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Report from the SMHIs monitoring cruise with R/V Svea

Photo: Ola Kalén, SMHI

Survey period:	2020-09-07 - 2020-09-13
Principal:	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 expedition, which is part of the Swedish national marine monitoring programme, the Skagerrak, the Kattegat, the Sound and the Baltic Proper were visited. There was a fresh to strong breeze from southwest during most of the cruise.

The surface water (0-10 m) in the northern parts of the Baltic Proper had for the season normal temperature. But in the Arkona Basin, the Bornholm Basin and the Bight of Hanö the sea surface temperature was above normal. In the Kattegat and the Skagerrak there were mostly normal sea surface temperatures. At most stations the sea surface temperature was 16-17°C. The lowest surface temperature was 15.5°C and this was at the coastal station Ref M1V1 between Öland and the main land. The sea surface salinity was still above normal seasonal values in the Baltic Proper, and was 7-8 psu. Sea surface salinity in the Kattegat and the Skagerrak was mostly normal.

Concentrations of dissolved inorganic nitrogen in the surface water (0-10m) were at most stations low, and at many stations below level of detection, which is normal for the season. Levels were above normal for the season at 5 stations, and the highest concentration was found at BCSIII-10 in the south eastern part of the Baltic Sea with just over 0.5 µmol/l. Concentrations of phosphate in the surface water were mostly normal for the season, but at one stations in the Skagerrak and in the Sound concentrations were below normal, and three stations in the Baltic Proper had concentrations above normal. Levels of silicate were in general above normal for the season in the Baltic Proper, and below normal in the Kattegat and the Skagerrak.

In the Skagerrak and the Kattegat the oxygen concentrations in the bottom water were mostly good, but at Släggö and at Anholt the concentration was below 3 ml/l. And in the Sound it was only 2.2 ml/l. In parts of the Arkona Basin and the Bornholm Basin, the Bight of Hanö and in the southeastern parts of the Baltic Proper oxygen deficiency (< 2 ml/l) was found in the bottom water. In both eastern and western Gotland Basin oxygen deficiency was found from 70 meters depth, and anoxic conditions with hydrogen sulfide present were found from 80-90 meters depth.

Next expedition is planned to 16th -22nd of October with R/V Svea.

RESULTS

The cruise was performed with the Swedish research vessel Svea and started in Lysekil on September the 6th and ended in the harbour of Falkenberg on the 13th of September. After the cruise, R/V Svea went to shipyard for warranty work.

The weather during the expedition was good with mostly a fresh to strong breeze. The air temperature was about 15°C.

Just as in August, 25 of the 25 planned stations were sampled. At some of the stations extra sampling of phytoplankton for Uppsala University was performed. Extra sampling of water and plankton were also made for selen measurements for EAWAG (Swiss Federal Institute of Aquatic Science and Technology). Two scientists from EAWAG participated during the cruise and they took additional samples for selen measurements at several stations. One scientist from Stockholm University was also onboard during the cruise for sampling of plankton and water.

In addition to the regular sampling program, Svea's instruments for measuring profiles during transit, the MVP (moving vessel profiler), were used. Profiles of temperature, salinity and oxygen were continuously measured at 4 transects; on the way out from Lysekil towards Å17, in the southern Baltic Proper between BY5 and BCSIII-10, in the eastern Gotland Basin from BY10 via BY15 to BY20, and in the western Gotland Basin from BY38 to BY39.

This report is based on data that have passed a first quality control. When data are published at the national oceanographic data centre 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 expedition and will be published later.

Data and reports can be downloaded here: https://www.smhi.se/en/theme/marine-environment-2-885

The Skagerrak

The surface water (0-10 m) temperature was between 16-17°C, which was some above normal at Å13 and Å15, and normal for the season at the other stations. The salinity in the surface water was mostly normal, and varied from just above 27 psu at Släggö to almost 33 psu at P2. At P2 the water was well mixed from the surface down to 70 meters, but at the other stations there was a very thin surface layer with lower salinity. This is visible in the vertical profiles, and the surface value at both Å13 and Å15 has lower salinity then normal. A thermocline separated the warmer water in the surface from the colder deep water, and it was very distinct at Å13 and P2. The thermocline coincided at several stations with a weak halocline which was found at 40-80 meters depth.

Concentration of phosphate in the surface water was below normal for the season at P2, and normal at the other stations. Measured levels were 0.03-0.11 µmol/l. For dissolved inorganic nitrogen the concentration in the surface water was below detection limit (<0.1 µmol/l) at P2, and just above detection at Å17. At the other stations it was about 0.35 µmol/l. Only Å15 had levels above normal, the other stations had normal levels. Concentration of silicate in the surface was 0.7 to 2.0 µmol/l. Highest concentration was found at Å15, where it also was above normal. Lowest levels were found at Å17. The concentration of nutrients in the deep water was generally normal, except at Å17, where silicate concentration at 50-150 meters depth were slightly below normal.

No distinct peak in chlorophyll fluorescence was found at any station. Measurements with the sensor on the CTD showed levels of activity from the surface down to as deep as 90 meters. Highest levels were found at about 10 meters depth at Å14.

Oxygen level in the bottom water was almost the same as in August, with about 5 ml/l at the stations in open sea and only 2.7 ml/l at the coastal station Släggö.

The Kattegat and the Sound

Sea surface temperature was 16-17°C, coldest at W Landskrona in the Sound. At N14 Falkenberg the surface temperature was a little above normal for the season, and normal at the other stations. The temperature in the deep water was also normal or slightly above normal. Sea surface salinity was 21-24 psu in the Kattegat, which is normal for the season, and 20 psu in the Sound which is above normal. The water down to the cline was well mixed. A distinct halocline and thermocline was found at 10-20 meters depth at all stations, and the stratification was very clear at Fladen and in the Sound. The deeper water was much more saline, and was measured to 33-35 psu at the bottom. The temperature in the deep water declined gradually with depth, but in the Sound the water from 30 meters to the bottom was well mixed with respect to both temperature and salinity.

Concentration of phosphate in the surface water was normal for the season in the Kattegat, but below normal in the Sound. Levels were about 0.06 µmol/l in the Kattegat and 0.14 µmol/l in the Sound. Concentration of dissolved inorganic nitrogen in the surface water was below detection at Fladen and N14 Falkenberg, and this is normal for the season. At the first visit at Anholt the concentration was 0.24 µmol/l and this is above normal, but at the second visit concentration was below detection limit. In the Sound normal concentration in the surface, measured to 0.15 µmol/l. Concentration of silicate was below normal for the season at all stations and varied between 0.2-0.6 µmol/l in the Kattegat and was 3.8 µmol/l in the Sound. Concentrations of nutrients below the halocline were normal for the season, or slightly below normal.

Measurements of chlorophyll fluorescence showed low activity and no peaks were found in the Kattegat, but in the Sound a small peak in fluorescence was found at 10 meters depth. The small variation that was found at all stations clearly reflected the change in salinity and the connection to different waterbodies.

Oxygen concentrations in the bottom water varied from 4.6 ml/l at Fladen to 2.2 ml/l in the Sound, where it was the same as in August. In the Sound the oxygen concentration from 30 meters down to the bottom was almost constant, and close to acute oxygen deficiency (< 2 ml/l).

The Baltic Proper

The sea surface (0-10 m) temperature in the Baltic Proper was 16-17°C, highest in the south eastern parts and lowest at the coastal station Ref M1V1. At the stations in the Arkona and the Bornholm Basin and in the Bight of Hanö the temperature was slightly above normal. At all other stations the temperature was normal for the season. A distinct thermocline was found at all stations except at Ref M1V1 which is very shallow and was well mixed from surface to bottom. The thermocline was found at 20-30 meters depth. At BY39 it was found at only 6 meters depth. Sea surface salinity was normal at BY32 in the northern part of the western Gotland Basin, and above or slightly above

normal at all other stations. At most stations there was a weak halocline coinciding with the thermocline. At the deeper stations a second halocline was found at about 60 meters depth. In the eastern Gotland Basin and at BY32 in the western Gotland Basin the temperature from 40 meters and deeper were generally above normal. The salinity was also generally above normal, but from 80 meters depth.

Concentration of phosphate in the surface was normal for the season at most stations, but at BY15, BY38 and at Ref M1V1 the levels were slightly above normal. Concentration was lowest in the northern Baltic Proper with 0.08 µmol/l at BY20 and BY32 and increased towards southwest. In the Arkona and the Bornholm Basin and the Bight of Hanö concentration was 0.25-0.28 µmol/l. At the coastal station Ref M1V1 the concentration was 0.49 µmol/l. Levels of dissolved inorganic nitrogen were below detection at several stations, and this is normal for the season, but BY5, BCSIII-10 and BY20 had concentrations above normal in the surface water. Silicate concentration in the surface layer was above normal at most stations, but not at BY38 where silicate was normal for the season. The concentration was 14.1-15.5 at the southern stations and 9.8-11.8 in the eastern and western Gotland Basin. Highest concentration was found at Ref M1V1 with 16.3 µmol/l.

Concentrations of nutrients below the halocline in the Arkona and the Bornholm Basin and the Bight of Hanö were largely normal for the season. But at BY5 concentrations of phosphate and dissolved inorganic nitrogen were above normal at 60-70 meters depth. And concentration of silicate was above normal from the sea surface down to 80 meters depth. At BY32 in the western Gotland Basin concentration of dissolved inorganic nitrogen was above normal from 60 meters depth to the bottom. Also BY38 had concentrations above normal, but from 90 meters. The situation was similar during the last cruise in August. At BY10 in the southern parts of the eastern Gotland Basin concentration of dissolved inorganic nitrogen was below normal at 80-125 meters depth. Other nutrients at the same depth were normal or above normal at the station.

At the two stations in the Arkona Basin, there was a relatively large difference of the oxygen concentration in the bottom water. At BY1 which is located more to the west, concentration in the bottom water was 3.0 ml/l, while at BY2, located in the eastern part, there was an acute oxygen deficiency (< 2ml/l) with concentrations of only 1.2 ml/l. When the stations were sampled in August, BY1 had 1.5 ml/l and BY2 had 2.8 ml/l. In the Bornholm Basin and Bight of Hanö, concentrations of oxygen in the bottom water were just above oxygen free, with only 0.1 and 0.2 ml/l respectively. This is almost the same as in August, and very low concentration. At BCSIII-10 in the southeastern Baltic Proper, the oxygen sample from the bottom was lost, but sensors on the CTD indicated concentrations marginally above oxygen free conditions from 75 meters and deeper. In the eastern Gotland Basin acute oxygen deficiency was present from 70-80 meters depth. At BY10 concentration at 70 meters was 1.2 ml/l and at the other two stations concentrations at 80 meters were below 2 ml/l. Hydrogen sulphide above detection limit were found from 90 meters depth at BY20 and from 150 meters depth at BY15. In the western Gotland Basin there was an acute oxygen deficiency from 70 meters and anoxic conditions with hydrogen sulphide was found at 80 meters depth.

Measurements of chlorophyll fluorescence indicated low but constant activity from the surface down to the thermocline, and no peaks of increased activity were found at any station. Highest levels were measured at the coastal station Ref M1V1 in southern Kalmarsund, and the levels were almost constant from surface to bottom.

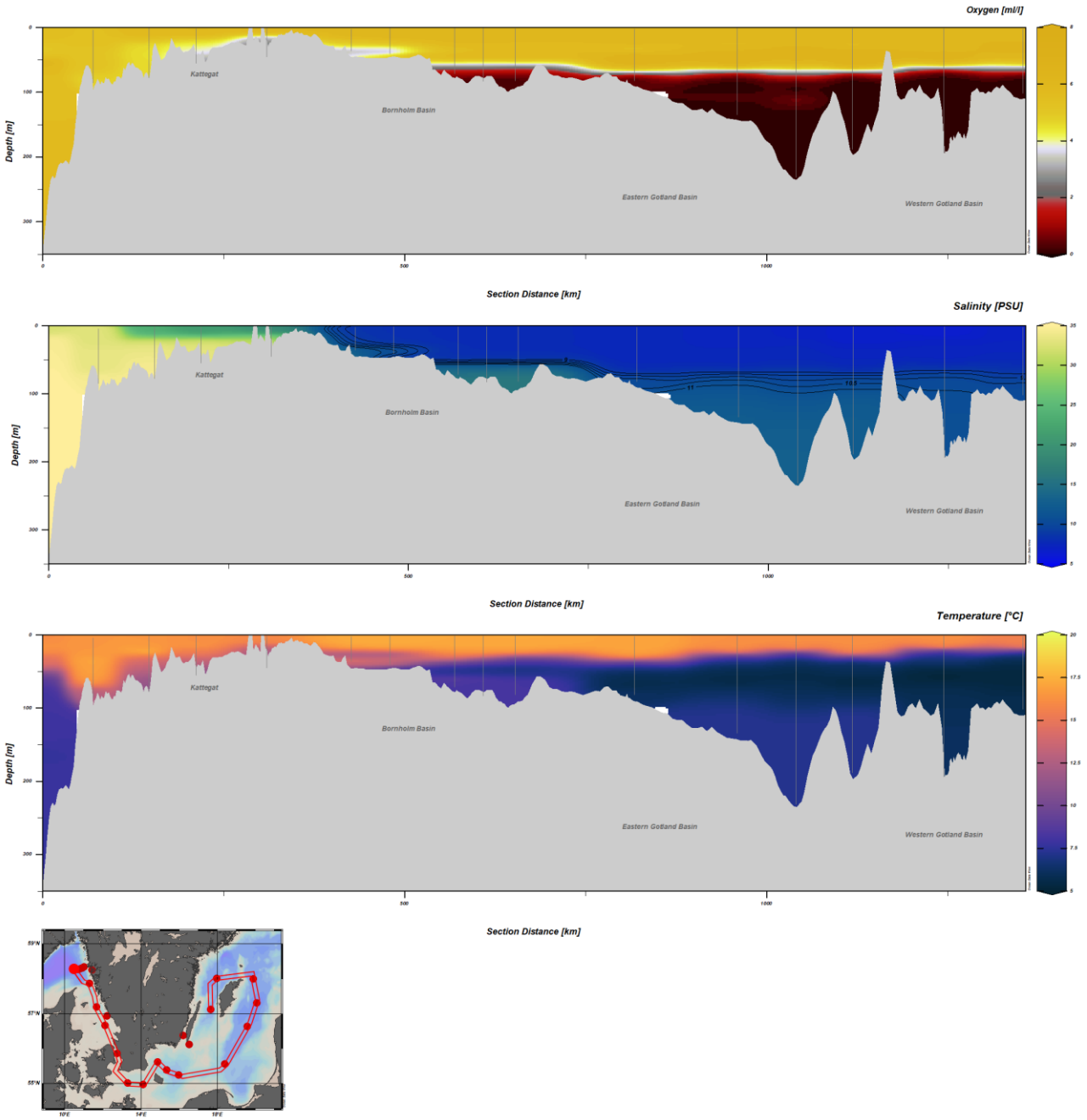

Figure 1. Transect showing dissolved oxygen, salinity and temperature from the Skagerrak, through the Sound and the Eastern Gotland Basin to the Western Gotland Basin.

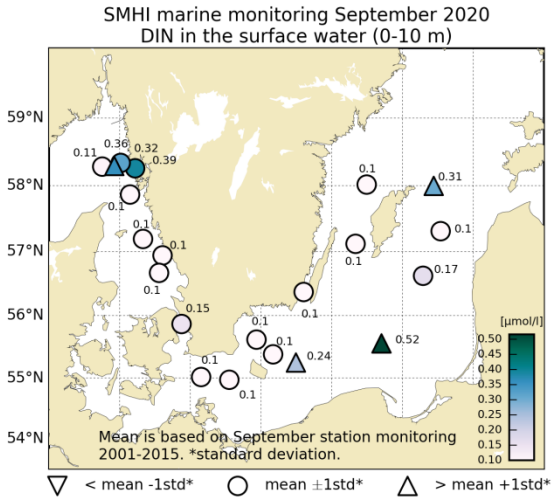

Figure 2. Concentration of dissolved inorganic nitrogen in the surface water (0-10m).

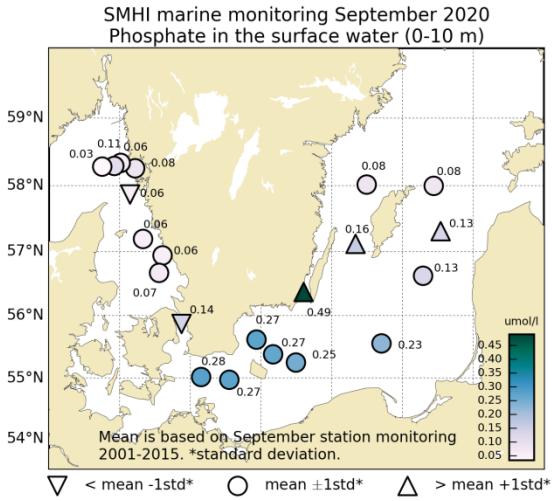

Figure 3. Concentration of phosphate in the surface water (0-10m).

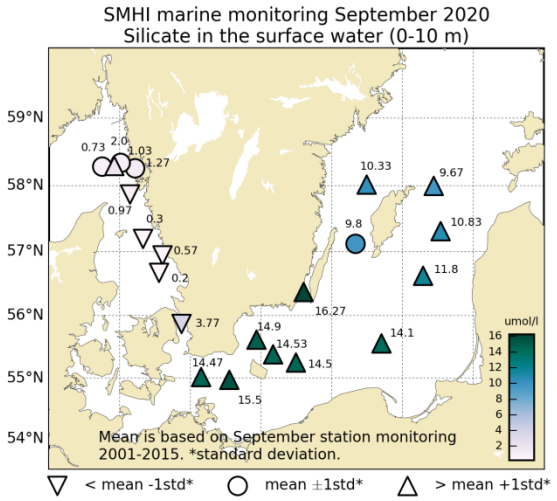

Figure 4. Concentration of silicate in the surface water (0-10m).

PARTICPANTS

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APPENDICES

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

SMHI
Havs
och Vatten
myndigheten

TRACKCHART
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Ship: R/V Svea
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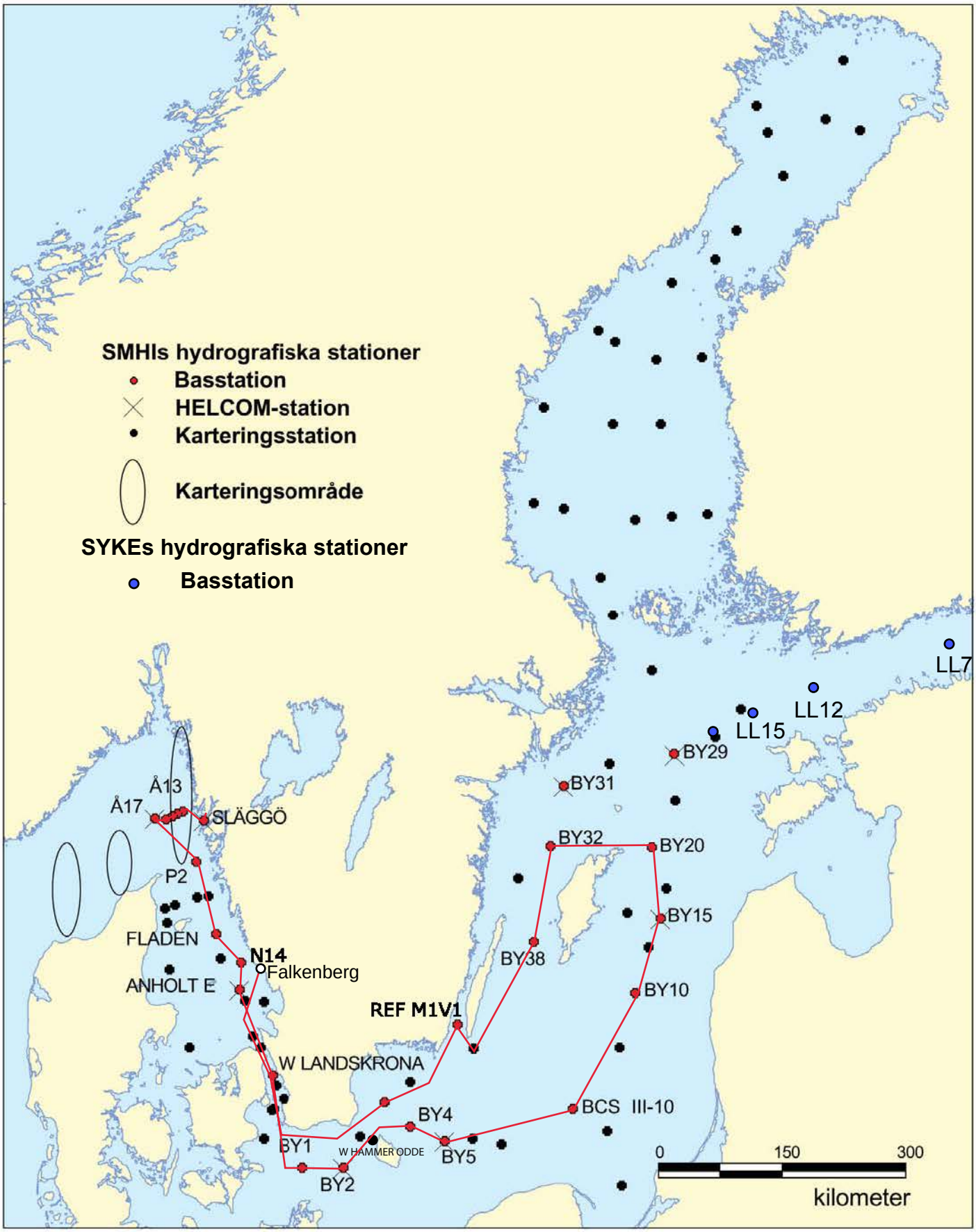
Series: 0578-0602



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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	Weath	Cloud	Waves	Iceob	Chla	Zoop	Phytop	Pp	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
0578	18	FIBG27	BAS...	SLÄGGÖ	5815.58	01126.10	20200907	0900	74	9	26	1	15.0	1014	1	1	1	0	x	x	x	-	9	9	x	x	x	x	-	x	x	-	x	x	x	x	x	x	x	-	x	-	x	-
0579	18	SKEX14	BAS...	Å13	5820.38	01101.60	20200907	1137	90	8	22	5	15.3	1014	1	6	3	0	x	-	-	-	10	10	x	x	x	x	-	x	x	-	x	x	x	x	x	x	x	-	x	-	-	-
0580	18	SKEX15	BAS...	Å14	5818.95	01056.59	20200907	1313	110	7	23	10	15	1014	2	7	3	0	-	-	-	-	11	0	-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
0581	18	SKEX16	BAS...	Å15	5817.68	01050.77	20200907	1425	135	7	22	11	14.4	1014	2	8	4	0	x	-	-	-	12	12	x	x	x	x	-	x	x	-	x	x	x	x	x	x	x	-	x	-	-	-
0582	18	SKEX17	BAS...	Å16	5816.04	01043.48	20200907	1600	202		22	12	14.3	1013	2	7	4	0	-	-	-	-	13	0	-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-	-	-	-
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0586	18	KANX50	BAS...	N14 FALKENBERG	5656.38	01212.63	20200908	0740	30		24	12	16.5	1009	2	8	4	0	x	x	x	-	7	7	x	x	x	x	x	x	x	-	x	x	x	x	x	x	x	x	x	-	x	x
0587	18	KAEX29	BAS...	ANHOLT E	5640.09	01206.57	20200908	1030	62		26	12	16.1	1012	2	4	4	0	x	x	x	x	10	10	x	x	x	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x	x	-
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0589	18	BPSA03	BAS...	BY2 ARKONA	5458.24	01405.96	20200909	0300	47		24	9	16.8	1017	9	9	9	0	x	x	x	-	8	8	x	x	x	x	-	x	x	-	x	x	x	x	x	x	x	-	x	x	x	-
0590	18	BPSB06	BAS...	BY4 CHRISTIANSÖ	5522.91	01520.26	20200909	1047	94	6	20	9	17.6	1013	1	6	3	0	x	-	-	-	12	12	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x	-	x	-	x	-
0591	18	BPSB07	BAS...	BY5 BORNHOLMSDJ	5514.99	01558.99	20200909	1206	91	6	20	12	17.5	1011	2	8	4	0	x	x	x	x	12	12	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-	-
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0593	18	BPEX13	BAS...	BY10	5637.44	01934.77	20200910	0645	147		27	13	14.3	1005	1	4	5	0	x	-	-	-	15	15	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x	-	x	-	x	x
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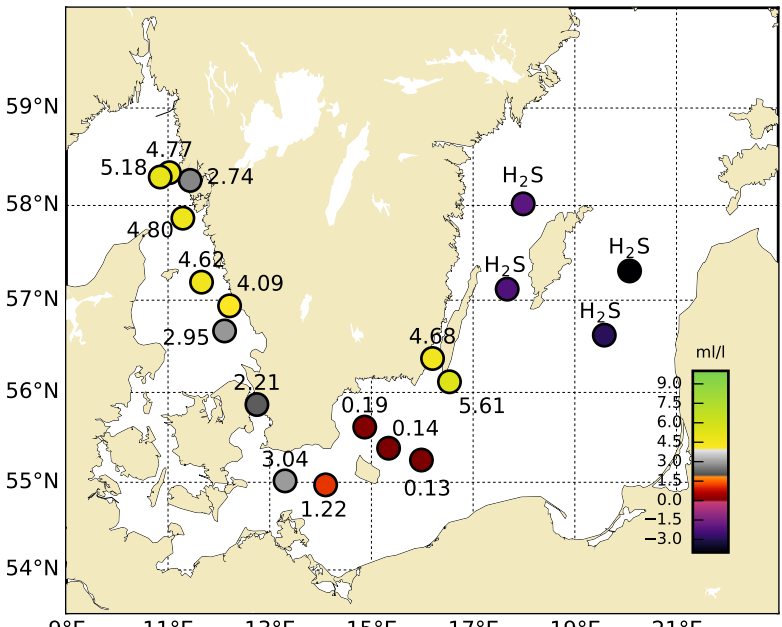
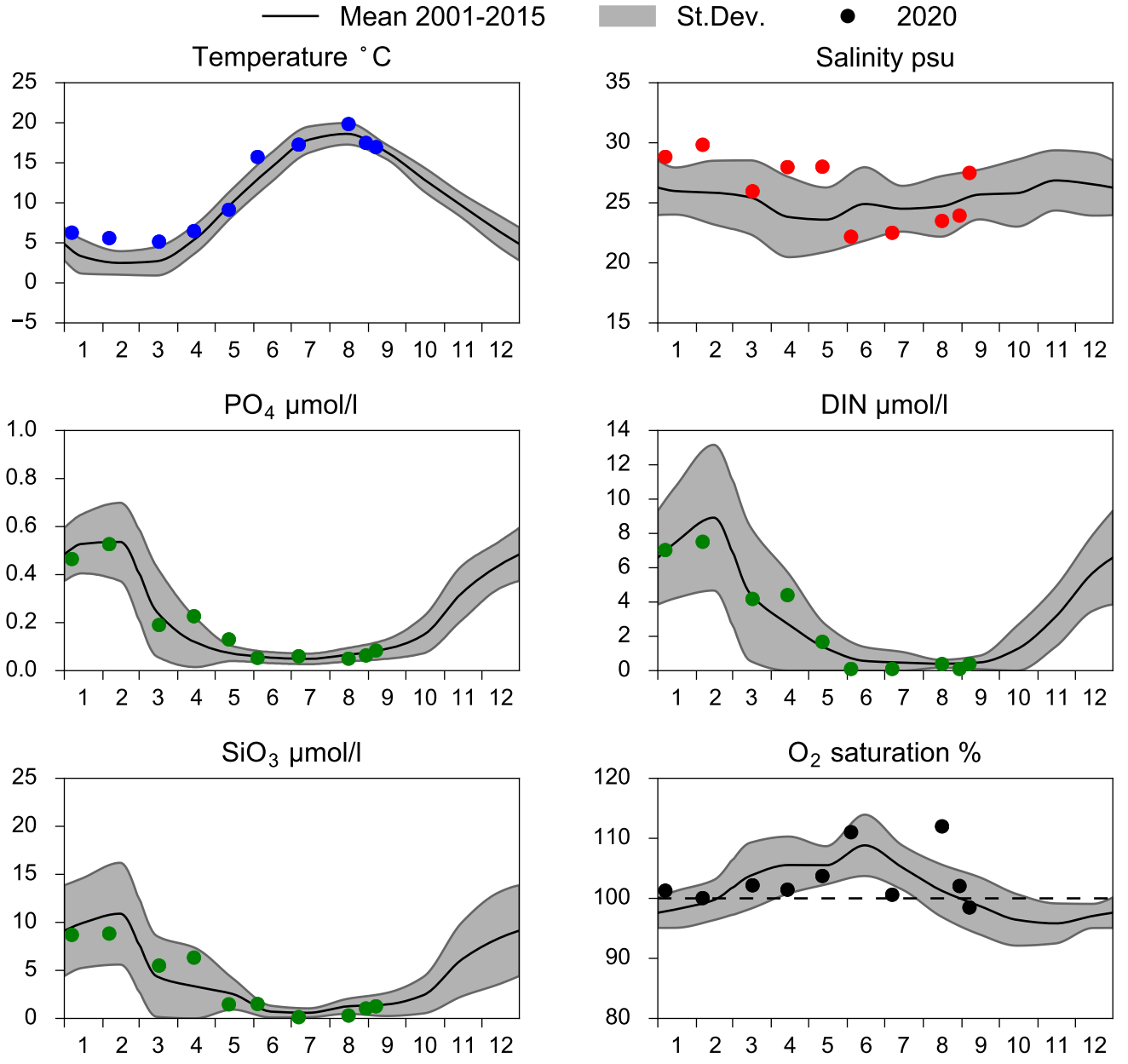
0599	18	BPWK01	BAS...	REF M1V1	5622.25	01612.12	20200911	1830	21		19	7	15.0	1013	9	9	9	0	x	x	x	-	5	5	x	x	x	x	x	x	x	-	x	x	x	x	x	x	x	x	x	-	x	-
0600	18	BPSH05	BAS...	HANÖBUKTEN	5537.06	01452.08	20200912	0200	80		20	8	17.1	1013	9	9	9	0	x	-	-	-	11	11	x	x	x	x	-	x	x	-	x	x	x	x	x	x	x	-	x	-	-	-
0601	18	SOCX39	BAS...	W LANDSKRONA	5551.98	01244.89	20200912	1540	50	8	25	7	14.8	1011	1	6	2	0	x	-	-	-	9	9	x	x	x	x	-	x	x	-	x	x	x	x	x	x	x	-	x	-	x	-
0602	18	KAEX29	BAS...	ANHOLT E	5640.16	01206.72	20200912	2254	62		24	12	14.6	1014	9	9	9	0	x	x	x	-	10	10	x	x	x	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x	x	x

Bottom water oxygen concentration (ml/l)

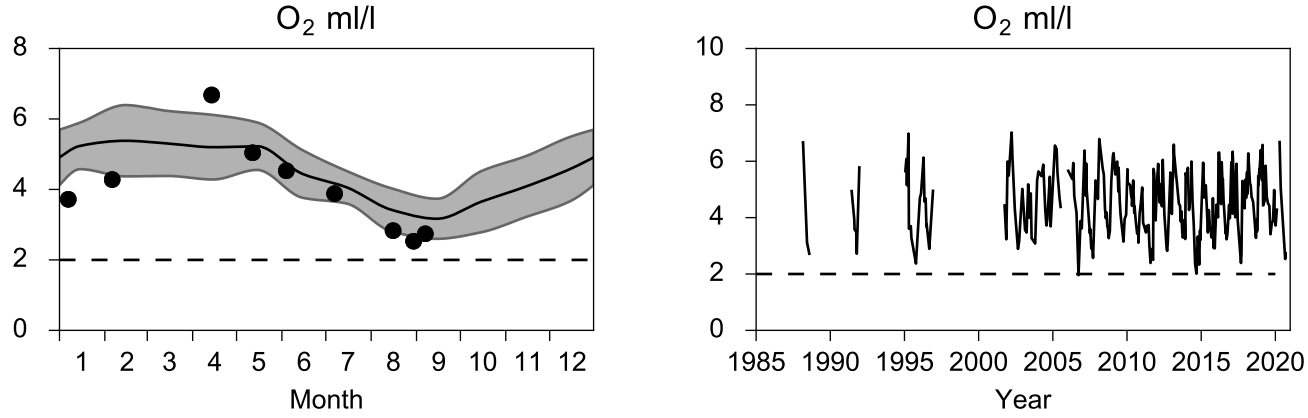


STATION SLÄGGÖ SURFACE WATER (0-10 m)

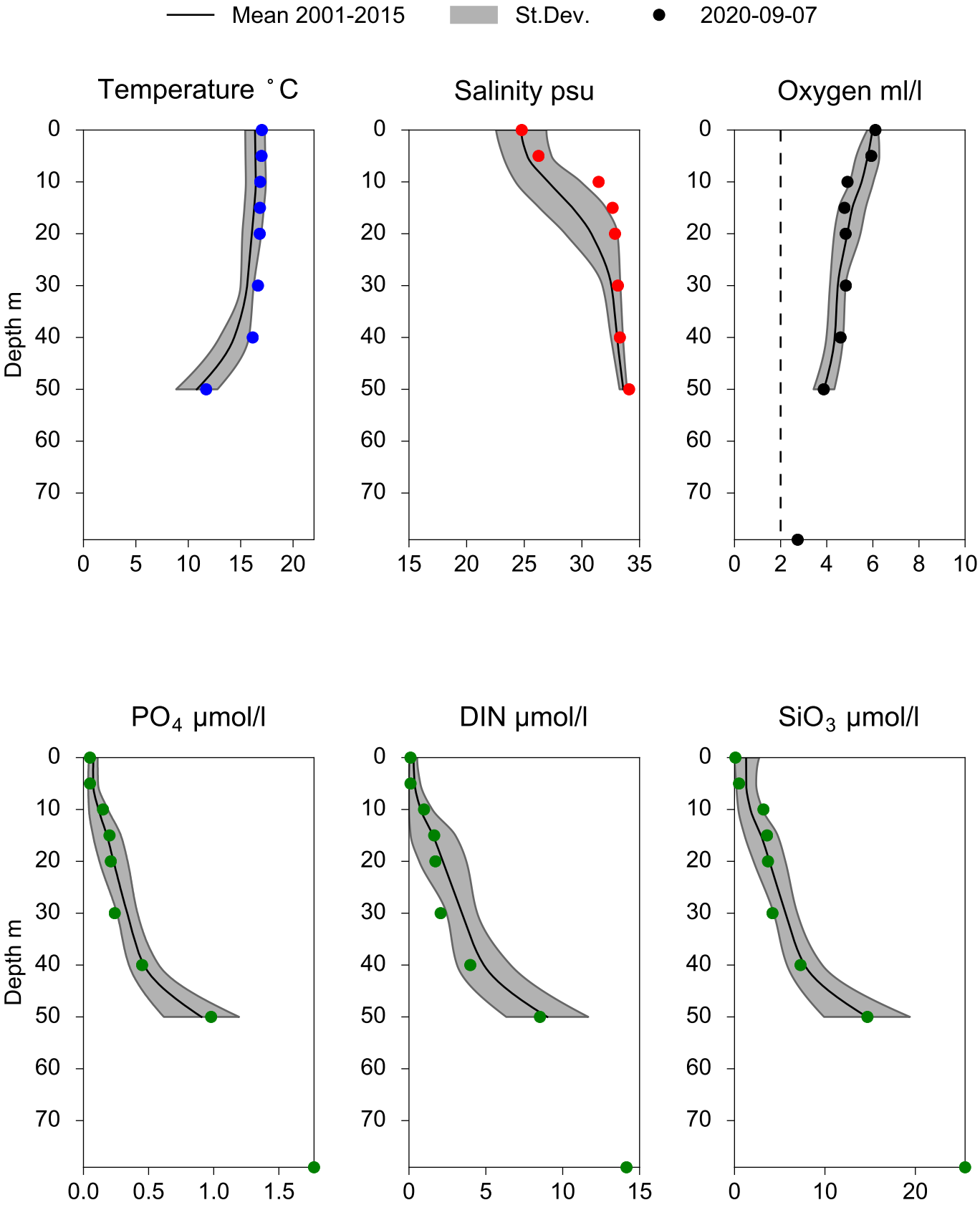
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 64 m)

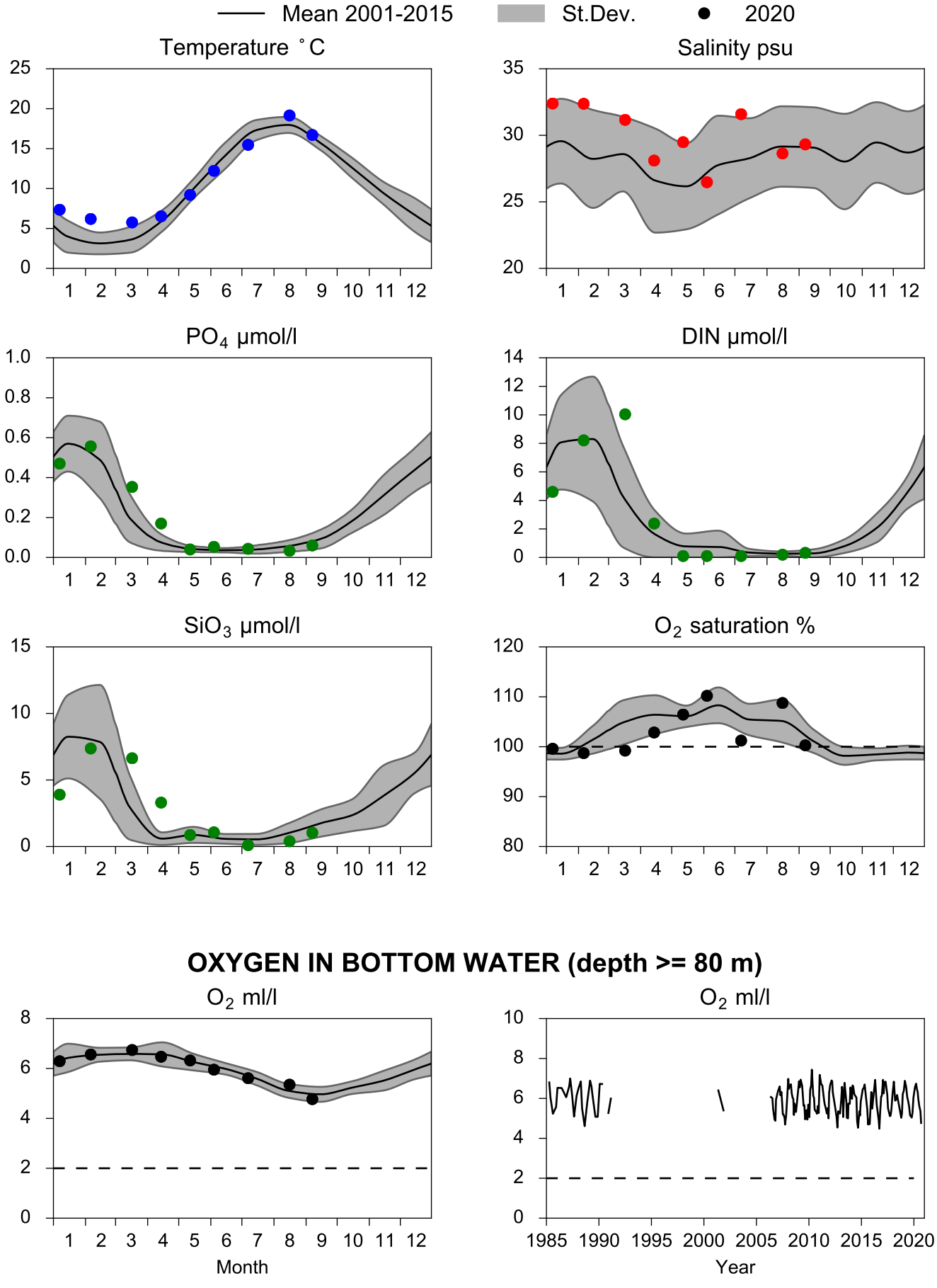


Vertical profiles SLÄGGÖ
September



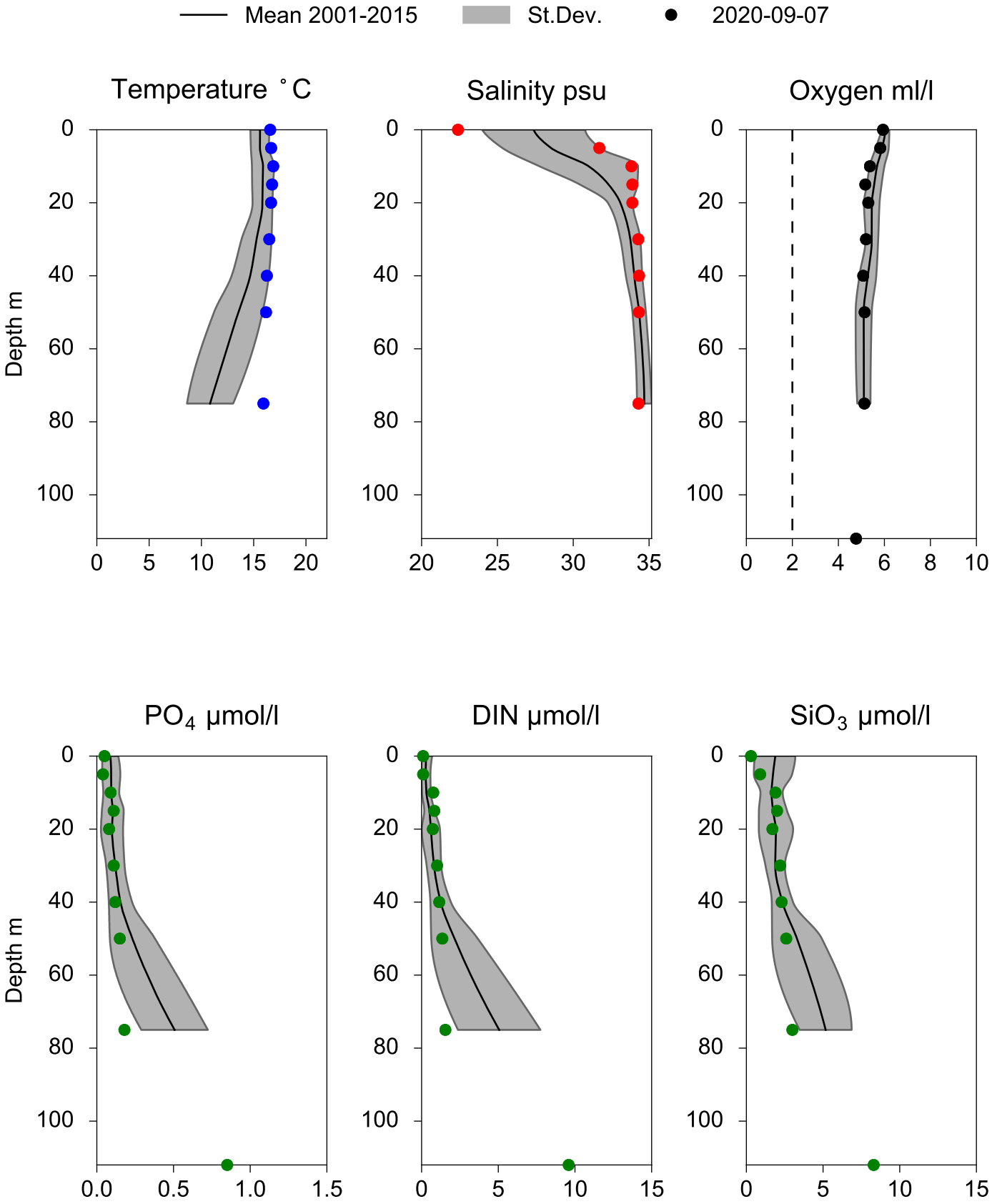
STATION Å13 SURFACE WATER (0-10 m)

Annual Cycles



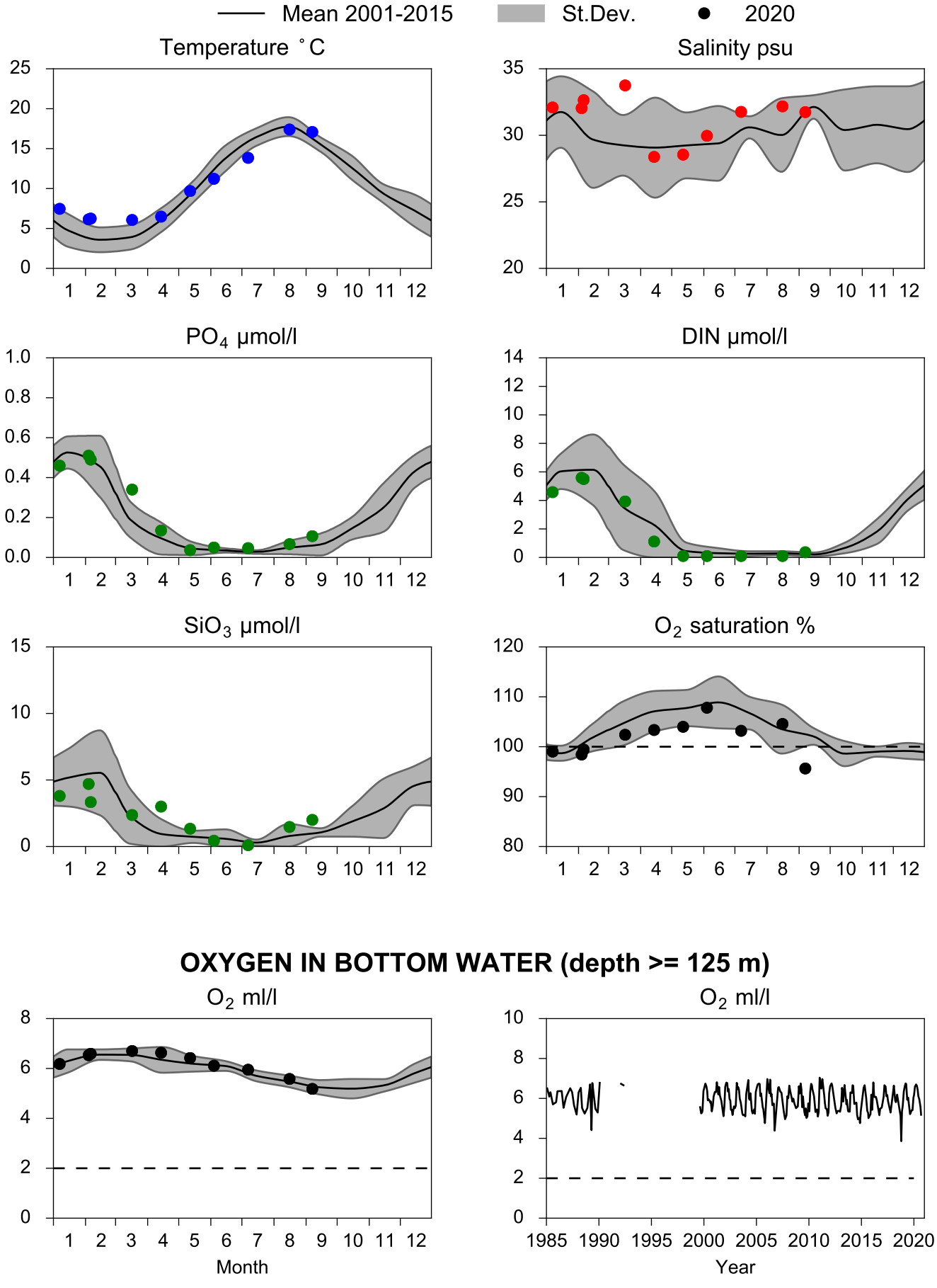
OXYGEN IN BOTTOM WATER (depth >= 80 m)

Vertical profiles Å13
September



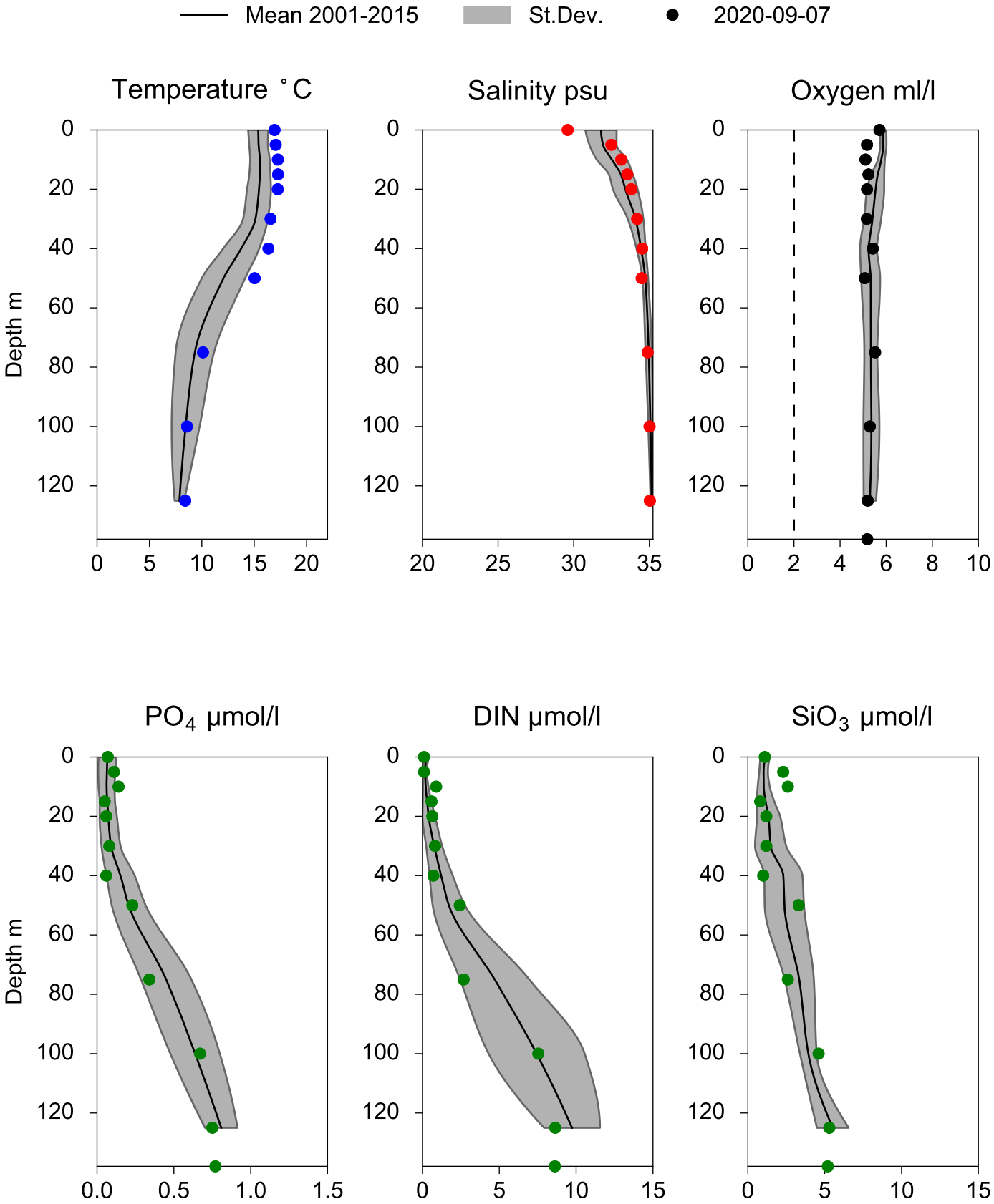
STATION Å15 SURFACE WATER (0-10 m)

Annual Cycles



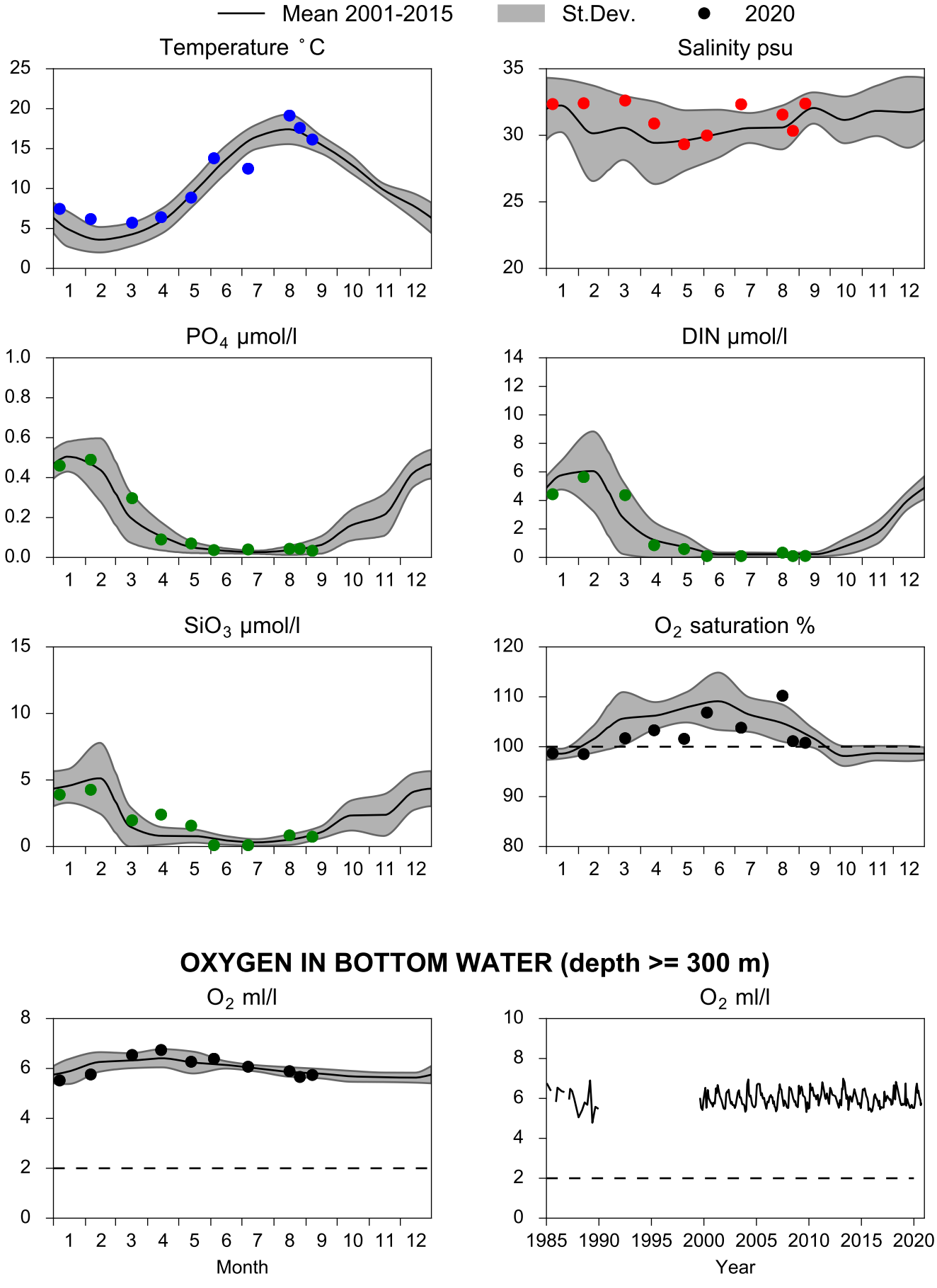
OXYGEN IN BOTTOM WATER (depth >= 125 m)

Vertical profiles Å15
September



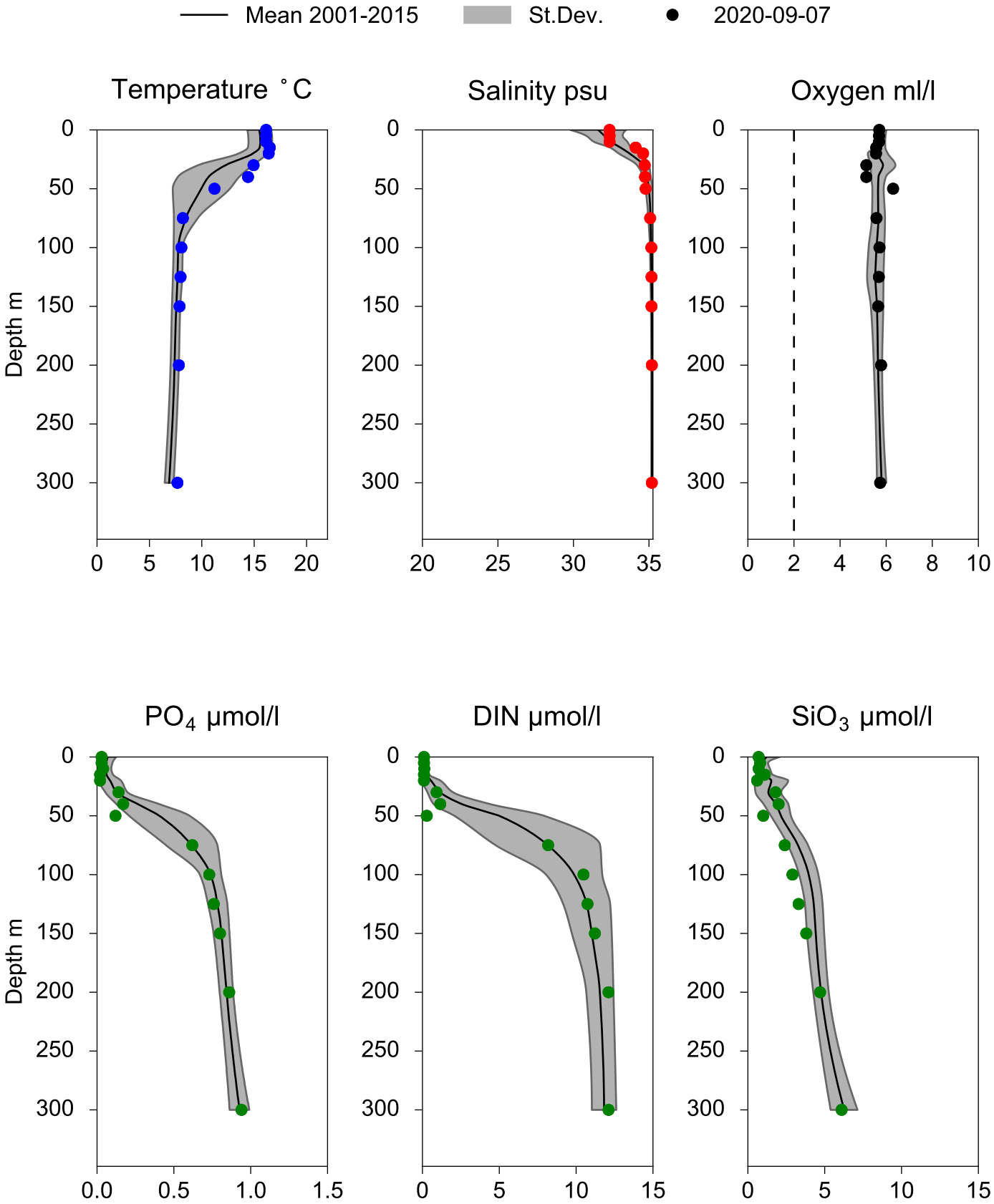
STATION Å17 SURFACE WATER (0-10 m)

Annual Cycles



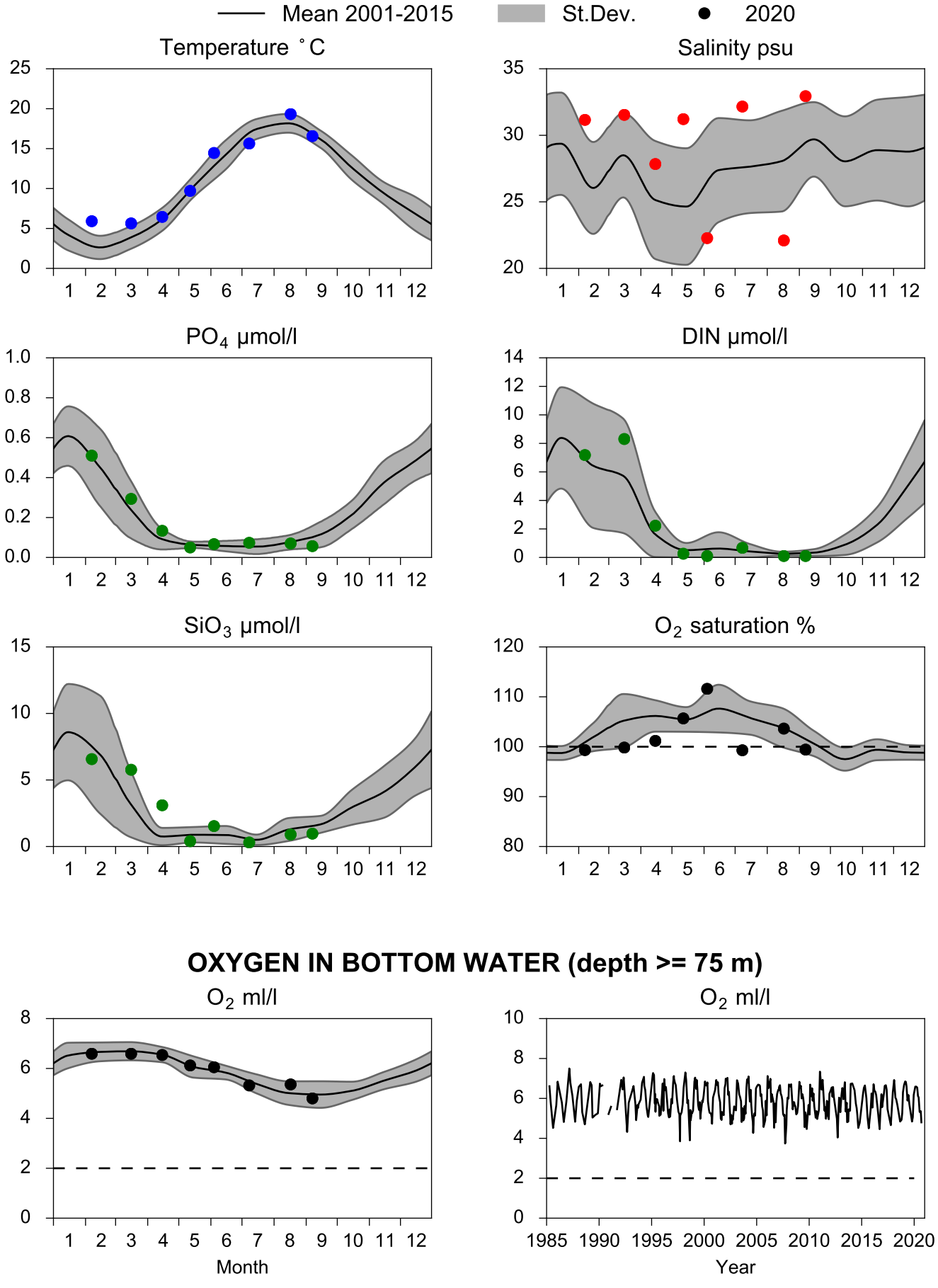
OXYGEN IN BOTTOM WATER (depth >= 300 m)

Vertical profiles Å17
September



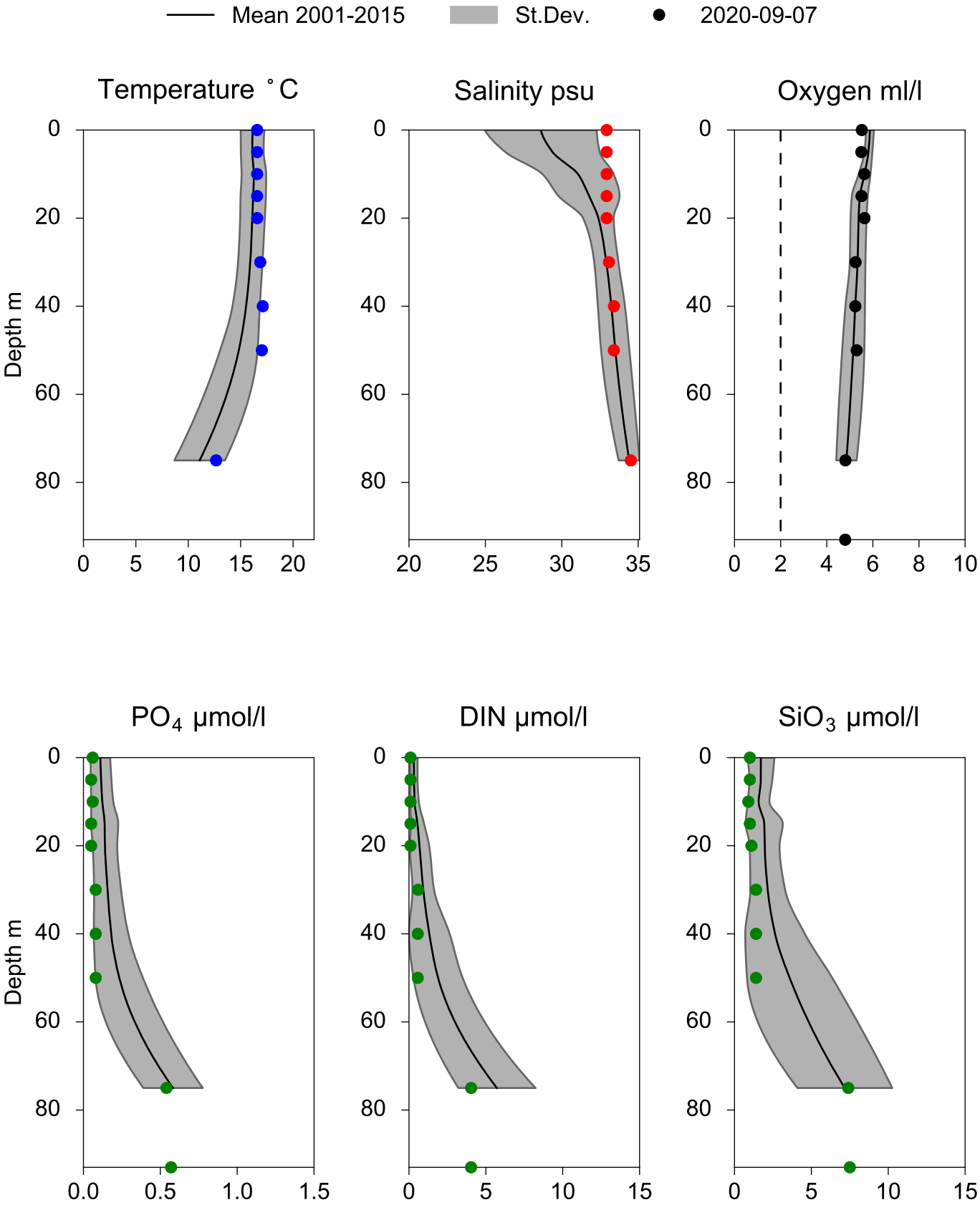
STATION P2 SURFACE WATER (0-10 m)

Annual Cycles

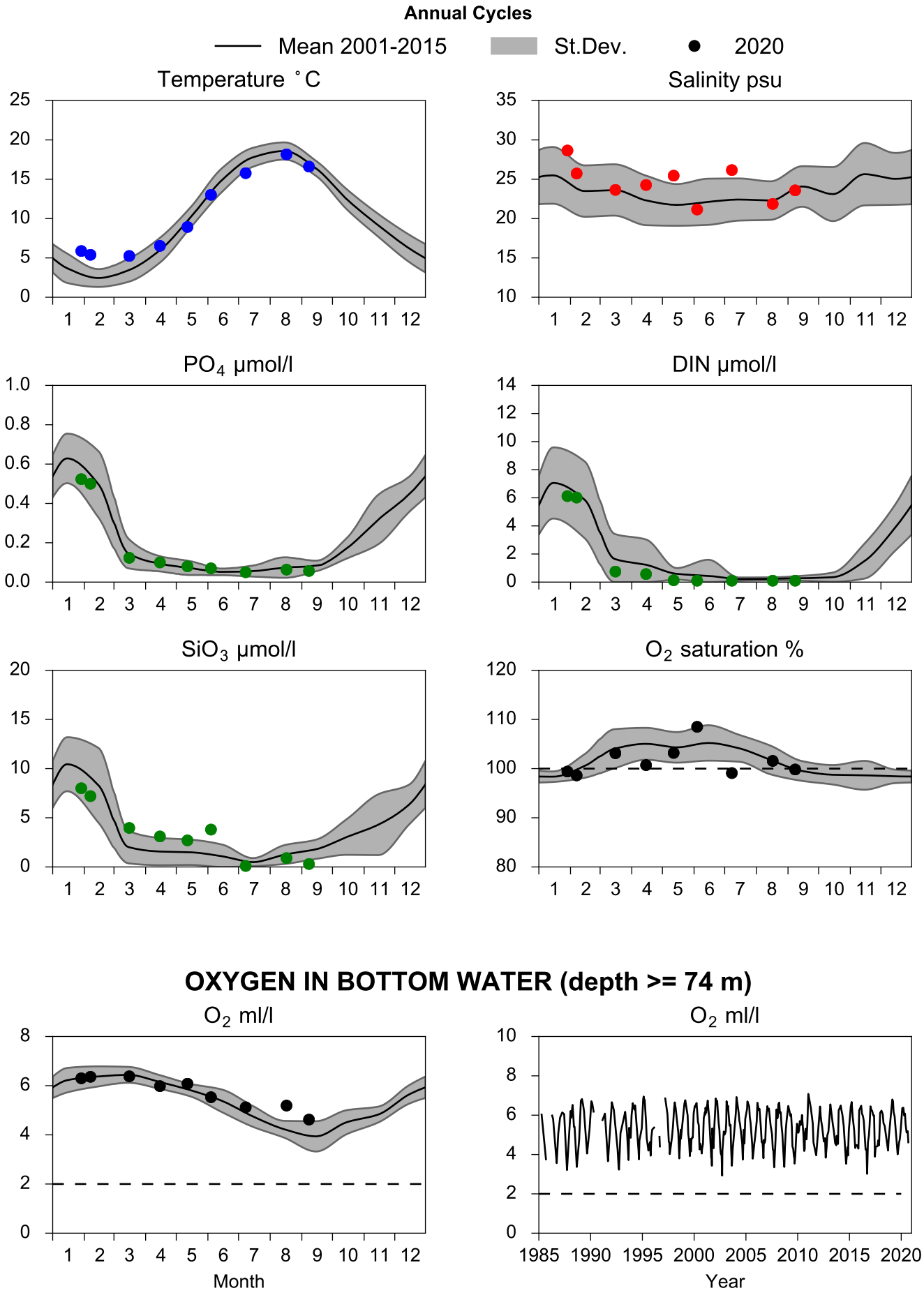


OXYGEN IN BOTTOM WATER (depth >= 75 m)

Vertical profiles P2
September

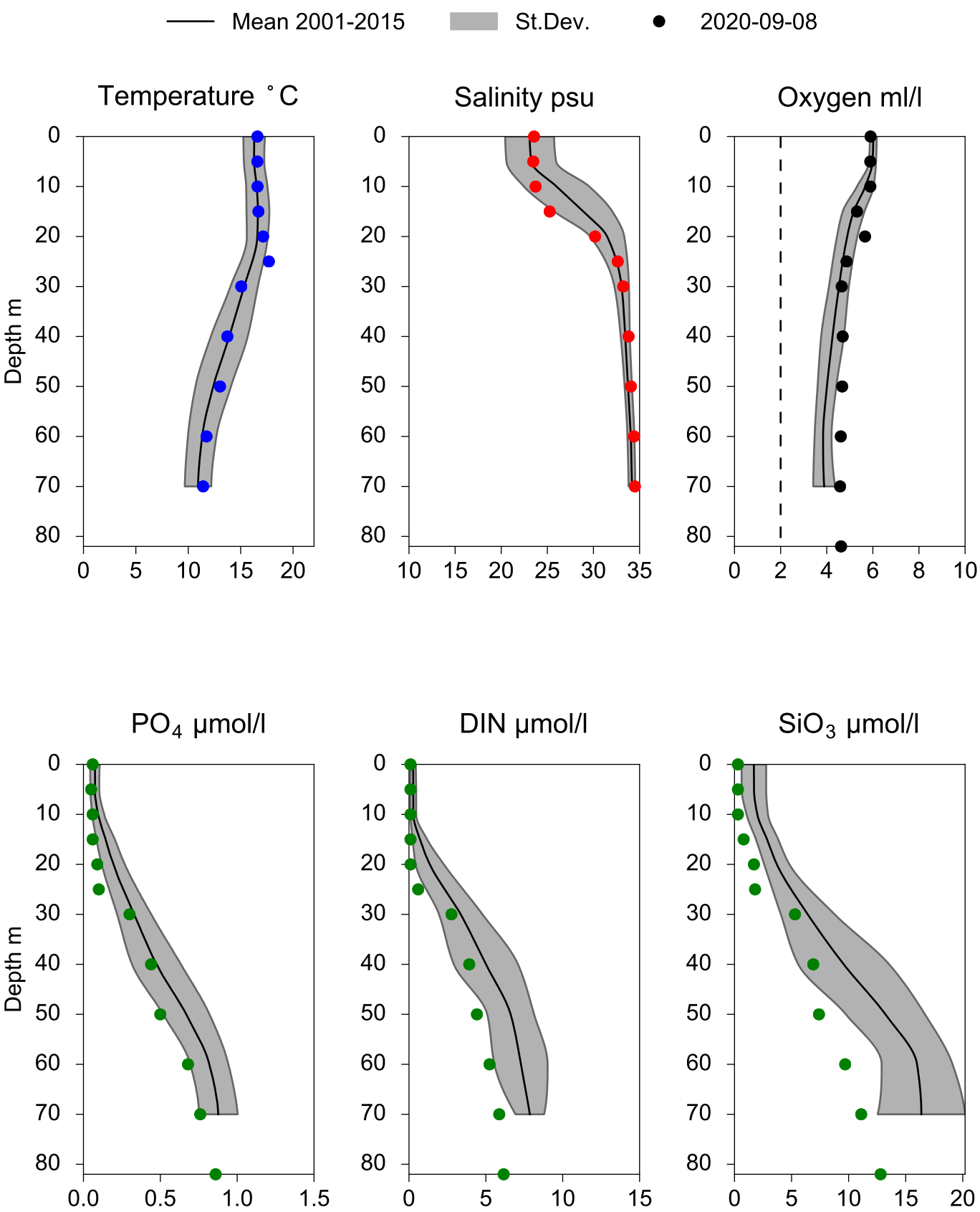


STATION FLADEN SURFACE WATER (0-10 m)



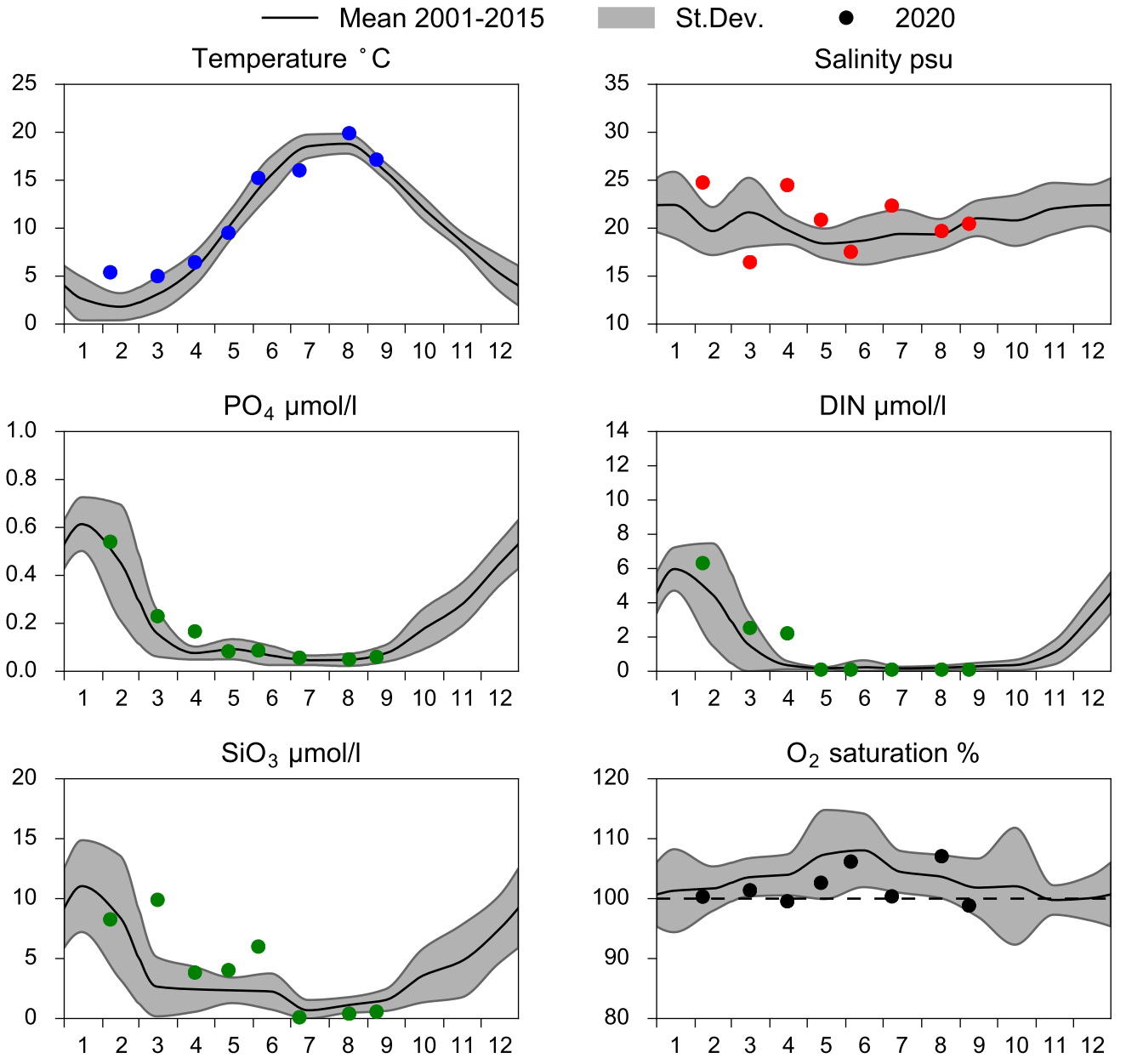
OXYGEN IN BOTTOM WATER (depth >= 74 m)

Vertical profiles FLADEN
September

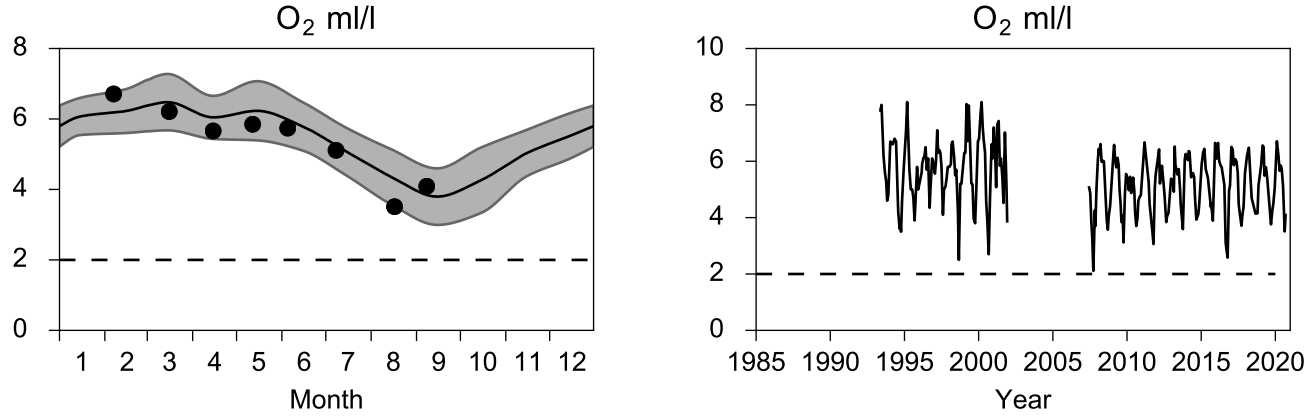


STATION N14 FALKENBERG SURFACE WATER (0-10 m)

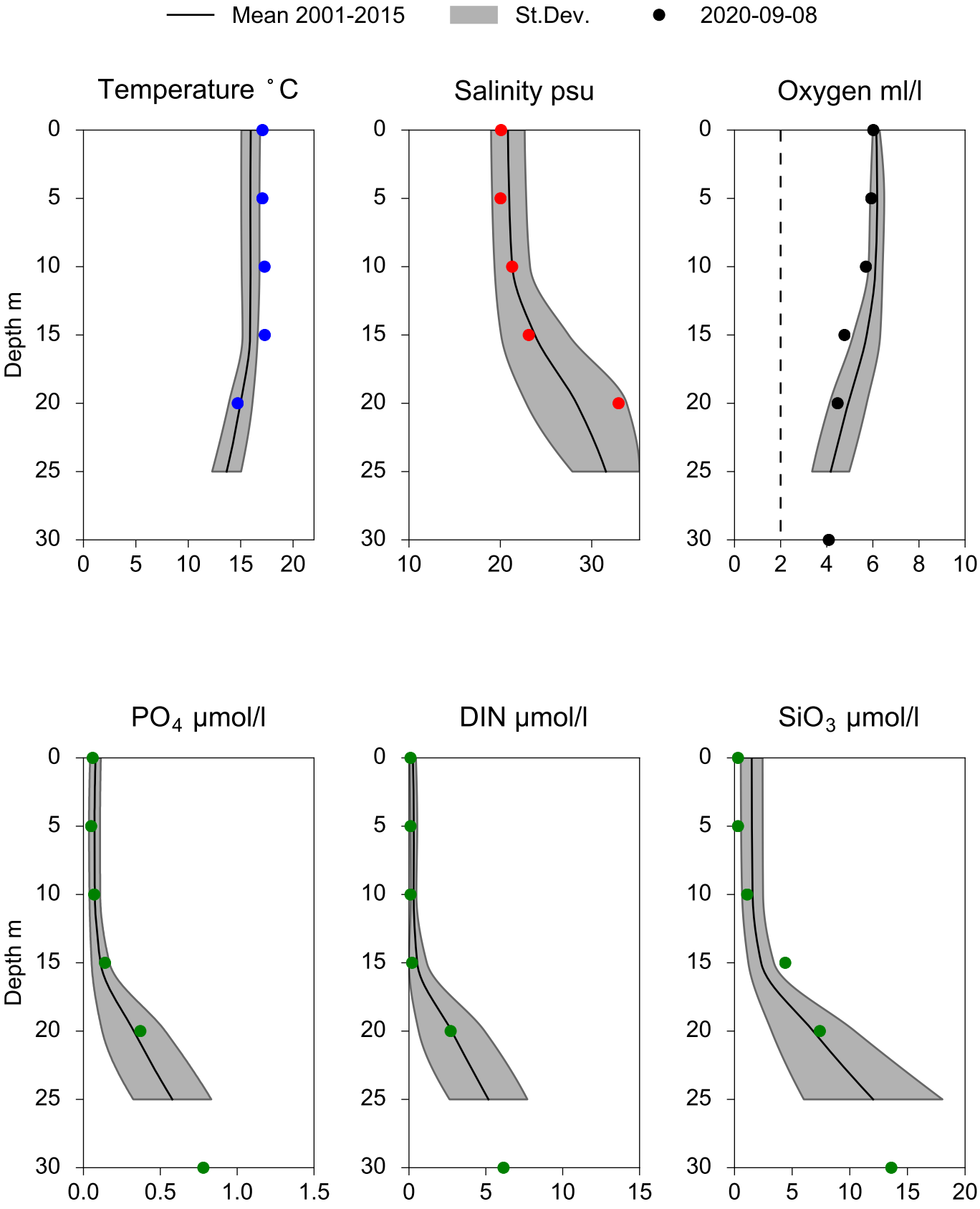
Annual Cycles



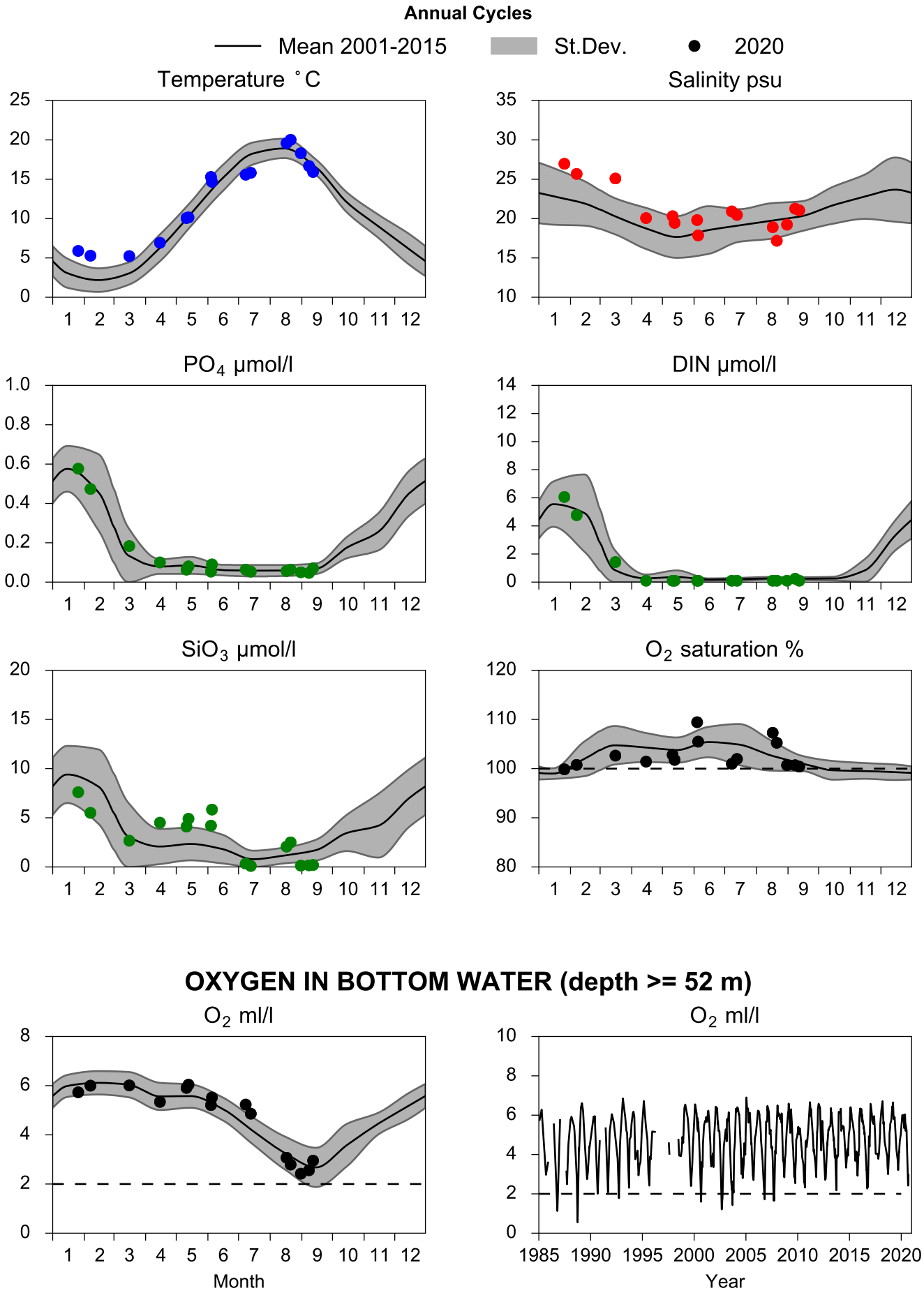
OXYGEN IN BOTTOM WATER (depth >= 20 m)



Vertical profiles N14 FALKENBERG
September

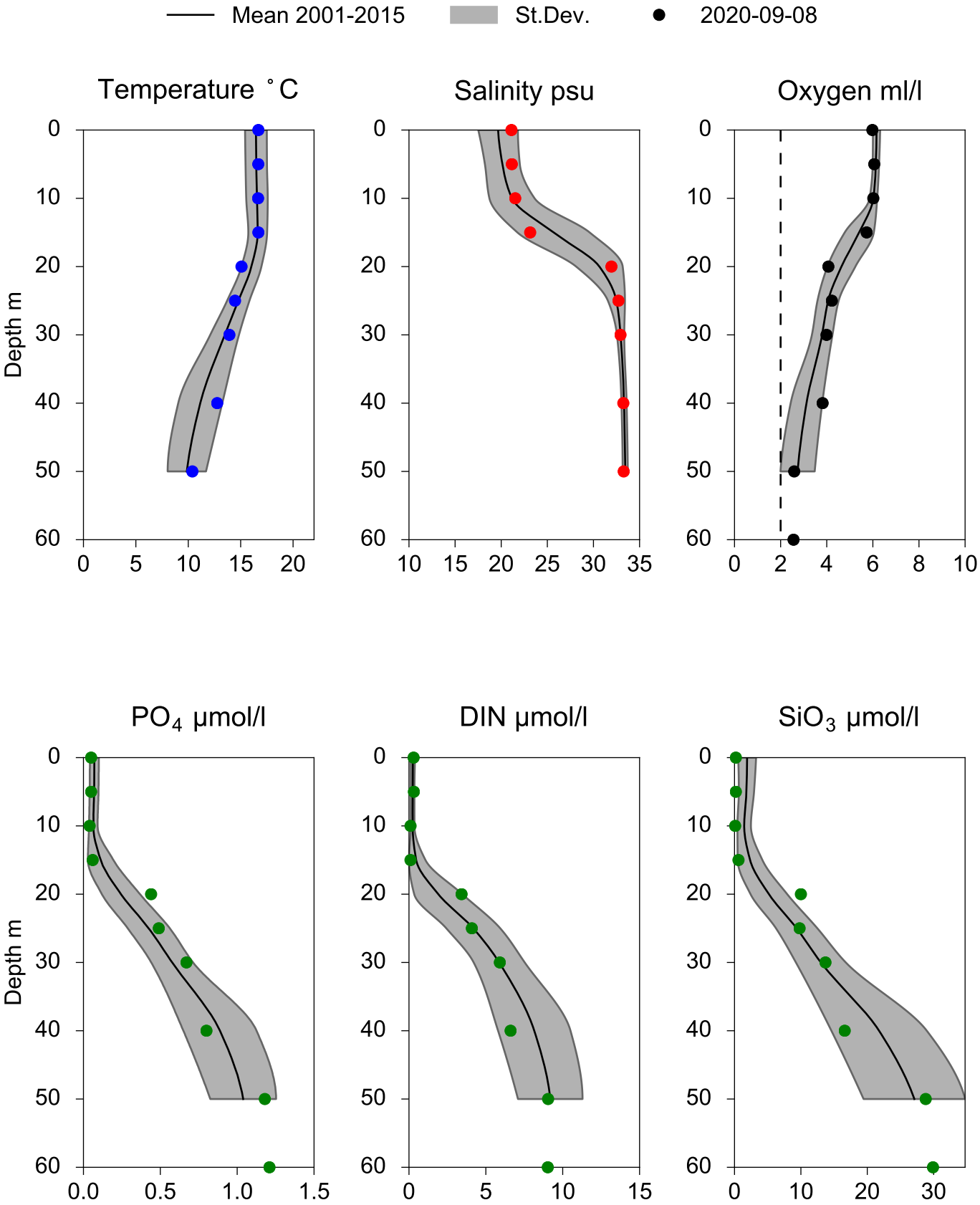


STATION ANHOLT E SURFACE WATER (0-10 m)



OXYGEN IN BOTTOM WATER (depth >= 52 m)

Vertical profiles ANHOLT E
September

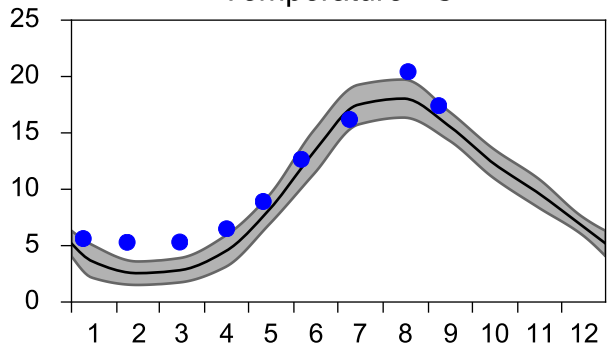


STATION BY1 SURFACE WATER (0-10 m)

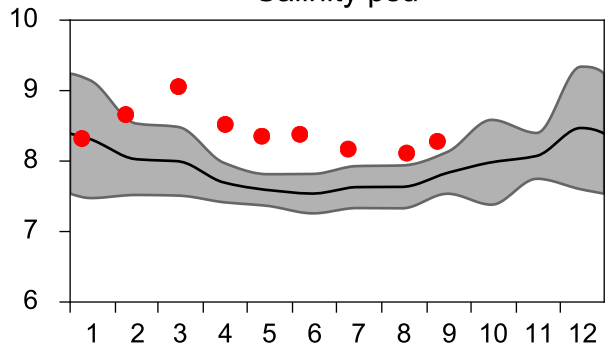
Annual Cycles

Mean 2001-2015 St.Dev. 2020

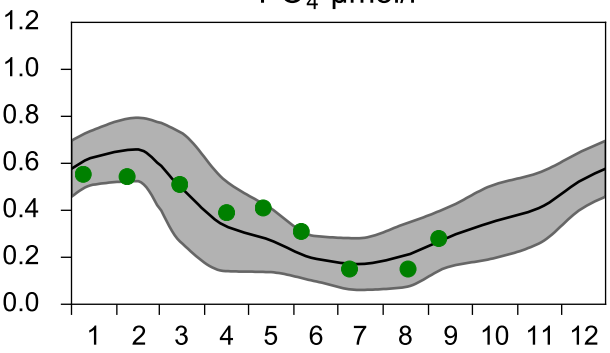
Temperature ˚C



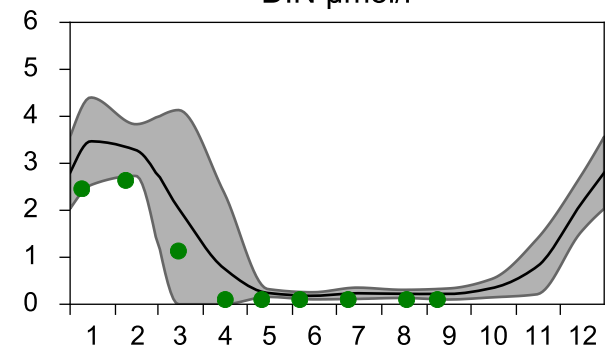
Salinity psu



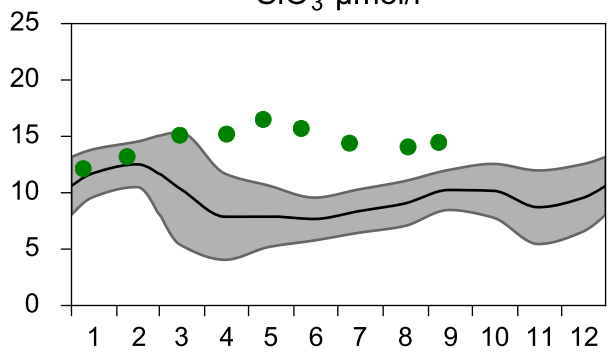
PO_4 µmol/l



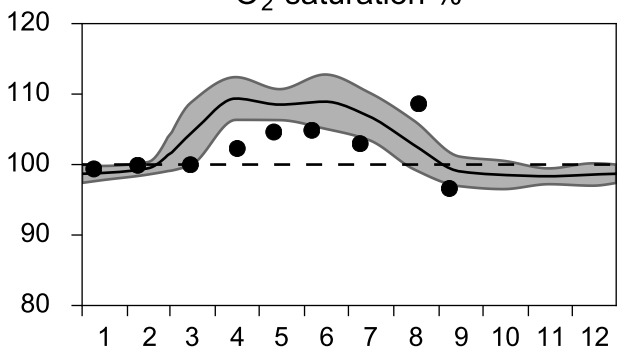
DIN µmol/l



SiO_3 µmol/l

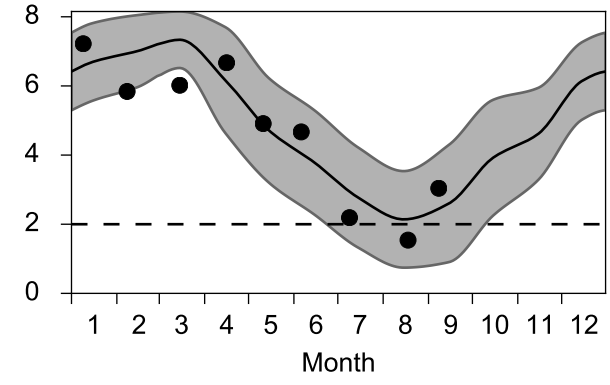


O_2 saturation %

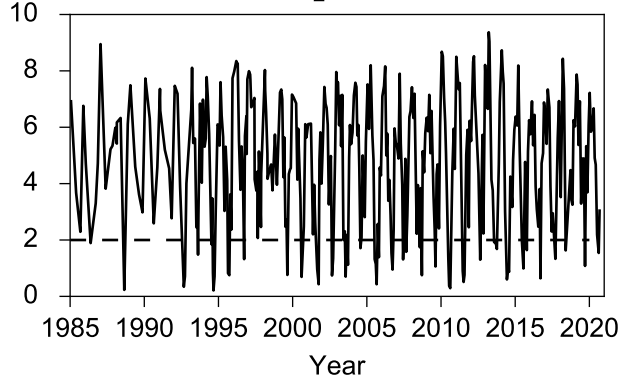


OXYGEN IN BOTTOM WATER (depth >= 40 m)

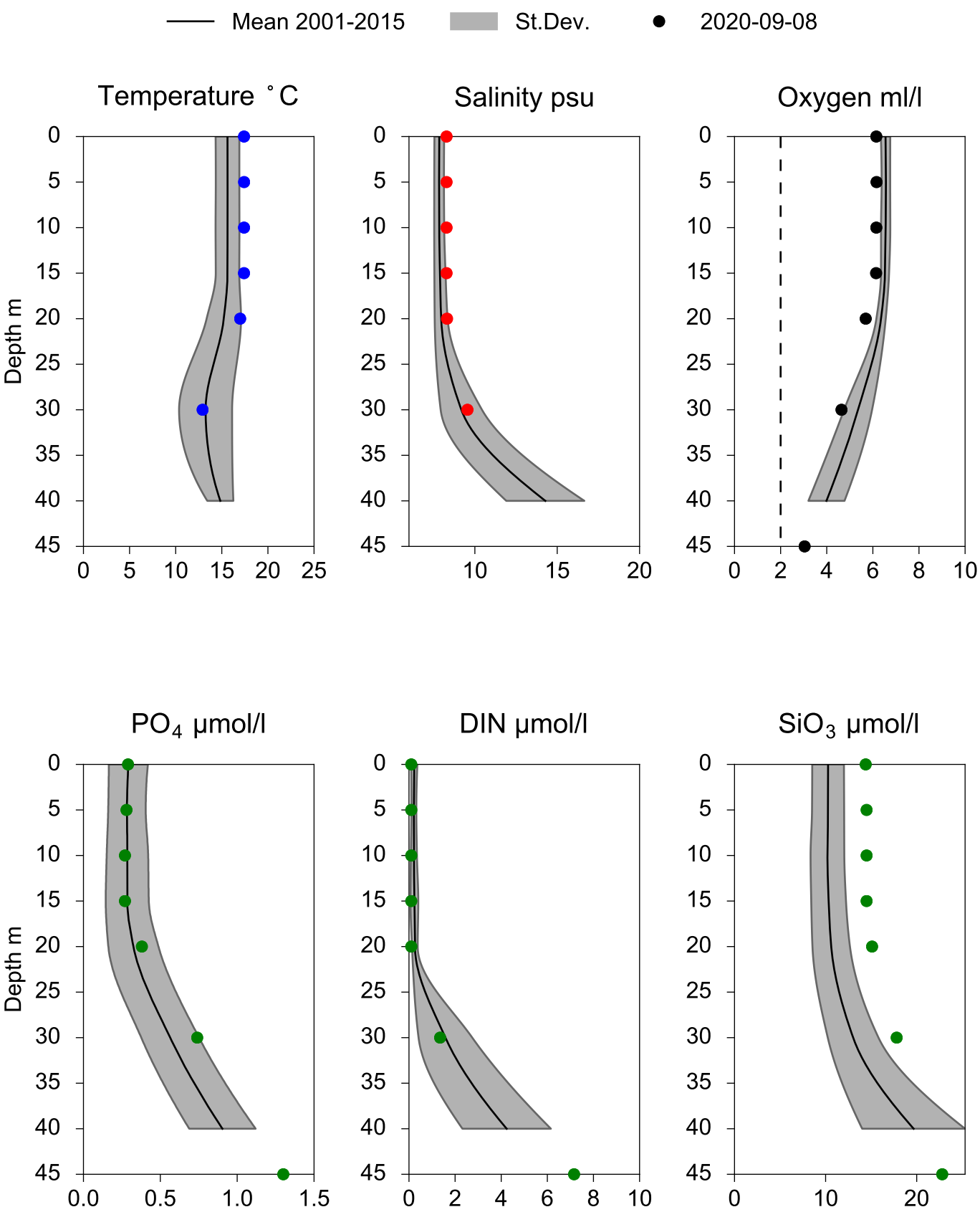
O_2 ml/l



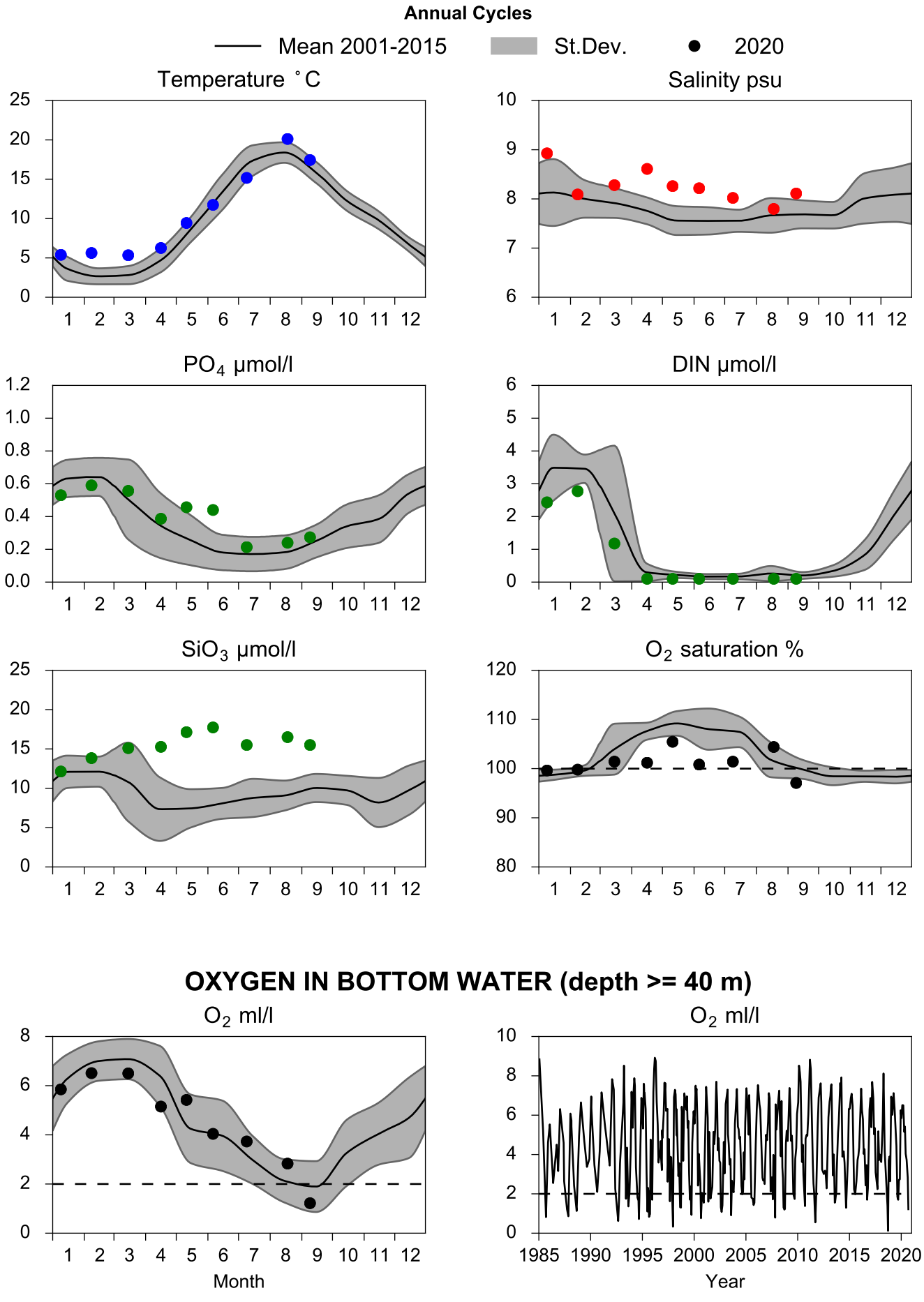
O_2 ml/l



Vertical profiles BY1
September

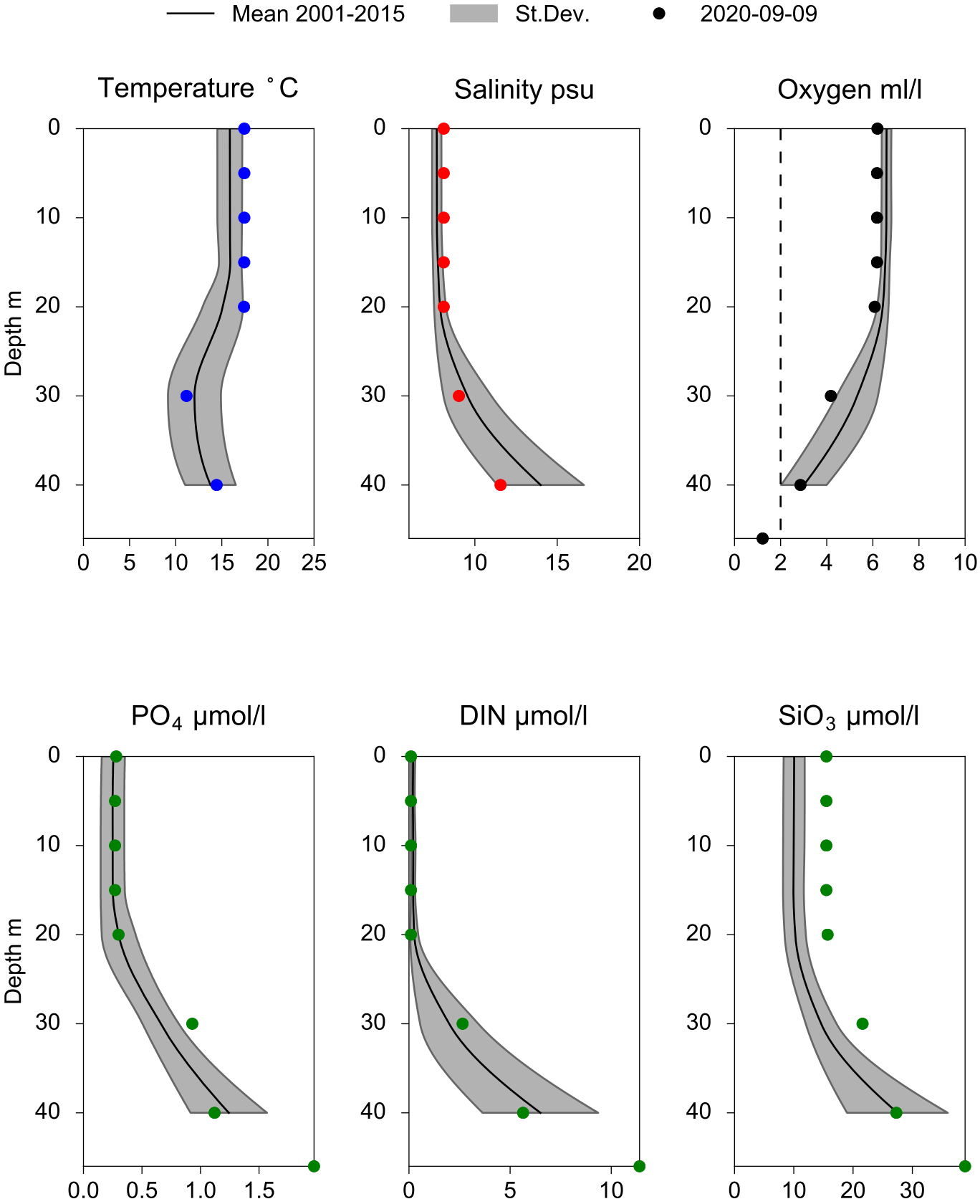


STATION BY2 ARKONA SURFACE WATER (0-10 m)

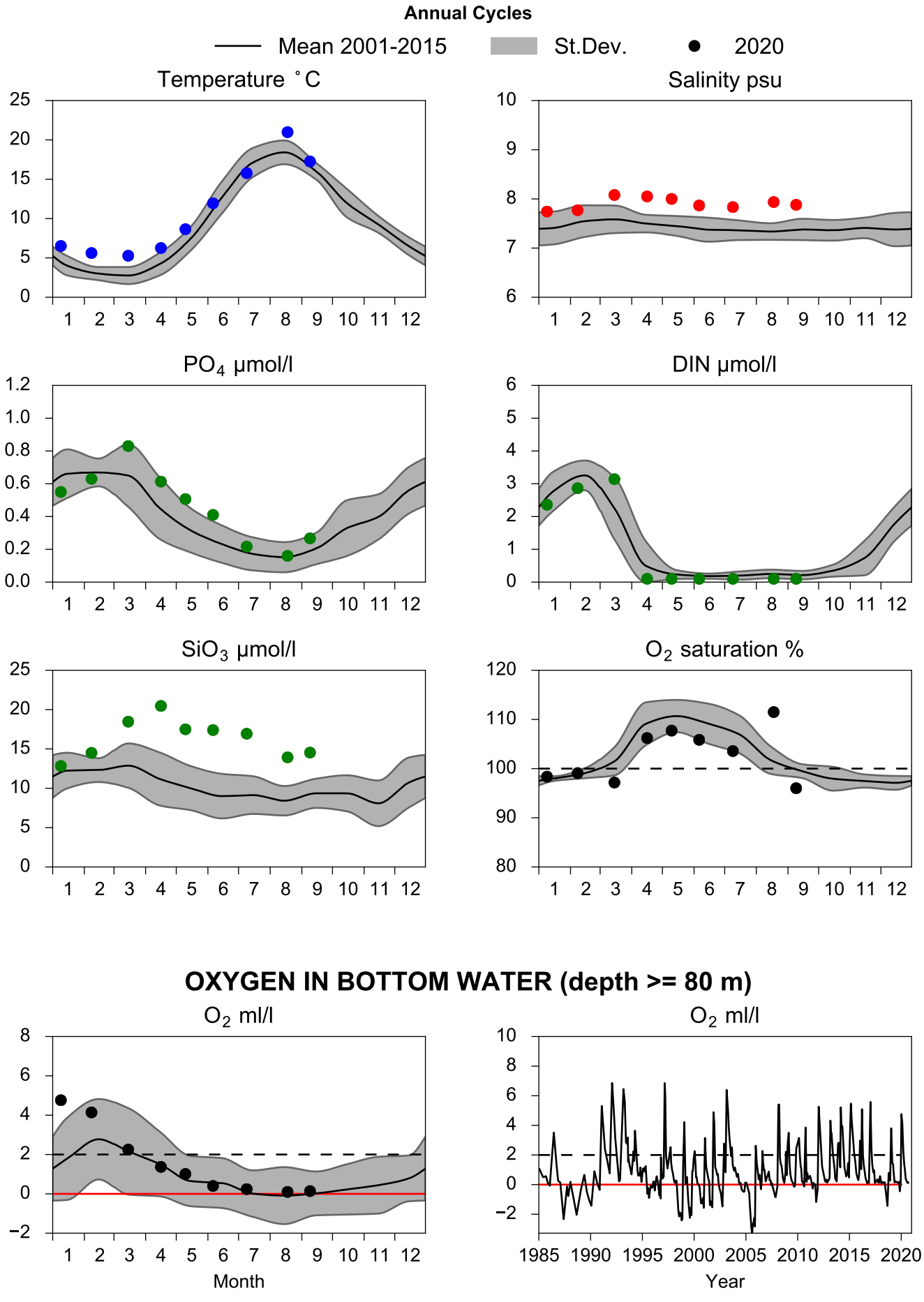


OXYGEN IN BOTTOM WATER (depth >= 40 m)

Vertical profiles BY2 ARKONA
September

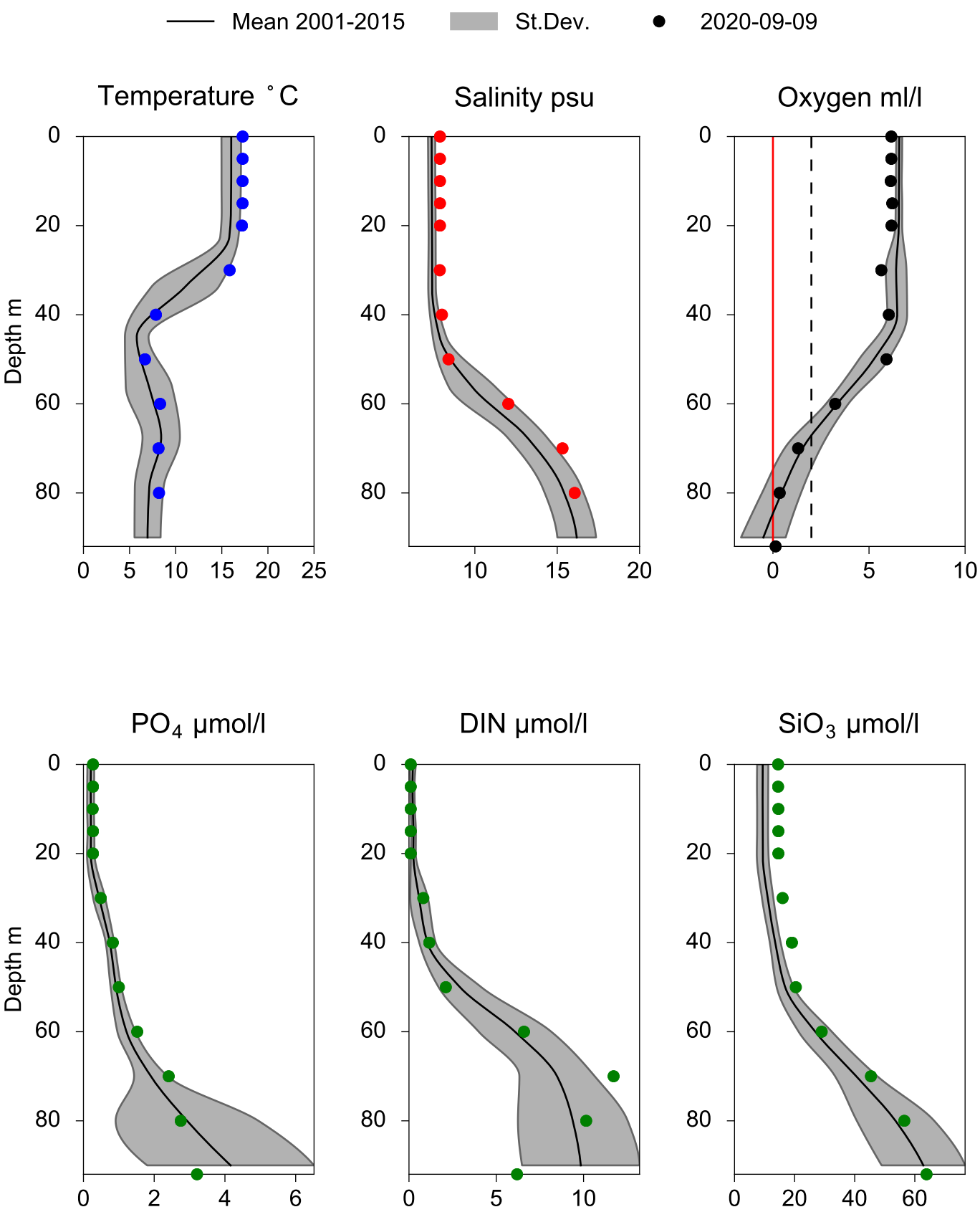


STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)

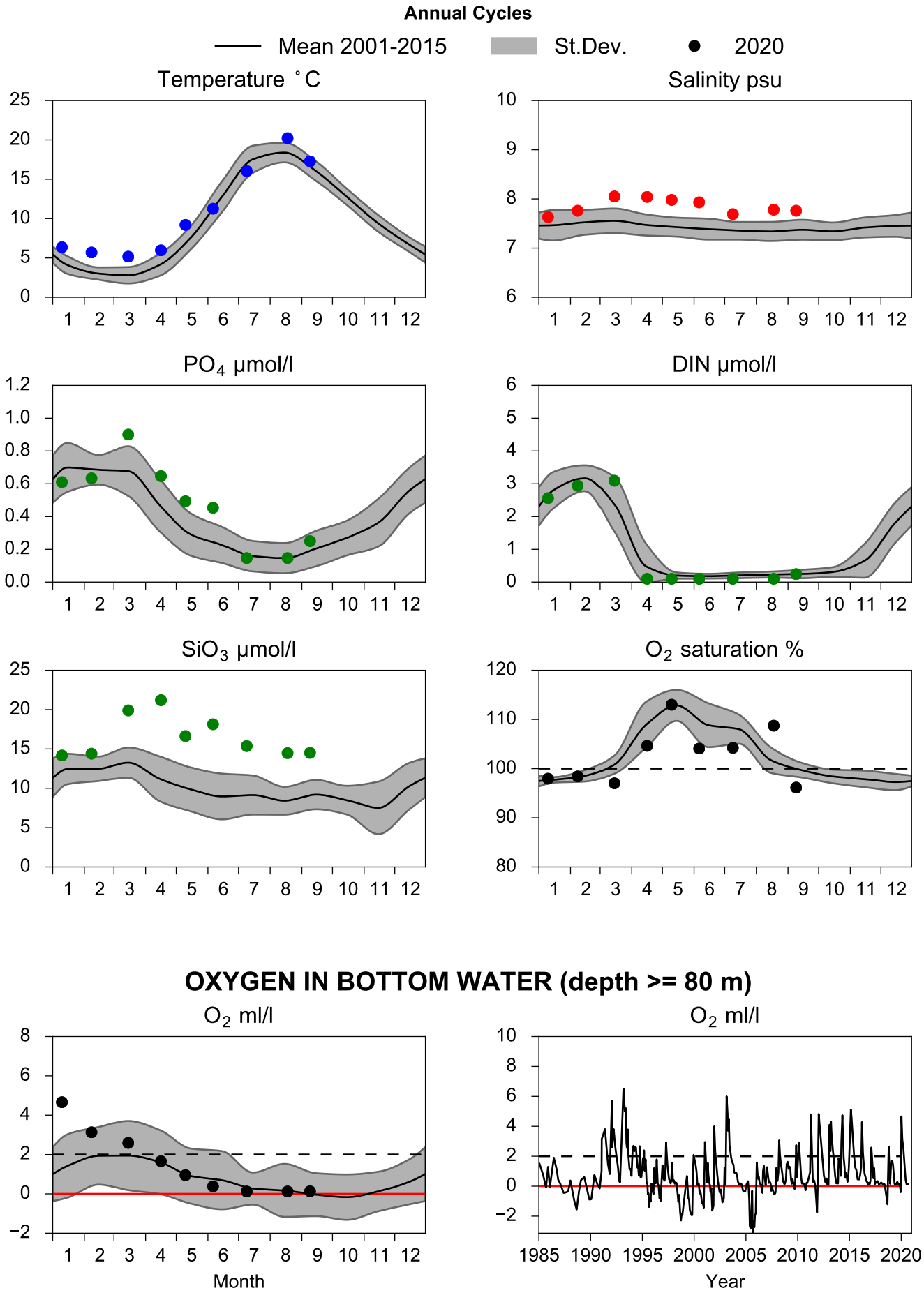


OXYGEN IN BOTTOM WATER (depth >= 80 m)

Vertical profiles BY4 CHRISTIANSÖ
September

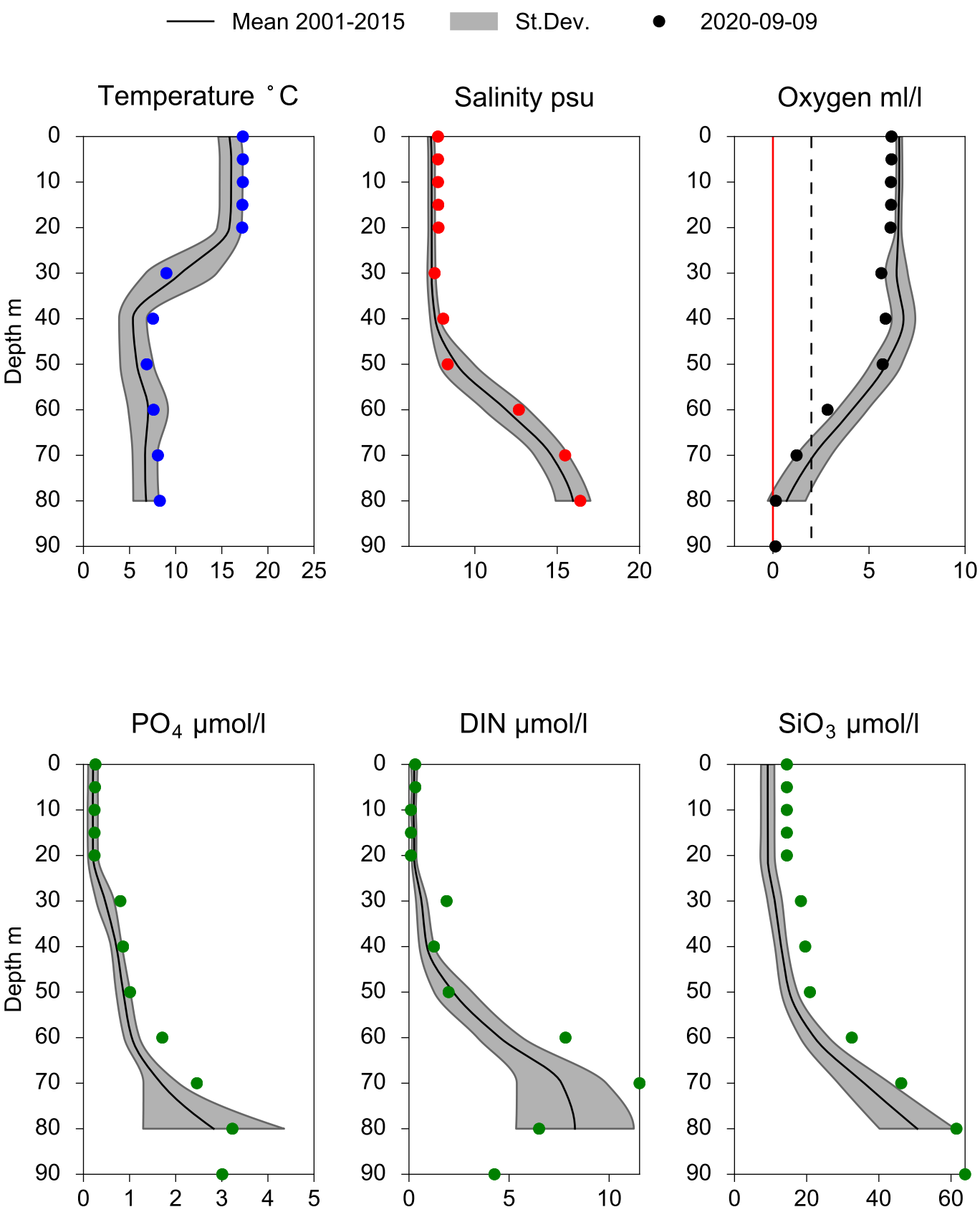


STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)



OXYGEN IN BOTTOM WATER (depth >= 80 m)

Vertical profiles BY5 BORNHOLMSDJ
September

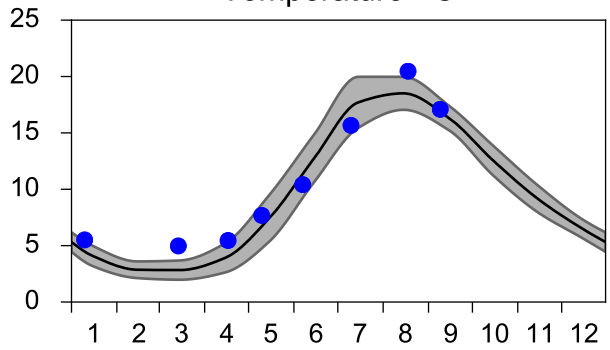


STATION BCS III-10 SURFACE WATER (0-10 m)

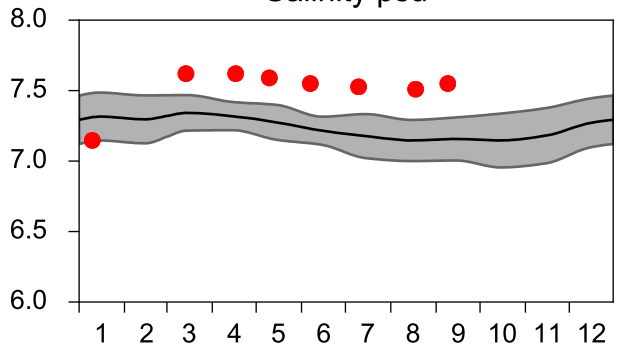
Annual Cycles

Mean 2001-2015 St.Dev. 2020

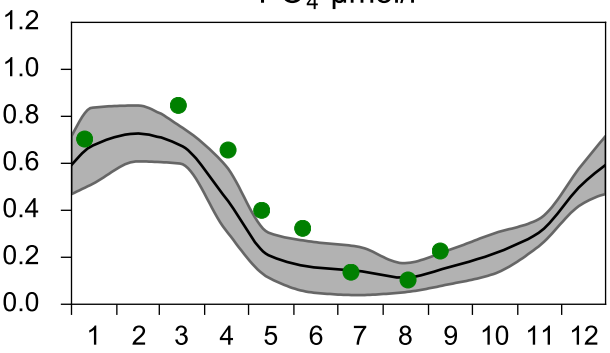
Temperature ˚C



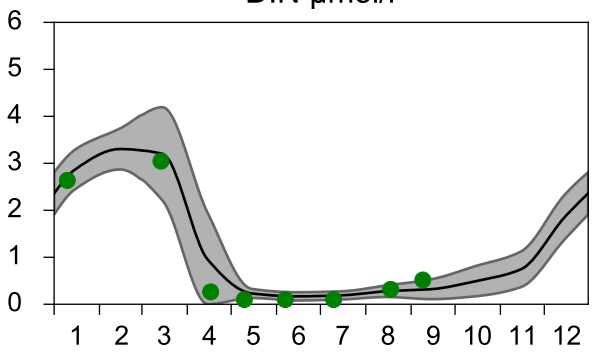
Salinity psu



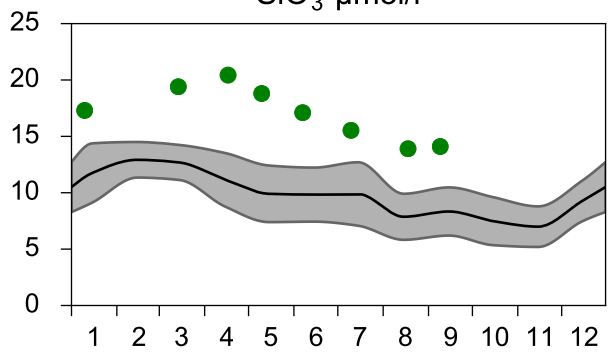
PO_4 µmol/l



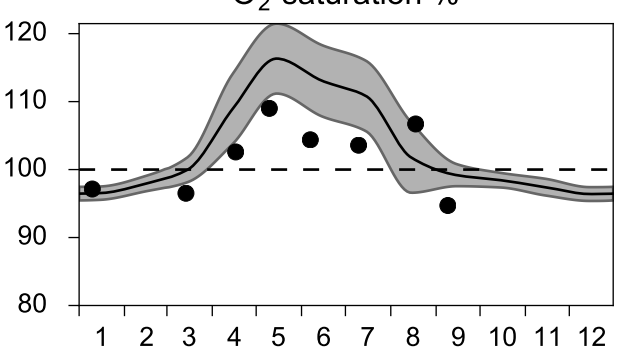
DIN µmol/l



SiO_3 µmol/l

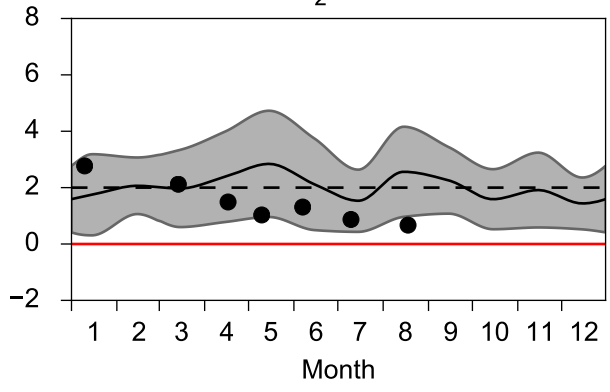


O_2 saturation %

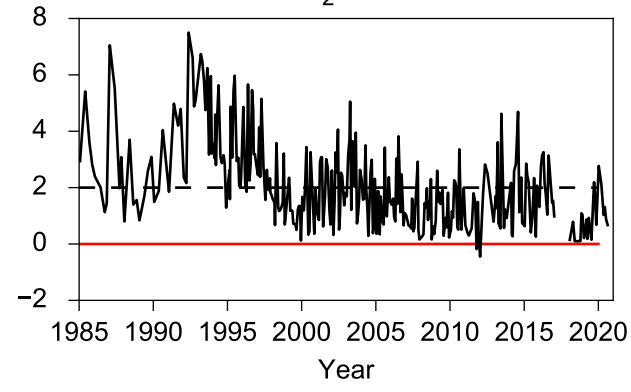


OXYGEN IN BOTTOM WATER (depth >= 80 m)

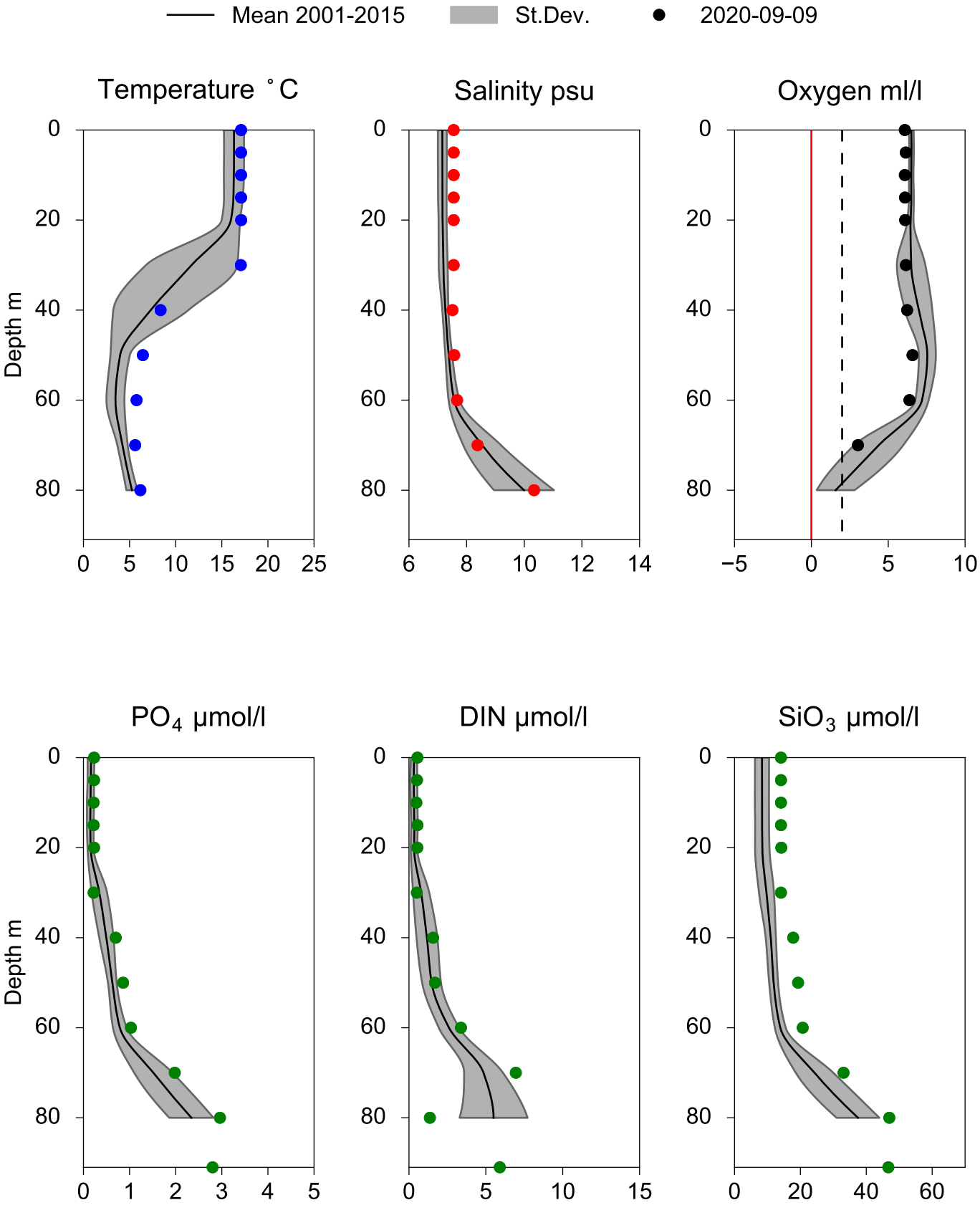
O_2 ml/l



O_2 ml/l

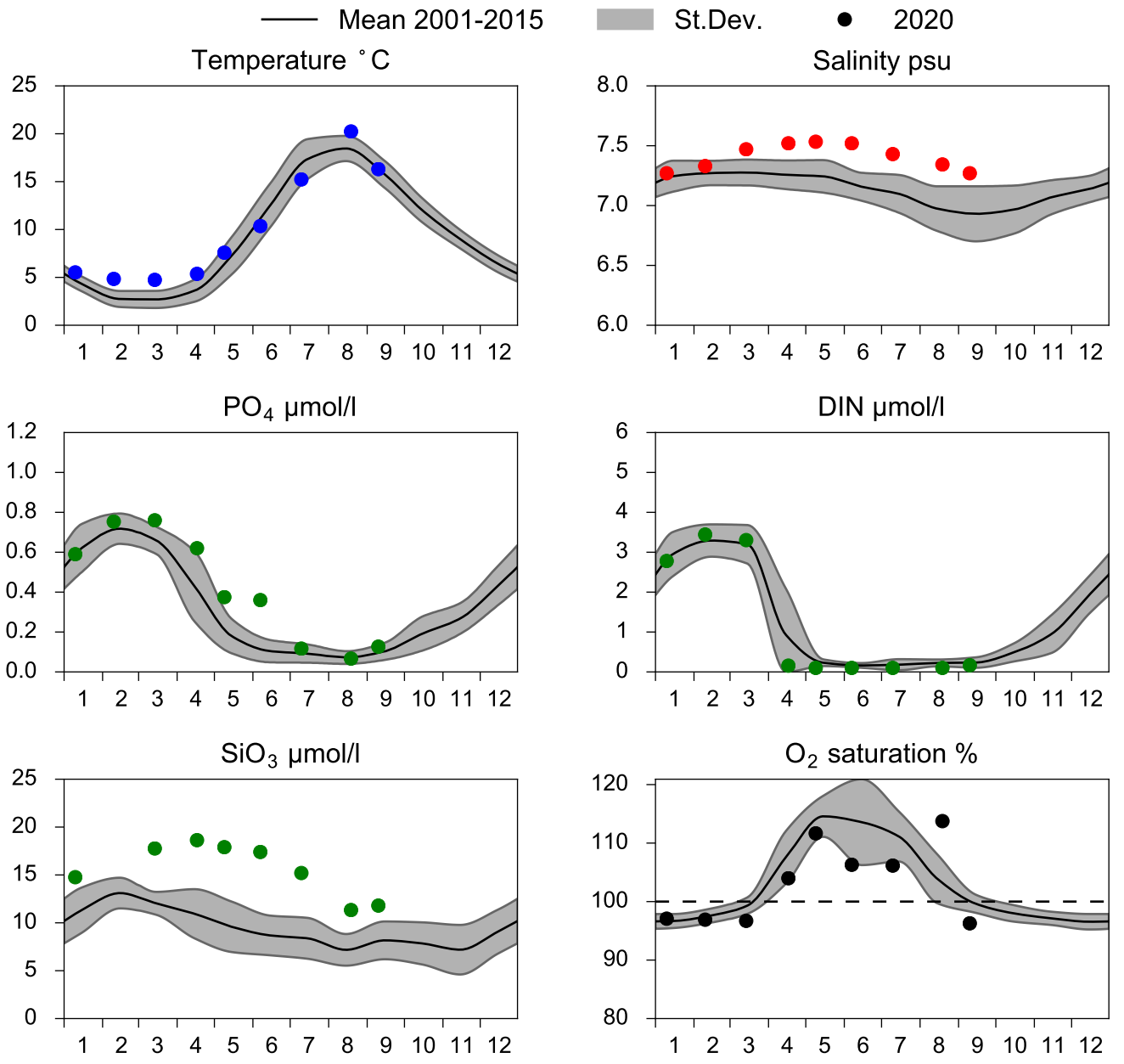


Vertical profiles BCS III-10
September

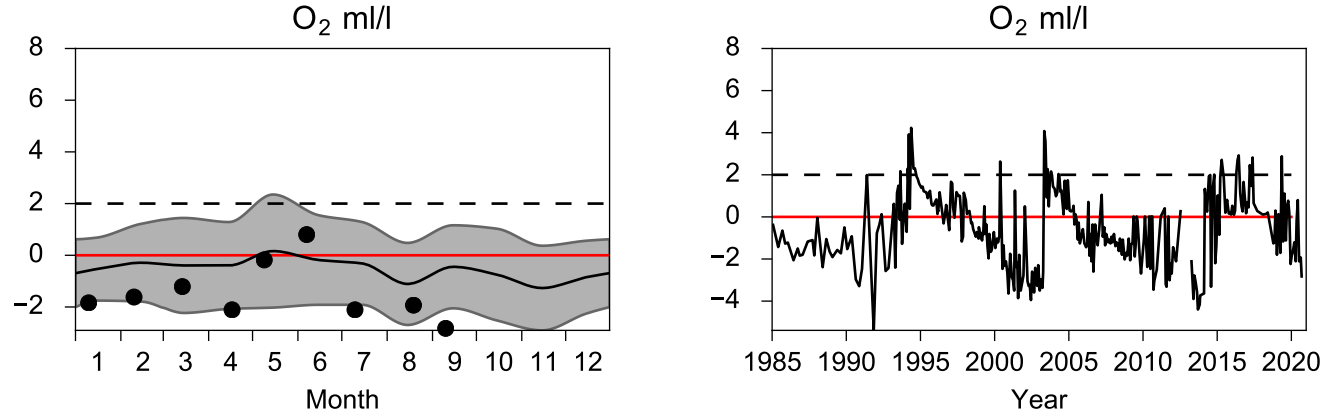


STATION BY10 SURFACE WATER (0-10 m)

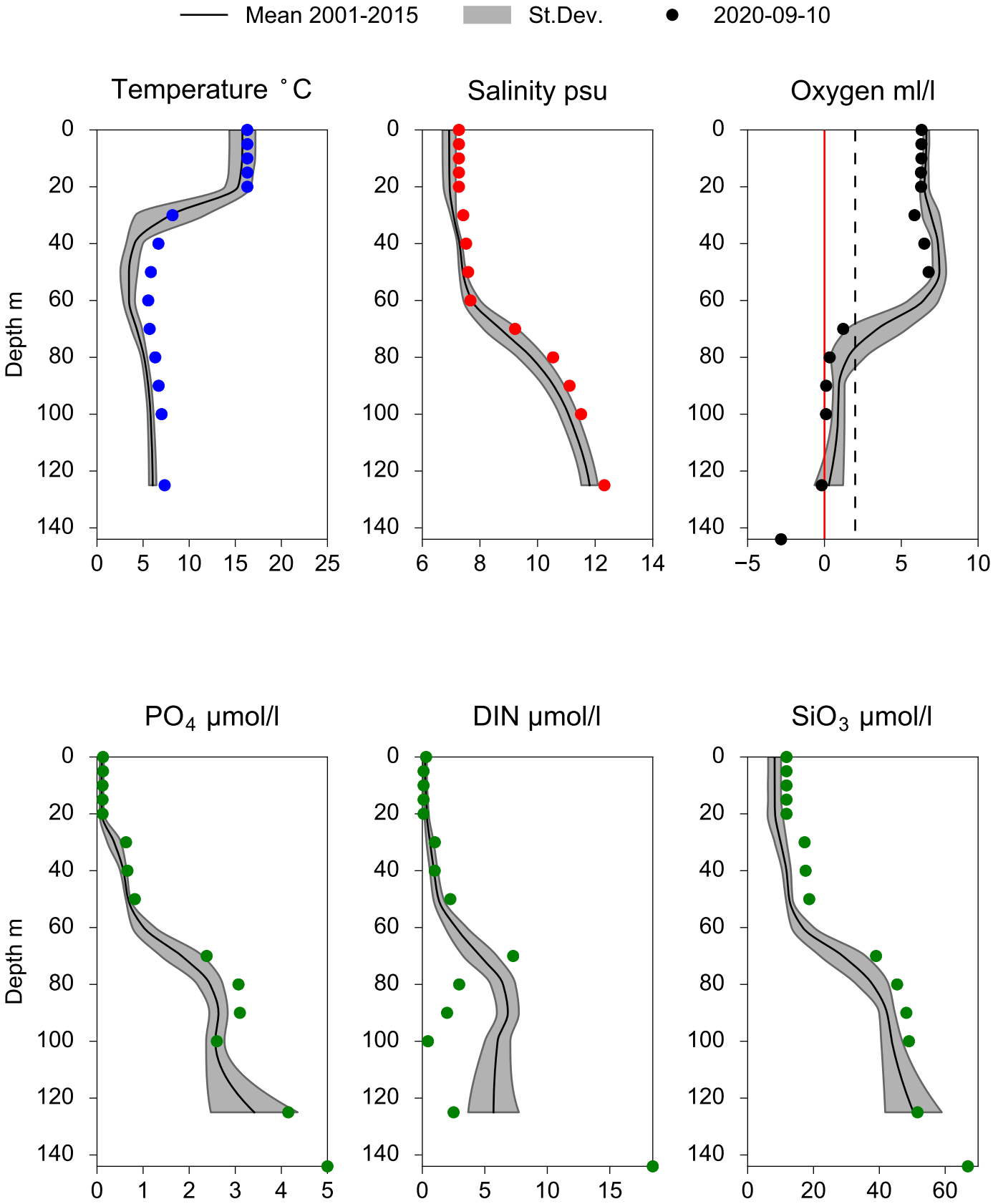
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 125 m)

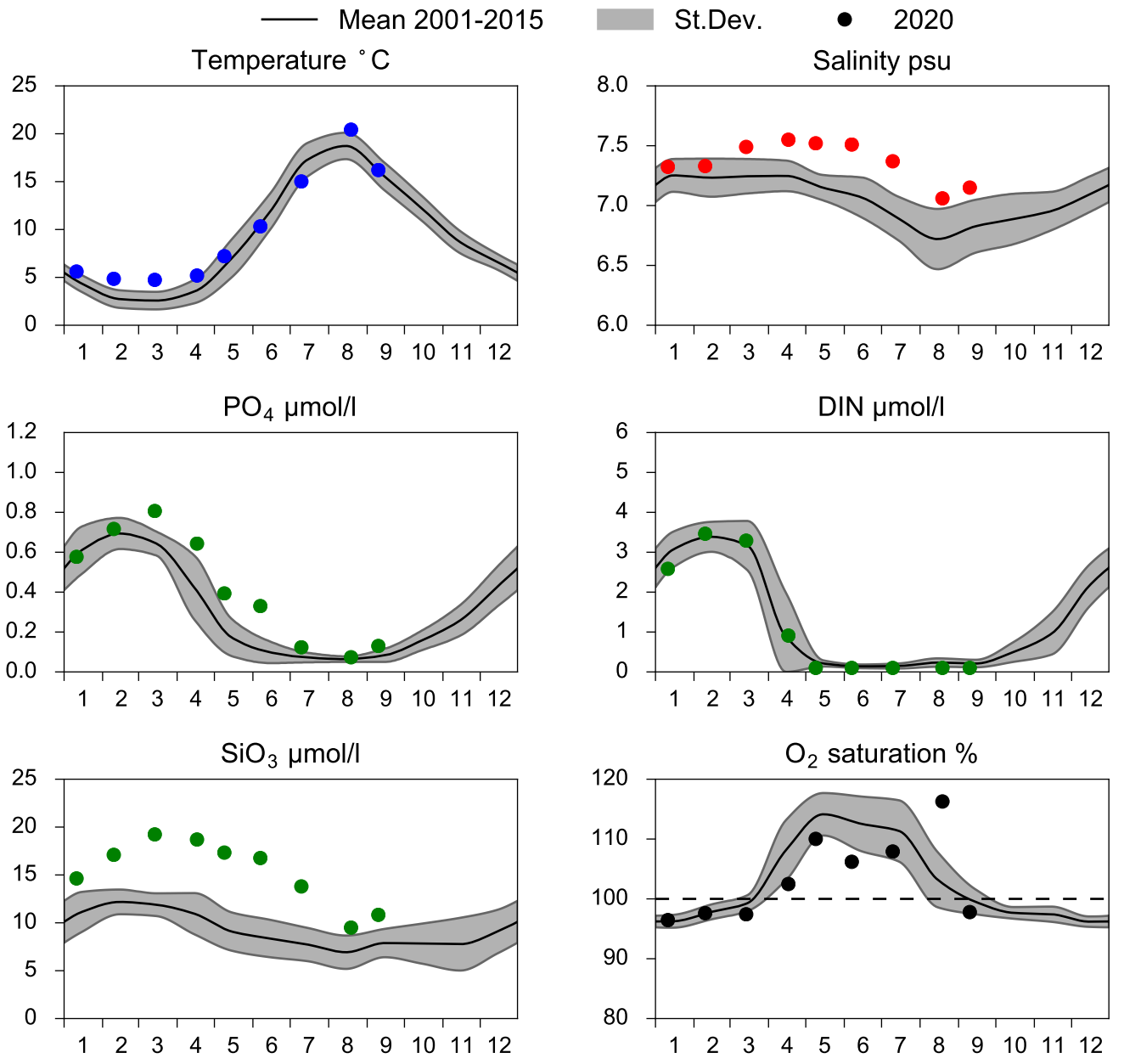


Vertical profiles BY10
September

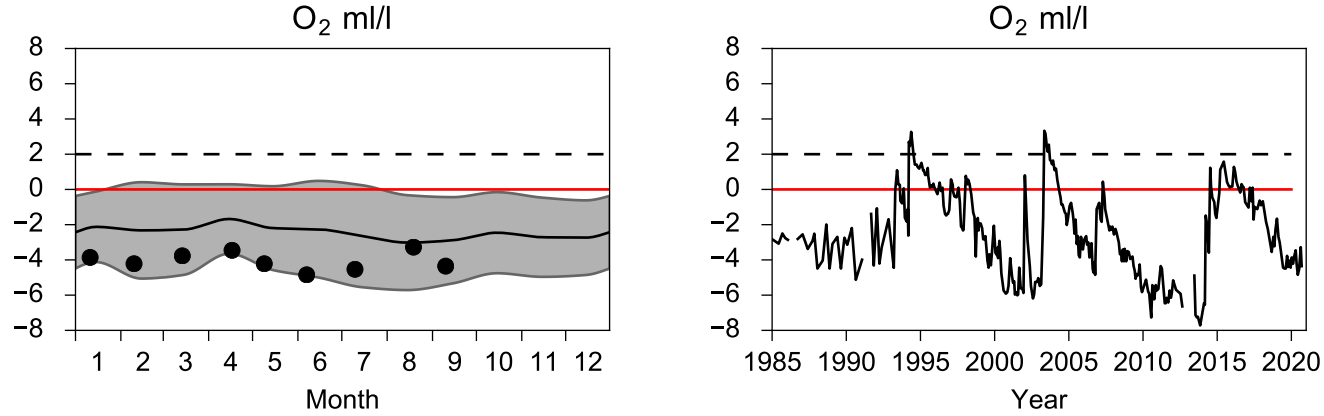


STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)

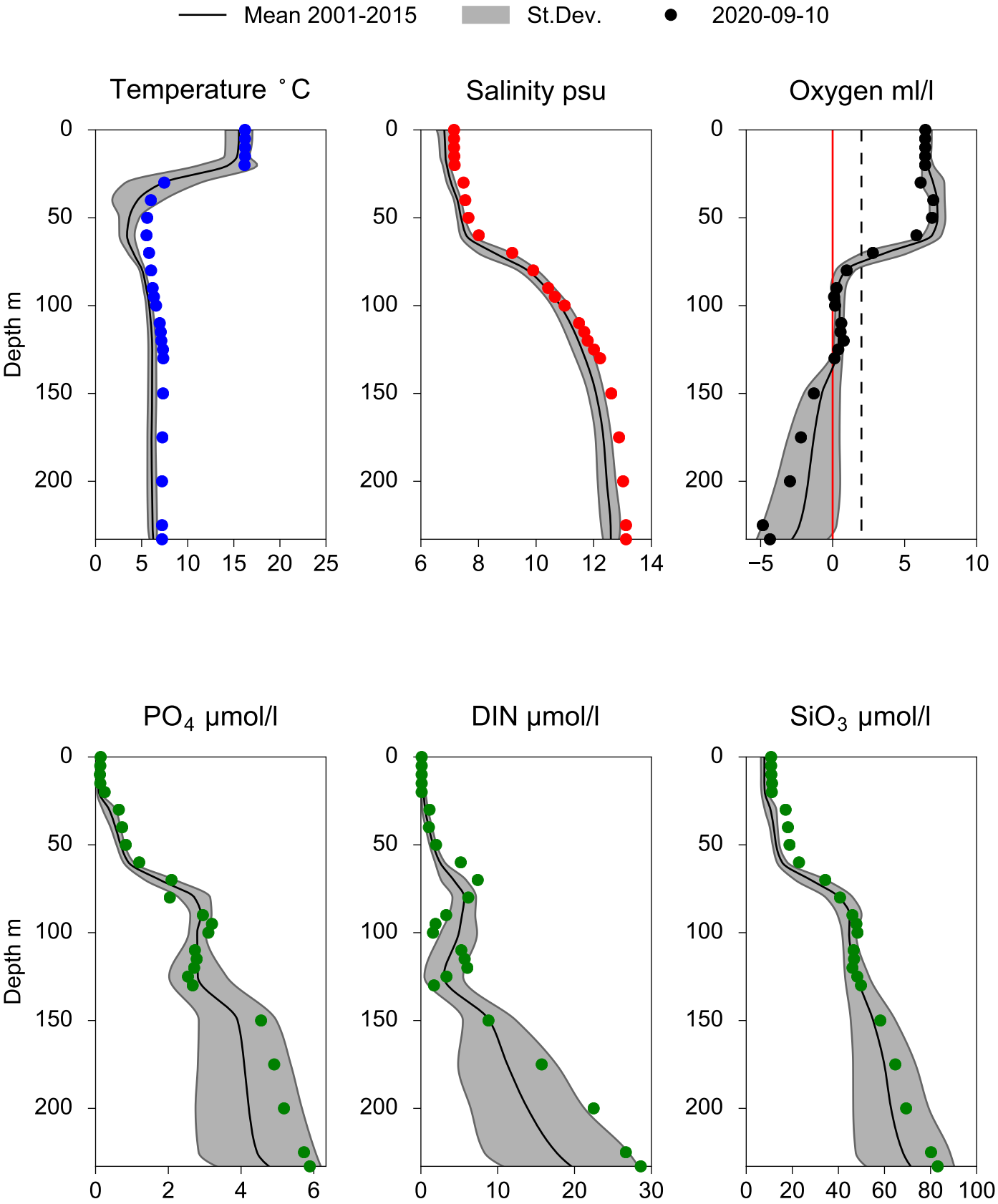
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 225 m)



Vertical profiles BY15 GOTLANDSDJ
September

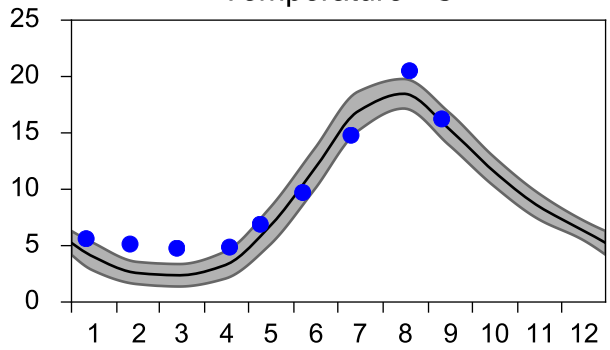


STATION BY20 FÅRÖDJ SURFACE WATER (0-10 m)

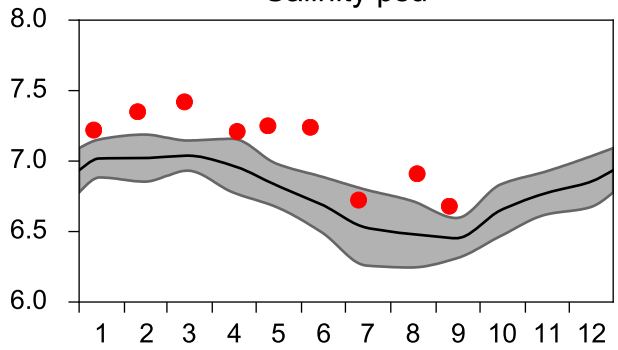
Annual Cycles

Mean 2001-2015 St.Dev. 2020

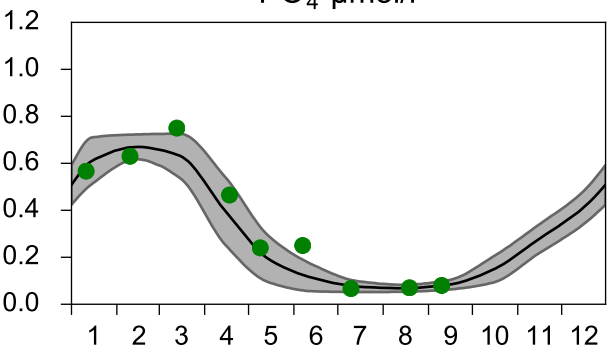
Temperature ˚C



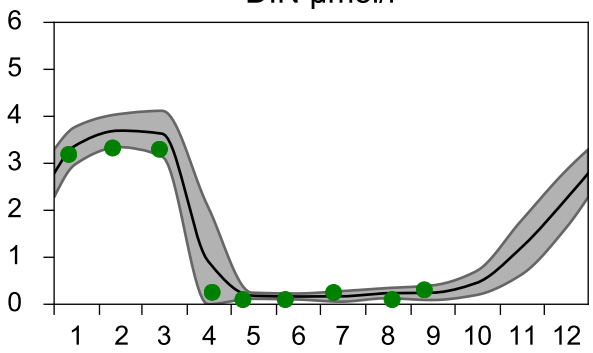
Salinity psu



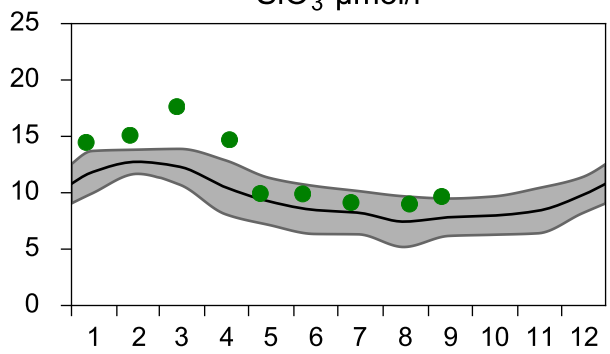
PO_4 µmol/l



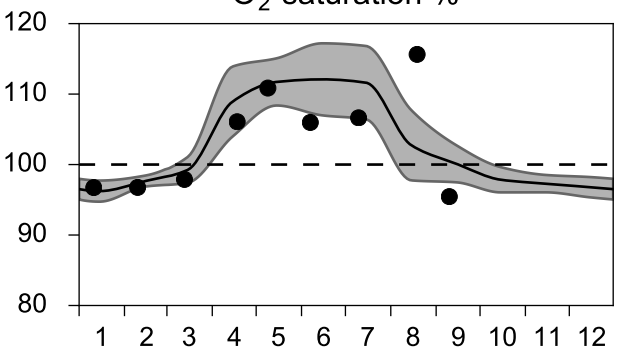
DIN µmol/l



SiO_3 µmol/l

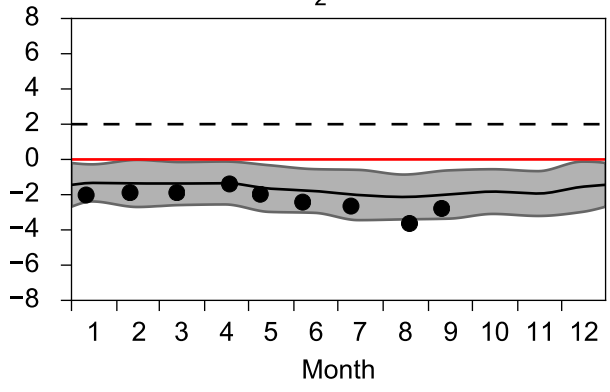


O_2 saturation %

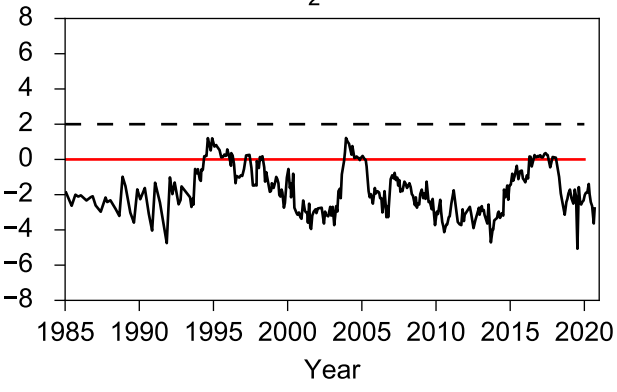


OXYGEN IN BOTTOM WATER (depth >= 175 m)

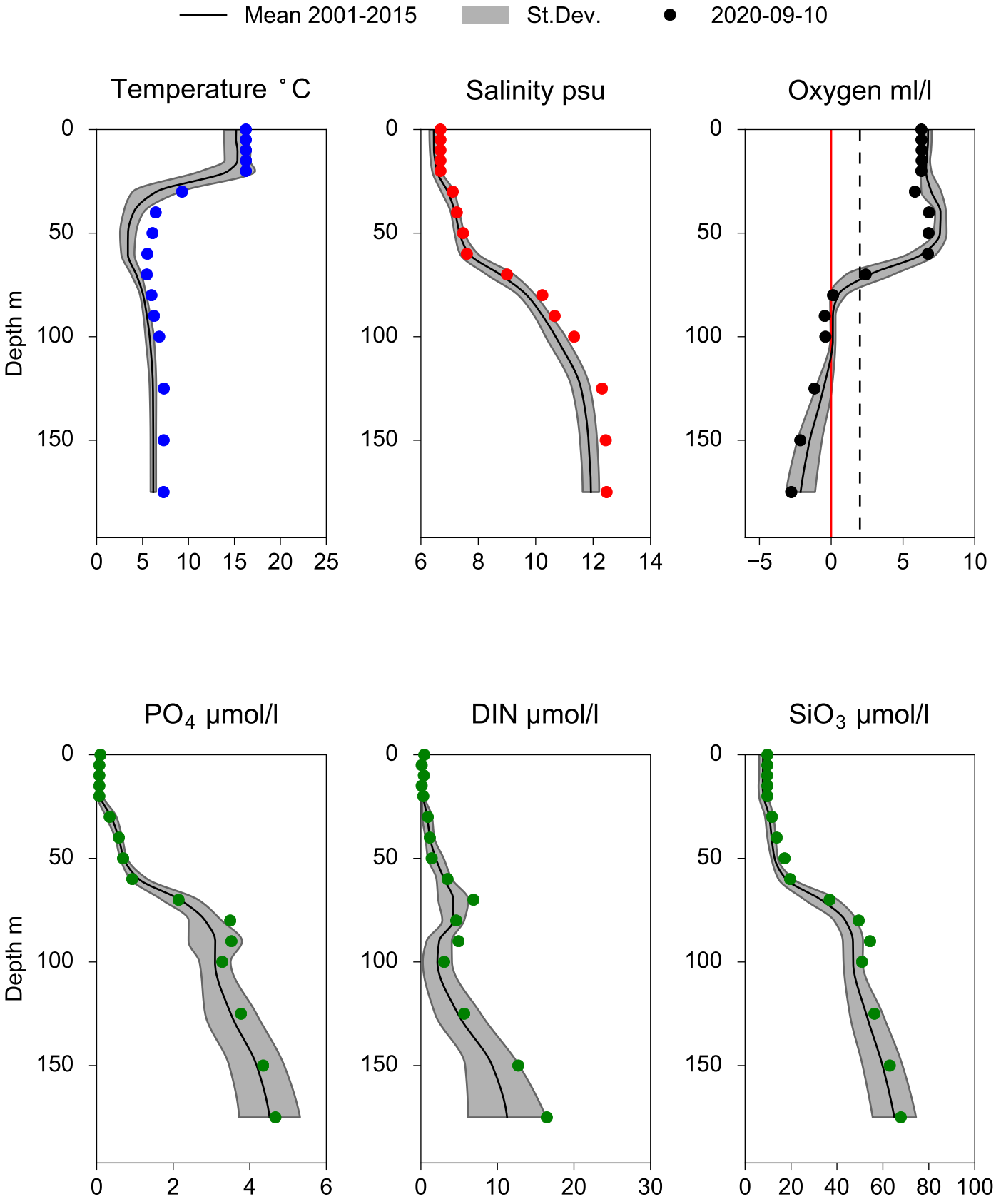
O_2 ml/l



O_2 ml/l



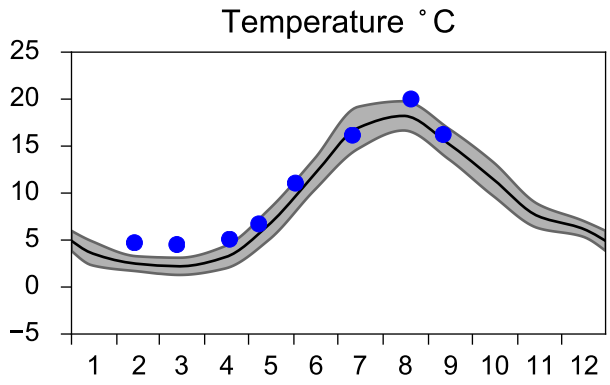
Vertical profiles BY20 FÅRÖDJ
September

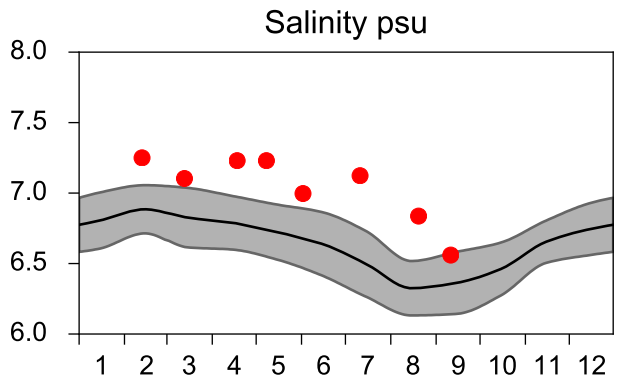


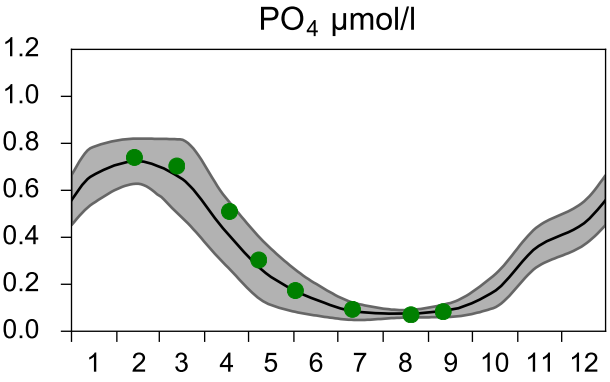
STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)

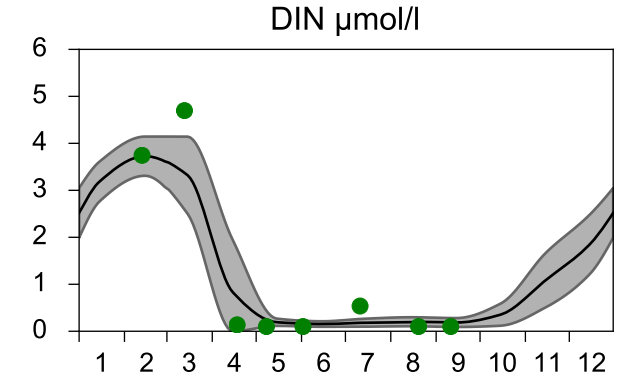
Annual Cycles

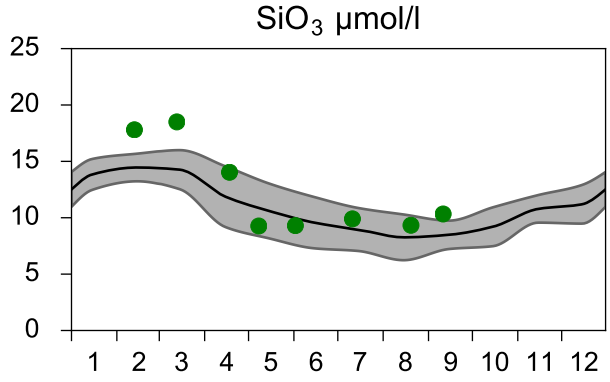
Mean 2001-2015 St.Dev. 2020

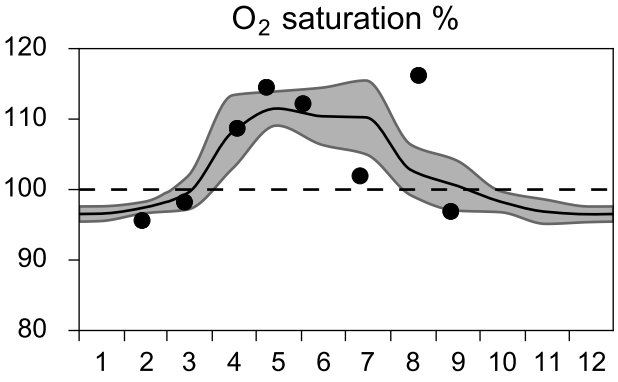




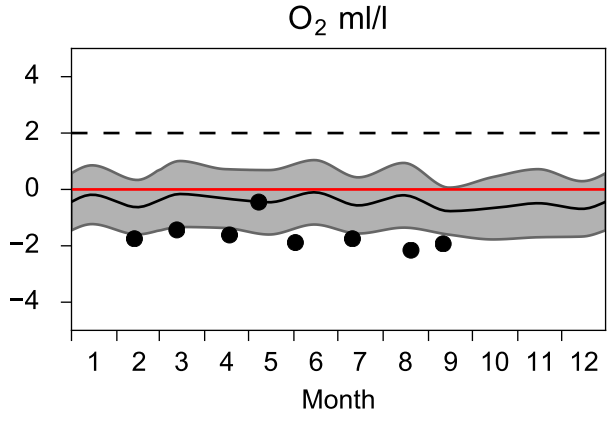


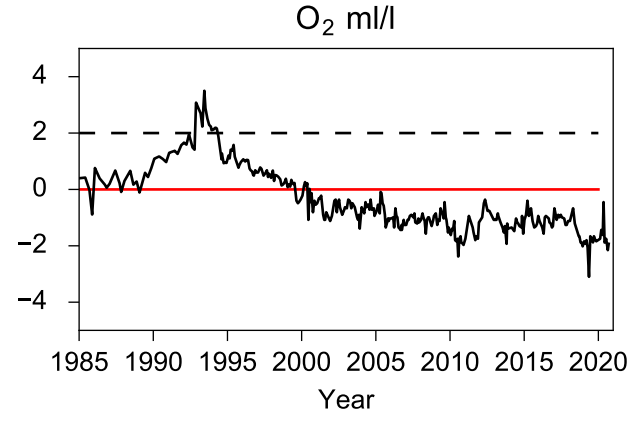




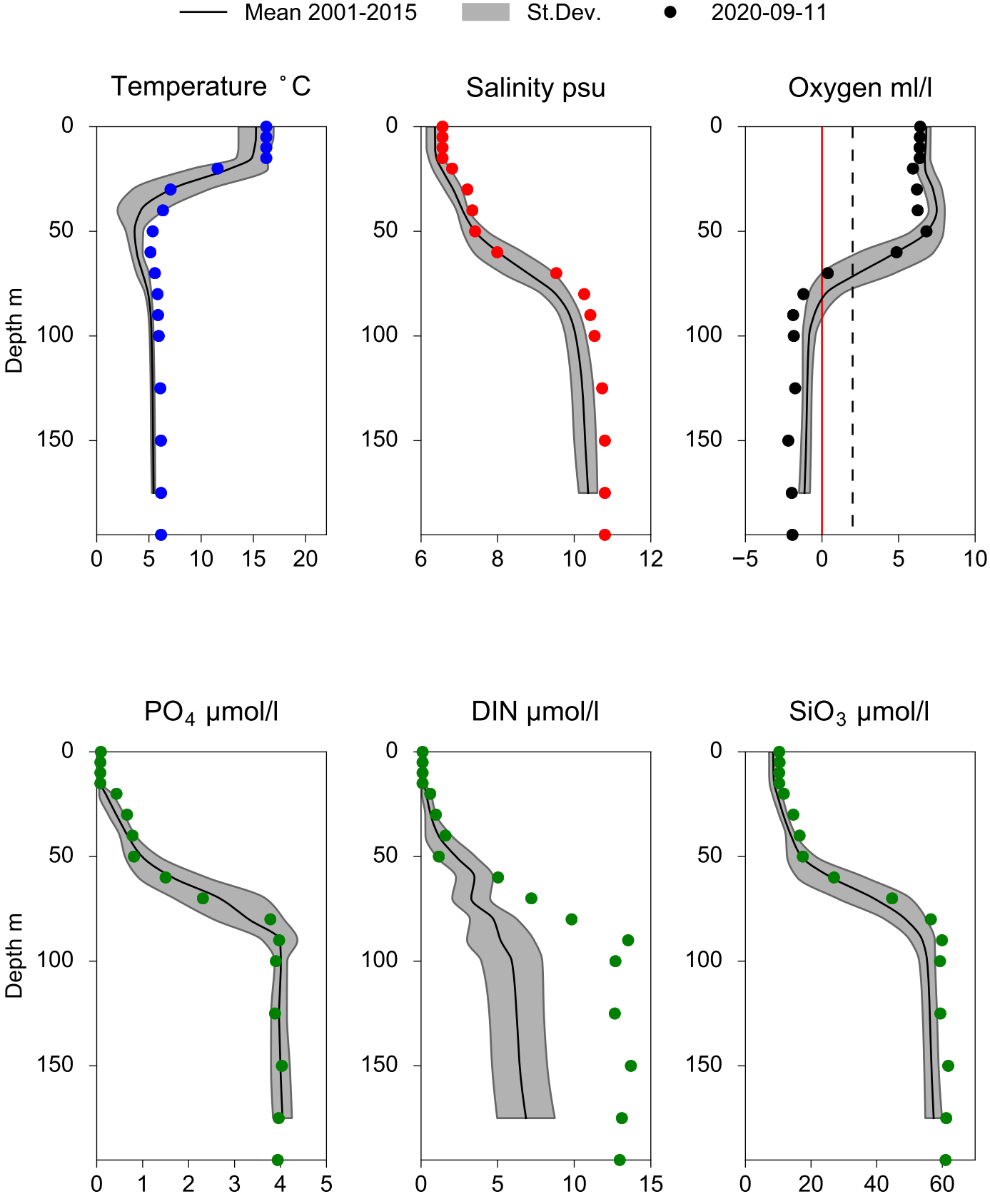


OXYGEN IN BOTTOM WATER (depth >= 175 m)



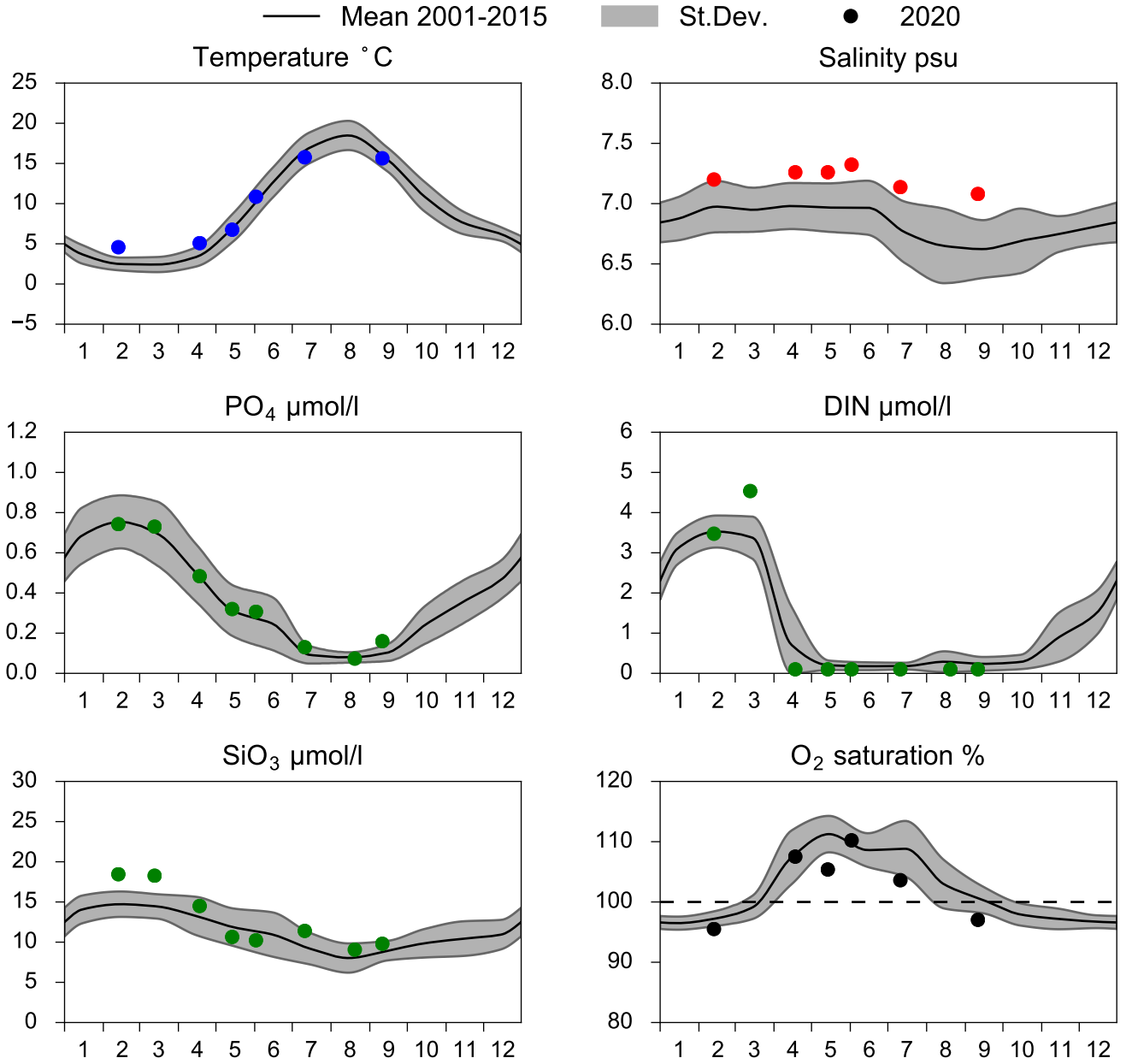


Vertical profiles BY32 NORRKÖPINGSDJ
September

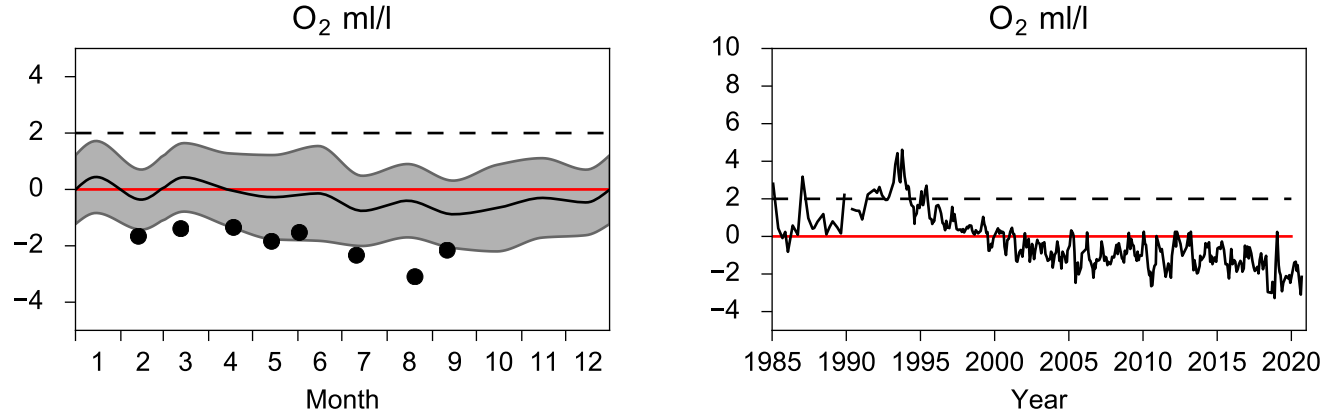


STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)

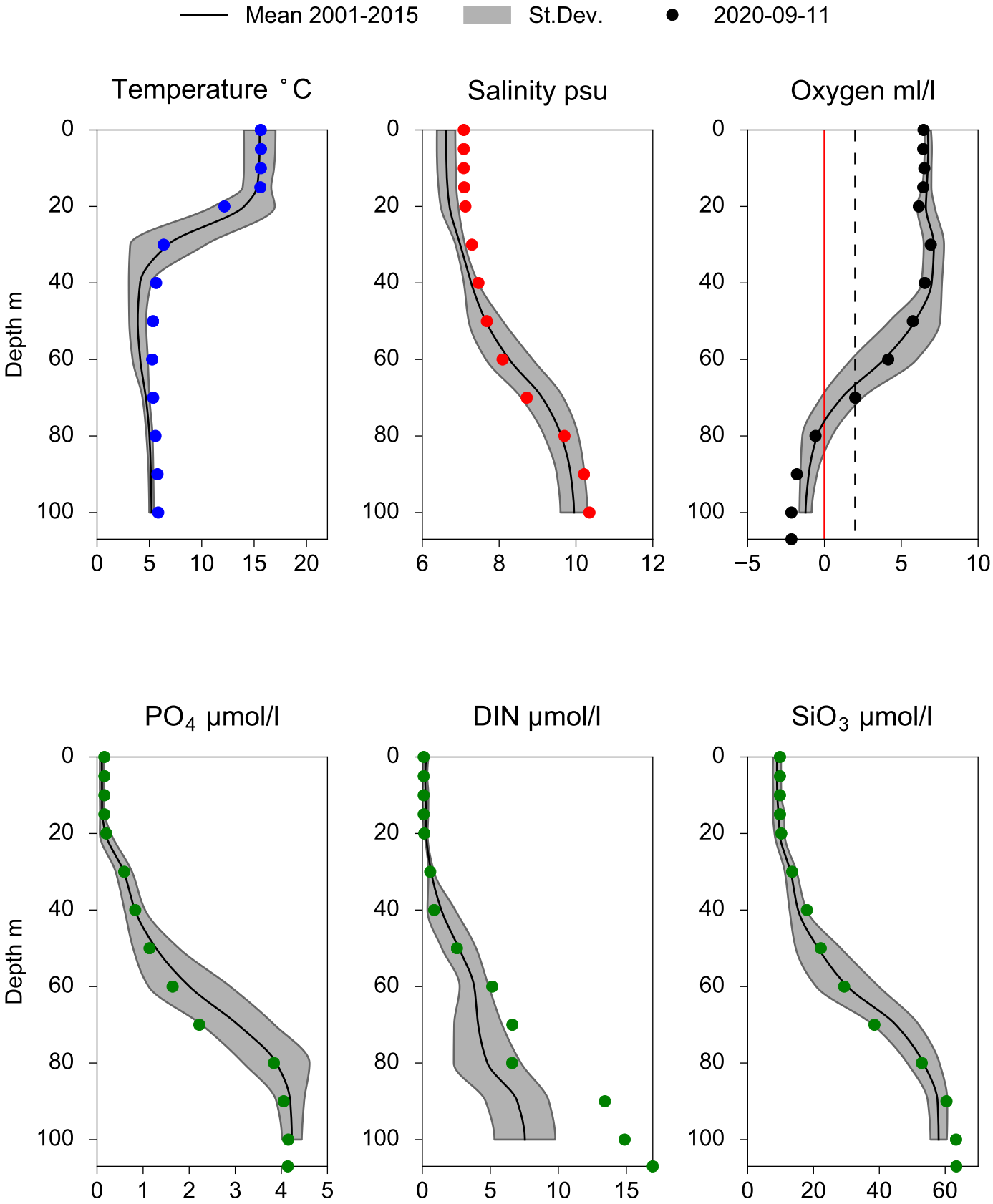
Annual Cycles



OXYGEN IN BOTTOM WATER (depth >= 100 m)



Vertical profiles BY38 KARLSÖDJ
September

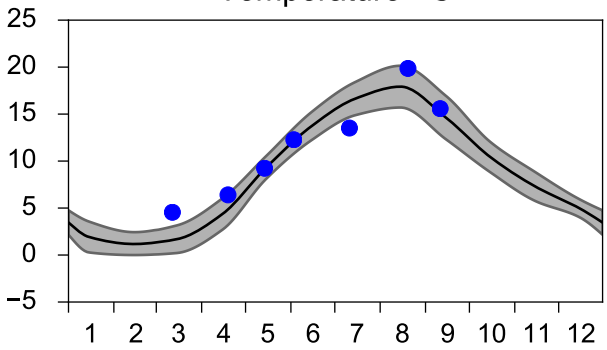


STATION REF M1V1 SURFACE WATER (0-10 m)

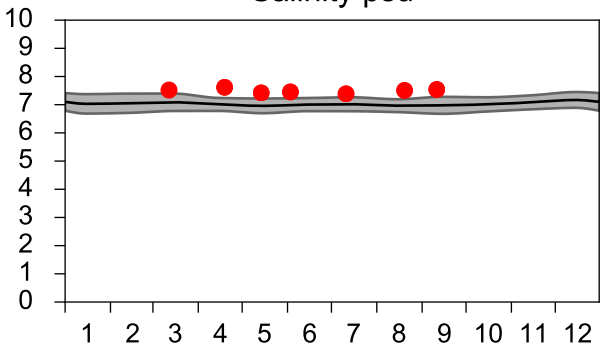
Annual Cycles

Mean 2001-2015 St.Dev. 2020

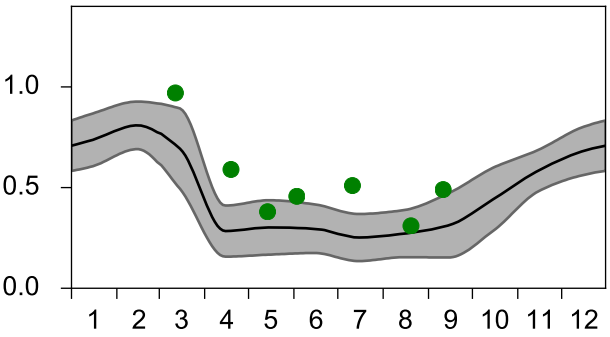
Temperature ˚C



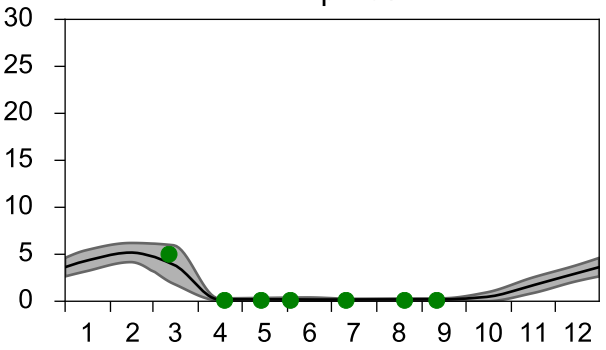
Salinity psu



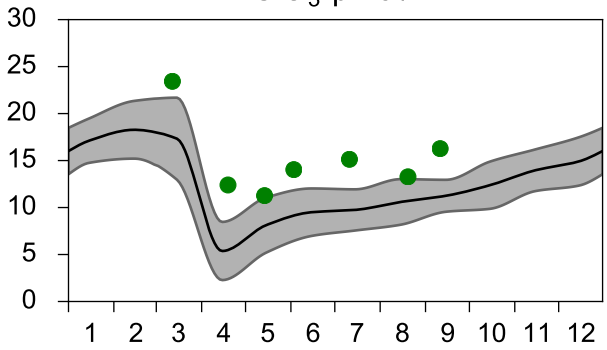
PO_4 µmol/l



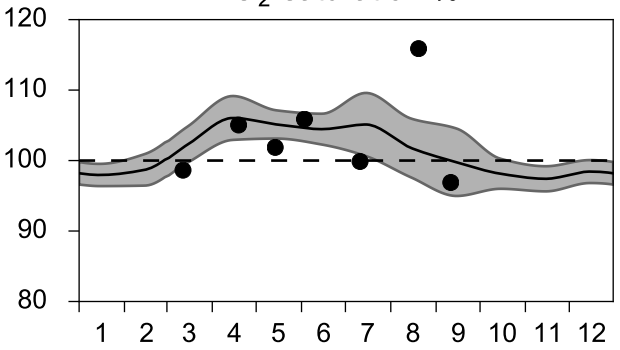
DIN µmol/l



SiO_3 µmol/l

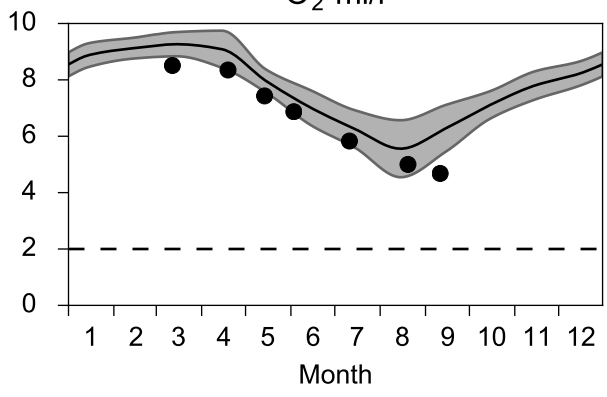


O_2 saturation %

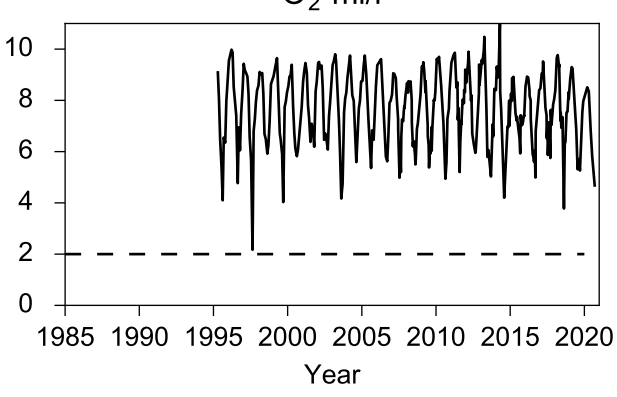


OXYGEN IN BOTTOM WATER (depth >= 15 m)

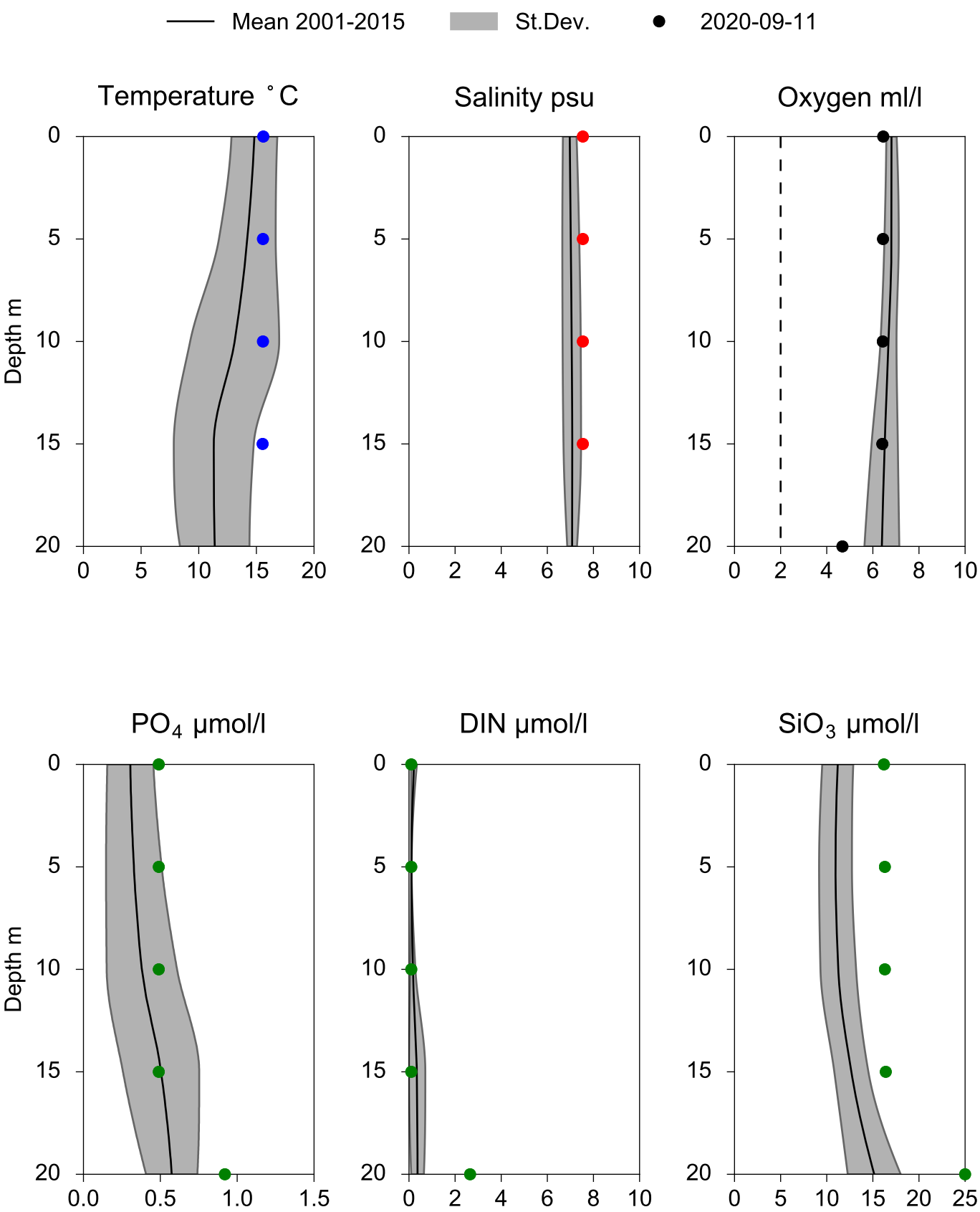
O_2 ml/l



O_2 ml/l



Vertical profiles REF M1V1
September

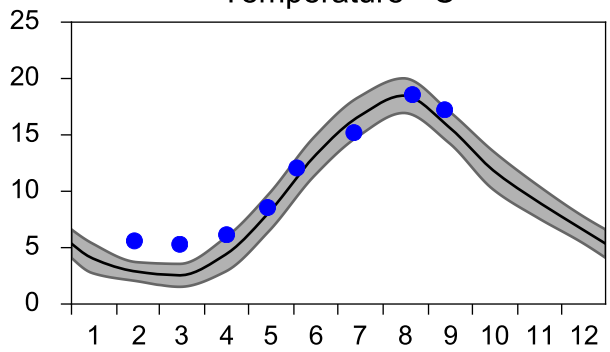


STATION HANÖBUKTEN SURFACE WATER (0-10 m)

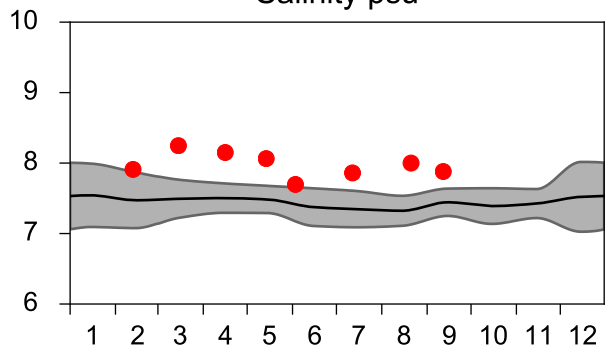
Annual Cycles

Mean 2001-2015 St.Dev. 2020

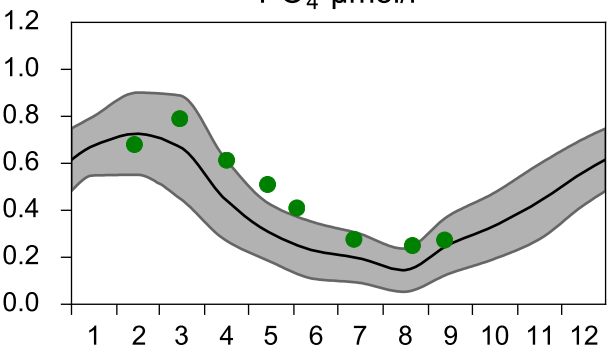
Temperature ˚C



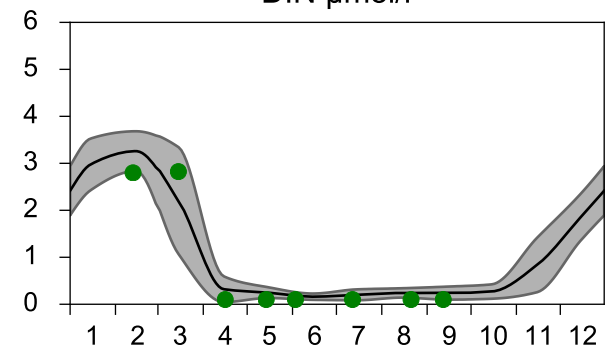
Salinity psu



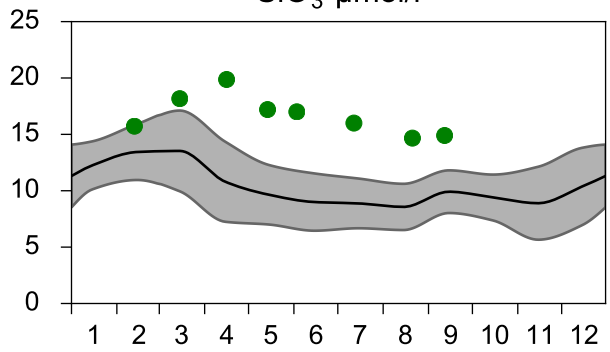
PO_4 µmol/l



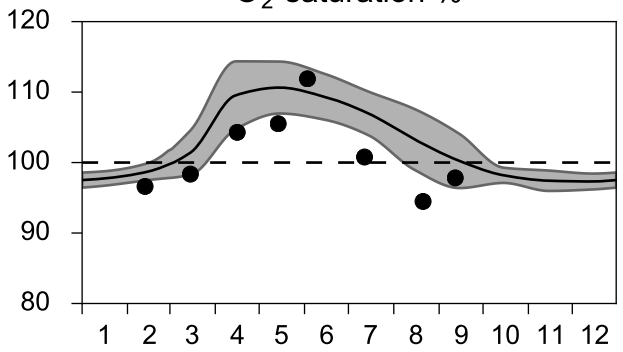
DIN µmol/l



SiO_3 µmol/l

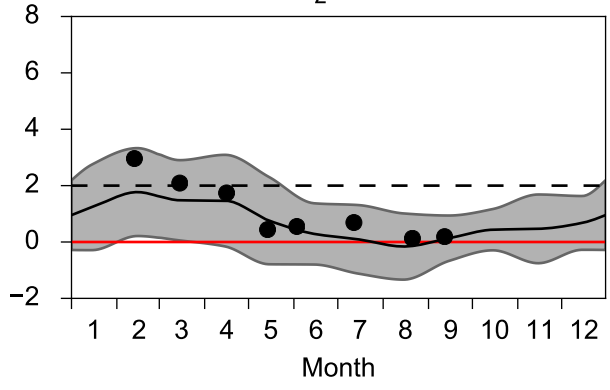


O_2 saturation %

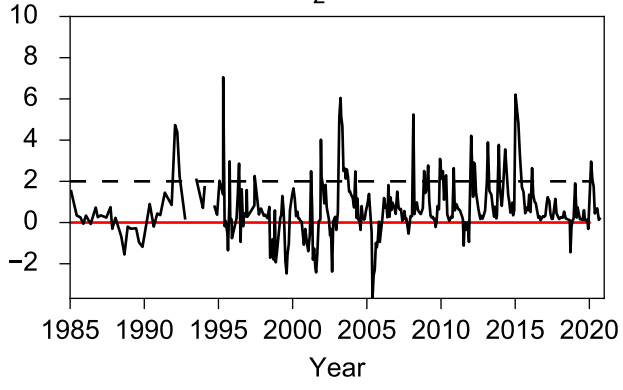


OXYGEN IN BOTTOM WATER (depth >= 70 m)

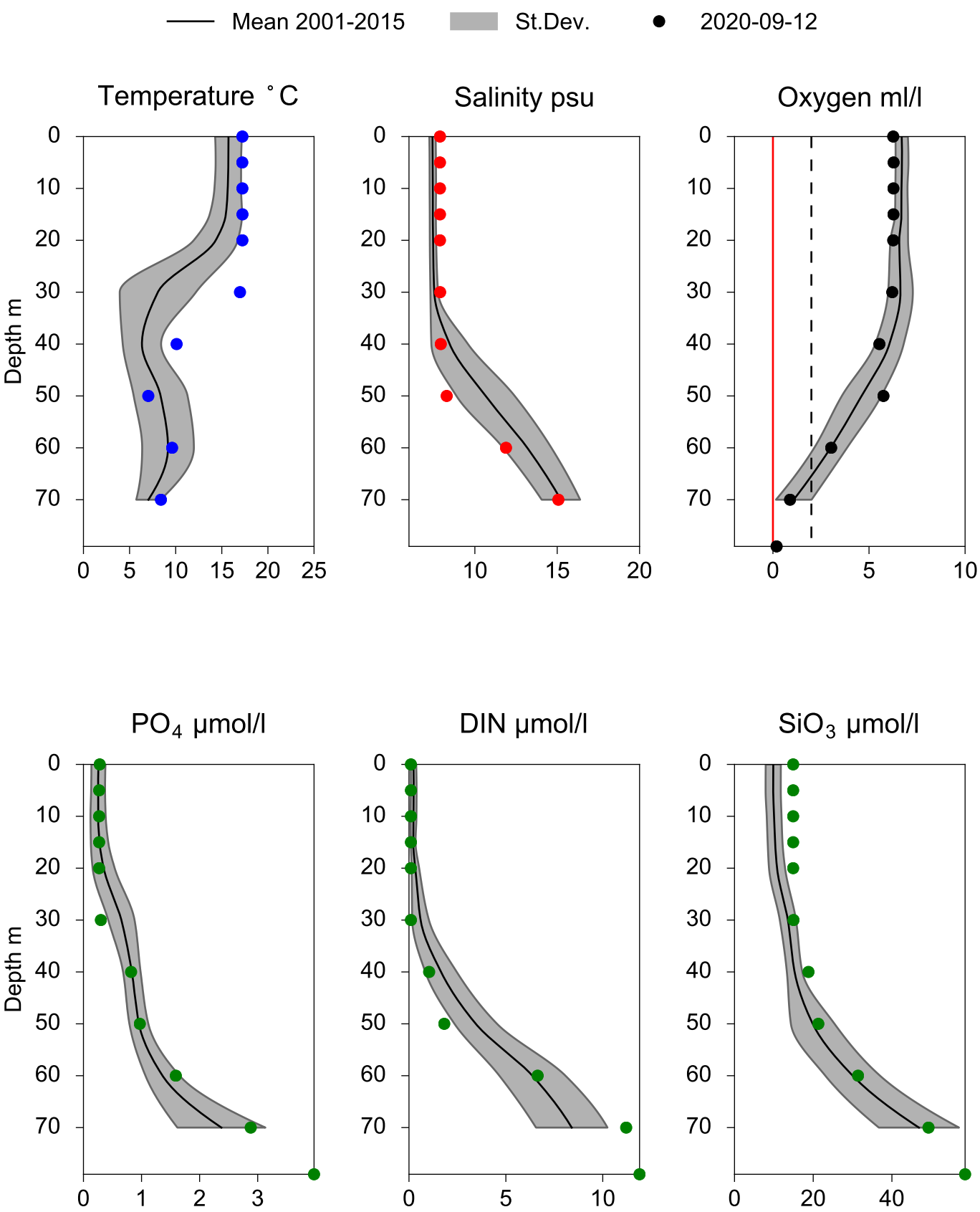
O_2 ml/l



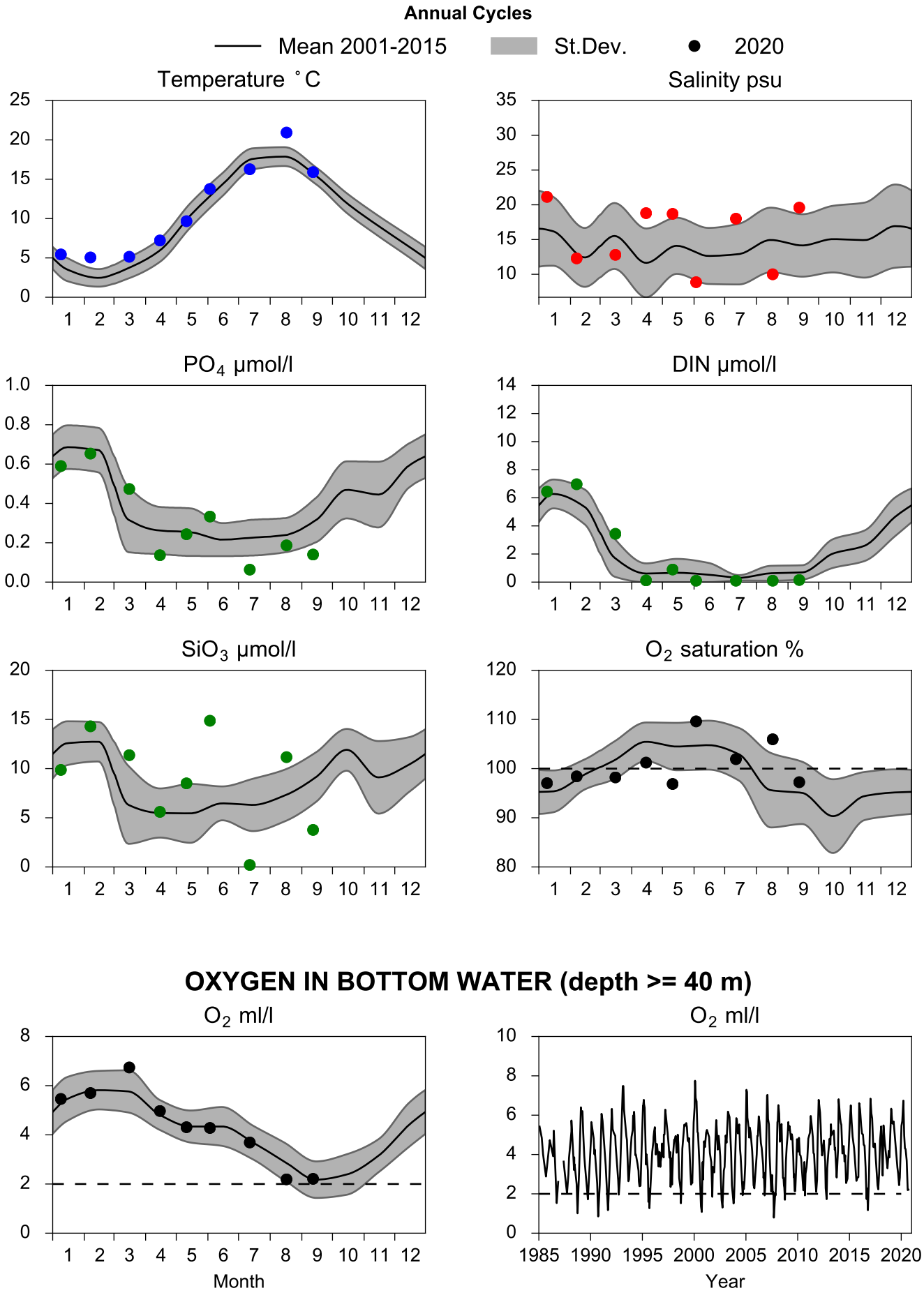
O_2 ml/l



Vertical profiles HANÖBUKTEN
September

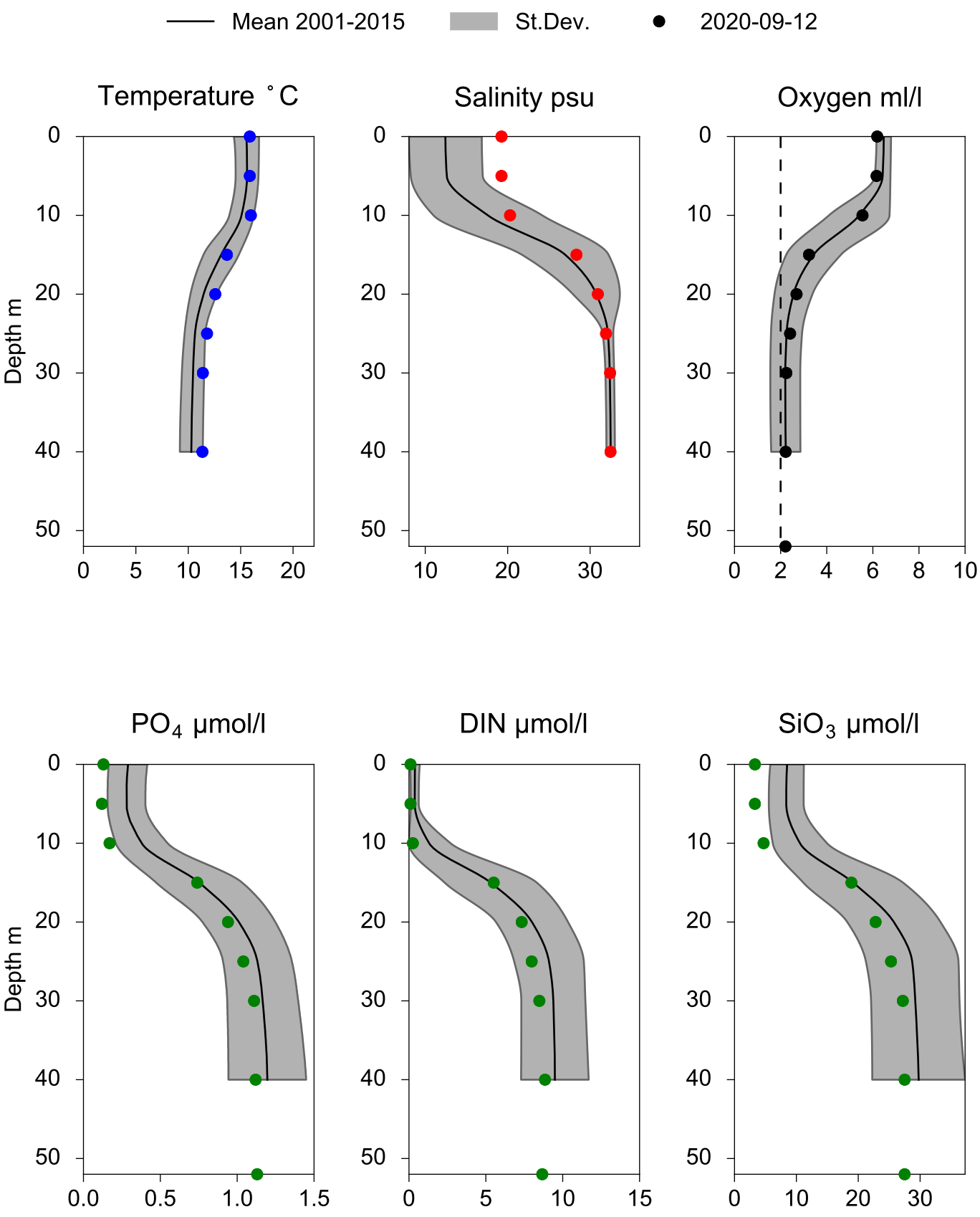


STATION W LANDSKRONA SURFACE WATER (0-10 m)

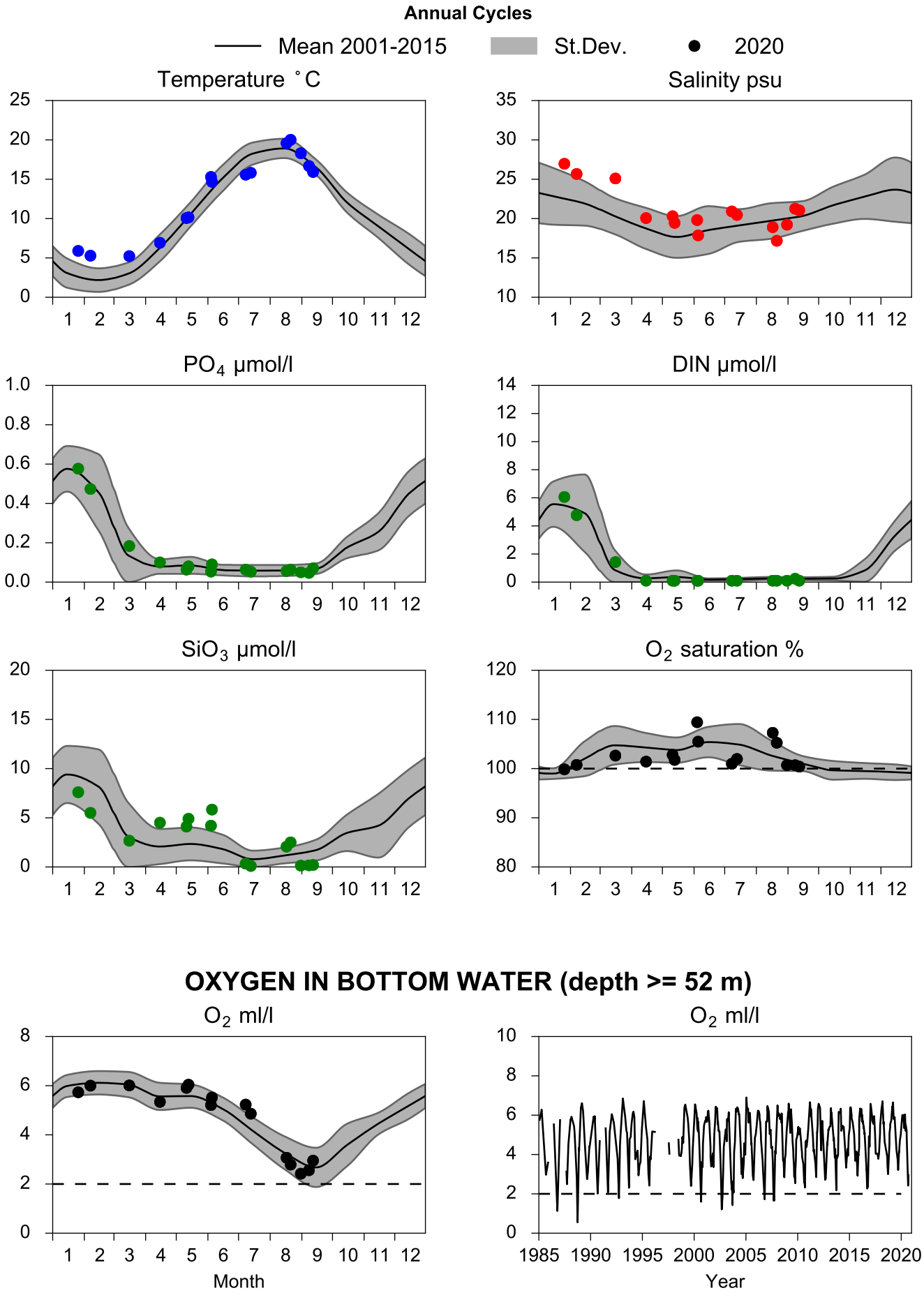


OXYGEN IN BOTTOM WATER (depth >= 40 m)

Vertical profiles W LANDSKRONA
September



STATION ANHOLT E SURFACE WATER (0-10 m)



OXYGEN IN BOTTOM WATER (depth >= 52 m)

Vertical profiles ANHOLT E
September