

CRUISE REPORT FROM R/V ARGOS

Survey period: 971202-971217

Survey area: The Skagerrak, the Kattegat, the Sound, the Baltic Proper, the Bay of Gdansk and the Gulf of Bothnia

Principal: SMHI

SUMMARY

The expedition was performed within SMHI's regular marine monitoring programme and covered the Skagerrak, the Kattegat, the Sound, the Baltic Proper and the Gulf of Bothnia. The weather was dominated by weak to moderate winds that occasionally were strong. In the Baltic Sea and the Gulf of Bothnia normal concentrations of nutrients were found. In the Kattegat and the Skagerrak lower concentrations of nutrients than normal were observed. In the south-western part of Skagerrak was an indication of ongoing production. In the Gotland Basin hydrogen sulphide was found below 170 m, and at the Fårö Deep hydrogen sulphide was found below 175 m. Low oxygen concentrations were found in the deep water of the Bornholm Basin and the eastern Arkona. The oxygen concentrations of the bottom water in the south-eastern Kattegat was normal (about 80% oxygen saturation).

PRELIMINARY RESULTS

The expedition was a part of SMHI's regular monitoring programme and covered the Skagerrak, the Kattegat, the Sound, the Baltic Proper, the Bay of Gdansk and the Gulf of Bothnia. Also, extra stations in the south eastern Kattegat was included. The expedition started in Karlskrona the 2:nd of December and ended in Göteborg the 17:th December. The weather during the expedition was dominated by weak to moderate winds, that occasionally were strong.

The Skagerrak

The sea surface temperature varied between 4.3°C in the south-eastern part and 7.0° in the central and south-western part. At station P2 the surface salinity was 22.0 psu, which indicates an influence of Baltic water. The nutrient concentrations were lower than normal except in the central part. At station HS5 an oxygen saturation of 109% was found in the surface water indicating an ongoing production.

The Kattegat and the Sound

The sea surface temperature was between 3.5°C to 5.3°C, coldest in north-eastern Kattegat and warmest in southern part of the Sound.

The surface salinity at Anholt E and Fladen was lower than normal and a strong outgoing current was observed in th Sound, which indicates a flow of surface water from the Baltic Sea to the Kattegat. The nutrient concentrations of the surface water were lower than normal, except for silicate that was higher.

The oxygen concentration in the deep water of the south eastern Kattegat was satisfactory, oxygen saturation of 80% was found below the halocline. Lowest oxygen concentration was observed at W Landskrona on 20-25 m (55% oxygen saturation).

The Baltic Sea inclcuding Bay Of Gdansk

The sea surface temperature varied between 4.5°C in the north-west and 7.6°C in the south.

All nutrients showed normal concentrations for the season in the surface water, except in the Bay of Gdansk where high nitrate concentrations were found (18 µmol/l).

Hydrogen sulphide was found in the deep water of the Gotland deep below 170 m, and at the Fårö deep below 175 m. No hydrogen sulphide was found in the Bornholm basin as well as in the deep water of the Bay of Gdansk.

The Bay of Bothnia

The sea surface temperature varied between 4.4°C in the south and 1.2°C in the north, but in the North Quark it was lower, The phosphate concentration was low, 0.05 µmol/l in the north to 0.2 µmol/l in the south. The nitrate concentration varied between 2.3 µmol/l in the south to 7.0 µmol/l in the north. The silicate concentration had a high variation with 9 µmol/l in the south and up to 33 µmol/l in the north.

PARTICIPANTS

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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

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Hydrographic
series

Ship: 14-Argos
Year: 1997

Date: 1997-12-18
Time: 13:31

Ser no	Stat code	P r o j	Station-----	Lat-----	Lon-----	Date yymmdd	Time hhmm utc	Bott depth m	Mld m	Secc depth m	Wind di ve	Air temp C	Air pres hPa	WCSI elec aoae tu	C Hrhh mot Pr	PPCPZZT Cilyooa Pw l	No de	T e	S a	P h	O x	H 2	P o	T o	N o	N o	T h	A o	S h	L i	P u	P i	T o	C o		
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0779	BPEX13BMP	BY10		N5638	E1935	971203	0725	148			36 2	6.1	1007	2720	x	--x----	16	xx	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	-	x	
0780	BPEX21BMP	BY15	GOTLANDSDJ	N5720	E2003	971203	1200	249			02 7	4.1	1009	2830	x	xxx---	20	xx	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-	-	-	
0781	BPEX21BAS	BY15	GOTLANDSDJ	N5720	E2003	971203	1305	249			02 7	4.1	1009	2830	-	-----	8	xx	-	x	x	x	-	x	x	-	-	-	x	-	-	-	-	-	-	
0782	BPEX26BMP	BY20	FÄRÖDJ	N5800	E1953	971203	1830	205			36 8	2.8	1010	5930	x	--x----	18	xx	-	x	x	x	x	x	x	x	-	x	-	-	-	-	-	-	x	
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0785	GBAX01BAS	TRÖSKELN	ÅLANDS HAV	N5939.8	E1953	971204	1030	61		7.5	36 4	1.1	1014	1620	x	-----	10	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
0786	GBAX02BAS	F64	SOLOVJEVA	N6011	E1909	971205	2110	276			21 12	1.1	1004	9930	x	-----	19	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
0787	GBSX03BAS	F33	GRUNDKALLEN	N6032.5	E1856	971206	0020	140			21 15	2.5	999	5940	x	-----	14	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
0788	GBSX07BAS	SR5		N6105	E1935	971206	0440	127			30 14	1.9	996	7940	x	-----	13	xx	x	x	-	x	x	x	x	x	x	x	x	x	x	-	-	-	-	
0789	GBSX06BAS	SS29		N6106.5	E2016	971206	0720	117			30 10	2.5	997	1430	x	-----	14	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
0790	GBSX04BAS	SR8		N6108	E2056	971206	0950	40		4.0	30 12	3.3	999	1340	x	-----	7	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
0791	GBSX22BAS	F26		N6159	E2004	971206	1655	137			34 10	1.8	1004	9930	x	-----	14	xx	x	x	-	x	x	x	x	x	x	x	-	-	-	-	-	-	-	
0792	GBSX17BAS	MS6		N6159	E1910	971206	1945	72			36 7	1.6	1006	9930	x	-----	10	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
0793	GBSX26BAS	US5B		N6235.2	E1958.5	971207	0025	218			36 3	0.3	1008	9920	x	-----	17	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	x	
0794	GBSX23BAS	US7		N6236	E2050	971207	0320	25			99 1	-0.3	1009	9910	x	-----	6	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
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0796	GBQX31BAS	F16		N6331.5	E2105	971207	1135	46			18 13	-1.5	1004	2730	x	-----	7	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
0797	GBBX32BAS	F13		N6347.5	E2129	971207	1350	65			18 13	-1.0	1004	9940	x	-----	9	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
0798	GBBX33BAS	B03		N6418.3	E2221.5	971207	1845	110			24 16	1.1	1001	9940	x	-----	13	xx	x	x	-	x	x	x	x	x	x	x	x	x	-	-	-	-	-	
0799	GBBX35BAS	RR7		N6444	E2349	971207	2320	41			21 16	1.7	999	9940	x	-----	6	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
0800	GBBX37BAS	RR5		N6450.2	E2310	971208	0200	67			23 18	2.6	998	9950	-	-----	9	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	x	
0801	GBBX46BAS	F2		N6523.5	E2330	971208	0600	87			23 14	2.8	997	9950	x	-----	11	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	
0802	GBBX40BAS	RR1		N6458	E2152	971208	1230	90			21 12	1.6	998	2830	x	-----	12	xx	-	x	-	x	x	-	x	x	-	x	-	-	-	-	-	-	x	
0803	GBBX43BAS	F9		N6442.5	E2204	971208	1430	128			18 13	2.5	998	2830	x	-----	13	xx	x	x	-	x	x	-	x	x	x	x	x	x	-	-	-	-	-	x
0804	GBSX28BAS	US2	ULVÖDJ	N6251	E1853.5	971209	0515	207			21 14	2.5	998	9950	x	-----	17	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-	

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Ship: 14-Argos
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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 ve	Air temp C	Air pres hPa	WCSI elec aoae tu hd	C t Cilyooa mot PrP	PPCPZZT Hrhhoo r de	T e a m l p i n	S h x y S	P 2 o 4 t	H P P	T N N	N T A	S H L	L P P	T C m										
0805	GBSX27BAS	US3		N6245	E1912	971209	0750	189			21 12	2.8	999	2740	x	-----	16	xx	x	x	-	x	x	x	x	x	x	-	-	-	-				
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0812	BPSE11BMP	BCS III-10		N5533.3	E1824	971211	1620	93			23 9	7.5	994	9930	x	-xx---	13	x	x	x	x	-	x	x	x	x	x	x	x	-	-	-			
0813	BPSE70BAS	PL-P63		N5521	E1903.5	971211	2015	84			27 9	7.7	995	9930	x	-----	11	xx	x	x	-	x	x	x	x	x	x	-	-	-	-	x			
0814	BPSG71BAS	PL-P1		N5450	E1920	971211	2350	111			23 6	7.9	996	9920	x	-----	14	xx	x	x	-	x	x	x	x	x	x	-	-	-	-	x			
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0827	SOCX49BAS	OSKARSGRUNDET (NÄRA)		N5535.9	E1251.5	971215	1930	8			07 8	1.5	1044	9910	x	-----	2	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0828	SOCX00BAS	T4		N5537	E1252	971215	1955	8			07 8	1.5	1044	9910	x	--x----	2	-	x	-	x	-	xx	x	x	x	x	-	x	-	-	-	-	-	-
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0830	SOCX39BMP	W LANDSKRONA		N5552.0	E1245.0	971215	2200	49			05 7	-0.5	1044	9910	x	--x----	9	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	
0831	KAEX33BAS	KULLEN		N5614	E1222.2	971216	0055	23			09 6	-0.2	1044	9920	x	-----	5	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	x	
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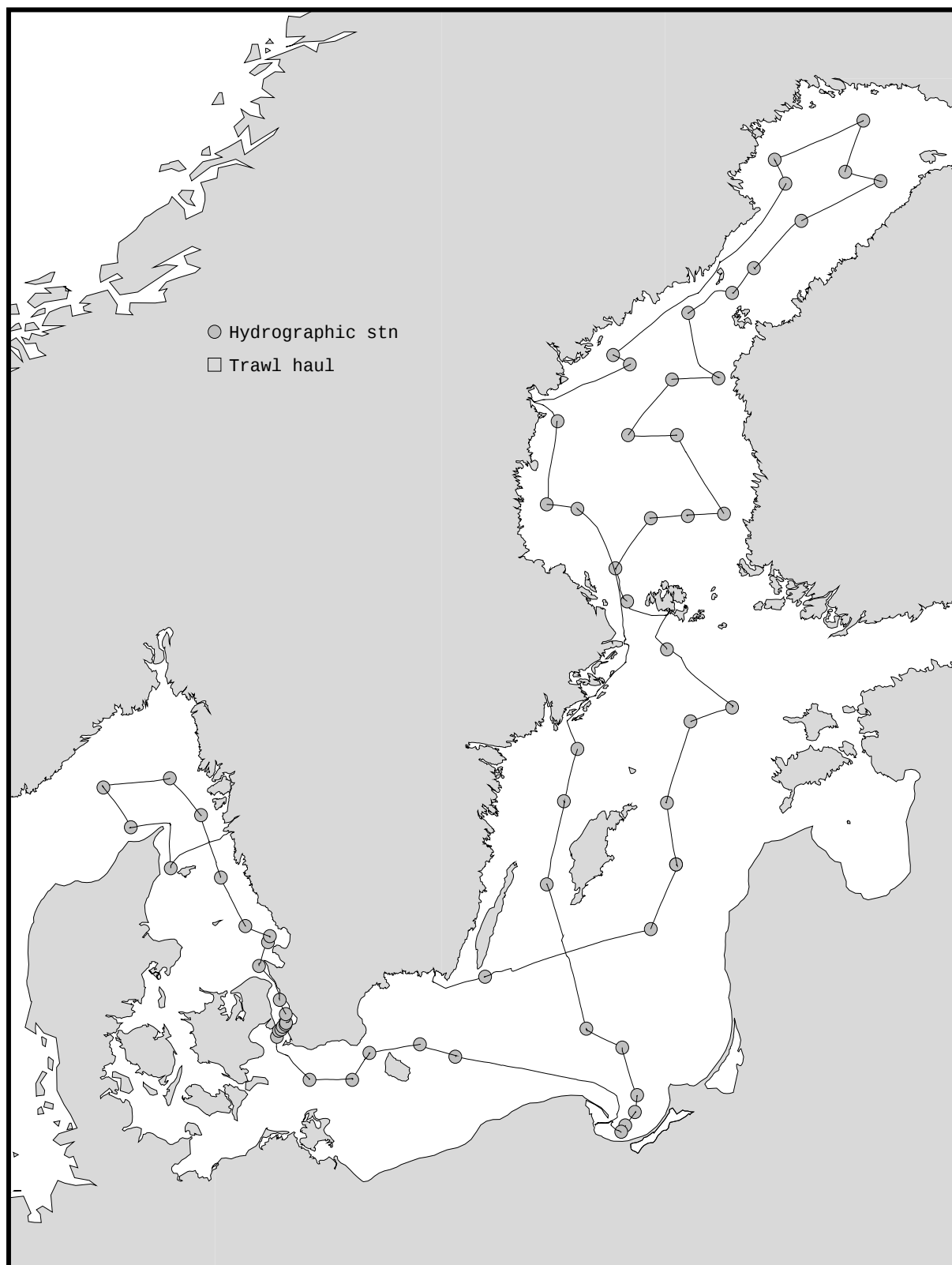
Ship: 14-Argos
Year: 1997

Date: 1997-12-18
Time: 13:31

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 ve	Air temp C	Air pres hPa	WCSI elec aoae tu	C d Cilyooa mot Pr	PPCPZZT Hrhh P l	No de	T e	S a	P h	O x	H 2	P o	T o	N o	N o	T h	A o	S h	L i	P u	P i	T o	C o	
0833	KAEL63BAS		LAHOLM-3 (YG)	N5633.3	E1234	971216	0315	22			09 6	-1.0	1044	9920	x	-----	5	xx	-	x	-	x	x	x	x	x	x	x	-	x	-	-	-	-	-
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0836	SKEX23PMK	P2		N5752	E1118	971216	1400	91			14 4	2.0	1044	1320	x	--x----	10	xx	-	x	-	x	x	x	x	x	x	x	x	-	-	-	-	-	
0837	SKEX17PMK	Å16		N5816	E1043.5	971216	1730	202			14 4	2.7	1044	9920	x	--x----	15	xx	-	x	-	x	x	x	x	x	x	-	x	-	-	-	-	x	
0838	SKNX21PMK	M6		N5810	E0930	971216	2150	630			16 7	2.8	1043	9920	x	xxx---	18	x	x	x	x	-	x	x	x	x	x	-	x	-	-	-	-	x	
0839	SKEX69PMK	HS5		N5744.2	E1000.4	971217	0210	90			05 7	1.6	1041	9920	x	--x----	10	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	x	
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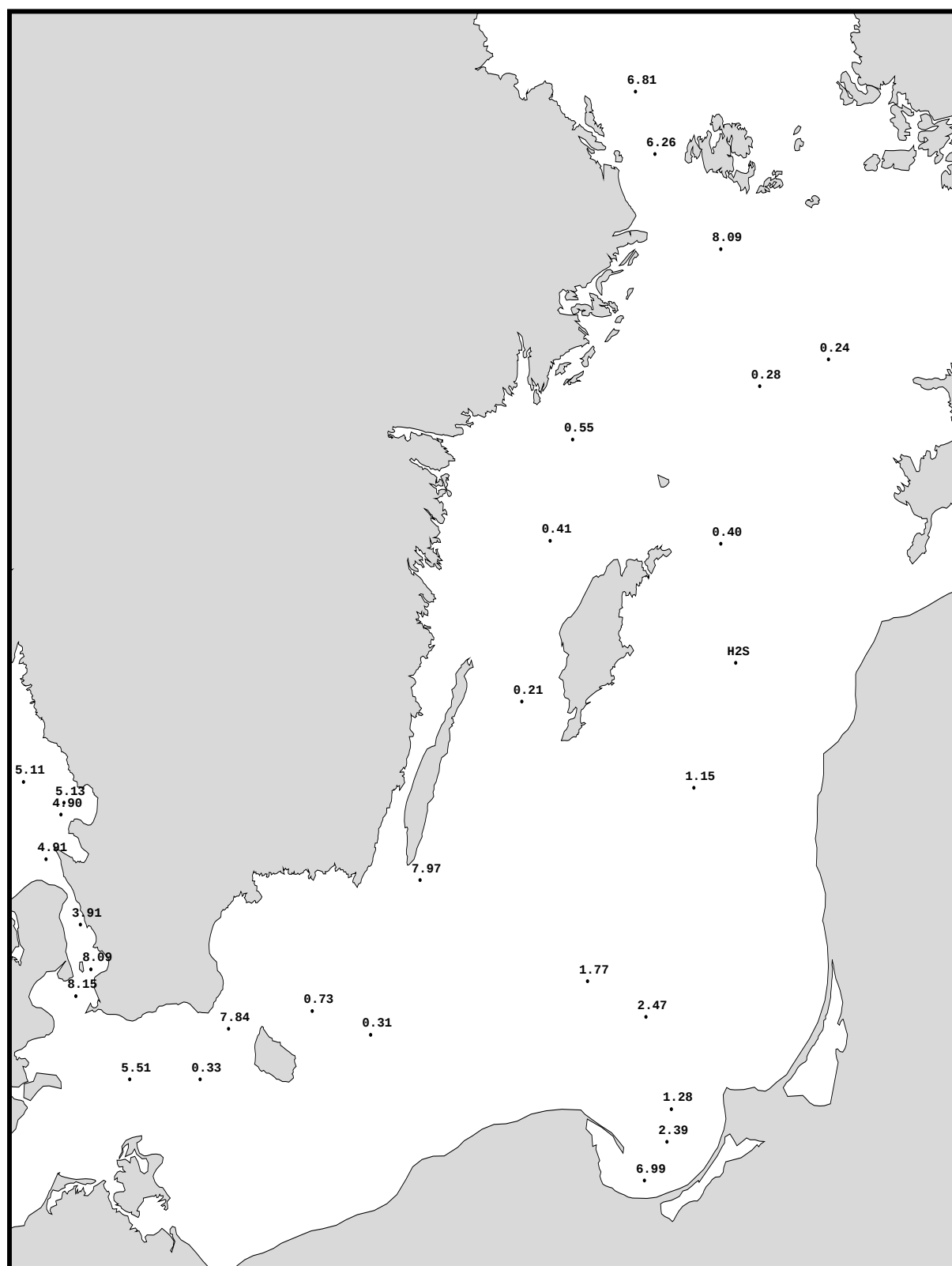
TRACK CHART

Country: Sweden
Ship : Argos
Date : 971202-971217
Series : 0778-0840



Bottom water oxygen concentration (ml/l)

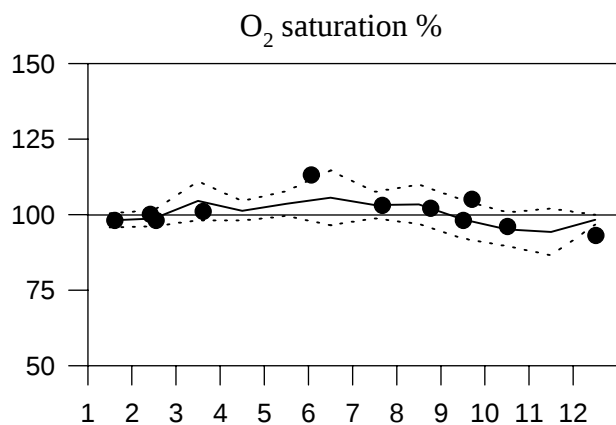
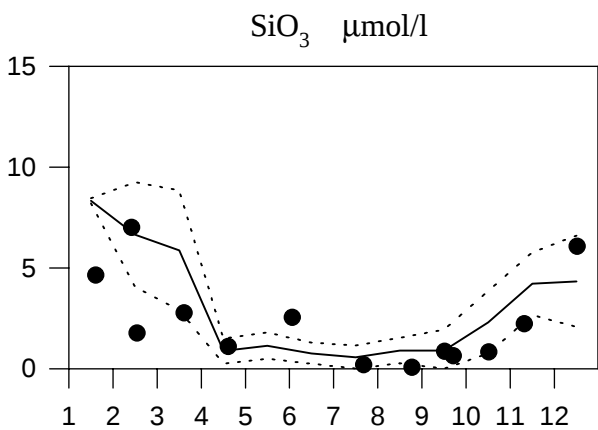
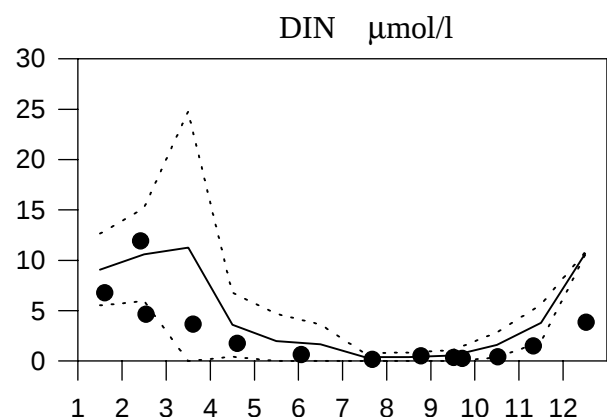
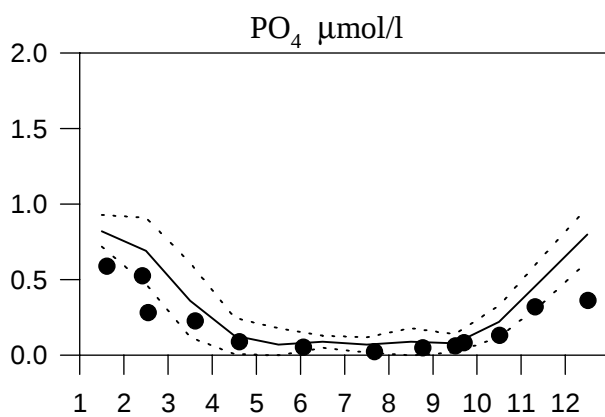
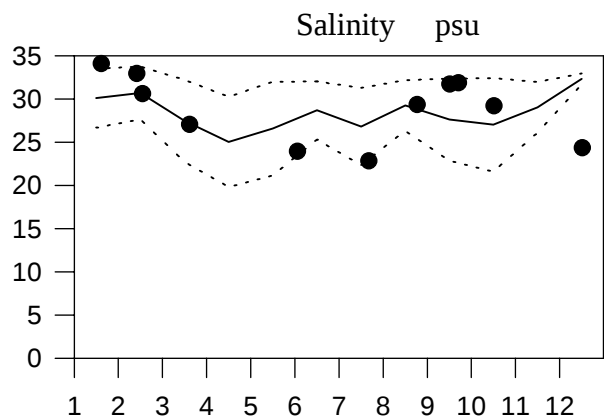
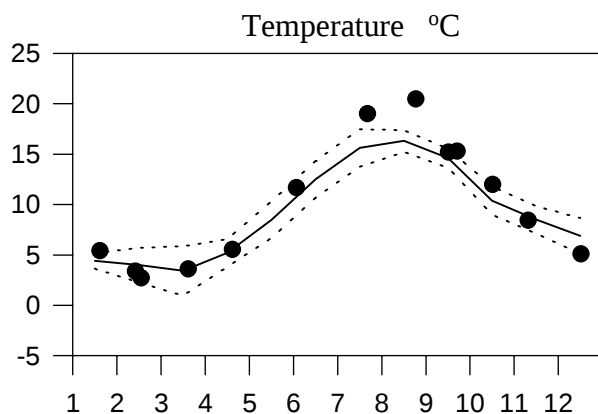
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Ship: Argos
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Series: 0778-0840



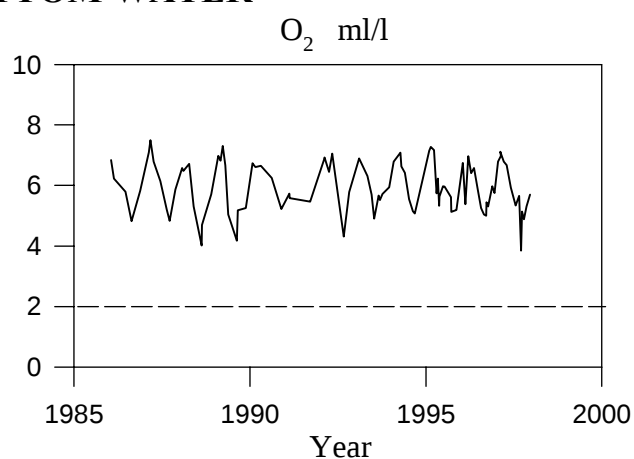
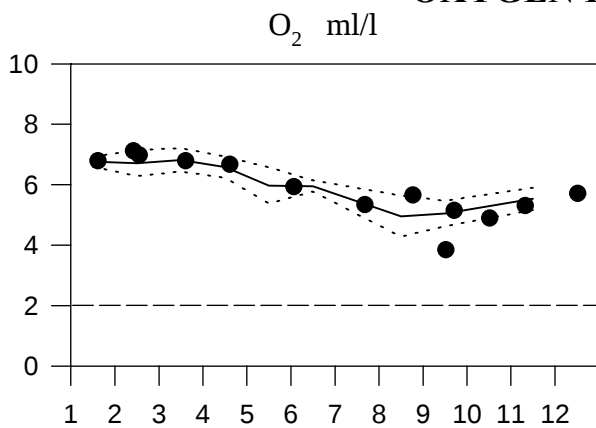
STATION P2 SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



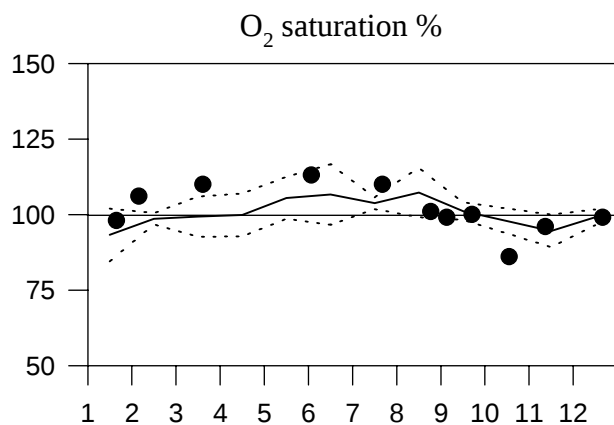
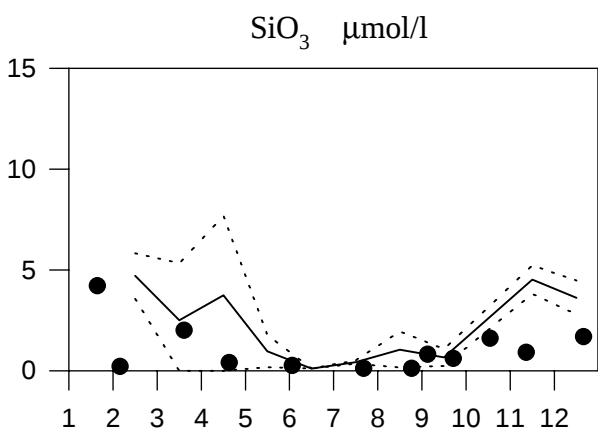
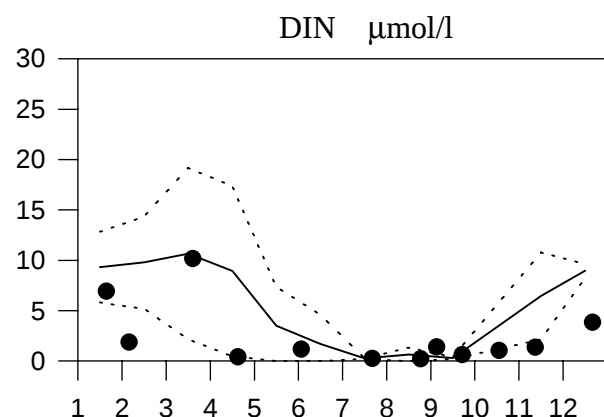
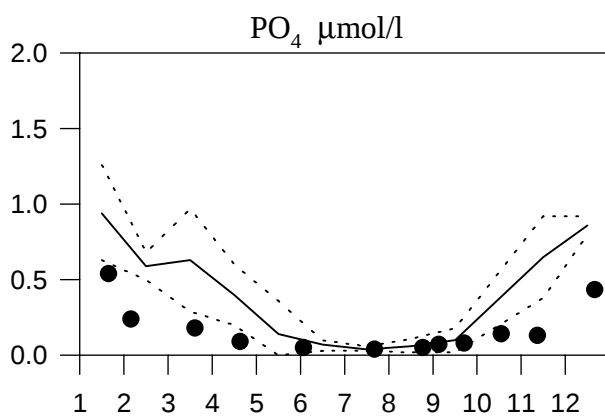
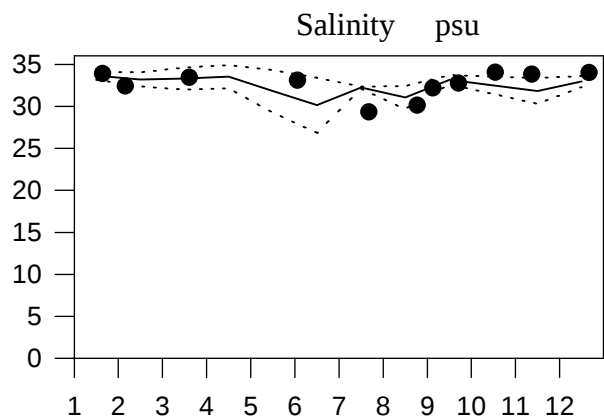
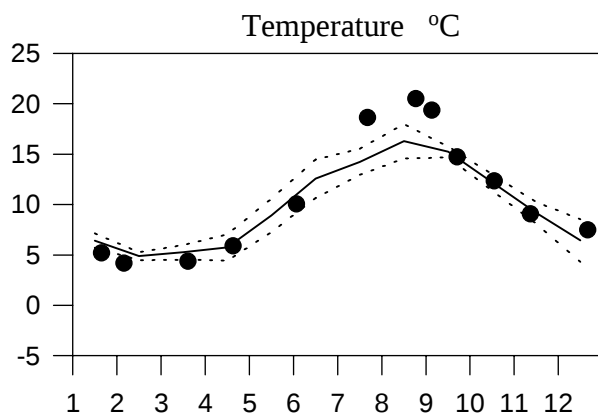
OXYGEN IN BOTTOM WATER



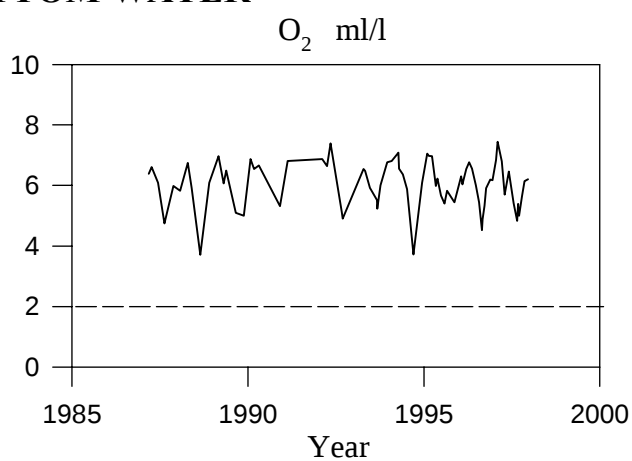
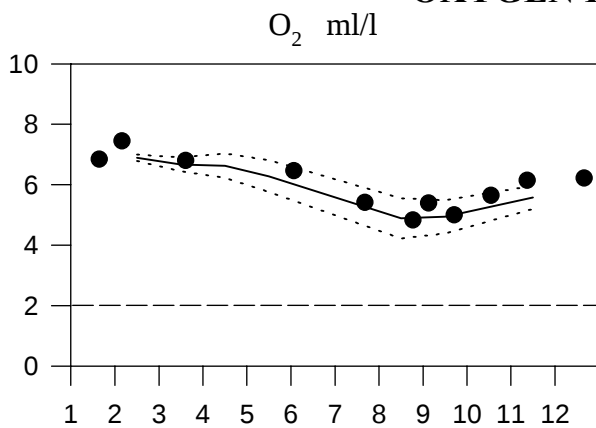
STATION HS5 SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



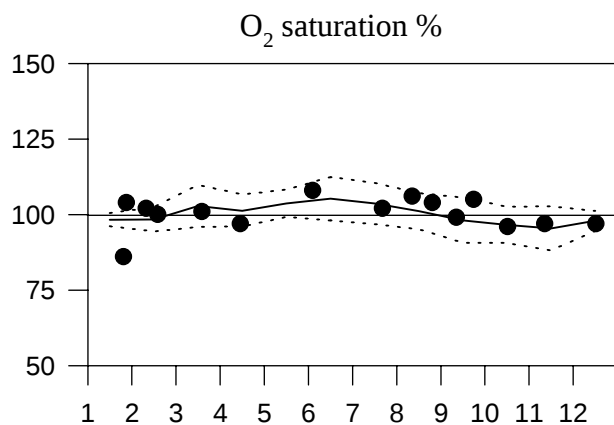
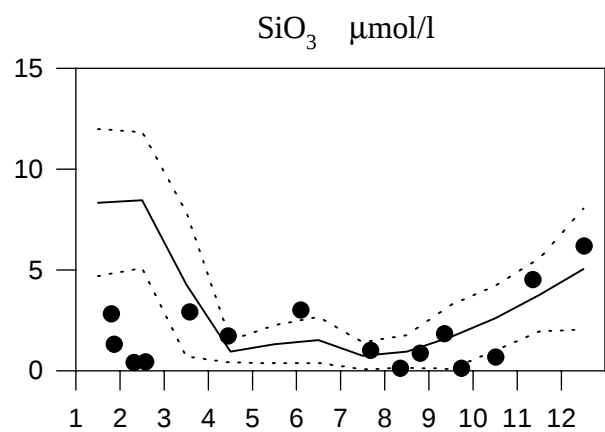
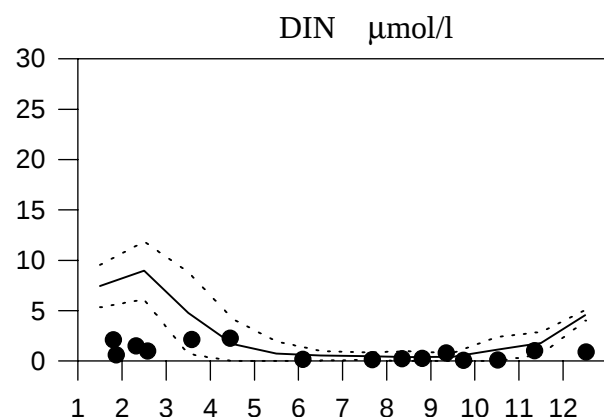
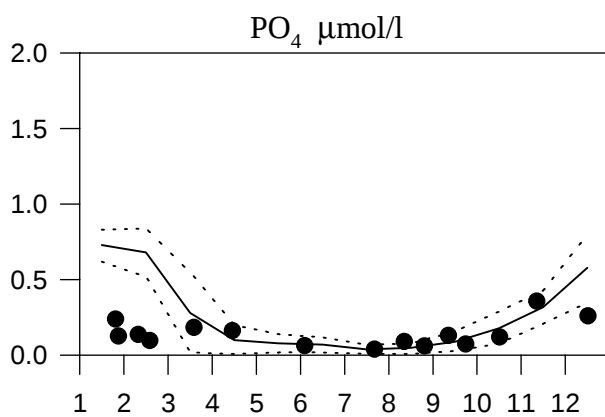
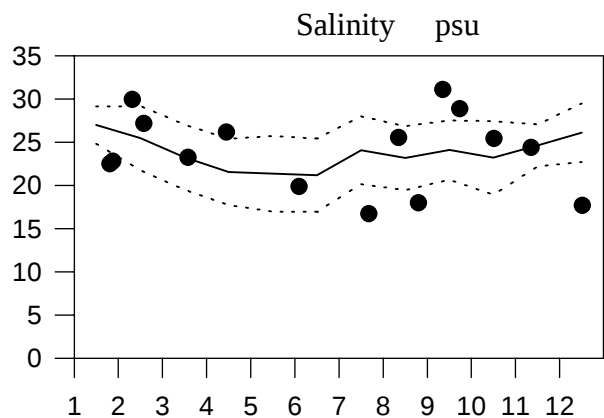
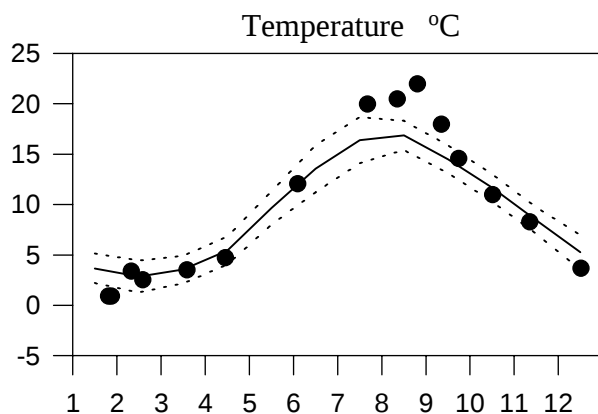
OXYGEN IN BOTTOM WATER



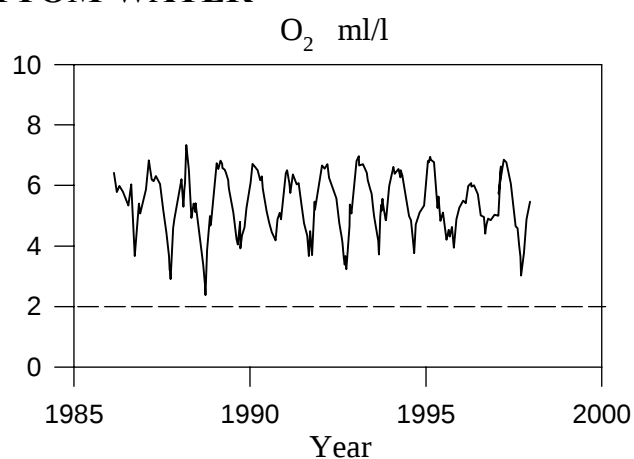
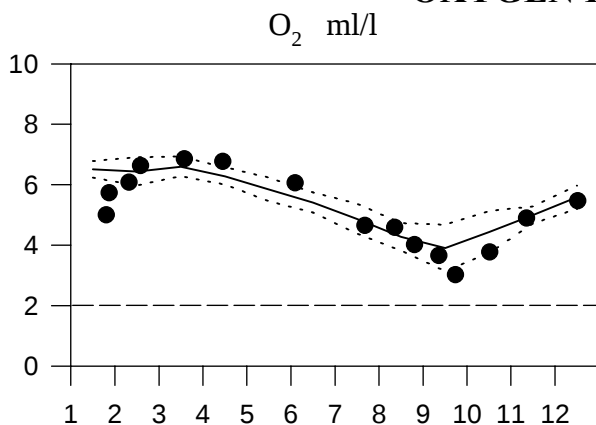
STATION FLADEN SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



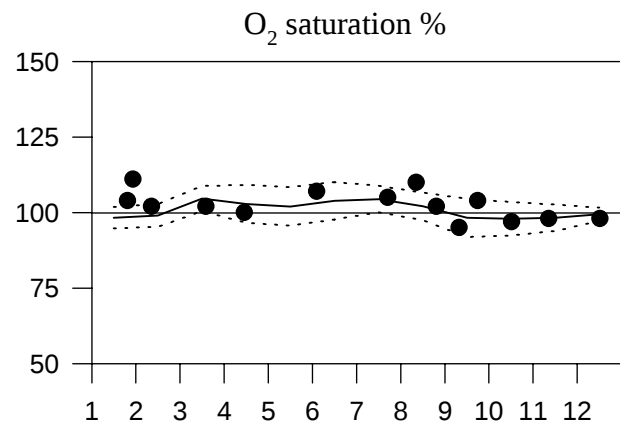
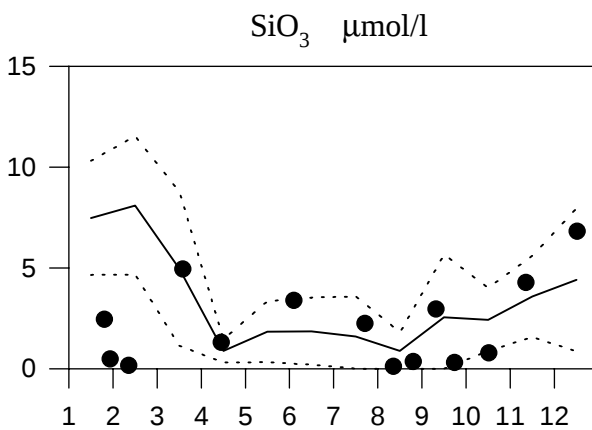
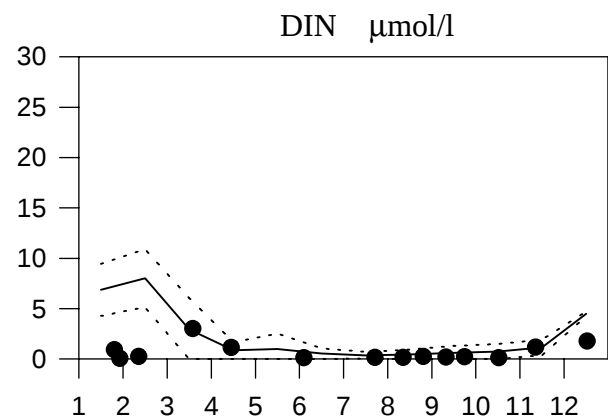
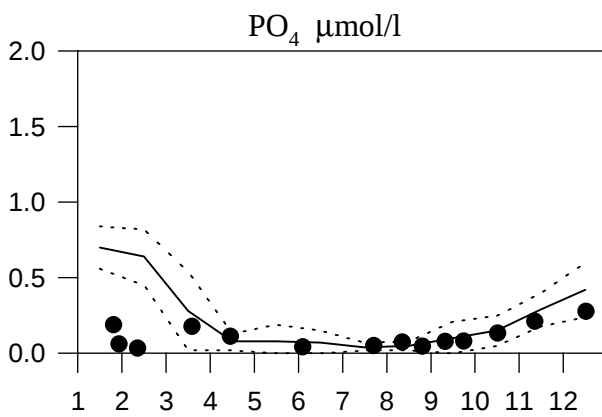
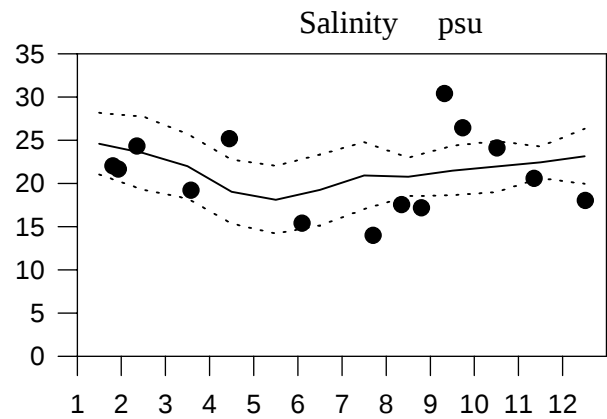
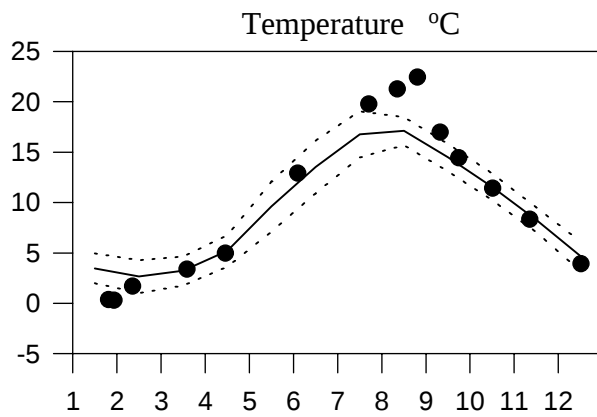
OXYGEN IN BOTTOM WATER



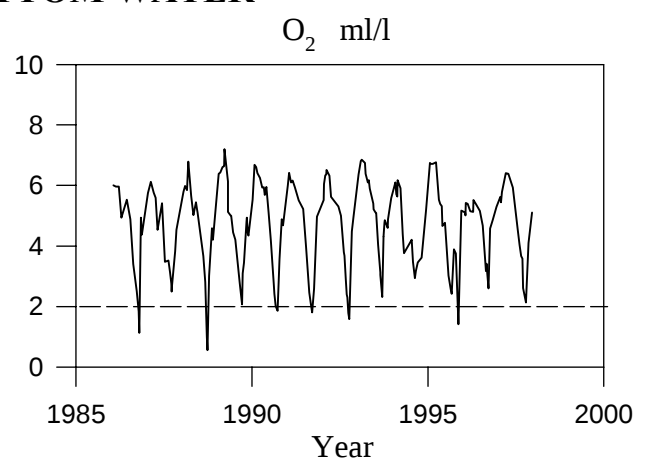
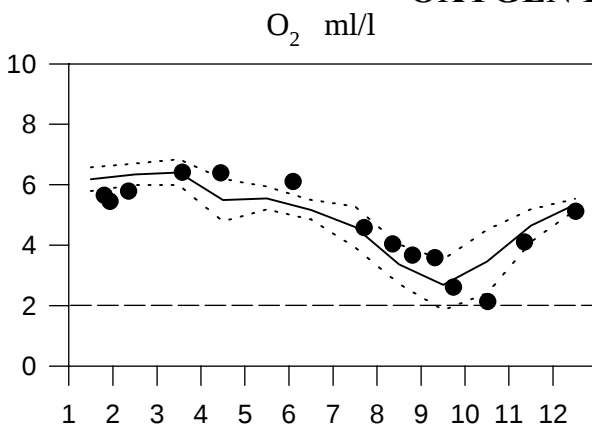
STATION ANHOLT E SURFACE WATER (above halocline)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



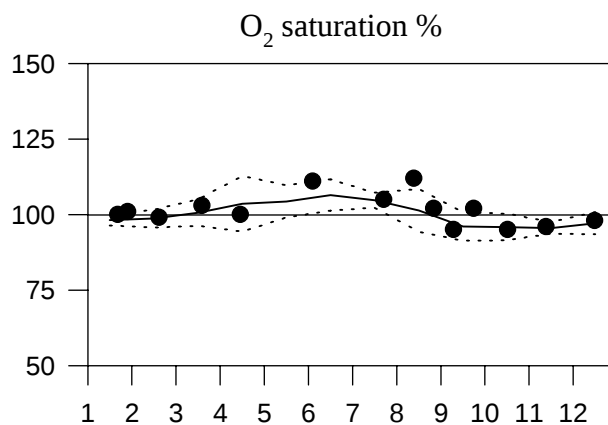
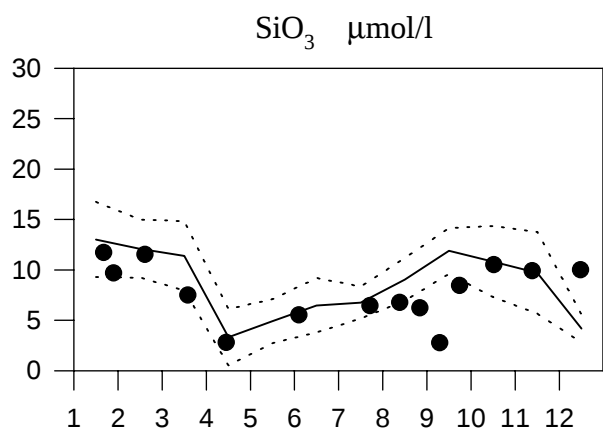
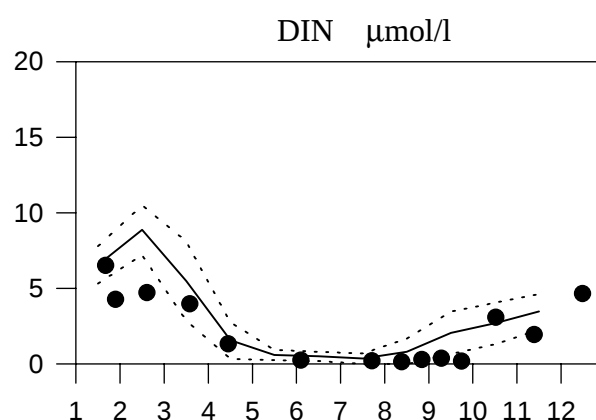
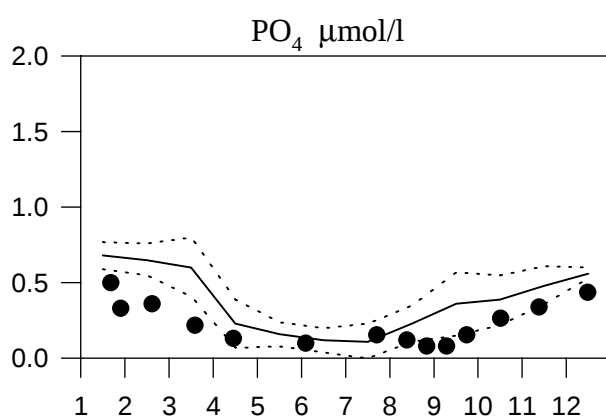
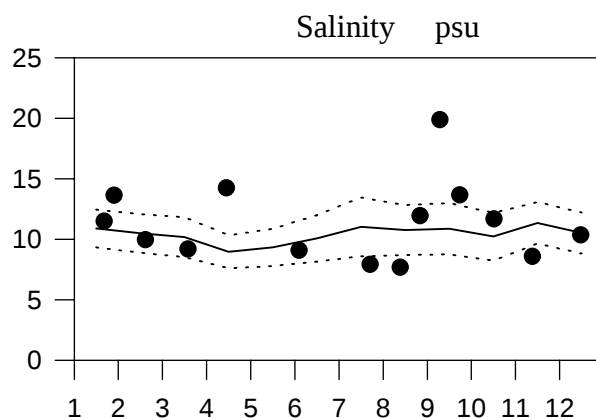
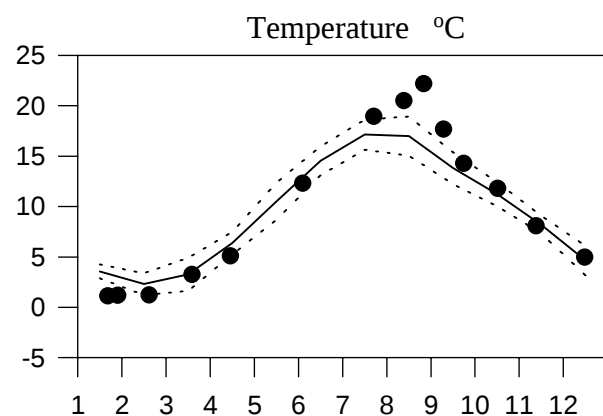
OXYGEN IN BOTTOM WATER



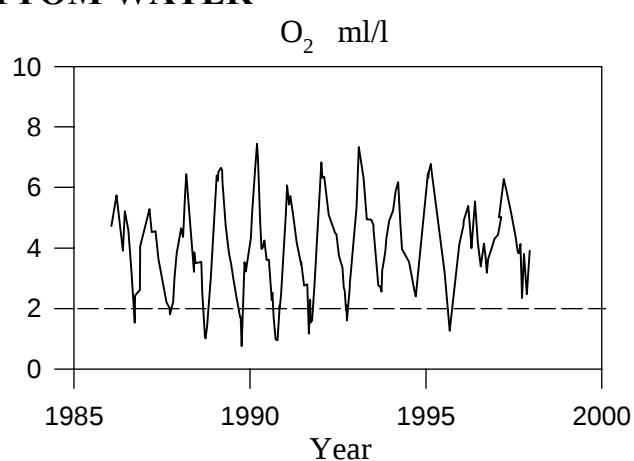
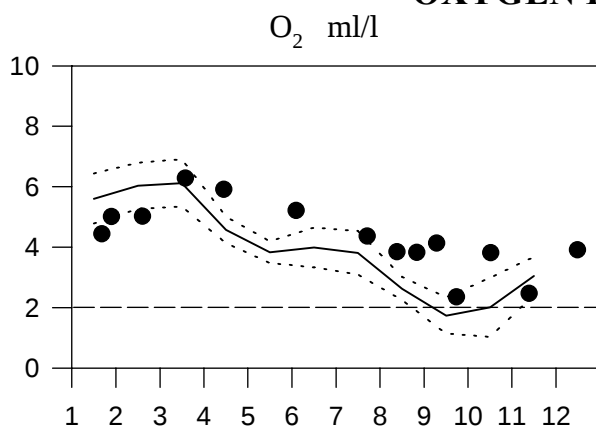
STATION W LANDSKRONA SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



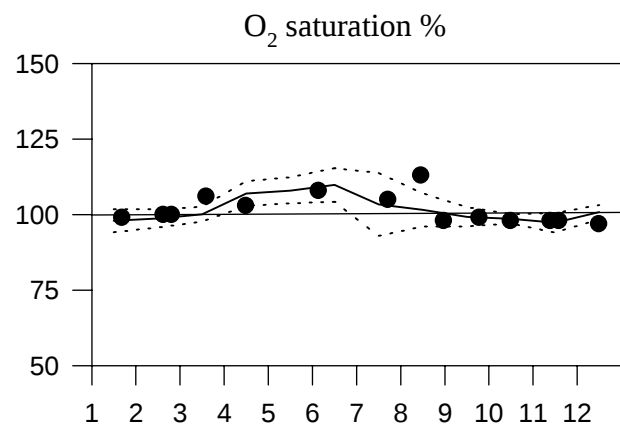
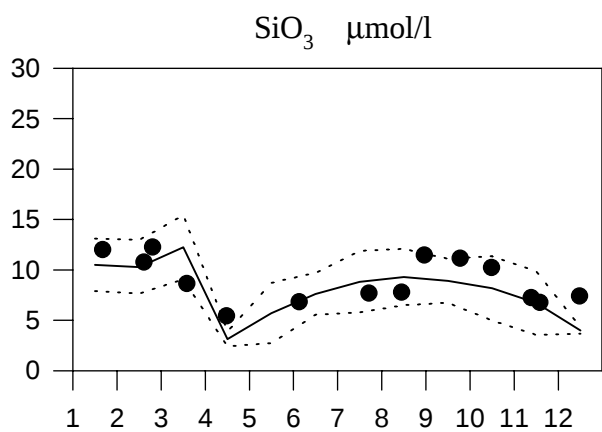
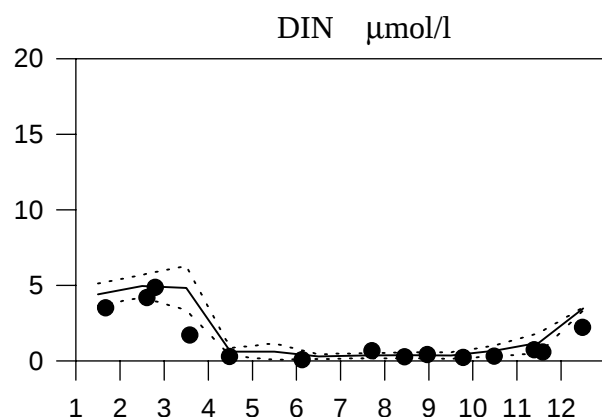
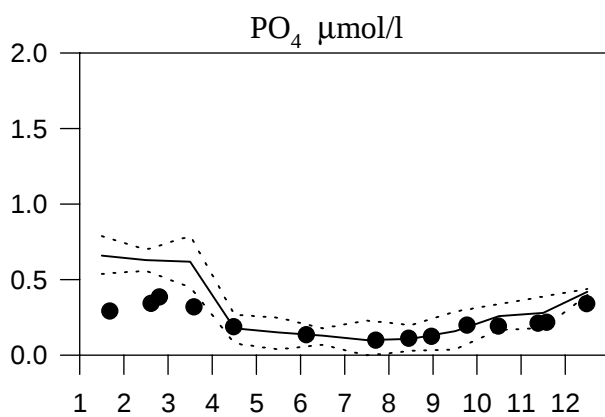
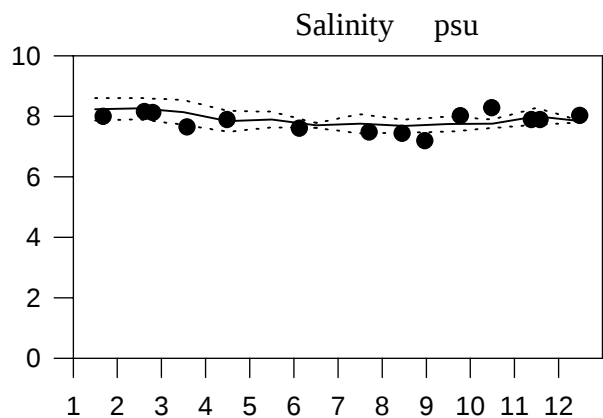
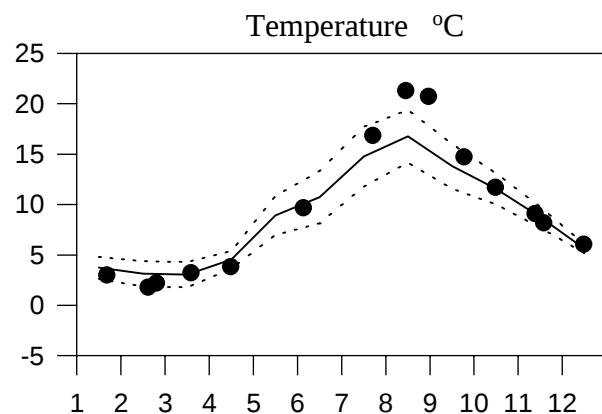
OXYGEN IN BOTTOM WATER



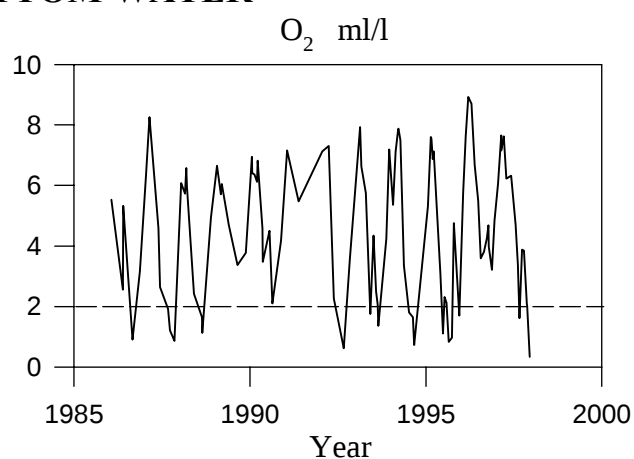
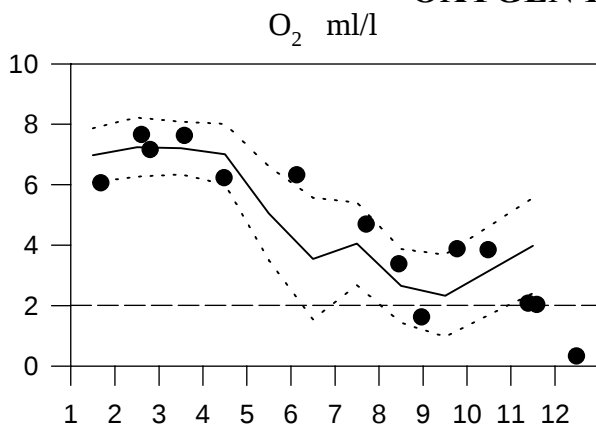
STATION BY2 SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



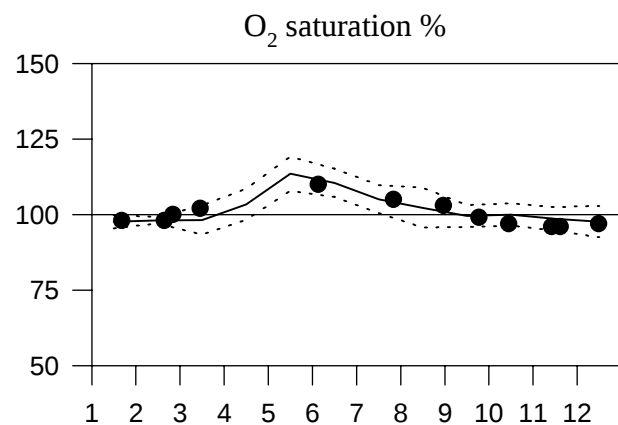
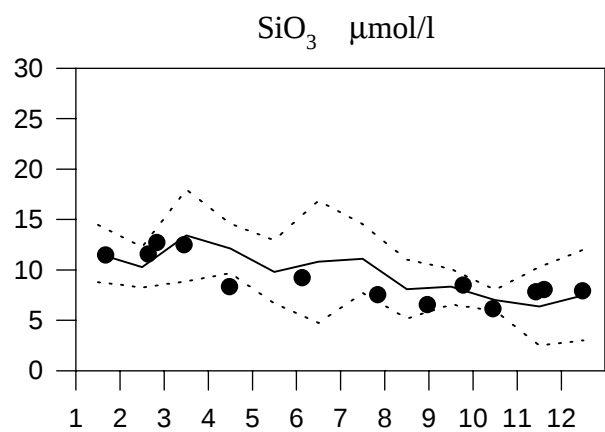
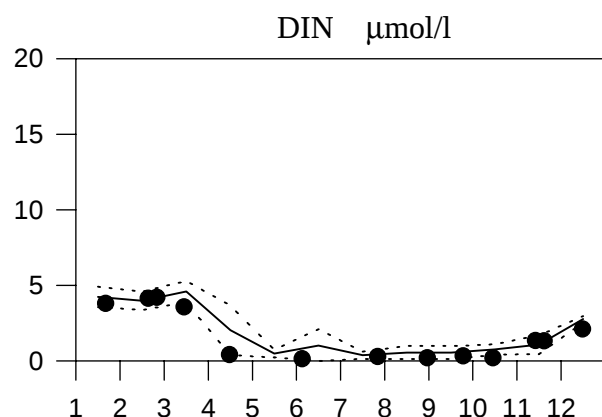
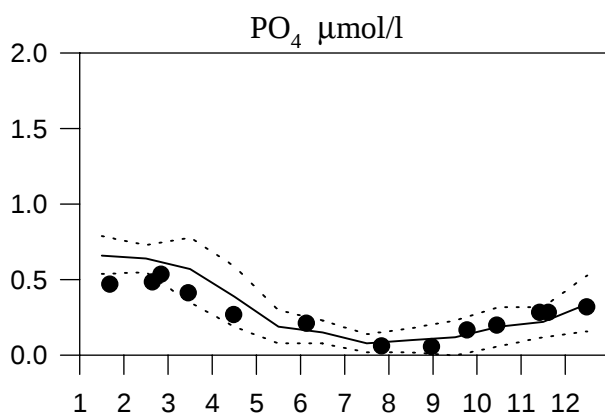
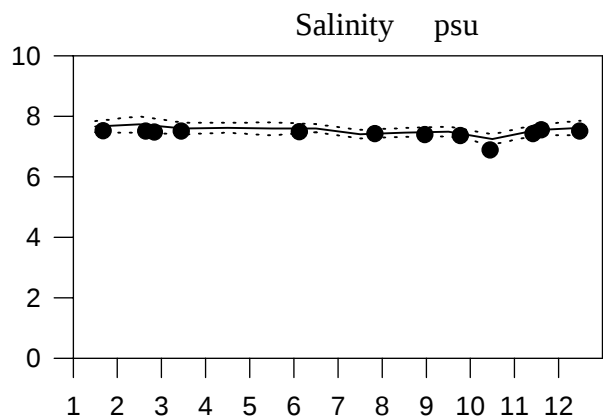
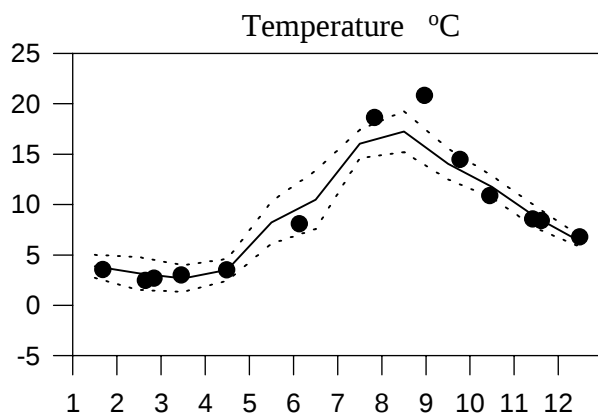
OXYGEN IN BOTTOM WATER



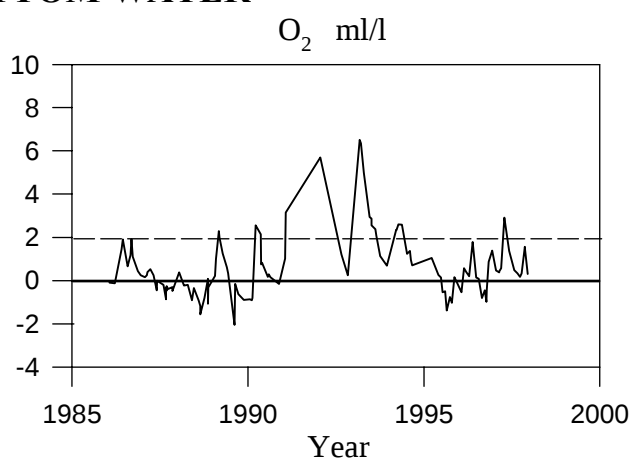
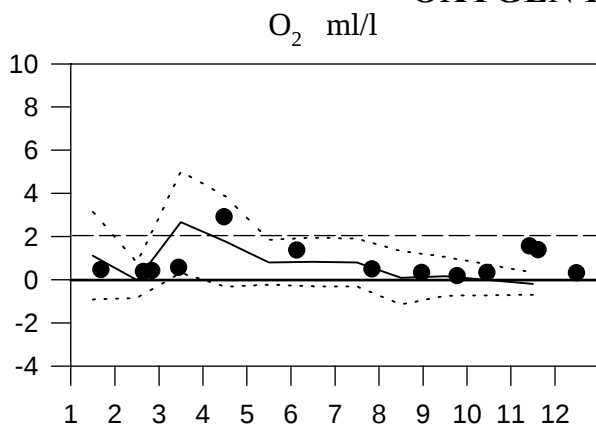
STATION BY5 SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



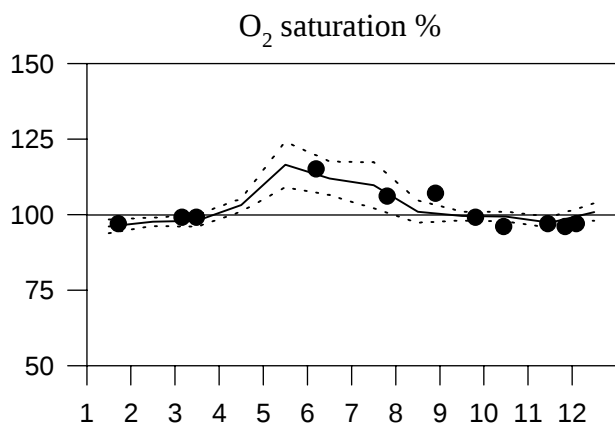
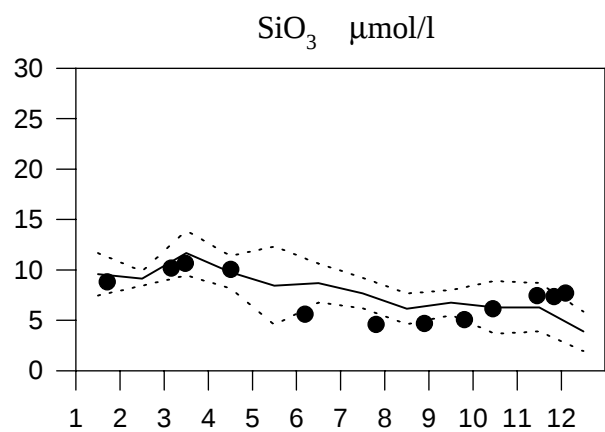
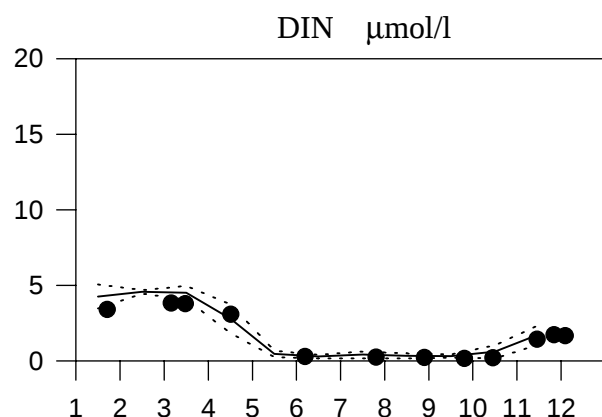
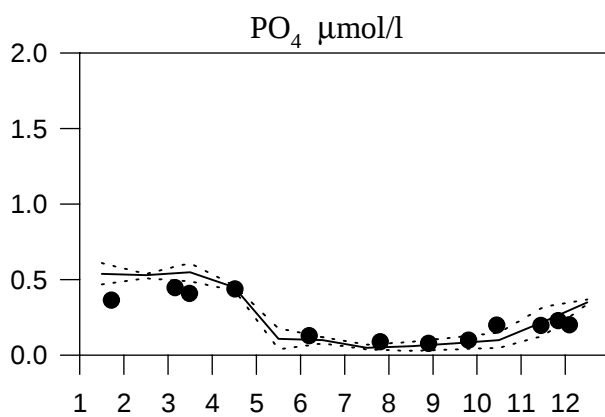
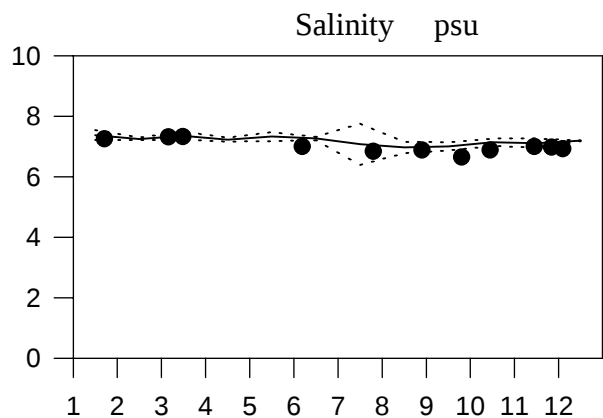
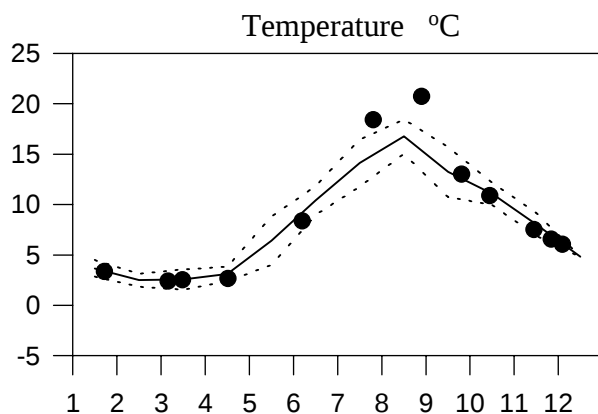
OXYGEN IN BOTTOM WATER



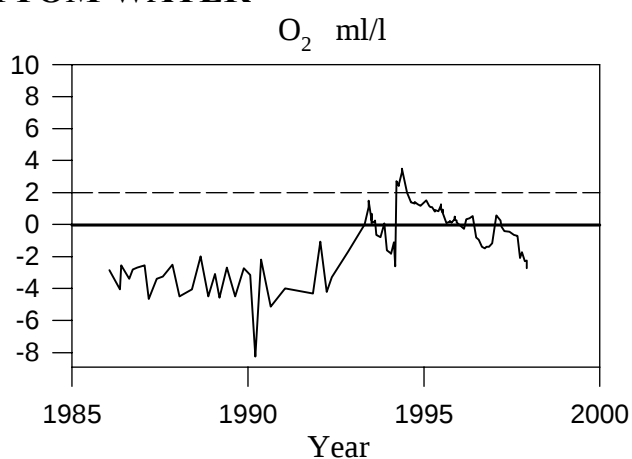
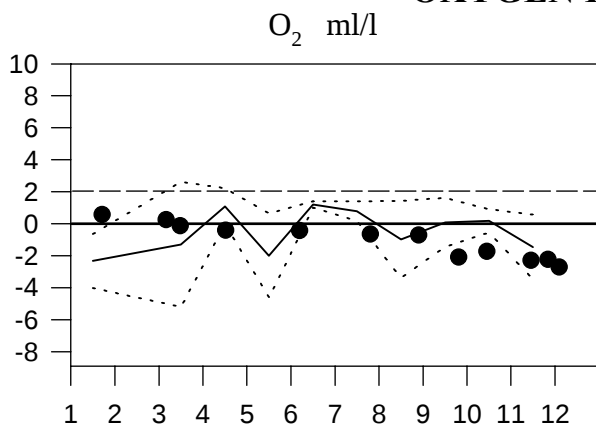
STATION BY15 SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997

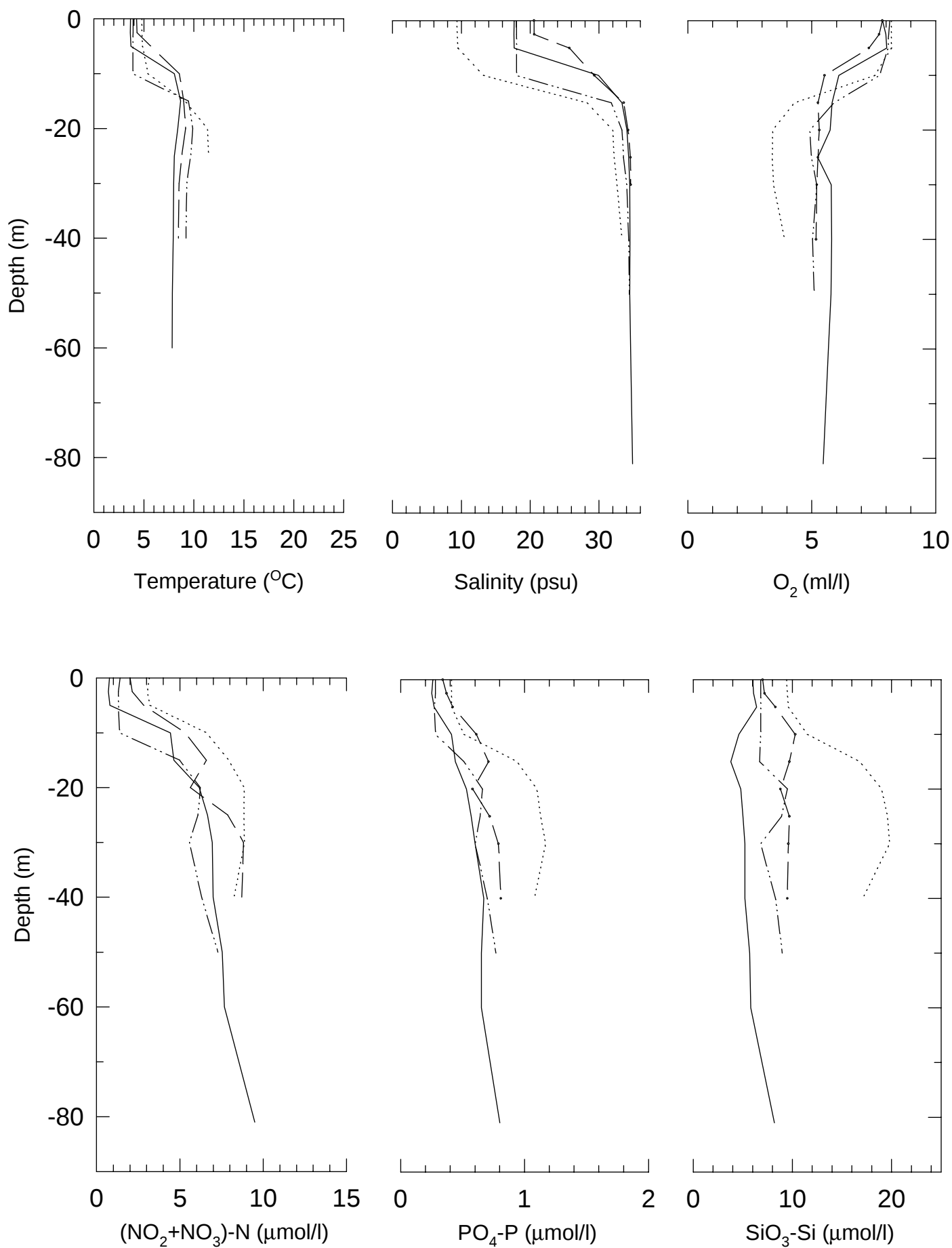


OXYGEN IN BOTTOM WATER

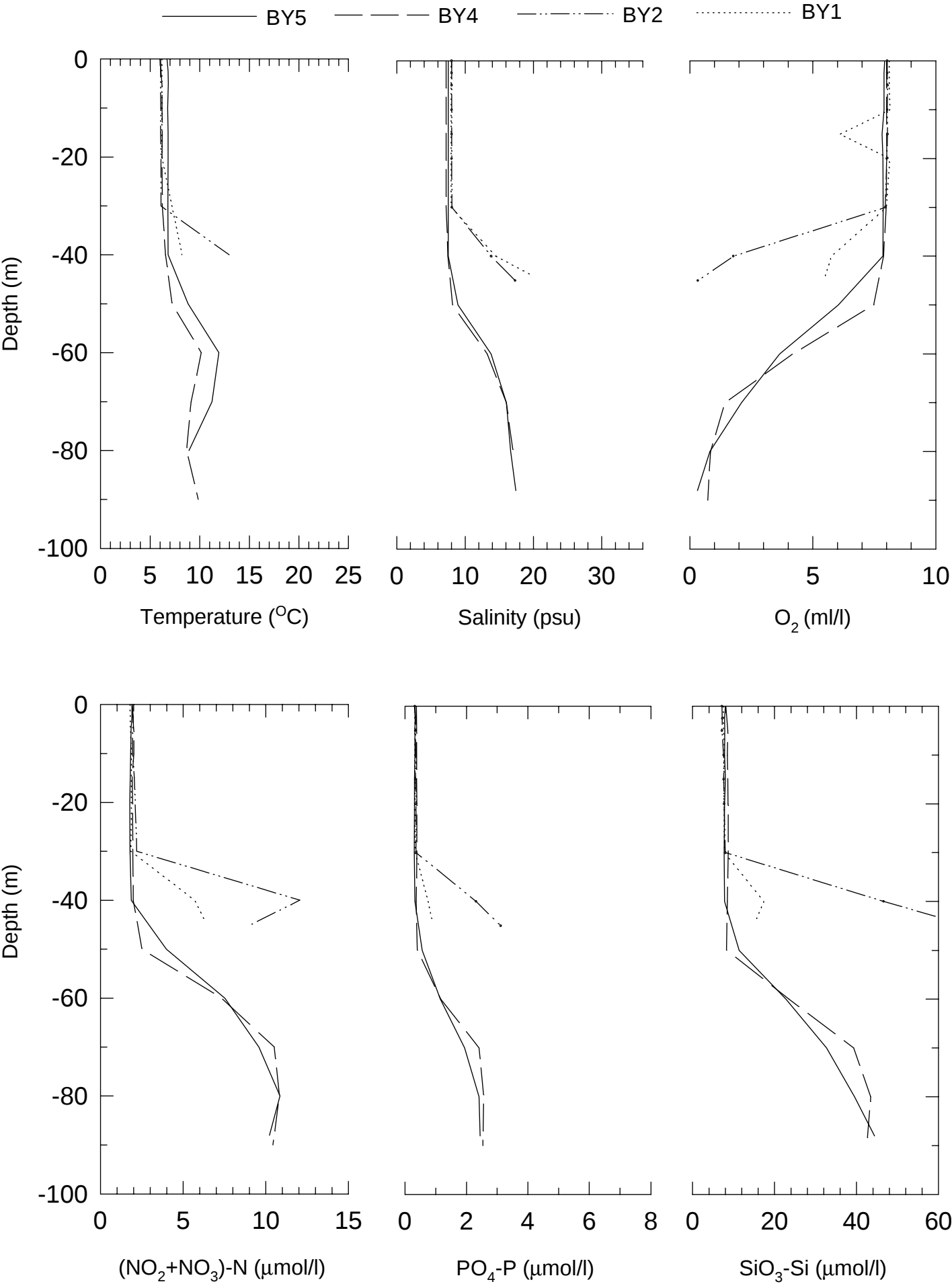


KATTEGAT and THE SOUND week 49-51 -97

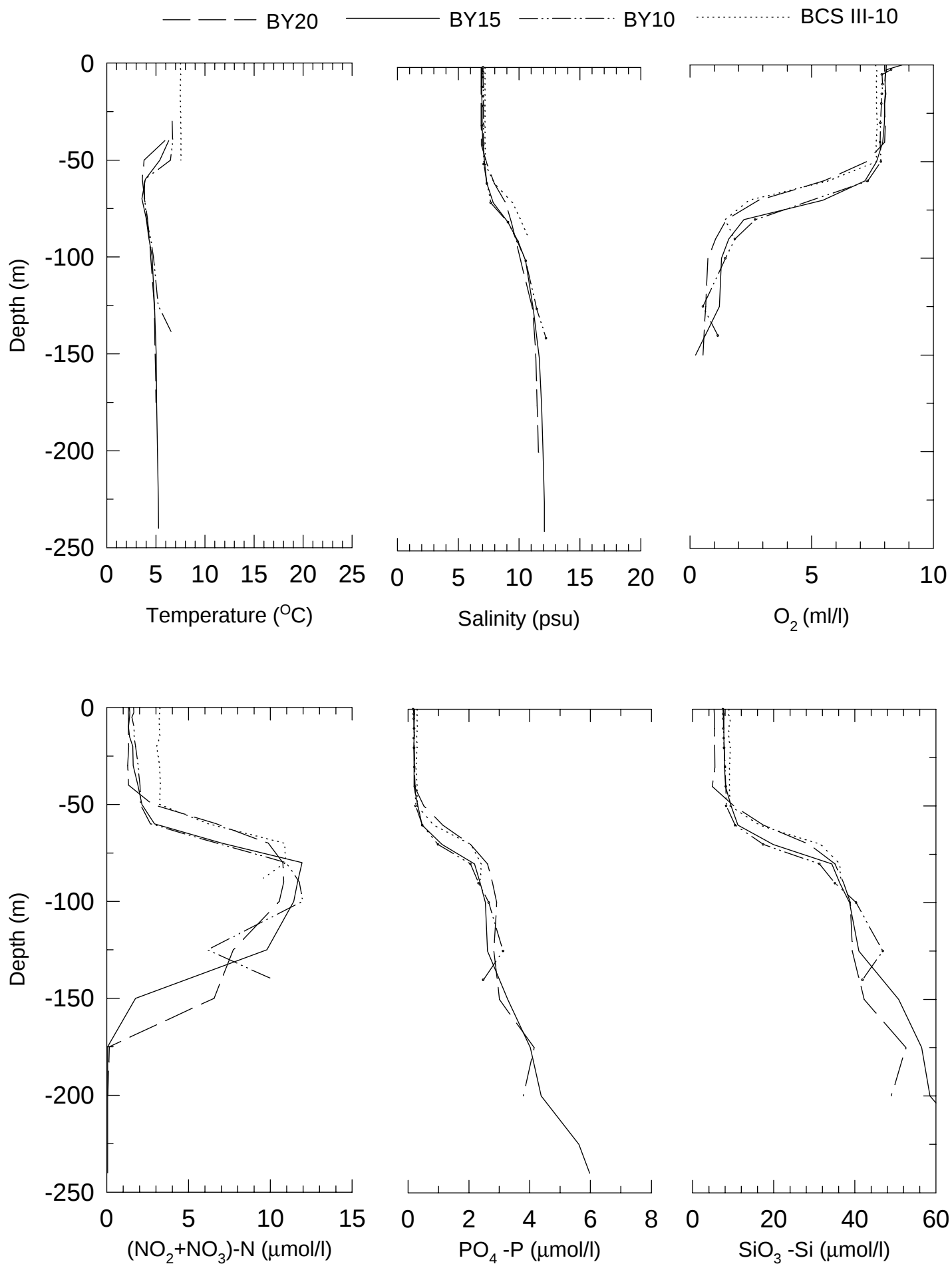
———— Fladen — — — Läsö - · - · - Anholt E ····· Landskrona



SOUTH BALTIC week 49-51 -97



EAST BALTIC week 49-51 -97



GULF OF BOTHNIA 971206-971210

