

Report from SMHI's marine monitoring cruise with R/V Svea – November 2024



Photo: Ann-Turi Skjevik, SMHI

Survey period: 2024-11-08 to 2024-11-13

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Cooperation partners: Swedish University of Agricultural Sciences (SLU),
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SUMMARY

During the expedition, which is part of the Swedish pelagic monitoring program, the Skagerrak, the Kattegat, the Sound and the Baltic Proper were visited.

The surface water temperature at most stations was above normal for the month, ranging between 11–12 °C in the Skagerrak and Kattegat and 8–11 °C in the Baltic Proper. The concentration of dissolved inorganic nitrogen (DIN) in the surface water was normal in the Skagerrak and Kattegat but mostly below normal in the Baltic Proper. Phosphate and silicate levels were mostly normal.

The oxygen concentration in the bottom water was normal in the Skagerrak (3.5–5.6 ml/l) but below normal in the Kattegat (3.4–4.2 ml/l). In the Arkona Basin, the oxygen situation in the bottom water was good, with concentrations around 4–5 ml/l. In the Bornholm Basin and Hanö Bight, acute oxygen deficiency (<2 ml/l) was observed from 70 meters depth, and bottom water oxygen concentrations were only 0.1–0.3 ml/l. At station BCS III-10, the oxygen concentration in the bottom water was 1.2 ml/l, which is normal, while at station BY10, the concentration was 0.7 ml/l, which is above normal. In other parts of the Eastern Gotland Basin, hydrogen sulphide was detected from 90 meters depth, and acute oxygen deficiency was observed from 75 meters depth. In the Western Gotland Basin, hydrogen sulphide was detected from 60–80 meters depth, and acute oxygen deficiency occurred from 55–65 meters depth.

The next expedition with R/V Svea is scheduled to start on December 5 in Kalmar, during which nutrient mapping in the Gulf of Bothnia will also be conducted.

RESULTS

The expedition was carried out with the research vessel R/V Svea and started in Lysekil on November 8 and ended in Kalmar on November 13. The weather during the expedition week was cloudy with light winds and air temperatures between 5 and 10 °C.

All 24 regular stations were sampled as planned, and we visited Uppsala University's monitoring station at Östergarnsholm for maintenance. The cruise also included a stop at Huvudskär to recover the remaining parts of the buoy that broke loose in October. A reference measurement at Flinten 7 was conducted en route south through the Sound. Profiles of salinity, temperature, oxygen and fluorescence in the water column were measured with the CTD¹ mounted on a rosette with space for 24 water sampling bottles.

Svea's ferrybox was operating throughout the expedition but without the pCO₂ instrument because of service. Daily, a reference sample was taken from the ferry box for chlorophyll analysis. The instrument for measuring profiles during transit; Moving Vessel Profiler (MVP), was deployed at several transects during the cruise.

This report is based on data that has undergone an initial quality control and which is compared against the monthly average for the period 1991 – 2020. When further quality control has been carried out, some values may change. Values stated in the report have been rounded to the nearest tenth and may therefore differ from published values. The data is published as soon as possible on the data host's website, normally within about a week after the end of the expedition. Some analyses are carried out after the expedition and are therefore published later.

More information about SMHI as a data host and to download data see this link (in Swedish):

<https://www.smhi.se/data/oceanografi/datavardskap-oceanografi-och-marinbiologi>

The cruise reports are published here:

<https://www.smhi.se/en/publications/publications/cruise-reports-from-the-marine-monitoring>

More information about the algae situation can be found in the Algaware report:

<https://www.smhi.se/publikationer/publikationer/algrapporter>

¹ CTD; short for Conductivity, Temperature, Depth.

The Skagerrak

The surface water temperature was around 11–12 °C, slightly warmer than normal near the coast. Surface salinity in the Skagerrak was normal, ranging from 32 psu offshore to 28 psu closer to the coast. At the westernmost point of the Å-transect, at station Å17, the thermocline and halocline coincided at 10 meters. Below this, the water was slightly warmer down to 30 meters, where another stratification layer was observed, and the water was colder. The salinity reached a maximum of 35 psu in the deep water, and the lowest temperature recorded was 7.5 °C. Closer to the coast, the stratification was slightly deeper at 20 and 50 meters, respectively.

The concentration of dissolved inorganic nutrients in the surface water had increased since October and was normal for the season, except at station Å15, where dissolved inorganic nitrogen (DIN) and silicate levels were lower than normal. DIN concentrations ranged from 0.8 to 2.6 µmol/l, silicate from 1.4 to 6.7 µmol/l, and phosphate from 0.1 to 0.4 µmol/l.

The oxygen situation near the bottom had improved since October and was generally good at all stations in the Skagerrak. Normal levels for the month were measured, with concentrations ranging from 3.5 to 5.6 ml/l. The lowest oxygen concentration was recorded at station Släggö.

Fluorescence measurements showed the highest values between 0–10 meters at stations Å17 and Släggö, with no significant peaks observed.

The Kattegat and the Sound

In the Kattegat and the Sound, surface temperatures were above normal at all stations, around 11 °C. Surface salinity was normal in the Kattegat, ranging from 22.7 to 27.5 psu. In the Sound, the surface salinity was 8.9 psu, which is lower than normal. In the Kattegat, the halocline and thermocline were located around 10–25 meters, with the warmest water at 14 °C near 25 meters. Deep water salinity in the Kattegat reached a maximum of 34.5 psu, with a temperature of approximately 12 °C. In the Sound, the thermocline and halocline coincided at depths of around 10–20 meters.

The concentration of dissolved inorganic nutrients in surface water varied across the region. In the Kattegat, concentrations had slightly increased since October and were generally normal, except at Fladen, where silicate concentration was 7 µmol/l, above normal levels. At other stations, silicate ranged between 2.4 and 3.3 µmol/l. DIN ranged from 0.1 to 1.1 µmol/l, and phosphate ranged from 0.2 to 0.3 µmol/l. In the Sound, nutrient concentrations had decreased since October. Phosphate levels were normal at 0.4 µmol/l, silicate was also normal at 10.8 µmol/l, while DIN was below normal at 1.3 µmol/l.

Oxygen levels in the bottom water of the Kattegat had decreased slightly since October and were now below normal, ranging from 3.4 to 4.2 ml/l. In the Sound, oxygen levels were normal but lowest in the area, at 3 ml/l.

Chlorophyll fluorescence was highest between 0 and 10 meters.

The Baltic Proper

The surface water temperature was warmer than normal at all stations except BY31 and BY38 in the Western Gotland Basin, where it was normal. Temperatures ranged from 8 °C in the Western Gotland Basin to 11 °C in other areas. Surface salinity ranged between 6.9–8.0 psu and was normal at most stations, except in the Western Gotland Basin, where it was above normal. In the Arkona Basin, a thermocline and halocline were observed between 15–30 meters, with warmer and saltier water in this layer. At around 30 meters, another stratification in both salinity and temperature was observed, with the water becoming even warmer and saltier below. In the Bornholm Basin, the water was well mixed down to 35 meters, where the thermocline and halocline coincided. At 40 meters, the temperature was around 6 °C, increasing steadily to approximately 12 °C at 75 meters. In the Eastern and Western Gotland Basins, halocline and thermocline were observed at around 40–50 meters. In the Western Gotland Basin, there was also a shallower thermocline and halocline at around 10 meters depth.

The concentrations of dissolved inorganic nutrients in surface water varied from below to above normal in the Baltic Proper. DIN concentrations were below normal and near detection limits in the Arkona and Bornholm Basins (0.1–0.15 µmol/l). In the Western Gotland Basin, DIN was higher but still below normal (0.16–0.94 µmol/l). In the Eastern Gotland Basin, DIN ranged from normal to above normal levels (0.74–1.86 µmol/l). Phosphate and silicate concentrations were mostly normal, ranging around 0.2–0.3 µmol/l and 7–11 µmol/l, respectively. At BY31 and BY39, both phosphate and silicate were above normal at approximately 0.6 and 14 µmol/l, respectively.

In the Arkona Basin, bottom water oxygen levels were good, with concentrations around 4–5 ml/l. In the Bornholm Basin and Hanö Bight, acute oxygen deficiency (<2 ml/l) was observed from 70 meters, and oxygen concentrations in the bottom water was only 0.1–0.3 ml/l. At station BCS III-10, the bottom water oxygen concentration was 1.2 ml/l, which is normal, while at station BY10, the concentration was 0.7 ml/l, above normal. In other parts of the Eastern Gotland Basin, hydrogen sulphide was detected from 90 meters, with acute oxygen deficiency from 75 meters. In the Western Gotland Basin, hydrogen sulphide was detected between 60–80 meters, and acute oxygen deficiency occurred between 55–65 meters. The highest hydrogen sulphide levels were recorded in the Eastern Gotland Basin at BY15 (Gotland Deep).

Fluorescence measurements indicated plankton activity in the surface layer, particularly in the Arkona Basin.

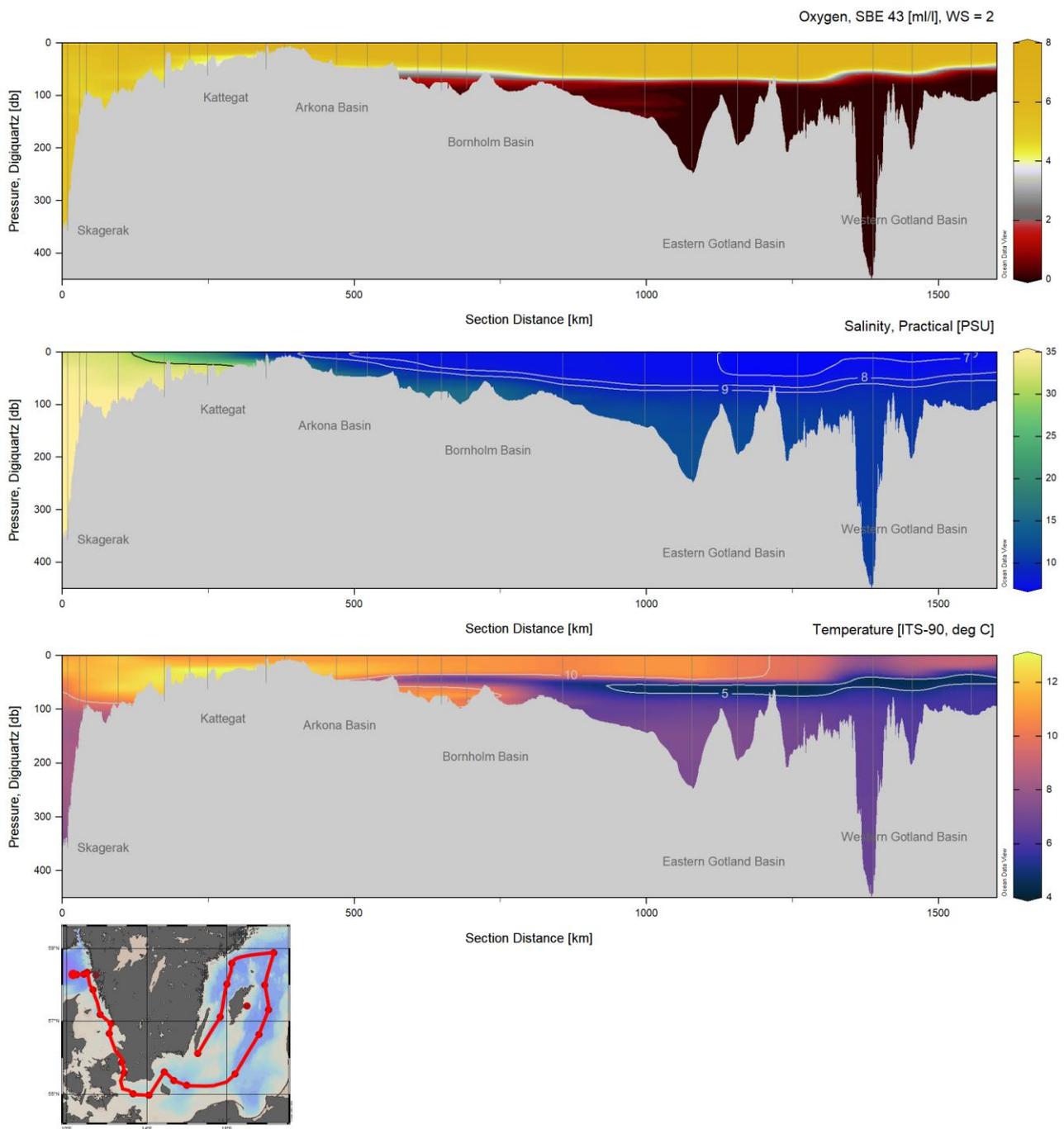


Figure 1. Cross section showing oxygen concentration, salinity and temperature from measurements with CTD, from the Skagerrak, through the Kattegat and further into the Baltic Proper, also shown in the map (bottom).

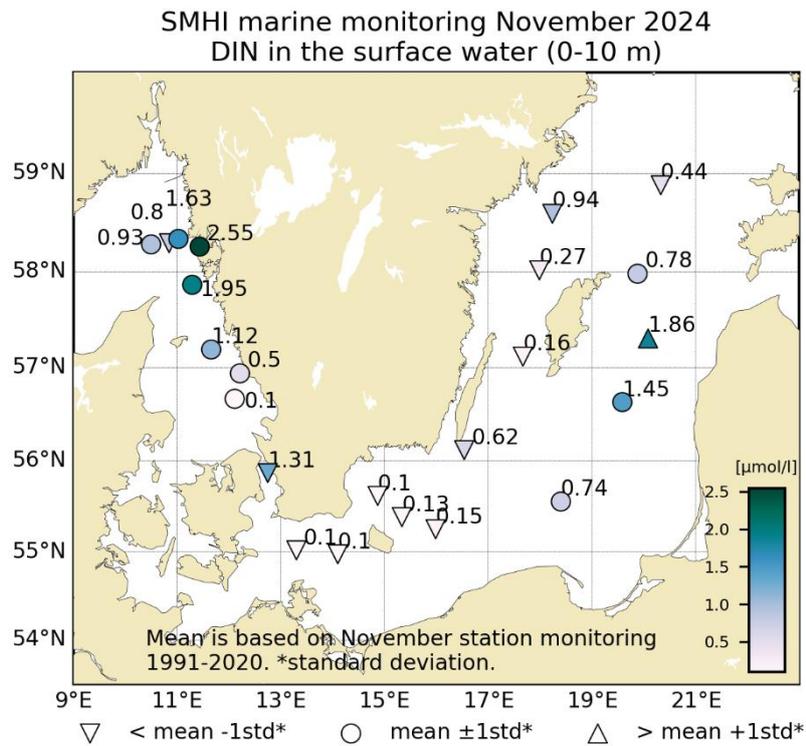


Figure 2. The concentration ($\mu\text{mol/l}$) of inorganic nitrogen (DIN) in the surface water (0 – 10 m). The mean value is based on data for the month at each station during the years 1991 – 2020.

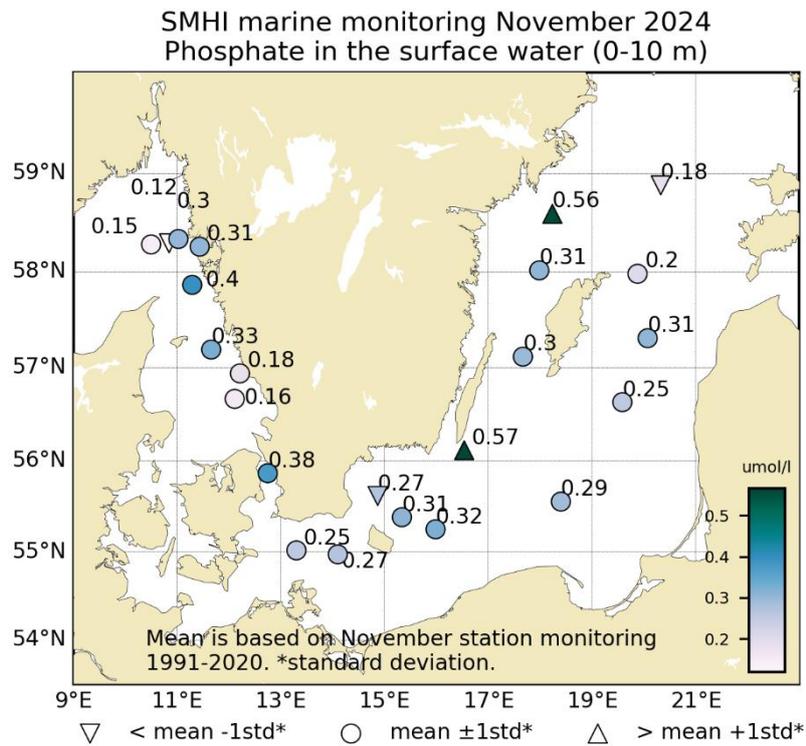


Figure 3. The concentration ($\mu\text{mol/l}$) of phosphate in the surface water (0 – 10 m). The mean value is based on data for the month at each station during the years 1991 – 2020.

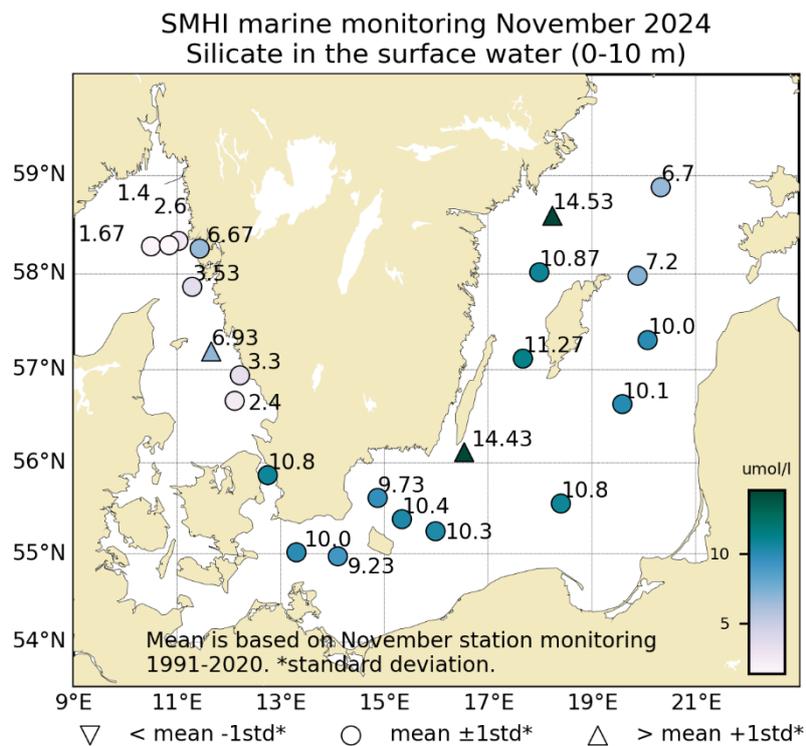


Figure 4. The concentration ($\mu\text{mol/l}$) of silicate in the surface water (0 – 10 m). The mean value is based on data for the month at each station during the years 1991 – 2020.

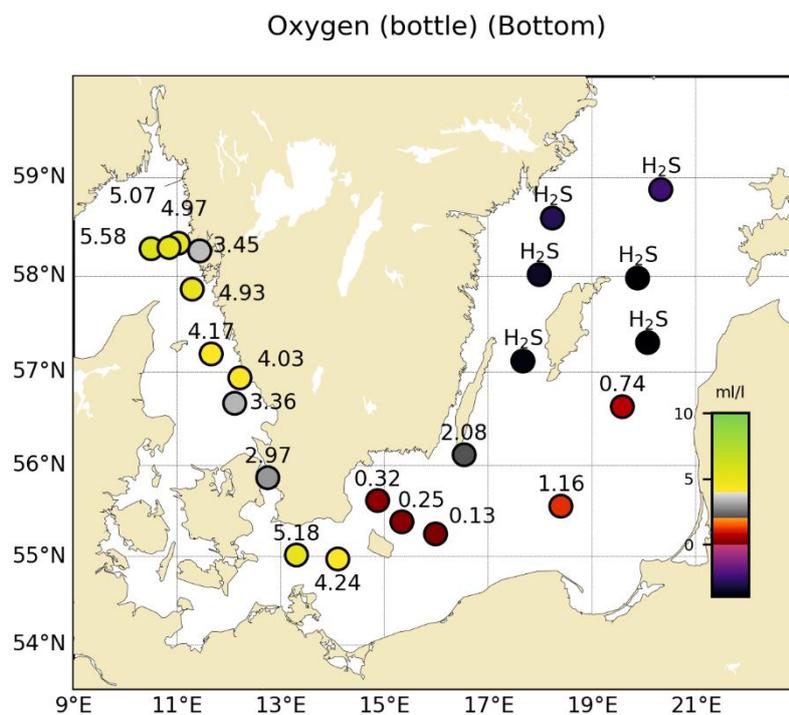


Figure 5. Dissolved oxygen concentration (ml/l) in the bottom water, approx. one meter above the seafloor. Presence of hydrogen sulphide is shown as H_2S . Note that the values have not been compared to statistics as in similar figures and only circles are shown.

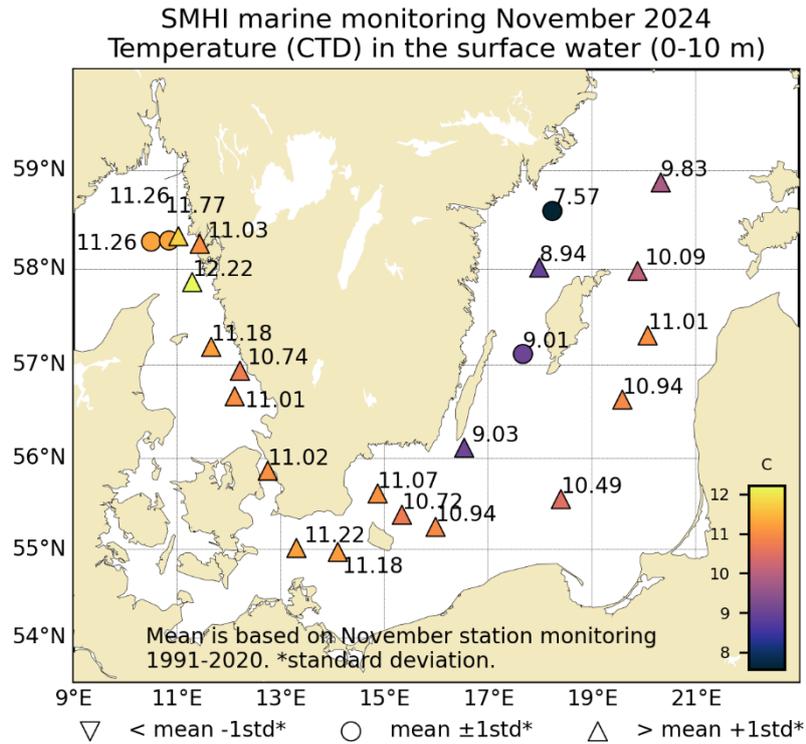


Figure 6. The temperature in the surface water (0 – 10 m). The mean value is based on data for the month at each station during the years 1991 – 2020.

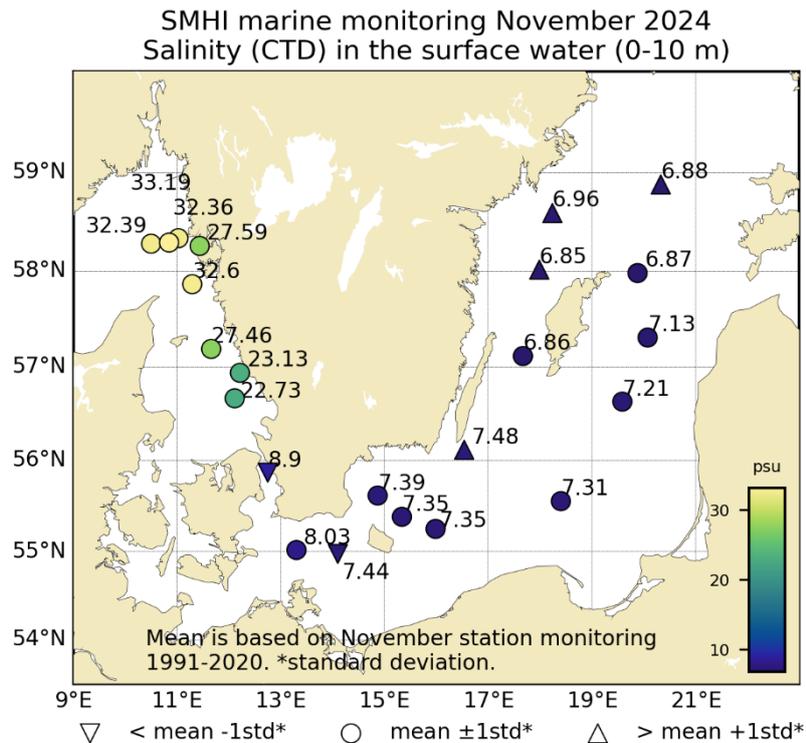


Figure 7. The salinity in the surface water (0 – 10 m). The mean value is based on data for the month at each station during the years 1991 – 2020.

PARTICIPANTS

Name	Role	From
Madeleine Nilsson	Chief Scientist, Water sampling	SMHI
Johan Kronsell	Water sampling	SMHI
Ann-Turi Skjevik	CTD operator	SMHI
Daniel Bergman-Sjöstrand	CTD operator	SMHI
Sara Johansson	Nutrient analysis, Quality manager	SMHI

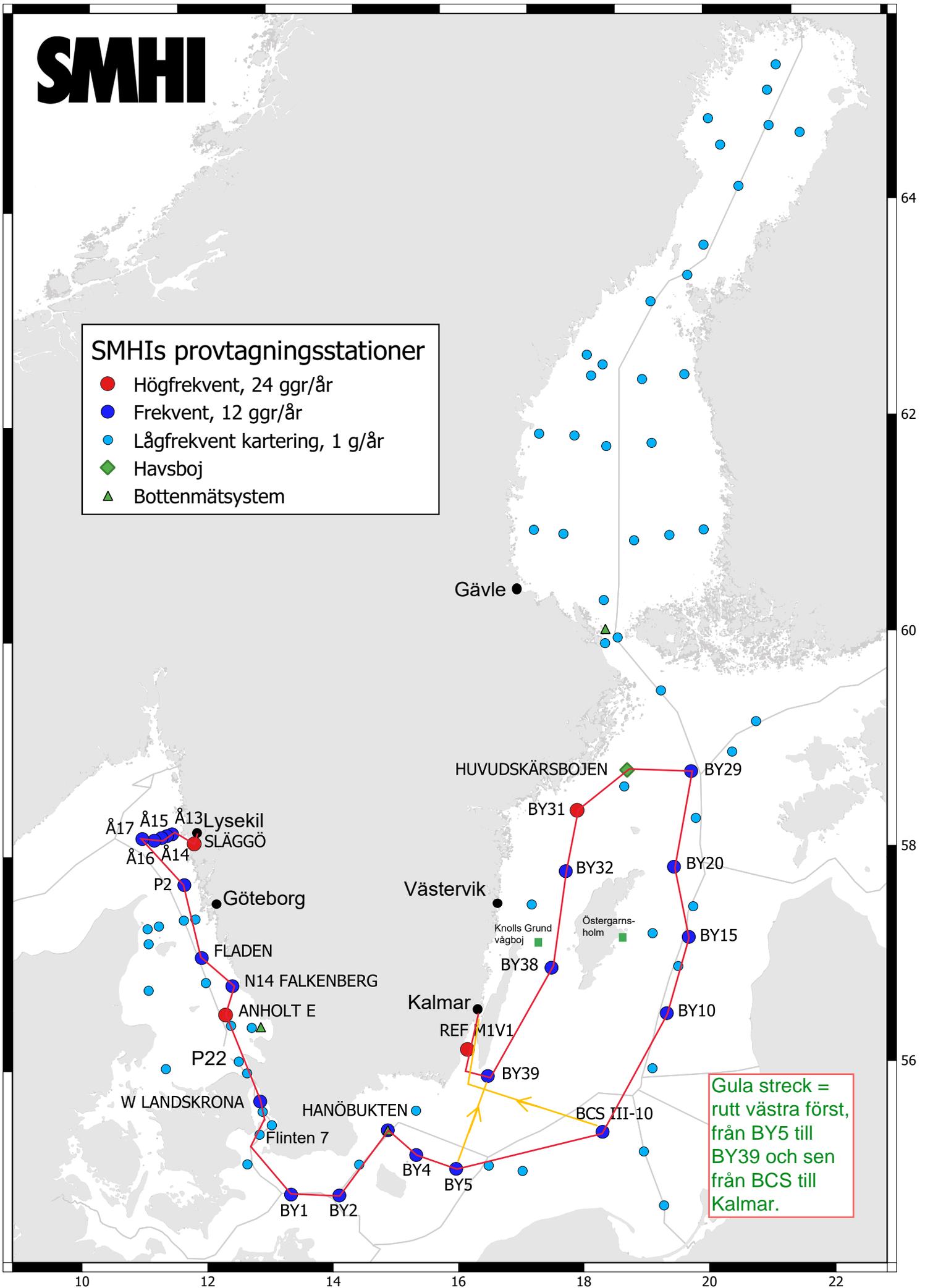
APPENDICES

- Track chart
- Table with stations, analysed parameters and number of sampling depths
- Monthly average plots for surface water
- Vertical profiles



SMHI:s provtagningsstationer

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

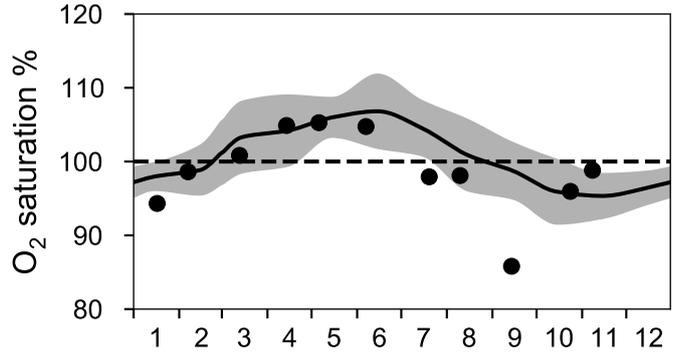
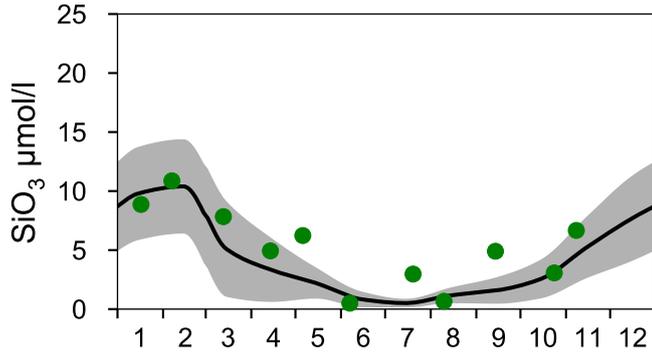
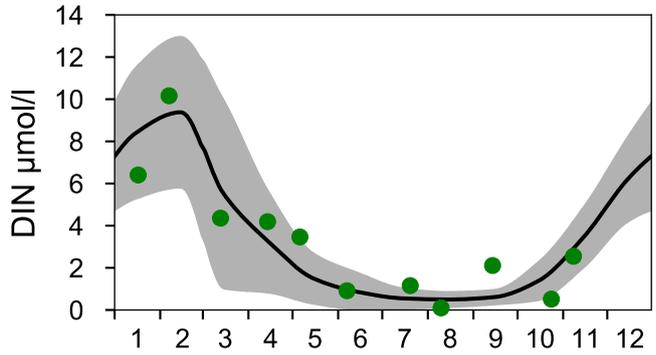
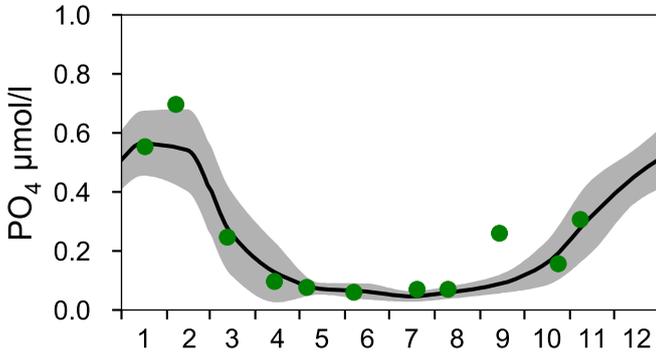
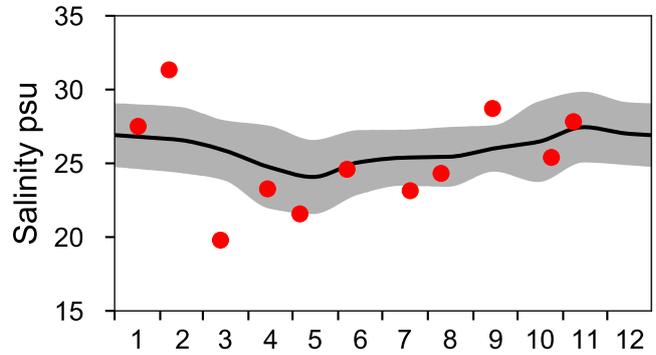
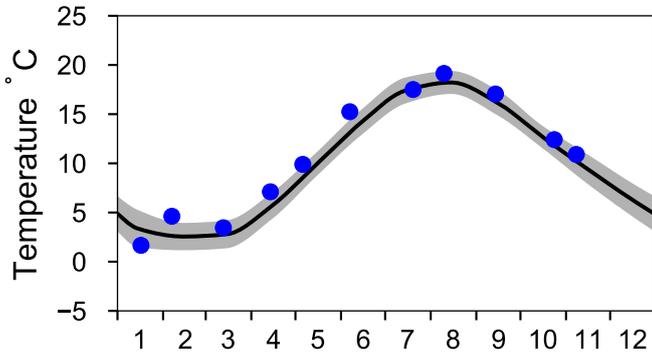


Gula streck =
rutt västra först,
från BY5 till
BY39 och sen
från BCS till
Kalmar.

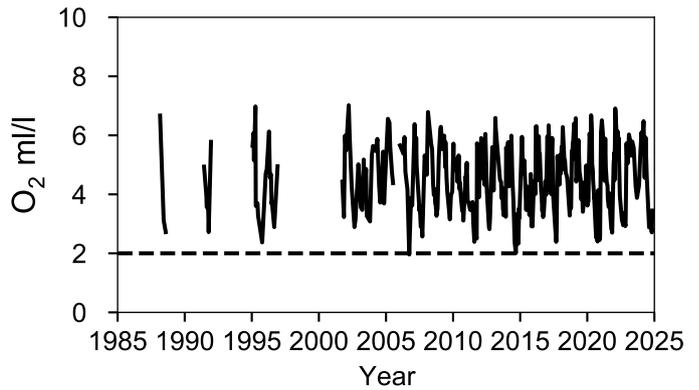
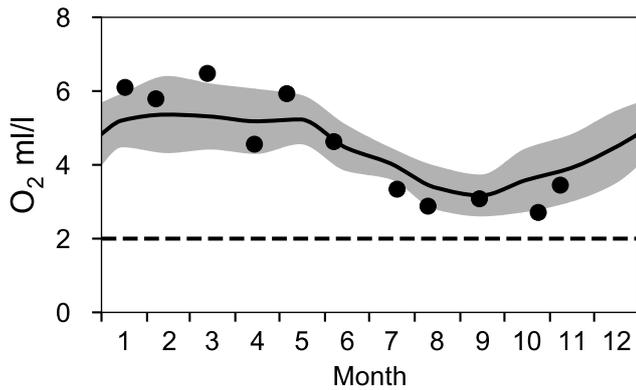
STATION SLÄGGÖ SURFACE WATER (0-10 m)

Annual Cycles

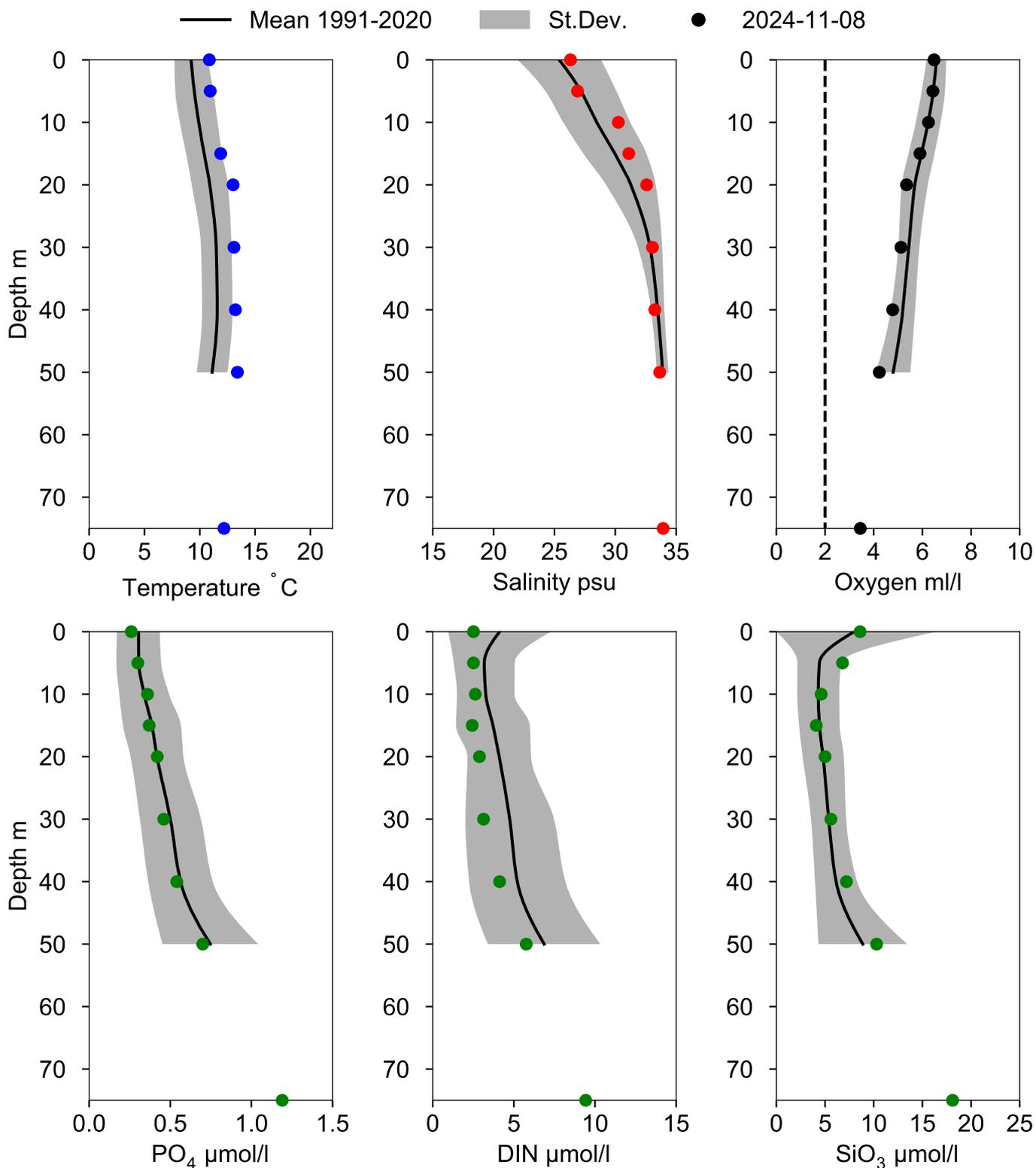
— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 64 m)



Vertical profiles SLÄGGÖ November



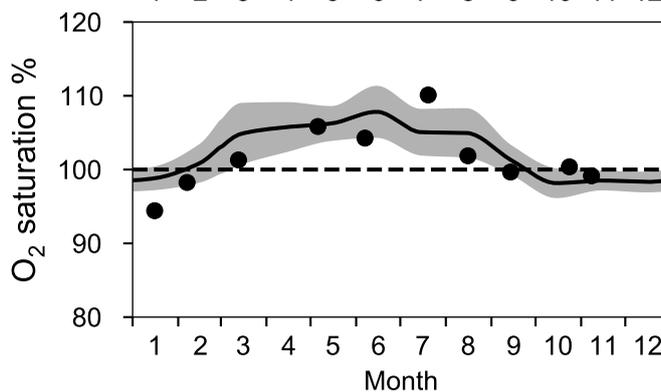
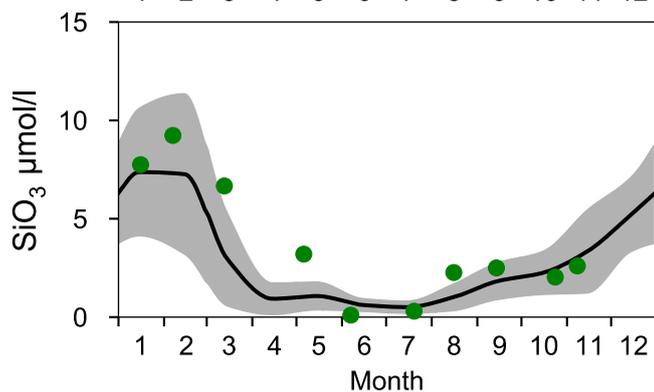
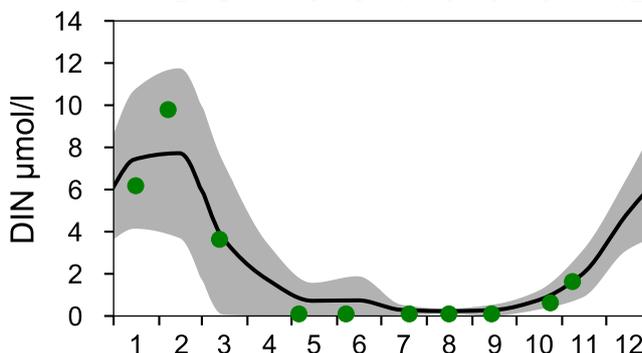
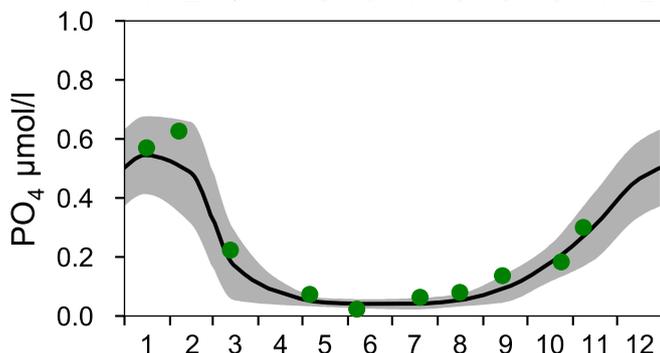
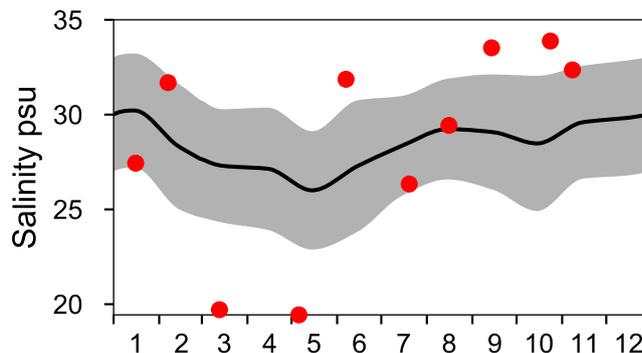
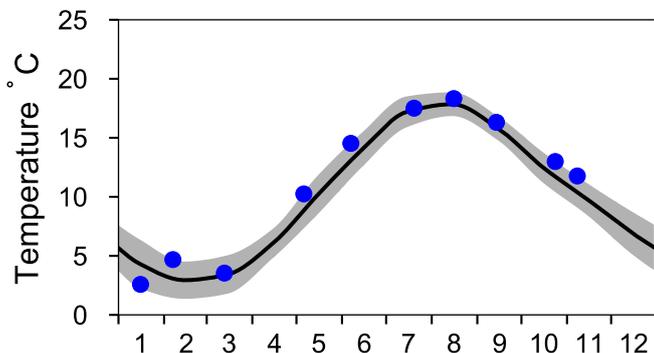
STATION Å13 SURFACE WATER (0-10 m)

Annual Cycles

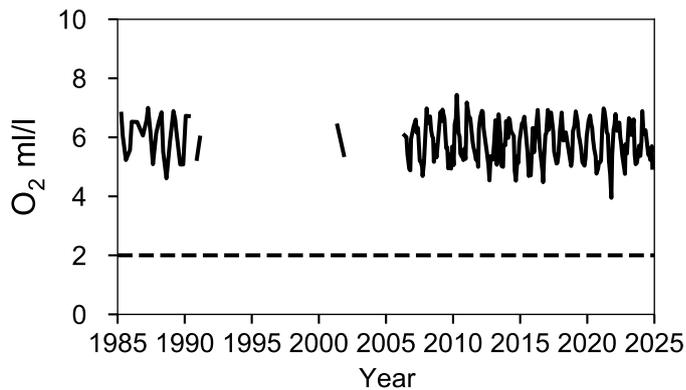
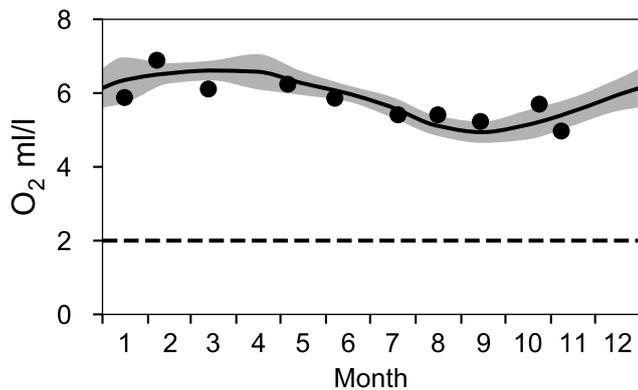
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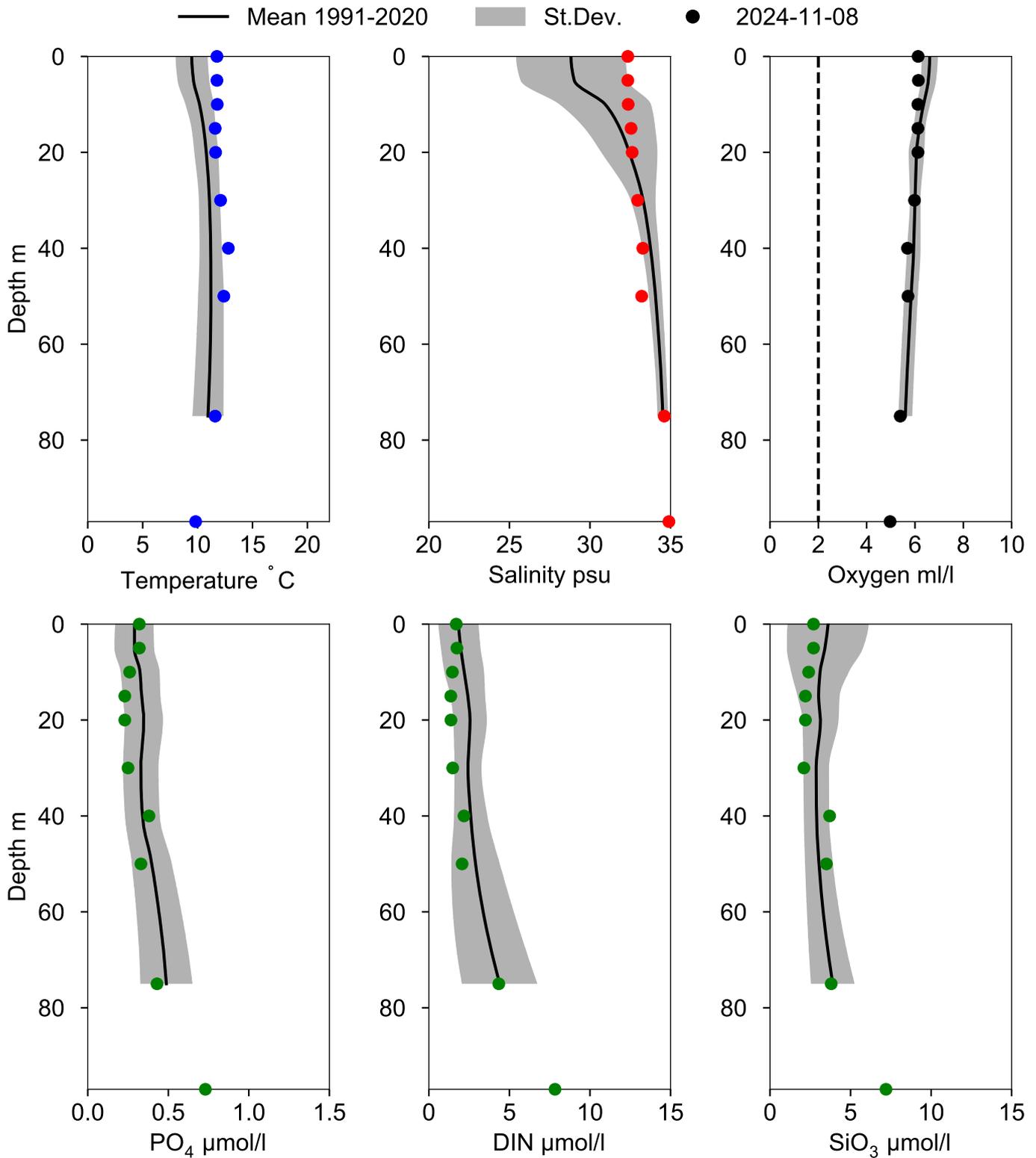
● 2024



OXYGEN IN BOTTOM WATER (depth >= 82 m)



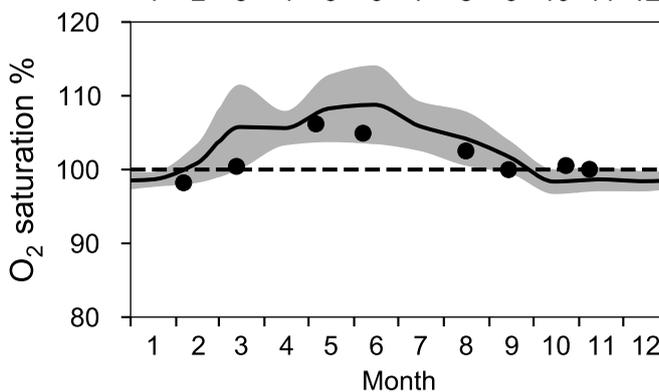
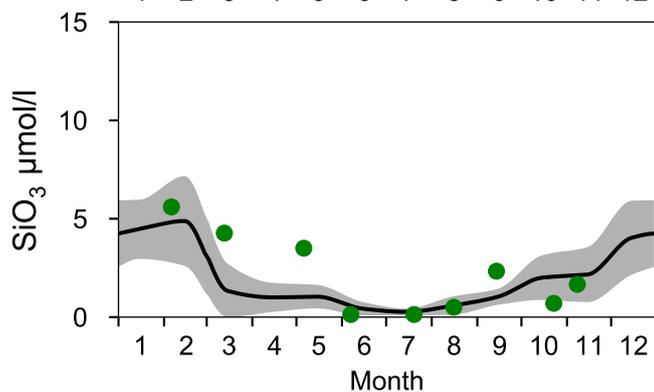
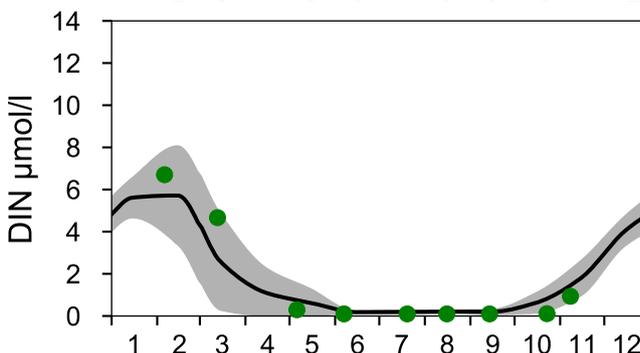
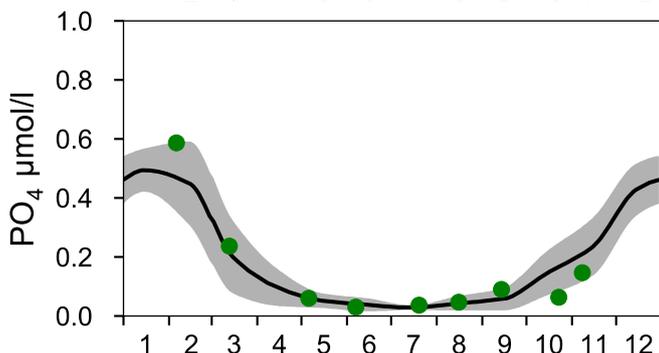
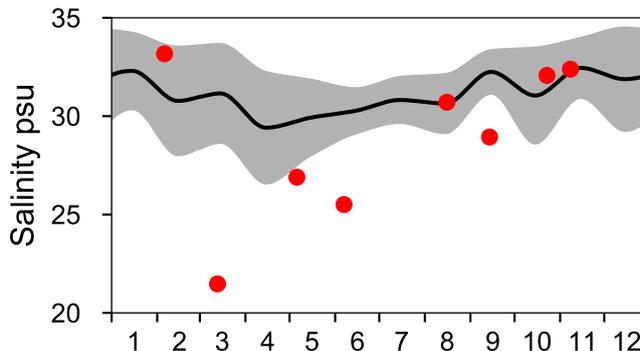
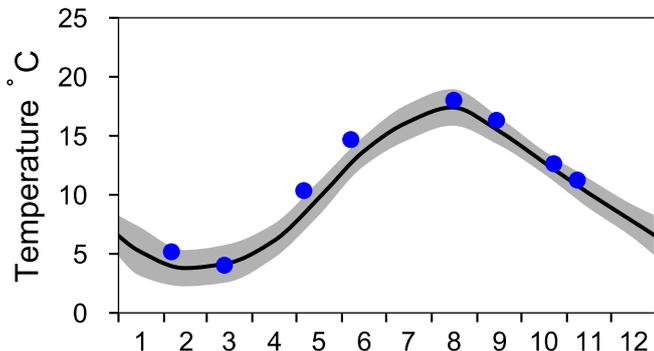
Vertical profiles A13 November



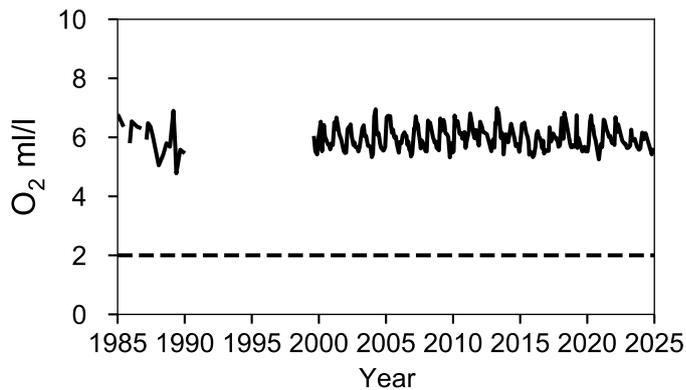
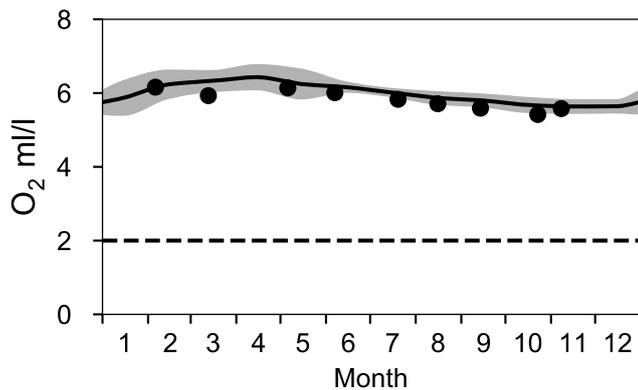
STATION A17 SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024

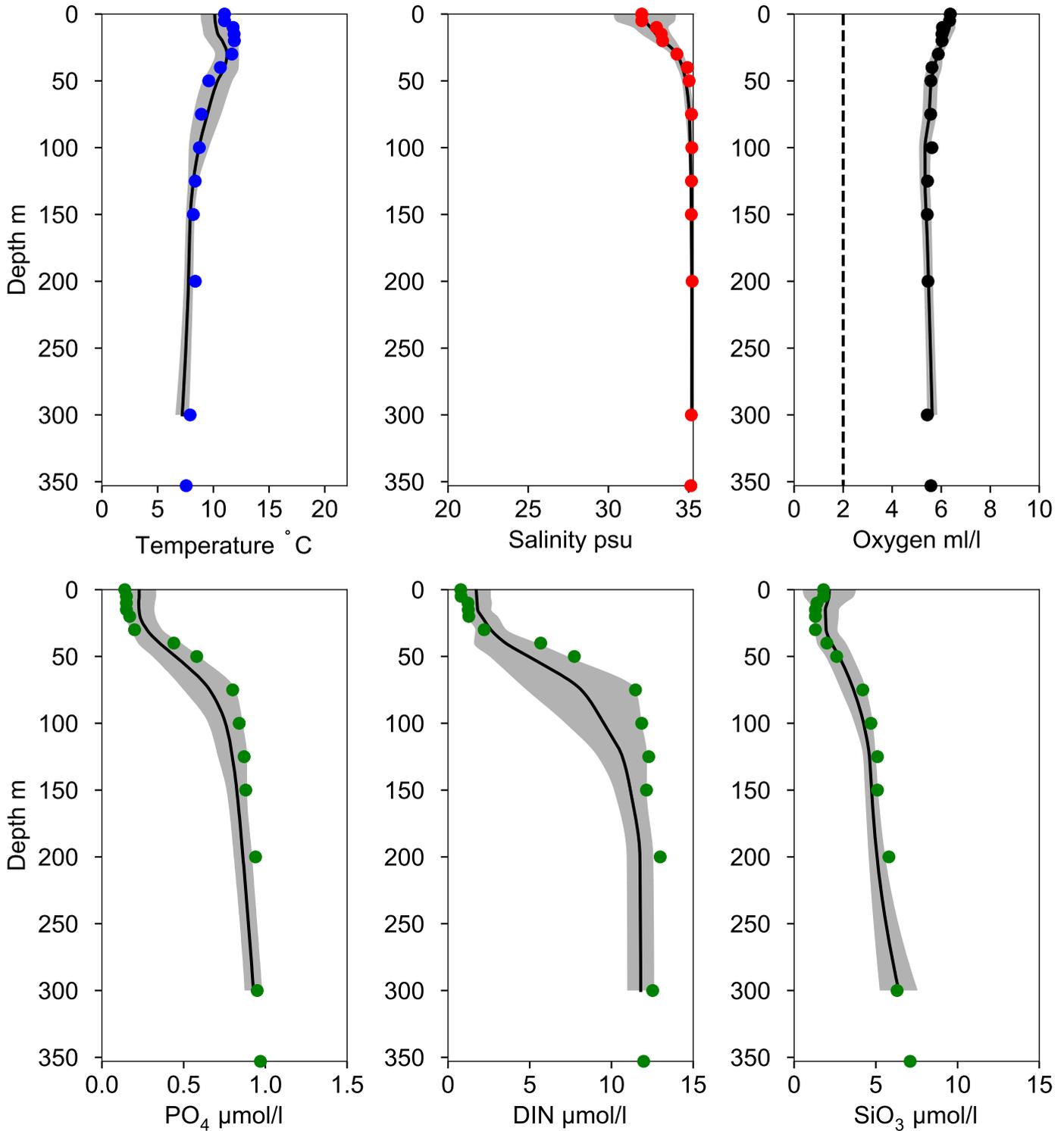


OXYGEN IN BOTTOM WATER (depth >= 300 m)



Vertical profiles A17 November

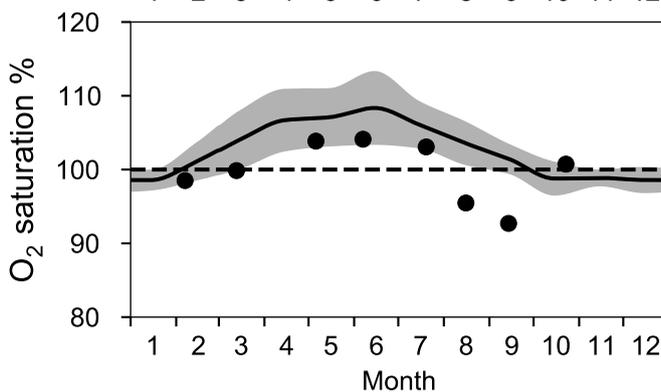
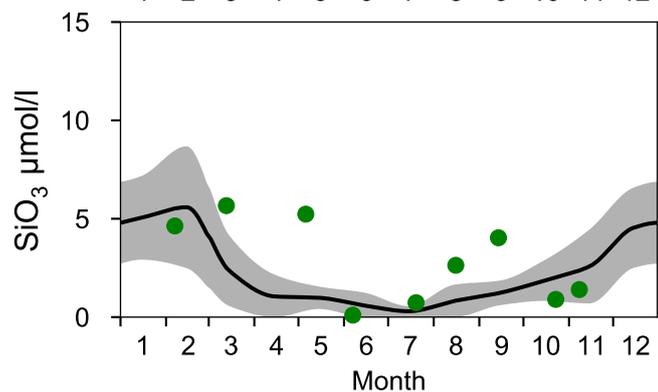
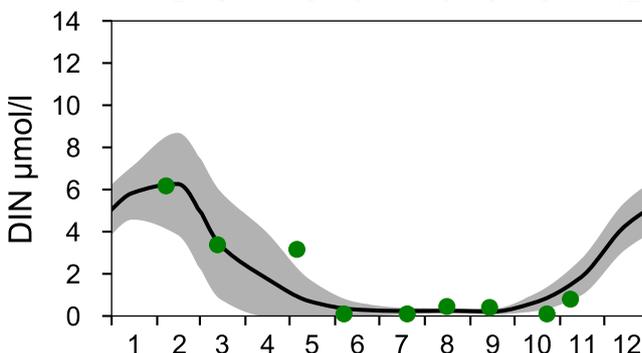
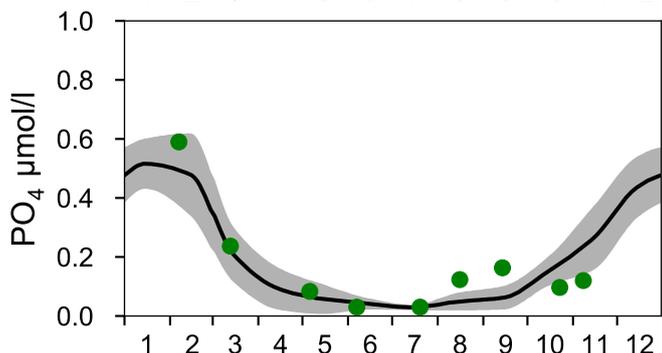
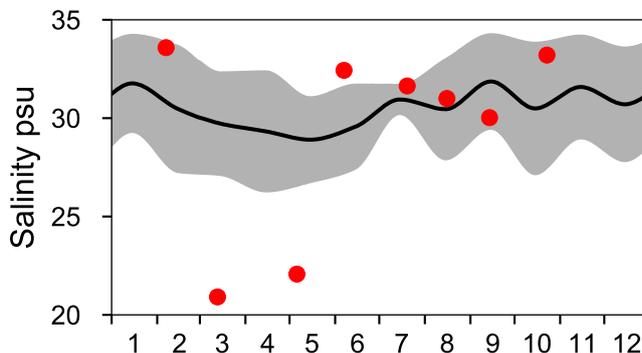
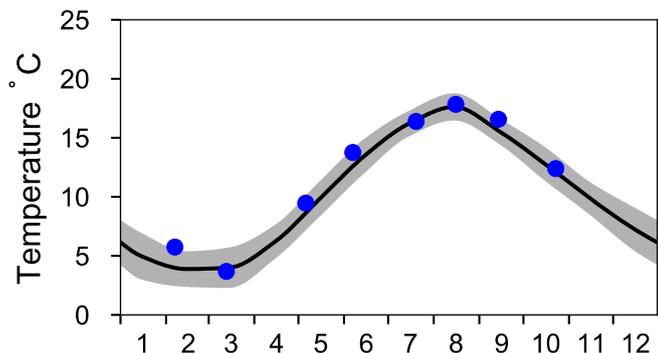
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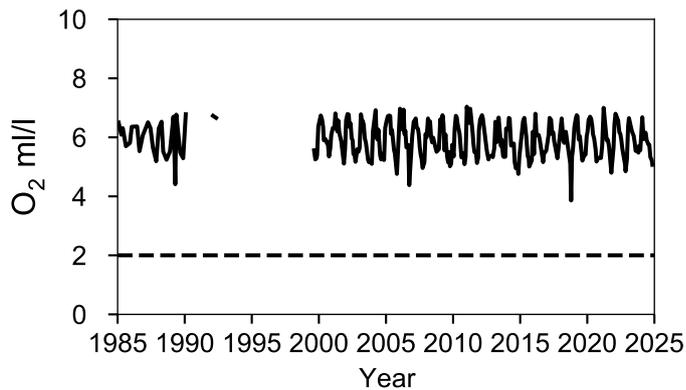
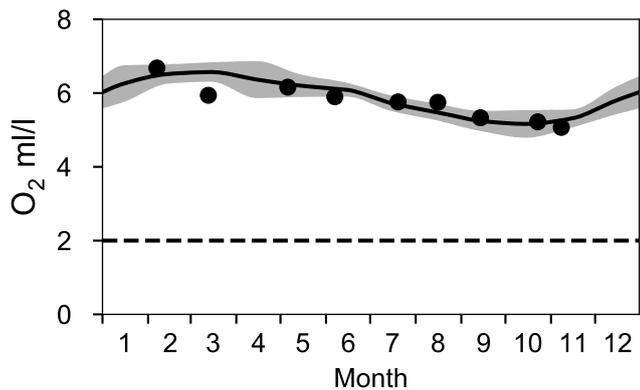
STATION Å15 SURFACE WATER (0-10 m)

Annual Cycles

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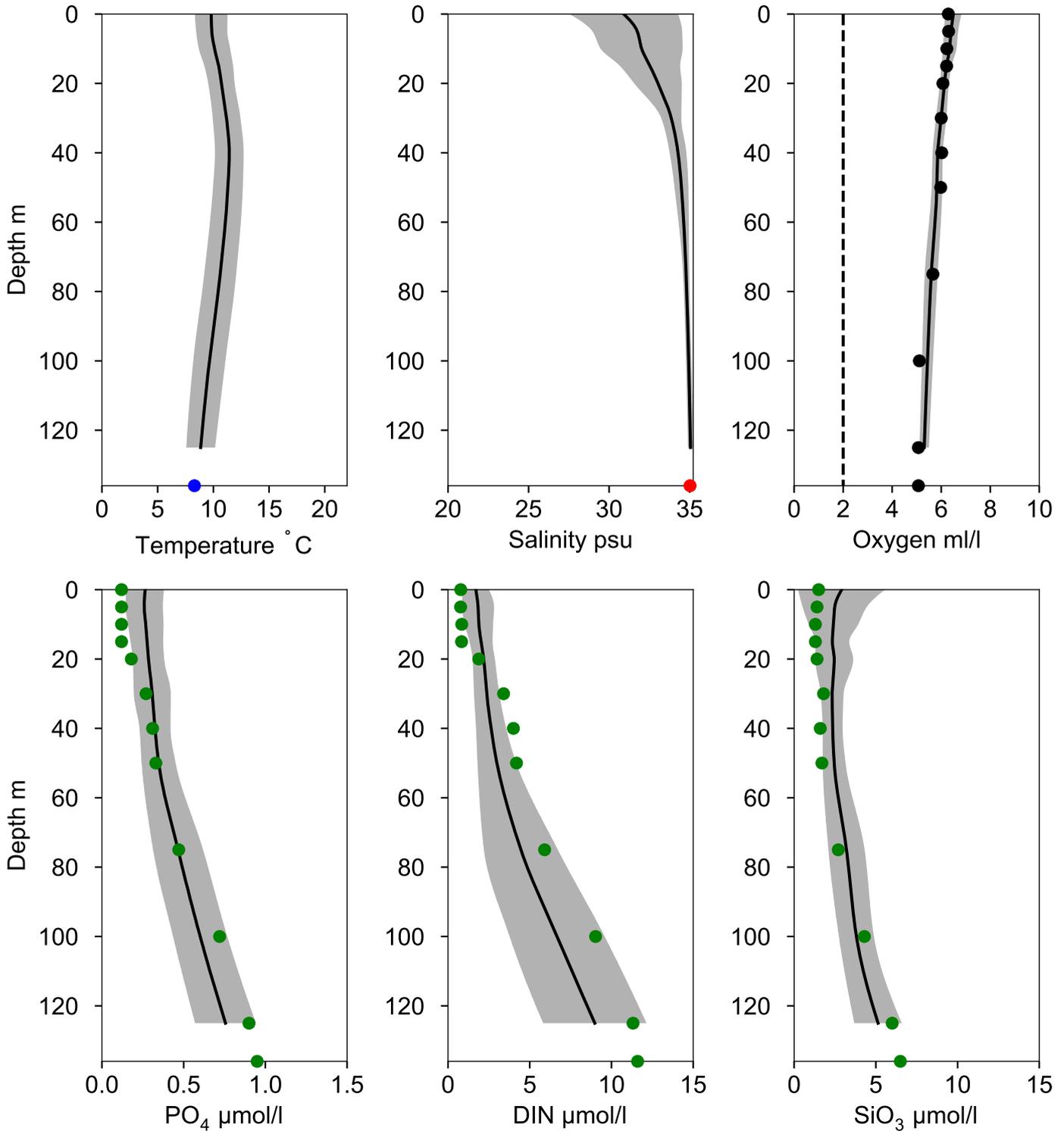


OXYGEN IN BOTTOM WATER (depth >= 125 m)



Vertical profiles A15 November

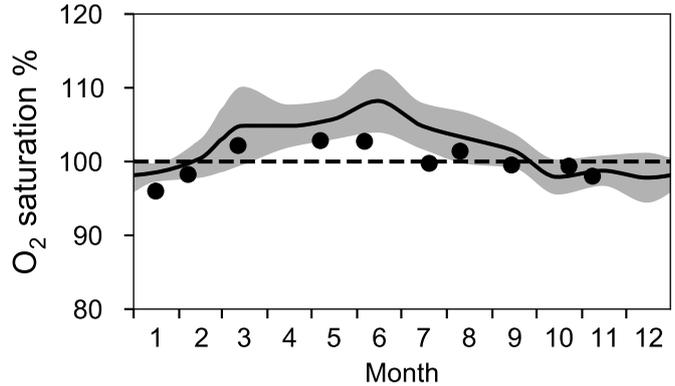
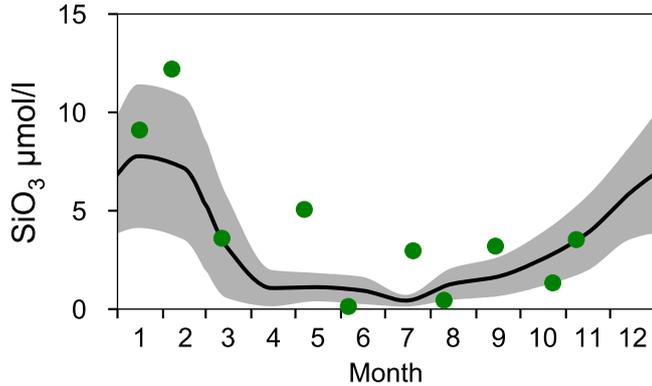
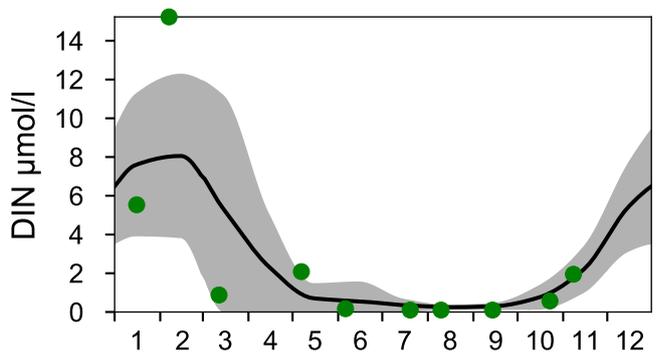
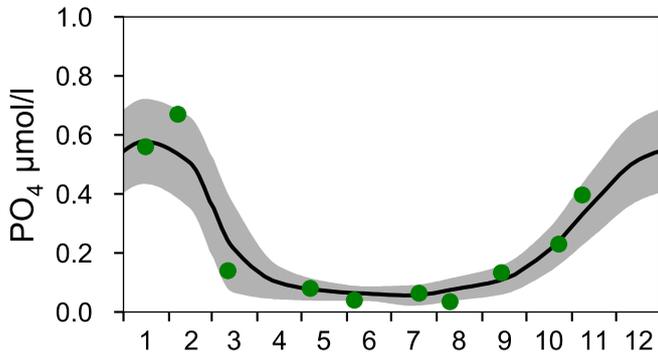
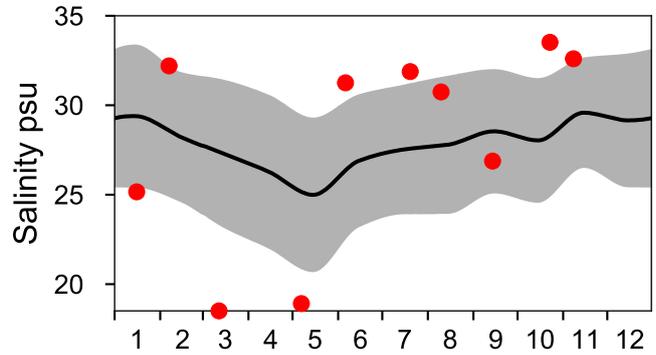
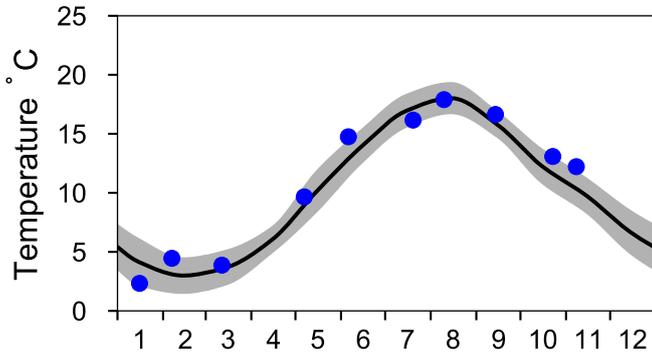
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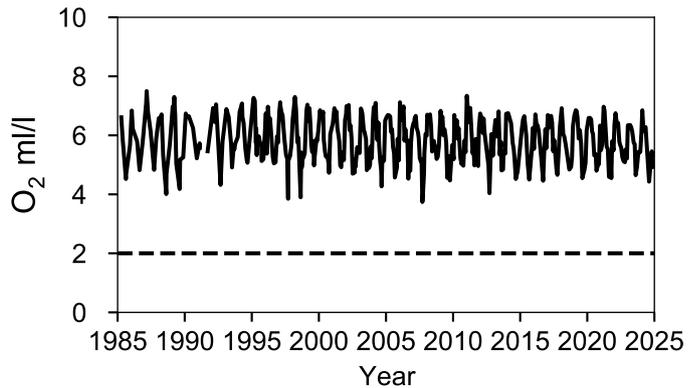
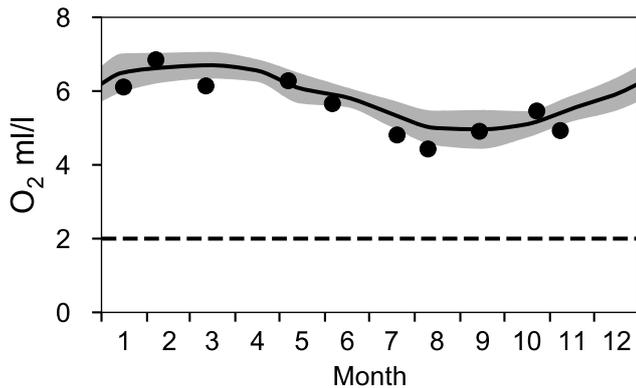
STATION P2 SURFACE WATER (0-10 m)

Annual Cycles

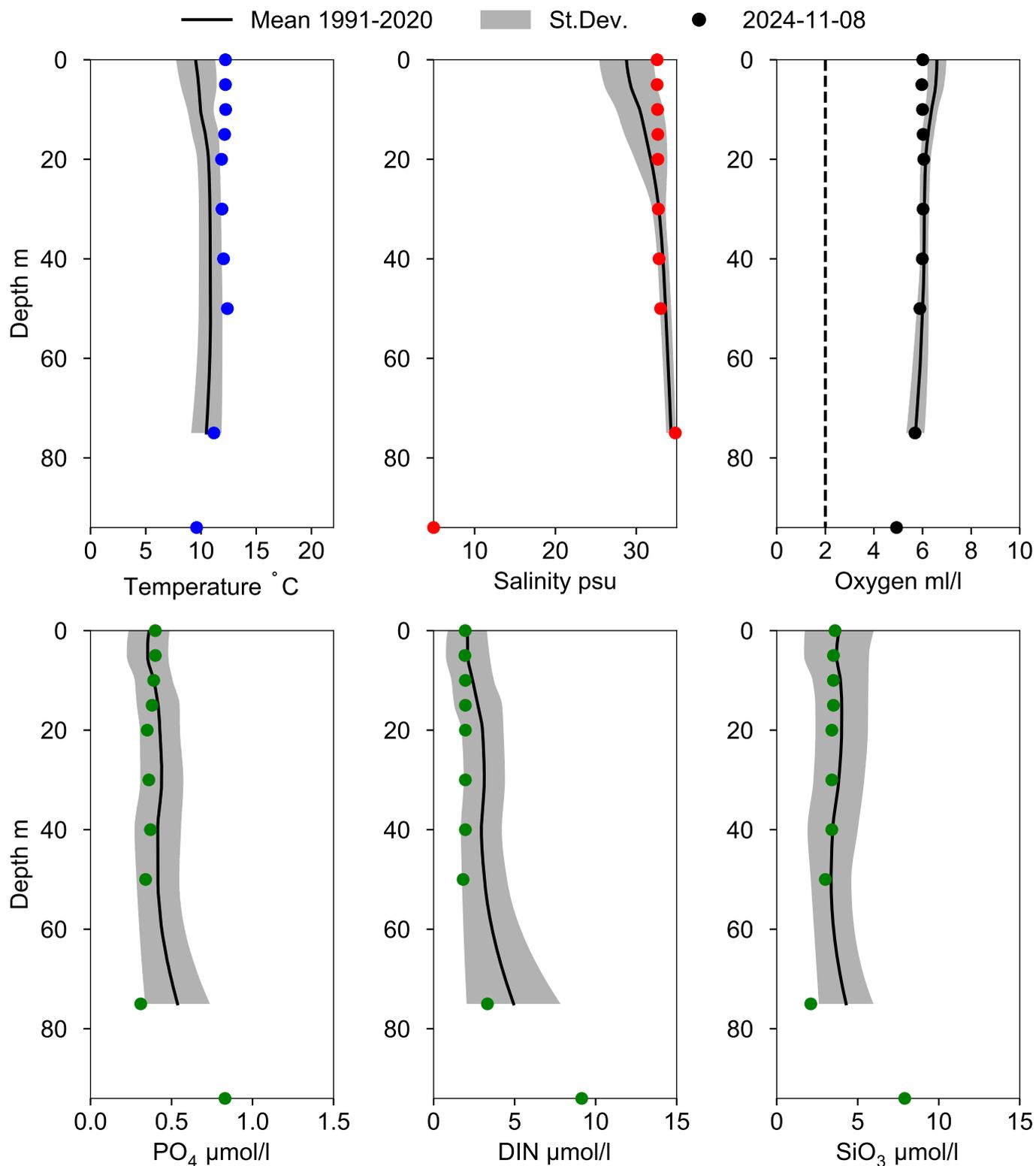
— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 75 m)



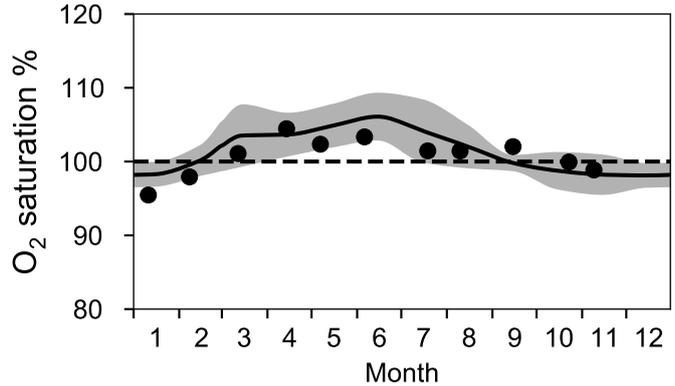
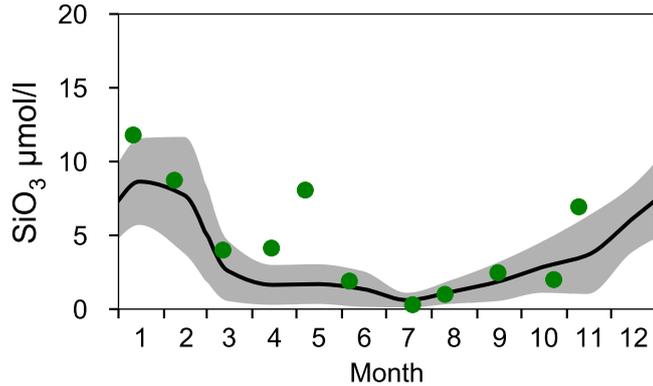
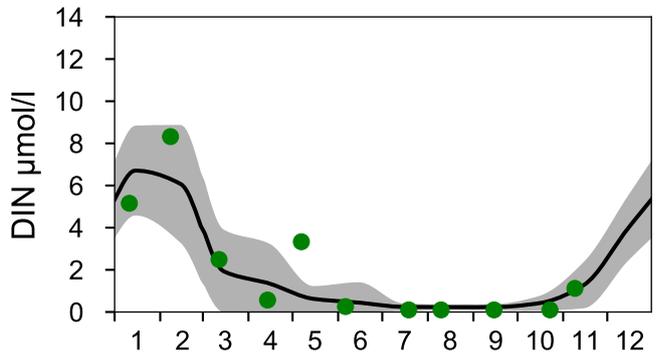
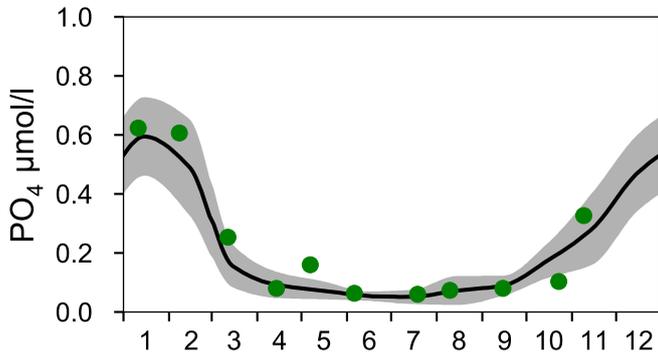
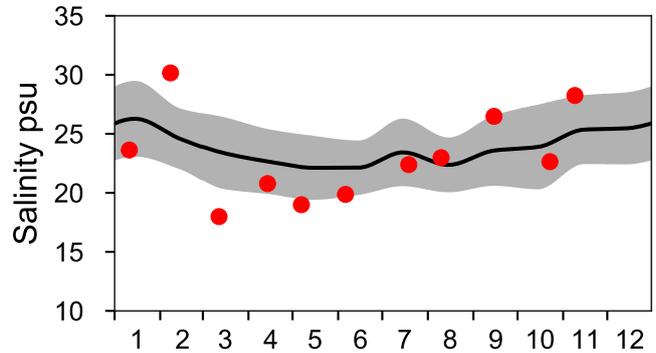
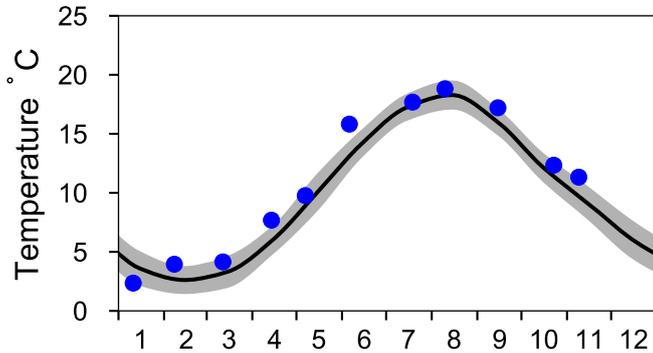
Vertical profiles P2 November



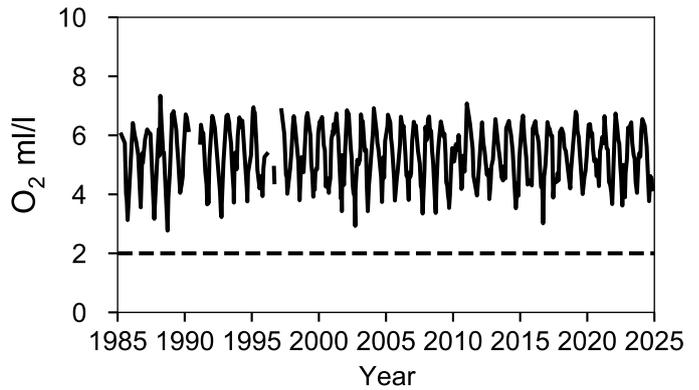
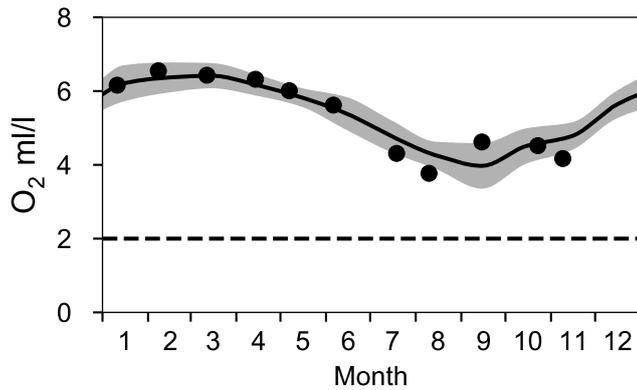
STATION FLADEN SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024

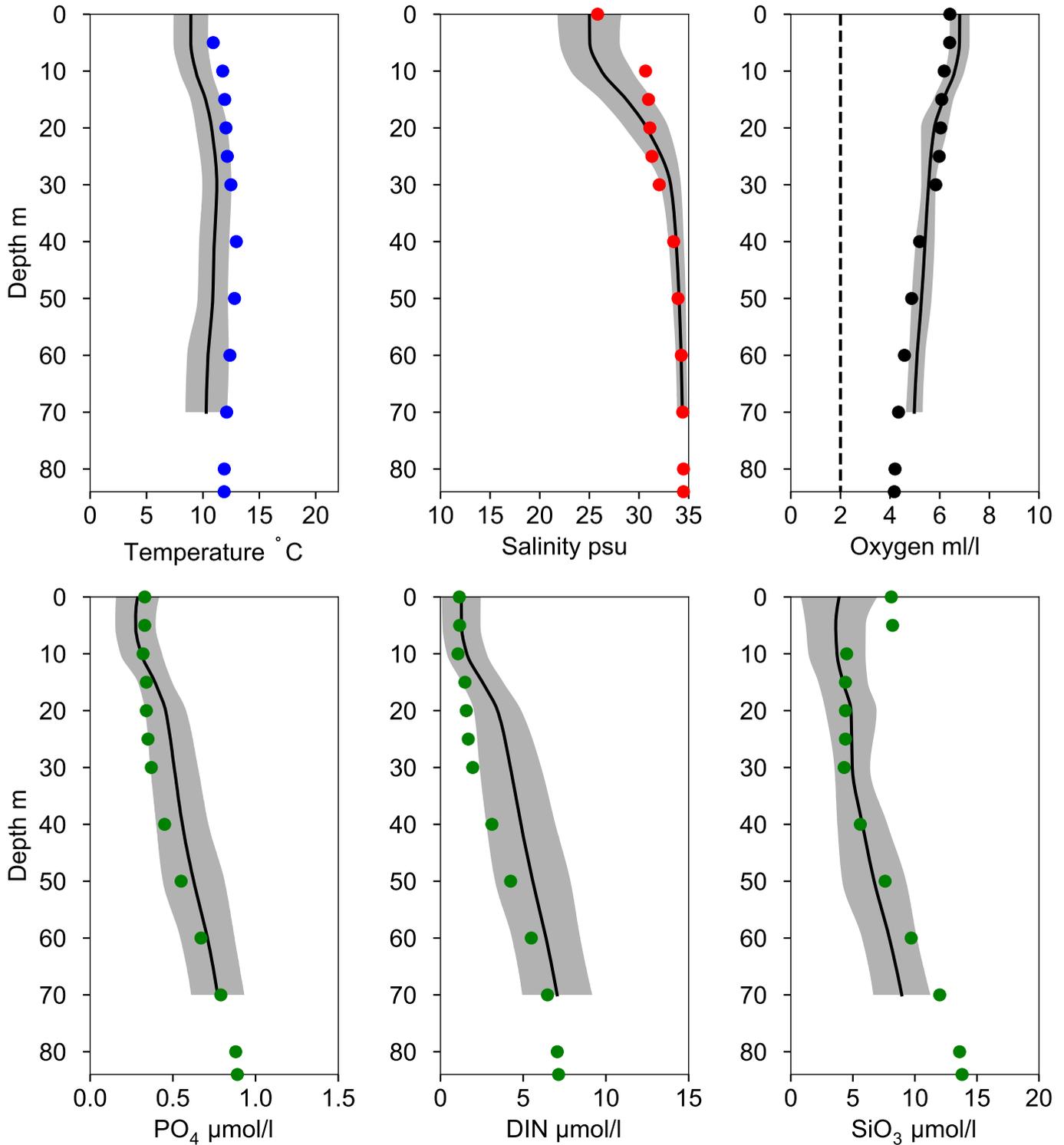


OXYGEN IN BOTTOM WATER (depth >= 74 m)



Vertical profiles FLADEN November

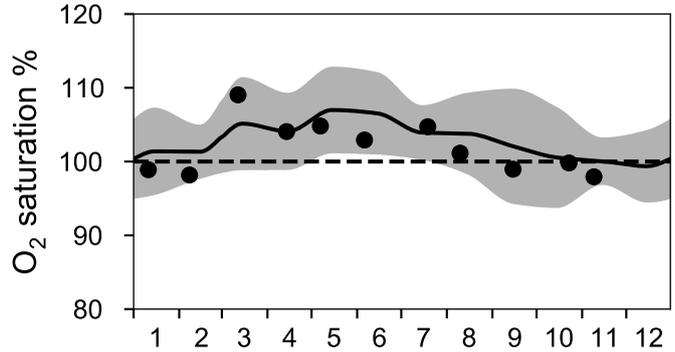
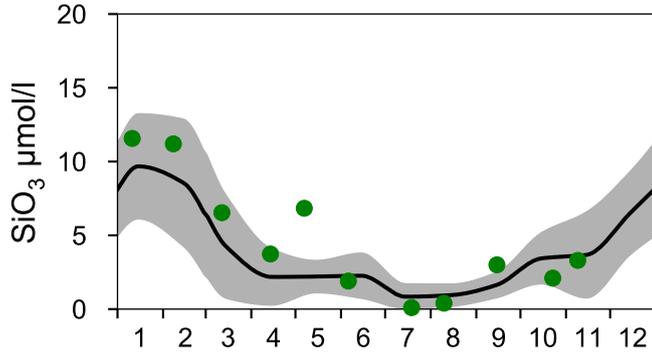
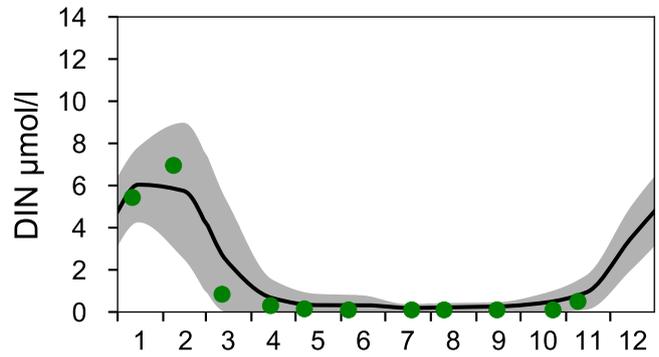
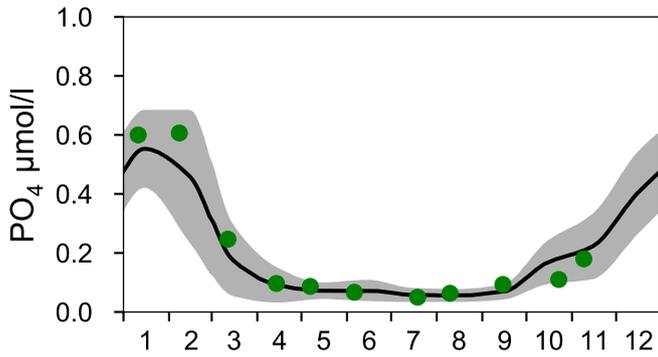
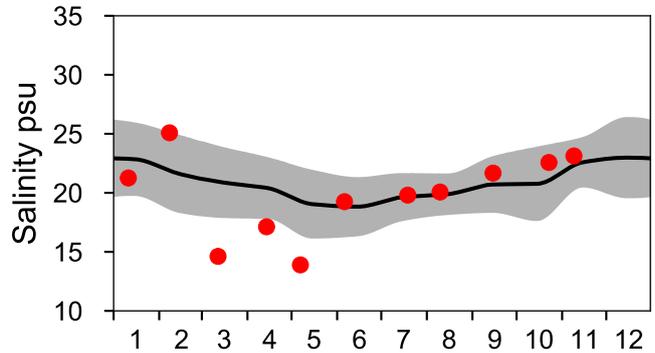
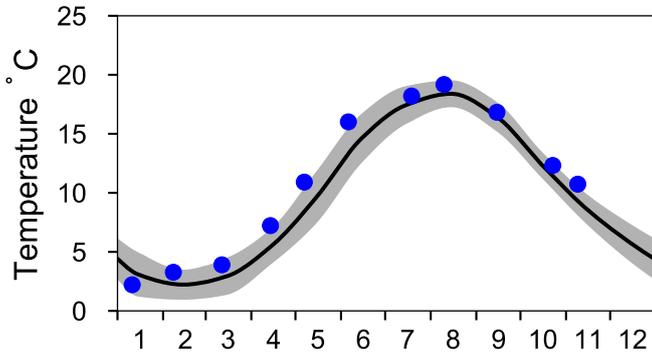
— Mean 1991-2020 St.Dev. ● 2024-11-09



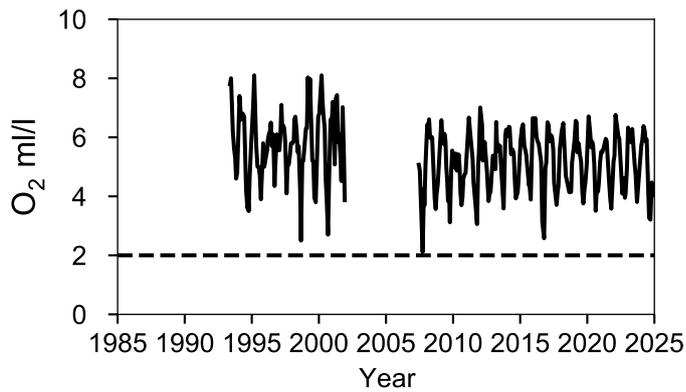
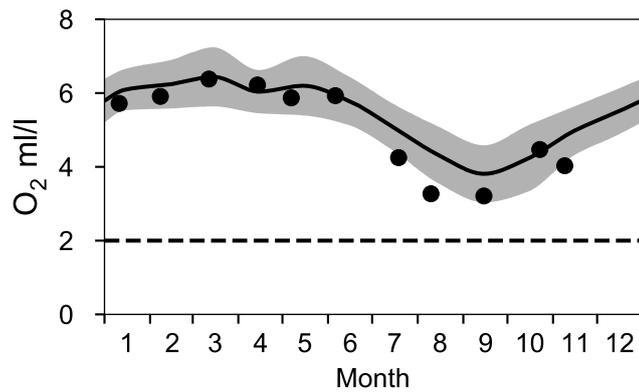
STATION N14 FALKENBERG SURFACE WATER (0-10 m)

Annual Cycles

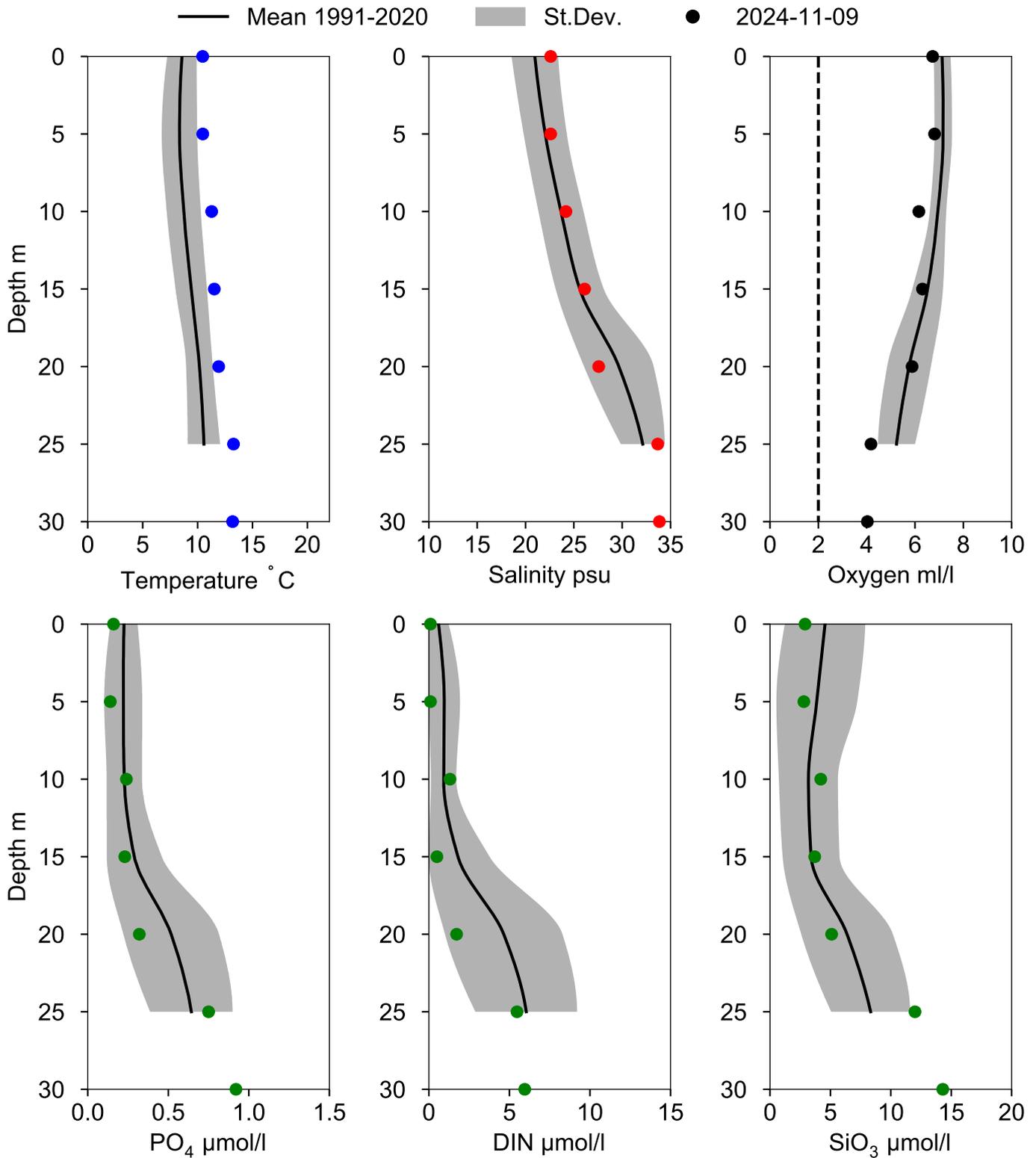
— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 25 m)



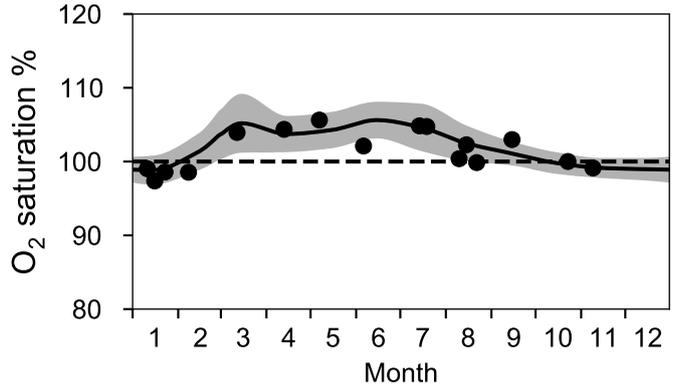
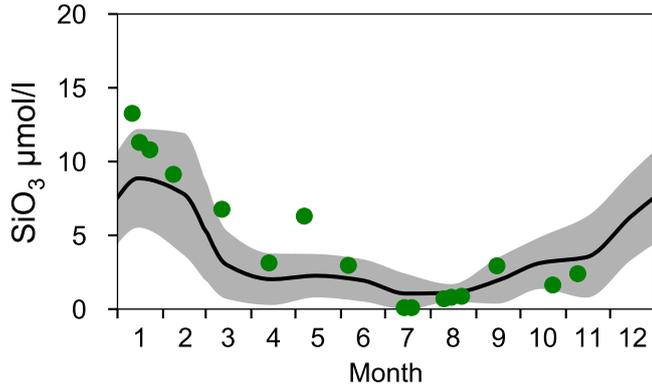
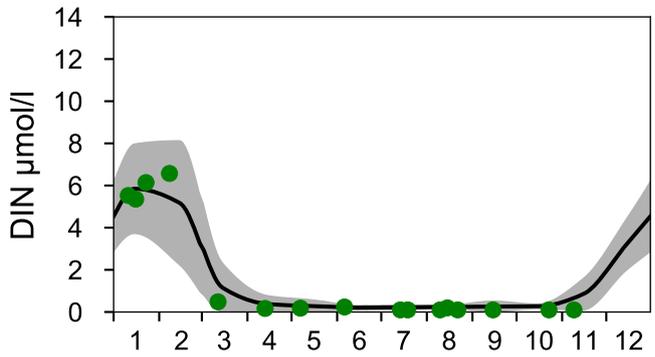
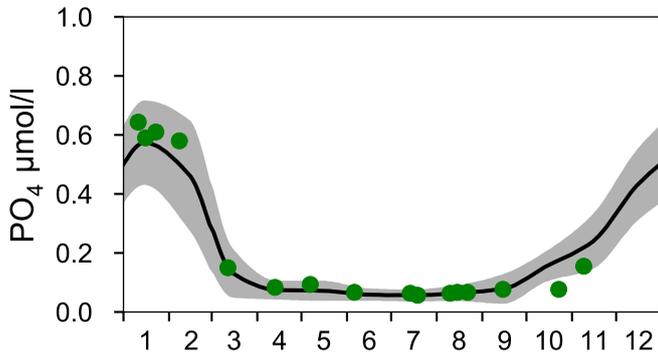
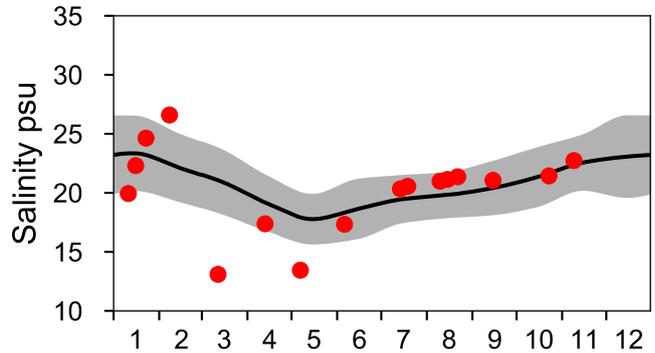
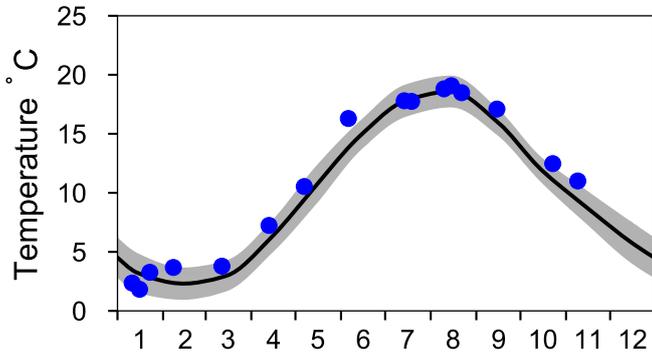
Vertical profiles N14 FALKENBERG November



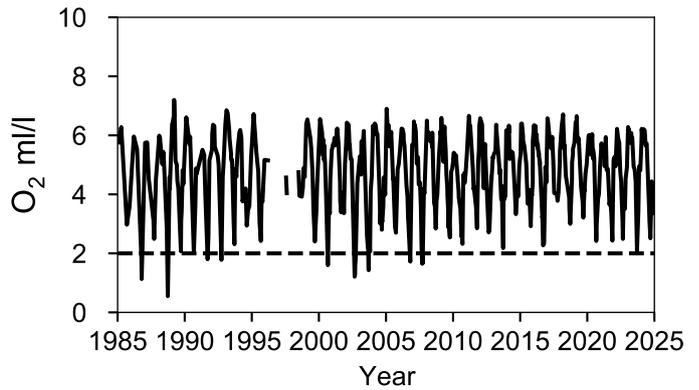
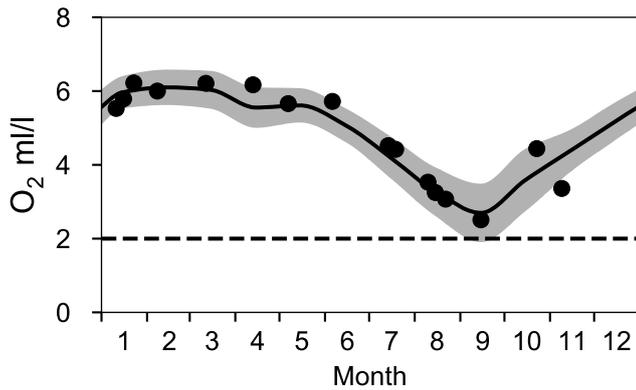
STATION ANHOLT E SURFACE WATER (0-10 m)

Annual Cycles

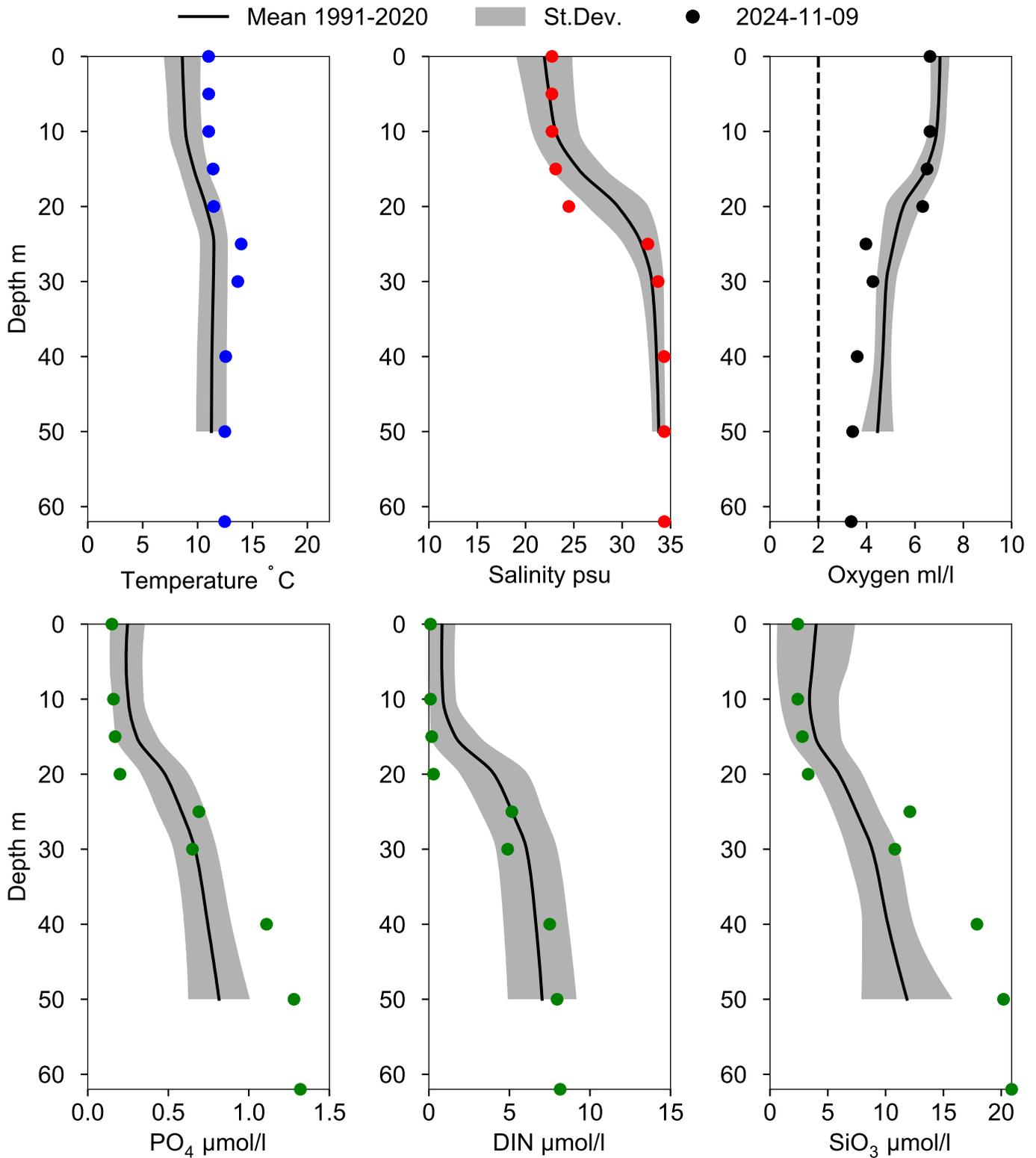
— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 52 m)



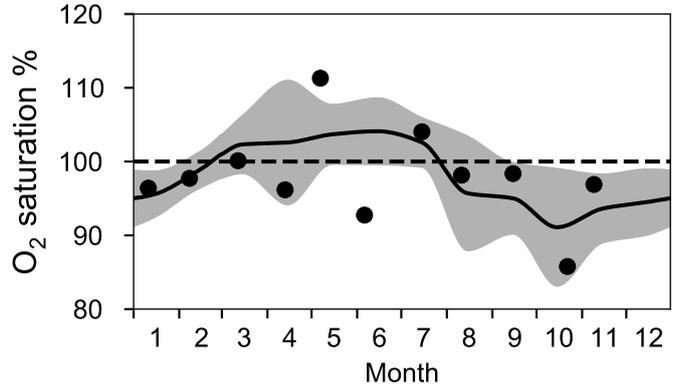
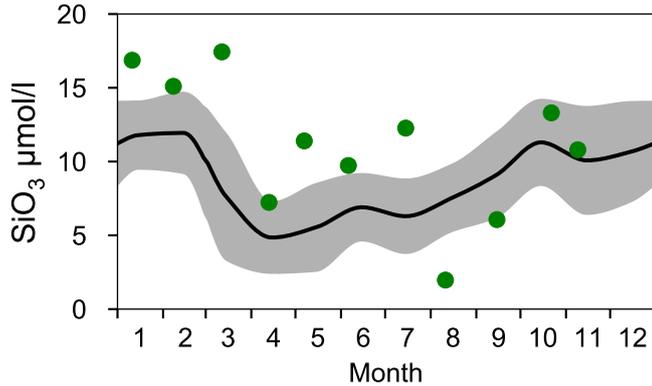
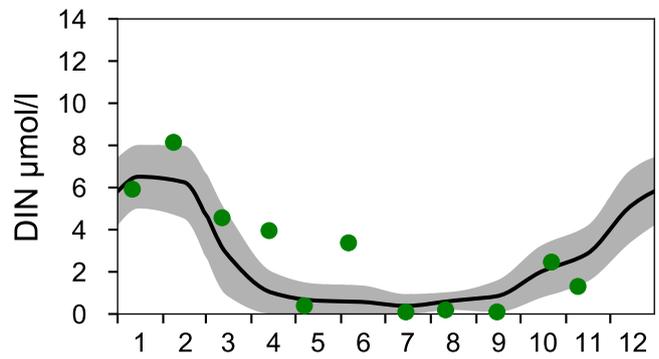
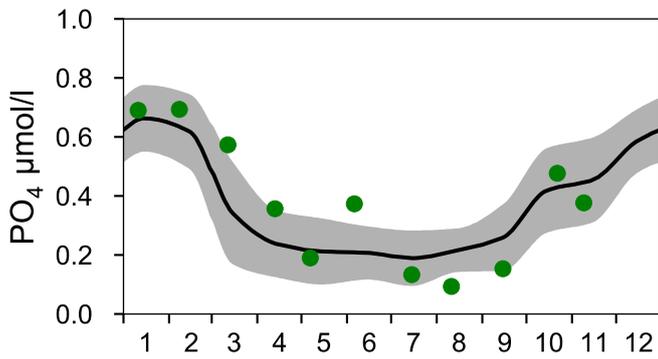
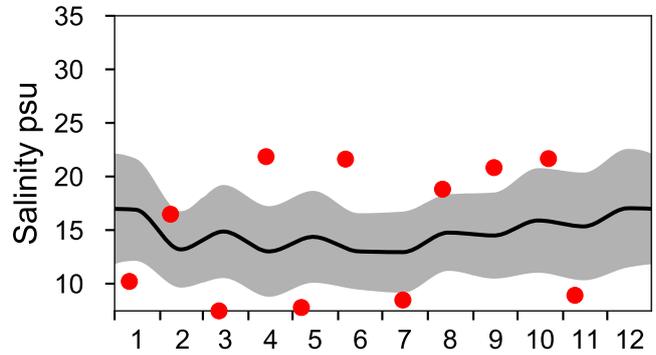
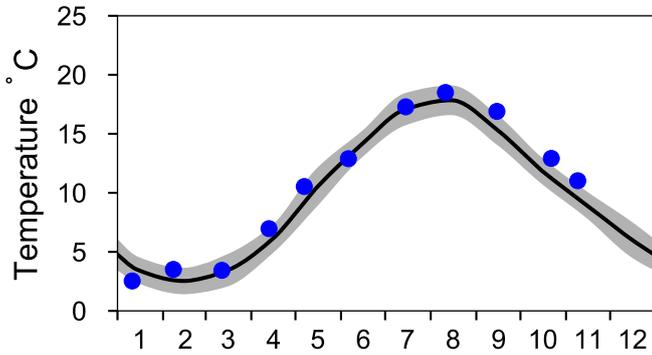
Vertical profiles ANHOLT E November



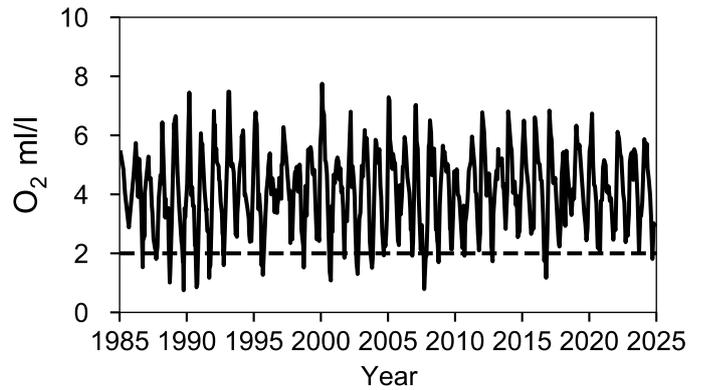
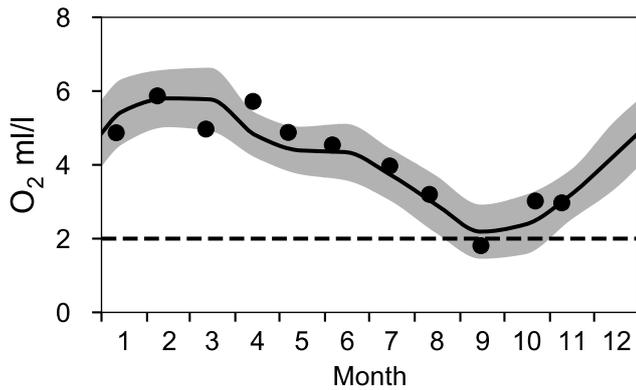
STATION W LANDSKRONA SURFACE WATER (0-10 m)

Annual Cycles

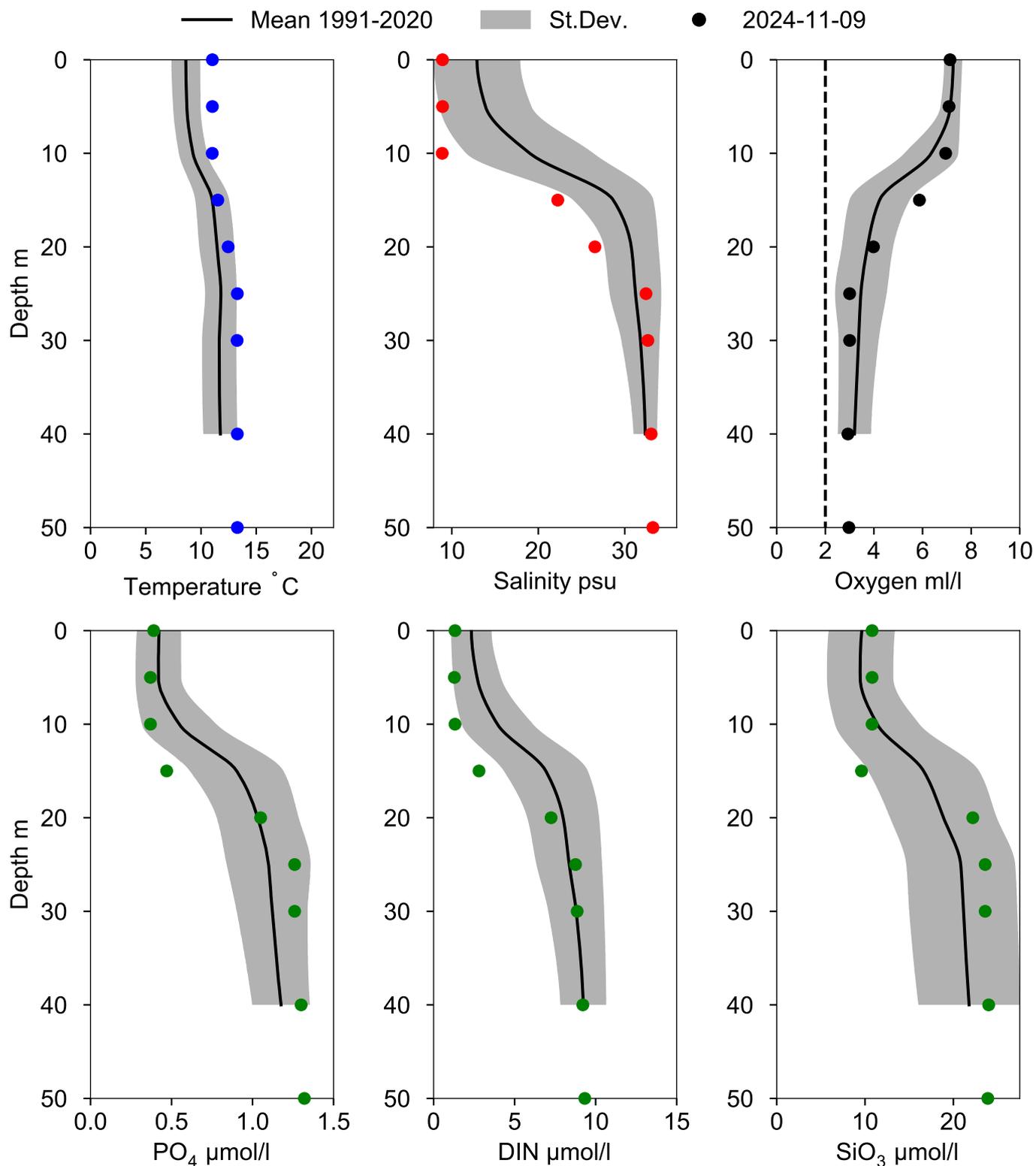
— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 40 m)



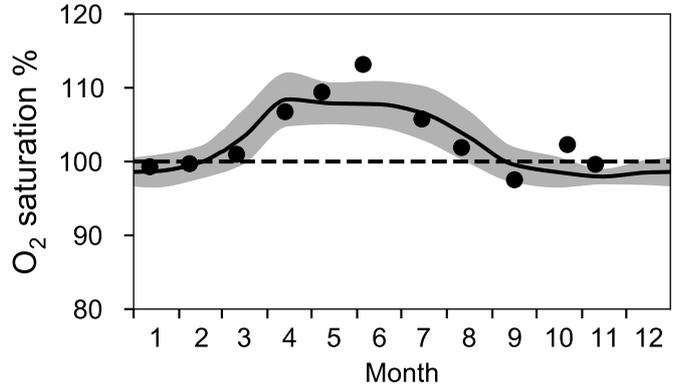
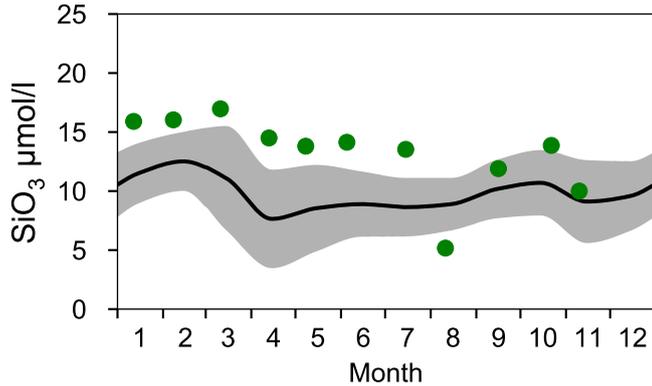
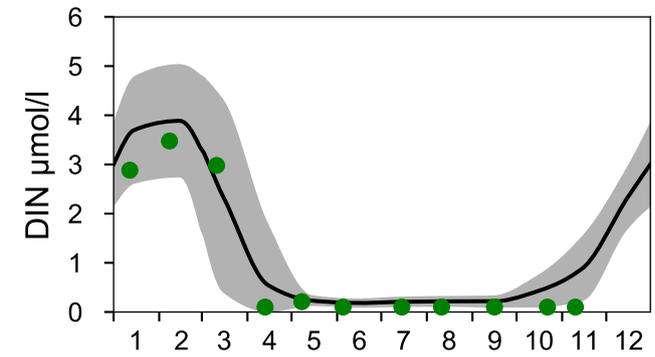
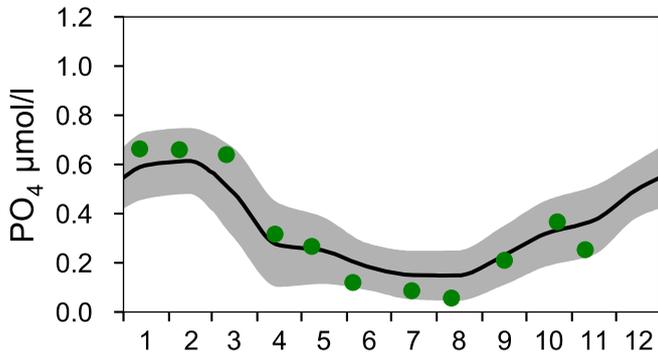
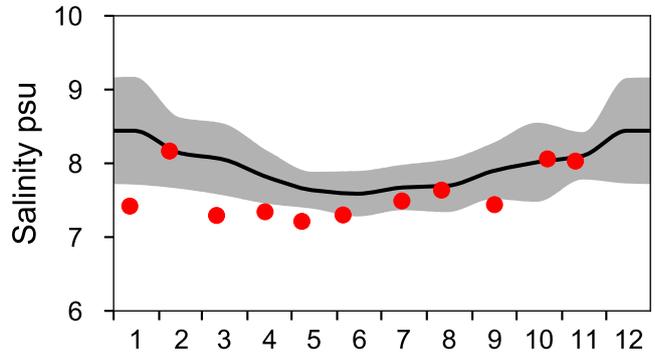
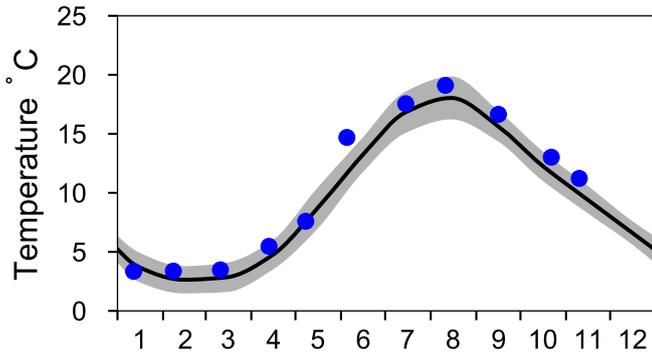
Vertical profiles W LANDSKRONA November



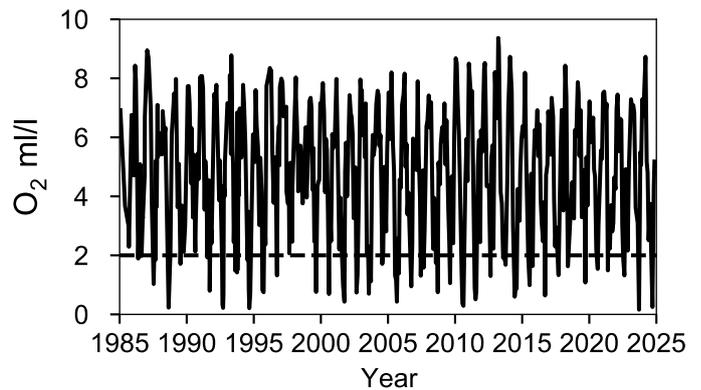
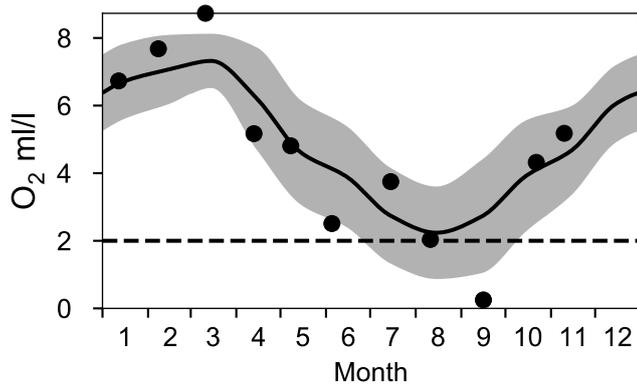
STATION BY1 SURFACE WATER (0-10 m)

Annual Cycles

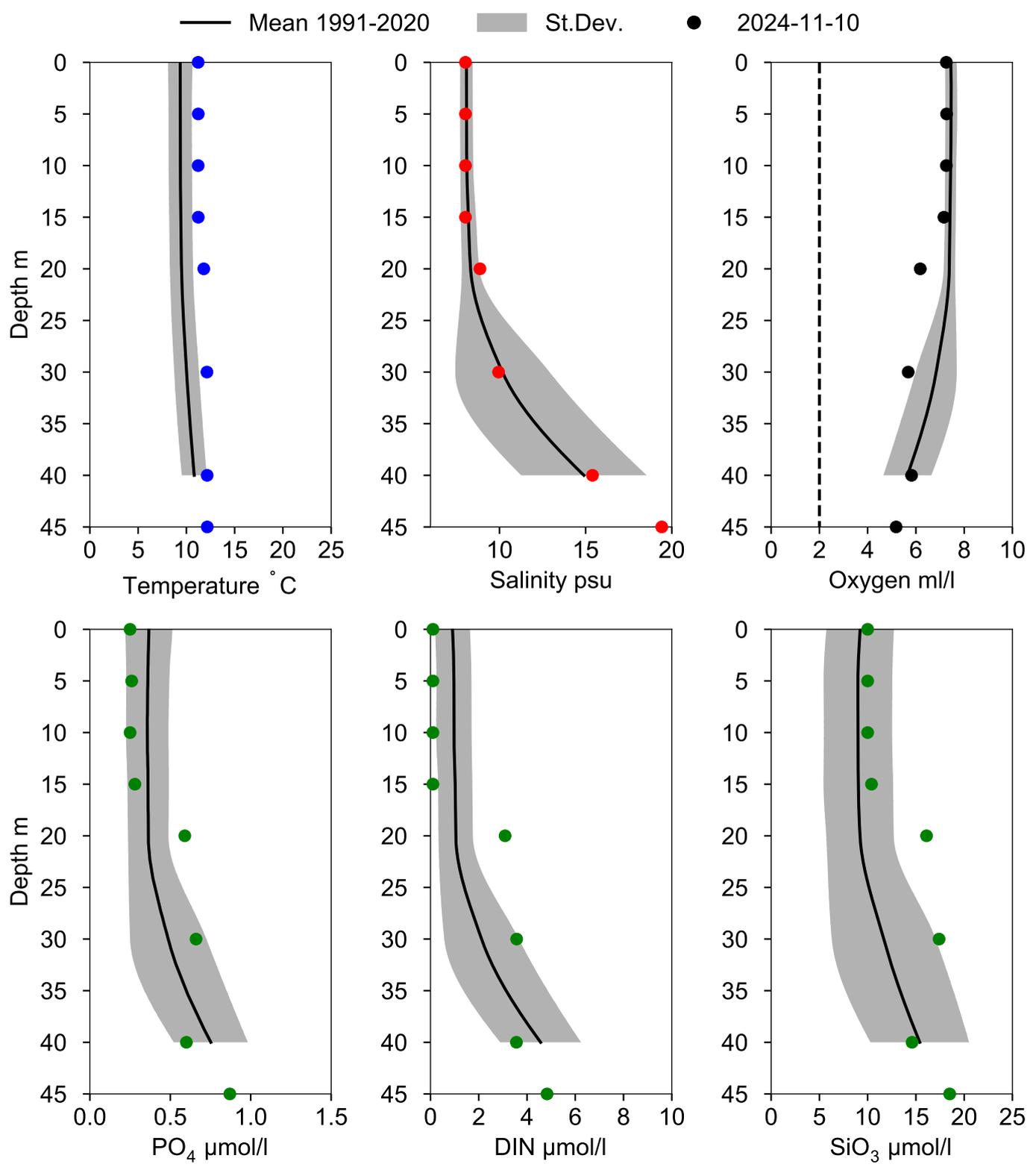
— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 39 m)



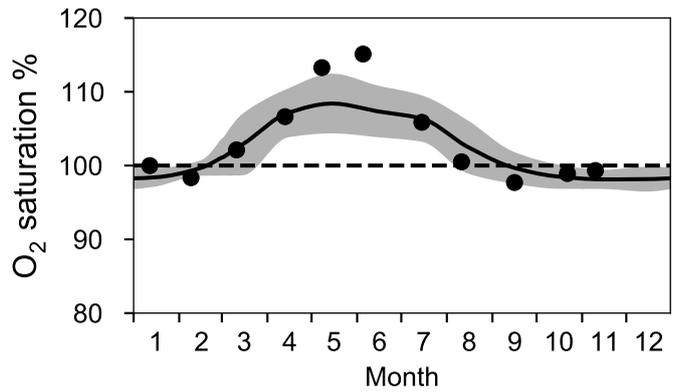
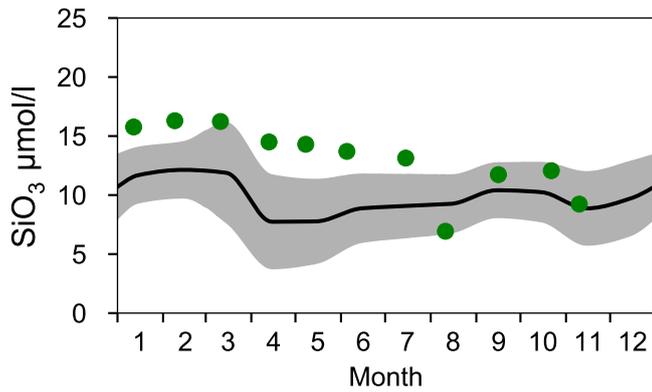
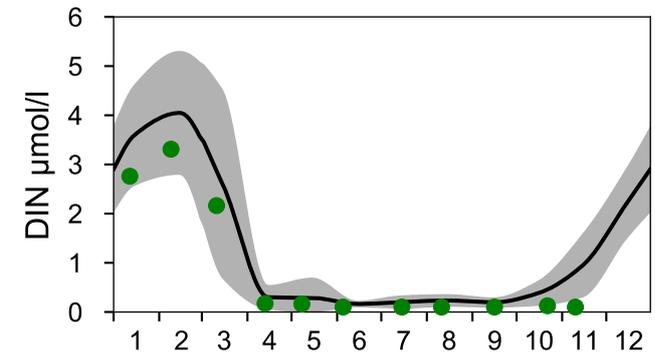
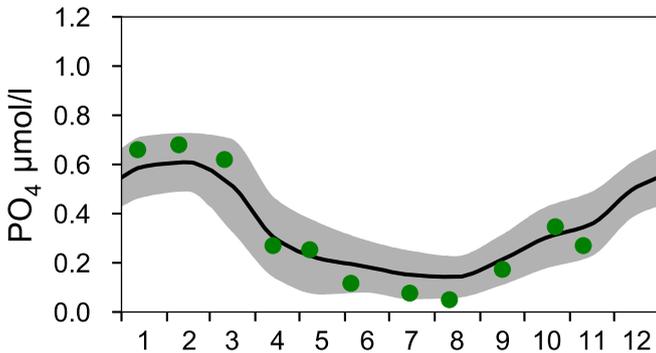
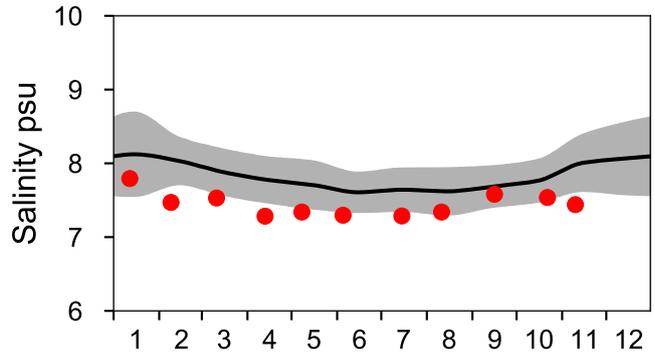
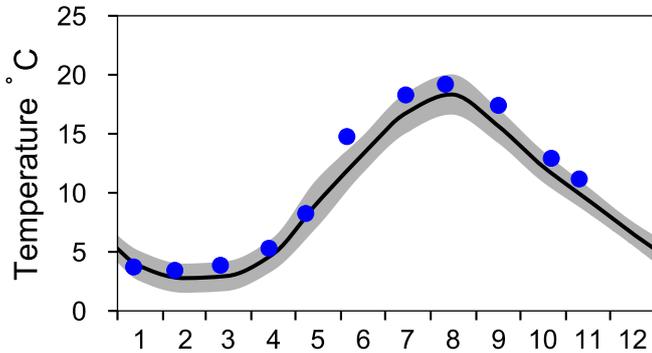
Vertical profiles BY1 November



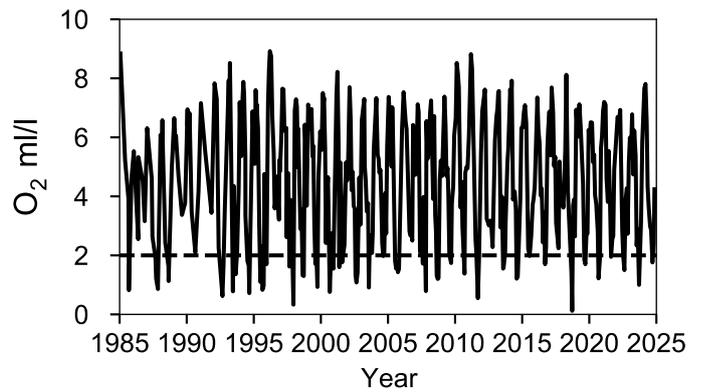
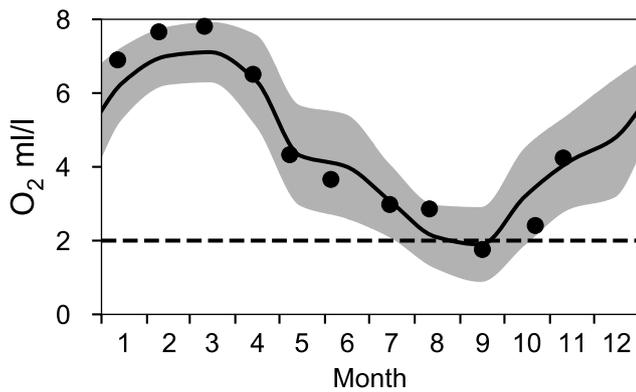
STATION BY2 ARKONA SURFACE WATER (0-10 m)

Annual Cycles

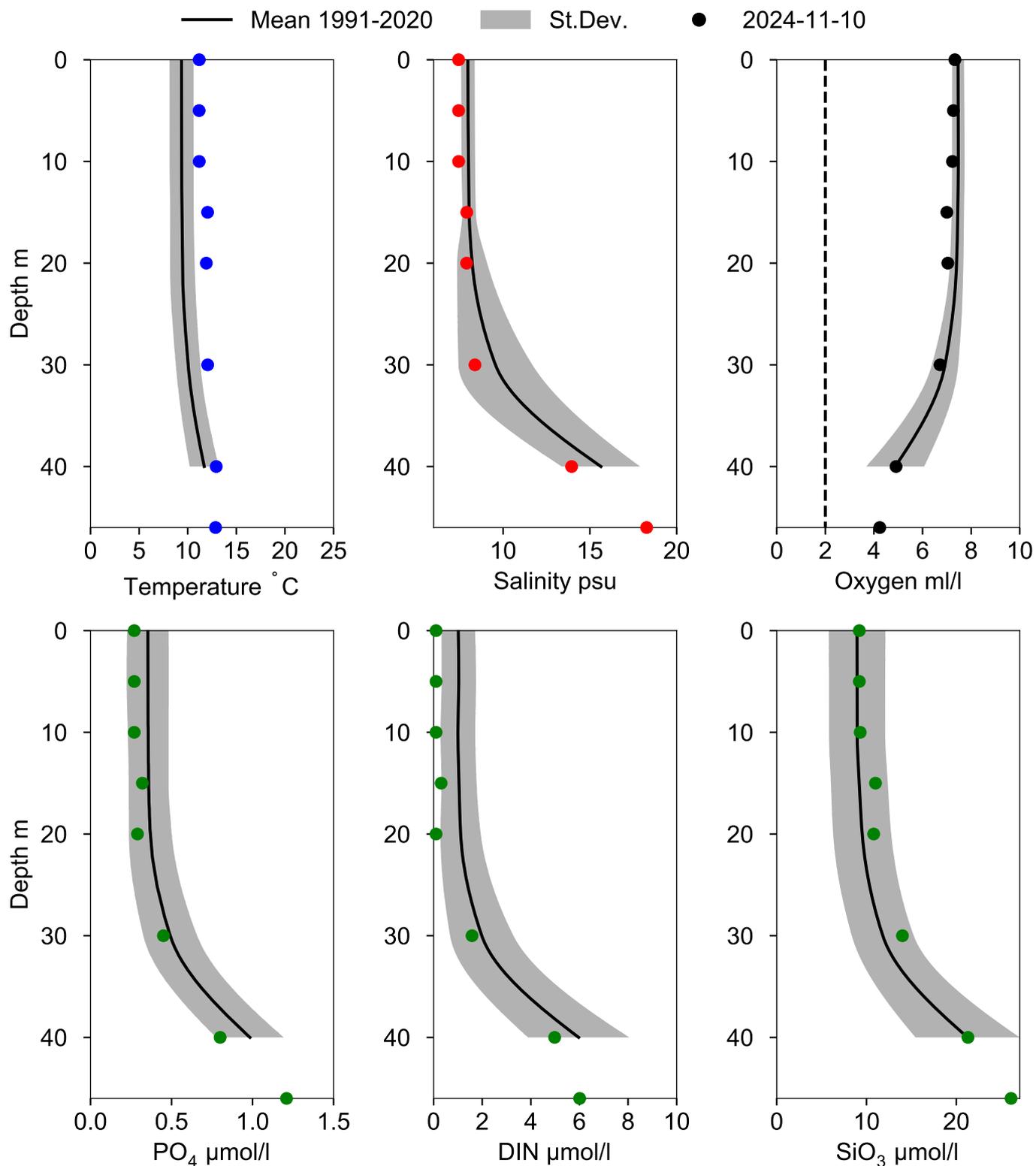
— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 40 m)



Vertical profiles BY2 ARKONA November



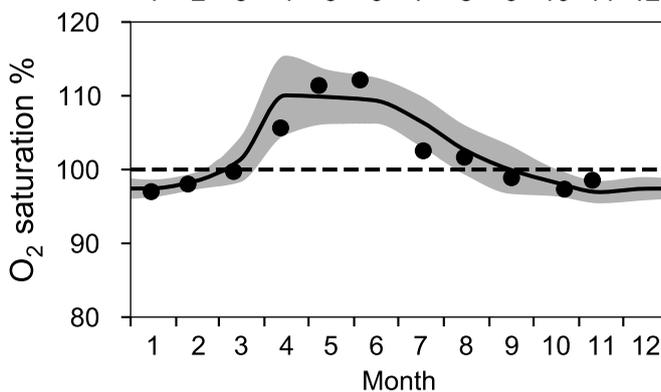
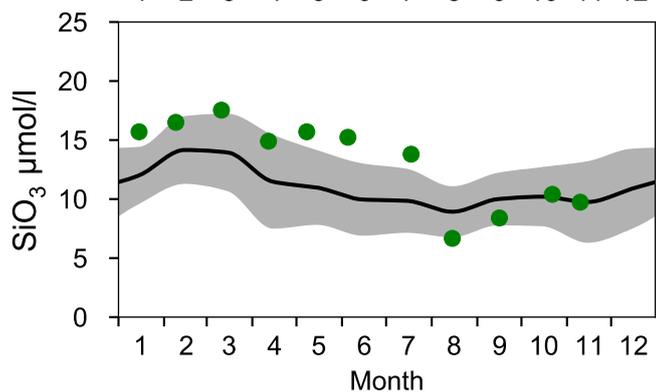
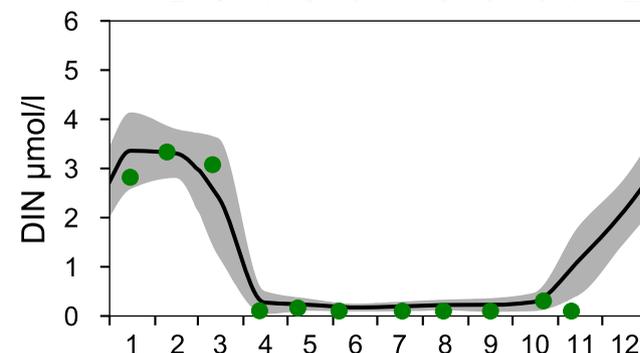
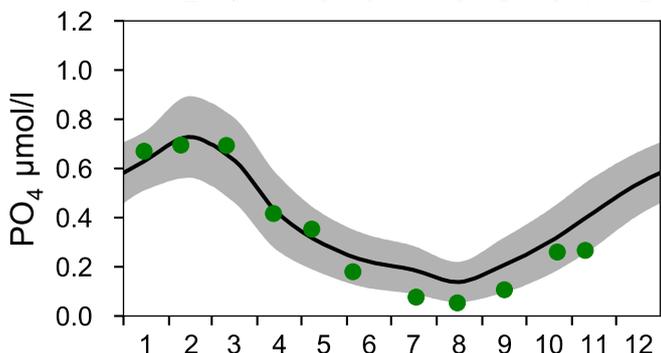
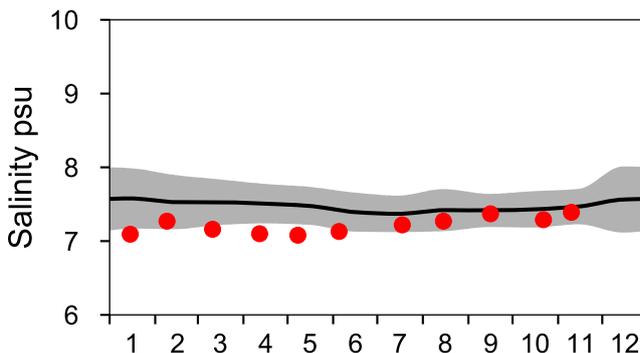
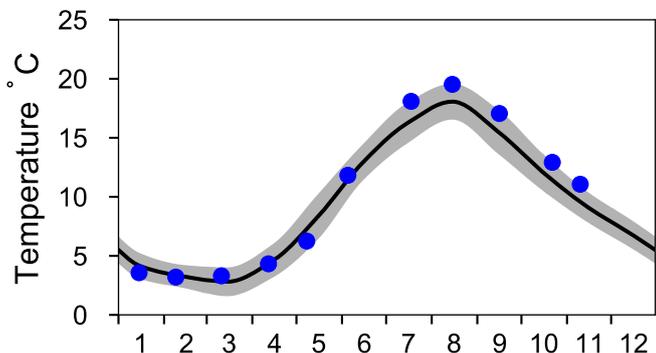
STATION HANÖBUKTEN SURFACE WATER (0-10 m)

Annual Cycles

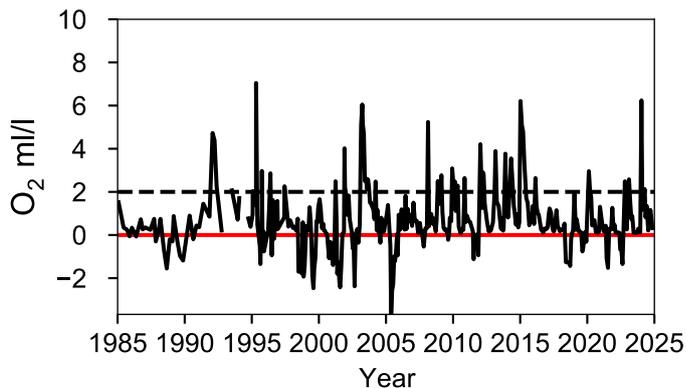
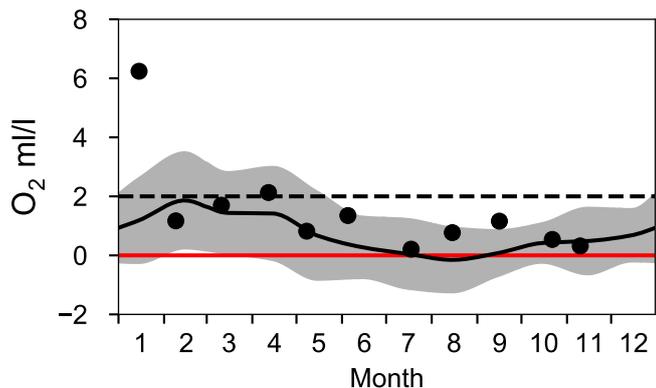
— Mean 1991-2020

■ St.Dev.

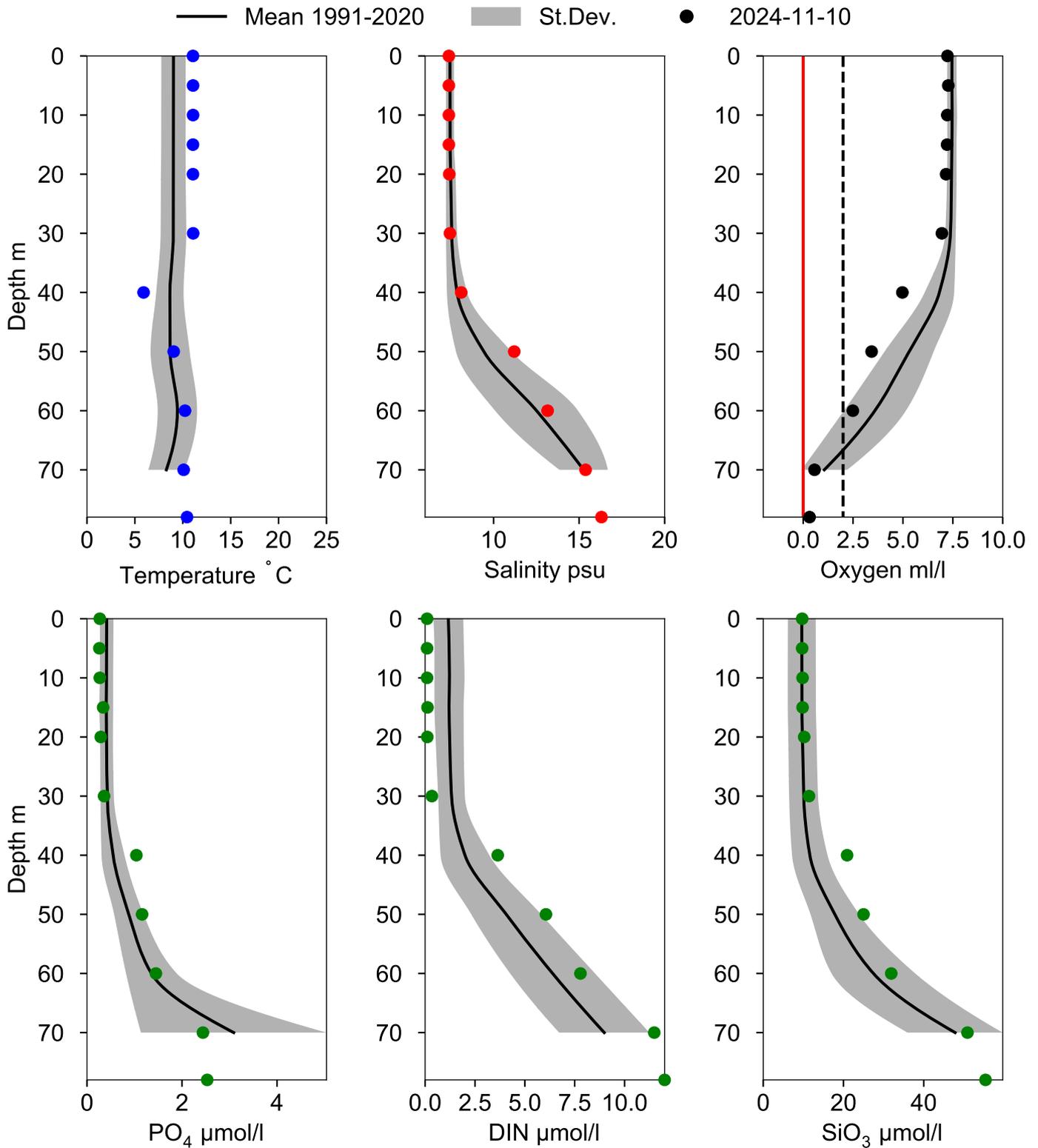
● 2024



OXYGEN IN BOTTOM WATER (depth >= 70 m)



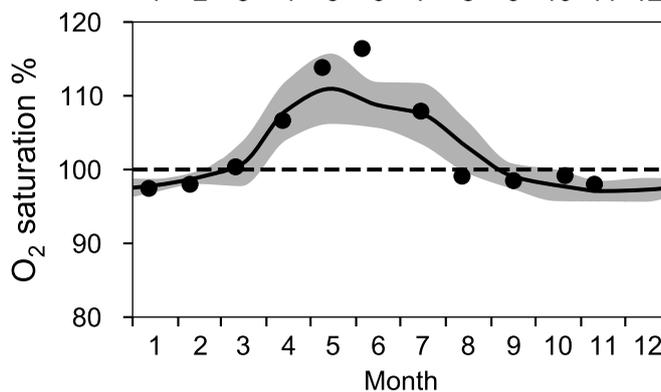
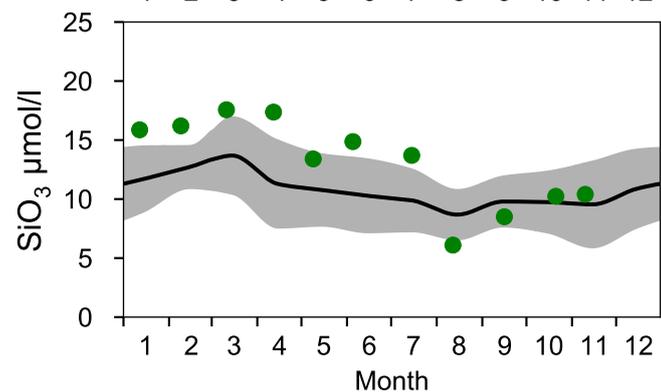
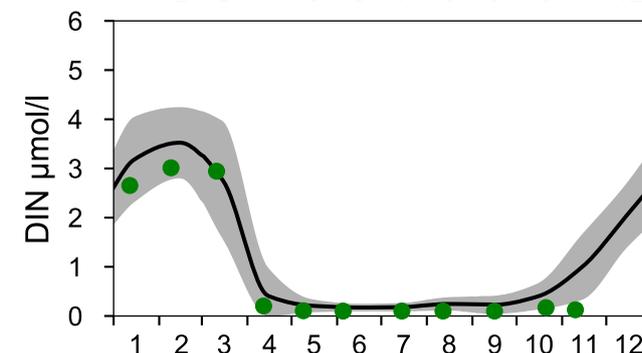
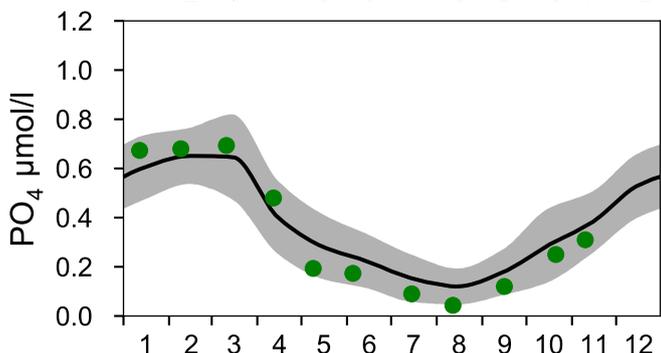
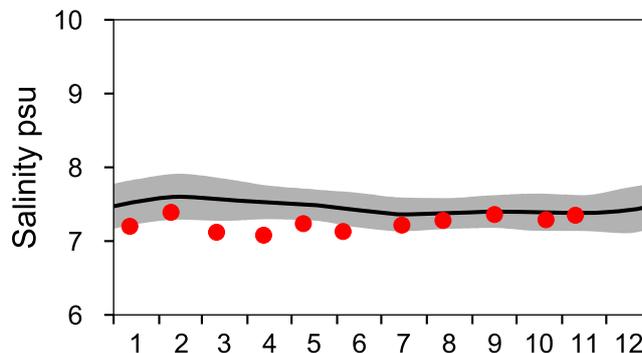
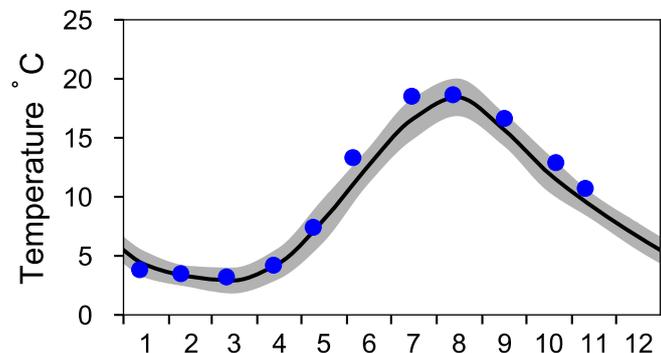
Vertical profiles HANÖBUKTEN November



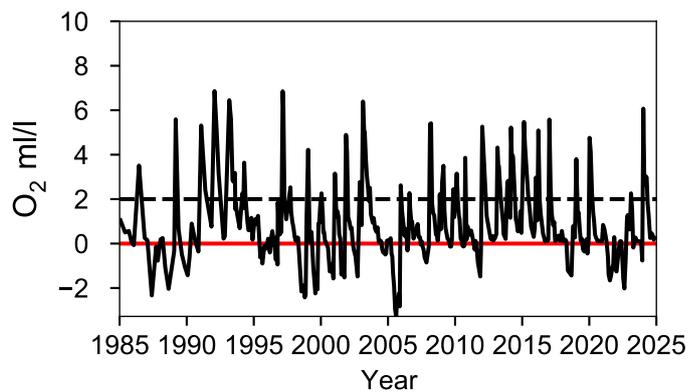
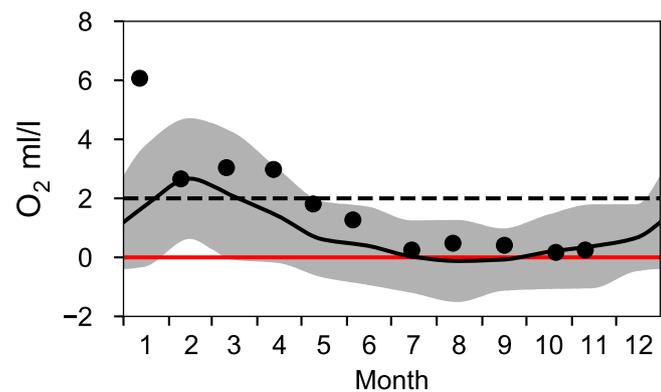
STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

Annual Cycles

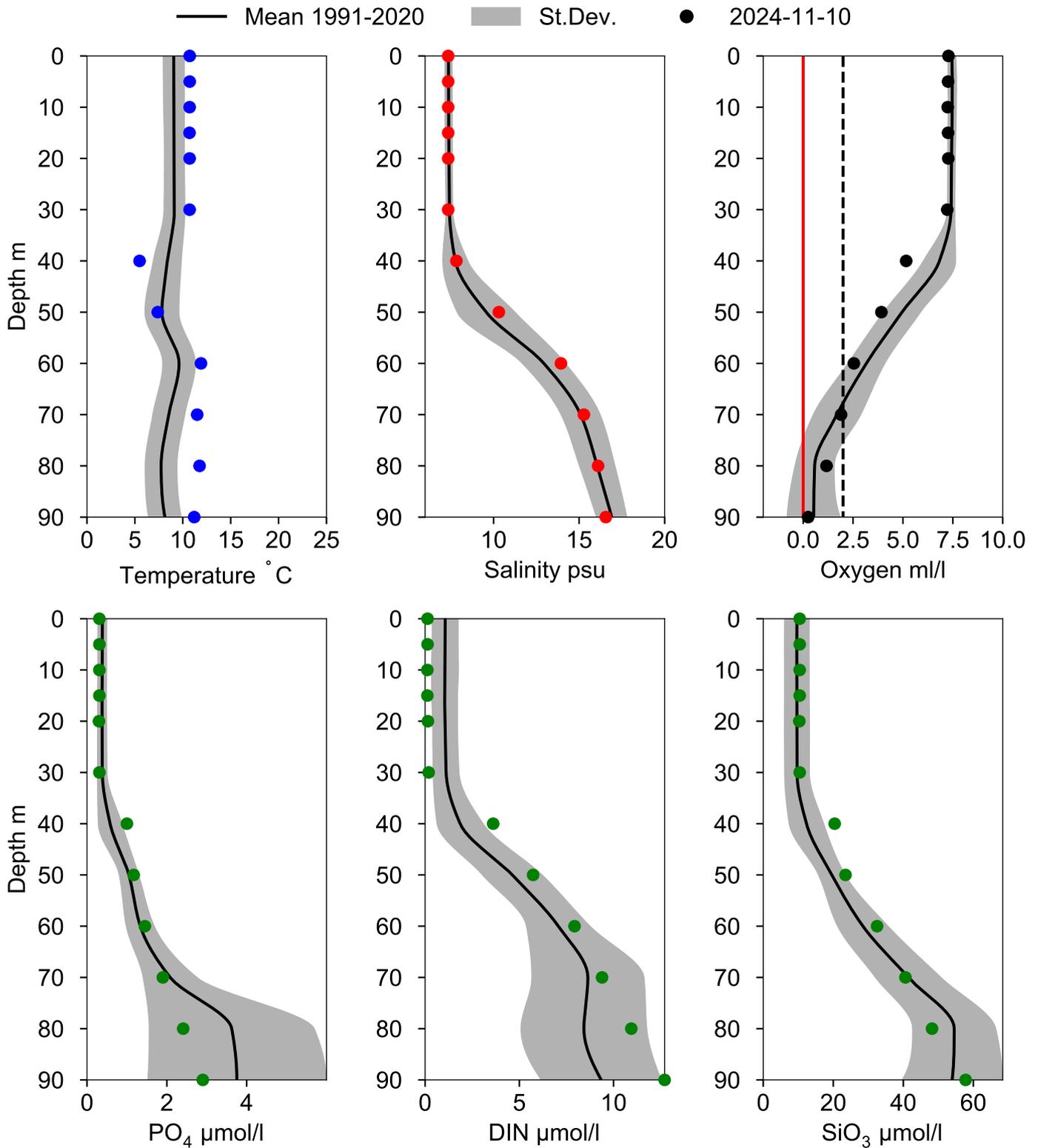
— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 80 m)



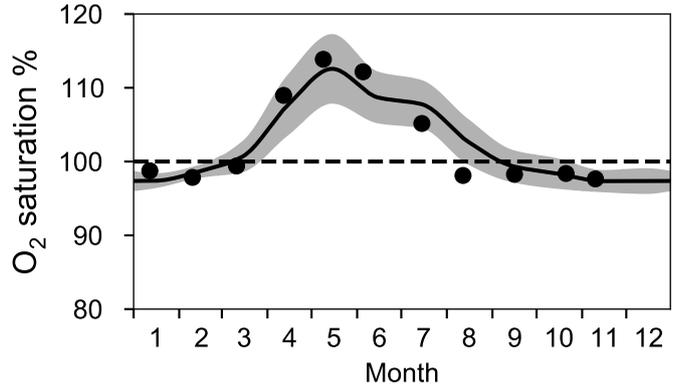
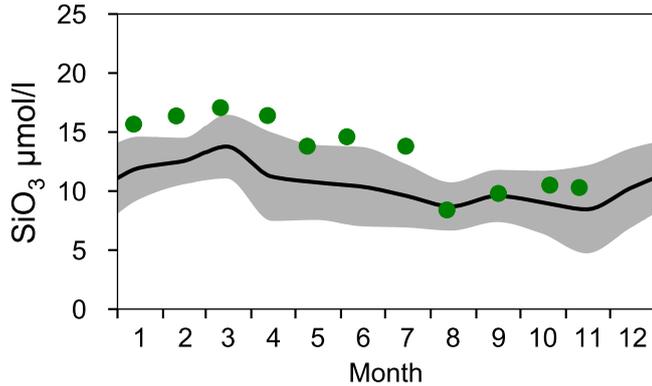
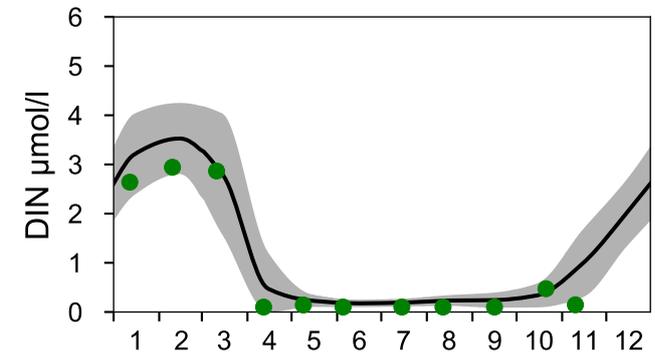
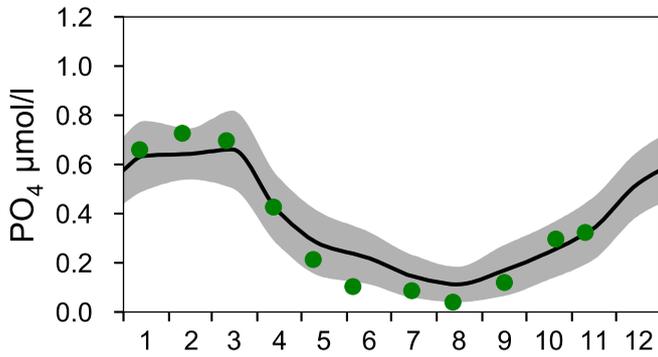
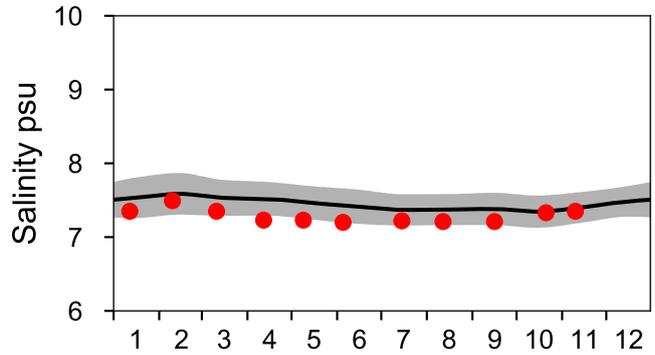
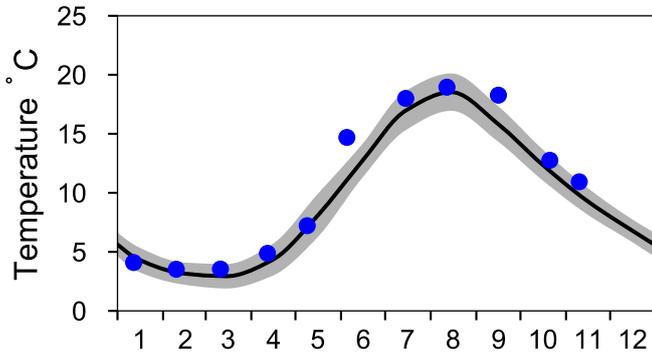
Vertical profiles BY4 CHRISTIANSÖ November



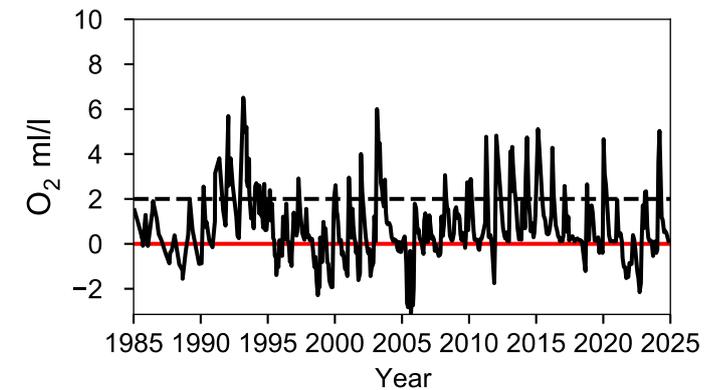
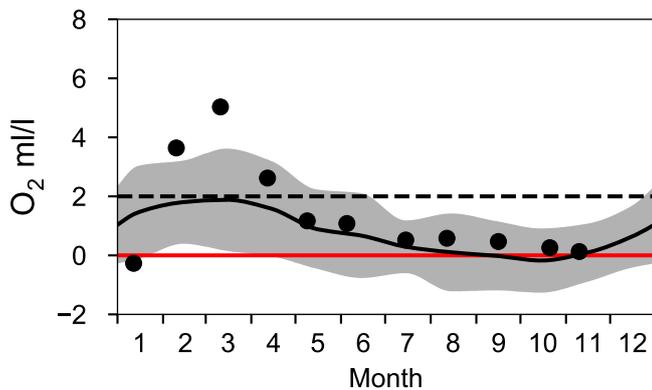
STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)

Annual Cycles

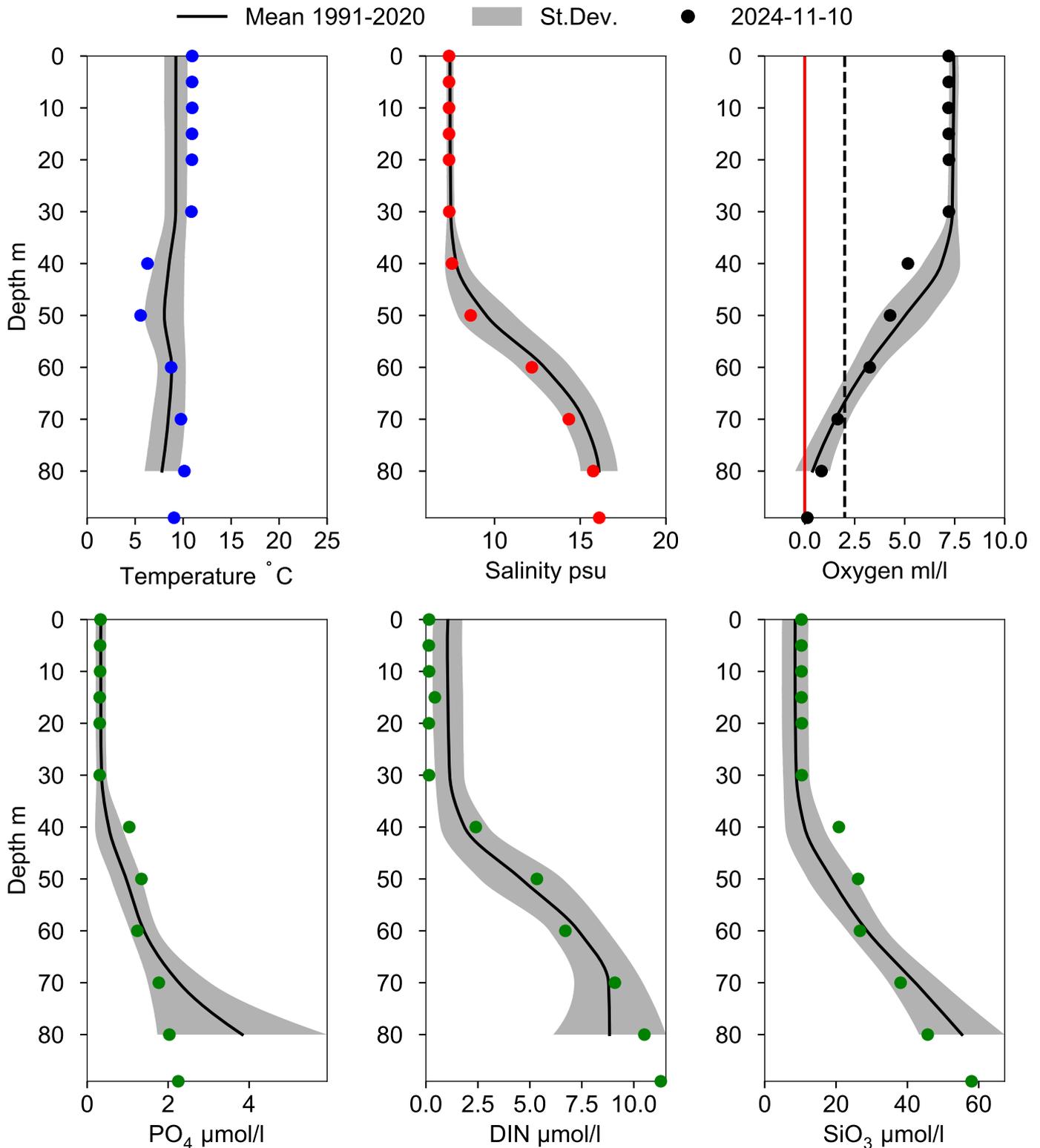
— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 80 m)



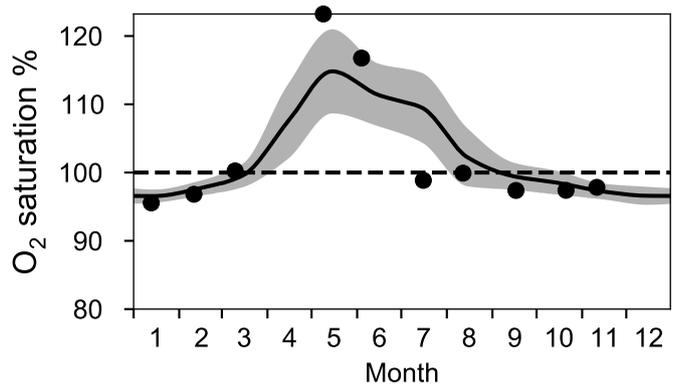
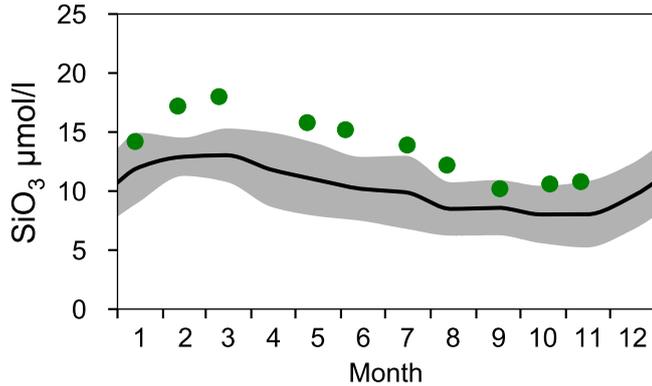
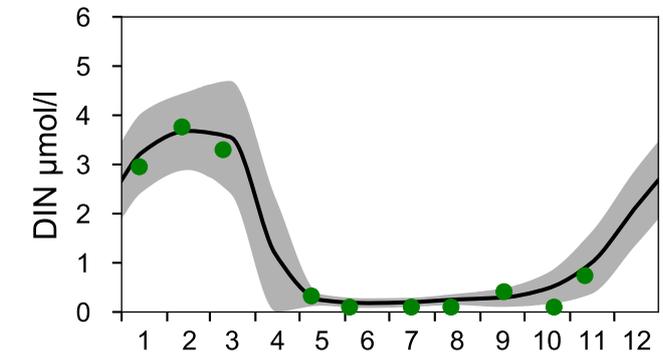
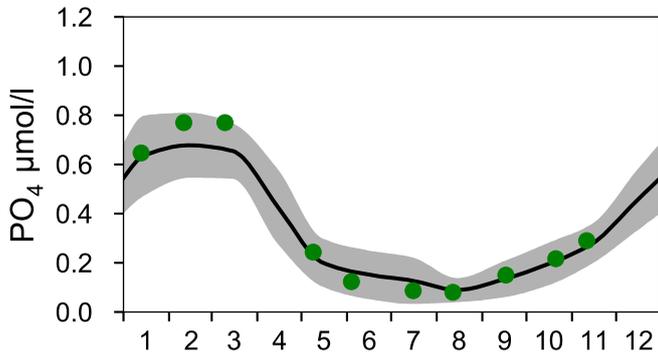
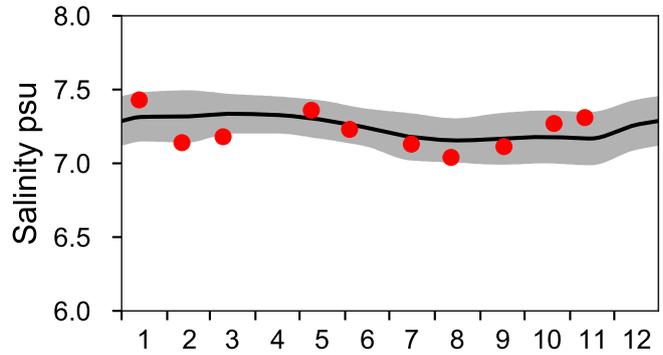
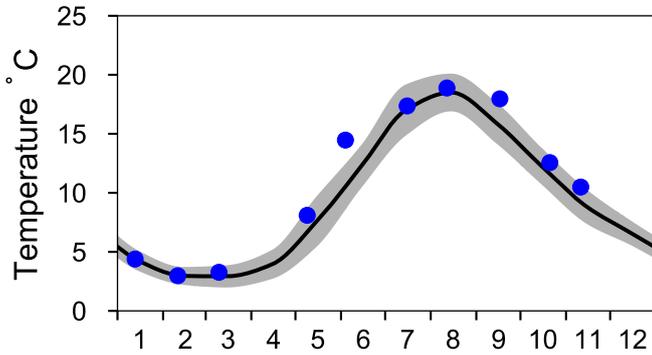
Vertical profiles BY5 BORNHOLMSDJ November



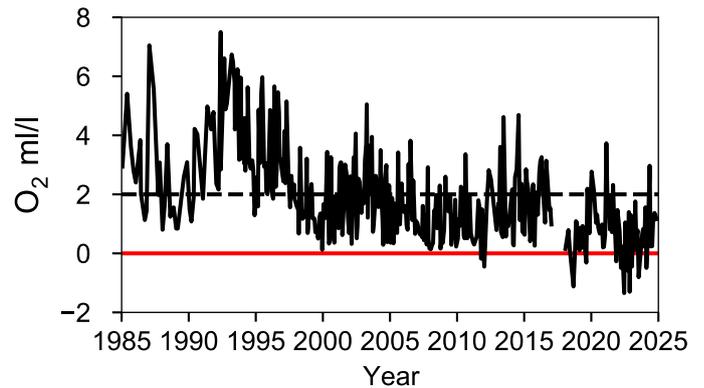
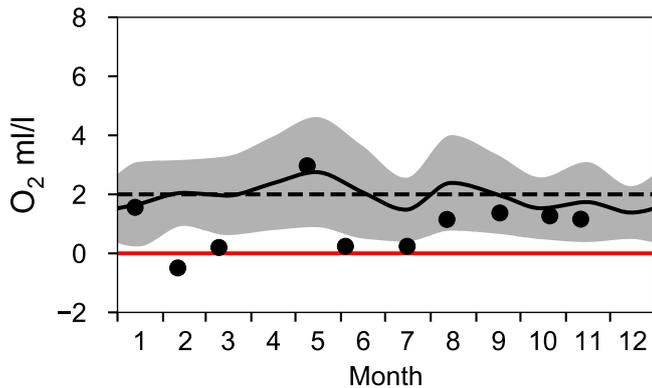
STATION BCS III-10 SURFACE WATER (0-10 m)

Annual Cycles

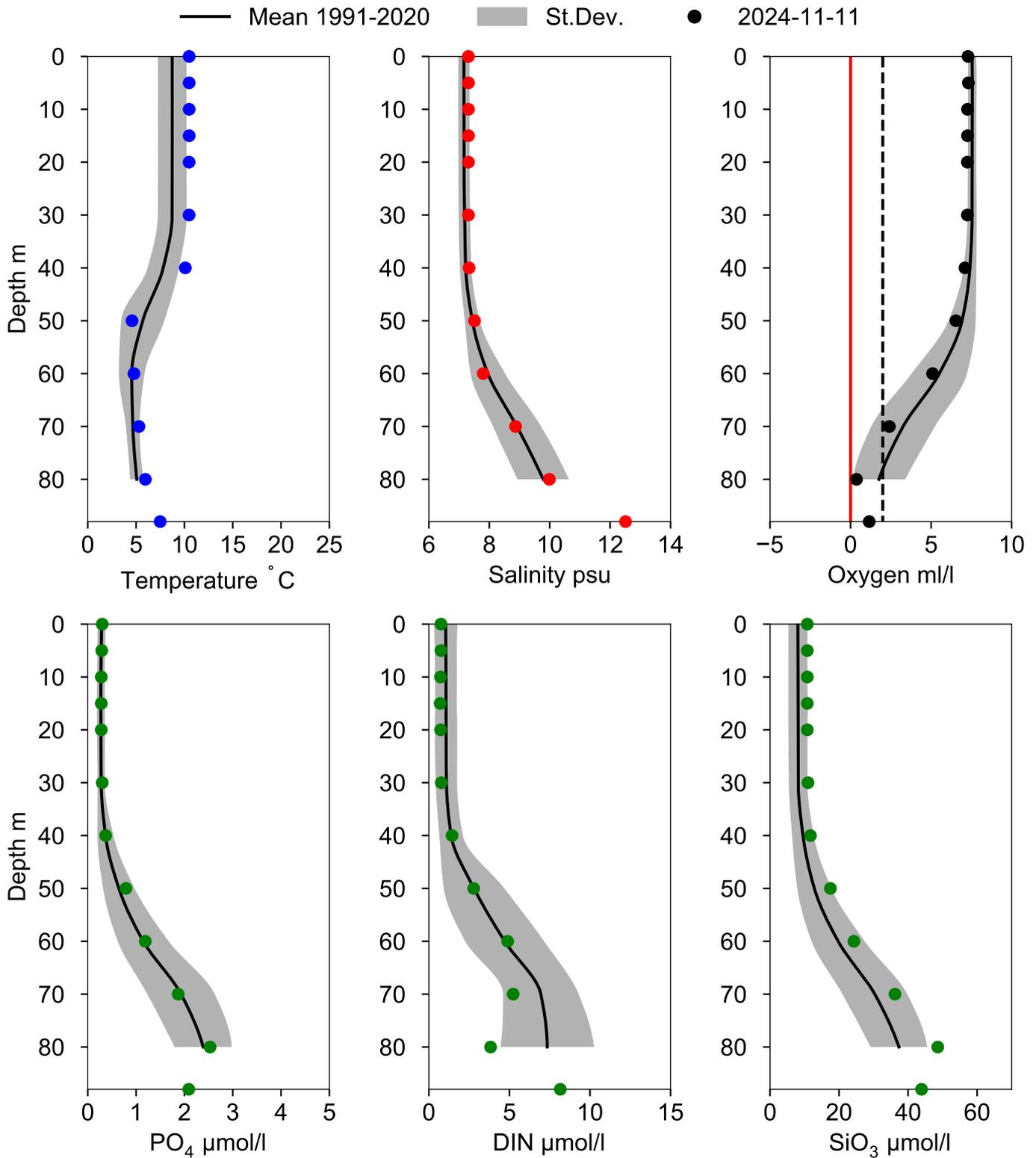
— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 80 m)



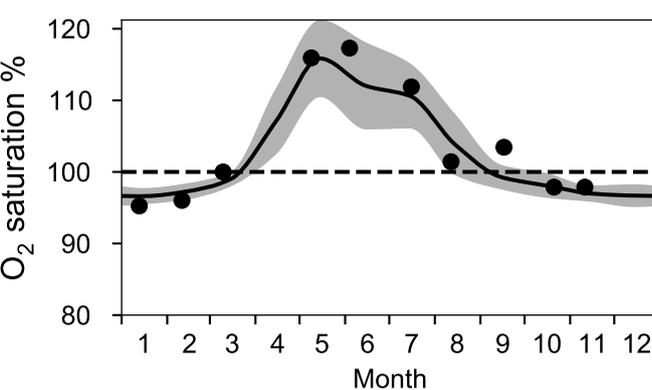
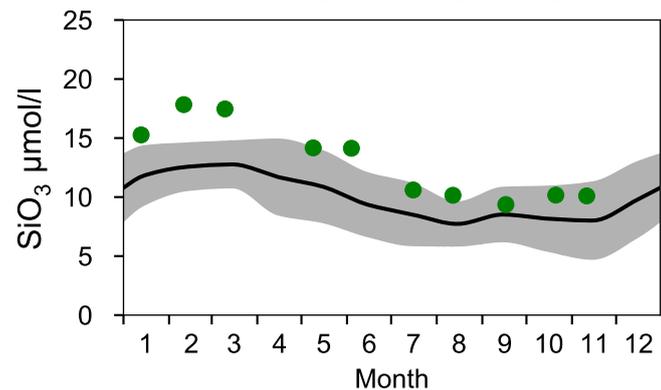
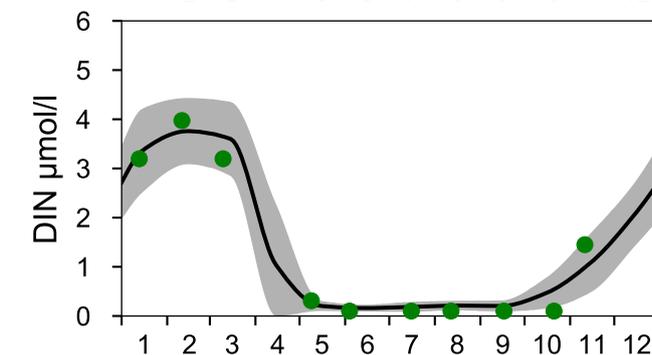
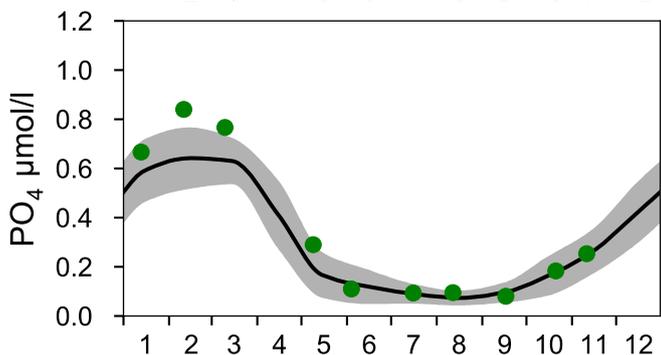
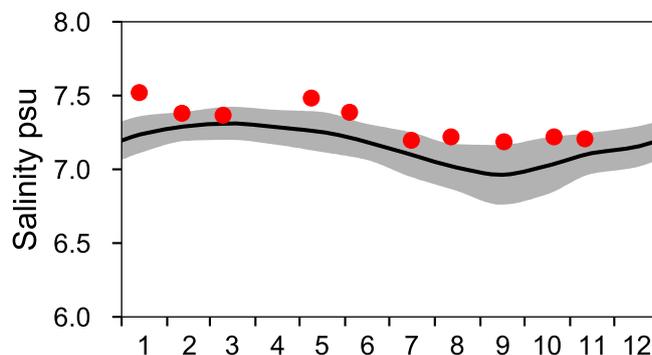
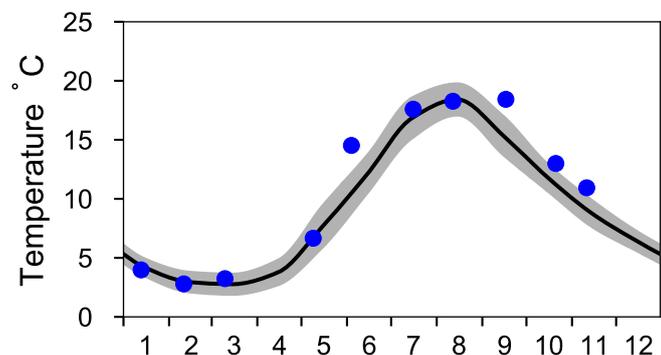
Vertical profiles BCS III-10 November



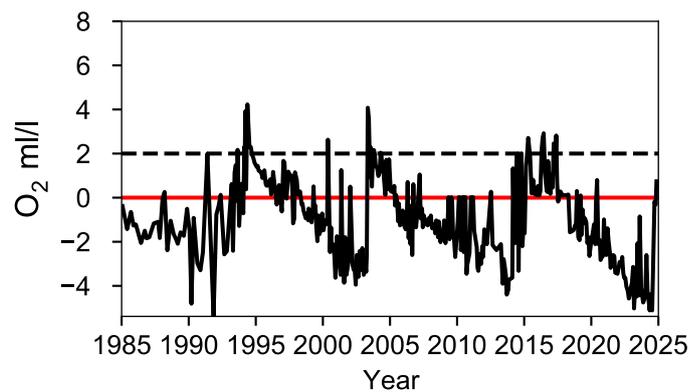
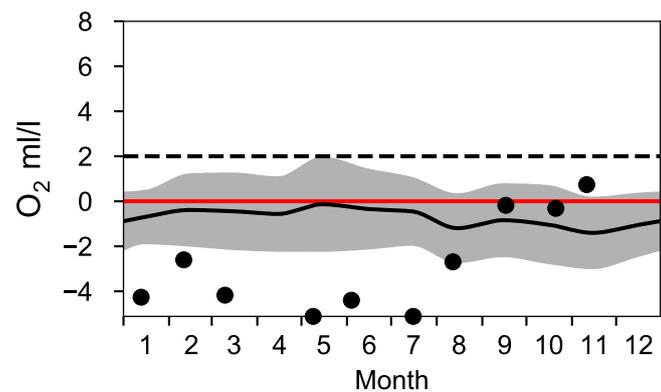
STATION BY10 SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024

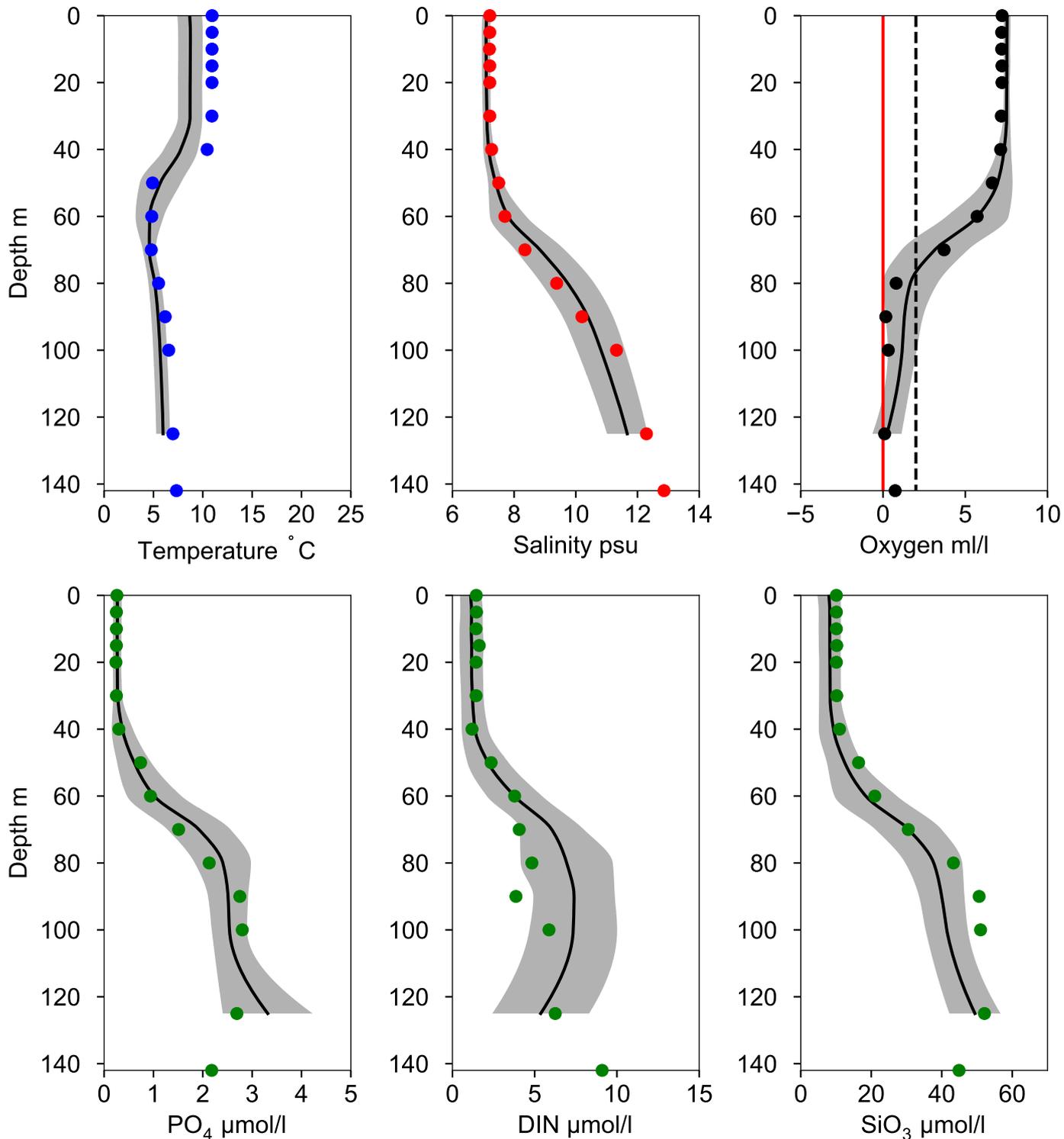


OXYGEN IN BOTTOM WATER (depth >= 125 m)



Vertical profiles BY10 November

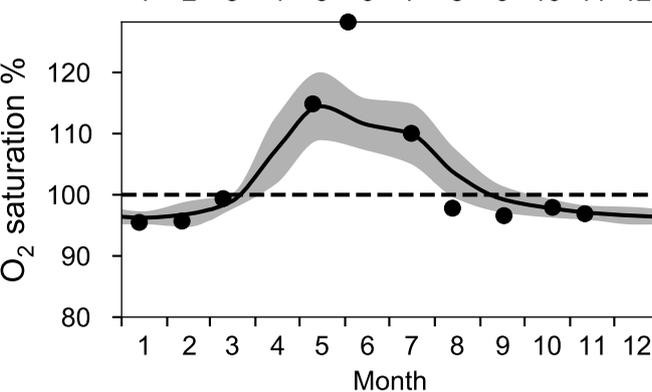
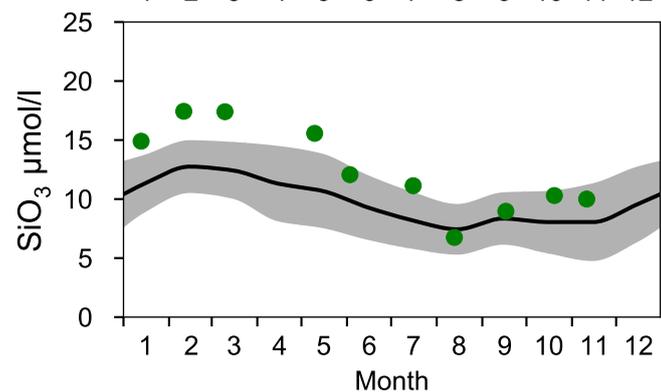
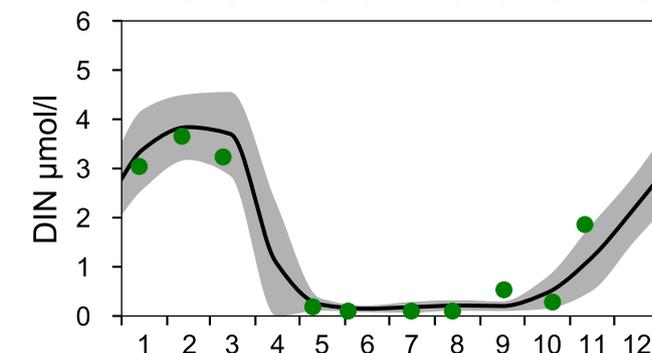
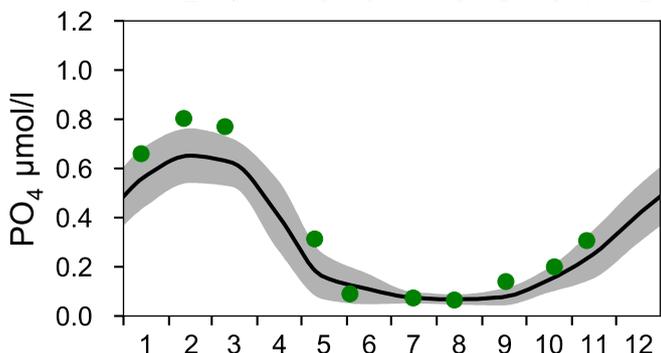
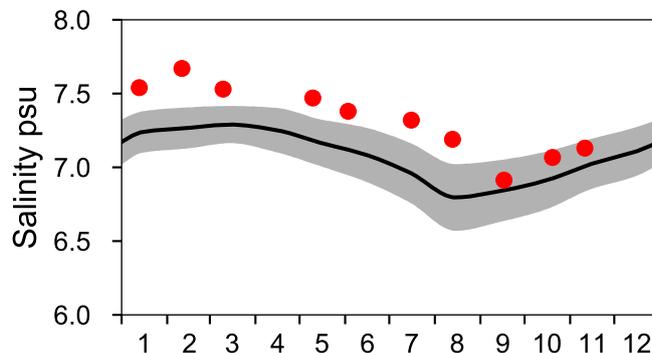
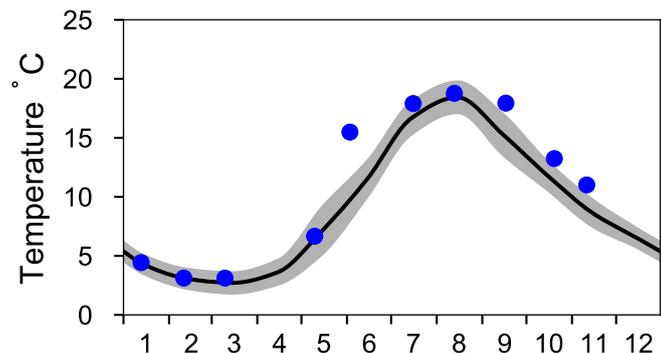
— Mean 1919-2020 ■ St.Dev. ● 2024-11-11



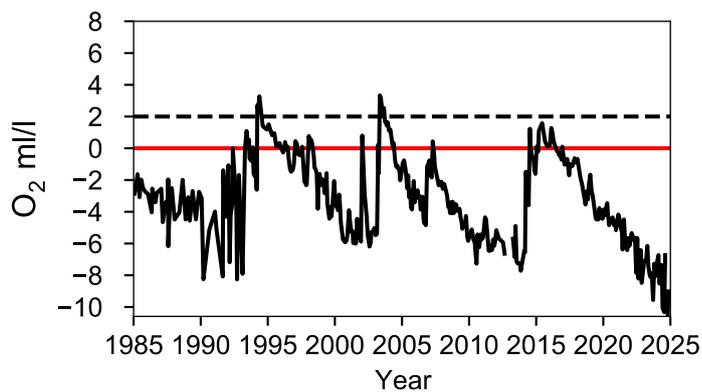
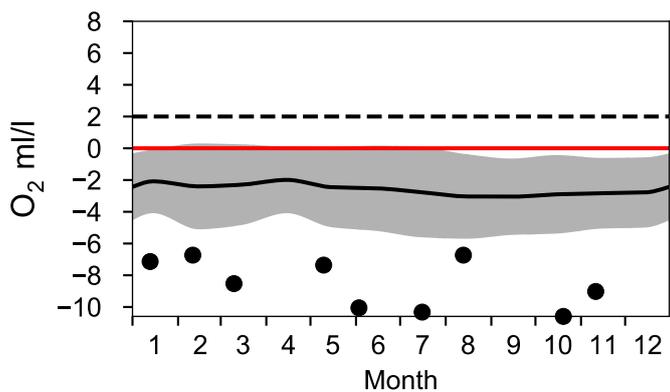
STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024

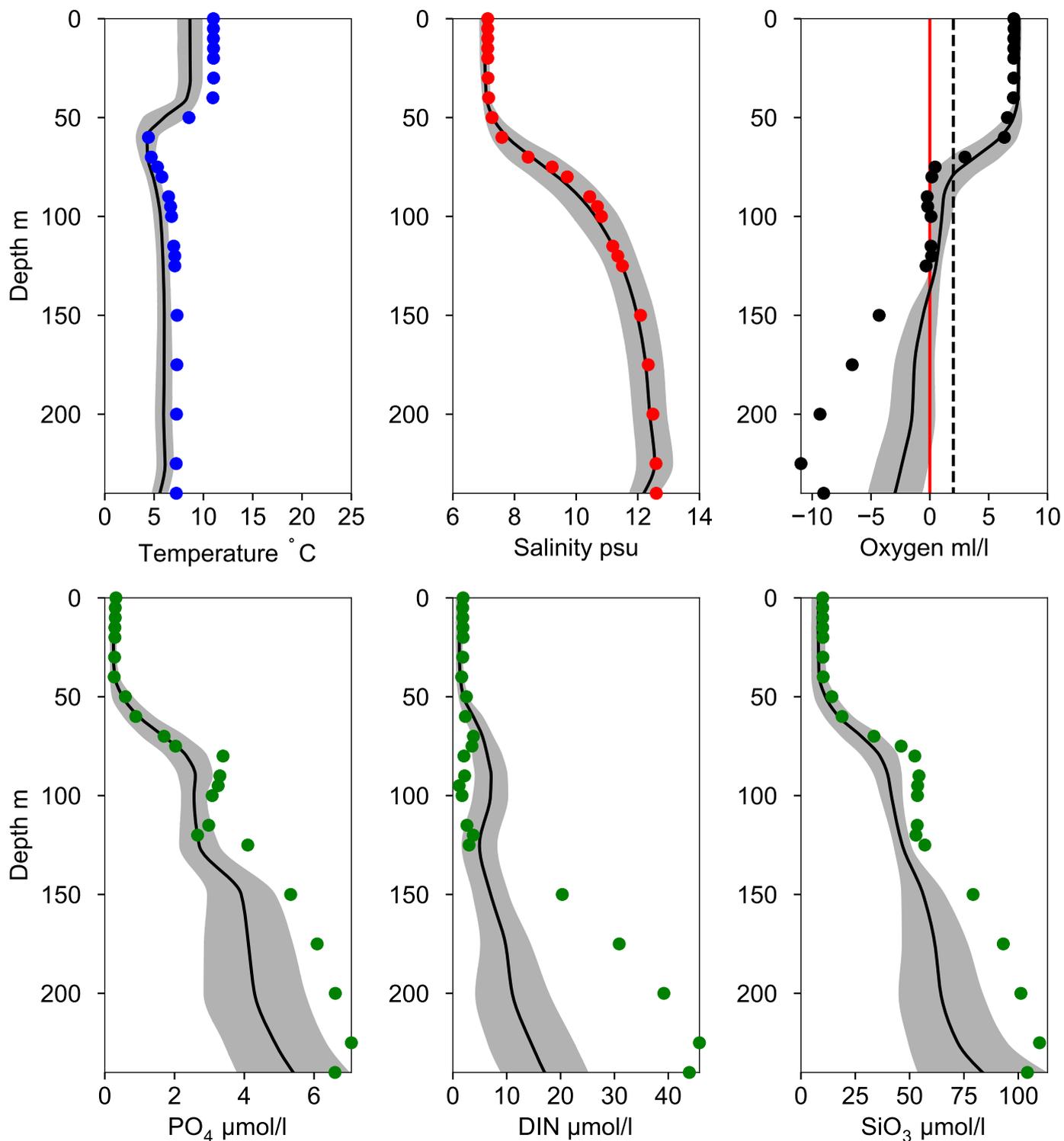


OXYGEN IN BOTTOM WATER (depth >= 225 m)



Vertical profiles BY15 GOTLANDSDJ November

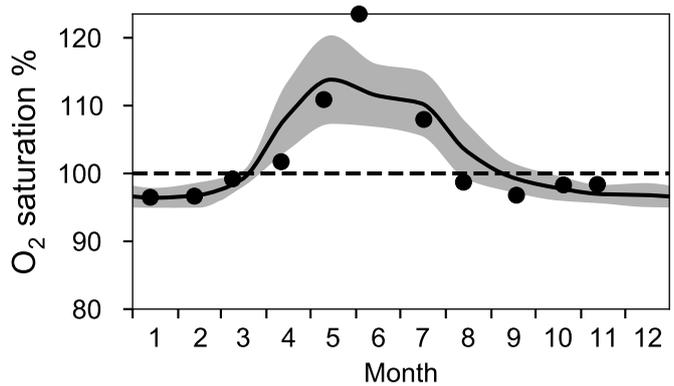
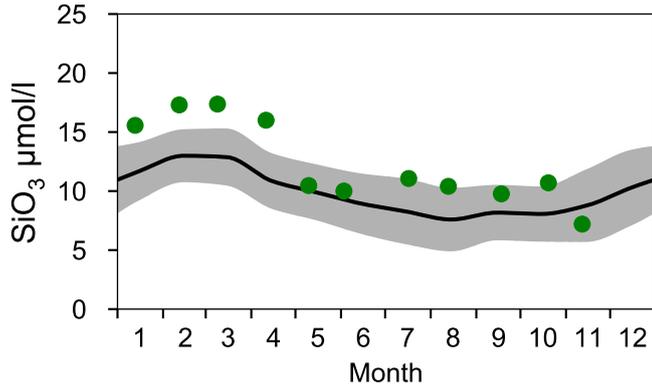
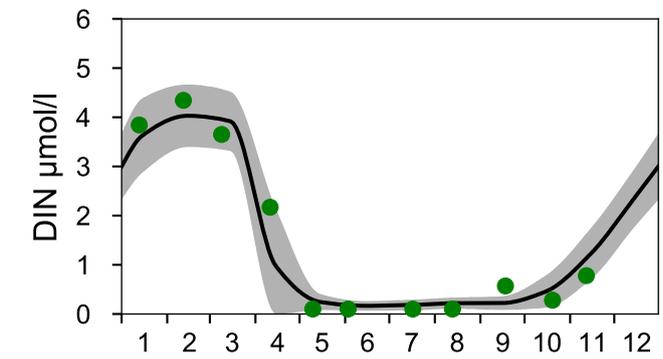
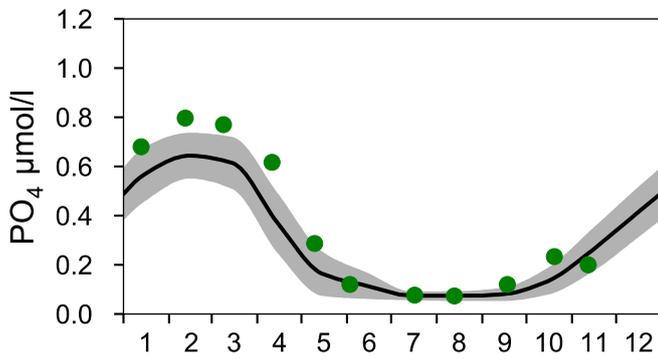
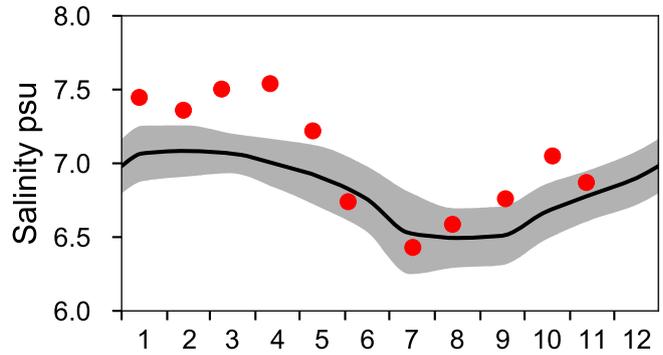
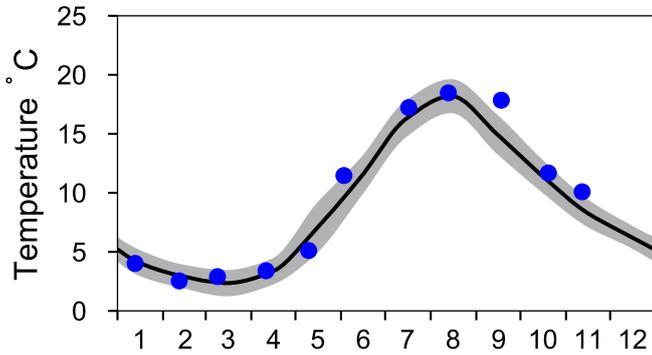
— Mean 1919-2020 St.Dev. ● 2024-11-11



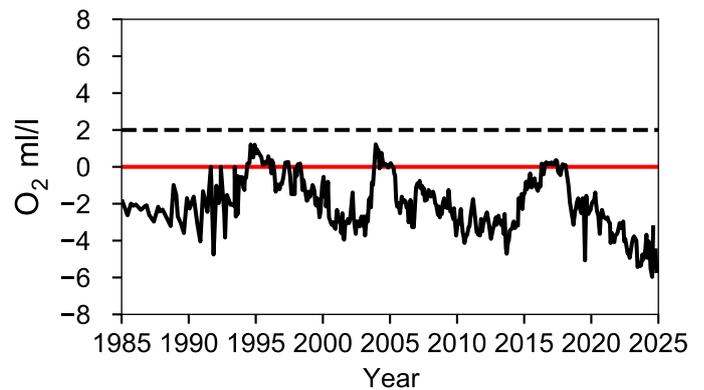
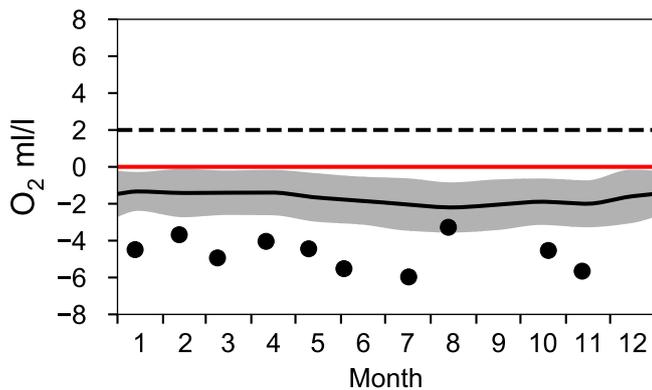
STATION BY20 FÄRÖDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024

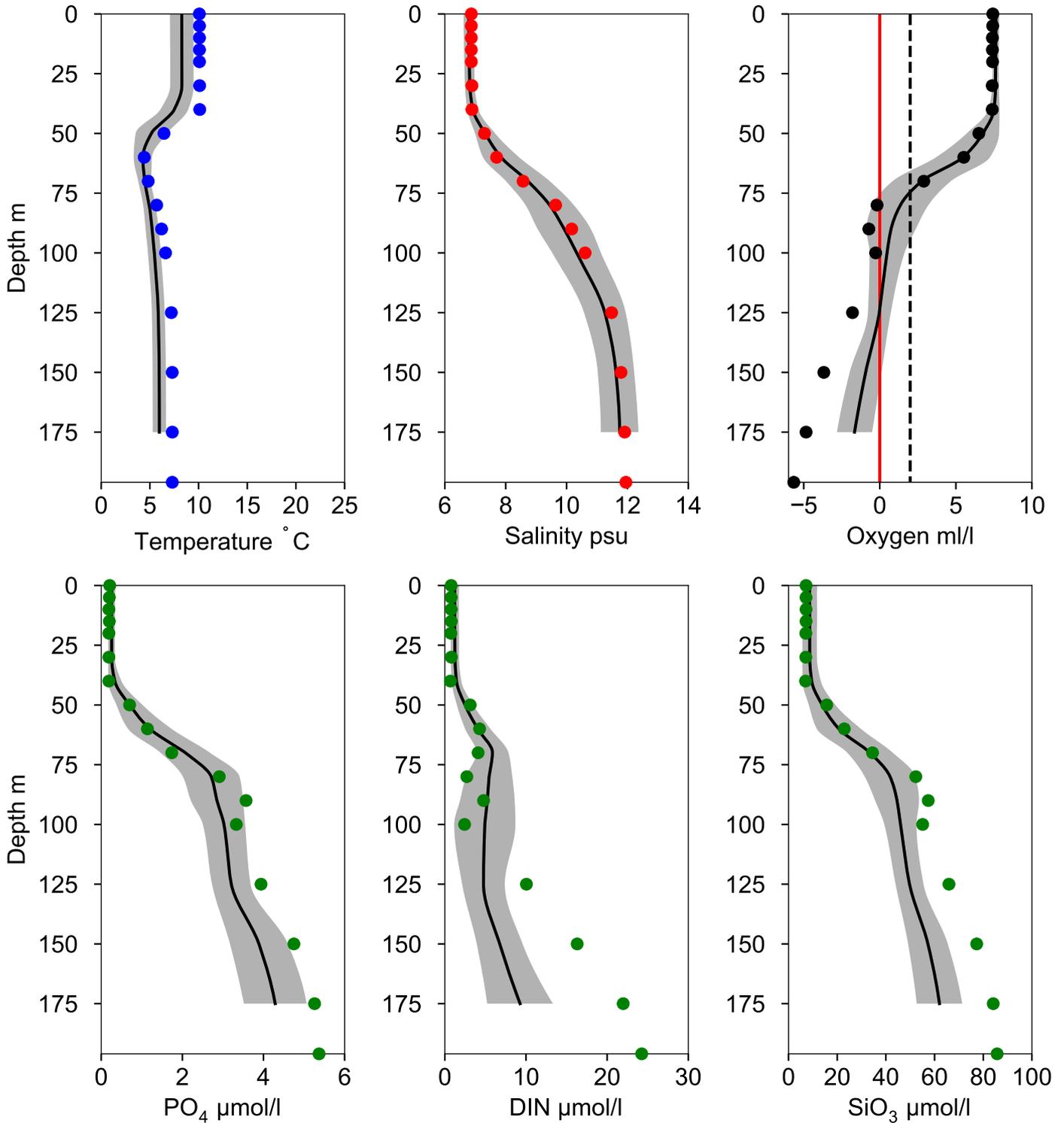


OXYGEN IN BOTTOM WATER (depth >= 175 m)



Vertical profiles BY20 FÅRÖDJ November

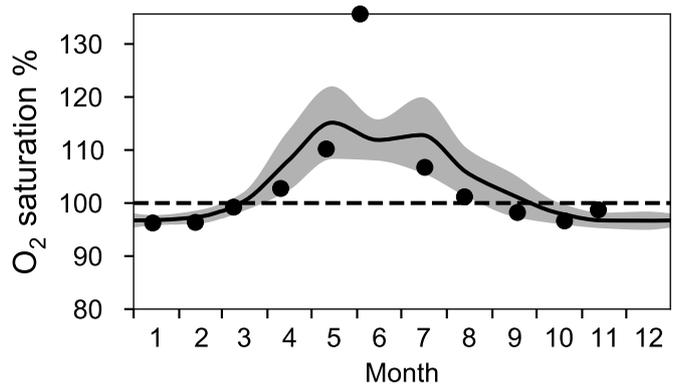
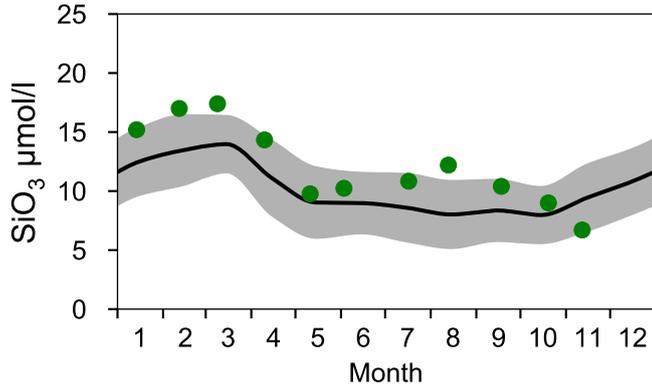
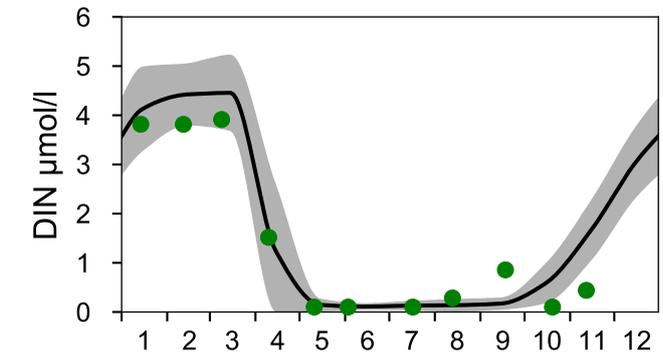
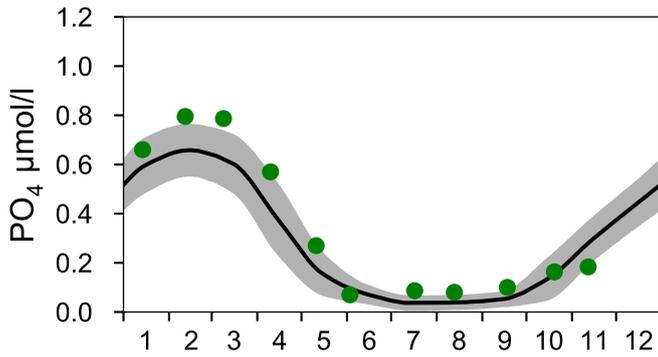
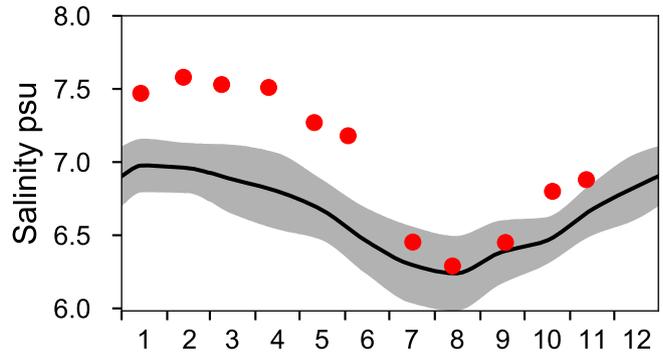
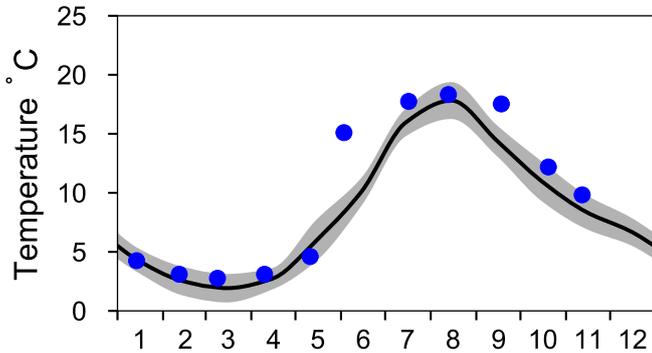
— Mean 1919-2020 St.Dev. ● 2024-11-12



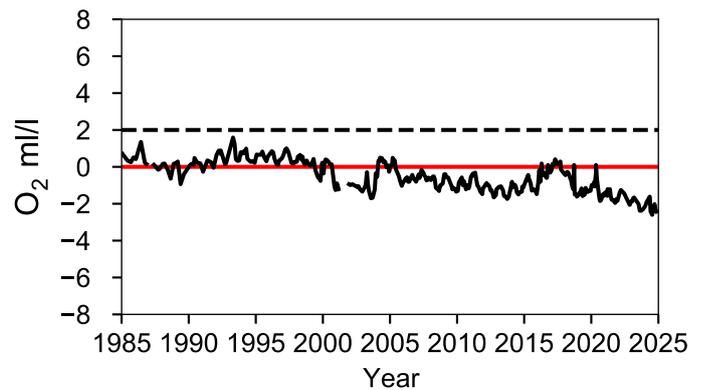
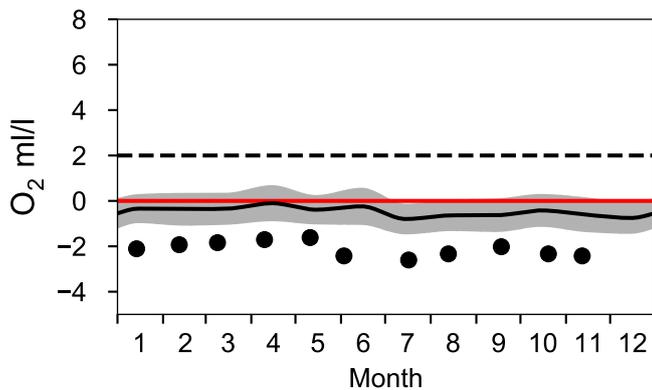
STATION BY29 / LL19 SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024

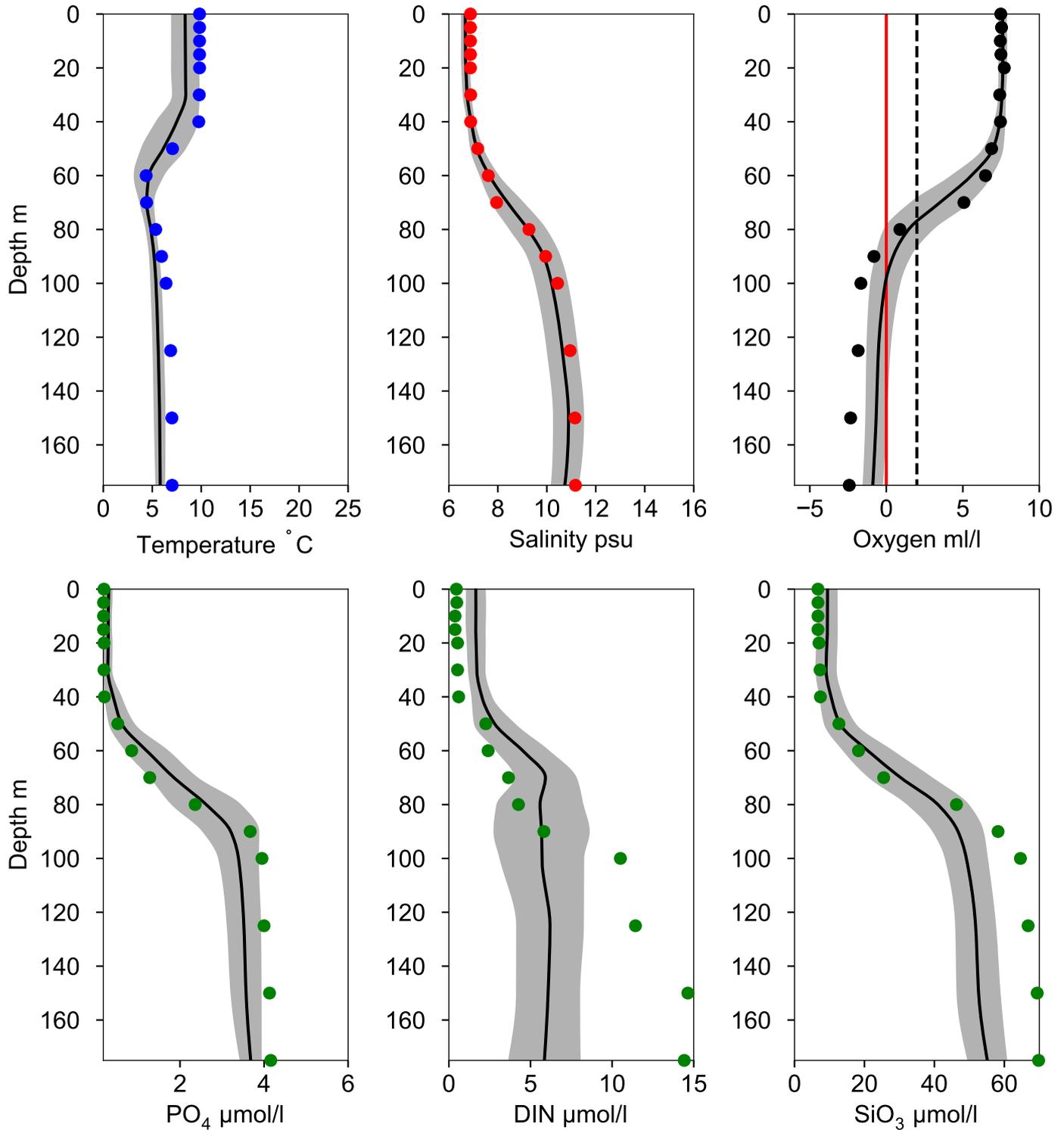


OXYGEN IN BOTTOM WATER (depth >= 150 m)



Vertical profiles BY29 / LL19 November

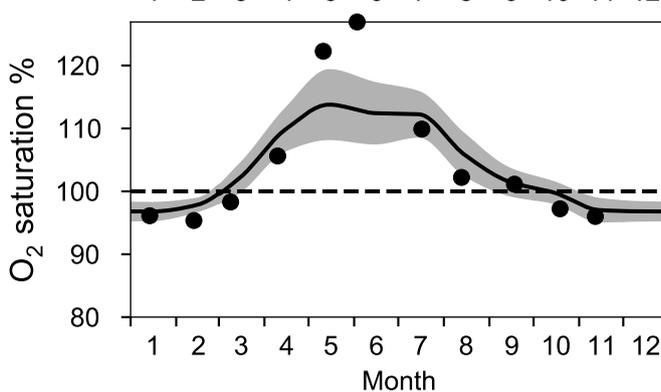
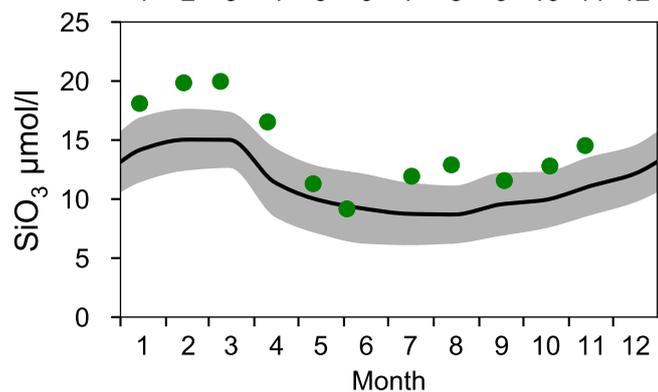
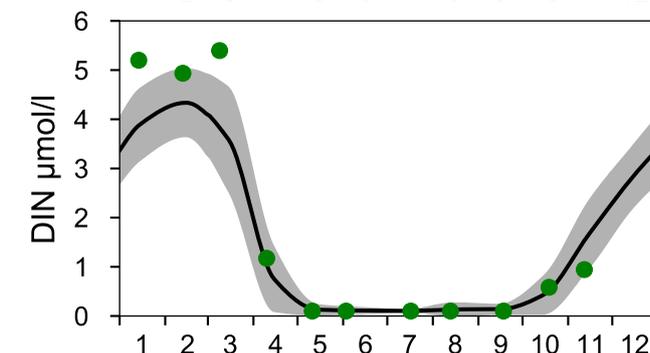
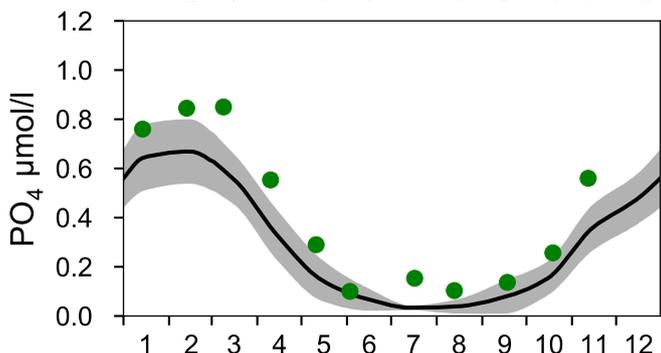
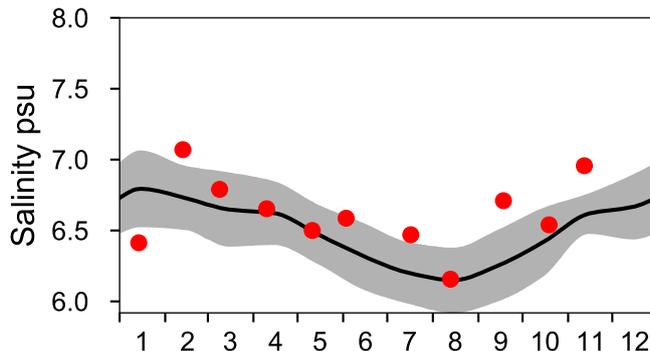
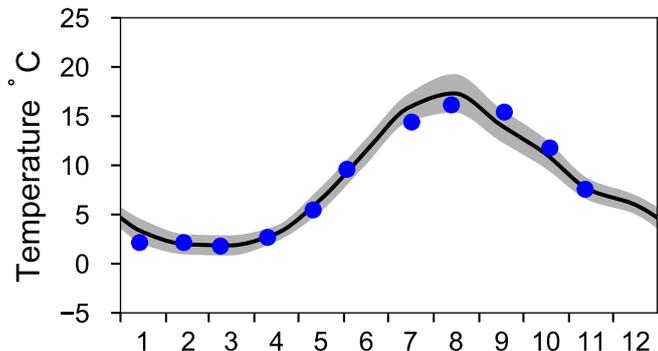
— Mean 1919-2020 ■ St.Dev. ● 2024-11-12



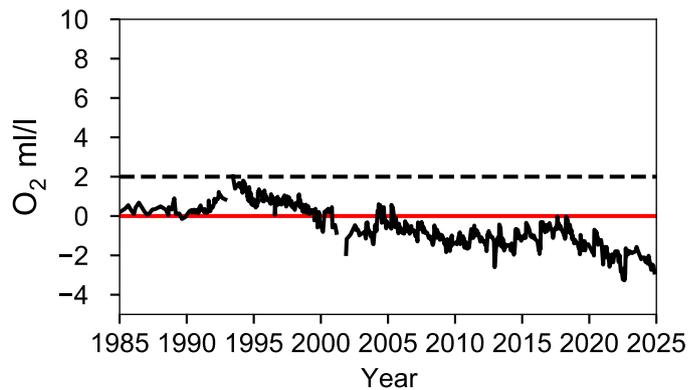
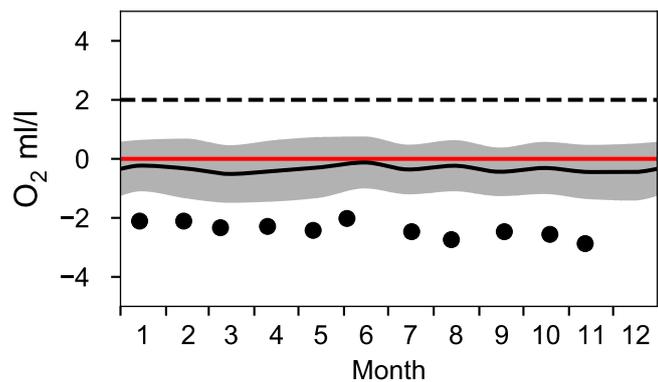
STATION BY31 LANDSORTSDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024

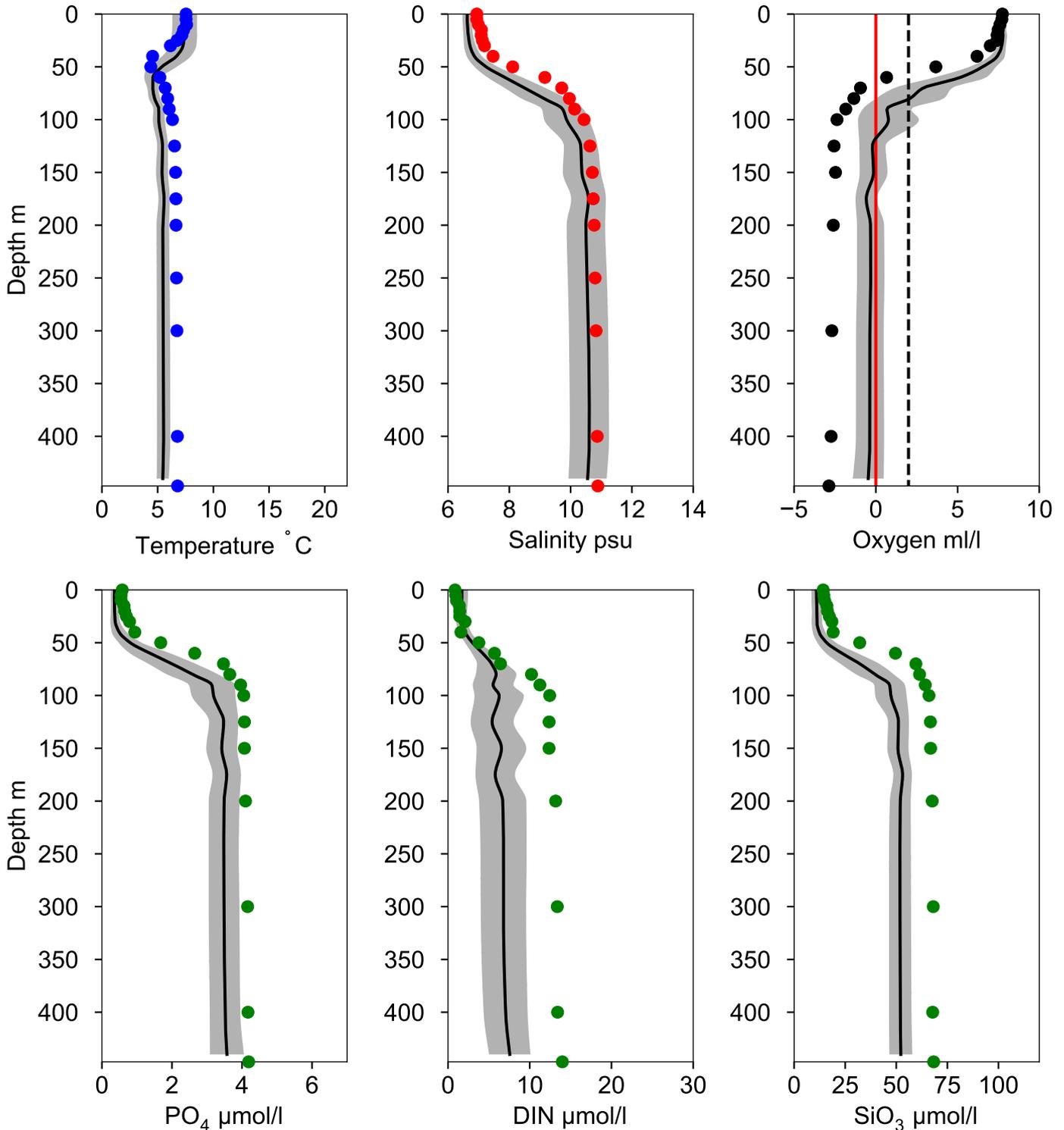


OXYGEN IN BOTTOM WATER (depth >= 419 m)



Vertical profiles BY31 LANDSORTSDJ November

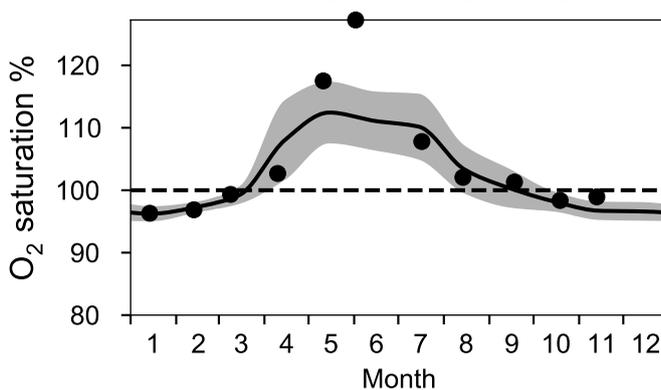
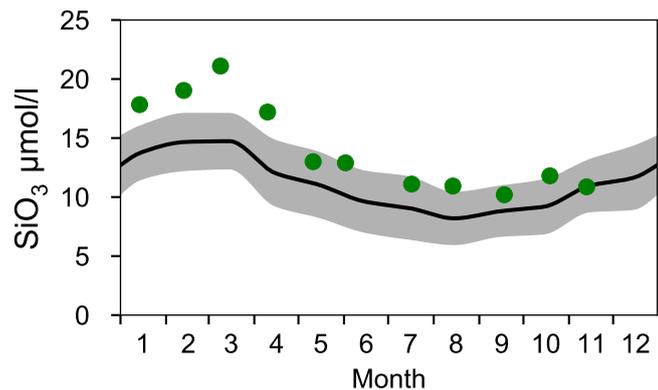
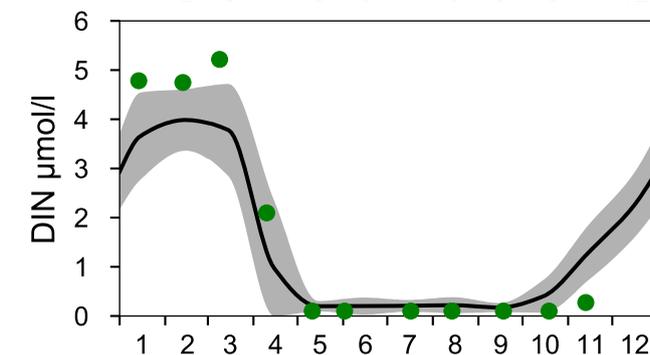
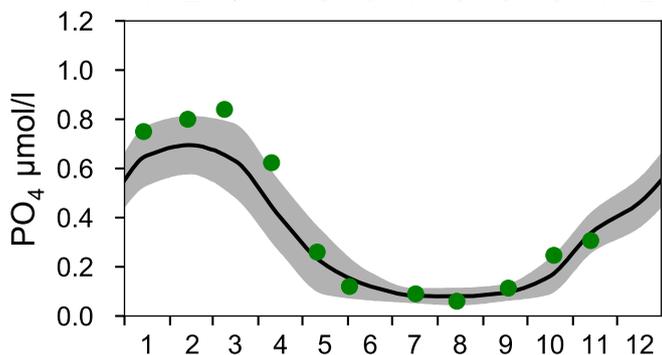
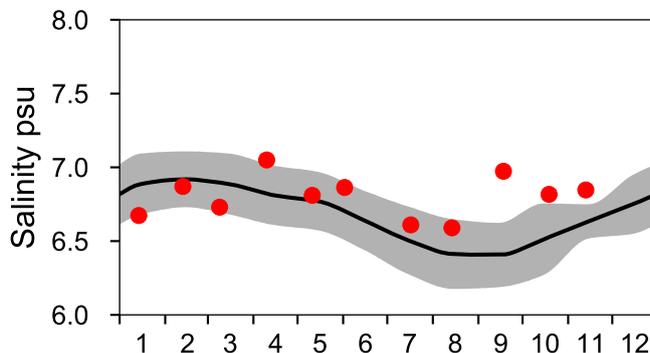
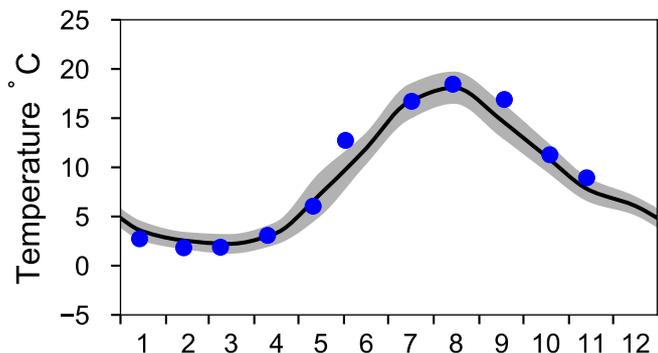
— Mean 1991-2020 St.Dev. ● 2024-11-12



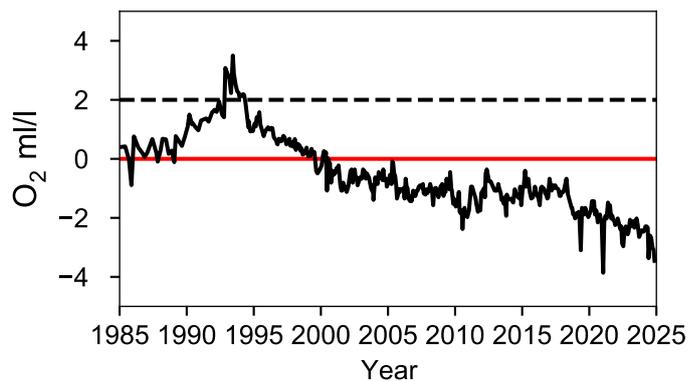
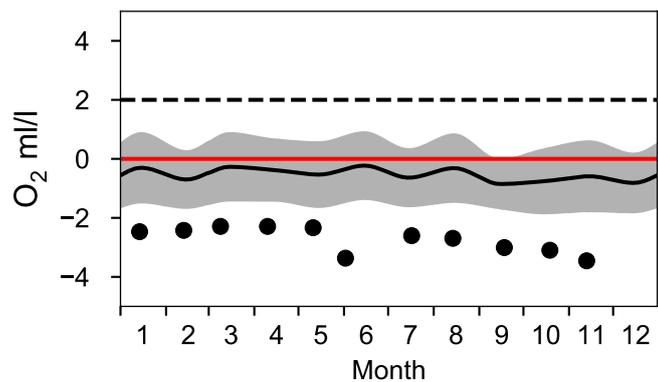
STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024

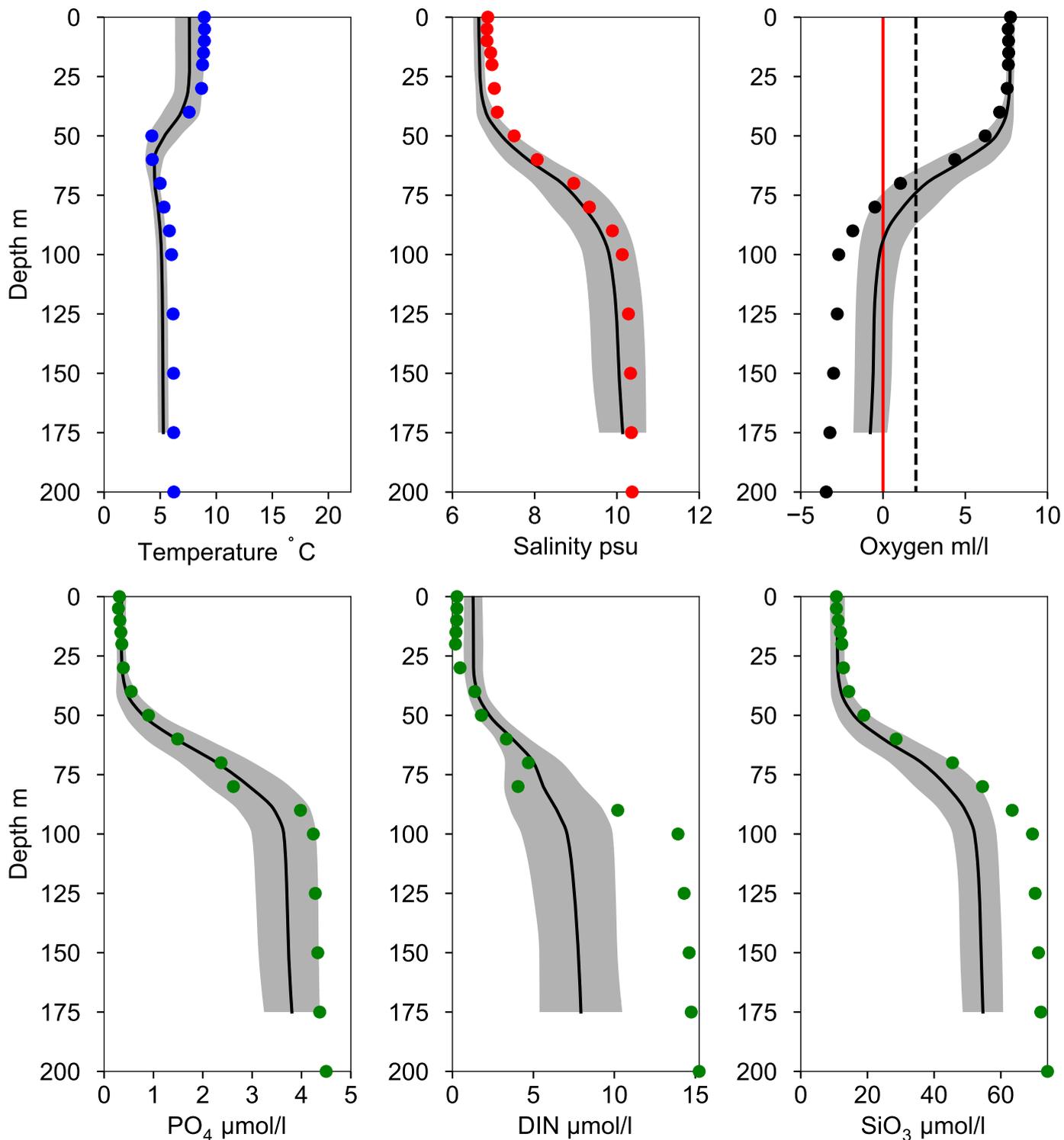


OXYGEN IN BOTTOM WATER (depth >= 175 m)



Vertical profiles BY32 NORRKÖPINGSDJ November

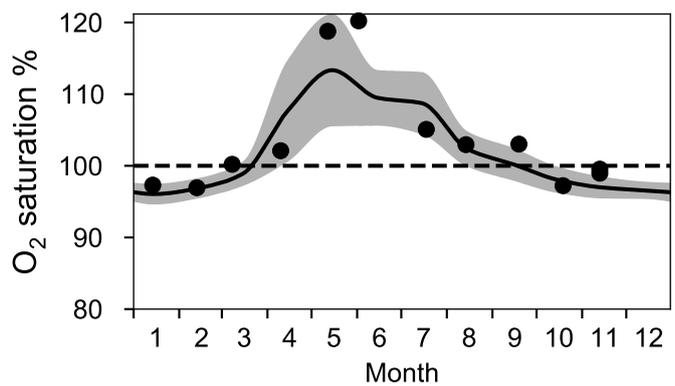
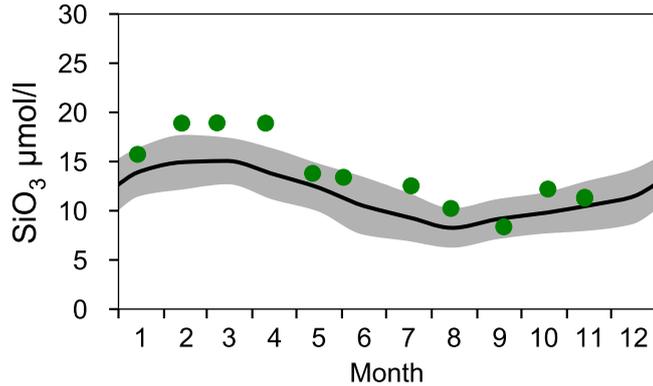
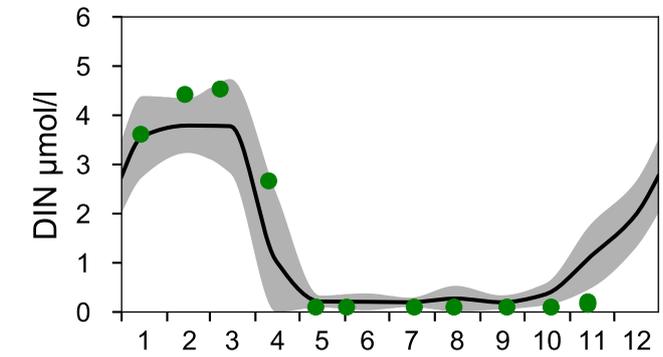
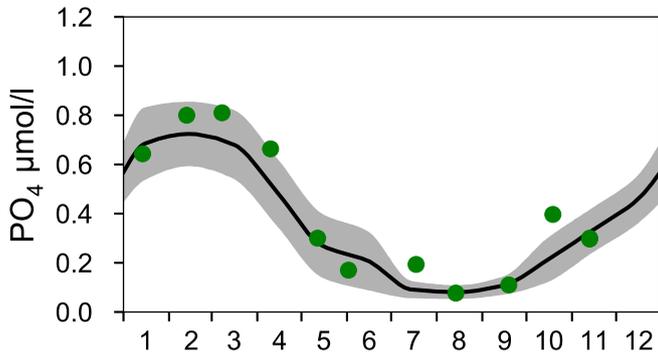
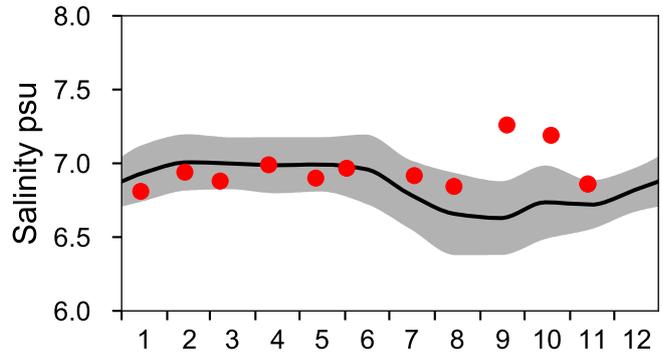
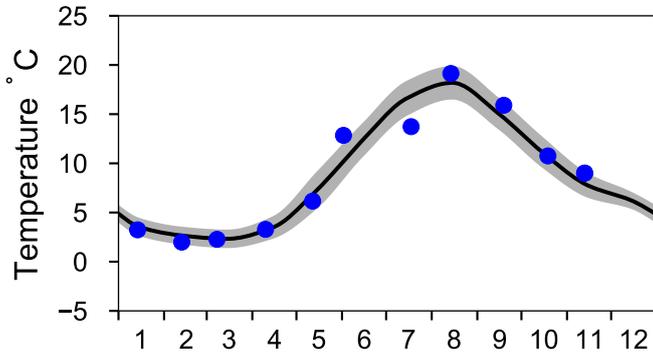
— Mean 1919-2020 St.Dev. ● 2024-11-13



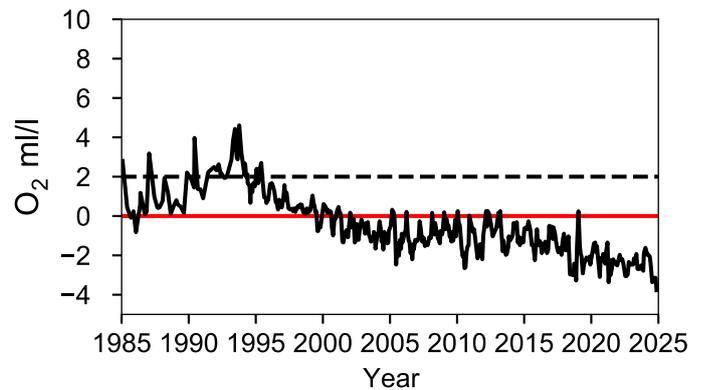
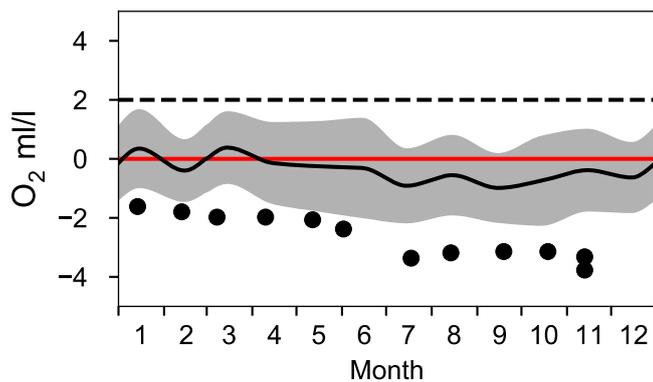
STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024

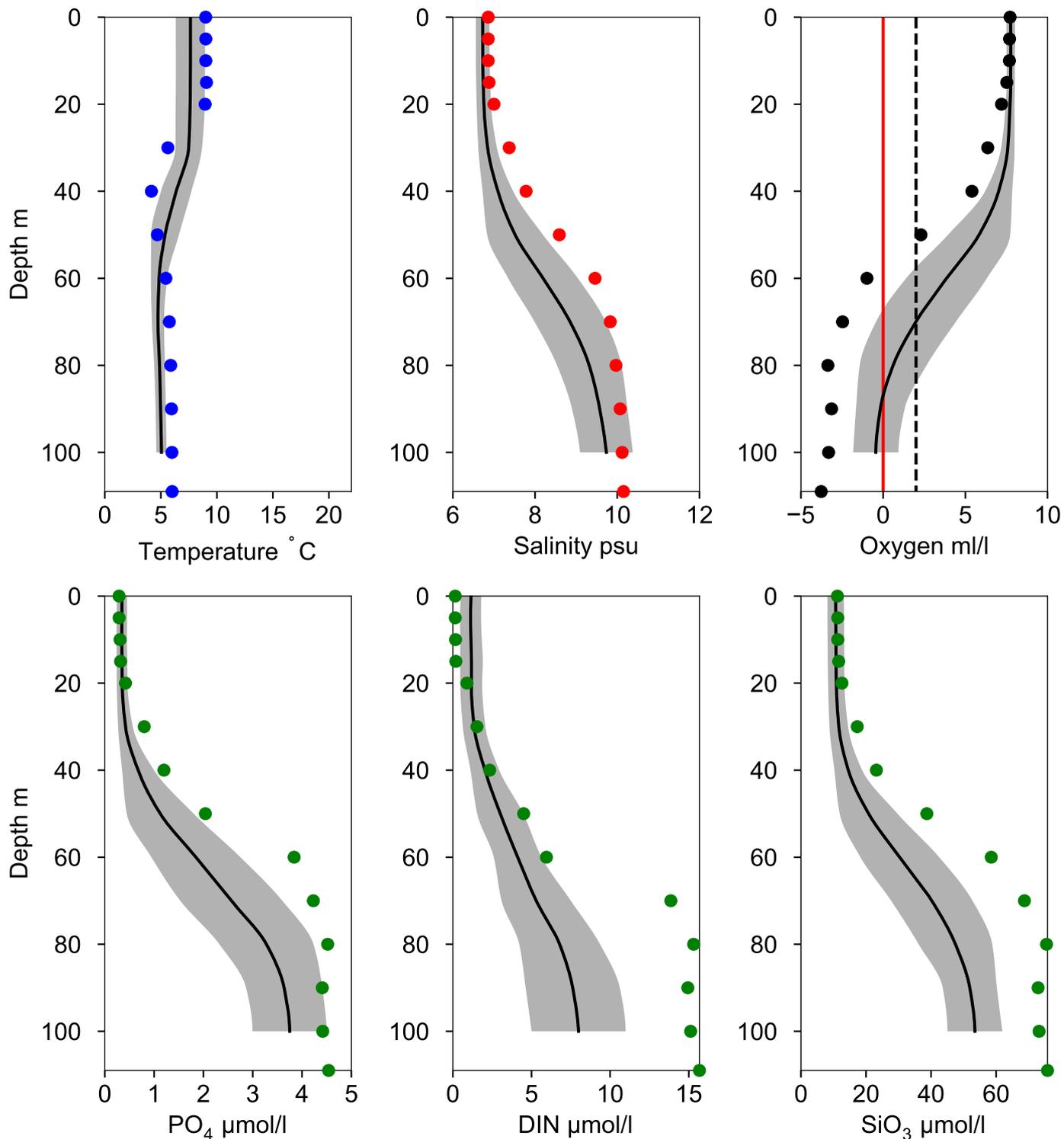


OXYGEN IN BOTTOM WATER (depth >= 100 m)



Vertical profiles BY38 KARLSÖDJ November

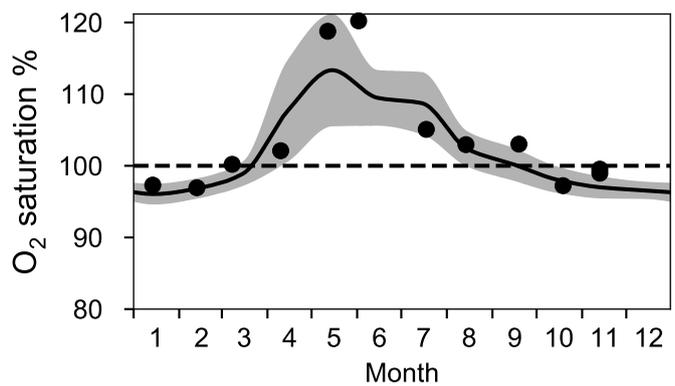
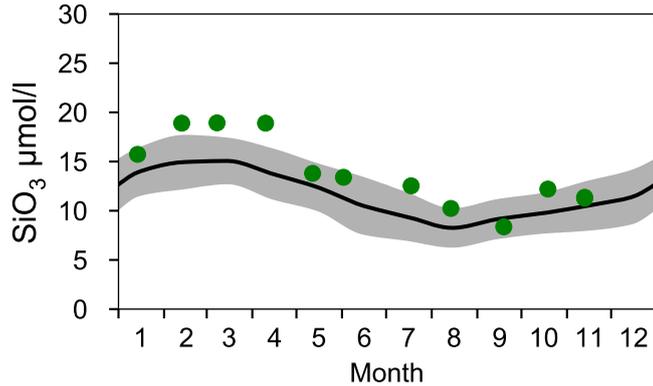
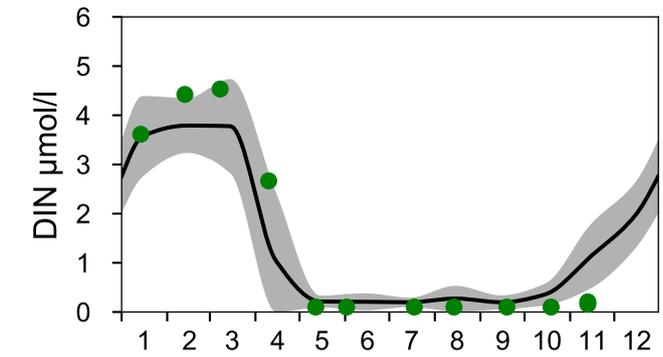
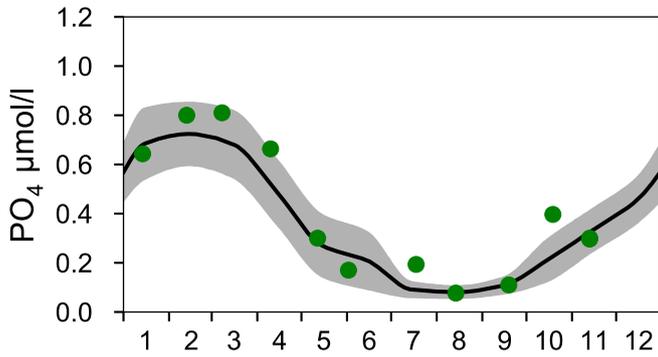
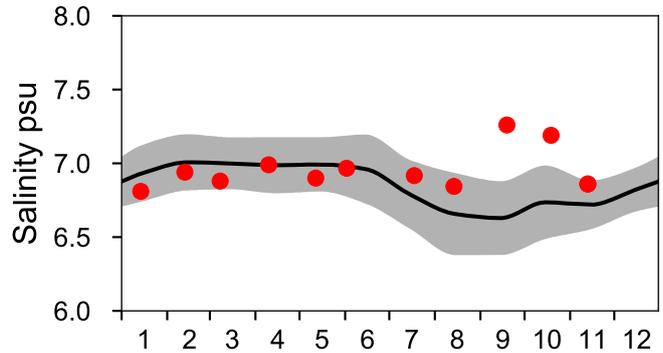
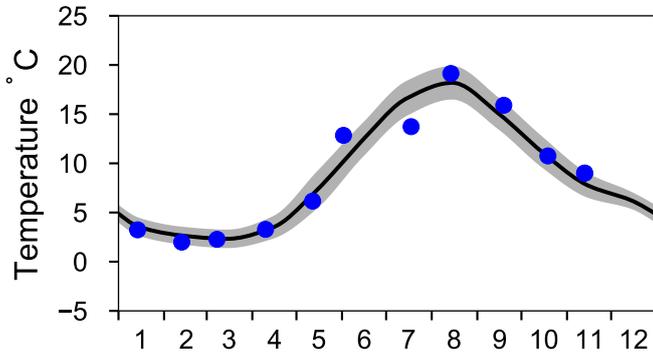
— Mean 1919-2020 ■ St.Dev. ● 2024-11-13



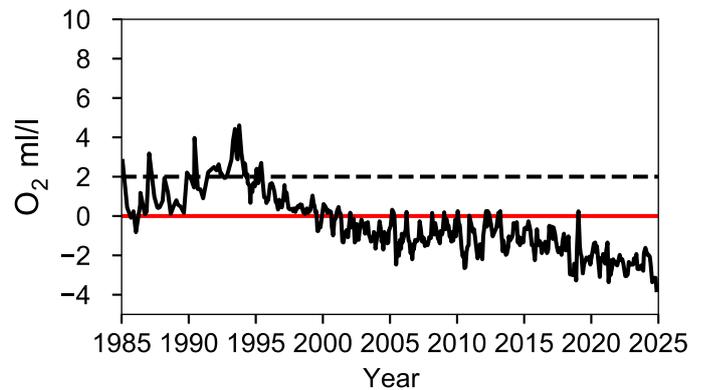
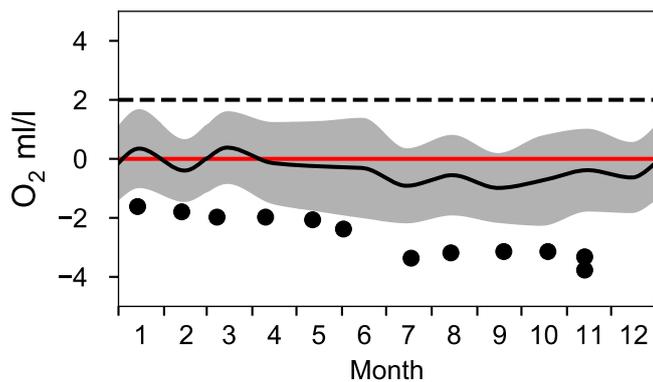
STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024

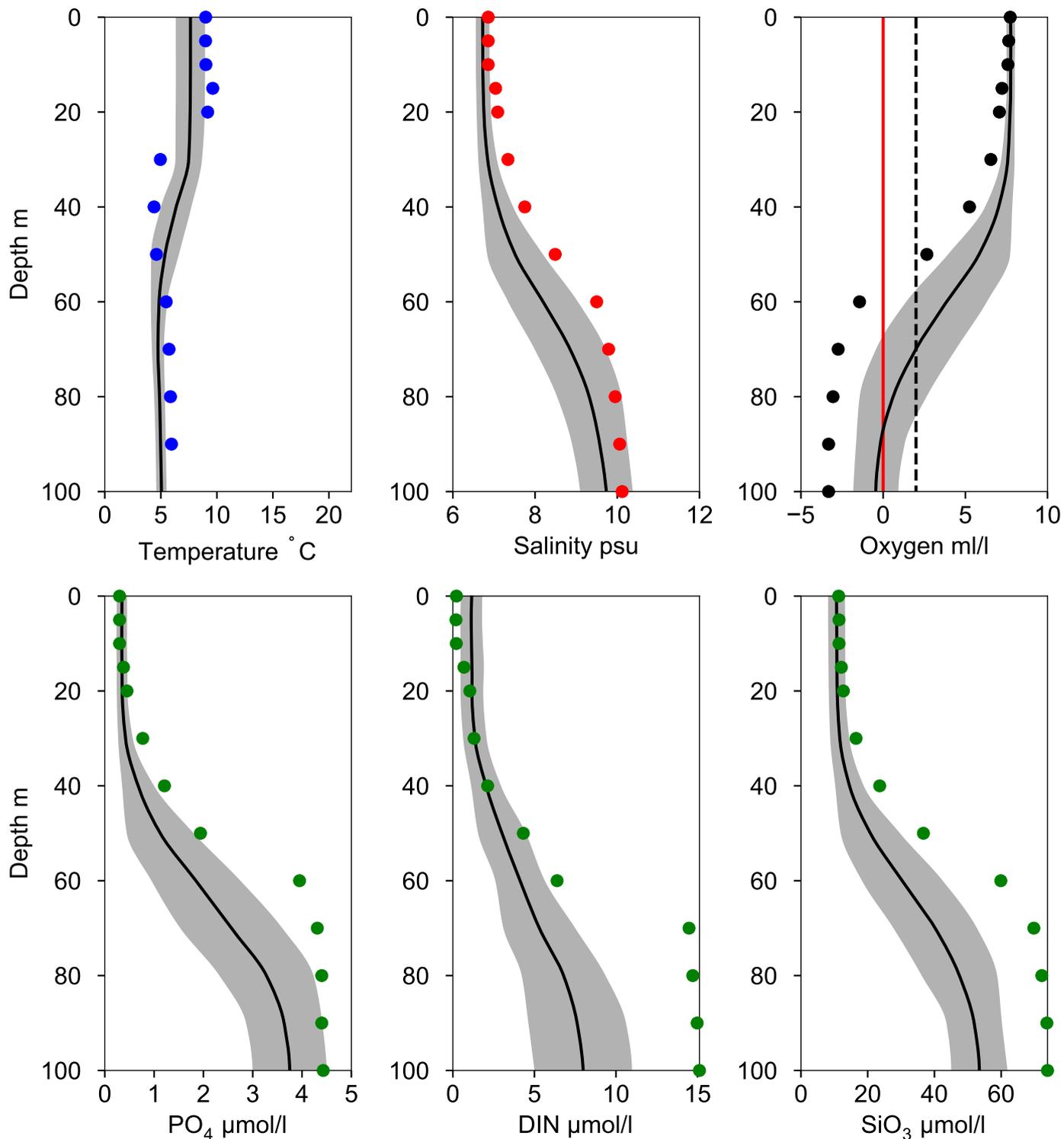


OXYGEN IN BOTTOM WATER (depth >= 100 m)



Vertical profiles BY38 KARLSÖDJ November

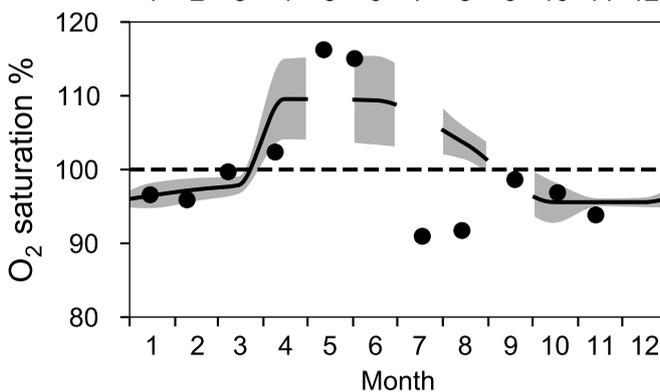
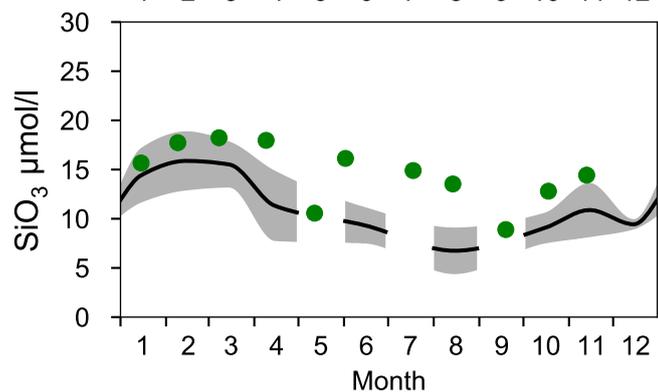
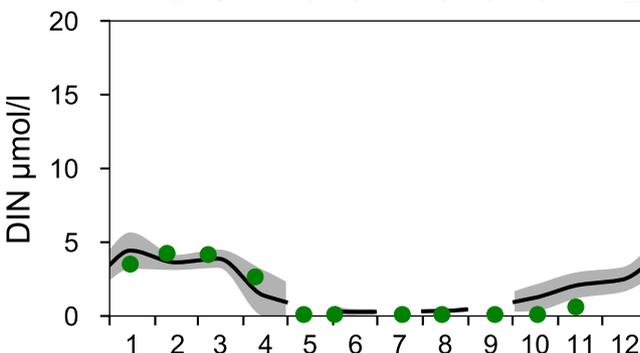
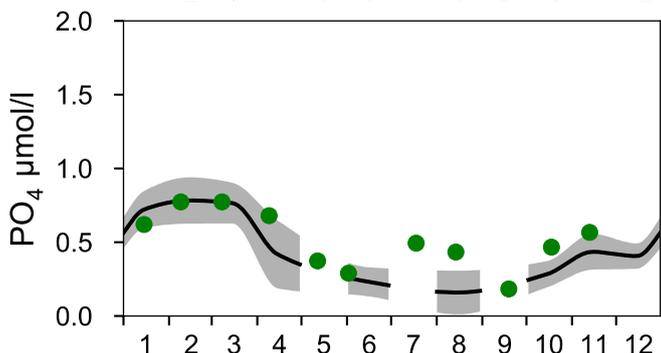
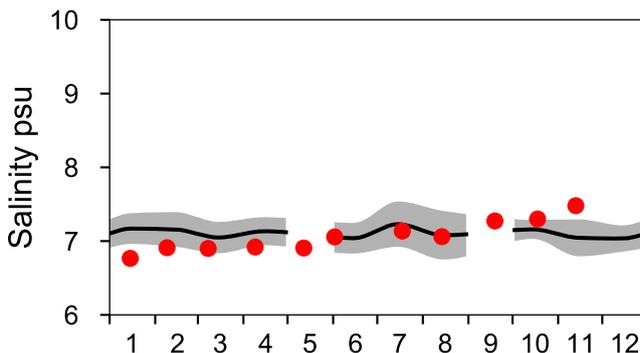
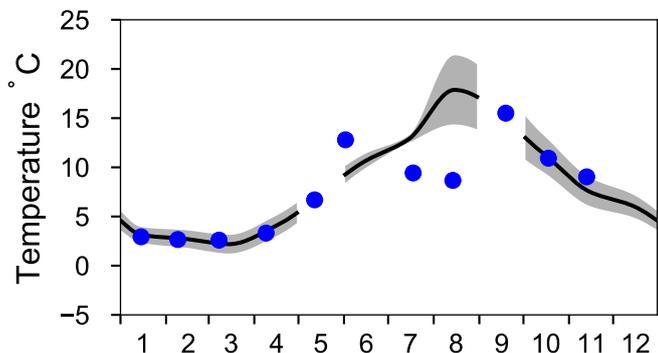
— Mean 1919-2020 St.Dev. ● 2024-11-13



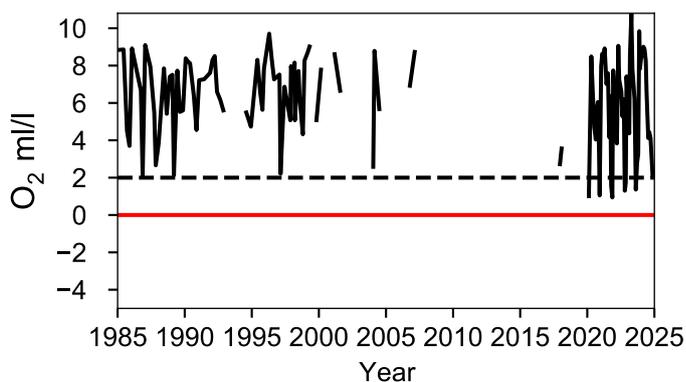
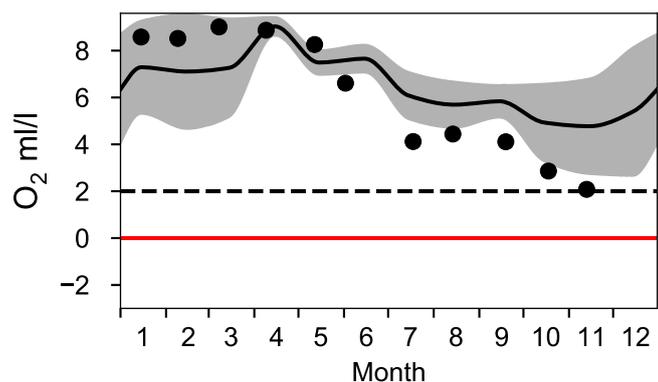
STATION BY39 ÖLANDS S UDDE SURFACE WATER (0-10 m)

Annual Cycles

— Mean 1991-2020 St.Dev. ● 2024



OXYGEN IN BOTTOM WATER (depth >= 40 m)



Vertical profiles BY39 ÖLANDS S UDDE November

