Lars Andersson,
Bengt Yhlen

Swedish Meteorological and Hydrological Institute
Oceanographical Laboratory

1997-03-24
Dnr: SaO-1997-69

EXPEDITIONSRAPPORT FRÅN U/F ARGOS

CRUISE REPORT FROM R/V ARGOS

Expeditionens varaktighet: 970314-970320
Survey period:

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

Uppdragsgivare: SMHI
Principal:

SUMMARY

Skagerrak: *The surface temperatures varied between 3.3 and 4.8 °C and surface salinites from 24 psu in the Baltic water to 33.5 in the remaining area. The spring bloom was almost over, except along the Jutland coast where nitrogen rich water from the North Sea was found.*

Kattegat and the Sound: *The pycnocline was located at between 6 and 15 metres depth. The extremely early springbloom was over and the nutrients concentrations had returned to normal values.*

The Baltic Proper: *The surface temperature was about 3 °C in the south and decreased to 1.5 °C in the north. In the southern part the pycnocline was located at a depth of 25 metres in the Arkona- and 45 metres in the Bornholm Basin, and in the central and northern parts between 60 to 90 metres. All nutrients, except phosphate, showed normal winter concentrations. Phosphate, on the other hand, showed very low concentrations, especially in the Arkona Basin where the spring bloom had started. Oxygen conditions in the bottom water are displayed in a figure. At Christiansö, where 6.85 ml/l oxygen was found in the bottom water at the end of February, the concentration had now decreased to 6.10 ml/l. This is still extremely high. Hydrogen sulphide was only found in the Gotland Deep below 175 meters depth.*

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

Telephone:
+46 31 696500

Telefax:
+46 31 690418
WWW:
http://www.smhi.se/oclab/

PRELIMINÄRA RESULTAT

Expeditionen, som utgick från Karlskrona och avslutades i Göteborg, ingick i SMHIs ordinarie havsövervakningsprogram. Förutom besök på basstationerna utfördes kartering i norra Östersjön för SMHIs årliga budget-beräkningar av närsalter. Dessutom utfördes provtagningar på 7 stationer längs Hallandskusten för Hallands Kustvattenkontrollprogram.
Vädret under expeditionen dominerades av svaga till måttliga vindar.

Skagerrak

Ytvattentemperaturerna i området varierade från 3.3°-4.8°C och saliniteten från 24 psu i det baltiska vattnet i sydost till 33.5 psu i övriga delar. Ett utpräglat språngskikt återfanns endast utefter svenska västkusten på djup mellan 10 och 15 meter, i övriga delar var språngskiktet svagt utbildat. Vårblomningen var i stort sett över, utom utefter norra Jyllandskusten där vatten med relativt höga kvävehalter strömmade in från Nordsjön. Detta vatten återfanns på ca. 30 meters djup invid svenska västkusten.

Kattegatt och Öresund

Språngskiktet låg i Kattegatt på ca. 6-10 meters djup medan det i Öresund låg något djupare ca. 15 meter Ytvattentemperaturen låg i hela området på drygt 3°C. Den extremt tidiga vårblomningen var över och närsalthalterna hade börjat stiga mot normala värden. Förutsättningar finns nu åter för en ny blomning. Fosfat varierade från 0.15-0.30 µmol/l, nitrit+nitrat 1.5-3.5 µmol/l och silikat 2.5-6.0 µmol/l.

Östersjön

Ytvattentemperaturen var ca. 3 grader i söder och minskade mot 1.5 grader längst i norr. Språngskiktet i de södra delarna låg på djup mellan 25 meter i Arkona och 45 meter i Bornholmsbassängen, och i de centrala och norra delarna på 60 till 90 meters djup. Salthalten i ytan varierade från 7.0 till 8.0 psu från de nordligaste delarna till Arkonabassängen. Vårblomningen hade startat i Arkonabassängen medan en typisk vintersituation rådde i övriga Östersjön. Samtliga närsalter utom fosfat, som uppvisade låga koncentrationer i Arkona, hade för årstiden normala eller något under normala koncentrationer i hela området. Fosfat varierade från 0.15-0.6 µmol/l, nitrit+nitrat från 0.3-4.7 µmol/l och silikat från 6.5-14 µmol/l. Syreförhållandena i bottenvattnet under haloklinen framgår av figur. Vid Christansö uppmättes vecka 9 hela 6.85 ml/l på 90 meters, halterna hade nu sjunkit till 6.10 ml/l, vilket fortfarande är extremt högt. Svavelväte återfanns endast på BY15, Gotlandsdjupet, från 175 meter och nedåt men halterna var låga.

DELTAGARE

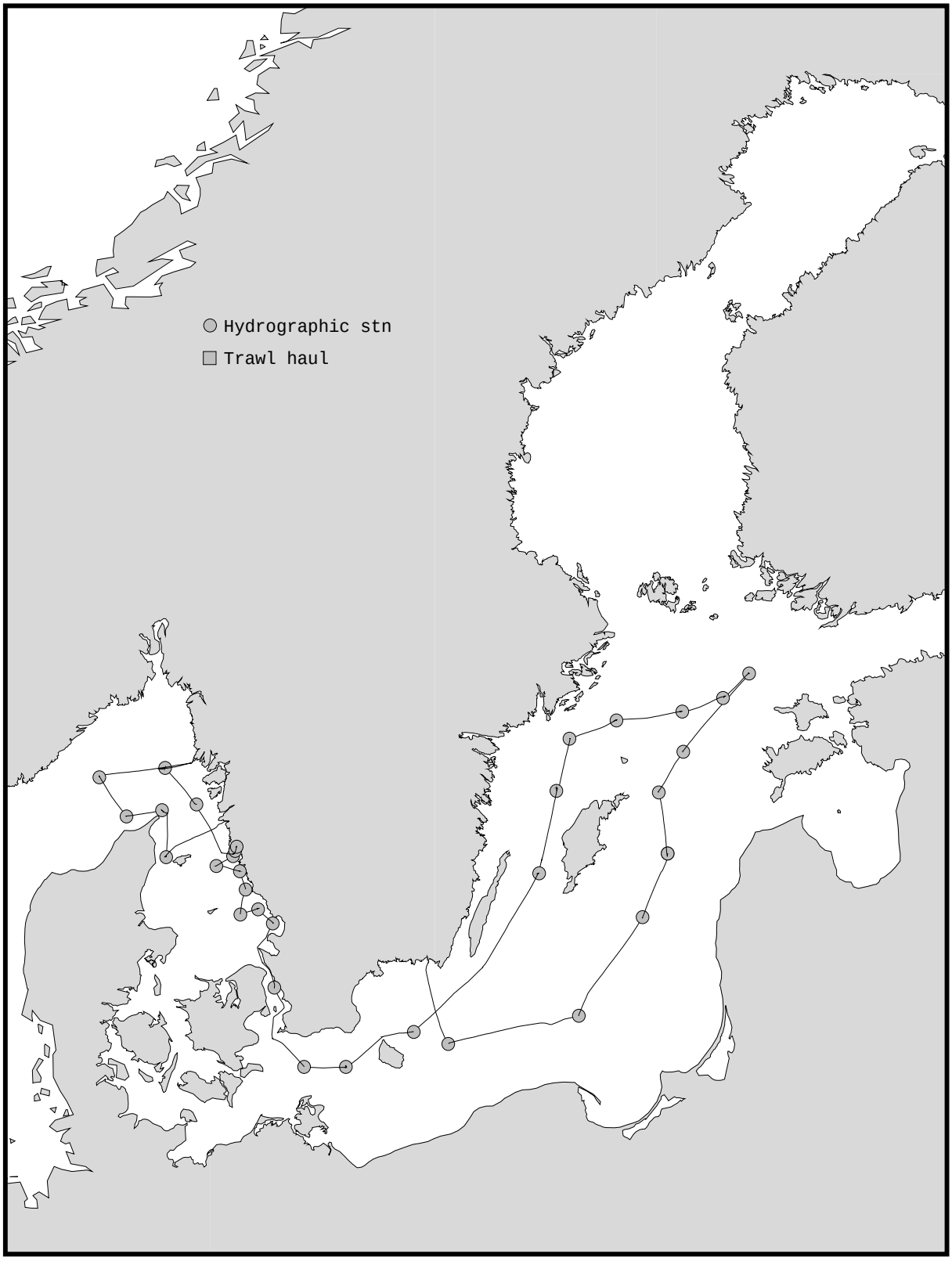
Namn		Från
Lars Andersson, expeditionsledare	v.11	SMHI Oceanografiska lab.
Bengt Yhlen, expeditionsledare	v.12	- ″ -
Nils Kajrup	v.11	- ″ -
Bodil Thorstensson		- ″ -
Eva Nyberg		- ″ -
Mikael Krysell		- ″ -
Björn Sjöberg	v.12	- ″ -

BILAGOR

- Färdkarta
- Tabell över provtagningsprogrammet + meteorologiska förhållanden
- Karta över syrehalter i bottenvattnet
- Profilplottar för vissa basstationer
- Månadsmedelvärdesplottar för vissa basstationer

T R A C K C H A R T

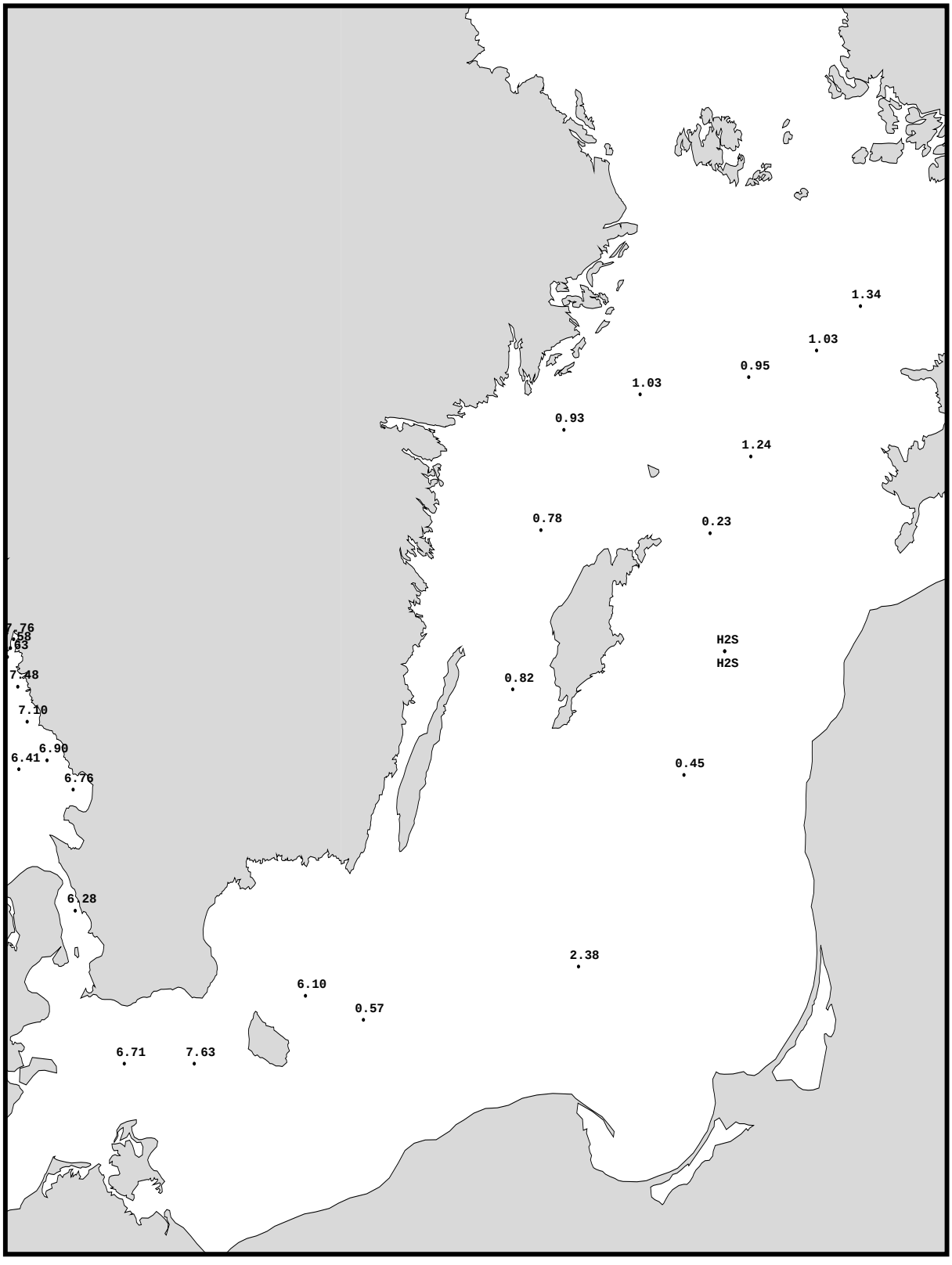
Country: Sweden
Ship: Argos
Date: 970314-970320
Series: 0235-0267



CSR RefNo: 1997-77AR/0235-0267

Bottom water oxygen concentration (ml/l)

Country: Sweden
Ship: Argos
Date: 970314-970320
Series: 0235-0267



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Ocean lab ***** series Year: 1997 ****** Time: 15:13

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0236	BPSE11BAS	BCS III-10		N5533.3	E1824	970315	0025	93			99	3	3.0	1012	9910	x	-xxx---	13	x	x	x	x	-	x	x	x	x	x	x	x	-	-	-	-	-	-
0237	BPEX13BAS	BY10		N5638	E1935	970315	0740	147		10	23	7	4.0	1010	1230	x	--x----	16	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-
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0246	BPNX37BAS	BY31	LANDSORTSDJ	N5835	E1814	970316	2210	452			36	8	-1.9	1016	9930	x	-xxx---	24	x	x	x	x	-	x	x	x	x	x	x	x	x	-	-	-	-	-	x
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SMHI ***** Hydrographic Ship: 14-Argos ****** Date: 1997-03-24
Ocean lab ***** series Year: 1997 ****** Time: 15:13

Ser no	Stat code	P r o j	Station-----------------	Lat-----	Lon-----	Date yymmdd	Time hhmm utc	Bott deph m	Mld m	Secc deph m	Wind di	Wind ve	Air temp C	Air pres hPa	WCSI elec aoae tu hd	C t d	PPCPZZT Hrhhoor Cilyooa motPBw PrP l	No de	T e m p	S a l i n	P h	O x y g	H 2 S	P o 4 P	T o t P	N o 2 N	N o 3 N	N h 4 N	T o t N	A l k a l	S i O 3	H u m u s	L i g n i	P O N	P O C	T O C	C o m m
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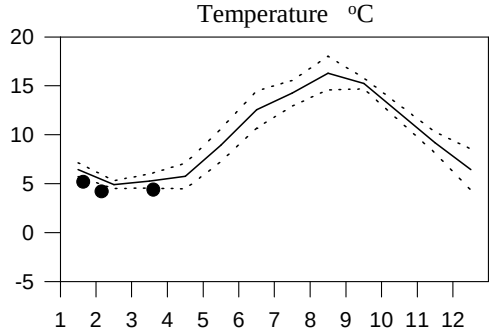
0267	KANX09BAS		LÄSÖ RÄNNA	N5717.6	E1044.5	970320	0330	43			99	3	2.9	1014	9920	x	--x----	8	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	-

STATION HS5 SURFACE WATER (0-15 m)

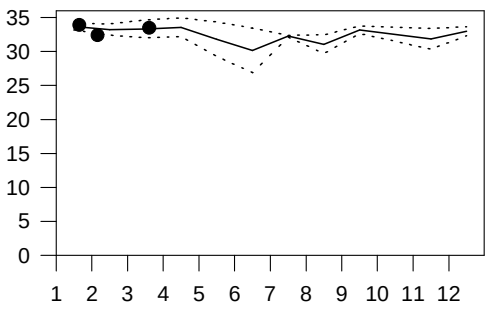
Annual Cycles

Mean 1986-1995 St.Dev. 1997

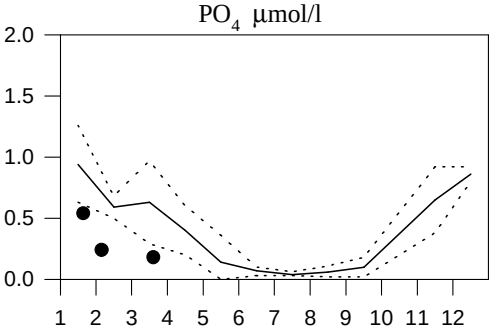
Temperature °C



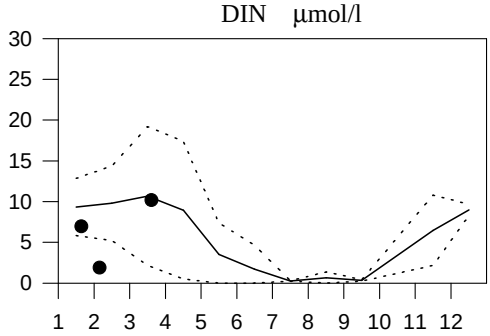
Salinity psu



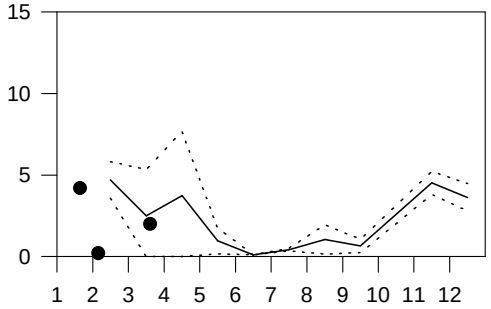
PO_4 µmol/l



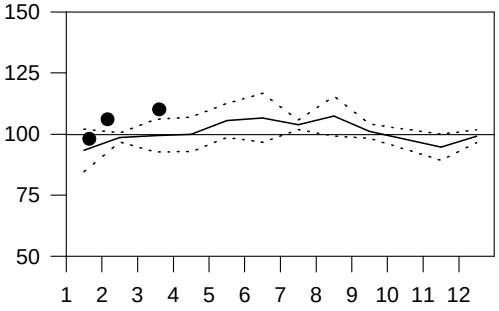
DIN µmol/l



SiO_3 µmol/l

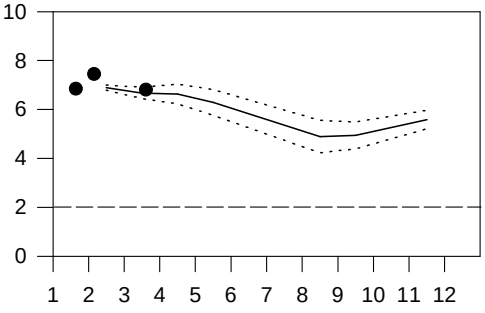


O_2 saturation %



OXYGEN IN BOTTOM WATER

O_2 ml/l



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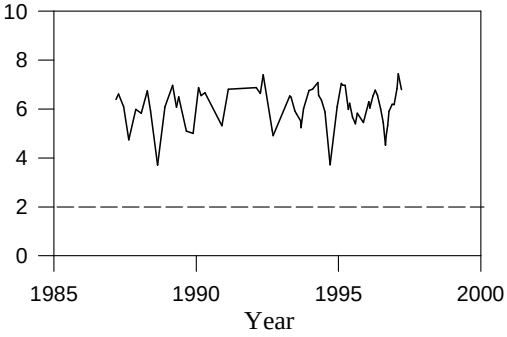
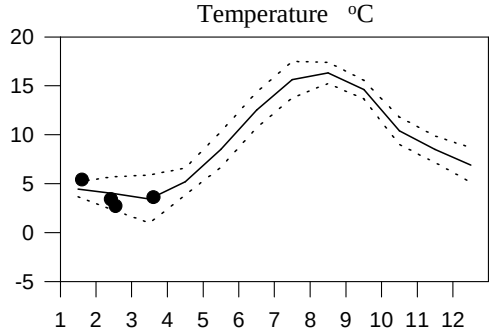


STATION P2 SURFACE WATER (0-15 m)

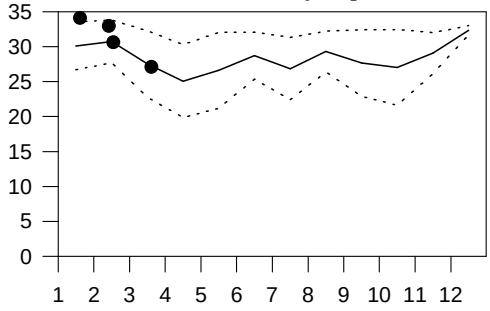
Annual Cycles

Mean 1986-1995 St.Dev. 1997

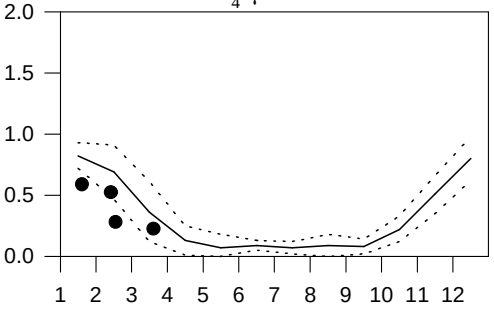
Temperature °C



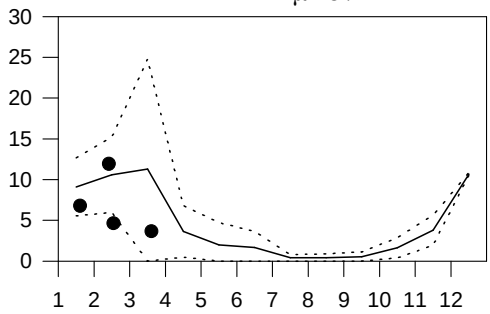
Salinity psu



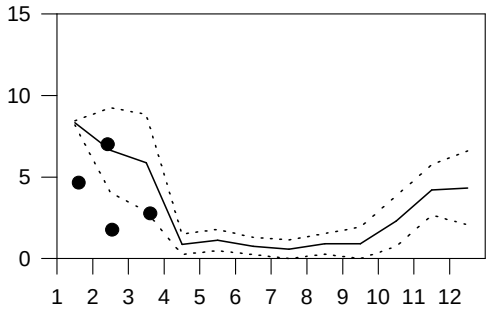
PO_4 µmol/l



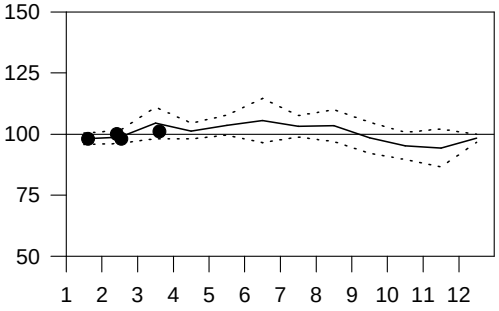
DIN µmol/l



SiO_3 µmol/l

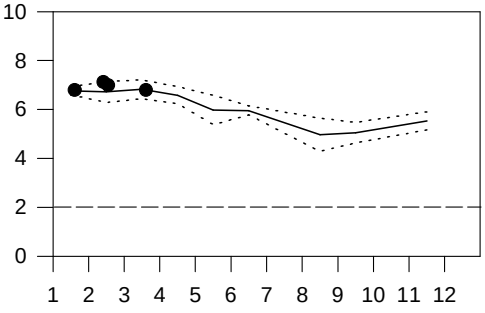


O_2 saturation %

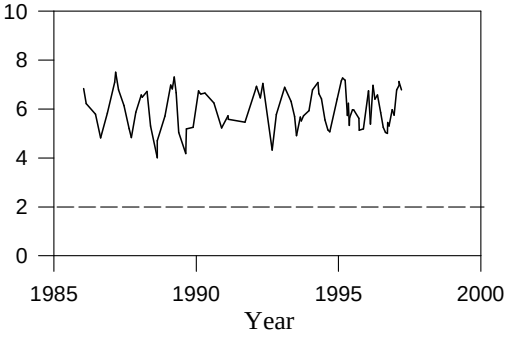


OXYGEN IN BOTTOM WATER

O_2 ml/l

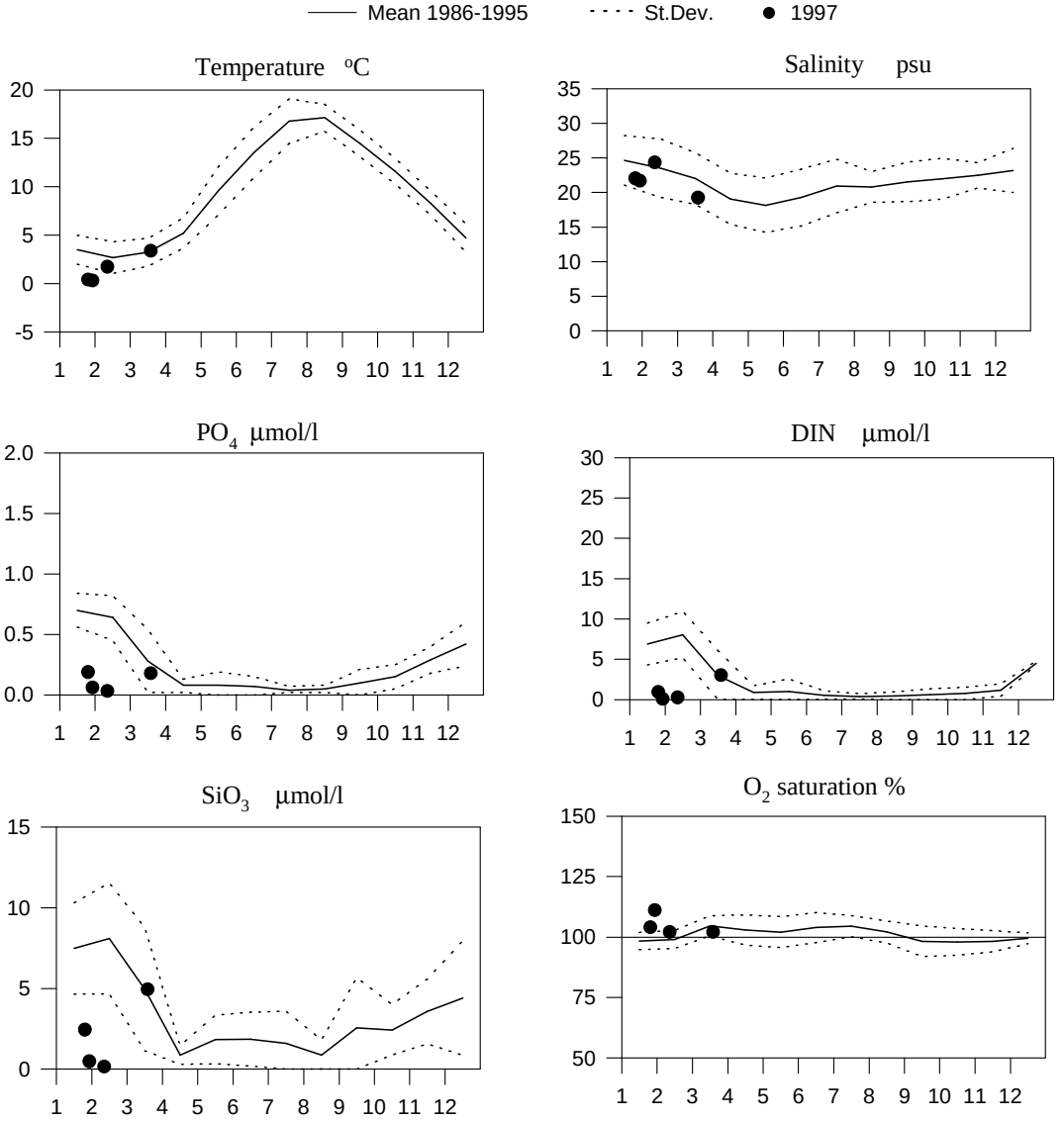


O_2 ml/l

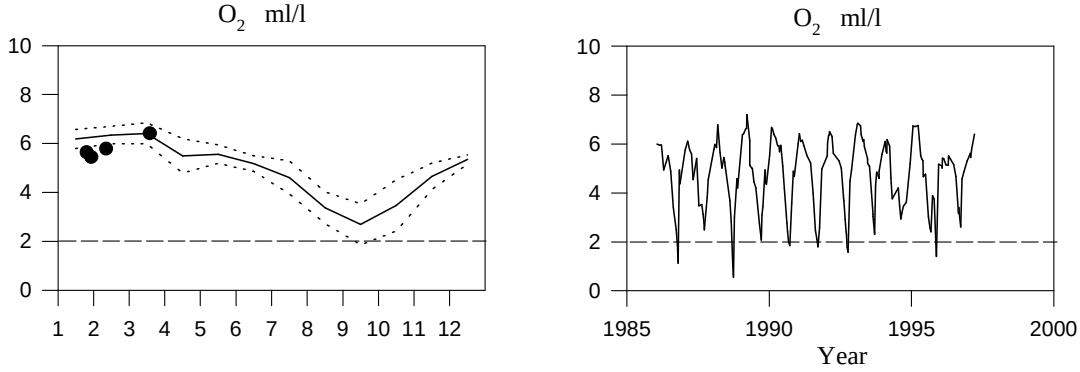


STATION ANHOLT E SURFACE WATER (above halocline)

Annual Cycles

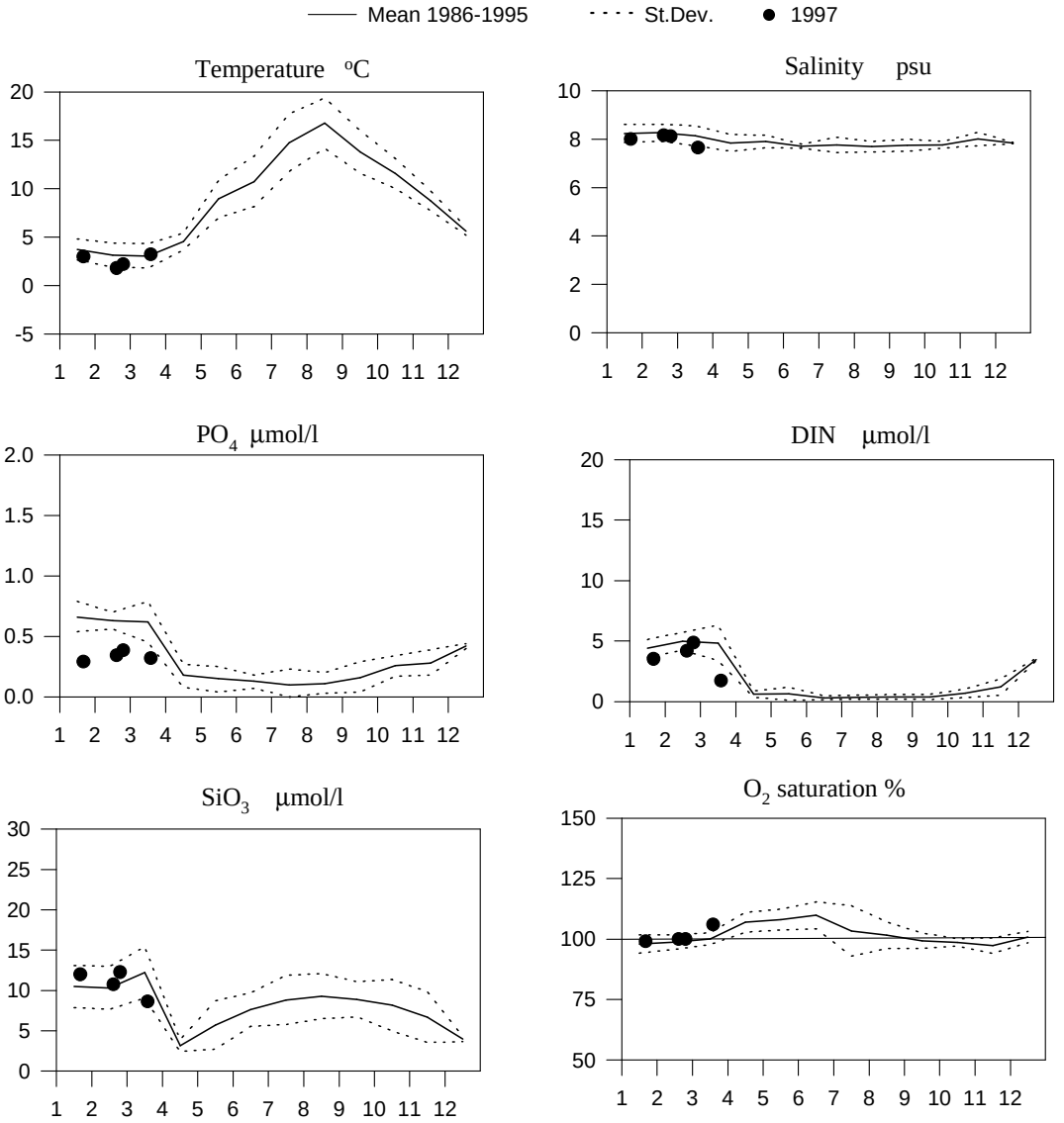


OXYGEN IN BOTTOM WATER

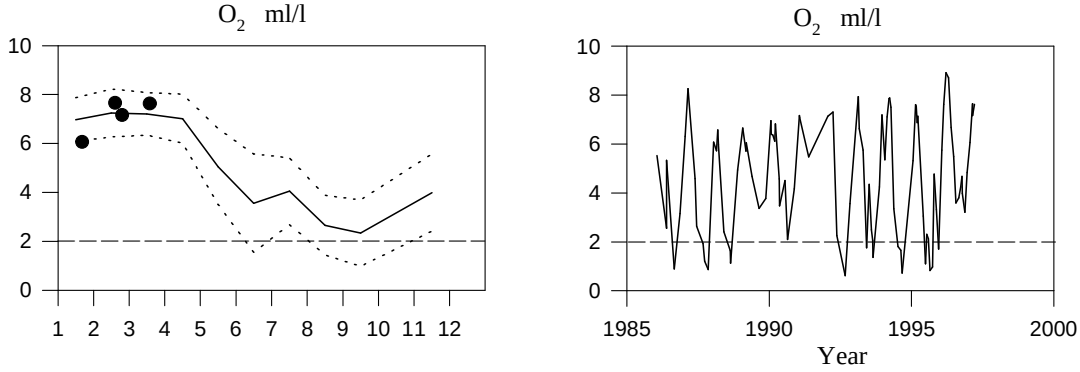


STATION BY2 SURFACE WATER (0-15 m)

Annual Cycles



OXYGEN IN BOTTOM WATER

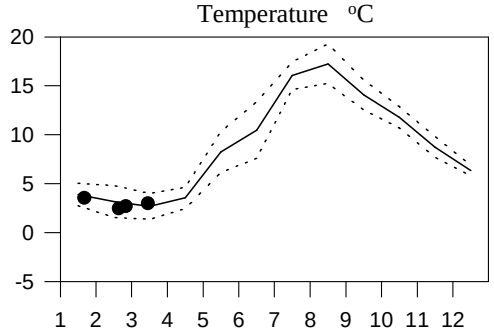


STATION BY5 SURFACE WATER (0-15 m)

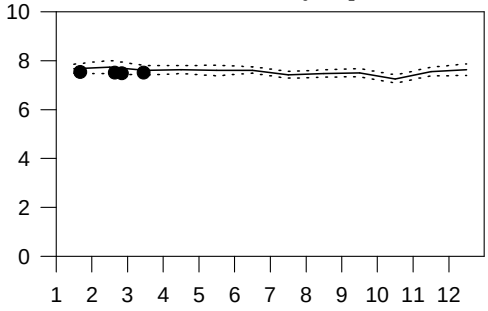
Annual Cycles

Mean 1986-1995 · · · · St.Dev. ● 1997

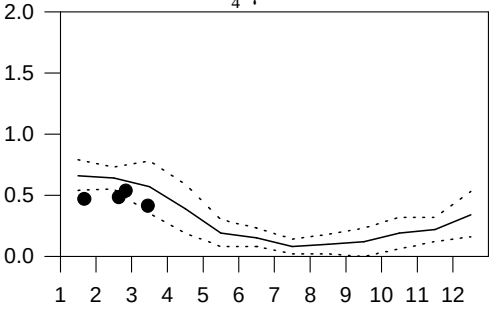
Temperature °C



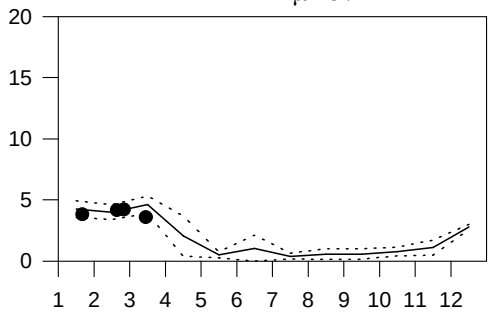
Salinity psu



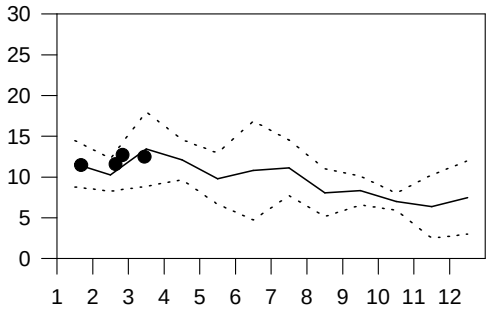
PO_4 µmol/l



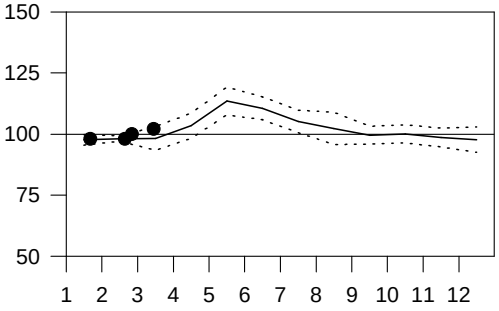
DIN µmol/l



SiO_3 µmol/l

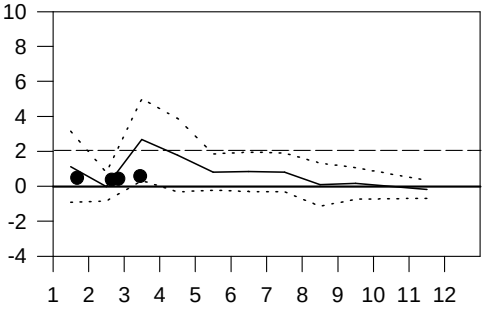


O_2 saturation %

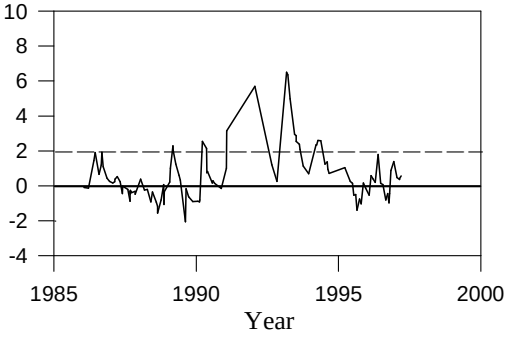


OXYGEN IN BOTTOM WATER

O_2 ml/l



O_2 ml/l

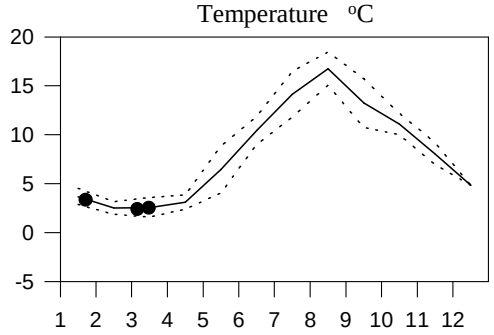


STATION BY15 SURFACE WATER (0-15 m)

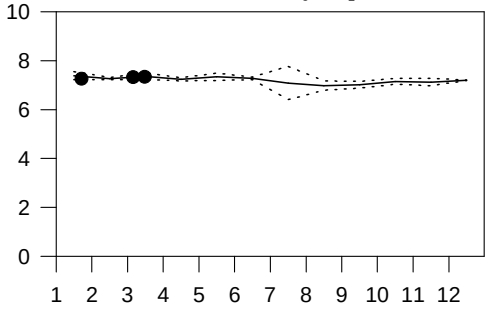
Annual Cycles

Mean 1986-1995 St.Dev. 1997

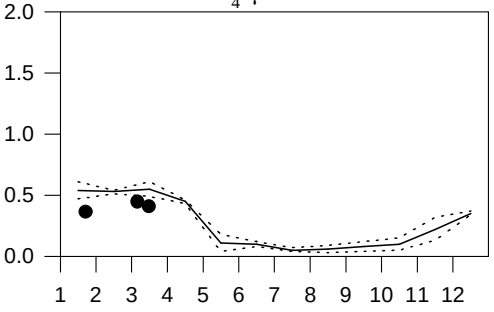
Temperature °C



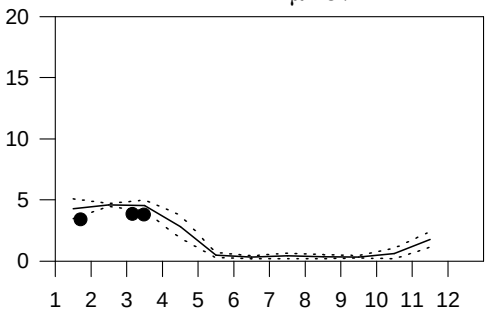
Salinity psu



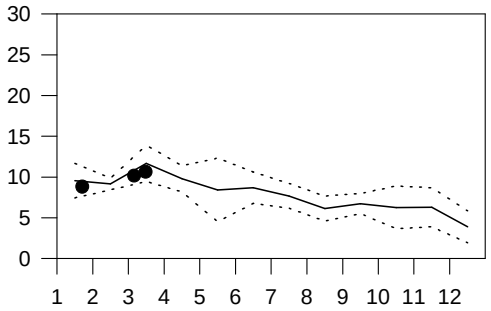
PO_4 µmol/l



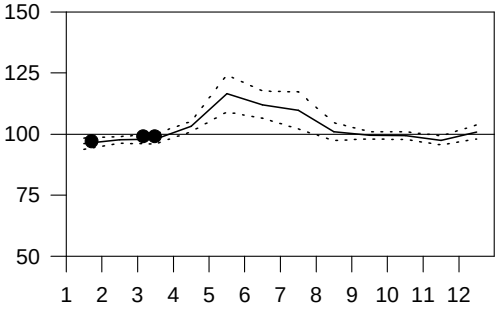
DIN µmol/l



SiO_3 µmol/l

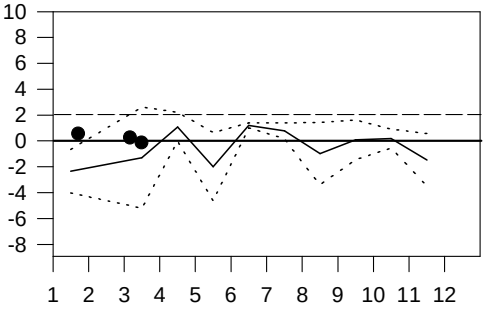


O_2 saturation %

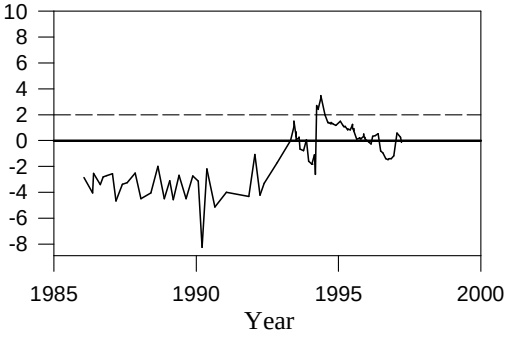


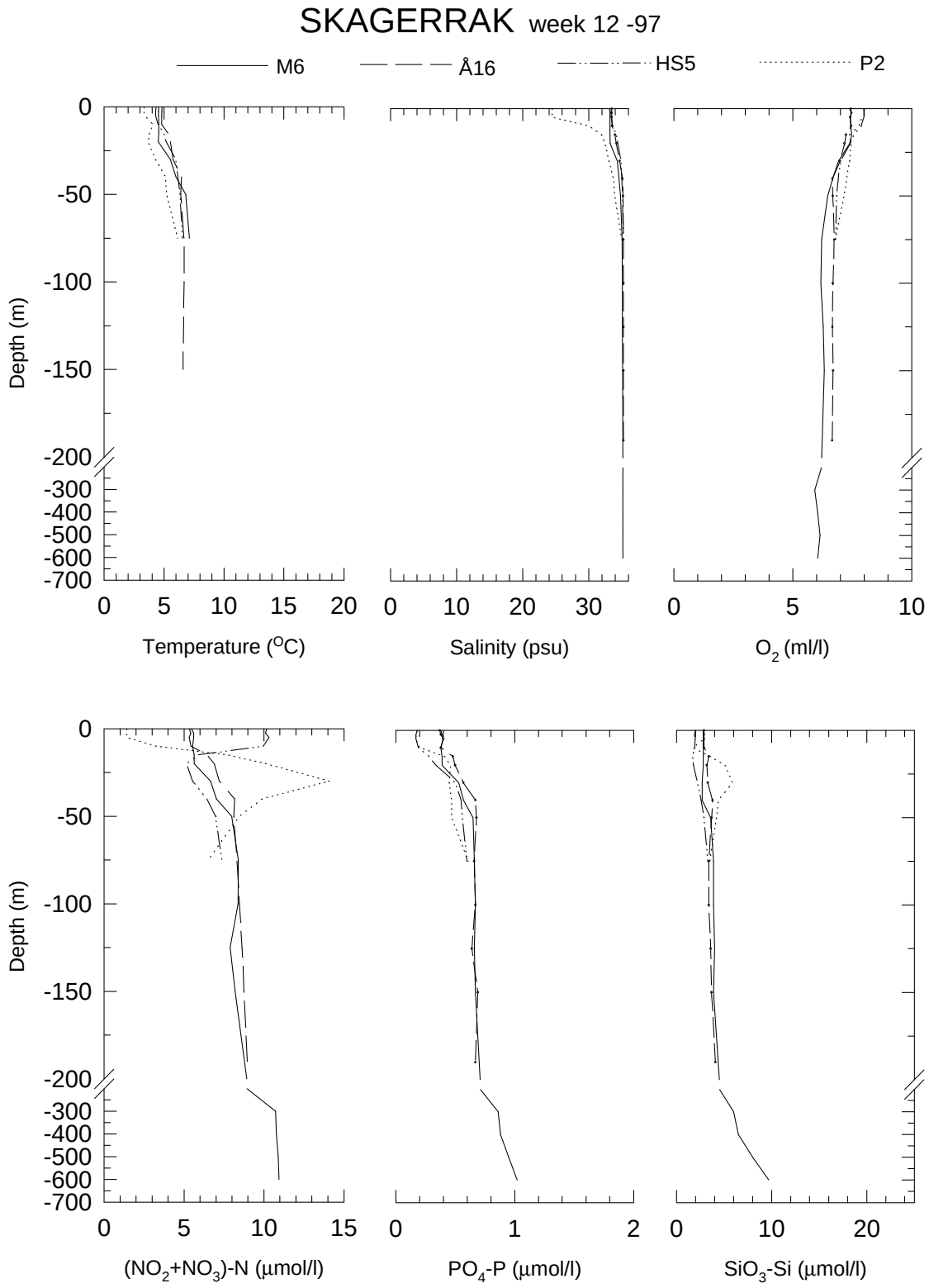
OXYGEN IN BOTTOM WATER

O_2 ml/l

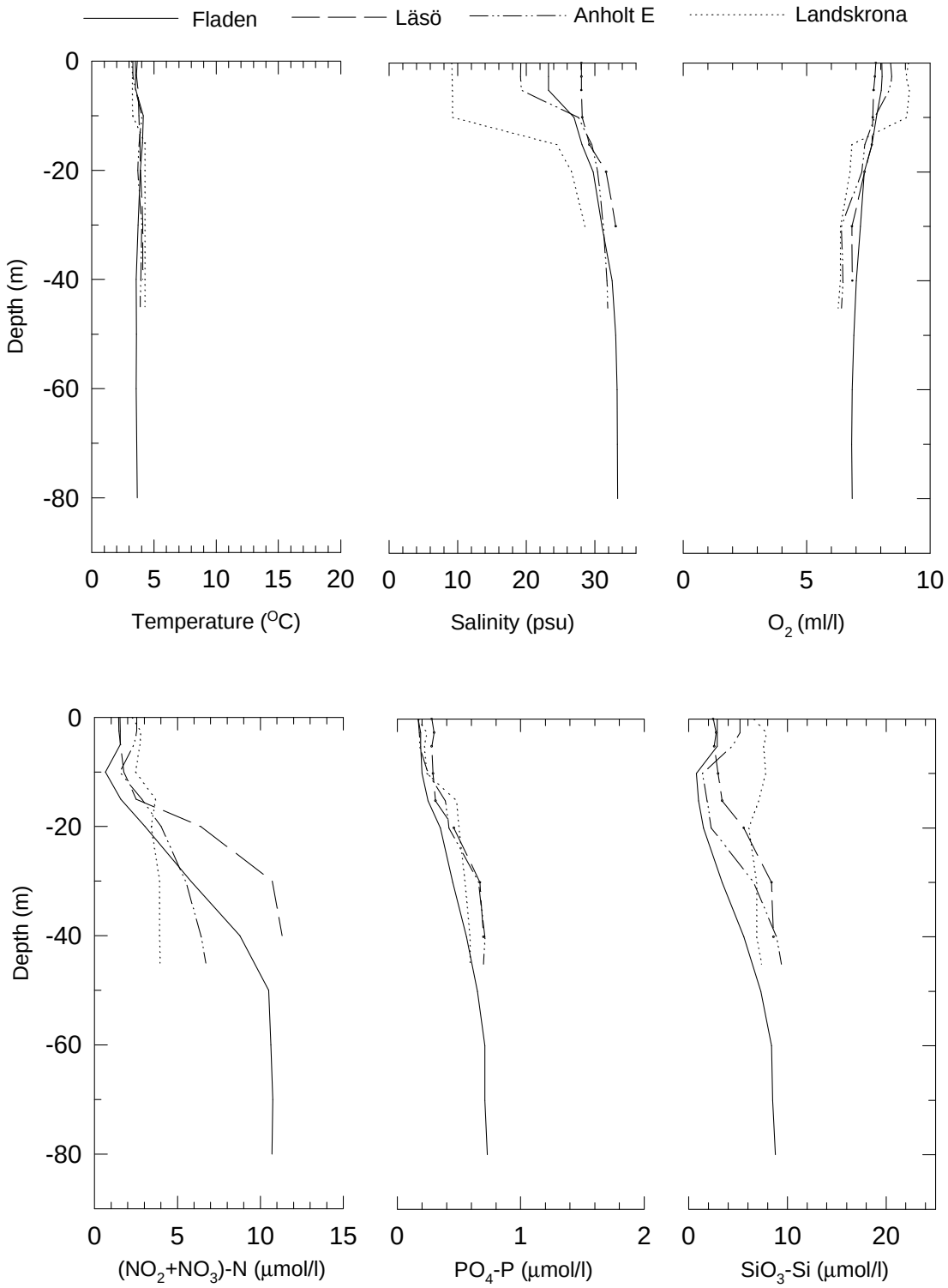


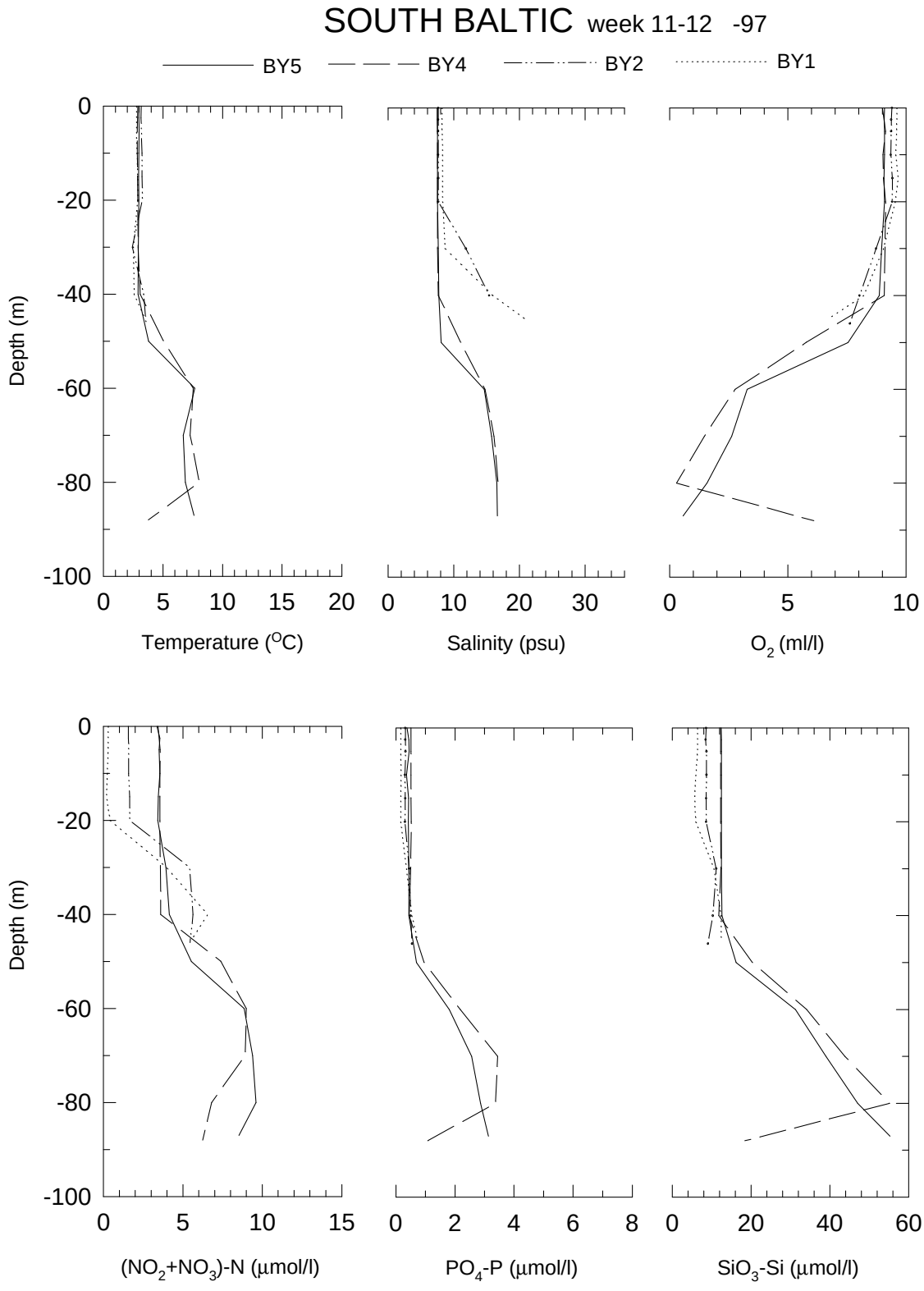
O_2 ml/l

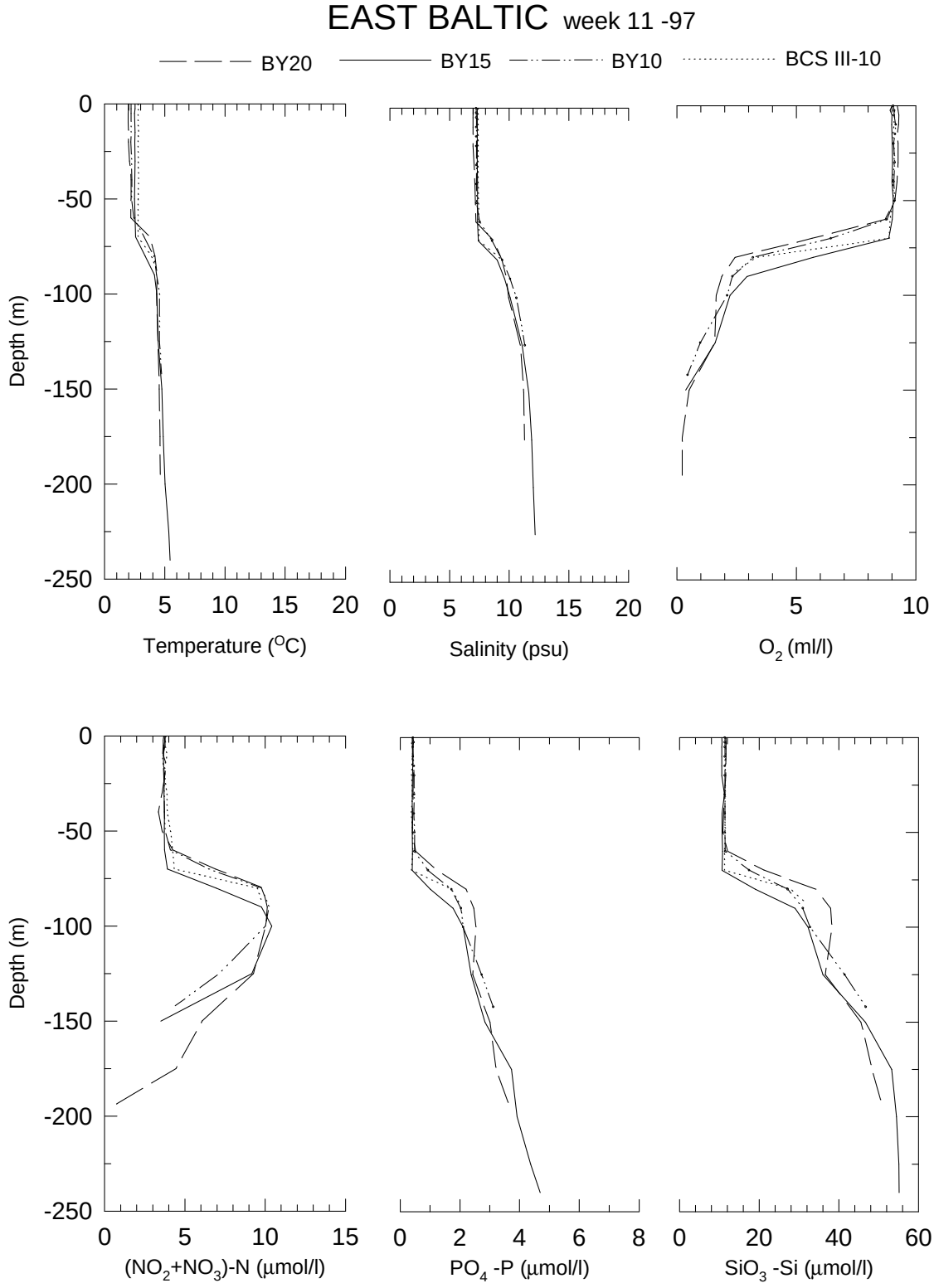



SKAGERRAK week 12 -97
M6
Å16
HS5
P2
Depth (m)
0
-50
-100
-150
-200
-300
-400
-500
-600
-700
0 5 10 15 20
Temperature (°C)
0 10 20 30
Salinity (psu)
0 5 10
O2 (ml/l)
0 5 10 15
(NO2+NO3)-N (µmol/l)
0 1 2
PO4-P (µmol/l)
0 10 20
SiO3-Si (µmol/l)

KATTEGAT and THE SOUND week 12 -97




SOUTH BALTIC week 11-12 -97
BY5
BY4
BY2
BY1
Depth (m)
0
-20
-40
-60
-80
-100
0 5 10 15 20
Temperature (°C)
0 10 20 30
Salinity (psu)
0 5 10
O2 (ml/l)
0 5 10 15
(NO2+NO3)-N (µmol/l)
0 2 4 6 8
PO4-P (µmol/l)
0 20 40 60
SiO3-Si (µmol/l)


EAST BALTIC week 11 -97
BY20
BY15
BY10
BCS III-10
Depth (m)
0
-50
-100
-150
-200
-250
0 5 10 15 20
Temperature (°C)
0 5 10 15 20
Salinity (psu)
0 5 10
O2 (ml/l)
0 5 10 15
(NO2+NO3)-N (µmol/l)
0 2 4 6 8
PO4 -P (µmol/l)
0 20 40 60
SiO3 -Si (µmol/l)