

Rapport från SMHIs utsjöexpedition med M/V Meri



Expeditionens varaktighet: 2018-01-24 - 2018-02-04
Uppdragsgivare: Sveriges Meteorologiska och Hydrologiska Institut,
Havs- och Vattenmyndigheten.
Samarbetspartner: Finlands miljöcentral (SYKE), VG-Shipping.

SAMMANFATTNING

Under expeditionen, som ingår i det svenska pelagiala övervakningsprogrammet, besöktes Skagerrak, Kattegatt, Öresund, Egentliga Östersjön och Ålands Hav. I Kattegatt, Öresund och Östersjön gjordes vinterkartering av närsalter.

I stora delar av Egentliga Östersjöns djupvatten påträffades syrgashalter nära noll i djupvattnet. Helt syrefria förhållanden, då svavelväte bildas, uppmättes i Västra Gotlandsbassängen från 80 meters djup, i Norra Gotlandsbassängen från 90-125 meter. I Östra Gotlandsbassängen uppmättes svavelväte närmast botten men enbart låga halter. Akut syrebrist (< 2ml/l) påträffades i Bornholmsbassängen och i Hanöbukten redan omkring 40-45 meter, i sydöstra Egentliga Östersjön vid 60 meter och i Östra och Västra Gotlandsbassängen vid ca 70 meter. I Arkonabassängen sjönk syrgaskoncentration till ca 3.5 ml/l närmast botten.

Närsalter i form av löst oorganiskt kväve (DIN) och fosfor (DIP) i ytskiktet låg generellt på normala vinternivåer i hela undersökningsområdet. Silikatkoncentrationerna i hela Egentliga Östersjön var fortsatt högre än normalt.

Nästa ordinarie expedition planeras till mitten av mars.

RESULTAT

Januari- och februariexpeditionen slogs samman till en längre expedition som genomfördes ombord på det finska fartyget Meri och startade i Göteborg den 24:e januari.

Vindarna var mestadels friska från sydväst men vred avslutningsvis över till hård nordlig vind i Skagerrak. Temperaturen låg strax över 0 grader, något kallare de sista dagarna i Kattegatt och Skagerrak då temperaturen sjönk ner till minus och det blev en del isbildning på däck.

På grund av problem med uppvärmning av inkommande havsvatten så kunde inte primärproduktion mätas under expeditionen.

Denna rapport är baserad på data som genomgått en första kvalitetskontroll. När data publiceras hos datavärden kan vissa värden ha ändrats då ytterligare kvalitetsgranskning genomförts. Data från denna expedition publiceras så fort som möjligt på datavärdens hemsida, normalt sker detta inom en till två veckor efter avslutad expedition.

Data kan hämtas här: <http://www.smhi.se/klimatdata/oceanografi/havsmiljodata>

Skagerrak

Ytvattentemperaturen var normal och varierade mellan drygt 3 °C till 5.2 °C. Under det kallare ytvattnet fanns vid de yttre stationerna ett för årstiden varmare vatten än normalt. Salthalten var normal, omkring 24 psu i ytan närmast kusten och upp till 31 psu vid Å17. Termoklin och haloklin sammanföll på samtliga stationer, och låg på mellan 7-12 meters djup.

Närsalterna löst oorganiskt kväve (summan av nitrat+nitrit+ammonium, ofta betecknat DIN efter engelskans "Dissolved Inorganic Nitrogen") låg på normala nivåer i ytvattnet i hela området och varierade omkring 10-11 µmol/l, vid Å17 något lägre, 6.3 µmol/l. Generellt återfanns lägre halter, under normalt, i vattenmassan under skiktningen. Löst oorganiskt fosfor (endast i formen fosfat, DIP efter engelskans "Dissolved Inorganic Phosphorus") låg på normala nivåer omkring 0.6-0.7 µmol/l i hela vattenkolumnen. Silikathalten var högre än normal för årstiden i ytvattnet på stationerna P2, Å13 och Å15 med halter omkring 13 till 14.5 µmol/l, i övrigt observerades halter på normala nivåer.

Inga stora fluorescenstoppar påträffades vilket indikerar låg växtplanktonaktivitet.

Syrgasförhållanden var goda vid samtliga besökta stationer med normala halter för säsongen.

Kattegatt och Öresund

Vattentemperaturen var normal för årstiden och låg omkring 3.5 °C i ytan, något högre i nordvästra Kattegatt omkring 4-5.5 °C och i södra Öresund drygt 4 °C. Temperaturen steg med ökande djup och var i den undre vattenmassan drygt 7 °C, i Öresund drygt 8 °C. Salthalten var normal och varierade i ytvattnet i Kattegatt mellan 15 och 30 psu, höst i nordväst och lägst i sydväst. I Öresund mellan 12-15 psu vid ytan och upp till 32 psu vid botten. Vid samtliga stationer sammanföll termoklinen med haloklinen mellan 10-20 meter, något grundare i Öresund och vid de västligaste stationerna i Kattegatt.

Koncentrationerna av DIN uppvisade normala värden för årstiden. Halterna hade ökat jämfört med de senaste mätningarna i december och DIN varierade nu omkring 5-6 µmol/l, avvikande högt vid

GF9 i nordväst med 9 $\mu\text{mol/l}$. Halterna av DIP i ytvattnet låg omkring 0.60-0.65 $\mu\text{mol/l}$, i Öresund något högre; 0.7-0.8 $\mu\text{mol/l}$. Halterna av DIN och DIP ökade båda något med djupet men inte mycket, något högre värden av DIN återfanns omkring 30 meter på stationerna i nordöstra Kattegatt. Silikalthalterna var högre än normalt i ytvattnet, framförallt i sydöstra Kattegatt, med värden omkring 15 $\mu\text{mol/l}$, i Öresund och vid N14 Falkenberg omkring 17 $\mu\text{mol/l}$. Vid stationerna i nordvästra Kattegatt varierade halterna i ytvattnet omkring 12 $\mu\text{mol/l}$.

Fluorescensmätningar med CTDn visade låga värden vilket indikerar på låga koncentrationer av växtplankton.

Bottenvattnet i hela området var väl syresatt vilket också är normalt för årstiden. Närmast botten låg syrgashalterna generellt över 6 ml/l, i Öresund något lägre, strax över 5 ml/l.

Egentliga Östersjön och Ålands Hav

Ytvattentemperaturen var något högre än normalt i hela Egentliga Östersjön, omkring 4-4.5 °C, vid den kustnära stationen Ref M1V1 ca 2.5 °C. I Ålands Hav låg temperaturen i den övre vattenmassan omkring 3 °C. Salthalten i ytvattnet varierade mellan 7.5-8.0 psu i Arkonabassängen och mellan 7.0-7.5 psu i övriga Egentliga Östersjön vilket är något över normalt i Västra Gotlandsbassängen och normalt i övriga områden. I Ålands hav låg salthalten på drygt 5.6 psu, vid Tröskeln Ålands Hav 6.0 psu.

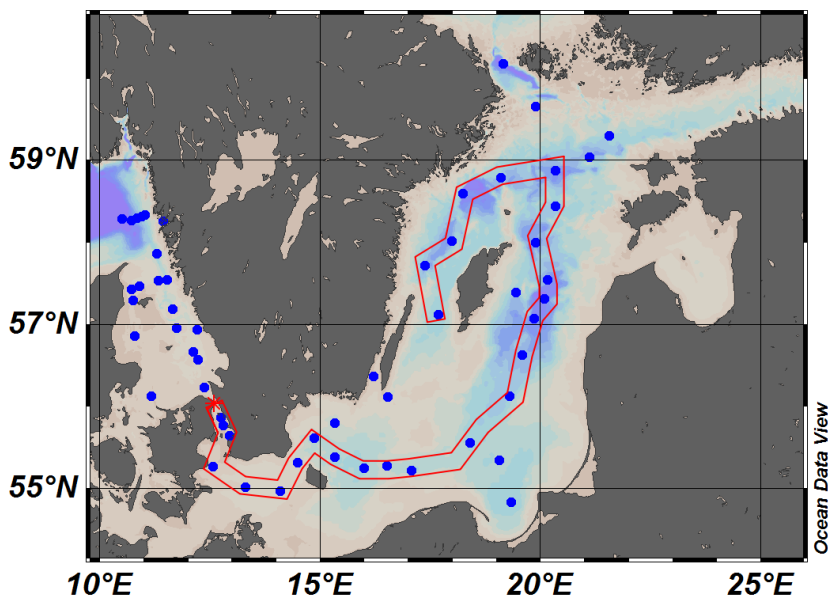
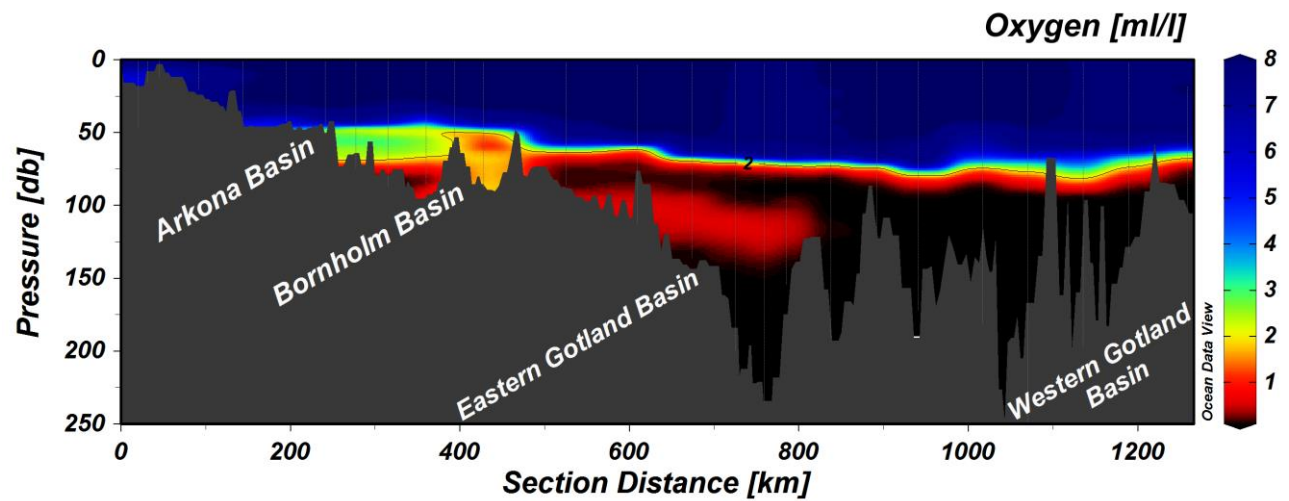
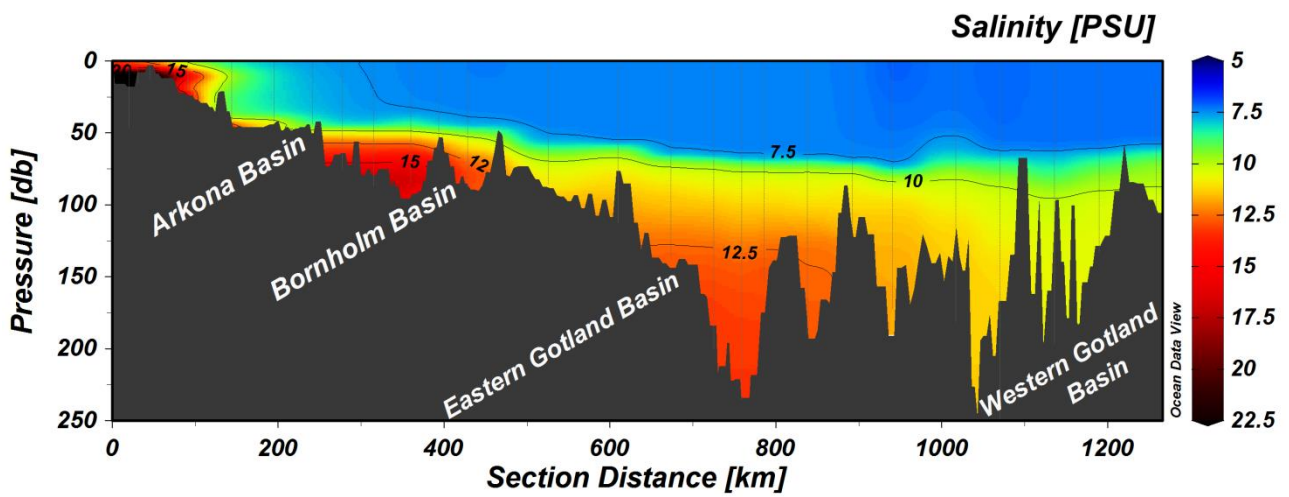
Ytskiktet var nerkylt och väl omblandat med tydlig skiktning i form av termoklin och haloklin som sammanföll i hela Egentliga Östersjön. Skiktningen återfanns i Arkonabassängen vid 40 meter, i Bornholmsbassängen vid 45 meter, i sydöstra delen av Egentliga Östersjön vid 60 meter, i Östra Gotlandsbassängen vid 70 meter, något djupare i den norra delen; omkring 80 meter, i Västra gotlandsbassängen vid 60 meter. I Ålands Hav fanns en svag skiktning vid 50 meter.

Närsalter i form av löst oorganiskt kväve (DIN) och fosfor (DIP) i ytskiktet låg på normala nivåer, något över i sydöstra delen av Egentliga Östersjön samt i norra delen av Östra Gotlandsbassängen. Koncentration av DIN låg omkring 2.5-4 $\mu\text{mol/l}$, förutom i sydöstra och nordöstra delen där koncentrationerna var lite högre, omkring 5-6.5 $\mu\text{mol/l}$. Koncentrationerna av DIP låg på omkring 0.5 $\mu\text{mol/l}$ i Ålands Hav, mellan 0.65-0.9 $\mu\text{mol/l}$ i Egentliga Östersjön med högst halter i och omkring Hanöbukten. I den undre vattenmassan låg halterna av DIP på eller strax under normala nivåer. Halterna av DIN låg på normala nivåer utom i Västra Gotlandsbassängen där värden närmast botten var högre, speciellt vid BY38 där koncentrationen var 20 $\mu\text{mol/l}$ närmast botten.

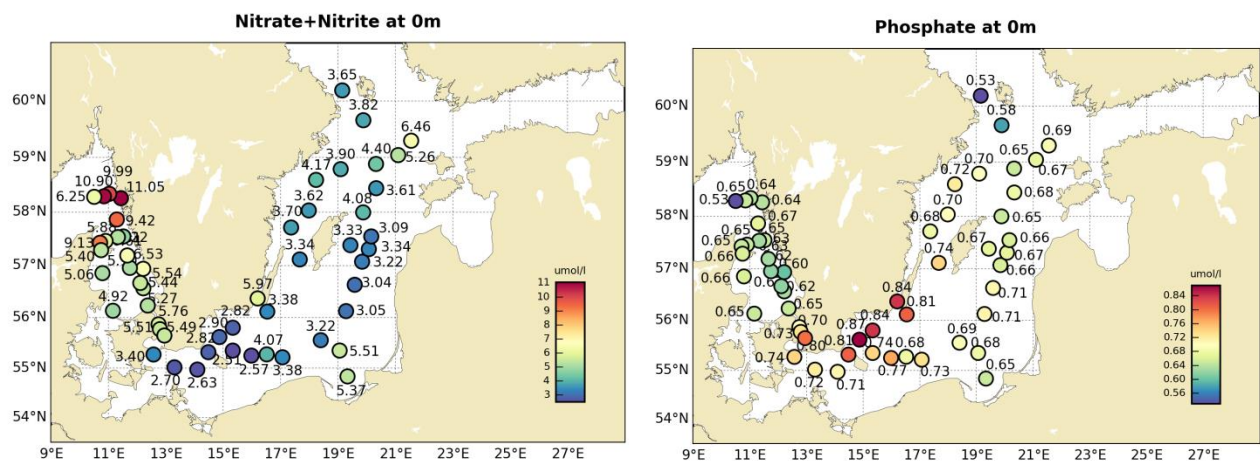
Silikatkoncentrationerna i hela Egentliga Östersjön var fortsatt högre än normalt ovanför haloklinen, tydligast i de södra delarna. Halterna varierade mellan 16-20 $\mu\text{mol/l}$, något högre vid den kustnära stationen Ref M1V1 samt i Ålands hav.

I stora delar av Egentliga Östersjöns djupvatten påträffades syrgashalter nära noll i djupvattnet. Helt syrefria förhållanden, då svavelväte bildas, uppmättes i Västra Gotlandsbassängen från 80 meters djup, i Norra Gotlandsbassängen från 90-125 meter. I Östra Gotlandsbassängen uppmättes svavelväte närmast botten men enbart låga halter. Akut syrebrist (< 2ml/l) påträffades i Bornholmsbassängen och i Hanöbukten redan omkring 40-45 meter, i sydöstra Egentliga Östersjön vid 60 meter och i Östra och Västra Gotlandsbassängen vid ca 70 meter. I Arkonabassängen sjönk syrgaskoncentration till ca 3.5 ml/l närmast botten.

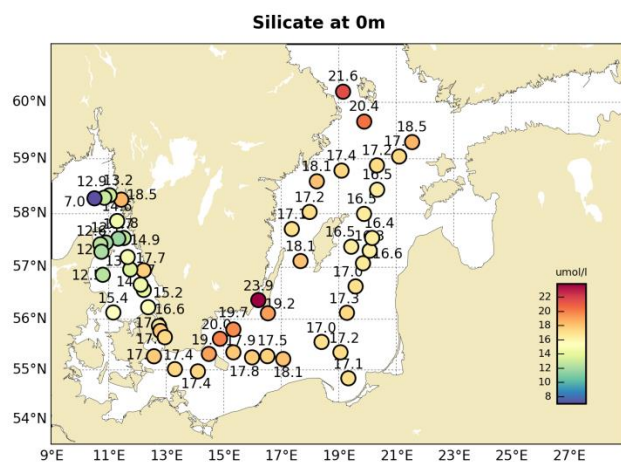
Fluorescensmätningarna från CTDn visade på låg växtplanktonaktivitet, inga kraftiga fluorescenstoppar påträffades.



Figur 1. Snitt som visar syre- och salthalt från Öresund, genom Egentliga Östersjön, till Västra Gotlandsbassängen.



Figur 2. Karta med ytvärden av Nitrat+Nitrit (vänster) och fosfat (höger) i µmol/l.



Figur 3. Karta med ytvärden av silikat i µmol/l.

DELTAGARE

Namn

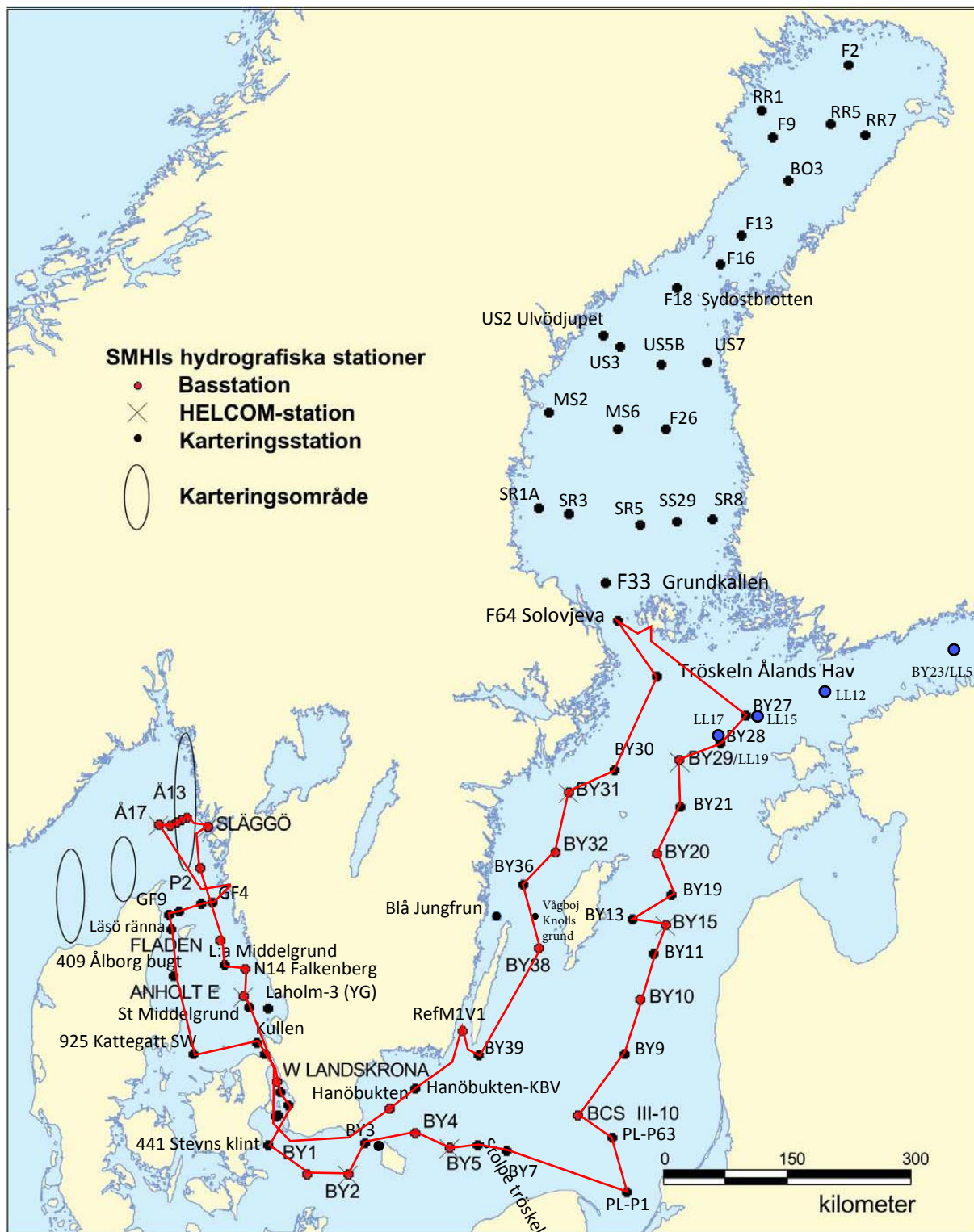
Johan Kronsell Expeditionsledare
Kristin Andreasson
Johan Håkansson
Sari Sipilä
Lena Viktorsson

Från

SMHI
SMHI
SMHI
SMHI
SMHI

BILAGOR

- Färdkarta
- Tabell över stationer, analyserade parametrar och antal provtagningsdjup
- Karta över syrehalter i bottenvattnet
- Vertikalprofiler för basstationer
- Figurer över månadsmedelvärden



Time: 11:51

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 aoe	CZPP hohp loy	No de	No btl	T e e	T a a	S s	P h	D o	D h	H o	P o	P n	N n	N a	N a	S h	C c	
																		m m	l l	l l	x x	s s	o o	r r	r r	r r	r r	r r	r r	r r	r r	r r
																		p p	t t	t t	y y	s s	t i	a a	z z	n n	t t	y y	3	u n	n	
																		- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
																		b b	c c	b b	c c	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
																		t t	t t	t t	t t	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
																		l d	l d	l d	l d	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
0001	1	KANX02	BAS...	SW VINGA GF4	5732.98	01131.12	20180124	1620	79		12 17	6.4	993	9990	x---	12 12		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0002	1	KANX04	BAS...	GF6	5732.27	01119.78	20180124	1850	46		23 16	6.8	994	9990	x---	9 9		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0003	1	KANX06	BAS...	GF8	5727.92	01054.06	20180124	2120	40		21 17	6.5	994	9990	x---	8 8		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0004	1	KANX07	BAS...	GF9	5725.91	01042.53	20180124	2335	26		24 19	7.4	994	9990	x---	6 6		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0005	1	KANX09	BAS...	LÄSÖ RÄNNA	5717.58	01044.65	20180125	0125	45		24 17	6.0	996	9990	x---	9 9		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0006	1	KAWA11	BAS...	409 ÅLBORG BUGT	5651.40	01047.50	20180125	0510	15		23 13	6.1	1000	9990	x---	4 4		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0007	1	KAWX14	BAS...	925 KATTEGAT SW	5607.92	01109.45	20180125	1030	45		21 17	5.5	1006	1730	x---	9 9		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0008	1	KAEX33	BAS...	KULLEN	5614.02	01222.22	20180125	1550	23		21 8	5.3	1009	1440	x---	6 6		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0009	1	SOCX39	BAS...	W LANDSKRONA	5551.99	01244.86	20180125	1900	50		19 10	5.1	1011	9990	x---	9 9		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0010	1	SOCX41	BAS...	ÖRESUND-7	5546.29	01247.69	20180125	2120	20		21 9	5.1	1012	9990	x---	5 5		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0011	1	SOCX44	BAS...	ÖRESUND-4	5538.84	01257.00	20180126	0015	16		21 5	5.1	1012	9990	x---	4 4		x x x x	- x x	- x x	x x x x	x x x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	- x x	
0012	1	BPSA01	BAS...	441 STEVNS KLINT	5516.29	01234																										

Time: 11:51

Year: 2018

[illegible]

STATION W LANDSKRONA SURFACE WATER (0-10 m)

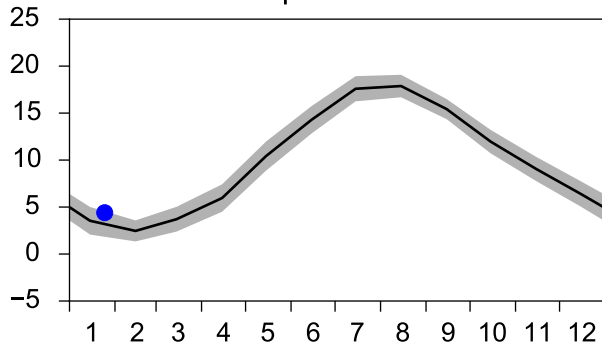
Annual Cycles

— Mean 2001-2015

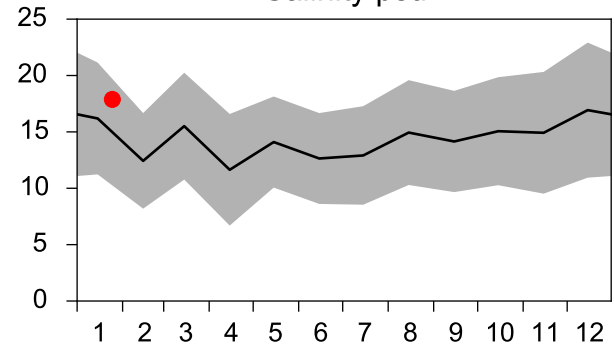
■ St.Dev.

● 2018

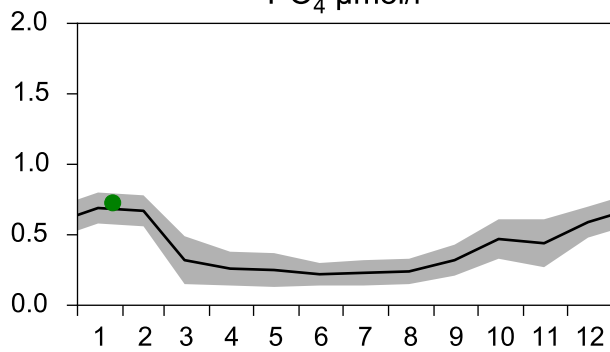
Temperature °C



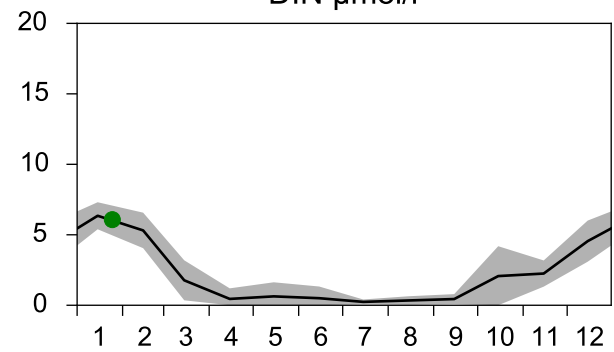
Salinity psu



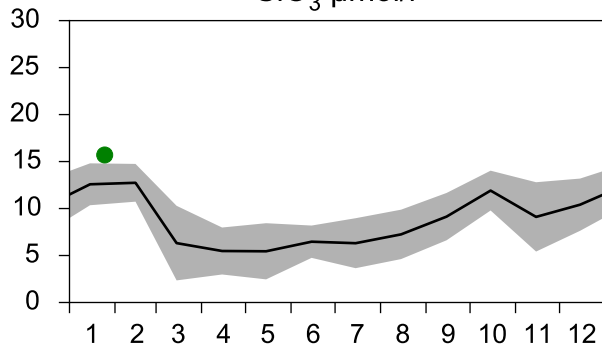
PO₄ µmol/l



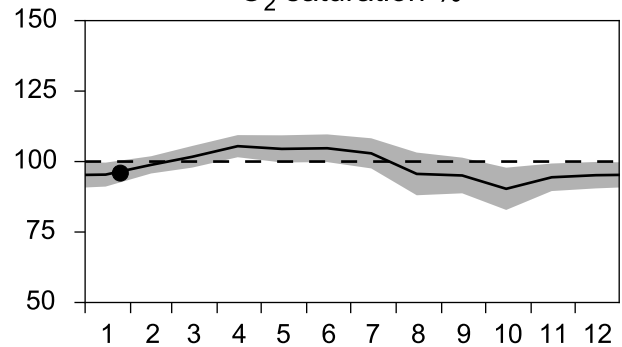
DIN µmol/l



SiO₃ µmol/l

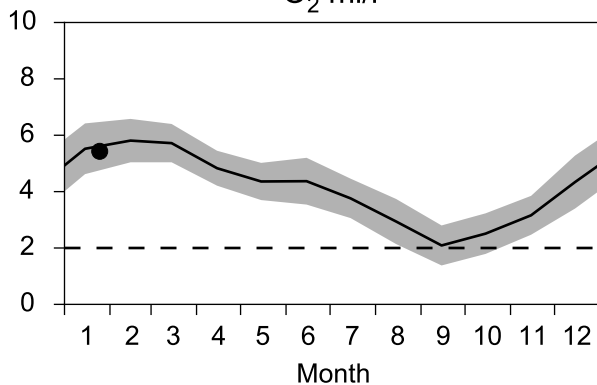


O₂ saturation %

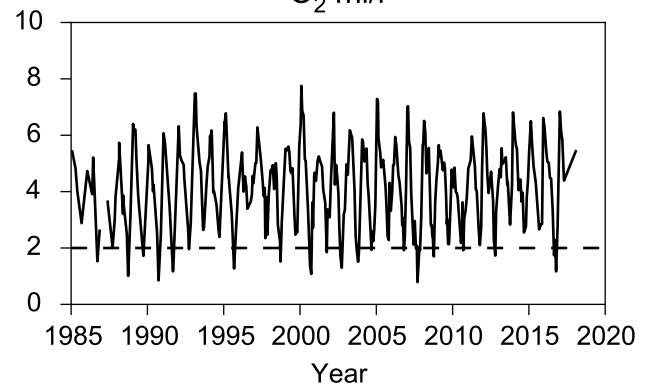


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

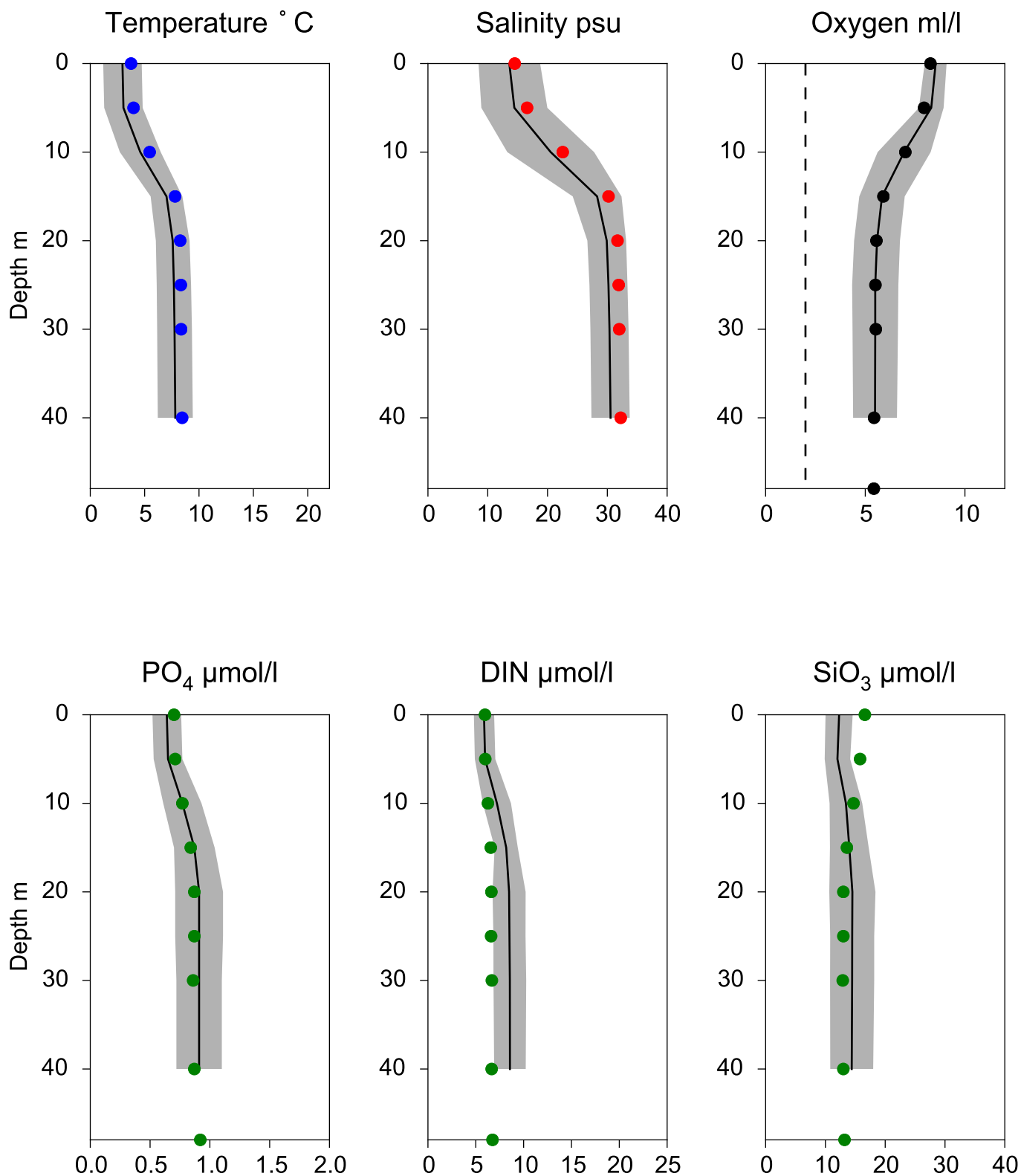


O₂ ml/l



Vertical profiles W LANDSKRONA January

— Mean 2001-2015 St.Dev. • 2018-01-25



STATION BY1 SURFACE WATER (0-10 m)

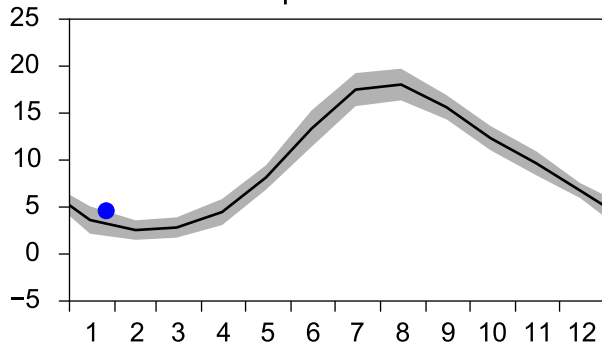
Annual Cycles

— Mean 2001-2015

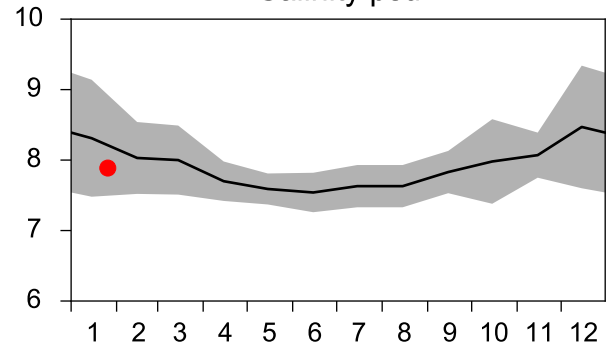
■ St.Dev.

● 2018

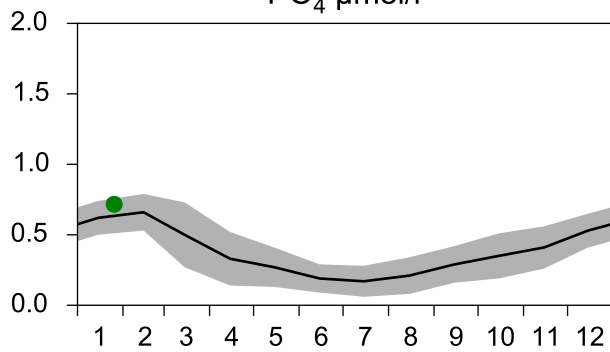
Temperature °C



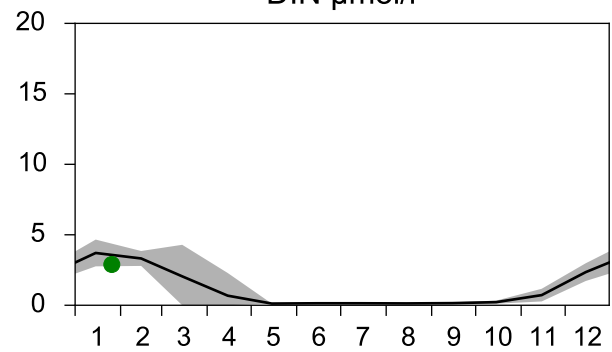
Salinity psu



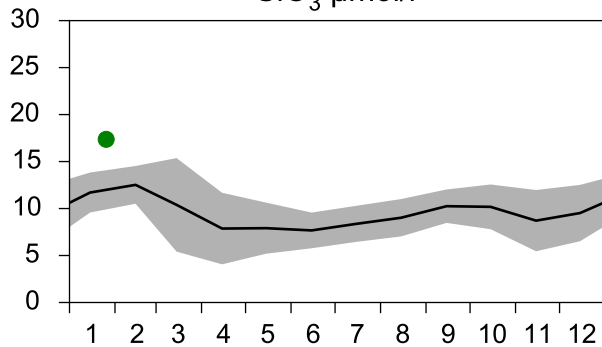
PO₄ µmol/l



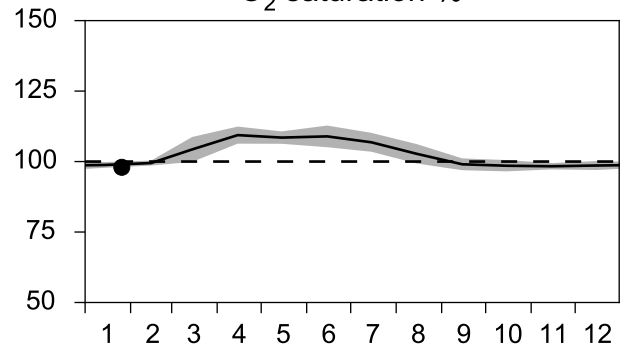
DIN µmol/l



SiO₃ µmol/l

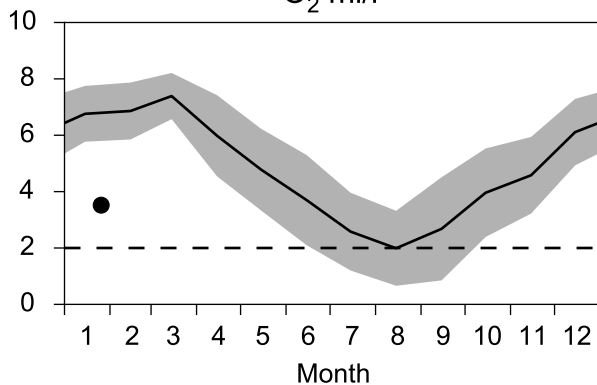


O₂ saturation %

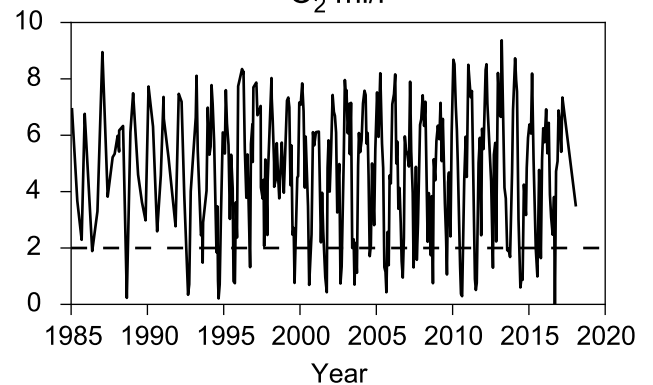


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

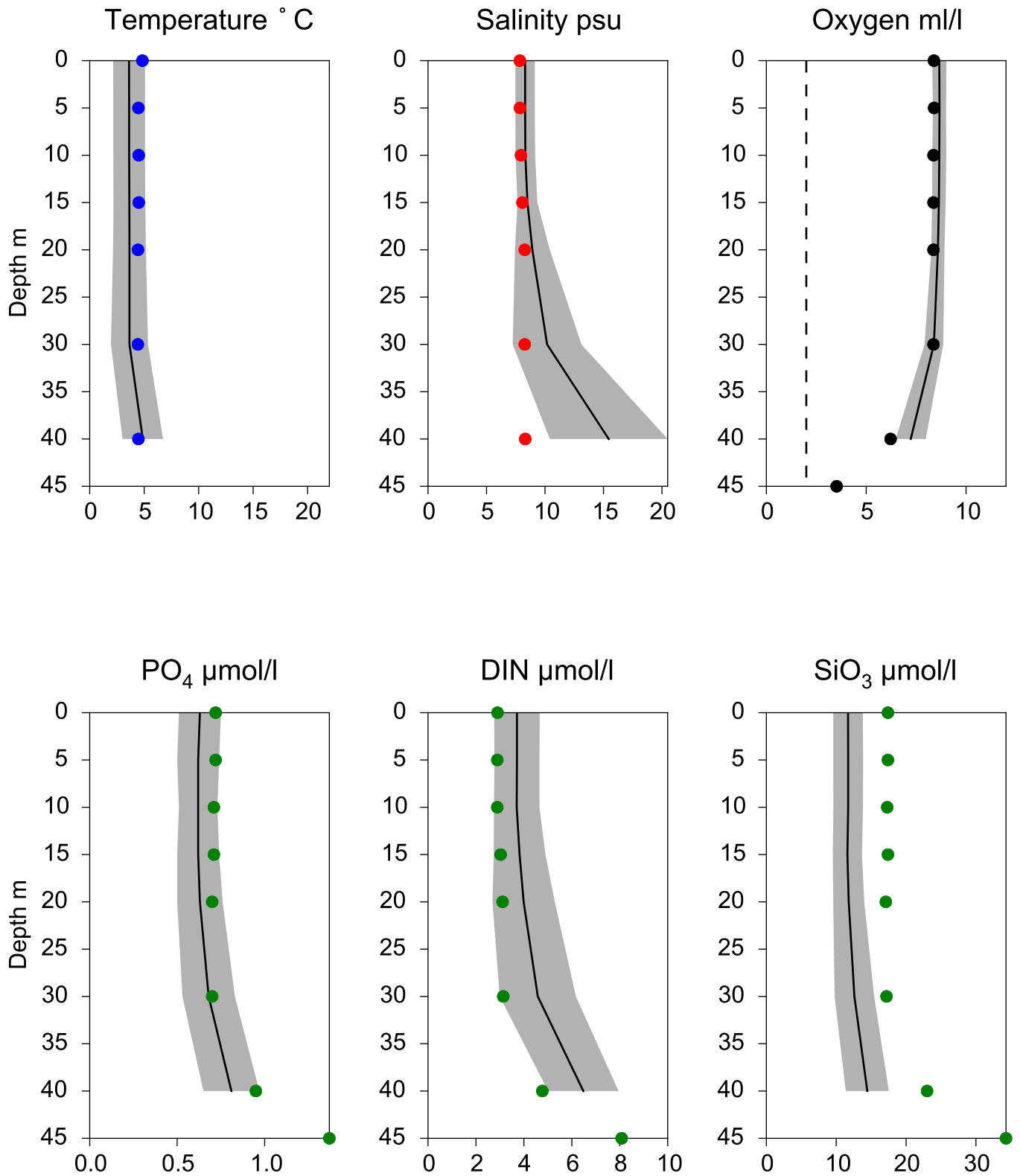


O₂ ml/l



Vertical profiles BY1 January

— Mean 2001-2015 St.Dev. • 2018-01-26



STATION BY2 ARKONA SURFACE WATER (0-10 m)

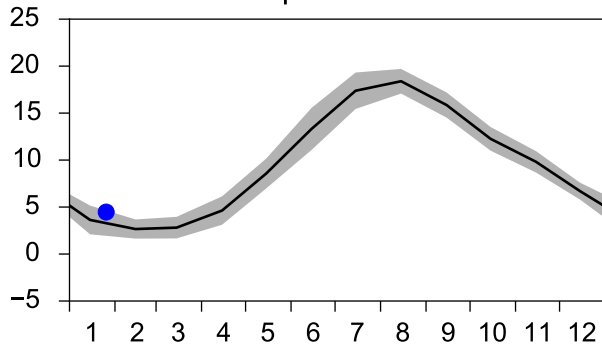
Annual Cycles

— Mean 2001-2015

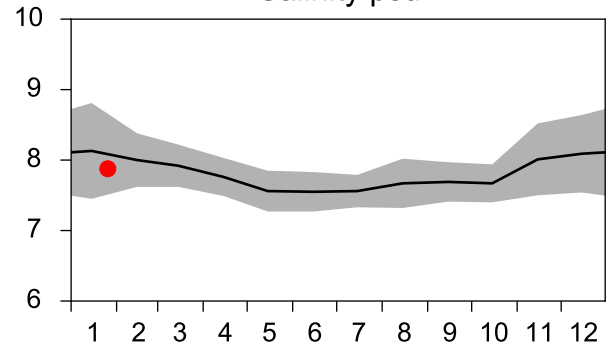
■ St.Dev.

● 2018

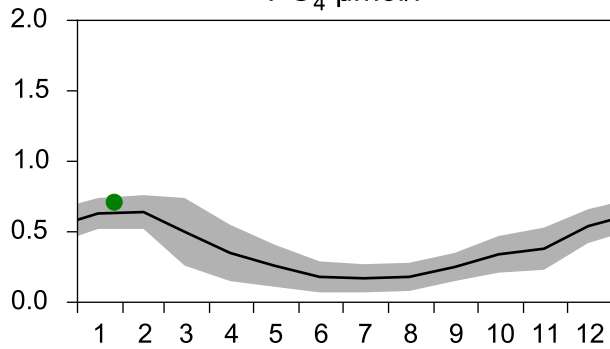
Temperature °C



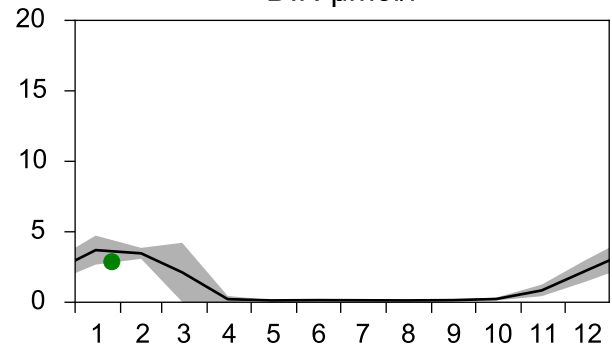
Salinity psu



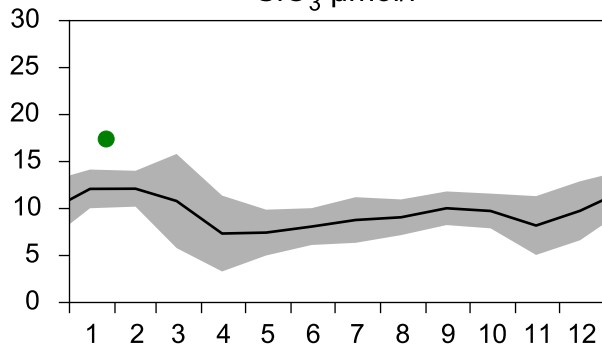
PO₄ µmol/l



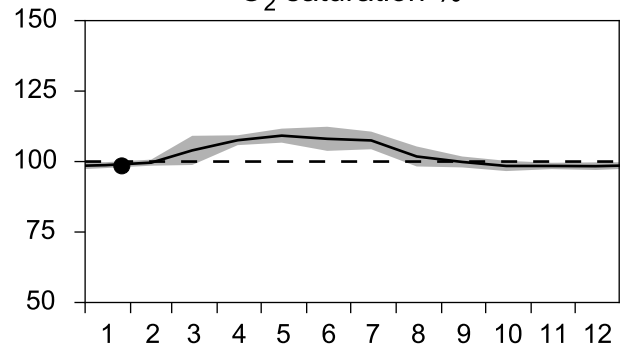
DIN µmol/l



SiO₃ µmol/l

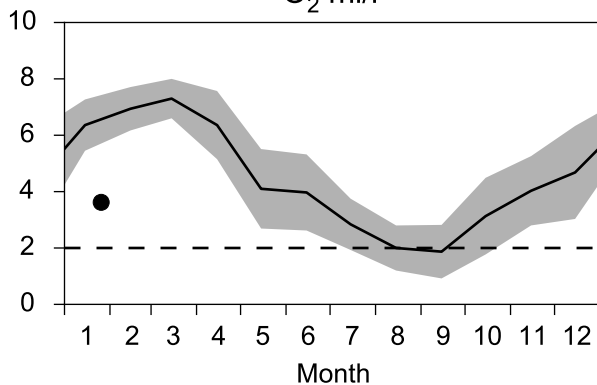


O₂ saturation %

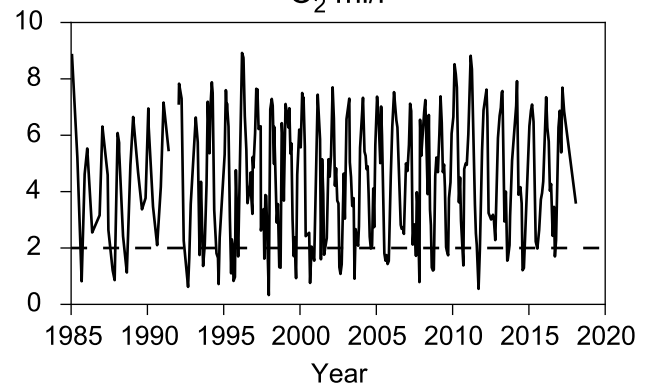


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

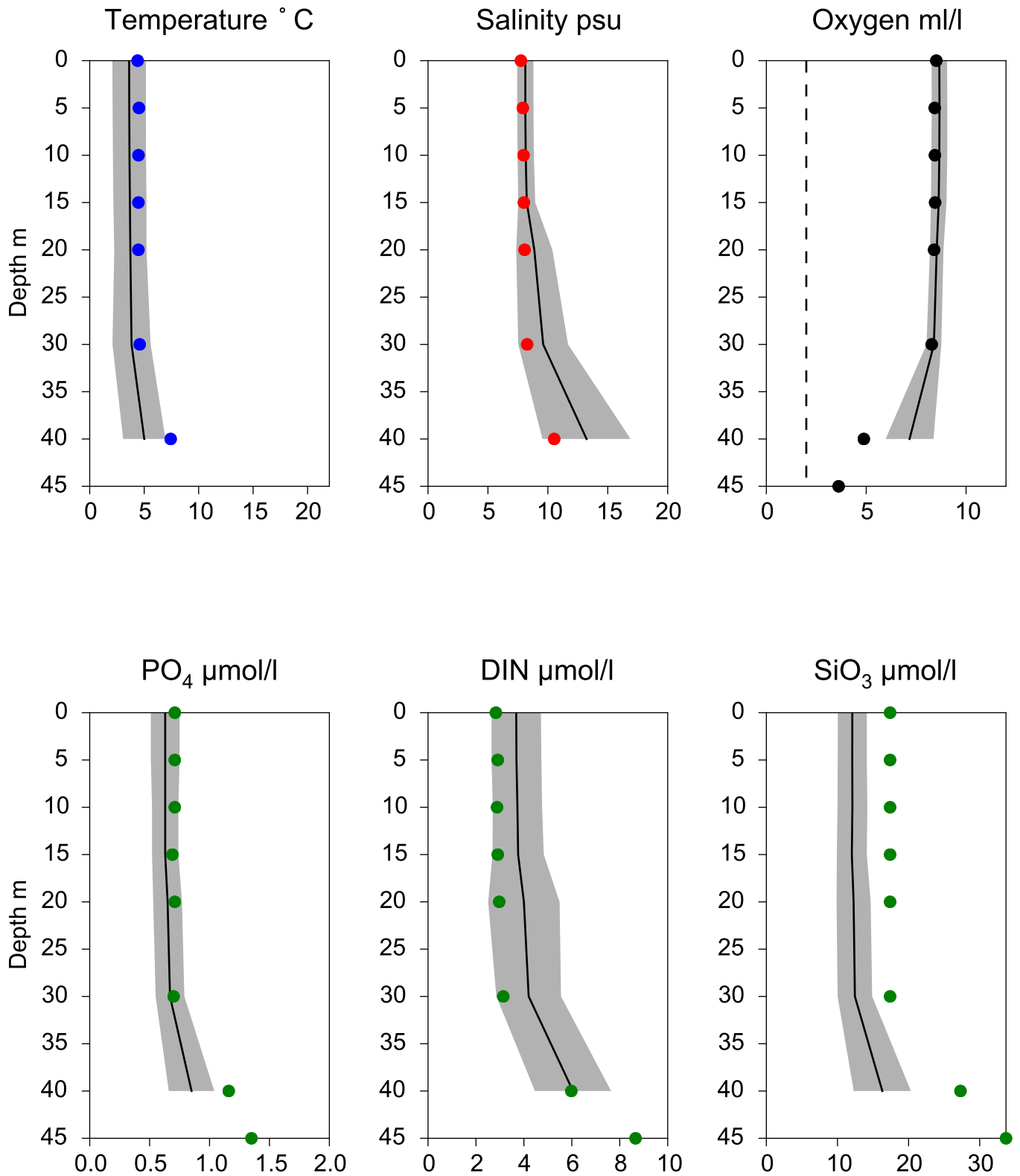


O₂ ml/l



Vertical profiles BY2 ARKONA January

— Mean 2001-2015 ■ St.Dev. ● 2018-01-26



STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

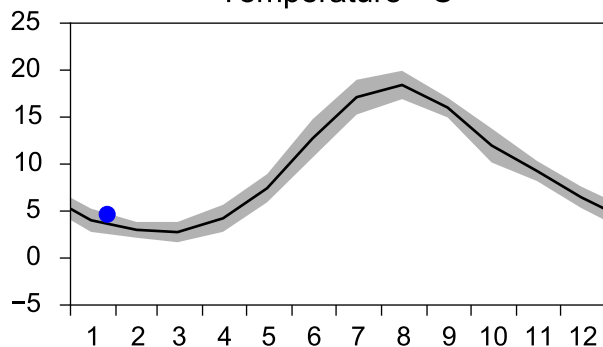
Annual Cycles

— Mean 2001-2015

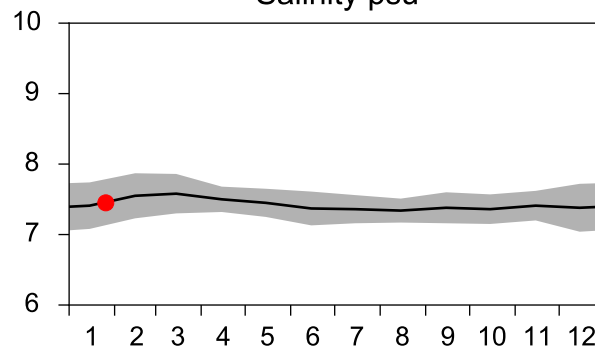
■ St.Dev.

● 2018

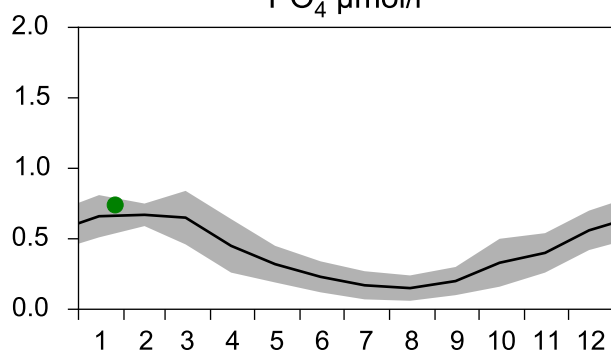
Temperature °C



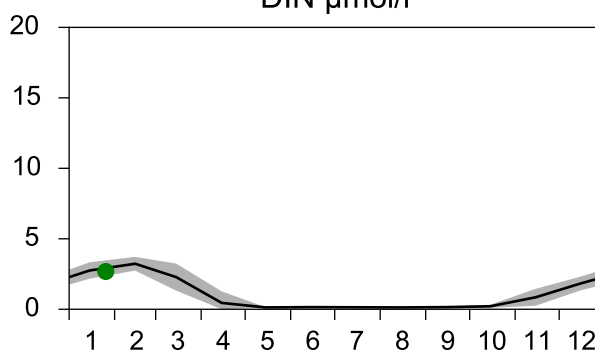
Salinity psu



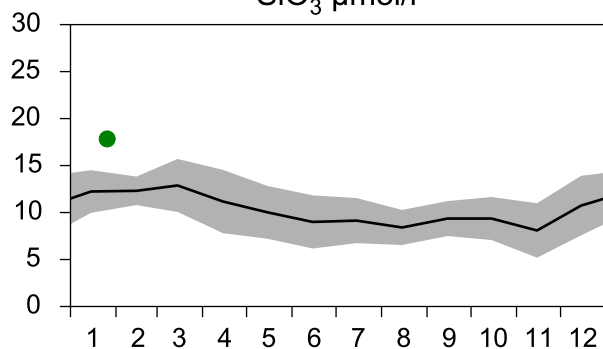
PO₄ µmol/l



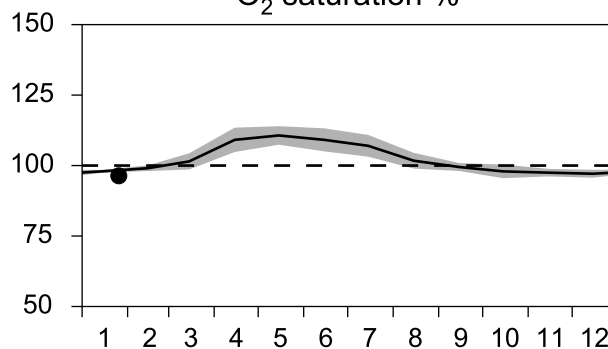
DIN µmol/l



SiO₃ µmol/l

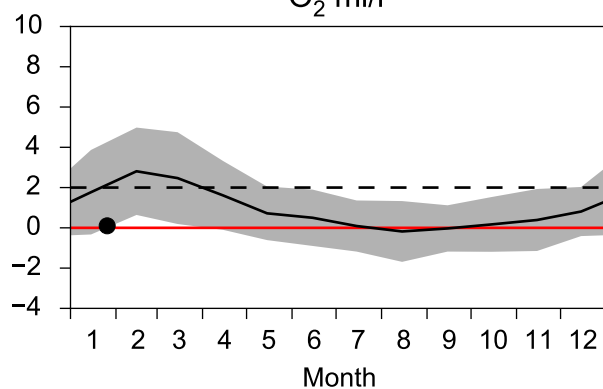


O₂ saturation %

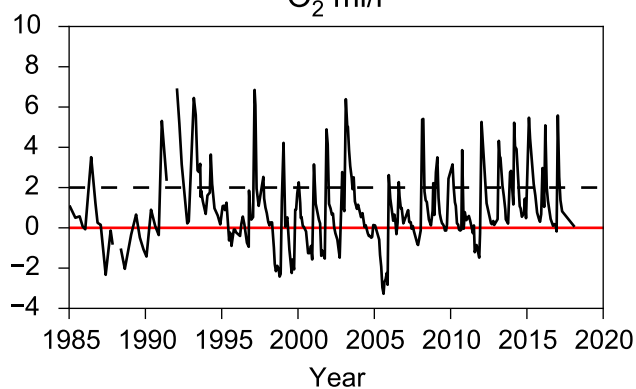


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

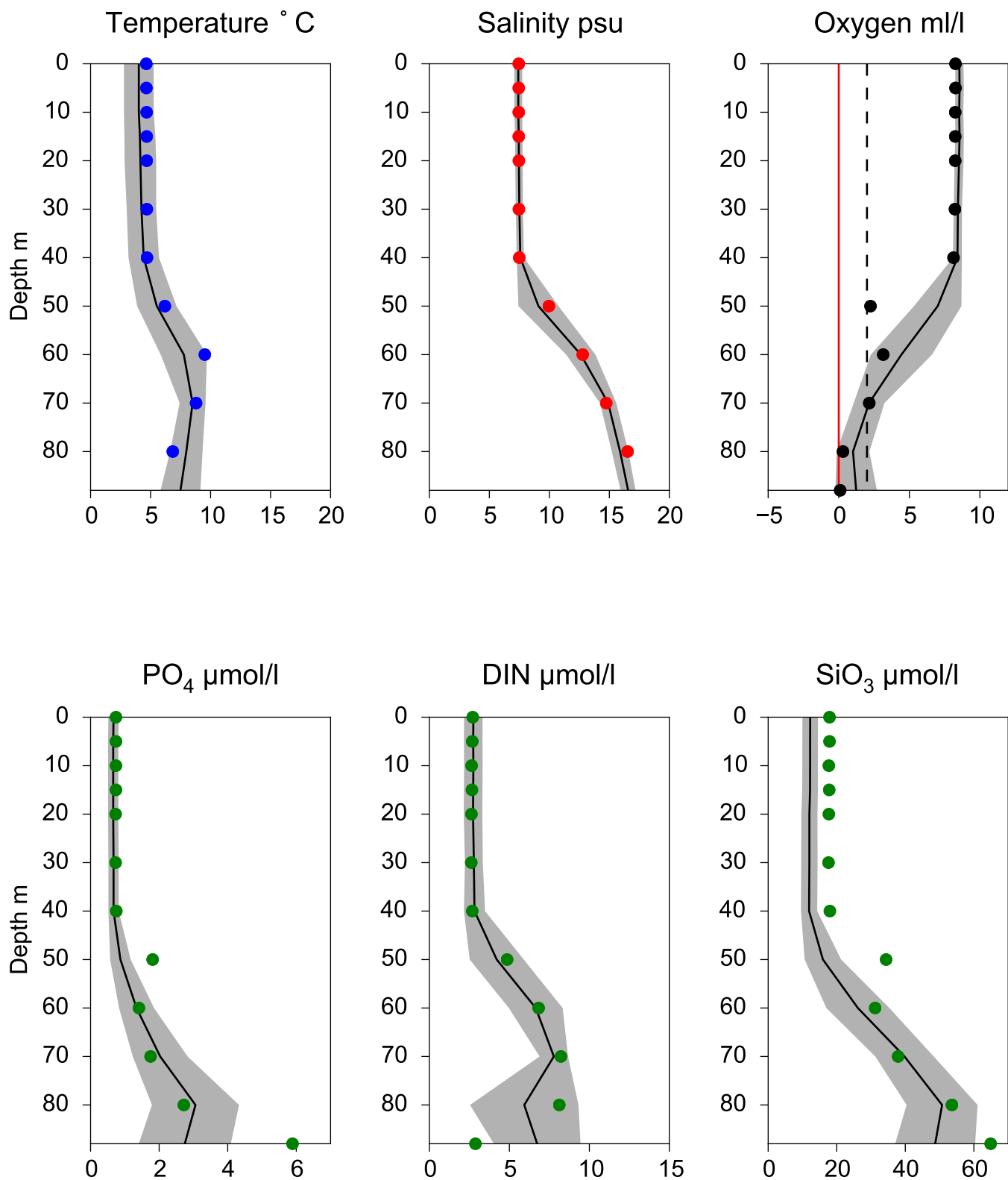


O₂ ml/l



Vertical profiles BY4 CHRISTIANSÖ January

— Mean 2001-2015 St.Dev. • 2018-01-26



STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)

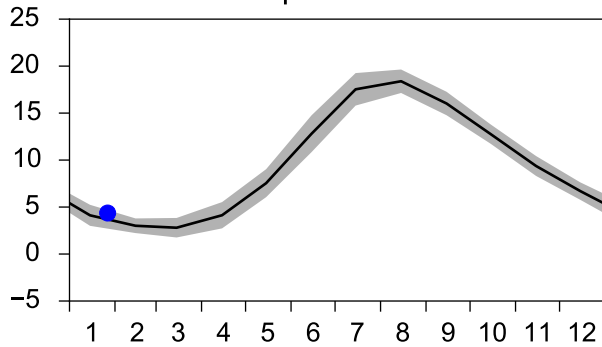
Annual Cycles

— Mean 2001-2015

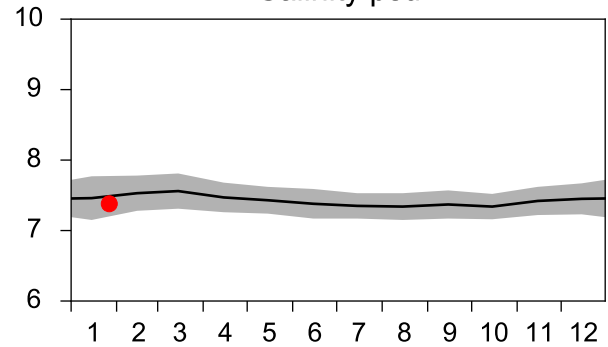
■ St.Dev.

● 2018

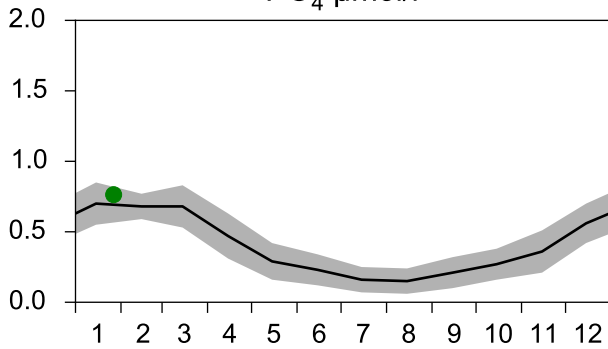
Temperature °C



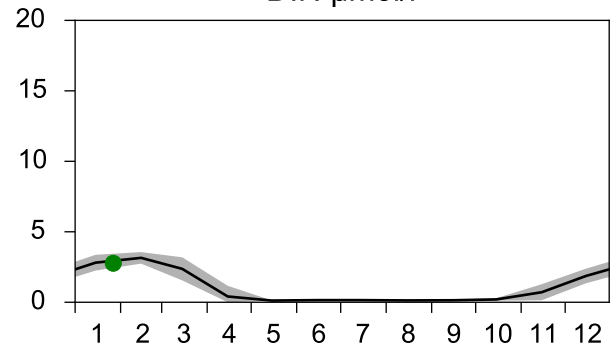
Salinity psu



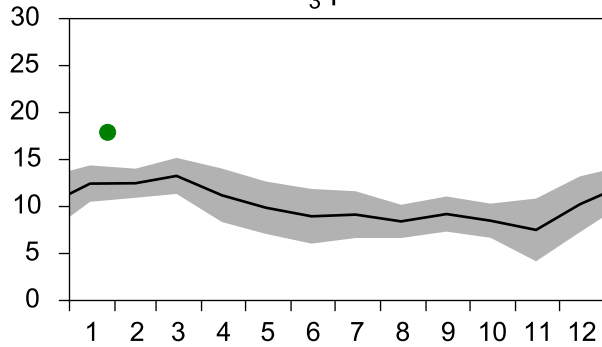
PO₄ µmol/l



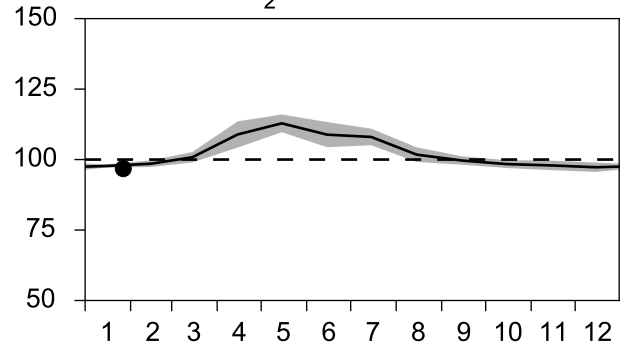
DIN µmol/l



SiO₃ µmol/l

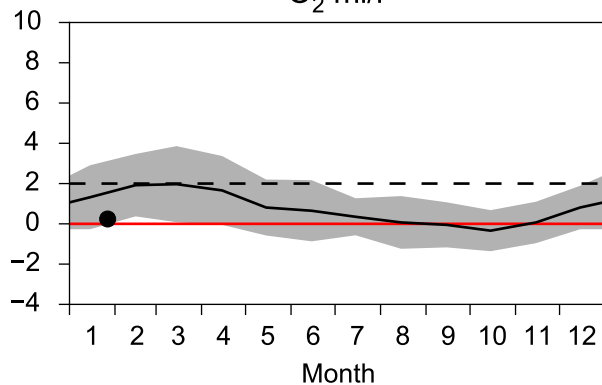


O₂ saturation %

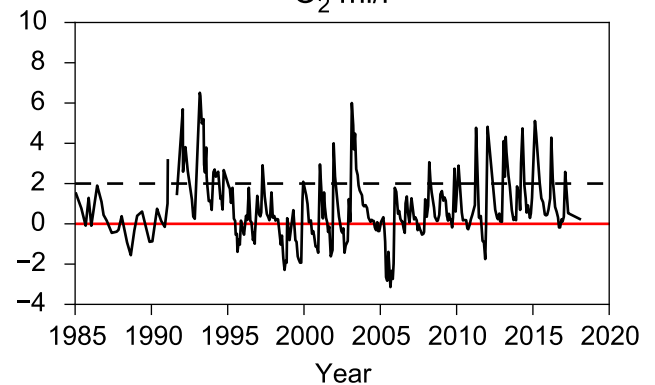


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

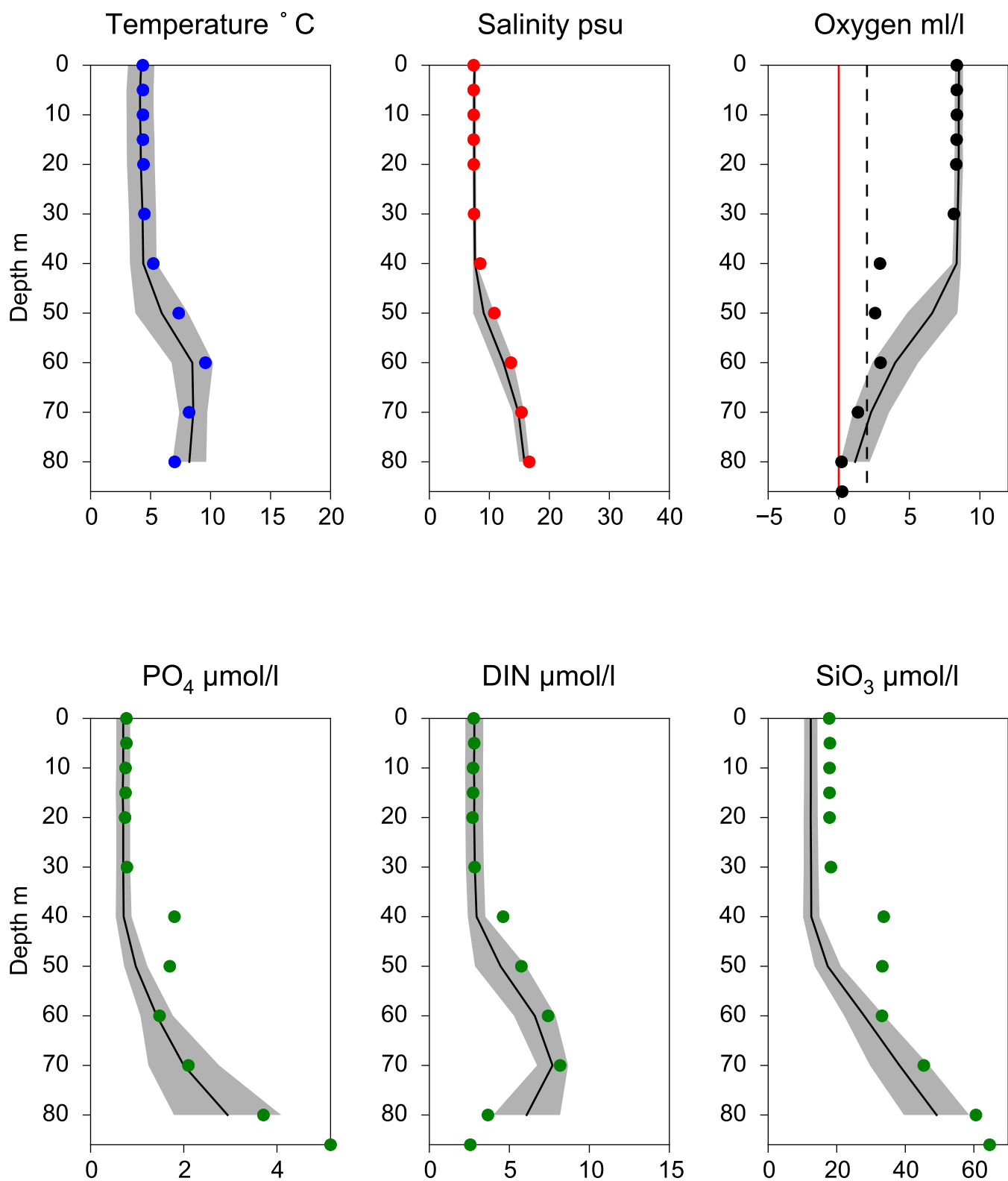


O₂ ml/l



Vertical profiles BY5 BORNHOLMSDJ January

— Mean 2001-2015 ■ St.Dev. ● 2018-01-27



STATION BCS III-10 SURFACE WATER (0-10 m)

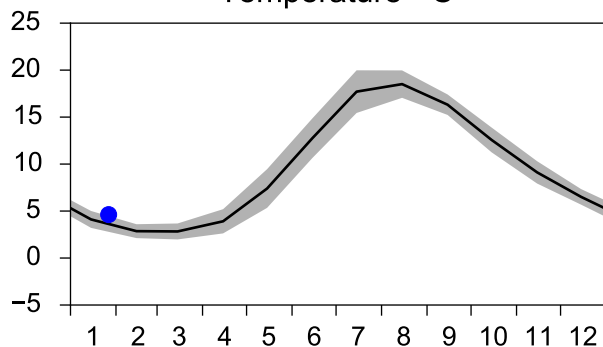
Annual Cycles

— Mean 2001-2015

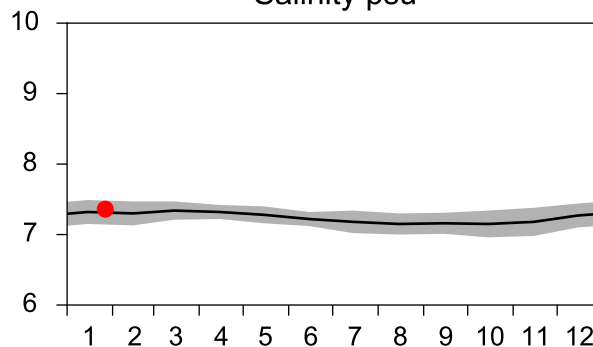
■ St.Dev.

● 2018

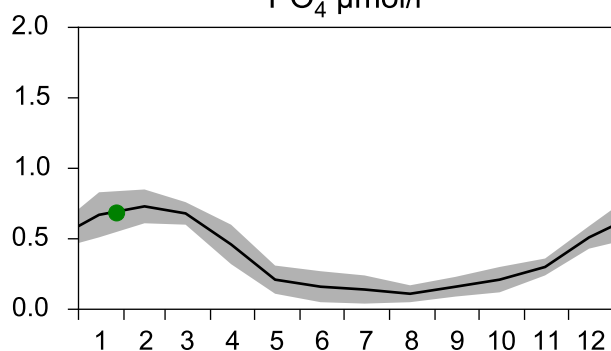
Temperature °C



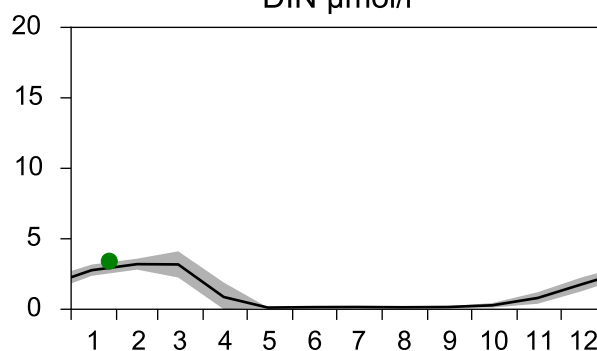
Salinity psu



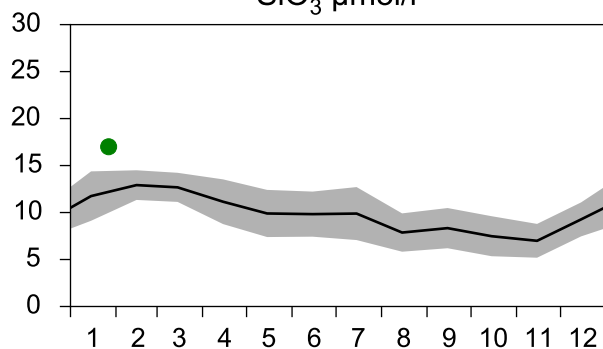
PO₄ µmol/l



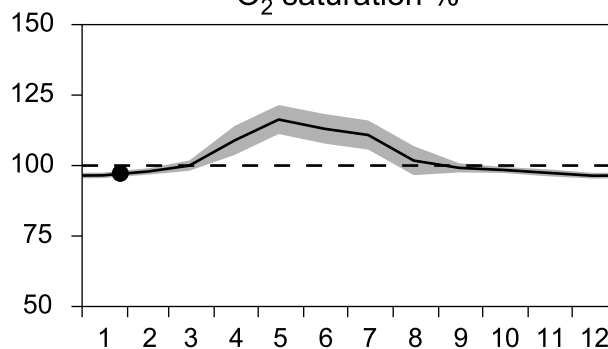
DIN µmol/l



SiO₃ µmol/l

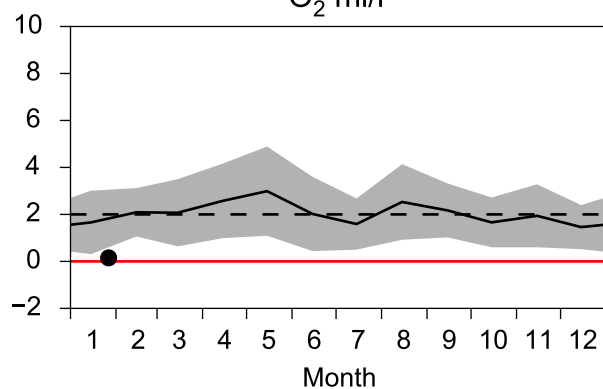


O₂ saturation %

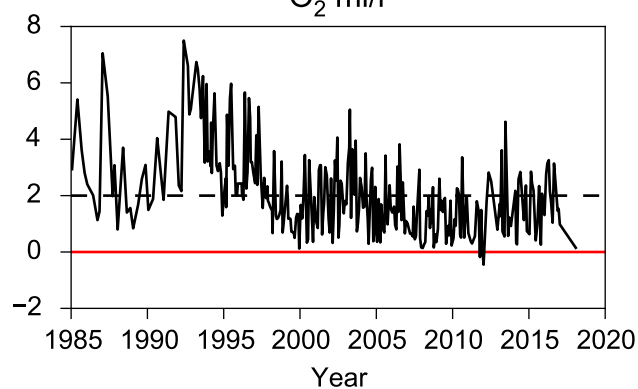


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

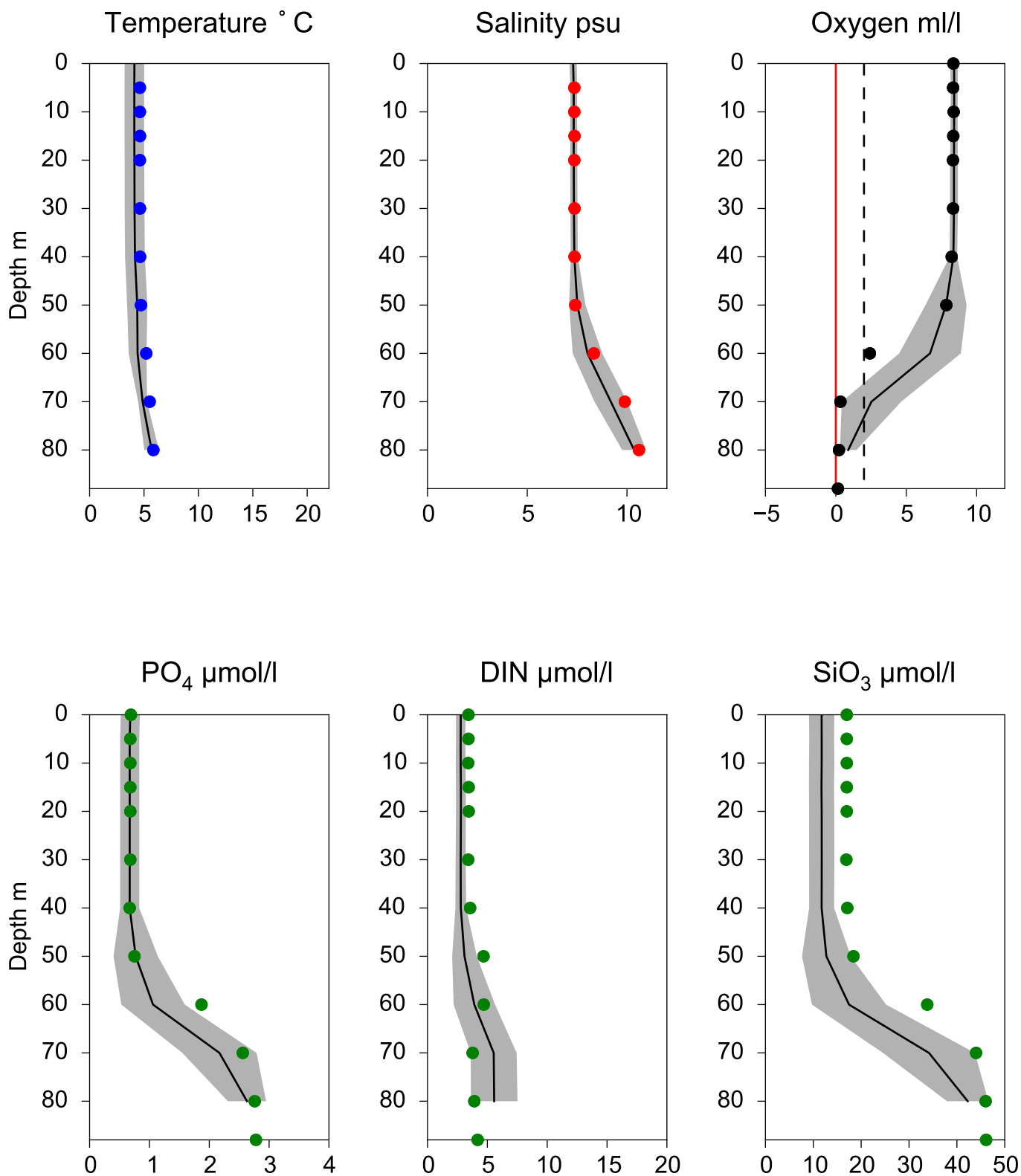


O₂ ml/l



Vertical profiles BCS III-10 January

— Mean 2001-2015 ■ St.Dev. ● 2018-01-27



STATION BY10 SURFACE WATER (0-10 m)

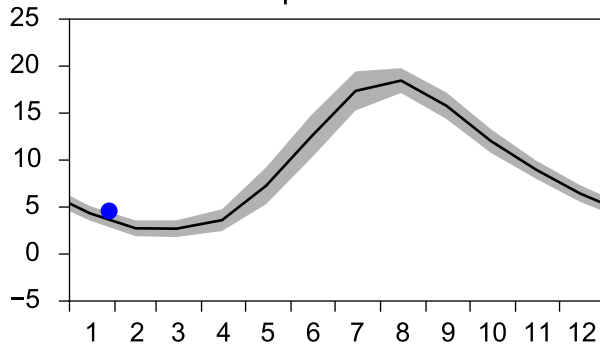
Annual Cycles

— Mean 2001-2015

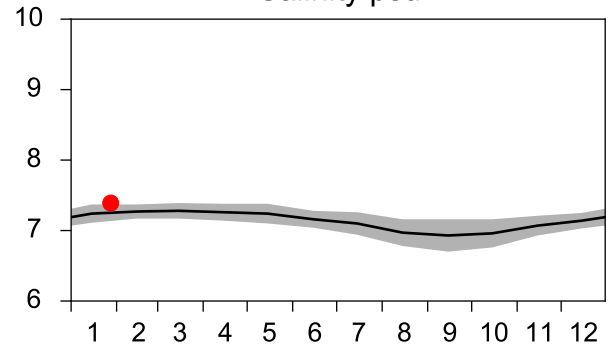
■ St.Dev.

● 2018

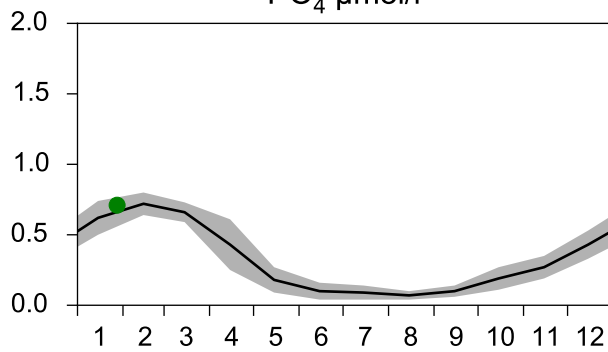
Temperature °C



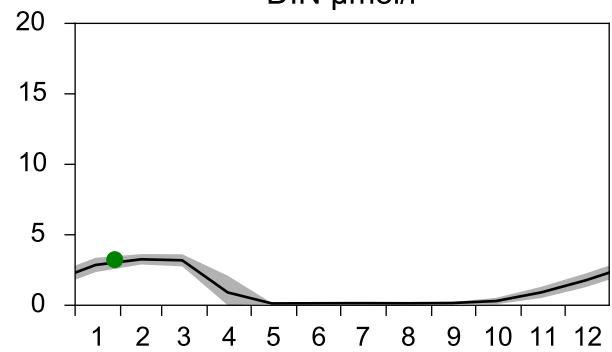
Salinity psu



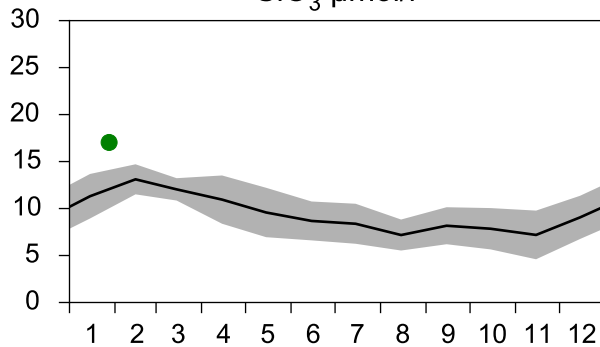
PO₄ µmol/l



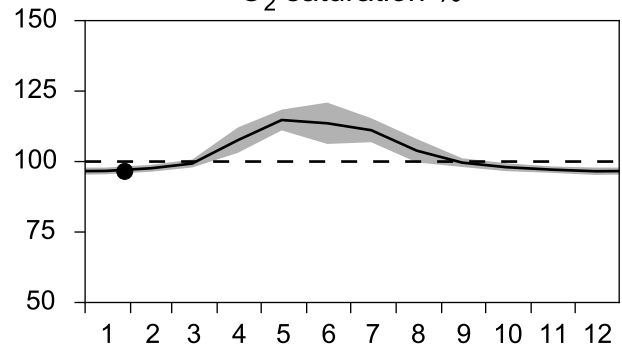
DIN µmol/l



SiO₃ µmol/l

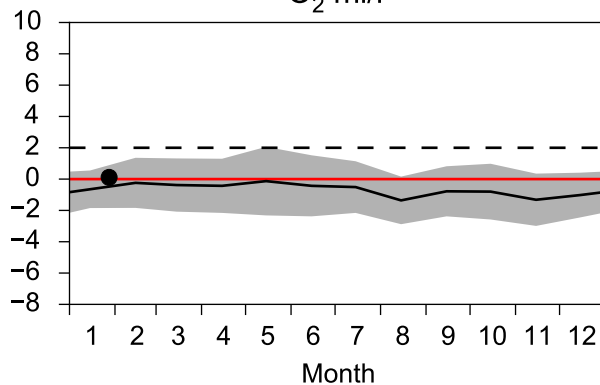


O₂ saturation %

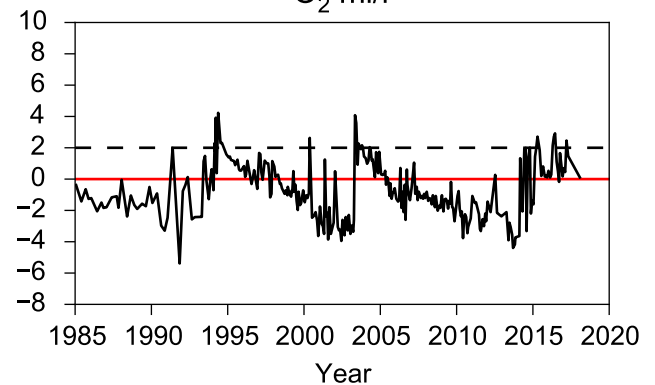


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

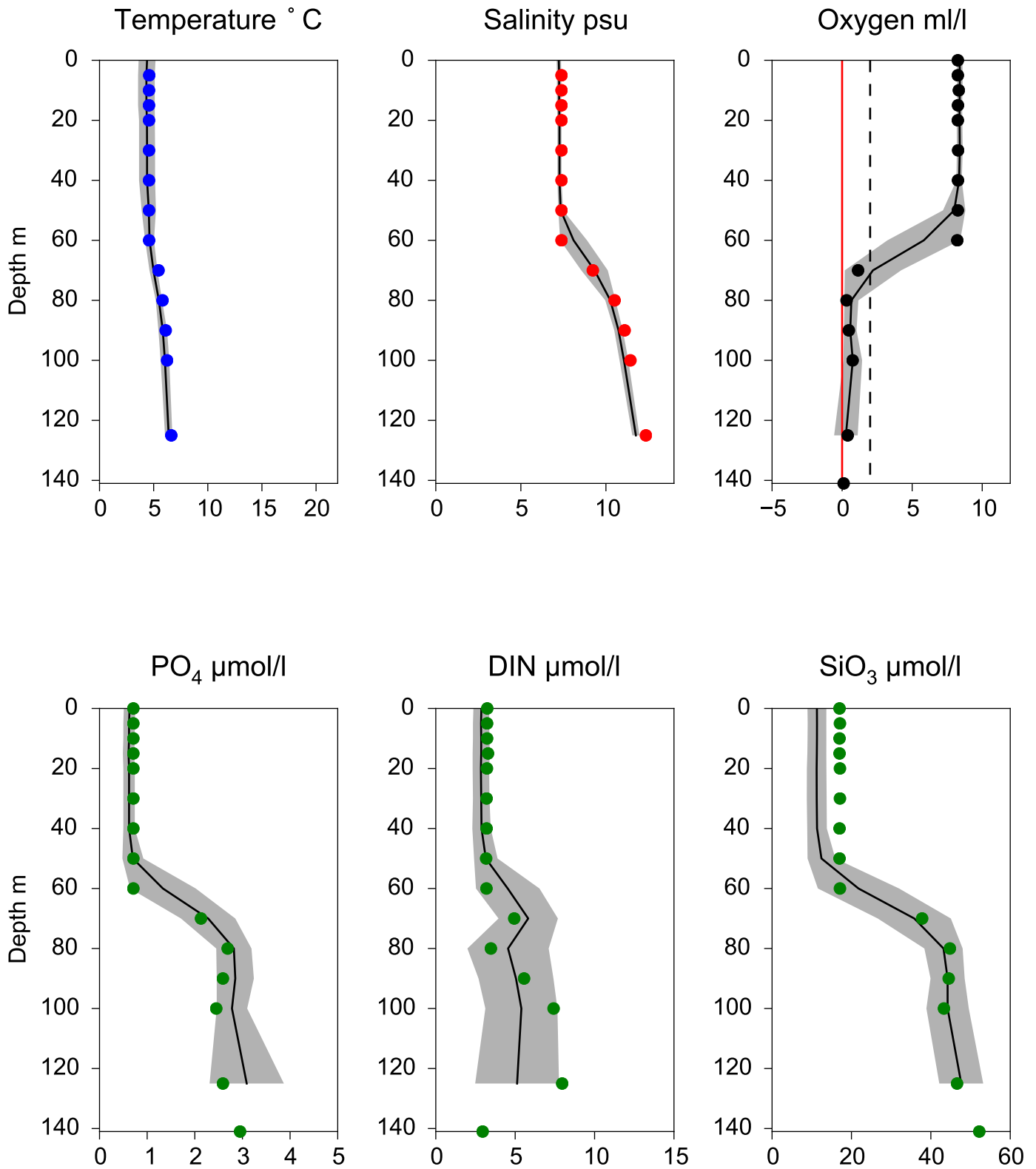


O₂ ml/l



Vertical profiles BY10 January

— Mean 2001-2015 ■ St.Dev. ● 2018-01-28



STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

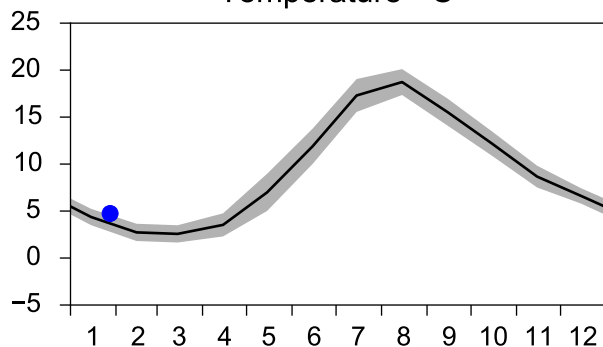
Annual Cycles

— Mean 2001-2015

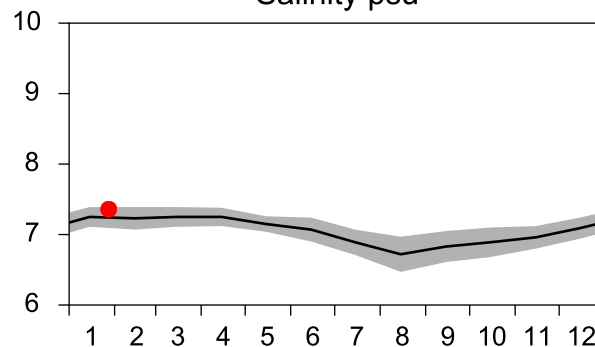
■ St.Dev.

● 2018

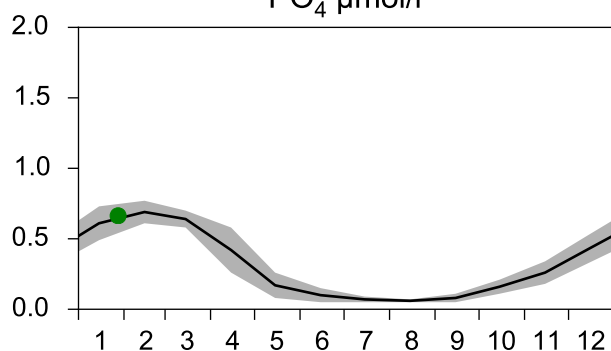
Temperature °C



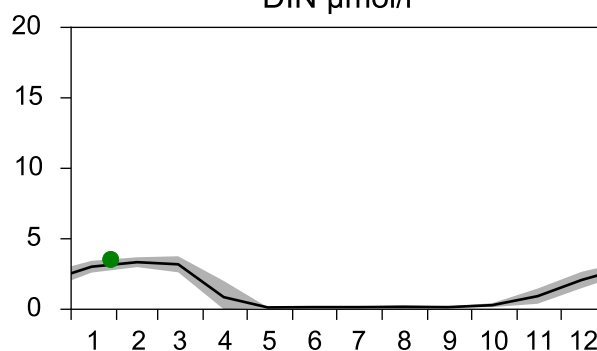
Salinity psu



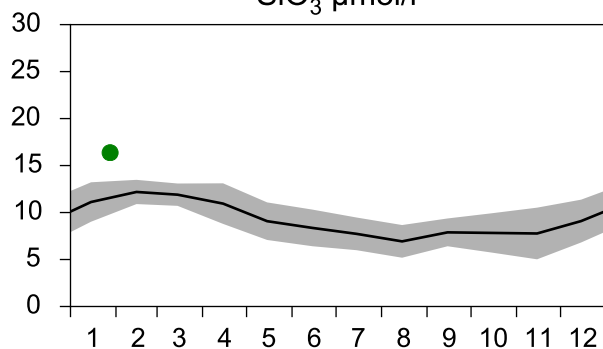
PO₄ µmol/l



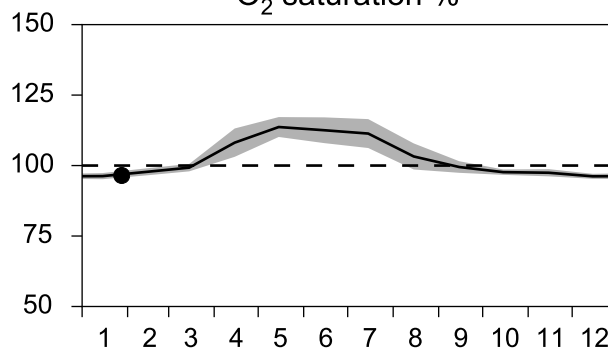
DIN µmol/l



SiO₃ µmol/l

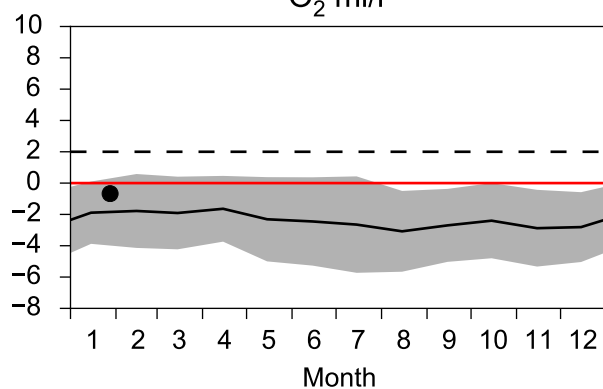


O₂ saturation %

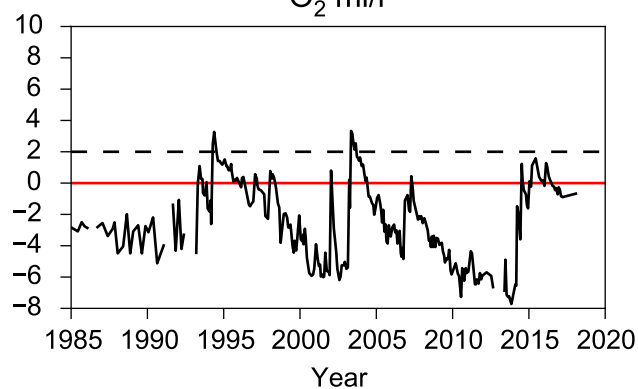


OXYGEN IN BOTTOM WATER (depth >= 225 m)

O₂ ml/l

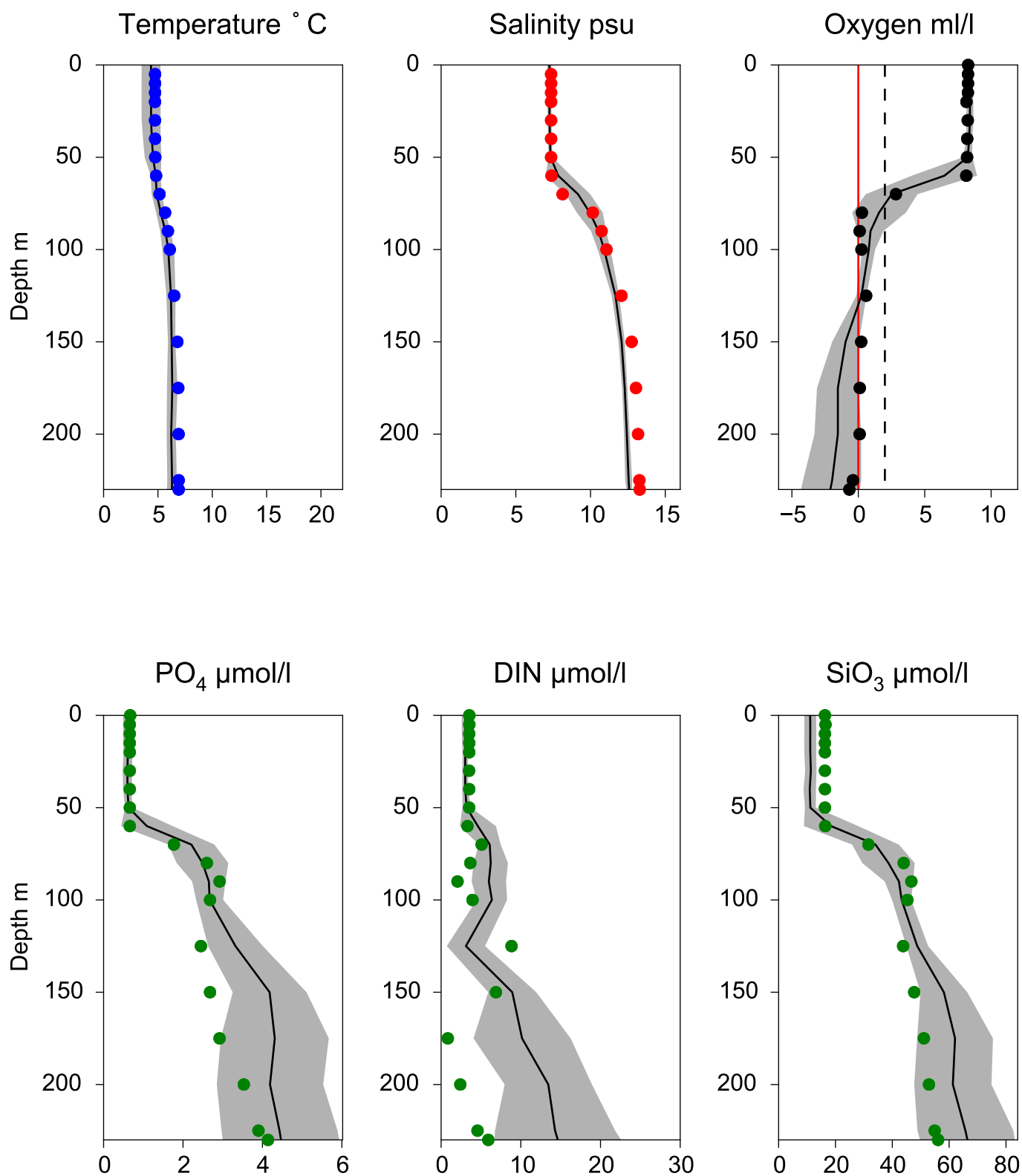


O₂ ml/l



Vertical profiles BY15 GOTLANDSDJ January

— Mean 2001-2015 St.Dev. • 2018-01-28



STATION BY20 FÅRÖDJ SURFACE WATER (0-10 m)

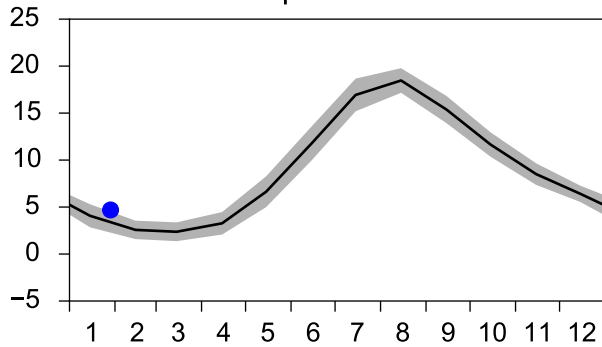
Annual Cycles

— Mean 2001-2015

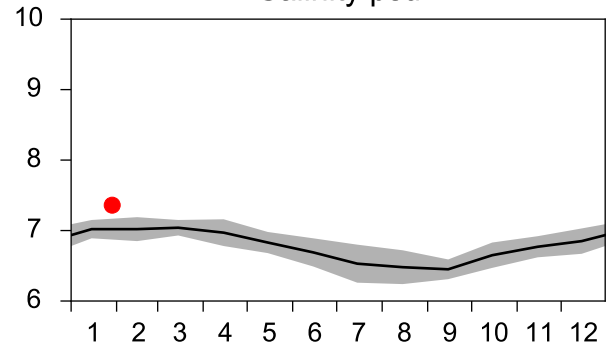
■ St.Dev.

● 2018

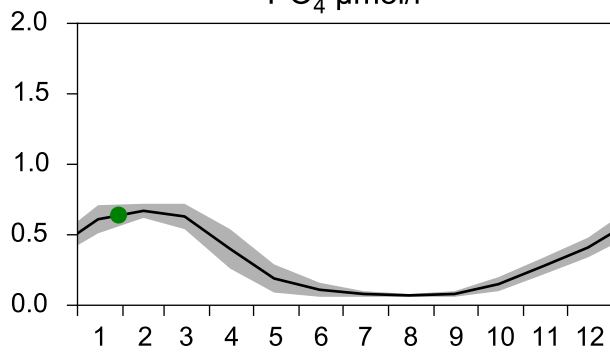
Temperature °C



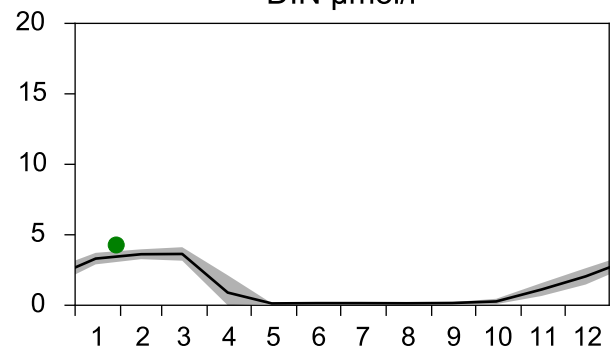
Salinity psu



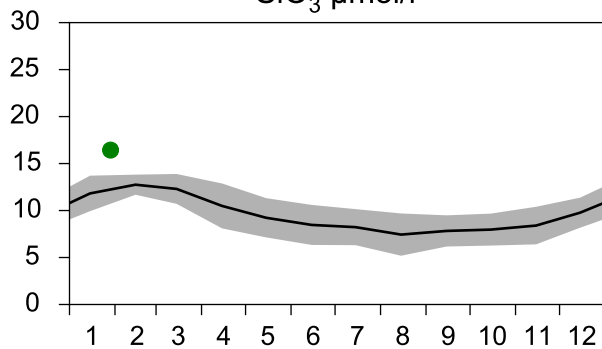
PO₄ µmol/l



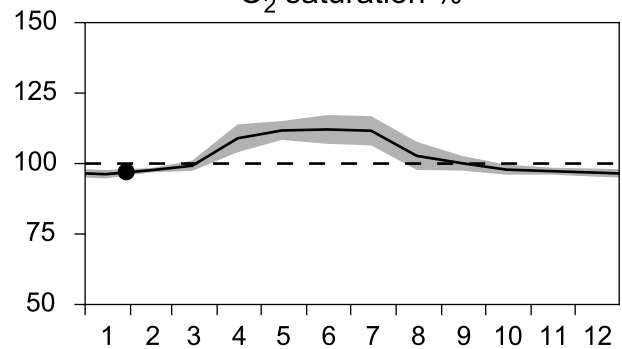
DIN µmol/l



SiO₃ µmol/l

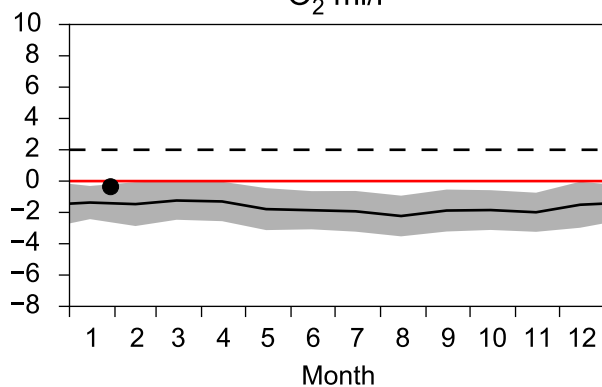


O₂ saturation %

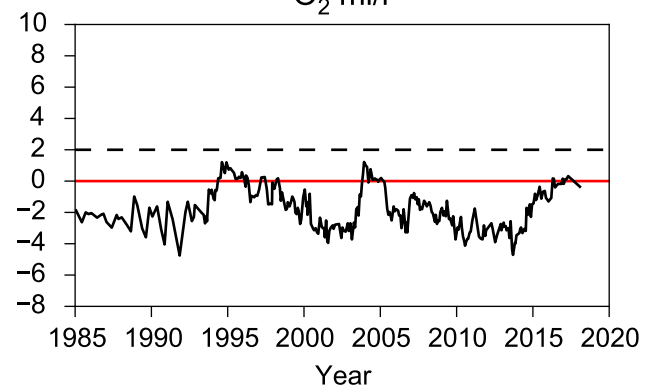


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

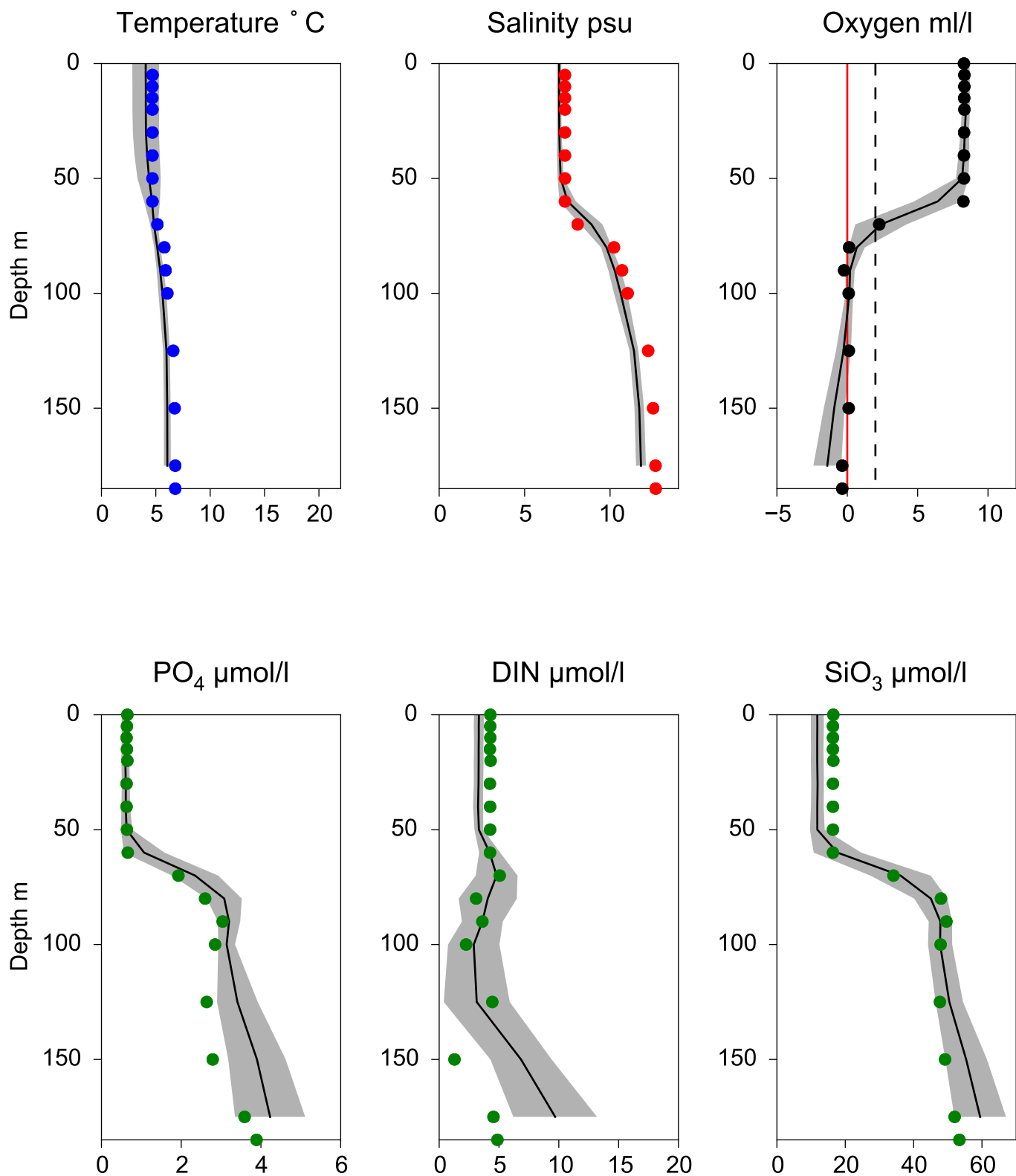


O₂ ml/l



Vertical profiles BY20 FÅRÖDJ January

— Mean 2001-2015 St.Dev. • 2018-01-29



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

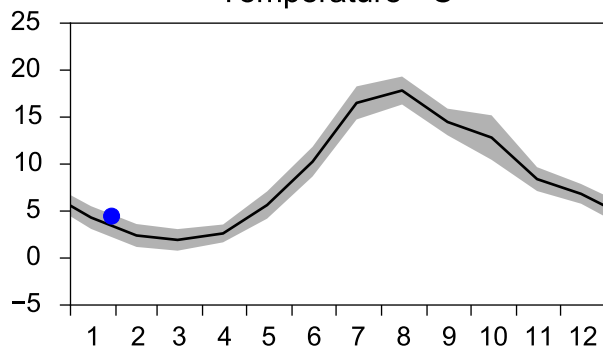
Annual Cycles

— Mean 2001-2015

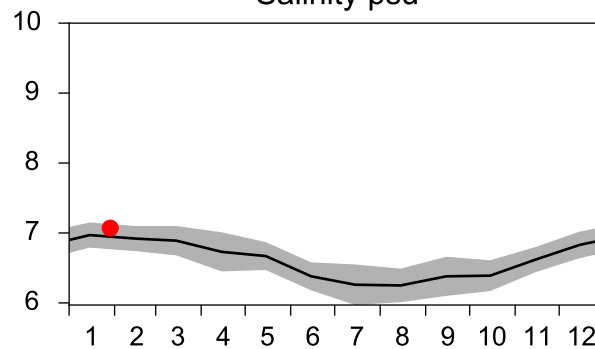
■ St.Dev.

● 2018

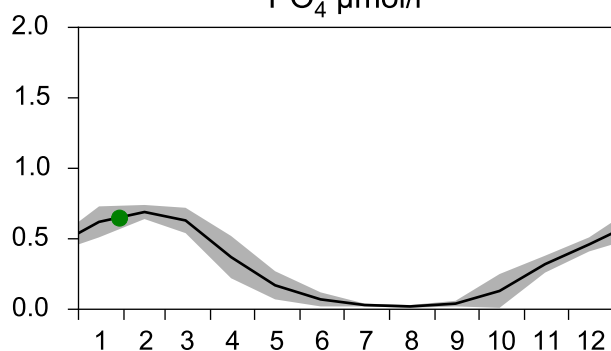
Temperature °C



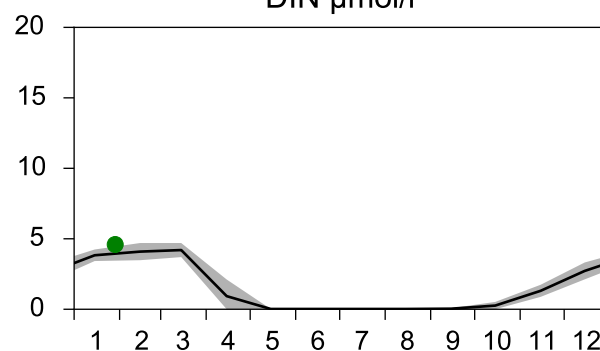
Salinity psu



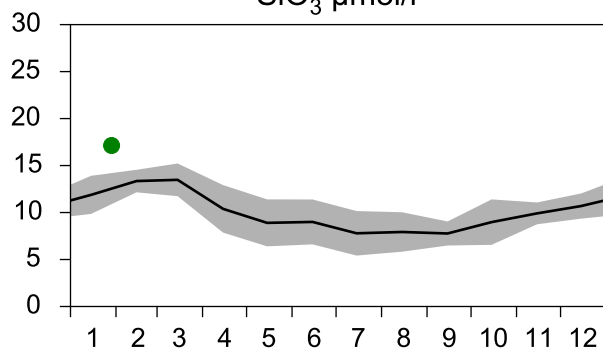
PO₄ µmol/l



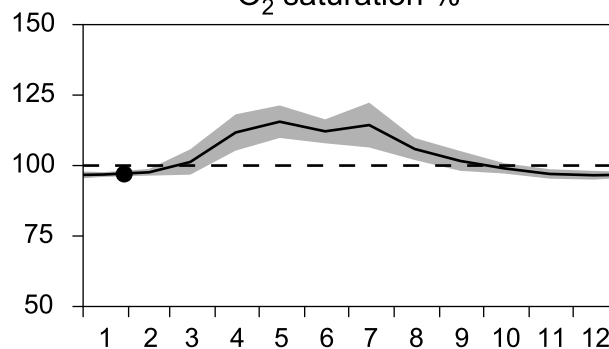
DIN µmol/l



SiO₃ µmol/l

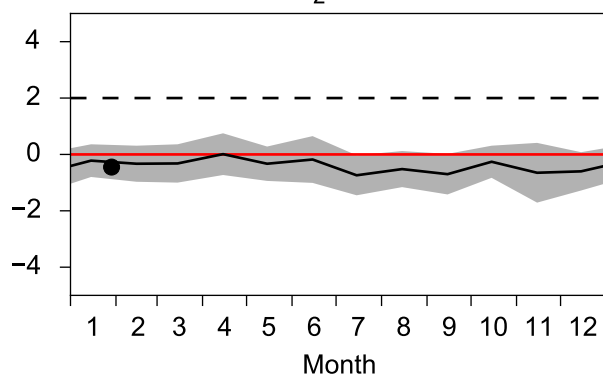


O₂ saturation %

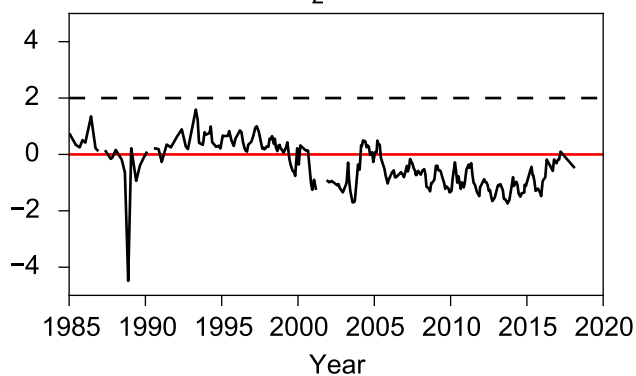


OXYGEN IN BOTTOM WATER (depth >= 150 m)

O₂ ml/l

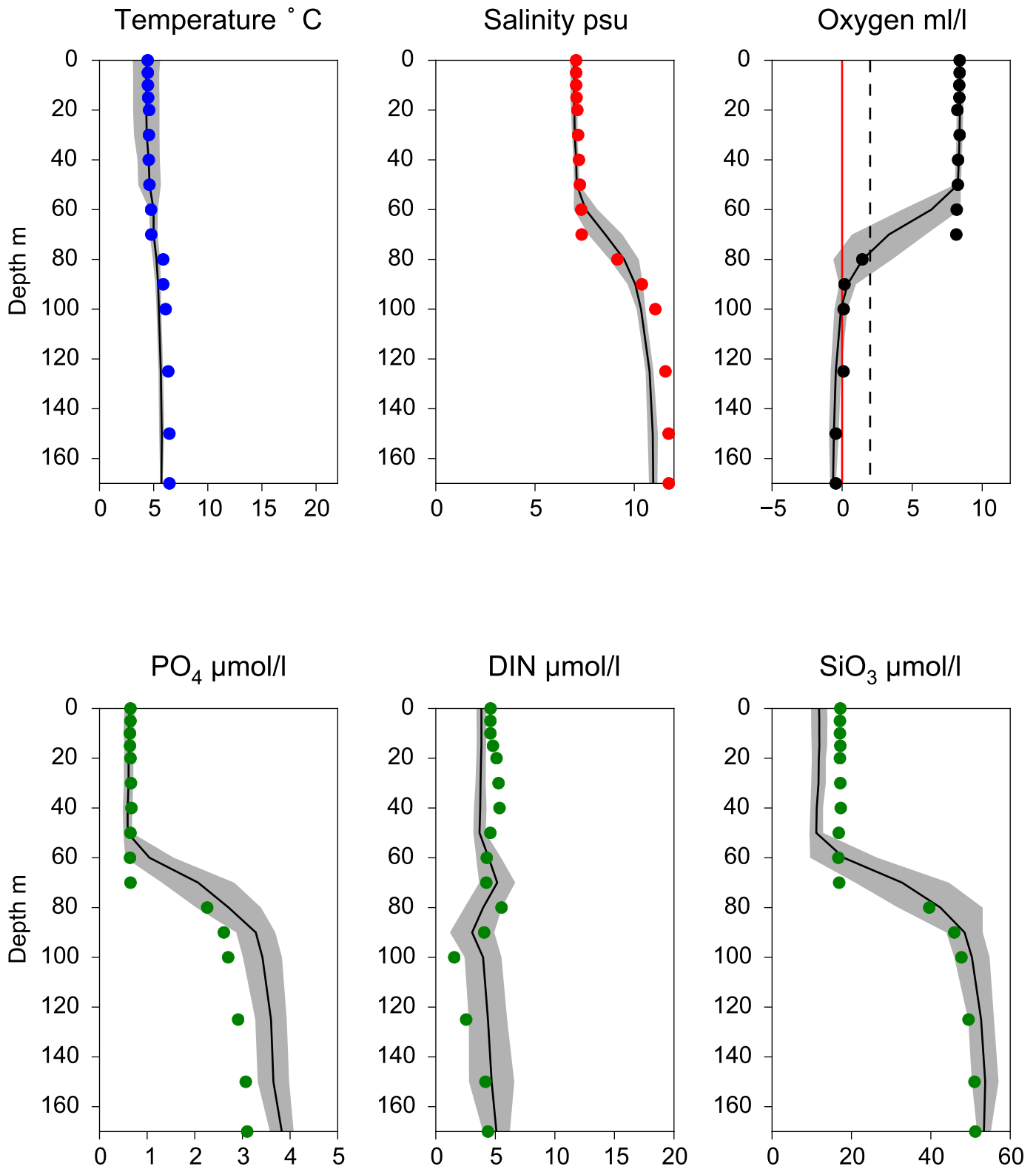


O₂ ml/l



Vertical profiles BY29 / LL19 January

— Mean 2001-2015 St.Dev. • 2018-01-29



STATION BY31 LANDSORTSDJ SURFACE WATER (0-10 m)

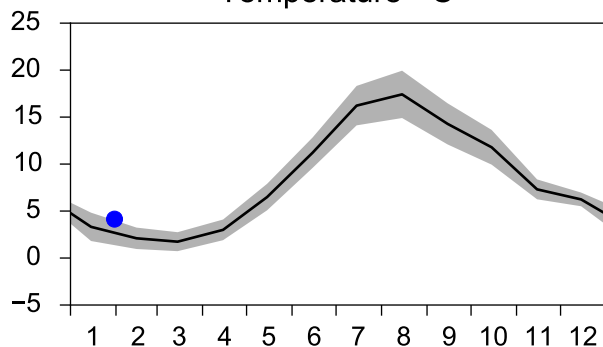
Annual Cycles

— Mean 2001-2015

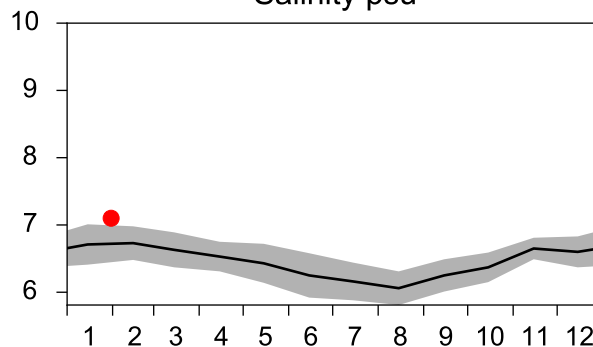
■ St.Dev.

● 2018

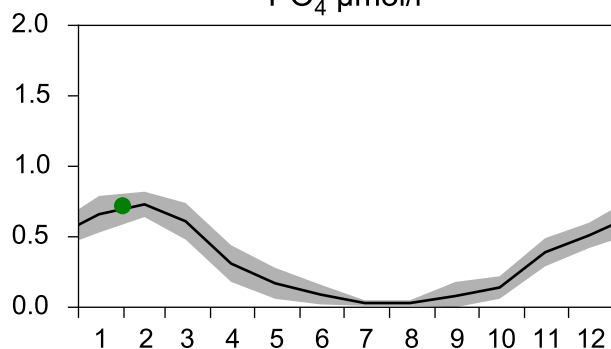
Temperature °C



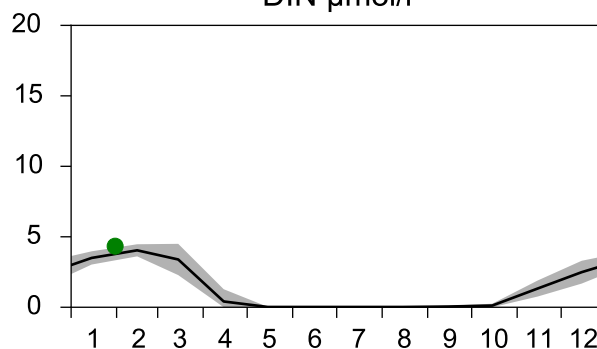
Salinity psu



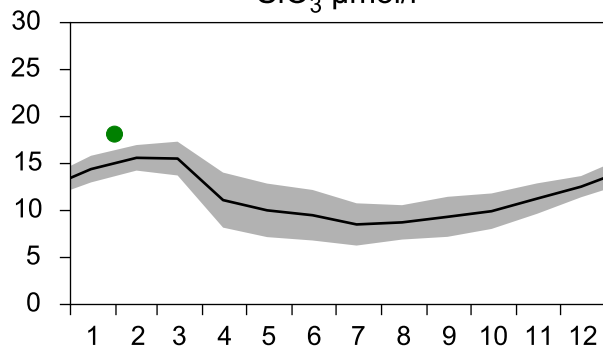
PO₄ µmol/l



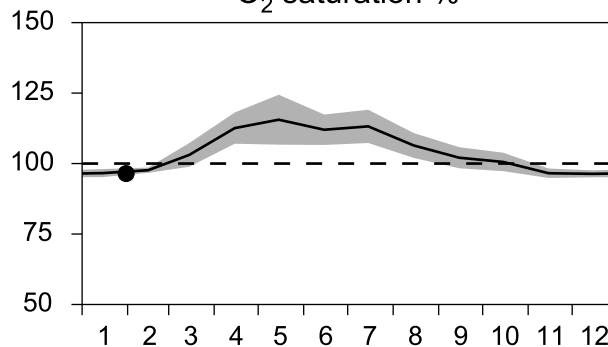
DIN µmol/l



SiO₃ µmol/l

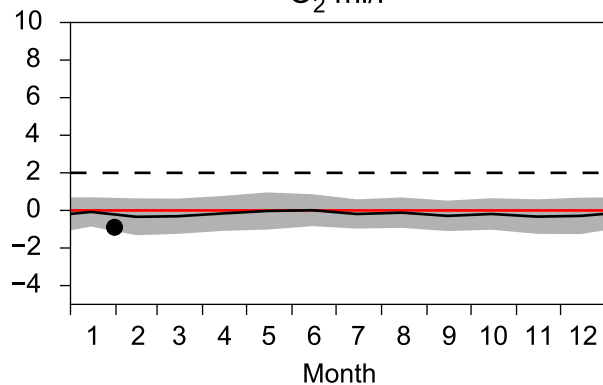


O₂ saturation %

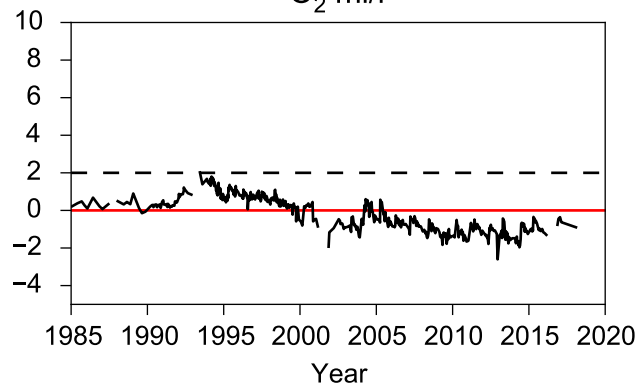


OXYGEN IN BOTTOM WATER (depth >= 425 m)

O₂ ml/l

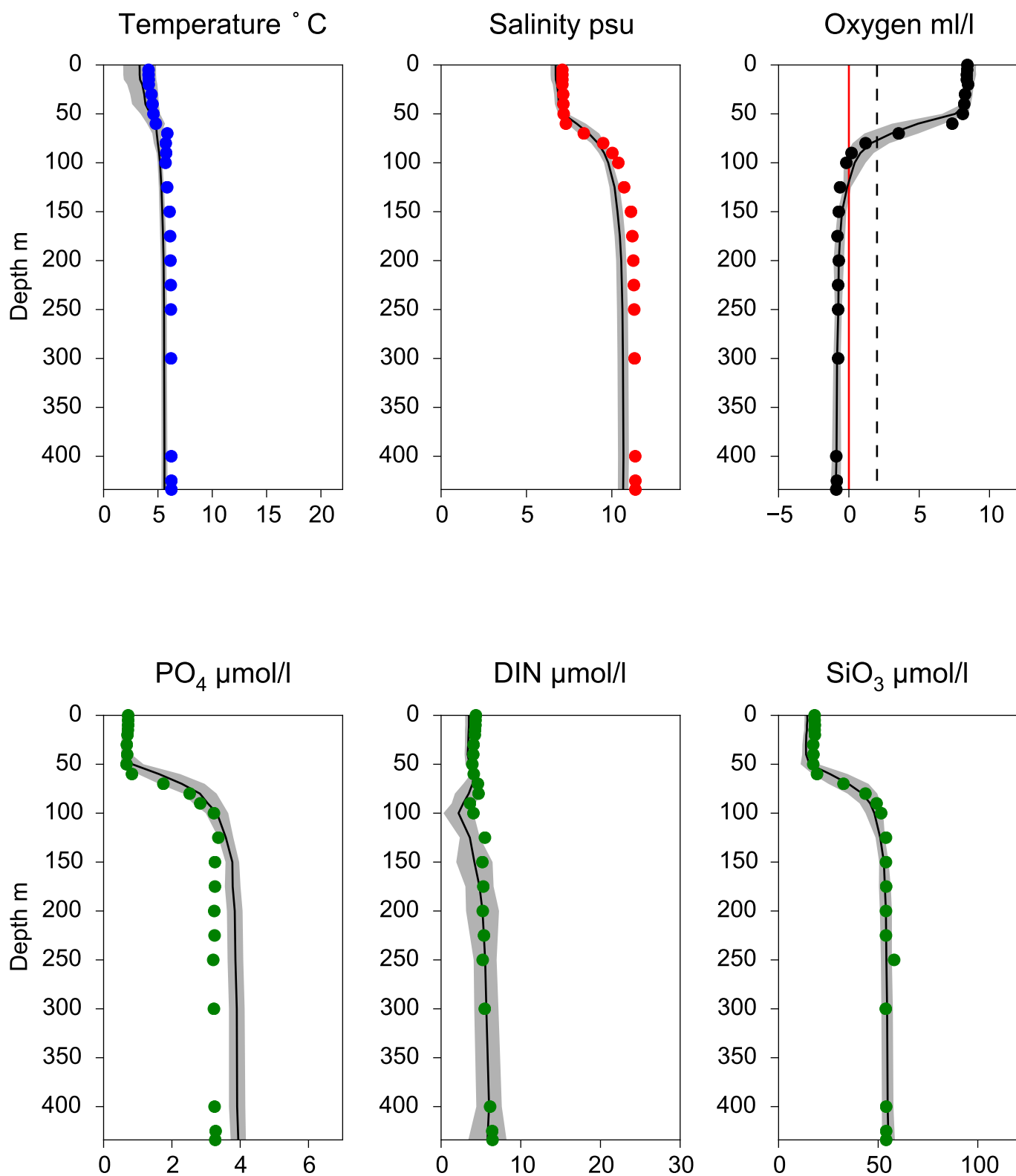


O₂ ml/l



Vertical profiles BY31 LANDSORTSDJ January

— Mean 2001-2015 St.Dev. ● 2018-01-31



STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

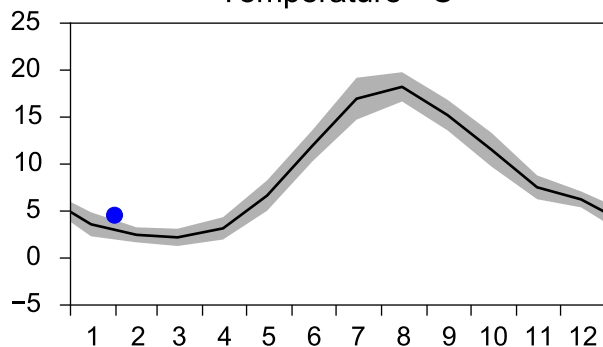
Annual Cycles

— Mean 2001-2015

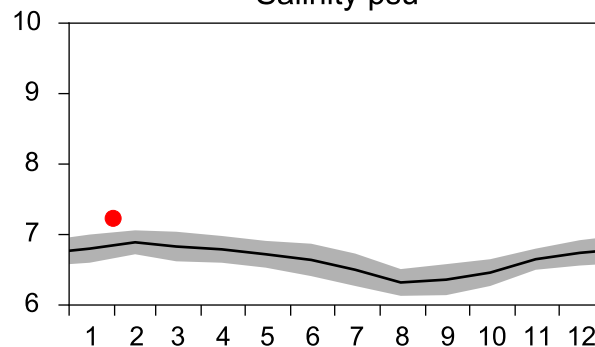
■ St.Dev.

● 2018

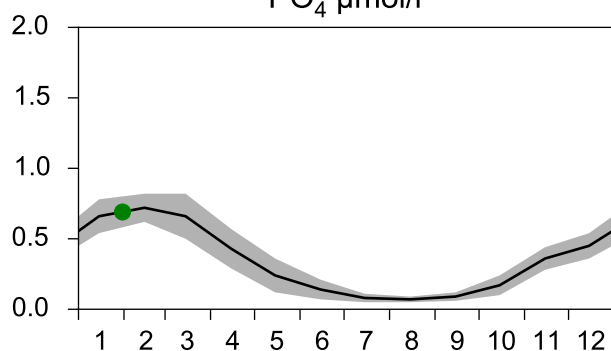
Temperature °C



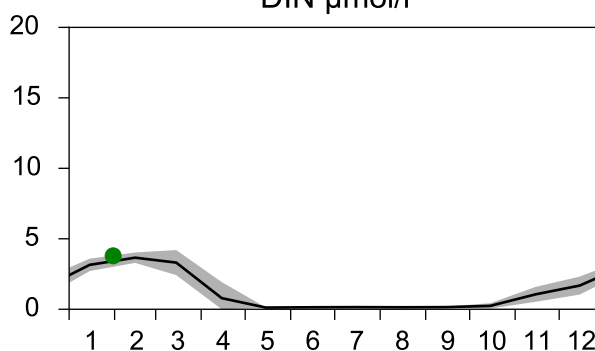
Salinity psu



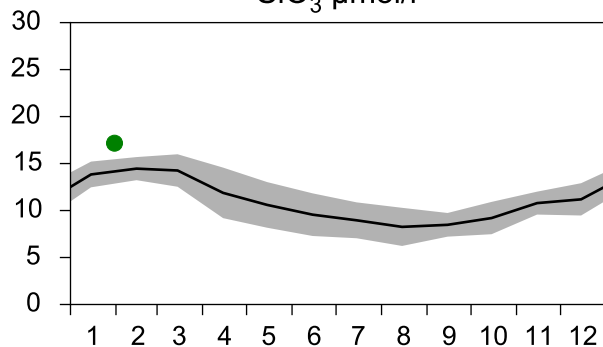
PO₄ µmol/l



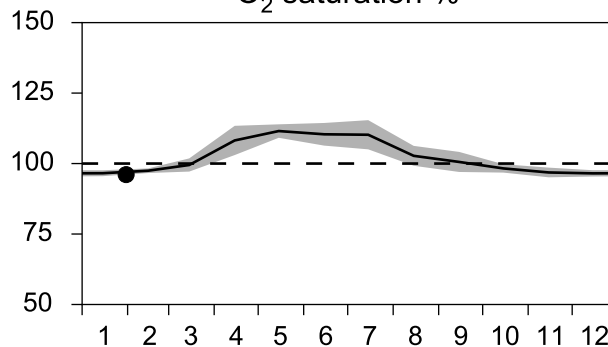
DIN µmol/l



SiO₃ µmol/l

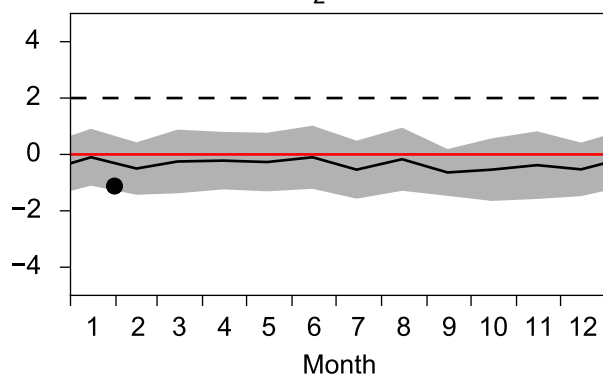


O₂ saturation %

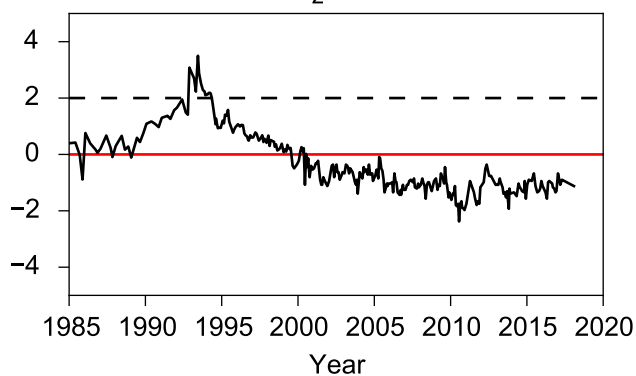


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

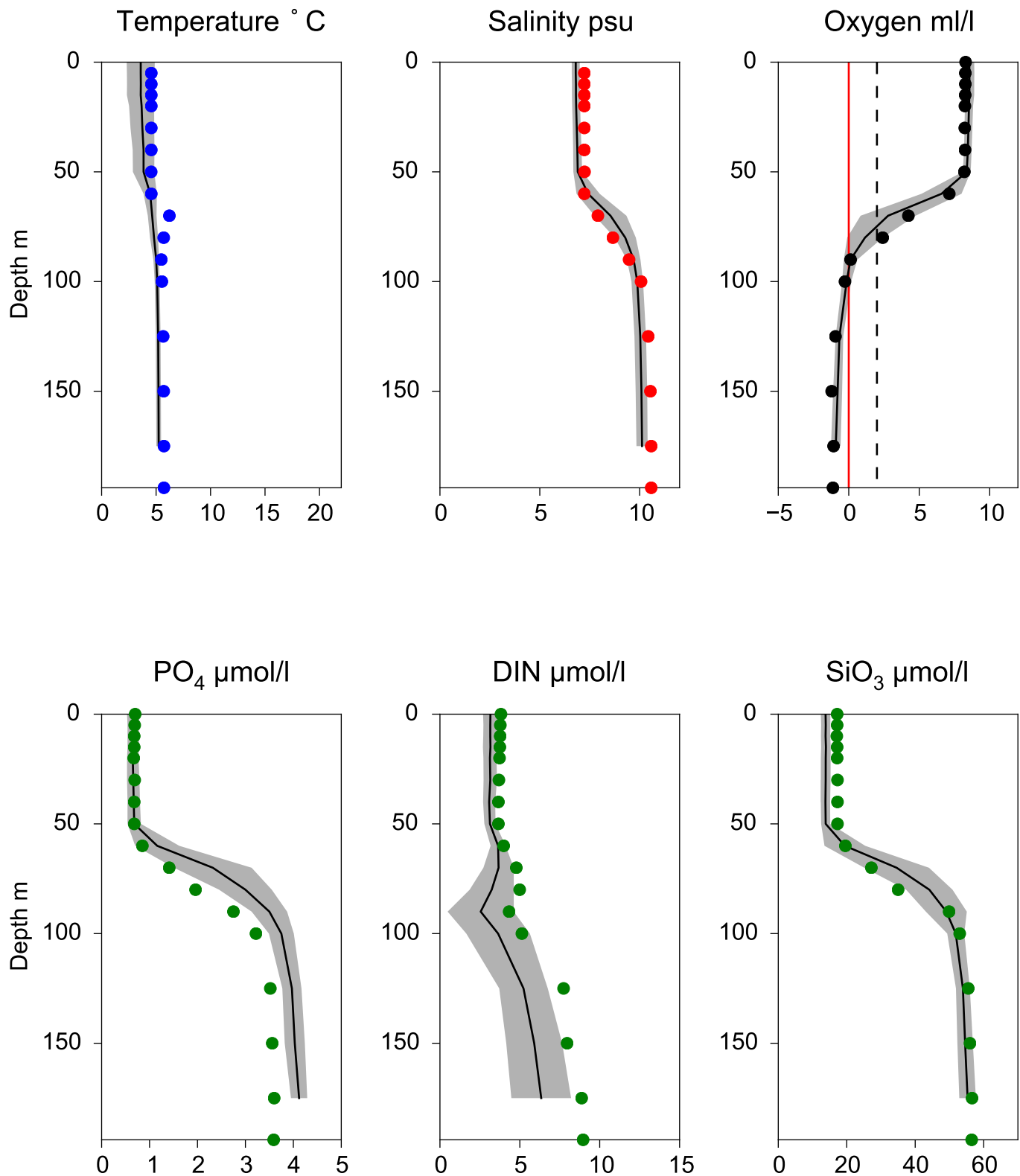


O₂ ml/l



Vertical profiles BY32 NORRKÖPINGS DJ January

— Mean 2001-2015 St.Dev. • 2018-01-31



STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

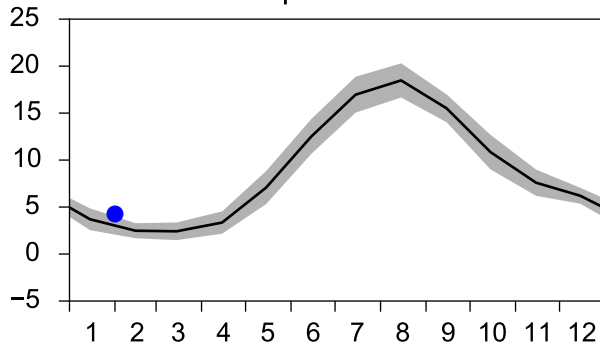
Annual Cycles

— Mean 2001-2015

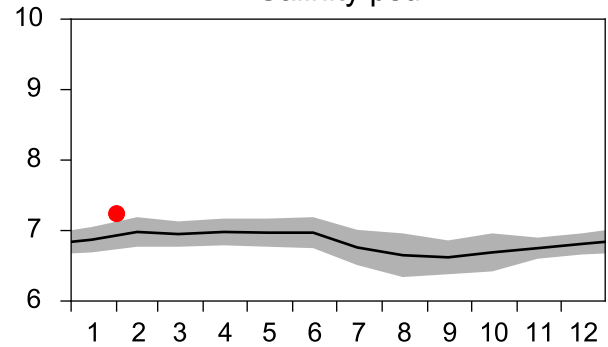
■ St.Dev.

● 2018

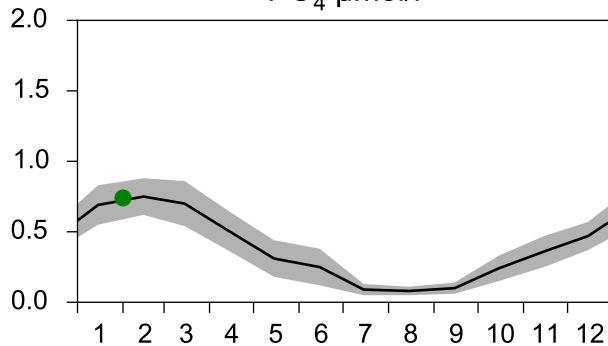
Temperature °C



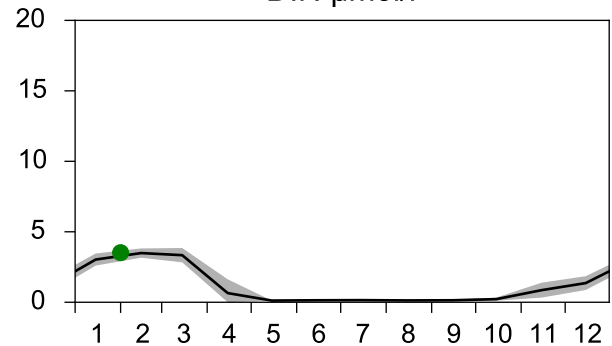
Salinity psu



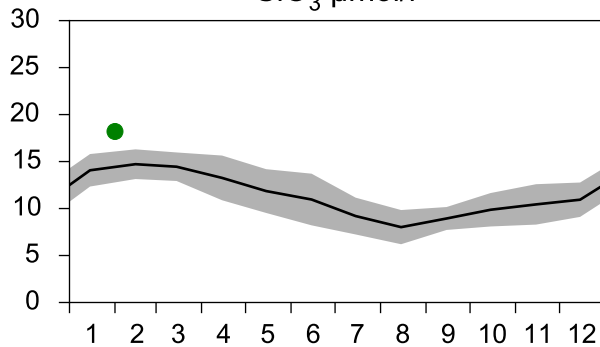
PO₄ µmol/l



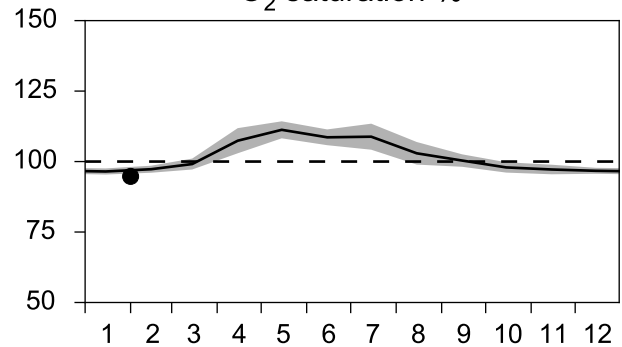
DIN µmol/l



SiO₃ µmol/l

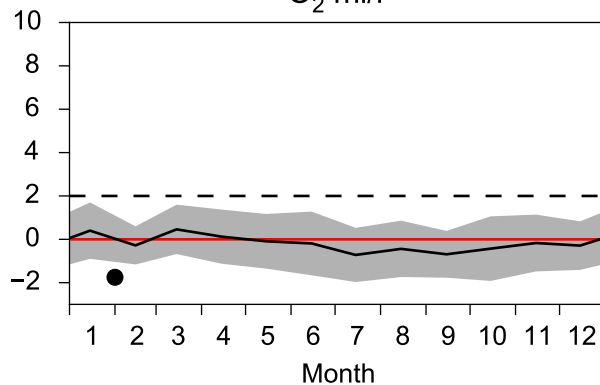


O₂ saturation %

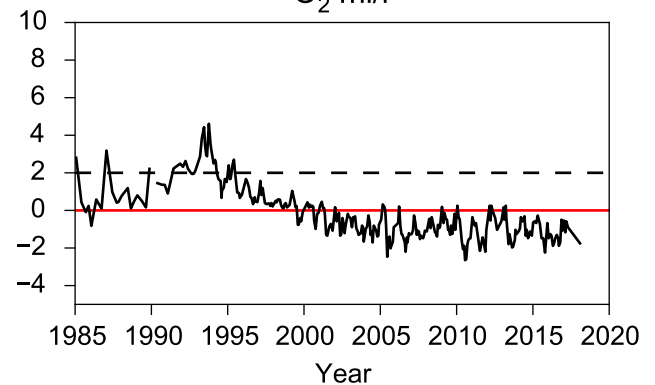


OXYGEN IN BOTTOM WATER (depth >= 100 m)

O₂ ml/l

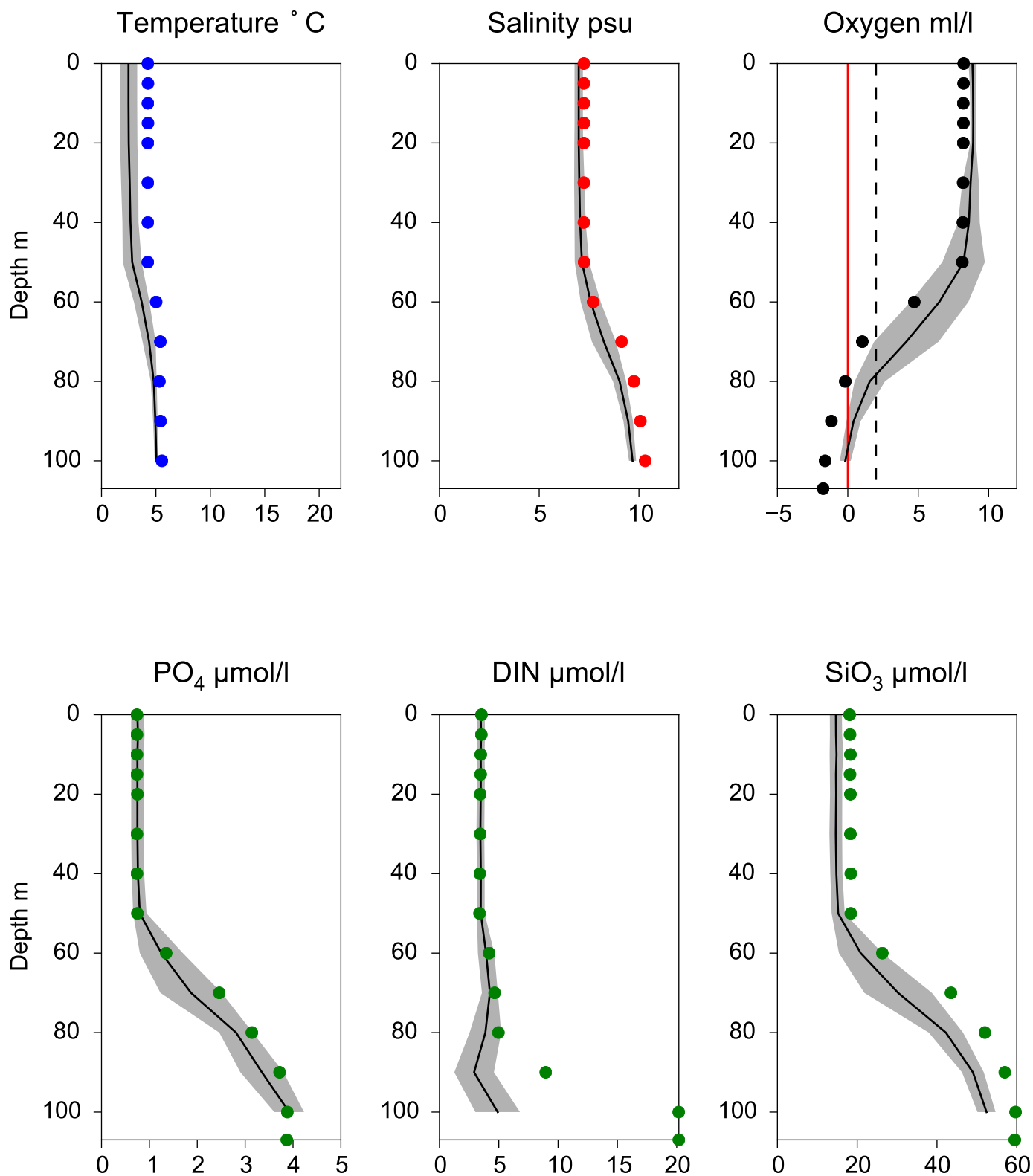


O₂ ml/l



Vertical profiles BY38 KARLSÖDJ February

— Mean 2001-2015 St.Dev. ● 2018-02-01



STATION REF M1V1 SURFACE WATER (0-10 m)

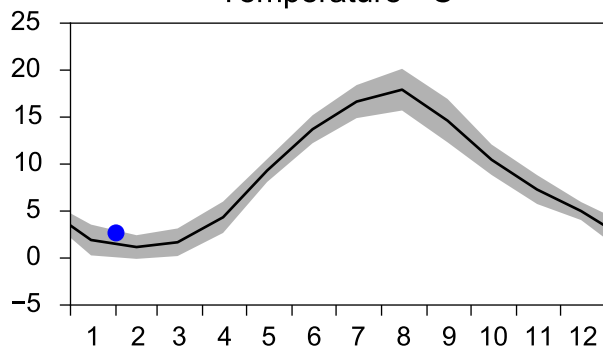
Annual Cycles

— Mean 2001-2015

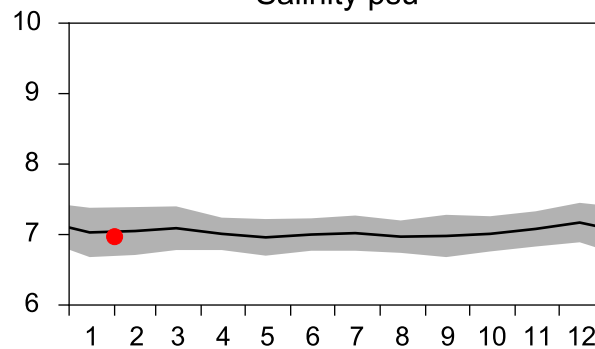
■ St.Dev.

● 2018

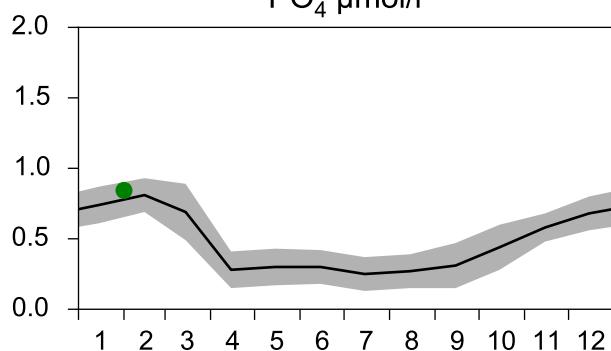
Temperature °C



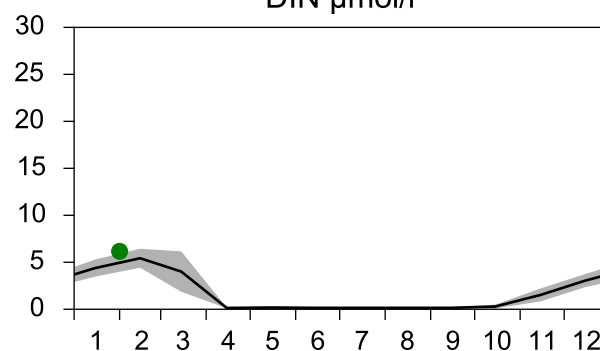
Salinity psu



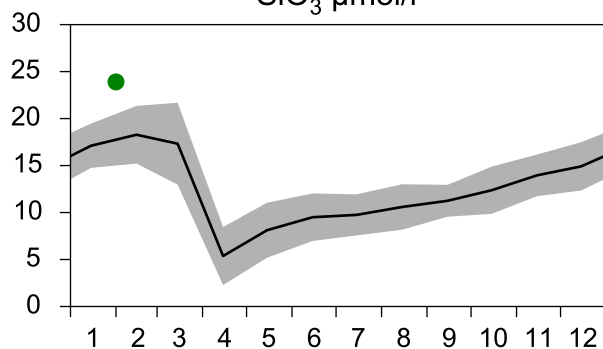
PO₄ µmol/l



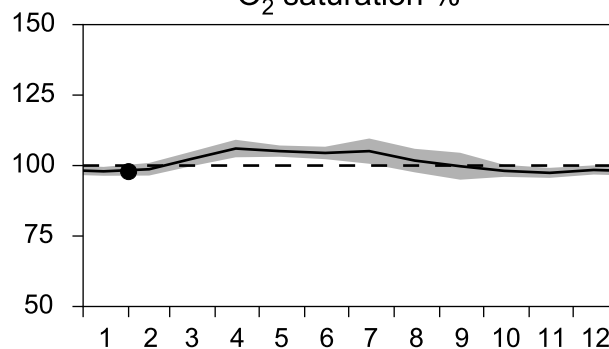
DIN µmol/l



SiO₃ µmol/l

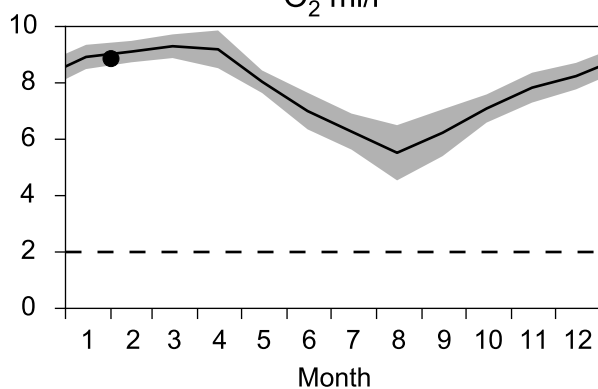


O₂ saturation %

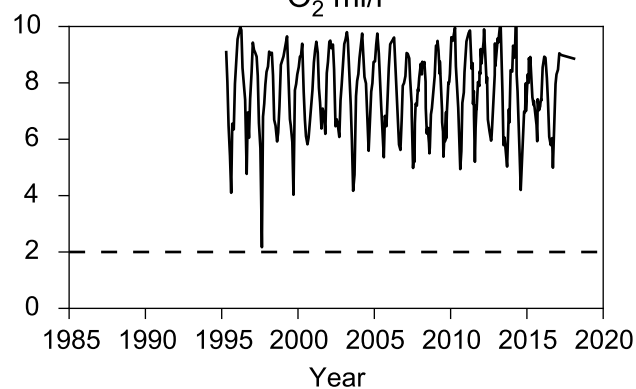


OXYGEN IN BOTTOM WATER (depth >= 17 m)

O₂ ml/l

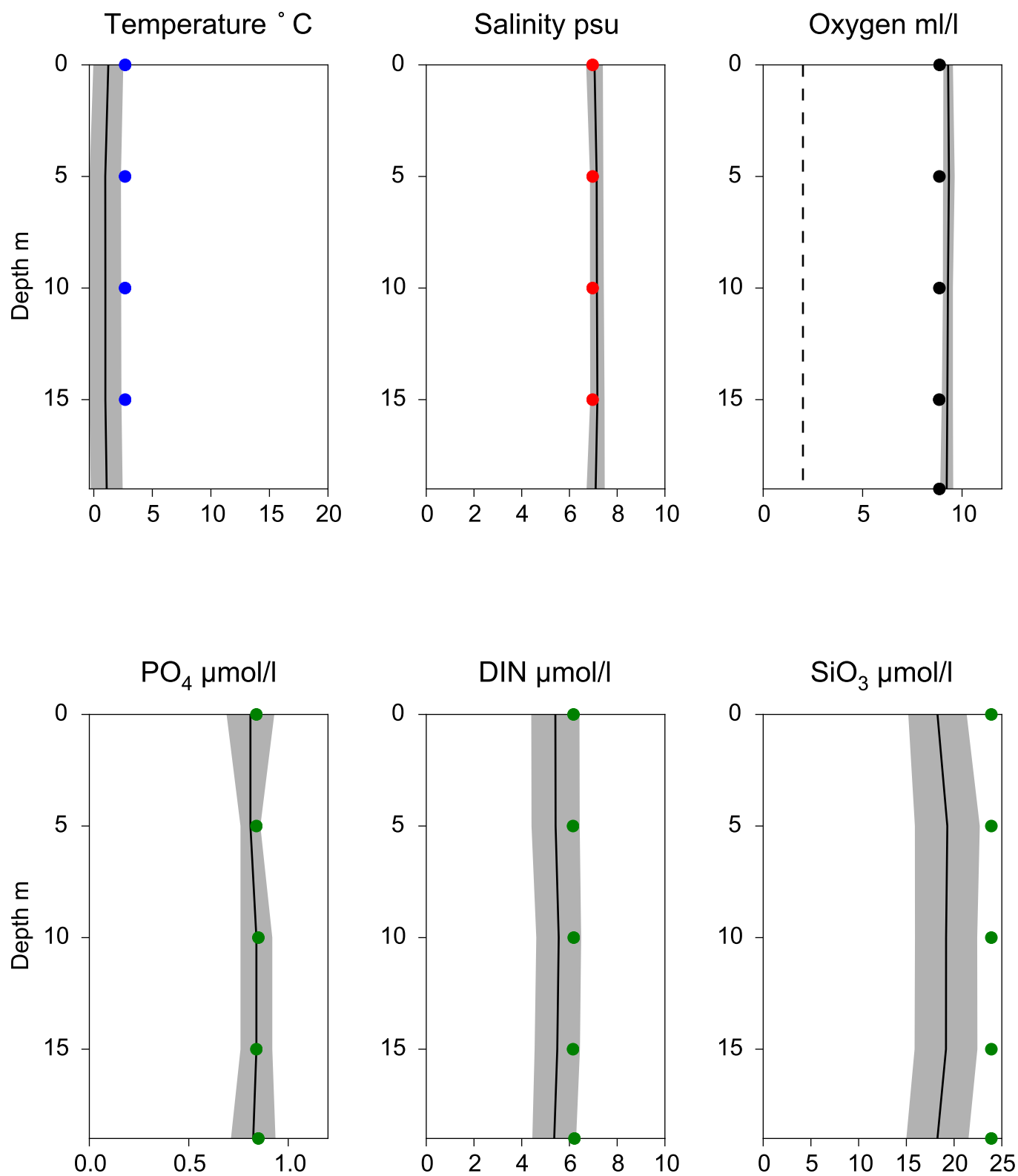


O₂ ml/l



Vertical profiles REF M1V1 February

— Mean 2001-2015 St.Dev. • 2018-02-01



STATION HANÖBUKTEN SURFACE WATER (0-10 m)

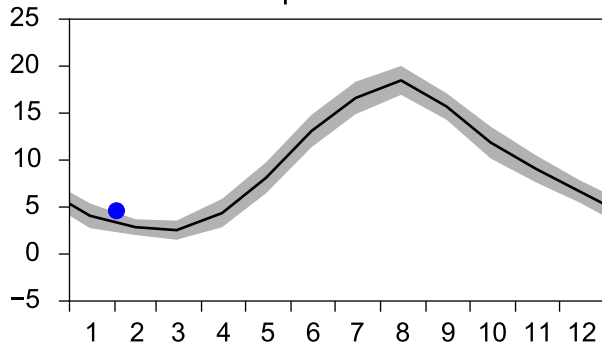
Annual Cycles

— Mean 2001-2015

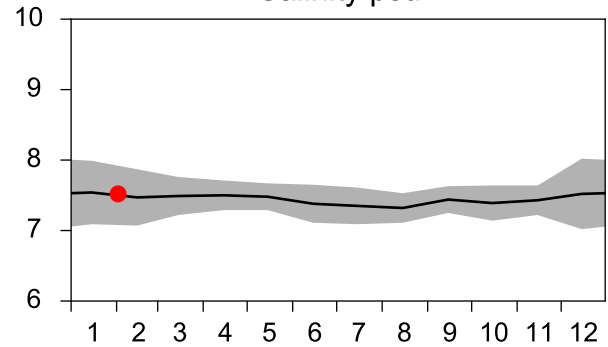
■ St.Dev.

● 2018

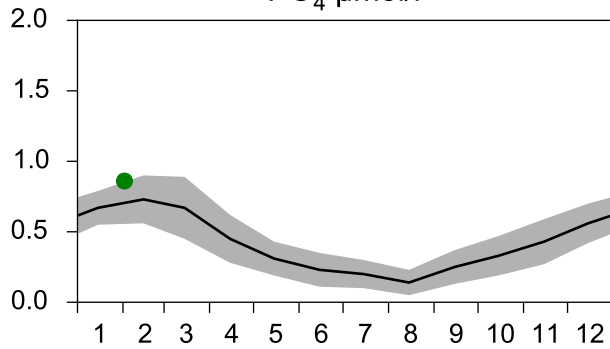
Temperature °C



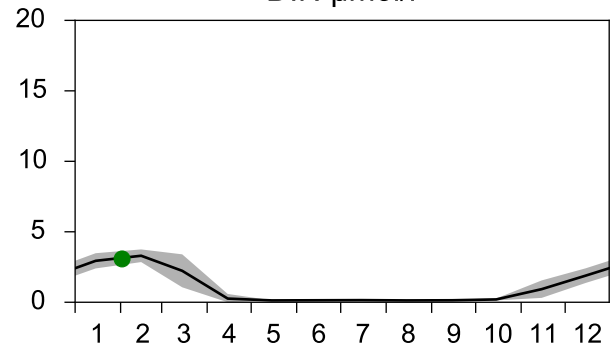
Salinity psu



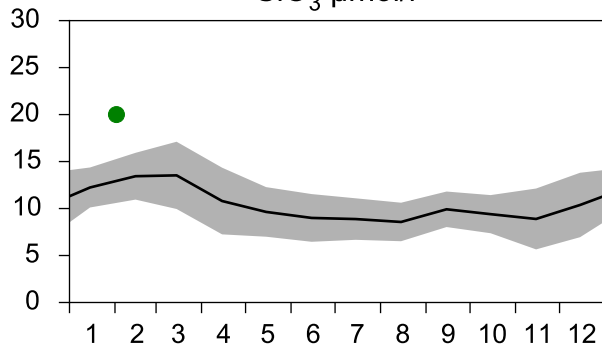
PO₄ µmol/l



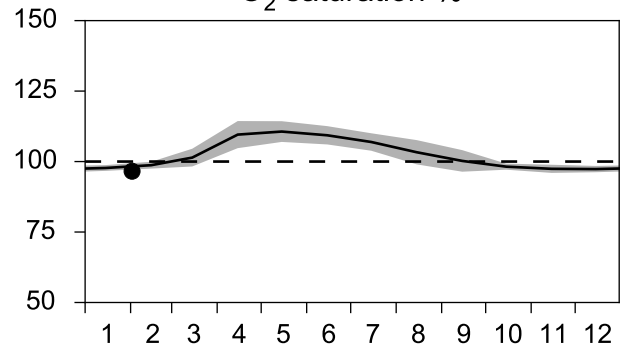
DIN µmol/l



SiO₃ µmol/l

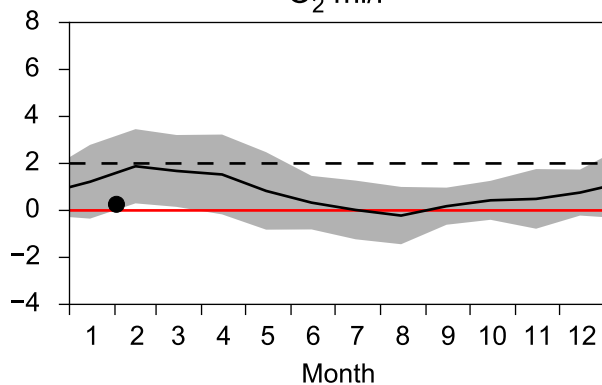


O₂ saturation %

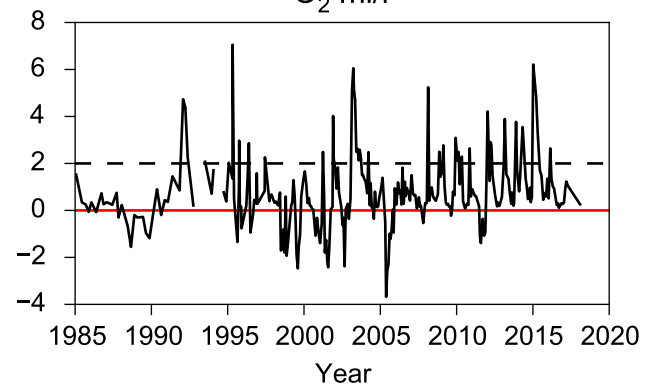


OXYGEN IN BOTTOM WATER (depth >= 70 m)

O₂ ml/l

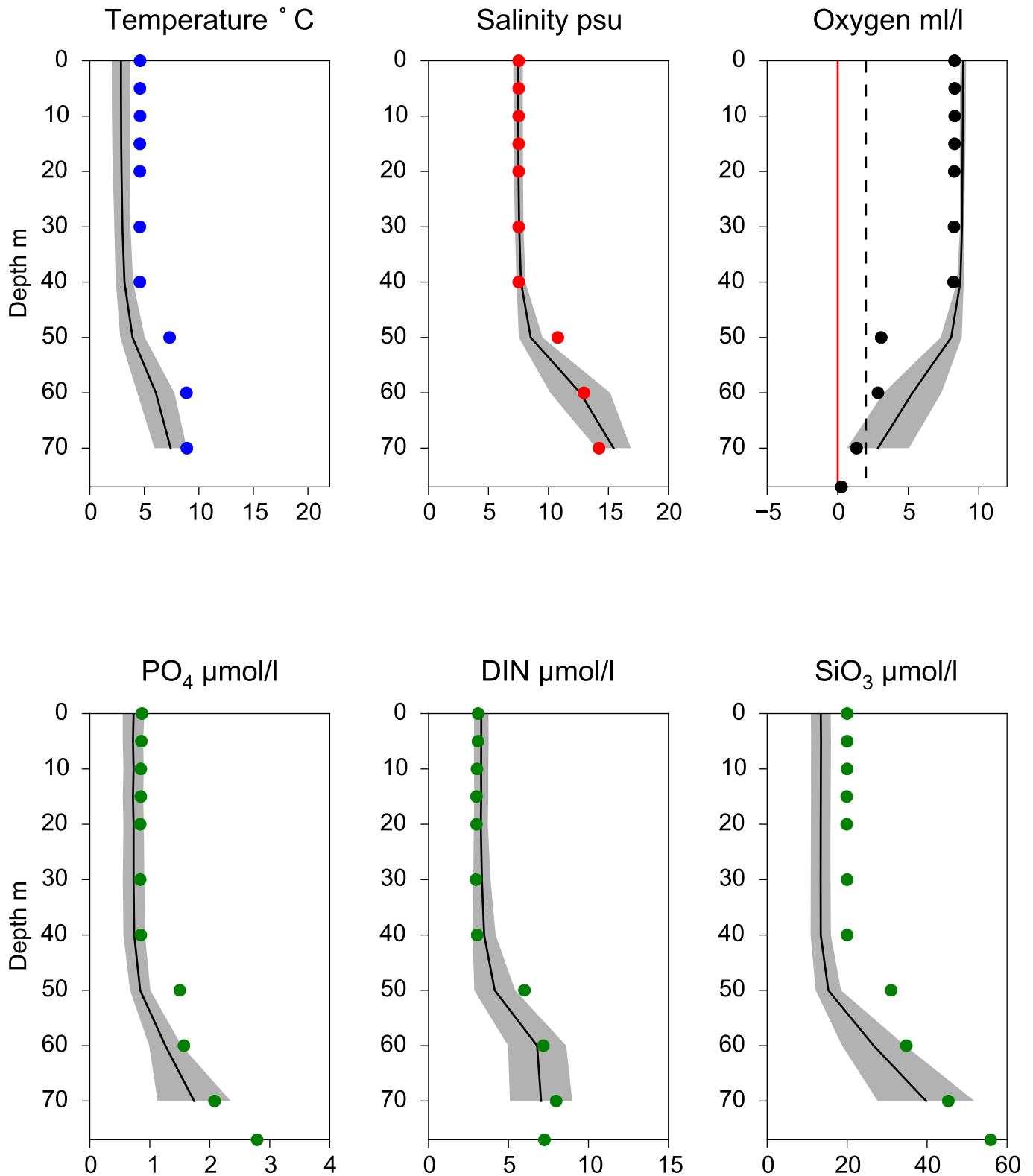


O₂ ml/l



Vertical profiles HANÖBUKTEN February

— Mean 2001-2015 St.Dev. • 2018-02-02



STATION ANHOLT E SURFACE WATER (0-10 m)

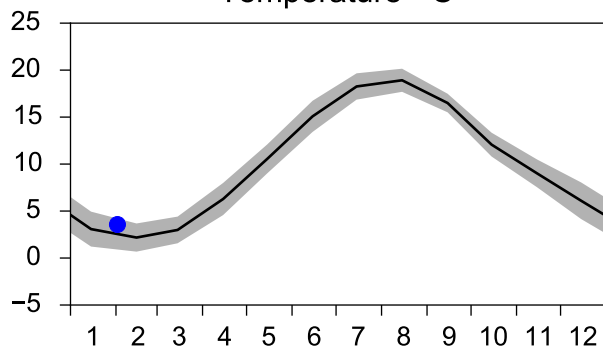
Annual Cycles

— Mean 2001-2015

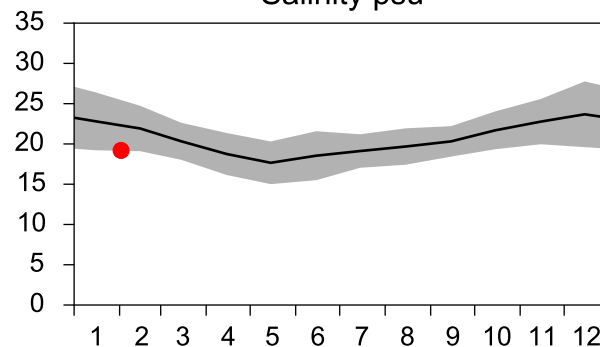
■ St.Dev.

● 2018

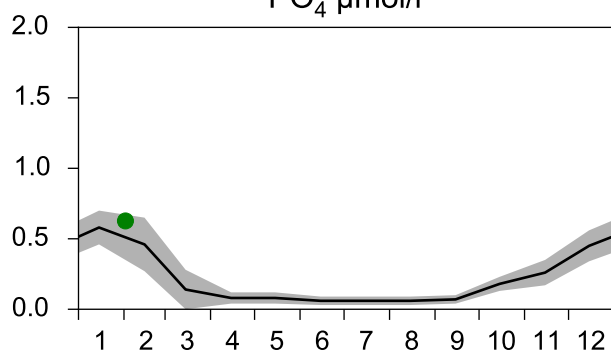
Temperature °C



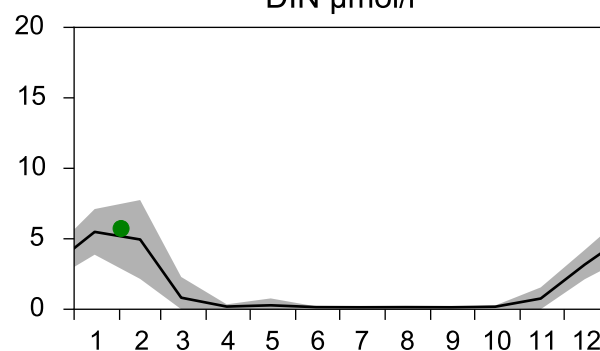
Salinity psu



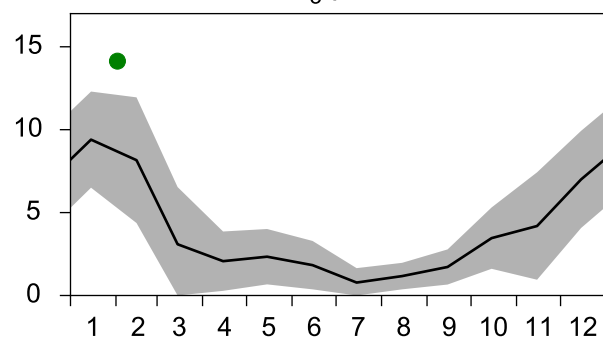
PO₄ µmol/l



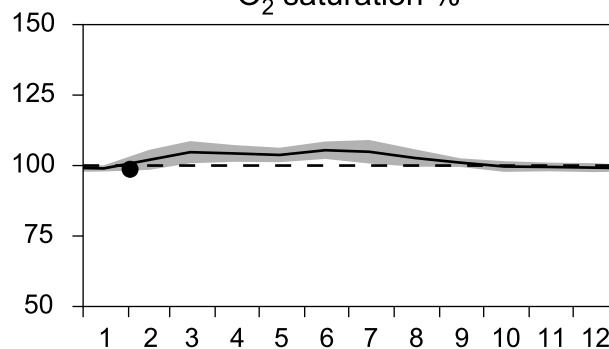
DIN µmol/l



SiO₃ µmol/l

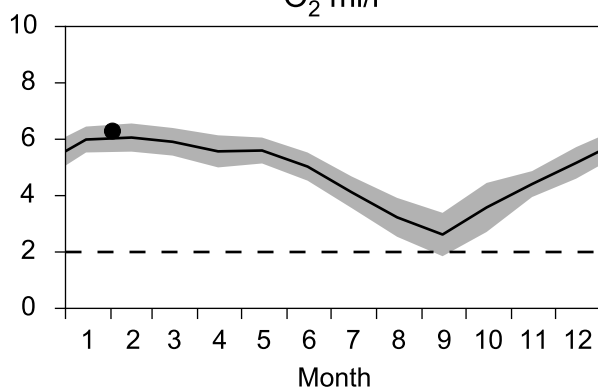


O₂ saturation %

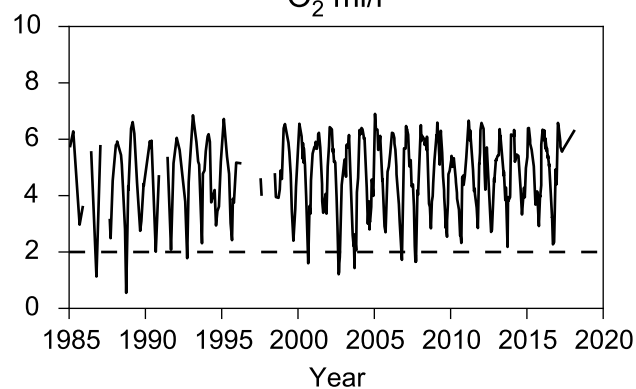


OXYGEN IN BOTTOM WATER (depth >= 52 m)

O₂ ml/l

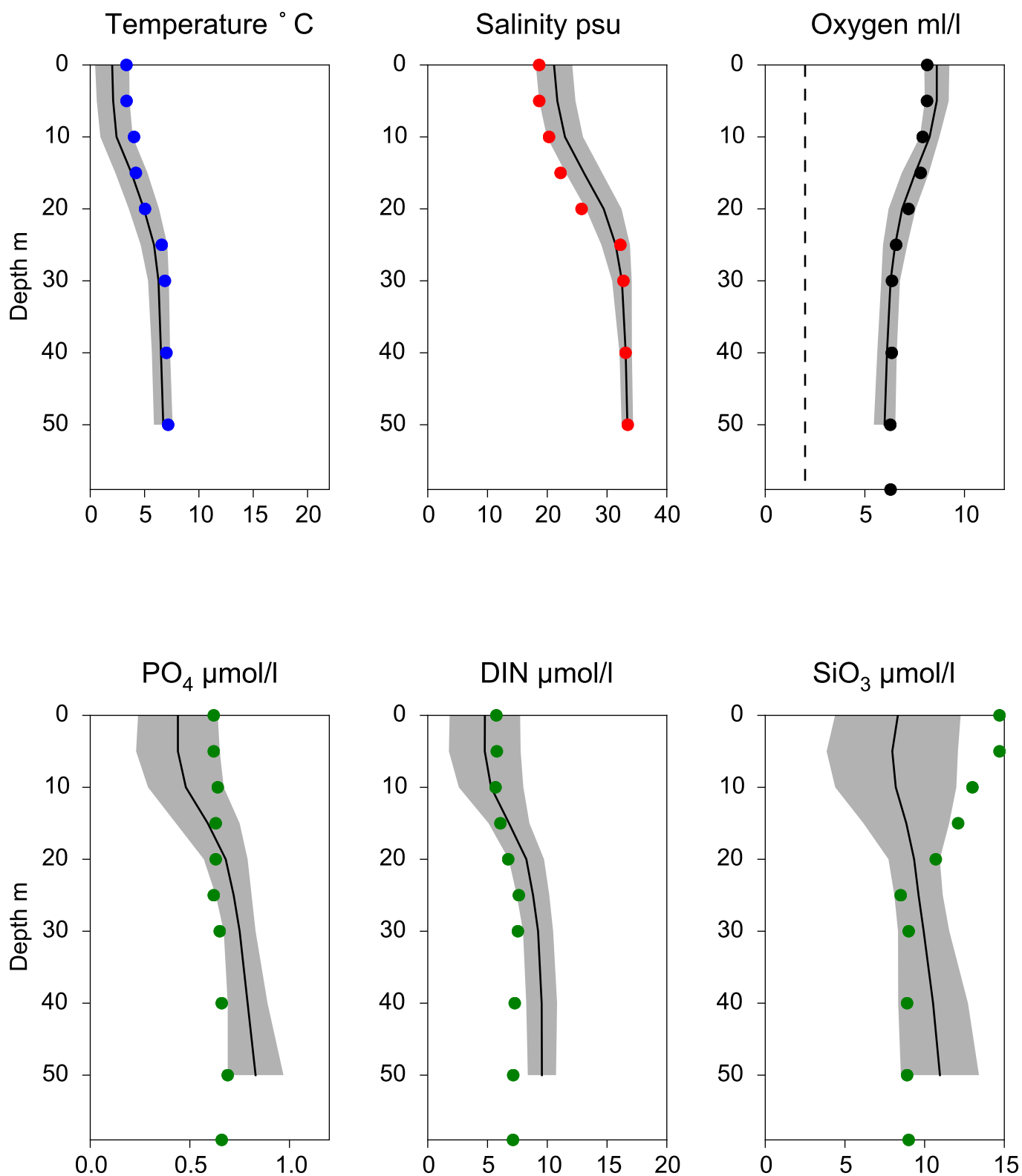


O₂ ml/l



Vertical profiles ANHOLT E February

— Mean 2001-2015 St.Dev. • 2018-02-02



STATION N14 FALKENBERG SURFACE WATER (0-10 m)

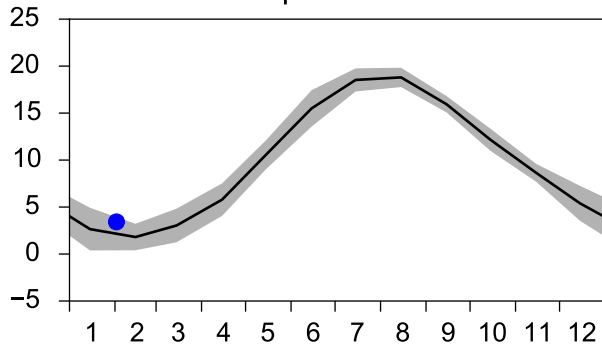
Annual Cycles

— Mean 2001-2015

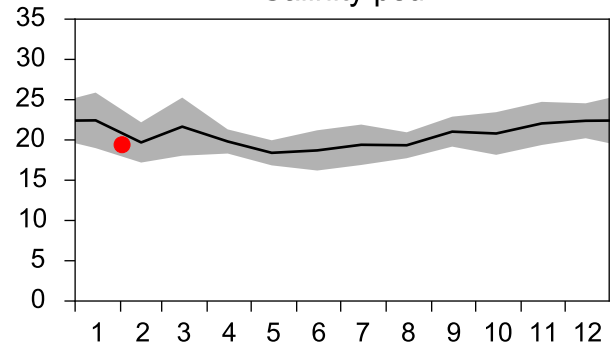
■ St.Dev.

● 2018

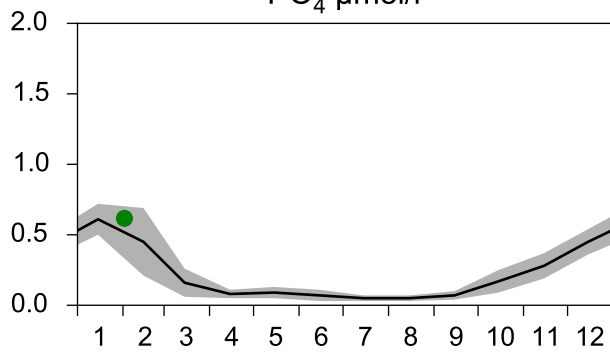
Temperature °C



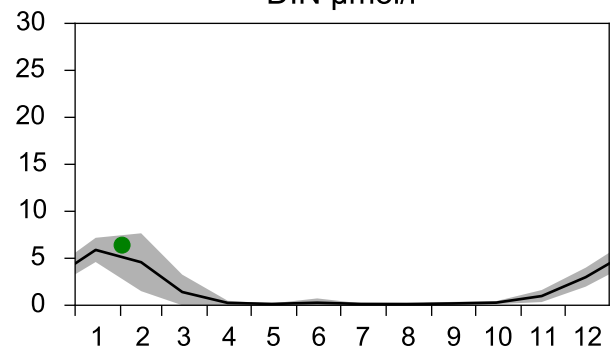
Salinity psu



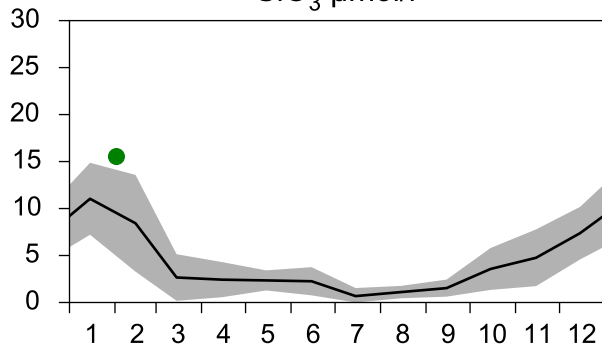
PO₄ µmol/l



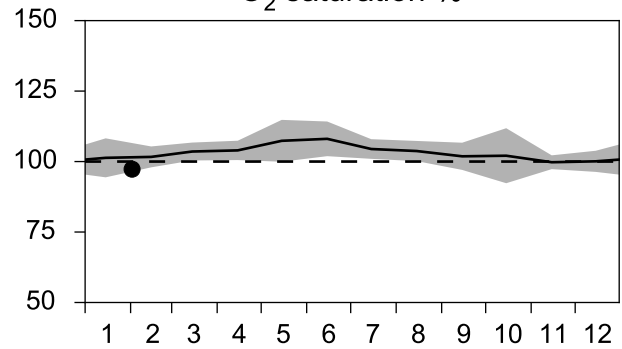
DIN µmol/l



SiO₃ µmol/l

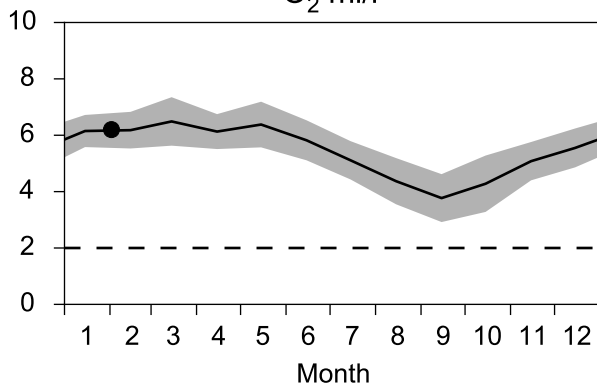


O₂ saturation %

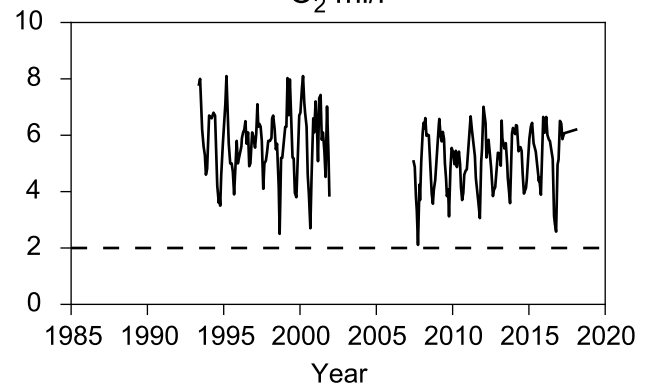


OXYGEN IN BOTTOM WATER (depth >= 25 m)

O₂ ml/l

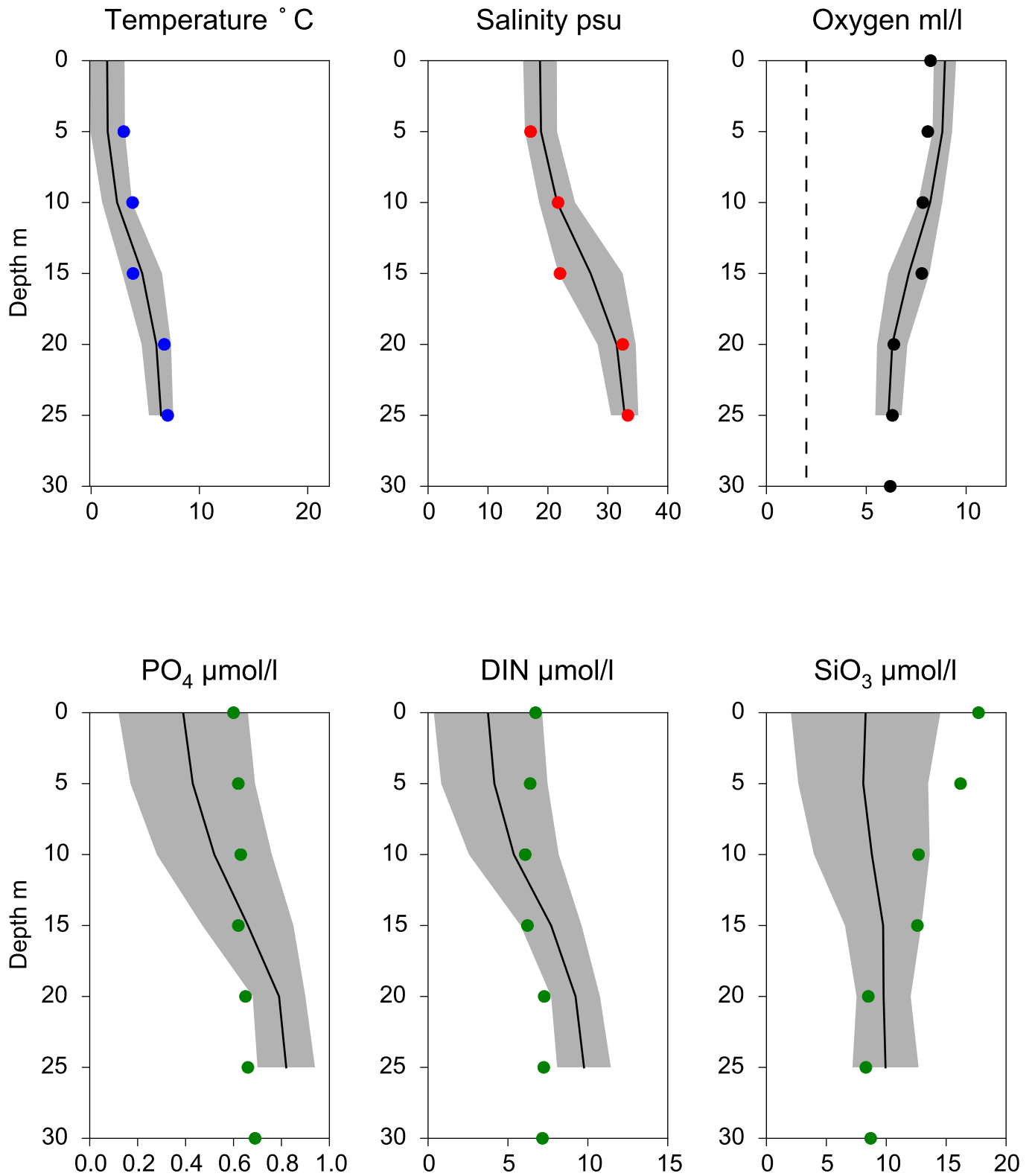


O₂ ml/l



Vertical profiles N14 FALKENBERG February

— Mean 2001-2015 St.Dev. • 2018-02-02



STATION FLADEN SURFACE WATER (0-10 m)

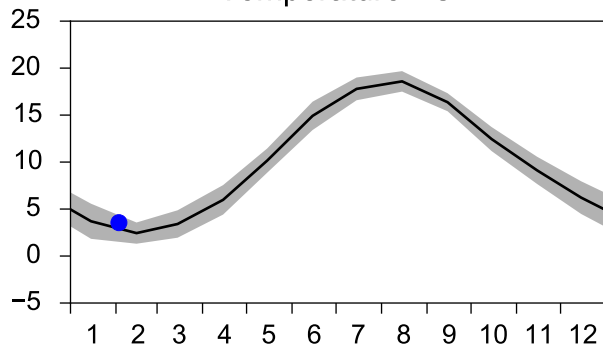
Annual Cycles

— Mean 2001-2015

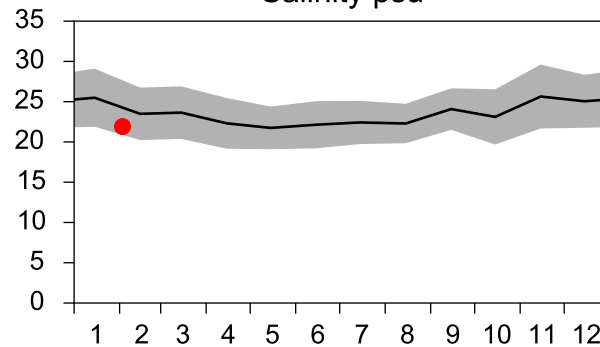
■ St.Dev.

● 2018

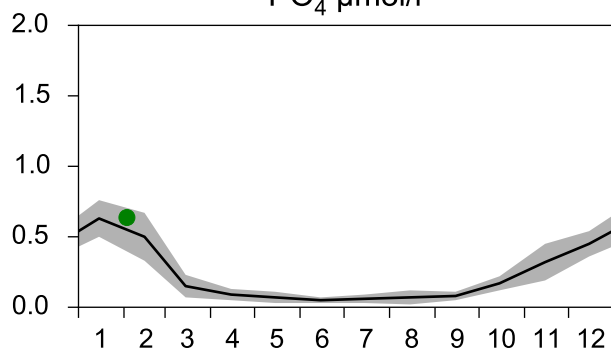
Temperature °C



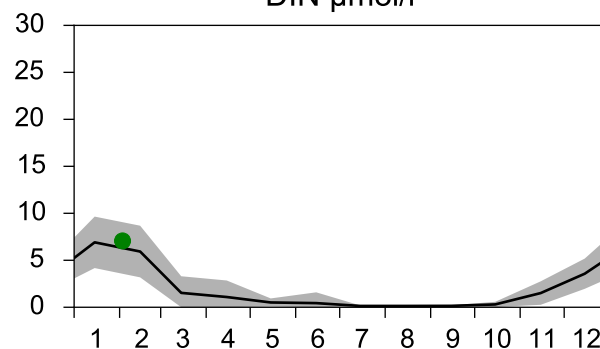
Salinity psu



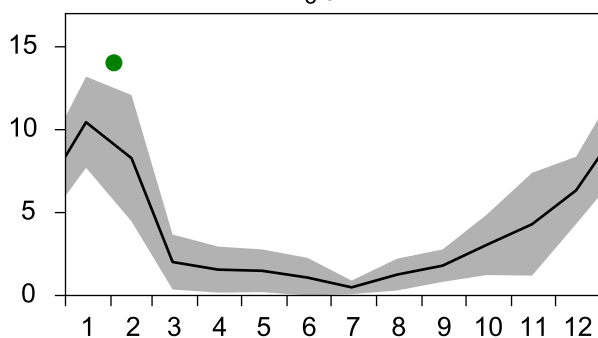
PO₄ µmol/l



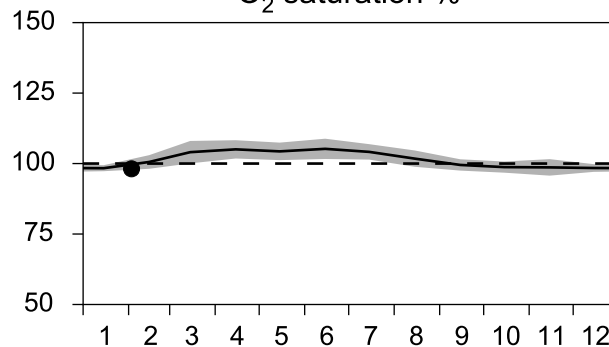
DIN µmol/l



SiO₃ µmol/l

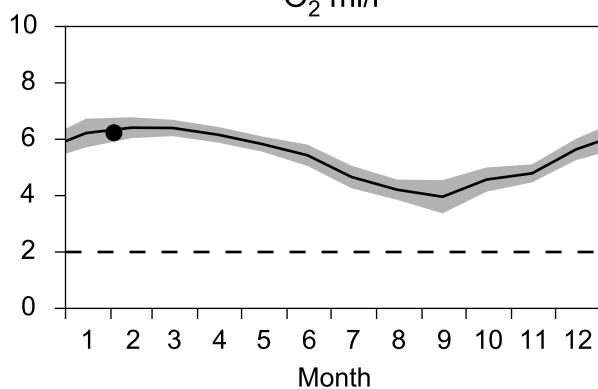


O₂ saturation %

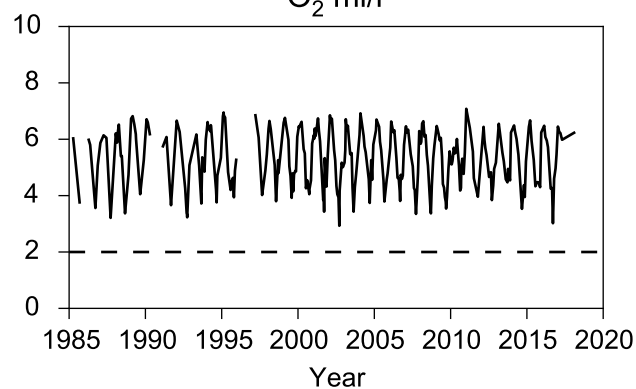


OXYGEN IN BOTTOM WATER (depth >= 74 m)

O₂ ml/l

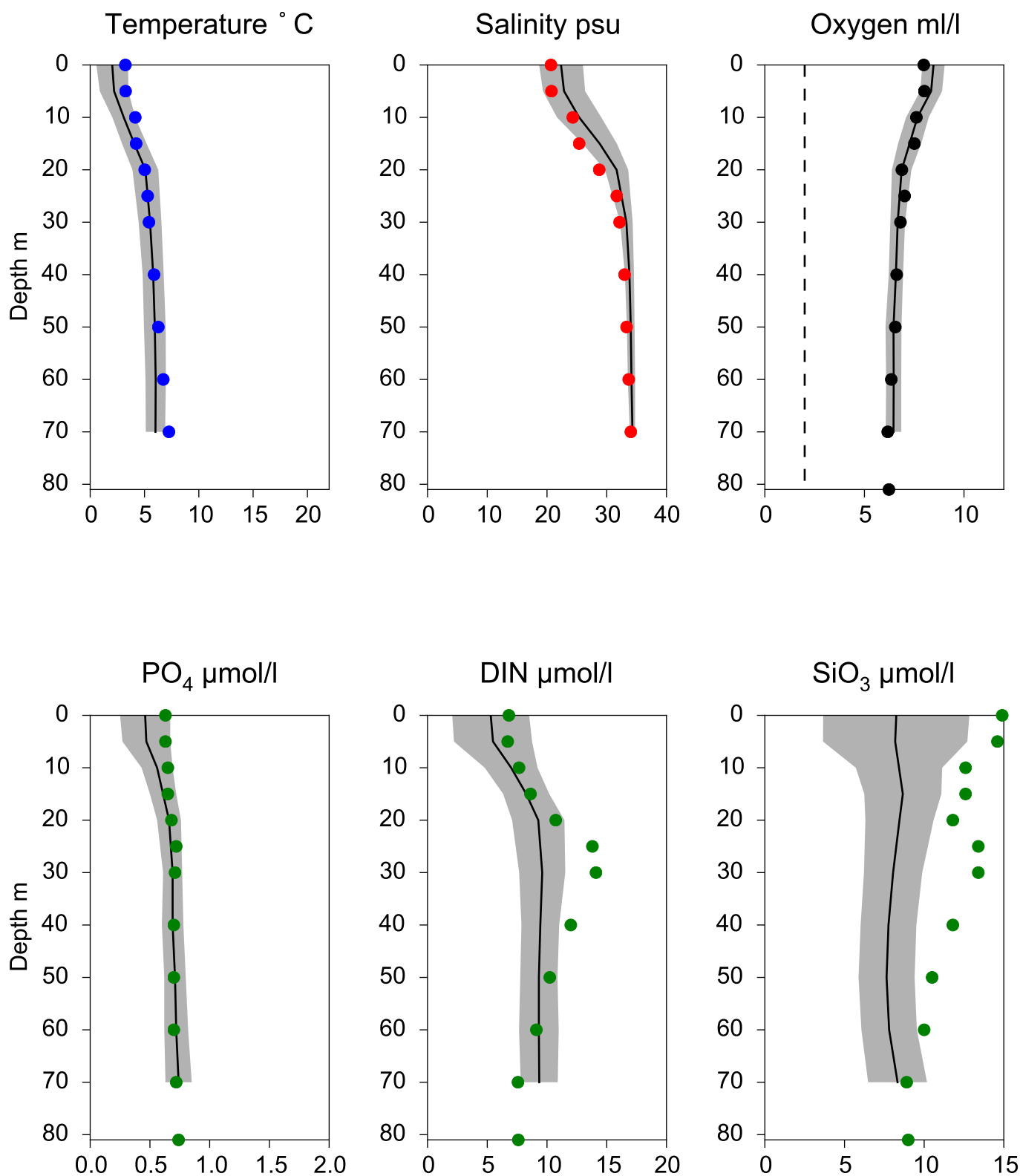


O₂ ml/l



Vertical profiles FLADEN February

— Mean 2001-2015 St.Dev. • 2018-02-03



STATION P2 SURFACE WATER (0-10 m)

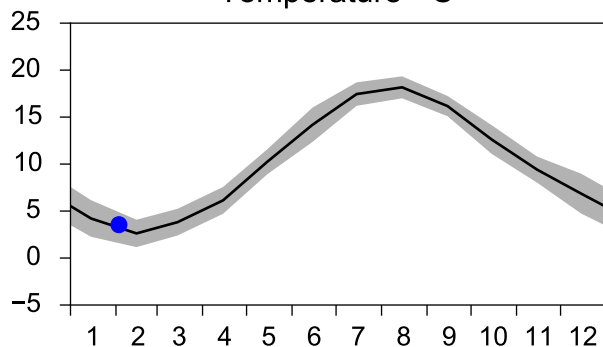
Annual Cycles

— Mean 2001-2015

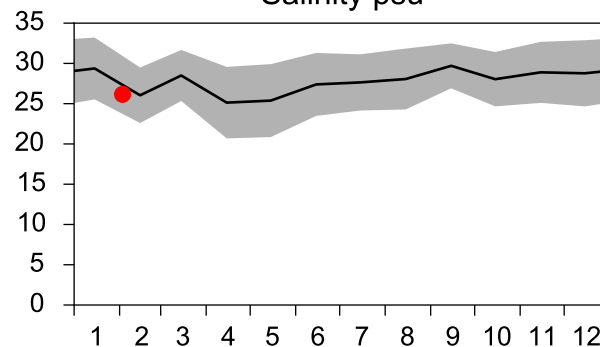
■ St.Dev.

● 2018

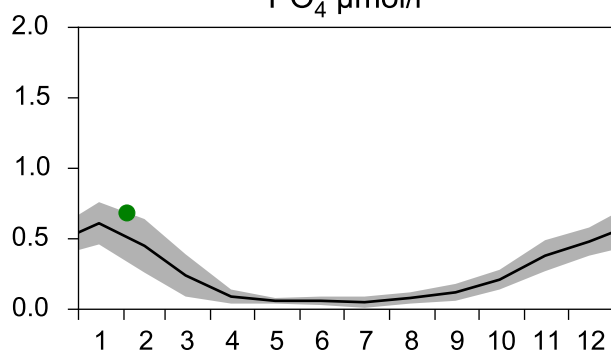
Temperature °C



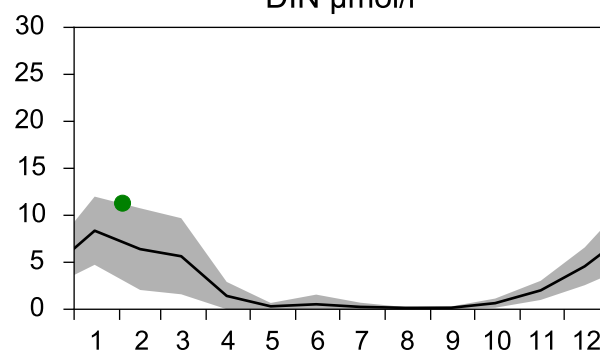
Salinity psu



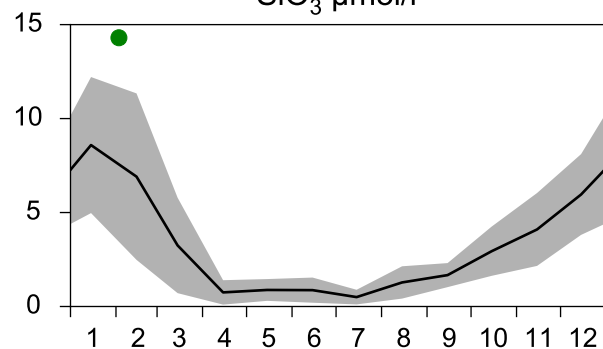
PO₄ μmol/l



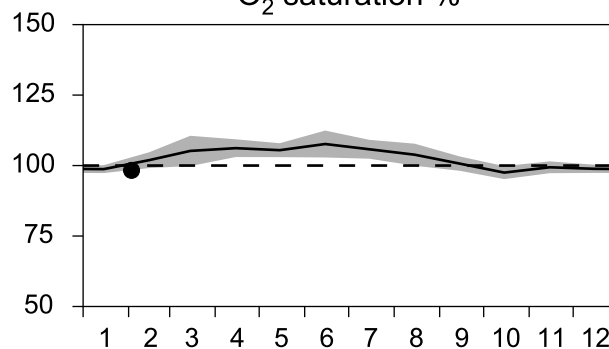
DIN μmol/l



SiO₃ μmol/l

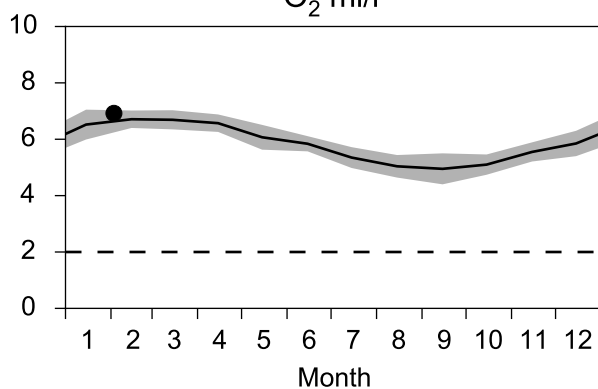


O₂ saturation %

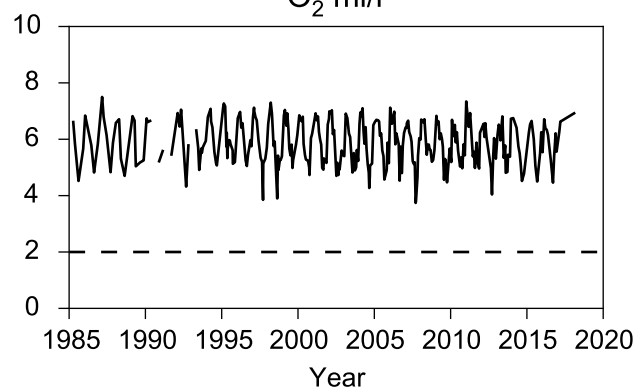


OXYGEN IN BOTTOM WATER (depth >= 75 m)

O₂ ml/l

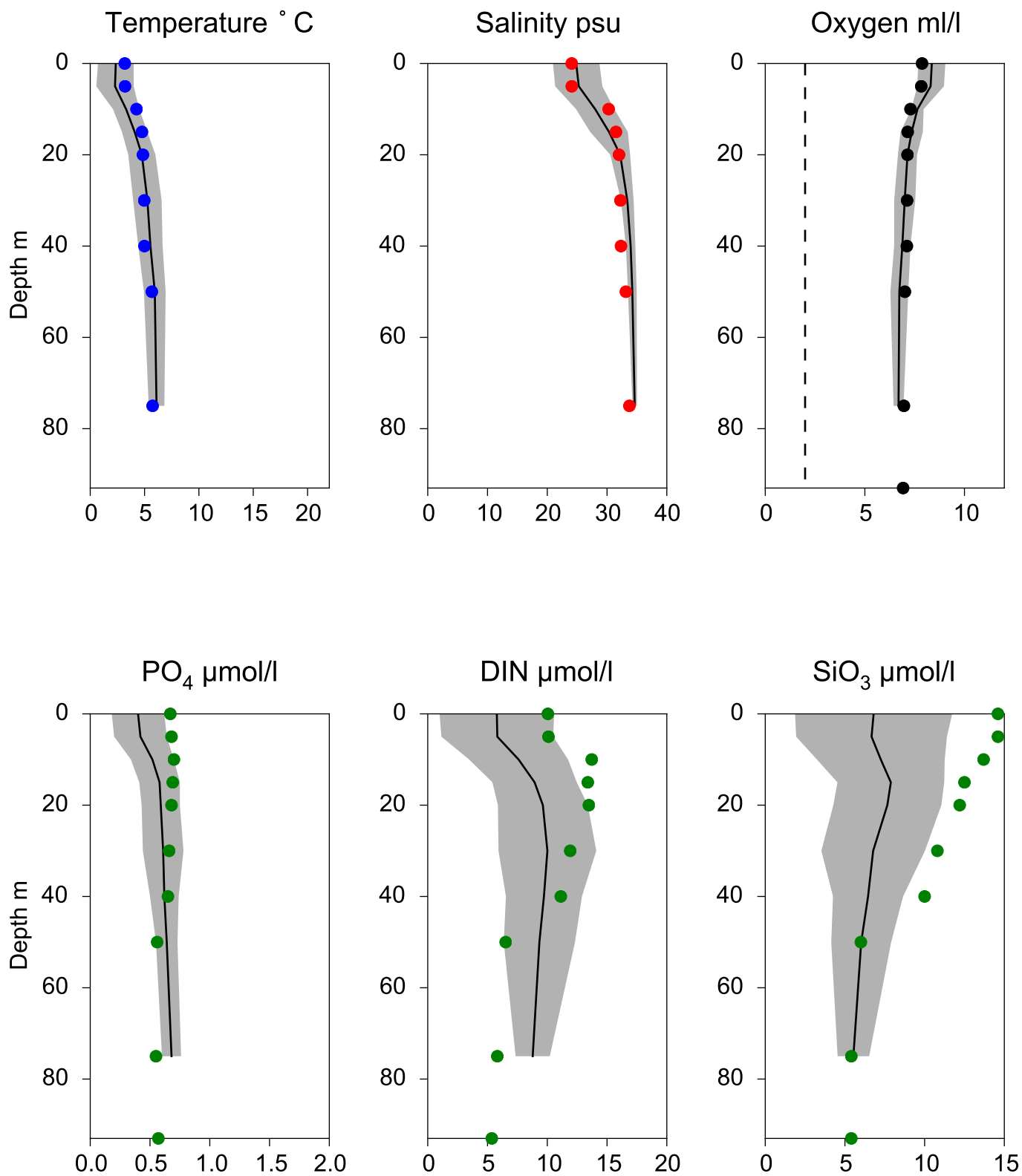


O₂ ml/l



Vertical profiles P2 February

— Mean 2001-2015 St.Dev. • 2018-02-03



STATION SLÄGGÖ SURFACE WATER (0-10 m)

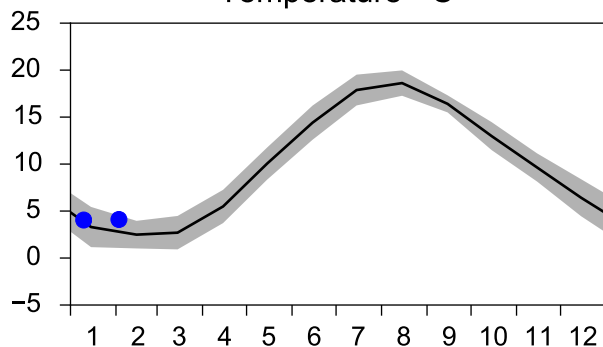
Annual Cycles

— Mean 2001-2015

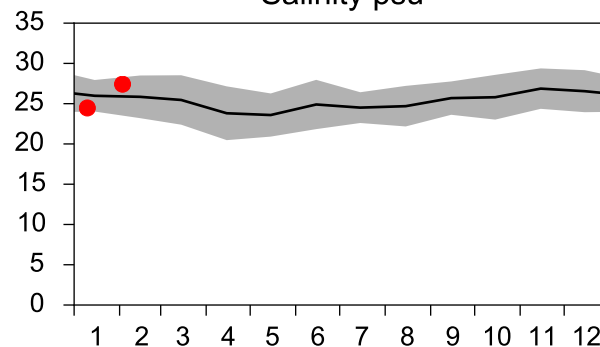
■ St.Dev.

● 2018

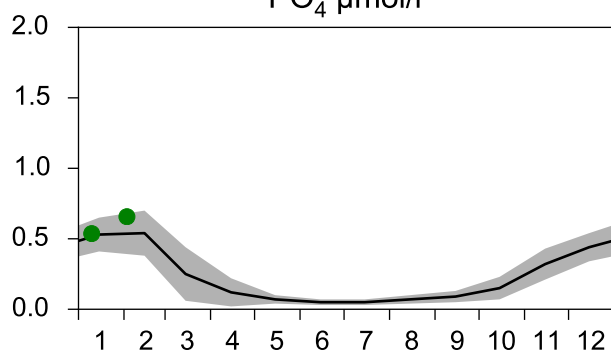
Temperature °C



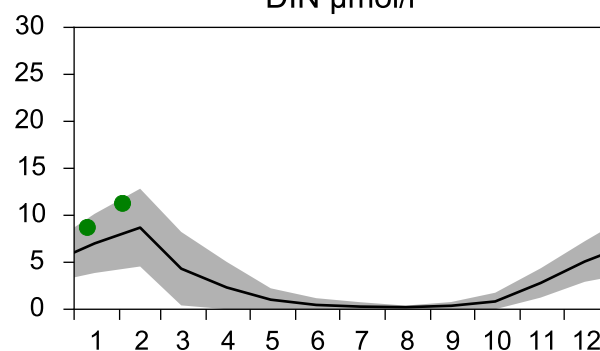
Salinity psu



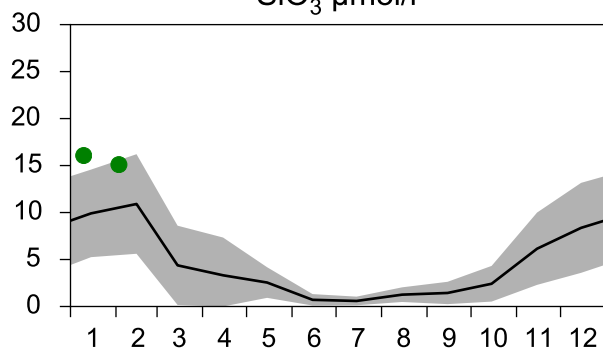
PO₄ µmol/l



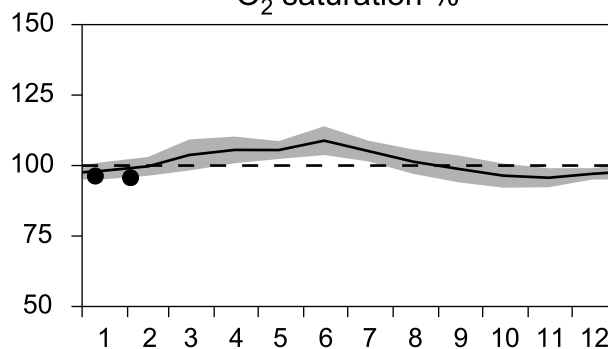
DIN µmol/l



SiO₃ µmol/l

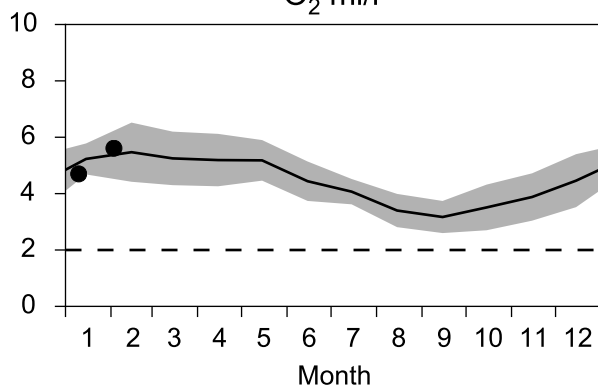


O₂ saturation %

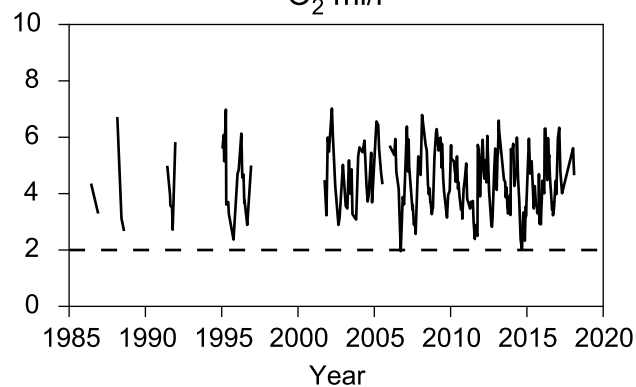


OXYGEN IN BOTTOM WATER (depth >= 64 m)

O₂ ml/l

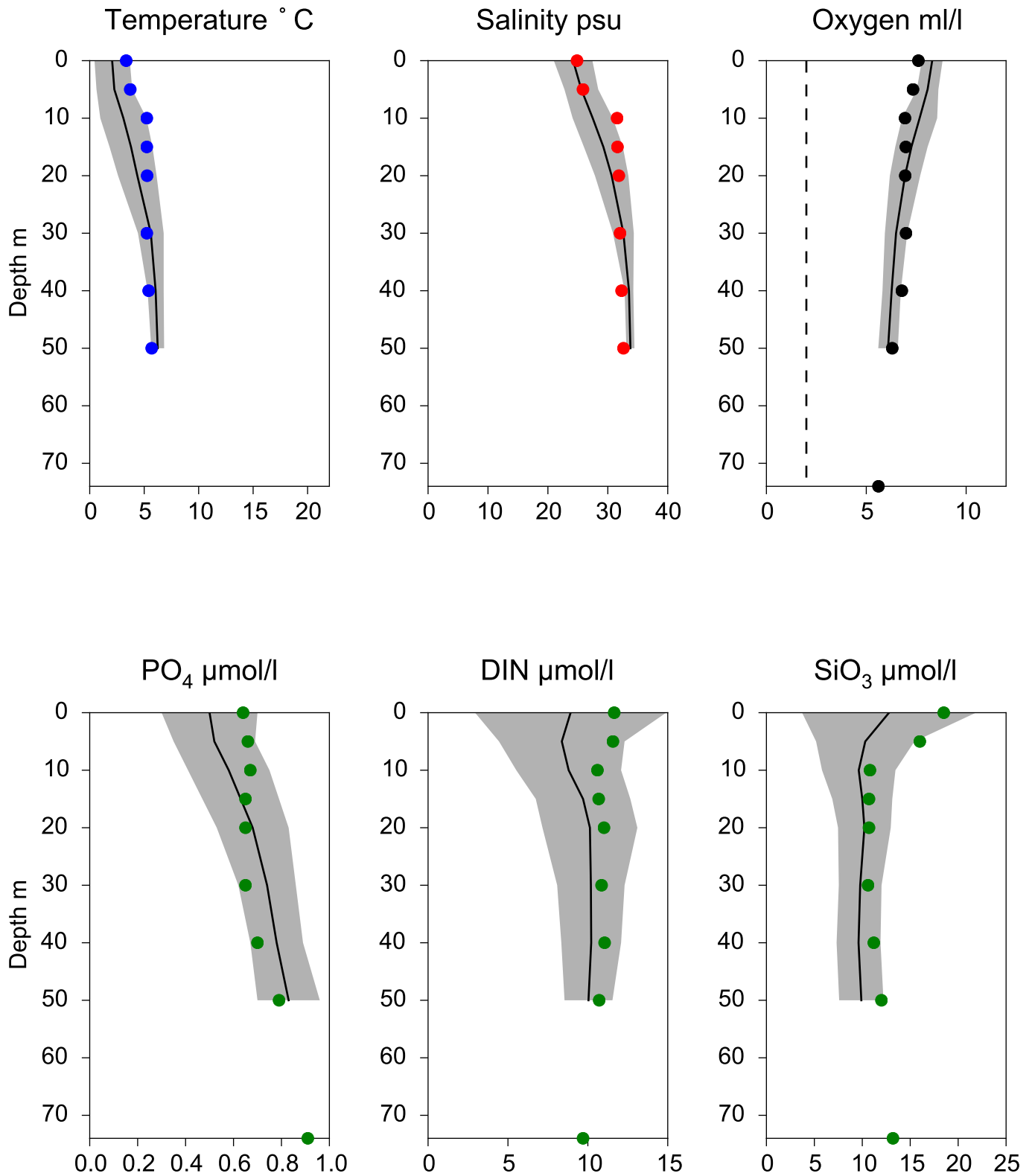


O₂ ml/l



Vertical profiles SLÄGGÖ February

— Mean 2001-2015 St.Dev. • 2018-02-03



STATION Å13 SURFACE WATER (0-10 m)

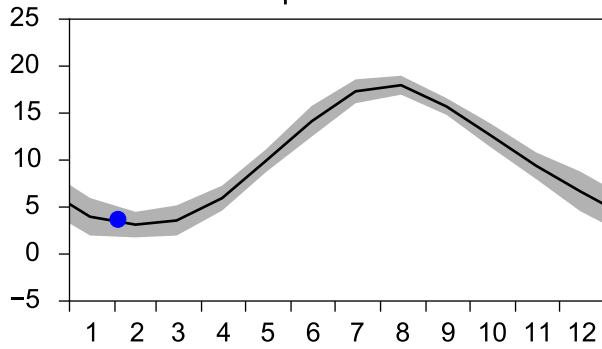
Annual Cycles

— Mean 2001-2015

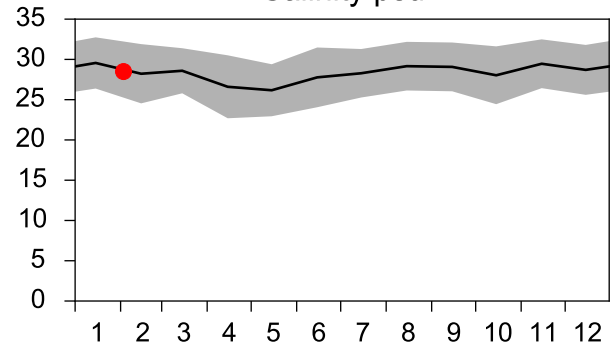
■ St.Dev.

● 2018

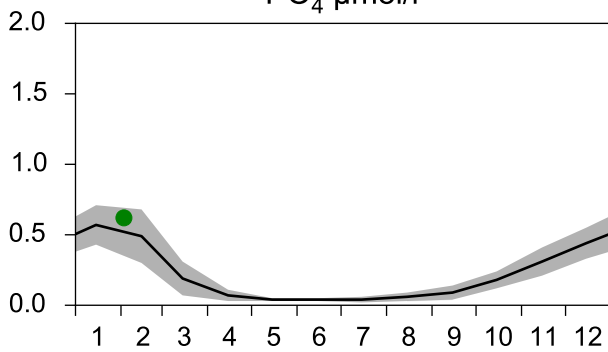
Temperature °C



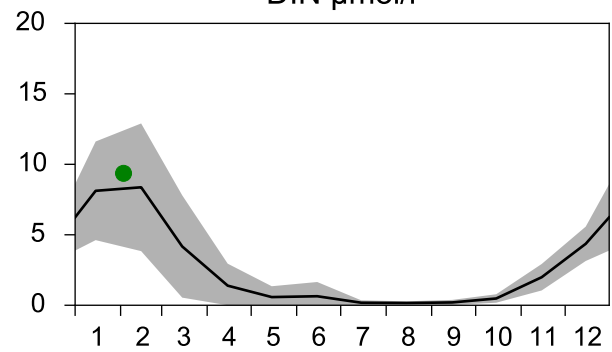
Salinity psu



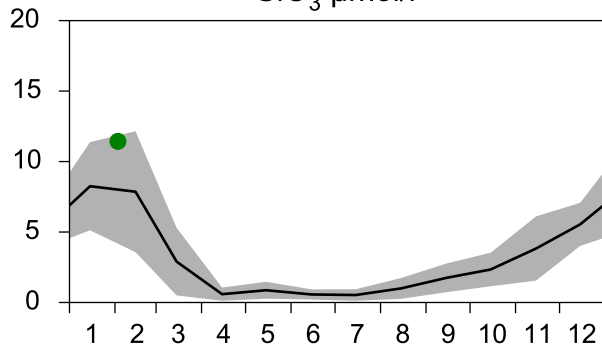
PO₄ µmol/l



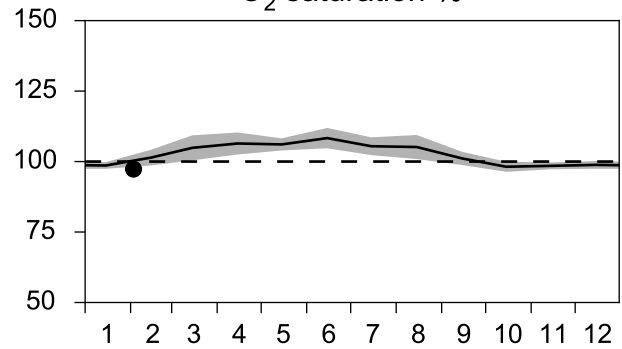
DIN µmol/l



SiO₃ µmol/l

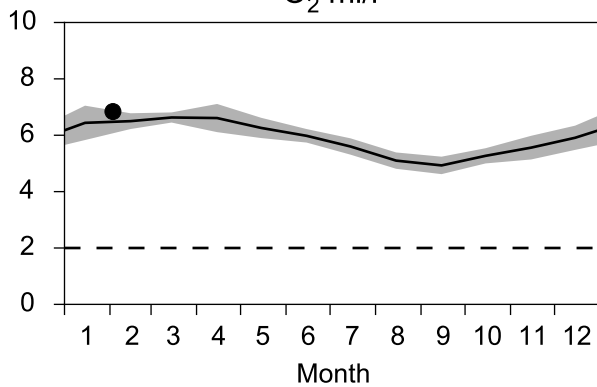


O₂ saturation %

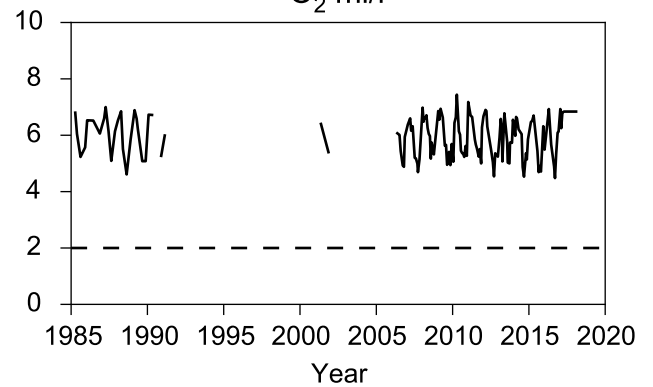


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

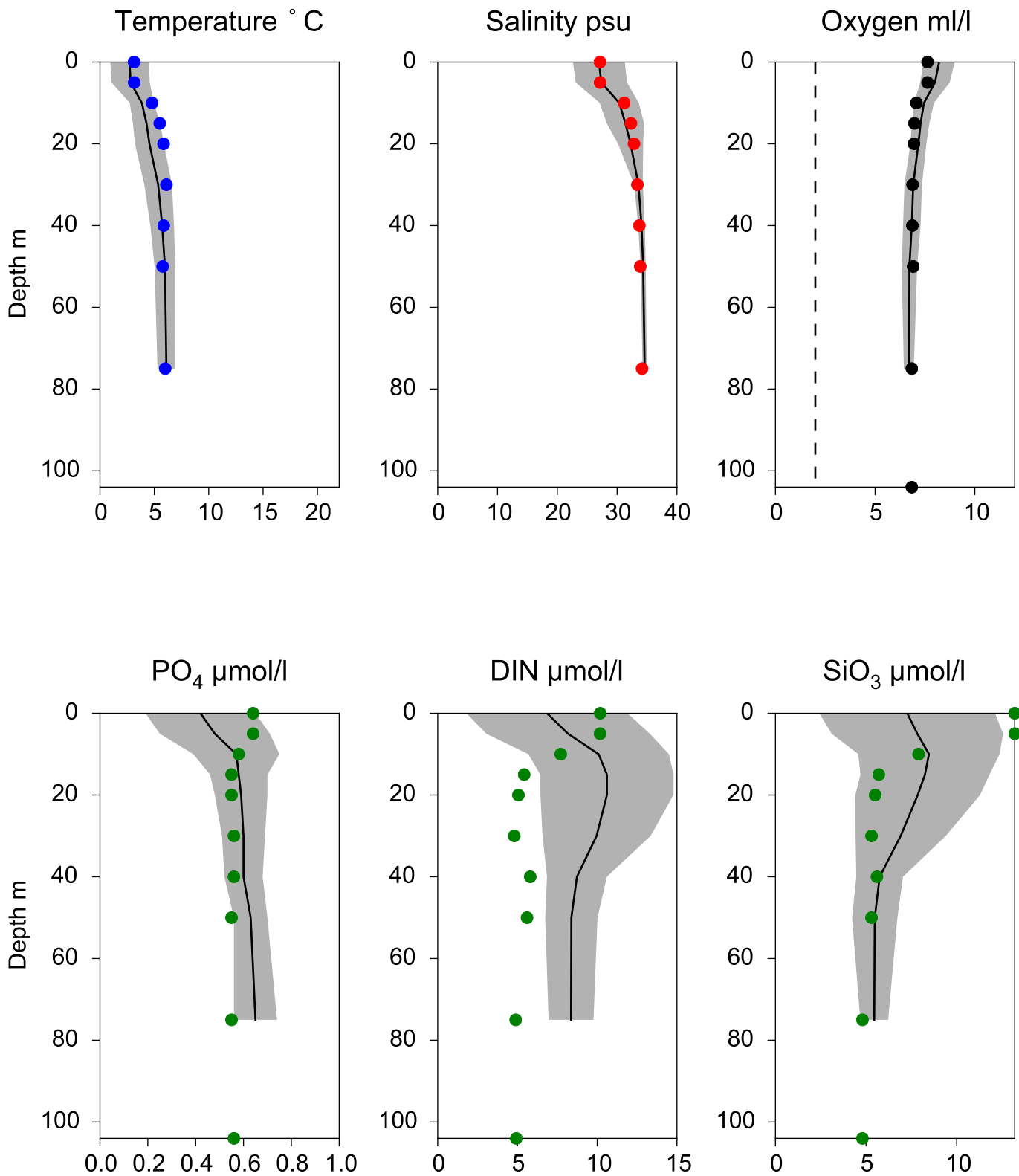


O₂ ml/l



Vertical profiles Å13 February

— Mean 2001-2015 St.Dev. • 2018-02-03



STATION Å15 SURFACE WATER (0-10 m)

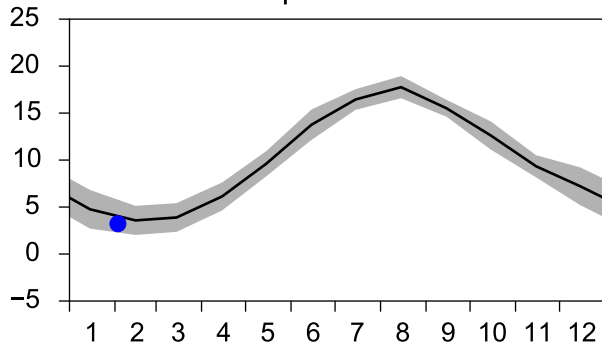
Annual Cycles

— Mean 2001-2015

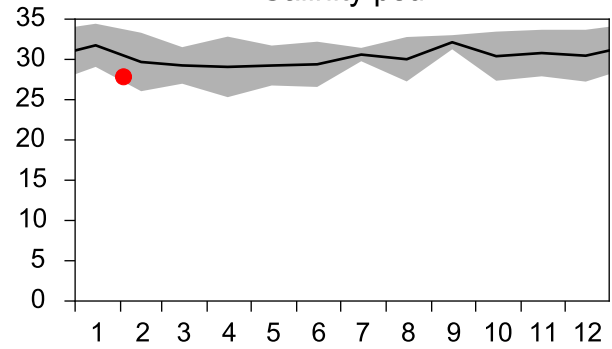
■ St.Dev.

● 2018

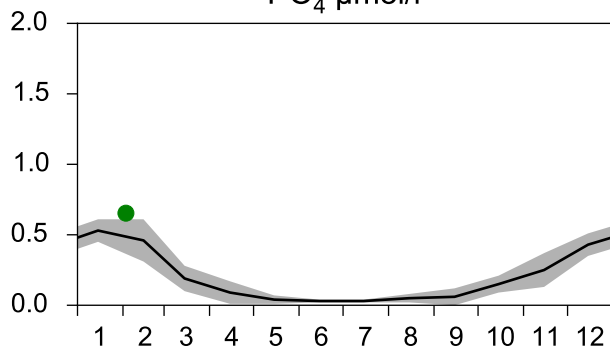
Temperature °C



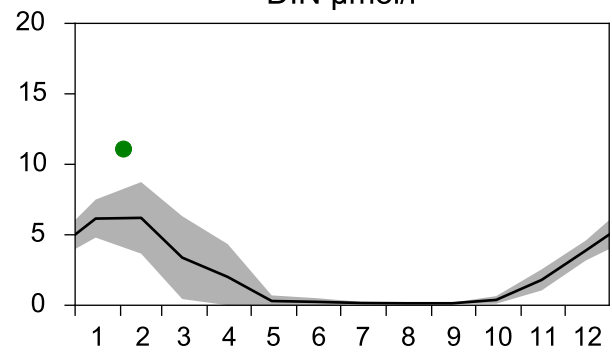
Salinity psu



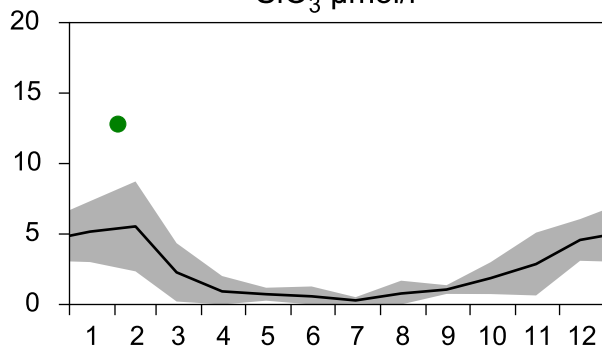
PO₄ µmol/l



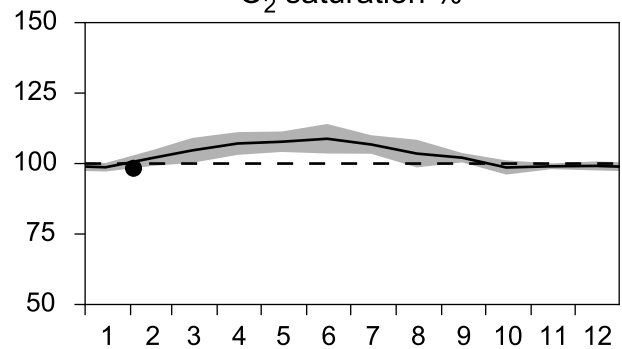
DIN µmol/l



SiO₃ µmol/l

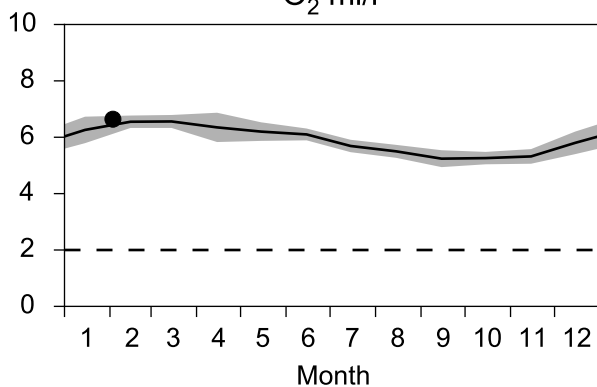


O₂ saturation %

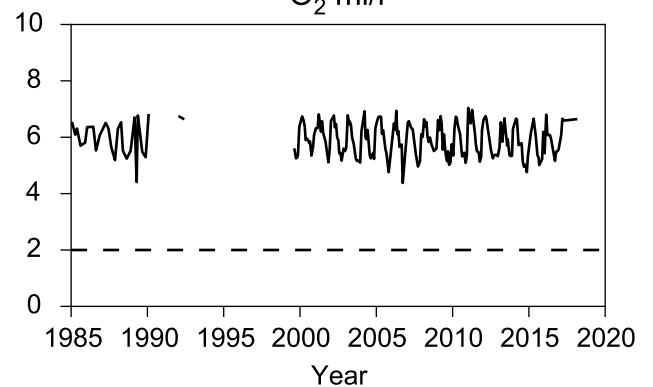


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

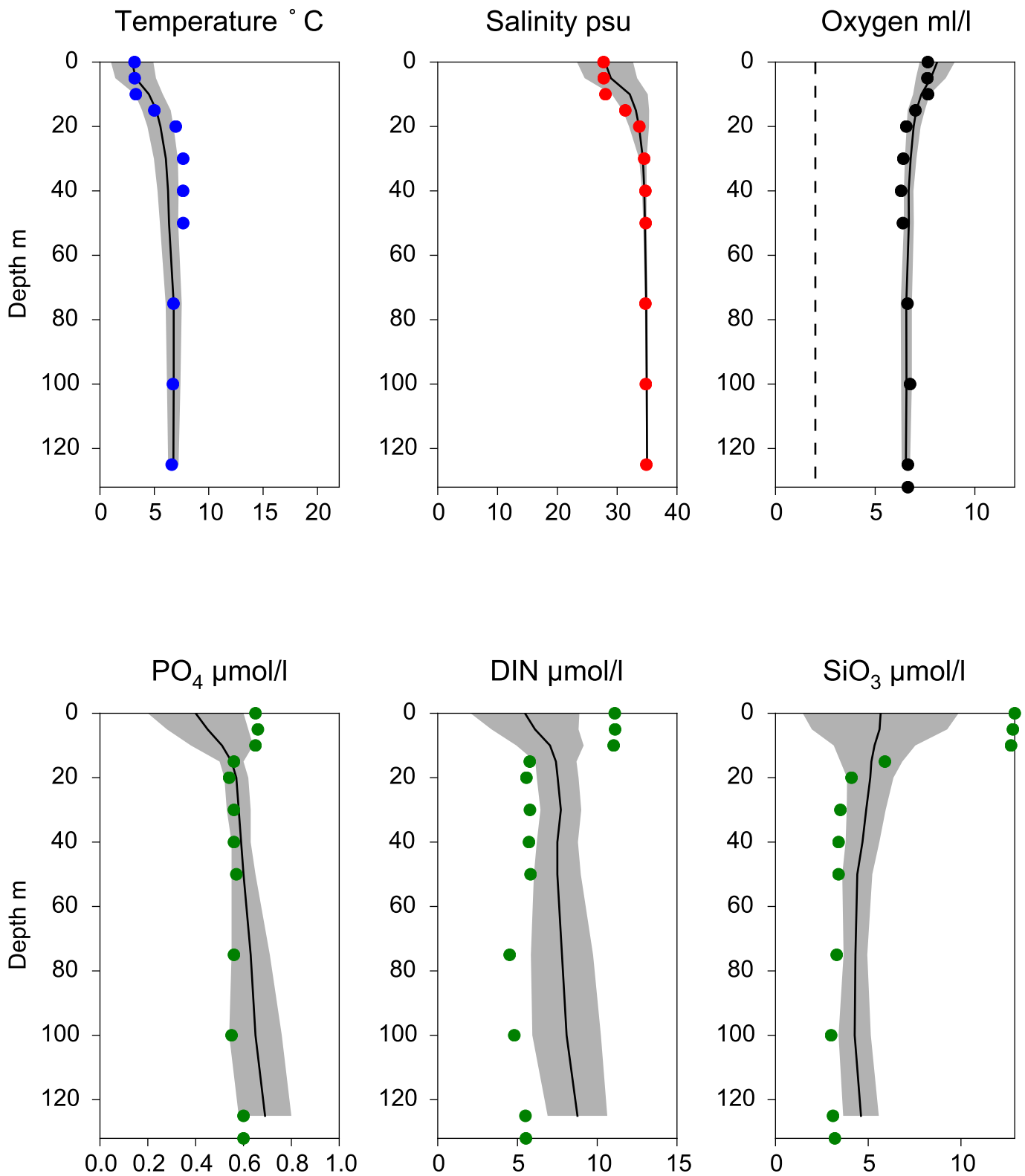


O₂ ml/l



Vertical profiles Å15 February

— Mean 2001-2015 ■ St.Dev. ● 2018-02-03



STATION Å17 SURFACE WATER (0-10 m)

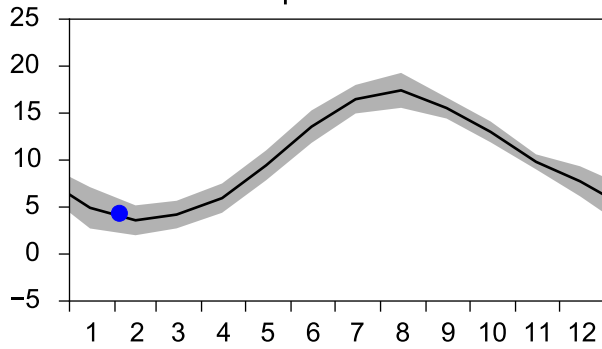
Annual Cycles

— Mean 2001-2015

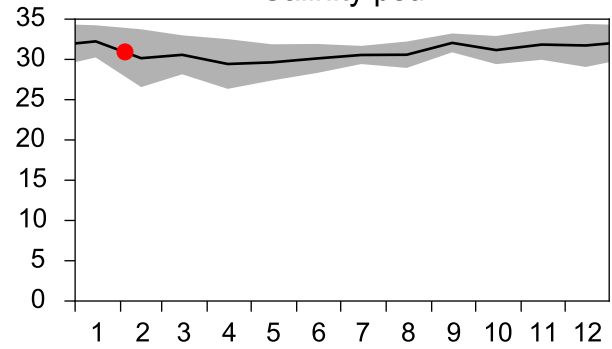
■ St.Dev.

● 2018

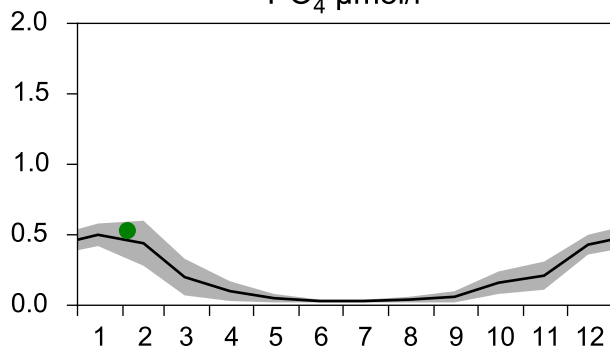
Temperature °C



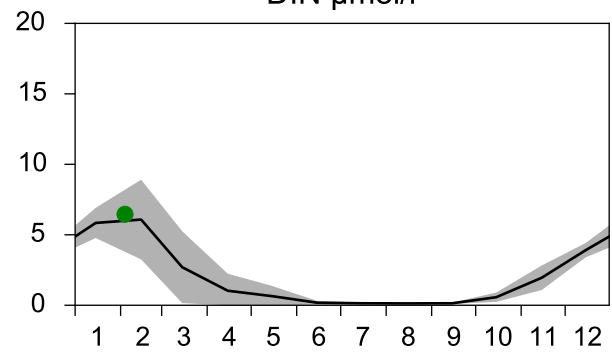
Salinity psu



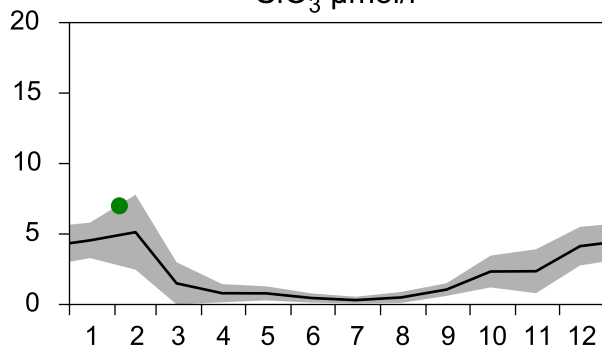
PO₄ µmol/l



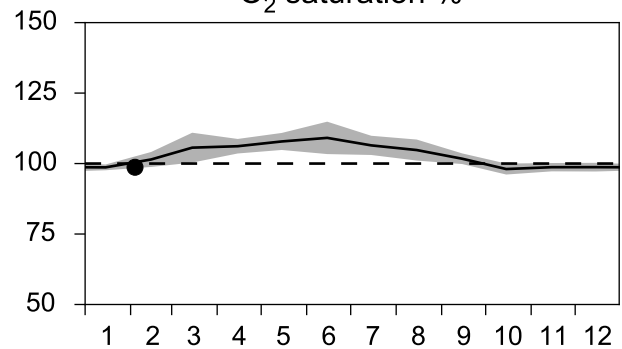
DIN µmol/l



SiO₃ µmol/l

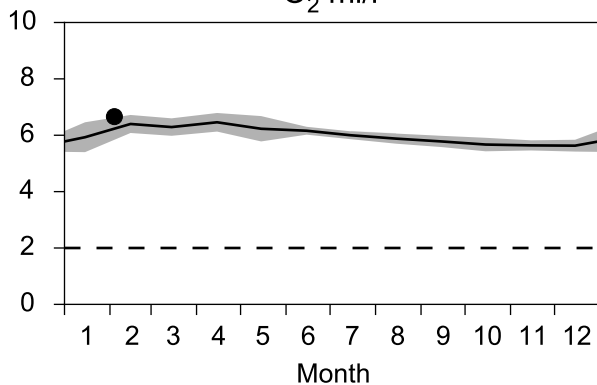


O₂ saturation %

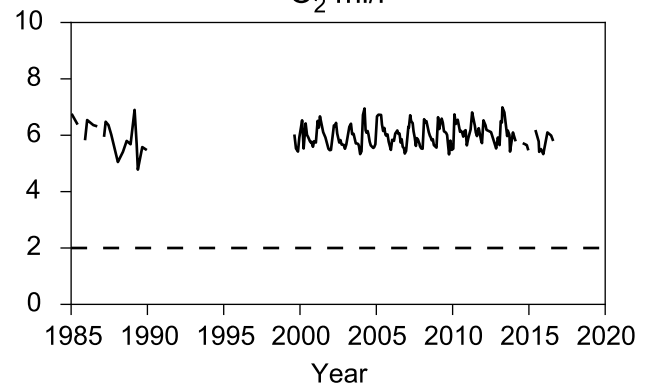


OXYGEN IN BOTTOM WATER (depth >= 300 m)

O₂ ml/l

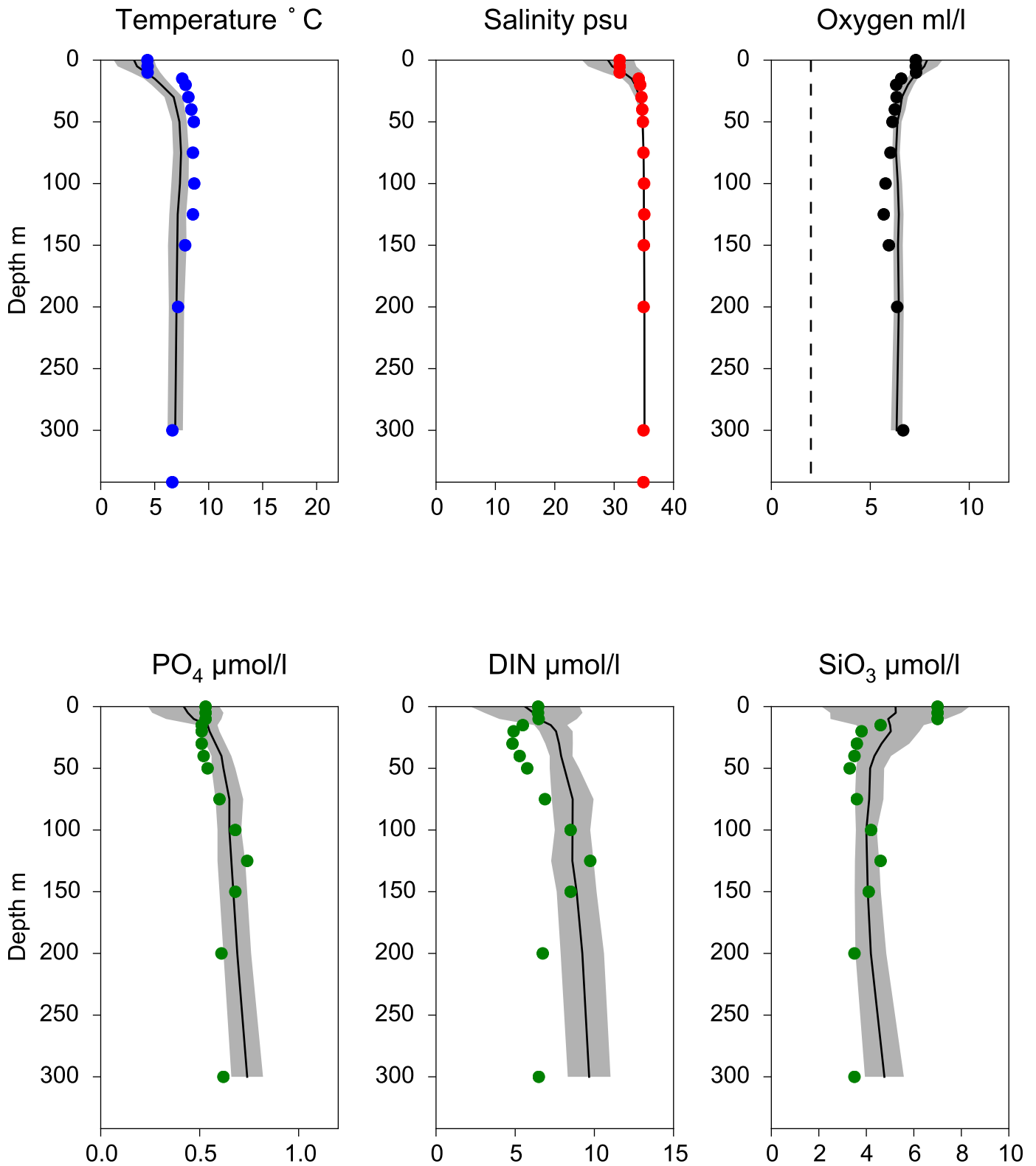


O₂ ml/l



Vertical profiles Å17 February

— Mean 2001-2015 ■ St.Dev. ● 2018-02-04



STATION SLÄGGÖ SURFACE WATER (0-10 m)

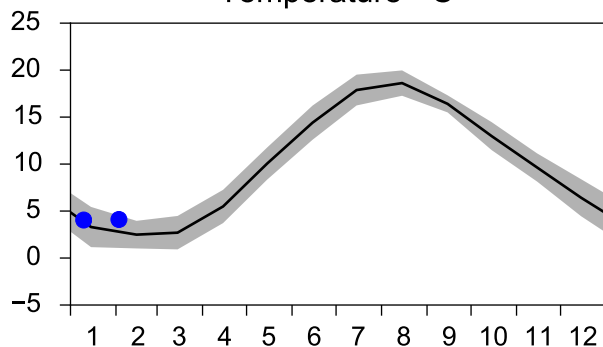
Annual Cycles

— Mean 2001-2015

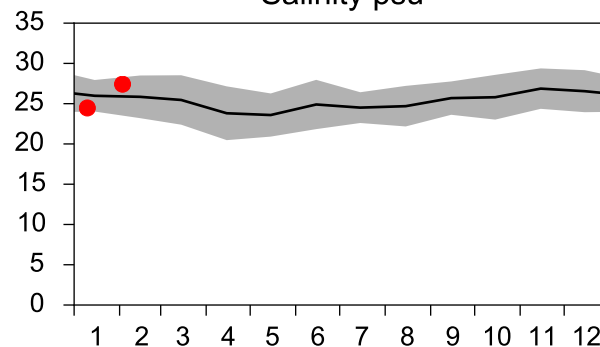
■ St.Dev.

● 2018

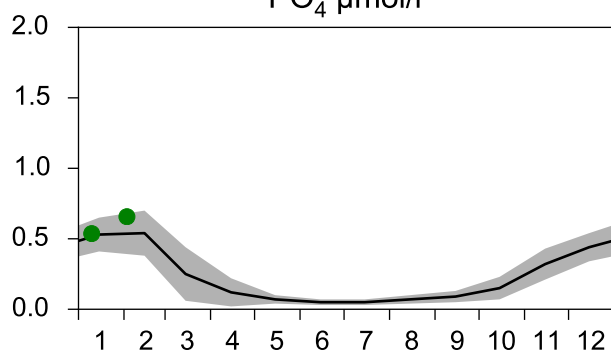
Temperature °C



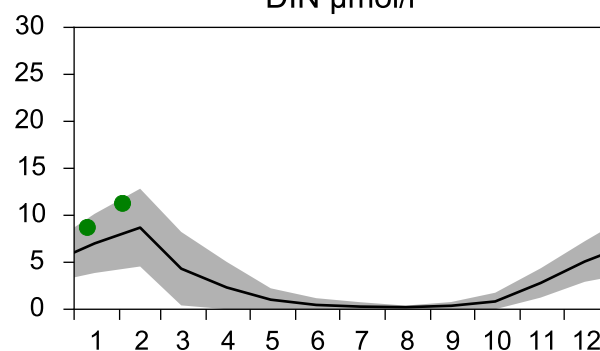
Salinity psu



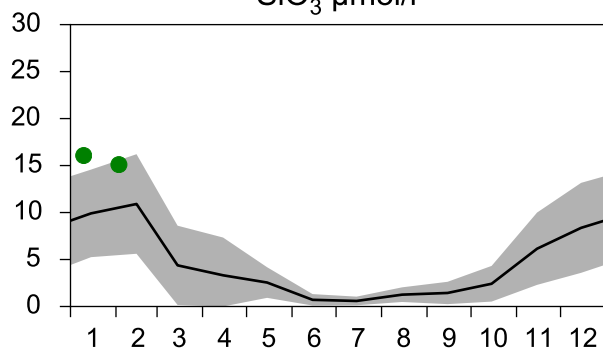
PO₄ µmol/l



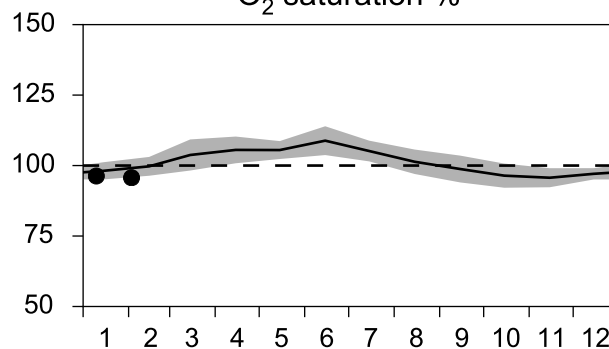
DIN µmol/l



SiO₃ µmol/l

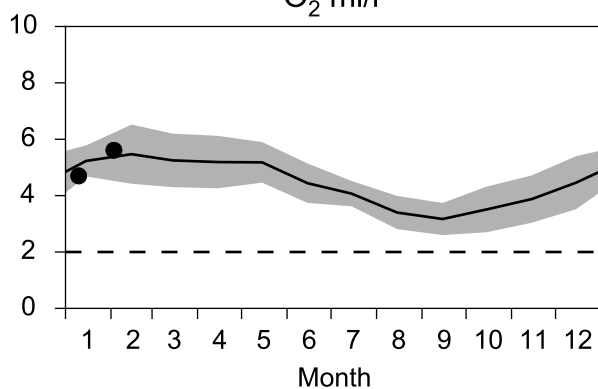


O₂ saturation %

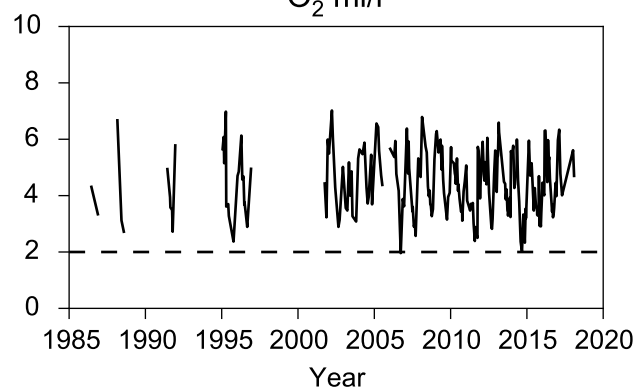


OXYGEN IN BOTTOM WATER (depth >= 64 m)

O₂ ml/l



O₂ ml/l



Vertical profiles SLÄGGÖ January

— Mean 2001-2015 ■ St.Dev. ● 2018-01-10

