

## CRUISE REPORT FROM R/V ARGOS

**Survey period:** 980118-980124

**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 program and covered the Skagerrak, the Kattegat, the Sound and the Baltic Proper. Mapping in the Kattegat was also performed. The weather was in the beginning of the cruise dominated by strong northerly to north-easterly winds and by the end the winds shifted to south and decreased. The temperatures were slightly higher than normal for the season. The nutrient concentrations were lower than normal for the season for all areas.*

*Hydrogen sulphide was observed below 150 m depth in the Fårö Deep (BY20). No hydrogen sulphide was observed in the Gotland Deep (BY15), however, the oxygen concentrations were still low (< 1 ml/l) below 125 m depth.*

*No visible algae blooms were observed, except in the eastern Kattegat where a bloom is taking place.*

## **PRELIMINARY RESULTS**

The expedition, which was a part of SMHI's ordinary monitoring program, began and ended in Göteborg. The weather during the expedition was in the beginning dominated by strong northerly to north-easterly winds which occasionally reached storm forces. At the end of the cruise the wind shifted to south and decreased.

### **The Skagerrak**

The sea surface temperature was about 6.5°C in the eastern part, which is slightly higher than normal for the season. Nutrient concentrations were lower than normal for the season, and for silicate much lower than normal (< 3.0 µmol/l).

### **The Kattegat and the Sound**

The sea surface temperature varied between 5°C in the south west Kattegat and 3°C in the east. The temperature in the Sound was about 4.3°C, slightly higher in the northern part. The nutrient concentrations were lower than normal for the season both in the Kattegat and the Sound. Phosphate concentrations varied between 0.4 and 0.8 µmol/l with lowest concentrations in the south eastern part of the Kattegat and the Sound. Nitrite concentrations varied between 0.2 and 0.8 µmol/l, with lowest concentrations in the south western parts of the Kattegat. The variations in ammonium concentrations were large and at some stations the concentrations were below the detection limit. Highest concentrations were found in the northern part of the Kattegat, and lowest in the south eastern part. Lowest concentrations of nitrate were found in the south eastern part of the Kattegat (3.8 µmol/l) and the Sound (3.6 µmol/l). The variations were also here large with highest concentrations in the north (11 µmol/l). The silicate concentrations varied between 5.2 µmol/l and 12.7 µmol/l. Lowest concentrations were found in the south eastern part of the Kattegat, and highest in the northern part. In the eastern Kattegat an ongoing algae bloom was observed. High fluorescence in the surface water was measured which is an indication of that. The species composition has not yet been investigated.

### **The Baltic Sea**

The sea surface temperature varied between 4.5°C in the south to below 4°C in the north. Nutrient concentrations were lower than normal for the season, phosphate 0.3-0.4 µmol/l, nitrite 0.02-0.10 µmol/l, nitrate 2.5-3.1 µmol/l and silicate 7.5-10 µmol/l. Oxygen concentrations less than 2 ml/l were observed on depths below 70 m in the Bornholm Basin and concentrations down to 0.3 ml/l were measured. These are lower concentrations than expected for the season. No hydrogen sulphide was observed in the Gotland Deep (BY15) but in the Fårö Deep (BY20) below 150 m depth. The oxygen concentration of the bottom water was however still low with a minima at 150 m depth at BY15. Concentrations less than 2 ml/l were observed below 80 m depth.

## **PARTICIPANTS**

Name	From
Bodil Thorstensson, Chief scientist	SMHI Oceanographical lab.
Tuulikki Jaako	- " -
Nils Kajrup	- " -
Jan Szaron	- " -
Jorge Valderrama	- " -

## **APPENDICES**

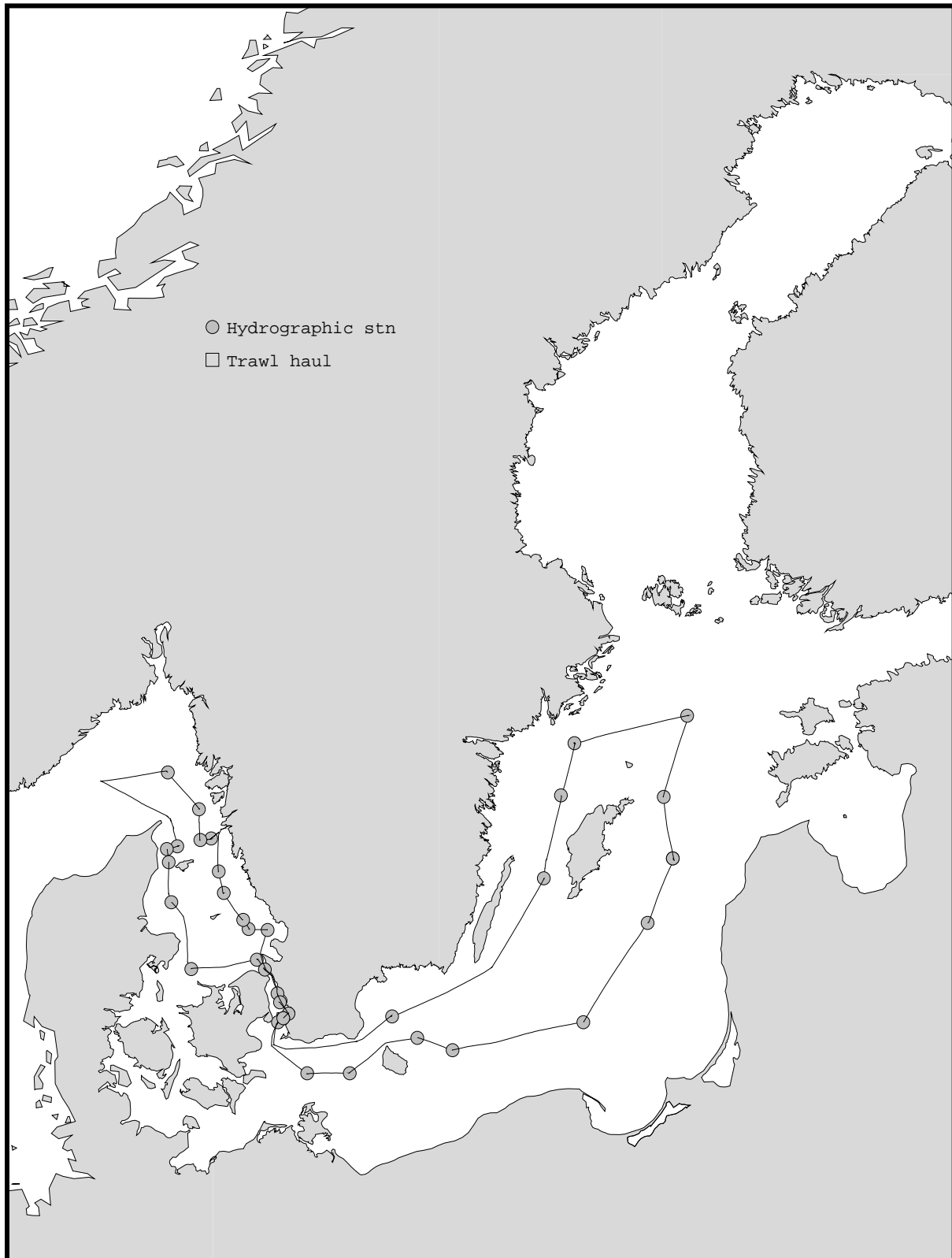
- Track chart
- Table over stations, parameters and sampling depths
- Map showing bottom oxygen concentrations
- Monthly average plots for selected stations
- Profiles for selected stations





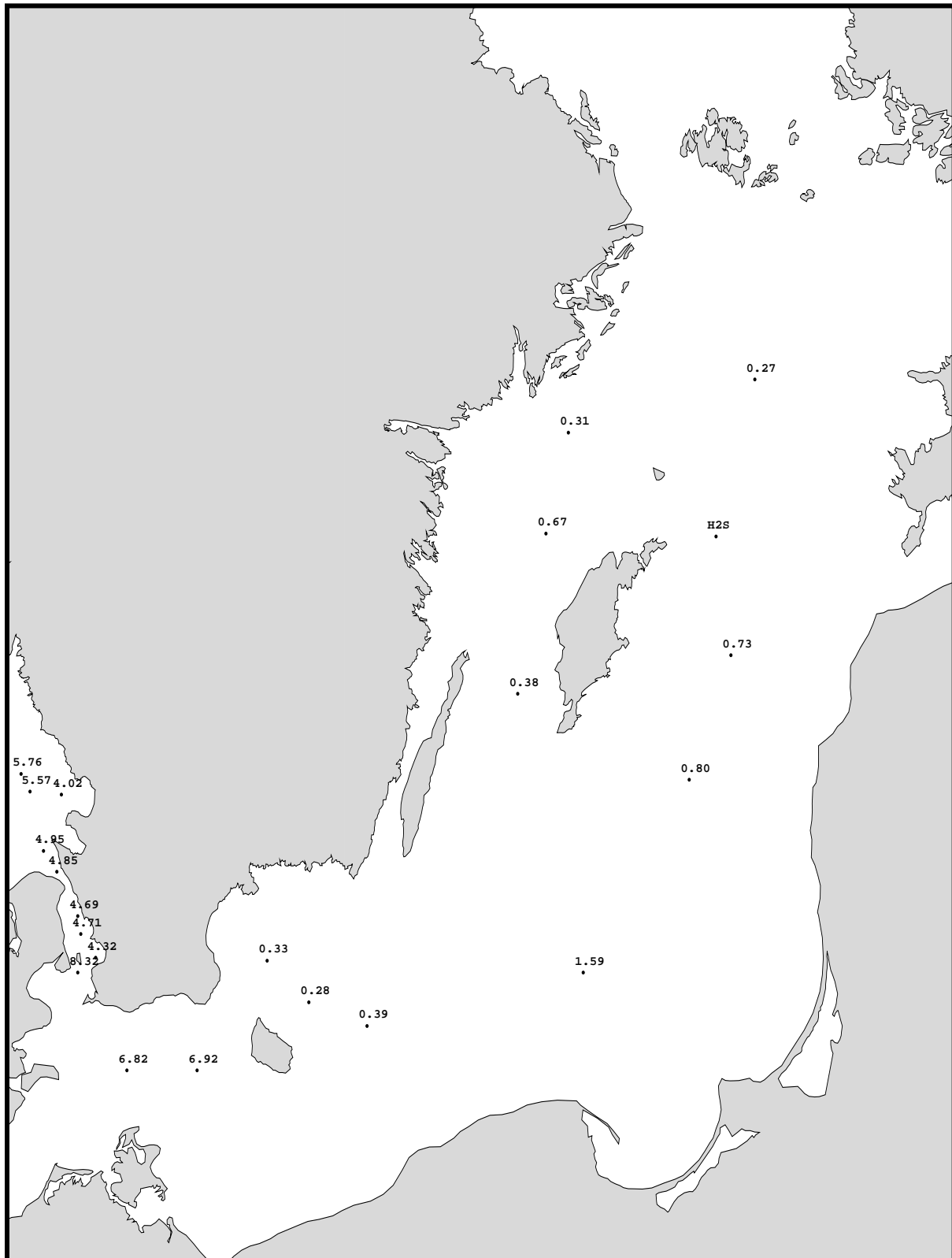
# TRACK CHART

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Ship : Argos  
Date : 980118-980124  
Series : 0001-0036



# Bottom water oxygen concentration (ml/l)

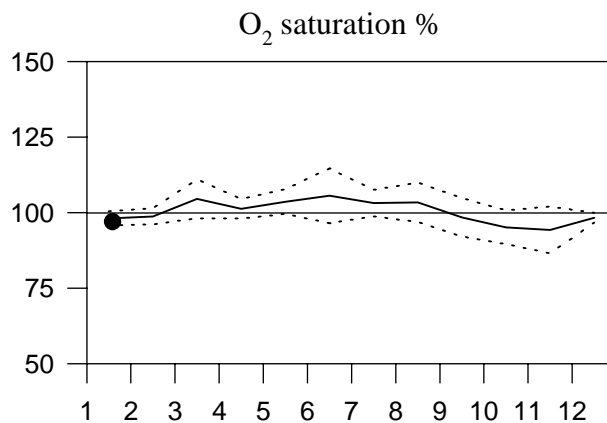
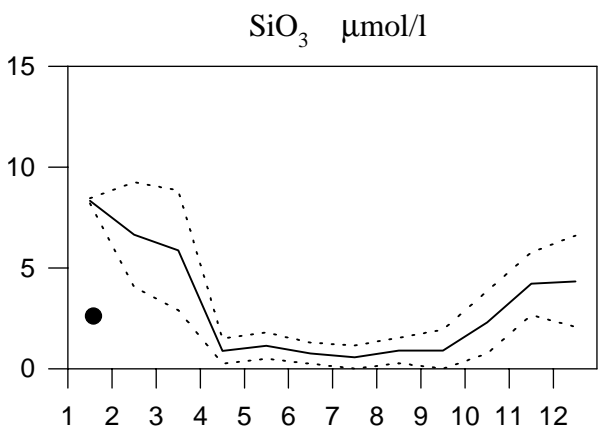
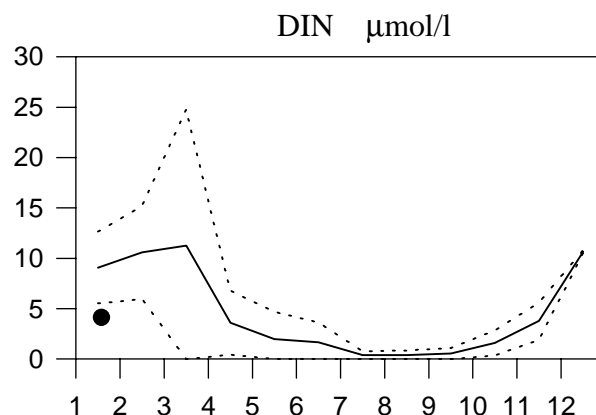
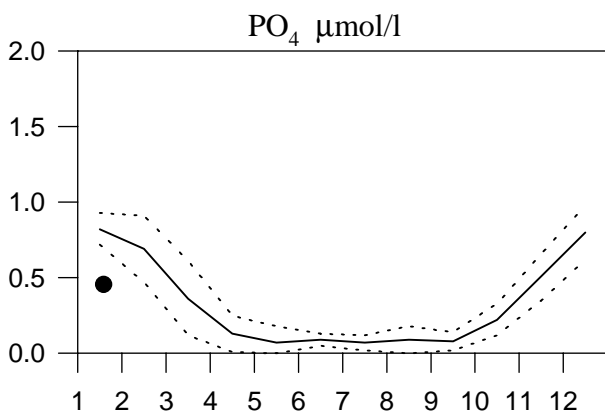
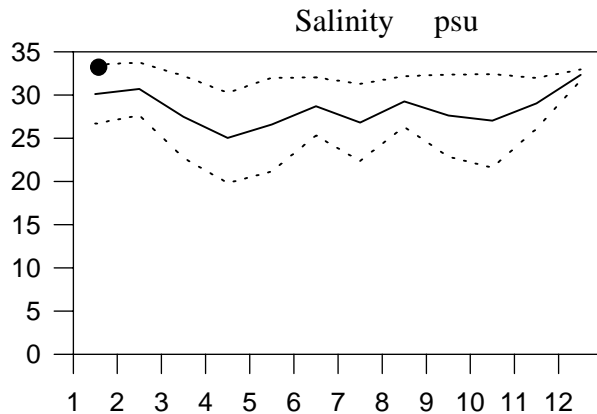
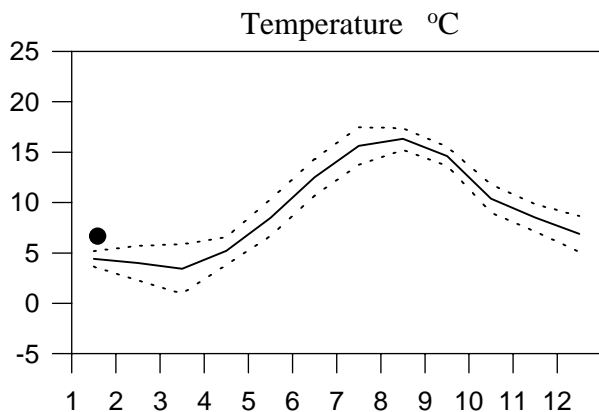
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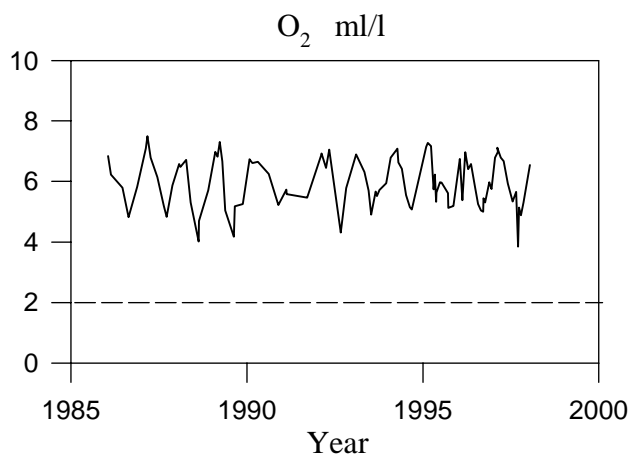
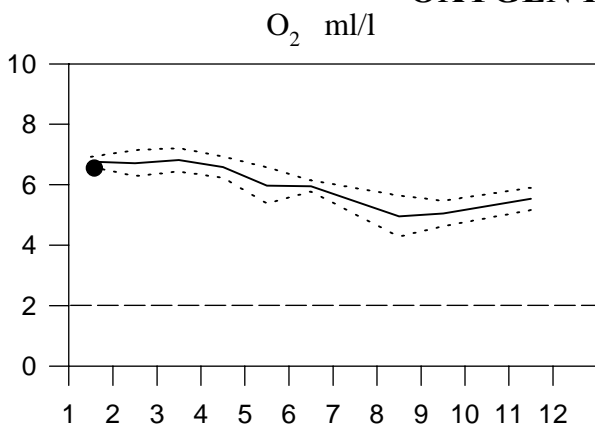
# STATION P2 SURFACE WATER (0-15 m)

## Annual Cycles

— Mean 1986-1995    - - - St.Dev.    ● 1997



## OXYGEN IN BOTTOM WATER

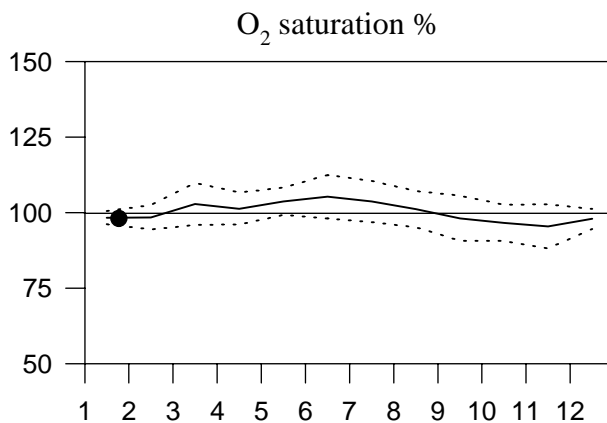
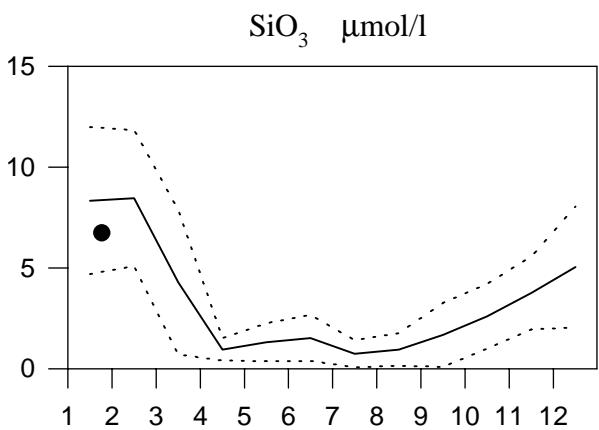
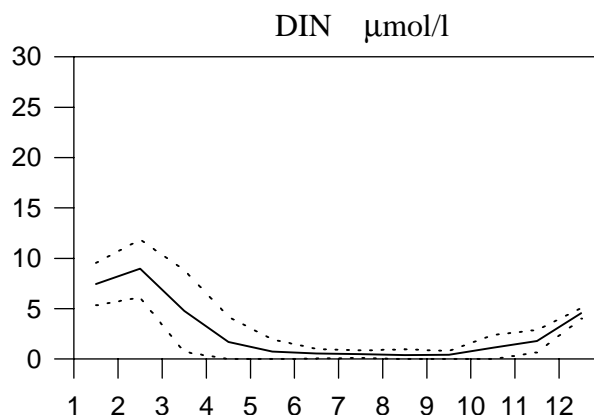
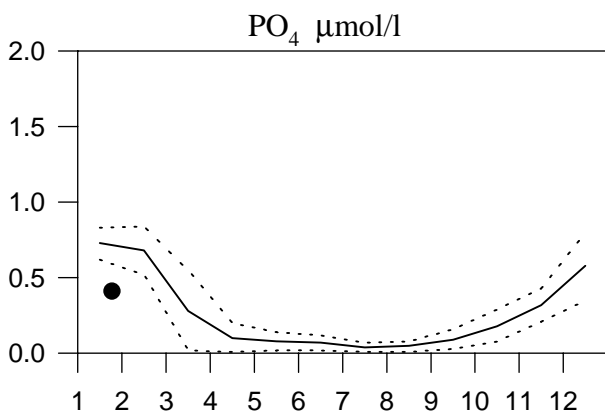
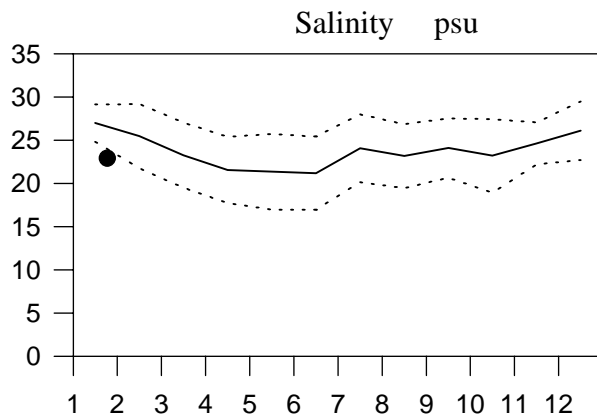
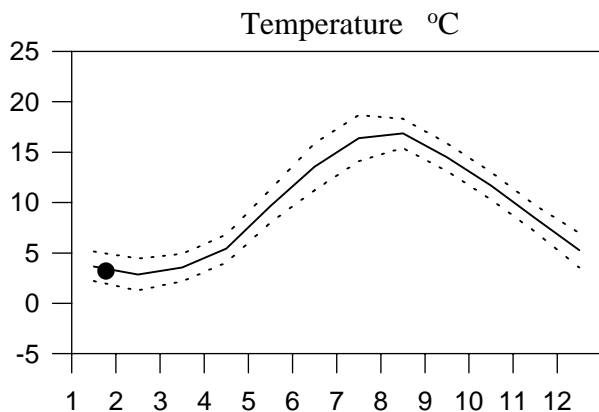




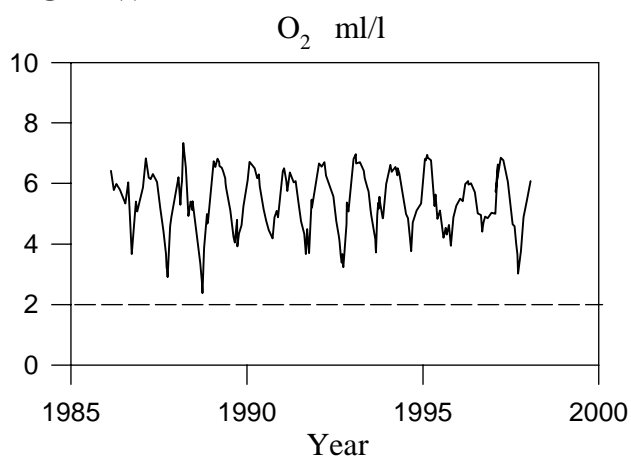
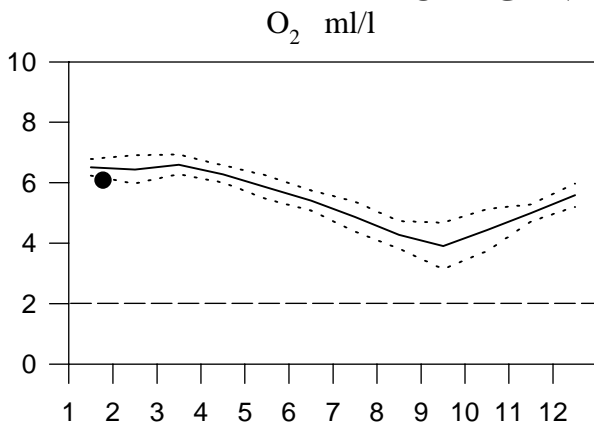
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## Annual Cycles

— Mean 1986-1995    - - - St.Dev.    ● 1997



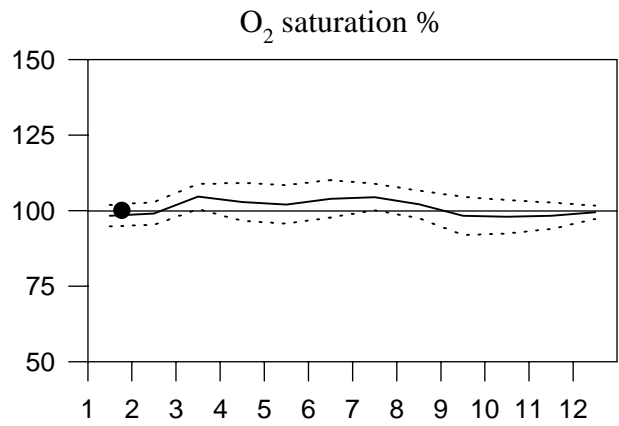
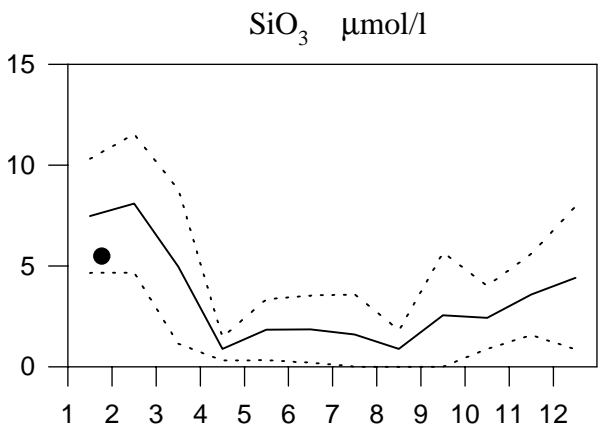
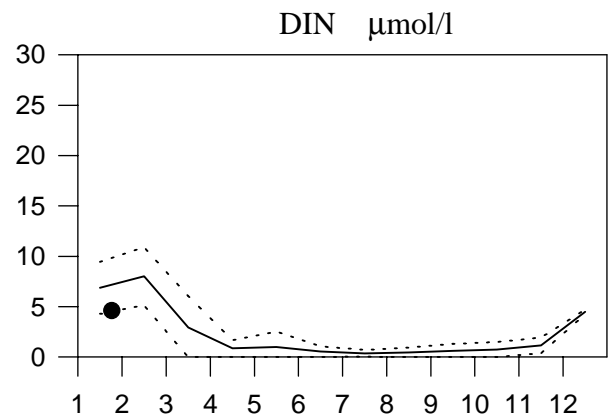
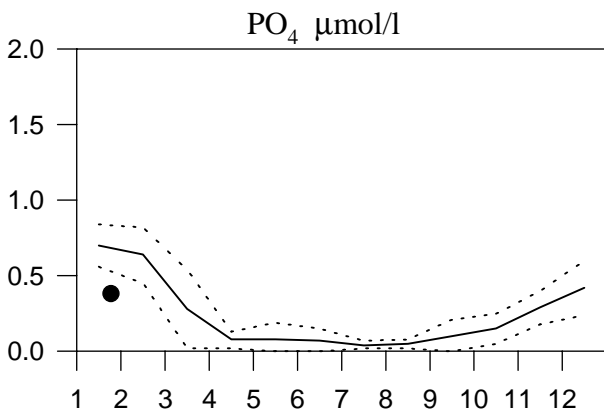
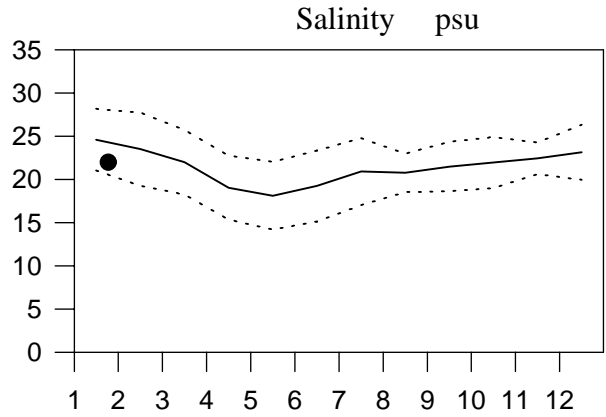
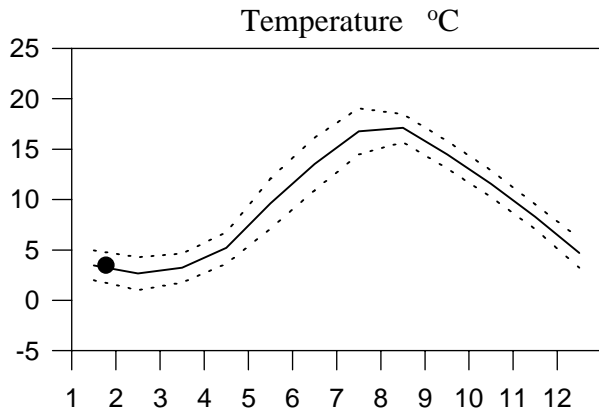
## OXYGEN IN BOTTOM WATER



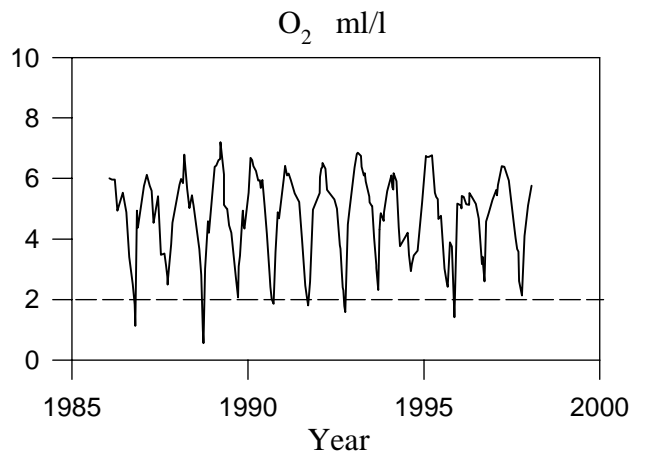
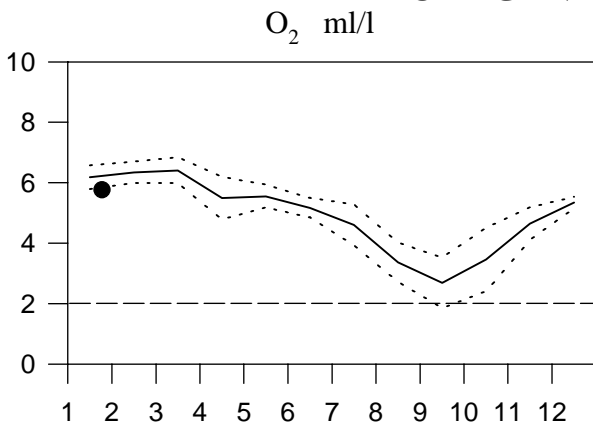
# STATION ANHOLT E SURFACE WATER (above halocline)

## Annual Cycles

— Mean 1986-1995    - - - St.Dev.    ● 1997



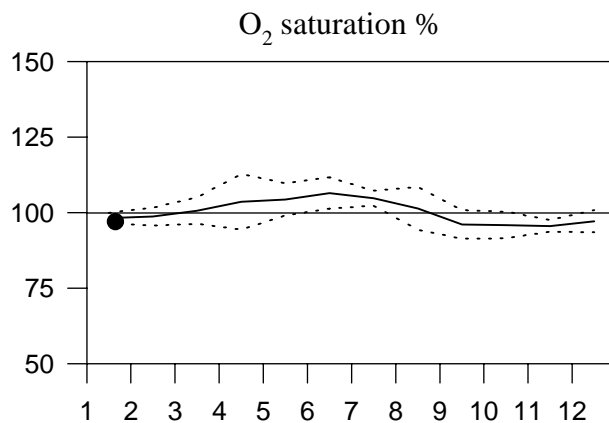
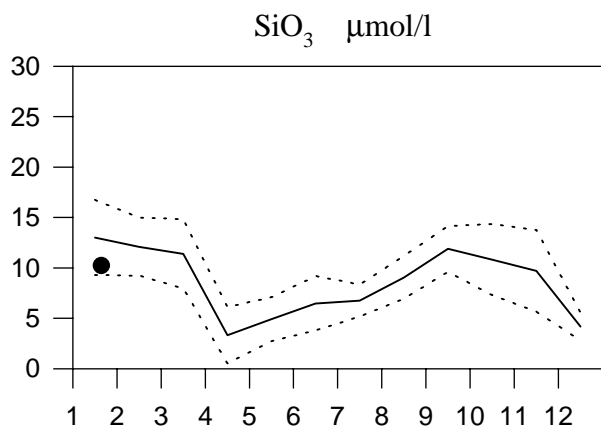
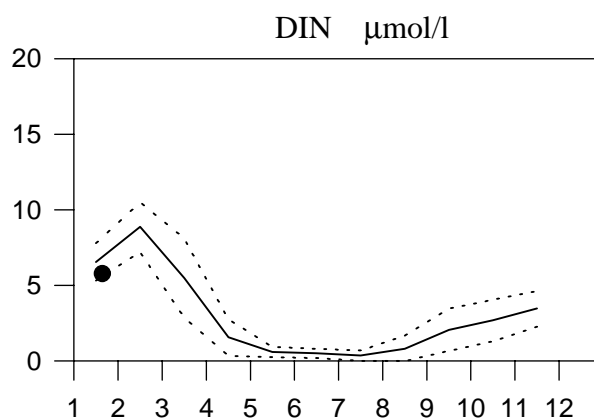
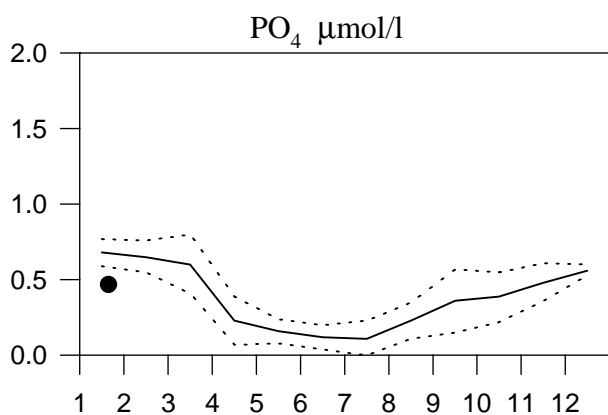
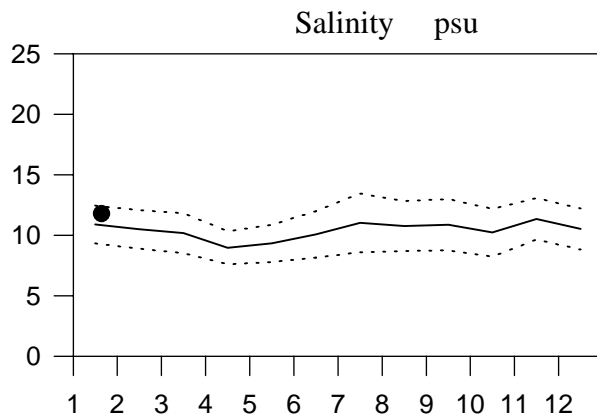
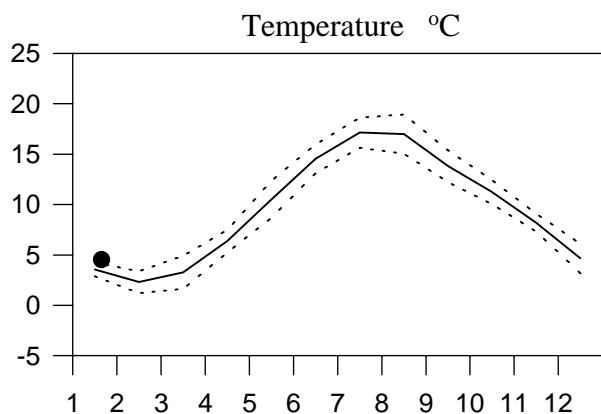
## OXYGEN IN BOTTOM WATER



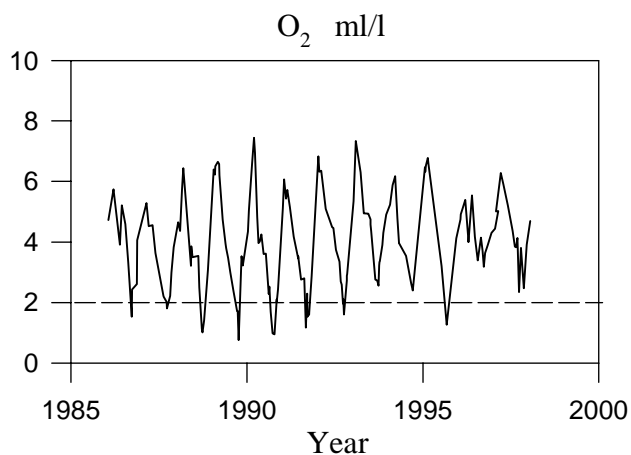
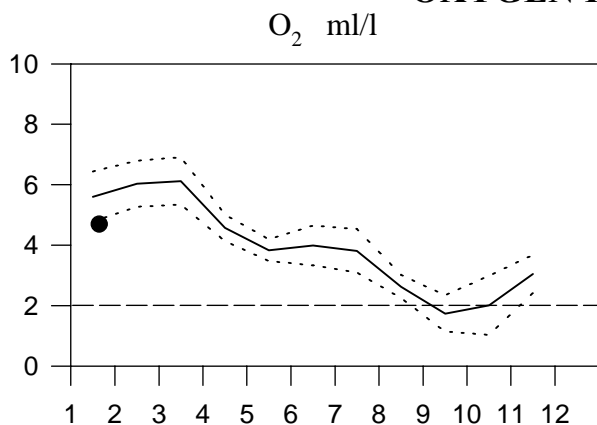
# STATION W LANDSKRONA SURFACE WATER (0-15 m)

## Annual Cycles

— Mean 1986-1995    - - - St.Dev.    ● 1997



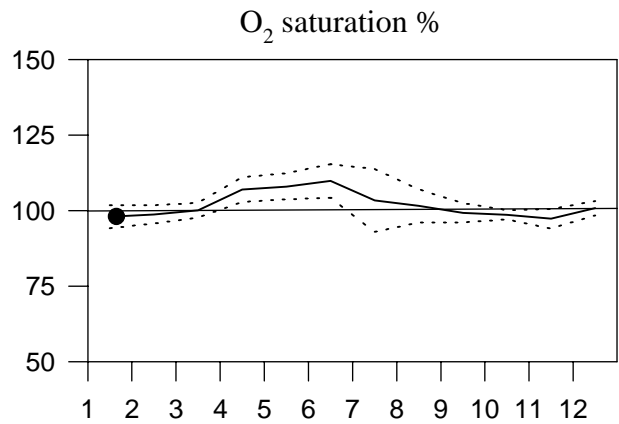
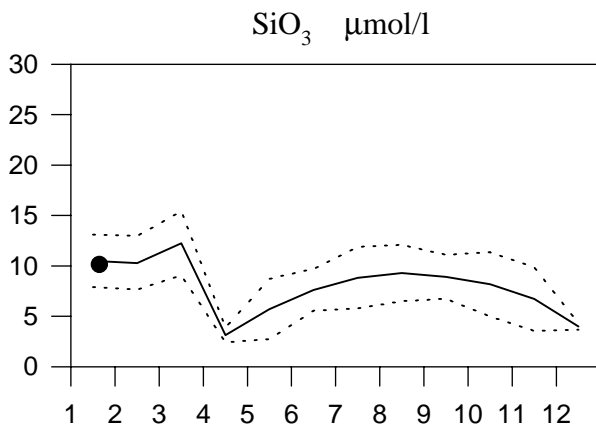
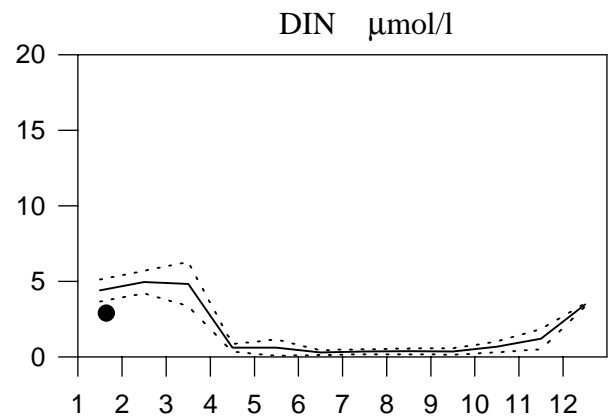
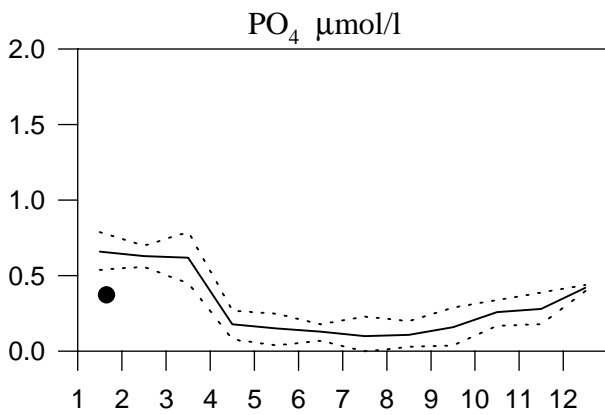
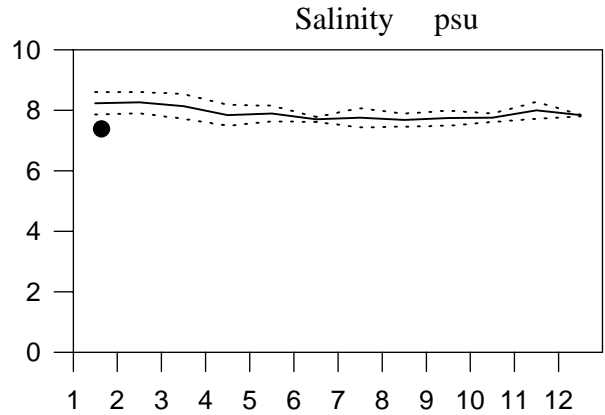
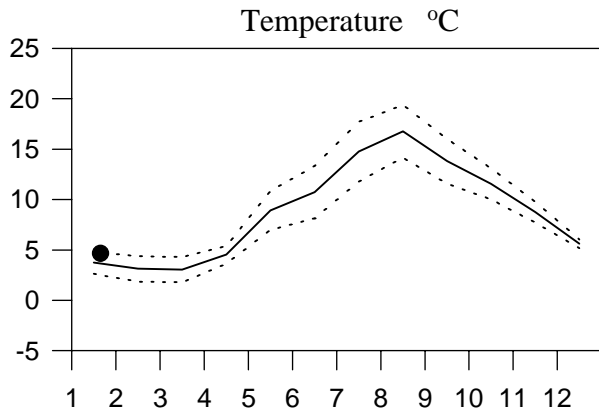
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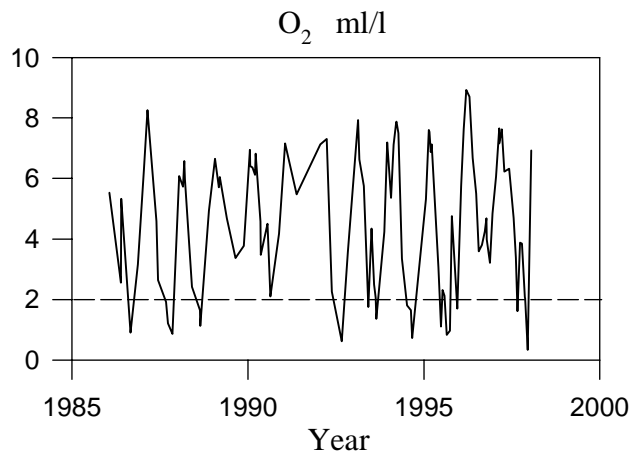
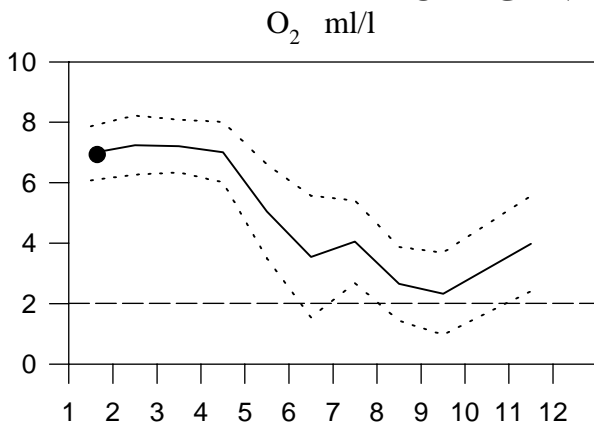
# STATION BY2 SURFACE WATER (0-15 m)

## Annual Cycles

— Mean 1986-1995    - - - St.Dev.    ● 1997



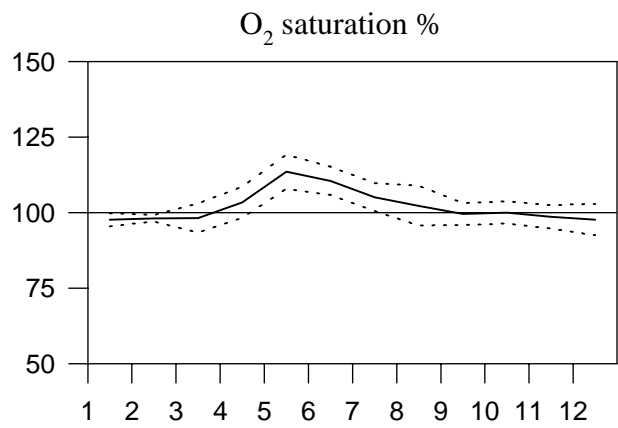
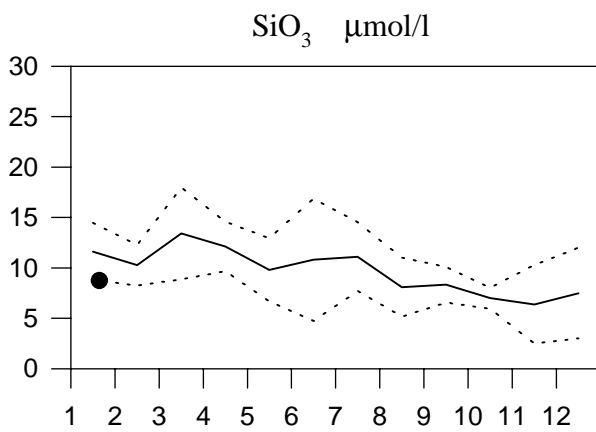
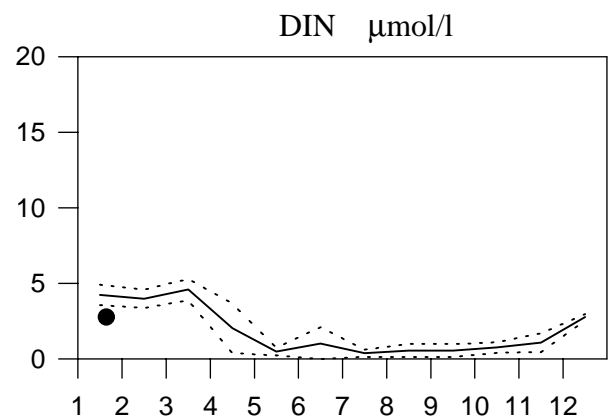
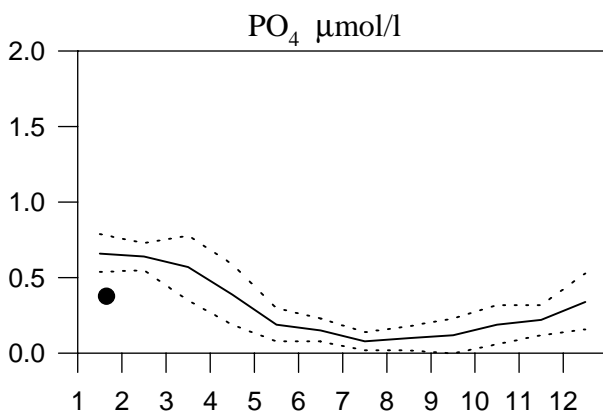
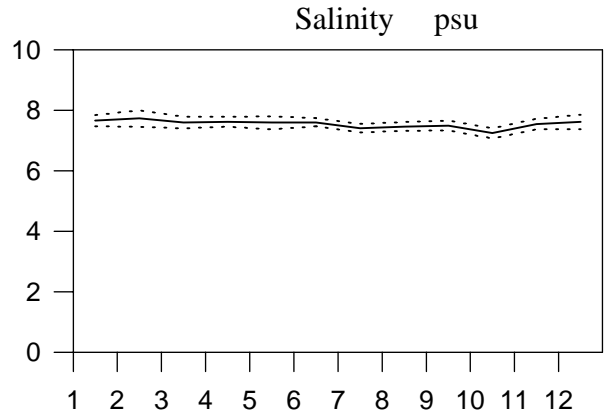
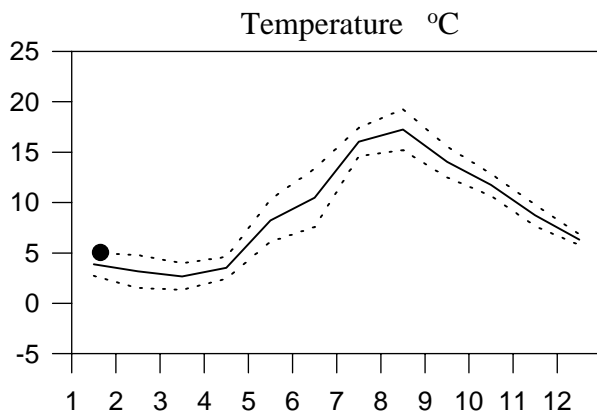
## OXYGEN IN BOTTOM WATER



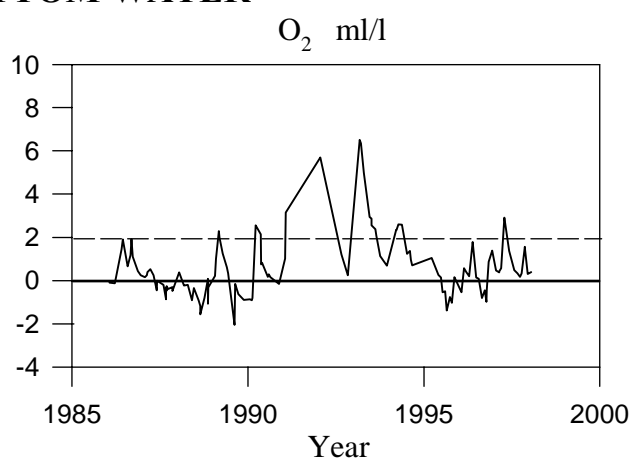
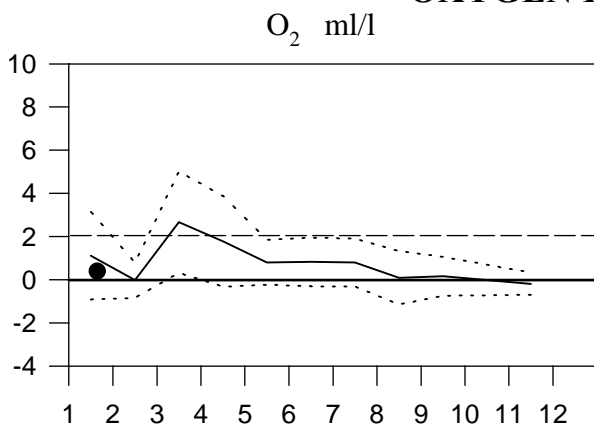
# STATION BY5 SURFACE WATER (0-15 m)

## Annual Cycles

— Mean 1986-1995    - - - St.Dev.    ● 1997



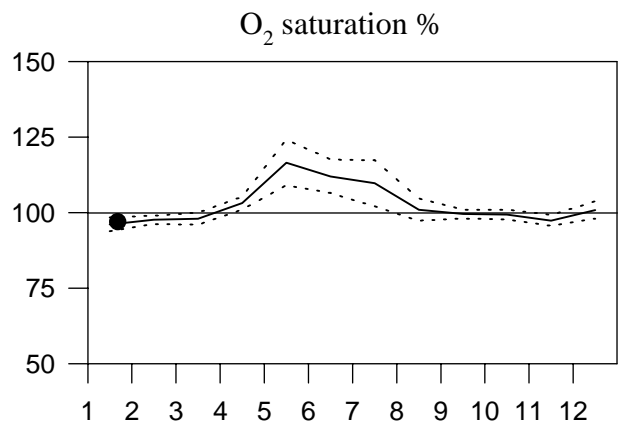
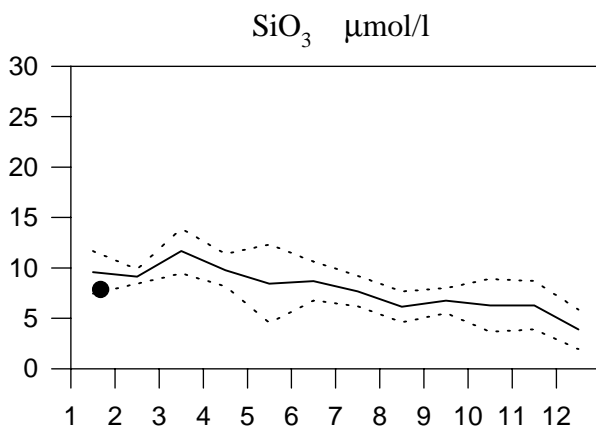
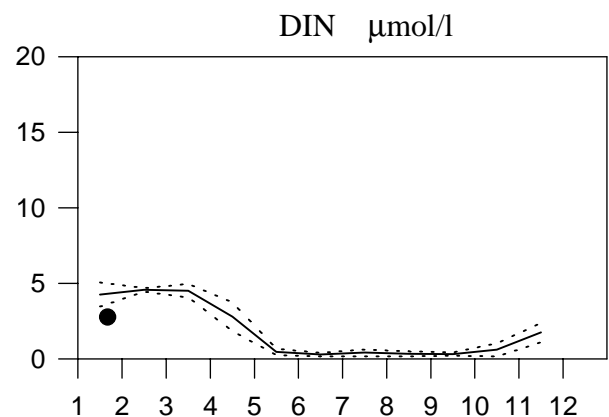
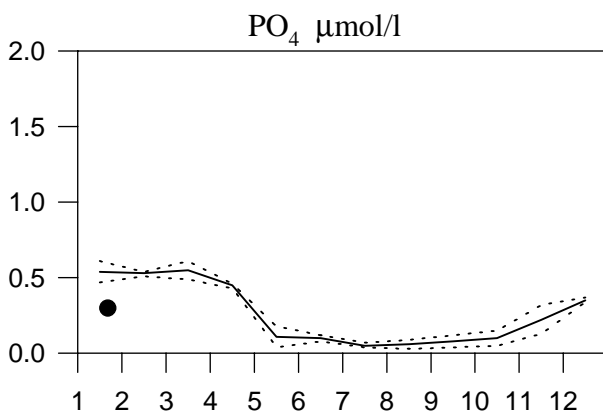
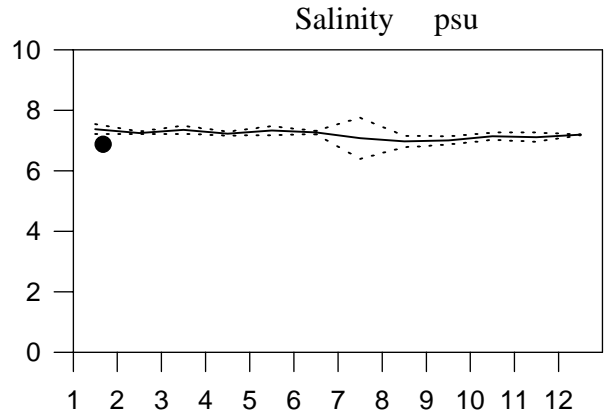
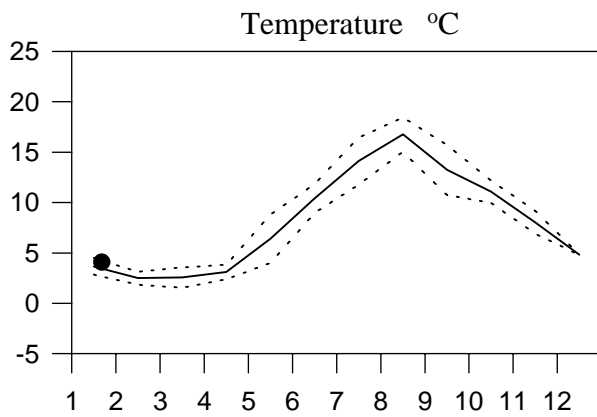
## OXYGEN IN BOTTOM WATER



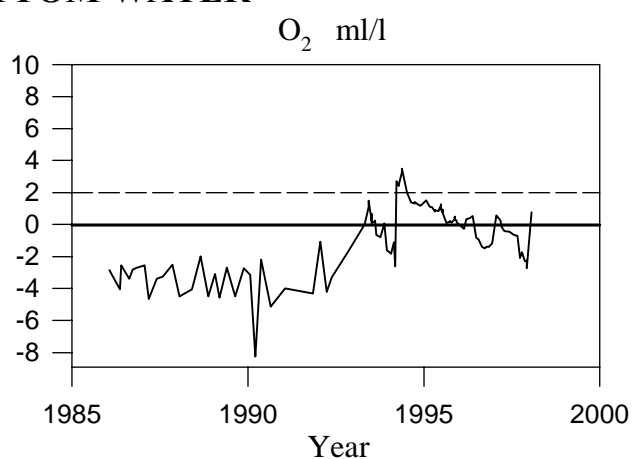
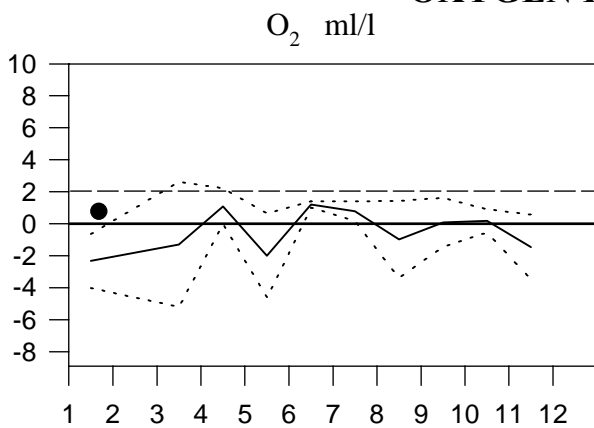
# STATION BY15 SURFACE WATER (0-15 m)

## Annual Cycles

— Mean 1986-1995    - - - St.Dev.    ● 1997



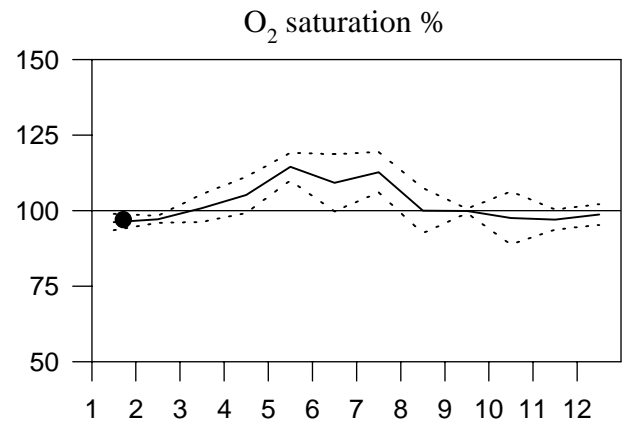
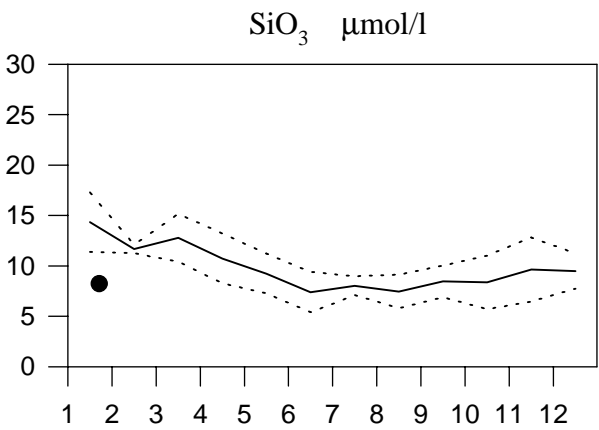
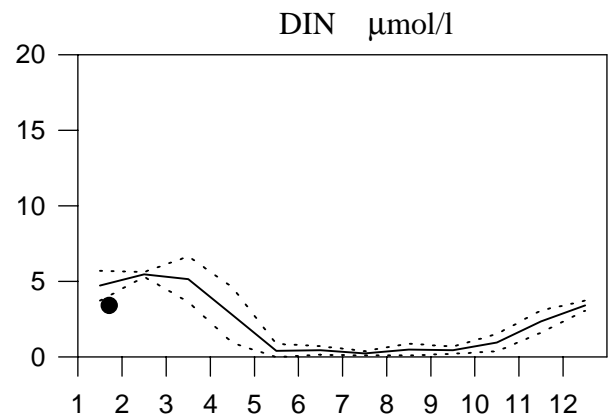
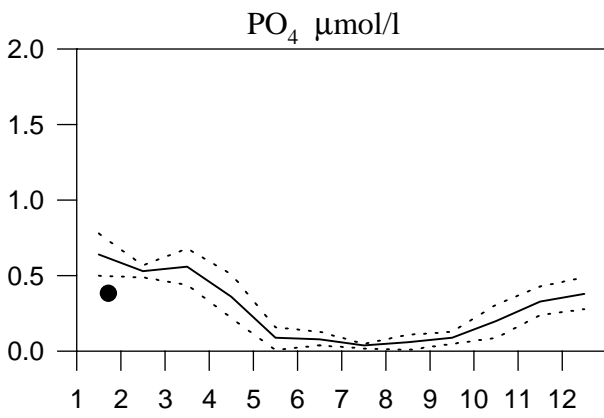
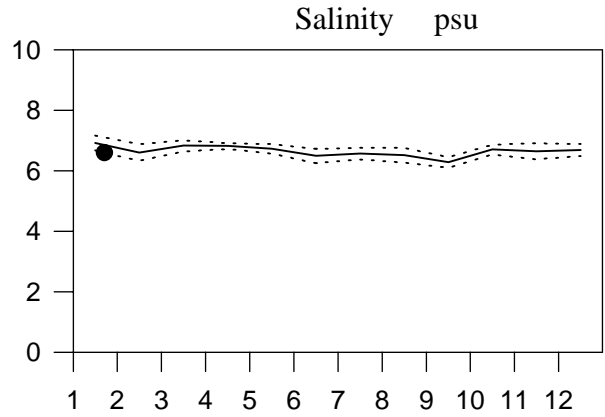
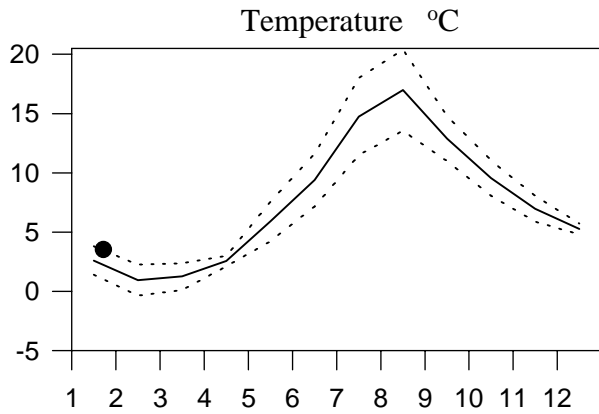
## OXYGEN IN BOTTOM WATER



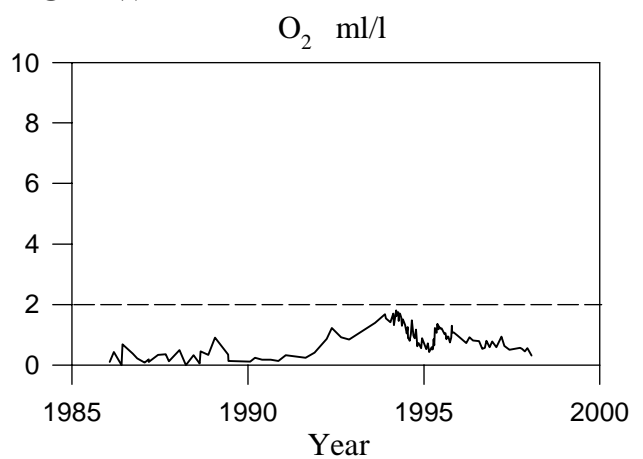
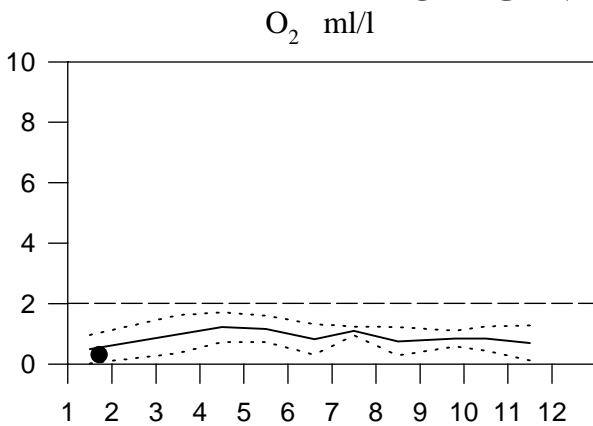
# STATION BY31 SURFACE WATER (0-15 m)

## Annual Cycles

— Mean 1986-1995    - - - St.Dev.    ● 1997



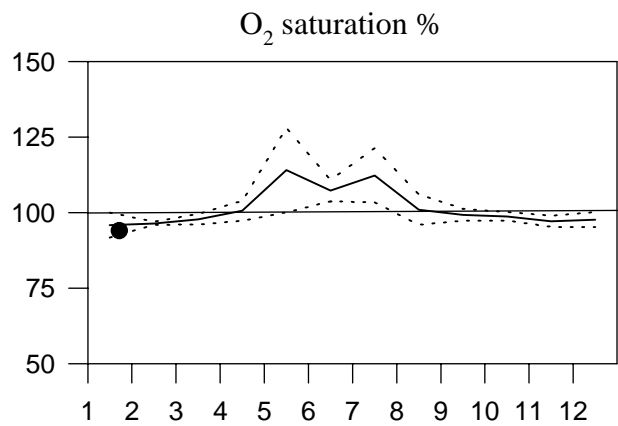
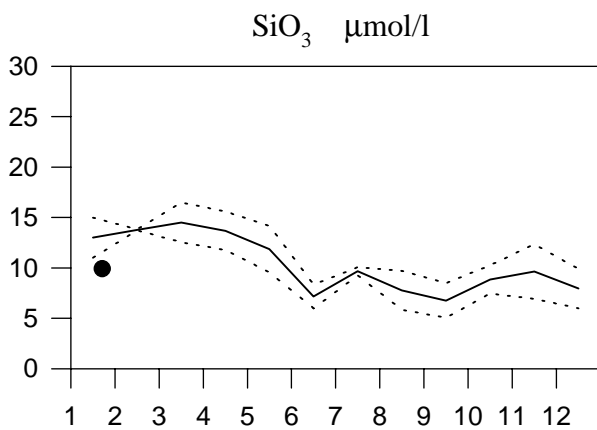
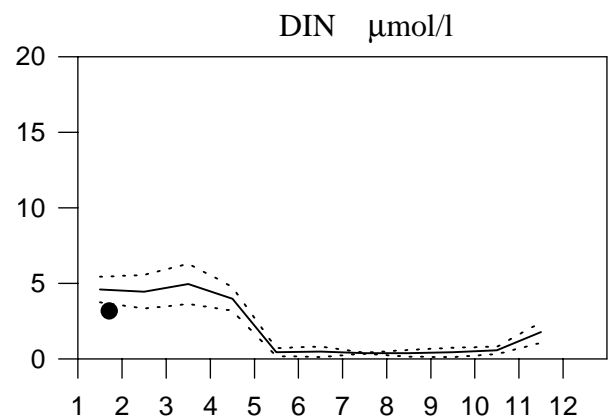
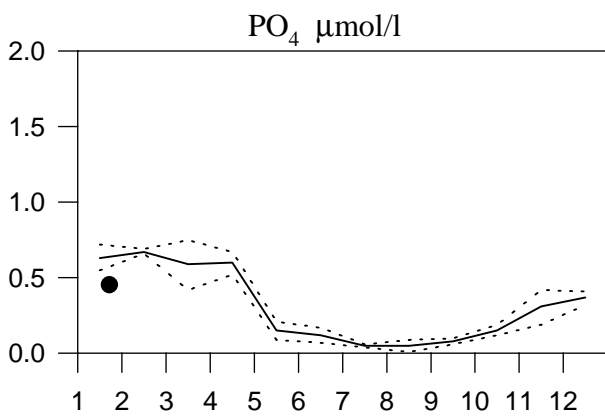
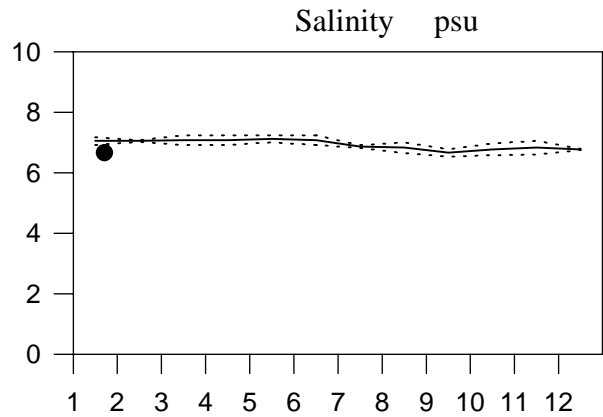
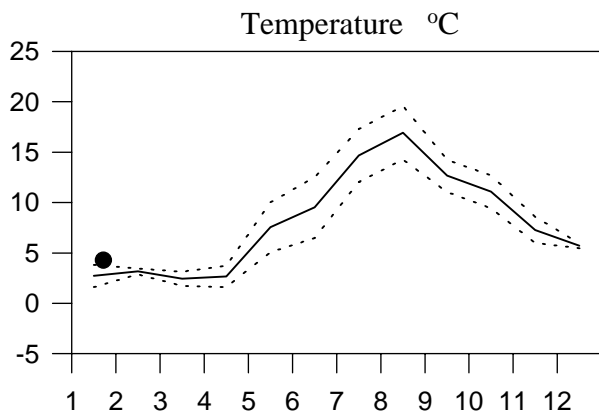
## OXYGEN IN BOTTOM WATER



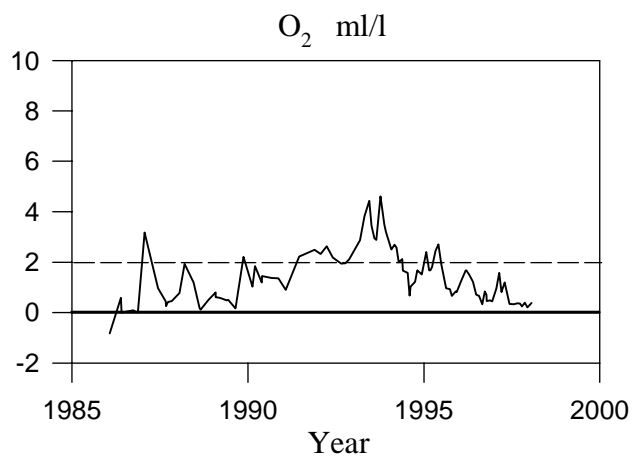
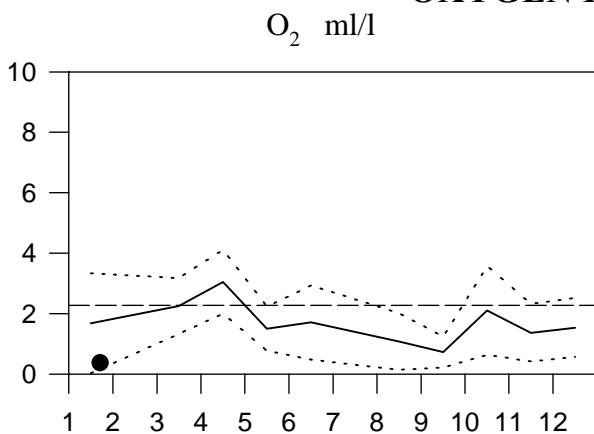
# STATION BY38 SURFACE WATER (0-15 m)

## Annual Cycles

— Mean 1986-1995    - - - St.Dev.    ● 1997



## OXYGEN IN BOTTOM WATER





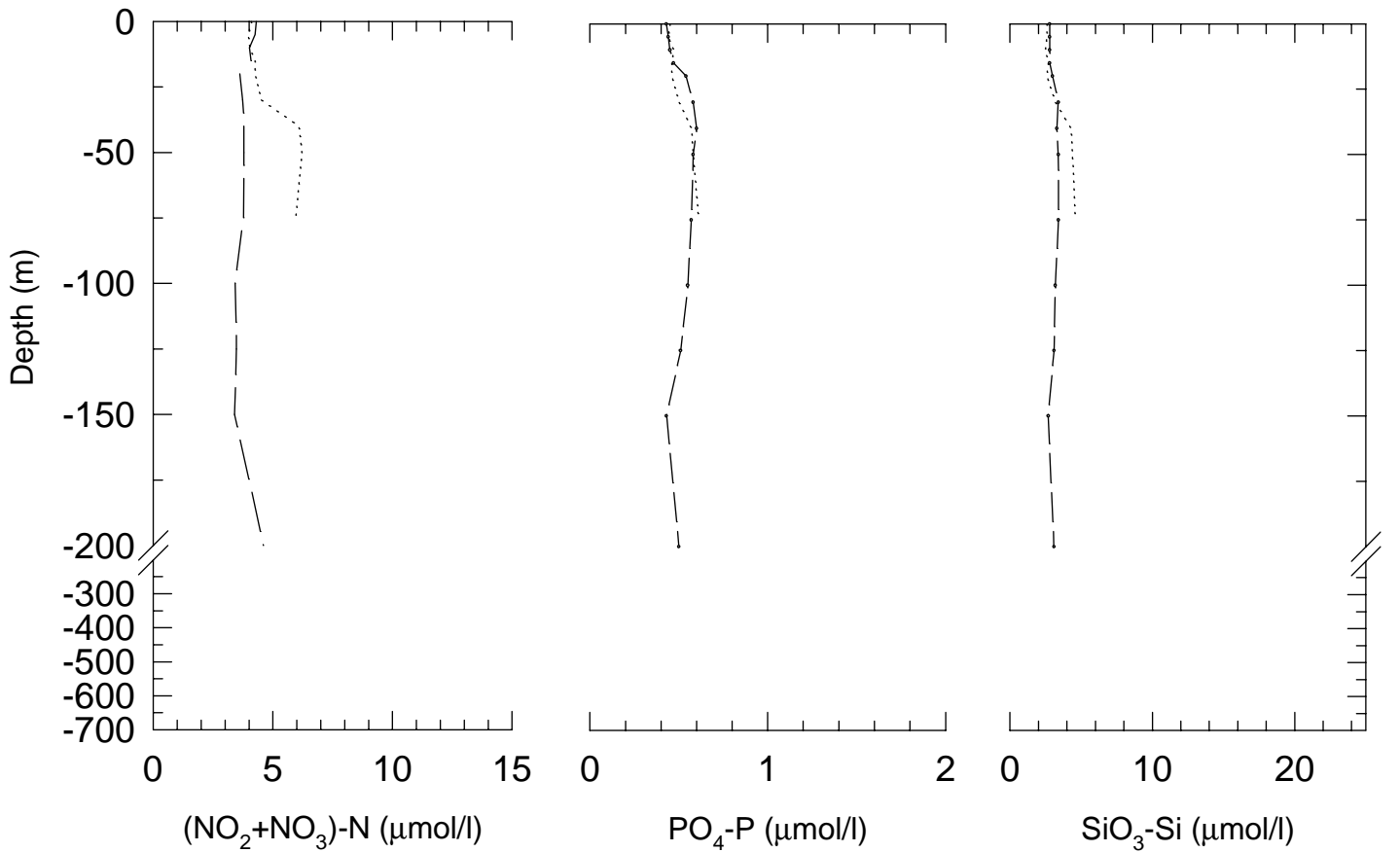
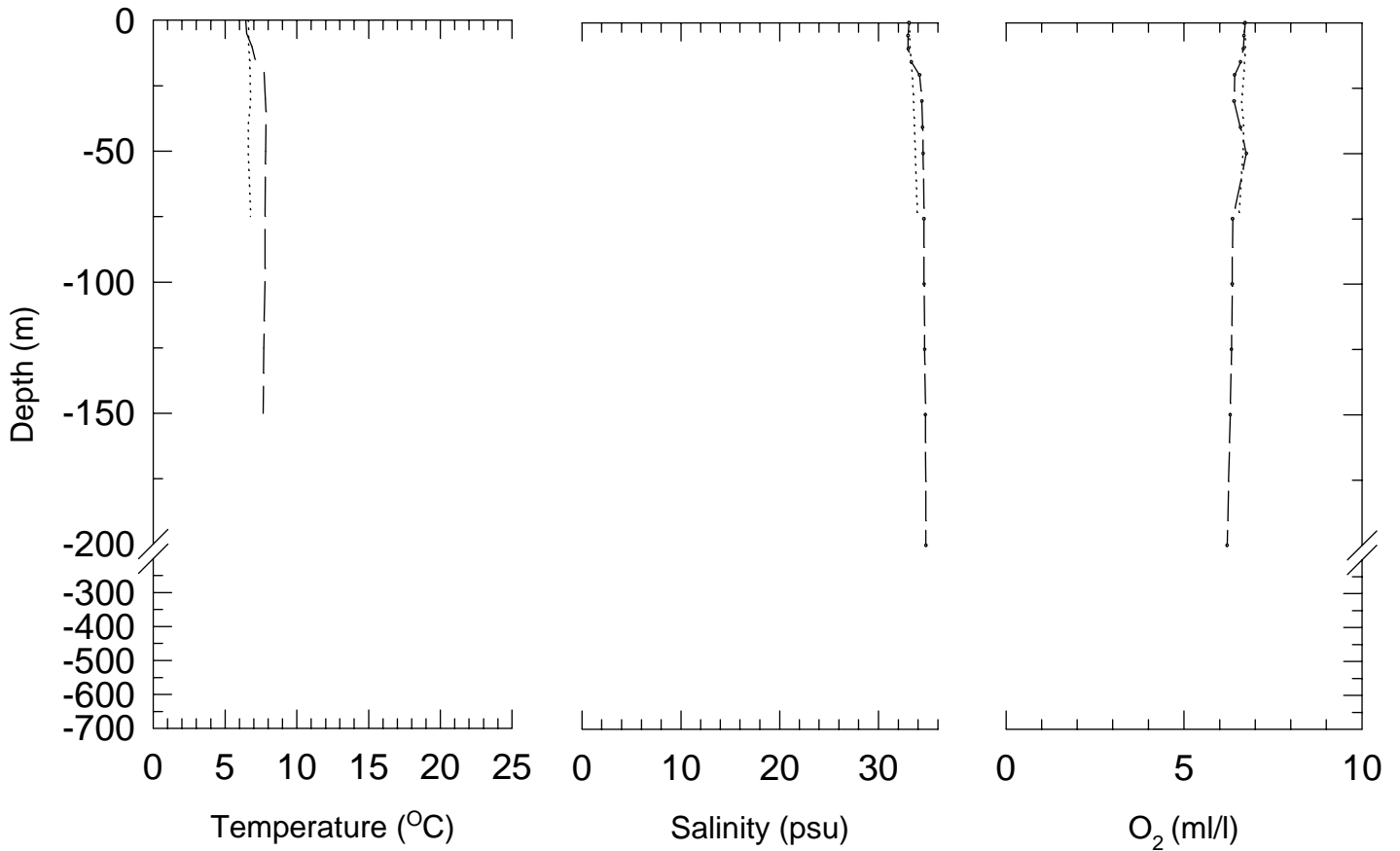
# SKAGERRAK week 4 -98

————— M6

- - - - - 16

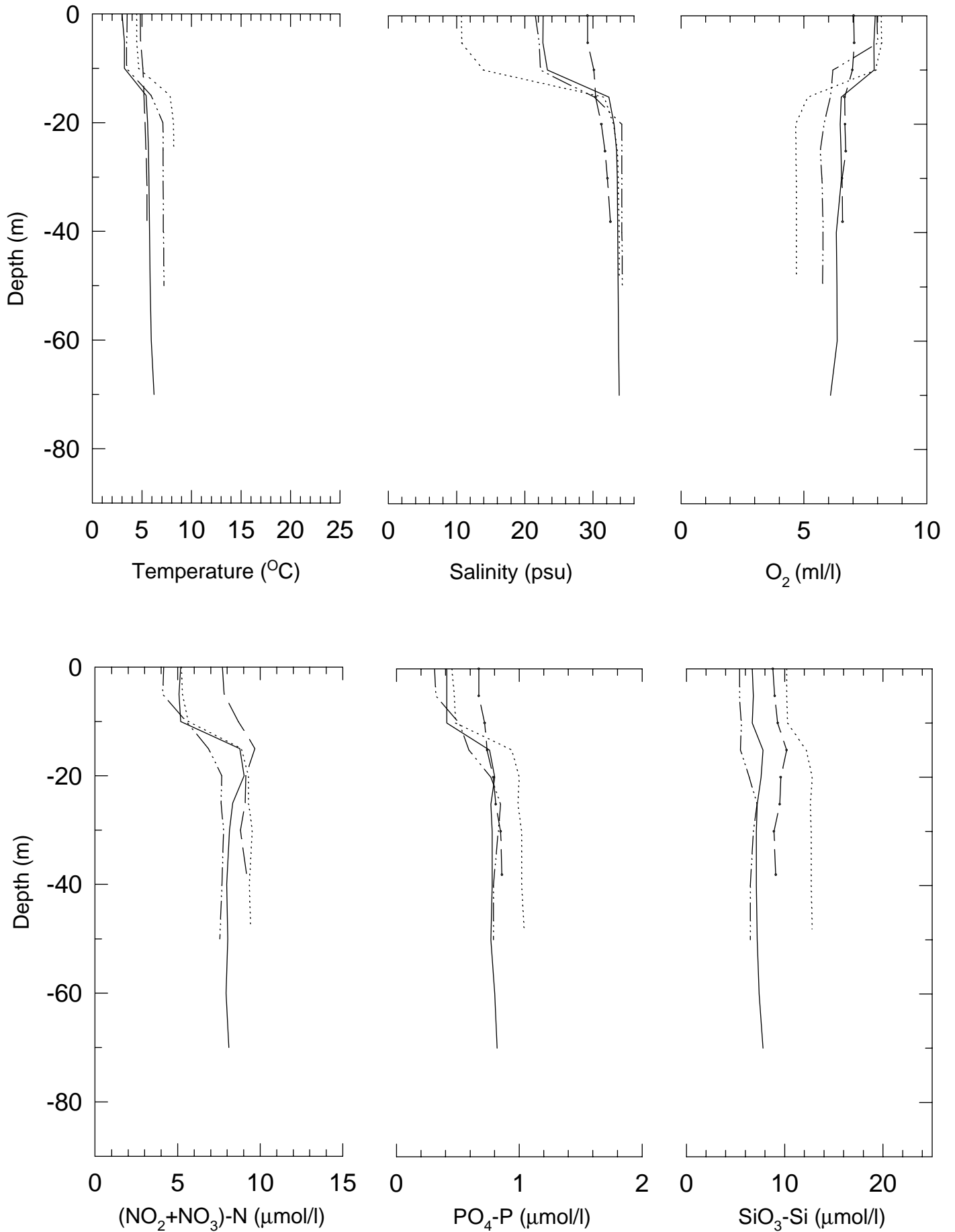
- · - · - · - HS5

····· P2



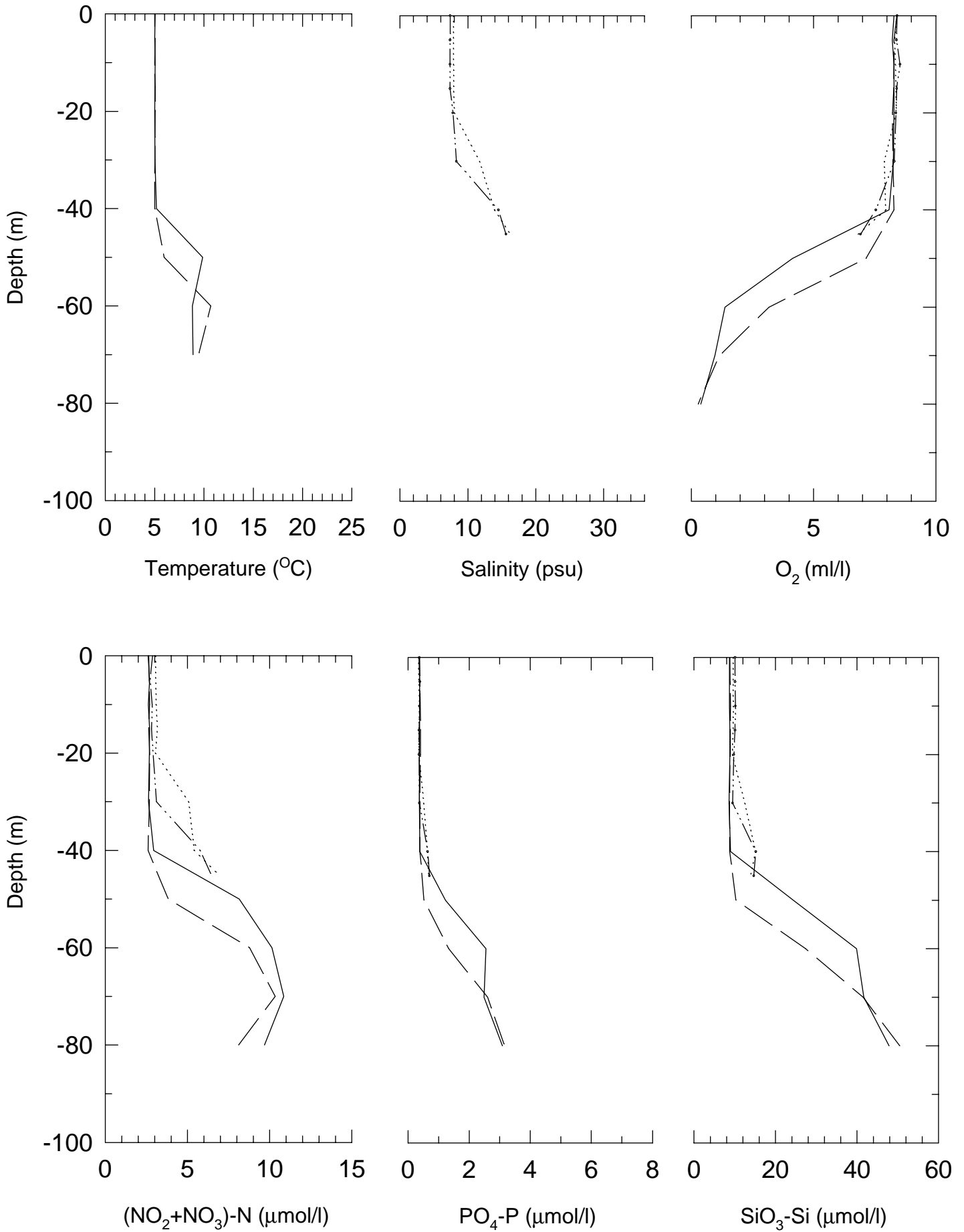
# KATTEGAT and THE SOUND week 4 -98

———— Fladen    - - - - Läsö    - · - · - Anholt E    ····· Landskrona



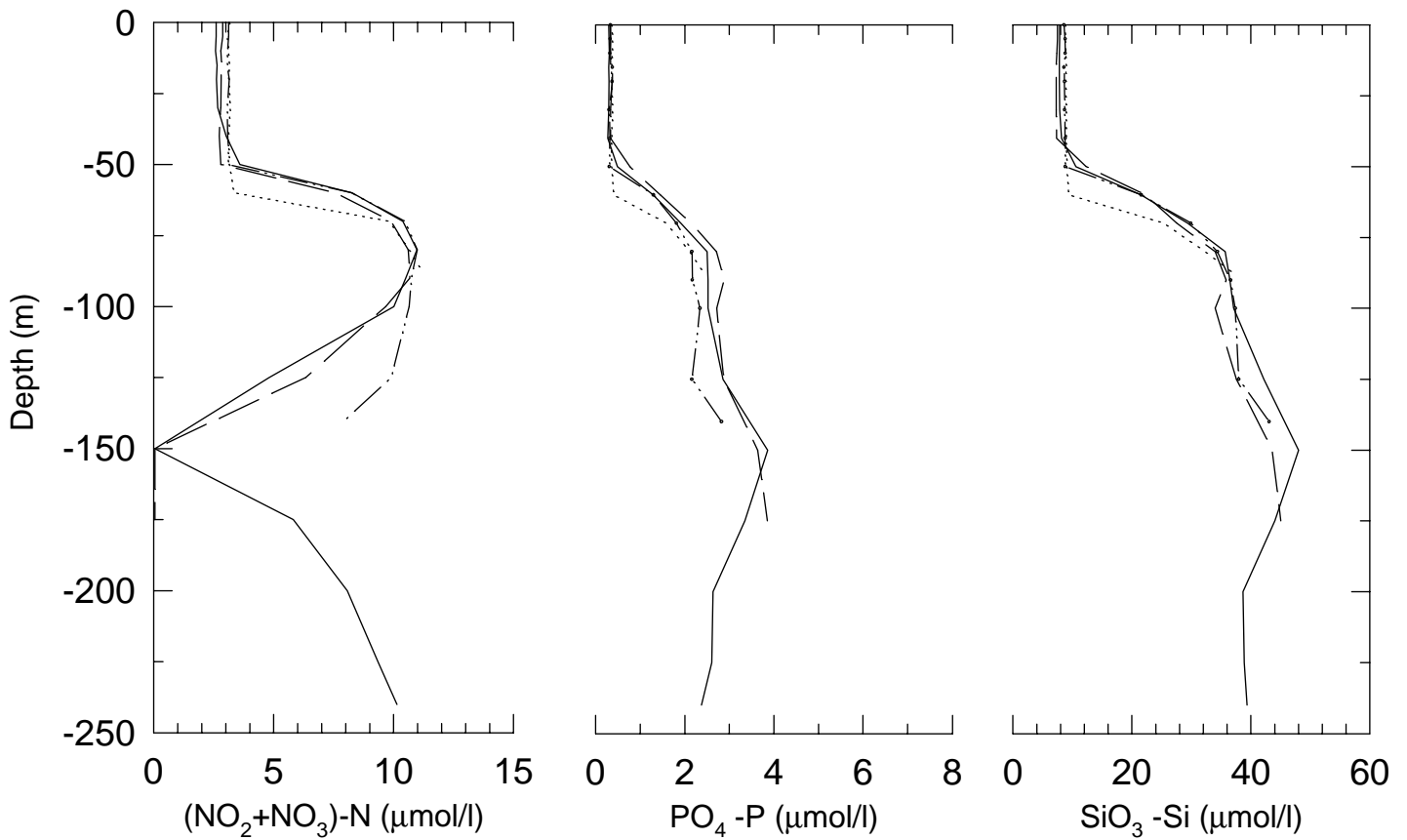
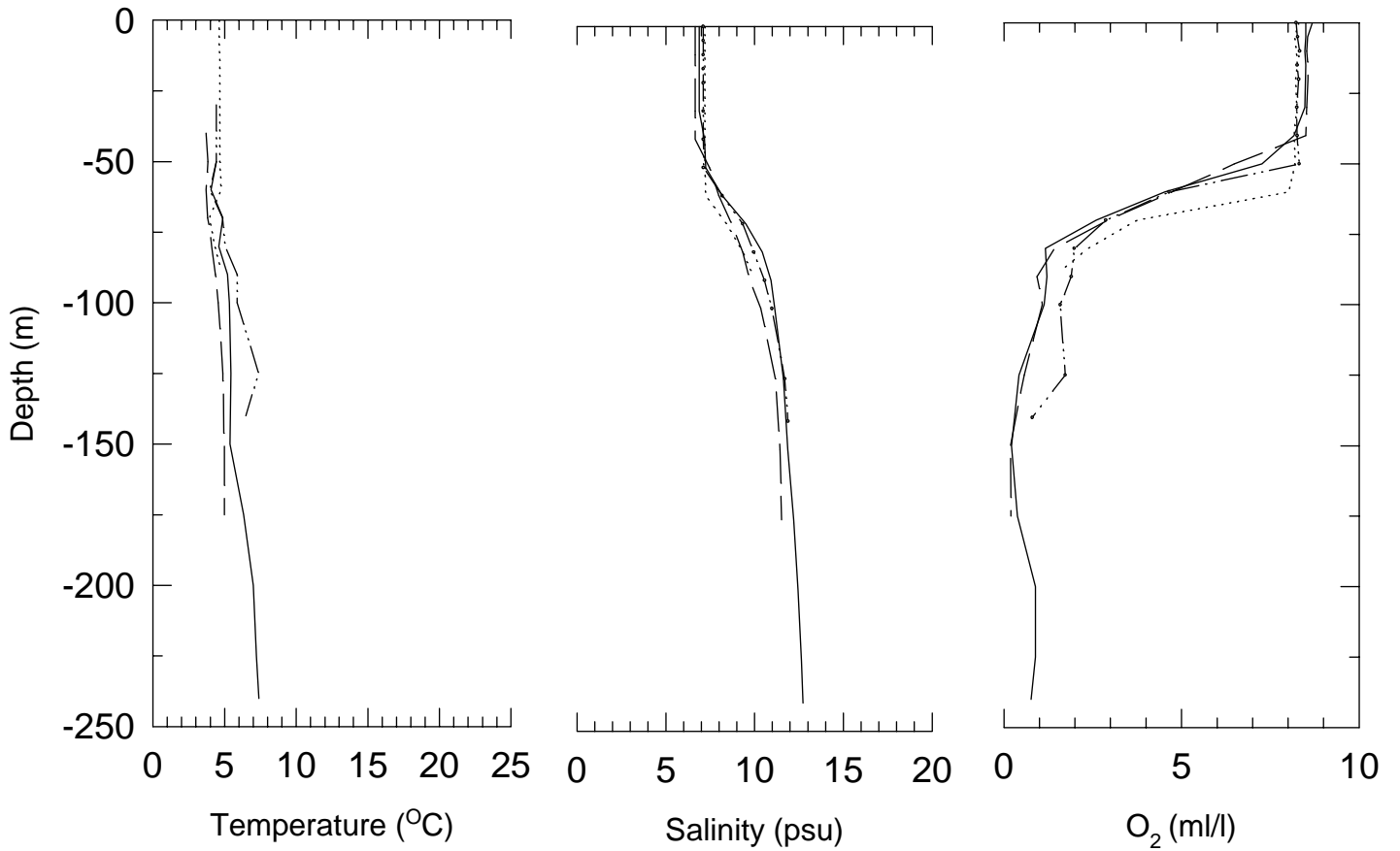
# SOUTH BALTIC week 4 -98

— BY5    - - - BY4    ····· BY2    ····· BY1



# EAST BALTIC week 4 -98

--- BY20    — BY15    -·-·- BY10    ····· BCS III-10



# WEST BALTIC week 4 -98

— BY31      - - - BY32      ····· BY38

