

Rapport från SMHIs utsjöexpedition med U/F Dana



Expeditionens varaktighet:

2018-09-02 - 2018-09-07

Uppdragsgivare:

Sveriges Meteorologiska och Hydrologiska Institut,
Havs- och Vattenmyndigheten.

SAMMANFATTNING

Under expeditionen, som ingår i det svenska pelagiala övervakningsprogrammet, besöktes Öresund, Egentliga Östersjön samt delar av Kattegatt. I Kattegatt får Anholt E representera hela havsområdet, då varken N14 eller Fladen besöktes, vilket normalt sker vid en ordinarie utsjöexpedition.

På grund av begränsad fartygstid i kombination med en nyligen genomförd fiskeriexpedition i Skagerrak och Kattegatt, där viss hydrografisk provtagning utförts, var expeditionen planerad att främst besöka stationer i Egentliga Östersjön.

I likhet med senaste genomförda expeditionen, vilket var i maj, var ytvattentemperaturen över det normala vid alla besökta stationer, med undantag för stationen REF M1V1 där ytvattentemperaturen var normal. Inga expeditioner har kunnat genomföras under sommaren på grund av tekniska problem på fartygssidan.

Närsalter i form av oorganiskt kväve i ytvattnet var generellt under detektionsgränsen, vilket är normalt för säsongen. För fosfat var nivåerna lägre än normalt för säsongen. Silikatkoncentrationen var normal till över normal för säsongen.

Nästa ordinarie expedition var planerad att genomföras 20-27 september, men fick avbrytas i Lysekil efter drygt halva tiden.

RESULTAT

Expeditionen i början av september genomfördes ombord på det danska forskningsfartyget U/F Dana. Expeditionen startade i Fredrikshamn den 2:e september och avslutades i samma hamn den 7:e. Vindarna var i stort måttliga under hela resan.

Under expeditionen genomfördes ingen håvning av zooplankton pga. tekniska begränsningar. I Skagerrak besöktes inga stationer, och i Kattegatt besöktes endast Anholt E. Kattegatt och Skagerrak hade i slutet av augusti besökts av U/F Dana under en fiskeriexpedition, och en separat rapport från den expeditionen kommer. Totalt provtogs 15 stationer under septemberexpeditionen.

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>

Kattegatt och Öresund

Temperaturen i ytvattnet var över det normala för årstiden och uppmäts till 18,1°C i Kattegatt, och 17,6°C i Öresund. Salthalten var över normal i Kattegatts ytvatten, och normal i Öresund. Uppmätta värden var 22,4 respektive 10,3.

Närsalterna löst oorganiskt kväve (summan av nitrat+nitrit+ammonium, ofta betecknat DIN) i ytvattnet var låga, vilket är normalt för årstiden. Löst oorganiskt fosfor (endast i formen fosfat eller DIP) var normal i Öresund och lägre än normalt i Kattegatt. Silikathalten var lägre än normalt i Kattegatt och under detektionsgräns, men normal i Öresund.

Syrgashalter i Kattegatts djupvatten och i Öresund var normal för årstiden. Vid Anholt E uppmättes syrgashalt på 3,47 ml/l vid botten, och vid W Landskrona var syrgasnivån vid botten 3,30 ml/l.

Fluorescensmätaren på CTDn visade på låg planktonaktivitet.

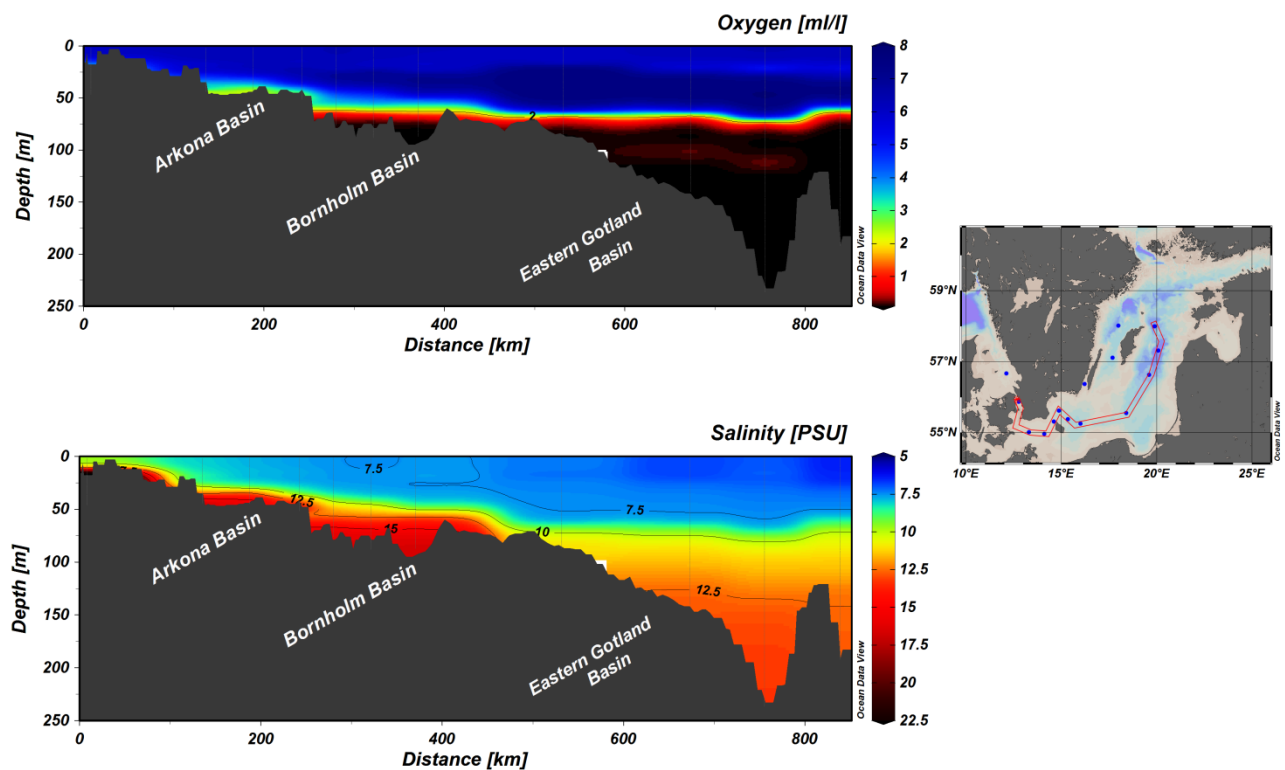
Egentliga Östersjön

Yttemperaturen i det undersökta området var för årstiden över normal vid alla besökta utsjöstationer, och varierade mellan 18,2 och 19,6°C. Vid den kustnära stationen REF M1V1 mellan Öland och fastlandet var temperaturen normal, och visade 14,3°C. Salthalten i ytvattnet var normal och låg mellan 6,4 och 8,1, lägst i den norra delen och högst i sydväst. En tydlig termoklin fanns på 20-30 meters djup och haloklinen låg på 60-70 meters djup för de djupaste stationerna.

Närsalterna i form av oorganiskt kväve och fosfat i ytvattnet visade på låga nivåer, vilket är normalt för årstiden. Det lösta oorganiska kvävet var helt förbrukat i ytvattnet. Ytvattenkoncentrationen av kisel var normal till över normal, och varierade mellan 7,9 och 12,3 µmol/l, högst halter i sydväst.

Akut syrebrist med syrenivåer under 2 ml/l, påträffades vid botten av Arkonabassängen. I Bornholmsbassängen, samt Östra och Västra Gotlandbassängen påträffades syrefria vattenmassor från ca 70-80 meters djup.

Fluorescensmätningarna från CTDn visade låg växtplanktonaktivitet i det övre vattenlagret.



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

DELTAGARE

Namn

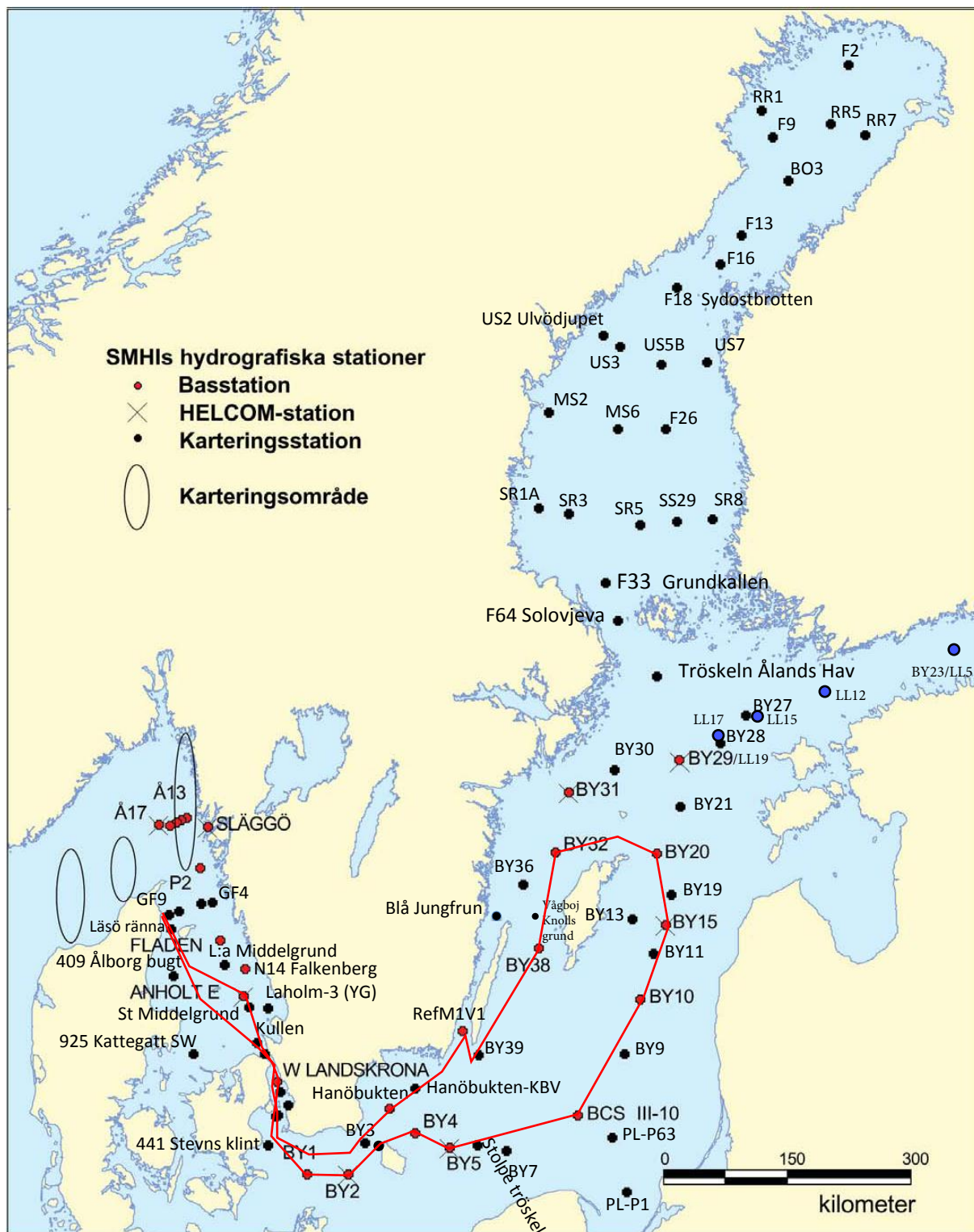
Anna-Kerstin Thell Expeditionsledare
Sara Johansson
Johan Kronsell
Kristin Andreasson

Från

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: 07:50

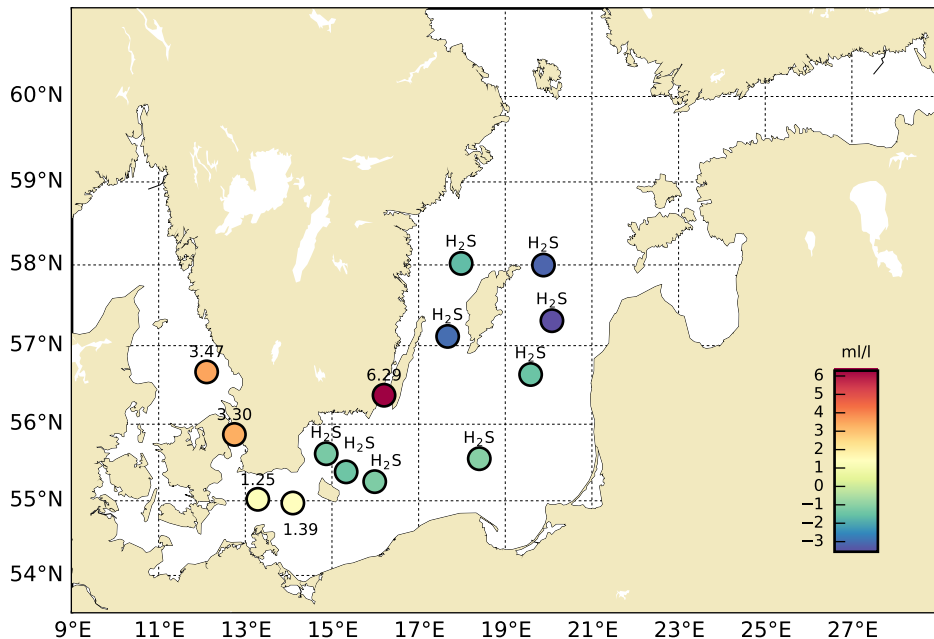
Ser no	Cru no	Stat code	Proj	Stat name	Lat	Lon	Start date yyyymmdd	Start time hhmm	Bottom depth m	Secchi depth m	Wind dir vel	Air temp C	Air pres hPa	WCW elac aove hdsb	I C ZPP loy apt o	No de	No btl	T e m m p t l d	S e a l l d	P h o x s o o r r r o o k o m m i a	D h o 2 h t t t t m t l i u o o - - - b c t t t d l	H P P x s o o r r r o o k o m m i a	N N N t t t t z n t y - - - b c t t t d l	N N N t t t t z n t y - - - b c t t t d l	A A A m t l i u o o - - - b c t t t d l	S H C C - - - b c t t t d l								
0951	09	KAEX29	BAS...	ANHOLT E	5640.13	01206.44	20180902	1830	60		05 5	17.8	1027	1130	x---	10	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-
0952	09	SOCX39	BAS...	W LANDSKRONA	5552.05	01244.86	20180903	0115	48		06 5	15.4	1026	9990	x---	9	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-
0953	09	BPSA02	BAS...	BY1	5501.16	01317.29	20180903	0735	44		07 9	18.5	1024	1530	x---	8	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-
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0955	09	BPSA05	BAS...	W HAMMER ODDE	5518.65	01436.13	20180903	1350	51		05 8	17.9	1023	2730	----	8	-	x	-	x	-	x	-	-	-	-	-	-	-	-	-	-	-	-
0956	09	BPSB06	BAS...	BY4 CHRISTIANSÖ	5522.84	01519.62	20180903	1620	89		06 7	18.1	1022	1430	x---	12	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-
0957	09	BPSB07	BAS...	BY5 BORNHOLMSDJ	5515.15	01559.18	20180903	1910	87		06 8	17.8	1021	9990	x---	12	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-
0958	09	BPSE11	BAS...	BCS III-10	5533.16	01824.00	20180904	0405	90		27 6	18.5	1018	1330	x---	12	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-
0959	09	BPEX13	BAS...	BY10	5638.14	01935.12	20180904	1145	139		02 6	18.7	1018	1130	x---	15	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-
0960	09	BPEX21	BAS...	BY15 GOTLANDSDJ	5718.71	02004.61	20180904	1640	236		01 8	18.4	1018	2730	x---	24	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-
0961	09	BPEX26	BAS...	BY20 FÄRÖDJ	5759.91	01952.89	20180904	2240	192		34 8	17.7	1018	9990	x---	17	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-
0962	09	BPWX38	BAS...	BY32 NORRKÖPINGS DJ	5801.11	01758.88	20180905	0605	199		03 4	17.7	1021	1230	x---	17	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-
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0965	09	BPWK01	BAS...	REF M1V1	5622.31	01612.10	20180905	2120	20		36 5	16.3	1020	9990	x---	5	-	x	-	x	-	x	-	-	-	-	-	-	-	-	-	-	-	-
0966	09	BPSH05	BAS...	HANÖBUKTEN	5537.06	01452.06	20180906	0400	76		06 6	17.9	1018	1430	x---	11	-	x	-	x	-	x	x	-	x	-	x	-	x	-	x	-	x	-

Bottom water oxygen concentration (ml/l)

Ship: Dana

Date: 20180902-20180906

Series: 0951-0966



STATION ANHOLT E SURFACE WATER (0-10 m)

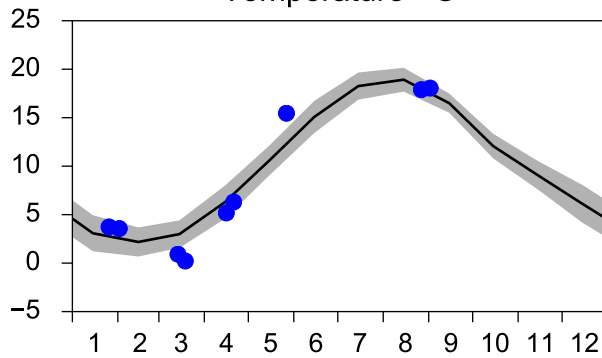
Annual Cycles

— Mean 2001-2015

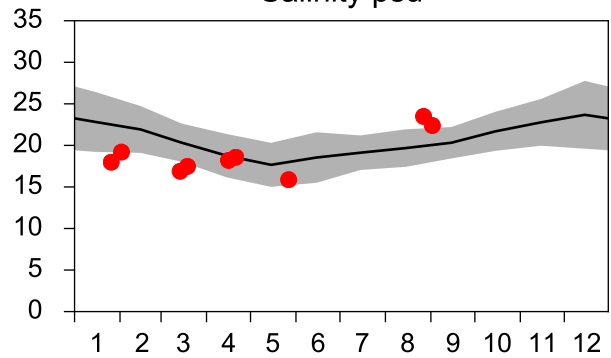
■ St.Dev.

● 2018

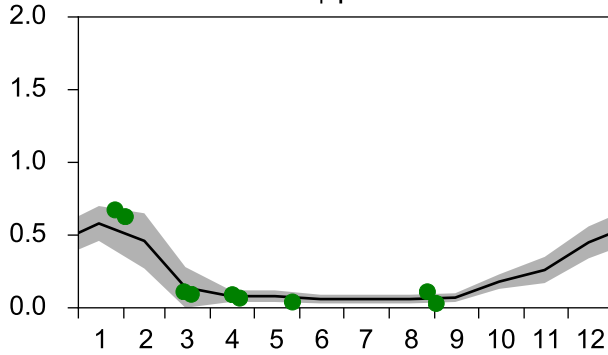
Temperature °C



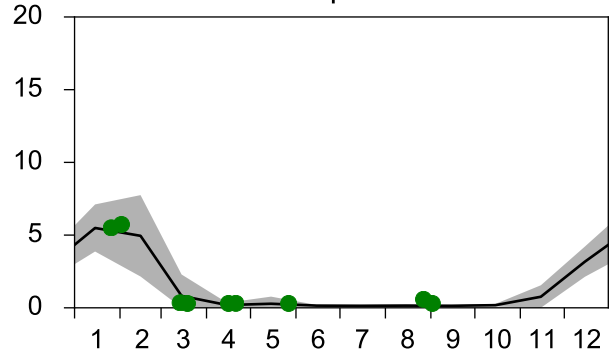
Salinity psu



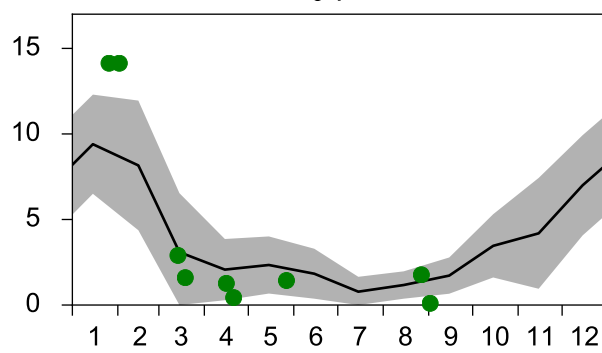
PO₄ µmol/l



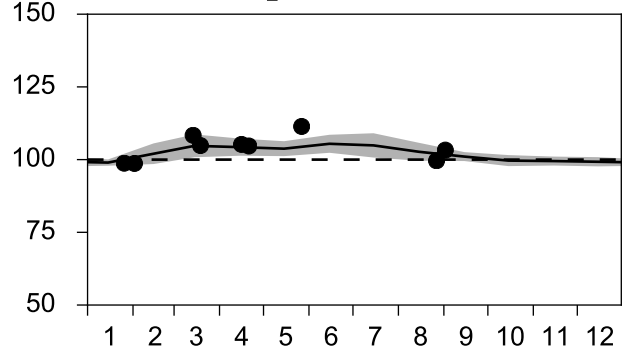
DIN µmol/l



SiO₃ µmol/l

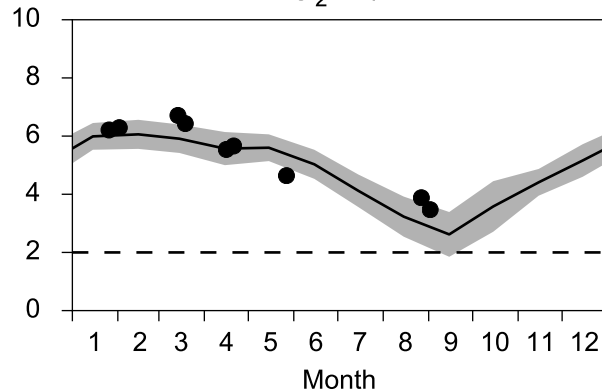


O₂ saturation %

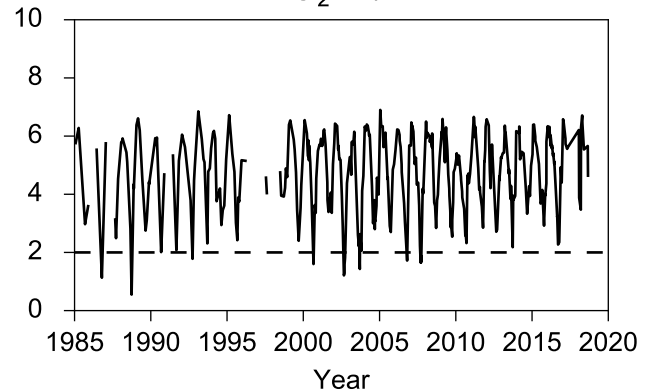


OXYGEN IN BOTTOM WATER (depth >= 52 m)

O₂ ml/l

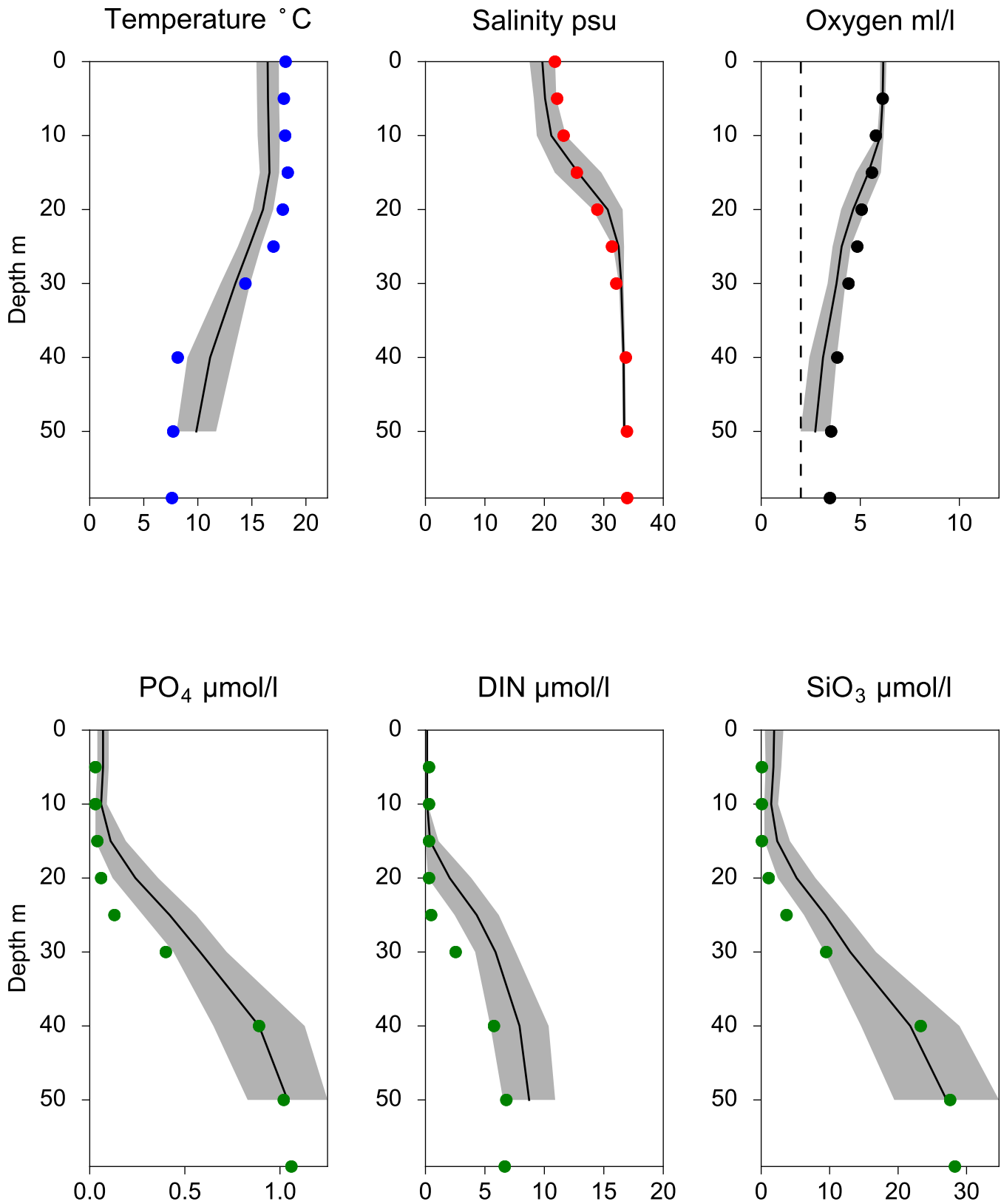


O₂ ml/l



Vertical profiles ANHOLT E September

— Mean 2001-2015 St.Dev. • 2018-09-02



STATION W LANDSKRONA SURFACE WATER (0-10 m)

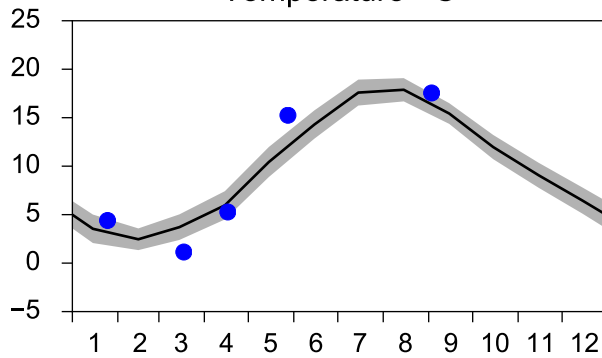
Annual Cycles

— Mean 2001-2015

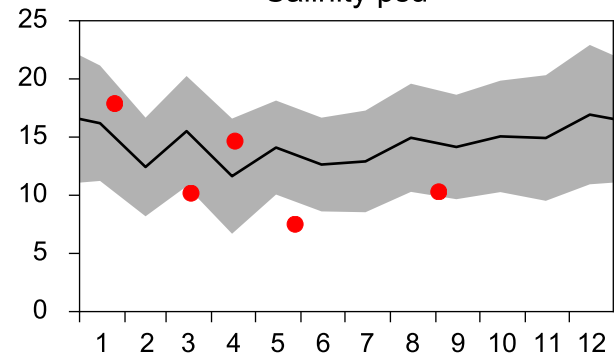
■ St.Dev.

● 2018

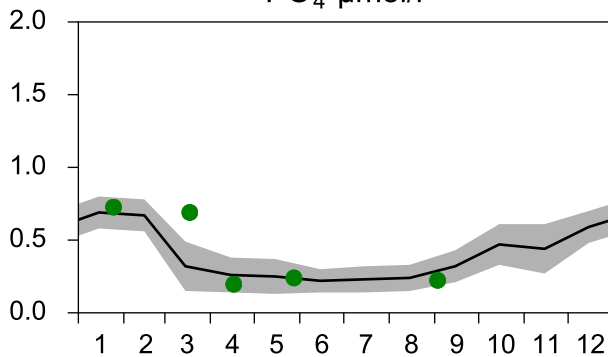
Temperature °C



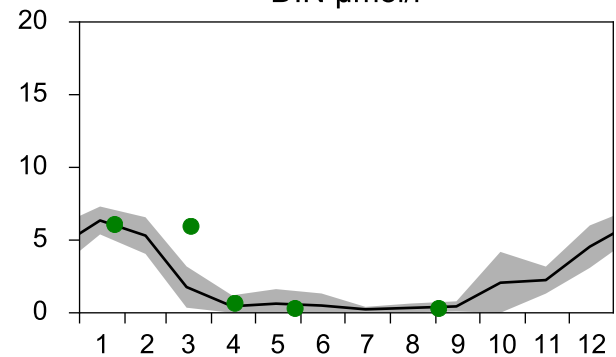
Salinity psu



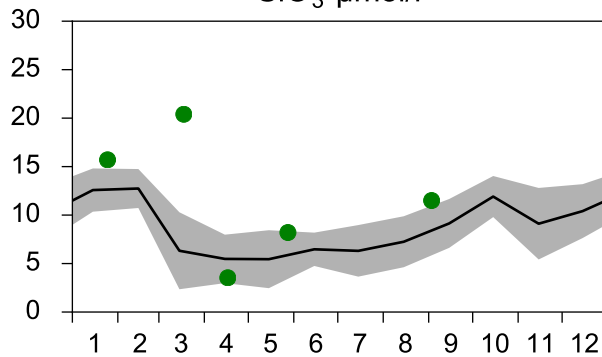
PO₄ μmol/l



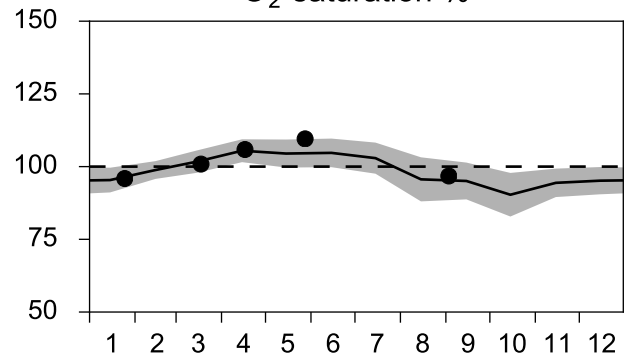
DIN μmol/l



SiO₃ μmol/l

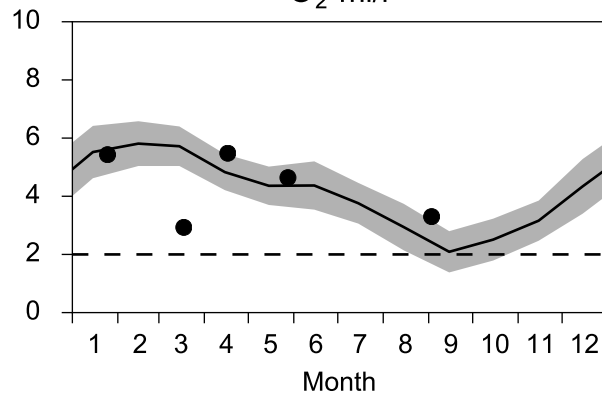


O₂ saturation %

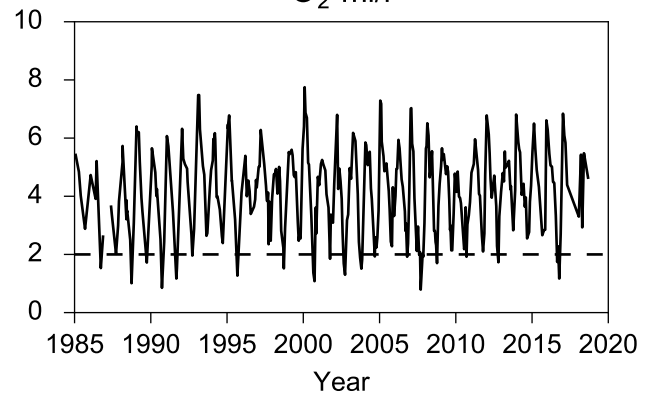


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

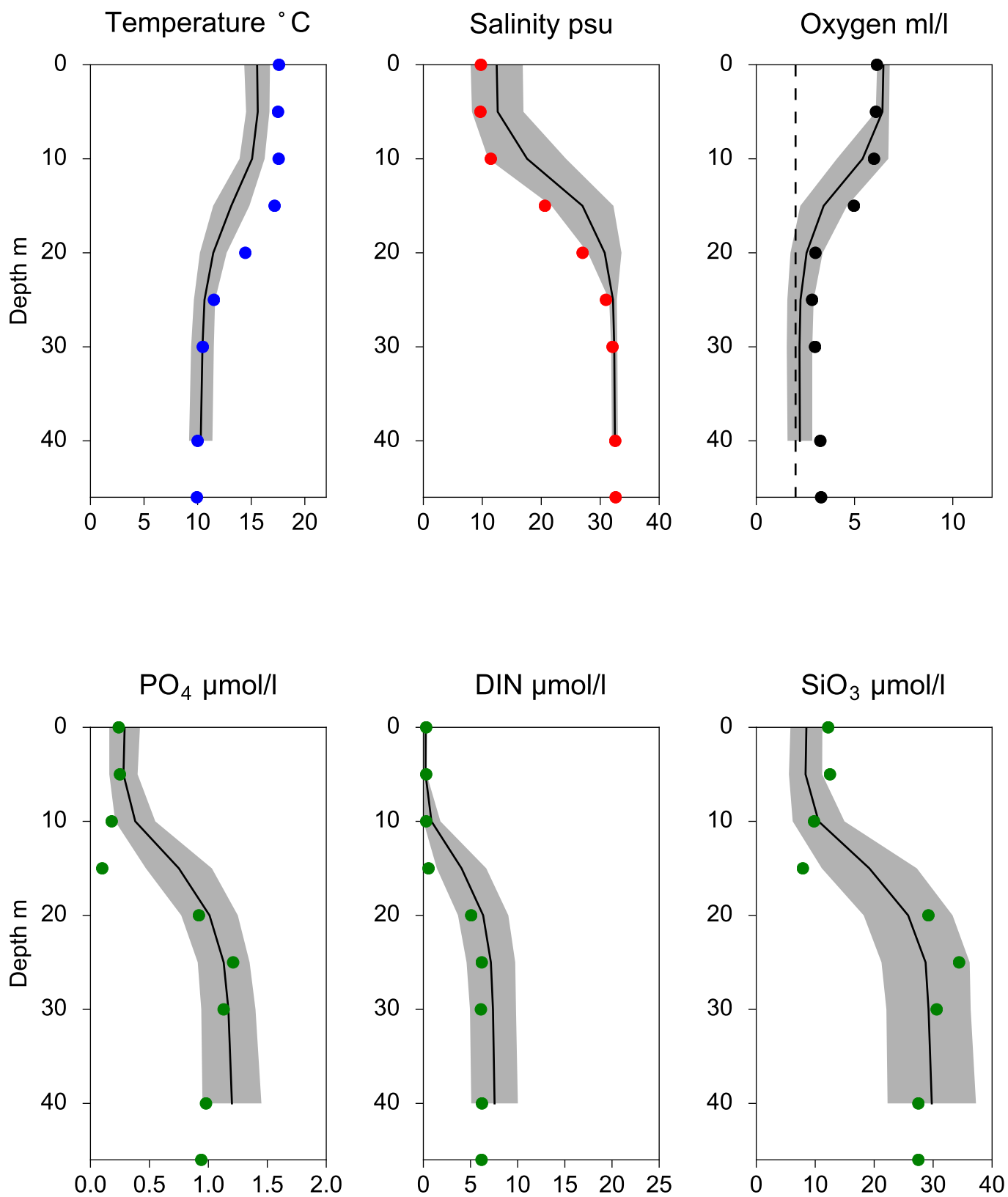


O₂ ml/l



Vertical profiles W LANDSKRONA September

— Mean 2001-2015 St.Dev. • 2018-09-03



STATION BY1 SURFACE WATER (0-10 m)

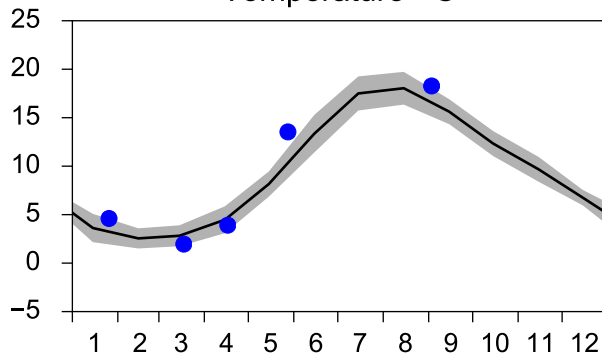
Annual Cycles

— Mean 2001-2015

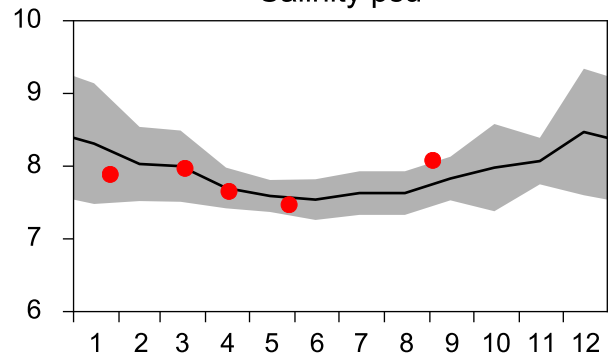
■ St.Dev.

● 2018

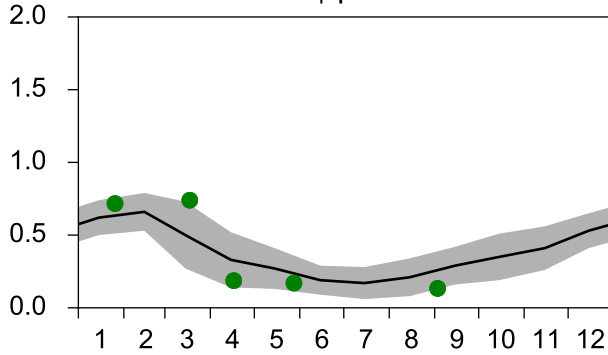
Temperature °C



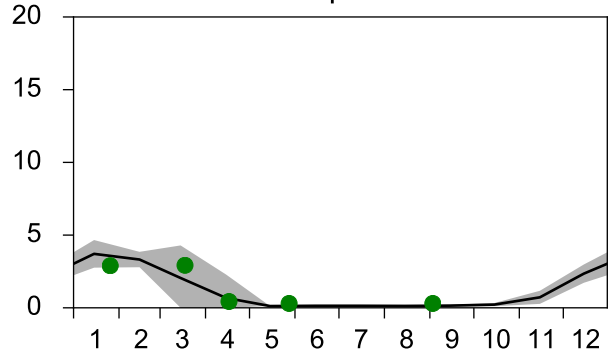
Salinity psu



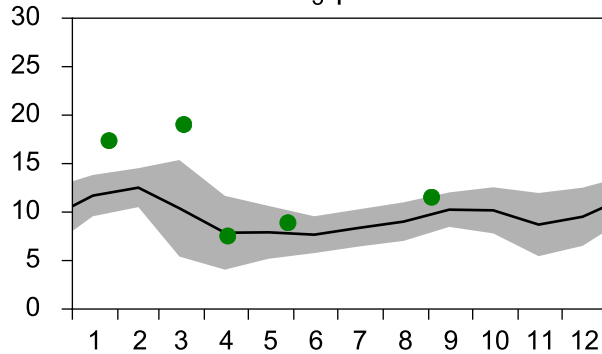
PO₄ µmol/l



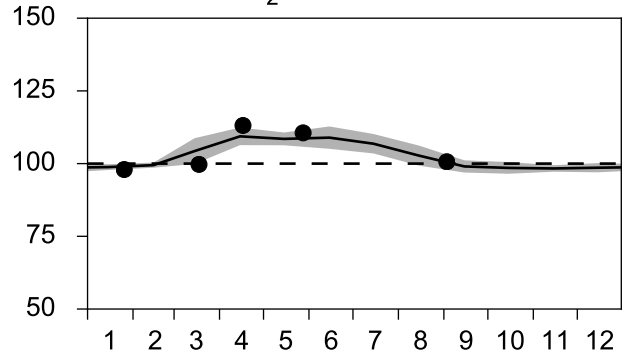
DIN µmol/l



SiO₃ µmol/l

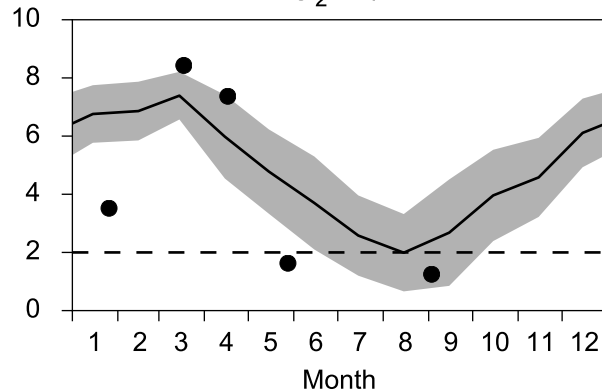


O₂ saturation %

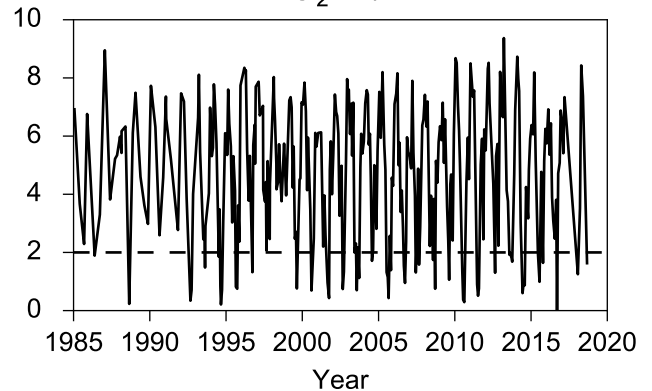


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

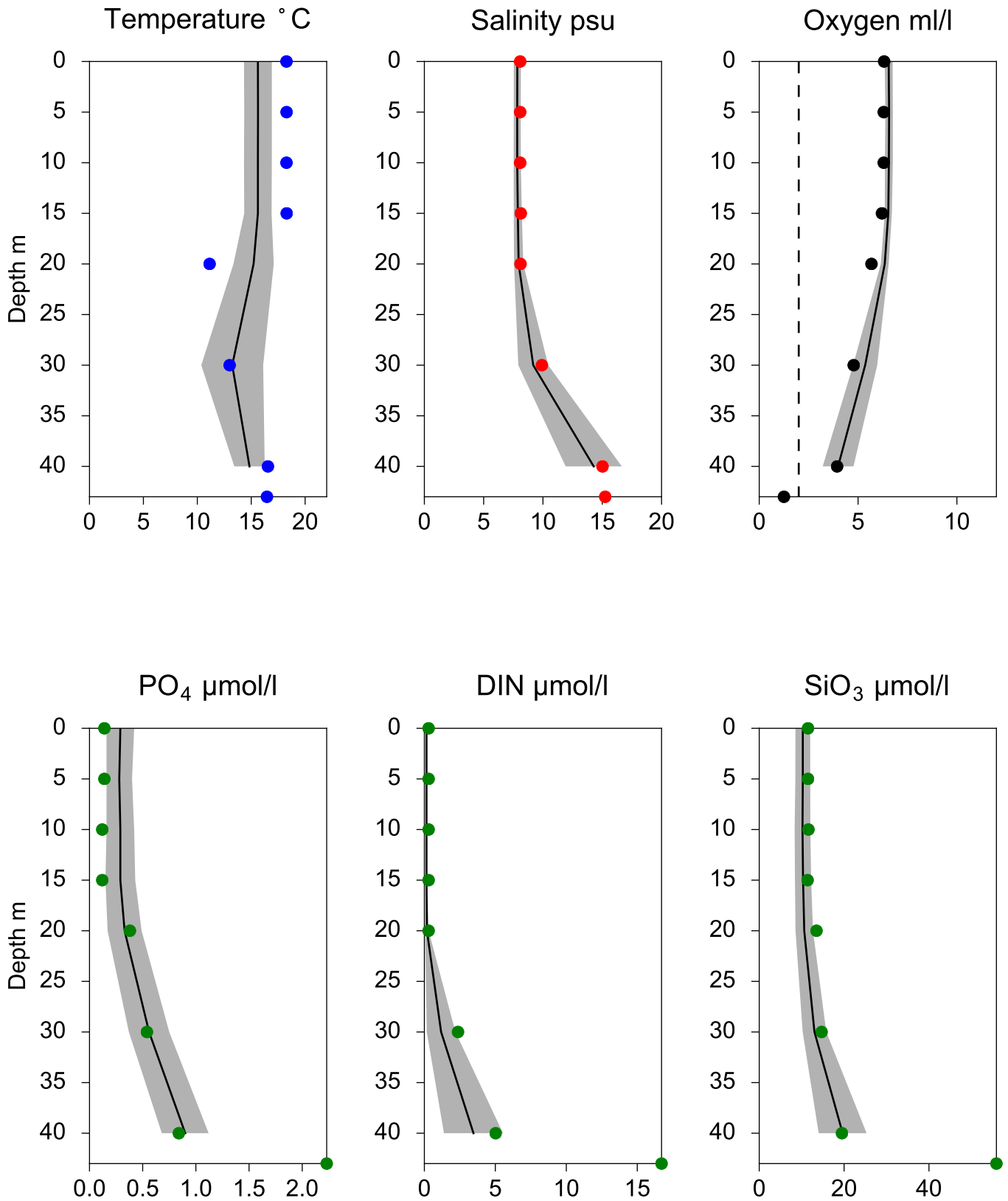


O₂ ml/l



Vertical profiles BY1 September

— Mean 2001-2015 ■ St.Dev. ● 2018-09-03



STATION BY2 ARKONA SURFACE WATER (0-10 m)

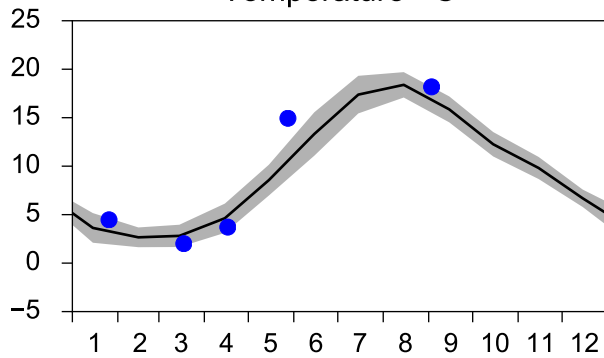
Annual Cycles

— Mean 2001-2015

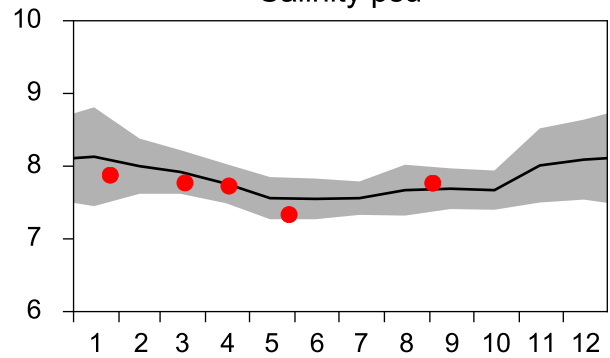
■ St.Dev.

● 2018

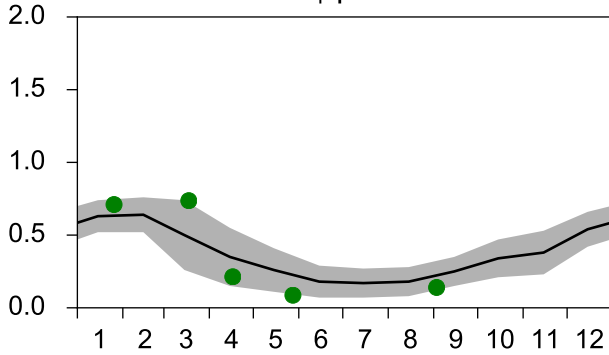
Temperature °C



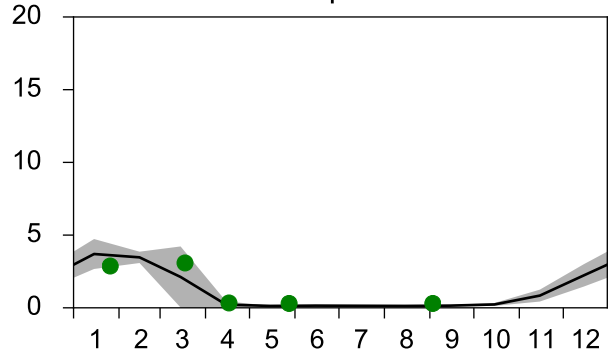
Salinity psu



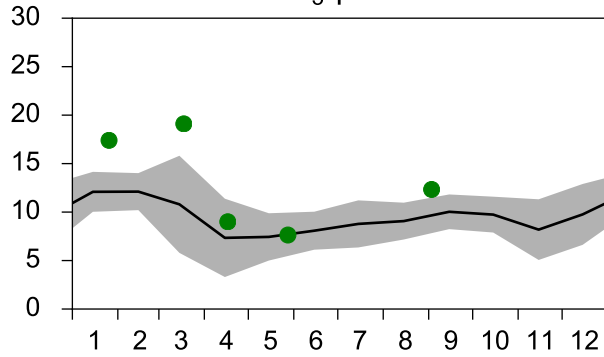
PO₄ µmol/l



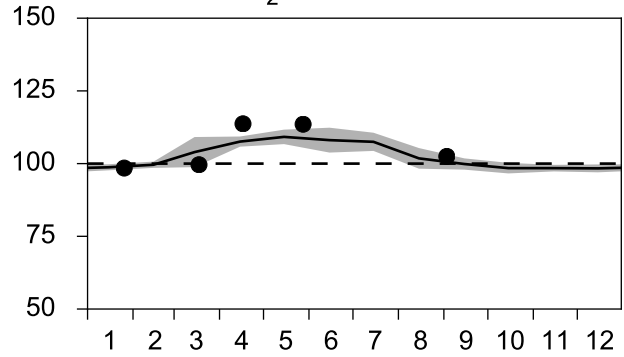
DIN µmol/l



SiO₃ µmol/l

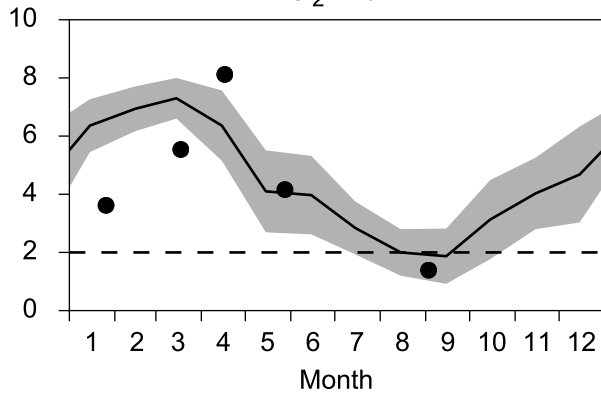


O₂ saturation %

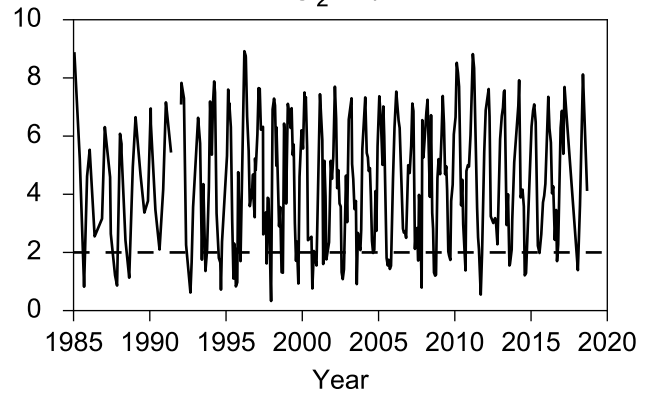


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

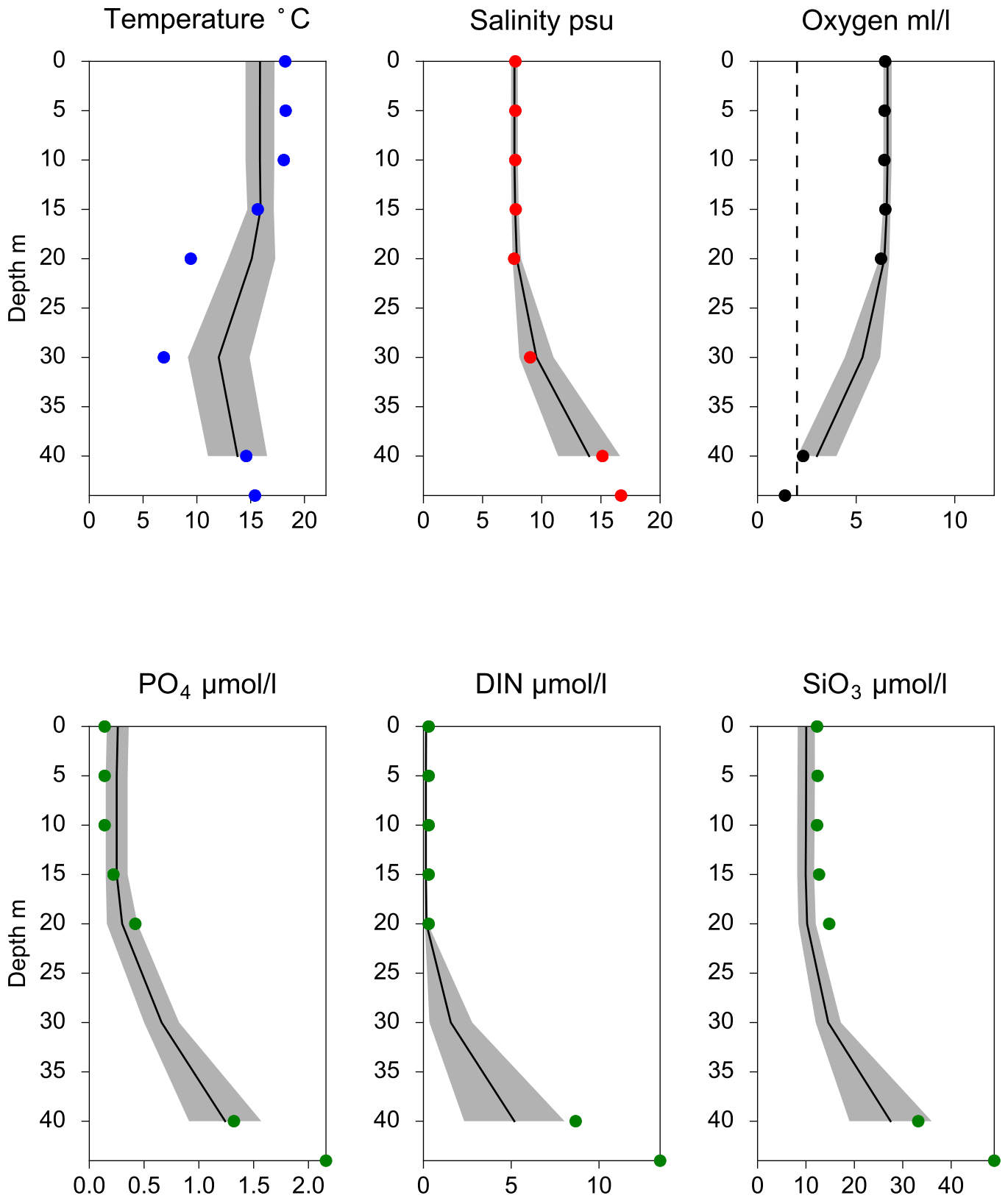


O₂ ml/l



Vertical profiles BY2 ARKONA September

— Mean 2001-2015 ■ St.Dev. ● 2018-09-03



STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

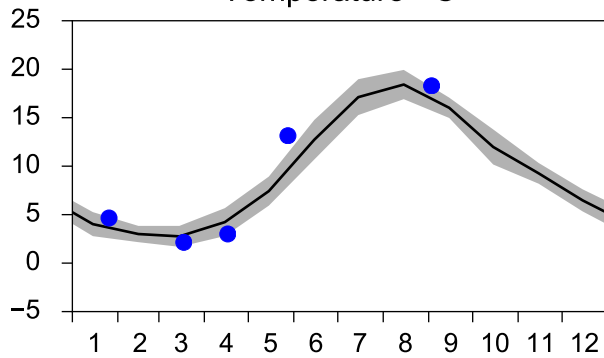
Annual Cycles

— Mean 2001-2015

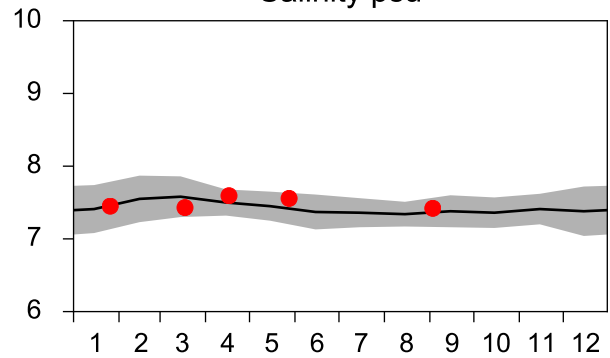
■ St.Dev.

● 2018

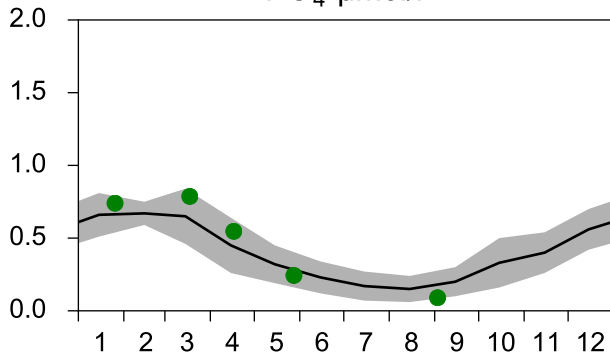
Temperature °C



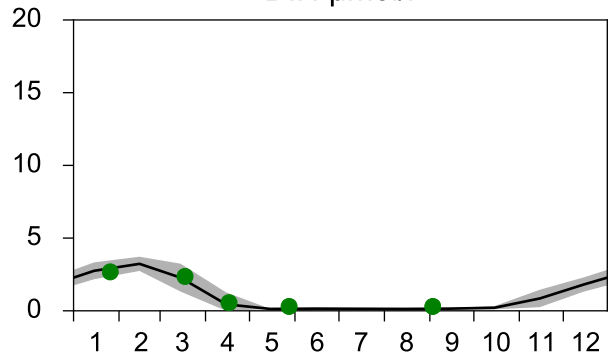
Salinity psu



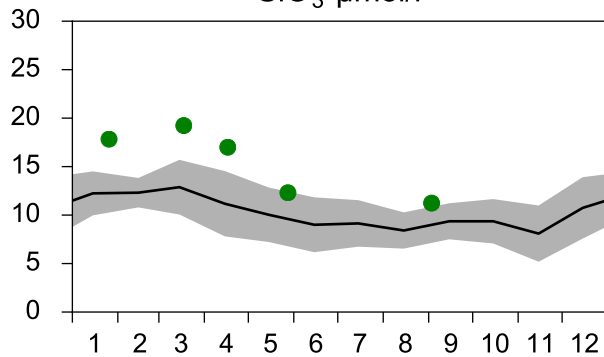
PO₄ µmol/l



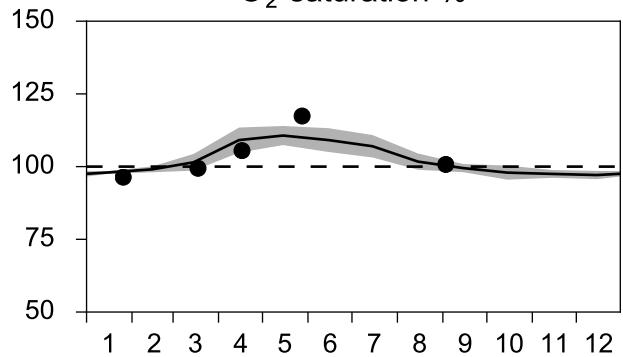
DIN µmol/l



SiO₃ µmol/l

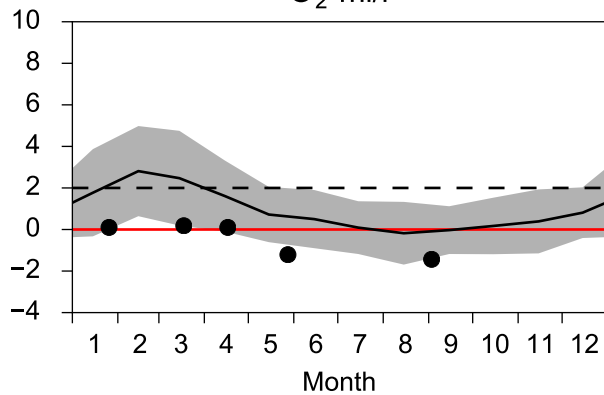


O₂ saturation %

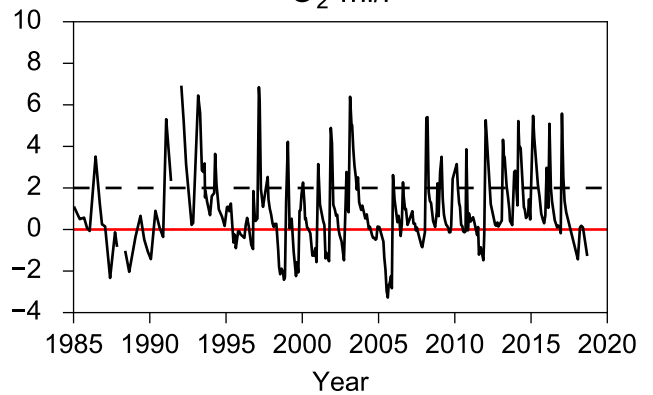


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l



O₂ ml/l

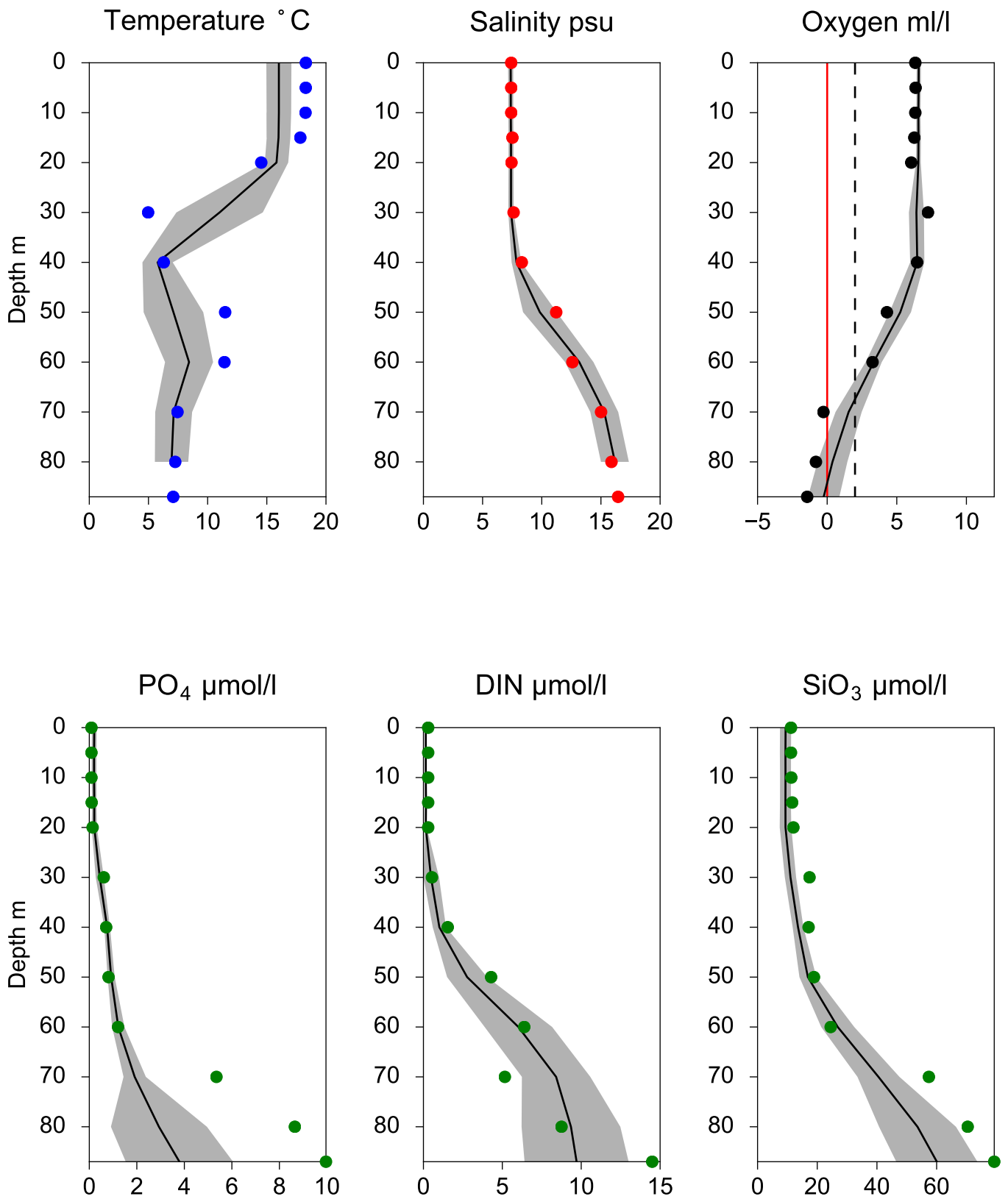


Vertical profiles BY4 CHRISTIANSÖ September

— Mean 2001-2015

■ St.Dev.

● 2018-09-03



STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)

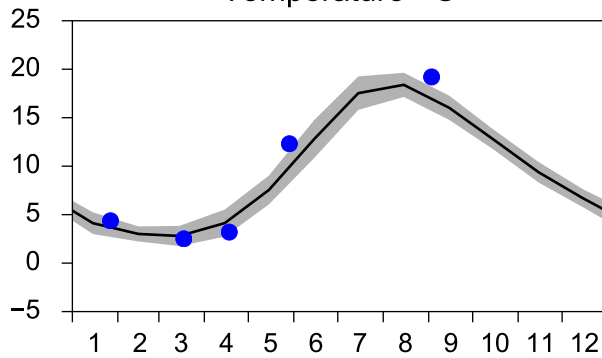
Annual Cycles

— Mean 2001-2015

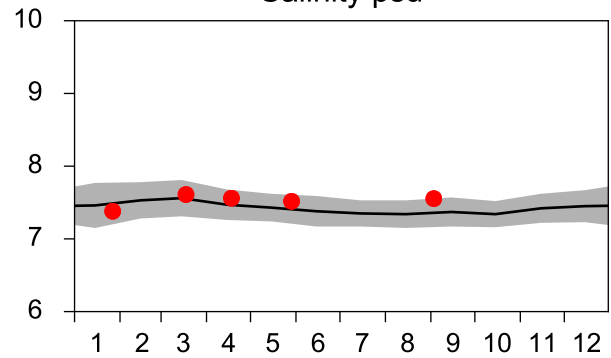
■ St.Dev.

● 2018

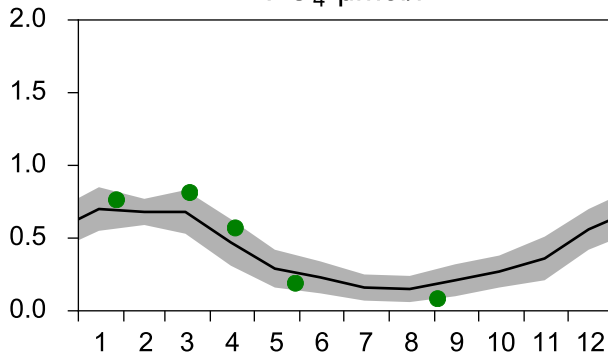
Temperature °C



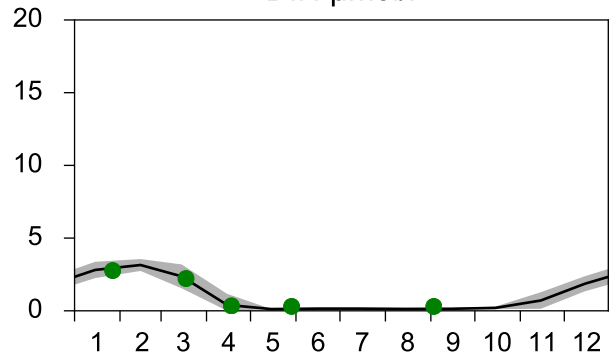
Salinity psu



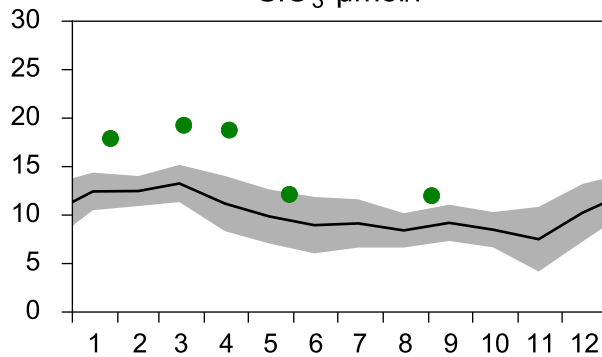
PO₄ µmol/l



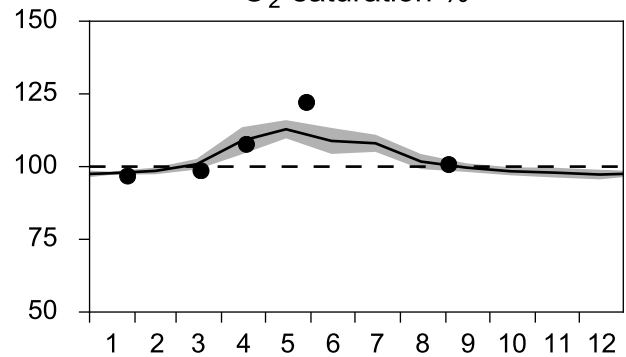
DIN µmol/l



SiO₃ µmol/l

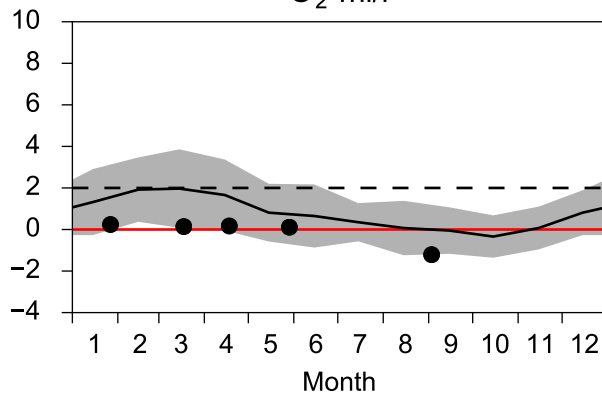


O₂ saturation %

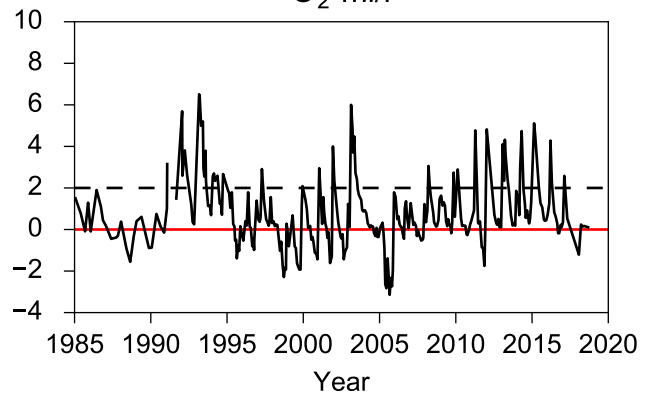


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

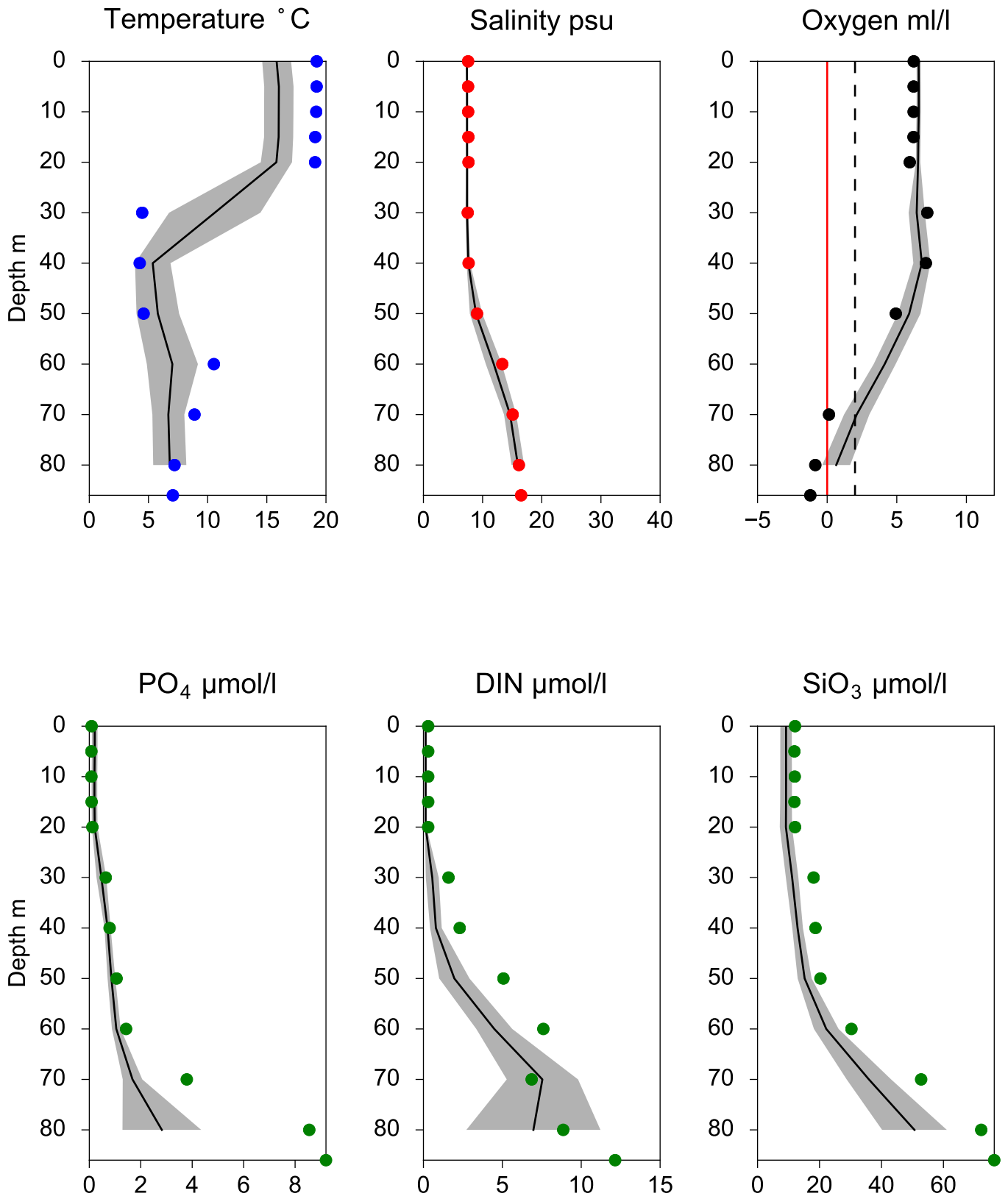


O₂ ml/l



Vertical profiles BY5 BORNHOLMSDJ September

— Mean 2001-2015 ■ St.Dev. ● 2018-09-03



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

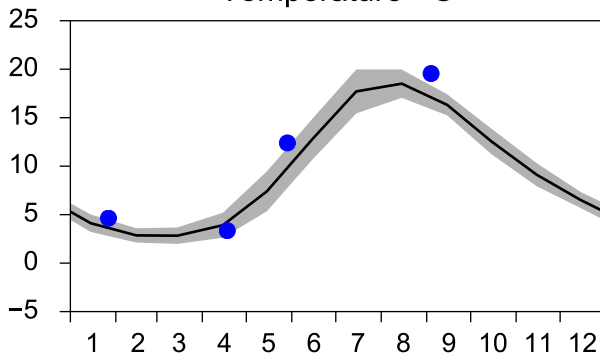
Annual Cycles

— Mean 2001-2015

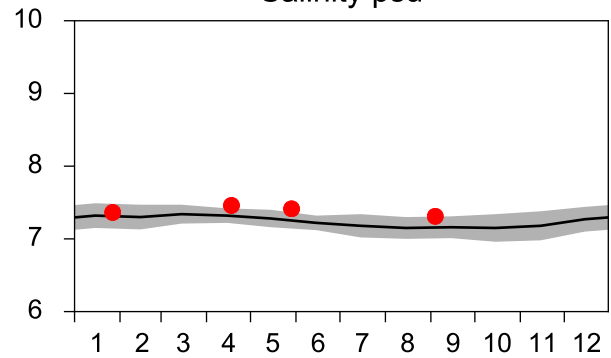
■ St.Dev.

● 2018

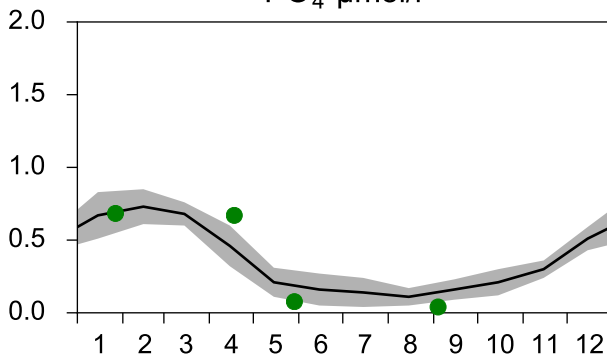
Temperature °C



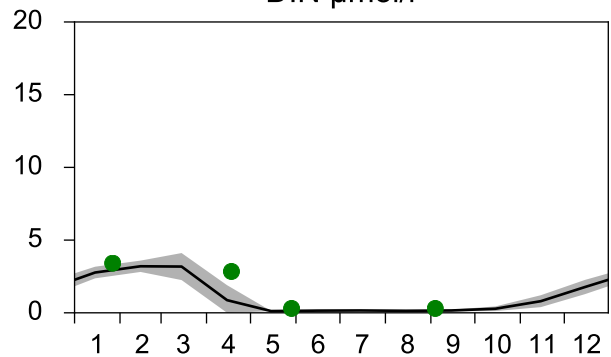
Salinity psu



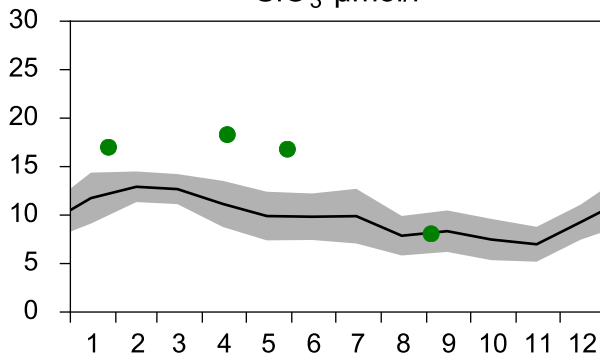
PO₄ µmol/l



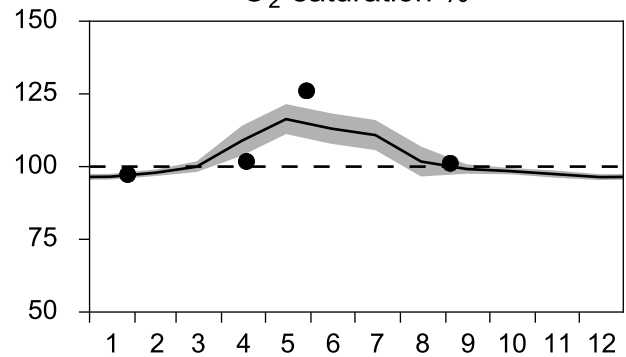
DIN µmol/l



SiO₃ µmol/l

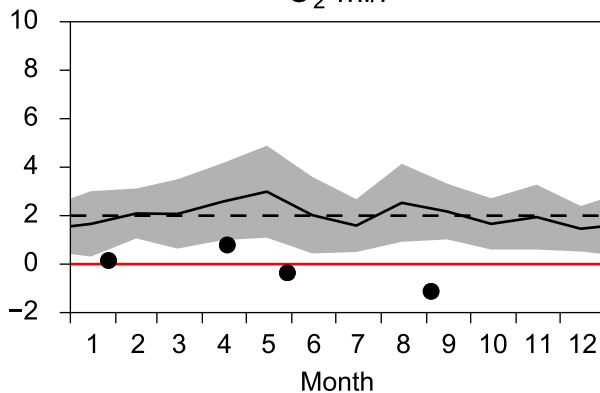


O₂ saturation %

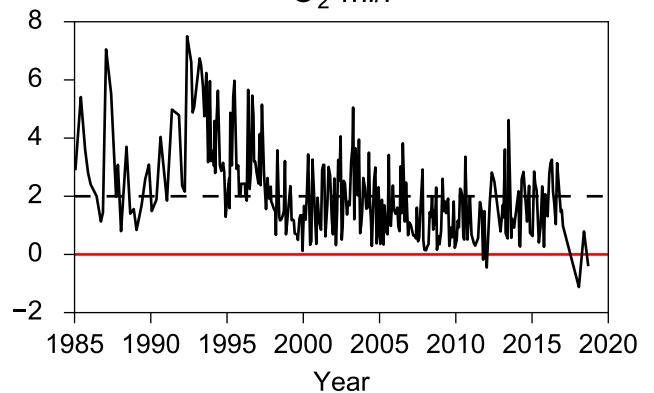


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

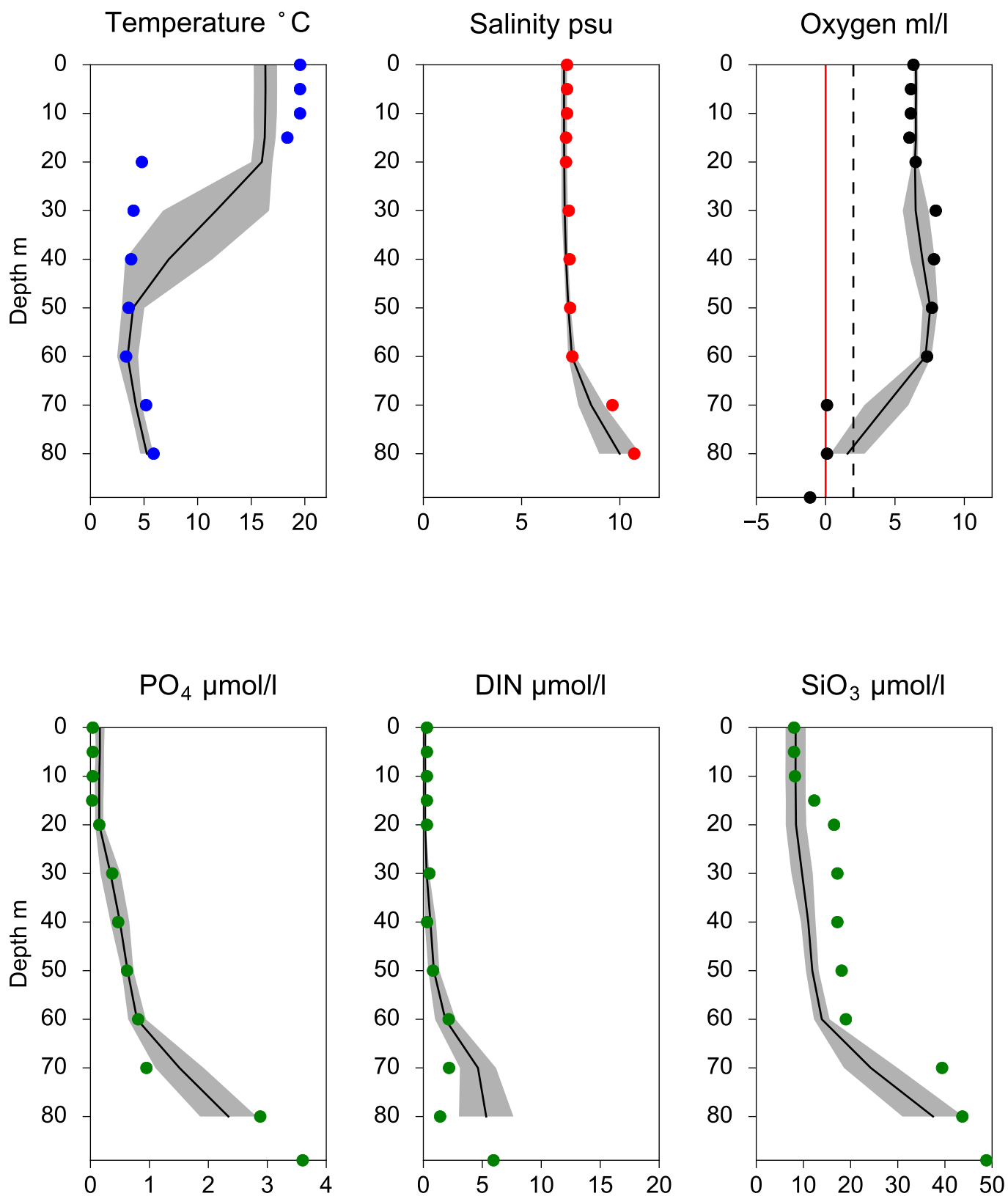


O₂ ml/l



Vertical profiles BCS III-10 September

— Mean 2001-2015 ■ St.Dev. ● 2018-09-04



STATION BY10 SURFACE WATER (0-10 m)

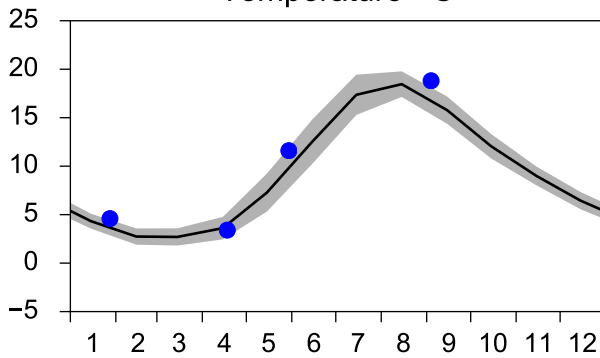
Annual Cycles

— Mean 2001-2015

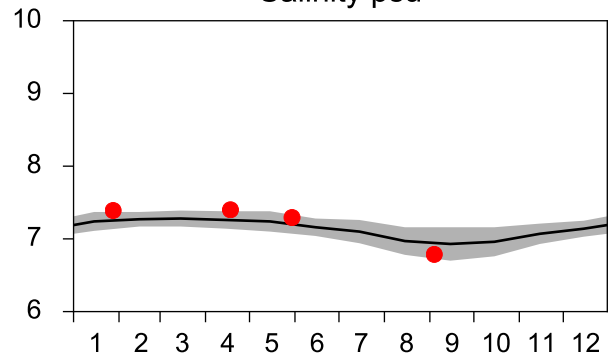
■ St.Dev.

● 2018

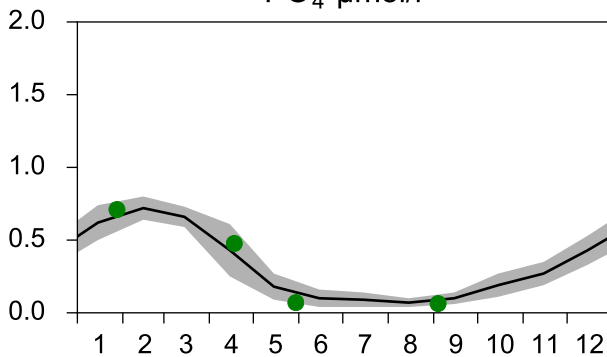
Temperature °C



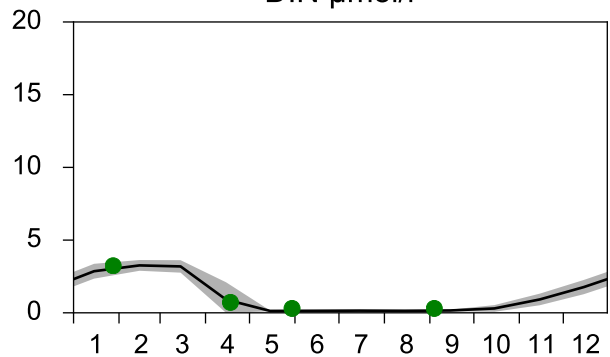
Salinity psu



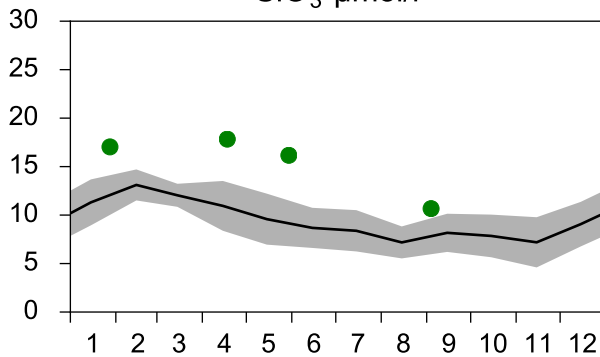
PO₄ µmol/l



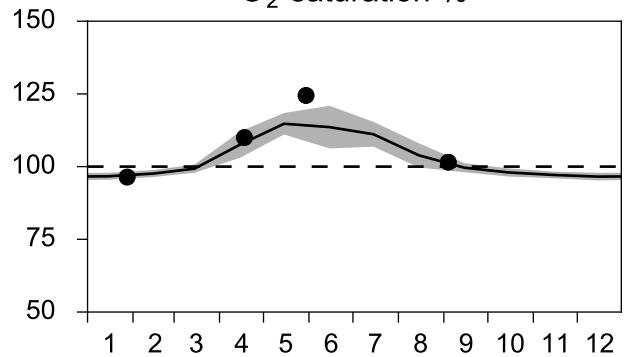
DIN µmol/l



SiO₃ µmol/l

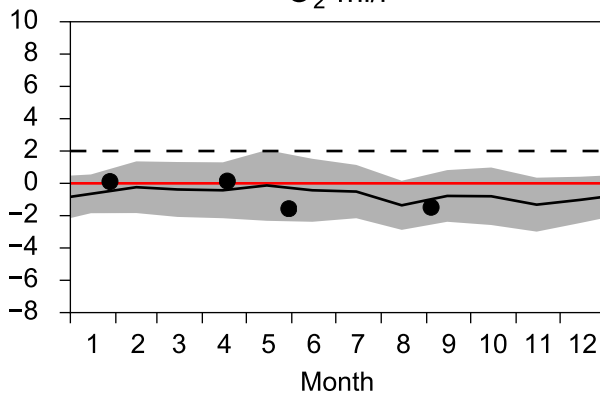


O₂ saturation %

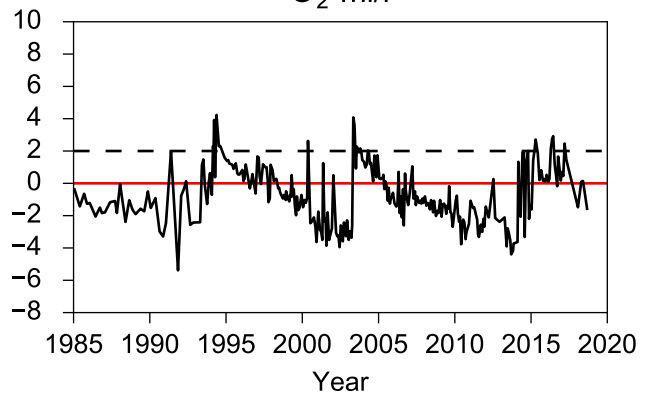


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

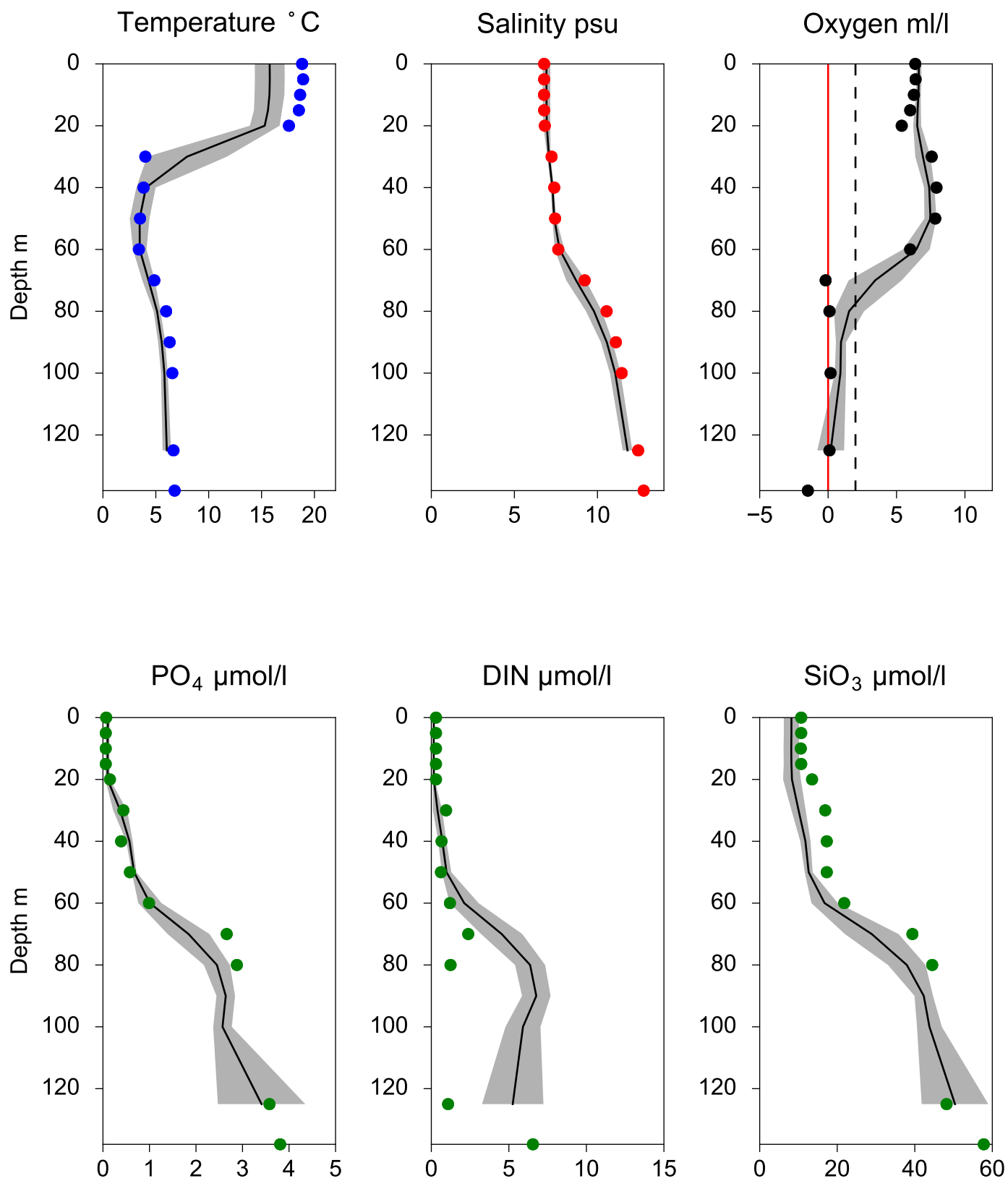


O₂ ml/l



Vertical profiles BY10 September

— Mean 2001-2015 ■ St.Dev. ● 2018-09-04



STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

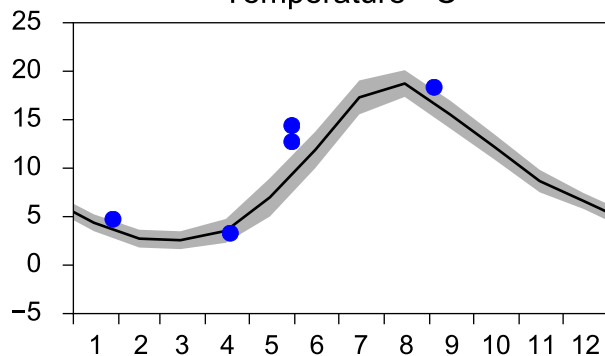
Annual Cycles

— Mean 2001-2015

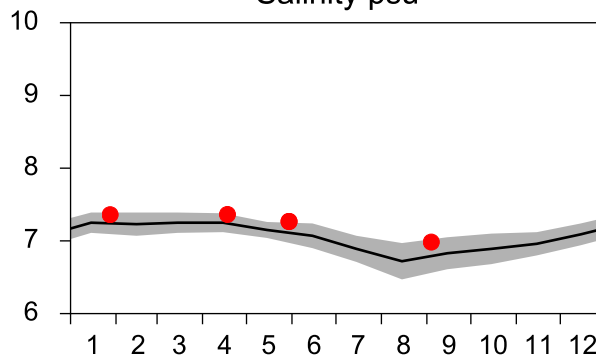
■ St.Dev.

● 2018

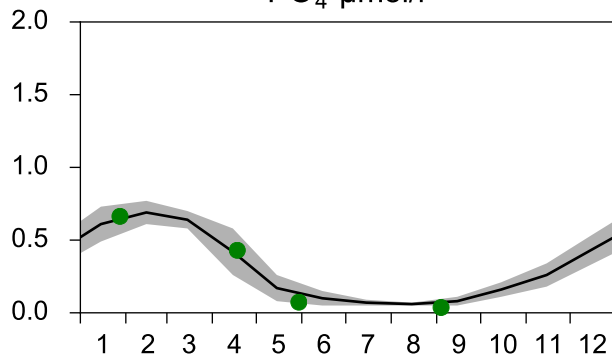
Temperature °C



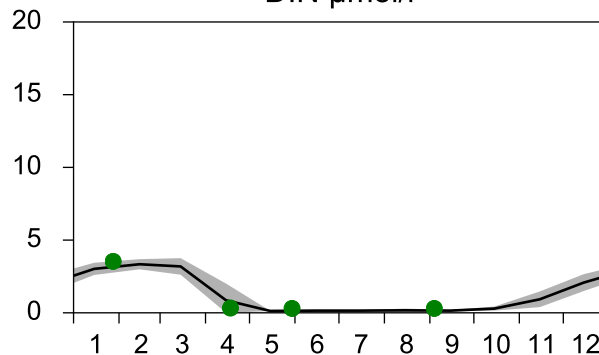
Salinity psu



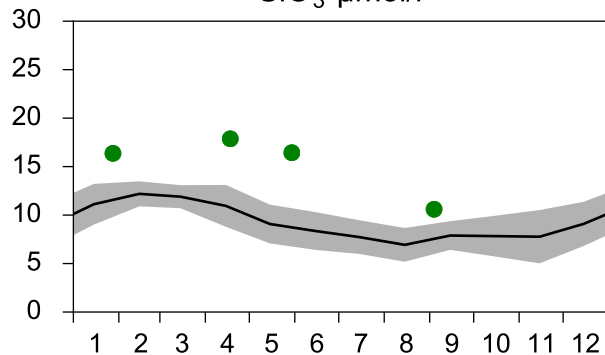
PO₄ µmol/l



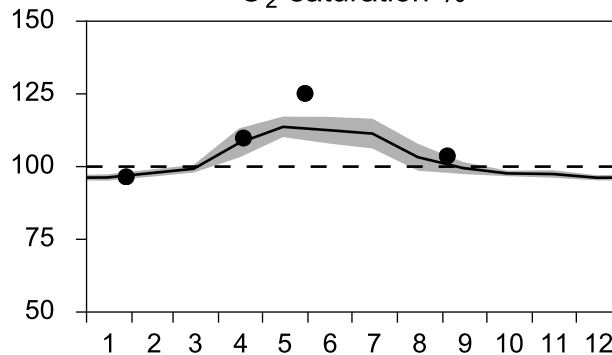
DIN µmol/l



SiO₃ µmol/l

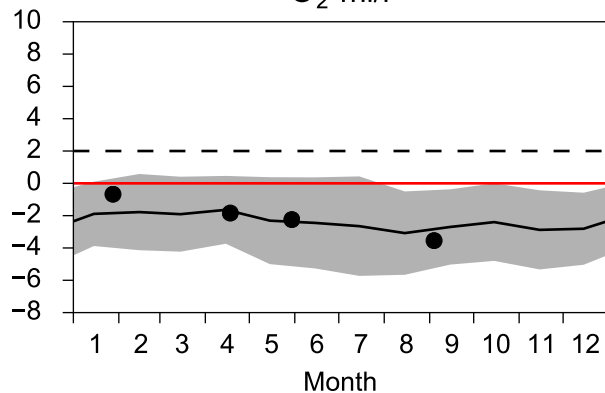


O₂ saturation %

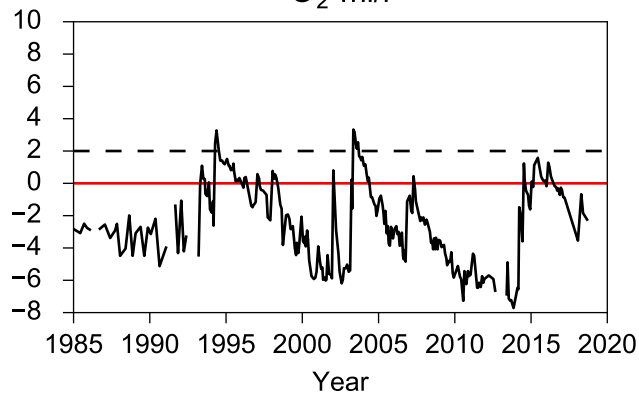


OXYGEN IN BOTTOM WATER (depth >= 225 m)

O₂ ml/l

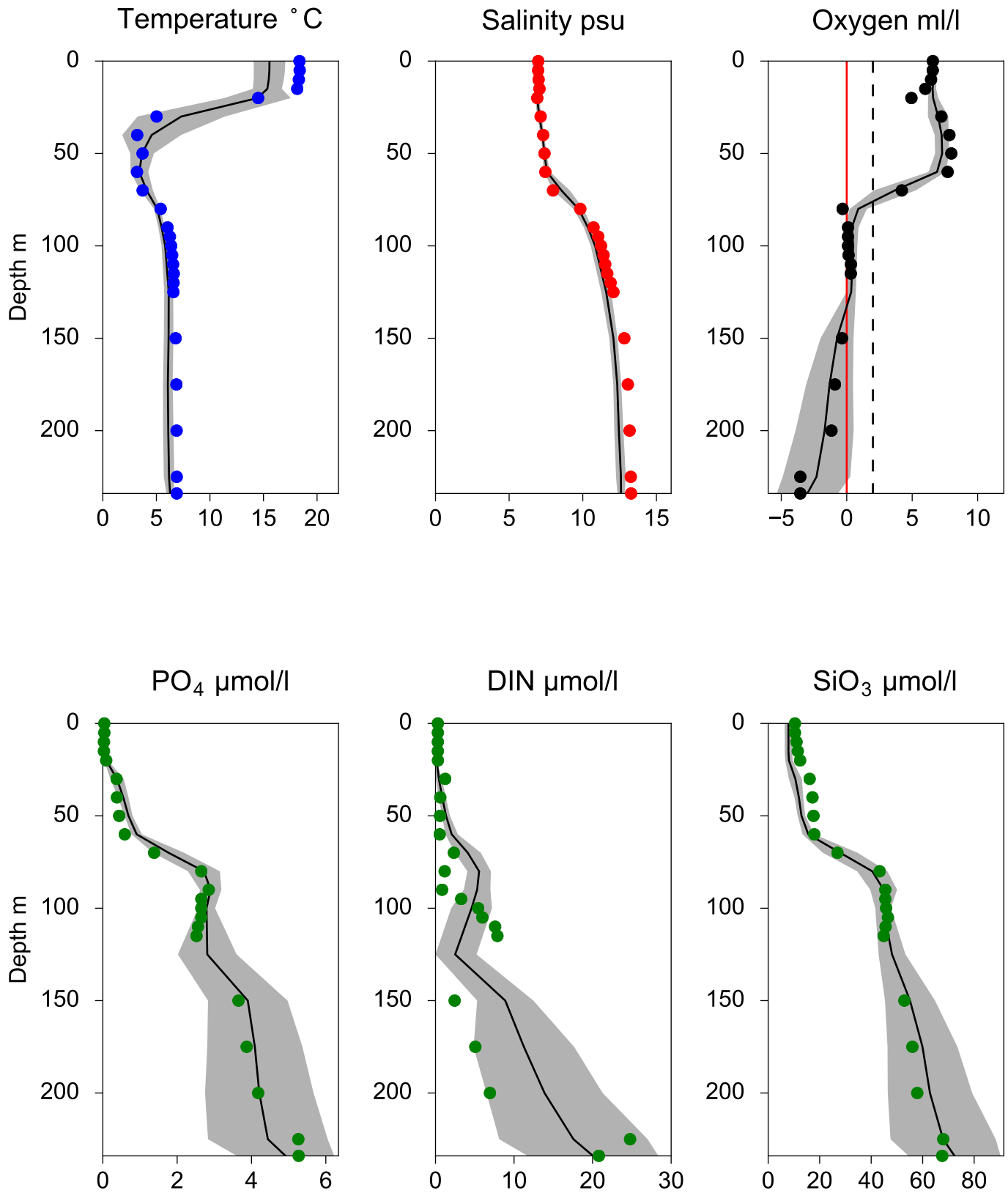


O₂ ml/l



Vertical profiles BY15 GOTLANDSDJ September

— Mean 2001-2015 St.Dev. • 2018-09-04



STATION BY20 FÅRÖDJ SURFACE WATER (0-10 m)

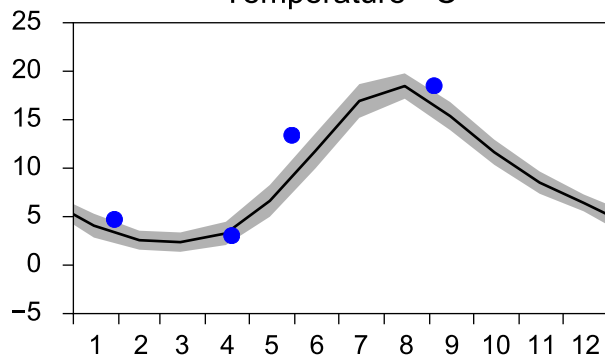
Annual Cycles

— Mean 2001-2015

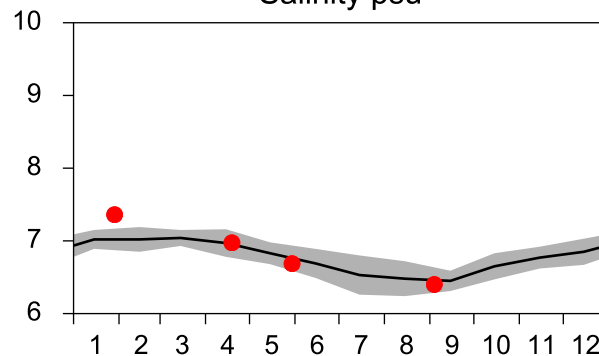
■ St.Dev.

● 2018

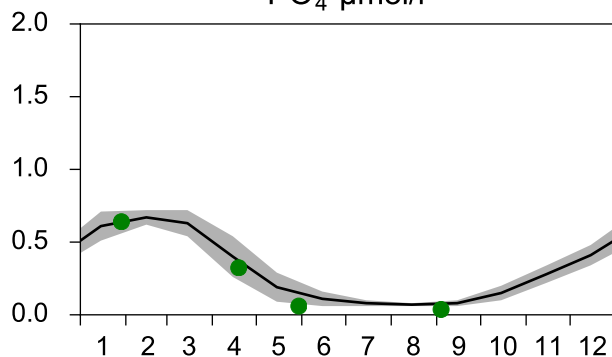
Temperature °C



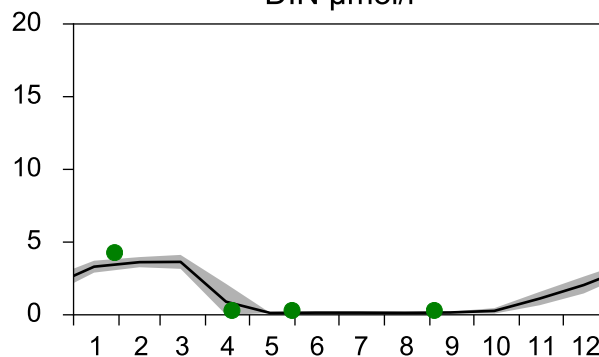
Salinity psu



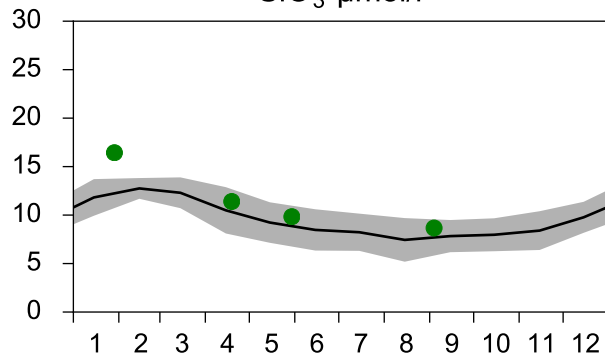
PO₄ µmol/l



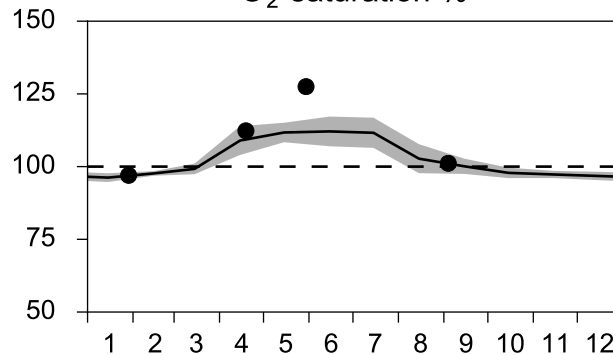
DIN µmol/l



SiO₃ µmol/l

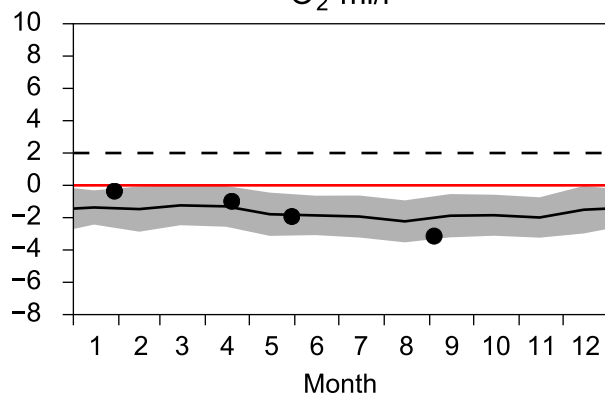


O₂ saturation %

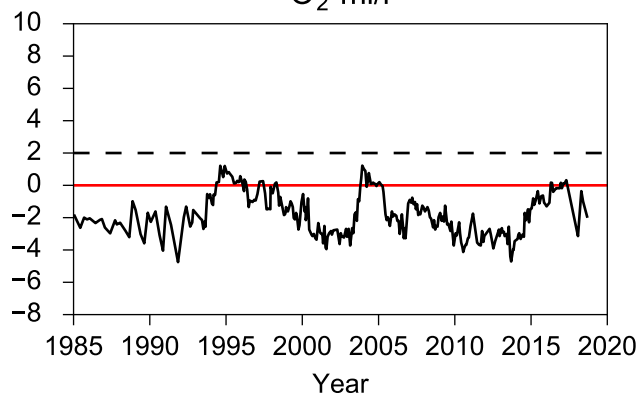


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

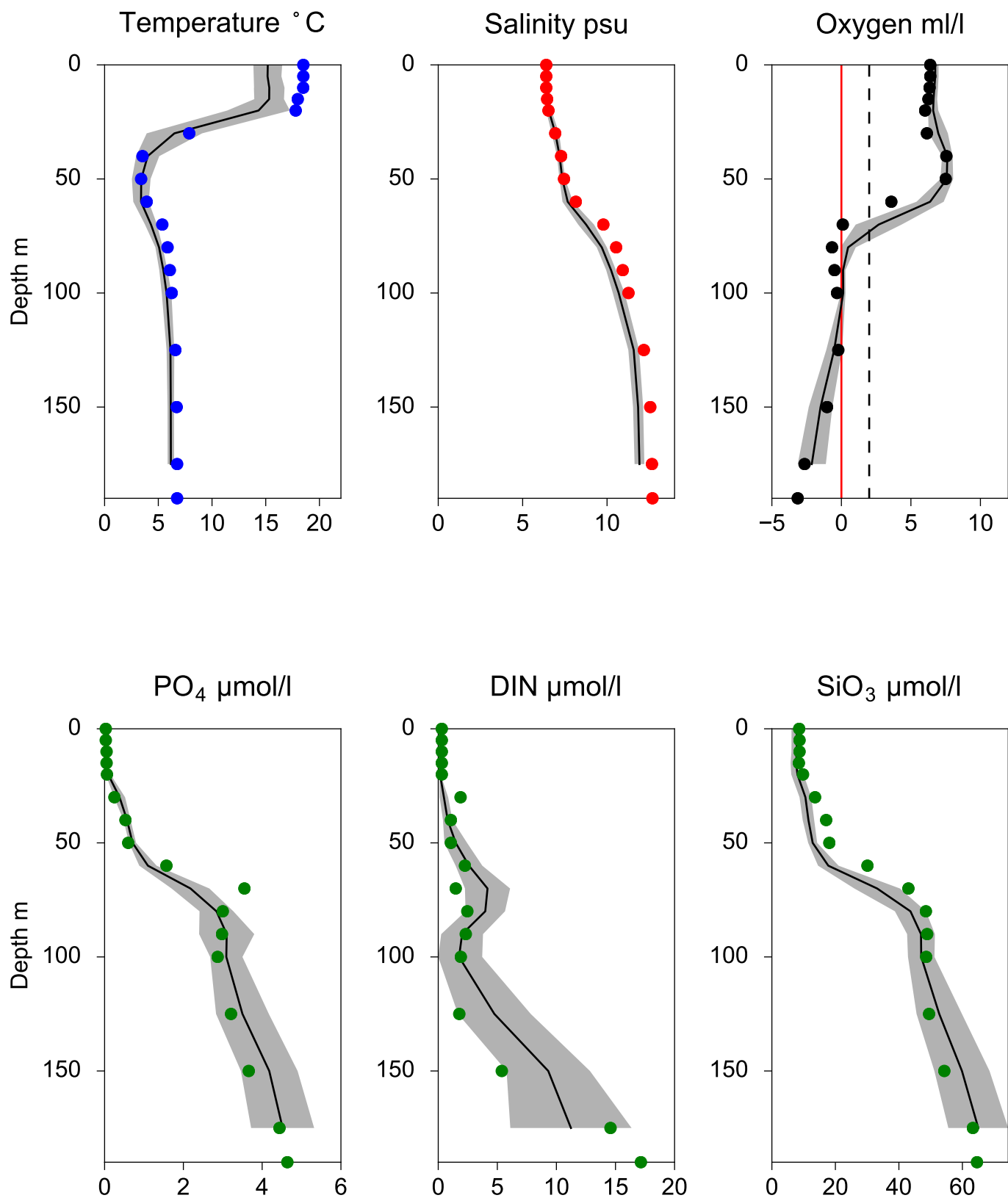


O₂ ml/l



Vertical profiles BY20 FÅRÖDJ September

— Mean 2001-2015 St.Dev. • 2018-09-04



STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

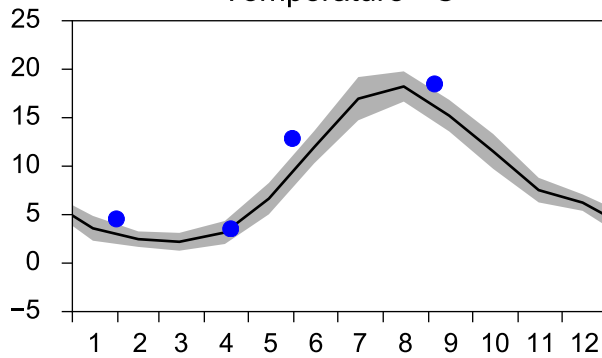
Annual Cycles

— Mean 2001-2015

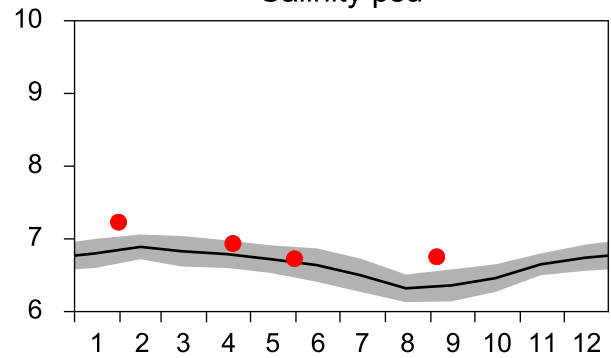
■ St.Dev.

● 2018

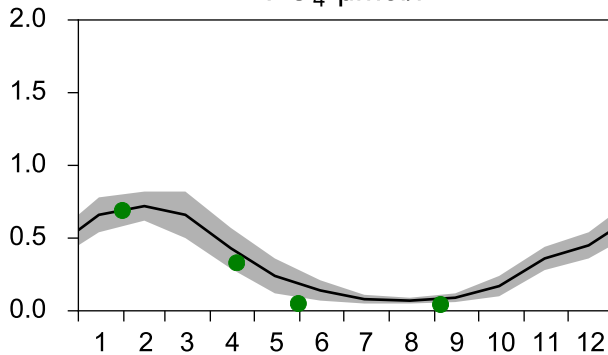
Temperature °C



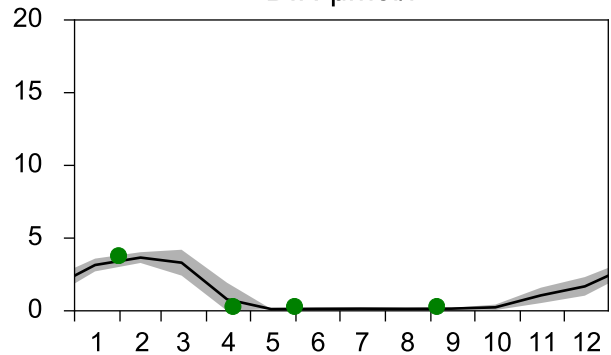
Salinity psu



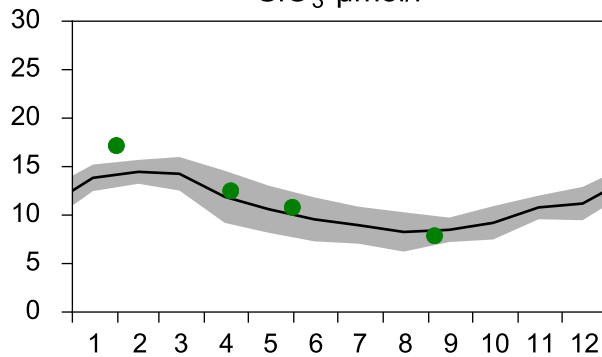
PO₄ µmol/l



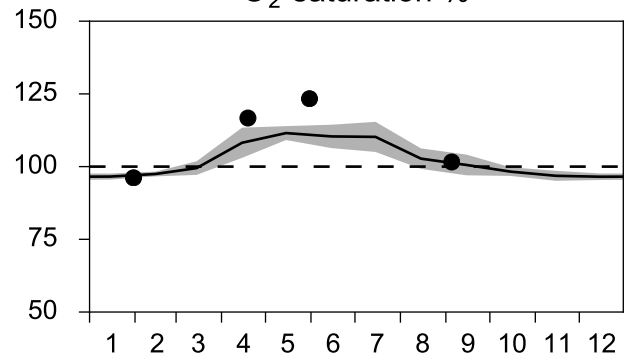
DIN µmol/l



SiO₃ µmol/l

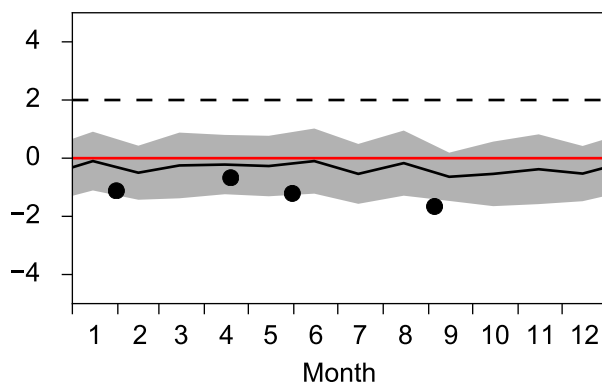


O₂ saturation %

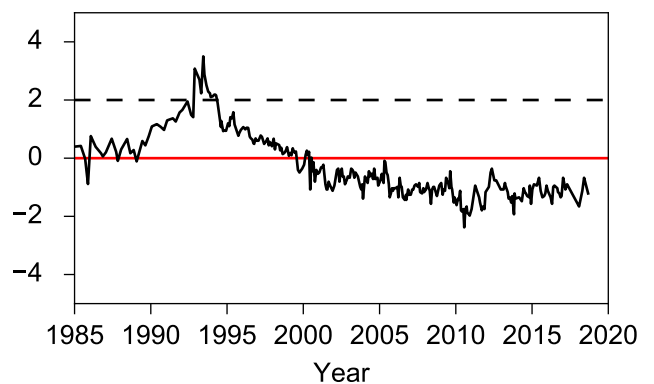


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

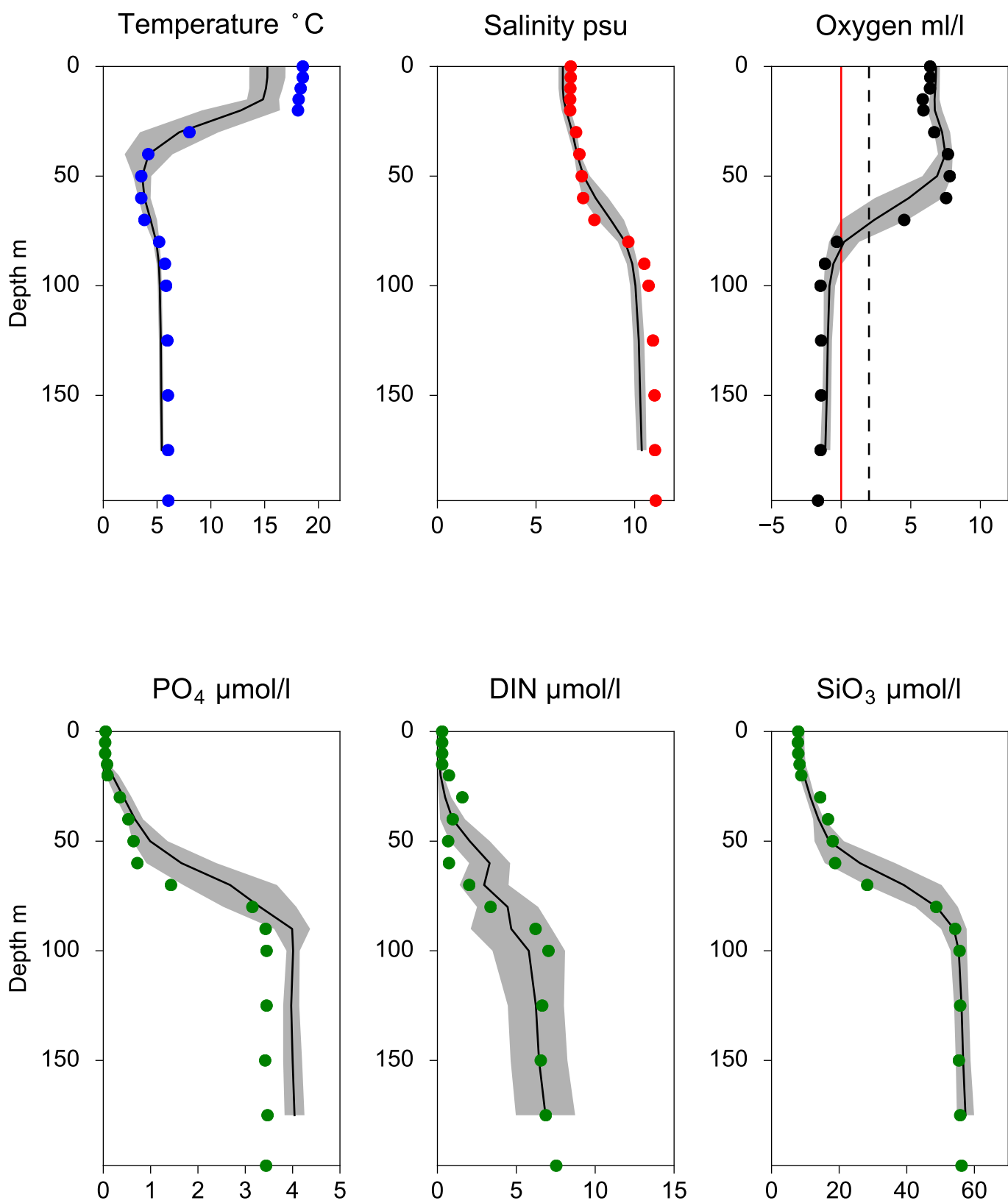


O₂ ml/l



Vertical profiles BY32 NORRKÖPINGSDJ September

— Mean 2001-2015 St.Dev. • 2018-09-05



STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

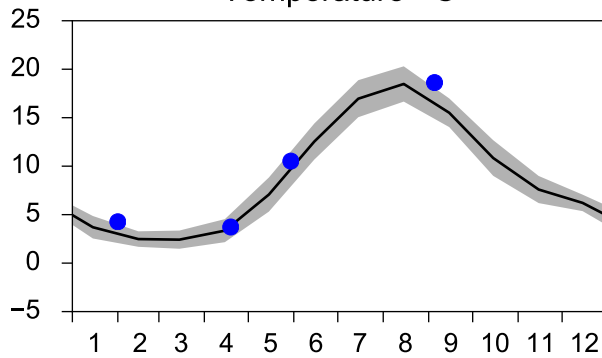
Annual Cycles

— Mean 2001-2015

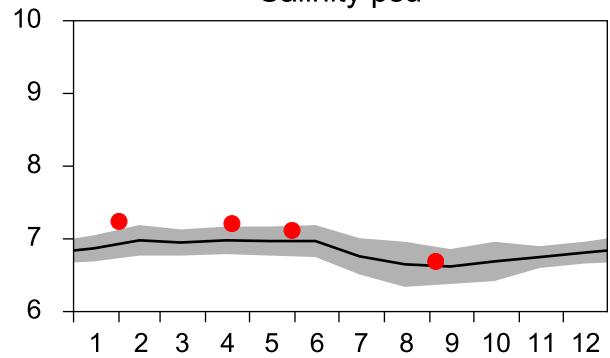
■ St.Dev.

● 2018

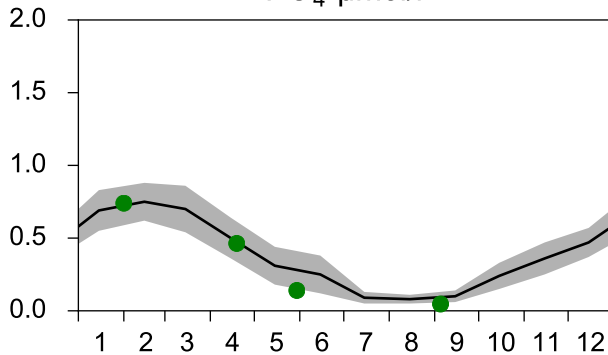
Temperature °C



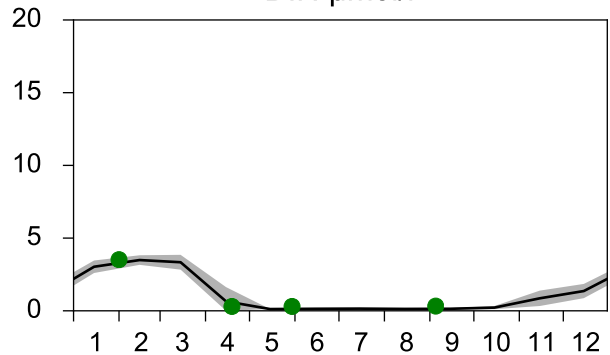
Salinity psu



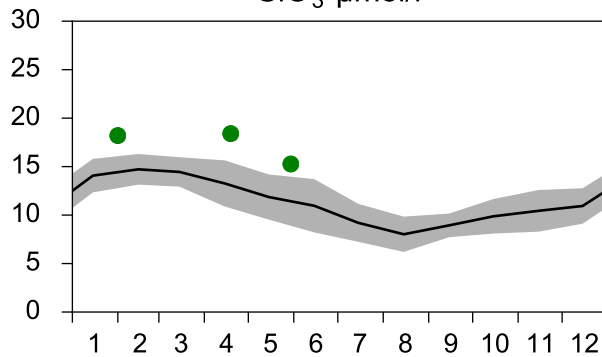
PO₄ µmol/l



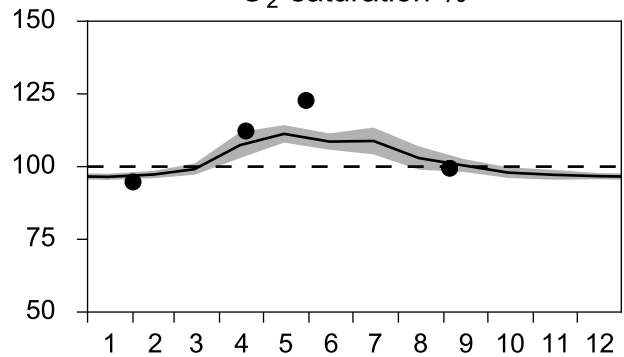
DIN µmol/l



SiO₃ µmol/l

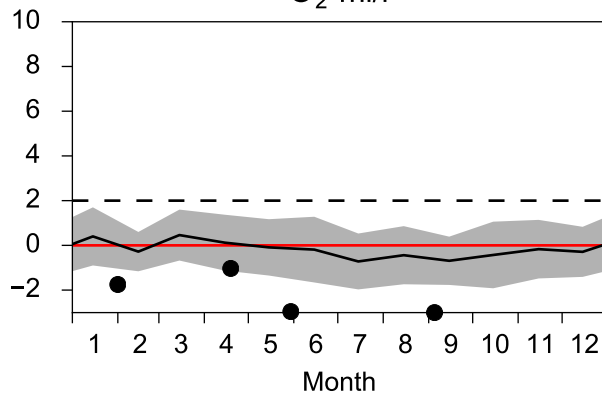


O₂ saturation %

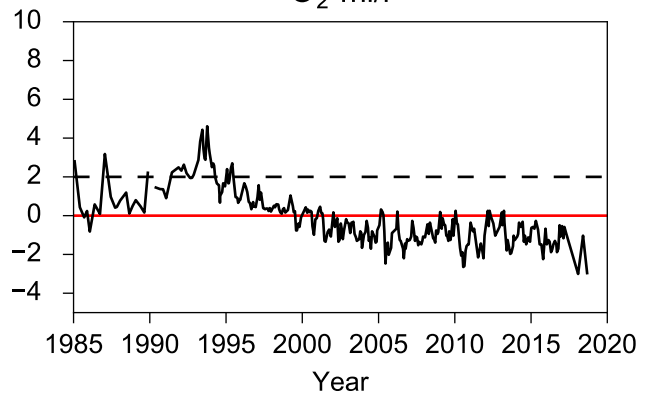


OXYGEN IN BOTTOM WATER (depth >= 100 m)

O₂ ml/l

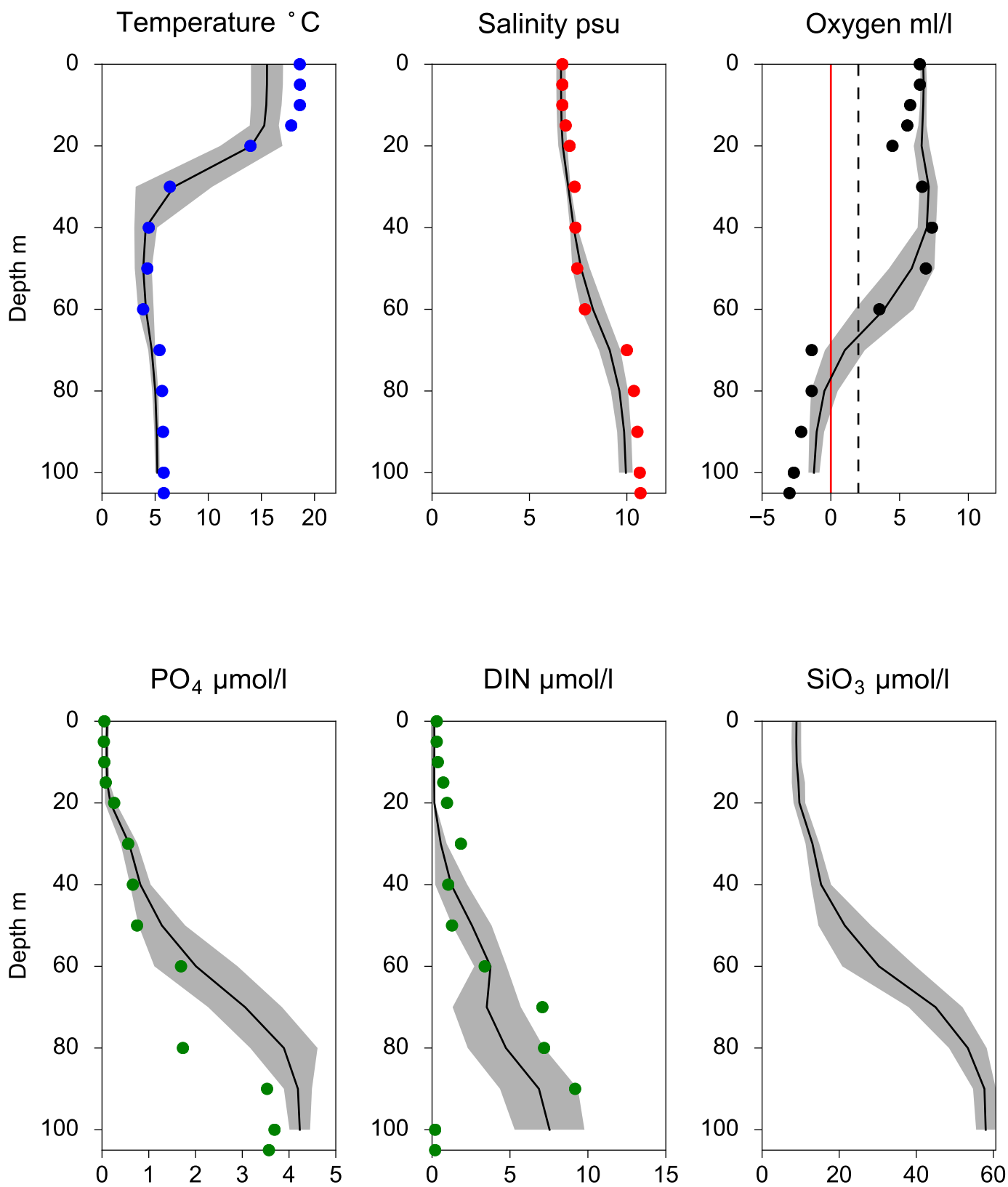


O₂ ml/l



Vertical profiles BY38 KARLSÖDJ September

— Mean 2001-2015 ■ St.Dev. ● 2018-09-05



STATION REF M1V1 SURFACE WATER (0-10 m)

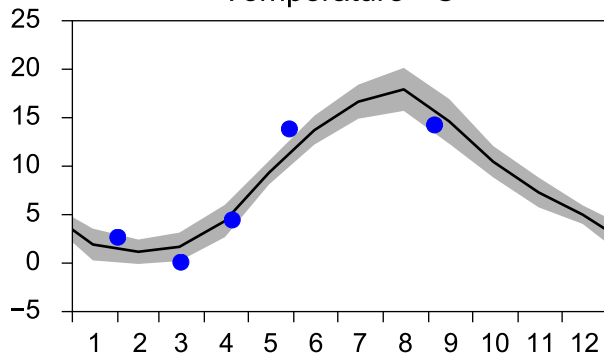
Annual Cycles

— Mean 2001-2015

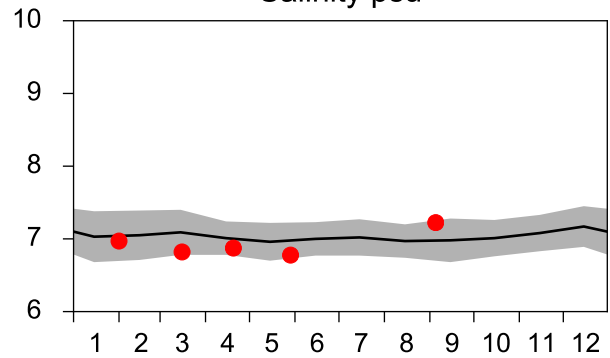
■ St.Dev.

● 2018

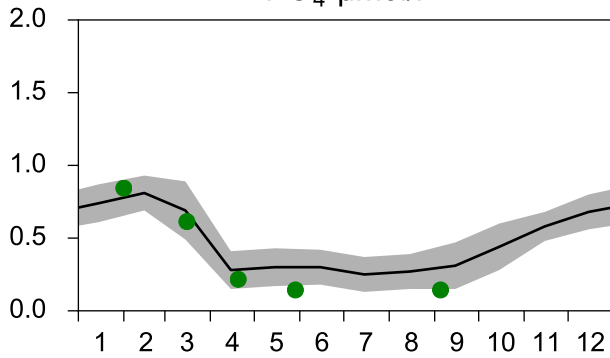
Temperature °C



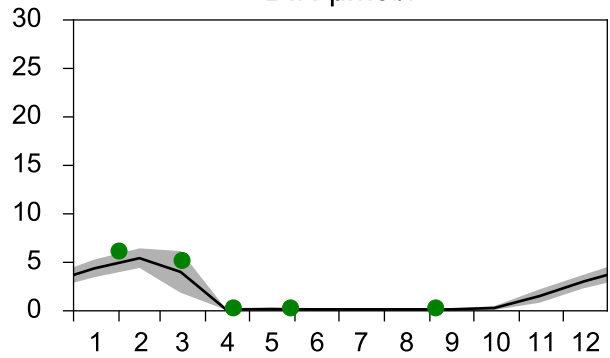
Salinity psu



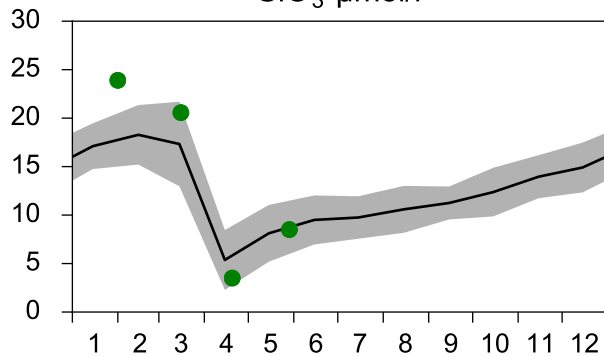
PO₄ µmol/l



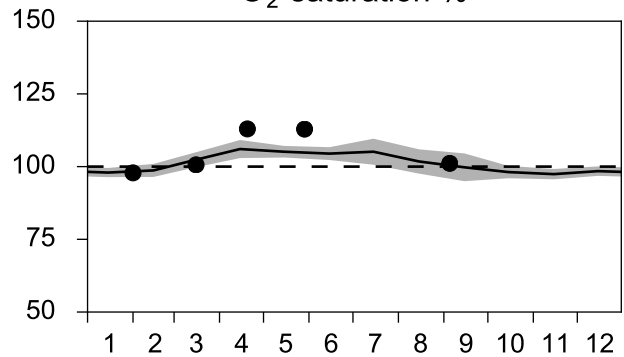
DIN µmol/l



SiO₃ µmol/l

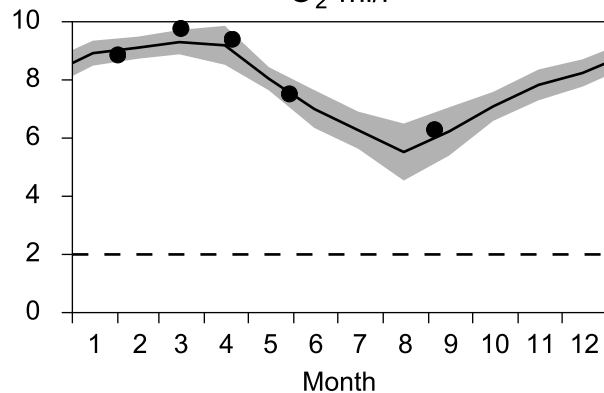


O₂ saturation %

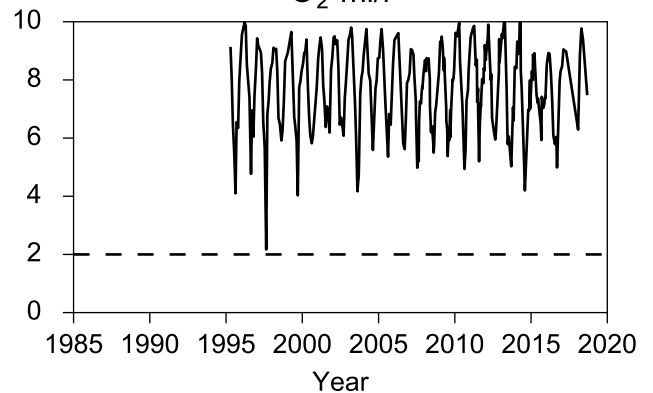


OXYGEN IN BOTTOM WATER (depth >= 17 m)

O₂ ml/l

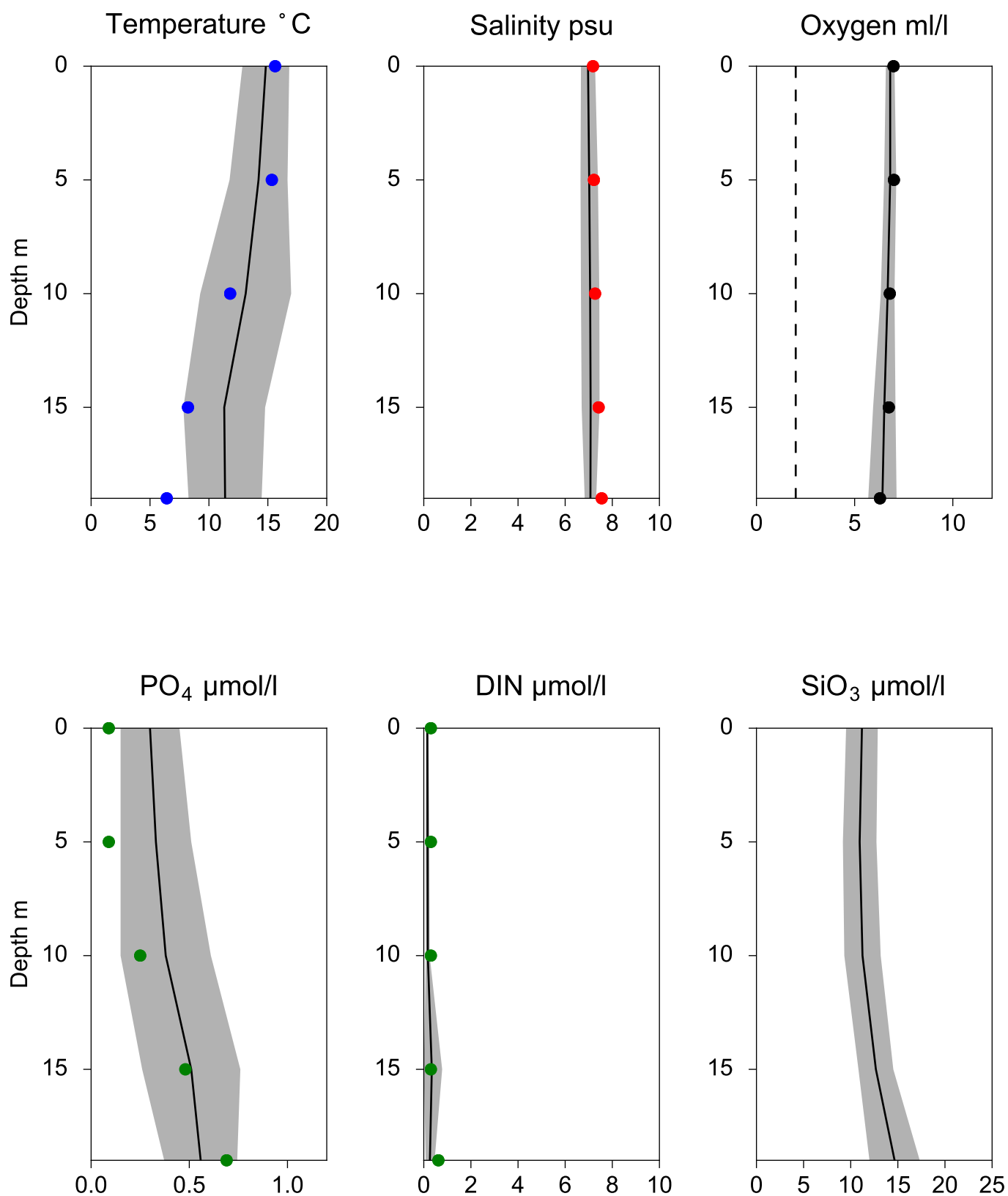


O₂ ml/l



Vertical profiles REF M1V1 September

— Mean 2001-2015 ■ St.Dev. ● 2018-09-05



STATION HANÖBUKTEN SURFACE WATER (0-10 m)

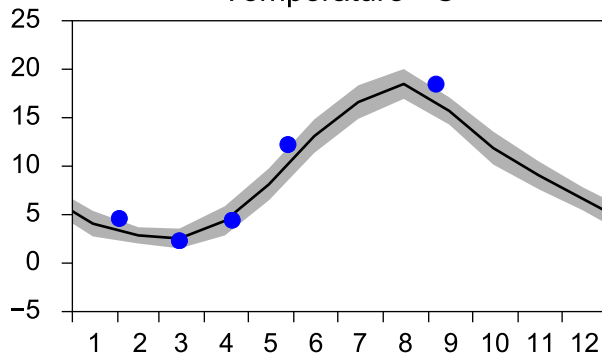
Annual Cycles

— Mean 2001-2015

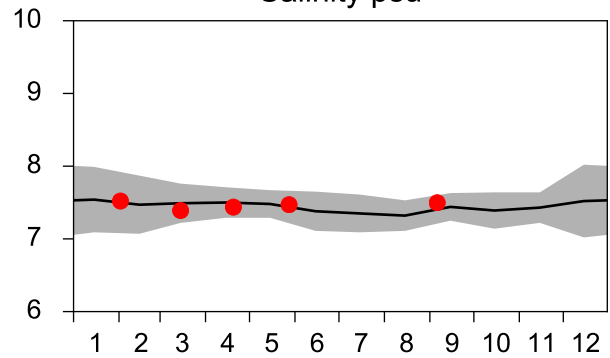
■ St.Dev.

● 2018

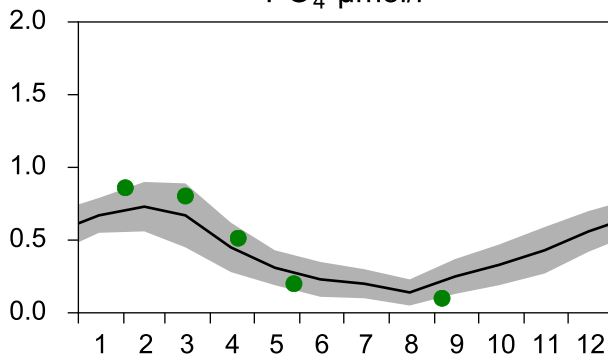
Temperature °C



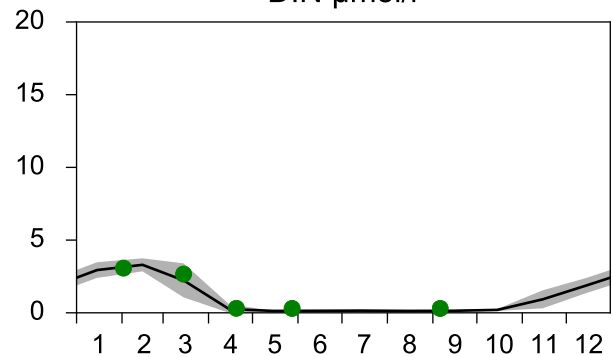
Salinity psu



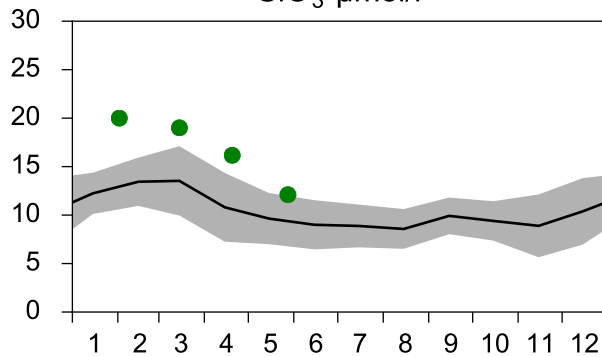
PO₄ µmol/l



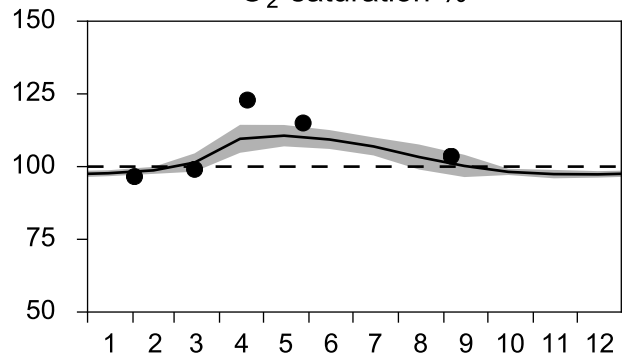
DIN µmol/l



SiO₃ µmol/l

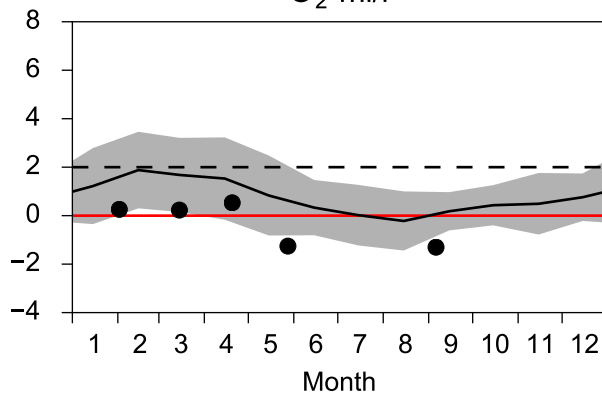


O₂ saturation %

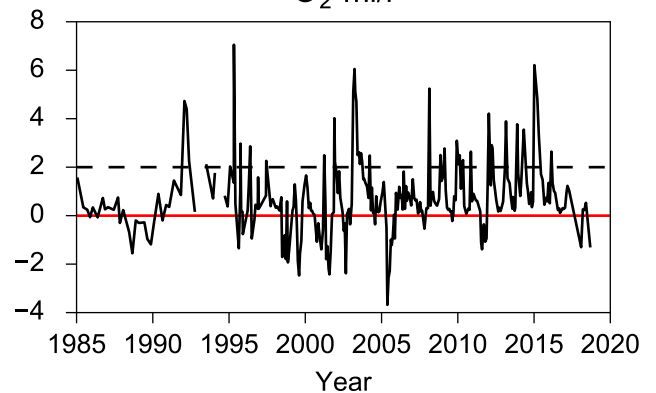


OXYGEN IN BOTTOM WATER (depth >= 70 m)

O₂ ml/l



O₂ ml/l



Vertical profiles HANÖBUKTEN September

— Mean 2001-2015

■ St.Dev.

● 2018-09-06

