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Report from the SMHI monitoring cruise with R/V Svea

Foto: Ola Kalén, SMHI

Survey period:	2020-10-16 - 2020-10-22
Principal:	Swedish Meteorological and Hydrological Institute (SMHI), Swedish Agency for Marine and Water Management (SwAM)
Cooperation partners:	Swedish University of Agricultural Sciences (SLU)

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SUMMARY

During the expedition, which is part of the Swedish national marine monitoring programme, the Skagerrak, the Kattegat, the Sound and the Baltic Proper was visited. During the passage east of Gotland, the winds were around 12 m/s, otherwise the winds were moderate and the weather overcast with only a few hours of sunshine.

The surface water (0–10 m) had cooled down by 3–4 degrees since September and the temperature was now 12–13°C, which is normal for the month. The salinity in the surface water in the Baltic Proper was still above normal for the season and varied between 7-8 psu. In the Skagerrak and the Kattegat, the observed surface salinity was normal at most stations.

The concentrations of inorganic nutrients in the surface water had increased since September, which is normal for the autumn when phytoplankton activity decreases. The concentrations of phosphate, inorganic nitrogen and silicon were generally normal in the Skagerrak and the Kattegat but were higher than normal in the Baltic Proper. In the deep water in the western Gotland Basin, the concentration of dissolved inorganic nitrogen was far above normal.

There was no oxygen deficiency in the bottom water was in the Skagerrak, the concentration was above 4 ml/l at all stations, including the coastal station Släggö. In the Kattegat, the lowest oxygen concentration was measured at the station Anholt E where the concentration was just below 4 ml/l, which is the limit for oxygen deficiency. In the Sound, there was hypoxic conditions (<2ml/l) from 25 m to the bottom. In the Baltic Proper, the oxygen situation has remained largely unchanged since September. In Arkona, the station BY1 was well oxygenated while there was hypoxia in the bottom water at the station BY2. In the Bornholm basin and the Hanö bight there was hypoxia from 70 m. At the station BY10 the oxygen concentration was zero or close to zero between 90–125 m and hydrogen sulphide was measured in the bottom water, at a depth of 145 m. At the station BCSIII-10 hypoxia prevailed from 80 m. As in September, hydrogen sulphide was first measured at 150 m at the BY15 station. At 80 m, the concentration of both hydrogen sulphide and oxygen was below the detection limit, but between 100–125 m there were low concentrations of oxygen. At the two stations in the western Gotland Basin and at the station BY20, hydrogen sulphide was measured from a depth of 80 m.

Next expedition is planned from 12–17 November with R/V Svea.

RESULT

The expedition was carried out on board R/V Svea and started in Karlskrona on 15 October and ended in Lysekil on 22 October.

The weather during the expedition was overcast with mostly moderate winds, during October 18 the winds increased on the Baltic Sea and the waves were relatively high. The air temperature remained around 10 ° C.

Just as in September, all planned stations were sampled, 24 of the planned 24 stations. At some of the stations, extra sampling was performed to measure selenium for EAWAG in Switzerland (Swiss Federal Institute of Aquatic Science and Technology) as well as aquatic and phytoplankton samples at a station in the Skagerrak for Uppsala University. During the expedition, two researchers from Stockholm University took part in taking extended samples for optical parameters at several of the regular monitoring stations.

Svea's instrument for measuring profiles while under way, MVP was not used during the expedition as it was waiting for service after the expedition.

This report is based on data that has undergone an initial quality control. When further quality control has been performed, certain values may change. Data from this expedition is published as soon as possible on the data host's website, normally this takes place within one week after the expedition has ended. Some analyzes are made after the expedition and are published later.

Data can be downloaded from SHARKweb here:
http://www.smhi.se/klimatdata/oceanografi/havsmiljodata

Skagerrak

Since September, the surface water had cooled down by about 3 degrees. The surface water temperature (0–10 m) was 12–13°C, which is normal for the season. It was warmest with just over 13°C at the stations Å16 and Å17 furthest to the west, which is slightly above normal temperature. The salinity of the surface water was generally normal and varied from 24 psu at station P2 to just over 32 psu at station Å17. At station P2, which is located on the border between the Skagerrak and the Kattegat, the salinity varies a lot and at this expedition it was slightly below normal, 24 psu, while at the expedition in September, the highest salinity in the Skagerrak was measured at the station, which then had a salinity of just over 33 psu. At the stations in the Å-section, there was a surface layer with colder and sweeter water down to a depth of about 5 m. Below 5 m, the temperature increased 1-2 degrees above the thermocline at 50–75 m that still separated the surface water from the deep water. The temperature in the colder deep water (below 75 m) was around 8 degrees. At stations P2 and Släggö there was a halocline at about 15 m which weakened slightly between 15–30 m where the temperature increased slightly and then decreased again below 30 m.

The concentrations of inorganic nutrients in the surface water had increased since September and were mostly normal for the month. The concentration of phosphate in the surface water (0–10 m) was normal for the season and was between 0.13–0.20 µmol/l. The concentrations of dissolved inorganic nitrogen in surface water were above normal at station Å17 and otherwise normal. At stations P2 and Släggö, the concentrations of nitrate were at the reporting limit (0.1 µmol/l) and slightly higher, 0.14–0.20 µmol/l at the stations in the Å-section. The concentrations of dissolved silica in the surface water

varied between 1.0–3.0 µmol/l, lowest at station Å17 and highest at stations P2 and Å13. The concentration of 1.0 µmol/l at station Å17 was slightly below normal and otherwise normal. The concentrations of nutrients were generally normal in the deep water, but slightly elevated below 40 m at stations P2 and Släggö. At station Å17, the concentrations of dissolved silica were slightly below normal in the deep water and low but normal in surface water.

There was no clear peak in chlorophyll fluorescence at any station.

The oxygen concentration in the bottom water was mostly the same as since August, around 5 ml/l at the stations out on the open sea. At the coastal station Släggö, the concentration had increased from only 2.7 ml/l in September to 4.1 ml/l at the time of the measurement in October.

Kattegat and the Sound

The temperature in the surface water (0–10 m) had fallen by about 4 degrees since September and was around 12°C in October at all stations in the Kattegat and the Sound, which was normal for the month. The salinity in the surface water varied between 19–22 psu in the Kattegat and was about 13 psu at the station W Landskrona in the Sound. These salinities were normal except at the station Anholt E where it was slightly below normal. The surface water was well mixed down to 10–15 m where there was a sharp halocline, below the halocline the salinity increased to 30–35 psu. The temperature increased by 1–2 degrees just below the halocline and the highest temperature in the water column was found around 15–20 m. At the station Anholt E, the temperature was highest by 16°C at 20 m, which was above normal. Below 20 m the temperature decreased with increasing depth and was generally normal in the deep water, the salinity was also normal in the deep water. In the Sound, the water was well mixed from about 30 m and at Anholt E in the southern Kattegat from about 50 m. At the other stations, the salinity increased and the temperature decreased continuously with increasing depth.

The concentrations of phosphate in the surface water had increased since September and were now around 0.1–0.2 µmol/l in the Kattegat and 0.3 µmol/l in the Sound. The lowest concentration in the surface water was measured at the station Anholt E and there the concentration was slightly below normal. The concentrations of dissolved inorganic nitrogen in the surface water were normal and most measurements in the Kattegat were around 0.1 µmol/l, which is the reporting limit. In the Sound, the concentration was higher, about 0.5 µmol/l. The concentrations of dissolved silica varied between 3.0–4.0 µmol/l in the Kattegat, which is normal while the concentration in the Sound was significantly higher, about 14 µmol/l, which is above normal. Below the halocline, the concentrations of inorganic nutrients were normal or slightly above normal in the Kattegat, in the Sound the concentrations of phosphate and silicon were clearly above normal from 25 m to the bottom.

The oxygen concentration in the bottom water varied from a maximum of 5 ml/l at the station Fladen to a minimum just over 2 ml/l in the Sound. The lowest oxygen concentration in the Kattegat was measured at the Anholt E station, which is also the deepest station, there the concentration was just below 4 ml/l, which is the limit for oxygen deficiency. In the Sound there was hypoxia from 25 m to the bottom, only in the bottom water the concentration was just over 2 ml/l which is the limit for hypoxia.

Measurements of chlorophyll fluorescence showed low levels and no clear peak in the measurements occurred in the Kattegat.

The Baltic Proper

Since September, the surface water had cooled down by about 3 degrees. The surface water temperature (0–10 m) was 12–13°C, which is normal for the season. Just as in September, the lowest temperatures were in the surface water in the Western Gotland basin and at the coastal station Ref M1V1. The surface water was well mixed down to 30–40 m where there was a sharp thermocline and the temperature decreased to about 6–7°C, except in the Arkona basin where the temperature increased sharply about 5 m from the bottom. The thermocline was shallowest in the north. At the station BY39 the thermocline was divided into two, one at about 20 m and the next at 30 m. At the station Ref M1V1 in Kalmar Sound where the bottom depth is only 20 m there was no stratification. In the Bornholm Basin, the temperature fluctuated a lot below the thermocline, most clearly a sharp peak of 14.5°C at a depth of 65 m at the stations Hanöbukten and BY4. In the Arkona basin, both temperature and salinity increased just above the bottom. The salinity of the surface water was above normal at almost all stations and varied between just under 7 psu in the north to just over 8 in the Arkona basin in the south. At all stations there was a halocline that coincided with the thermocline at a depth of 30–40 m. At the deeper stations, the halocline that separates the deep water from the surface water was about 50 m in the Bornholm Basin, about 60 m at the northernmost station BY32 and about 70 m at other stations in the Baltic Proper. In the deep water, salinity and temperature were above normal at the stations, BY15, BY20 and BY32.

The concentrations of phosphate in the surface water had increased markedly since September and were above normal at most stations in the eastern Gotland Basin and at the station BY5 in the Bornholm Basin. The concentrations varied from a minimum of about 0.2–0.3 µmol/l around Gotland to a maximum of 0.5 µmol/l in Arkona and the Bornholm Basin. The concentrations of dissolved inorganic nitrogen had also increased since September, but not as clearly as phosphate. The concentrations were now above the reporting limit at all stations and were above normal at most stations, the concentrations ranged from 0.12–1.17 µmol/l. Concentrations of dissolved silica were above normal at all stations except in the Western Gotland Basin, concentrations increased from north to south and varied between 11–17 µmol/l.

The concentrations of inorganic nutrients below the halocline were mostly normal. At the station BY10 in the south-eastern Gotland Basin, the concentration of phosphate was higher than normal and the concentration of dissolved inorganic nitrogen lower than normal from 90–125 m, at these depths the oxygen concentration was also lower than normal (close to zero). In the western Gotland Basin, the levels of dissolved inorganic nitrogen remained well above normal from about 70 m. At the station BY15 in the eastern Gotland Basin, the concentrations of phosphate and dissolved inorganic nitrogen fluctuated in the transition between oxygenated and completely oxygen-free water between 80–150 m depth.

There bottom water was hypoxic or anoxic at all stations except three, BY1, Ref M1V1 and BY39. In the Arkona basin, at BY1, the oxygen concentration had increased further since September and was now 4.7 ml/l. At station BY2, on the other hand, the oxygen concentration had decreased and was now 1.9 ml/l. In Hanö bight and the Bornholm Basin, the oxygen situation was largely unchanged since July, the oxygen concentration in the bottom water was practically zero, both oxygen and hydrogen sulphide were sampled and the analyzes showed that the levels were below the detection limit. At these stations, there was hypoxia (<2 ml/l) from 70 m. In the Western Gotland Basin and at the station BY20, hydrogen sulphide was measured from a depth of 80 m. The concentration of hydrogen sulphide in the Western Gotland Basin was above normal and has been so in the bottom water throughout 2020. As in September, hydrogen sulphide was first measured at 150 m at the station BY15. At 80 m, the concentration of both hydrogen sulphide and oxygen was

below the detection limit, but between 100–125 m there were low concentrations of oxygen, which the highest measurement at a depth of 105 m, 0.6 ml/l. At 130 m it was anoxic but no hydrogen sulphide was detected. At the station BY10, the situation was also unchanged since September, the oxygen was zero or close to zero between 90–125 m and hydrogen sulphide was measured in the bottom water at a depth of 145 m. At the station BCSIII-10 it was oxygenated all the way to the bottom, hypoxia prevailed from 80 m but the concentration was slightly higher here than in the Bornholm Basin.

Measurements of chlorophyll fluorescence showed a low but steady activity from the surface down to the thermocline, and no peaks with higher activity were noted at any station.

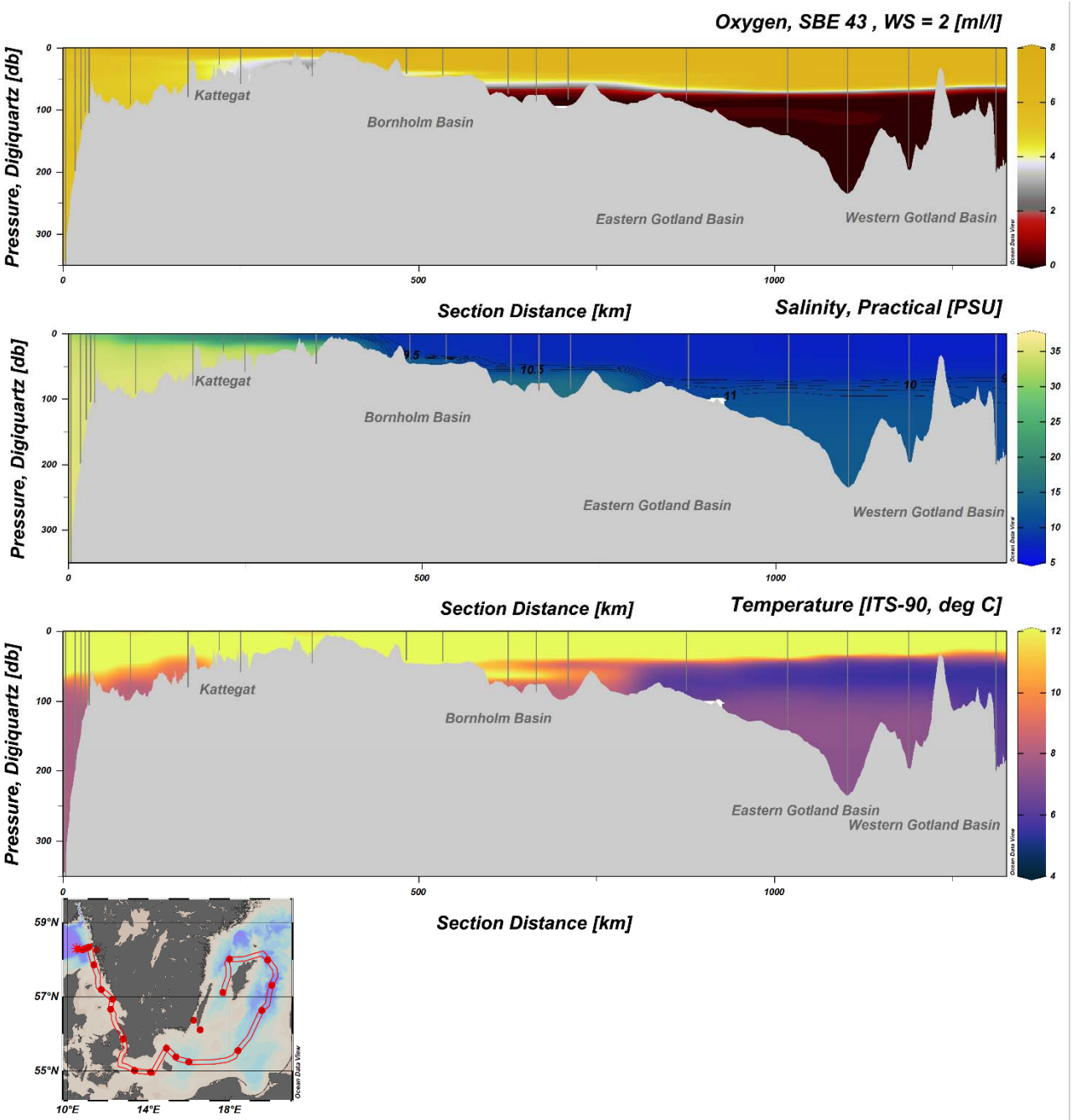

Figure 1. Transect showing dissolved oxygen, salinity and temperature from the Skagerrak, through the Sound and the Eastern Gotland Basin to the Western Gotland Basin.

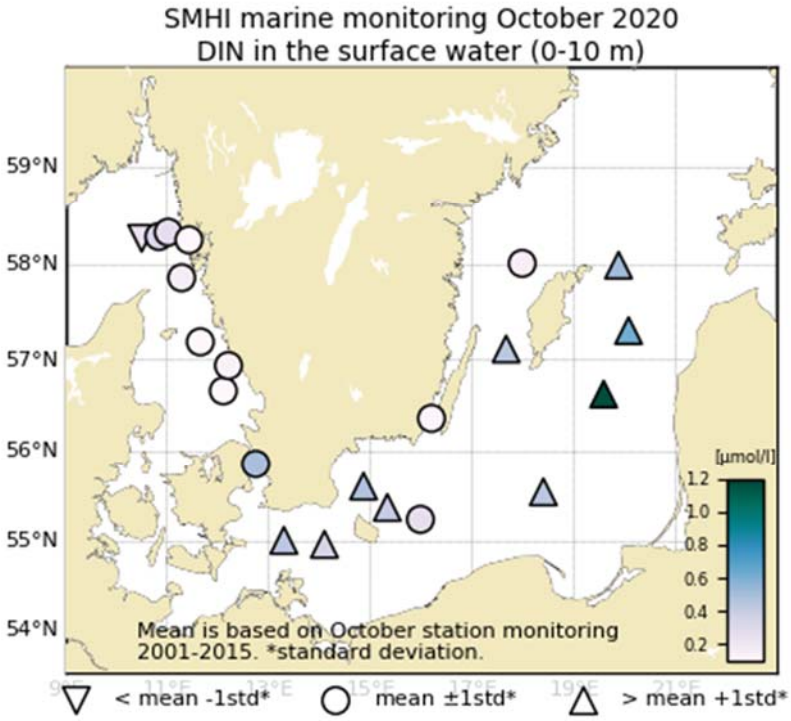

Figure 2. Concentration of dissolved inorganic nitrogen in the surface water (0-10m).

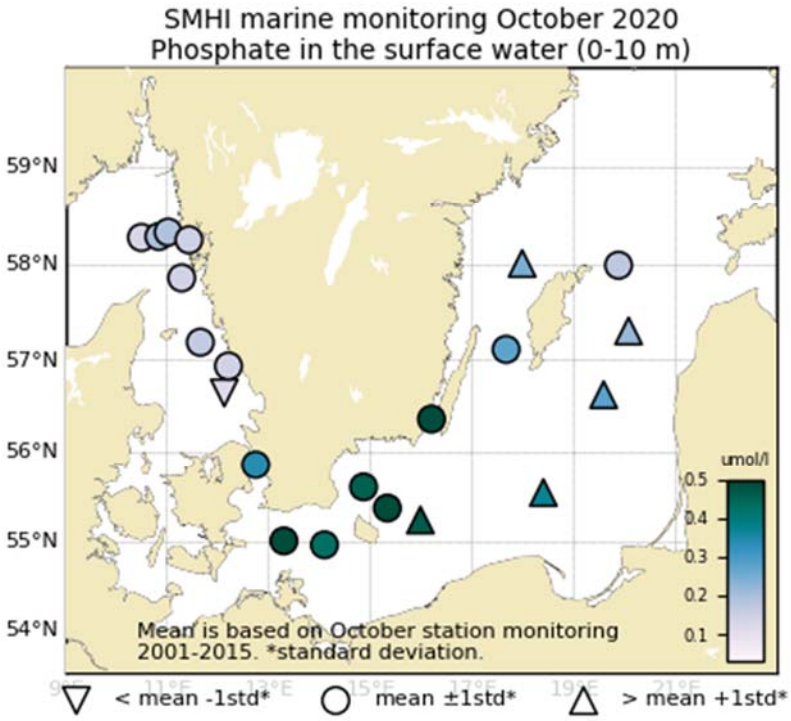

Figure 3. Concentration of phosphate in the surface water (0-10m).

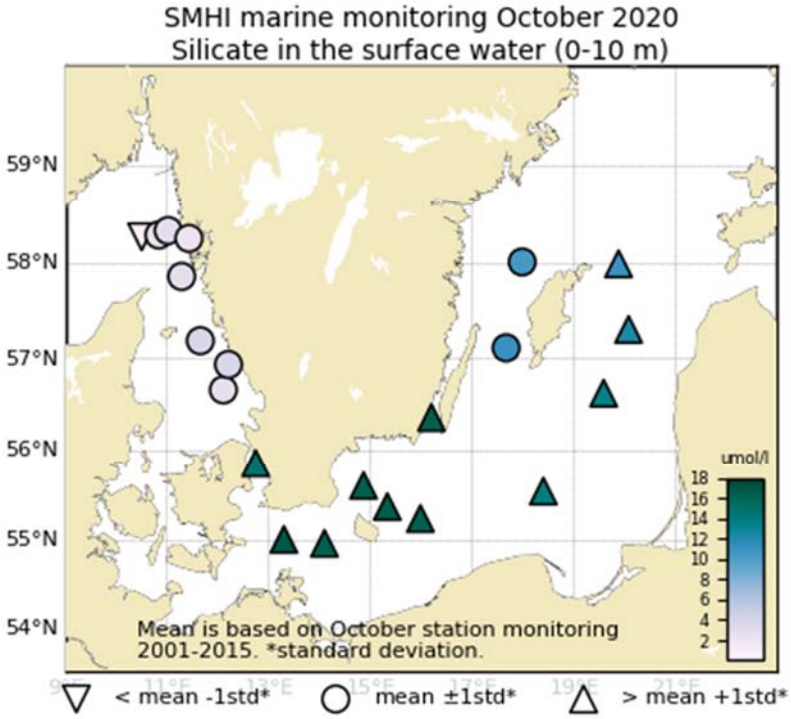

Figure 4 Concentration of silicate in the surface water (0-10m).

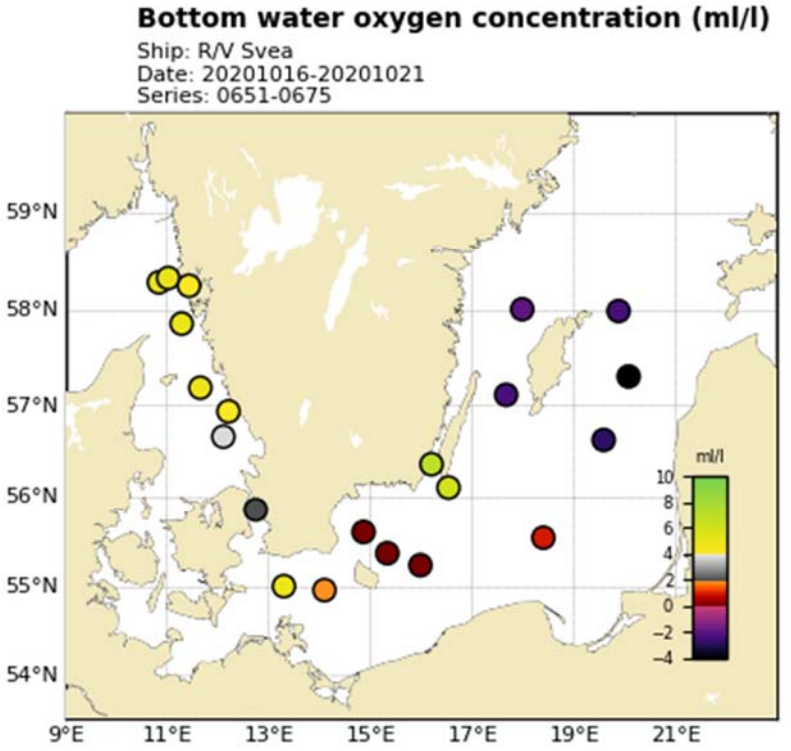

Figure 5. Concentration of oxygen and hydrogen sulphide (as negative oxygen) in the bottom water, ca 1 m above the bottom.

PARTICPANTS

Name		From
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Johan Kronsell		SMHI
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Madeleine Nilsson		SMHI
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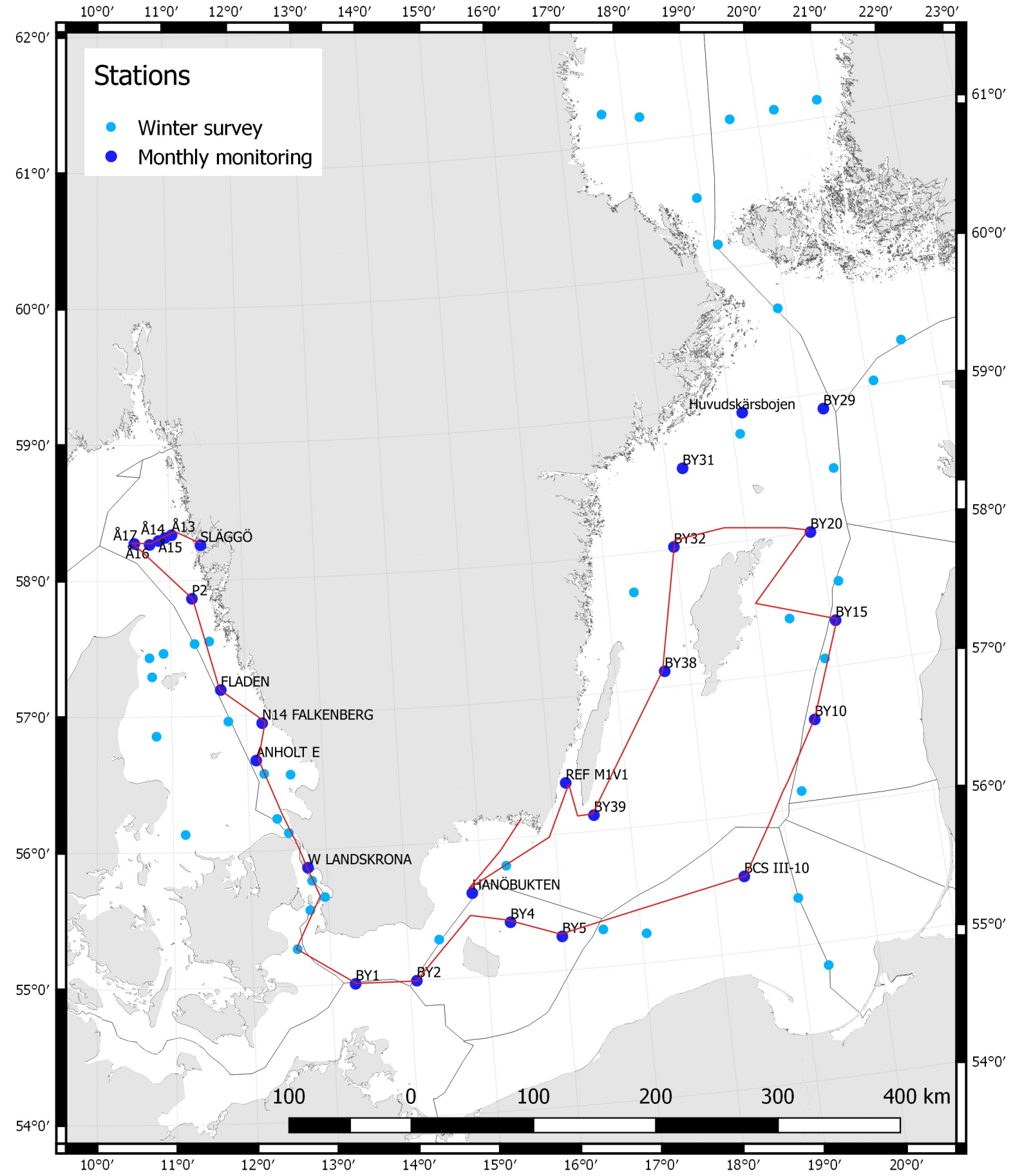
APPENDICES

- Track chart
- Table over stations, sampled parameters and number of sampling depths
- Vertical profiles for regular monitoring stations
- Monthly average surface water plots for regular monitoring stations

SMHI
Havs
och Vatten
myndigheten

SMHI

TRACK CHART
Ship: R/V Svea
Start: Karlskrona 20201016
Stop: Lysekil 20201021

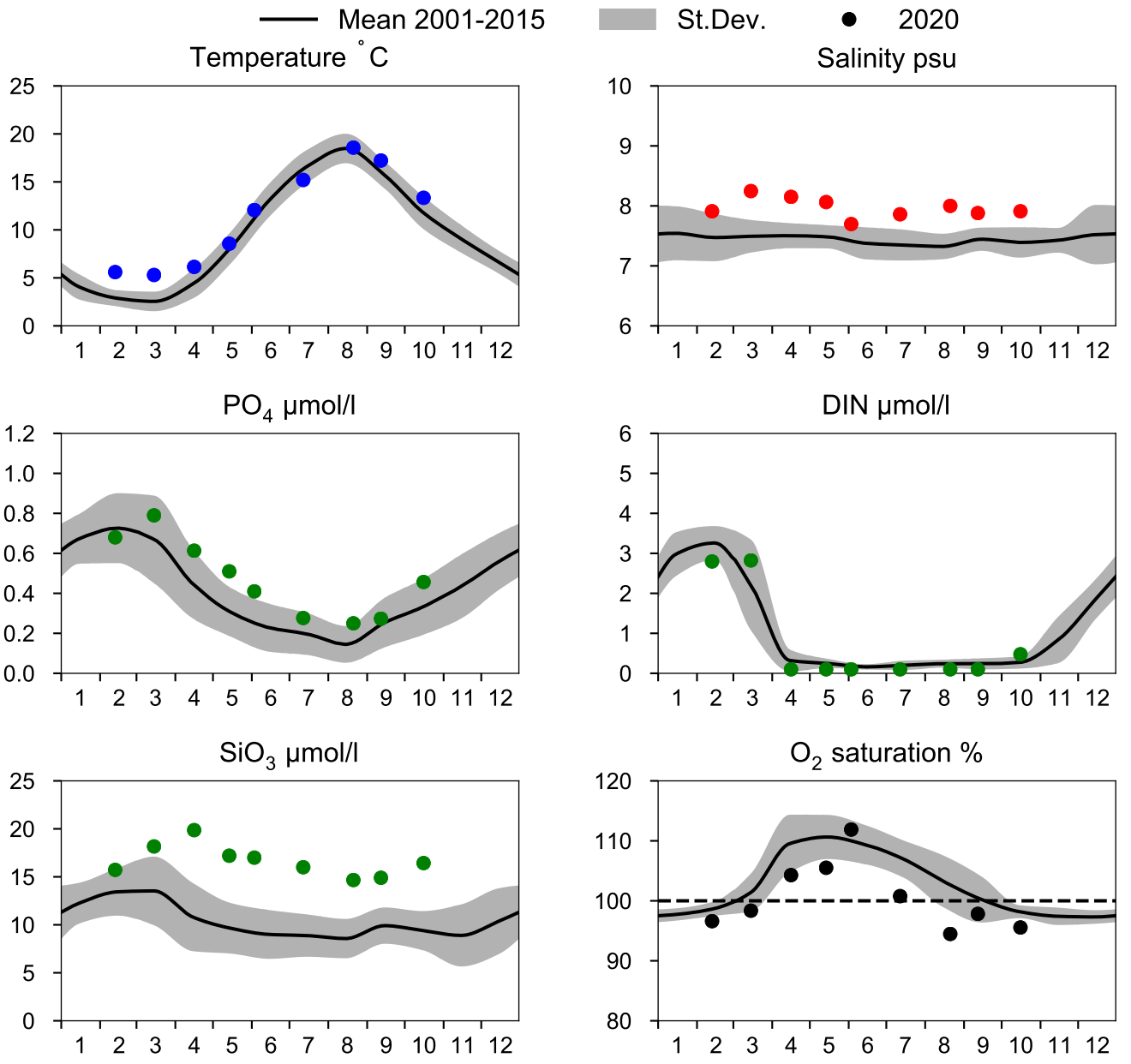


Ship: SE
Year: 2020

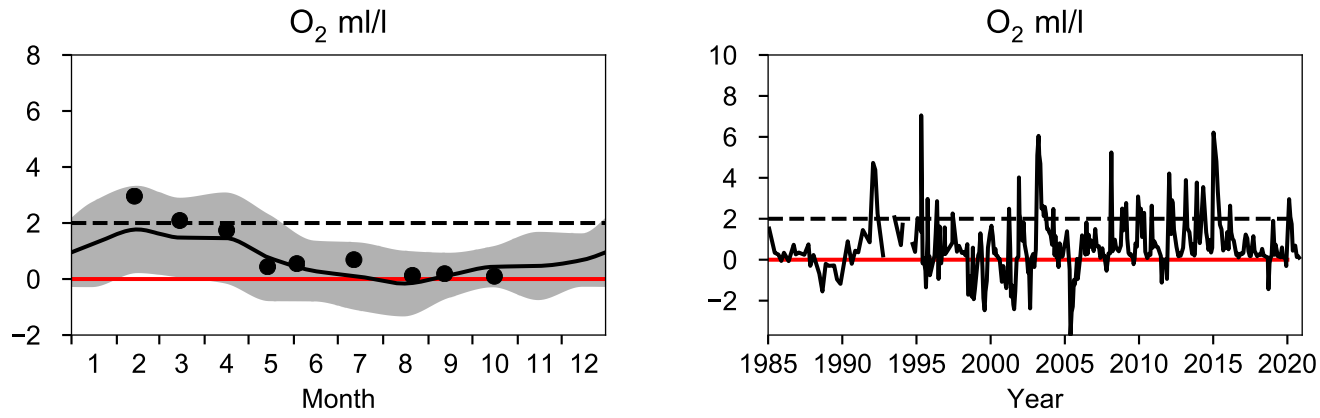
Ser no	Cru no	Stat code	Proj	Stat name	Lat	Lon	Start date yyyymmdd	Start time hhmm	Bottom depth m	Secchi depth m	Wind dir	Wind vel	Air temp C	Air pres hPa	WCWI	CZPP	No de	No btl	Temp_btl	Temp_ctd	Salt_btl	Salt_ctd	Ph	Doxy_btl	Doxy_ctd	H2S	Phos	Ptot	Ntri	Ntra	Ntrz	Amon	Ntot	Alky	Sio3-si	Humus	Comnt_visit	Comnt_samp
0651	20	BPSH05	BAS...	HANÖBUKTEN	5537.10	01452.00	20201016	1650	80		23	10	10.8	1019	9990	----	11		x	x	-	x	-	x	x	x	x	-	x	x	x	x	-	-	x	-	-	-
0653	20	BPWK01	BAS...	REF M1V1	5622.25	01612.11	20201017	0100	21		33	7	7.8	1020	9990	-x--	5		x	x	-	x	x	x	x	-	x	-	x	x	x	x	-	-	x	-	-	-
0654	20	BPSE49	BAS...	BY39 ÖLANDS S UDDE	5606.97	01632.13	20201017	0400	51		35	4	9.1	1018	9990	----	8		x	x	-	x	-	x	x	-	-	-	-	-	-	-	-	-	-	-	-	-
0655	20	BPWX45	BAS...	BY38 KARLSÖDJ	5707.01	01740.13	20201017	1320	113	8	26	4	9.4	1014	1330	----	14		x	x	-	x	-	x	x	x	x	-	x	x	x	x	-	-	x	-	x	-
0656	20	BPWX38	BAS...	BY32 NORRKÖPINGSDJ	5801.00	01759.07	20201017	1800	201		22	9	9.8	1008	9990	----	17		-	x	-	x	-	x	x	x	x	-	x	x	x	x	-	-	x	-	x	-
0657	20	BPEX26	BAS...	BY20 FÅRÖDJ	5759.88	01952.71	20201018	0100	196		23	9	9.1	1000	6990	----	17		x	x	-	x	-	x	x	x	x	-	x	x	x	x	-	-	x	-	x	-
0658	20	BPEX21	BAS...	BY15 GOTLANDSDJ	5718.72	02004.54	20201018	1215	240		27	11	8.1	1000	1650	----	24		-	x	-	x	x	x	x	x	x	-	x	x	x	x	-	-	x	-	x	-
0659	20	BPEX13	BAS...	BY10	5638.02	01935.13	20201018	1800	146		28	12	9.4	1004	9990	----	15		x	x	-	x	-	x	x	x	x	-	x	x	x	x	-	-	x	-	x	-
0660	20	BPSE11	BAS...	BCS III-10	5533.31	01824.02	20201019	0330	90		26	9	9.5	1011	9990	----	12		x	x	-	x	-	x	x	-	x	-	x	x	x	x	-	-	x	-	x	-
0661	20	BPSB07	BAS...	BY5 BORNHOLMSDJ	5514.99	01559.05	20201019	1200	90	7	25	12	10.6	1015	1440	-x-x	12		x	x	-	x	-	x	x	x	x	-	x	x	x	x	-	-	x	-	x	-
0662	20	BPSB06	BAS...	BY4 CHRISTIANSÖ	5522.97	01520.03	20201019	1620	92		27	9	10.4	1016	1440	----	12		x	x	-	x	-	x	x	-	x	-	x	x	x	x	-	-	x	-	-	-
0663	20	BPSA03	BAS...	BY2 ARKONA	5458.28	01405.90	20201019	2235	47		20	10	11.2	1017	9990	-x--	8		x	x	-	x	-	x	x	-	x	-	x	x	x	x	-	-	x	-	x	-
0664	20	BPSA02	BAS...	BY1	5500.95	01318.07	20201020	0250	46		17	8	10.9	1016	9990	----	8		x	x	-	x	-	x	x	-	x	-	x	x	x	x	-	-	x	-	x	-
0665	20	SOCX39	BAS...	W LANDSKRONA	5552.08	01244.84	20201020	1000	49	6	14	12	11.6	1012	2830	----	9		x	x	-	x	-	x	x	-	x	-	x	x	x	x	-	-	x	-	x	-
0666	20	KAEX29	BAS...	ANHOLT E	5640.12	01206.66	20201020	1545	63		14	13	11.3	1005	2740	-x--	10		x	x	-	x	x	x	x	-	x	-	x	x	x	x	-	-	x	-	x	-
0667	20	KANX50	BAS...	N14 FALKENBERG	5656.40	01212.70	20201020	1830	32		16	11	10.7	1003	9990	-x--	7		x	x	-	x	x	x	x	-	x	-	x	x	x	x	-	-	x	-	x	-
0668	20	KANX25	BAS...	FLADEN	5711.54	01139.52	20201020	2215	84		15	7	9.8	1003	9990	----	12		x	x	-	x	-	x	x	-	x	-	x	x	x	x	-	-	x	-	-	-
0669	20	SKEX23	BAS...	P2	5752.00	01117.51	20201021	0315	95		18	8	11.1	1000	9990	----	10		x	x	-	x	-	x	x	-	x	-	x	x	x	x	-	-	x	-	-	-
0670	20	SKEX18	BAS...	Å17	5817.05	01030.10	20201021	0705	350	9	19	7	13.0	999	2630	-x--	15		x	x	-	x	x	x	x	-	x	-	x	x	x	x	-	-	x	-	x	-
0671	20	SKEX17	BAS...	Å16	5816.01	01043.49	20201021	0945	200		20	7	13.5	1000	2830	----	13		-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	x	-
0672	20	SKEX16	BAS...	Å15	5817.66	01050.63	20201021	1050	137	7	15	6	13.0	999	2830	----	12		x	x	-	x	-	x	x	-	x	-	x	x	x	x	-	-	x	-	x	-
0673	20	SKEX15	BAS...	Å14	5818.93	01056.51	20201021	1225	107		15	7	12.5	999	2830	----	11		-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
0674	20	SKEX14	BAS...	Å13	5820.37	01101.63	20201021	1320	116	7	13	8	12.1	999	2830	----	10		x	x	-	x	-	x	x	-	x	-	x	x	x	x	-	-	x	-	-	-
0675	20	FIBG27	BAS...	SLÄGGÖ	5815.58	01126.12	20201021	1620	78		11	4	12.0	997	9990	-x--	9		x	x	-	x	-	x	x	-	x	-	x	x	x	x	-	-	x	-	-	-

STATION HANÖBUKTEN SURFACE WATER (0-10 m)

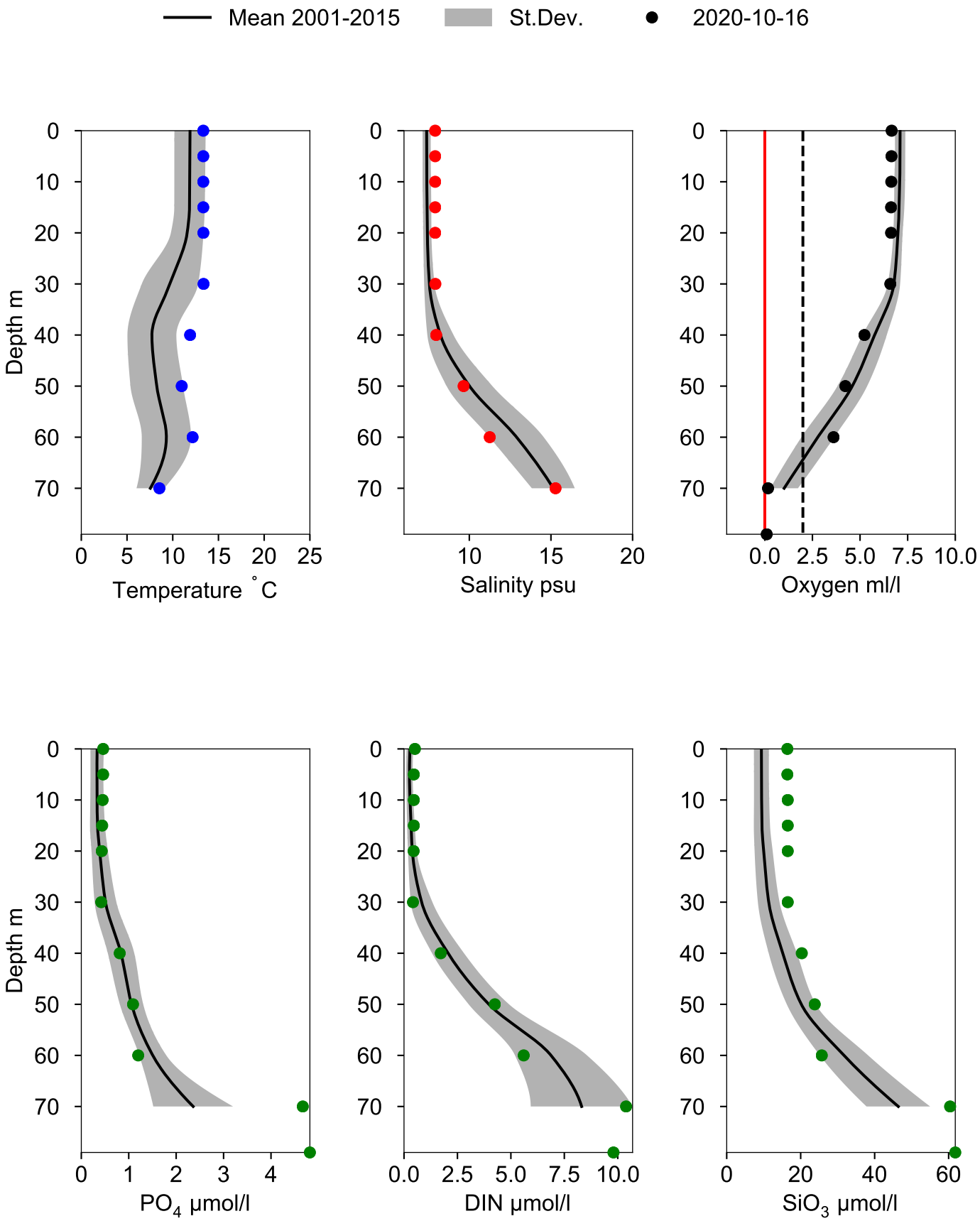
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 70 m)

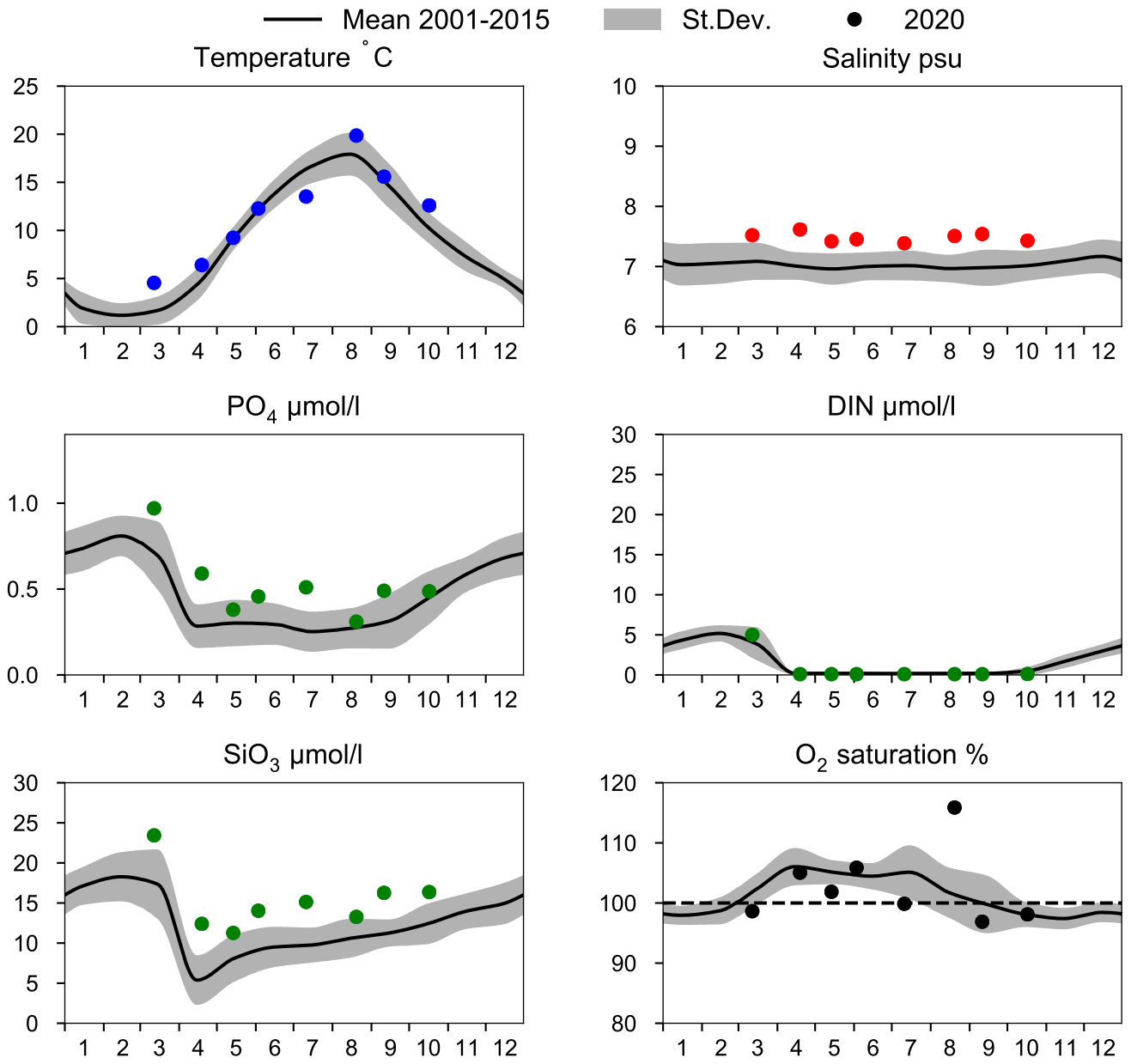


Vertical profiles HANÖBUKTEN
October

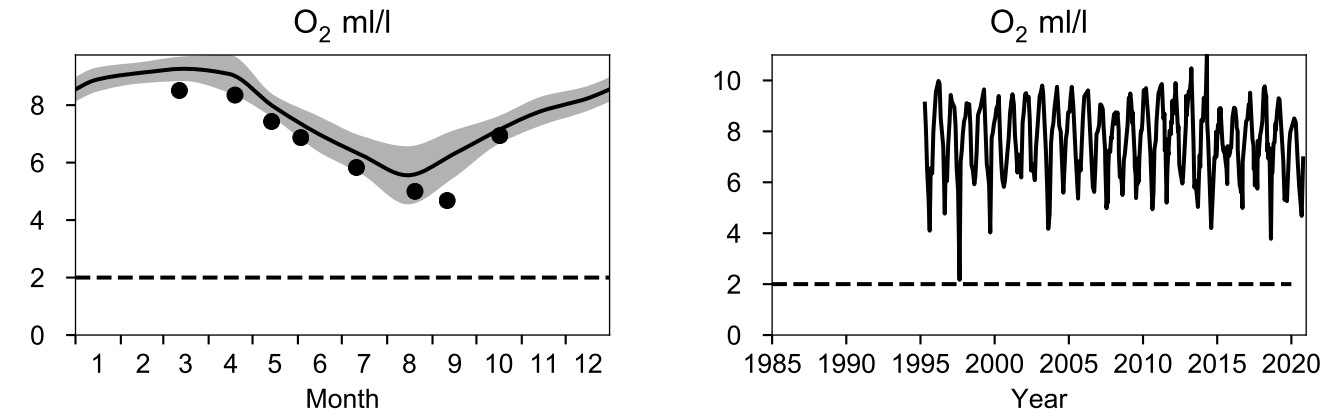


STATION REF M1V1 SURFACE WATER (0-10 m)

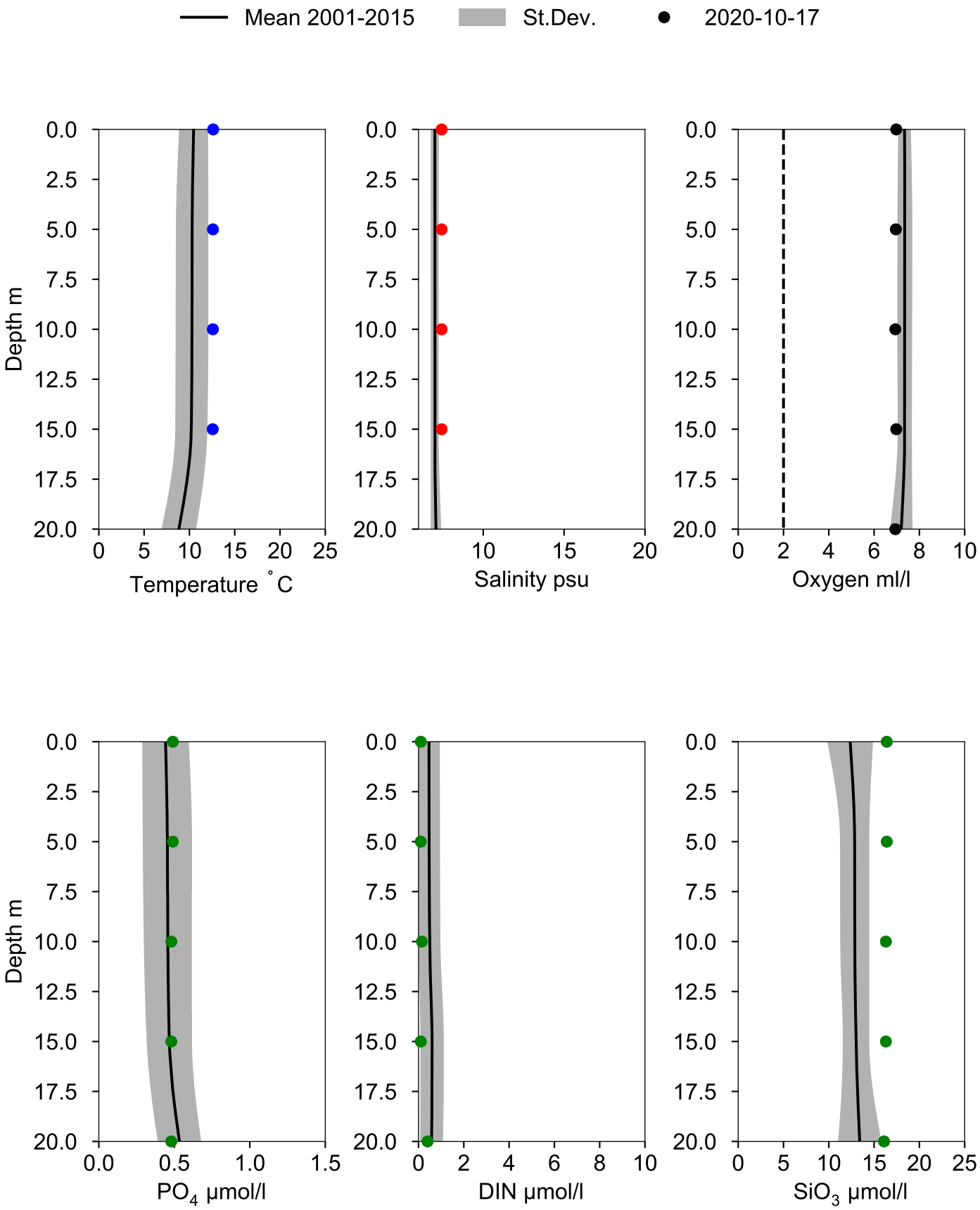
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 15 m)

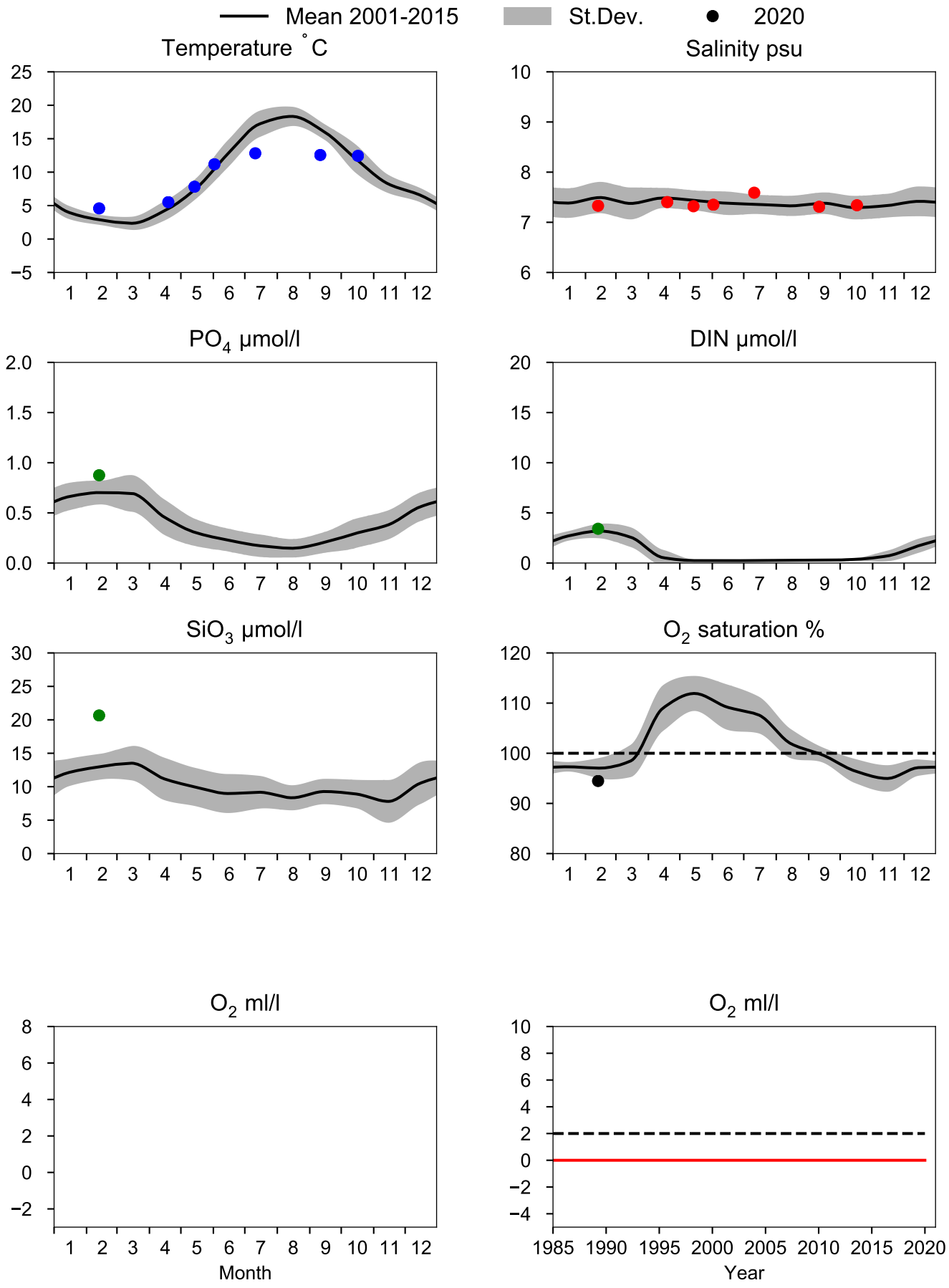


Vertical profiles REF M1V1
October

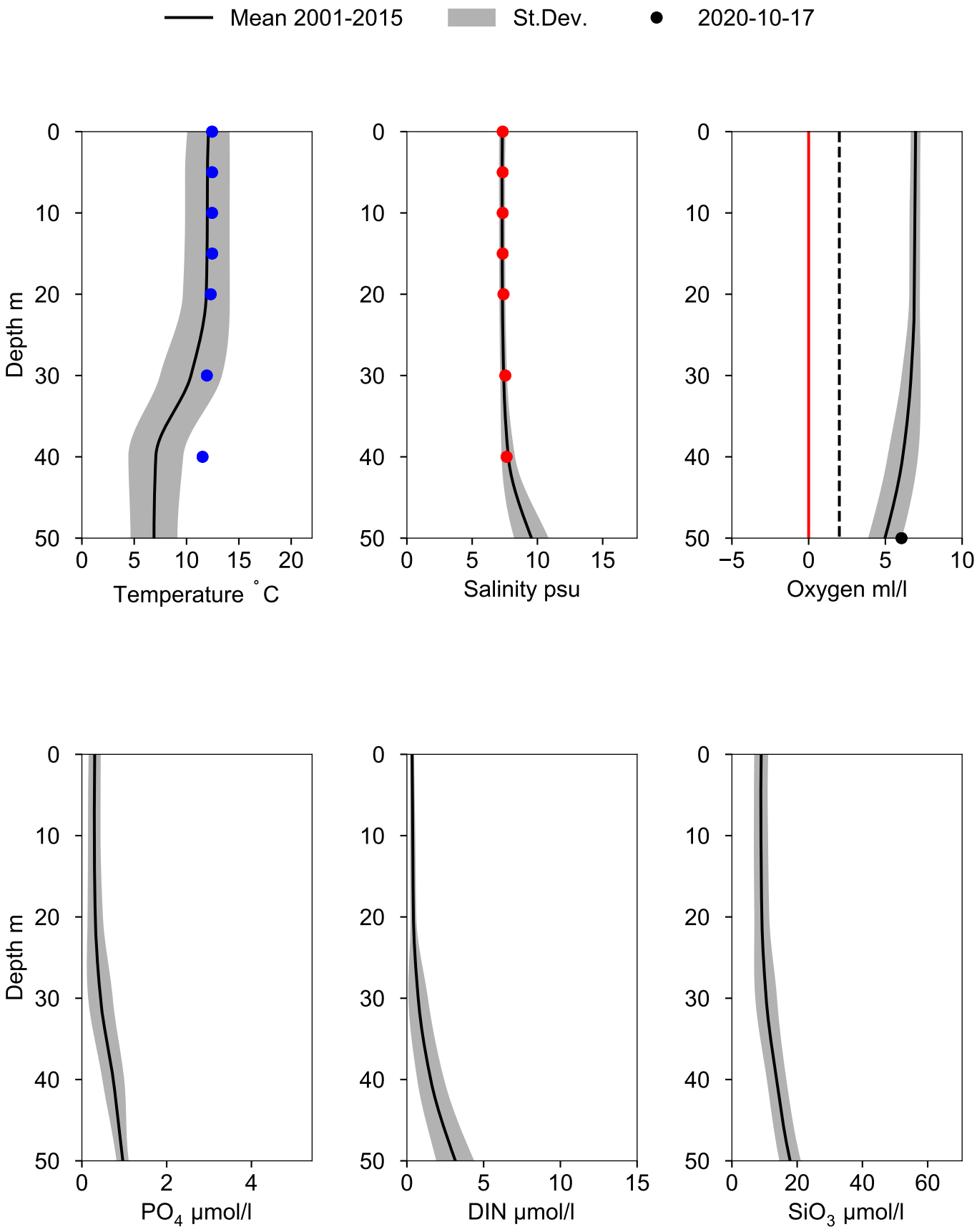


STATION BY39 ÖLANDS S UDDE SURFACE WATER (0-10 m)

Annual Cycles

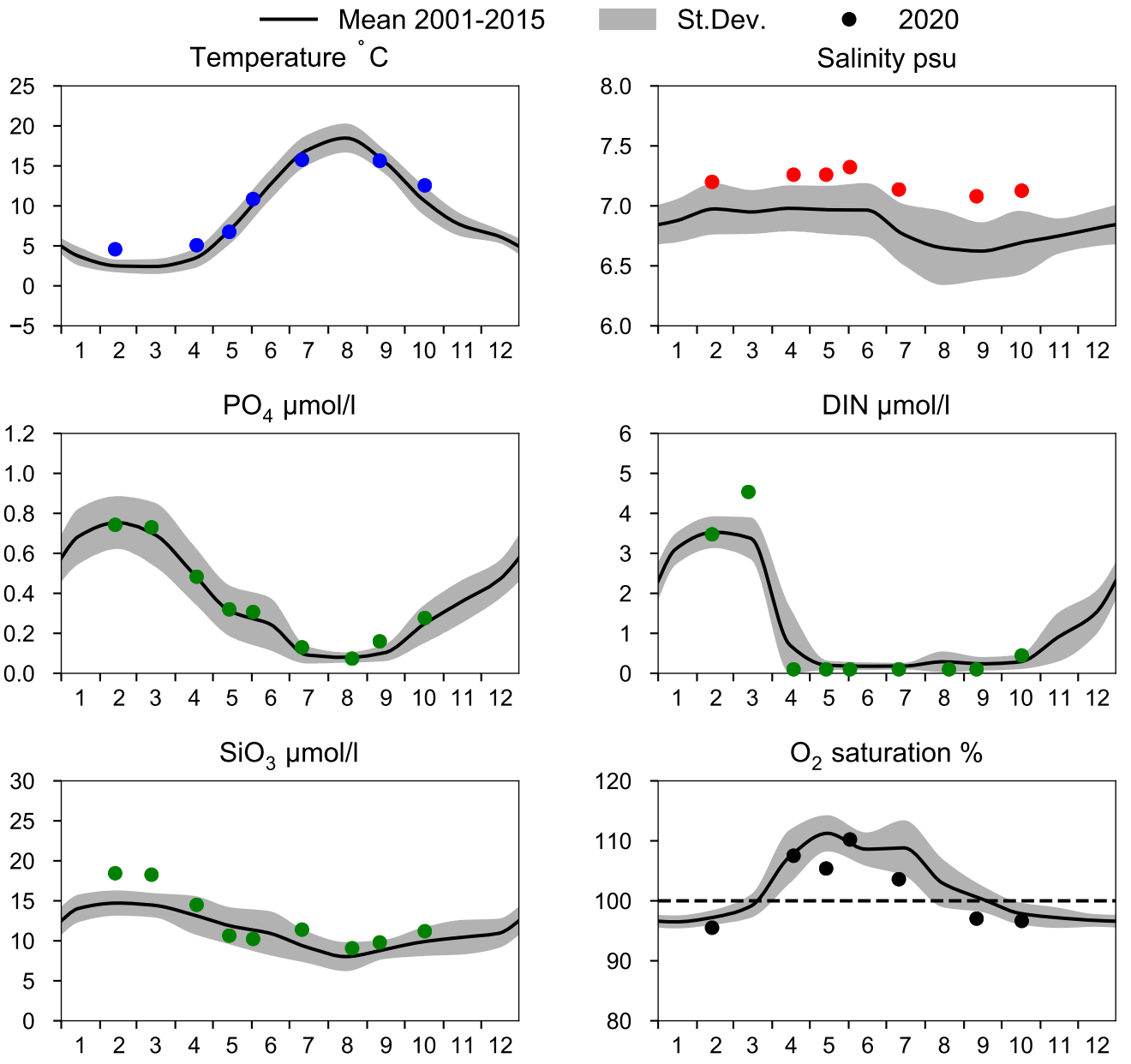


Vertical profiles BY39 ÖLANDS S UDDE
October

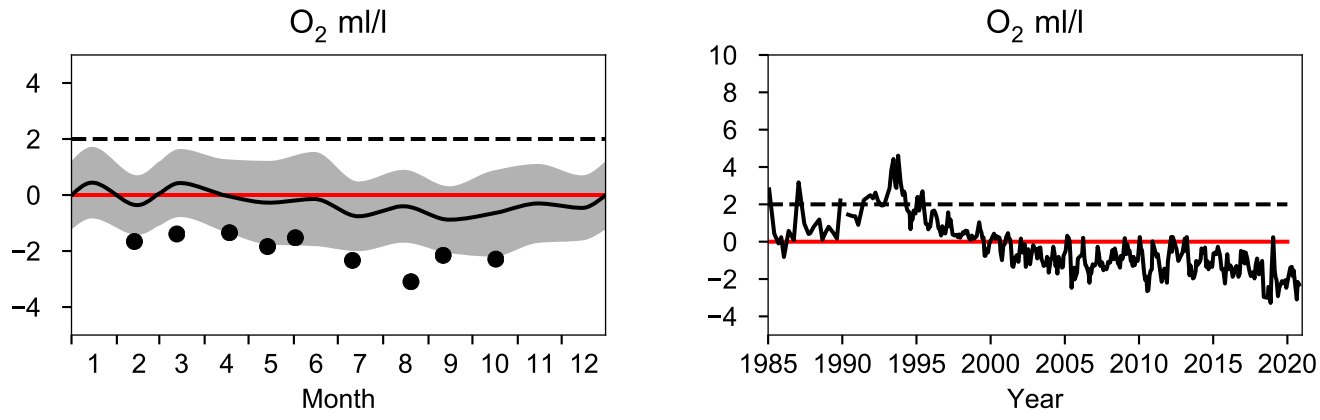


STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

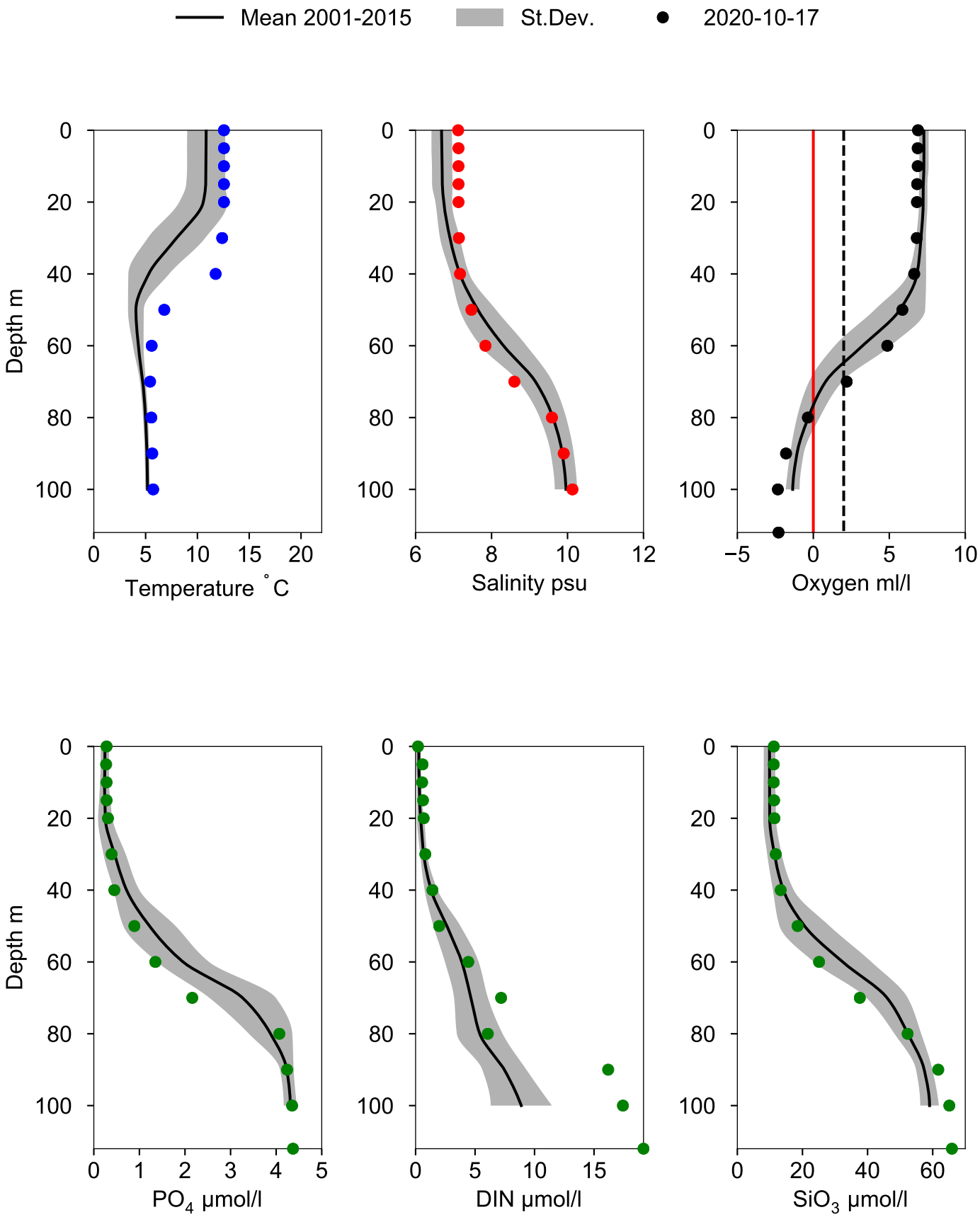
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 100 m)

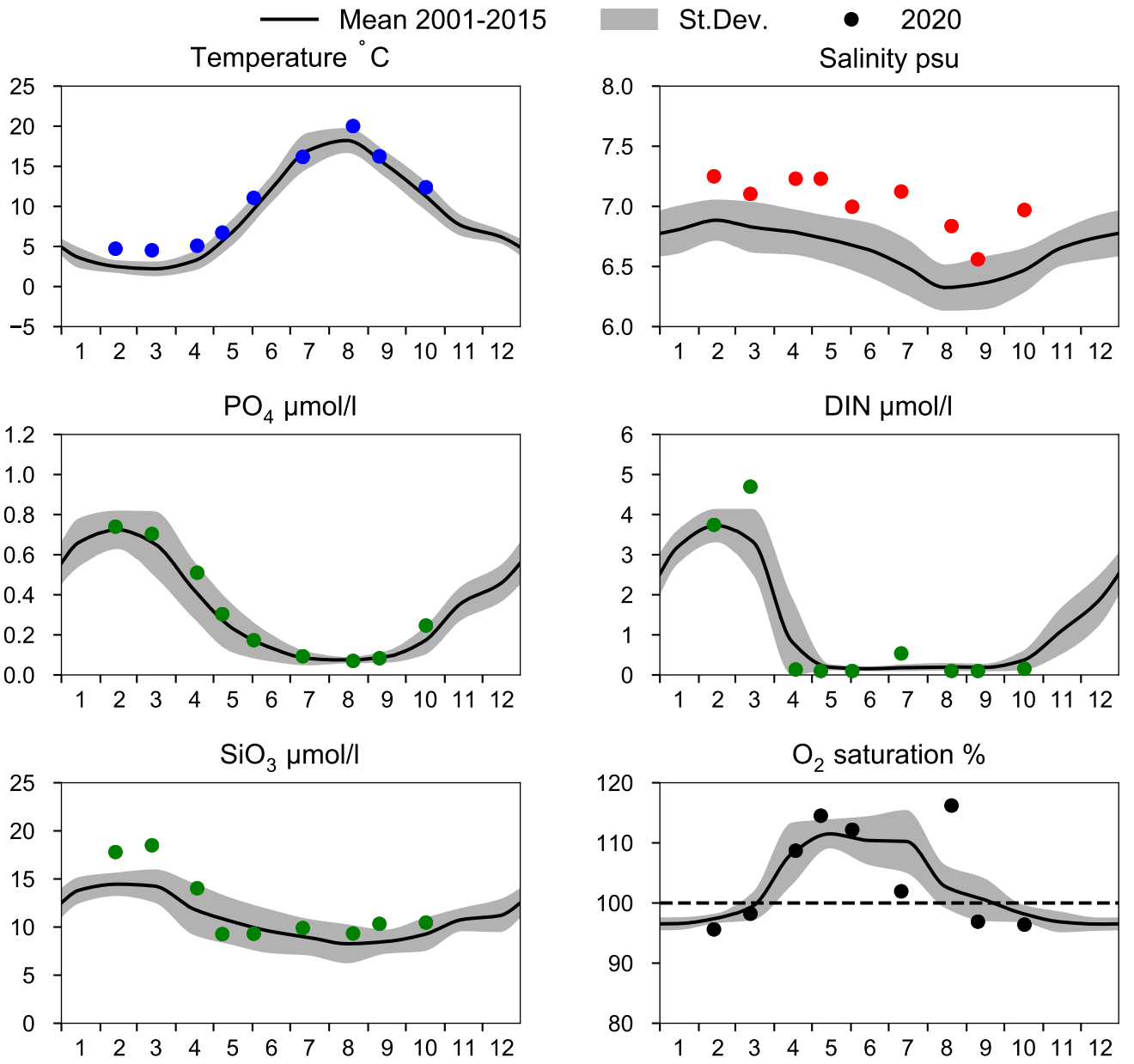


Vertical profiles BY38 KARLSÖDJ
October

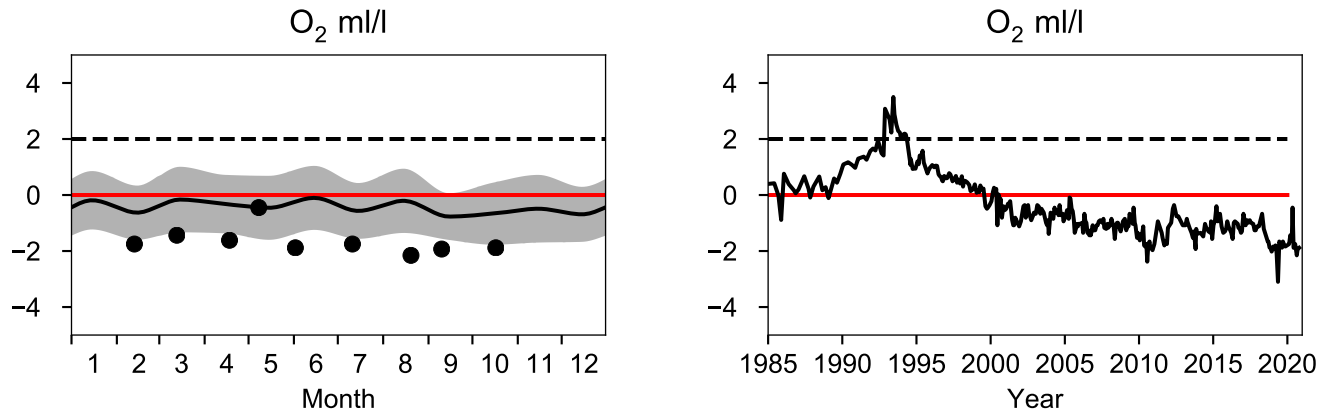


STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

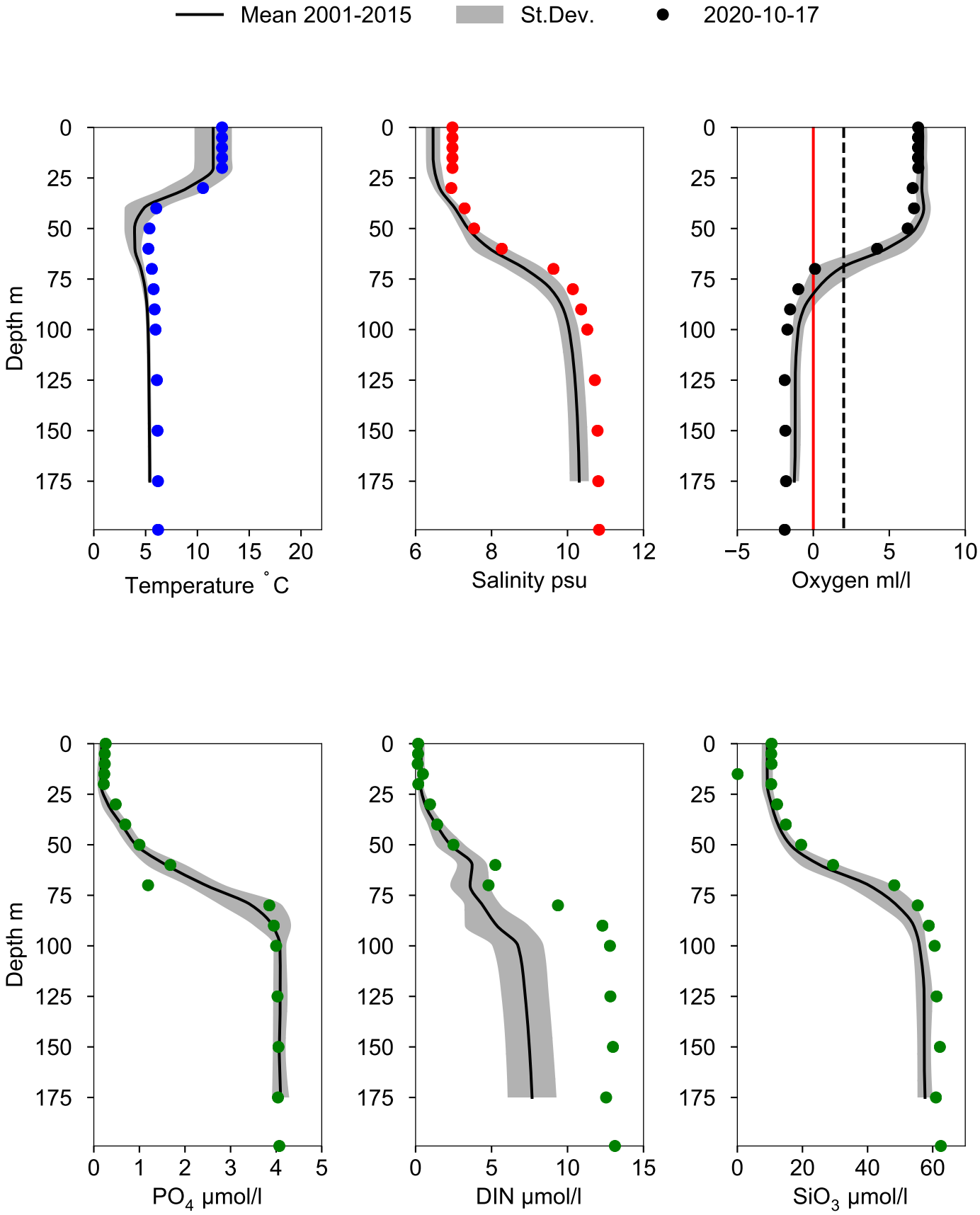
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 175 m)

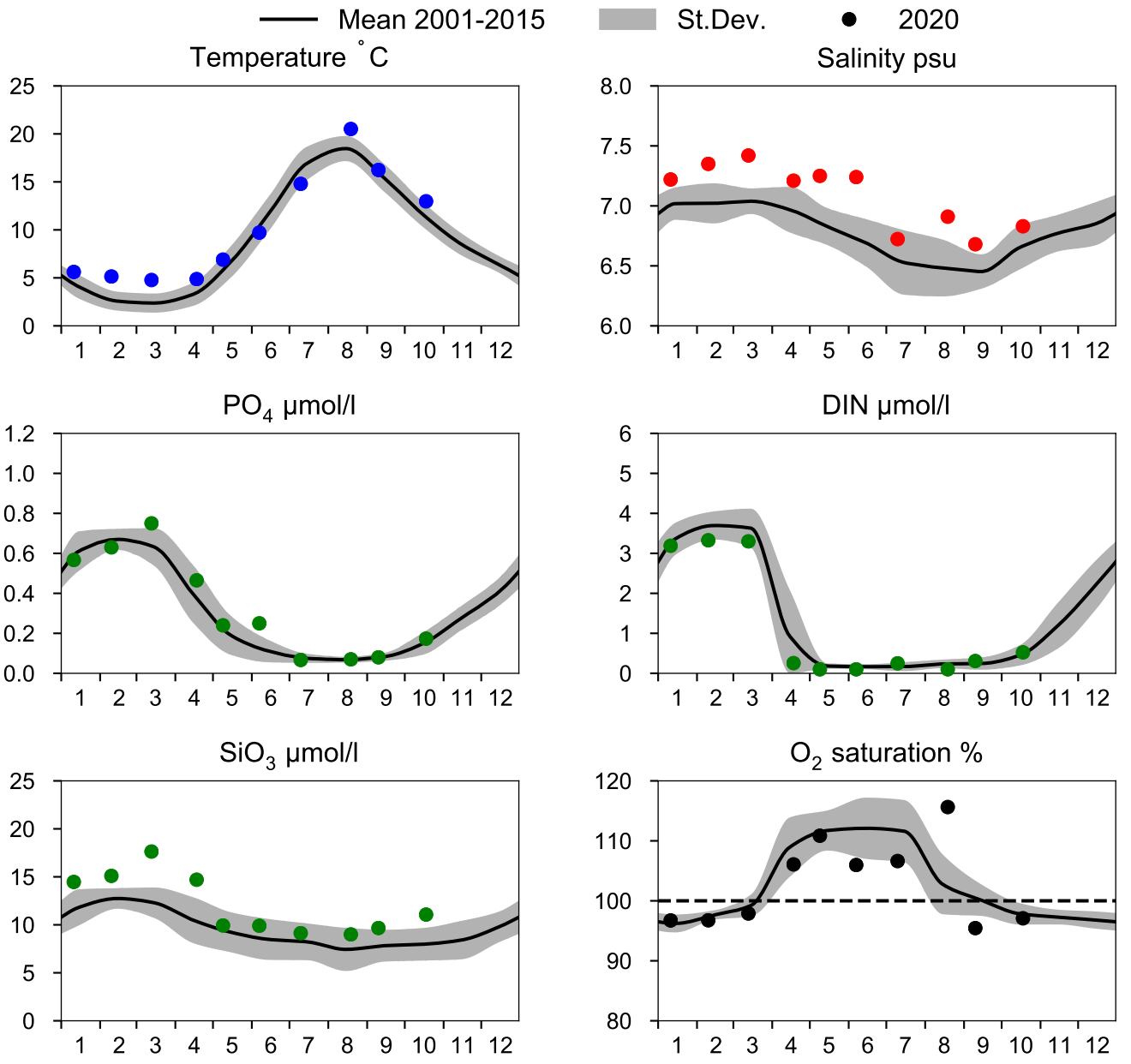


Vertical profiles BY32 NORRKÖPINGSDJ
October

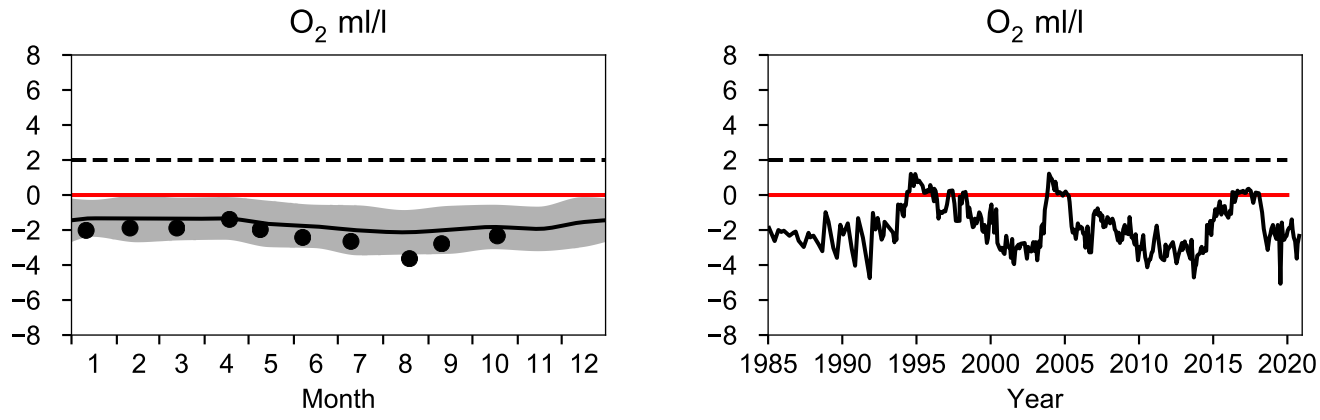


STATION BY20 FÅRÖDJ SURFACE WATER (0-10 m)

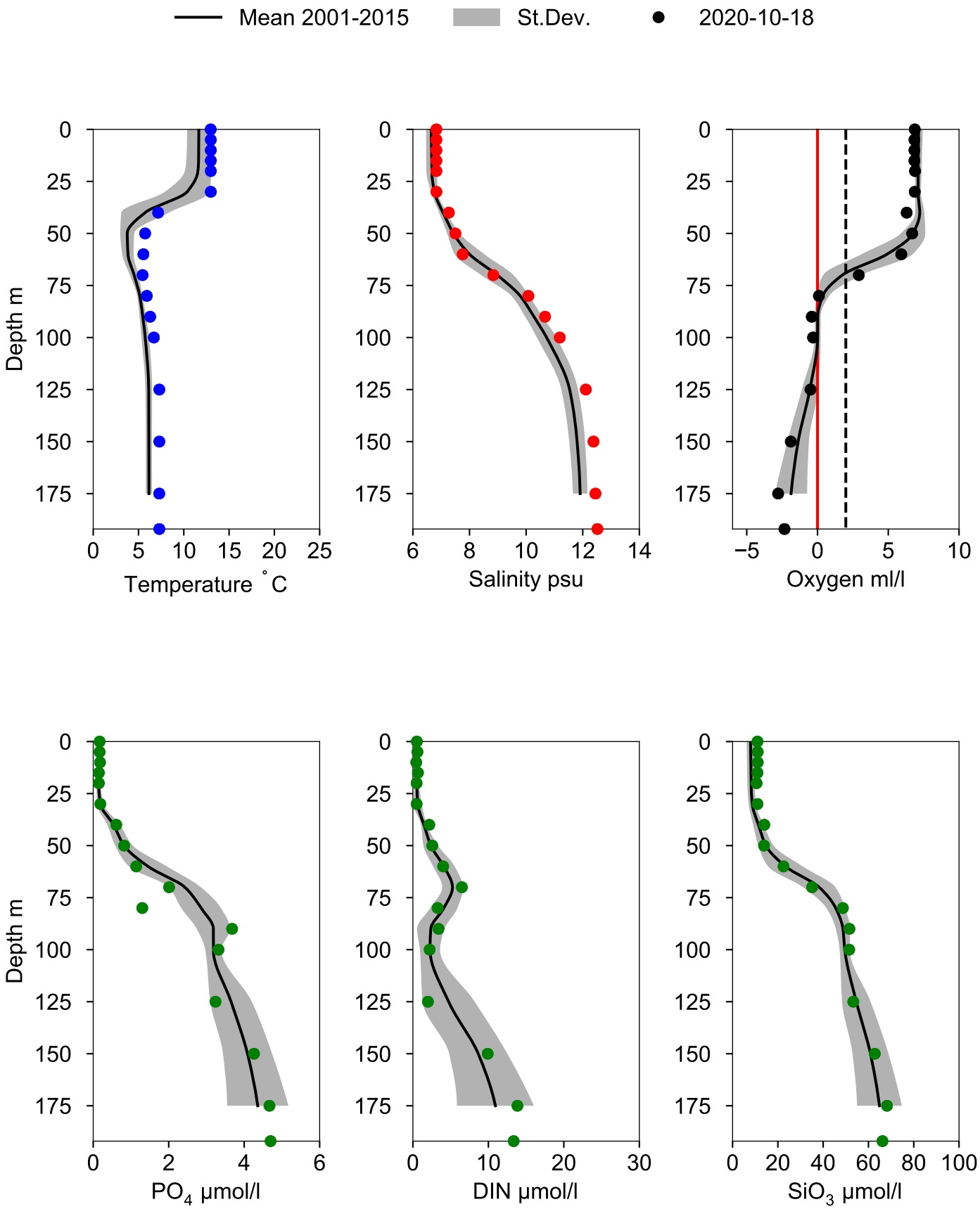
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 175 m)

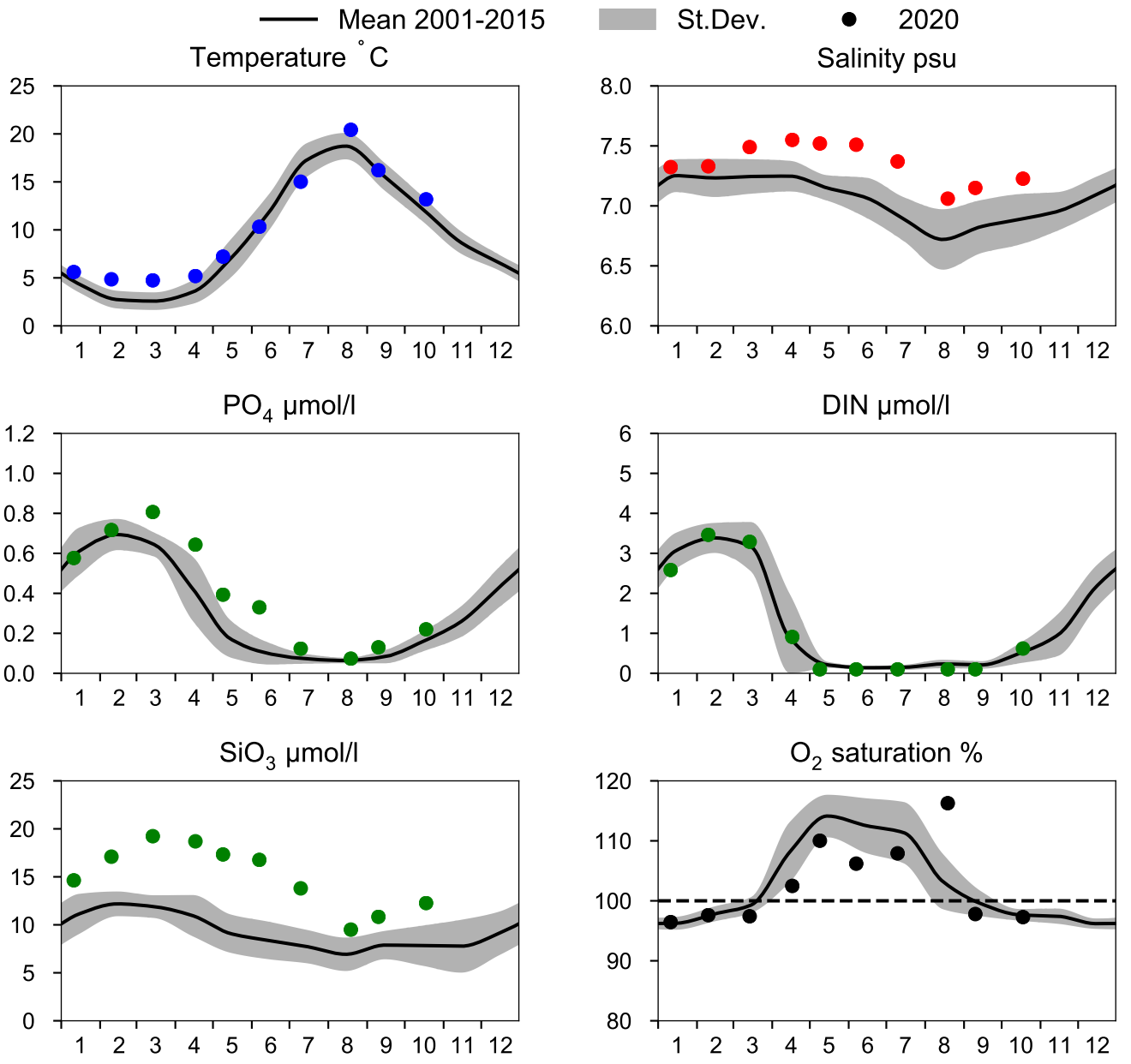


Vertical profiles BY20 FÅRÖDJ
October

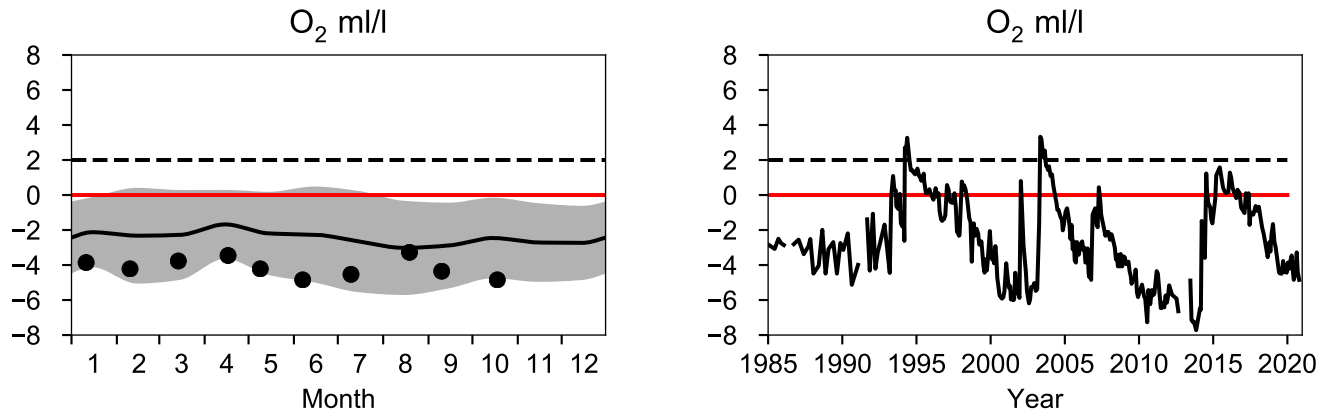


STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

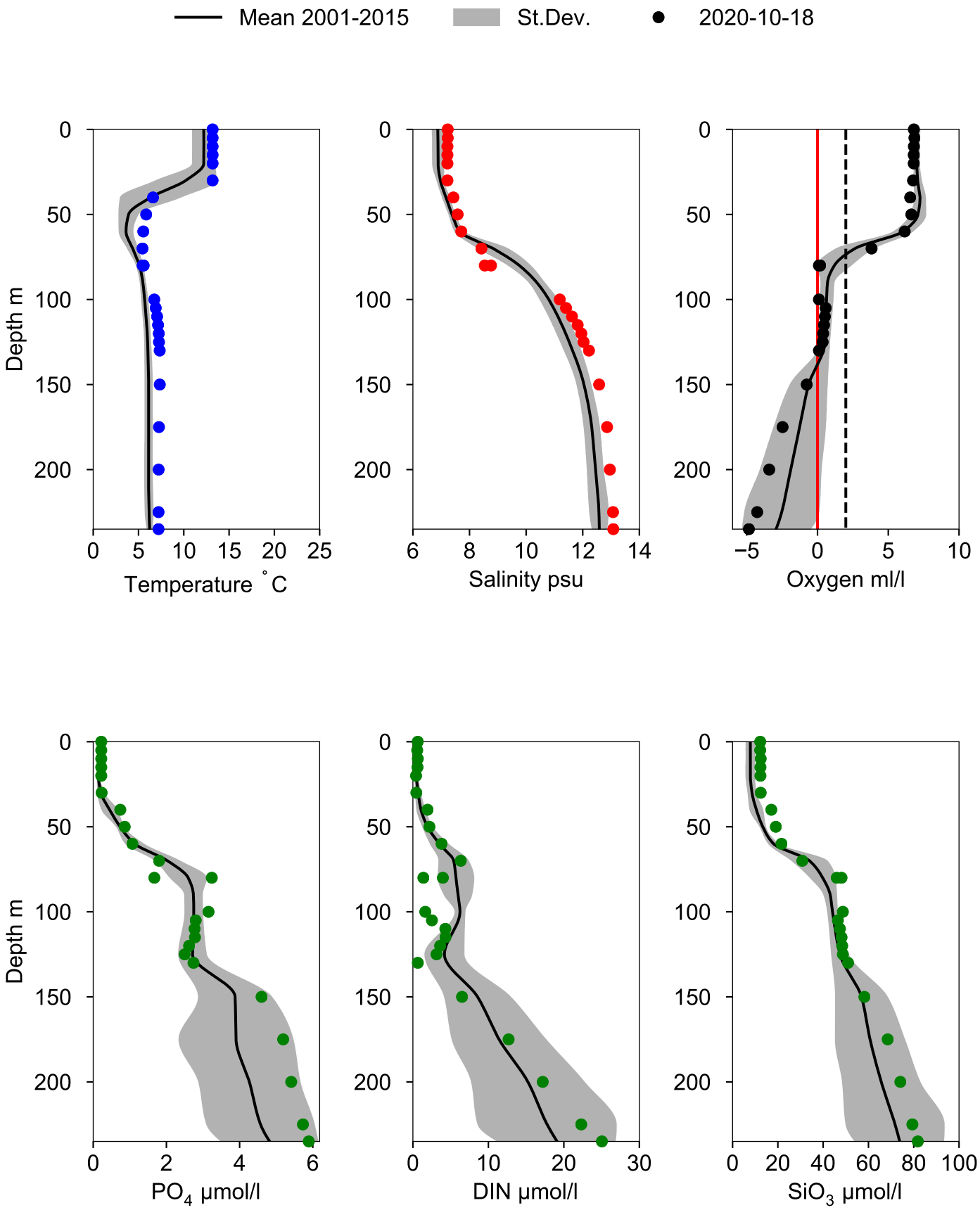
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 225 m)

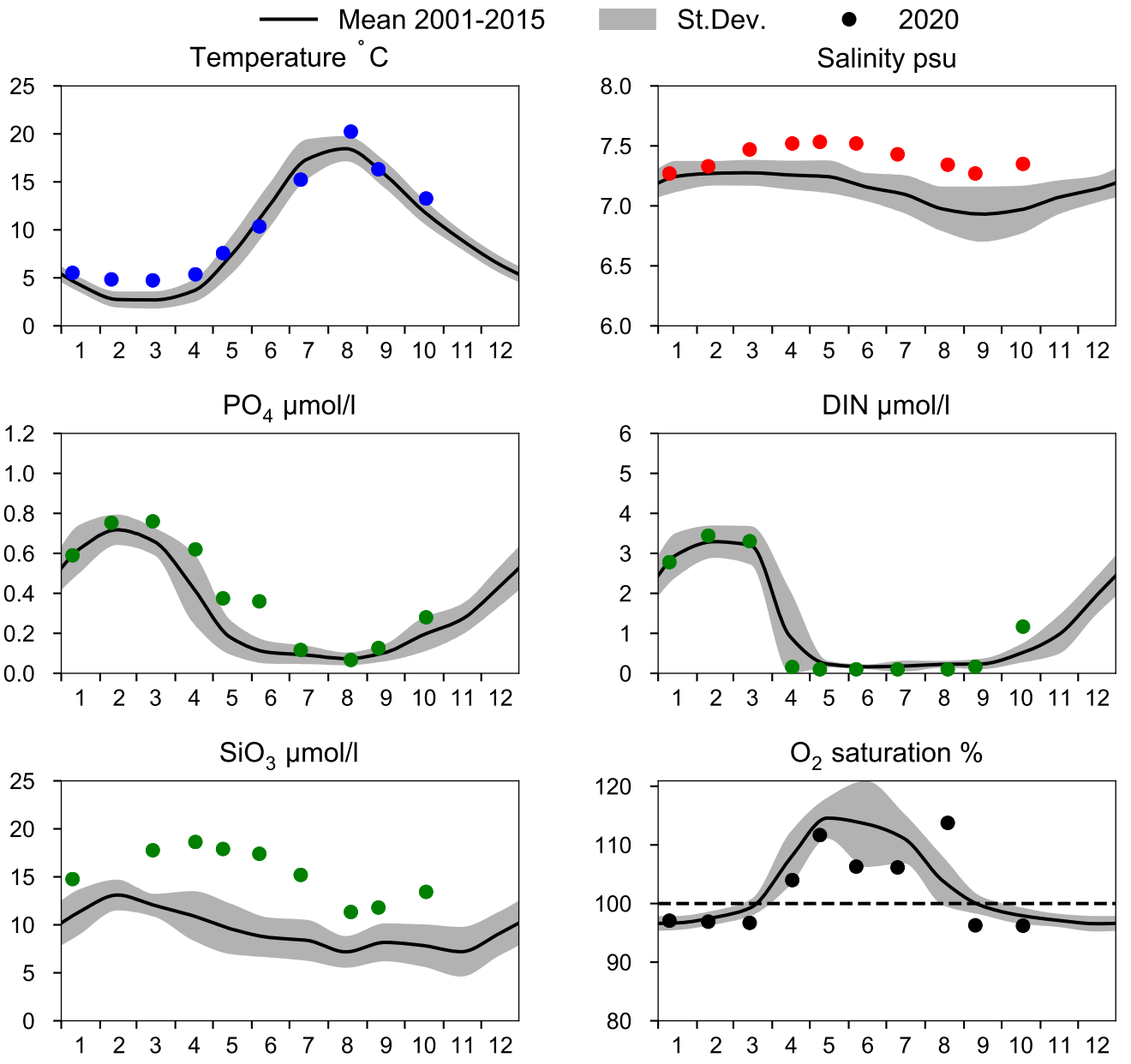


Vertical profiles BY15 GOTLANDSDJ
October

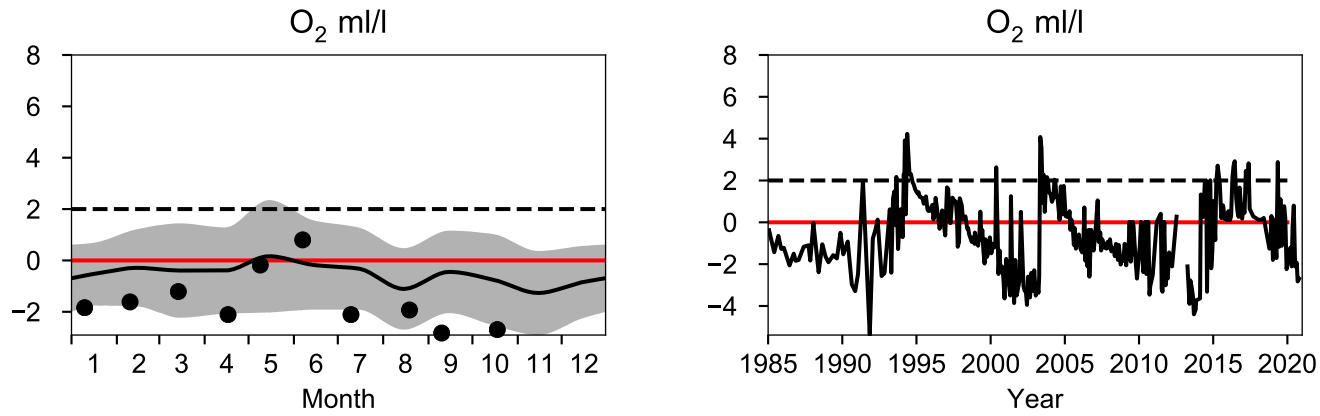


STATION BY10 SURFACE WATER (0-10 m)

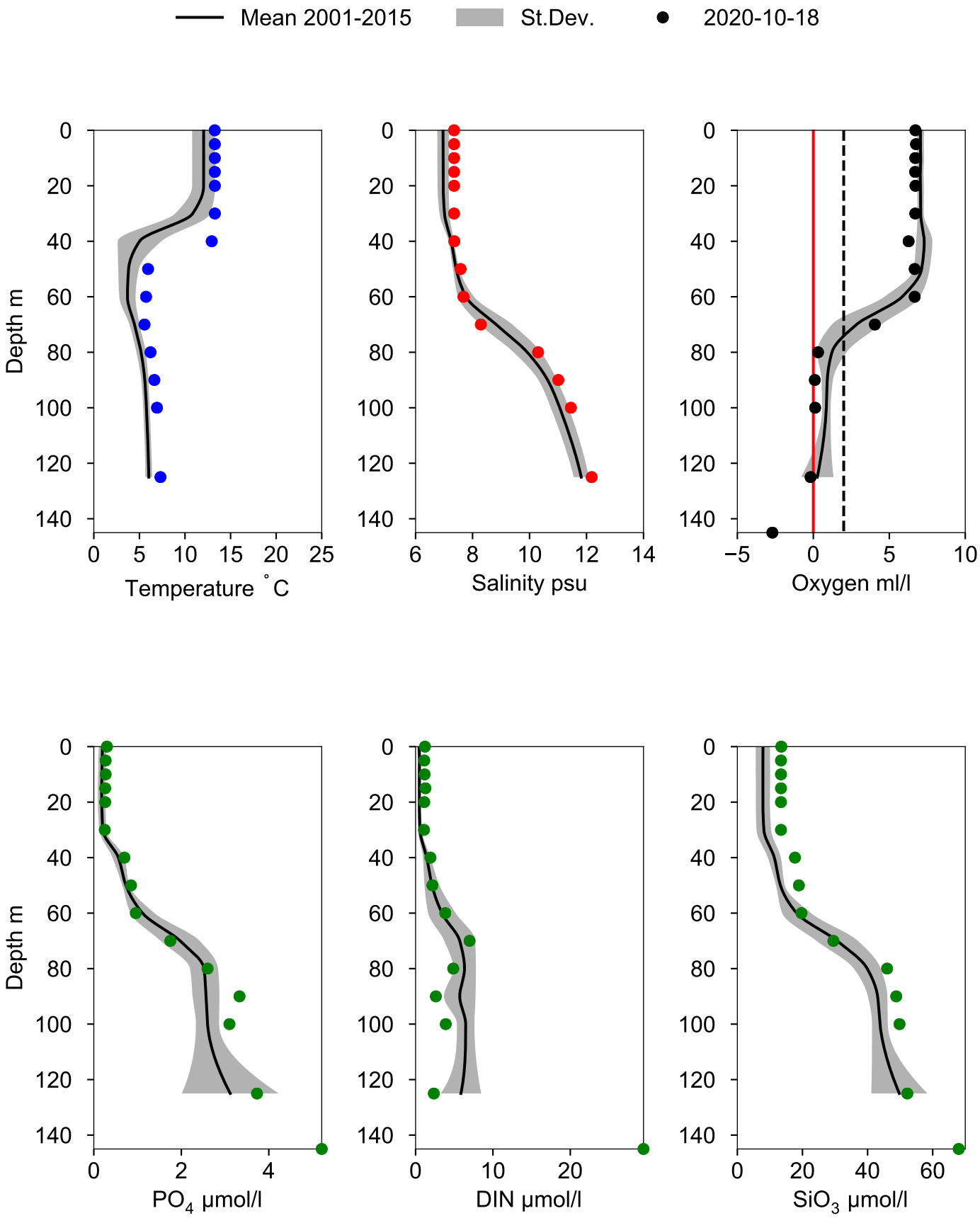
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 125 m)

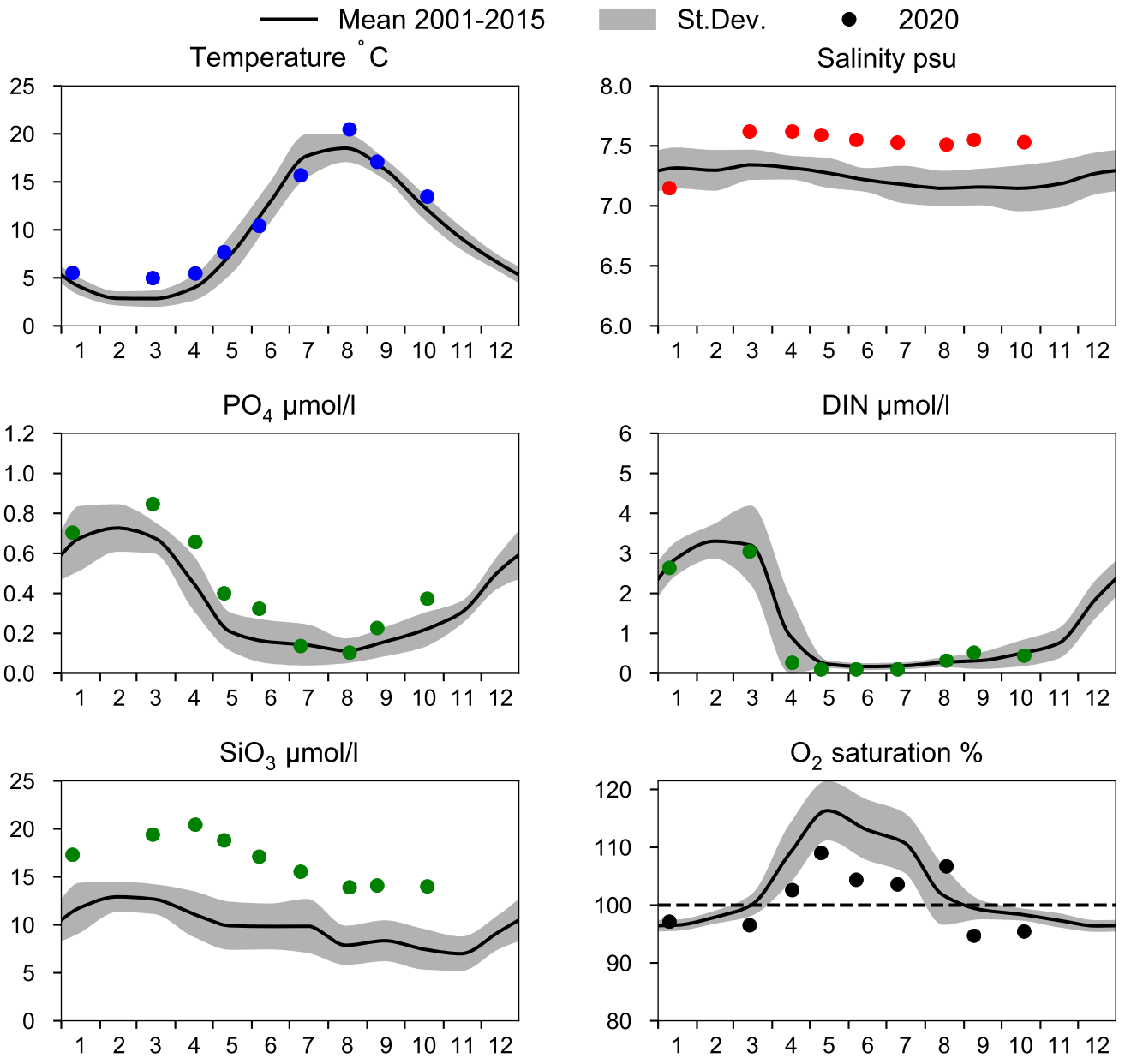


Vertical profiles BY10
October

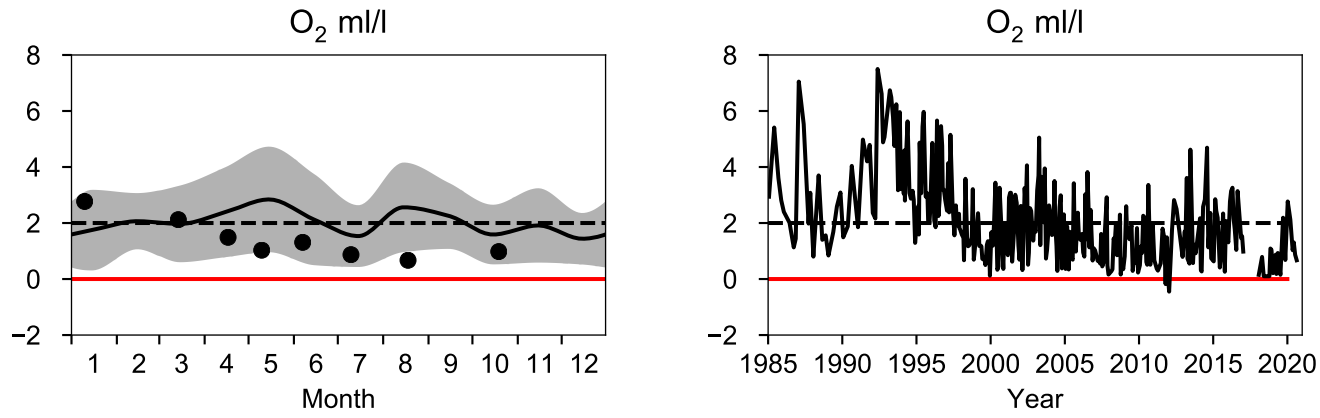


STATION BCS III-10 SURFACE WATER (0-10 m)

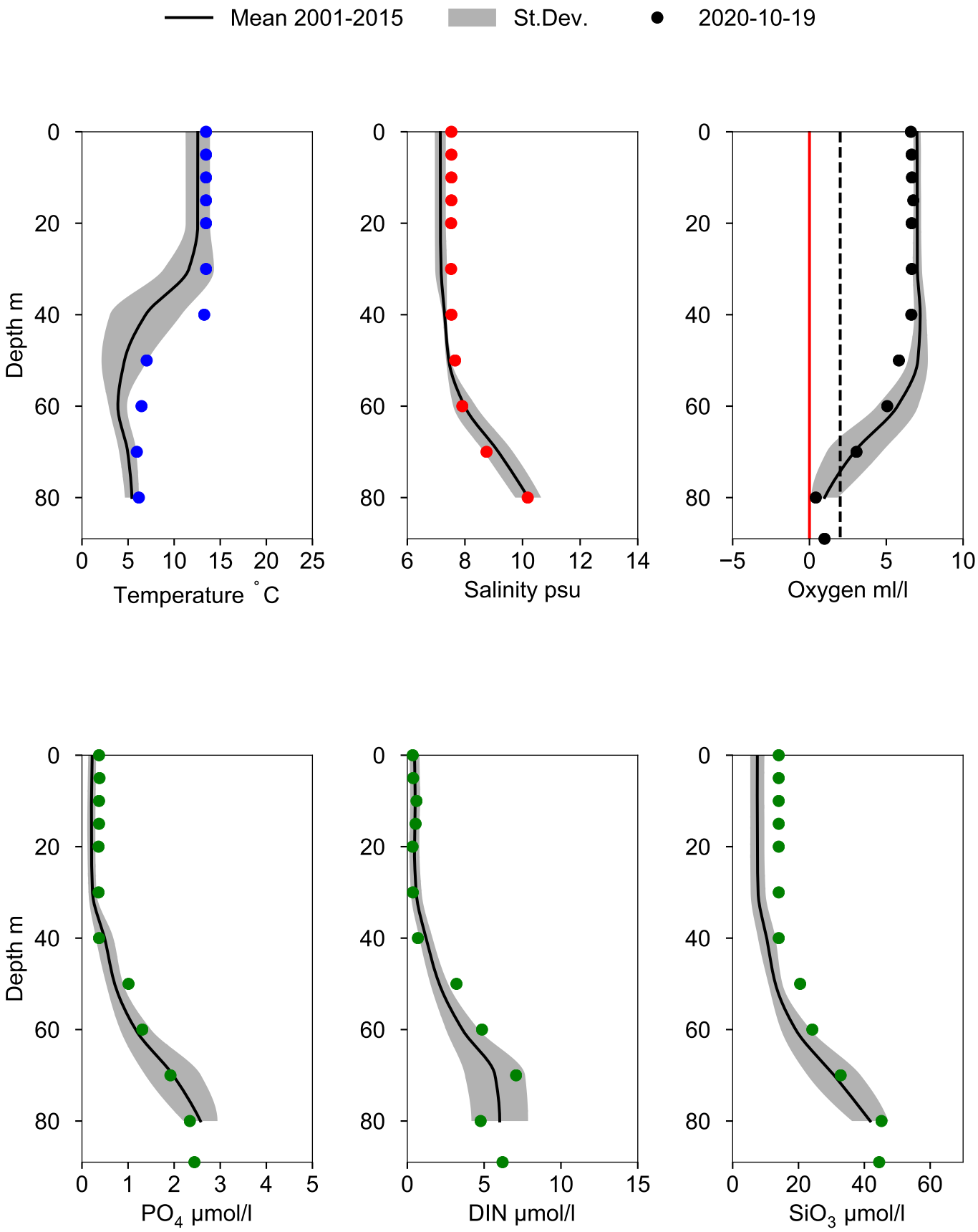
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 80 m)

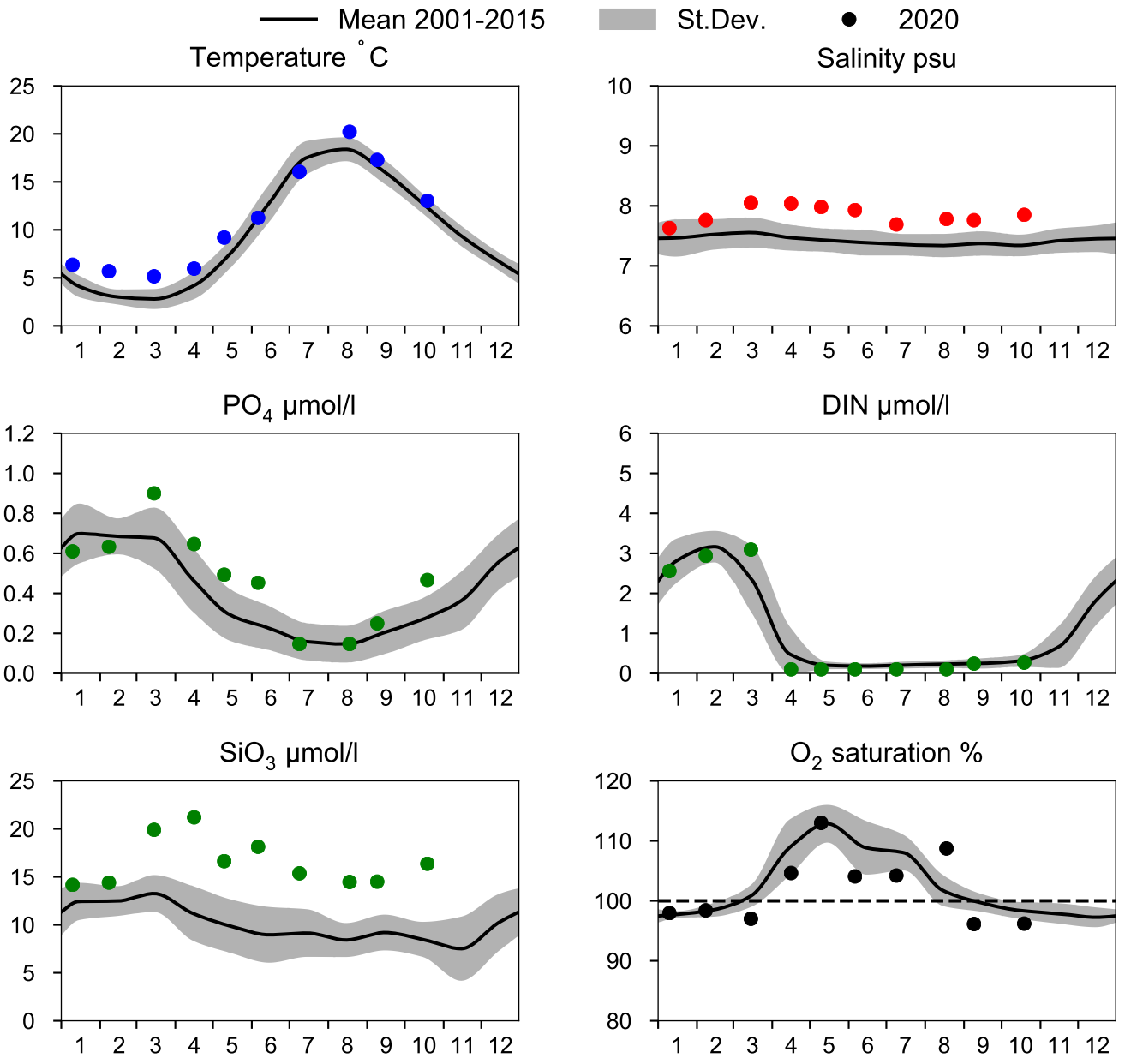


Vertical profiles BCS III-10
October

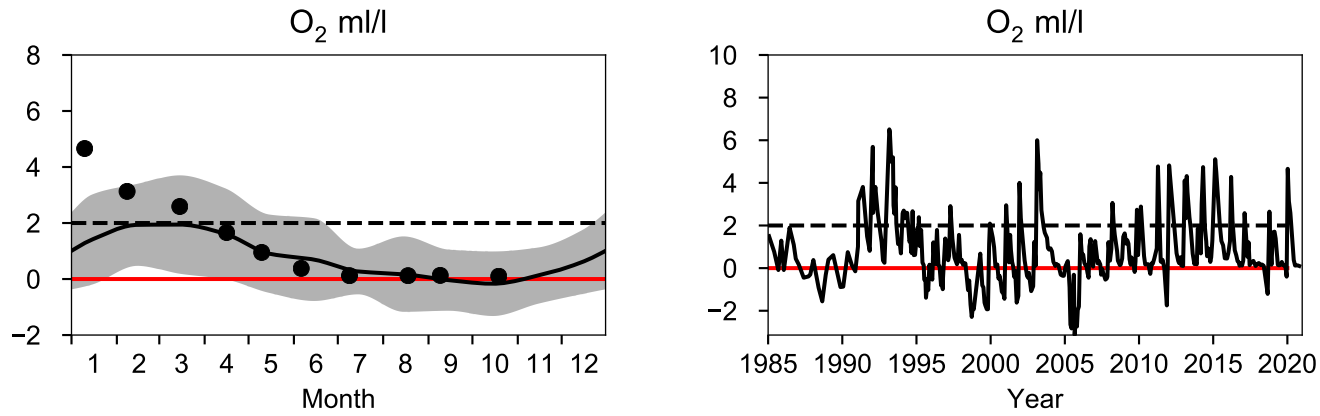


STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)

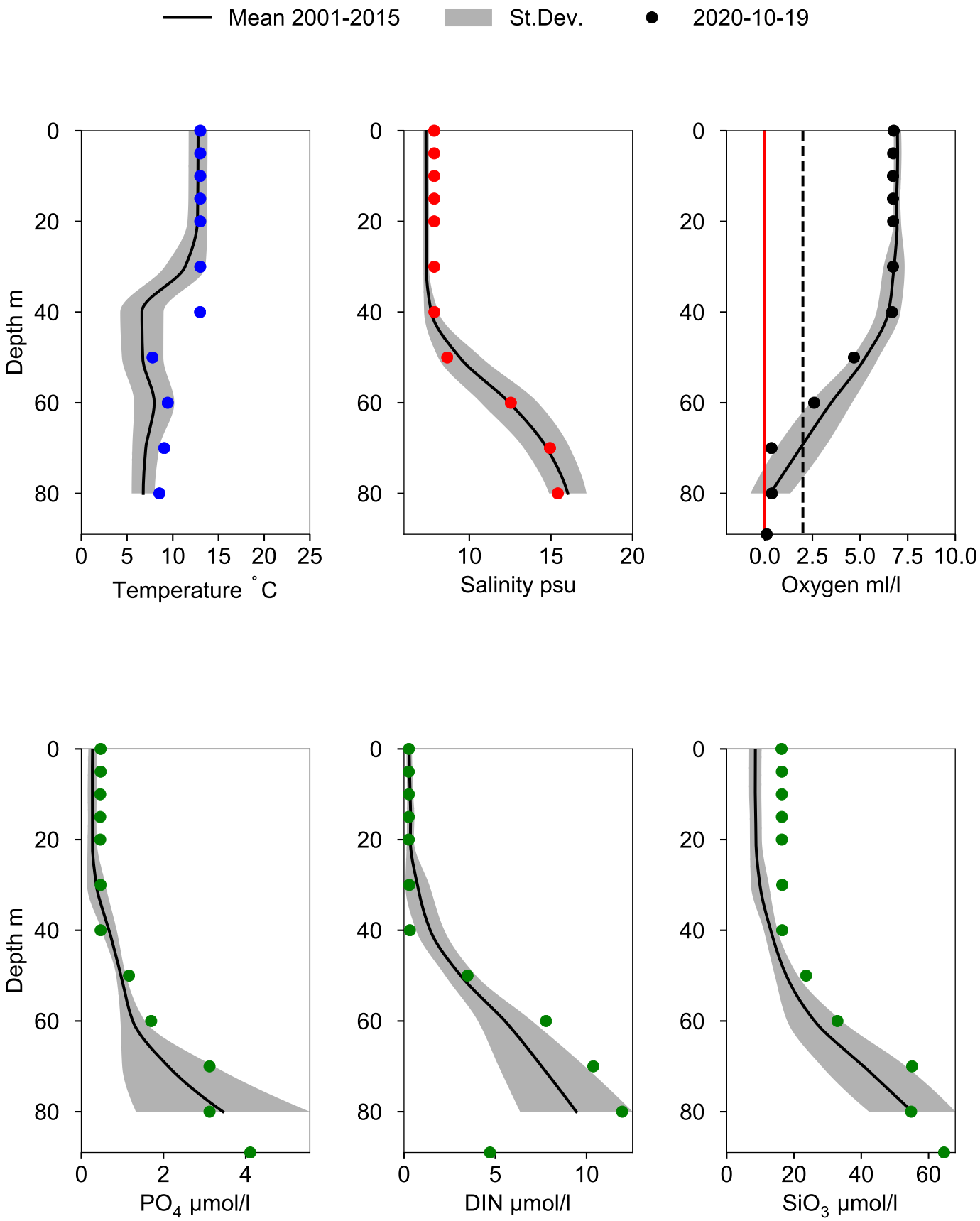
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 80 m)

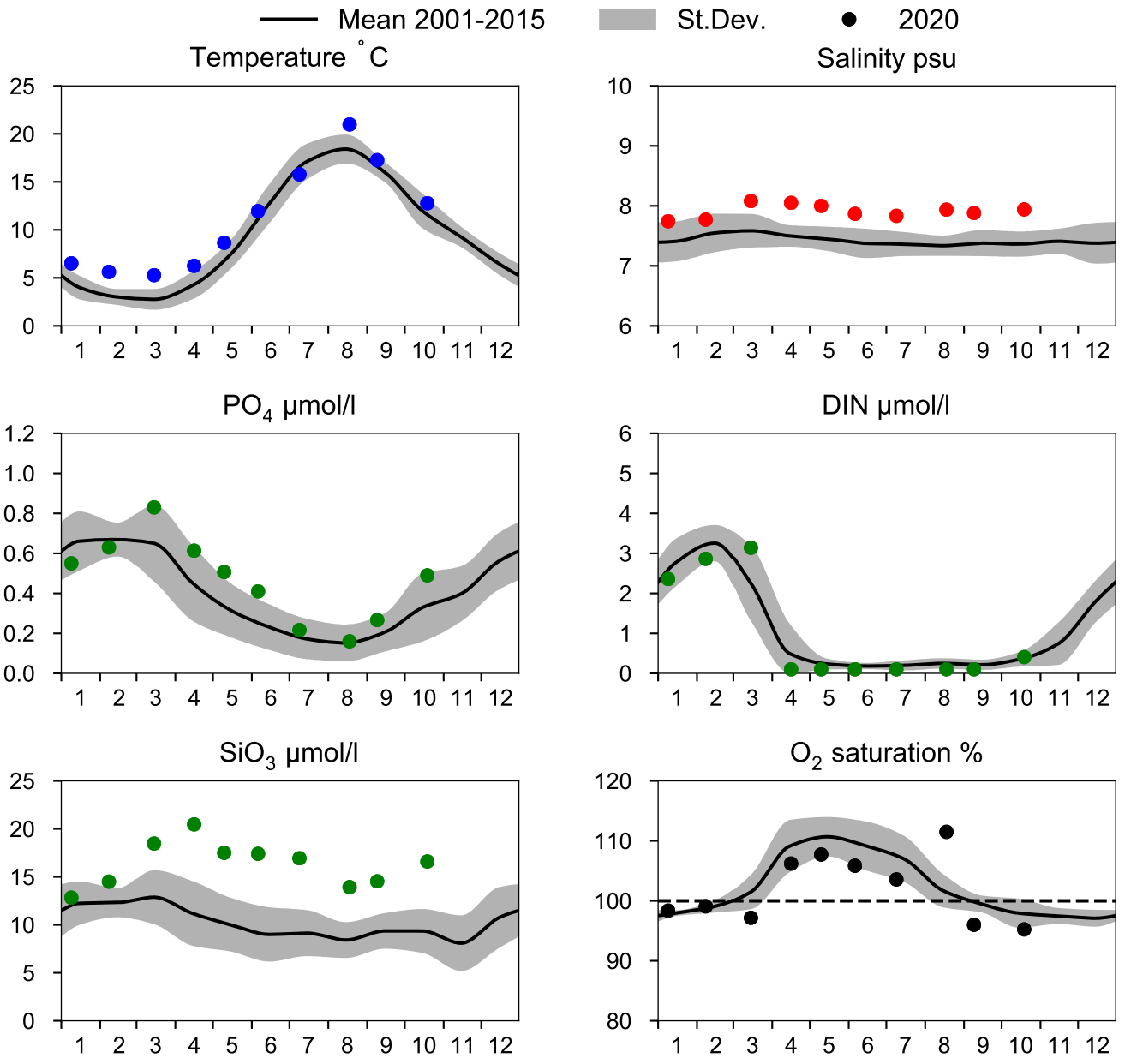


Vertical profiles BY5 BORNHOLMSDJ
October

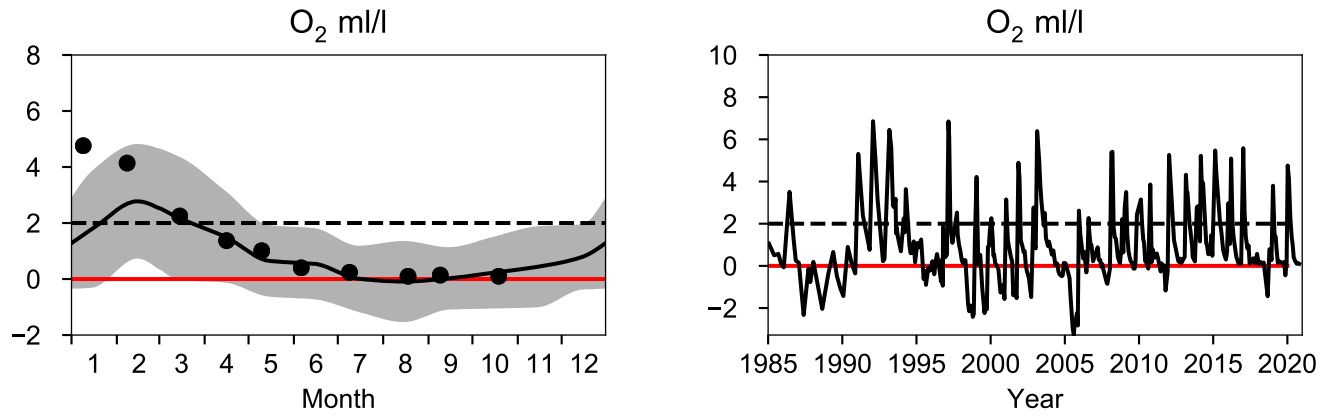


STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

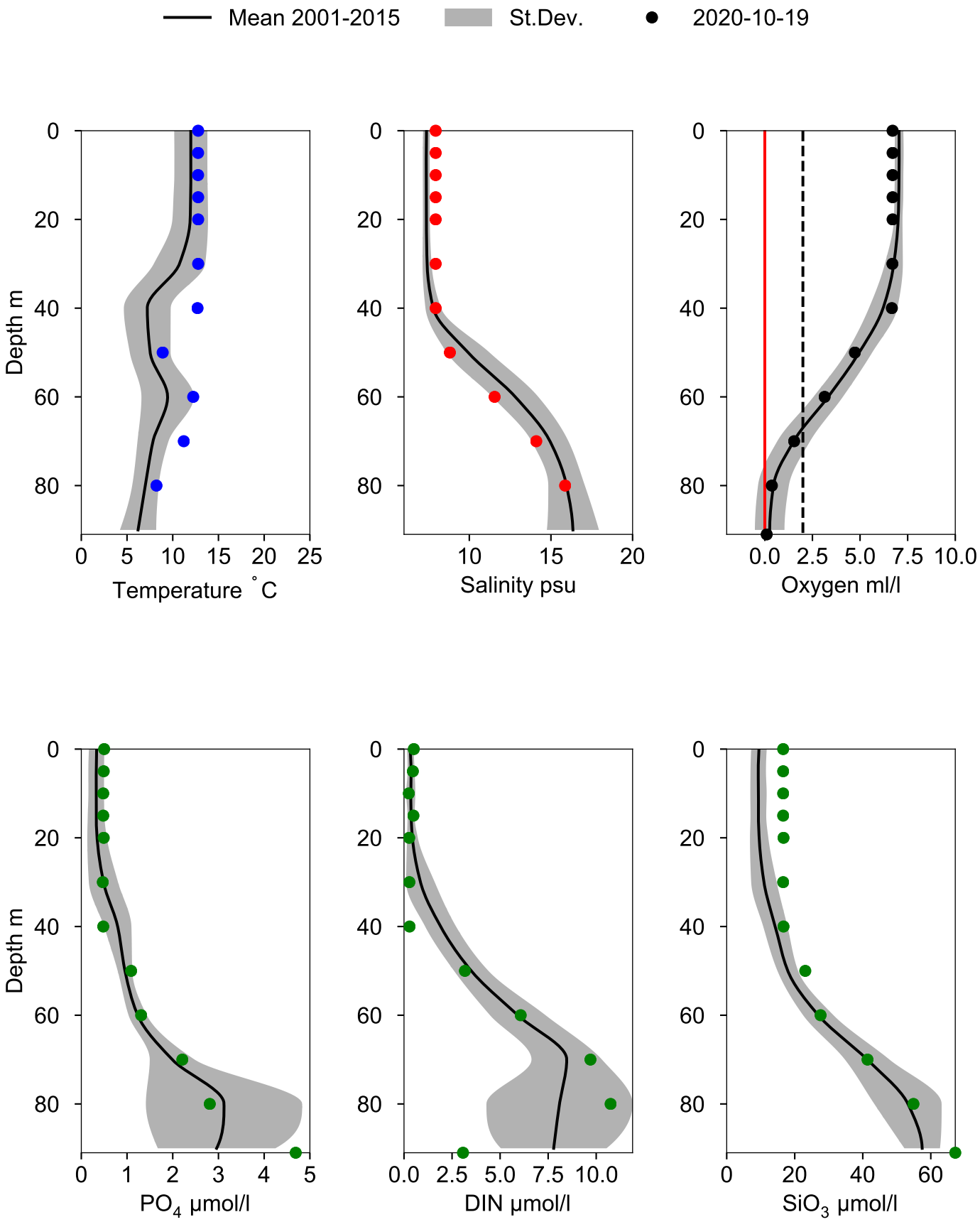
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 80 m)

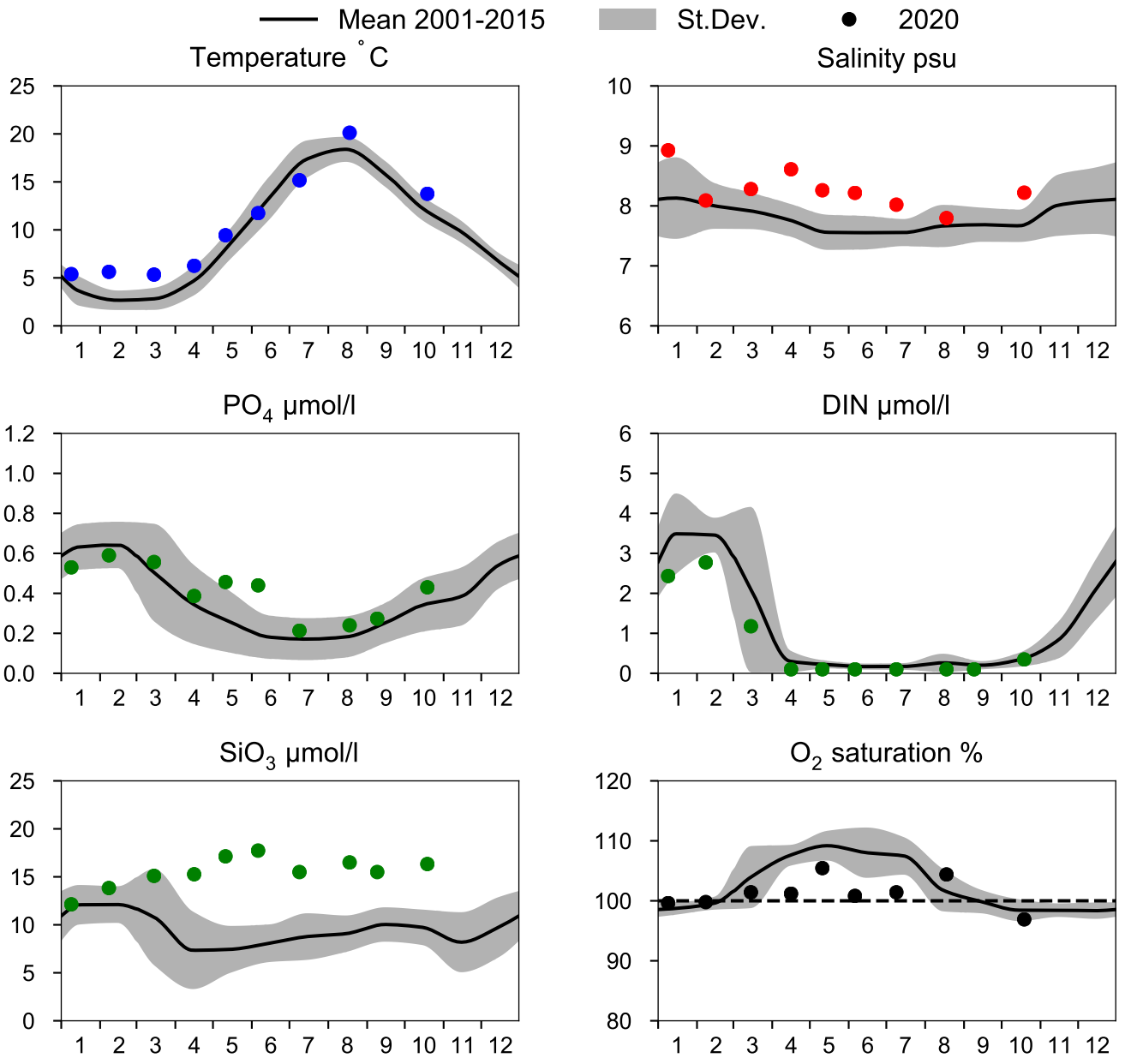


Vertical profiles BY4 CHRISTIANSÖ
October

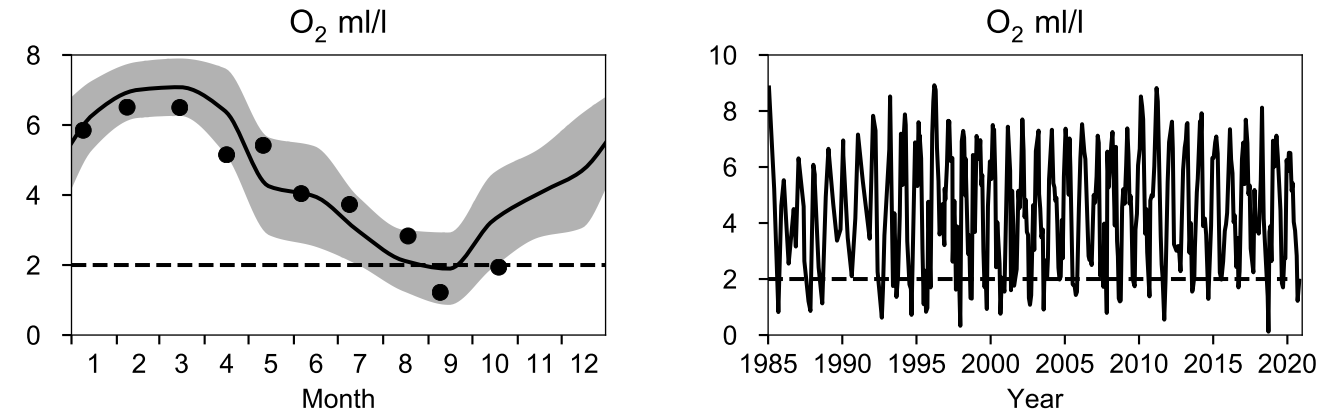


STATION BY2 ARKONA SURFACE WATER (0-10 m)

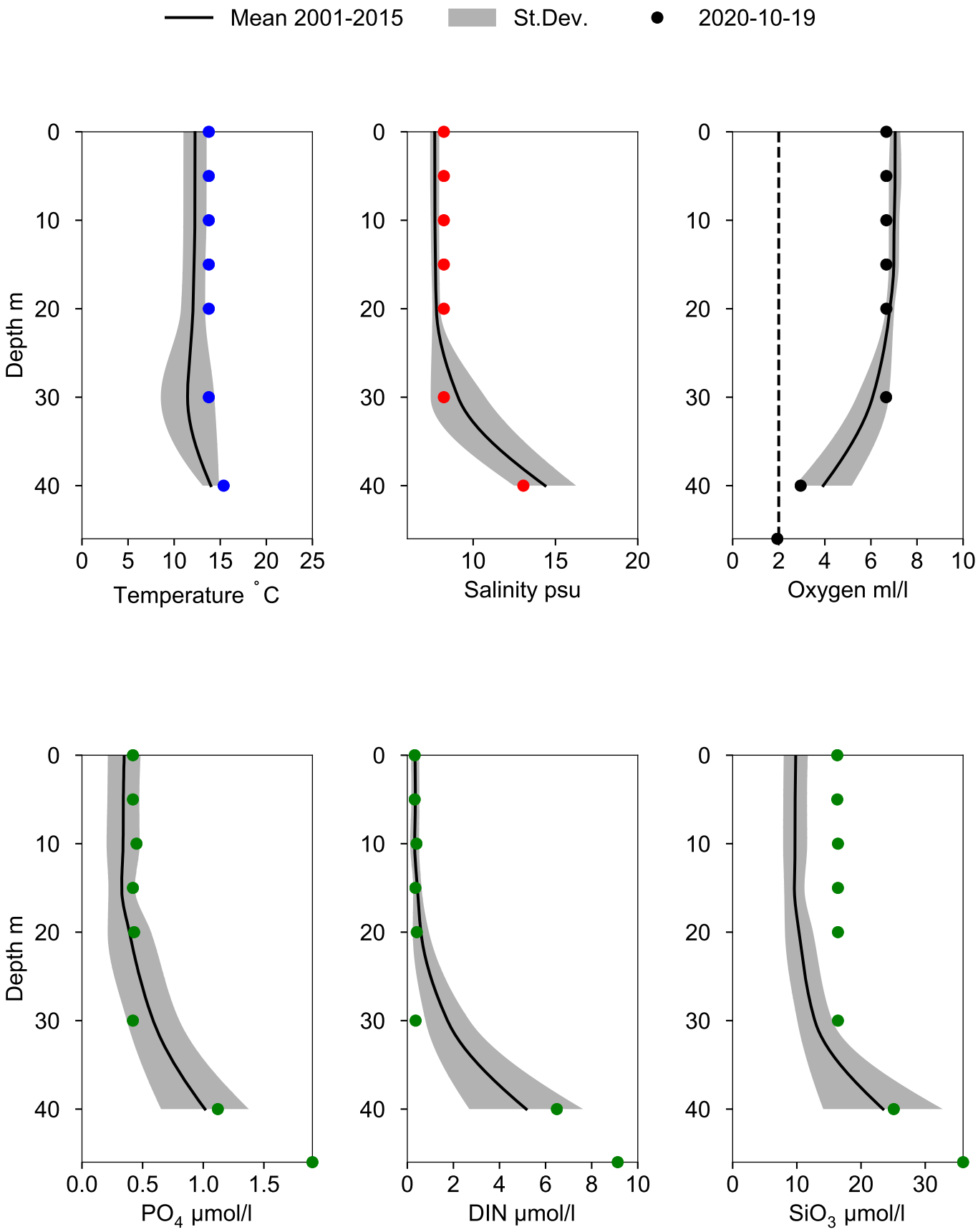
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 40 m)

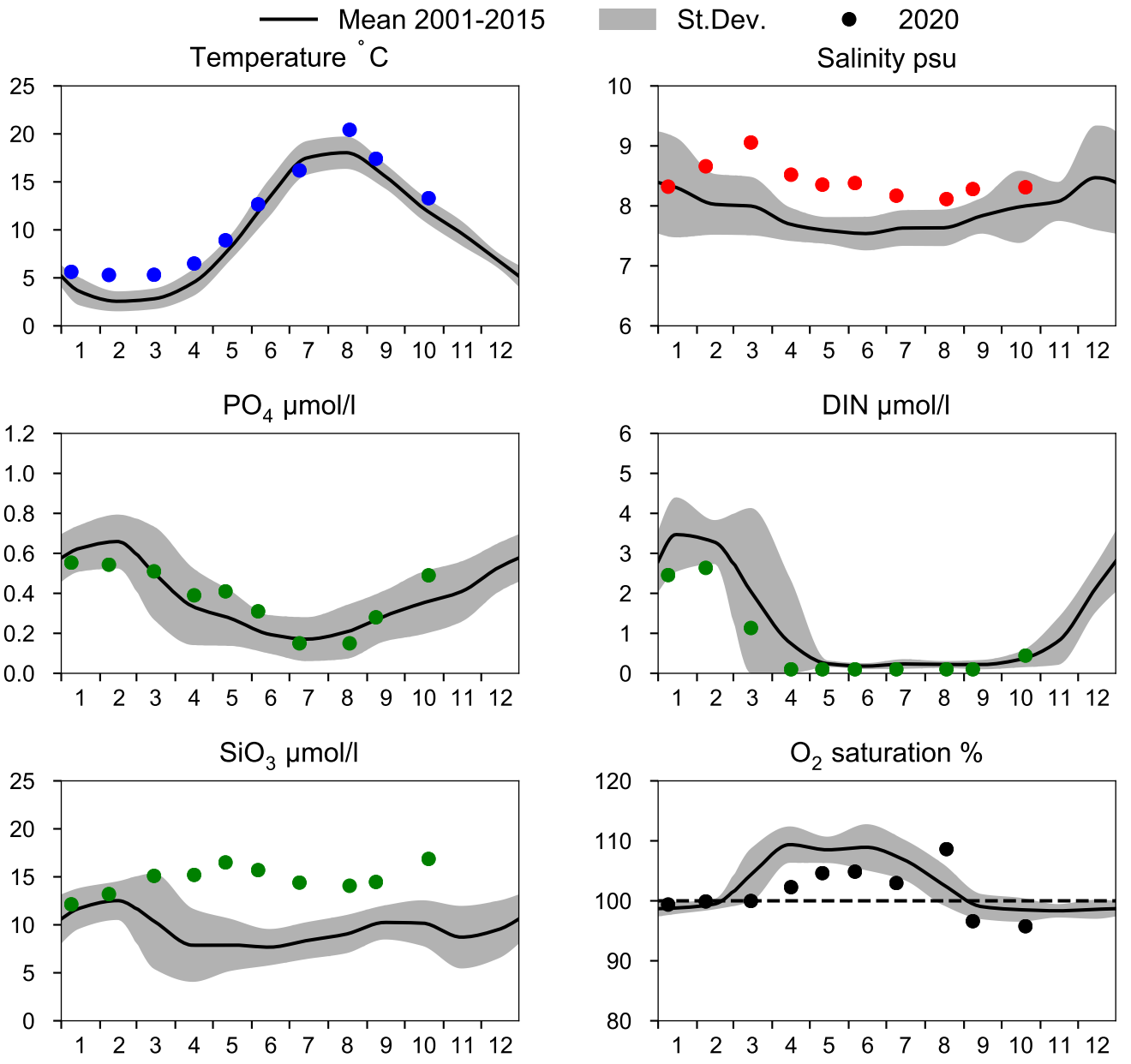


Vertical profiles BY2 ARKONA
October

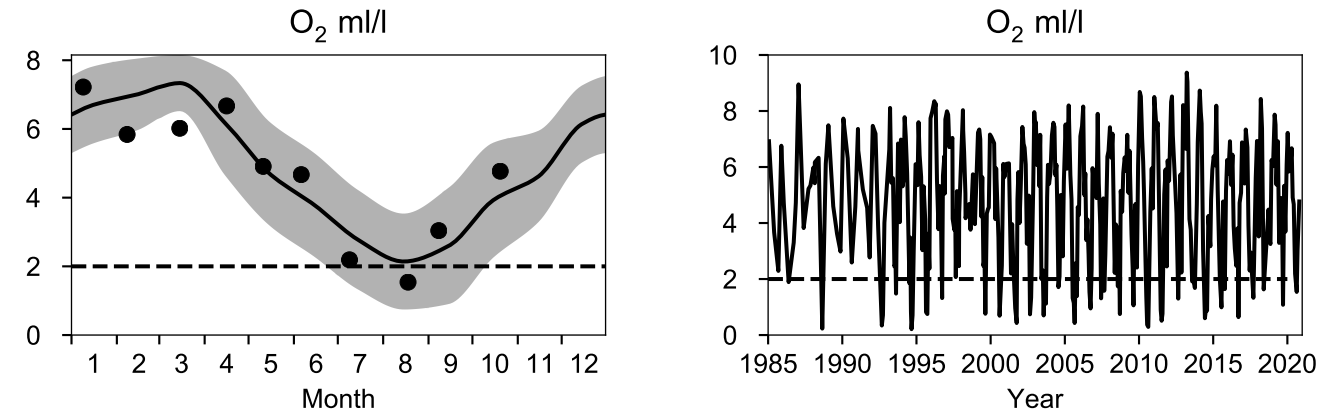


STATION BY1 SURFACE WATER (0-10 m)

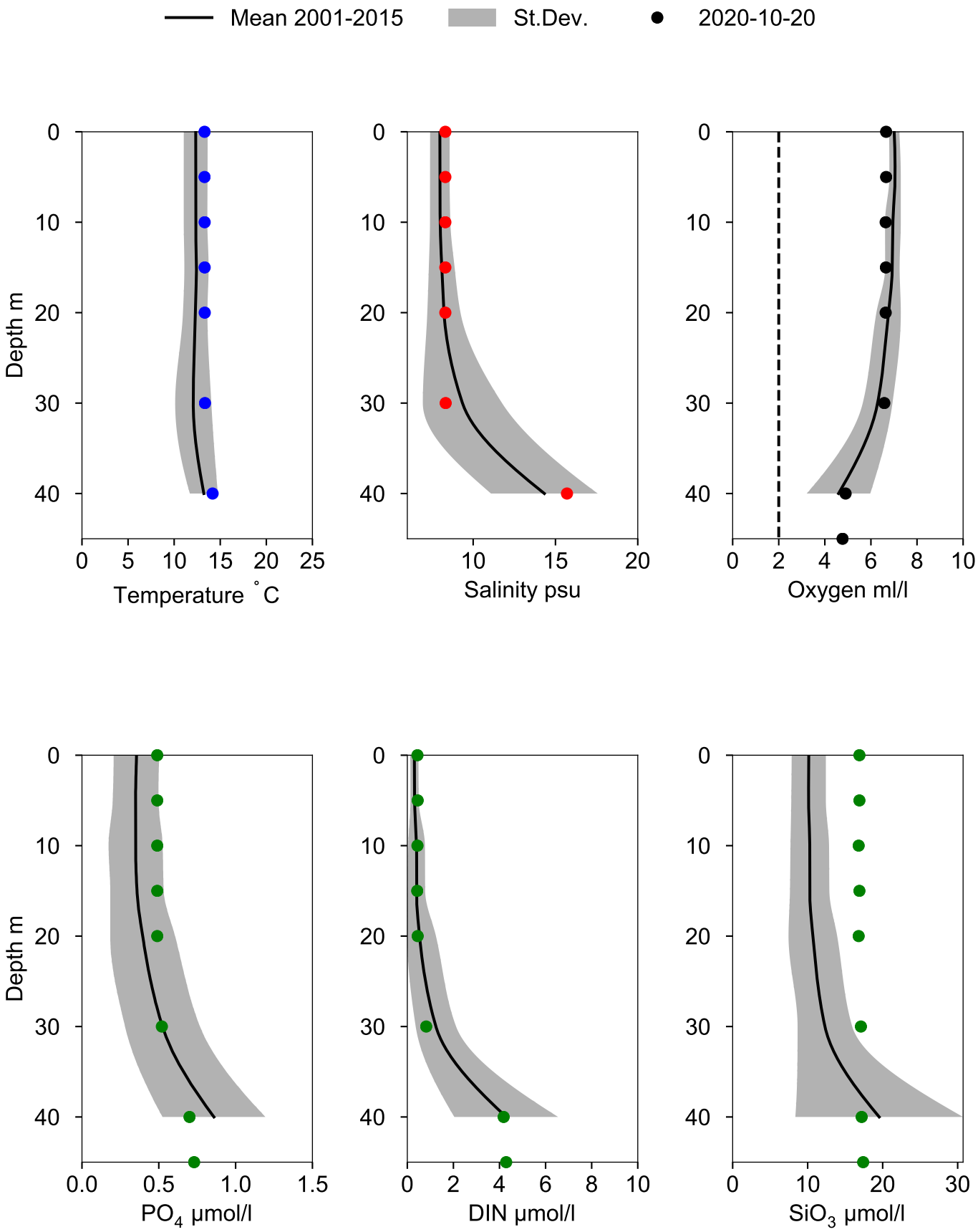
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 40 m)

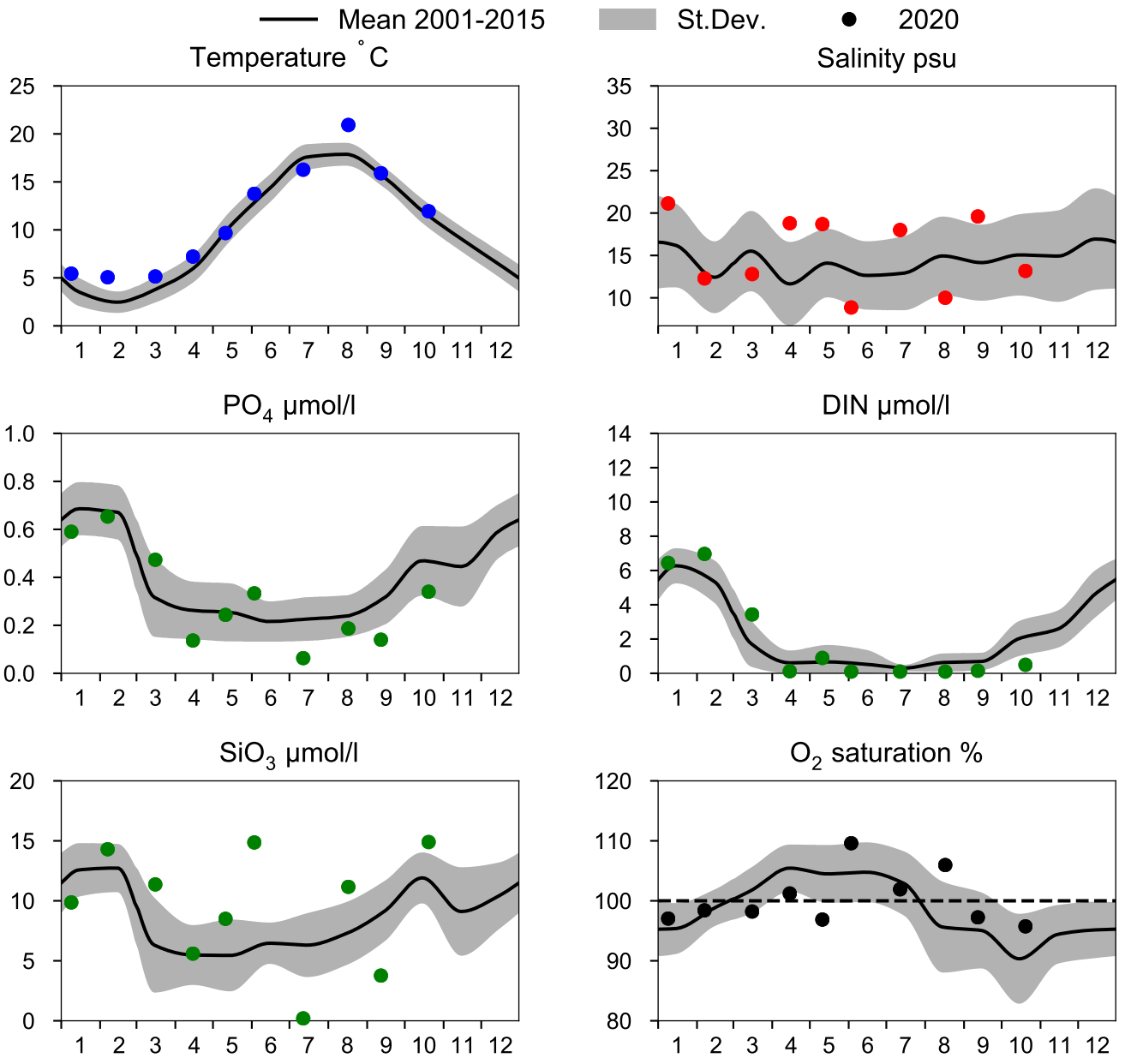


Vertical profiles BY1
October

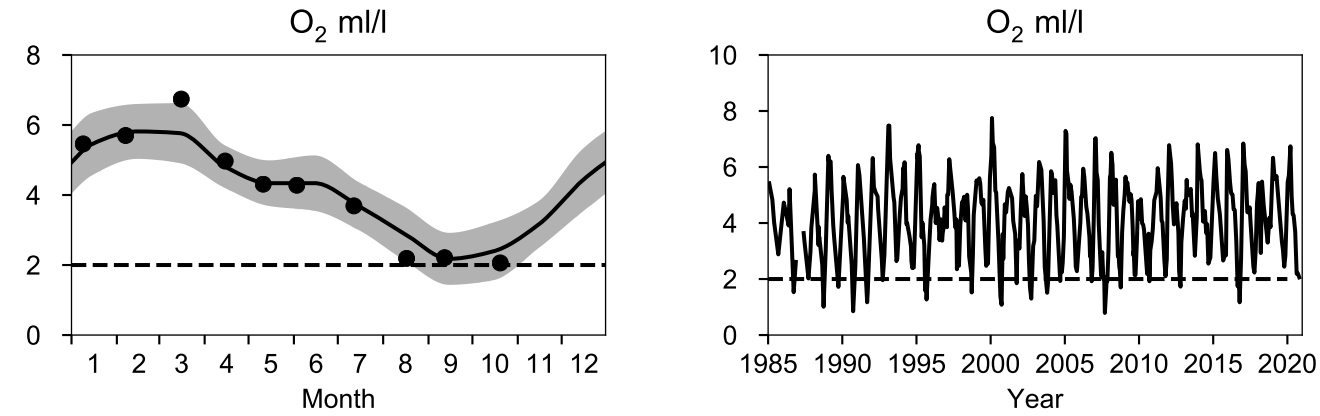


STATION W LANDSKRONA SURFACE WATER (0-10 m)

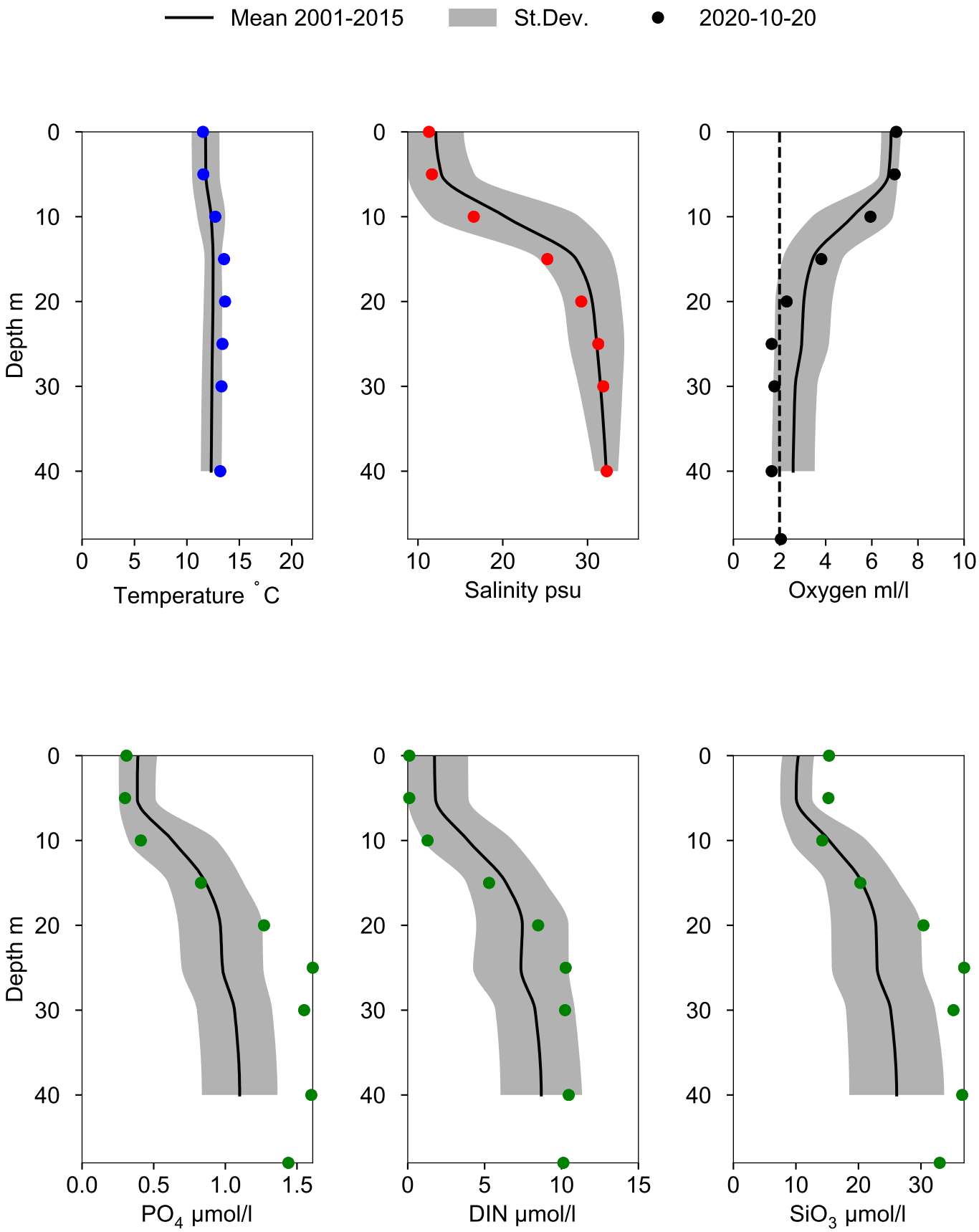
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 40 m)

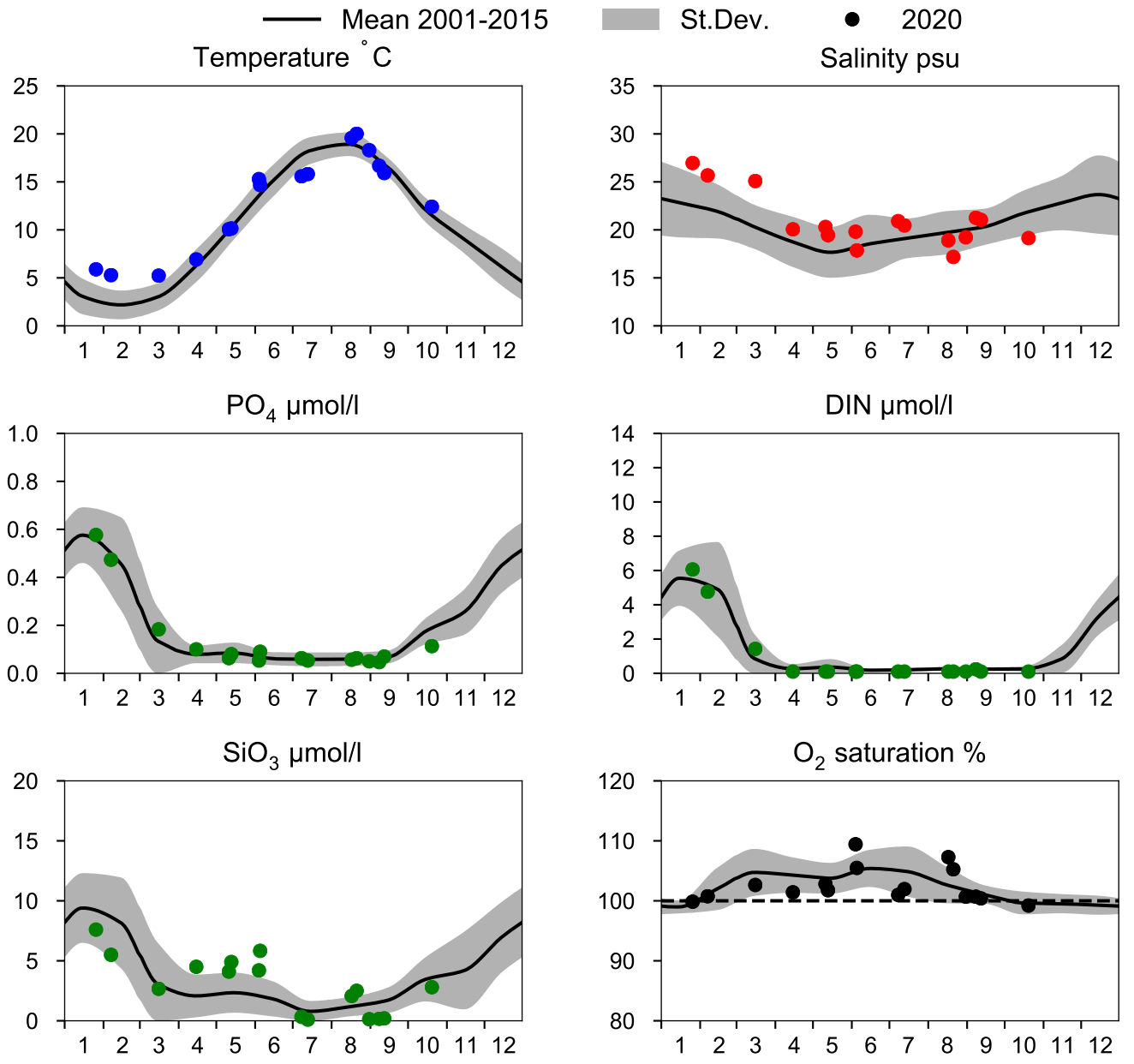


Vertical profiles W LANDSKRONA
October

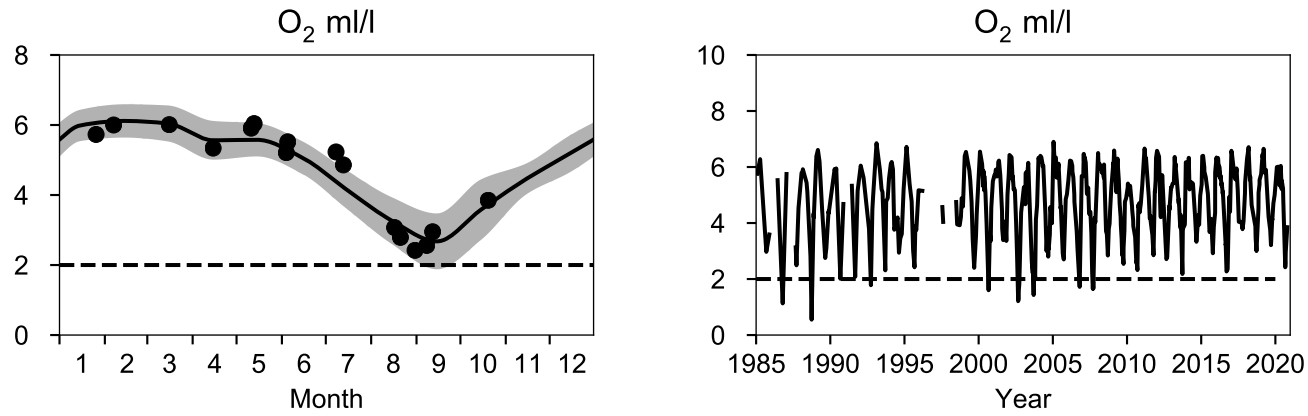


STATION ANHOLT E SURFACE WATER (0-10 m)

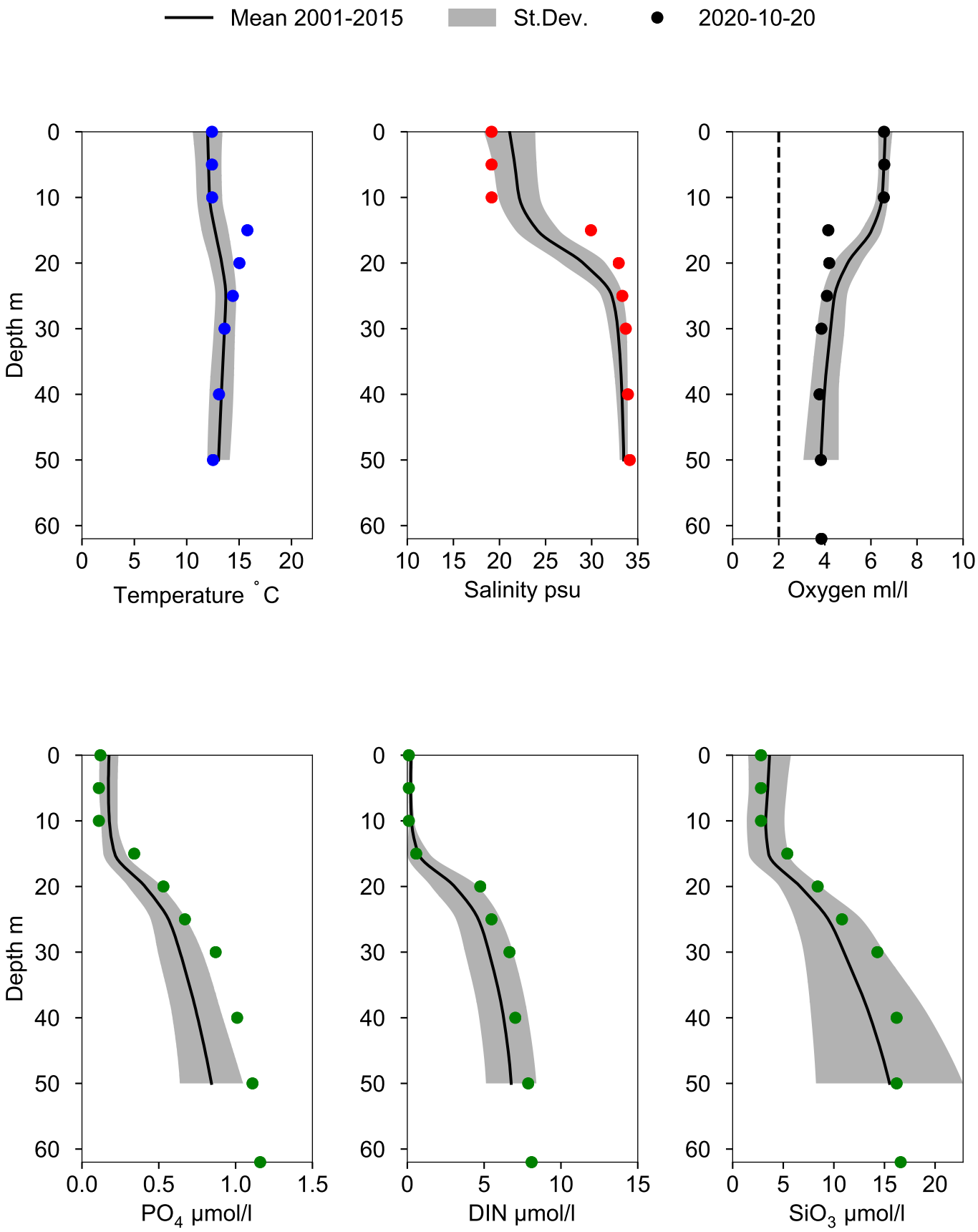
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 52 m)

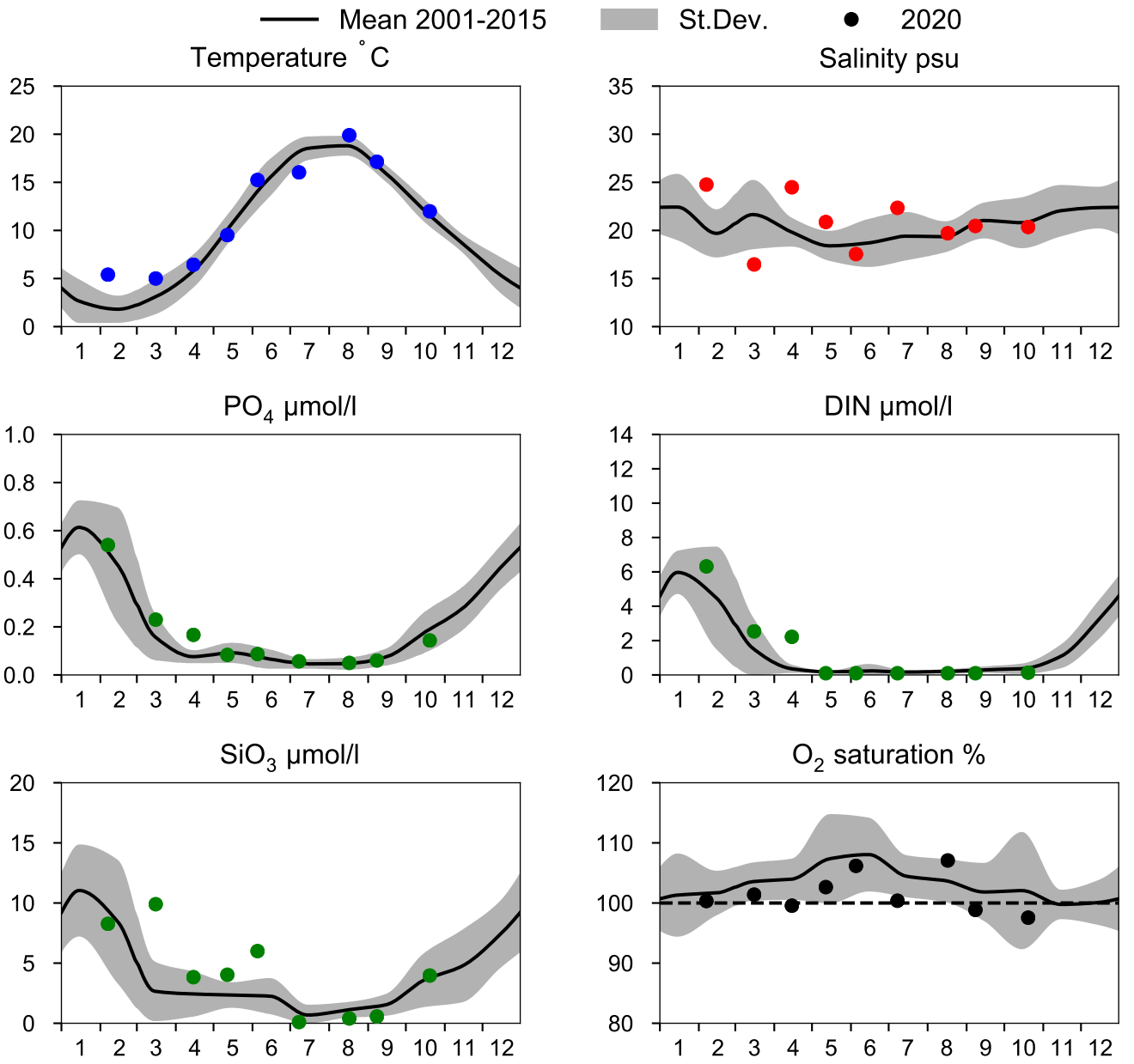


Vertical profiles ANHOLT E
October

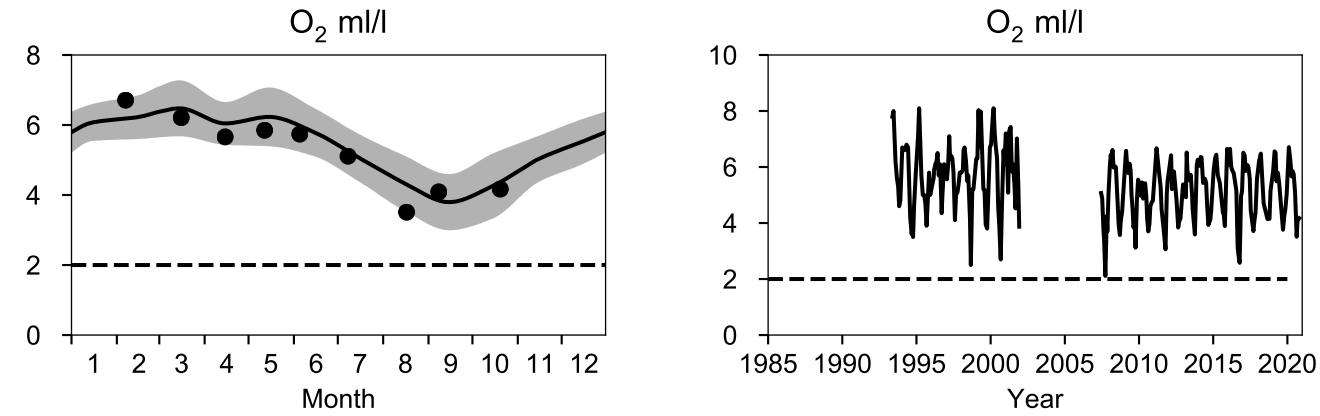


STATION N14 FALKENBERG SURFACE WATER (0-10 m)

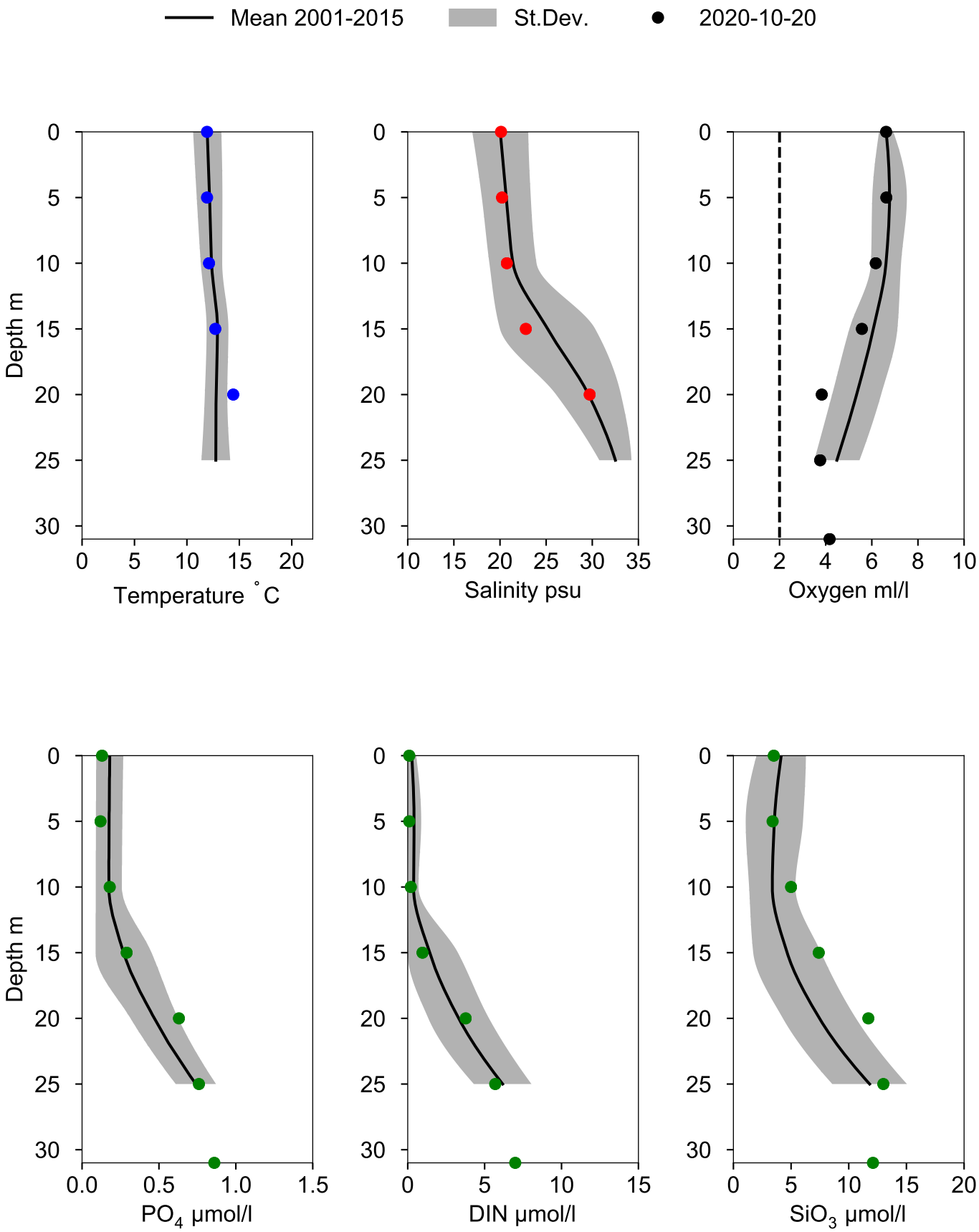
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 20 m)

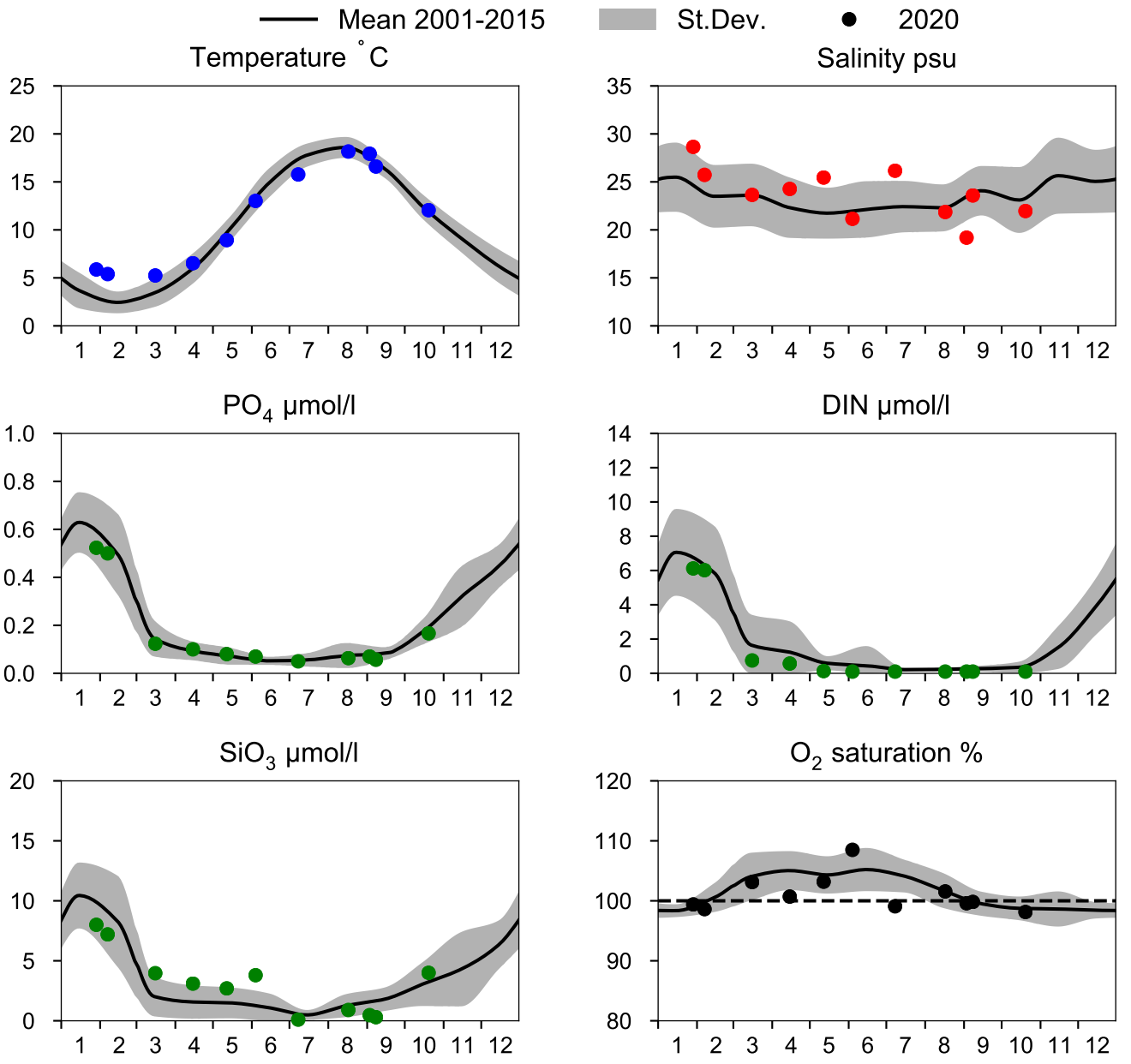


Vertical profiles N14 FALKENBERG
October

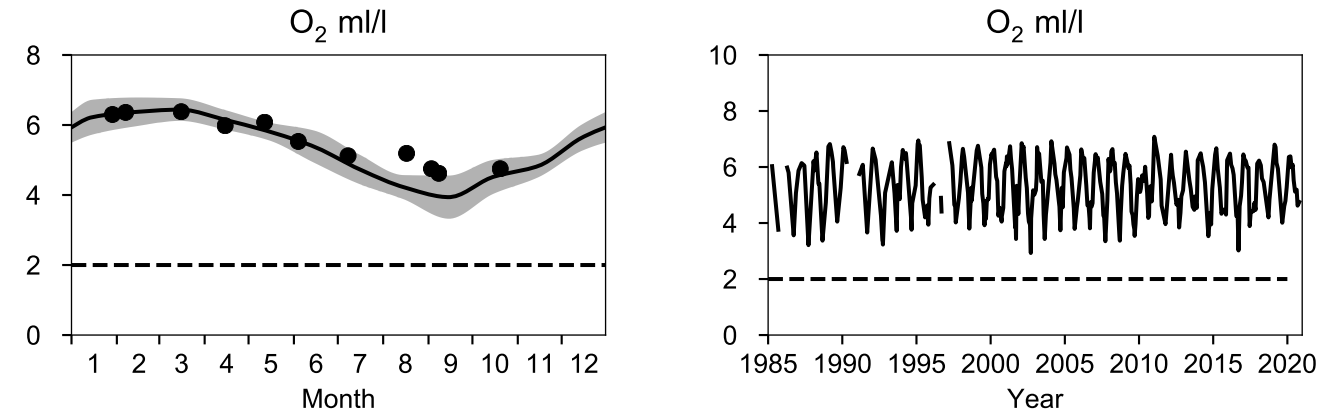


STATION FLADEN SURFACE WATER (0-10 m)

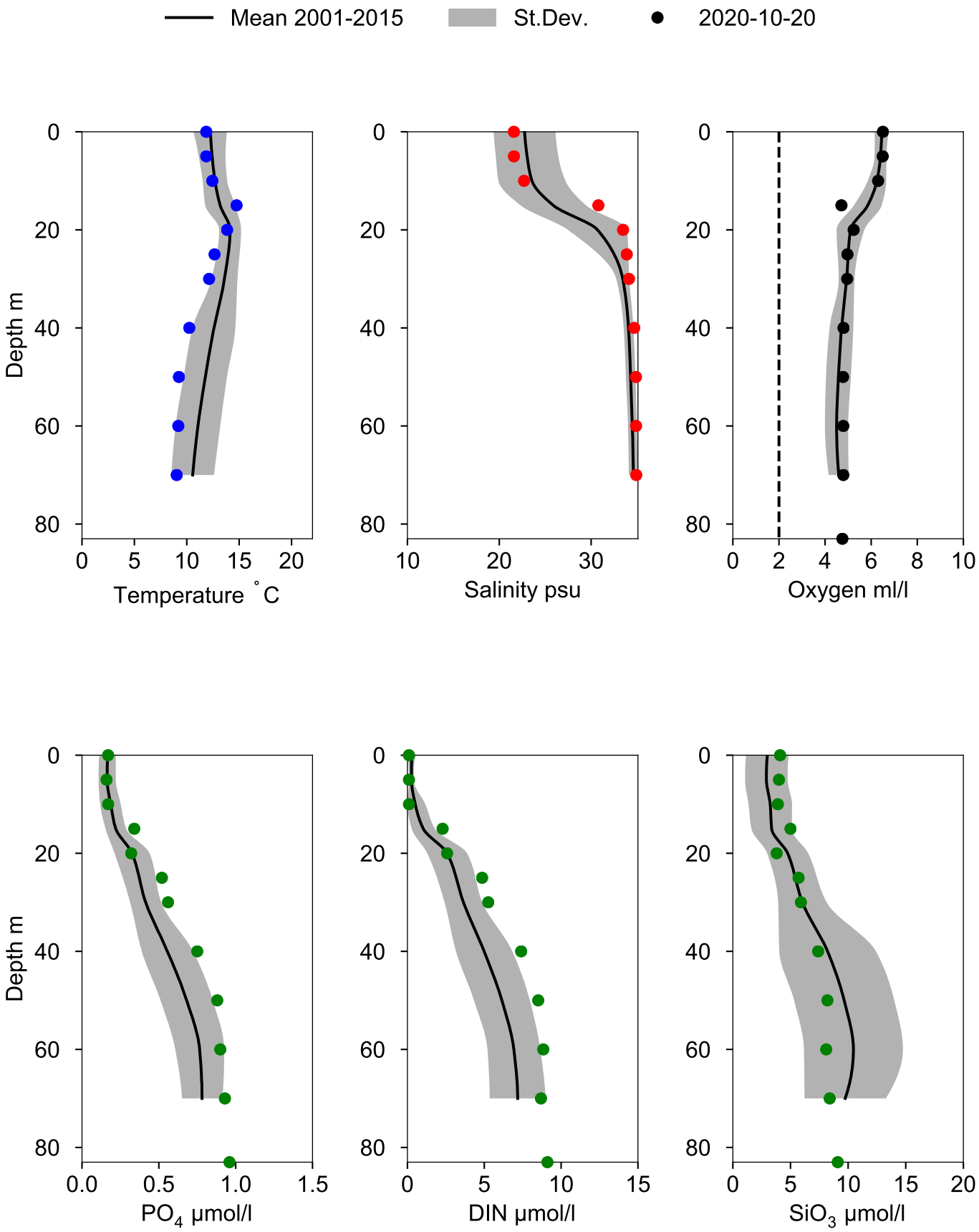
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 74 m)

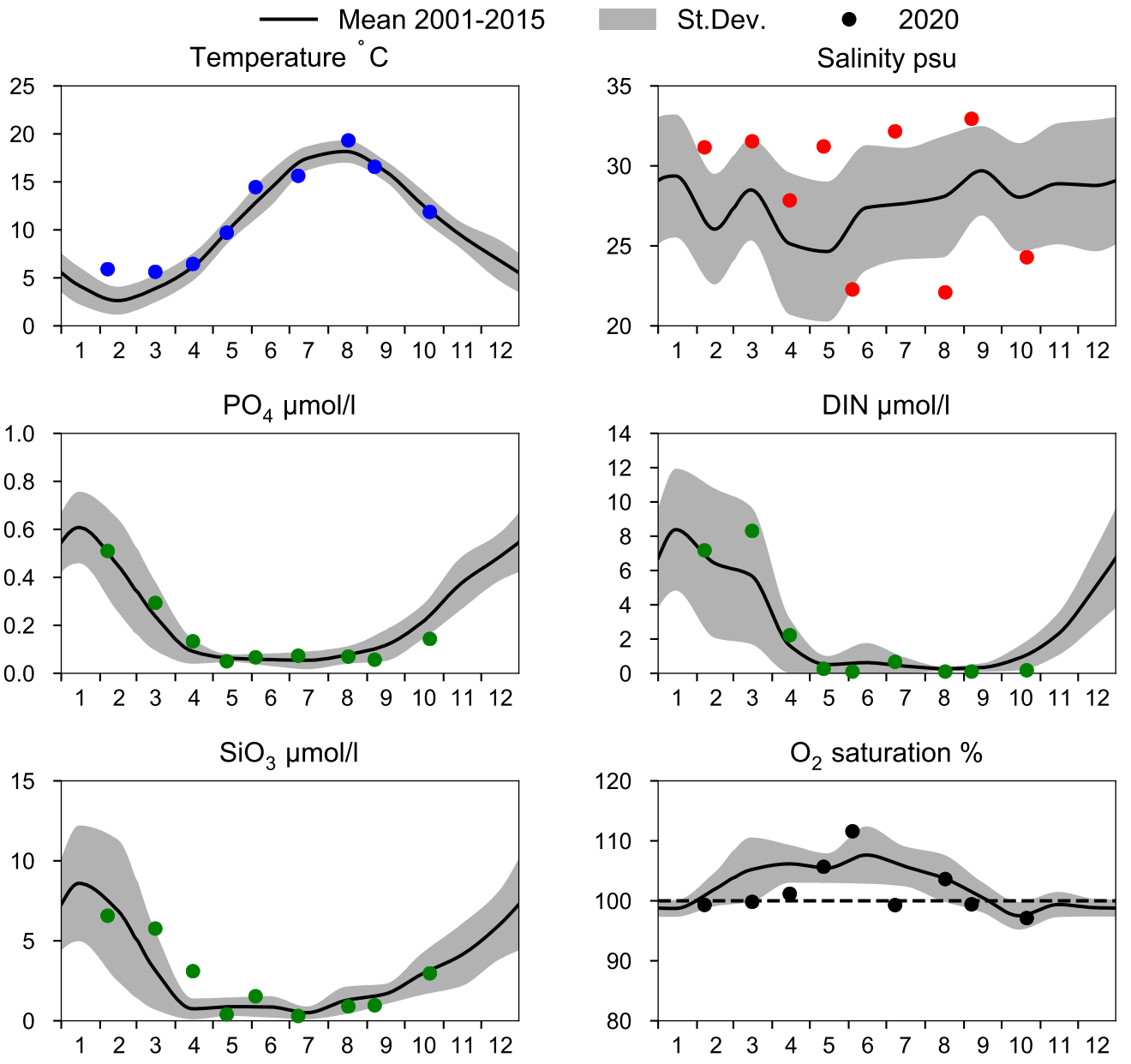


Vertical profiles FLADEN
October

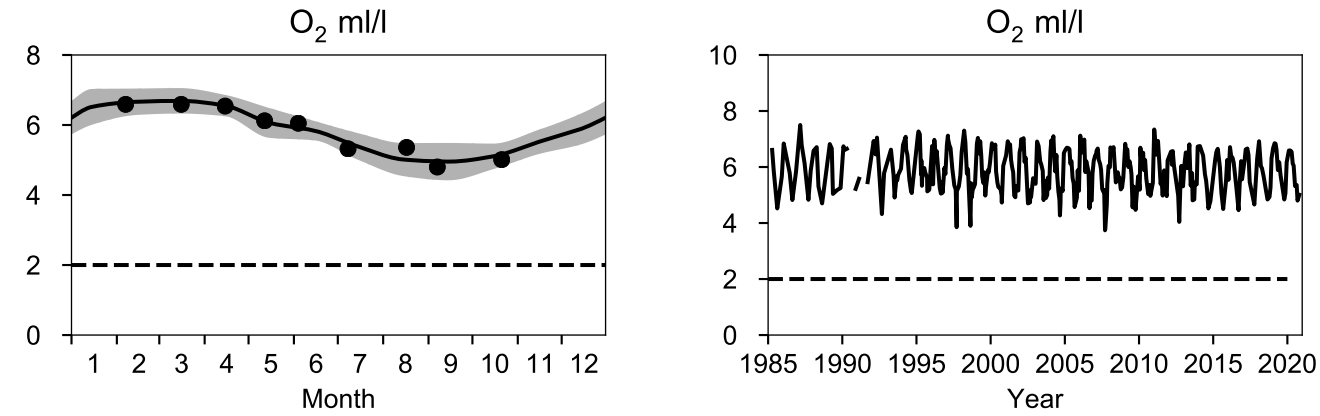


STATION P2 SURFACE WATER (0-10 m)

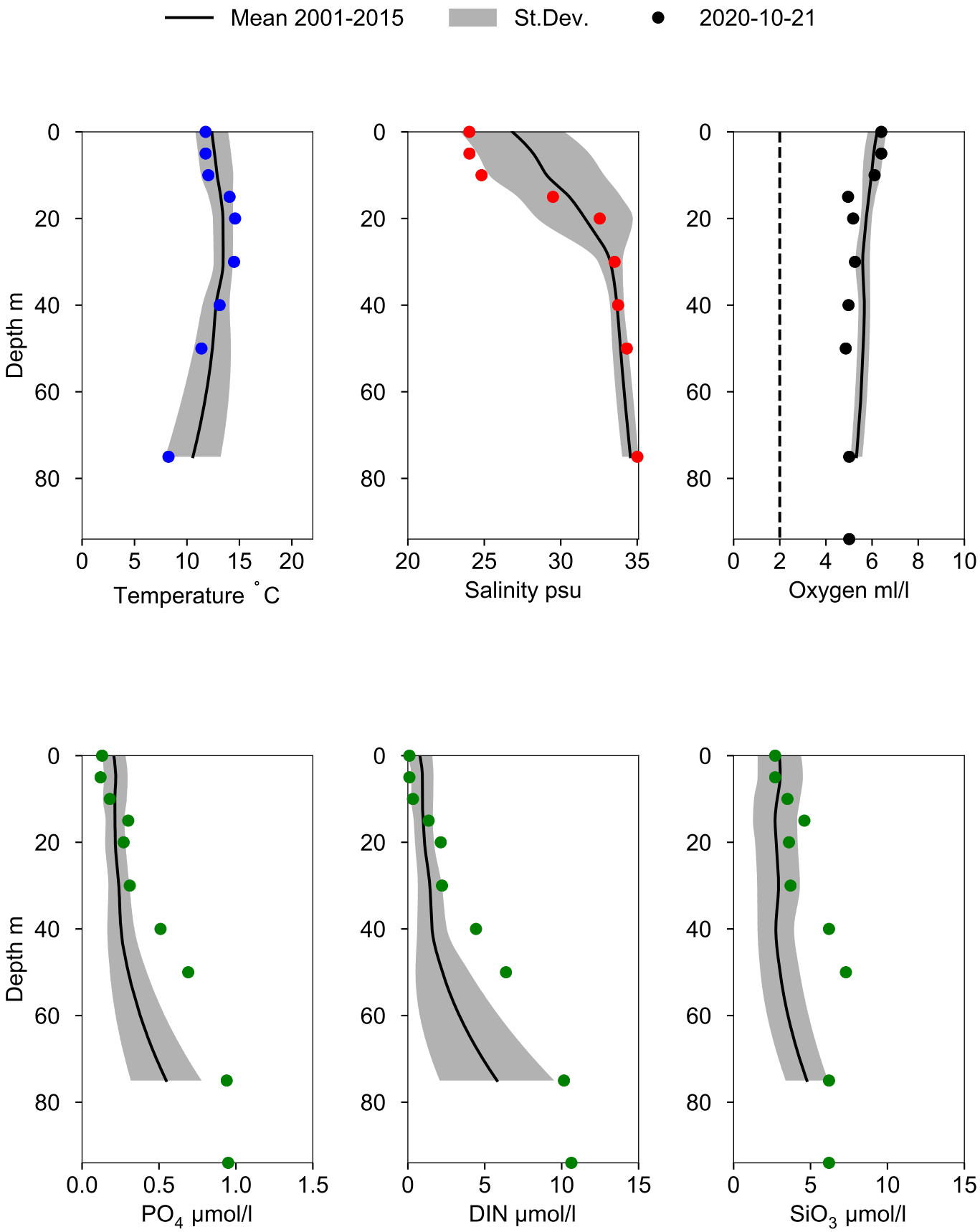
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 75 m)

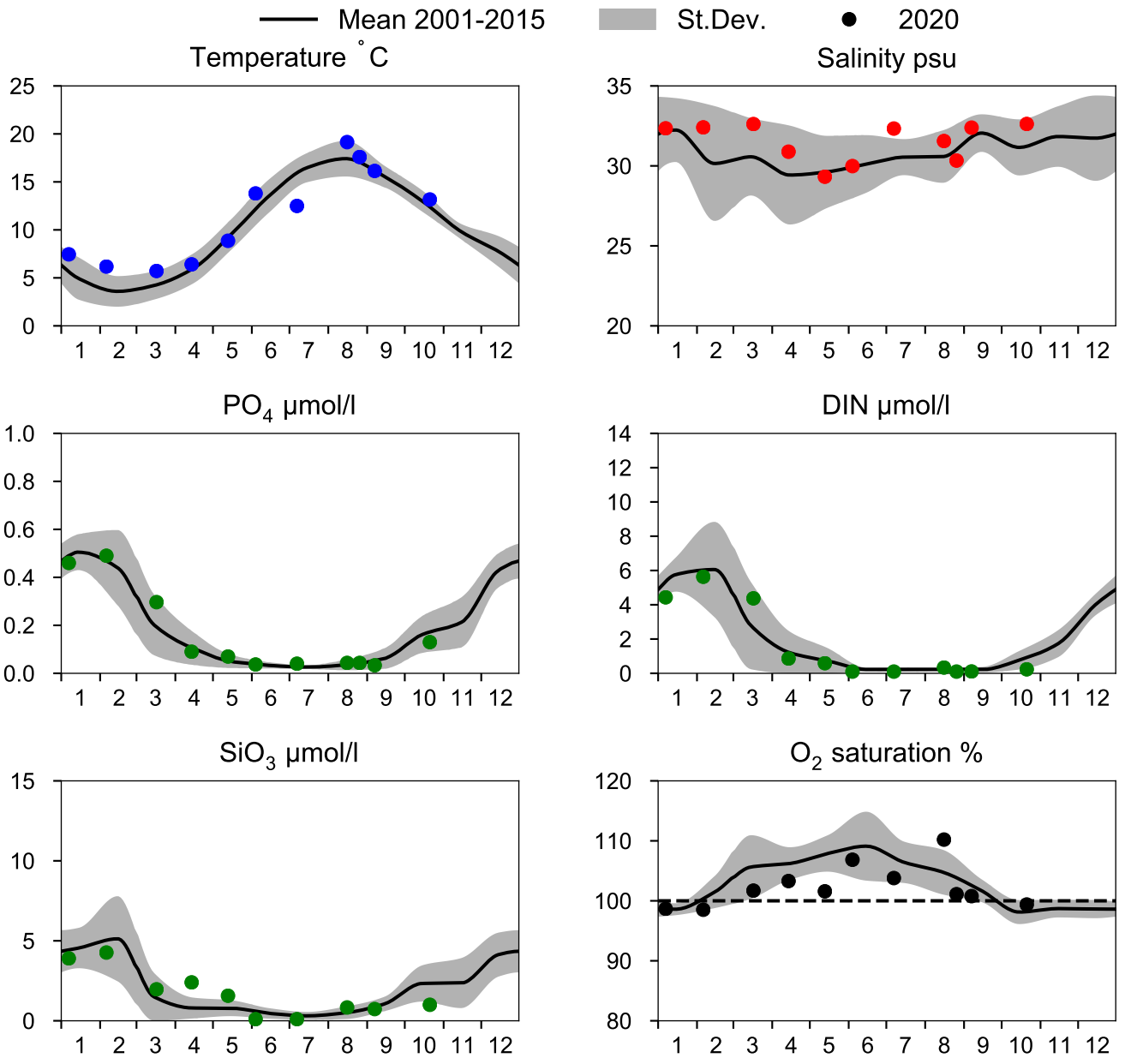


Vertical profiles P2
October

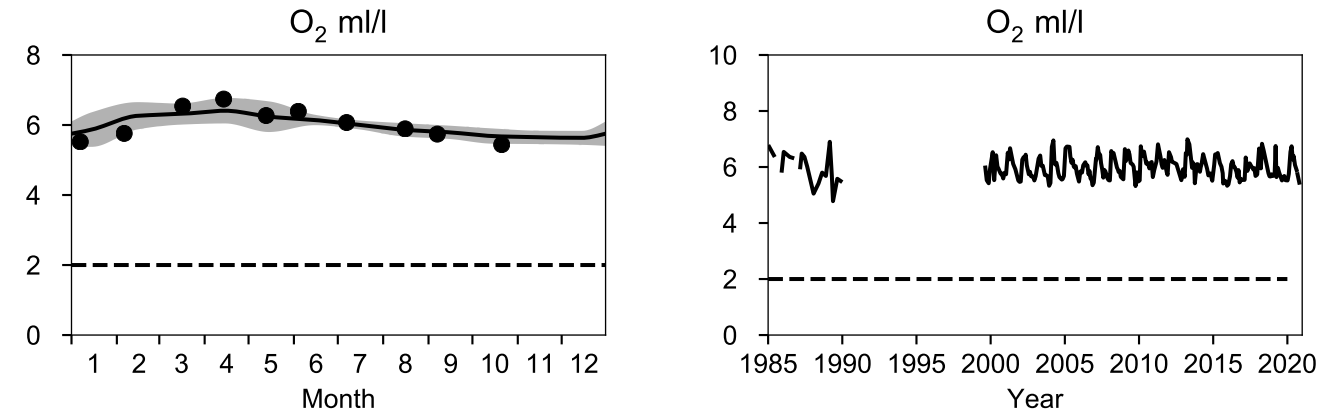


STATION Å17 SURFACE WATER (0-10 m)

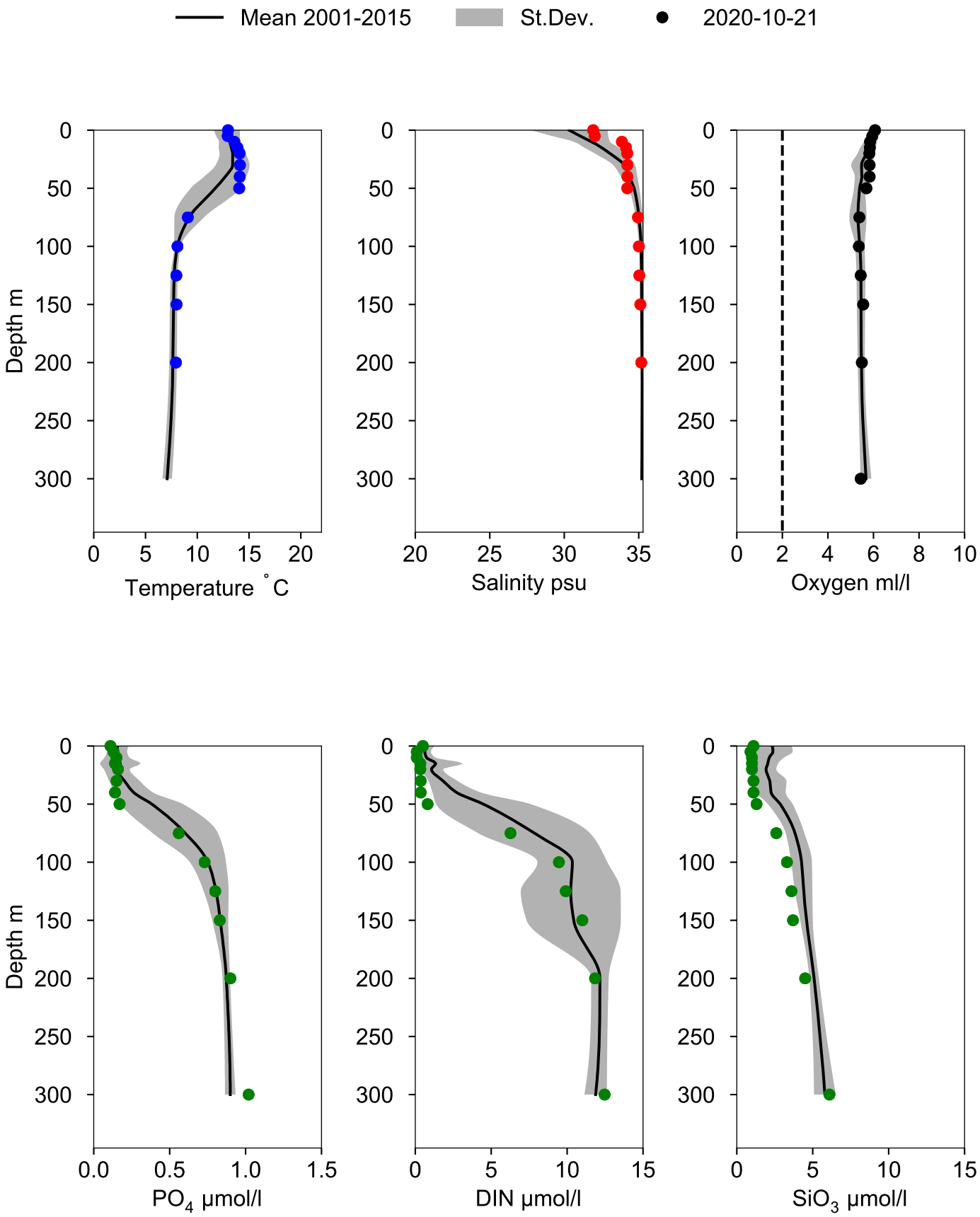
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 300 m)

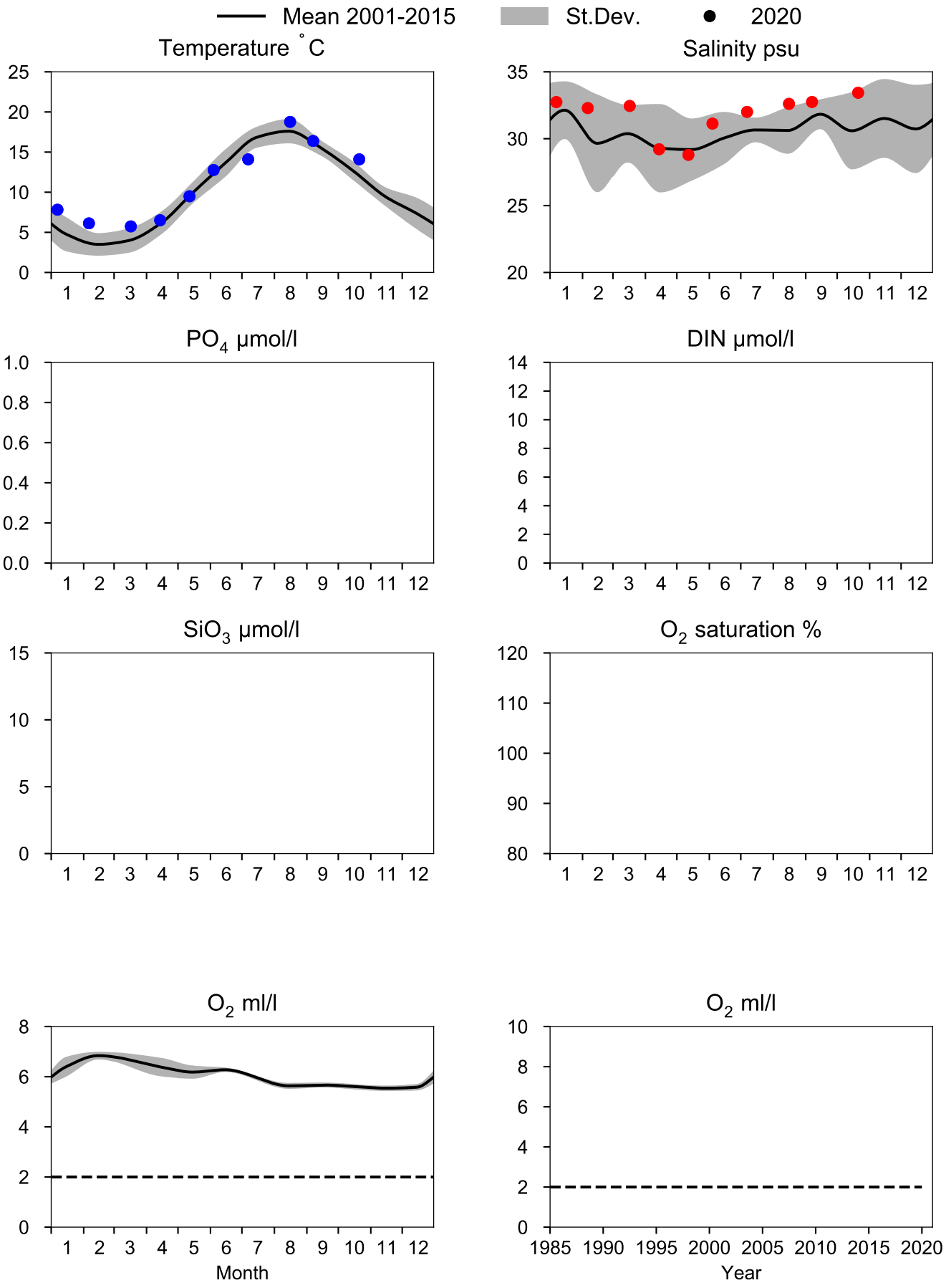


Vertical profiles Å17
October

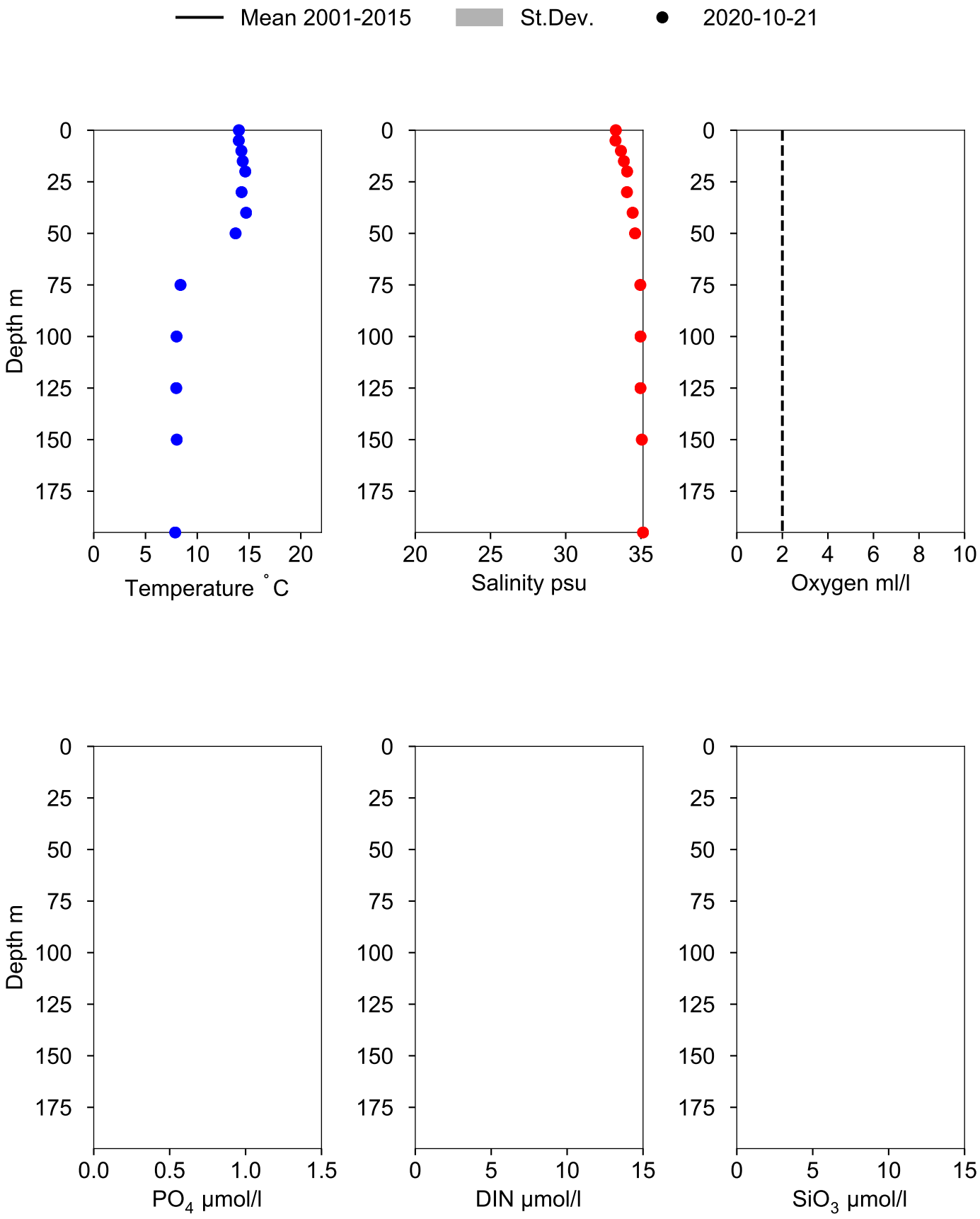


STATION Å16 SURFACE WATER (0-10 m)

Annual Cycles

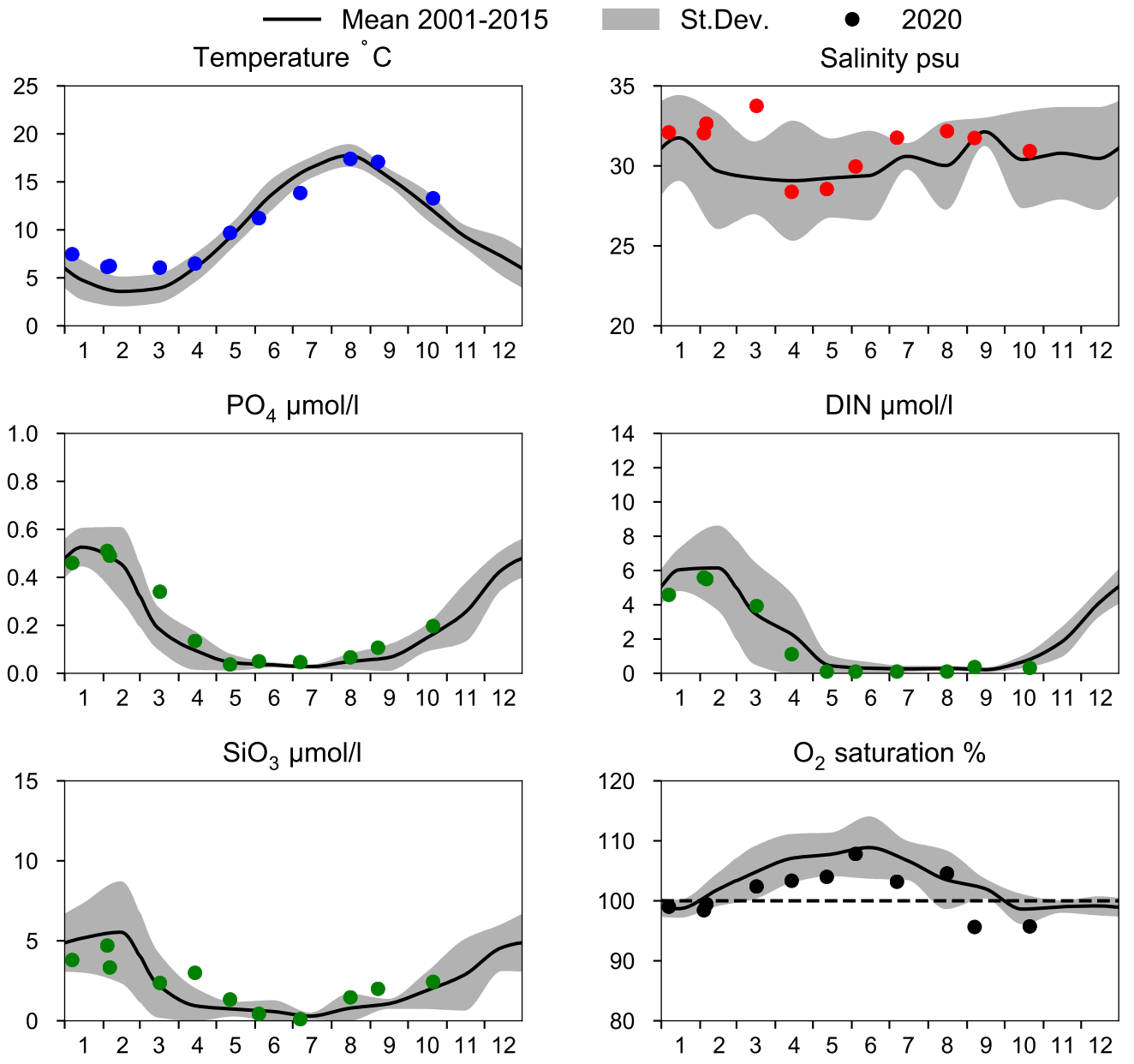


Vertical profiles Å16
October

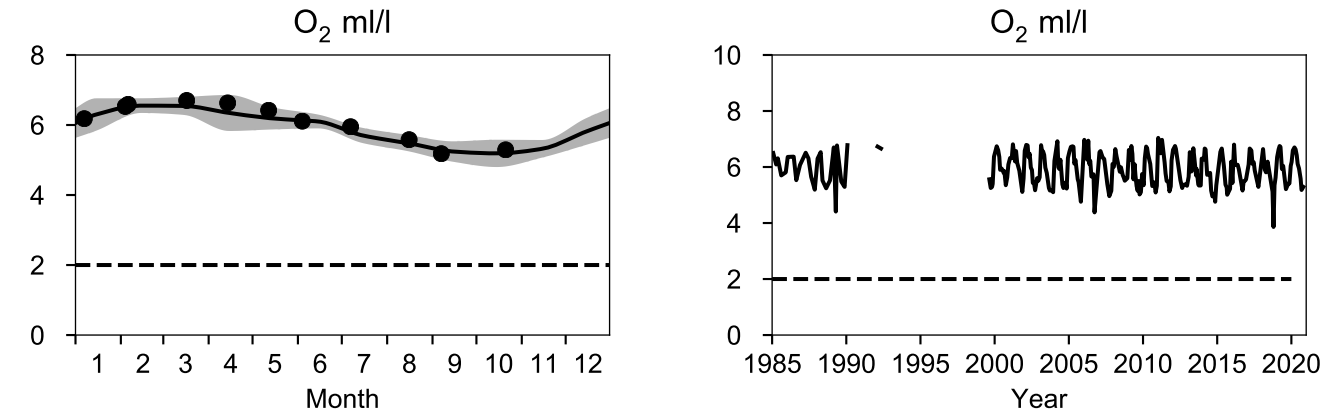


STATION Å15 SURFACE WATER (0-10 m)

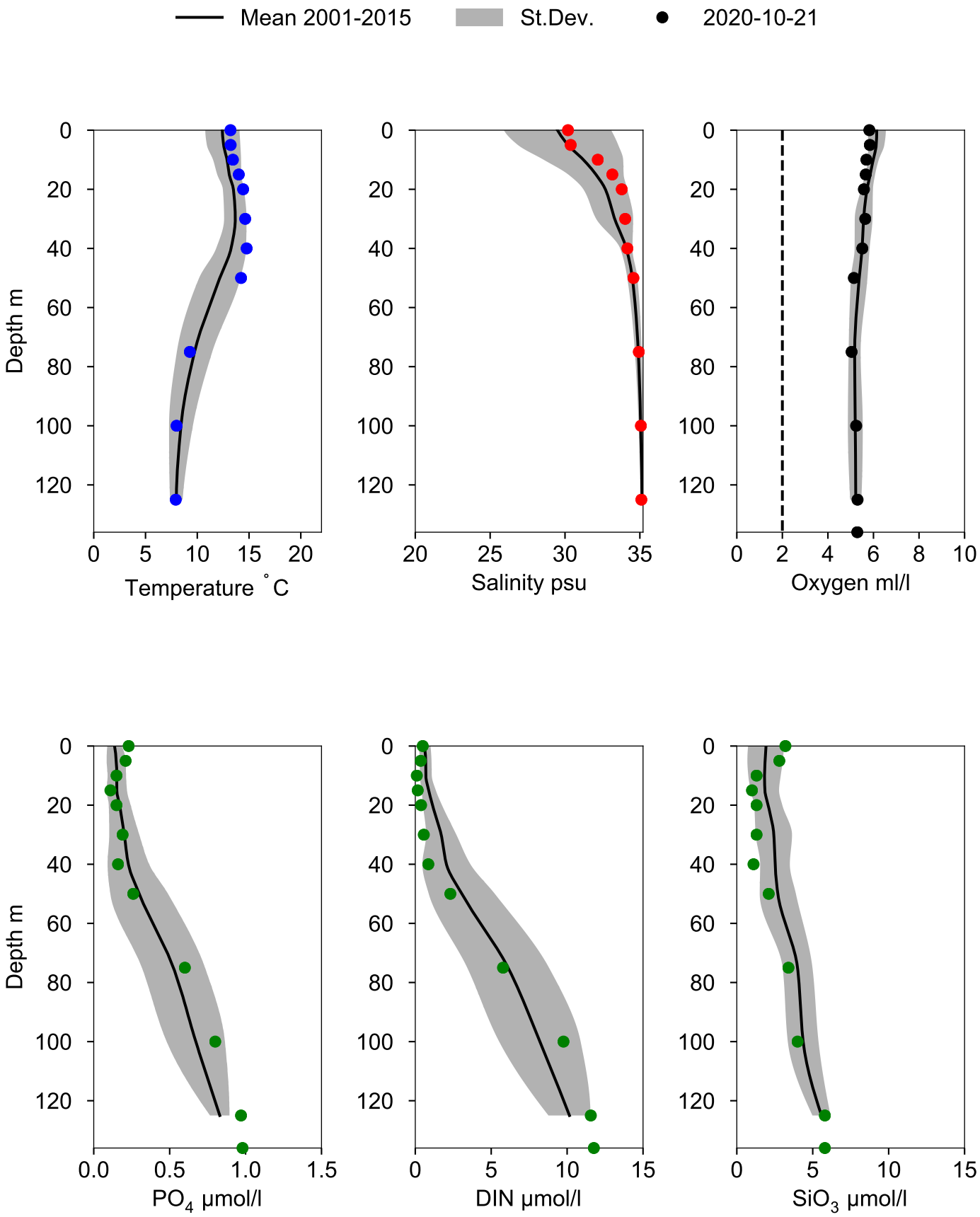
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 125 m)

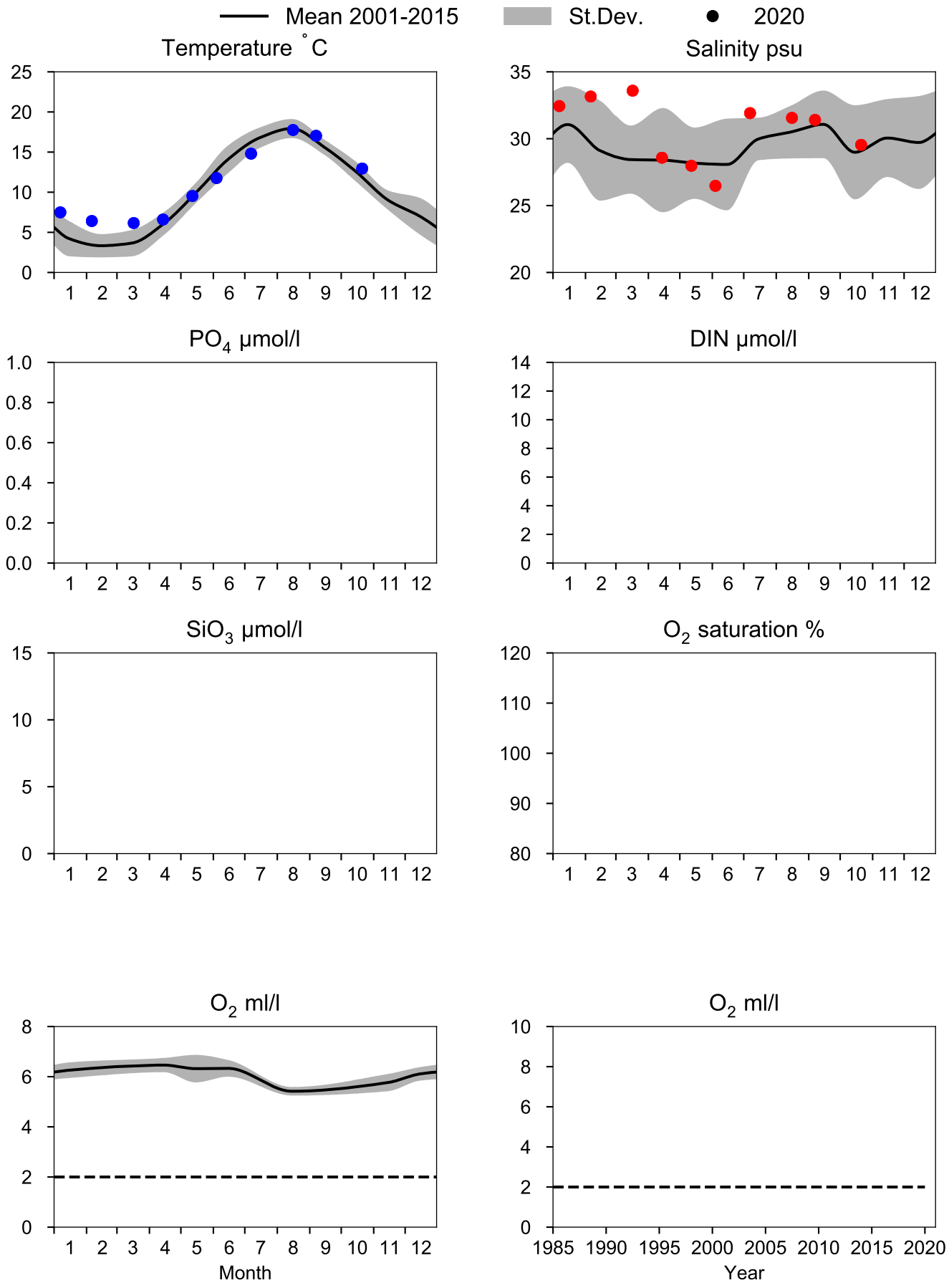


Vertical profiles Å15
October

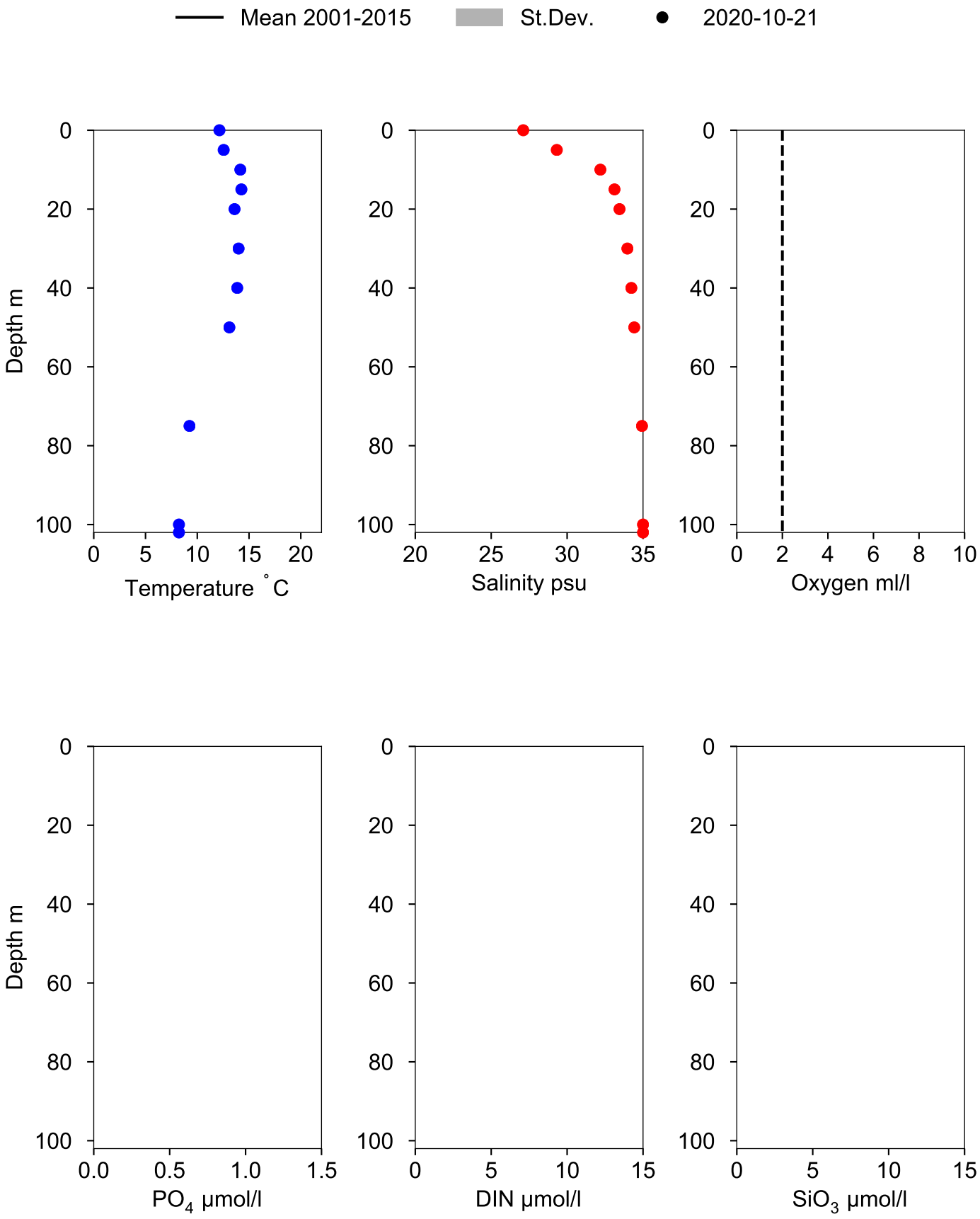


STATION Å14 SURFACE WATER (0-10 m)

Annual Cycles

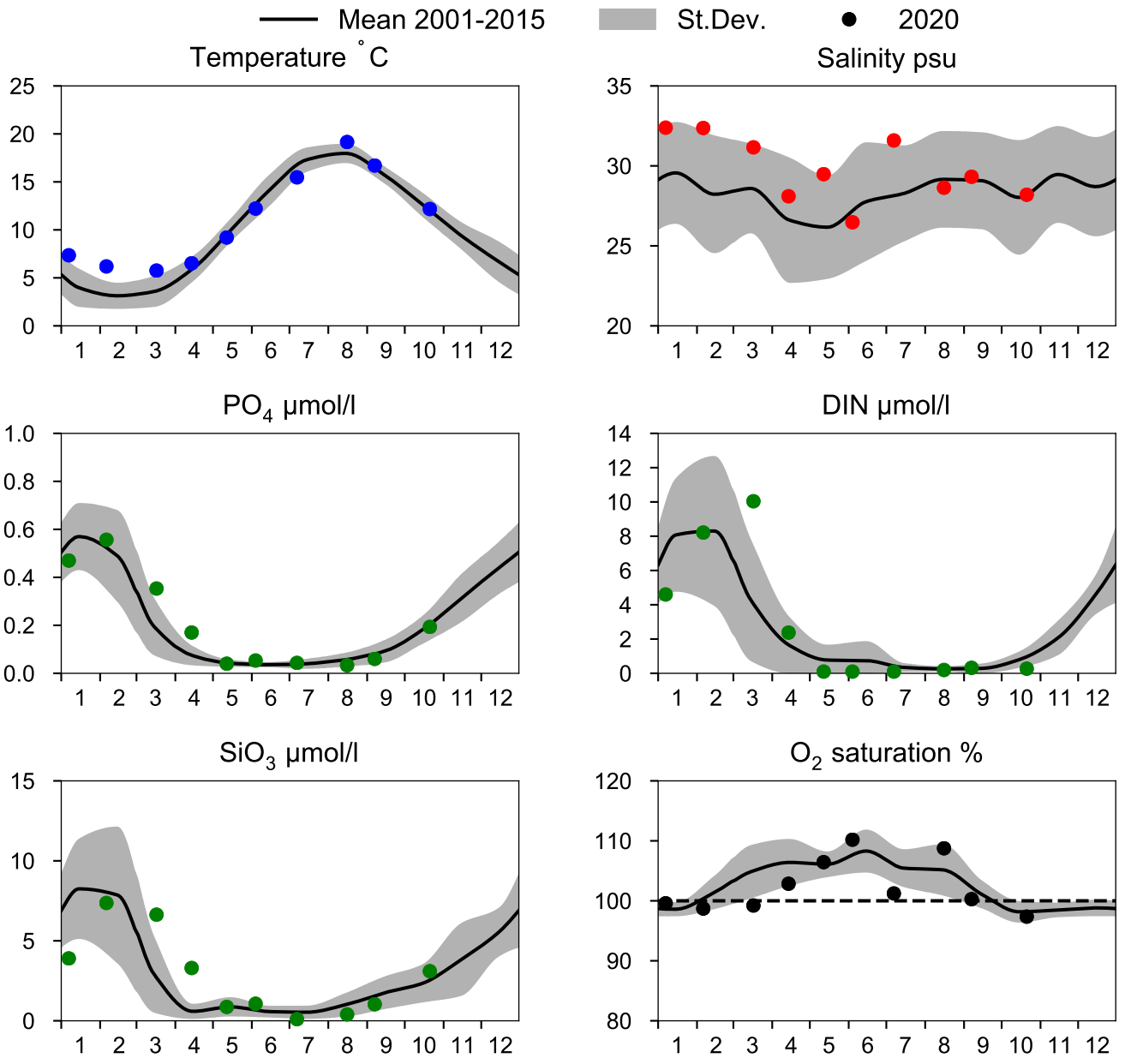


Vertical profiles Å14
October

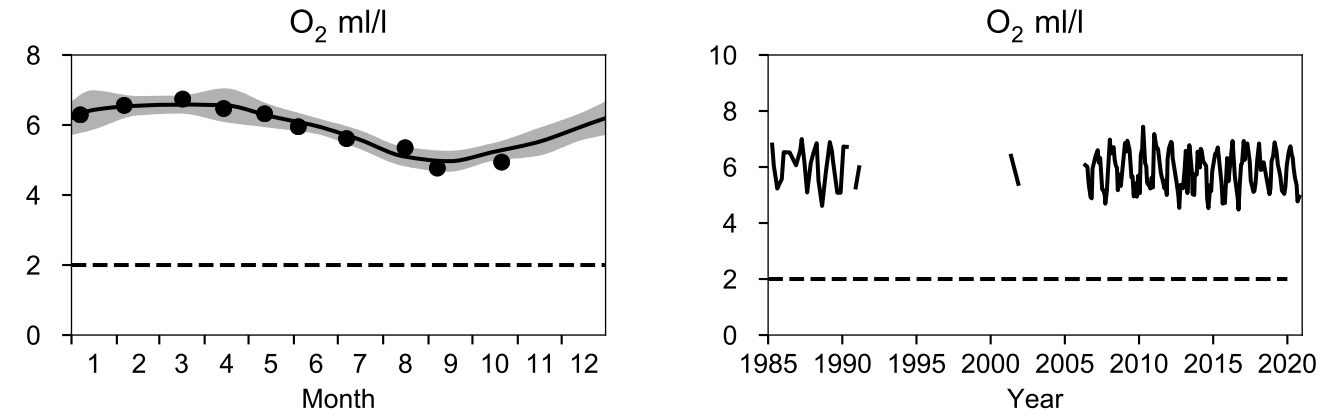


STATION Å13 SURFACE WATER (0-10 m)

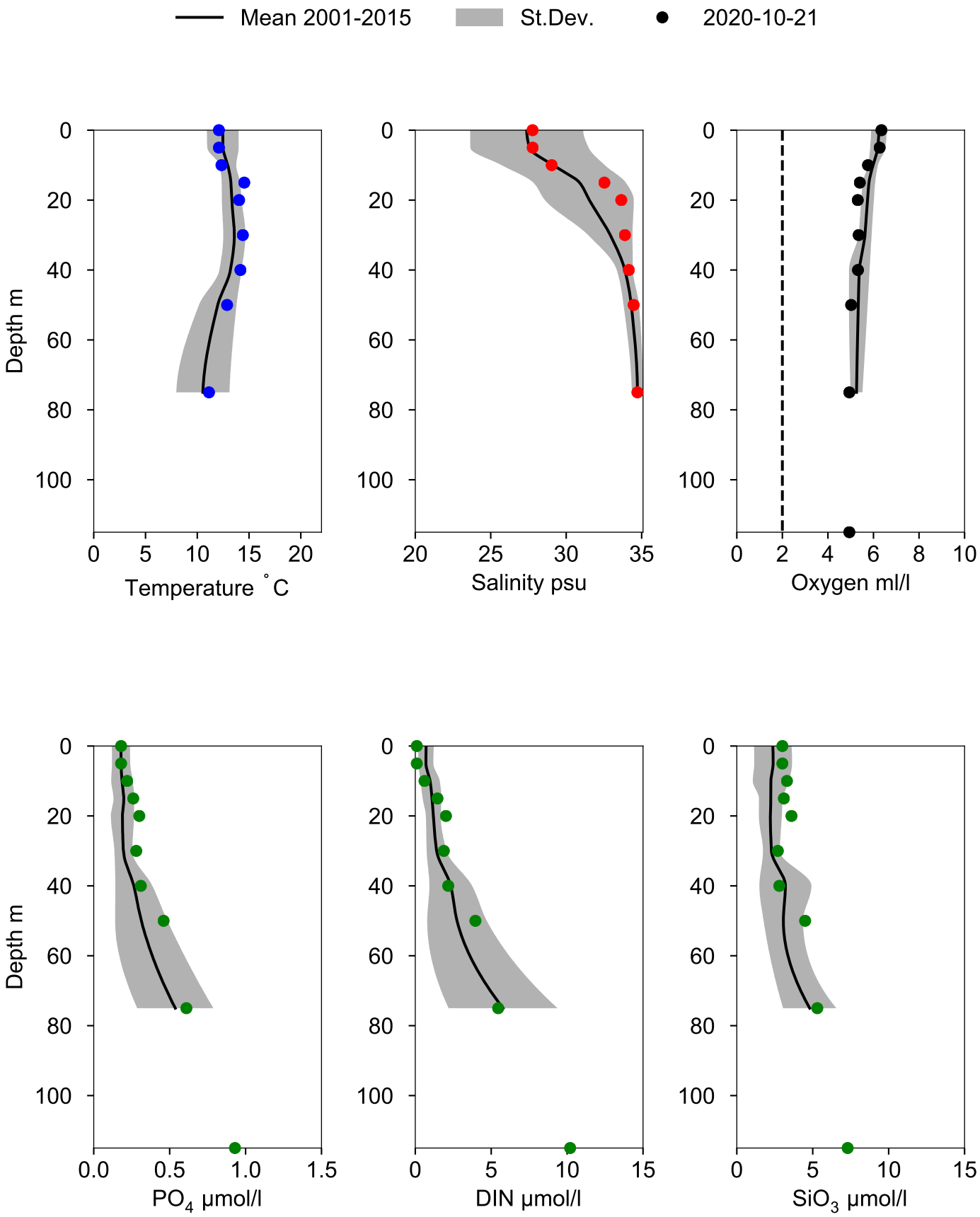
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 80 m)

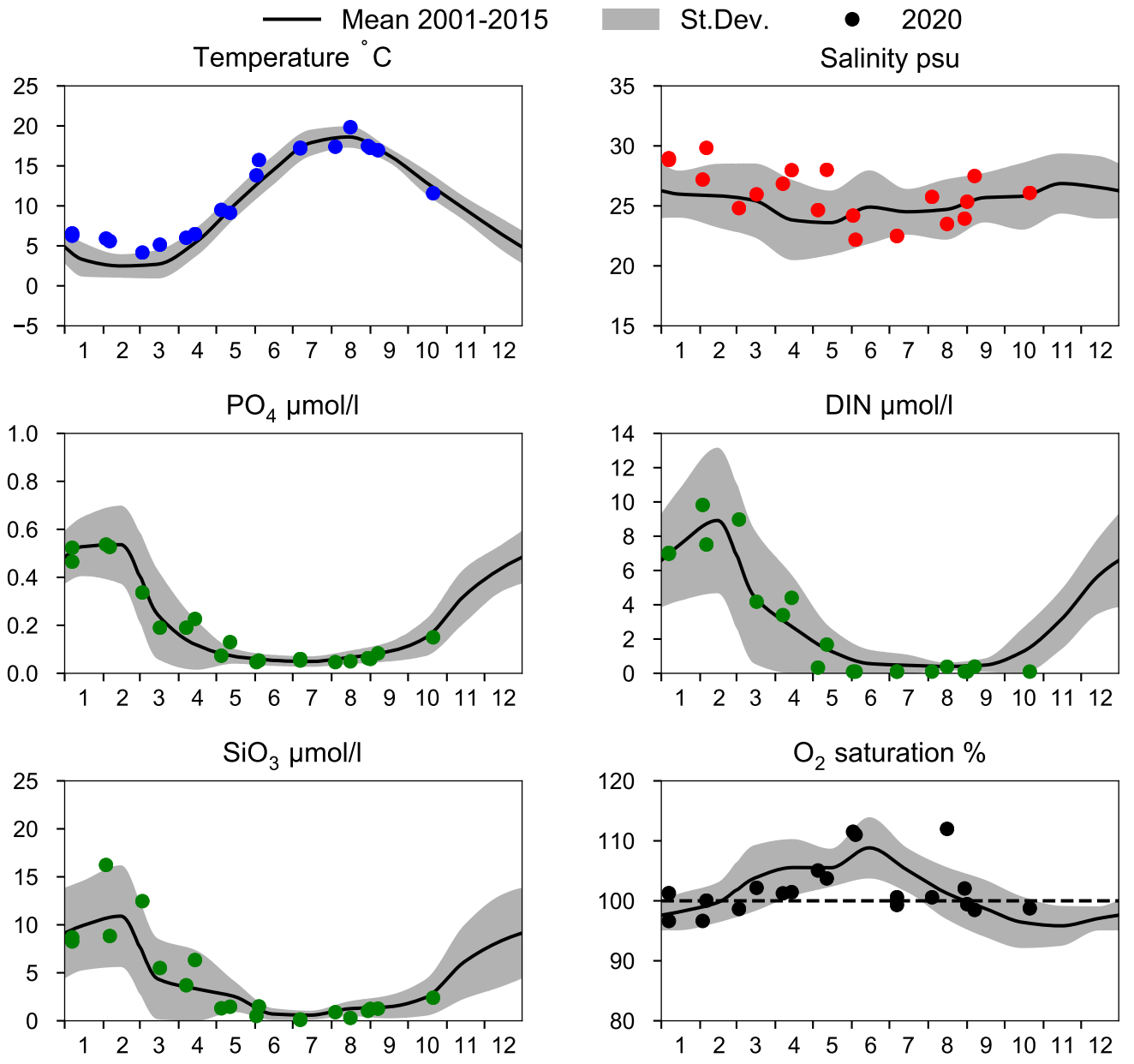


Vertical profiles Å13
October

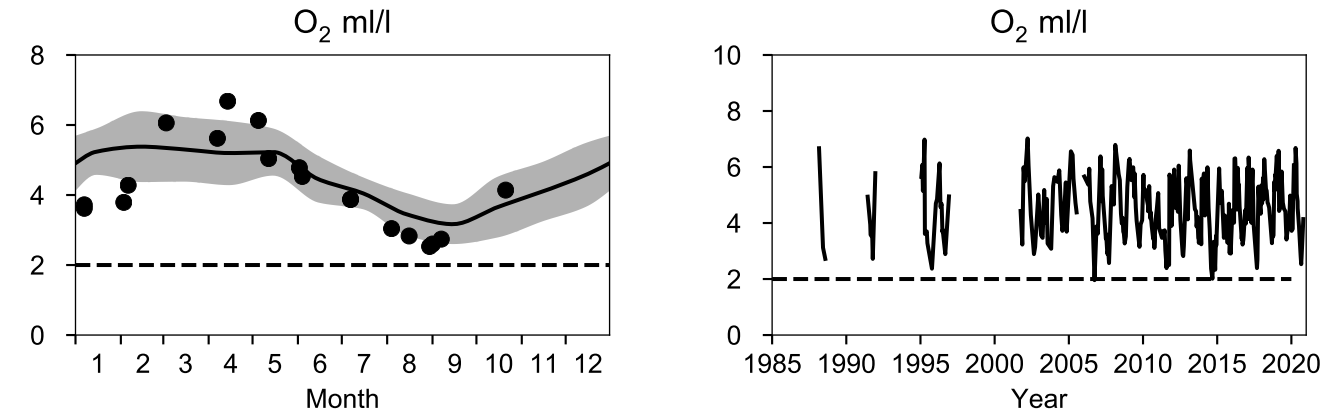


STATION SLÄGGÖ SURFACE WATER (0-10 m)

Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 64 m)



Vertical profiles SLÄGGÖ
October