

Report from the SMHI monitoring cruise with R/V Aranda



Survey period:

2017-02-09 to 2017-02-17

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 the Baltic Proper the winter pool of nutrients were mapped.

All nutrients in the surface water were generally normal for the season, except in the Baltic Proper where concentrations of silicate were higher or much higher than normal. The surface water temperature was normal for the season except in the Skagerrak where it was colder. The surface salinity was lower than normal in the Skagerrak and the Kattegat and normal to slightly above normal in the Baltic Proper.

In large parts of the deep water in the Baltic Proper the oxygen concentrations were close to 0 ml/l. At the stations in the western Gotland basin hydrogen sulphide was present from 80 to 100 meters, at station BY31 Landsort Deep from 125 meters and at station BY29 no hydrogen sulphide was present this time. Between BY29 and BY15 in the eastern Gotland basin hydrogen sulphide was found at the bottom depth at BY21 and from 215 meters at BY15. Hypoxia, < 2 ml/l was found in all basins from 65-85 meters depths in the Baltic Proper. In the Hanö Bight, hypoxia was found from 70 meters, in contrast oxygen concentrations above 2 ml/l were observed in the bottom water in the Bornholm basin.

The fluorescence from the CTD showed an ongoing spring bloom in the surface water in the Skagerrak and the Kattegat.

Next cruise is scheduled to start 9th of March.

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RESULTS

The cruise was performed aboard the Finnish research vessel Aranda and started in Helsinki on the 9th of February and ended in Åbo/Turku on 17th of February. The winds during the cruise were weak to moderate and from varying directions.

During the cruise a wave buoy at Knolls grund was replaced with a new one.

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 temperature in the surface water was lower than normal for the season and varied between 0.7 and 2.0°C, and the surface salinity was lower than normal, 19.7-25.9 psu. The halocline and thermocline coincided at 10-25 meters depth.

The concentration of inorganic nitrogen (nitrate+nitrite+ammonia) in the surface was slightly below normal and was between 4.48 and 5.13 µmol/l. Silicate was generally lower than normal in the surface water and varied between 7.2 and 8.9 µmol/l. The concentration of phosphate was slightly higher than normal and was between 0.55 and 0.59 µmol/l in the surface water.

The bottom water was well oxygenated with 6.1 ml/l.

The fluorescence from the CTD showed an ongoing spring bloom in the surface water.

The Kattegat and the Sound

The temperature of the surface water was normal for the season and varied between 1.4 and 2.2 °C. The surface salinities were lower than normal for the season and varied between 21 psu in the northern part and 8 psu in the Sound. In the Kattegat the thermocline and halocline coincided at 15 meters depth. The Sound had a stronger stratification at 15 meter with low salinity in the surface, 8 psu, and higher in the bottom layer, 31 psu.

The phosphate concentration was normal to slightly above normal and varied between 0.57 and 0.63 µmol/l. The inorganic nitrogen in the surface water was normal for the season and varied between 4.27 – 5.20 µmol/l. The concentration of silicate in surface water varied between 8.6-13.7 µmol/l, with the highest concentrations in the Sound and was normal to above normal for the season.

The deep water was well oxygenated in the whole Kattegat as well as in the Sound, which is normal for the season. The lowest concentrations in the bottom water were measured to 6.1 ml/l.

The fluorescence from the CTD indicated some plankton activity in the whole area.

The Baltic Proper

The temperature in the surface water was normal for the season and varied between 1.9-3.6 °C. The salinity was normal to slightly above normal in the whole investigated area. Surface salinity varied between 6.9-8.0 psu with the lowest salinity in the Northern Gotland Basin and the highest in the Arkona Basin. The surface layer was well mixed to 60-80 meters in the central and northern parts and shallower in the southwestern parts where it was well mixed to 40-50 meters.

Mapping of the winter pool was performed in the area, presented in figure 2. The phosphate concentrations were normal to slightly above normal for the season, concentrations varied between 0.65-0.96 $\mu\text{mol/l}$. The concentrations of inorganic nitrogen was normal except in the south and in the south west where it was above normal, variations were 3.62-7.54 $\mu\text{mol/l}$, lowest in the western Gotland basin and highest in the Arkona basin. Silicate concentrations continued to be highly elevated in the whole area and varied between 13.5-21.1 $\mu\text{mol/l}$.

In large parts of the deep water in the Baltic Proper the oxygen concentrations were close to 0 ml/l. At the stations in western Gotland basin hydrogen sulphide was present from 80 to 100 meters, at BY31 Landsort Deep from 125 meters and at BY29 no hydrogen sulphide was present this time. Between BY29 and BY15 in the eastern Gotland basin hydrogen sulphide was found at the bottom depth at BY21 and from 215 meters at BY15. Hypoxia, < 2 ml/l was found in all basins from 65-85 meters depths in the Baltic Proper.

In the Hanö Bight, hypoxia was found from 70 meters, however oxygen concentrations above 2 ml/l were observed in the Bornholm basin in the bottom water.

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

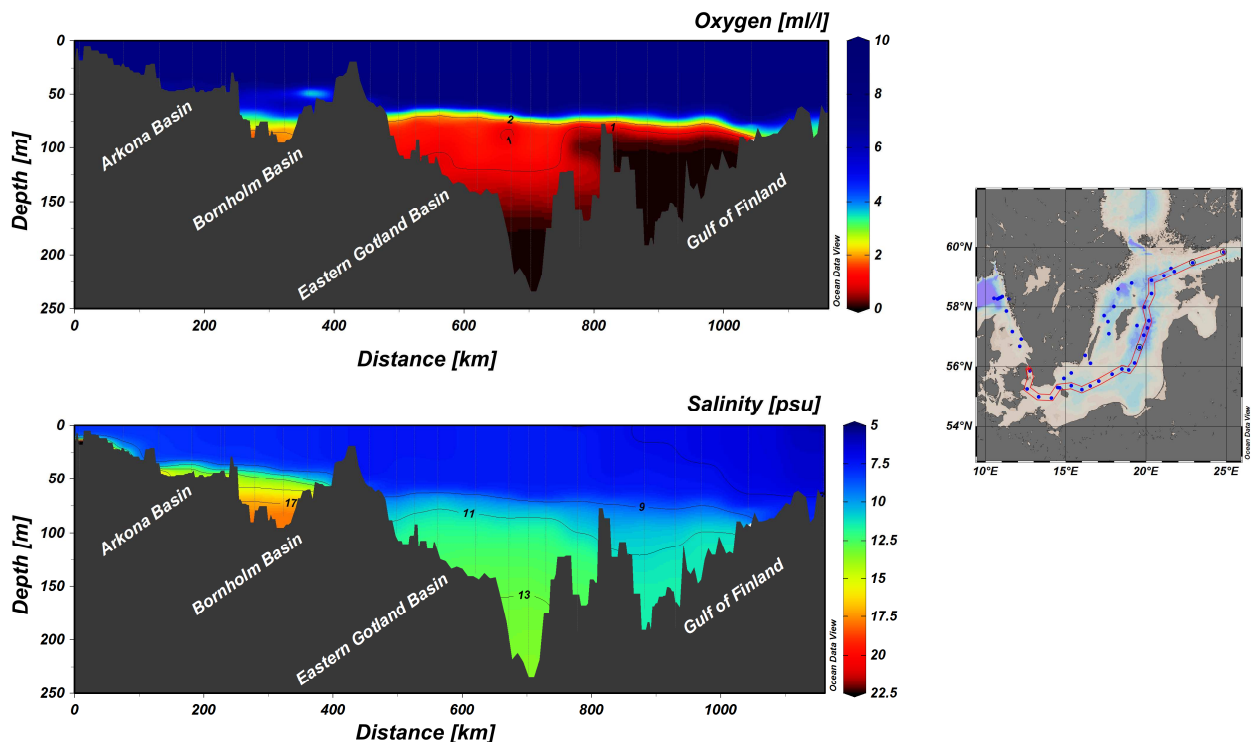


Figure 1. Transect showing oxygen and salinity through the Baltic Proper, from the Sound to the Gulf of Finland

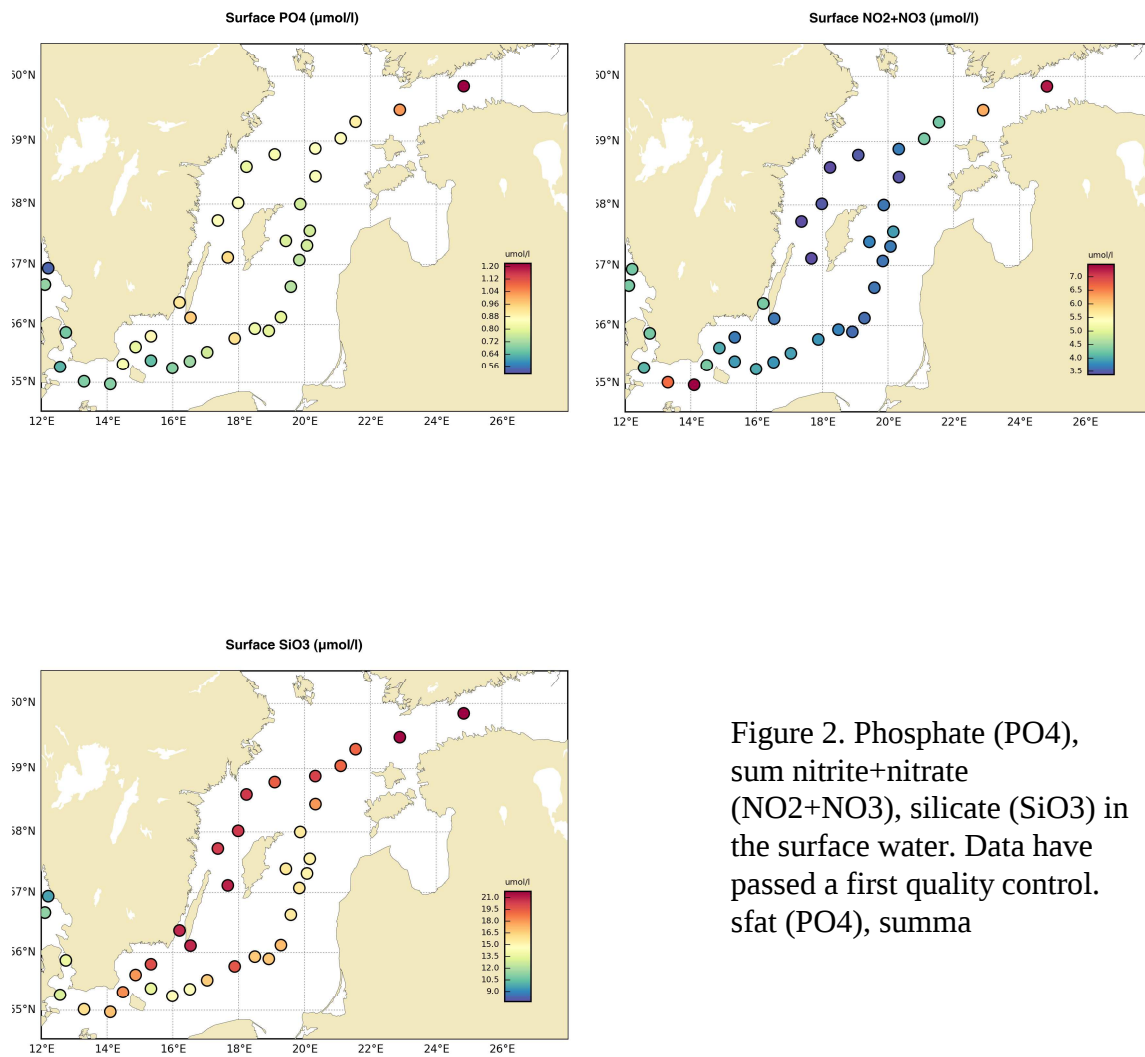


Figure 2. Phosphate (PO₄), sum nitrite+nitrate (NO₂+NO₃), silicate (SiO₃) in the surface water. Data have passed a first quality control. sfat (PO₄), summa

PARTICIPANTS

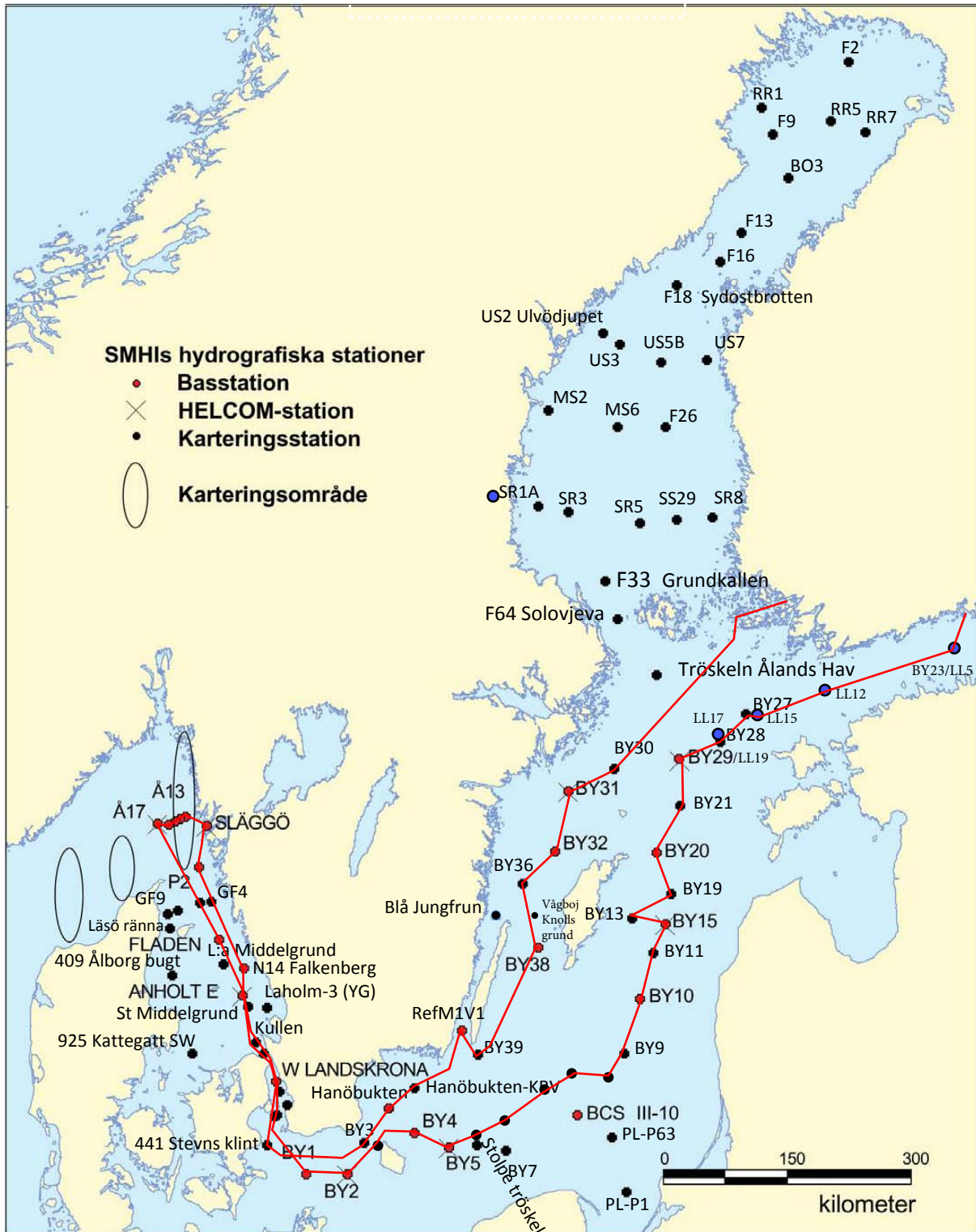
Name		Institute
Anna-Kerstin Thell	Chief Scientist	SMHI
Kristin Andreasson		SMHI
Sara Johansson		SMHI
Johan Kronsell		SMHI
Daniel Simonsson		SMHI
Ann-Turi Skjevik		SMHI

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: 20170108-20170115
 Series: 0001-0033



Time: 13:43

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	WCWI elac aove	CZPP ho hoy	No de	No btl	T e	T e	S a	S a	P h	D o	D H	P P	N N	N N	A A	N A	S H	C C

Time: 13:43

Year: 2017

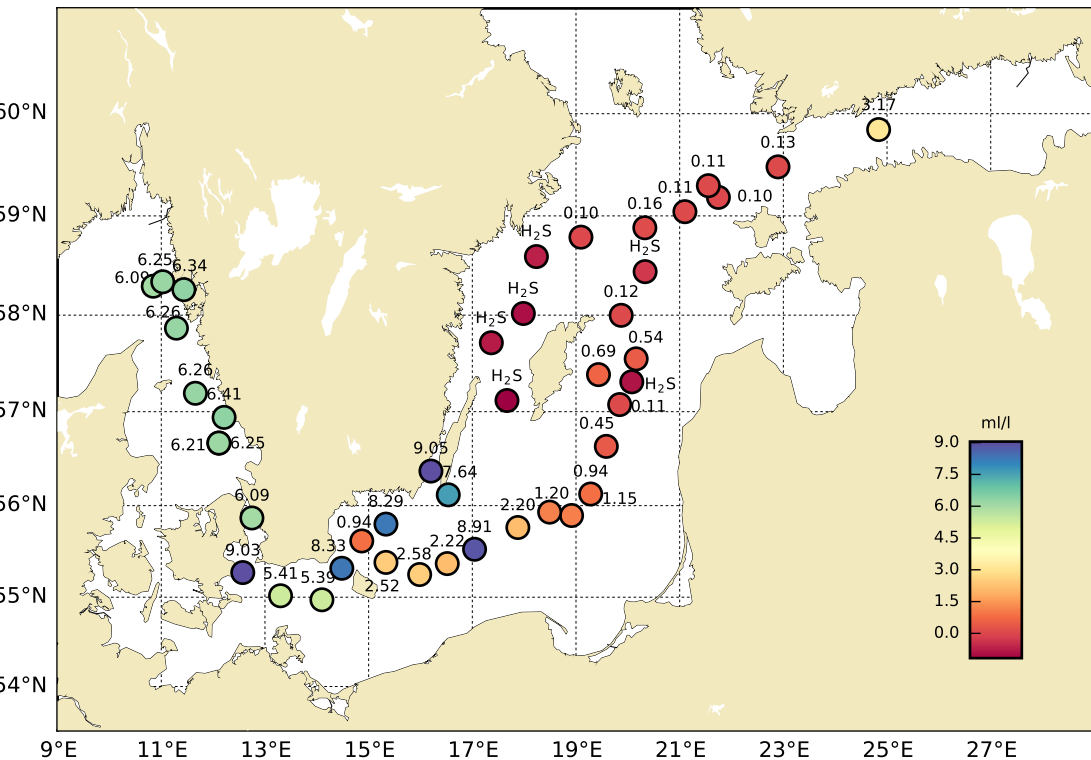
Ser no	Cru no	Stat code	Proj	Stat name	Lat	Lon	Start date yyyymmdd	Start time hhmm	Bottom depth m	Secchi depth m	Wind dir vel	Air temp C	Air pres hPa	WCVI elac aove	CZPP hoyp apt	No de	No btl	T e m m p p t t s s a a l l h o o x x s s o o r r r r o o k k m m m m n n n n a a s h c c
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0133	3	BPSA00	BAS	BY3 HAMRARNE SUND	5519.11	01428.95	20170215	0000	48		26 3	3.9 1035	9990	----	8 8	8 8	x x x x	- x x x x x x x x x x x x - x - -
0134	3	BPSH05	BAS	HANÖBUKTEN	5537.03	01452.04	20170215	0230	80		28 2	3.6 1034	9990	x---	11 11	11 11	x x x x	- x x x x x x x x x x x x - x - -
0135	3	BPSH51	BAS	HANÖBUKTEN-KBV	5548.02	01520.05	20170215	0445	60		00 0	2.0 1034	9990	----	9 9	9 9	x x x x	- x x x x x x x x x x x x - x - -
0136	3	BPWK01	BAS	REF M1V1	5622.25	01612.11	20170215	0925	21		00 0	1.0 1034	1101	xxxx	5 5	5 5	x x x x	x x x x x x x x x x x x x x x x - -
0137	3	BPSE49	BAS	BY39 ÖLANDS S UDDE	5606.98	01632.16	20170215	1205	50	15	22 5	3.0 1033	0020	----	8 8	8 8	x x x x	- x x x x x x x x x x x x - x - -
0138	3	BPWX45	BAS	BY38 KARLSÖDJ	5707.03	01740.12	20170215	1840	114		22 8	3.5 1029	9990	x-x-	14 14	14 14	x x x x	- x x x x x x x x x x x x - x x -
0139	3	BPWX00	EXT	Kno1ls grund	5730.86	01736.81	20170215	2315	90		23 8	3.3 1026	9990	----	12		- x - x	- - x - - - - - - - - - - x -
0140	3	BPWX42	BAS	BY36	5743.01	01722.01	20170216	0110	140		24 6	2.7 1025	9990	----	15 15	15 15	x x x x	- x x x x x x x x x x x x - x - -
0141	3	BPWX38	BAS	BY32 NORRKÖPINGSDJ	5801.01	01759.06	20170216	0430	205		29 4	2.4 1022	9990	x---	17 17	17 17	x x x x	- x x x x x x x x x x x x - x - -
0142	3	BPNX37	BAS	BY31 LANDSORTSDJ	5835.62	01814.18	20170216	0830	459	13	27 8	0.9 1019	1130	xxxx	23 23	23 23	x x x x	x x x x x x x x x x x x x x x x - -
0143	3	BPNX36	BAS	BY30	5847.29	01905.71	20170216	1305	191	10	25 8	1.5 1015	1630	----	16 16	16 16	x x x x	- x x x x x x x x x x x x - x - -

Bottom water oxygen concentration (ml/l)

Ship: Aranda

Date: 20170209-20170217

Series: 0095-0143



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

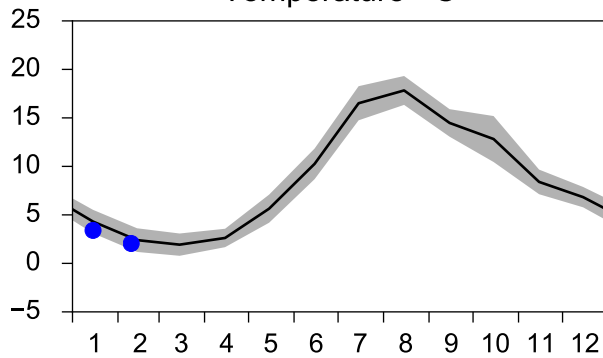
Annual Cycles

— Mean 2001-2015

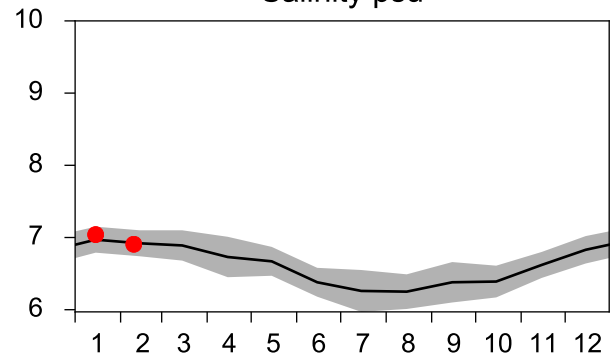
■ St.Dev.

● 2017

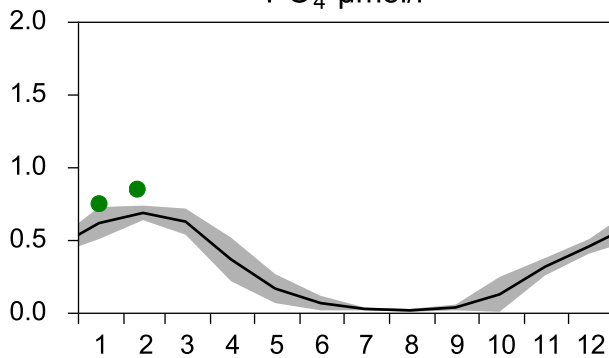
Temperature °C



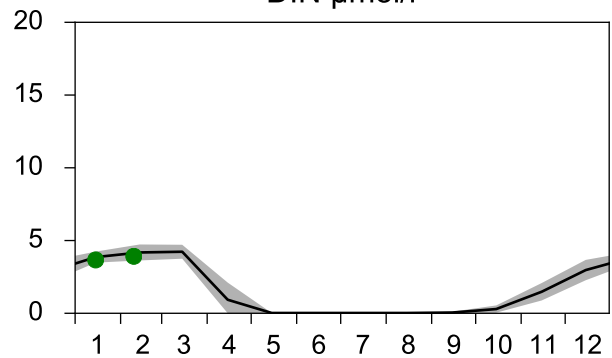
Salinity psu



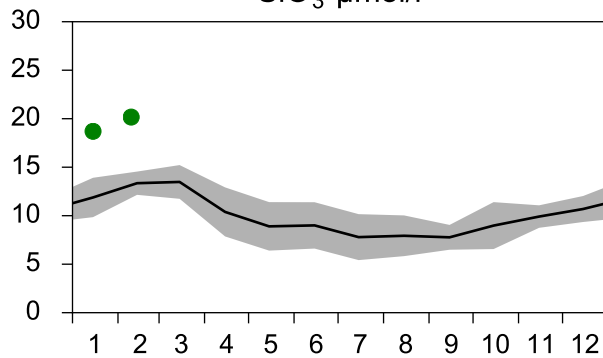
PO₄ μmol/l



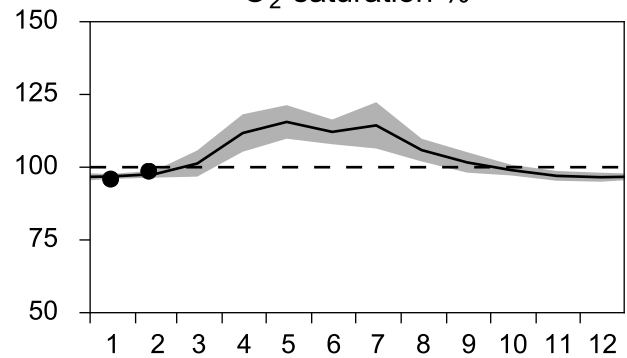
DIN μmol/l



SiO₃ μmol/l

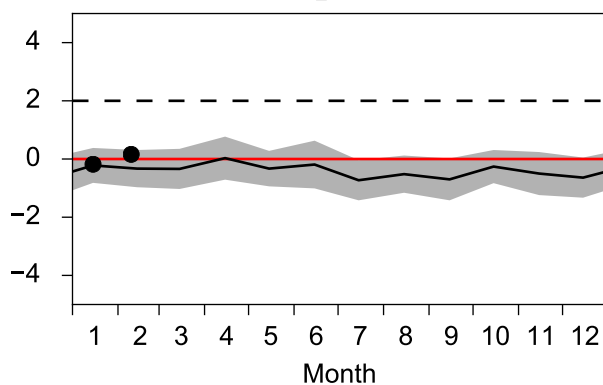


O₂ saturation %

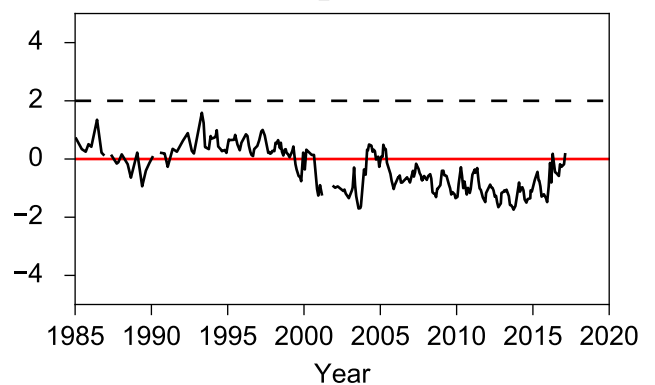


OXYGEN IN BOTTOM WATER (depth >= 150 m)

O₂ ml/l

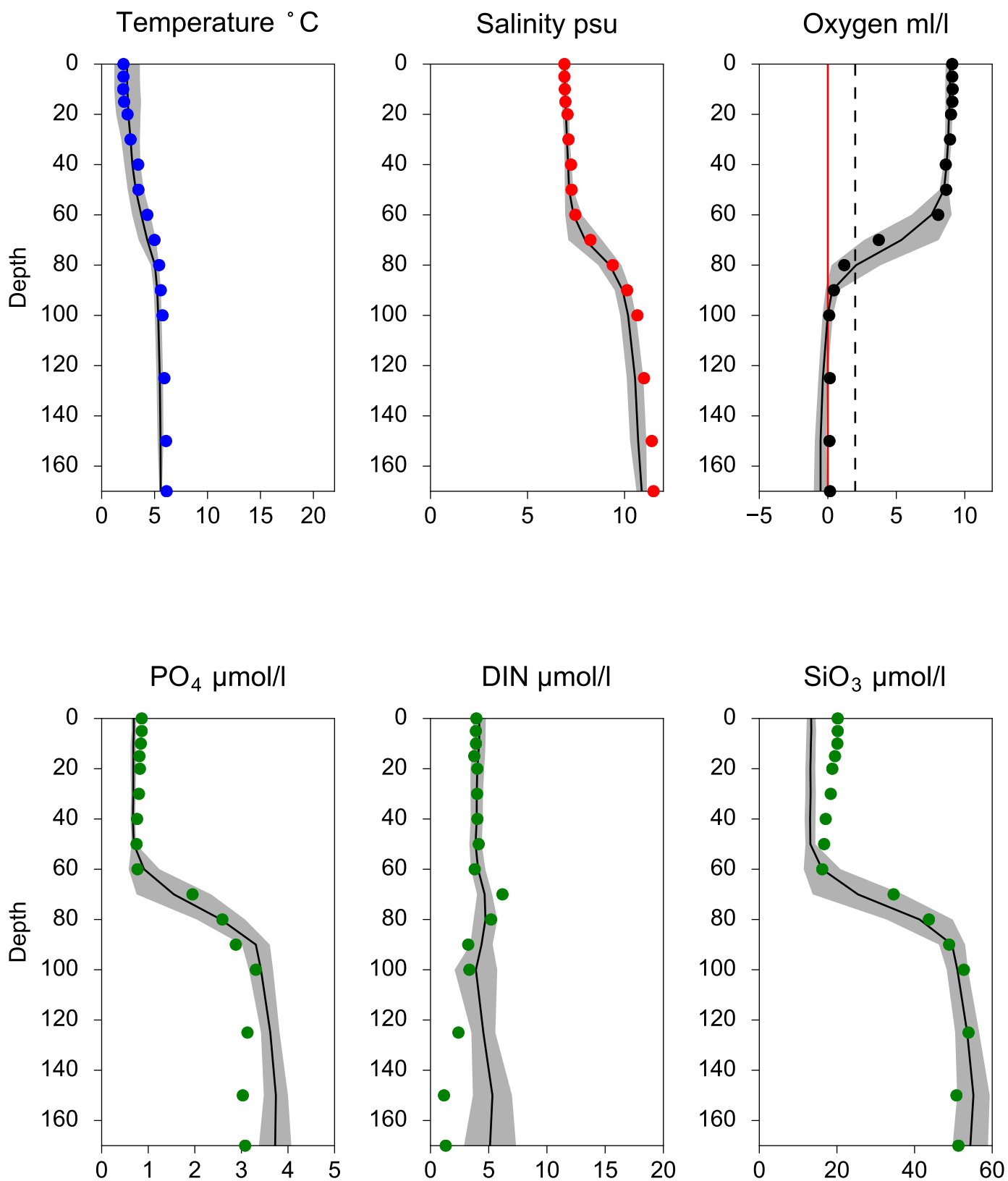


O₂ ml/l



Vertical profiles BY29 / LL19 February

— Mean 2001-2015 St.Dev. ● 2017-02-10



STATION BY20 FÅRÖDJ SURFACE WATER (0-10 m)

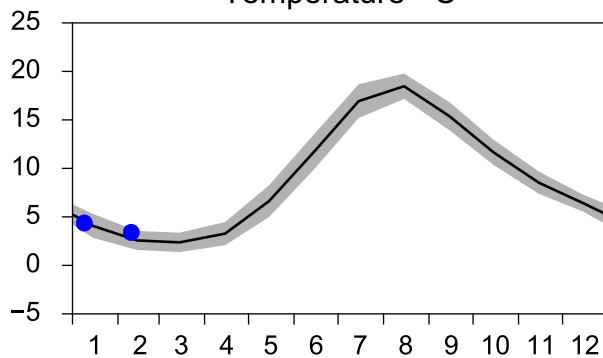
Annual Cycles

— Mean 2001-2015

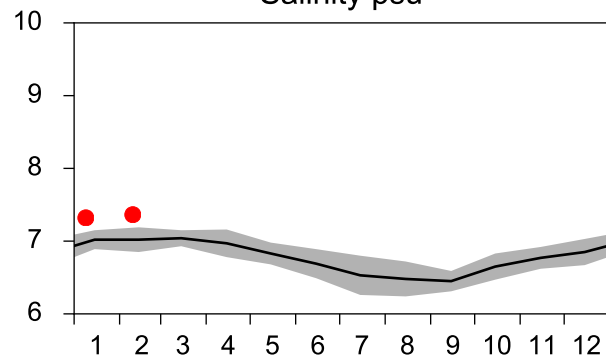
■ St.Dev.

● 2017

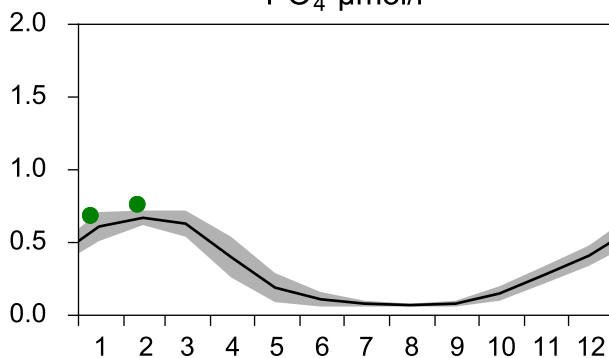
Temperature °C



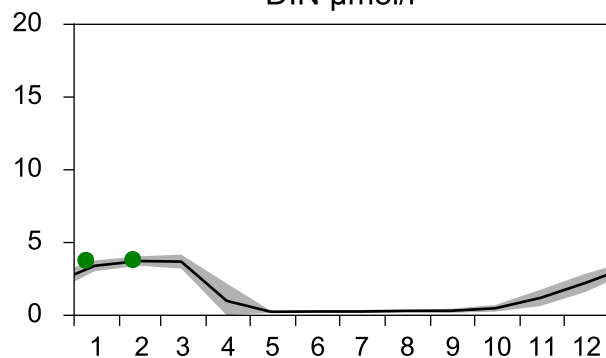
Salinity psu



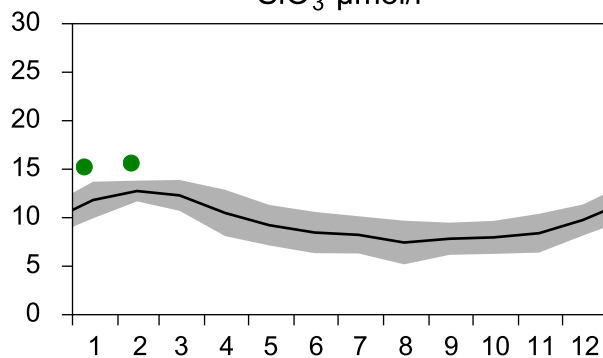
PO₄ µmol/l



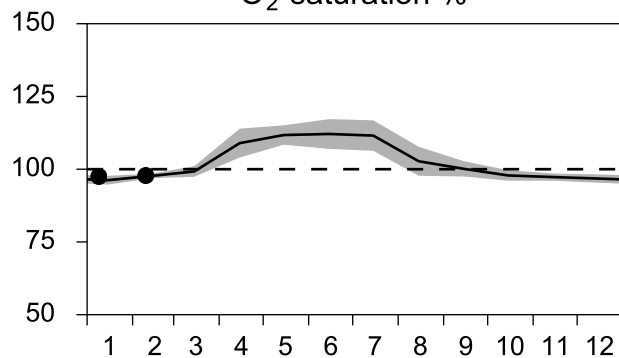
DIN µmol/l



SiO₃ µmol/l

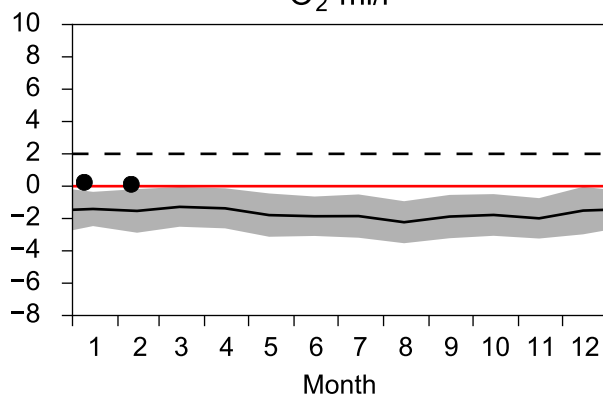


O₂ saturation %

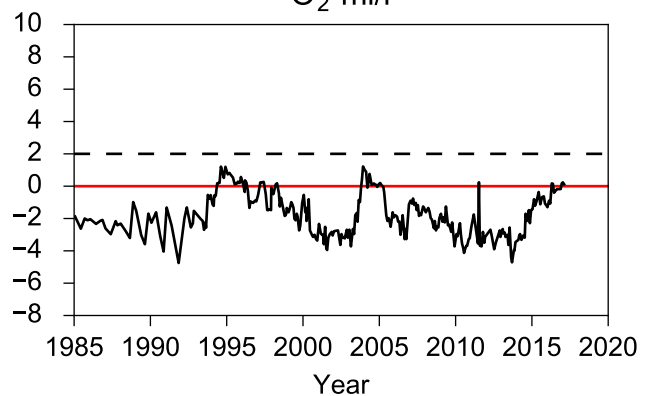


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

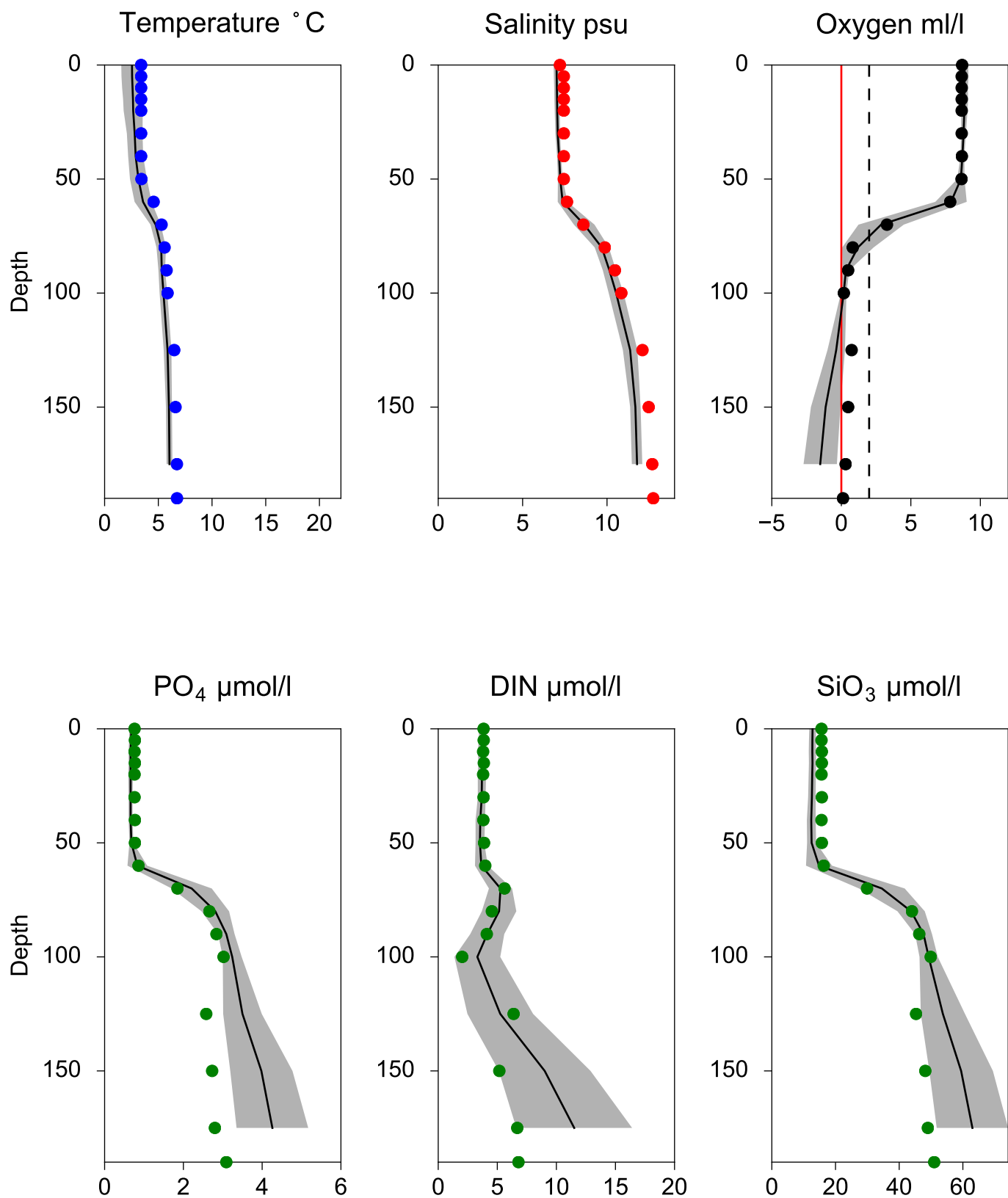


O₂ ml/l



Vertical profiles BY20 FÅRÖDJ February

— Mean 2001-2015 St.Dev. • 2017-02-10



STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

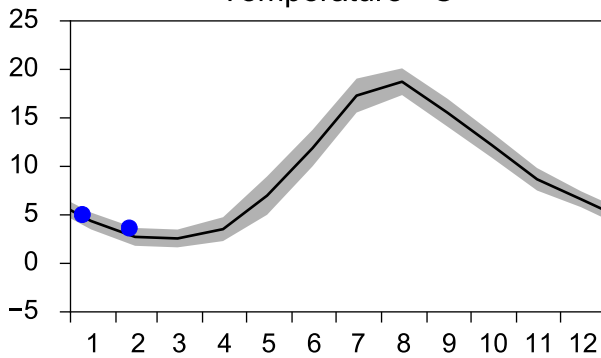
Annual Cycles

— Mean 2001-2015

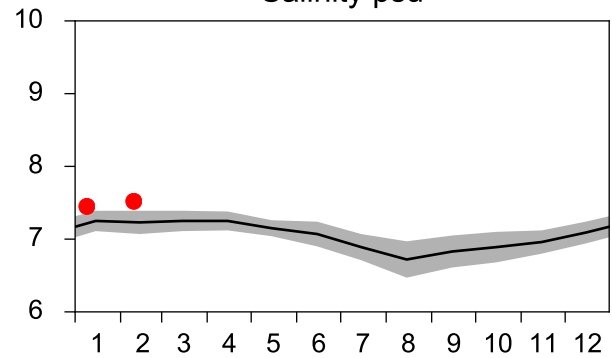
■ St.Dev.

● 2017

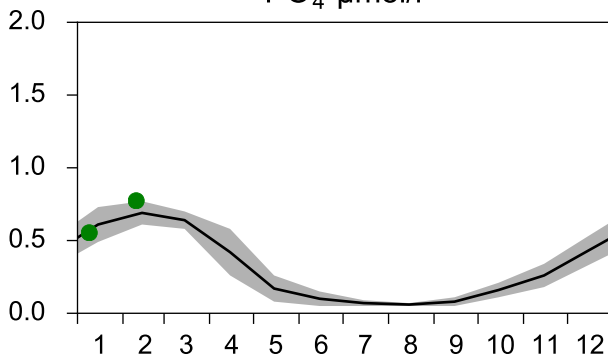
Temperature °C



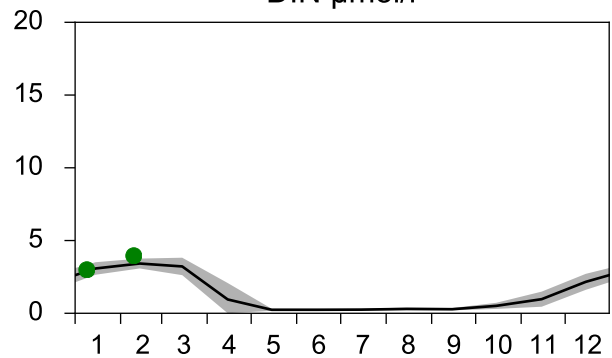
Salinity psu



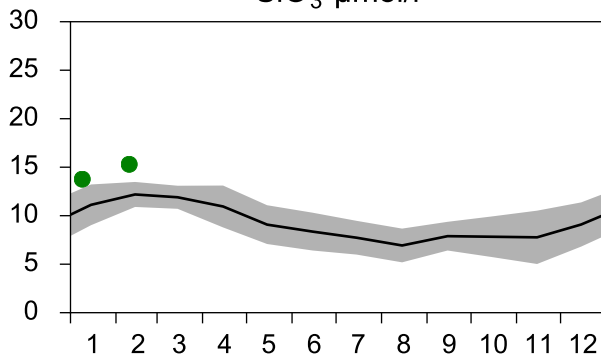
PO₄ µmol/l



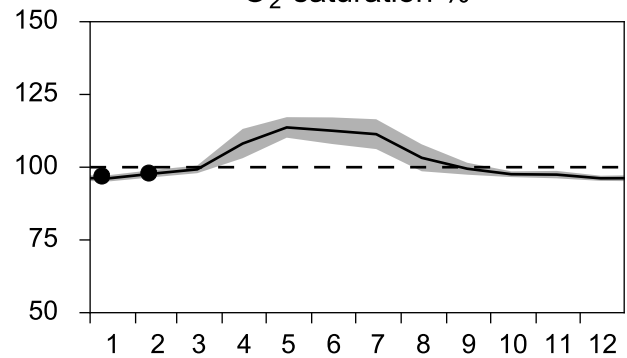
DIN µmol/l



SiO₃ µmol/l

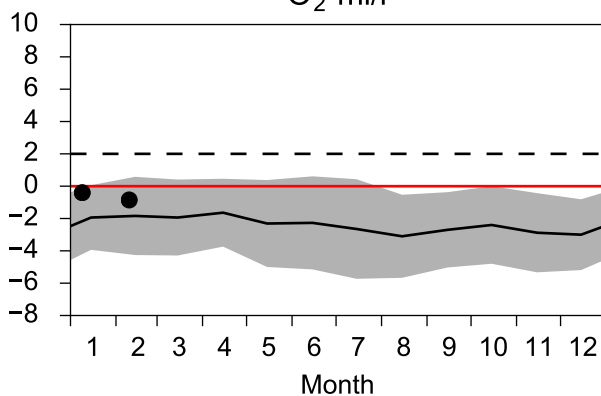


O₂ saturation %

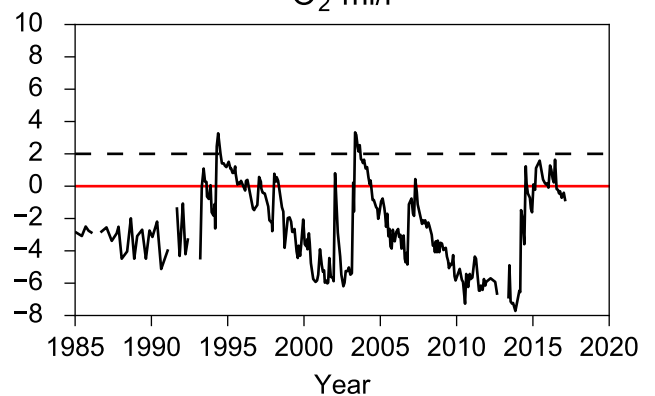


OXYGEN IN BOTTOM WATER (depth >= 225 m)

O₂ ml/l

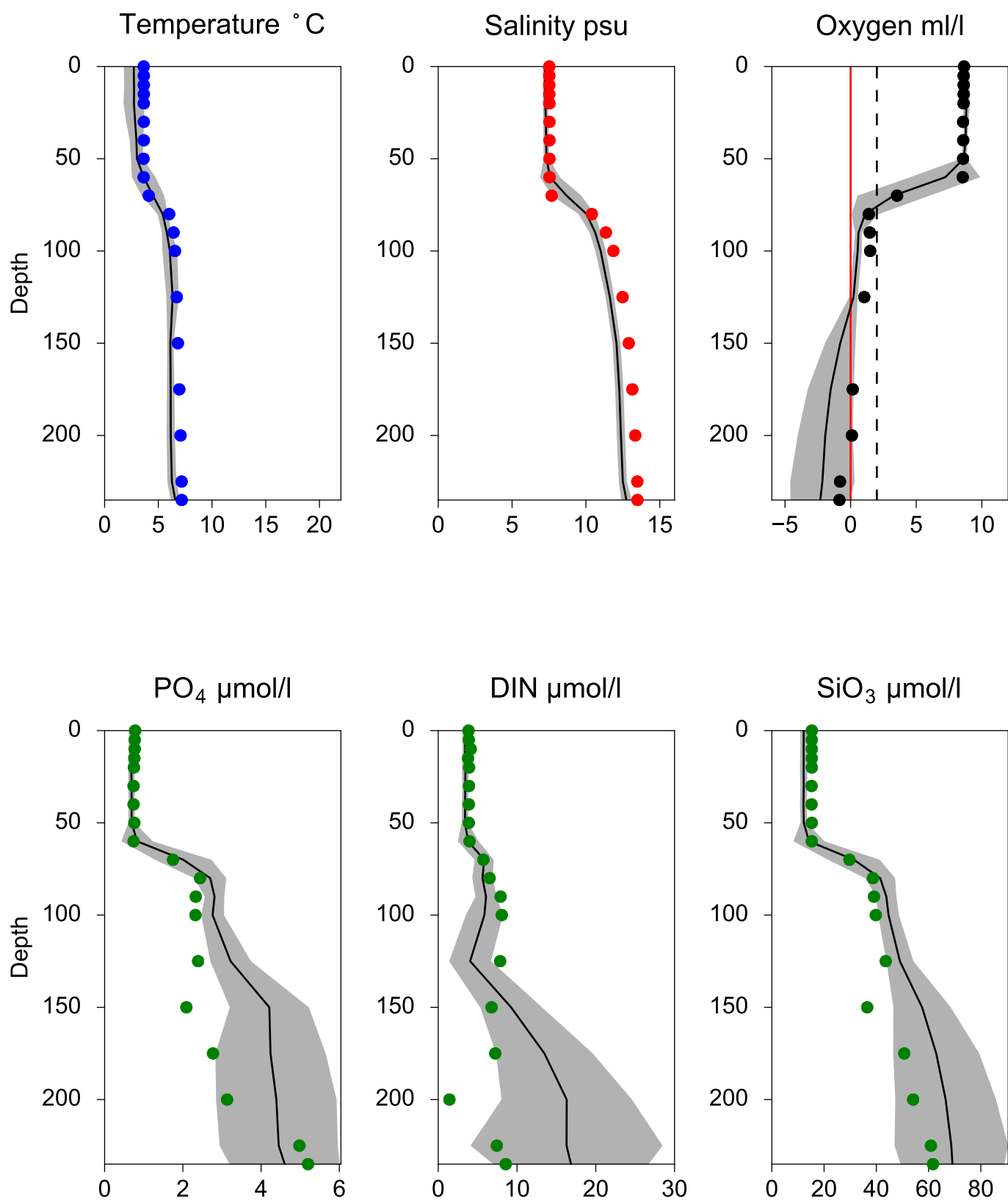


O₂ ml/l



Vertical profiles BY15 GOTLANDSDJ February

— Mean 2001-2015 St.Dev. • 2017-02-10



STATION BY10 SURFACE WATER (0-10 m)

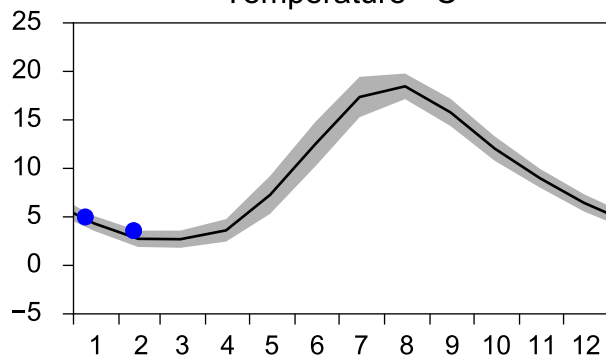
Annual Cycles

— Mean 2001-2015

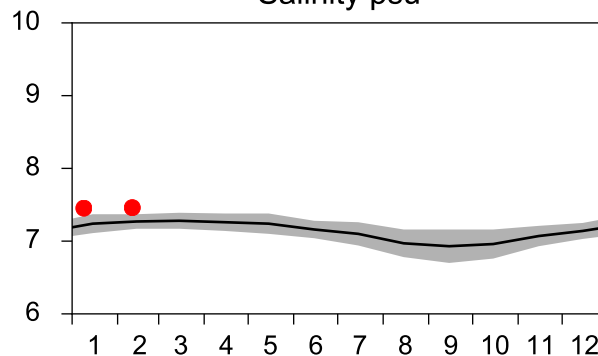
■ St.Dev.

● 2017

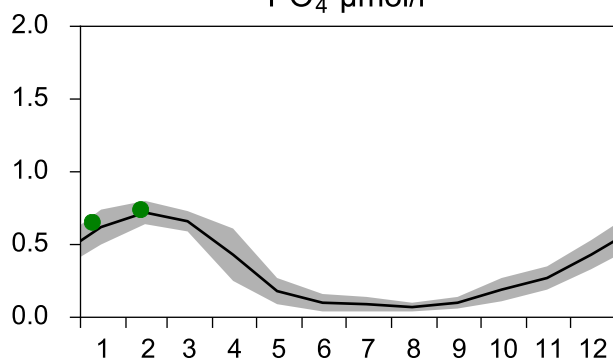
Temperature °C



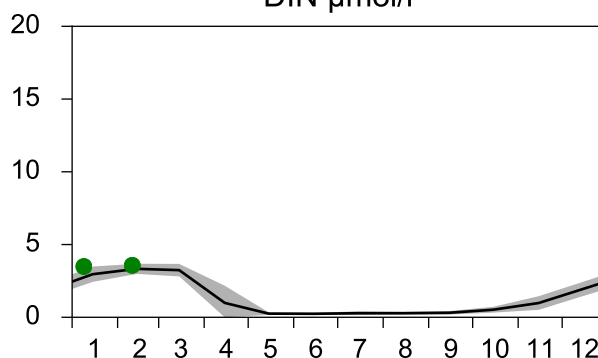
Salinity psu



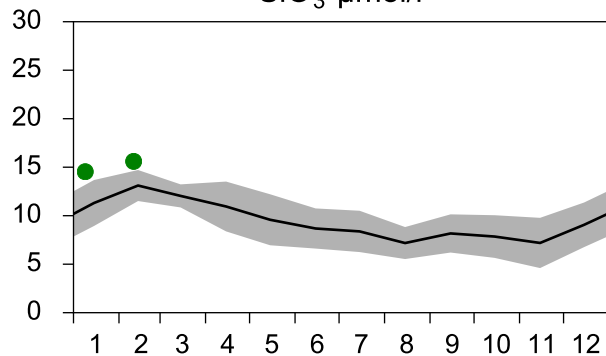
PO₄ μmol/l



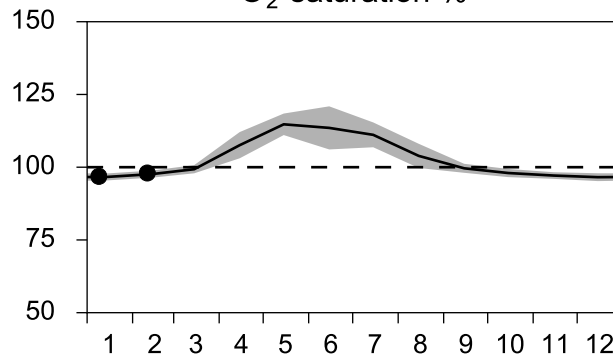
DIN μmol/l



SiO₃ μmol/l

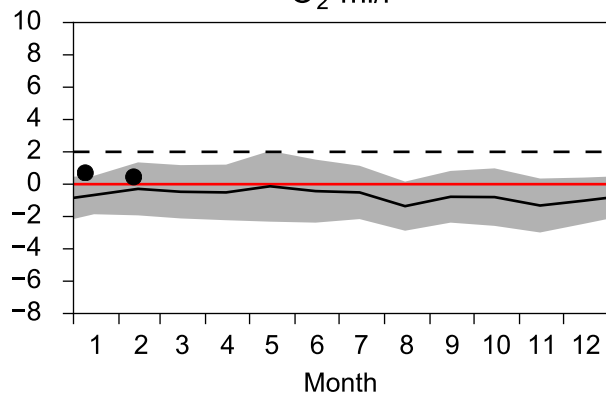


O₂ saturation %

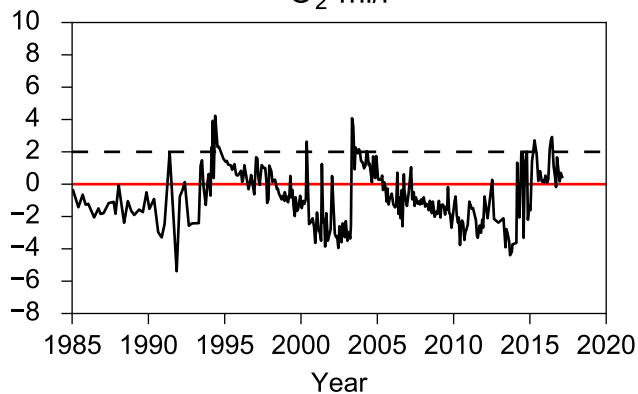


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

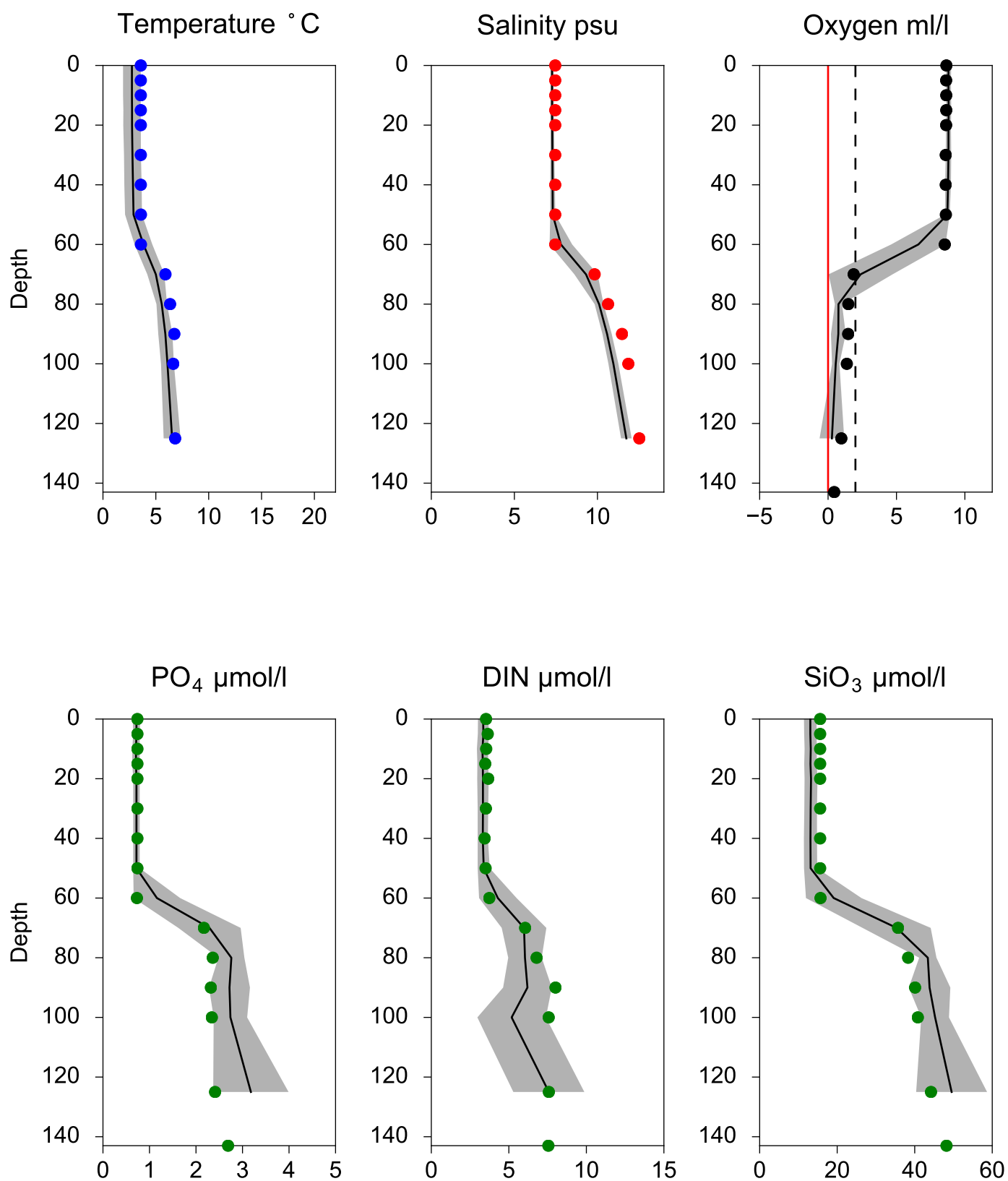


O₂ ml/l



Vertical profiles BY10 February

— Mean 2001-2015 St.Dev. • 2017-02-11



STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)

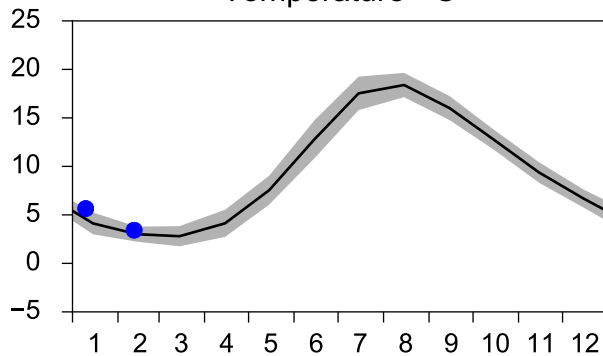
Annual Cycles

— Mean 2001-2015

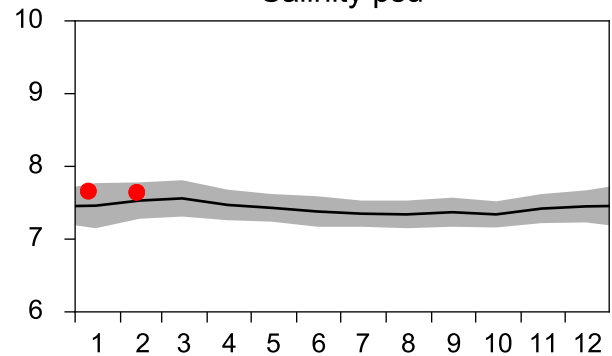
■ St.Dev.

● 2017

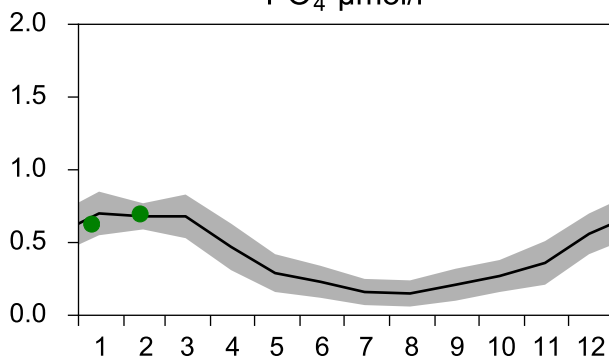
Temperature °C



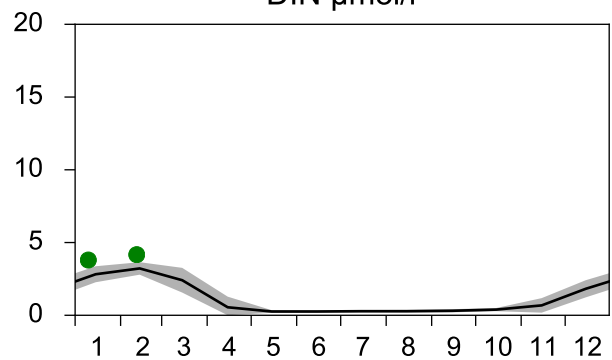
Salinity psu



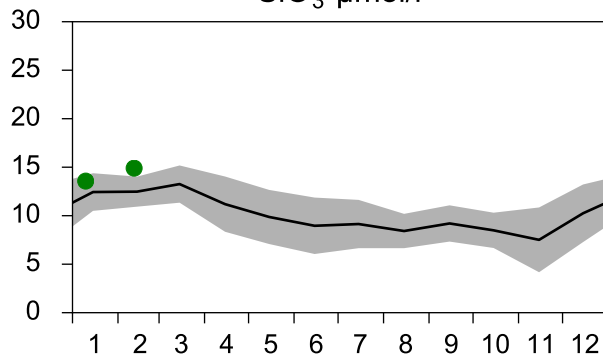
PO₄ μmol/l



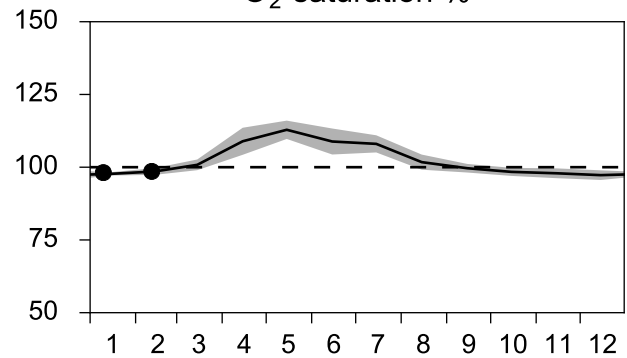
DIN μmol/l



SiO₃ μmol/l

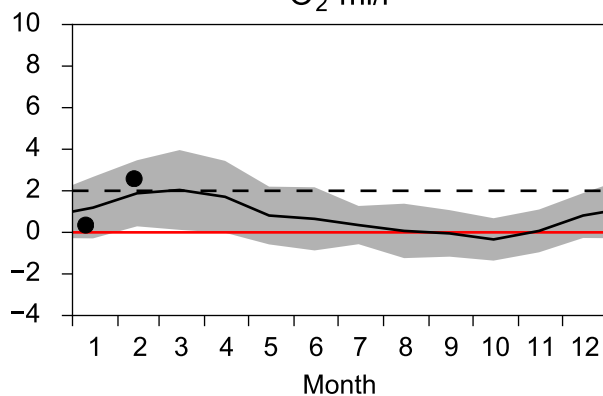


O₂ saturation %

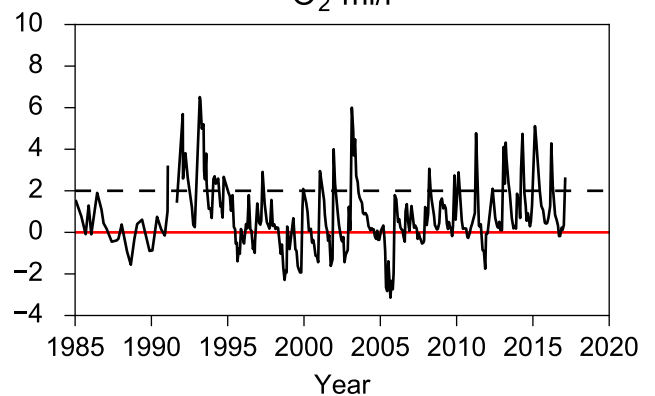


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

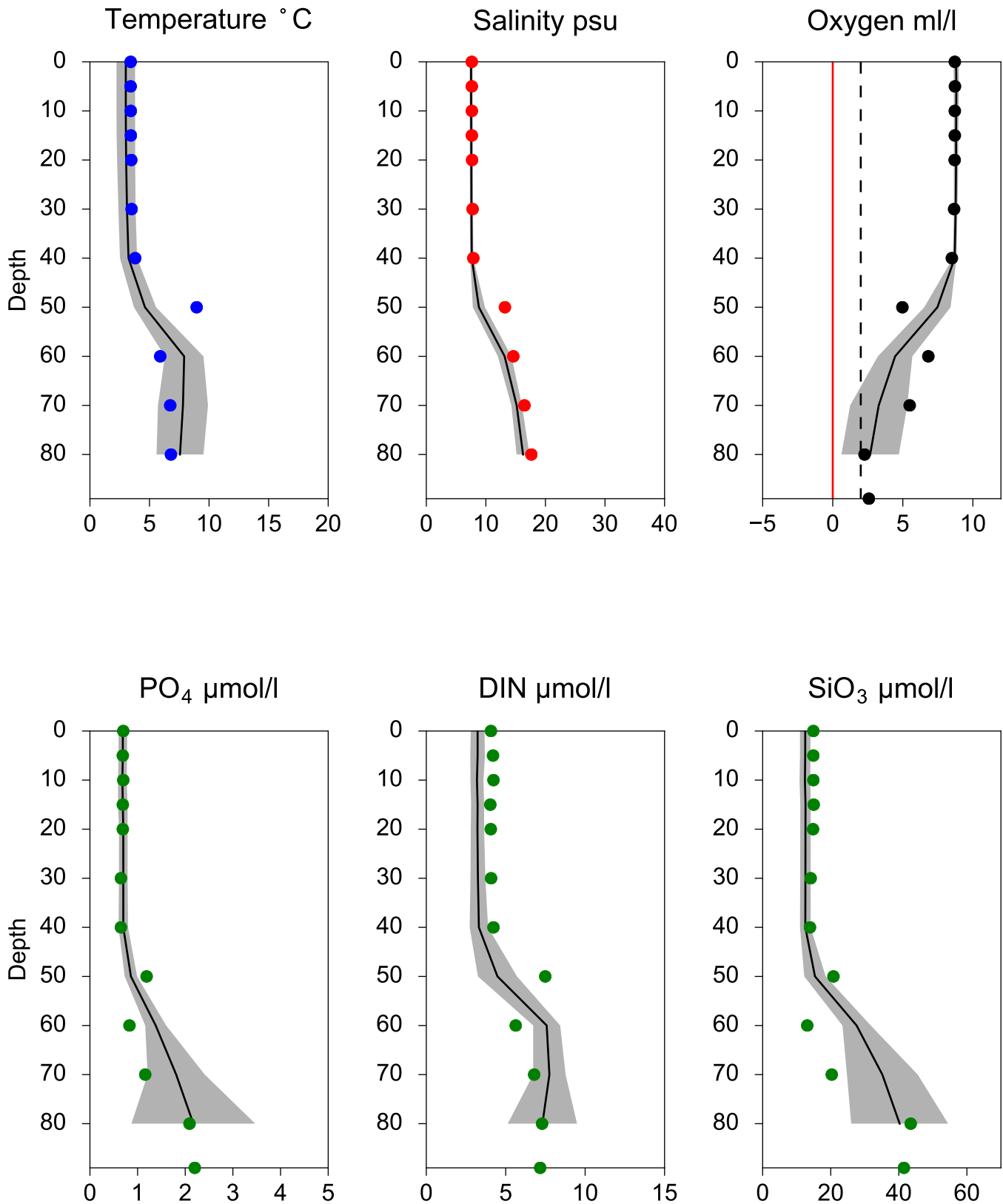


O₂ ml/l



Vertical profiles BY5 BORNHOLMSDJ February

— Mean 2001-2015 St.Dev. • 2017-02-12



STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

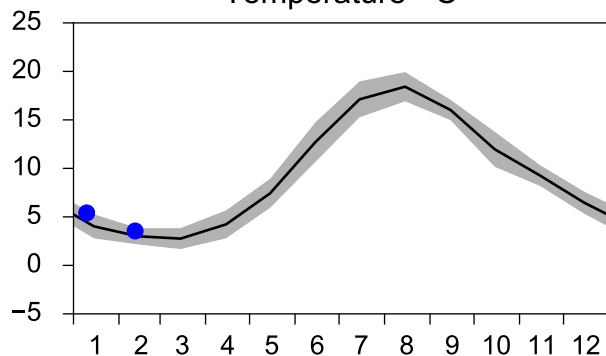
Annual Cycles

— Mean 2001-2015

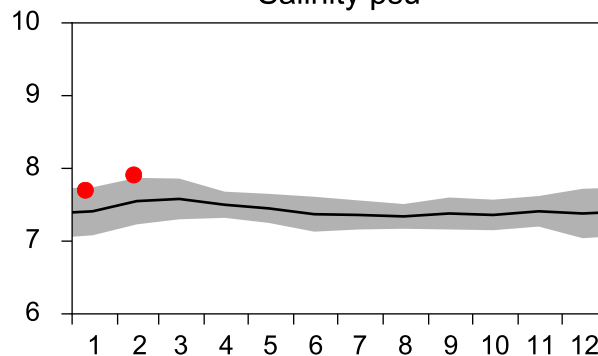
■ St.Dev.

● 2017

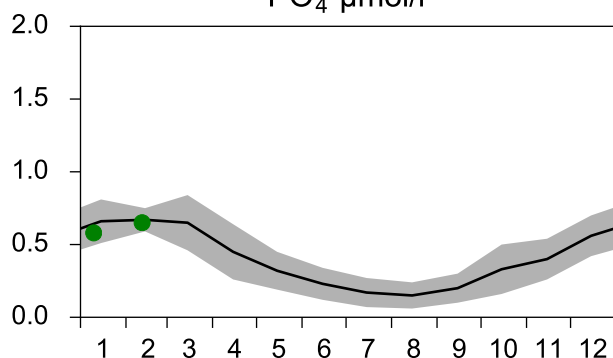
Temperature °C



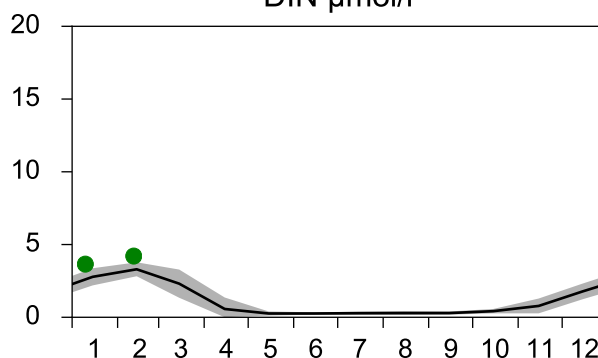
Salinity psu



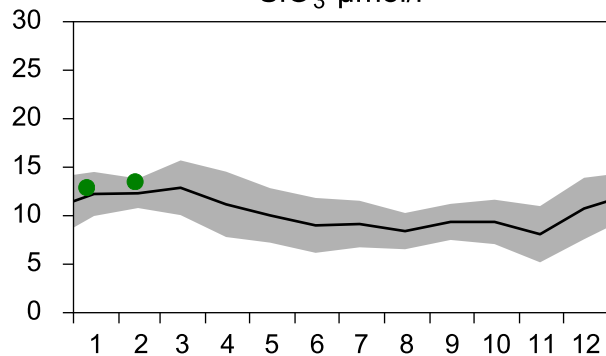
PO₄ μmol/l



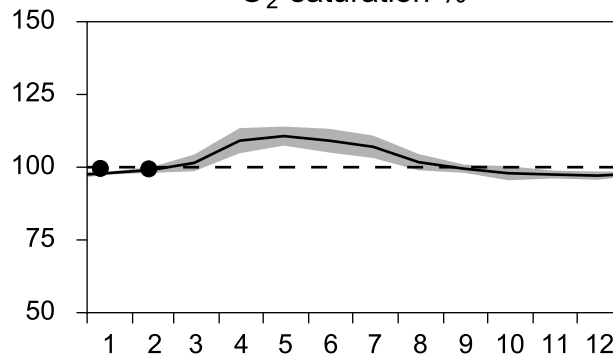
DIN μmol/l



SiO₃ μmol/l

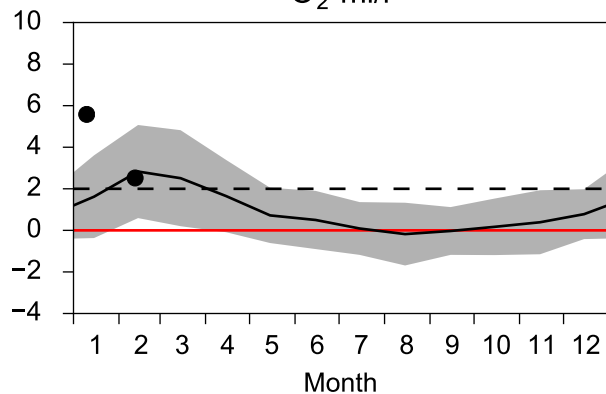


O₂ saturation %

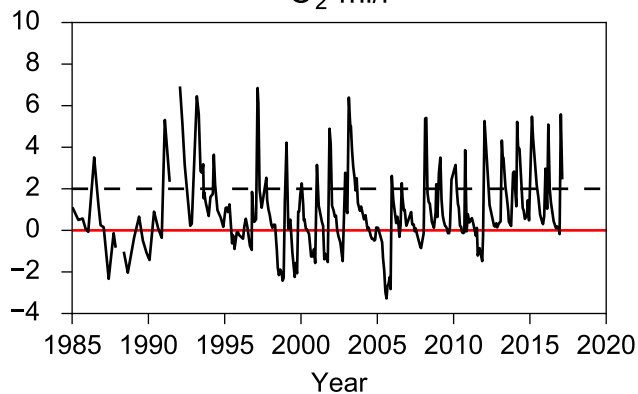


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

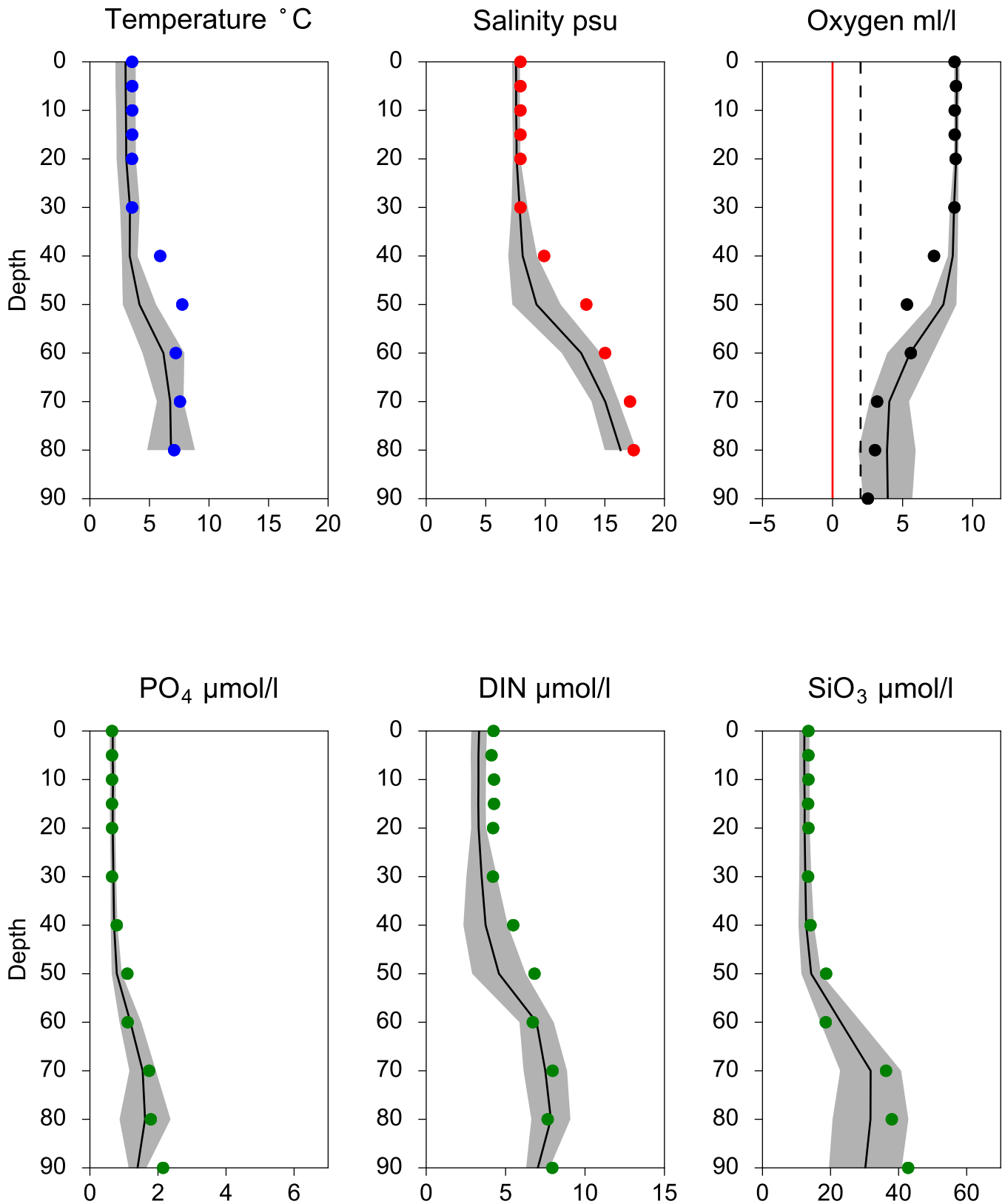


O₂ ml/l



Vertical profiles BY4 CHRISTIANSÖ February

— Mean 2001-2015 ■ St.Dev. ● 2017-02-12



STATION BY2 ARKONA SURFACE WATER (0-10 m)

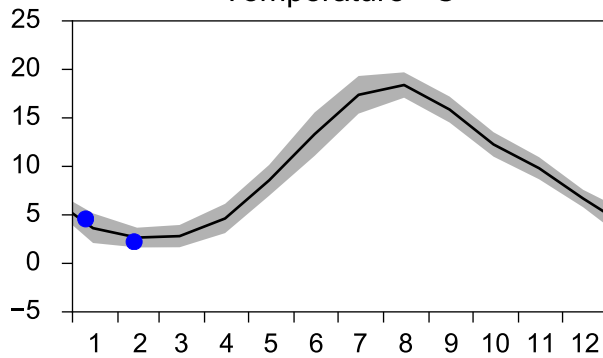
Annual Cycles

— Mean 2001-2015

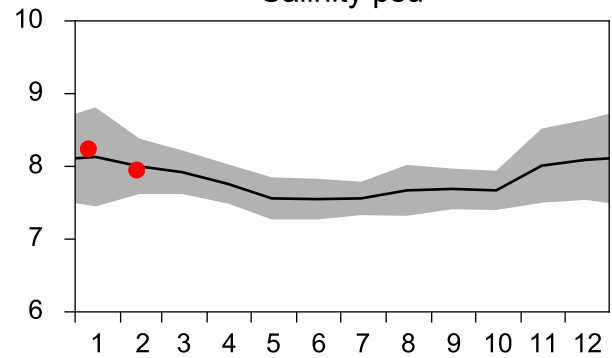
■ St.Dev.

● 2017

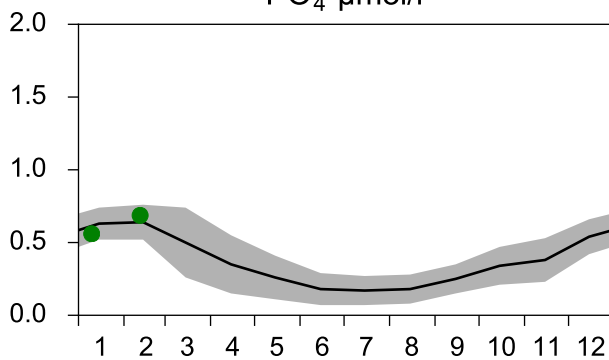
Temperature °C



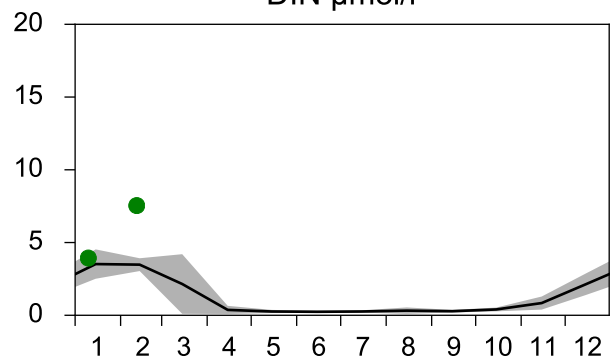
Salinity psu



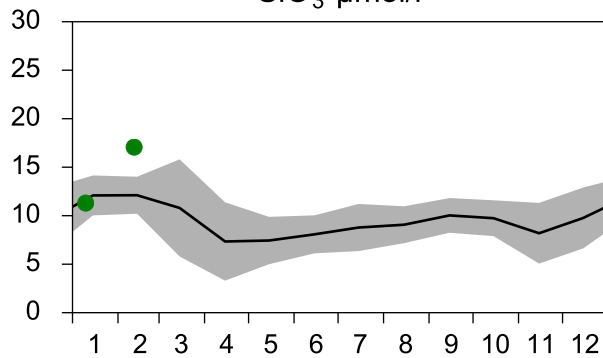
PO₄ µmol/l



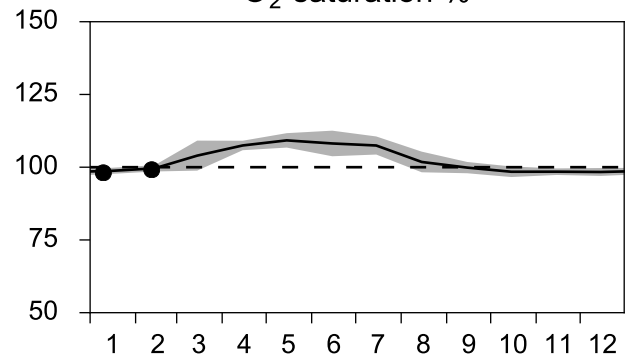
DIN µmol/l



SiO₃ µmol/l

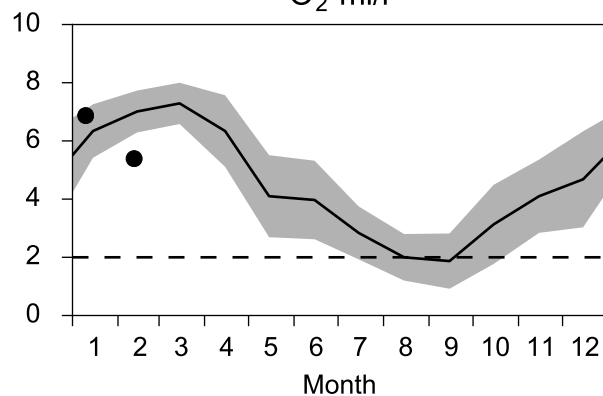


O₂ saturation %

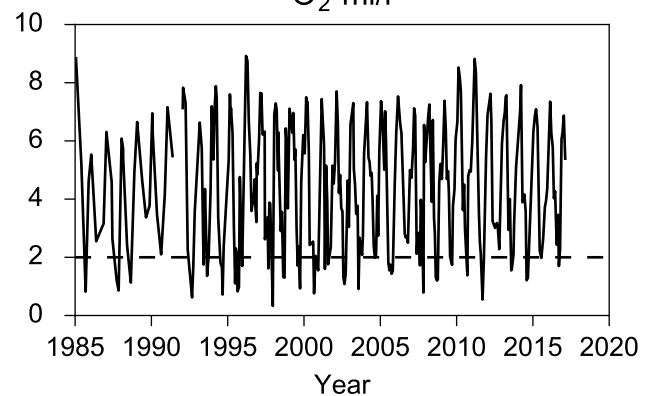


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

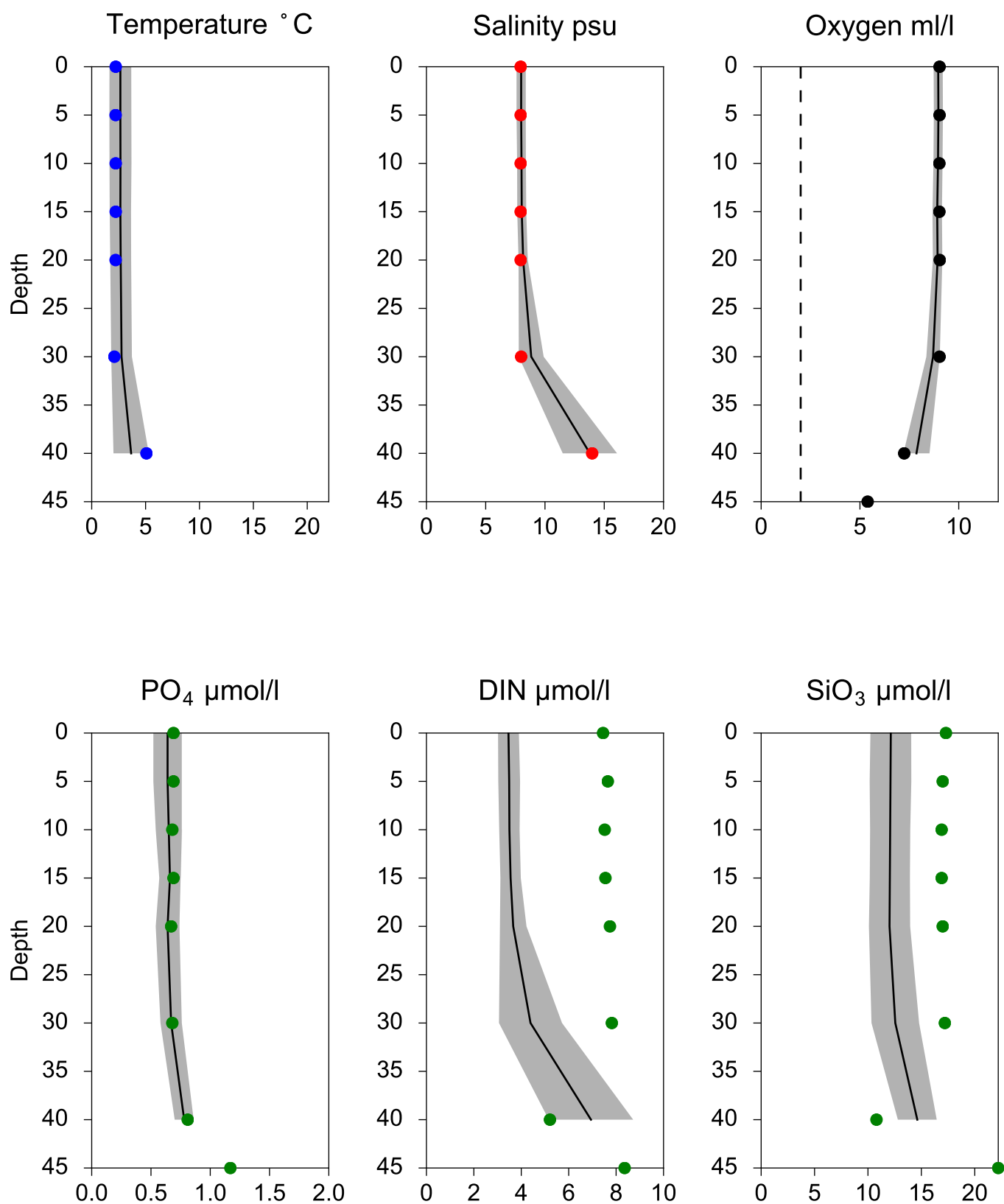


O₂ ml/l



Vertical profiles BY2 ARKONA February

— Mean 2001-2015 St.Dev. • 2017-02-12



STATION BY1 SURFACE WATER (0-10 m)

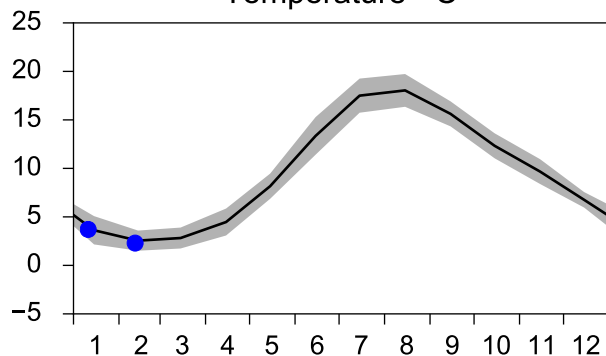
Annual Cycles

— Mean 2001-2015

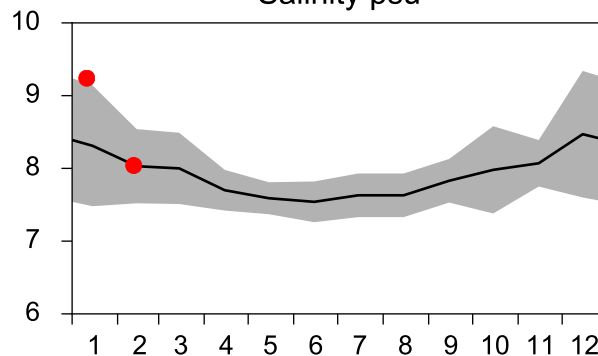
■ St.Dev.

● 2017

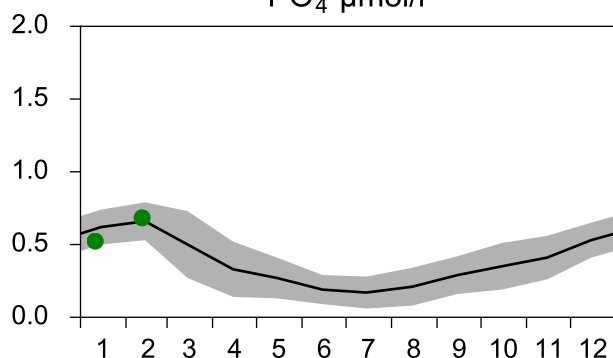
Temperature °C



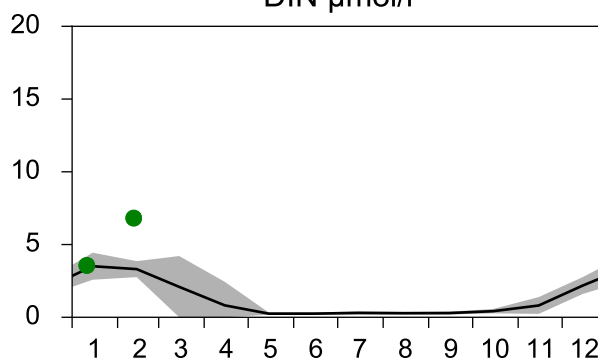
Salinity psu



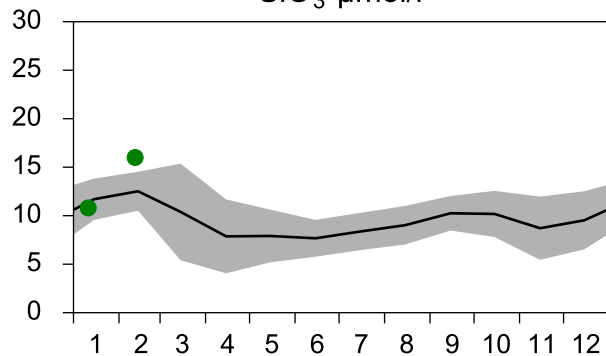
PO₄ μmol/l



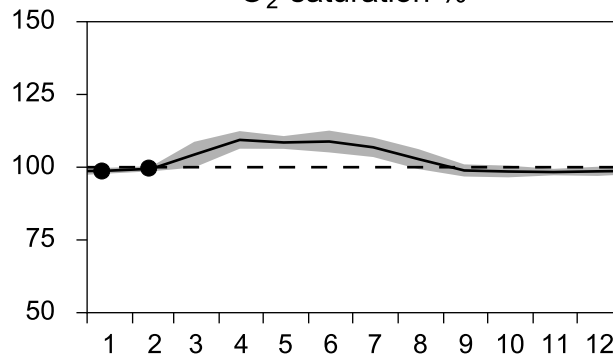
DIN μmol/l



SiO₃ μmol/l

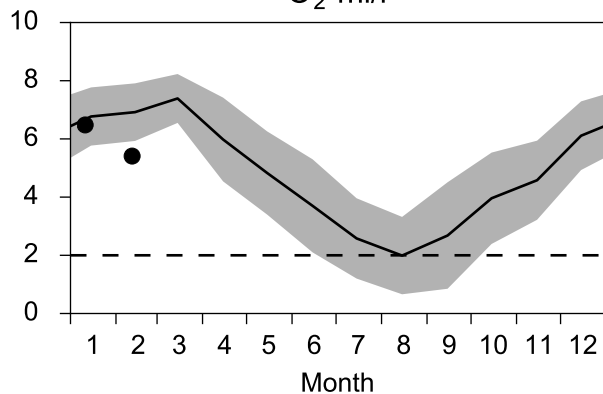


O₂ saturation %

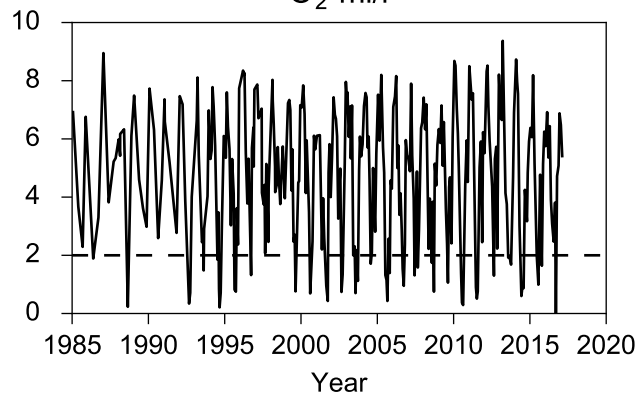


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

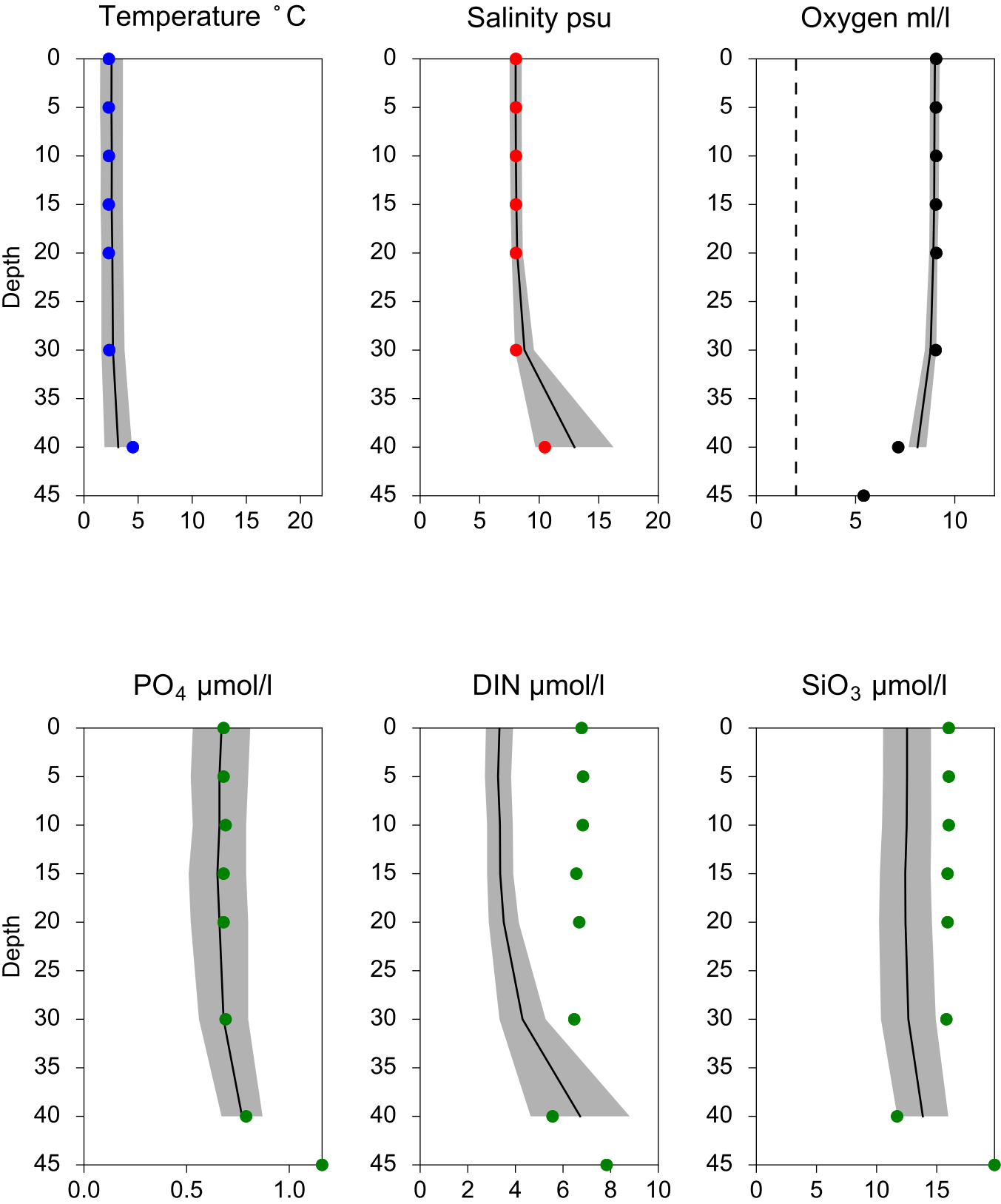


O₂ ml/l



Vertical profiles BY1
February

— Mean 2001-2015 St.Dev. • 2017-02-12



STATION W LANDSKRONA SURFACE WATER (0-10 m)

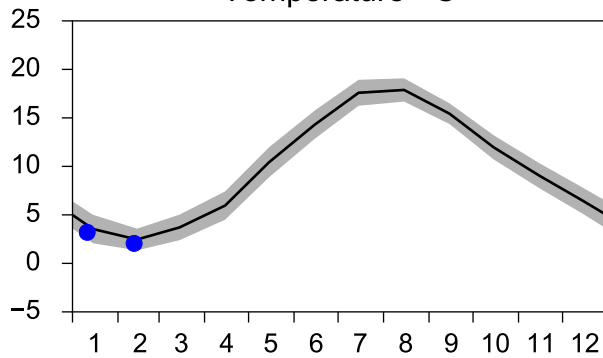
Annual Cycles

— Mean 2001-2015

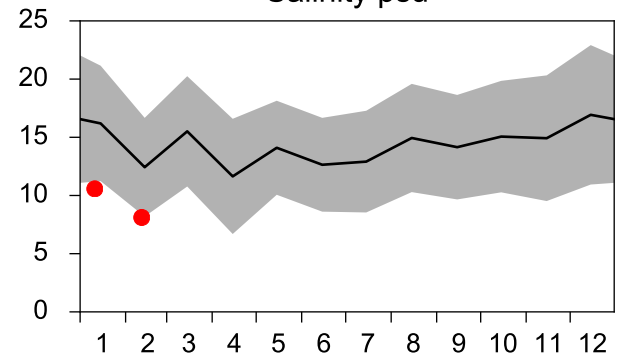
■ St.Dev.

● 2017

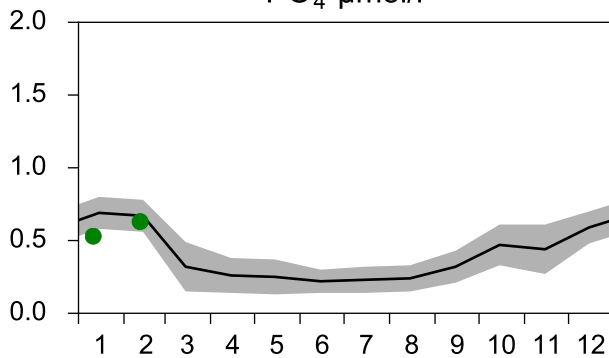
Temperature °C



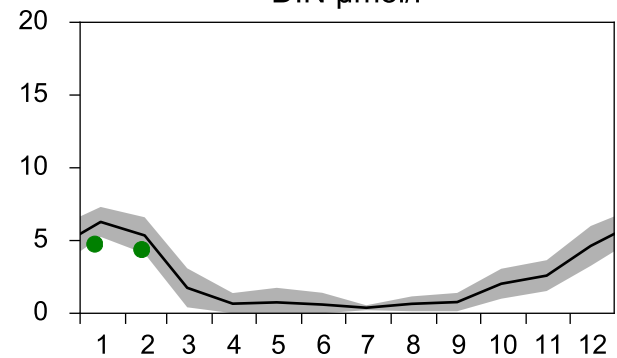
Salinity psu



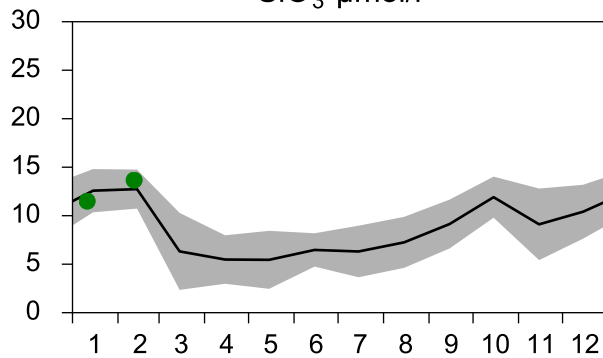
PO₄ µmol/l



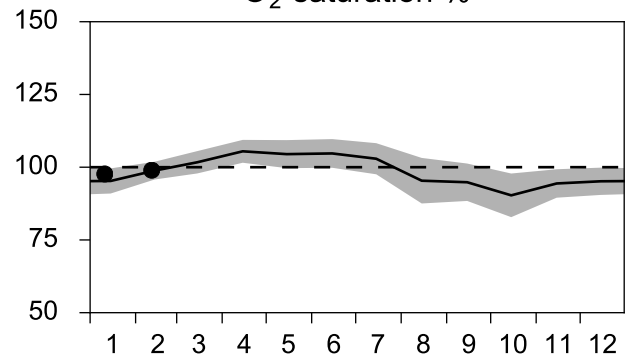
DIN µmol/l



SiO₃ µmol/l

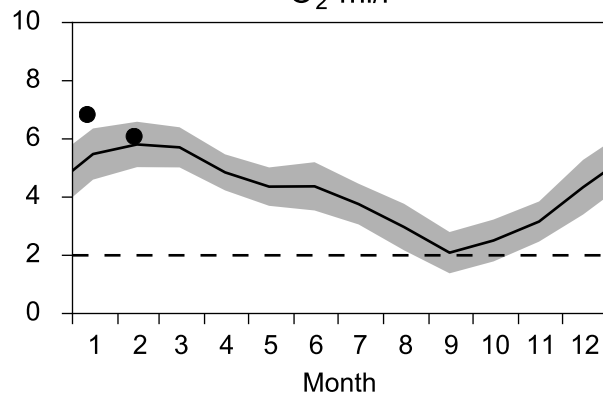


O₂ saturation %

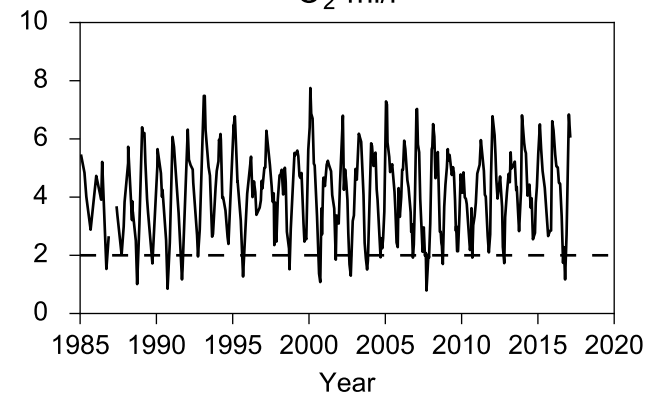


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

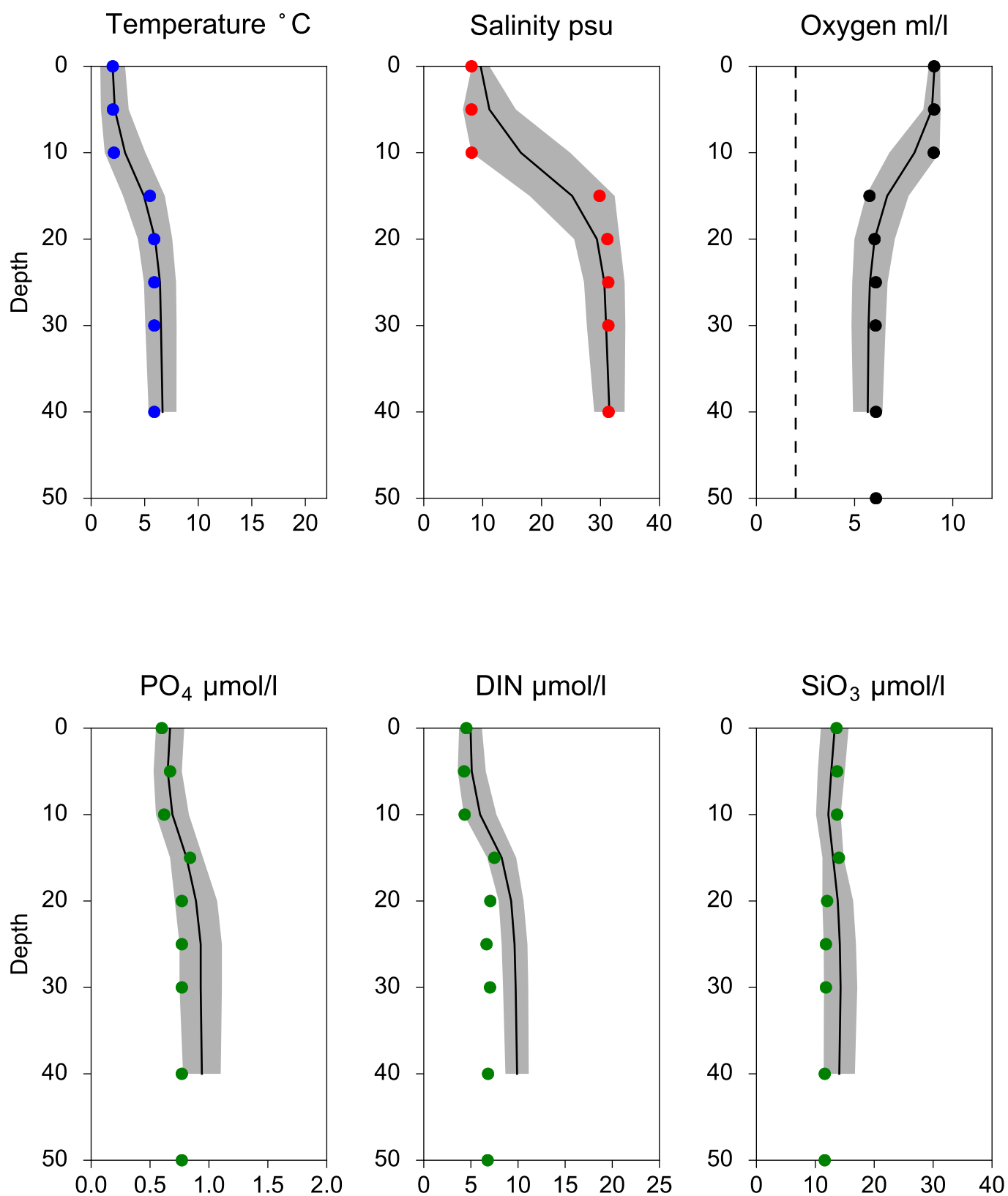


O₂ ml/l



Vertical profiles W LANDSKRONA February

— Mean 2001-2015 St.Dev. • 2017-02-12



STATION ANHOLT E SURFACE WATER (0-10 m)

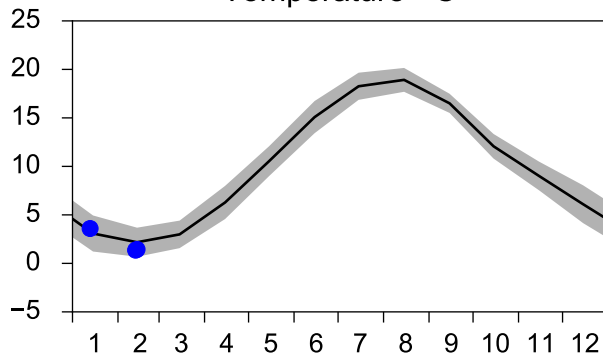
Annual Cycles

— Mean 2001-2015

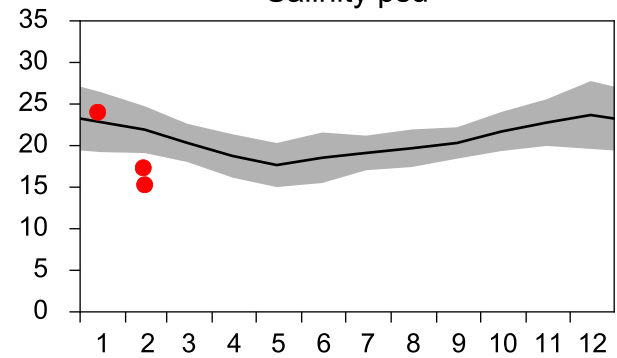
■ St.Dev.

● 2017

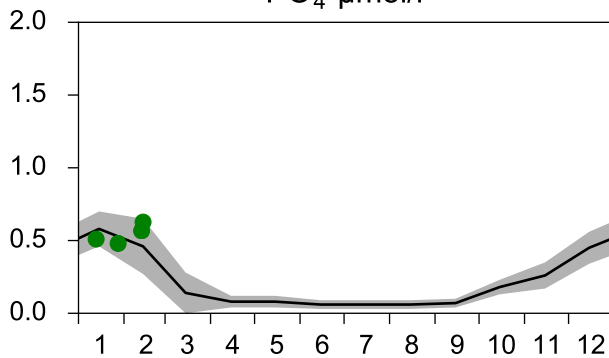
Temperature °C



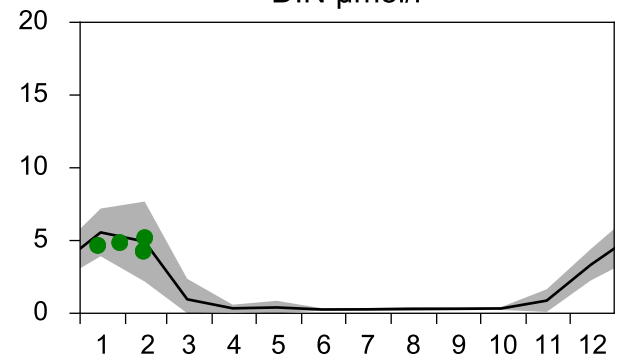
Salinity psu



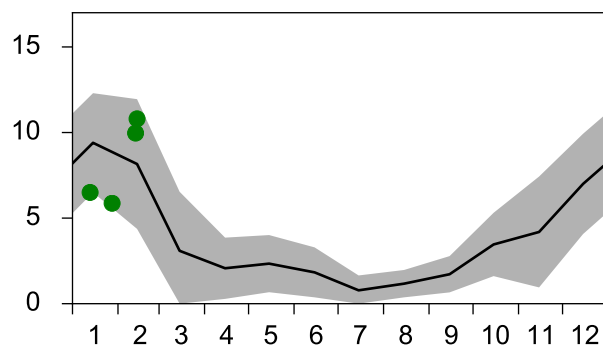
PO₄ µmol/l



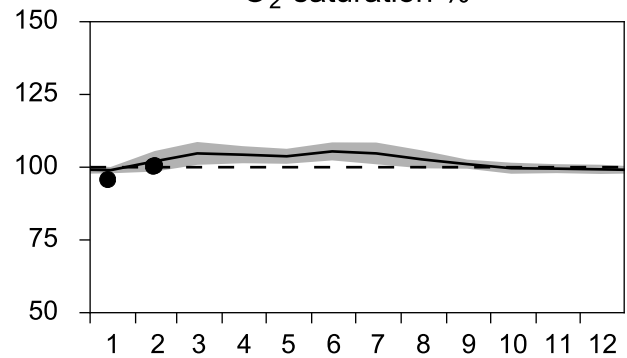
DIN µmol/l



SiO₃ µmol/l

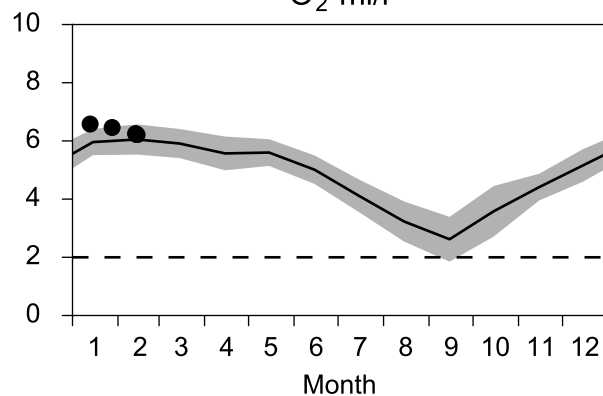


O₂ saturation %

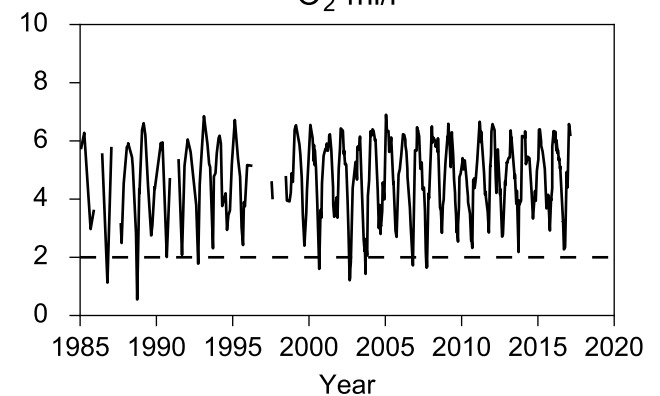


OXYGEN IN BOTTOM WATER (depth >= 52 m)

O₂ ml/l

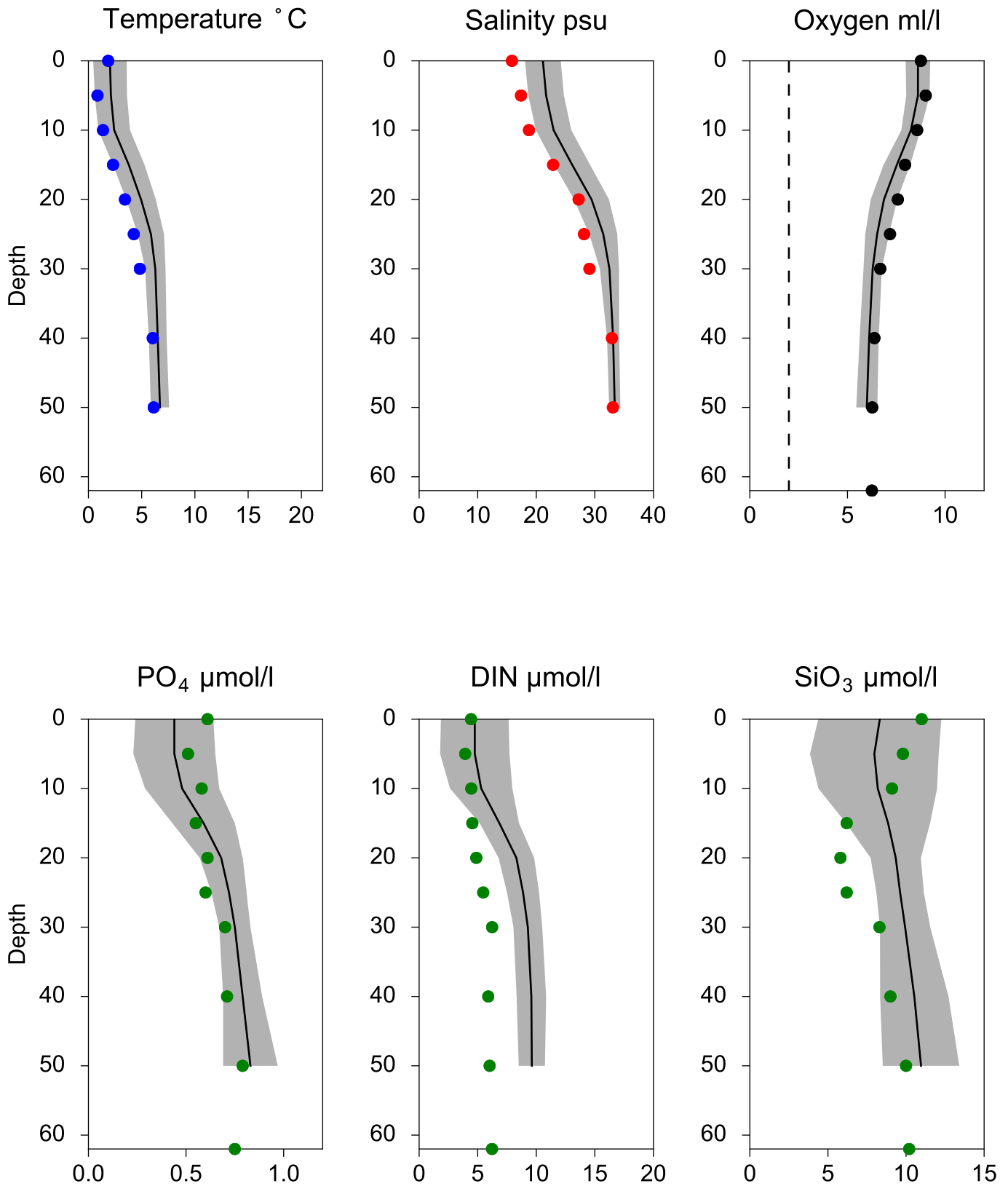


O₂ ml/l



Vertical profiles ANHOLT E February

— Mean 2001-2015 St.Dev. • 2017-02-13



STATION FLADEN SURFACE WATER (0-10 m)

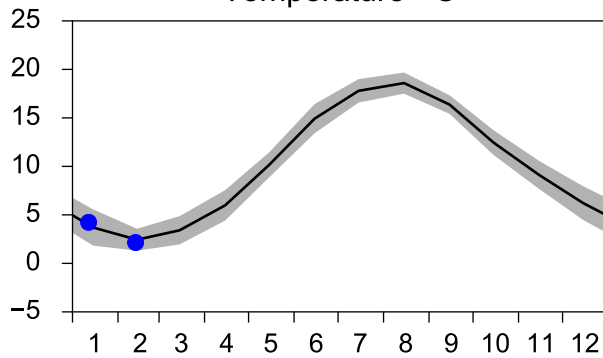
Annual Cycles

— Mean 2001-2015

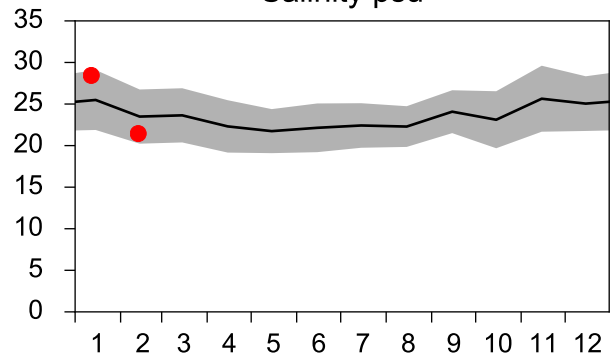
■ St.Dev.

● 2017

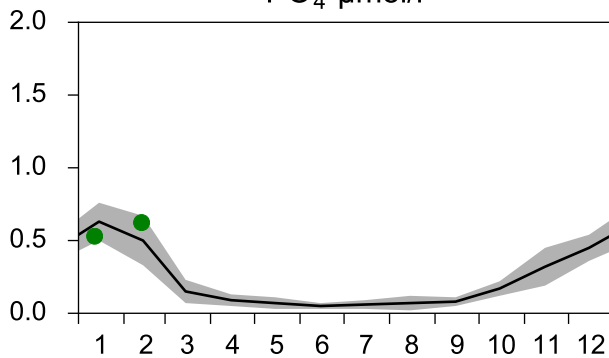
Temperature °C



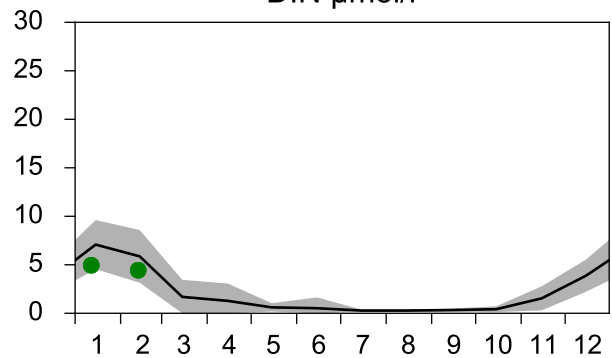
Salinity psu



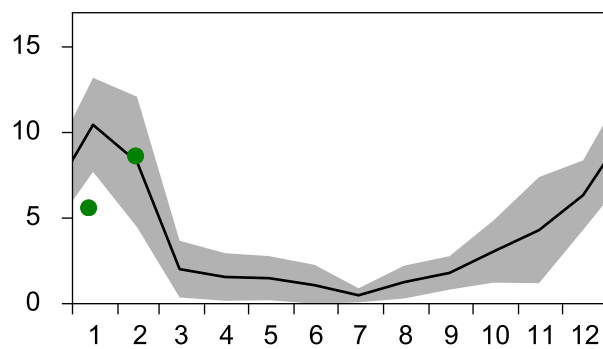
PO₄ μmol/l



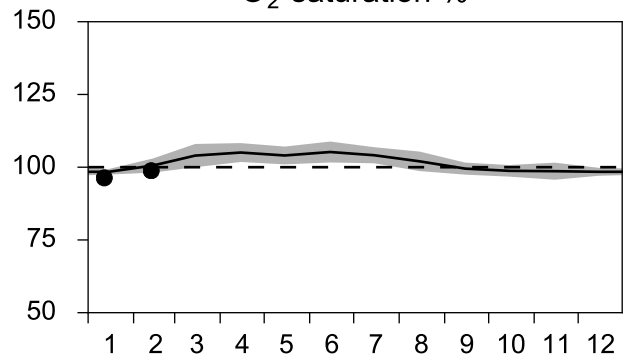
DIN μmol/l



SiO₃ μmol/l

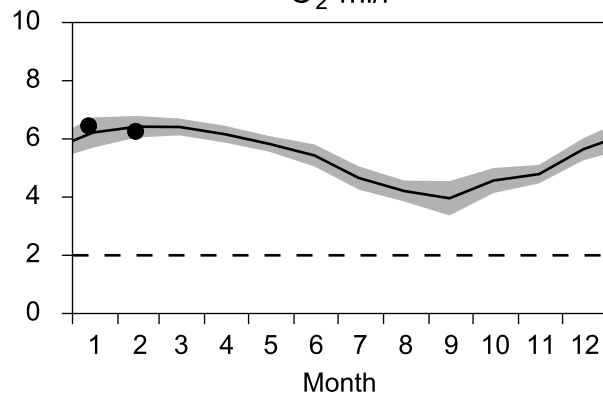


O₂ saturation %

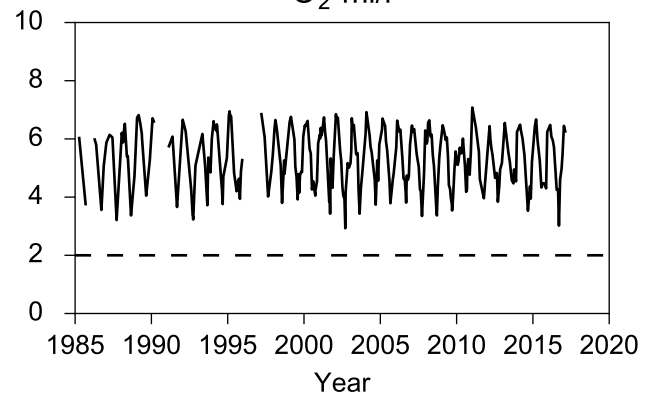


OXYGEN IN BOTTOM WATER (depth >= 74 m)

O₂ ml/l

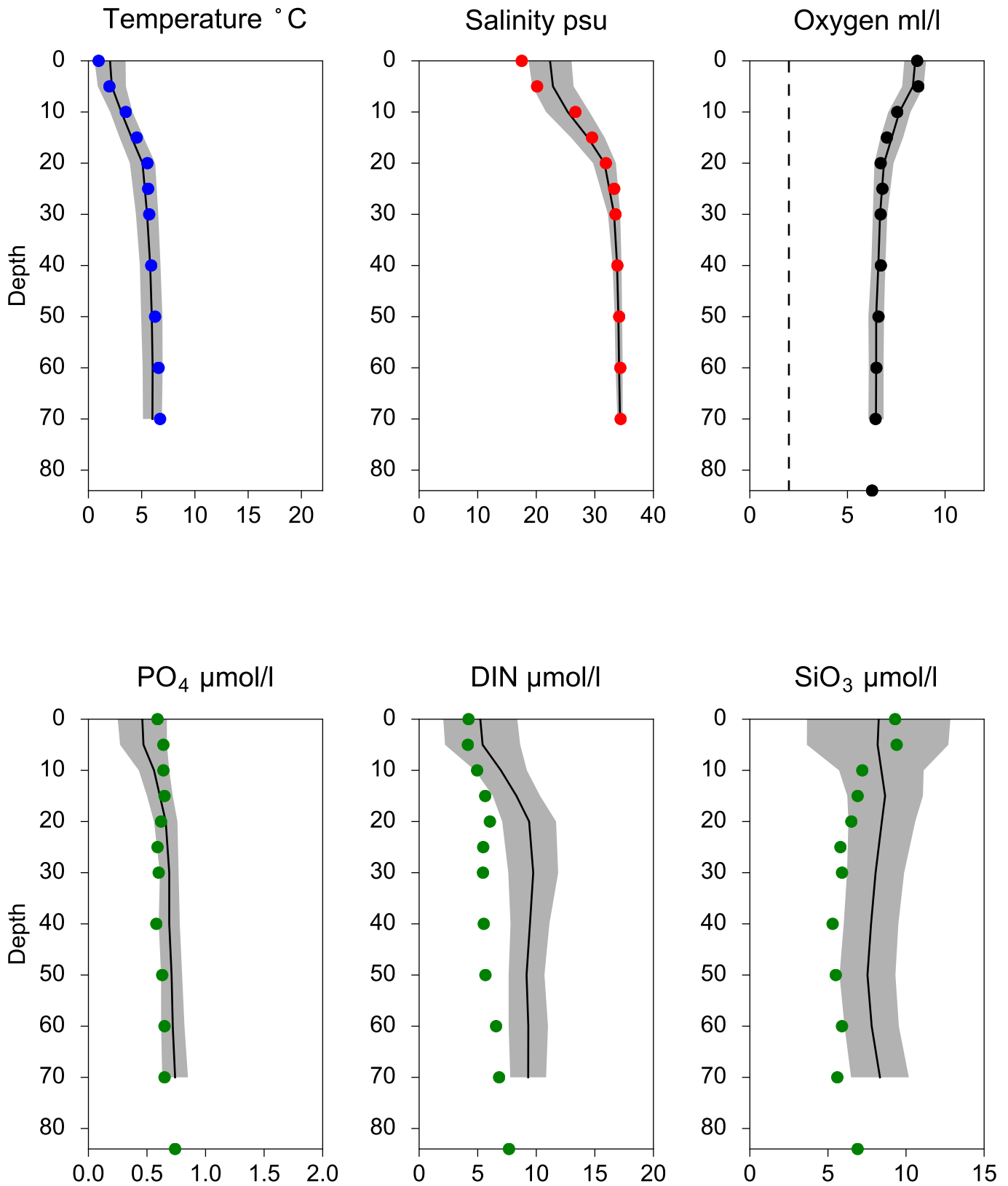


O₂ ml/l



Vertical profiles FLADEN February

— Mean 2001-2015 St.Dev. • 2017-02-13



STATION Å17 SURFACE WATER (0-10 m)

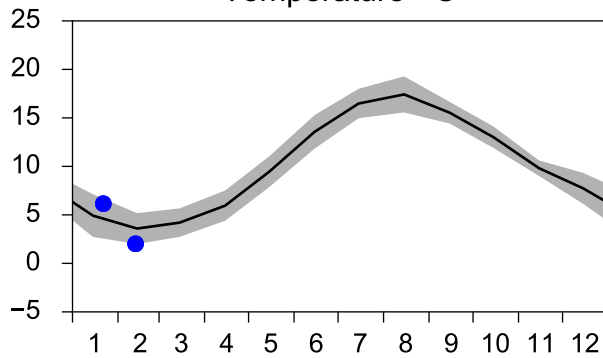
Annual Cycles

— Mean 2001-2015

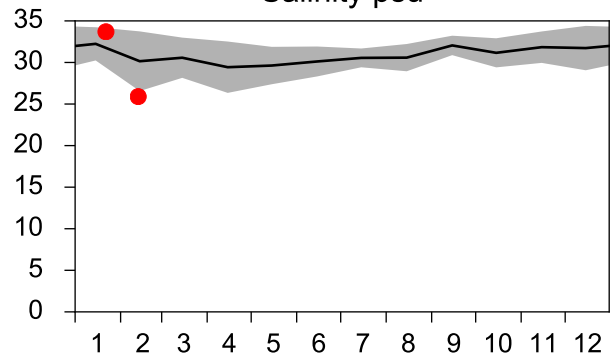
■ St.Dev.

● 2017

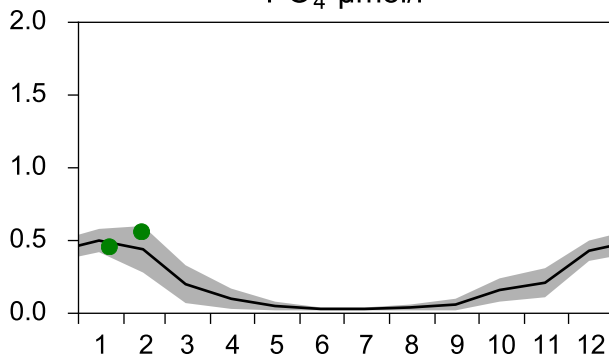
Temperature °C



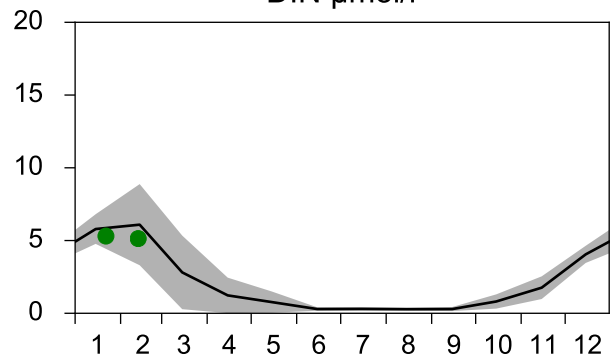
Salinity psu



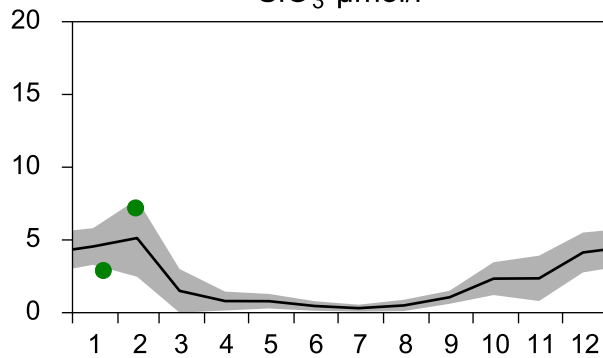
PO₄ µmol/l



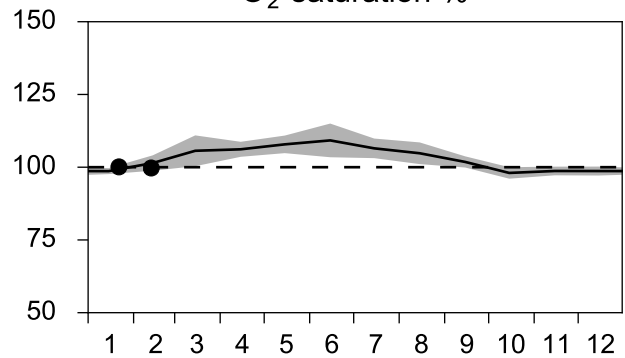
DIN µmol/l



SiO₃ µmol/l

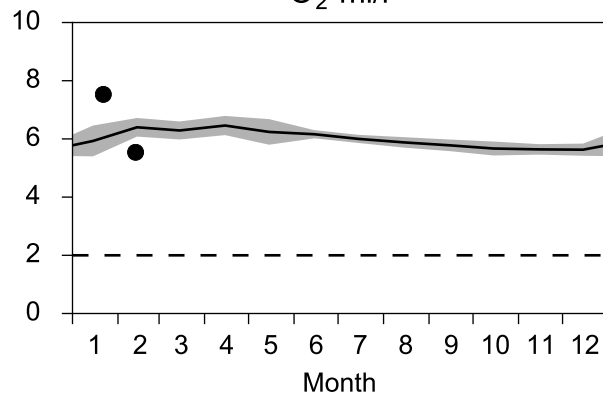


O₂ saturation %

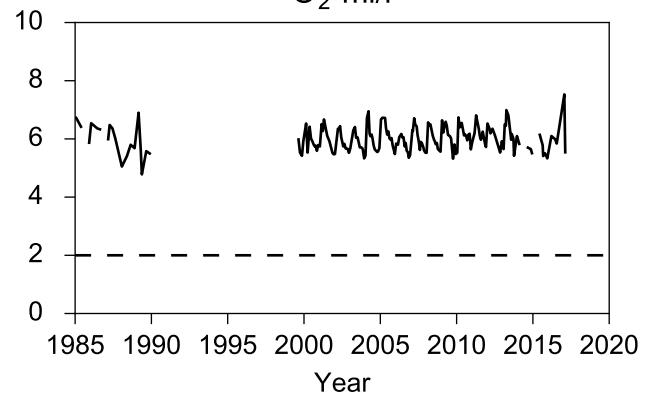


OXYGEN IN BOTTOM WATER (depth >= 300 m)

O₂ ml/l

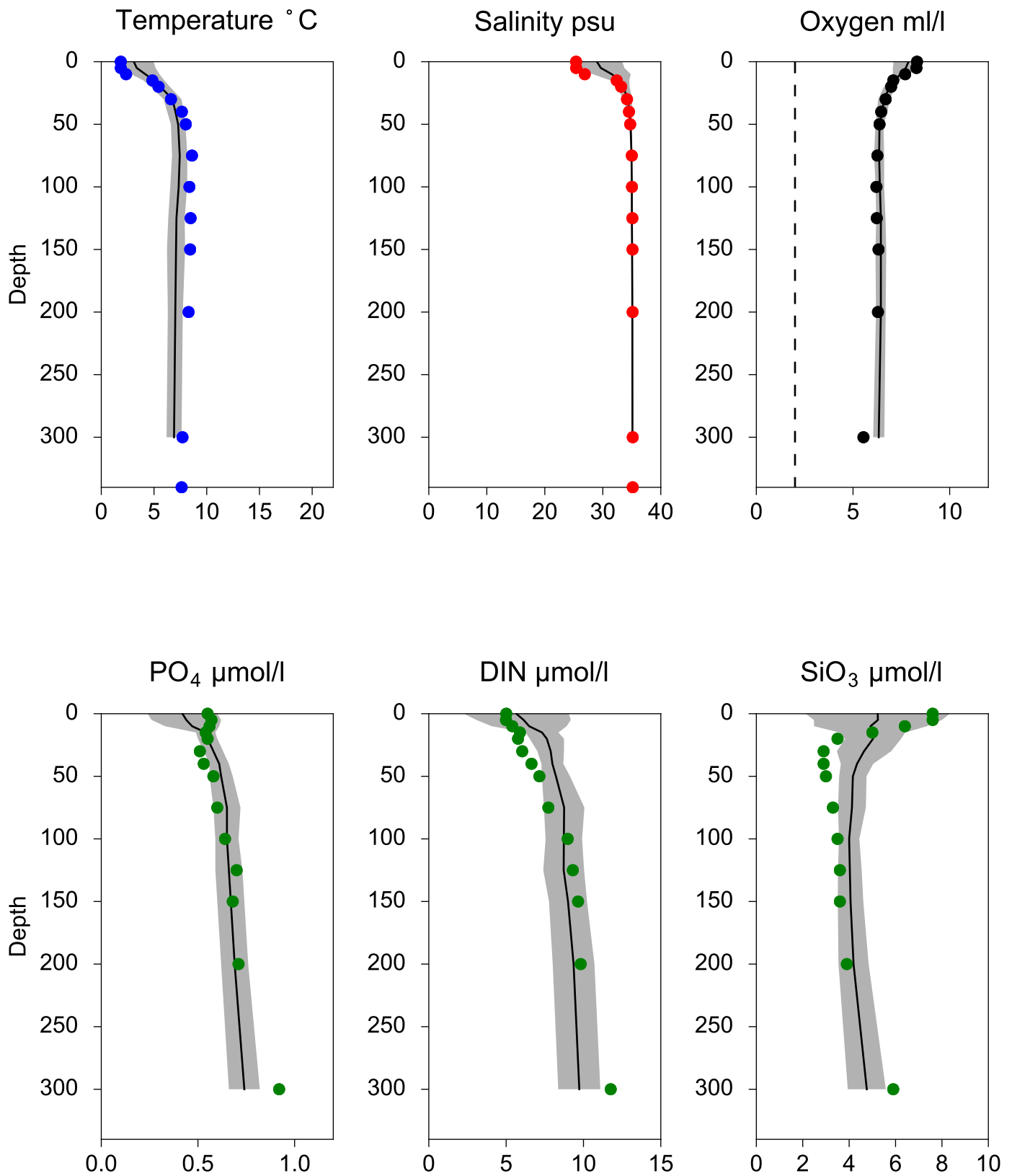


O₂ ml/l



Vertical profiles Å17 February

— Mean 2001-2015 St.Dev. • 2017-02-13



STATION Å15 SURFACE WATER (0-10 m)

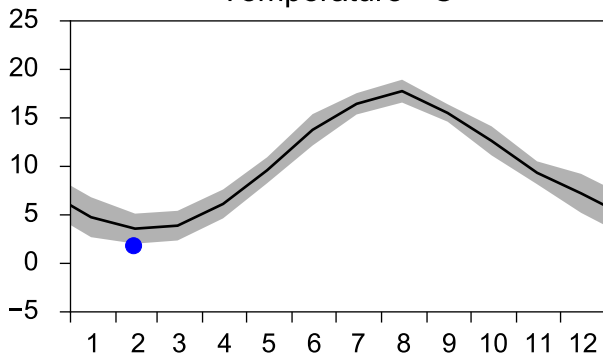
Annual Cycles

— Mean 2001-2015

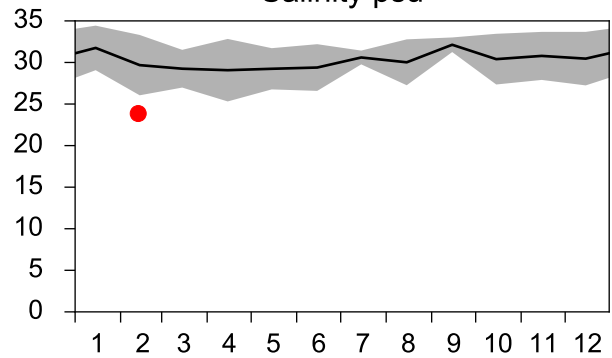
■ St.Dev.

● 2017

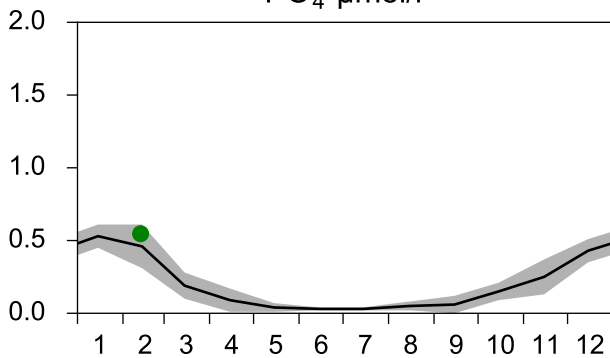
Temperature °C



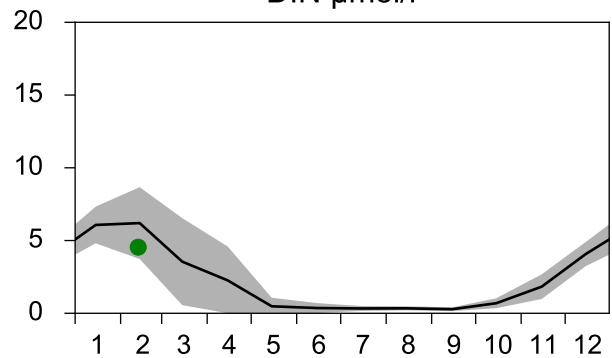
Salinity psu



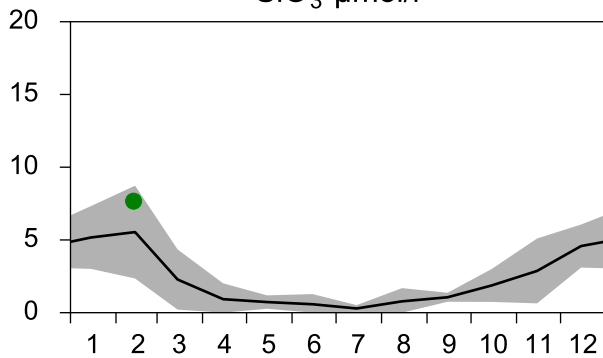
PO₄ µmol/l



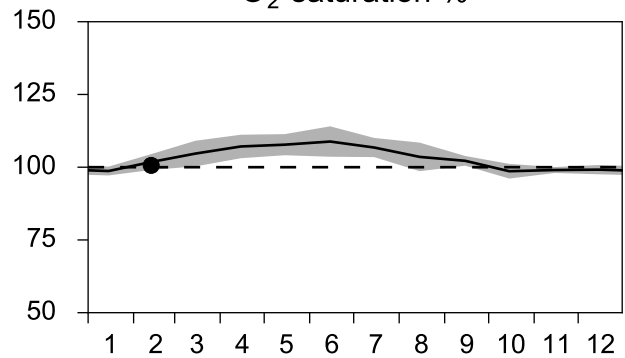
DIN µmol/l



SiO₃ µmol/l

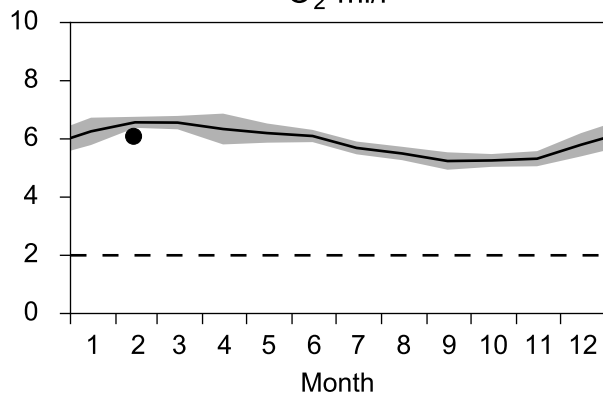


O₂ saturation %

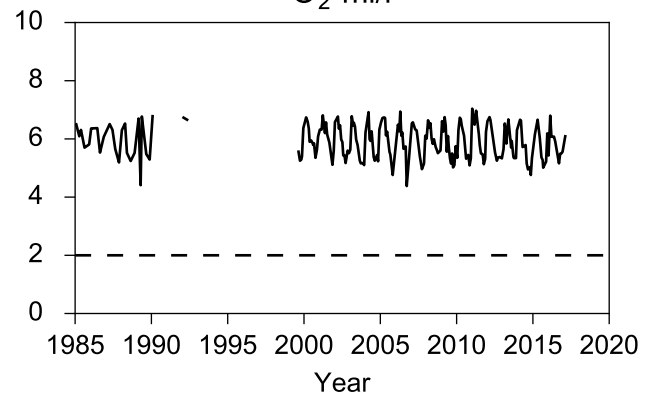


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l



O₂ ml/l

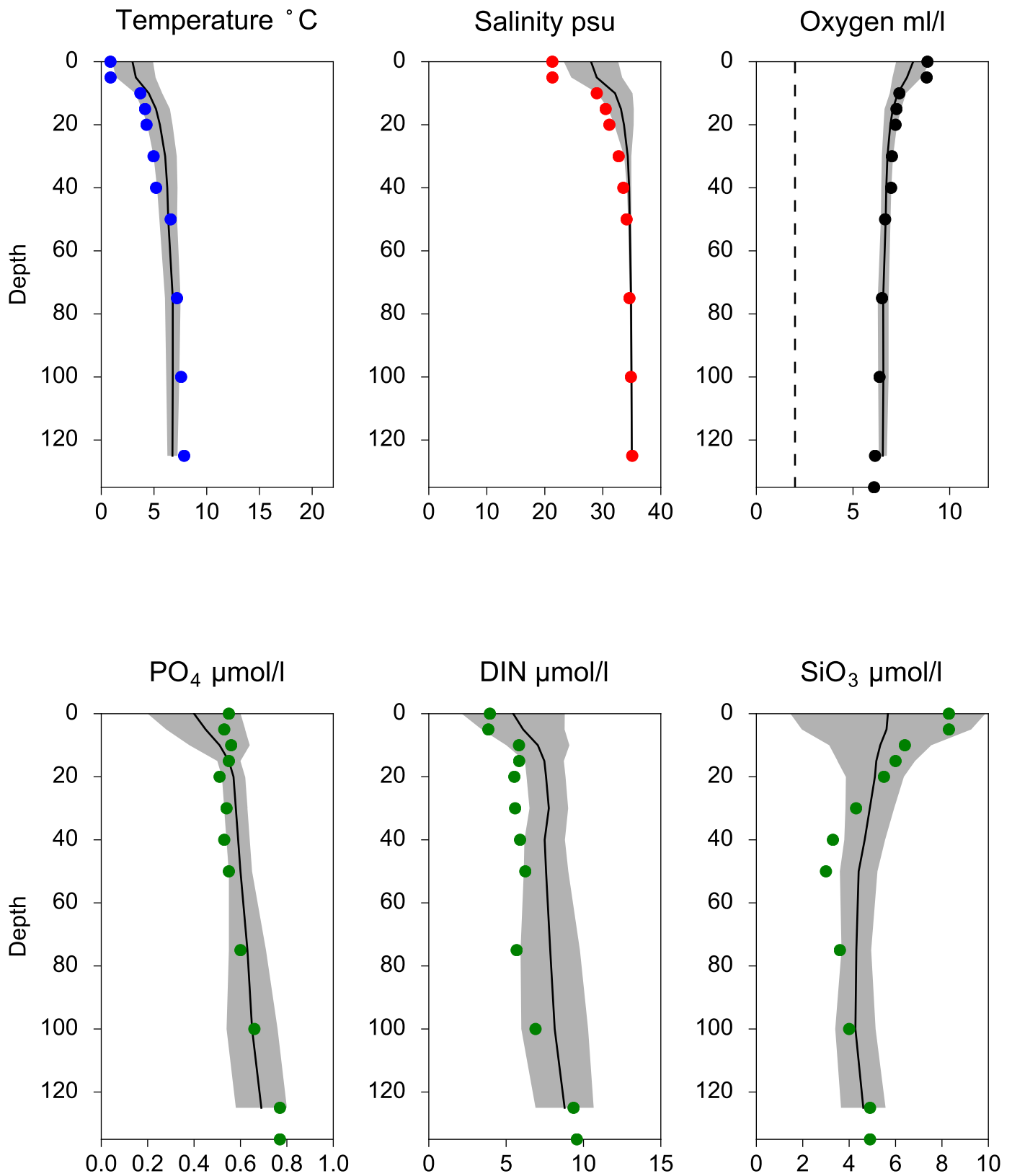


Vertical profiles Å15 February

— Mean 2001-2015

■ St.Dev.

● 2017-02-13



STATION Å13 SURFACE WATER (0-10 m)

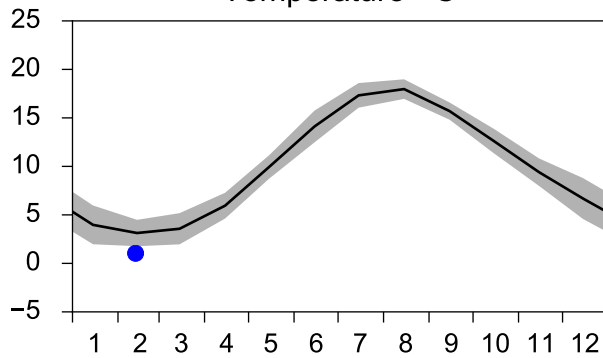
Annual Cycles

— Mean 2001-2015

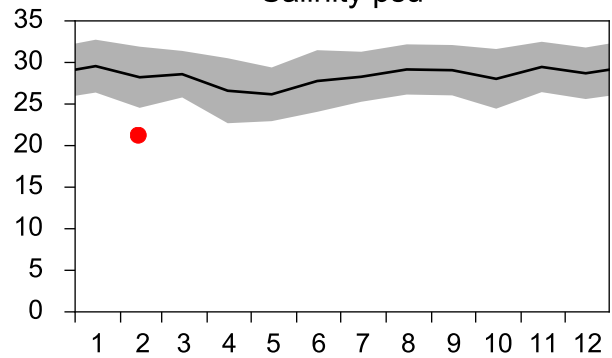
■ St.Dev.

● 2017

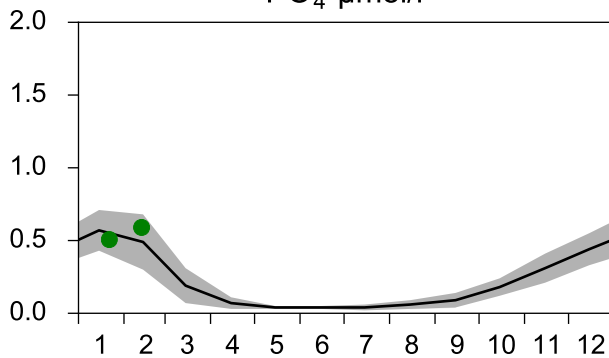
Temperature °C



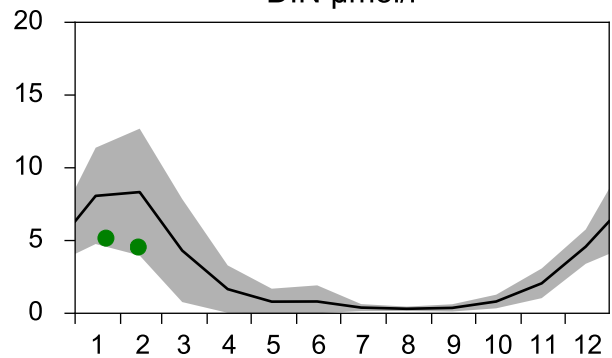
Salinity psu



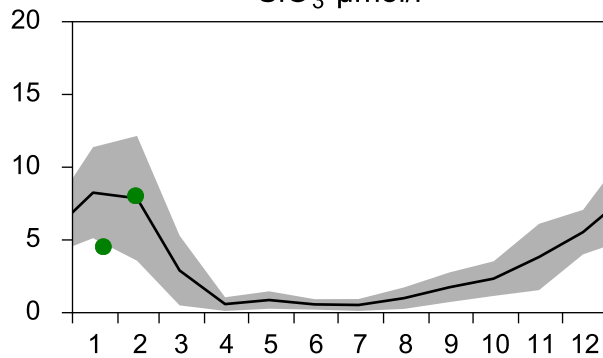
PO₄ µmol/l



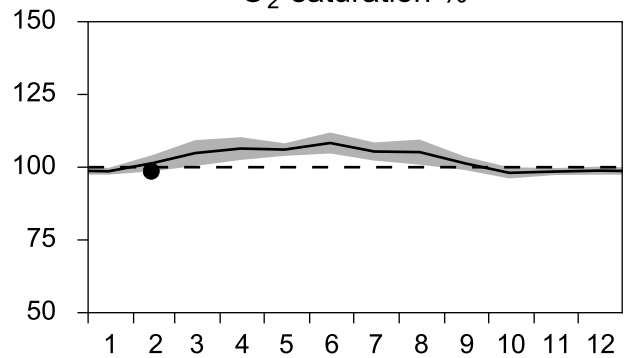
DIN µmol/l



SiO₃ µmol/l

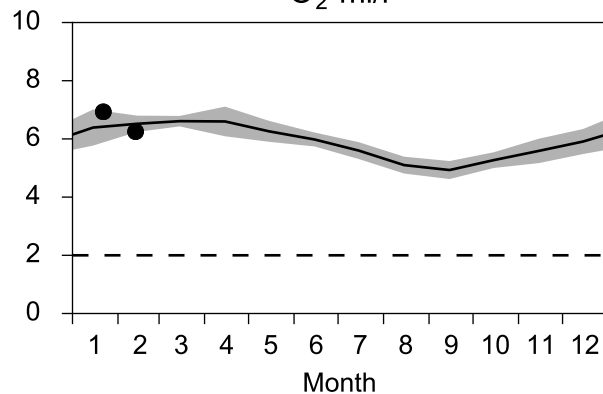


O₂ saturation %

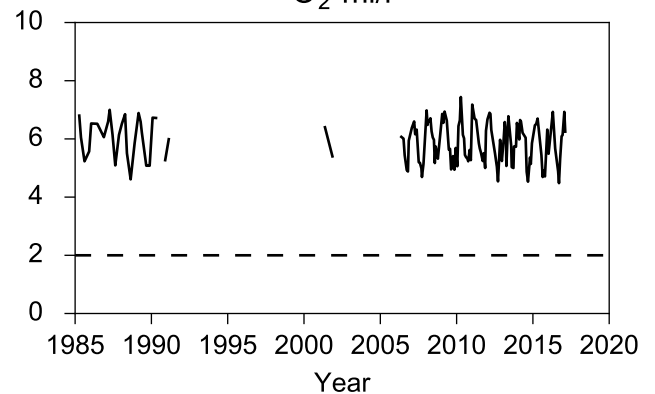


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

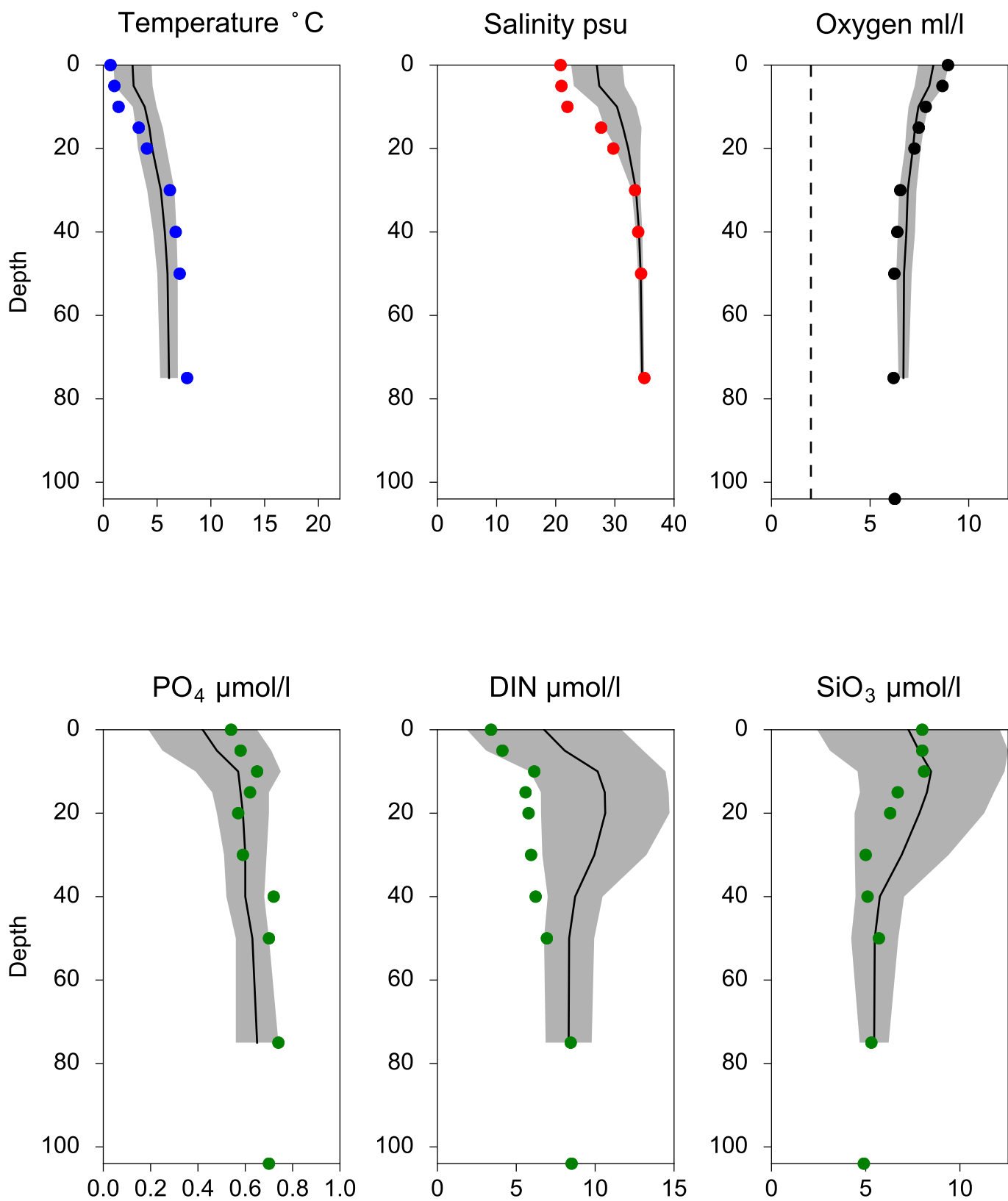


O₂ ml/l



Vertical profiles Å13 February

— Mean 2001-2015 St.Dev. • 2017-02-13



STATION SLÄGGÖ SURFACE WATER (0-10 m)

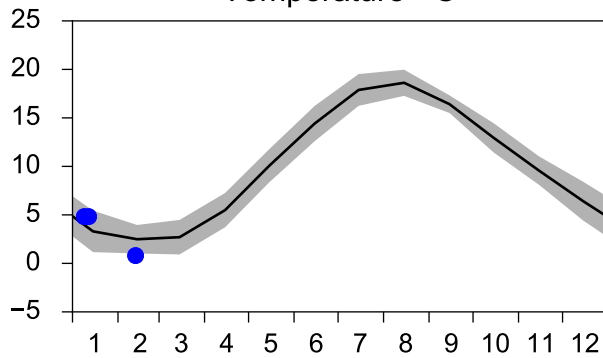
Annual Cycles

— Mean 2001-2015

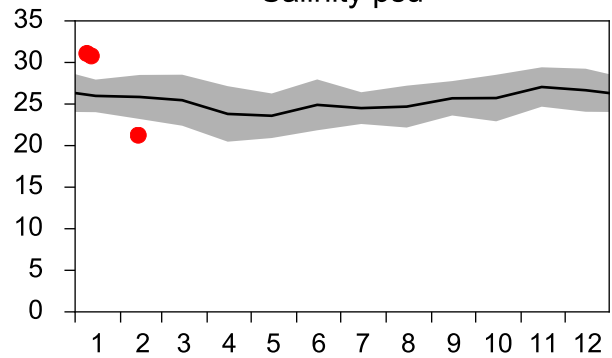
■ St.Dev.

● 2017

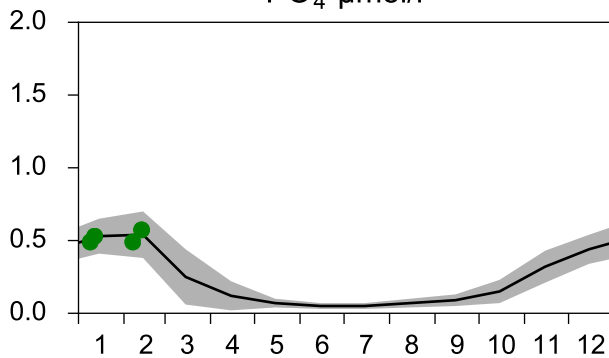
Temperature °C



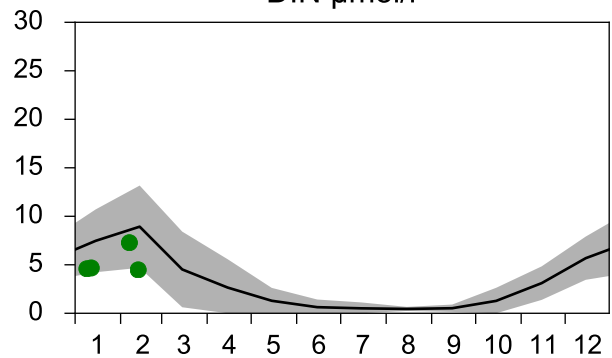
Salinity psu



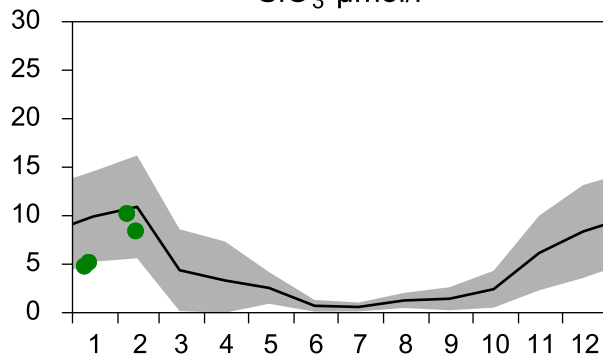
PO₄ μmol/l



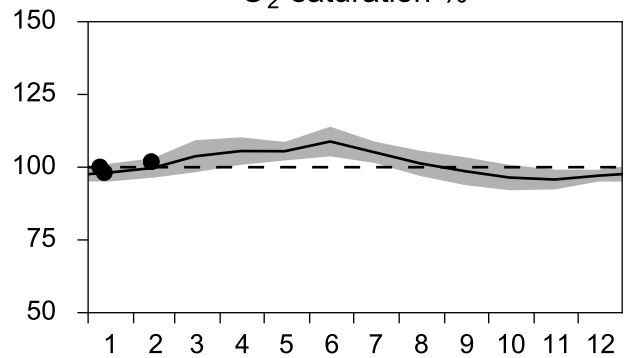
DIN μmol/l



SiO₃ μmol/l

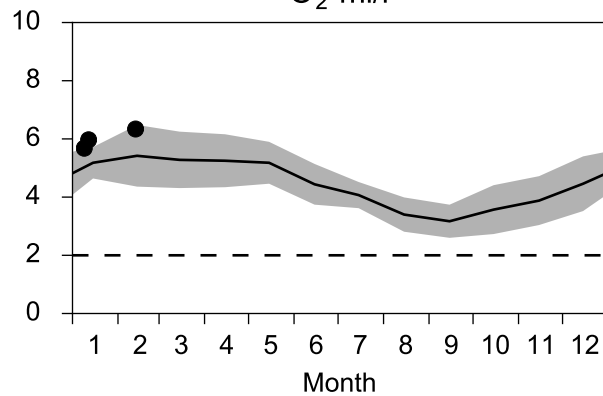


O₂ saturation %

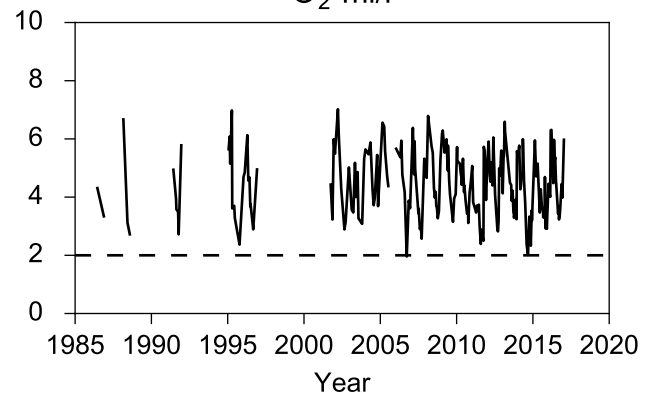


OXYGEN IN BOTTOM WATER (depth >= 64 m)

O₂ ml/l



O₂ ml/l

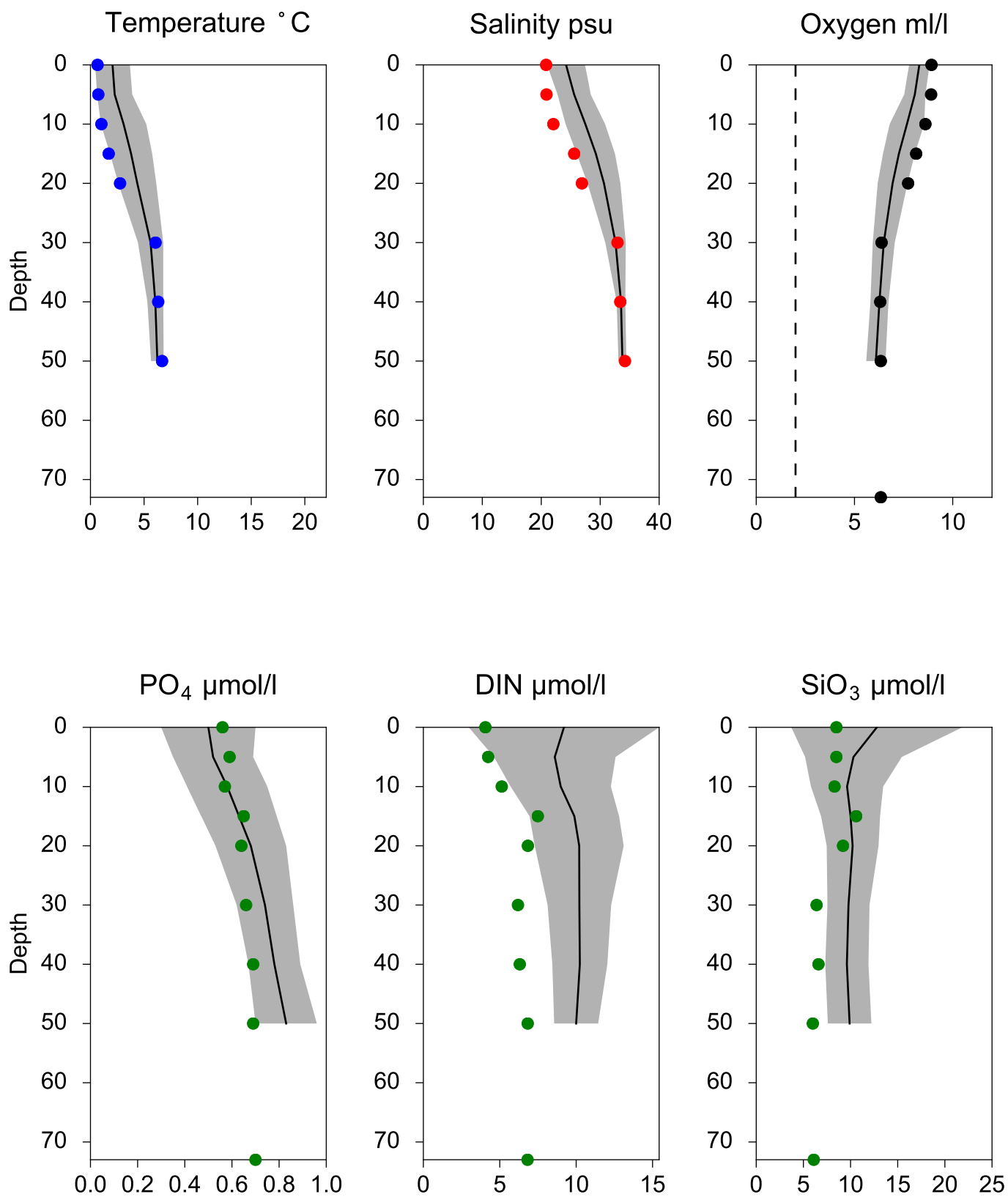


Vertical profiles SLÄGGÖ February

— Mean 2001-2015

■ St.Dev.

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STATION P2 SURFACE WATER (0-10 m)

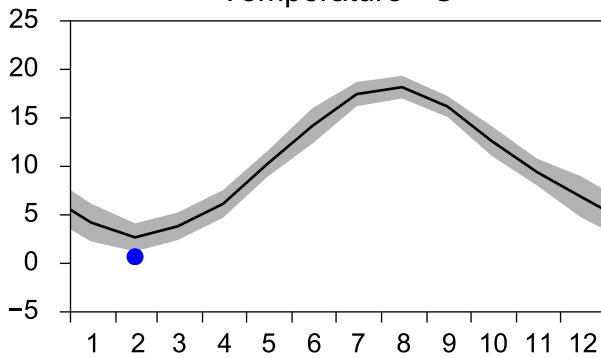
Annual Cycles

— Mean 2001-2015

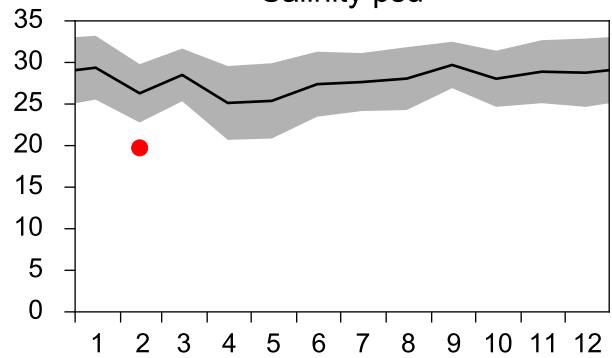
■ St.Dev.

● 2017

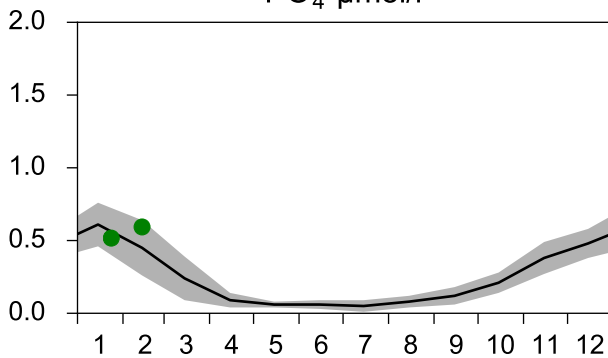
Temperature °C



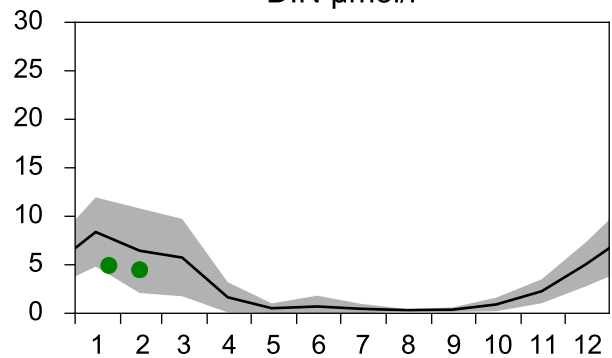
Salinity psu



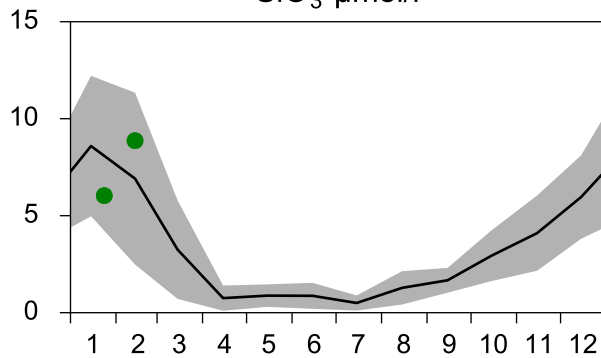
PO₄ μmol/l



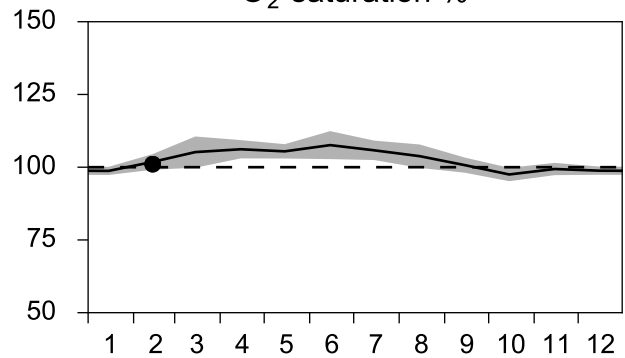
DIN μmol/l



SiO₃ μmol/l

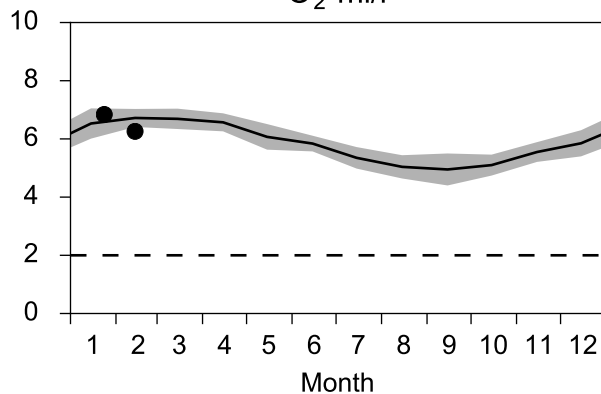


O₂ saturation %

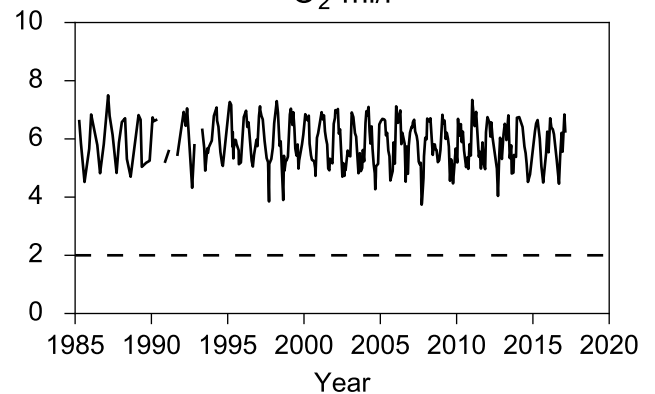


OXYGEN IN BOTTOM WATER (depth >= 75 m)

O₂ ml/l



O₂ ml/l

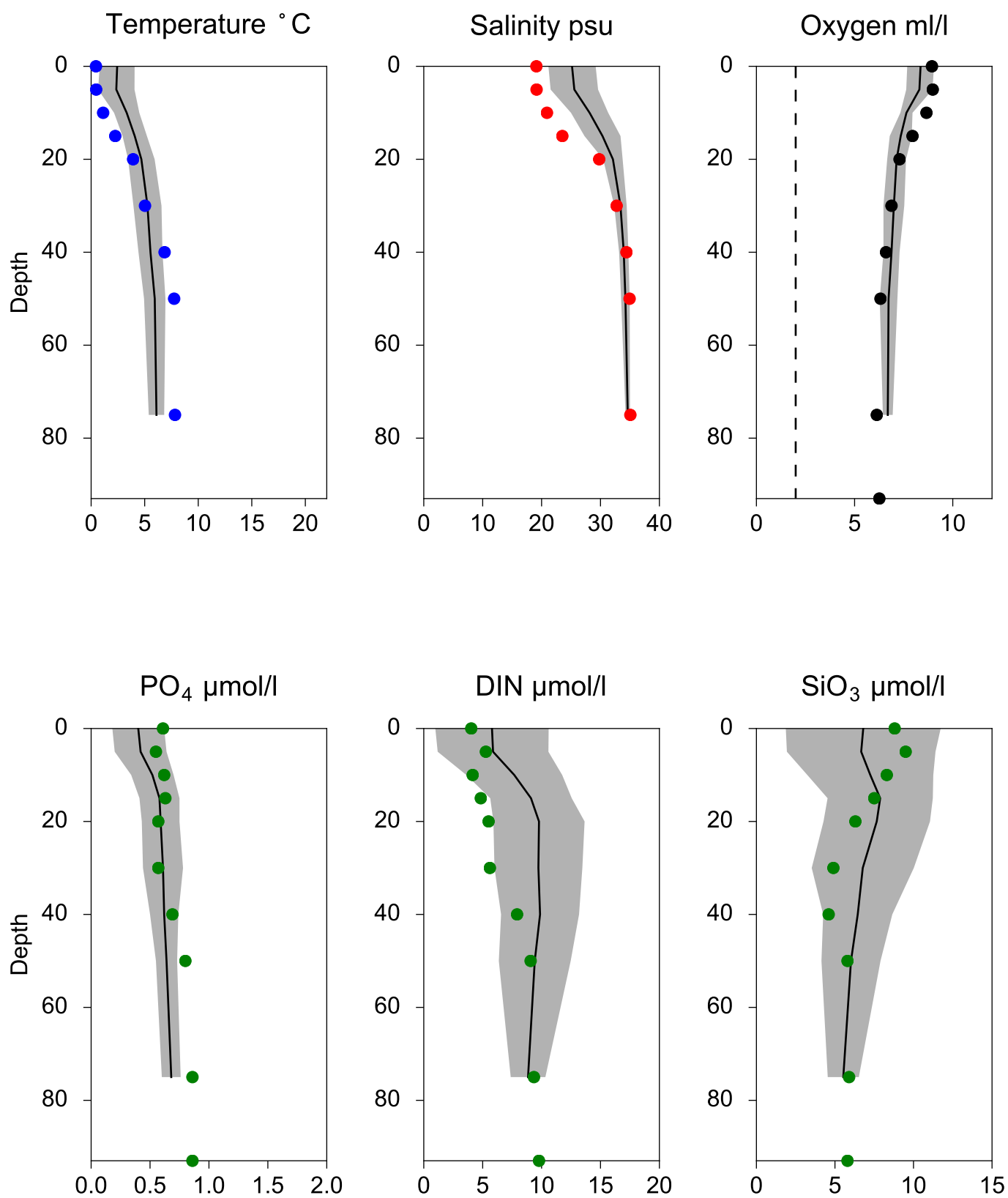


Vertical profiles P2 February

— Mean 2001-2015

■ St.Dev.

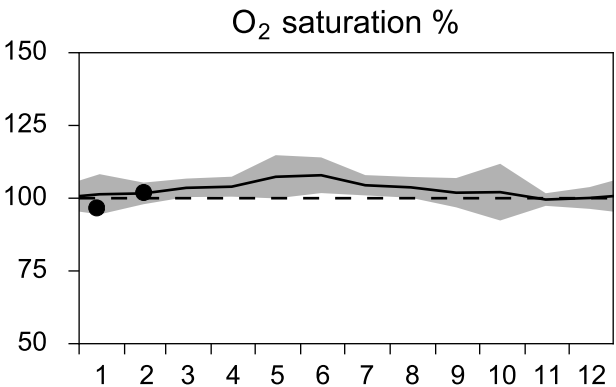
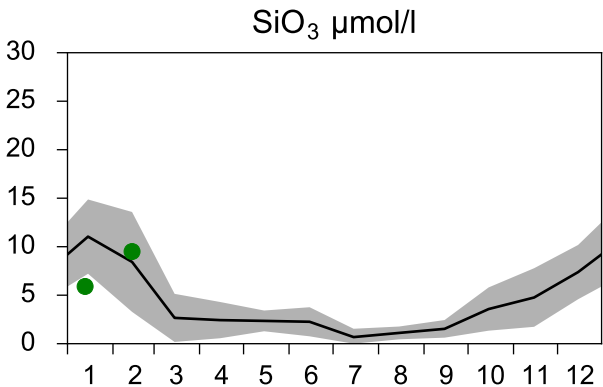
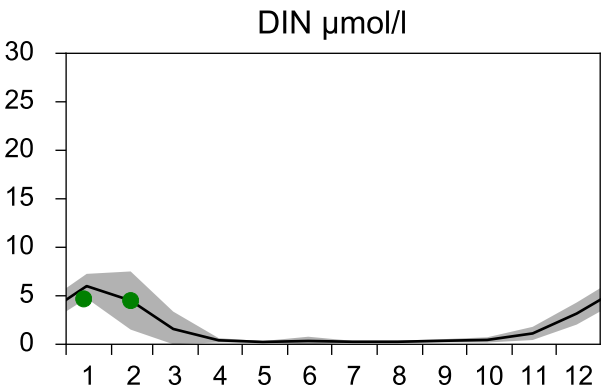
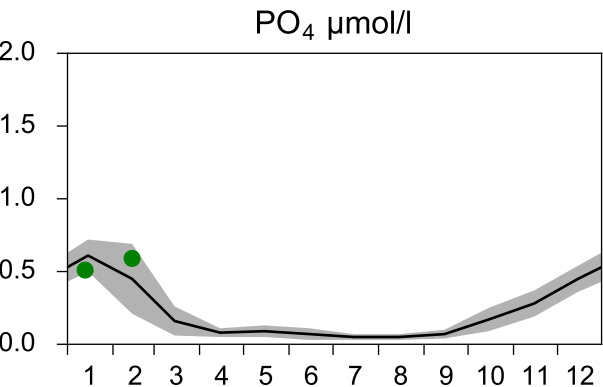
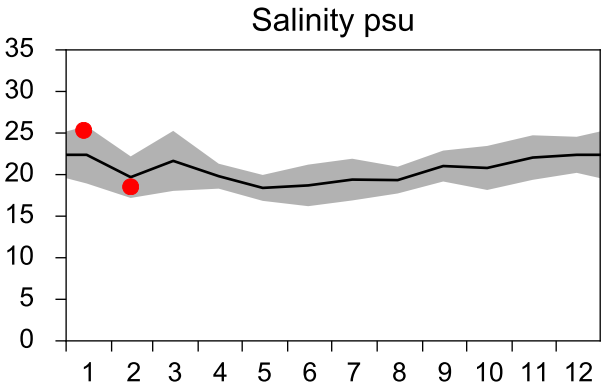
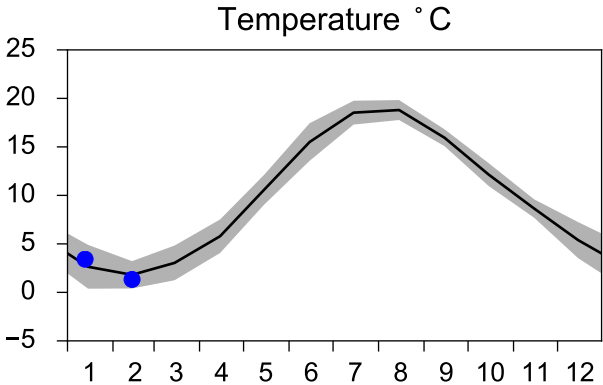
● 2017-02-14



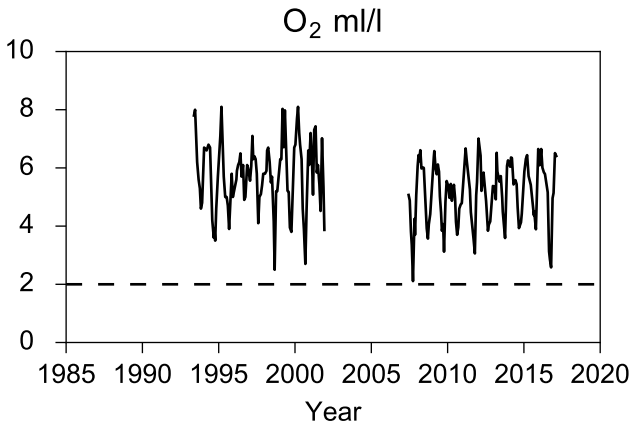
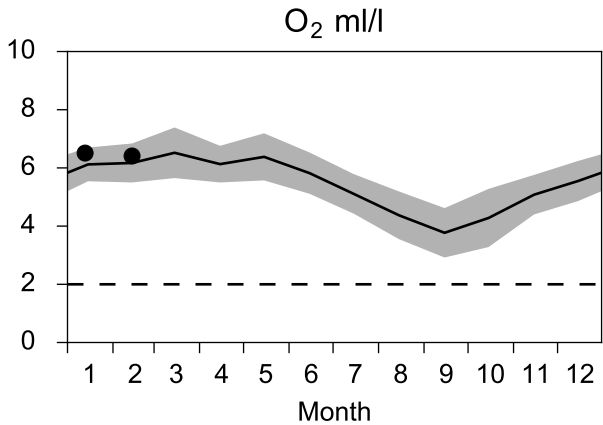
STATION N14 FALKENBERG SURFACE WATER (0-10 m)

Annual Cycles

— Mean 2001-2015 St.Dev. • 2017

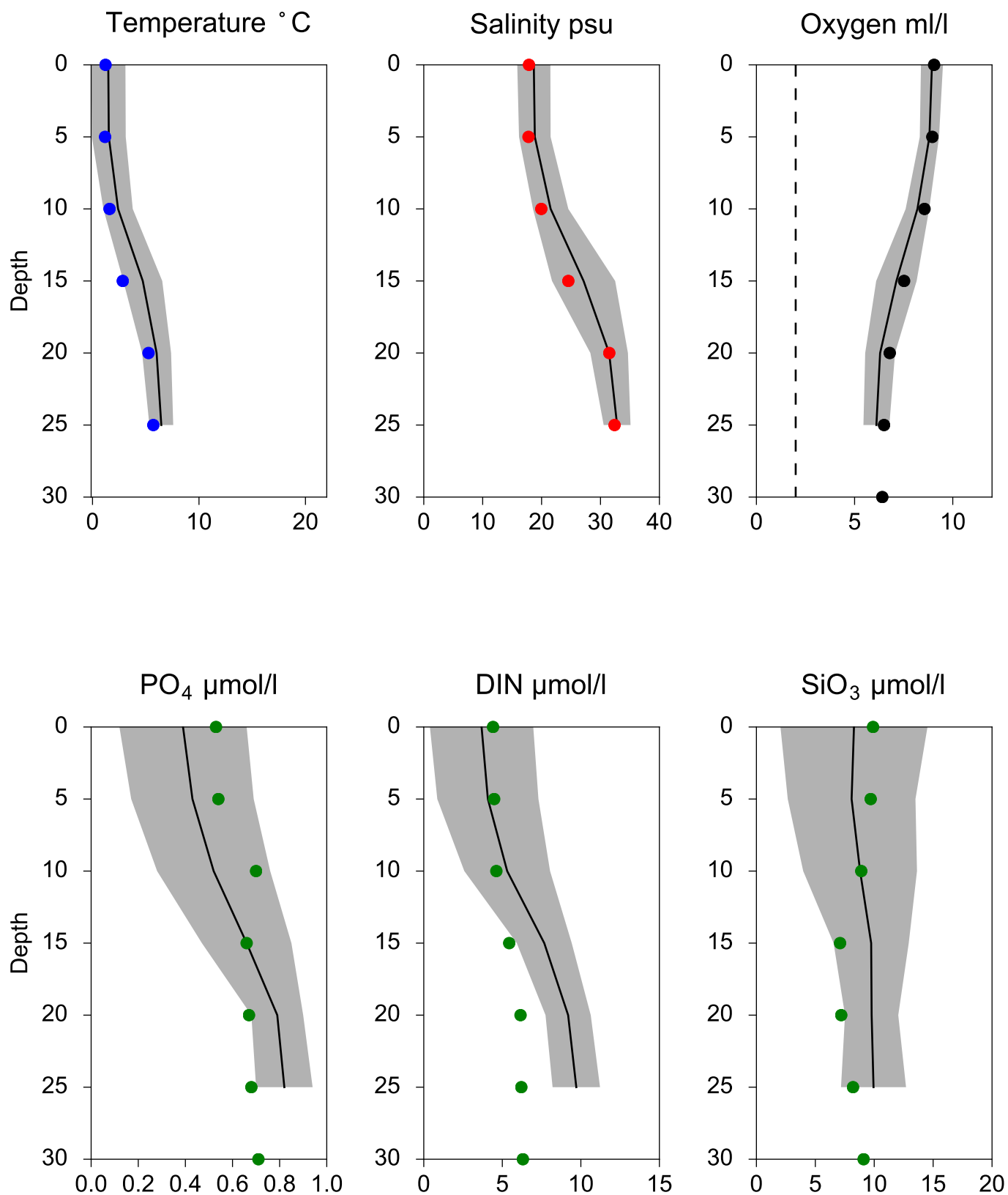


OXYGEN IN BOTTOM WATER (depth >= 25 m)



Vertical profiles N14 FALKENBERG February

— Mean 2001-2015 St.Dev. • 2017-02-14



STATION ANHOLT E SURFACE WATER (0-10 m)

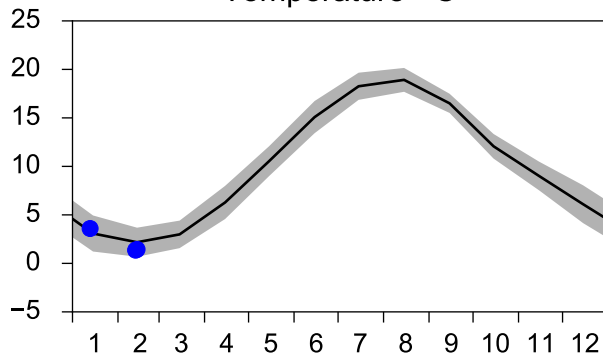
Annual Cycles

— Mean 2001-2015

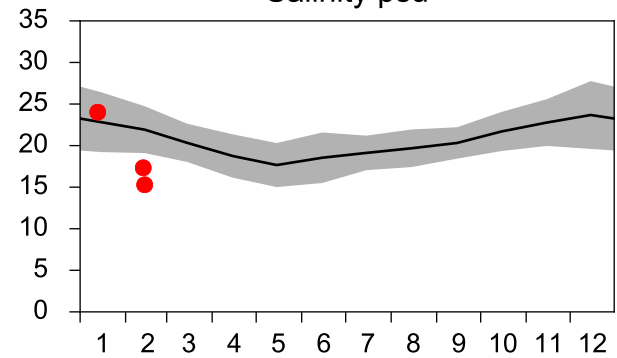
■ St.Dev.

● 2017

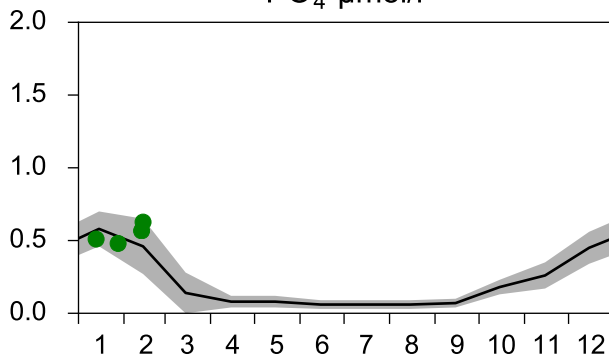
Temperature °C



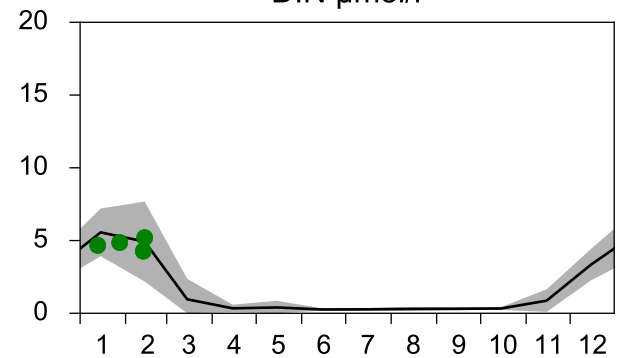
Salinity psu



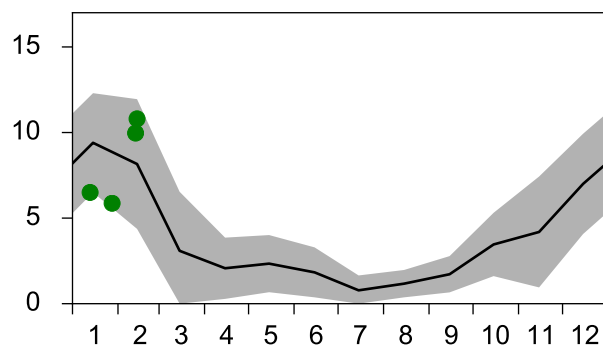
PO₄ µmol/l



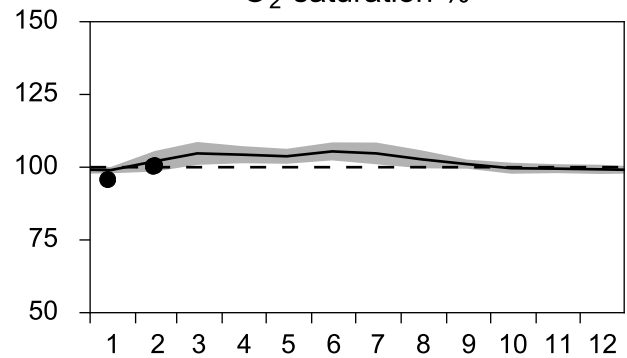
DIN µmol/l



SiO₃ µmol/l

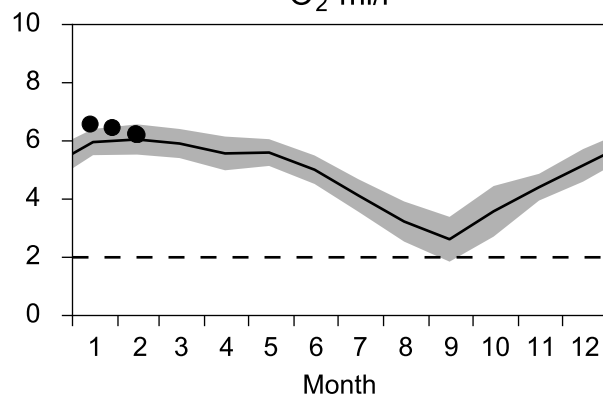


O₂ saturation %

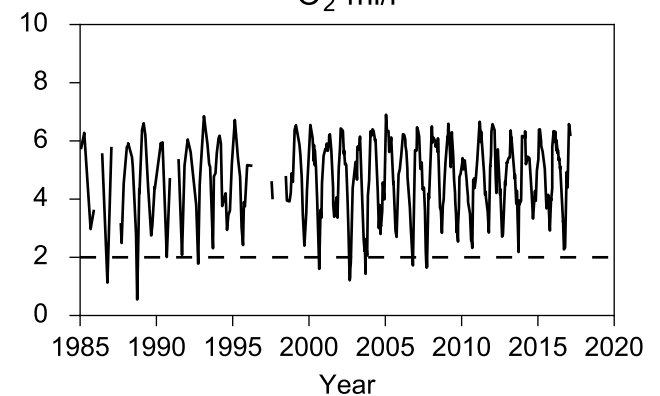


OXYGEN IN BOTTOM WATER (depth >= 52 m)

O₂ ml/l



O₂ ml/l

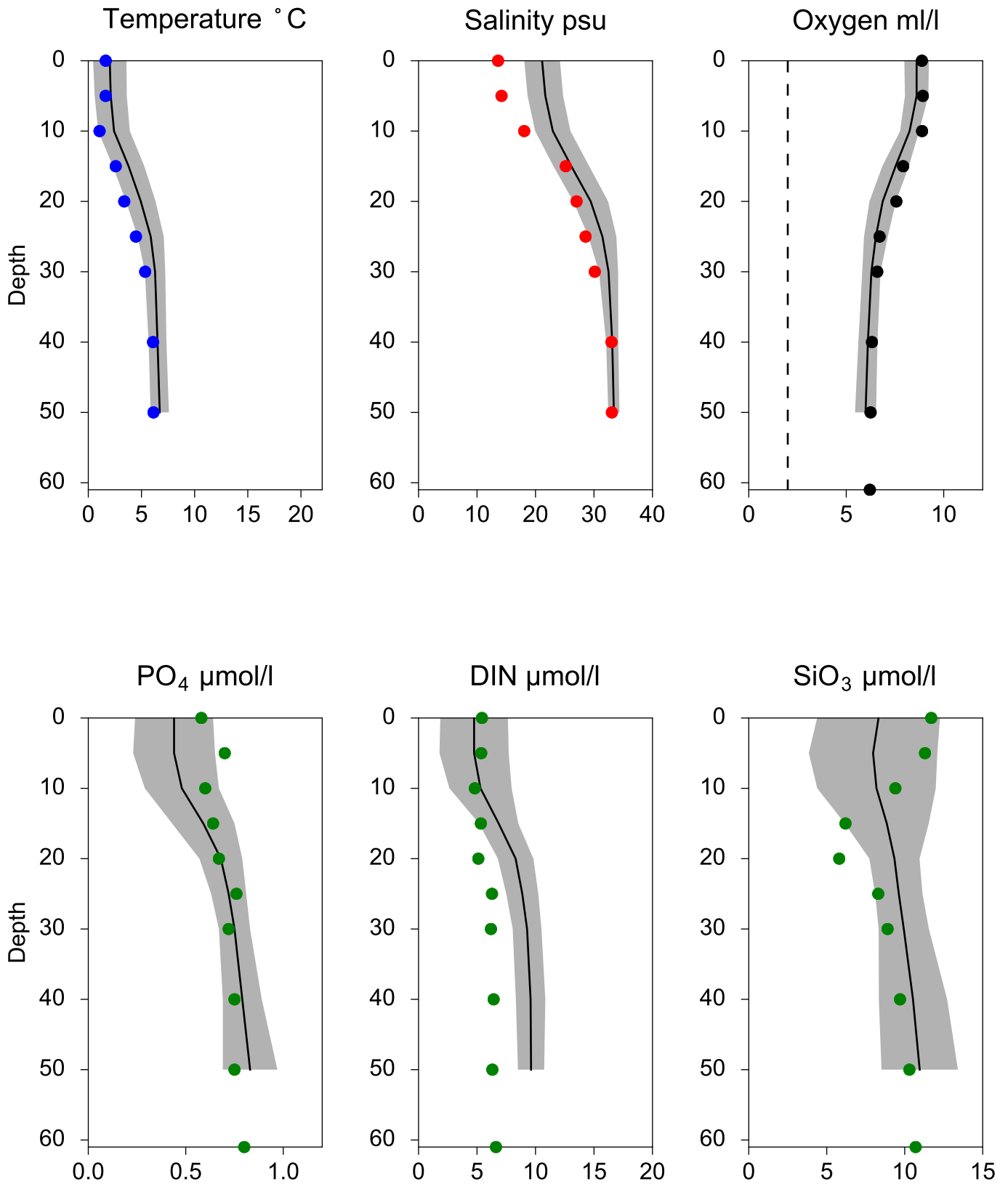


Vertical profiles ANHOLT E February

— Mean 2001-2015

■ St.Dev.

● 2017-02-14



STATION HANÖBUKTEN SURFACE WATER (0-10 m)

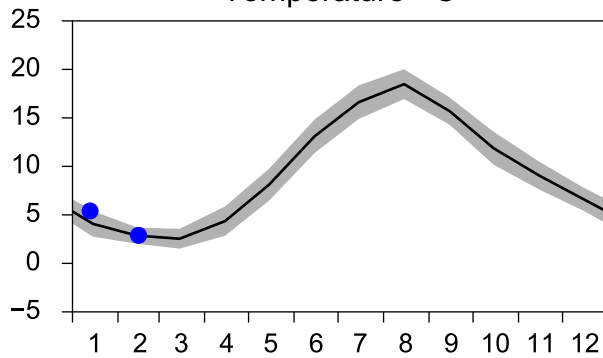
Annual Cycles

— Mean 2001-2015

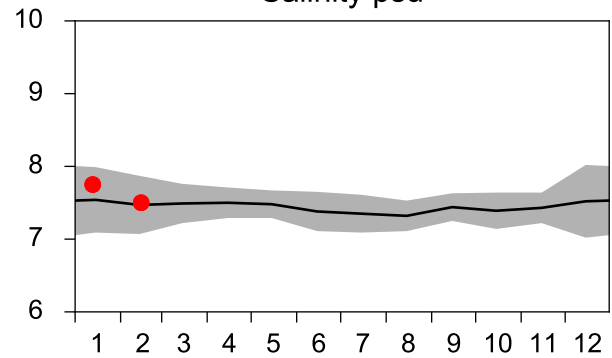
■ St.Dev.

● 2017

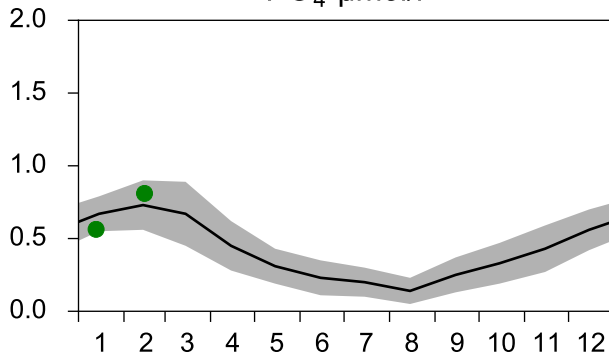
Temperature °C



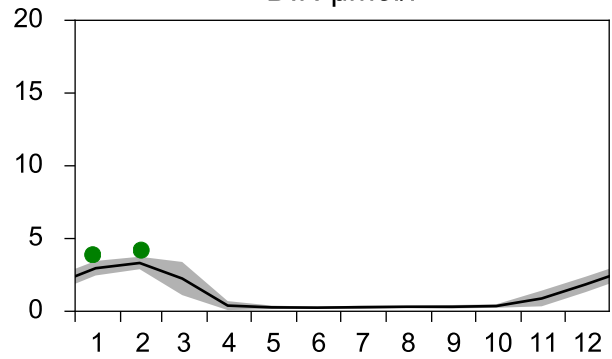
Salinity psu



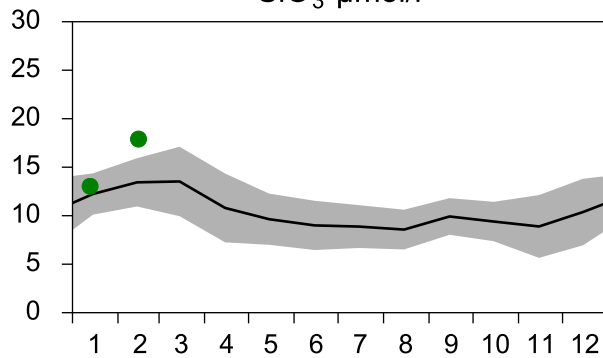
PO₄ µmol/l



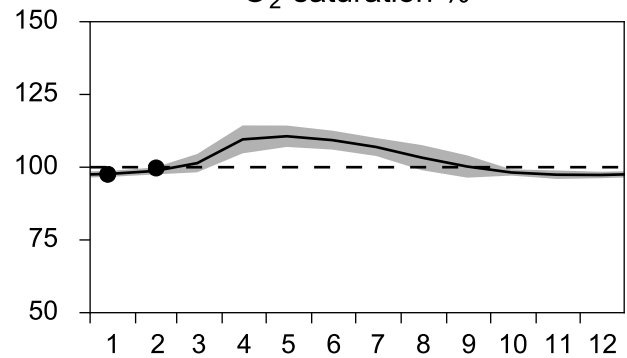
DIN µmol/l



SiO₃ µmol/l

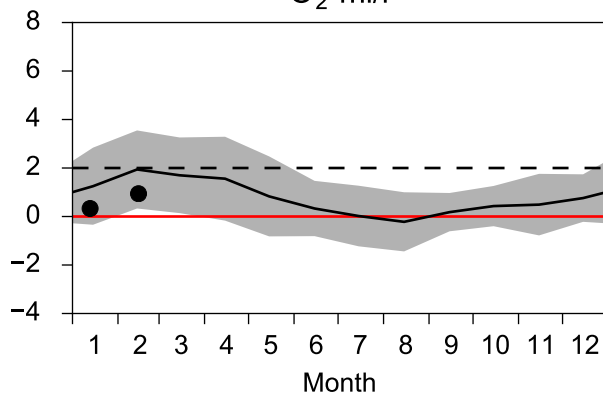


O₂ saturation %

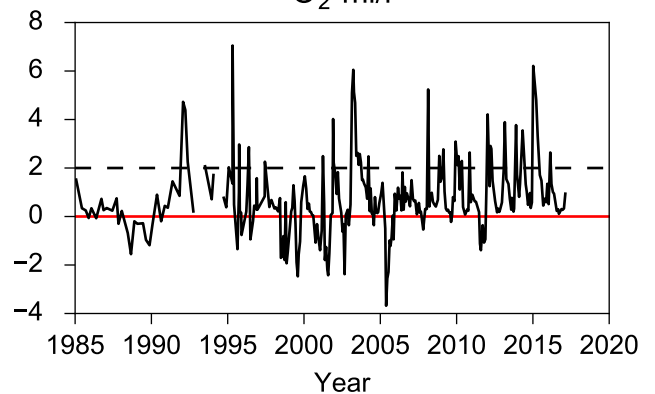


OXYGEN IN BOTTOM WATER (depth >= 70 m)

O₂ ml/l



O₂ ml/l

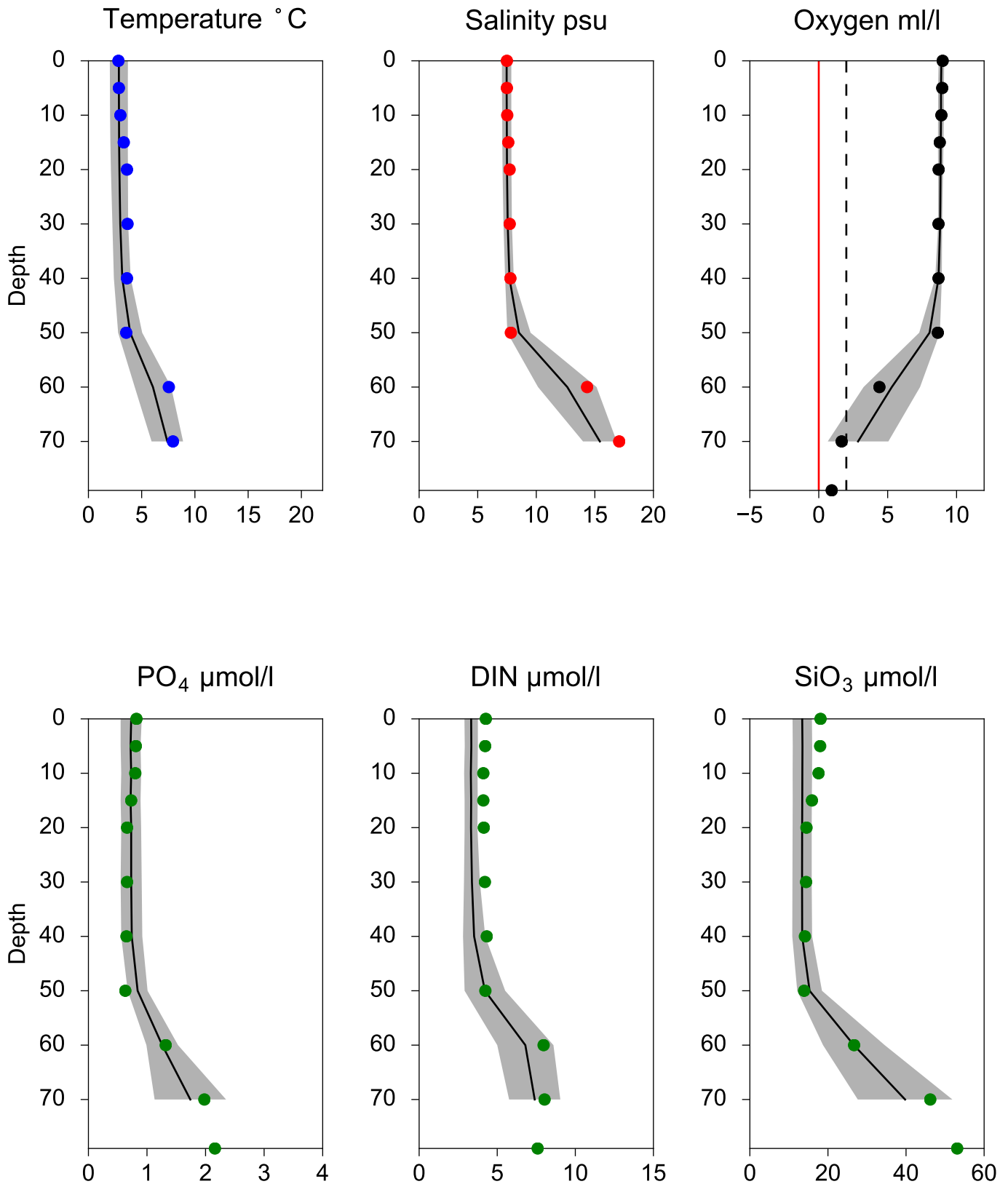


Vertical profiles HANÖBUKTEN February

— Mean 2001-2015

■ St.Dev.

● 2017-02-15



STATION REF M1V1 SURFACE WATER (0-10 m)

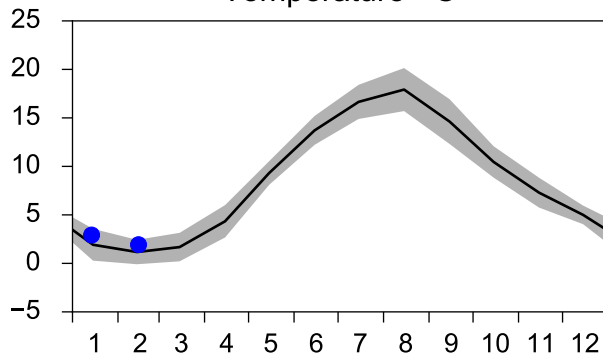
Annual Cycles

— Mean 2001-2015

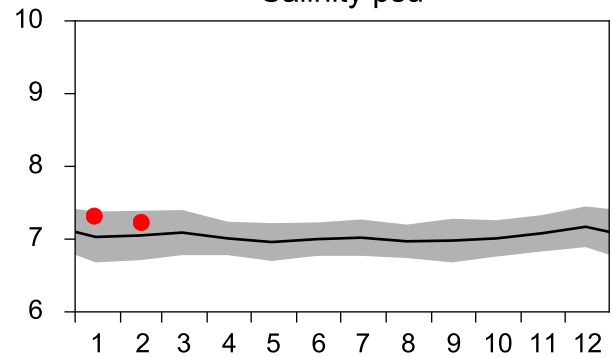
■ St.Dev.

● 2017

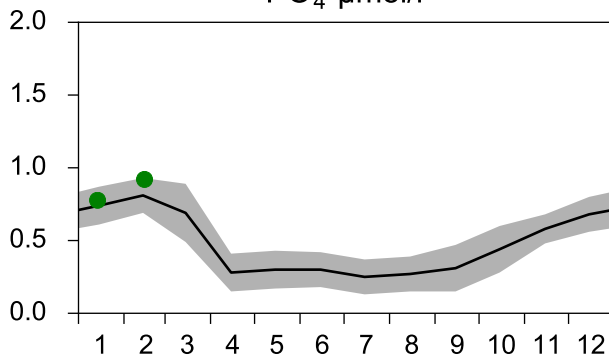
Temperature °C



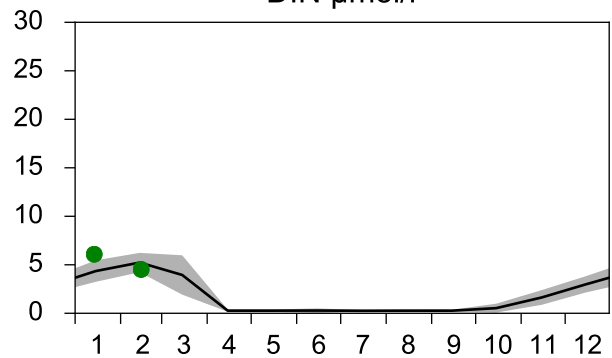
Salinity psu



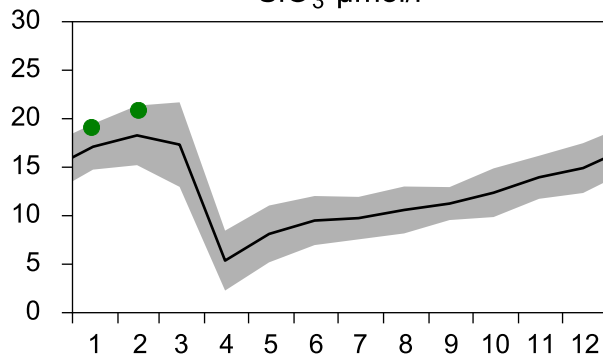
PO₄ µmol/l



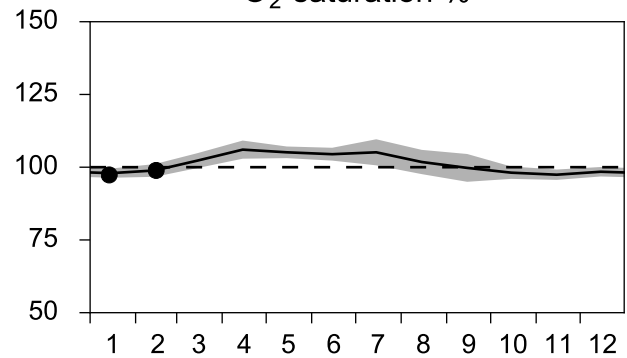
DIN µmol/l



SiO₃ µmol/l

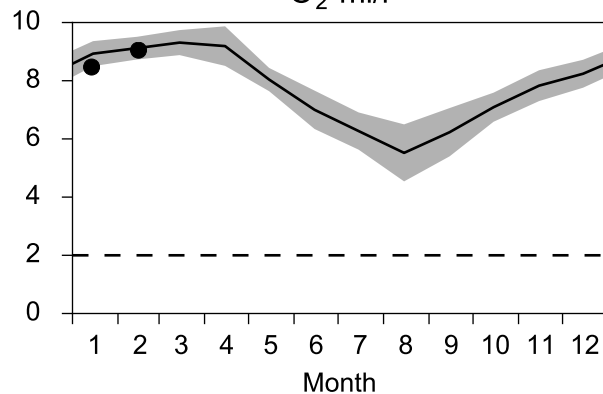


O₂ saturation %

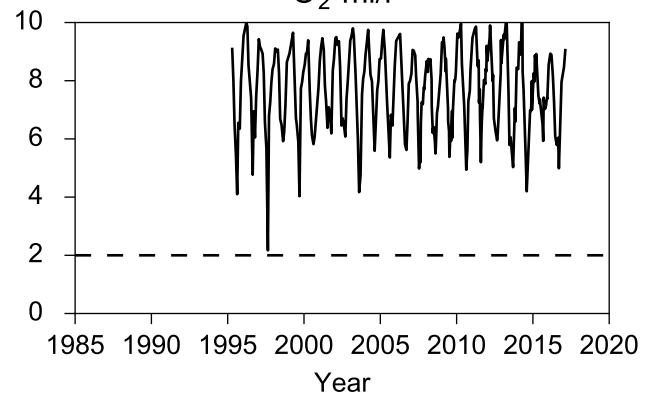


OXYGEN IN BOTTOM WATER (depth >= 17 m)

O₂ ml/l

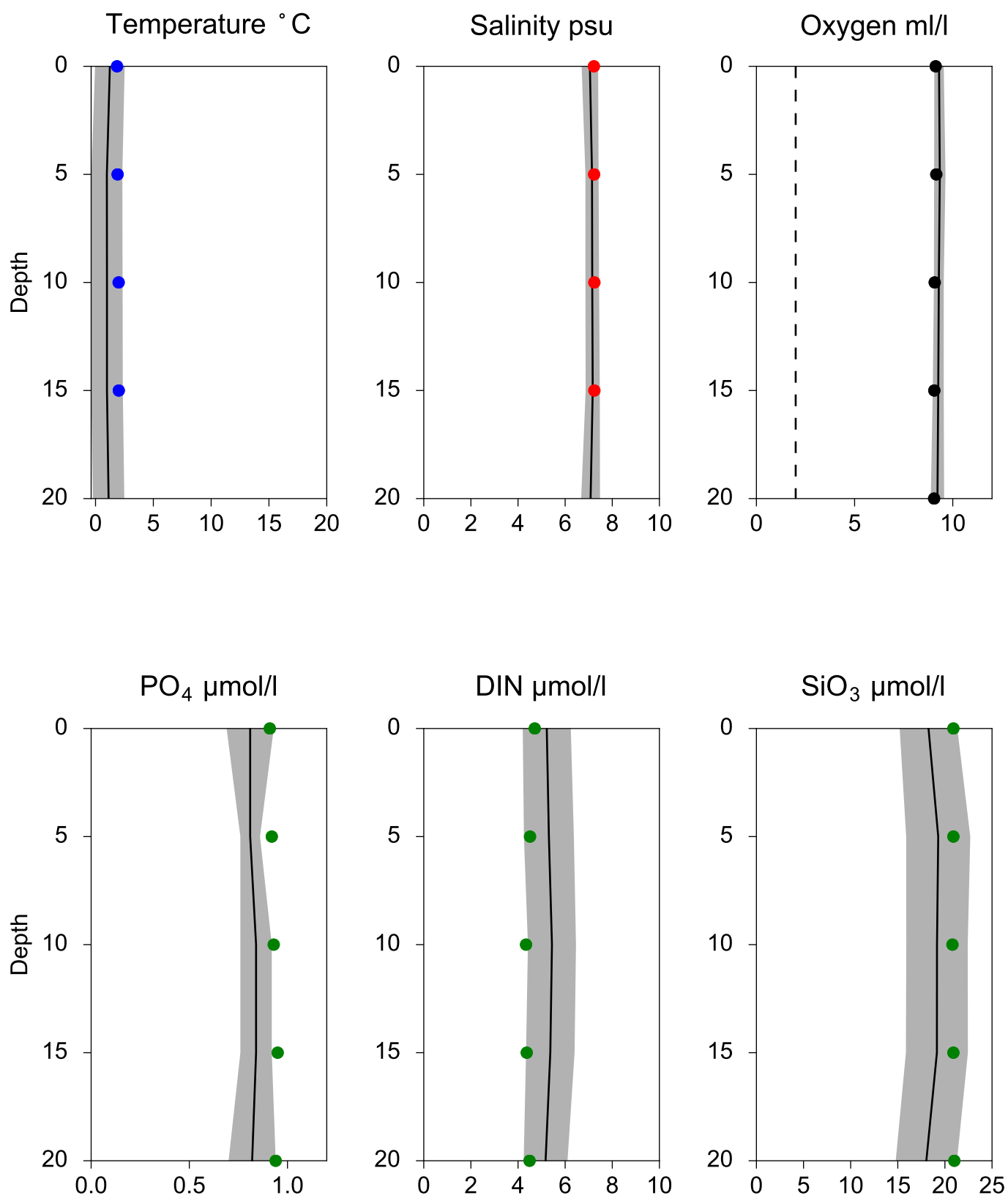


O₂ ml/l



Vertical profiles REF M1V1 February

— Mean 2001-2015 St.Dev. • 2017-02-15



STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

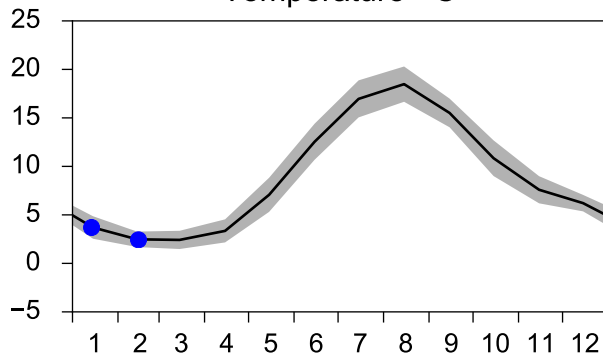
Annual Cycles

— Mean 2001-2015

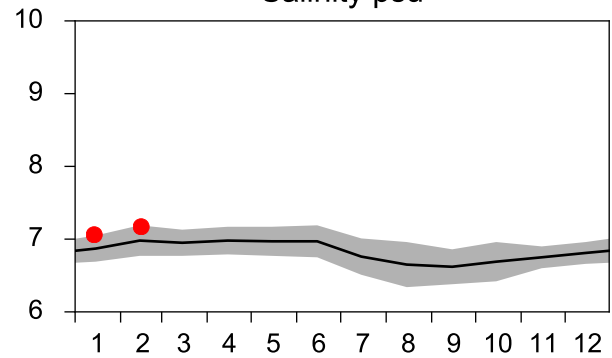
■ St.Dev.

● 2017

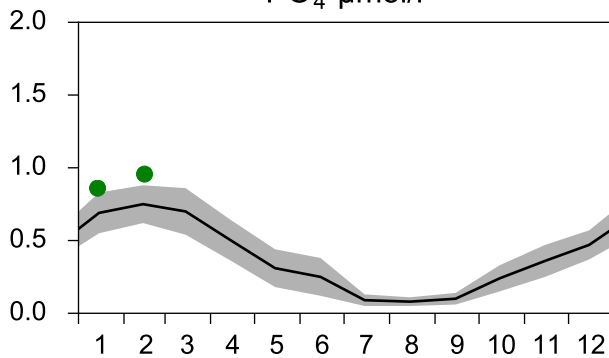
Temperature °C



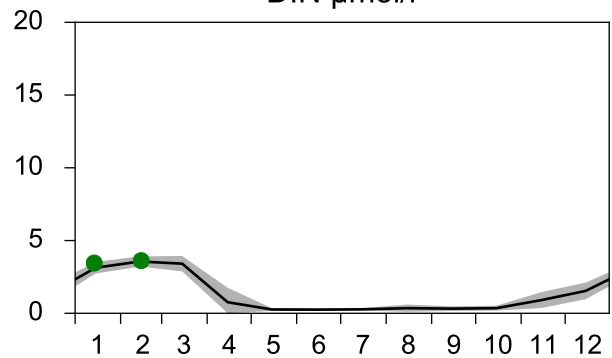
Salinity psu



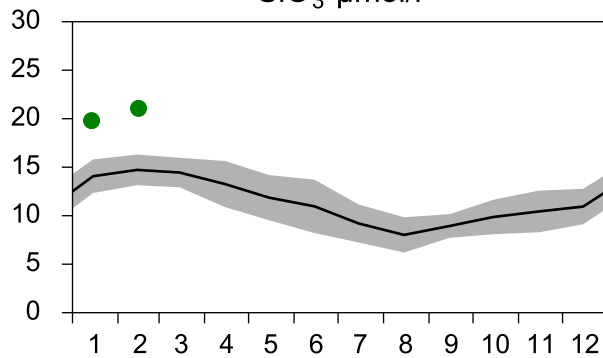
PO₄ μmol/l



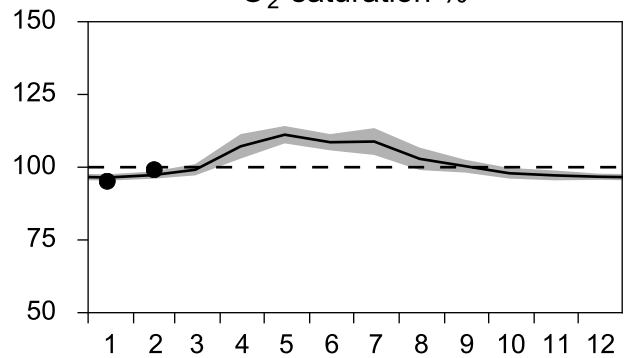
DIN μmol/l



SiO₃ μmol/l

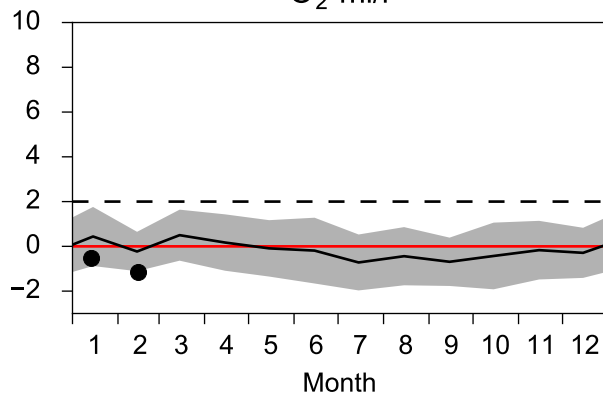


O₂ saturation %

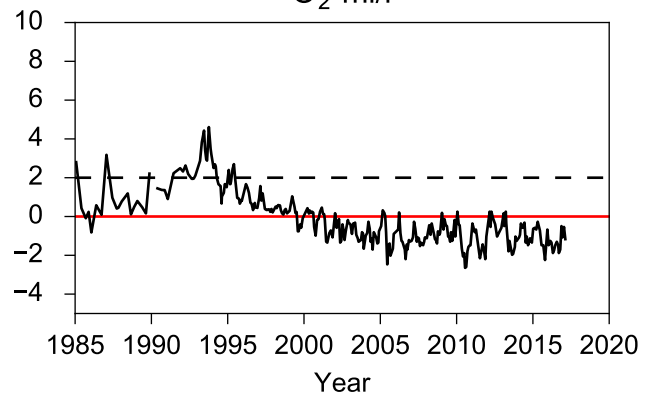


OXYGEN IN BOTTOM WATER (depth >= 100 m)

O₂ ml/l

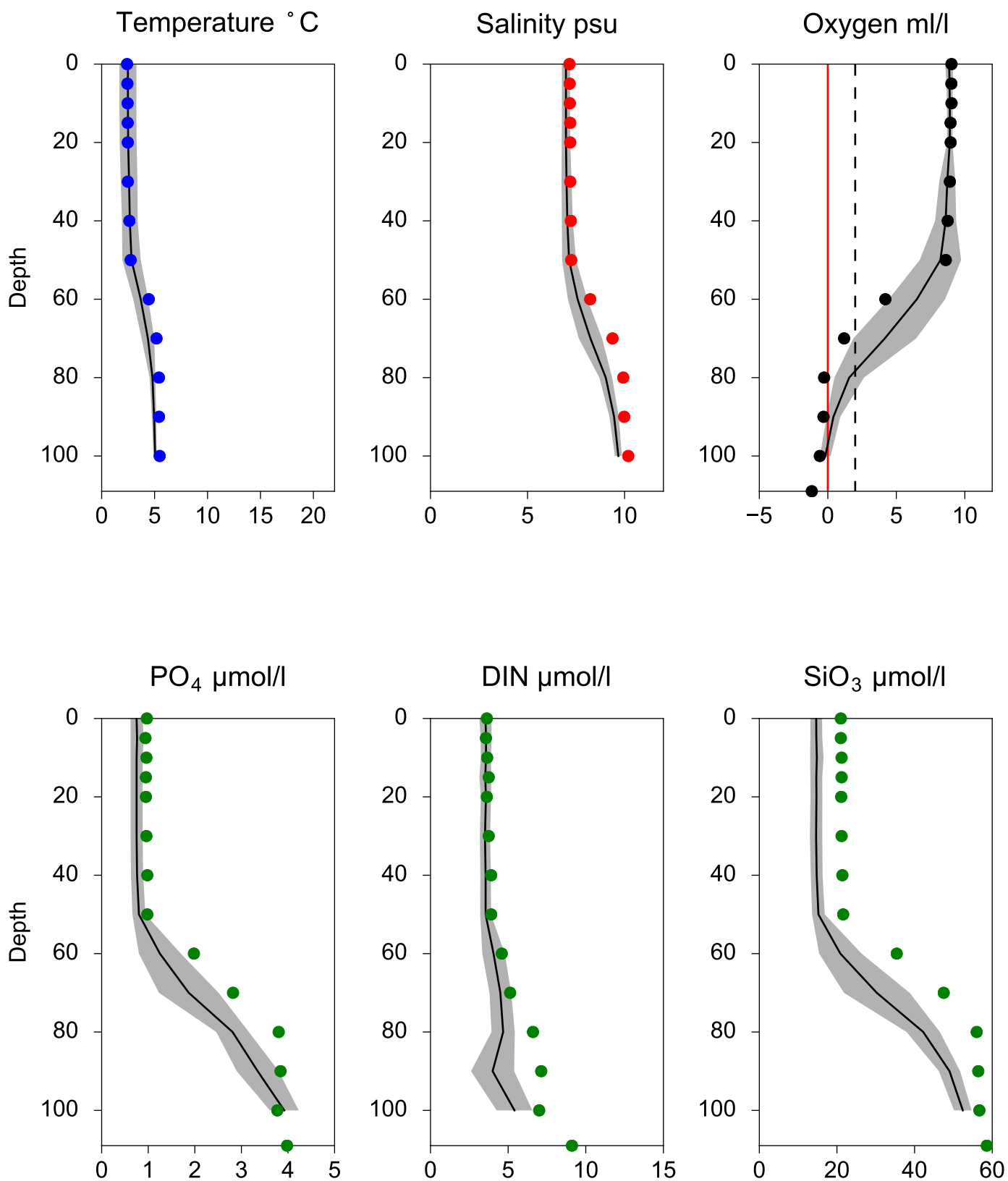


O₂ ml/l



Vertical profiles BY38 KARLSÖDJ February

— Mean 2001-2015 St.Dev. • 2017-02-15



STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

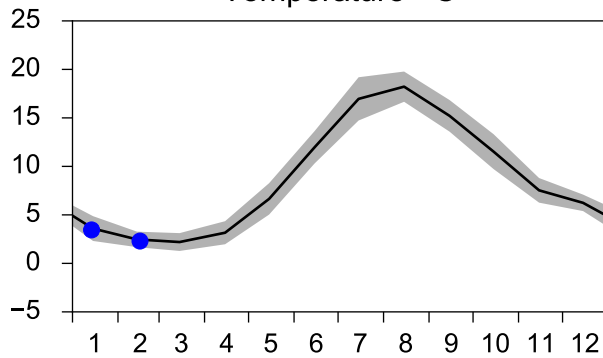
Annual Cycles

— Mean 2001-2015

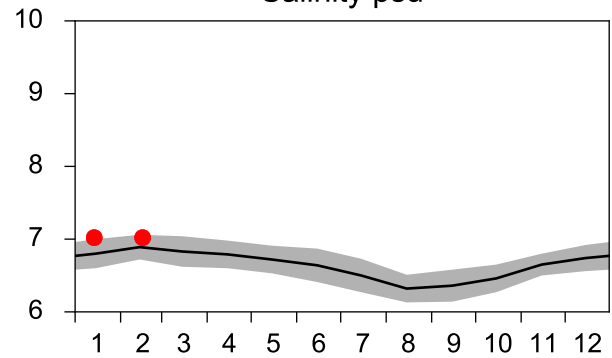
■ St.Dev.

● 2017

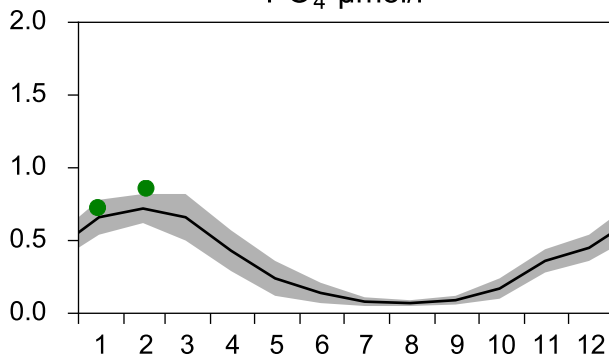
Temperature °C



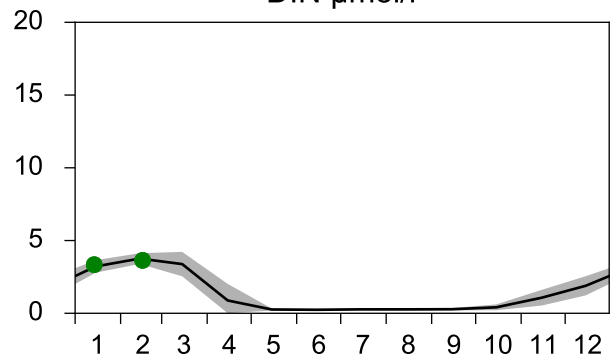
Salinity psu



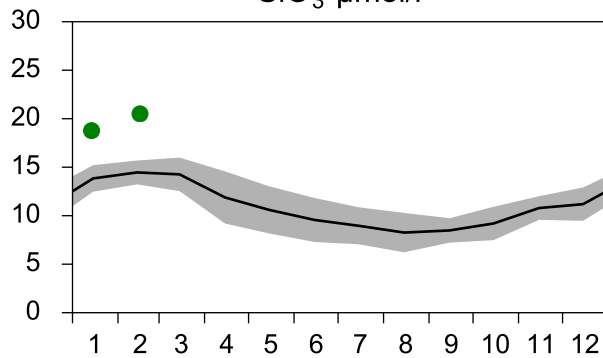
PO₄ µmol/l



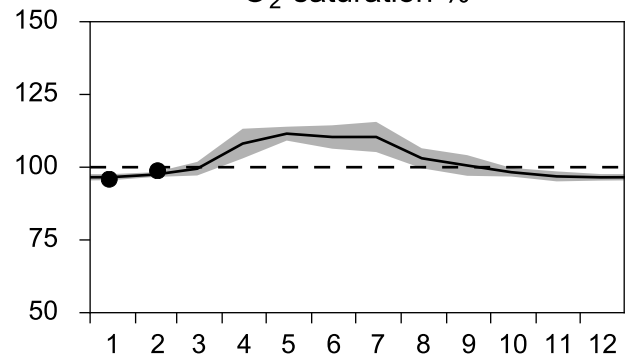
DIN µmol/l



SiO₃ µmol/l

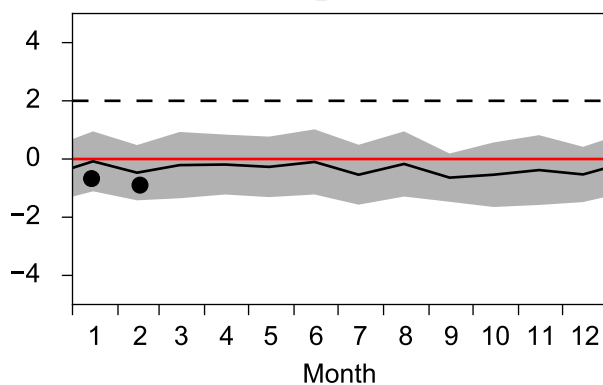


O₂ saturation %

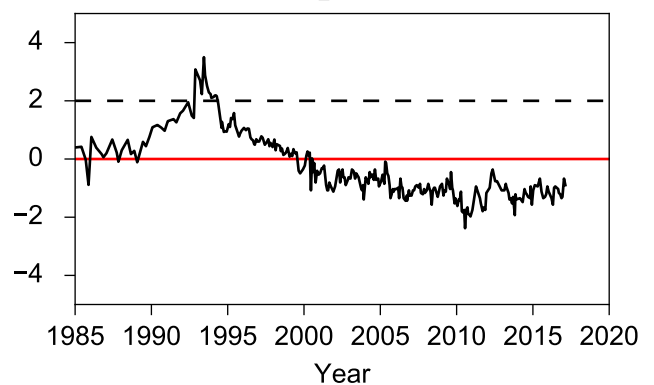


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

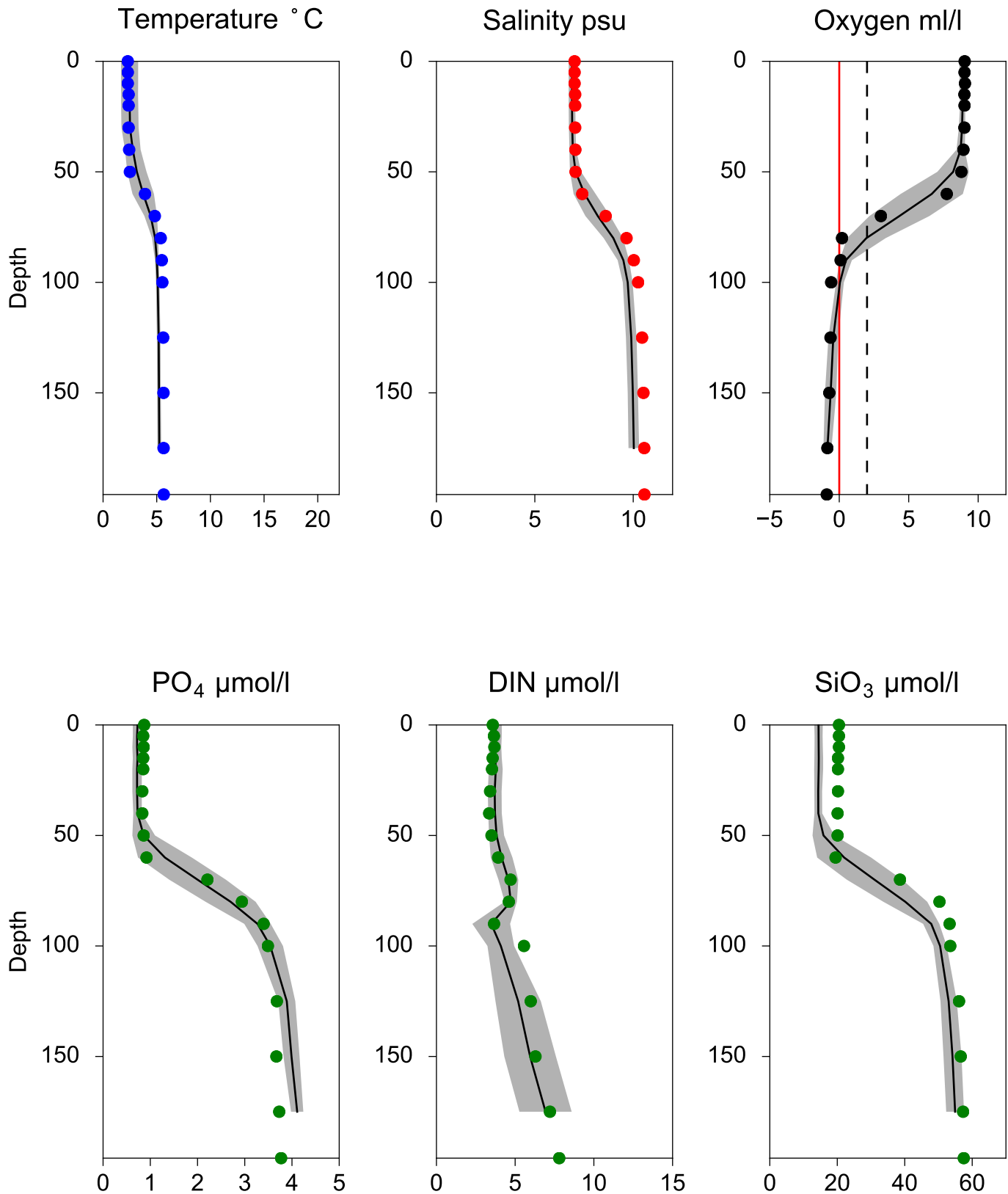


O₂ ml/l



Vertical profiles BY32 NORRKÖPINGSDJ February

— Mean 2001-2015 St.Dev. • 2017-02-16



STATION BY31 LANDSORTSDJ SURFACE WATER (0-10 m)

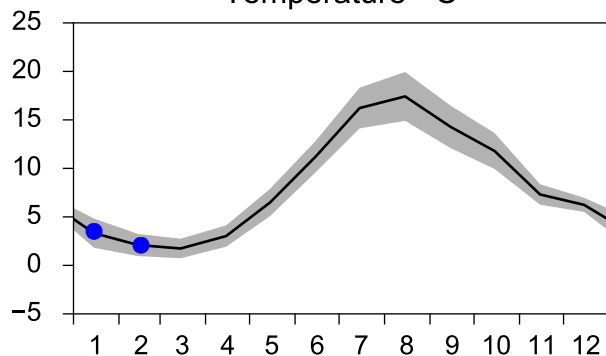
Annual Cycles

— Mean 2001-2015

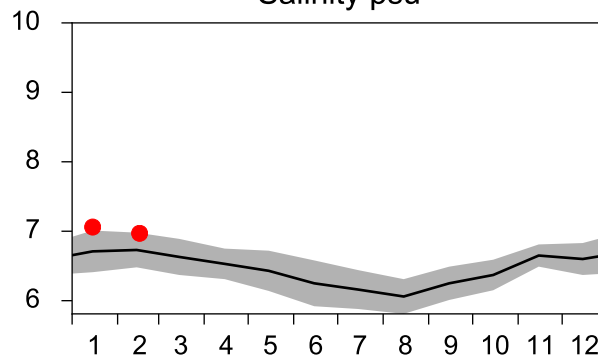
■ St.Dev.

● 2017

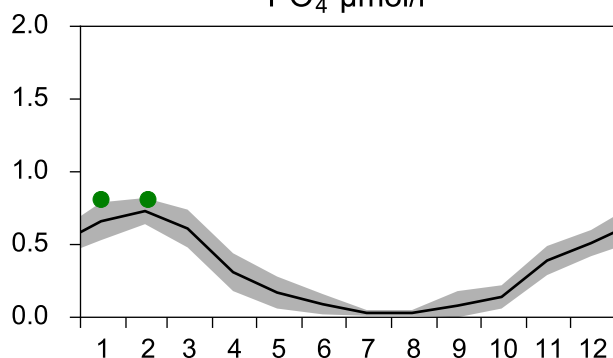
Temperature °C



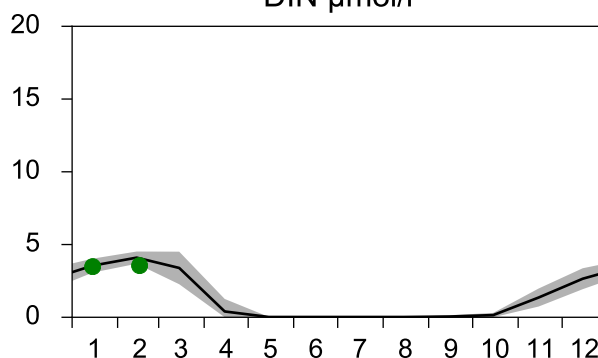
Salinity psu



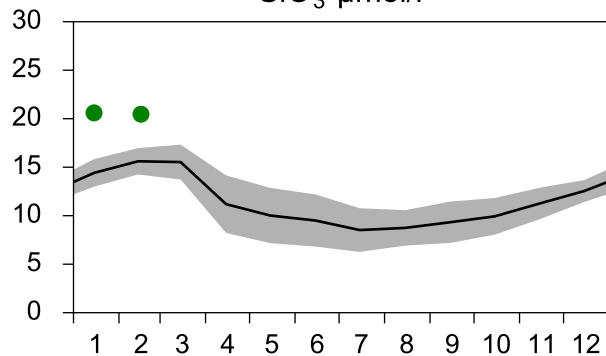
PO₄ µmol/l



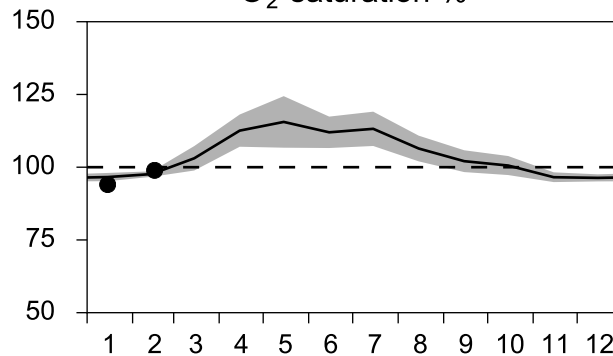
DIN µmol/l



SiO₃ µmol/l

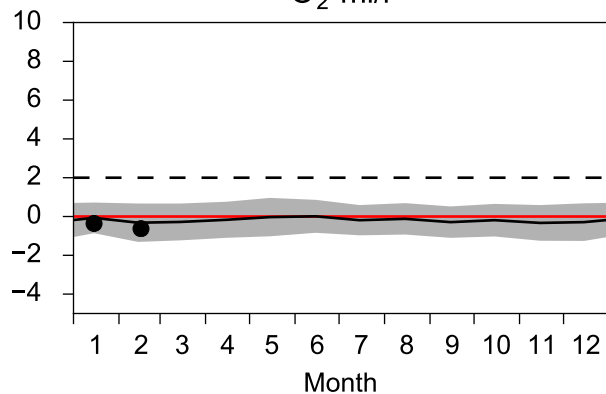


O₂ saturation %

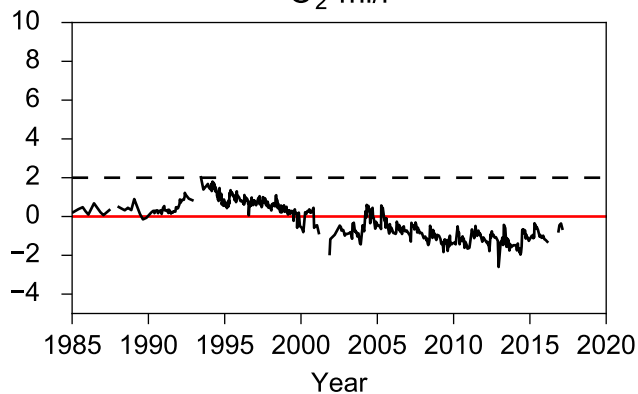


OXYGEN IN BOTTOM WATER (depth >= 425 m)

O₂ ml/l



O₂ ml/l



Vertical profiles BY31 LANDSORTSDJ February

— Mean 2001-2015 ■ St.Dev. ● 2017-02-16

