Coast Guard Vessel 001 – M/V Poseidon for all their professional help during the expedition.

APPENDICES

- Track chart
- Table over stations, parameters and sampling depths
- Map showing bottom oxygen concentrations
- Profiles for selected stations

Plots

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

*Mean and standard deviation for **N14 Falkenberg** is **not** based on data from SMHI.*

"Normal" values are values within ± 1 standard deviation compared with mean values taken from the period 1995 - 2004