

Rapport från SMHIs utsjöexpedition med R/V Aranda



Expeditionens varaktighet:	2016-06-13 - 2016-06-20
Undersökningsområde:	Skagerrak, Kattegatt, Öresund och Egentliga Östersjön
Uppdragsgivare:	SMHI samt Havs- och Vattenmyndigheten

SAMMANFATTNING

Under svenska havsövervakningsprogrammets expedition i juni besöktes Skagerrak, Kattegatt, Öresund och Egentliga Östersjön. Denna rapport är baserad på data som genomgått en första kvalitetskontroll, när data publiceras hos datavärden kan vissa värden ha ändras efter att en ytterligare granskning gjorts.

I Västerhavet var samtliga närsaltskoncentrationer mycket låga i ytvattnet. Omkring 10m fanns skiktningar och högre halter av närsalter återfanns under 20-30 meter. I Egentliga Östersjön var det oorganiska kvävet (nitrit+nitrat) slut ner till 30-40 meter, dock fanns det fortfarande fosfat kvar i de sydvästra delarna. Koncentrationen av silikat var fortfarande högre än normalt i hela Egentliga Östersjön

Akut syrebrist (< 2 ml/l) uppmättes från omkring 70 meters djup i hela Egentliga Östersjön. Svavelväte uppmättes endast nära botten, 175-195 m, på Fårödjupet samt från 80 meters djup i Västra Gotlandsbassängen. Gotlandsdjupet var fortfarande helt syresatt.

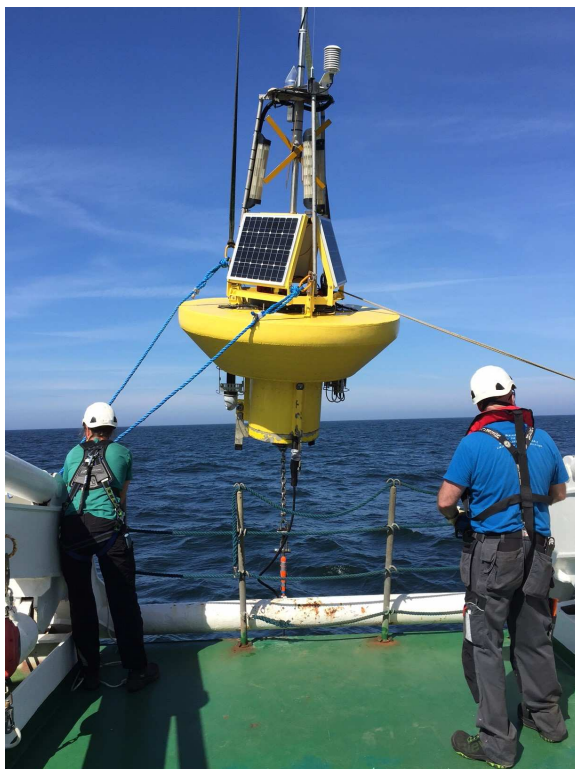
Nästa ordinarie expedition är planerad att starta 18:e juli.

RESULTAT

Expeditionen genomfördes ombord det finska forskningsfartyget Aranda och startade i Helsingfors den 13:e juni och avslutades den 20:e i Nådendal, nära Åbo, där Aranda skulle på varv.

Vindarna var svaga omkring syd fram till de sista dagarna av expeditionen, då passerade ett lågtryck över Östersjön och vindarna gick upp till 10-15m/s, i huvudsak västlig riktning.

Under expeditionen utfördes, på uppdrag av Umeå universitet, extra zooplanktonprovtagning på stationerna BY15, BY5, BY2, Anholt E och Släggö. I slutet av expeditionen besöktes havsbojen vid Huvudskär för en kortare service samt en referensmätning, figur 1.



Figur 1. Service av vågbojen vid Huvudskär.

Tyvärr kunde inget ammonium analyseras innan Lysekil under den här expeditionen på grund av instrumentfel, väl i Lysekil byttes det felaktiga instrumentet ut och ammonium kunde analyseras från station Å17 och framåt, se separat krysslista. De figurer som visar DIN (oorganiskt kväve) består därför enbart av nitrit+nitrat för alla stationer tagna innan Å17. I de fall då svavelväte påträffats så har DIN tagits bort i figurerna eftersom DIN nästan enbart består av ammonium vid syrefria förhållanden.

Under provtagningen av LL19 blev det kortslutning i vajern och kontakten med rosetten och CTDn bröts. Vajern kunde retermineras och var klar strax innan BY10, stationerna LL17, BY20 samt BY15 saknar därför provtagning med CTD.

Under expeditionen analyserades växtplanktonprover ombord av växtplanktonexperten Malin Mohlin, resultaten presenteras i Algaware-rapporten för juni; http://www.smhi.se/oceanografi/oce_info_data/reports/alg/alsit16_6.pdf, nedan följer en sammanfattning.

I Skagerrak var artdiversiteten stor bland dinoflagellaterna, men det var kiselalgen *Proboscia alata* som dominerade fytoplanktonsamhället.

Kiselalger var mycket vanliga i Kattegatt och även här var det *Proboscia alata* som var flest till antal med undantag av Anholt E, där även *Dactyliosolen fragilissimus* och *Guinardia flaccida* var mycket vanliga.

Det var inga synliga ytansamlingar under juniexpedition i Östersjön. Filamentösa cyanobakterier var dock synliga i vattnet för ögat på alla stationer i Egentliga Östersjön. Vid närmare analys av både yt- och integrerade prover (0-10 m) var det främst stora mängder av *Aphanizomenon flos-aquae*. Den giftiga arten *Nodularia spumigena* fanns dock i alla prover men var inte dominerande till antal. Det skulle snabbt kunna uppkomma ytansamlingar om vädret tillåter; ingen vind och högre temperatur i vattnet.

Daglig algövervakning via satellit utförs av SMHI under sommaren och finns tillgänglig på <http://www.smhi.se/vadret/hav-och-kust/algsituationen>.

Skagerrak

Temperaturen i ytvattnet var normal, eller strax över normal, för årstiden och varierade från 15 °C i utsjön till 17 °C mer kustnära. Ytsalthalten i yttre Skagerrak var normal för årstiden och något lägre än normalt närmast kusten och låg mellan 20 och 30 psu. Skiktningen, både när det gäller temperatur och salthalt, sammanföll på omkring 10 m.

Samtliga närsaltskoncentrationer var mycket låga i ytlagret i hela området, vilket också är normalt för säsongen. Koncentrationen av fosfat varierade mellan 0,02-0,05 µmol/l, koncentrationen av nitrat och nitrit låg under rapporteringsgränsen (<0,10 µmol/l respektive <0,02 µmol/l). Silikatkoncentration låg på 0,1 µmol/l förutom vid P2 där halter på 0,7 µmol/l uppmättes. Vid samtliga stationer var fluorescensen maximal kring 20-30 m, på Å13 syntes en kraftig topp på 25m. Vid 10-20 m vattnet övermättat med syre vilket indikerar högre planktonaktivitet, närsaltshalterna ökade först vid 30 m. Bottenvattnet var väl syresatt, även vid Släggö i Gullmarsfjordens mynning.

Kattegatt och Öresund

Temperaturen i ytvattnet var normal för årstiden och varierade mellan 16 och 17,5 °C. Salthalten i ytlagret var också normal för årstiden förutom i Öresund där den var högre än normalt omkring 10-15 m. Lägsta uppmätta värde i ytan i Öresund låg på drygt 9 psu och högsta, på 28 psu, kom från 10 m från Fladen. I området låg salt- och temperaturskiktningen på djup mellan 5 och 15 meter.

Samtliga närsalter i ytvattnet var mycket låga vilket är normalt för årstiden. Fosfatkoncentrationerna varierade mellan 0,04-0,30 µmol/l, nitrat och nitrit var under eller omkring rapporteringsgränsen (<0,10 µmol/l respektive <0,02 µmol/l) och silikatvarierade mellan 0,4 och 9 µmol/l. Högsta närsaltskoncentrationerna återfanns i Öresund. Närsaltshaltkoncentrationer över rapporteringsgränsen återfanns först vid 15-20 m och djupare. Syreförhållandena i djupvattnet var goda och lägsta koncentrationen uppmättes i Öresund, knappt 4,5 ml/l. Vid samtliga stationer sågs en fluorescenstopp kring 10-25 m, högst vid W Landskrona mellan 10 och 15 m.

Egentliga Östersjön

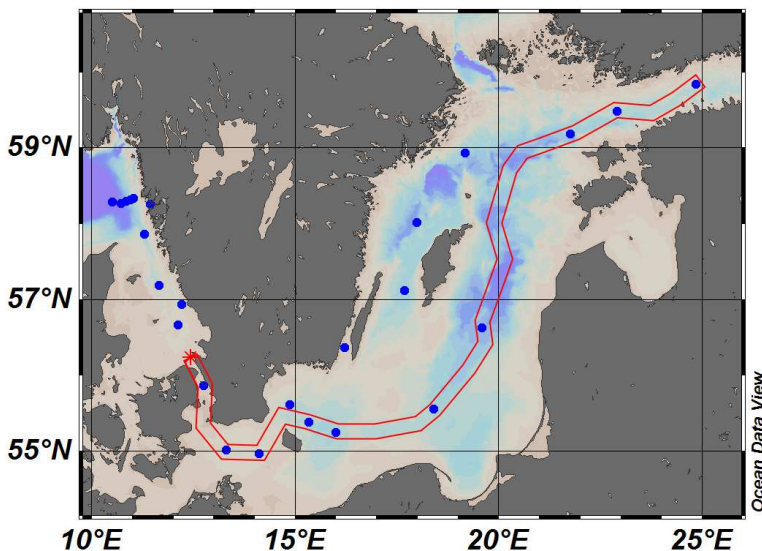
Temperaturen i ytvattnet var normal och låg på omkring 14-15 °C, varmest i sydvästra delarna av Östersjön. Ytsalthalten var normal eller strax över och varierade mellan 7 och 8 psu.

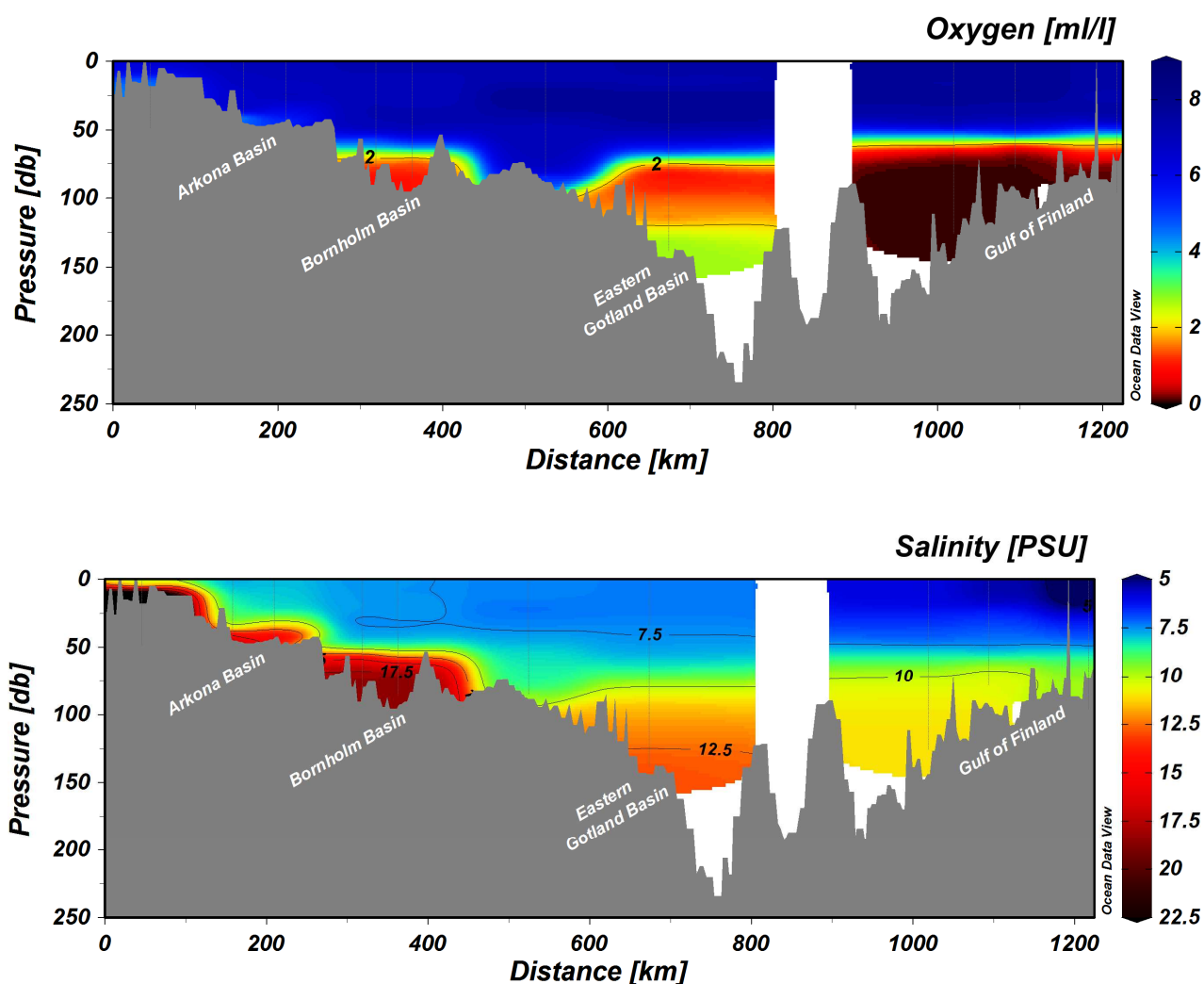
Haloklinen i Östersjön varierade mellan 50-80 meter, förutom i Arkonabassängen där den låg något grundare på omkring 35-40 meter. En välutvecklad sommartermoklin hade utvecklats vid 15-20 meter.

Halterna av nitrit i ytan låg på mellan 0,03-0,04 $\mu\text{mol/l}$ och nitrathalterna var under rapporteringsgränsen på 0,10 $\mu\text{mol/l}$ förutom på BY5 där koncentrationen låg på drygt 0,35 $\mu\text{mol/l}$. Först vid 50 m ökar halterna av nitrat och nitrit. Fosfathalterna i ytan låg i Västra Gotlandsbassängen något under normala nivåer och i Arkonabassängen något över normalt, i övriga Östersjön på nivåer normalt för årstiden. Koncentrationen i centrala delarna låg på omkring 0,10 $\mu\text{mol/l}$, i Arkona- och Bornholmsbassängen omkring 0,30 $\mu\text{mol/l}$. Silikatkoncentrationerna var högre än normalt och låg mellan 9-14 $\mu\text{mol/l}$.

I Västra Gotlandsbassängen var det en snabb övergång från syresatt vatten till det anoxiska skiktet vid 90 meter, vid BY38 uppmättes akut syrebrist (< 2 ml/l) vid 70 meter och svavelväte från 80 meter. I norra delen av Östra Gotlandsbassängen, BY20, var syrekoncentrationerna varierande med strax över 2 ml/l på 80 meter, men svavelväte uppmättes endast närmast botten vid 175 och 195 meter. Vid BY15 Gotlandsdjupet var fortfarande hela vattenkolumnen syresatt, det var dock mycket låga syrgashalter i botten-skiktet och akut syrebrist rådde redan från 70 meter. Akut syrebrist observerades även i Hanöbukten från ca 60 meter och i Bornholmsbassängen från 70 meter, vilket är en försämring sedan SMHI's förra mätning i maj.

Fluorescensmätningarna och planktonprovtagningarna visade biologisk aktivitet i ytlagret i hela Egentliga Östersjön och vissa fluorescenstoppar observerades kring 10 meter. Inga tydliga ytansamlingar kunde observeras men det fanns gott om cyanobakterier i ytlagret som vid fortsatt lugnt väder kan ansamlas i ytan.





Figur 2. Snitt som visar syre- och salthalt genom Egentliga Östersjön från Öresund till Finska viken.

DELTAGARE

Namn

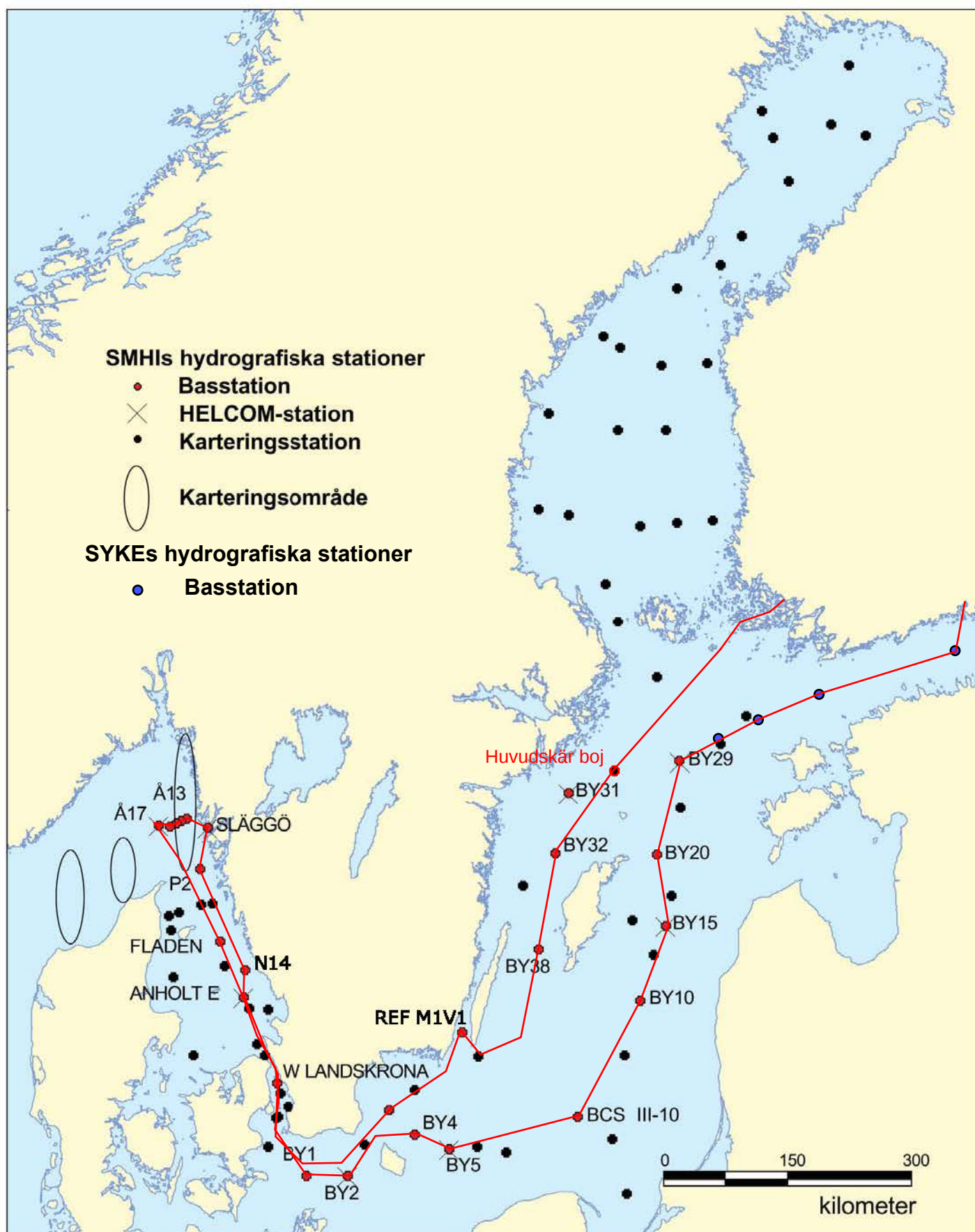
Örjan Bäck
Sara Johansson
Daniel Bergman Sjöstrand
Sari Sipilä
Johanna Linders
Malin Mohlin

Från

SMHI
SMHI
SMHI
SMHI
SMHI
SMHI

BILAGOR

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



Ship: AR
Year: 2016

[illegible]

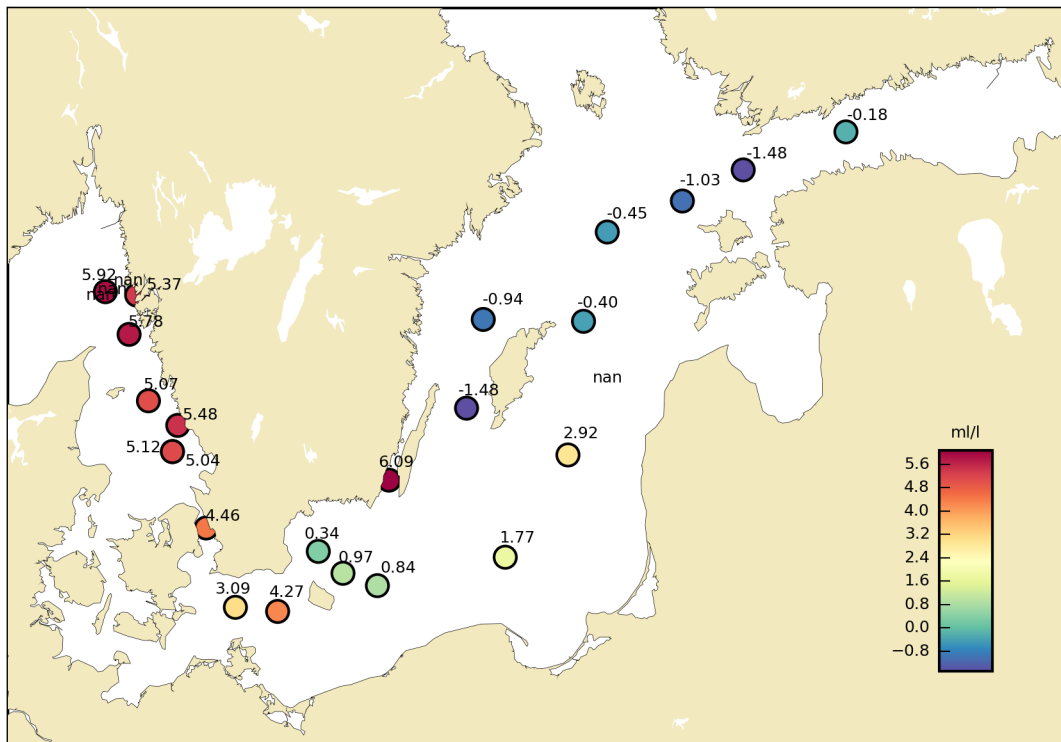
Bottom water oxygen concentration (ml/l)

Country: Finland

Ship : Aranda

Date : 20160613-20160620

Series : 0326-0354



STATION BY20 FÅRÖDJ SURFACE WATER (0-10m)

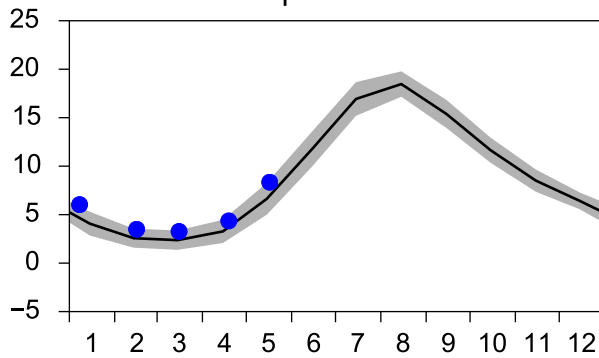
Annual Cycles

— Mean 2001-2015

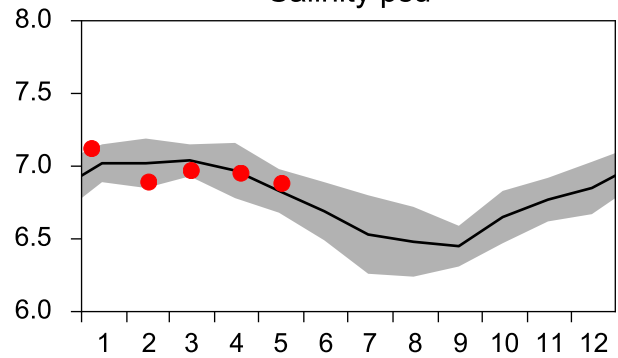
■ St.Dev.

● 2016

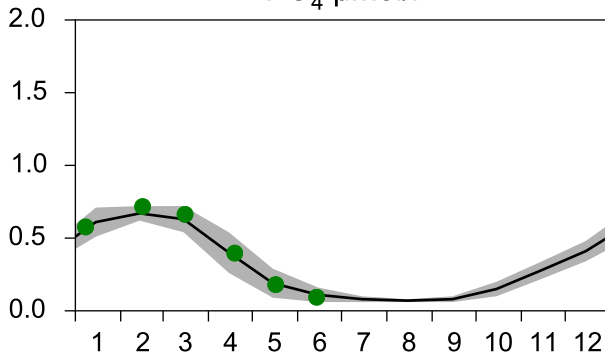
Temperature °C



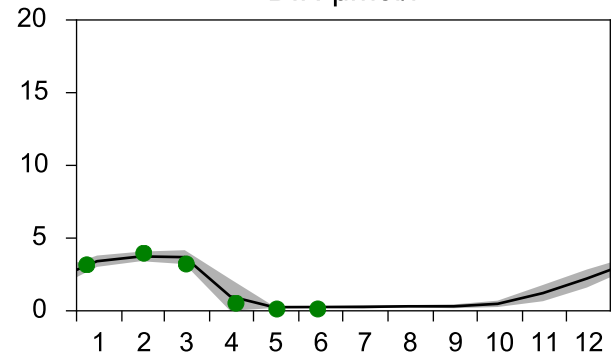
Salinity psu



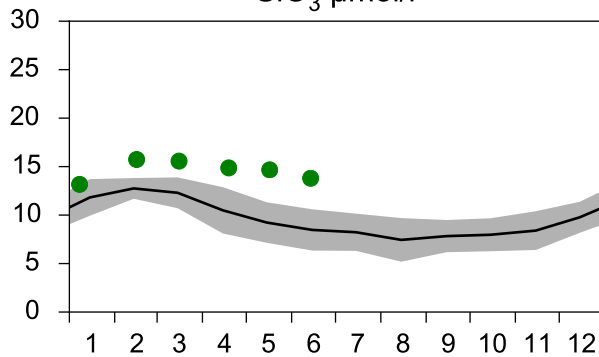
PO₄ µmol/l



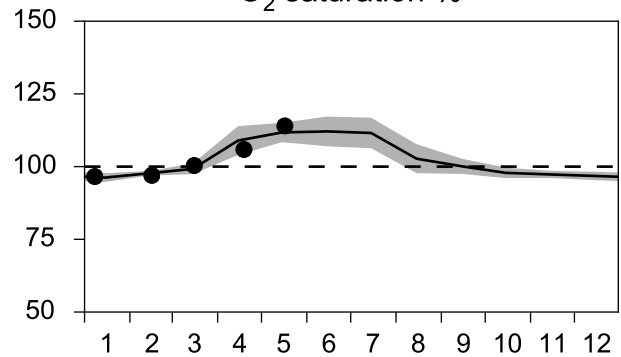
DIN µmol/l



SiO₃ µmol/l

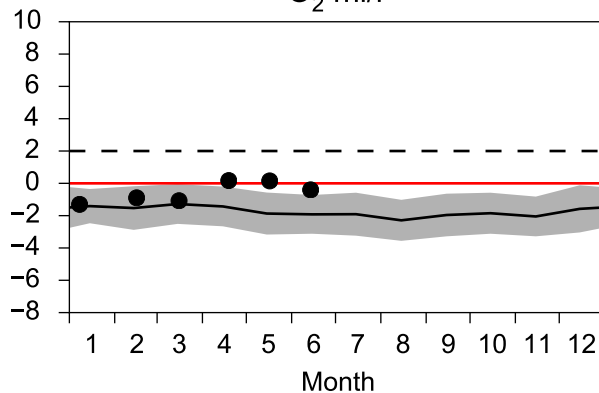


O₂ saturation %

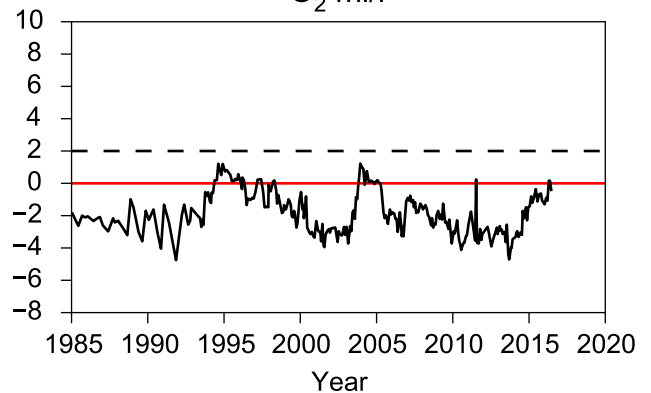


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l

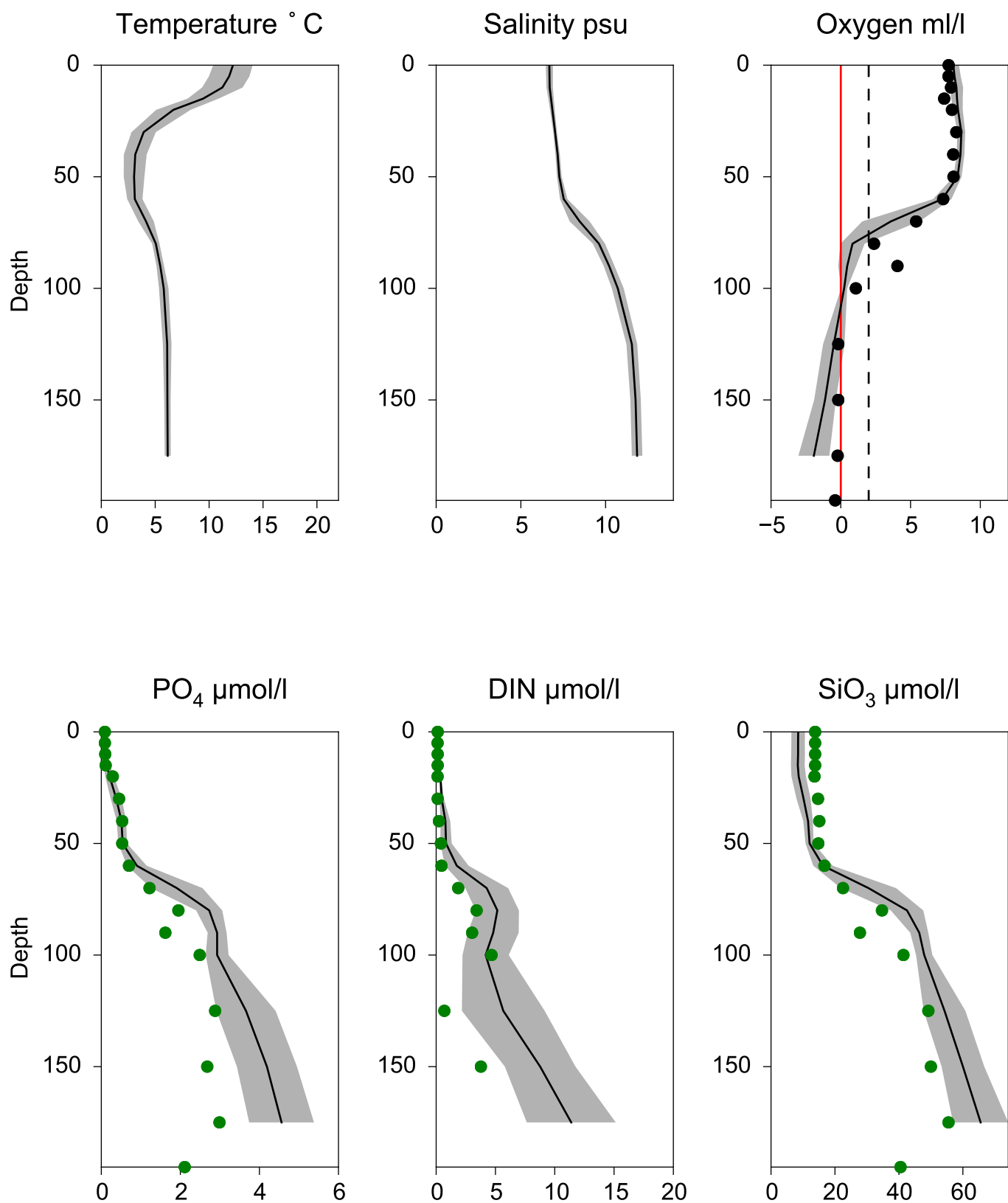


O₂ ml/l



Vertical profiles BY20 FÅRÖDJ June

— Mean 2001-2015 ■ St.Dev. ● 2016-06-14



STATION BY15 GOTLANDSDJ SURFACE WATER (0-10m)

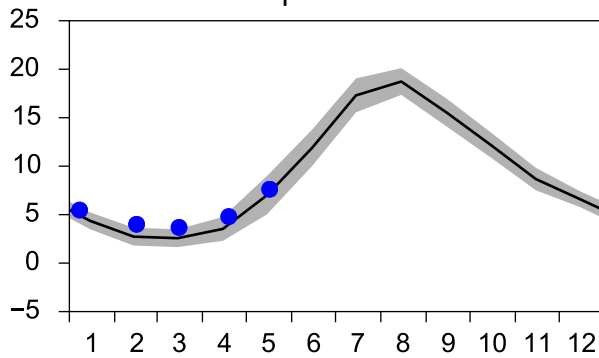
Annual Cycles

— Mean 2001-2015

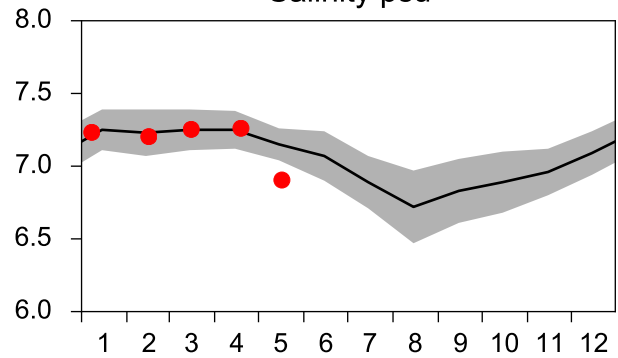
■ St.Dev.

● 2016

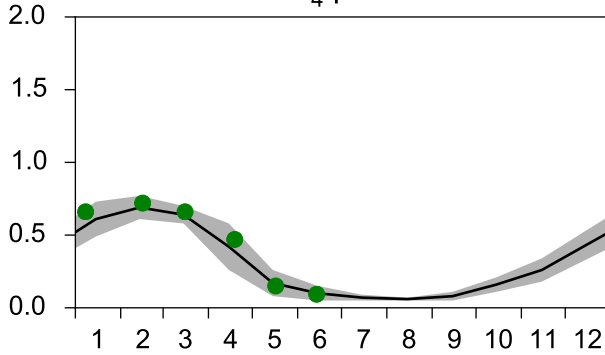
Temperature °C



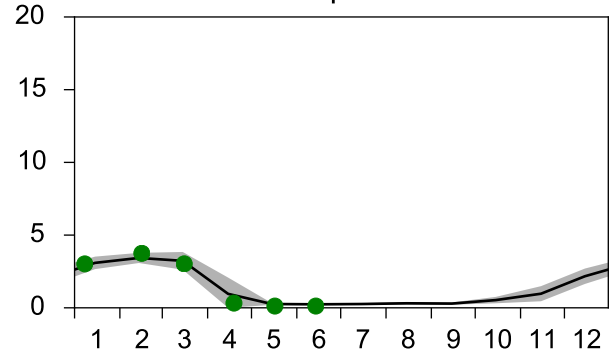
Salinity psu



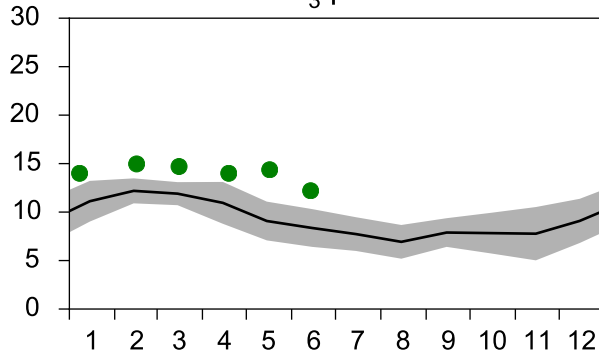
PO₄ µmol/l



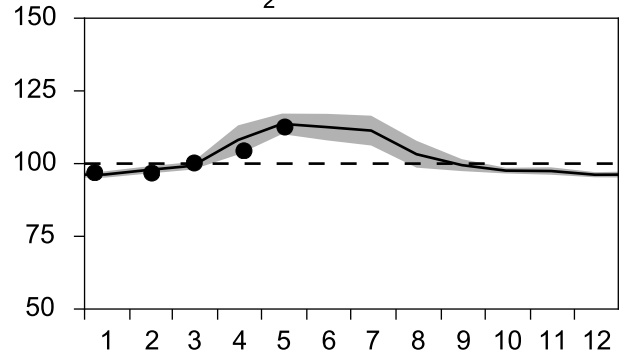
DIN µmol/l



SiO₃ µmol/l

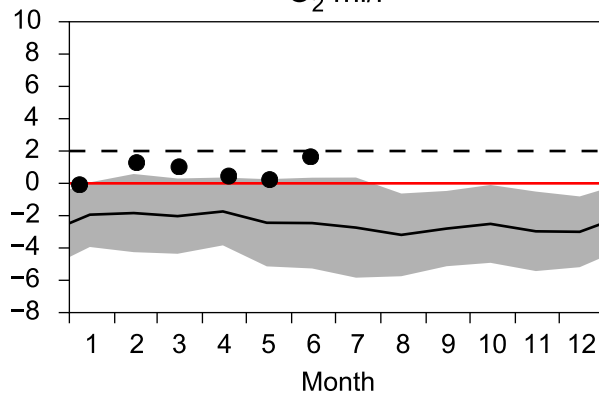


O₂ saturation %

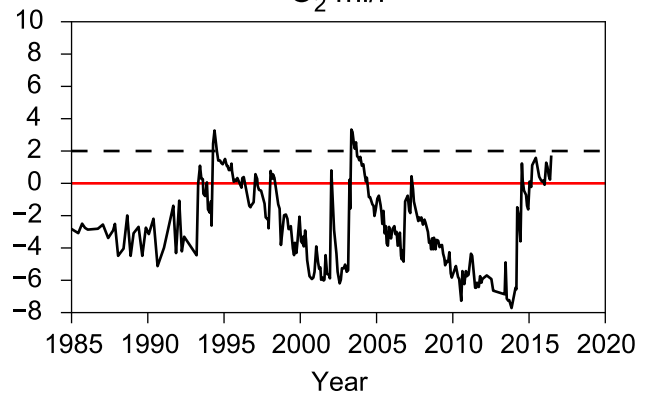


OXYGEN IN BOTTOM WATER (depth >= 225 m)

O₂ ml/l

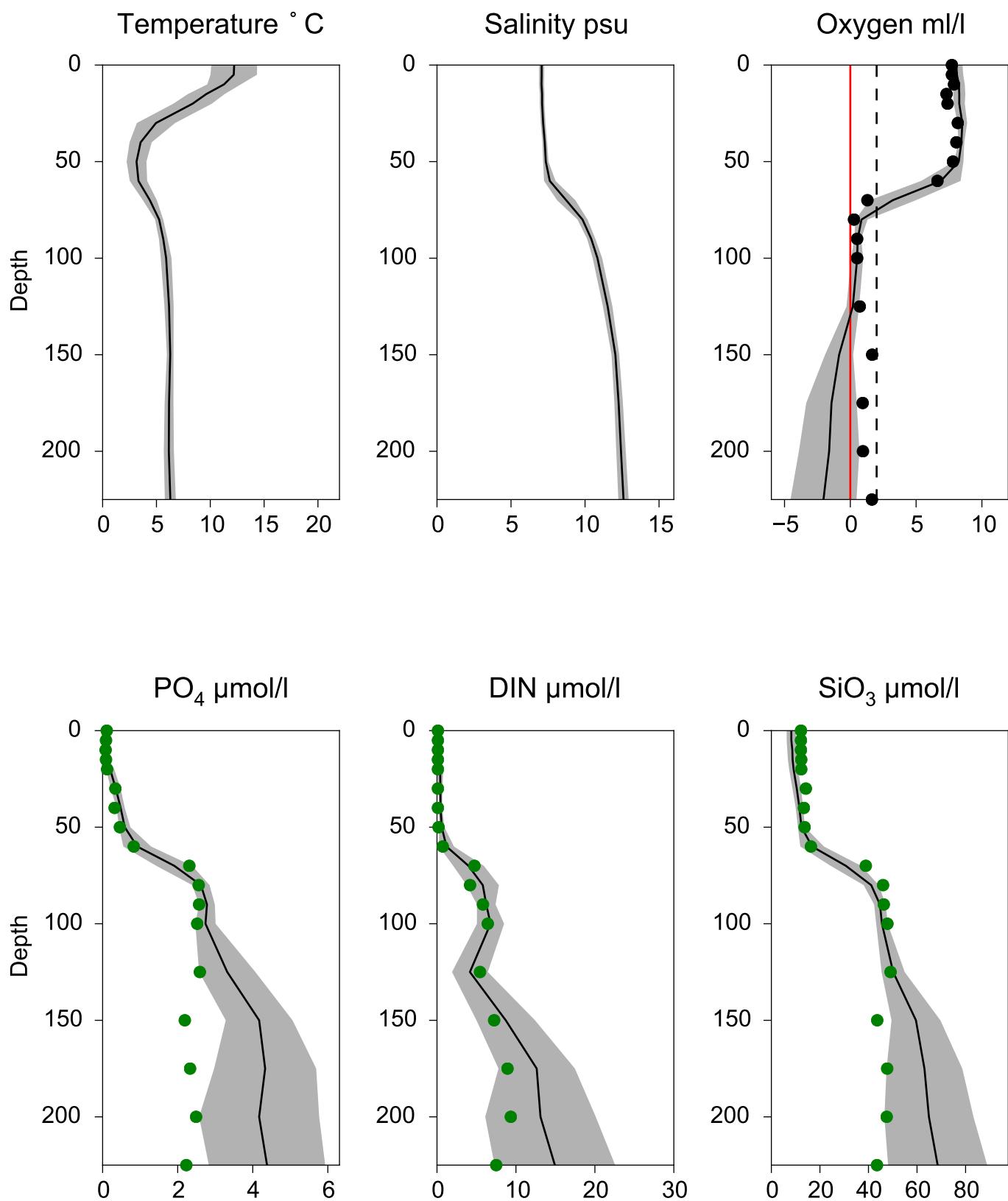


O₂ ml/l



Vertical profiles BY15 GOTLANDSDJ June

— Mean 2001-2015 ■ St.Dev. ● 2016-06-14



STATION BY10 SURFACE WATER (0-10m)

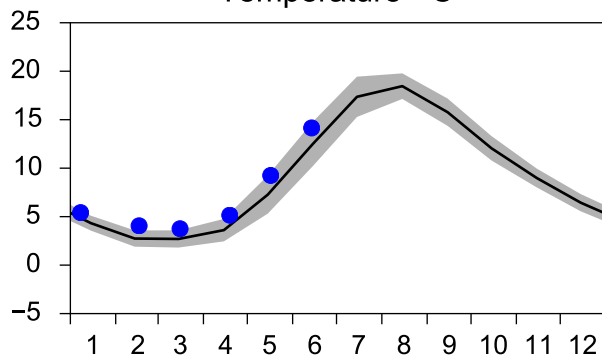
Annual Cycles

— Mean 2001-2015

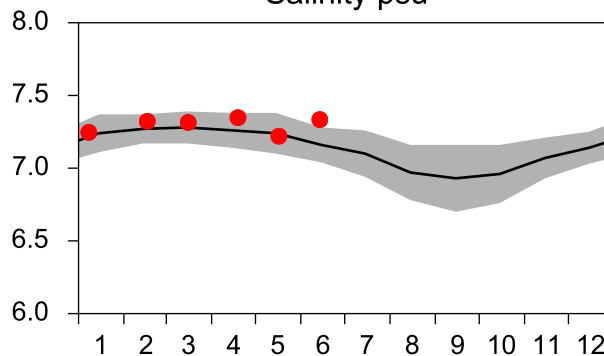
■ St.Dev.

● 2016

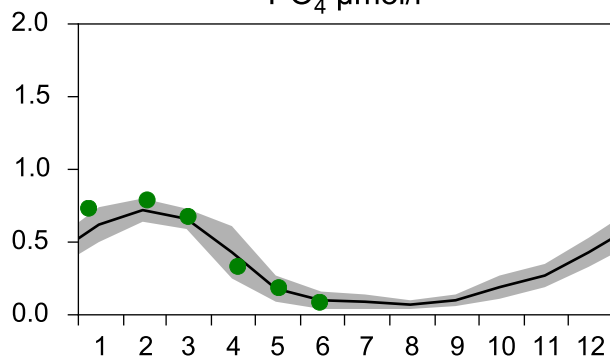
Temperature °C



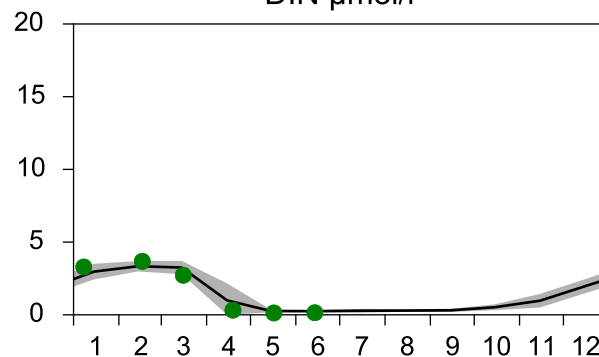
Salinity psu



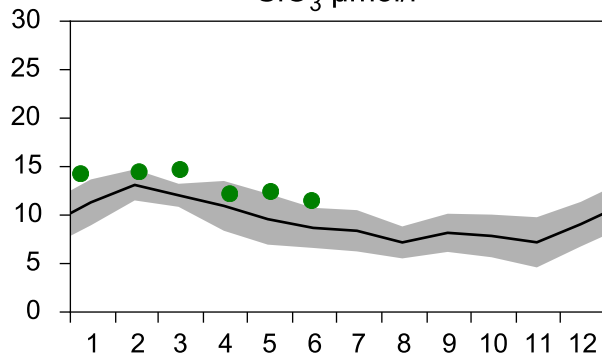
PO₄ µmol/l



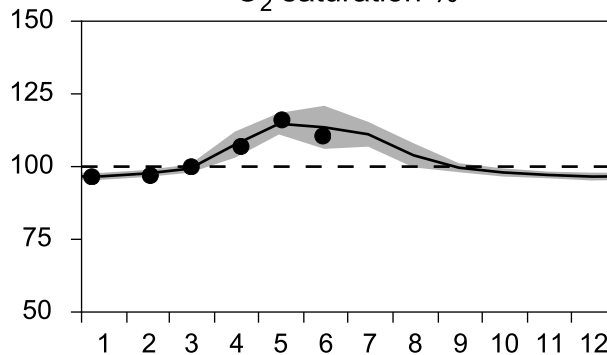
DIN µmol/l



SiO₃ µmol/l

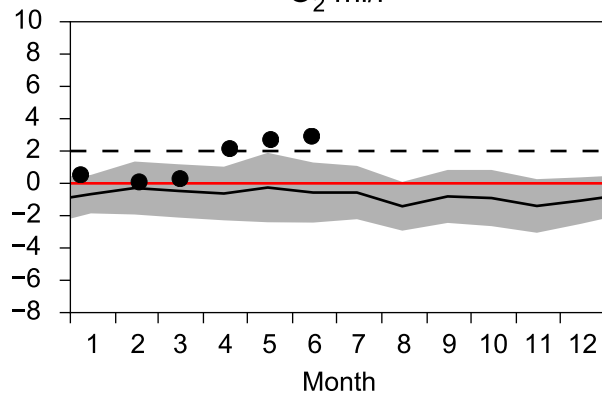


O₂ saturation %

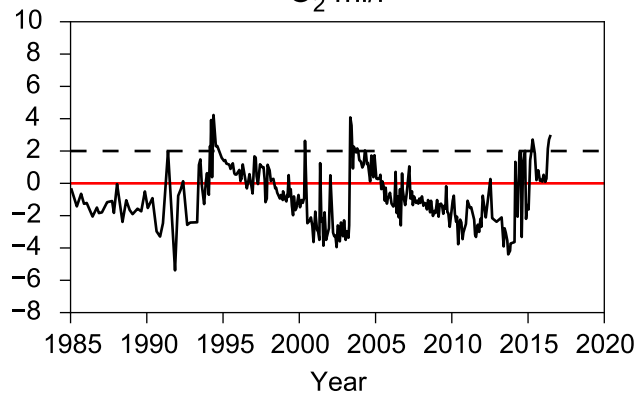


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

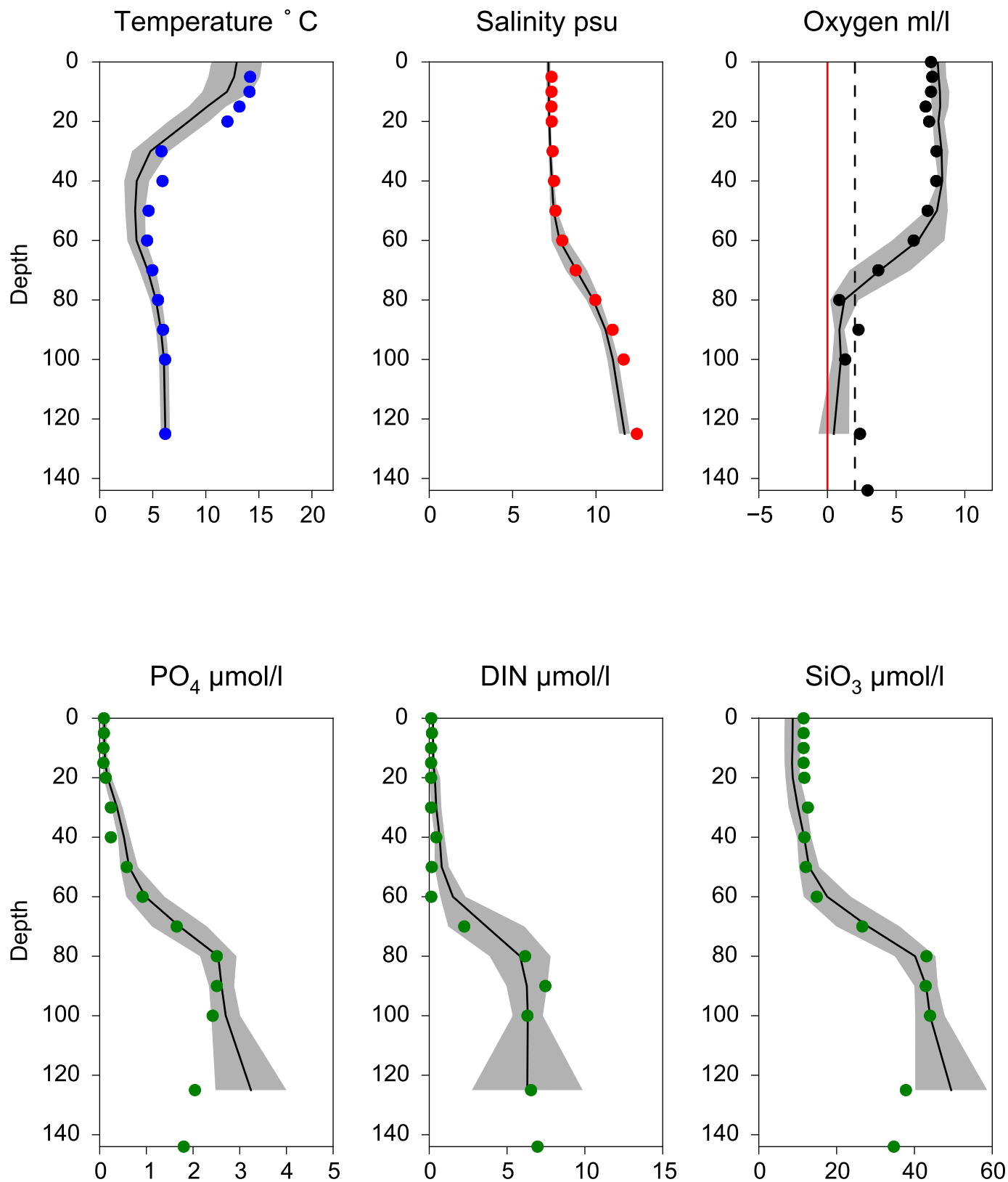


O₂ ml/l



Vertical profiles BY10 June

— Mean 2001-2015 St.Dev. • 2016-06-14



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

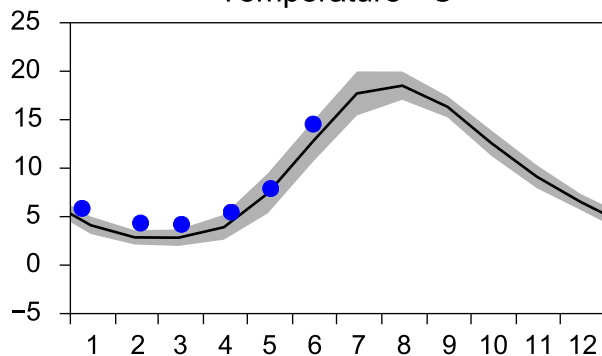
Annual Cycles

— Mean 2001-2015

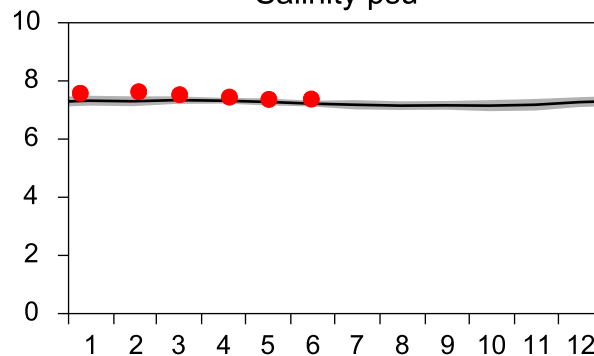
■ St.Dev.

● 2016

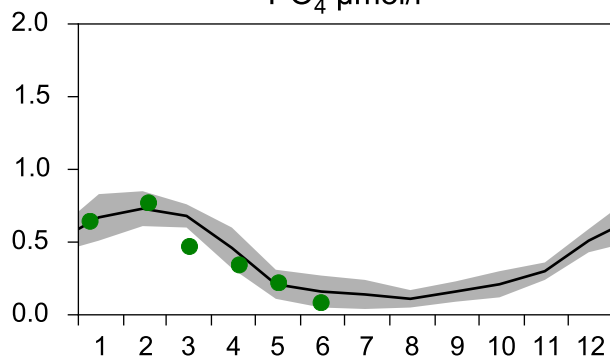
Temperature °C



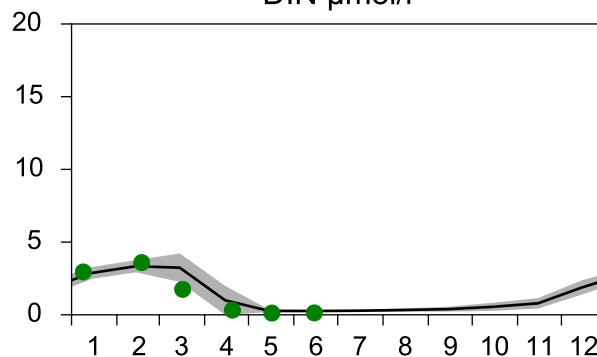
Salinity psu



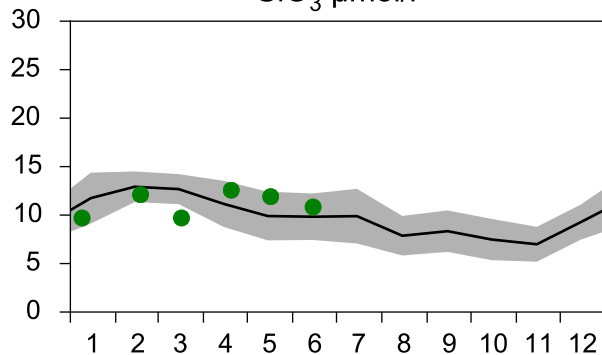
PO₄ µmol/l



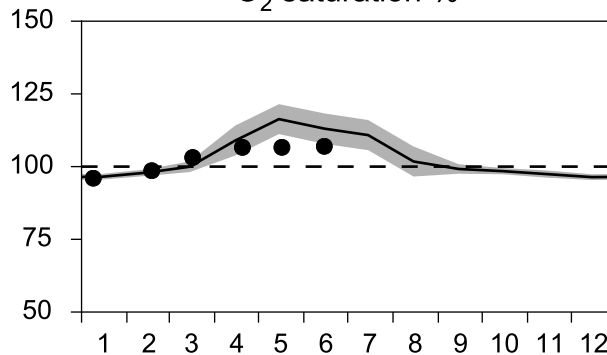
DIN µmol/l



SiO₃ µmol/l

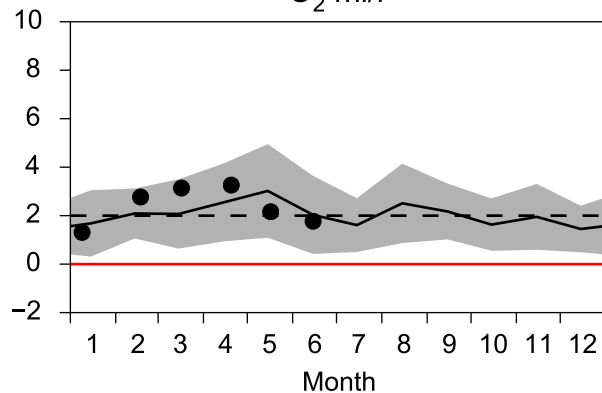


O₂ saturation %

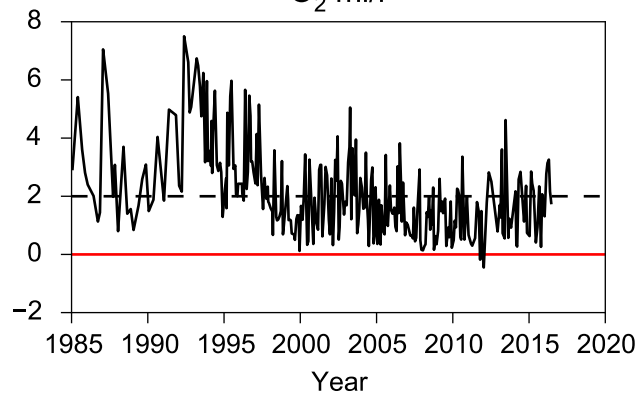


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

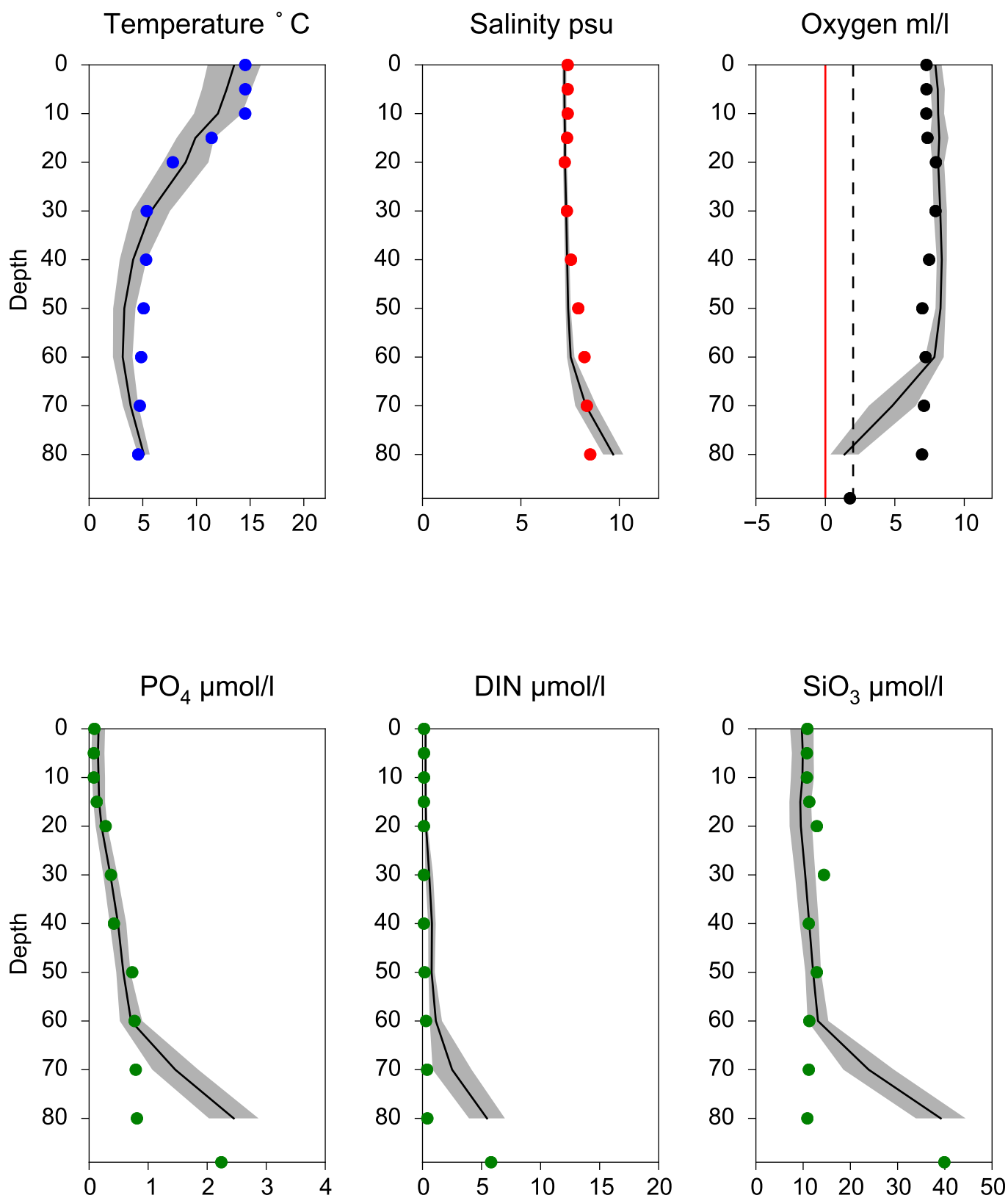


O₂ ml/l



Vertical profiles BCS III-10 June

— Mean 2001-2015 ■ St.Dev. ● 2016-06-15



STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10m)

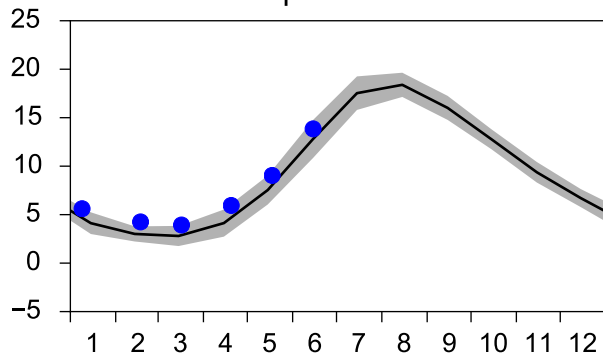
Annual Cycles

— Mean 2001-2015

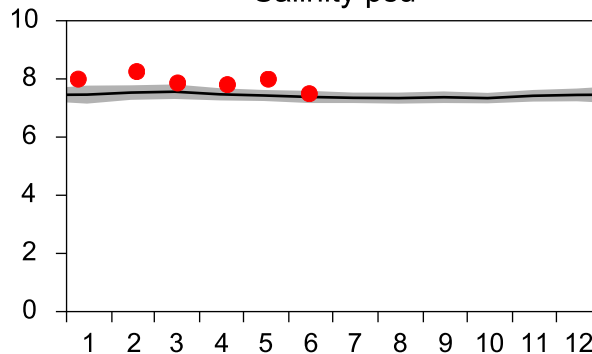
■ St.Dev.

● 2016

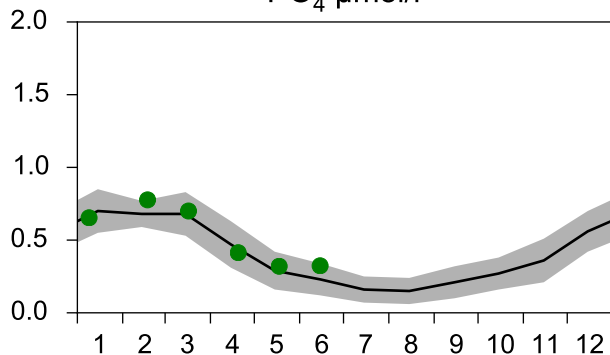
Temperature °C



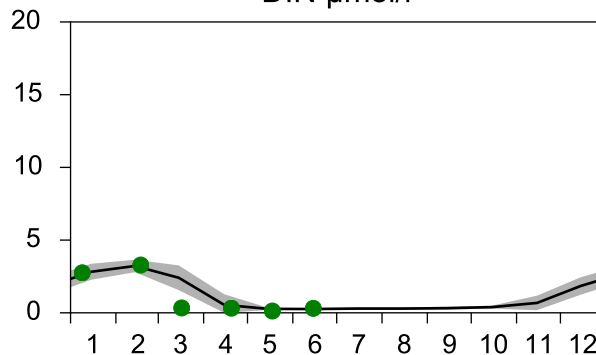
Salinity psu



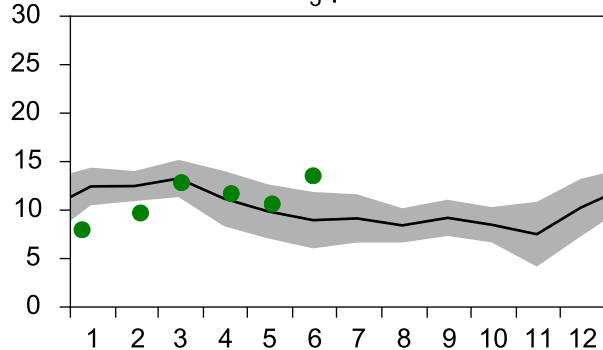
PO₄ µmol/l



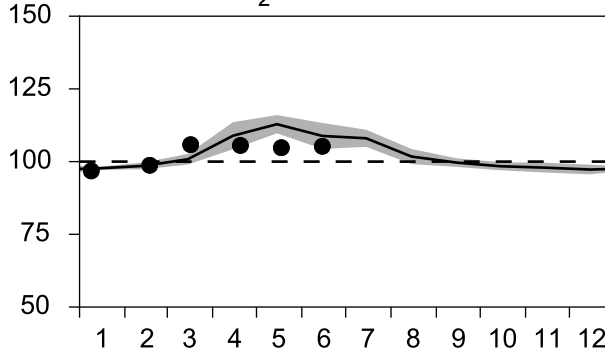
DIN µmol/l



SiO₃ µmol/l

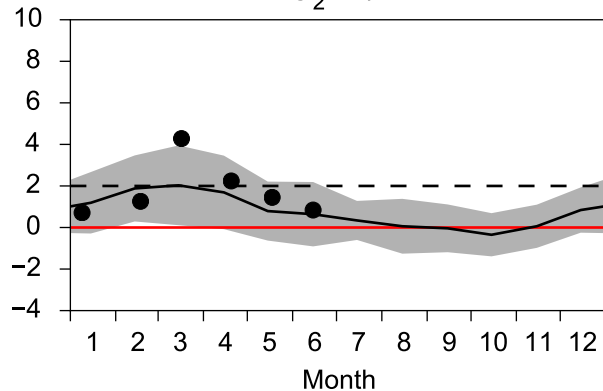


O₂ saturation %

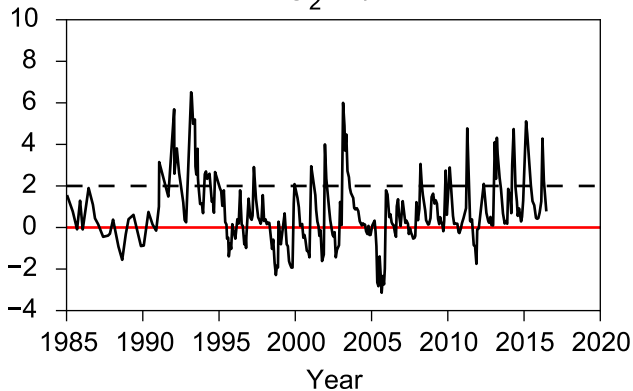


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

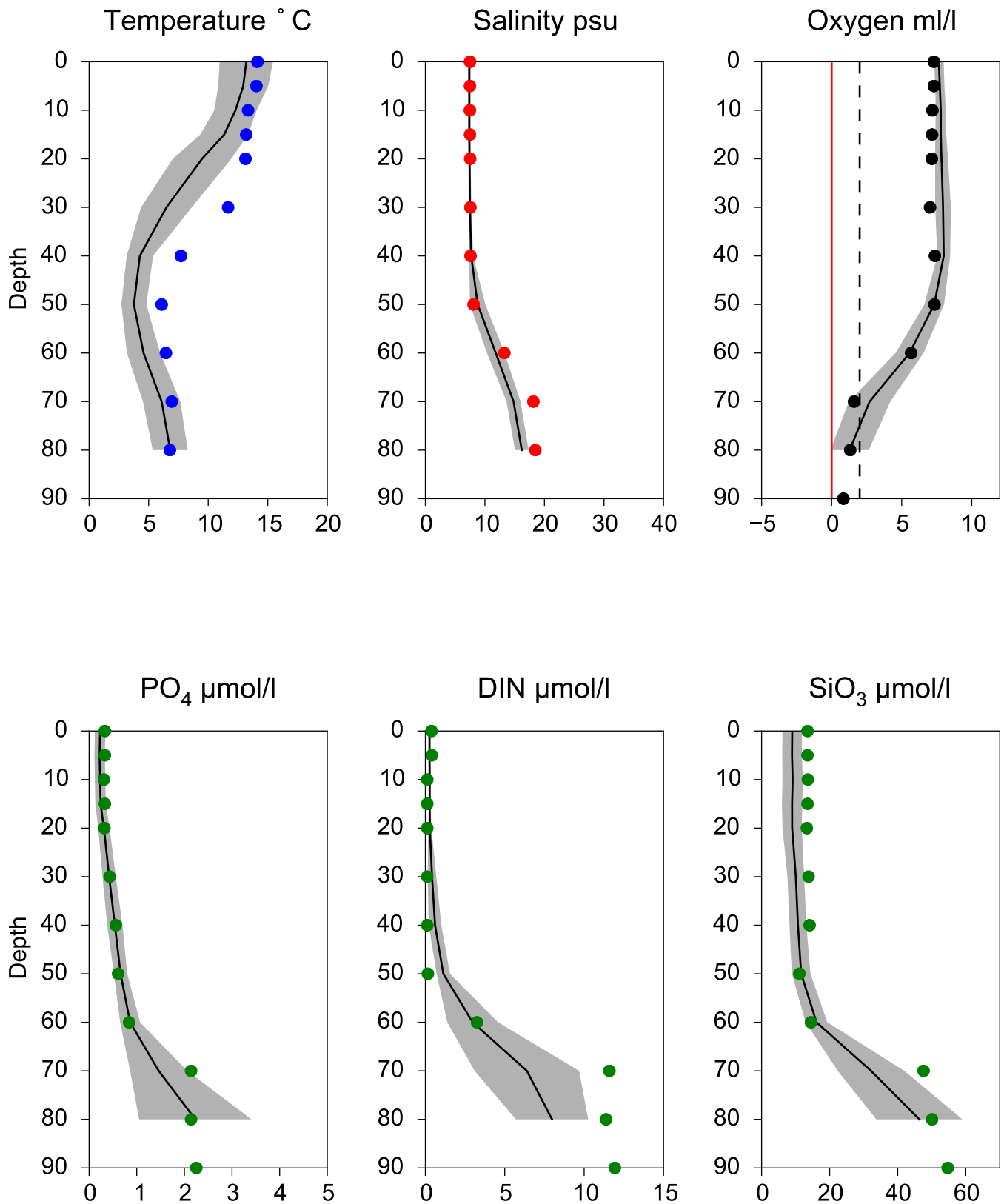


O₂ ml/l



Vertical profiles BY5 BORNHOLMSDJ June

— Mean 2001-2015 St.Dev. • 2016-06-15



STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10m)

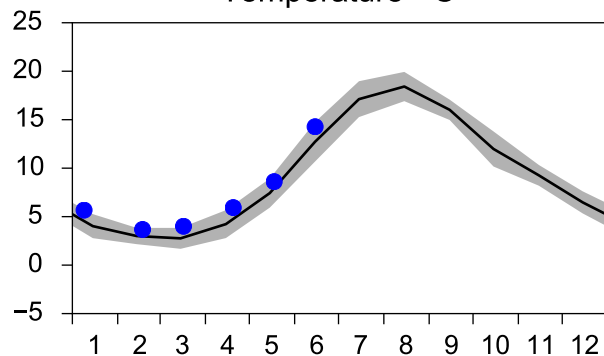
Annual Cycles

— Mean 2001-2015

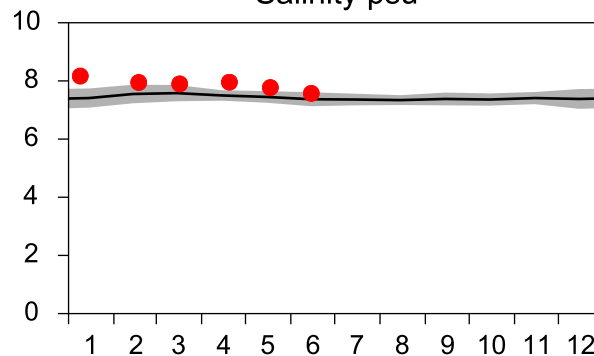
■ St.Dev.

● 2016

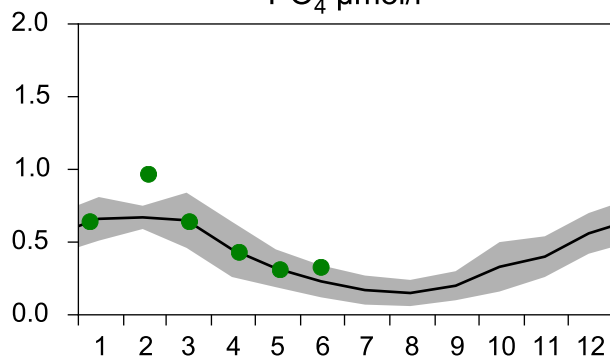
Temperature °C



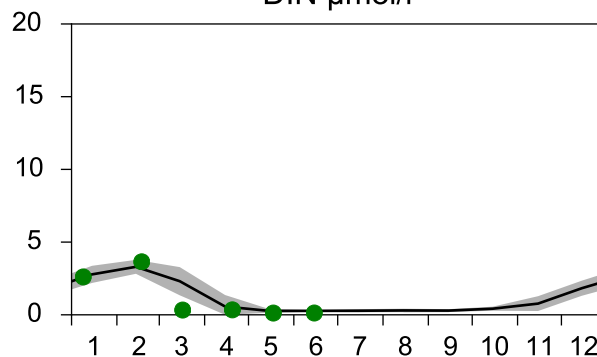
Salinity psu



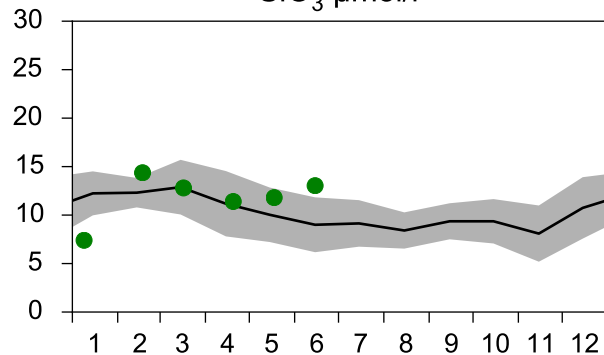
PO₄ µmol/l



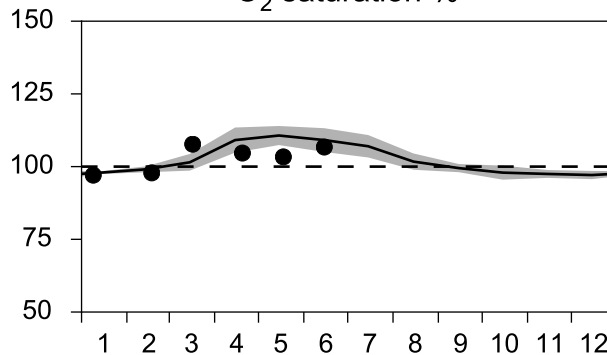
DIN µmol/l



SiO₃ µmol/l

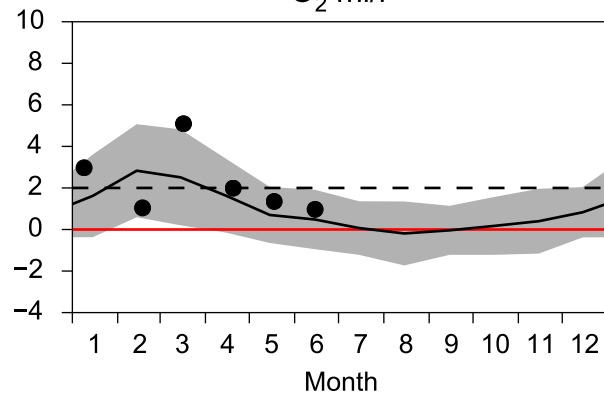


O₂ saturation %

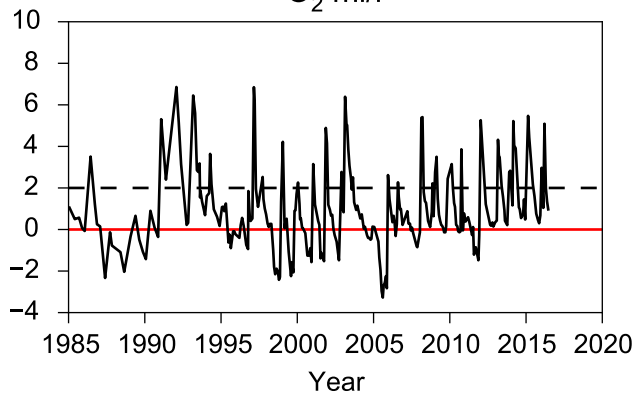


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

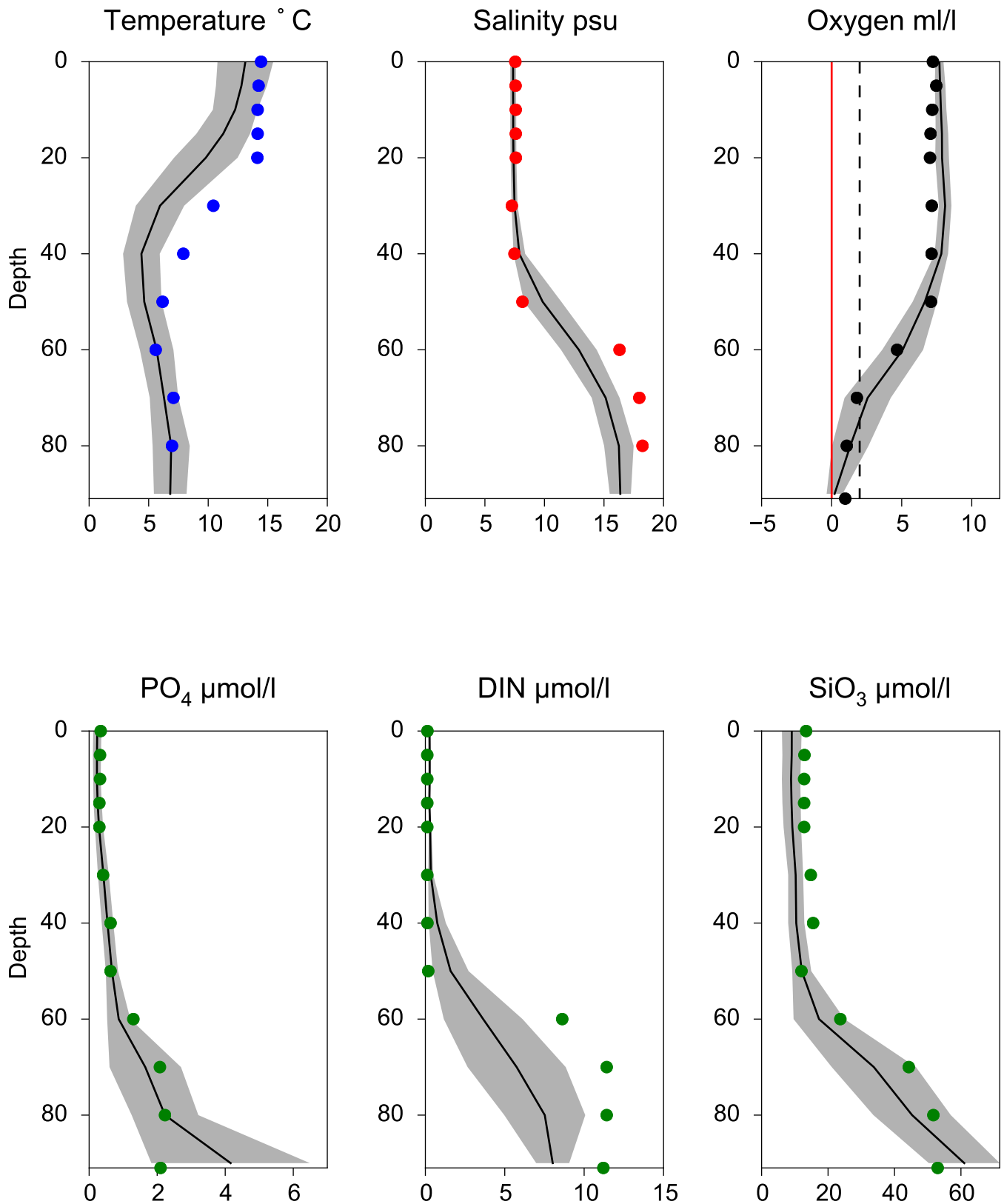


O₂ ml/l



Vertical profiles BY4 CHRISTIANSÖ June

— Mean 2001-2015 St.Dev. • 2016-06-15



STATION BY2 ARKONA SURFACE WATER (0-10m)

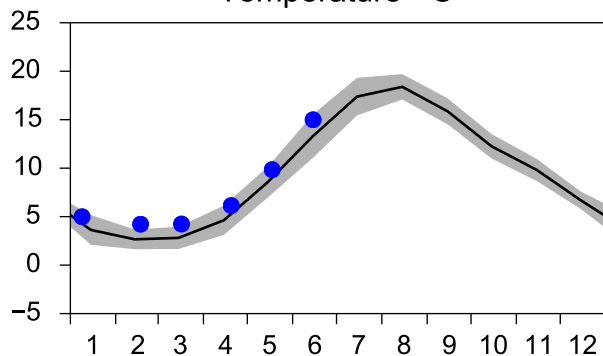
Annual Cycles

— Mean 2001-2015

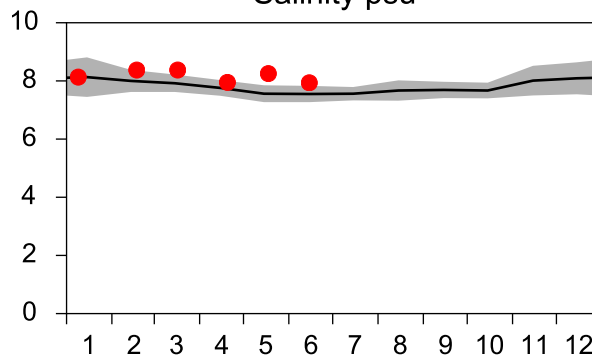
■ St.Dev.

● 2016

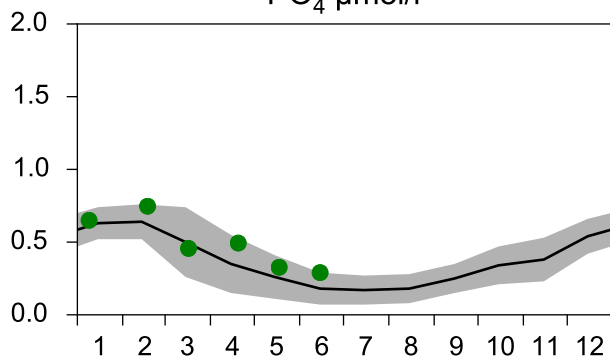
Temperature °C



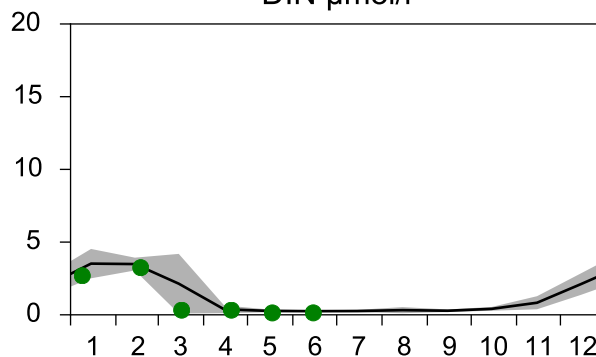
Salinity psu



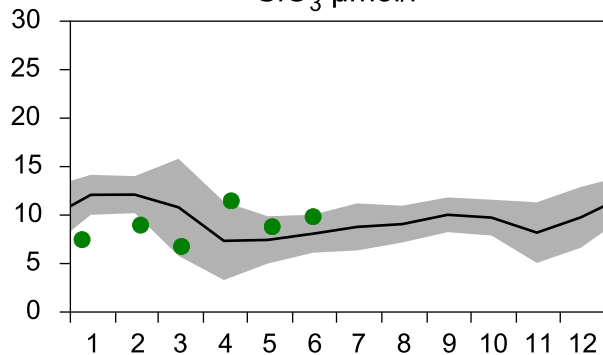
PO₄ μmol/l



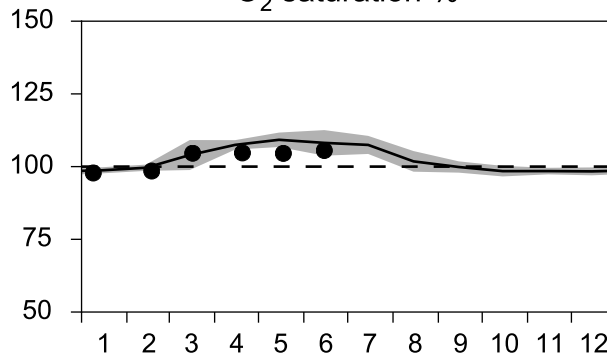
DIN μmol/l



SiO₃ μmol/l

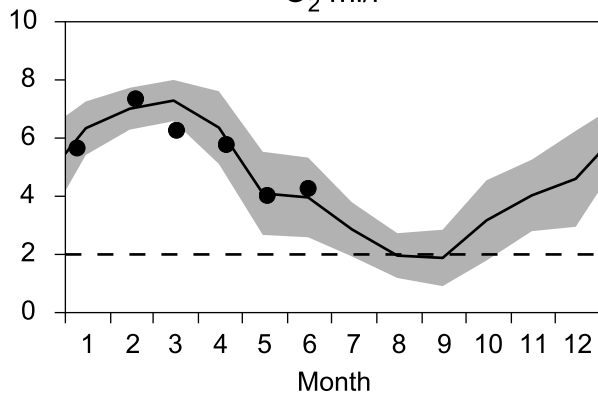


O₂ saturation %

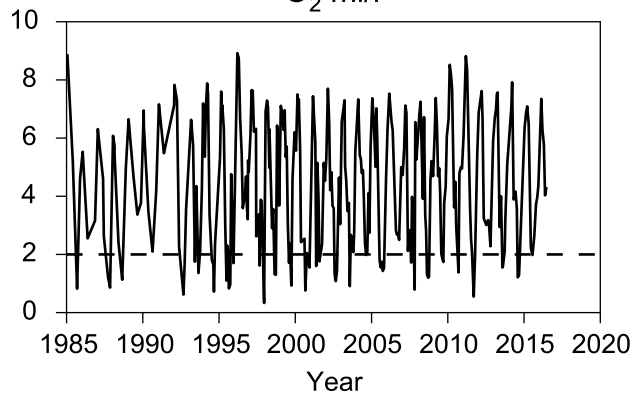


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

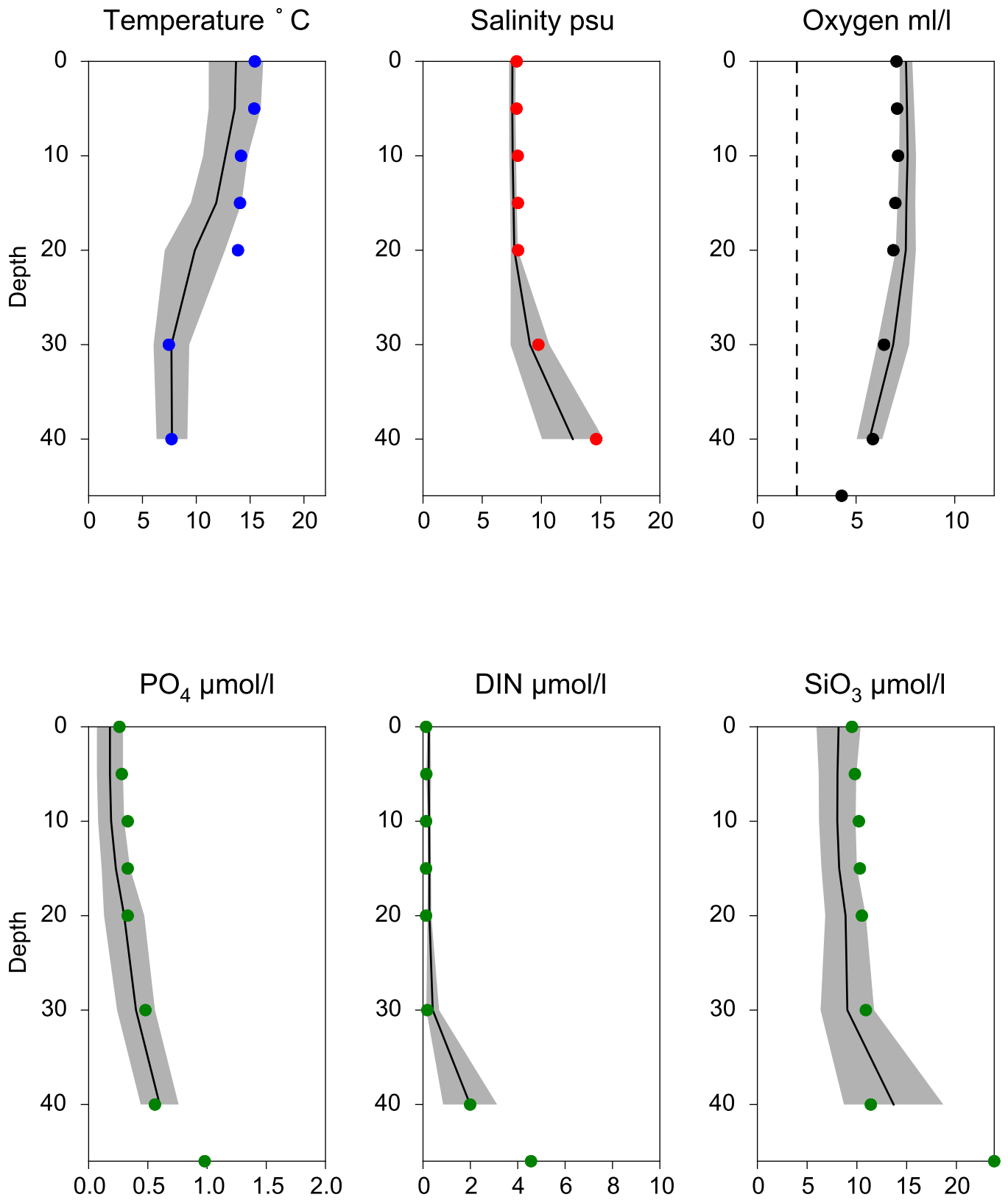


O₂ ml/l



Vertical profiles BY2 ARKONA June

— Mean 2001-2015 St.Dev. • 2016-06-15

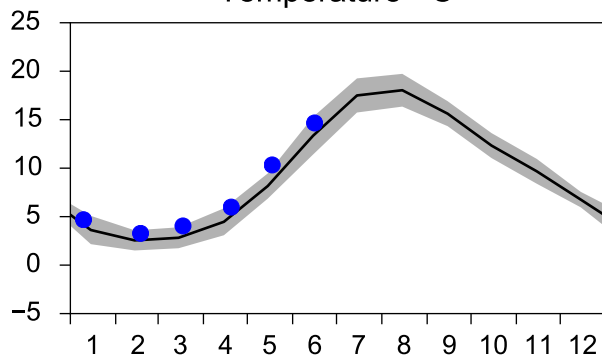


STATION BY1 SURFACE WATER (0-10m)

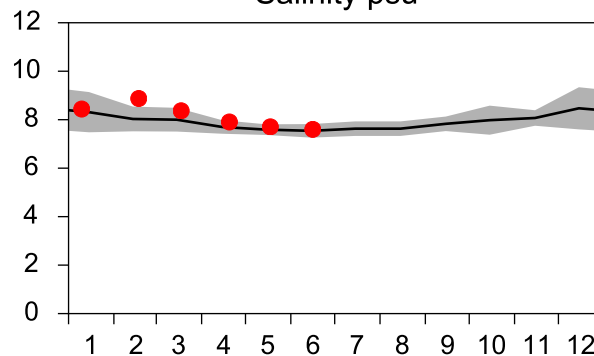
Annual Cycles

— Mean 2001-2015 St.Dev. • 2016

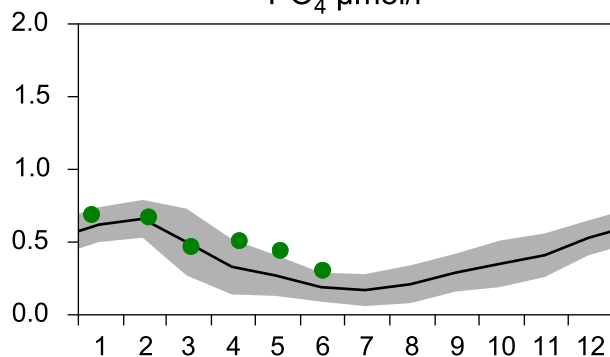
Temperature °C



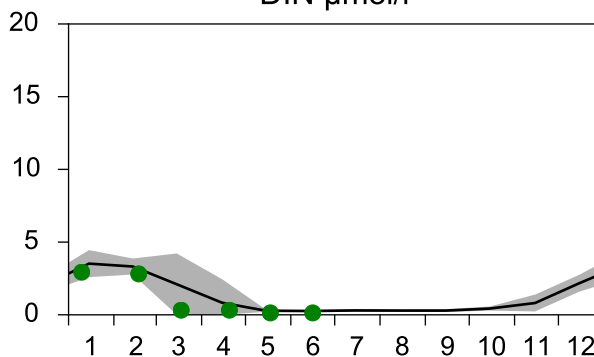
Salinity psu



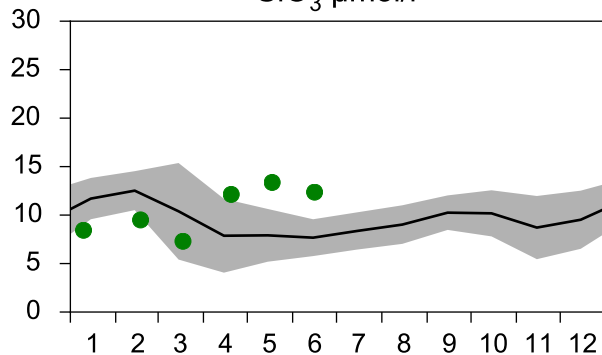
PO₄ µmol/l



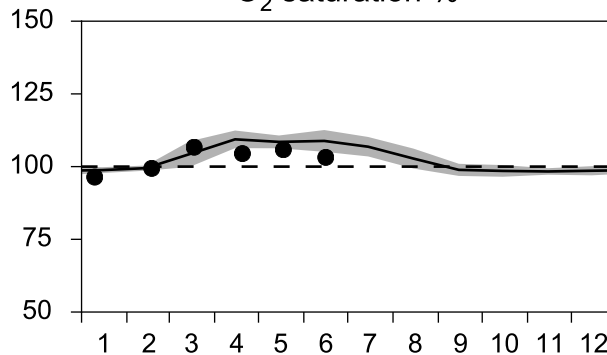
DIN µmol/l



SiO₃ µmol/l

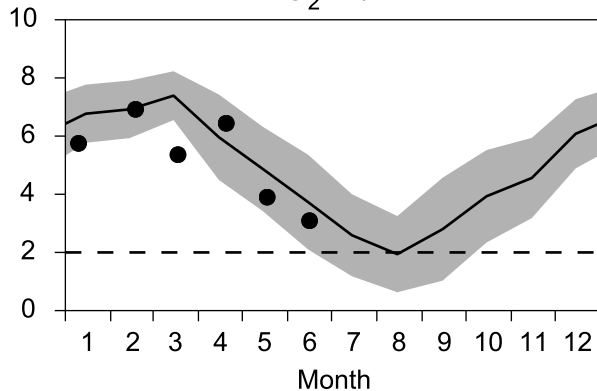


O₂ saturation %

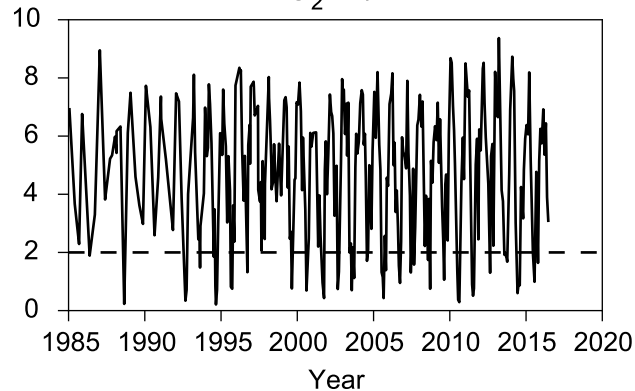


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

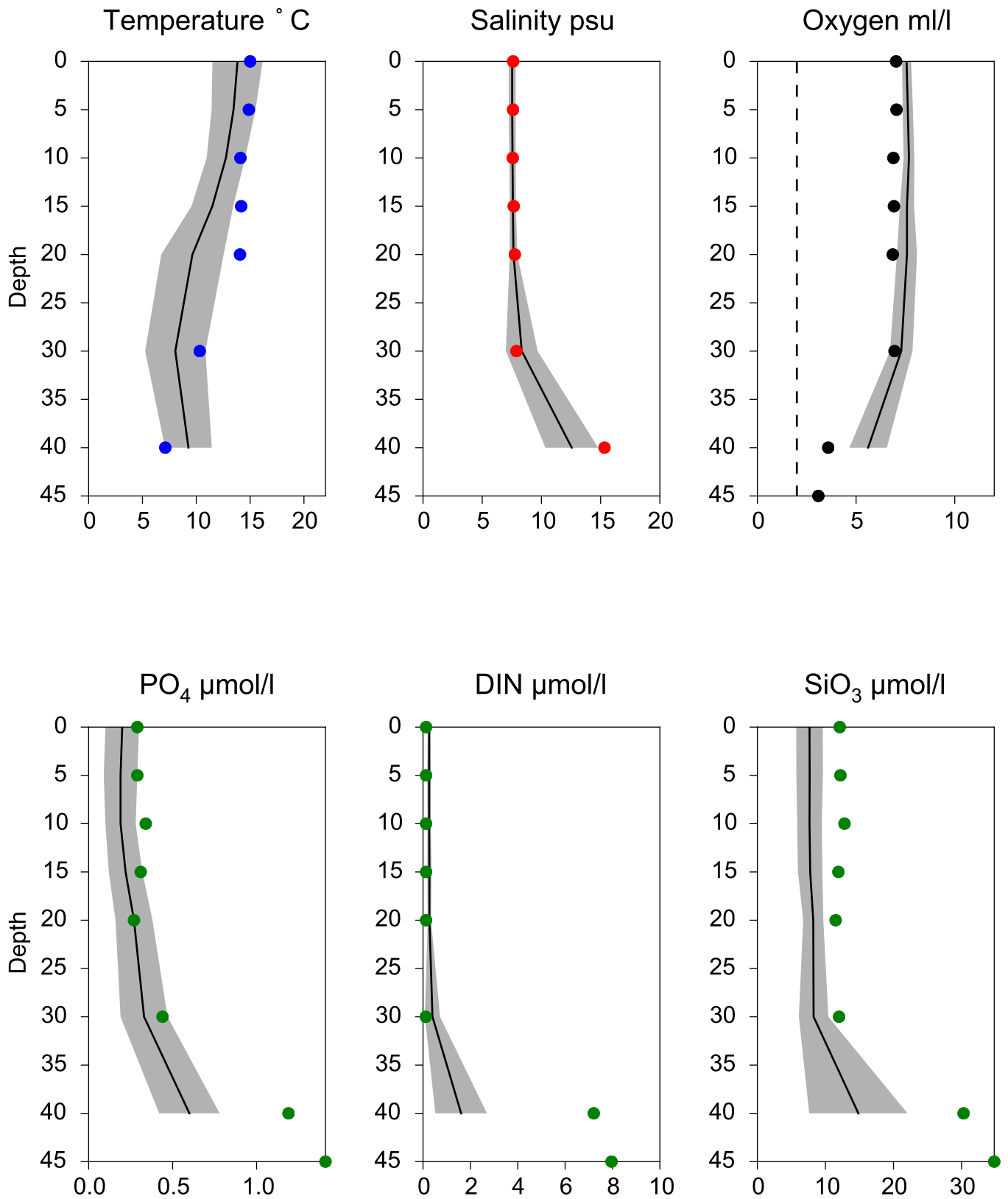


O₂ ml/l



Vertical profiles BY1 June

— Mean 2001-2015 St.Dev. • 2016-06-16



STATION W LANDSKRONA SURFACE WATER (0-10m)

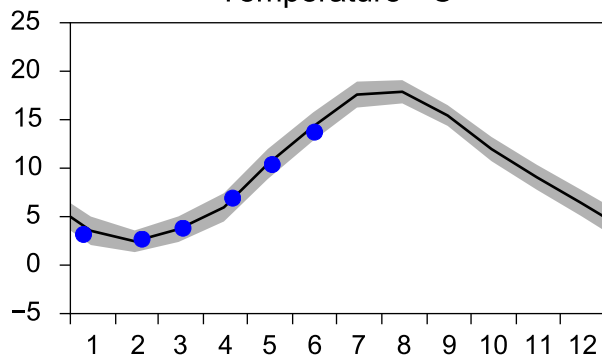
Annual Cycles

— Mean 2001-2015

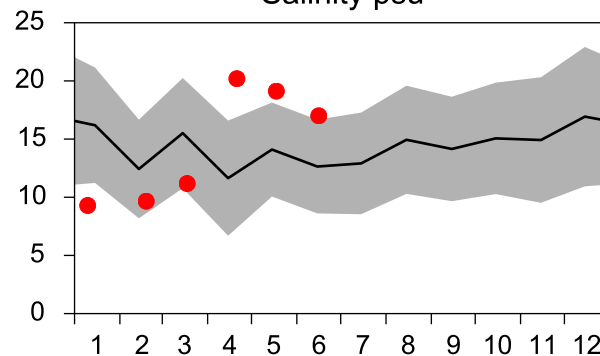
■ St.Dev.

● 2016

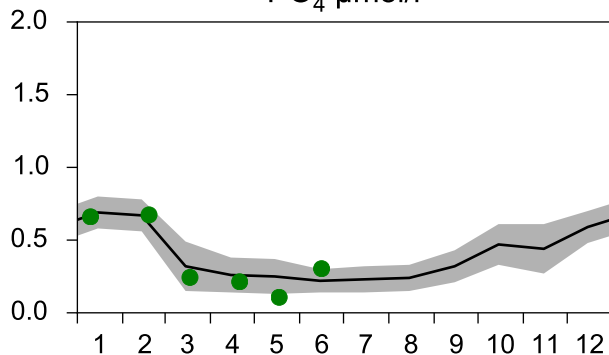
Temperature °C



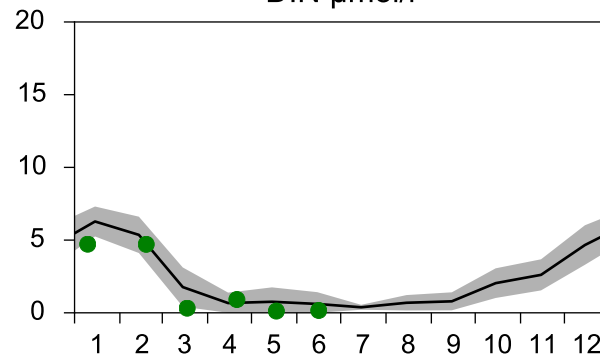
Salinity psu



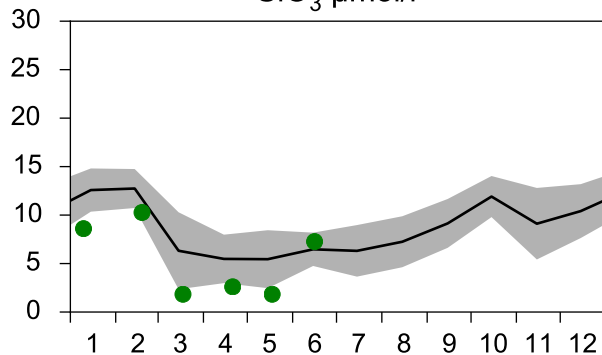
PO₄ µmol/l



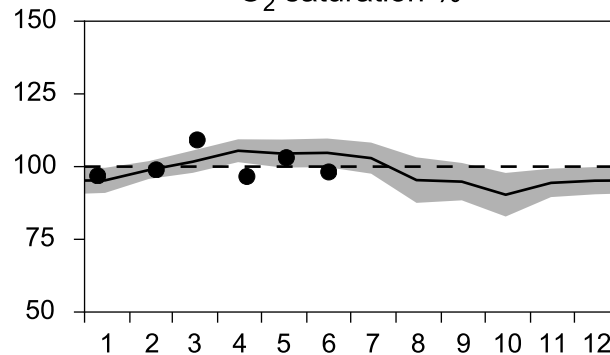
DIN µmol/l



SiO₃ µmol/l

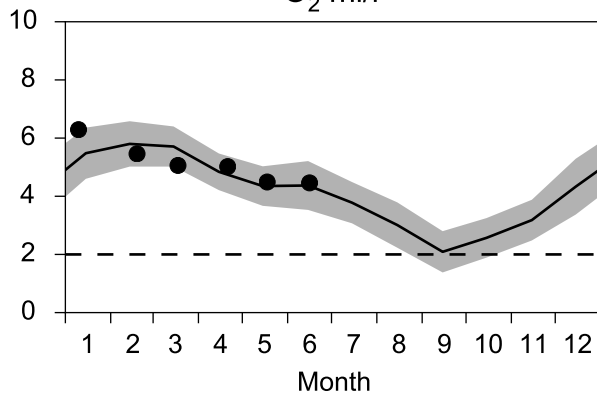


O₂ saturation %

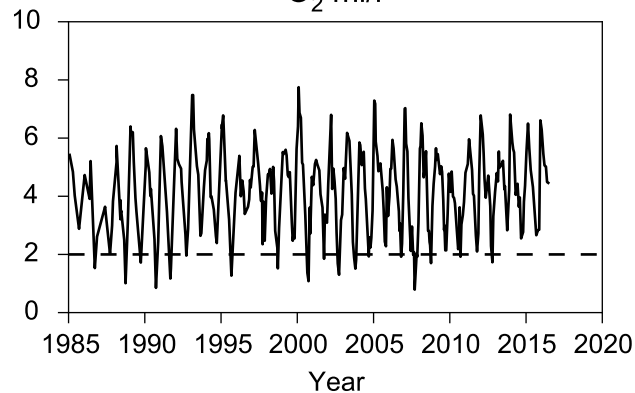


OXYGEN IN BOTTOM WATER (depth >= 40 m)

O₂ ml/l

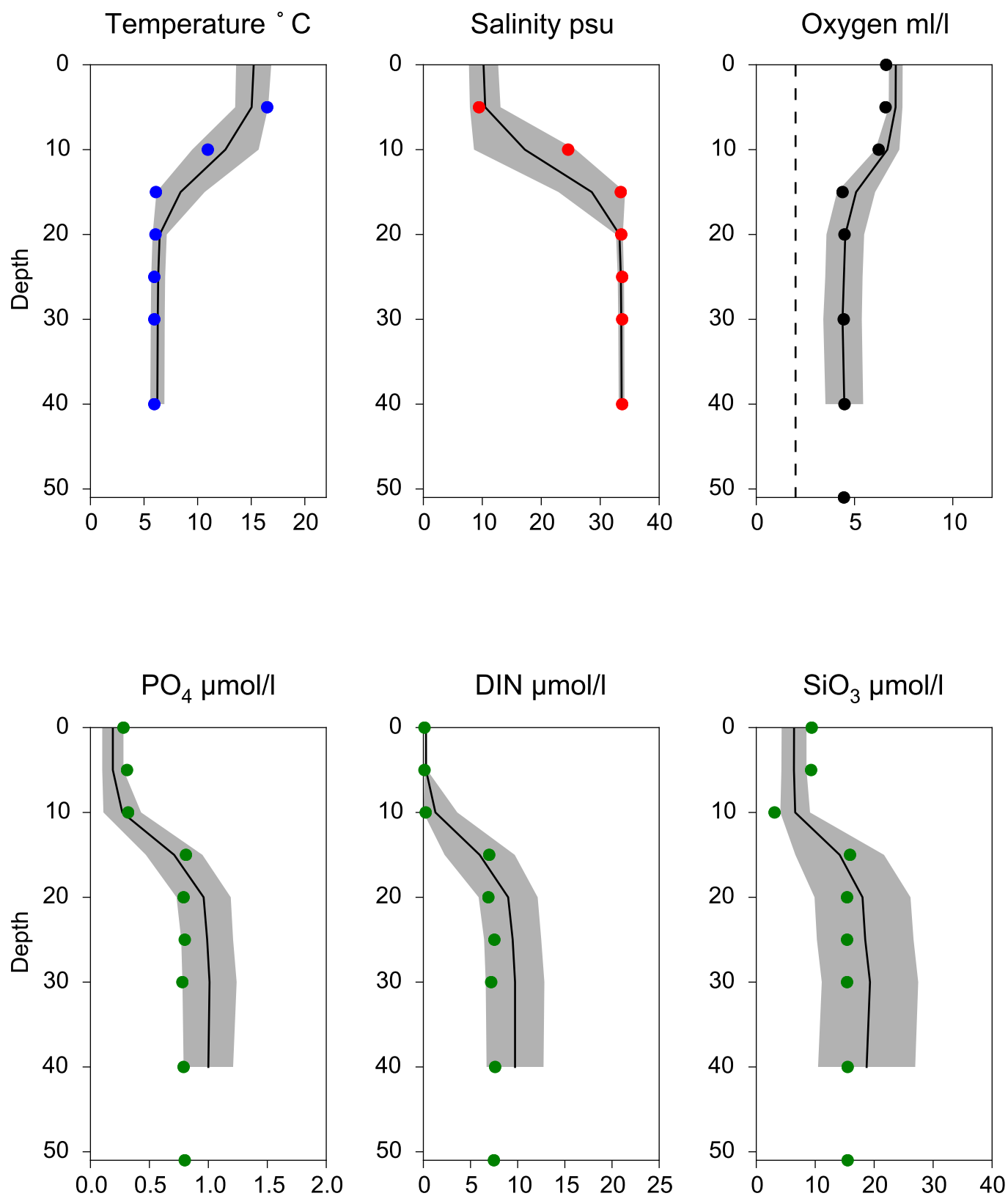


O₂ ml/l



Vertical profiles W LANDSKRONA June

— Mean 2001-2015 St.Dev. • 2016-06-16



STATION ANHOLT E SURFACE WATER (0-10m)

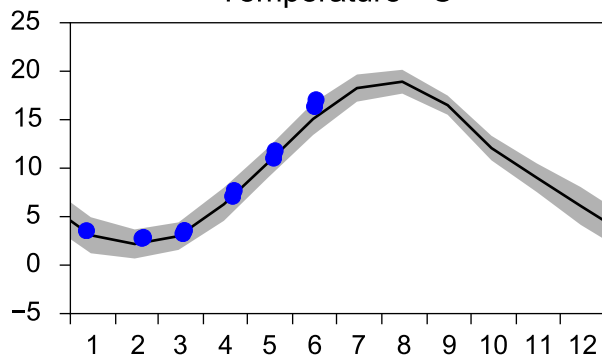
Annual Cycles

— Mean 2001-2015

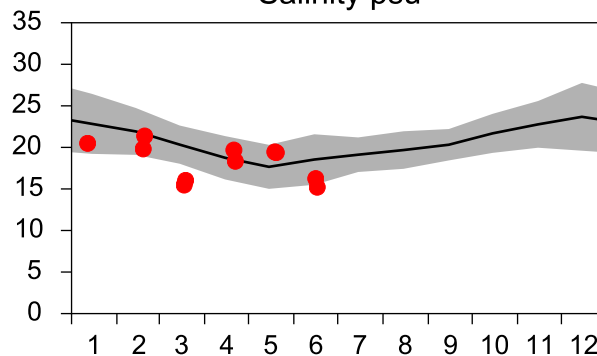
■ St.Dev.

● 2016

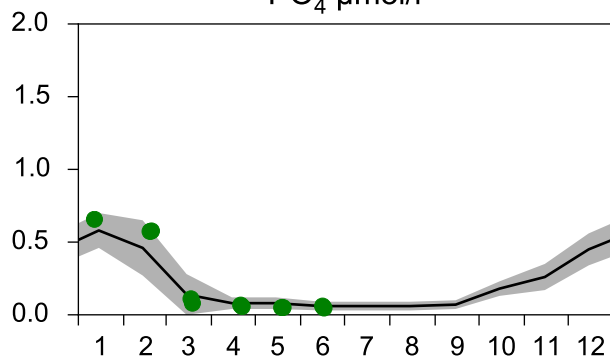
Temperature °C



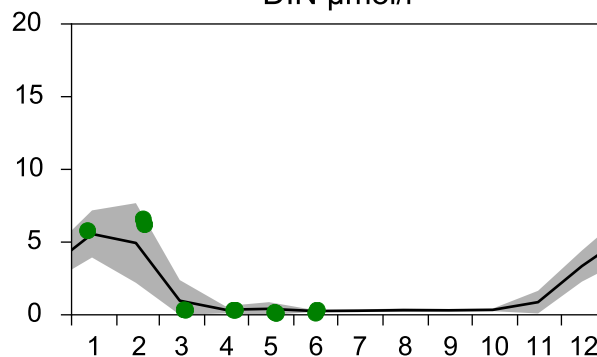
Salinity psu



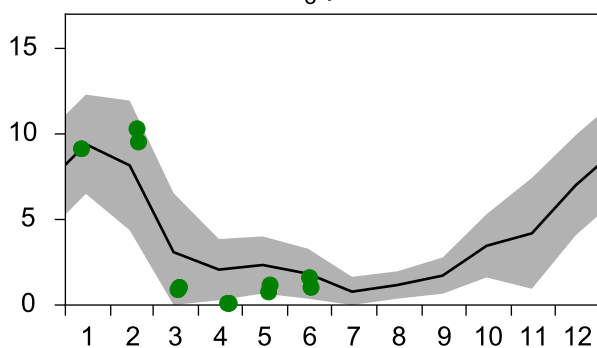
PO₄ µmol/l



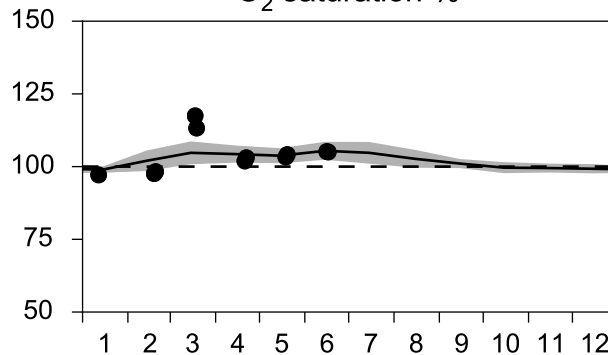
DIN µmol/l



SiO₃ µmol/l

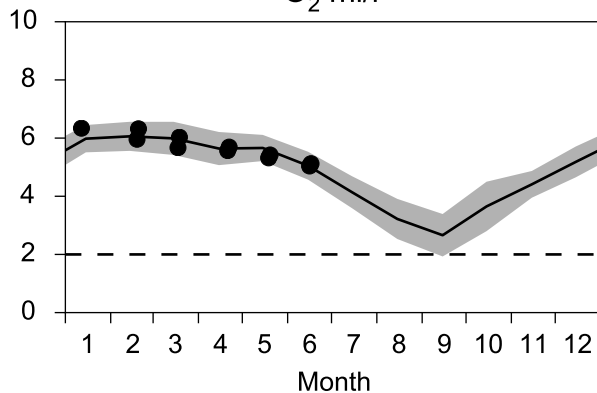


O₂ saturation %

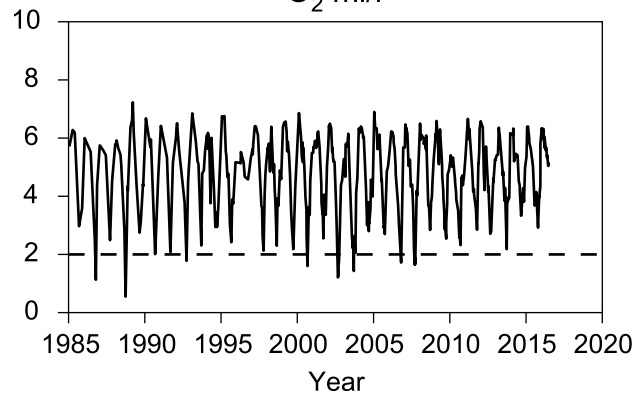


OXYGEN IN BOTTOM WATER (depth >= 45 m)

O₂ ml/l

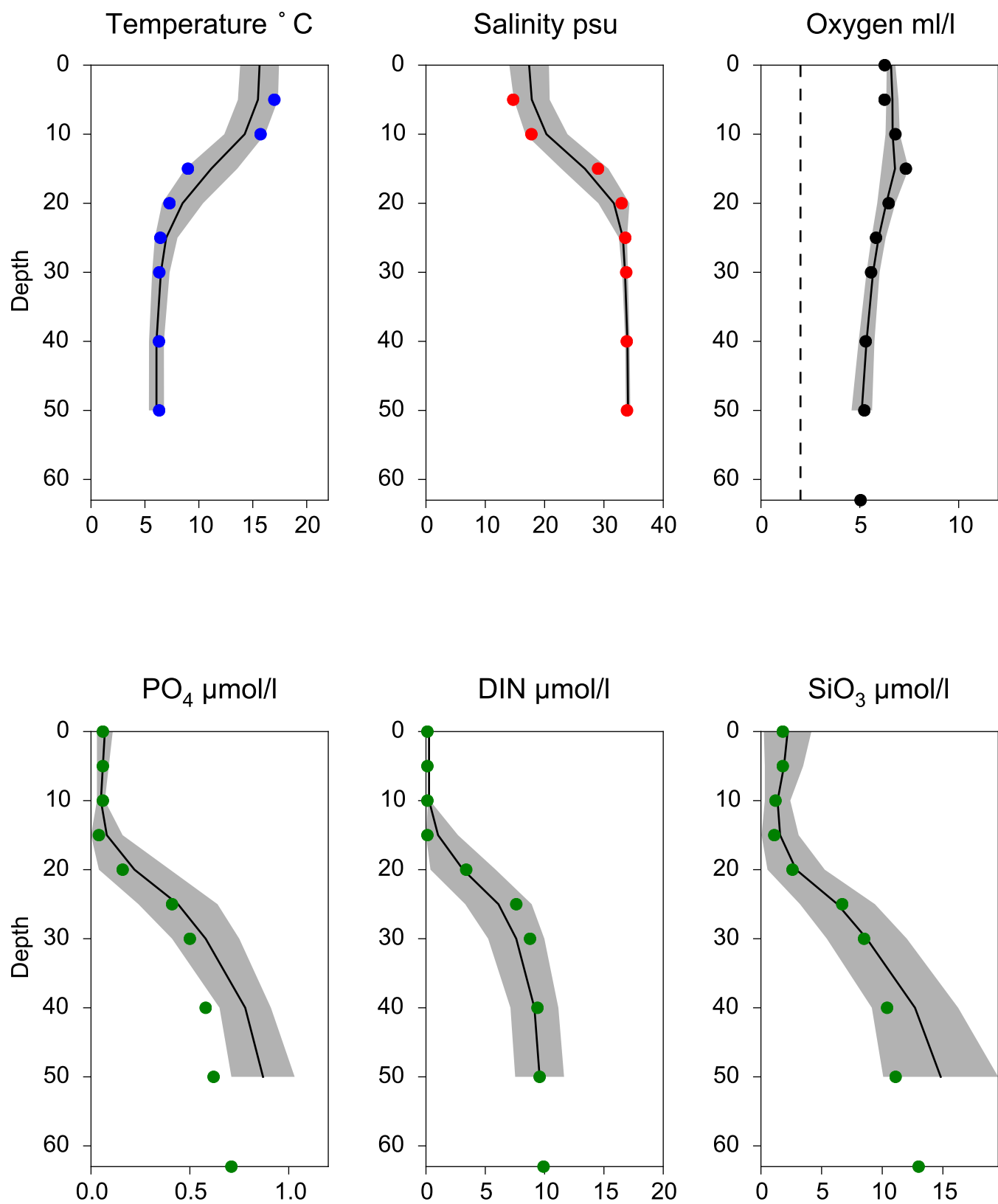


O₂ ml/l



Vertical profiles ANHOLT E June

— Mean 2001-2015 St.Dev. • 2016-06-16



STATION FLADEN SURFACE WATER (0-10m)

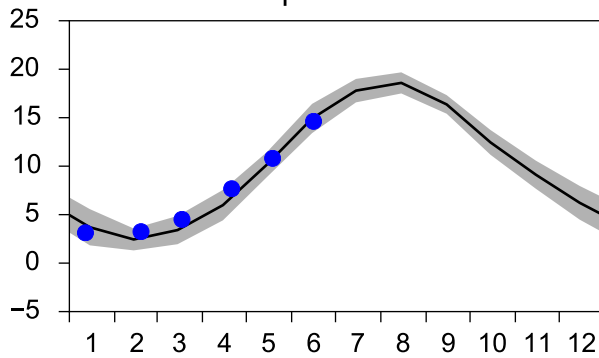
Annual Cycles

— Mean 2001-2015

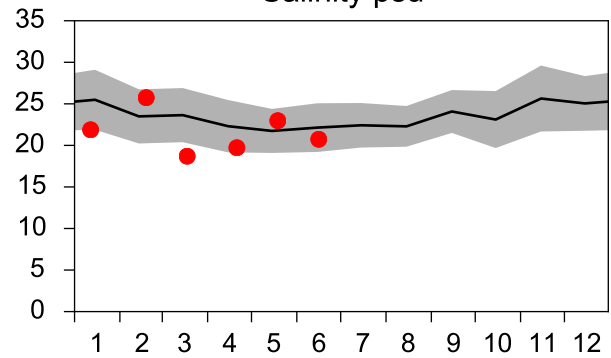
■ St.Dev.

● 2016

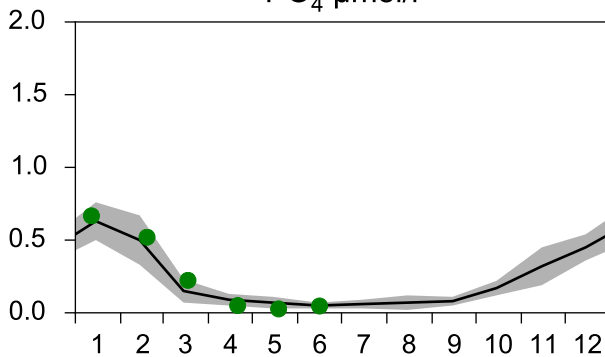
Temperature °C



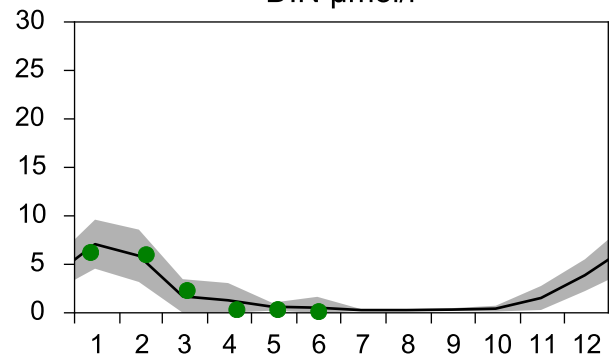
Salinity psu



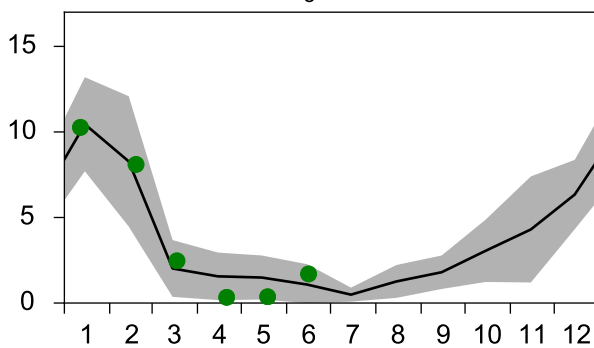
PO₄ µmol/l



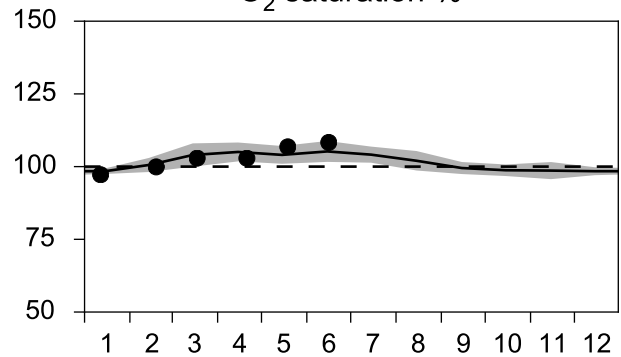
DIN µmol/l



SiO₃ µmol/l

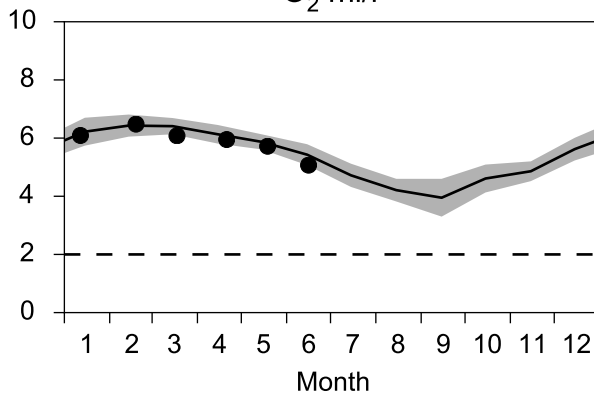


O₂ saturation %

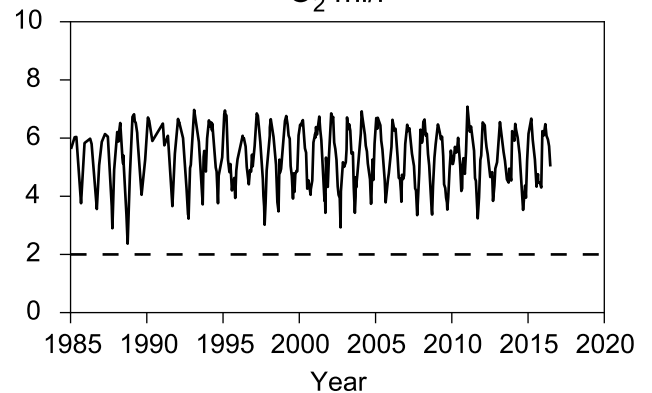


OXYGEN IN BOTTOM WATER (depth >= 65 m)

O₂ ml/l

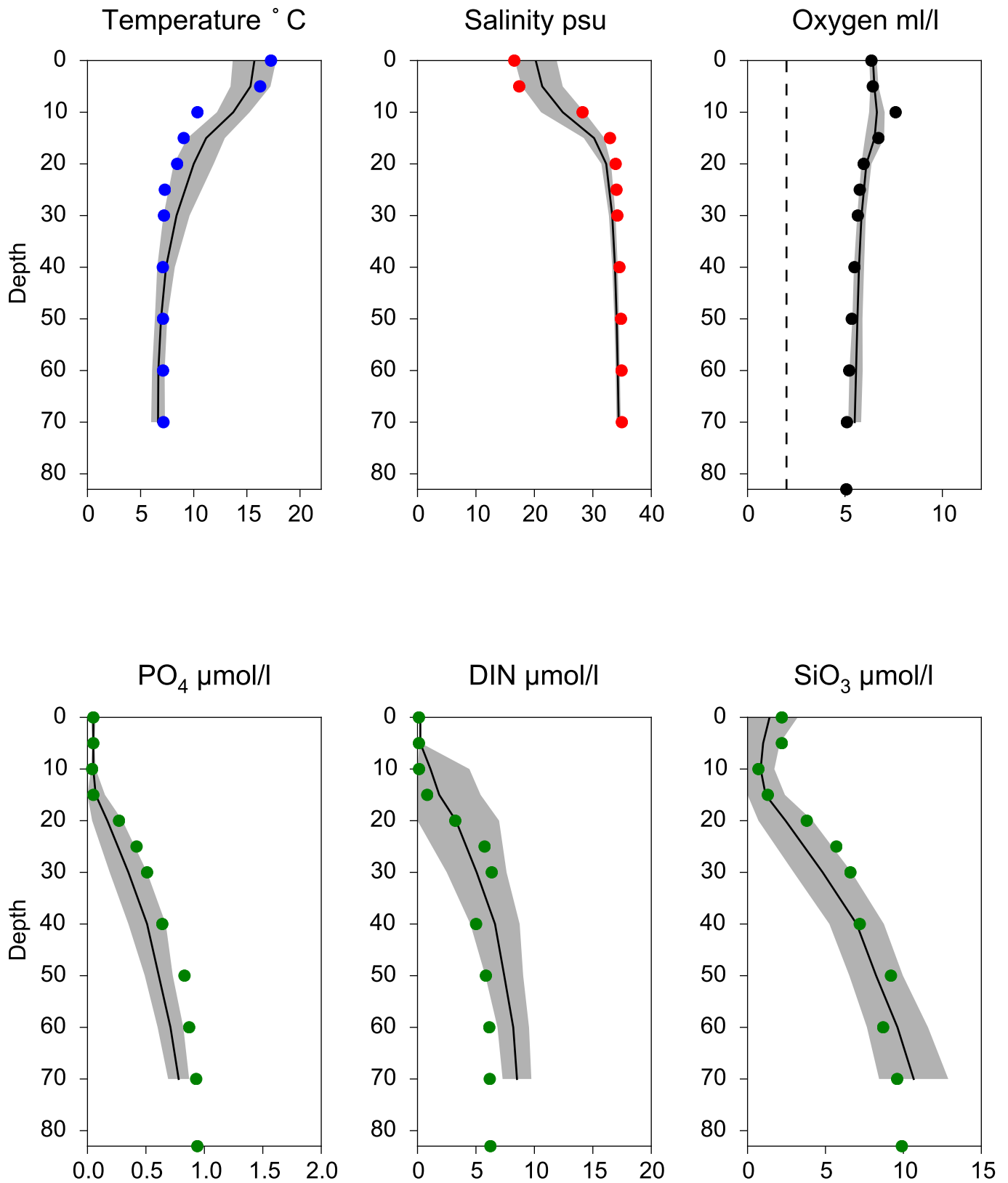


O₂ ml/l



Vertical profiles FLADEN June

— Mean 2001-2015 St.Dev. • 2016-06-16

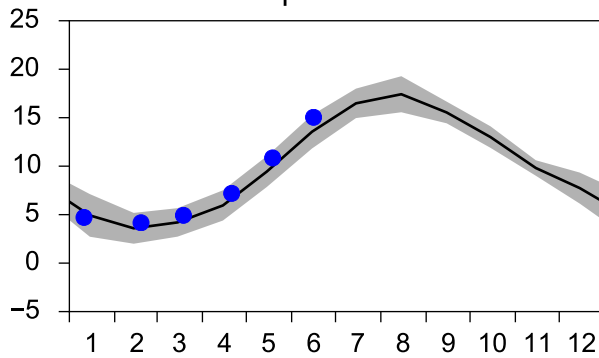


STATION Å17 SURFACE WATER (0-10m)

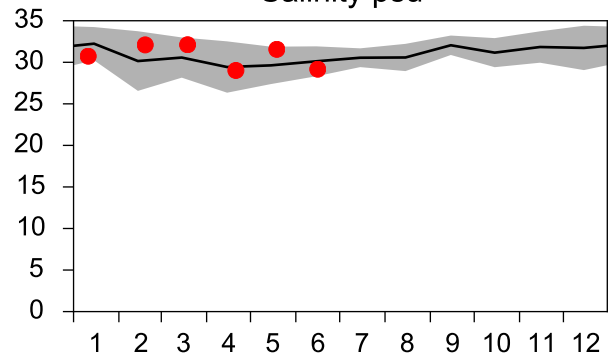
Annual Cycles

— Mean 2001-2015 St.Dev. • 2016

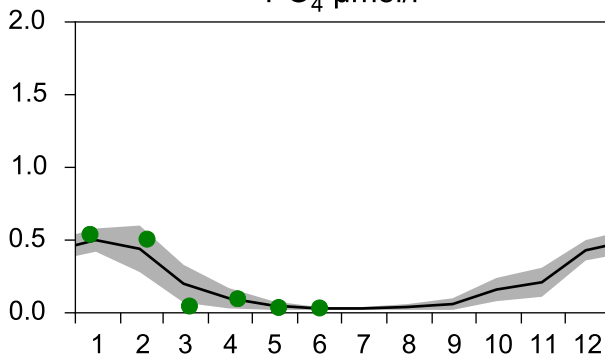
Temperature °C



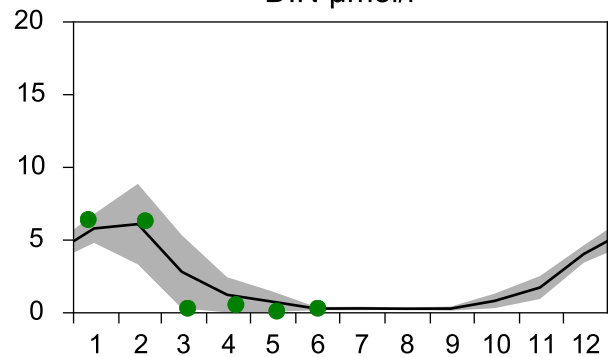
Salinity psu



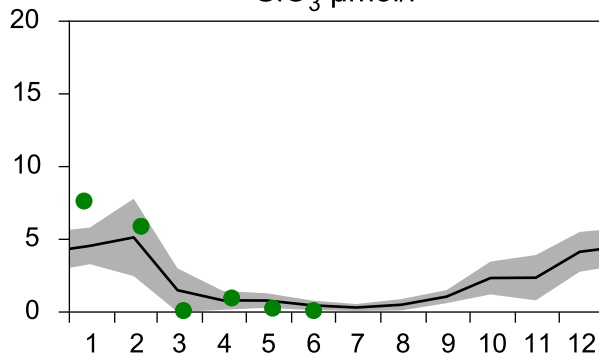
PO₄ µmol/l



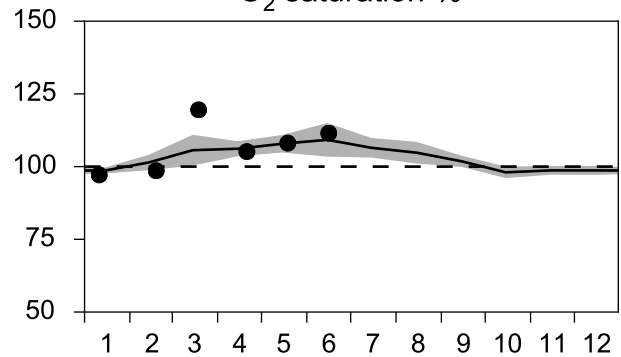
DIN µmol/l



SiO₃ µmol/l

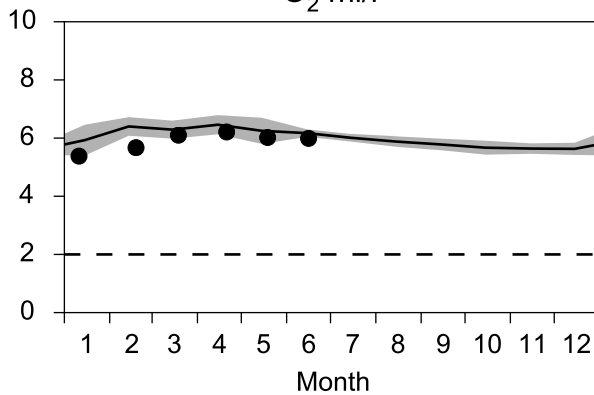


O₂ saturation %

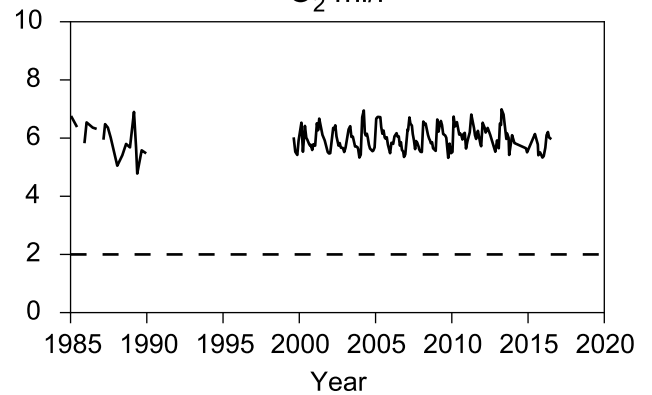


OXYGEN IN BOTTOM WATER (depth >= 300 m)

O₂ ml/l

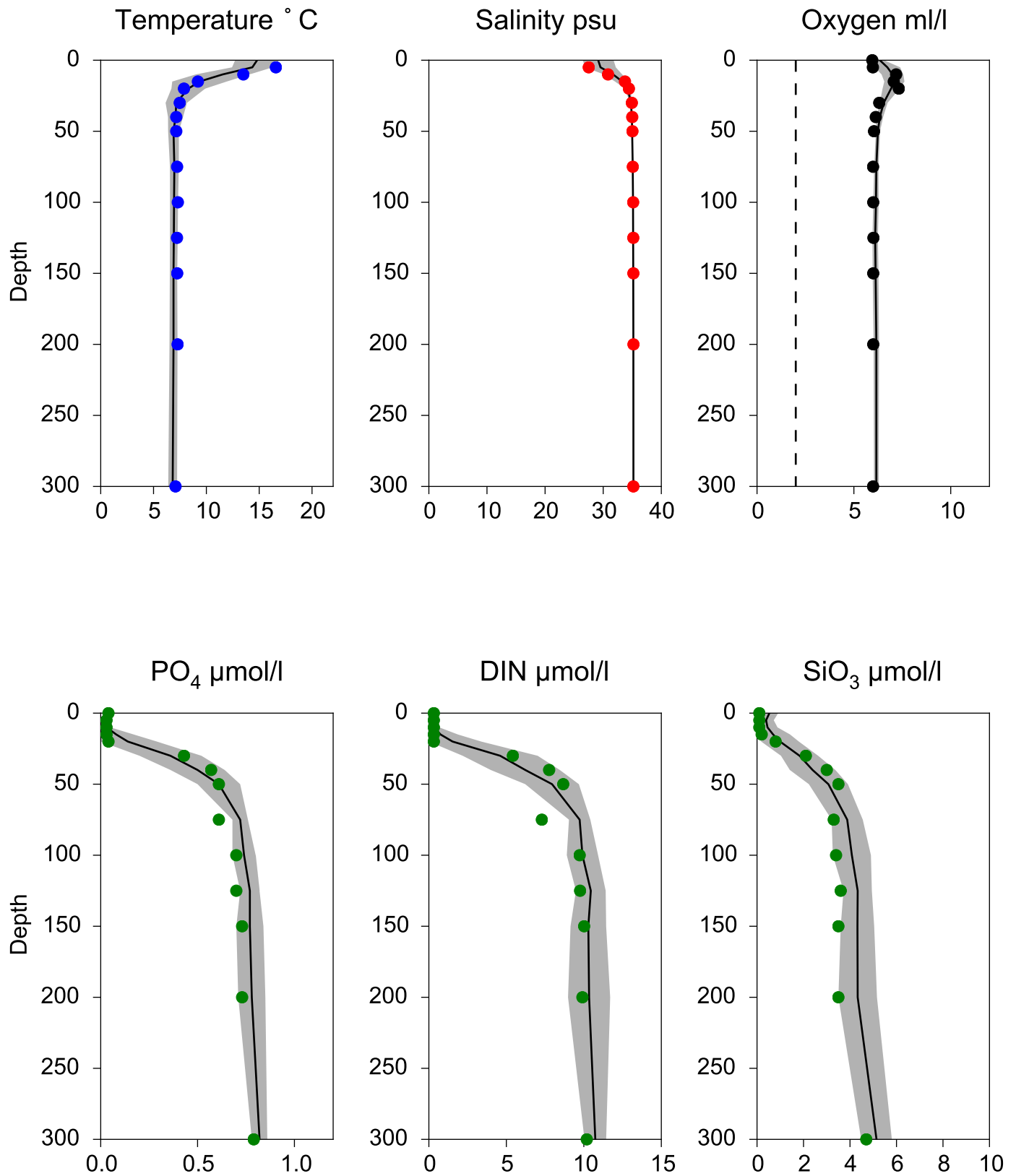


O₂ ml/l



Vertical profiles Å17 June

— Mean 2001-2015 ■ St.Dev. ● 2016-06-16

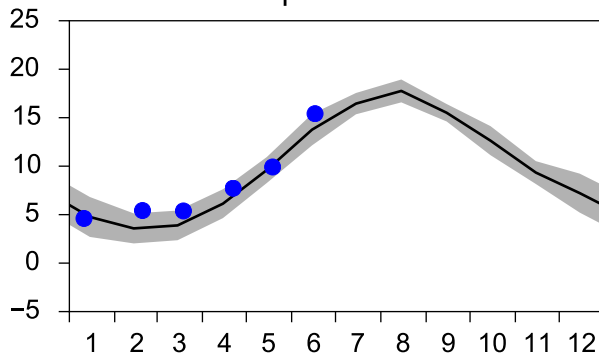


STATION Å15 SURFACE WATER (0-10m)

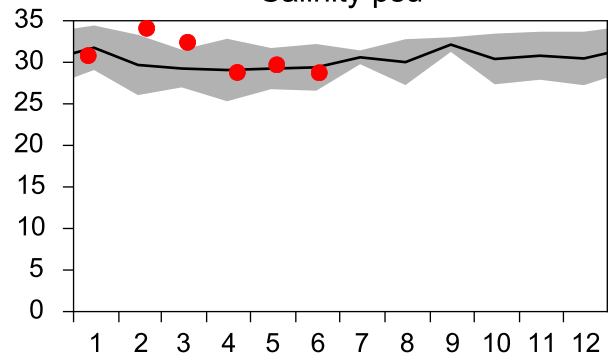
Annual Cycles

— Mean 2001-2015 St.Dev. • 2016

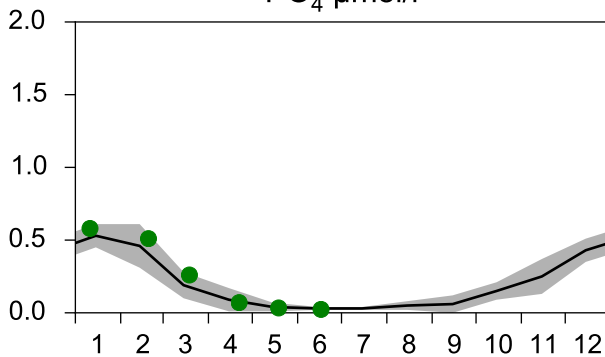
Temperature °C



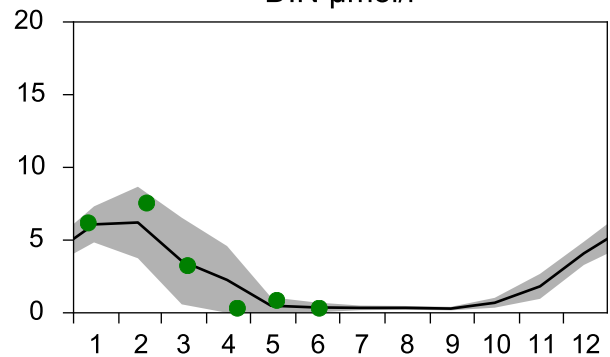
Salinity psu



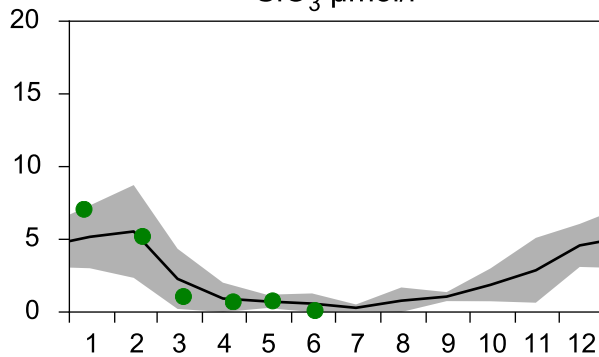
PO₄ µmol/l



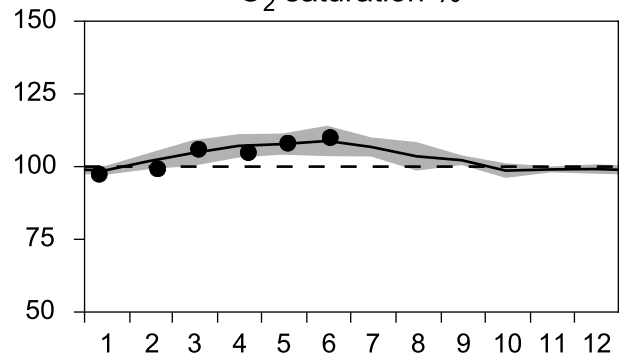
DIN µmol/l



SiO₃ µmol/l

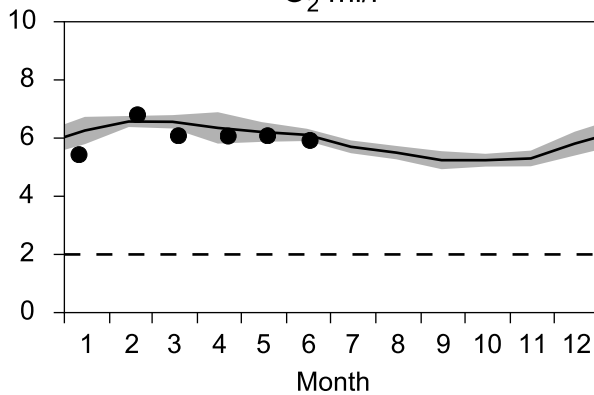


O₂ saturation %

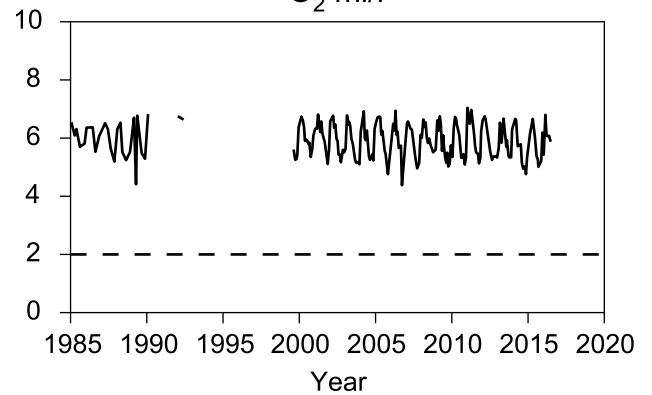


OXYGEN IN BOTTOM WATER (depth >= 125 m)

O₂ ml/l

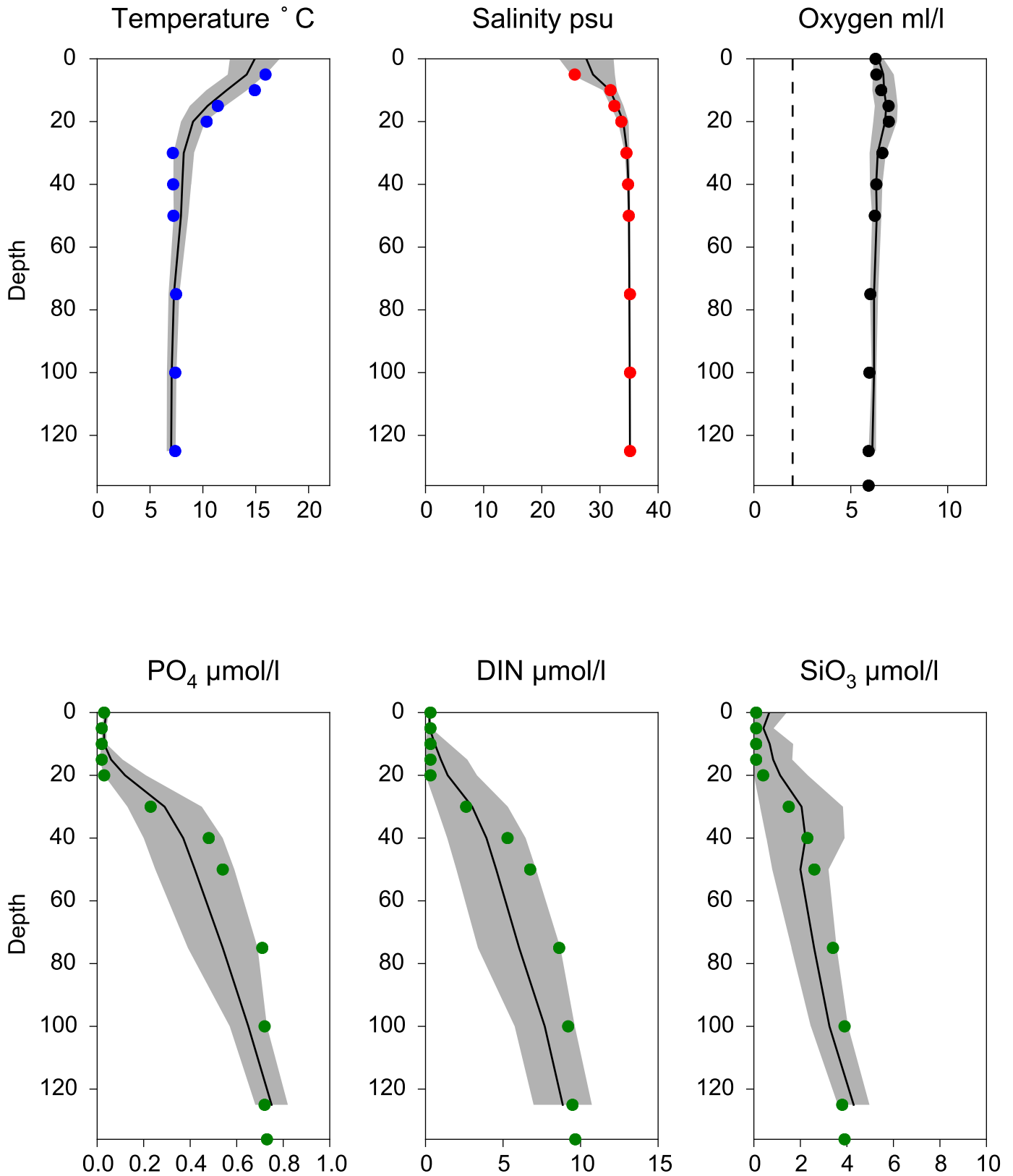


O₂ ml/l



Vertical profiles Å15 June

— Mean 2001-2015 ■ St.Dev. ● 2016-06-17



STATION Å13 SURFACE WATER (0-10m)

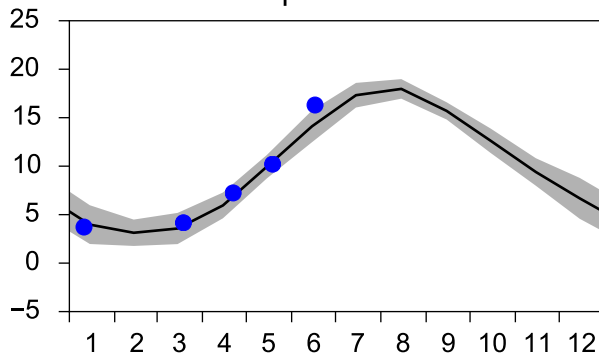
Annual Cycles

— Mean 2001-2015

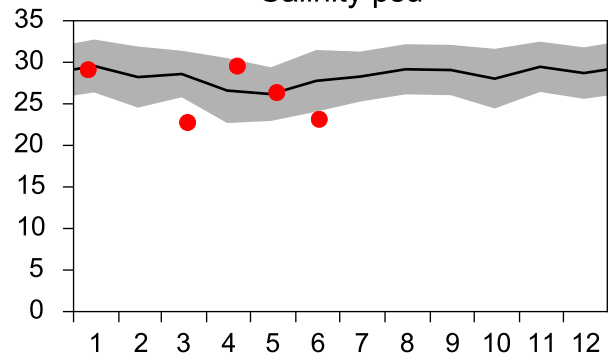
■ St.Dev.

● 2016

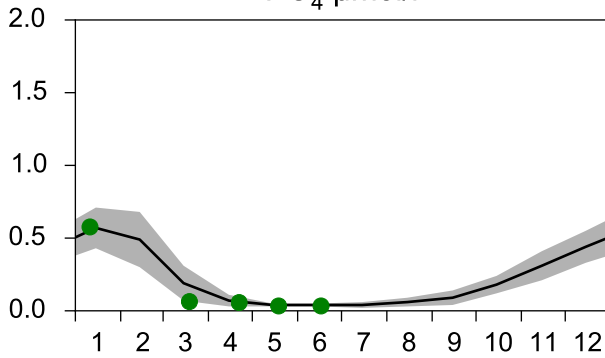
Temperature °C



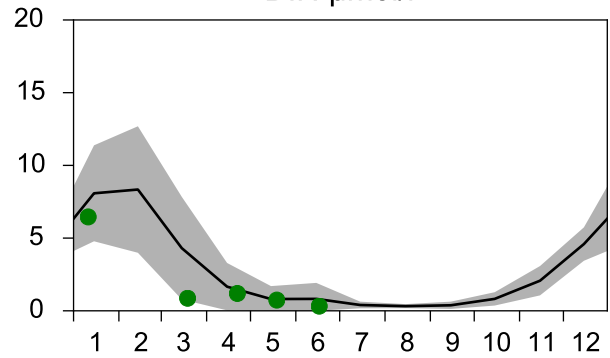
Salinity psu



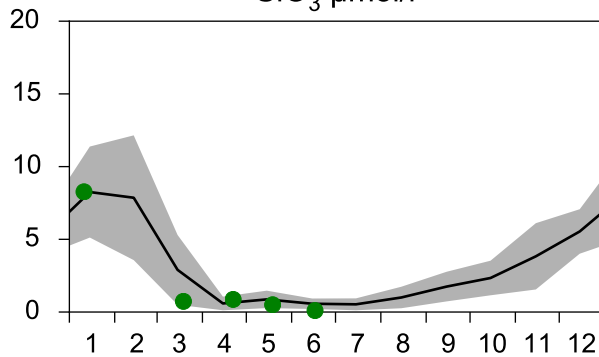
PO₄ µmol/l



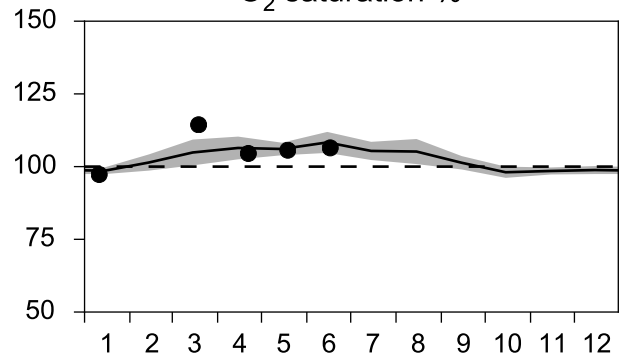
DIN µmol/l



SiO₃ µmol/l

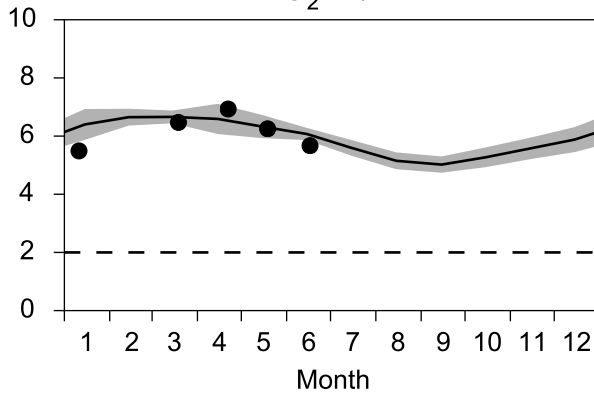


O₂ saturation %

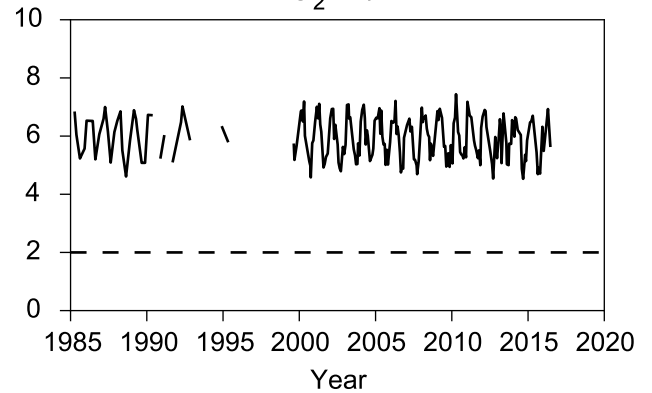


OXYGEN IN BOTTOM WATER (depth >= 75 m)

O₂ ml/l

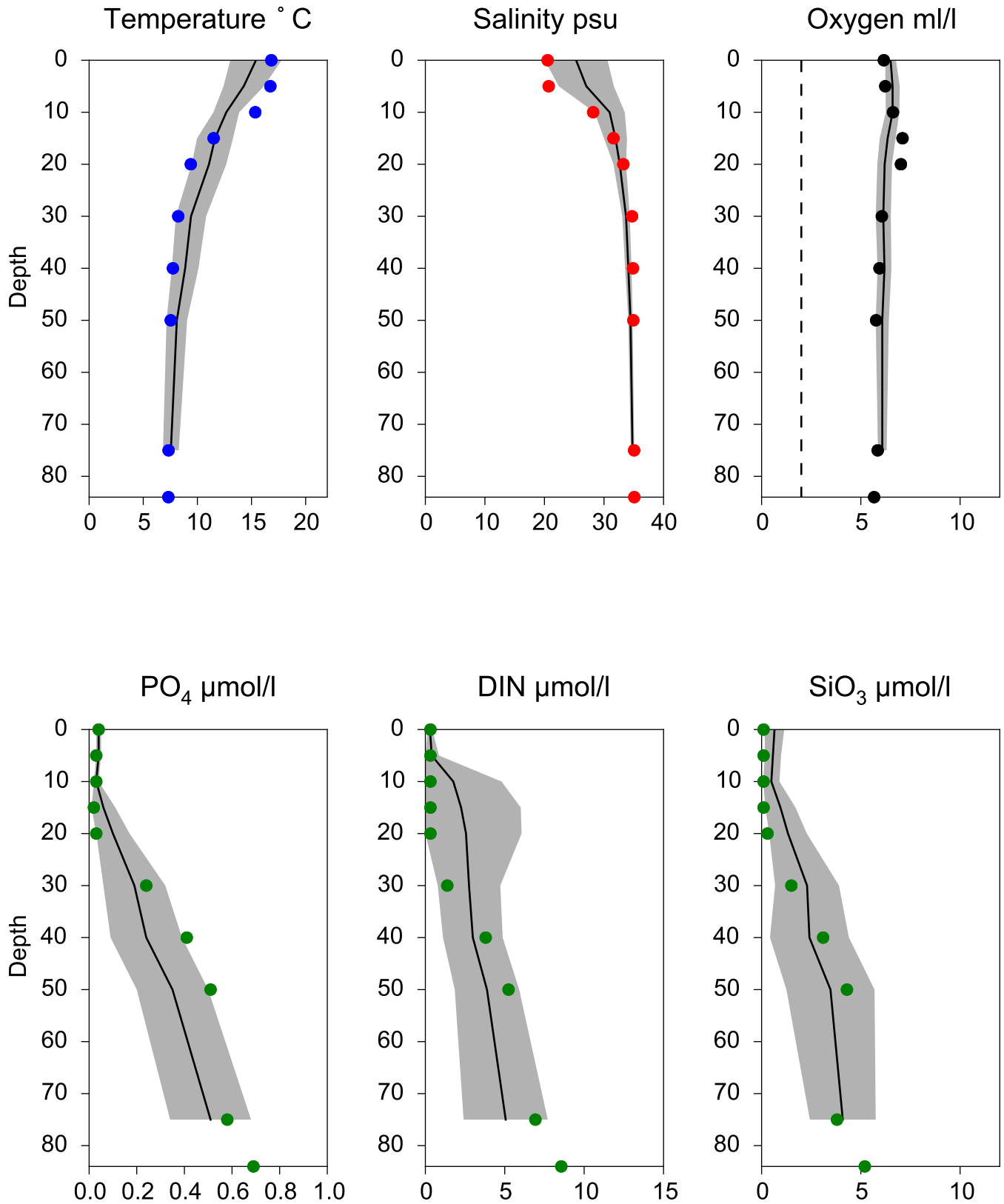


O₂ ml/l



Vertical profiles Å13 June

— Mean 2001-2015 St.Dev. • 2016-06-17



STATION SLÄGGÖ SURFACE WATER (0-10m)

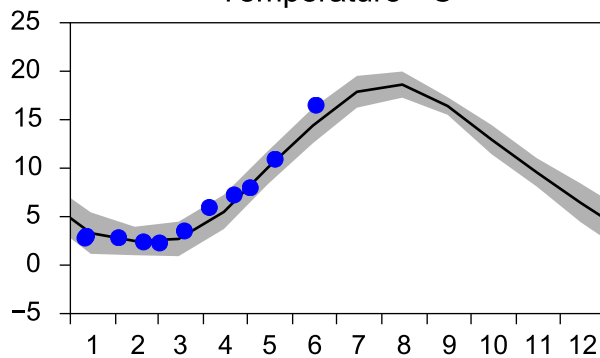
Annual Cycles

— Mean 2001-2015

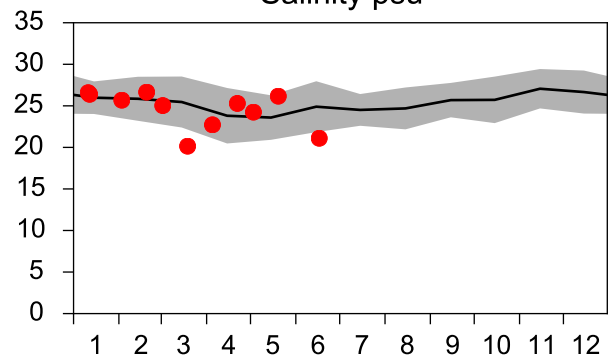
■ St.Dev.

● 2016

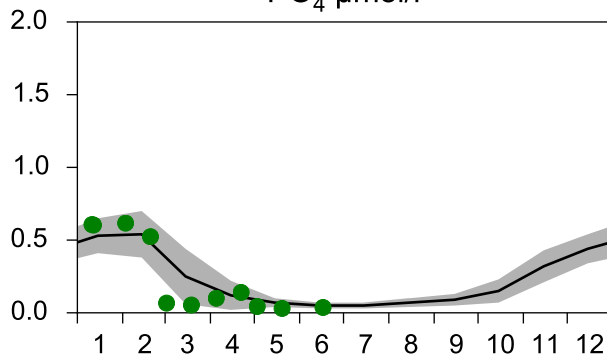
Temperature °C



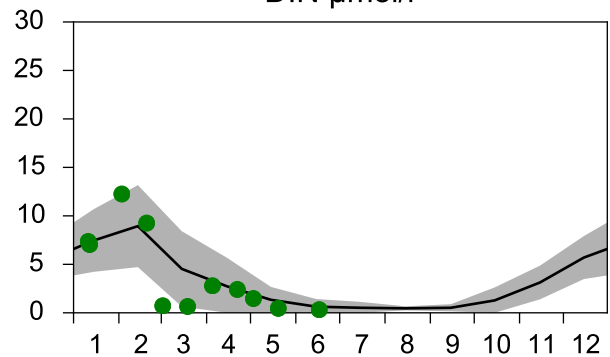
Salinity psu



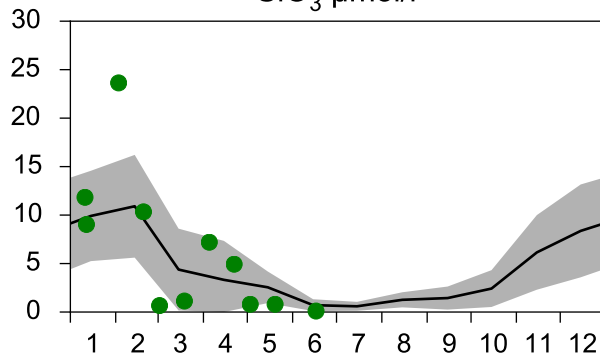
PO₄ µmol/l



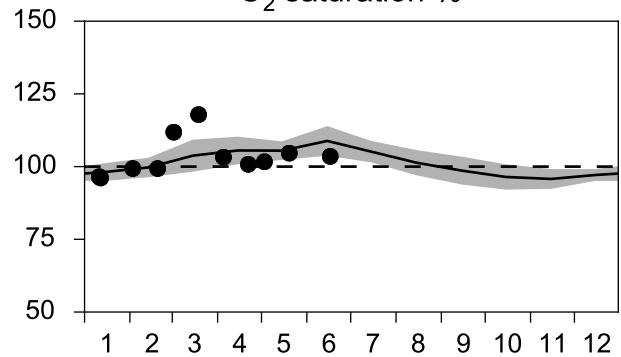
DIN µmol/l



SiO₃ µmol/l

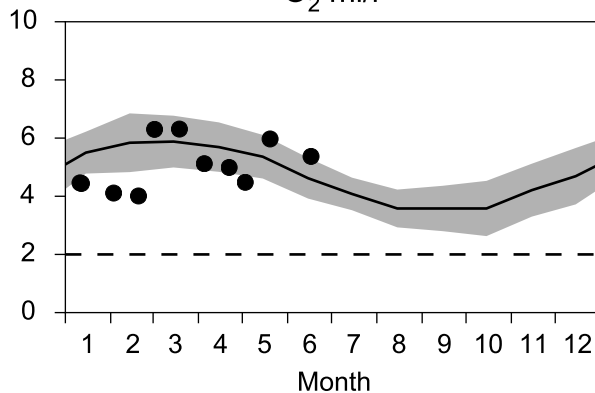


O₂ saturation %

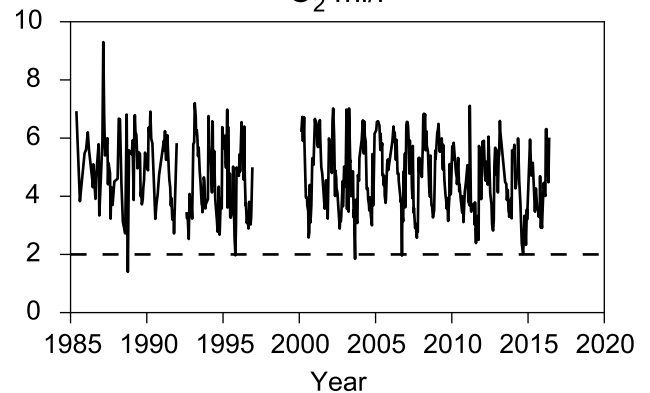


OXYGEN IN BOTTOM WATER (depth >= 50 m)

O₂ ml/l

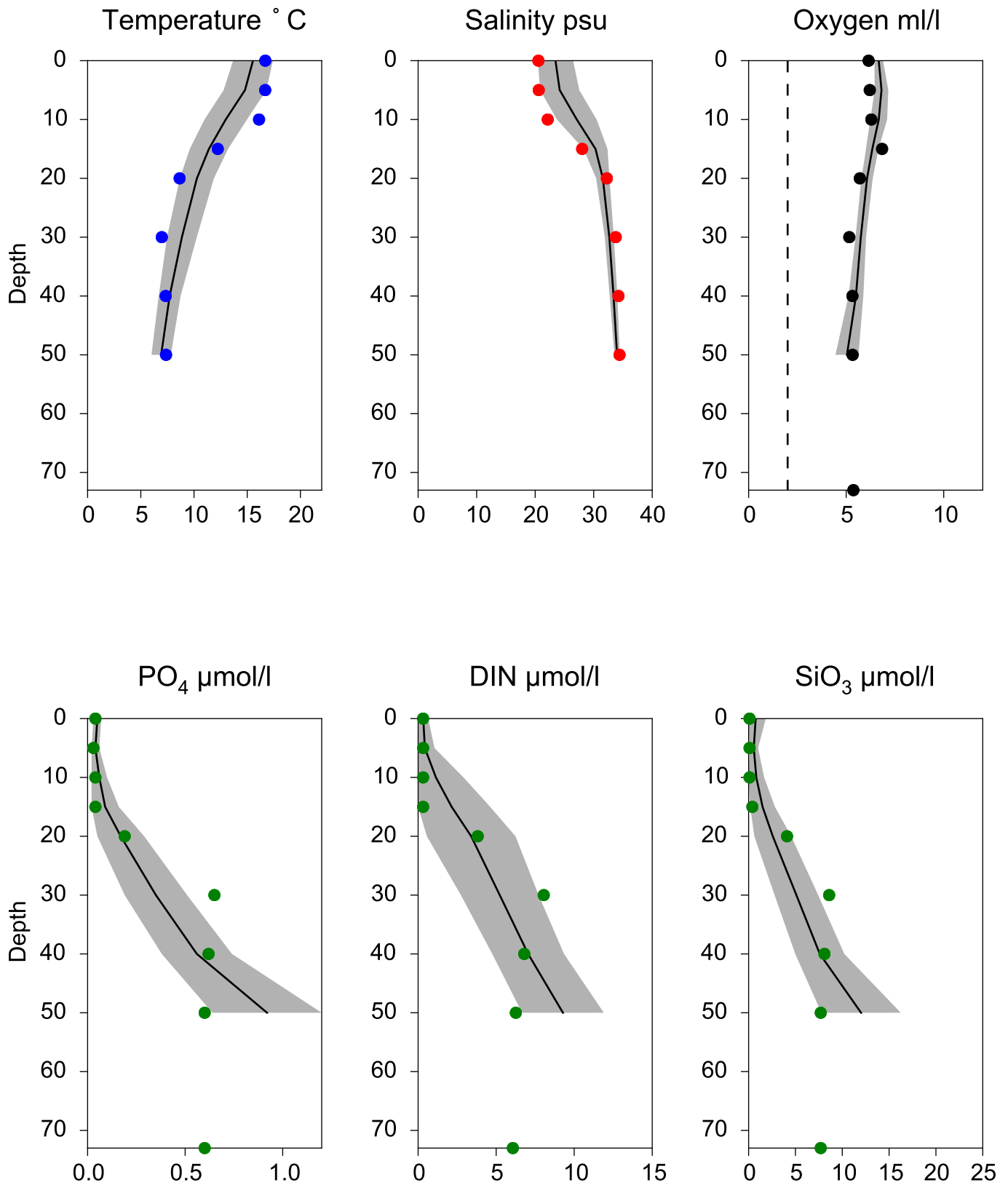


O₂ ml/l



Vertical profiles SLÄGGÖ June

— Mean 2001-2015 St.Dev. • 2016-06-17



STATION P2 SURFACE WATER (0-10m)

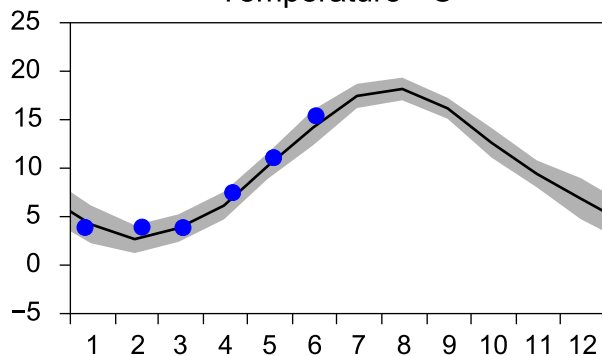
Annual Cycles

— Mean 2001-2015

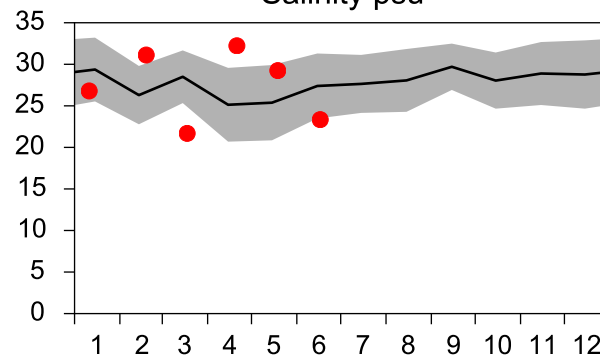
■ St.Dev.

● 2016

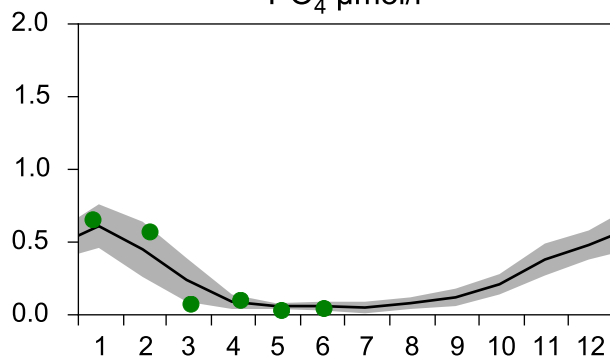
Temperature °C



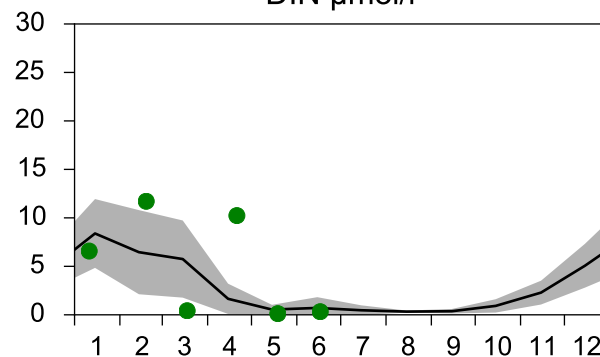
Salinity psu



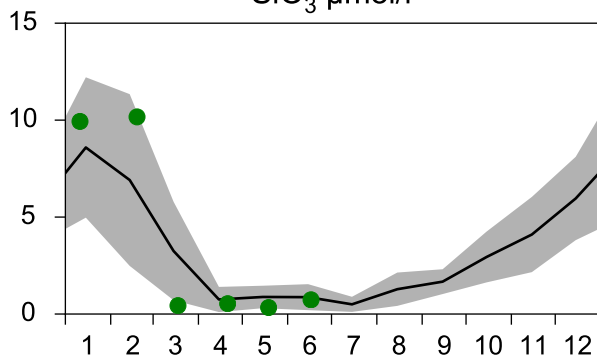
PO₄ µmol/l



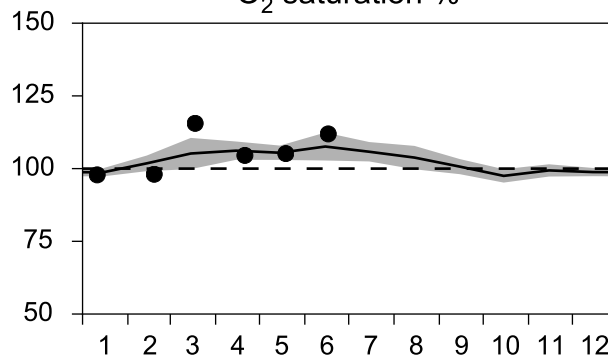
DIN µmol/l



SiO₃ µmol/l

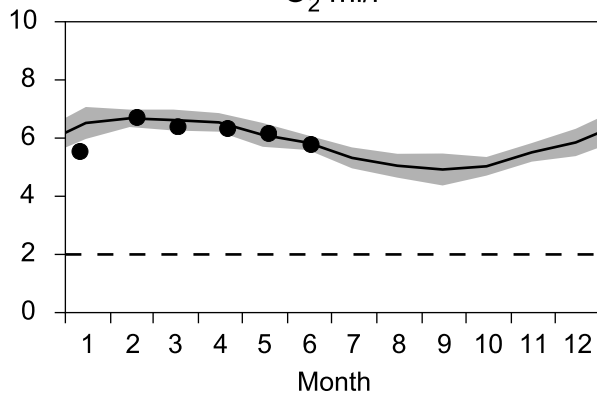


O₂ saturation %

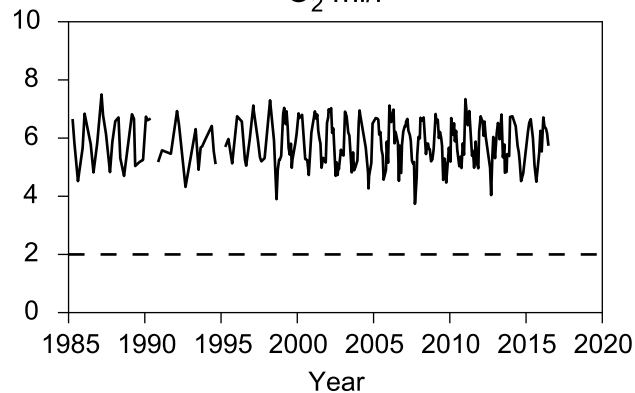


OXYGEN IN BOTTOM WATER (depth >= 80 m)

O₂ ml/l

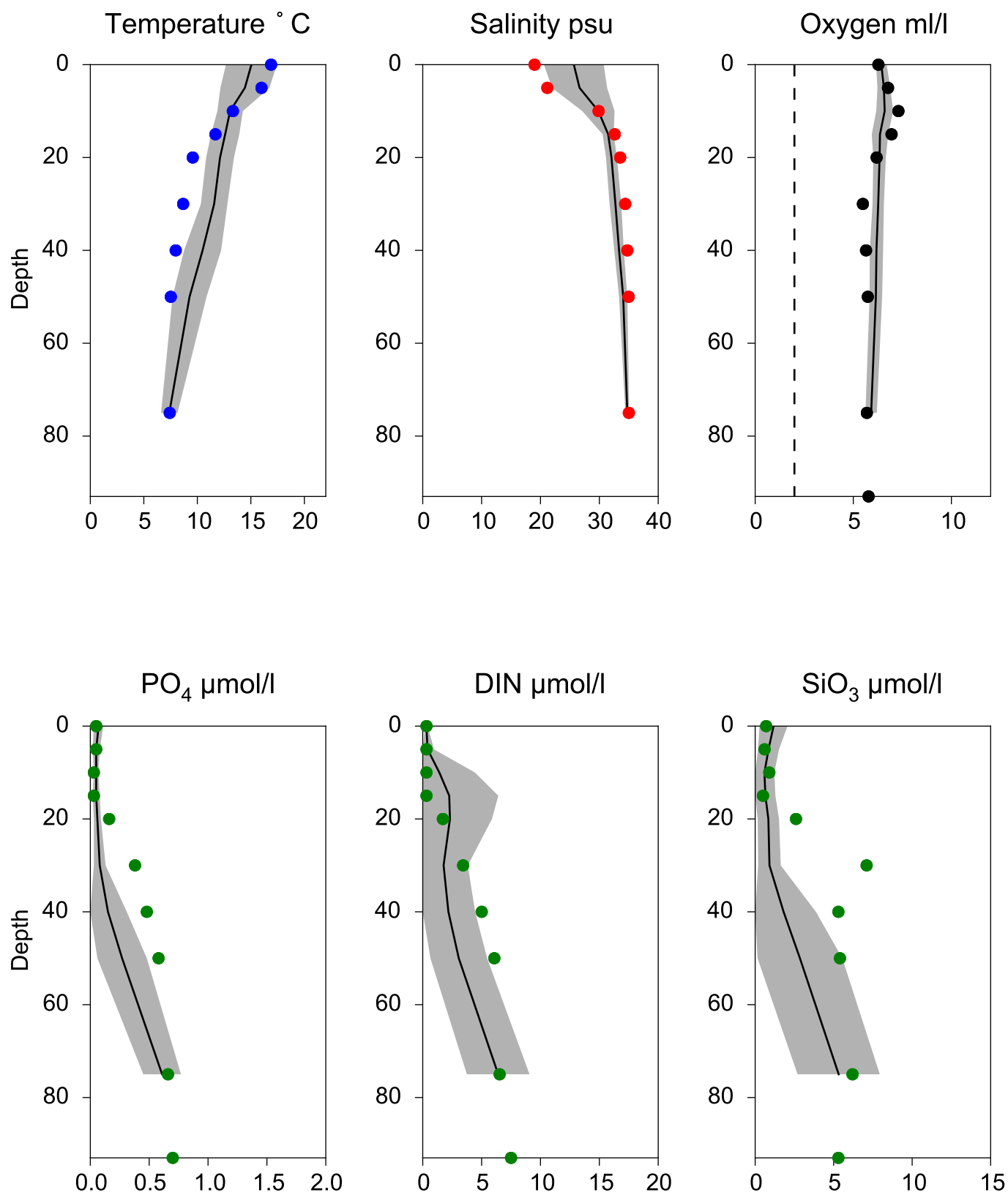


O₂ ml/l



Vertical profiles P2 June

— Mean 2001-2015 St.Dev. • 2016-06-17



STATION N14 FALKENBERG SURFACE WATER (0-10m)

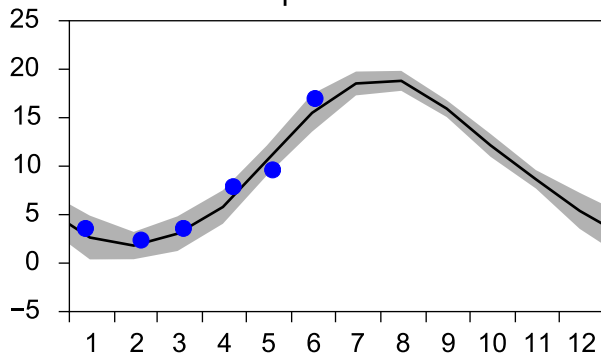
Annual Cycles

— Mean 2001-2015

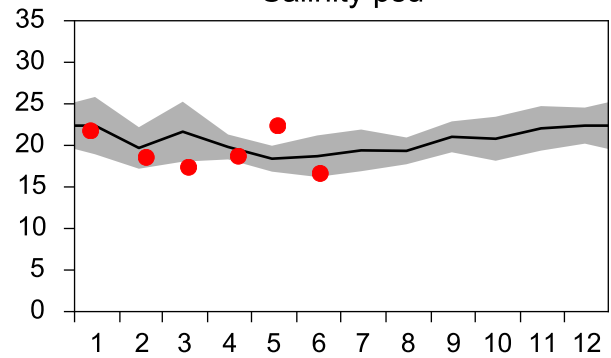
■ St.Dev.

● 2016

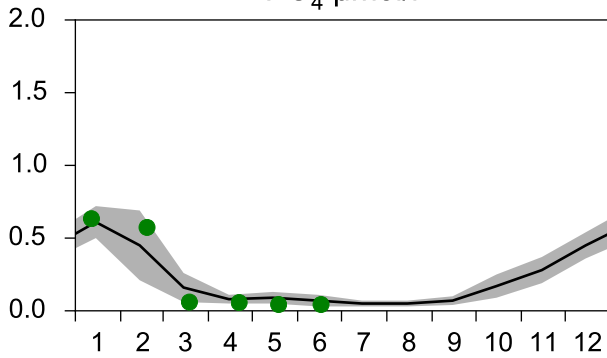
Temperature °C



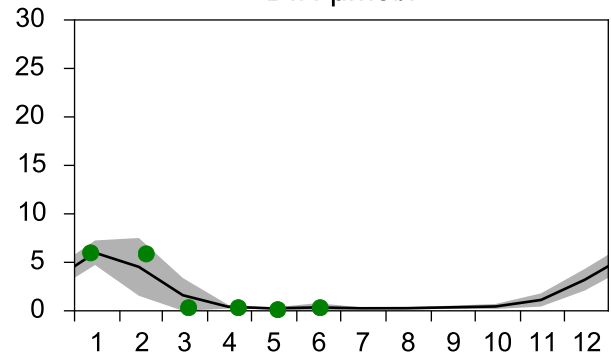
Salinity psu



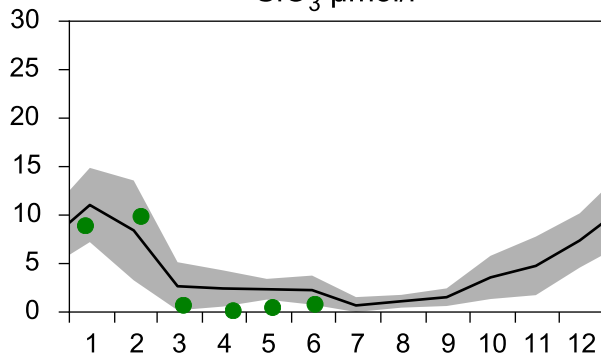
PO₄ µmol/l



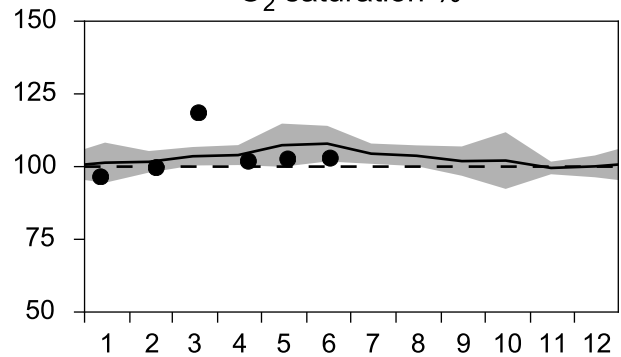
DIN µmol/l



SiO₃ µmol/l

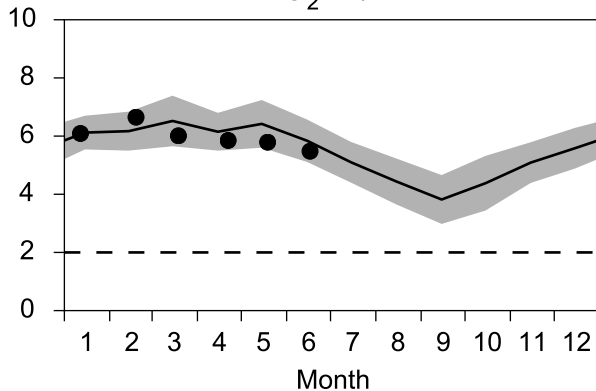


O₂ saturation %

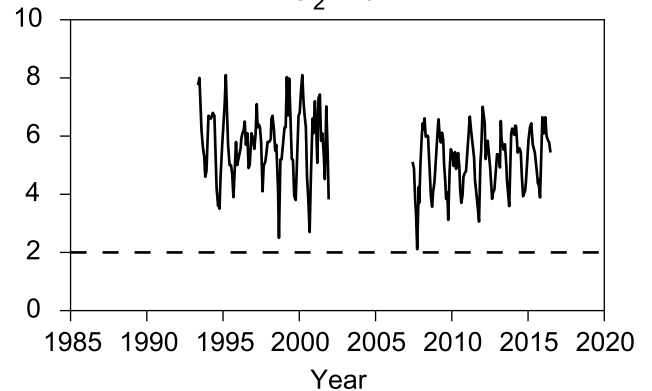


OXYGEN IN BOTTOM WATER (depth >= 25 m)

O₂ ml/l

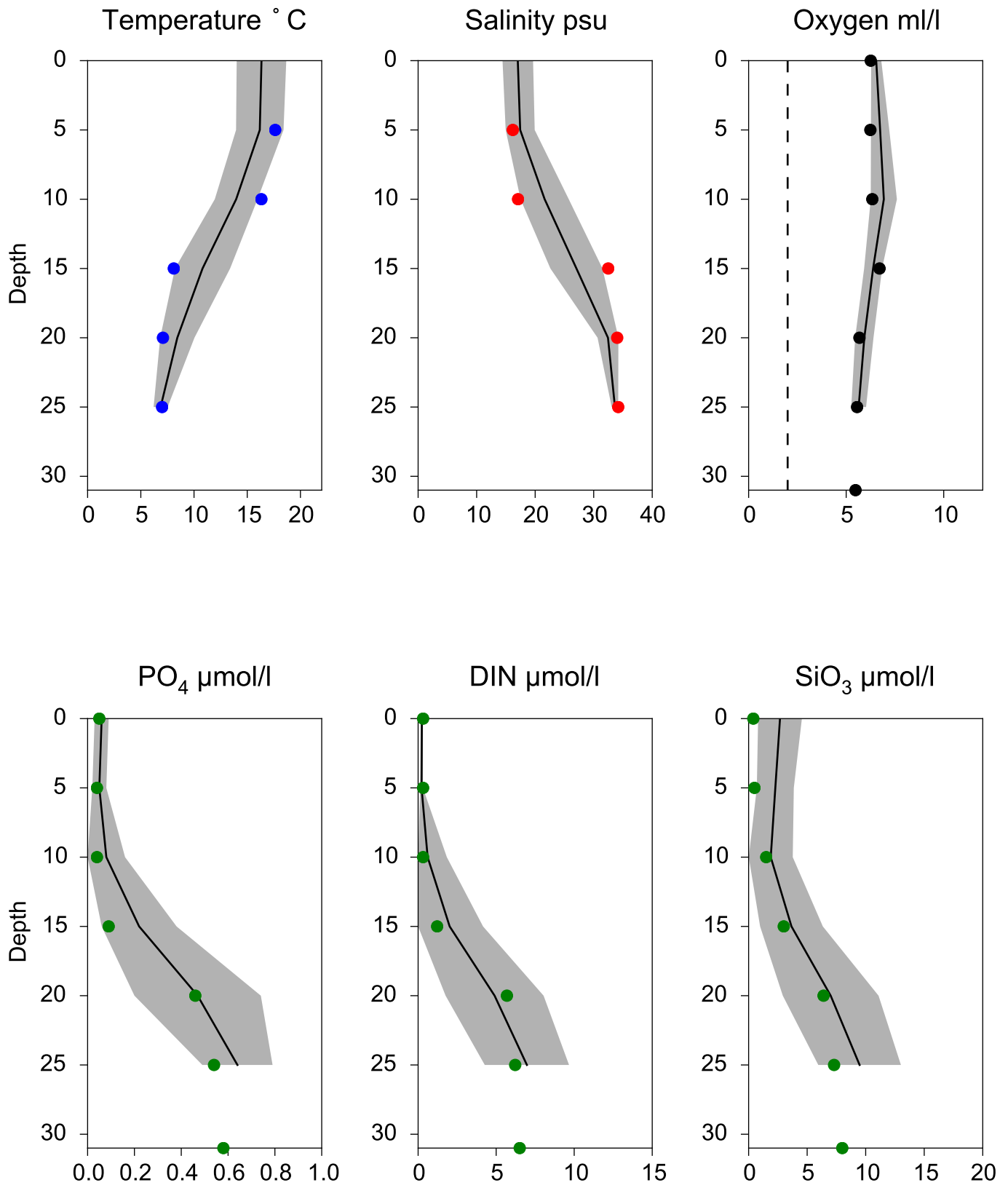


O₂ ml/l



Vertical profiles N14 FALKENBERG June

— Mean 2001-2015 St.Dev. • 2016-06-17



STATION ANHOLT E SURFACE WATER (0-10m)

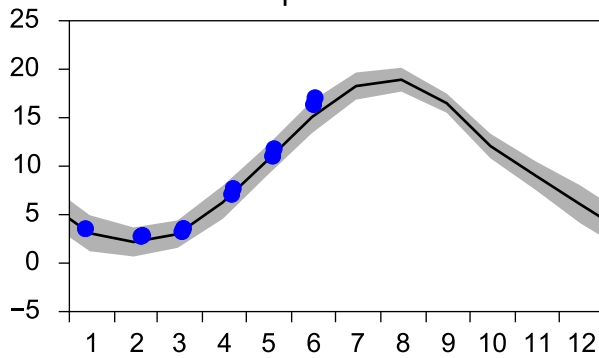
Annual Cycles

— Mean 2001-2015

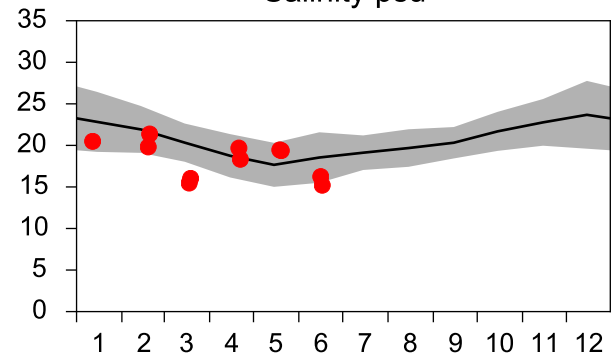
■ St.Dev.

● 2016

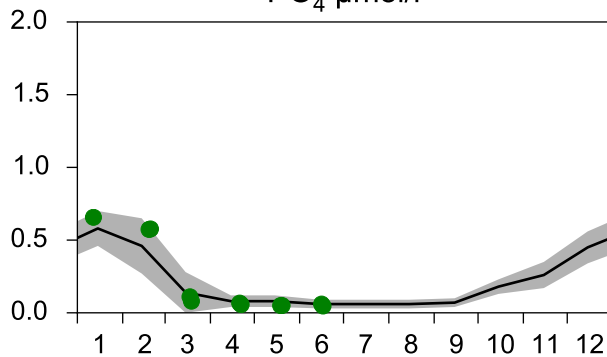
Temperature °C



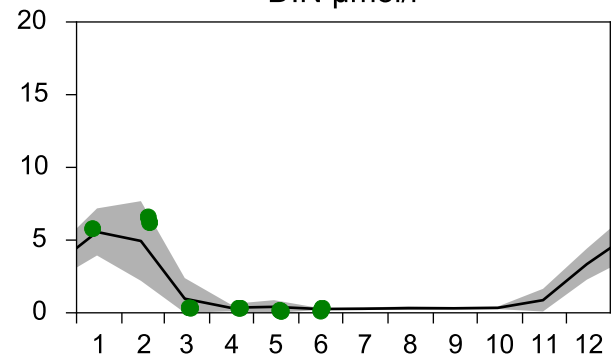
Salinity psu



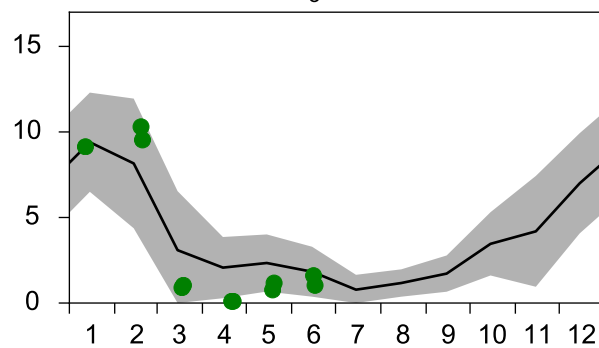
PO₄ µmol/l



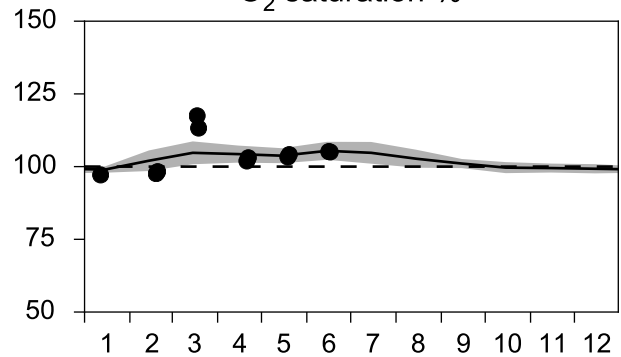
DIN µmol/l



SiO₃ µmol/l

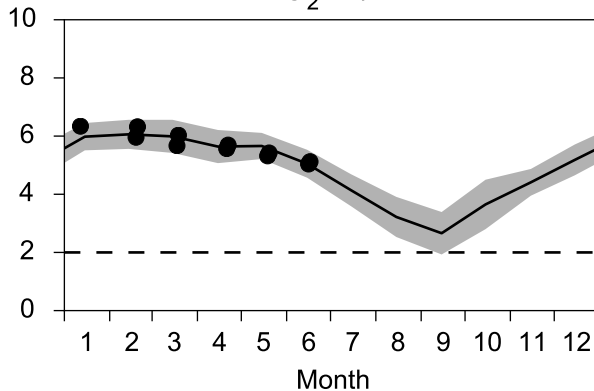


O₂ saturation %

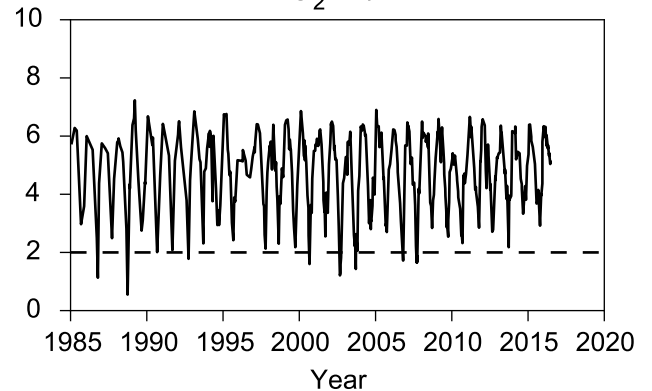


OXYGEN IN BOTTOM WATER (depth >= 45 m)

O₂ ml/l



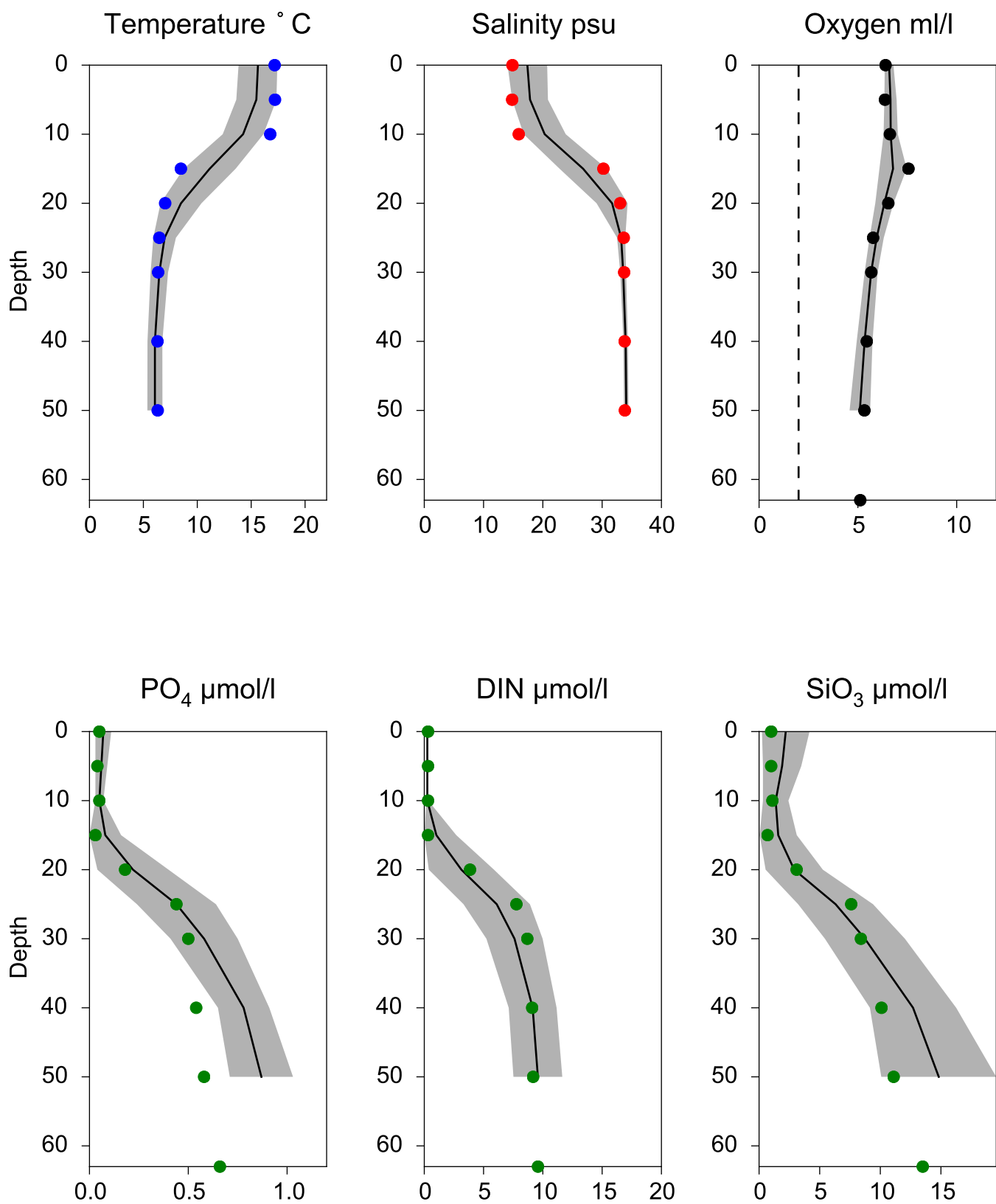
O₂ ml/l



Vertical profiles ANHOLT E

June

— Mean 2001-2015 St.Dev. • 2016-06-17



STATION HANÖBUKTEN SURFACE WATER (0-10m)

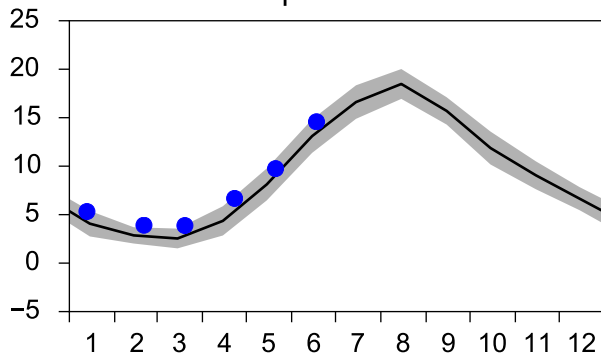
Annual Cycles

— Mean 2001-2015

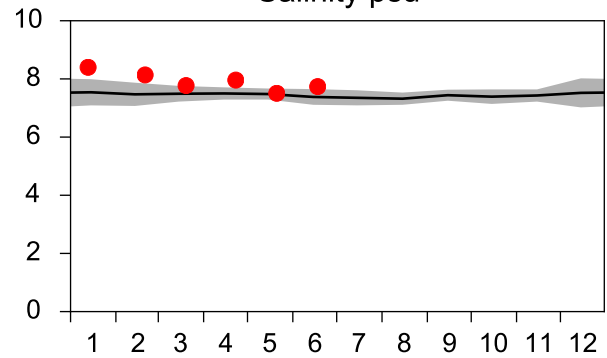
■ St.Dev.

● 2016

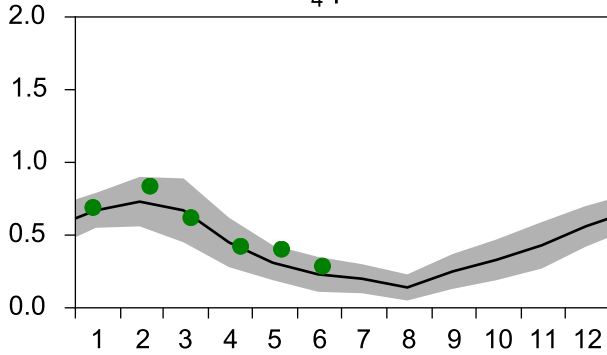
Temperature °C



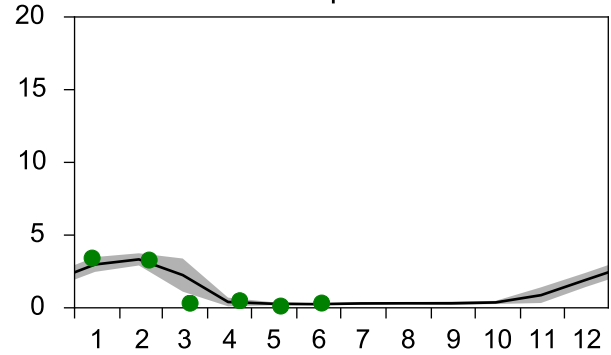
Salinity psu



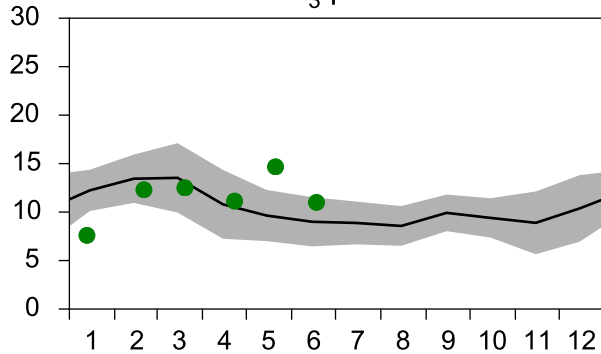
PO₄ µmol/l



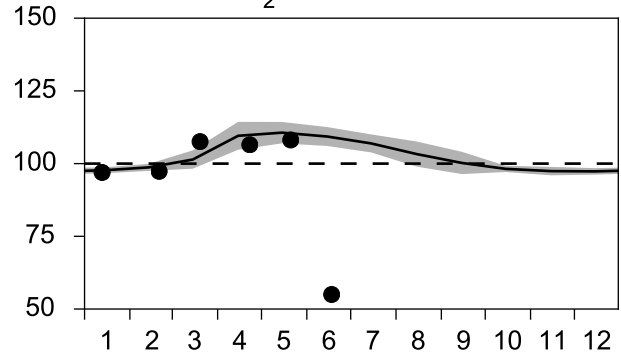
DIN µmol/l



SiO₃ µmol/l

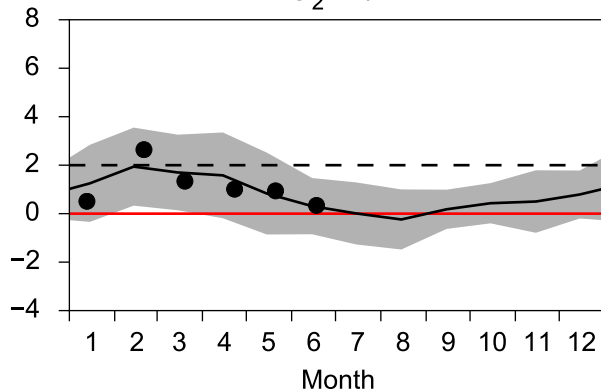


O₂ saturation %

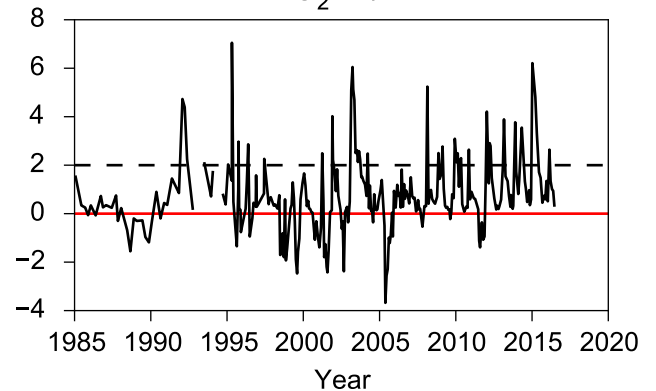


OXYGEN IN BOTTOM WATER (depth >= 70 m)

O₂ ml/l



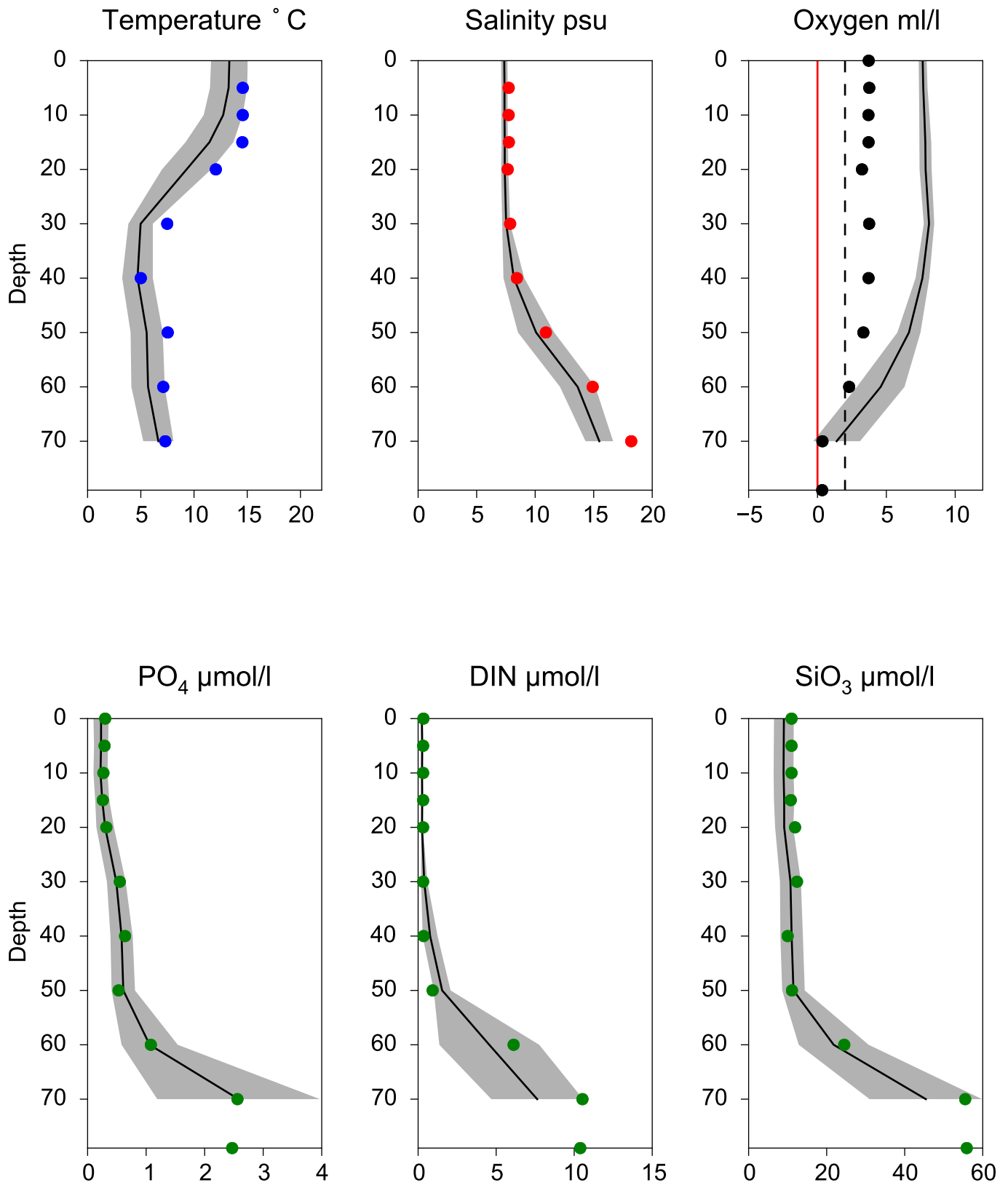
O₂ ml/l



Vertical profiles HANÖBUKTEN

June

— Mean 2001-2015 St.Dev. • 2016-06-18



STATION REF M1V1 SURFACE WATER (0-10m)

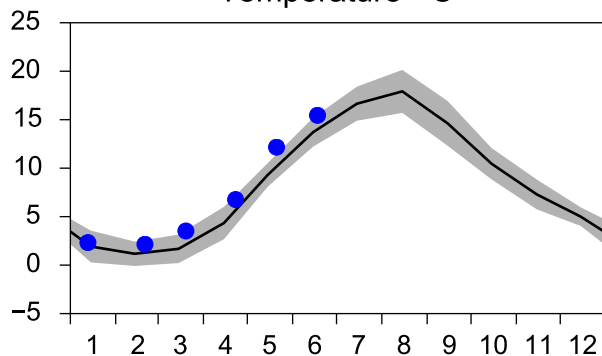
Annual Cycles

— Mean 2001-2015

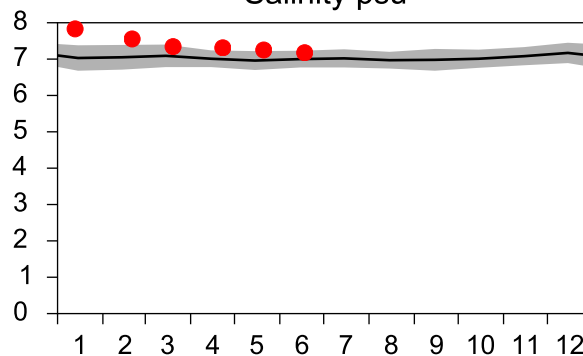
■ St.Dev.

● 2016

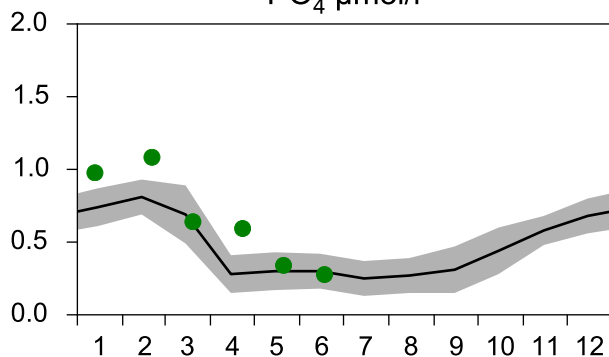
Temperature °C



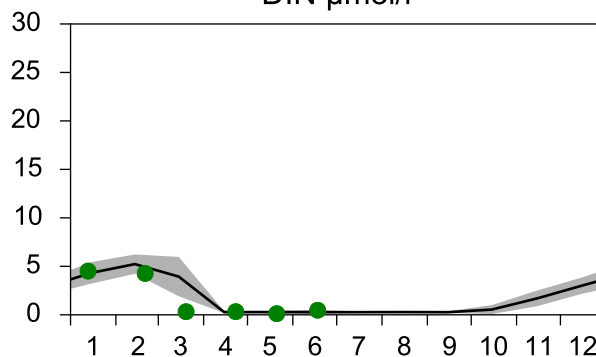
Salinity psu



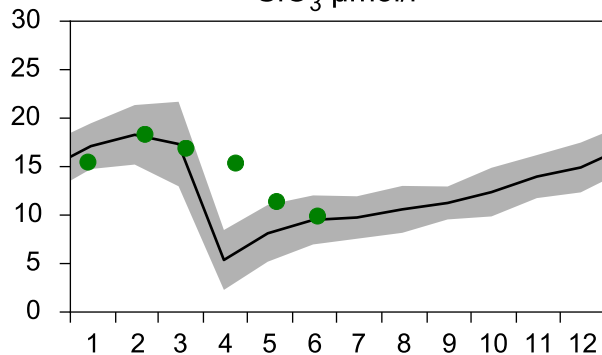
PO₄ µmol/l



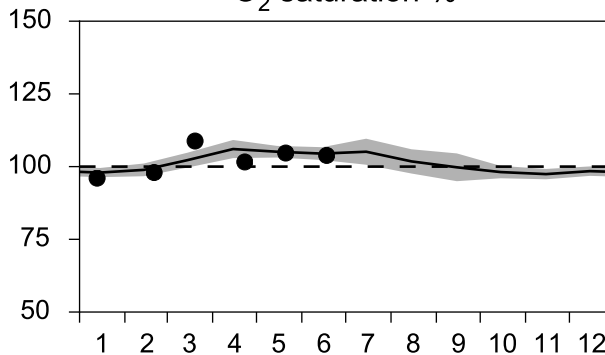
DIN µmol/l



SiO₃ µmol/l

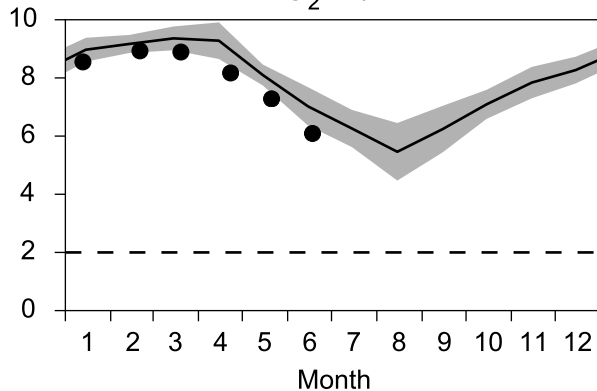


O₂ saturation %

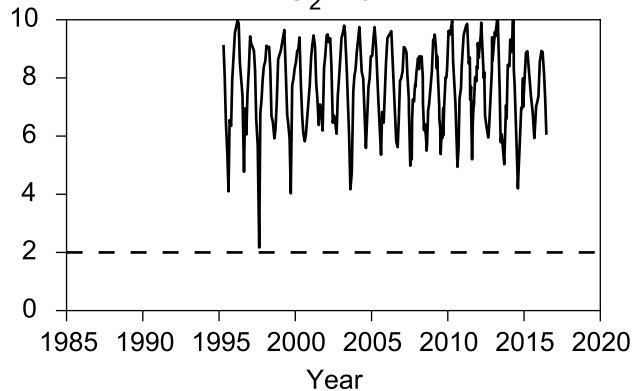


OXYGEN IN BOTTOM WATER (depth >= 17 m)

O₂ ml/l

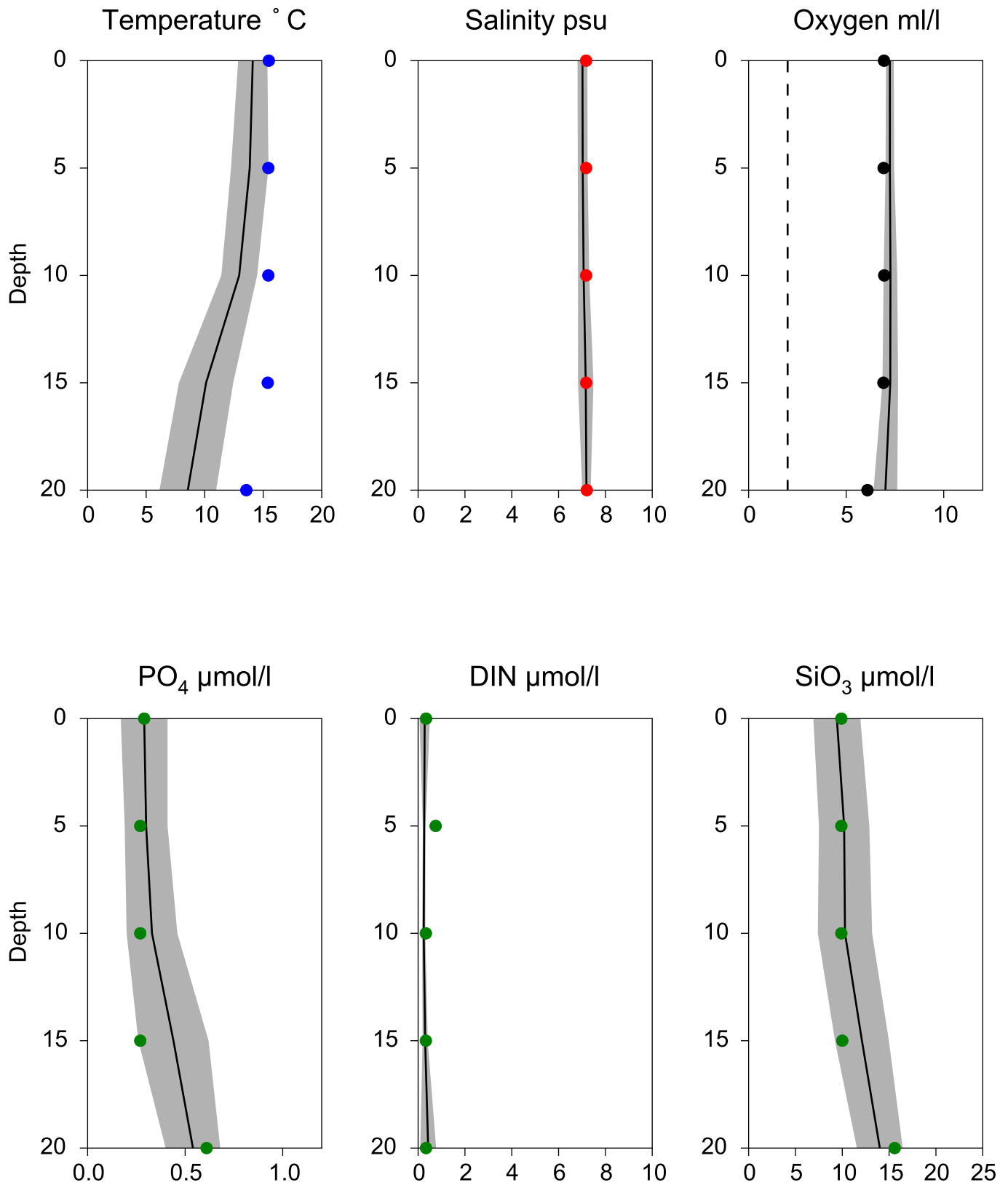


O₂ ml/l



Vertical profiles REF M1V1 June

— Mean 2001-2015 St.Dev. • 2016-06-18



STATION BY38 KARLSÖDJ SURFACE WATER (0-10m)

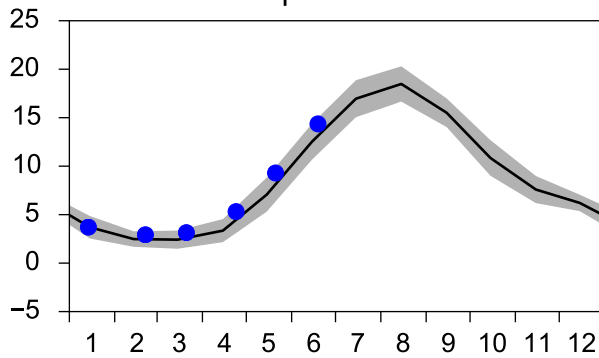
Annual Cycles

— Mean 2001-2015

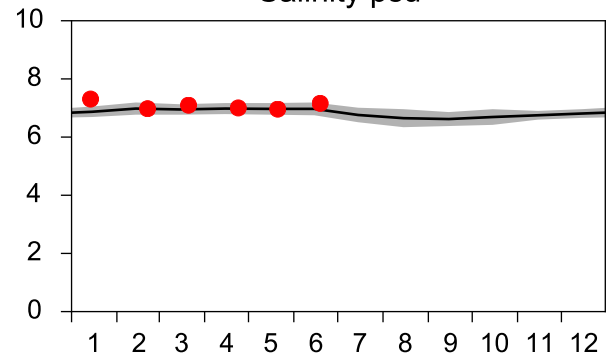
■ St.Dev.

● 2016

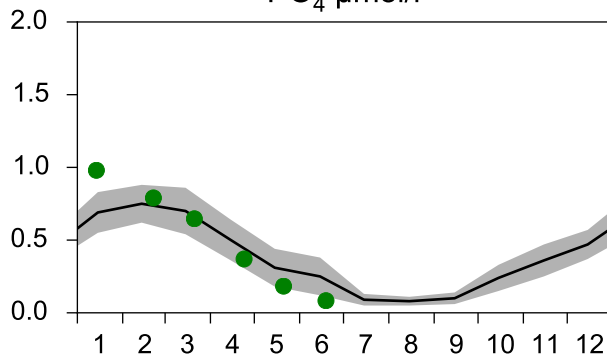
Temperature °C



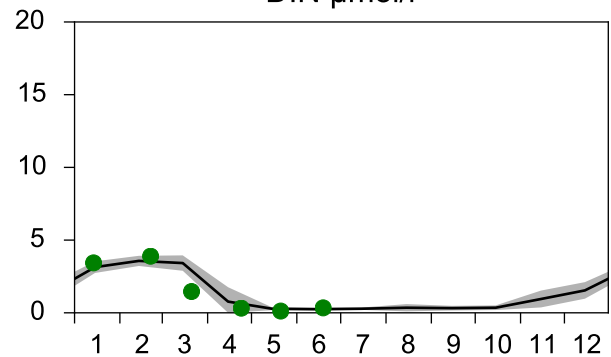
Salinity psu



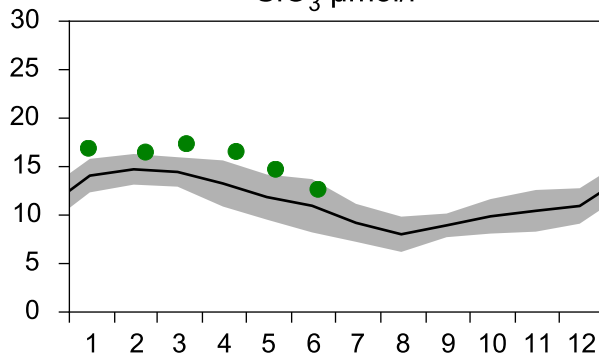
PO₄ µmol/l



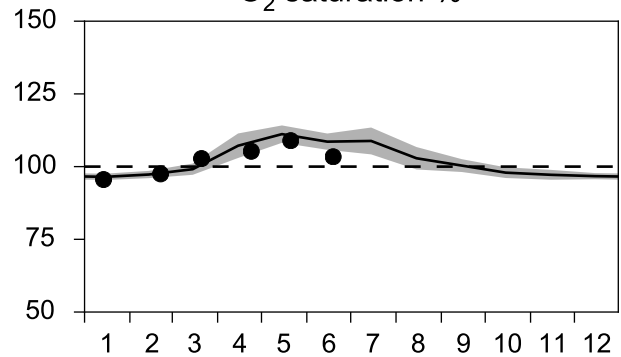
DIN µmol/l



SiO₃ µmol/l

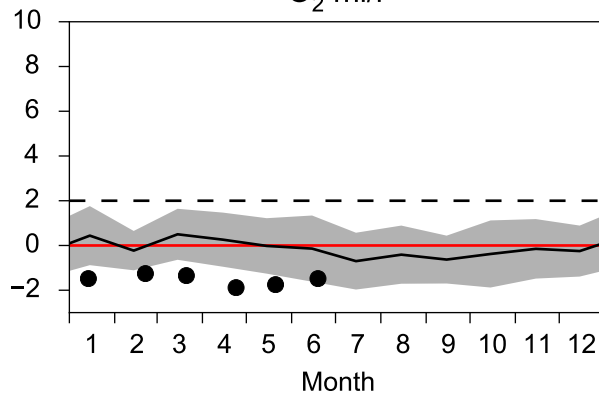


O₂ saturation %

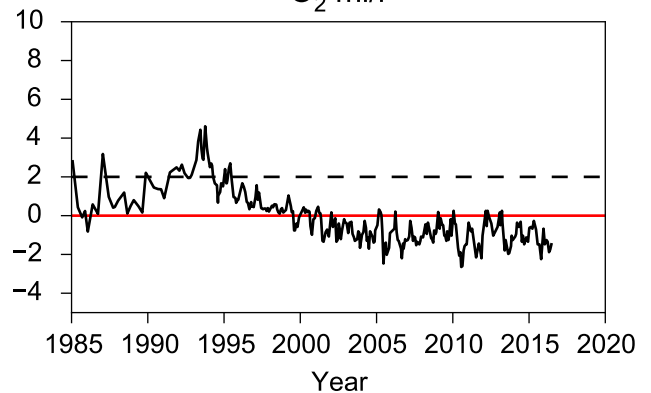


OXYGEN IN BOTTOM WATER (depth >= 100 m)

O₂ ml/l

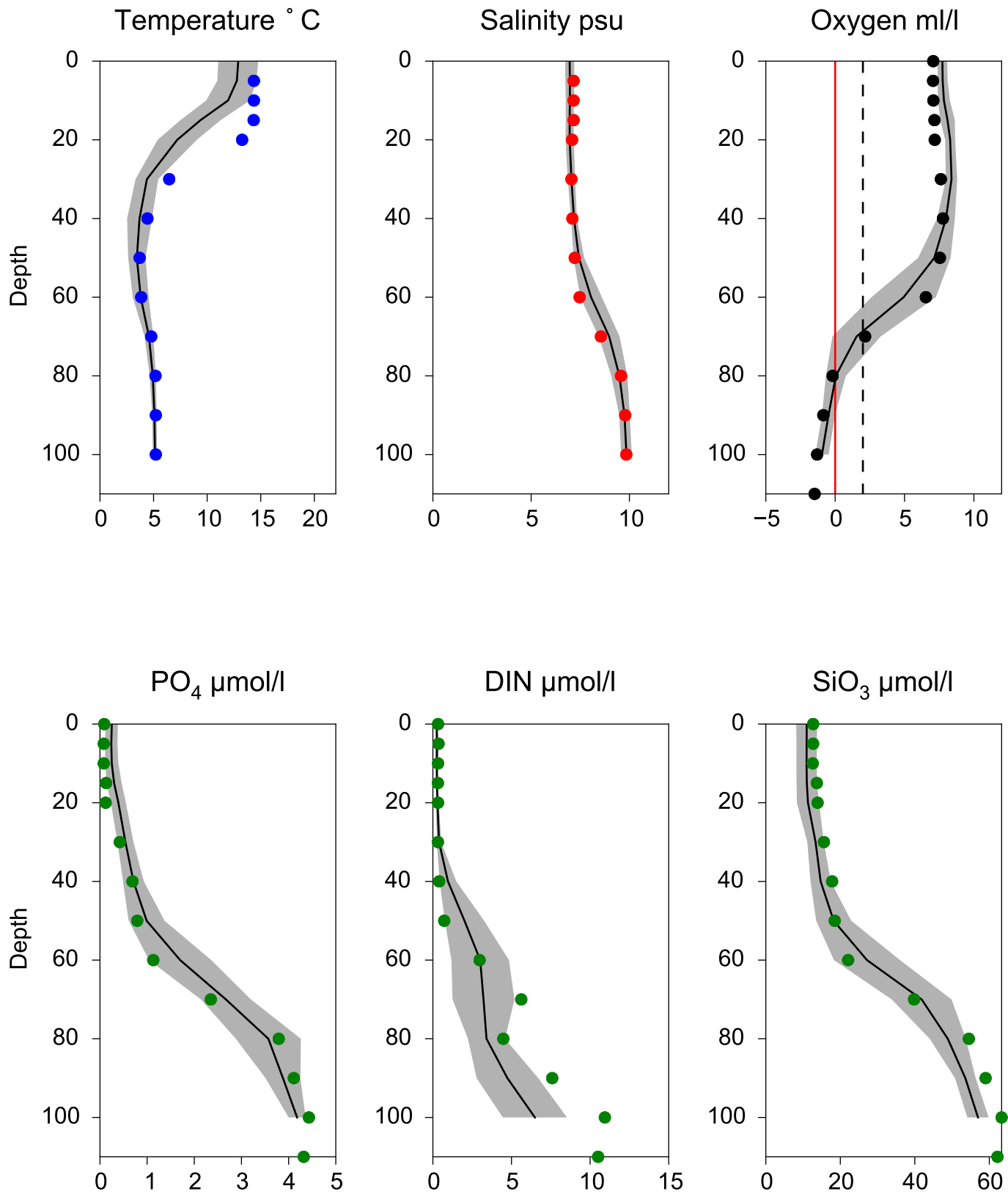


O₂ ml/l



Vertical profiles BY38 KARLSÖDJ June

— Mean 2001-2015 St.Dev. • 2016-06-19



STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10m)

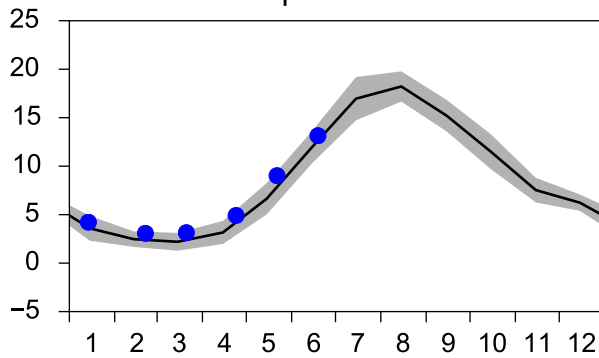
Annual Cycles

— Mean 2001-2015

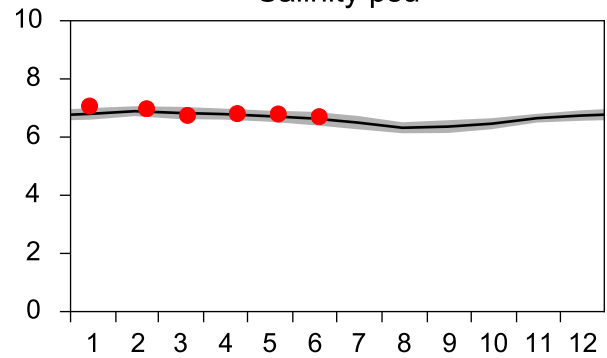
■ St.Dev.

● 2016

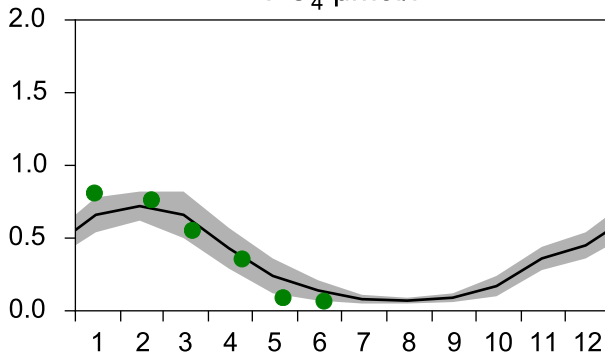
Temperature °C



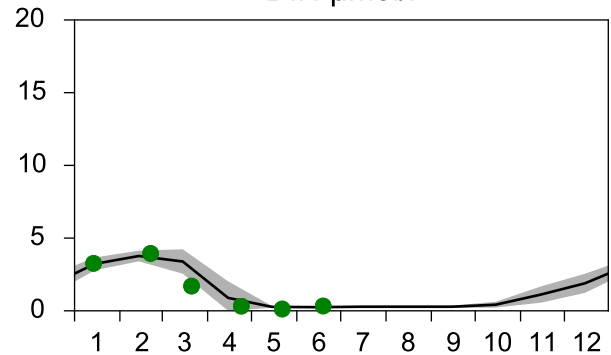
Salinity psu



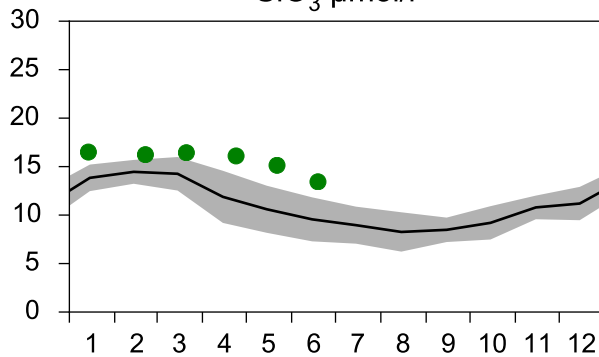
PO₄ µmol/l



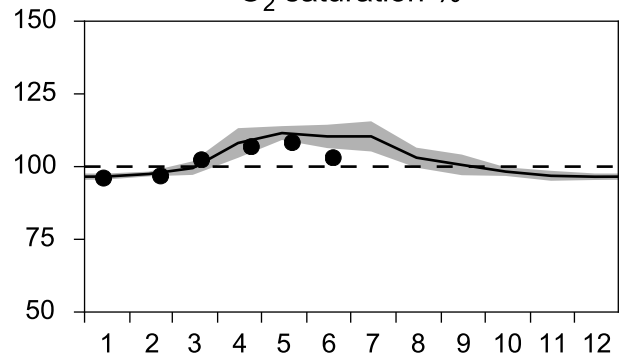
DIN µmol/l



SiO₃ µmol/l

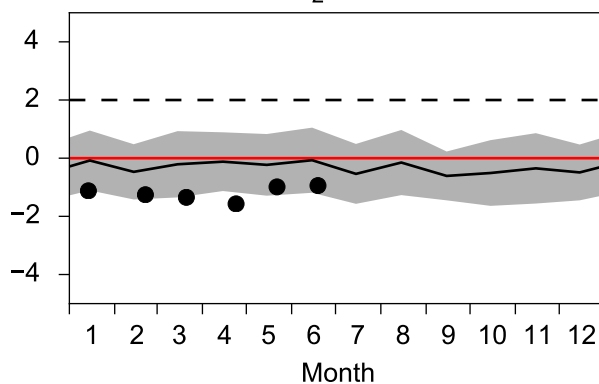


O₂ saturation %

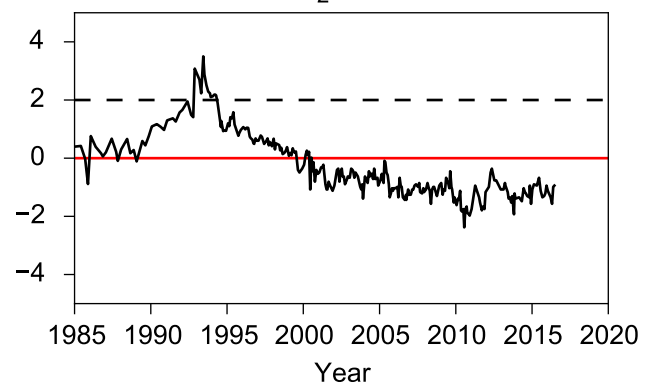


OXYGEN IN BOTTOM WATER (depth >= 175 m)

O₂ ml/l



O₂ ml/l



Vertical profiles BY32 NORRKÖPINGSDJ June

— Mean 2001-2015 St.Dev. • 2016-06-19

