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Report from the SMHI monitoring cruise with R/V Svea

photo: Ola Kalén, SMHI

Survey period: 2021-04-13 to 2021-04-19

Principals: Swedish Meteorological and Hydrological Institute (SMHI), Swedish Agency for Marine and Water Management (SwAM)

Cooperation partners: Swedish University of Agricultural Sciences (SLU), Swedish Maritime Administration (SMA)

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SUMMARY

During the cruise, which is part of the Swedish national marine monitoring programme, the Skagerrak, the Kattegat, the Sound and the Baltic Proper were visited.

The surface temperature increased in all monitored basins in April. In the Kattegat the temperature increased the most by 2°C since the visit in March. In the Skagerrak and Kattegat, the surface salinity was above normal at the stations closest to the coast. In large parts of the Baltic Proper, the salinity both surface and deep water, was also higher than normal.

In general, the dissolved nutrients had decreased since the March cruise. The levels of dissolved inorganic nitrogen in the surface water had decreased and were in principle consumed at all stations except the stations near the coast in the Skagerrak. Phosphate levels were normal in the Baltic Proper and the Kattegat, but just as for the dissolved inorganic nitrogen, higher than normal closer to the coast in the Skagerrak. The silicate levels in the surface water were still higher than normal in large parts of the Baltic Proper and at some stations in the central Skagerrak.

In the Baltic Proper, it was obvious at which stations the spring flowering had passed and where it continued, as at these there was a lower concentration of nutrients in the surface water compared with the levels during the previous cruise. In the Arkona and Bornholm Basin, the chlorophyll fluorometer on the CTD showed relatively low plankton activity in the surface layer down to the halocline. At stations in the Eastern Gotland Basin, a fluorescence peak was found directly above the halocline, at a depth of 50 - 60 meters, probably a remnant of the spring bloom. In the Western Gotland Basin, the plankton activity was larger and here from the surface down to a depth of 30 - 50 meters. The secchi disk depth was large, 11 - 14 meters, in the Hanö Bight, the Arkona Basin and in the Bornholm Basin, where the spring bloom was over. In the other Baltic areas, the visibility depth was around 8 meters.

The oxygen situation remains poor in large parts of the Baltic Proper. In the Bornholm Basin and in Hanö Bight, oxygen-free conditions were found at the bottom or from depths exceeding 80 meters. Acute oxygen deficiency (<2 ml/l oxygen) was found from a depth of 70 meters. In the eastern Bornholm Basin and further east up to and including BCSIII-10, the deep water was not completely oxygen-free with levels ranging from 0.6 ml/l up to 2 ml/l.

In the Eastern Gotland Basin, the oxygen content varied just over zero from a depth of 75 - 80 meters, at a depth of about 90 meters slightly higher oxygen levels were noted and from a depth of 100 - 125 meters the oxygen levels were again just above zero and from 125 meters depth and downwards hydrogen sulphide was found. Acute oxygen deficiency was noted at a depth of 65 meters. In the Western Gotland Basin, completely oxygen-free conditions were found from depths exceeding 80 - 90 meters. Acute oxygen deficiency from 65 - 75 meters depth. At the relatively shallow stations in the Baltic Proper, such as in the Arkona Basin, the Kalmarsund and at Öland's southern cape, good oxygen conditions were noted throughout the profile.

Next cruise with R/V Svea is planned for 18th – 24th of May. It starts and ends in Kalmar.

RESULTS

The cruise was performed onboard R/V Svea and started in Lysekil on 13th of April and ended in the same port on 19th of April.

Initially, the winds were weak to moderate, mainly from the northeast. In the southern Baltic Proper, the wind increased to over 10 m/s and then decreased when the cruise returned to the west coast of Sweden. The air temperature varied between 4.3 - 7.8°C on the west coast and between 4.2 - 6.5°C in the Baltic Proper and the weather was mainly fair.

All planned stations were visited and sampled during the cruise.

At three stations in the Skagerrak and Kattegat and two in the Baltic Proper, samples were taken for analysis of eDNA (environmental DNA) for researchers at the University of Turku, just as in February and March. Water samples for selenium analysis were taken at three stations in the Baltic Proper and two in the Skagerrak and Kattegat for EAWAG in Switzerland. Phytoplankton samples were also collected for Uppsala University at four stations in the Skagerrak and Kattegat.

Svea's MVP (Moving vessel profiler) instrument for measuring temperature, salinity and oxygen profiles during cruise speed, was planned to be used at five transects. The transects that could be performed were at Kriegers Flak, across the Slupsk Channel and between BY38-BY39. However, due to a cable breakage, the MVP could not be run to full depth. The deep transects, at the Å-transect, at BY32-BY38 and between BY10-BY15 therefore had to be canceled. At the BY38-BY39 transect the communication with the MVP's measuring probe was interrupted and the transect was therefore not completed. After repair, the MVP worked again and the system was tested in the Kattegat on the way to home port.

Both the Ferrybox onboard Svea and the two ADCPs (current measurement) were running throughout the cruise.

This report is based on data that have passed a first quality control. When data are published at the National Oceanographic Data Centre at SMHI some values might have changed after further quality controls have been performed. Data from this cruise will be published as soon as possible at the data centre's webpage, normally within a week after the cruise. Some analyses are done after the cruise and will be published later.

More information, data and reports can be found here:
https://www.smhi.se/en/theme/marine-environment-2-885

The Skagerrak

The heating of the surface water continued in April and had now increased by about 1°C, since the previous visit in March, and varied between 5.6 - 5.9°C, which is normal for the season. No clear temperature stratification, thermocline, was observed in the area and the entire water column had approximately the same temperature. The only exception was at station Å17 in the central Skagerrak, where a weak thermocline was found at a depth of about 20 - 30 meters.

The salinity in the surface water, down to the salinity stratification - the halocline, was higher than normal at the stations closest to the coast and amounted to 31 - 32 psu. At the other stations in the Skagerrak, the surface salinity was normal and varied between 32 - 33 psu. The halocline was found at depths between 10 - 30 meters depth. Normal salinities were found in the deep water.

The levels of dissolved inorganic nitrogen in the surface water had decreased since the last visit in March. The levels were normal for the season at all stations and varied between 0.12 - 2.5 µmol/l. Closest to the coast, the levels in the deep water were lower than normal and in the central Skagerrak, the levels just below the halocline were higher than normal. The phosphate content in the surface water was higher than normal closest to the coast, but at the other stations the levels were normal. The concentration varied between 0.13 - 0.28 µmol/l. In deep water, phosphate concentrations were normal or slightly lower than normal. The silicate levels in the surface water were generally normal, but at Å17 and Å13 the levels were above normal. The concentrations varied between 1.4 - 3.3 µmol/l. In the deep water, silicate concentrations were found to be higher than normal at the coast, at Släggö, and normal or slightly lower than normal in open Skagerrak.

At all stations in the Skagerrak, higher levels or peaks of chlorophyll fluorescence, measured with the CTD, were found between 0 - 20 meters. The Secchi disk depth at Släggö was only 5 meters this cruise, compared to 11 meters during the visit in March. In the open Skagerrak, a Secchi disk depth of 7 meters was measured.

The lowest oxygen concentration in the bottom water was found at Släggö, 4.5 ml/l. In the deep water in open Skagerrak, the oxygen situation was, as usual, good and the levels varied around 6.5 - 7.0 ml/l.

The Kattegat and the Sound

In the Kattegat and the Sound, the surface water temperature had increased more than in Skagerrak, by about 2 °C compared with the cruise in March. The temperature in the surface water now varied between 5.7 - 6.4°C, which is normal for the season. A weak thermocline was found at a depth of 10 - 30 meters so the temperature in the deep water did not differ much from the surface water. At Anholt E and in the Sound, the temperature in the deep water was slightly higher than normal. The salinity of the surface water was, just like closest to the coast in the Skagerrak, elevated and varied between 22 - 28 psu. In the Sound, the salinity was normal and around 11 psu. In deep water, the salinity was generally normal but slightly lower in the Sound at intermediate depths.

The nutrients in the surface water had been consumed further in April and the levels were generally normal for the season. The dissolved inorganic nitrogen in the surface water was in principle completely consumed, which is normally the case this time of the year, and the levels varied around the detection limit, 0.1 µmol/l. In the deep water, levels were found to be lower than normal. The

phosphate content in the surface water was normal or slightly above normal and varied between 0.1 - 0.15 µmol/l. In deep water, the phosphate content, just as for dissolved inorganic nitrogen, was lower than normal. The silicate content in the surface water was normal, 2.3 - 3.3 µmol/l. In the Sound slightly higher, 7.8 µmol/l. The silicate content in the deep water varied greatly, from lower than normal levels in the north-eastern parts of the Kattegat, normal levels in the central parts and higher levels than normal in the Sound.

The oxygen situation in the Kattegat was good with concentrations in the bottom water of around 5.0 - 6.7 ml/l. In the Sound, the oxygen situation was on the limit of depletion with oxygen levels just over 4 ml/l in the deep water.

Measurements of chlorophyll fluorescence, with the sensor on the CTD, indicated some activity, in the form of fluorescence peaks at a depth of about 10 - 25 meters. The Secchi disk depth varied between 5 - 7 meters.

The Baltic Proper

The temperature in the surface water was normal for the season and varied between 3.9 - 4.8°C. Lowest in the northern parts and highest in the southwest. At the coastal station RefM1V1, in the Kalmarsund, 5°C was measured. In the Arkona Basin, the temperature was more or less the same from surface to bottom. In the other basins, thermocline and halocline coincided and warmer water was found under the slightly colder surface water. The temperature in the deep water was generally higher than normal. The surface salinity was still elevated above normal at all stations except in Western Gotland Basin where the salinity was normal. The salinity varied between 7.0 - 8.2 psu. In the Arkona Basin, the halocline was found at a depth of 30 - 40 meters, in the Bornholm Basin and Hanö Bight from a depth of about 50 meters and in other deep basins from a depth of 60 - 70 meters. In the deep water, the salinity was higher than normal in the Western and Eastern Gotland Basins.

The content of dissolved nutrients had decreased since the visit in March as a result of the spring bloom. This was most evident for dissolved inorganic nitrogen that had been completely consumed since the visit in March, when elevated levels were noted. Concentrations were now found below the detection limit (<0.1 µmol/l) at all stations. In the deep water, a layer was found, between 75 - 110 meters deep, with lower levels of dissolved inorganic nitrogen than normal in the Eastern Gotland Basin, while the levels in the deep water exceeding 150 meters depth were much higher than normal. In the Western Gotland Basin, high levels of dissolved inorganic nitrogen were also found, but from depths exceeding 60 - 75 meters. The high levels of dissolved inorganic nitrogen in the deep basins consist of ammonium which is formed from other nitrogen components in the presence of oxygen-free conditions and hydrogen sulphide.

The silicate content in the surface water was elevated, 16 - 19 µmol/l, in all basins except in the Arkona where normal levels, 7 - 13 µmol/l, were detected. Elevated silicate levels were also found in the deep water, in the deeper basins. Phosphate levels were normal for the season and varied between 0.27 - 0.49µmol/l. In the deep water, higher concentrations than normal were found in the Western Gotland Basin, in the Bornholm Basin and in Hanö Bight.

In the Arkona and Bornholm basins, the chlorophyll fluorometer on the CTD showed some but low plankton activity in the surface layer down to the halocline. At the stations in the Eastern Gotland Basin, a fluorescence peak was found directly above the halocline, at a depth of 50-60 meters,

probably a remnant of the spring bloom. In the Western Gotland Basin, the activity was greater and here from the surface down to a depth of 30 - 50 meters. The Secchi disk depth was large, 11 - 14 meters, in Hanö Bight, Arkona Basin and in the Bornholm Basin, where the spring bloom was over. In other areas, the Secchi disk depth was 8 meters.

The oxygen situation remains poor in large parts of the Baltic Proper. In the Bornholm Basin and in Hanö Bight, oxygen-free conditions were found at the bottom or from depths exceeding 80 meters. Acute oxygen deficiency (<2 ml/l) was found from a depth of 70 meters. In the eastern Bornholm Basin and further east at BCSIII-10, the bottom water was not completely oxygen-free. At BY5 low oxygen levels just above zero and at BCSIII-10 the oxygen content was about 2 ml/l at the bottom, indicating that a small inflow pulse with oxygenated water reached these areas. At BY10, which is the next station where a possible inflow could be noted, no signs of improved oxygen conditions were seen. Completely oxygen-free conditions were already noted at a depth of about 90 meters. Acute oxygen deficiency was found here at a depth of just over 80 meters.

In the East Gotland Basin, at BY15, the oxygen content varied just above zero from a depth of 75 - 80 meters, at a depth of about 90 meters slightly higher oxygen levels were noted, up to 0.6 ml/l, which stems from small inflows that are not heavy enough to reach the bottom water but are stored at intermediate depths. From a depth of 100 - 125 meters, the oxygen levels were again just above zero and from a depth of 125 meters and down, hydrogen sulphide was found. Acute oxygen deficiency was noted at a depth of 65 meters.

At BY20 slightly north in the Eastern Gotland Basin, the conditions were similar. But no signs of inflows were found here. Oxygen-free conditions were noted from a depth of 90 - 100 meters and acute oxygen deficiency from a depth of 70 meters. In the Western Gotland Basin, oxygen conditions were largely the same as before. Completely oxygen-free conditions were noted from depths exceeding 80 - 90 meters. Acute oxygen deficiency from 65 - 75 meters depth.

At the relatively shallow stations (<50 meters deep) in the Arkona Basin, the Kalmar Strait and at Ölands Southern cape, good oxygen conditions were noted in the entire profile. In these areas there were no strong stratification and the wind mixing usually reaches all the way down to the bottom.

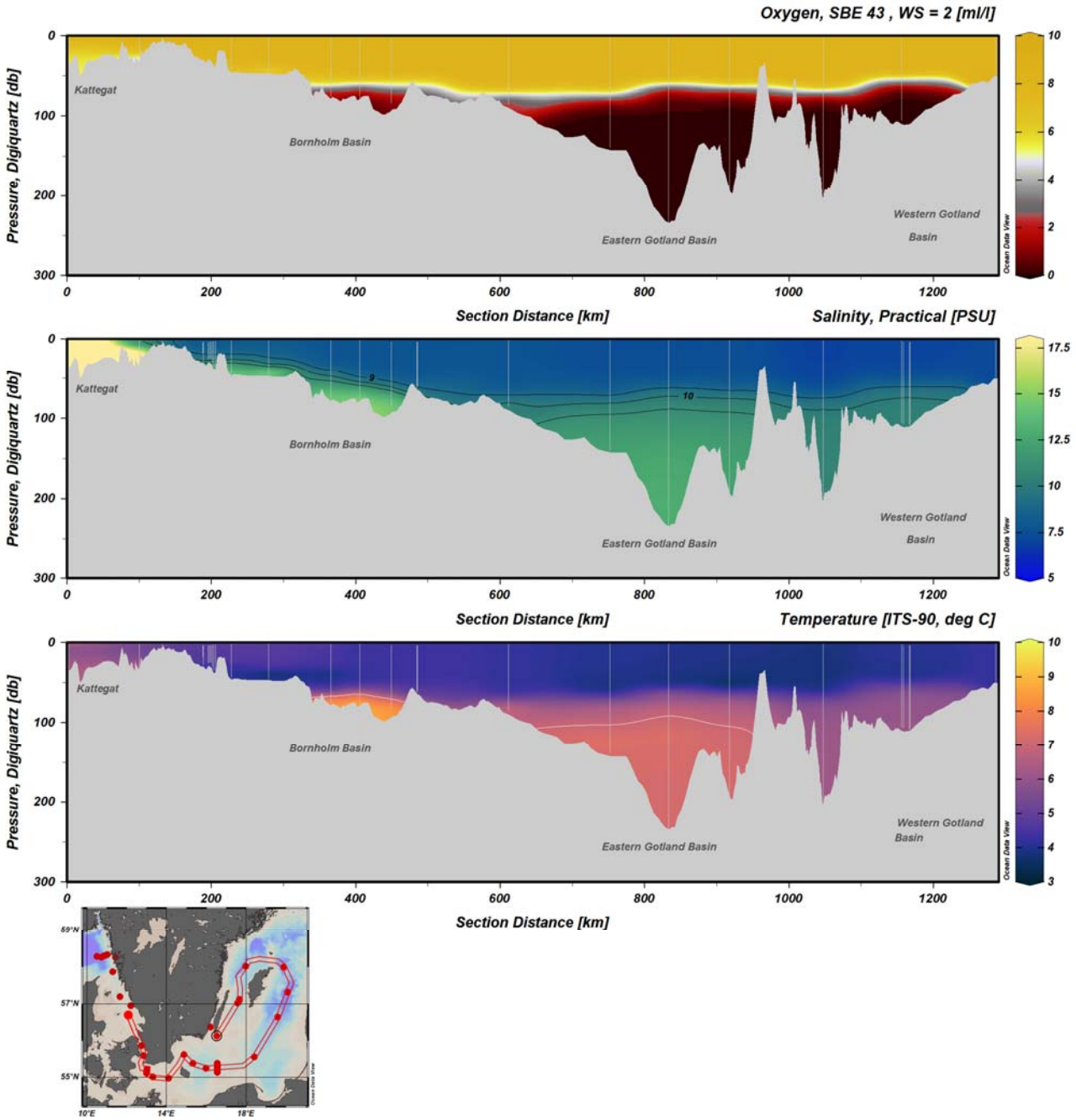


Figure 1. Transect showing CTD and MVP measurements of dissolved oxygen, salinity and temperature from Kattegat, the Sound through the Eastern Gotland Basin to the Western Gotland Basin.

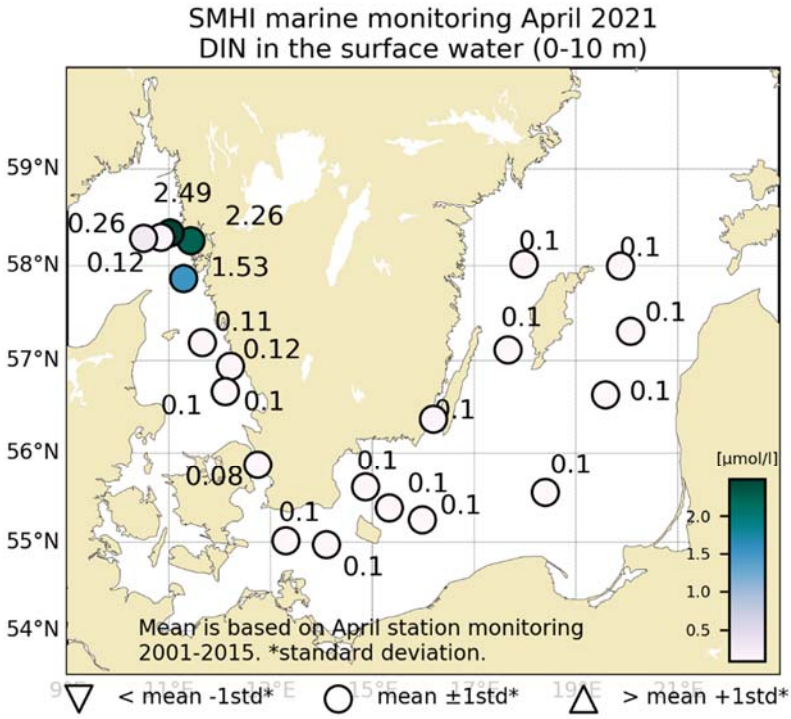


Figure 2. Concentration of dissolved inorganic nitrogen in the surface water (0-10m).

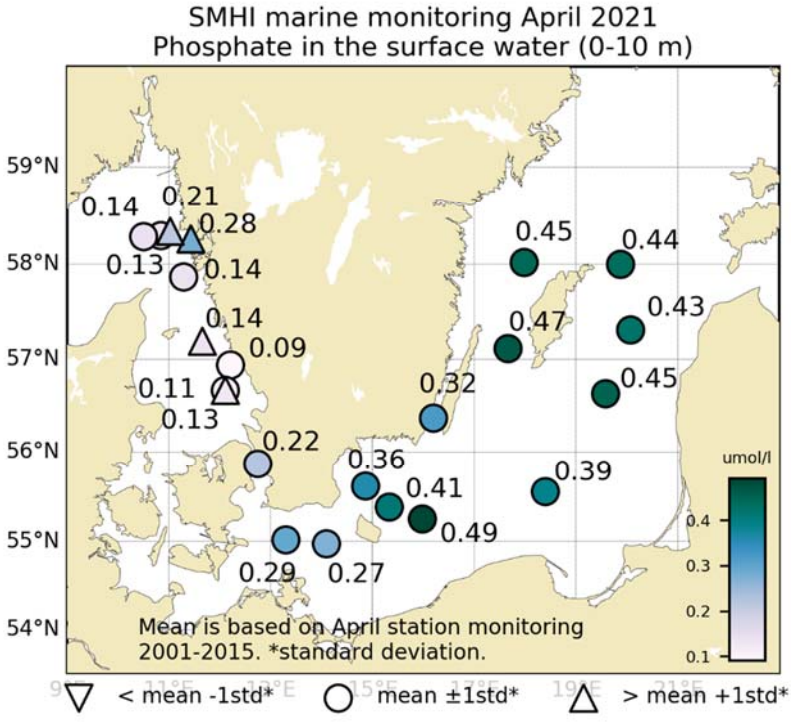


Figure 3. Concentration of phosphate in the surface water (0-10m).

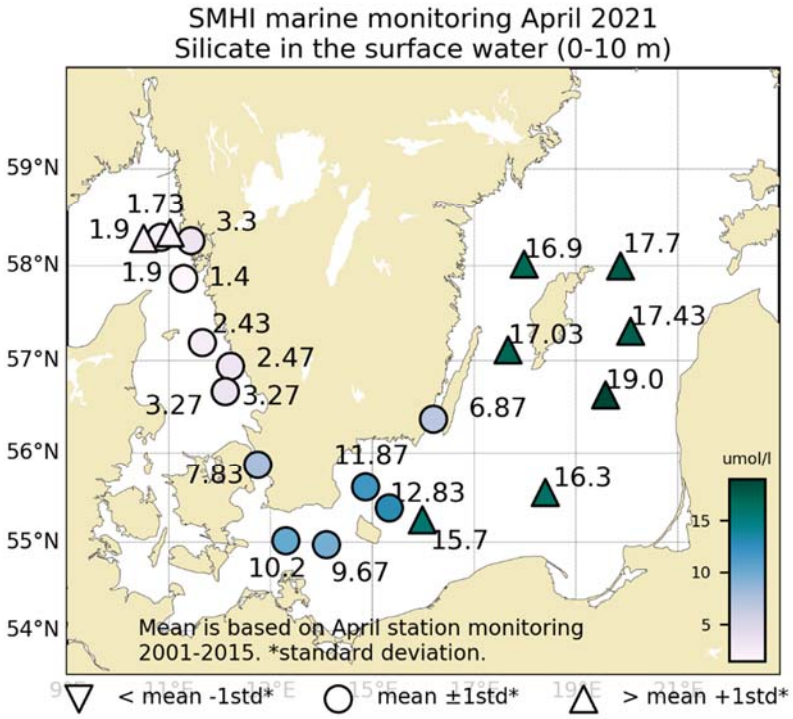


Figure 4. Concentration of silicate in the surface water (0-10m).

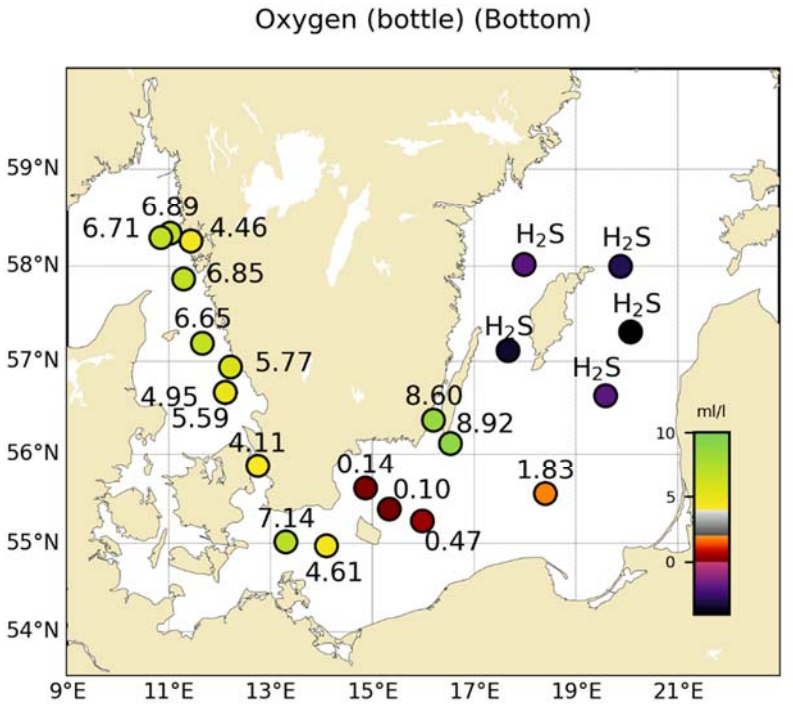


Figure 5. Oxygen concentration in the bottom water.

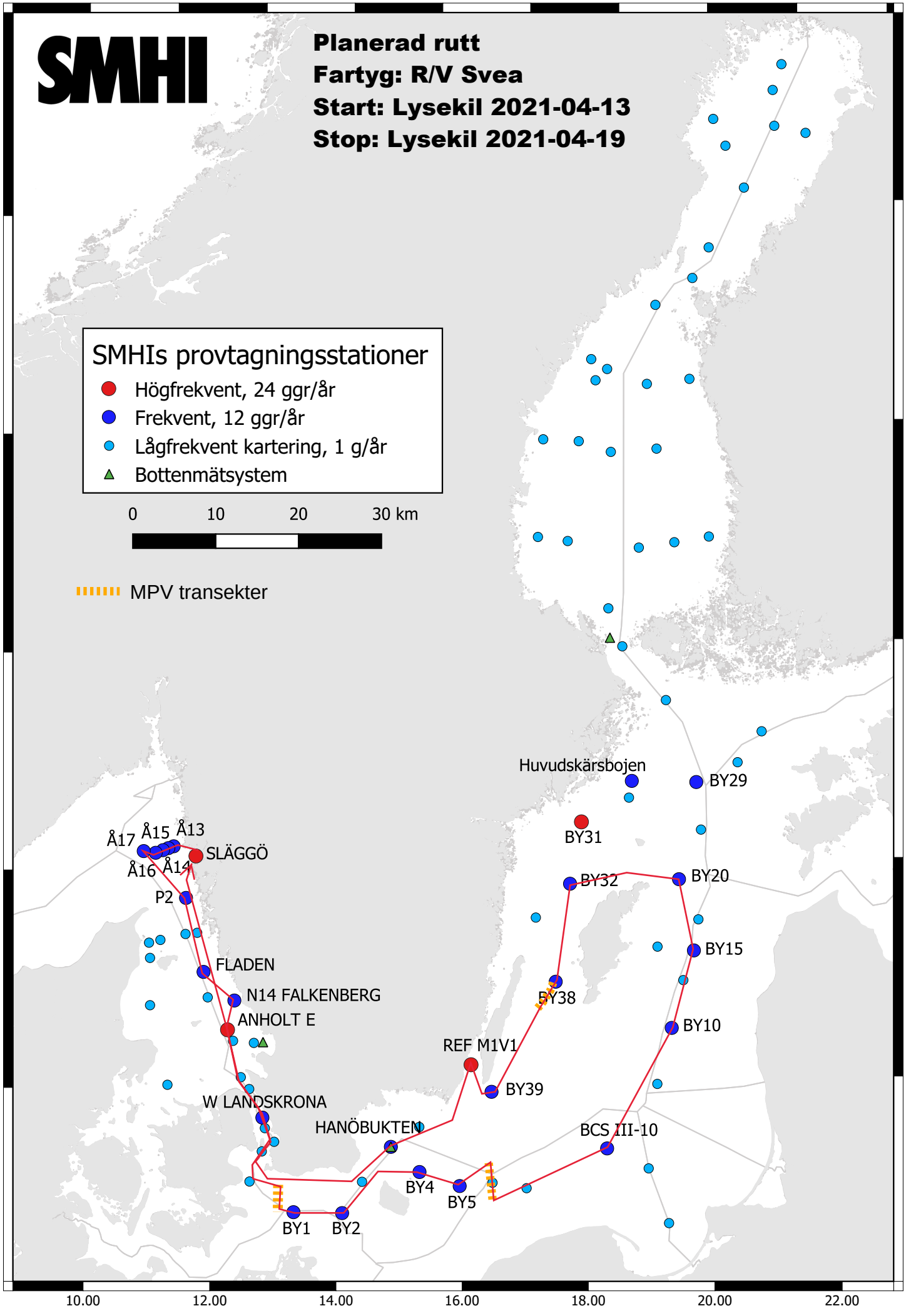
PARTICIPANTS

Name	Role	Institute
Sara Johansson	Chief Scientist	SMHI
Ola Kalén		SMHI
Kristin Andreasson	Quality controller	SMHI
Ann-Turi Skjevik		SMHI
Johanna Linders		SMHI

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
Planerad rutt
Fartyg: R/V Svea
Start: Lysekil 2021-04-13
Stop: Lysekil 2021-04-19
SMHIs provtagningsstationer
Högfrekvent, 24 ggr/år
Frekvent, 12 ggr/år
Lågfrekvent kartering, 1 g/år
Bottenmätsystem
0
10
20
30 km
MPV transekter
Å17
Å15
Å13
Å16
Å14
SLÄGGÖ
P2
FLADEN
N14 FALKENBERG
ANHOLT E
W LANDSKRONA
HANÖBUKTEN
BY1
BY2
BY4
BY5
REF M1V1
BY39
BY38
BY31
Huvudskärsbojen
BY29
BY32
BY20
BY15
BY10
BCS III-10
64.00
62.00
60.00
58.00
56.00
10.00
12.00
14.00
16.00
18.00
20.00
22.00

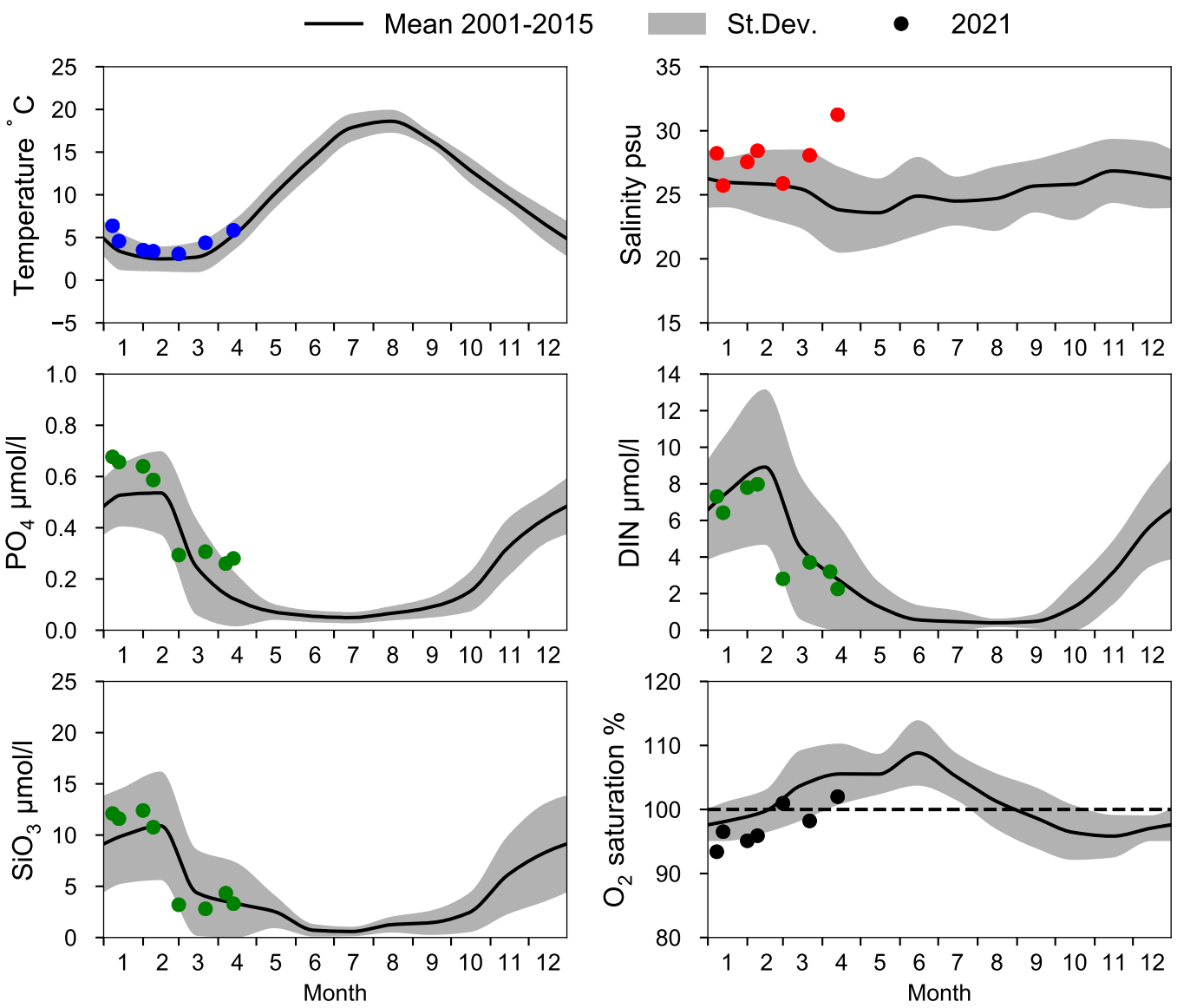
Date: 2021-04-22
Time: 13:53

Ship: SE
Year: 2021

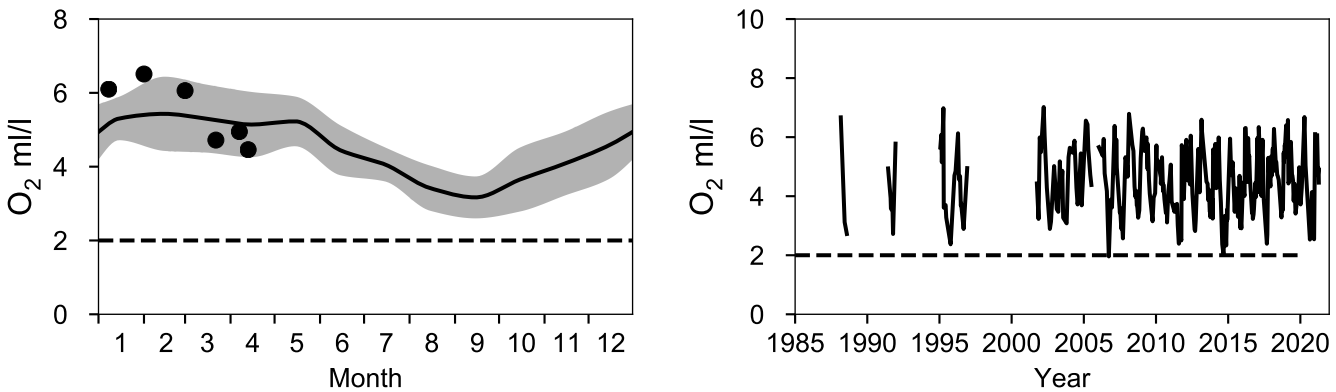
Ser no	Cru no	Stat code	Proj	Stat name	Lat	Lon	Start date yyyymmdd	Start time hhmm	Bottom depth m	Secchi depth m	Wind dir	Wind vel	Air temp C	Air pres hPa	WCWI elac aoveo tueo hdsb	CZPP hohp loy apt o p	No de	No btl	Temp_bottle	Temp_cld	Sal_btl	Sal_cld	Alk_btl	Alk_cld	DO_btl	DO_cld	H2S	PH_sot	PO4_sot	NTRI_sot	NTRA_sot	NTRZ_sot	NTRO_sot	ANTOT_sot	ALK_sot	ASI3_sot	SHUMSI	COMMENT_VISIT	COMMENT_SAMP
0278	7	FIBG27	BAS...	SLÄGGÖ	5815.58	01126.11	20210413	1145	76	5	7	8	4.3	1019	2820	-x--	9		x	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0279	7	SKEX14	BAS...	Å13	5820.38	01101.65	20210413	1445	103	7	27	4	5.1	1020	1220	----	10		x	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0280	7	SKEX15	BAS...	Å14	5818.92	01056.54	20210413	1615	112		31	7	5.5	1020	1230	----	11		-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
0281	7	SKEX16	BAS...	Å15	5817.65	01050.66	20210413	1740	138		34	6	5.4	1021	1220	----	12		x	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	x	-
0282	7	SKEX17	BAS...	Å16	5816.03	01043.50	20210413	1900	203		31	5	5.4	1022	9990	----	13		-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
0283	7	SKEX18	BAS...	Å17	5817.05	01030.32	20210413	2045	353		27	3	5.4	1022	9990	-x--	15		x	x	-	x	x	x	-	x	-	x	x	x	x	-	-	x	-	-	-
0284	7	SKEX23	BAS...	P2	5752.01	01117.51	20210414	0115	95		36	3	5	1023	9999	----	10		x	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0285	7	KANX25	BAS...	FLADEN	5711.55	01139.54	20210414	0630	84	7	28	1	6	1025	1120	----	13		x	x	-	x	-	x	-	x	-	x	x	x	x	-	-	x	-	x	-
0286	7	KANX50	BAS...	N14 FALKENBERG	5656.41	01212.75	20210414	0945	32	5	30	4	6.1	1026	1120	-x--	7		x	x	-	x	x	x	-	x	-	x	x	x	x	-	-	x	-	x	-
0287	7	KAEX29	BAS...	ANHOLT E	5640.11	01206.67	20210414	1230	64	7	32	6	6.4	1027	1120	-x--	10		x	x	-	x	x	x	-	x	-	x	x	x	x	-	-	x	-	-	-
0288	7	SOCX39	BAS...	W LANDSKRONA	5552	01244.94	20210414	1830	52		36	6	6.3	1027	9990	----	9		x	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0290	7	BPSA02	BAS...	BY1	5500.95	01318.07	20210415	0330	47		34	1	4.5	1028	9990	----	8		x	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	x	-
0291	7	BPSA03	BAS...	BY2 ARKONA	5458.28	01405.94	20210415	0715	47	11	6	6	4.6	1028	2820	-x--	8		x	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0292	7	BPSB06	BAS...	BY4 CHRISTIANSÖ	5522.98	01520.02	20210415	1345	93	14	3	10	5	1026	2430	----	12		x	x	-	x	x	x	x	x	-	x	x	x	x	-	-	x	-	-	-
0293	7	BPSB07	BAS...	BY5 BORNHOLMSDJ	5514.99	01559.04	20210415	1740	91		21	11	4.5	1025	1440	-x--	12		x	x	-	x	x	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0294	7	BPSE11	BAS...	BCS III-10	5533.33	01824.06	20210416	0645	91		17	7	4.2	1020	2840	----	12		x	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0295	7	BPEX13	BAS...	BY10	5638	01935.07	20210416	1500	145		2	11	5.1	1018	2840	----	15		x	x	-	x	x	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0296	7	BPEX21	BAS...	BY15 GOTLANDSDJ	5718.73	02004.56	20210416	2030	242		3	8	5.5	1021	9990	-x--	24		x	x	-	x	x	x	x	-	x	-	x	x	x	-	-	x	-	x	-
0297	7	BPEX26	BAS...	BY20 FÅRÖDJ	5759.86	01952.68	20210417	0310	198		5	12	5.1	1023	9990	----	17		-	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0298	7	BPWX38	BAS...	BY32 NORRKÖPINGSDJ	5801.02	01759.02	20210417	0930	201	8	3	7	4.2	1025	2630	----	17		x	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0299	7	BPWX45	BAS...	BY38 KARLSÖDJ	5706.90	01740.04	20210417	1630	110	8	5	7	4.5	1023	1130	----	14		x	x	-	x	-	x	x	-	x	-	x	x	x	-	-	x	-	-	-
0300	7	BPSE49	BAS...	BY39 ÖLANDS S UDDE	5606.95	01632.14	20210418	0010	52		1	10	4.6	1021	9990	----	8		x	x	-	x	-	x	-	x	-	x	x	x	x	-	-	x	-	-	-
0301	7	BPWK01	BAS...	REF M1V1	5622.21	01612.11	20210418	0300	21		36	8	4.7	1022	9990	-x--	5		x	x	-	x	x	x	-	x	-	x	x	x	x	-	-	x	-	-	-
0302	7	BPSH05	BAS...	HANÖBUKTEN	5537.04	01452.02	20210418	1015	80	12	5	5	6.5	1022	1430	----	11		x	x	-	x	-	x	-	x	-	x	x	x	x	-	-	x	-	-	-
0303	7	KAEX29	BAS...	ANHOLT E	5640.12	01206.67	20210419	0330	64		8	4	7.8	1023	9990	-x--	10		x	x	-	x	x	x	-	x	-	x	x	x	x	-	-	x	-	-	-

STATION SLÄGGÖ SURFACE WATER (0-10 m)

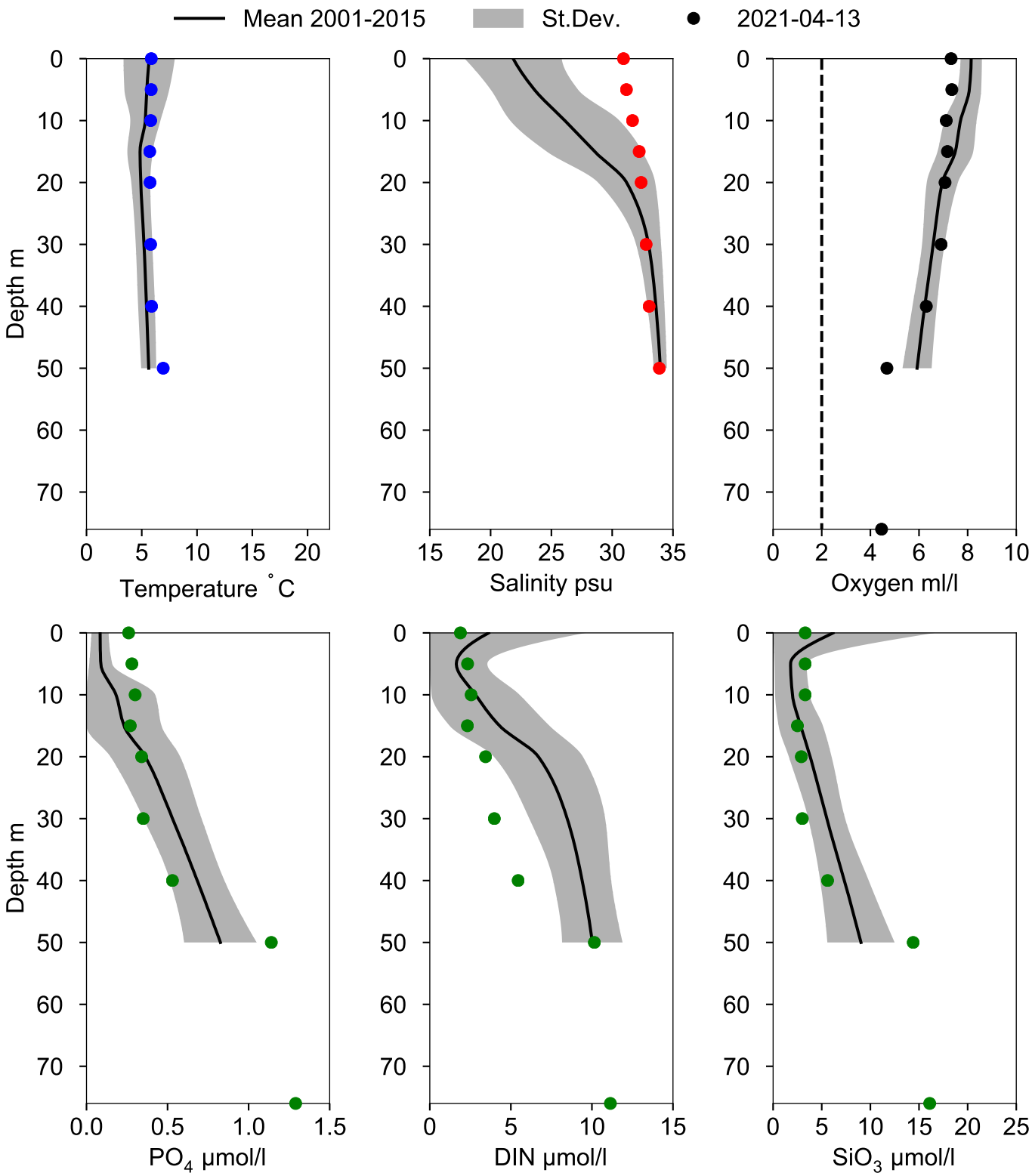
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 64 m)

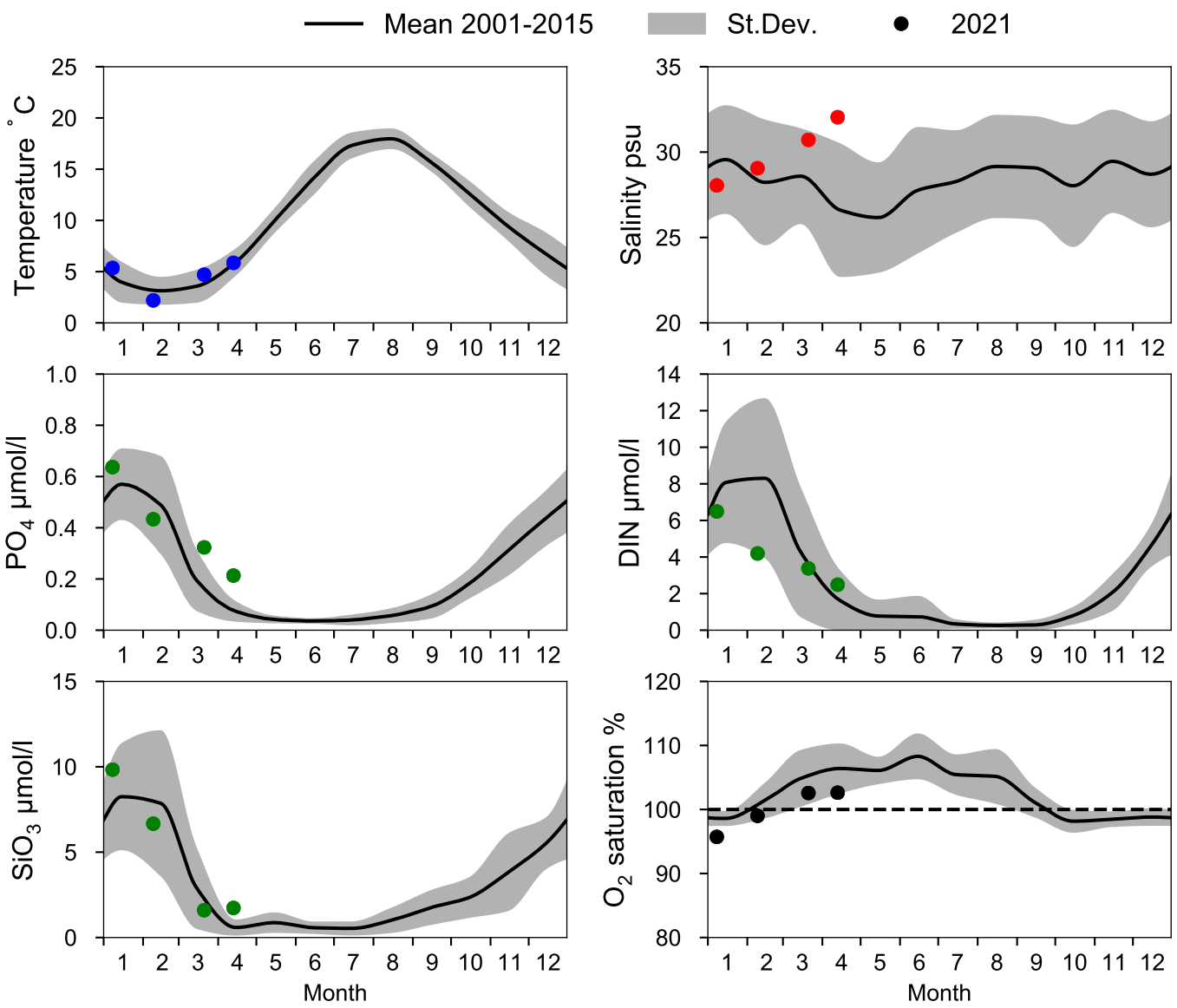


Vertical profiles SLÄGGÖ
April

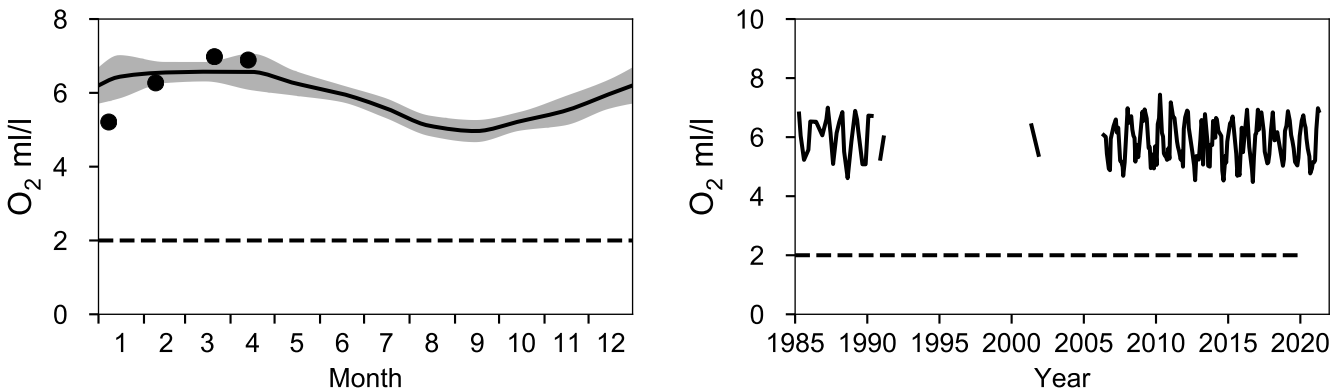


STATION Å13 SURFACE WATER (0-10 m)

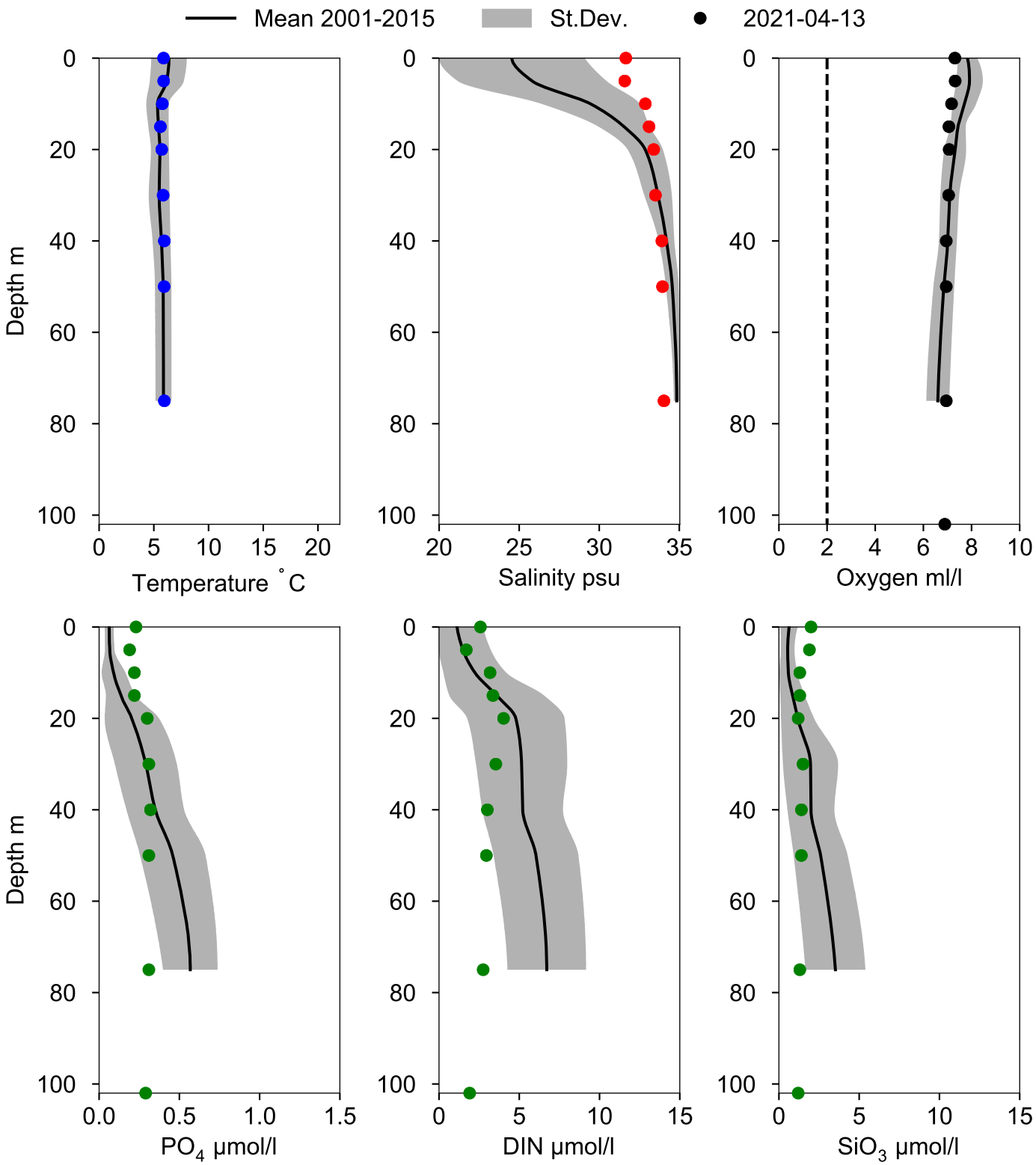
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 80 m)

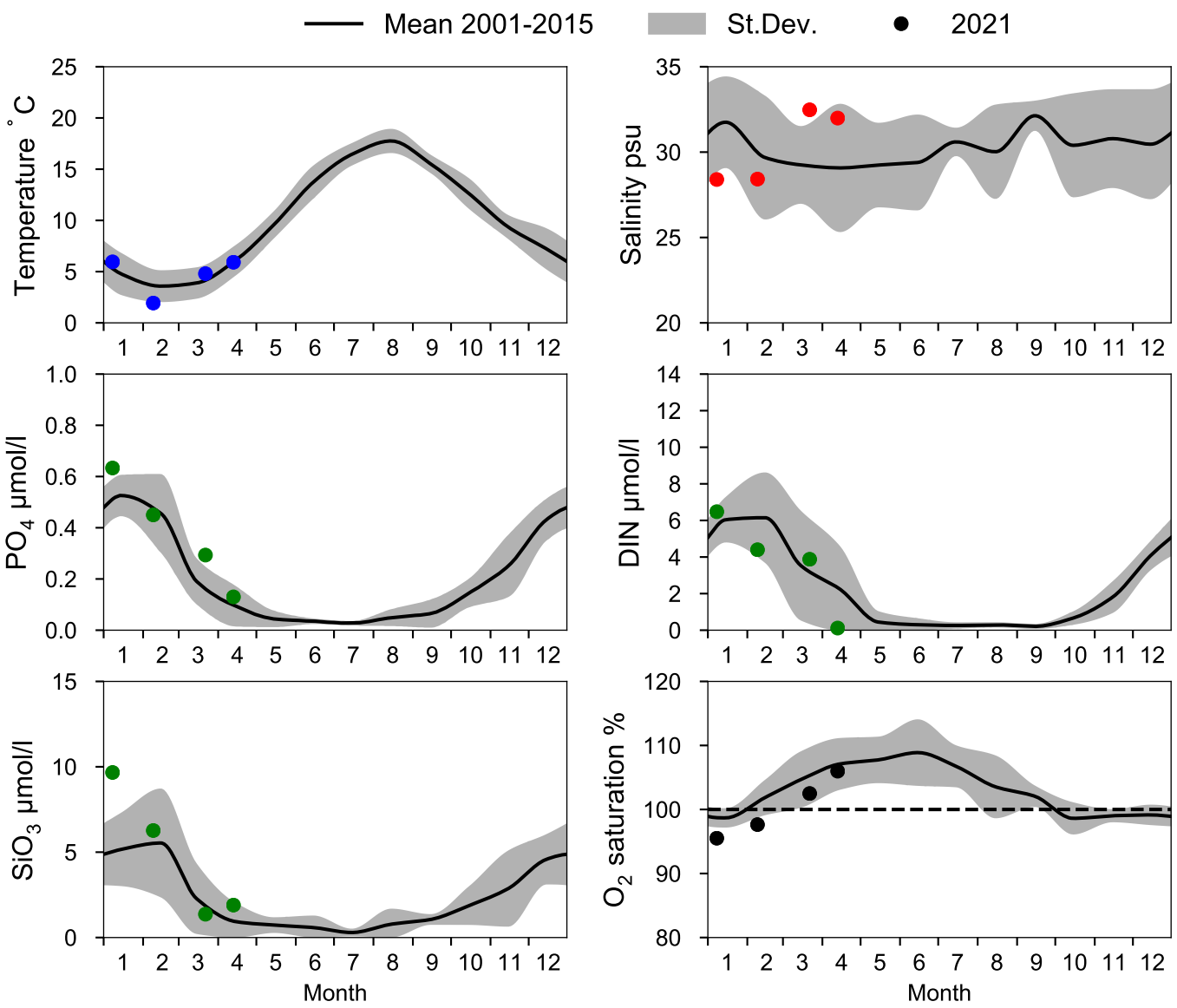


Vertical profiles Å13
April

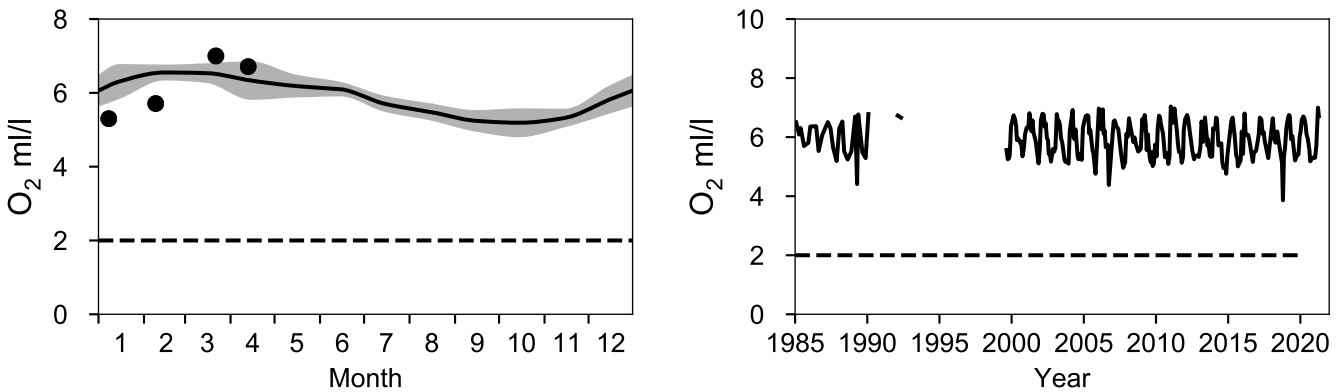


STATION Å15 SURFACE WATER (0-10 m)

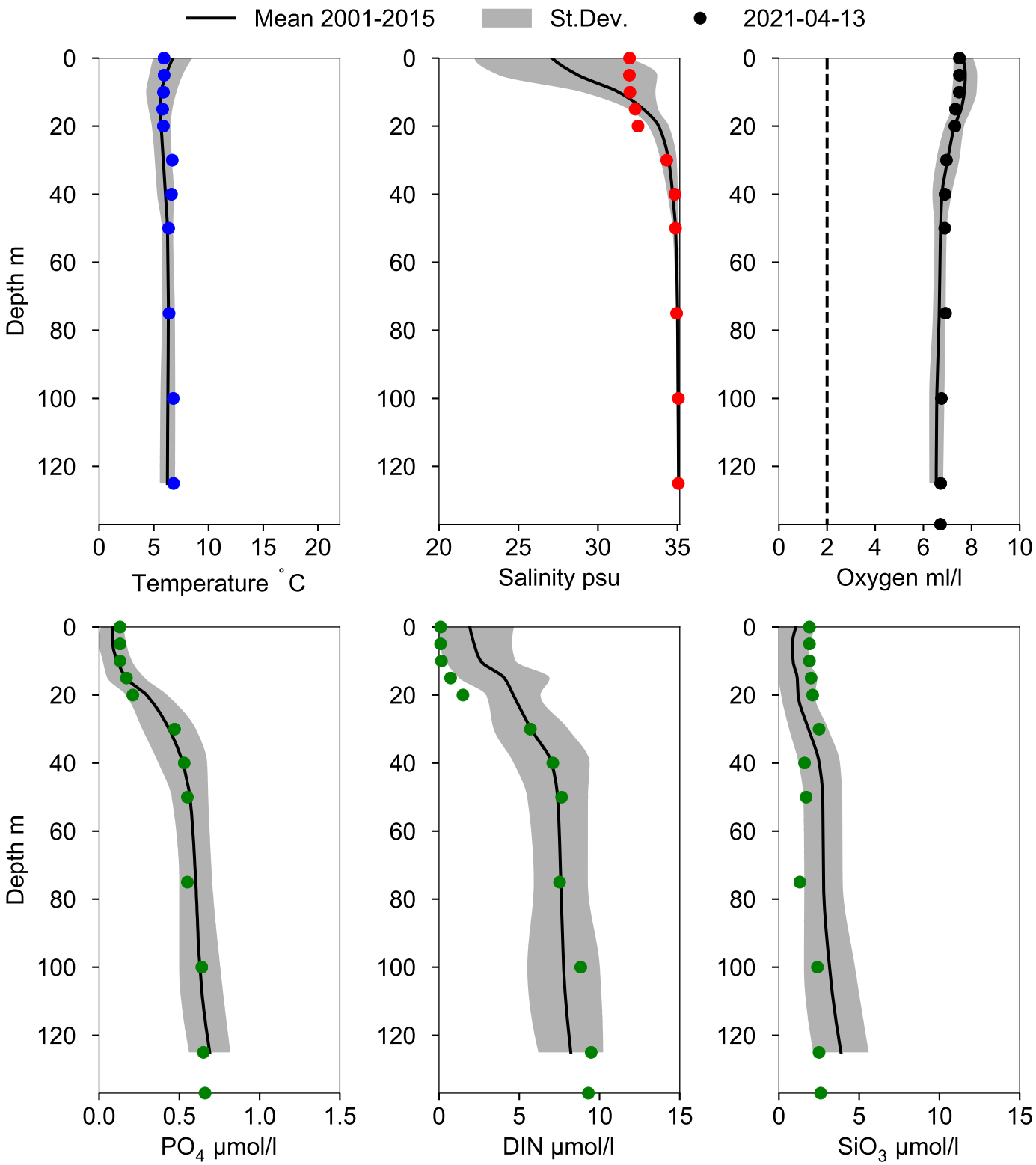
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 125 m)

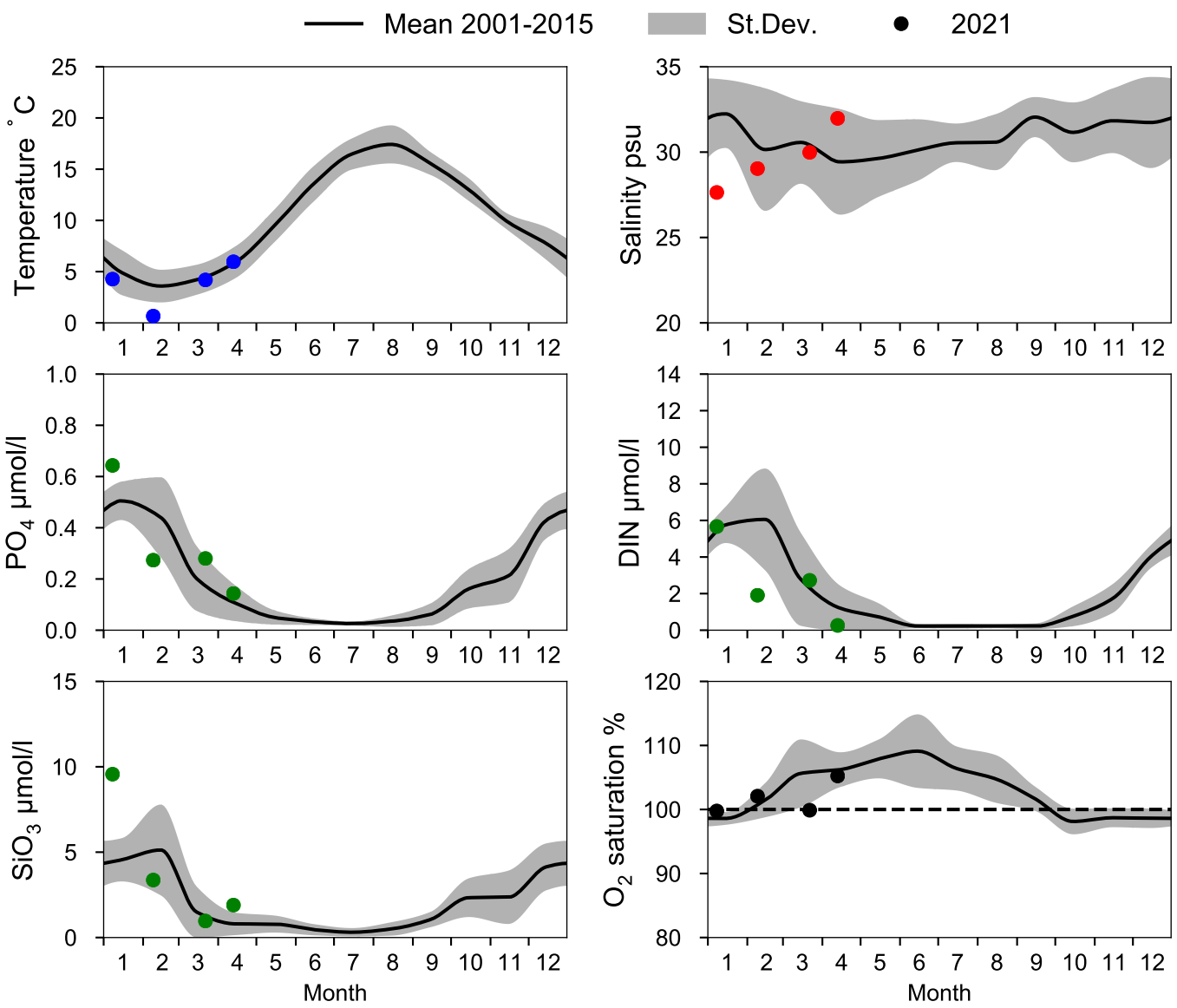


Vertical profiles Å15
April

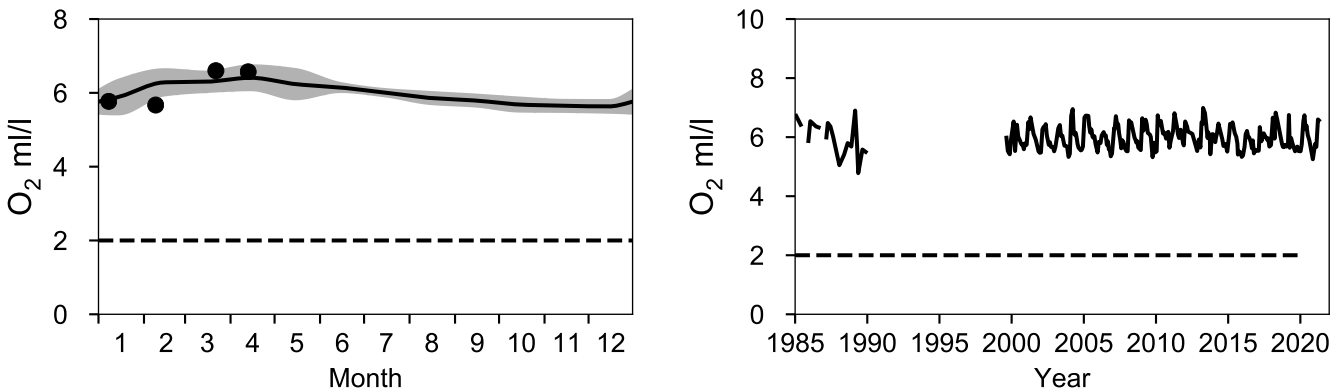


STATION Å17 SURFACE WATER (0-10 m)

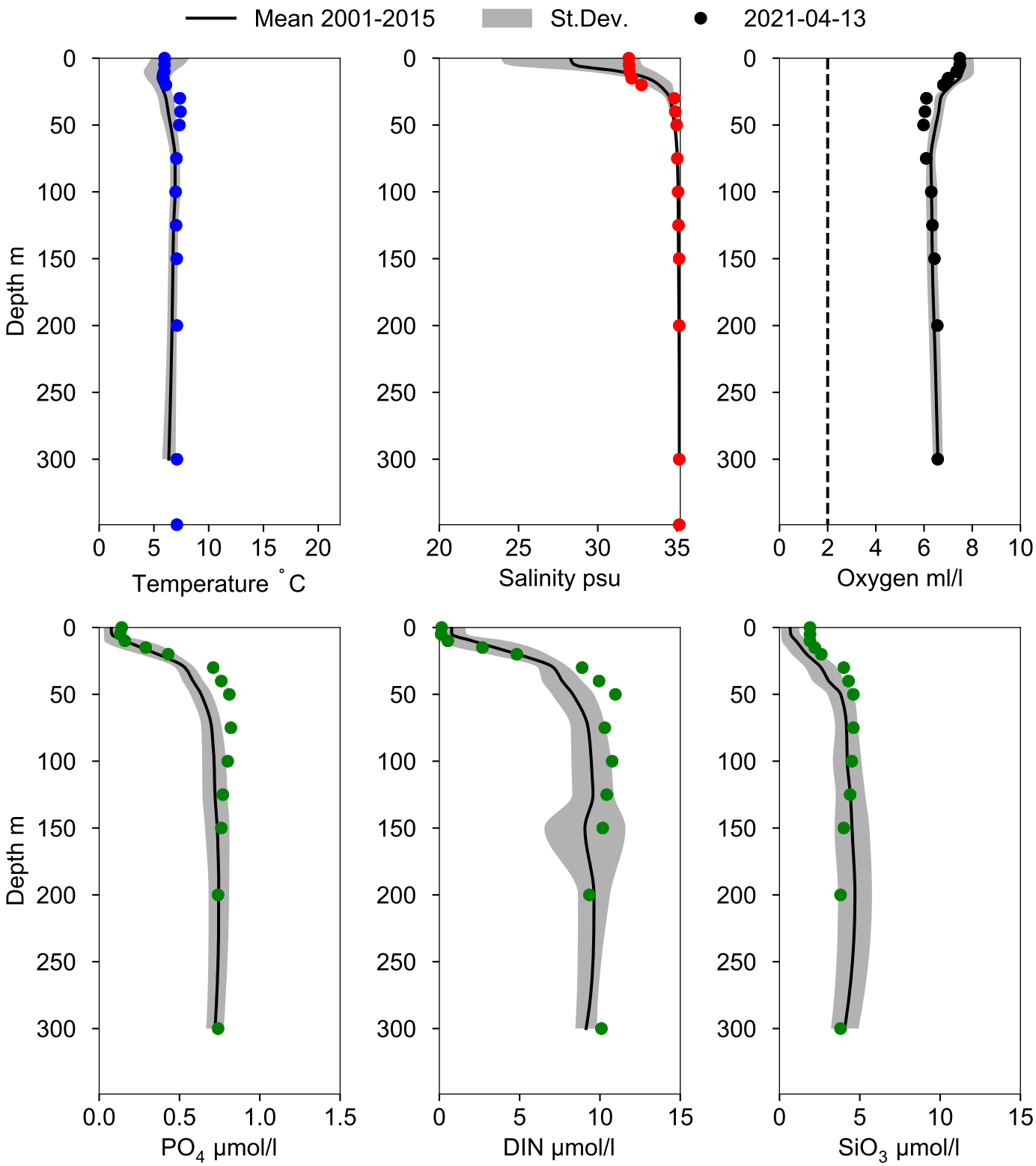
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 300 m)

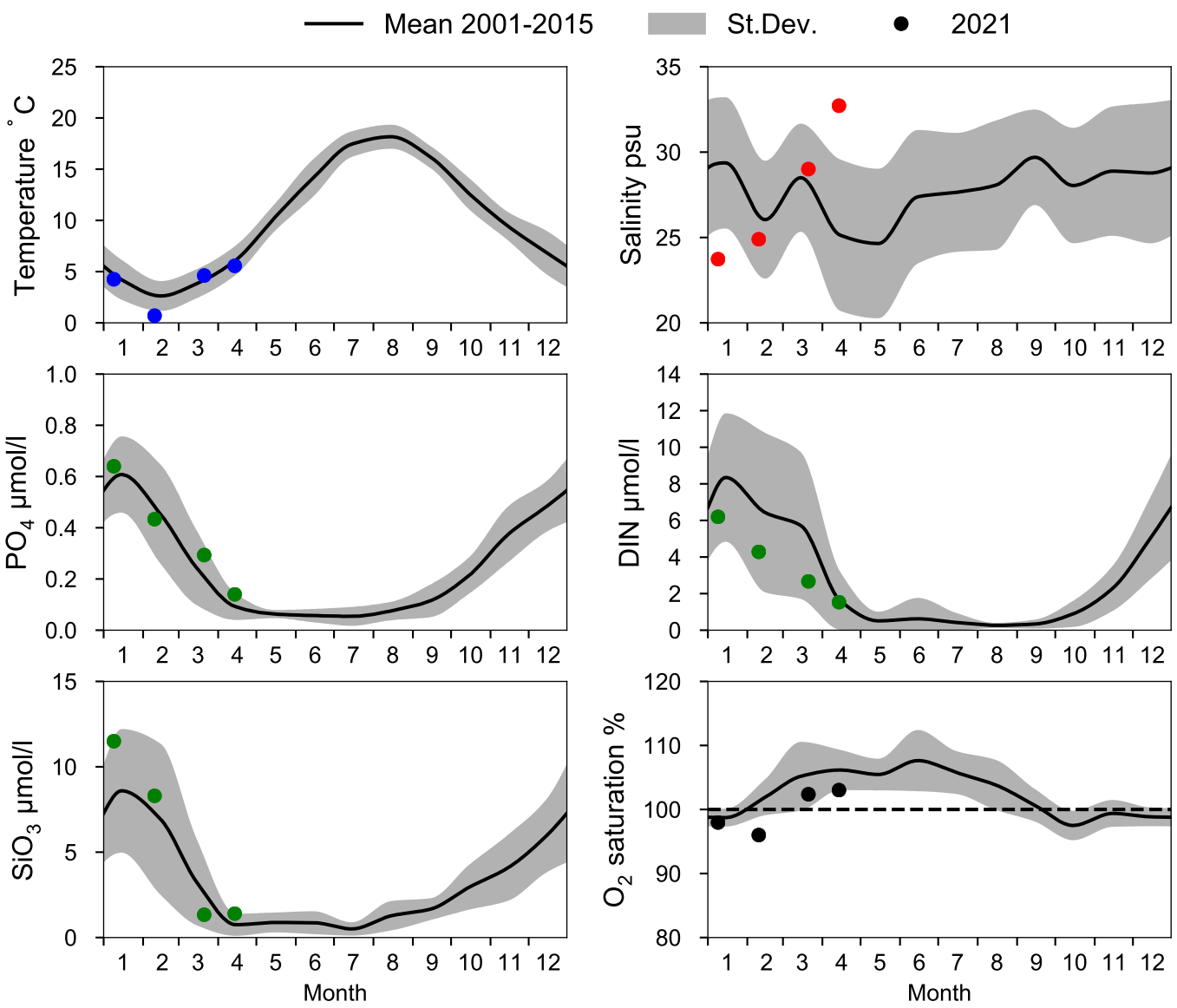


Vertical profiles Å17
April

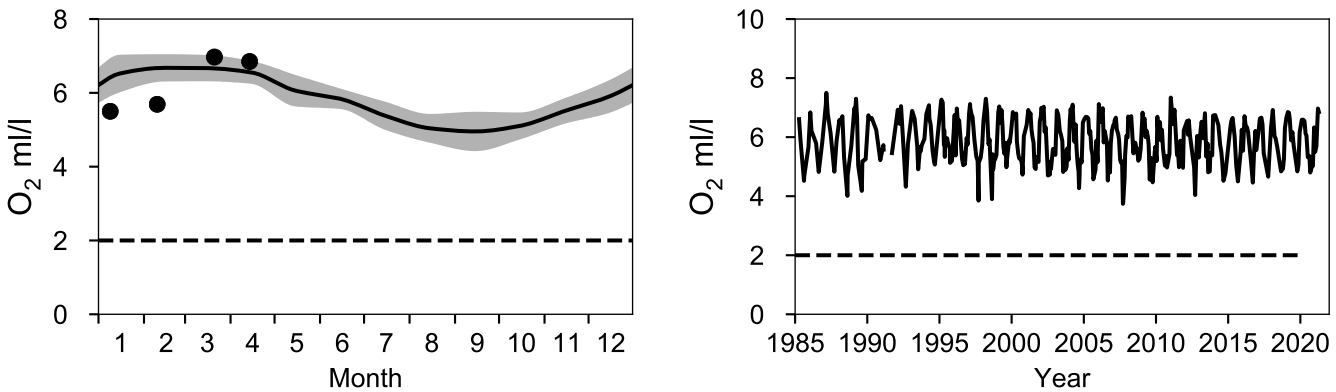


STATION P2 SURFACE WATER (0-10 m)

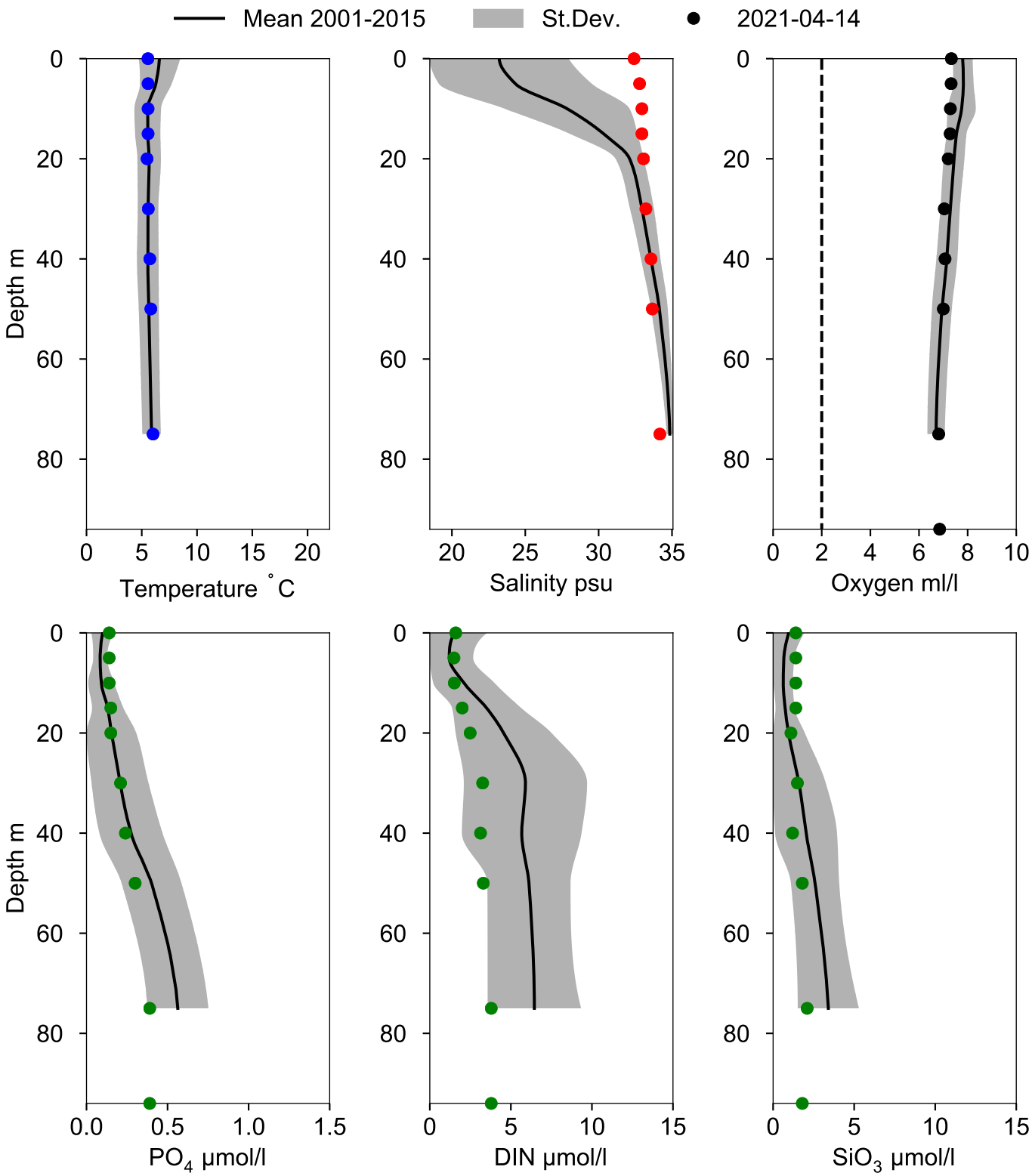
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 75 m)

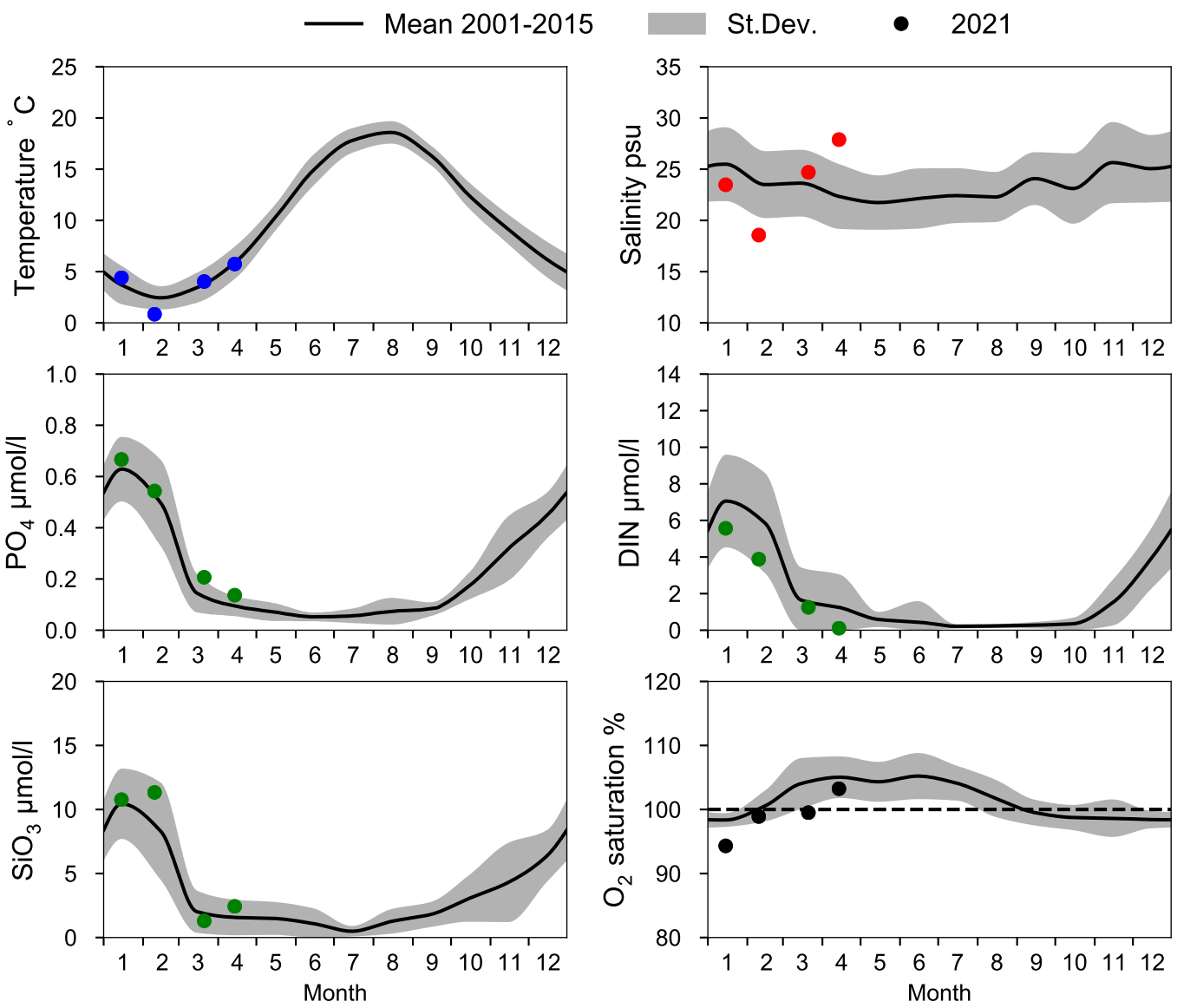


Vertical profiles P2
April

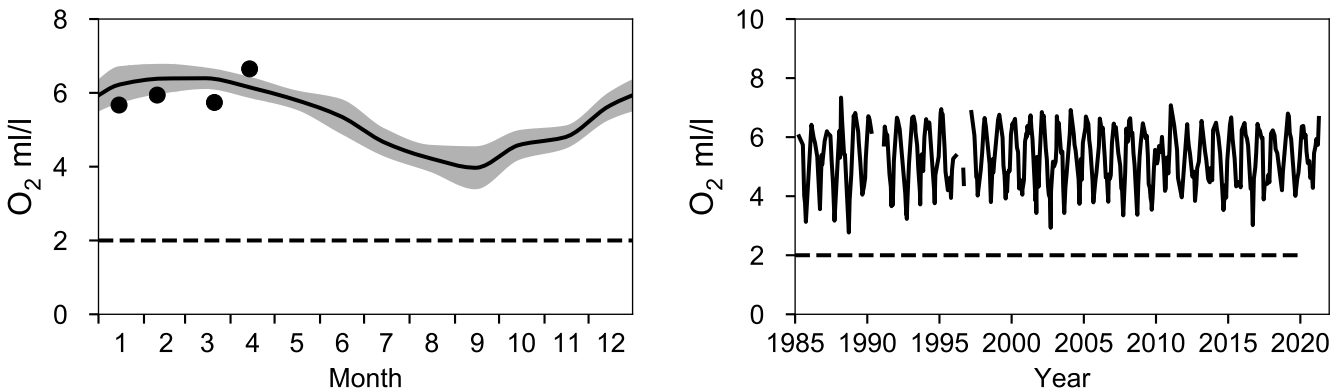


STATION FLADEN SURFACE WATER (0-10 m)

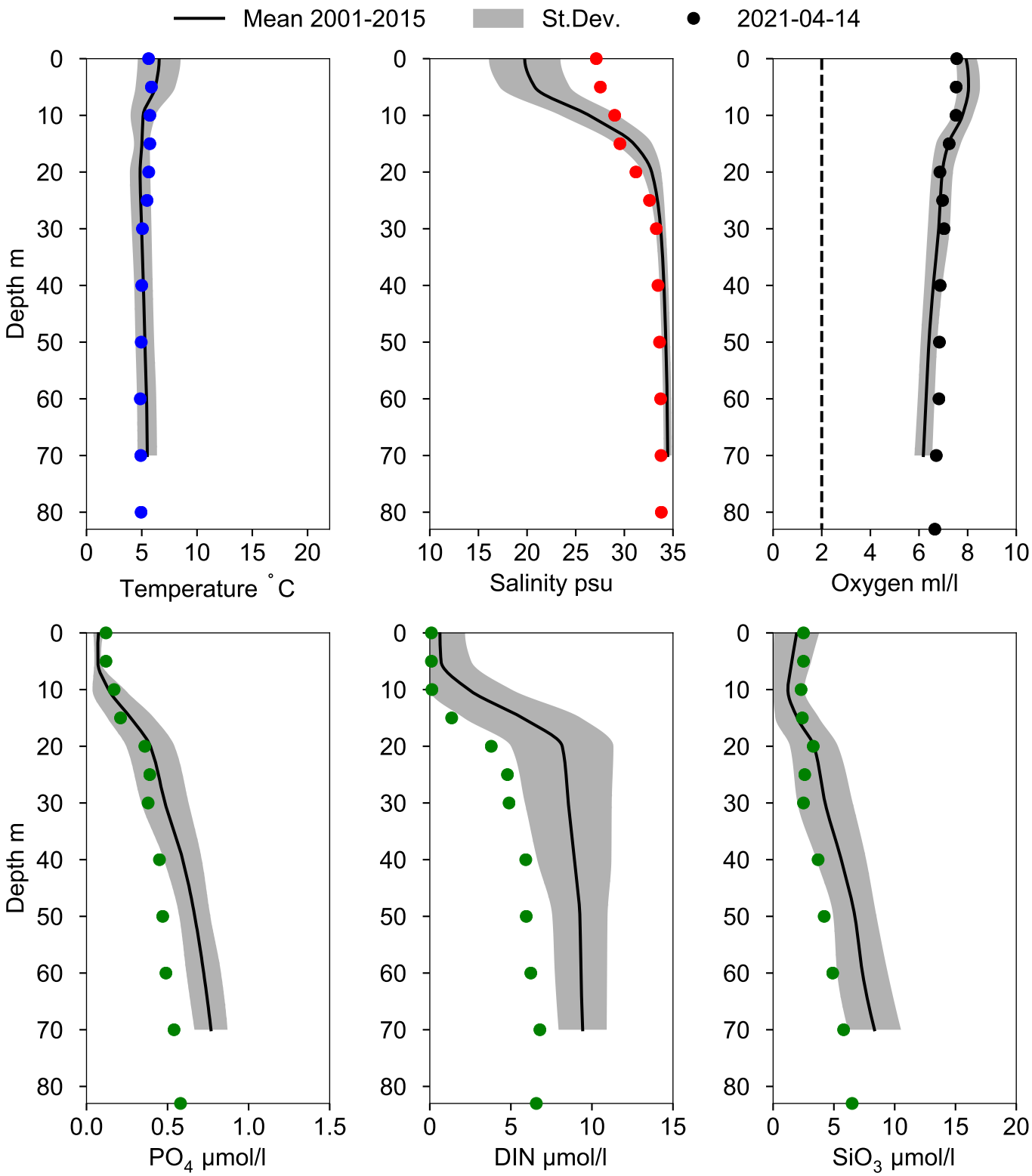
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 74 m)

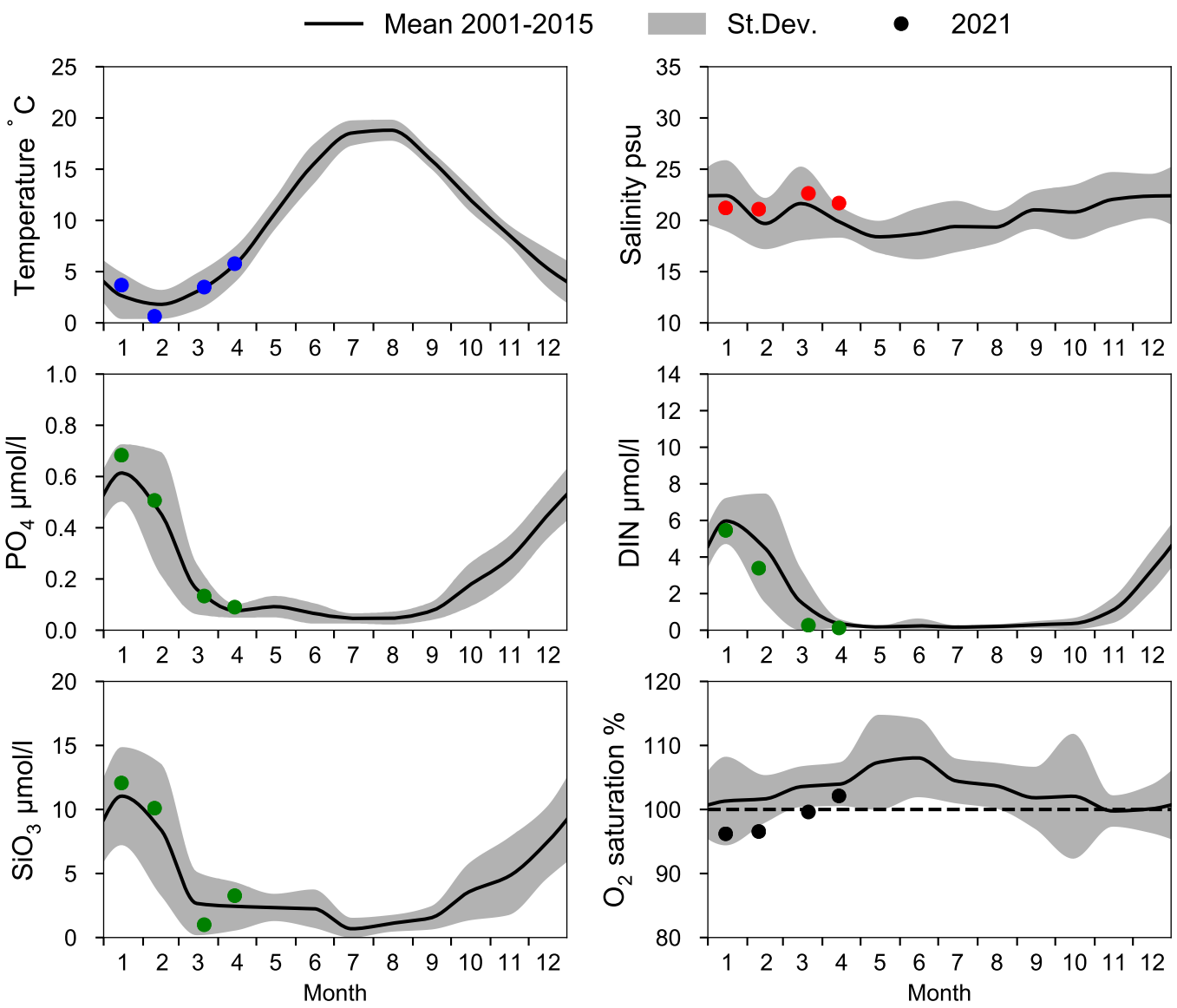


Vertical profiles FLADEN
April

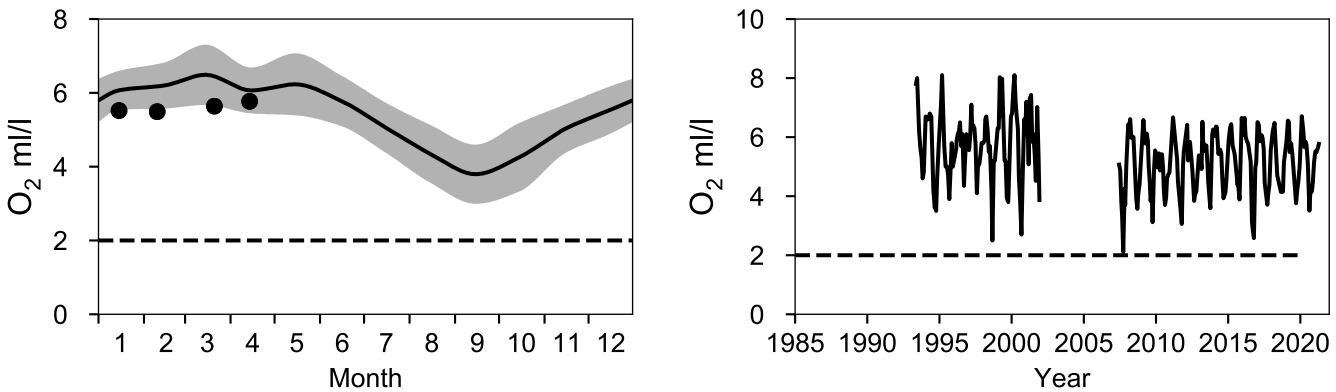


STATION N14 FALKENBERG SURFACE WATER (0-10 m)

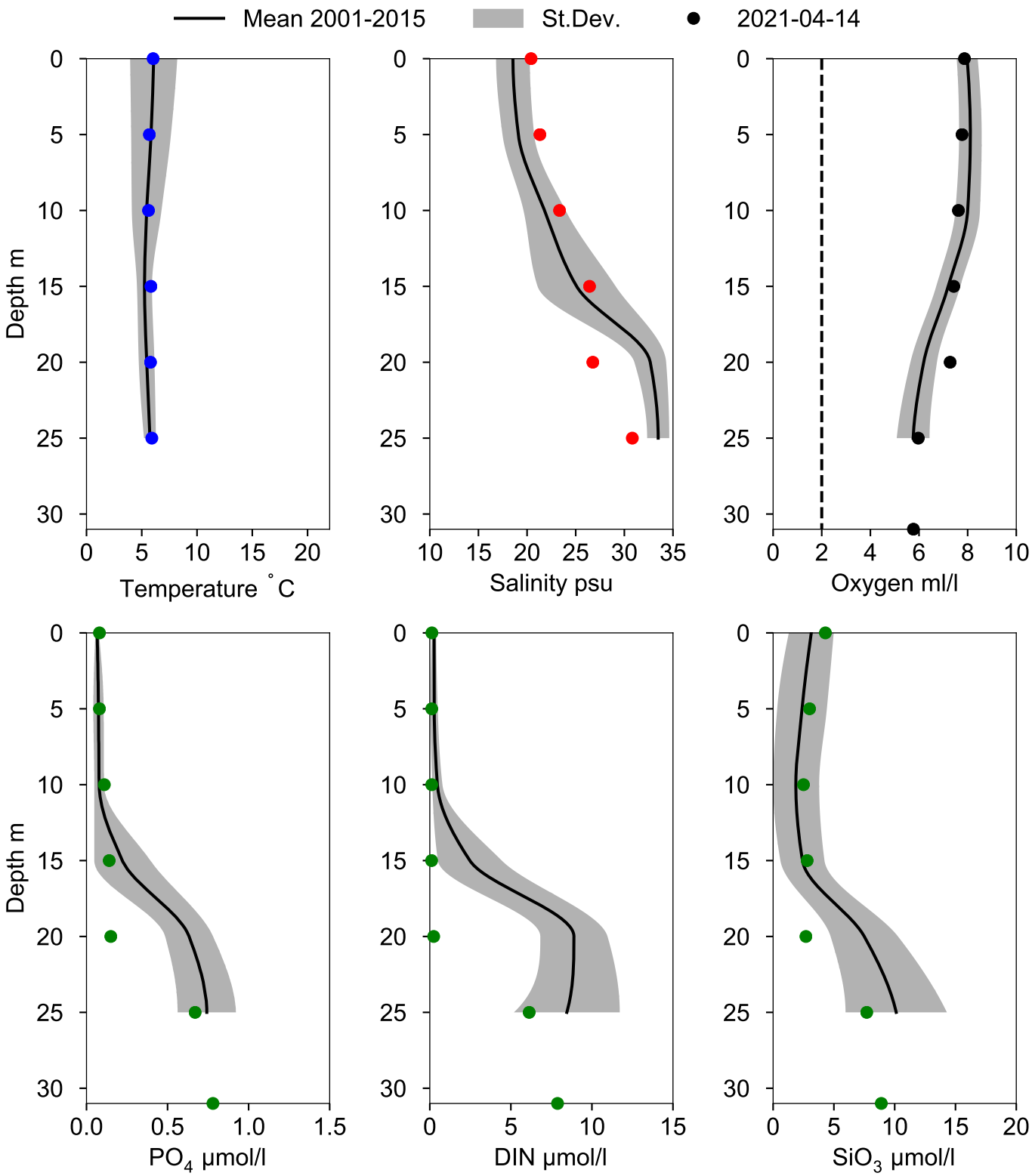
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 20 m)

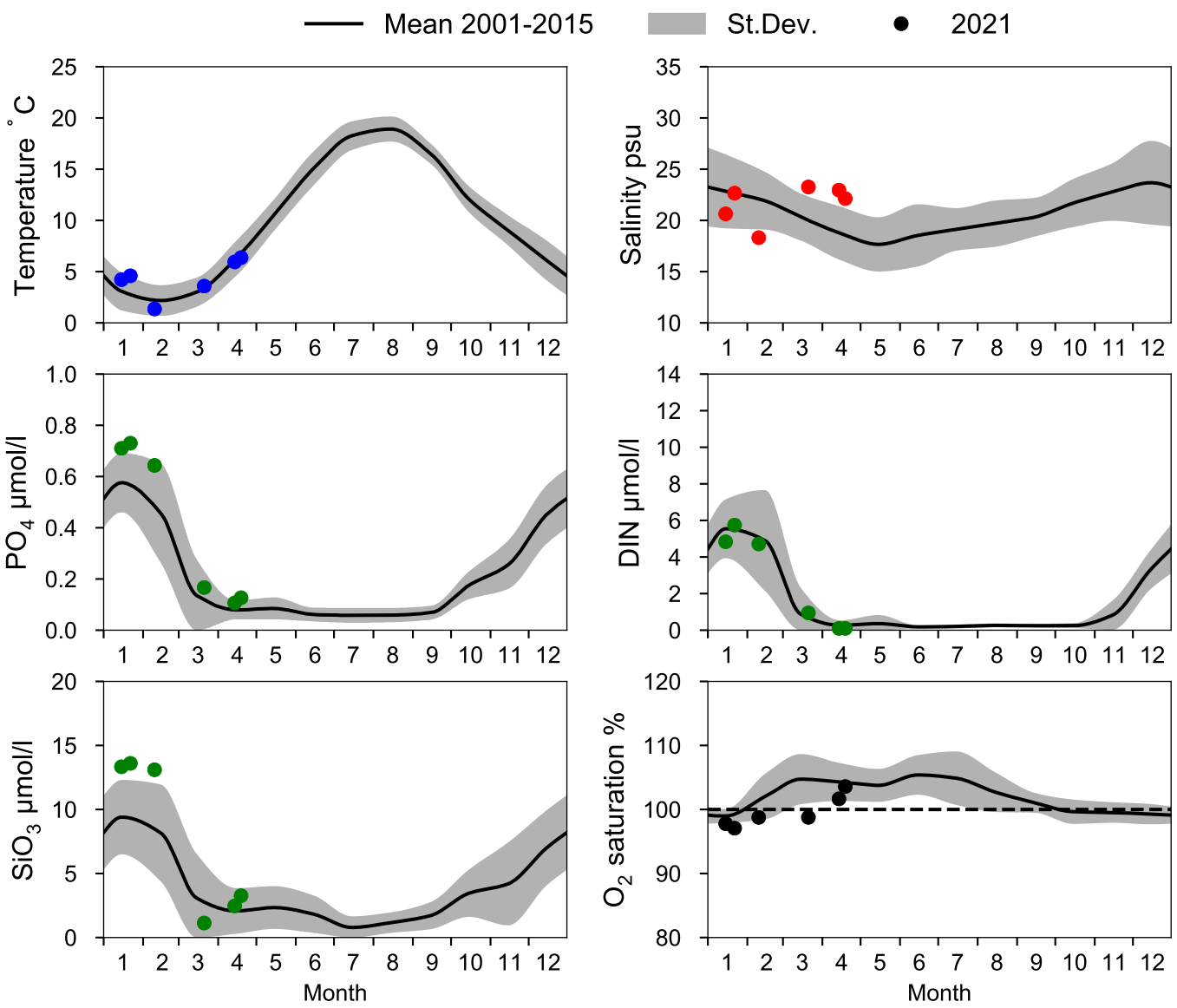


Vertical profiles N14 FALKENBERG
April

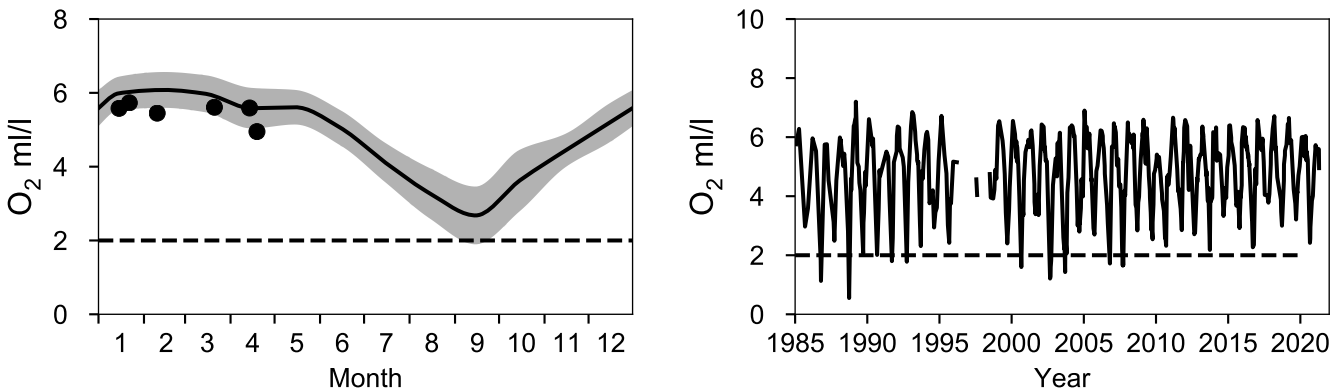


STATION ANHOLT E SURFACE WATER (0-10 m)

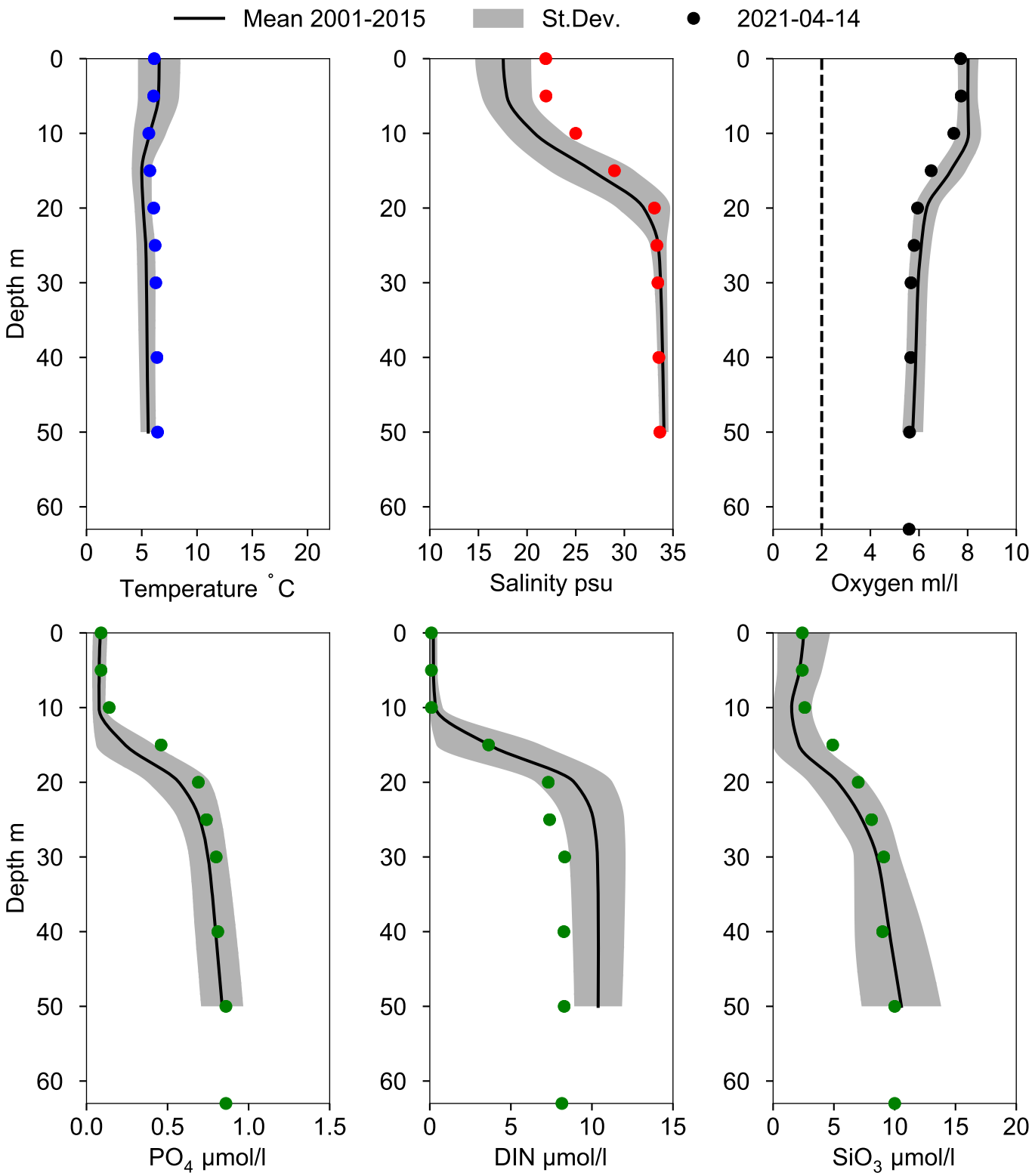
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 52 m)

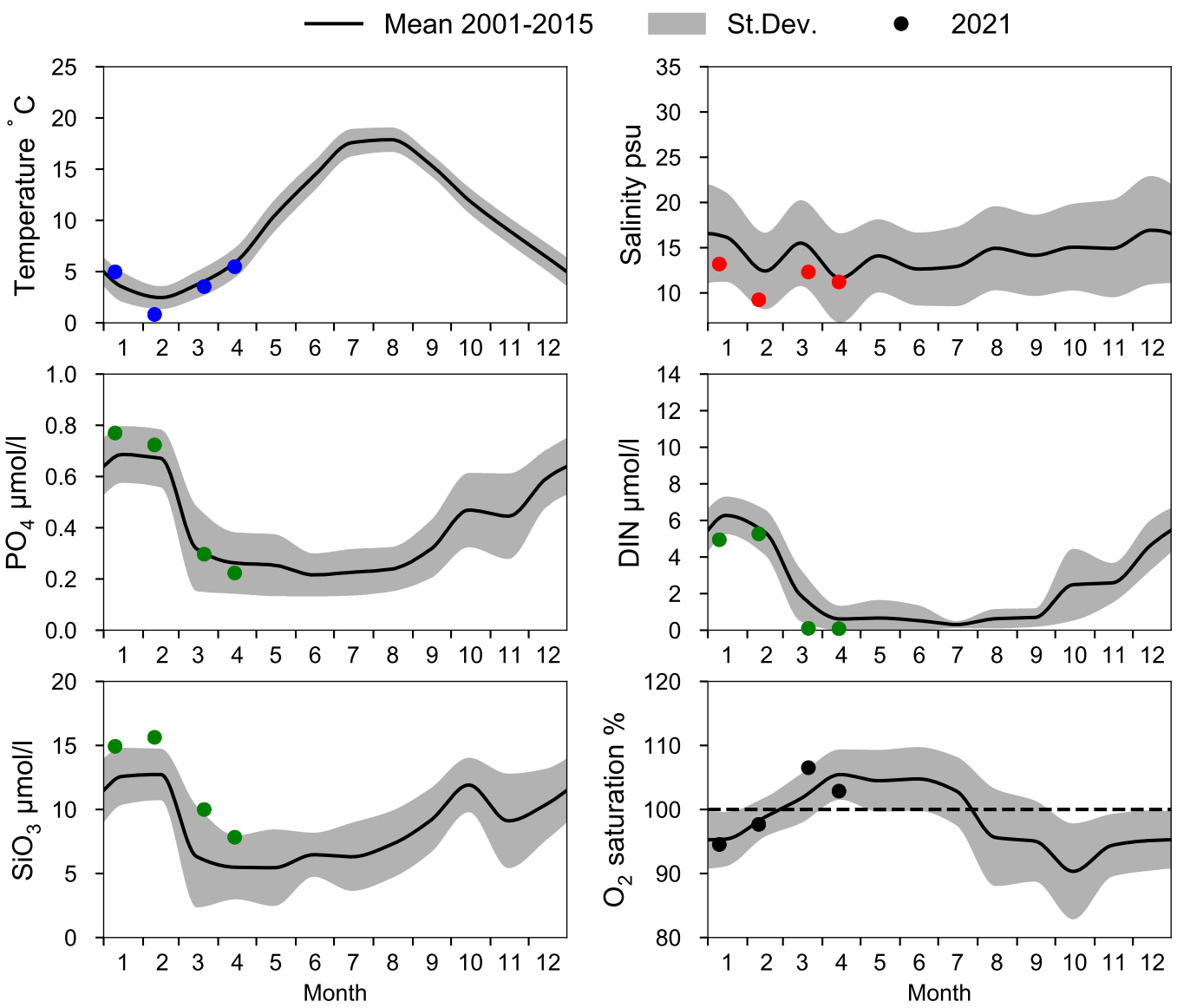


Vertical profiles ANHOLT E
April

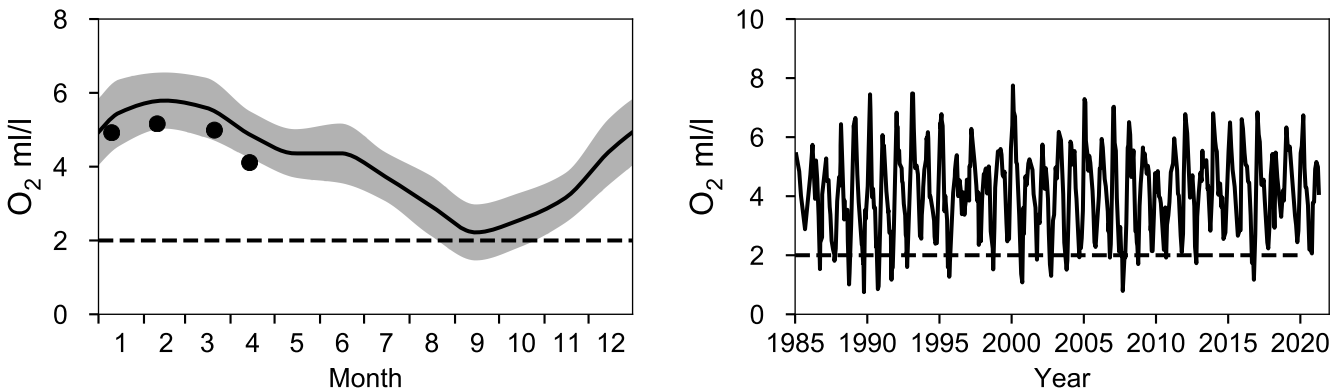


STATION W LANDSKRONA SURFACE WATER (0-10 m)

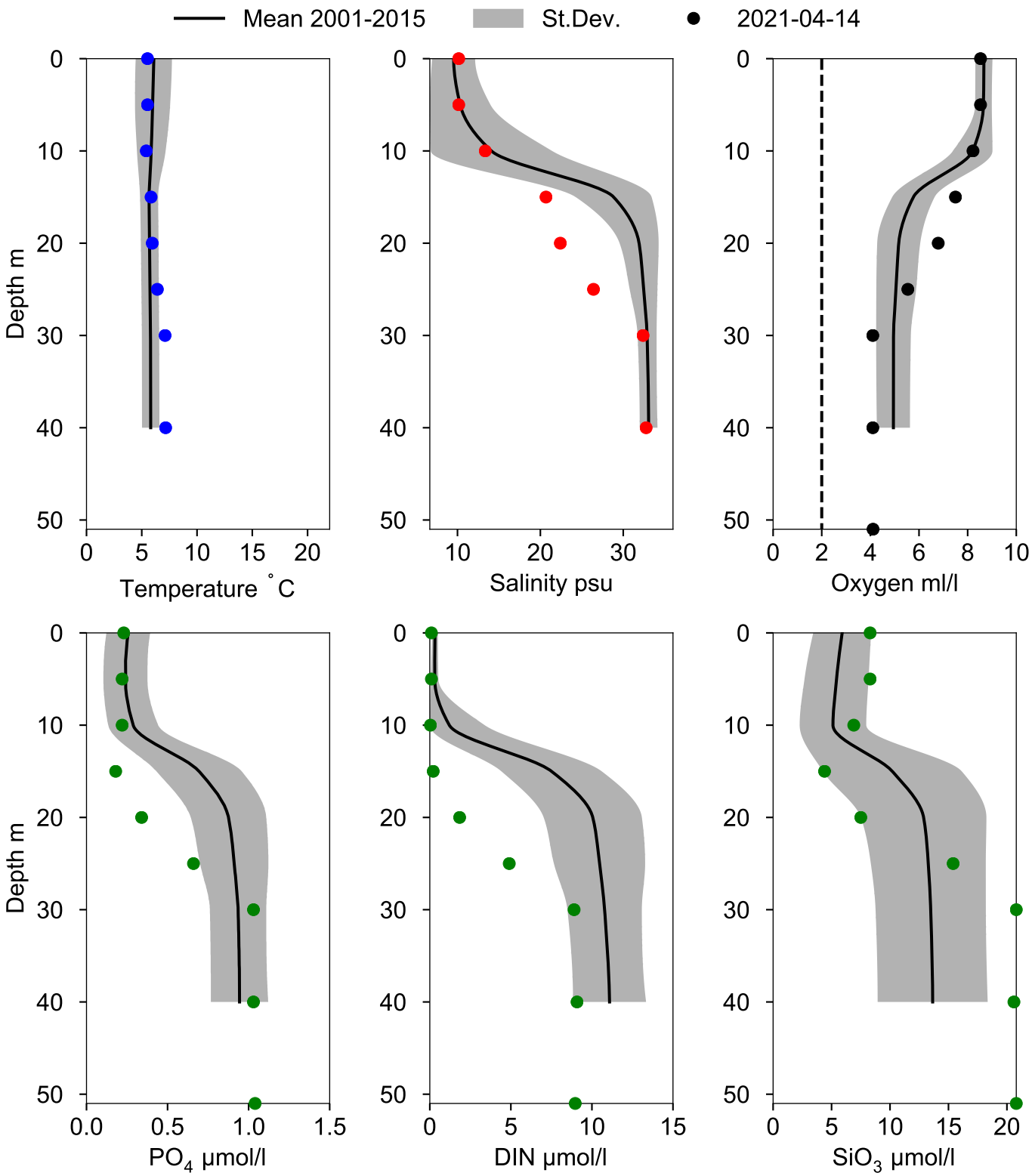
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 40 m)

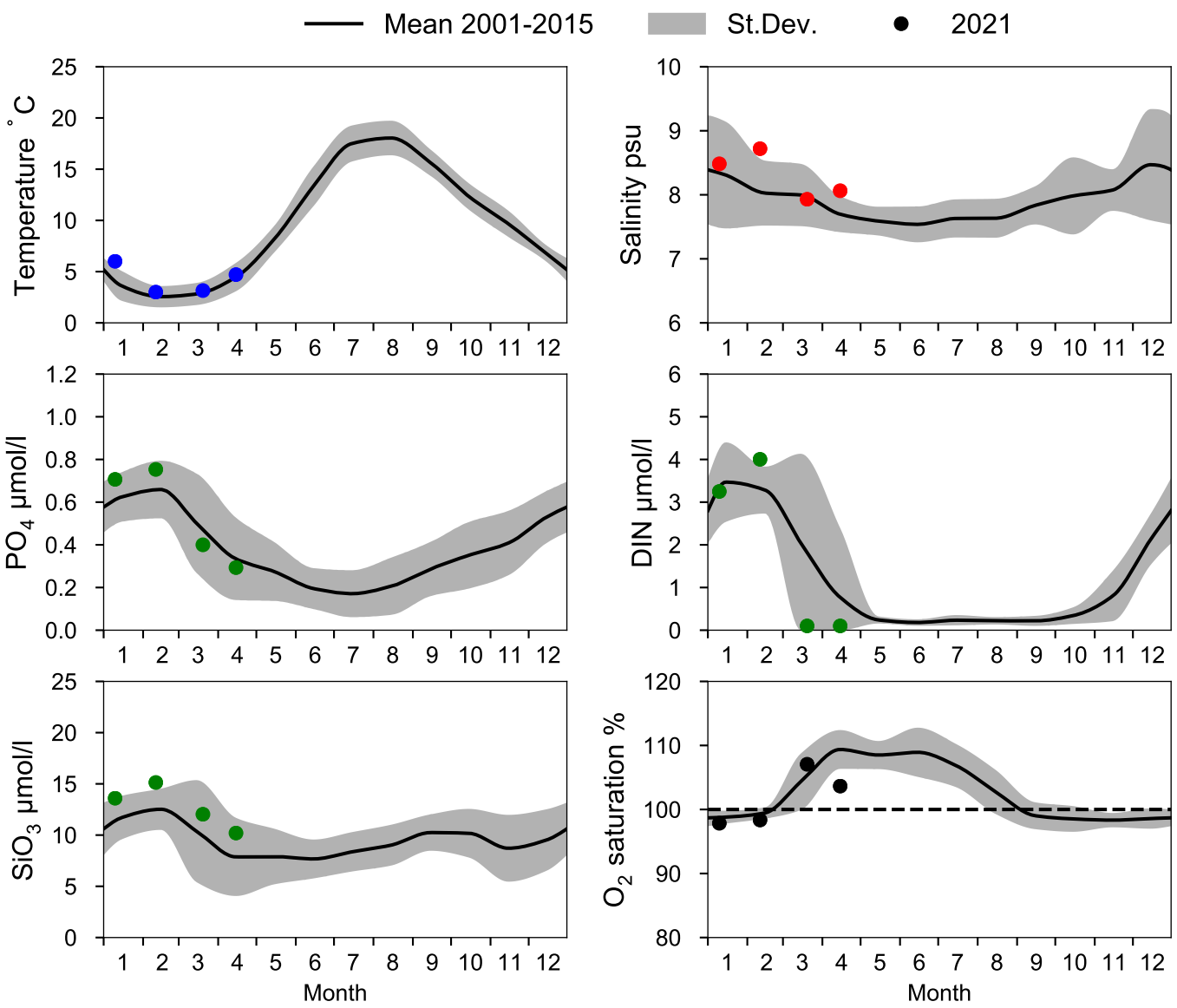


Vertical profiles W LANDSKRONA
April

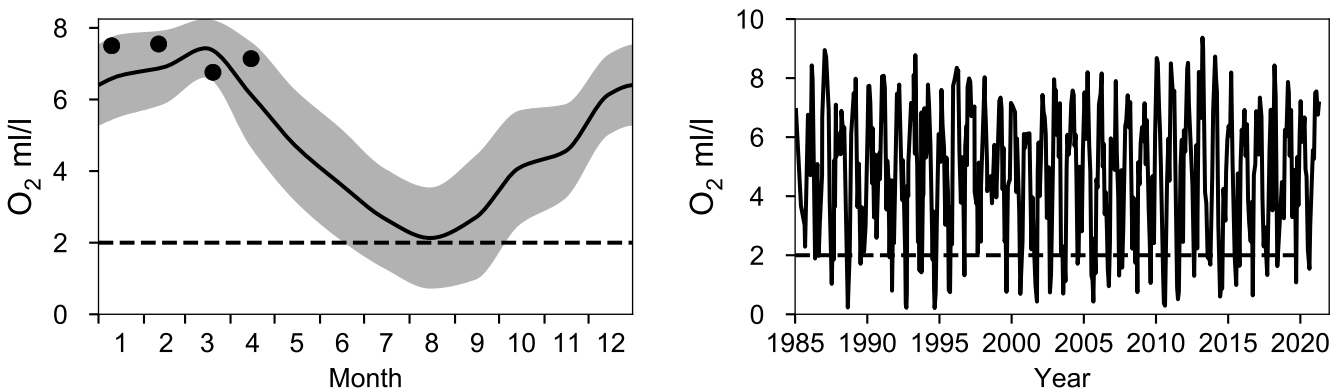


STATION BY1 SURFACE WATER (0-10 m)

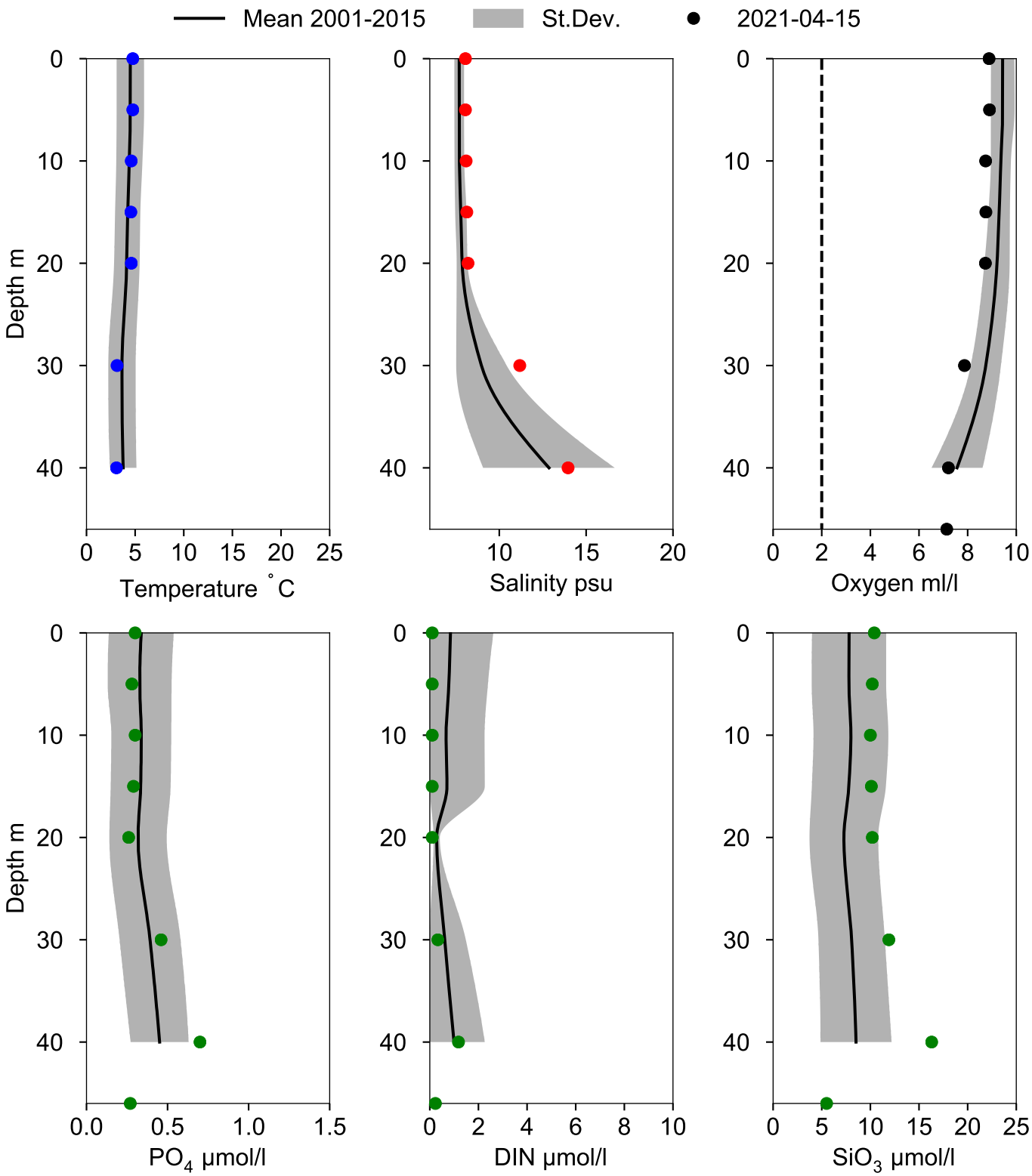
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 39 m)

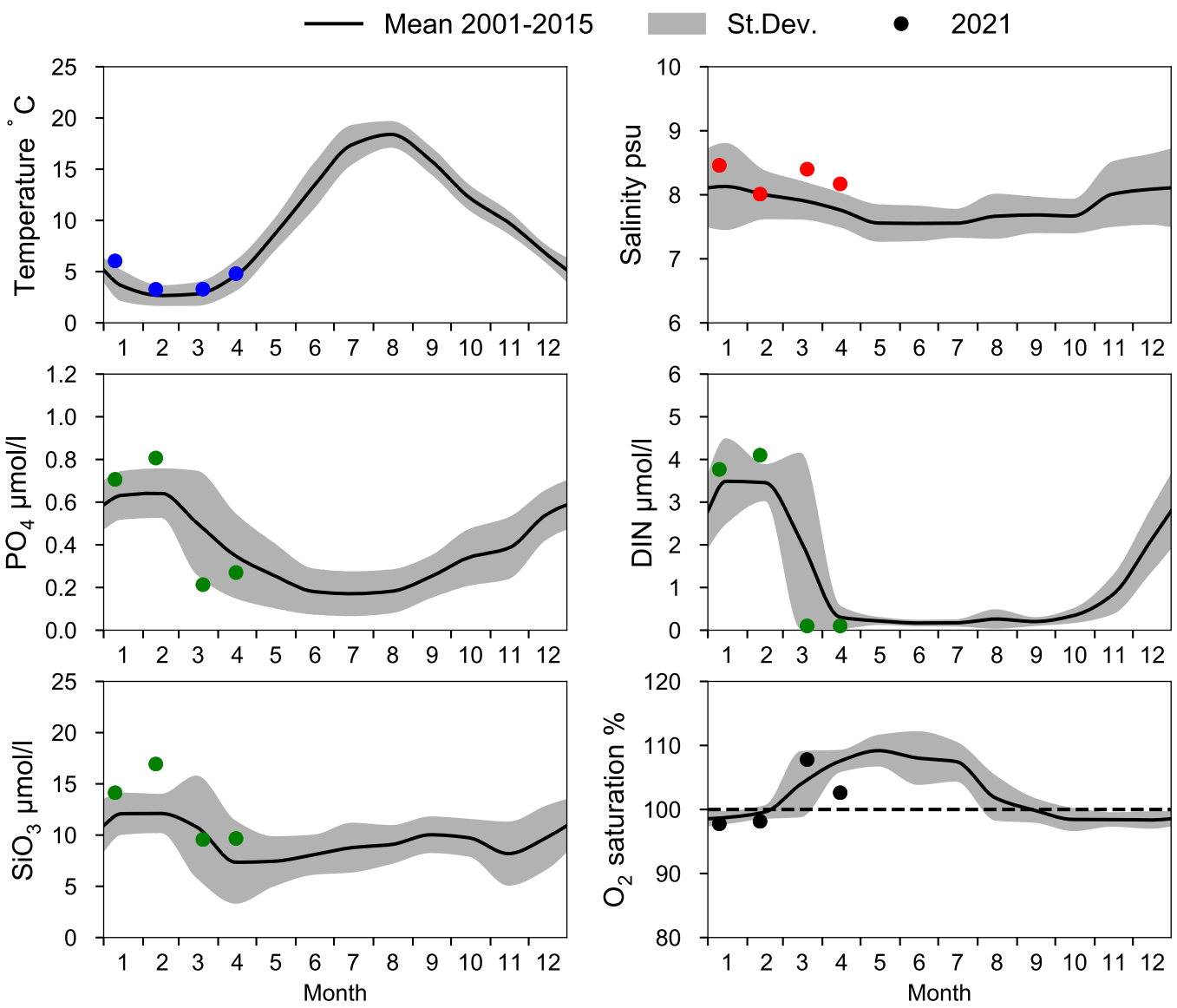


Vertical profiles BY1
April

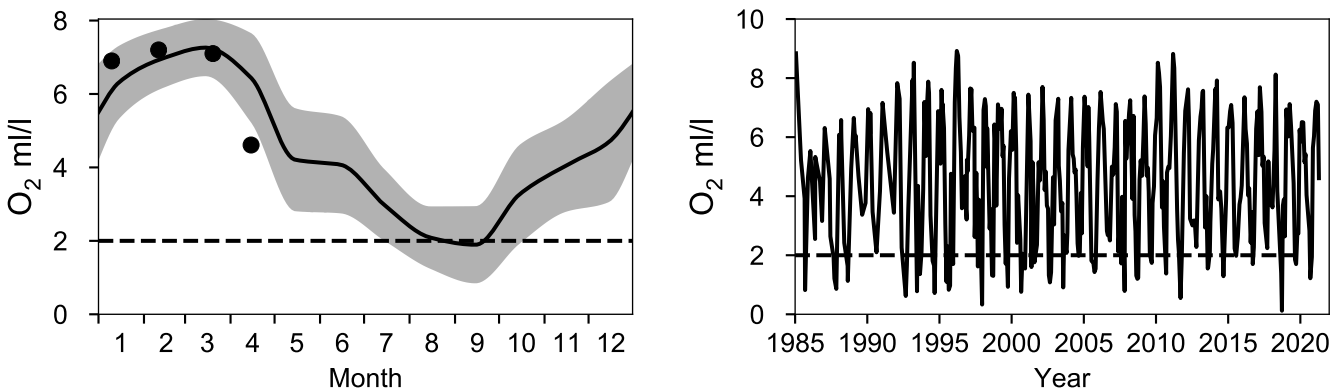


STATION BY2 ARKONA SURFACE WATER (0-10 m)

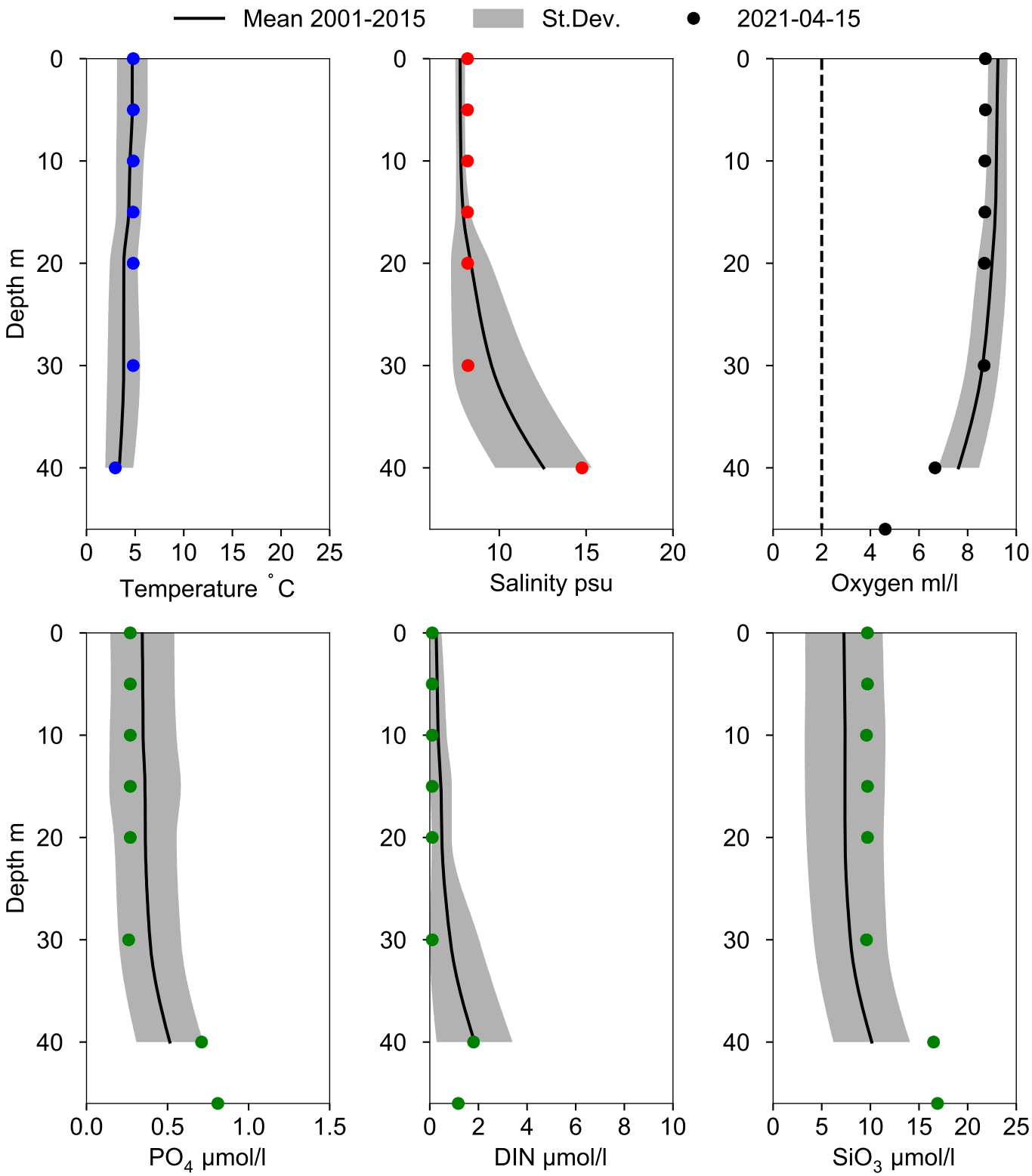
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 40 m)

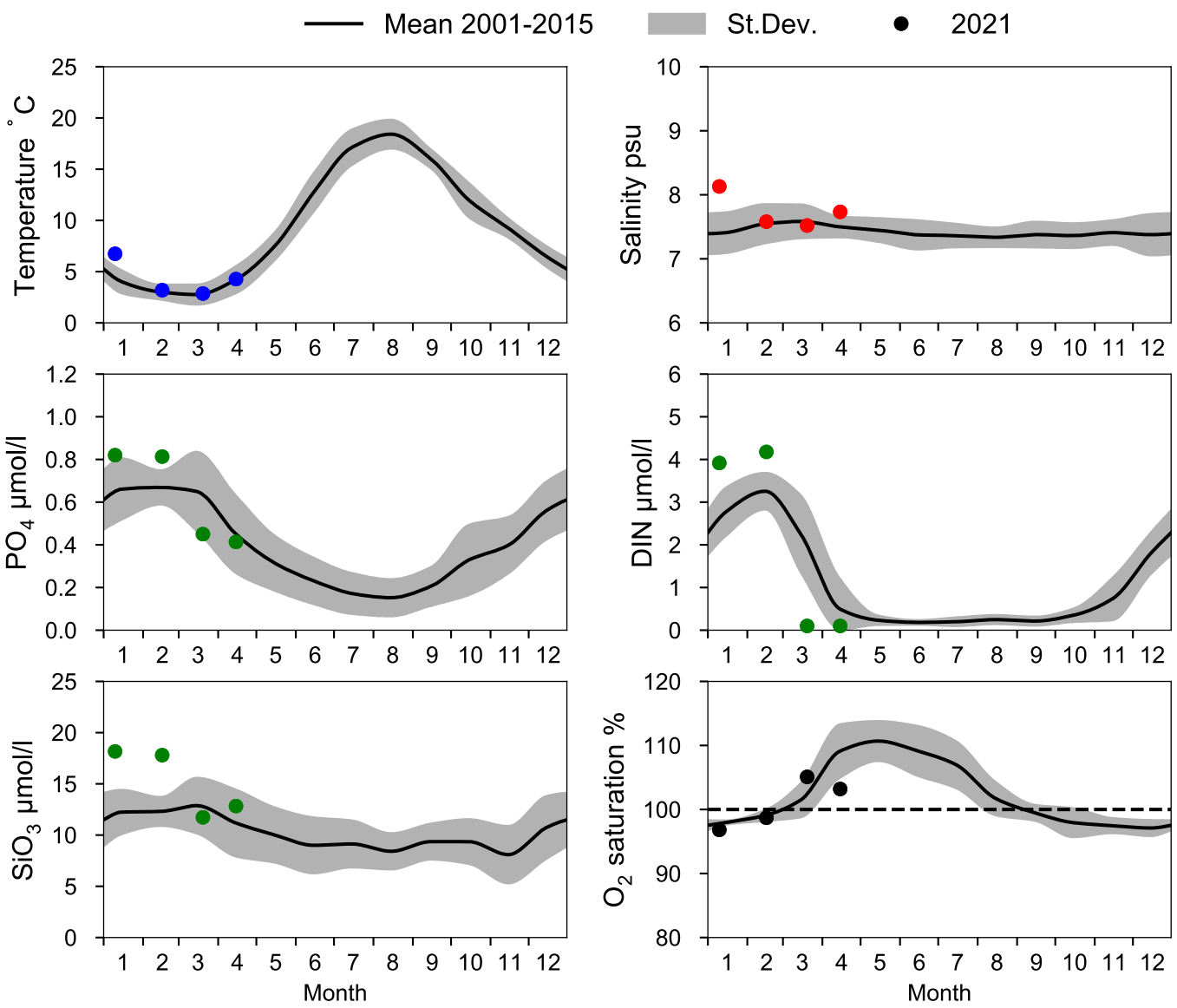


Vertical profiles BY2 ARKONA
April

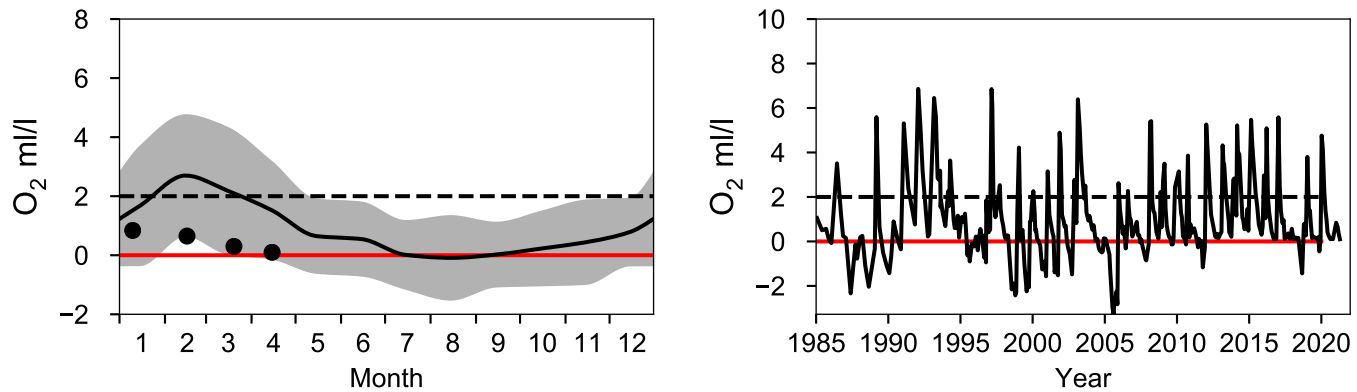


STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

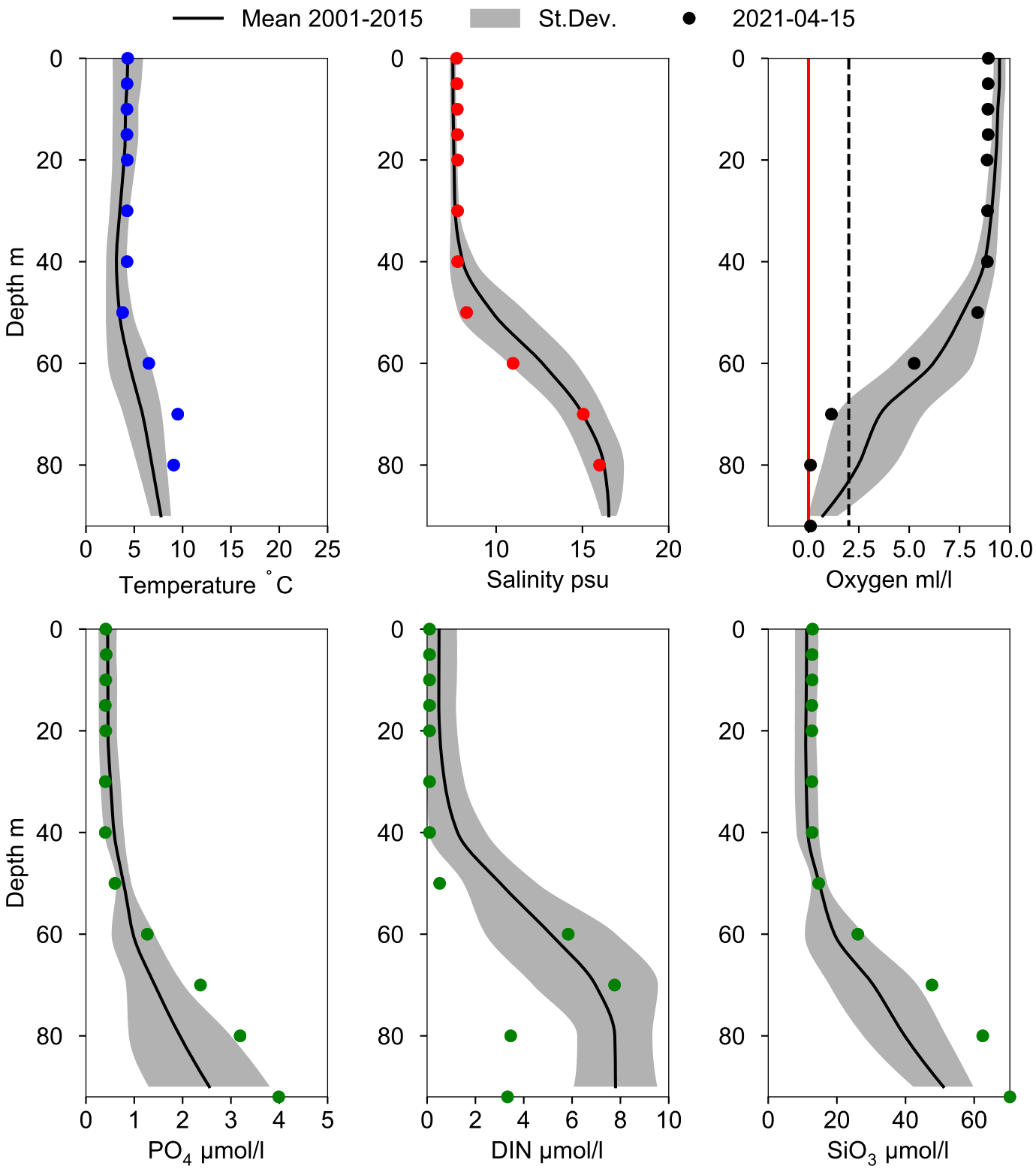
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 80 m)

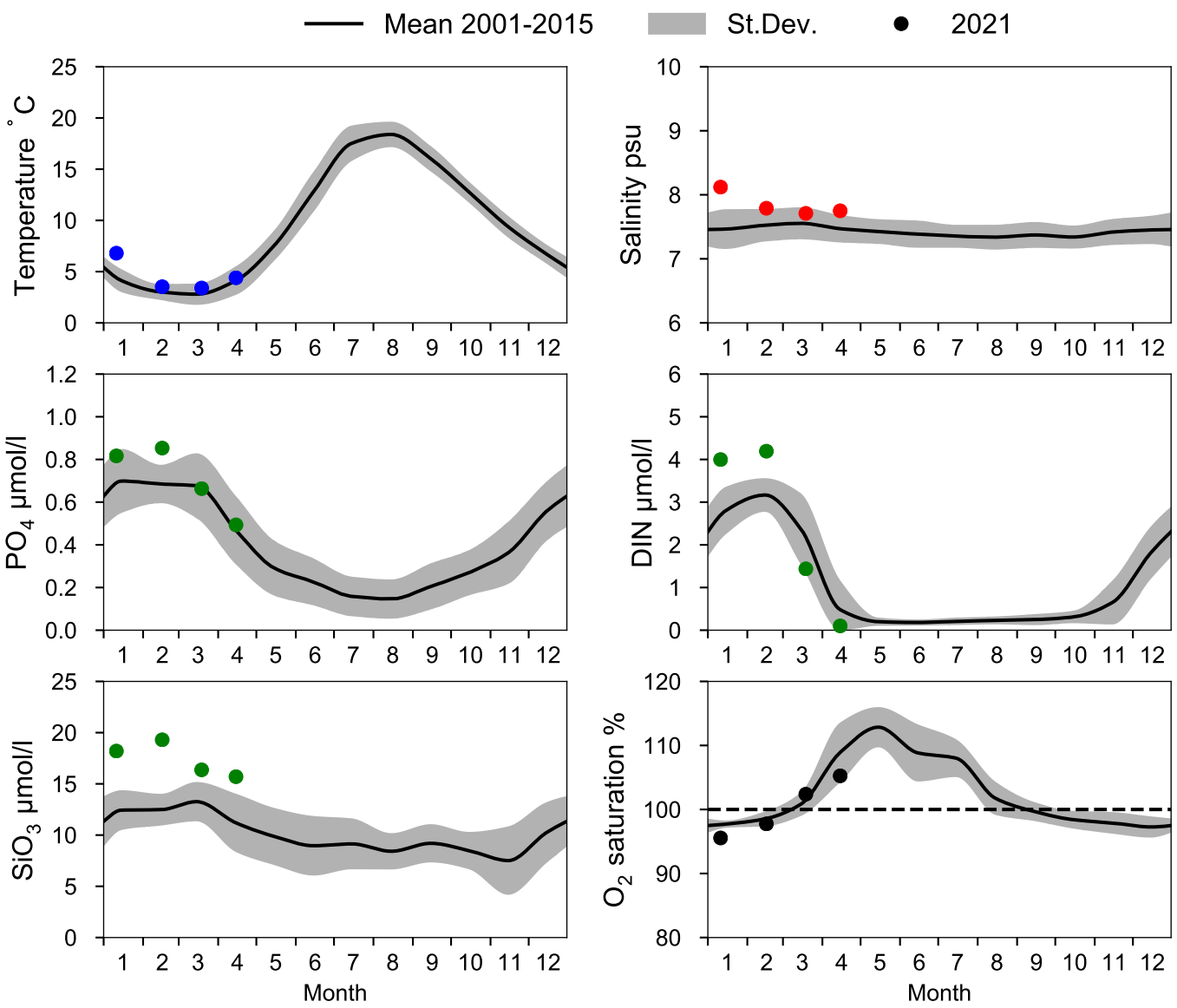


Vertical profiles BY4 CHRISTIANSÖ
April

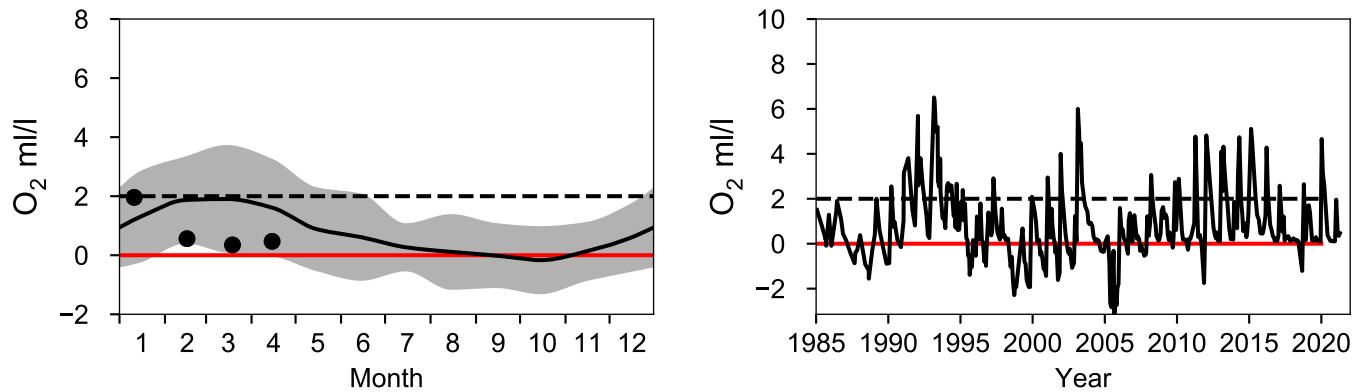


STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)

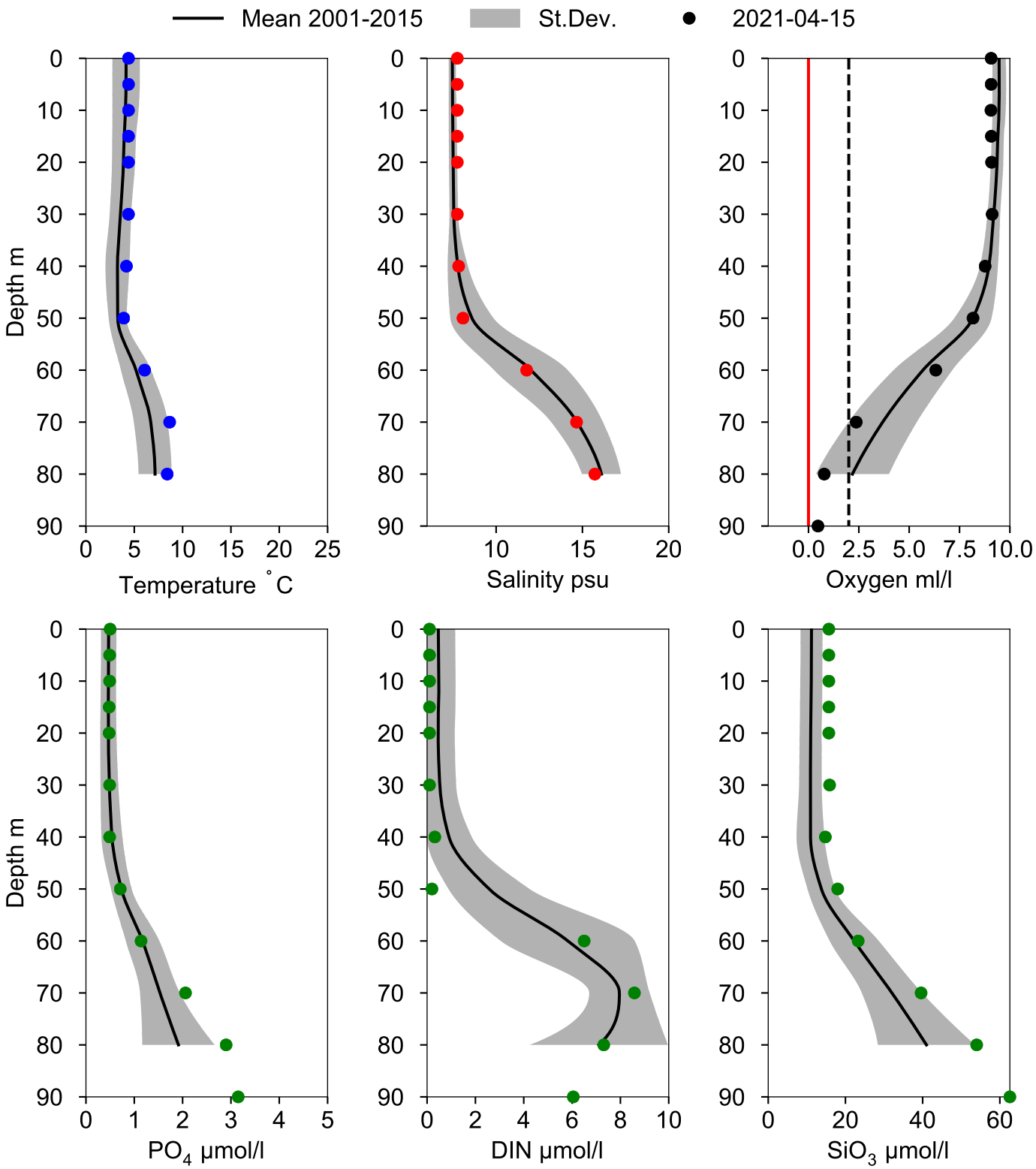
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 80 m)

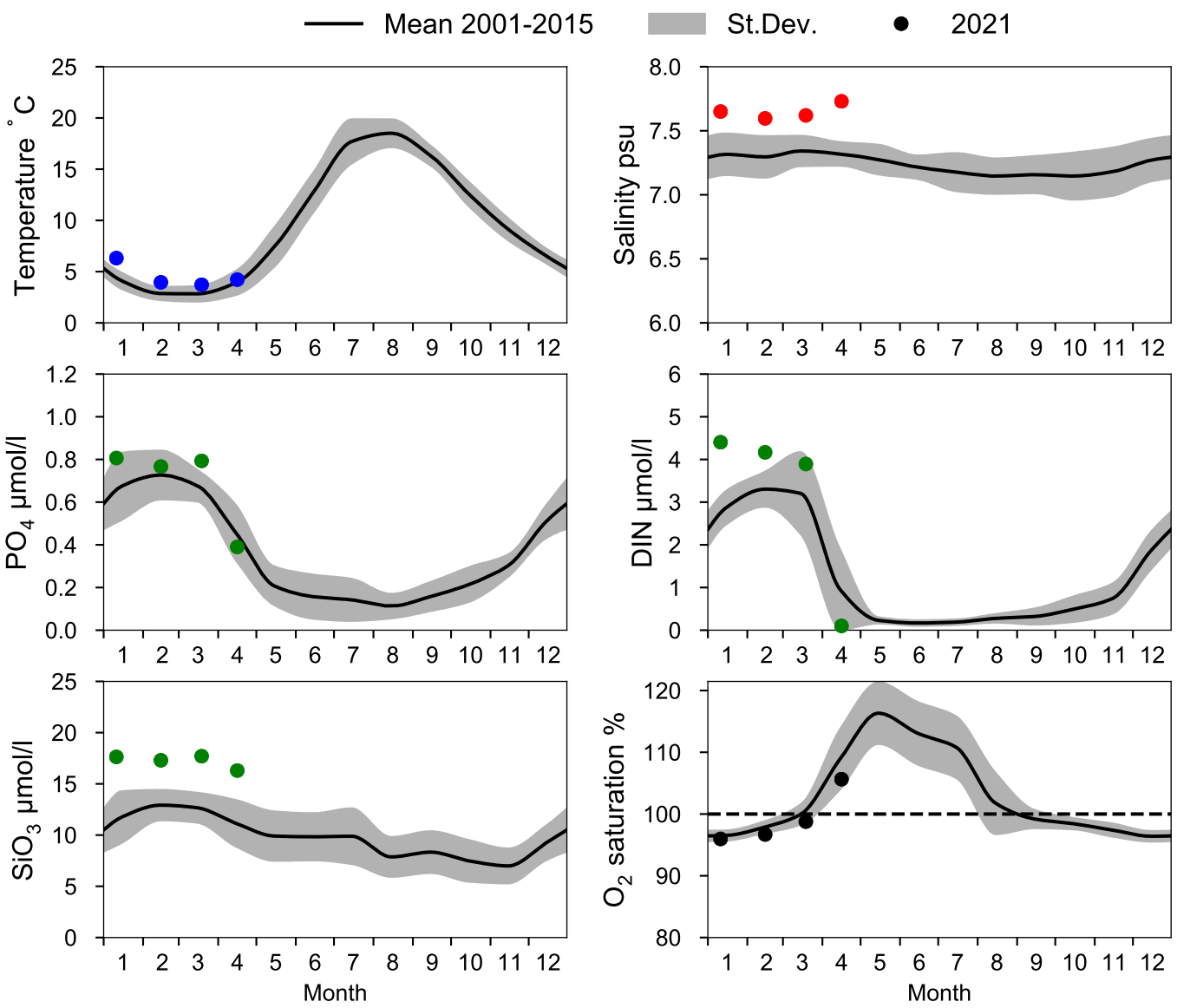


Vertical profiles BY5 BORNHOLMSDJ
April

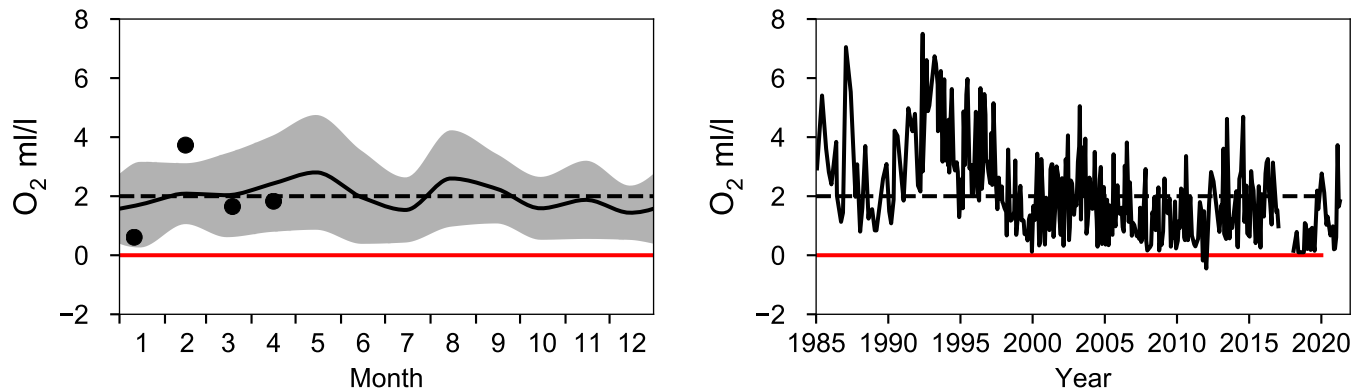


STATION BCS III-10 SURFACE WATER (0-10 m)

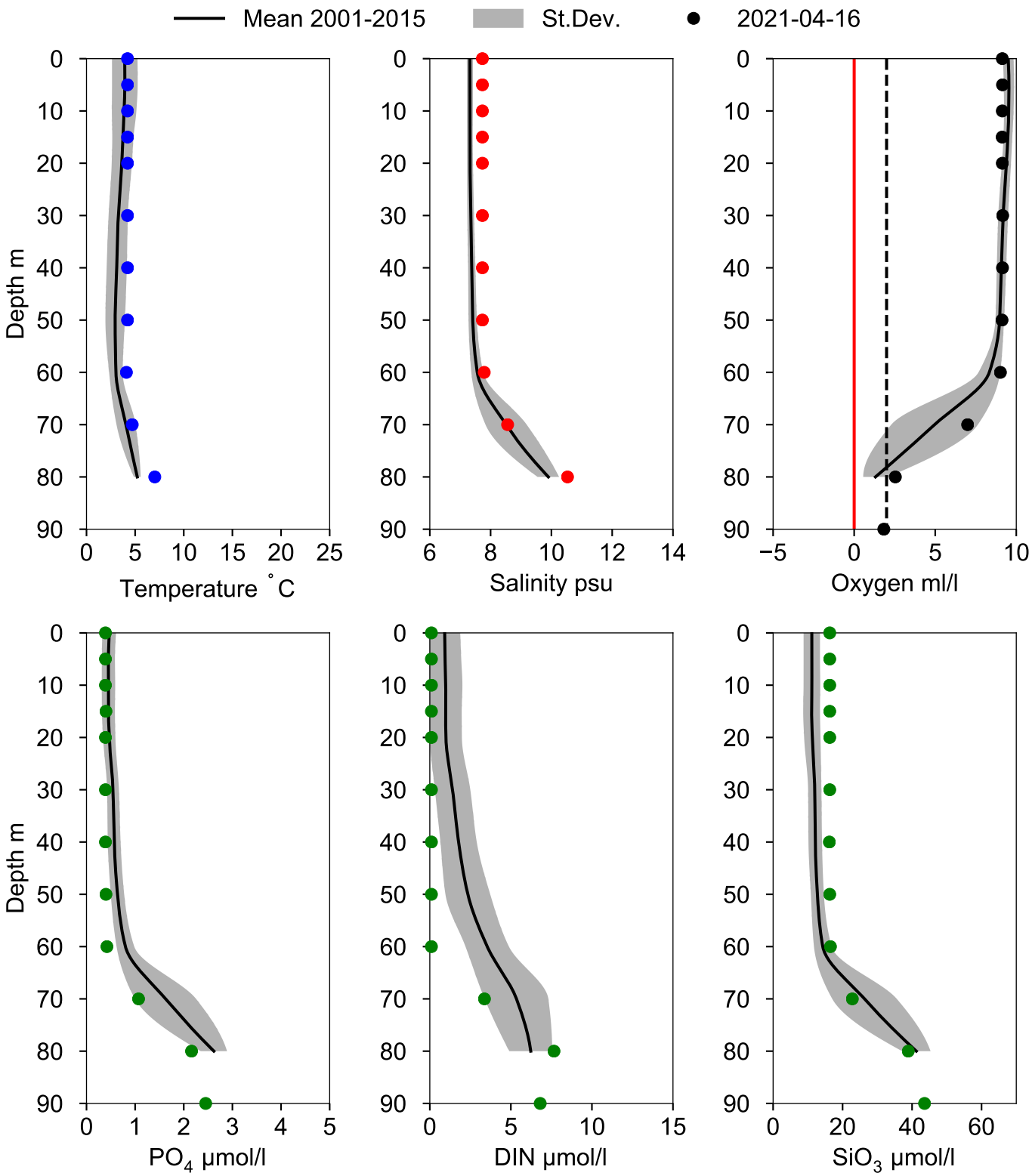
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 80 m)

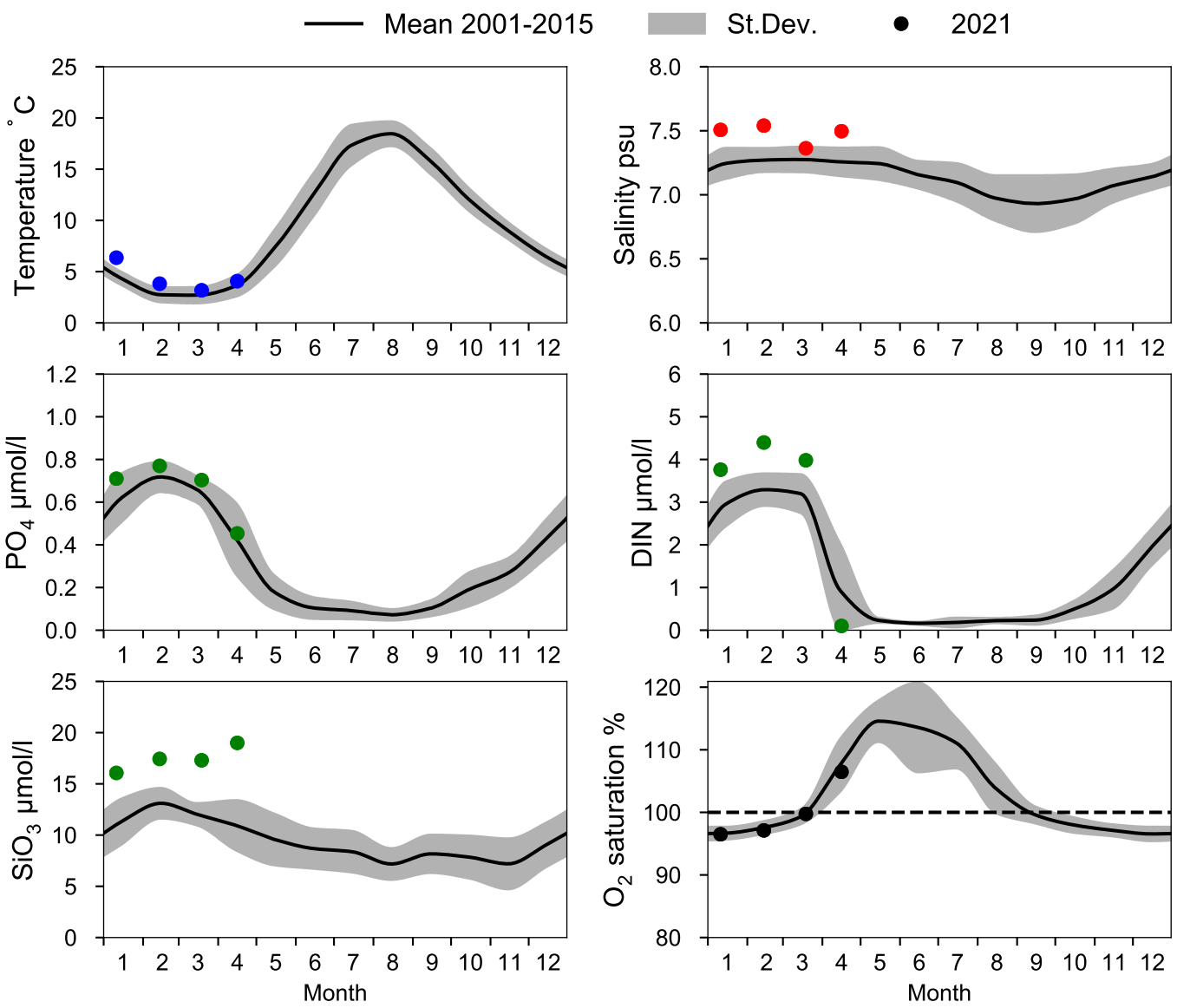


Vertical profiles BCS III-10
April

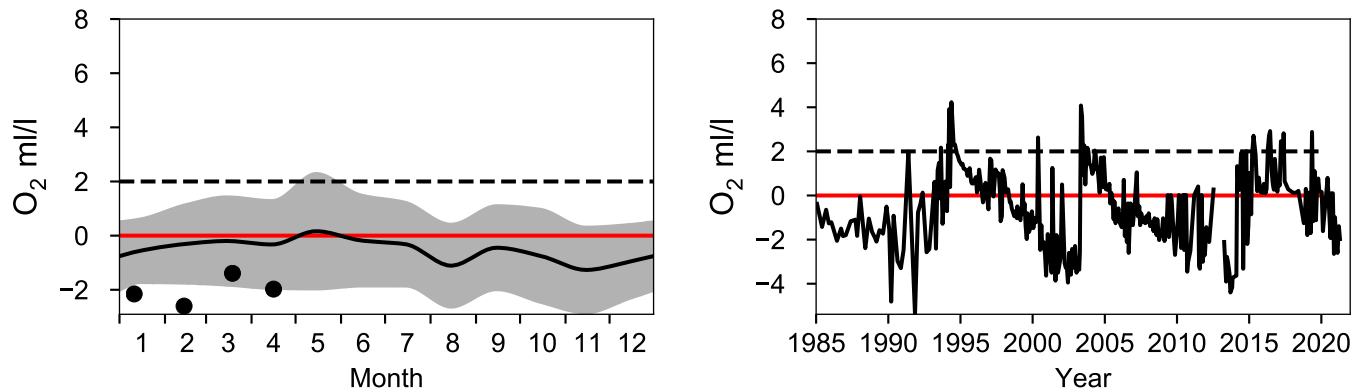


STATION BY10 SURFACE WATER (0-10 m)

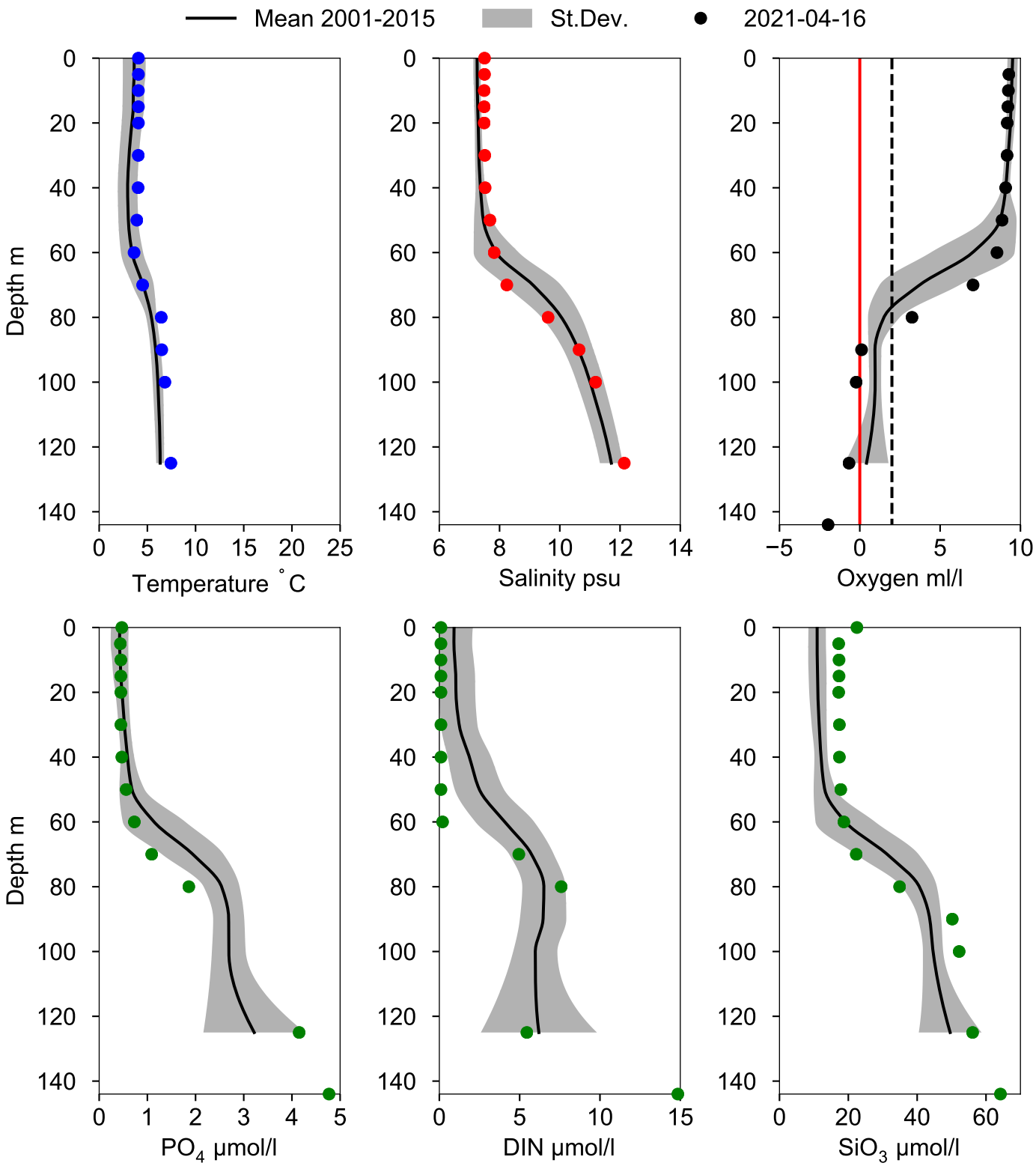
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 125 m)

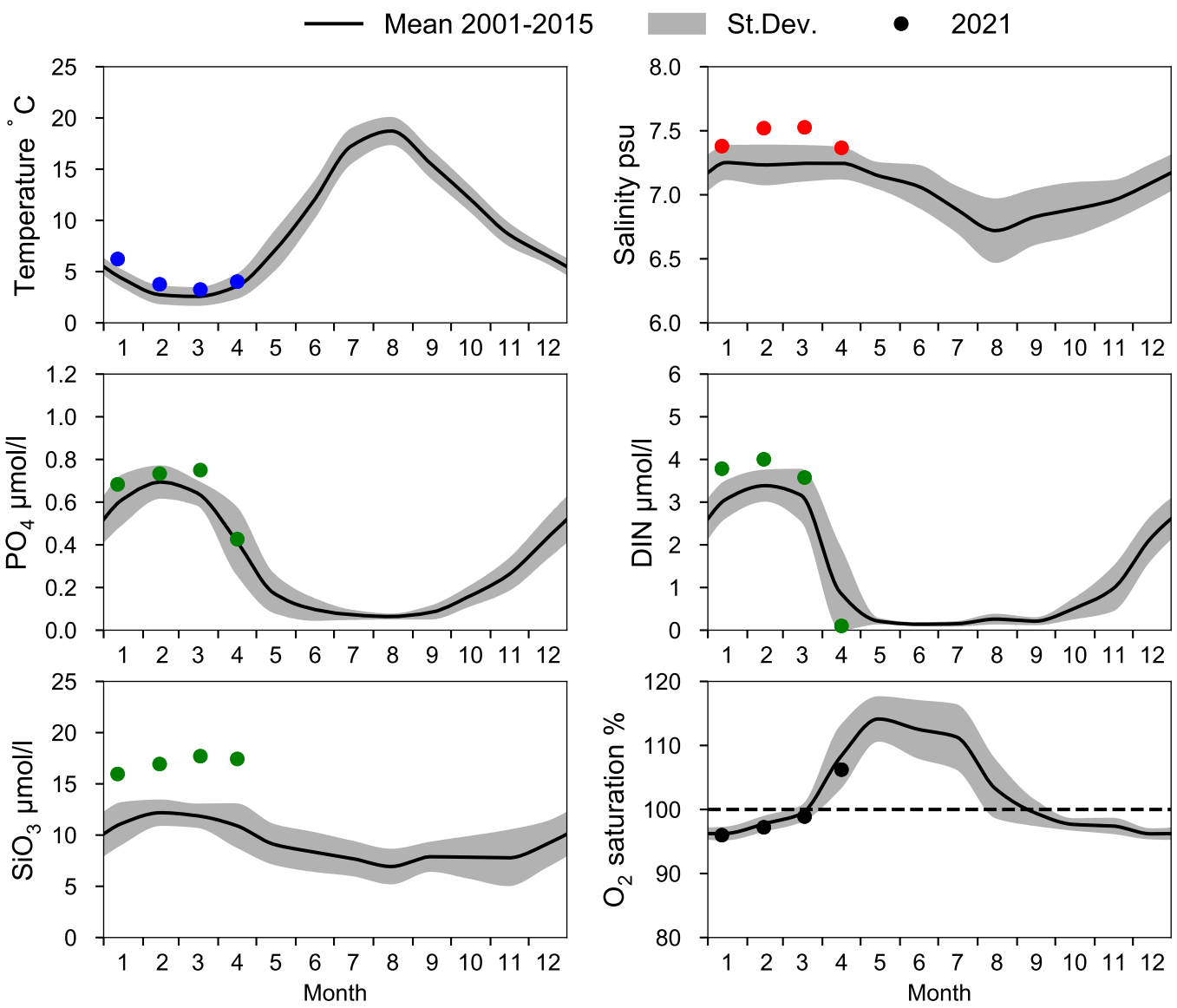


Vertical profiles BY10
April

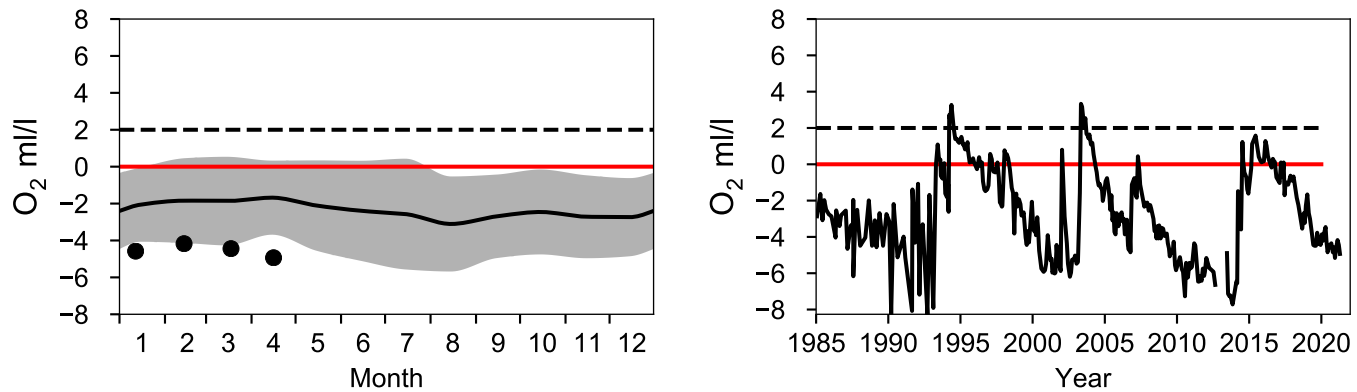


STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

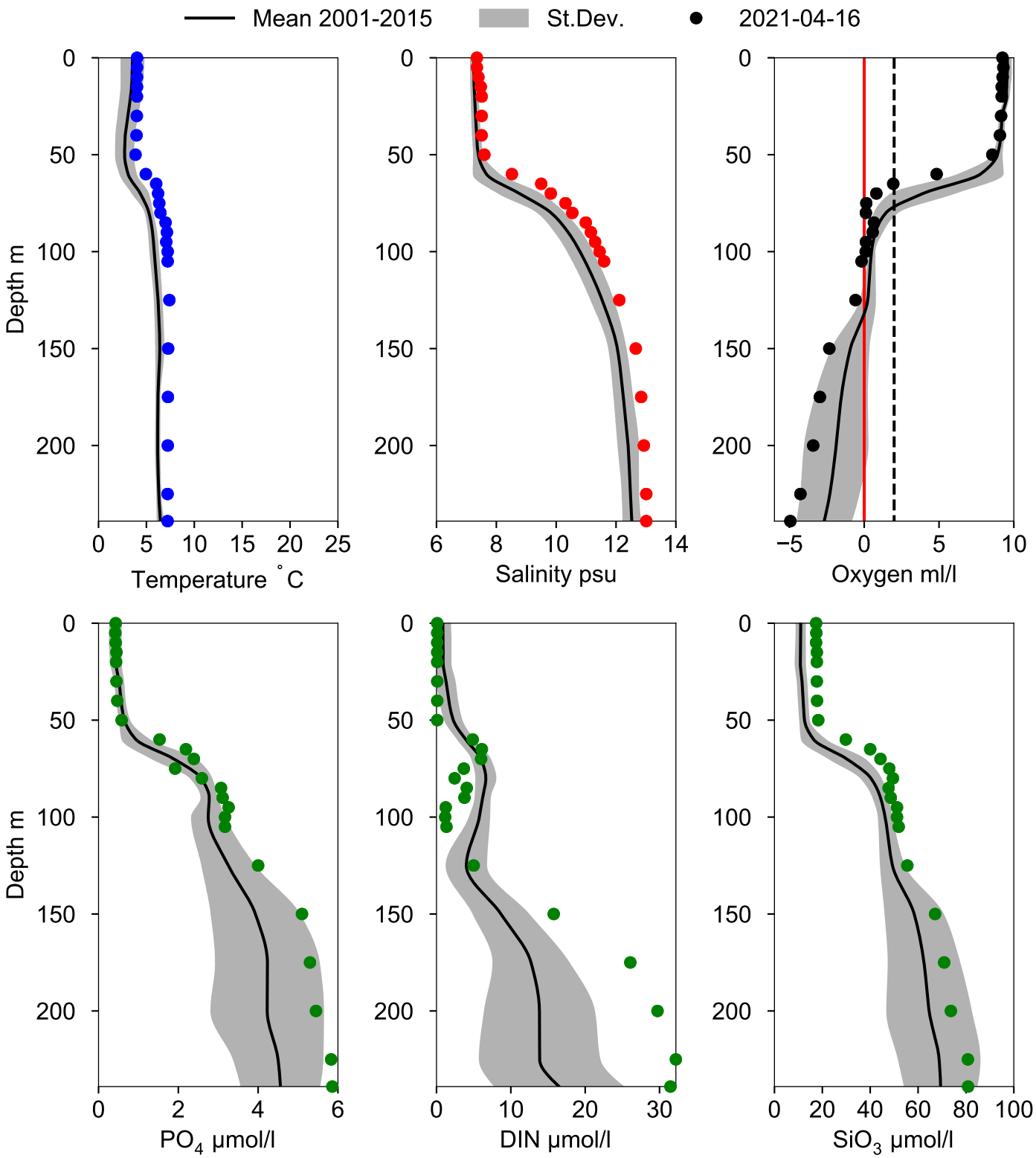
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 224 m)

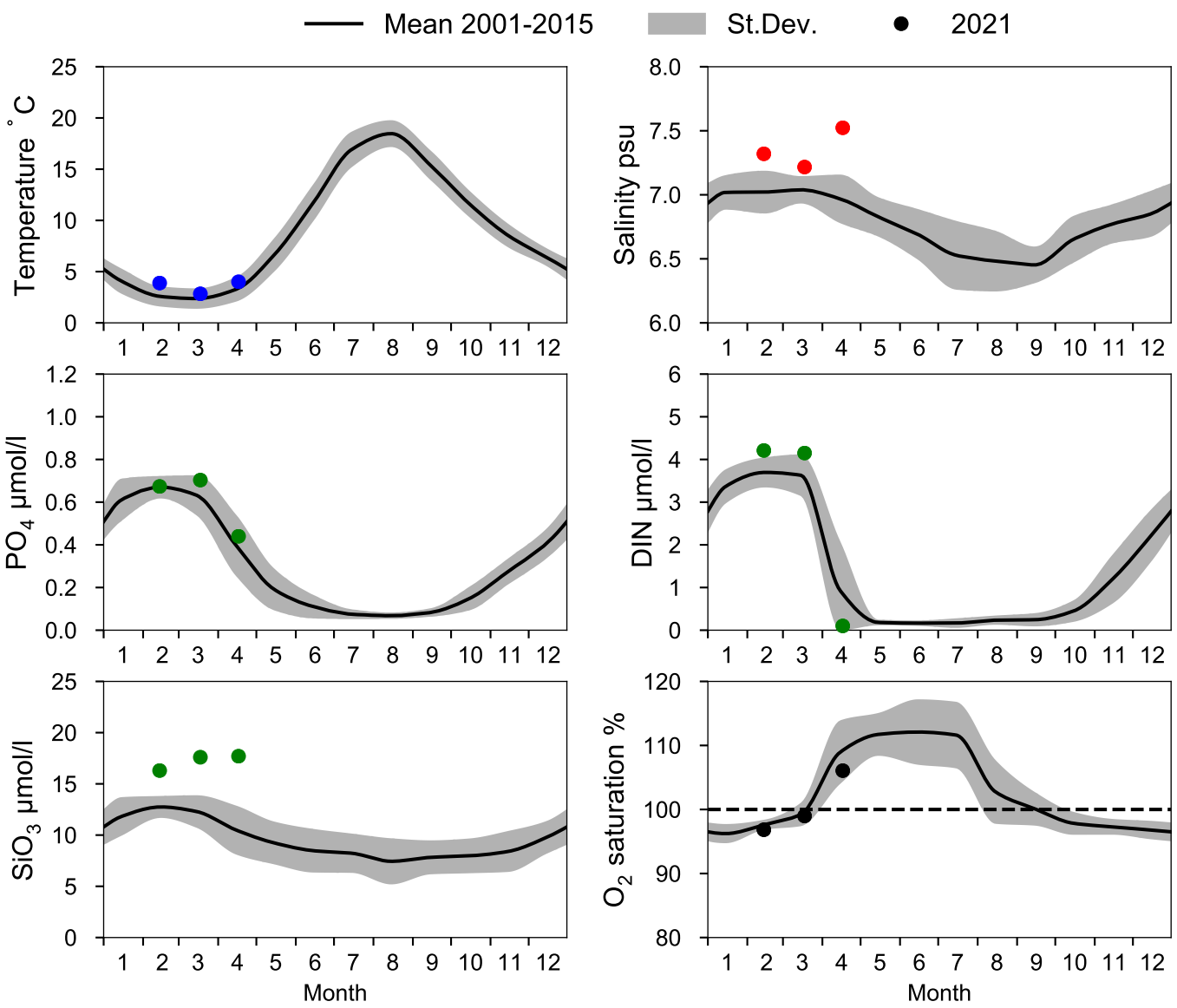


Vertical profiles BY15 GOTLANDSDJ
April

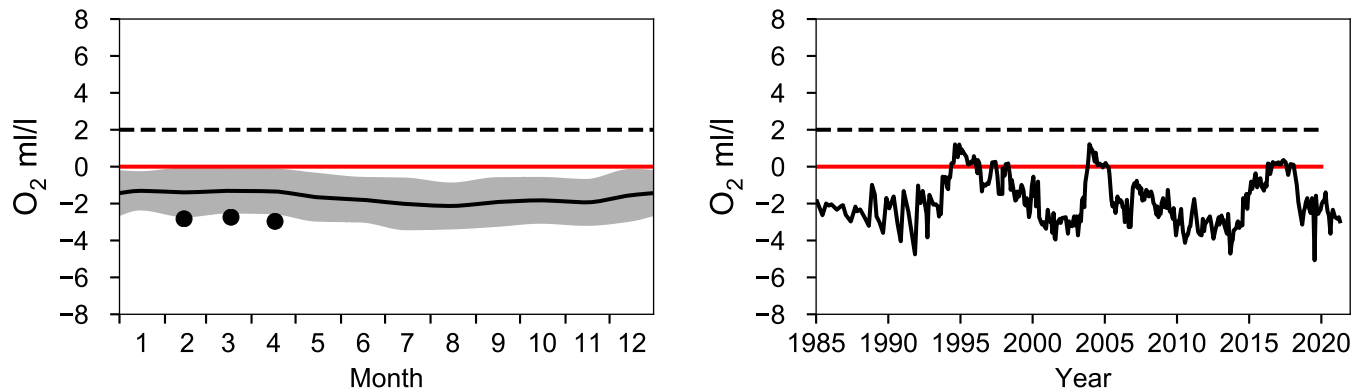


STATION BY20 FÅRÖDJ SURFACE WATER (0-10 m)

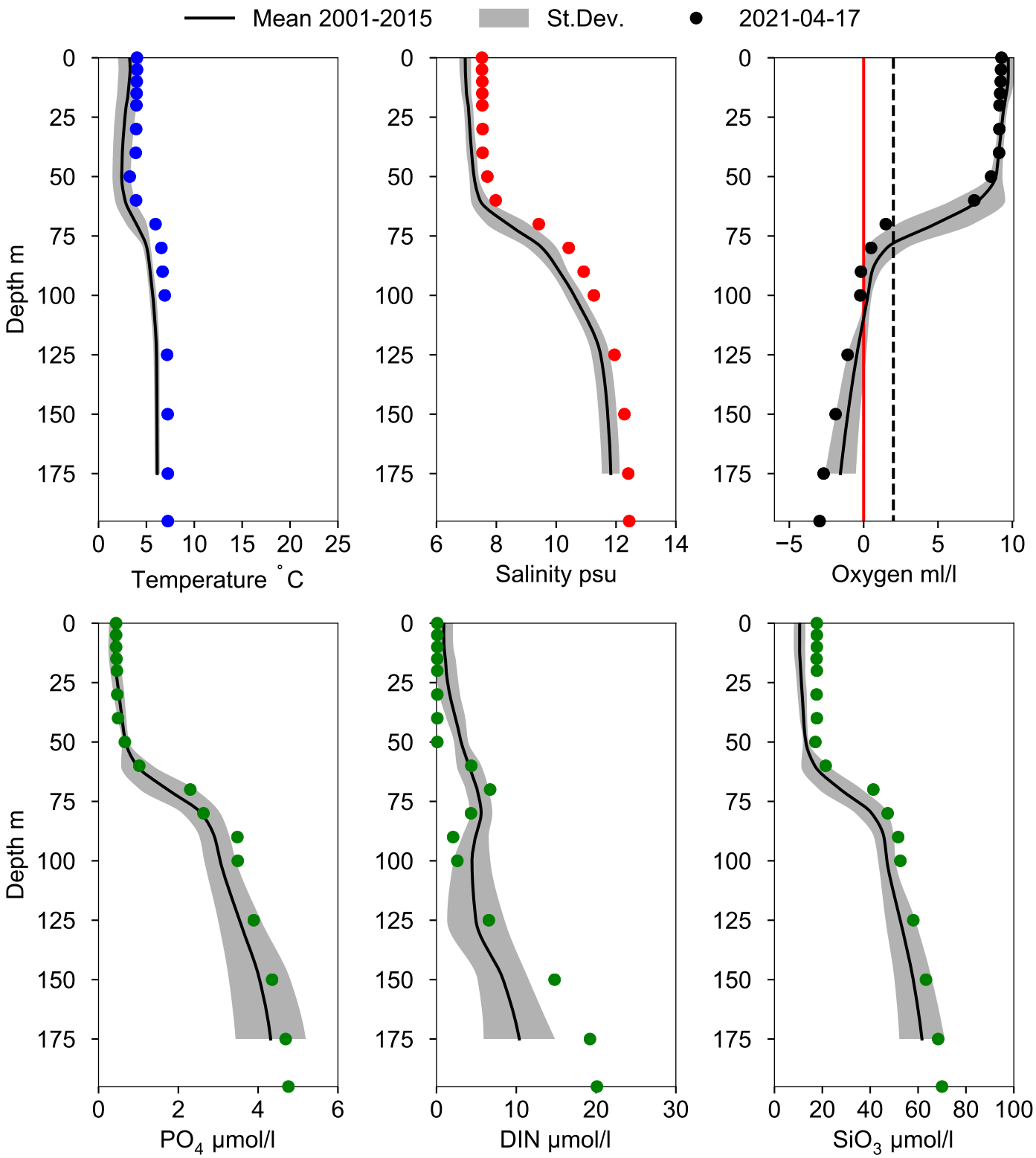
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 175 m)

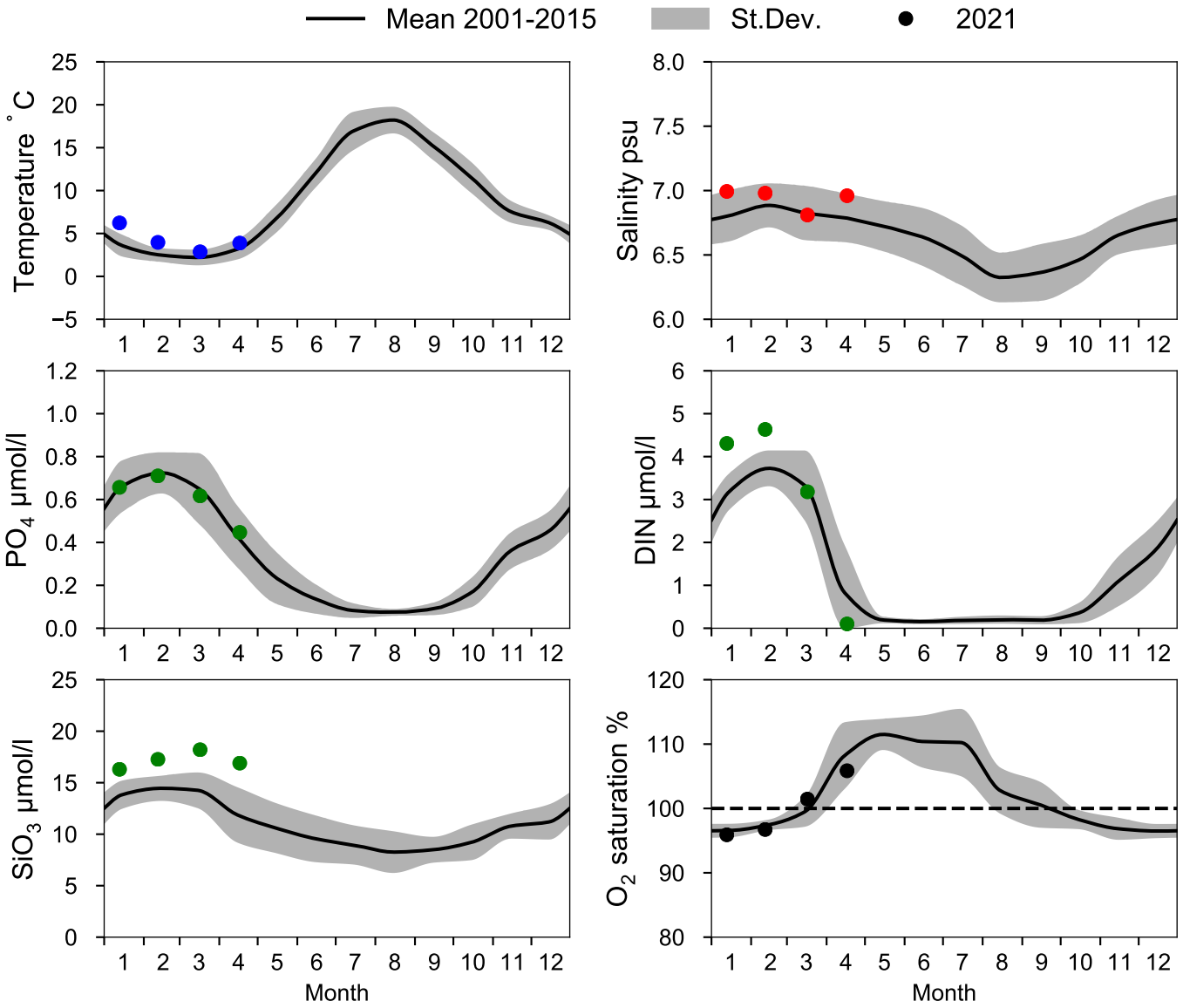


Vertical profiles BY20 FÅRÖDJ
April

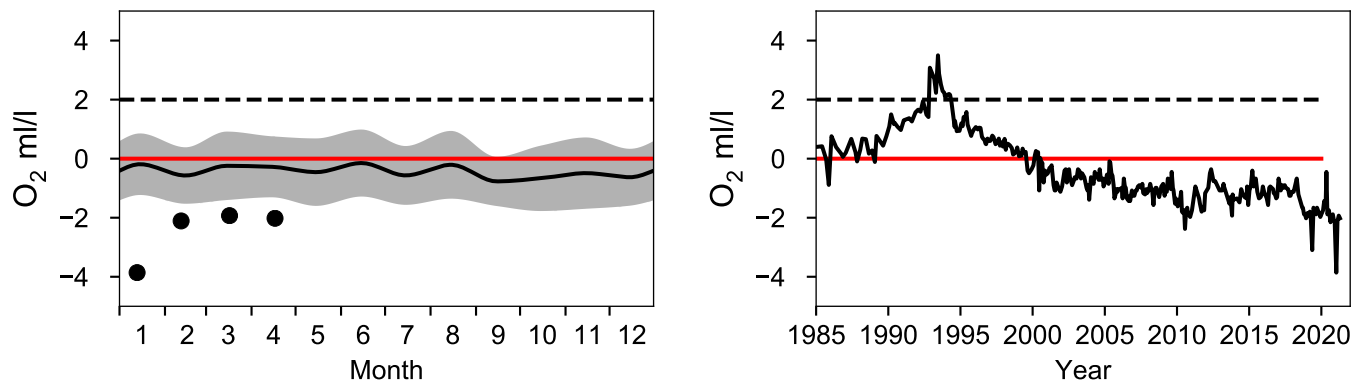


STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

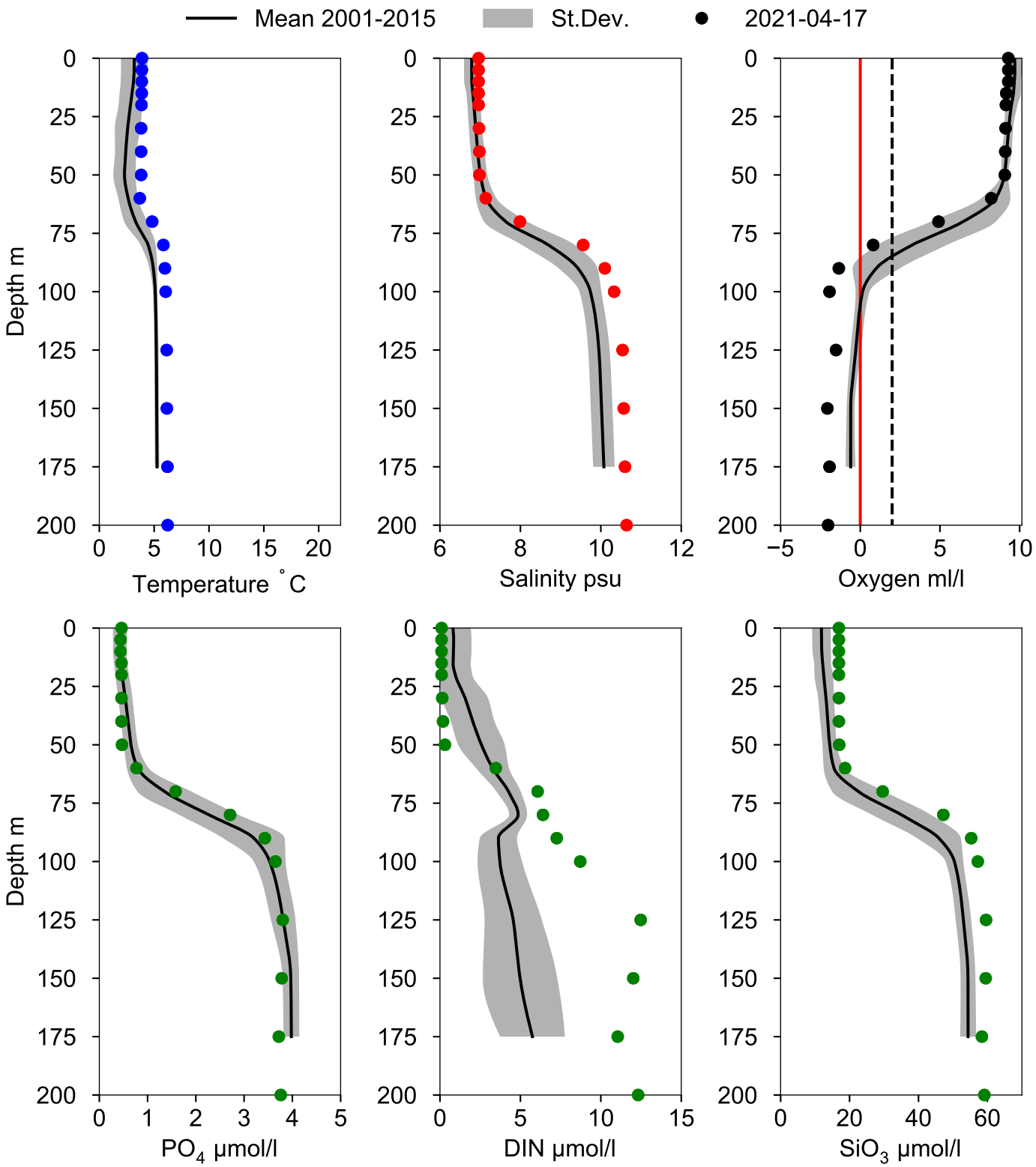
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 175 m)

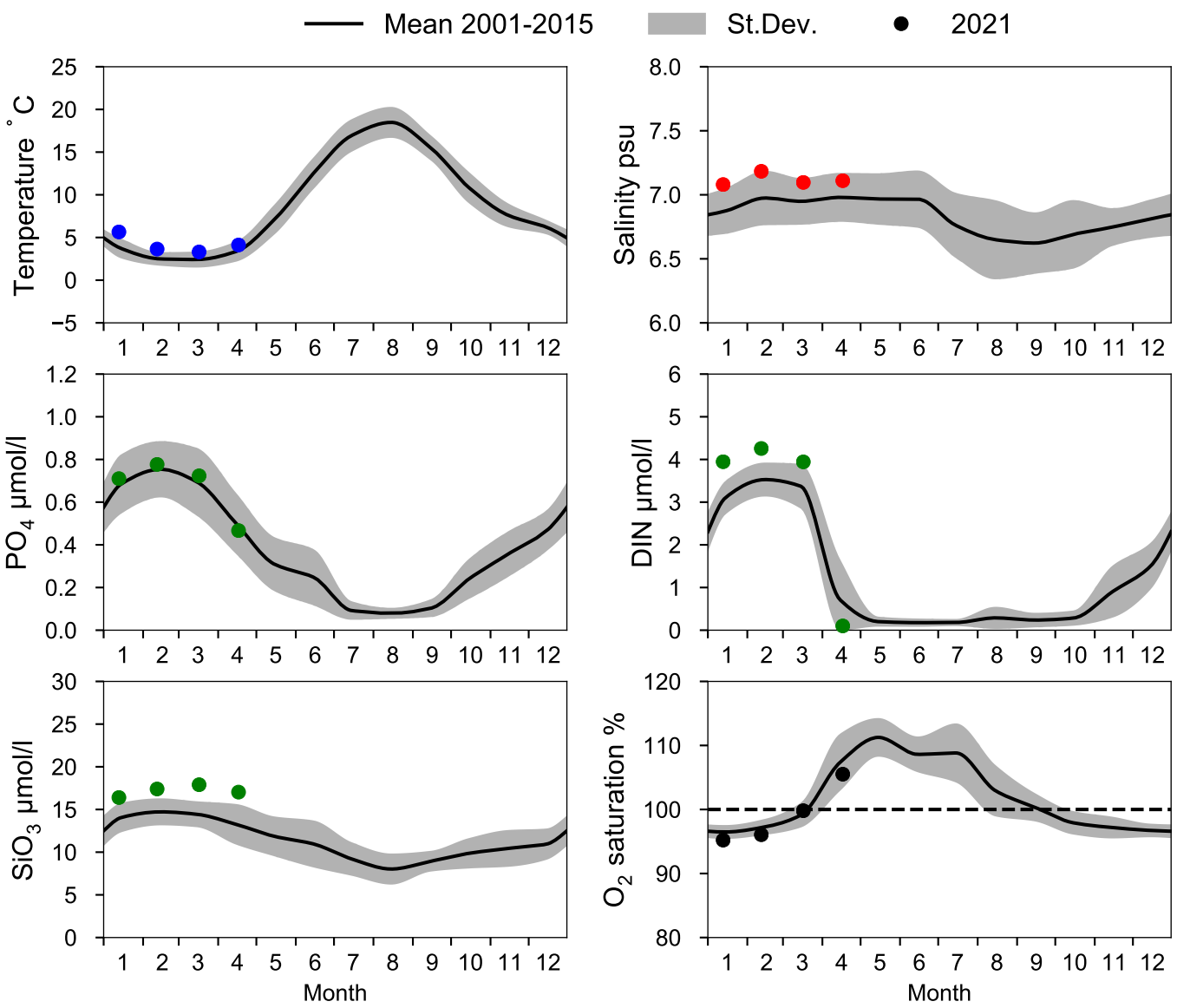


Vertical profiles BY32 NORRKÖPINGSDJ
April

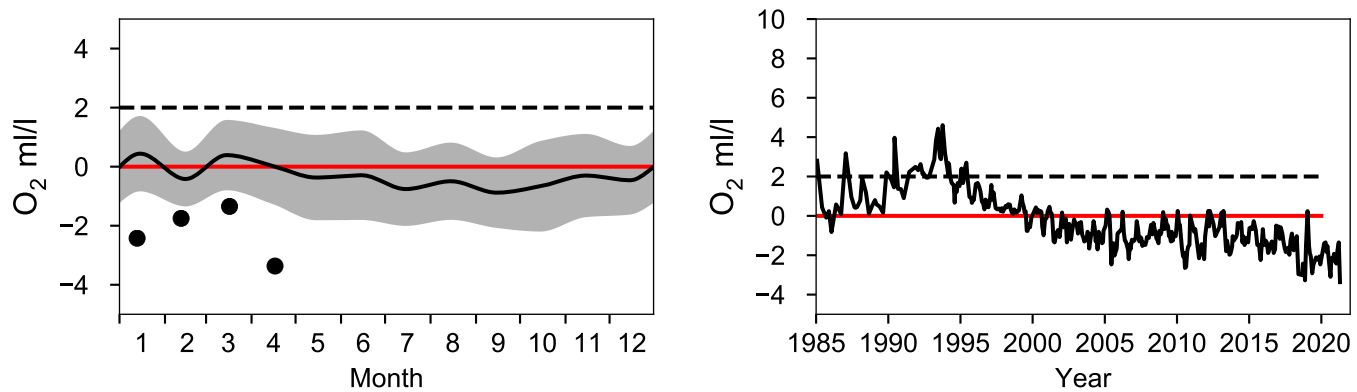


STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

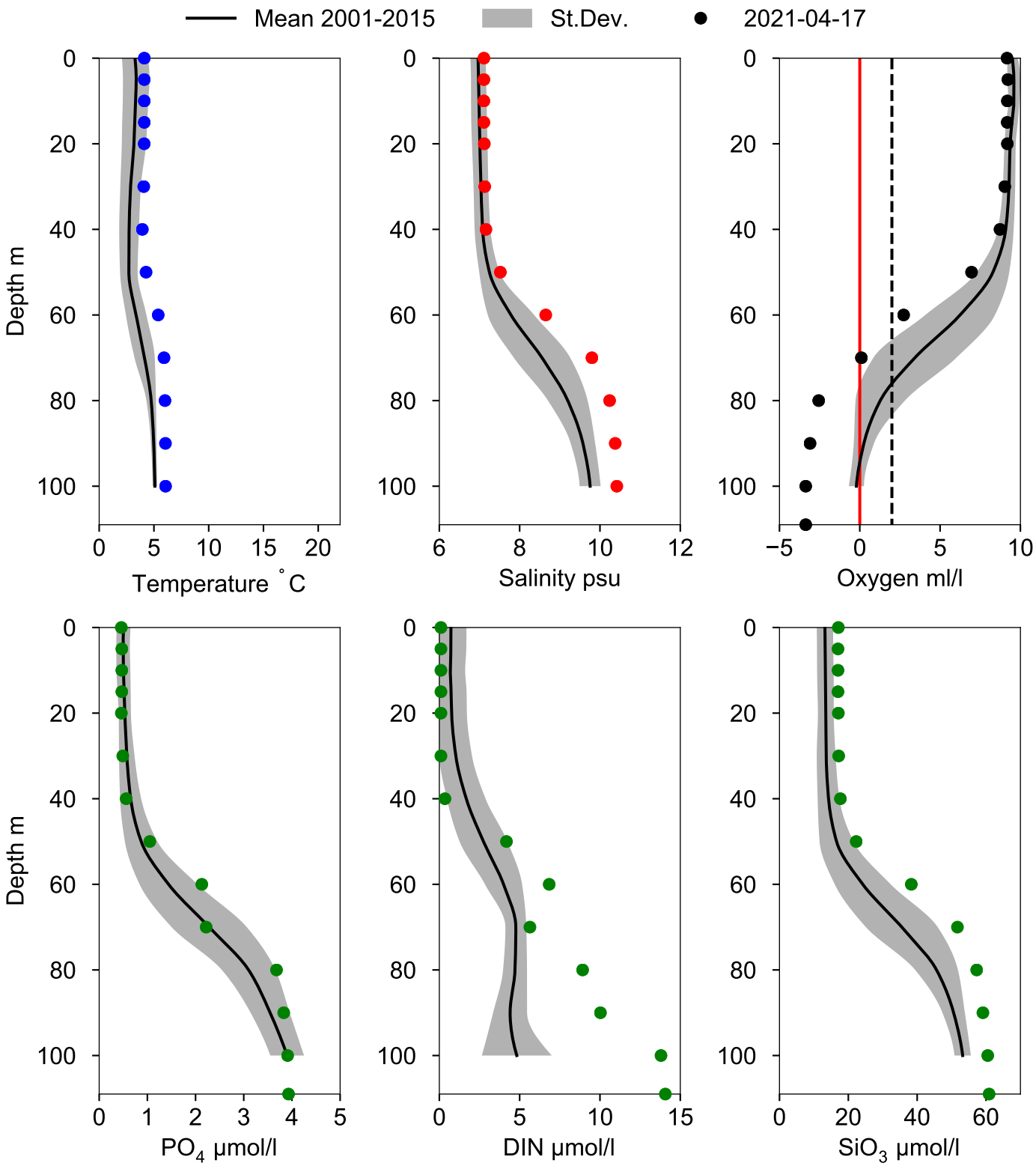
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 100 m)

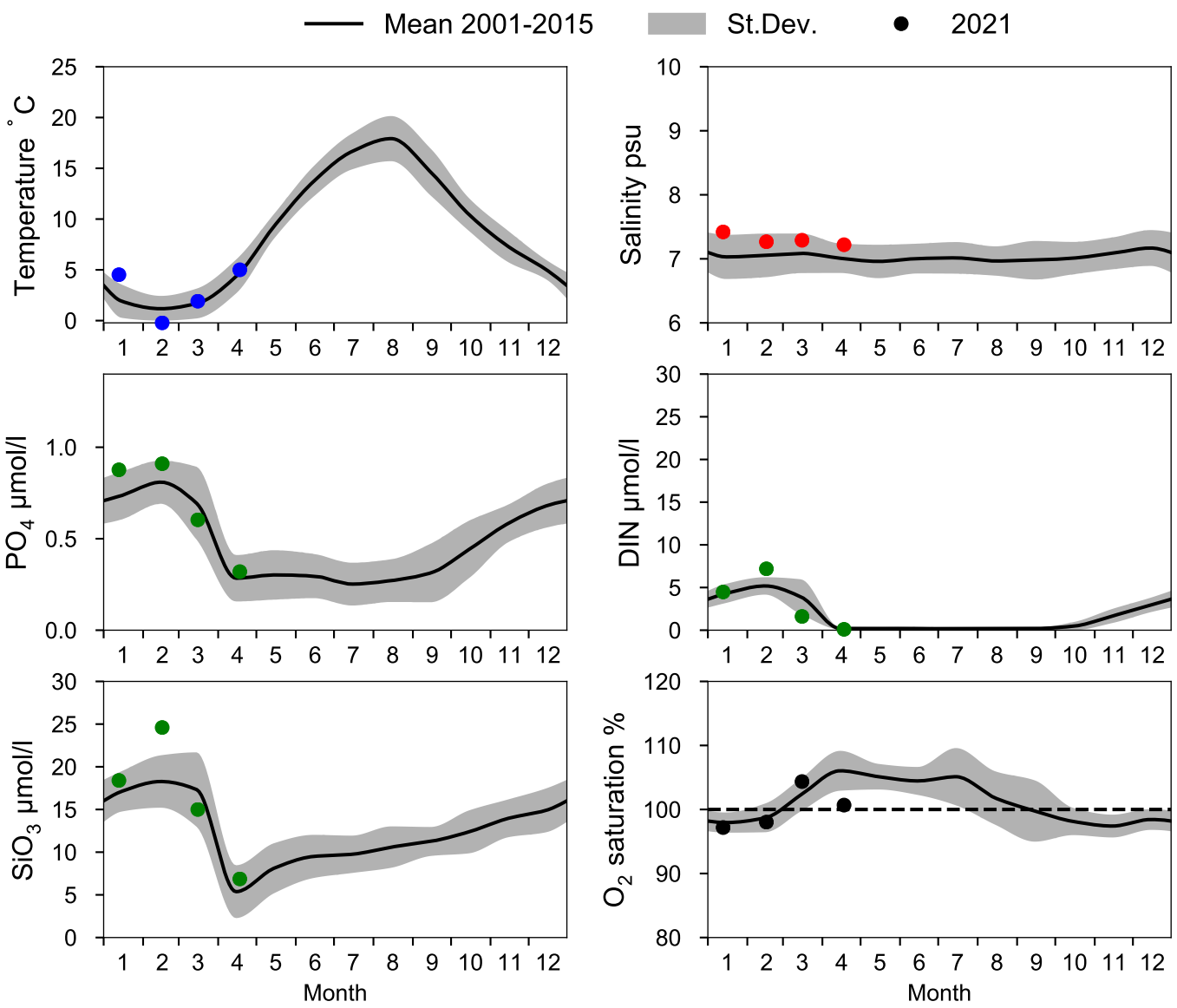


Vertical profiles BY38 KARLSÖDJ
April

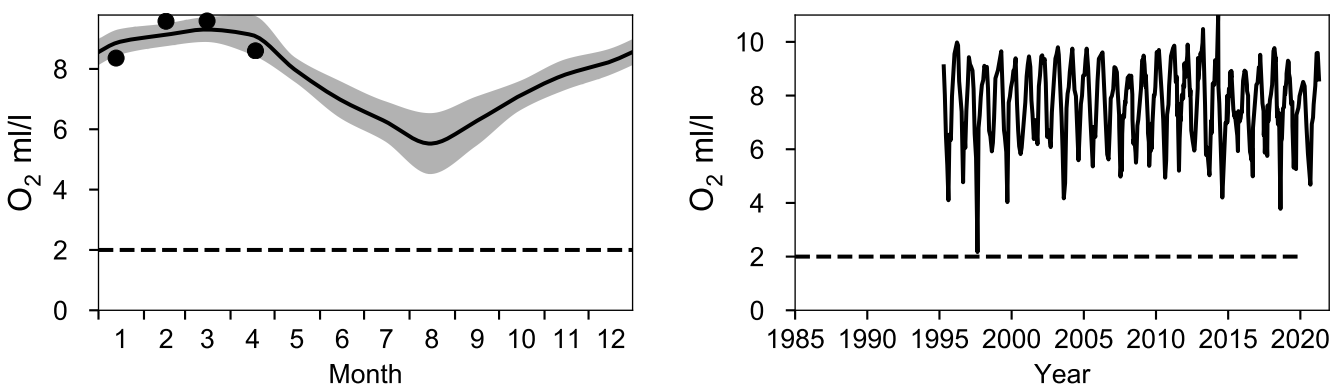


STATION REF M1V1 SURFACE WATER (0-10 m)

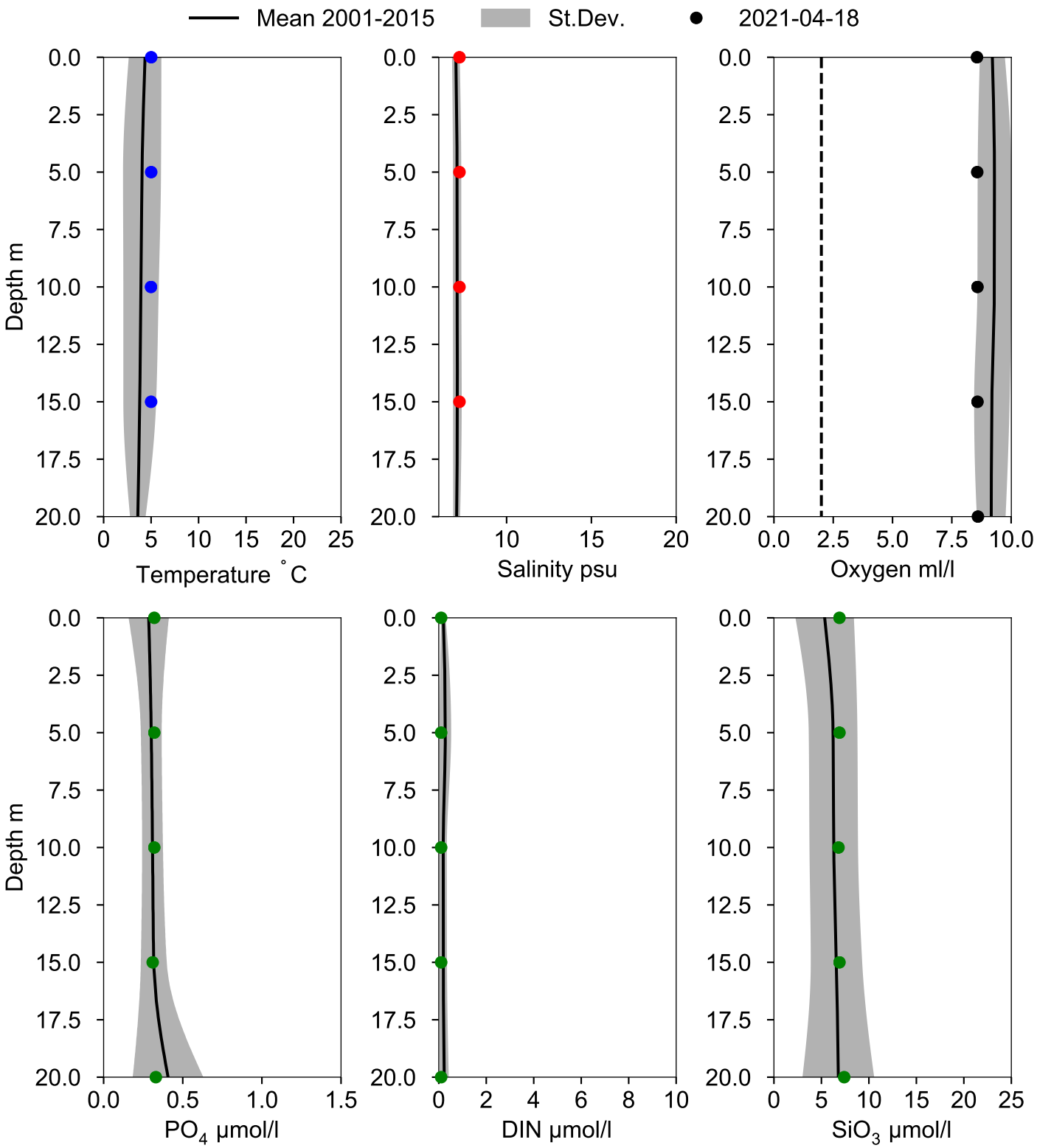
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 15 m)

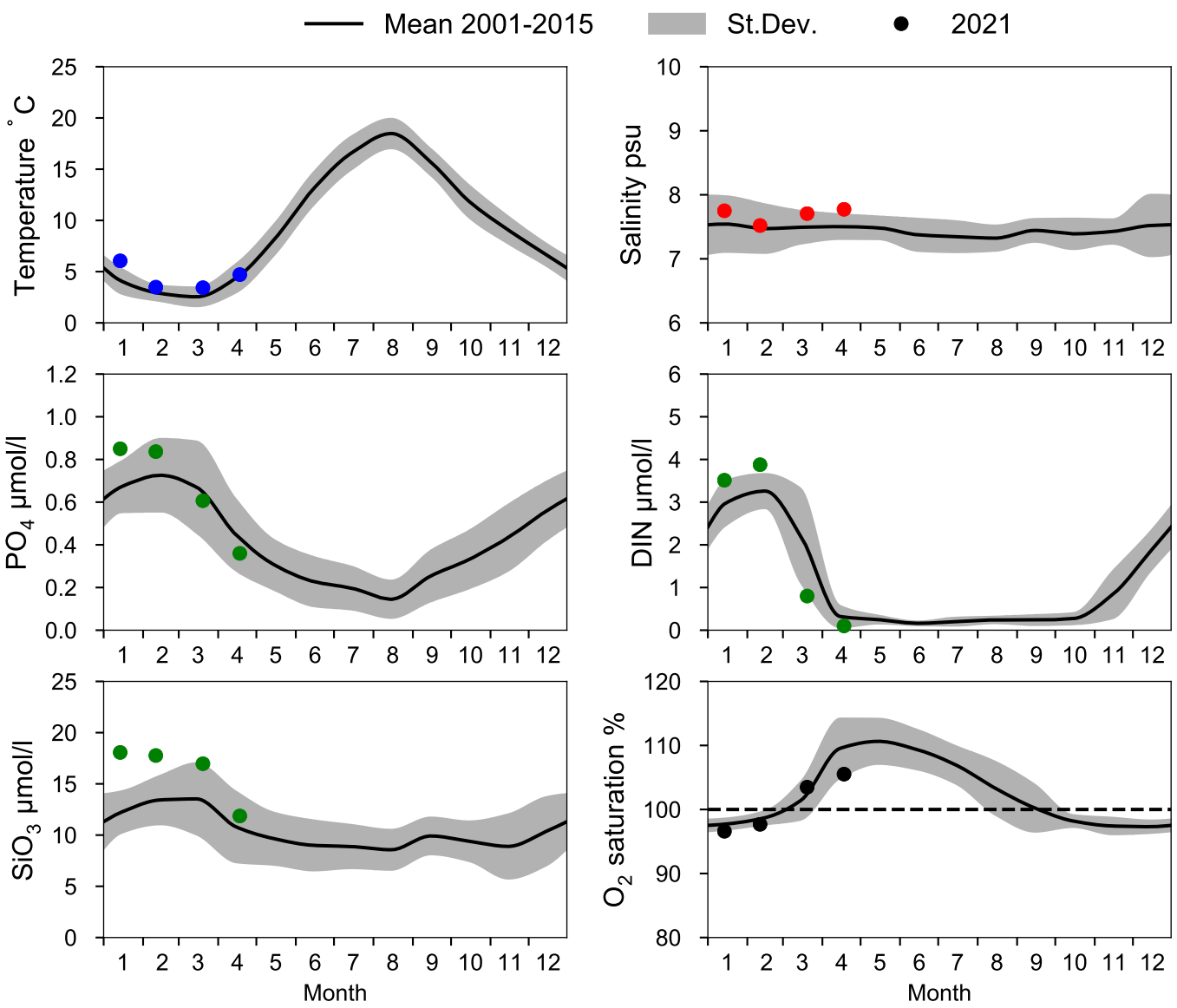


Vertical profiles REF M1V1
April

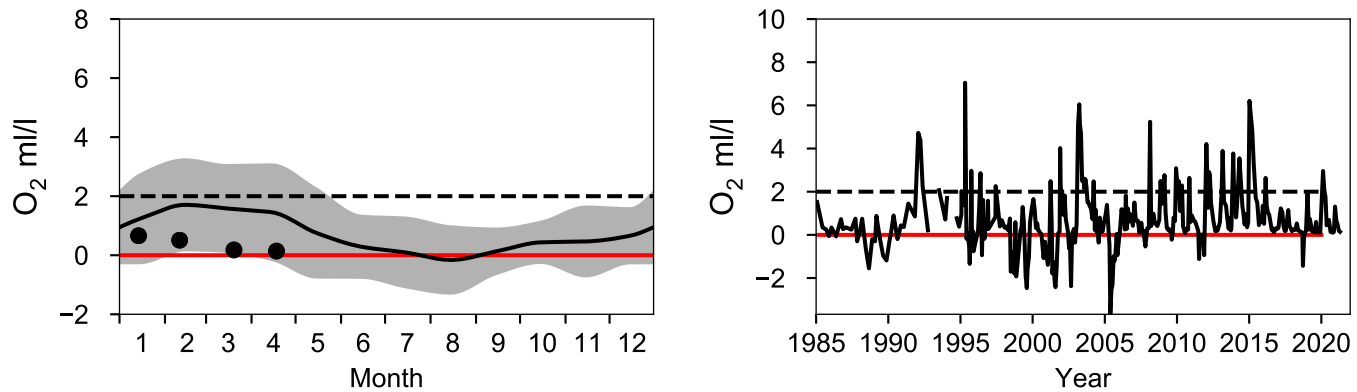


STATION HANÖBUKTEN SURFACE WATER (0-10 m)

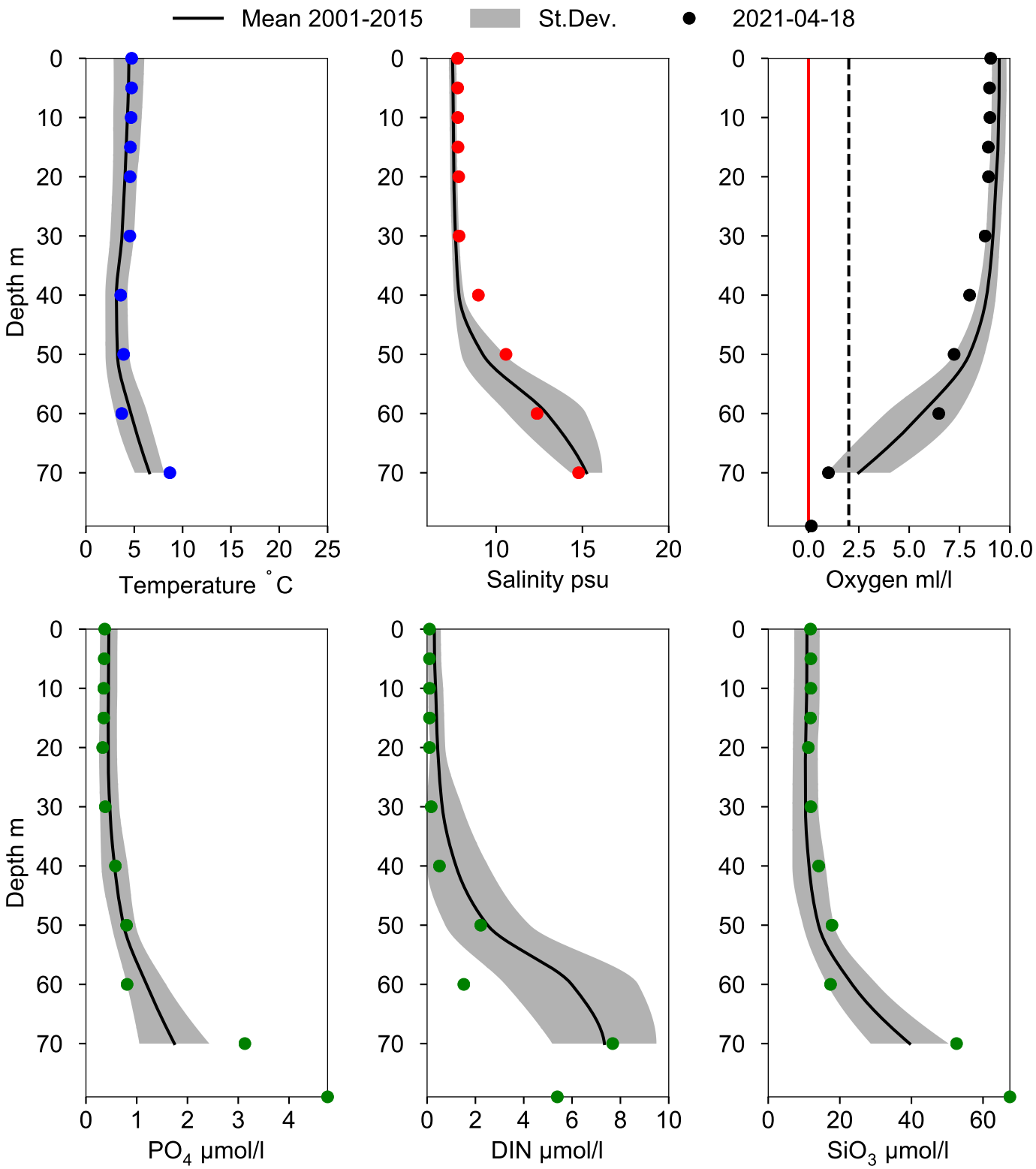
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 70 m)

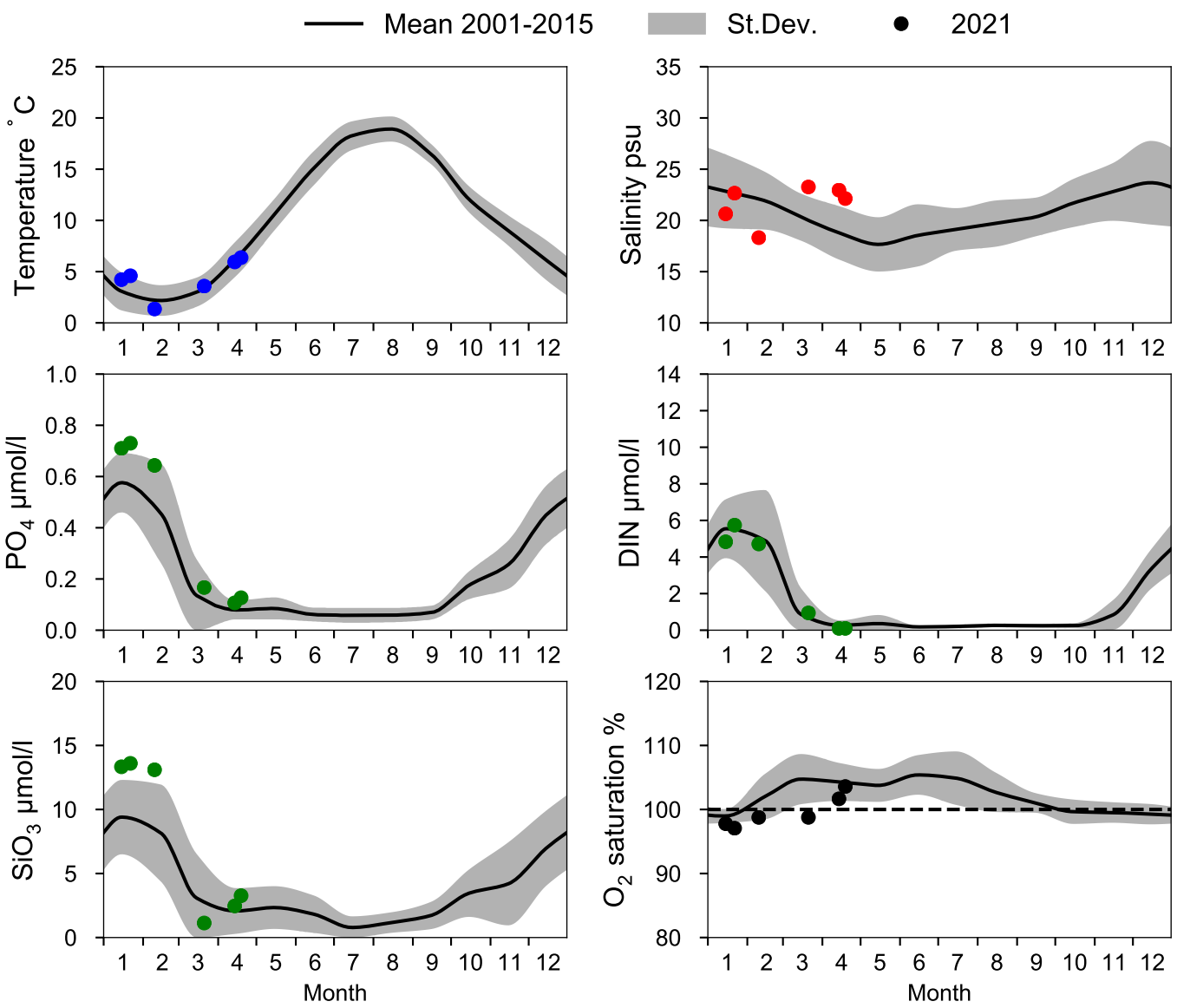


Vertical profiles HANÖBUKTEN
April

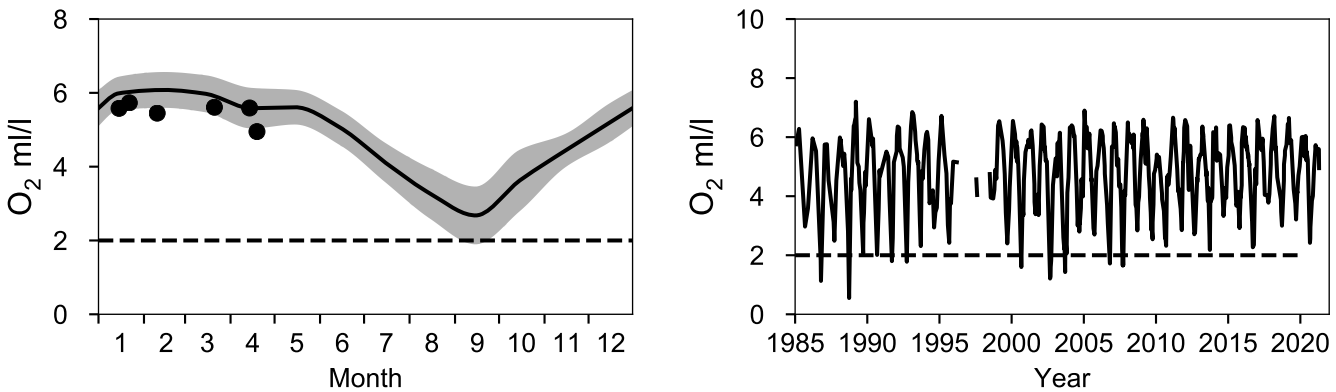


STATION ANHOLT E SURFACE WATER (0-10 m)

Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 52 m)



Vertical profiles ANHOLT E
April