

Rapport från SMHIs utsjöexpedition med R/V Aranda



Expeditionens varaktighet: 2017-03-09 - 2017-03-16
Uppdragsgivare: Sveriges Meteorologiska och Hydrologiska Institut,
Havs- och Vattenmyndigheten.

SAMMANFATTNING

Under expeditionen, som ingår i det svenska pelagiala övervakningsprogrammet, besöktes Skagerrak, Kattegatt, Öresund och Egentliga Östersjön.

I stora delar av Egentliga Östersjöns djupvatten påträffades syrgashalter nära noll. Helt syrefria förhållanden då svavelväte uppmättes noterades i Västra Gotlandsbassängen från 100 meters djup och i Östra Gotlandsbassängen men då enbart vid Gotlandsdjupet BY15 från 225 meters djup. Vid övriga stationer i Östra Gotlandsbassängen var syrehalterna mycket nära noll men svavelväte påträffades inte. Akut syrebrist (< 2ml/l) påträffades i alla bassänger i Egentliga Östersjön vid djup överstigande 60-70 meter.

Fosfathalten i ytvattnet var högre än normalt i Västra och Östra Gotlandsbassängen. Medan i Östra Gotlandsbassängens djupvatten, från 70 till 200 meters djup, noterades fosfathalter som var lägre än normalt. Silikathalten i hela Egentliga Östersjöns ytvatten var högre än normalt. I Skagerrak var halterna av oorganiskt kväve lägre än normalt. I övrigt var närsaltshalterna i stort normala i både Skagerrak och Kattegatt.

Temperaturen i ytvattnet var normal för årstiden medan salthalten i ytvattnet var högre än normalt i Norra, Östra och Västra Gotlandsbassängen. I Skagerrak och Kattegatt pågick vårblomningen.

Nästa ordinarie expedition planeras starta 18:e april.

RESULTAT

Expeditionen genomfördes ombord på det finska forskningsfartyget Aranda och startade i Åbo den 9:e mars och avslutades i samma hamn den 16:e. Vindarna under expeditionens första dygn var friska från sydväst men vinden avtog snabbt och därefter var vindarna svaga mestadels från väst eller syd. Åter i sydöstra Östersjön ökade vinden igen till kuling, nu från väst.

Under expeditionen genomfördes en interkalibrering av ett antal analyser mellan SMHI och den Finska miljöcentralen SYKE. De parametrar som interkalibrerades var klorofyll, syrgas, svavelväte, närsalter samt totalmängder av kväve och fosfor. Interkalibrering görs för att säkerställa att båda laboratorierna ger jämförbara analysresultat.

Under expeditionen insamlades 0,6 m³ östersjövatten åt QUASIMEME (Quality Assurance of Information for Marine Environmental Monitoring in Europe). Detta vatten kommer att användas för att framställa referensmaterial som kommer skickas till olika laboratorier i Europa för analys. QUASIMEME genomför oberoende kontroller av laboratorier som regelbundet arbetar med miljöanalyser.

Denna rapport är baserad på data som genomgått en första kvalitetskontroll. När data publiceras hos datavärden kan vissa värden ha ändras 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 i Skagerrak var normal för årstiden och varierade mellan 3 och 5°C, högst i utsjö och något lägre närmast kusten. Salthalten i ytan var högre än normalt i utsjön och lägre än normalt vid stationerna längs kusten. Salthalten varierade mellan 21,8 i den södra delen till 33,3 i yttre Skagerrak. Termoklin och haloklin sammanföll och återfanns på 5-10 meters djup förutom i yttre Skagerrak där skiktningen var svagt utvecklad och återfanns djupare, på 40 meters djup.

Halten av oorganiskt kväve (summan av nitrat+nitrit+ammonium) var generellt lägre än normalt i hela vattenkolumnen förutom i yttre Skagerrak där normala halter uppmättes. I ytvattnet varierade halterna mellan 0,3 – 2,0 µmol/l. Fosfat- och silikathalten var generellt normala för årstiden både i ytvattnet och i vattenkolumnen. I ytan varierade fosfathalterna mellan 0,1 -0,3 µmol/l och silikathalten mellan 0,3 – 3,1 µmol/l.

Vårblomningen pågick vid samtliga stationer i Skagerrak. I ytvattnet, mellan 0-10 meters djup, påträffades fluorescensmaxima men vid kusten var intensiteten något lägre jämfört med i utsjön.

Syrgashalten i hela vattenkolumnen var normal vid samtliga besökta stationer.

Kattegatt och Öresund

Ytvattentemperaturen var normal i hela området och varierade omkring 3°C. Även salthalten var normal och varierade mellan 18,6 och 23,6 högst i de norra delarna. I Öresund var salthalten i ytan 11,3. Skiktningen återfanns på 10-15 meters djup.

Närsaltshalterna i Kattegatt uppvisade generellt normala halter för årstiden. Koncentrationen av oorganiskt kväve varierade kring 0,3 µmol/l och halten av fosfat omkring 0,13 µmol/l. Silikathalten var också normal men varierade något mer i området från 2,6 µmol/l i norr till 6,6 µmol/l i de centrala delarna. I Öresund uppmättes dock högre halter än normalt, oorganiskt kväve 3,6 µmol/l, silikat 13,3 µmol/l och fosfat 0,5 µmol/l.

Bottenvattnet i Kattegatt var väl syresatt, vid botten noterades syrgashalter mellan 5,7 och 6,2 ml/l.

Vårblomningen pågick även i detta område och hög fluorescens noterades från ytan ner till 15 meters djup.

Egentliga Östersjön

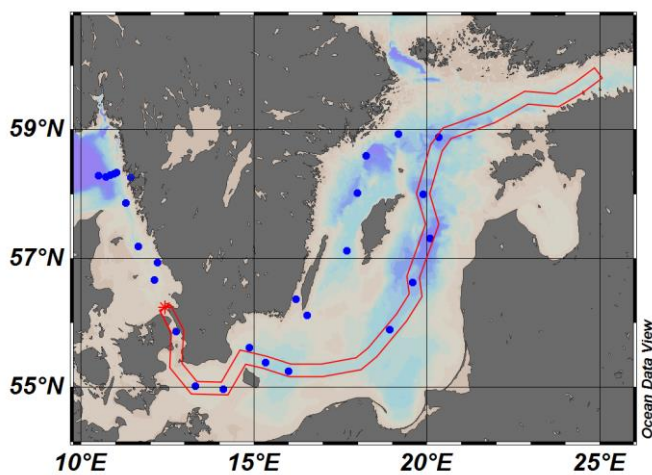
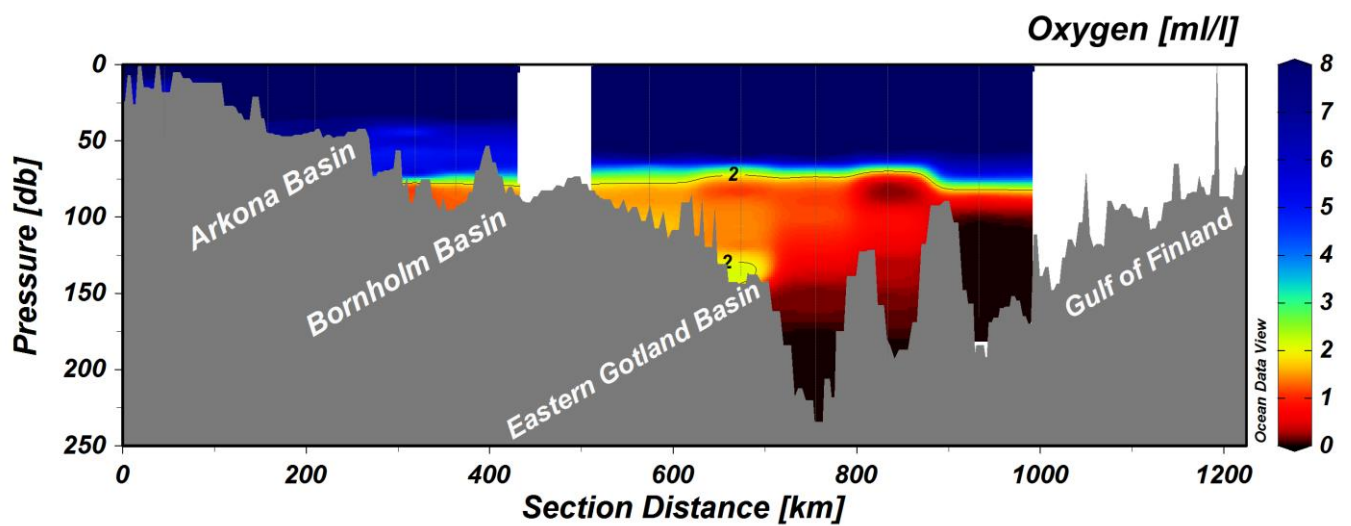
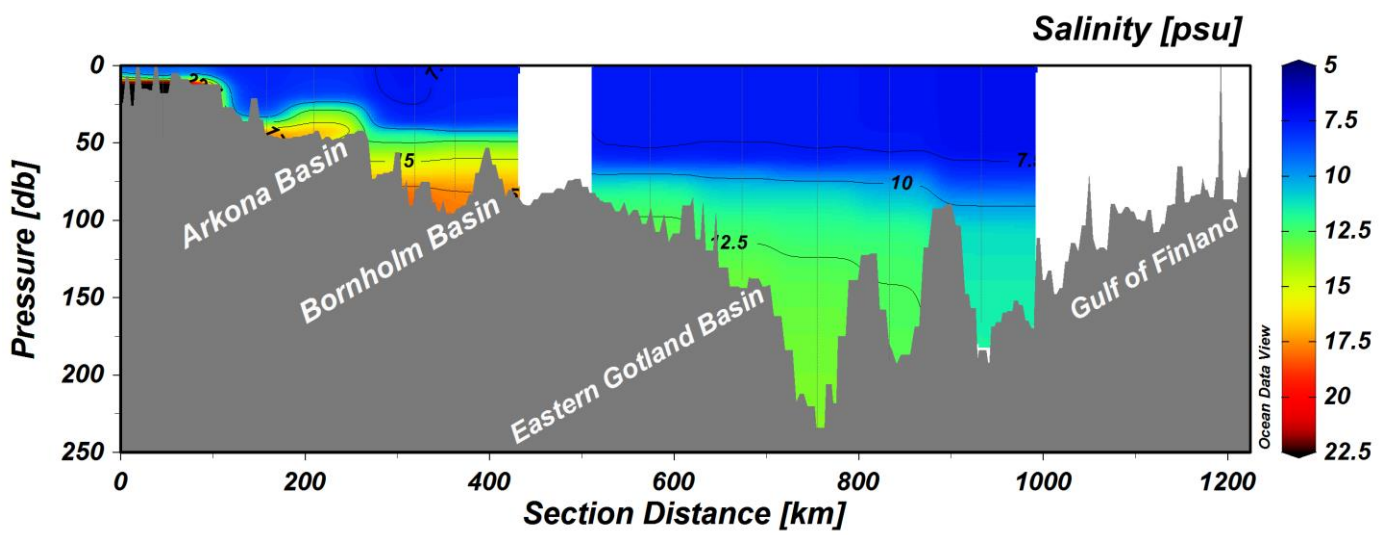
Temperaturen i ytvattnet var normal för årstiden och varierade mellan 2,0 till 3,4 °C, lägst i de norra och högst i sydvästra delarna. Salthalten var högre än normalt i Östra, Norra och Västra Gotlandsbassängen, 7,0 – 7,5, medan den var normal i Arkona och Bornholmsbassängen, 7,4 – 8,0. Ytlagret var välomblandat ner till skiktningen som återfanns på 50-65 meters djup förutom i Arkona- och Bornholmsbassängen där den låg grundare på omkring 30-40 meters djup.

Halten av oorganiskt kväve i ytvattnet var normal eller något över det normala och varierade mellan 3,0 och 4,0 µmol/l. Fosfathalten i ytvattnet var högre än normalt i Västra och Östra Gotlandsbassängen med halter omkring 0,8 µmol/l. I övriga områden var halterna i ytvattnet normala, förutom vid BY4 i Bornholmsbassängen där höga halter på 1,0 µmol/l noterades. I Östra Gotlandsbassängens djupvatten, från 70 till 200 meters djup, noterades fosfathalter som var lägre än normalt. Silikathalten i hela Egentliga Östersjön var högre än normalt. Halterna låg mellan 14,8 – 20,8 µmol/l. Högst i Västra Gotlandsbassängen och lägst i Arkonabassängen.

I stora delar av Egentliga Östersjöns djupvatten påträffades syrgashalter nära noll. Helt syrefria förhållanden då svavelväte uppmättes noterades i Västra Gotlandsbassängen från 100 meters djup och i Östra Gotlandsbassängen men då enbart vid Gotlandsdjupet BY15 från 225 meters djup. Vid övriga stationer i Östra Gotlandsbassängen var syrehalterna mycket nära noll men svavelväte påträffades inte.

Akut syrebrist (< 2ml/l) påträffades i alla bassänger vid djup överstigande 60-70 meter. I Arkonabassängen var dock hela vattenkolumnen väl syresatt.

Fluorescensmätningarna från CTD:n visade att planktonaktiviteten var låg i hela området.



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

DELTAGARE

Namn			Från
Martin Hansson	Åbo – Lysekil	Expeditionsledare	SMHI
Johanna Linders	Åbo – Lysekil		SMHI
Ann-Turi Skjevik	Åbo – Lysekil		SMHI
Jörgen Öberg	Åbo – Lysekil		SMHI
Örjan Bäck	Lysekil - Åbo	Expeditionsledare	SMHI
Kristin Andreason	Lysekil - Åbo		SMHI
Anna-Kerstin Thell	Lysekil – Åbo		SMHI
Sara Johansson			SMHI
Johan Håkansson			SMHI
Jere Riikonen			SYKE
Ilkka Lastumäki			SYKE

BILAGOR

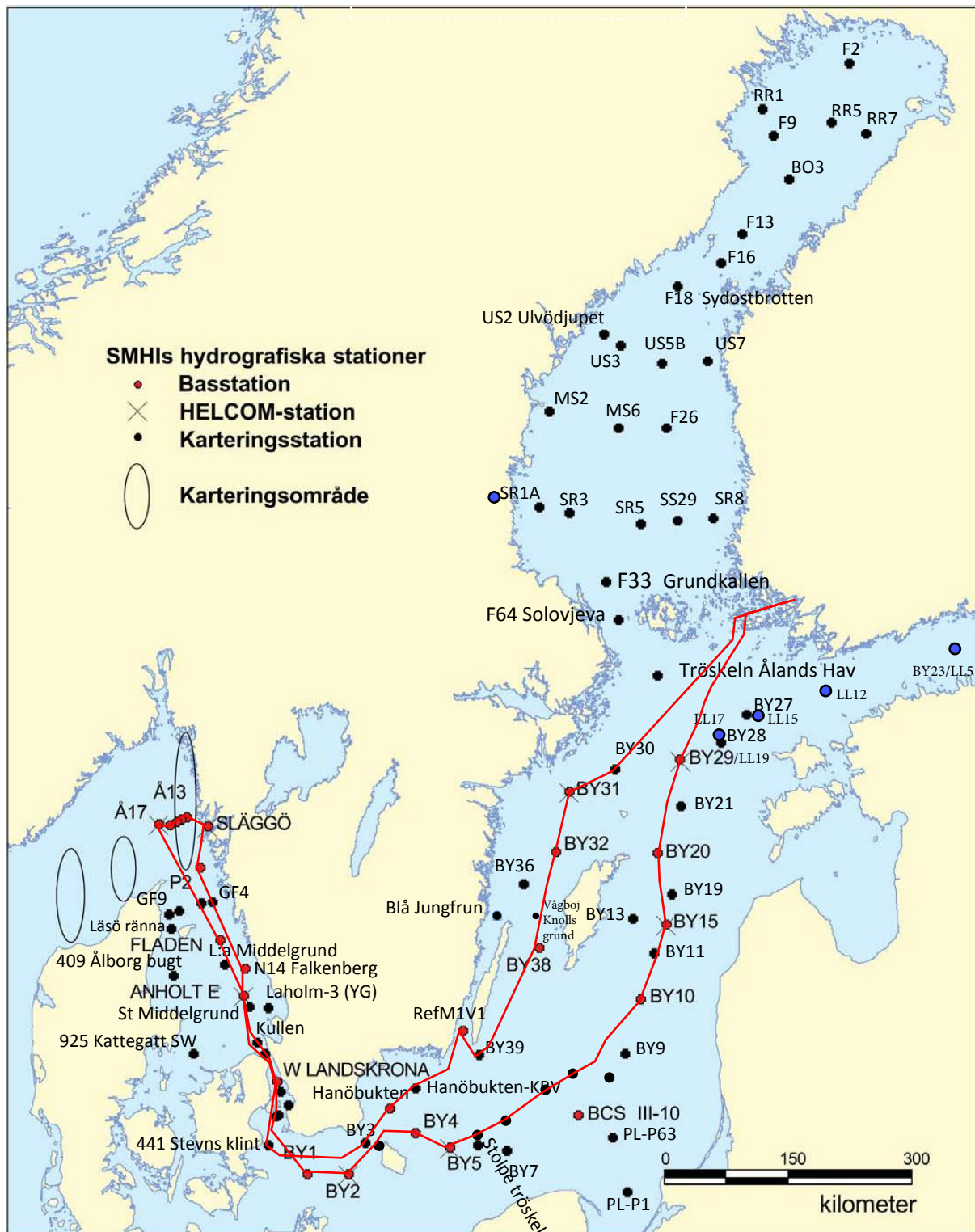
- Färdkarta
- Tabell över stationer, analyserade parametrar och antal provtagningsdjup
- Karta över syrehalter i bottenvattnet
- Vertikalprofiler för basstationer
- Figurer över månadsmedelvärden

SMHI

Havs
och Vatten
myndigheten

TRACKCHART

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



Ship: AR
Year: 2017

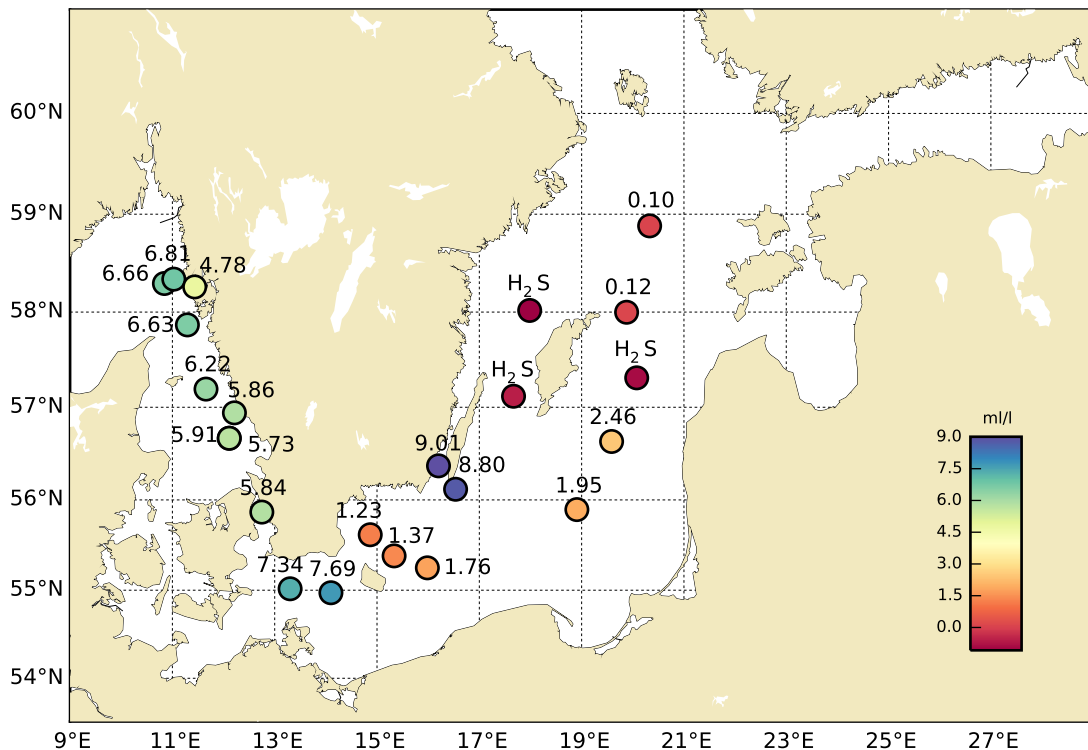
Ser no	Cru no	Stat code	Proj	Stat name	Lat	Lon	Start date yyyymmdd	Start time hhmm	Bottom depth m	Secchi depth m	Wind dir dir	Wind vel vel	Air temp C	Air pres hPa	WCWI elac aove	CZPP hohp loy	No de de	No btl	T e e	T a a	S s	P p	D d	H h	P p	N n	N n	N n	A a	S s	H h	C c	C c		
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0144	4	BPNX00	EXT	HUVUDSKÄR	5856.23	01909.79	20170310	0110	92			22	6.7	1.9	1011	9990	----	12	-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	x	-
0145	4	BPNX37	BAS	BY31 LANDSORTSDJ	5835.62	01814.18	20170310	0450	459			23	4.4	2.0	1010	9990	-x--	23	23	-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	-
0146	4	BPWX38	BAS	BY32 NORRKÖPINGSDDJ	5801.01	01759.07	20170310	0920	205	15		23	4.1	2.3	1012	2830	x---	17	17	x	x	-	x	x	x	x	x	x	x	x	x	x	-	-	-
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0148	4	BPSE00	EXT	4.5 NE Ölands Södra	5606.98	01632.16	20170310	2100	51			31	6.0	3.0	1020	9990	----	8	x	x	-	x	-	x	x	-	-	-	-	-	-	-	-	-	-
0149	4	BPWK01	BAS	REF M1V1	5622.25	01612.12	20170311	0015	21			32	4.4	2.5	1022	9990	xxxx	5	5	x	x	x	x	x	x	-	x	x	x	x	x	x	-	-	-
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0152	4	KAEX29	BAS	ANHOLT E	5640.12	01206.67	20170311	2150	62			15	5	2.7	1025	9990	xxxx	10	10	x	x	x	x	x	x	-	x	x	x	x	x	x	-	-	-
0153	4	KANX25	BAS	FLADEN	5711.58	01139.42	20170312	0120	84			17	4.3	3	1025	9990	x---	12	12	x	x	x	-	x	x	-	x	x	x	x	x	-	-	-	-
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0155	4	SKEX17	BAS	Å16	5816.04	01043.47	20170312	1115	202	6		18	8	3.4	1024	2830	----	14	0	-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	-
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0158	4	SKEX14	BAS	Å13	5820.38	01101.64	20170312	1430	90	7		17	7.3	3.1	1023	2730	x---	10	10	x	x	x	-	x	x	-	x	x	x	x	x	-	-	-	-
0159	4	FIBG27	BAS	SLÄGGÖ	5815.59	01126.14	20170312	1700	74			18	3.6	3.4	1024	1520	xxx-	9	9	x	x	x	-	x	x	-	x	x	x	x	x	-	-	-	-
0160	4	SKEX23	BAS	P2	5752.00	01117.57	20170312	2205	93			19	8	3.3	1024	9990	x---	10	10	x	x	x	-	x	x	-	x	x	x	x	x	-	-	-	-
0161	4	KANX50	BAS	N14 FALKENBERG	5656.42	01212.74	20170313	0410	30			17	7	1.5	1024	9990	xxxx	7	7	x	x	x	x	x	-	x	x	x	x	x	x	-	-	-	-
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Bottom water oxygen concentration (ml/l)

Ship: Aranda

Date: 20170310-20170315

Series: 0144-0172



STATION BY31 LANDSORTSDJ SURFACE WATER (0-10 m)

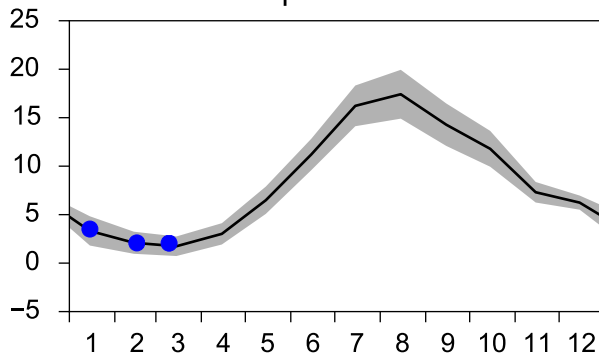
Annual Cycles

— Mean 2001-2015

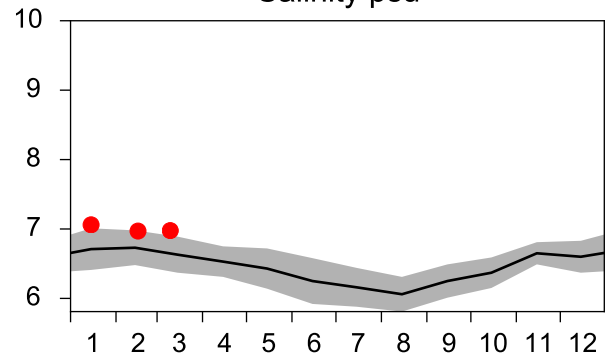
■ St.Dev.

● 2017

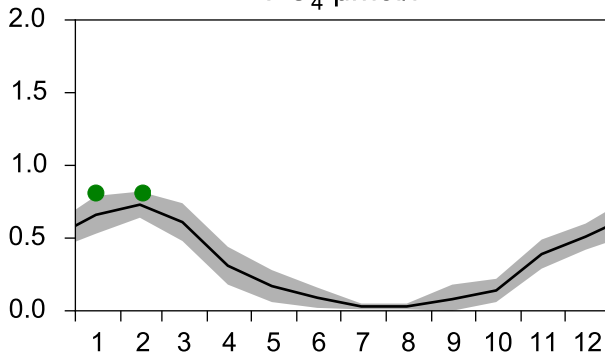
Temperature °C



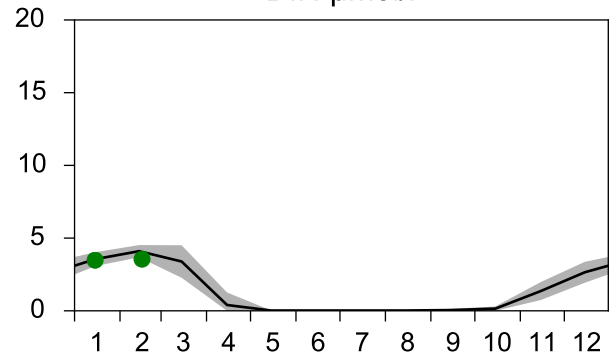
Salinity psu



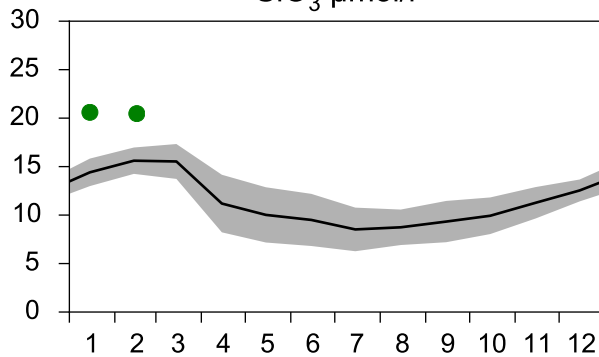
PO₄ μmol/l



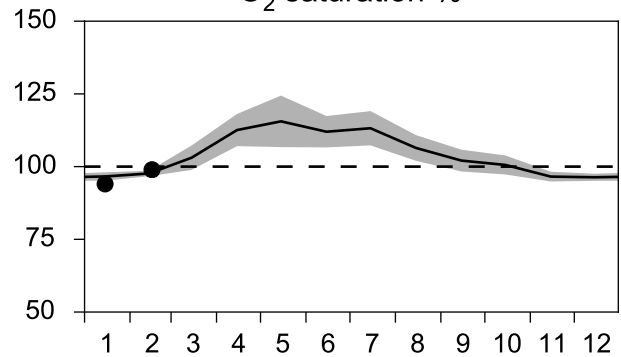
DIN μmol/l



SiO₃ μmol/l

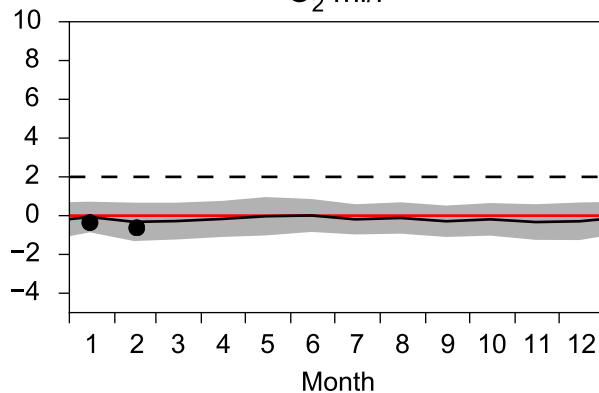


O₂ saturation %

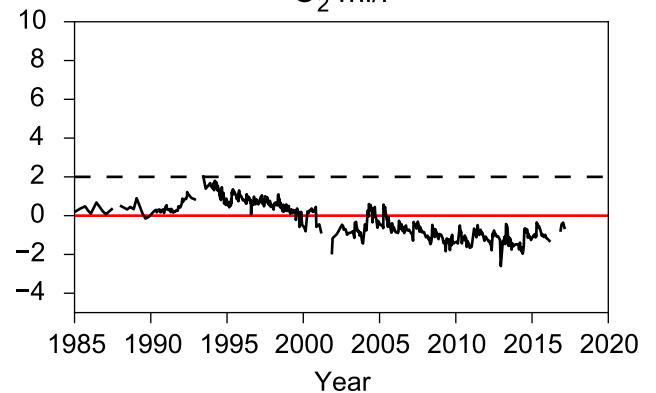


OXYGEN IN BOTTOM WATER (depth >= 425 m)

O₂ ml/l

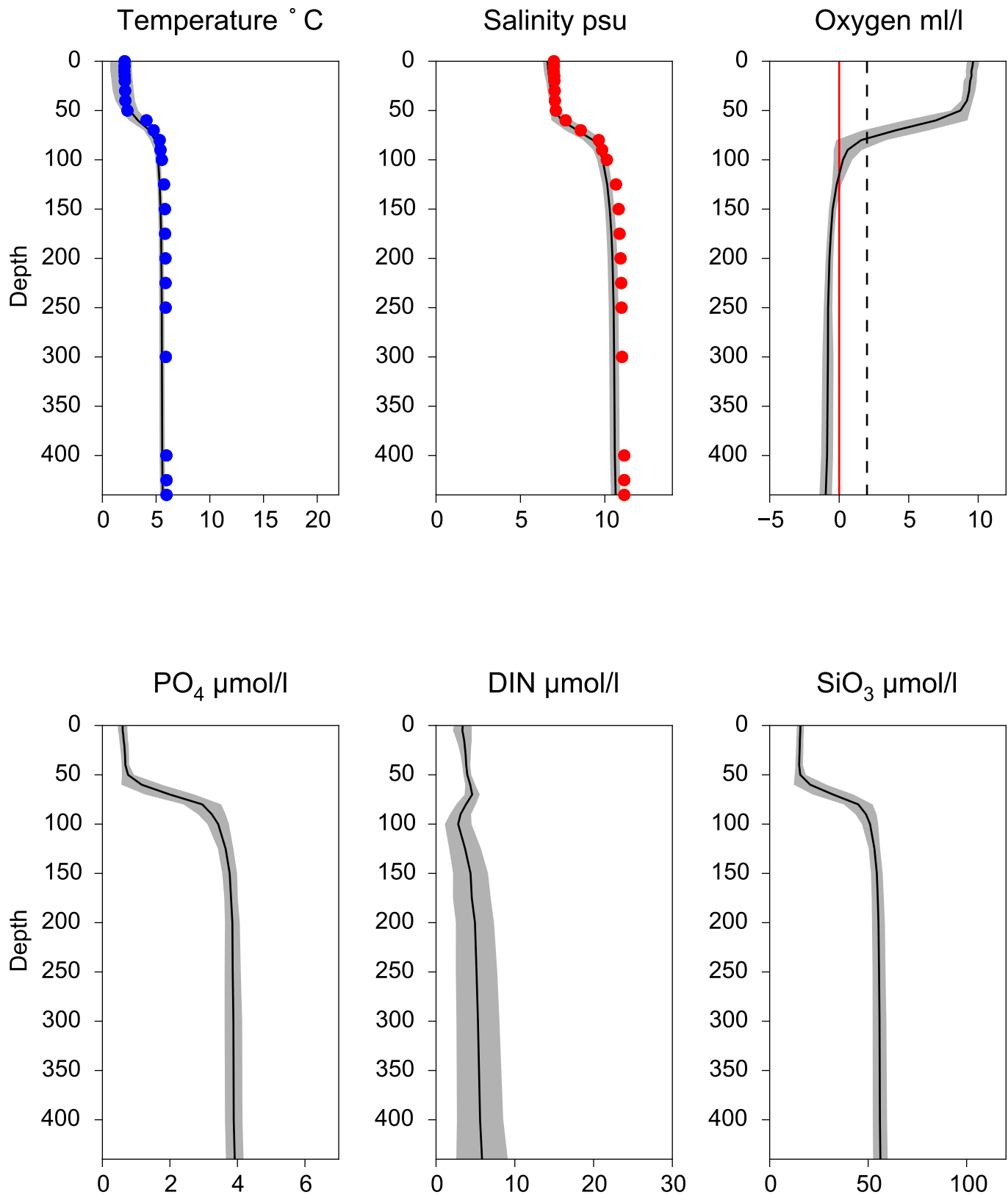


O₂ ml/l



Vertical profiles BY31 LANDSORTSDJ March

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



STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

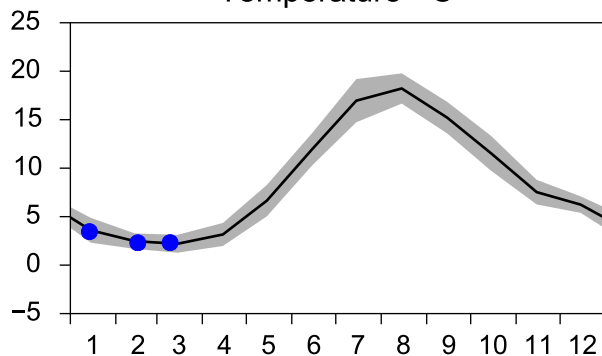
Annual Cycles

— Mean 2001-2015

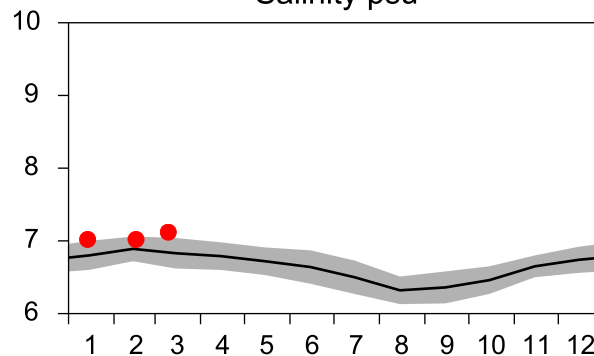
■ St.Dev.

● 2017

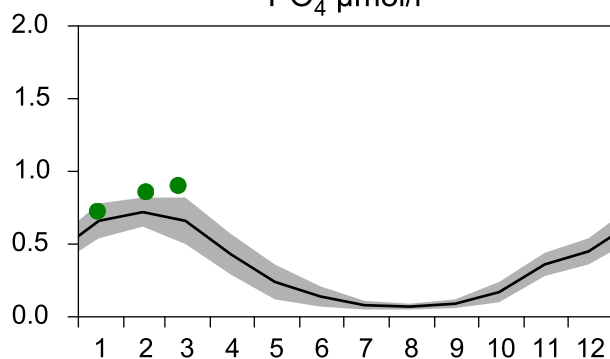
Temperature °C



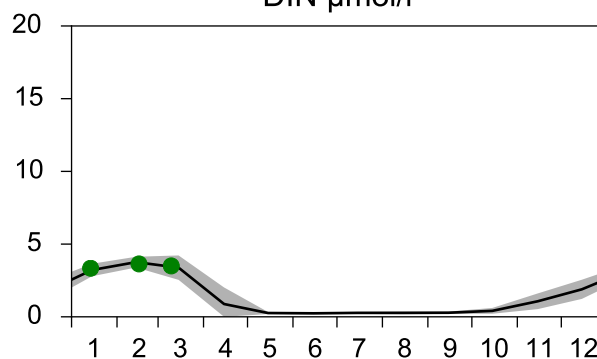
Salinity psu



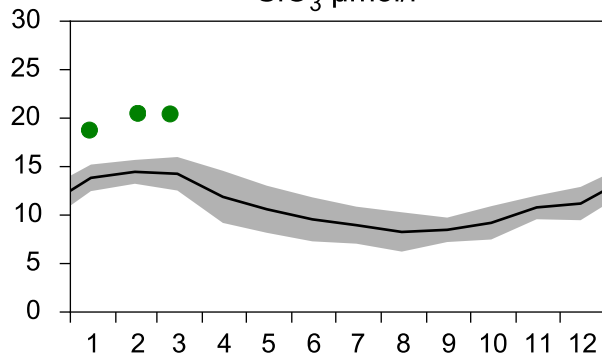
PO₄ µmol/l



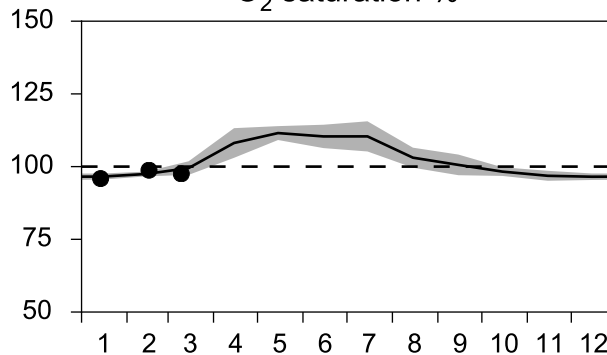
DIN µmol/l



SiO₃ µmol/l

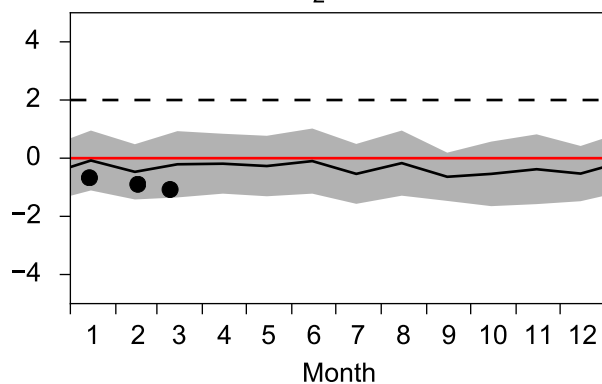


O₂ saturation %

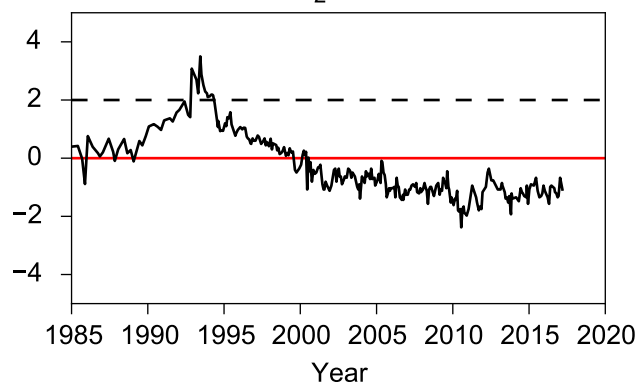


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

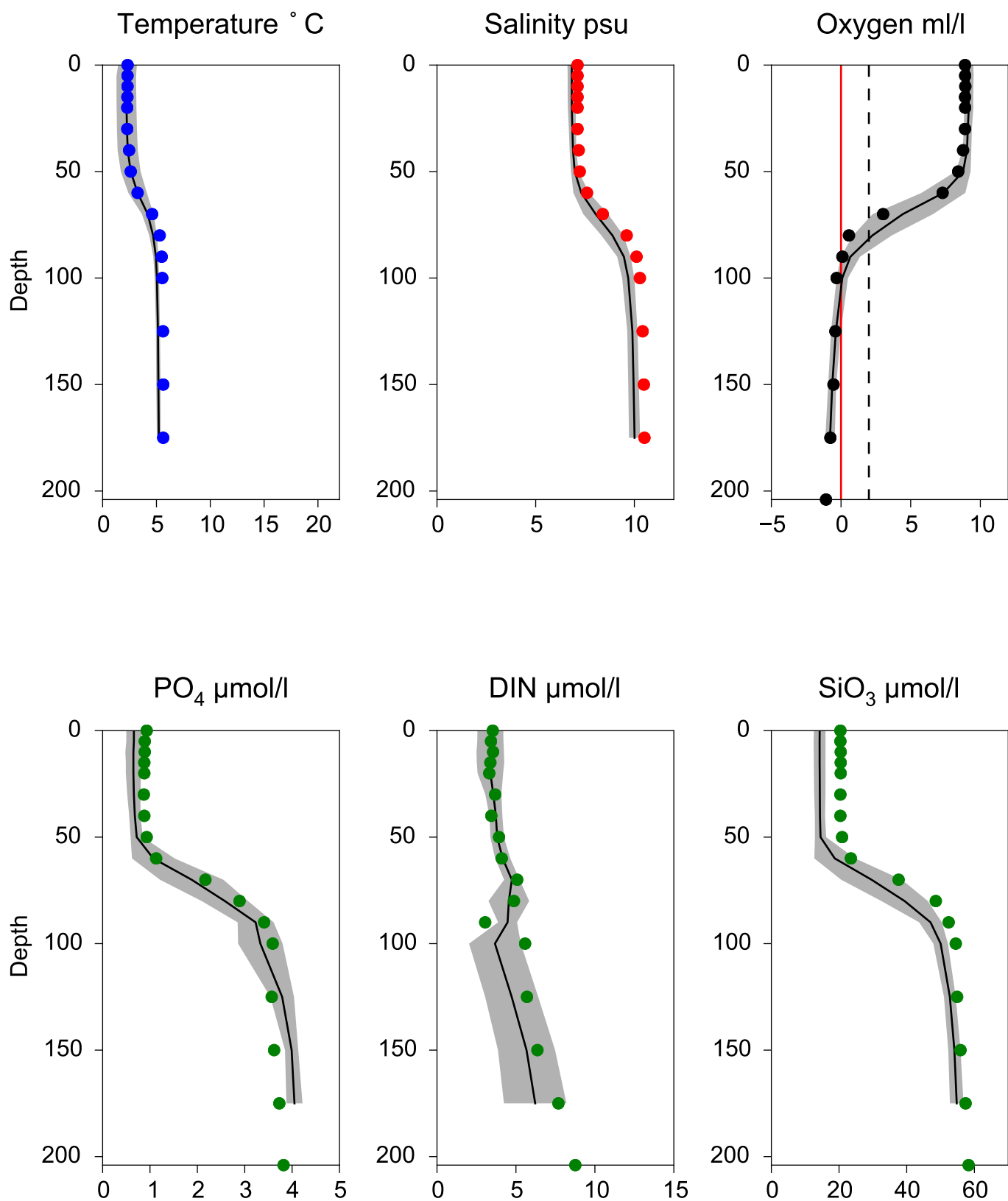


O₂ ml/l



Vertical profiles BY32 NORRKÖPINGSDJ March

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STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

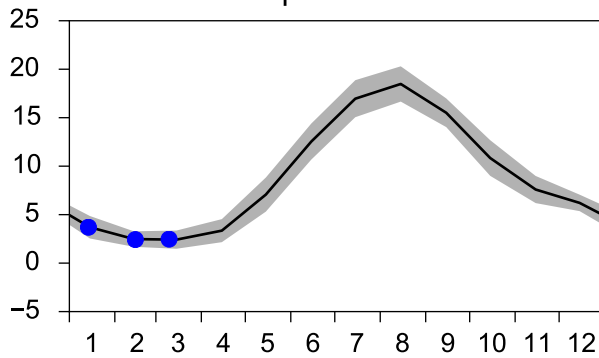
Annual Cycles

— Mean 2001-2015

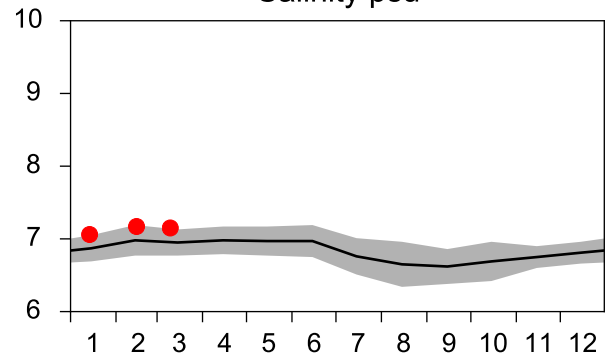
■ St.Dev.

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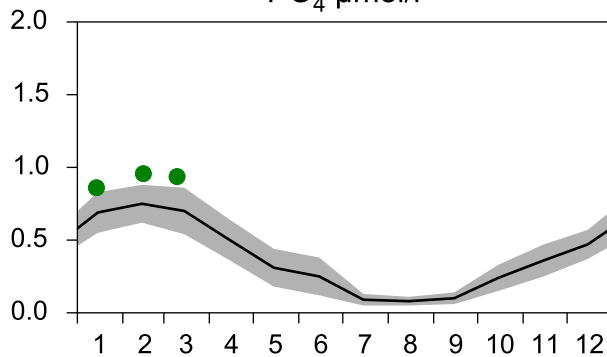
Temperature °C



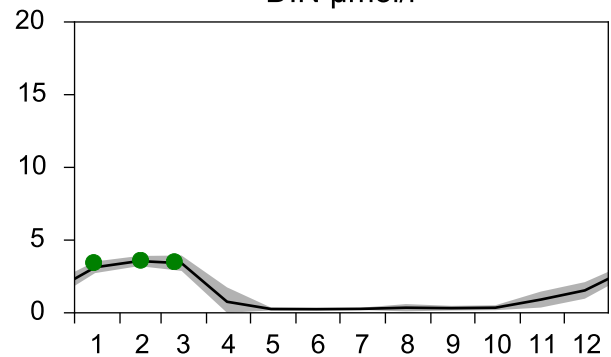
Salinity psu



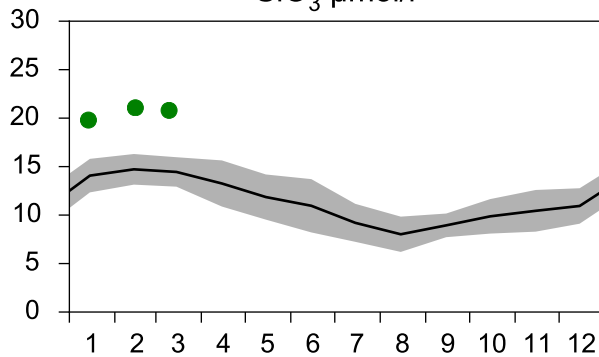
PO₄ µmol/l



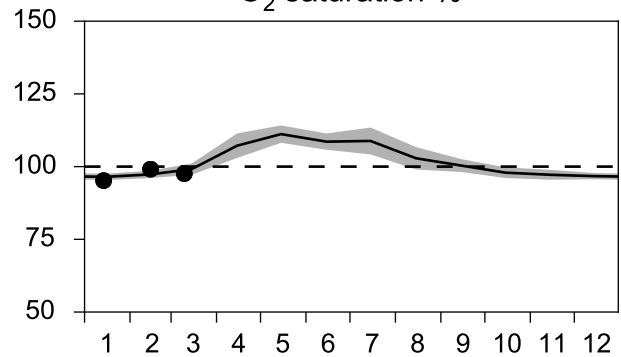
DIN µmol/l



SiO₃ µmol/l

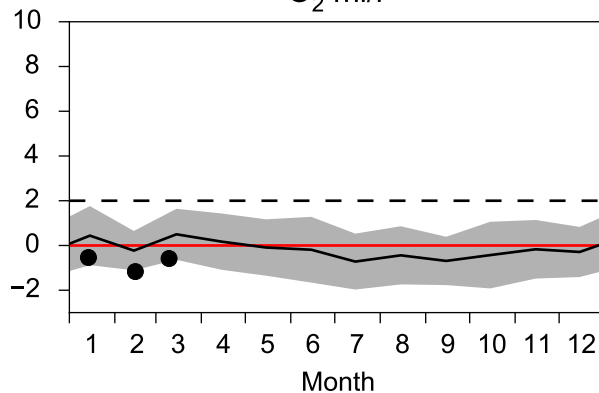


O₂ saturation %

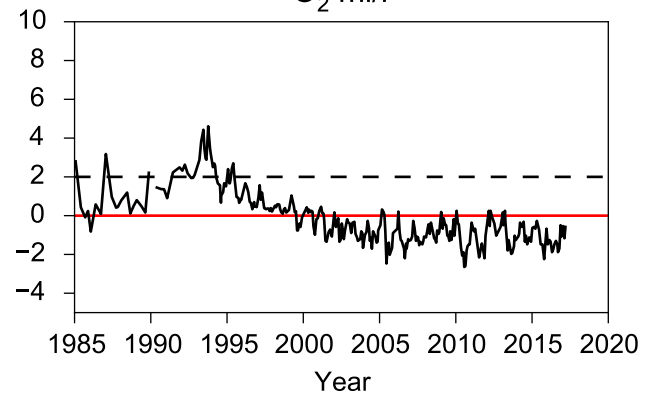


OXYGEN IN BOTTOM WATER (depth >= 100 m)

O₂ ml/l

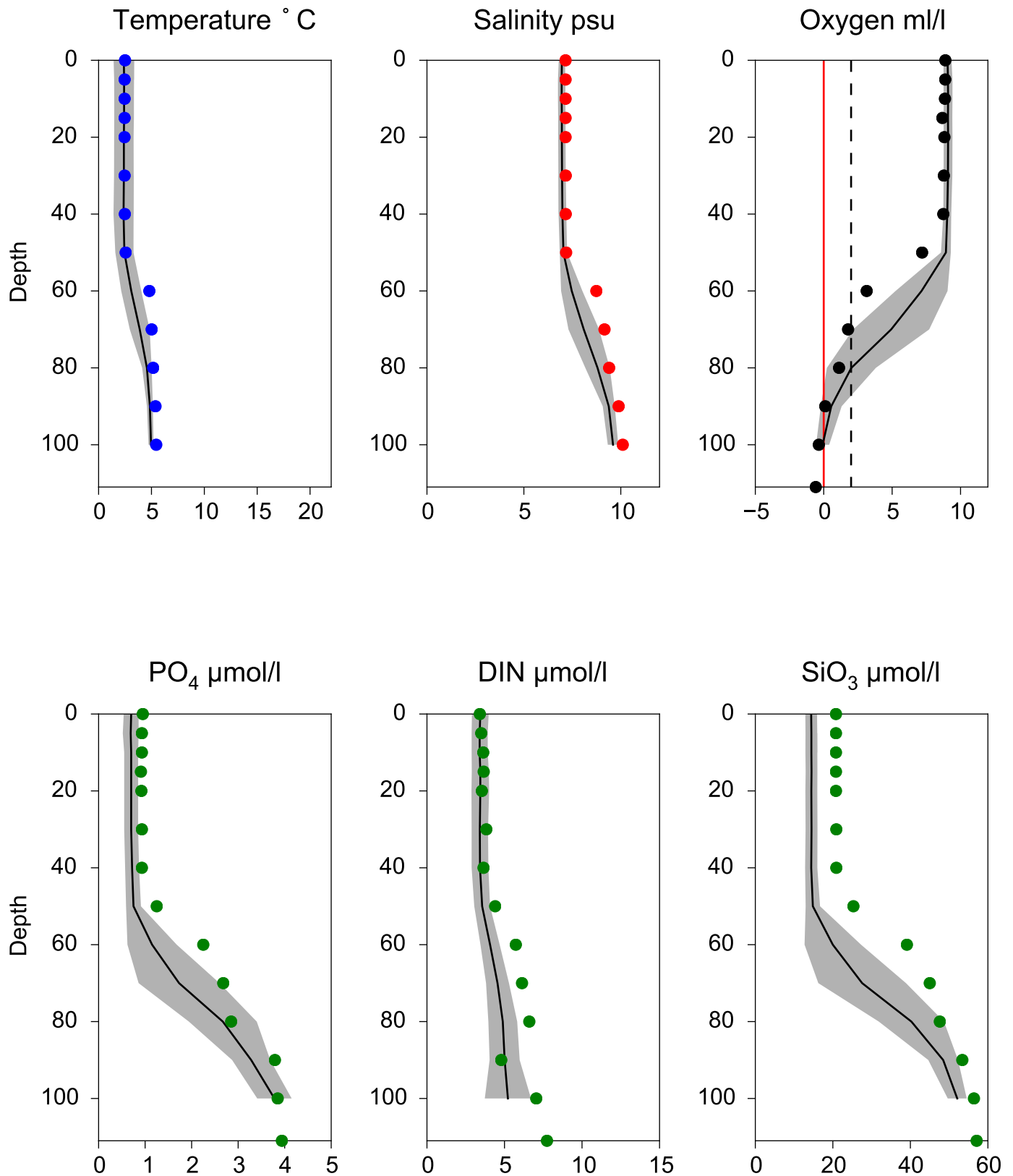


O₂ ml/l



Vertical profiles BY38 KARLSÖDJ March

— Mean 2001-2015 St.Dev. • 2017-03-10



STATION REF M1V1 SURFACE WATER (0-10 m)

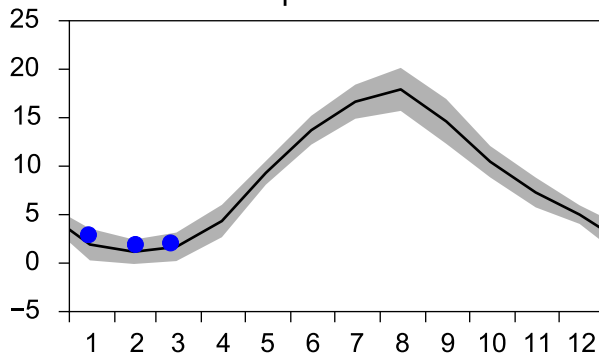
Annual Cycles

— Mean 2001-2015

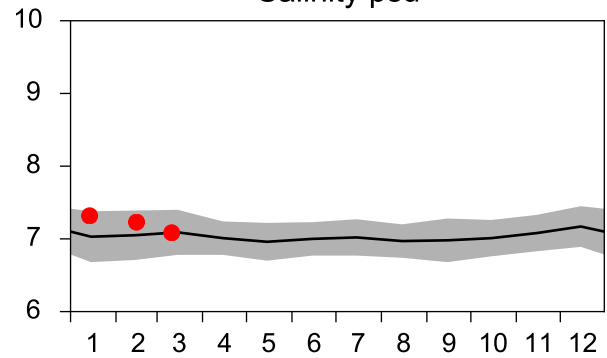
■ St.Dev.

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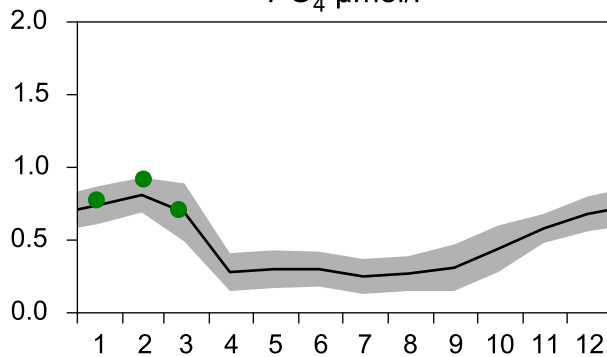
Temperature °C



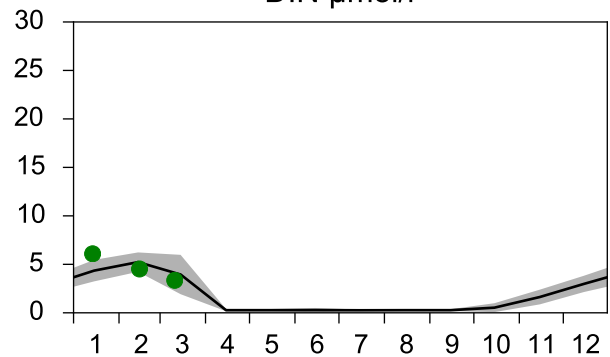
Salinity psu



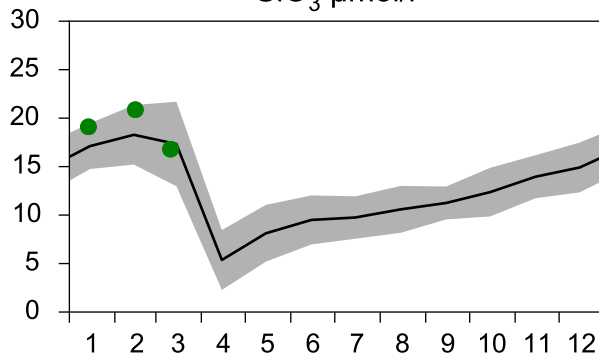
PO₄ µmol/l



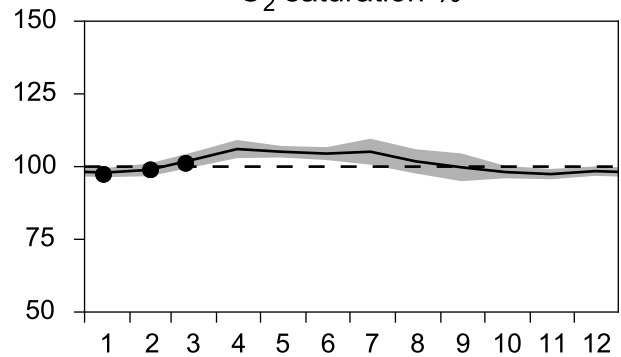
DIN µmol/l



SiO₃ µmol/l

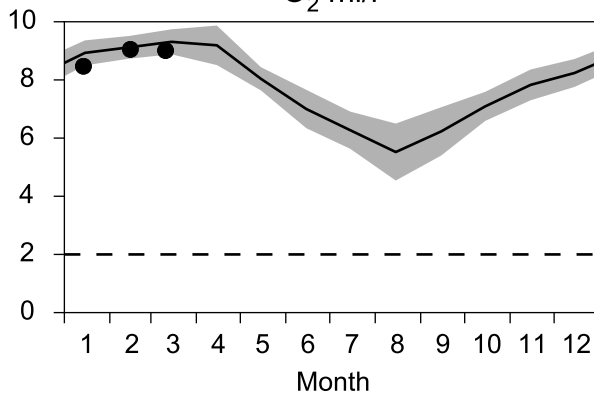


O₂ saturation %

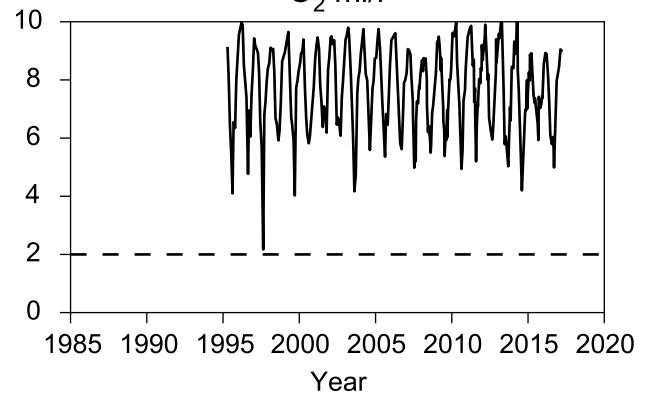


OXYGEN IN BOTTOM WATER (depth >= 17 m)

O₂ ml/l

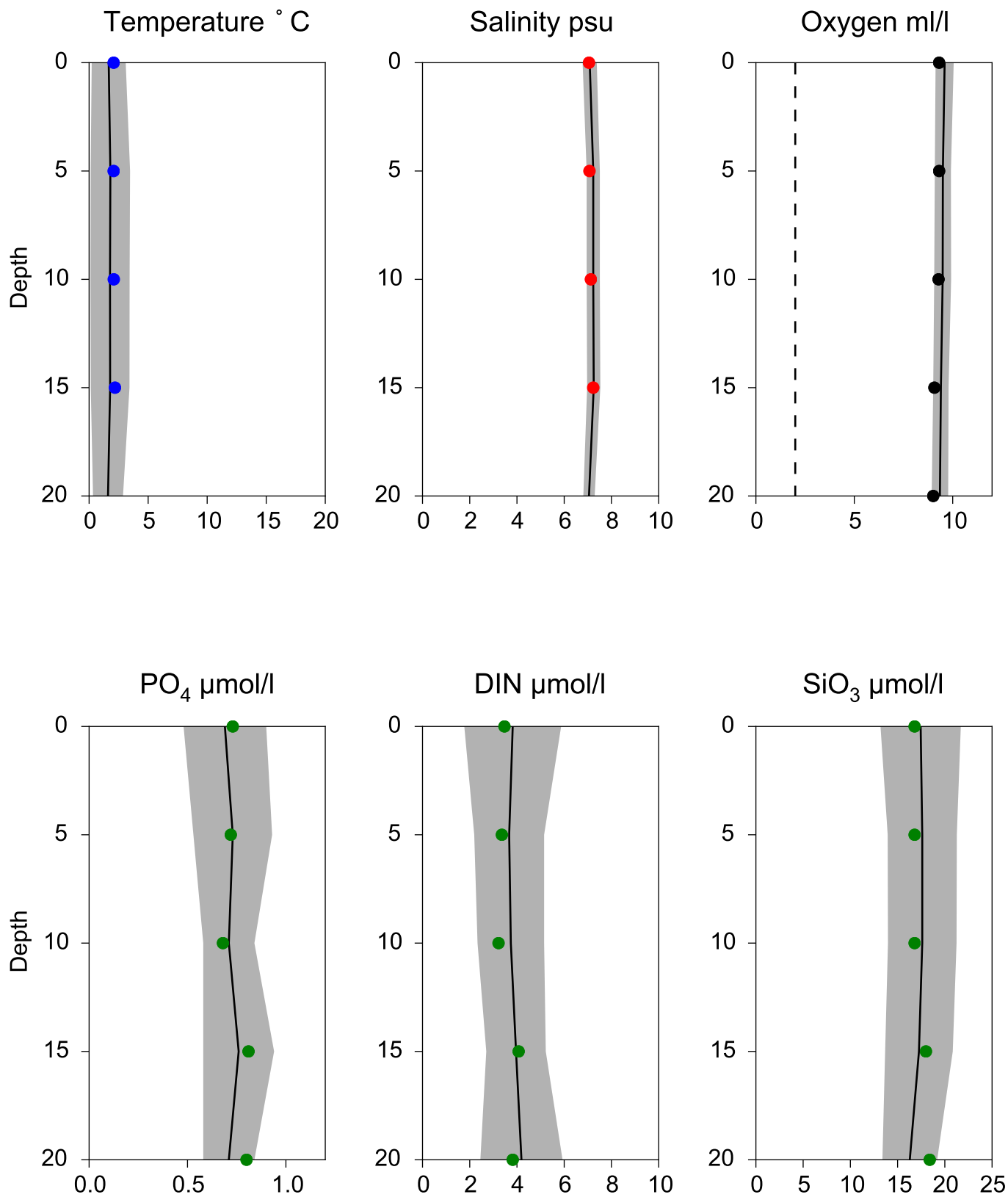


O₂ ml/l



Vertical profiles REF M1V1 March

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STATION HANÖBUKTEN SURFACE WATER (0-10 m)

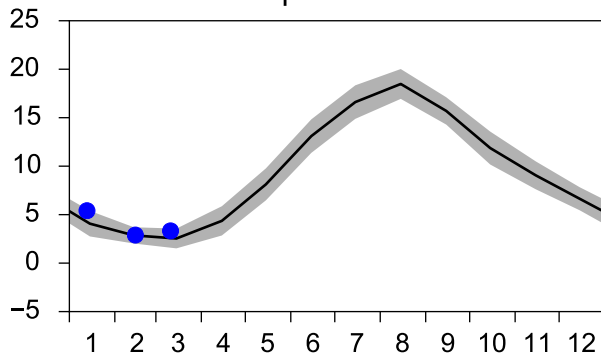
Annual Cycles

— Mean 2001-2015

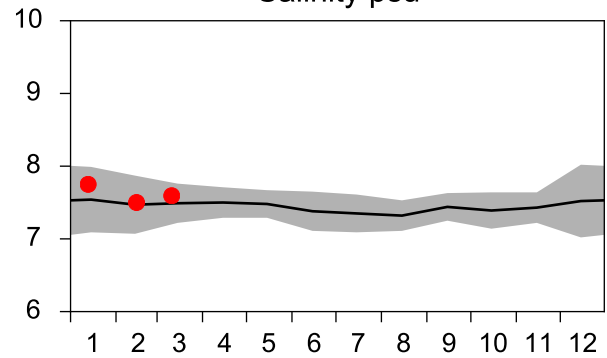
■ St.Dev.

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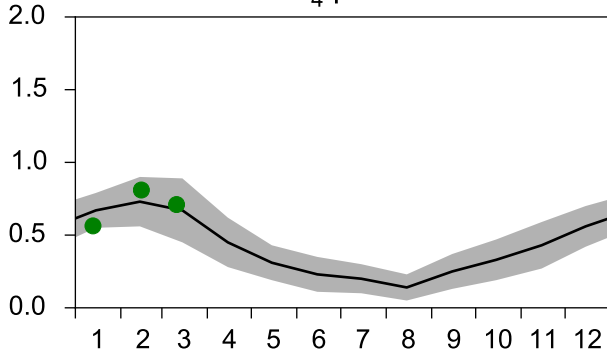
Temperature °C



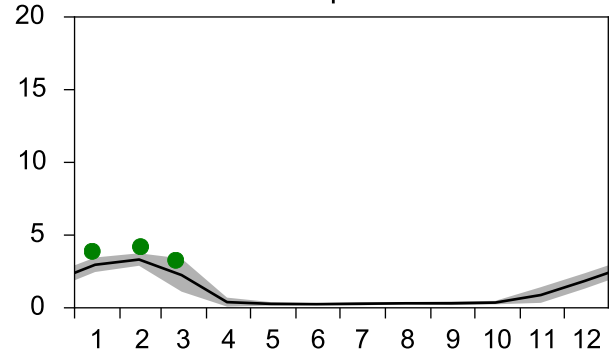
Salinity psu



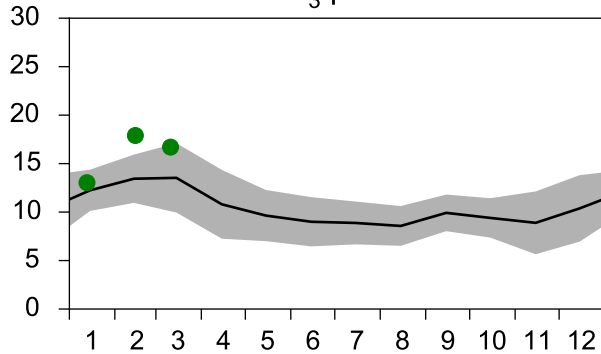
PO₄ µmol/l



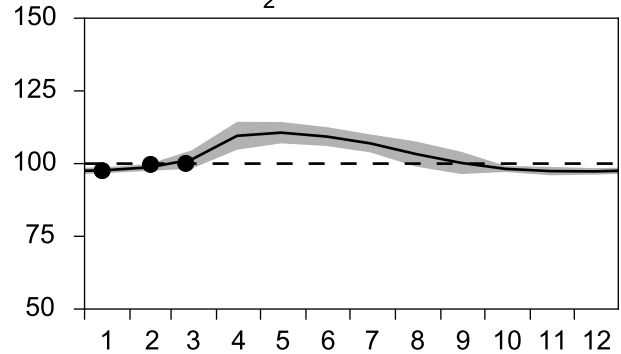
DIN µmol/l



SiO₃ µmol/l

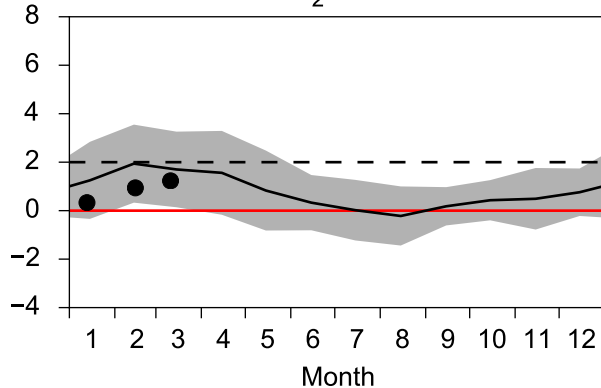


O₂ saturation %

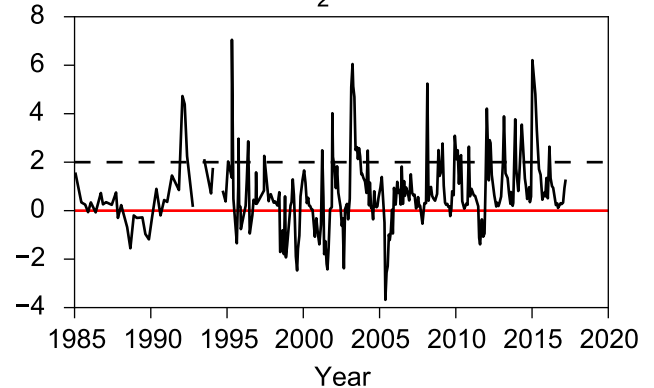


OXYGEN IN BOTTOM WATER (depth >= 70 m)

O₂ ml/l

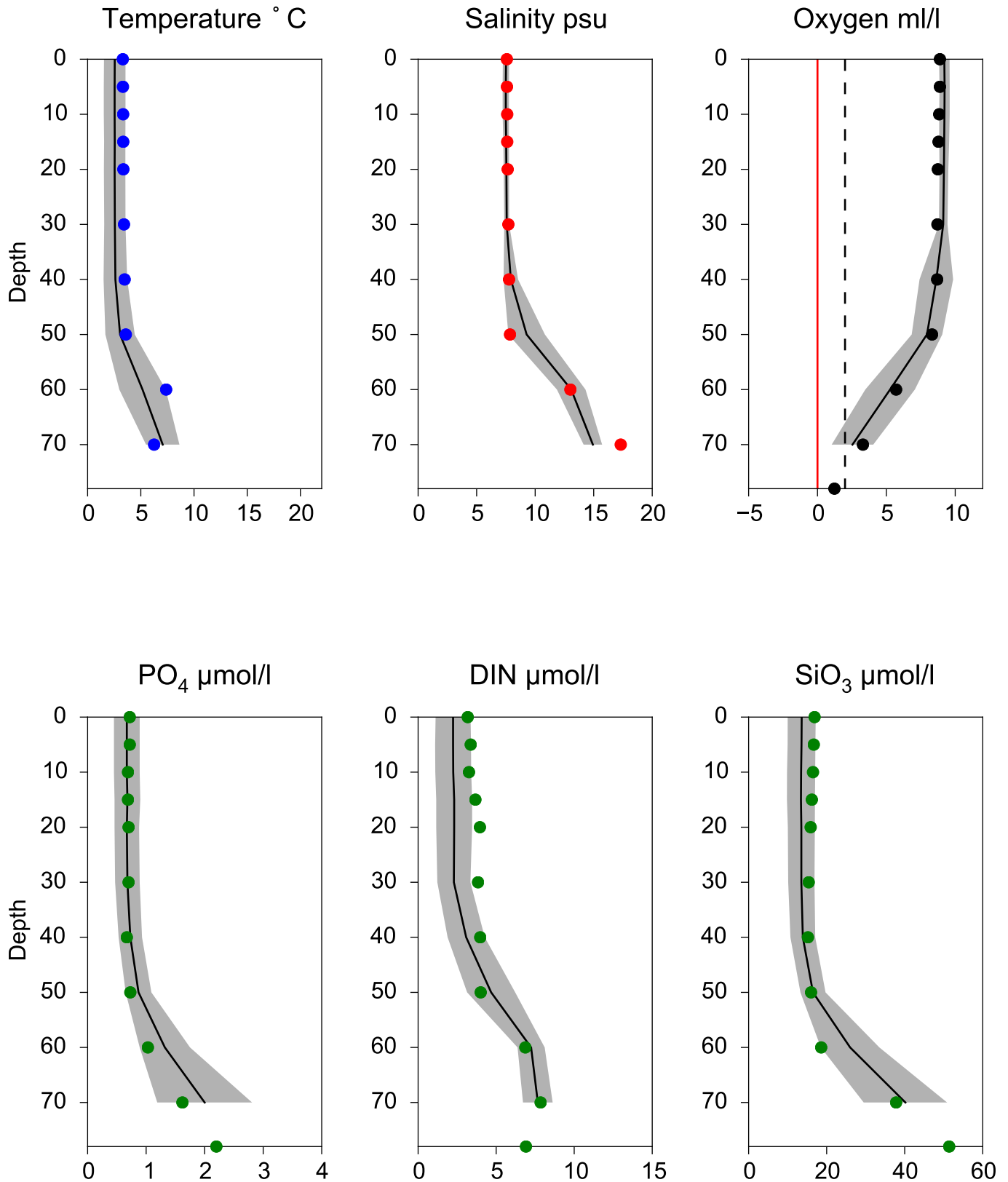


O₂ ml/l



Vertical profiles HANÖBUKTEN March

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STATION W LANDSKRONA SURFACE WATER (0-10 m)

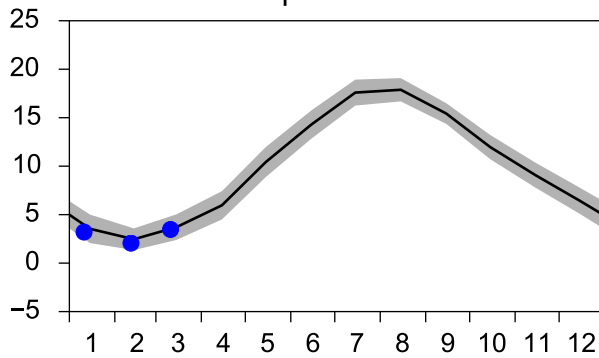
Annual Cycles

— Mean 2001-2015

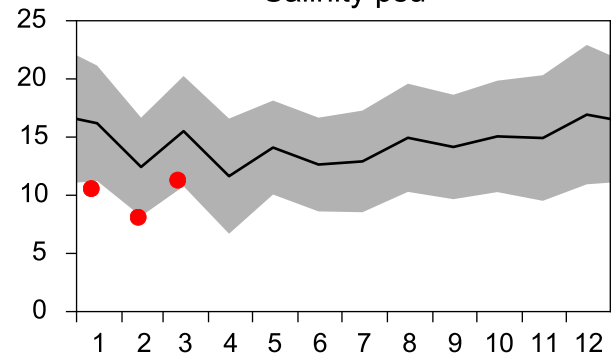
■ St.Dev.

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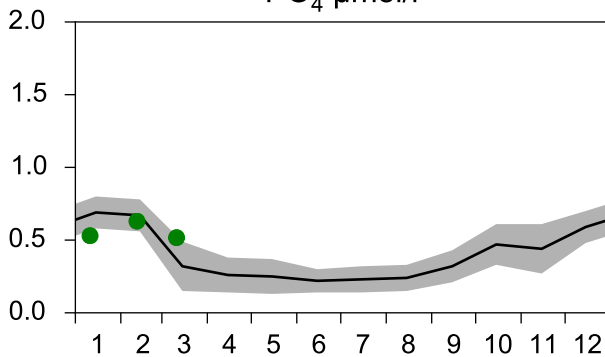
Temperature °C



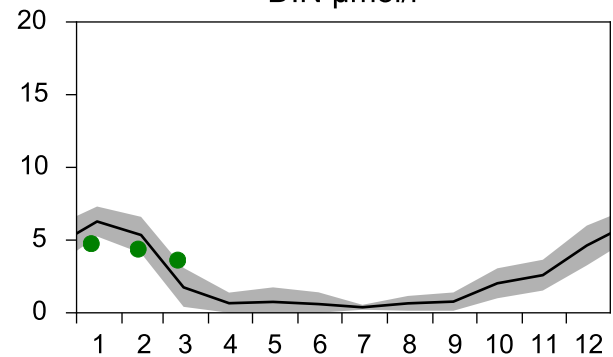
Salinity psu



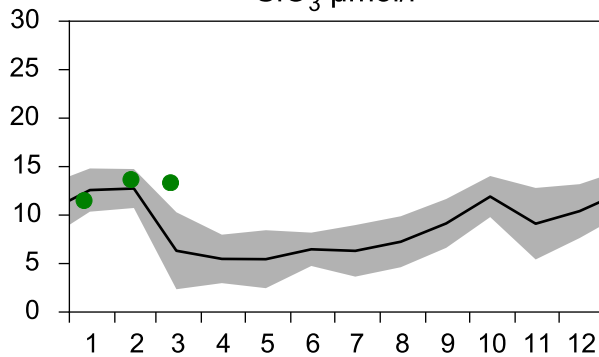
PO₄ µmol/l



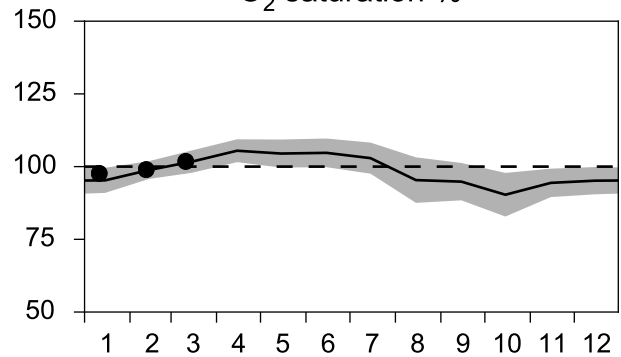
DIN µmol/l



SiO₃ µmol/l

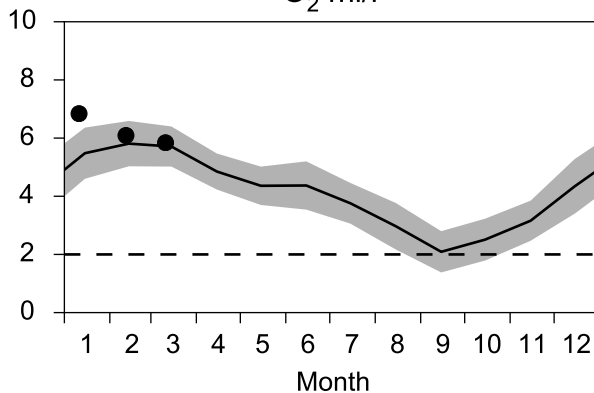


O₂ saturation %

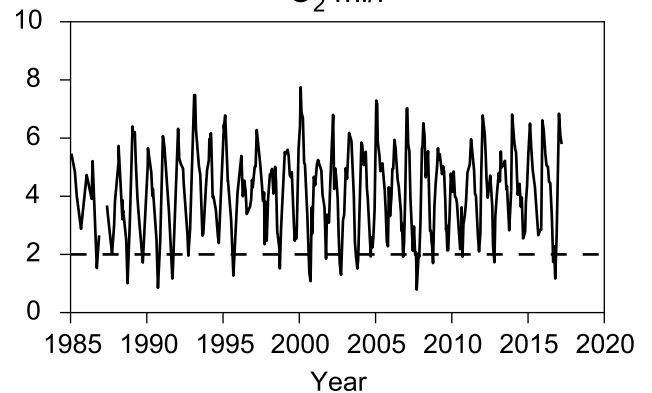


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

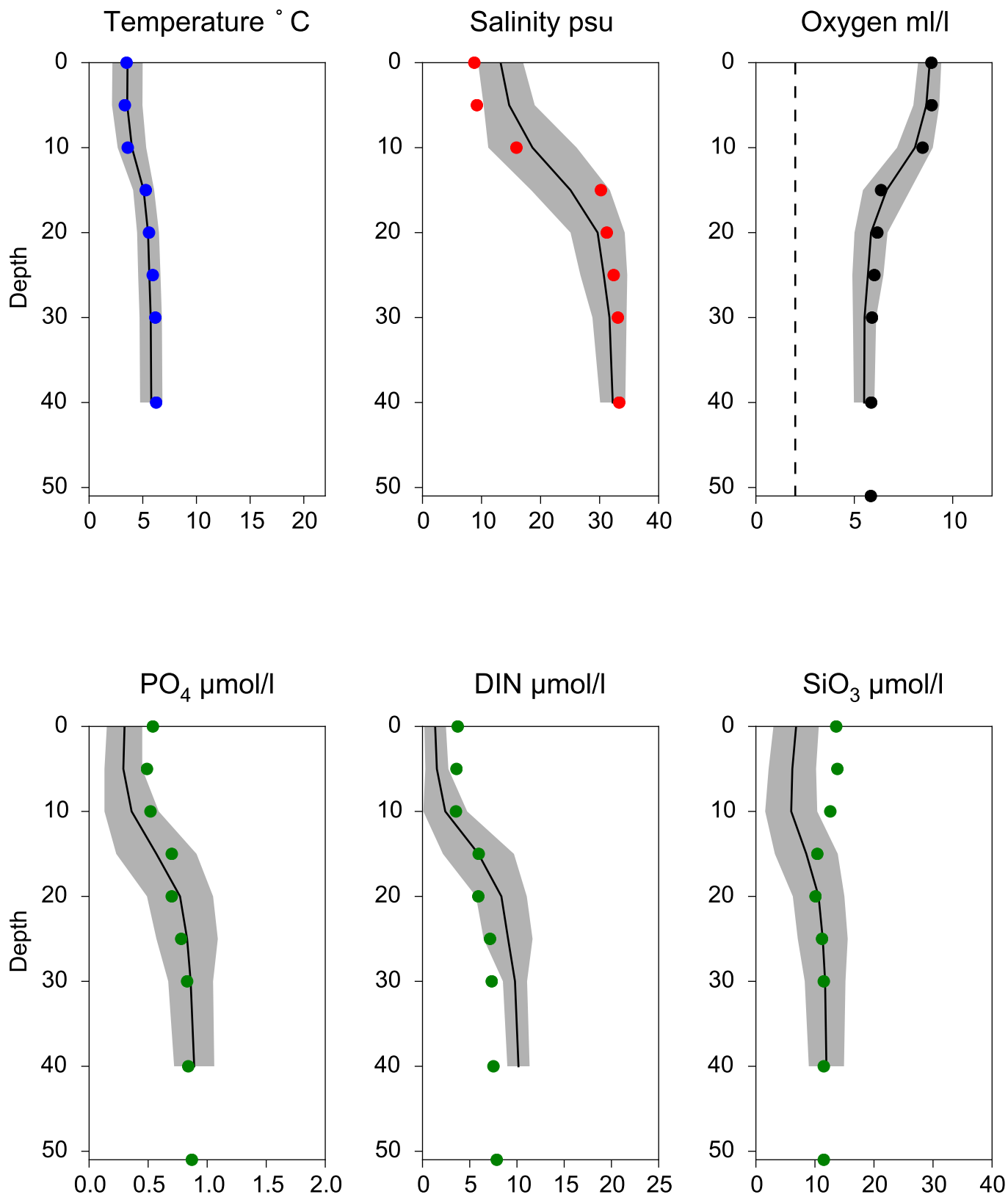


O₂ ml/l



Vertical profiles W LANDSKRONA March

— Mean 2001-2015 St.Dev. ● 2017-03-11



STATION ANHOLT E SURFACE WATER (0-10 m)

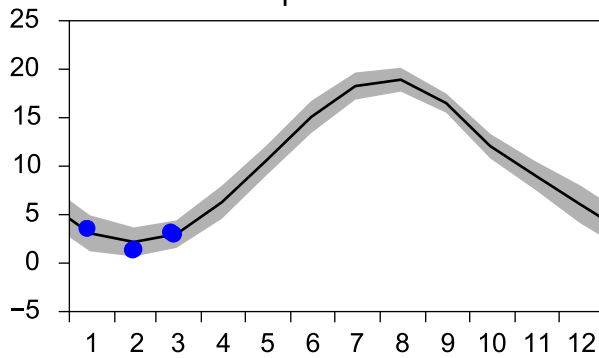
Annual Cycles

— Mean 2001-2015

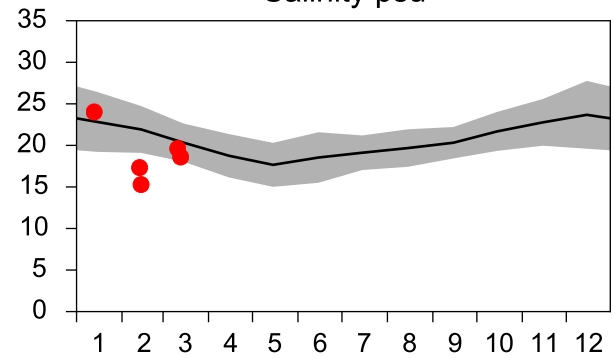
■ St.Dev.

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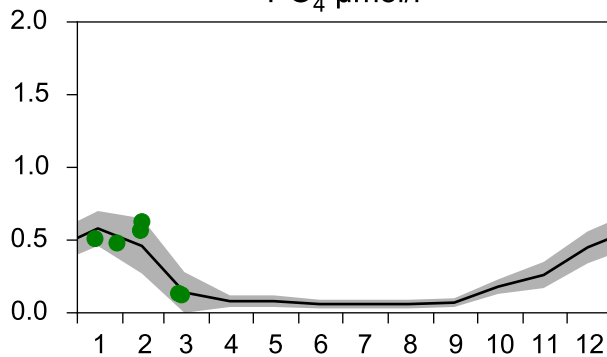
Temperature °C



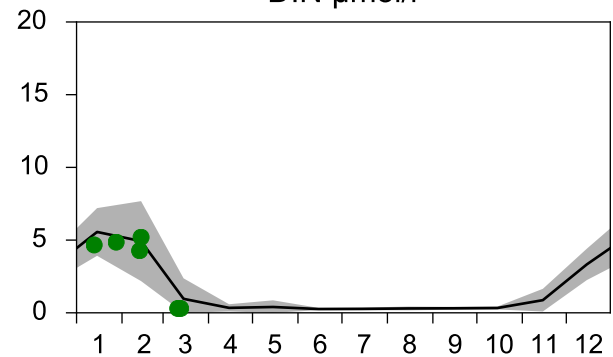
Salinity psu



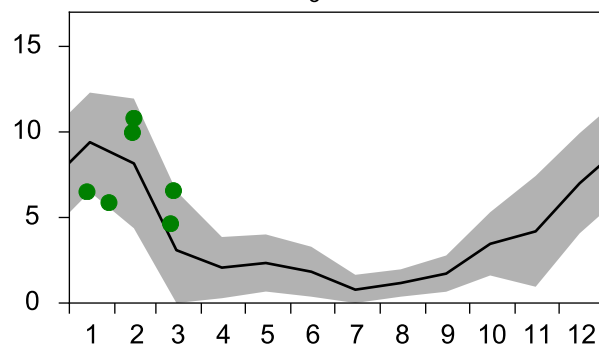
PO₄ µmol/l



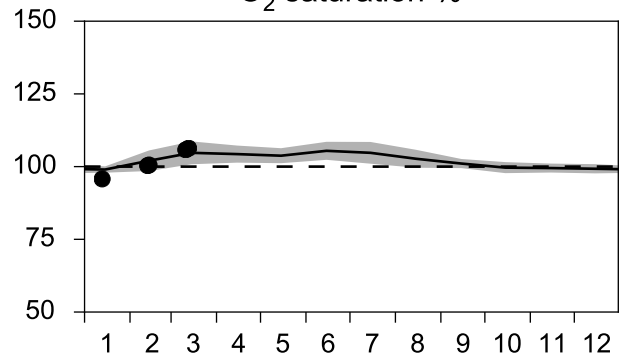
DIN µmol/l



SiO₃ µmol/l

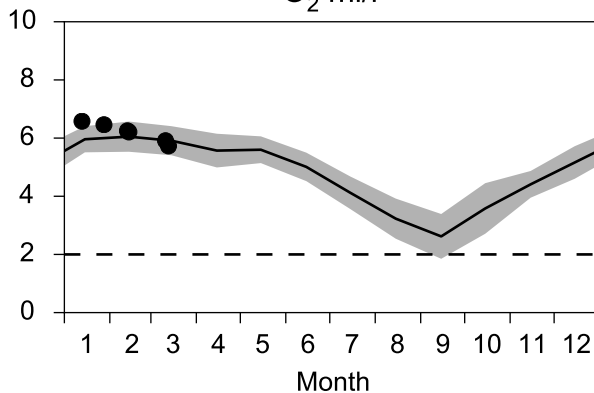


O₂ saturation %

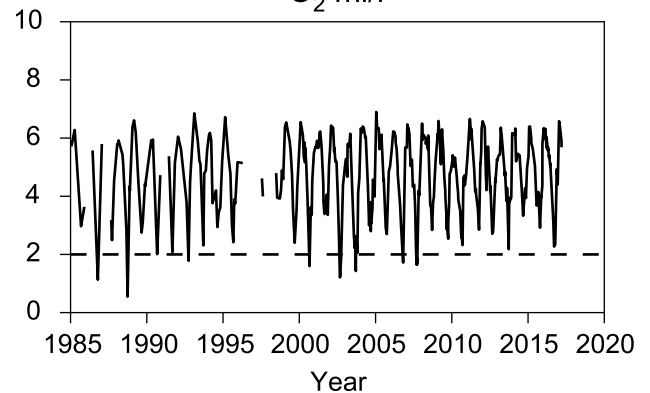


OXYGEN IN BOTTOM WATER (depth >= 52 m)

O₂ ml/l

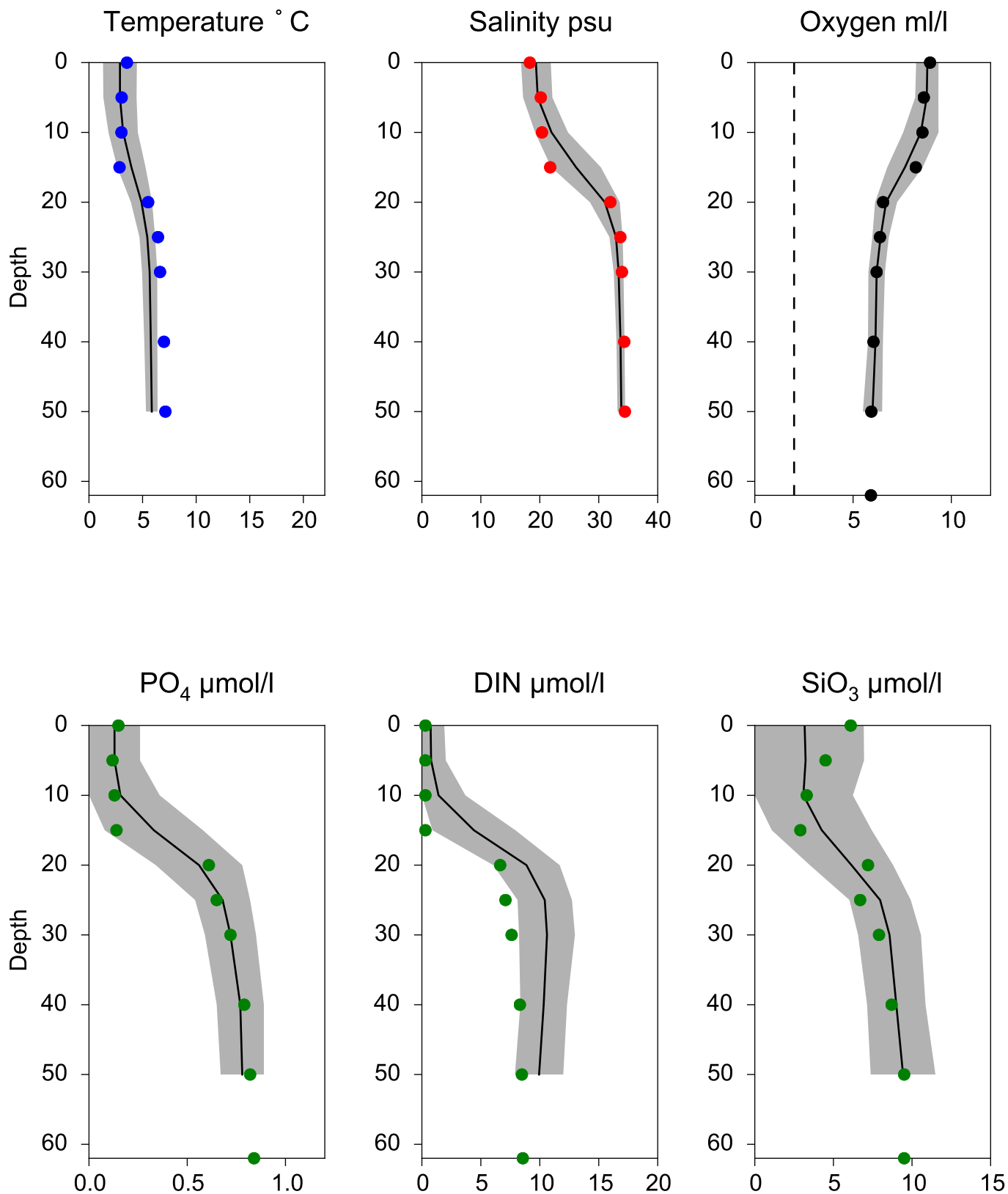


O₂ ml/l



Vertical profiles ANHOLT E March

— Mean 2001-2015 St.Dev. • 2017-03-11



STATION FLADEN SURFACE WATER (0-10 m)

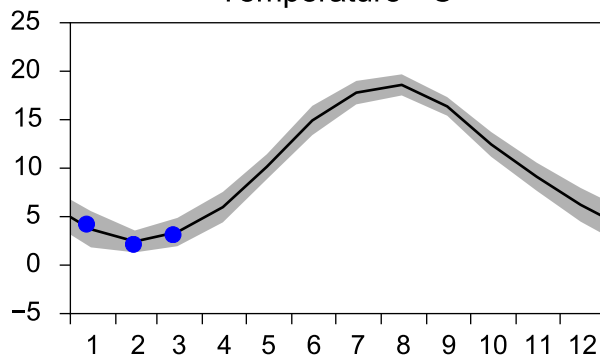
Annual Cycles

— Mean 2001-2015

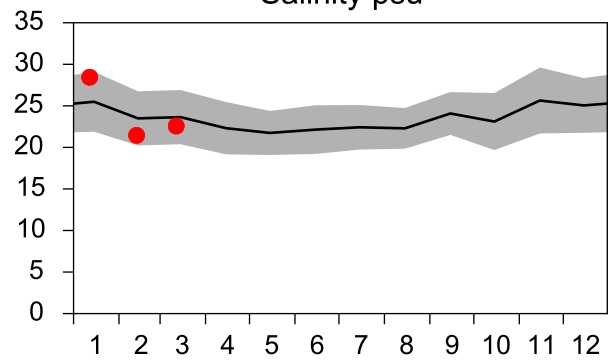
■ St.Dev.

● 2017

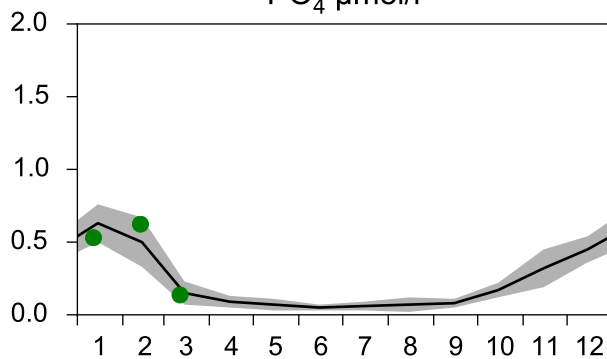
Temperature °C



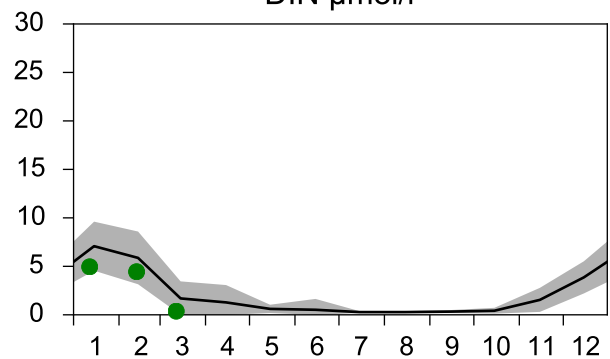
Salinity psu



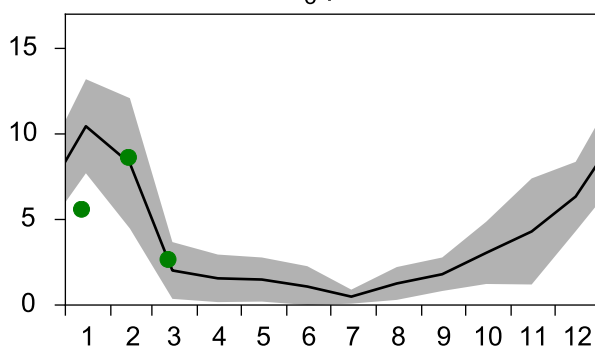
PO₄ µmol/l



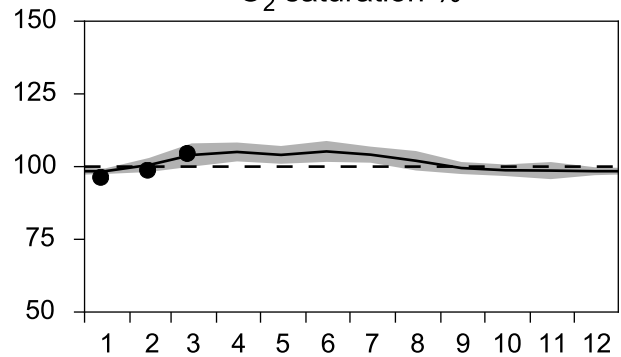
DIN µmol/l



SiO₃ µmol/l

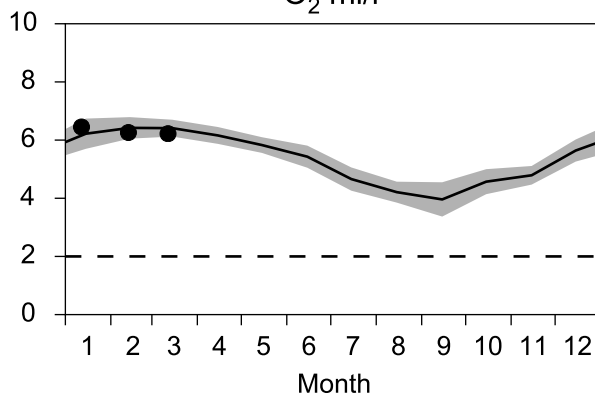


O₂ saturation %

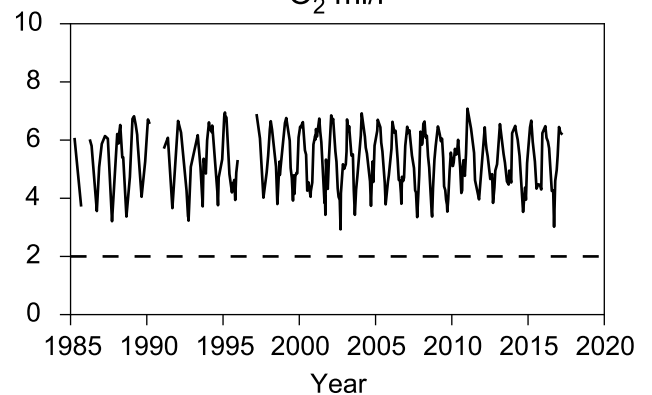


OXYGEN IN BOTTOM WATER (depth >= 74 m)

O₂ ml/l

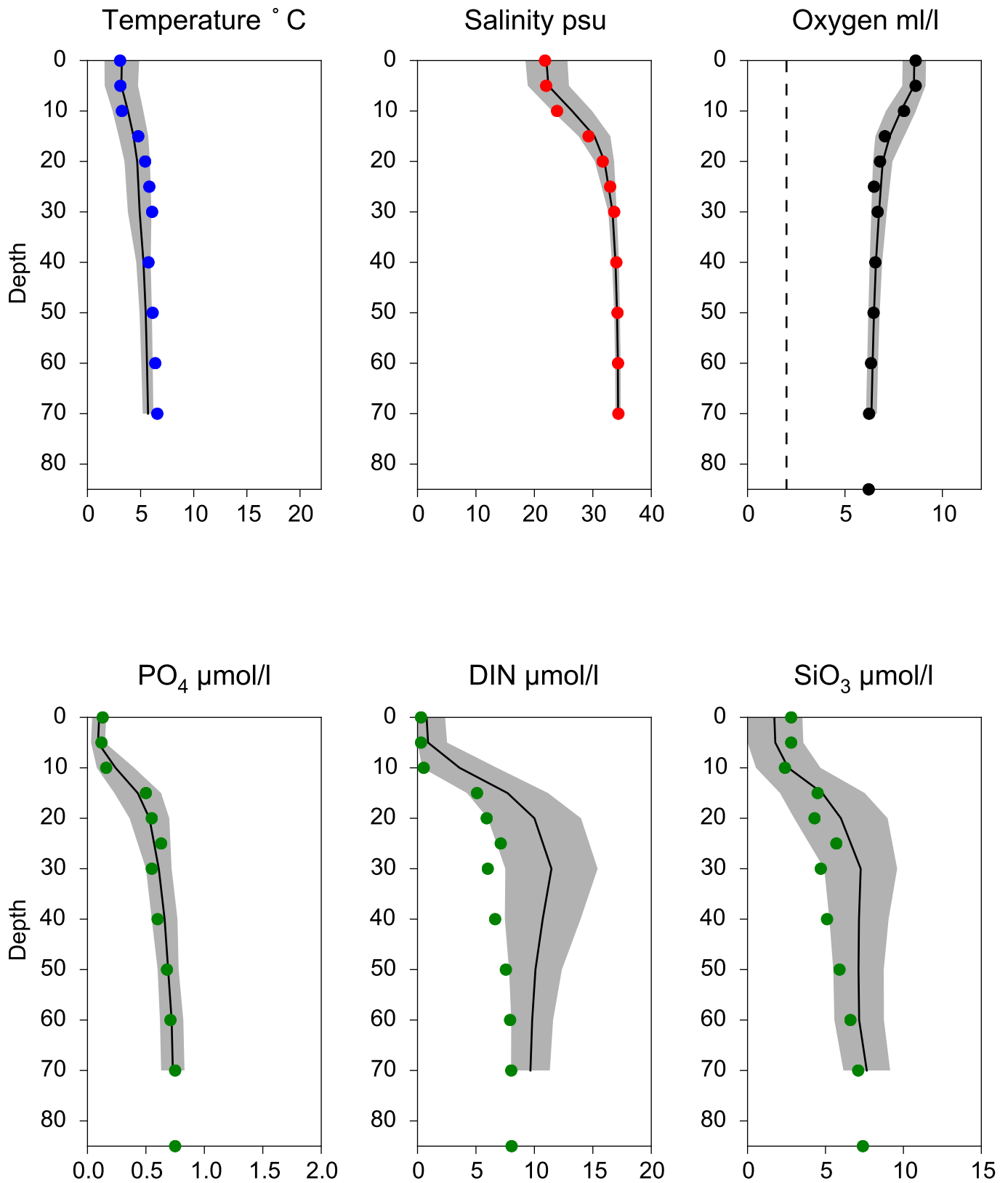


O₂ ml/l



Vertical profiles FLADEN March

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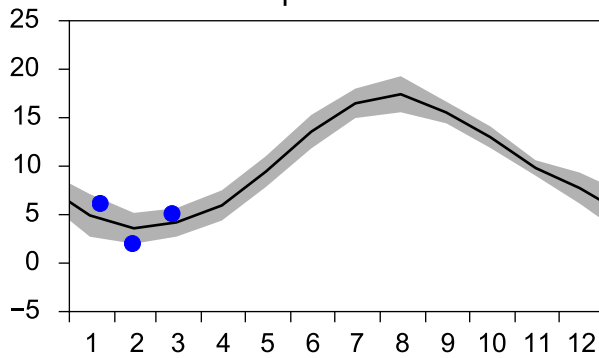


STATION Å17 SURFACE WATER (0-10 m)

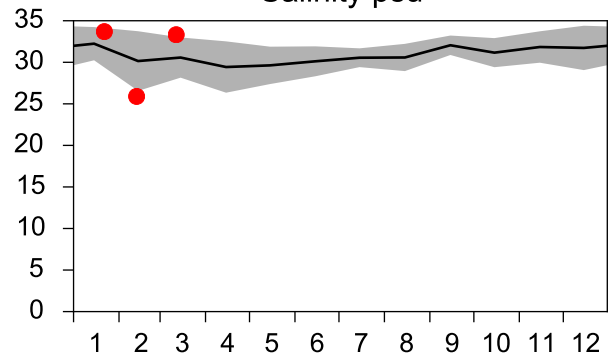
Annual Cycles

— Mean 2001-2015 St.Dev. • 2017

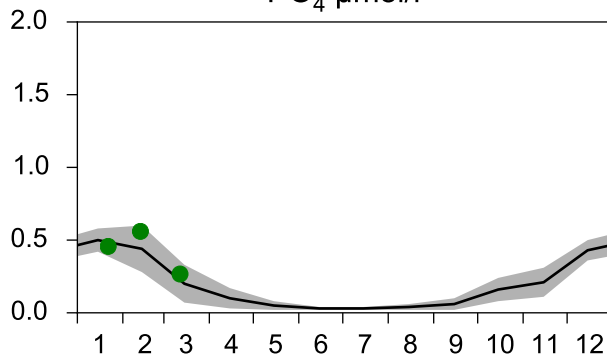
Temperature °C



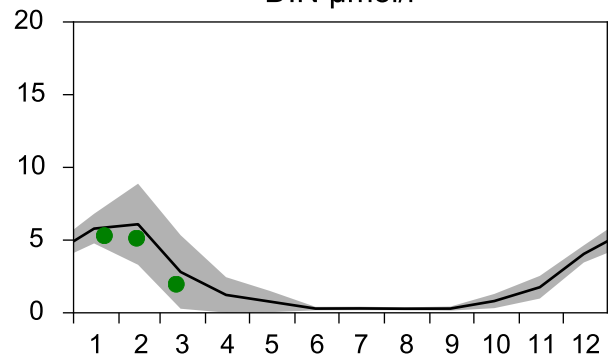
Salinity psu



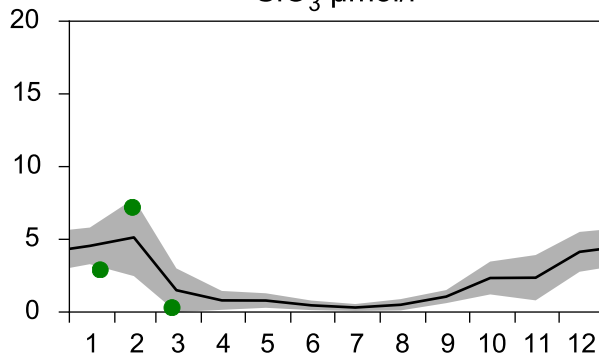
PO₄ µmol/l



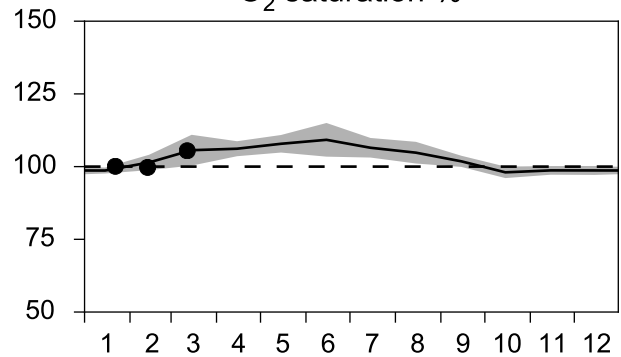
DIN µmol/l



SiO₃ µmol/l

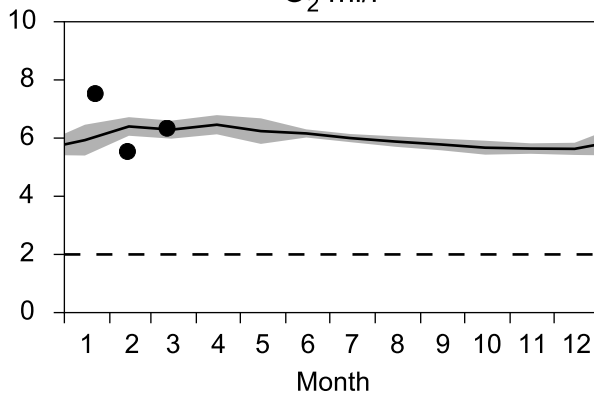


O₂ saturation %

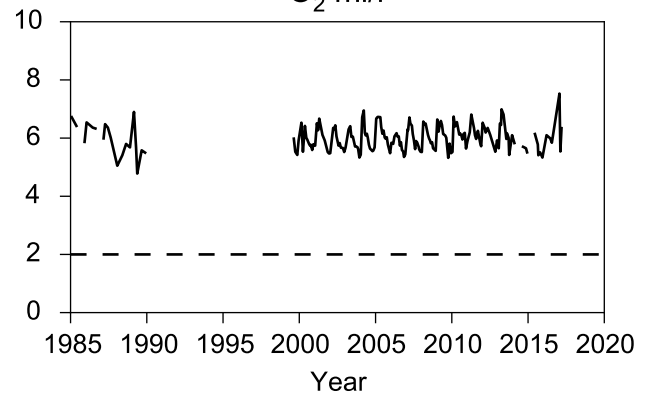


OXYGEN IN BOTTOM WATER (depth >= 300 m)

O₂ ml/l

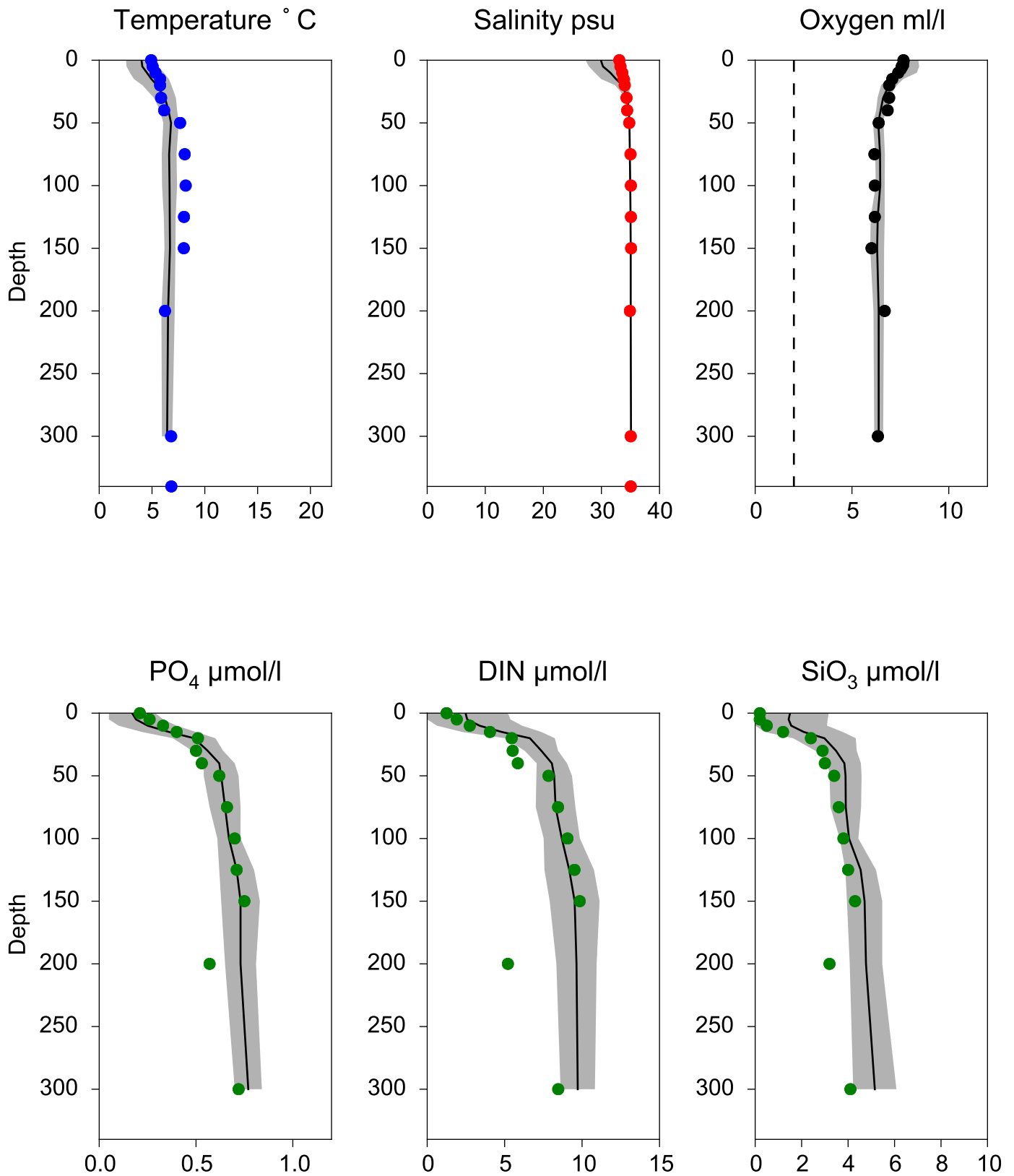


O₂ ml/l



Vertical profiles Å17 March

— Mean 2001-2015 St.Dev. • 2017-03-12

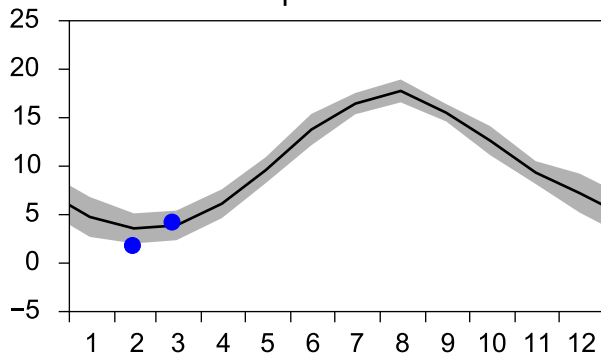


STATION Å15 SURFACE WATER (0-10 m)

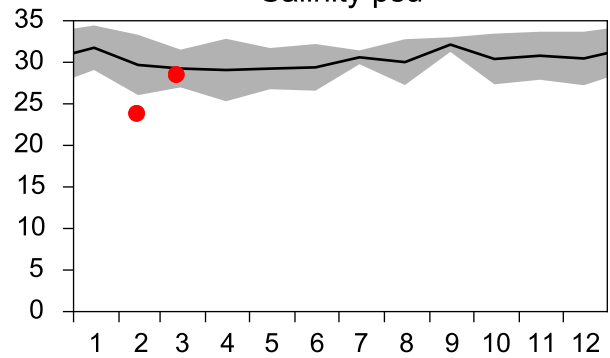
Annual Cycles

— Mean 2001-2015 St.Dev. • 2017

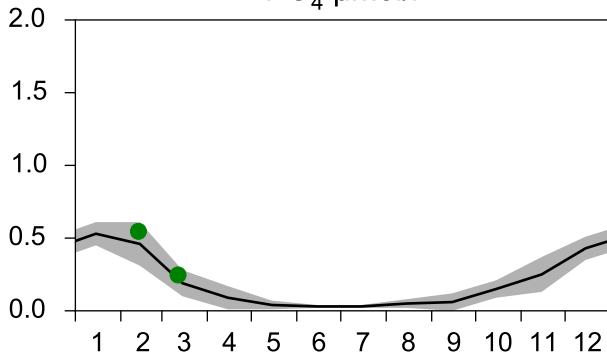
Temperature °C



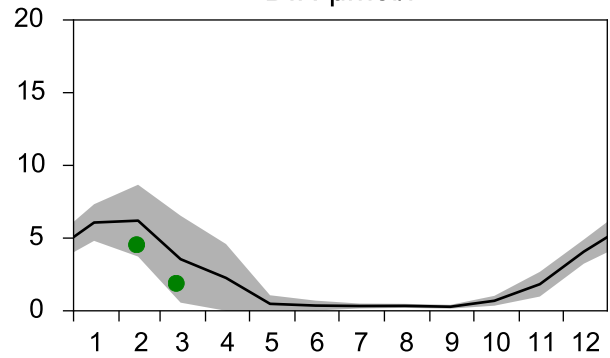
Salinity psu



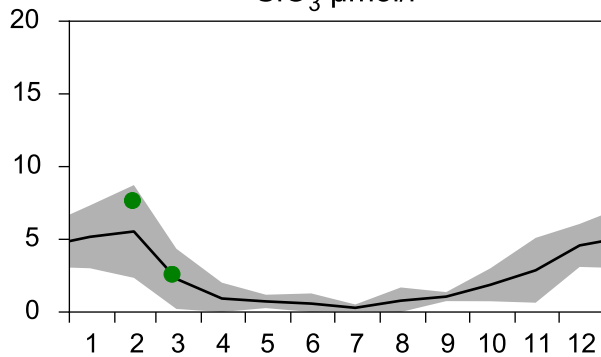
PO₄ µmol/l



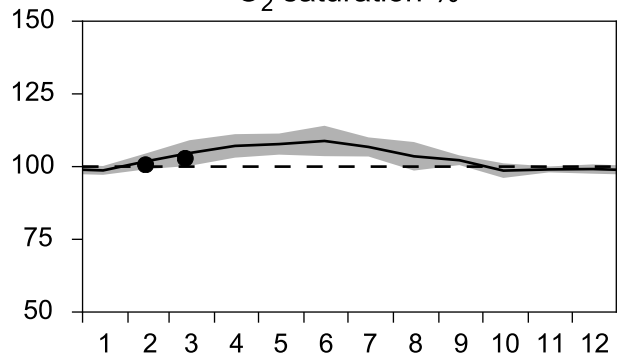
DIN µmol/l



SiO₃ µmol/l

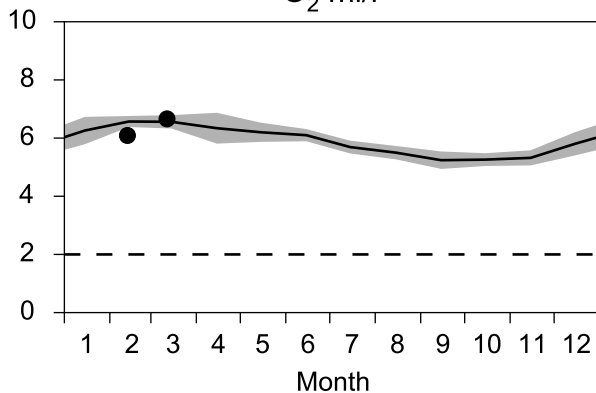


O₂ saturation %

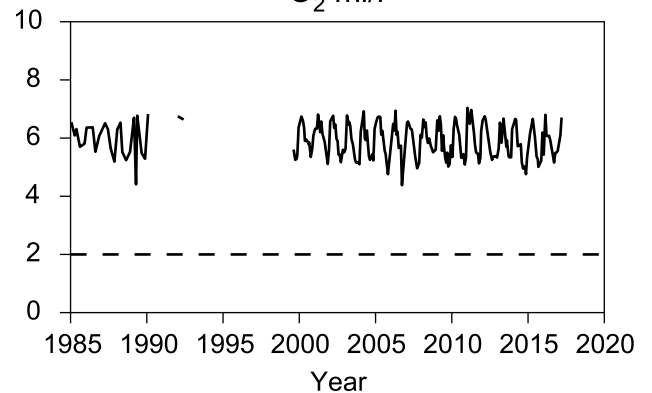


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

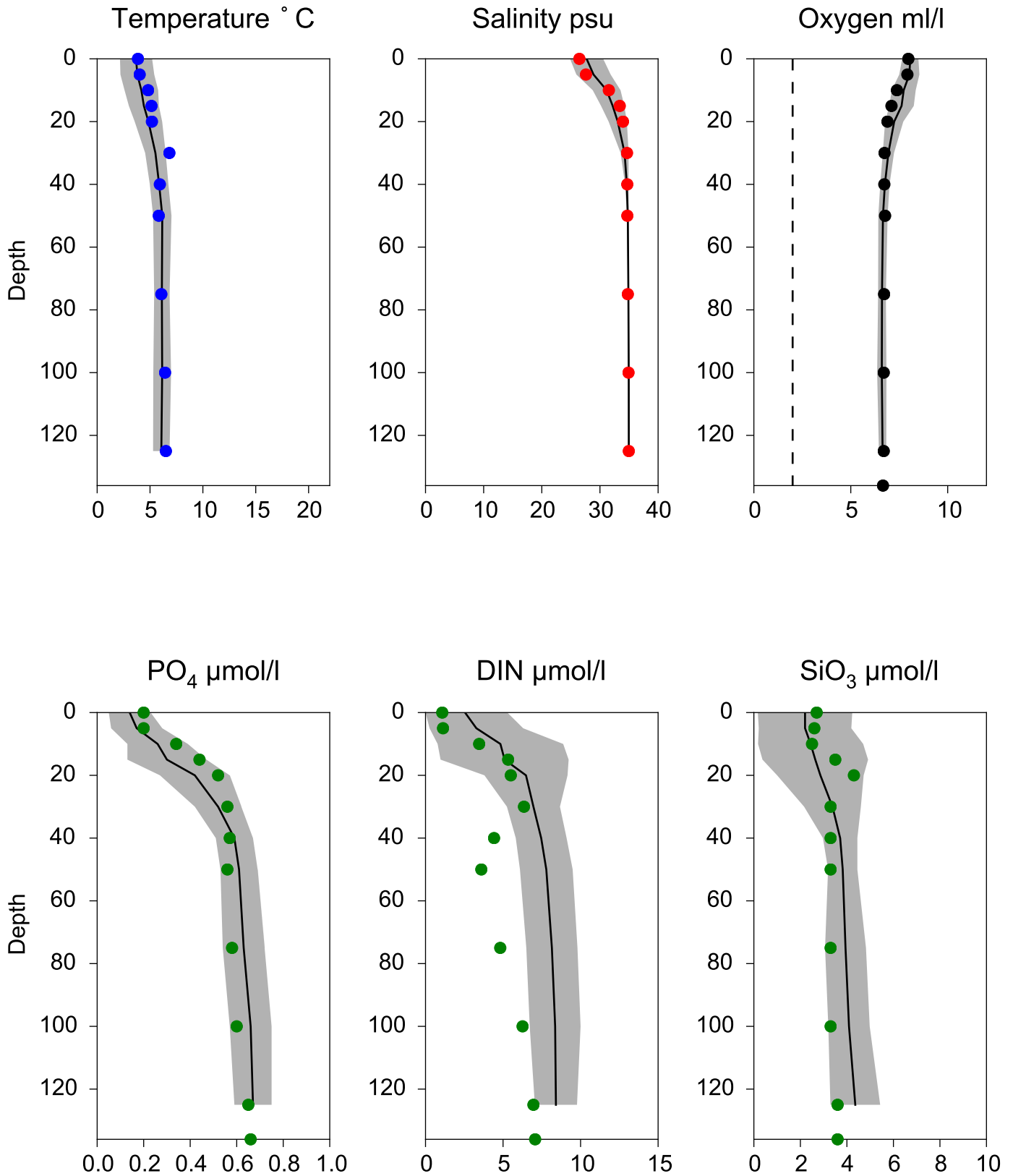


O₂ ml/l



Vertical profiles Å15 March

— Mean 2001-2015 St.Dev. • 2017-03-12



STATION Å13 SURFACE WATER (0-10 m)

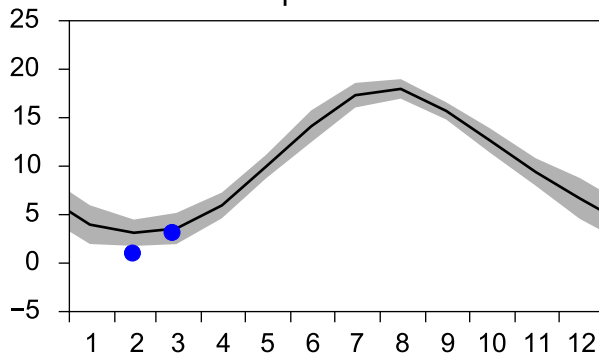
Annual Cycles

— Mean 2001-2015

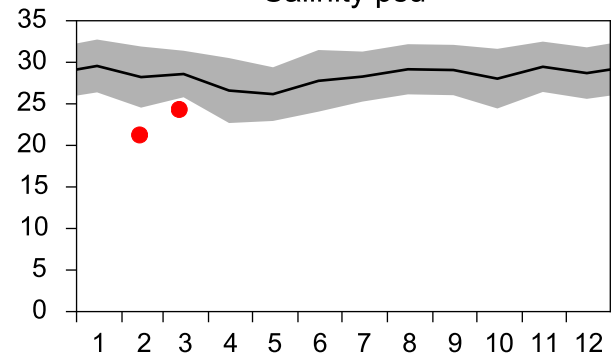
■ St.Dev.

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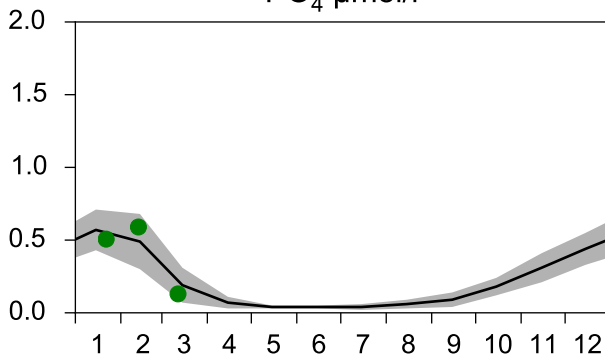
Temperature °C



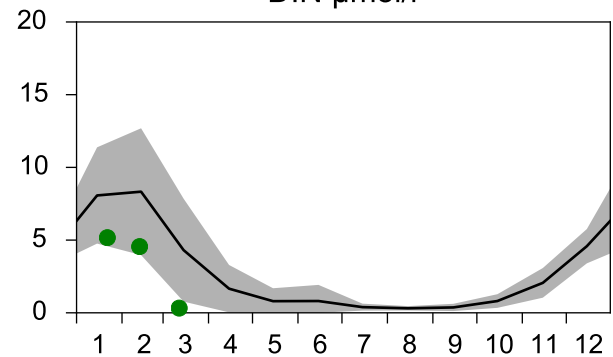
Salinity psu



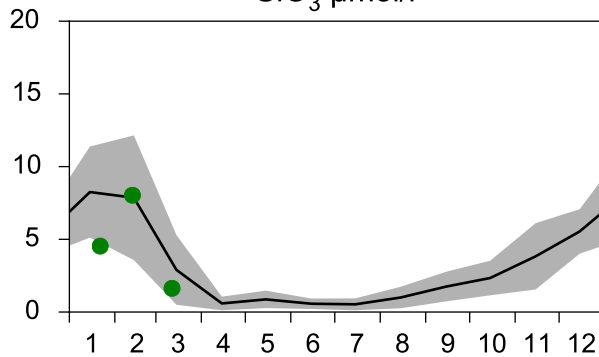
PO₄ µmol/l



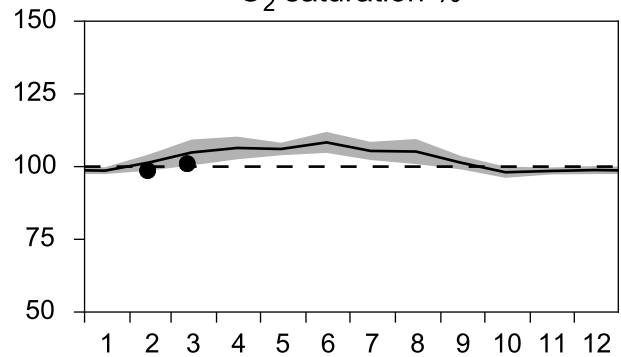
DIN µmol/l



SiO₃ µmol/l

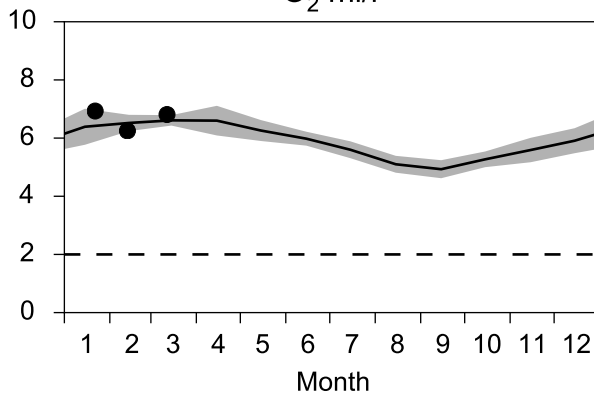


O₂ saturation %

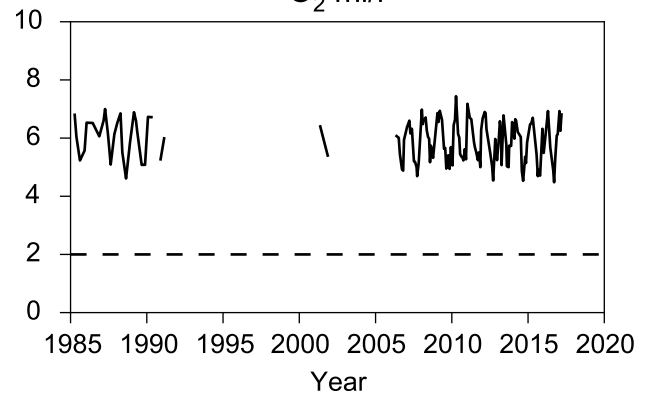


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

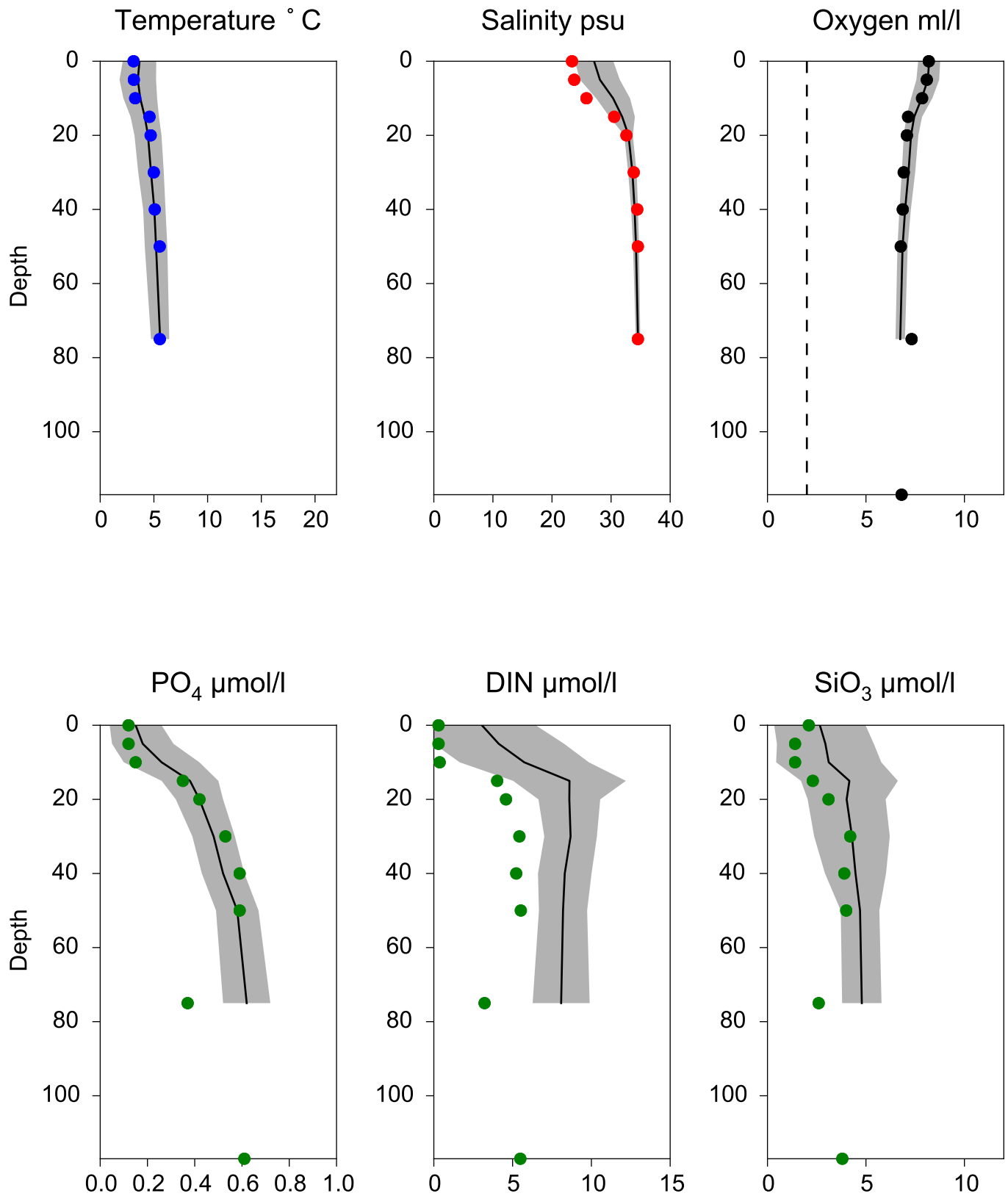


O₂ ml/l



Vertical profiles Å13 March

— Mean 2001-2015 St.Dev. • 2017-03-12



STATION SLÄGGÖ SURFACE WATER (0-10 m)

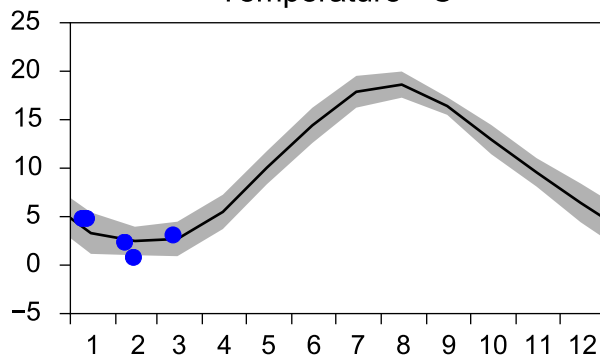
Annual Cycles

— Mean 2001-2015

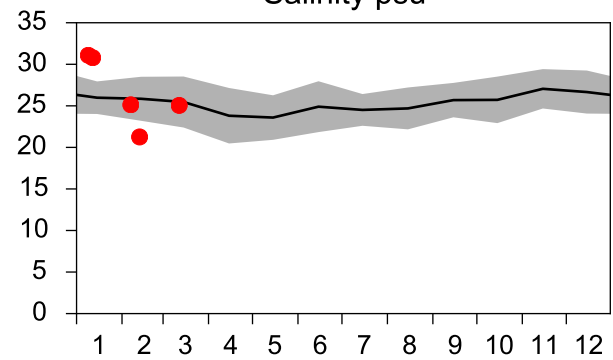
■ St.Dev.

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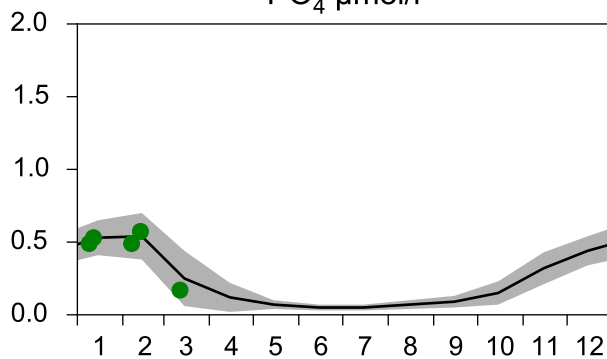
Temperature °C



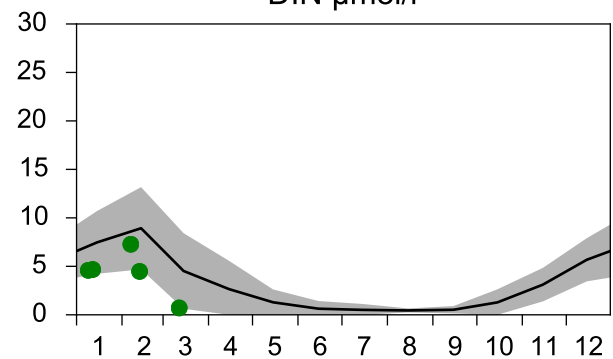
Salinity psu



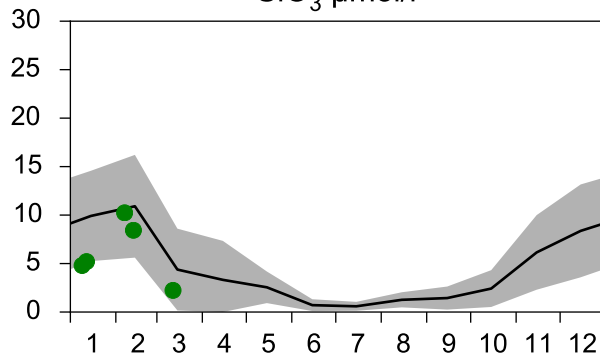
PO₄ µmol/l



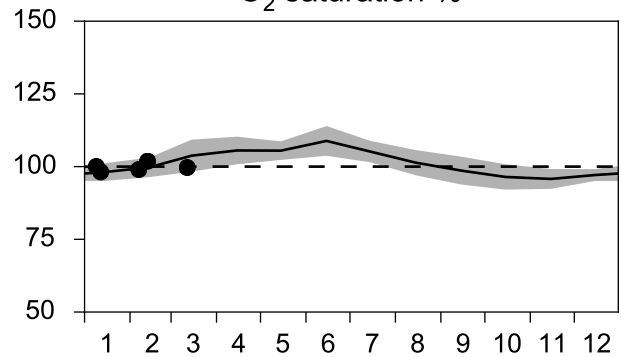
DIN µmol/l



SiO₃ µmol/l

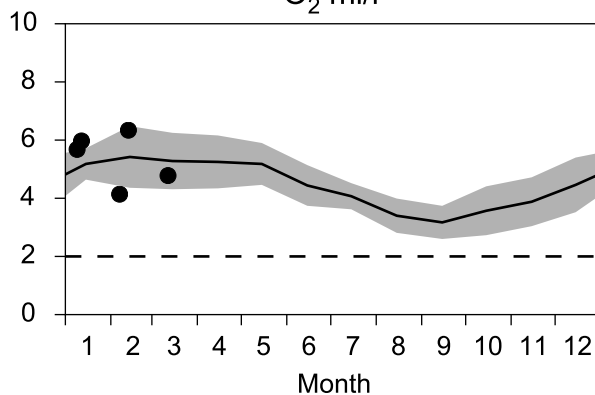


O₂ saturation %

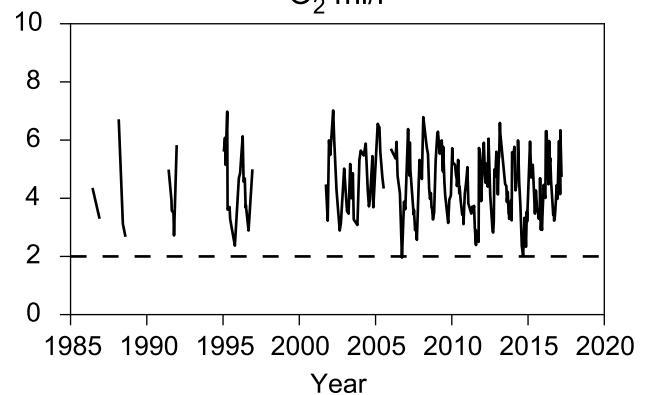


OXYGEN IN BOTTOM WATER (depth >= 64 m)

O₂ ml/l

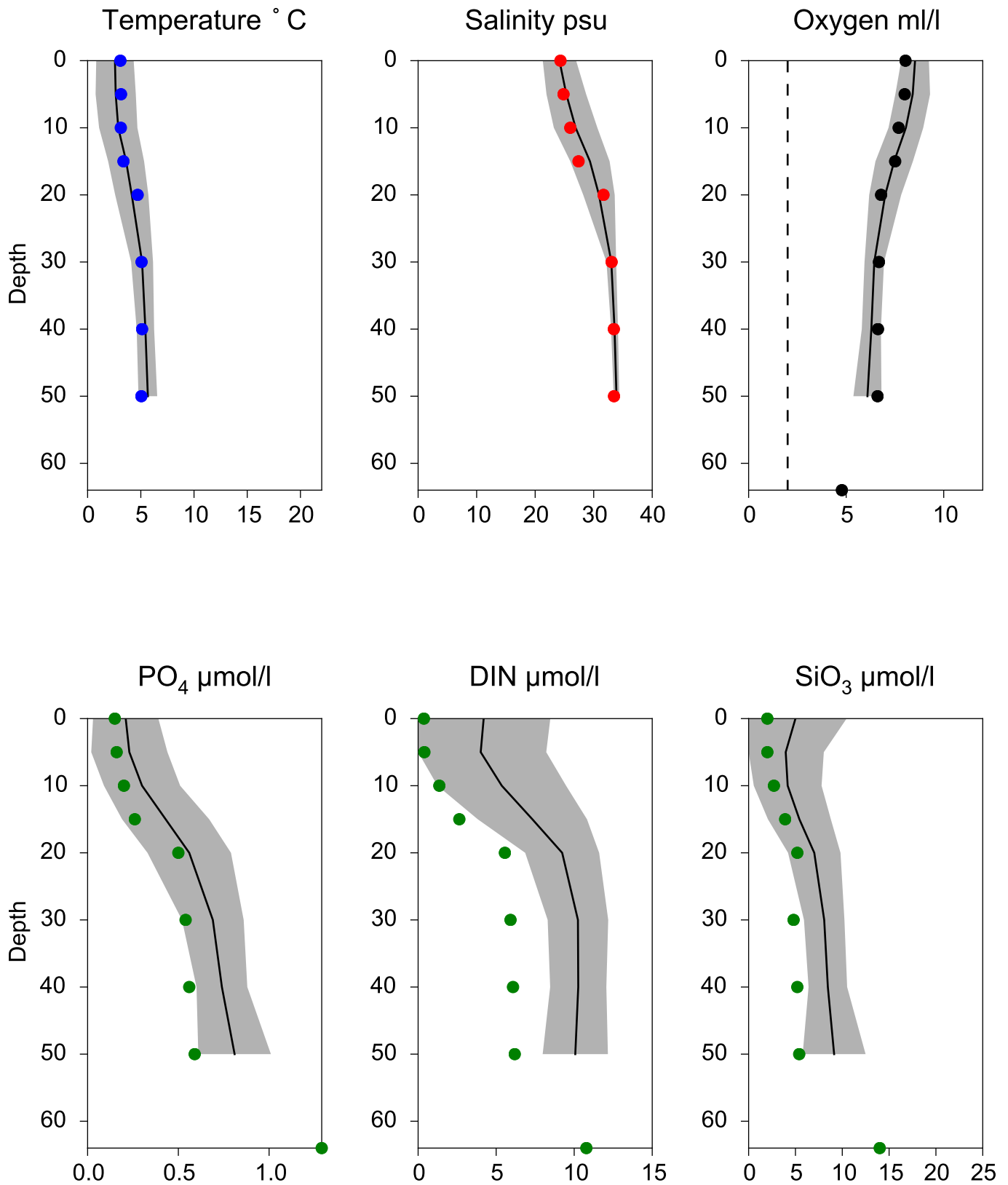


O₂ ml/l



Vertical profiles SLÄGGÖ March

— Mean 2001-2015 St.Dev. • 2017-03-12



STATION P2 SURFACE WATER (0-10 m)

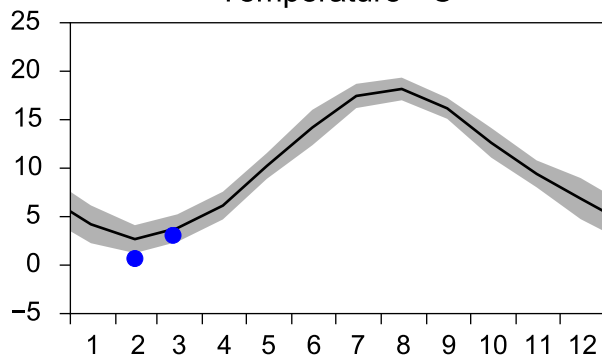
Annual Cycles

— Mean 2001-2015

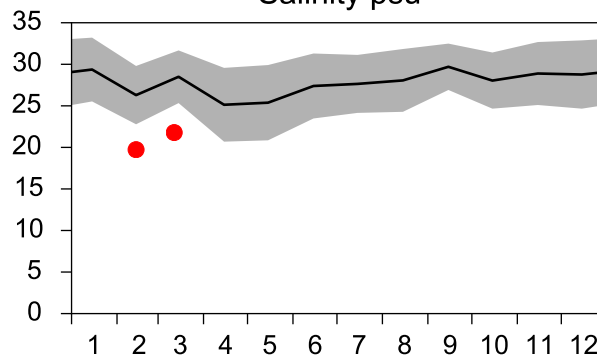
■ St.Dev.

● 2017

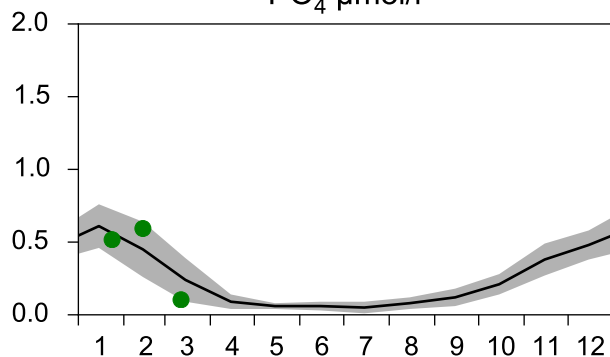
Temperature °C



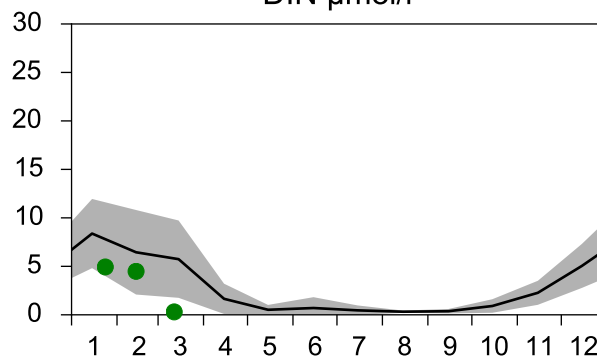
Salinity psu



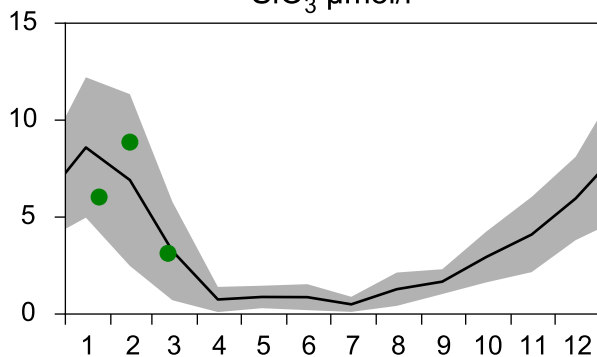
PO₄ µmol/l



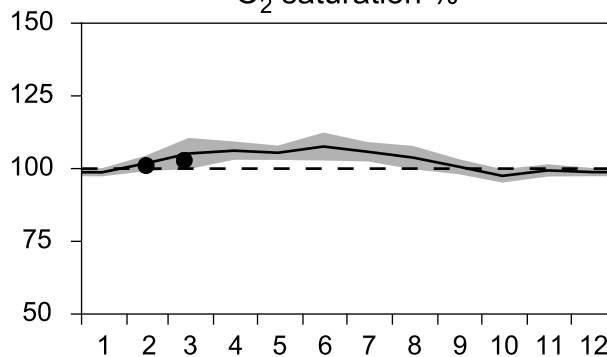
DIN µmol/l



SiO₃ µmol/l

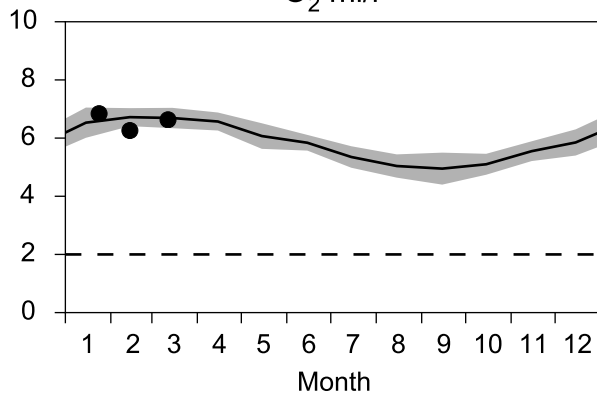


O₂ saturation %

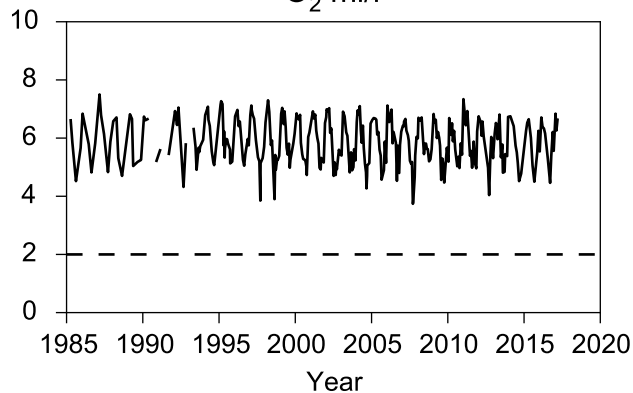


OXYGEN IN BOTTOM WATER (depth >= 75 m)

O₂ ml/l

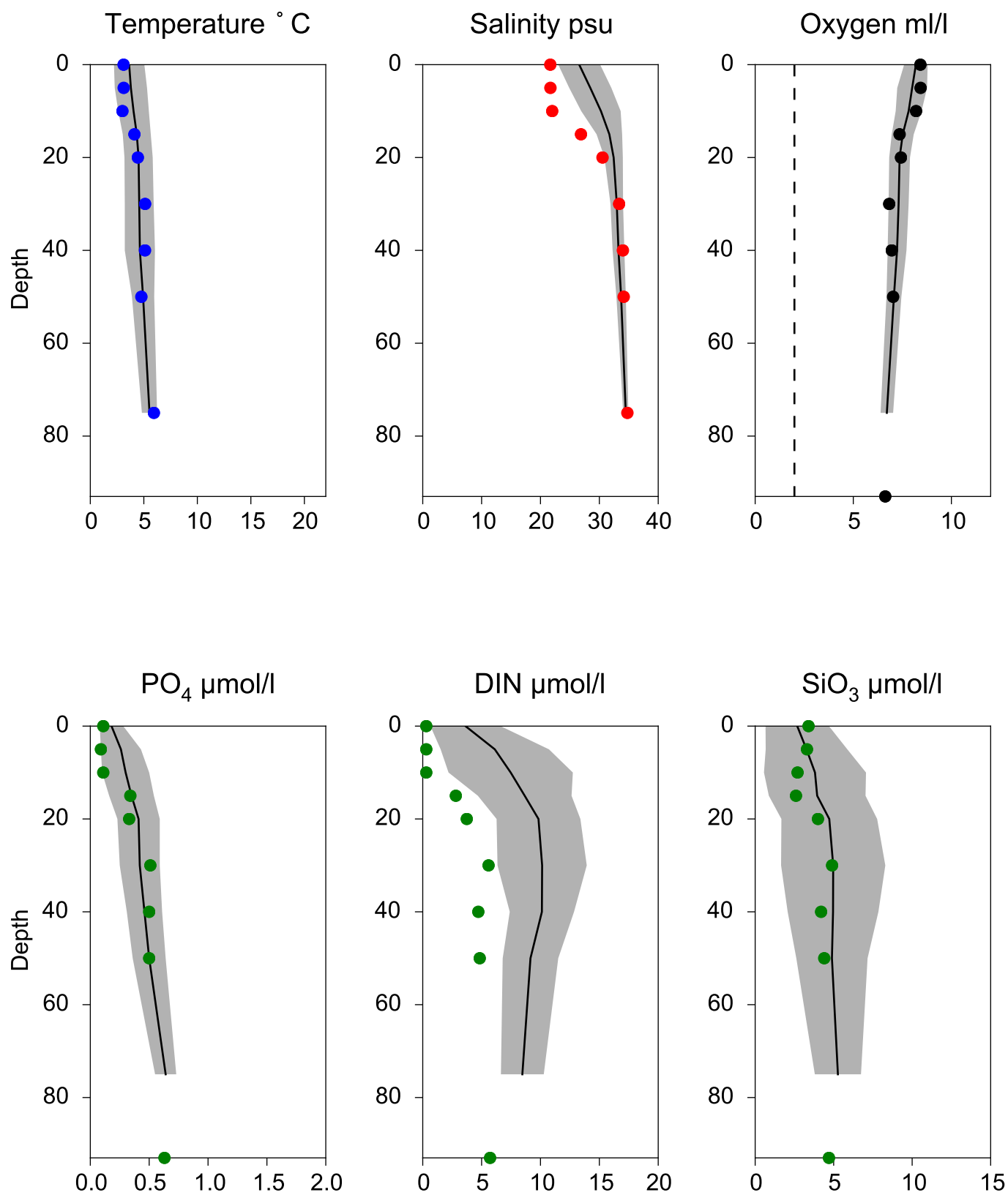


O₂ ml/l



Vertical profiles P2 March

— Mean 2001-2015 St.Dev. • 2017-03-12



STATION N14 FALKENBERG SURFACE WATER (0-10 m)

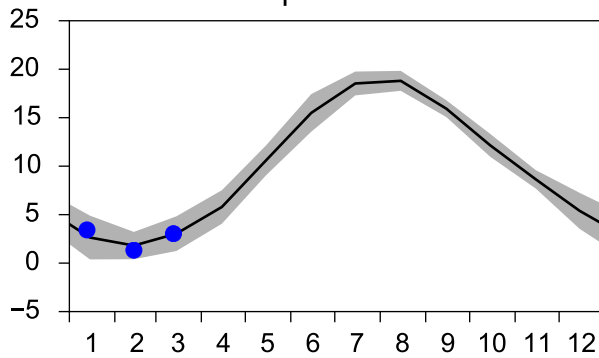
Annual Cycles

— Mean 2001-2015

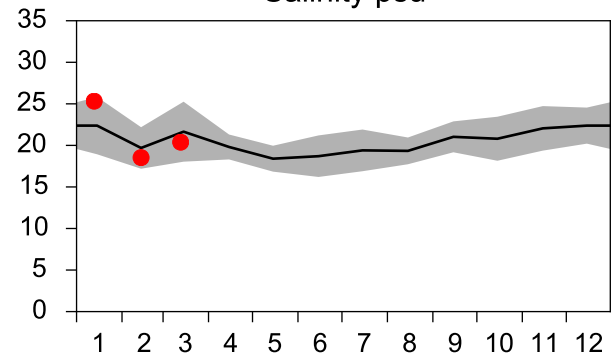
■ St.Dev.

● 2017

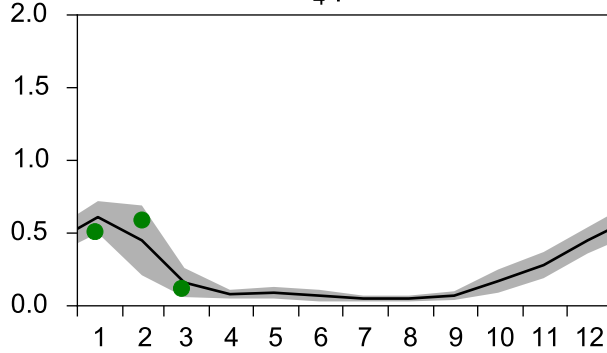
Temperature °C



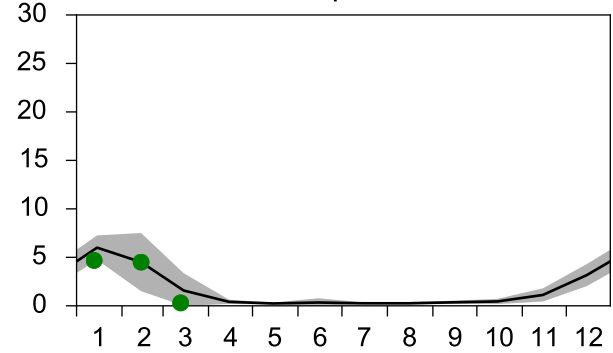
Salinity psu



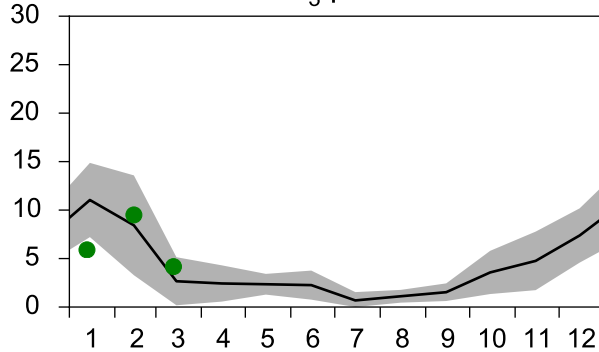
PO₄ µmol/l



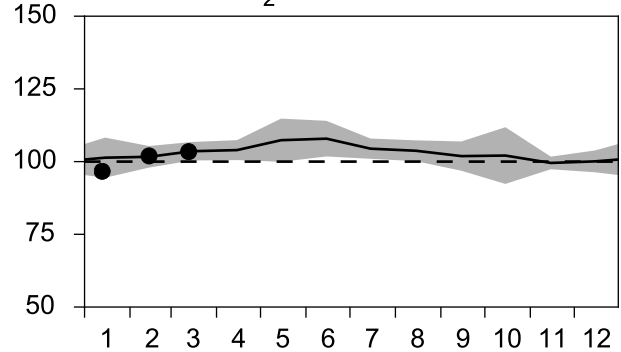
DIN µmol/l



SiO₃ µmol/l

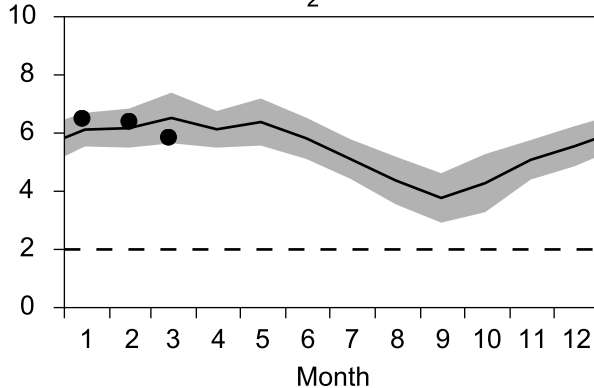


O₂ saturation %

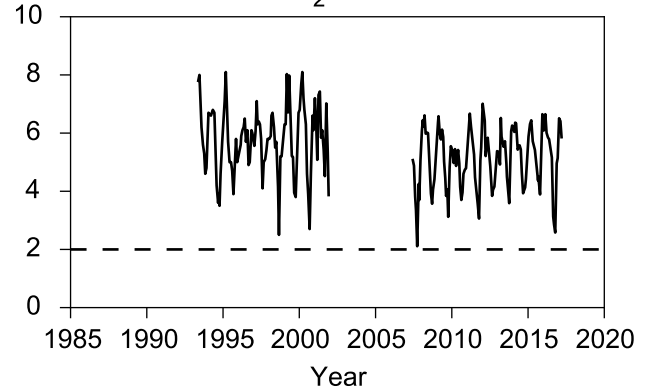


OXYGEN IN BOTTOM WATER (depth >= 25 m)

O₂ ml/l

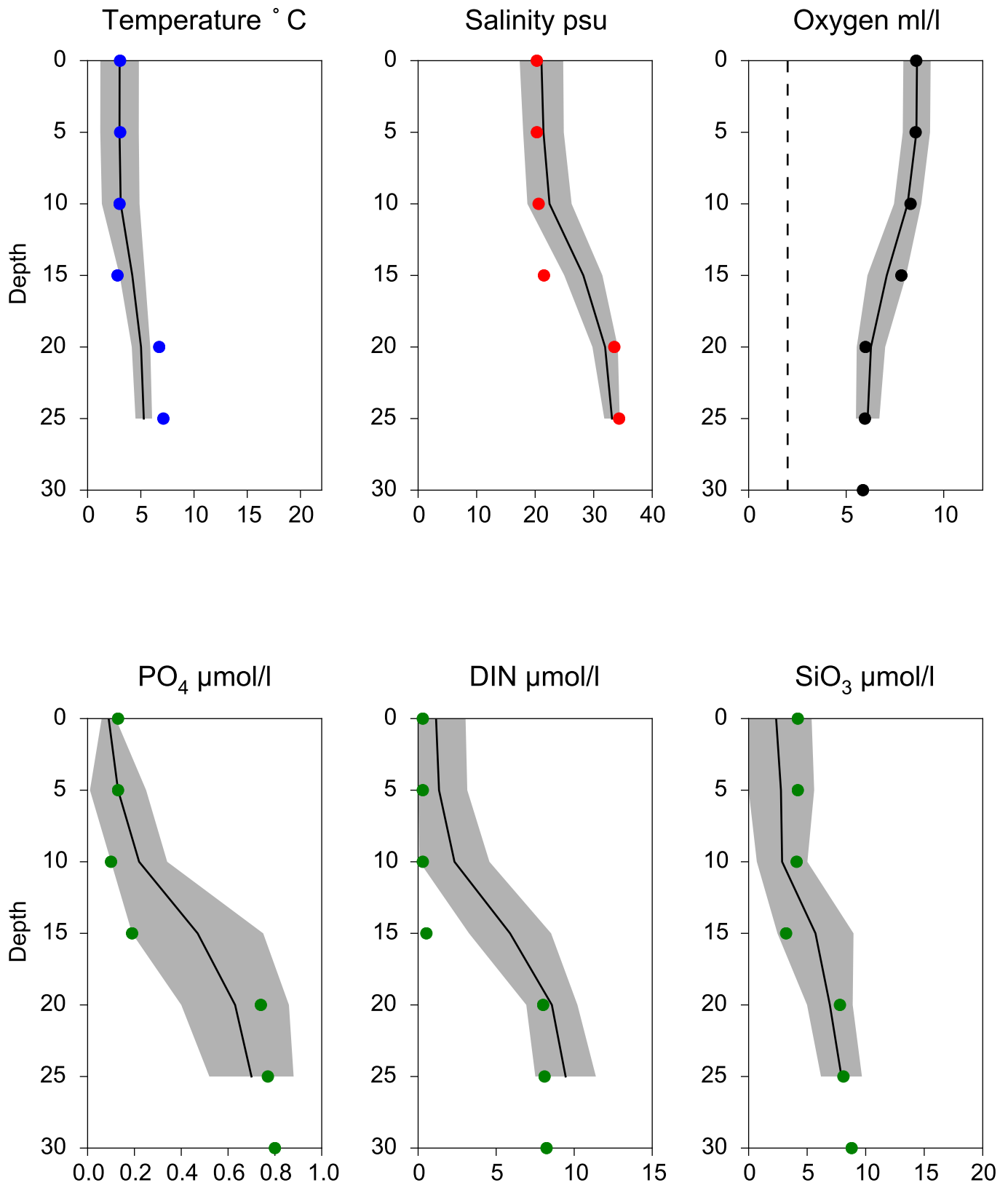


O₂ ml/l



Vertical profiles N14 FALKENBERG March

— Mean 2001-2015 St.Dev. • 2017-03-13



STATION ANHOLT E SURFACE WATER (0-10 m)

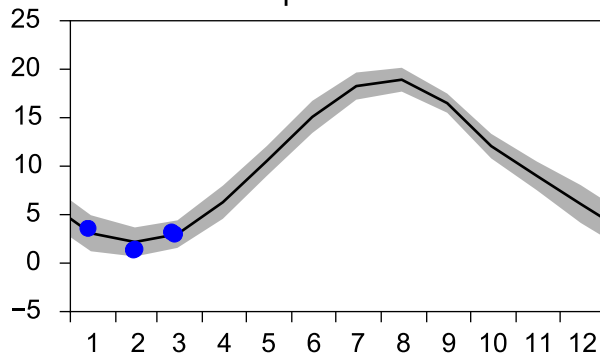
Annual Cycles

— Mean 2001-2015

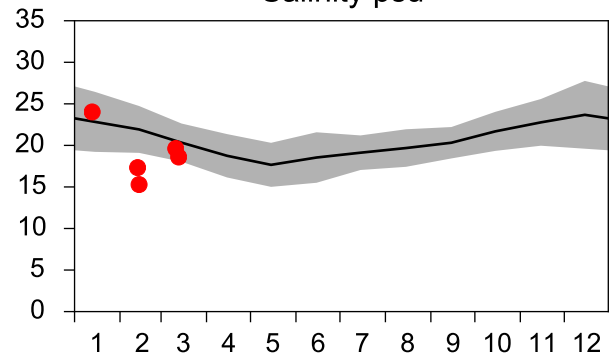
■ St.Dev.

● 2017

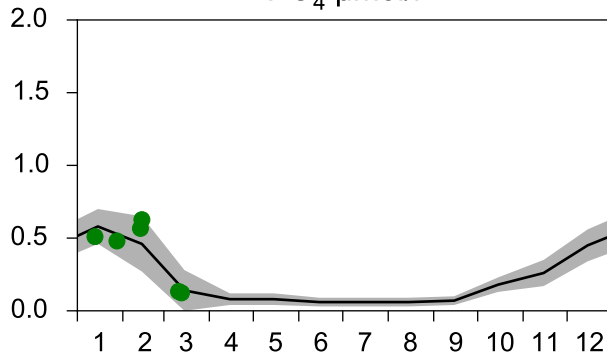
Temperature °C



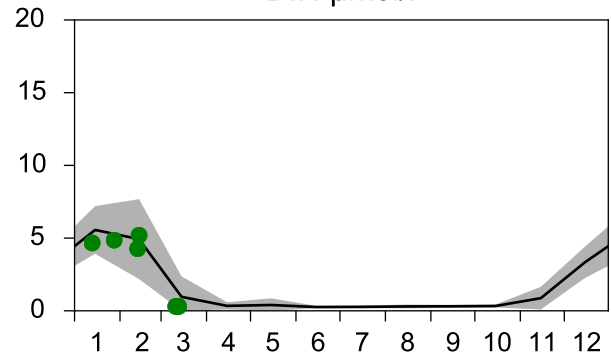
Salinity psu



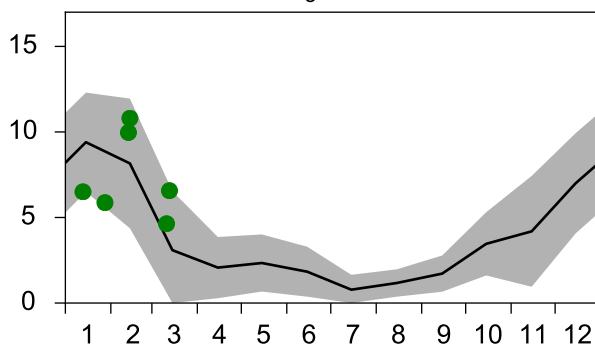
PO₄ µmol/l



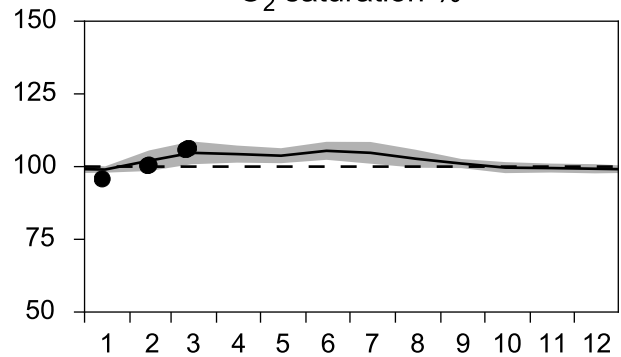
DIN µmol/l



SiO₃ µmol/l

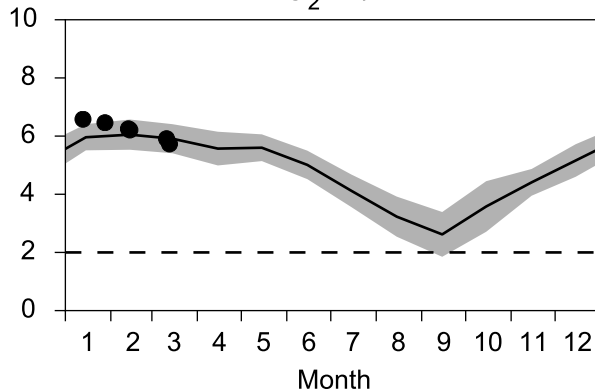


O₂ saturation %

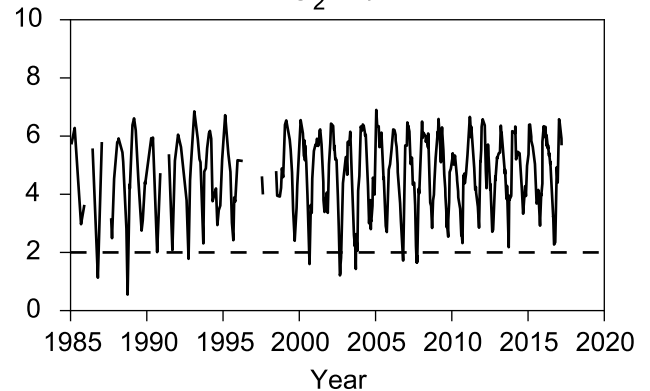


OXYGEN IN BOTTOM WATER (depth >= 52 m)

O₂ ml/l

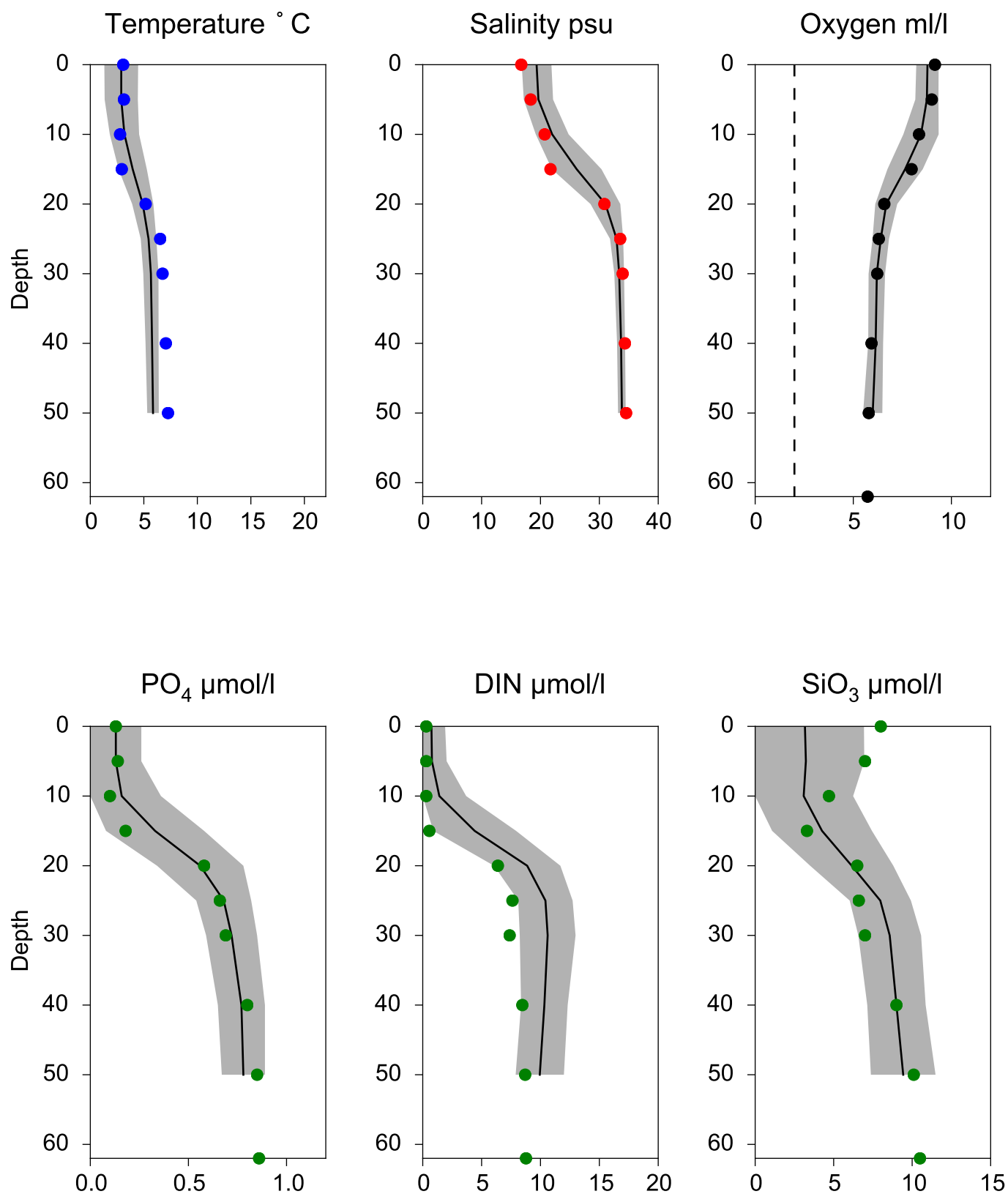


O₂ ml/l



Vertical profiles ANHOLT E March

— Mean 2001-2015 St.Dev. • 2017-03-13



STATION BY1 SURFACE WATER (0-10 m)

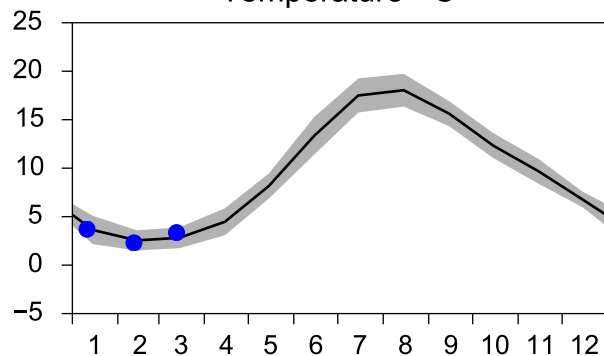
Annual Cycles

— Mean 2001-2015

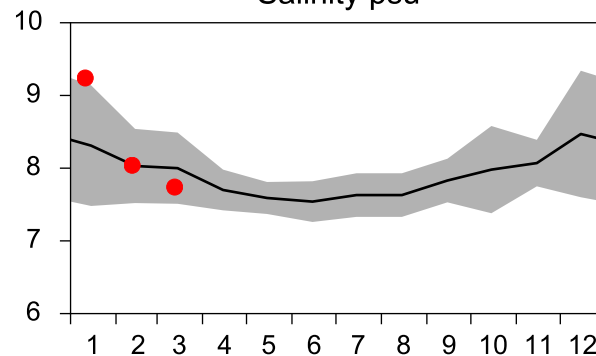
■ St.Dev.

● 2017

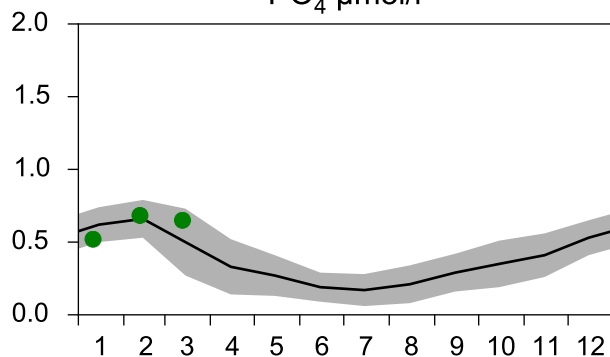
Temperature °C



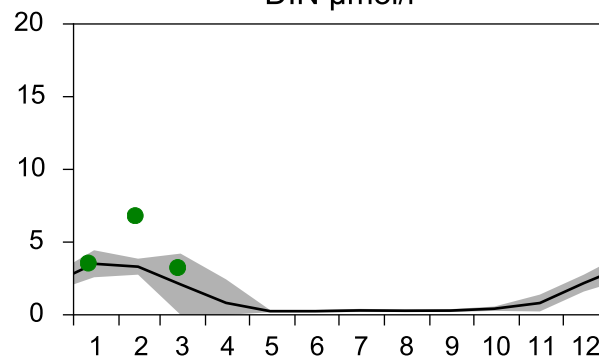
Salinity psu



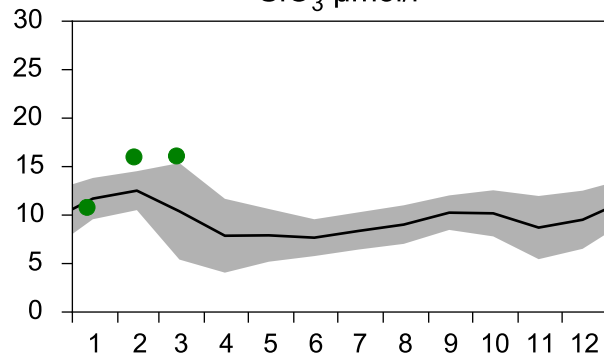
PO₄ µmol/l



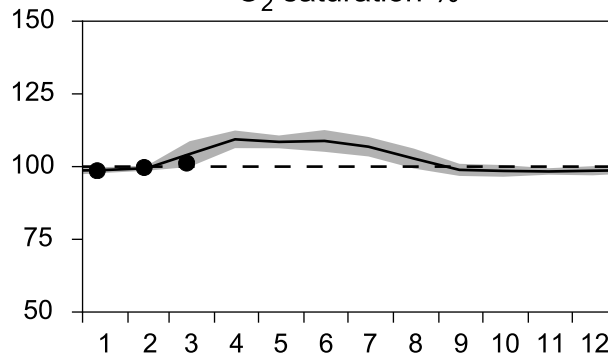
DIN µmol/l



SiO₃ µmol/l

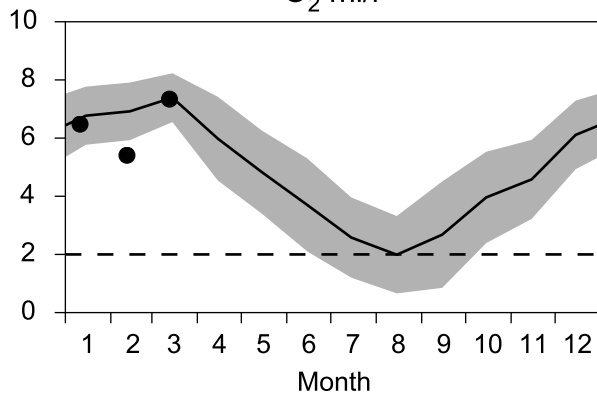


O₂ saturation %

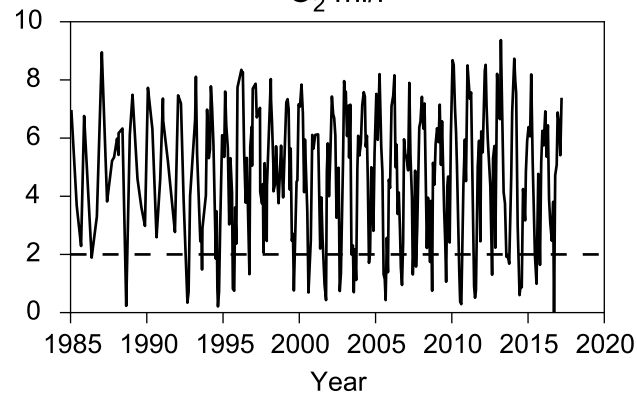


OXYGEN IN BOTTOM WATER (depth ≥ 40 m)

O₂ ml/l

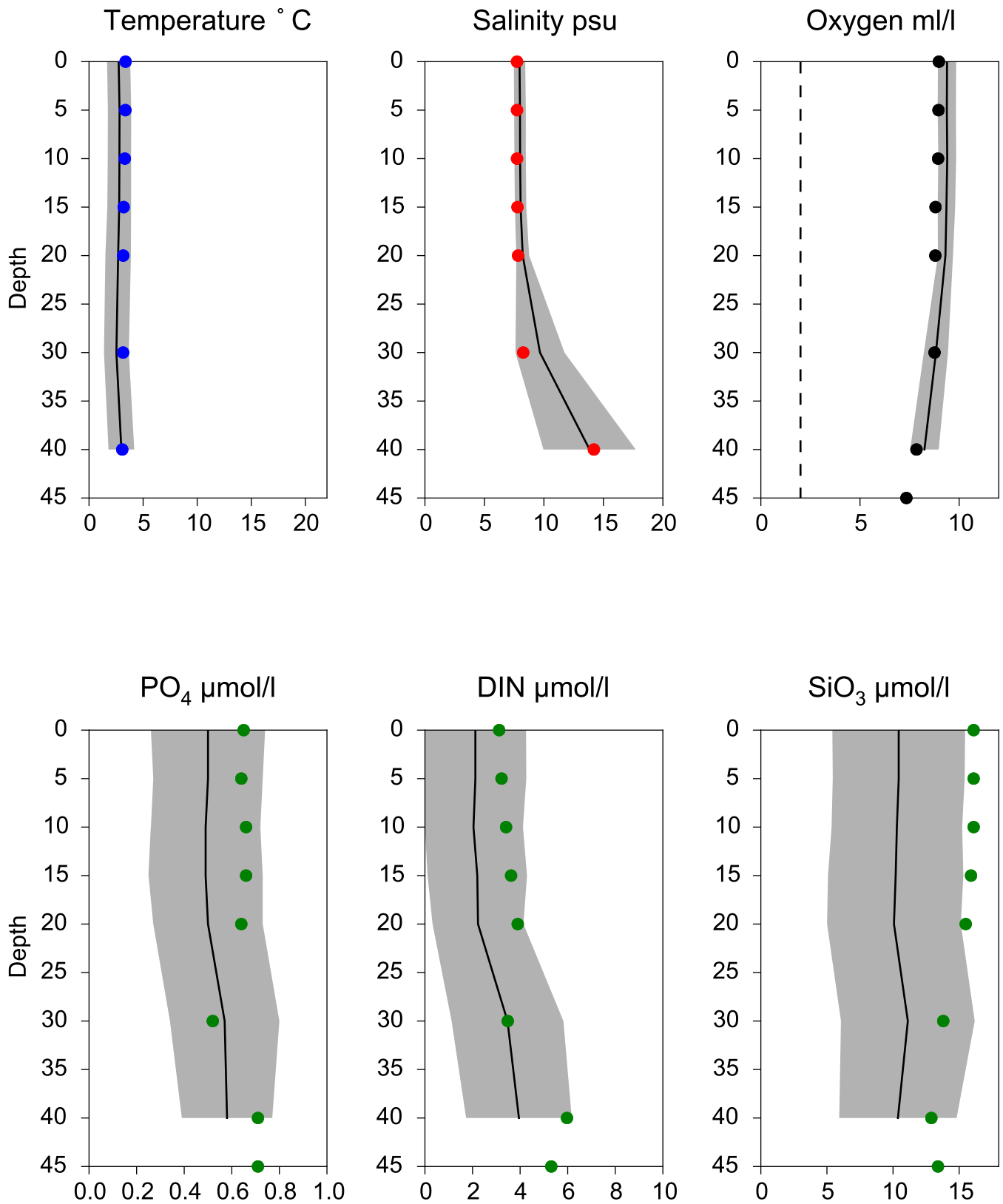


O₂ ml/l



Vertical profiles BY1 March

— Mean 2001-2015 St.Dev. • 2017-03-13



STATION BY2 ARKONA SURFACE WATER (0-10 m)

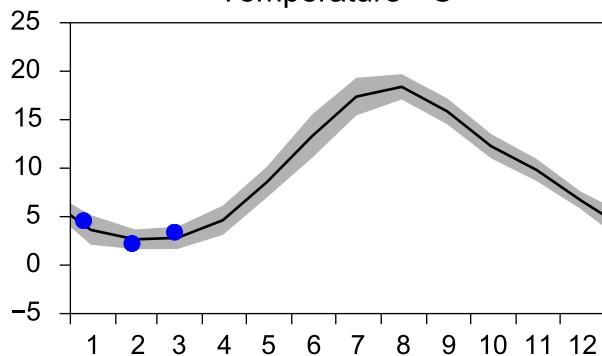
Annual Cycles

— Mean 2001-2015

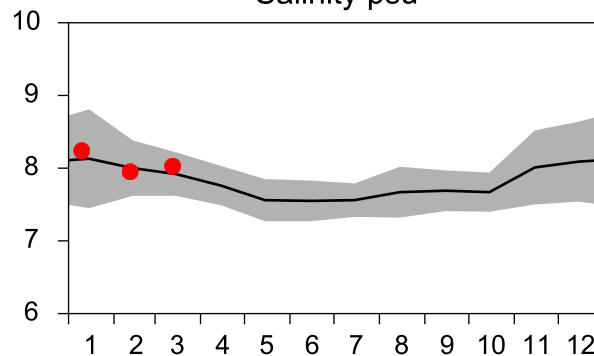
■ St.Dev.

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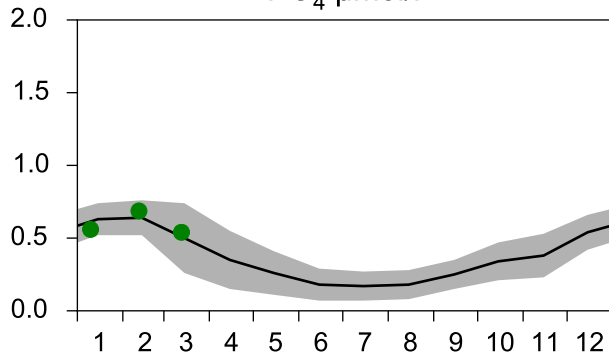
Temperature °C



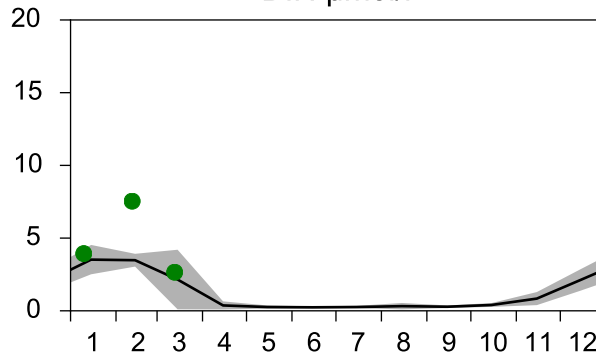
Salinity psu



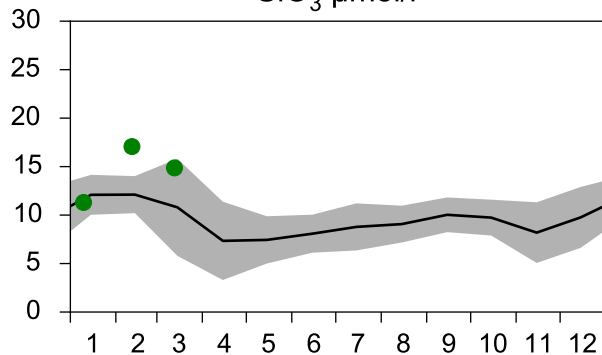
PO₄ µmol/l



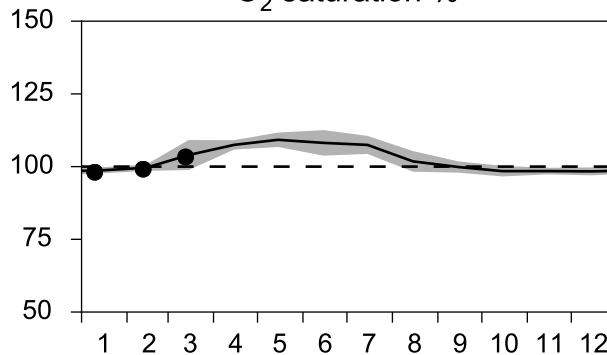
DIN µmol/l



SiO₃ µmol/l

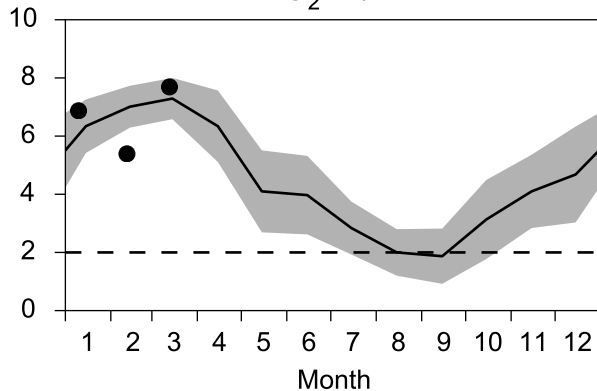


O₂ saturation %

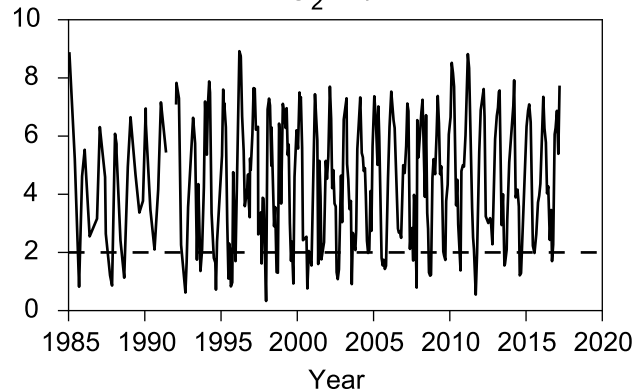


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

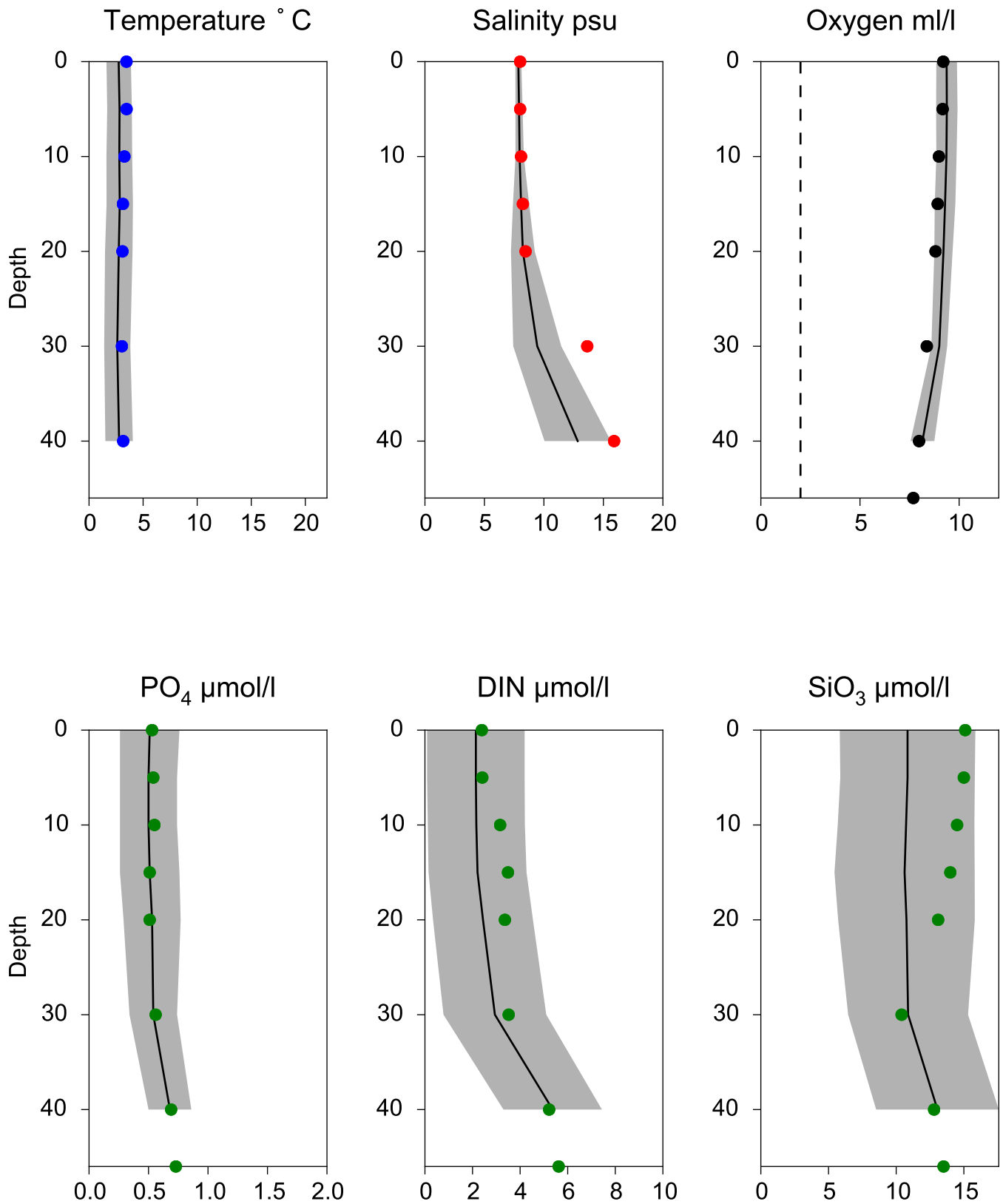


O₂ ml/l



Vertical profiles BY2 ARKONA March

— Mean 2001-2015 St.Dev. • 2017-03-13



STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

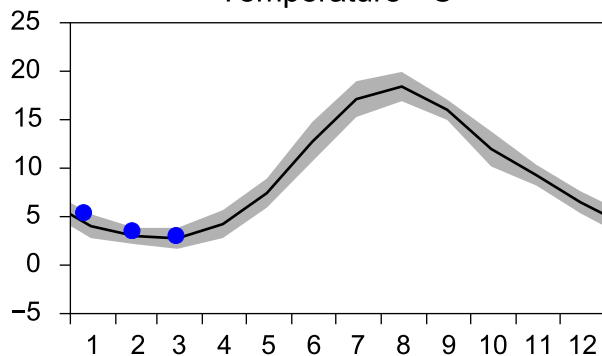
Annual Cycles

— Mean 2001-2015

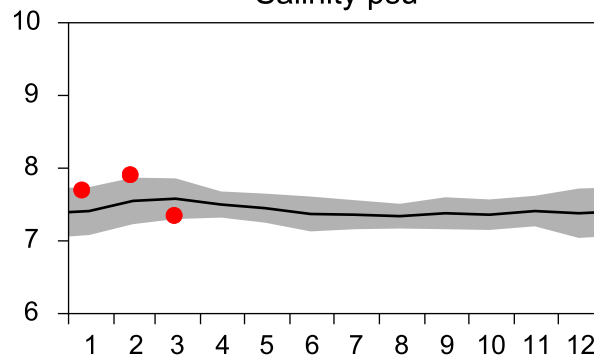
■ St.Dev.

● 2017

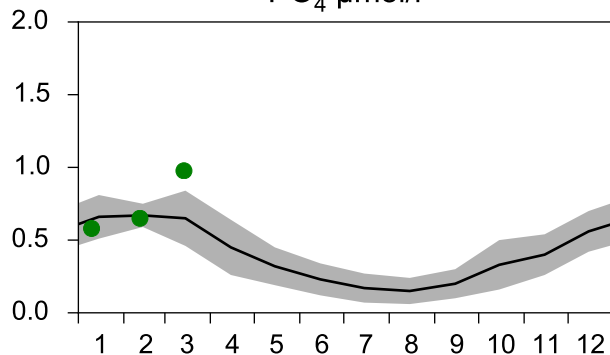
Temperature °C



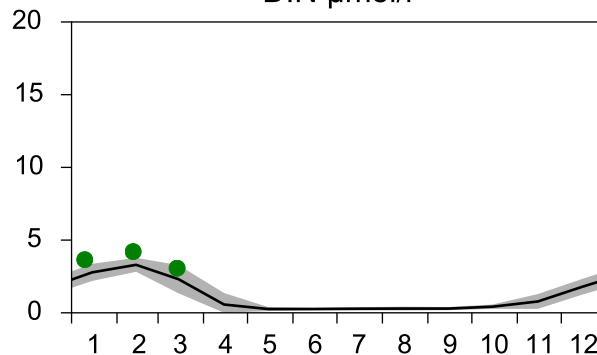
Salinity psu



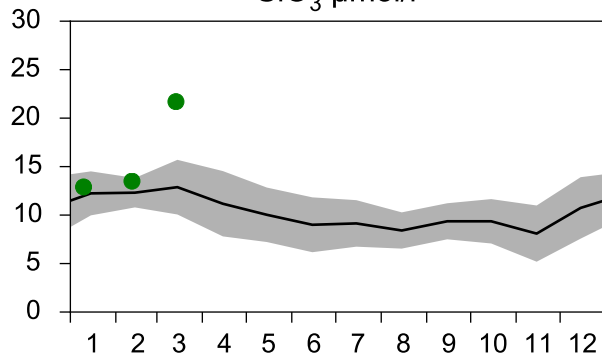
PO₄ µmol/l



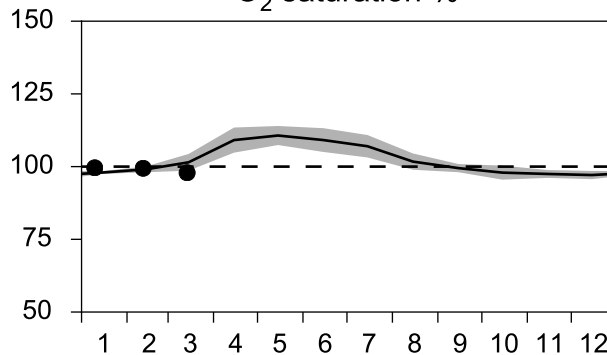
DIN µmol/l



SiO₃ µmol/l

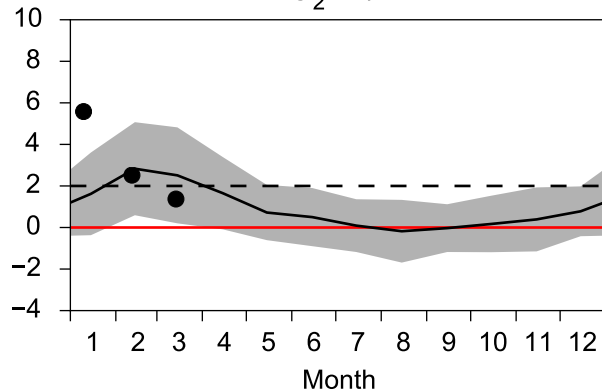


O₂ saturation %

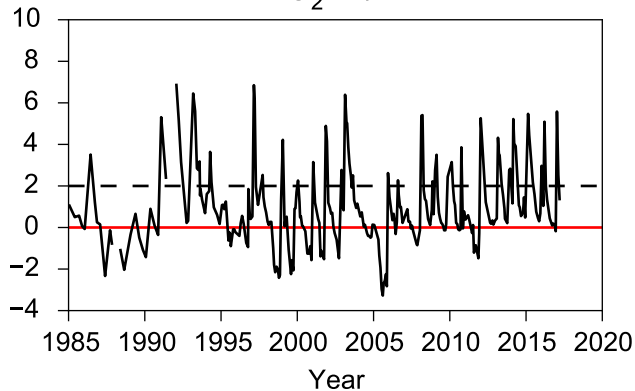


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

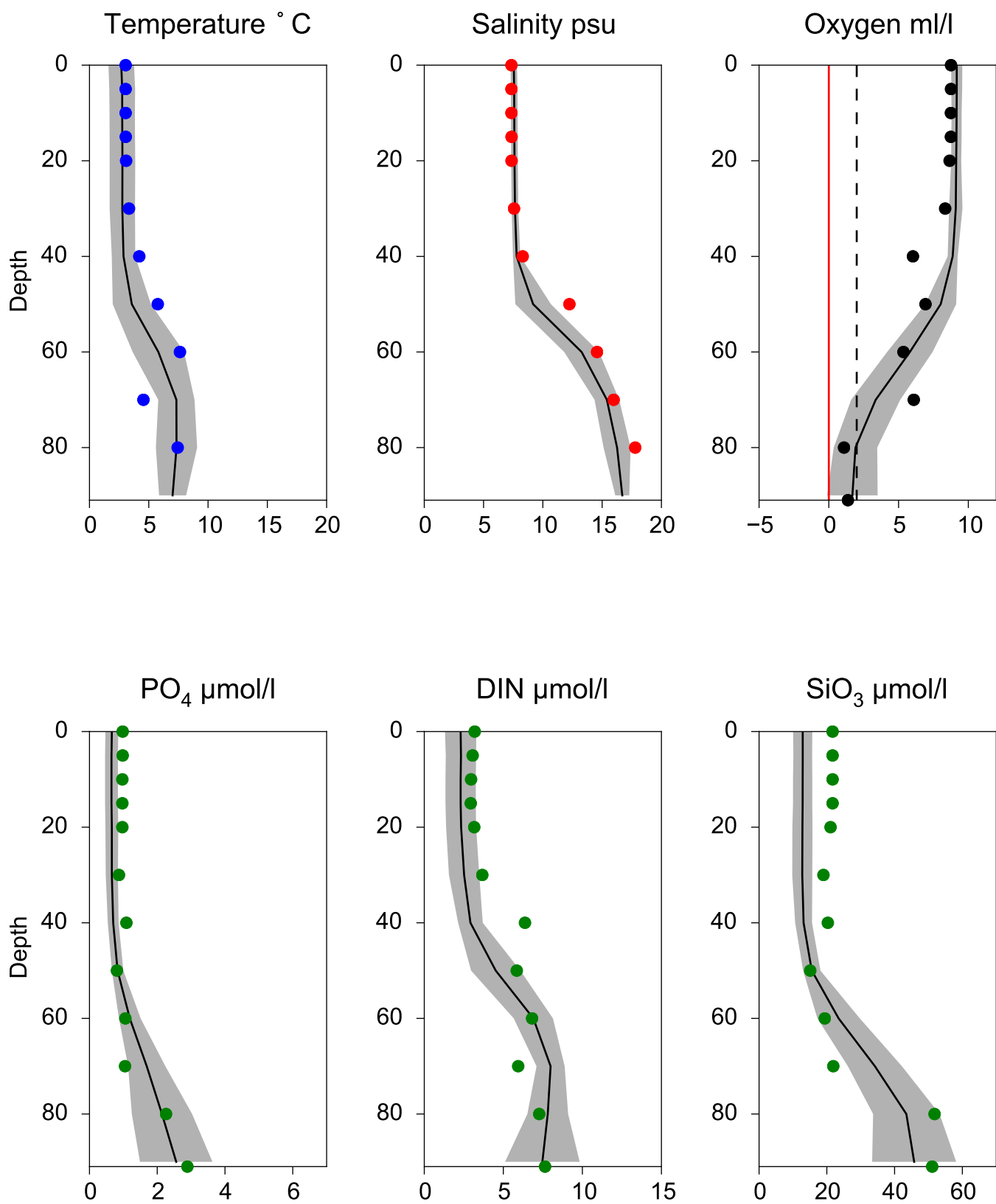


O₂ ml/l



Vertical profiles BY4 CHRISTIANSÖ March

— Mean 2001-2015 St.Dev. • 2017-03-14



STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)

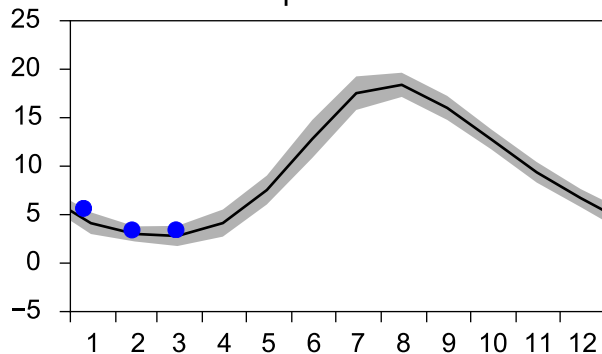
Annual Cycles

— Mean 2001-2015

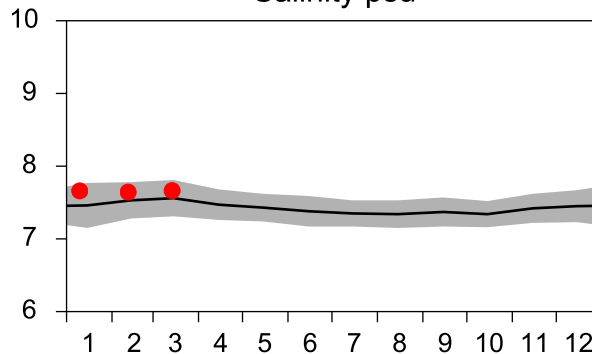
■ St.Dev.

● 2017

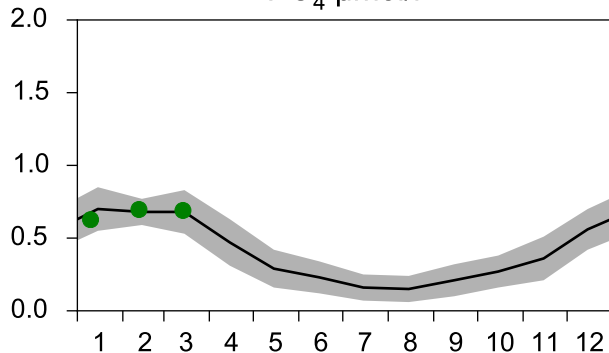
Temperature °C



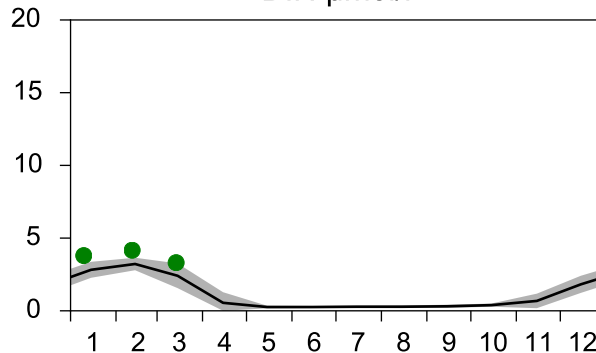
Salinity psu



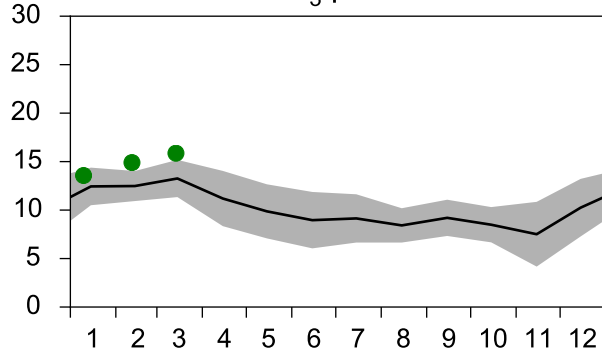
PO₄ µmol/l



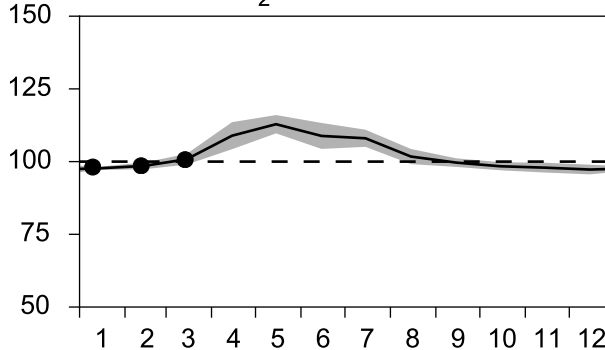
DIN µmol/l



SiO₃ µmol/l

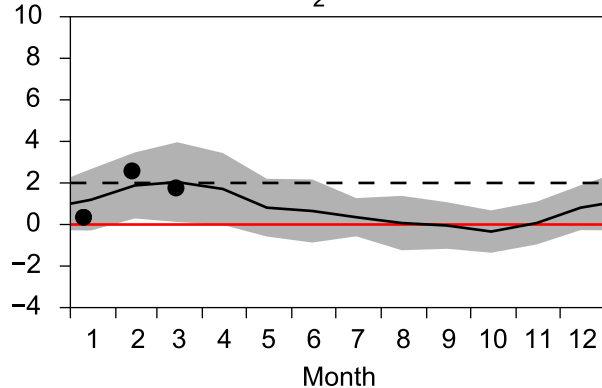


O₂ saturation %

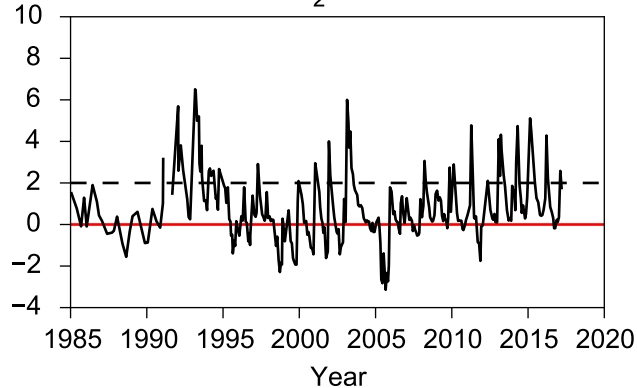


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

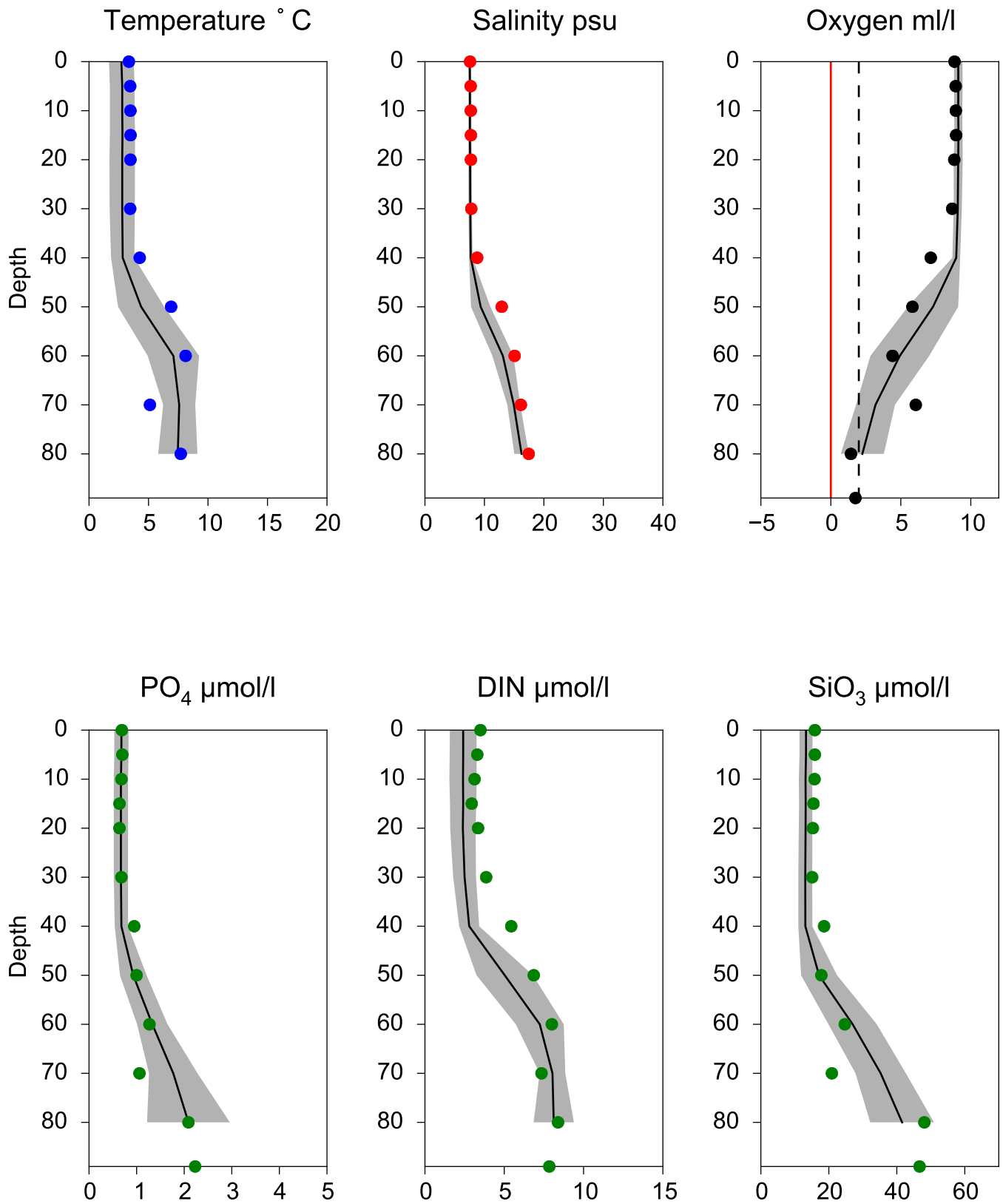


O₂ ml/l



Vertical profiles BY5 BORNHOLMSDJ March

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



STATION BY10 SURFACE WATER (0-10 m)

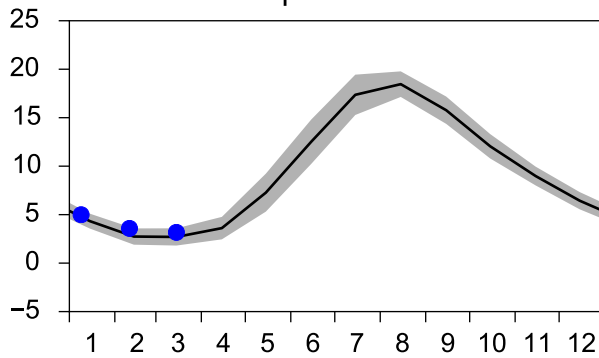
Annual Cycles

— Mean 2001-2015

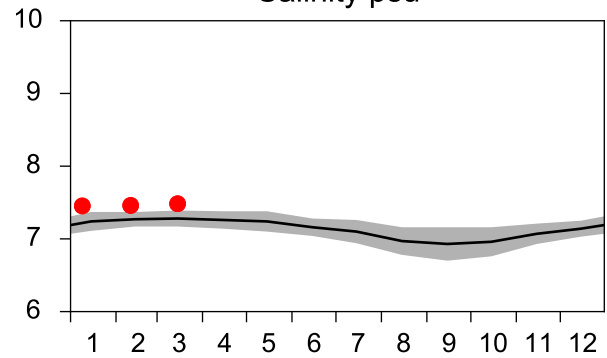
■ St.Dev.

● 2017

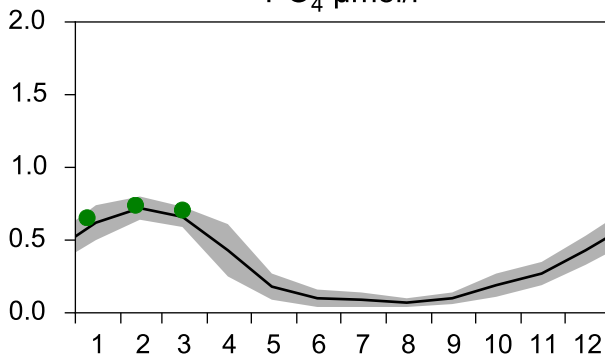
Temperature °C



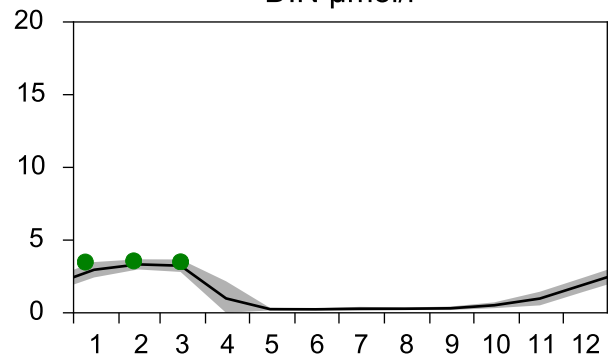
Salinity psu



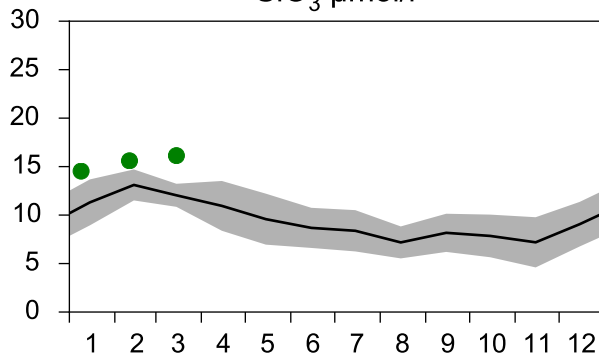
PO₄ μmol/l



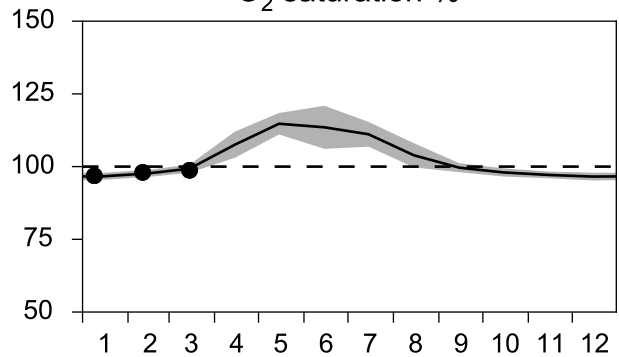
DIN μmol/l



SiO₃ μmol/l

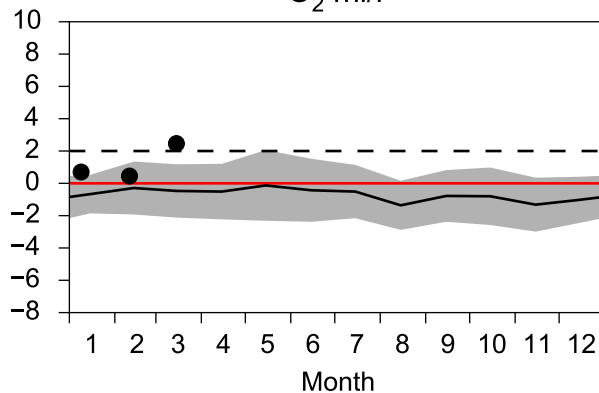


O₂ saturation %

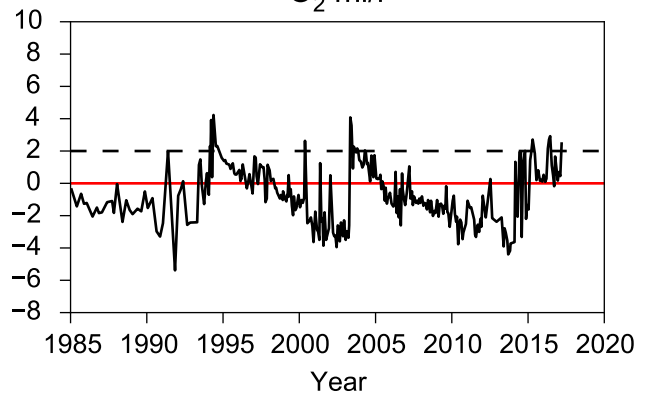


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

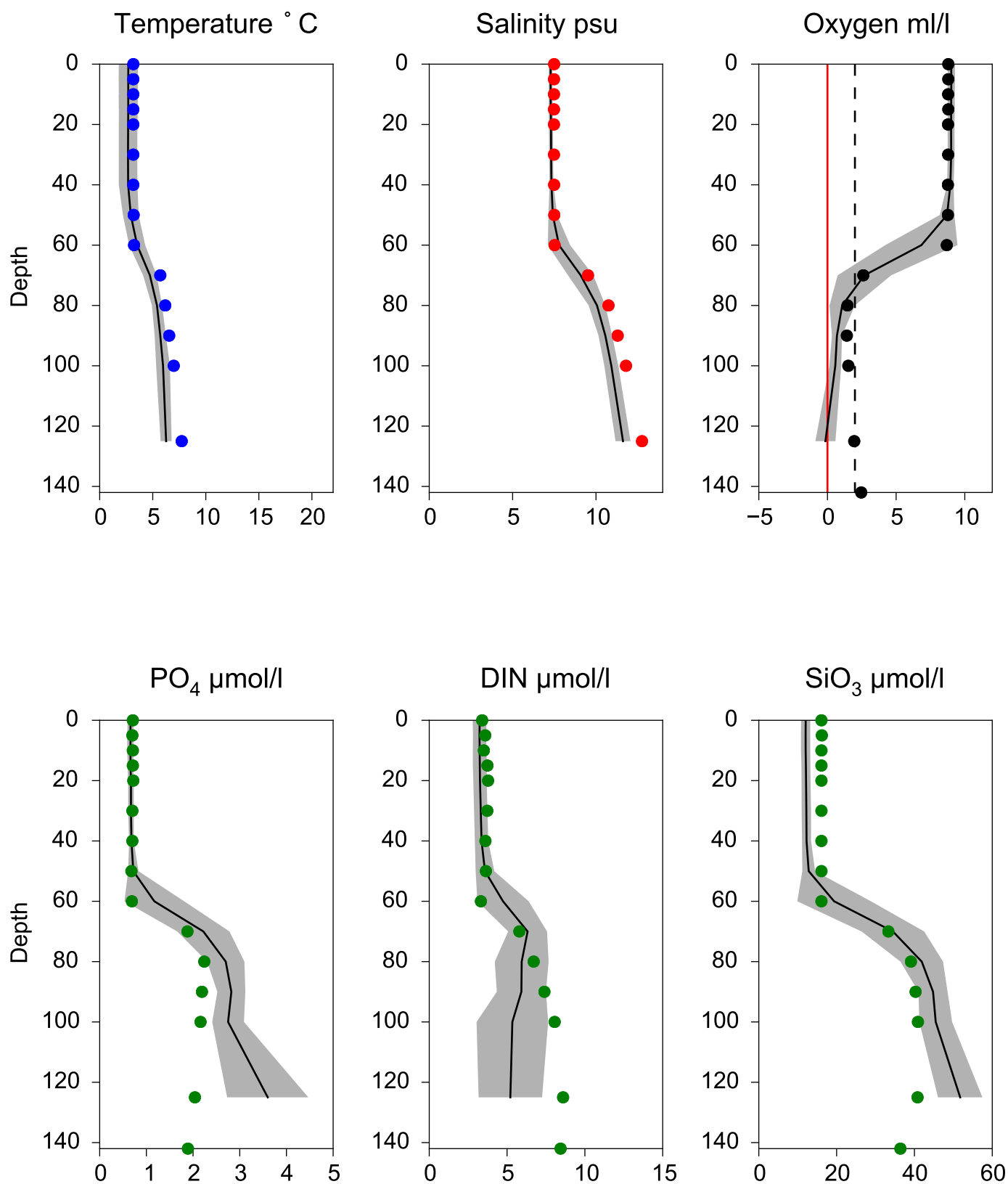


O₂ ml/l



Vertical profiles BY10 March

— Mean 2001-2015 St.Dev. • 2017-03-15



STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

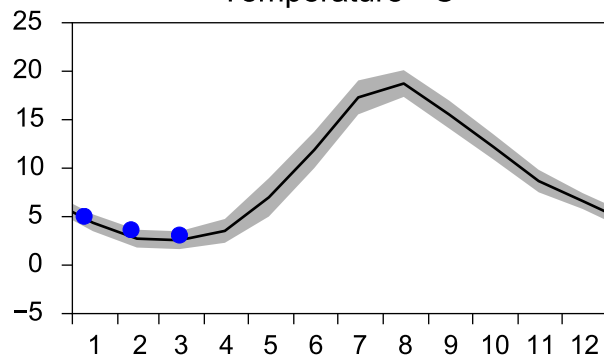
Annual Cycles

— Mean 2001-2015

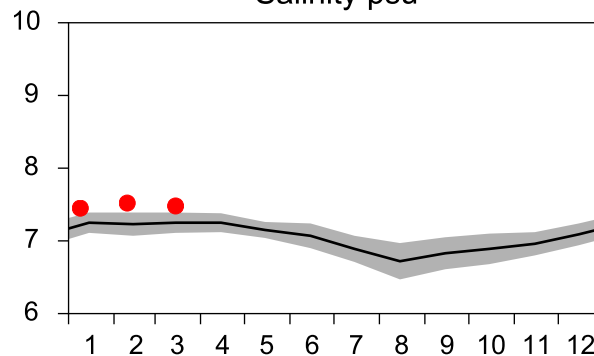
■ St.Dev.

● 2017

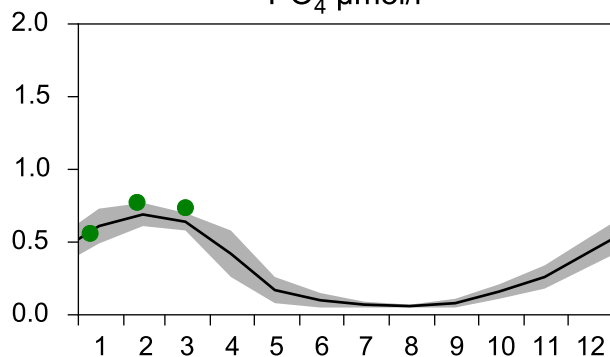
Temperature °C



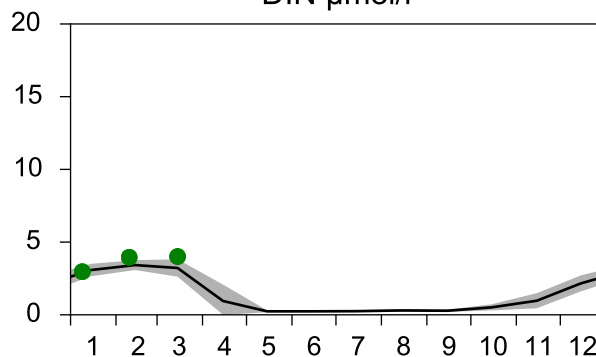
Salinity psu



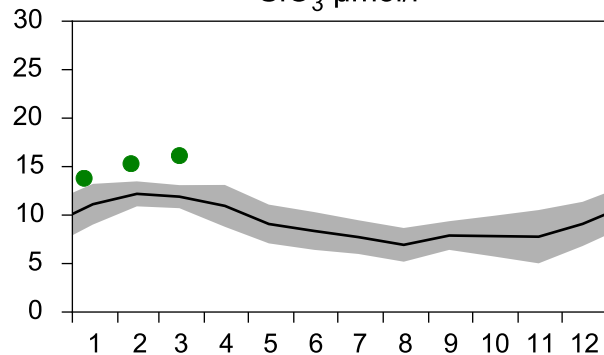
PO₄ µmol/l



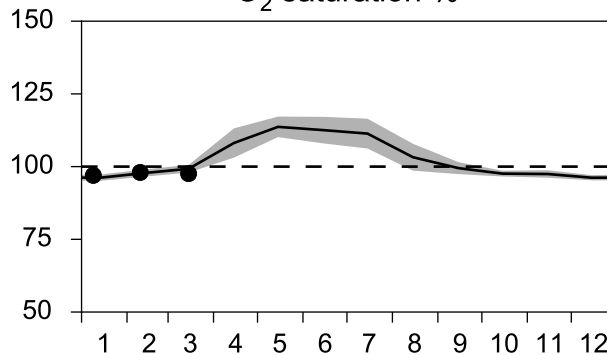
DIN µmol/l



SiO₃ µmol/l

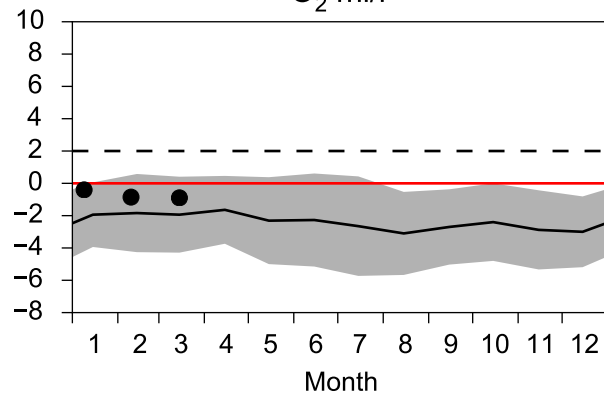


O₂ saturation %

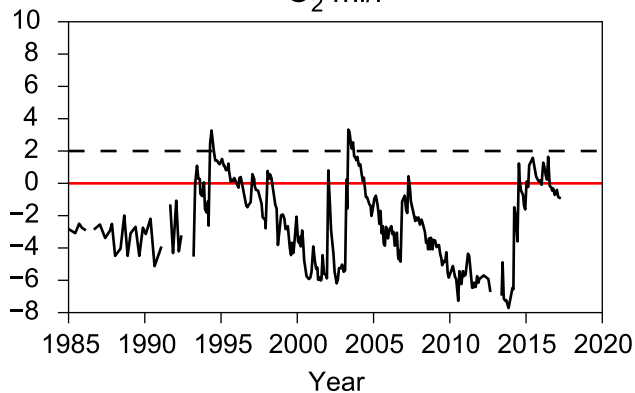


OXYGEN IN BOTTOM WATER (depth >= 225 m)

O₂ ml/l

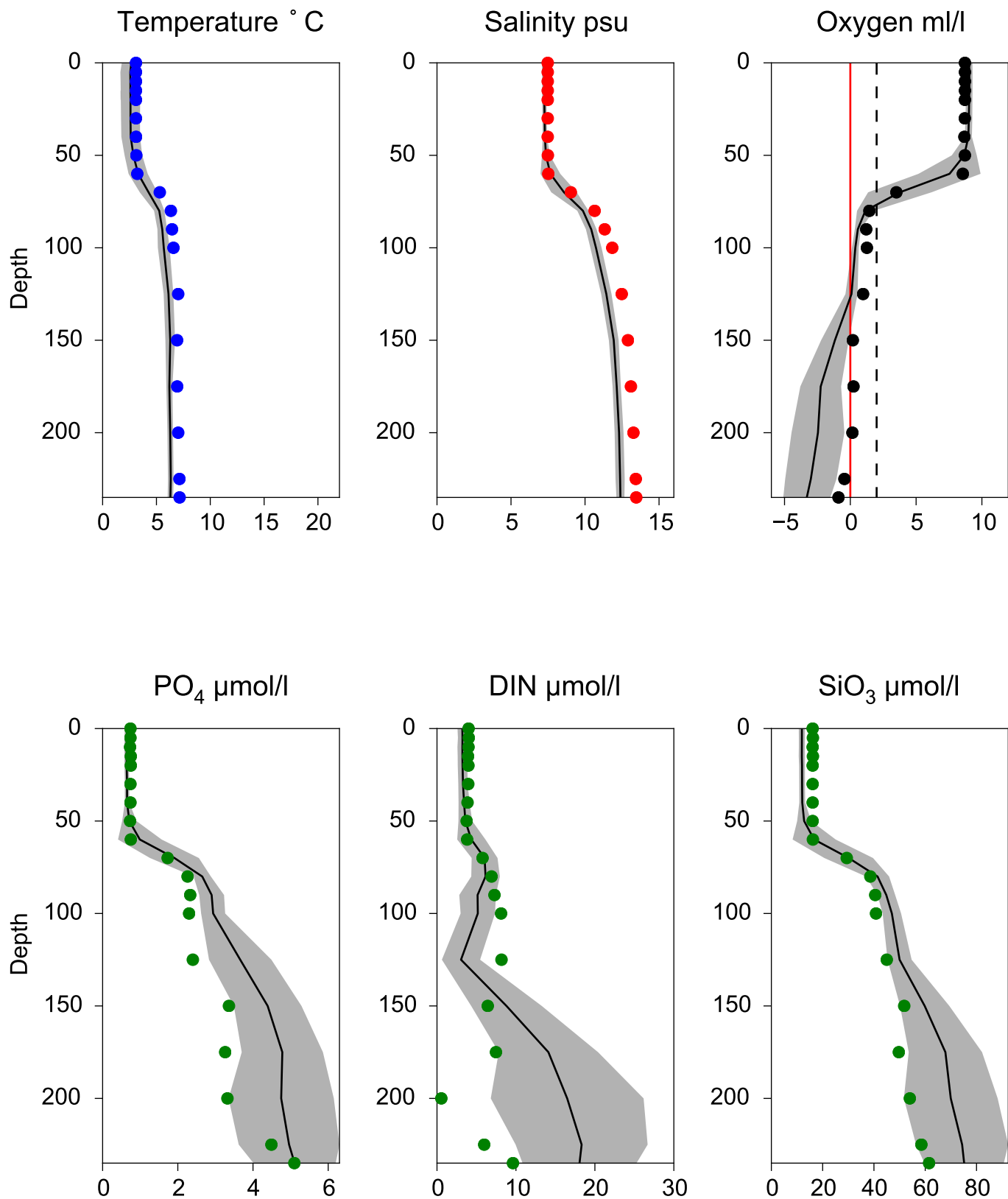


O₂ ml/l



Vertical profiles BY15 GOTLANDSDJ March

— Mean 2001-2015 St.Dev. • 2017-03-15



STATION BY20 FÅRÖDJ SURFACE WATER (0-10 m)

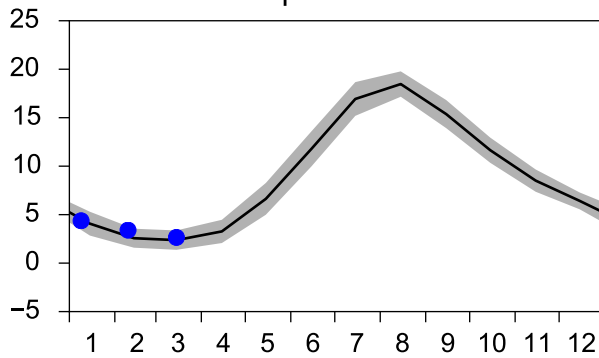
Annual Cycles

— Mean 2001-2015

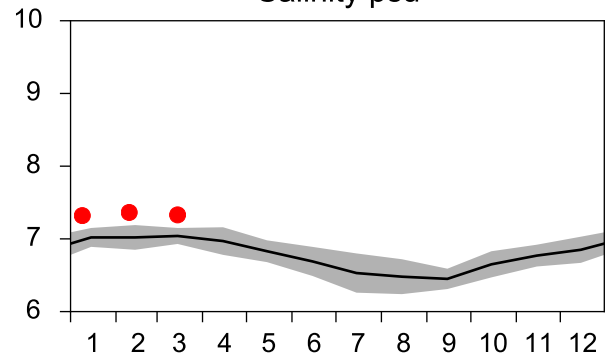
■ St.Dev.

● 2017

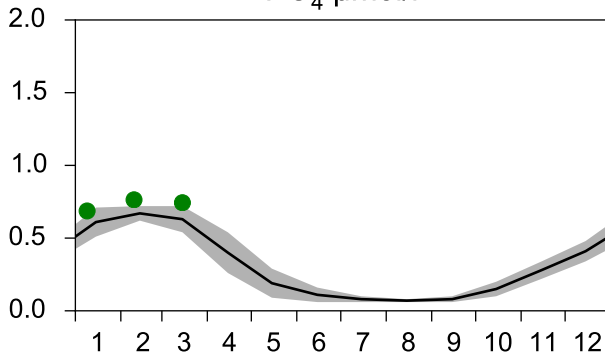
Temperature °C



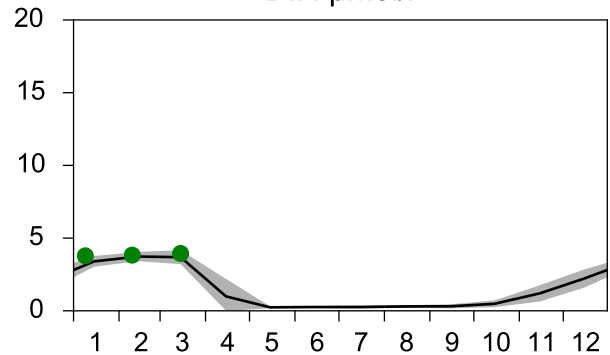
Salinity psu



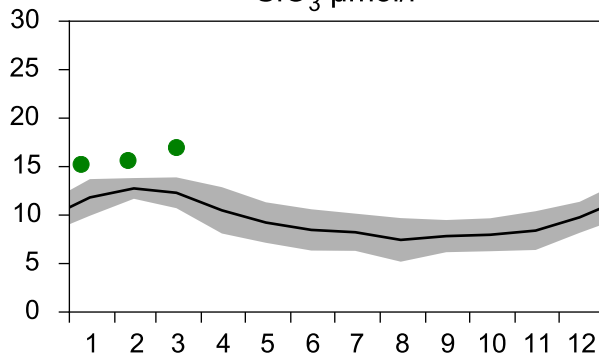
PO₄ µmol/l



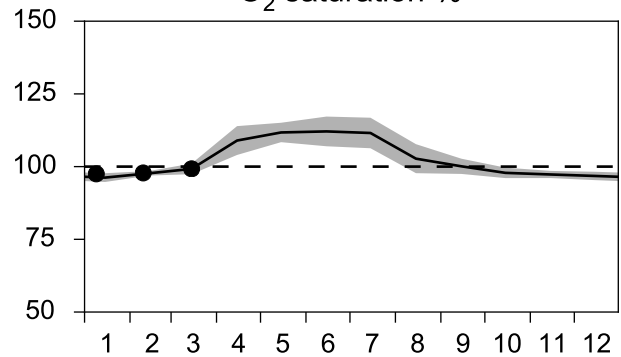
DIN µmol/l



SiO₃ µmol/l

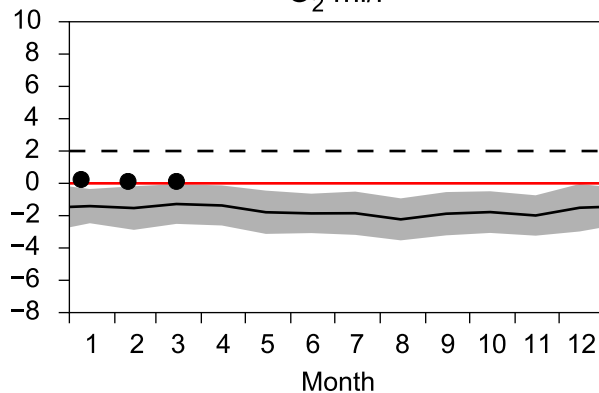


O₂ saturation %

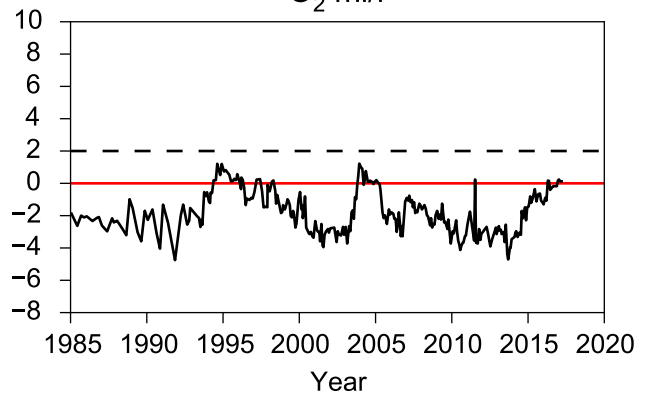


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

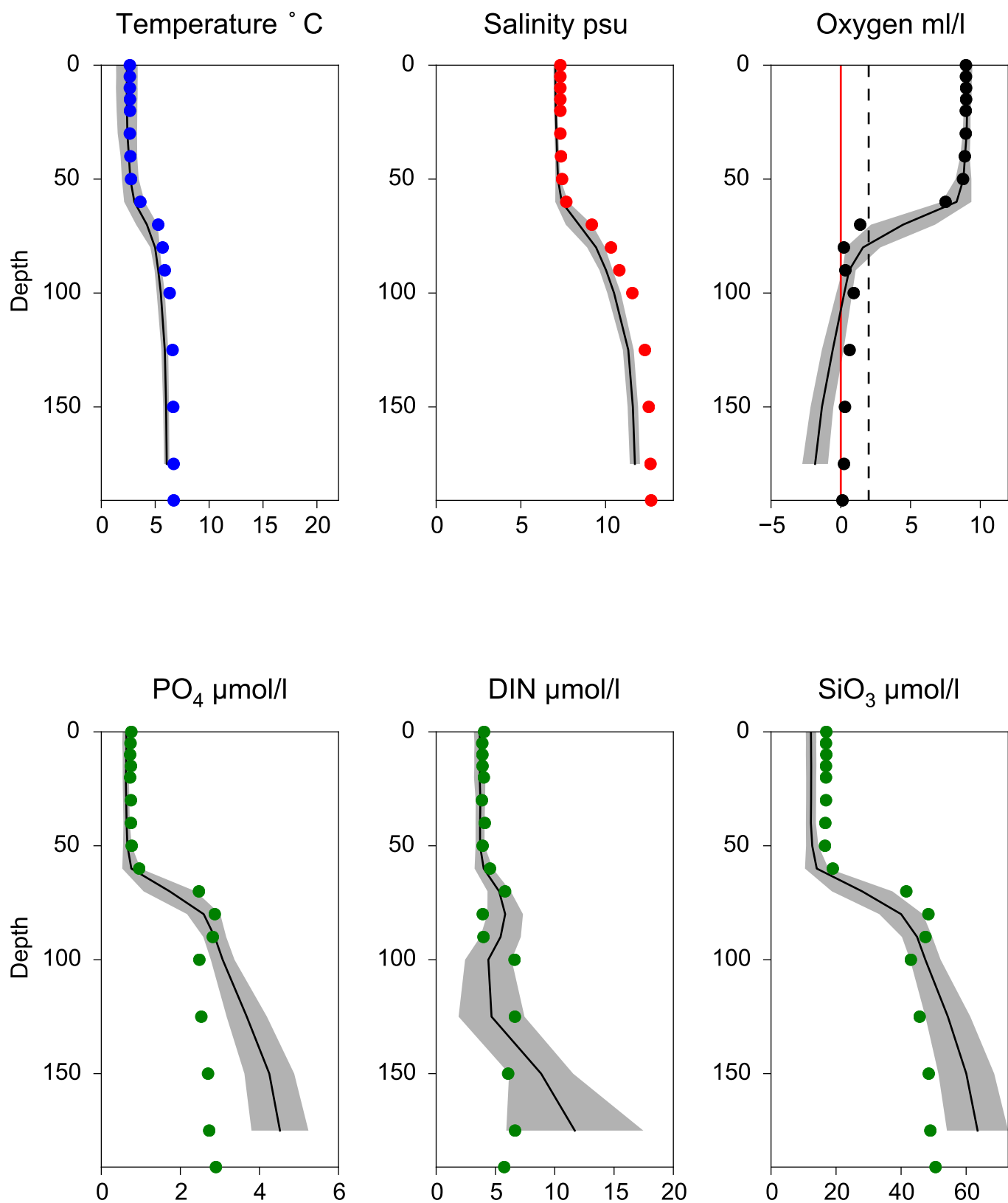


O₂ ml/l



Vertical profiles BY20 FÅRÖDJ March

— Mean 2001-2015 St.Dev. • 2017-03-15



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

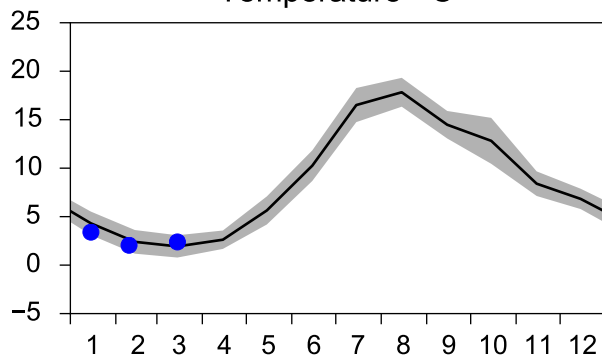
Annual Cycles

— Mean 2001-2015

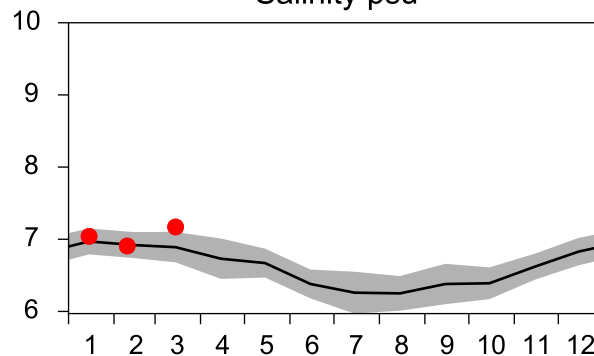
■ St.Dev.

● 2017

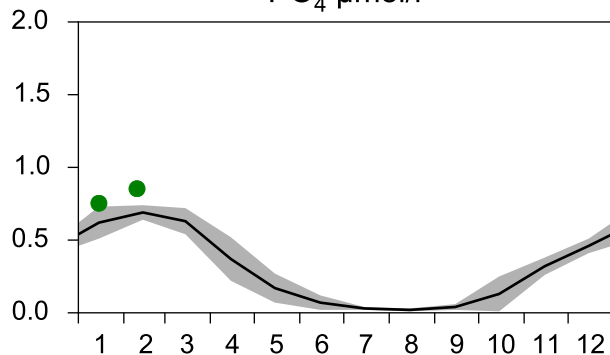
Temperature °C



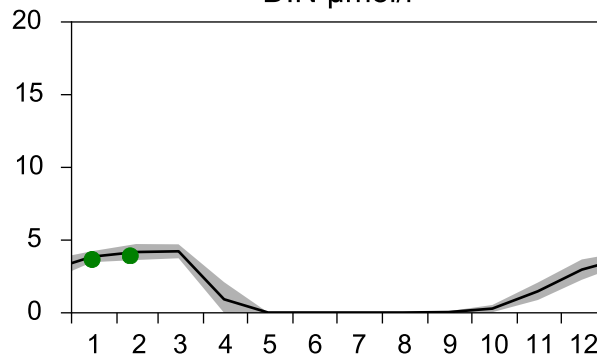
Salinity psu



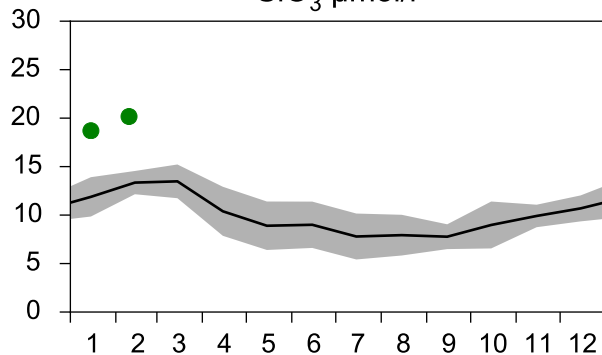
PO₄ µmol/l



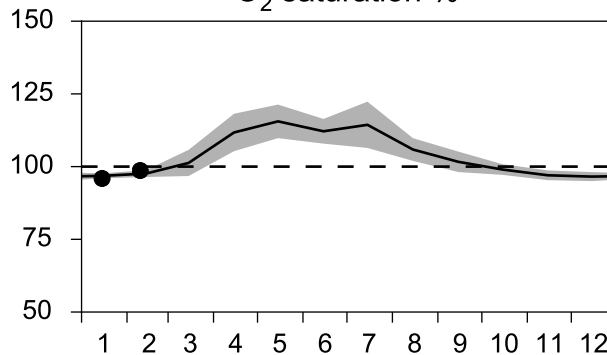
DIN µmol/l



SiO₃ µmol/l

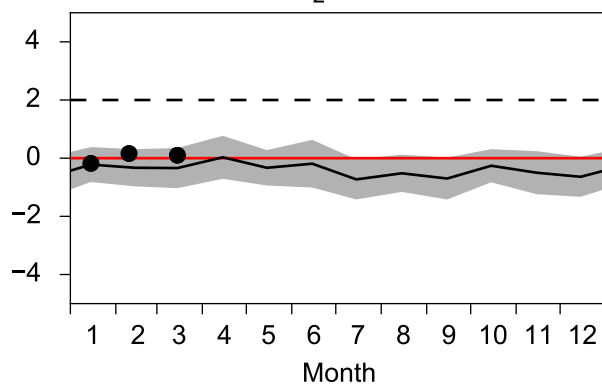


O₂ saturation %

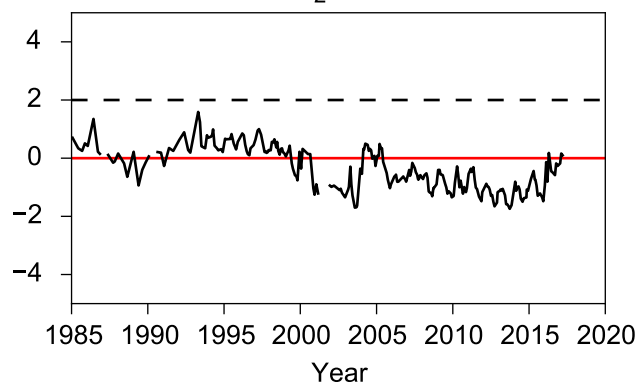


OXYGEN IN BOTTOM WATER (depth >= 150 m)

O₂ ml/l



O₂ ml/l



Vertical profiles BY29 / LL19 March

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

