

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 inlcuding 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 were 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

Name	From
Jan Szaron, chief scientist	SMHI Oceanographical lab.
Nils Kajrup	- " -
Marie Larsson	- " -
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Mats Ohlson (v50-51)	- " -
Jorge Valderrama (v49)	- " -
Natalja Drgos (v50)	IMGW Gdynia

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 Ship: 14-Argos
**** series Year: 1997

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

Ser no	Stat code	P	Station	Lat	Lon	Date	Time	Bott	Mld	Secc	Wind	Air	Air	WCSI	C	PPCPZT	No	T	S	P	O	H	P	T	N	N	T	A	S	H	L	P	P	T	C			
						yymmdd	hhmm	deph		deph	di	ve	temp	pres	elec	t	Hrh	hour	de	e	a	h	x	2	o	o	o	h	o	l	i	u	i	O	O	O	O	
						utc	m	m	m				C	hPa	aoae	d	Cily	ooa		m	l	y	S	4	t	2	3	4	t	k	O	m	g	N	C	C	m	
															tu	mot	PBw		p	i	g		P	P	N	N	N	N	a	3	u	n						
															hd	Pr	P	l																				
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	x	x	x	x	x	x	-	-	-	
0806	GBSX13BAS	MS2		N6208	E1752	971209	1830	73			21	8	3.8	999	9930	x	-----	10	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-		
0807	GBSX10BAS	SR1A		N6114	E1740	971210	0045	64			18	7	4.8	1000	9930	x	-----	9	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-		
0808	GBSX09BAS	SR3		N6111	E1814	971210	0240	74			18	7	5.0	1001	9930	x	-----	10	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-		
0809	BPNX37BMP	BY31	LANDSORTSDJ	N5835	E1814	971210	1840	459			18	6	5.7	999	9920	x	--x----	24	xx	x	x	-	x	x	x	x	x	x	x	x	x	x	x	-	-	x		
0810	BPWX38BMP	BY32	NORRKÖPINGSDJ	N5801	E1759	971210	2320	211			16	6	6.0	998	9920	x	-----	17	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-		
0811	BPWX45BMP	BY38	KARLSÖDJ	N5707	E1740	971211	0545	113			14	10	6.3	994	9930	x	--xx---	14	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x	-	-	-		
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	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		
0815	BPSG00BAS	PL-P116		N5439.1	E1917.6	971212	0125	91			23	3	7.9	995	9920	x	-----	12	xx	x	x	-	x	x	x	x	-	x	x	-	-	-	-	-	-	x		
0816	BPSG00BAS	PL-P110		N5430.3	E1906.8	971212	0255	73			23	2	7.7	996	5910	x	-----	10	xx	x	x	-	x	x	x	x	-	x	x	-	-	-	-	-	-	x		
0817	BPSG00BAS	PL-P115		N5426.2	E1902.5	971212	0350	55			00	0	6.7	997	9900	x	---x---	8	xx	x	x	-	x	-	x	x	-	-	x	x	-	-	-	-	-	x		
0818	BPSB07BMP	BY5	BORNHOLMSDJ	N5515	E1559	971215	0045	92			07	16	2.6	1033	9940	x	xxx---	13	x	x	x	x	-	x	x	x	x	x	x	x	x	x	-	-	-	-		
0819	BPSB06BMP	BY4	CHRISTIANSÖ	N5523	E1520	971215	0430	94			07	16	3.6	1035	9940	x	-----	12	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-		
0820	BPSA04BAS	BY3	HAMRARNE SUND	N5517.5	E1424	971215	0815	49			05	16	3.5	1037	2840	x	-----	8	xx	-	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	-	-	-	-	-	-	-		
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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		
0832	KAEX32BAS	HALLANDS VÄDERÖ		N5629.5	E1232.0	971216	0240	25			09	6	-1.0	1044	9920	x	-----	6	xx	-	x	-	x	x	x	x	x	-	x	-	-	-	-	-	-	-		

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***** Hydrographic
series

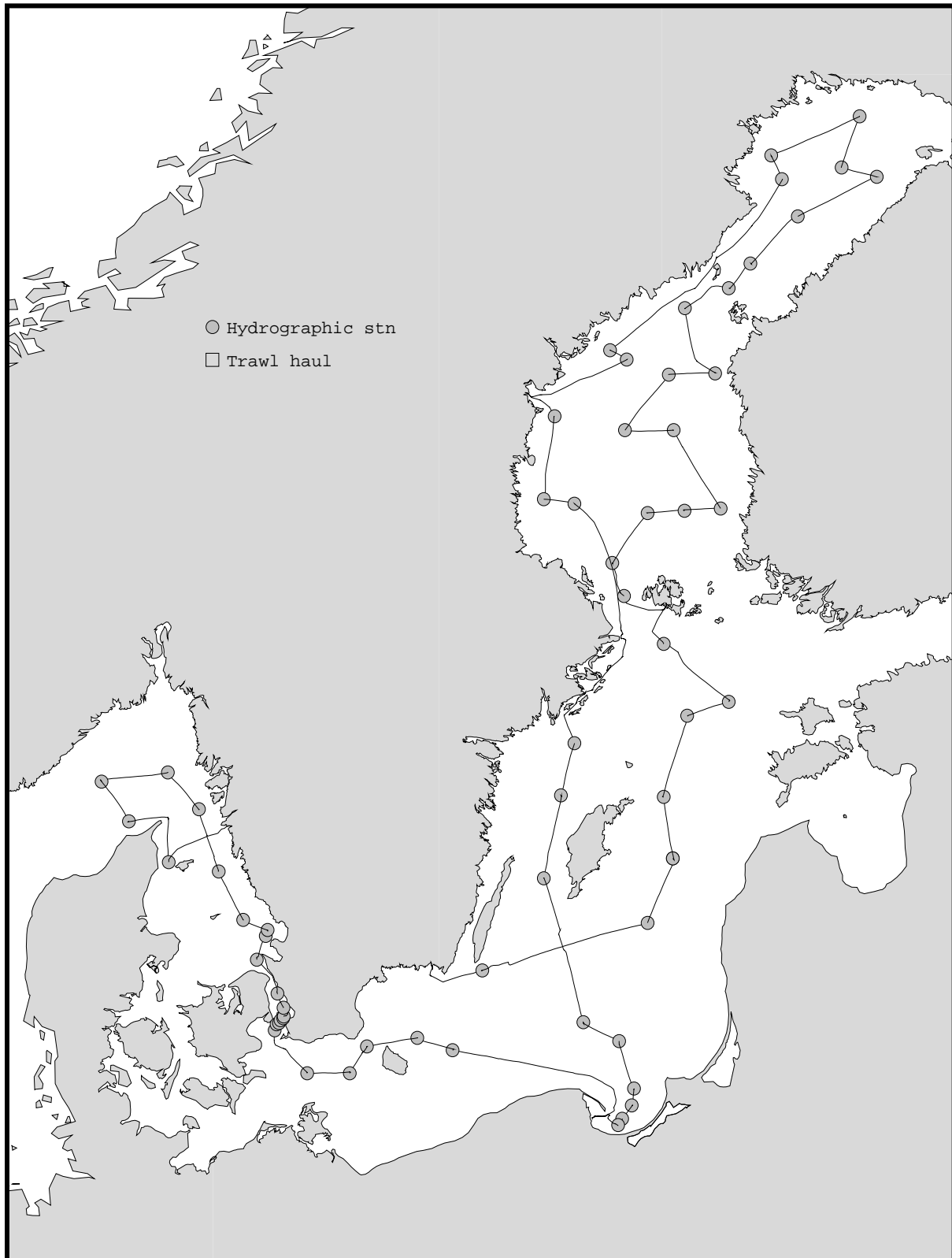
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		o					utc	m	m	m		C	hPa	aoae	d	Cilyooa		m	l	y	S	4	t	2	3	4	t	k	O	m	g	N	C	C	m			
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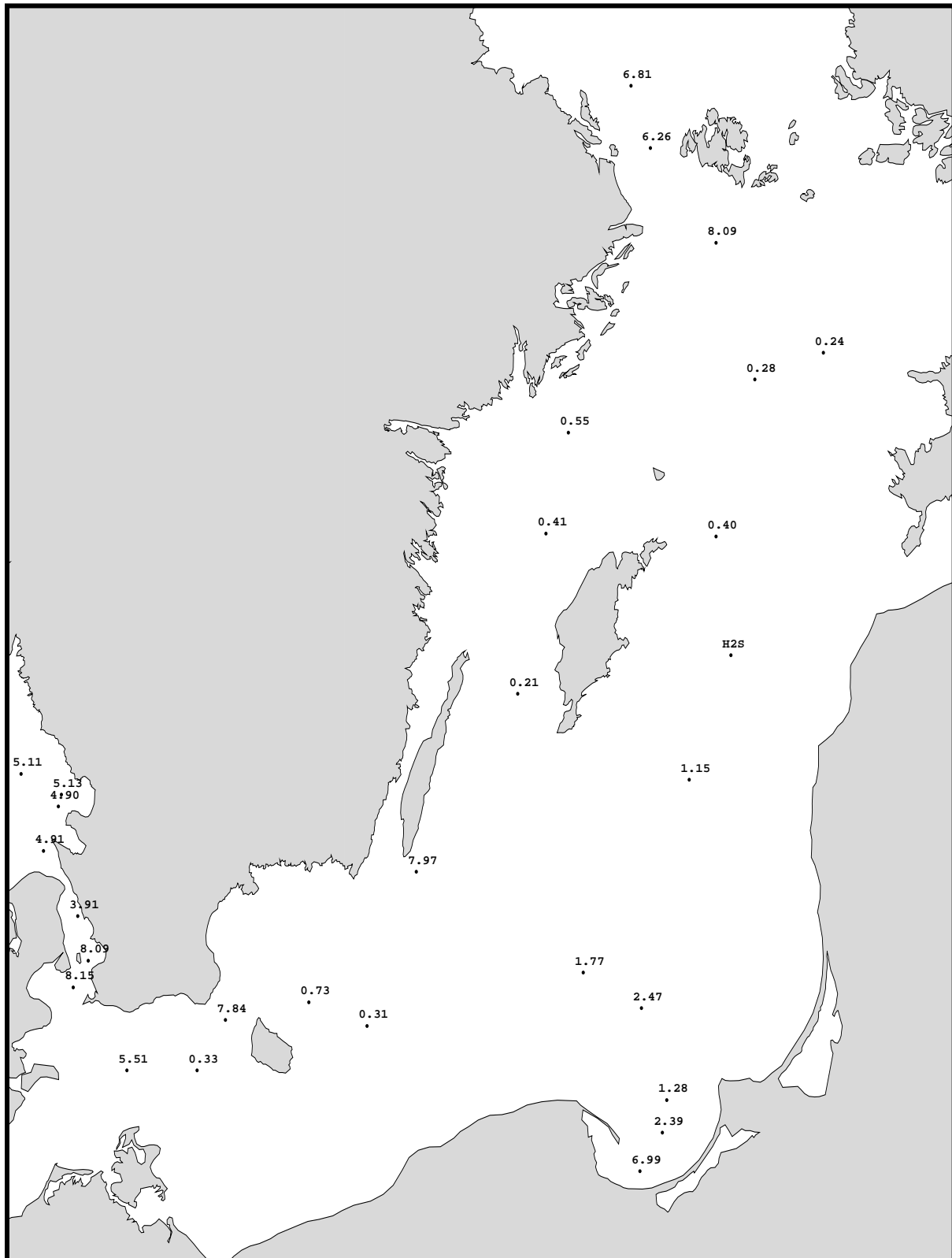
TRACK CHART

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



Bottom water oxygen concentration (ml/l)

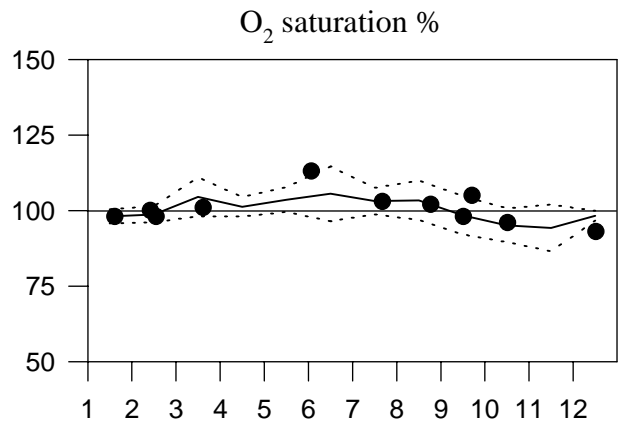
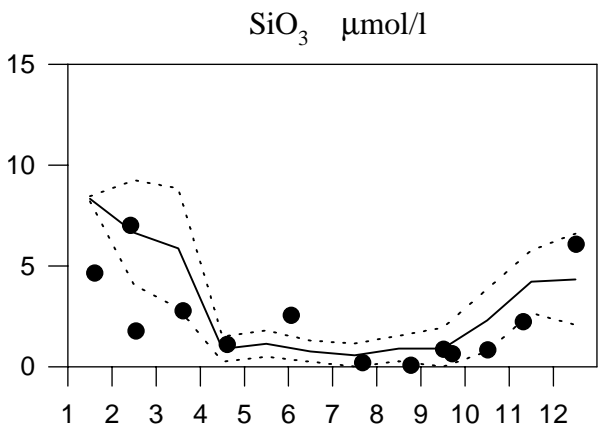
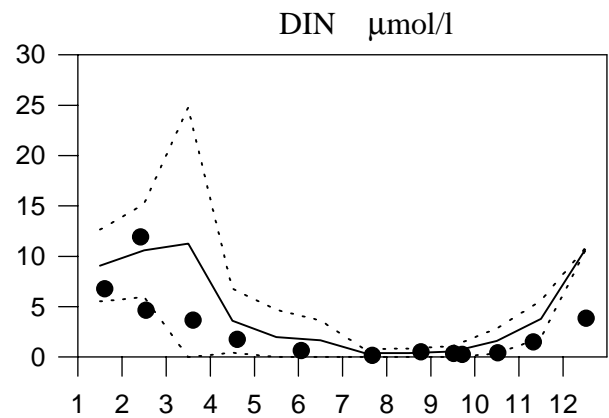
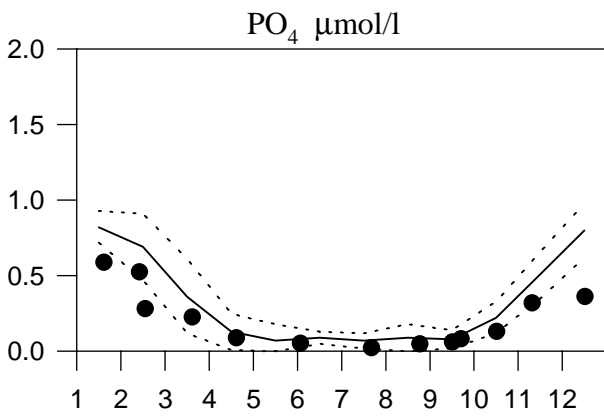
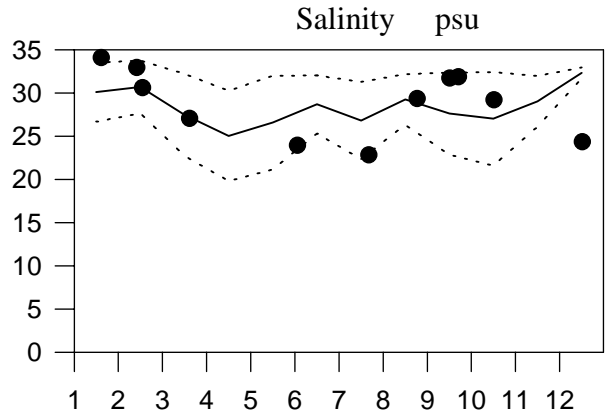
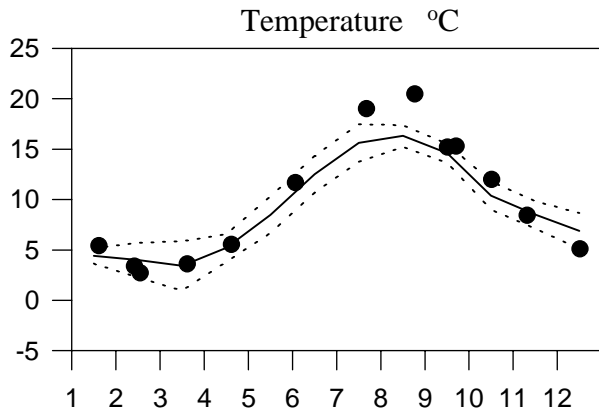
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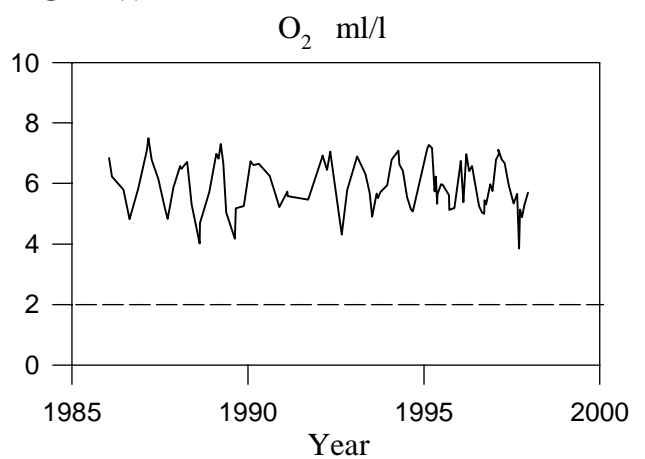
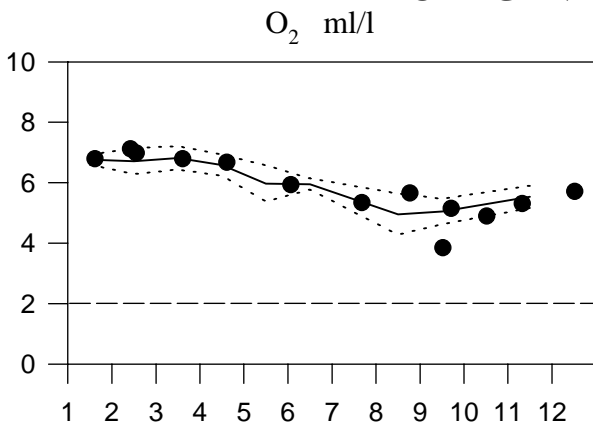
STATION P2 SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



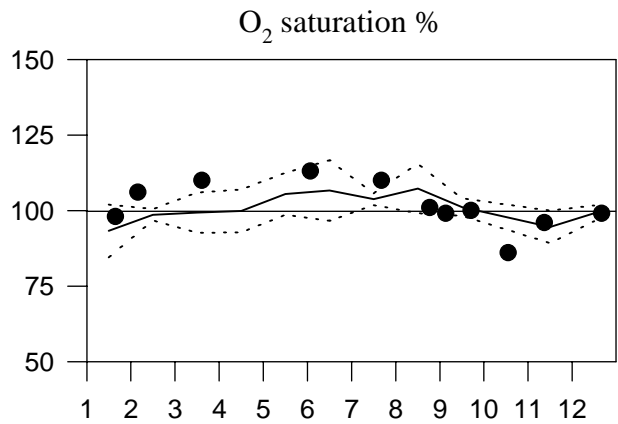
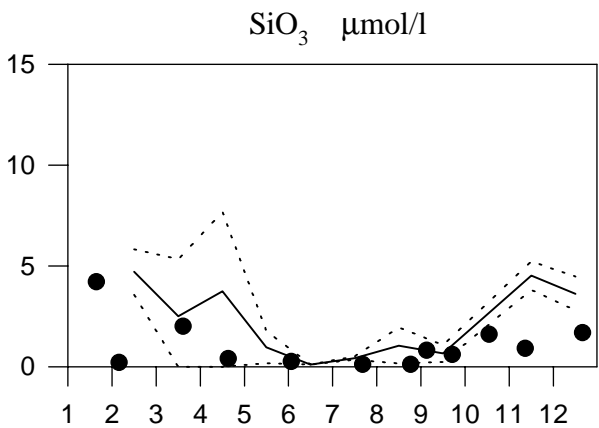
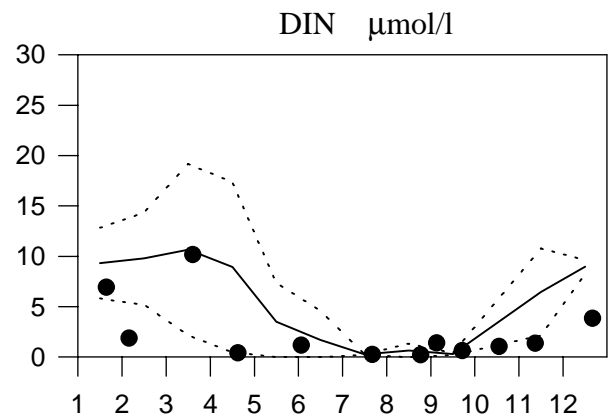
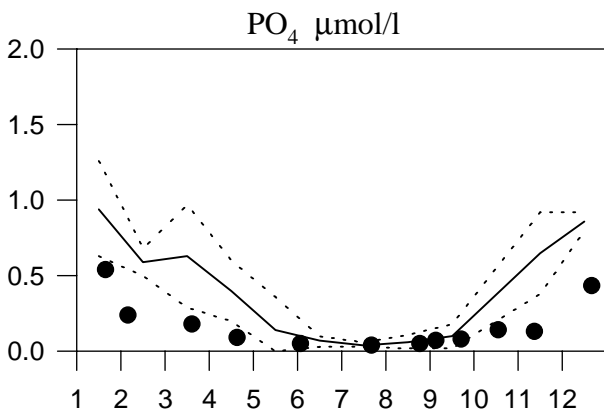
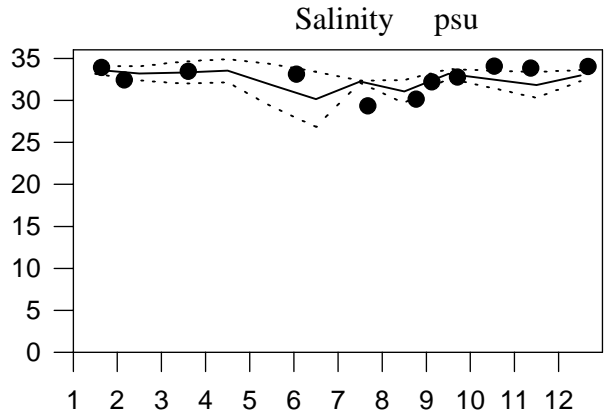
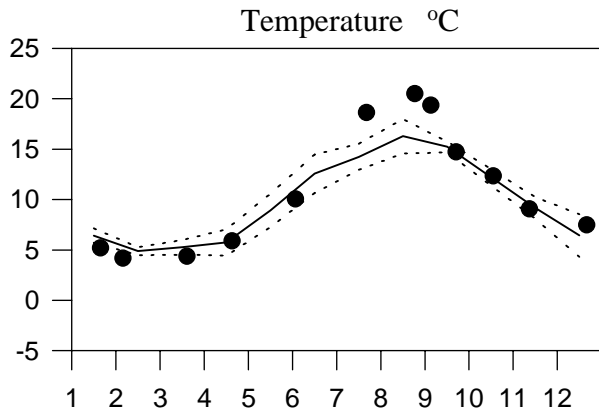
OXYGEN IN BOTTOM WATER



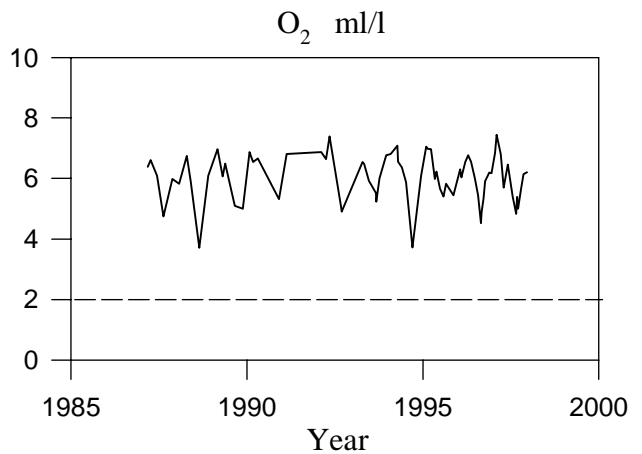
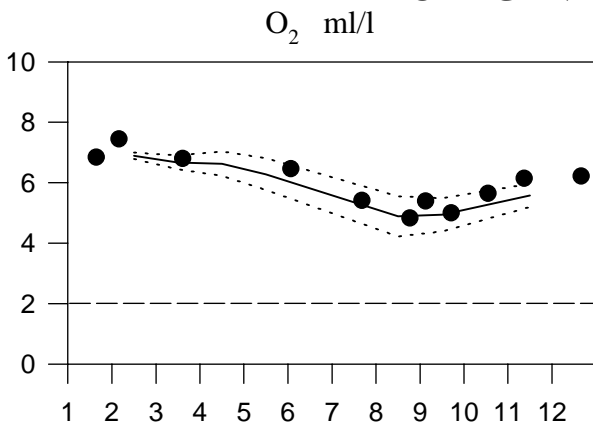
STATION HS5 SURFACE WATER (0-15 m)

Annual Cycles

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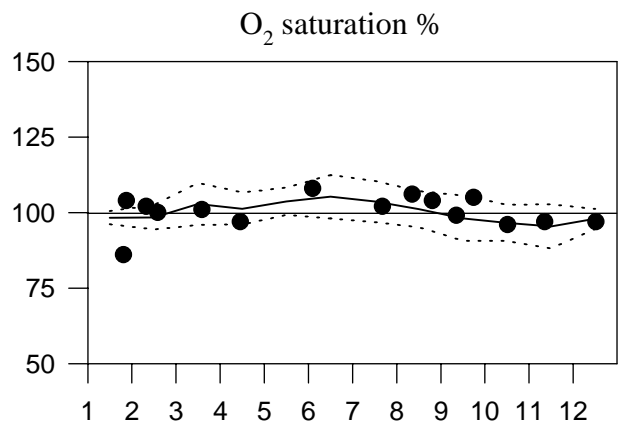
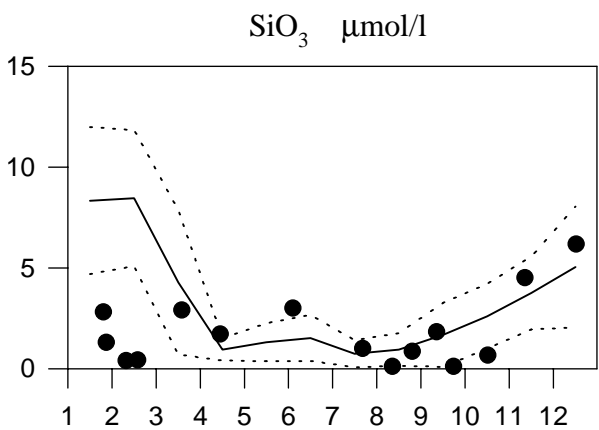
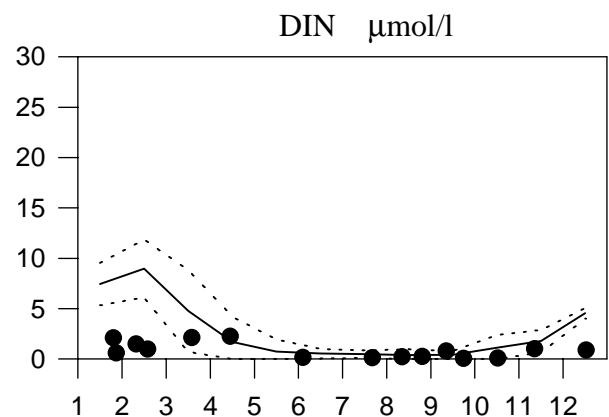
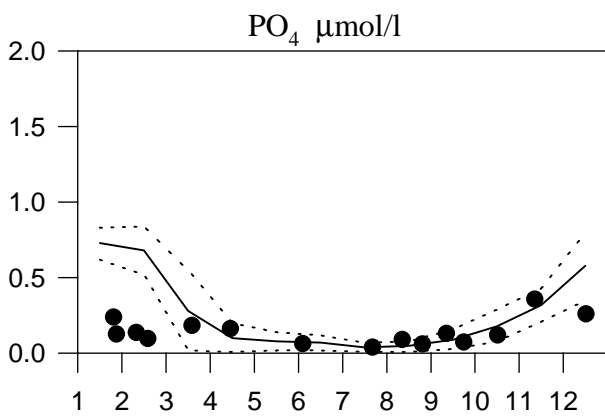
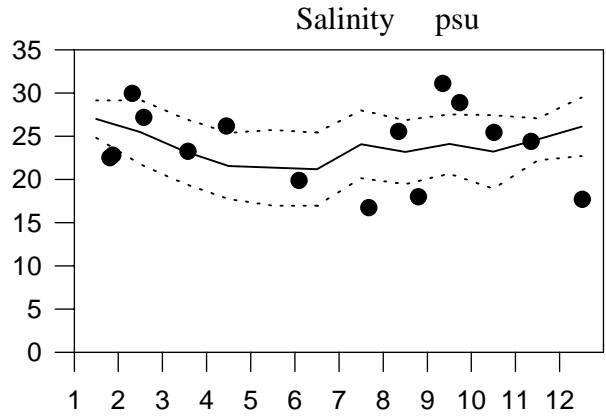
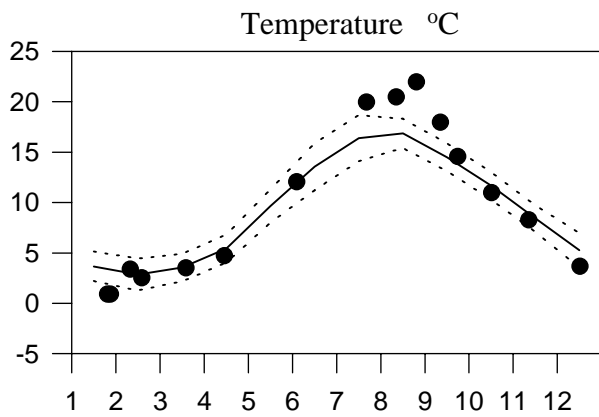
OXYGEN IN BOTTOM WATER



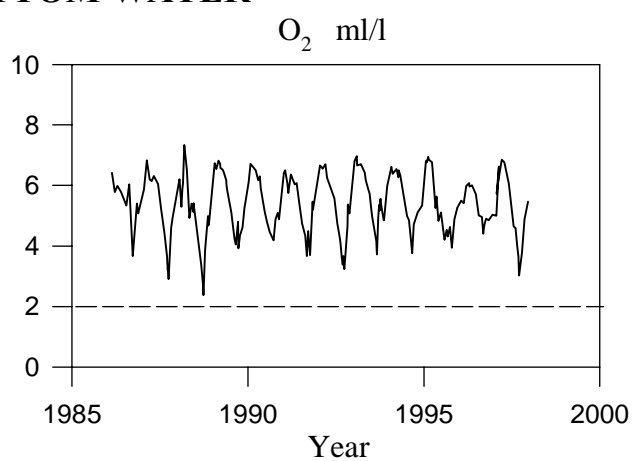
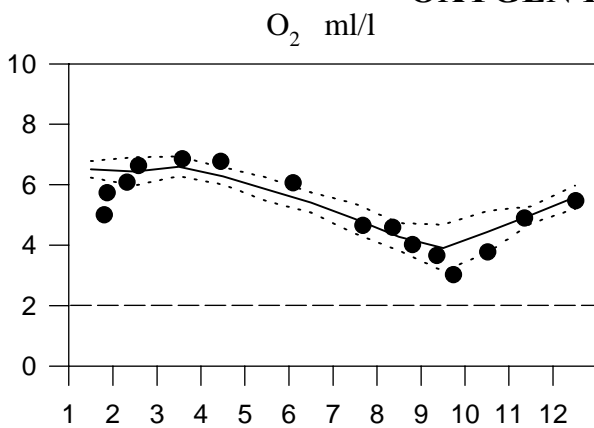
STATION FLADEN SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



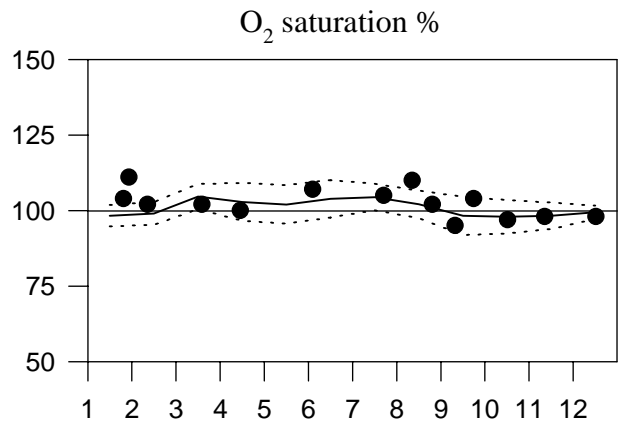
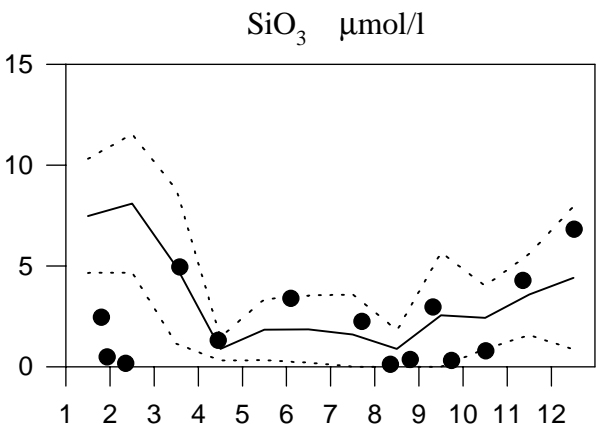
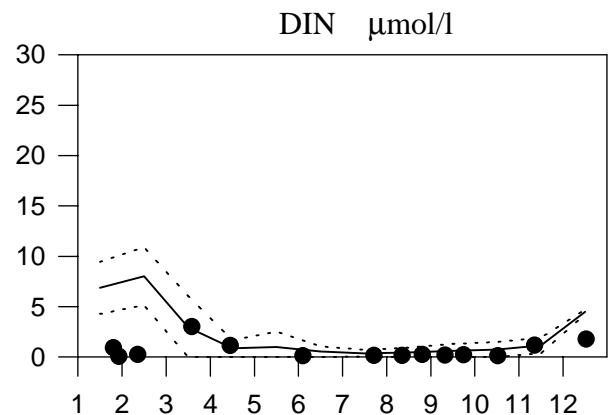
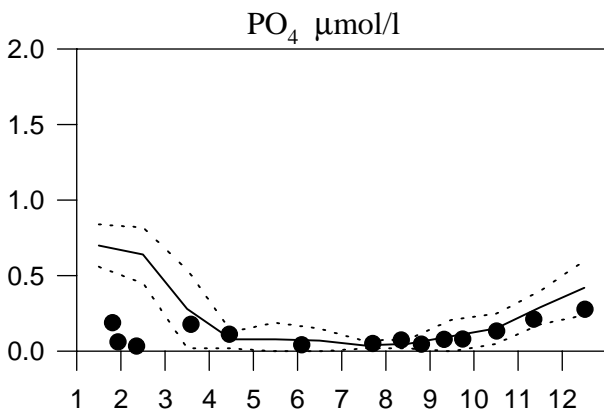
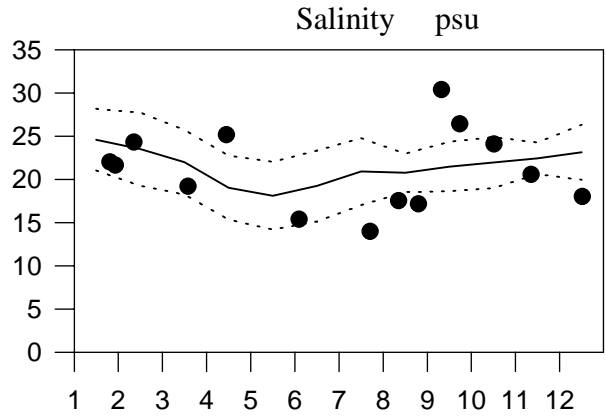
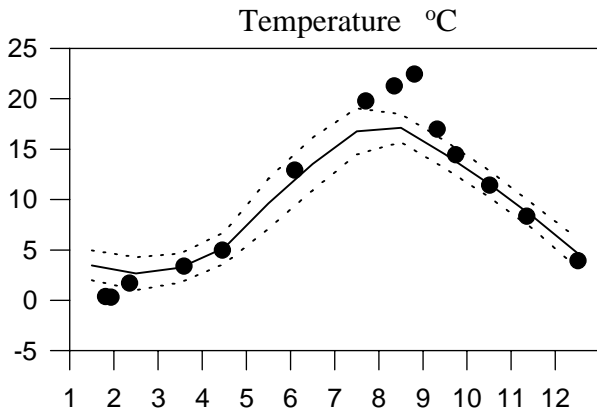
OXYGEN IN BOTTOM WATER



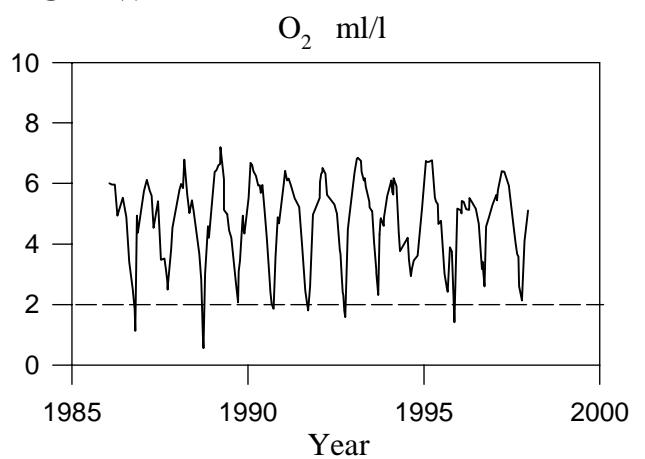
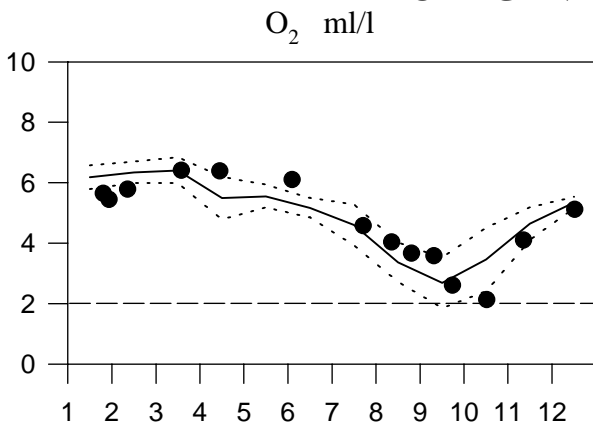
STATION ANHOLT E SURFACE WATER (above halocline)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



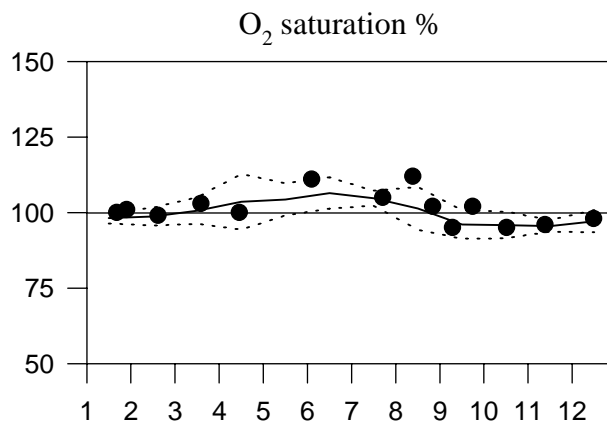
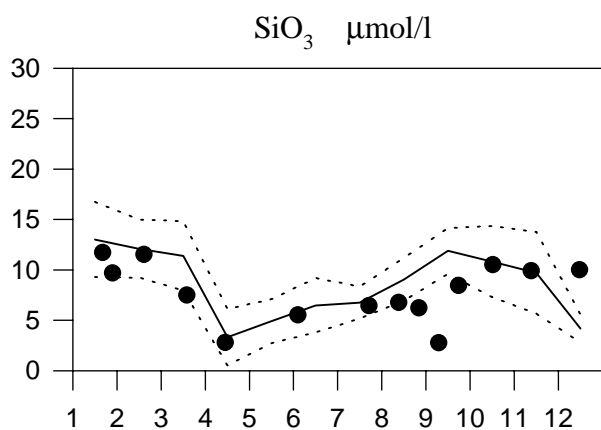
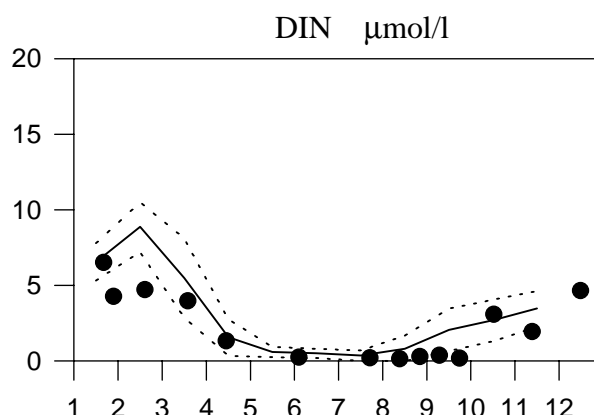
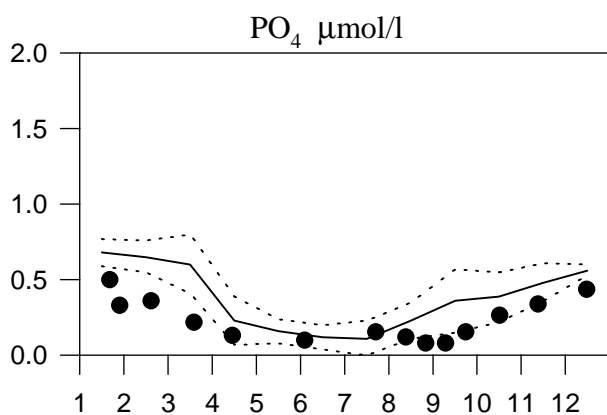
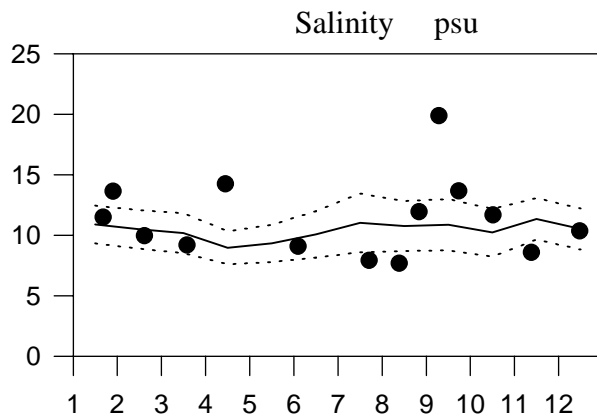
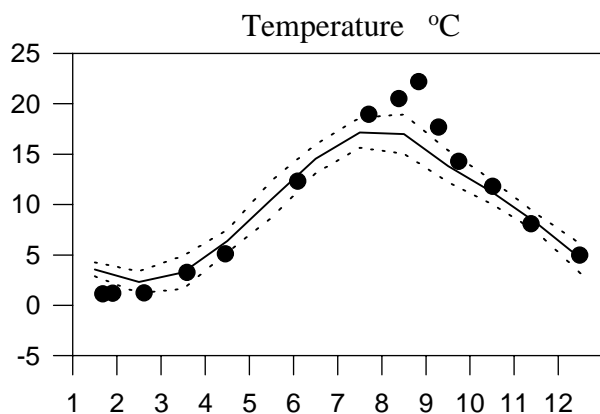
OXYGEN IN BOTTOM WATER



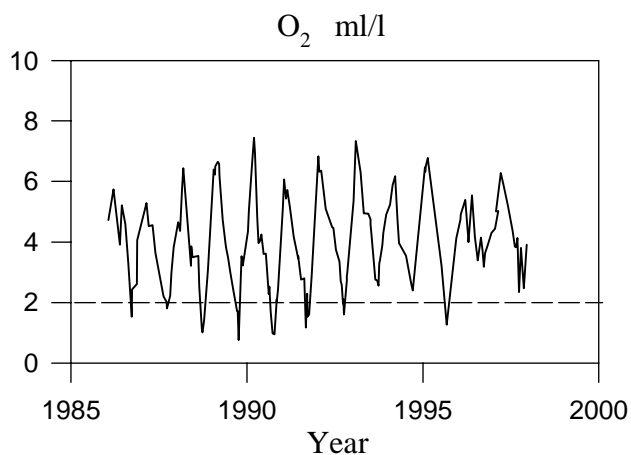
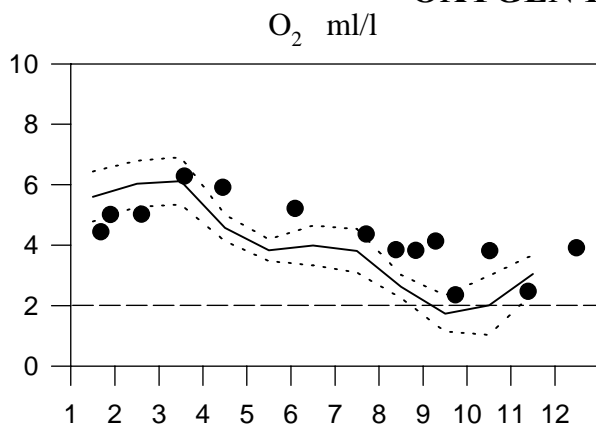
STATION W LANDSKRONA SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



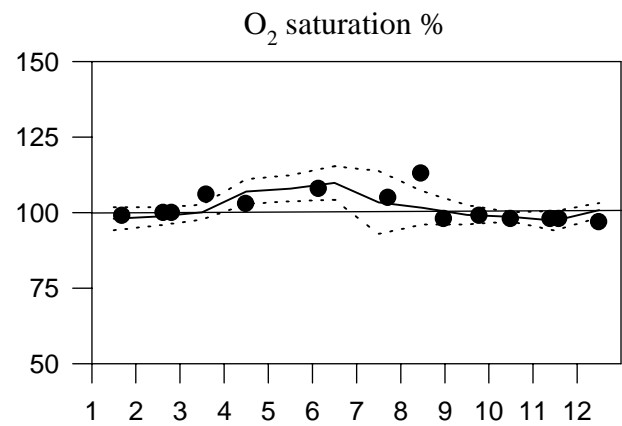
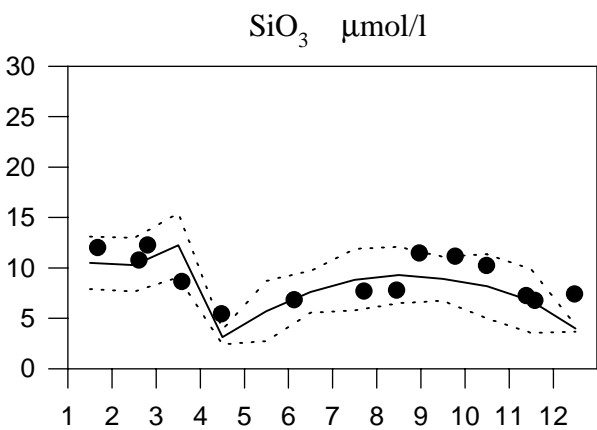
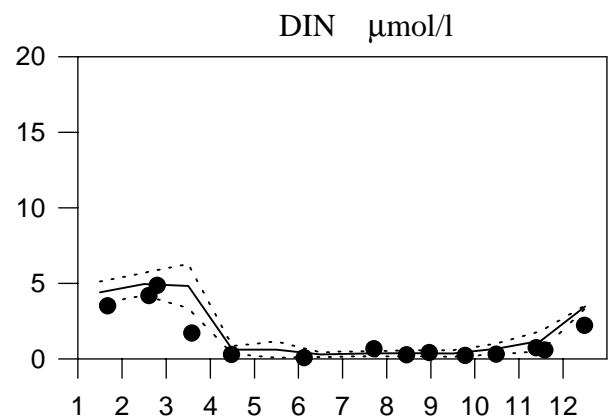
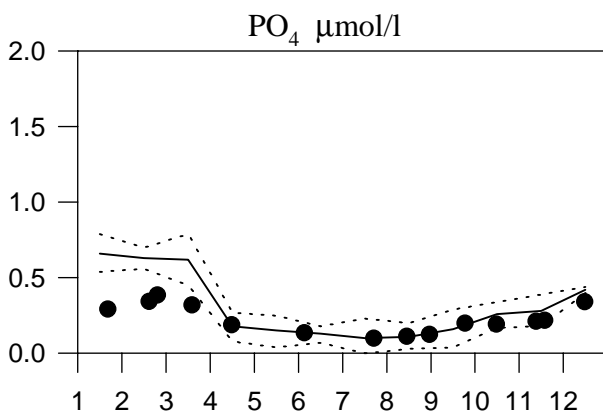
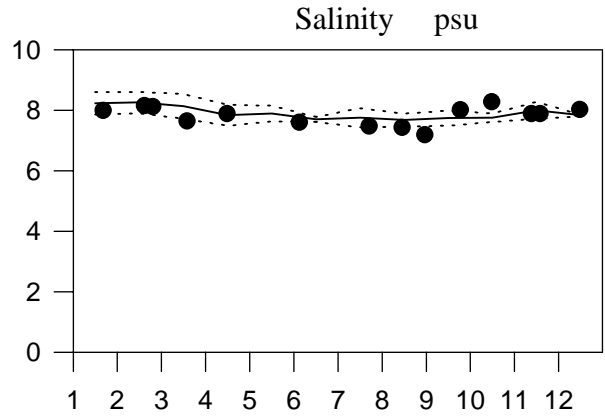
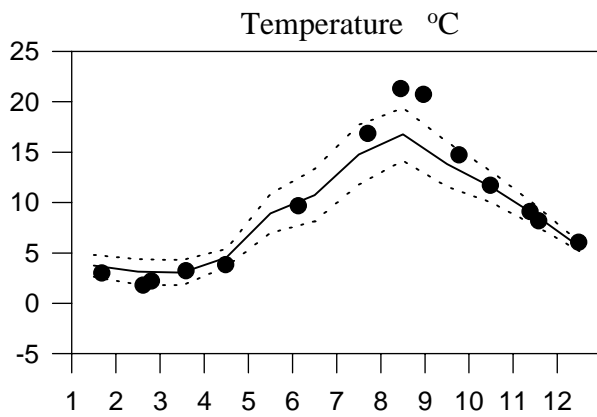
OXYGEN IN BOTTOM WATER



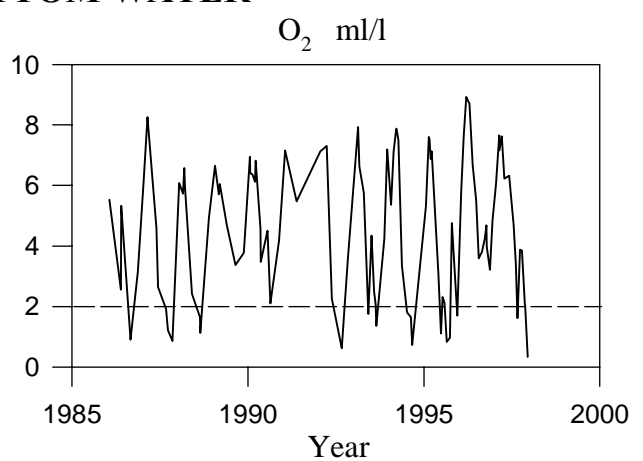
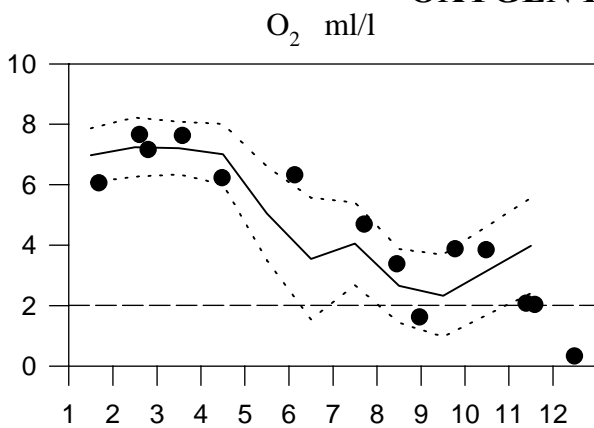
STATION BY2 SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



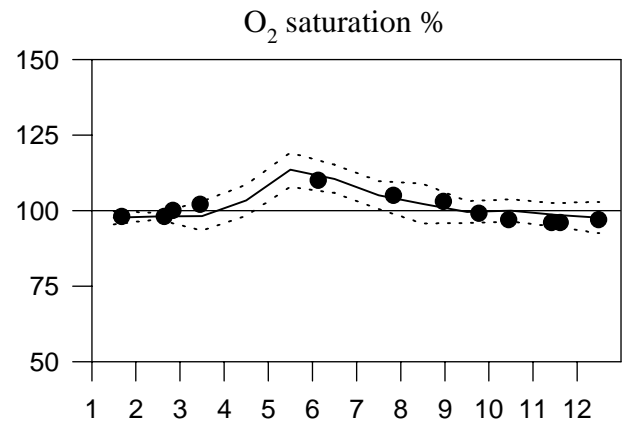
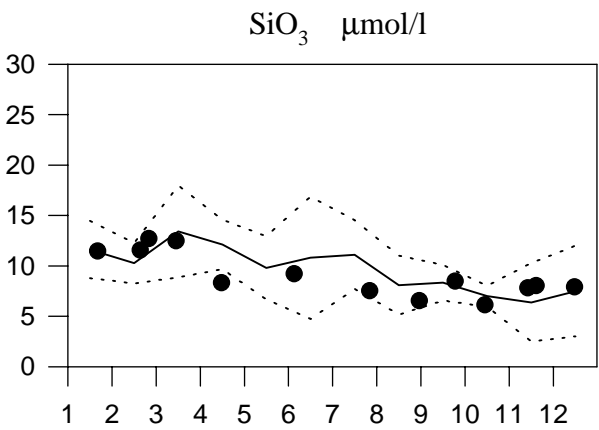
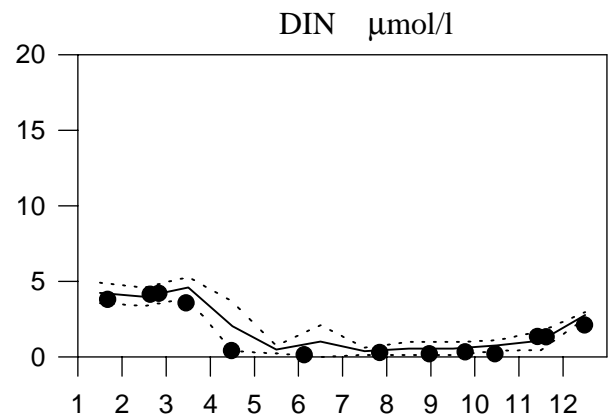
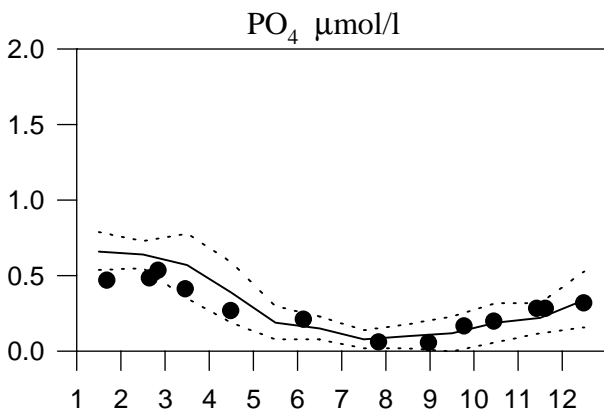
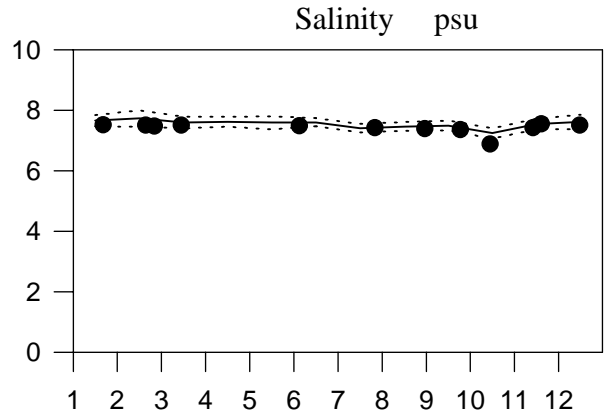
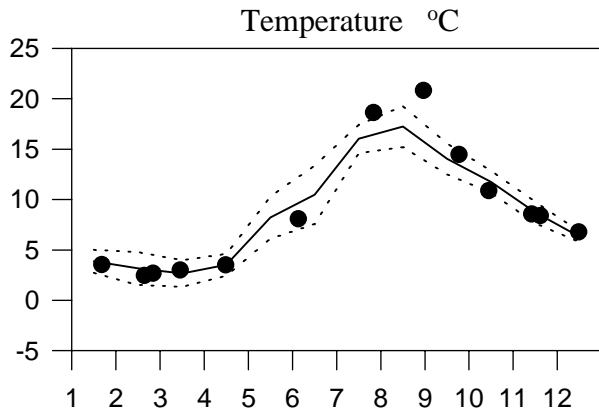
OXYGEN IN BOTTOM WATER



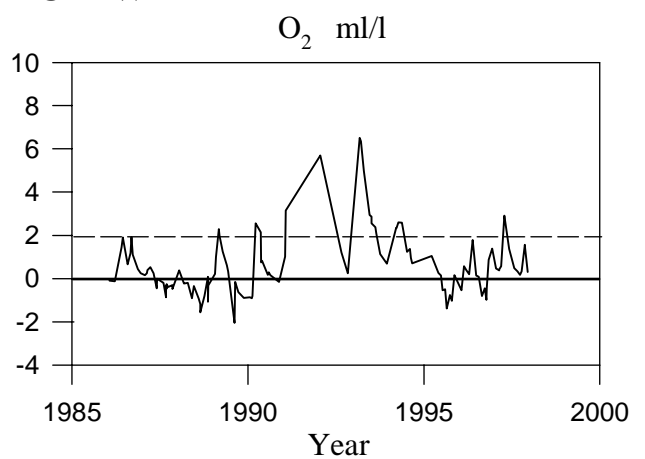
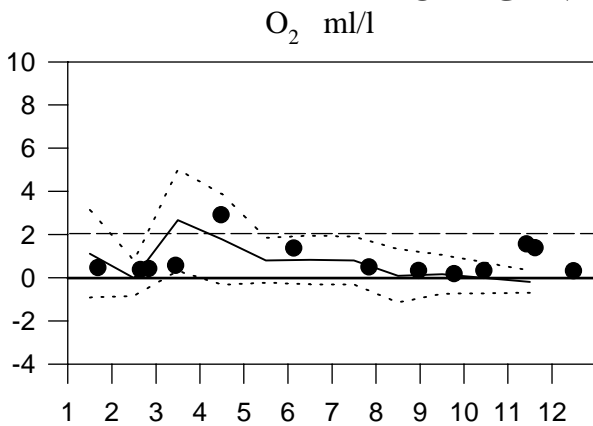
STATION BY5 SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997



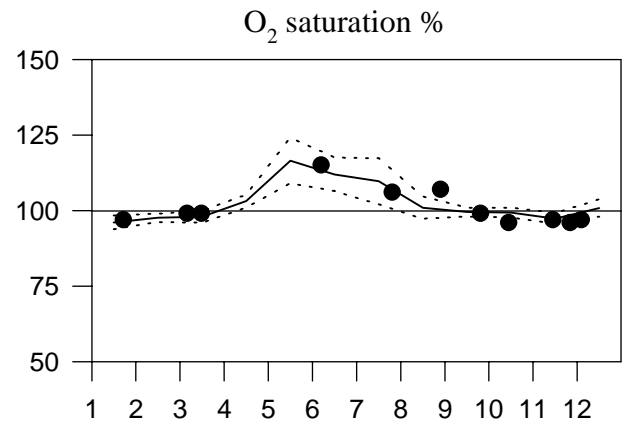
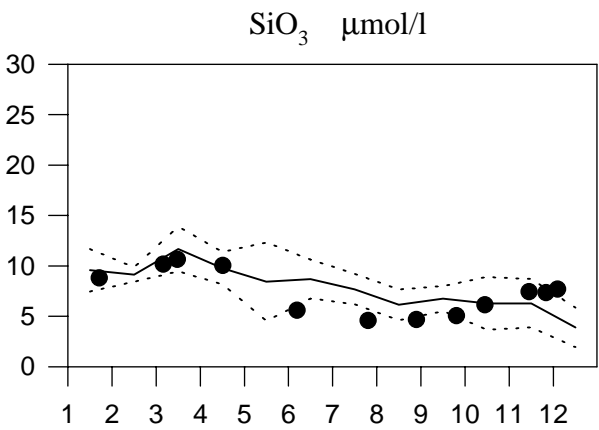
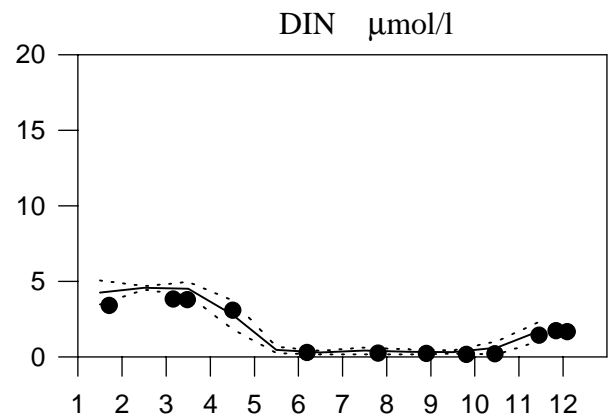
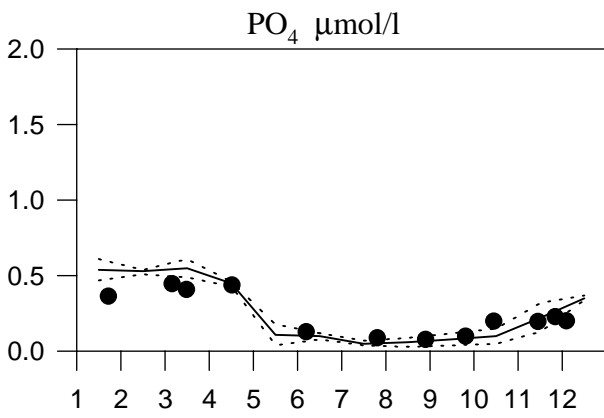
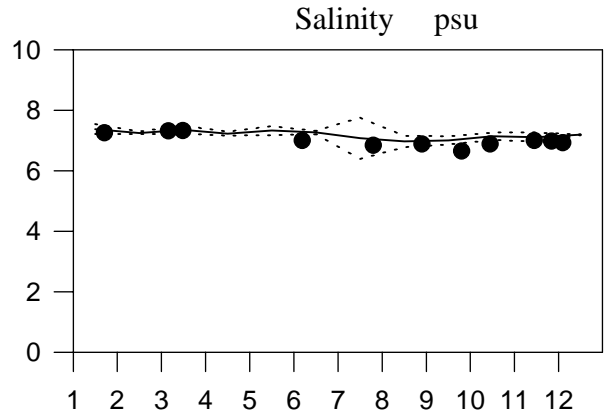
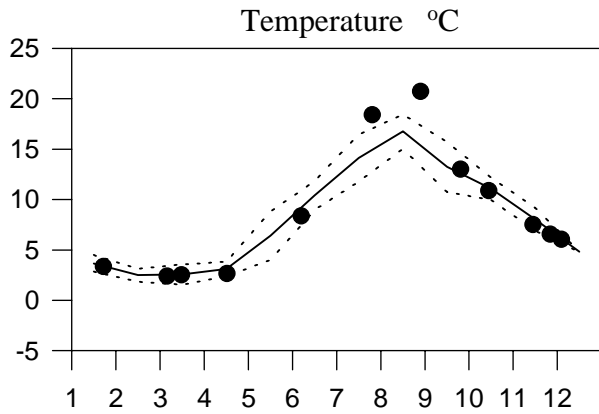
OXYGEN IN BOTTOM WATER



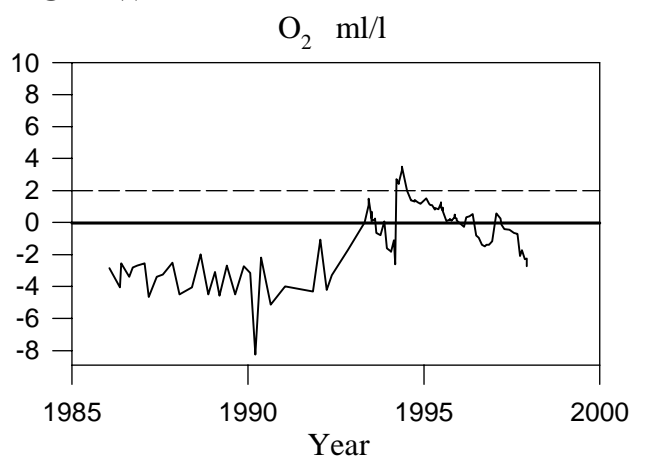
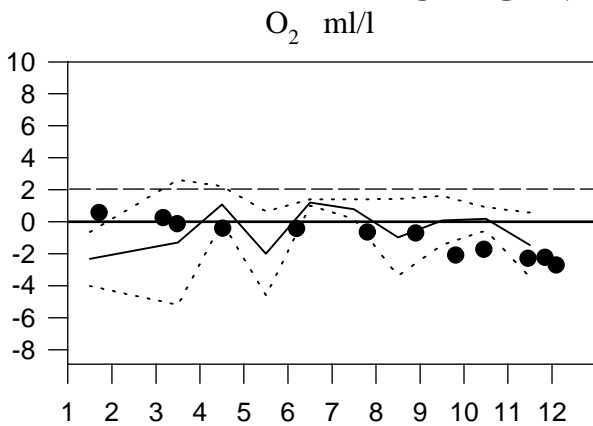
STATION BY15 SURFACE WATER (0-15 m)

Annual Cycles

— Mean 1986-1995 - - - St.Dev. ● 1997

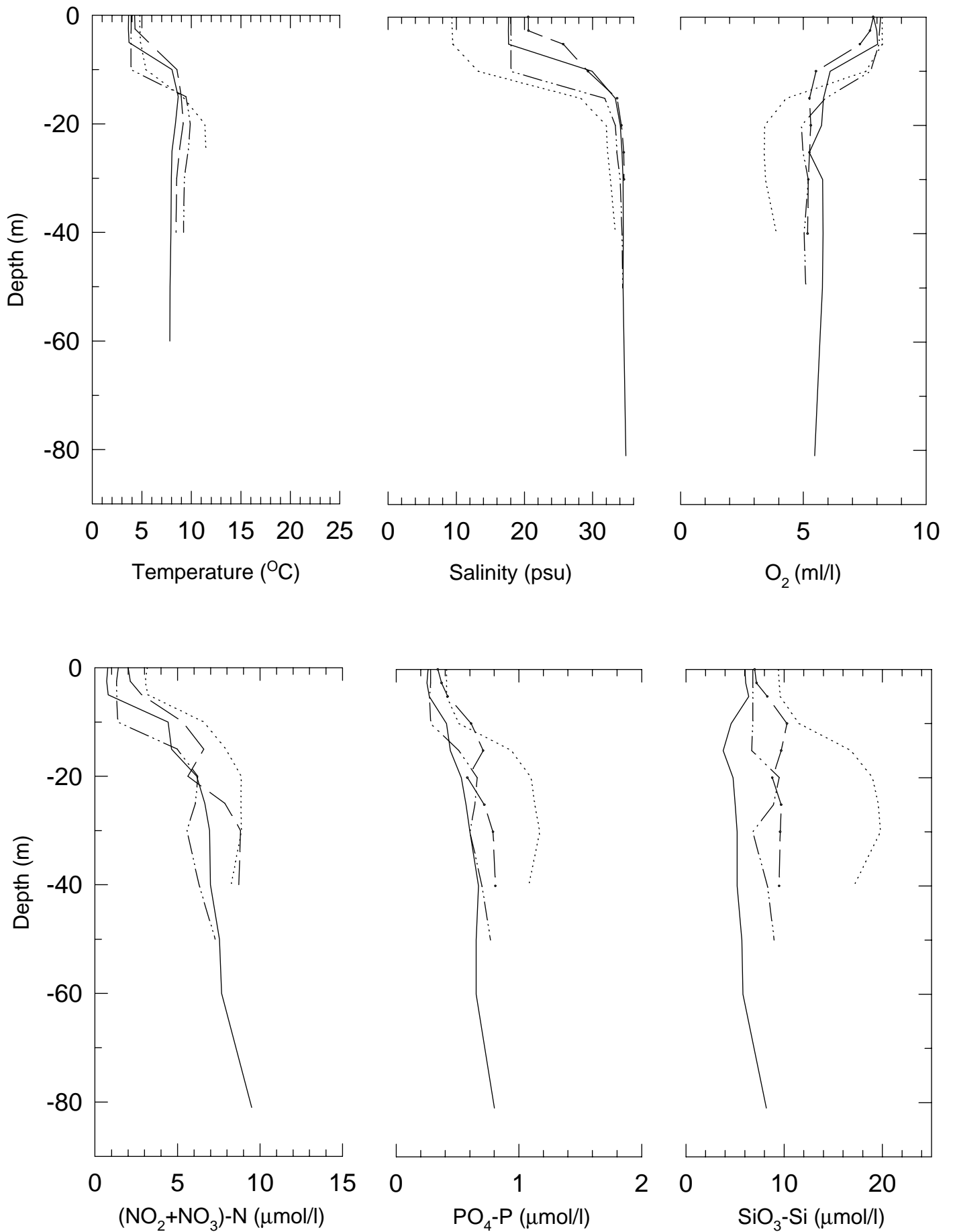


OXYGEN IN BOTTOM WATER



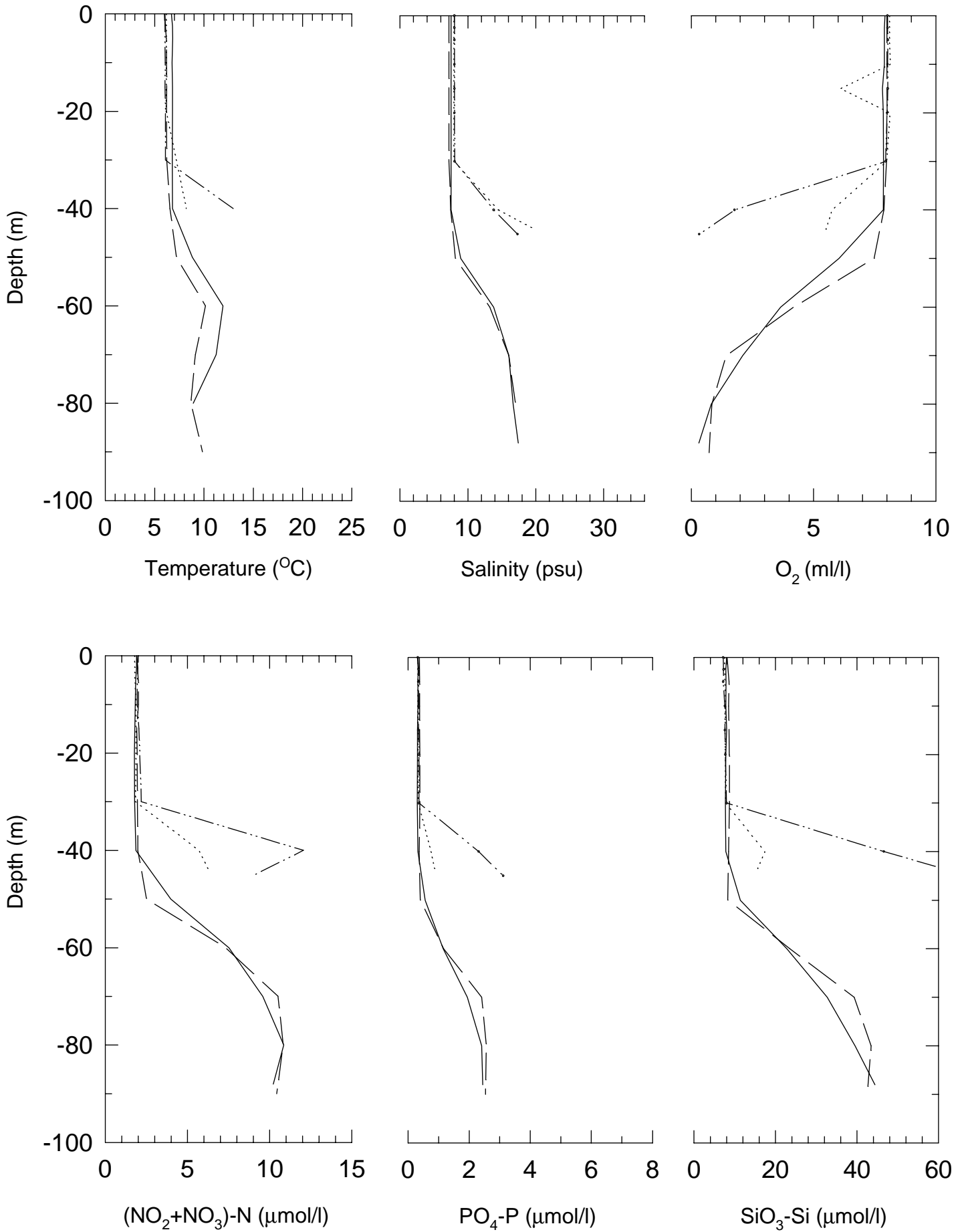
KATTEGAT and THE SOUND week 49-51 -97

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



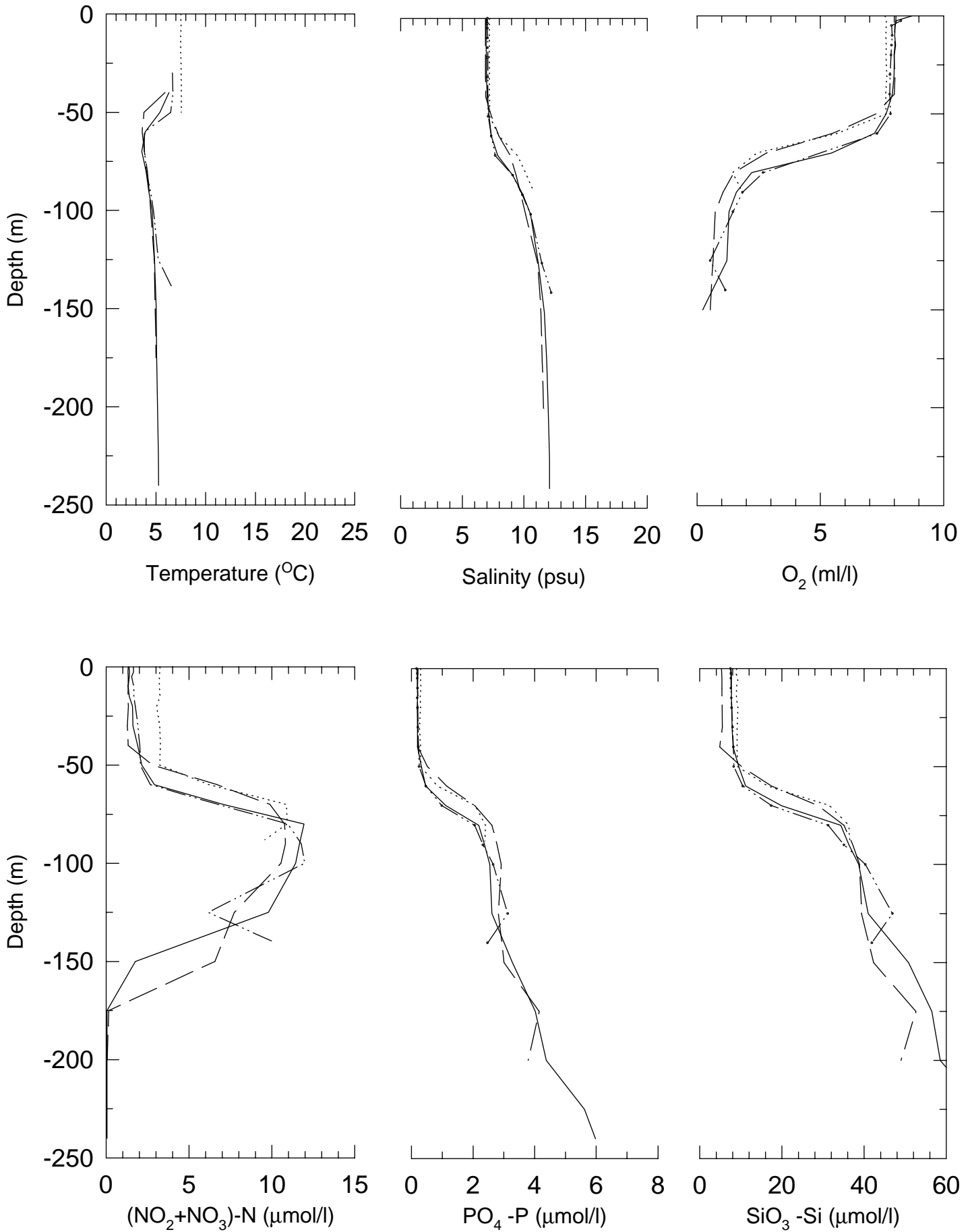
SOUTH BALTIC week 49-51 -97

— BY5 - - - BY4 ····· BY2 BY1



EAST BALTIC week 49-51 -97

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



GULF OF BOTHNIA 971206-971210

