

Report from the SMHI monitoring cruise with R/V Aranda



Survey period: 2017-03-09 to 2017-03-16
Principal: The Swedish Meteorological and Hydrological Institute and
the Swedish Agency for Marine and Water Management

SUMMARY

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

In large parts of the deep water in the Baltic Proper the oxygen concentrations were close to zero. Completely oxygen free conditions, when hydrogen sulfide is measured, was found in the Western Gotland Basin from 100 meters depth and in the Eastern Gotland Basin but then only in the Gotland Deep BY15 from 225 meters depth. In the remaining areas in the Eastern Gotland Basin oxygen concentrations was close to zero but no hydrogen sulfide were observed at any depth. Acute hypoxia was found in all basins in the Baltic Proper at depths exceeding 60-70 meters.

The surface concentration of phosphate was elevated in the Western and Eastern Gotland Basin. While, the phosphate concentration in deep water, from 70 to 100 meters, in the Eastern Gotland Basin was lower than normal. Silicate concentrations were elevated in the whole Baltic Proper. The concentration of inorganic nitrogen in Skagerrak was lower than normal. However, remaining nutrients in both Skagerrak and Kattegat showed normal levels.

The surface temperature was normal for the season but the salinity was higher than normal in the Eastern, Northern and Western Gotland Basin. The spring bloom was ongoing in Skagerrak and Kattegat.

Next cruise is scheduled to start 18th of April.

RESULTS

The cruise was performed aboard the Finnish research vessel Aranda and started in Åbo/Turku on the 9th of March and ended in Åbo/Turku on 16th of March. The winds during the first day of the cruise were fresh from southwest but the wind subsided and weak winds were prevailing from west or south. Back in the southeast Baltic Proper the wind increased to gale force now from west.

During the cruise an intercalibration was performed between SMHI and the Finnish Environment Institute (SYKE). The parameters that were intercalibrated was chlorophyll-a, oxygen, hydrogen sulfide, nutrients and total amounts of nitrogen and phosphorus. The intercalibration is done to ensure that both laboratories provide comparable analysis results.

For QUASIMEME (Quality Assurance of Information for Marine Environmental Monitoring in Europe) about 0.6 m³ of sea water from the Baltic Proper was collected. This water will be used by QUASIMEME to produce reference material that will be sent to different laboratories in Europe for analysis for external quality assurance.

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

Download data here: <http://www.smhi.se/klimatdata/oceanografi/havsmiljodata>

The Skagerrak

The surface water temperature in the Skagerrak was normal for the season and varied between 3 and 5°C, highest in the offshore areas and lowest along the coast. The salinity in the surface was higher than normal in the central parts of Skagerrak and slightly lower than normal at the stations along the coast. The salinity varied between 21.8 in the southern parts and 33.3 in the outer parts. The thermocline and halocline coincided and was found at 5 to 10 meters depth except from the central parts where the stratification was weakly developed and found deeper, at 40 meters depth.

The concentration of inorganic nitrogen (Σ nitrate + nitrite + ammonia) was generally lower than normal in the whole water column except for outer Skagerrak where normal concentrations were found. In the surface water the concentrations ranged from 0.3 – 2.0 $\mu\text{mol/l}$. Phosphate and silicate showed normal values for the season both in the surface water and in the water column. In the surface water phosphate varied between 0.1 - 0.3 $\mu\text{mol/l}$ and silicate between 0.3 – 3.1 $\mu\text{mol/l}$.

The spring blooms were continuing at all stations in Skagerrak. Fluorescence maxima were found at 0 – 10 meters depth but near the coast the intensity was lower compared with the offshore areas.

The whole water column was well oxygenated at all sampling stations.

The Kattegat and the Sound

The temperature in the surface water was normal for the season and varied around 3.0 °C. The salinity was also normal and varied between 18.6 and 23.6, highest in the northern parts. In the Sound the salinity in the surface was 11.3. The stratification was found at 10-15 meters depth.

The nutrients in Kattegat showed generally normal amounts for the season. The concentration of inorganic nitrogen varied around 0.3 µmol/l and phosphate around 0.13 µmol/l. The silicate concentration was also normal for the season but varied somewhat more in the investigated area, from 2.5 µmol/l in the northern parts to 6.6 µmol/l in the central parts. In the Sound higher concentrations than normal was noted, inorganic nitrogen 3.6 µmol/l, silicate 13.3 µmol/l and 0.5 µmol/l.

The deep water was well oxygenated in the whole Kattegat as well as in the Sound, which is normal for the season. The concentrations in the deep water varied from 5.7 and 6.2 ml/l.

The spring bloom was ongoing in Kattegat which was seen from the fluorescence profiles from the CTD. High fluorescence was found from the surface down to 15 meters depth.

The Baltic Proper

The temperature in the surface water was normal and varied from 2.0 to 3.4 °C, lowest in the northern parts and highest in the southwestern parts. The salinity was higher than normal in the Eastern, Northern and Western Gotland Basin, 7.0 – 7.5 while normal values, 7.4 - 8.0 were found in the Arkona and Bornholm Basins. The surface layer was well mixed down to the stratification that was found at 50-65 meters depth except from Arkona and Bornholm Basins where the stratification was found shallower, at 30-40 meters depth.

The amount of inorganic nitrogen in the surface water was normal or somewhat elevated. The concentration ranged from 3.0 to 4.0 µmol/l. The concentration of phosphate was higher than normal in the Western and Eastern Gotland Basin and varied around 0.8 µmol/l. In the remaining areas normal conditions was found except for the Bornholm Basin and station BY4 where high phosphate concentration, 1.0 µmol/l, was found. The deep water in Eastern Gotland Basin, from 70 to 100 meters, showed phosphate concentration lower than normal. The silicate concentration in the surface water was elevated in the whole Baltic Proper and ranged from 14.8 to 20.8 µmol/l. Highest in the Western Gotland Basin and lowest in the Arkona Basin.

In large parts of the deep water in the Baltic Proper the oxygen concentrations were close to zero. Completely oxygen free conditions, where hydrogen sulfide is measured, were found in the Western Gotland Basin at depth exceeding 100 meters and in the Eastern Gotland Basin from depth exceeding 225 meters depth. However, in the Eastern Gotland Basin hydrogen sulfide was only found at BY15, the Gotland Deep. All other stations in that basin showed oxygen concentrations near zero but no hydrogen sulfide was found.

Acute hypoxia (< 2 ml/l) was found in all basins from 70-80 meters depths in the Baltic Proper. Though, the whole water column was well oxygenated in the Arkona Basin.

The fluorescence profiles from the CTD showed low phytoplankton activity in the whole investigated area.

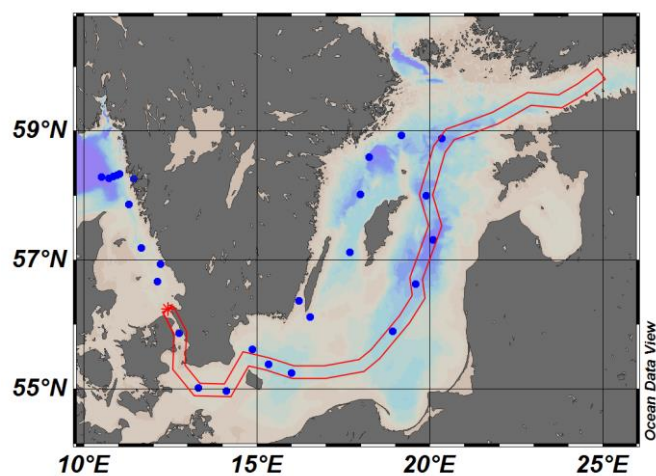
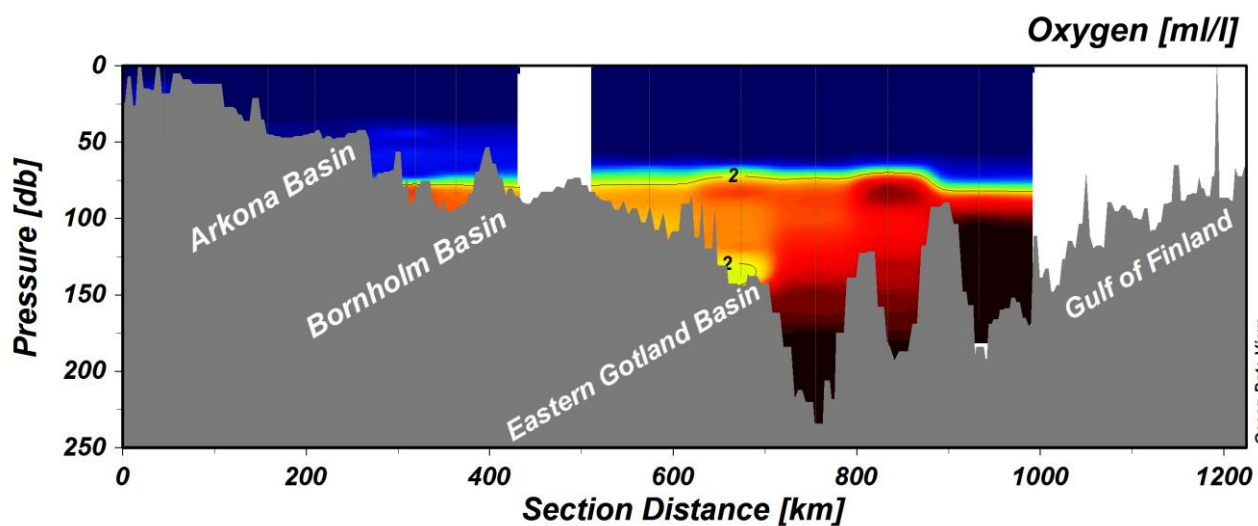
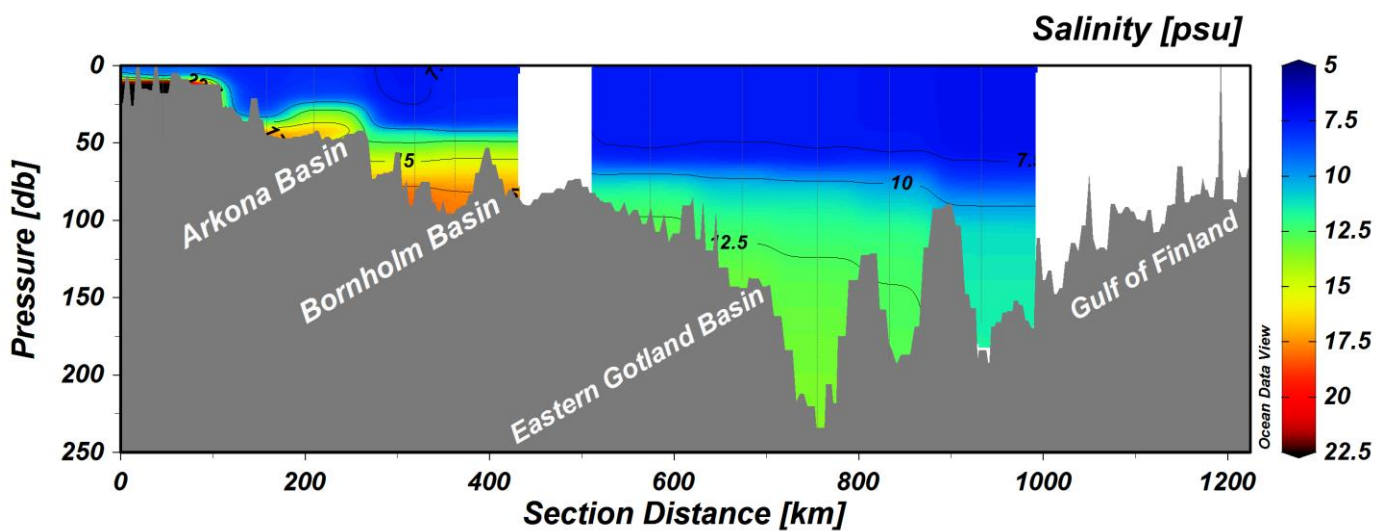


Figure 1. Transect showing oxygen and salinity through the Baltic Proper, from the Sound to the Eastern Gotland Basin.

PARTICIPANTS

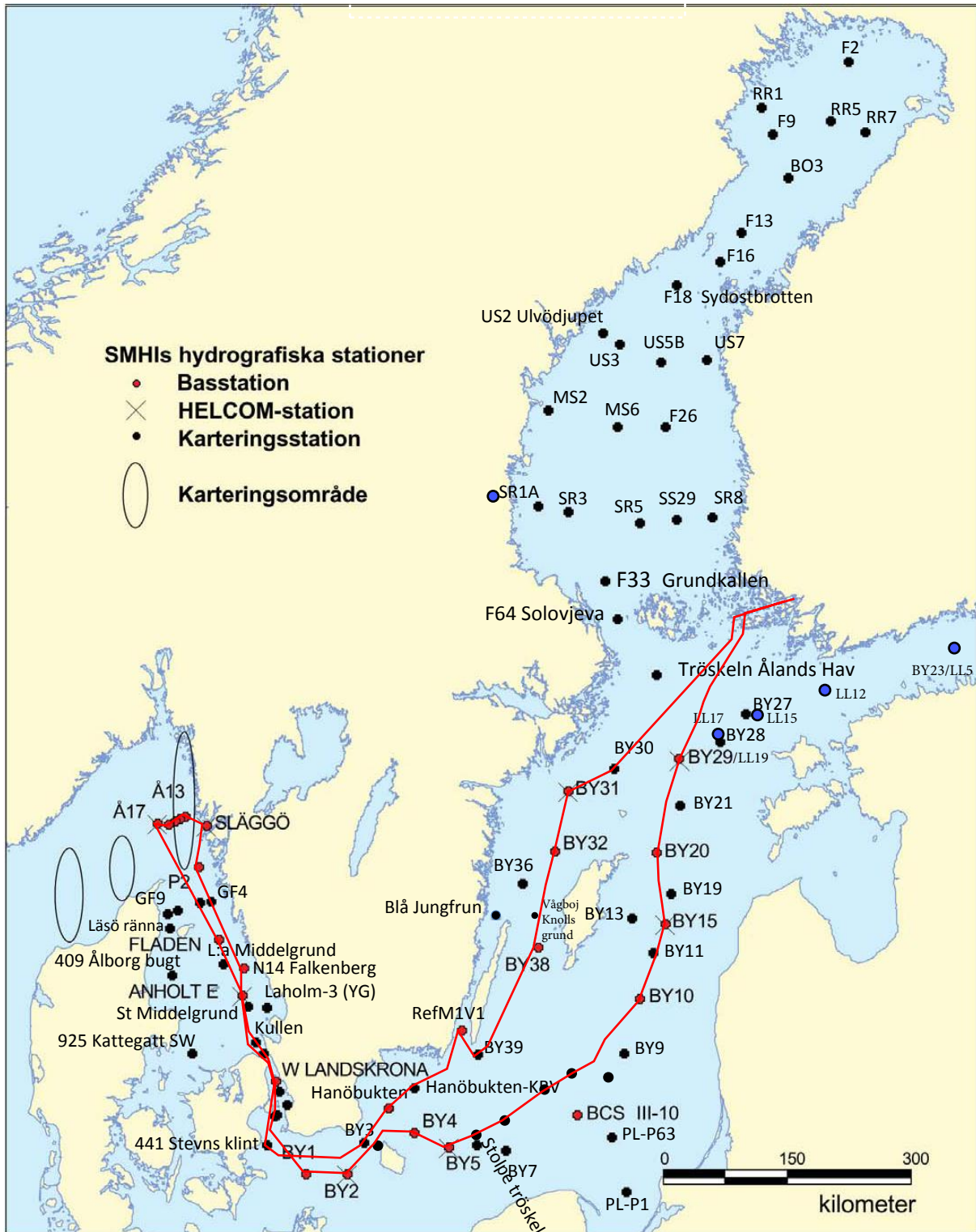
Name			Institute
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Ann-Turi Skjevik	Åbo/Turku – Lysekil		SMHI
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Sara Johansson			SMHI
Johan Håkansson			SMHI
Jere Riikonen			SYKE
Ilkka Lastumäki			SYKE

APPENDICES

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

TRACKCHART

Country: Sweden
 Ship: R/V ARANDA
 Date: 20170309-20170316
 Series: 0144-0172



Time: 10:28

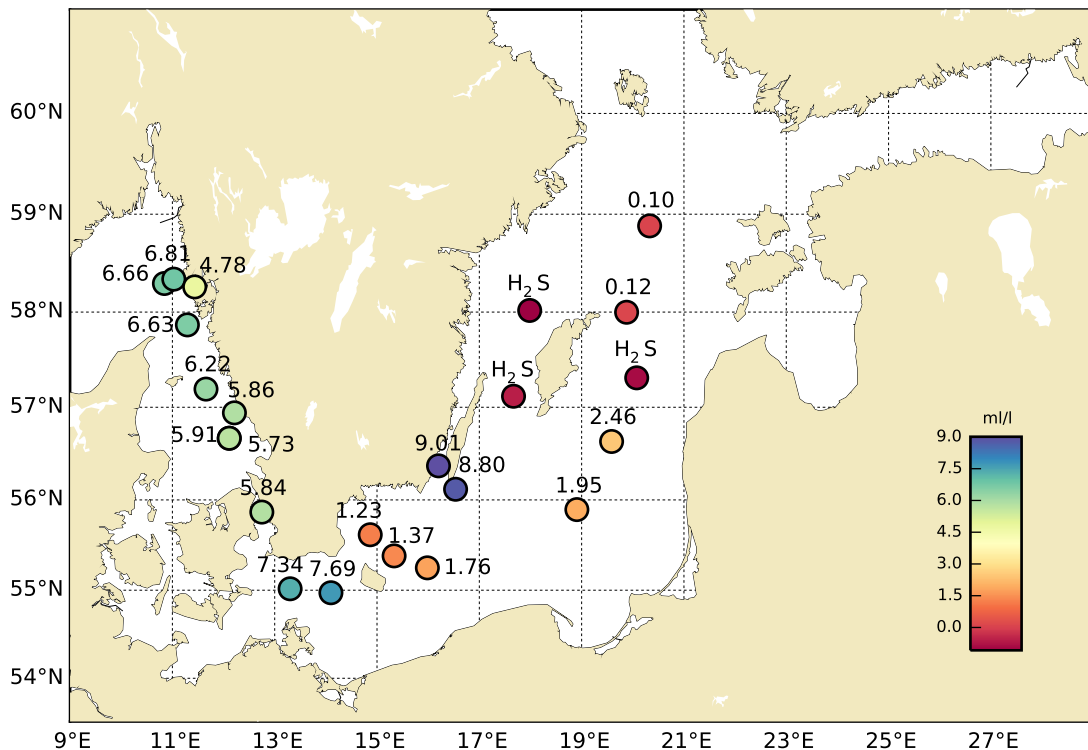
Ser no	Cru no	Stat code	Proj	Stat name	Lat	Lon	Start date yyyymmdd	Start time hhmm	Bottom depth m	Secchi depth m	Wind dir dir	Air vel vel	Air temp temp C	Air pres pres hPa	WCWI elac elac aove hdsb	CZPP loy loyp	No de de	No btl btl	T e m m l p t t	T e m m l p t t	S a h o o 2 h t t t t m t l i u o o	P D H P N N N A N A S H C C
0144	4	BPNX00	EXT	HUVUDSKÄR	5856.23	01909.79	20170310	0110	92		22	6.7	1.9	1011	9990	----	12		- x - x - - x - - - - - - - - - - x -			
0145	4	BPNX37	BAS	BY31 LANDSORTSDJ	5835.62	01814.18	20170310	0450	459		23	4.4	2.0	1010	9990	-x--	23 23	- x - x - - x - - - - - - - - - - -				
0146	4	BPWX38	BAS	BY32 NORRKÖPINGSDJ	5801.01	01759.07	20170310	0920	205	15	23	4.1	2.3	1012	2830	x---	17 17	x x - x x x x x x x x x x x x - x - -				
0147	4	BPWX45	BAS	BY38 KARLSÖDING	5707.03	01740.12	20170310	1415	114	17	29	3.0	3.0	1015	2820	x-x-	14 14	x x x x x x x x x x x x x x x x - x - -				
0148	4	BPSE00	EXT	4.5 NE Ölands Södra	5606.98	01632.16	20170310	2100	51		31	6.0	3.0	1020	9990	----	8	x x - x - x x - - - - - - - - - - -				
0149	4	BPWK01	BAS	REF M1V1	5622.25	01612.12	20170311	0015	21		32	4.4	2.5	1022	9990	xxxx	5 5	x x x x x x x - x x x x x x x x - -				
0150	4	BPSH05	BAS	HANÖBUKTEN	5537.04	01452.03	20170311	0600	80	9	36	3.1	2.4	1024	2730	x---	11 11	x x x x x x x - x x x x x x x - x - -				
0151	4	SOCX39	BAS	W LANDSKRONA	5552	01244.9	20170311	1650	50		19	7	3.9	1025	1220	x---	9 9	x x x x - x x - x x x x x x x - x - -				
0152	4	KAEX29	BAS	ANHOLT E	5640.12	01206.67	20170311	2150	62		15	5	2.7	1025	9990	xxxx	10 10	x x x x x x x - x x x x x x x x - -				
0153	4	KANX25	BAS	FLADEN	5711.58	01139.42	20170312	0120	84		17	4.3	3	1025	9990	x---	12 12	x x x x - x x - x x x x x x x - x - -				
0154	4	SKEX18	BAS	Å17	5817.06	01030.26	20170312	0930	340	6	19	9	3.7	1023	2830	xxx-	15 14	x x - x x x x - x x x x x x x x - -				
0155	4	SKEX17	BAS	Å16	5816.04	01043.47	20170312	1115	202	6	18	8	3.4	1024	2830	----	14 0	- x - x - - x - - - - - - - - - - -				
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Bottom water oxygen concentration (ml/l)

Ship: Aranda

Date: 20170310-20170315

Series: 0144-0172



STATION BY31 LANDSORTSDJ SURFACE WATER (0-10 m)

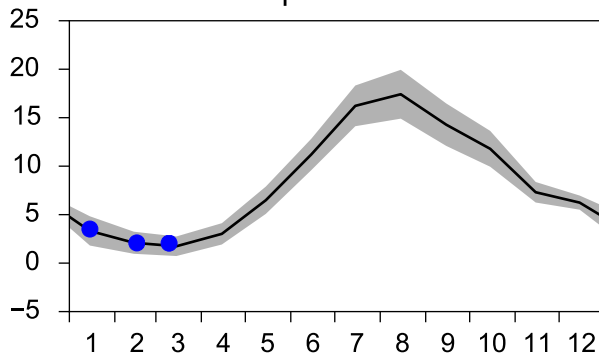
Annual Cycles

— Mean 2001-2015

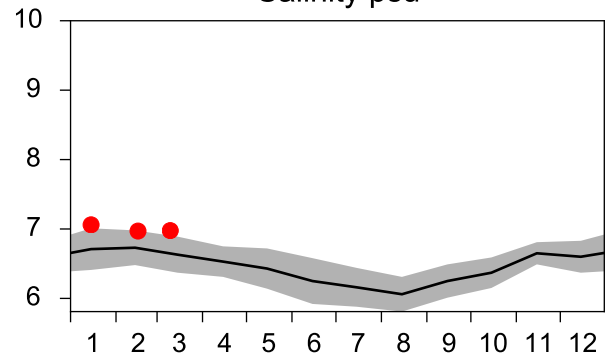
■ St.Dev.

● 2017

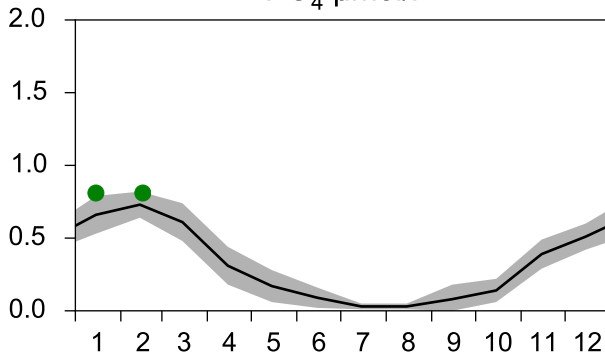
Temperature °C



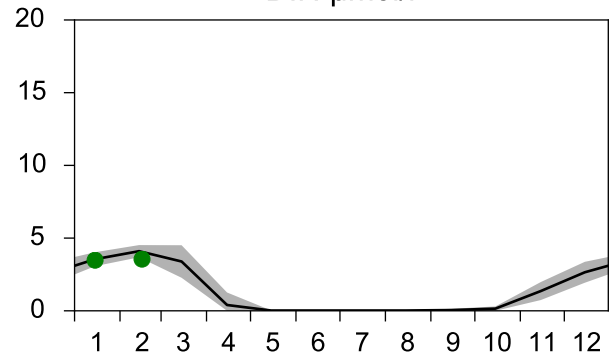
Salinity psu



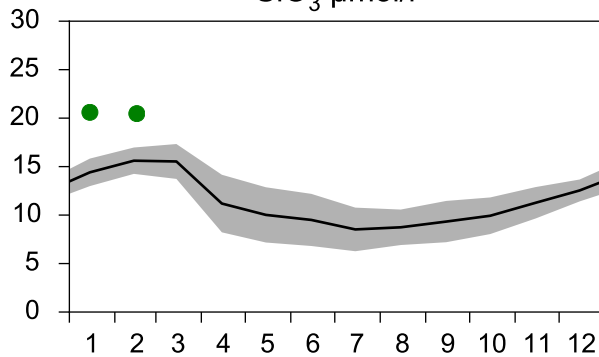
PO₄ μmol/l



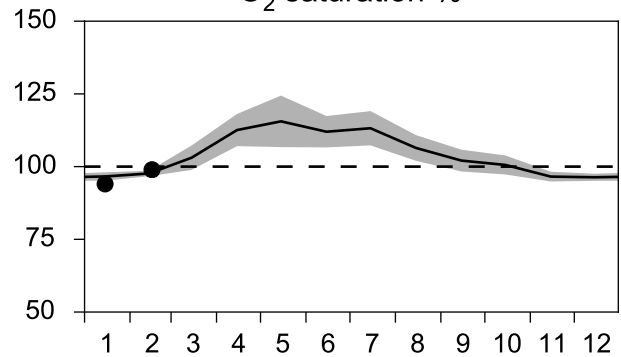
DIN μmol/l



SiO₃ μmol/l

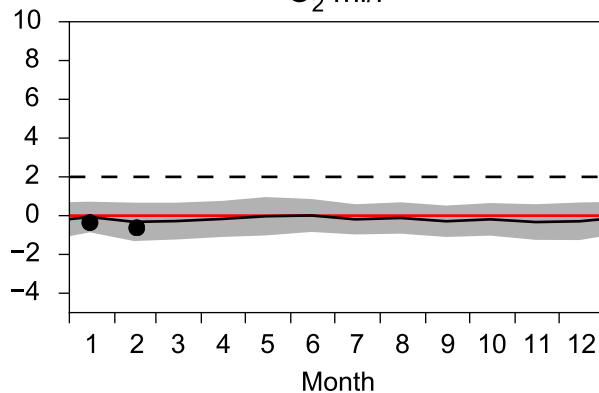


O₂ saturation %

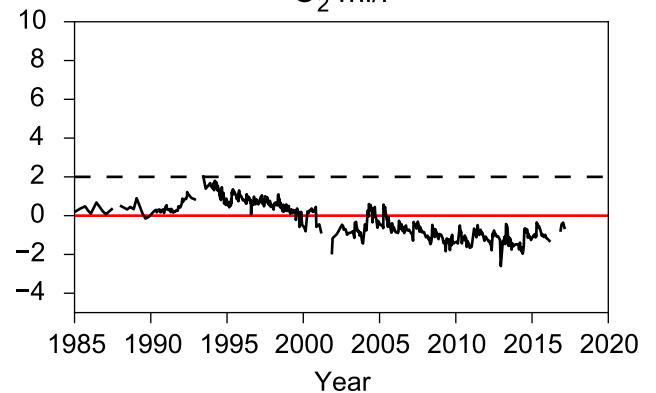


OXYGEN IN BOTTOM WATER (depth >= 425 m)

O₂ ml/l

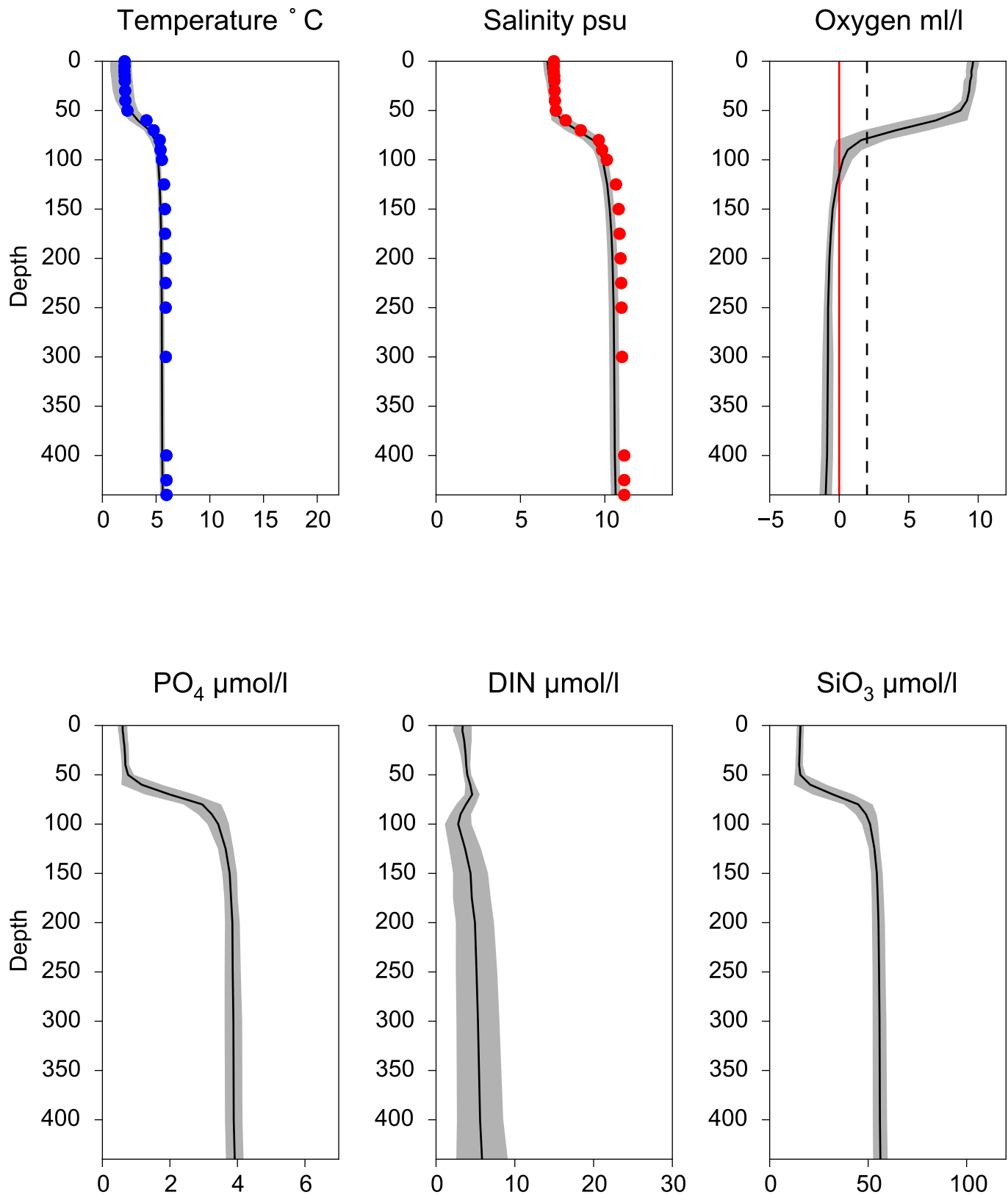


O₂ ml/l



Vertical profiles BY31 LANDSORTSDJ March

— Mean 2001-2015 ■ St.Dev. ● 2017-03-10



STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

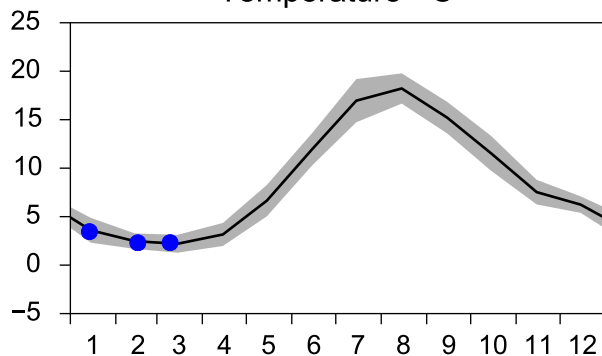
Annual Cycles

— Mean 2001-2015

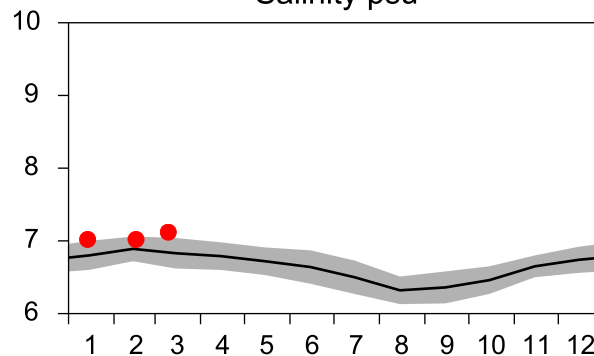
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● 2017

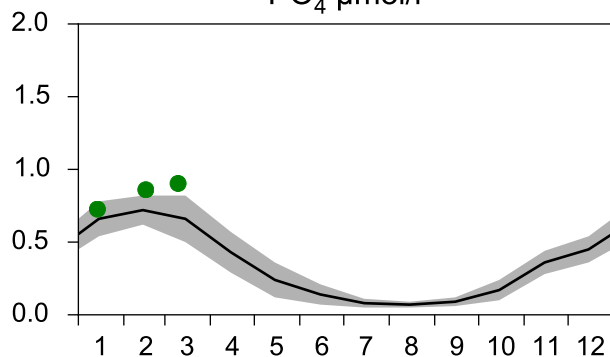
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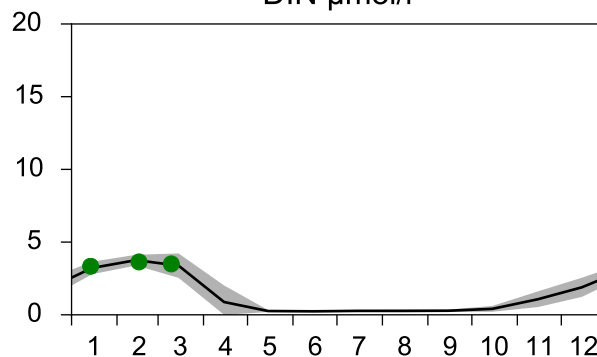
Salinity psu



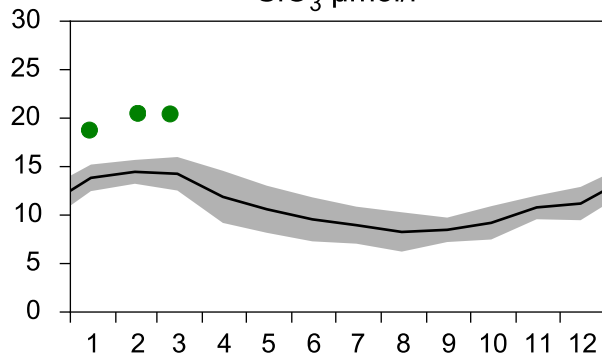
PO₄ µmol/l



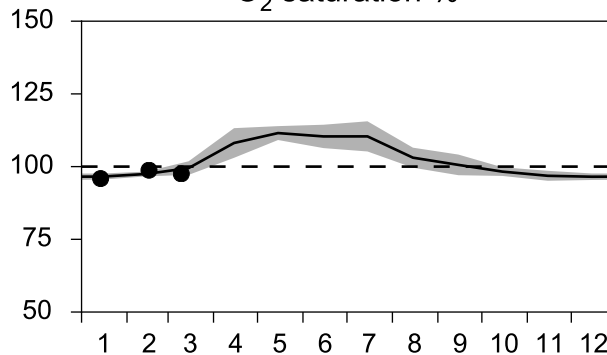
DIN µmol/l



SiO₃ µmol/l

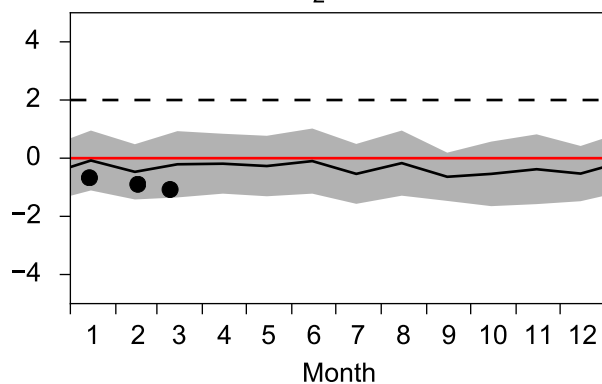


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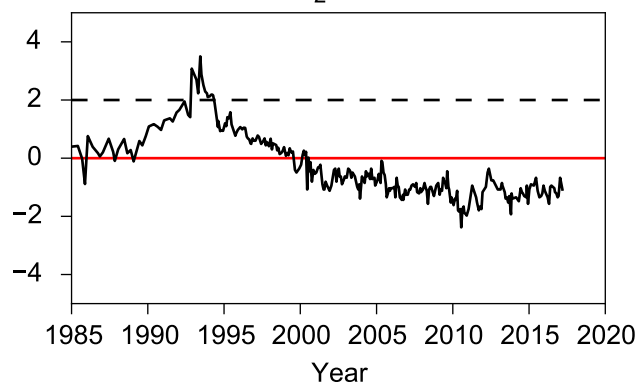


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O₂ ml/l

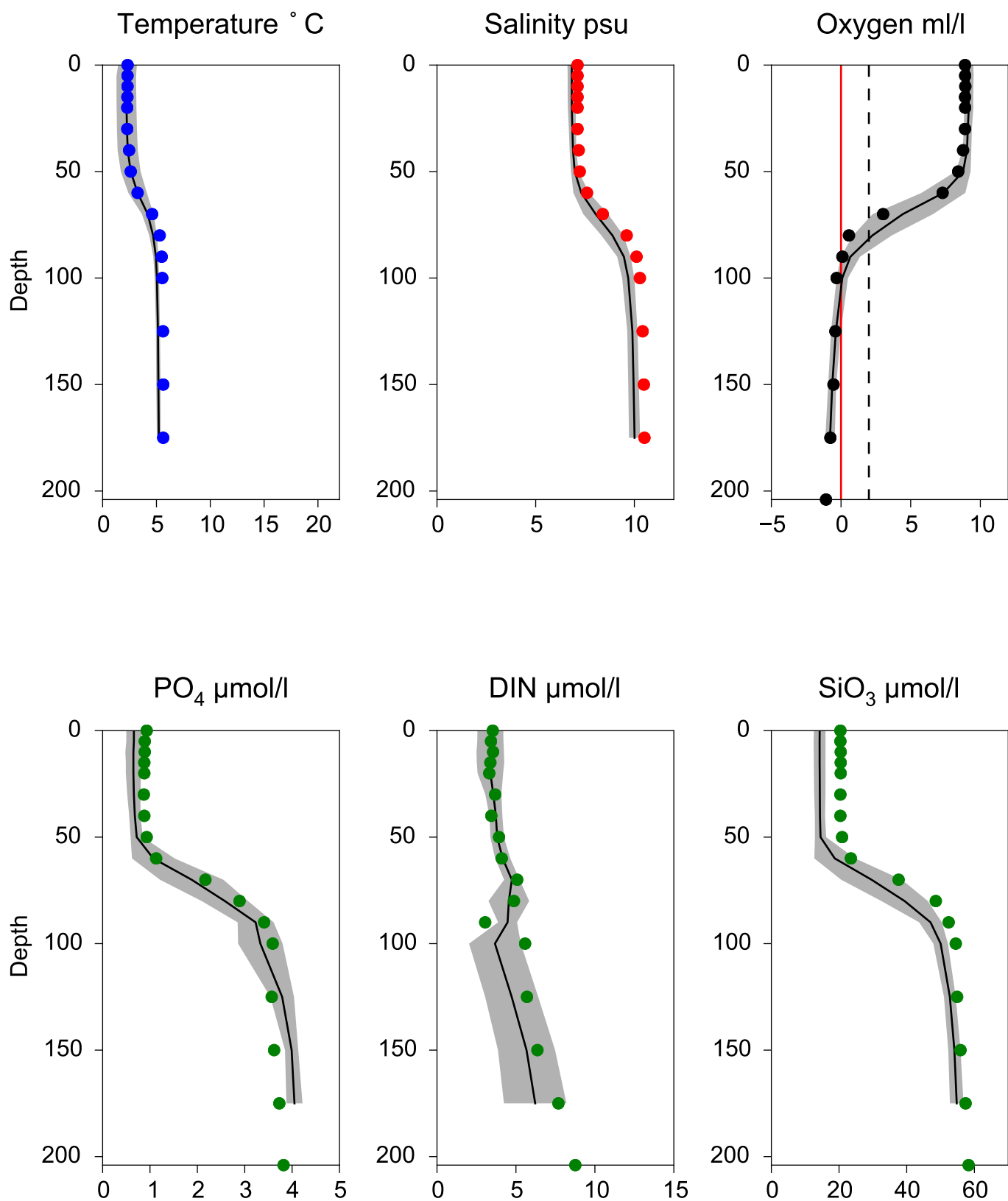


O₂ ml/l



Vertical profiles BY32 NORRKÖPINGSDJ March

— Mean 2001-2015 St.Dev. • 2017-03-10



STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

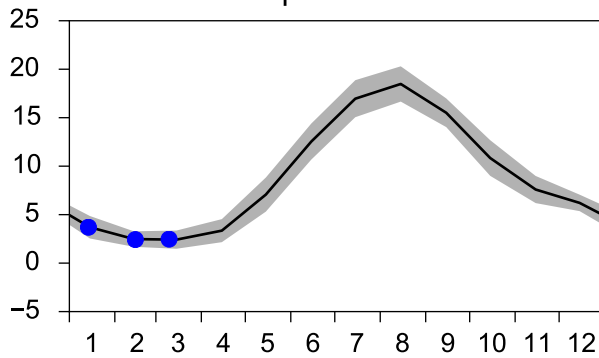
Annual Cycles

— Mean 2001-2015

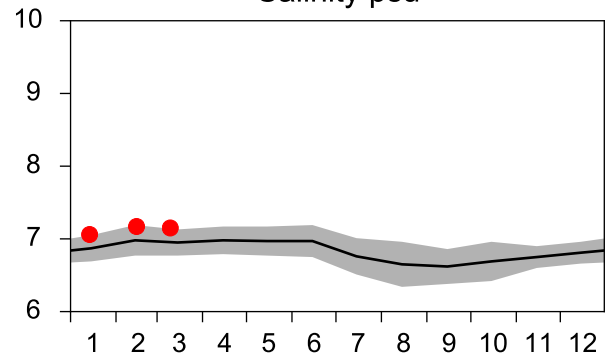
■ St.Dev.

● 2017

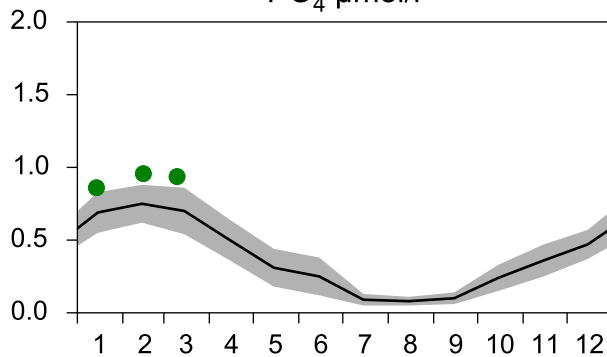
Temperature °C



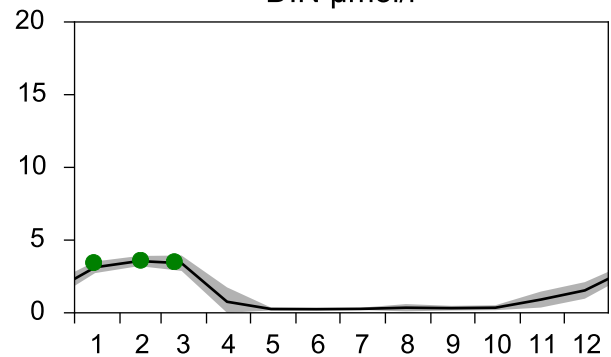
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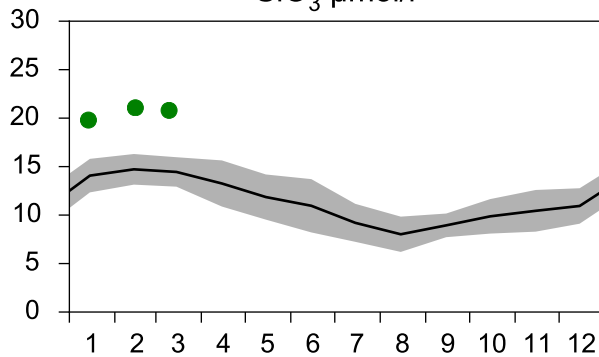
PO₄ µmol/l



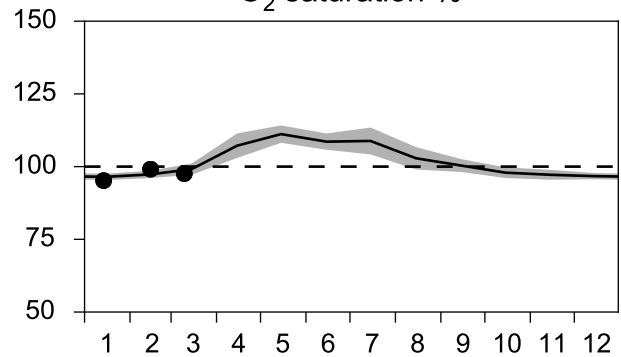
DIN µmol/l



SiO₃ µmol/l

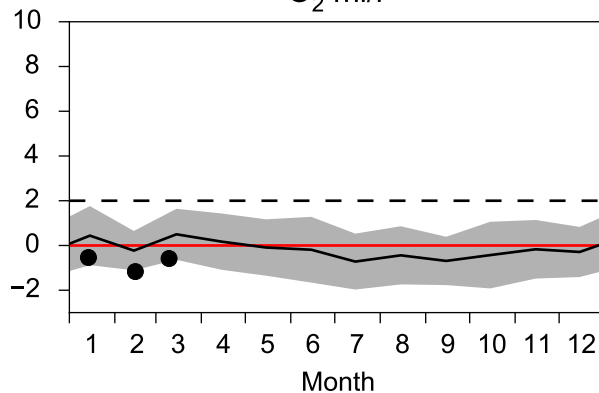


O₂ saturation %

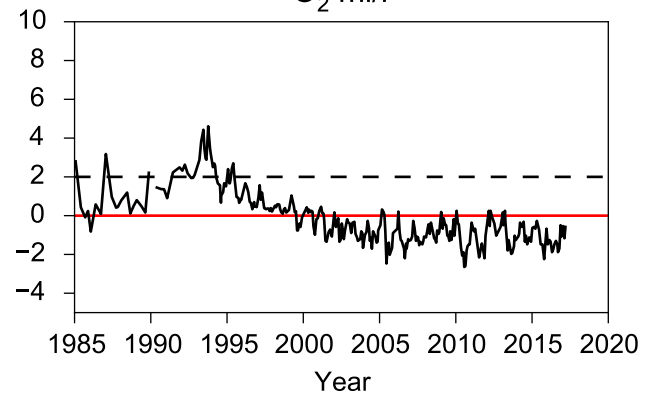


OXYGEN IN BOTTOM WATER (depth >= 100 m)

O₂ ml/l

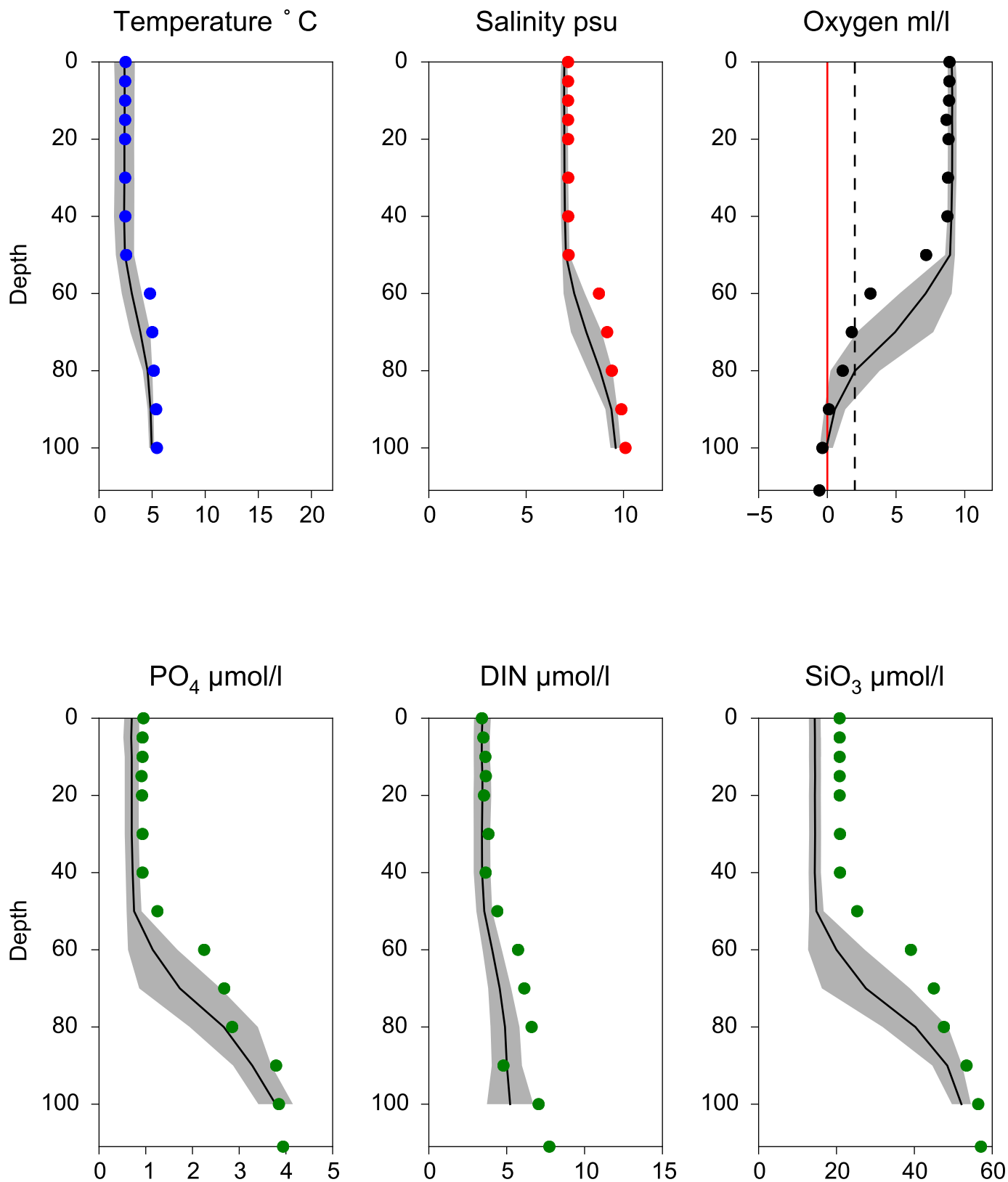


O₂ ml/l



Vertical profiles BY38 KARLSÖDJ March

— Mean 2001-2015 ■ St.Dev. ● 2017-03-10



STATION REF M1V1 SURFACE WATER (0-10 m)

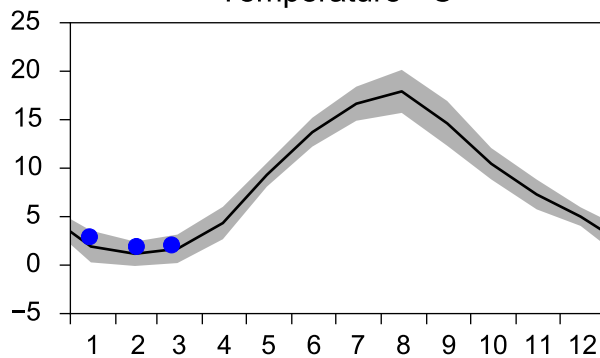
Annual Cycles

— Mean 2001-2015

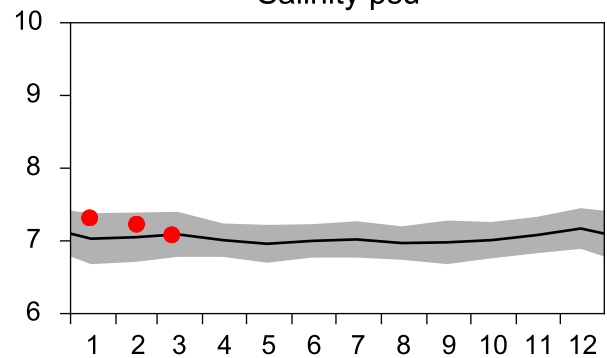
■ St.Dev.

● 2017

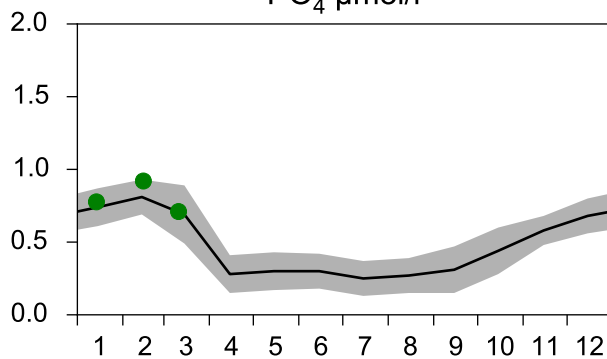
Temperature °C



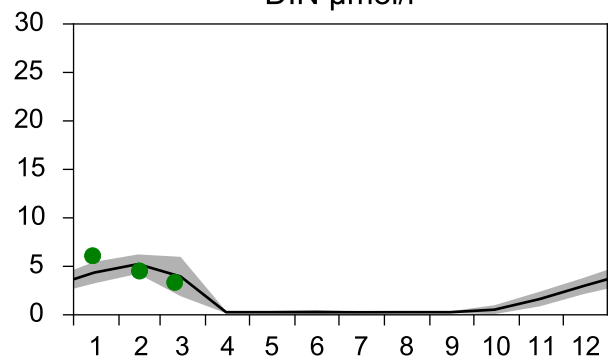
Salinity psu



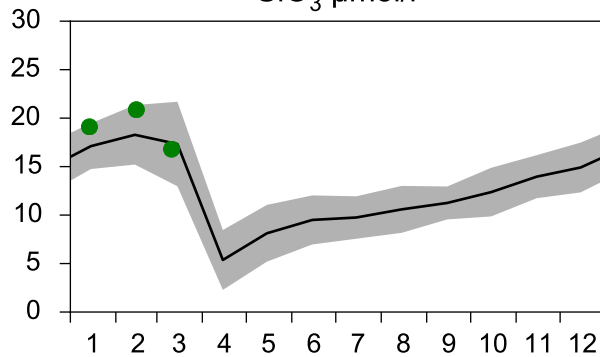
PO₄ µmol/l



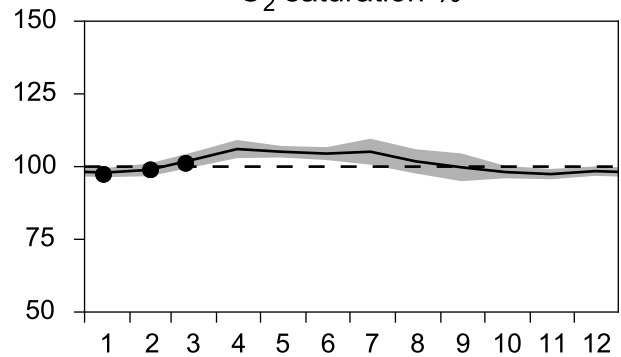
DIN µmol/l



SiO₃ µmol/l

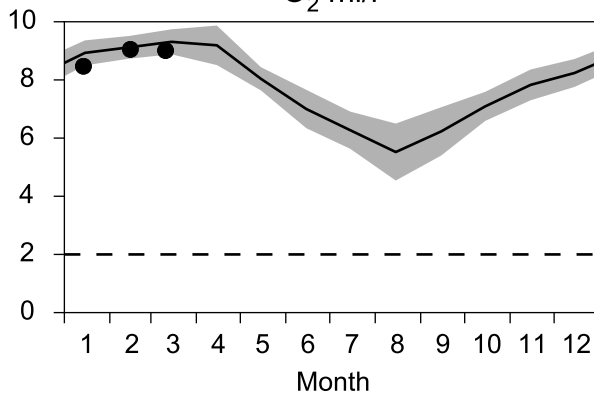


O₂ saturation %

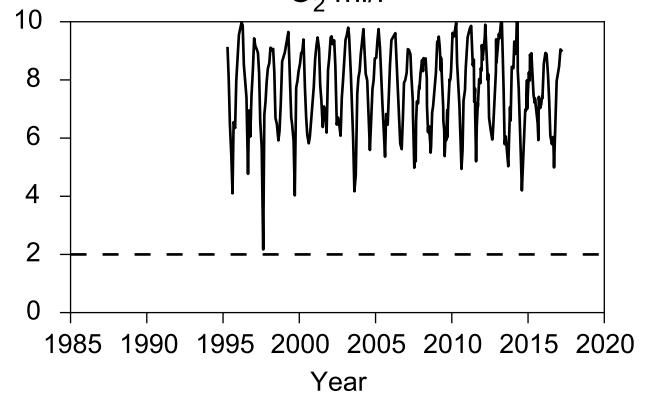


OXYGEN IN BOTTOM WATER (depth >= 17 m)

O₂ ml/l

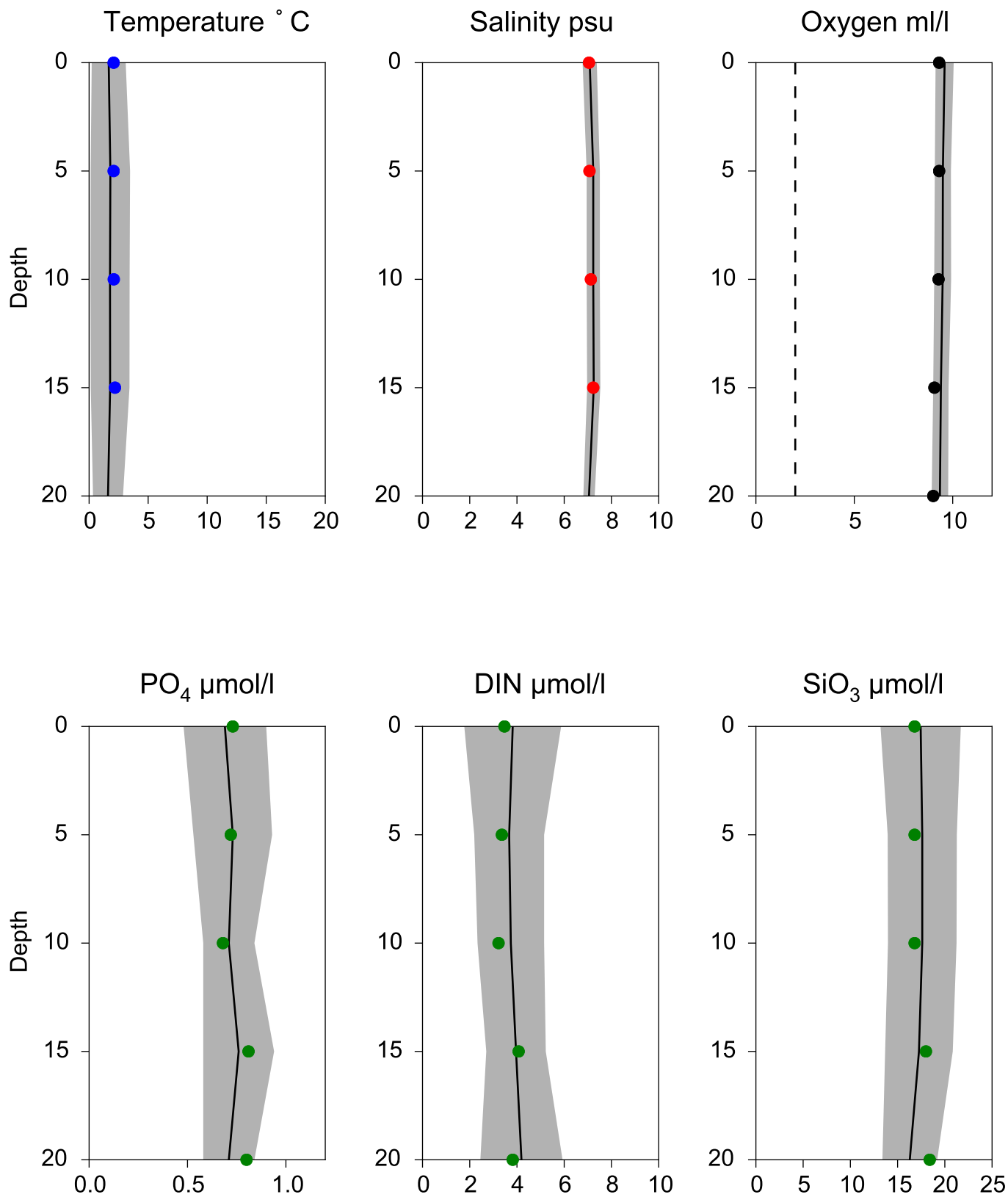


O₂ ml/l



Vertical profiles REF M1V1 March

— Mean 2001-2015 St.Dev. • 2017-03-11



STATION HANÖBUKTEN SURFACE WATER (0-10 m)

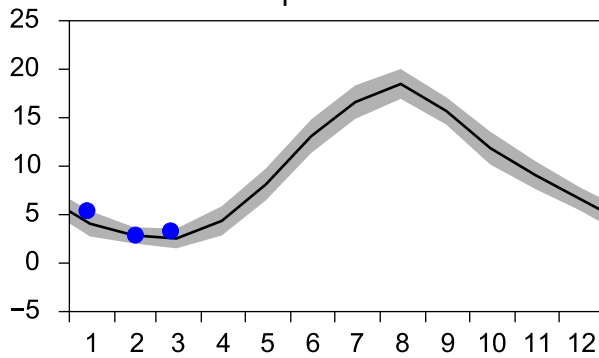
Annual Cycles

— Mean 2001-2015

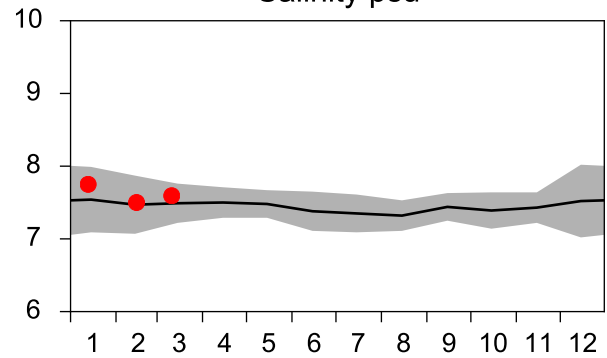
■ St.Dev.

● 2017

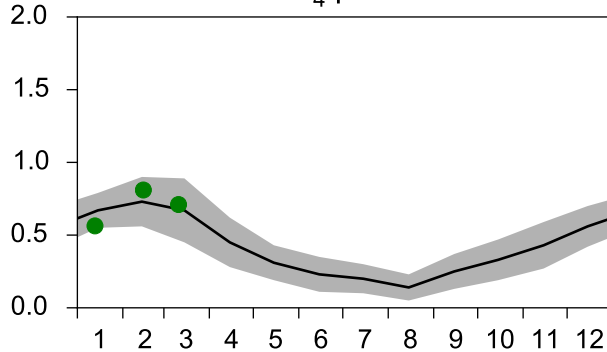
Temperature °C



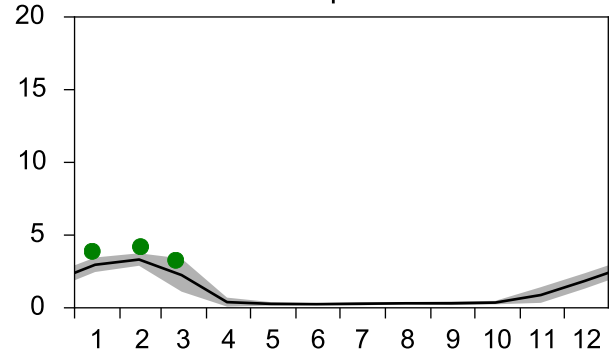
Salinity psu



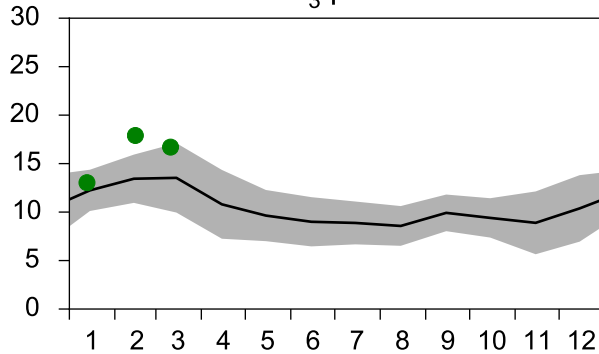
PO₄ µmol/l



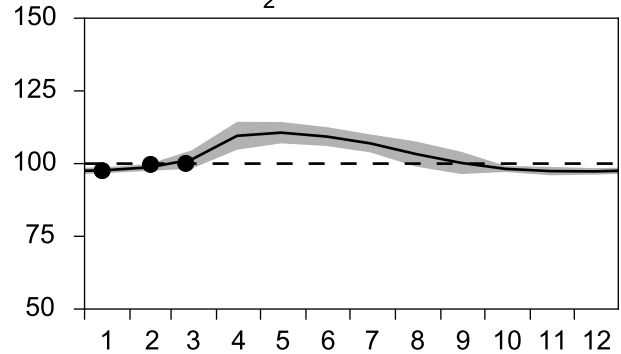
DIN µmol/l



SiO₃ µmol/l

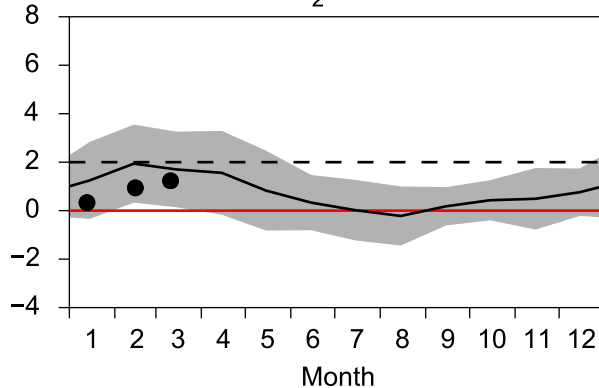


O₂ saturation %

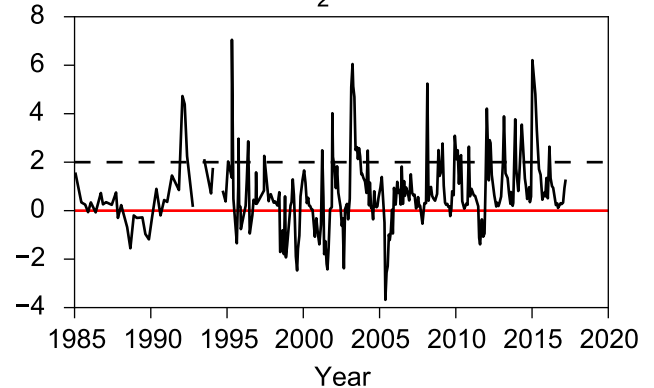


OXYGEN IN BOTTOM WATER (depth >= 70 m)

O₂ ml/l

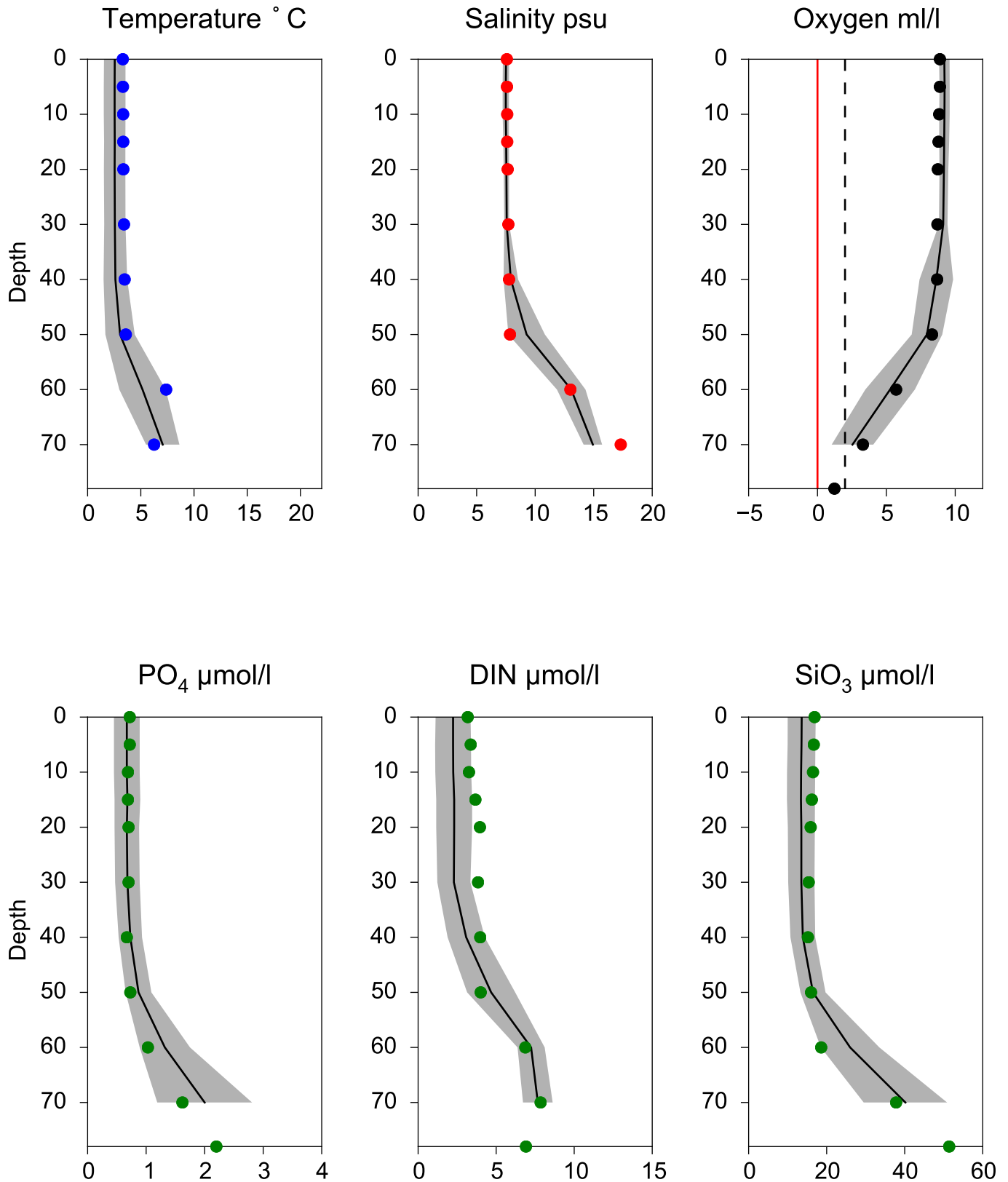


O₂ ml/l



Vertical profiles HANÖBUKTEN March

— Mean 2001-2015 St.Dev. • 2017-03-11



STATION W LANDSKRONA SURFACE WATER (0-10 m)

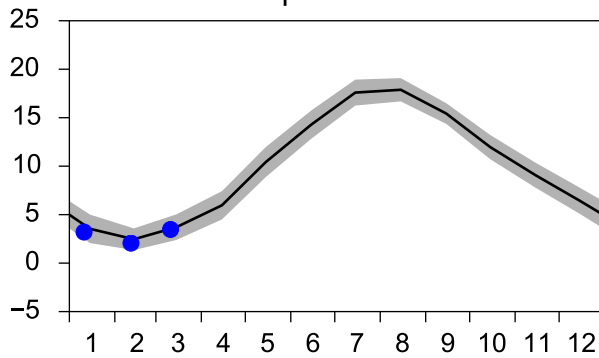
Annual Cycles

— Mean 2001-2015

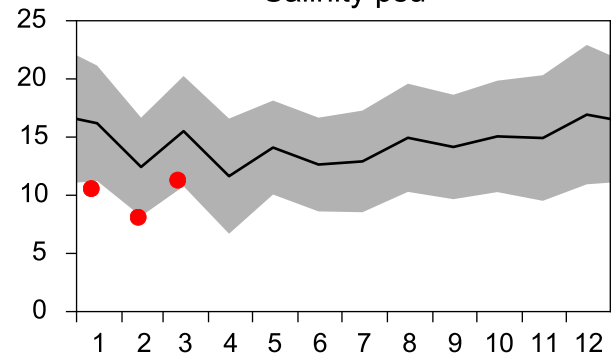
■ St.Dev.

● 2017

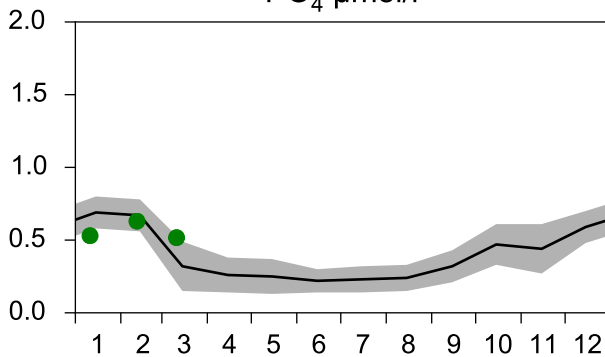
Temperature °C



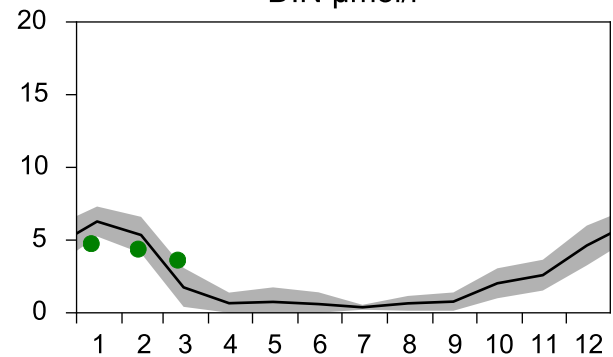
Salinity psu



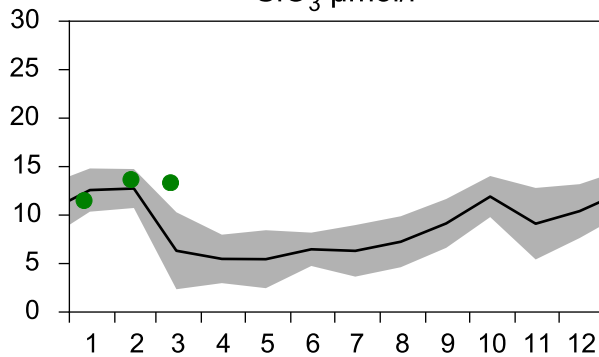
PO₄ µmol/l



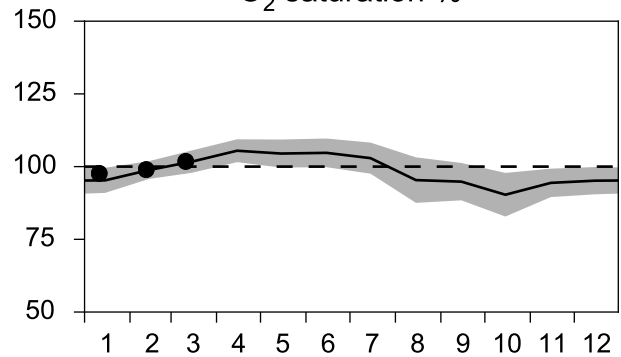
DIN µmol/l



SiO₃ µmol/l

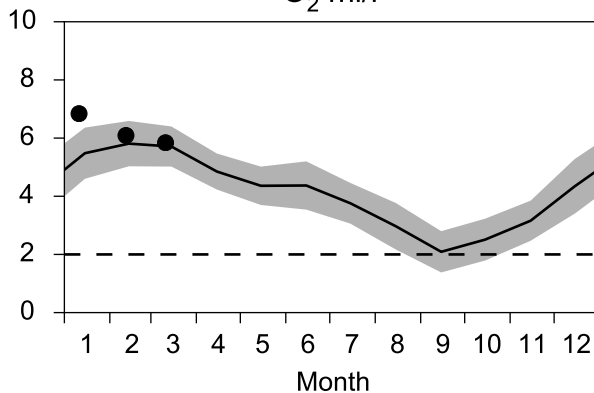


O₂ saturation %

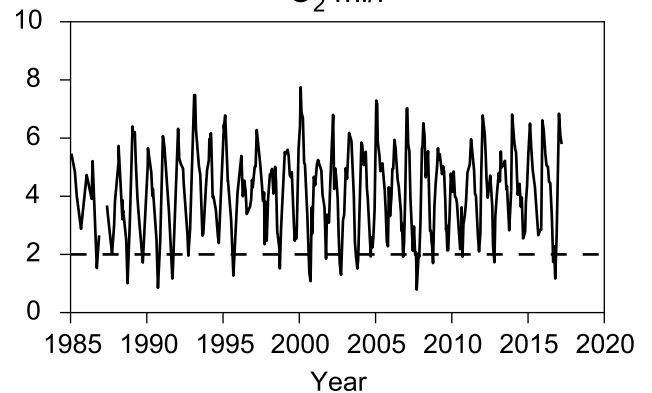


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

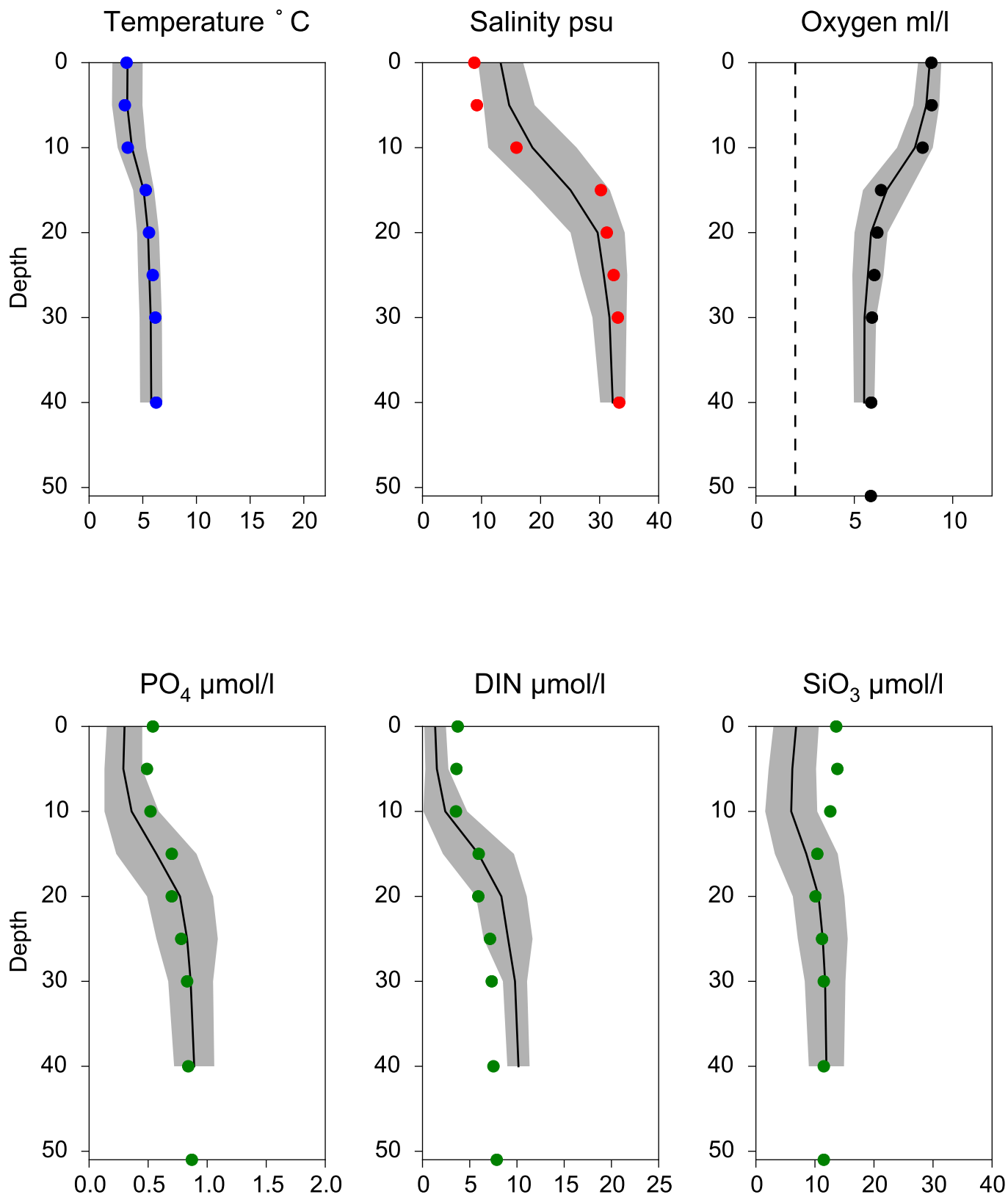


O₂ ml/l



Vertical profiles W LANDSKRONA March

— Mean 2001-2015 St.Dev. ● 2017-03-11



STATION ANHOLT E SURFACE WATER (0-10 m)

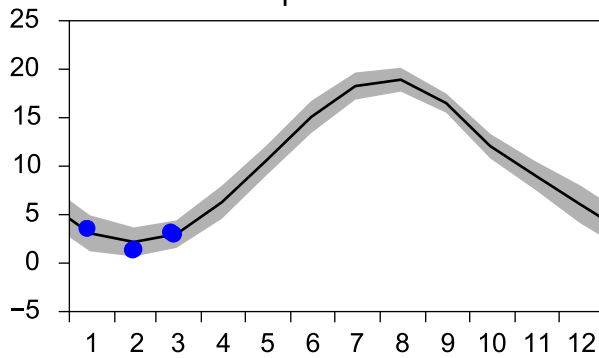
Annual Cycles

— Mean 2001-2015

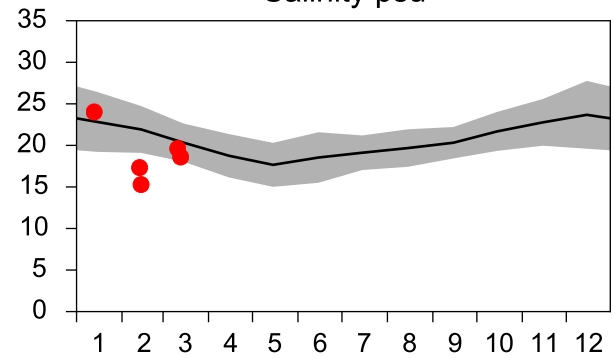
■ St.Dev.

● 2017

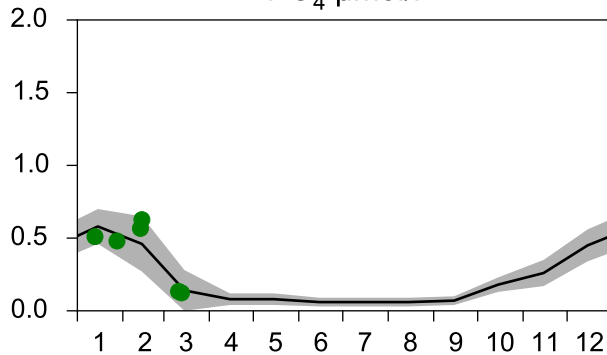
Temperature °C



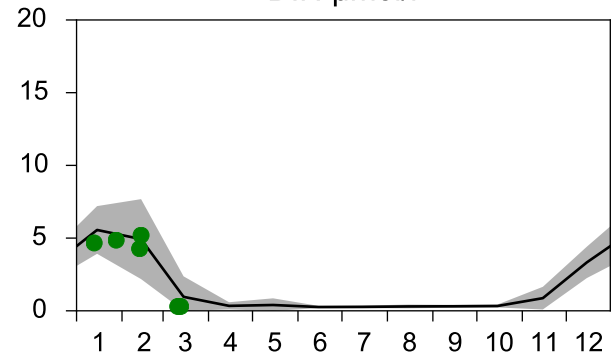
Salinity psu



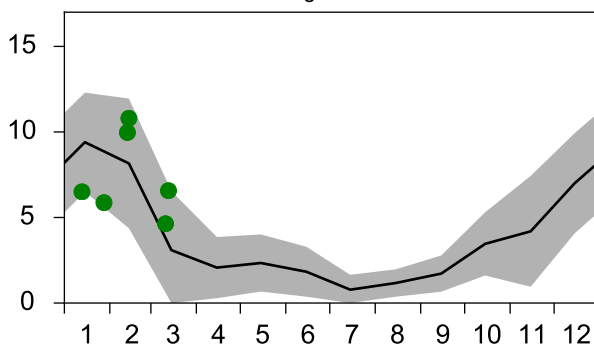
PO₄ µmol/l



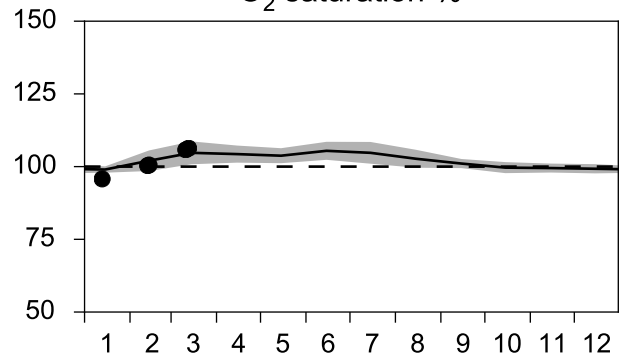
DIN µmol/l



SiO₃ µmol/l

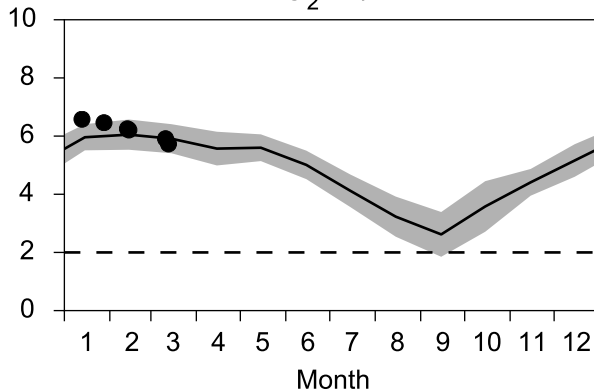


O₂ saturation %

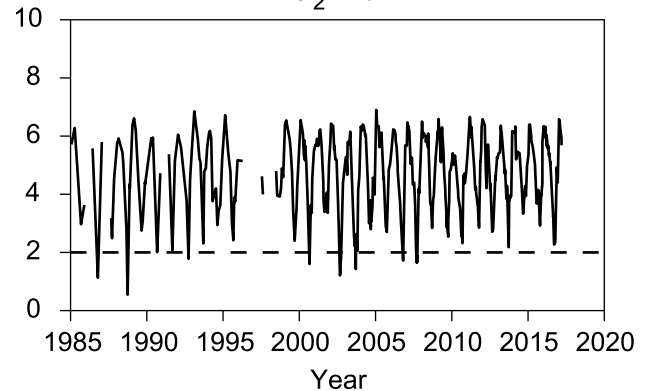


OXYGEN IN BOTTOM WATER (depth >= 52 m)

O₂ ml/l

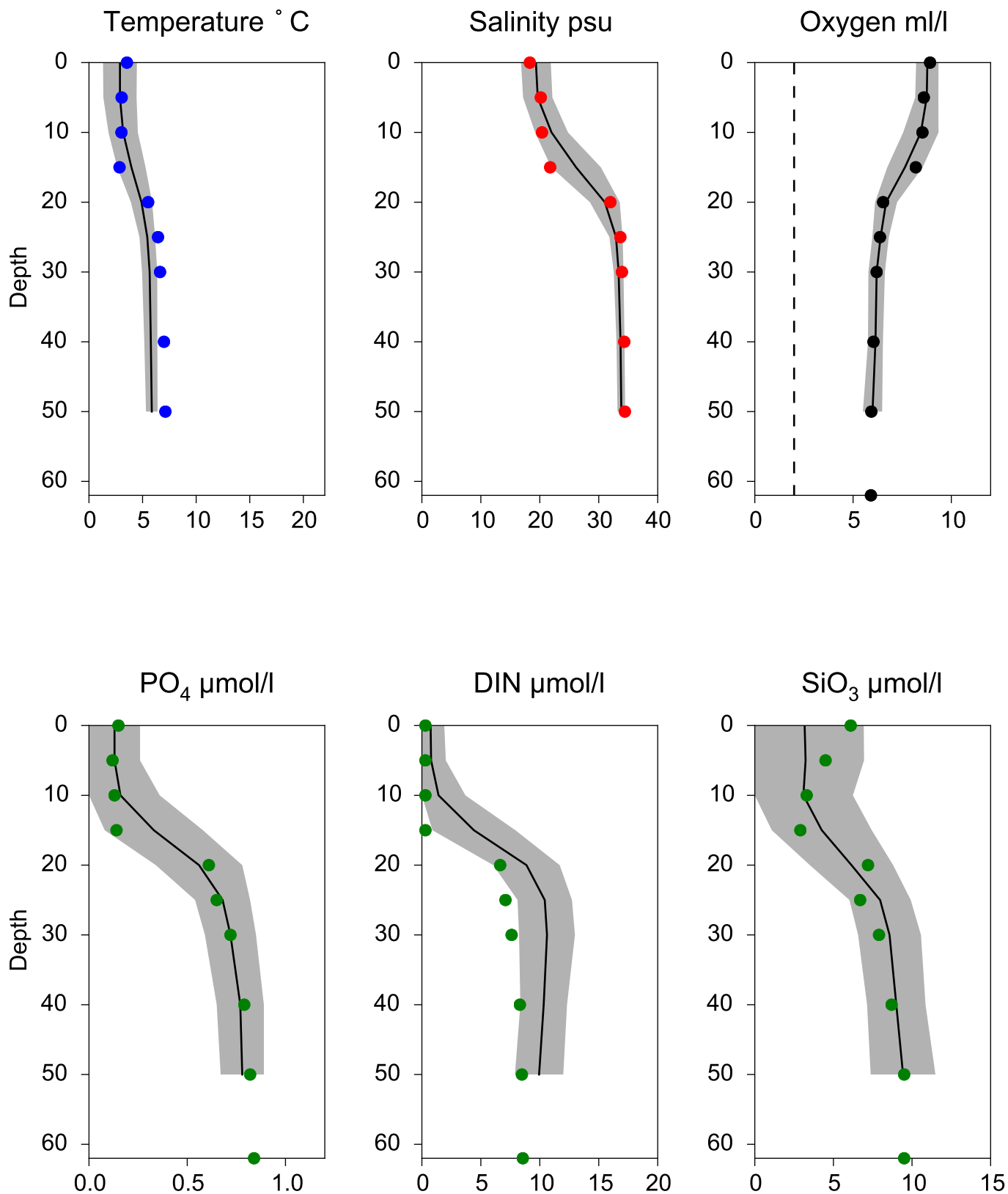


O₂ ml/l



Vertical profiles ANHOLT E March

— Mean 2001-2015 St.Dev. • 2017-03-11



STATION FLADEN SURFACE WATER (0-10 m)

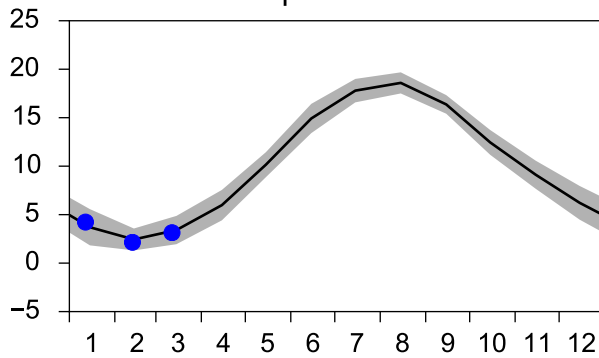
Annual Cycles

— Mean 2001-2015

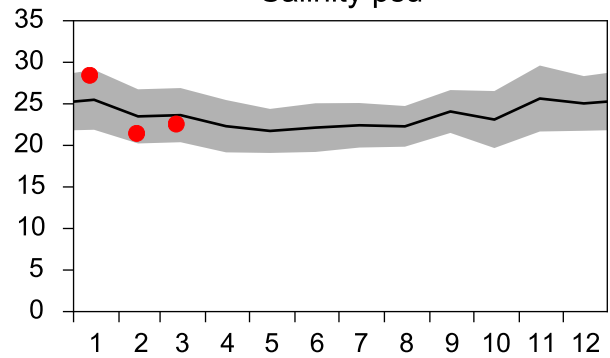
■ St.Dev.

● 2017

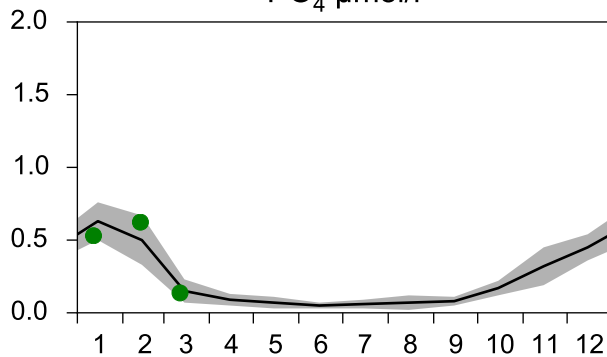
Temperature °C



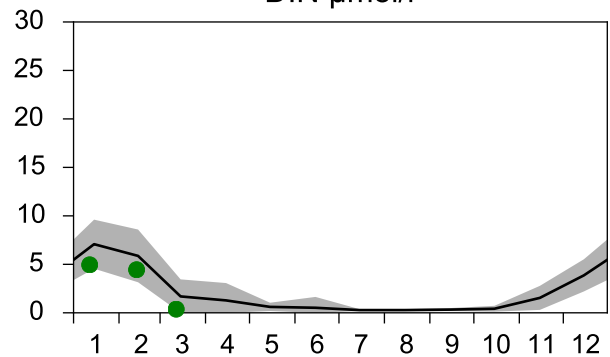
Salinity psu



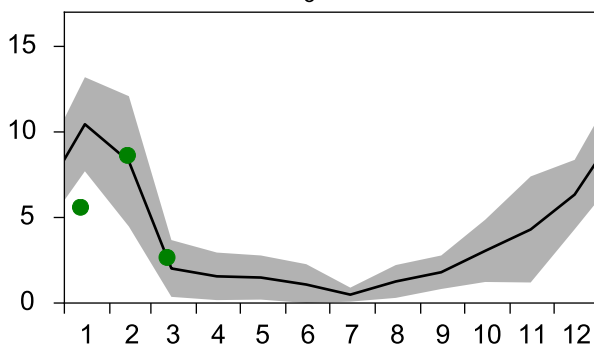
PO₄ µmol/l



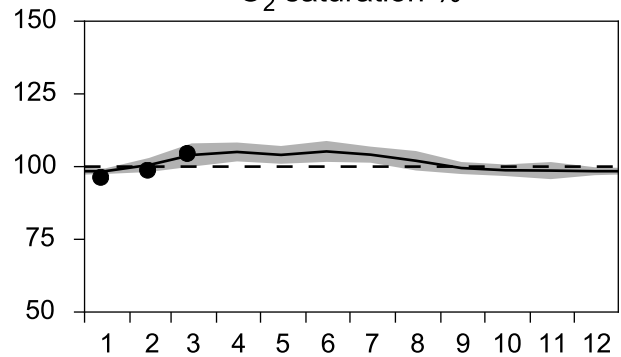
DIN µmol/l



SiO₃ µmol/l

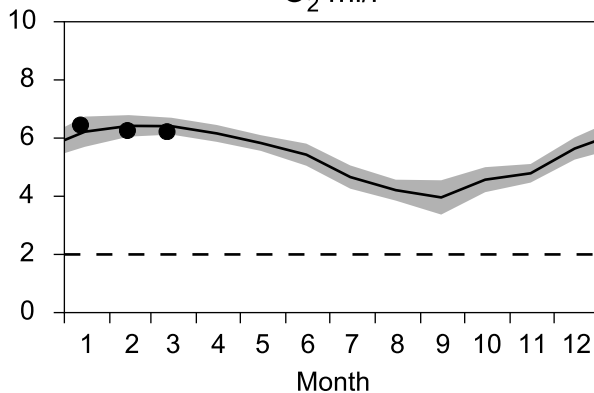


O₂ saturation %

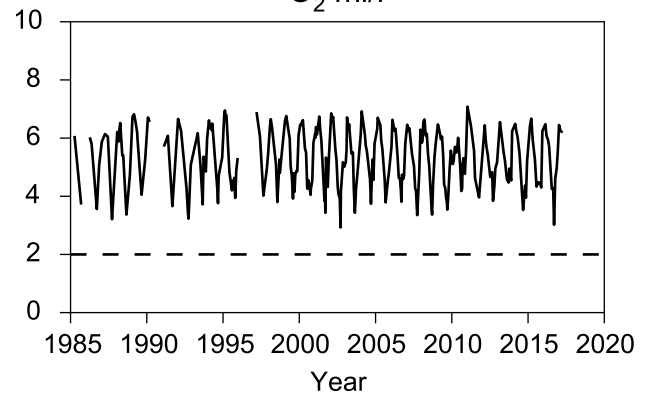


OXYGEN IN BOTTOM WATER (depth >= 74 m)

O₂ ml/l

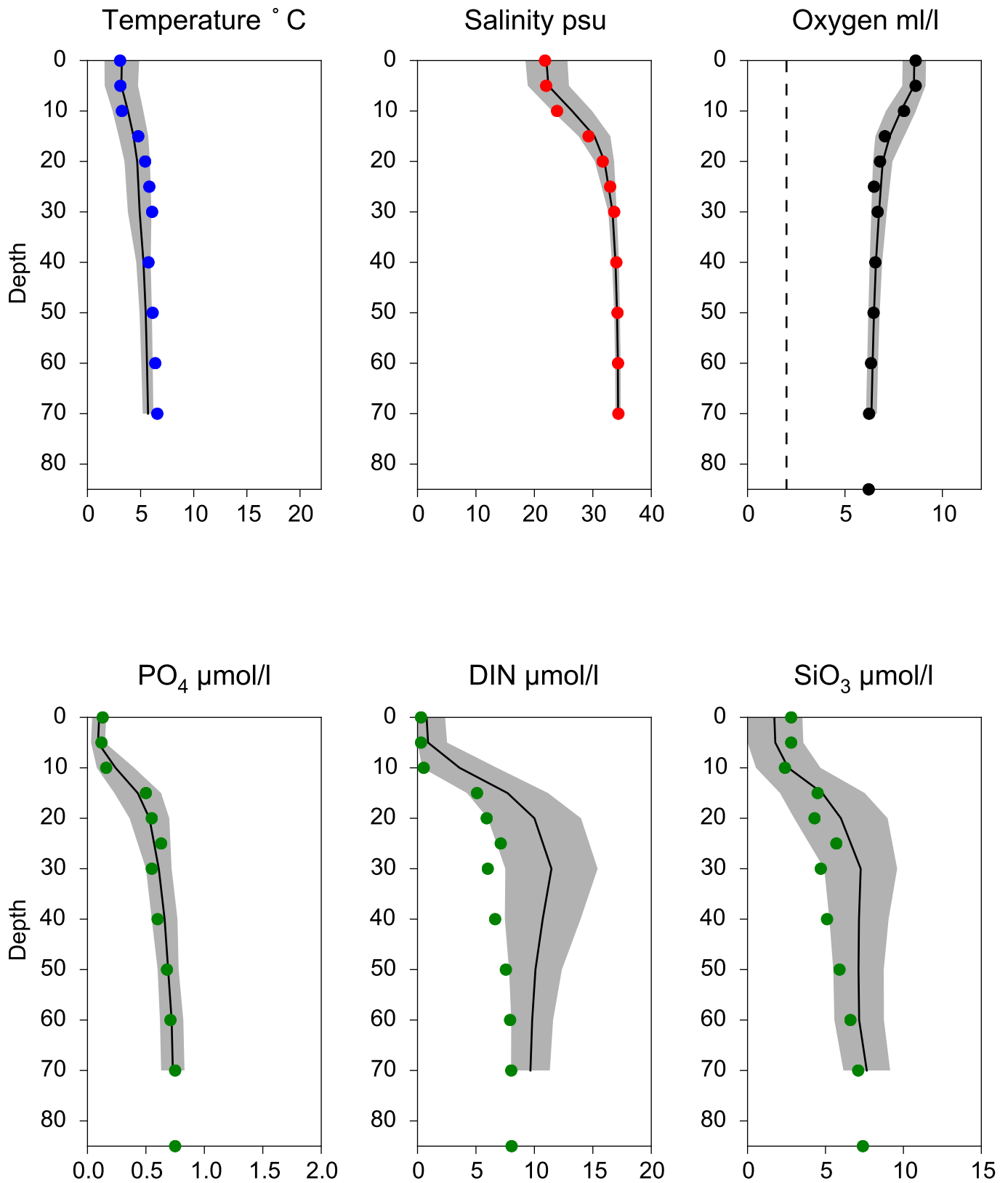


O₂ ml/l



Vertical profiles FLADEN March

— Mean 2001-2015 St.Dev. • 2017-03-12

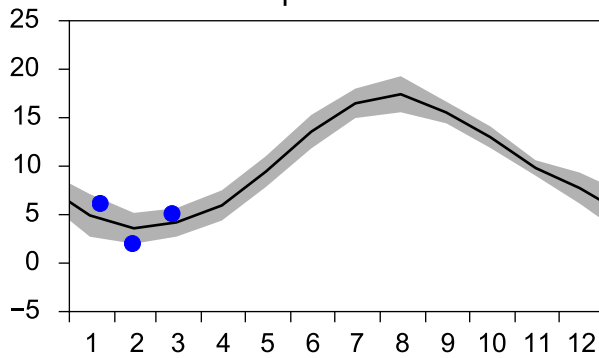


STATION Å17 SURFACE WATER (0-10 m)

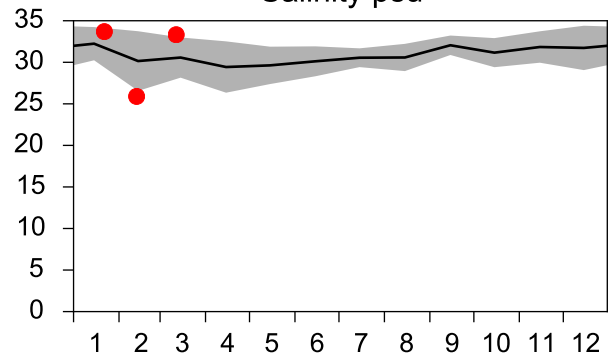
Annual Cycles

— Mean 2001-2015 St.Dev. • 2017

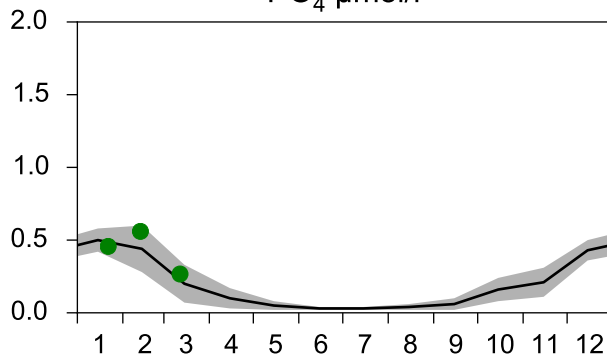
Temperature °C



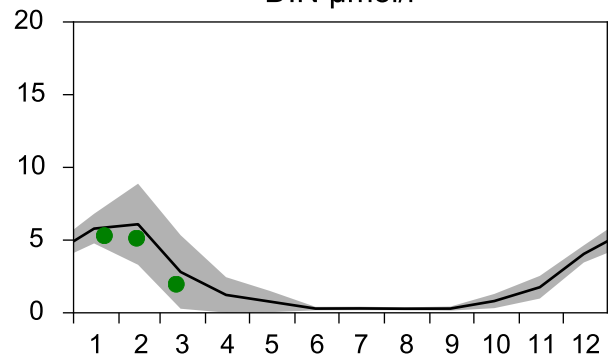
Salinity psu



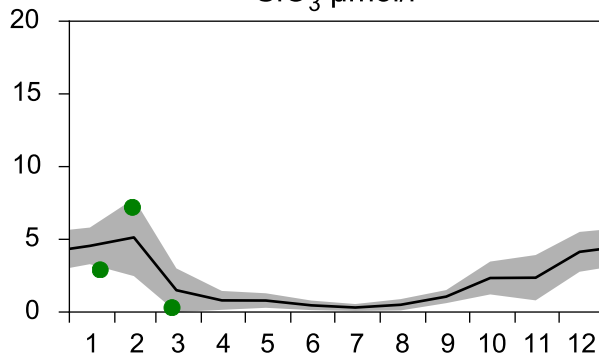
PO₄ µmol/l



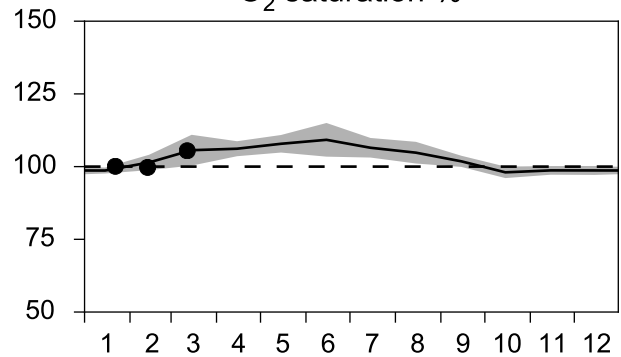
DIN µmol/l



SiO₃ µmol/l

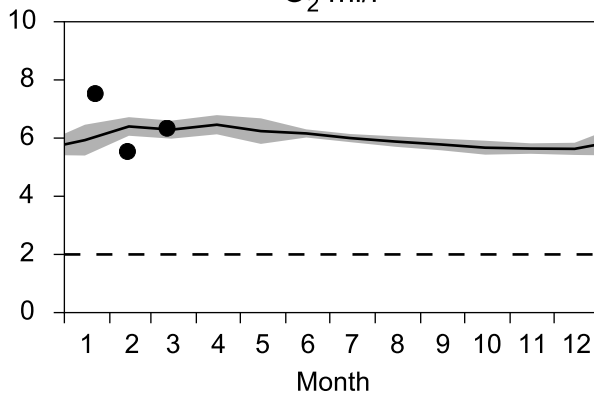


O₂ saturation %

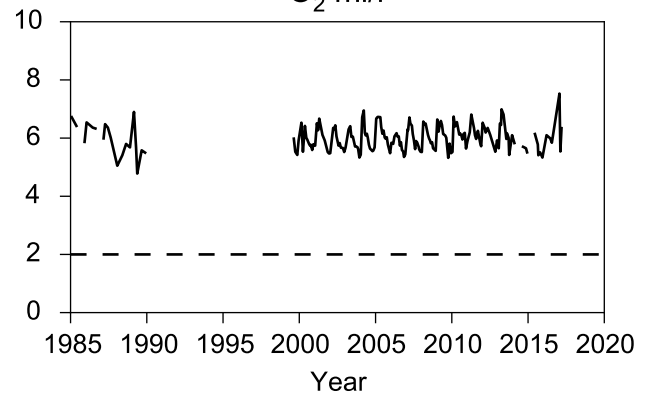


OXYGEN IN BOTTOM WATER (depth >= 300 m)

O₂ ml/l

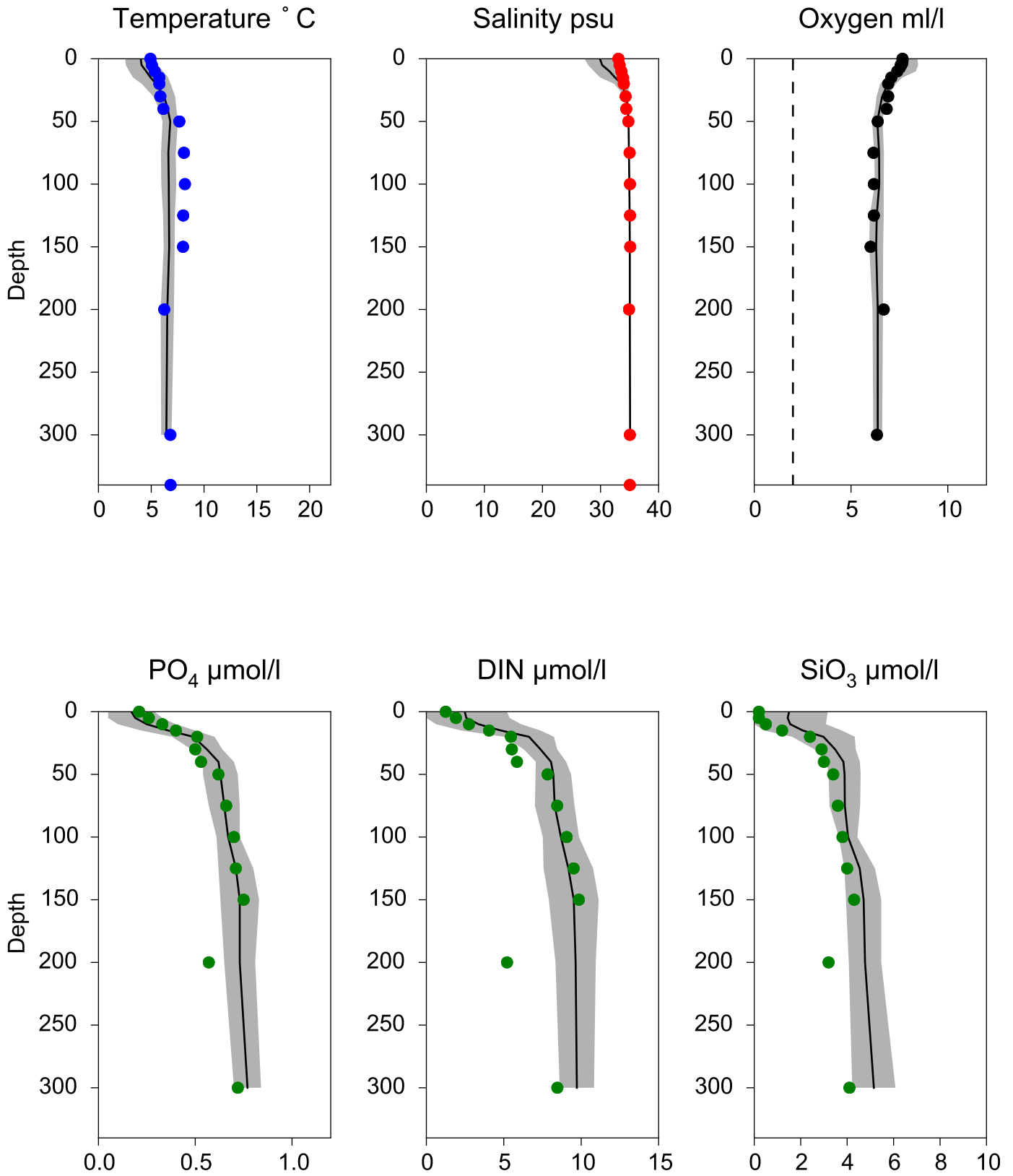


O₂ ml/l



Vertical profiles Å17 March

— Mean 2001-2015 St.Dev. • 2017-03-12



STATION Å15 SURFACE WATER (0-10 m)

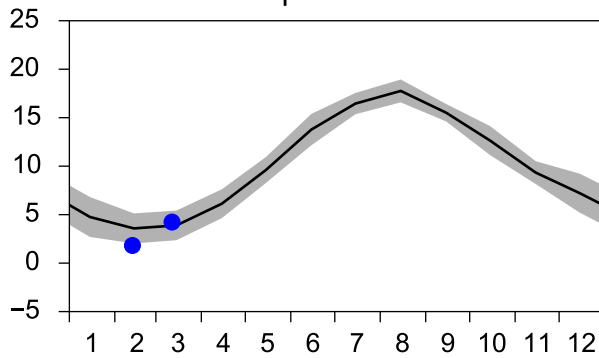
Annual Cycles

— Mean 2001-2015

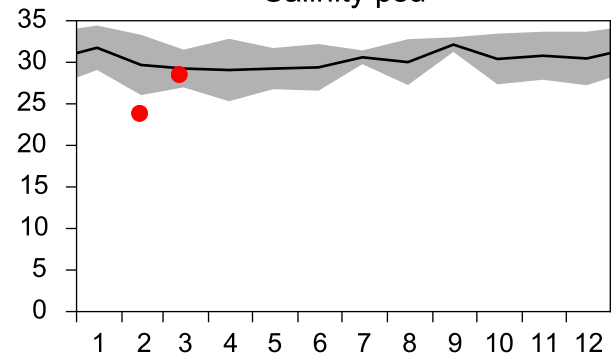
■ St.Dev.

● 2017

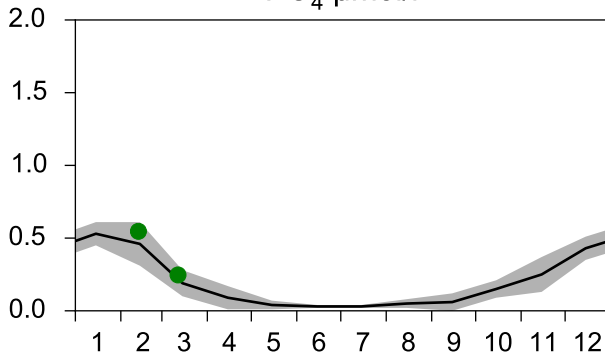
Temperature °C



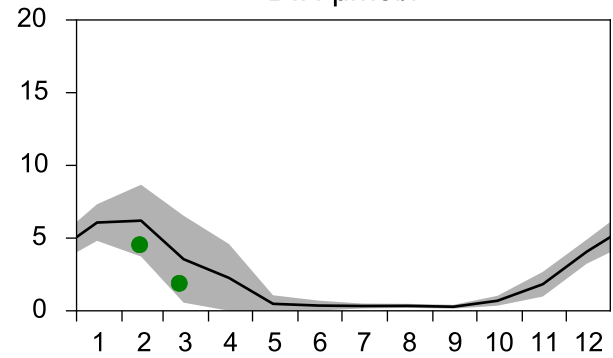
Salinity psu



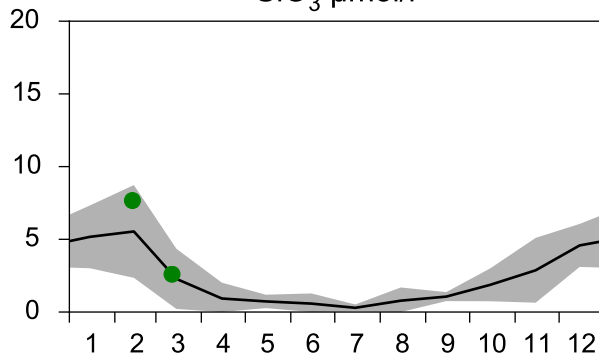
PO₄ µmol/l



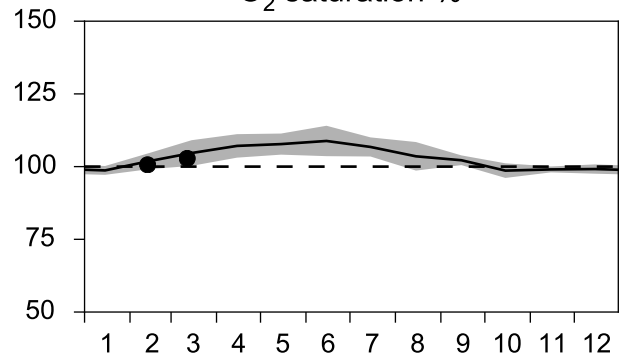
DIN µmol/l



SiO₃ µmol/l

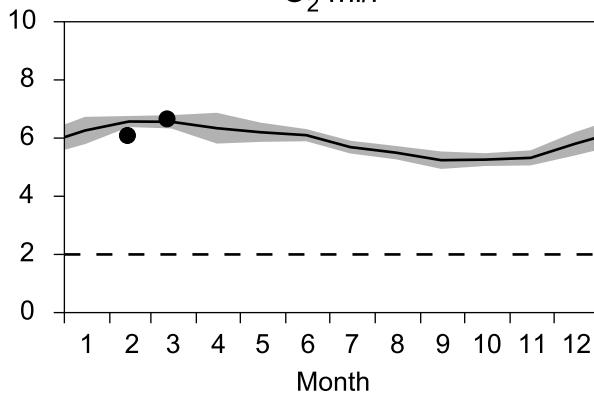


O₂ saturation %

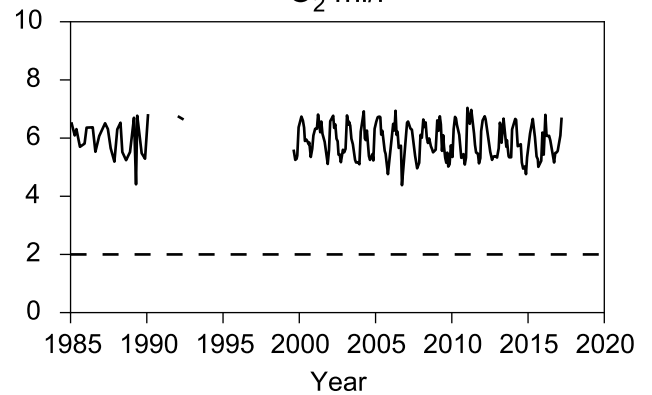


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

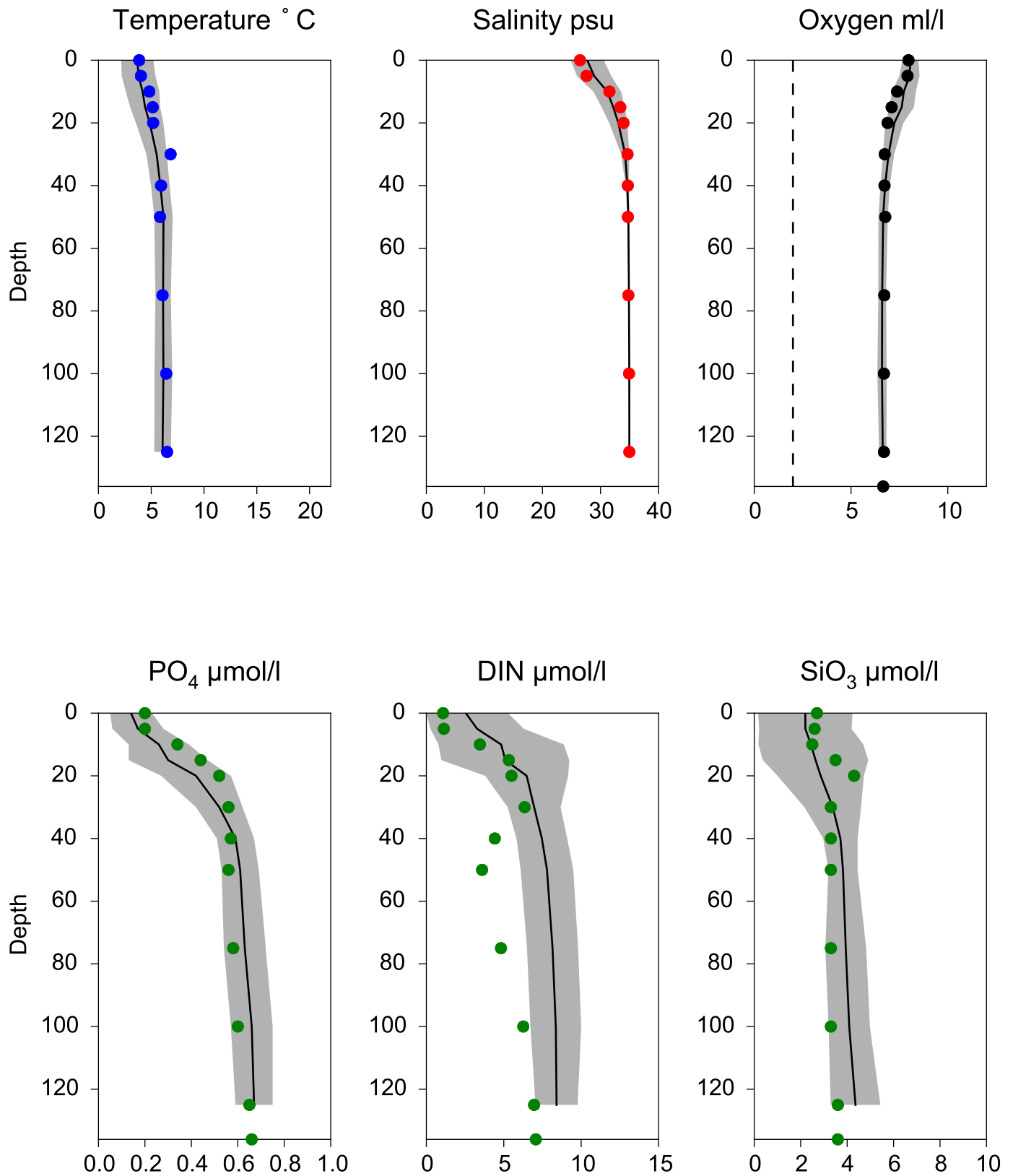


O₂ ml/l



Vertical profiles Å15 March

— Mean 2001-2015 St.Dev. • 2017-03-12



STATION Å13 SURFACE WATER (0-10 m)

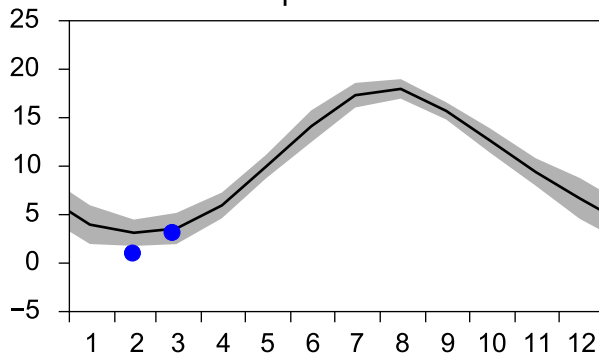
Annual Cycles

— Mean 2001-2015

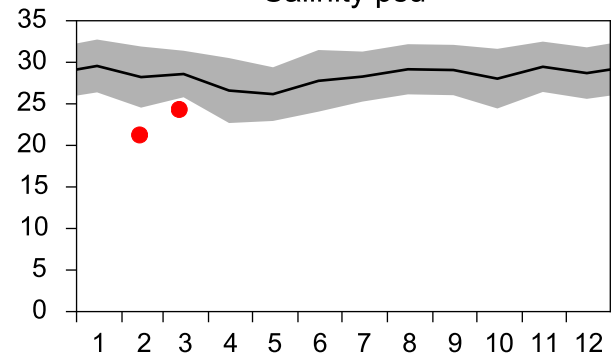
■ St.Dev.

● 2017

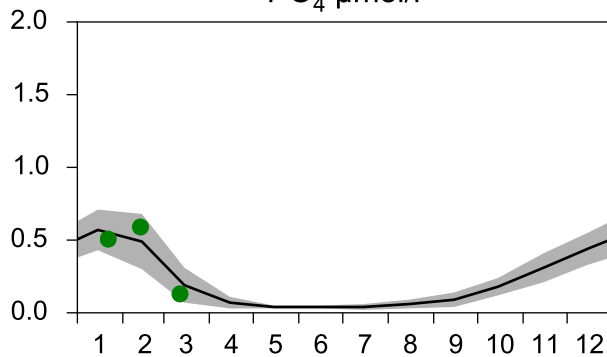
Temperature °C



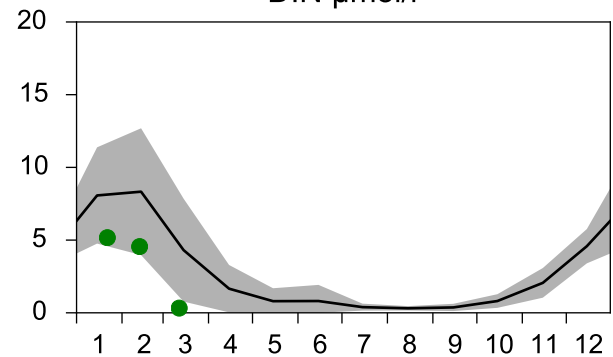
Salinity psu



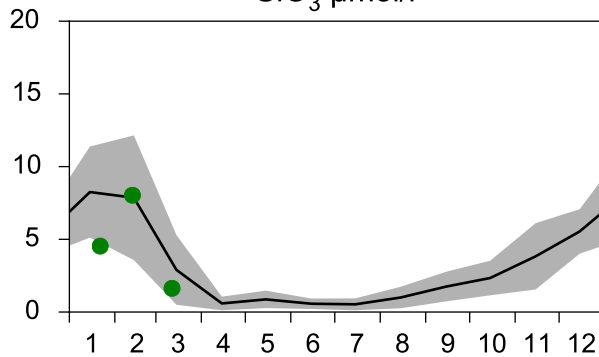
PO₄ µmol/l



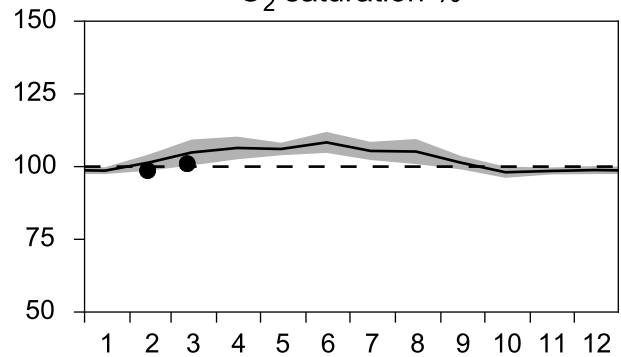
DIN µmol/l



SiO₃ µmol/l

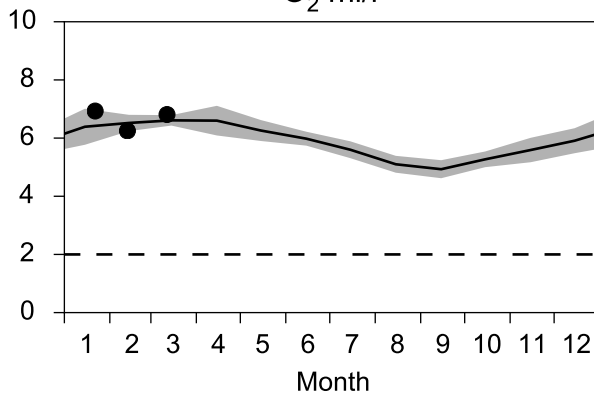


O₂ saturation %

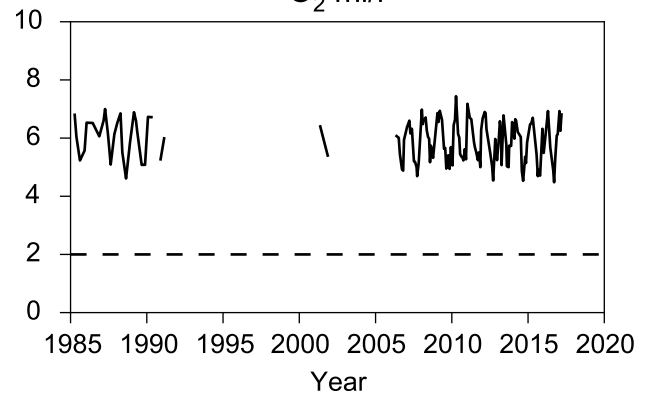


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

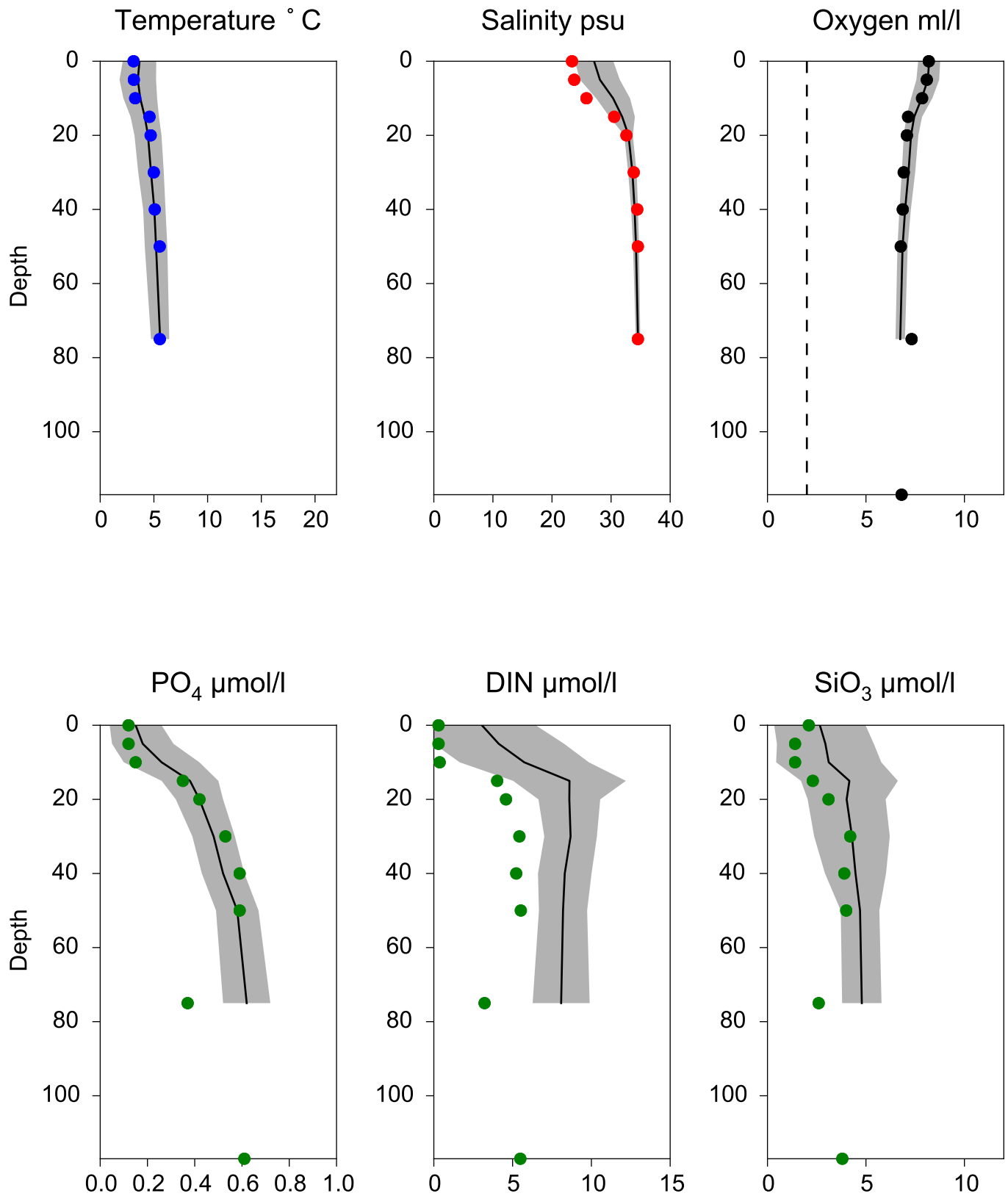


O₂ ml/l



Vertical profiles Å13 March

— Mean 2001-2015 St.Dev. • 2017-03-12



STATION SLÄGGÖ SURFACE WATER (0-10 m)

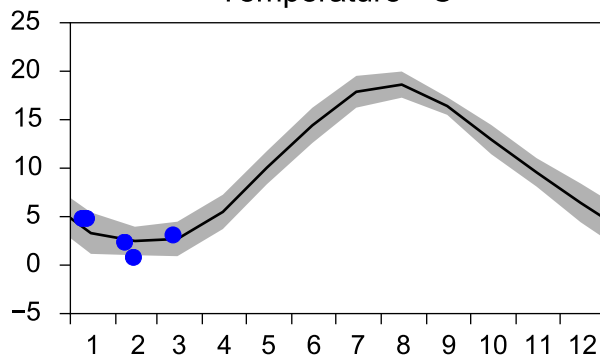
Annual Cycles

— Mean 2001-2015

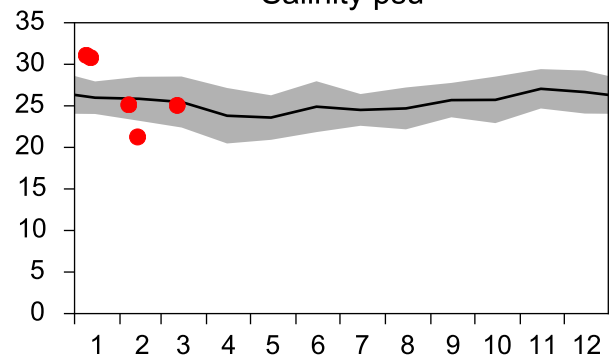
■ St.Dev.

● 2017

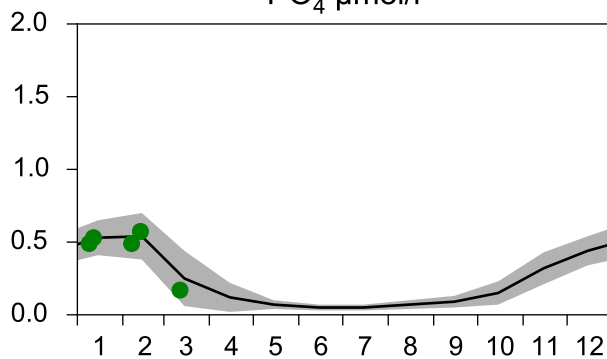
Temperature °C



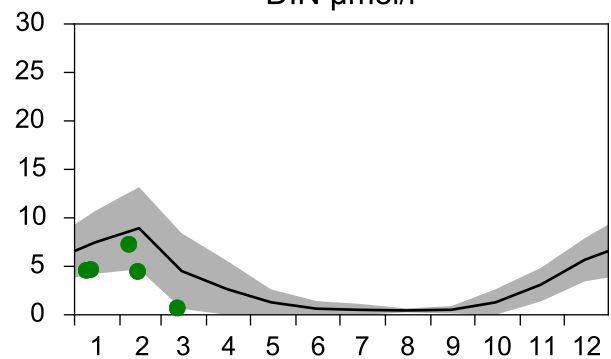
Salinity psu



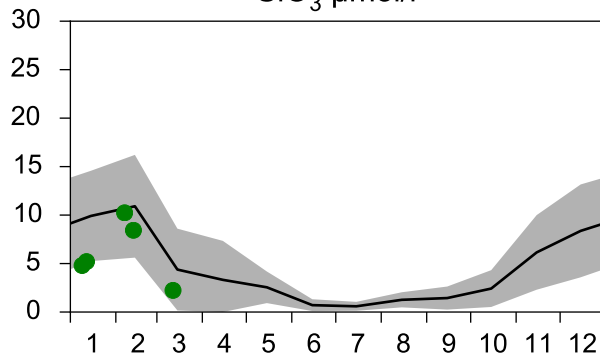
PO₄ µmol/l



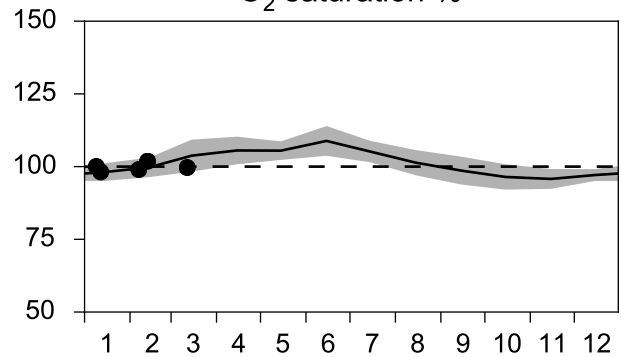
DIN µmol/l



SiO₃ µmol/l

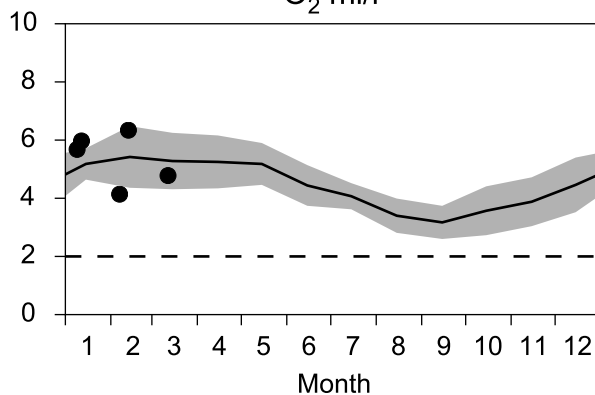


O₂ saturation %

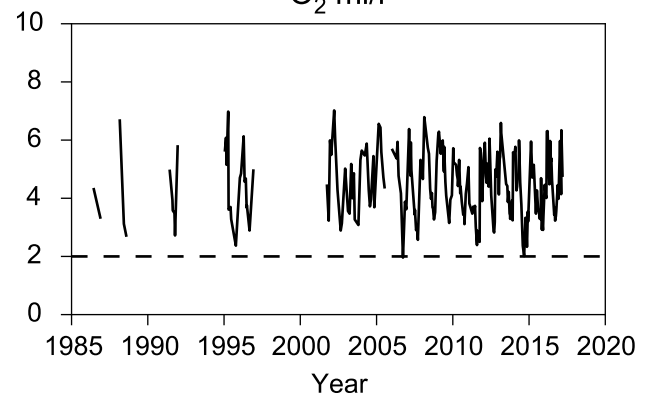


OXYGEN IN BOTTOM WATER (depth >= 64 m)

O₂ ml/l

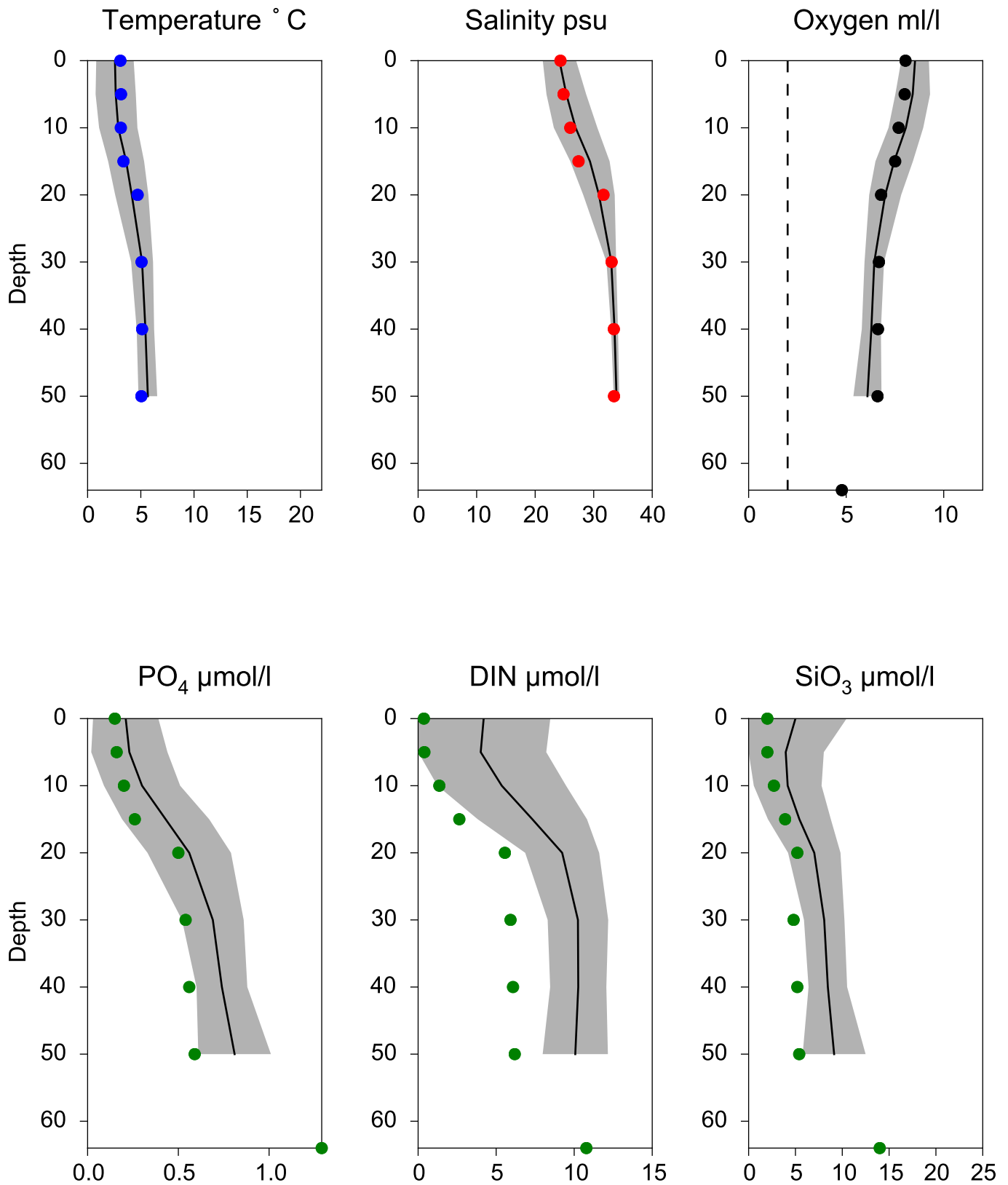


O₂ ml/l



Vertical profiles SLÄGGÖ March

— Mean 2001-2015 St.Dev. • 2017-03-12



STATION P2 SURFACE WATER (0-10 m)

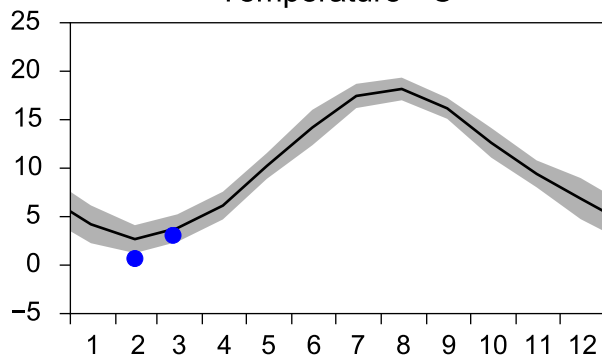
Annual Cycles

— Mean 2001-2015

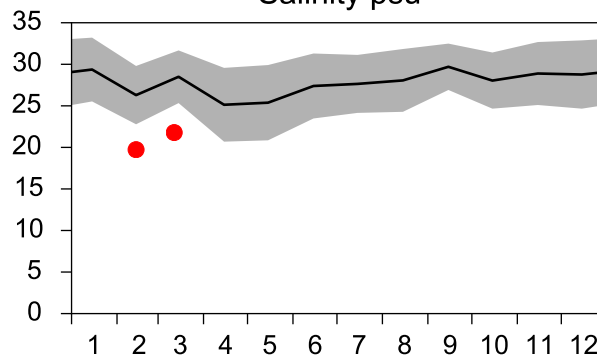
■ St.Dev.

● 2017

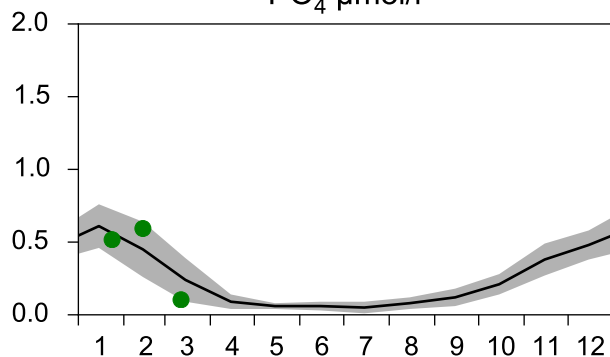
Temperature °C



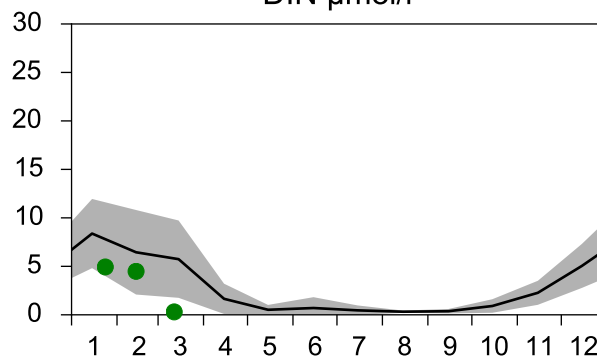
Salinity psu



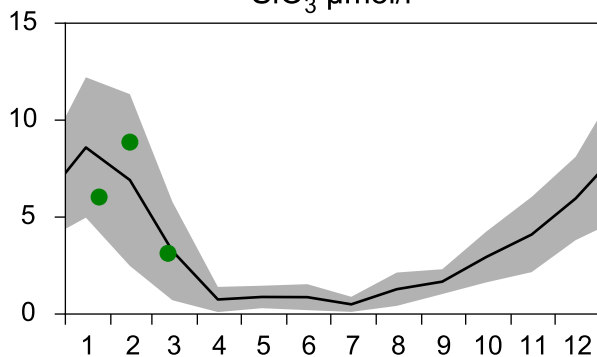
PO₄ µmol/l



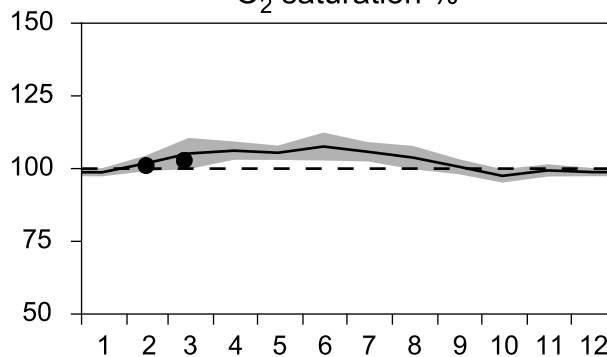
DIN µmol/l



SiO₃ µmol/l

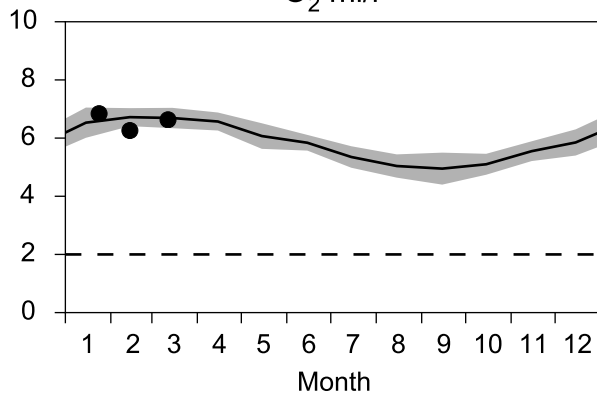


O₂ saturation %

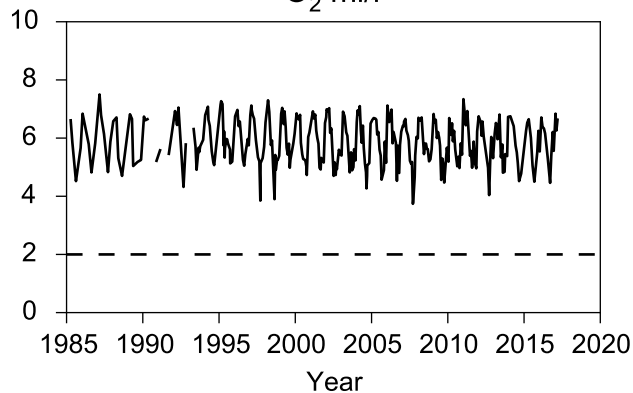


OXYGEN IN BOTTOM WATER (depth >= 75 m)

O₂ ml/l

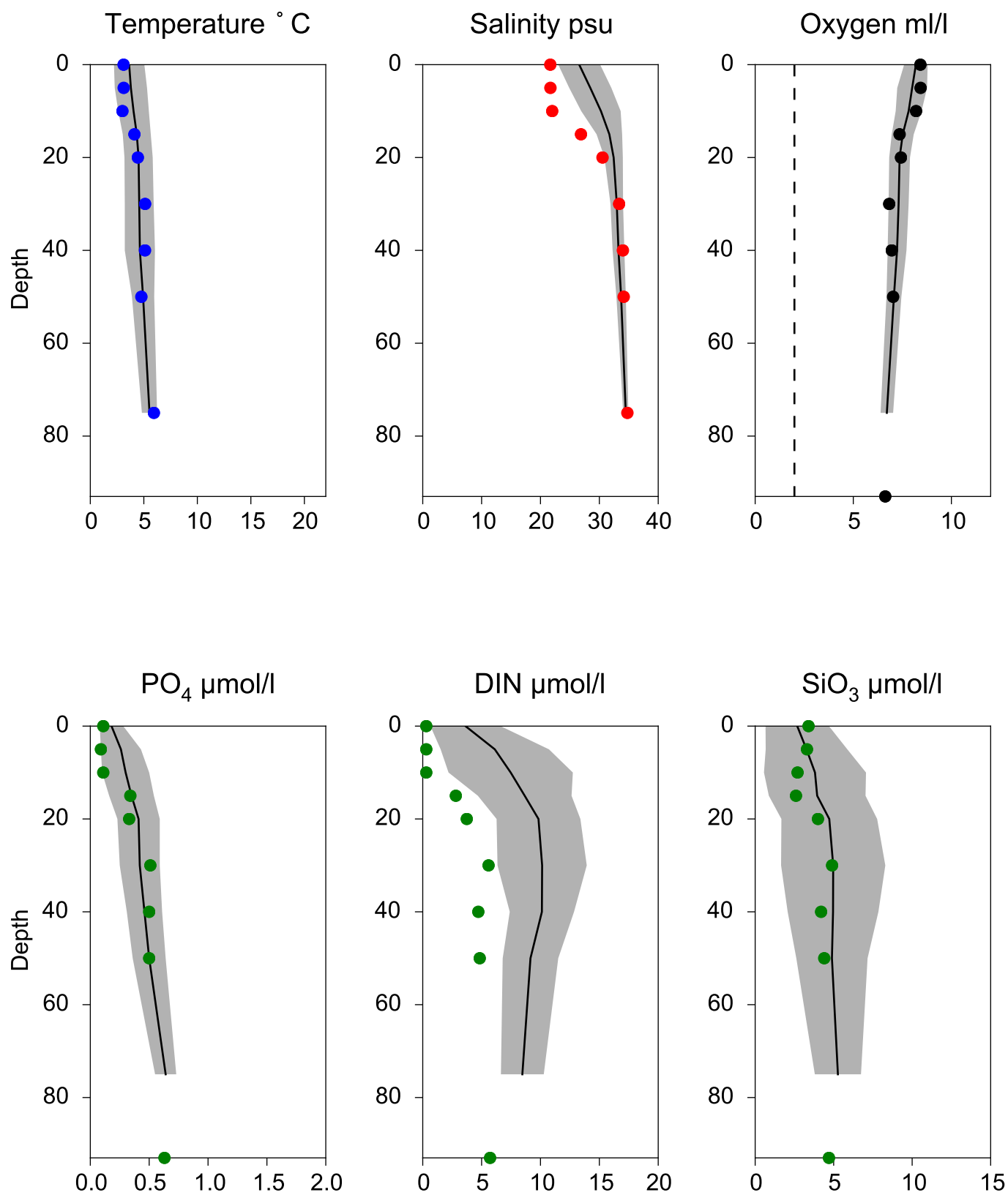


O₂ ml/l



Vertical profiles P2 March

— Mean 2001-2015 St.Dev. • 2017-03-12



STATION N14 FALKENBERG SURFACE WATER (0-10 m)

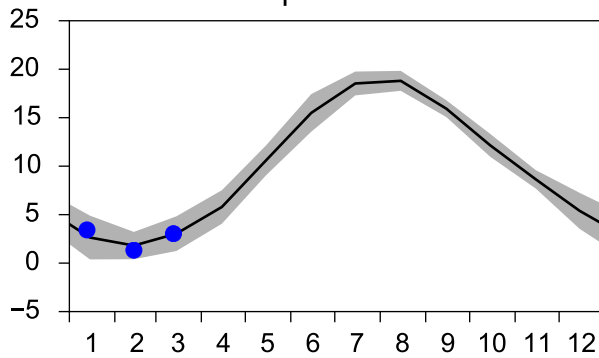
Annual Cycles

— Mean 2001-2015

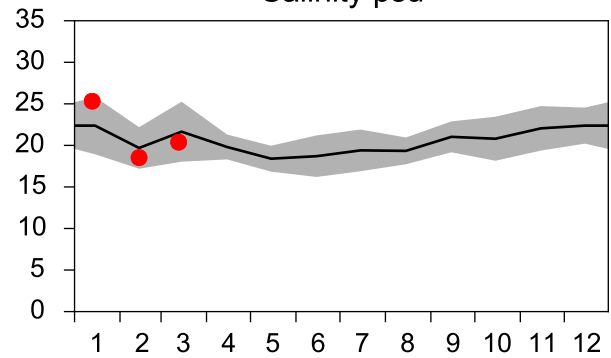
■ St.Dev.

● 2017

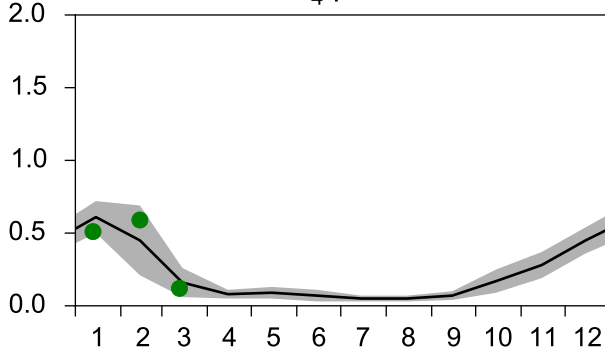
Temperature °C



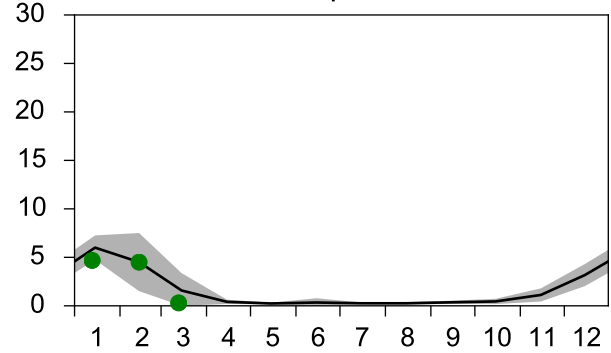
Salinity psu



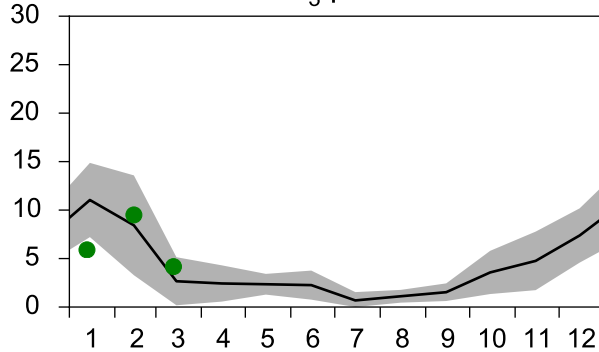
PO₄ µmol/l



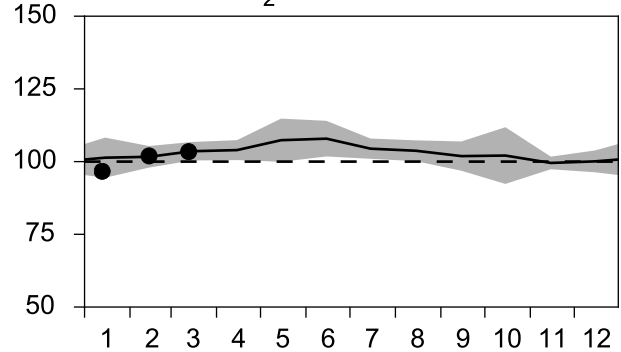
DIN µmol/l



SiO₃ µmol/l

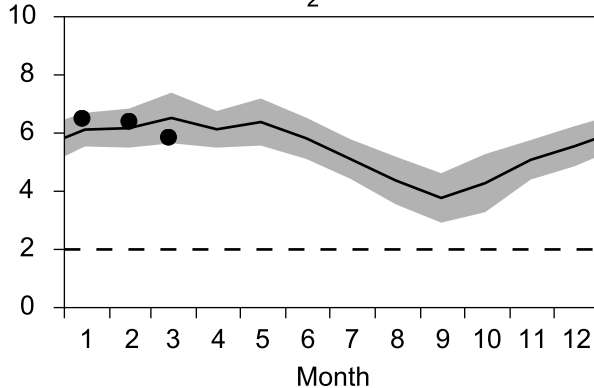


O₂ saturation %

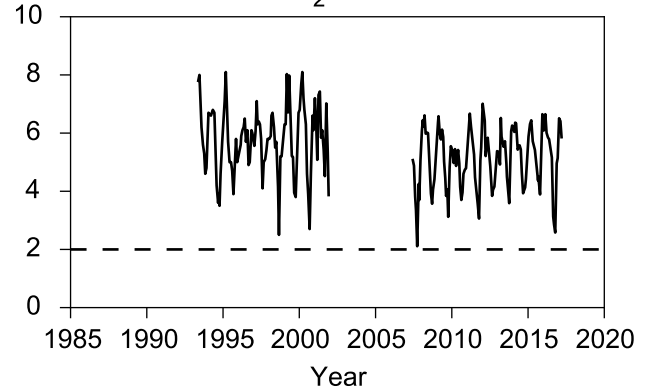


OXYGEN IN BOTTOM WATER (depth >= 25 m)

O₂ ml/l

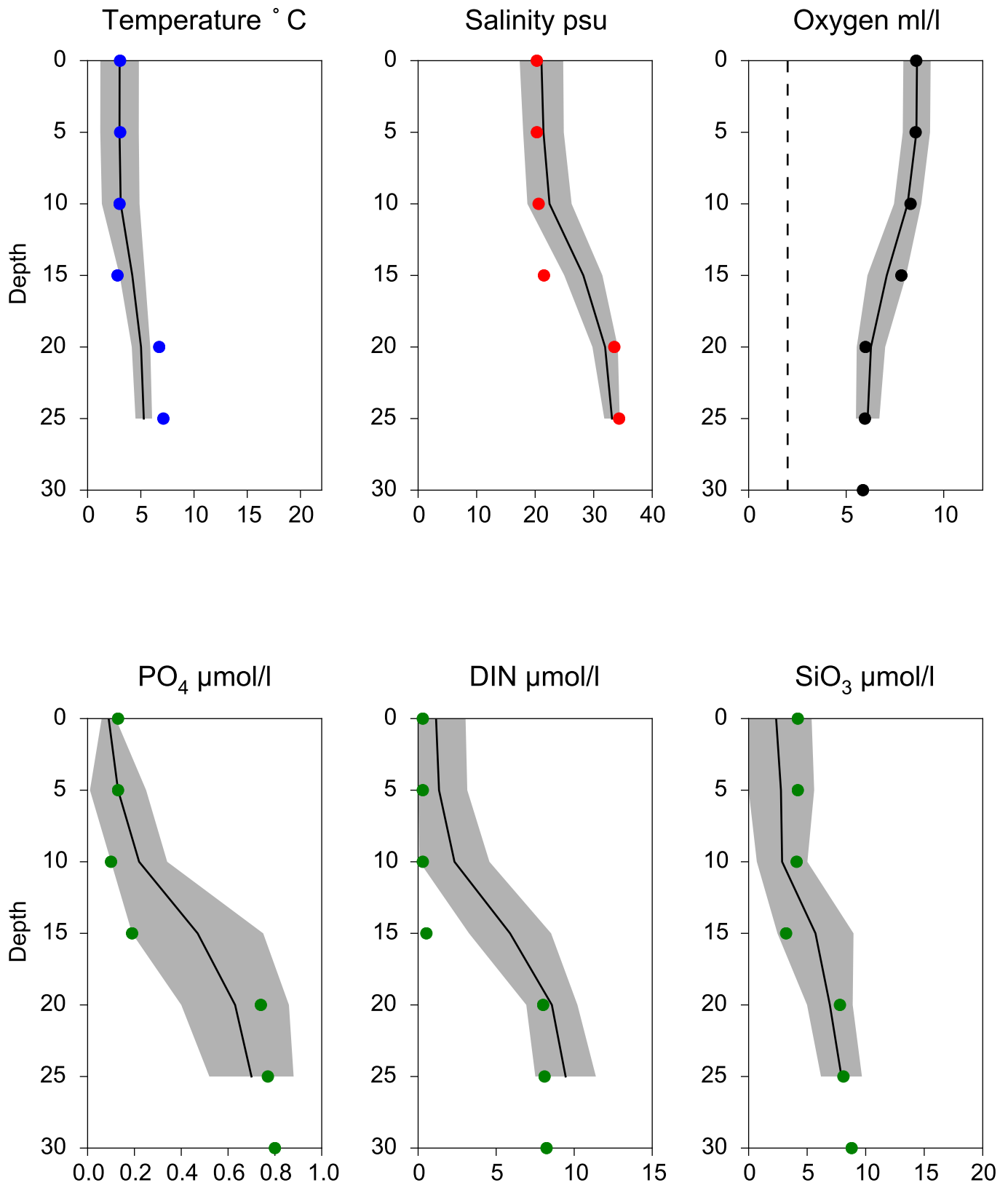


O₂ ml/l



Vertical profiles N14 FALKENBERG March

— Mean 2001-2015 St.Dev. • 2017-03-13



STATION ANHOLT E SURFACE WATER (0-10 m)

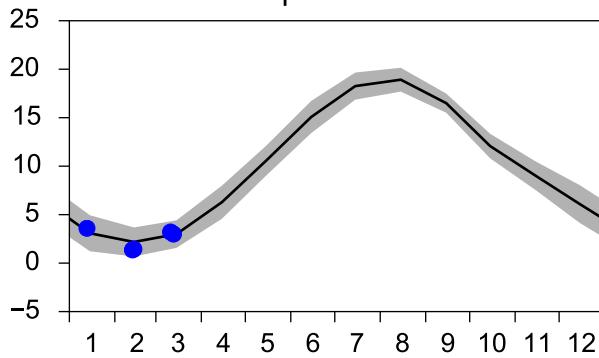
Annual Cycles

— Mean 2001-2015

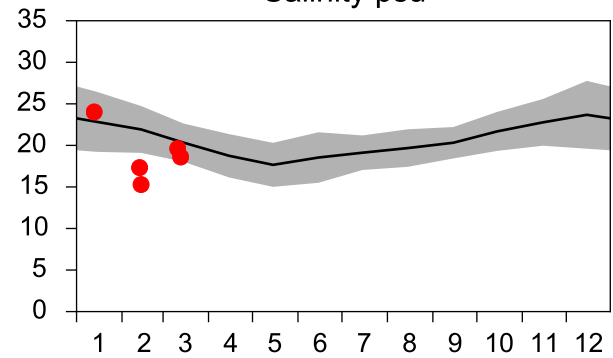
■ St.Dev.

● 2017

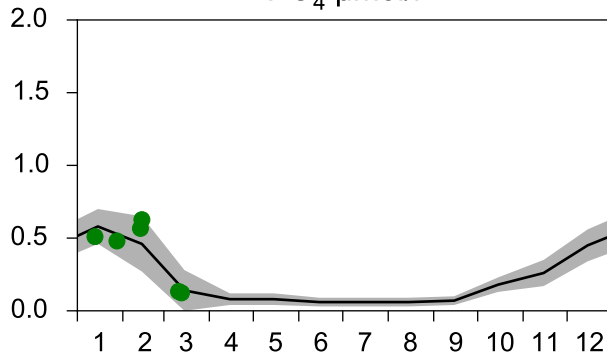
Temperature °C



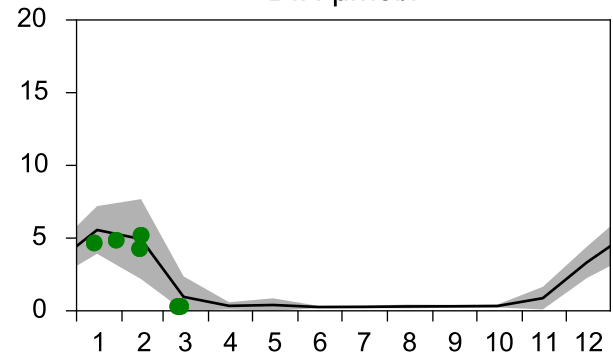
Salinity psu



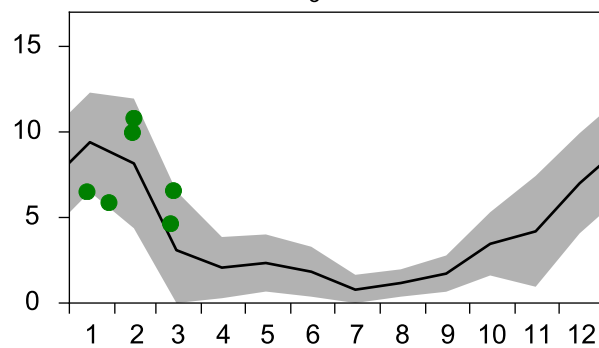
PO₄ µmol/l



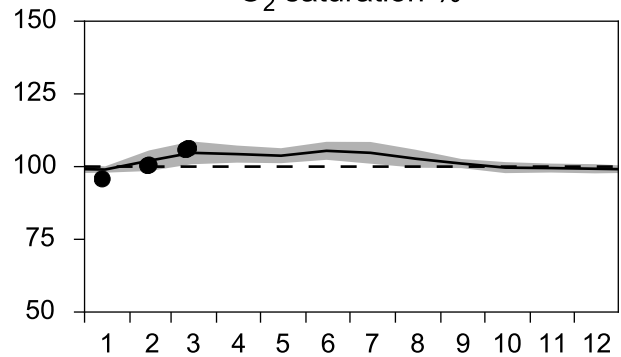
DIN µmol/l



SiO₃ µmol/l

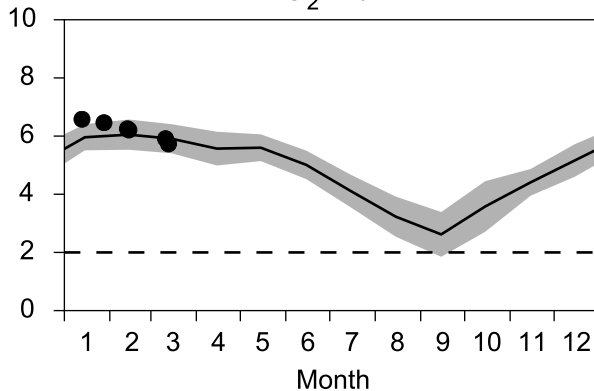


O₂ saturation %

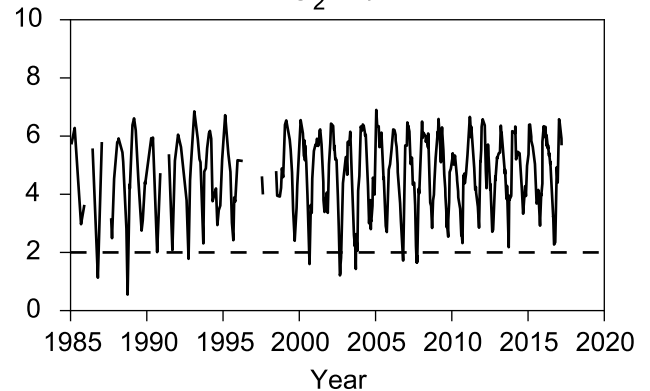


OXYGEN IN BOTTOM WATER (depth >= 52 m)

O₂ ml/l

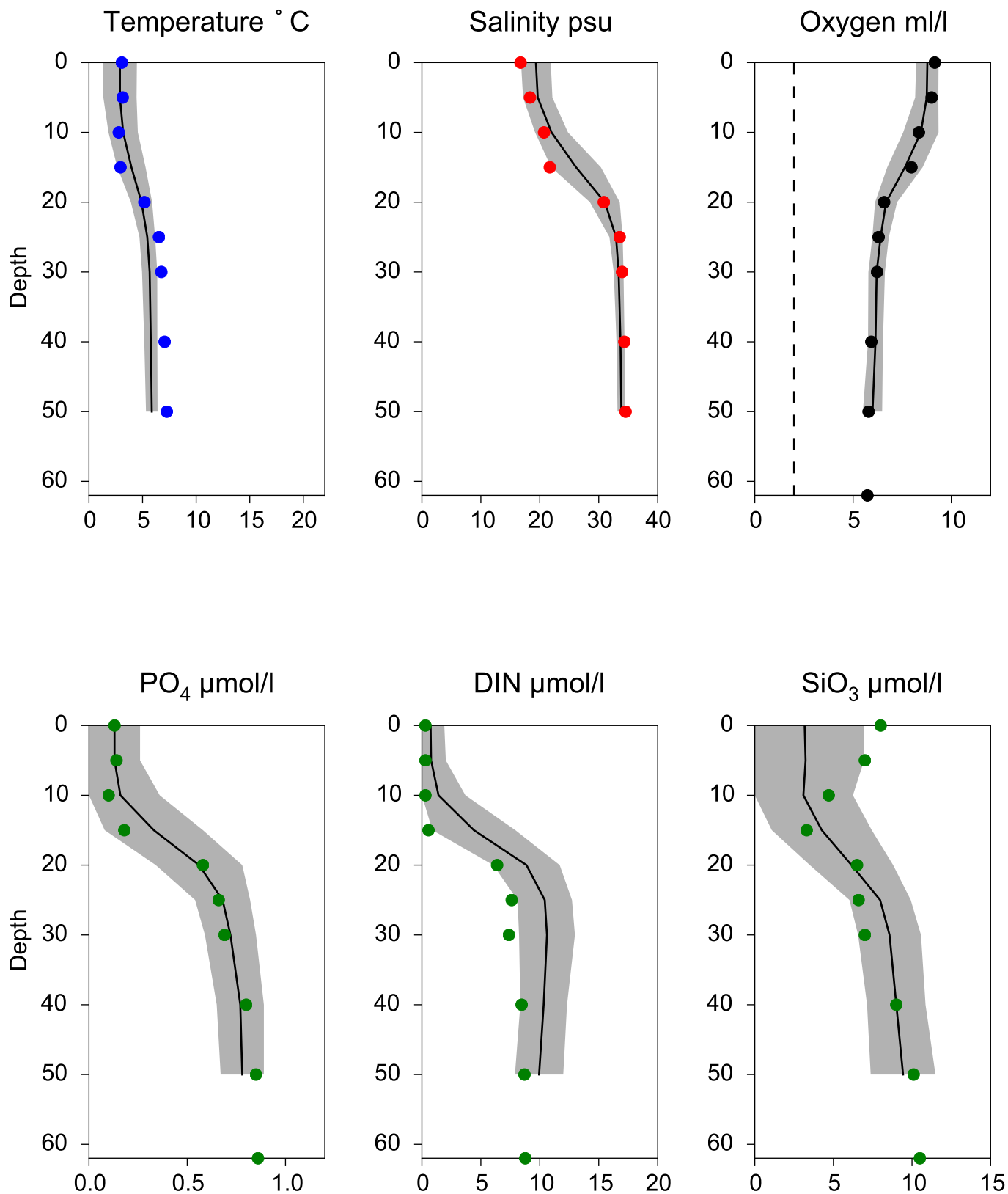


O₂ ml/l



Vertical profiles ANHOLT E March

— Mean 2001-2015 St.Dev. • 2017-03-13



STATION BY1 SURFACE WATER (0-10 m)

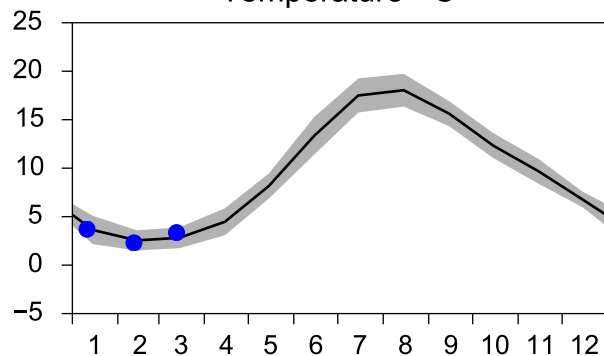
Annual Cycles

— Mean 2001-2015

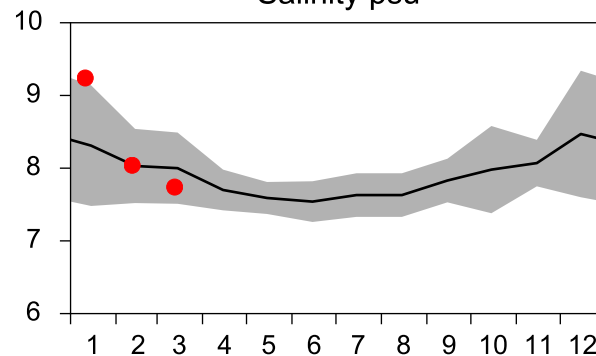
■ St.Dev.

● 2017

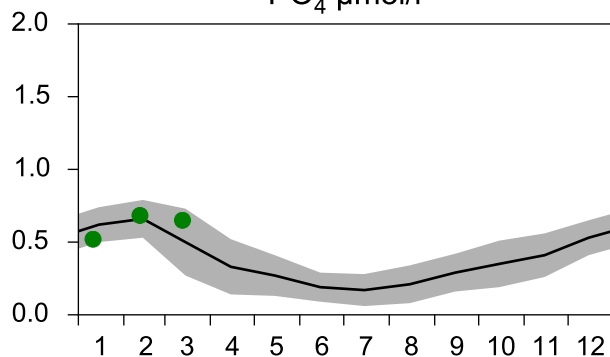
Temperature °C



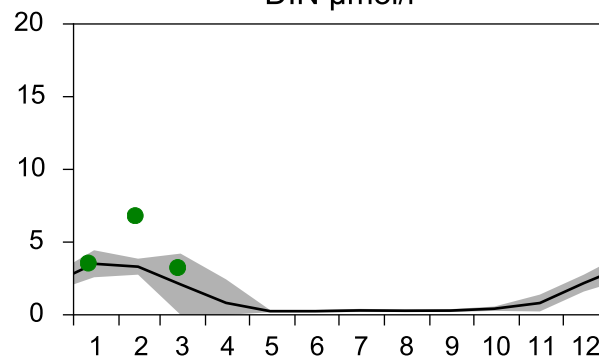
Salinity psu



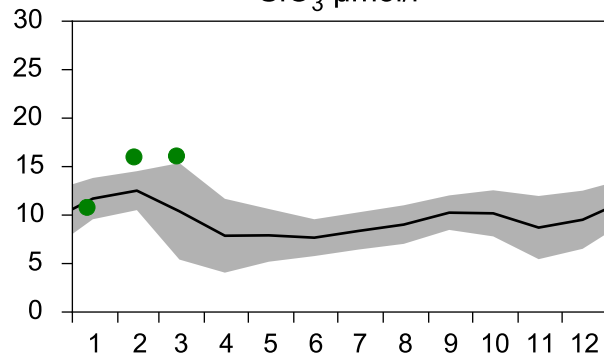
PO₄ µmol/l



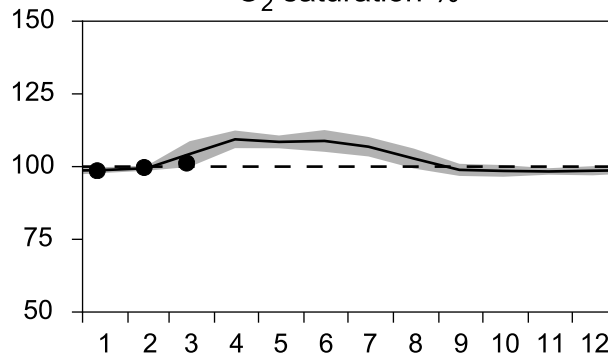
DIN µmol/l



SiO₃ µmol/l

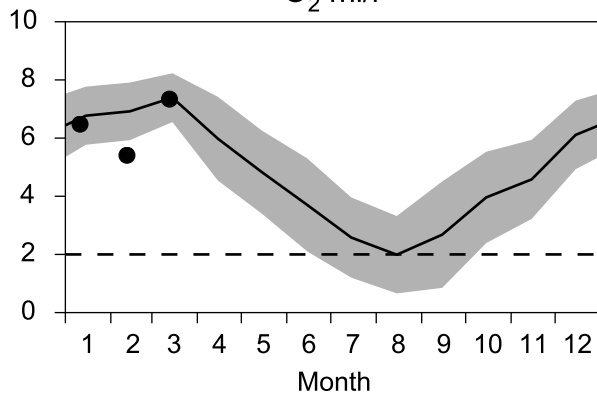


O₂ saturation %

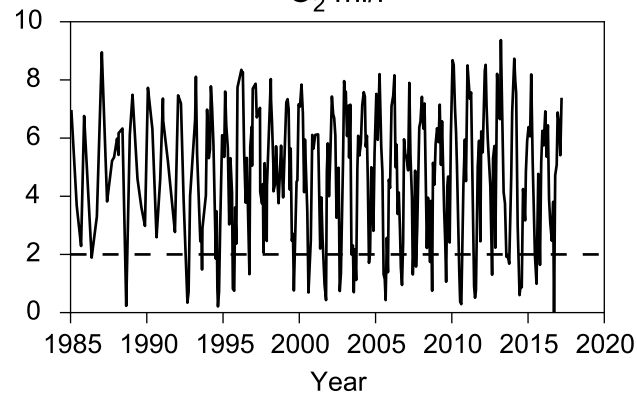


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

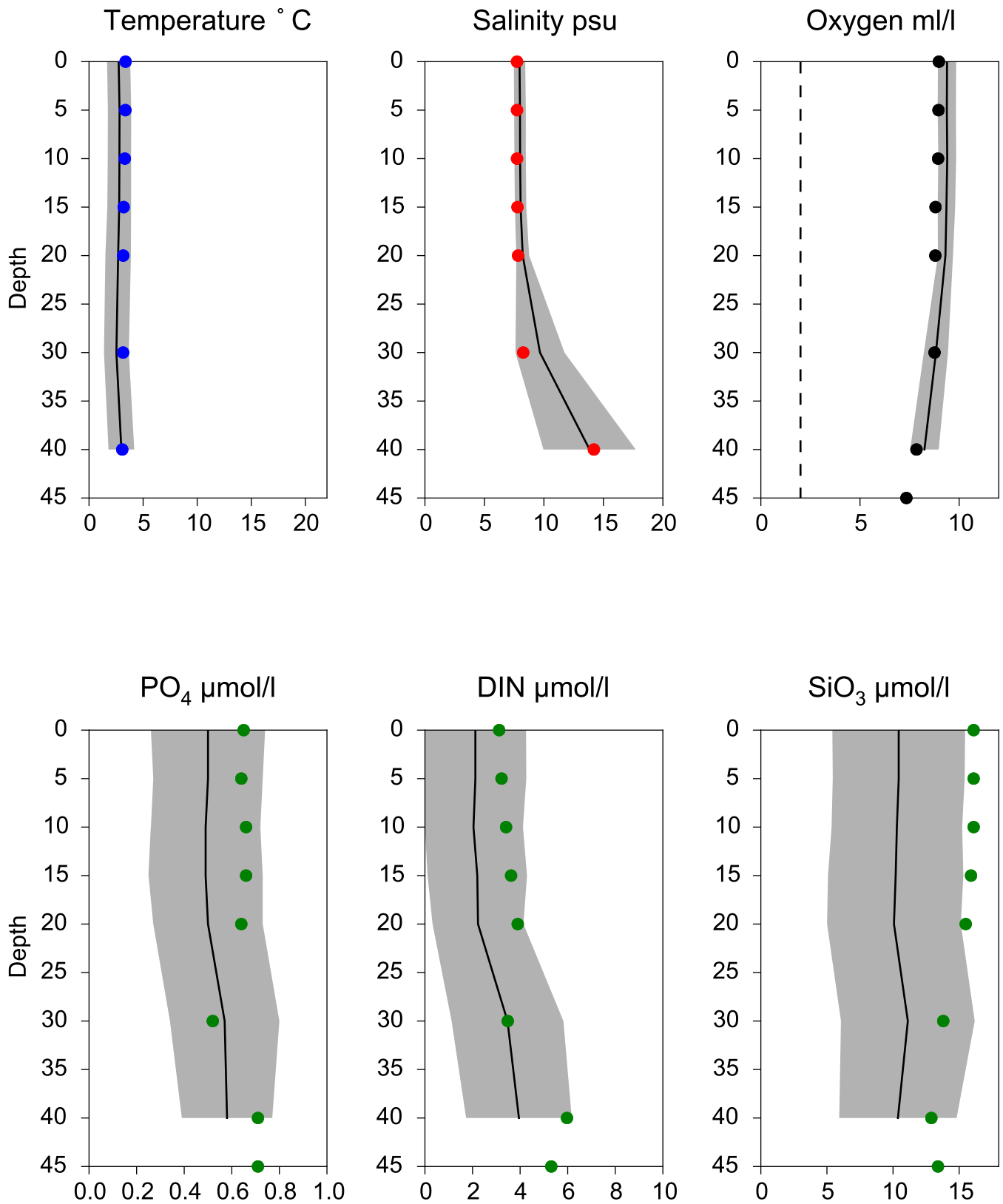


O₂ ml/l



Vertical profiles BY1 March

— Mean 2001-2015 St.Dev. • 2017-03-13



STATION BY2 ARKONA SURFACE WATER (0-10 m)

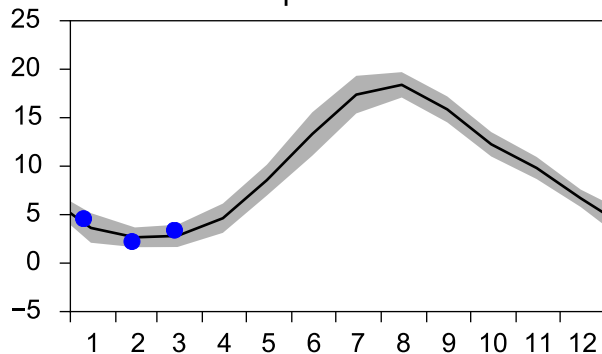
Annual Cycles

— Mean 2001-2015

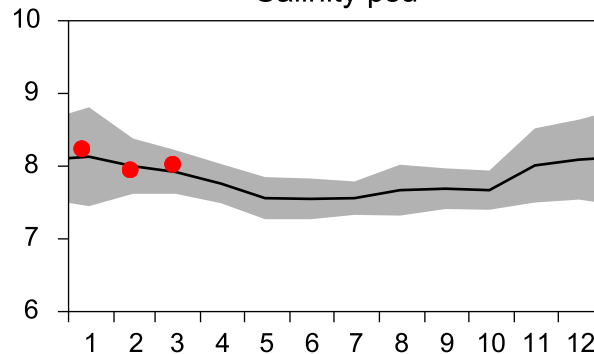
■ St.Dev.

● 2017

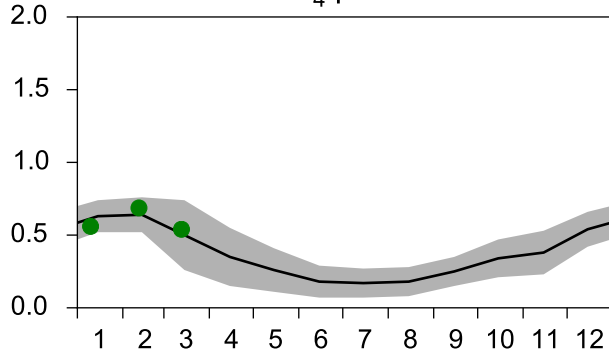
Temperature °C



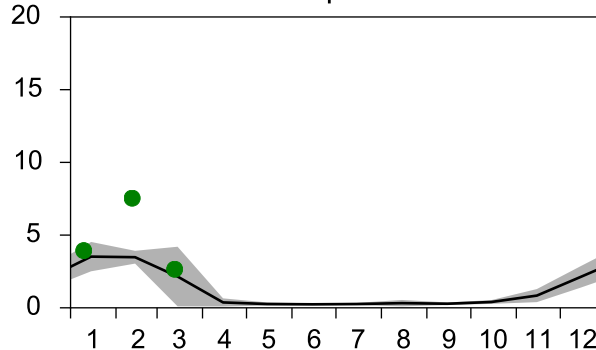
Salinity psu



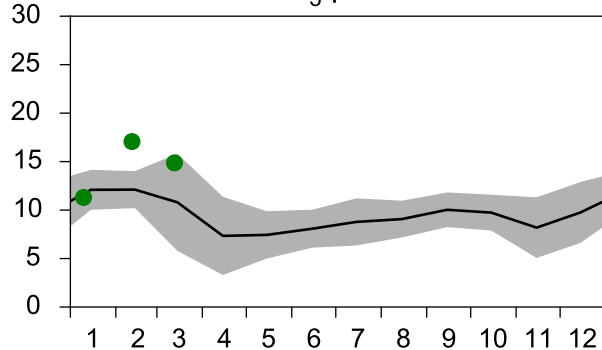
PO₄ µmol/l



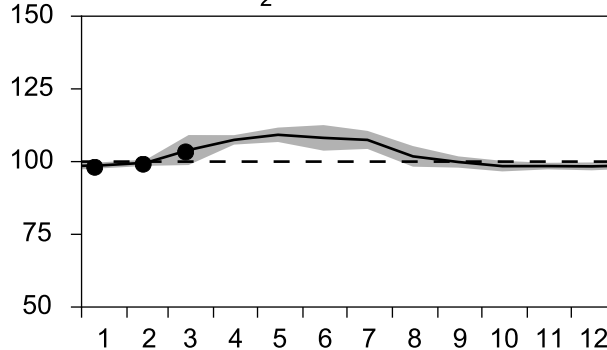
DIN µmol/l



SiO₃ µmol/l

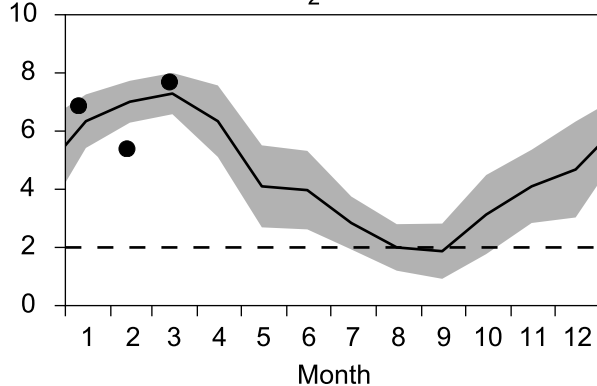


O₂ saturation %

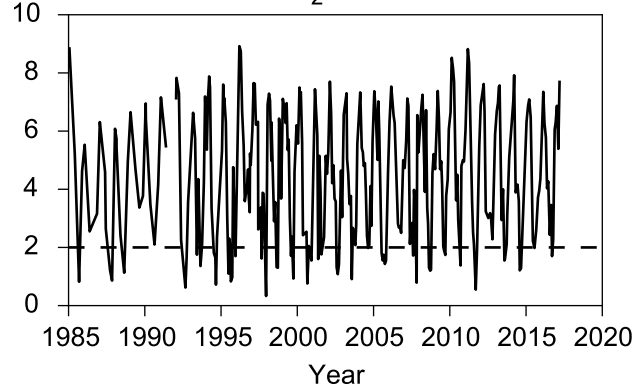


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

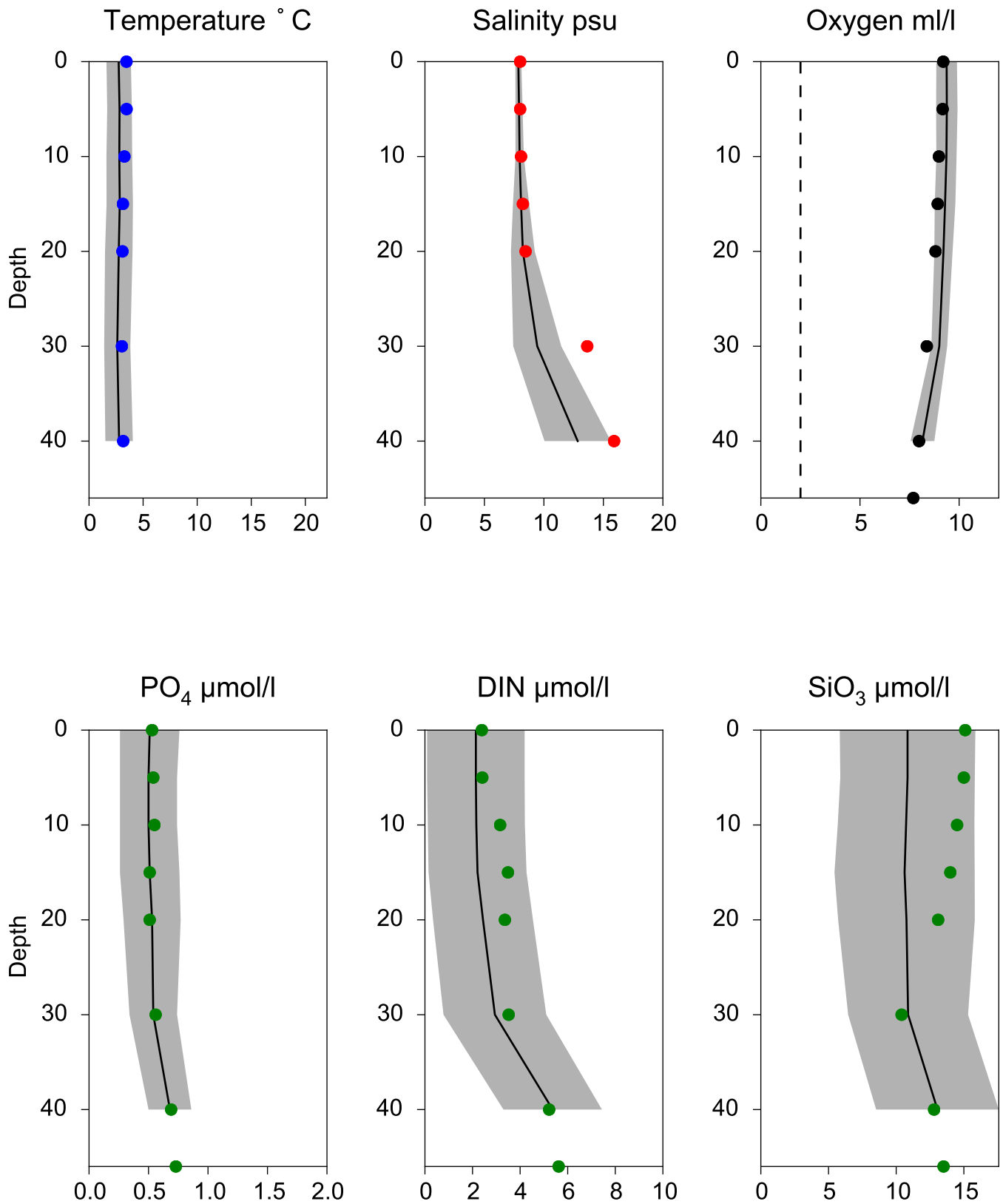


O₂ ml/l



Vertical profiles BY2 ARKONA March

— Mean 2001-2015 St.Dev. • 2017-03-13



STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

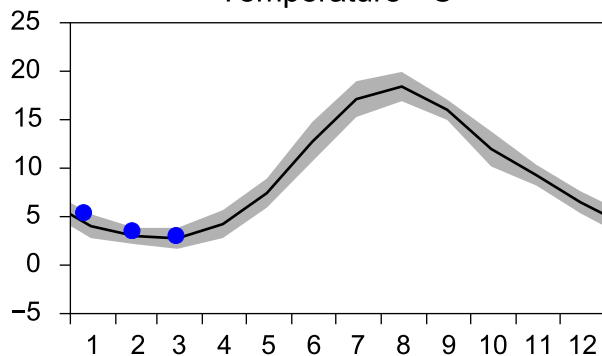
Annual Cycles

— Mean 2001-2015

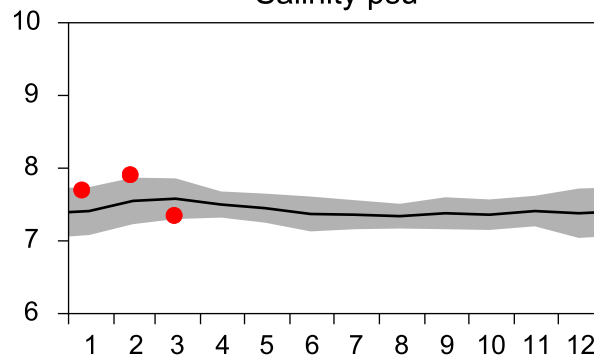
■ St.Dev.

● 2017

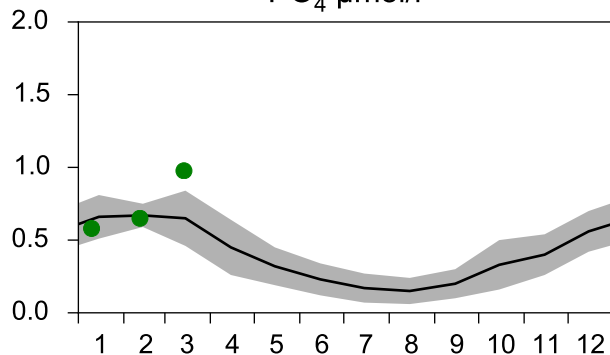
Temperature °C



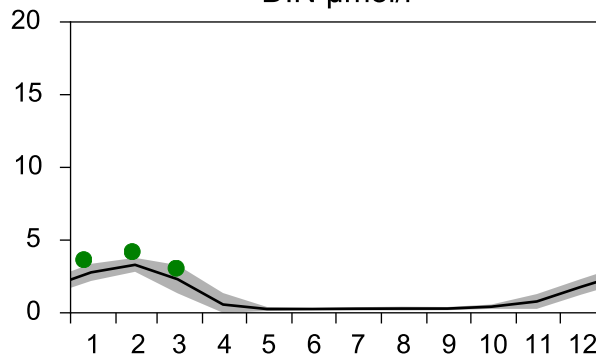
Salinity psu



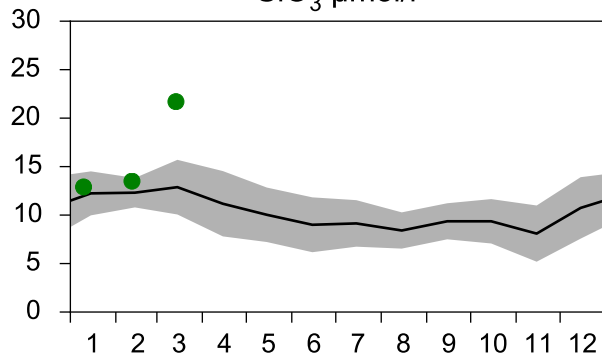
PO₄ µmol/l



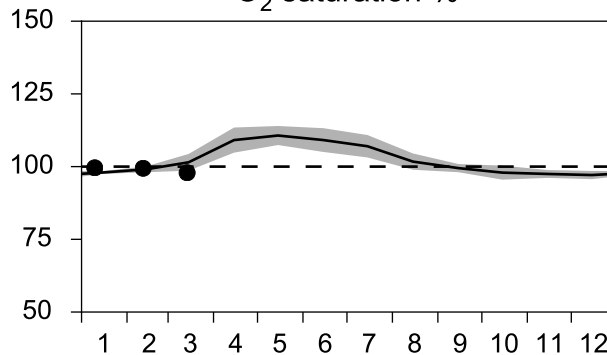
DIN µmol/l



SiO₃ µmol/l

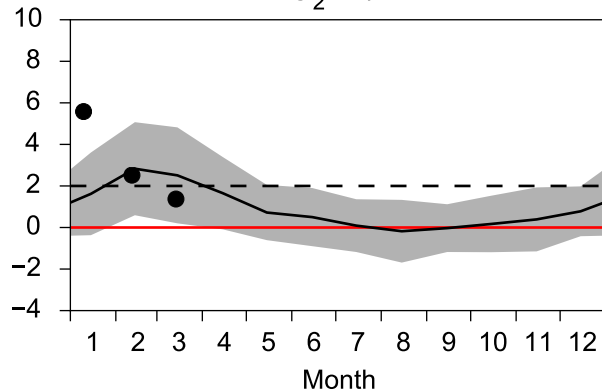


O₂ saturation %

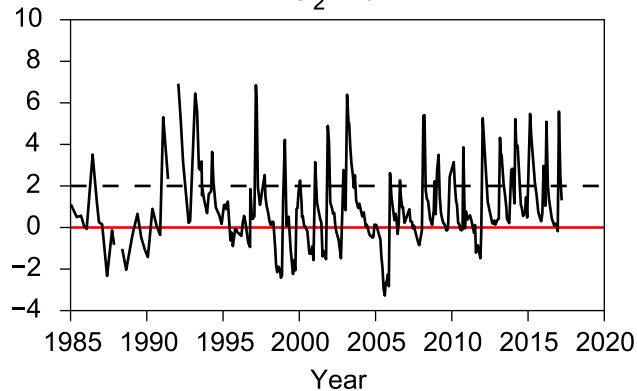


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

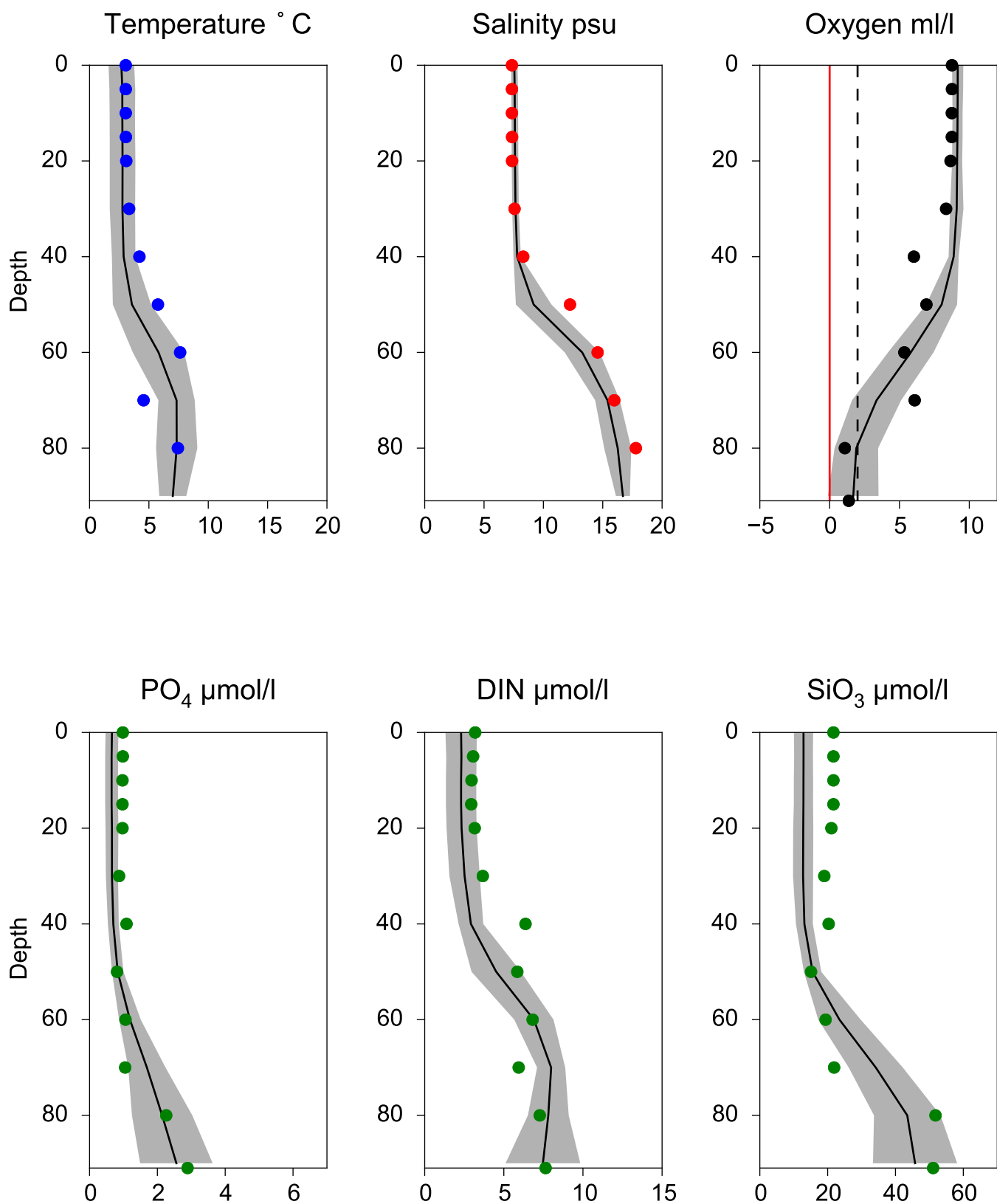


O₂ ml/l



Vertical profiles BY4 CHRISTIANSÖ March

— Mean 2001-2015 St.Dev. • 2017-03-14



STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)

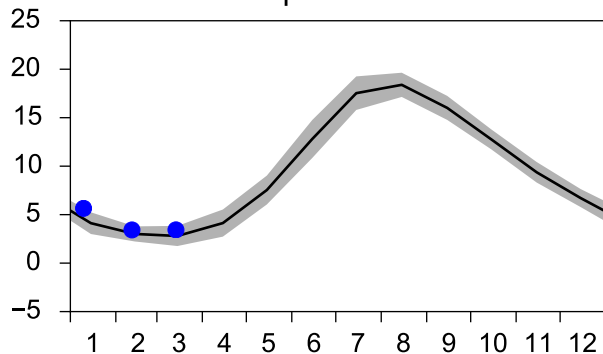
Annual Cycles

— Mean 2001-2015

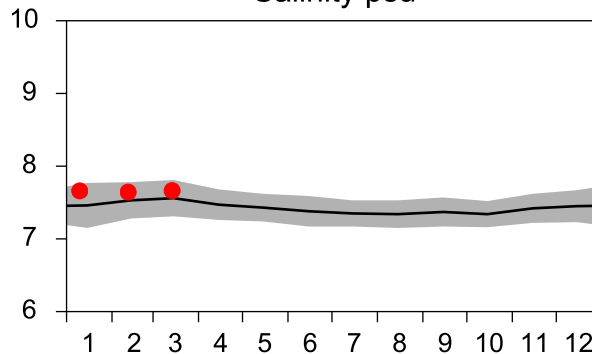
■ St.Dev.

● 2017

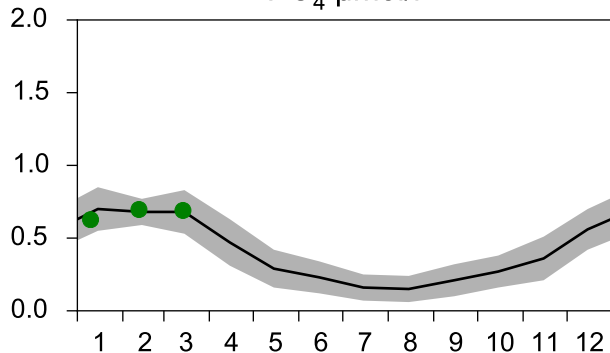
Temperature °C



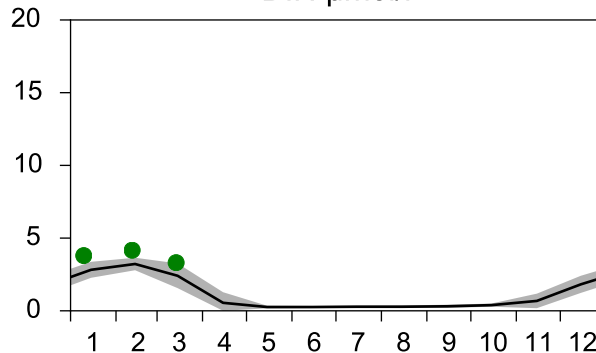
Salinity psu



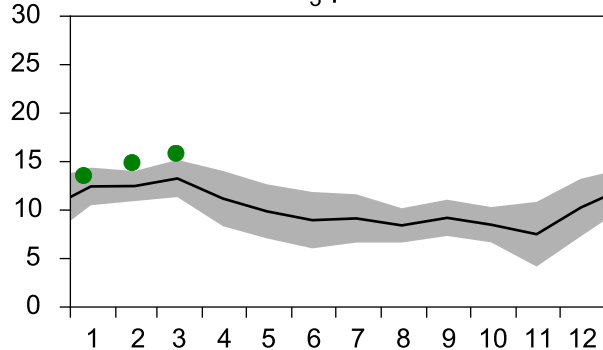
PO₄ µmol/l



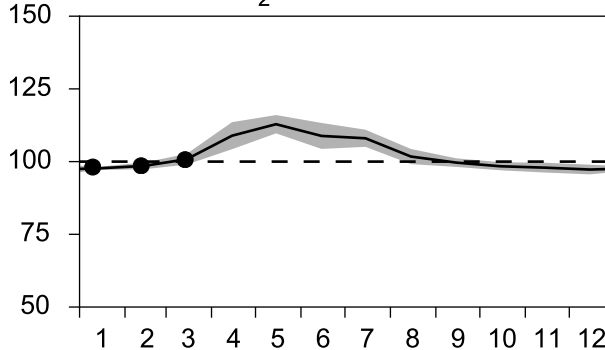
DIN µmol/l



SiO₃ µmol/l

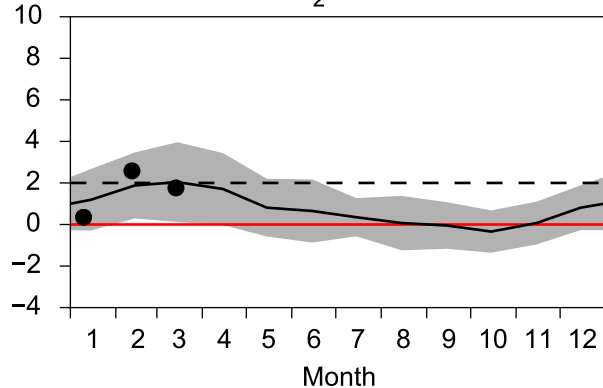


O₂ saturation %

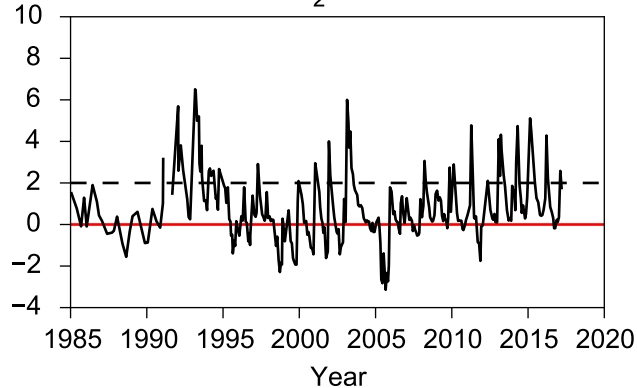


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

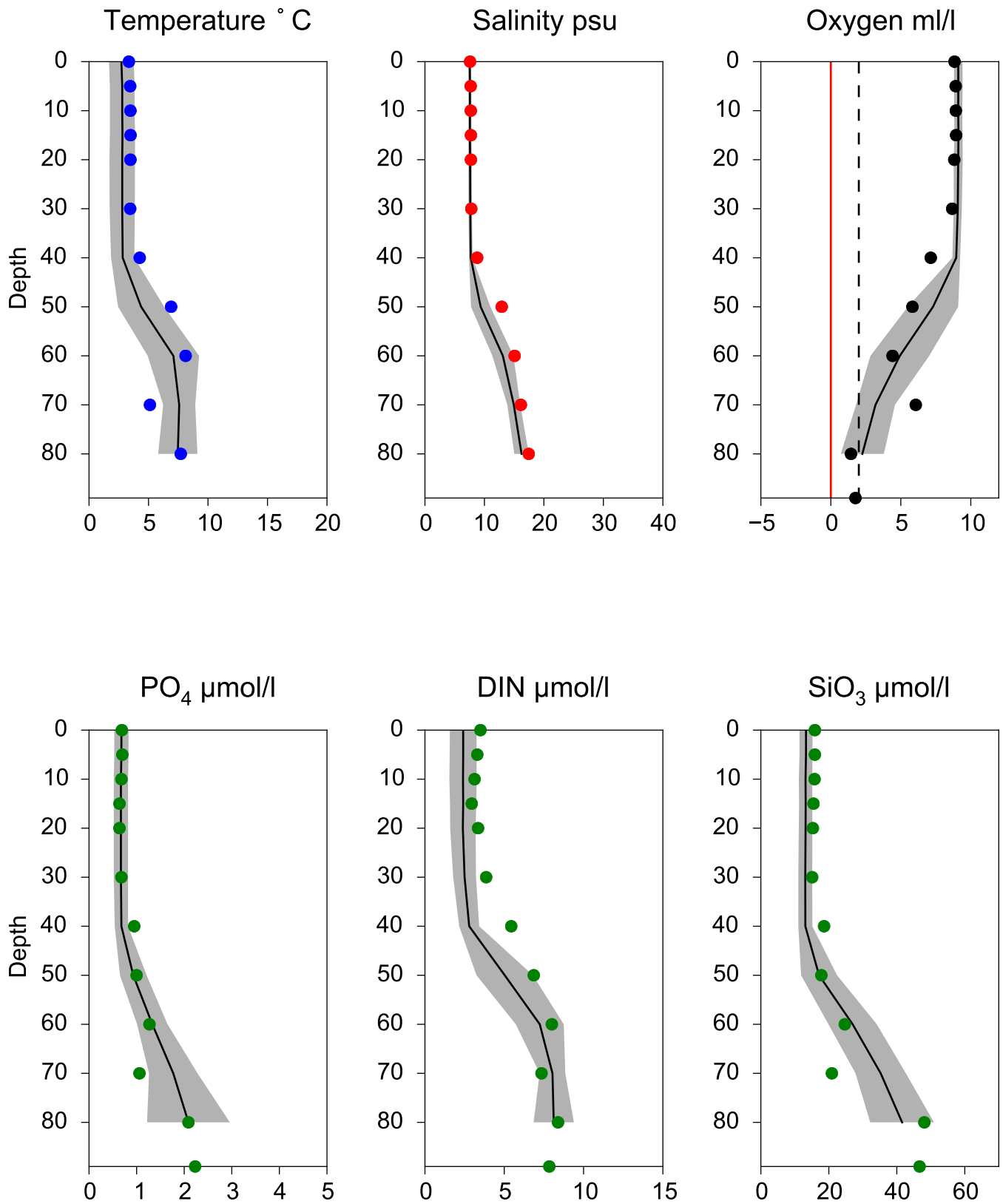


O₂ ml/l



Vertical profiles BY5 BORNHOLMSDJ March

— Mean 2001-2015 ■ St.Dev. ● 2017-03-14



STATION BY10 SURFACE WATER (0-10 m)

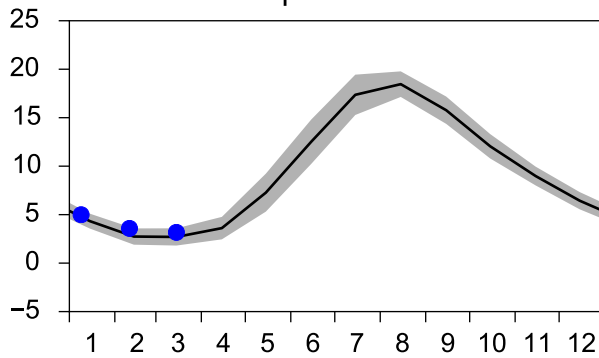
Annual Cycles

— Mean 2001-2015

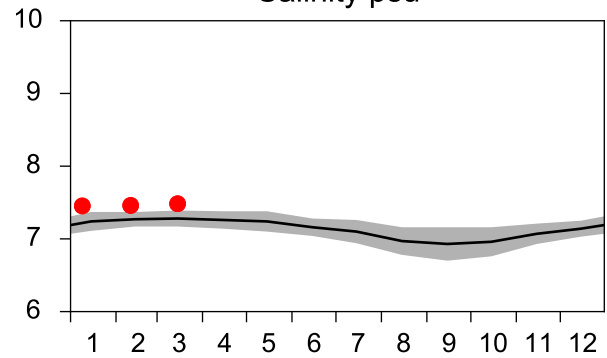
■ St.Dev.

● 2017

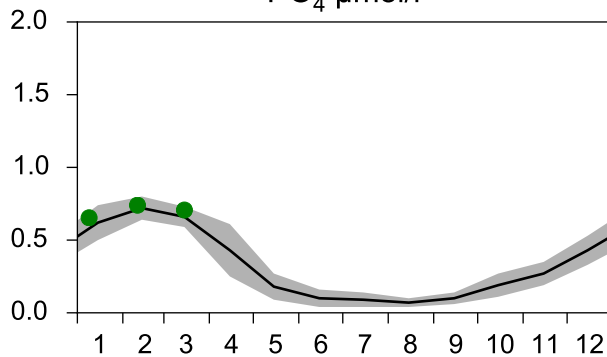
Temperature °C



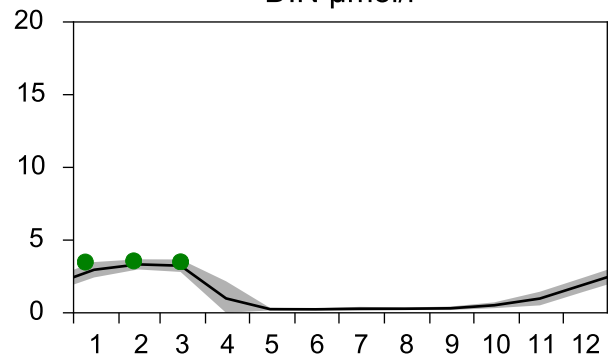
Salinity psu



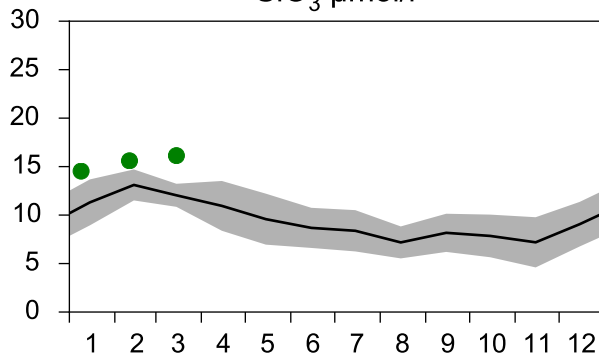
PO₄ µmol/l



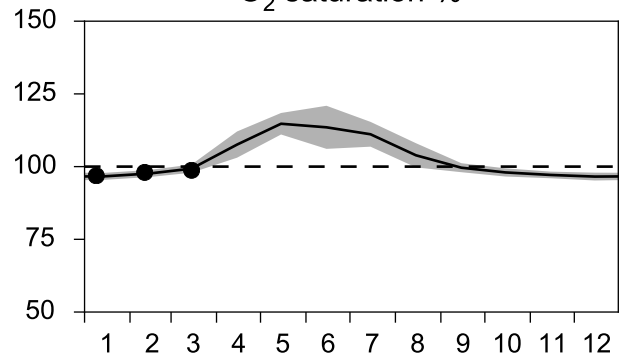
DIN µmol/l



SiO₃ µmol/l

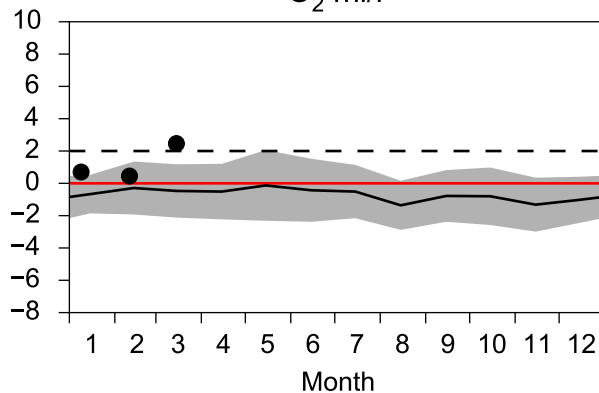


O₂ saturation %

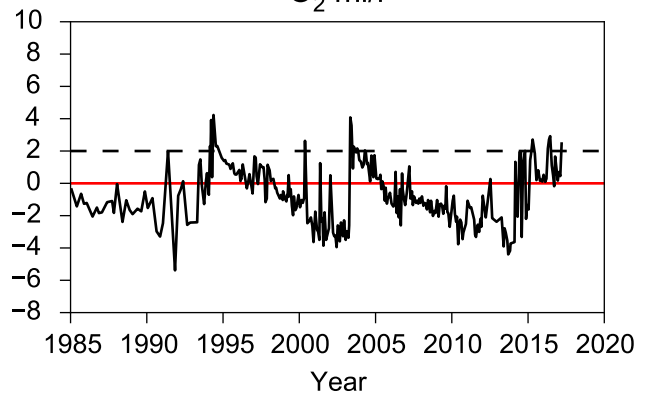


OXYGEN IN BOTTOM WATER (depth ≥ 125 m)

O₂ ml/l

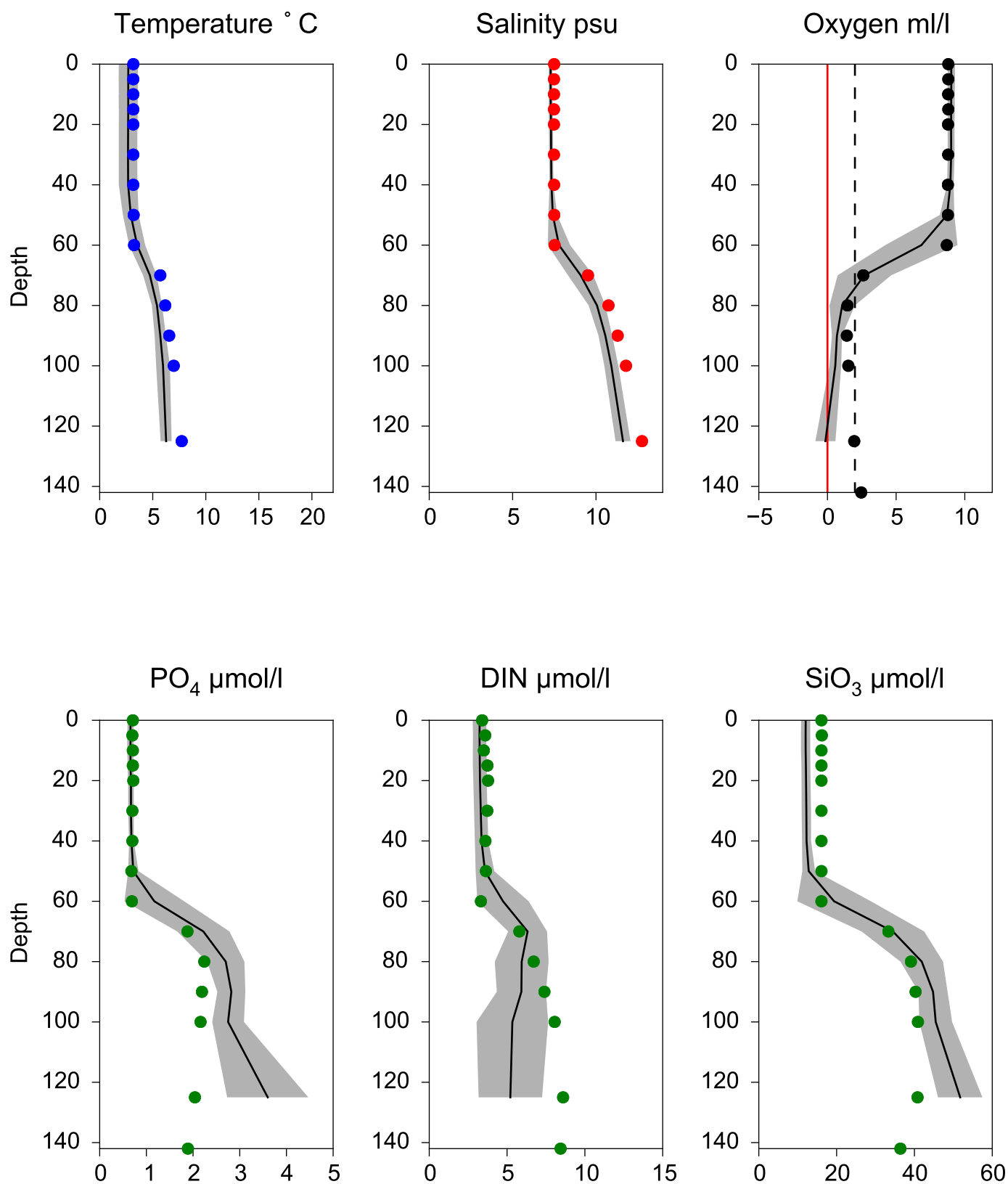


O₂ ml/l



Vertical profiles BY10 March

— Mean 2001-2015 St.Dev. • 2017-03-15



STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

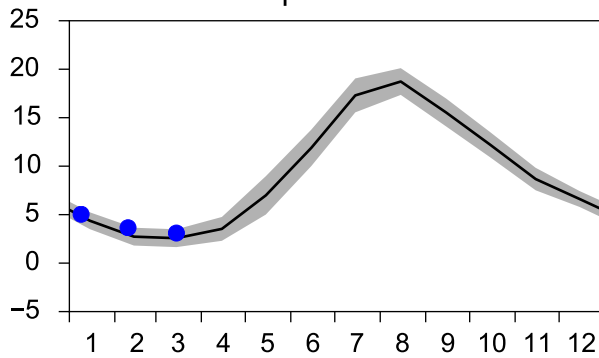
Annual Cycles

— Mean 2001-2015

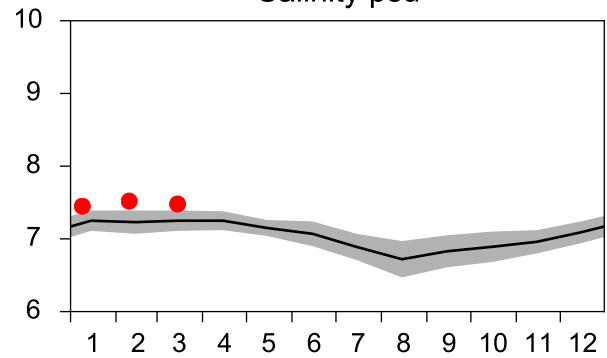
■ St.Dev.

● 2017

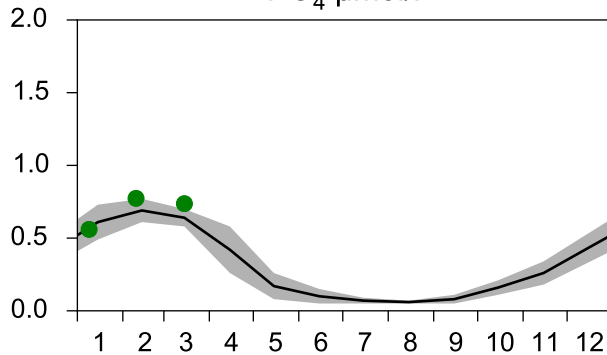
Temperature °C



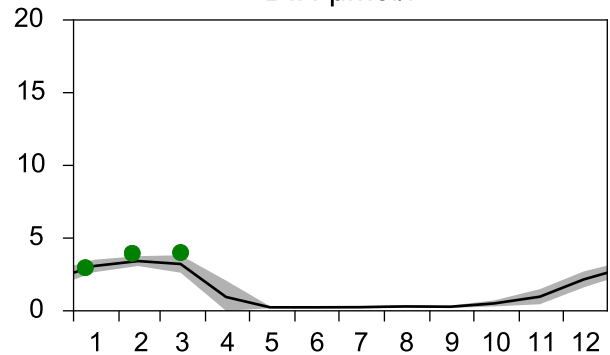
Salinity psu



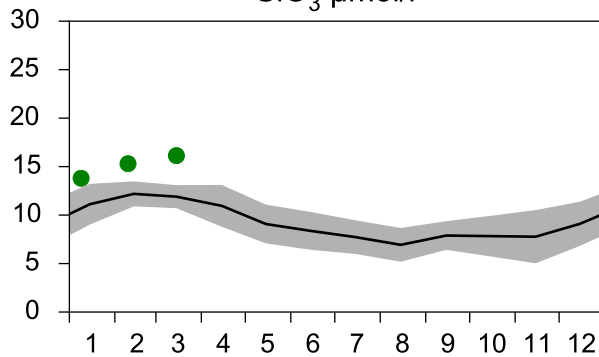
PO₄ µmol/l



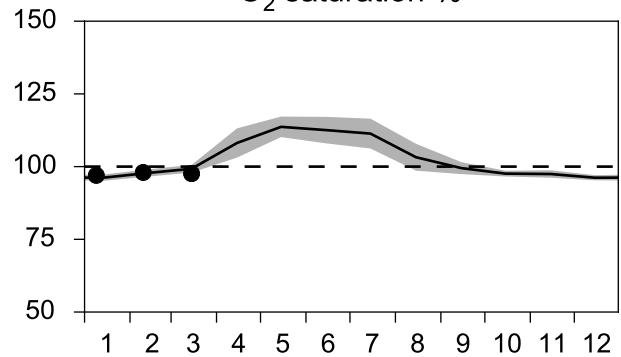
DIN µmol/l



SiO₃ µmol/l

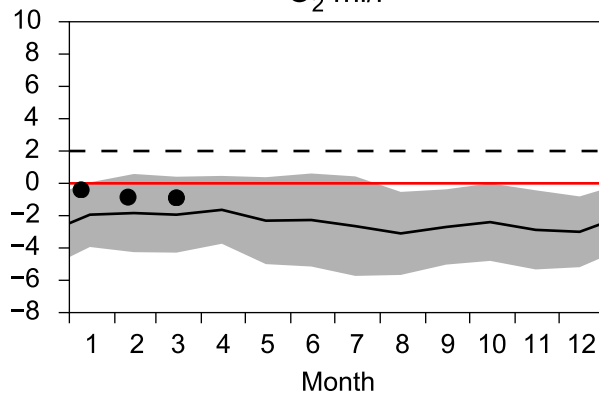


O₂ saturation %

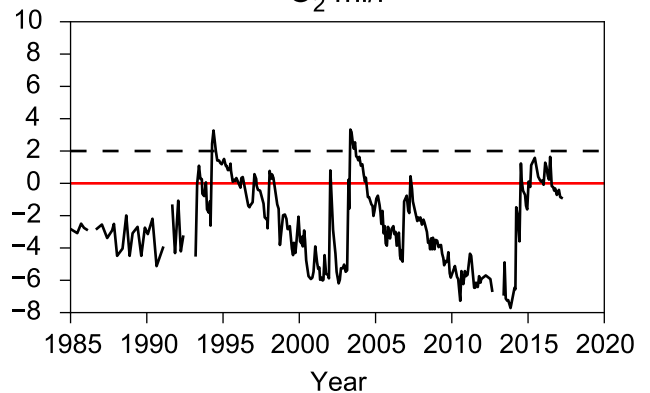


OXYGEN IN BOTTOM WATER (depth >= 225 m)

O₂ ml/l

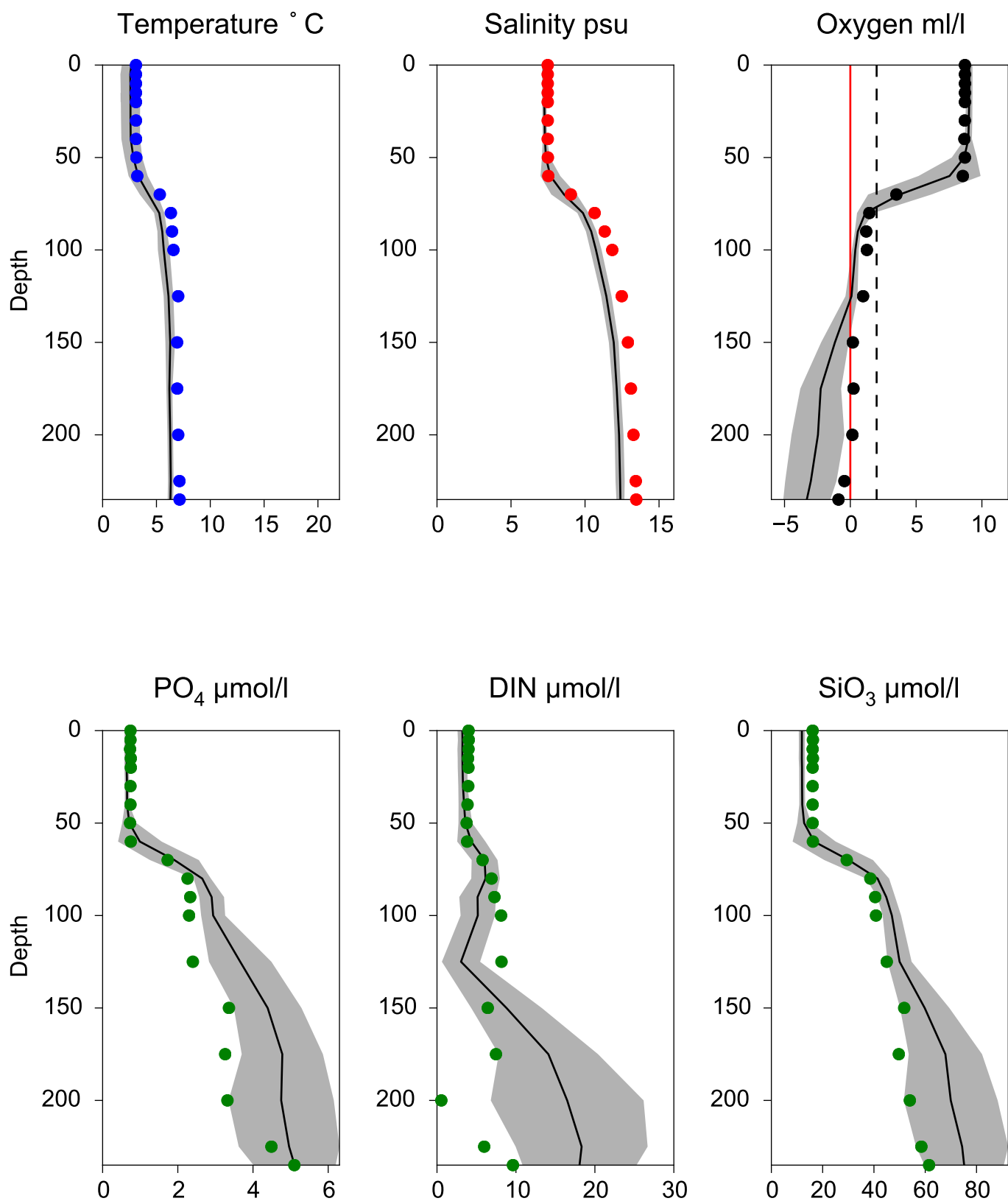


O₂ ml/l



Vertical profiles BY15 GOTLANDSDJ March

— Mean 2001-2015 St.Dev. • 2017-03-15



STATION BY20 FÅRÖDJ SURFACE WATER (0-10 m)

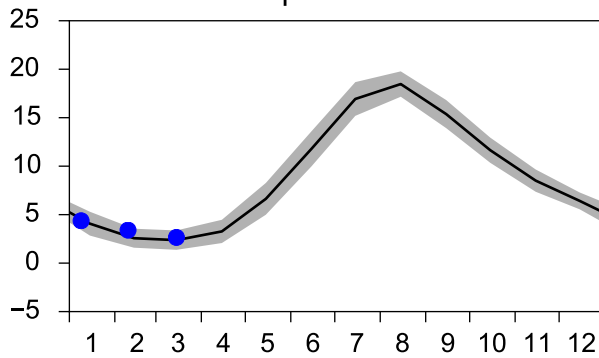
Annual Cycles

— Mean 2001-2015

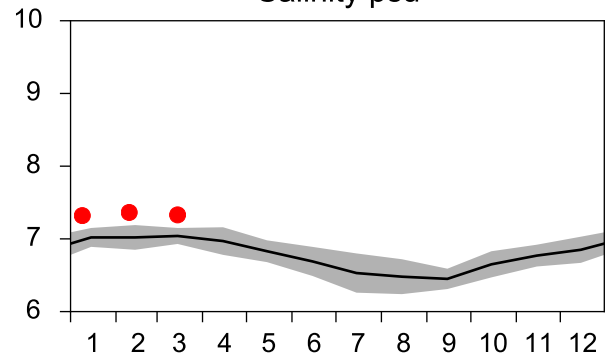
■ St.Dev.

● 2017

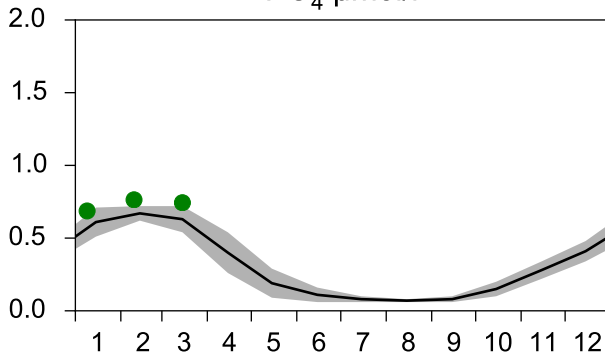
Temperature °C



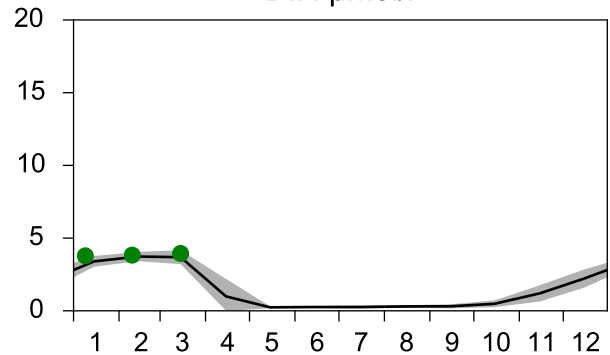
Salinity psu



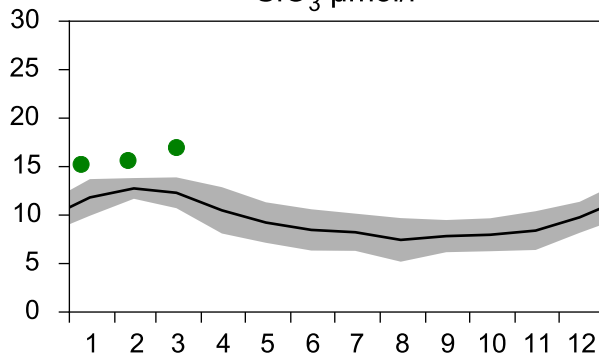
PO₄ µmol/l



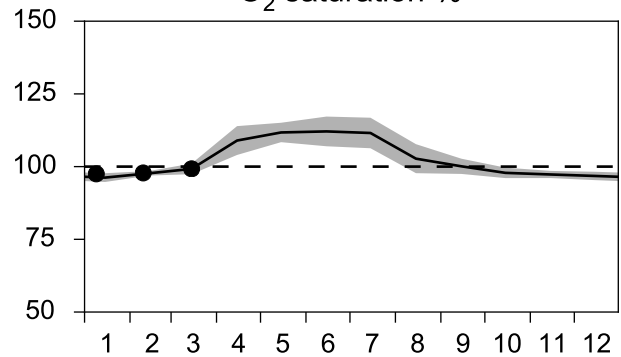
DIN µmol/l



SiO₃ µmol/l

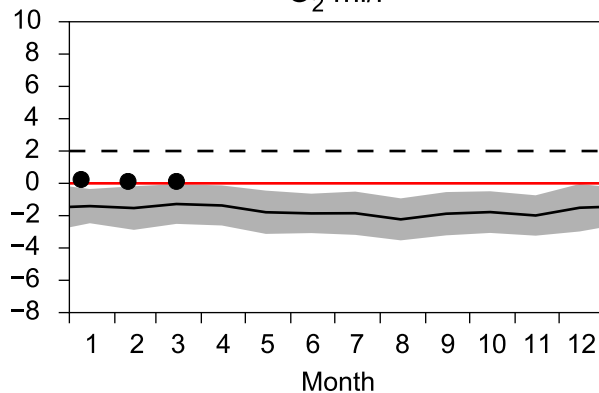


O₂ saturation %

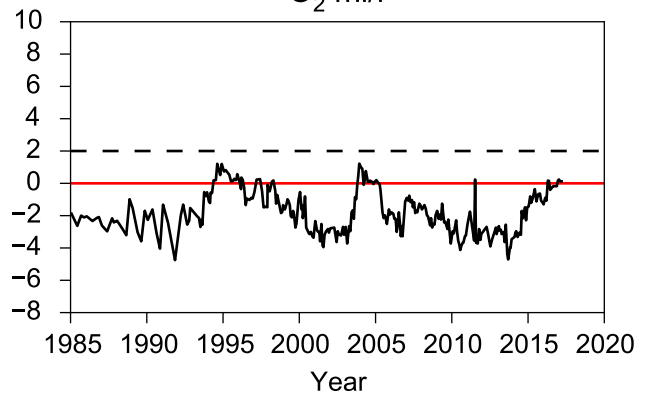


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

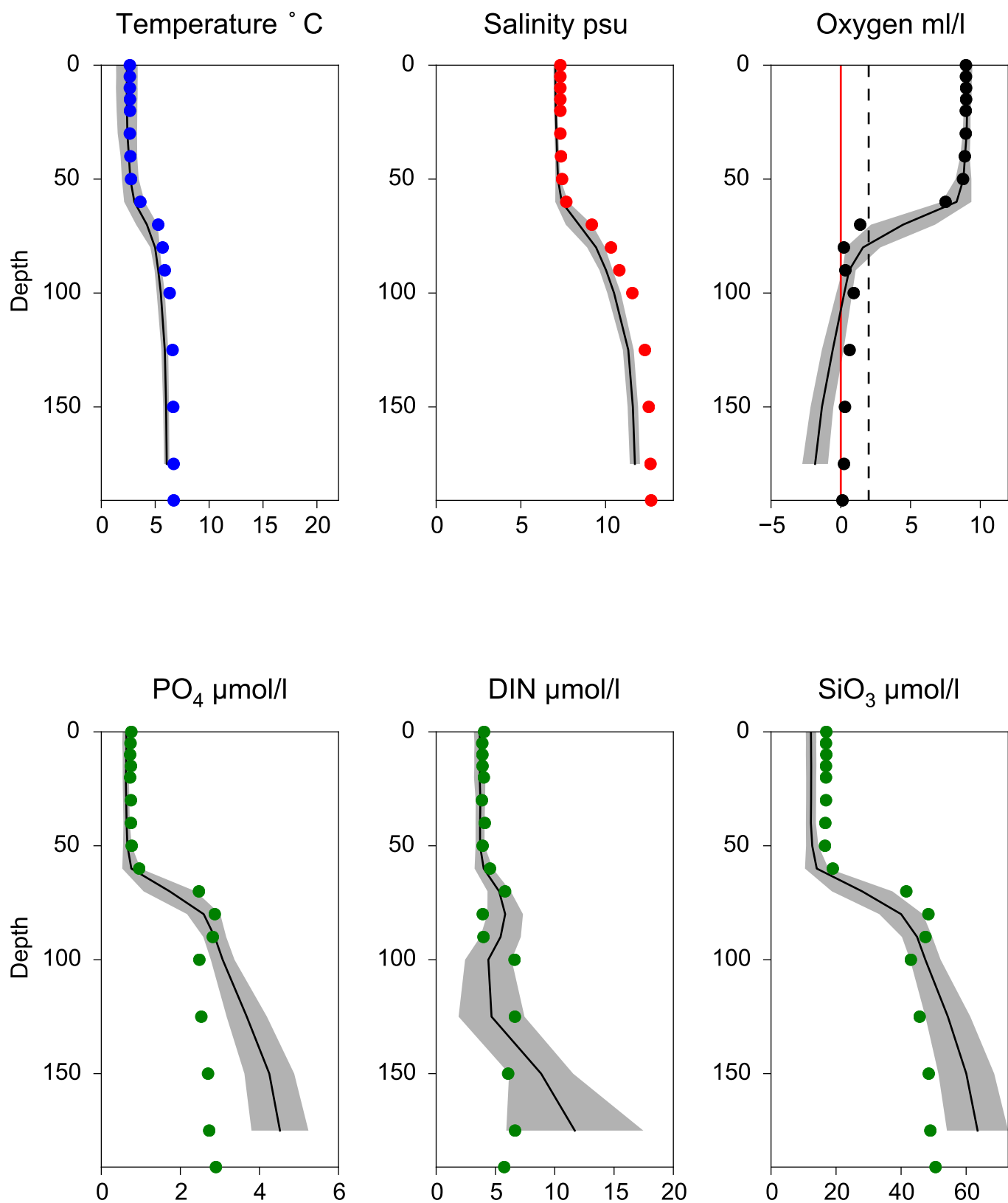


O₂ ml/l



Vertical profiles BY20 FÅRÖDJ March

— Mean 2001-2015 St.Dev. • 2017-03-15



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

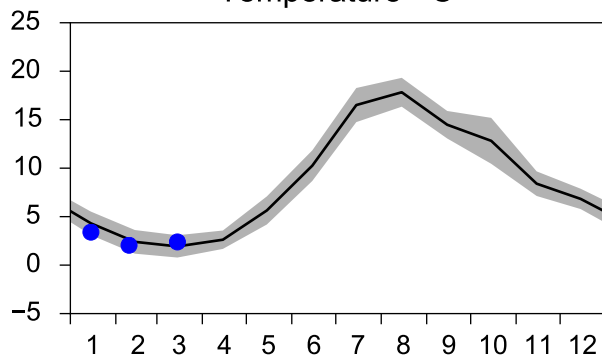
Annual Cycles

— Mean 2001-2015

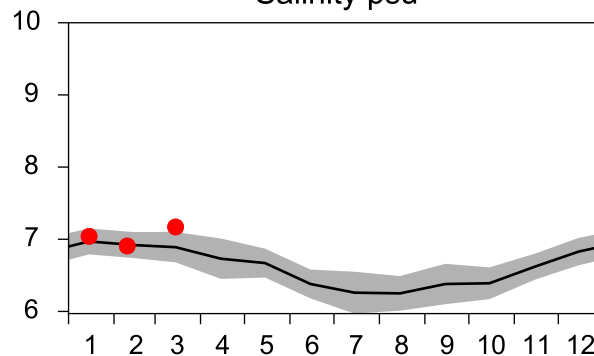
■ St.Dev.

● 2017

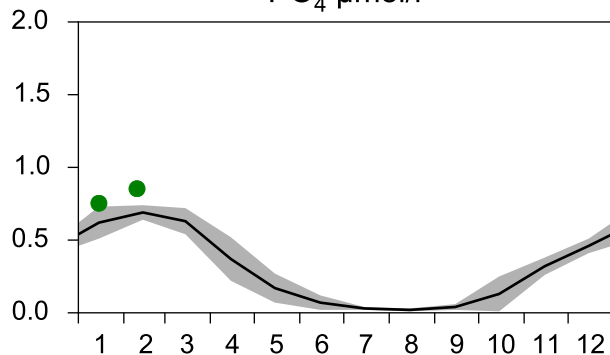
Temperature °C



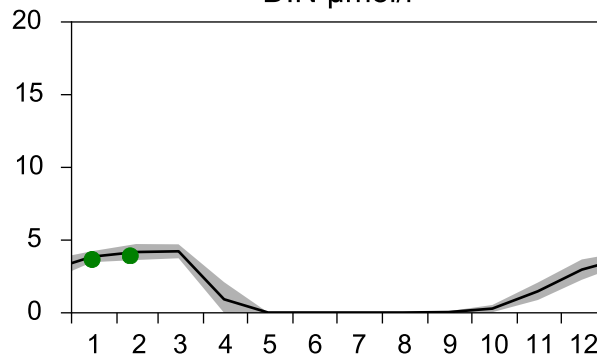
Salinity psu



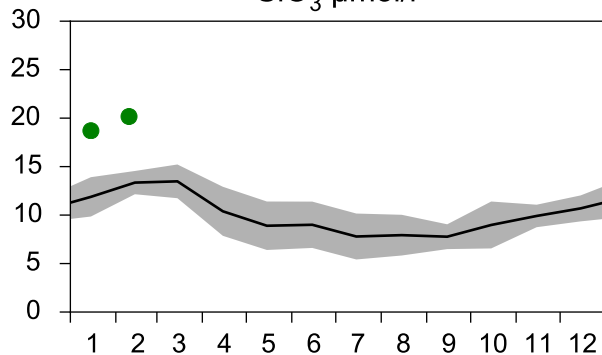
PO₄ µmol/l



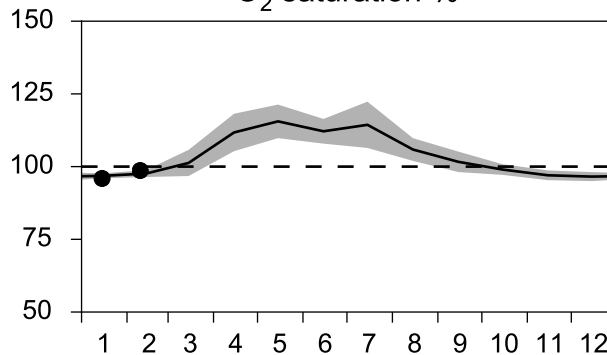
DIN µmol/l



SiO₃ µmol/l

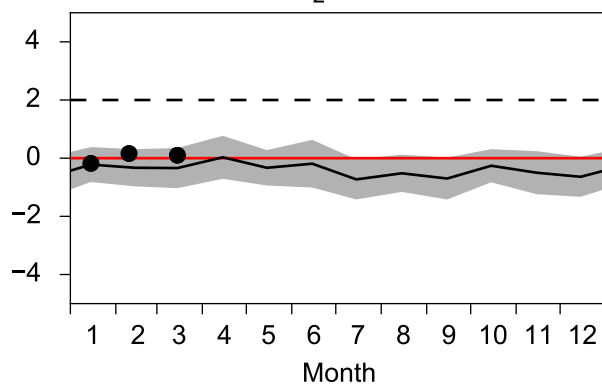


O₂ saturation %

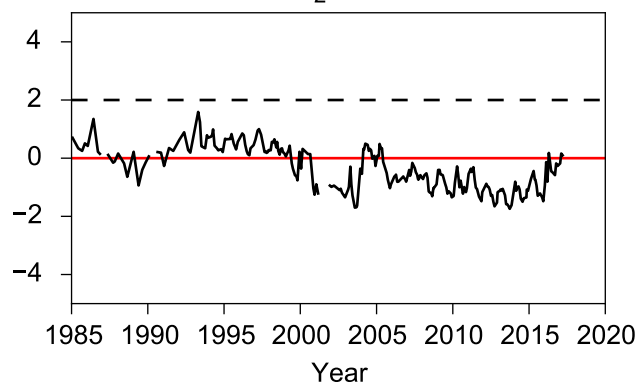


OXYGEN IN BOTTOM WATER (depth >= 150 m)

O₂ ml/l



O₂ ml/l



Vertical profiles BY29 / LL19 March

— Mean 2001-2015 ■ St.Dev. ● 2017-03-15

