Bodil
Thorstensson

Swedish Meteorological and Hydrological Institute
Oceanographical Laboratory

1997-11-18
Dnr: SaO-1997-0239

EXPEDITIONSRAPPORT FRÅN U/F ARGOS

CRUISE REPORT FROM R/V ARGOS

Expeditionens varaktighet: 971110-971115
Survey period:

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

Uppdragsgivare: SMHI
Principal:

SUMMARY

The expedition was performed within SMHIs regular marine monitoring program and covered the Skagerrak, the Kattegatt, the Sound and the Baltic Proper. A special sampling program was performed in the Hanö Bight. The winds during the expedition were moderate and had most of the time a direction from between south and east. The weather was mild with an air temperature of about 8°C. The surface water temperatures were normal. The thermocline was found below 10 meters in the Kattegatt and in the Sound, and below 35-40 meters in the Baltic. The nutrient concentrations were mostly much above than the detection limit but had not reached the high winter levels.
The oxygen concentrations in the Bornholm Basin were below 2 ml/l from a depth of 70m. Hydrogen sulphide was found in the deep water of the East Gotland Basin.

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

Telephone:
+46 31 696500
Telefax:
+46 31 690418

E-mail:
shark@smhi.se
WWW:
http://www.smhi.se/sgn0102/nodc/

PRELIMINÄRA RESULTAT

Expeditionen, som ingick i SMHIs ordinarie övervakningsprogram, startade i Göteborg och avslutades i Karlskrona. Vindarna under expeditionen var måttliga och hade mestadels en riktning mellan syd och ost, vid Gotland omkring väst. Vädret var milt med en temperatur omkring 8°C. Utöver det ordinarie monitoringprogrammet utfördes i Hanöbukten provtagning enligt Hanöbuktsprogrammet.

Skagerrak

Ytvattentemperaturerna låg mellan 8.3 och 9.3°C. Fosfathalterna var fortfarande låga med en förhöjd halt vid station P2 i jämförelse med föregående mätning (0.31 µmol/l). Det fanns ingen kraftig termoklin och station HS5 vid danska kusten saknade helt skiktning.

Kattegatt och Öresund

Ytvattentemperaturerna låg mellan 8.0 och 8.5°C. Vattnet var skiktat i hela området. Uttalade salt-och temperatursprång förelåg strax under 10m i Öresund och vid Läsö ränna. Fluorescensen i östra Kattegatt tydde på biologisk aktivitet. Närsaltshalterna var på en nivå mellan sommar-och vintervärden. Ammoniumvärdena var höga vid Läsö ränna, 1.3-1.4 µmol/l, och i Öresund, 1.0 µmol/l. Vid Kullen var nitrathalten högre än i övriga området(1.4-1.5 µmol/l).
De lägsta syrevärdena i Kattegatt återfanns vid Anholt E 20m, 3.90 ml/l (61% mättnad) och Kullen 15m, 2.47 ml/l (41% mättnad). I Öresund hade W Landskrona på 44m ett mättnadsvärde på 41% (2.47 ml/l).

Östersjön

Temperaturvariationen i ytvattnet i Östersjön låg mellan 6.7 och 9.1°C, värden från BY29 i norr och från Arkona i söder. Termoklinen låg på 35-40m i hela Östersjön. Fluorescensen var högre än i övrigt i södra Östersjön och vid Ölands södra udde (BY39).
Nitrathalten låg på mellan 0.2 och 1.0 µmol/l, utom vid BY1, där den var under detektionsgränsen. För fosfat var gränserna 0.17-0.32 µmol/l, för silikat 6.2 till 8.5 µmol/l.
I Bornholmsbassängen var syrehalten under 2 ml/l från 70m och djupare, vilket innebar en syremättnad mindre än 28%.
Svavelväte återfanns i östra Gotlandsbassängen på 150m vid Fårödjupet, på 175m vid Gotlandsdjupet och på 140m vid BY10.

DELTAGARE

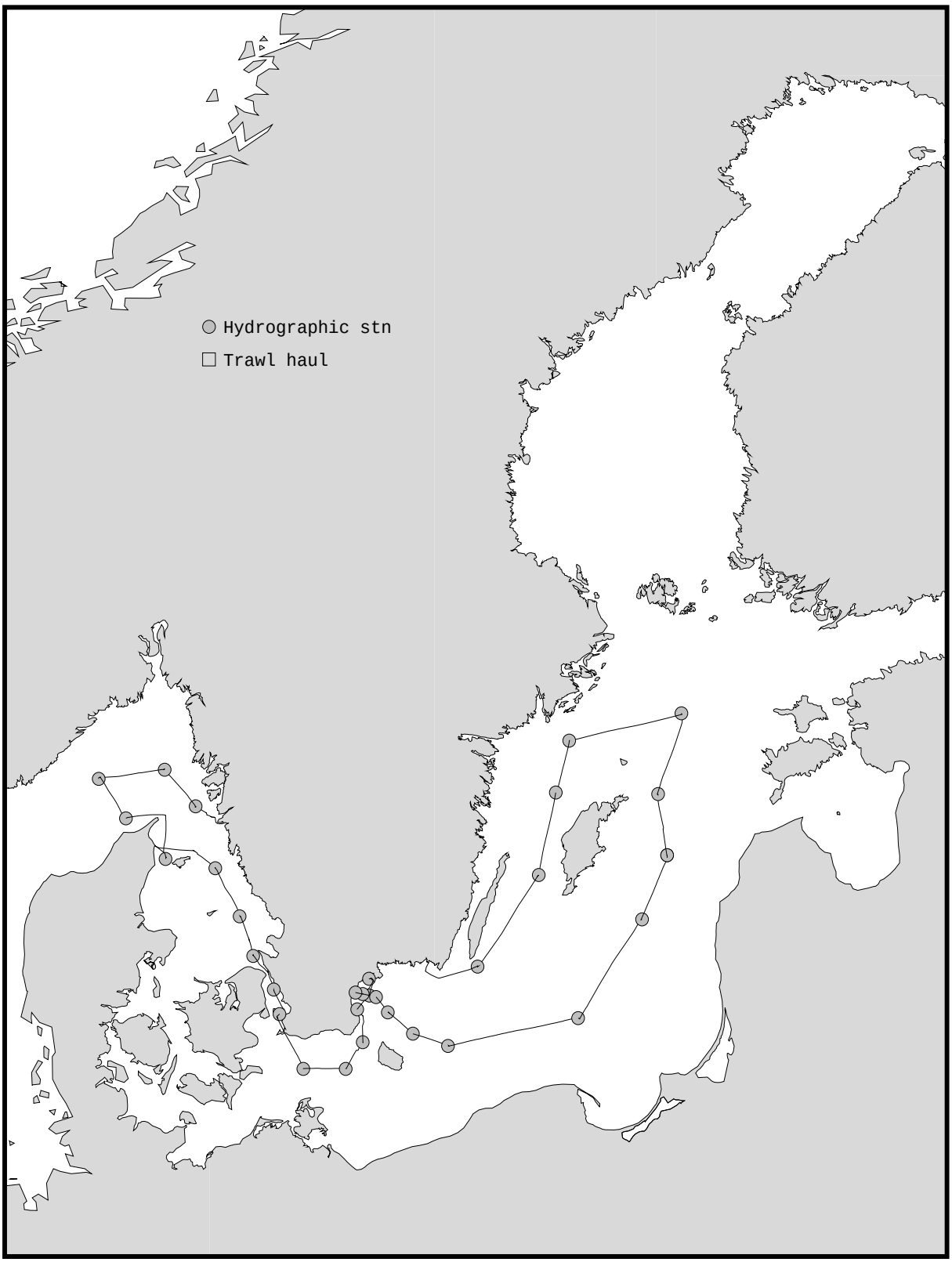
Namn	Från
Bodil Thorstensson, expeditionsledare	SMHI Oceanografiska lab.
Tuulikki Jaako	- ” -
Mats Ohlson	- ” -
Björn Sjöberg	- ” -
Jan Szaron	- ” -

BILAGOR

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

T R A C K C H A R T

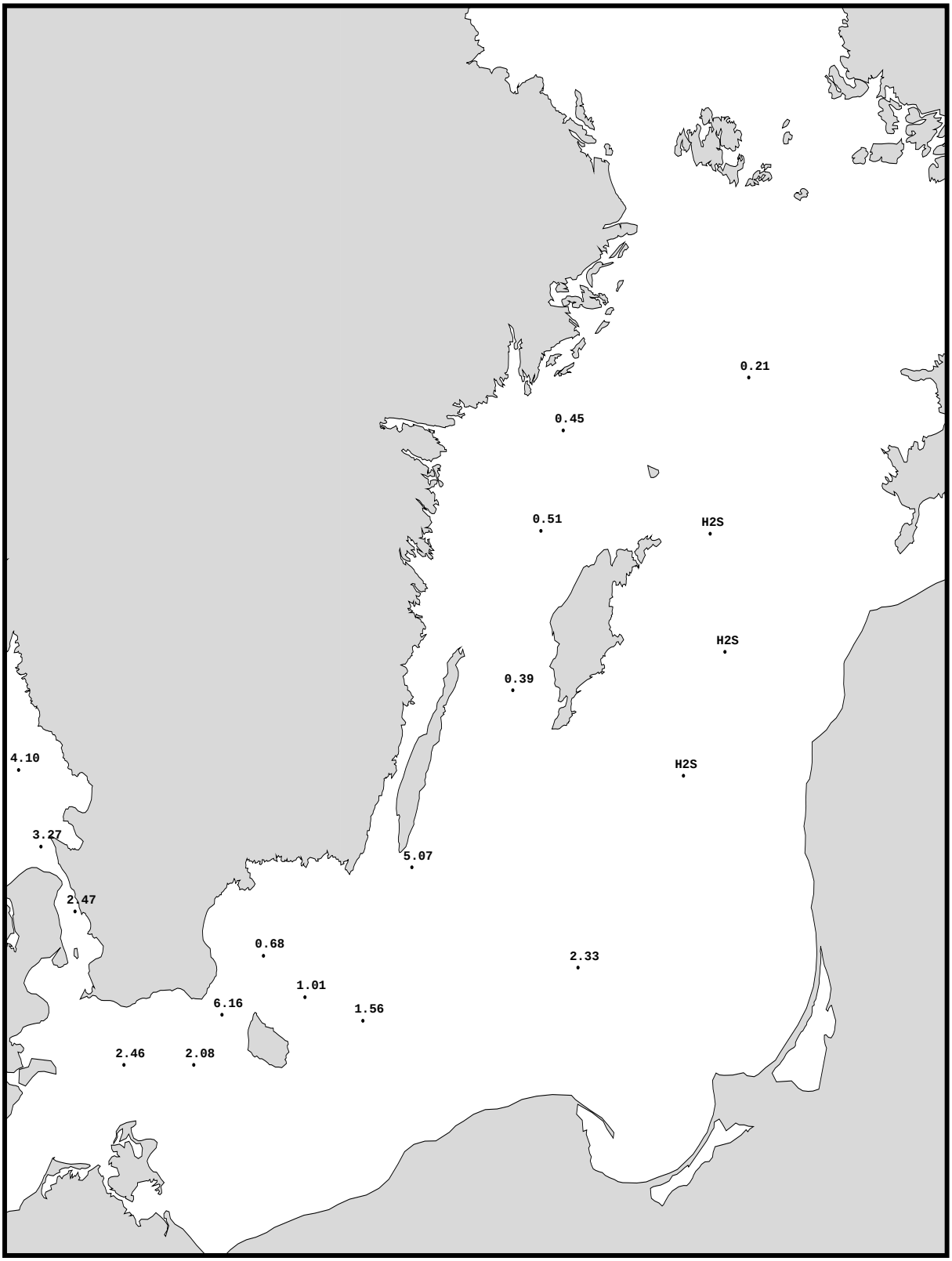
Country: Sweden
Ship : Argos
Date : 971110-971115
Series : 0695-0726



CSR RefNo: 1997-77AR/0695-0726

Bottom water oxygen concentration (ml/l)

Country: Sweden
Ship: Argos
Date: 971110-971115
Series: 0695-0726



SMHI   ***** Hydrographic series *****   Ship: 14-Argos   Year: 1997   ******   Date: 1997-11-17
Ocean lab   Time: 08:37

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 (Weather Cloud Sea Ice)	Ctd	PPCPZZT (PhytoPlankton, PhytoPlankton Bw, Chlorophyll, Primprod, ZooPlankton, ZooBottom, Tool)	No de	Temp	Salin	Ph	Oxyg	H2S	Po4P	TotP	No2N	No3N	Nh4N	TotN	Alkal	SiO3	Humus	Ligni	PON	POC	TOC	Comm
0695	SKEX23	PMK	P2	N5752	E1118	971110	1120	97		6.5	18	10	8.2	996	2730	-	--x----	11	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0696	SKEX17	PMK	Å16	N5816	E1043.5	971110	1445	200			14	10	9.2	996	2830	x	--x----	14	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0697	SKNX21	PMK	M6	N5810	E0930	971110	1930	620			14	10	8.6	995	9930	x	-xxx---	18	x	x	x	x	-	x	x	x	x	x	x	x	x	-	-	-	-	-	x
0698	SKEX69	PMK	HS5	N5744.2	E1000.4	971111	0110	87			14	12	8.9	996	9930	x	--x----	10	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0699	KANX09	BMP	LÄSÖ RÄNNA	N5717.6	E1044.5	971111	0645	43			16	8	8.4	998	6820	x	--x----	9	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0700	KANX25	BMP	FLADEN	N5711.5	E1140	971111	1820	80			16	8	8.6	1002	9930	x	--x----	13	x	x	x	x	-	x	x	x	x	x	x	x	x	-	-	-	-	-	x
0701	KAEX29	BMP	ANHOLT E	N5640.0	E1207.0	971111	2250	54			16	8	7.0	1003	9930	x	-xxx---	10	x	x	x	x	-	x	x	x	x	x	x	x	x	-	-	-	-	-	x
0702	KAEX33	BAS	KULLEN	N5614	E1222.2	971112	0205	23			16	8	6.8	1003	9920	x	-------	5	-	-	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0703	SOCX39	BMP	W LANDSKRONA	N5552.0	E1245.0	971112	0535	48			11	6	6.7	1003	9920	x	--x----	10	-	-	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0704	SOCX49	BAS	OSKARSGRUNDET (NÄRA)	N5535.9	E1251.5	971112	0735	9			14	6	7.6	1003	4920	x	-------	3	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0705	BPSA02	BMP	BY1	N5500	E1318	971112	1140	47		7	14	7	7.5	1000	4920	x	-------	8	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0706	BPSA03	BMP	BY2 ARKONA	N5500	E1405	971112	1435	47			09	7	8	1003	2820	x	-xxx---	9	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x	-	-	-	x
0707	BPSA04	HNO	BY3 HAMRARNE SUND	N5517.5	E1424	971112	1645	48			09	10	8	1003	9920	x	--x----	8	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0708	BPSH14	HNO	HANÖ-4	N5539	E1418	971112	1900	18			09	7	8.6	1002	9920	x	--x----	4	-	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0709	BPSH20	HNO	HANÖ-10	N5548	E1431.5	971112	2025	25			11	7	9.1	1001	9920	x	--x----	5	-	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0710	BPSH11	HNO	HANÖ-1	N5559	E1431	971112	2200	14			11	7	9.1	1001	9920	x	--x----	3	-	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0711	BPSH19	HNO	HANÖ-9	N5549	E1424	971112	2335	15			05	9	9	1000	9920	x	--x----	3	-	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0712	BPSH13	HNO	HANÖ-3	N5550	E1416	971113	0020	17			05	5	9	999	9920	x	--x----	4	-	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0713	BPSH18	HNO	HANÖ-8	N5547	E1439	971113	0155	43			05	7	8	998	9930	x	--x----	7	-	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0714	BPSH05	BAS	HANÖBUKTEN	N5537	E1452	971113	0325	78			05	5	8.3	996	9920	x	--x----	11	-	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0715	BPSB06	BMP	BY4 CHRISTIANSÖ	N5523	E1520	971113	0600	94			16	2	8.2	995	9920	x	-------	12	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x
0716	BPSB07	BMP	BY5 BORNHOLMSDJ	N5515	E1559	971113	0855	91		8	21	12	7.9	996	2830	x	-xxx---	13	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x	-	-	-	x
0717	BPSE11	BMP	BCS III-10	N5533.3	E1824	971113	1630	90			21	15	9	999	9940	x	--xx---	13	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x	-	-	-	x
0718	BPEX13	BMP	BY10	N5638	E1935	971114	0045	147			27	13	6.9	1003	9940	x	--x----	16	x	x	-	x	x	x	x	x	x	x	x	-	x	-	-	-	-	-	-
0719	BPEX21	BMP	BY15 GOTLANDSDJ	N5720	E2003	971114	0610	249		10	27	6	7	1006	2830	x	-xxx---	20	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-
0720	BPEX21	BAS	BY15 GOTLANDSDJ	N5720	E2003	971114	0745	249		10	27	6	7	1006	2830	-	-------	4	x	x	-	x	x	x	-	x	x	-	-	-	x	-	-	-	-	-	-
0721	BPEX26	BMP	BY20 FÅRÖDJ	N5800	E1953	971114	1130	202		10	27	4	7.3	1009	1630	x	--x----	18	x	x	-	x	x	x	x	x	x	x	x	-	x	-	-	-	-	-	-

SMHI ***** Hydrographic Ship: 14-Argos ****** Date: 1997-11-17
Ocean lab ***** series Year: 1997 ****** Time: 08:37

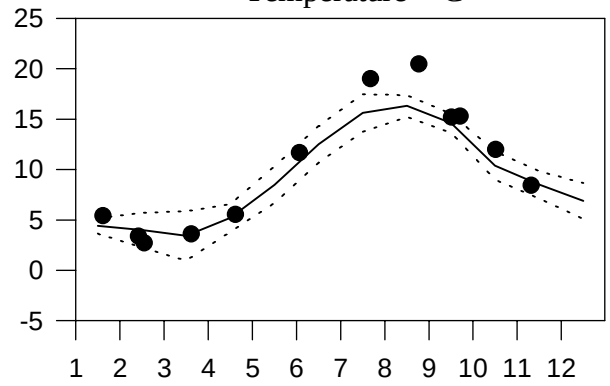
Ser no	Stat code	Proj	Station-----------------	Lat-----	Lon-----	Date yymmdd	Time hhmm utc	Bott deph m	Mld m	Secc deph m	Wind di	Wind ve	Air temp C	Air pres hPa	WCSI elec aoae tu hd	Ctd	PPCPZZZT Hrhhoor Cilyooa motPBw PrP l	No de	Temp	Salin	Ph	Oxyg	H2S	PO4P	TotP	NO2N	NO3N	NH4N	TotN	Alkal	SiO3	Humus	Ligni	PON	POC	TOC	Comm
0722	BPNX35BMP		BY29	N5853	E2019	971114	1700	179			25	6	6.4	1011	9930	x	--xx---	17	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	-
0723	BPNX37BMP		BY31 LANDSORTSDJ	N5835	E1814	971114	2350	449			25	2	8	1014	9910	x	--x----	24	x	x	-	x	-	x	x	x	x	x	x	-	x	x	-	-	-	-	-
0724	BPWX38BMP		BY32 NORRKÖPINGSDJ	N5801	E1759	971115	0410	205			25	3	7.3	1015	9910	x	-------	17	x	x	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	-
0725	BPWX45BMP		BY38 KARLSÖDJ	N5707	E1740	971115	0940	113		11	00	0	9.0	1018	4810	x	--xx---	15	x	x	x	x	-	x	x	x	x	x	x	x	x	x	-	-	-	-	x
0726	BPSE49BAS		BY39 ÖLANDS S UDDE	N5607	E1632	971115	1520	50			11	3	7.8	1018	9910	x	-------	8	x	x	-	x	-	x	-	x	x	-	-	-	x	-	-	-	-	-	-

STATION P2 SURFACE WATER (0-15 m)

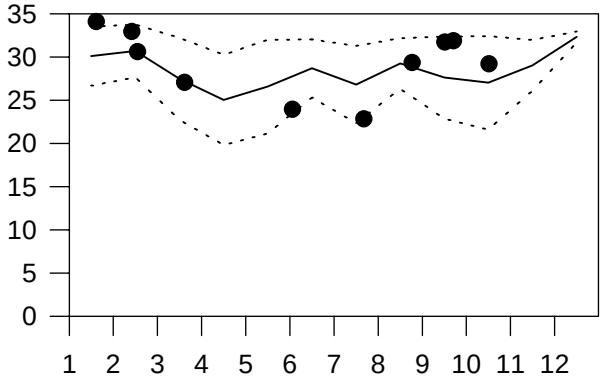
Annual Cycles

Mean 1986-1995 St.Dev. 1997

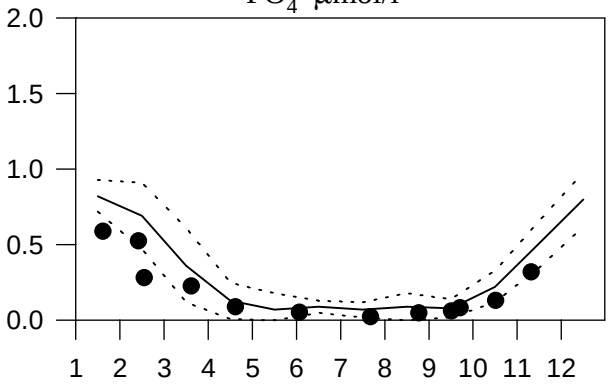
Temperature °C



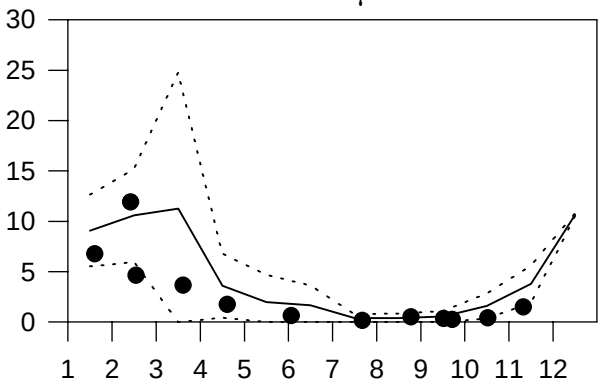
Salinity psu



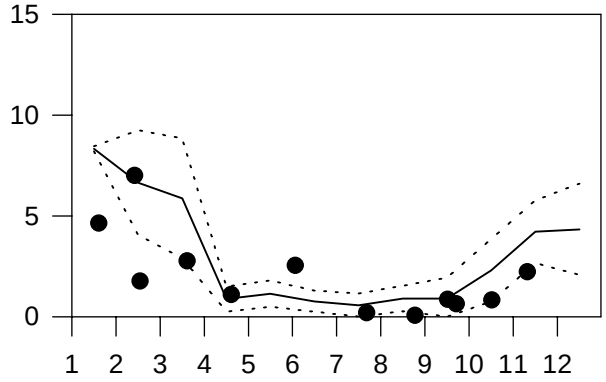
PO_4 µmol/l



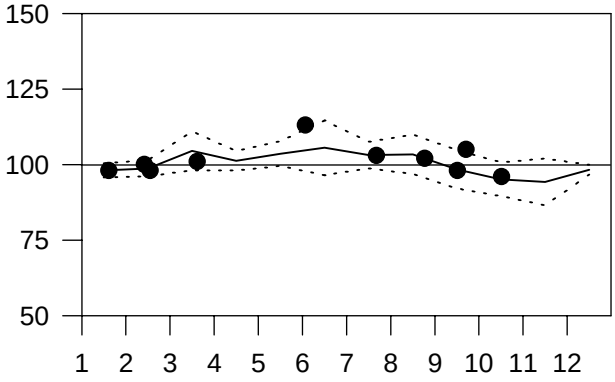
DIN µmol/l



SiO_3 µmol/l

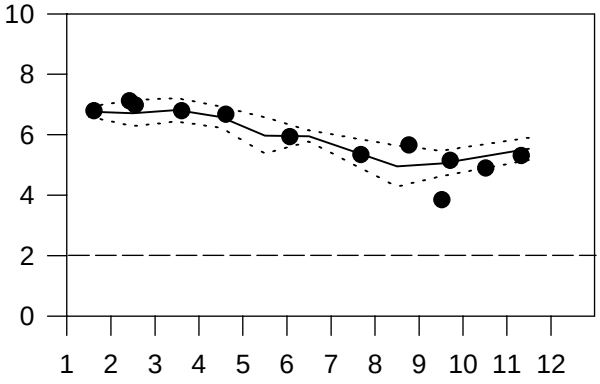


O_2 saturation %

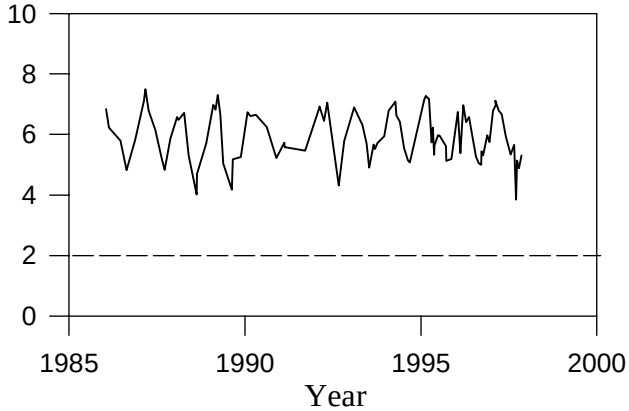


OXYGEN IN BOTTOM WATER

O_2 ml/l



O_2 ml/l

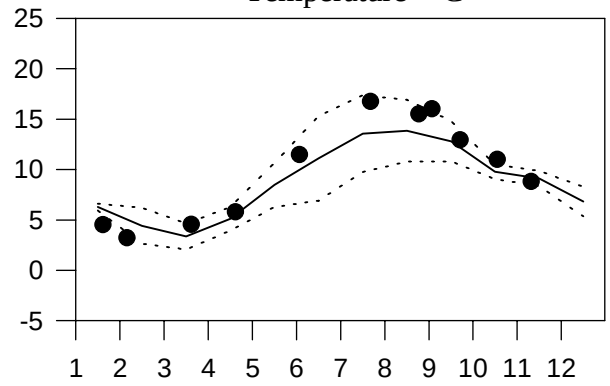


STATION M6 SURFACE WATER (0-15 m)

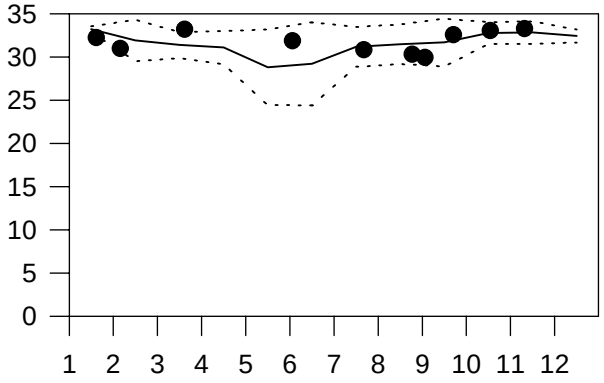
Annual Cycles

Mean 1986-1995 St.Dev. 1997

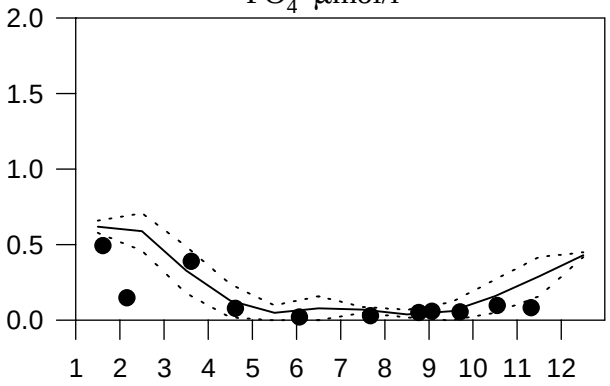
Temperature °C



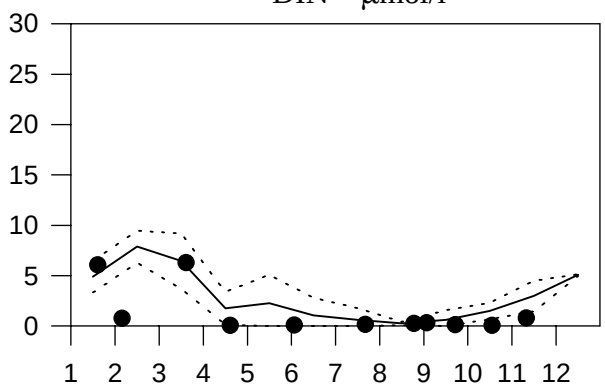
Salinity psu



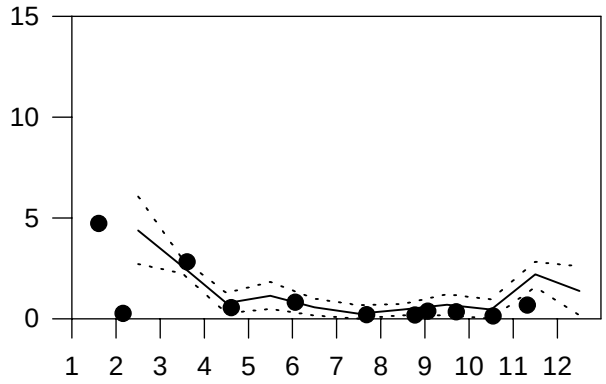
PO_4 µmol/l



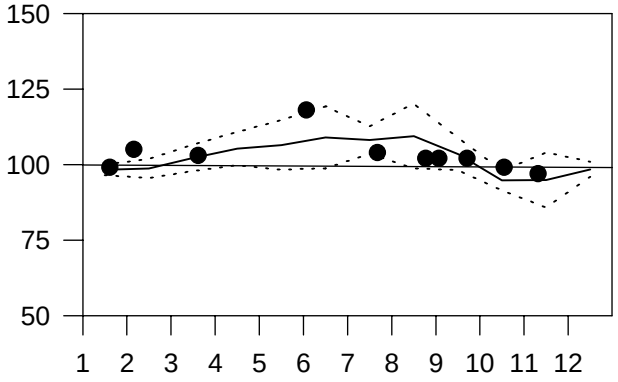
DIN µmol/l



SiO_3 µmol/l

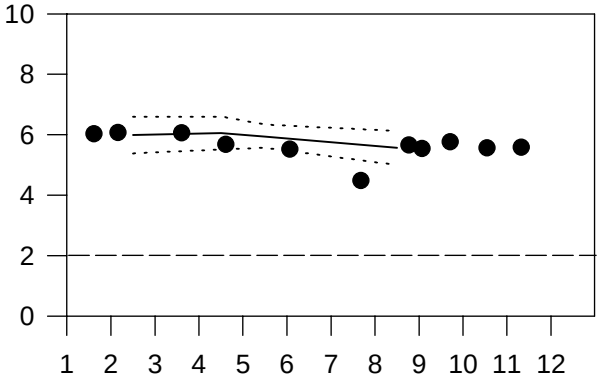


O_2 saturation %

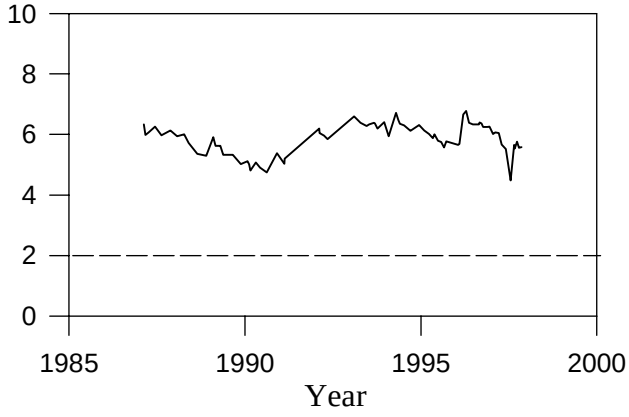


OXYGEN IN BOTTOM WATER

O_2 ml/l



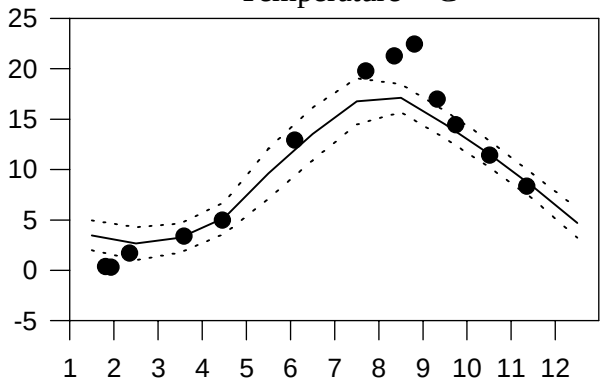
O_2 ml/l



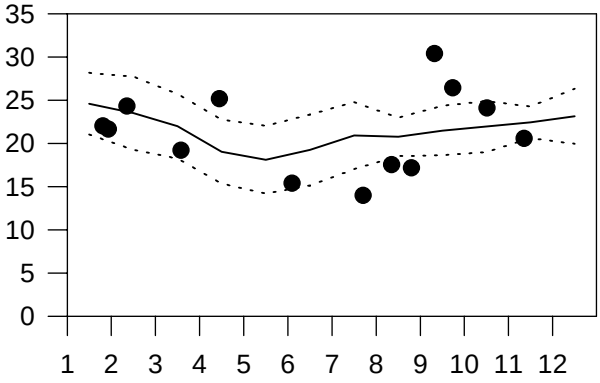
STATION ANHOLT E SURFACE WATER (above halocline)

Annual Cycles

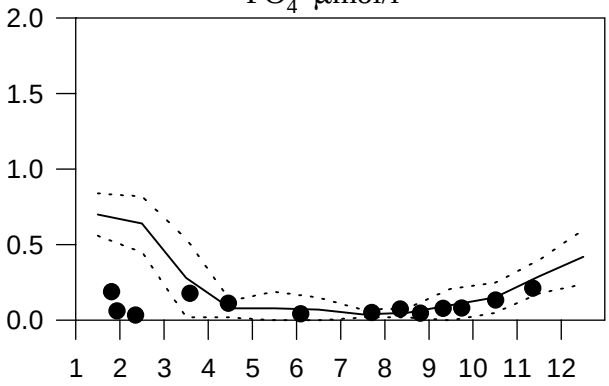
Temperature °C



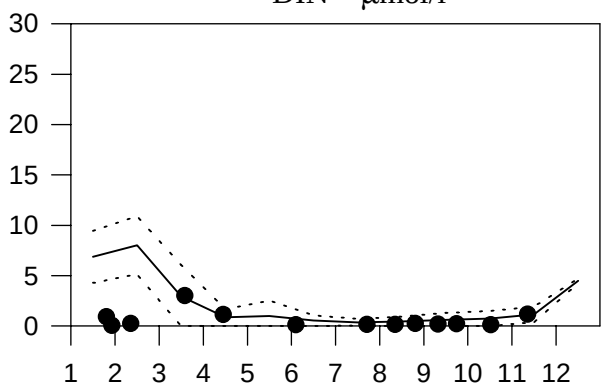
Salinity psu



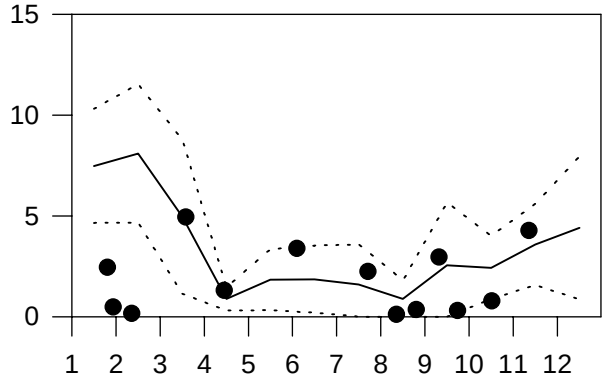
PO_4 µmol/l



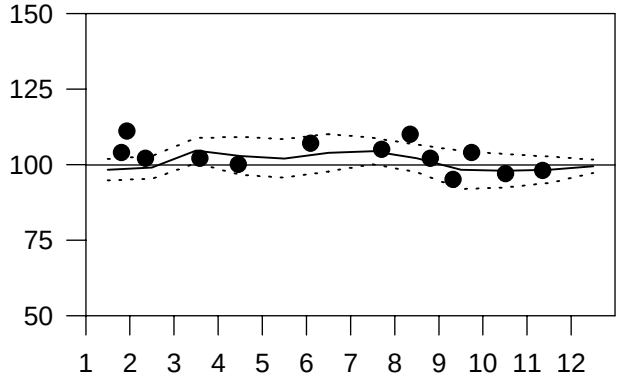
DIN µmol/l



SiO_3 µmol/l

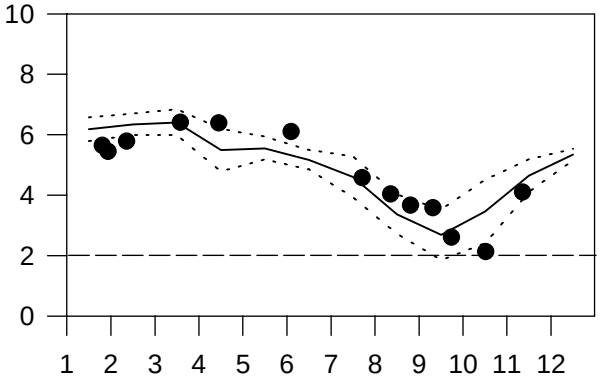


O_2 saturation %

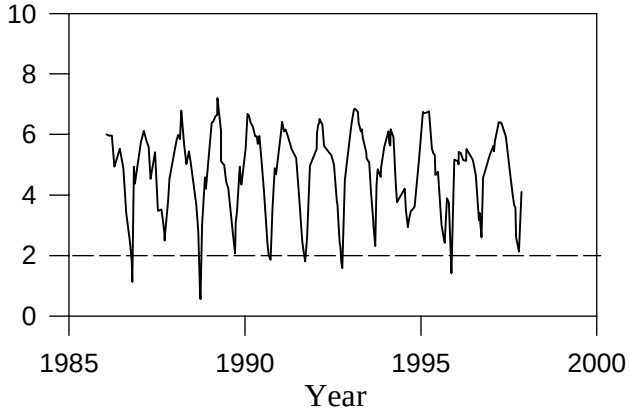


OXYGEN IN BOTTOM WATER

O_2 ml/l



O_2 ml/l

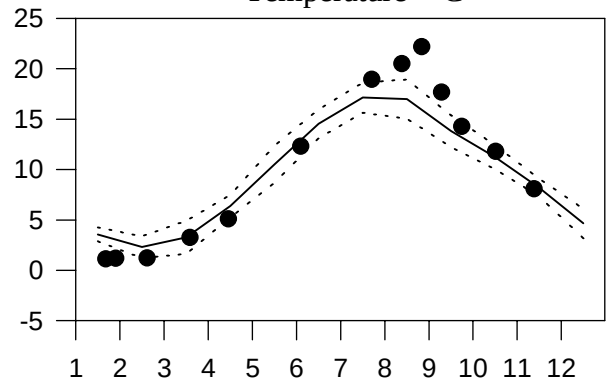


STATION W LANDSKRONA SURFACE WATER (0-15 m)

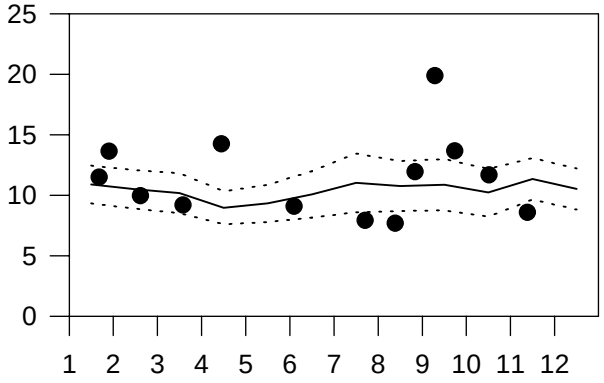
Annual Cycles

Mean 1986-1995 St.Dev. 1997

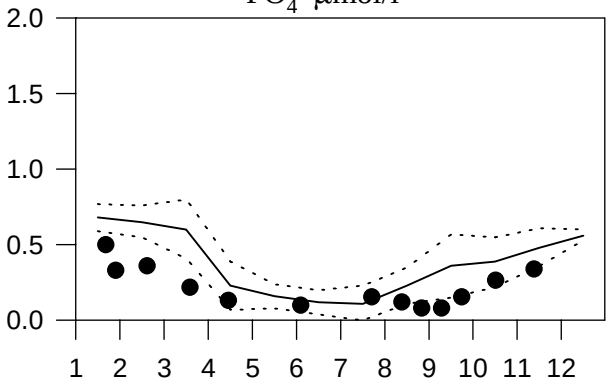
Temperature °C



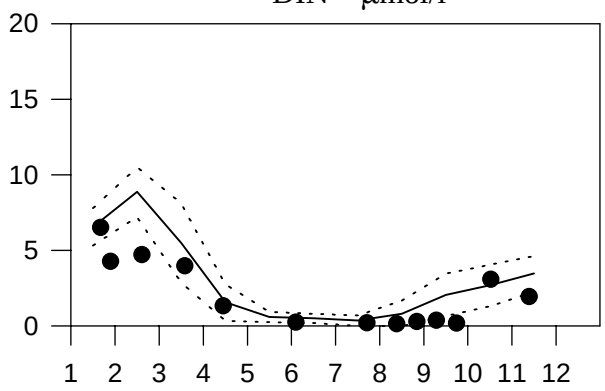
Salinity psu



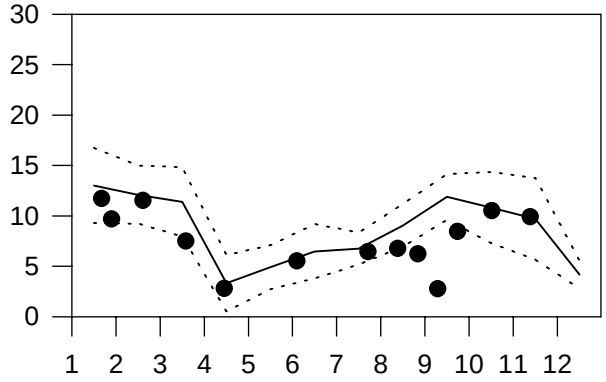
PO_4 µmol/l



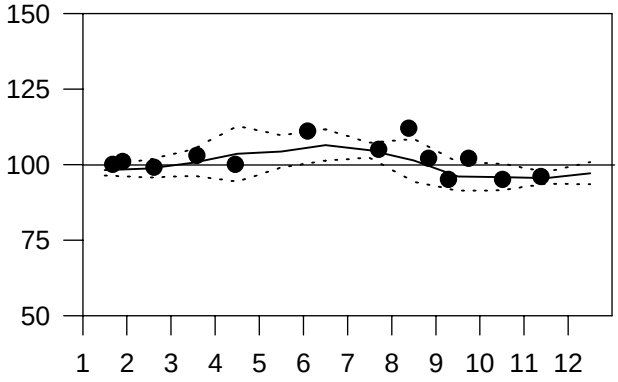
DIN µmol/l



SiO_3 µmol/l

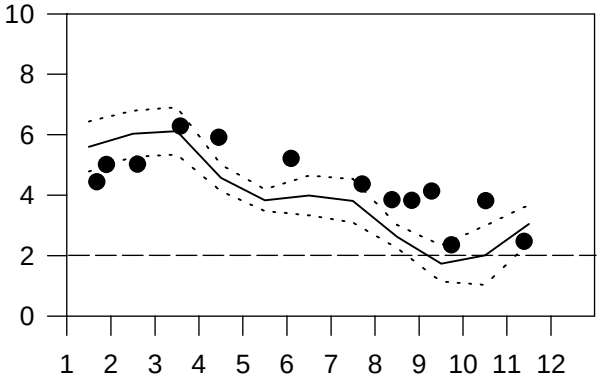


O_2 saturation %

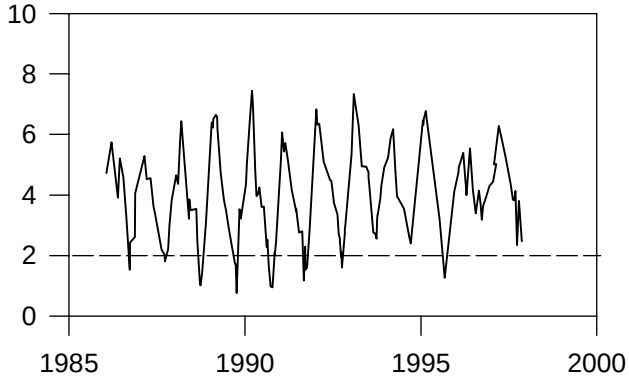


OXYGEN IN BOTTOM WATER

O_2 ml/l



O_2 ml/l

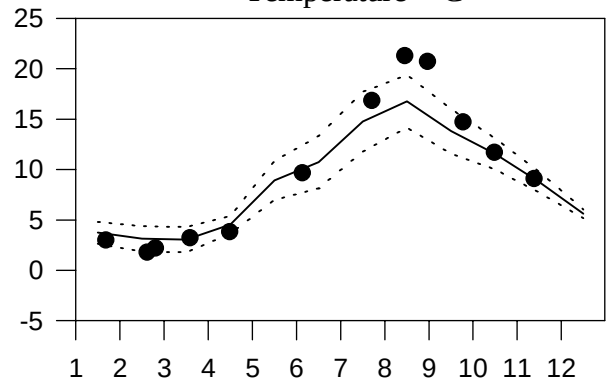


STATION BY2 SURFACE WATER (0-15 m)

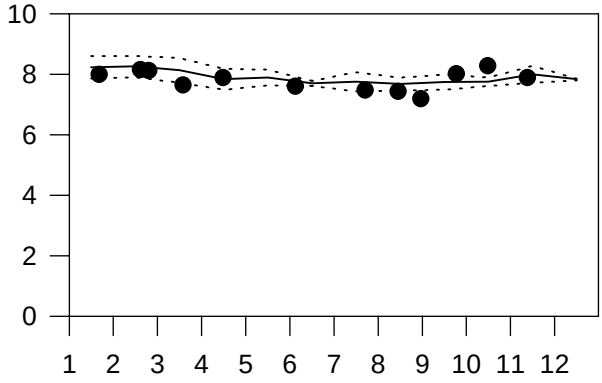
Annual Cycles

Mean 1986-1995 St.Dev. 1997

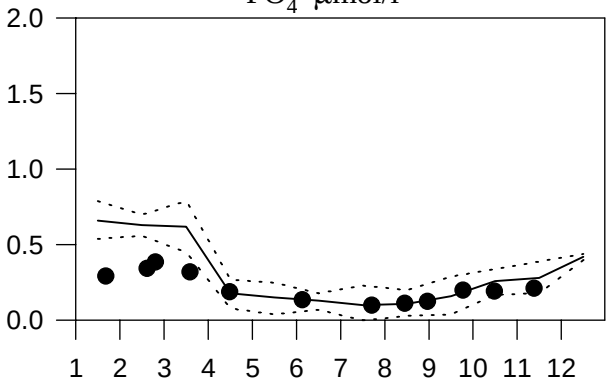
Temperature °C



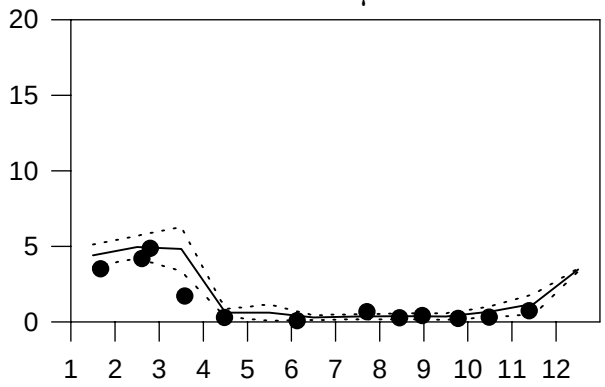
Salinity psu



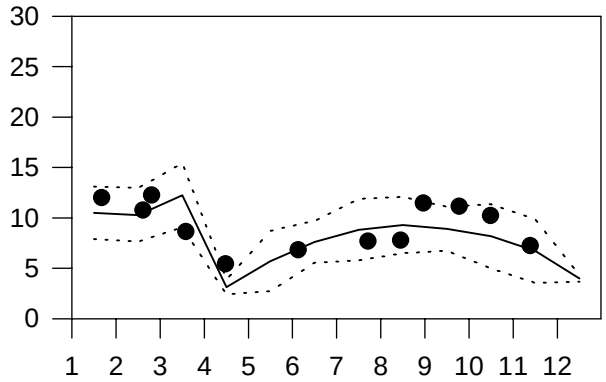
PO_4 µmol/l



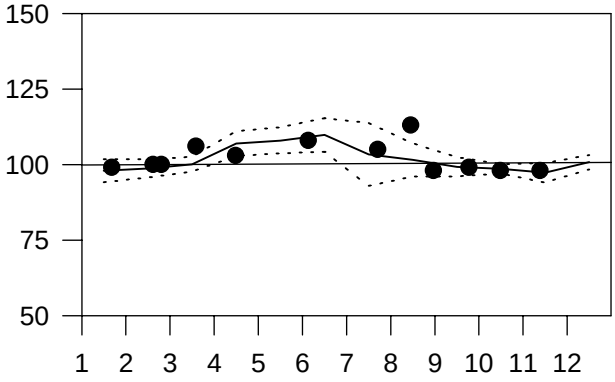
DIN µmol/l



SiO_3 µmol/l

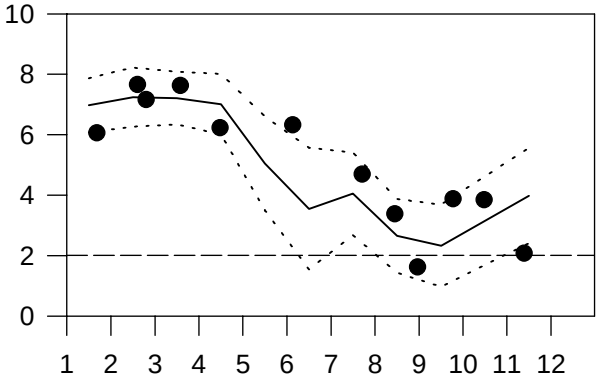


O_2 saturation %

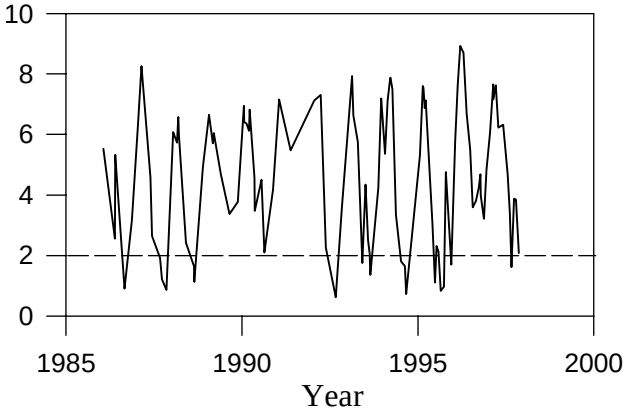


OXYGEN IN BOTTOM WATER

O_2 ml/l



O_2 ml/l

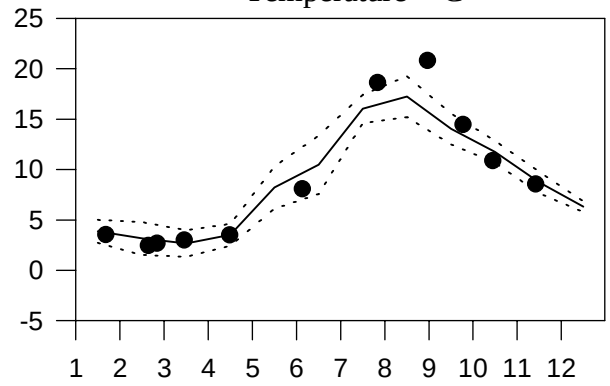


STATION BY5 SURFACE WATER (0-15 m)

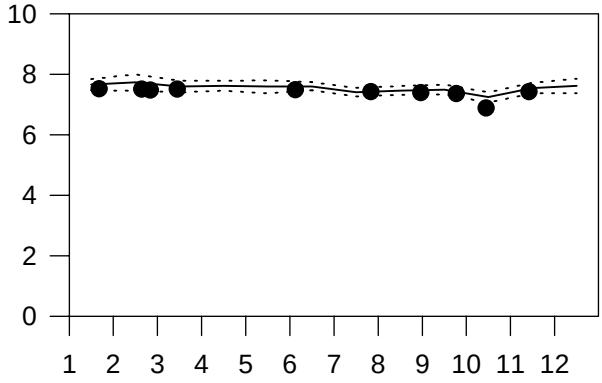
Annual Cycles

Mean 1986-1995 St.Dev. 1997

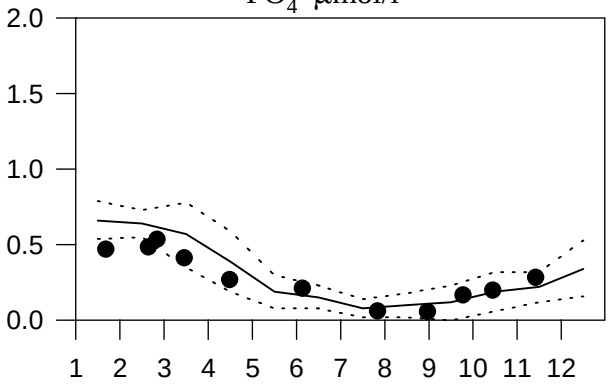
Temperature °C



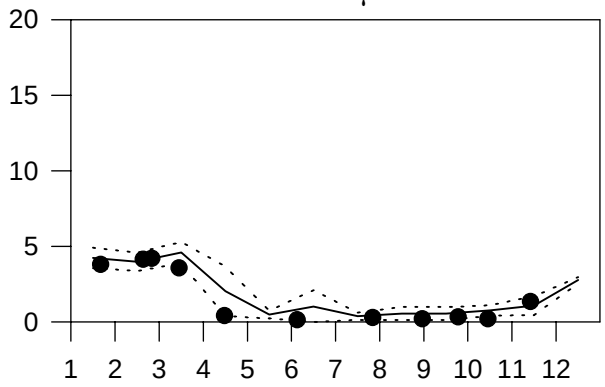
Salinity psu



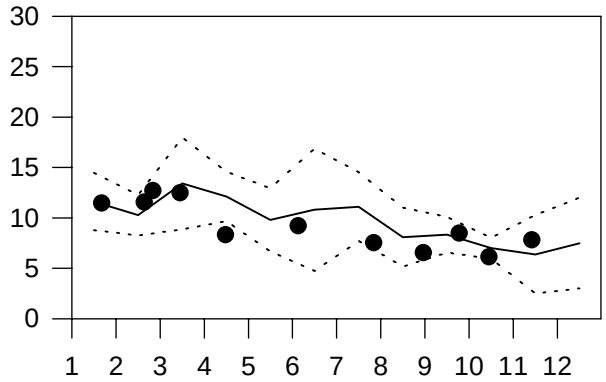
PO_4 µmol/l



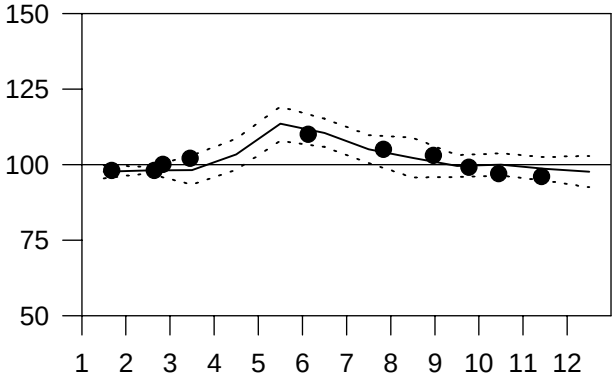
DIN µmol/l



SiO_3 µmol/l

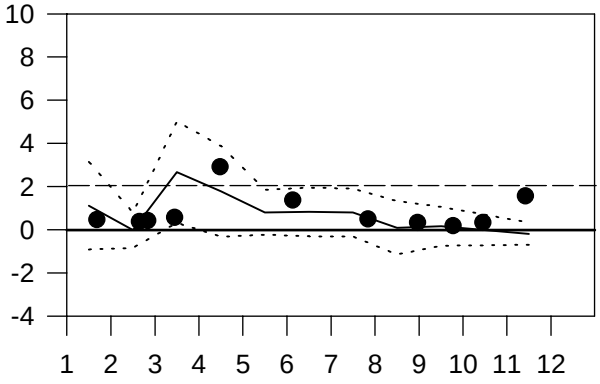


O_2 saturation %

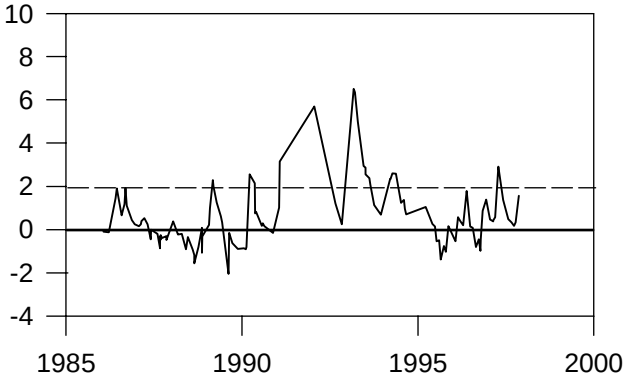


OXYGEN IN BOTTOM WATER

O_2 ml/l



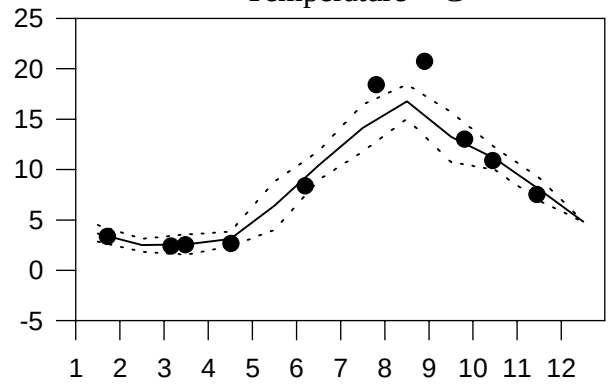
O_2 ml/l



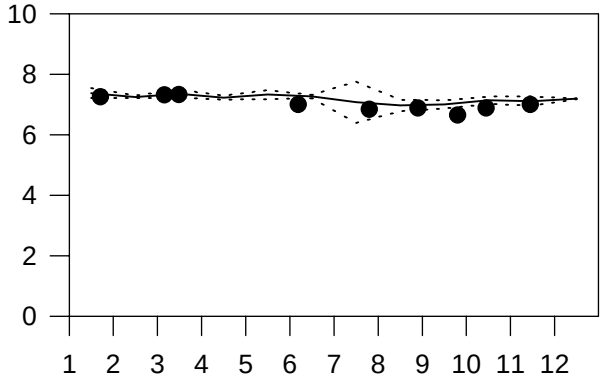
STATION BY15 SURFACE WATER (0-15 m)

Annual Cycles

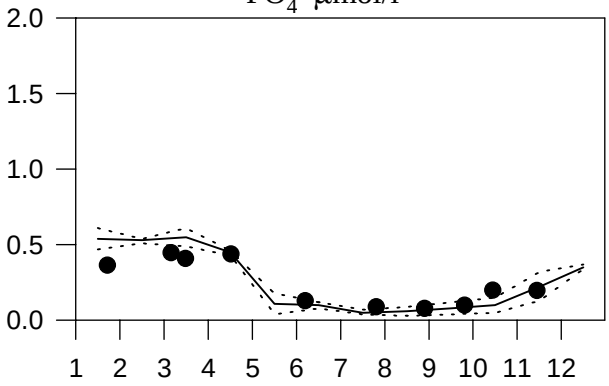
Temperature °C



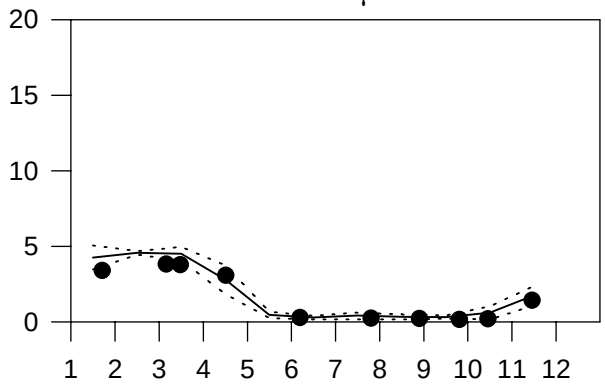
Salinity psu



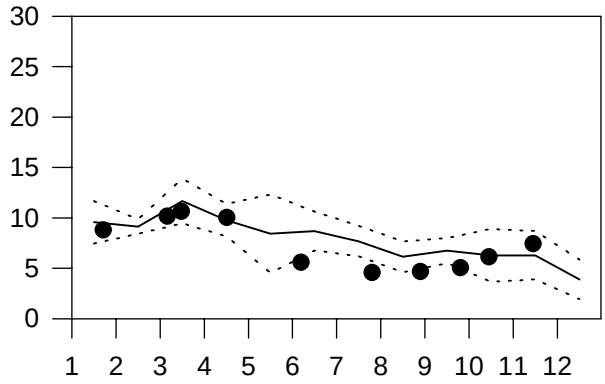
PO_4 µmol/l



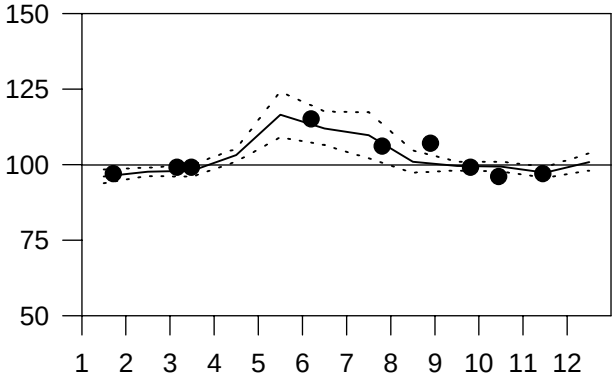
DIN µmol/l



SiO_3 µmol/l

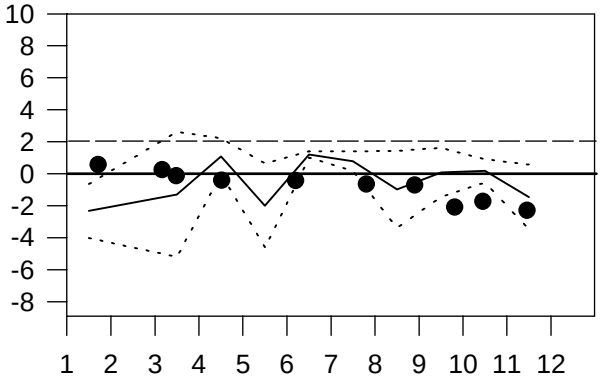


O_2 saturation %

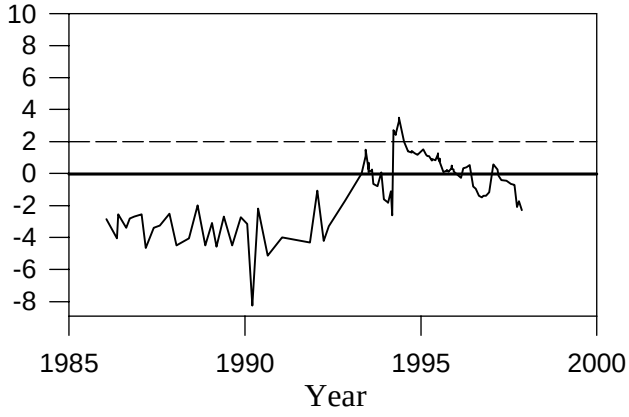


OXYGEN IN BOTTOM WATER

O_2 ml/l



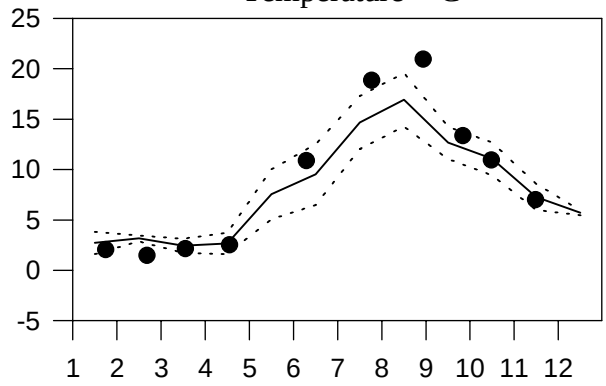
O_2 ml/l



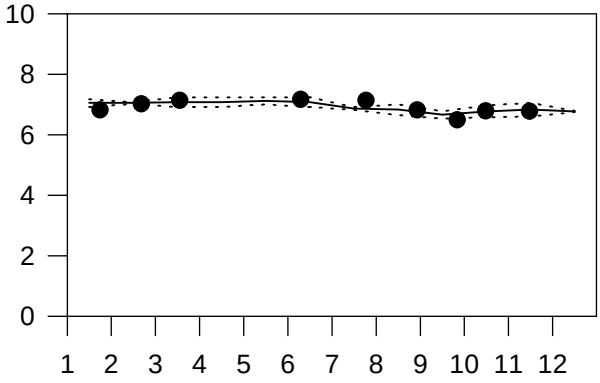
STATION BY38 SURFACE WATER (0-15 m)

Annual Cycles

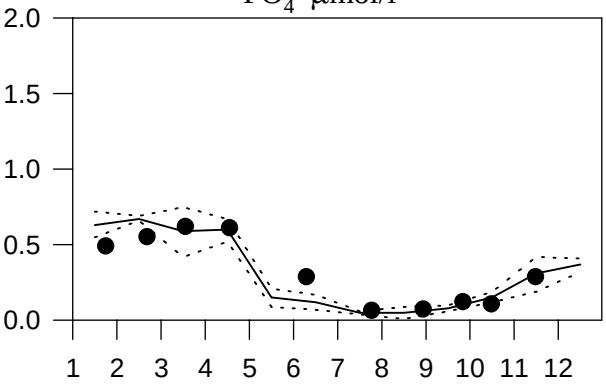
Temperature °C



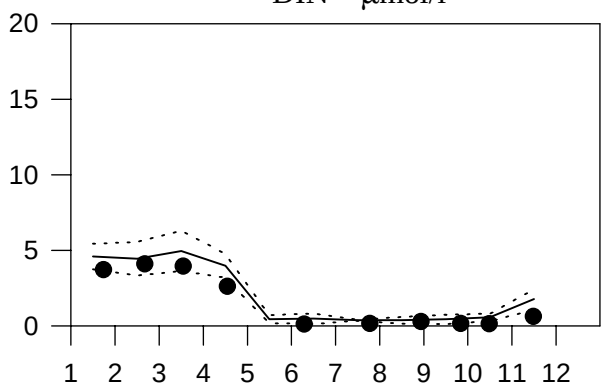
Salinity psu



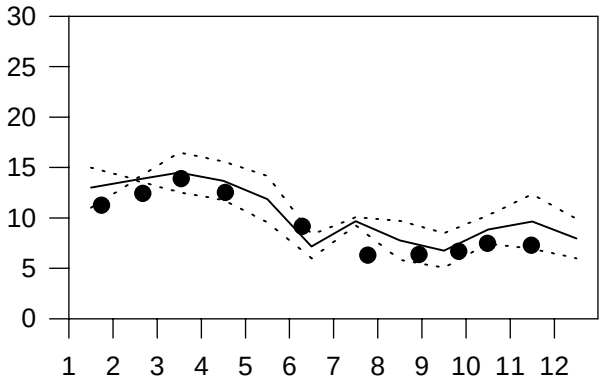
PO_4 µmol/l



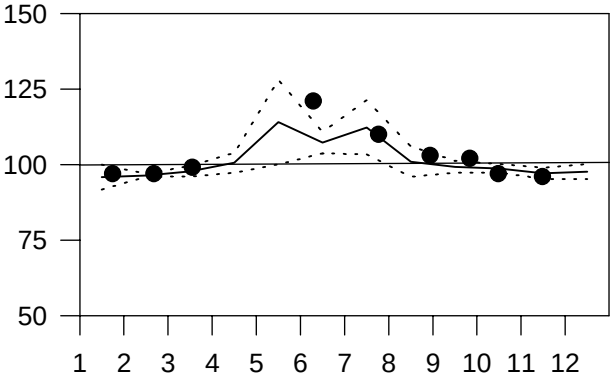
DIN µmol/l



SiO_3 µmol/l

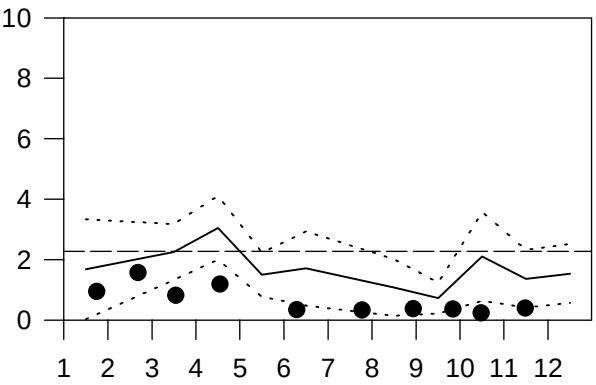


O_2 saturation %

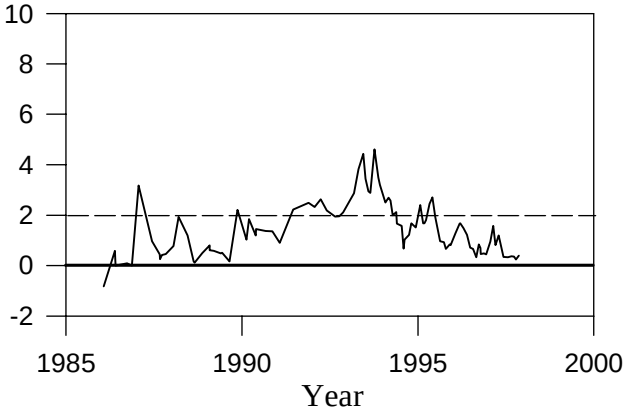


OXYGEN IN BOTTOM WATER

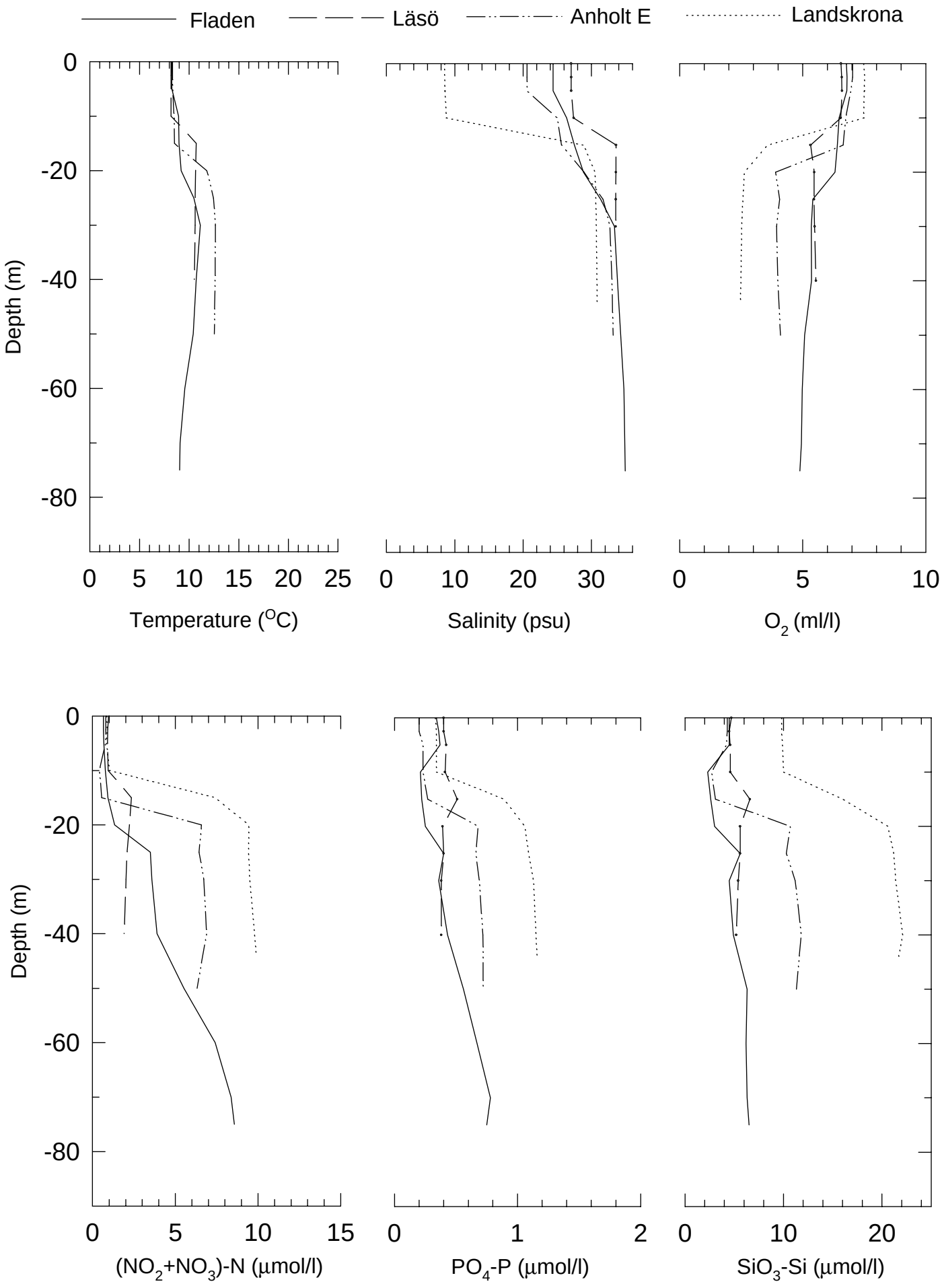
O_2 ml/l

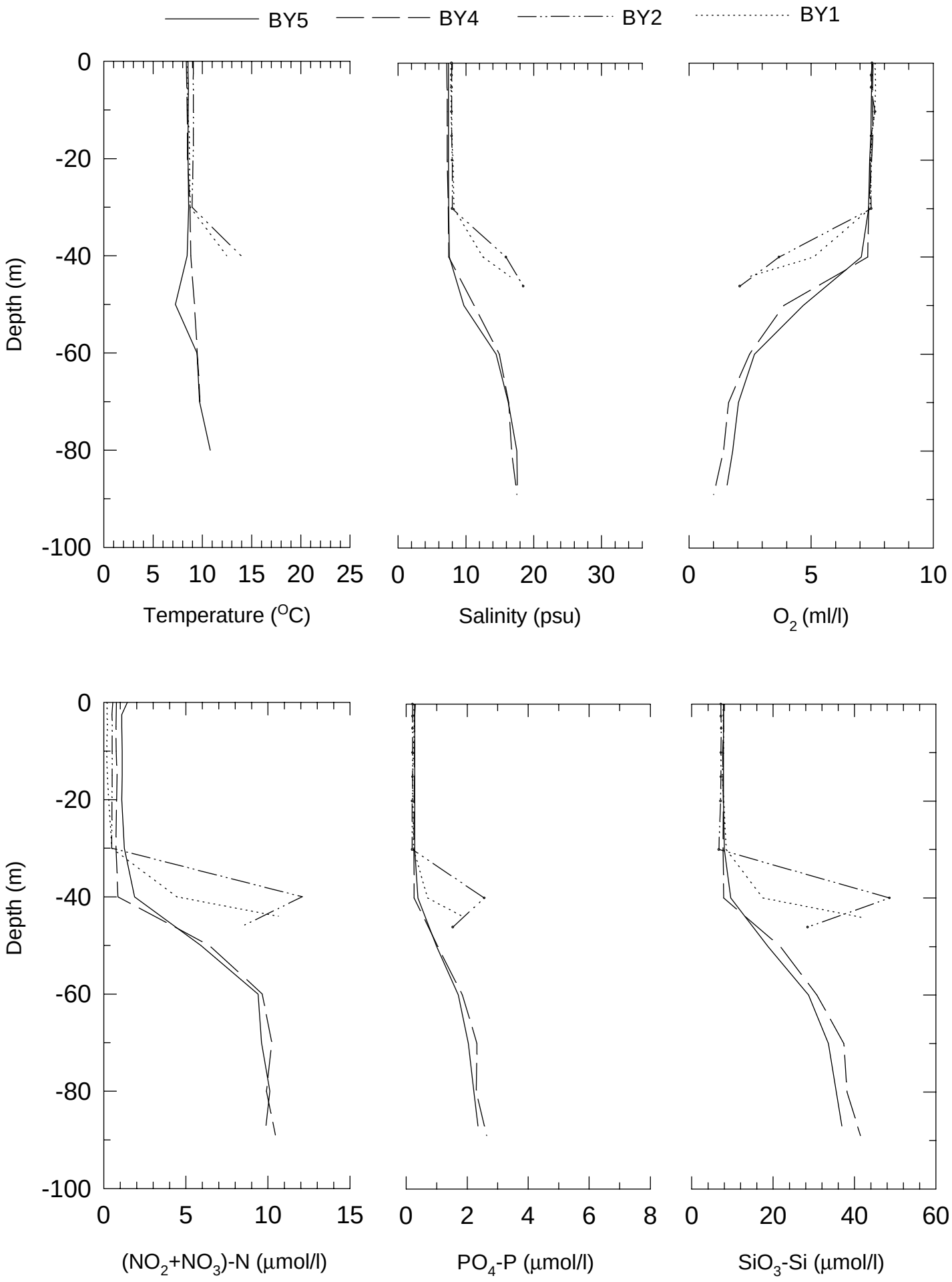


O_2 ml/l



KATTEGAT and THE SOUND week 46 -97




SOUTH BALTIC week 46 -97
BY5
BY4
BY2
BY1
Depth (m)
0
-20
-40
-60
-80
-100
0 5 10 15 20 25
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 46 -97