

## Rapport från SMHIs utsjöexpedition med R/V Svea



<b>Expeditionens varaktighet:</b>	2023-04-12 – 2023-04-18
<b>Uppdragsgivare:</b>	Sveriges Meteorologiska och Hydrologiska Institut (SMHI), Havs- och Vattenmyndigheten (HaV)
<b>Samarbetspartner:</b>	Sveriges Lantbruksuniversitet (SLU), Sjöfartsverket (SjöV)

### SAMMANFATTNING

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

Vattentemperaturen i ytvattnet var normal för årstiden vid alla de besökta stationerna.

Halterna av fosfat och löst oorganiskt kväve var låga i hela det undersökta området, vilket är normalt för årstiden. Kiselkoncentrationen i ytvattnet var något över det normala för årstiden i Västerhavet och normala i Egentliga Östersjön.

I Arkonabassängen var syresituationen god i bottenvattnet. I Bornholmsbassängen och Hanöbukten hade syrekonsentrationen minskat sedan mätningarna i mars och där noterades syrebrist (<2 ml/l) vid botten i Bornholmsbassängen och från 70 m i Hanöbukten, men inget svavelväte uppmättes. Vid stationen BCSIII-10 hade däremot syresituationen förbättrats något sedan mätningarna i mars och där uppmättes inget svavelväte, syrebrist mättes från 80 m. I Östra och Västra Gotlandsbassängerna började syrebristen vid 70-80 meters djup. Svavelväte återfanns från 80 meters djup i Östra Gotlandsbassängen och från 90 meter i Västra Gotlandsbassängen.

Nästa ordinarie expedition är planerad att starta 8:e maj i Lysekil.

## RESULTAT

Expeditionen genomfördes med R/V Svea och startade i Lysekil den 12:e april och avslutades i Göteborg den 18:e april. Vindarna under expeditionen var svaga till måttliga och varierade mellan sydost och nordost. Lufttemperaturen varierade mellan 3,2 och 8,9°C.

Sveas båda ADCP:er (strömmätning) var igång under expeditionen. Ferryboxen (kontinuerliga mätningar på 4 meters djup) var endast igång de första dagarna på grund av förlorad gps-signal.

Extra växtplanktonprover från ytvattnet togs vid stationerna Släggö, Å17 och Anholt E till ett projekt som genomförs vid Uppsala och Stockholms Universitet.

Under expeditionen närvarande två personer från Göteborgs Universitet för provtagning och analys av det marina karbonatsystemet. För att överbestämma karbonatsystemet analyserades tre av de relaterade variablerna ombord: pH, total alkalinitet (TA) samt löst oorganiskt kol (DIC). Vidare togs vattenprover hem för analys av organisk alkalinitet, samt för ett lagringsexperiment av prover innehållande svavelväte.

Rapporten är baserad på data som genomgått en första kvalitetskontroll och som är jämförd mot månadsmedelvärde för perioden 1991 – 2020. När ytterligare kvalitetsgranskning genomförts kan vissa värden komma att ändras. Värden som anges i rapporten har avrundats till närmaste tiondel och kan därför skilja sig från publicerade värden. Data publiceras så fort som möjligt på datavärdens hemsida, normalt inom ca en vecka efter avslutad expedition. Vissa analyser utförs efter expeditionen och publiceras därför senare.

Data kan laddas ner här:

<https://sharkweb.smhi.se/hamta-data/>

### Skagerrak

Temperaturen i ytvattnet varierade mellan 6,0°C och 6,5°C, vilket är normalt för årstiden. Ytsalthalten varierade mellan 21 och 31 psu, lägst vid kusten, vilket är normalt till lägre än det normala i det undersökta området. En tydlig skiktning som sammanföll på 15-25 meters djup, syntes på de flesta stationerna. Å17 hade ytterligare en temperaturskiktning runt 50 meter.

Halterna av fosfat och löst oorganiskt kväve i Skagerraks ytvatten var förbrukade eller låga vilket är normalt för årstiden. Kiselkoncentrationen var något över det normala i området och varierade mellan 2,1 och 4,0 µmol/l. Fosfathalten var 0,05-0,07 µmol/l och löst oorganiskt kväve var lägre än detektionsgräns som är 0,1 µmol/l.

Syresituationen var god vid samtliga stationer i Skagerrak, med värden normala för årstiden. Lägst koncentration i bottenvattnet uppmättes vid Släggö, 5,3 ml/l.

Klorofyllfluorescensen, som är ett mått på planktonaktiviteten uppmätt från CTD-sonden, visade hög aktivitet runt 20 meter i området.

## Kattegatt och Öresund

Yttemperaturen i Kattegatt och Öresund var normal för årstiden och varierade mellan 6,2-6,4°C. Ytsalthalten varierade mellan 18-20 psu i Kattegatt och i Öresund var salthalten 9 psu, vilket är normalt till något lägre än normalt. I Kattegatt och i Öresund återfanns temperatur- och salthaltsprångskiktet mellan 10 och 20 meter.

Koncentrationen av fosfat och löst oorganiskt kväve i ytvattnet var normalt till lägre än normalt i området. Fosfat varierade mellan 0,06-0,21 µmol/l och halterna av löst oorganiskt kväve var <0,1-0,21 µmol/l. Halten av kisel var normal till högre än normal och låg mellan 4,5-6,4 µmol/l. De högsta halterna uppmättes i Öresund.

Syrehalterna var normala för årstiden och i bottenvattnet uppmättes som lägst 5,8 ml/l i Kattegatt och 4,5 ml/l i Öresund.

Klorofyllfluorescensen visade låg aktivitet i området.

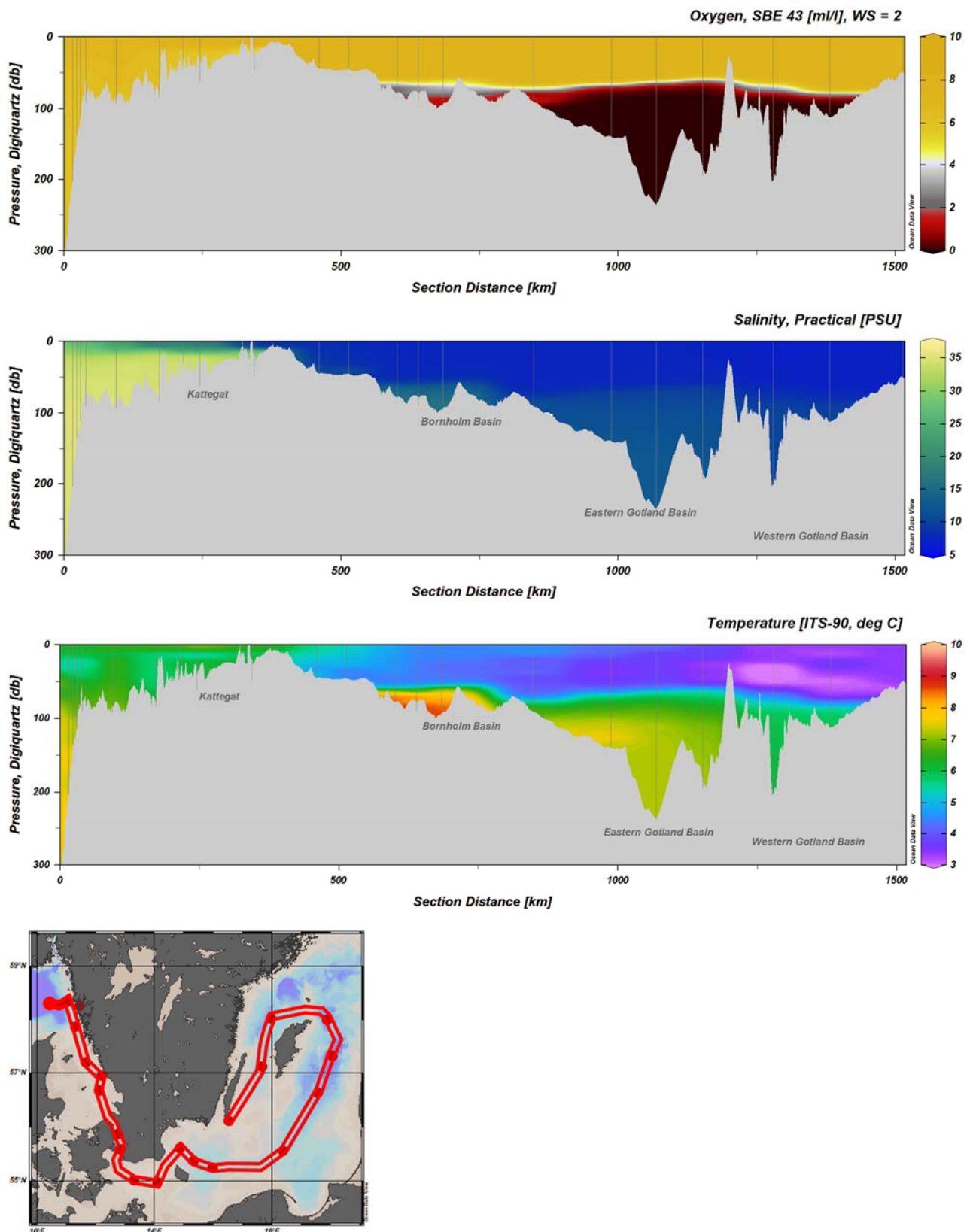
## Egentliga Östersjön

Vattentemperaturen i ytvattnet var normal för årstiden på de besökta stationerna i området. Temperaturen varierade mellan 3,3-5,6°C. Salthalten i ytan var 7,0-8,5 psu och varierade mellan att vara normal till något över det normala i hela det undersökta området. En skiktning av både temperatur och salthalt påträffades på djup mellan 60 och 85 meter.

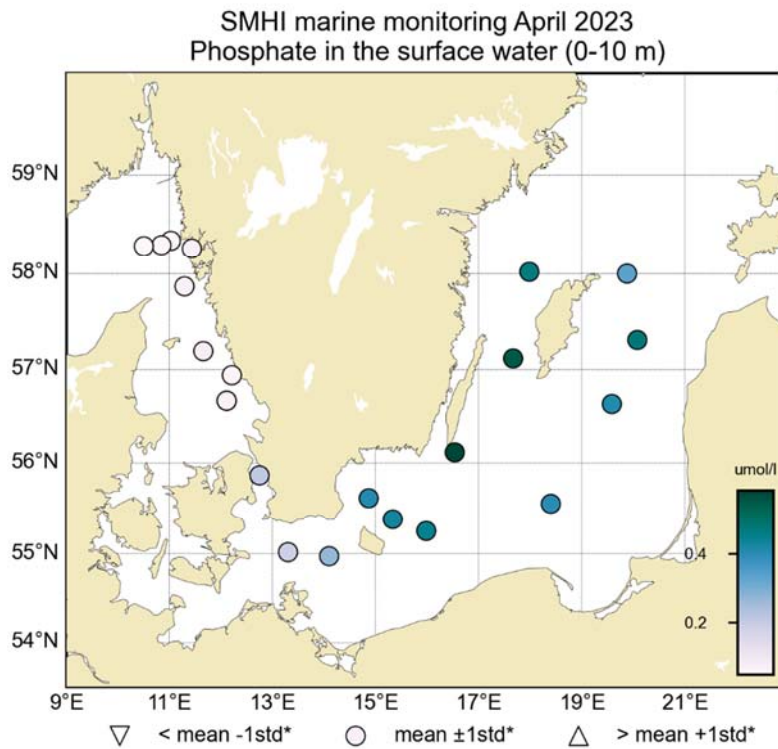
Närsaltskoncentrationerna i ytvattnet var normala i hela området. Halterna av fosfat varierade mellan 0,19-0,59 µmol/l, löst oorganiskt kväve mellan <0,1-1,33 µmol/l och kiselhalten varierade mellan 7,2-15,3 µmol/l.

I Arkonabassängen var syresituationen god, som lägst 4,7 ml/l i bottenvattnet. I Bornholmsbassängen och Hanöbukten hade syrekoncentrationen minskat sedan mätningarna i mars och där noterades syrebrist (<2 ml/l) vid botten i Bornholmsbassängen och från 70 m i Hanöbukten, men inget svavelväte uppmättes. Vid stationen BCSIII-10 hade däremot syresituationen förbättrats något sedan mätningarna i mars och där uppmättes inget svavelväte, syrebrist mättes från 80 m. I Östra och Västra Gotlandsbassängerna började syrebristen vid 70-80 meters djup. Svavelväte återfanns från 80 meters djup i Östra Gotlandsbassängen och från 90 meter i Västra Gotlandsbassängen.

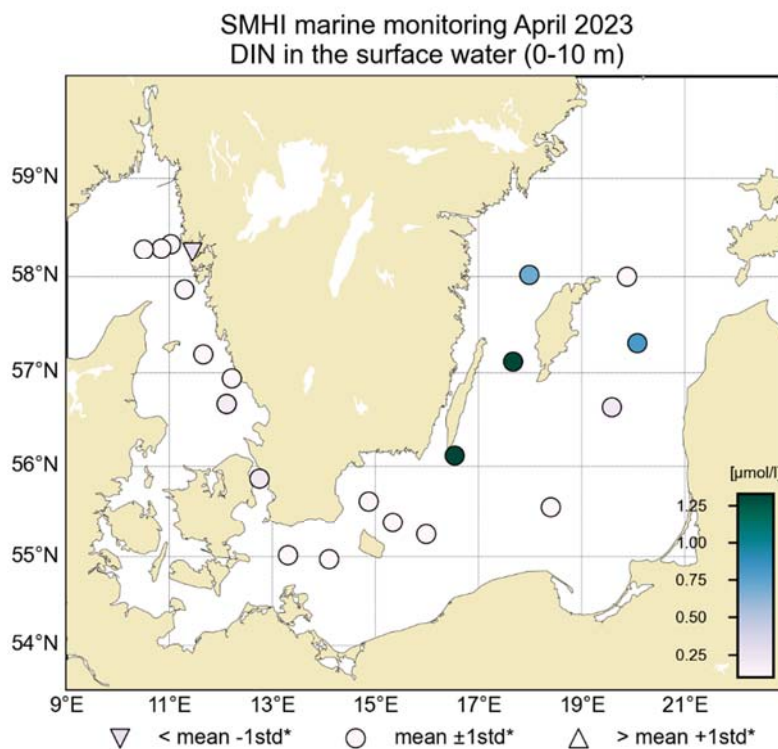
Viss planktonaktivitet syntes vid mätning från CTD-sonden i Östra och Västra Gotlandsbassängerna.



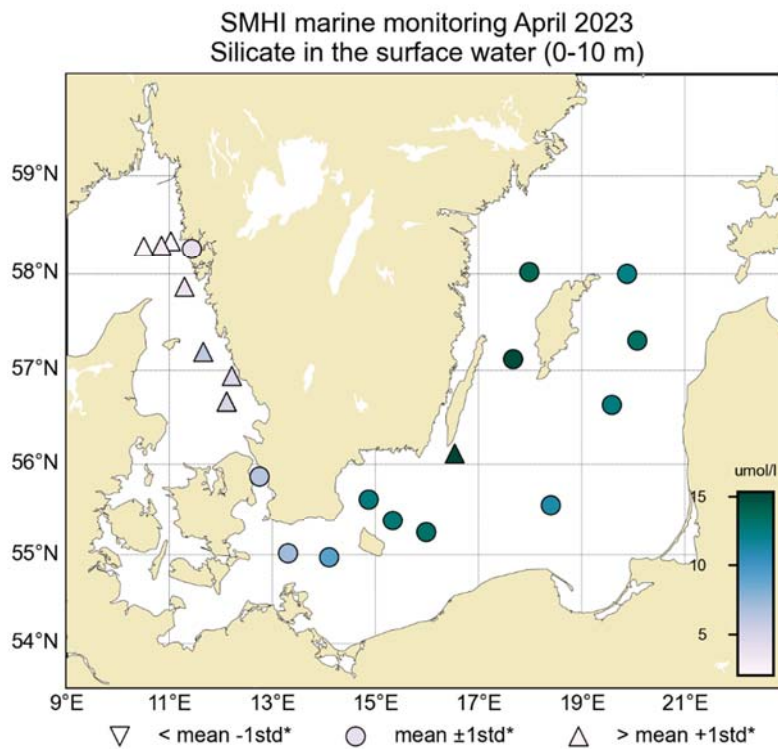
Figur 1. Snitt som visar temperatur, salthalt och syrekonzentration från Skagerrak, genom Öresund och vidare upp genom Egntliga Östersjön enligt karta (nederst). Figur skapad i Ocean Data View med DIVA-interpolation.



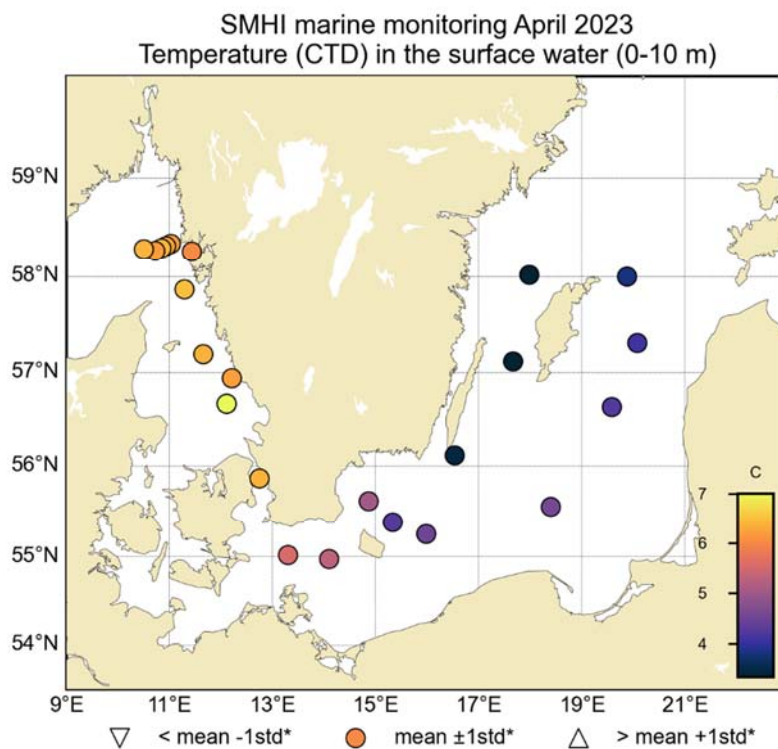
Figur 2. Koncentrationen av fosfat i ytvattnet (0–10 m). Medelvärdet är baserat på aktuell månads data inom varje bassäng under åren 1991–2020



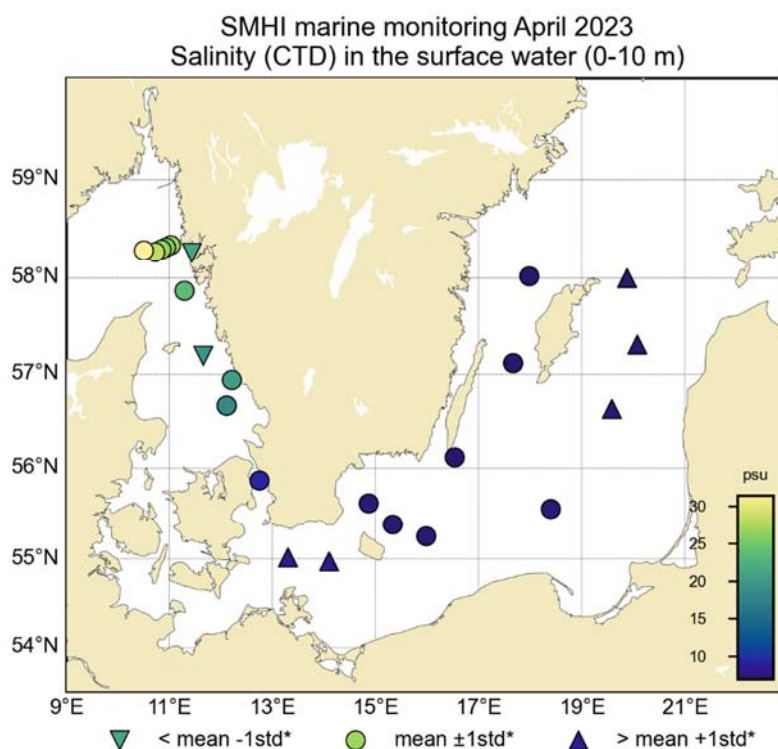
Figur 3. Koncentrationen av löst oorganiskt kväve (DIN) i ytvattnet (0–10m). Medelvärdet är baserat på aktuell månads data inom varje bassäng under åren 1991–2020.



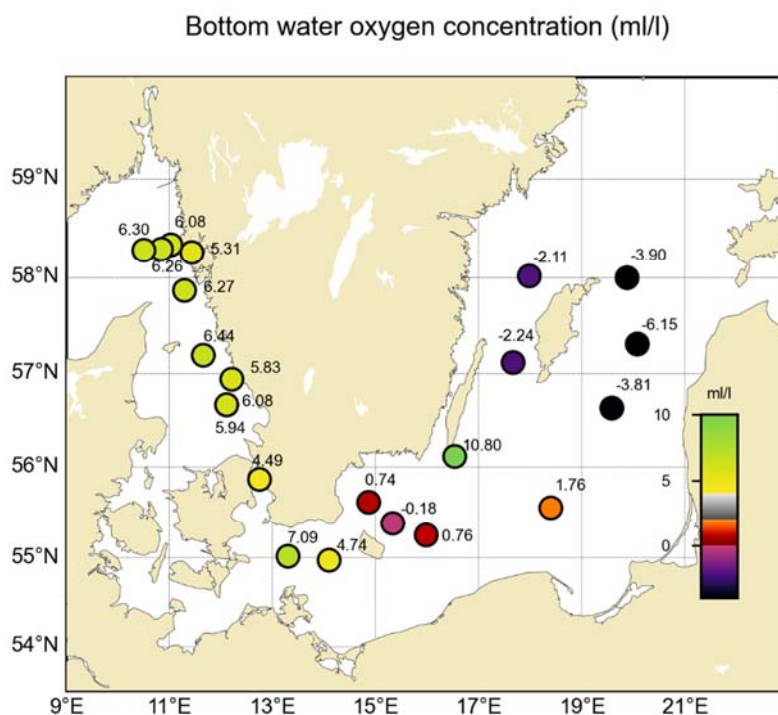
Figur 4. Koncentrationen av silikat i ytvattnet (0–10 m). Medelvärdet är baserat på aktuell månads data inom varje bassäng under åren 1991–2020.



Figur 5. Temperatur i ytvattnet (0–10 m). Medelvärdet är baserat på aktuell månads data inom varje bassäng under åren 1991–2020.



Figur 6. Salthalt i ytvattnet (0–10 m). Medelvärde är baserat på aktuell månads data inom varje bassäng under åren 1991–2020.



Figur 7. Koncentrationen av syre i bottenvattnet, ca 1 m ovanför botten. Observera att värdet inte jämförts mot statistik på samma sätt som figur 2–6 och därför visas bara cirklar i diagrammet. Närvaro av svavelväte visas som negativ syrekonzentration.

## DELTAGARE

Namn	Roll	Från
Anna-Kerstin Thell	Expeditionsledare	SMHI
Helena Björnberg		SMHI
Örjan Bäck		SMHI
Johan Håkansson		SMHI
Sari Sipilä		SMHI
Maja Billman		Göteborgs universitet
Adam Ulfsbo		Göteborgs universitet

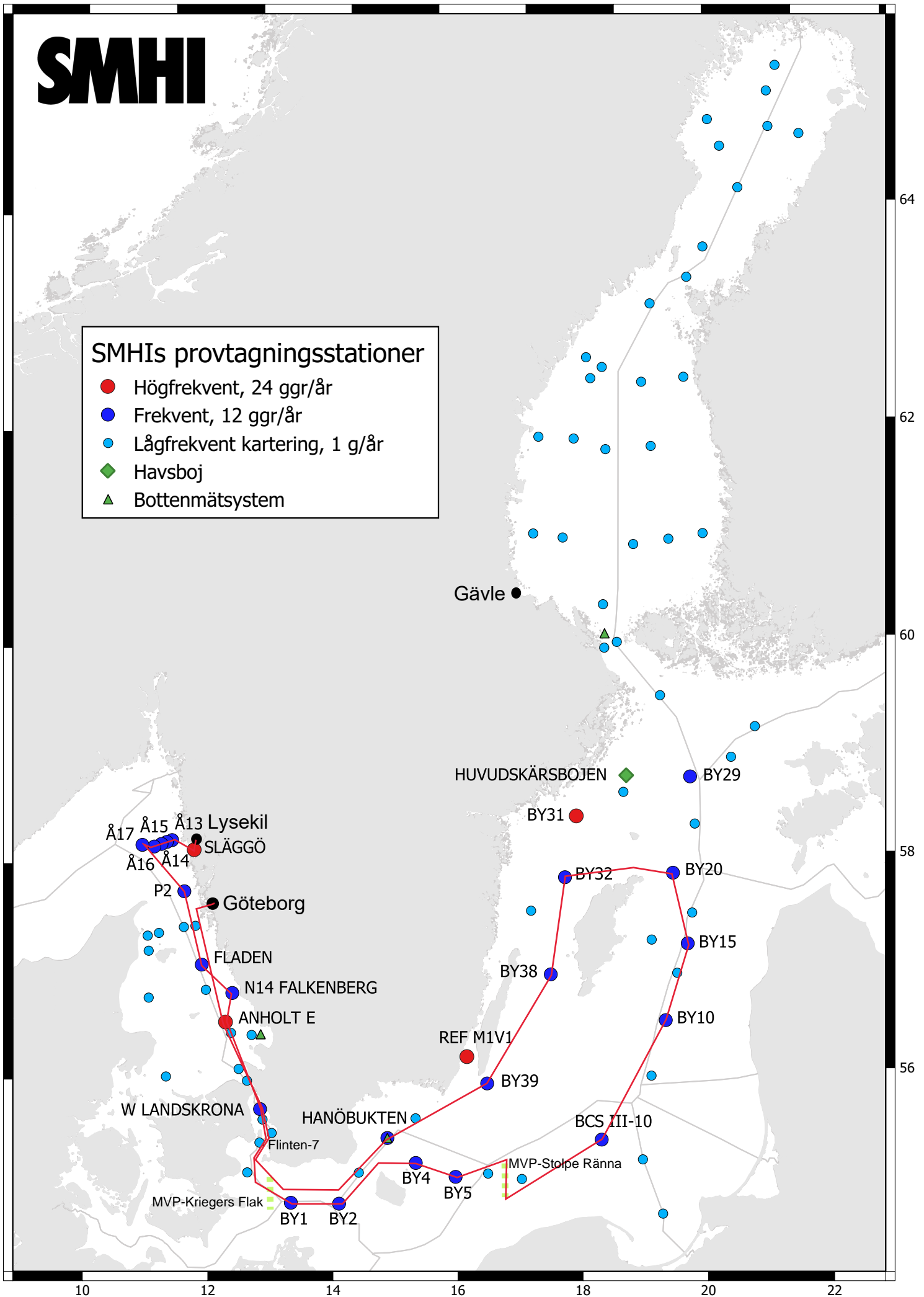
## BILAGOR

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



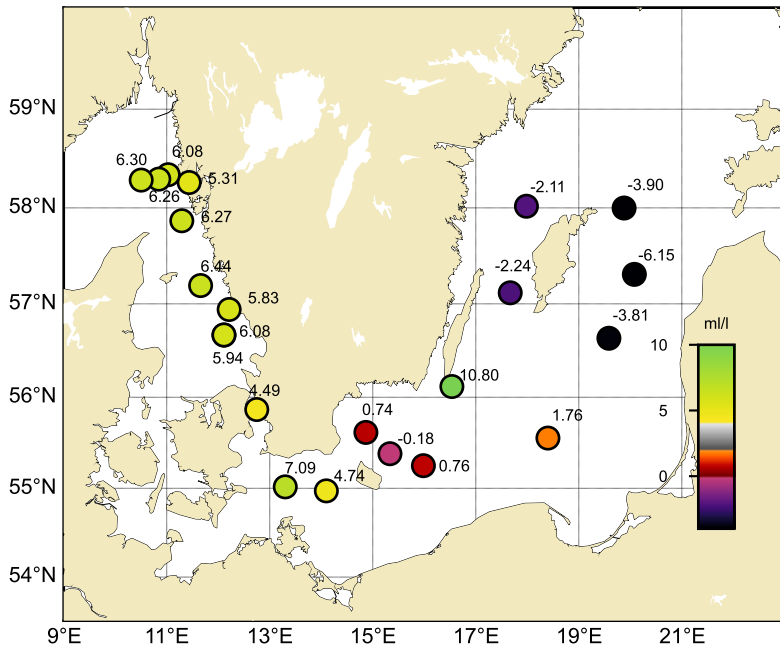
## SMHI's provtagningsstationer

- Högfrekvent, 24 ggr/år
- Frekvent, 12 ggr/år
- Lågfrekvent kartering, 1 g/år
- ◆ Havsboj
- ▲ Bottenmätsystem





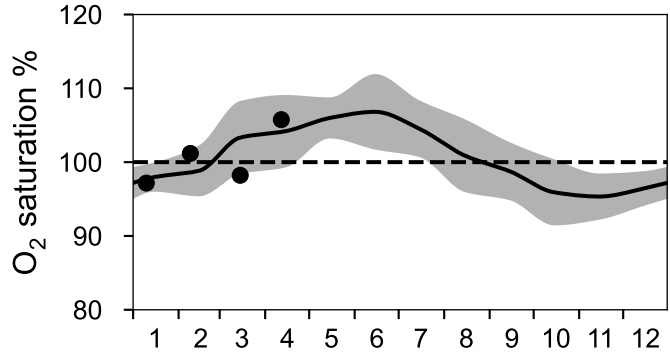
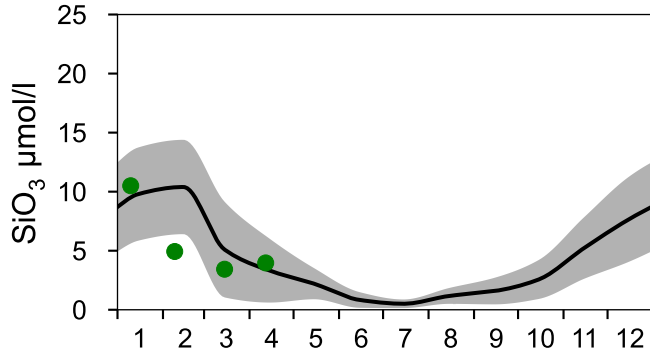
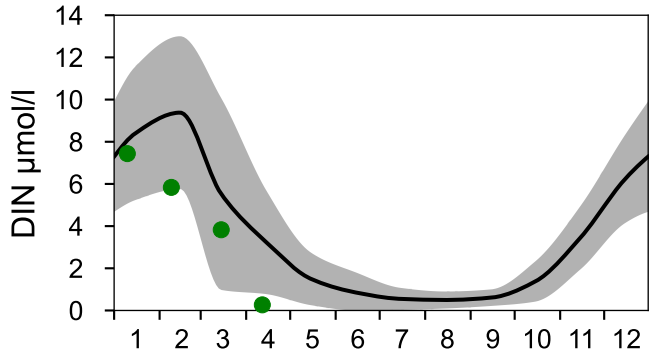
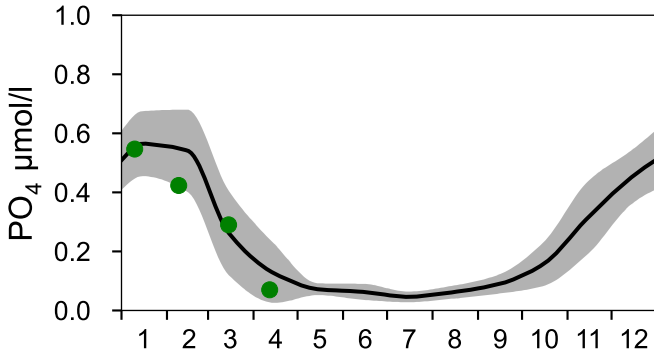
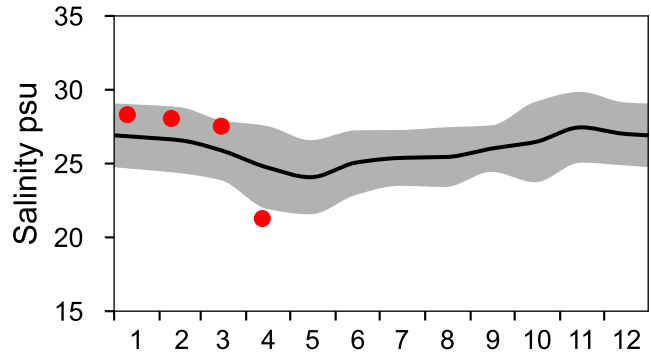
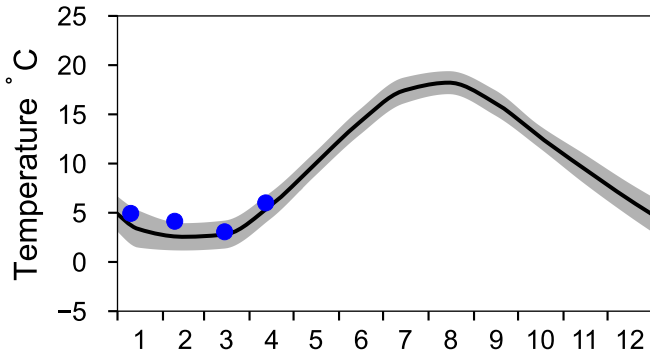
# Bottom water oxygen concentration (ml/l)



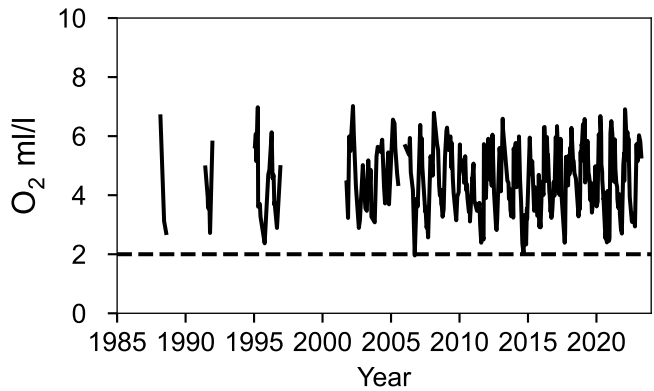
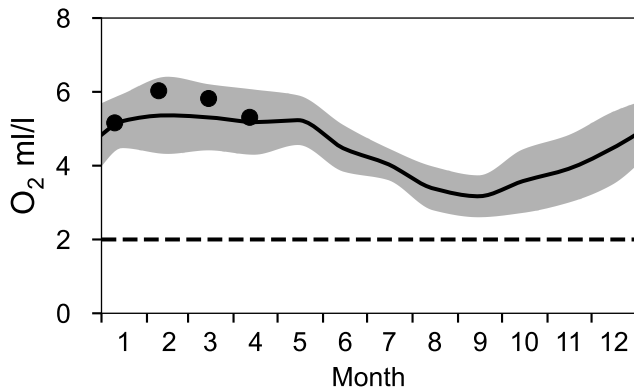
# STATION SLÄGGÖ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023



## OXYGEN IN BOTTOM WATER (depth >= 64 m)

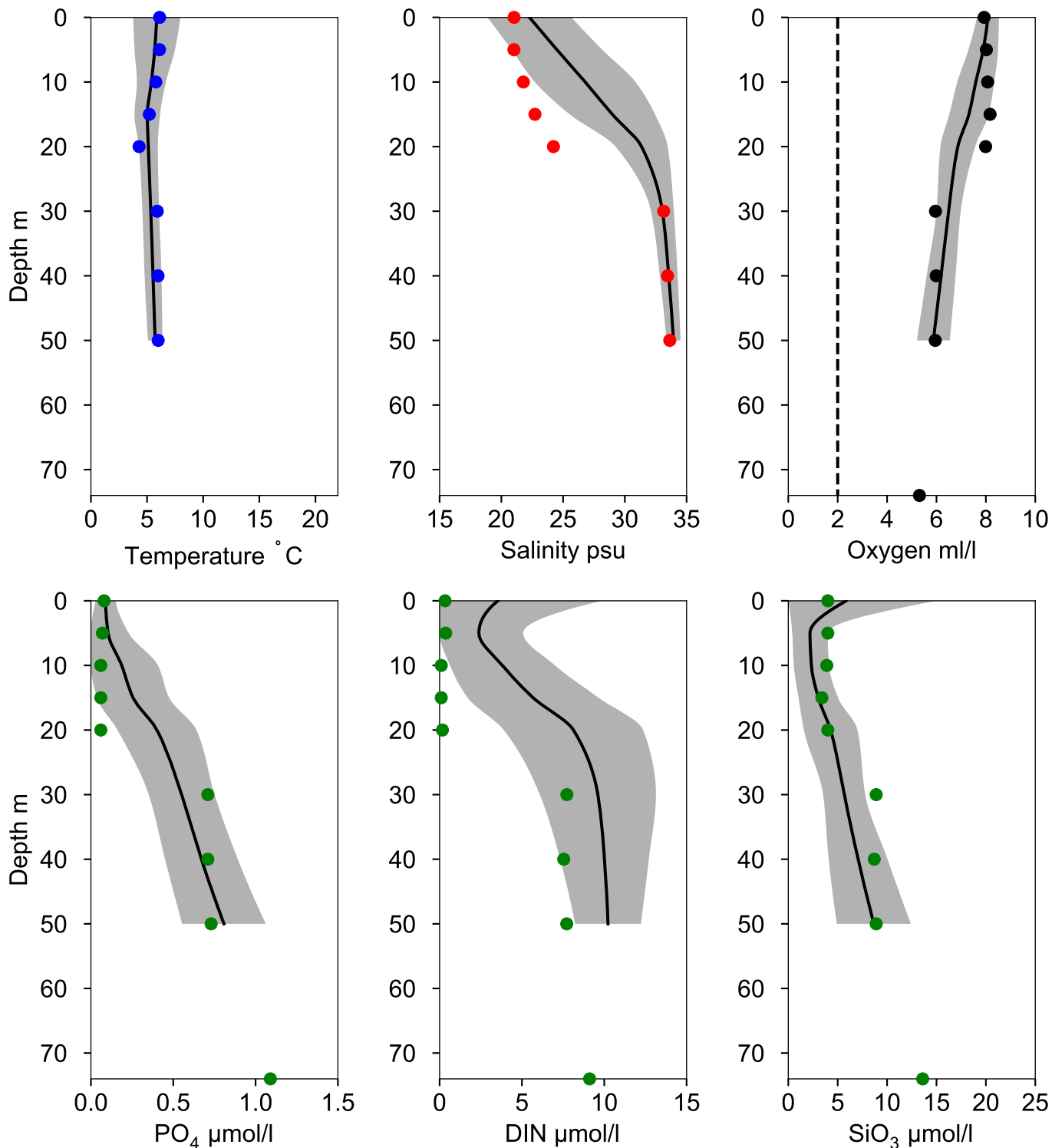


# Vertical profiles SLÄGGÖ April

— Mean 1991-2020

■ St.Dev.

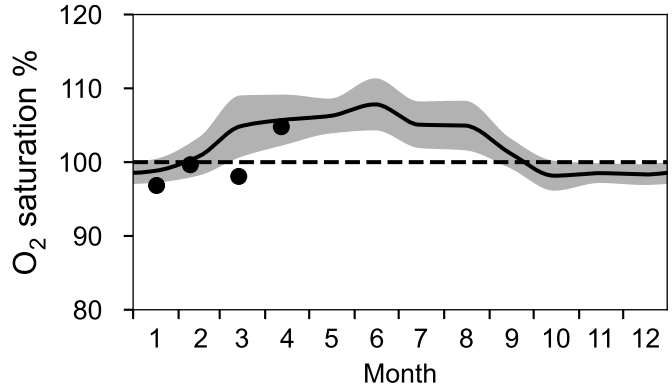
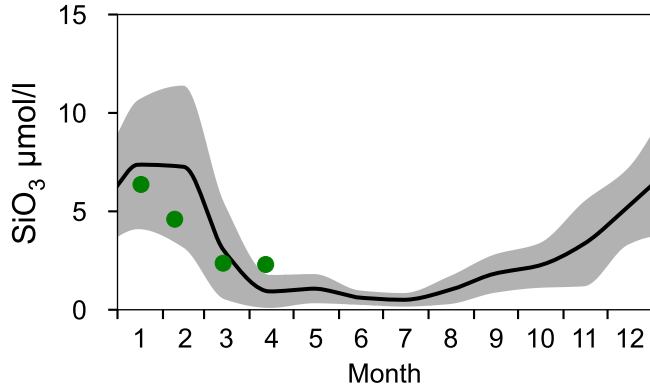
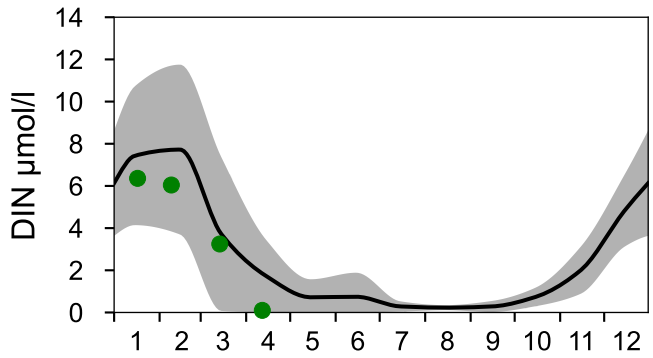
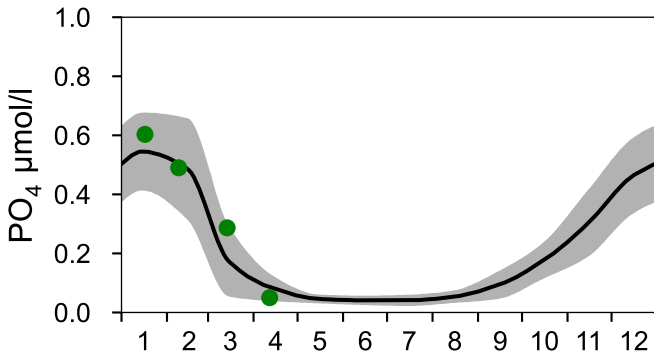
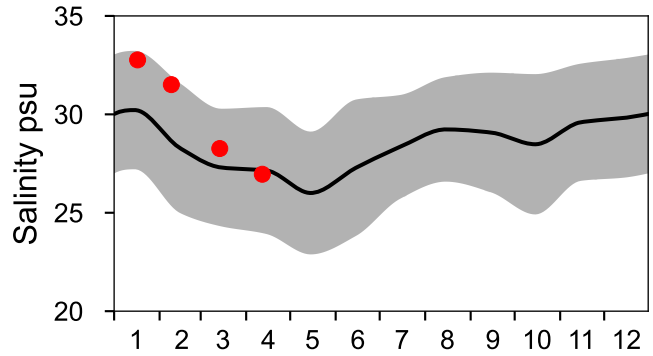
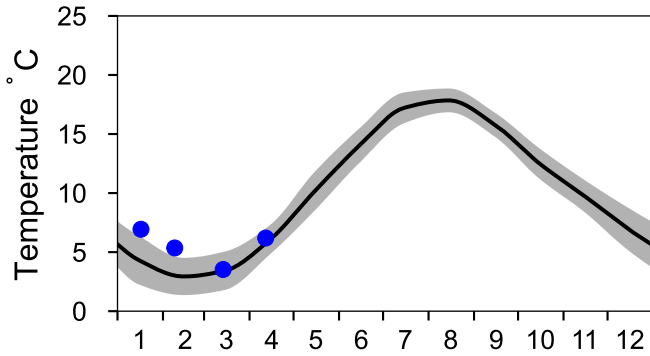
● 2023-04-12



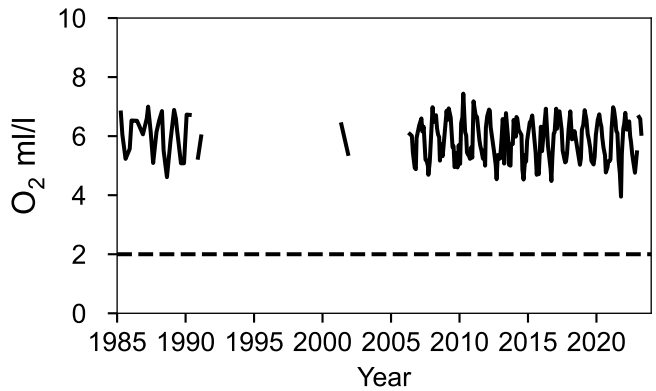
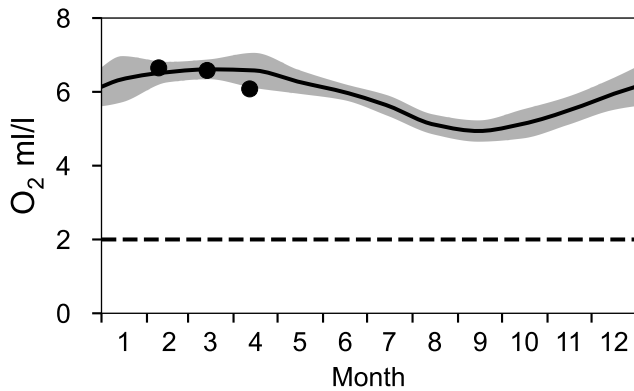
# STATION Å13 SURFACE WATER (0-10 m)

Annual Cycles

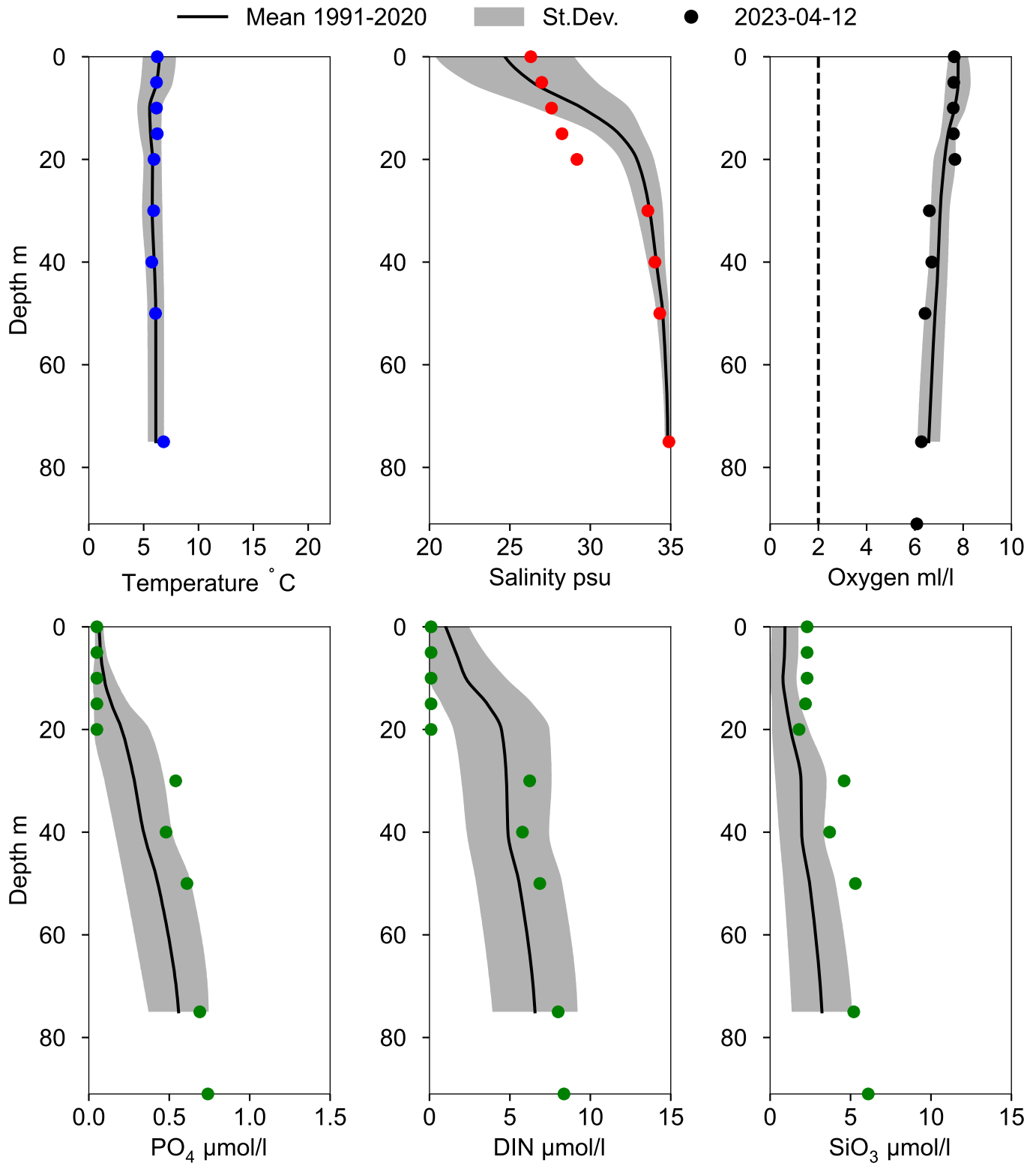
— Mean 1991-2020    St.Dev.    ● 2023



## OXYGEN IN BOTTOM WATER (depth >= 82 m)



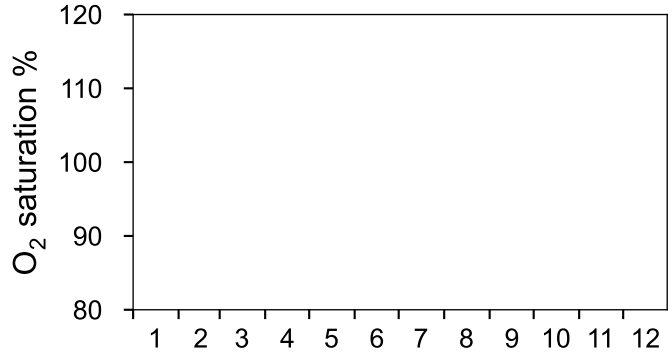
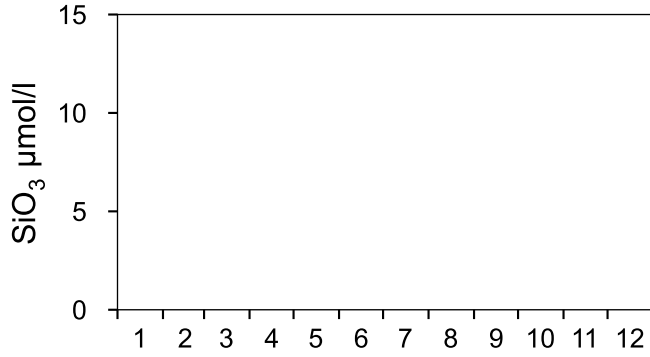
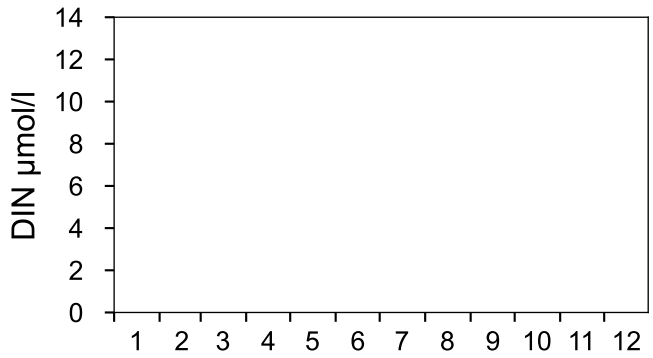
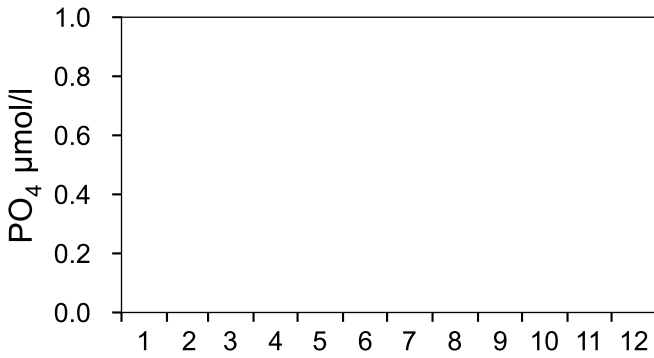
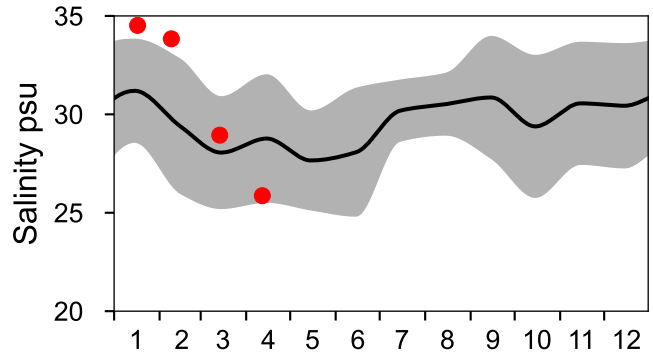
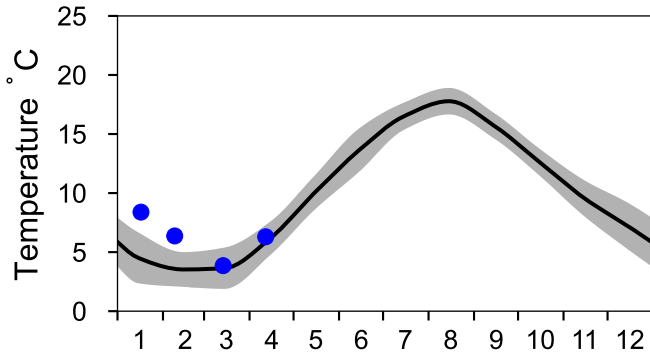
# Vertical profiles Å13 April



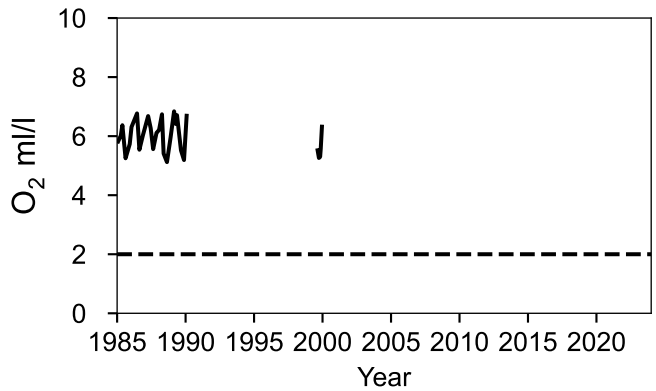
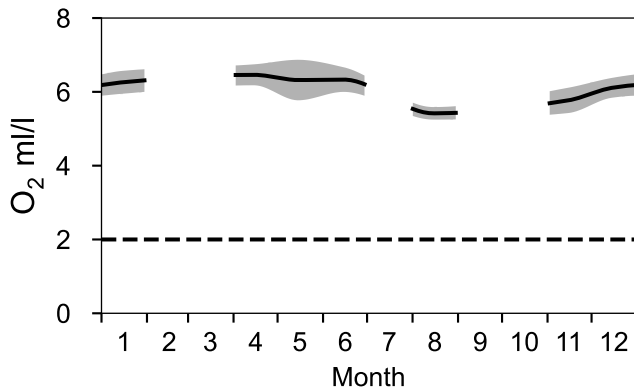
# STATION Å14 SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023



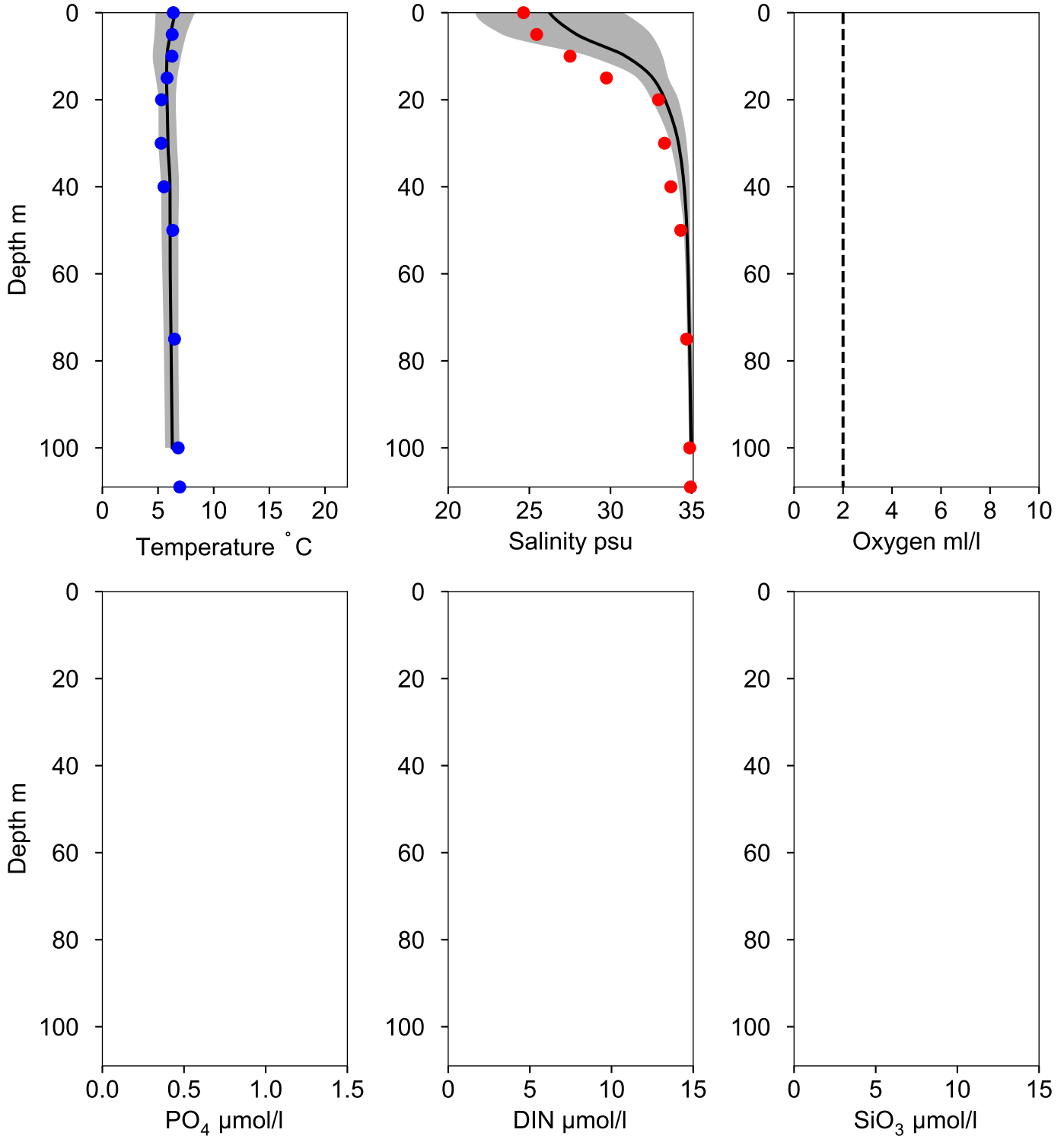
## OXYGEN IN BOTTOM WATER (depth >= 100 m)





# Vertical profiles Å14 April

— Mean 1991-2020    ■ St.Dev.    ● 2023-04-12



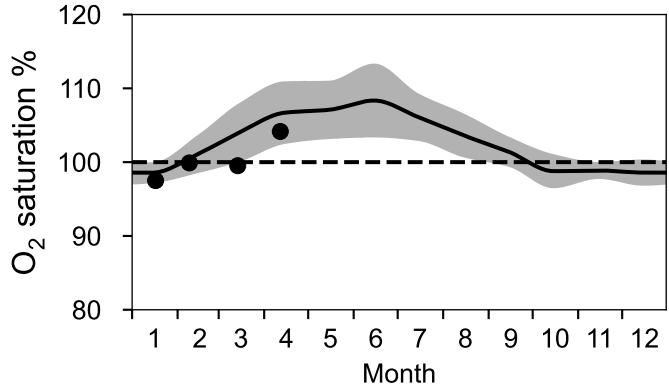
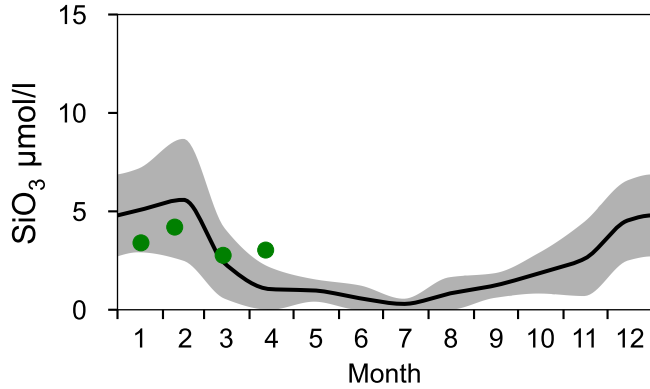
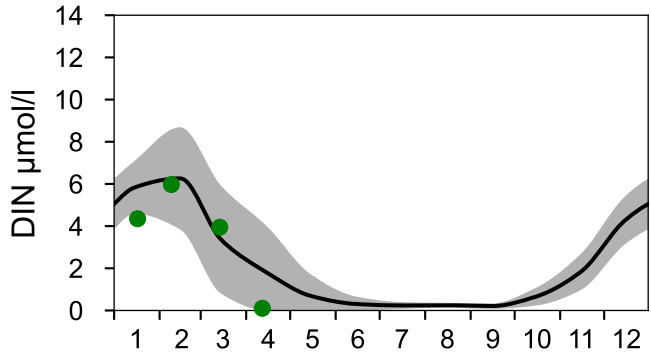
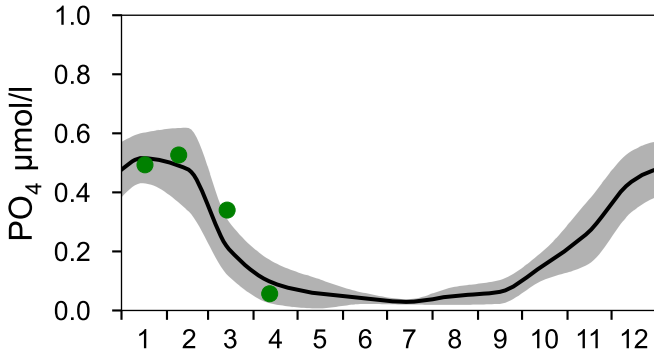
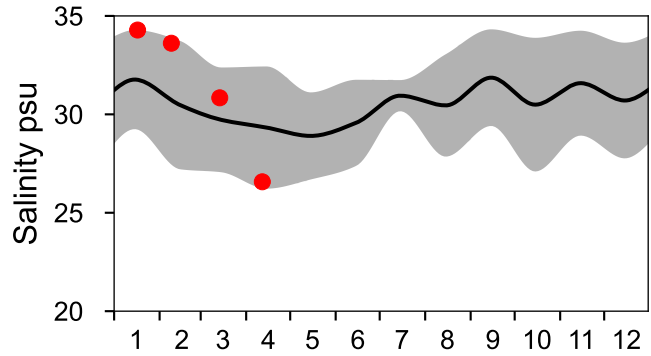
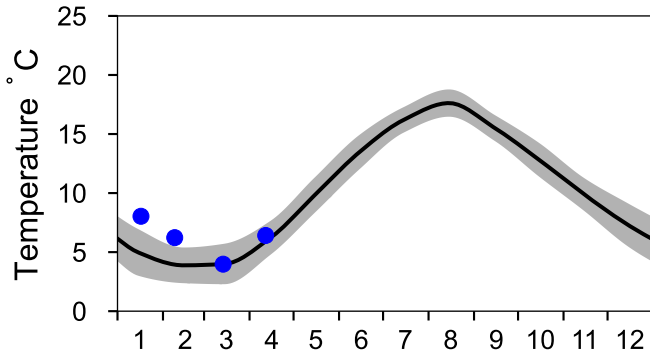
# STATION Å15 SURFACE WATER (0-10 m)

Annual Cycles

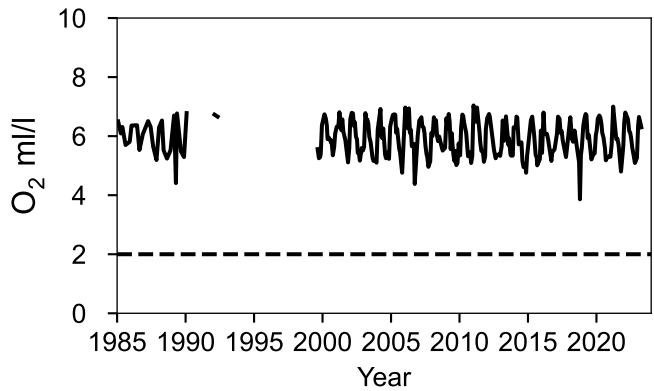
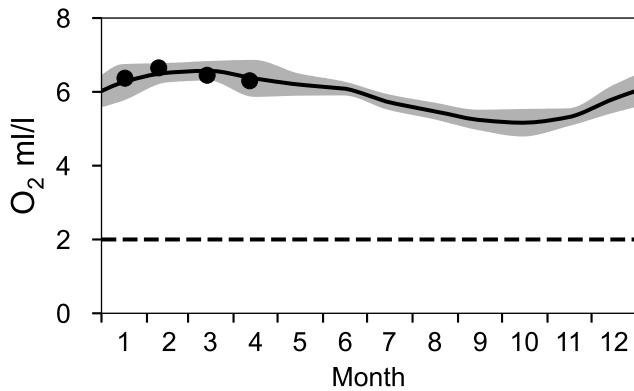
— Mean 1991-2020

■ St.Dev.

● 2023

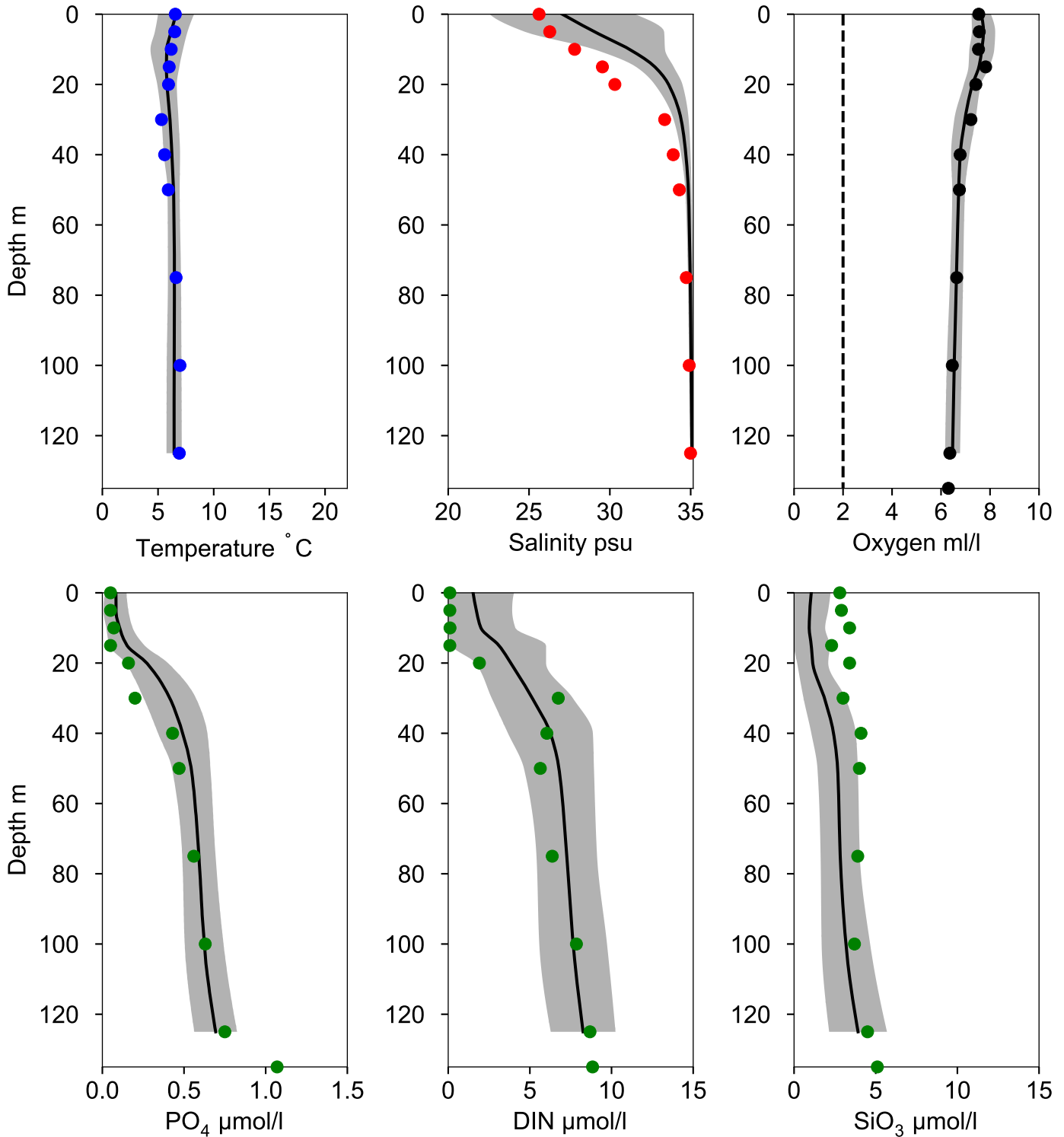


## OXYGEN IN BOTTOM WATER (depth >= 125 m)



# Vertical profiles Å15 April

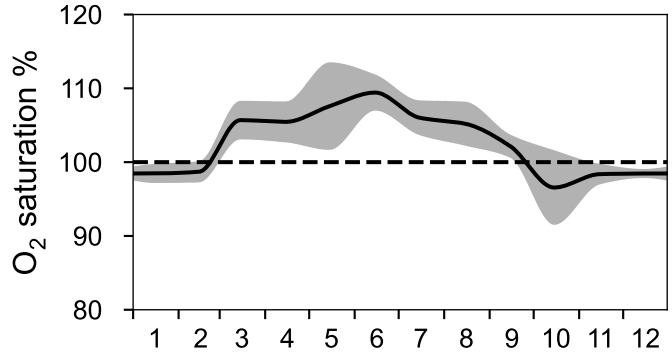
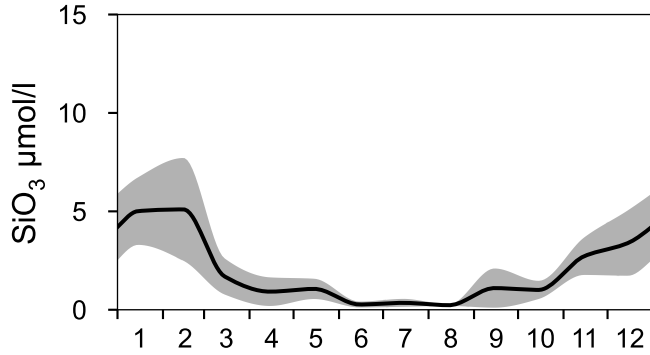
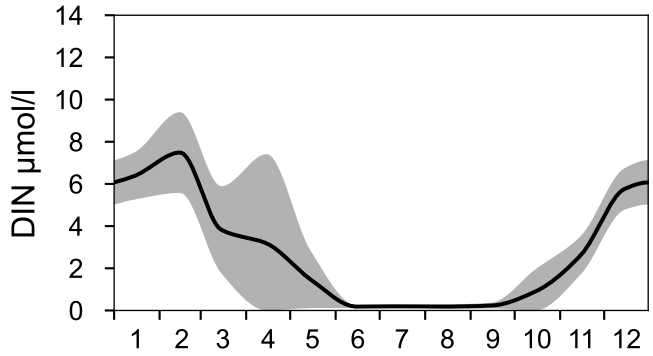
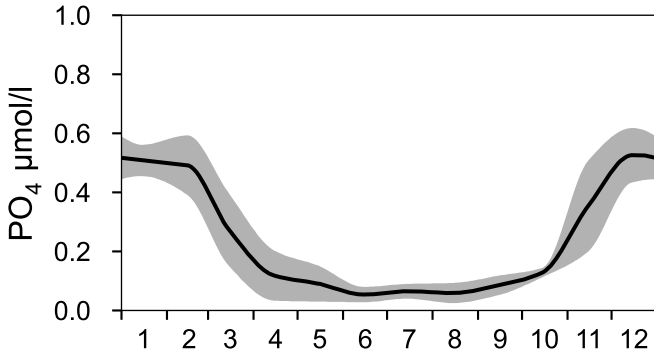
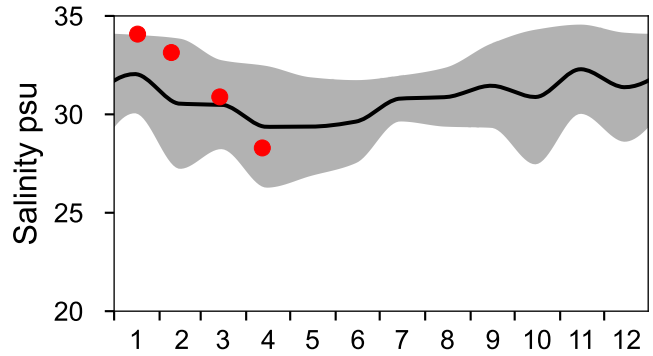
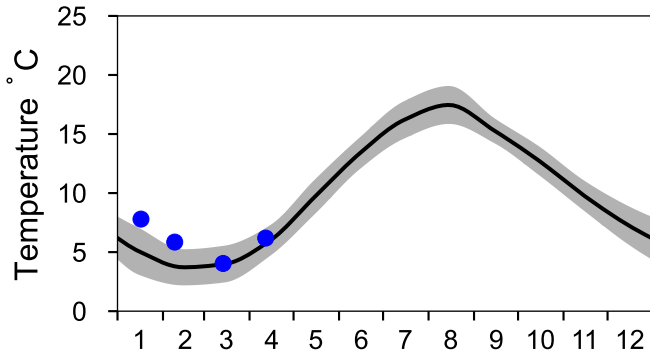
— Mean 1991-2020    ■ St.Dev.    ● 2023-04-12



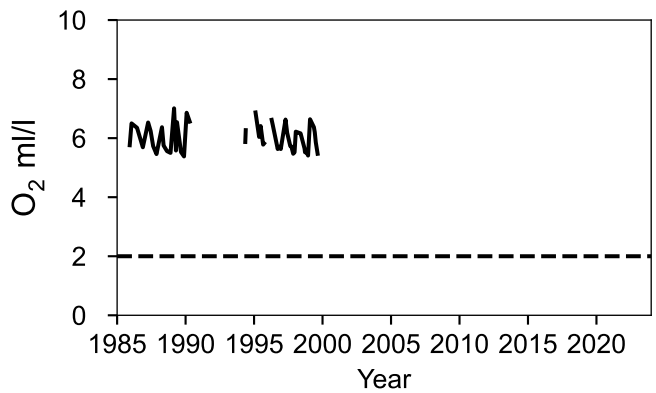
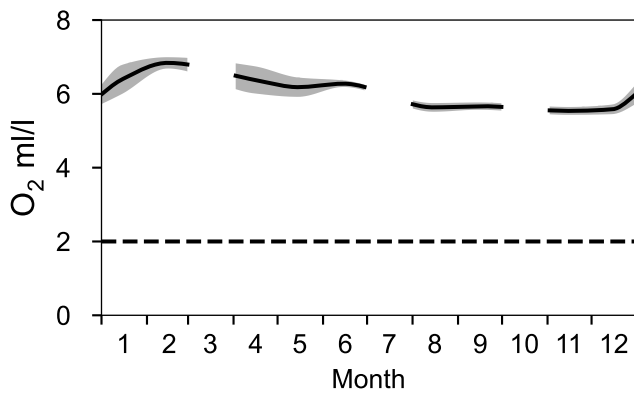
# STATION Å16 SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

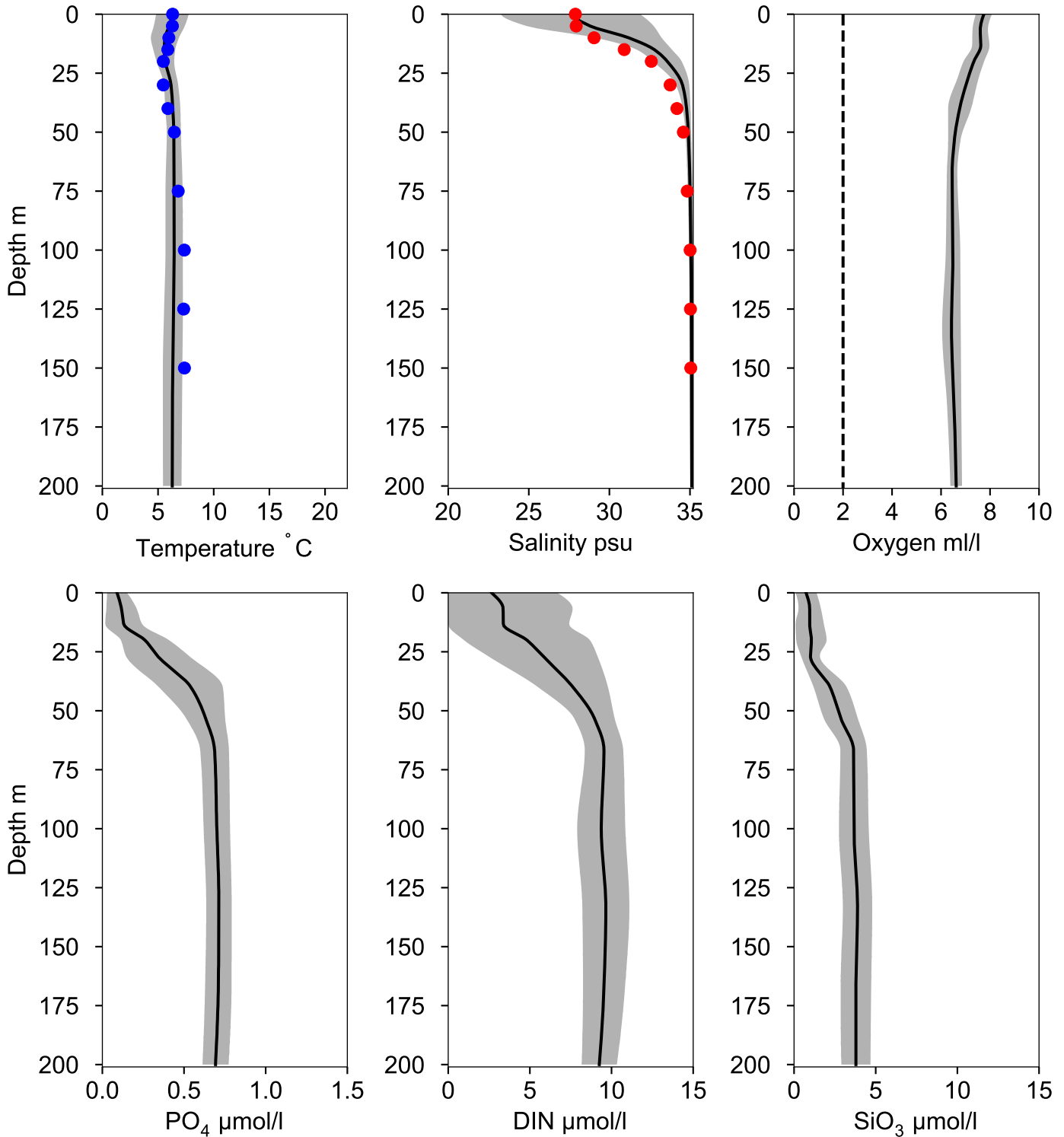


## OXYGEN IN BOTTOM WATER (depth >= 193 m)



# Vertical profiles A16 April

— Mean 1991-2020    ■ St.Dev.    ● 2023-04-12



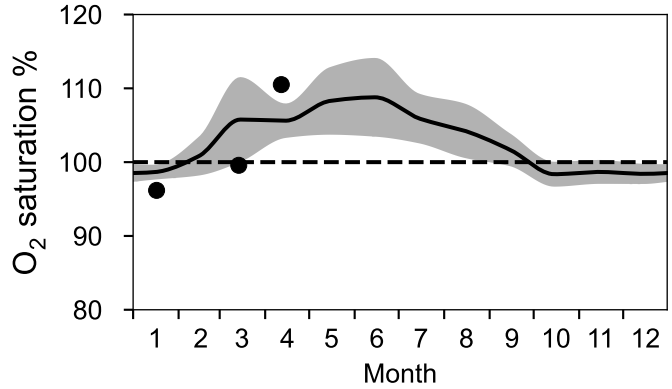
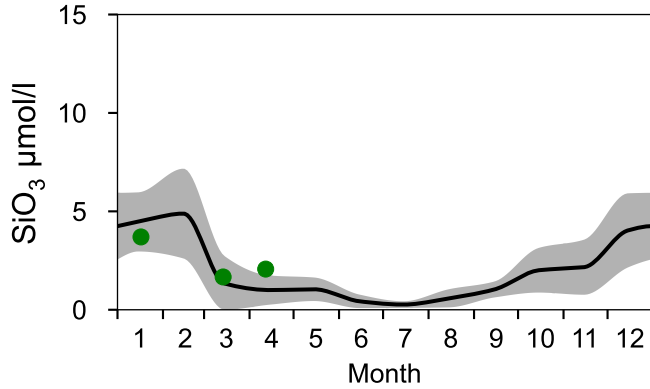
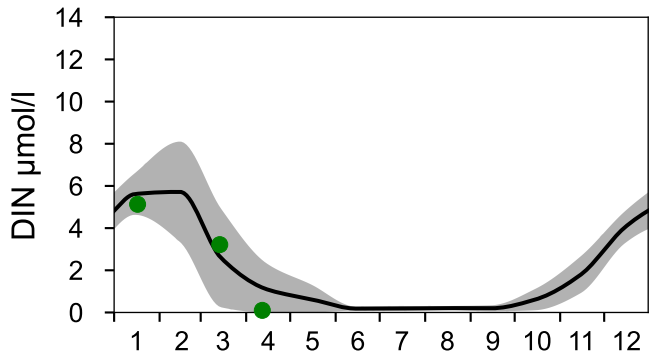
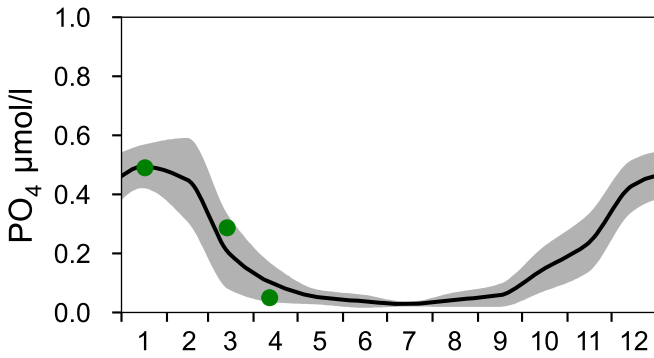
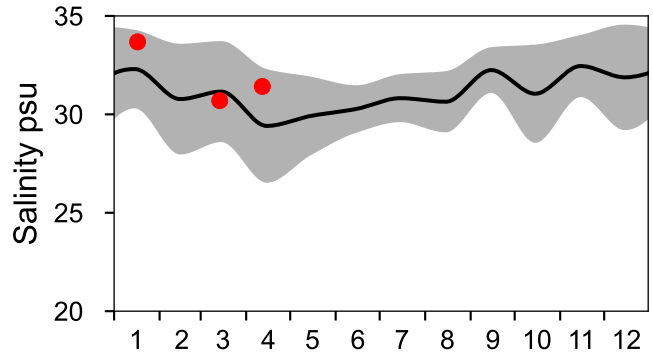
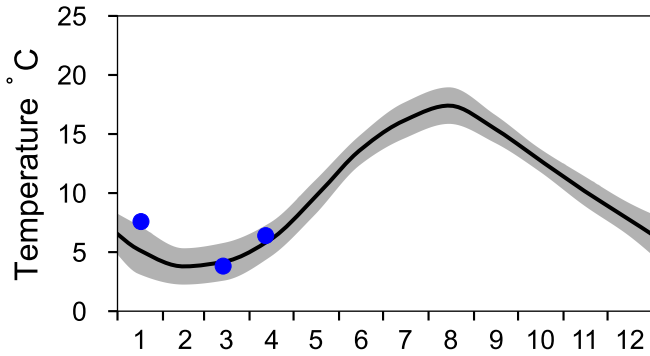
# STATION Å17 SURFACE WATER (0-10 m)

Annual Cycles

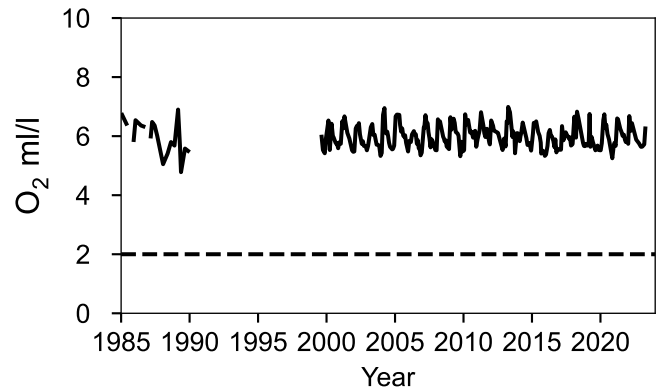
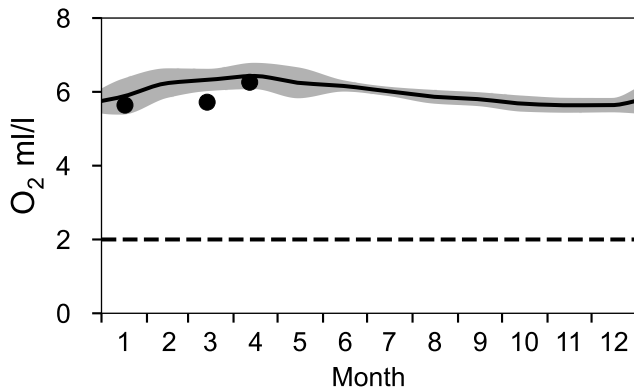
— Mean 1991-2020

■ St.Dev.

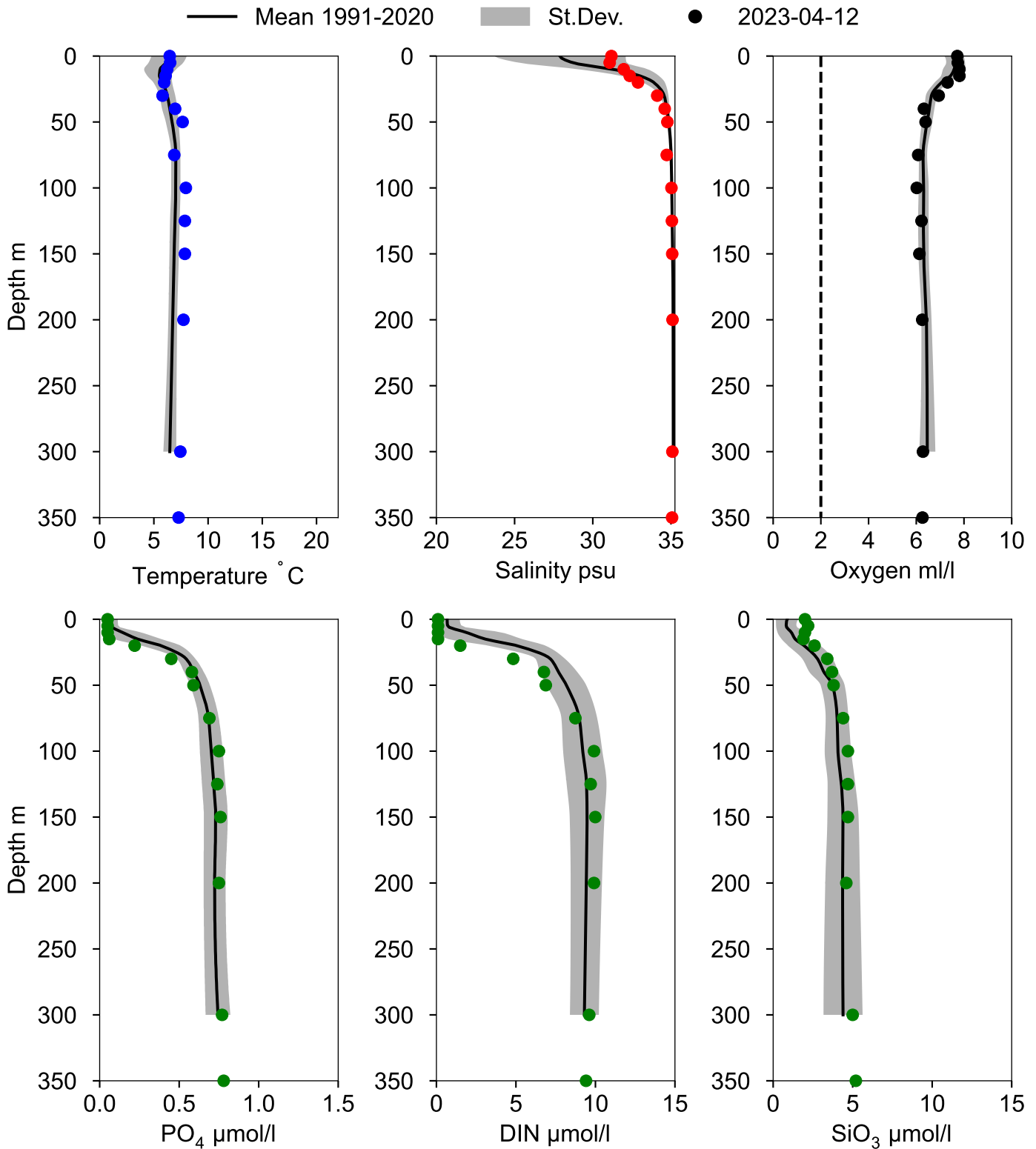
● 2023



## OXYGEN IN BOTTOM WATER (depth >= 300 m)



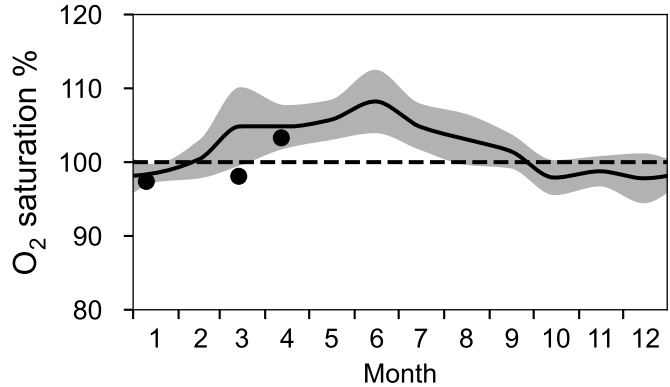
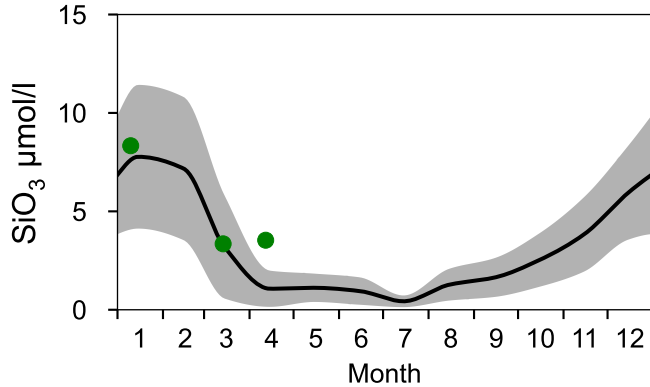
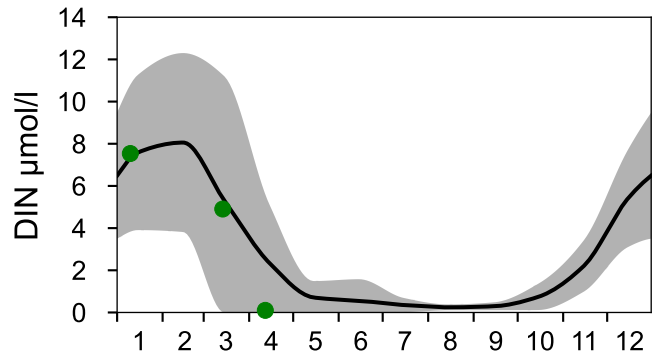
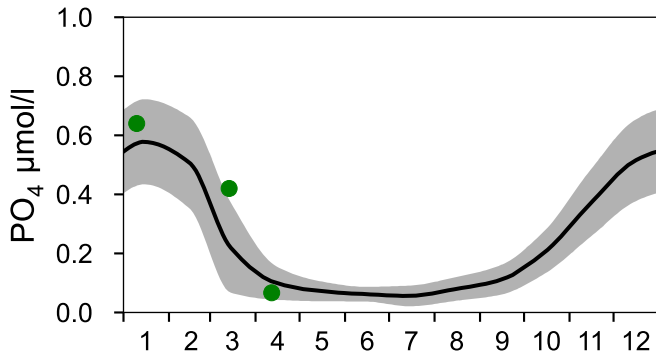
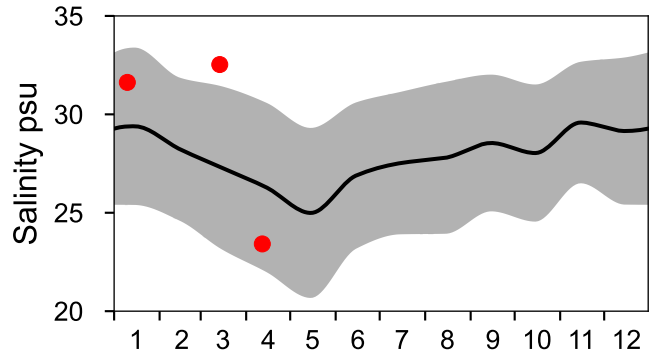
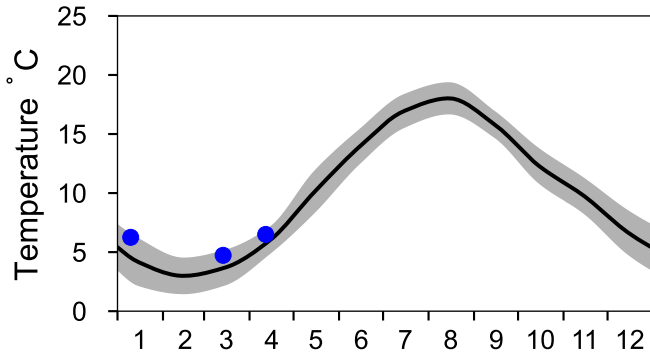
# Vertical profiles Å17 April



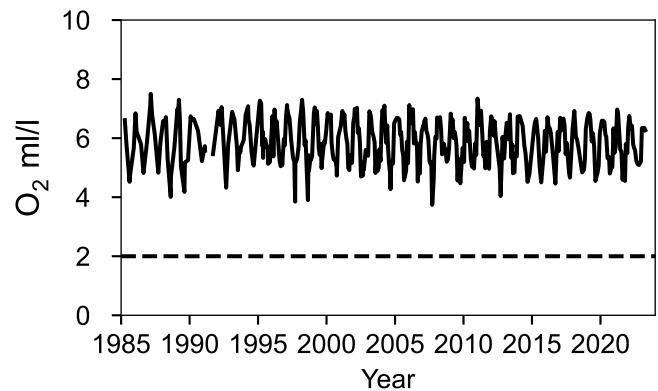
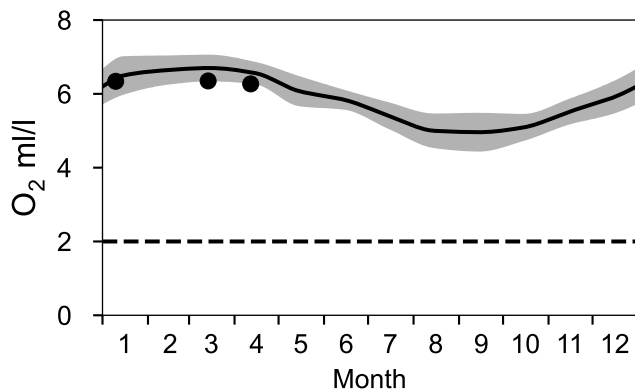
# STATION P2 SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

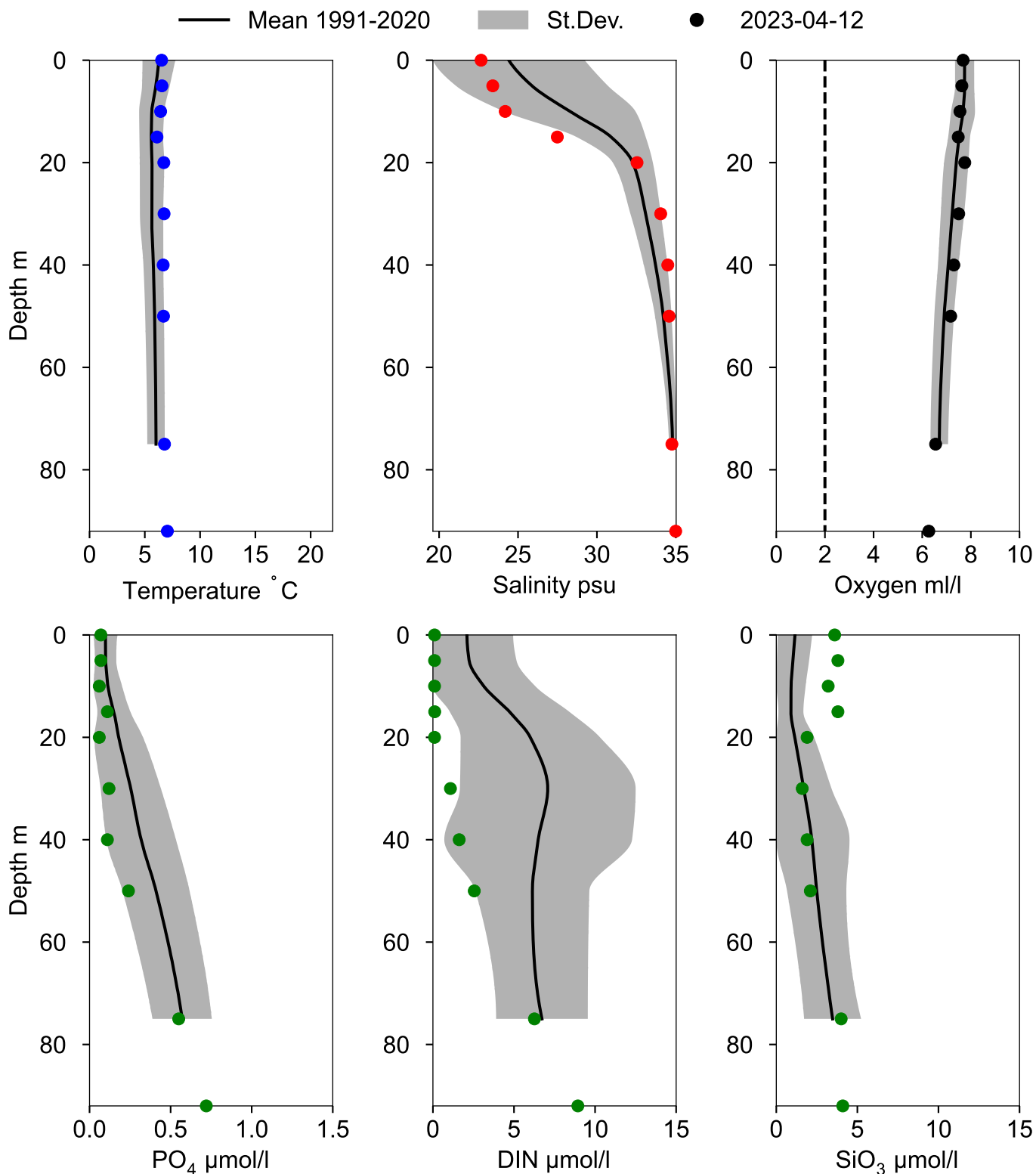


## OXYGEN IN BOTTOM WATER (depth >= 75 m)





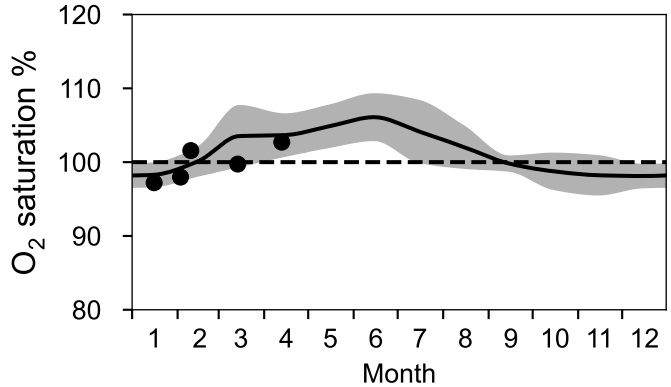
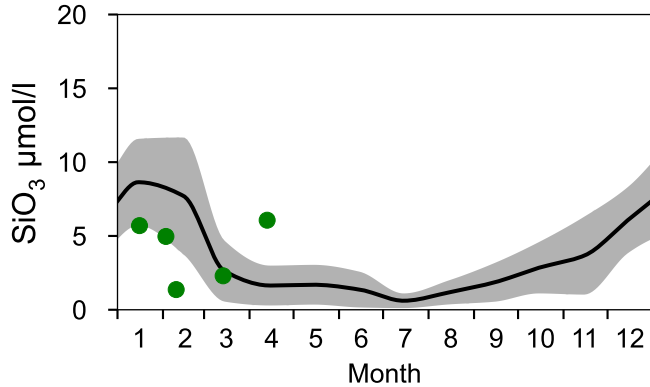
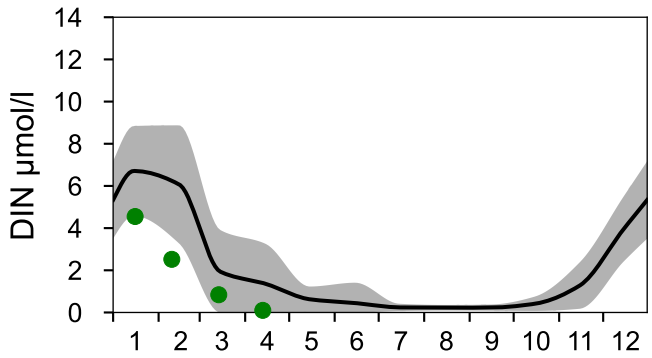
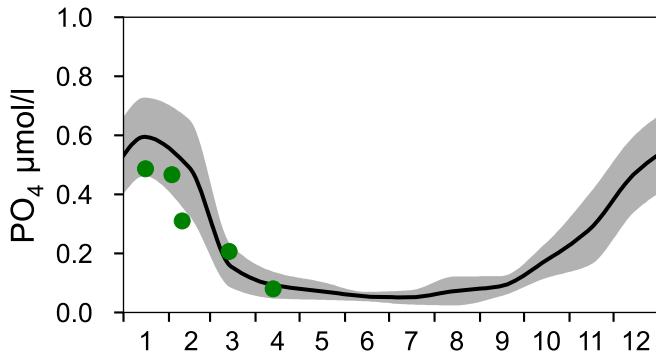
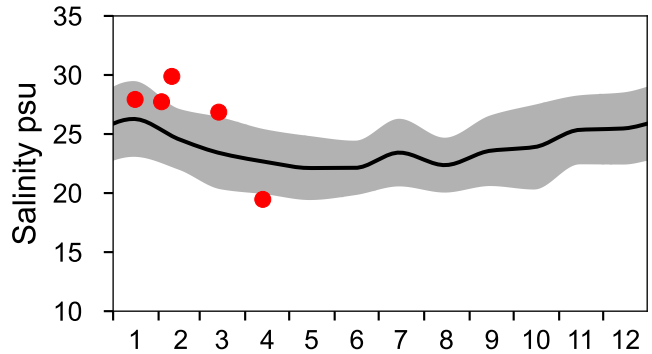
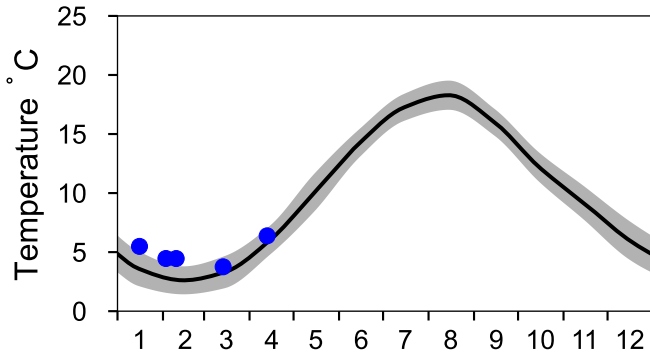
# Vertical profiles P2 April



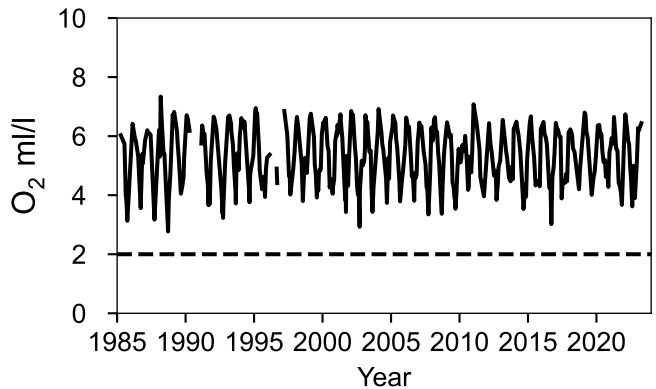
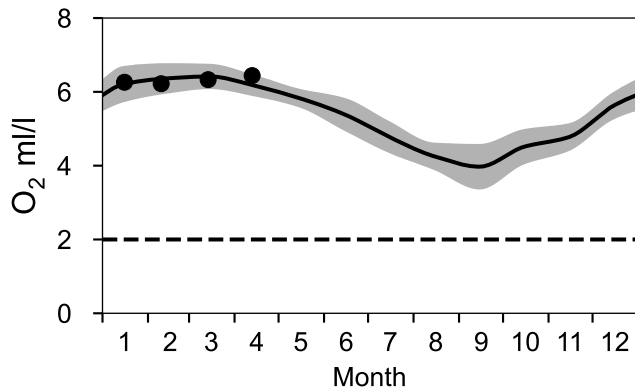
# STATION FLADEN SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

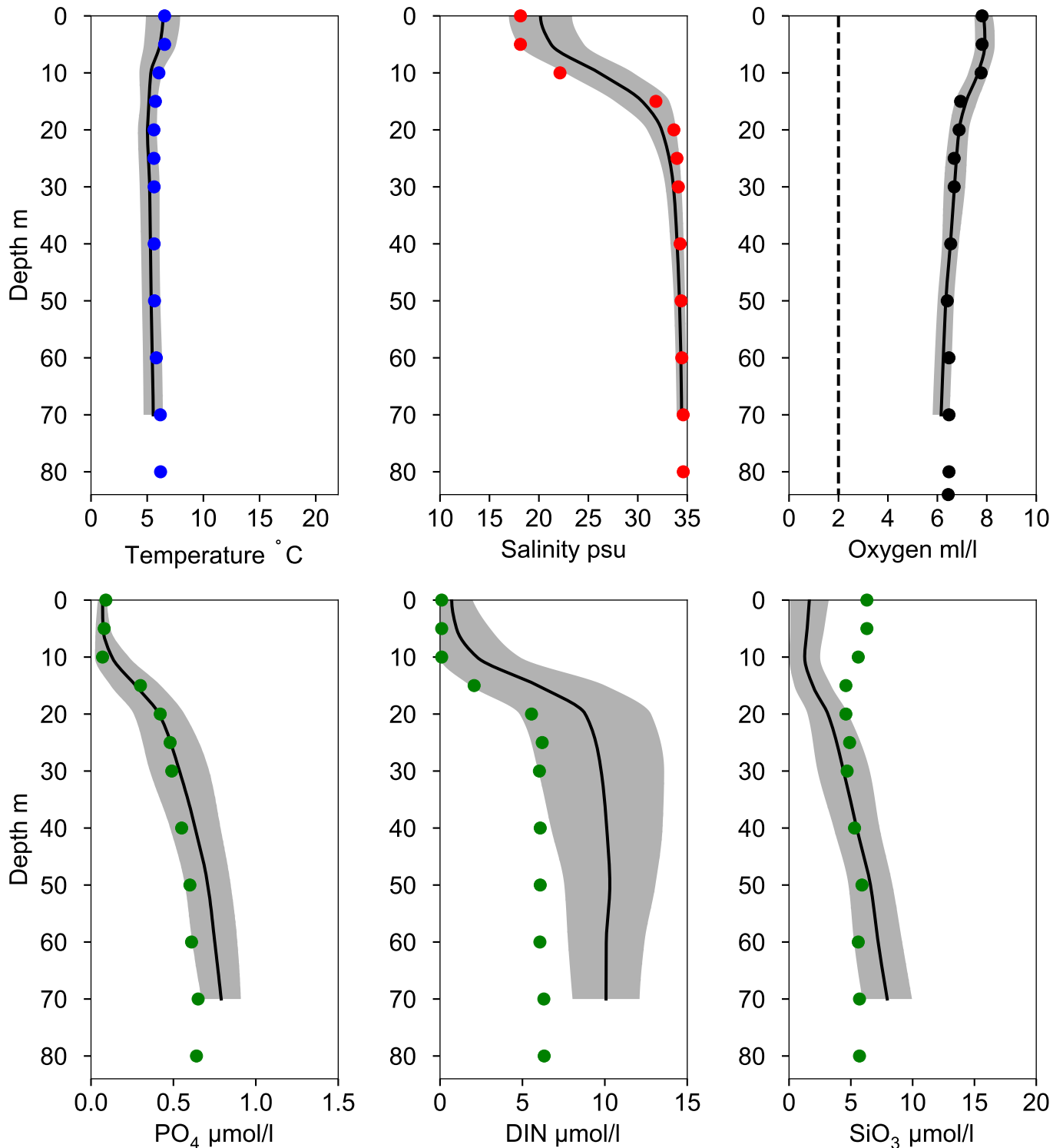


## OXYGEN IN BOTTOM WATER (depth >= 74 m)



# Vertical profiles FLADEN April

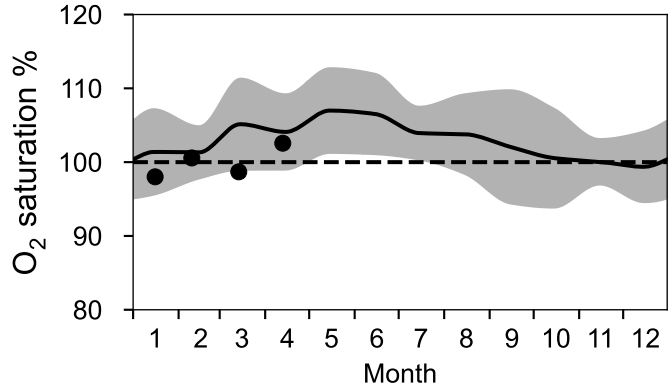
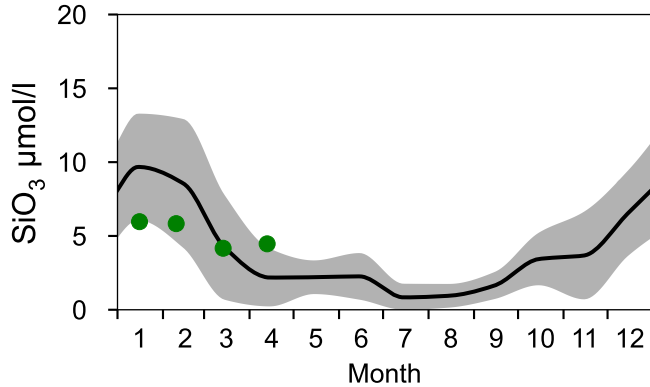
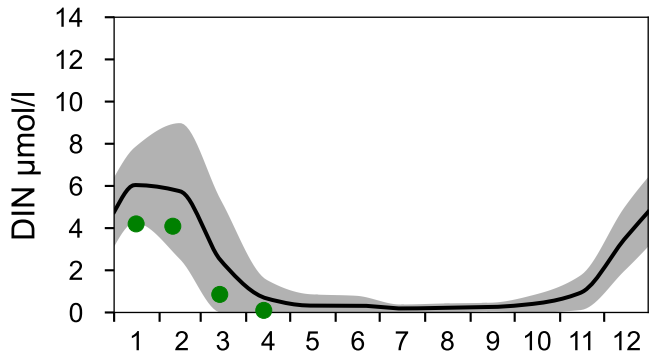
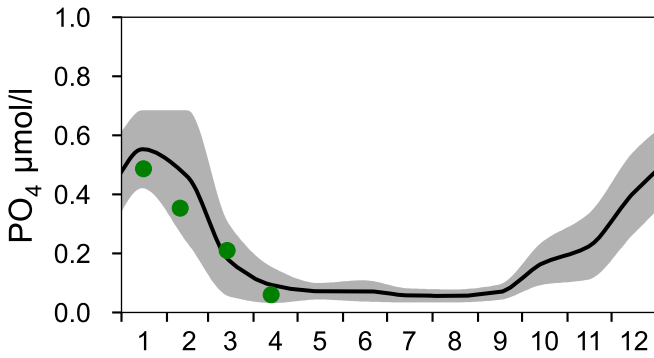
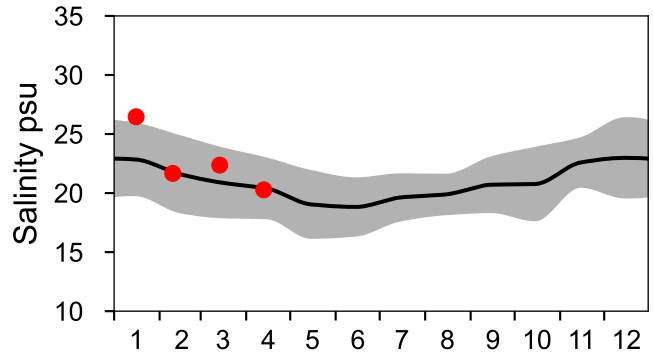
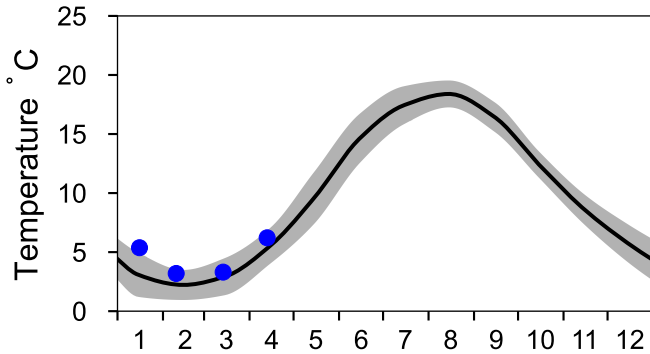
— Mean 1991-2020    St.Dev.    ● 2023-04-13



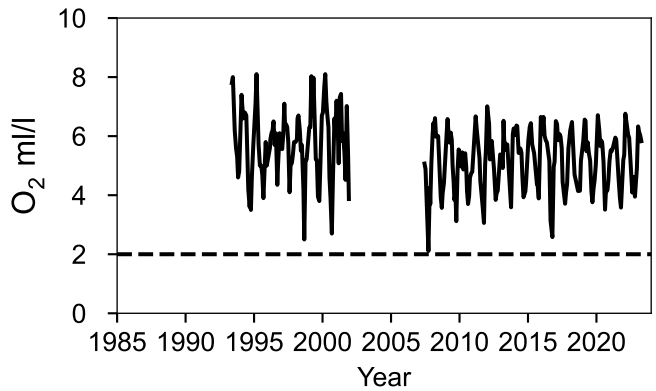
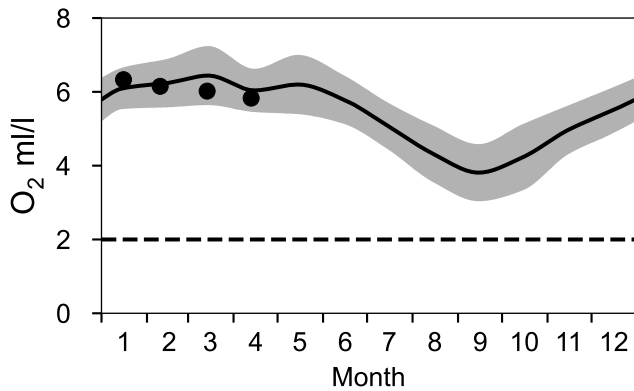
# STATION N14 FALKENBERG SURFACE WATER (0-10 m)

Annual Cycles

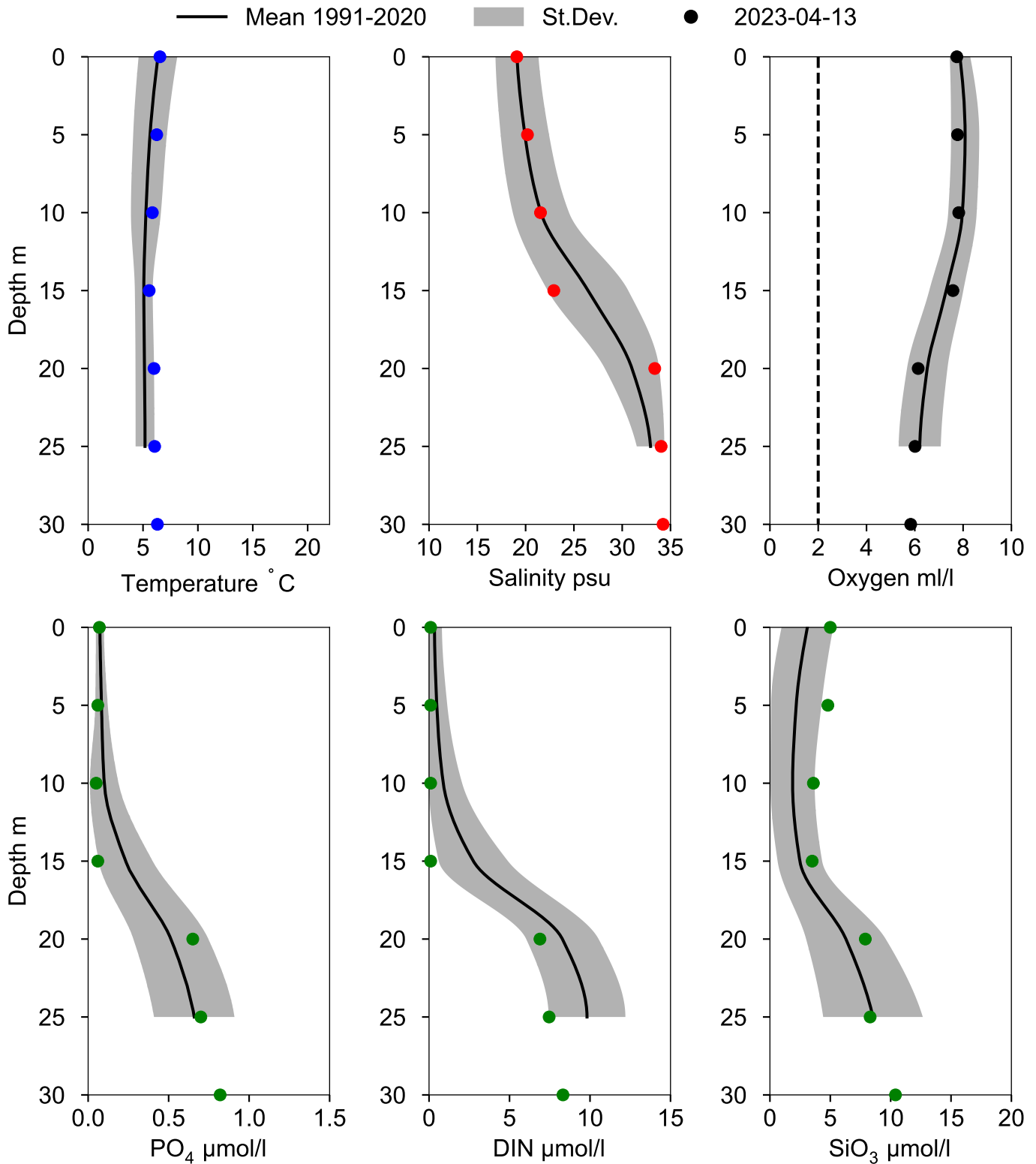
— Mean 1991-2020    St.Dev.    ● 2023



## OXYGEN IN BOTTOM WATER (depth >= 25 m)



# Vertical profiles N14 FALKENBERG April



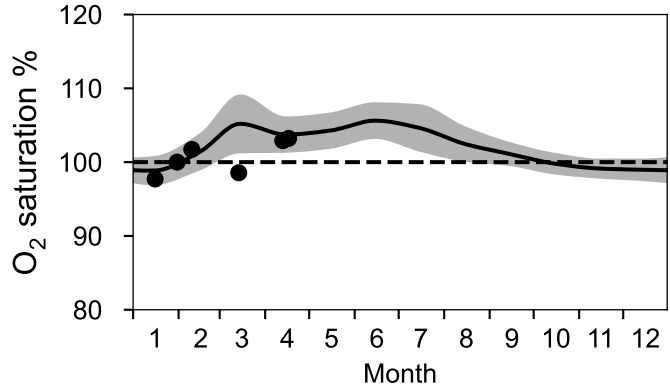
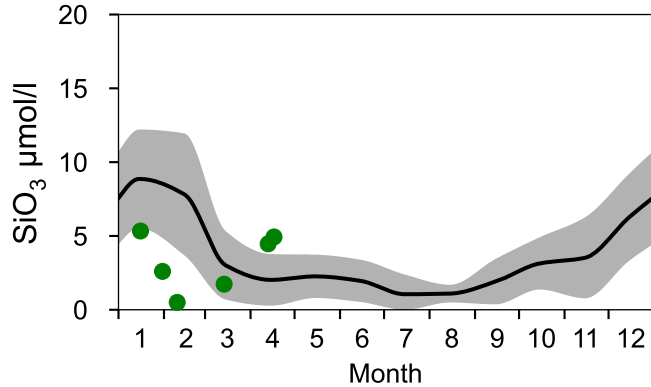
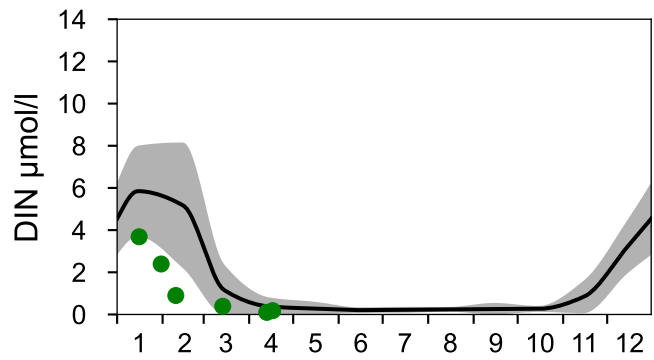
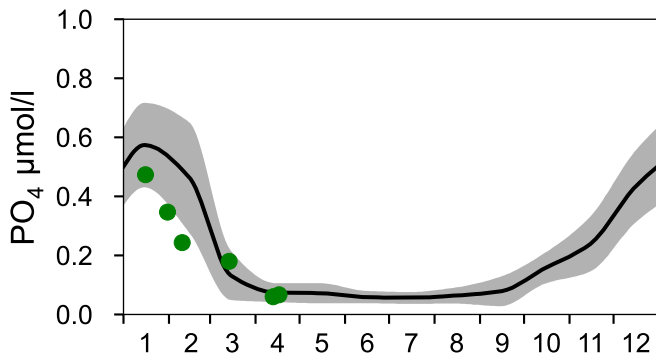
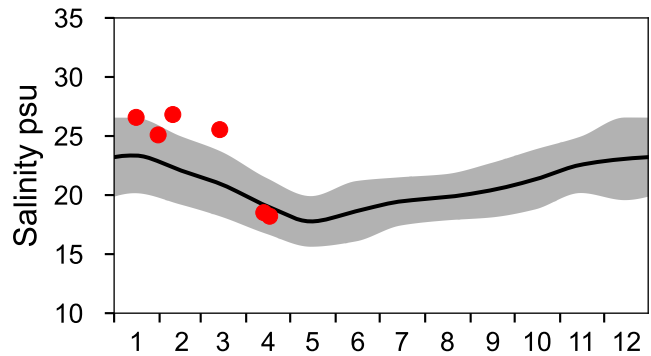
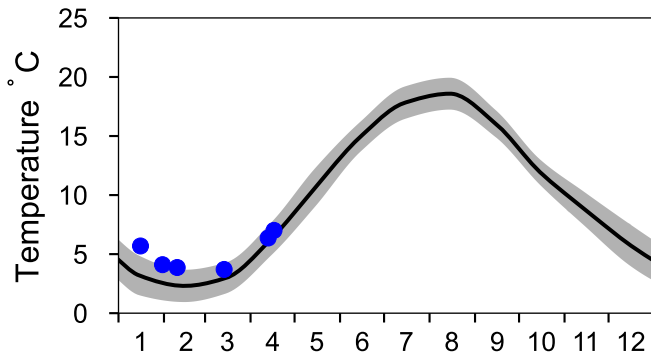
# STATION ANHOLT E SURFACE WATER (0-10 m)

Annual Cycles

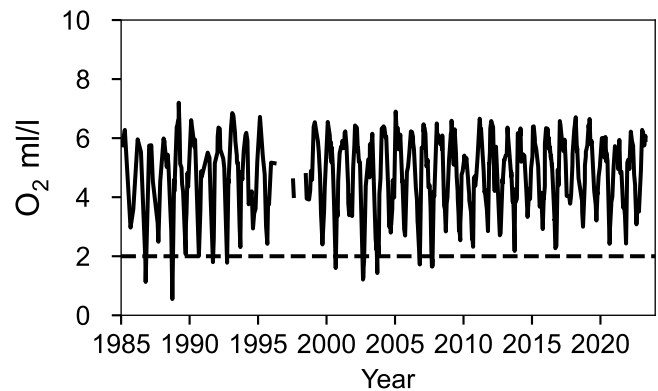
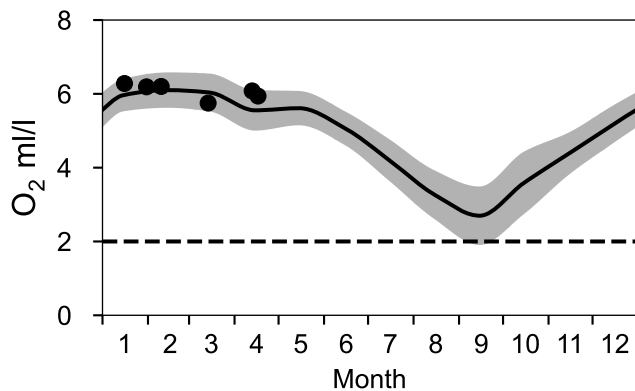
— Mean 1991-2020

■ St.Dev.

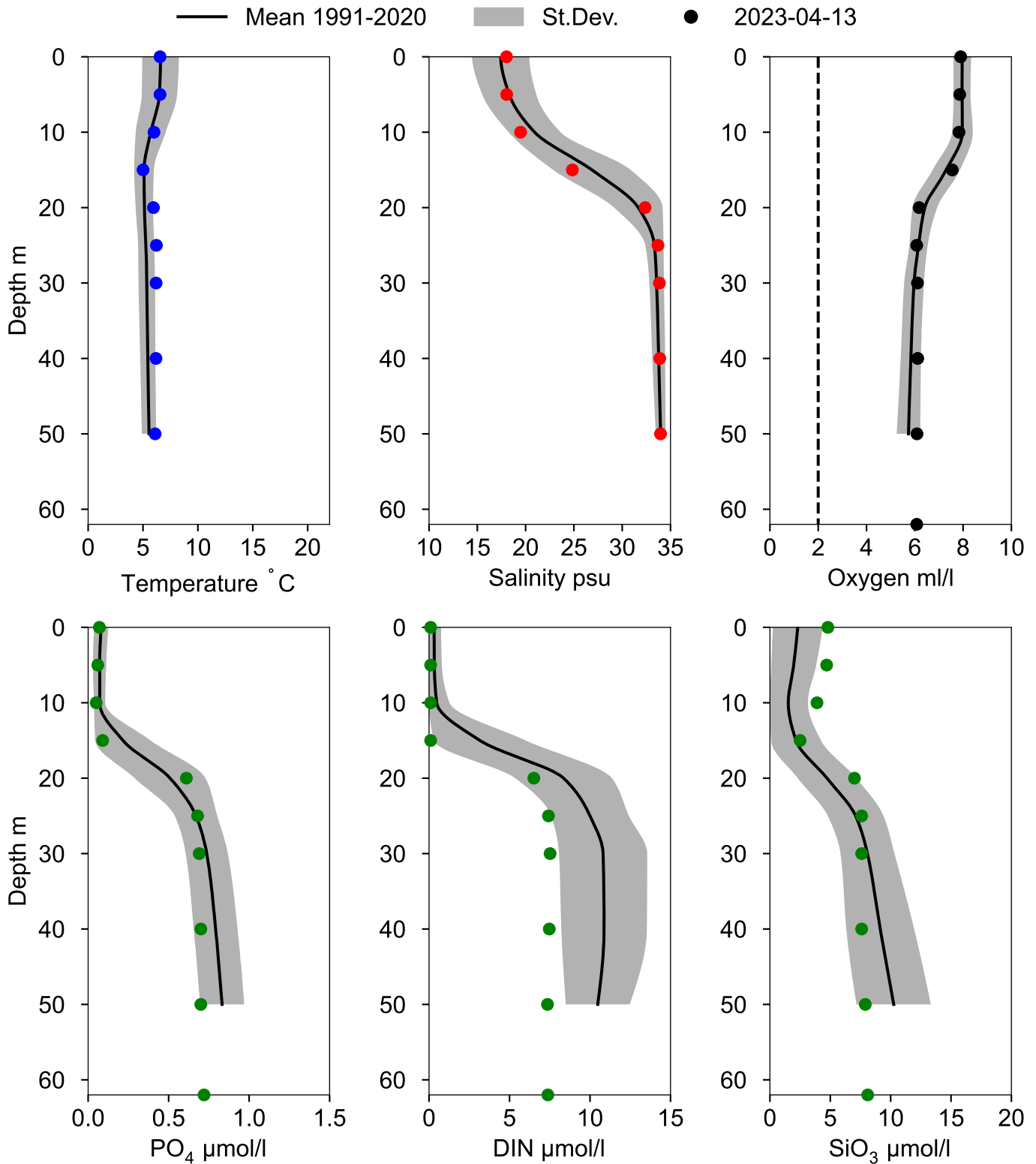
● 2023



## OXYGEN IN BOTTOM WATER (depth >= 52 m)



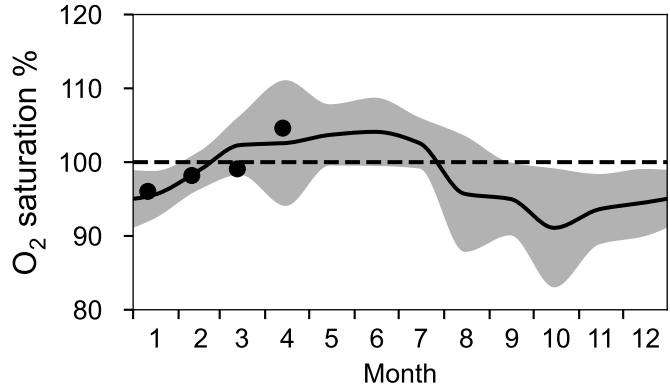
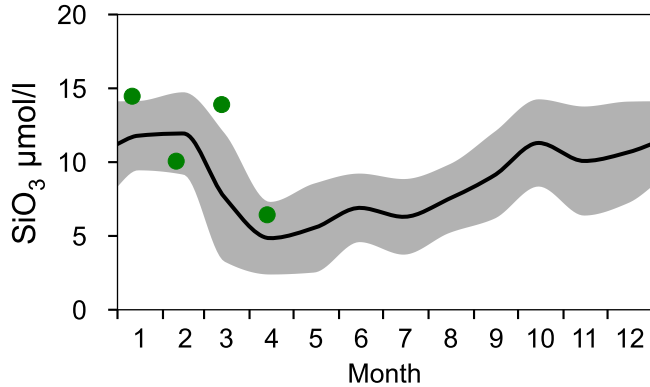
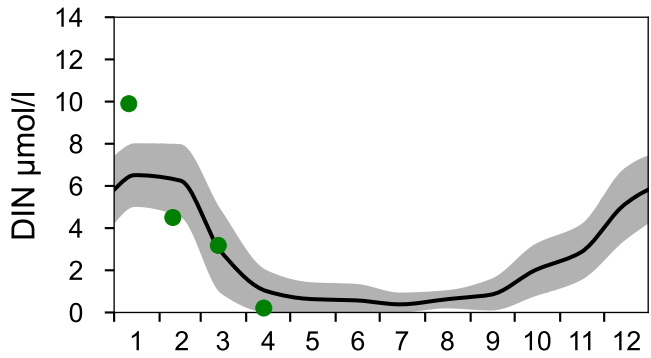
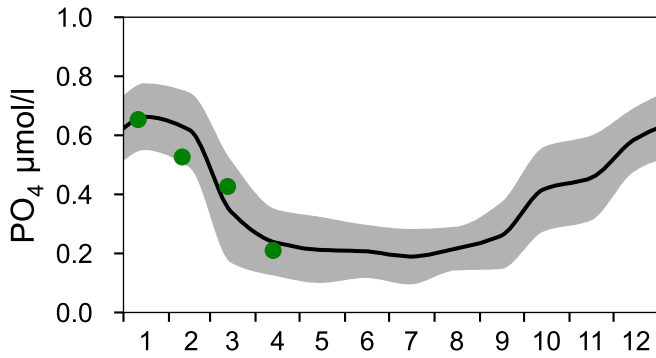
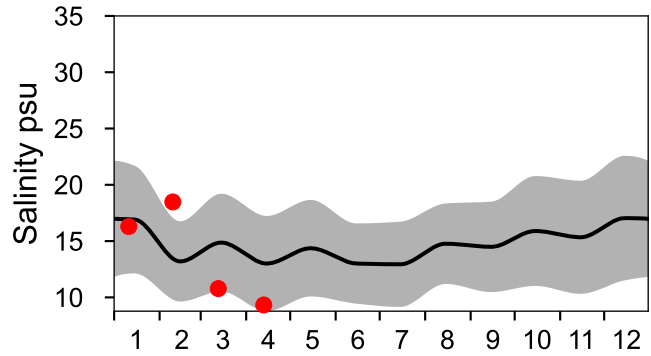
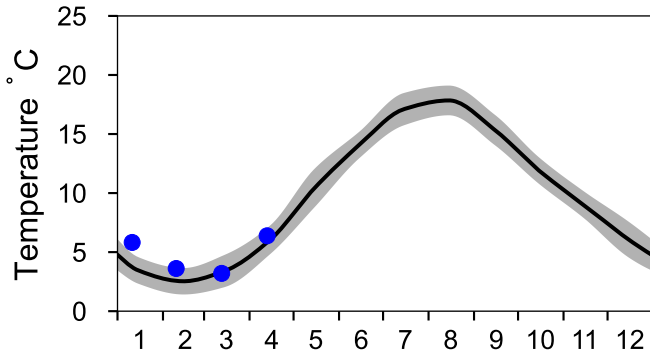
# Vertical profiles ANHOLT E April



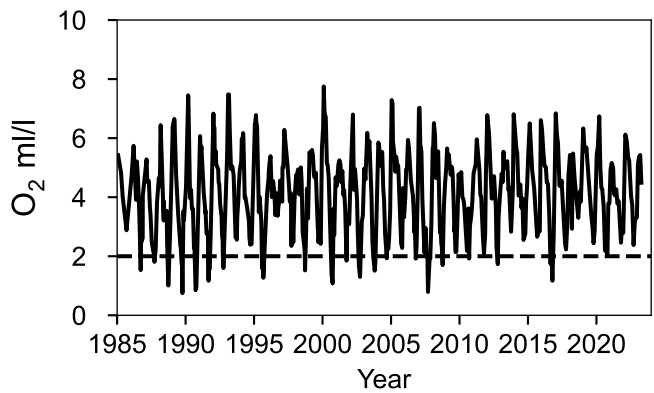
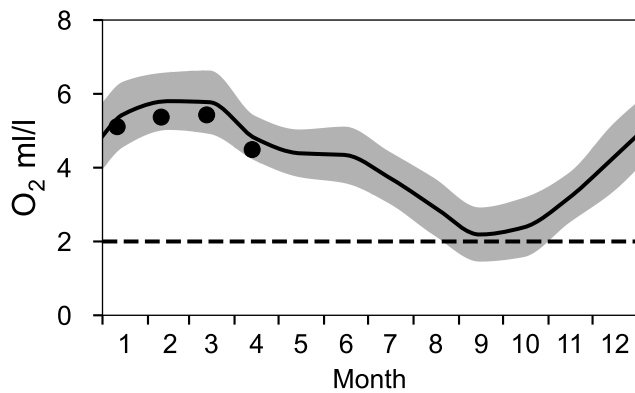
# STATION W LANDSKRONA SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023



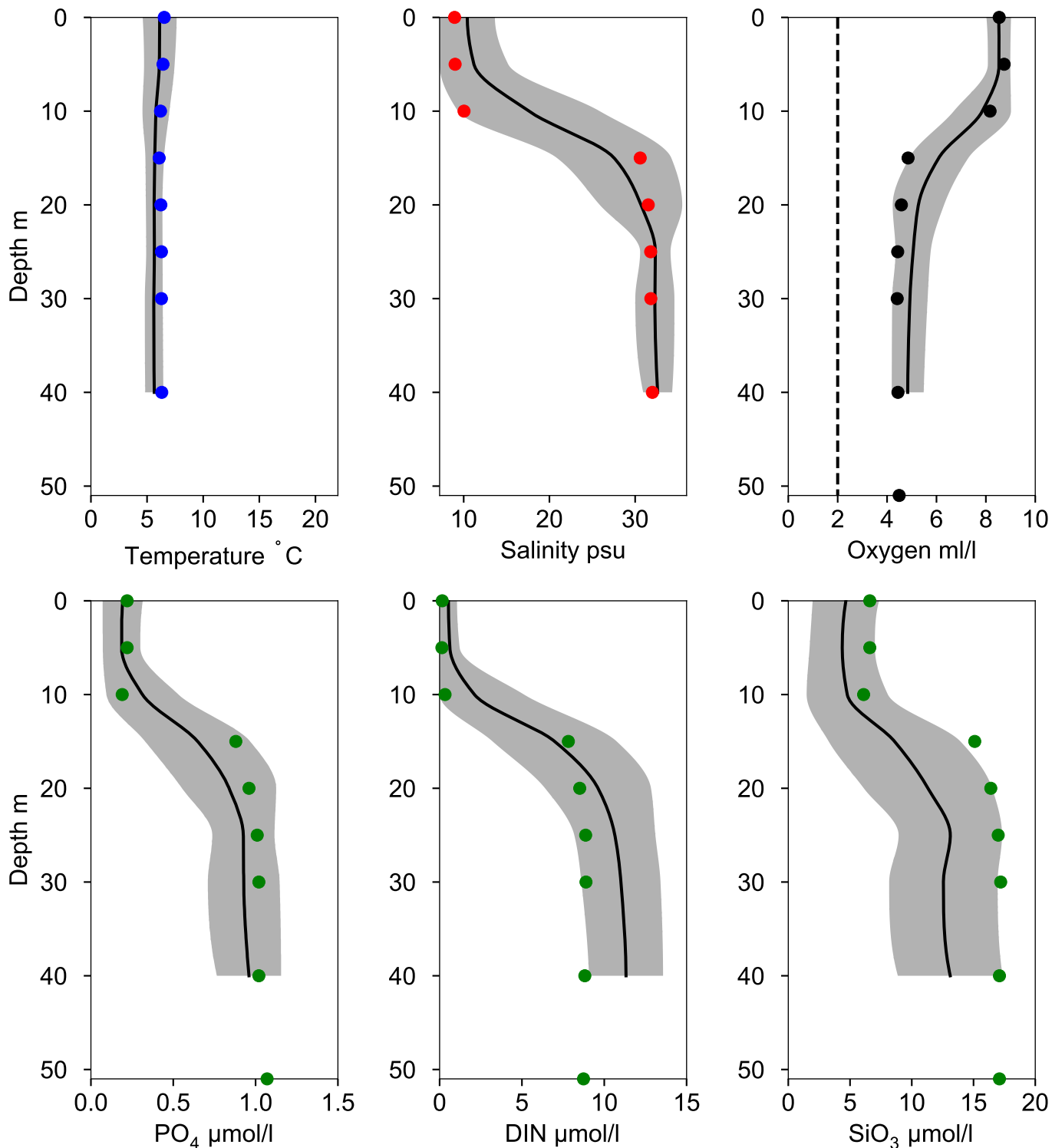
## OXYGEN IN BOTTOM WATER (depth >= 40 m)





# Vertical profiles W LANDSKRONA April

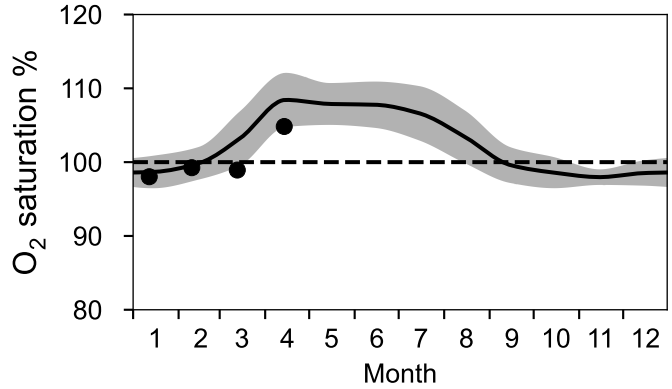
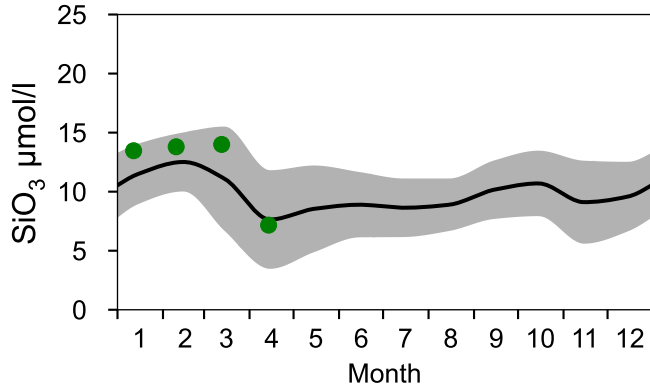
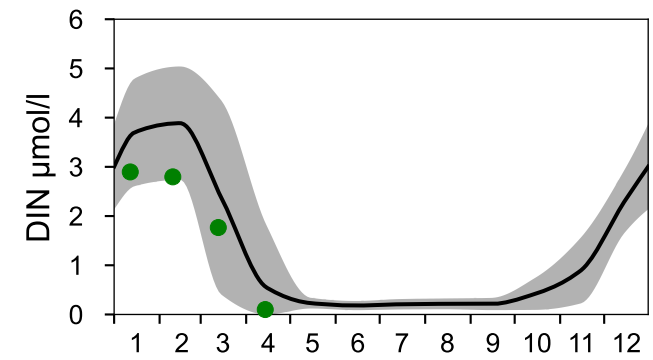
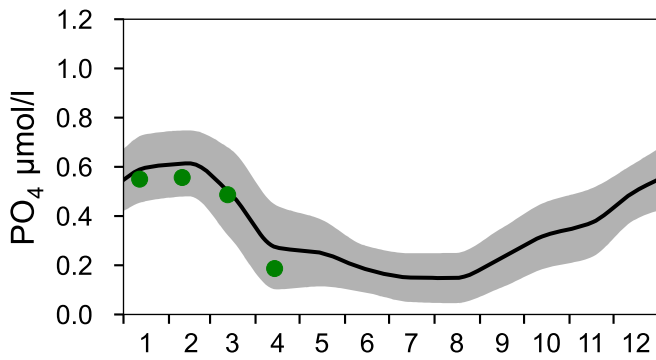
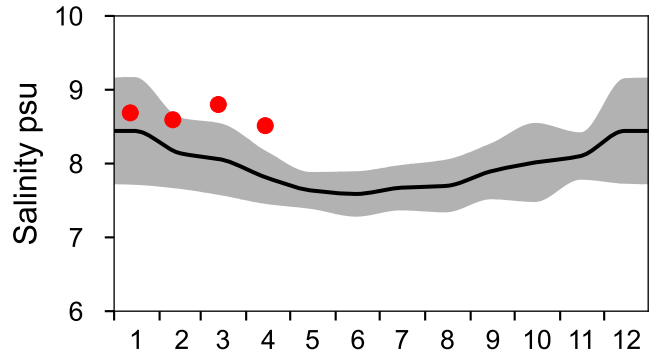
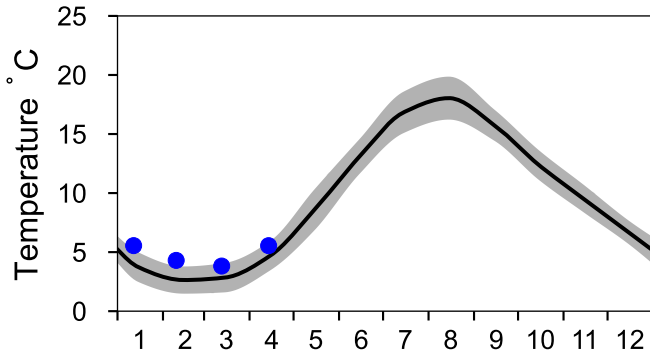
— Mean 1991-2020    ■ St.Dev.    ● 2023-04-13



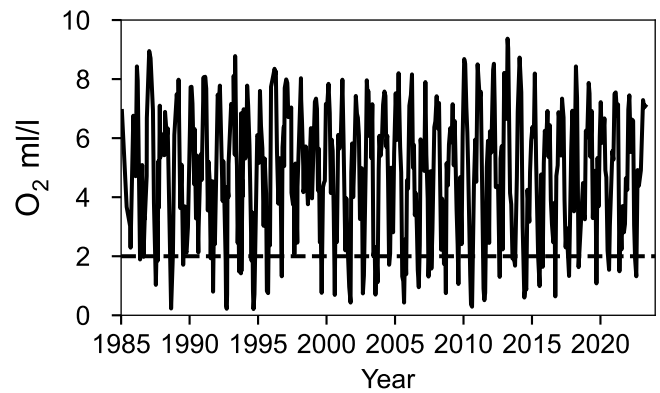
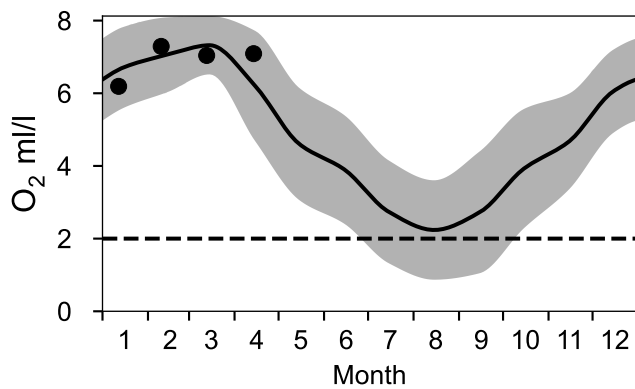
# STATION BY1 SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

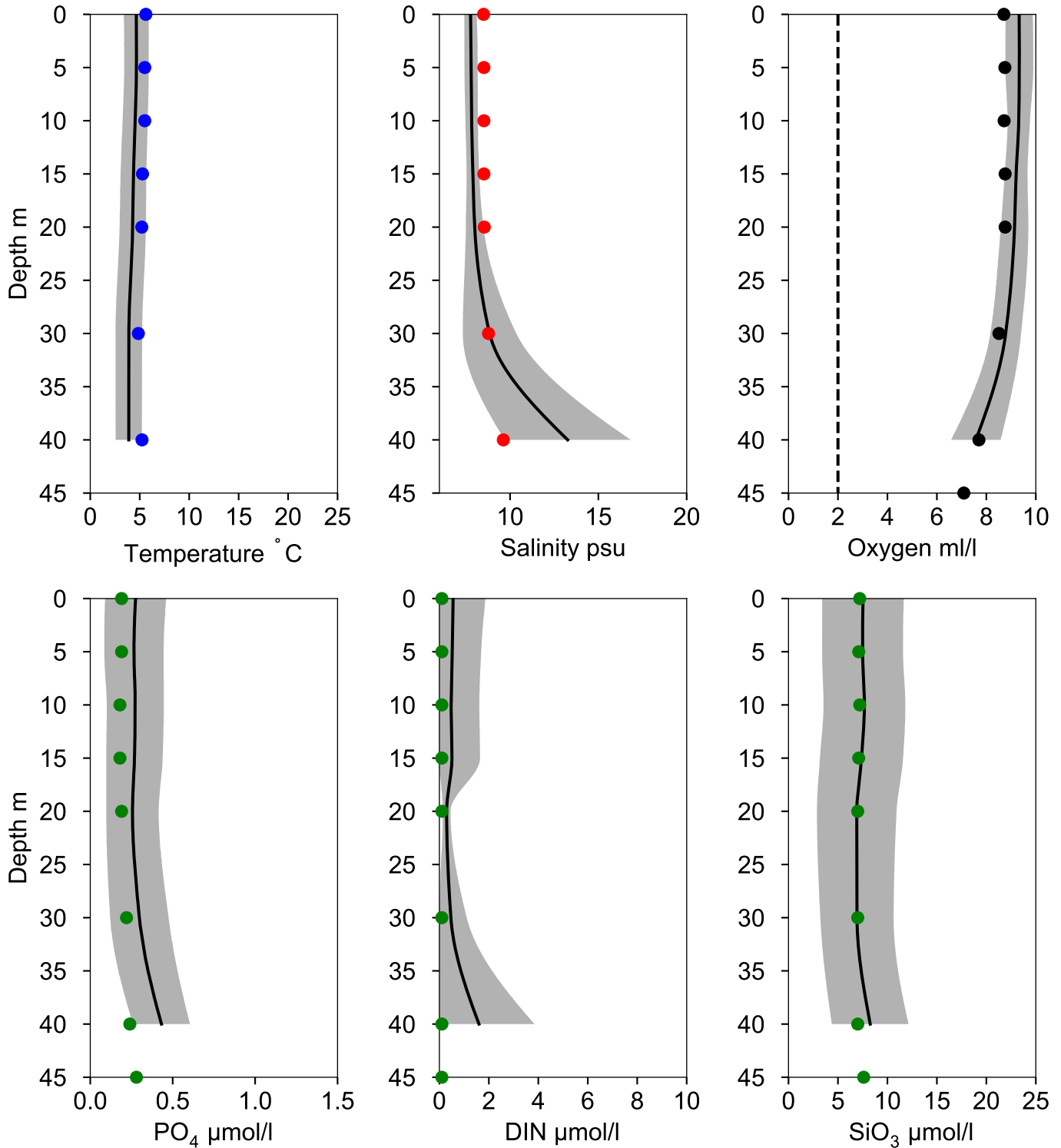


## OXYGEN IN BOTTOM WATER (depth >= 39 m)



# Vertical profiles BY1 April

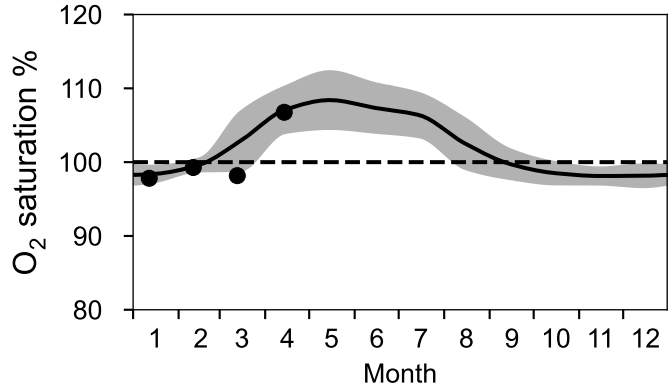
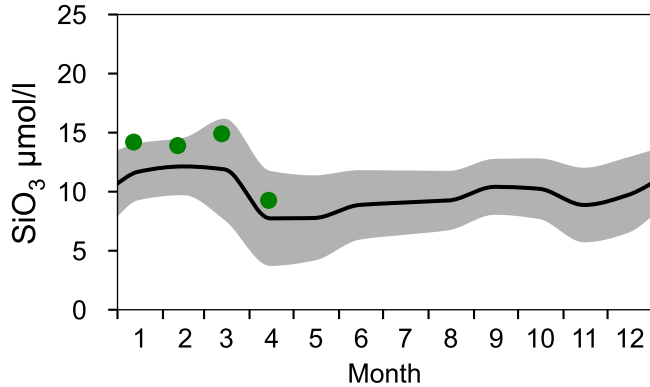
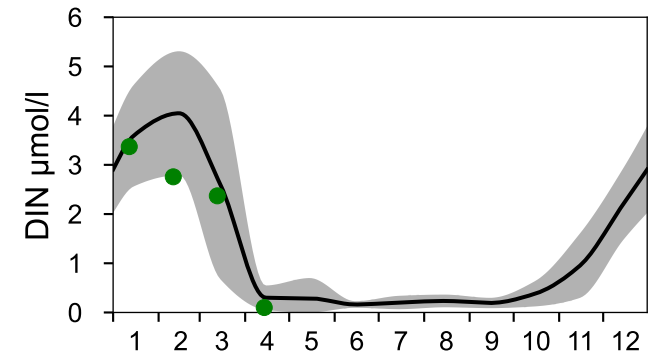
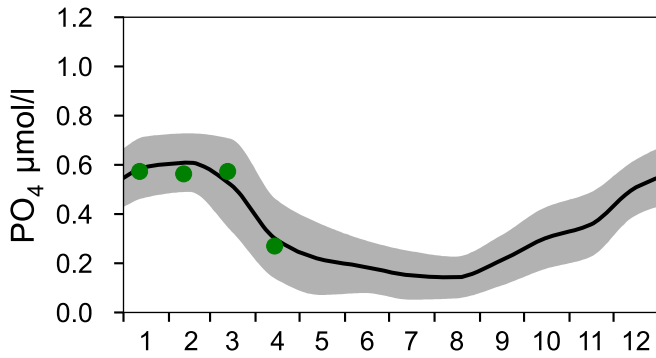
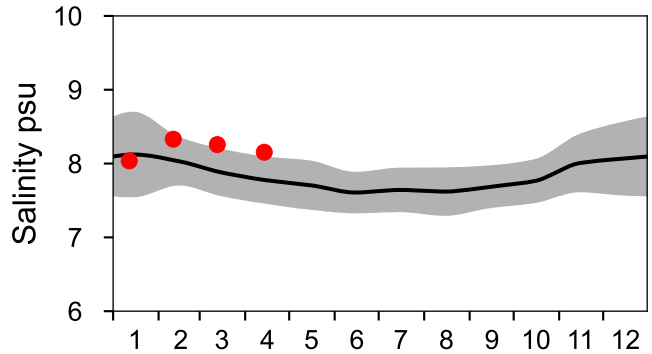
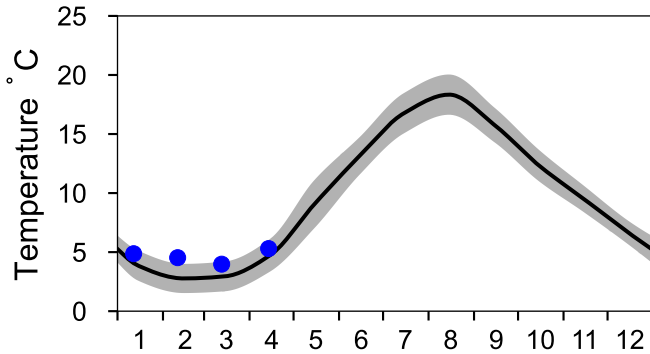
— Mean 1991-2020    ■ St.Dev.    ● 2023-04-14



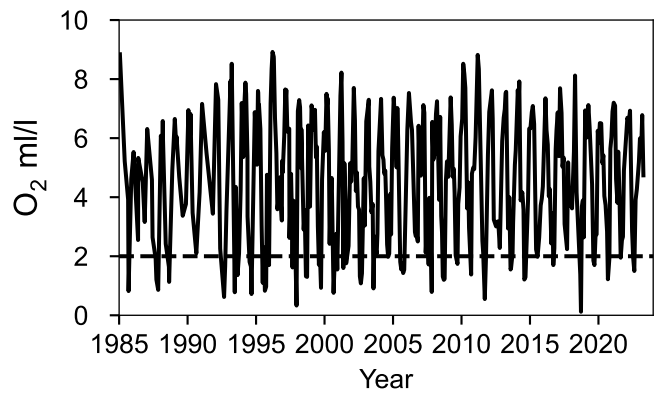
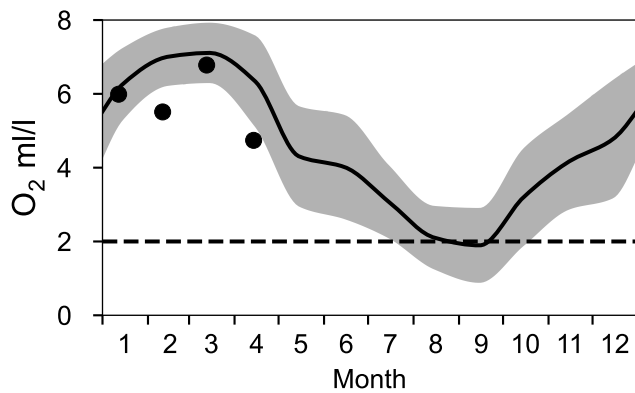
# STATION BY2 ARKONA SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

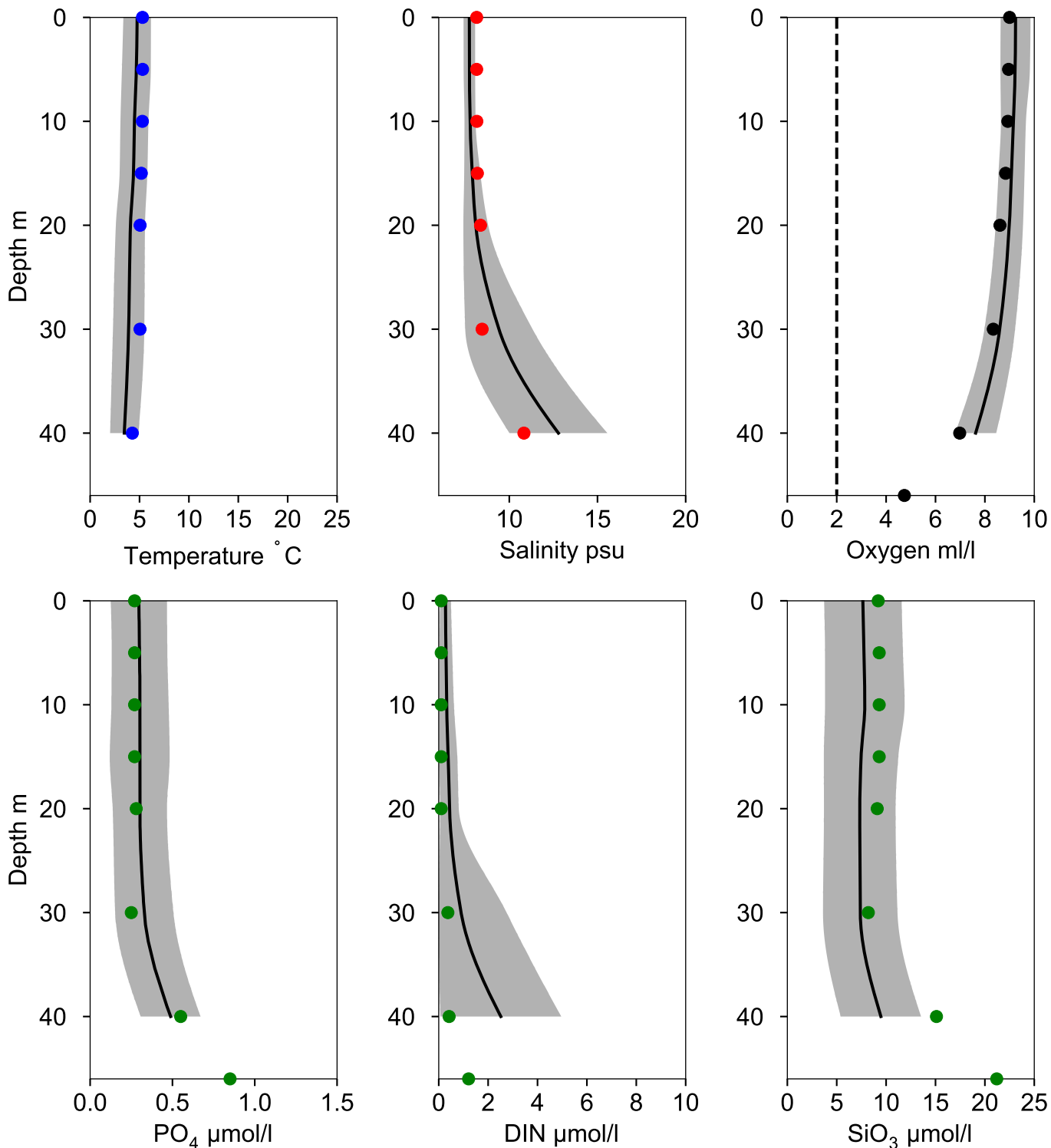


## OXYGEN IN BOTTOM WATER (depth >= 40 m)



# Vertical profiles BY2 ARKONA April

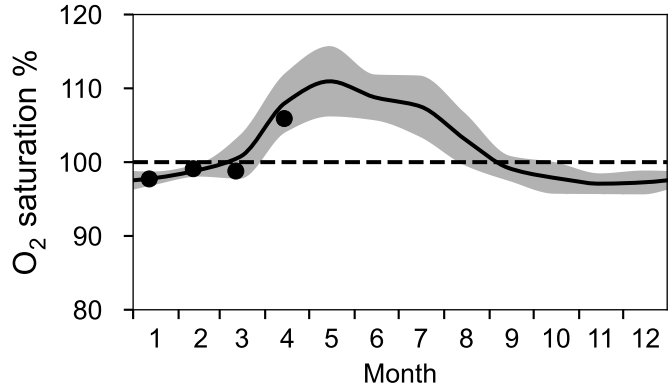
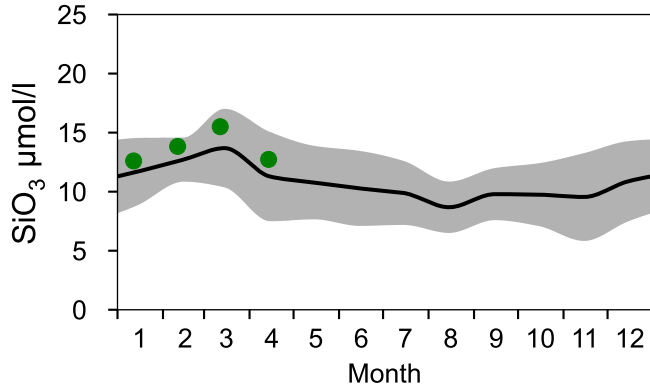
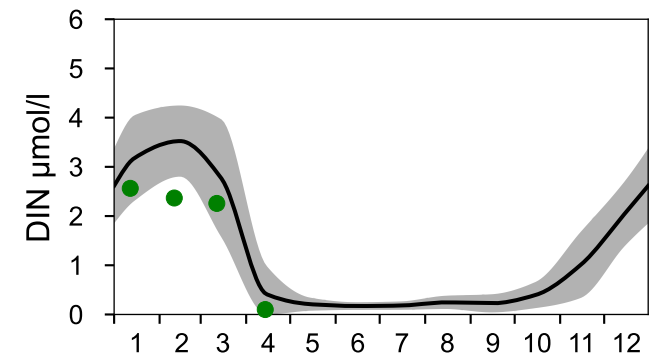
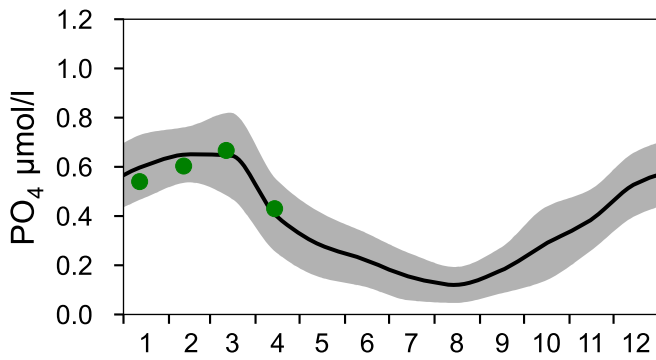
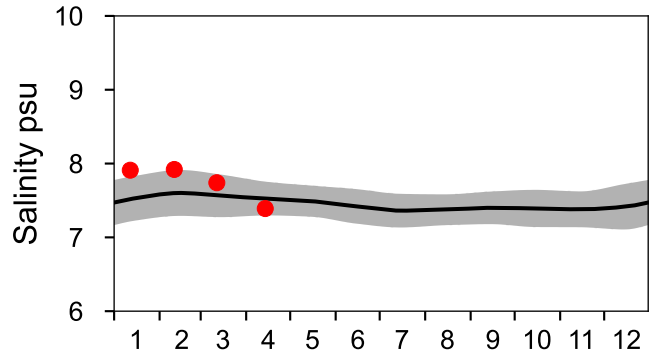
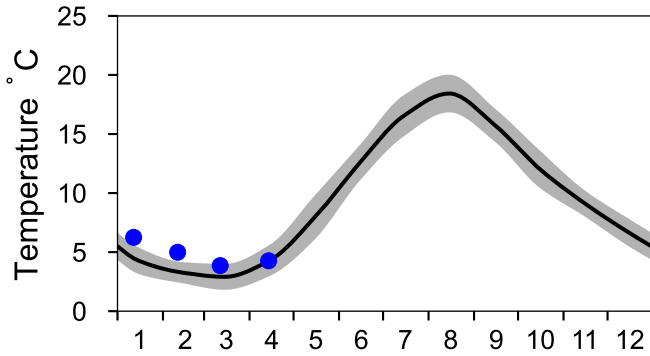
— Mean 1991-2020    St.Dev.    ● 2023-04-14



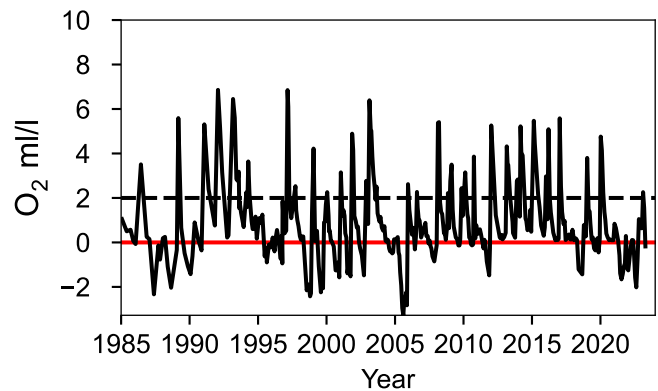
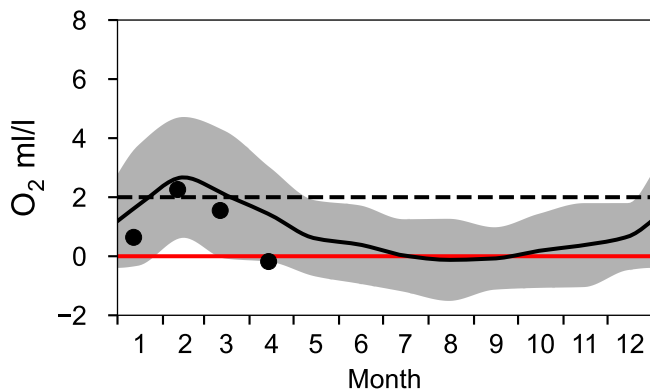
# STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

Annual Cycles

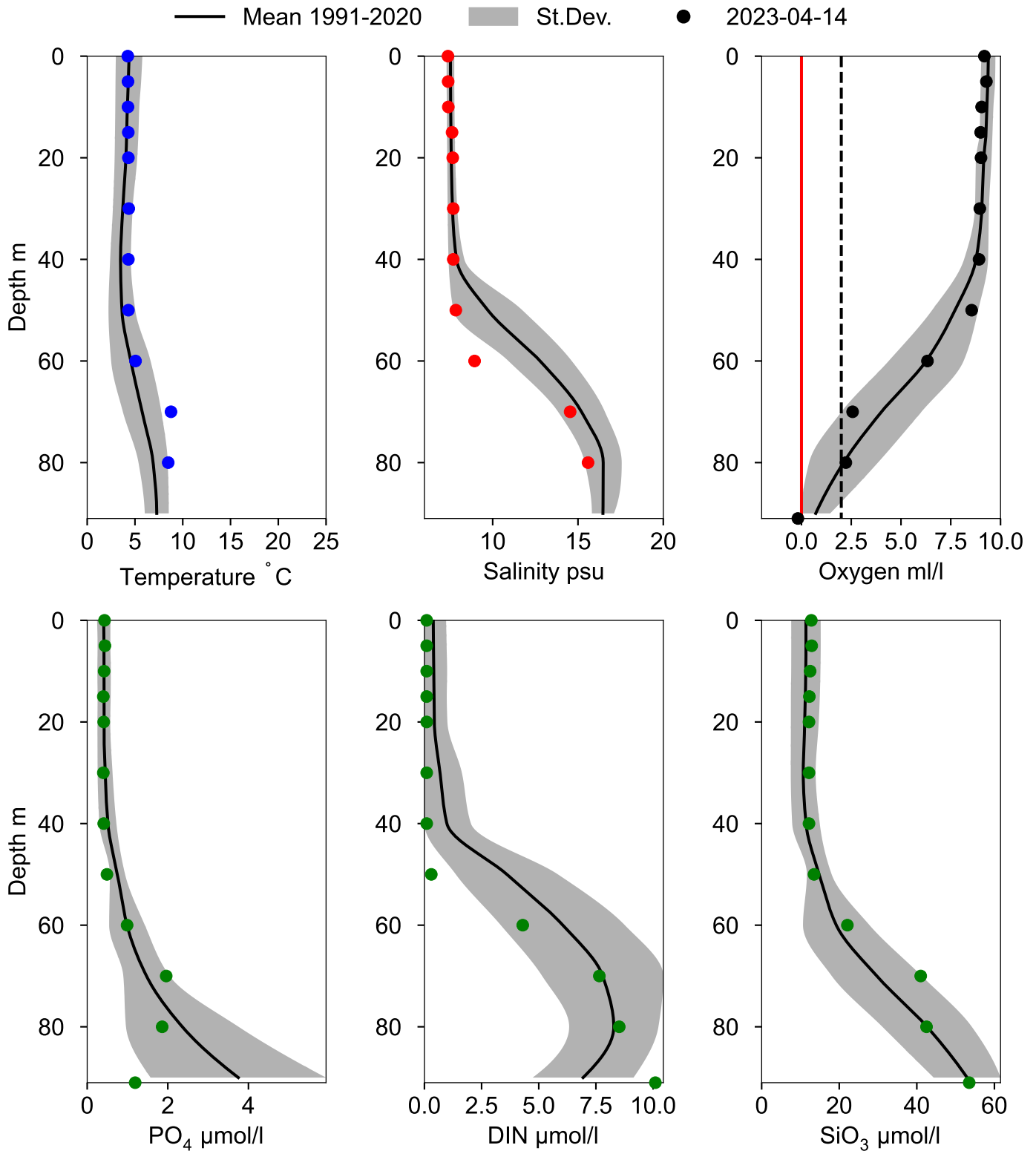
— Mean 1991-2020    St.Dev.    ● 2023



## OXYGEN IN BOTTOM WATER (depth >= 80 m)



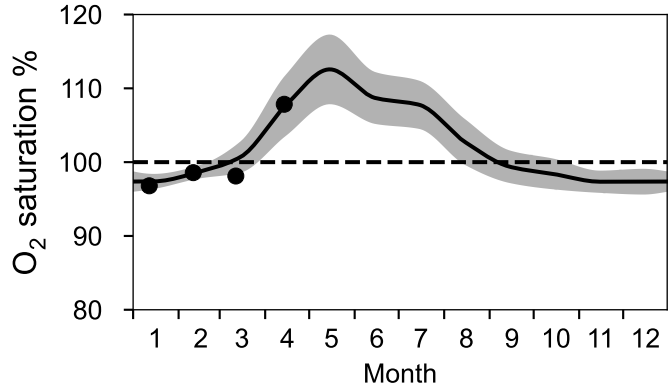
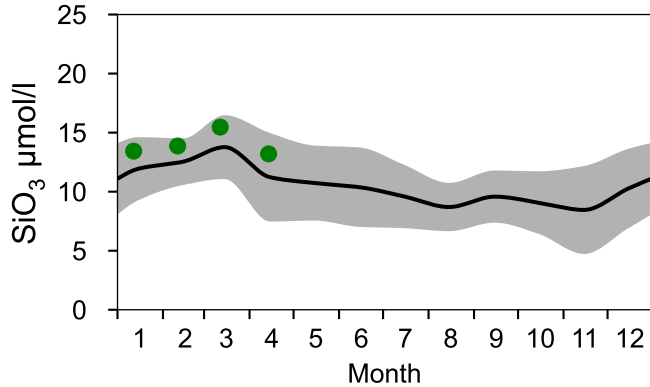
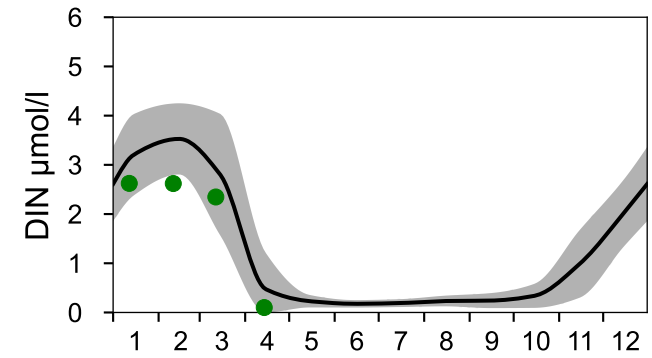
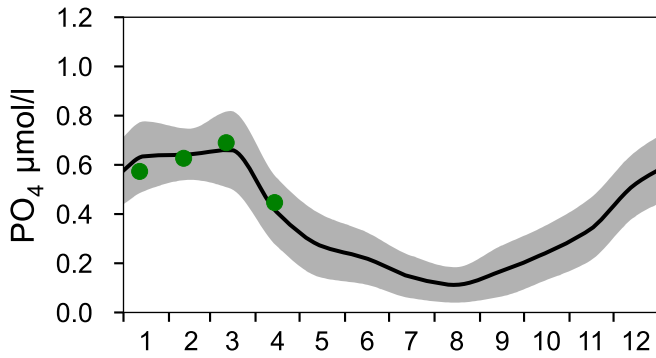
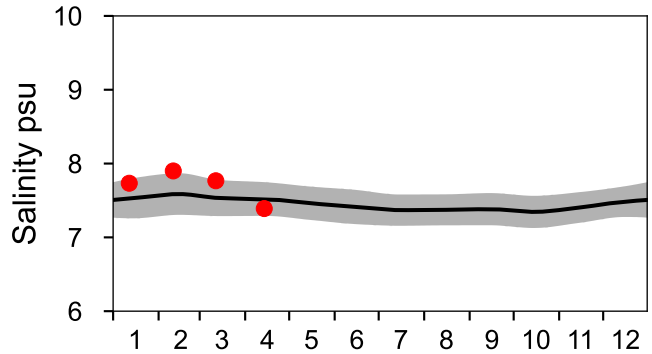
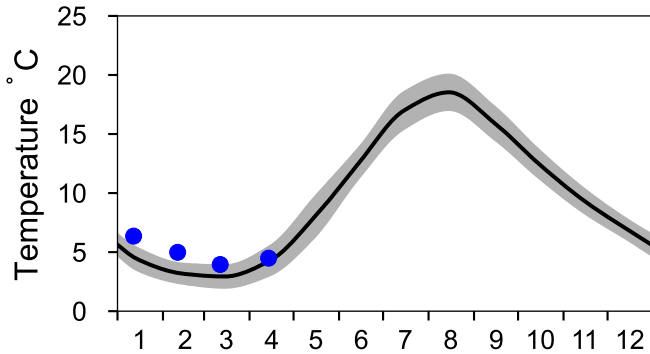
# Vertical profiles BY4 CHRISTIANSÖ April



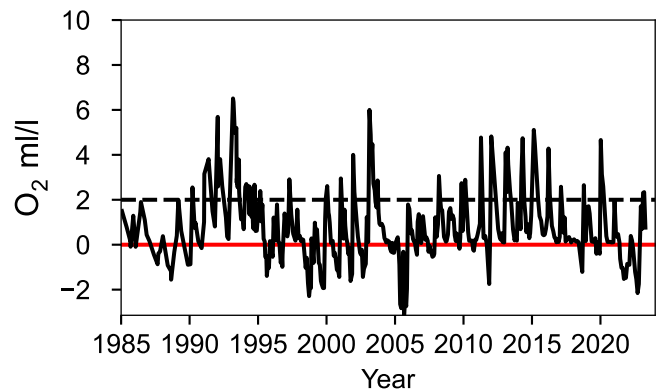
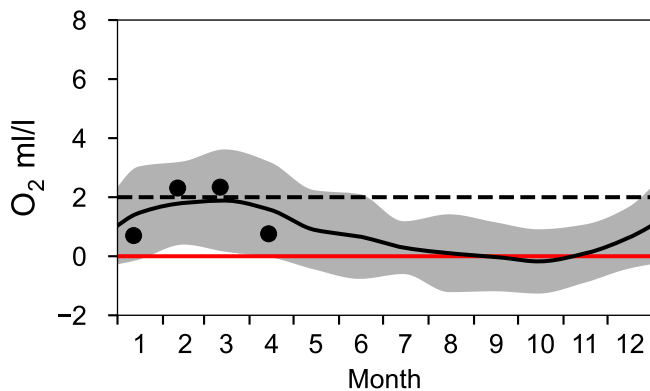
# STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023



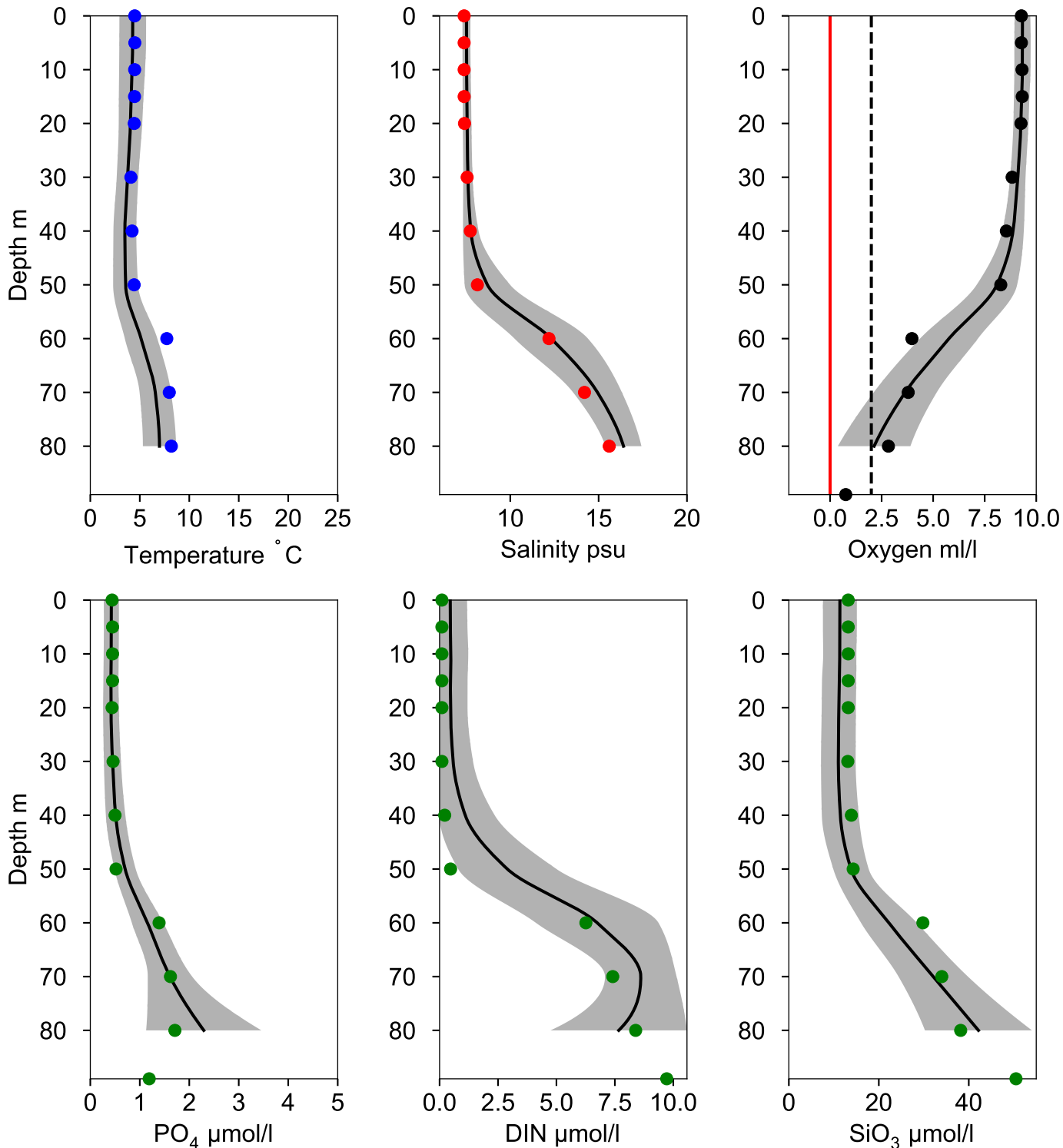
## OXYGEN IN BOTTOM WATER (depth >= 80 m)





# Vertical profiles BY5 BORNHOLMSDJ April

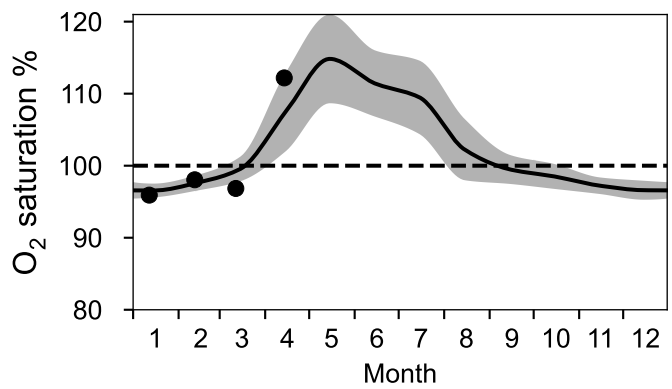
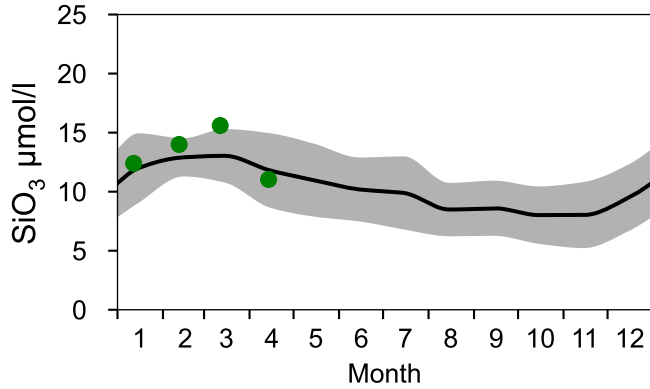
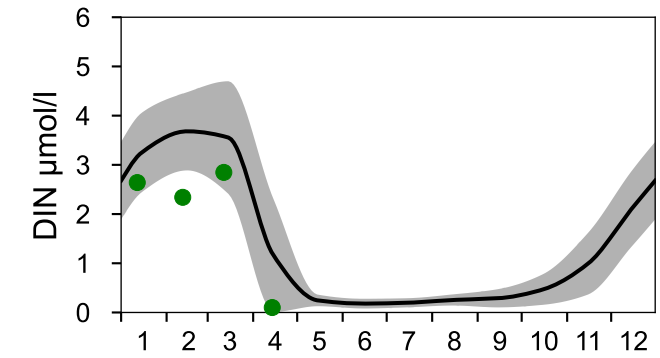
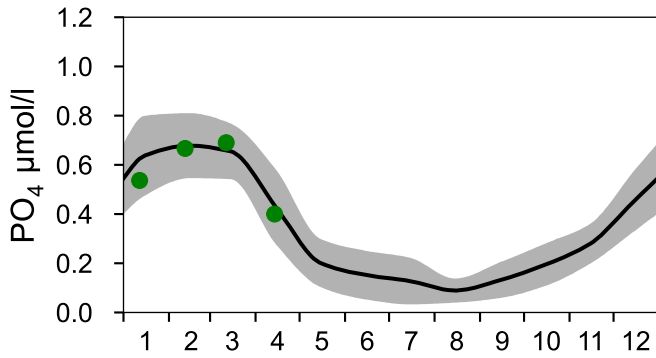
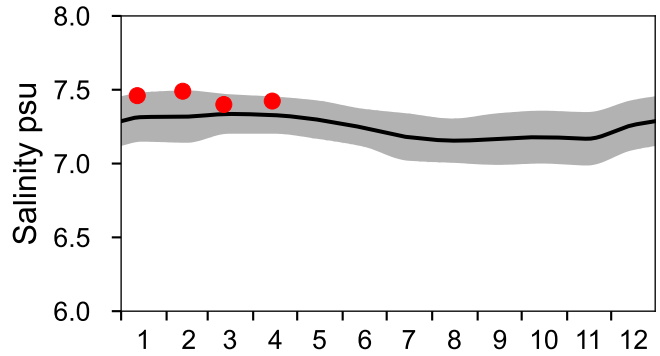
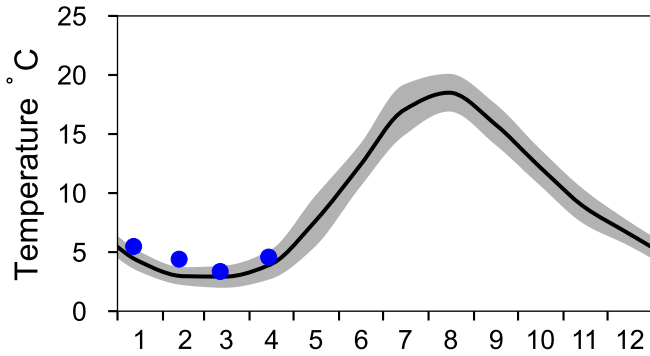
— Mean 1991-2020    ■ St.Dev.    ● 2023-04-14



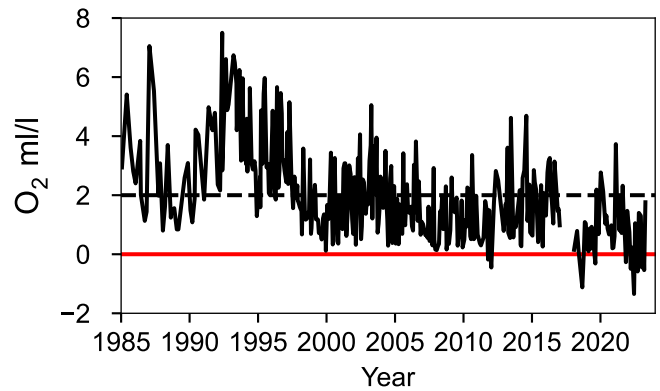
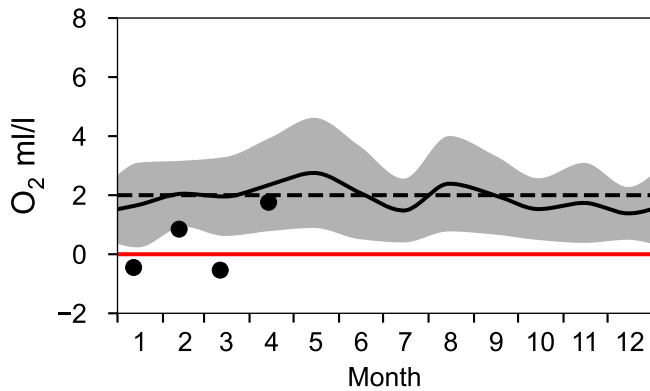
# STATION BCS III-10 SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

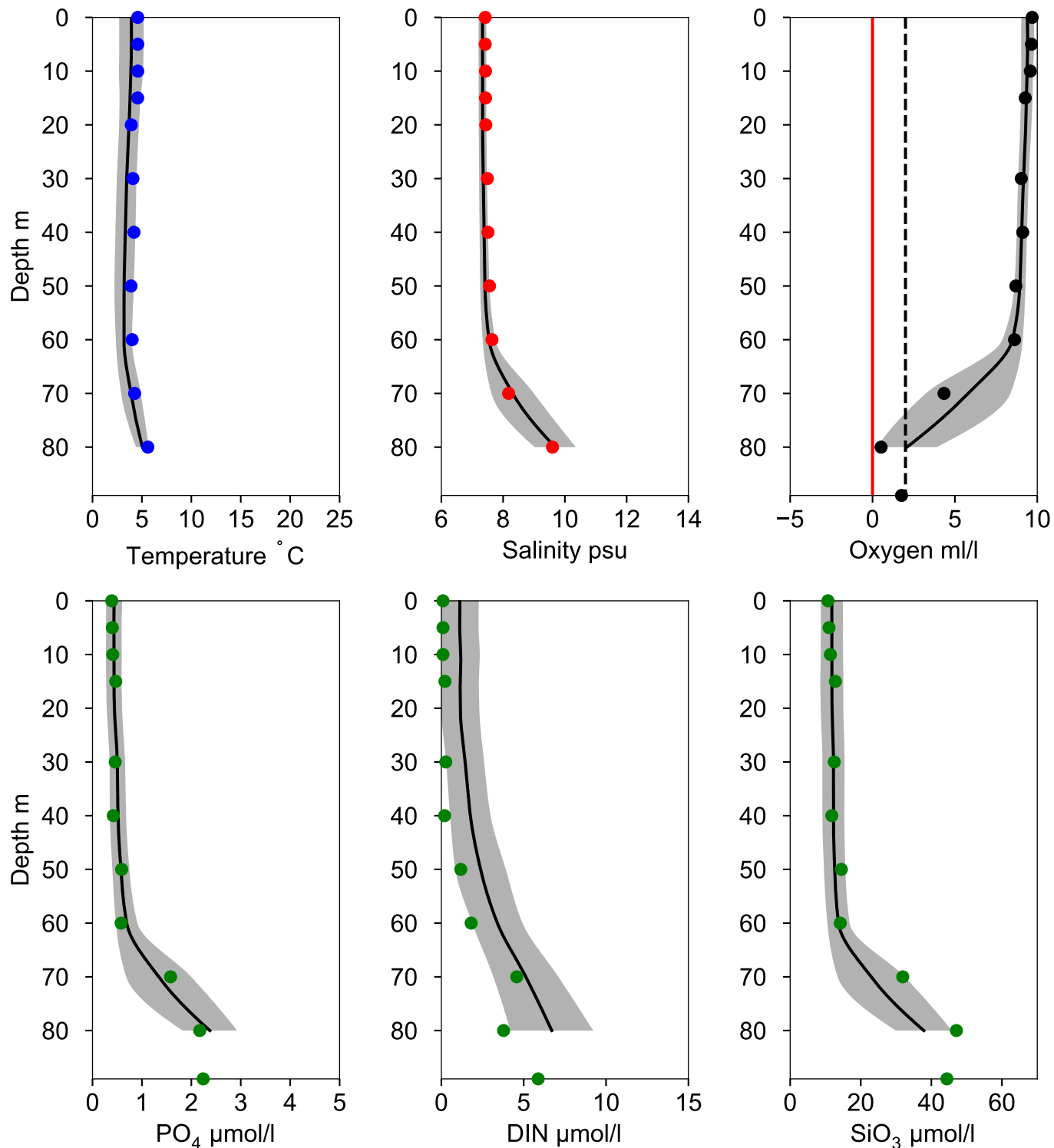


## OXYGEN IN BOTTOM WATER (depth >= 80 m)



# Vertical profiles BCS III-10 April

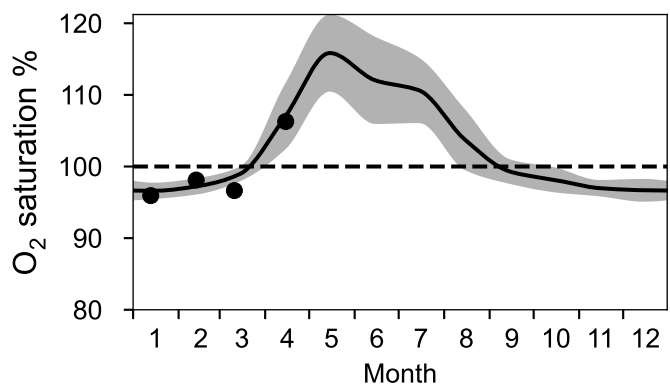
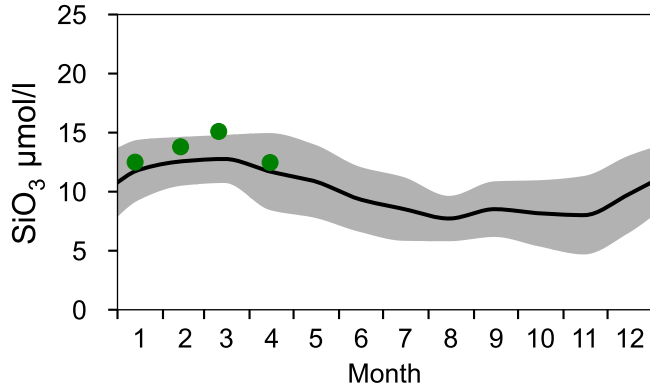
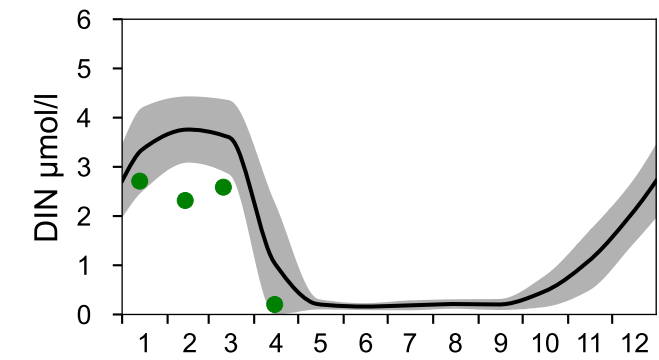
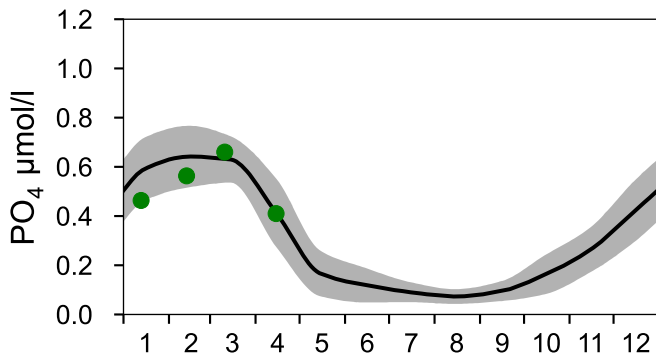
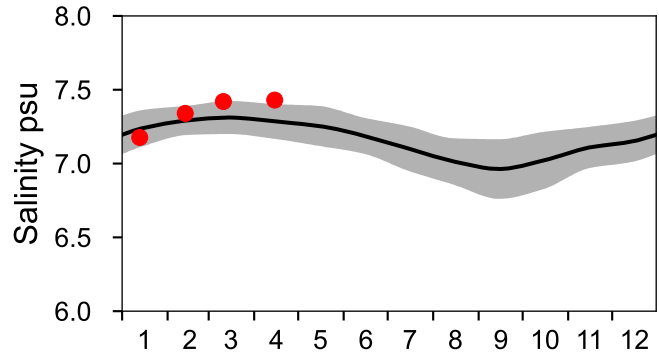
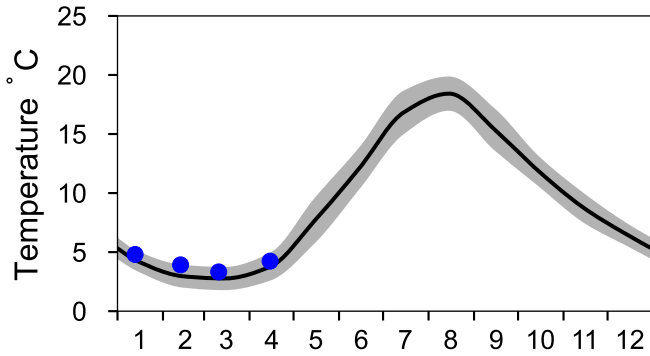
— Mean 1991-2020    St.Dev.    ● 2023-04-14



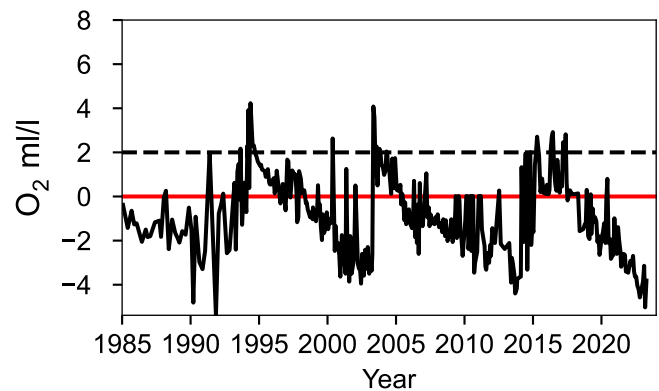
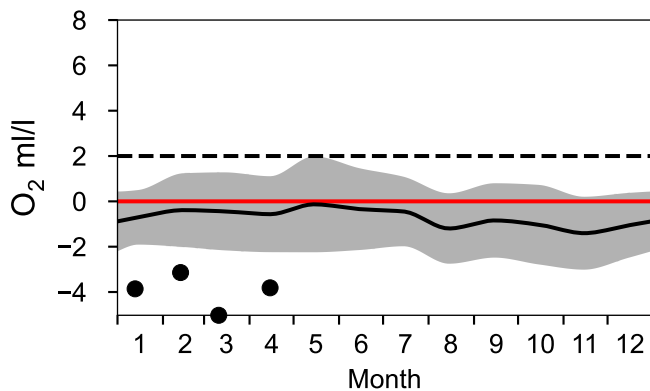
# STATION BY10 SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

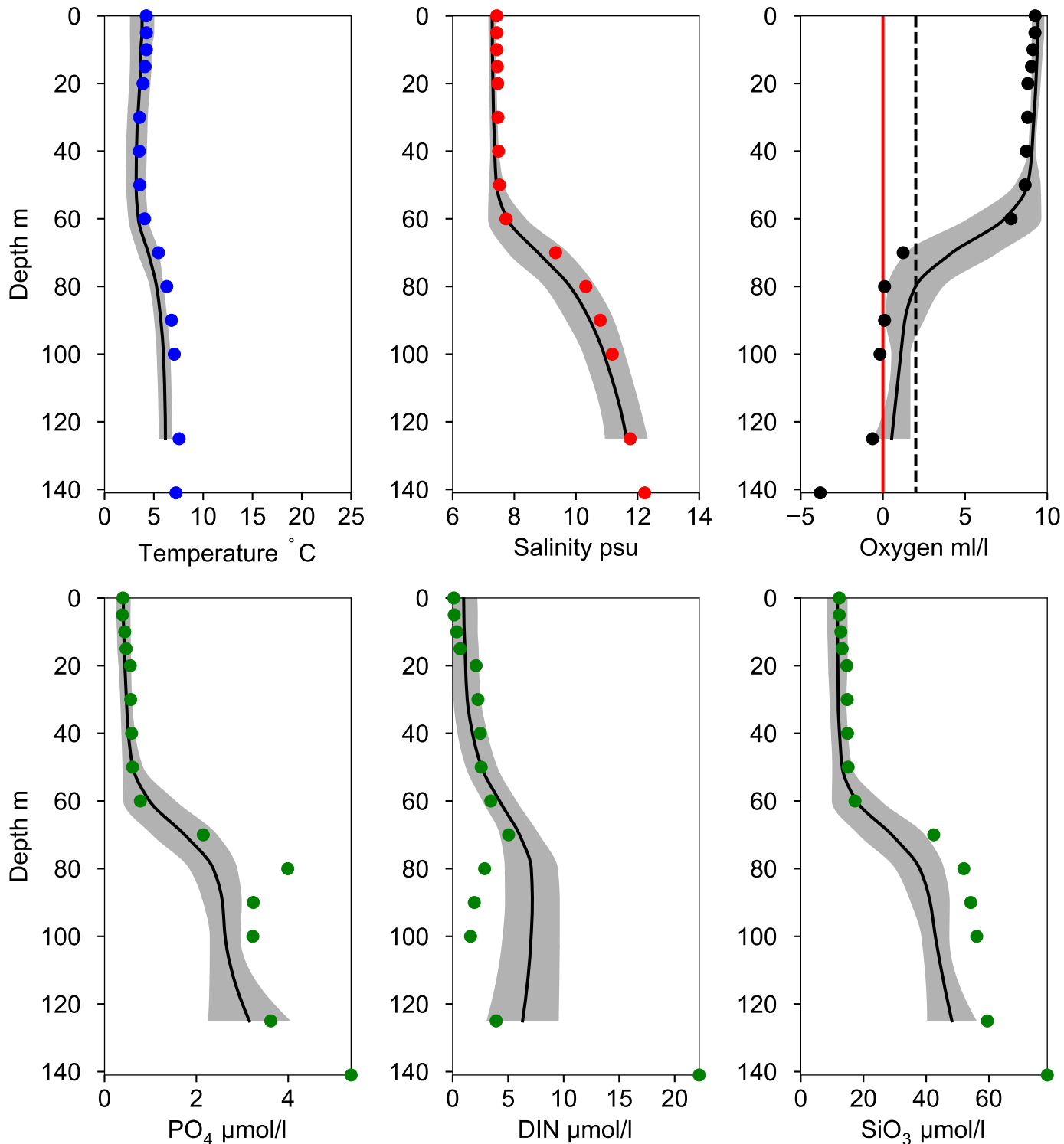


## OXYGEN IN BOTTOM WATER (depth >= 125 m)



# Vertical profiles BY10 April

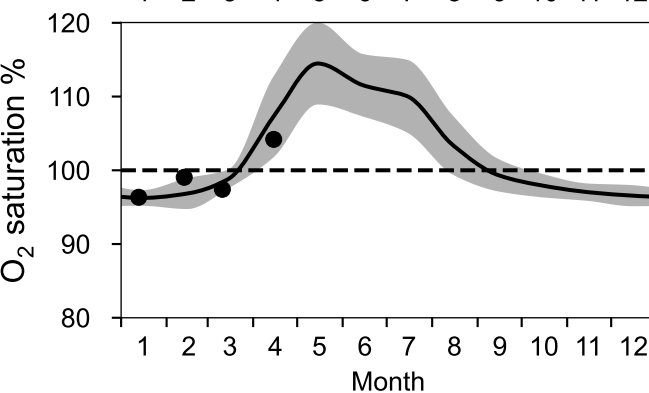
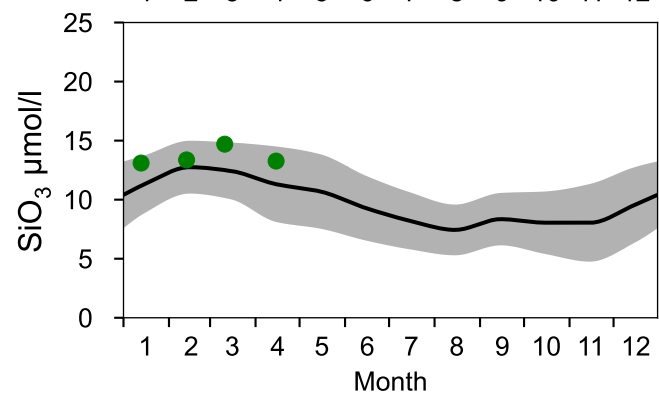
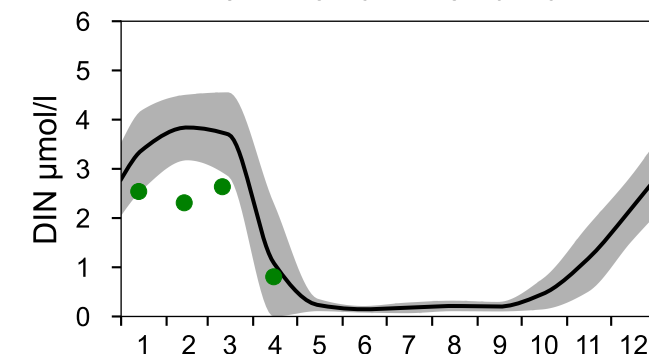
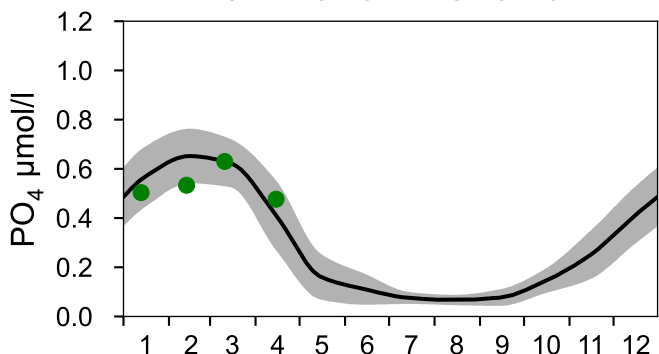
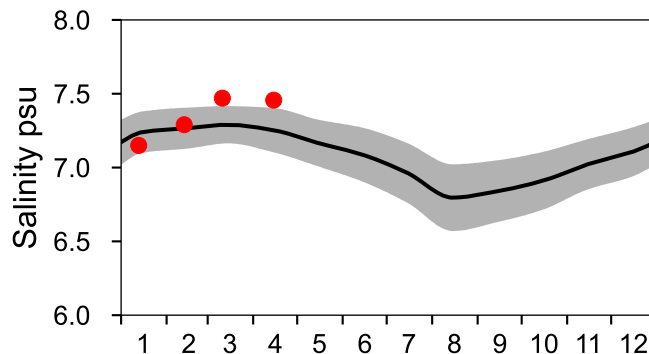
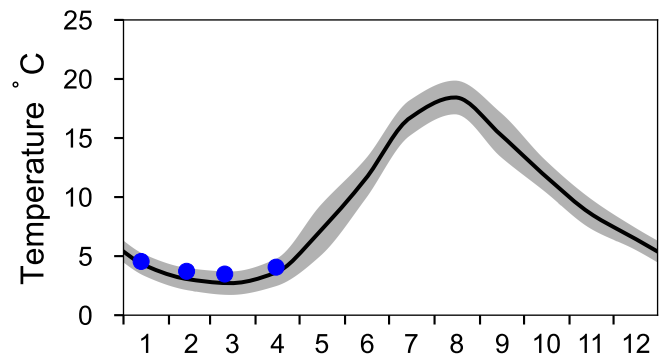
— Mean 1991-2020    St.Dev.    ● 2023-04-15



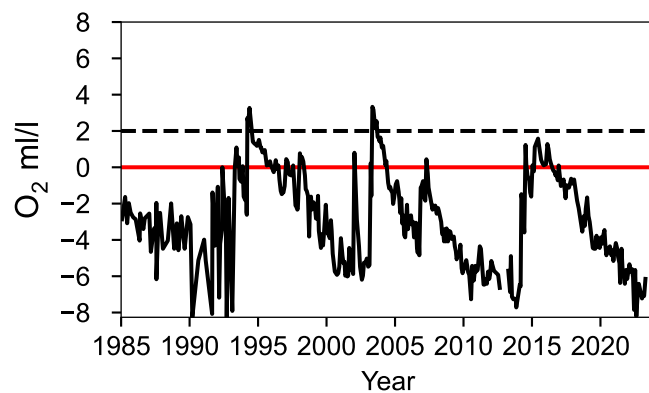
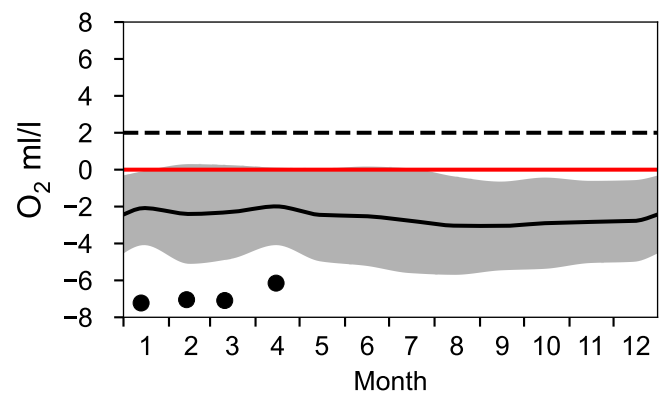
# STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

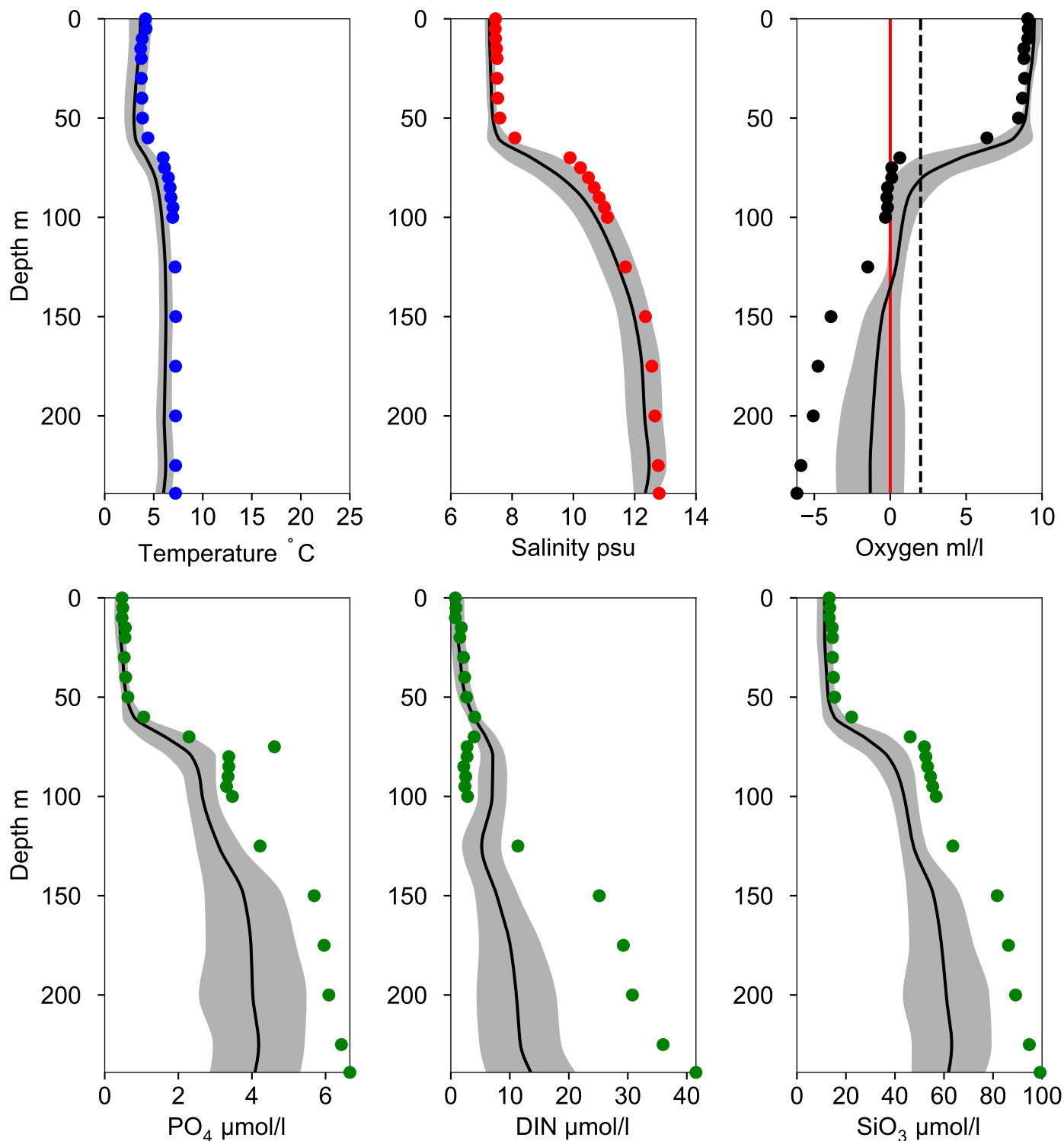


## OXYGEN IN BOTTOM WATER (depth >= 225 m)



# Vertical profiles BY15 GOTLANDSDJ April

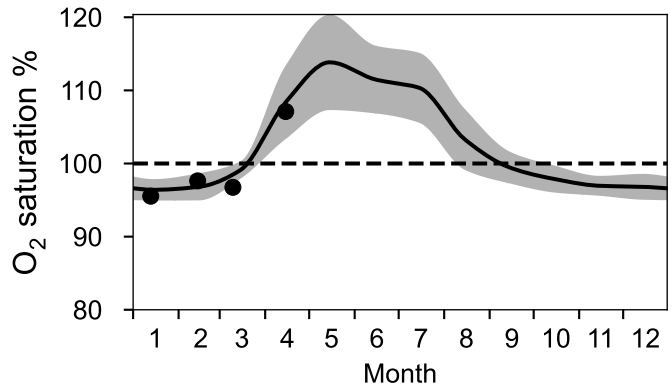
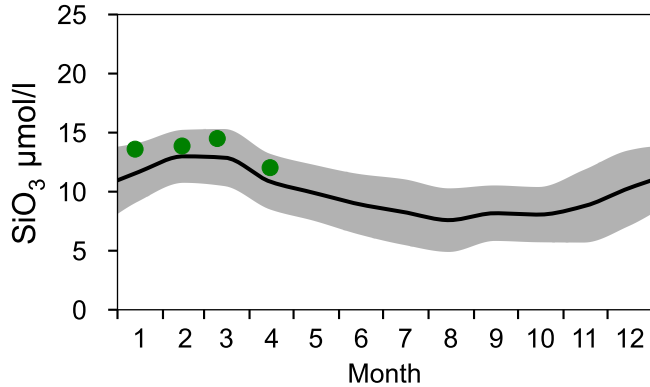
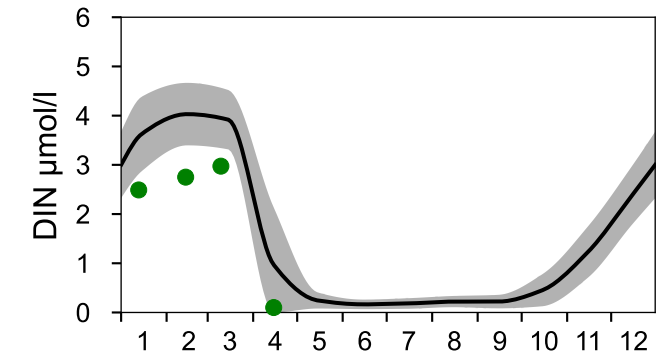
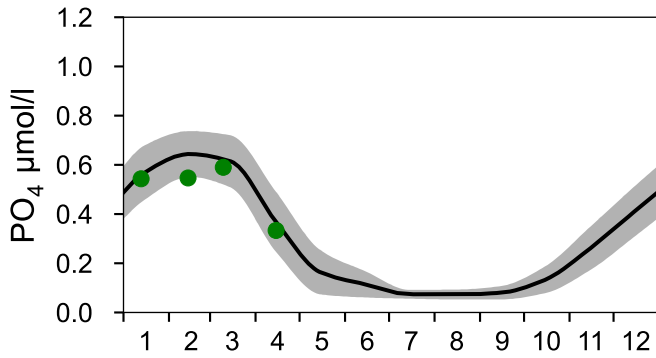
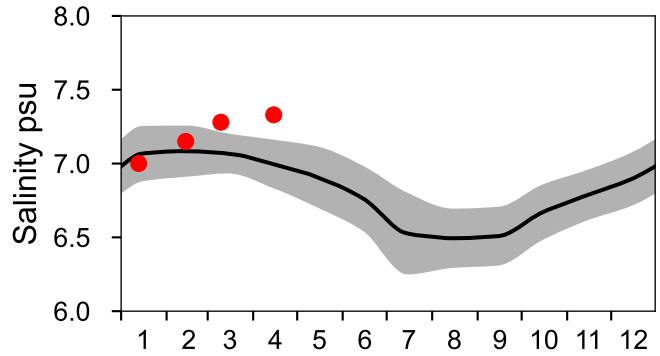
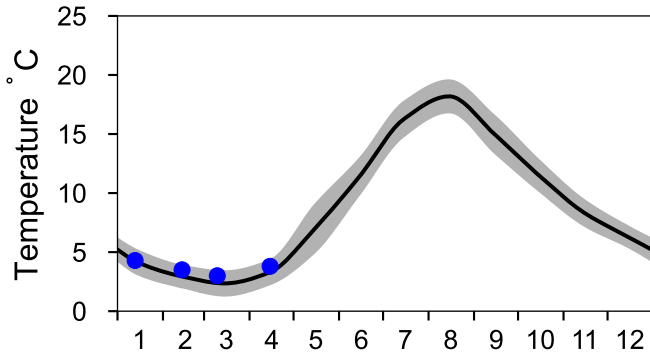
— Mean 1991-2020    St.Dev.    ● 2023-04-15



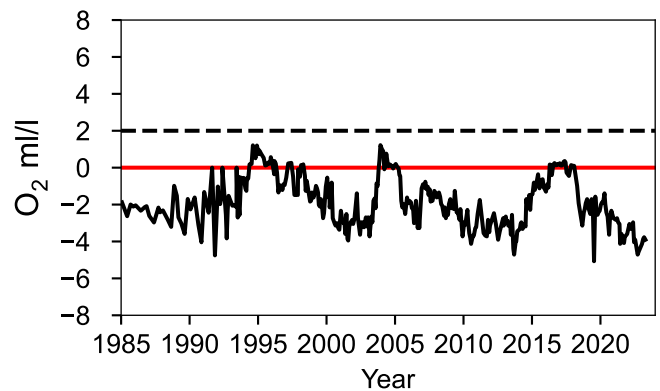
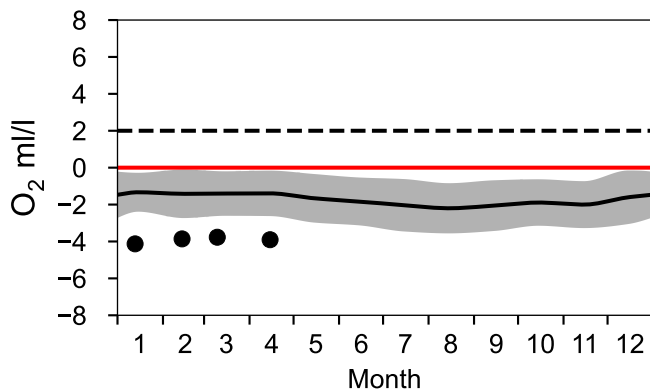
# STATION BY20 FÄRÖDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023



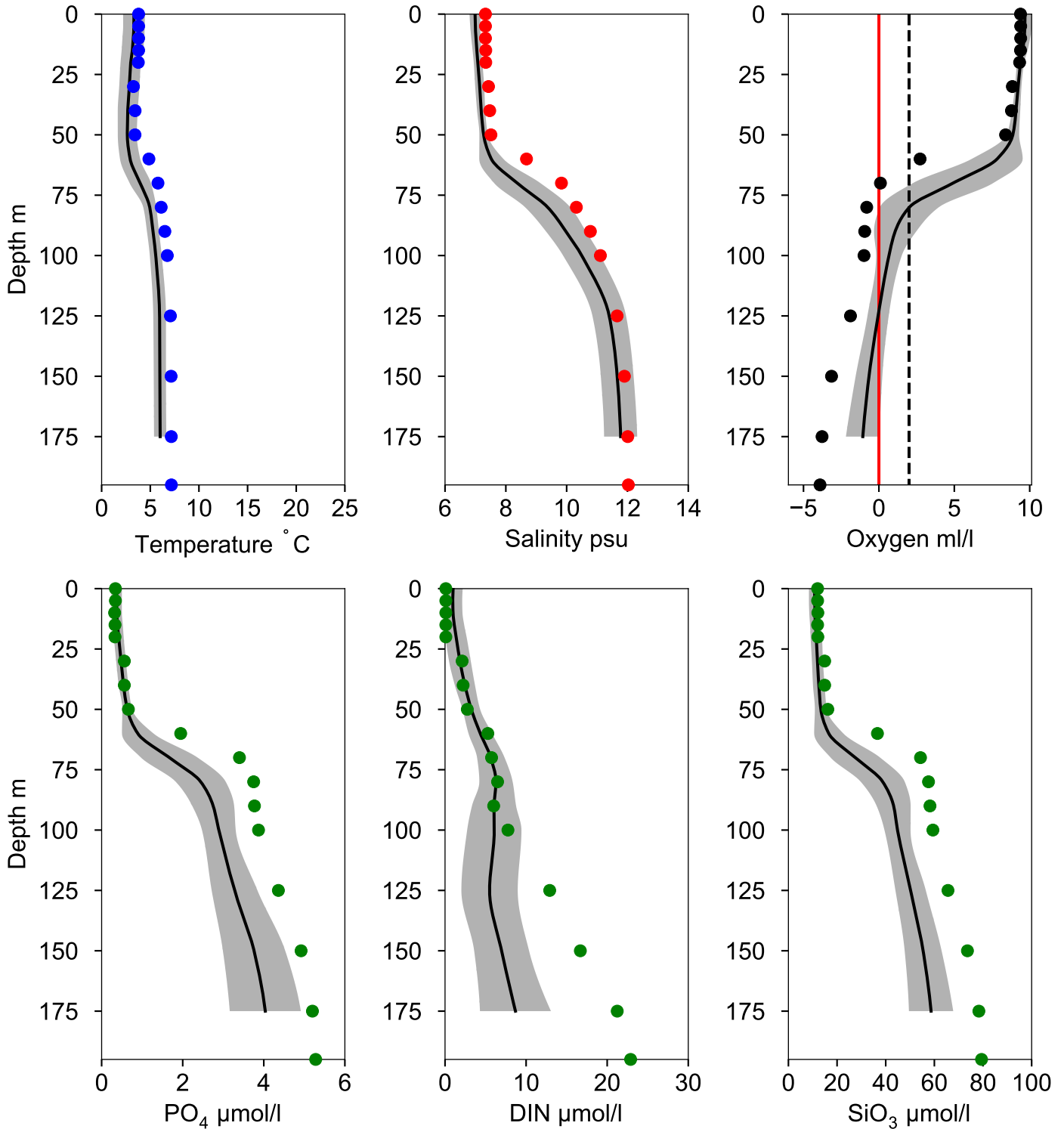
## OXYGEN IN BOTTOM WATER (depth >= 175 m)





# Vertical profiles BY20 FÅRÖDJ April

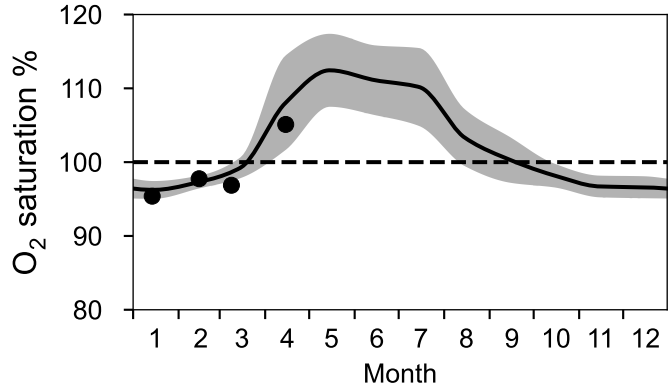
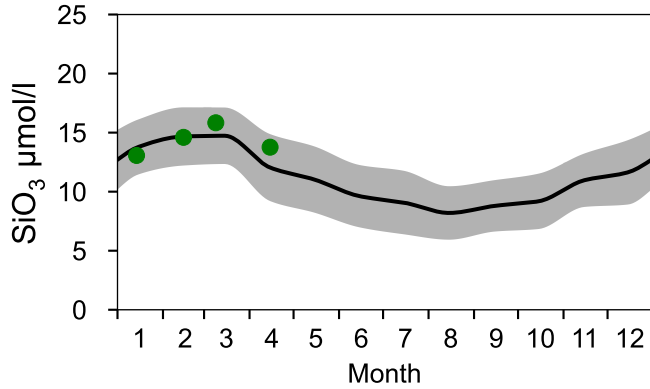
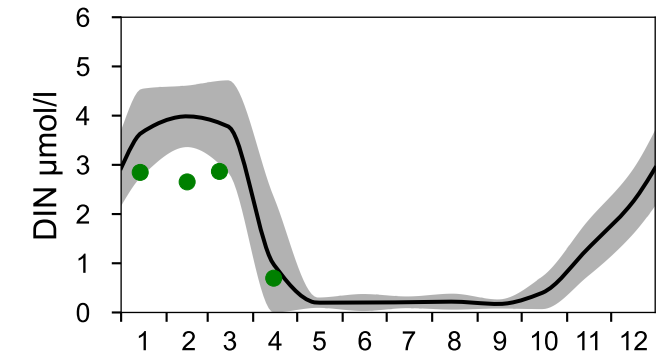
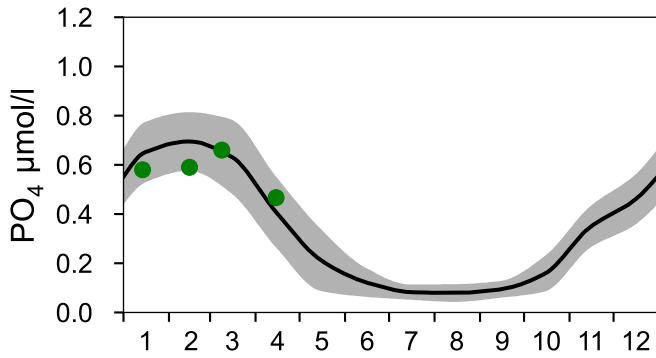
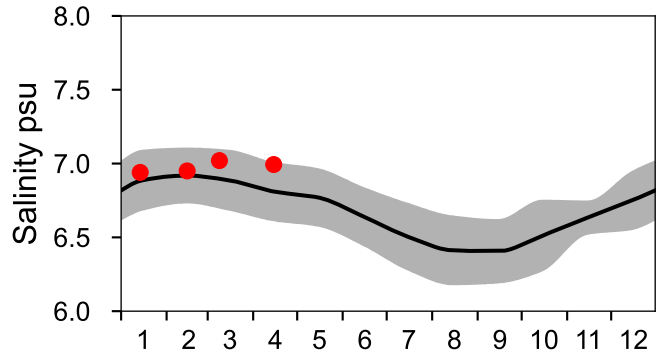
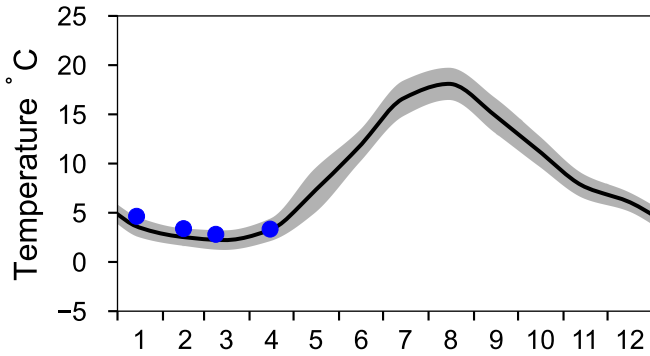
— Mean 1991-2020    ■ St.Dev.    ● 2023-04-15



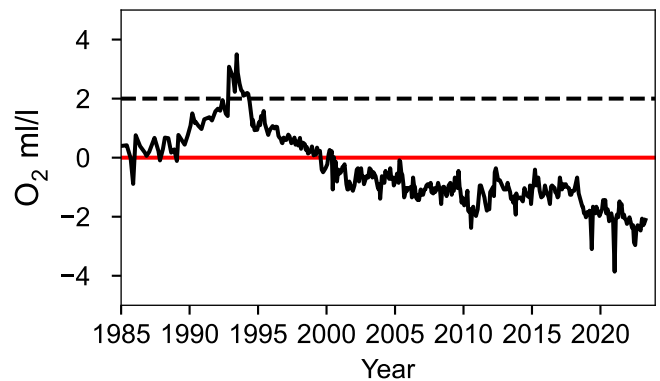
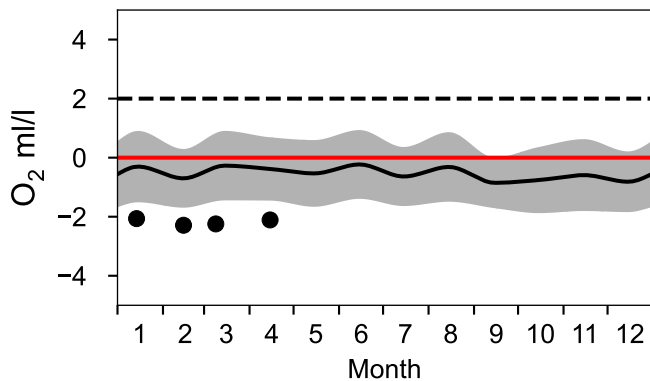
# STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

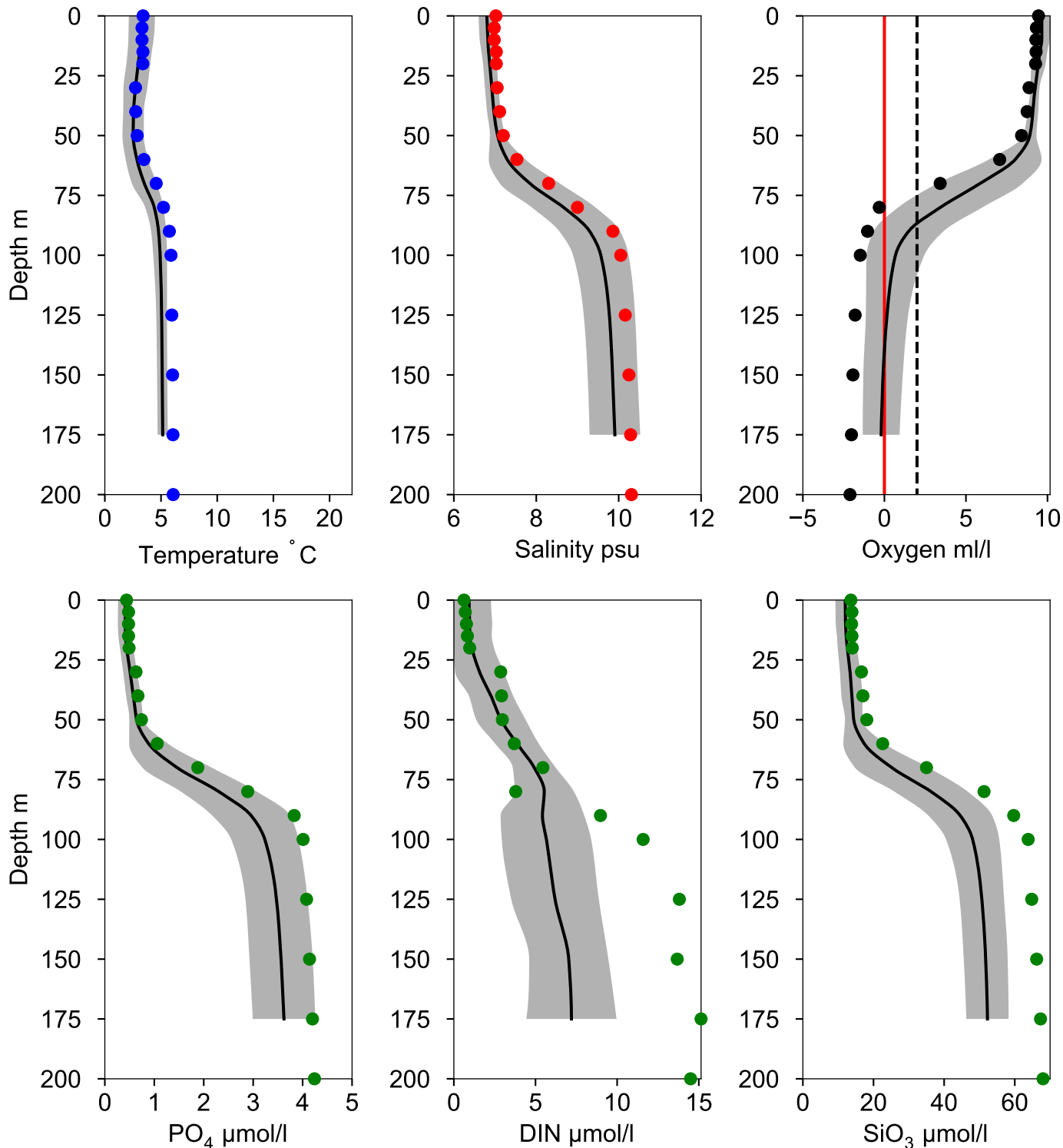


## OXYGEN IN BOTTOM WATER (depth >= 175 m)



# Vertical profiles BY32 NORRKÖPINGSDJ April

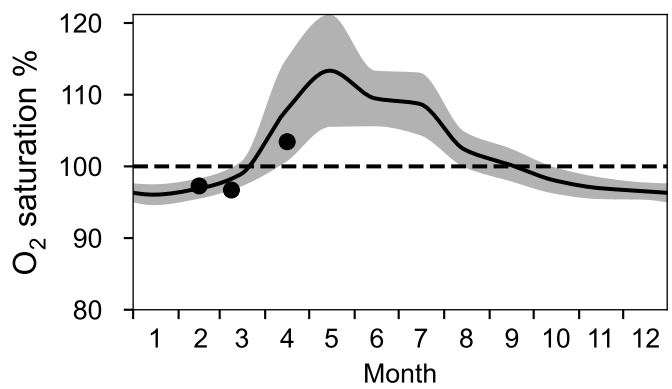
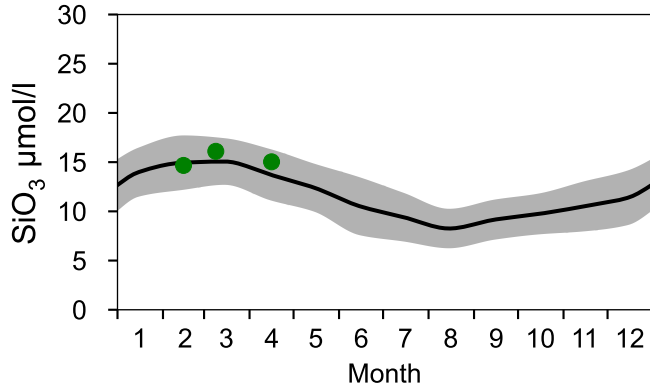
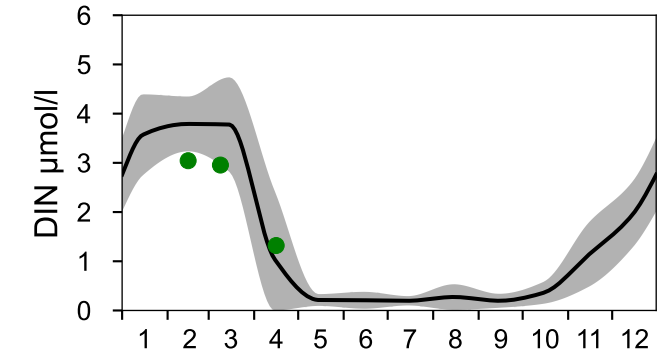
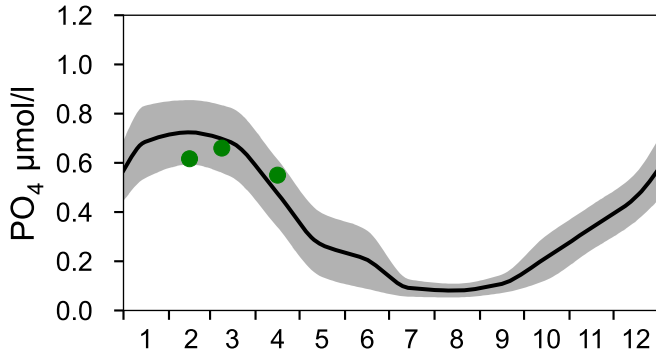
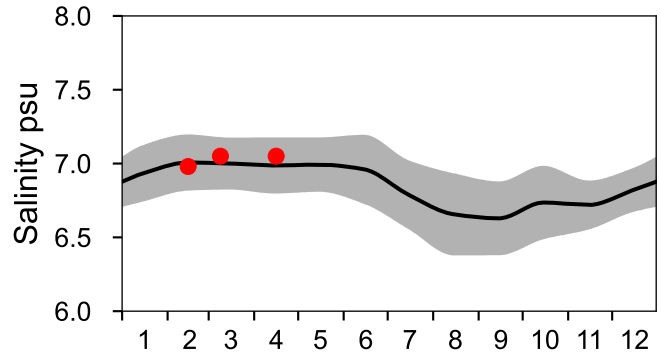
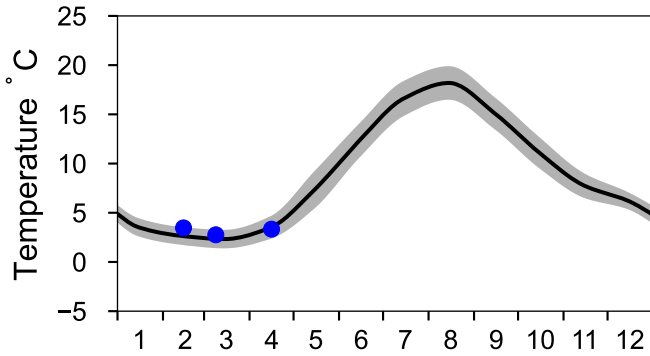
— Mean 1991-2020    ■ St.Dev.    ● 2023-04-15



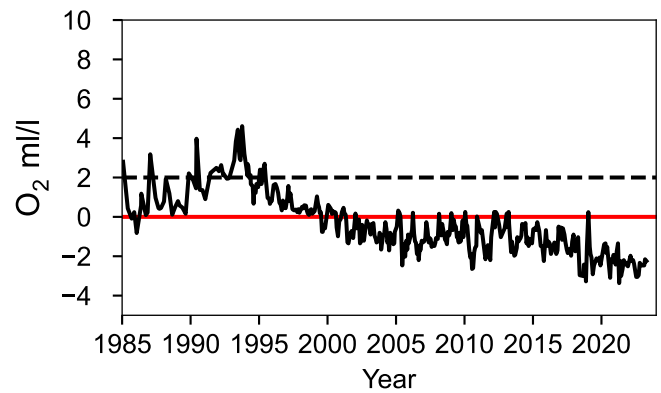
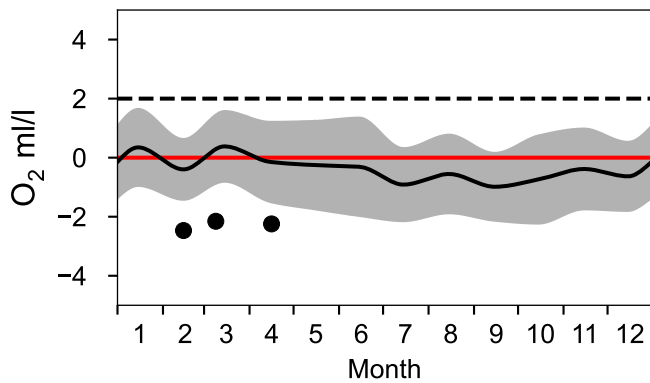
# STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

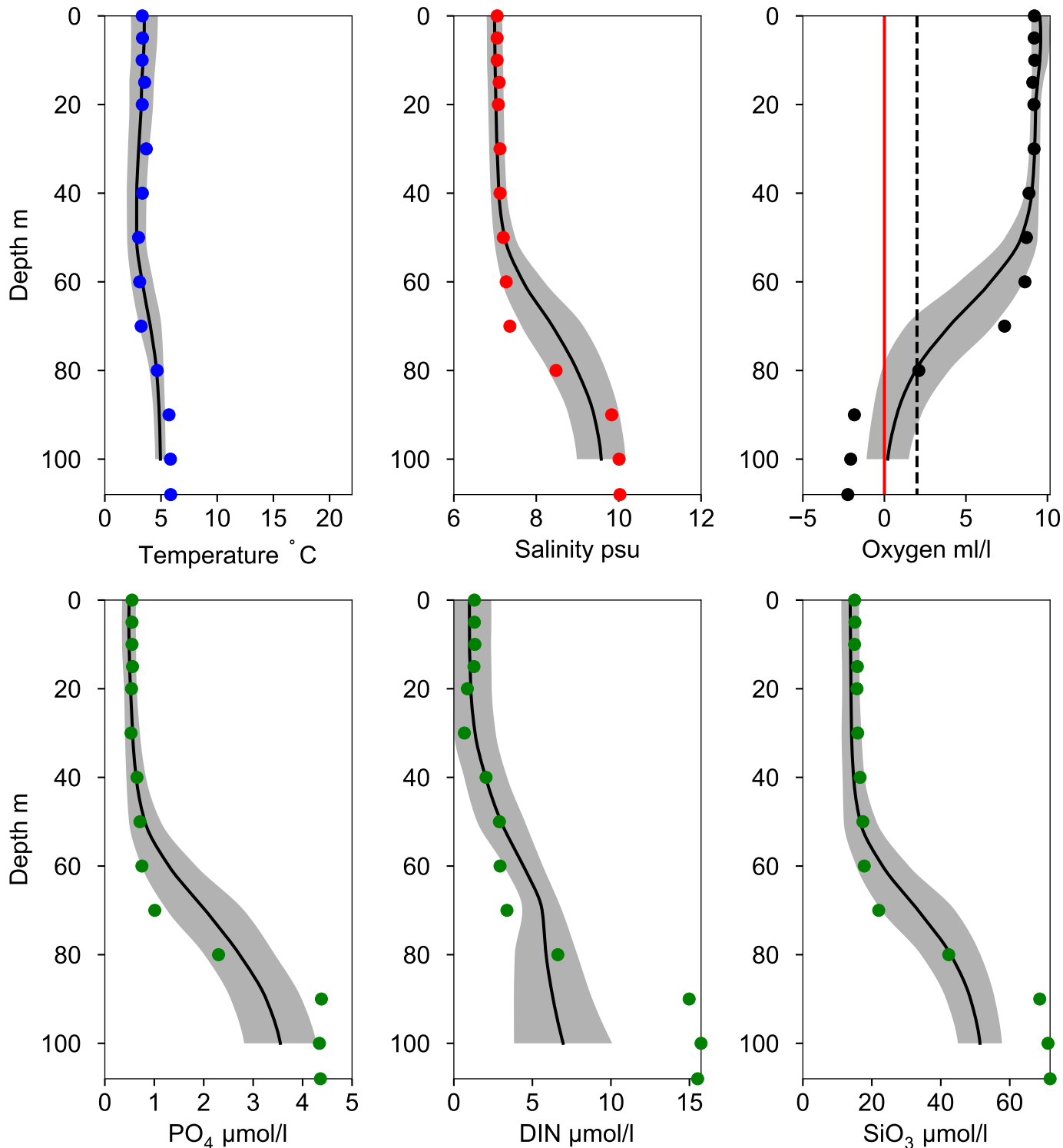


## OXYGEN IN BOTTOM WATER (depth >= 100 m)



# Vertical profiles BY38 KARLSÖDJ April

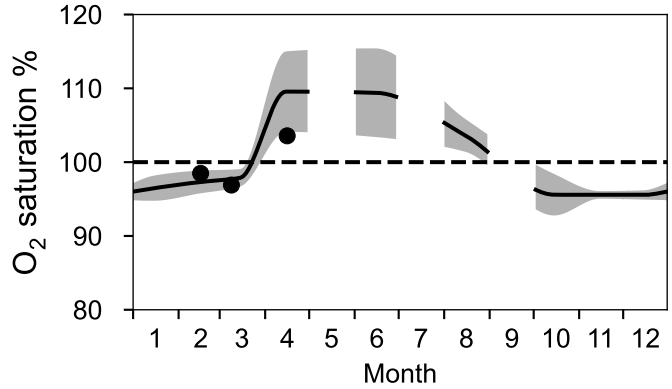
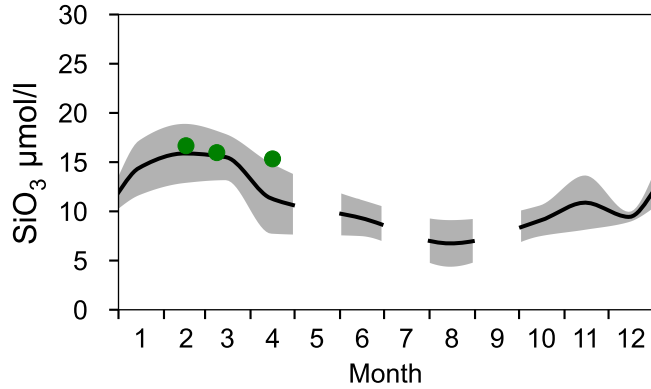
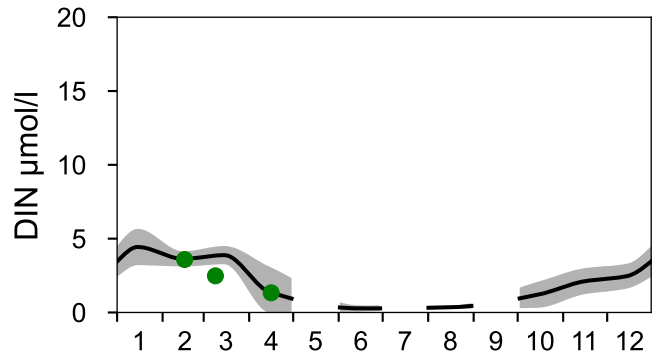
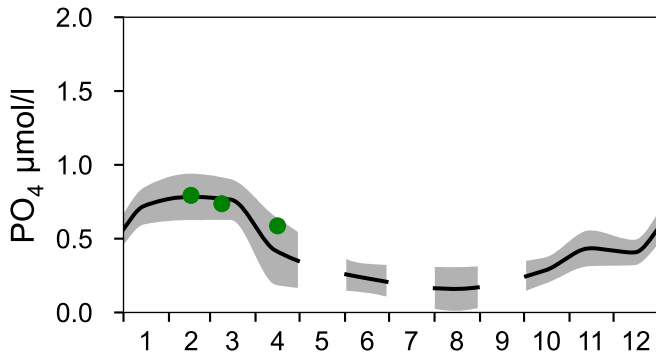
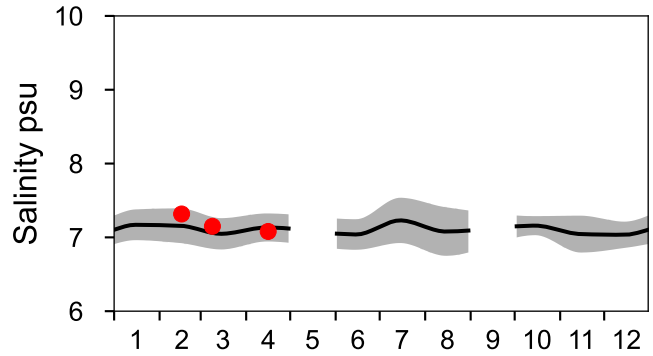
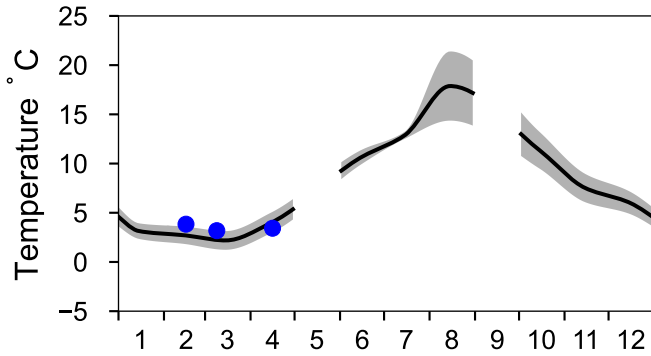
— Mean 1991-2020    St.Dev.    ● 2023-04-16



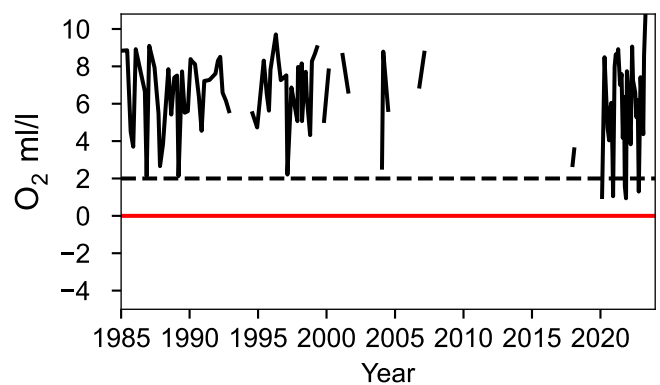
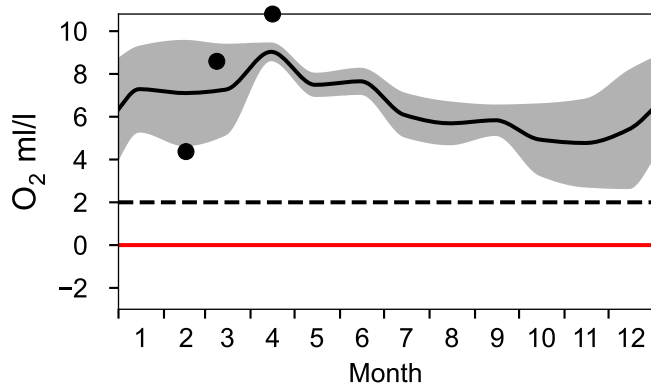
# STATION BY39 ÖLANDS S UDDE SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

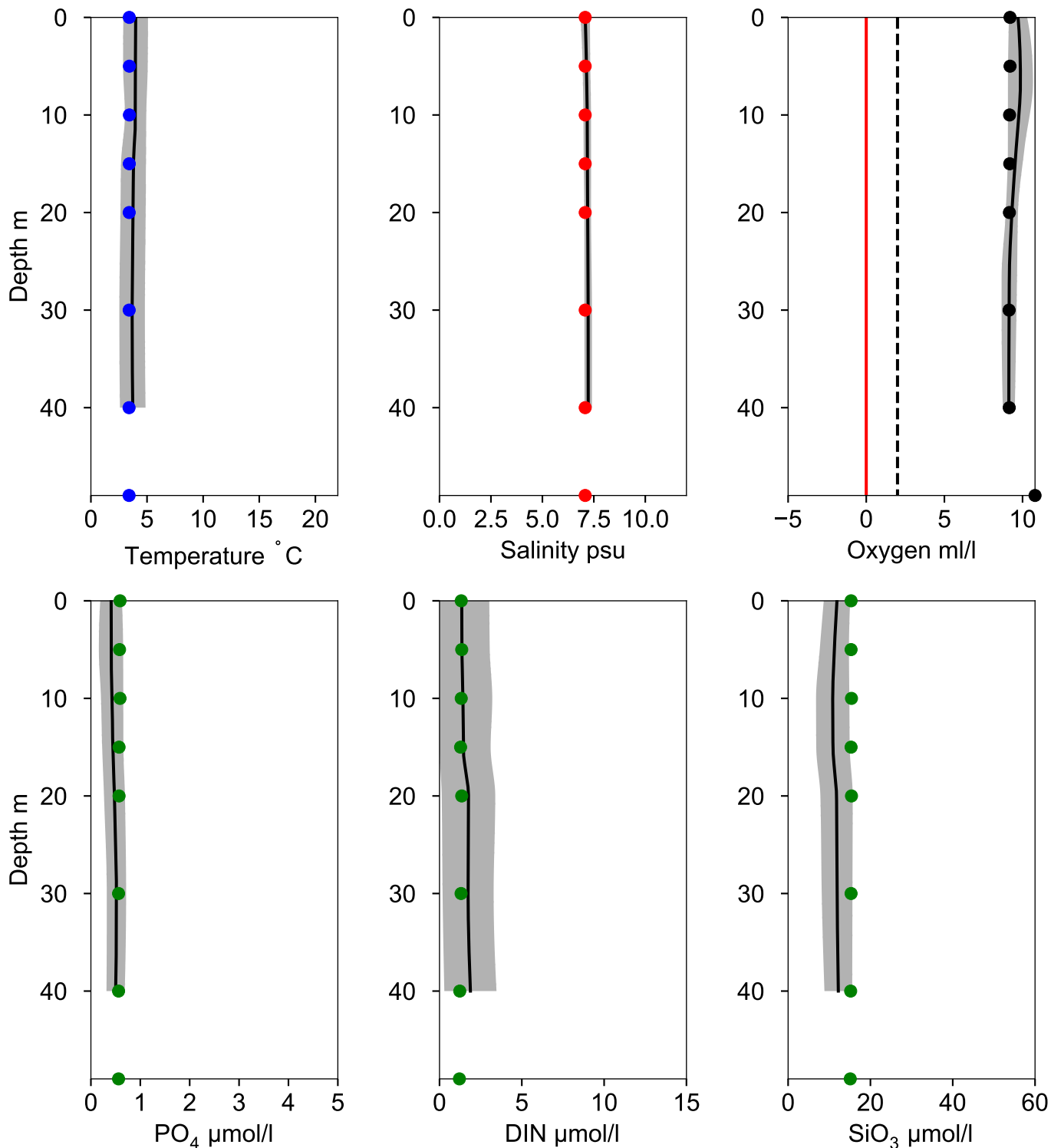


## OXYGEN IN BOTTOM WATER (depth >= 40 m)



# Vertical profiles BY39 ÖLANDS S UDDE April

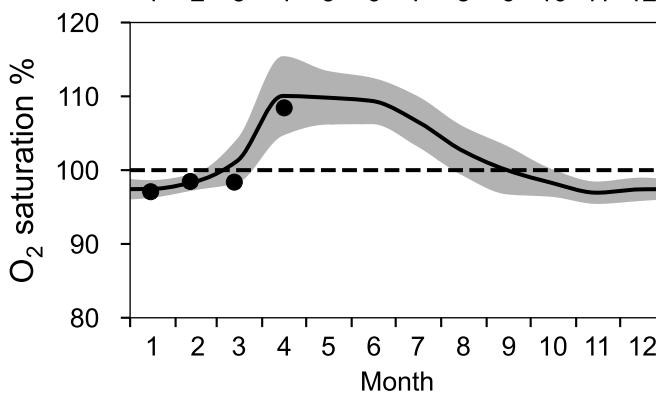
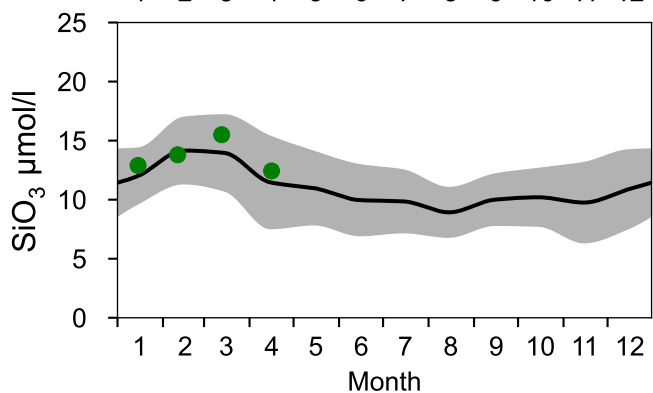
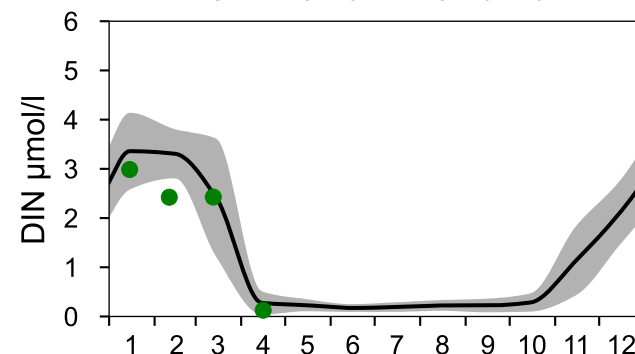
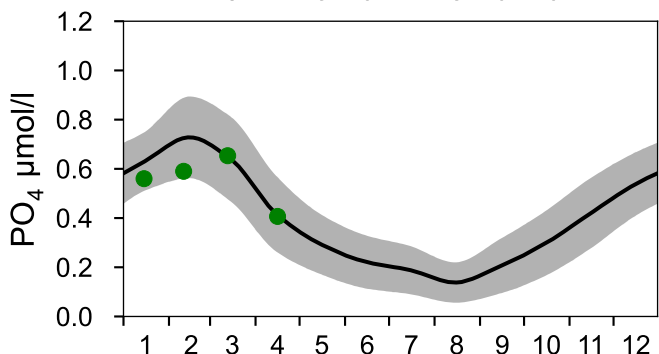
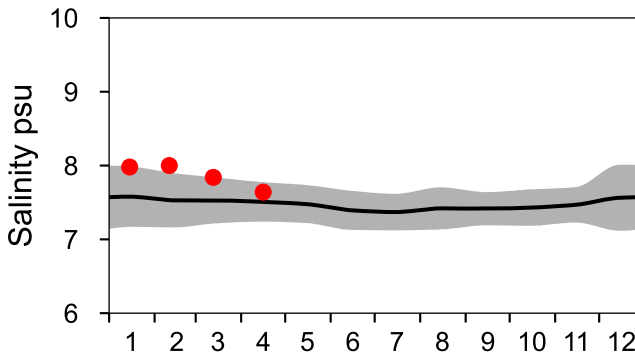
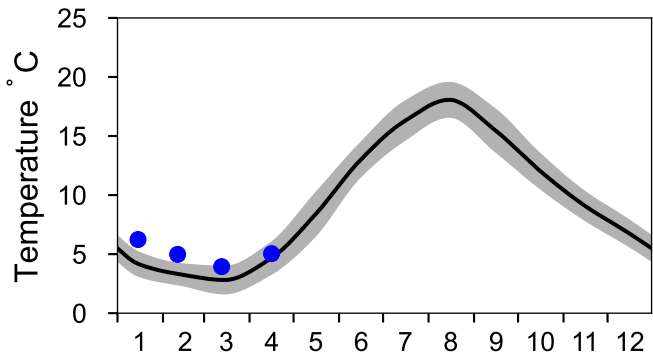
— Mean 1991-2020    St.Dev.    ● 2023-04-16



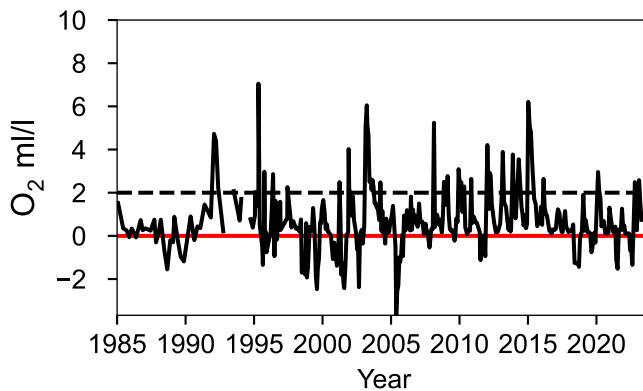
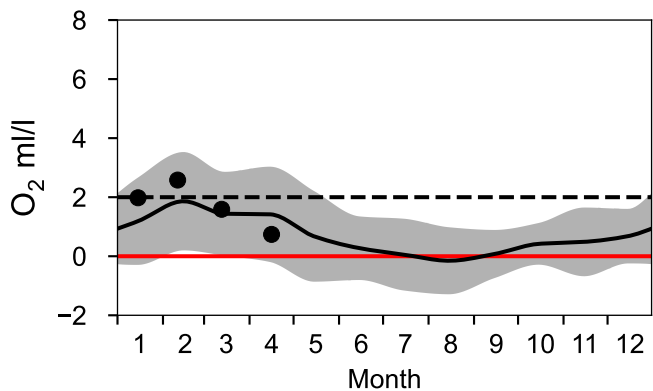
# STATION HANÖBUKTEN SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023

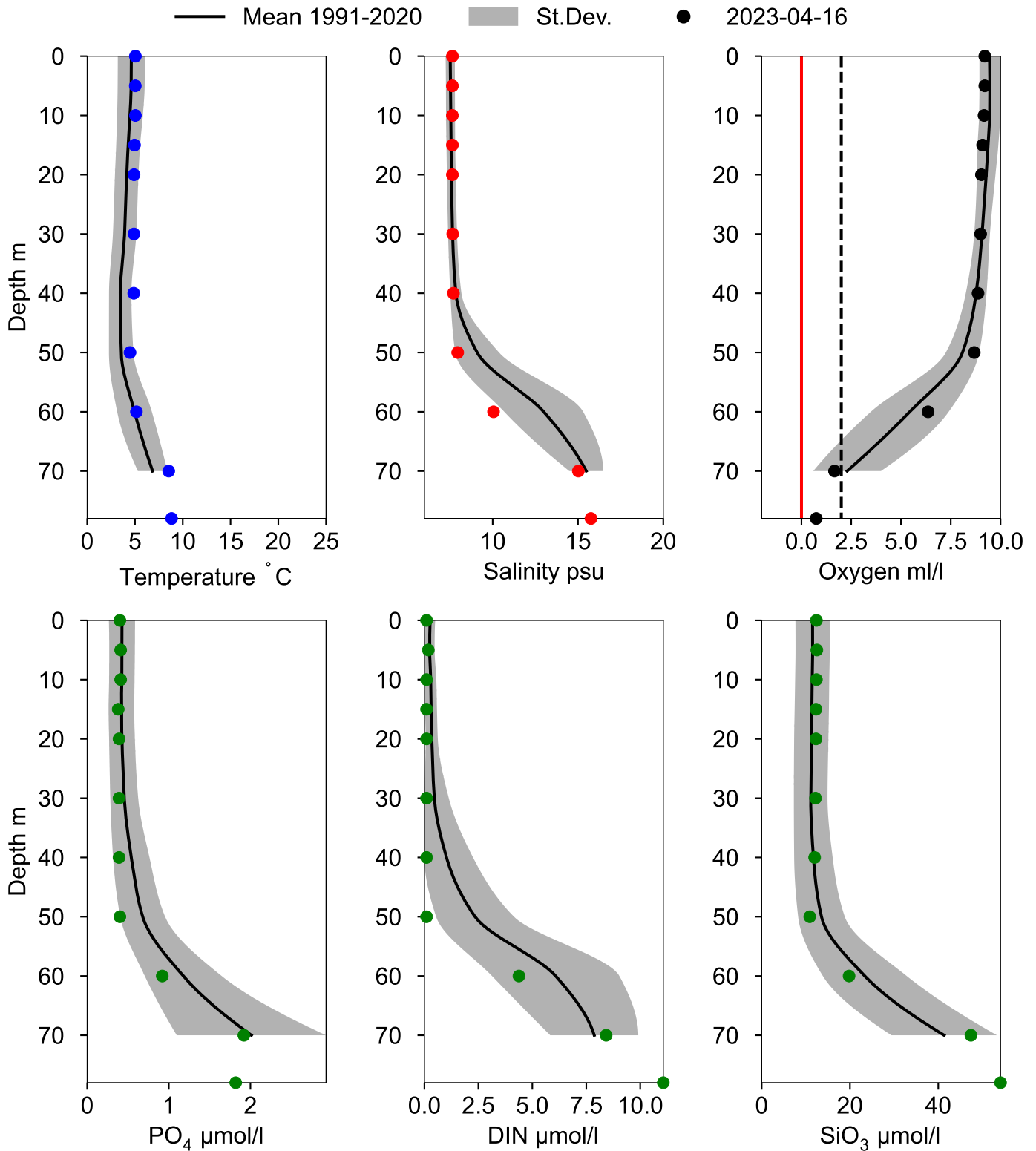


## OXYGEN IN BOTTOM WATER (depth >= 70 m)





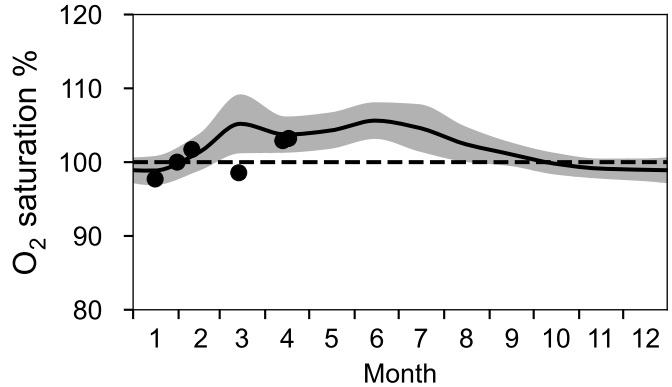
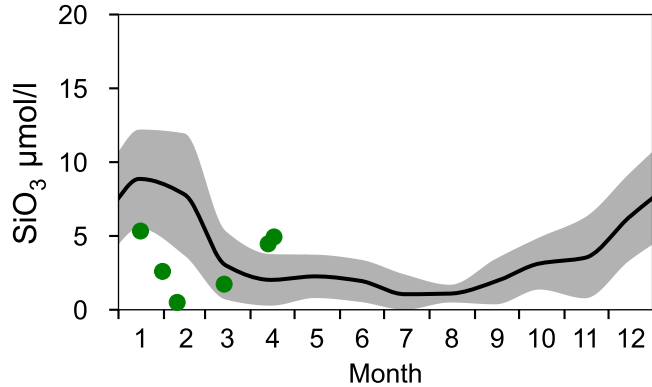
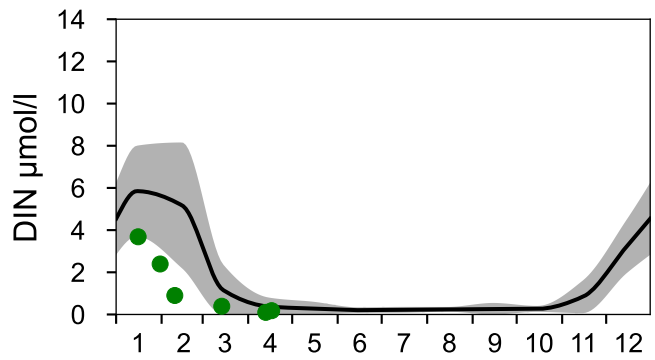
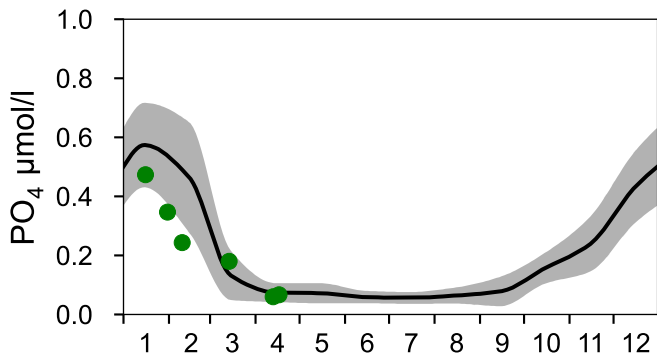
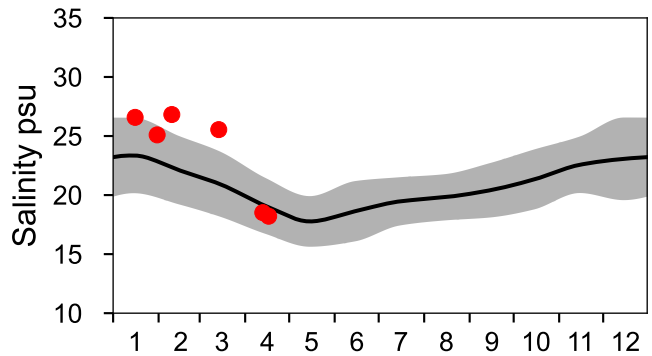
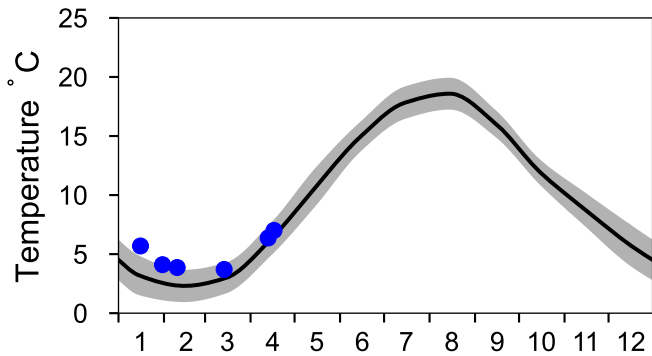
# Vertical profiles HANÖBUKTEN April



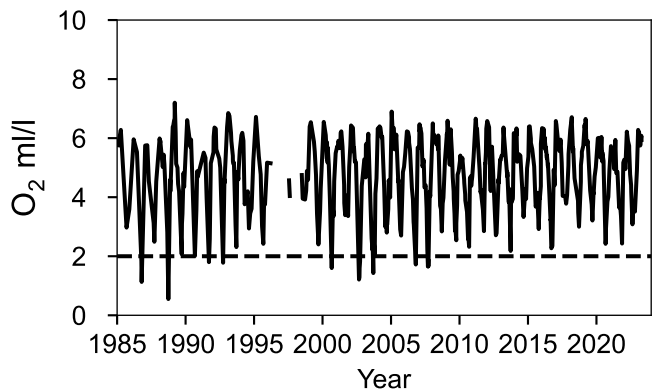
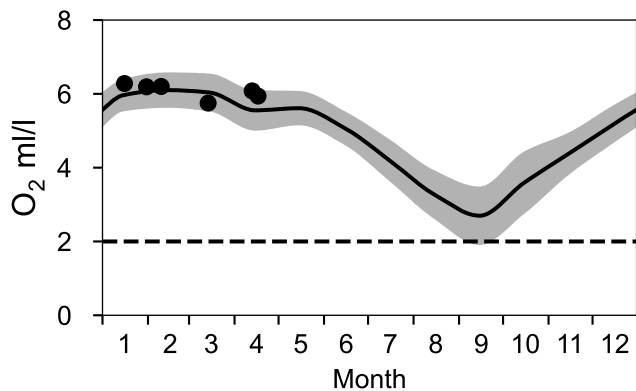
# STATION ANHOLT E SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020    St.Dev.    ● 2023



## OXYGEN IN BOTTOM WATER (depth >= 52 m)



# Vertical profiles ANHOLT E April

