

Report from the SMHI monitoring cruise with M/V Meri



Photo: Panu Hänninen

Survey period: 2017-09-12 - 2017-09-18
Principal: Swedish Meteorological and Hydrological Institute (SMHI),
Swedish Agency for Marine and Water Management (SwAM).
Cooperation partners: Finnish Environment Institute (SYKE)

SUMMARY

The September cruise, which is part of the Swedish national marine monitoring programme, covered the Skagerrak, the Kattegat, the Sound and the Baltic Proper.

Oxygen concentrations close to zero were observed in all deep water areas in the Baltic Proper. Anoxic conditions, when hydrogen sulphide forms, were measured in the Western Gotland Basin from about 70 metres depth, in the Eastern Gotland Basin intermediate at 80 meters and nearest the bottom at BY20 and at BY15 Gotland Depth from 225 meters. It was still oxygenated nearest bottom at 4-CTRY-BP but between 70 and 95 meters acute hypoxia was found (dissolved $O_2 < 2$ ml/l). Areas with acute hypoxia were also found in the Bornholm Basin at 65 meters and in the Eastern and the Western Gotland Basins starting at around 60-70 meters. In the Arkona Basin the entire water column was well oxygenated, except at BY1 where acute hypoxia was found close to the bottom.

The nutrients DIN and DIP were generally depleted in the surface water which is normal at this time of year. In the southwestern Baltic Proper small amounts of phosphate was measured. Surface concentrations of silicate were still above normal in the whole investigated area.

The surface water temperature in the investigated area was normal to colder than normal for the season. The salinity in the surface water was normal except from the Skagerrak, BY1 and BY29 where it was higher than normal.

Next monitoring cruise is scheduled to start in the middle of October.

RESULTS

The expedition was conducted aboard the Finnish vessel Meri, it started in Åbo on the 12th of September and ended in Göteborg the 18th. The winds during the expedition were strong from west in the beginning to weak from east in the end. The strongest wind was in Eastern Gotland basin with 21 m/s.

During the expedition net samples of jelly fish was made in order to develop methods for monitoring. The samples were photographed and the images will later be analysed.

This report is based on data that have passed a first quality control. When data are published at the national oceanographic data centre some values might have changed after further quality controls have been performed. Data from this cruise will be published as soon as possible on the data center's webpage, normally within one or two weeks after the cruise.

Download data here: <http://www.smhi.se/klimatdata/oceanografi/havsmiljodata> (only available in Swedish)

The Skagerrak

The surface water temperature in the Skagerrak was normal for the season and varied between 15.2 and 15.9 °C. The salinity in the surface was slightly higher than normal except for the southern part where it was lower than normal and varied between 26 psu and 35 psu. Thermocline and halocline coincided and was found at depth between 5 and 70 meters in the area.

Concentrations of nutrients in the surface water were very low which is normal for this time of year, except for the southern part where the amount of silicate was higher than normal. The level of dissolved inorganic nitrogen, DIN, (which is the sum on nitrate, nitrite and ammonia) was around 0.3 µmol/l and the concentrations of phosphate varied between 0.03 and 0.13 µmol/l. The silicate concentrations were between 0.8 and 3.9 µmol/l.

Concentrations of dissolved oxygen were normal in the entire water column at all sampled stations.

The fluorescence sond on the CTD generally showed higher levels of fluorescence in the upper part of the water column.

The Kattegat and the Sound

In the Kattegat and the Sound surface water temperature was normal and varied between 14.8-16.1°C, warmest close to the coast of Kattegat at N14 Falkenberg. The surface salinity was also normal and varied from 17.8 psu in the Sound to 21.2 psu at N14 Falkenberg. The pycnocline was found at depth between 15 and 20 meters. At W Landskrona and Fladen also a halocline was found at 7-11 meters depth.

All concentrations of nutrients were normal for the season in the entire Kattegat and the Sound except for the amount of silicate, which was slightly above normal. In Kattegat, DIN was depleted in the surface water and phosphate concentrations were around 0.1 µmol/l. The concentration of silicate in the surface water varied between 3.1-3.3 µmol/l. In surface water of the Sound, the concentration of phosphate was 0.2 µmol/l, the silicate about 10.3 µmol/l and DIN was 1.4 µmol/l.

Oxygen concentrations close to the bottom in the area were at normal levels between 3.7 and 4.4 ml/l in the Kattegat and 2.4 ml/l in the Sound.

The fluorescence sond at the CTD generally showed higher levels of fluorescence in the upper part of the water column.

The Baltic Proper

The temperature in the surface water in the Baltic Proper was normal to lower than normal and varied between 13.1 to 16.0 °C. The salinity in the surface water was normal, except for the western and the northern sampling stations where it was slightly above normal, and varied between 6.5-8.3 psu. A clear thermocline was found about 10-35 meters in the area. There was also a pycnocline between 50 and 70 meters, in the Arkona basin it was found more shallow, about 30 meters.

The dissolved inorganic nitrogen was depleted in the surface water. The amount of phosphate in the surface water was between 0.06 and 0.38 $\mu\text{mol/l}$, highest in the Arkona and the Bornholm basins. Surface concentrations of silicate were still above normal in the entire Baltic Proper and varied from 11.4 $\mu\text{mol/l}$ in the Western Gotland Basin to 16.0 $\mu\text{mol/l}$ in the Hanö Bay.

Oxygen concentrations close to zero were observed in all the deep water areas in the Baltic Proper. Anoxic conditions, when hydrogen sulphide forms, were found in the Western Gotland Basin from about 70 metres depth, in the Eastern Gotland Basin intermediate at 80 meters and near the bottom at BY20 and at BY15 Gotland Depth from 225 meters. It was still oxygenated at the bottom at 4-CTRY-BP but between 70 and 95 meters acute hypoxia was found (dissolved $\text{O}_2 < 2 \text{ ml/l}$). Areas with acute hypoxia were found in the Bornholm Basin at 65 meters and in the Eastern and the Western Gotland Basin starting at around 60-70 meters. In the Arkona Basin the entire water column was well oxygenated, except at BY1 where acute hypoxia was found from 40 meters.

Fluorescence measurements with the CTD showed some phytoplankton activity just above the thermocline.

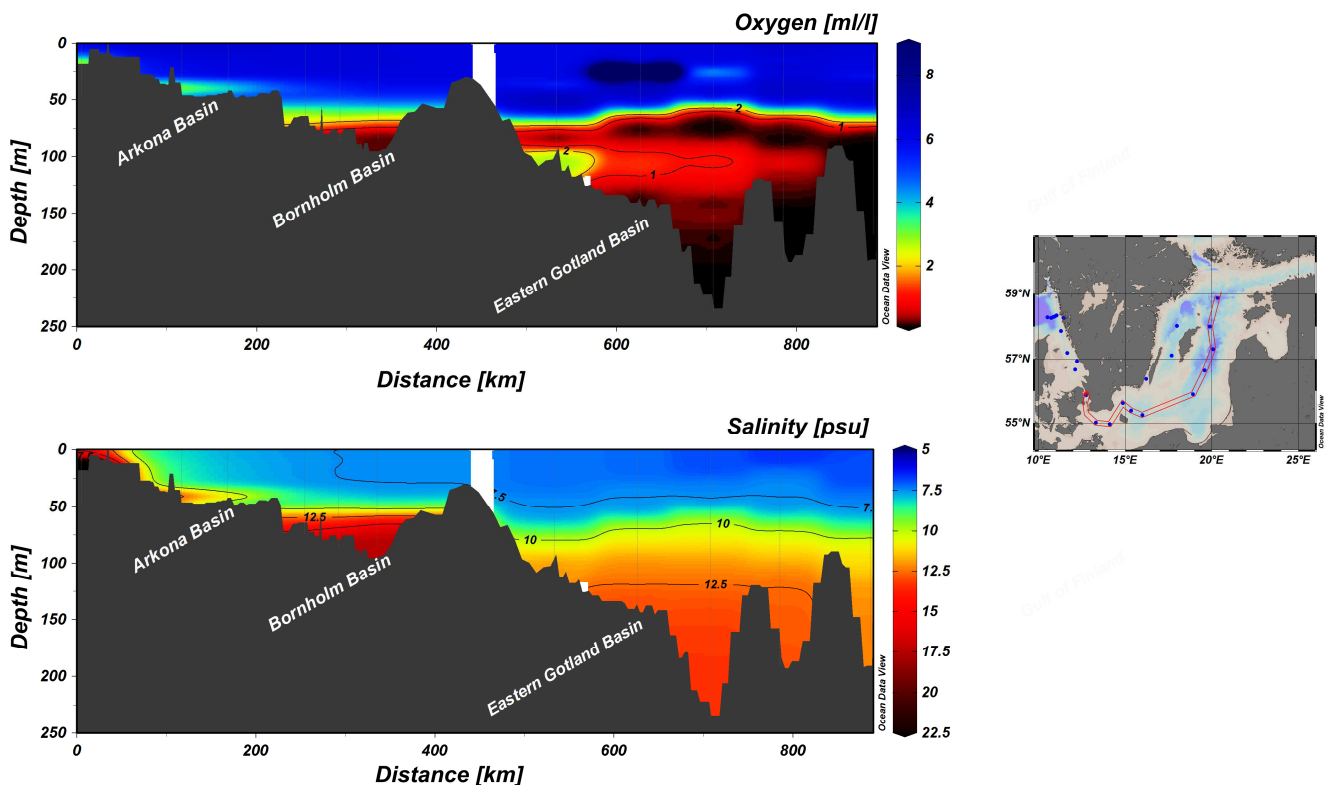


Figure 1. Transect showing oxygen and salinity through the Baltic Proper, from the Sound to the Northern part of the Gotland basin.

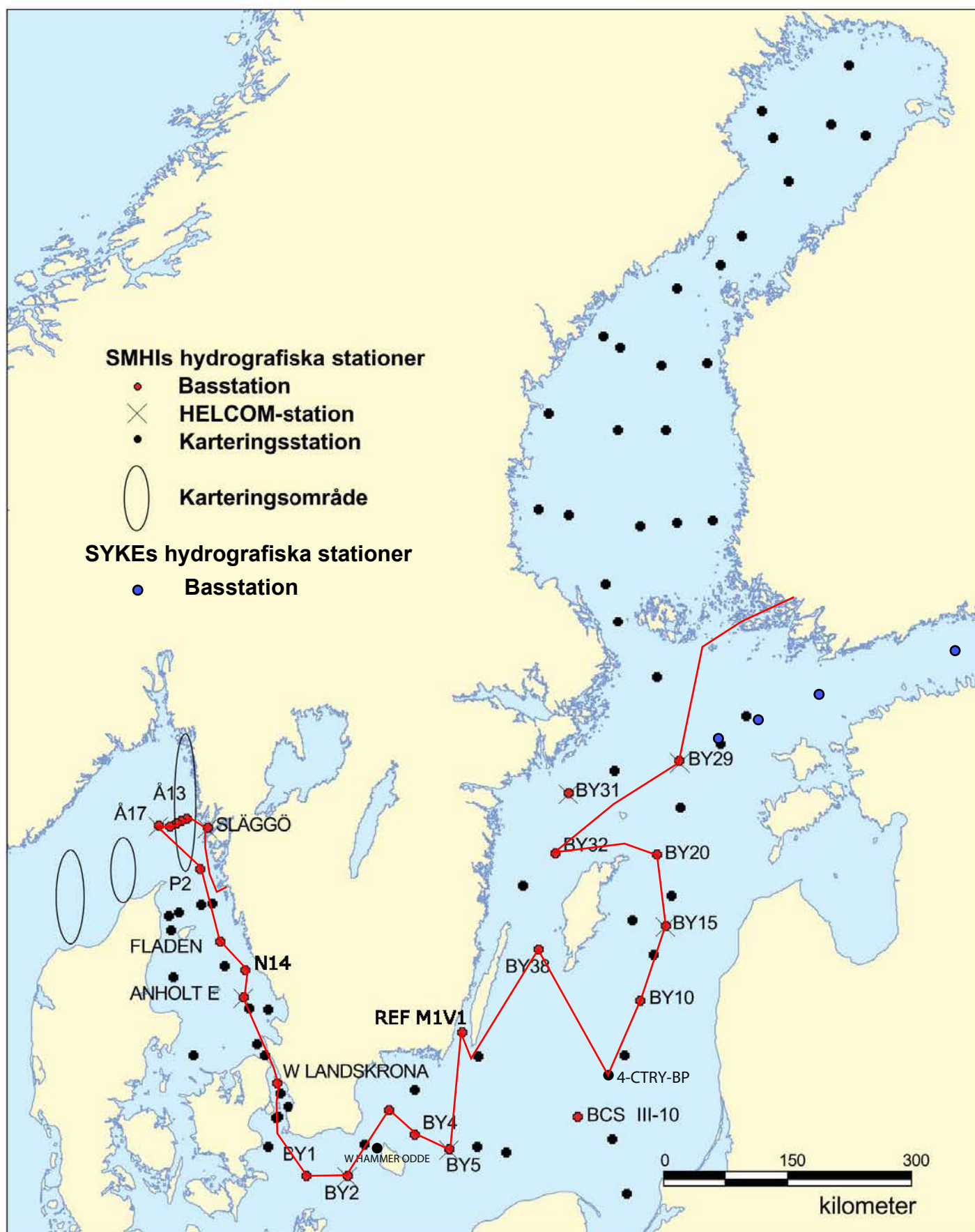
PARTICIPANTS

Name		From
Anna-Kerstin Thell	Chief Scientist	SMHI
Martin Hansson		SMHI
Johan Håkansson		SMHI
Sara Johansson		SMHI
Johan Kronsell		SMHI
Panu Hänninen		SYKE

APPENDICES

- Track chart
- Table over stations, sampled parameters and number of sampling depths
- Map showing bottom oxygen concentrations
- Vertical profiles for regular monitoring stations
- Monthly average surface water plots for regular monitoring stations

TRACKCHART
Country: Sweden
Ship: M/V MERI
Date: 20170912-20170918
Series: 0001-0024



Ship: 02
Year: 2017

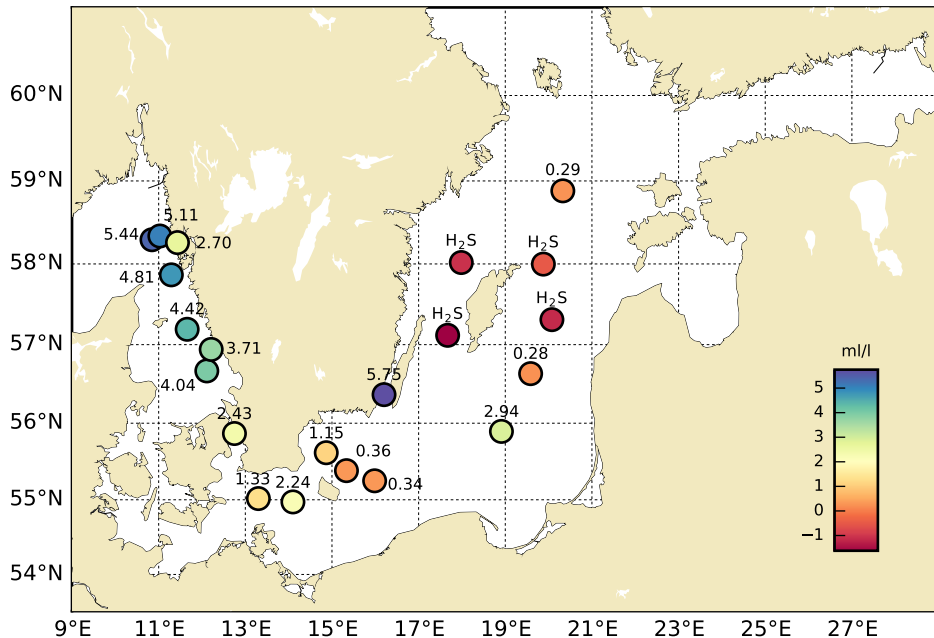
Ser no	Cru no	Stat code	Proj	Stat name	Lat	Lon	Start date yyyymmdd	Start time hhmm	Bottom depth m	Secchi depth m	Wind dir vel	Air temp C	Air pres hPa	WCVI elac aove tueo hdsb	CZPP lohoy apt p p t t o	No de	No btl	T e m m l l	S a h o o 2 h t t t t t m t l i u o o	P d h p n n n n a s h c c
0001	1	BPNX35	BAS...	BY29 / LL19	5852.92	02019.69	20170913	0530	178	5	23 10	15.3	997	2530	x-x-	16	16	x x - x - x x x x x x x x x x - x - - x		
0002	1	BPWX38	BAS...	BY32 NORRKÖPINGS DJ	5801.02	01759.07	20170913	1600	205		18 10	11.1	991	6840	x---	17	17	x x - x - x x x x x x x x x x - x - - x		
0003	1	BPEX26	BAS...	BY20 FÄRÖDJ	5759.88	01952.74	20170913	2320	203		15 9	13.8	984	9990	x---	17	17	x x - x - x x x x x x x x x x - x - - x		
0004	1	BPEX21	BAS...	BY15 GOTLANDSDJ	5718.75	02004.59	20170914	0530	249		26 11	13.4	982	2850	x-xx	19	19	x x - x x x x x x x x x x x x x x -		
0005	1	BPEX13	BAS...	BY10	5638.04	01935.11	20170914	1400	147		25 21	14.0	989	2860	x---	15	15	x x x x - x x - x x x x x x x x - x - -		
0006	1	BPSE14	BAS...	4-CTRY-BP	5553.65	01854.66	20170914	2300	115		27 15	14.3	994	9990	x-x-	14	14	x x x x - x x - x x x x x x x x - x x x -		
0007	1	BPWX45	BAS...	BY38 KARLSÖDJ	5707.02	01740.17	20170915	0910	114	5	28 8	14.8	999	2830	x-x-	14	14	x x x x - x x x x x x x x x x - x x - x		
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0010	1	BPSB06	BAS...	BY4 CHRISTIANSÖ	5523.00	01520.04	20170916	0600	94	8	22 9	13.5	1009	0030	x--x	12	12	x x x x x x x - x x x x x x x x x - - -		
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0012	1	BPSA03	BAS...	BY2 ARKONA	5458.28	01405.92	20170916	1450	47		18 3	13	1011	1230	xxx-	8	8	x x x x - x x - x x x x x x x x - x x -		
0013	1	BPSA02	BAS...	BY1	5500.95	01318.08	20170916	1800	47		16 4	13.9	1012	9990	x---	8	8	x x x x - x x - x x x x x x x x - x - -		
0014	1	SOCX39	BAS...	W LANDSKRONA	5552.00	01244.93	20170917	0000	50		12 5	10.8	1013	9990	x---	9	9	x x x x - x x - x x x x x x x x - x - x		
0015	1	KAEX29	BAS...	ANHOLT E	5640.10	01206.66	20170917	0600	62	11	13 4	15.9	1014	1220	xxxx	10	10	x x x x x x x - x x x x x x x x x x x x		
0016	1	KANX50	BAS...	N14 FALKENBERG	5656.39	01212.74	20170917	0930	30	11	18 3	16.1	1014	1120	xxxx	7	7	x x x x x x x - x x x x x x x x x - - -		
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0020	1	SKEX17	BAS...	Å16	5816.03	01043.48	20170917	2315	202		08 6	14.1	1014	9990	----	13	0	- x - x - - x - - - - - - - - - - x -		
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0022	1	SKEX15	BAS...	Å14	5818.93	01056.52	20170918	0145	110		09 4	13.2	1014	9990	----	11	0	- x - x - - x - - - - - - - - - - x -		
0023	1	SKEX14	BAS...	Å13	5820.38	01101.65	20170918	0250	90		09 3	12.8	1013	9990	x---	10	10	x x x x - x x - x x x x x x x x - x - -		
0024	1	FIBG27	BAS...	SLÄGGÖ	5815.58	01126.03	20170918	0600	74	3	09 4	11.4	1013	1120	xxx-	9	9	x x x x - x x - x x x x x x x x - x - -		

Bottom water oxygen concentration (ml/l)

Ship: Meri

Date: 20170912-20170918

Series: 0001-0024



STATION BY29 / LL19 SURFACE WATER (0-10 m)

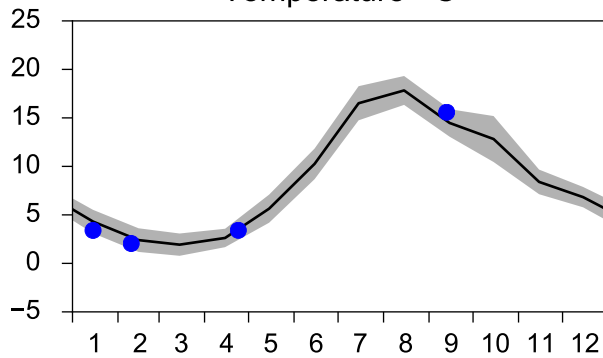
Annual Cycles

— Mean 2001-2015

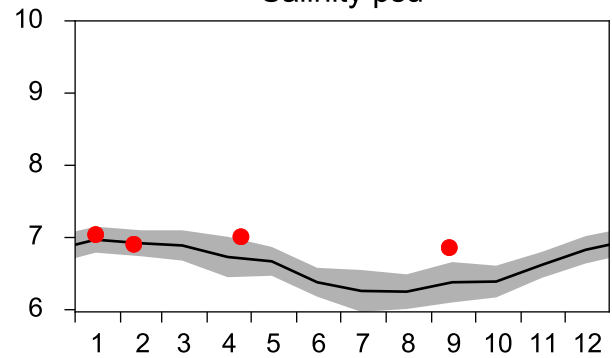
■ St.Dev.

● 2017

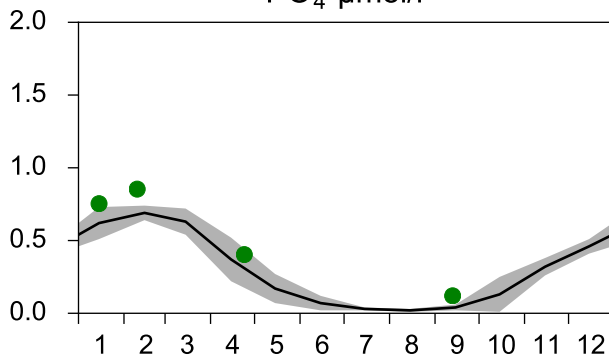
Temperature °C



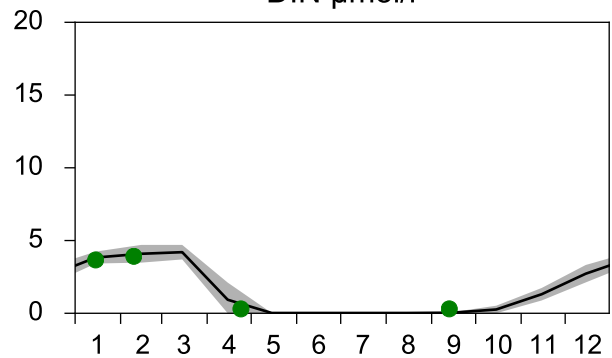
Salinity psu



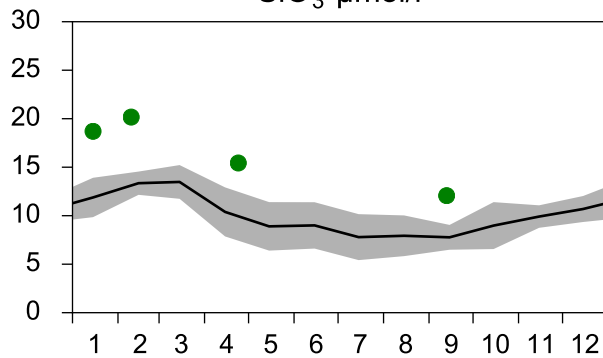
PO₄ µmol/l



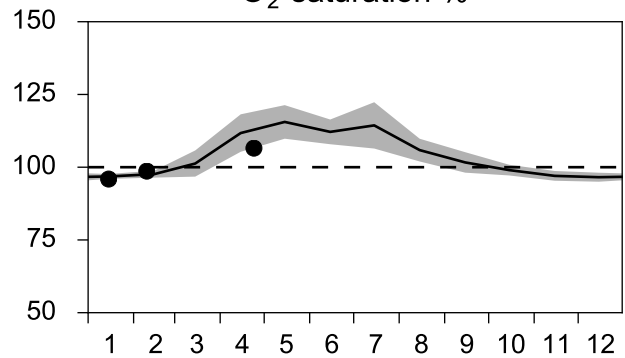
DIN µmol/l



SiO₃ µmol/l

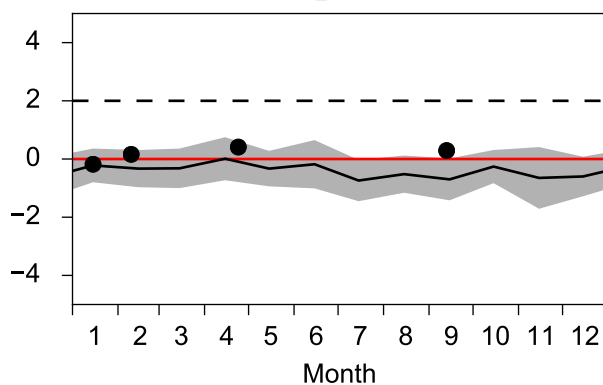


O₂ saturation %

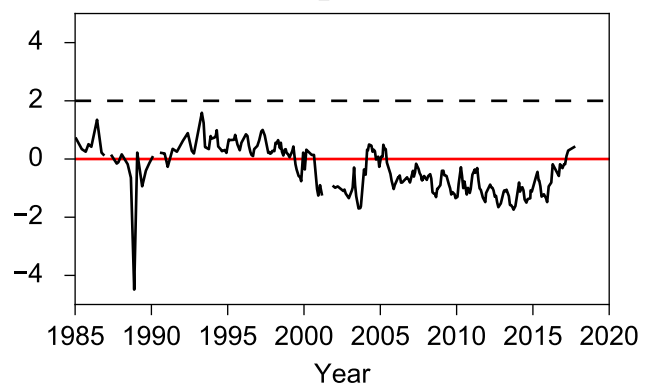


OXYGEN IN BOTTOM WATER (depth >= 150 m)

O₂ ml/l

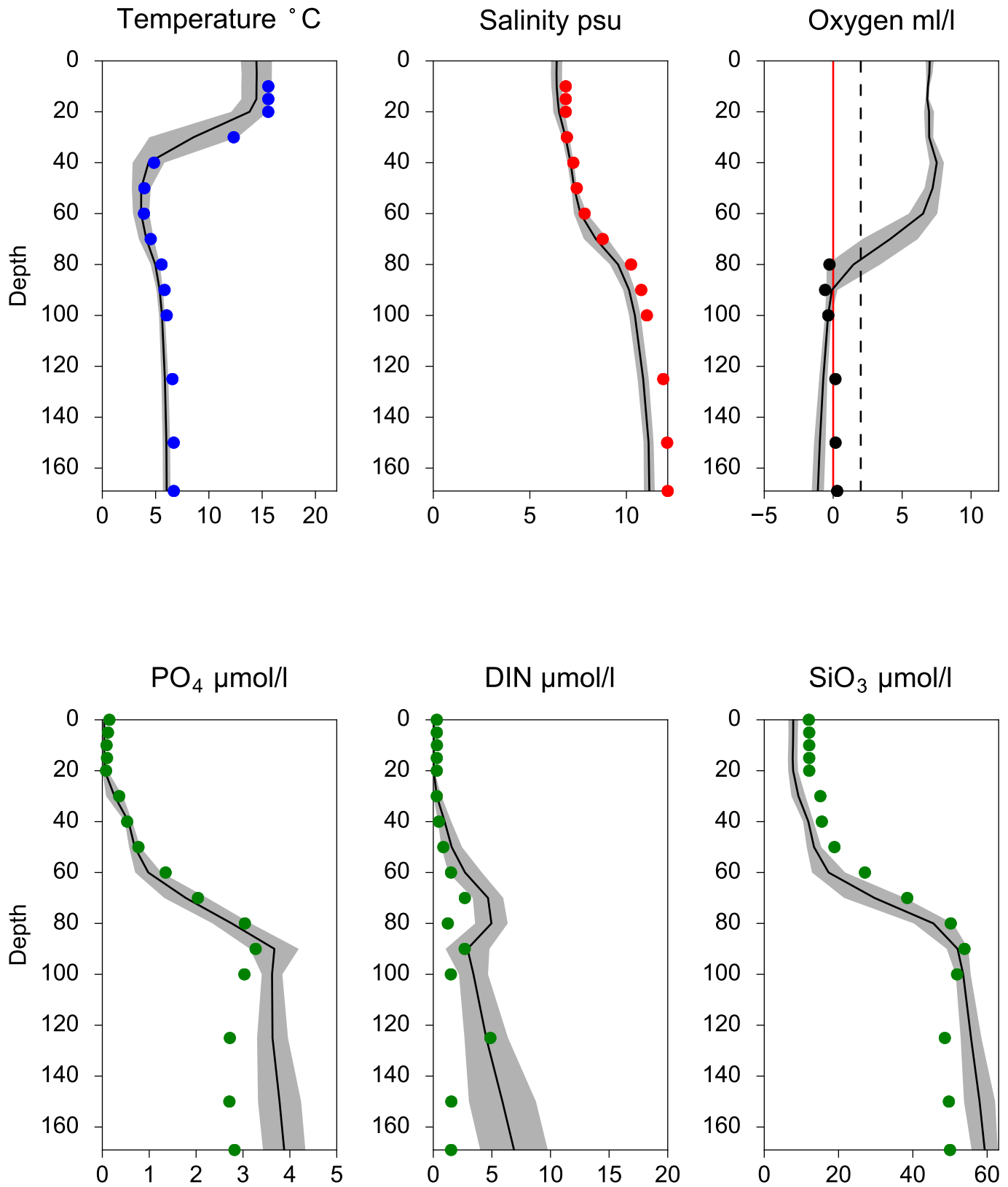


O₂ ml/l



Vertical profiles BY29 / LL19 September

— Mean 2001-2015 St.Dev. • 2017-09-13



STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

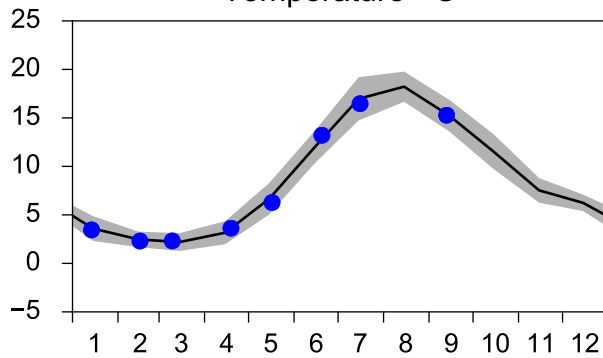
Annual Cycles

— Mean 2001-2015

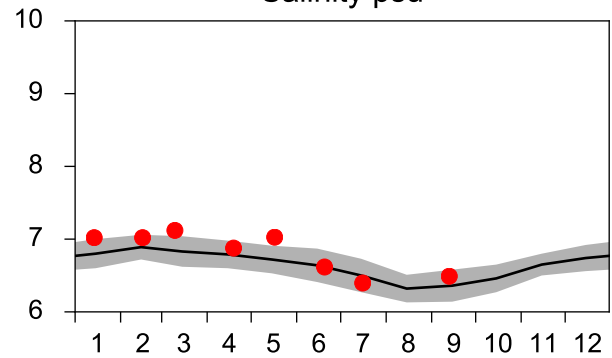
■ St.Dev.

● 2017

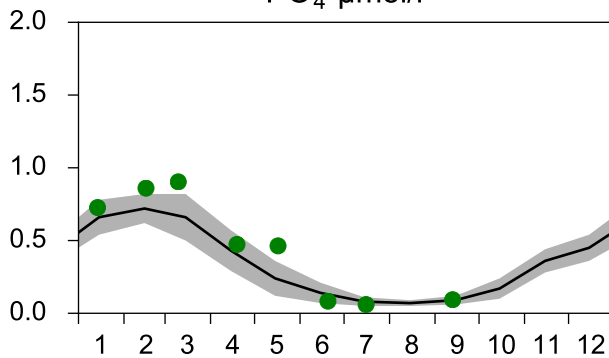
Temperature °C



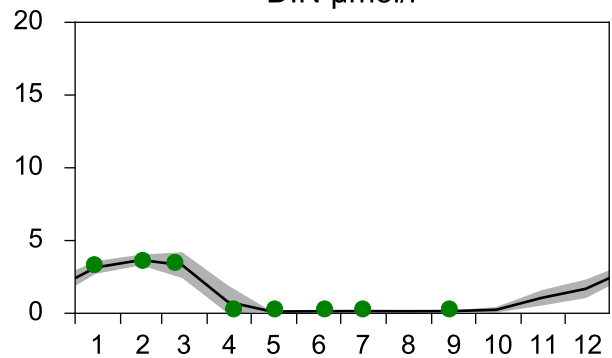
Salinity psu



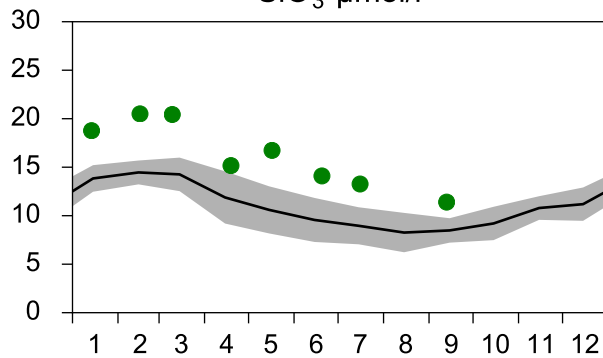
PO₄ µmol/l



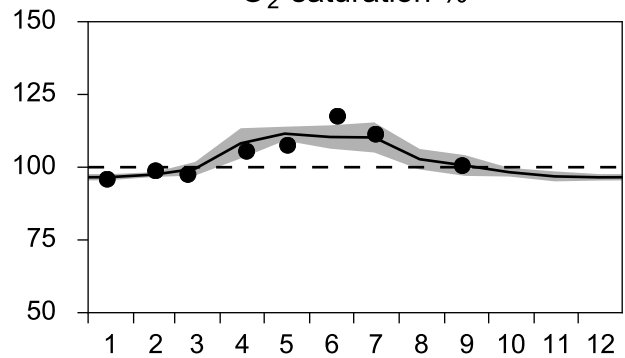
DIN µmol/l



SiO₃ µmol/l

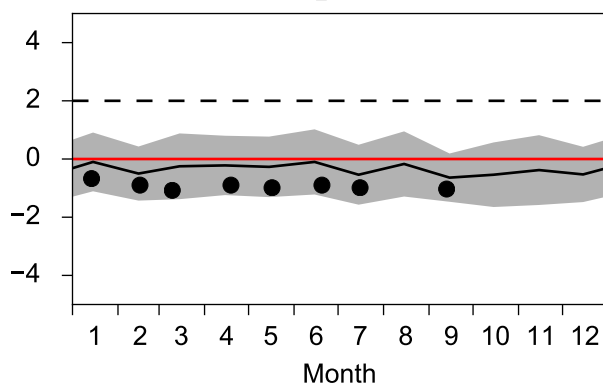


O₂ saturation %

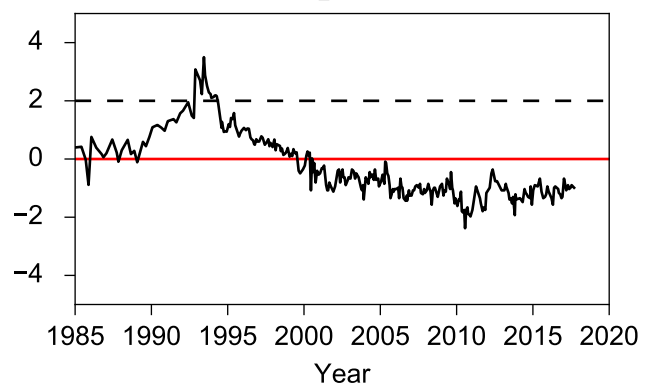


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

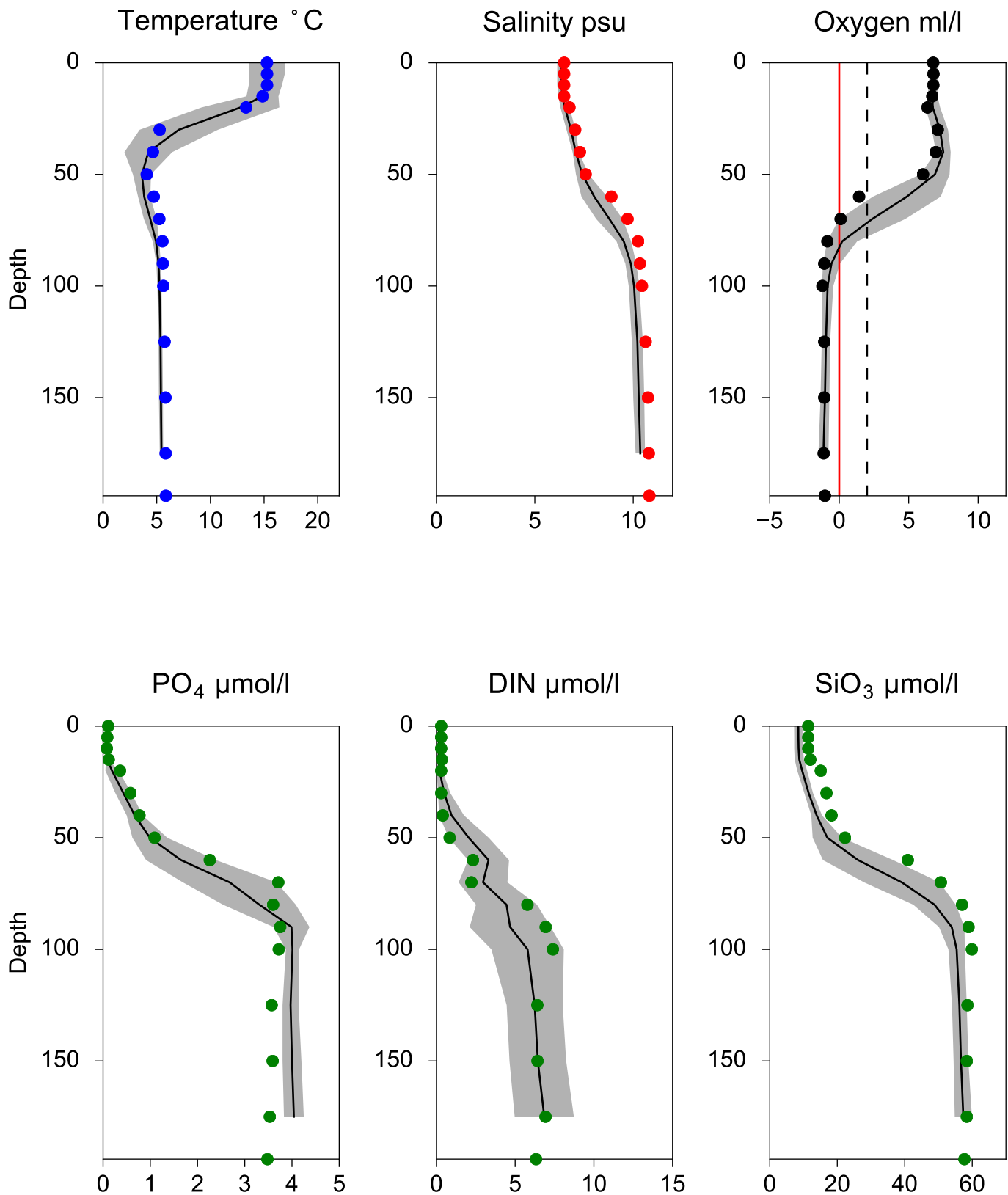


O₂ ml/l



Vertical profiles BY32 NORRKÖPINGSDJ September

— Mean 2001-2015 St.Dev. • 2017-09-13



STATION BY20 FÅRÖDJ SURFACE WATER (0-10 m)

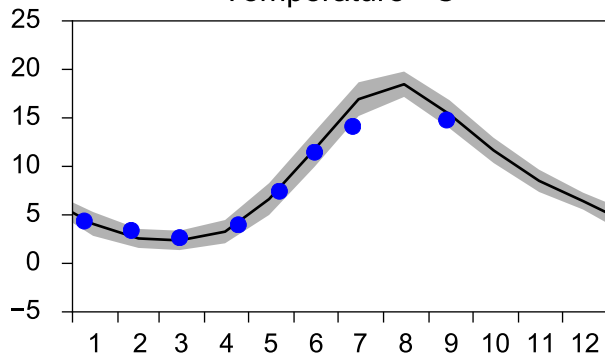
Annual Cycles

— Mean 2001-2015

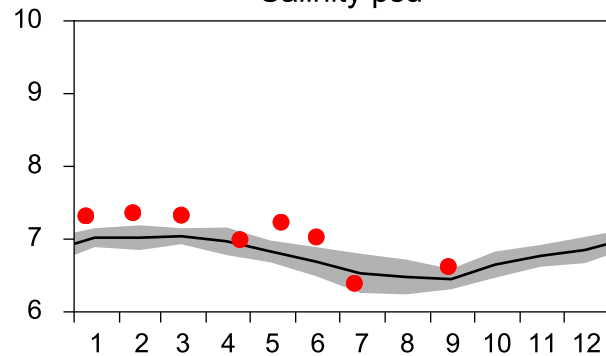
■ St.Dev.

● 2017

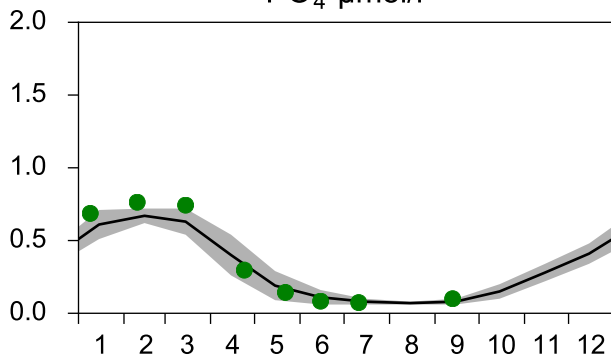
Temperature °C



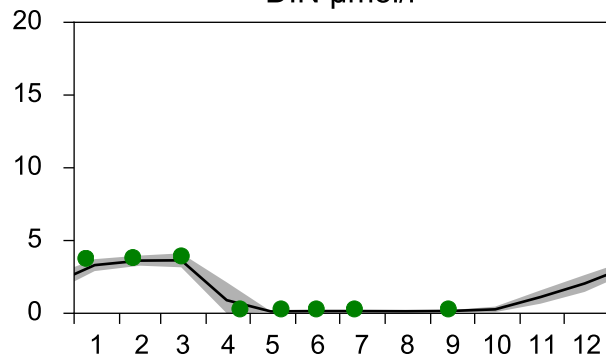
Salinity psu



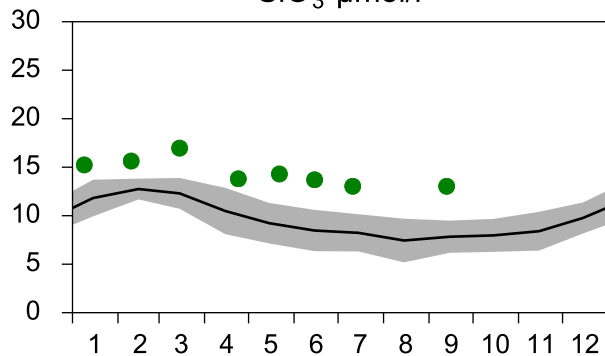
PO₄ µmol/l



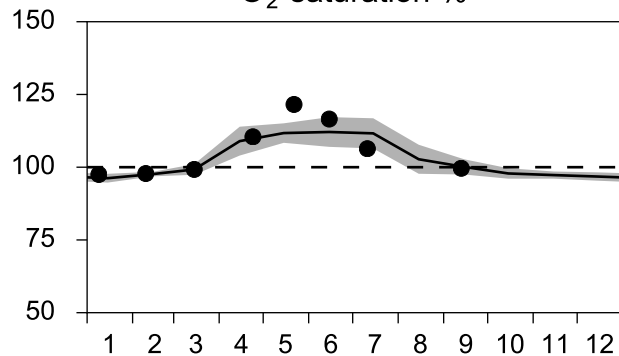
DIN µmol/l



SiO₃ µmol/l

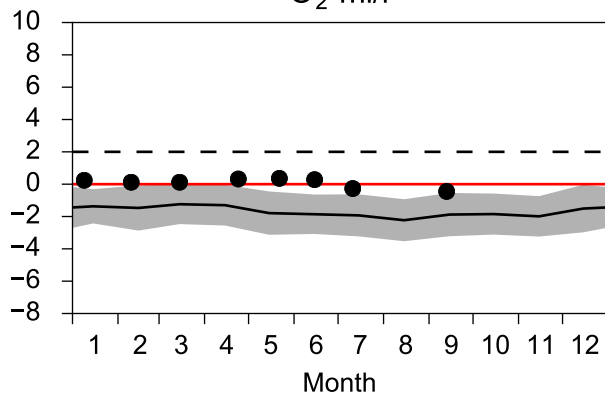


O₂ saturation %

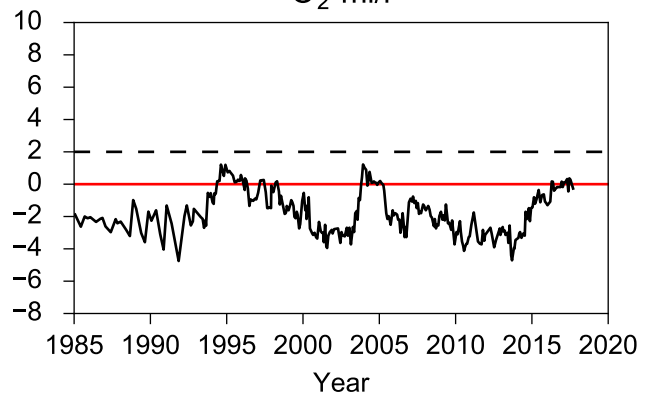


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

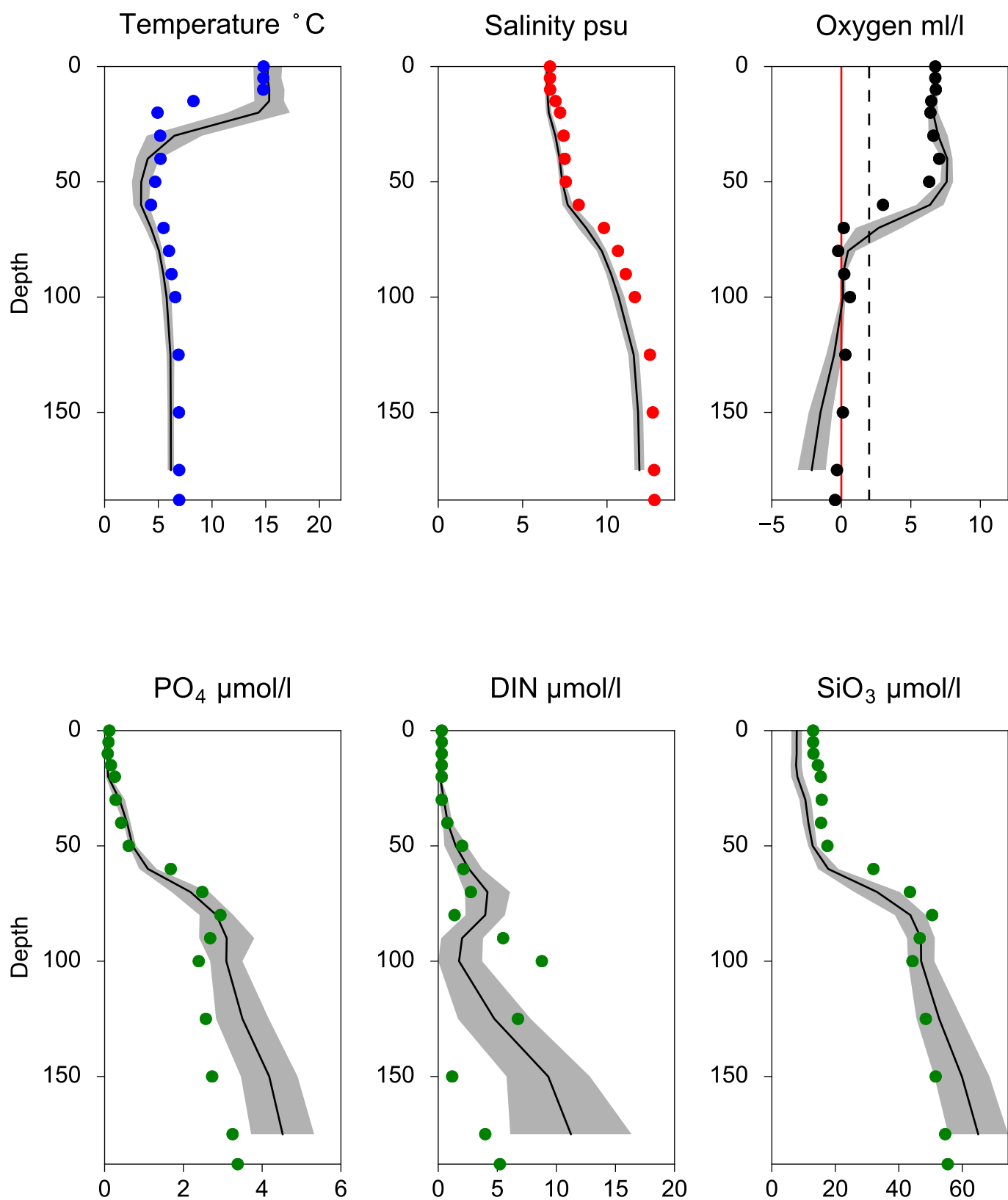


O₂ ml/l



Vertical profiles BY20 FÅRÖDJ September

— Mean 2001-2015 St.Dev. • 2017-09-13



STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

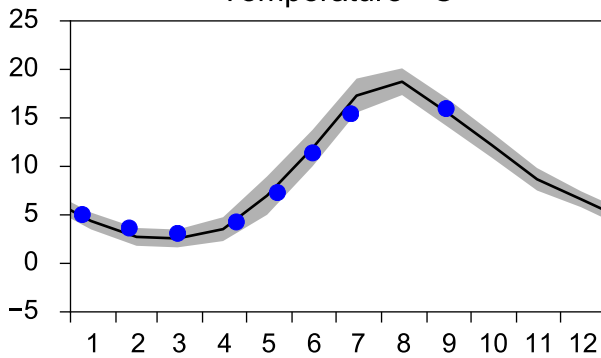
Annual Cycles

— Mean 2001-2015

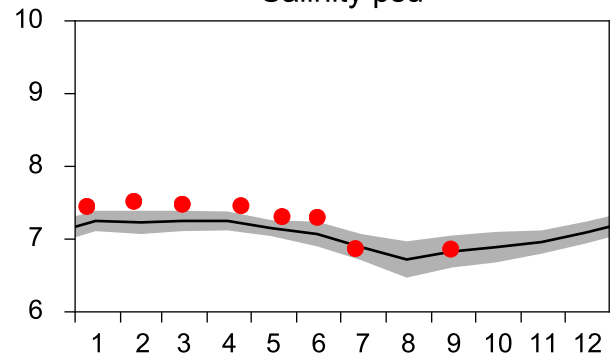
■ St.Dev.

● 2017

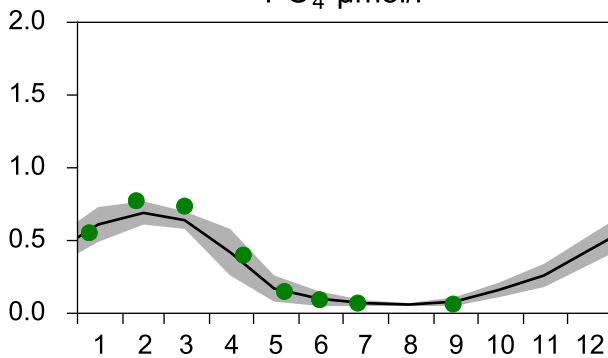
Temperature °C



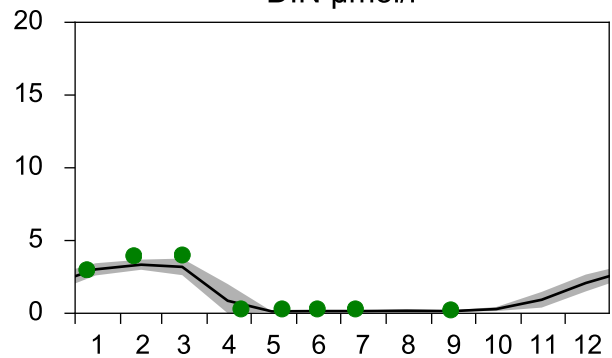
Salinity psu



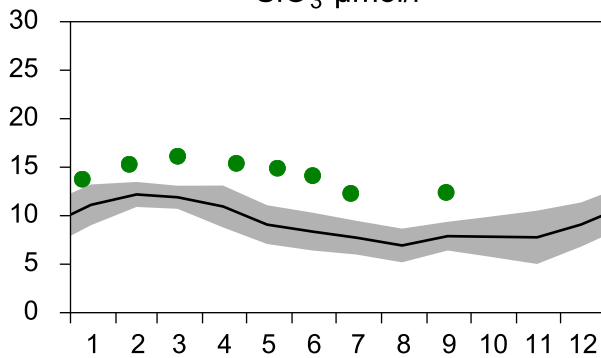
PO₄ µmol/l



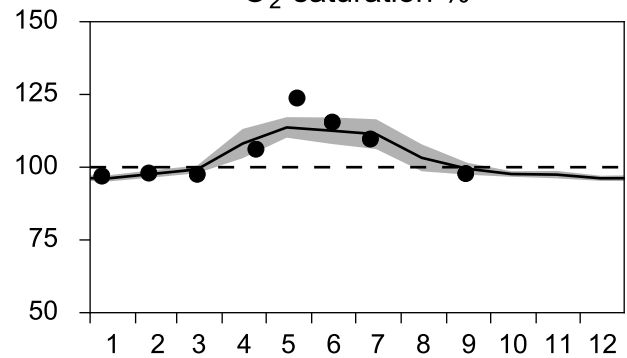
DIN µmol/l



SiO₃ µmol/l

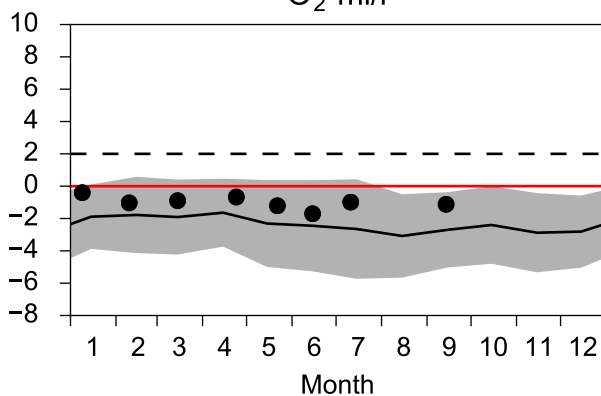


O₂ saturation %

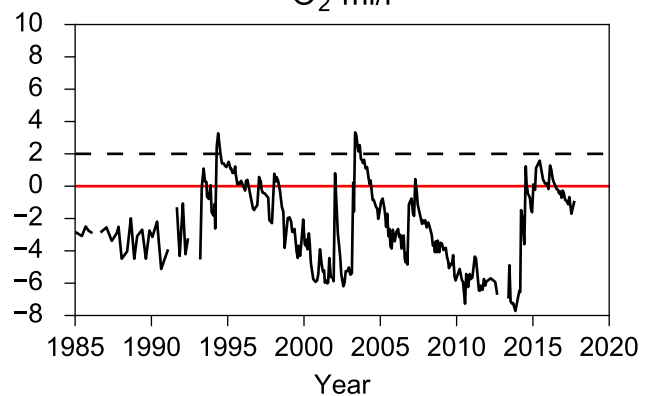


OXYGEN IN BOTTOM WATER (depth >= 225 m)

O₂ ml/l

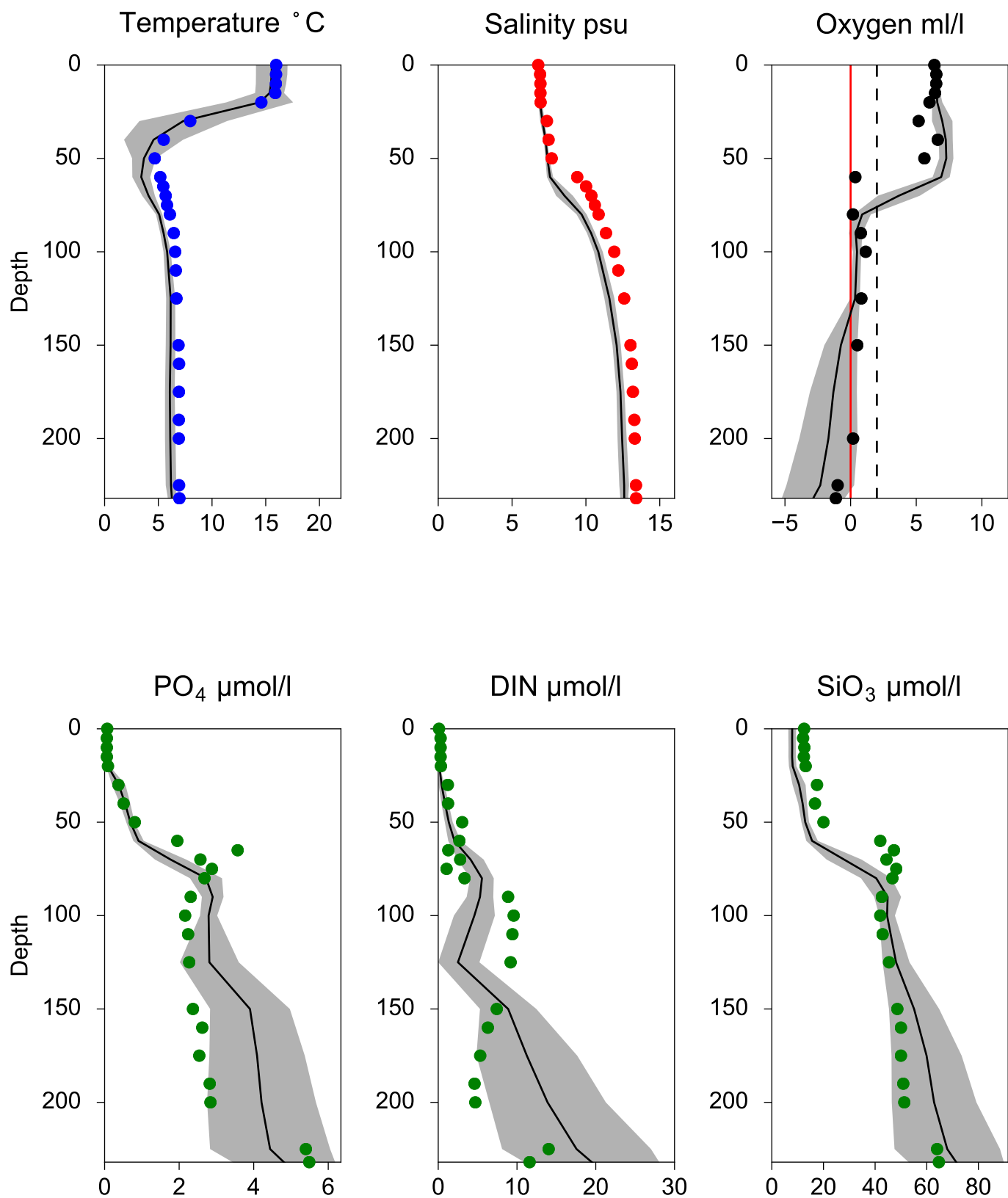


O₂ ml/l



Vertical profiles BY15 GOTLANDSDJ September

— Mean 2001-2015 St.Dev. • 2017-09-14



STATION BY10 SURFACE WATER (0-10 m)

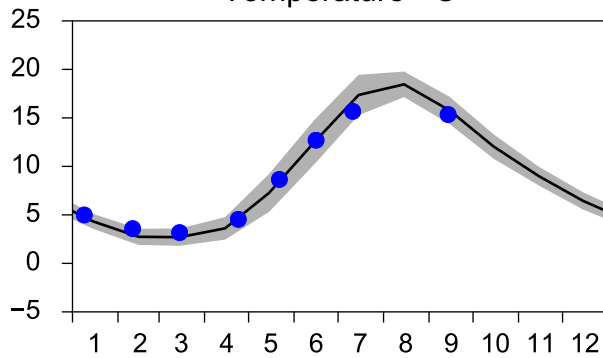
Annual Cycles

— Mean 2001-2015

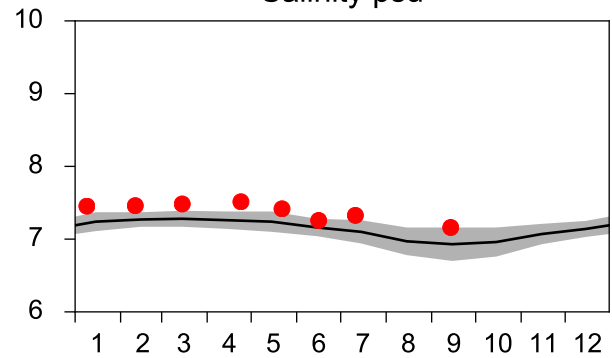
■ St.Dev.

● 2017

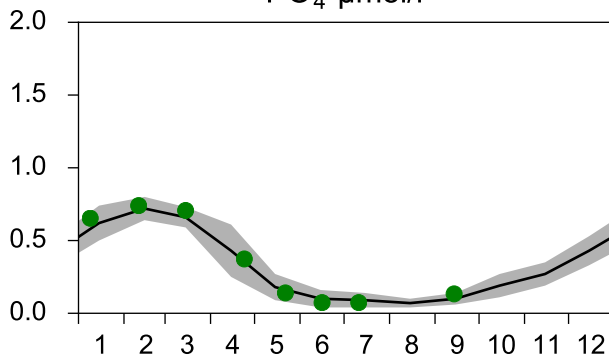
Temperature °C



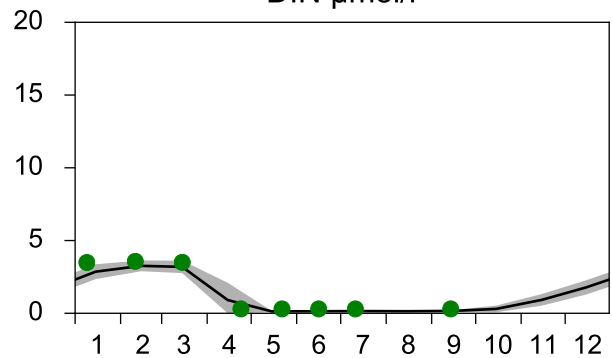
Salinity psu



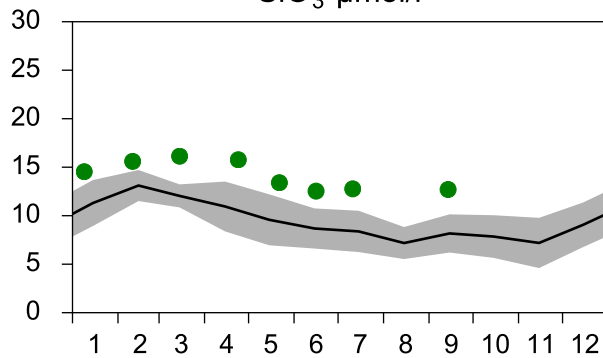
PO₄ µmol/l



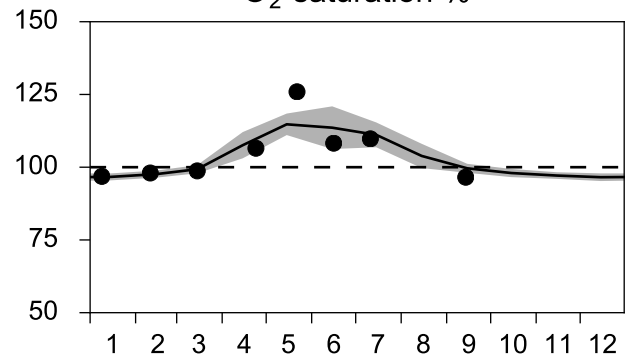
DIN µmol/l



SiO₃ µmol/l

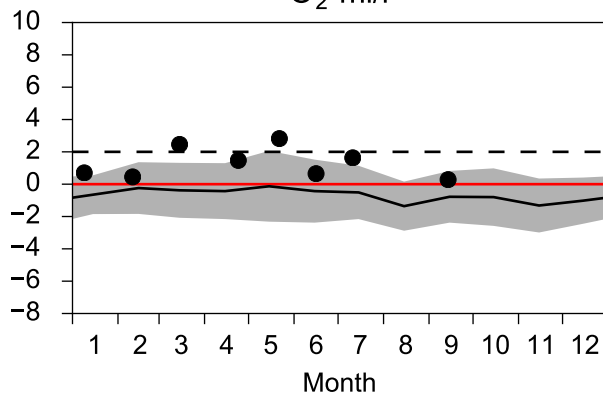


O₂ saturation %

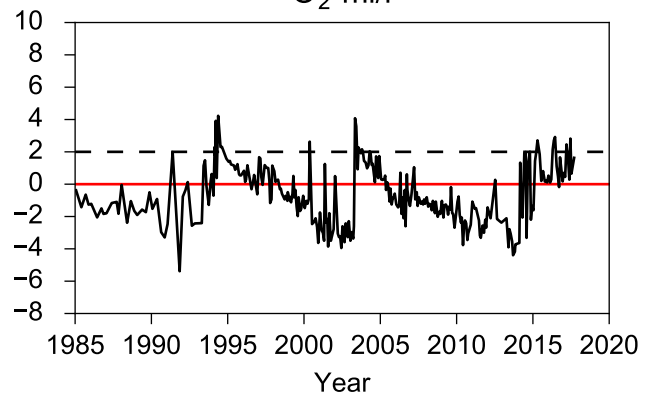


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

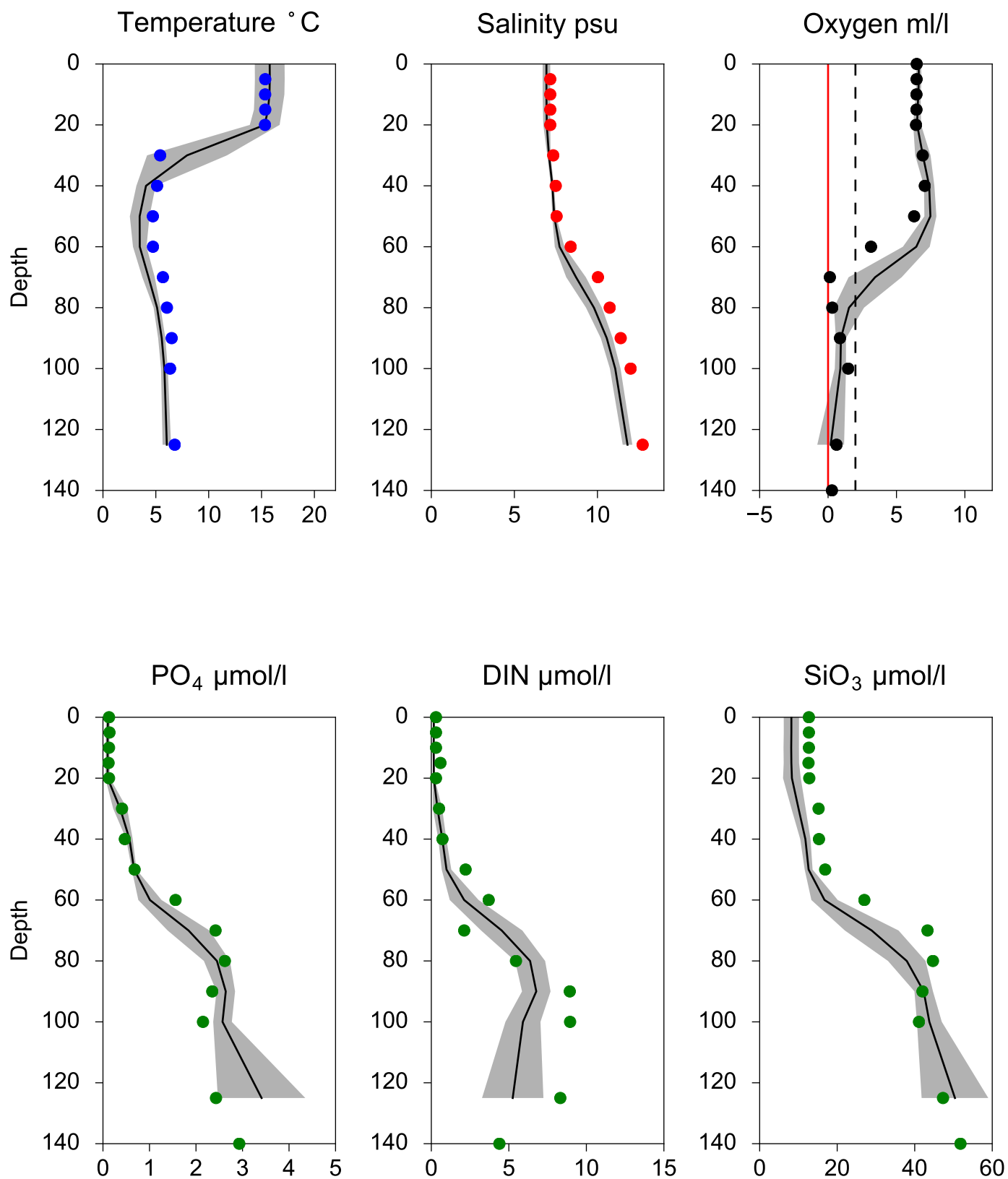


O₂ ml/l



Vertical profiles BY10 September

— Mean 2001-2015 ■ St.Dev. ● 2017-09-14



STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

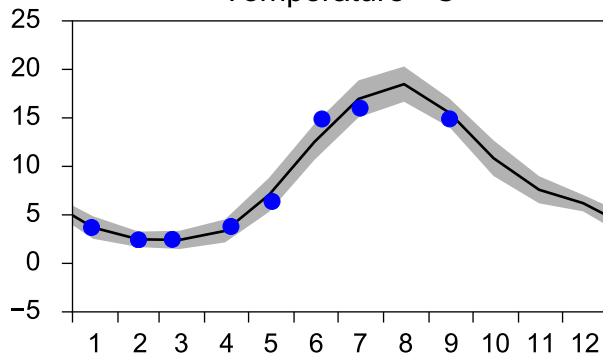
Annual Cycles

— Mean 2001-2015

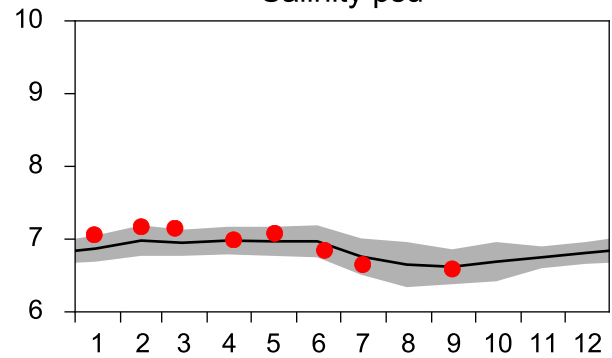
■ St.Dev.

● 2017

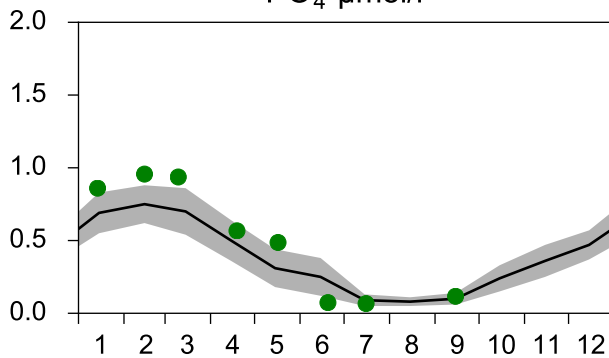
Temperature °C



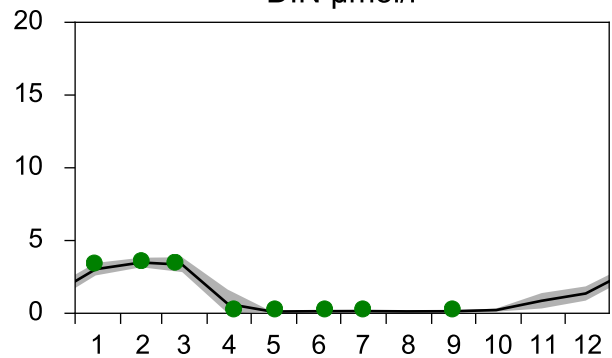
Salinity psu



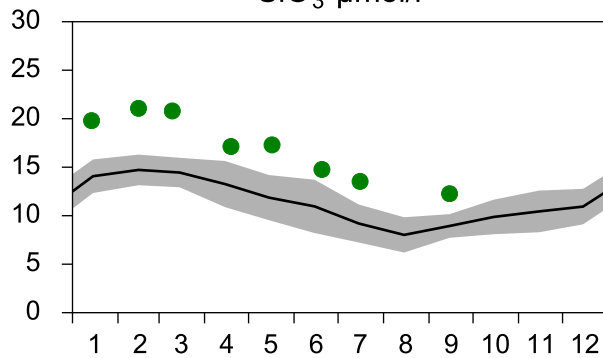
PO₄ µmol/l



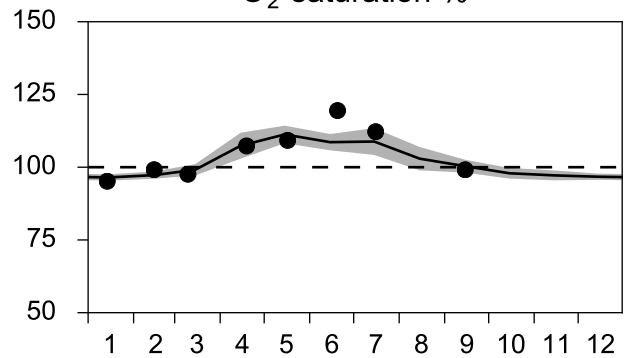
DIN µmol/l



SiO₃ µmol/l

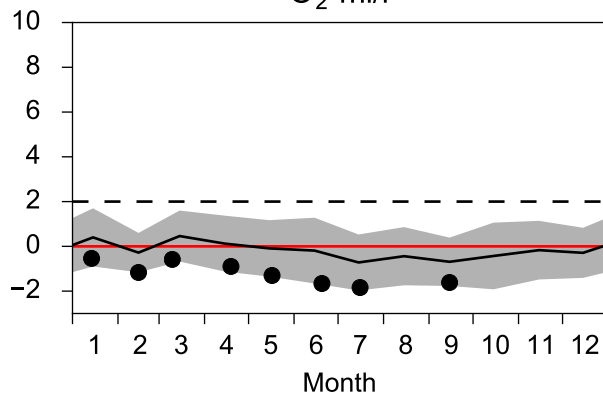


O₂ saturation %

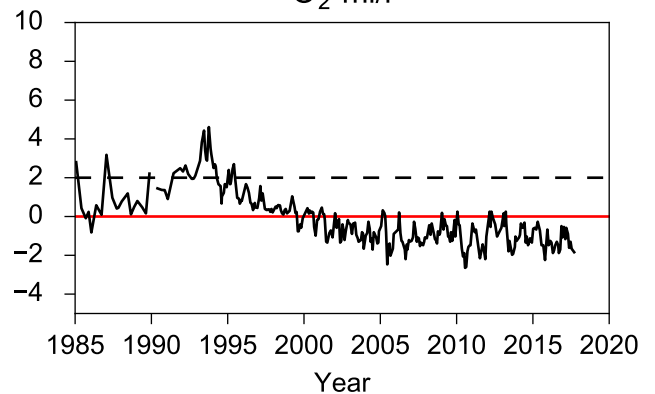


OXYGEN IN BOTTOM WATER (depth >= 100 m)

O₂ ml/l

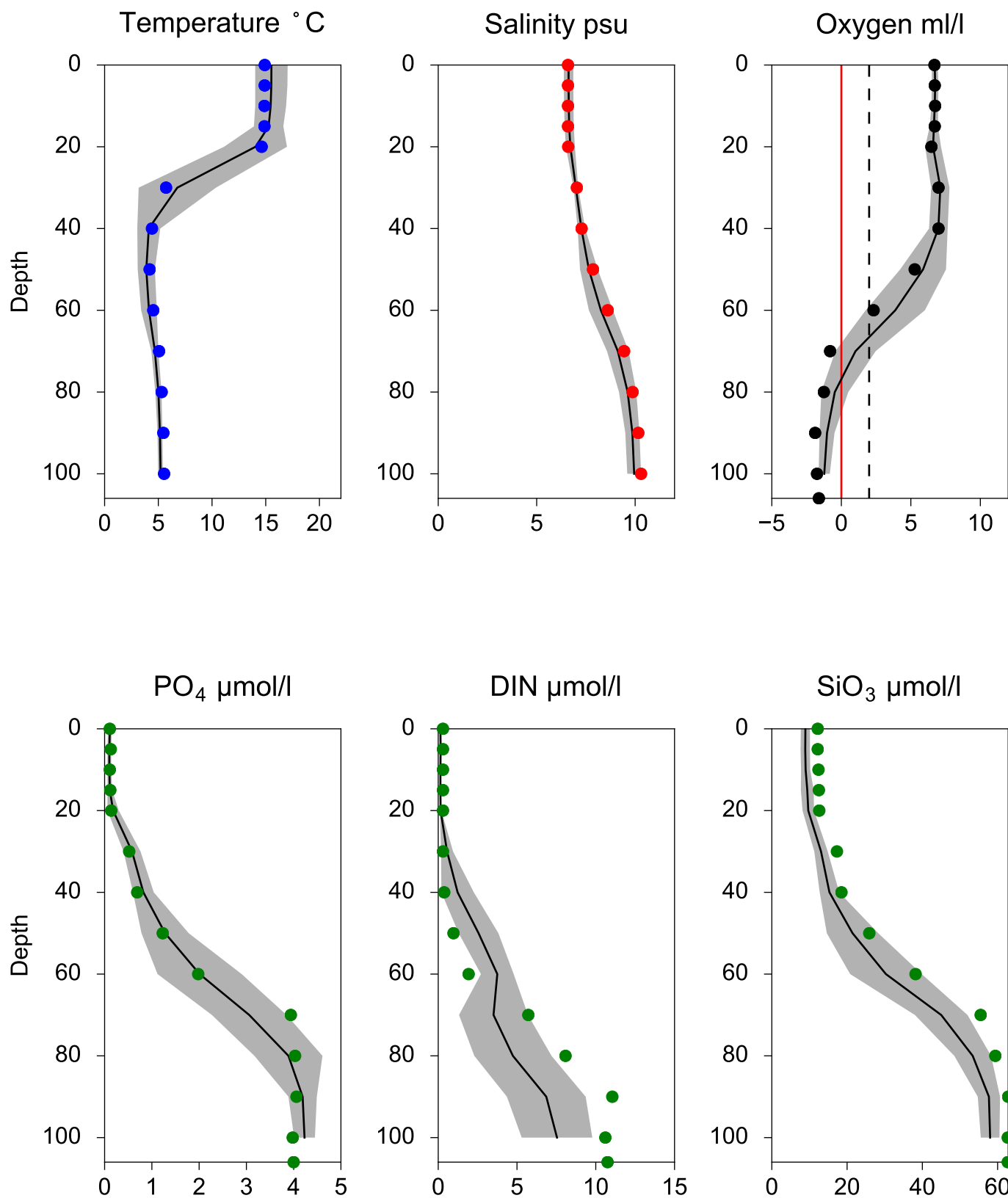


O₂ ml/l



Vertical profiles BY38 KARLSÖDJ September

— Mean 2001-2015 ■ St.Dev. ● 2017-09-15



STATION REF M1V1 SURFACE WATER (0-10 m)

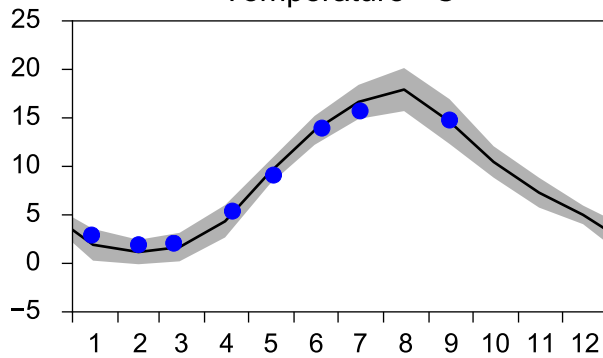
Annual Cycles

— Mean 2001-2015

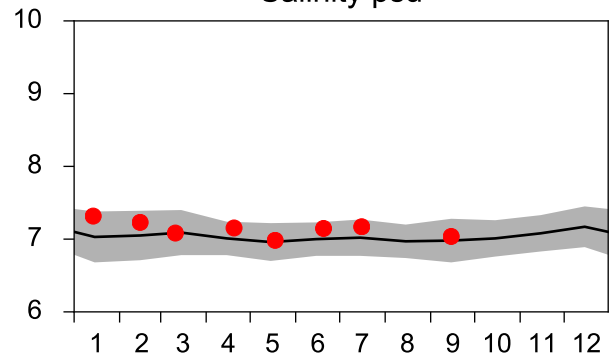
■ St.Dev.

● 2017

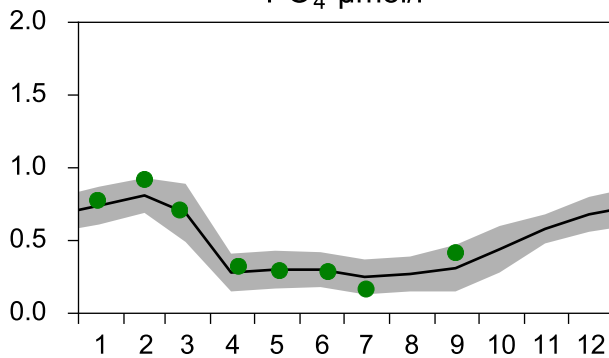
Temperature °C



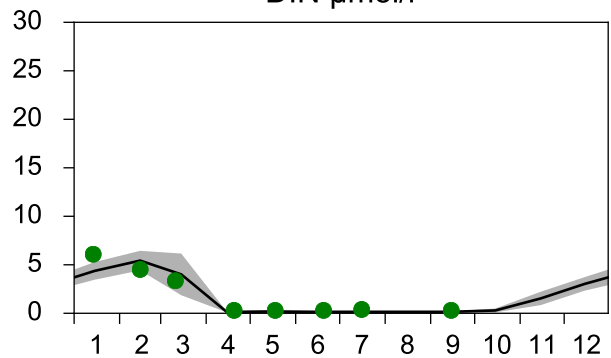
Salinity psu



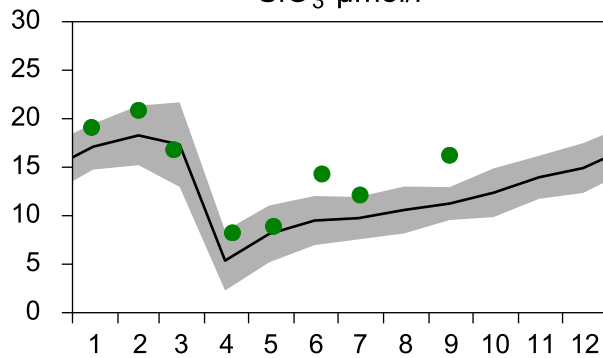
PO₄ µmol/l



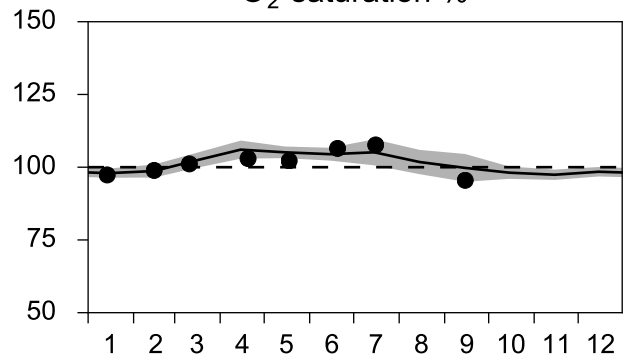
DIN µmol/l



SiO₃ µmol/l

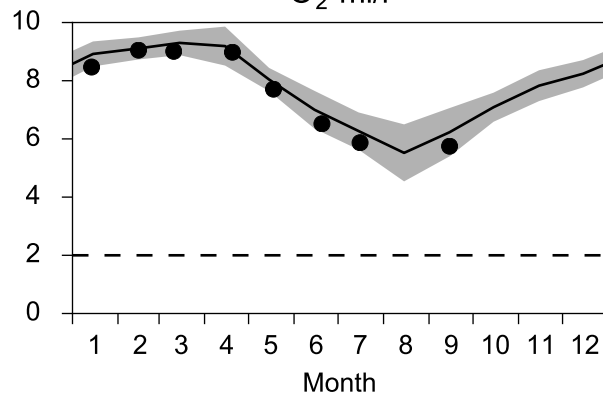


O₂ saturation %

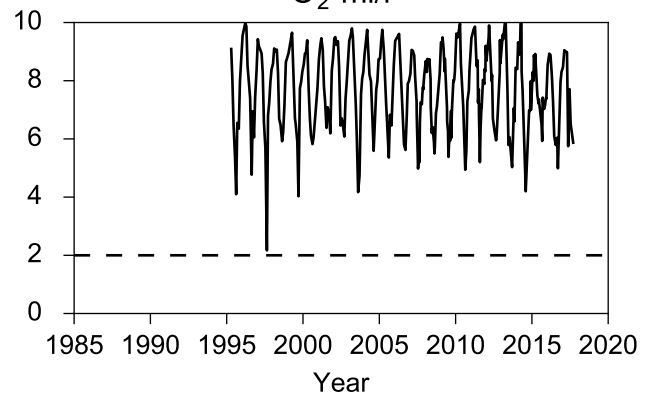


OXYGEN IN BOTTOM WATER (depth >= 17 m)

O₂ ml/l

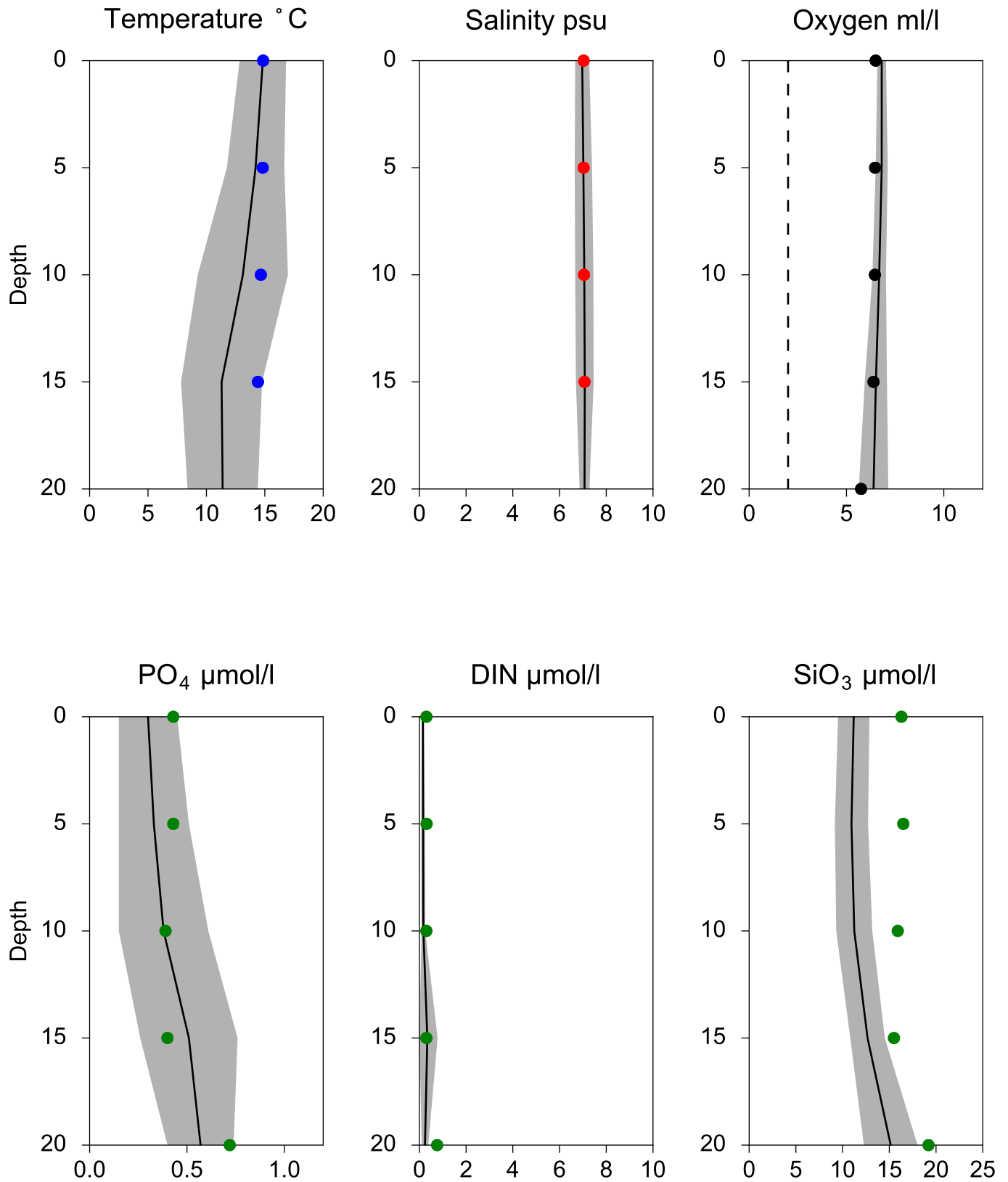


O₂ ml/l



Vertical profiles REF M1V1 September

— Mean 2001-2015 ■ St.Dev. ● 2017-09-15



STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)

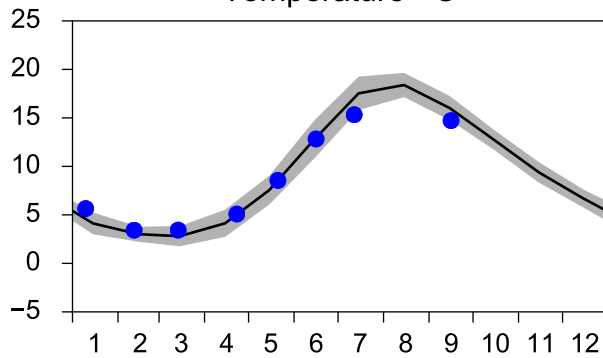
Annual Cycles

— Mean 2001-2015

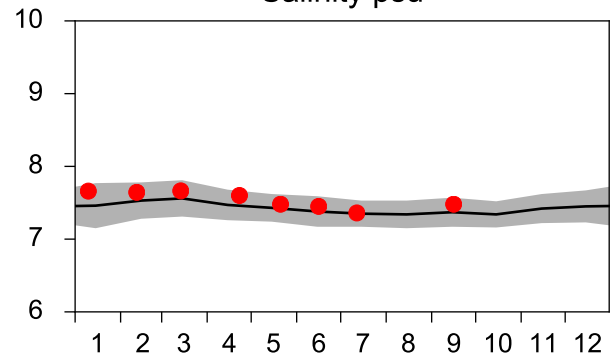
■ St.Dev.

● 2017

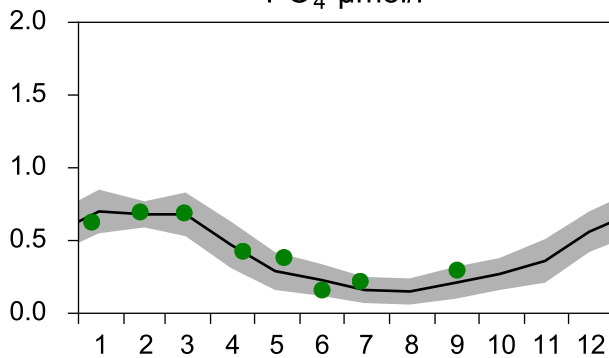
Temperature °C



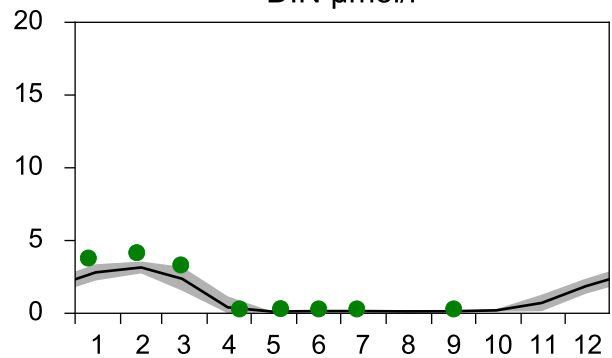
Salinity psu



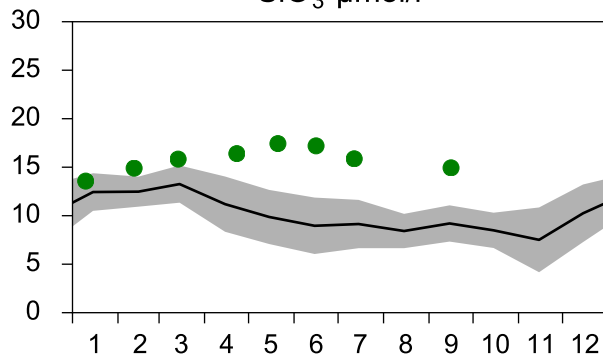
PO₄ µmol/l



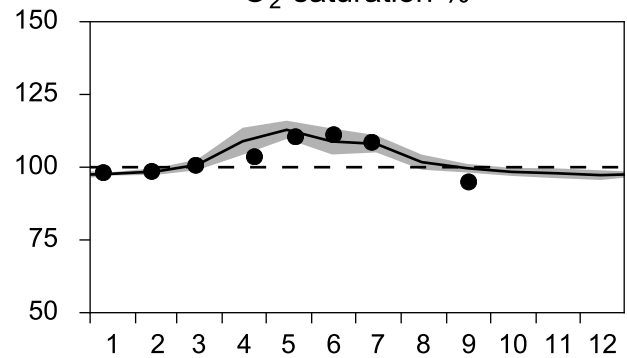
DIN µmol/l



SiO₃ µmol/l

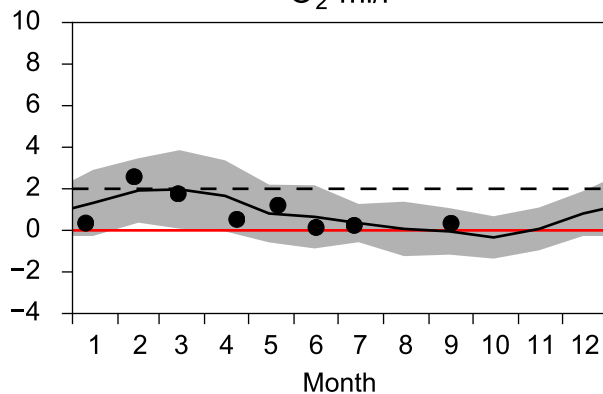


O₂ saturation %

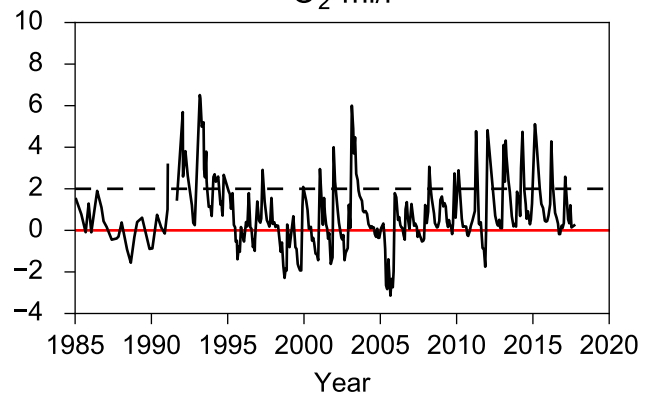


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

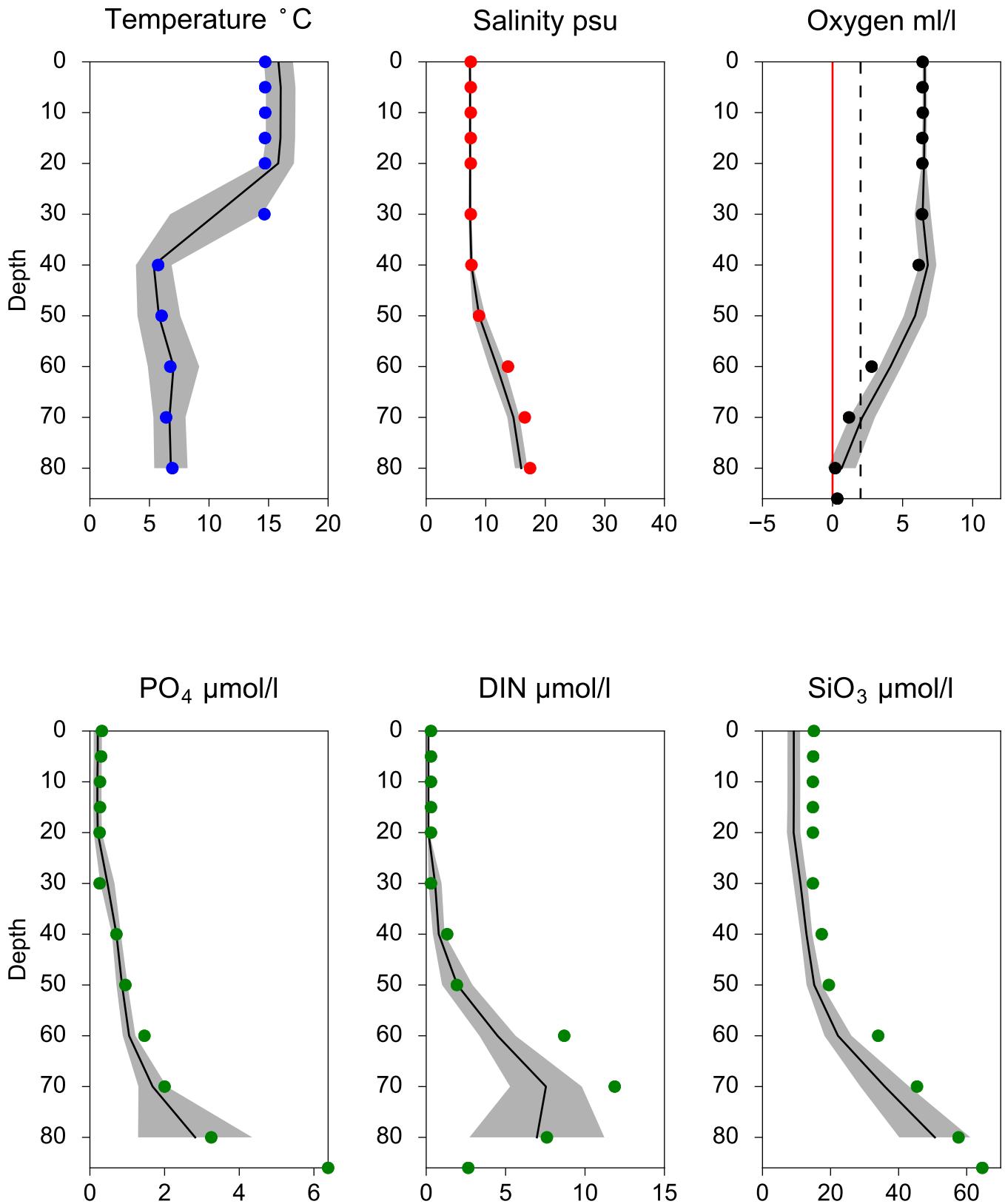


O₂ ml/l



Vertical profiles BY5 BORNHOLMSDJ September

— Mean 2001-2015 ■ St.Dev. ● 2017-09-16



STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

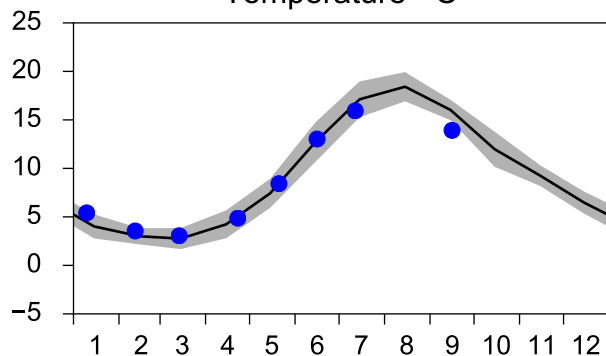
Annual Cycles

— Mean 2001-2015

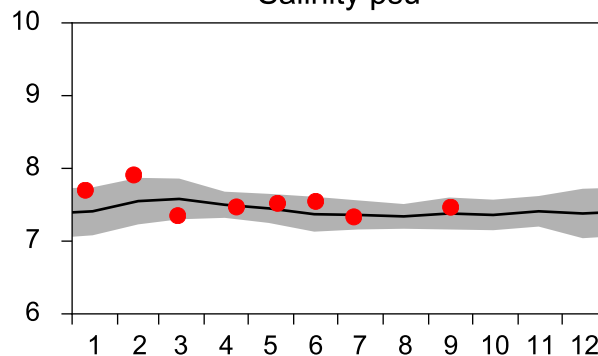
■ St.Dev.

● 2017

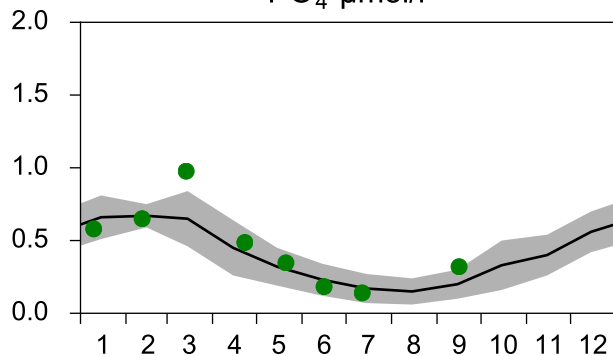
Temperature °C



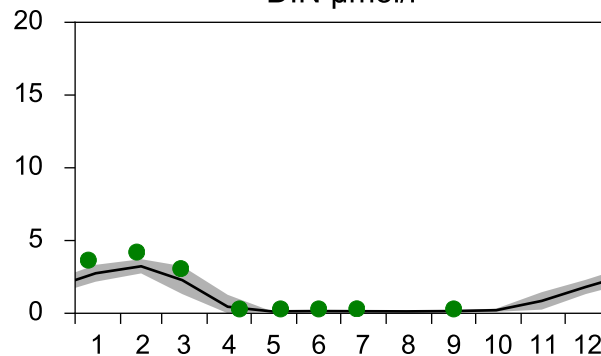
Salinity psu



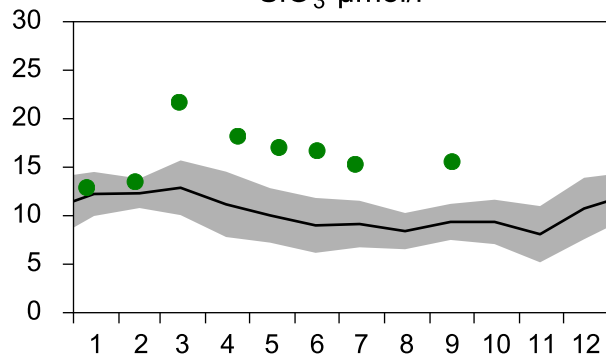
PO₄ µmol/l



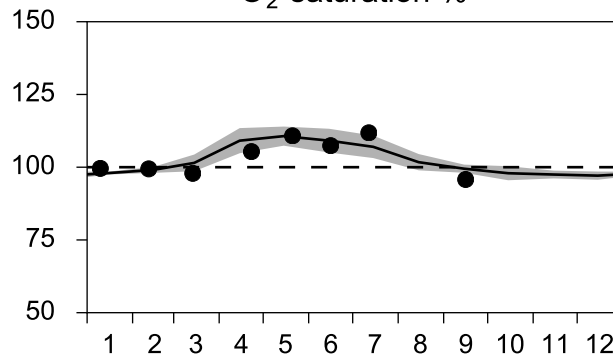
DIN µmol/l



SiO₃ µmol/l

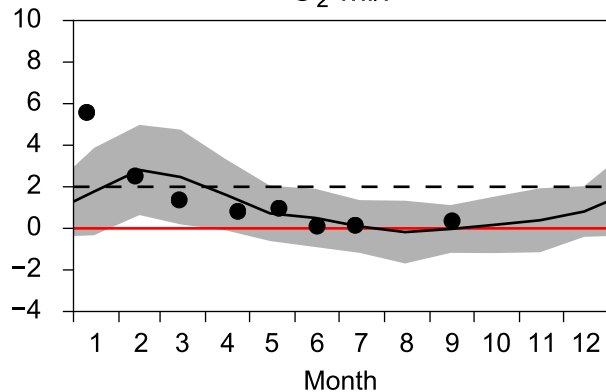


O₂ saturation %

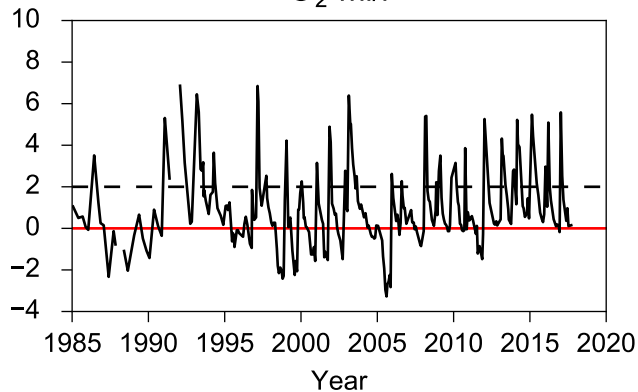


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

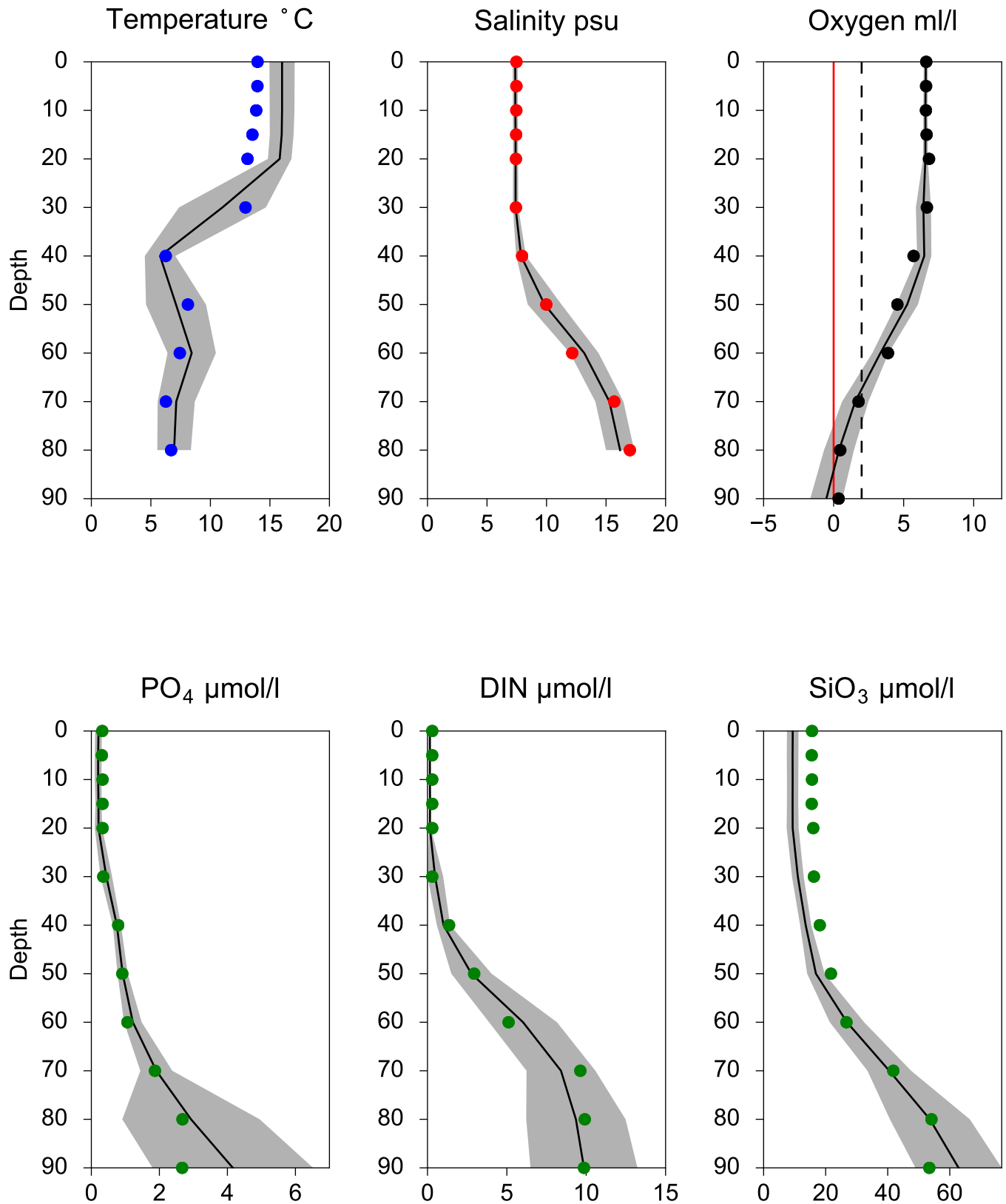


O₂ ml/l



Vertical profiles BY4 CHRISTIANSÖ September

— Mean 2001-2015 St.Dev. • 2017-09-16



STATION HANÖBUKTEN SURFACE WATER (0-10 m)

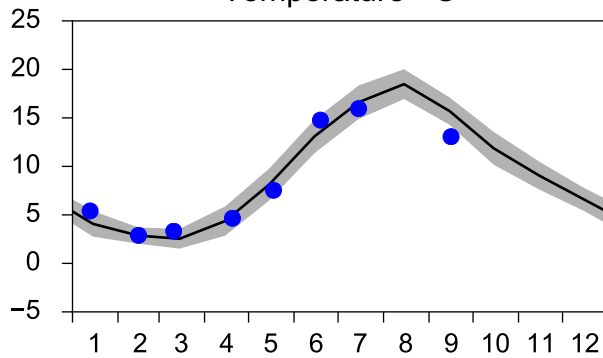
Annual Cycles

— Mean 2001-2015

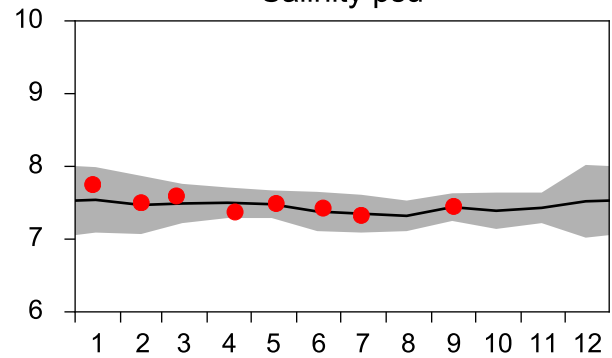
■ St.Dev.

● 2017

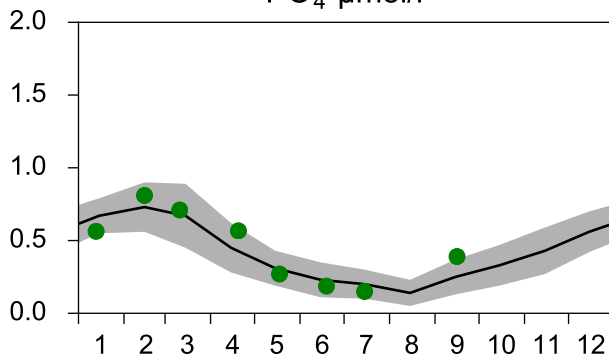
Temperature °C



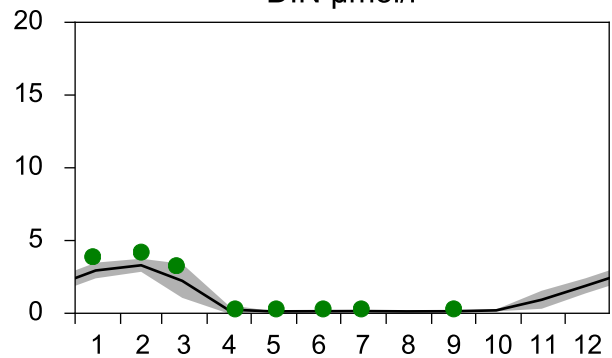
Salinity psu



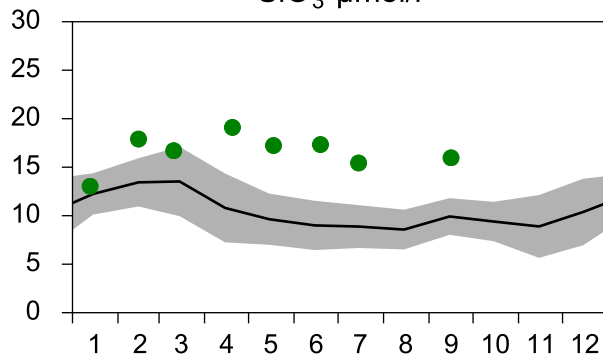
PO₄ µmol/l



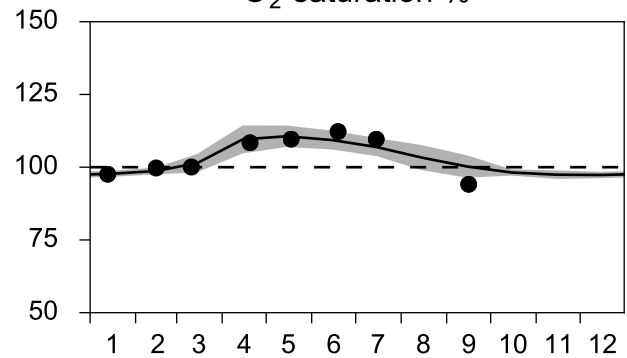
DIN µmol/l



SiO₃ µmol/l

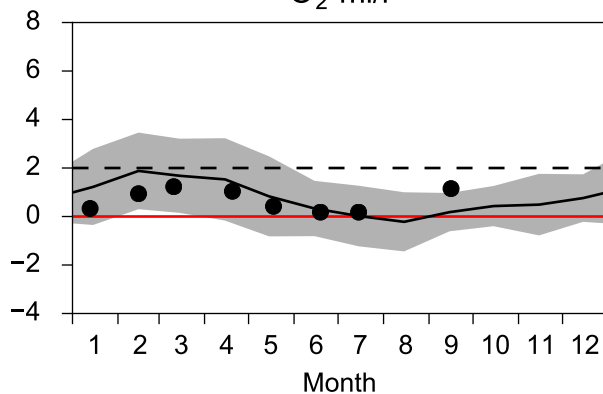


O₂ saturation %

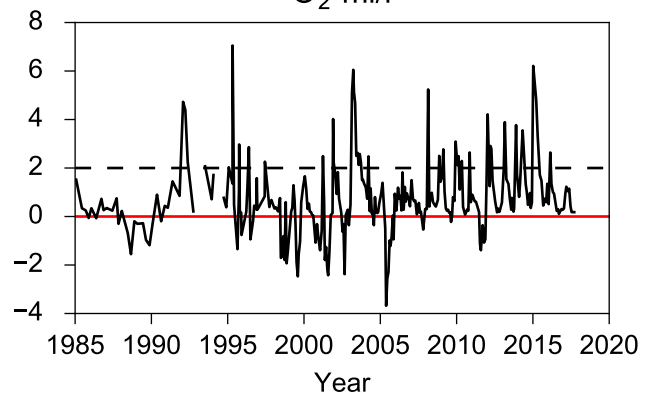


OXYGEN IN BOTTOM WATER (depth >= 70 m)

O₂ ml/l



O₂ ml/l

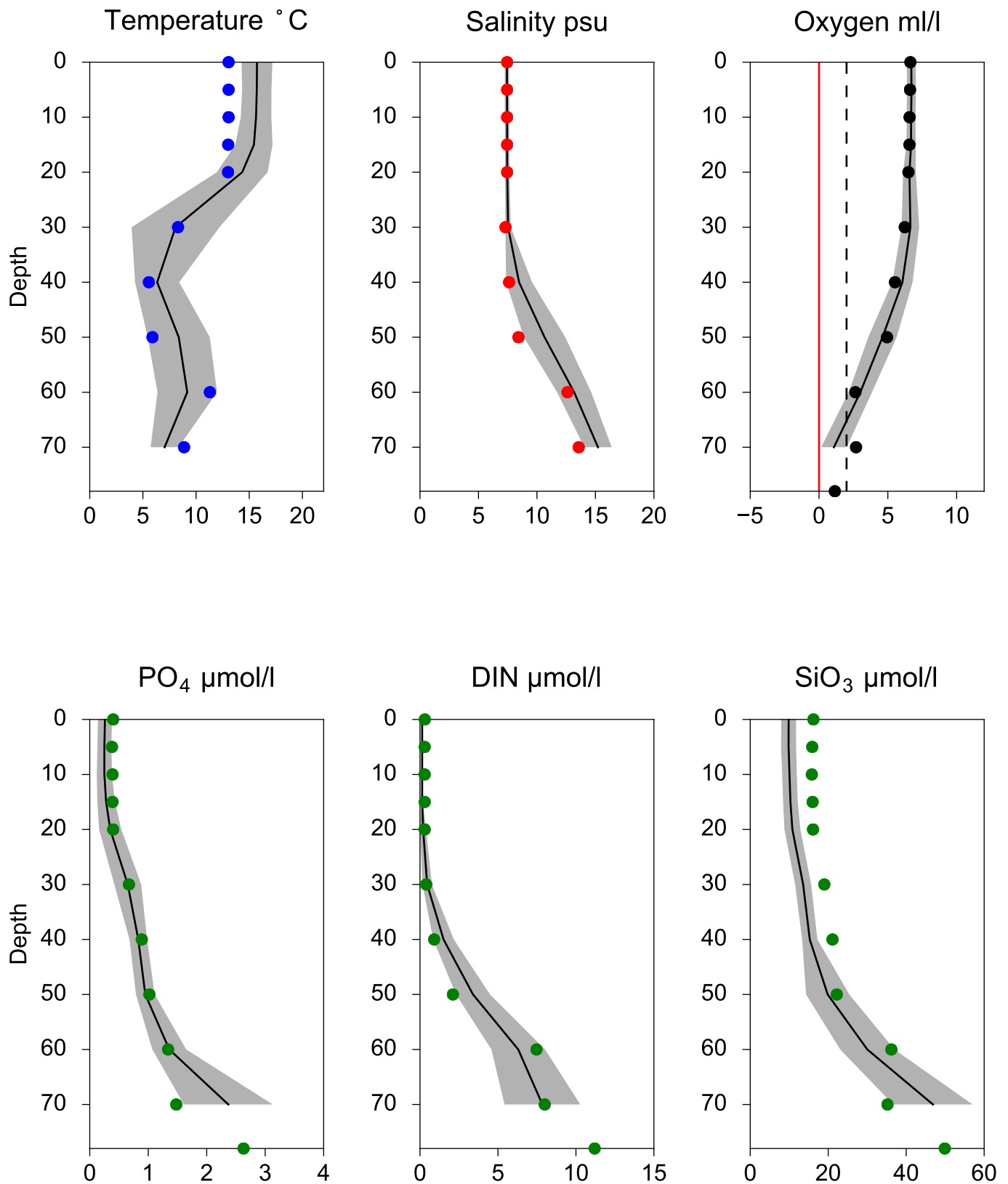


Vertical profiles HANÖBUKTEN September

— Mean 2001-2015

■ St.Dev.

● 2017-09-16



STATION BY2 ARKONA SURFACE WATER (0-10 m)

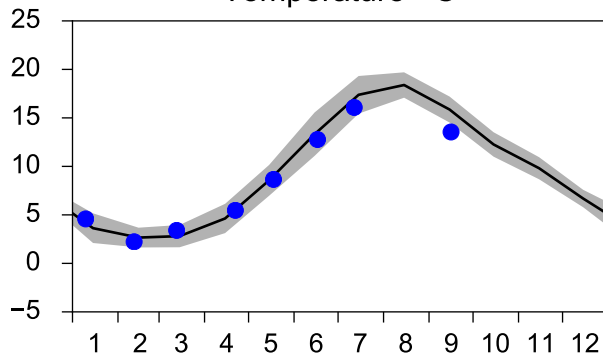
Annual Cycles

— Mean 2001-2015

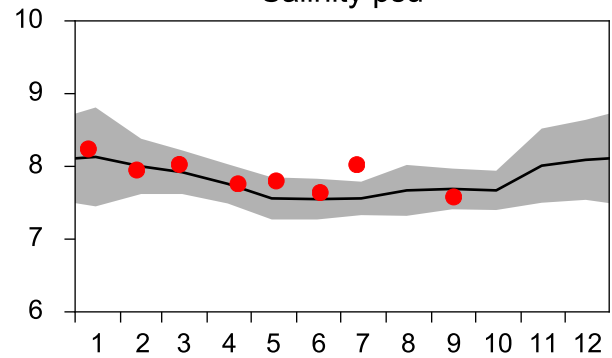
■ St.Dev.

● 2017

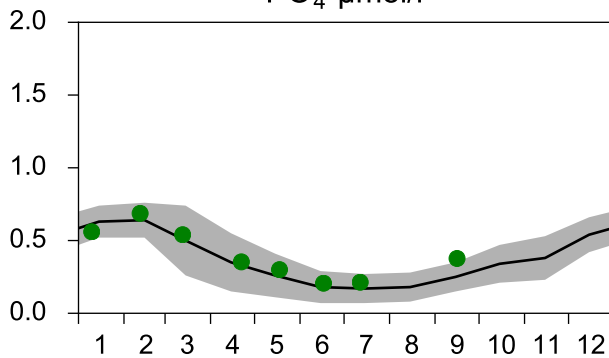
Temperature °C



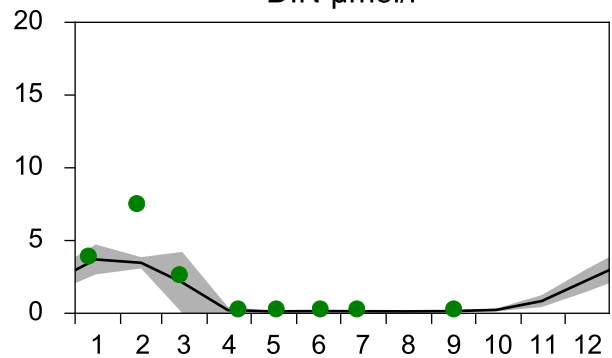
Salinity psu



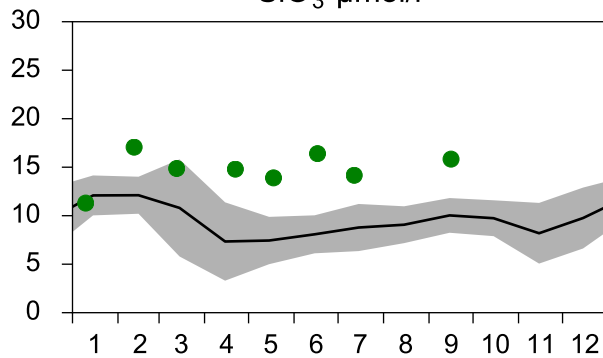
PO₄ µmol/l



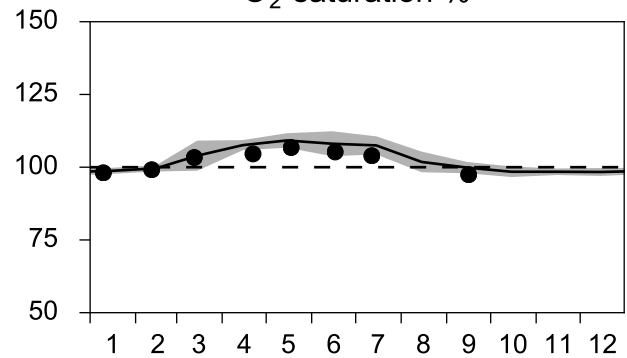
DIN µmol/l



SiO₃ µmol/l

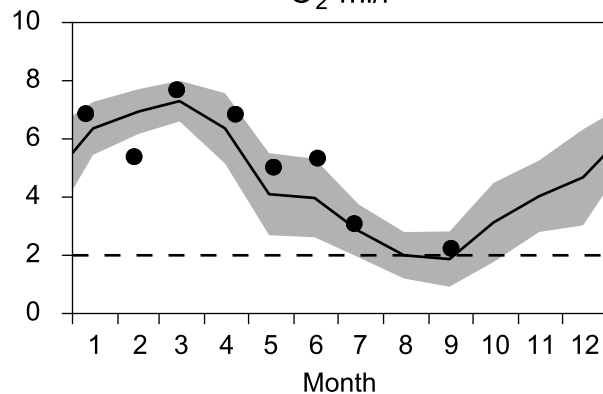


O₂ saturation %

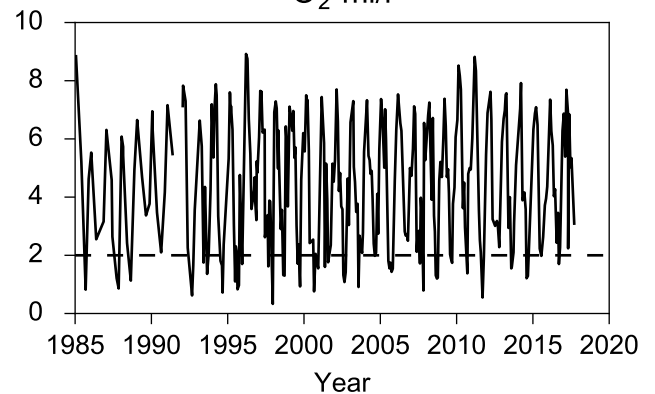


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

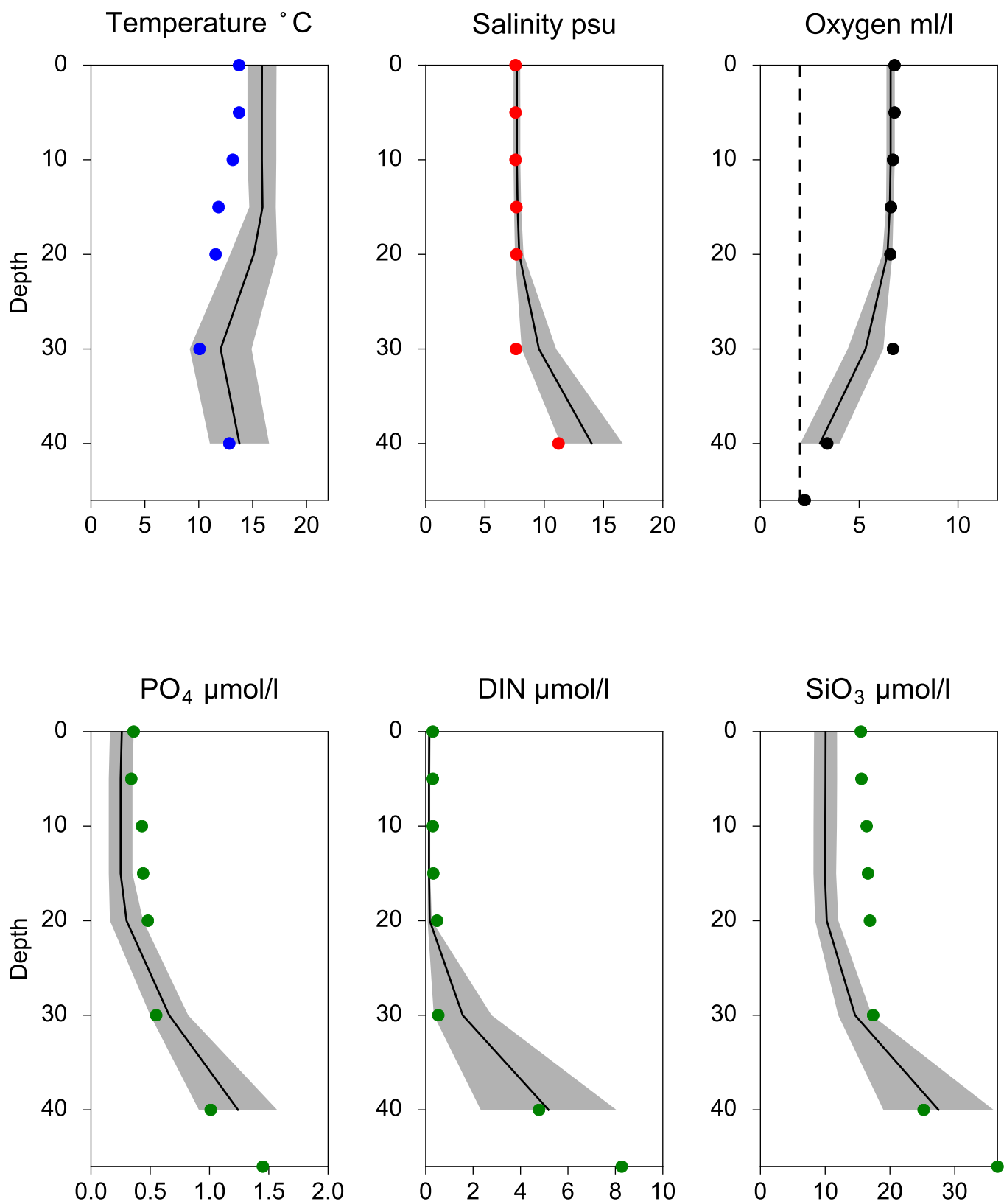


O₂ ml/l



Vertical profiles BY2 ARKONA September

— Mean 2001-2015 St.Dev. • 2017-09-16



STATION BY1 SURFACE WATER (0-10 m)

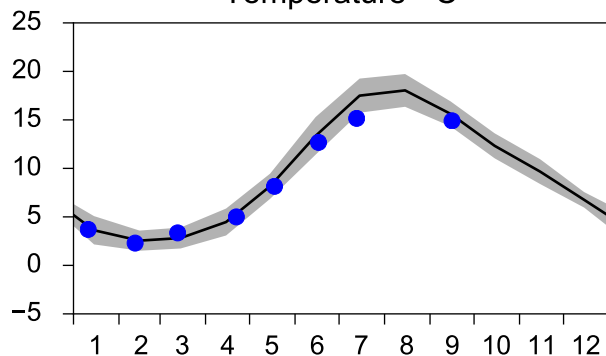
Annual Cycles

— Mean 2001-2015

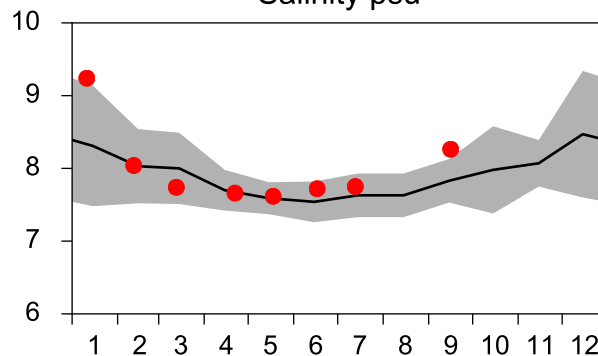
■ St.Dev.

● 2017

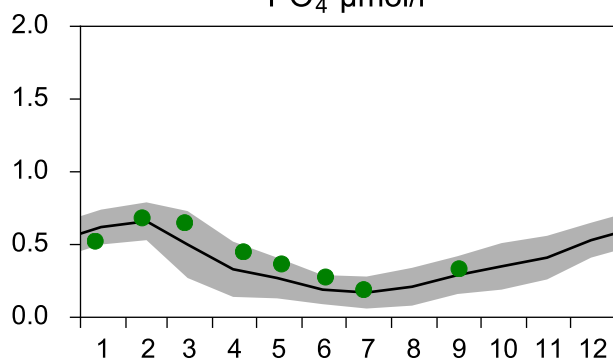
Temperature °C



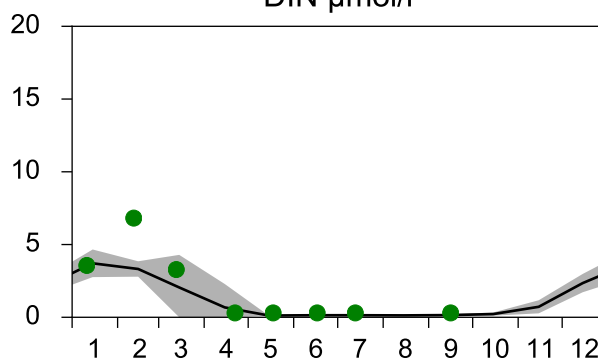
Salinity psu



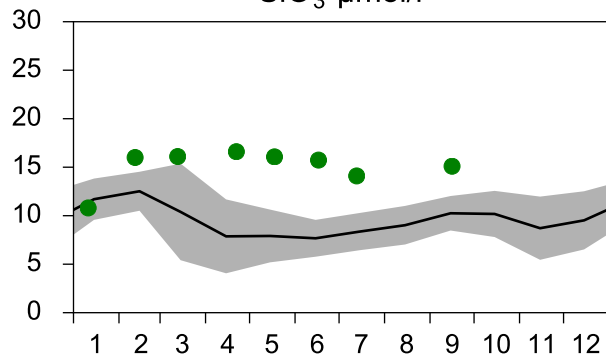
PO₄ µmol/l



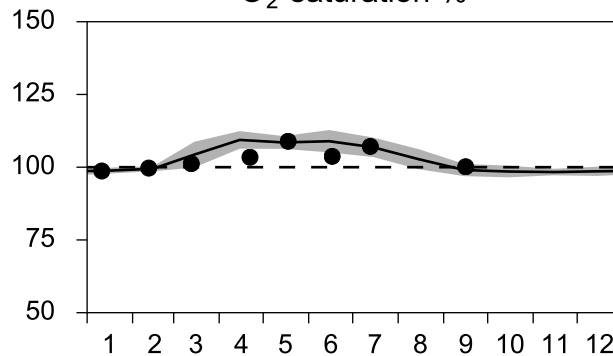
DIN µmol/l



SiO₃ µmol/l

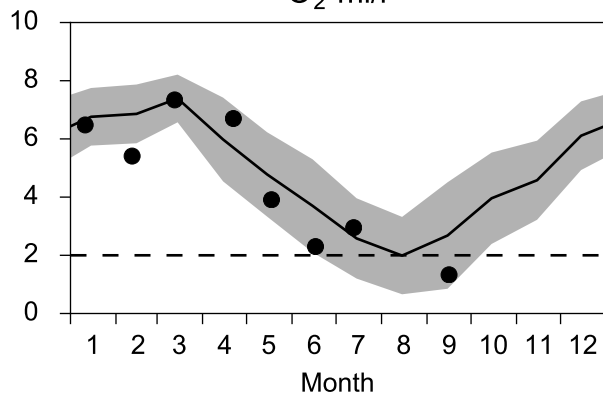


O₂ saturation %

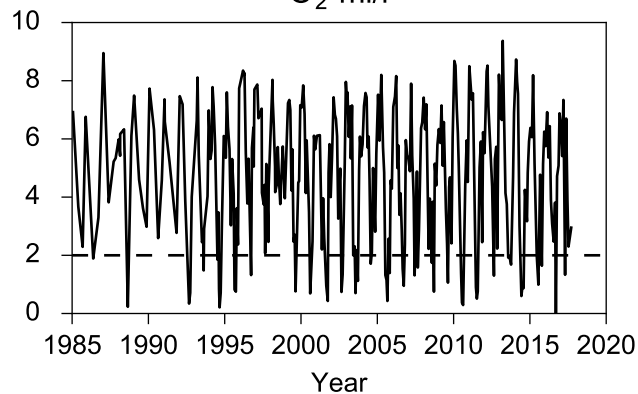


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

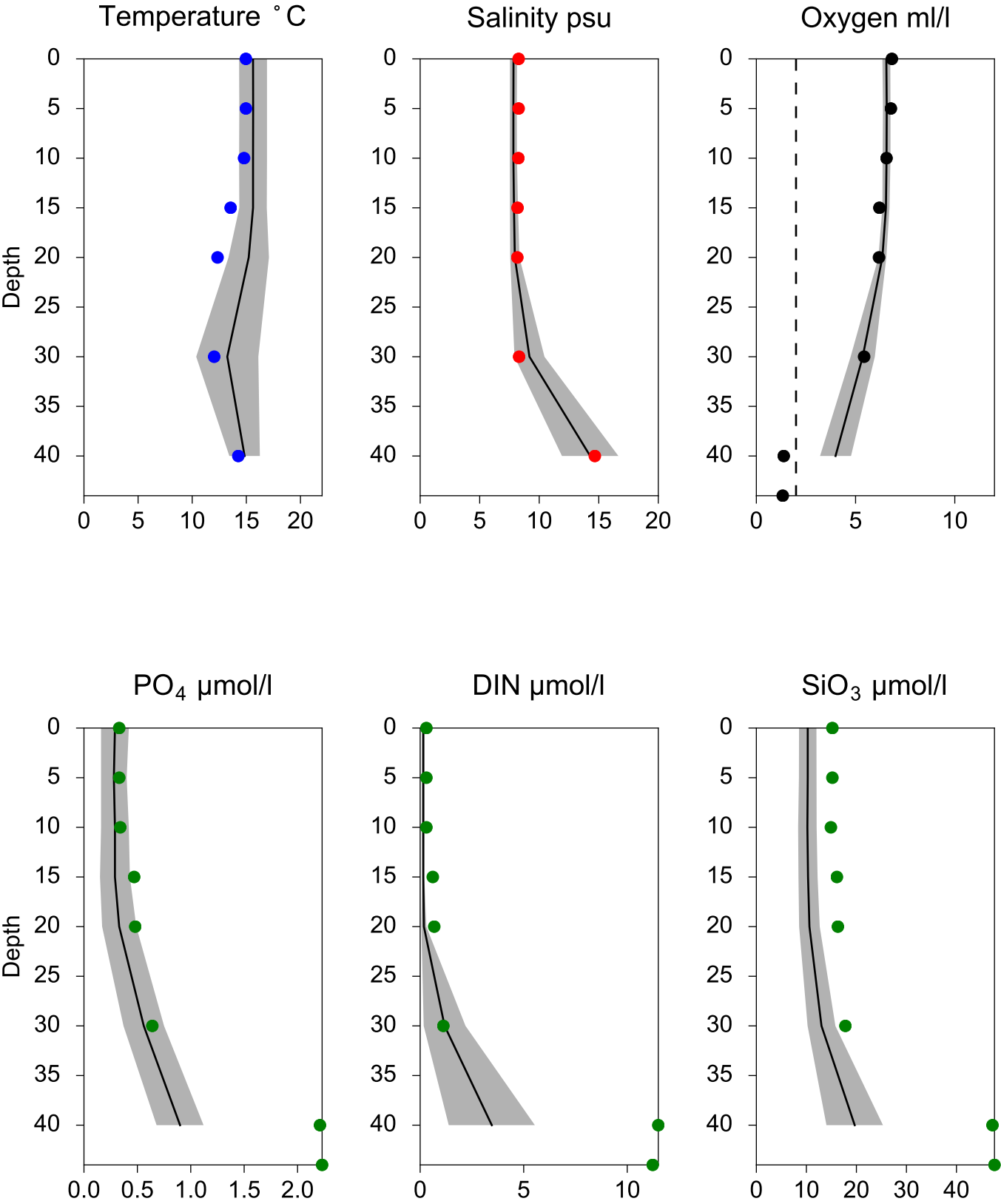


O₂ ml/l



Vertical profiles BY1
September

— Mean 2001-2015 St.Dev. • 2017-09-16



STATION W LANDSKRONA SURFACE WATER (0-10 m)

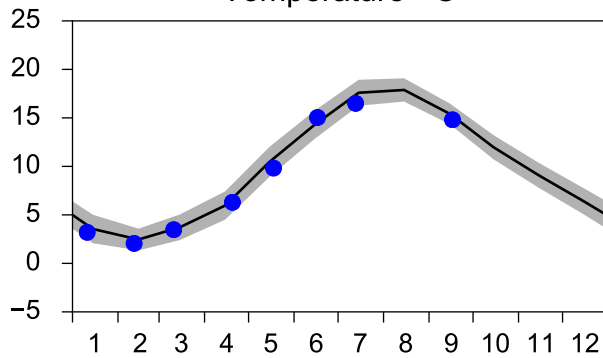
Annual Cycles

— Mean 2001-2015

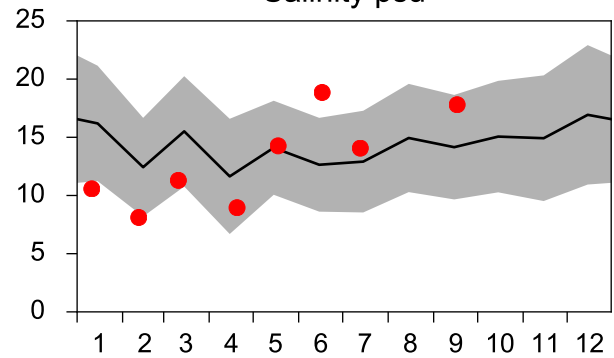
■ St.Dev.

● 2017

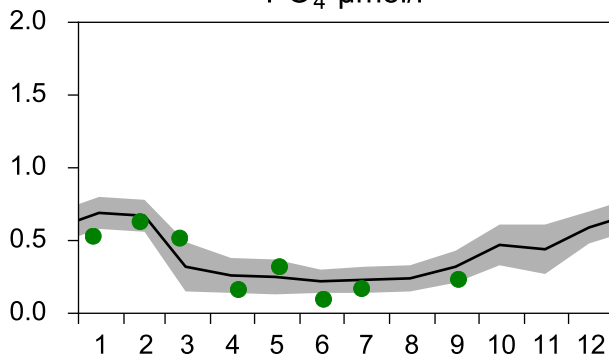
Temperature °C



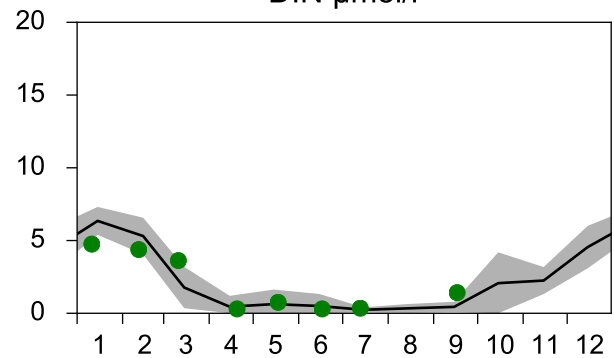
Salinity psu



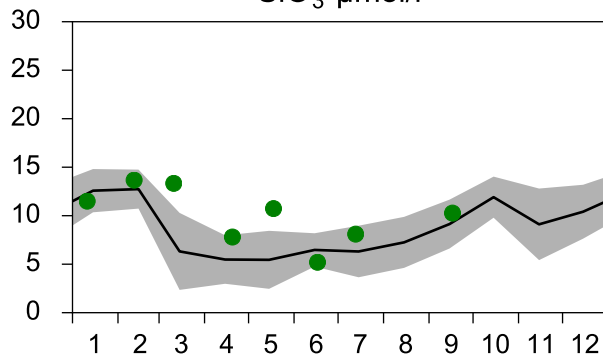
PO₄ µmol/l



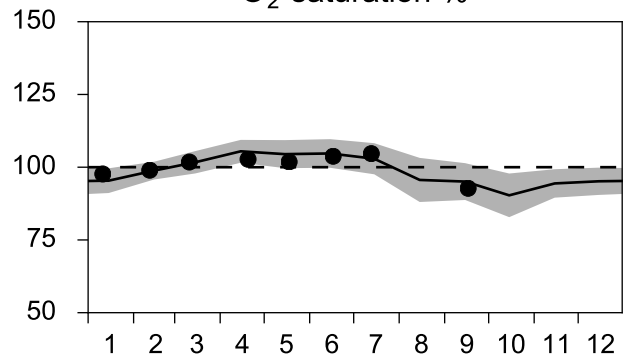
DIN µmol/l



SiO₃ µmol/l

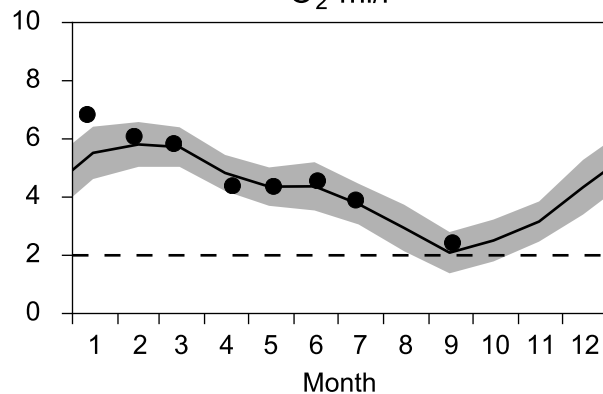


O₂ saturation %

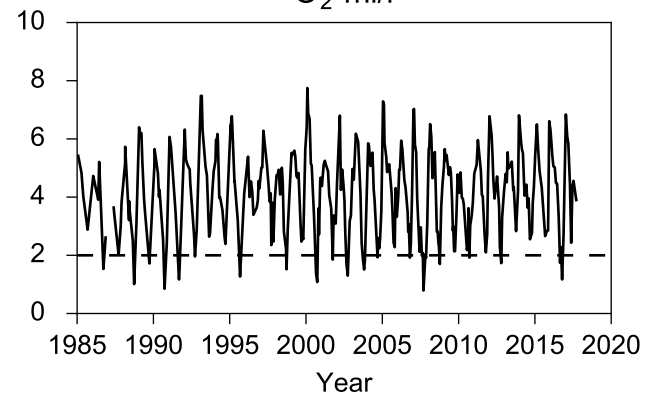


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

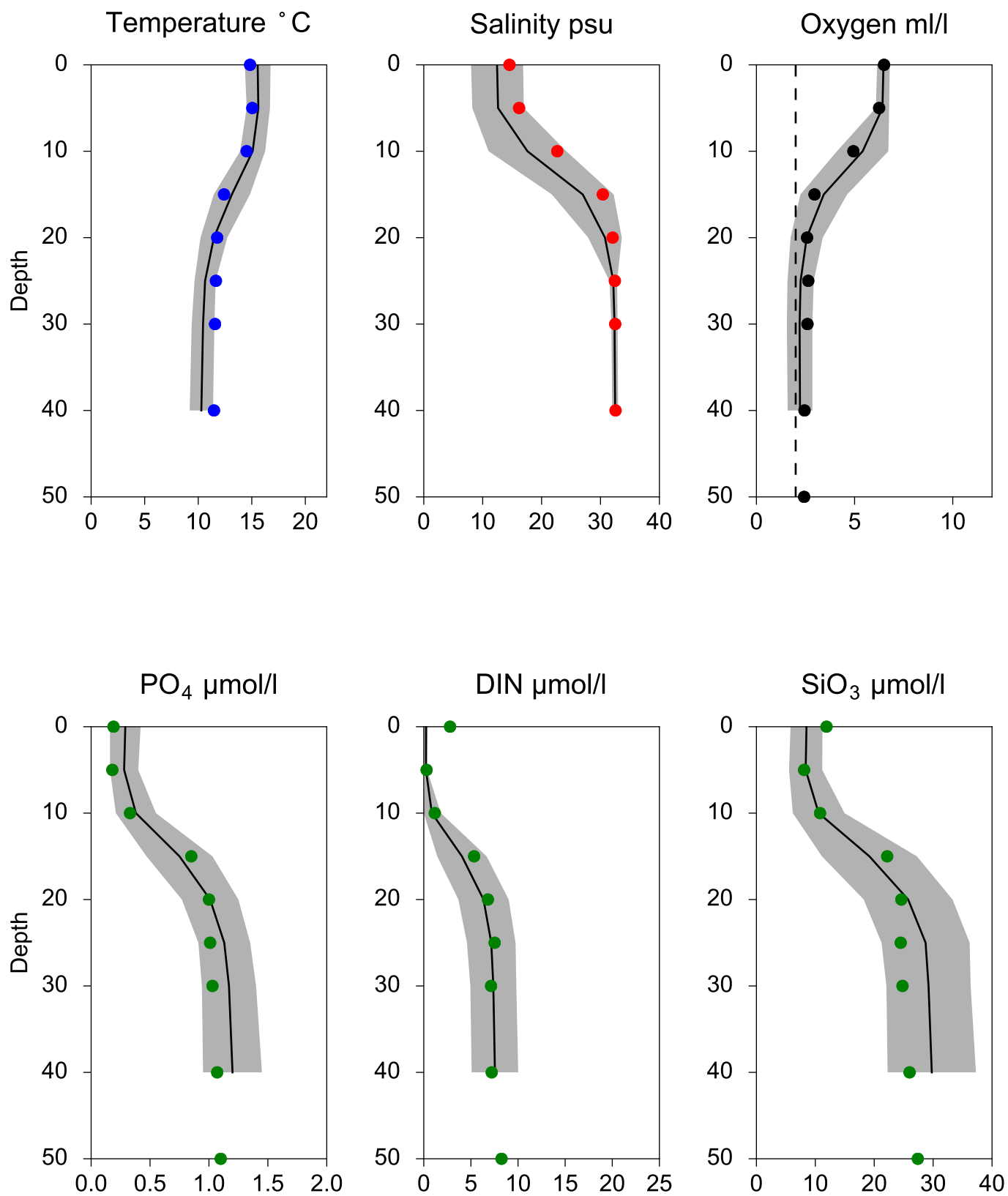


O₂ ml/l



Vertical profiles W LANDSKRONA September

— Mean 2001-2015 St.Dev. • 2017-09-17



STATION ANHOLT E SURFACE WATER (0-10 m)

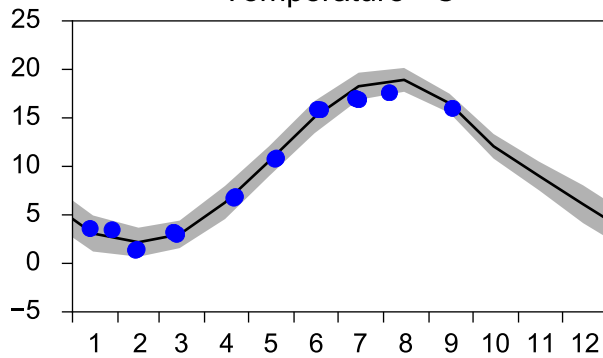
Annual Cycles

— Mean 2001-2015

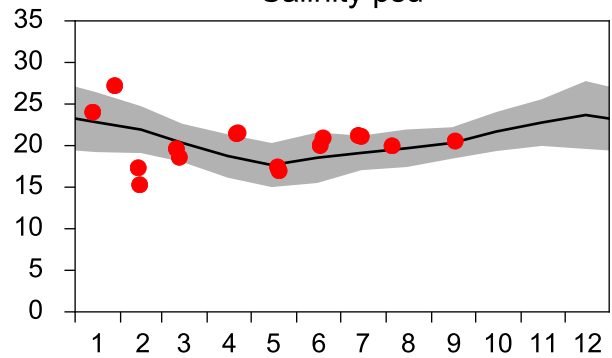
■ St.Dev.

● 2017

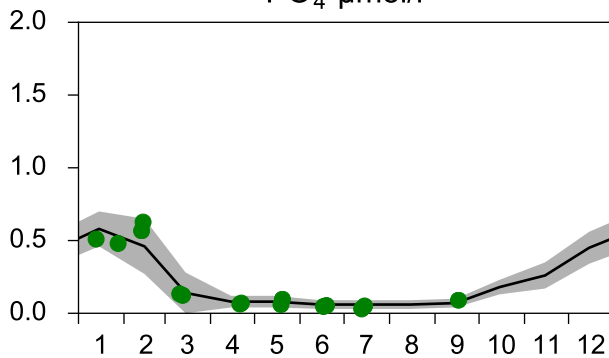
Temperature °C



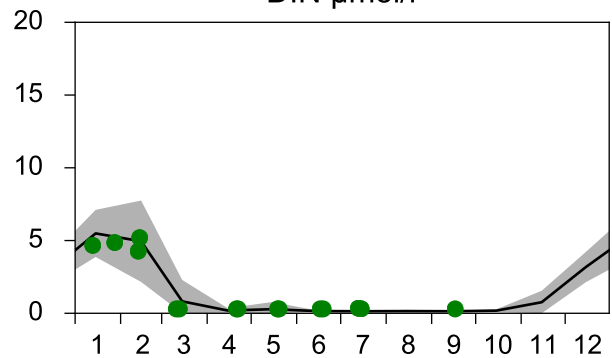
Salinity psu



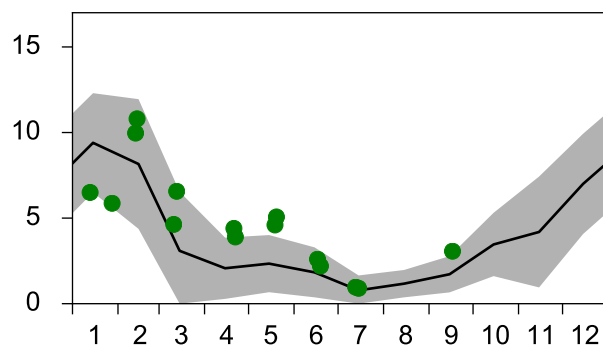
PO₄ µmol/l



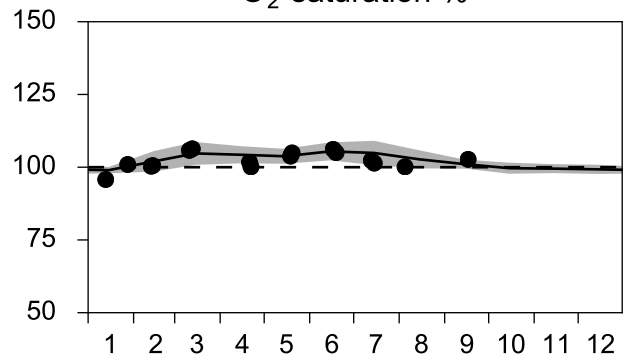
DIN µmol/l



SiO₃ µmol/l

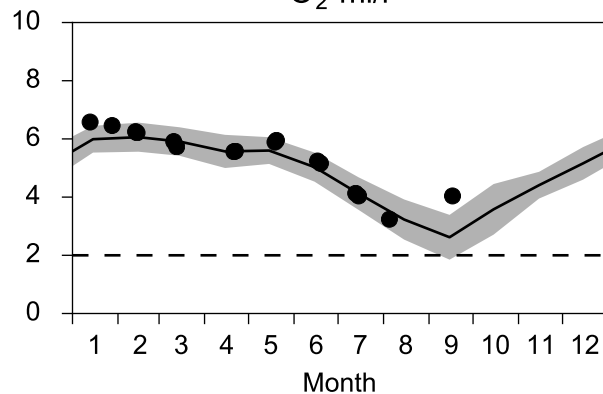


O₂ saturation %

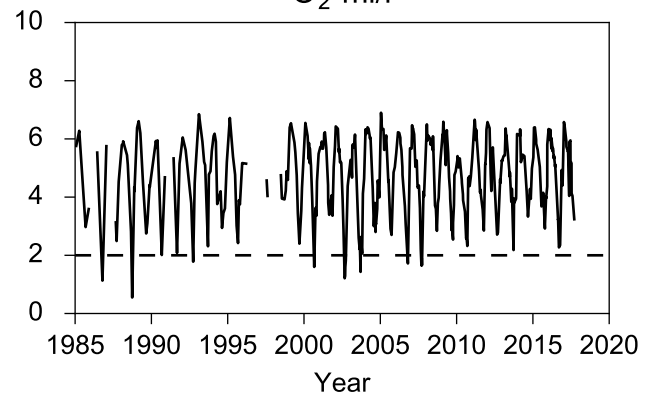


OXYGEN IN BOTTOM WATER (depth >= 52 m)

O₂ ml/l

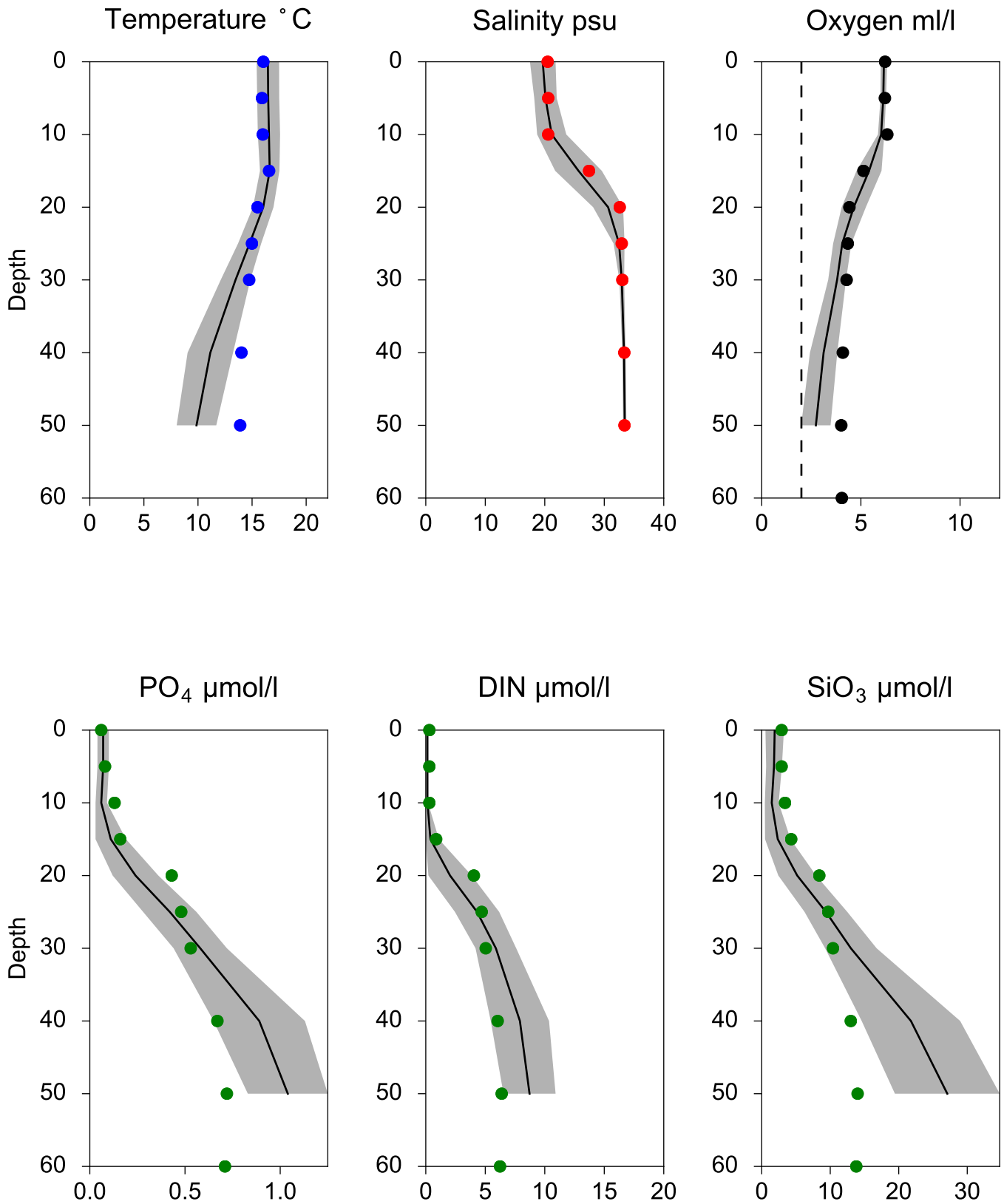


O₂ ml/l



Vertical profiles ANHOLT E September

— Mean 2001-2015 ■ St.Dev. ● 2017-09-17



STATION N14 FALKENBERG SURFACE WATER (0-10 m)

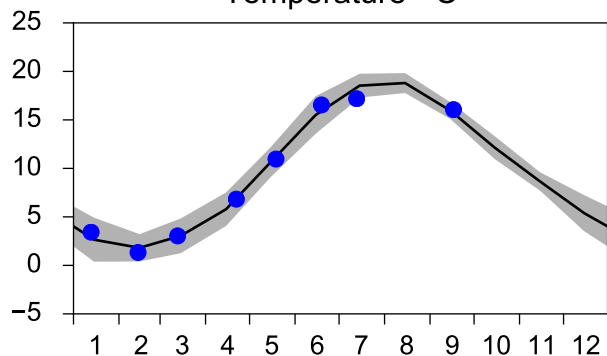
Annual Cycles

— Mean 2001-2015

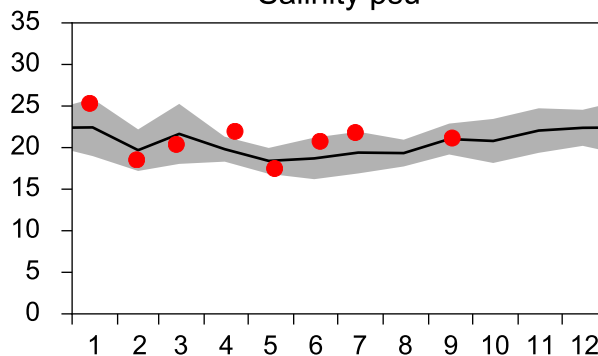
■ St.Dev.

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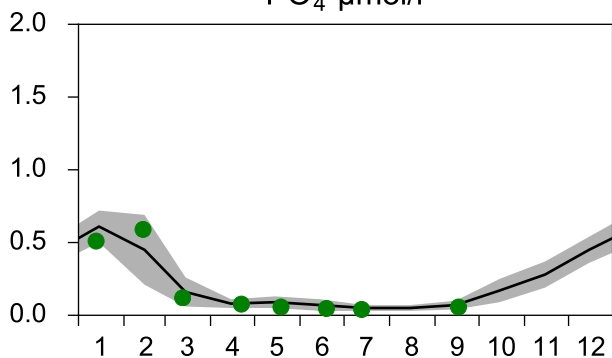
Temperature °C



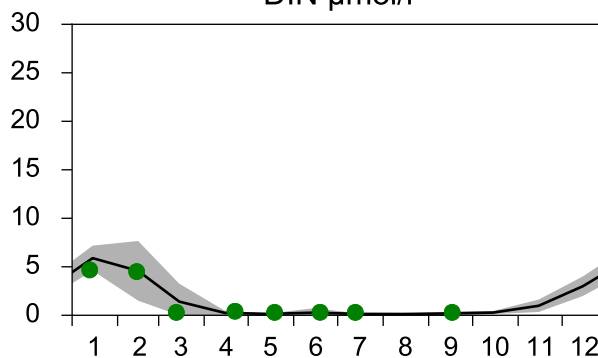
Salinity psu



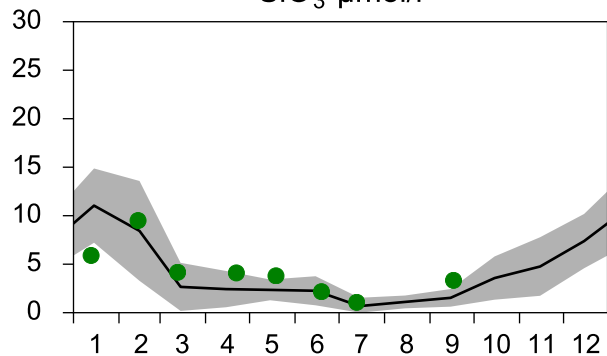
PO₄ µmol/l



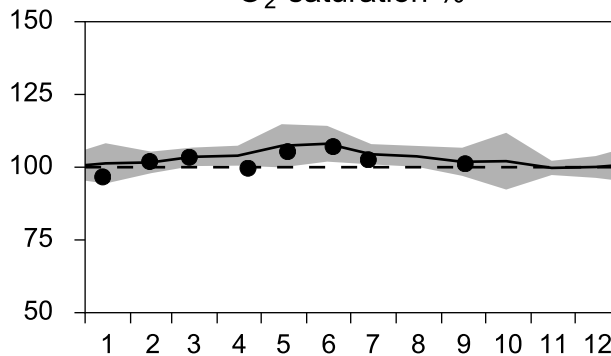
DIN µmol/l



SiO₃ µmol/l

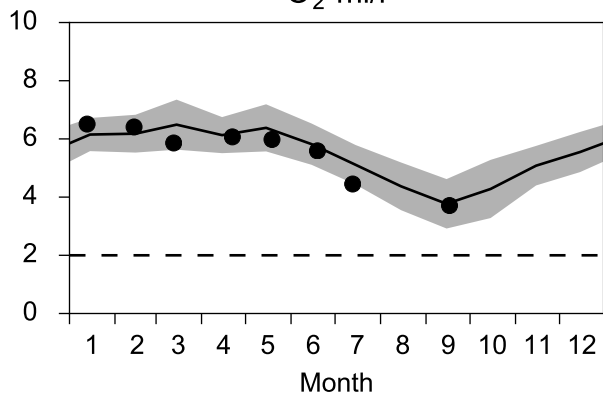


O₂ saturation %

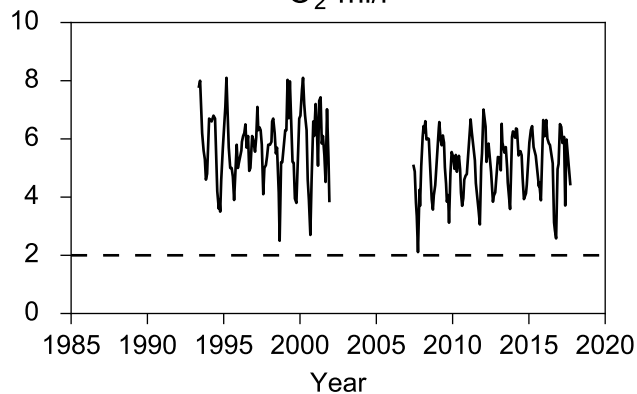


OXYGEN IN BOTTOM WATER (depth >= 25 m)

O₂ ml/l

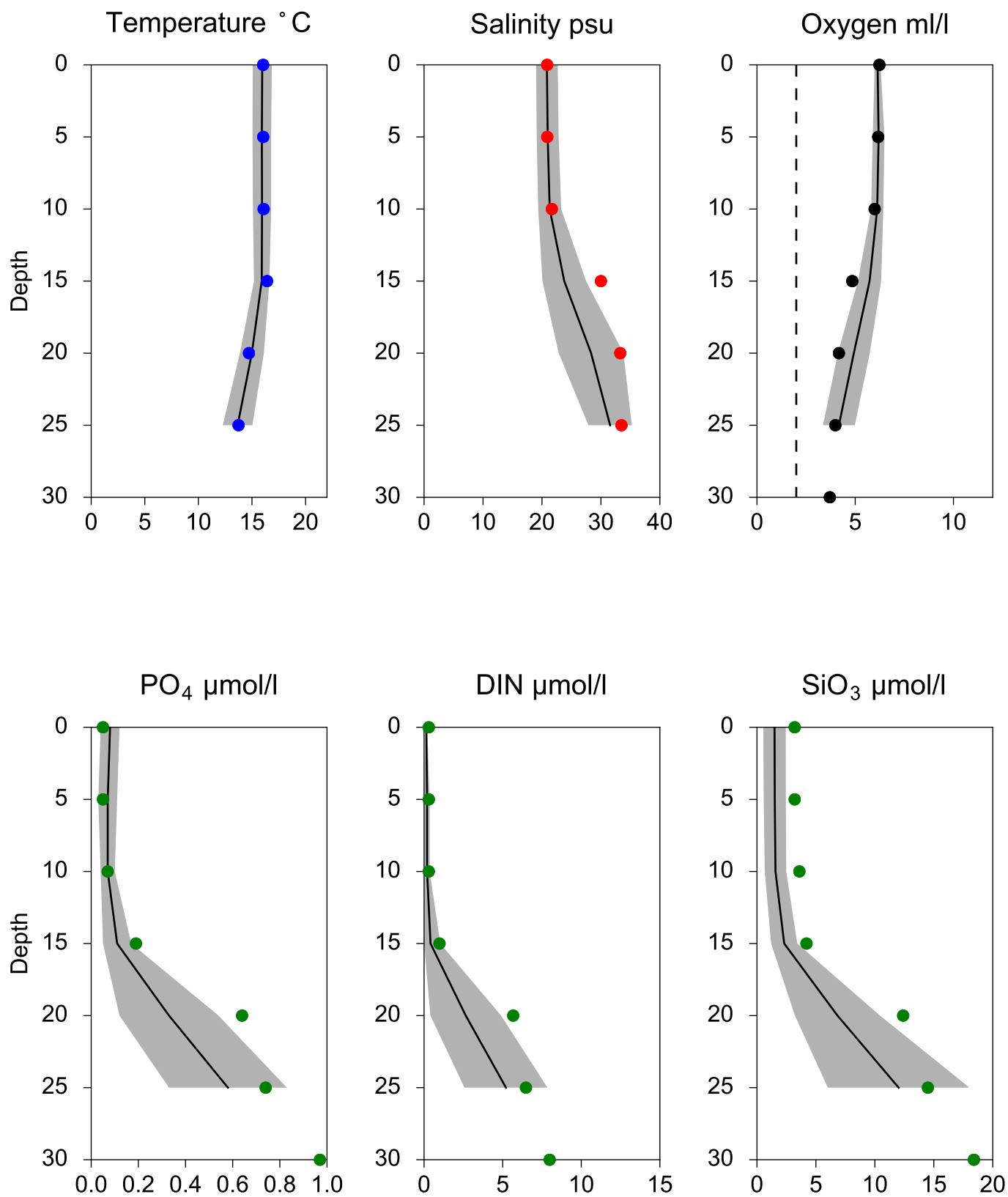


O₂ ml/l



Vertical profiles N14 FALKENBERG September

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STATION FLADEN SURFACE WATER (0-10 m)

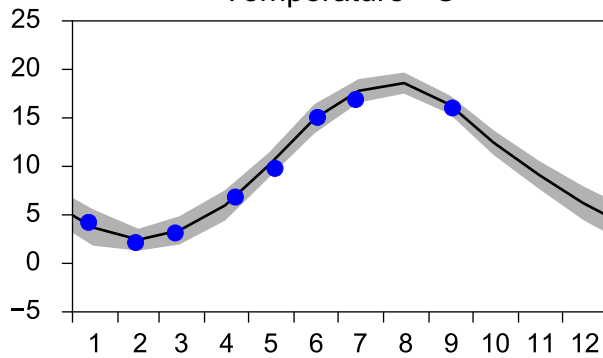
Annual Cycles

— Mean 2001-2015

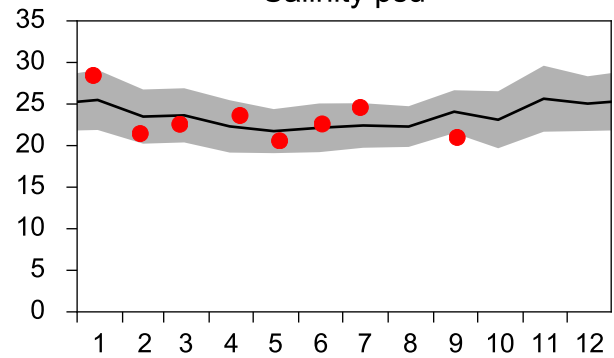
■ St.Dev.

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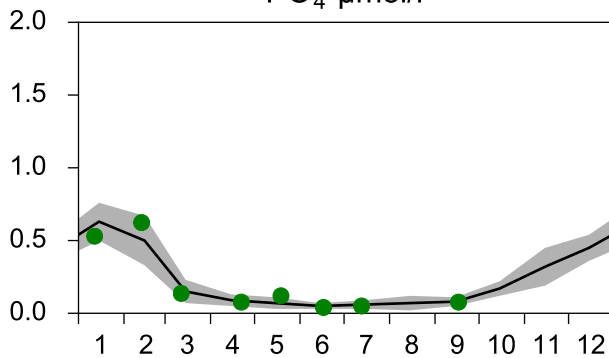
Temperature °C



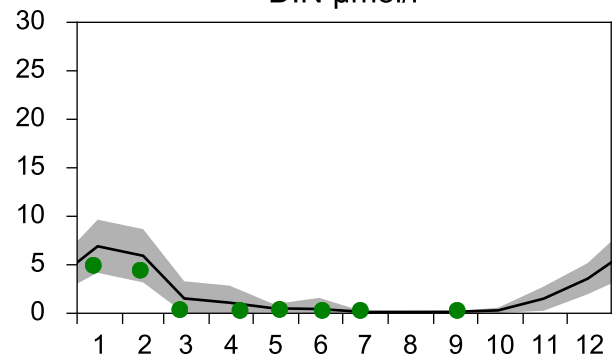
Salinity psu



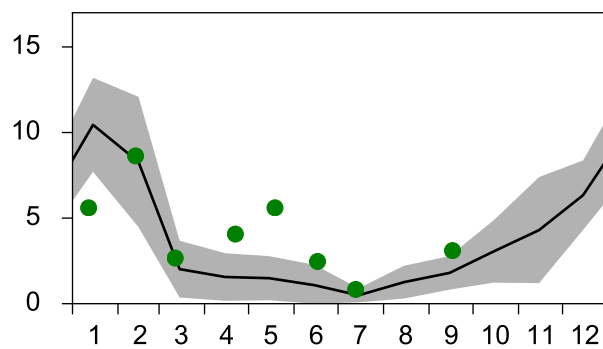
PO₄ µmol/l



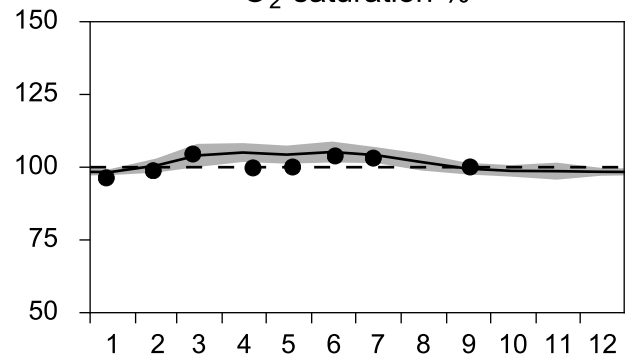
DIN µmol/l



SiO₃ µmol/l

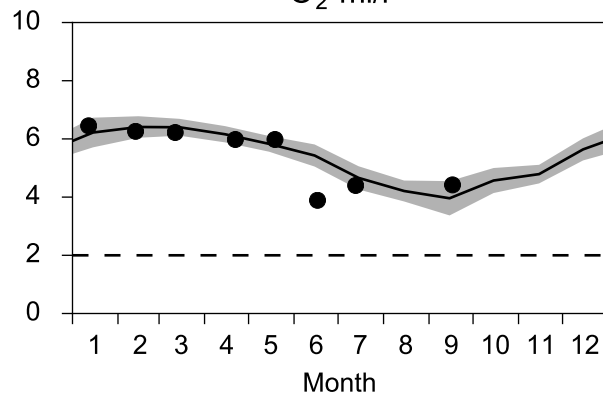


O₂ saturation %

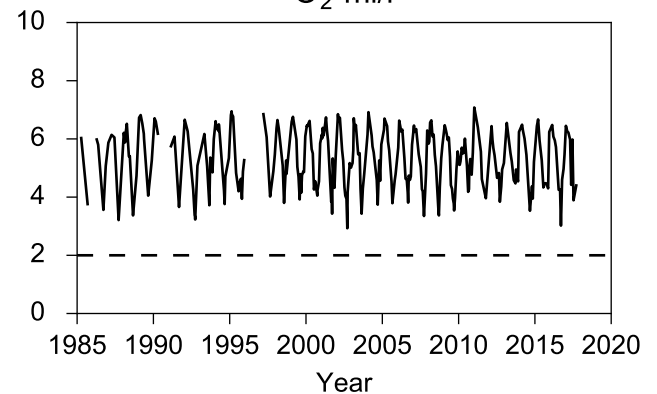


OXYGEN IN BOTTOM WATER (depth >= 74 m)

O₂ ml/l

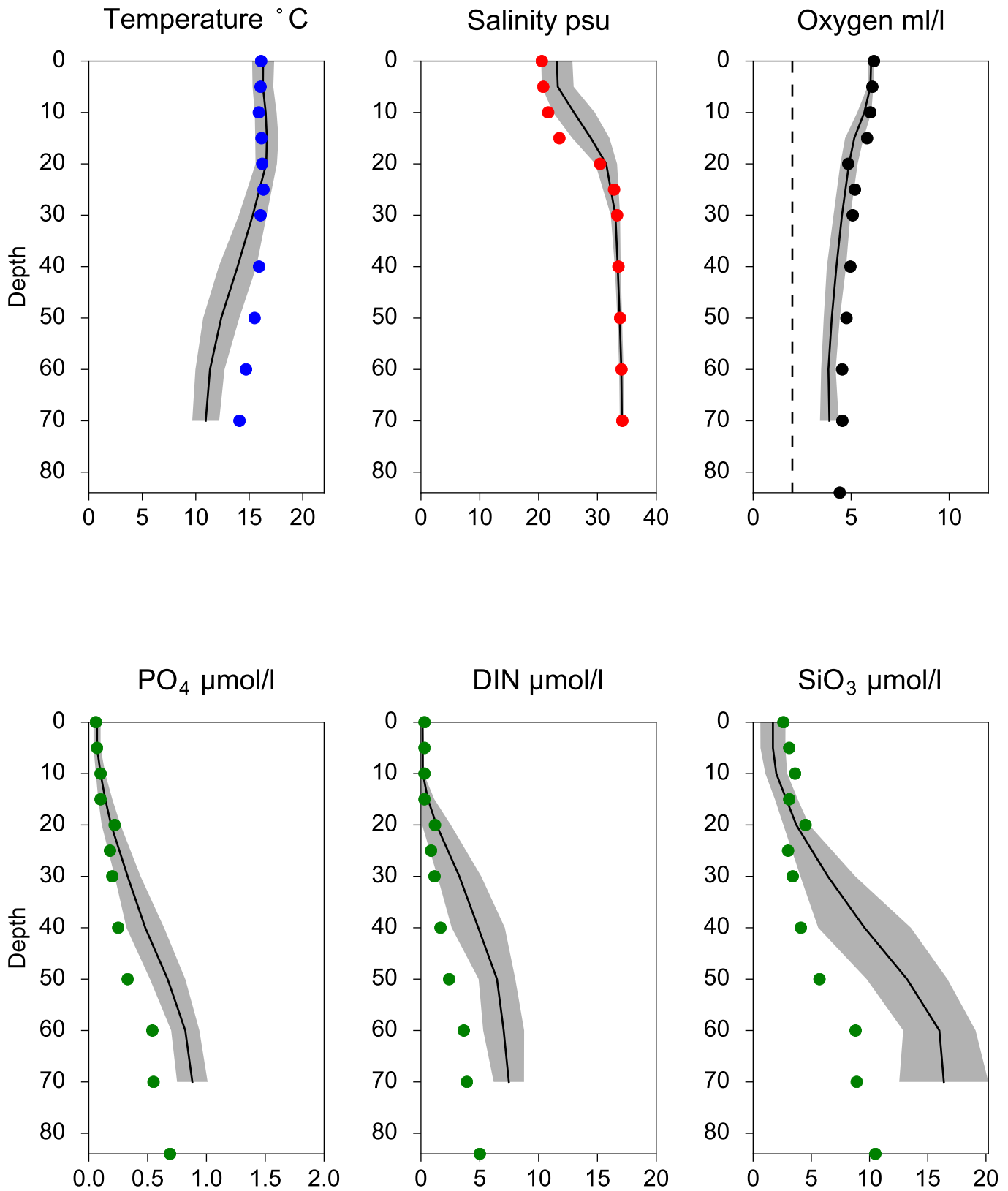


O₂ ml/l



Vertical profiles FLADEN September

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STATION P2 SURFACE WATER (0-10 m)

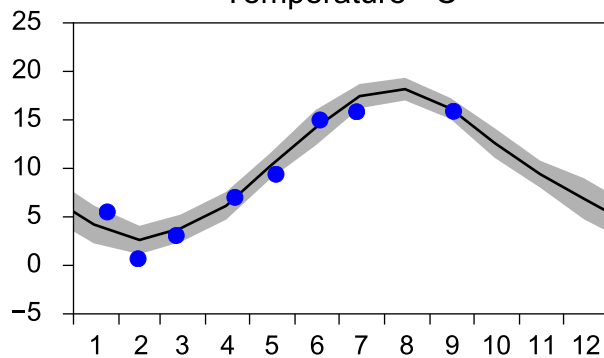
Annual Cycles

— Mean 2001-2015

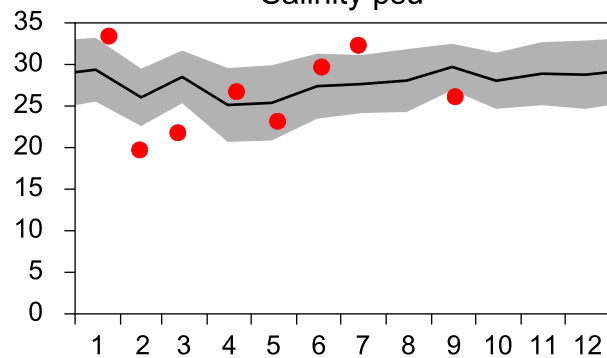
■ St.Dev.

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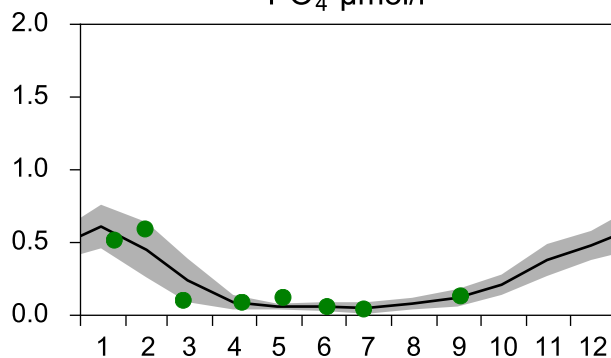
Temperature °C



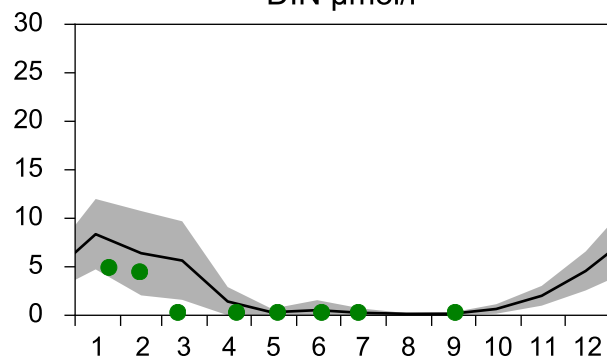
Salinity psu



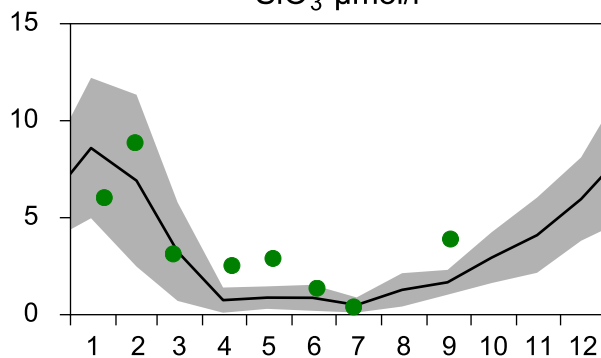
PO₄ µmol/l



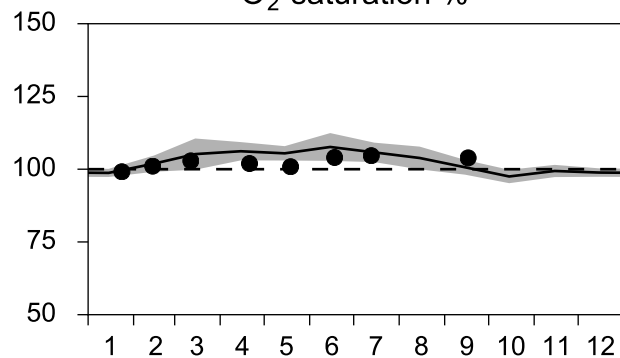
DIN µmol/l



SiO₃ µmol/l

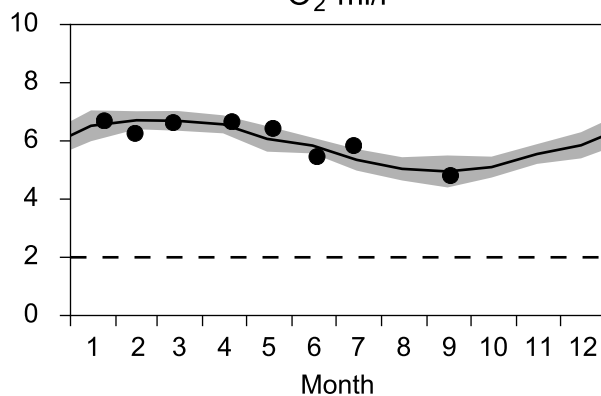


O₂ saturation %

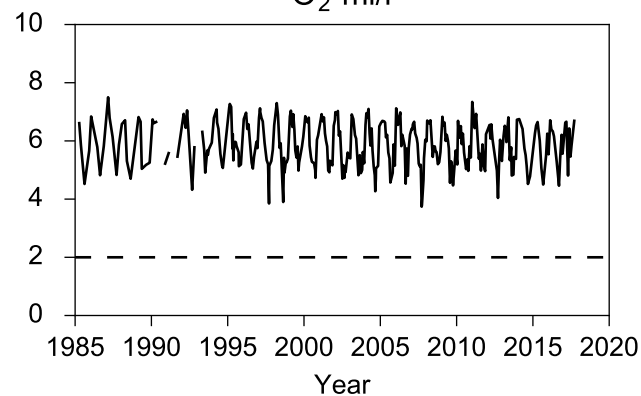


OXYGEN IN BOTTOM WATER (depth >= 75 m)

O₂ ml/l



O₂ ml/l

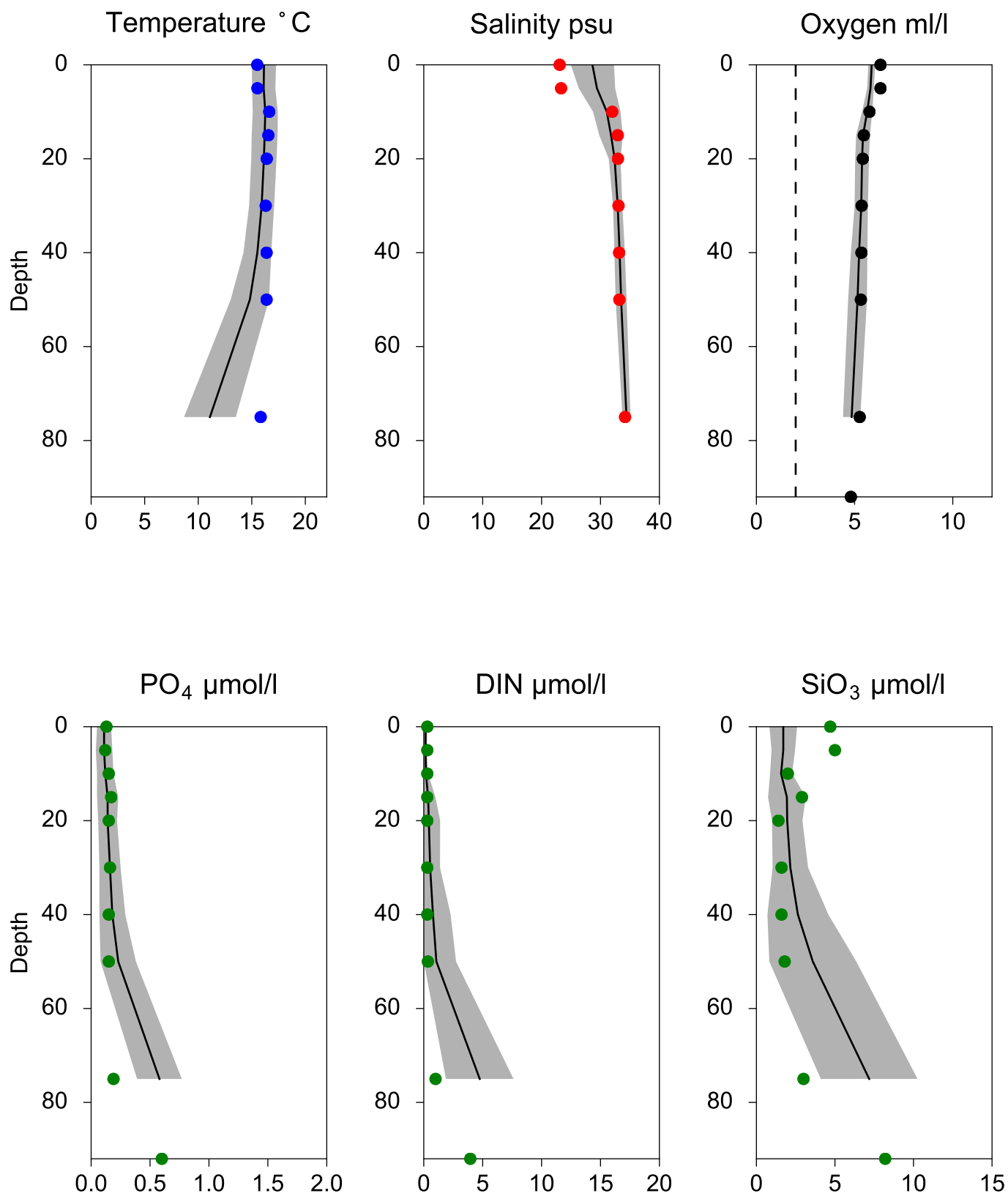


Vertical profiles P2 September

— Mean 2001-2015

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STATION Å17 SURFACE WATER (0-10 m)

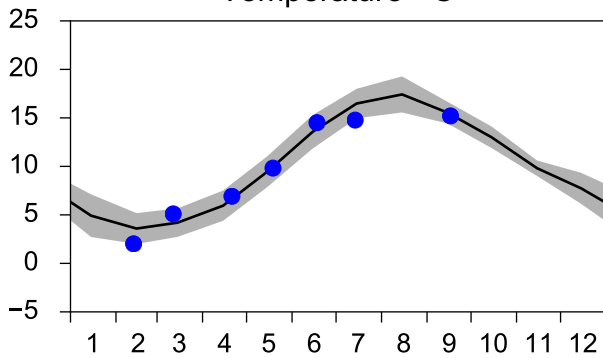
Annual Cycles

— Mean 2001-2015

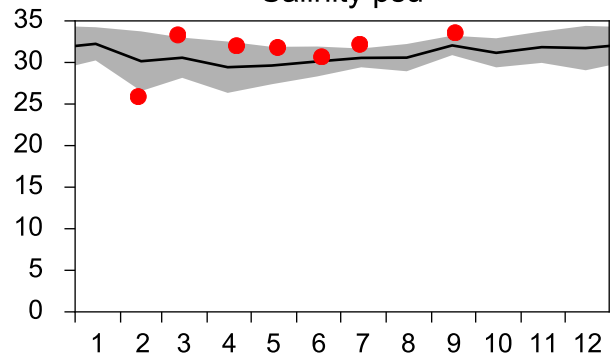
■ St.Dev.

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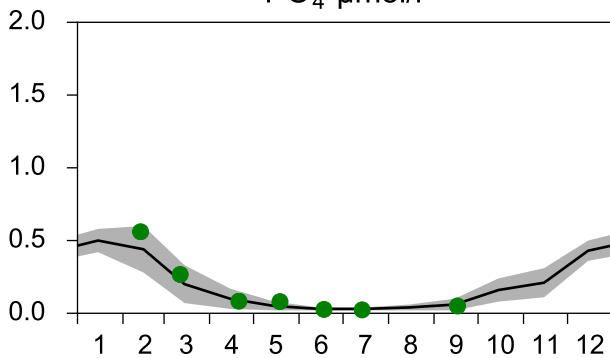
Temperature °C



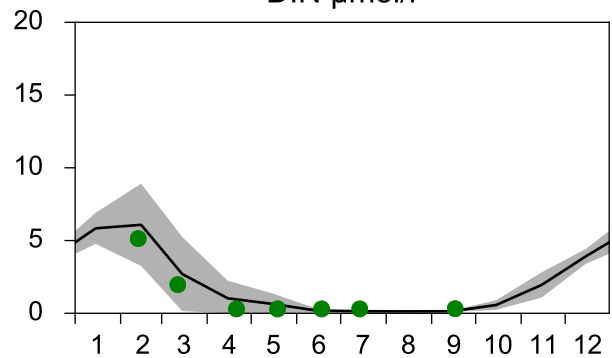
Salinity psu



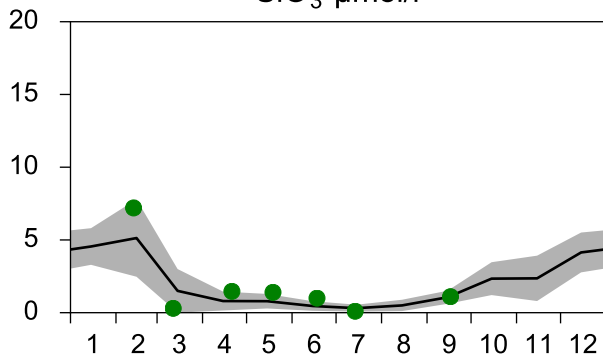
PO₄ μmol/l



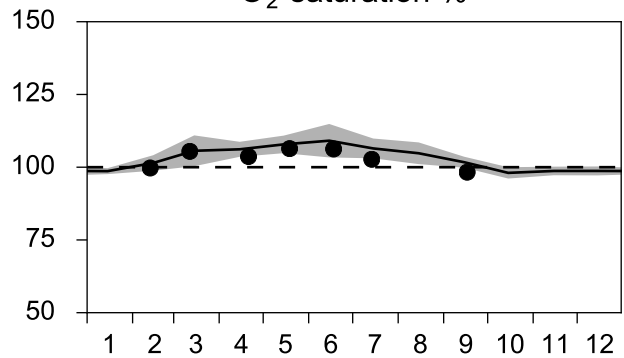
DIN μmol/l



SiO₃ μmol/l

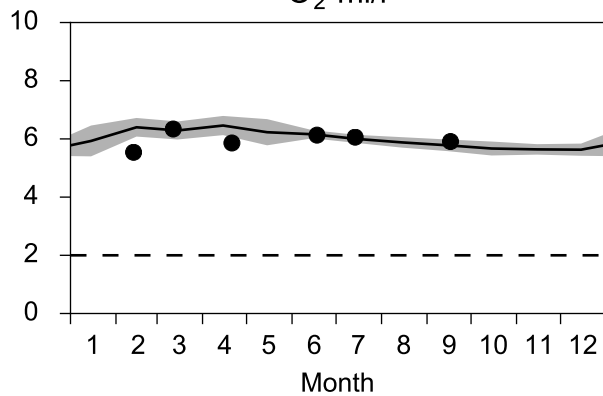


O₂ saturation %

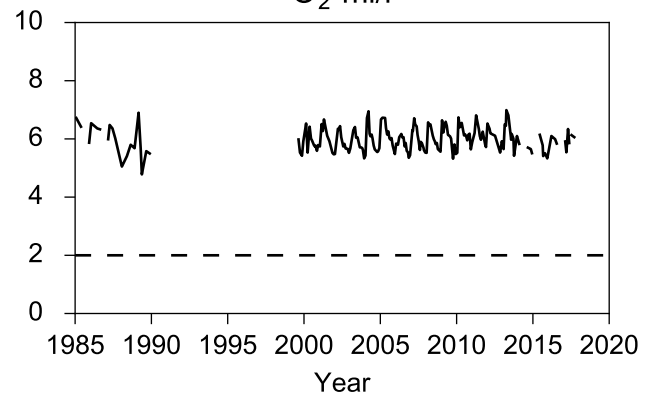


OXYGEN IN BOTTOM WATER (depth >= 300 m)

O₂ ml/l

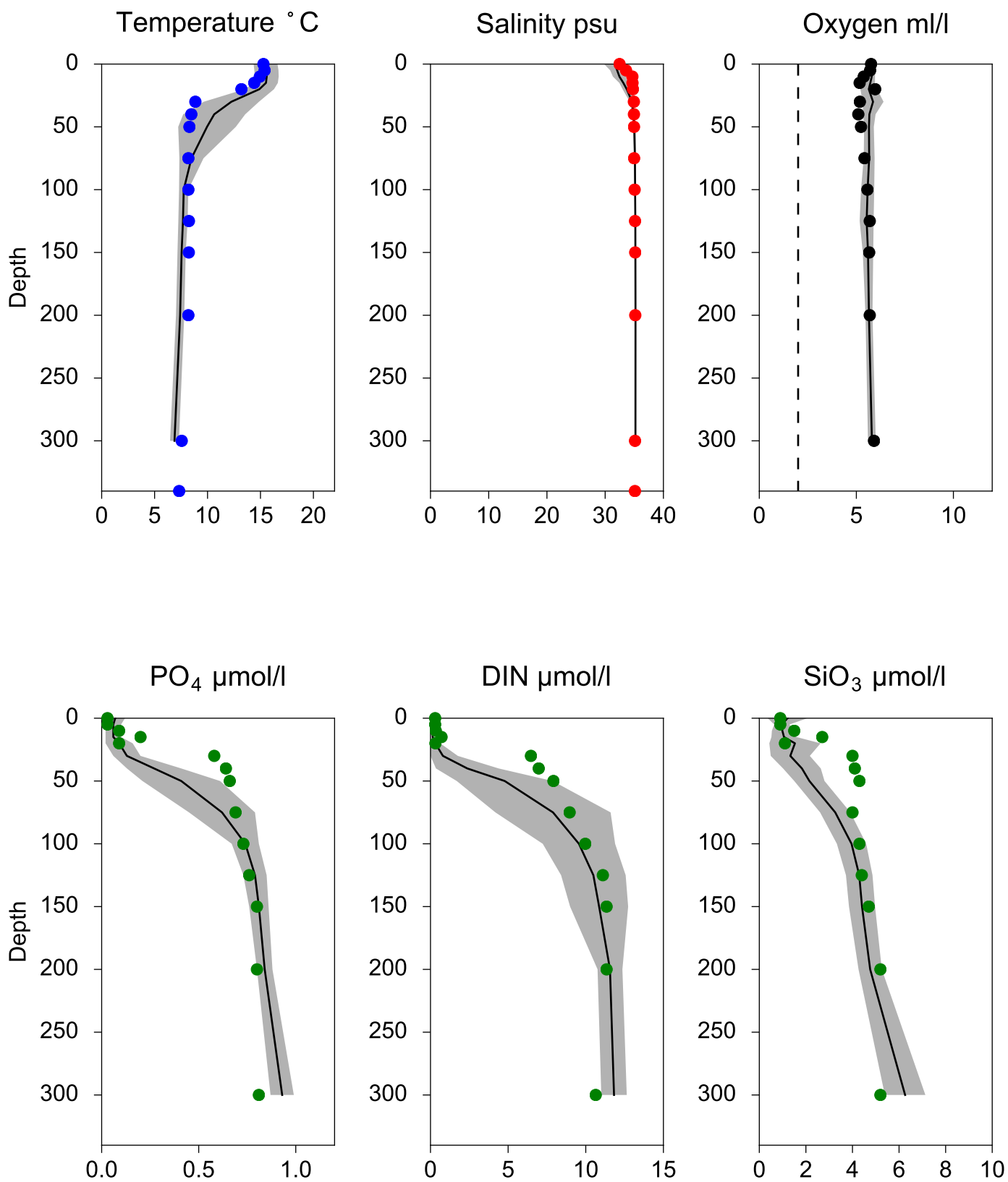


O₂ ml/l



Vertical profiles Å17 September

— Mean 2001-2015 ■ St.Dev. ● 2017-09-17



STATION Å15 SURFACE WATER (0-10 m)

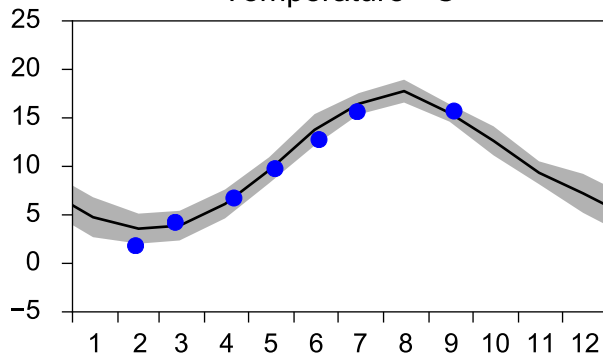
Annual Cycles

— Mean 2001-2015

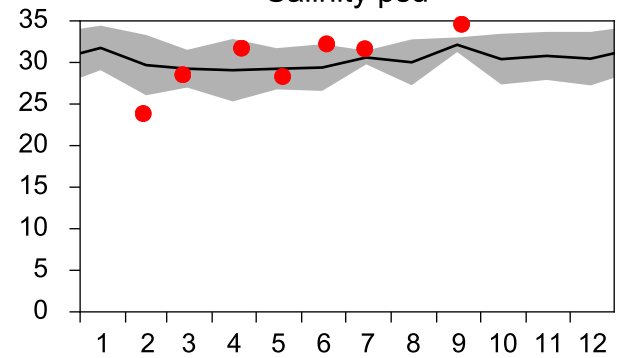
■ St.Dev.

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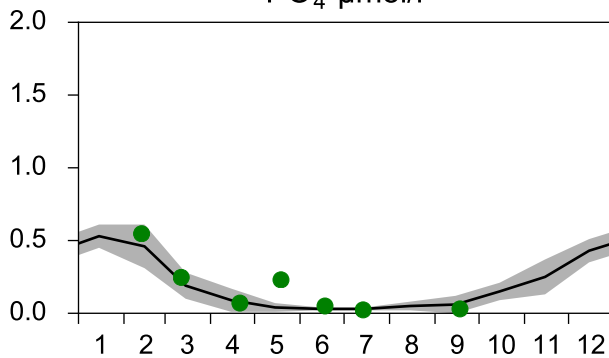
Temperature °C



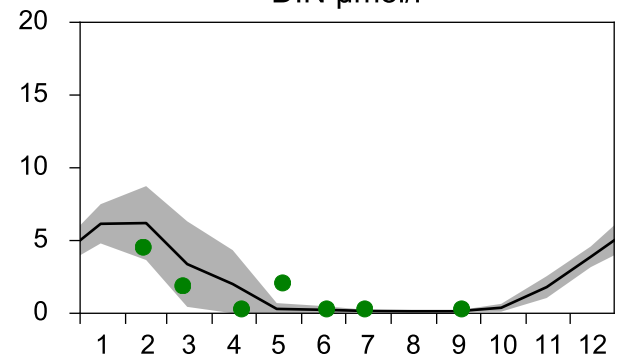
Salinity psu



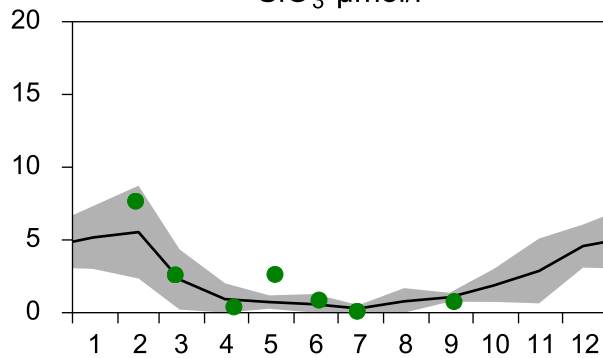
PO₄ µmol/l



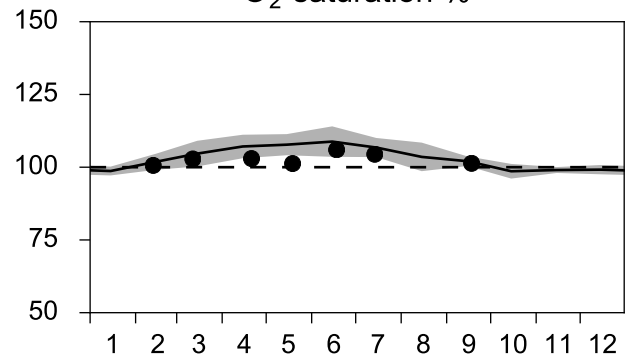
DIN µmol/l



SiO₃ µmol/l

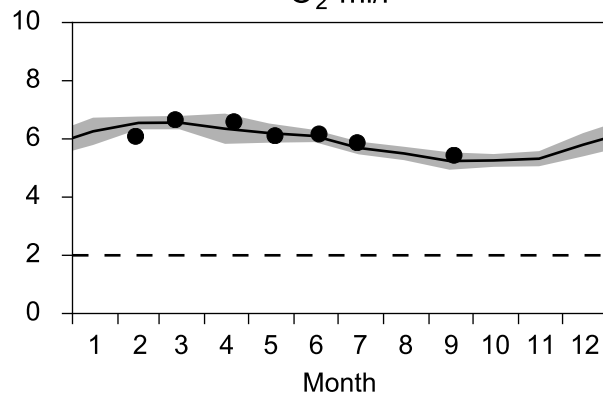


O₂ saturation %

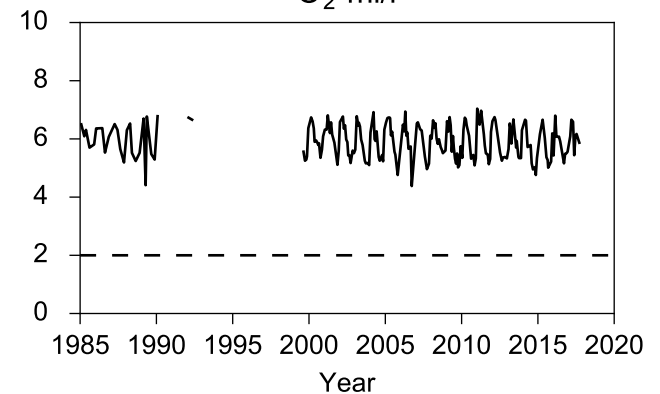


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

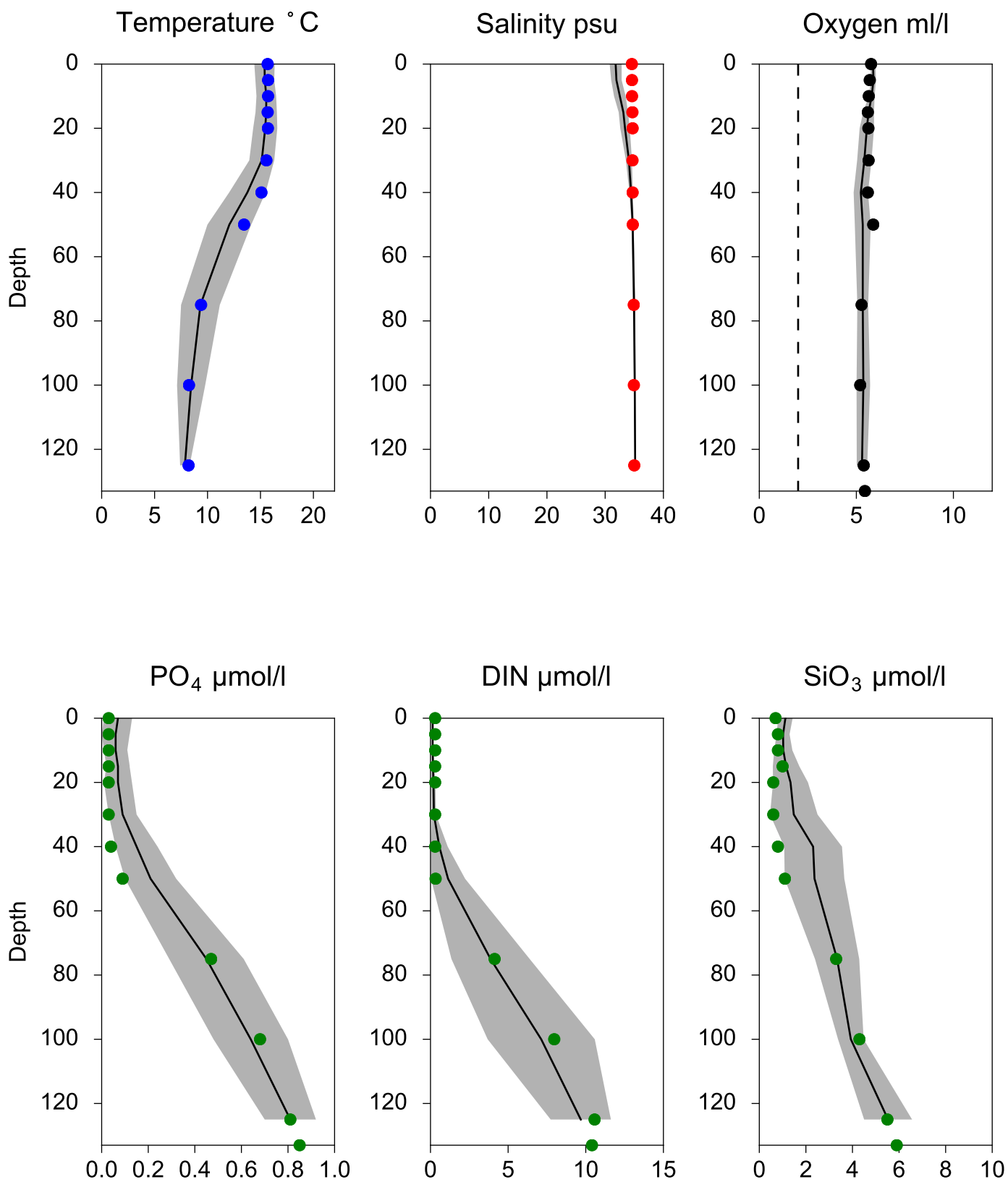


O₂ ml/l



Vertical profiles Å15 September

— Mean 2001-2015 ■ St.Dev. ● 2017-09-18



STATION Å13 SURFACE WATER (0-10 m)

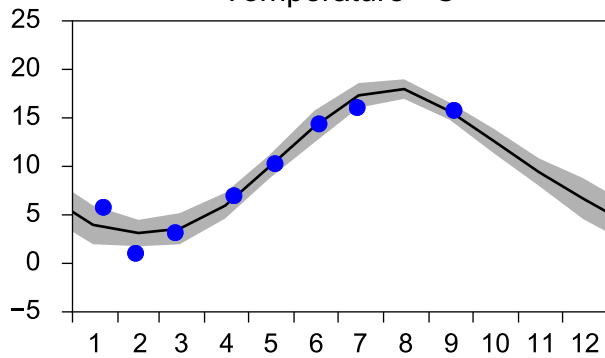
Annual Cycles

— Mean 2001-2015

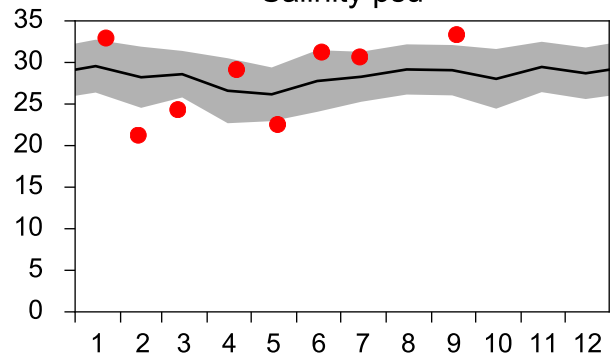
■ St.Dev.

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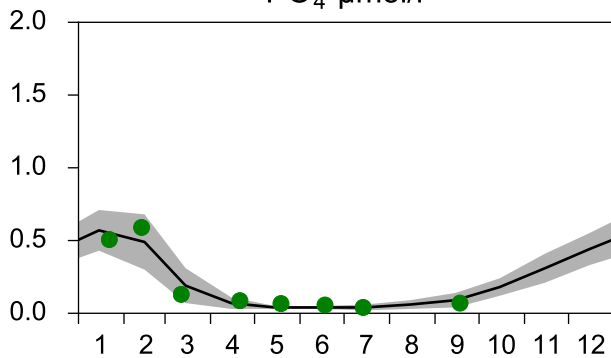
Temperature °C



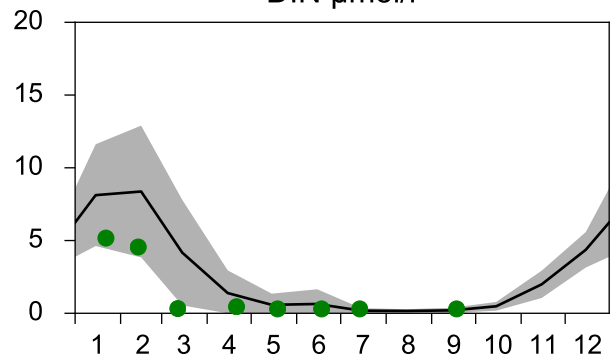
Salinity psu



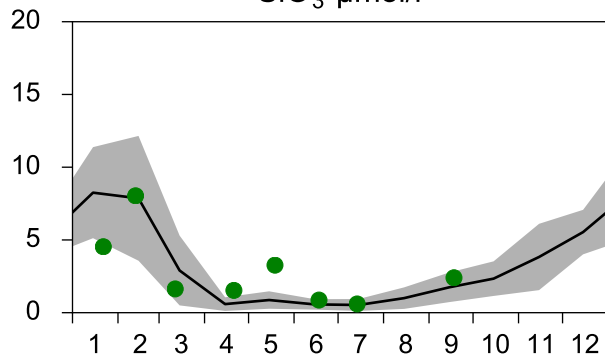
PO₄ µmol/l



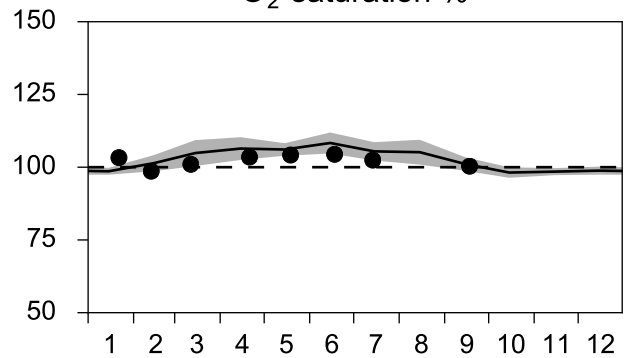
DIN µmol/l



SiO₃ µmol/l

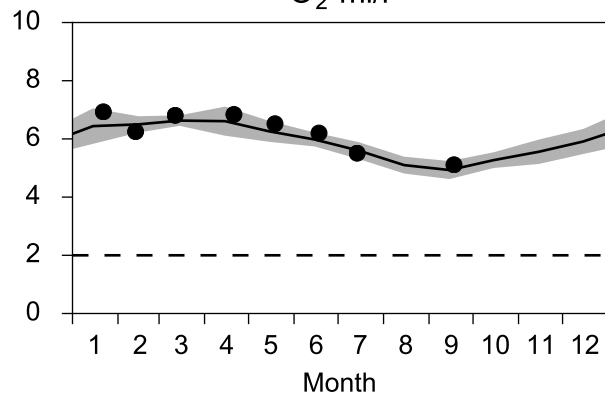


O₂ saturation %

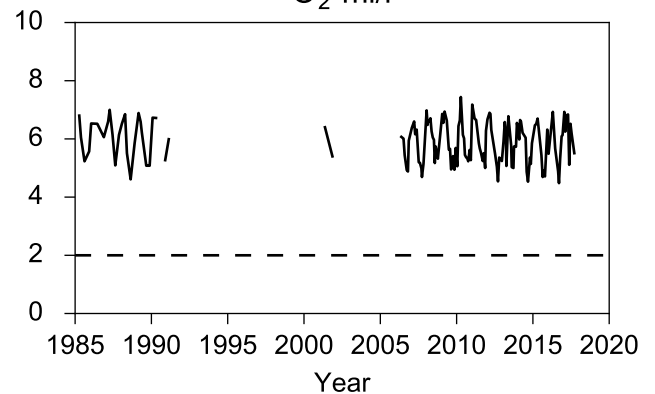


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

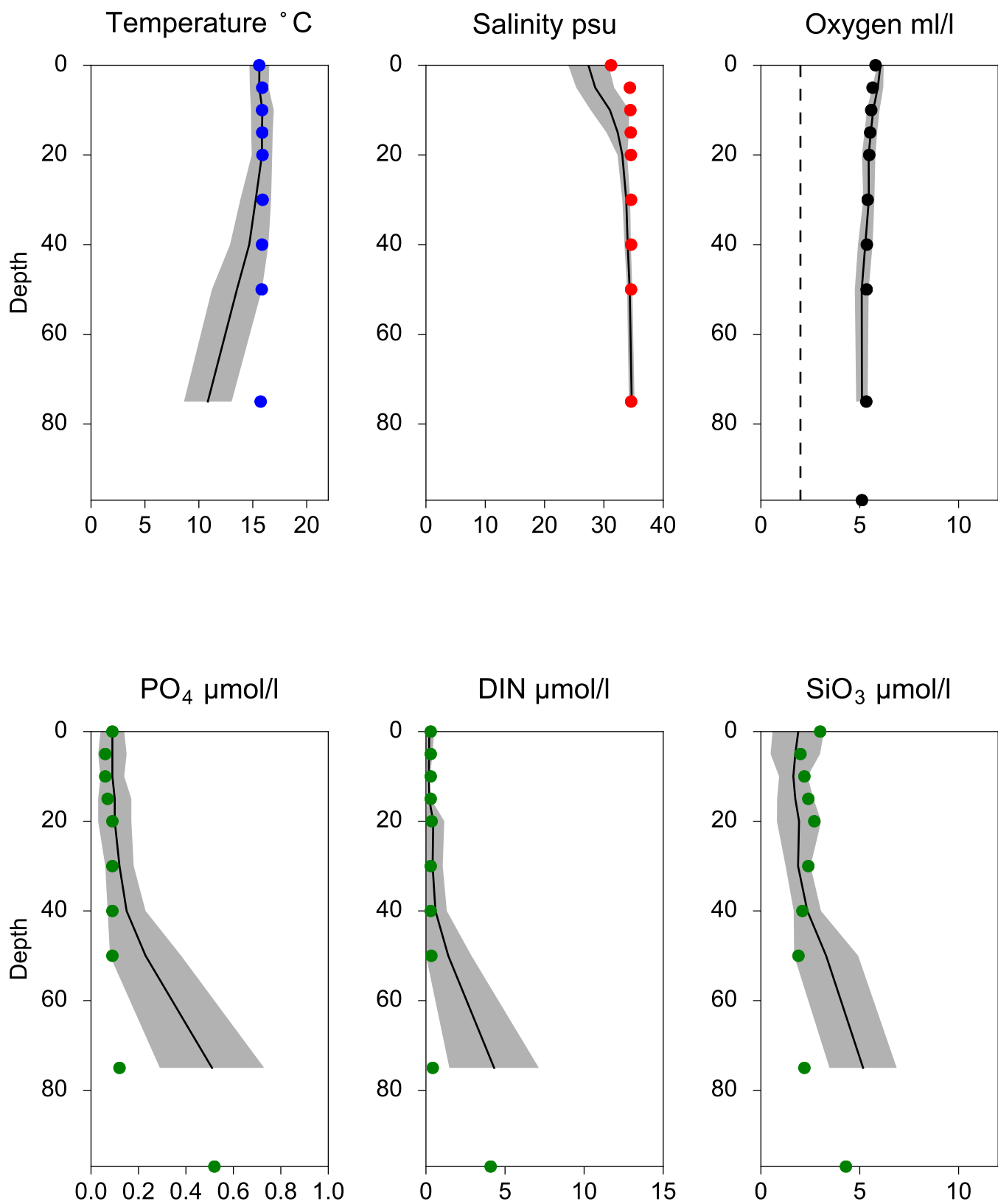


O₂ ml/l



Vertical profiles Å13 September

— Mean 2001-2015 ■ St.Dev. ● 2017-09-18



STATION SLÄGGÖ SURFACE WATER (0-10 m)

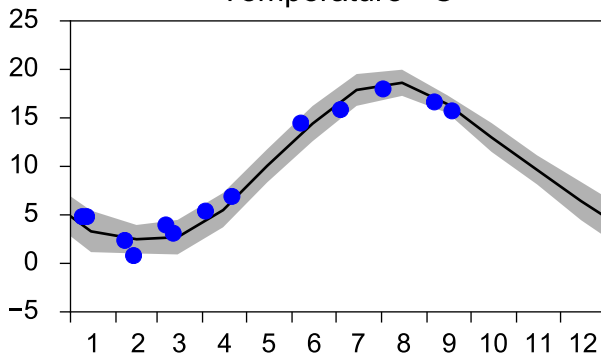
Annual Cycles

— Mean 2001-2015

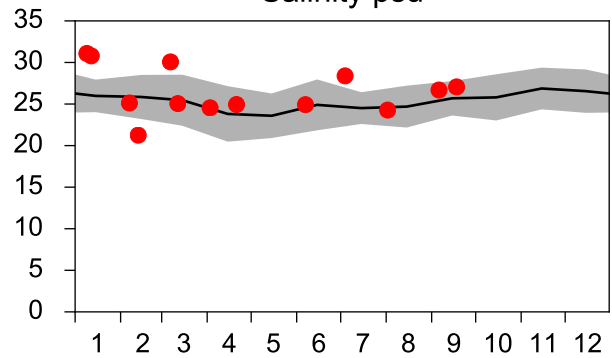
■ St.Dev.

● 2017

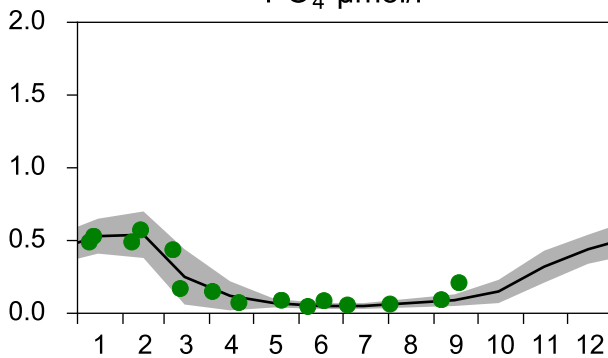
Temperature °C



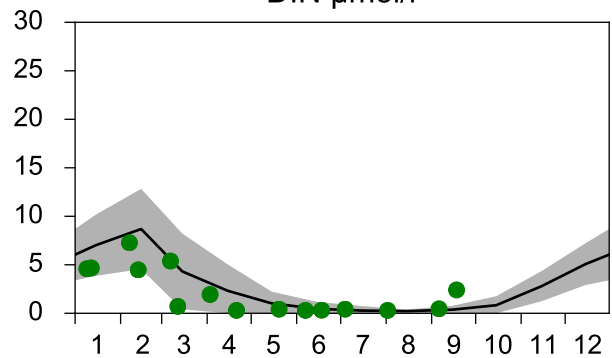
Salinity psu



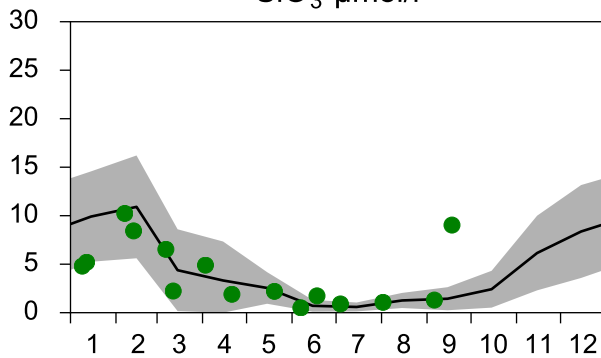
PO₄ µmol/l



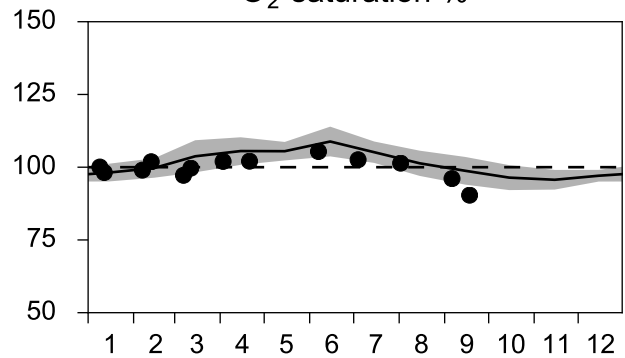
DIN µmol/l



SiO₃ µmol/l

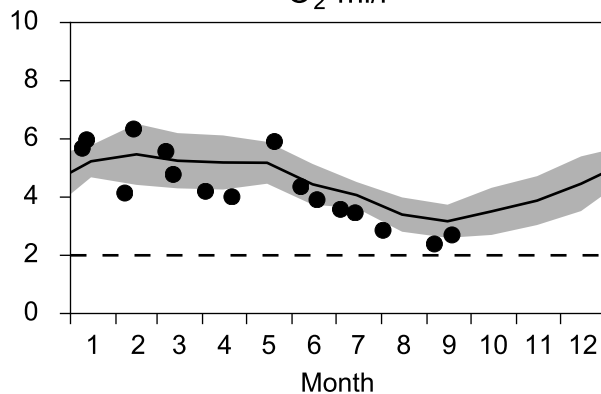


O₂ saturation %

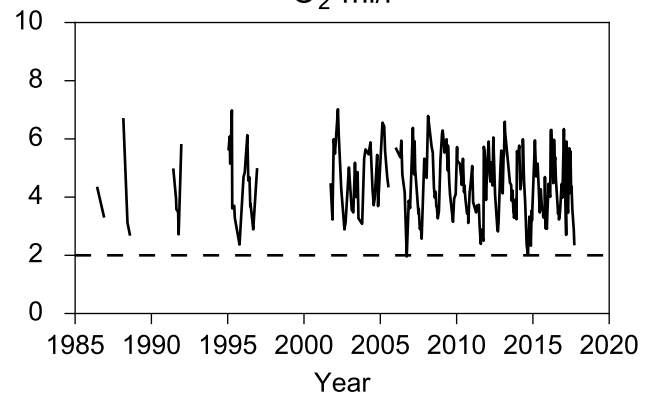


OXYGEN IN BOTTOM WATER (depth >= 64 m)

O₂ ml/l



O₂ ml/l



Vertical profiles SLÄGGÖ September

— Mean 2001-2015 ■ St.Dev. ● 2017-09-18

