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Oceanographical Laboratory

1997-09-29
Dnr: SaO-1997-208

EXPEDITIONSRAPPORT FRÅN U/F ARGOS

CRUISE REPORT FROM R/V ARGOS

Expeditionens varaktighet: 970922-970926
Survey period:

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

Uppdragsgivare: SMHI
Principal:

SUMMARY

The expedition was performed within SMHIs regular monitoring programme and covered the Skagerrak, the Kattegat, the Sound and the Baltic Proper. The weather was dominated by weak northerly winds and clear skies. The surface water temperatures, which at the last cruise generally were the highest on record, had now decreased to or near to normal values. However, the thermocline had simultaneously shifted downwards in the water column. In the Skagerrak and the Kattegatt the surface water was more or less depleted of all nutrients, whereas in the Baltic both phosphate (0.1-0.20 µmol/l) and silicate (4.5-12 µmol/l) was present.
Hydrogen sulphide was observed in the deep water of the East Gotland Basin (stations BY15 and BY20). No visible algae blooms were observed in any of the sea areas.

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PRELIMINÄRA RESULTAT

Expeditionen, som ingick i SMHIs ordinarie övervakningsprogram, utgick från Göteborg och avslutades i Västervik. Vädret under expeditionen dominerades av svaga till måttliga nordliga vindar, uppehållsväder och lufttemperatur kring 16°C.

Skagerrak

Temperaturen i ytvattnet hade sjunkit till ca. 15°C, vilket är en minskning med ungefär 6 grader sedan förra expeditionen i slutet av augusti. Termoklinen hade under samma tid fördjupats från 20 till 50 meter. Närsalthalterna i ytlagret var för årstiden normala, d.v.s. låga.

Kattegatt och Öresund

Ytvattentemperaturen varierade mellan 14.2 och 15.5°C, vilket är normalt för årstiden. Även här hade alltså temperaturen minskat drastiskt sedan föregående expedition, då rekordvärden på nästan 23°C uppmättes. Termoklinen hade i Kattegatt fördjupats från 10 till 25 meter. Närsalterna i ytlagret var uttömda och samtliga mätvärden låg under eller strax över detektionsgränserna. Det lägsta syrevärdet i Kattegatts djupvatten uppmättes vid Anholt E, 2.61 ml/l på 50 m djup, motsvarande en mättnad på 40%. I Öresund var syrehalten i djupvattnet vid W Landskrona 2.35 ml/l (36% mättnad).

Södra Östersjön

Termoklinen låg på ca. 20 meters djup och ytlagret hade en temperatur på 14.5°C. Vid föregående expedition var yttemperaturen över 22°C och djupet till termoklinen 10 meter. Närsalthalterna i ytlagret var typiska för årstiden; fosfat 0.15-0.20 µmol/l, nitrit 0.02 µmol/l, nitrat <0.10 µmol/l, ammonium 0.10-0.30 µmol/l och silikat 9-12 µmol/l. I Arkonabassängen uppmättes det lägsta syrevärdet i djupvattnet på station BY2, 3.88 ml/l, vilket dock är en ökning med 1.2 ml/l sedan föregående mätning. Låga syrgashalter (<2 ml/l) uppmättes både i Hanöbuktens och Bornholmsbassängens djupvatten. Vid station BY4 ökade dock halterna igen närmast botten, där resterna av ett tidigare inflöde av högsalint vatten återfanns.

Centrala och norra Östersjön

Ytvattentemperaturen varierade från 11.5°C i norr till 14.4°C i söder. Djupet till termoklinen varierade mellan 15 och 30 m, medan haloklinen återfanns på ca. 80 m djup i hela området. Närsalthalterna i ytvattnet uppvisade normala koncentrationer, nitrit och nitrat kring detektionsgränserna (<0.02 resp <0.10 µmol/l, fosfat 0.10-0.15 µmol/l och silikat 4.5-6.7 µmol/l.

Syrehalter lägre än 2 ml/l uppmättes allmänt på djup överstigande 90 m. Svavelväte återfanns i Gotlandsdjupet på djup större än 200 m, samt i Fårödjupet på djup överstigande 150 m.

DELTAGARE

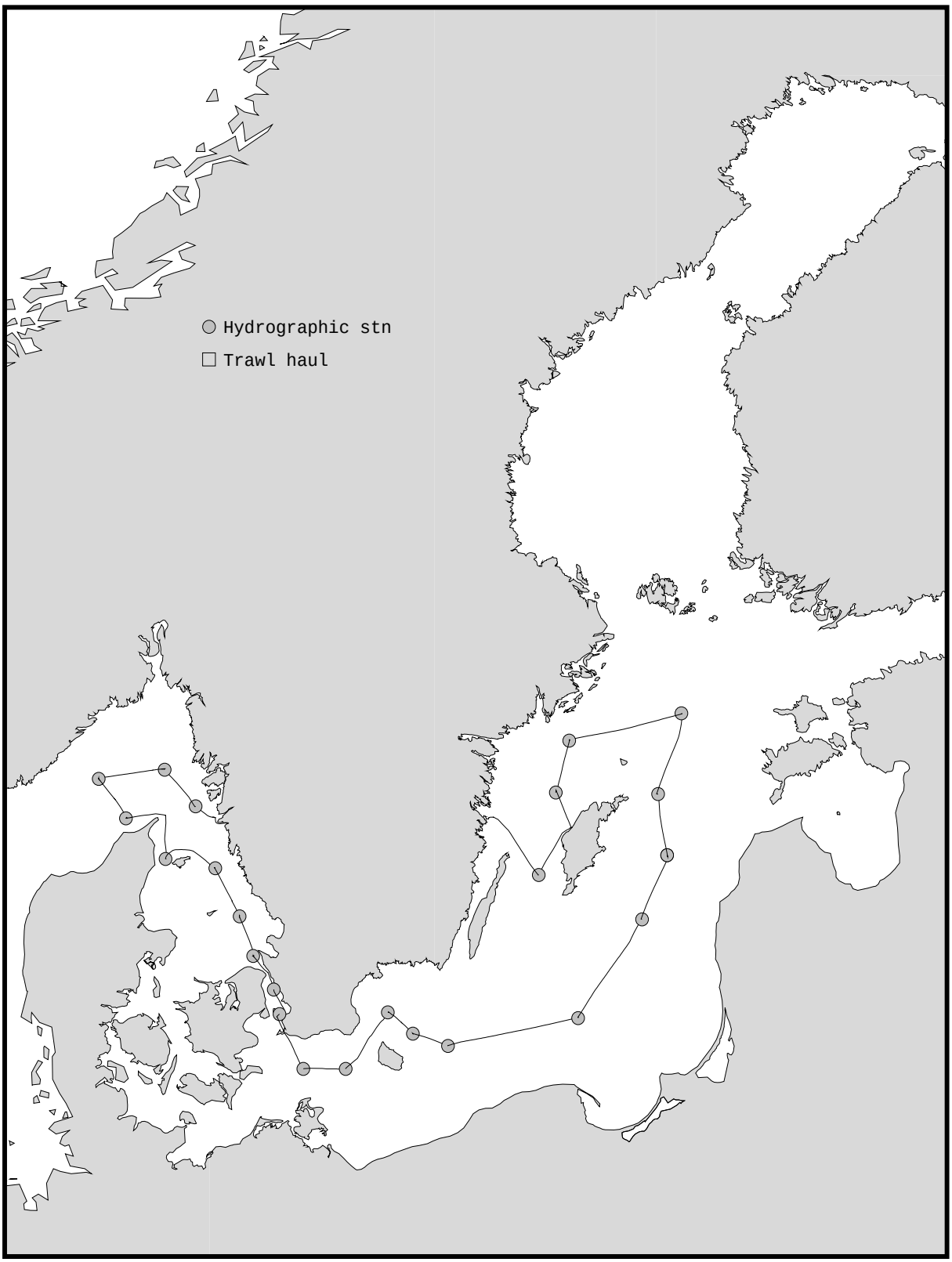
Namn	Från
Lars Andersson, expeditionsledare	SMHI Oceanografiska lab.
Mikael Krysell	-”-
Marie Larsson	-”-
Bodil Thorstensson	-”-
Bo Juhlin	SMHI Norrköping
Carina Pettersson-Erlandsson	Praktikant

BILAGOR

- Färdkarta
- Tabell över stationer, antal parametrar och provtagningsdjup
- Karta över syrehalter i bottenvattnet
- Månadsmedelvärdesplottar för vissa basstationer

T R A C K C H A R T

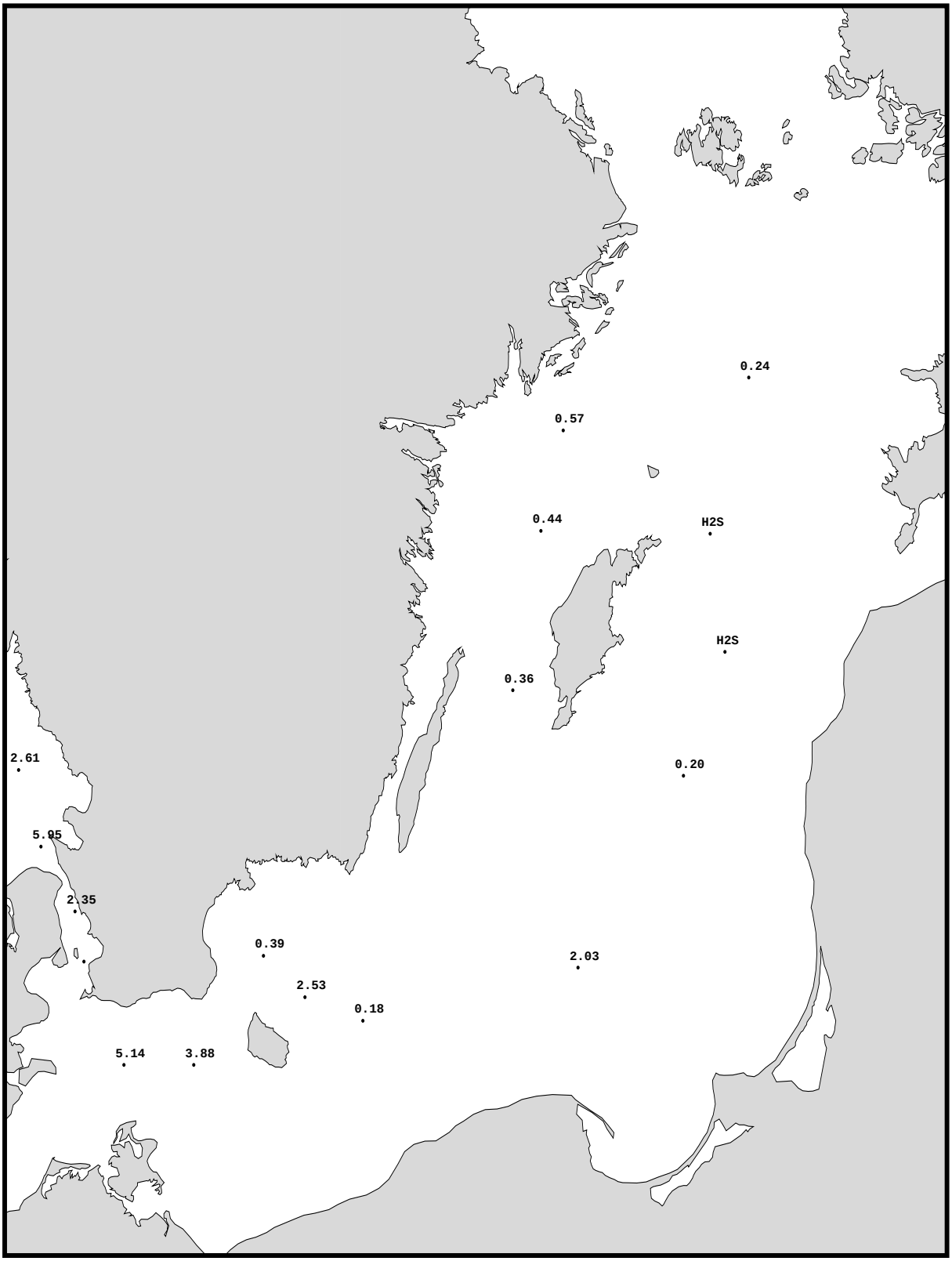
Country: Sweden
Ship : Argos
Date : 970922-970926
Series : 0604-0627



CSR RefNo: 1997-77AR/0604-0627

Bottom water oxygen concentration (ml/l)

Country: Sweden
Ship: Argos
Date: 970922-970926
Series: 0604-0627



SMHI ***** Hydrographic Ship: 14-Argos ****** Date: 1997-09-29
Ocean lab ***** series Year: 1997 ****** Time: 08:20

Ser no	Stat code	Proj	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 i n	P h l	O x y g	H 2 S	P o 4 P	T o t	N o 2	N o 3	N o 4	T o t	A l k	S i O	H u m	L i g n	P O N	P O C	T O C	C o m
0604	SKEX23BAS		P2	N5752	E1118	970922	1155	93		8	36	4	15.5	1020	1430	x	--x----	10	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	-
0605	SKEX17BAS		Å16	N5816	E1043.5	970922	1520	202		8	33	4	14.4	1020	1330	x	--x----	15	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0606	SKNX21BAS		M6	N5810	E0930	970922	2005	640			25	3	13.5	1017	9930	x	→xxx---	18	x	x	x	x	-	x	x	x	x	x	x	x	x	-	-	-	-	-	-
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0608	KANX09BAS		LÄSÖ RÄNNA	N5717.6	E1044.5	970923	0355	43			30	8	12.0	1013	9930	x	--x----	8	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	-
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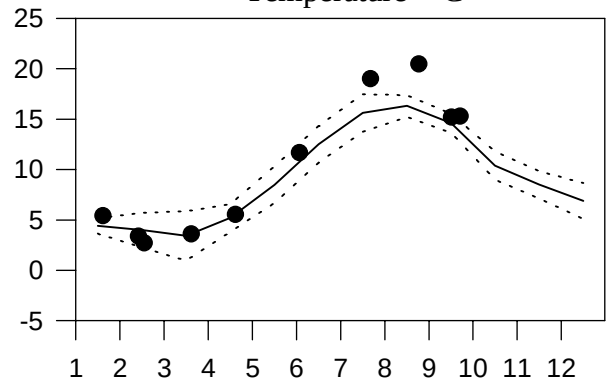
STATION P2 SURFACE WATER (0-15 m)

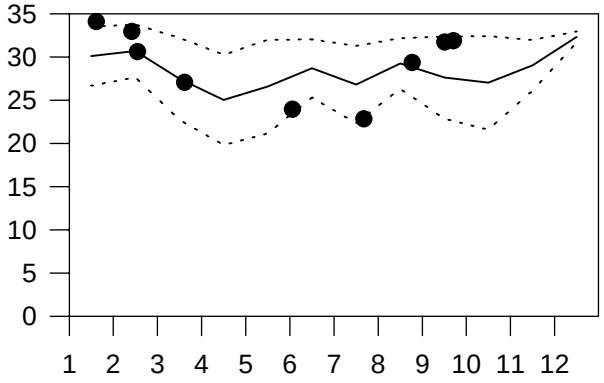
Annual Cycles

Mean 1986-1995 St.Dev. 1997

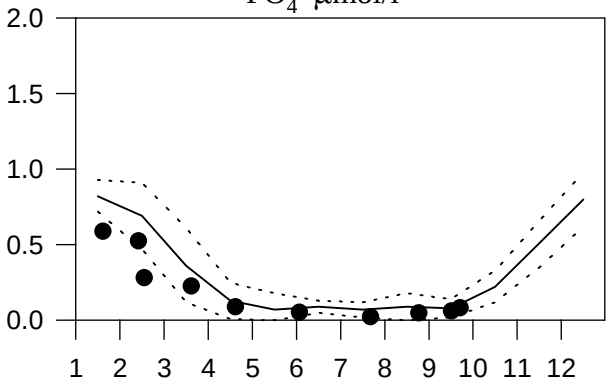
Temperature °C



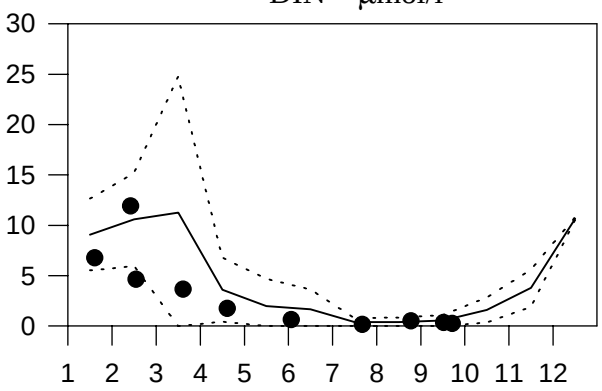
Salinity psu



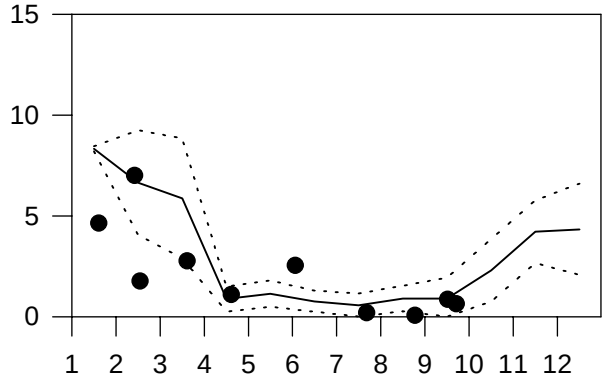
PO_4 µmol/l



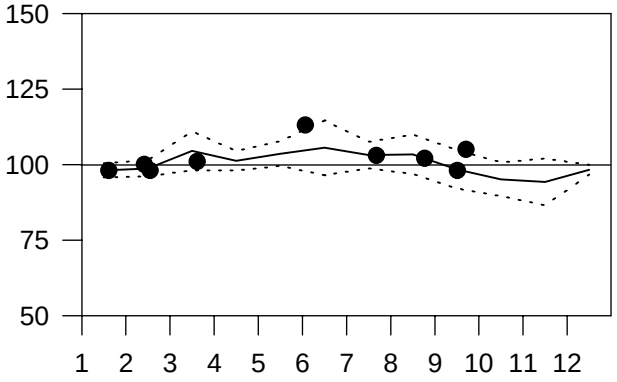
DIN µmol/l



SiO_3 µmol/l

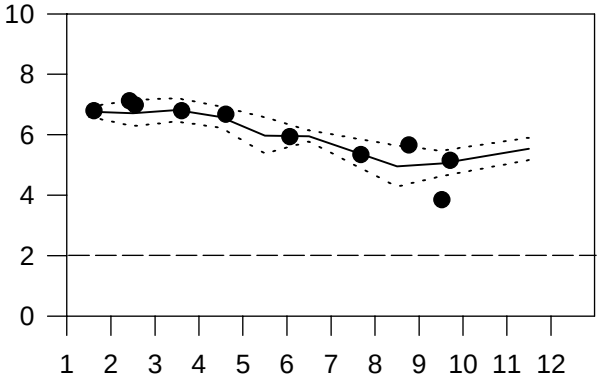


O_2 saturation %

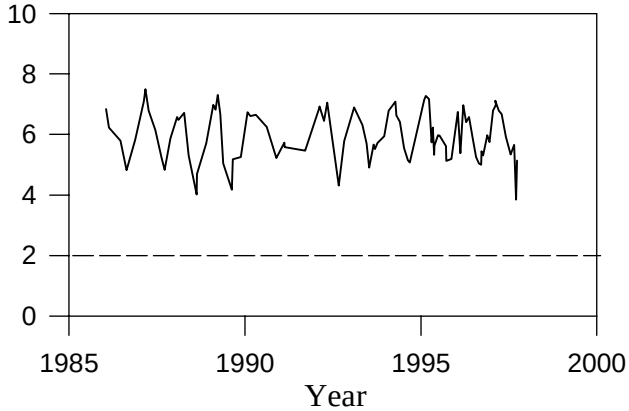


OXYGEN IN BOTTOM WATER

O_2 ml/l



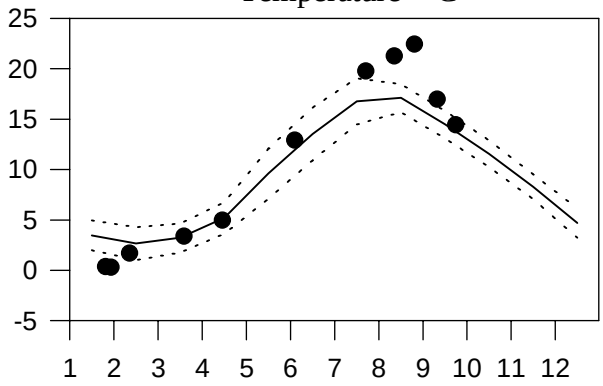
O_2 ml/l



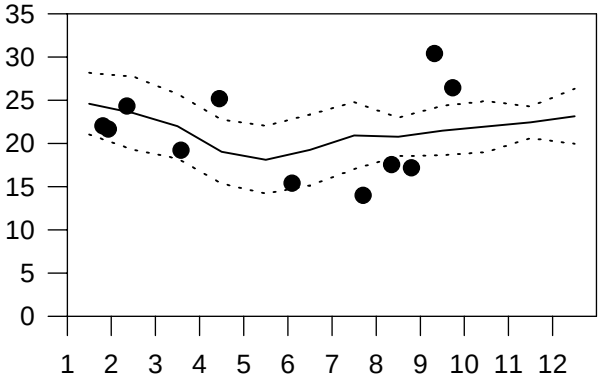
STATION ANHOLT E SURFACE WATER (above halocline)

Annual Cycles

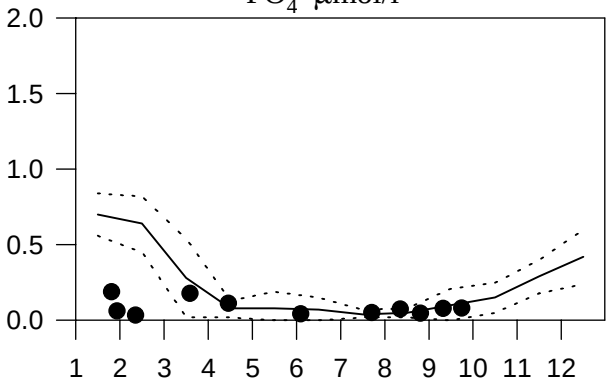
Temperature °C



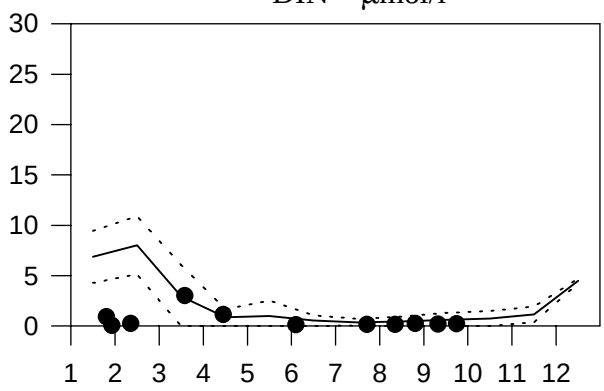
Salinity psu



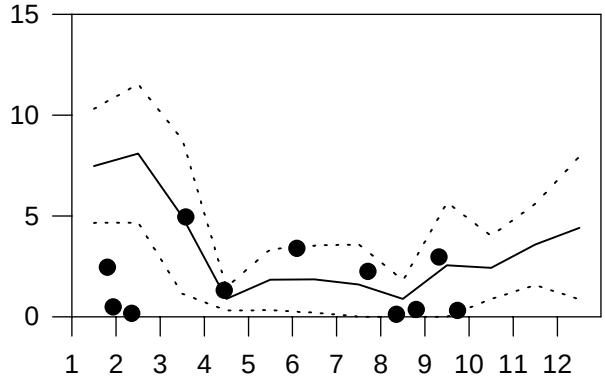
PO_4 µmol/l



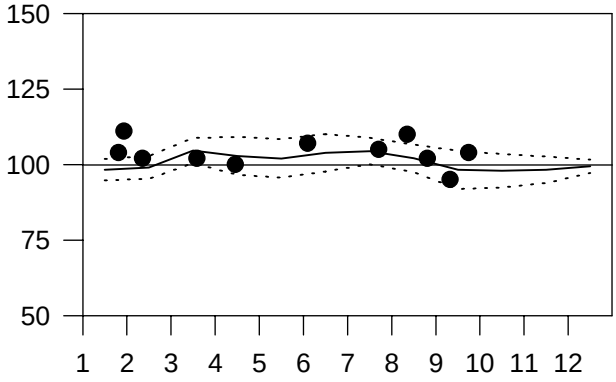
DIN µmol/l



SiO_3 µmol/l

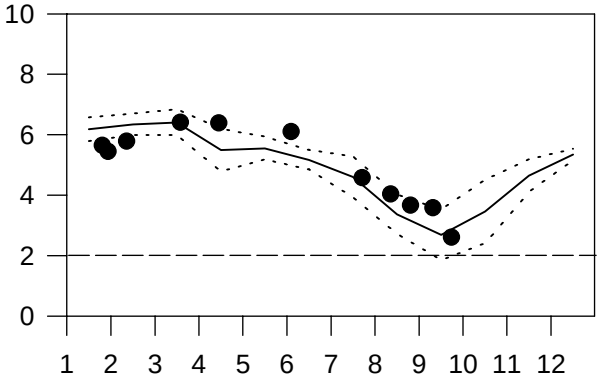


O_2 saturation %

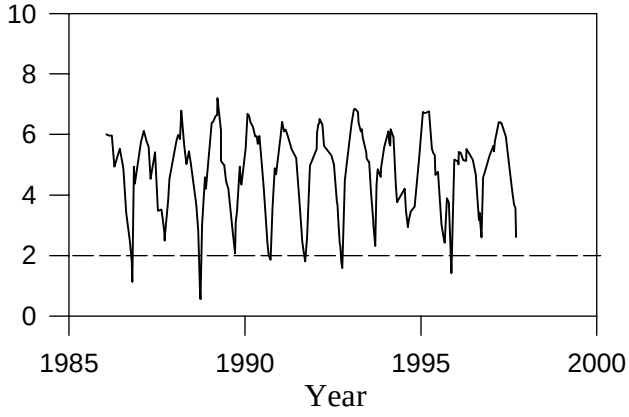


OXYGEN IN BOTTOM WATER

O_2 ml/l



O_2 ml/l

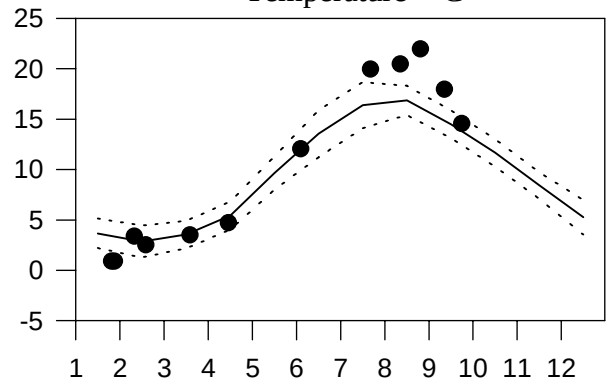


STATION FLADEN SURFACE WATER (0-15 m)

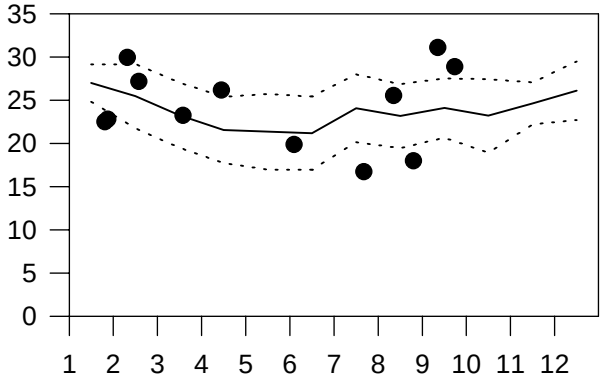
Annual Cycles

Mean 1986-1995 St.Dev. 1997

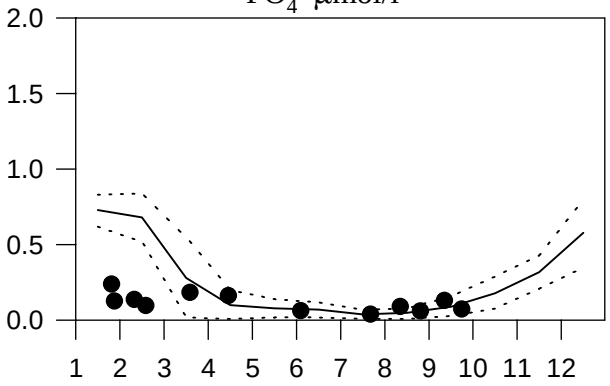
Temperature °C



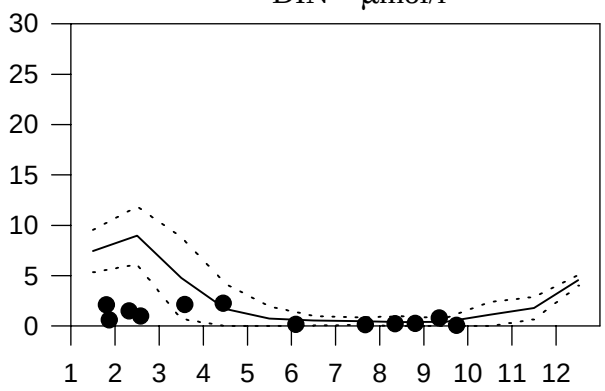
Salinity psu



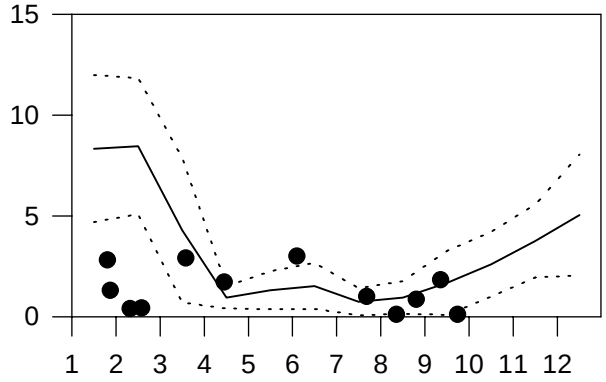
PO_4 µmol/l



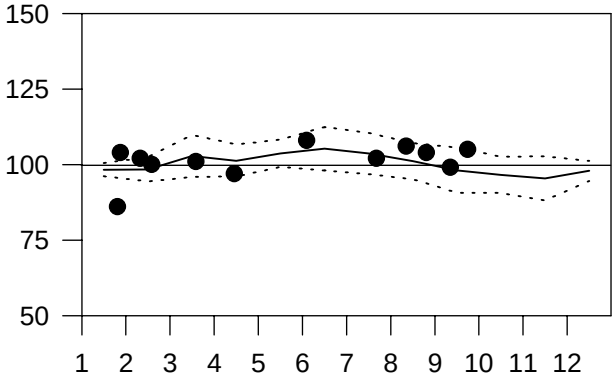
DIN µmol/l



SiO_3 µmol/l

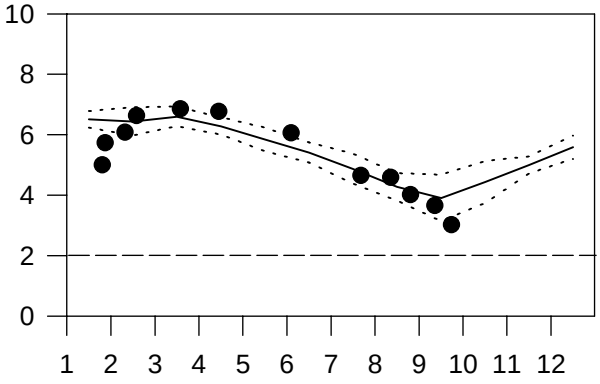


O_2 saturation %

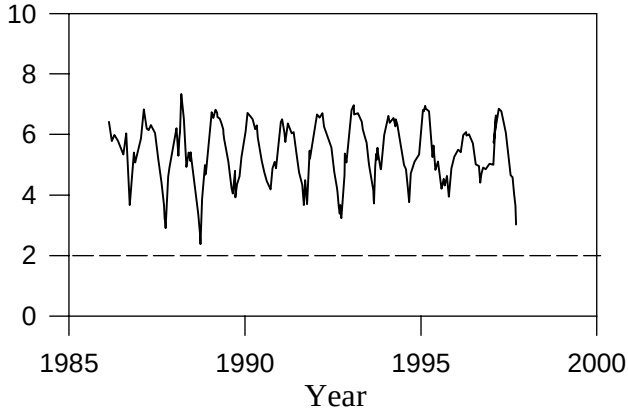


OXYGEN IN BOTTOM WATER

O_2 ml/l



O_2 ml/l

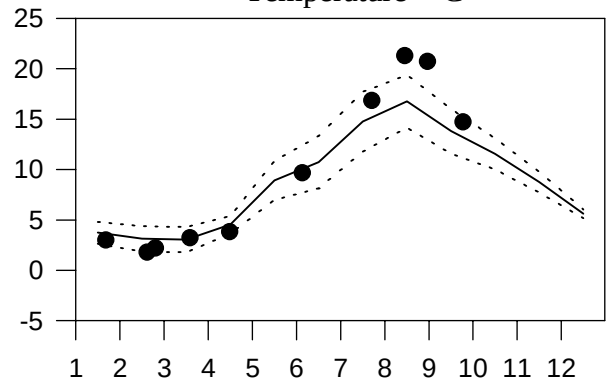


STATION BY2 SURFACE WATER (0-15 m)

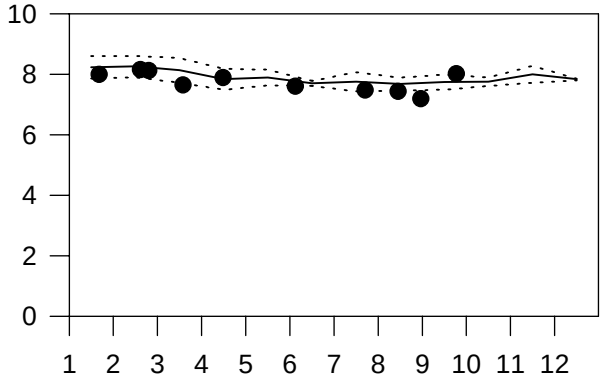
Annual Cycles

Mean 1986-1995 St.Dev. 1997

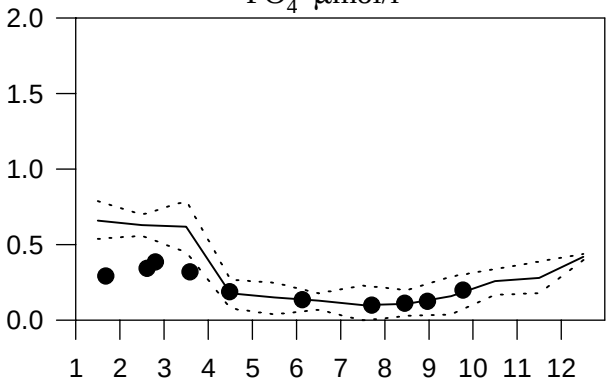
Temperature °C



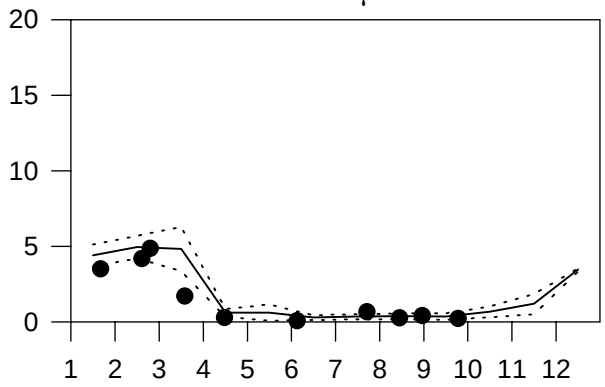
Salinity psu



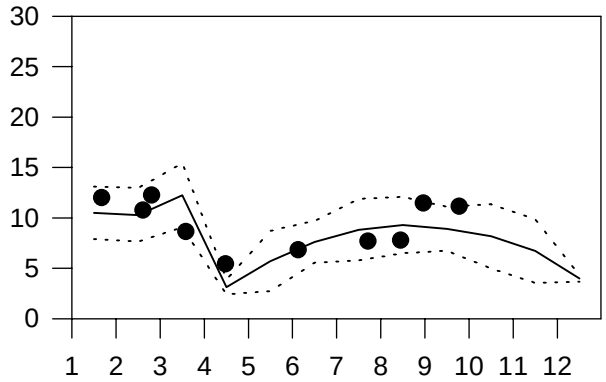
PO_4 µmol/l



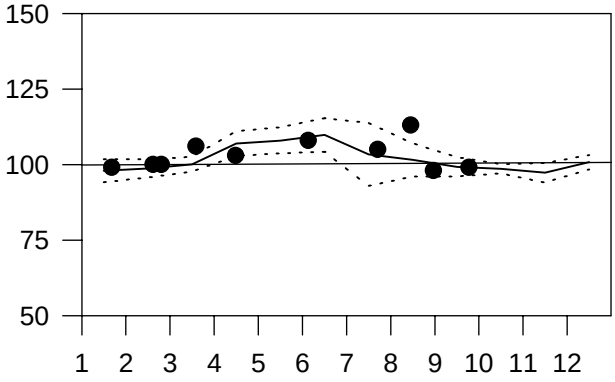
DIN µmol/l



SiO_3 µmol/l

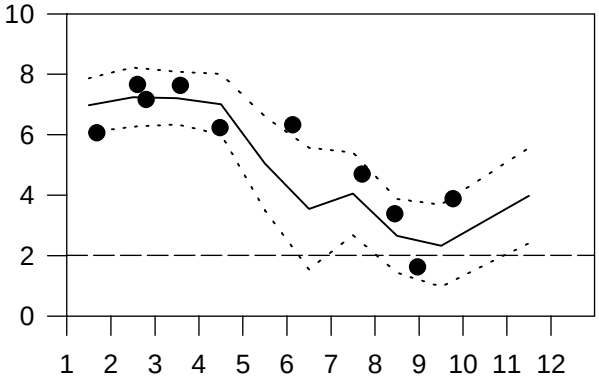


O_2 saturation %

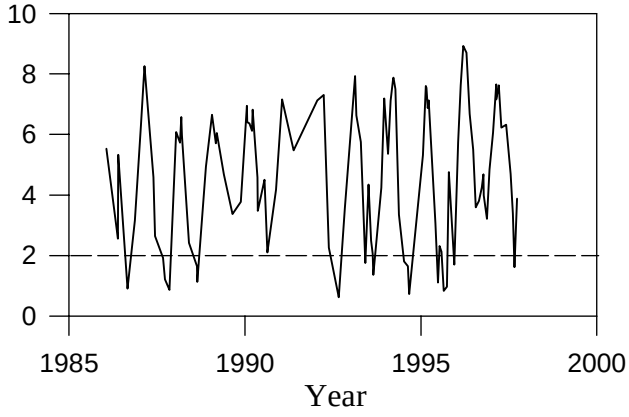


OXYGEN IN BOTTOM WATER

O_2 ml/l



O_2 ml/l

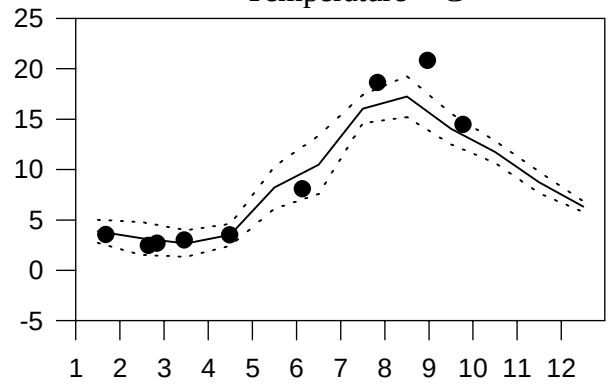


STATION BY5 SURFACE WATER (0-15 m)

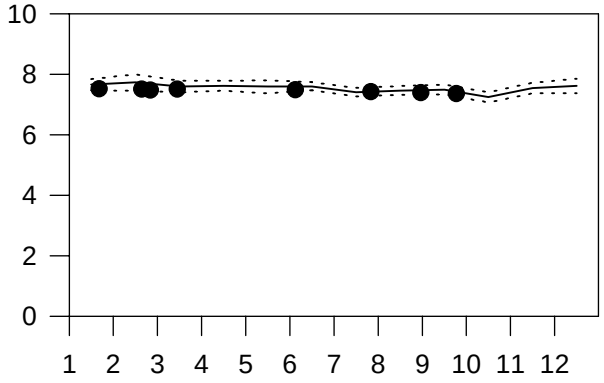
Annual Cycles

Mean 1986-1995 St.Dev. 1997

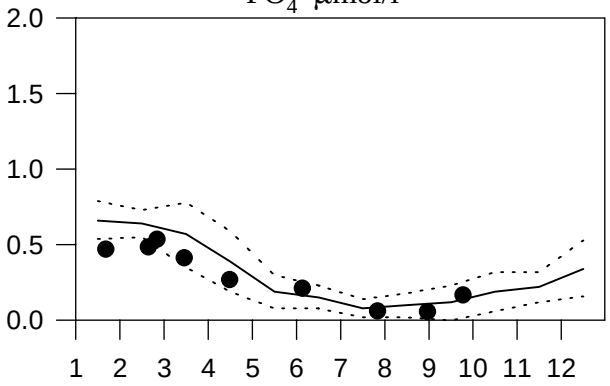
Temperature °C



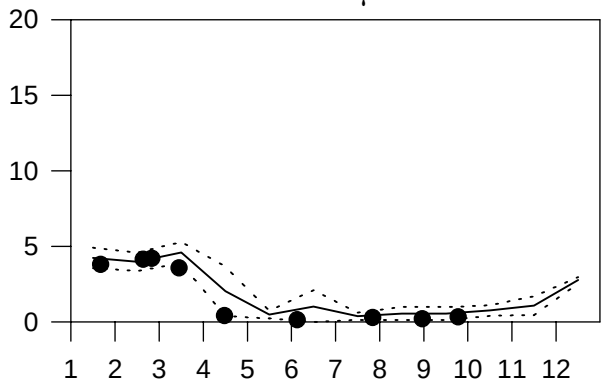
Salinity psu



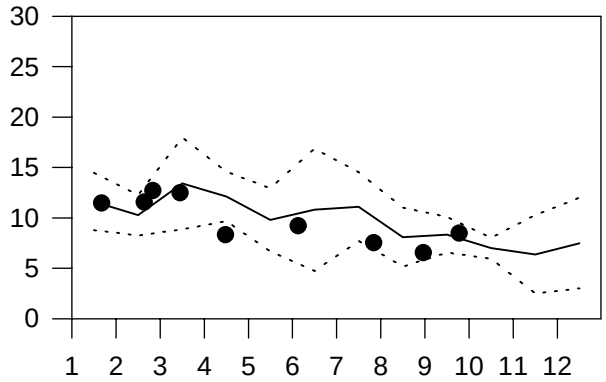
PO_4 µmol/l



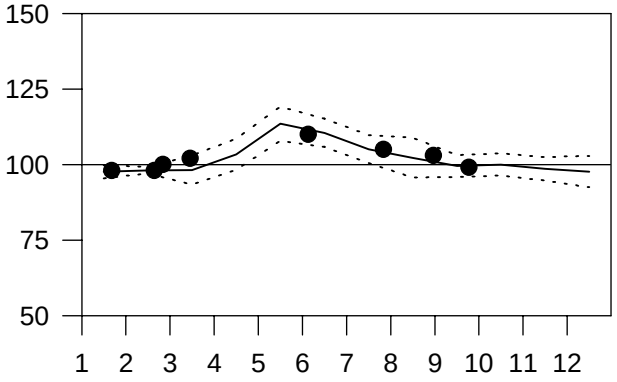
DIN µmol/l



SiO_3 µmol/l

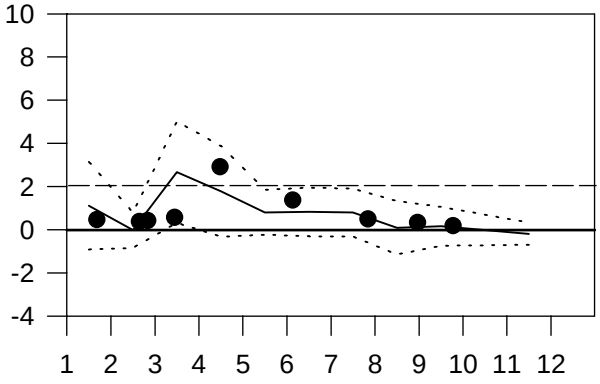


O_2 saturation %

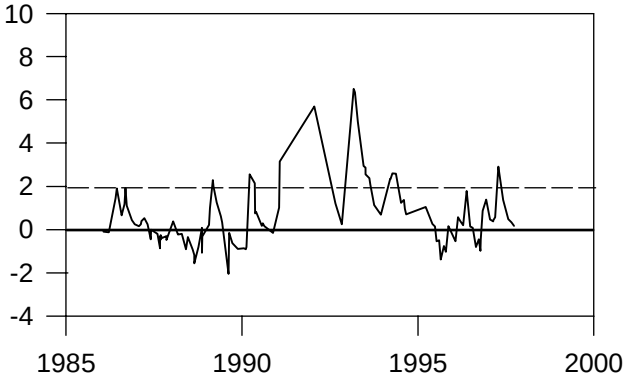


OXYGEN IN BOTTOM WATER

O_2 ml/l



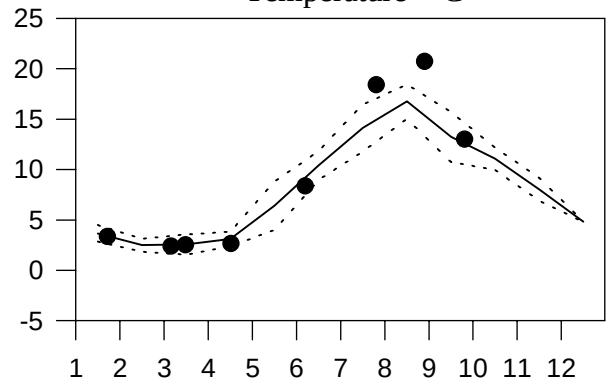
O_2 ml/l



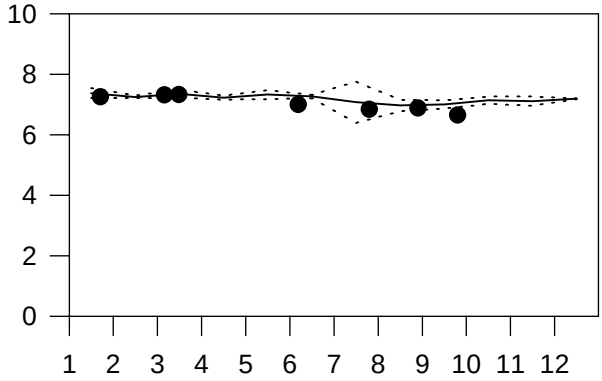
STATION BY15 SURFACE WATER (0-15 m)

Annual Cycles

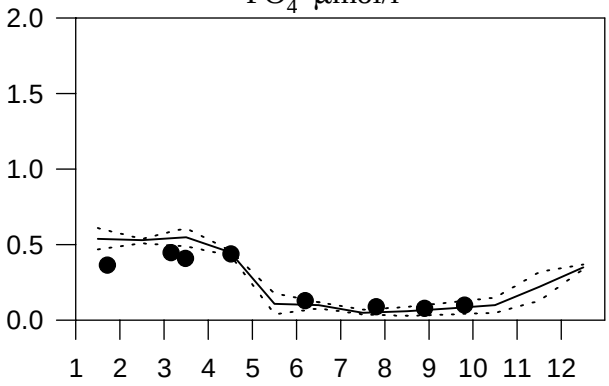
Temperature °C



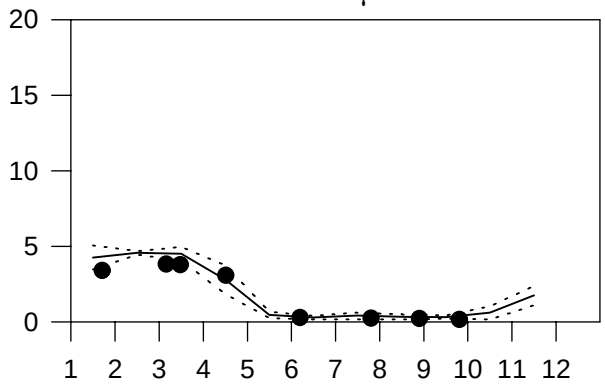
Salinity psu



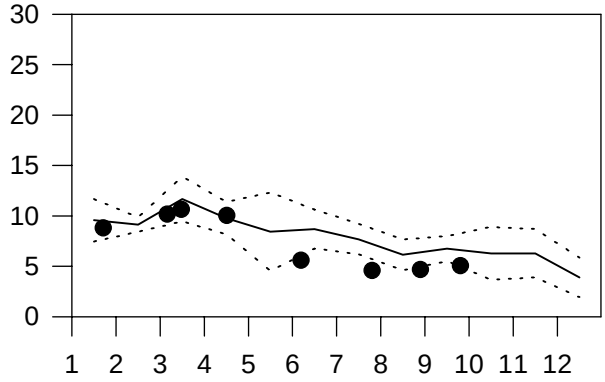
PO_4 µmol/l



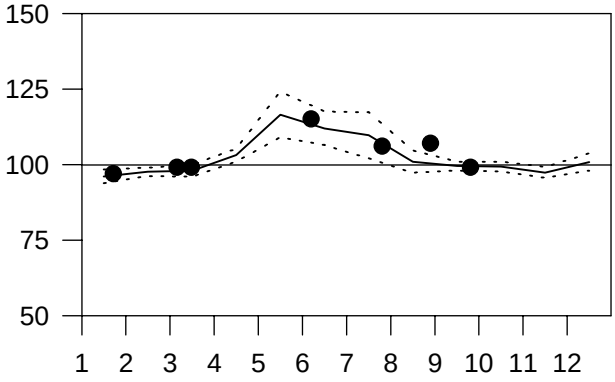
DIN µmol/l



SiO_3 µmol/l

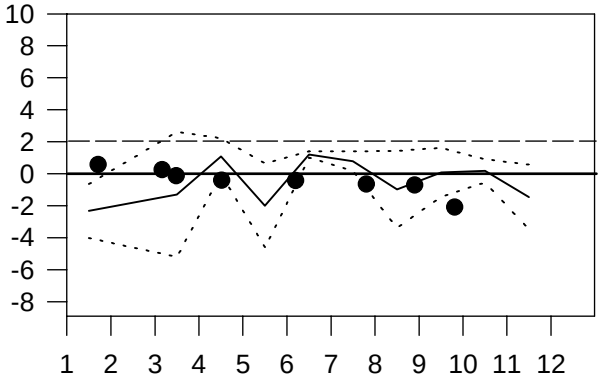


O_2 saturation %

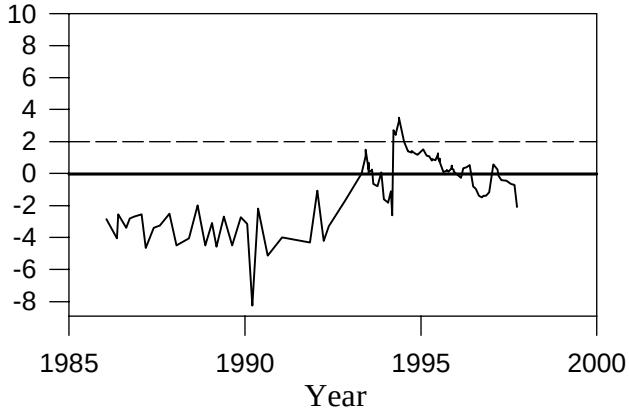


OXYGEN IN BOTTOM WATER

O_2 ml/l

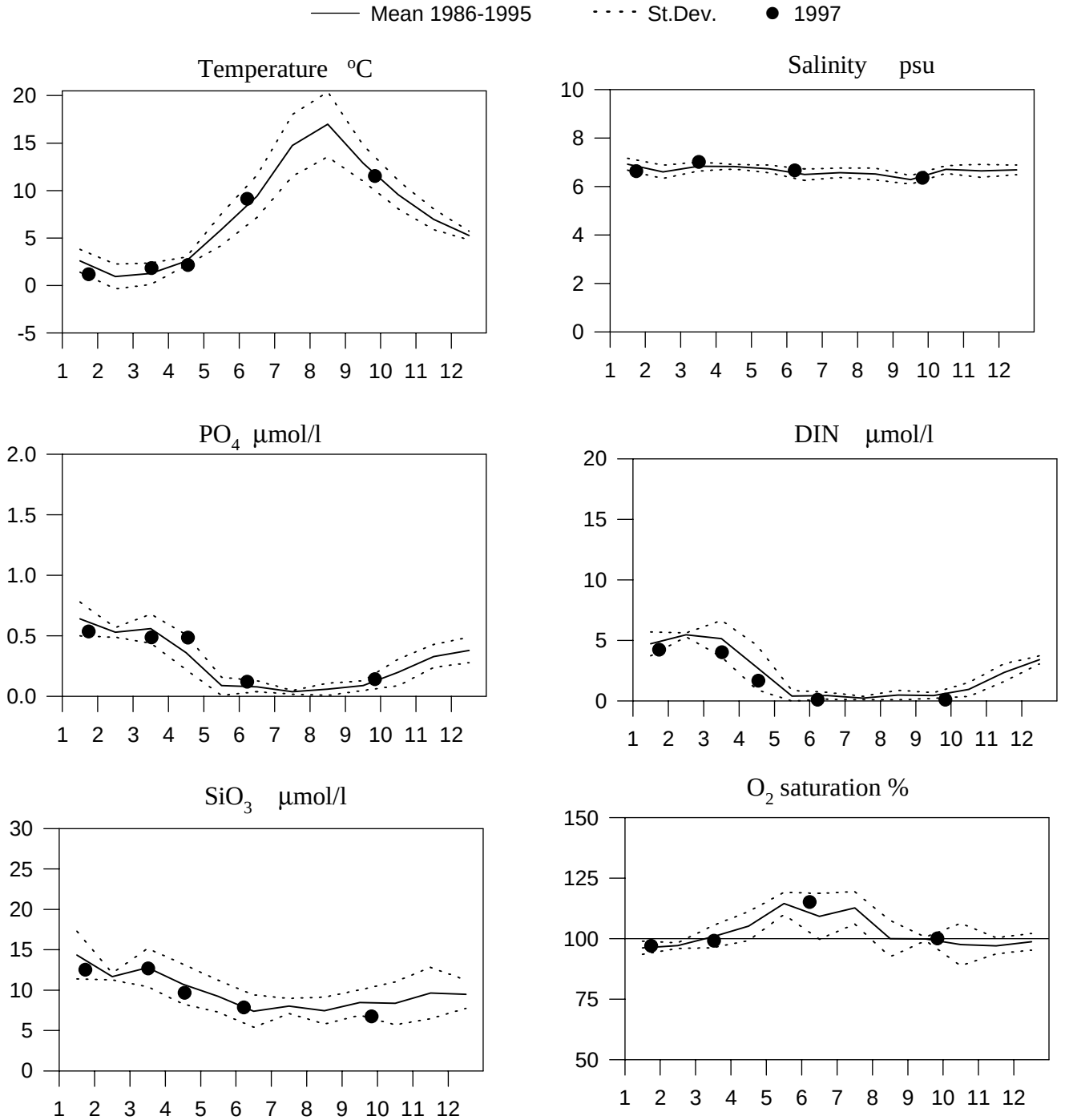


O_2 ml/l

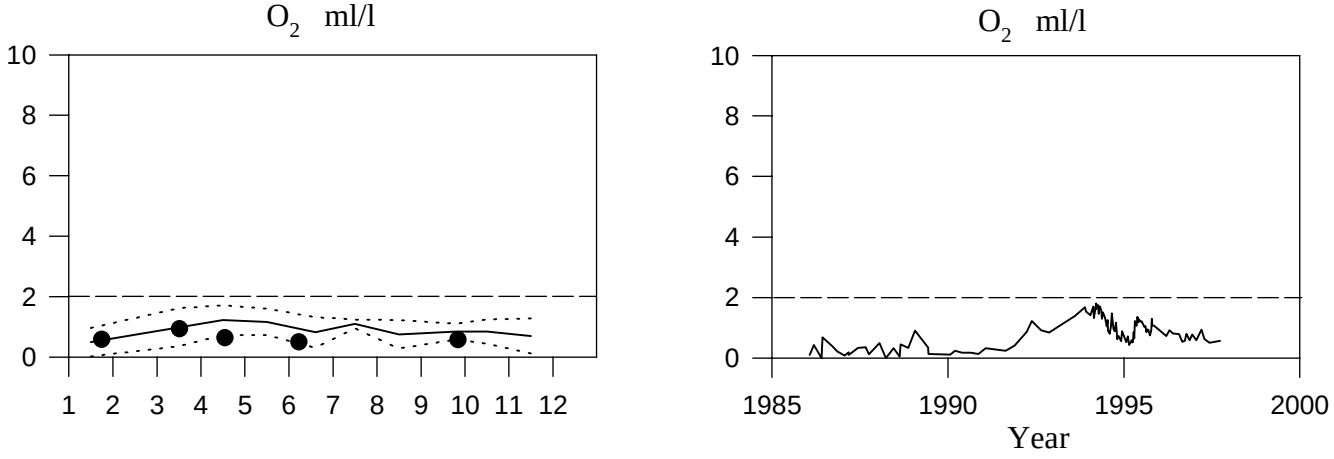


STATION BY31 SURFACE WATER (0-15 m)

Annual Cycles



OXYGEN IN BOTTOM WATER

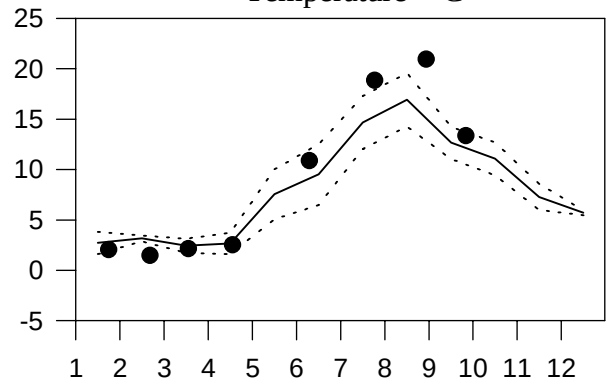


STATION BY38 SURFACE WATER (0-15 m)

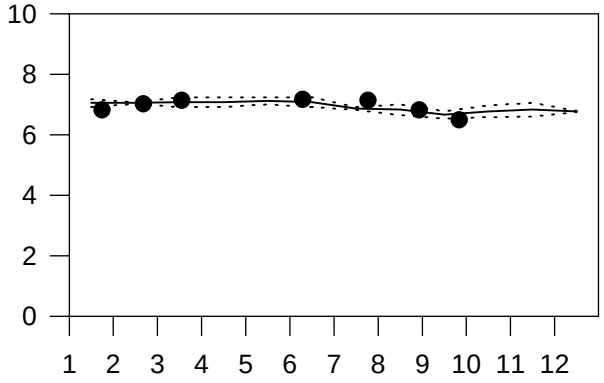
Annual Cycles

Mean 1986-1995 St.Dev. 1997

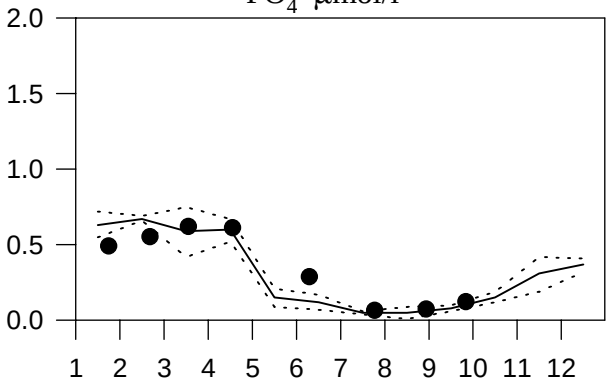
Temperature °C



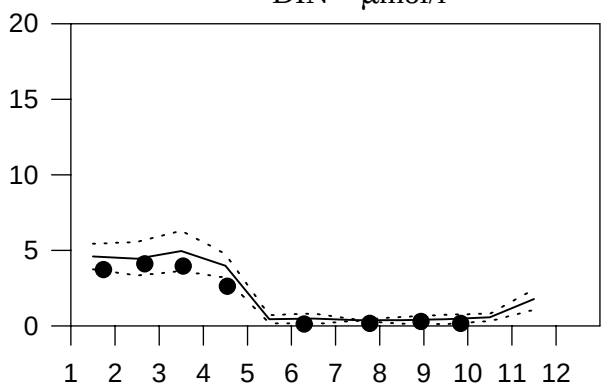
Salinity psu



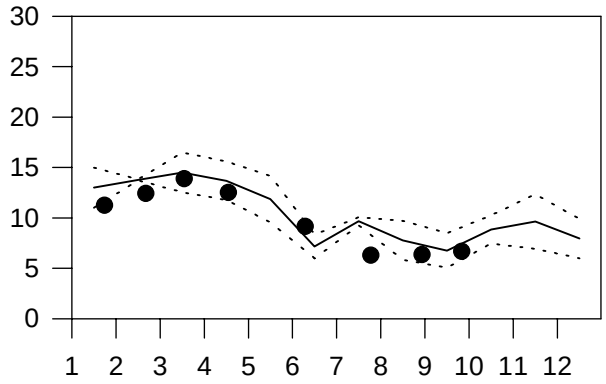
PO_4 µmol/l



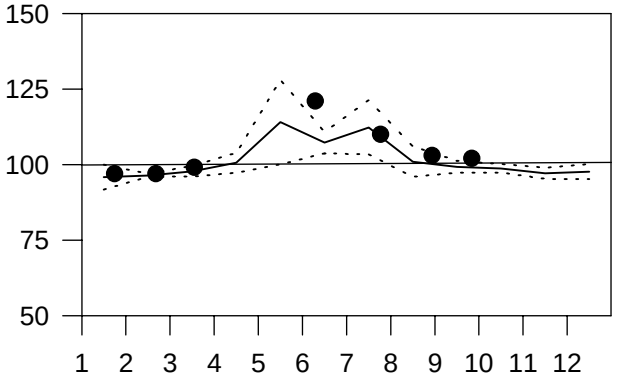
DIN µmol/l



SiO_3 µmol/l

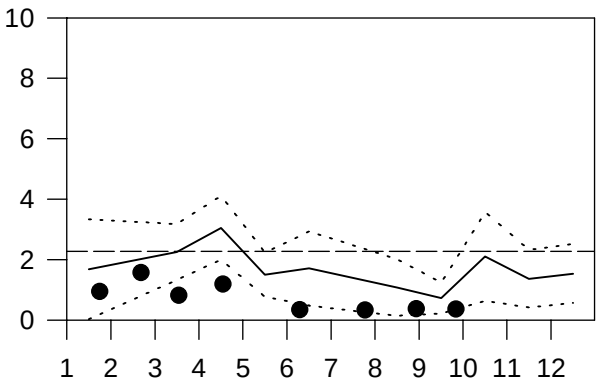


O_2 saturation %

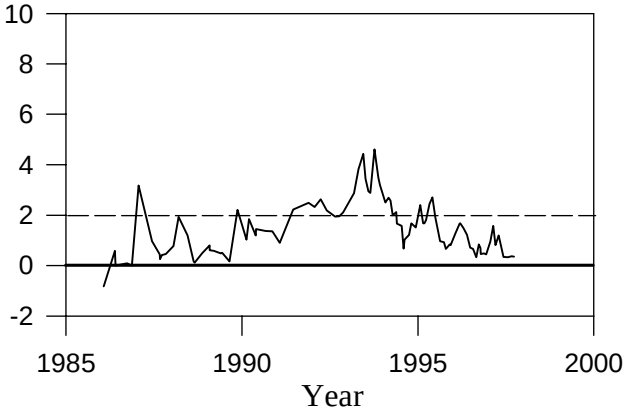


OXYGEN IN BOTTOM WATER

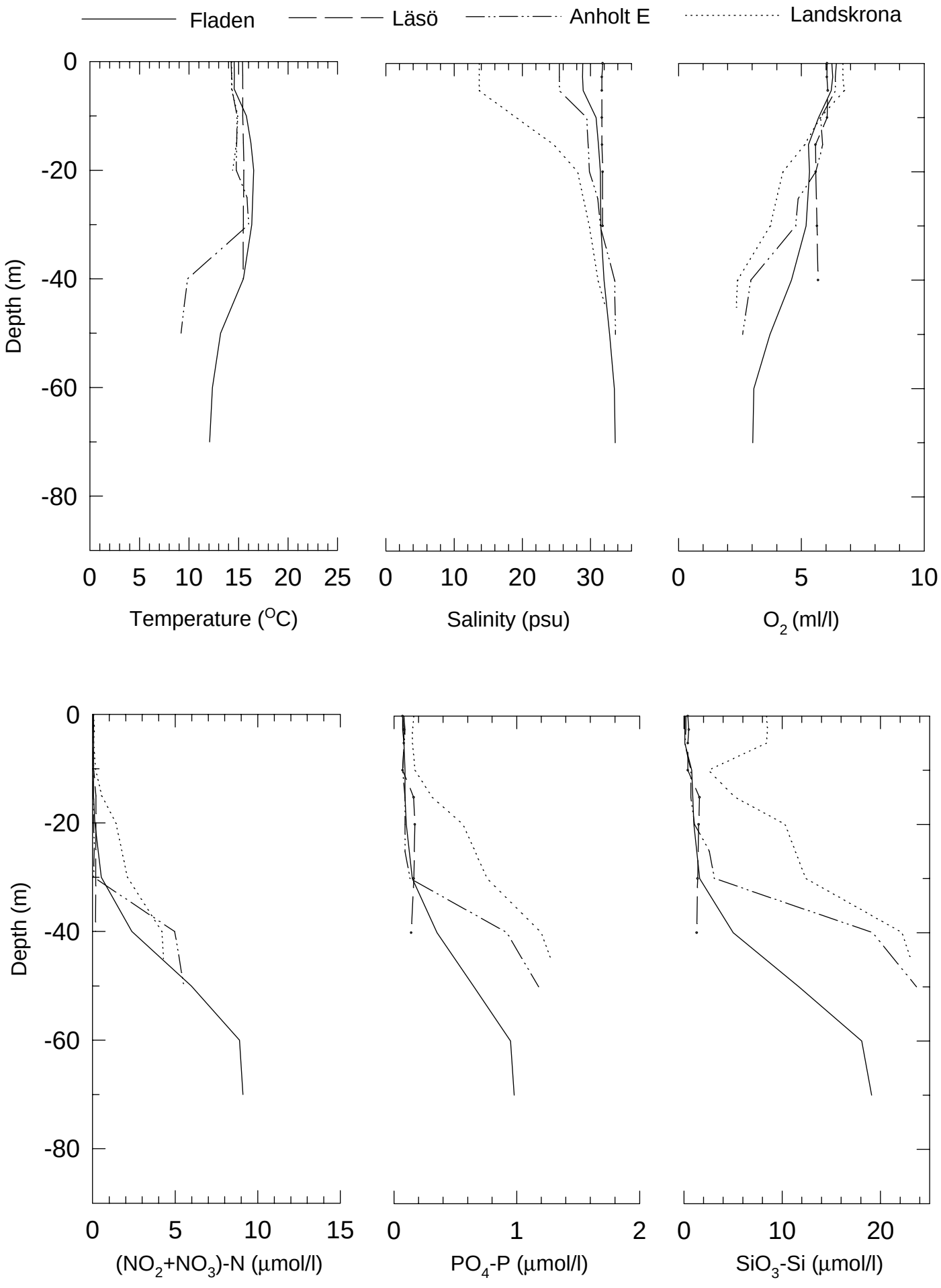
O_2 ml/l



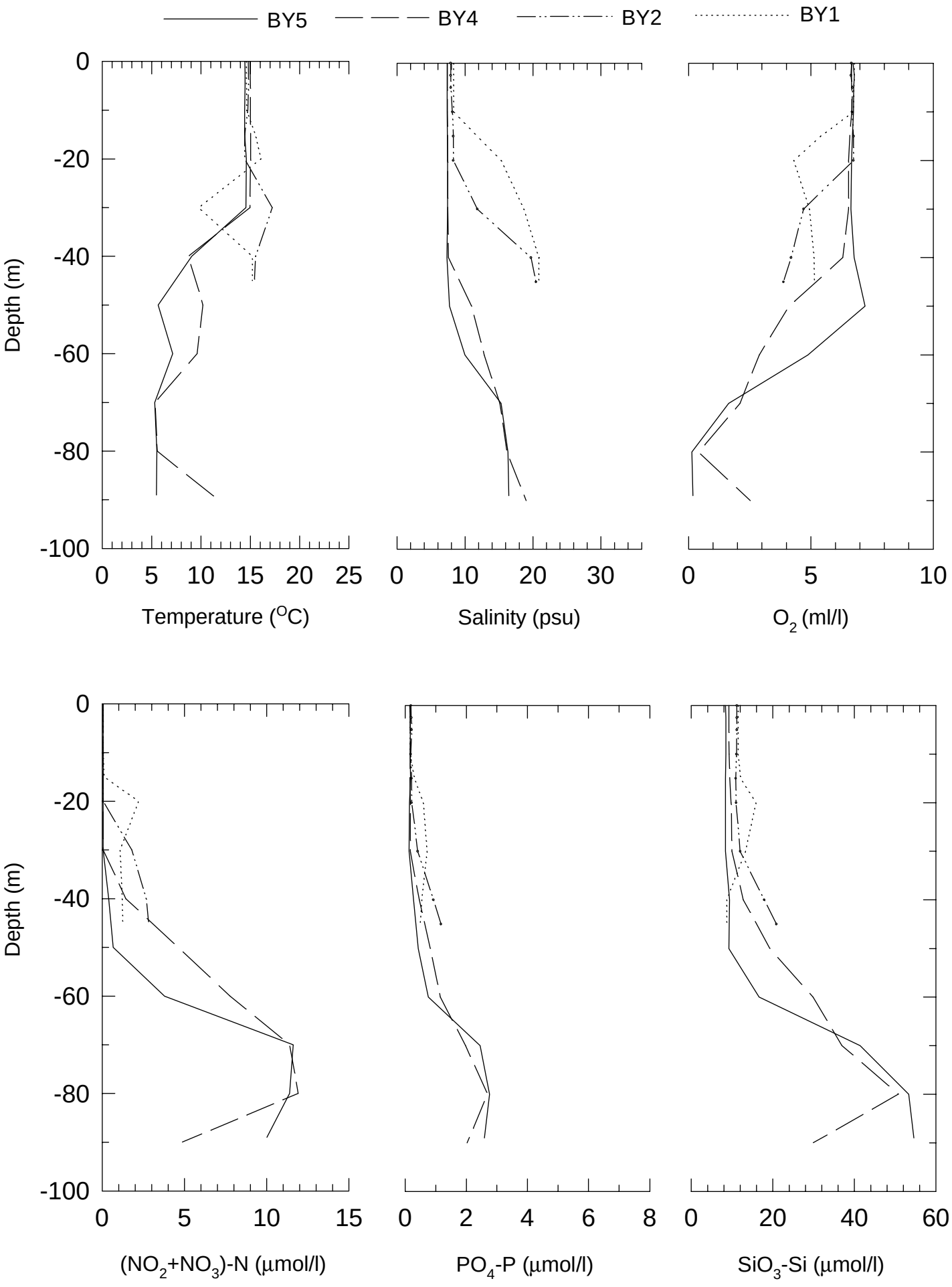
O_2 ml/l



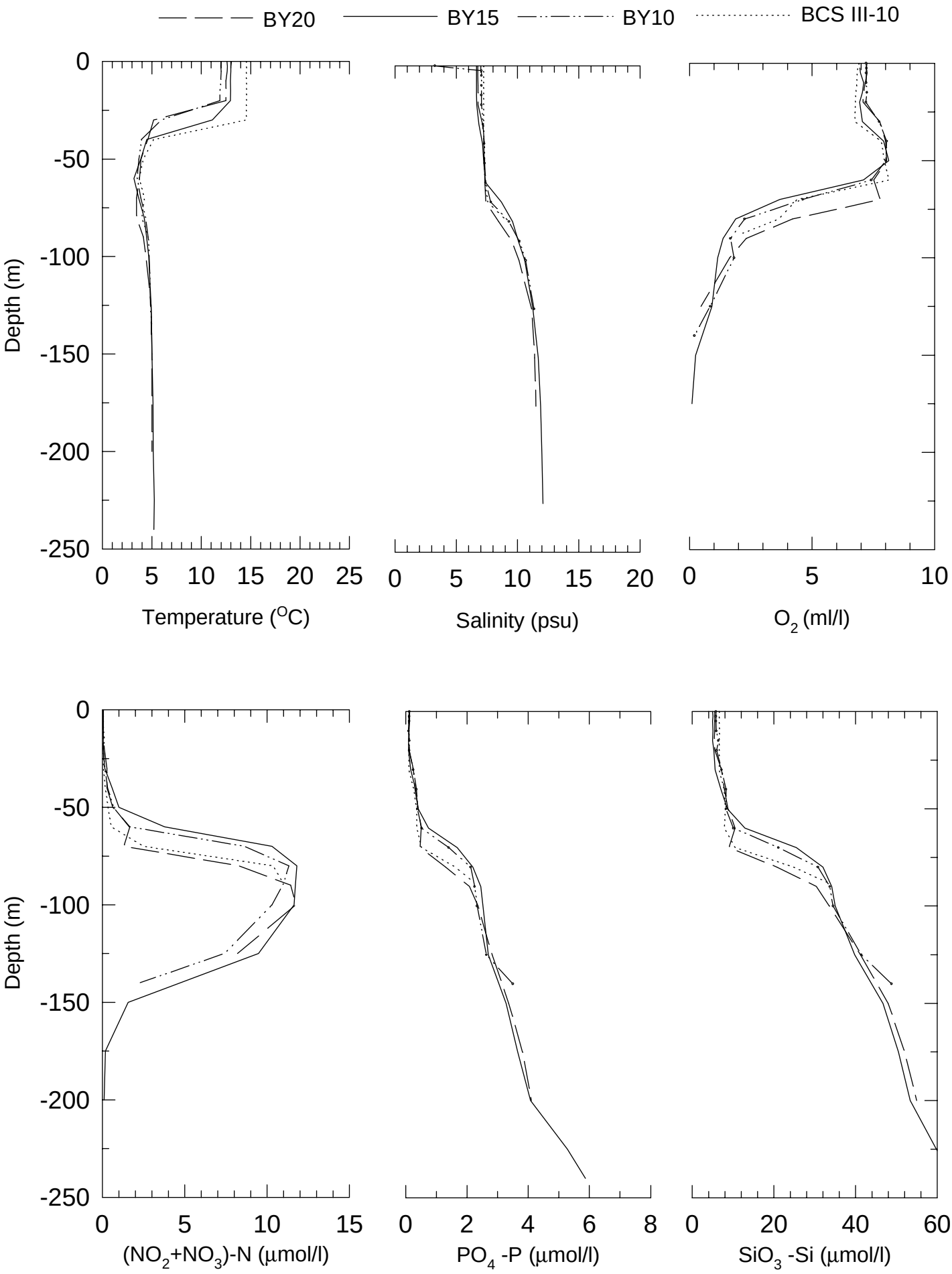
KATTEGAT and THE SOUND week 39 -97

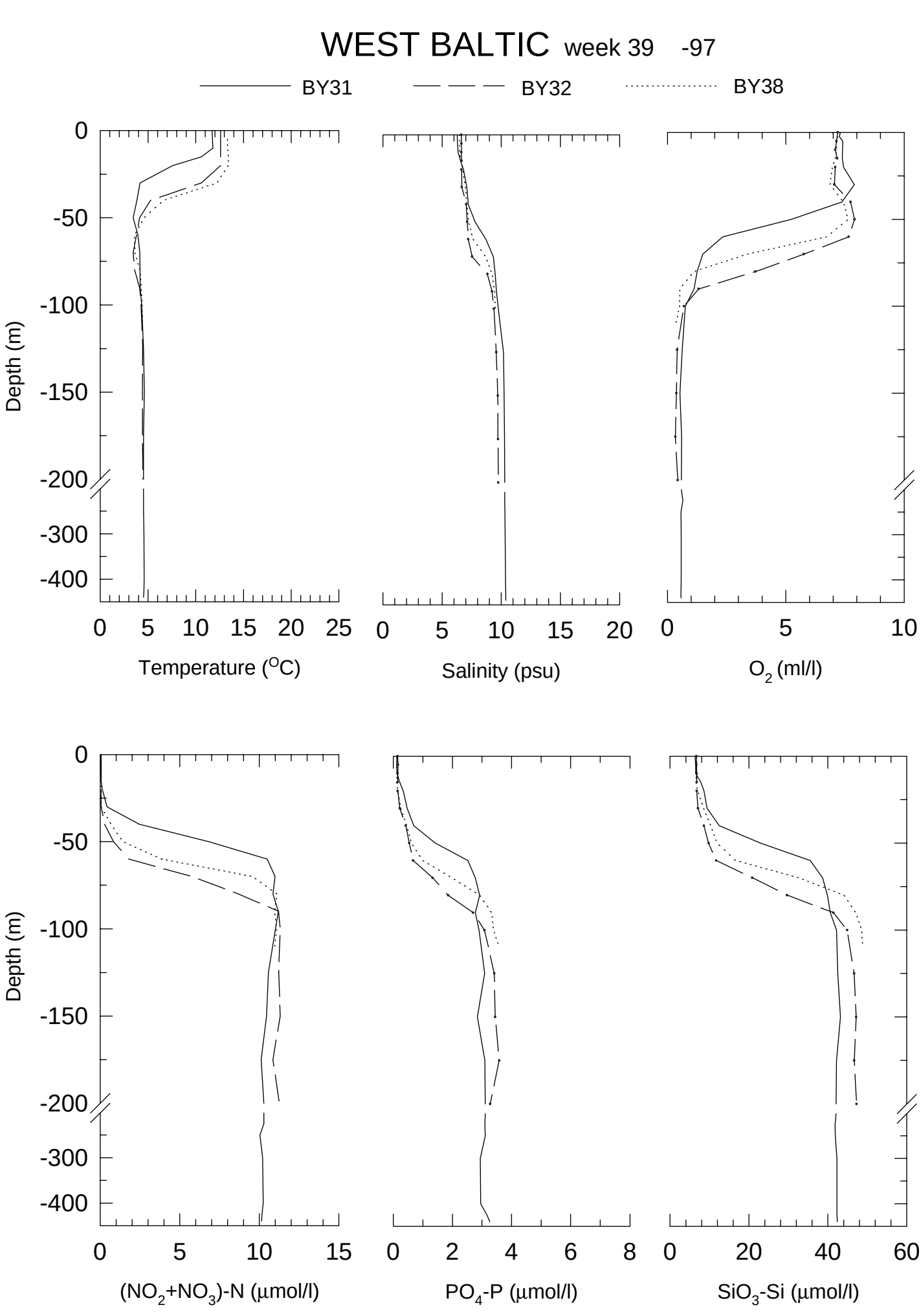


SOUTH BALTIC week 39 -97



EAST BALTIC week 39 -97




WEST BALTIC week 39 -97
BY31
BY32
BY38
Depth (m)
0
-50
-100
-150
-200
-300
-400
0 5 10 15 20 25
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)