

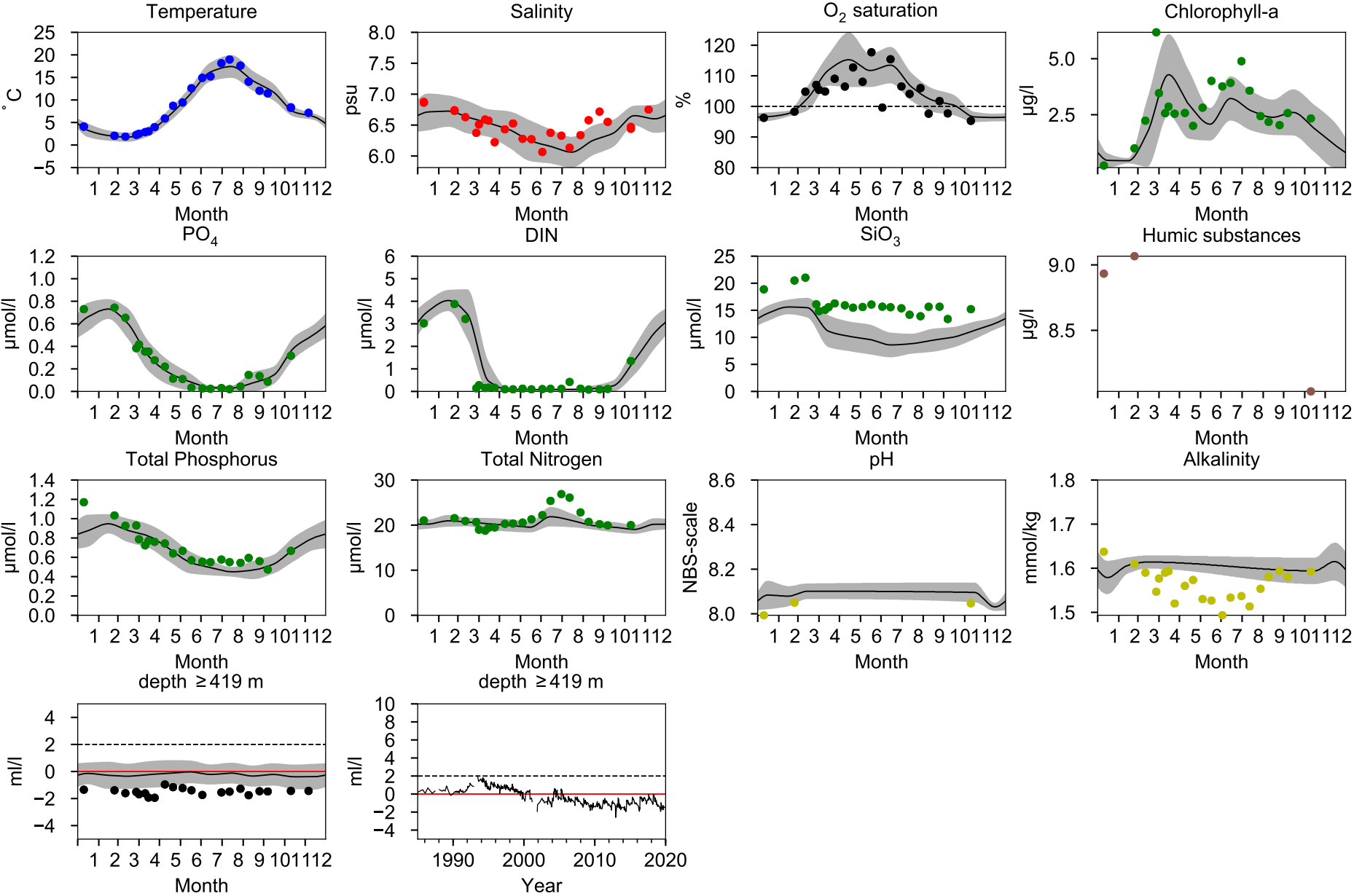
Appendix I

Seasonal cycles from monthly and high frequency stations sampled 2019.

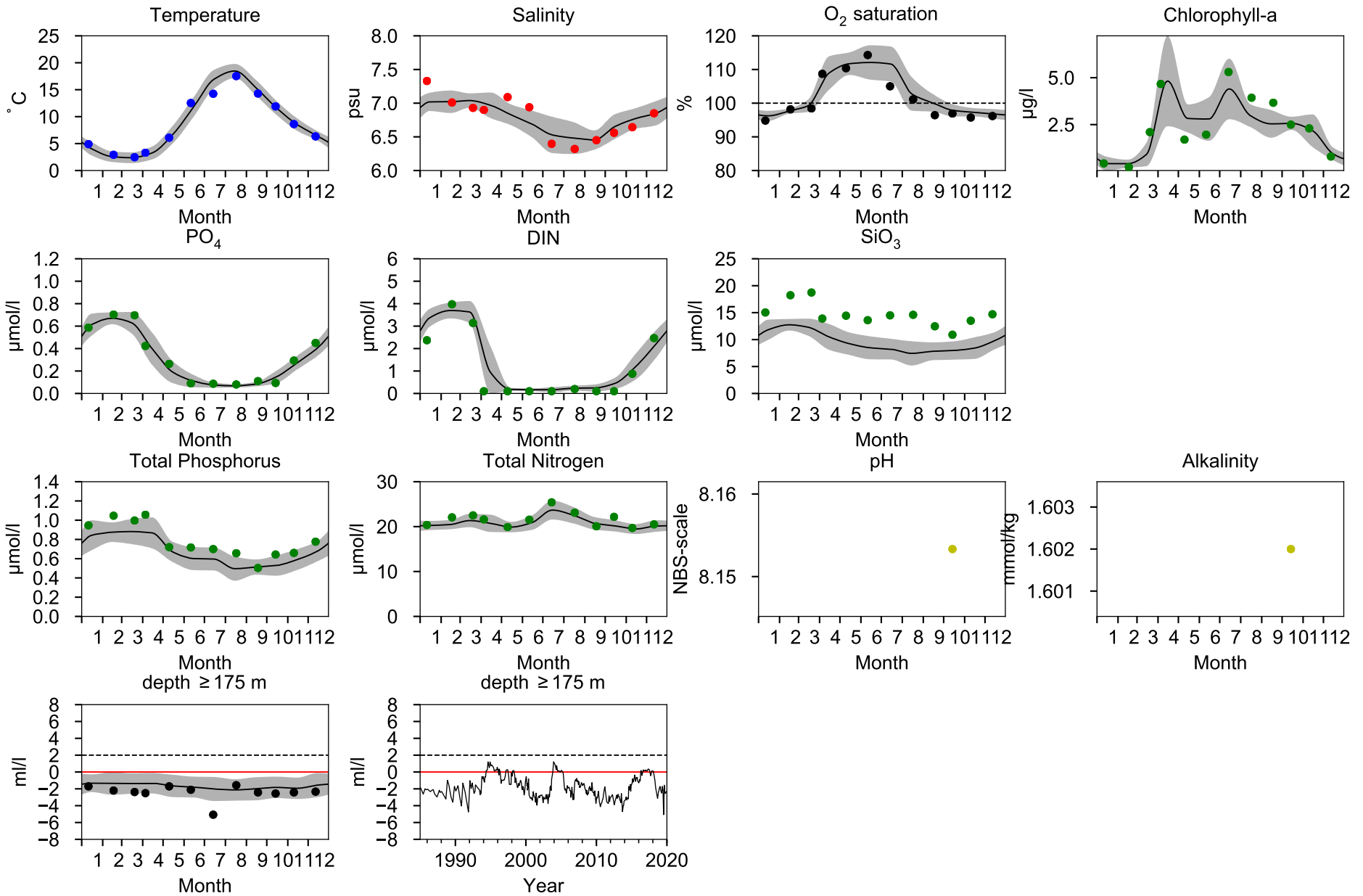
Surface water (0-10 m): including comparison to the mean and standard deviation for the period 2001-2015 for each month at each station. Included parameters are salinity, temperature, dissolved inorganic phosphorus (DIP), dissolved inorganic nitrogen (DIN; sum of ammonium, nitrate and nitrite), dissolved silica, total nitrogen, total phosphorus, chlorophyll, pH, alkalinity, humic substances, dissolved oxygen and oxygen saturation. Dissolved oxygen (including hydrogen sulphide expressed as negative oxygen) is presented for the bottom water.

Data for oxygen is primarily from the water sampling, but if data is missing, values from sensors on the CTD are presented instead. Data for salinity and temperature is primarily from sensors on the CTD. Data in the time series for bottom oxygen is only from water samples.

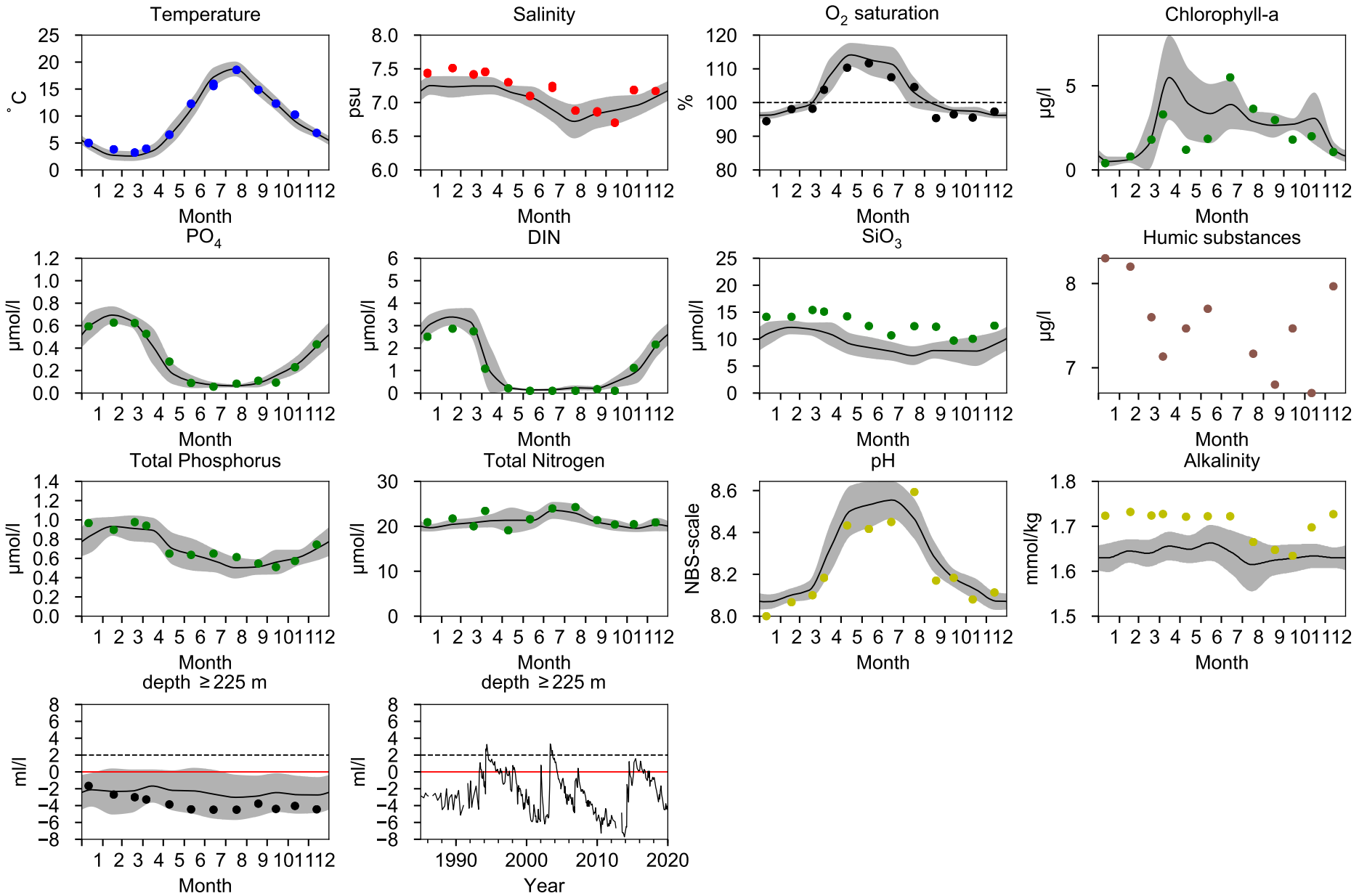
STATION BY31 LANDSORTSDJ SURFACE WATER (0-10 m)



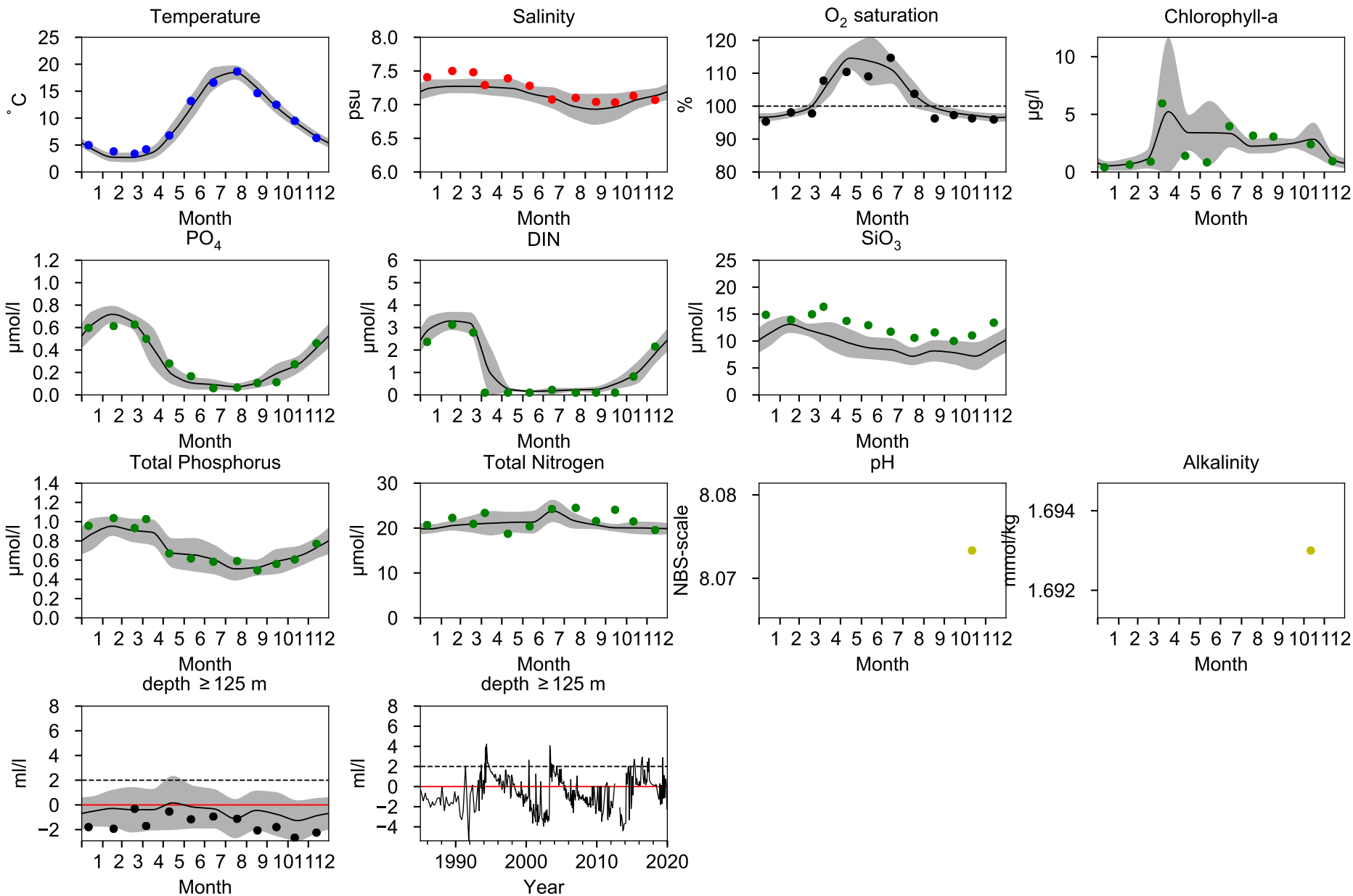
STATION BY20 FÄRÖDJ SURFACE WATER (0-10 m)



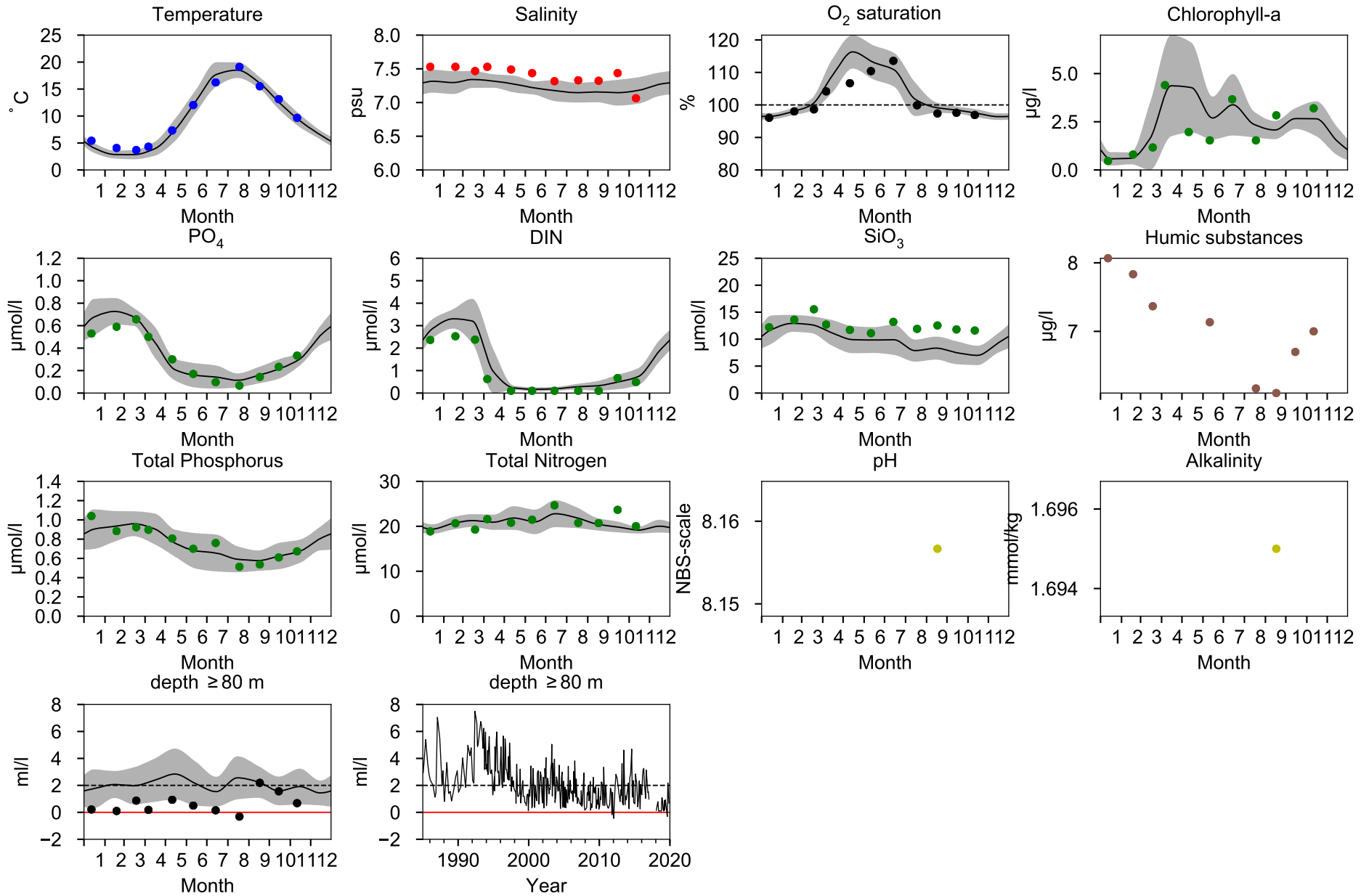
STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)



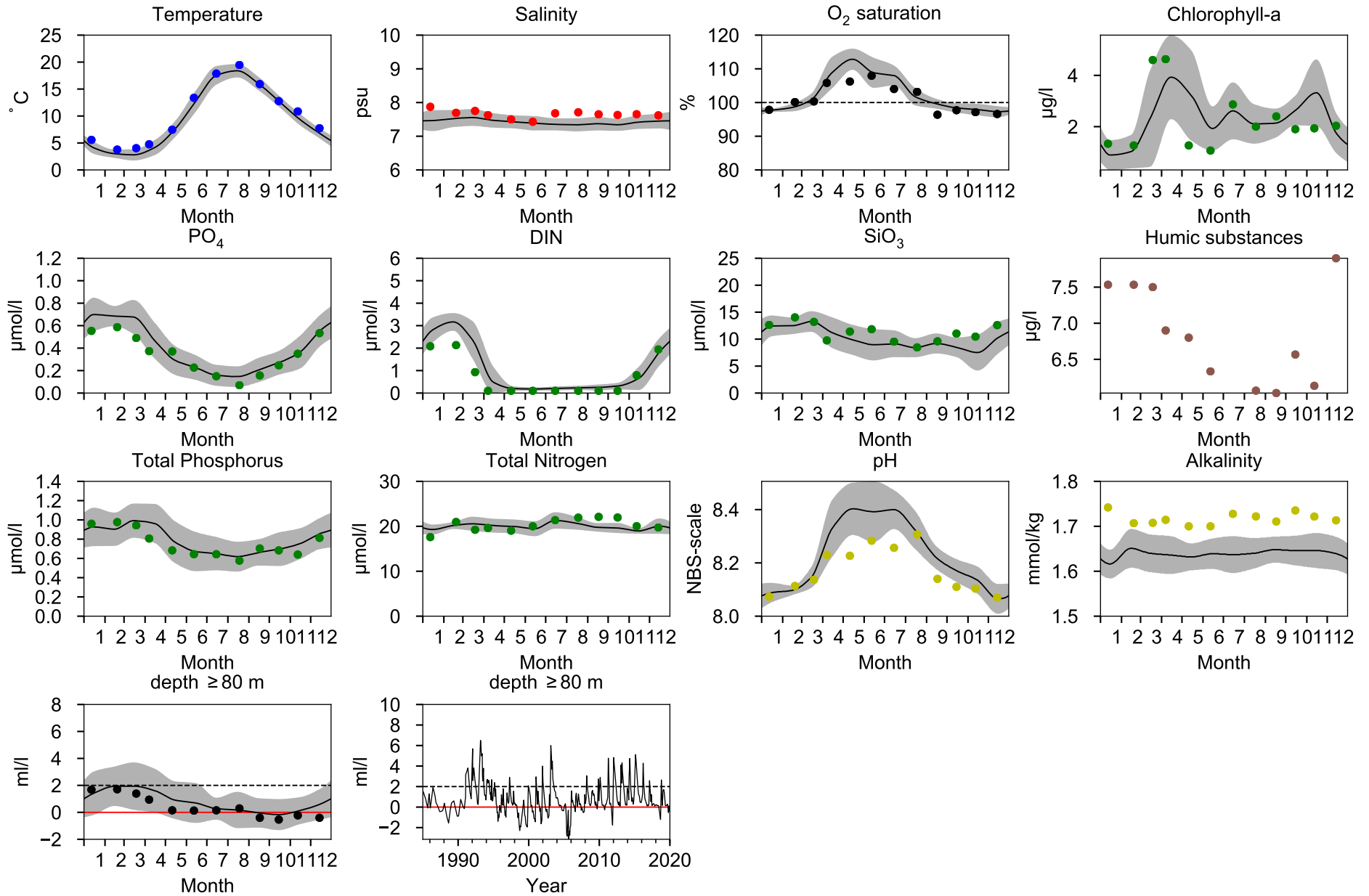
STATION BY10 SURFACE WATER (0-10 m)



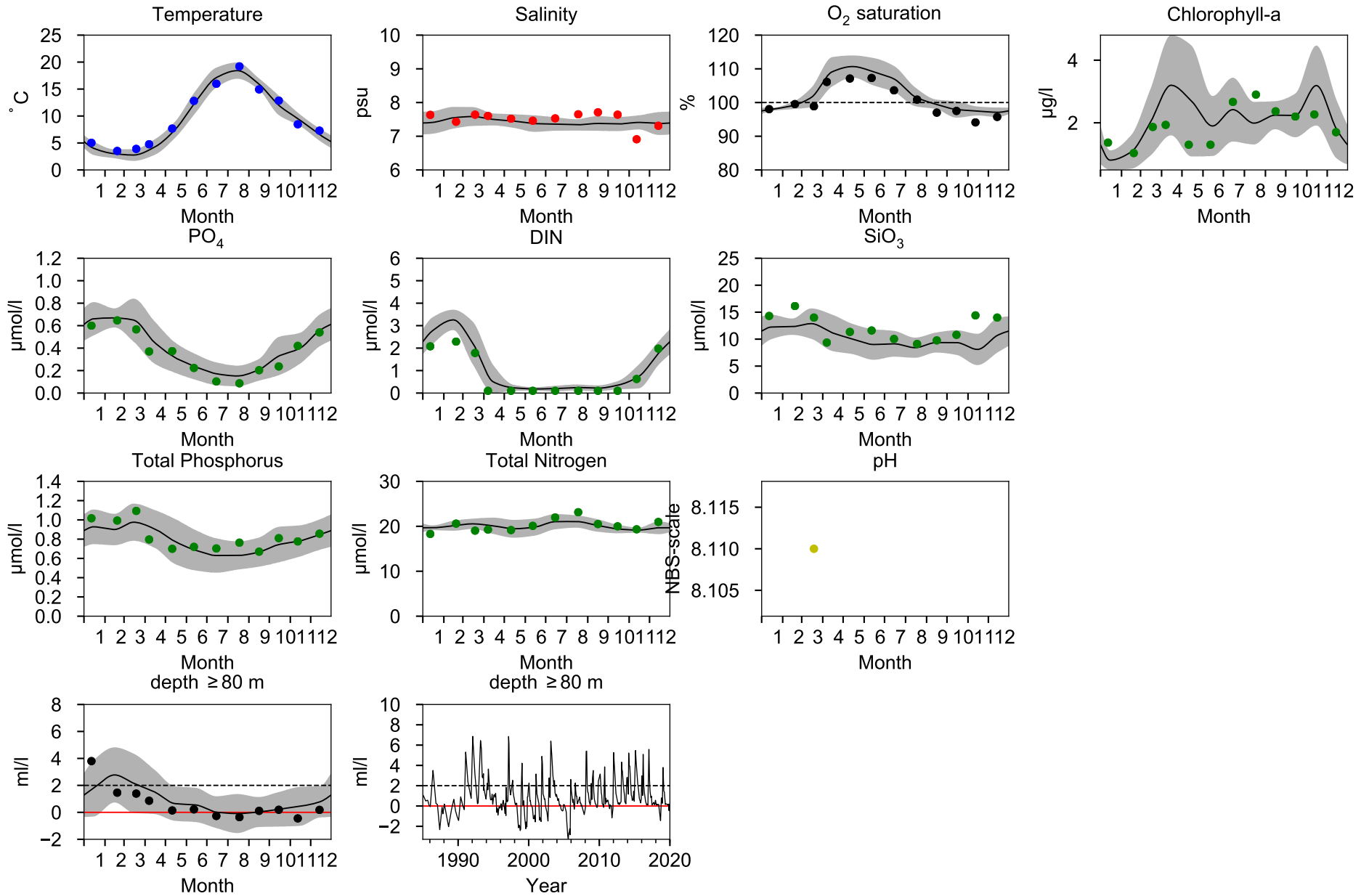
STATION BCS III-10 SURFACE WATER (0-10 m)



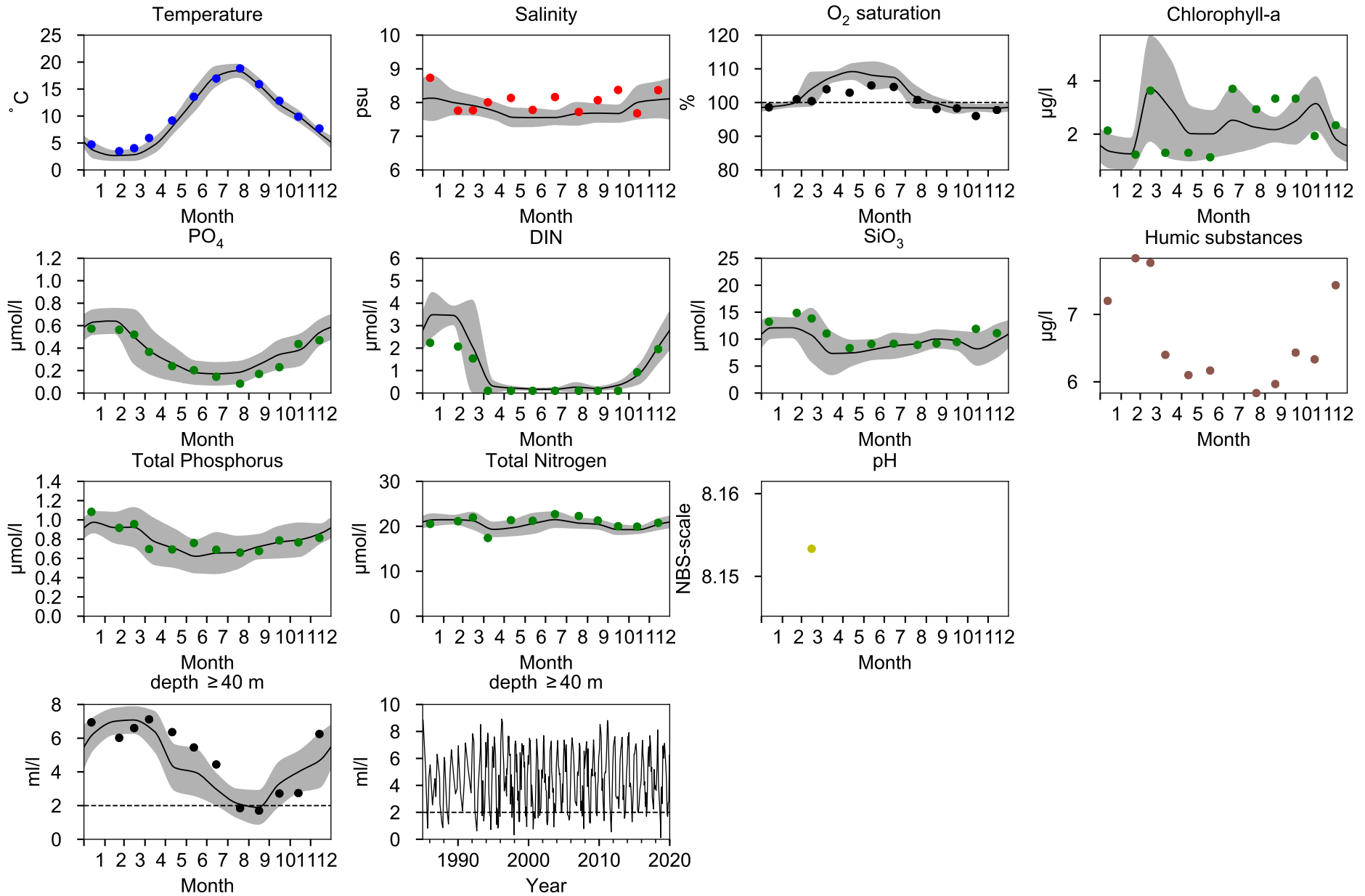
STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)



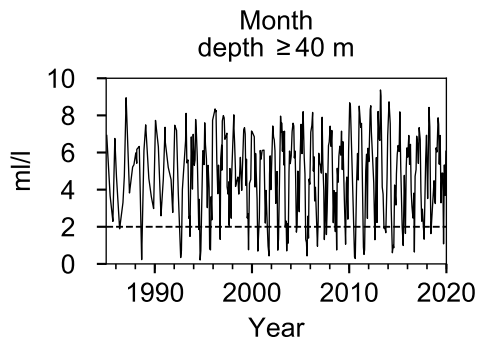
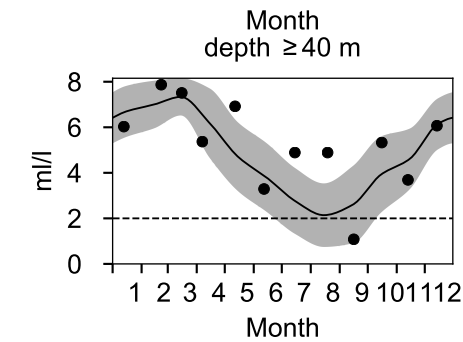
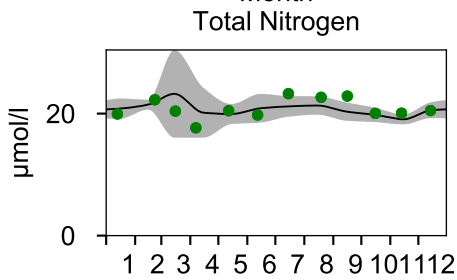
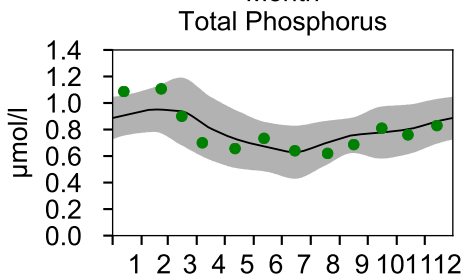
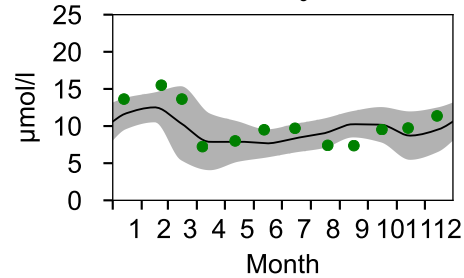
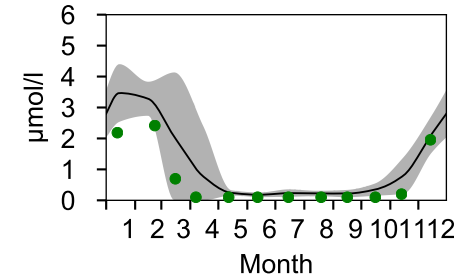
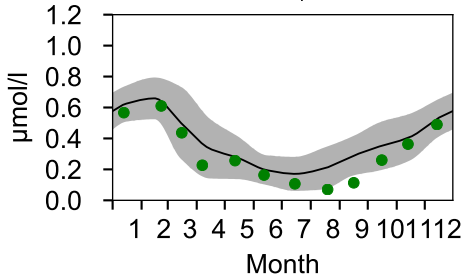
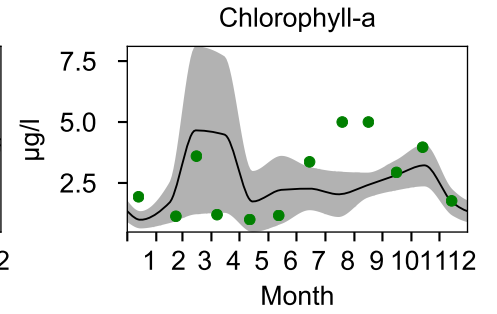
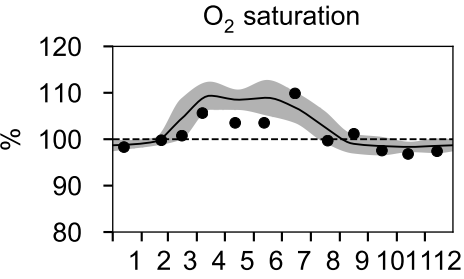
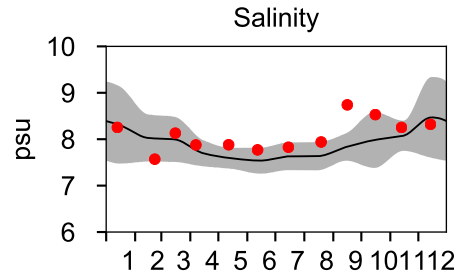
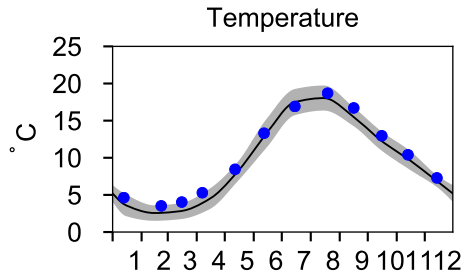
STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)



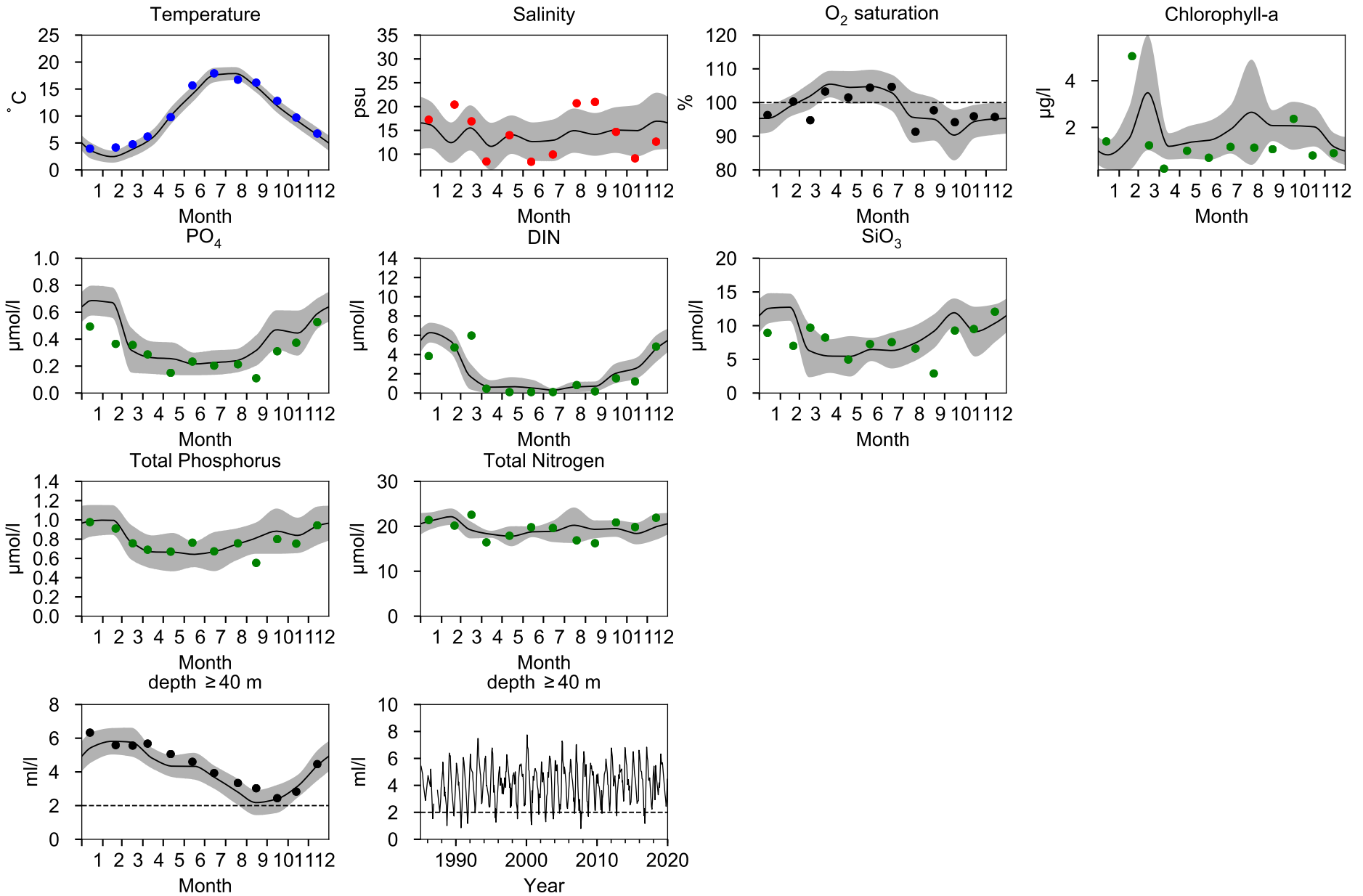
STATION BY2 ARKONA SURFACE WATER (0-10 m)



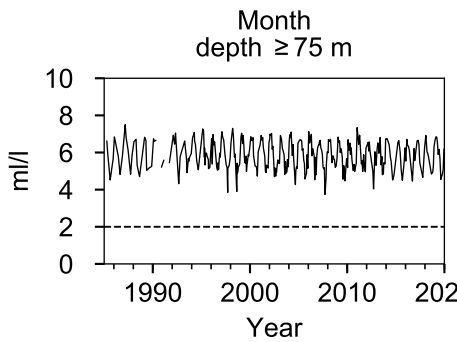
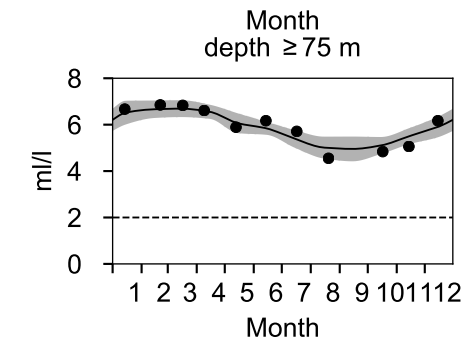
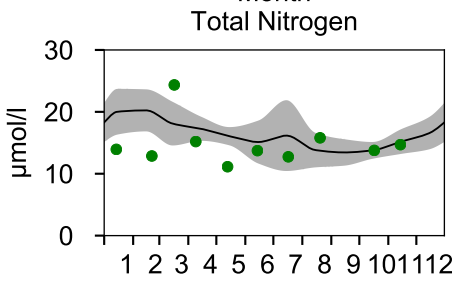
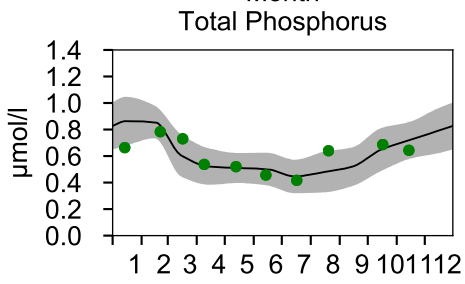
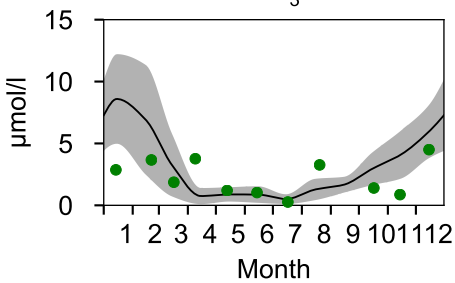
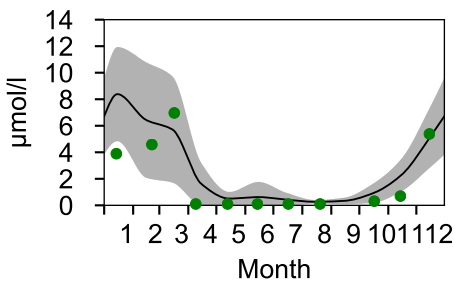
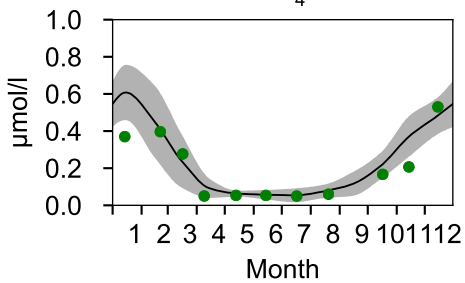
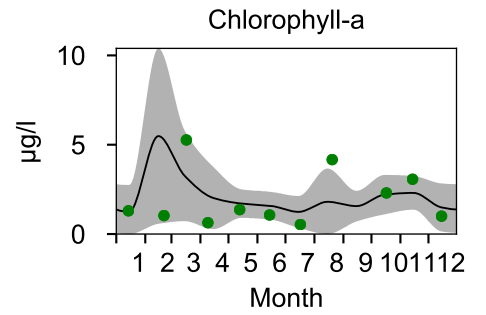
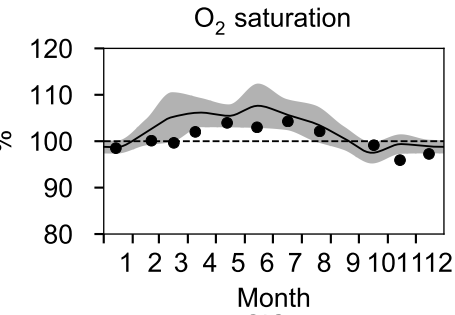
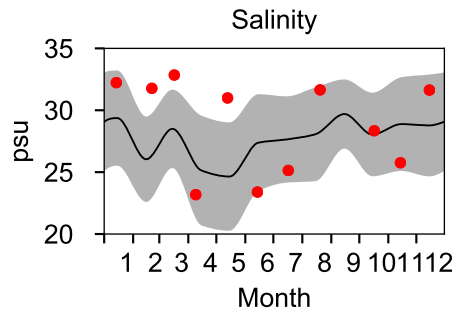
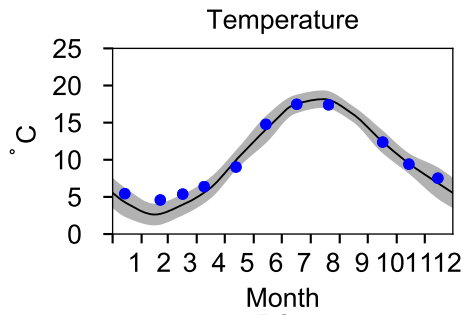
STATION BY1 SURFACE WATER (0-10 m)



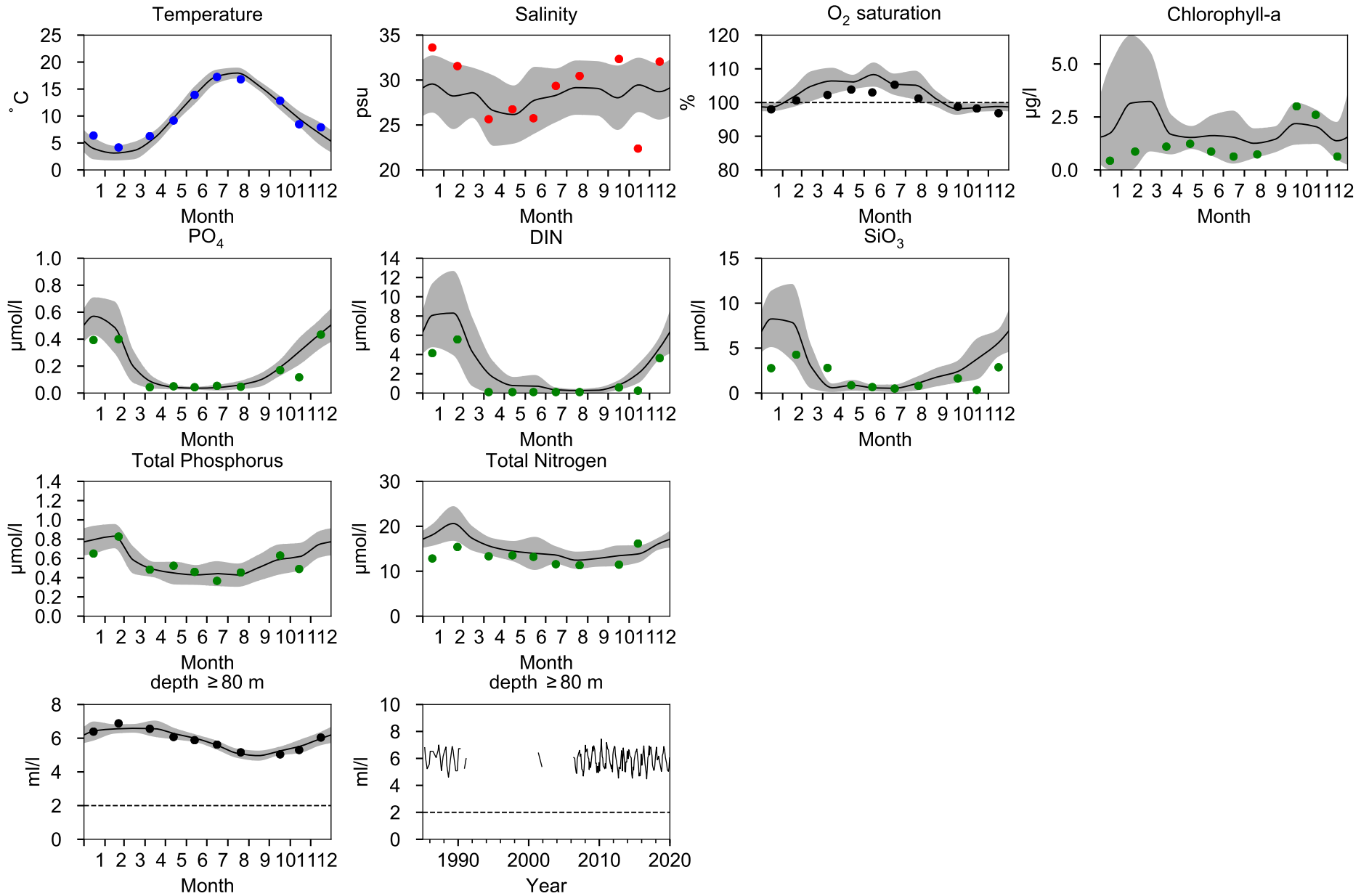
STATION W LANDSKRONA SURFACE WATER (0-10 m)



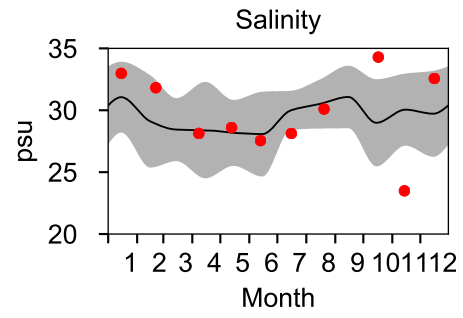
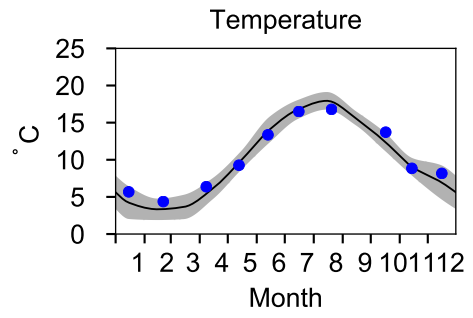
STATION P2 SURFACE WATER (0-10 m)



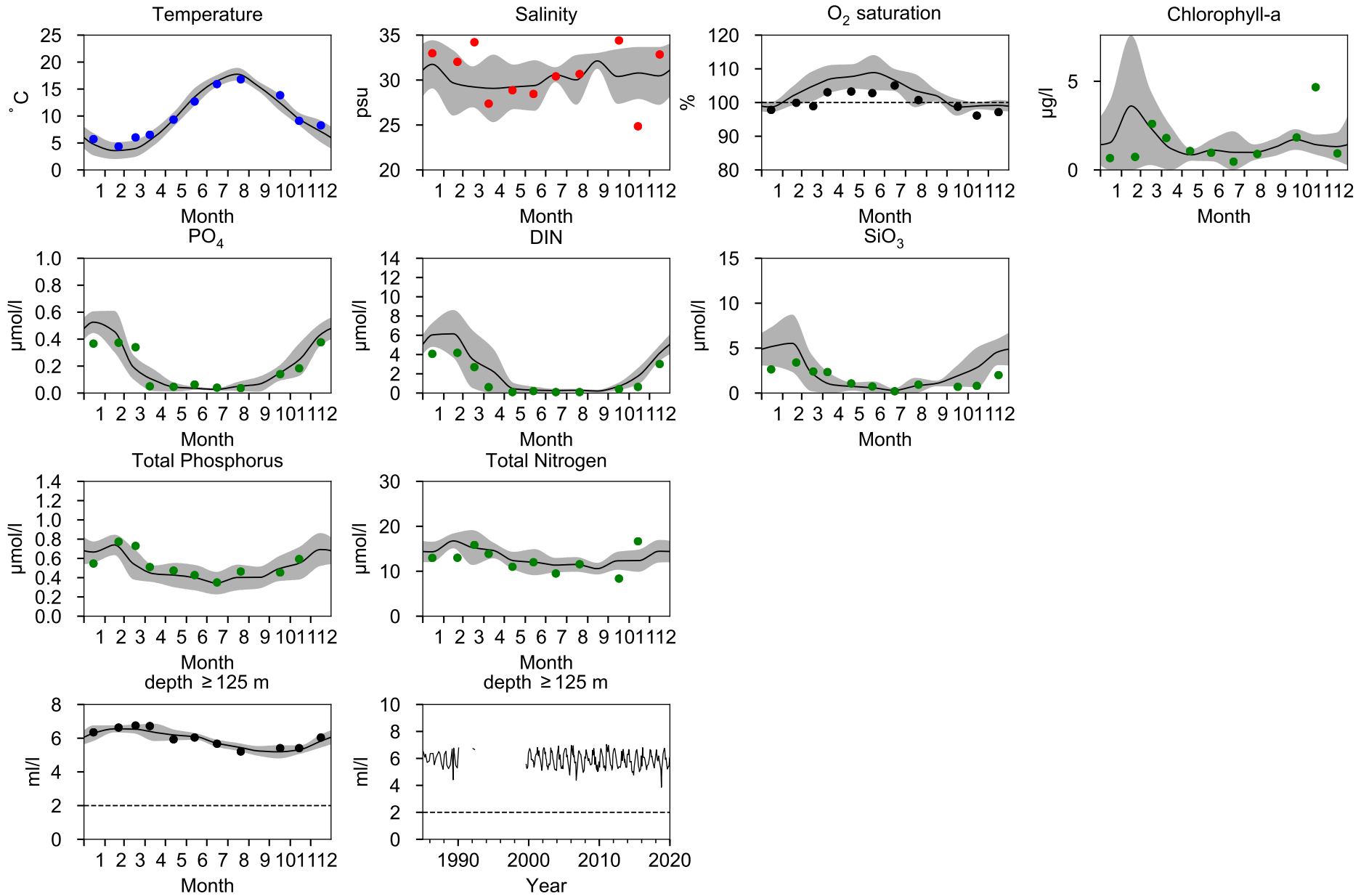
STATION Å13 SURFACE WATER (0-10 m)



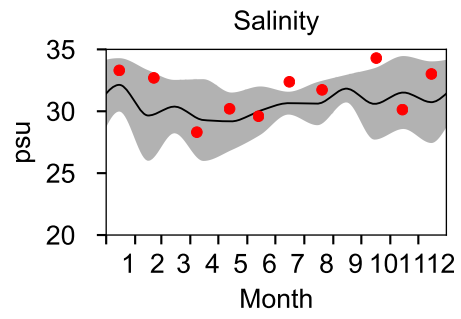
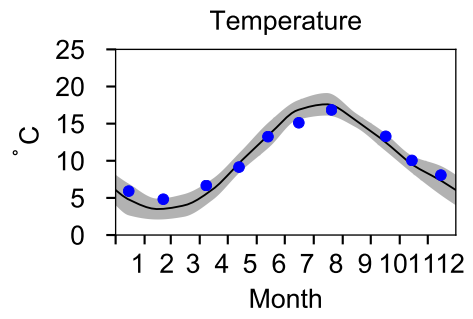
STATION Å14 SURFACE WATER (0-10 m)



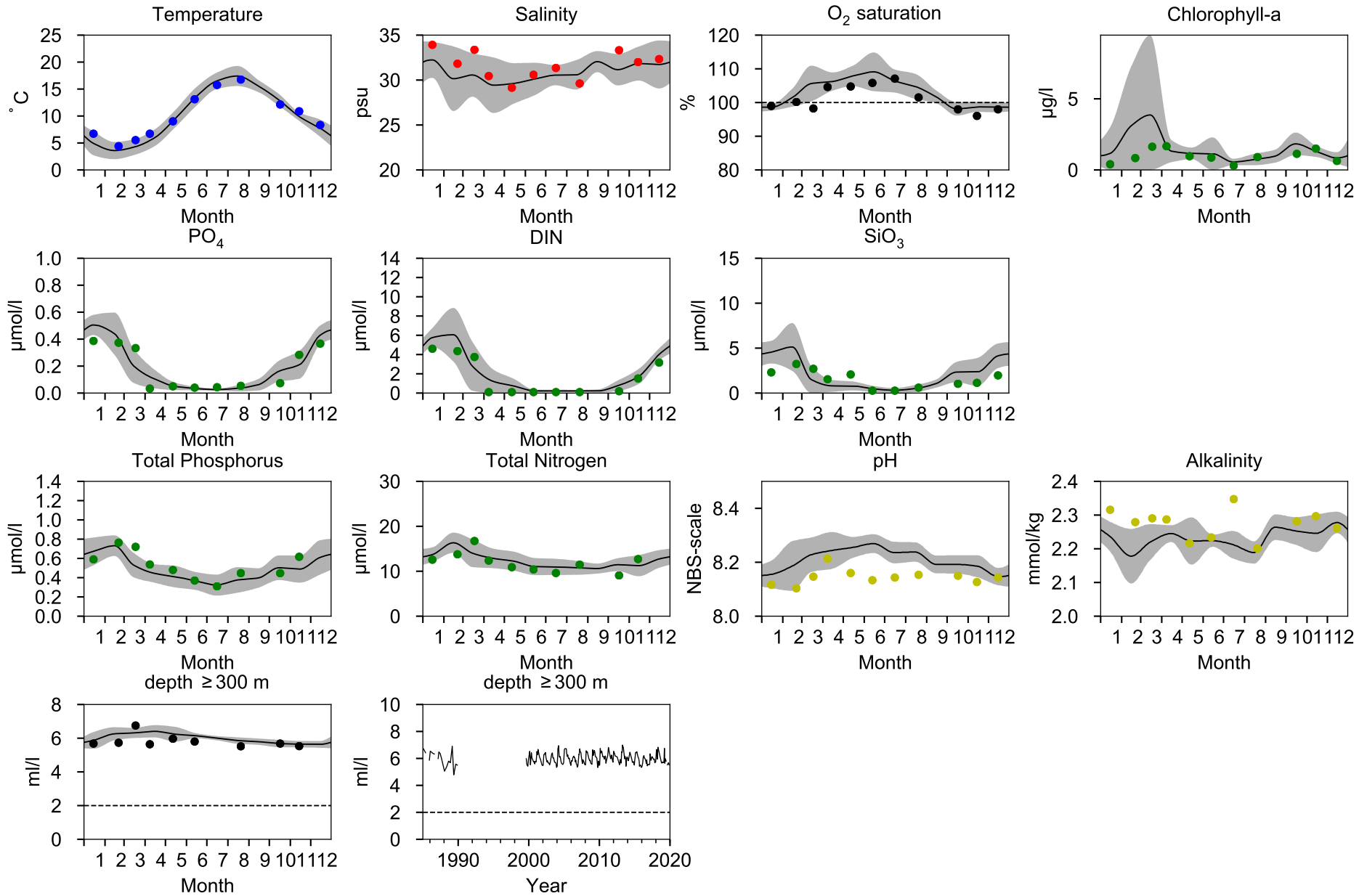
STATION Å15 SURFACE WATER (0-10 m)



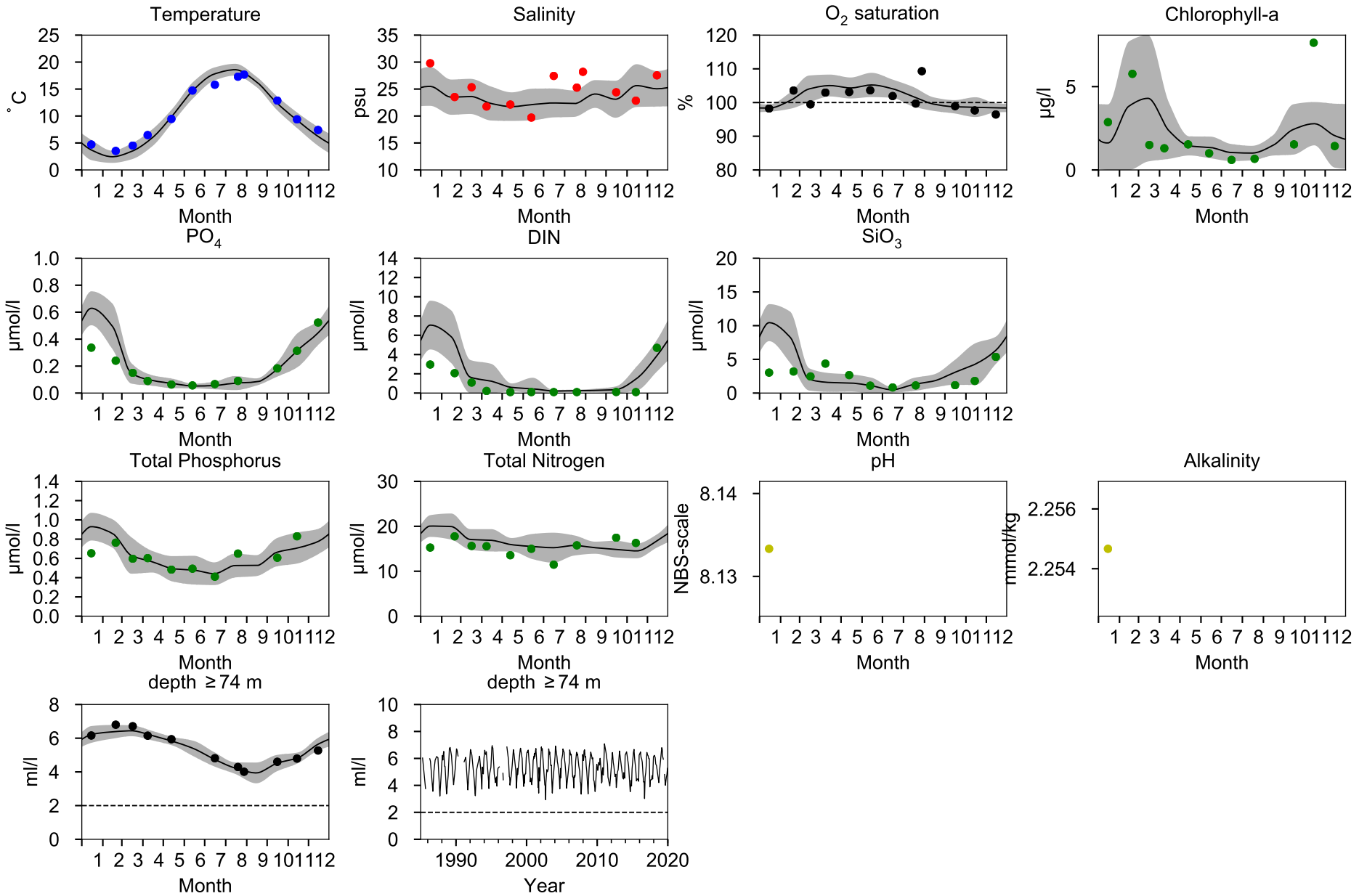
STATION Å16 SURFACE WATER (0-10 m)



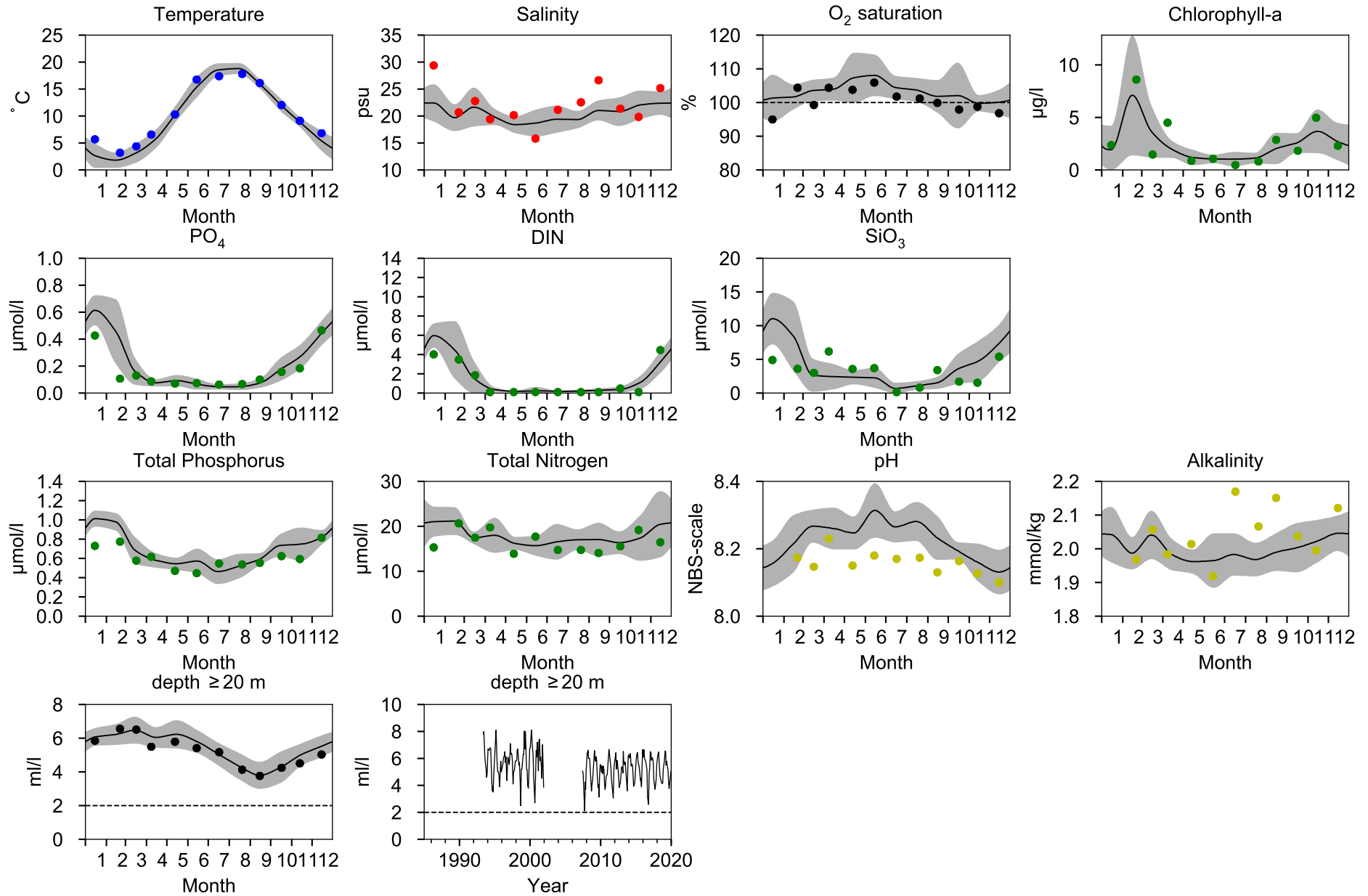
STATION Å17 SURFACE WATER (0-10 m)



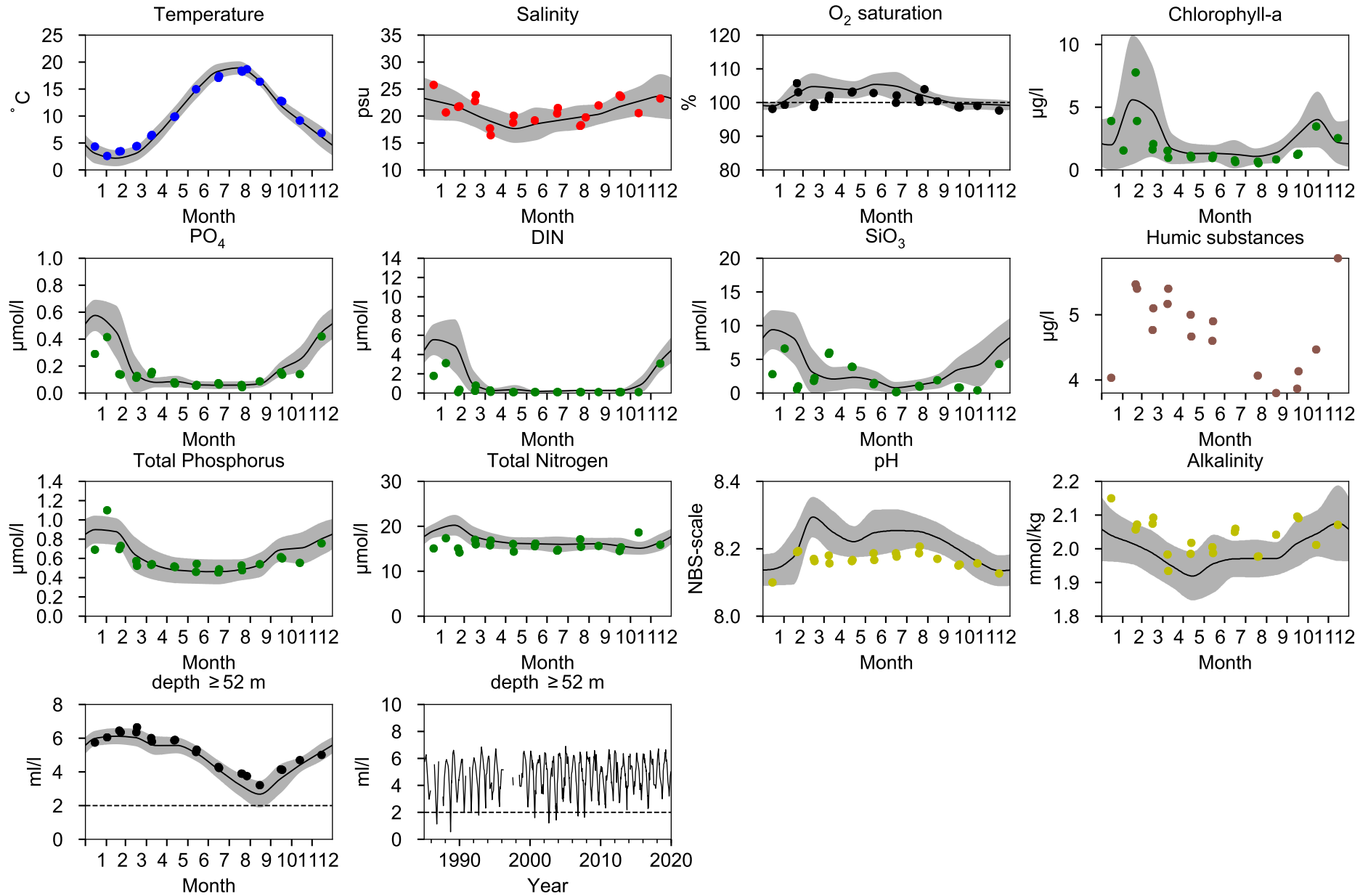
STATION FLADEN SURFACE WATER (0-10 m)



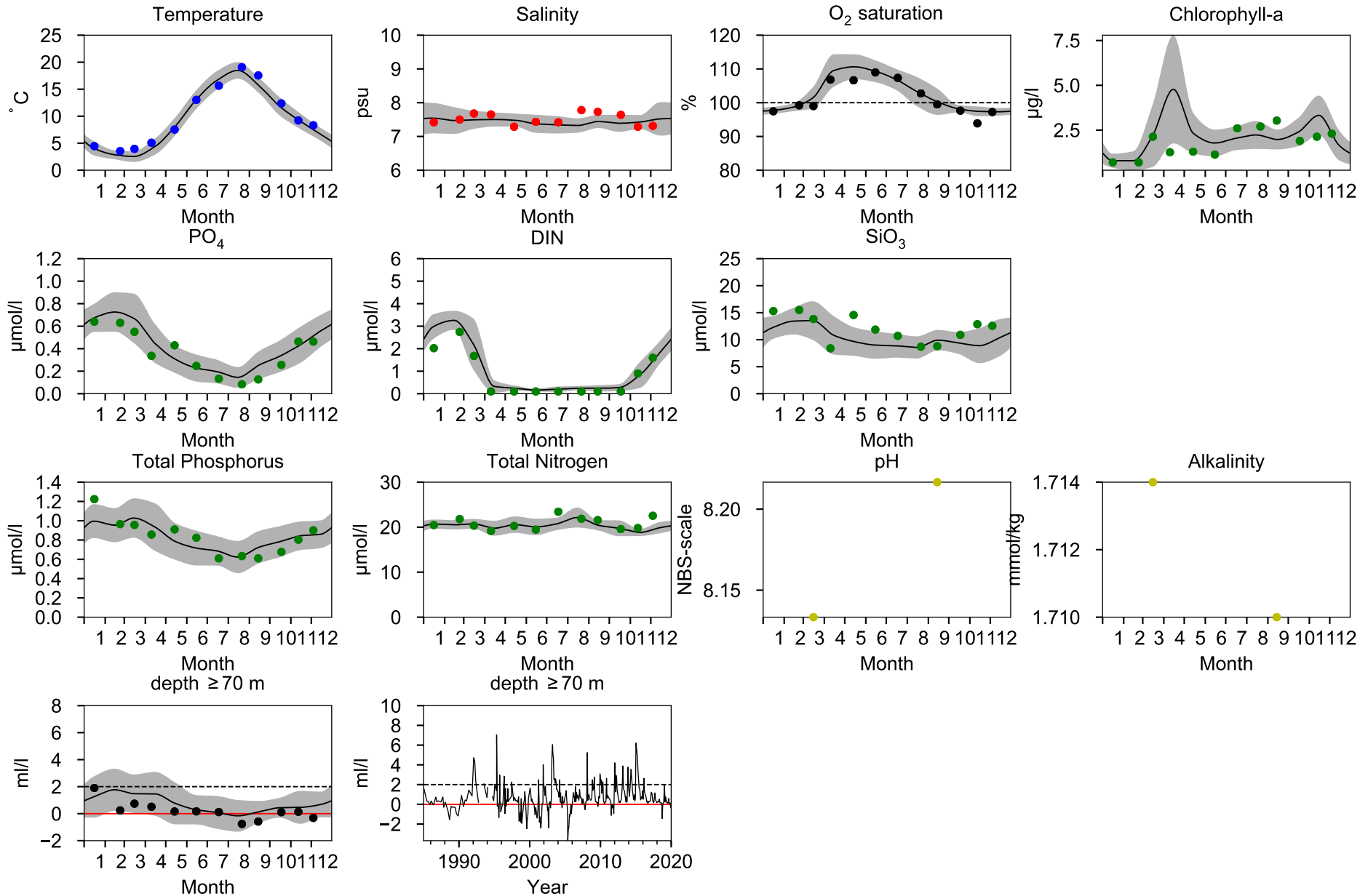
STATION N14 FALKENBERG SURFACE WATER (0-10 m)



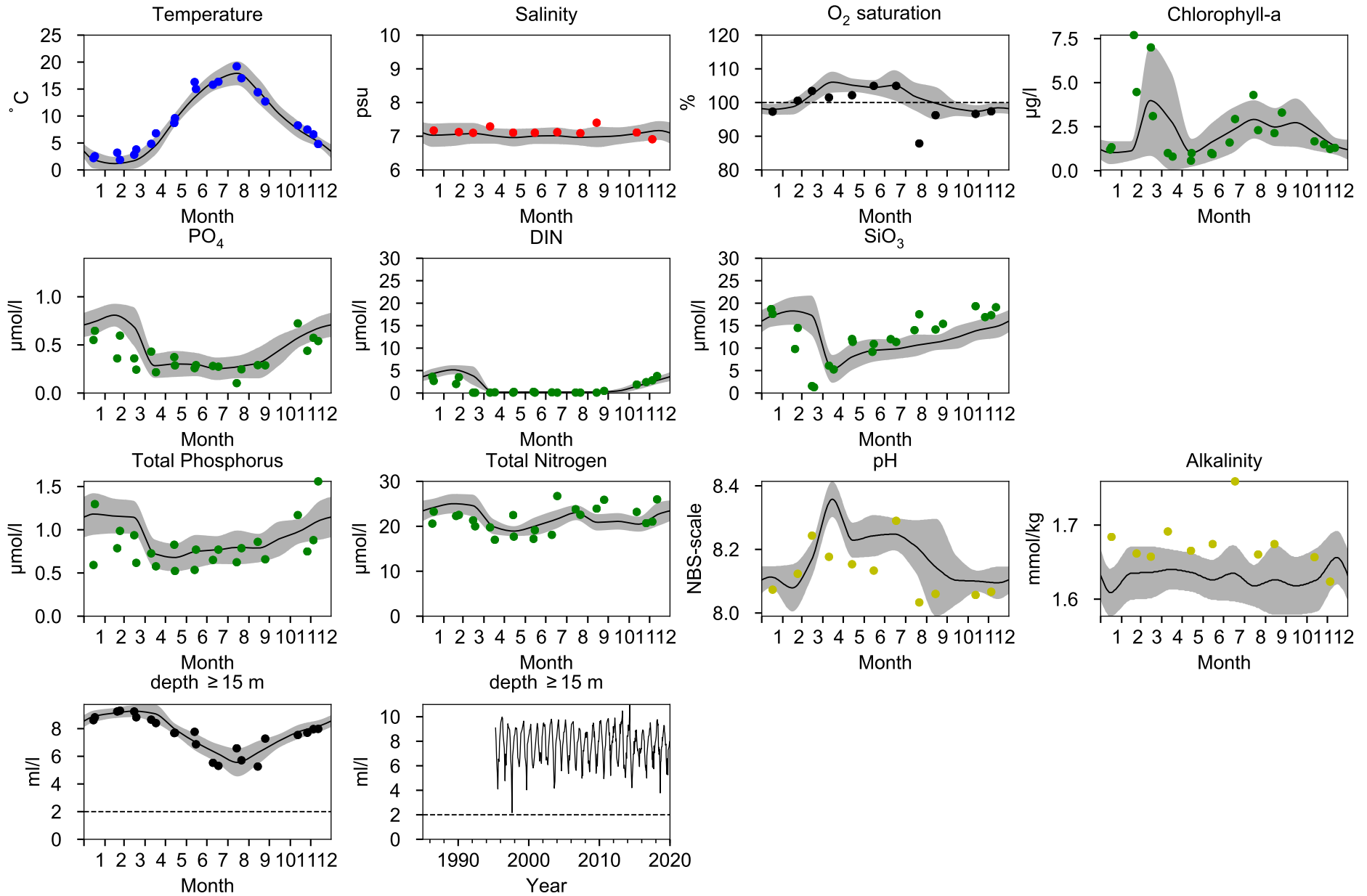
STATION ANHOLT E SURFACE WATER (0-10 m)



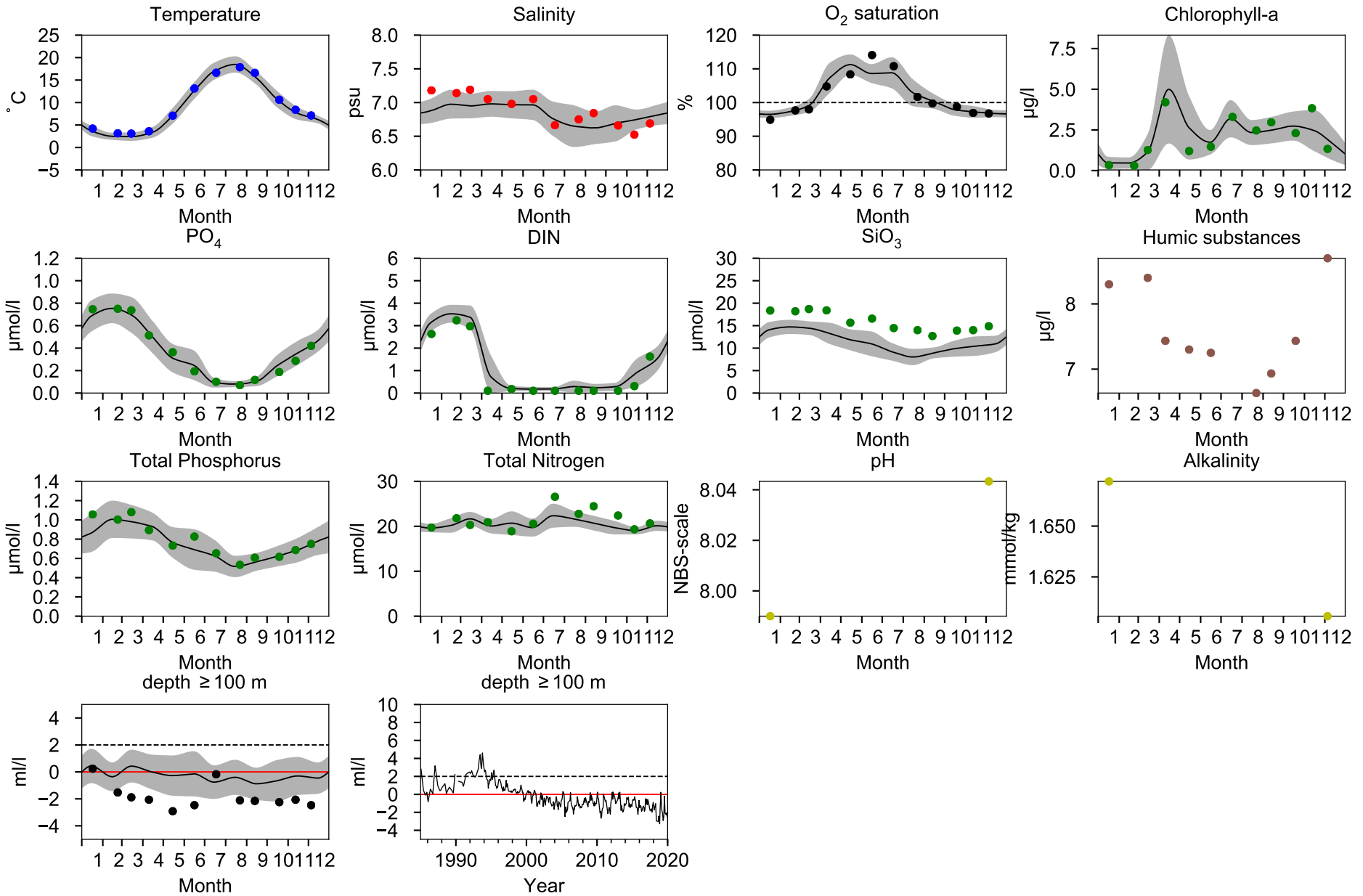
STATION HANÖBUKTEN SURFACE WATER (0-10 m)



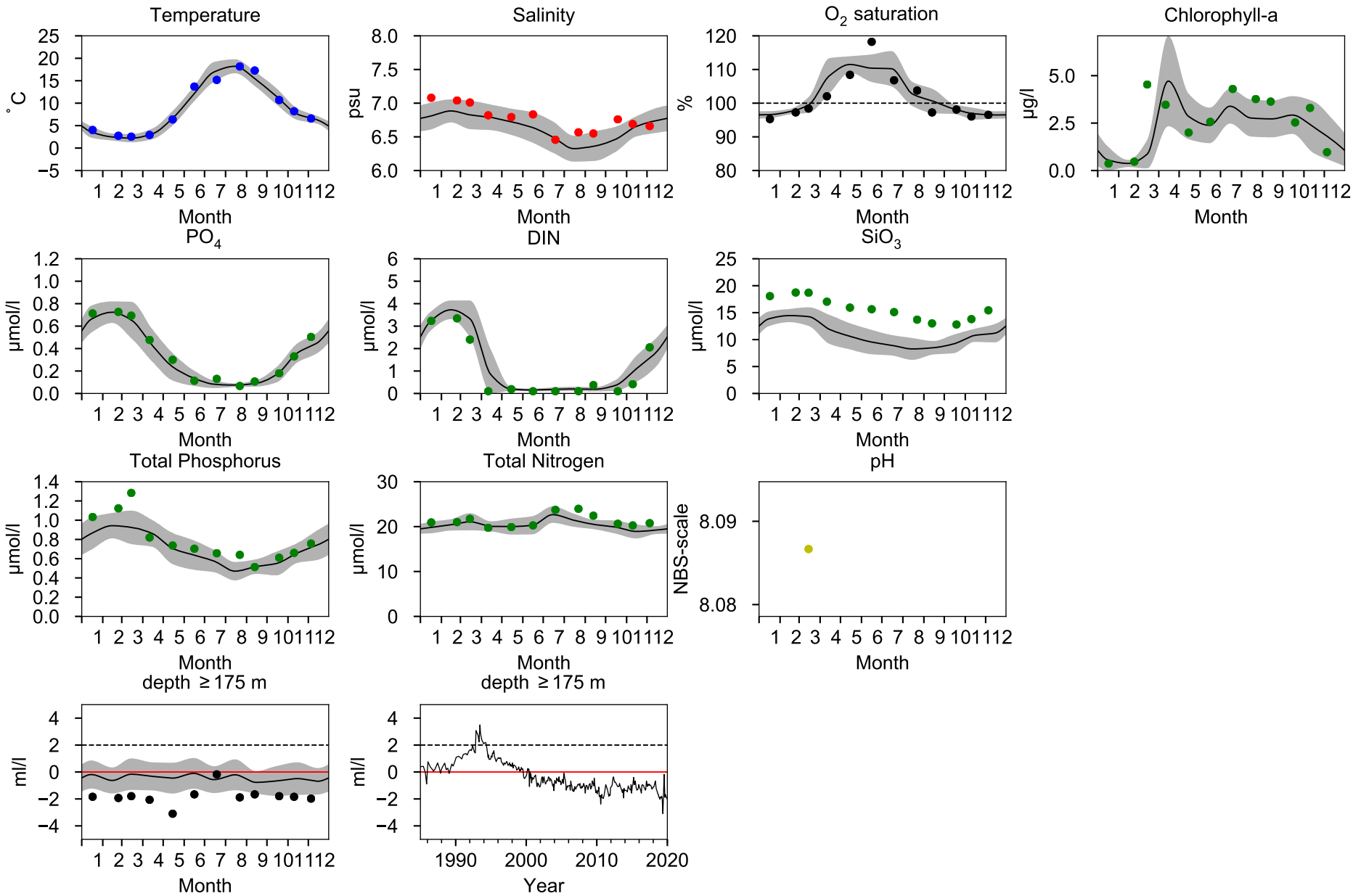
STATION REF M1V1 SURFACE WATER (0-10 m)



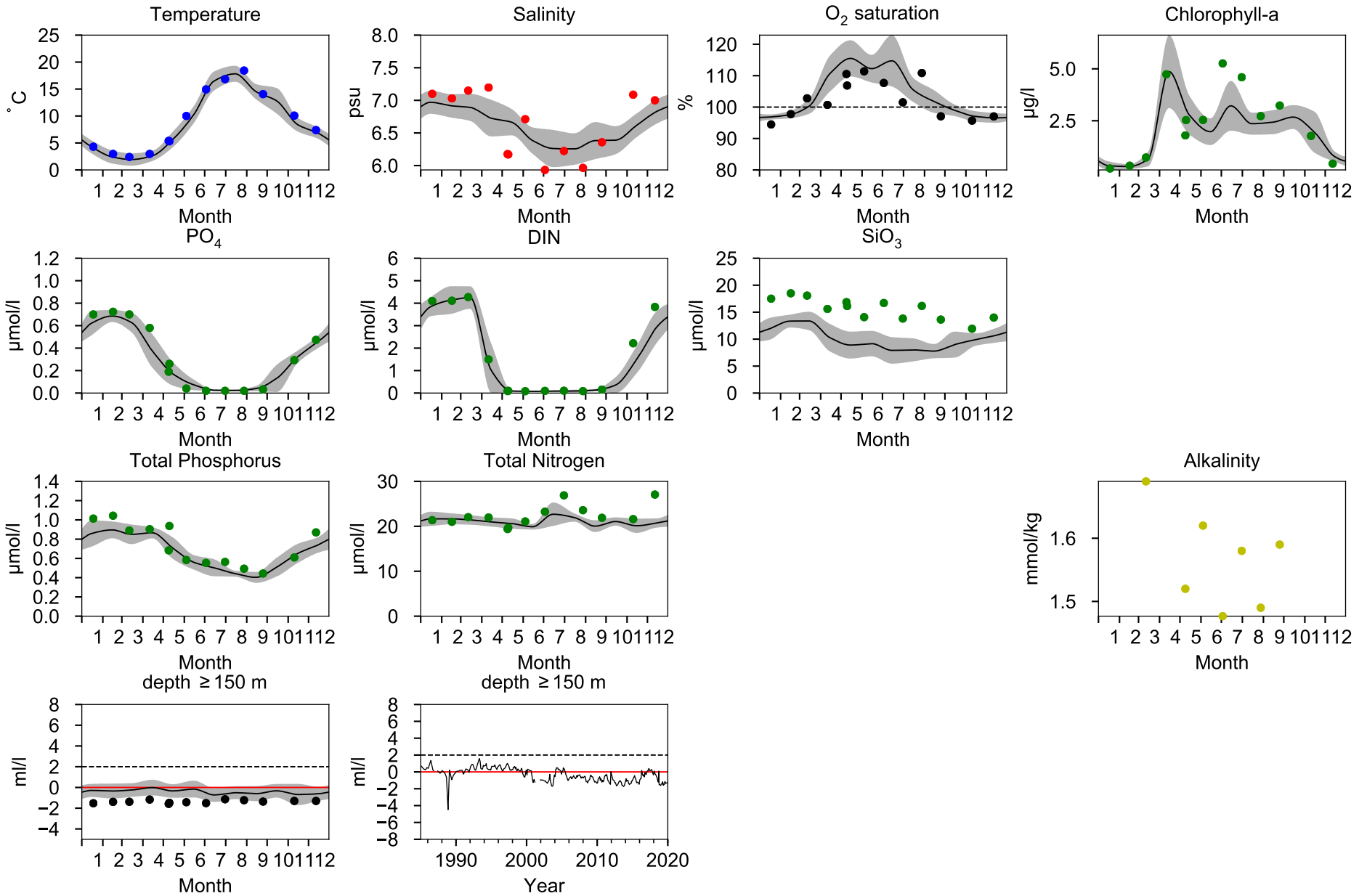
STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)



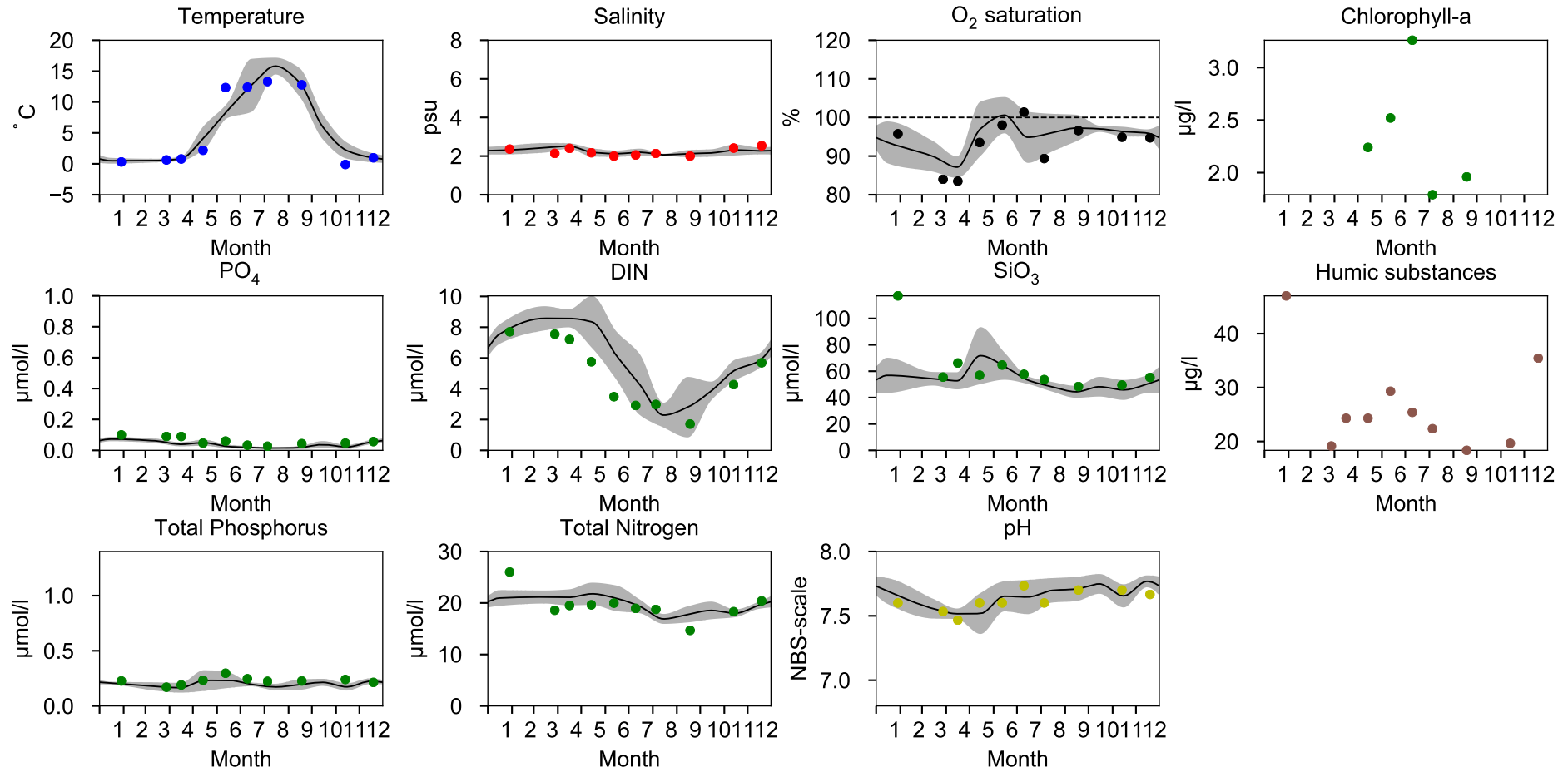
STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)



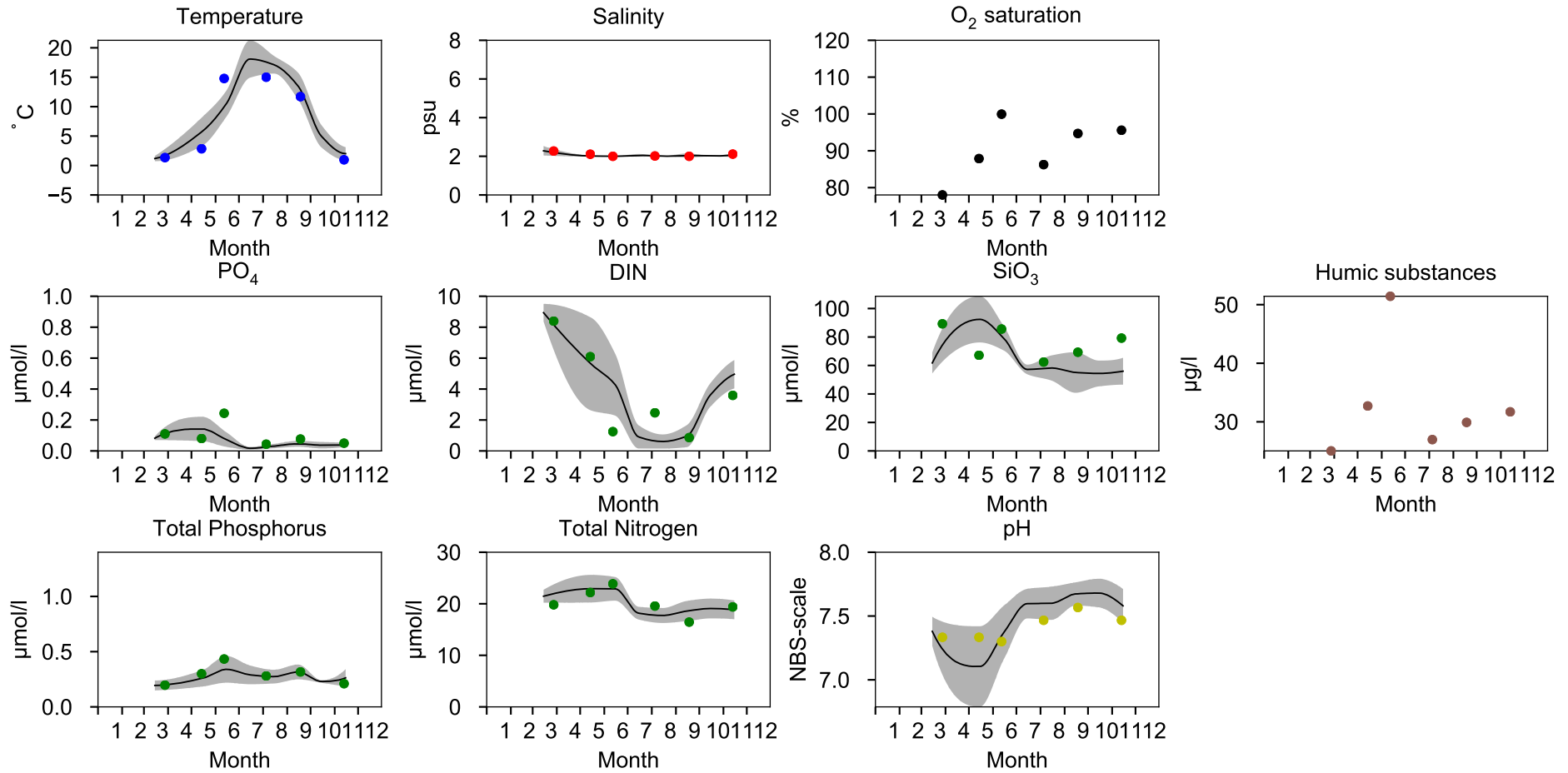
STATION BY29 / LL19 SURFACE WATER (0-10 m)



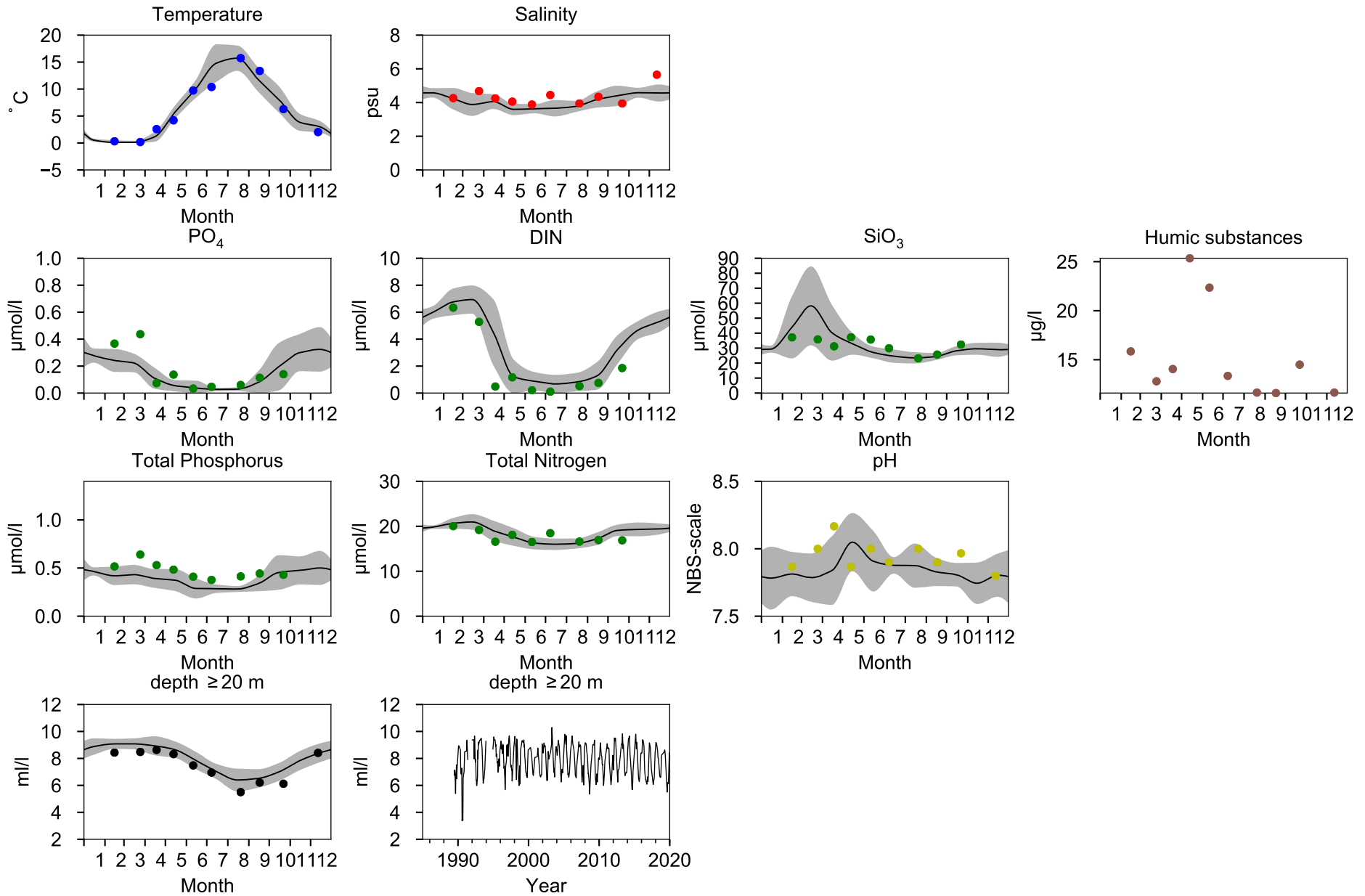
STATION RÅNEÅ-2 SURFACE WATER (0-10 m)



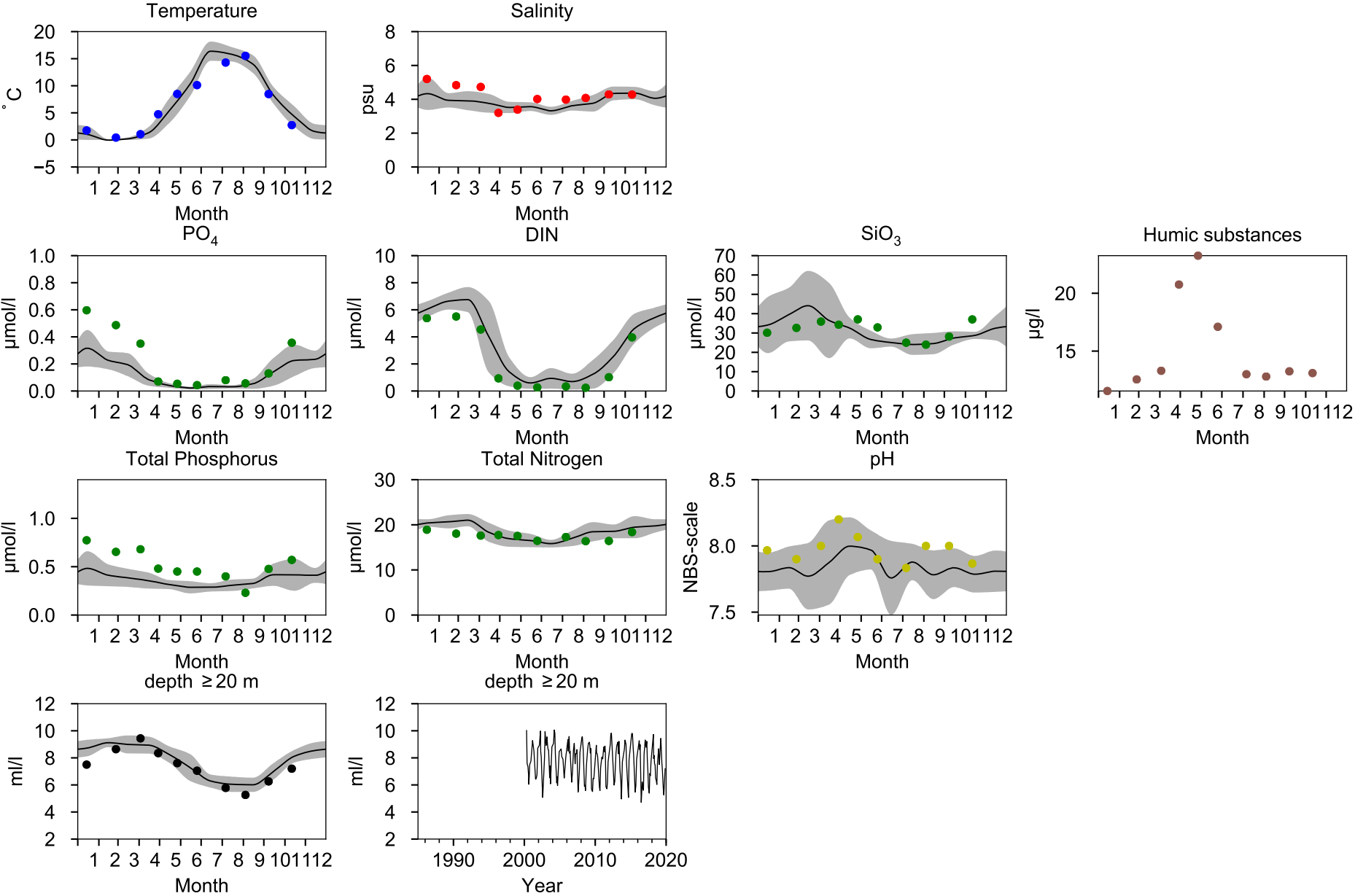
STATION RÂNEÅ-1 SURFACE WATER (0-10 m)



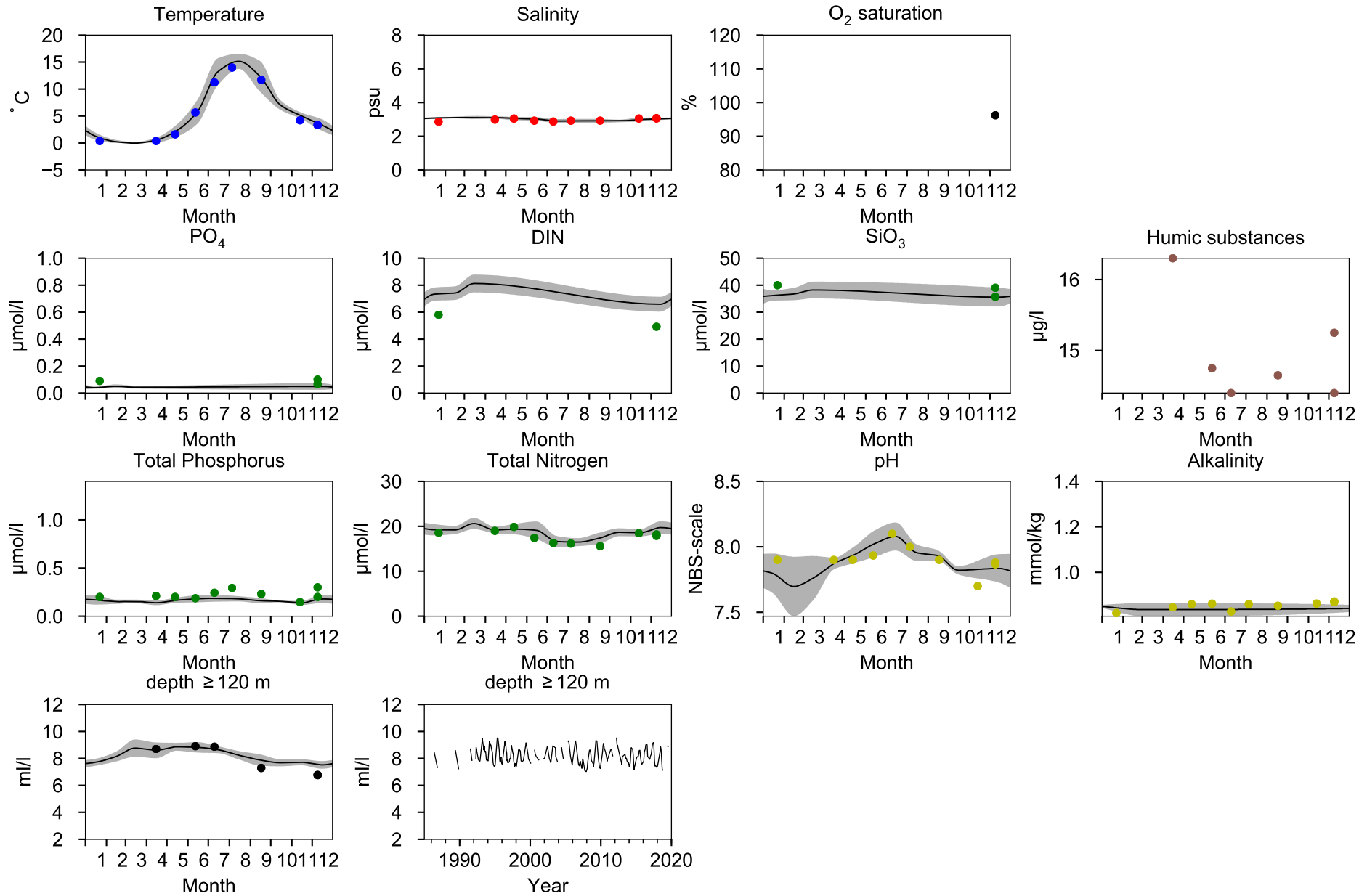
STATION NB1 / B3 SURFACE WATER (0-10 m)



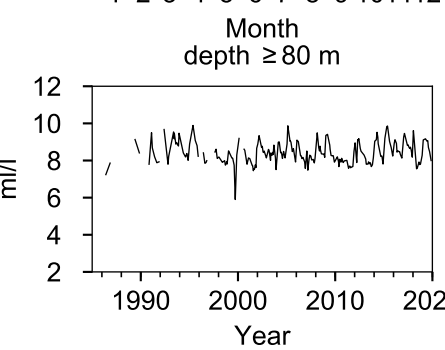
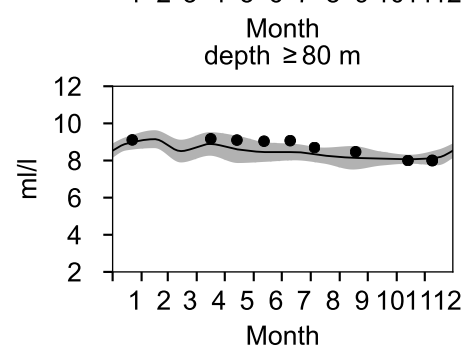
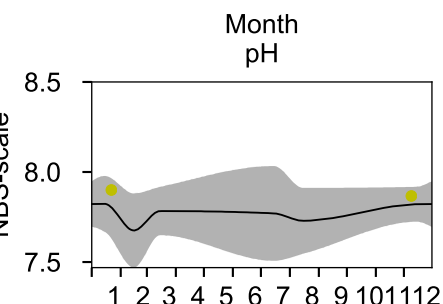
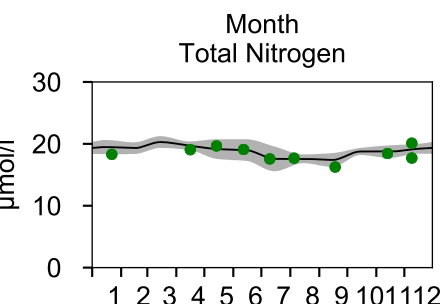
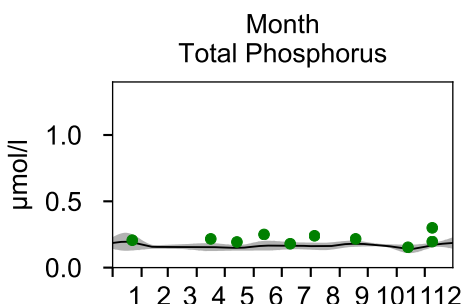
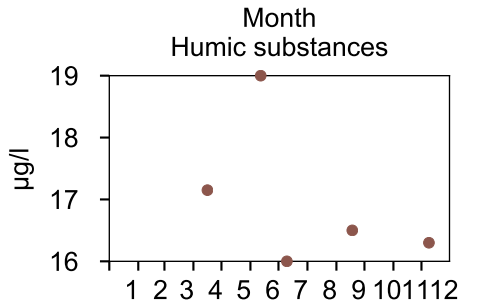
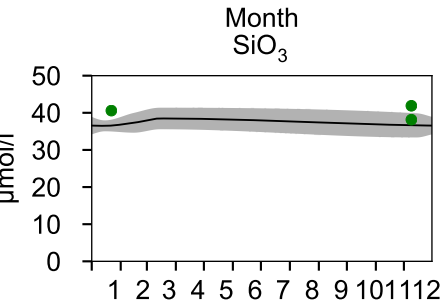
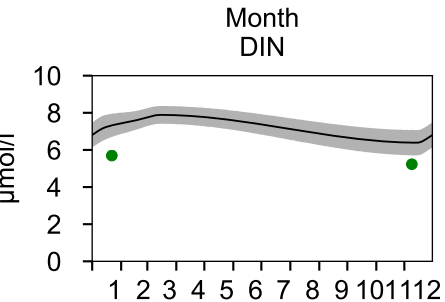
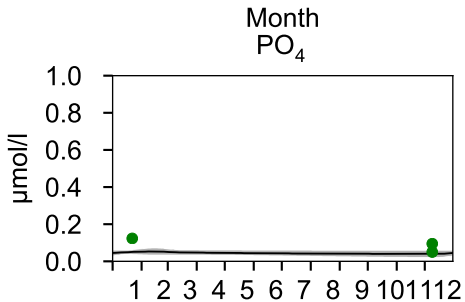
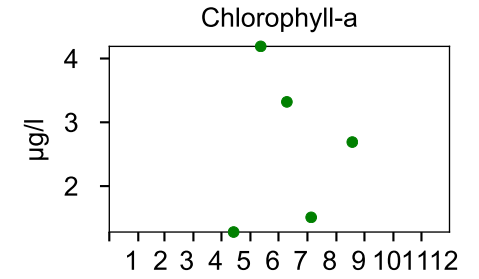
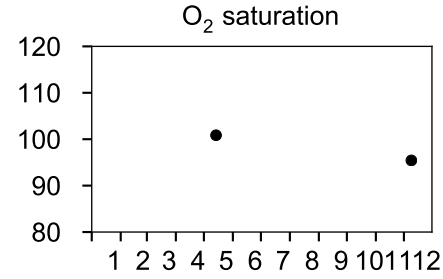
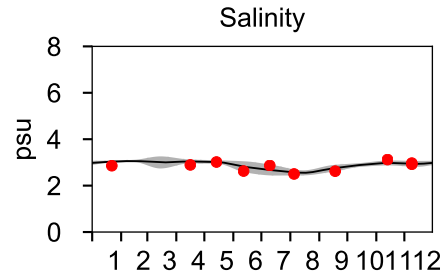
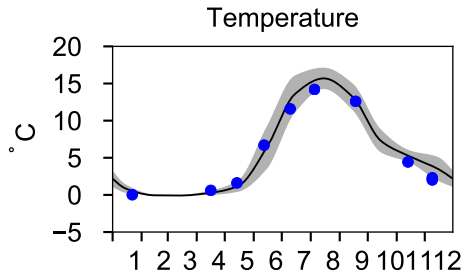
STATION B7 SURFACE WATER (0-10 m)



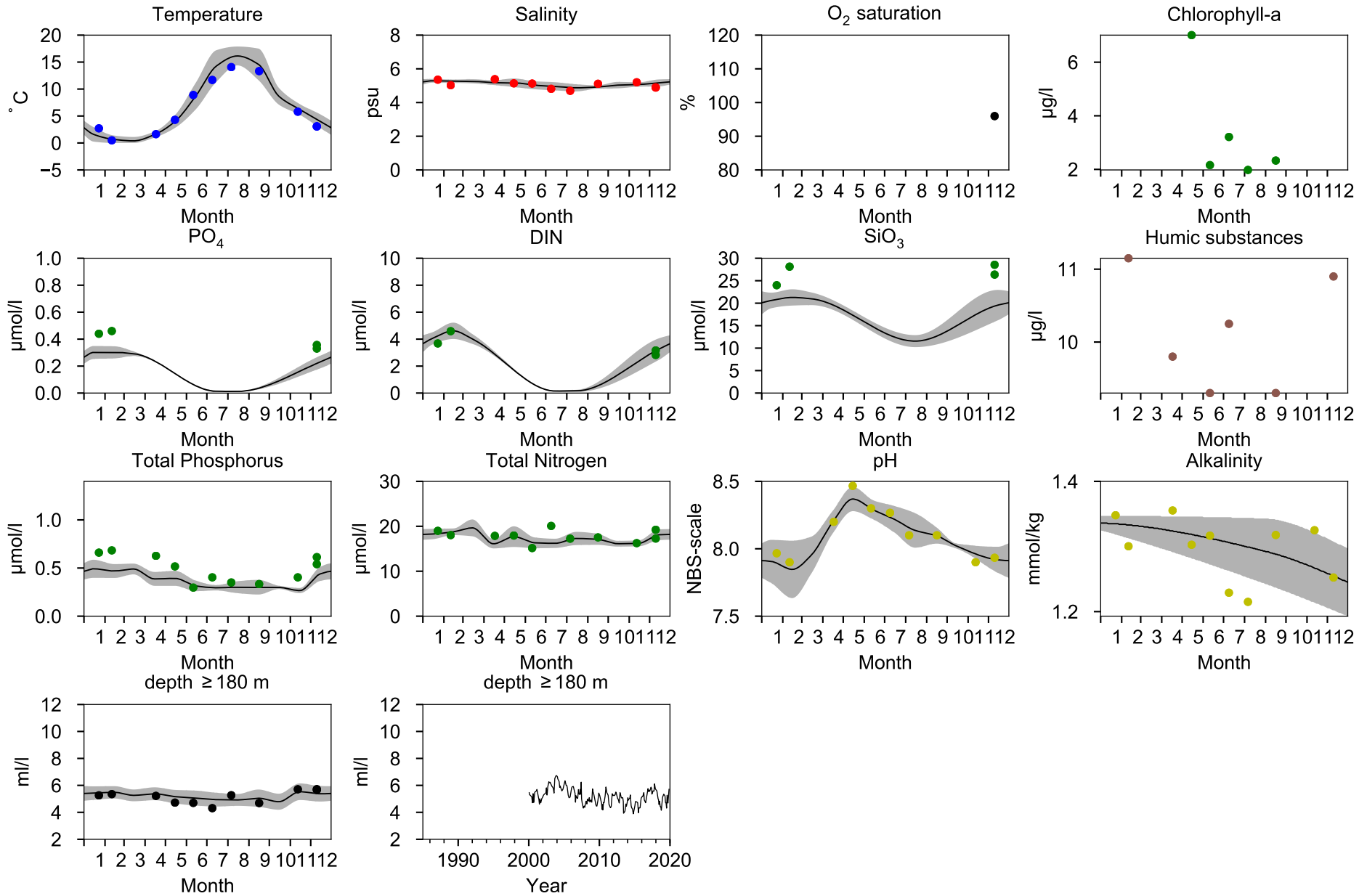
STATION F9 / A13 SURFACE WATER (0-10 m)



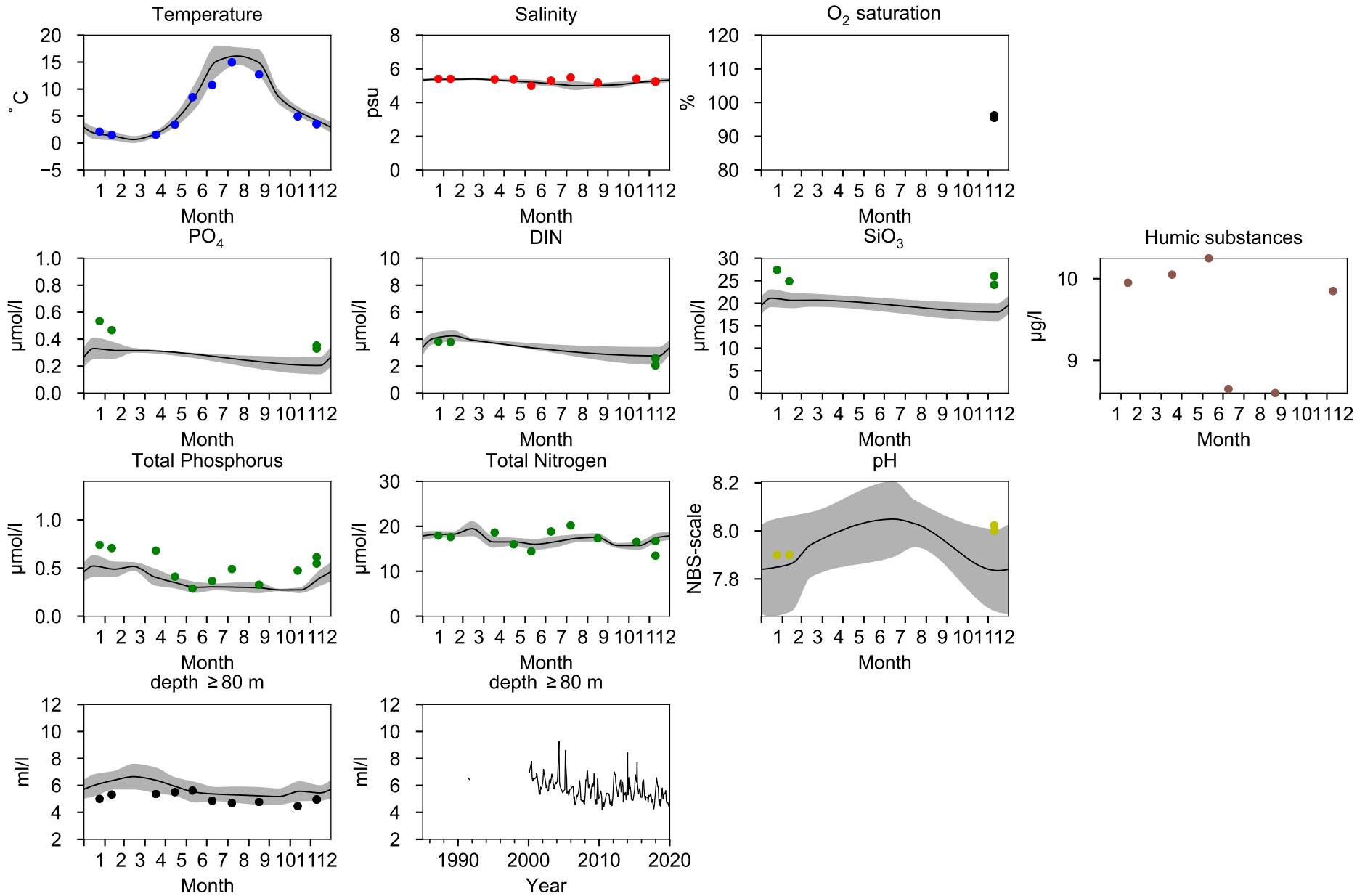
STATION F3 / A5 SURFACE WATER (0-10 m)



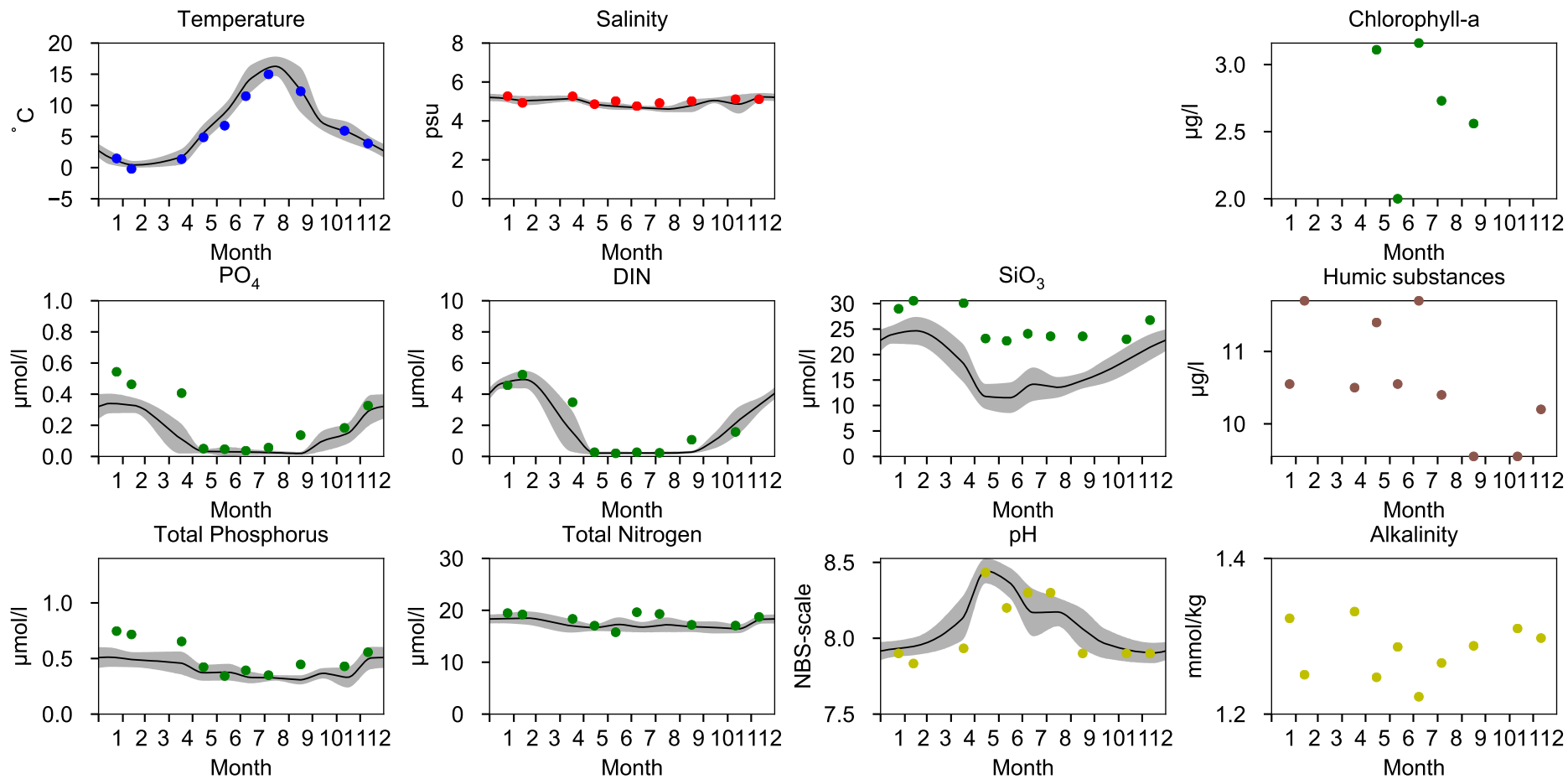
STATION C3 SURFACE WATER (0-10 m)



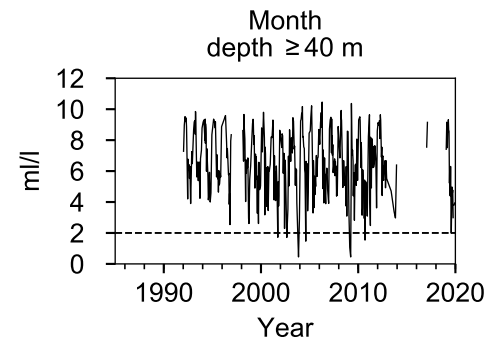
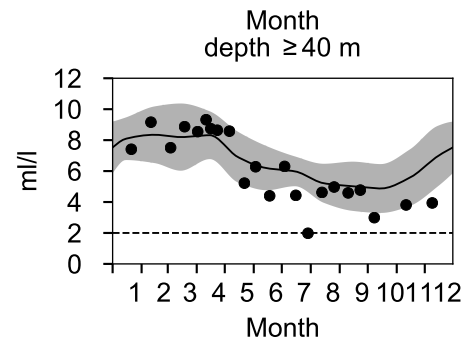
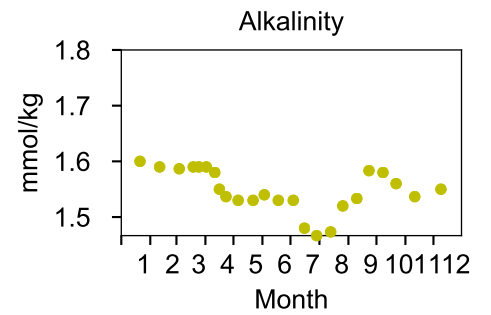
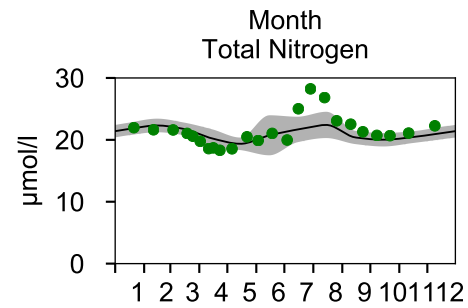
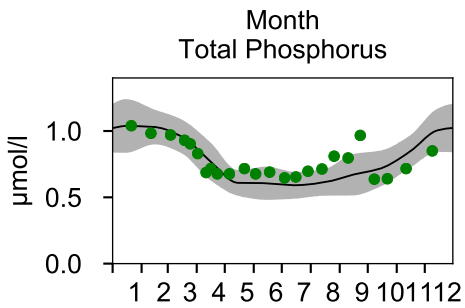
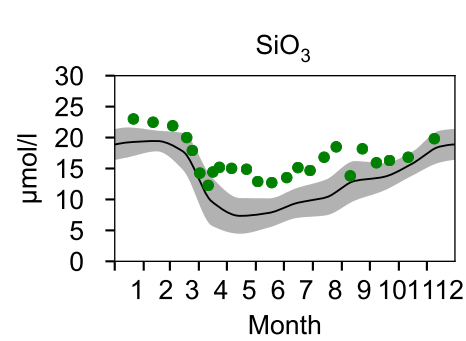
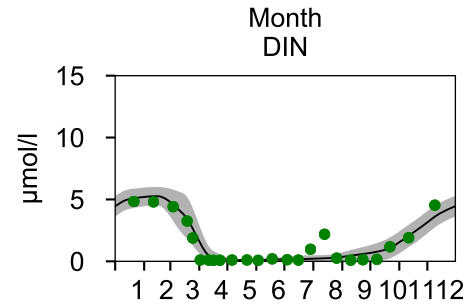
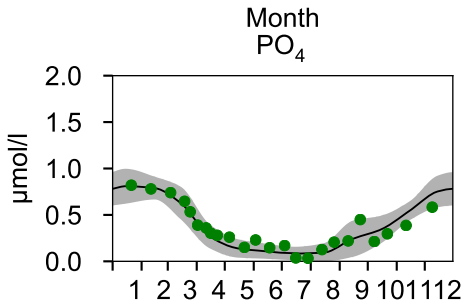
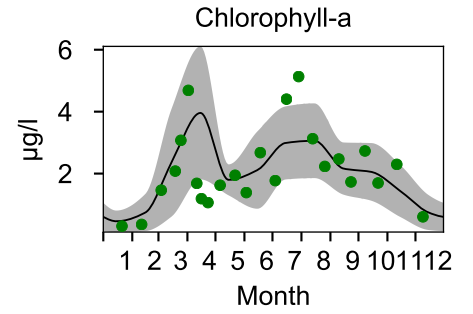
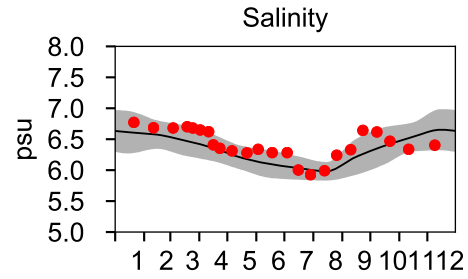
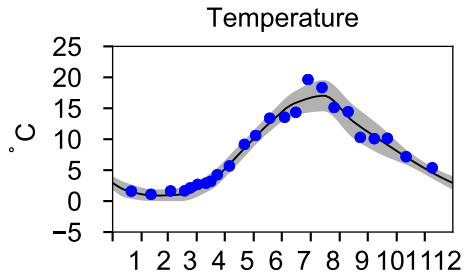
STATION MS4 / C14 SURFACE WATER (0-10 m)



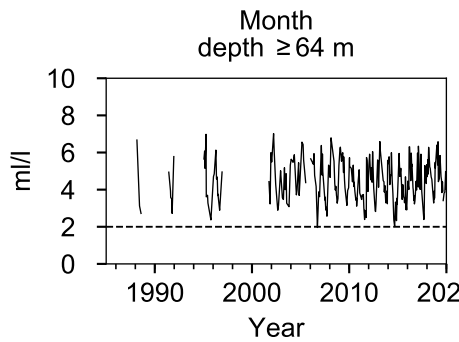
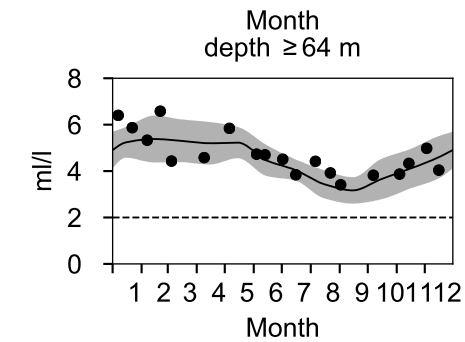
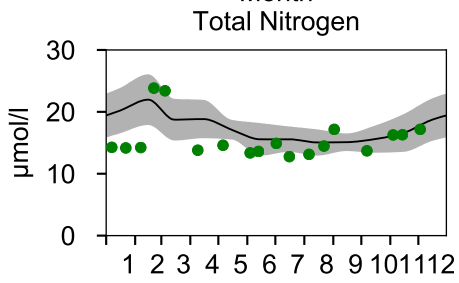
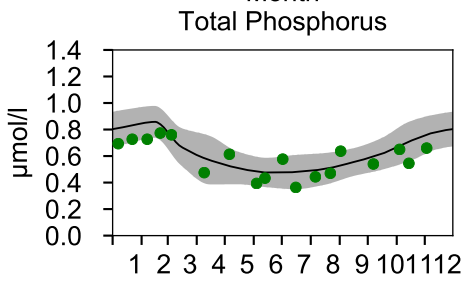
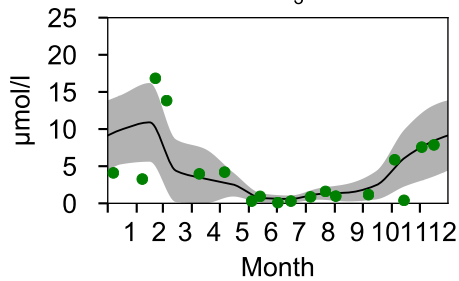
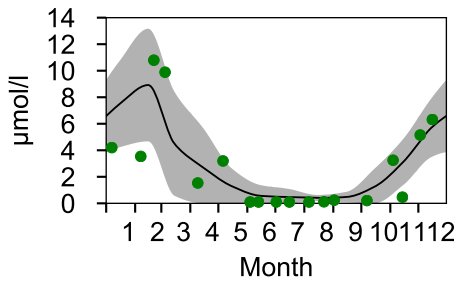
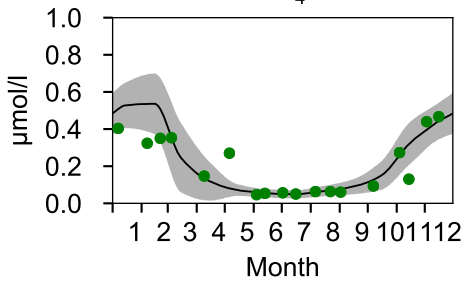
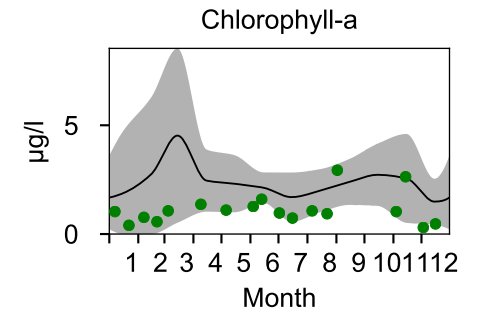
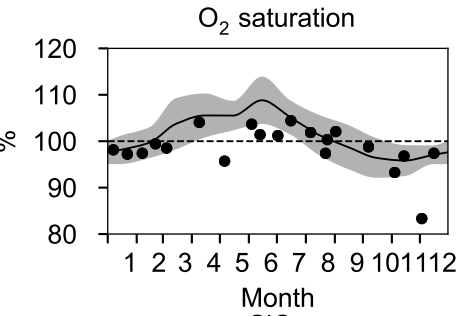
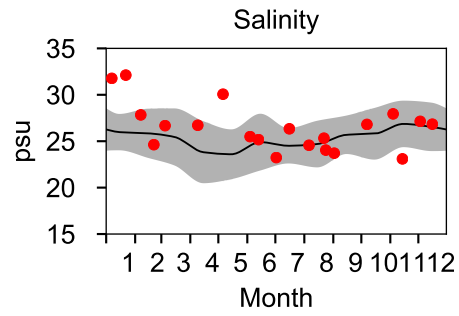
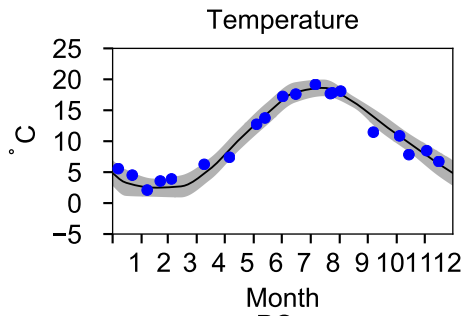
STATION GAVIK-1 SURFACE WATER (0-10 m)



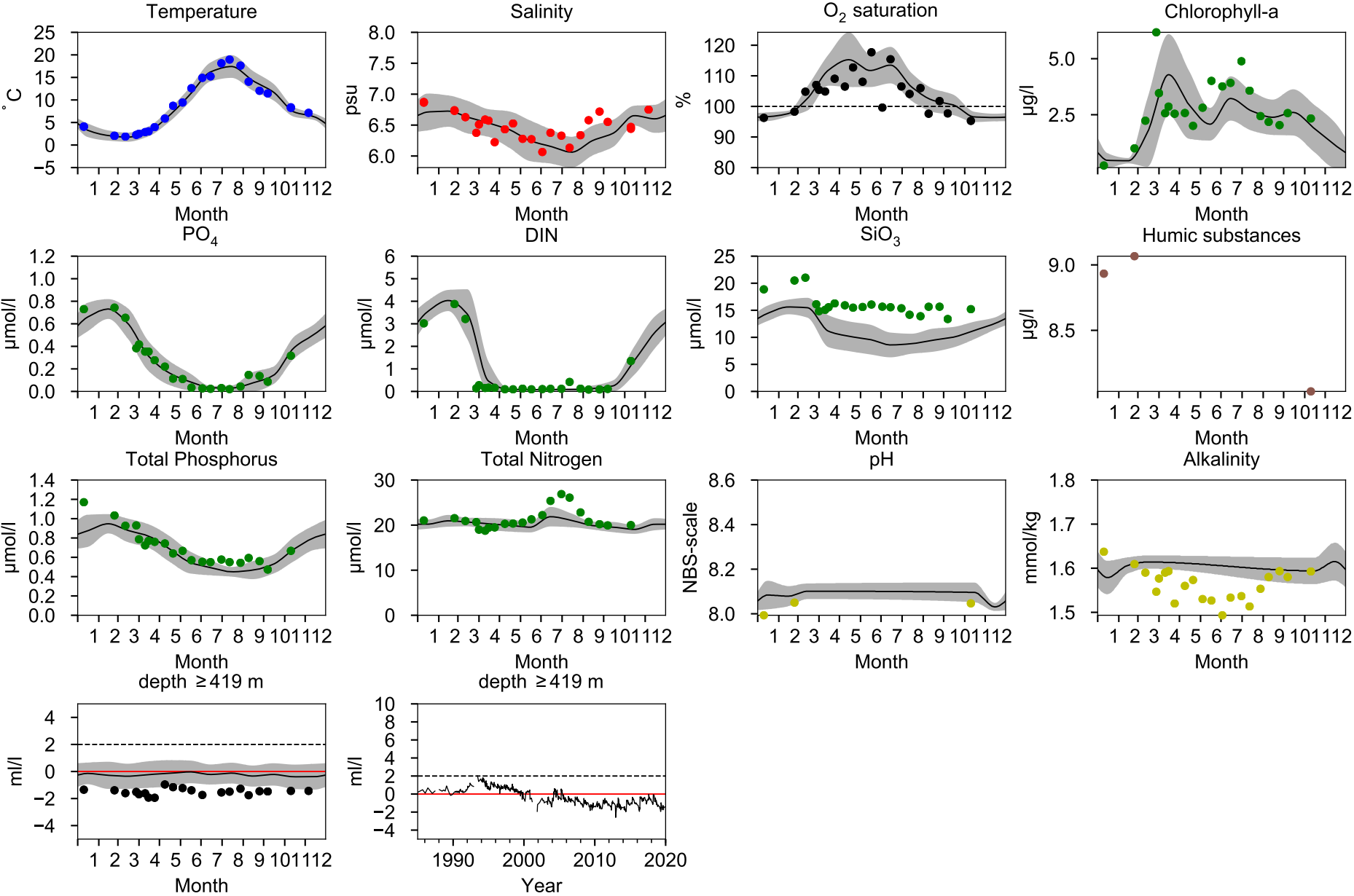
STATION B1 SURFACE WATER (0-10 m)



STATION SLÄGGÖ SURFACE WATER (0-10 m)



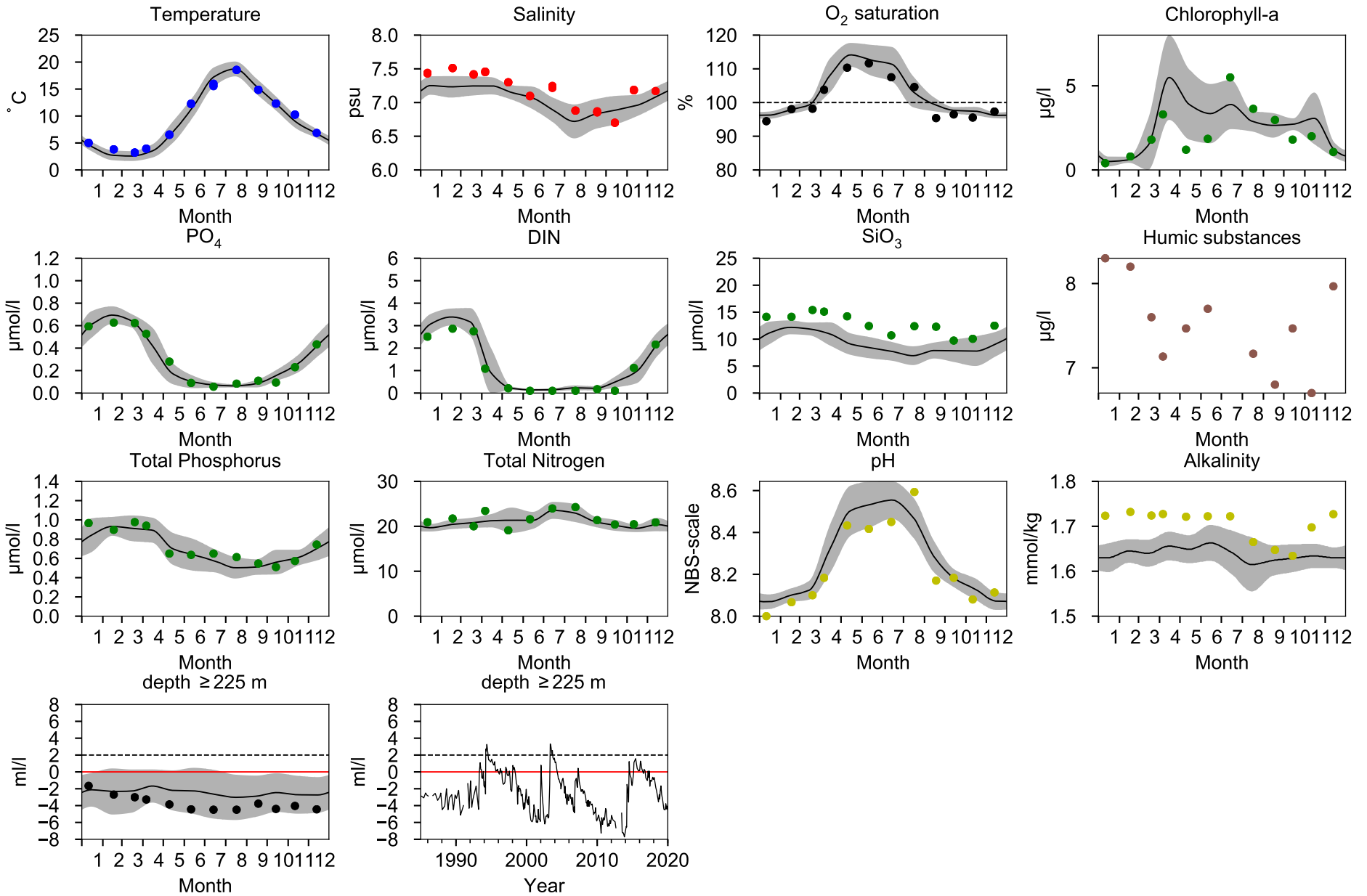
STATION BY31 LANDSORTSDJ SURFACE WATER (0-10 m)



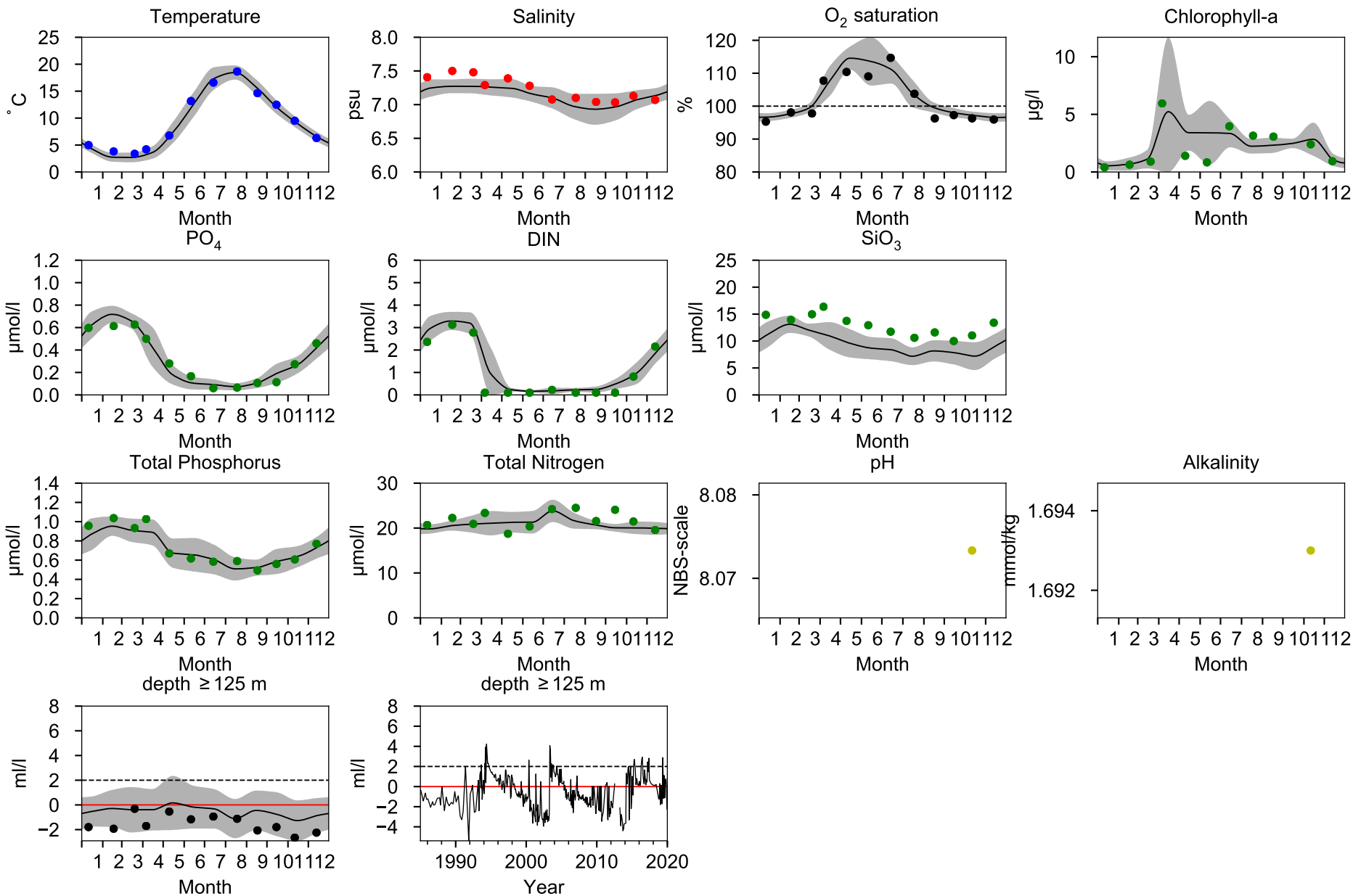
STATION BY20 FÄRÖDJ SURFACE WATER (0-10 m)



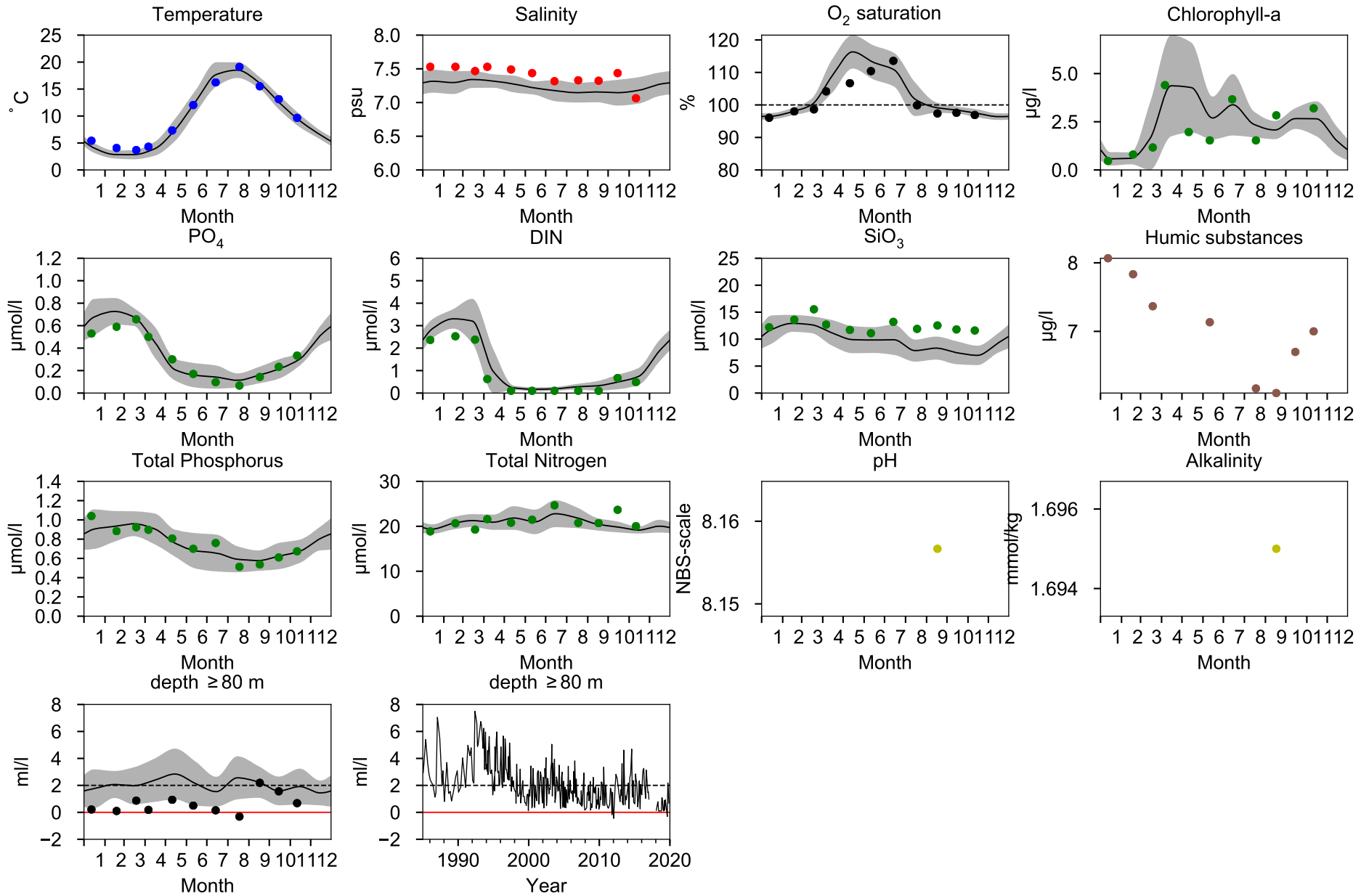
STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)



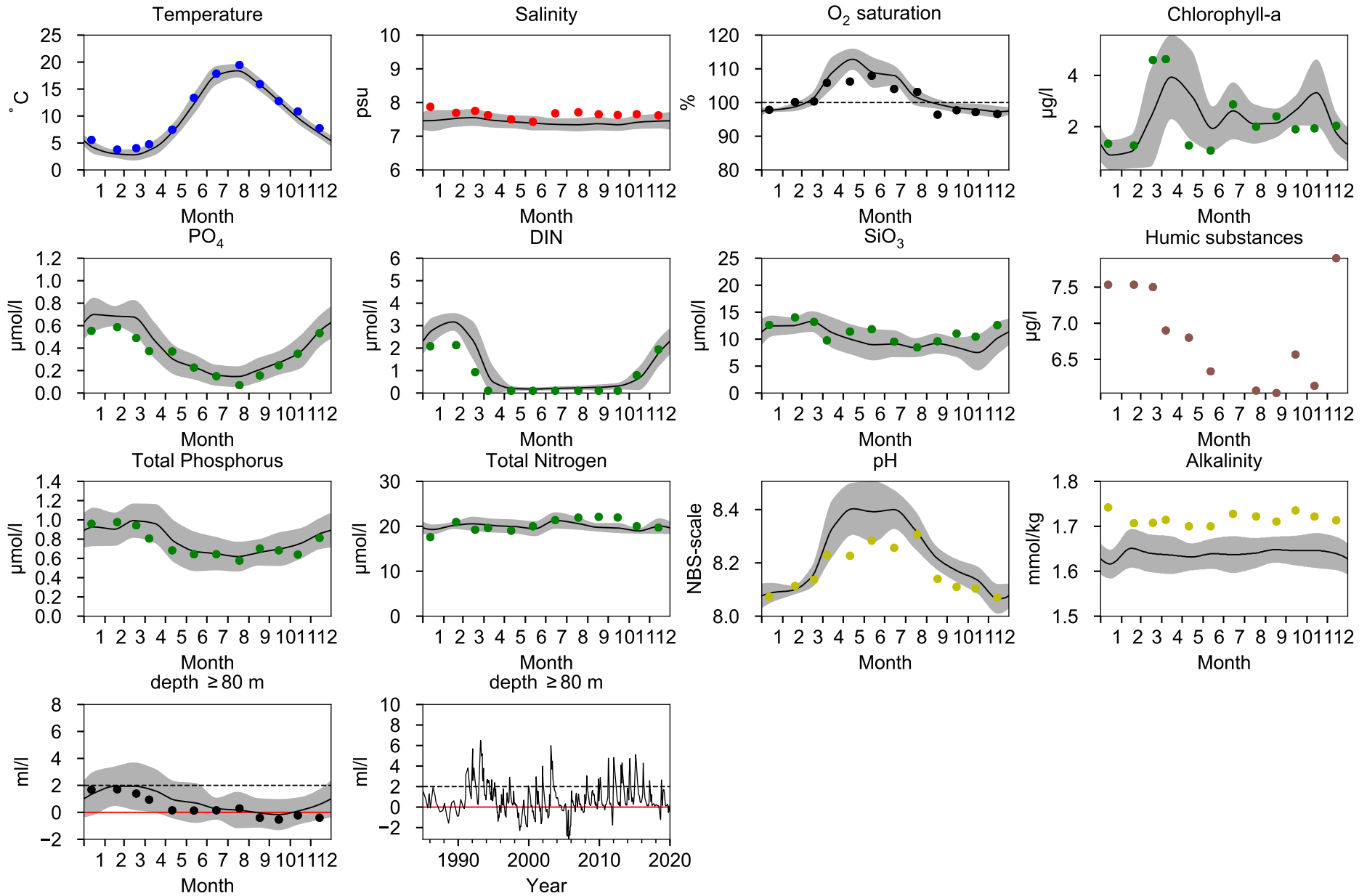
STATION BY10 SURFACE WATER (0-10 m)



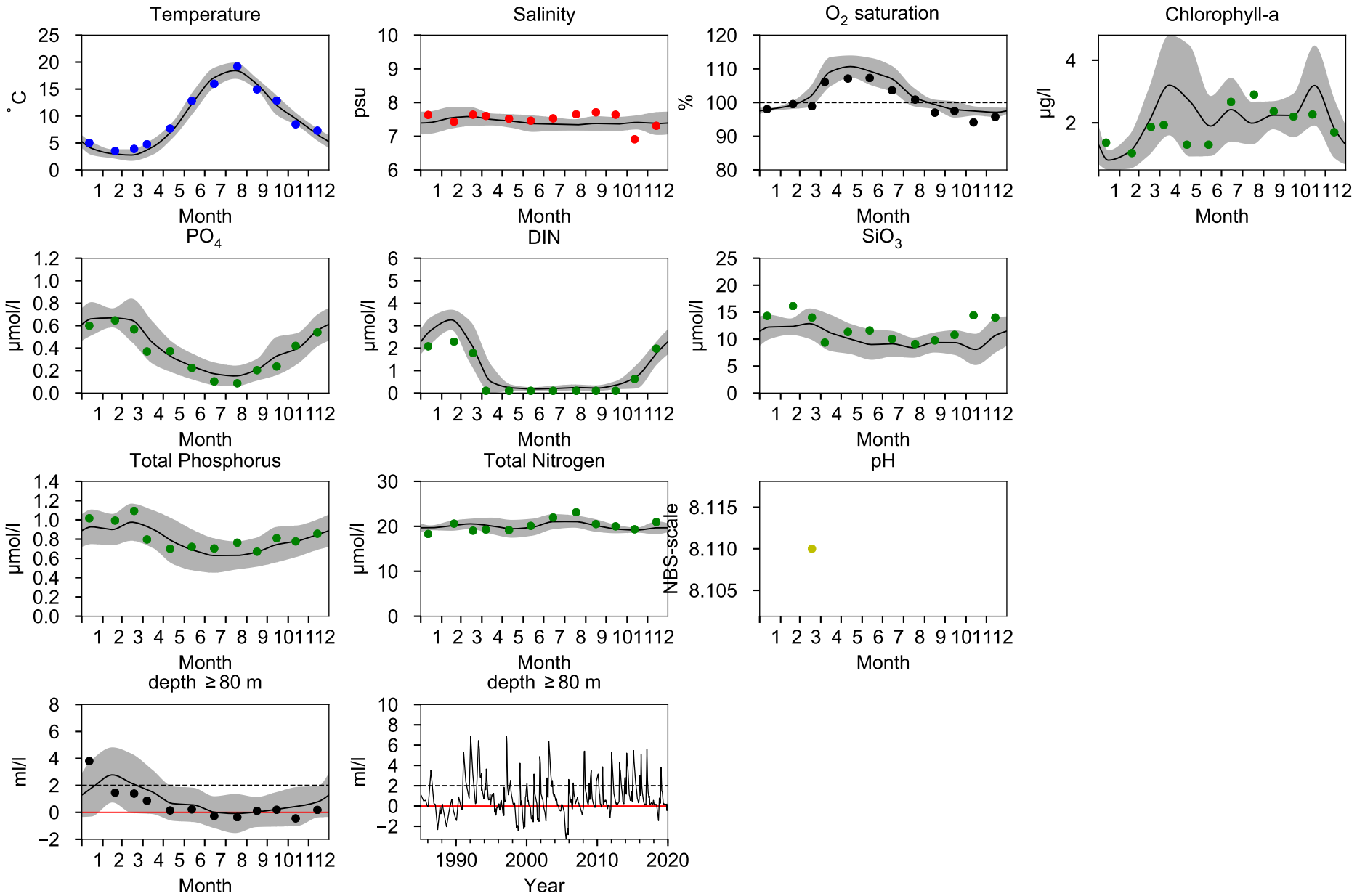
STATION BCS III-10 SURFACE WATER (0-10 m)



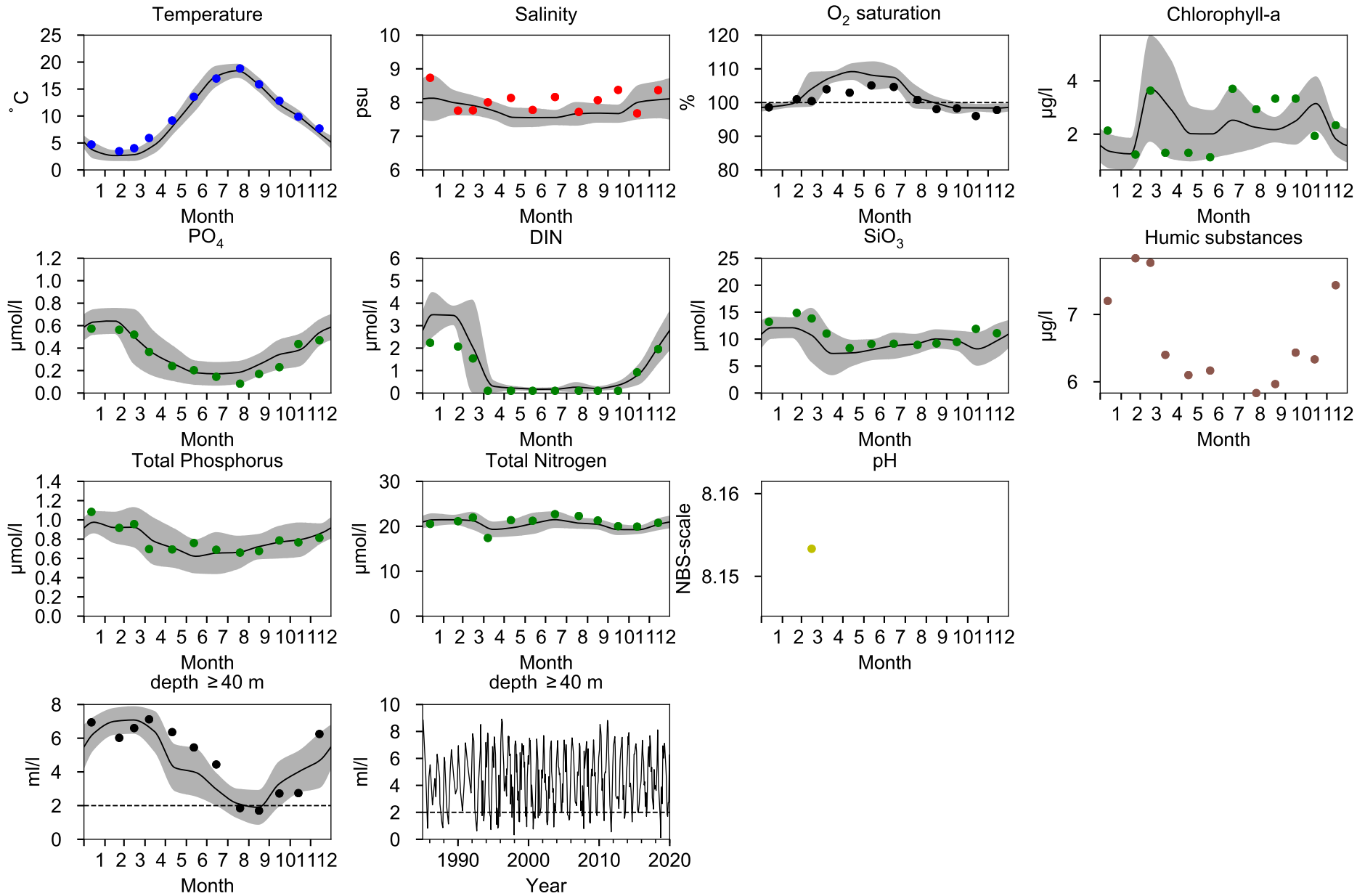
STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)



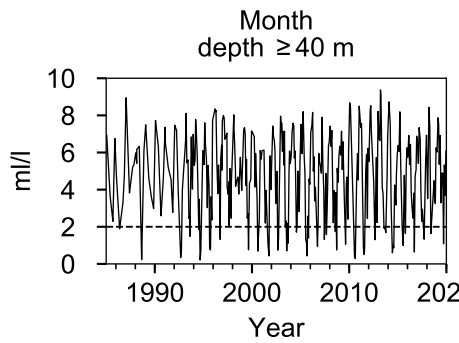
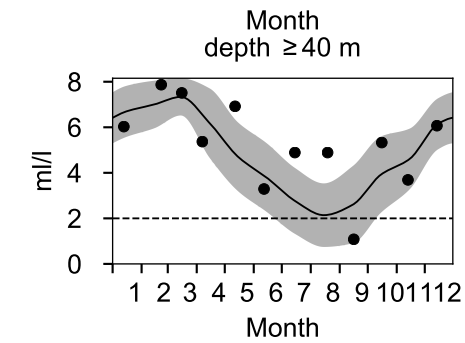
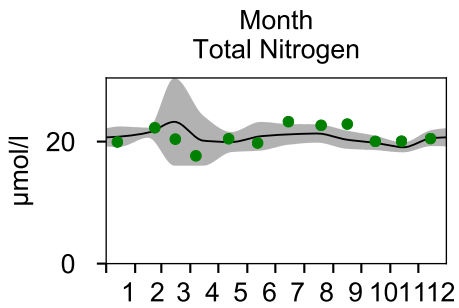
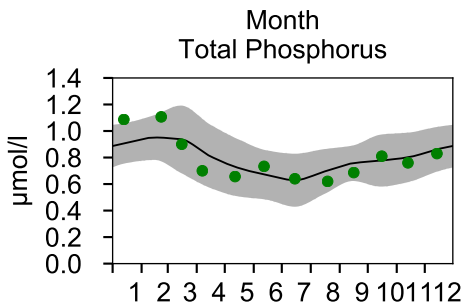
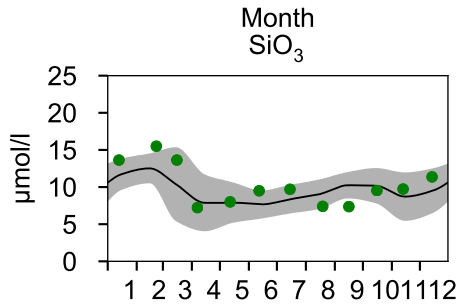
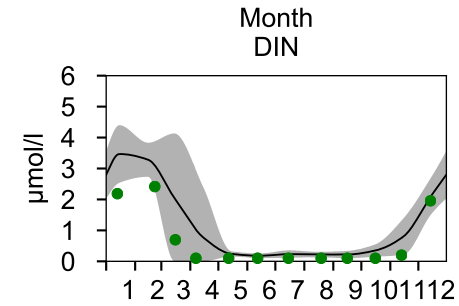
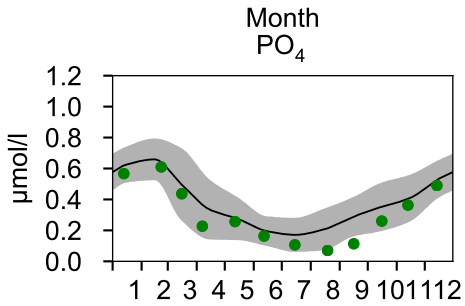
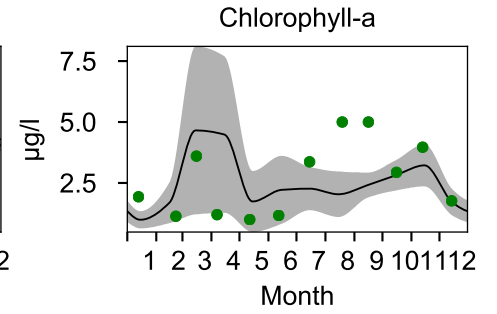
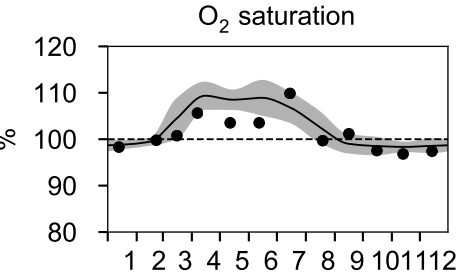
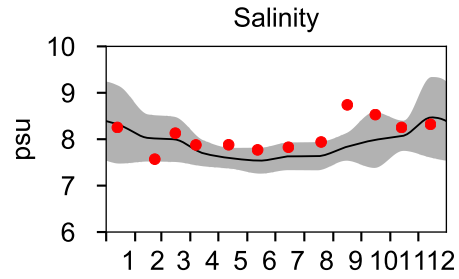
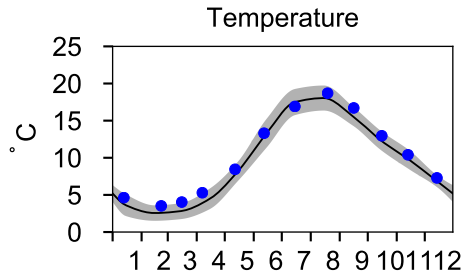
STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)



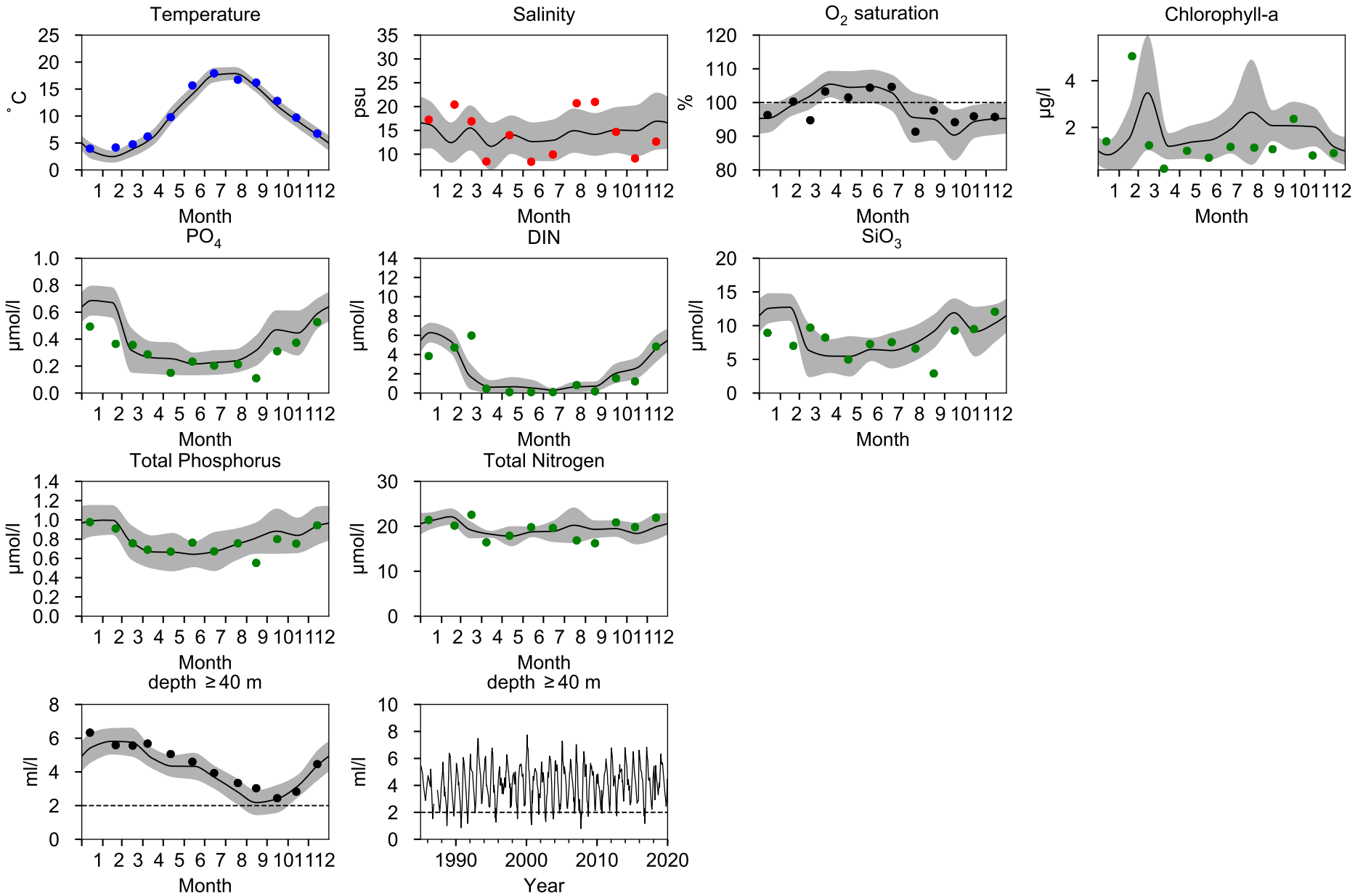
STATION BY2 ARKONA SURFACE WATER (0-10 m)



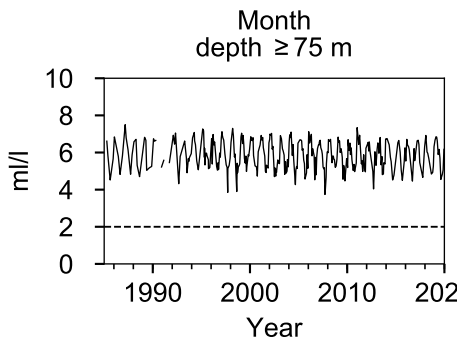
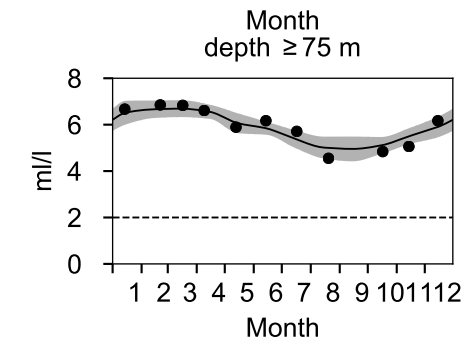
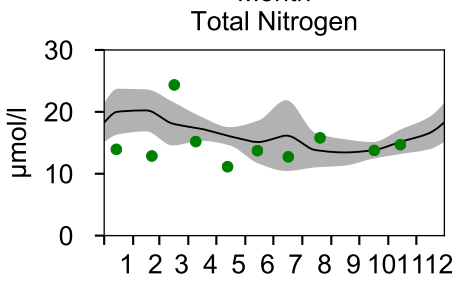
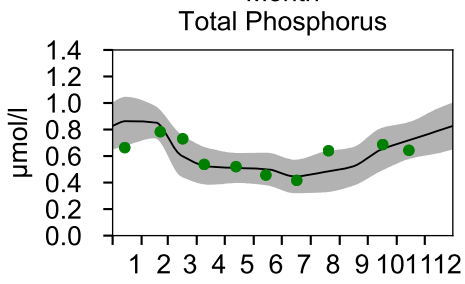
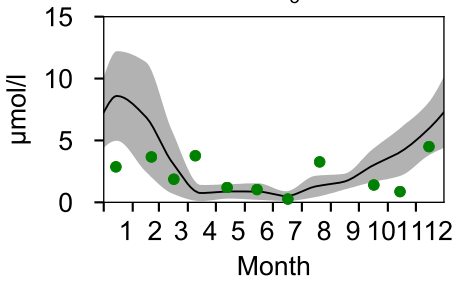
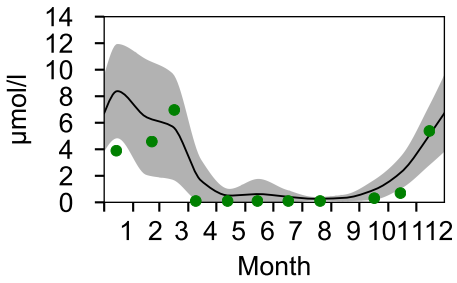
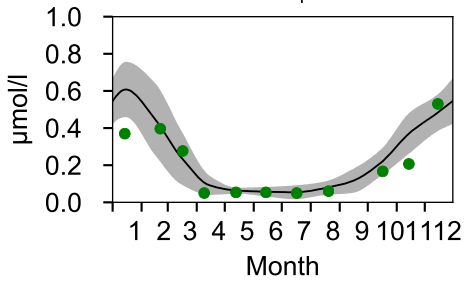
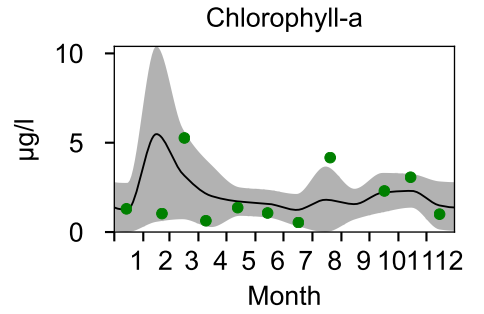
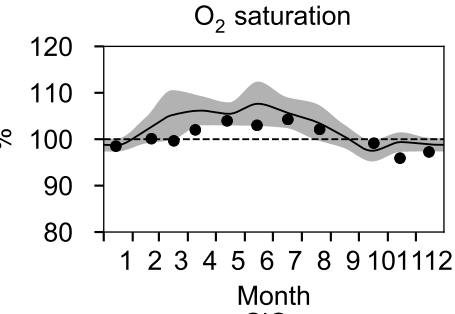
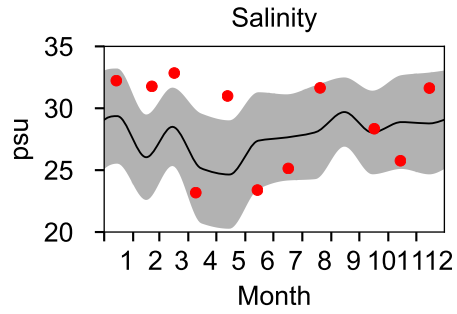
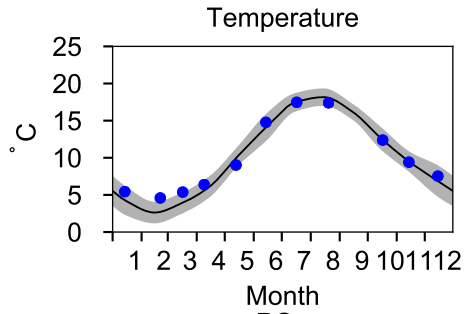
STATION BY1 SURFACE WATER (0-10 m)



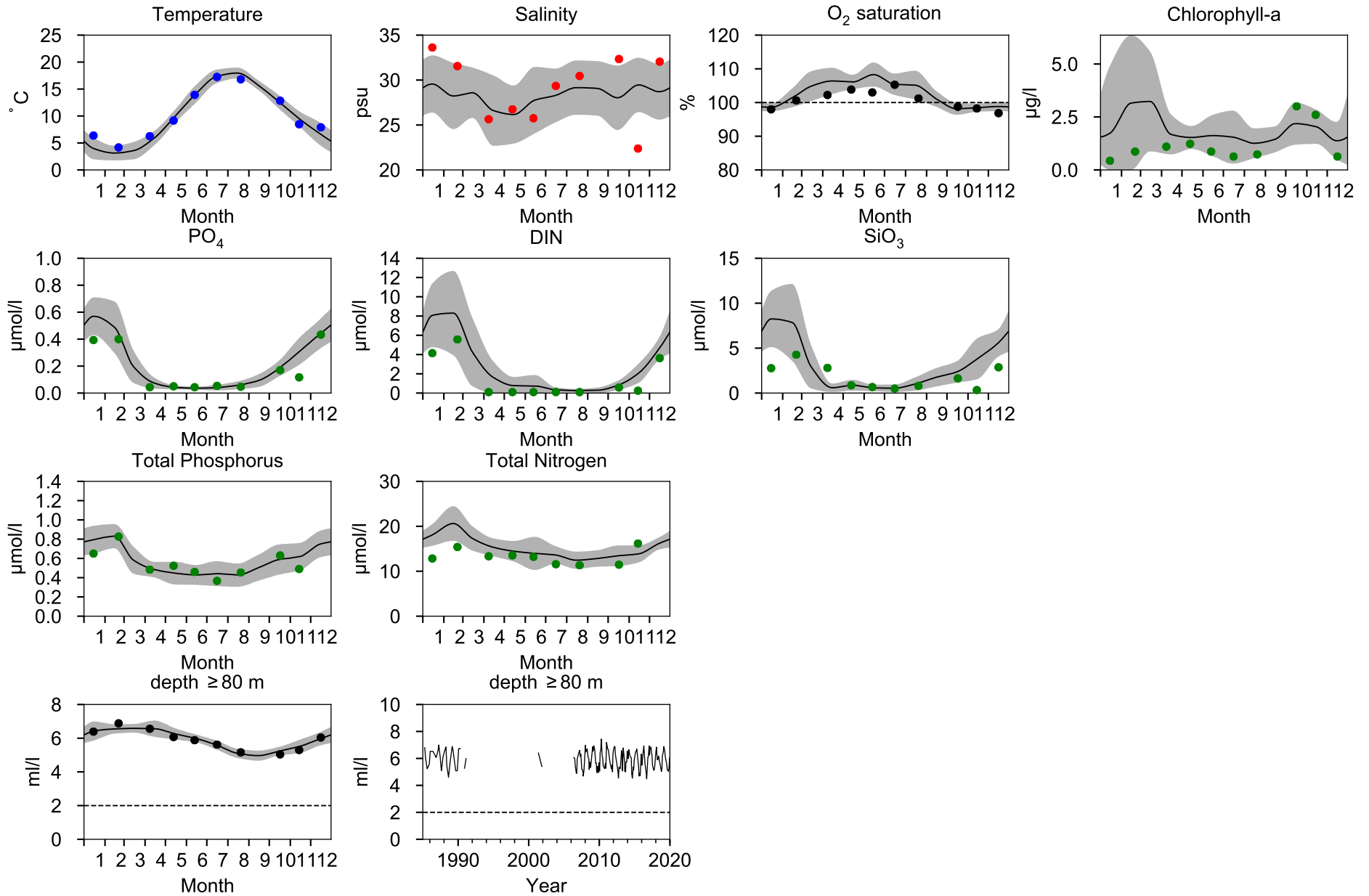
STATION W LANDSKRONA SURFACE WATER (0-10 m)



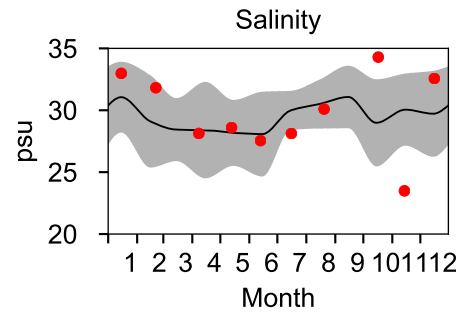
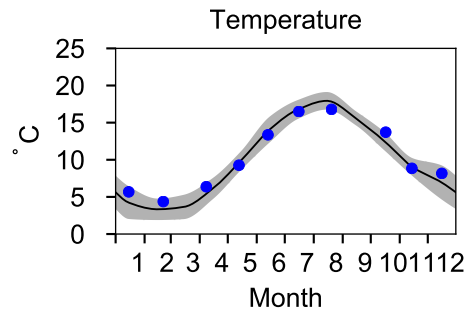
STATION P2 SURFACE WATER (0-10 m)



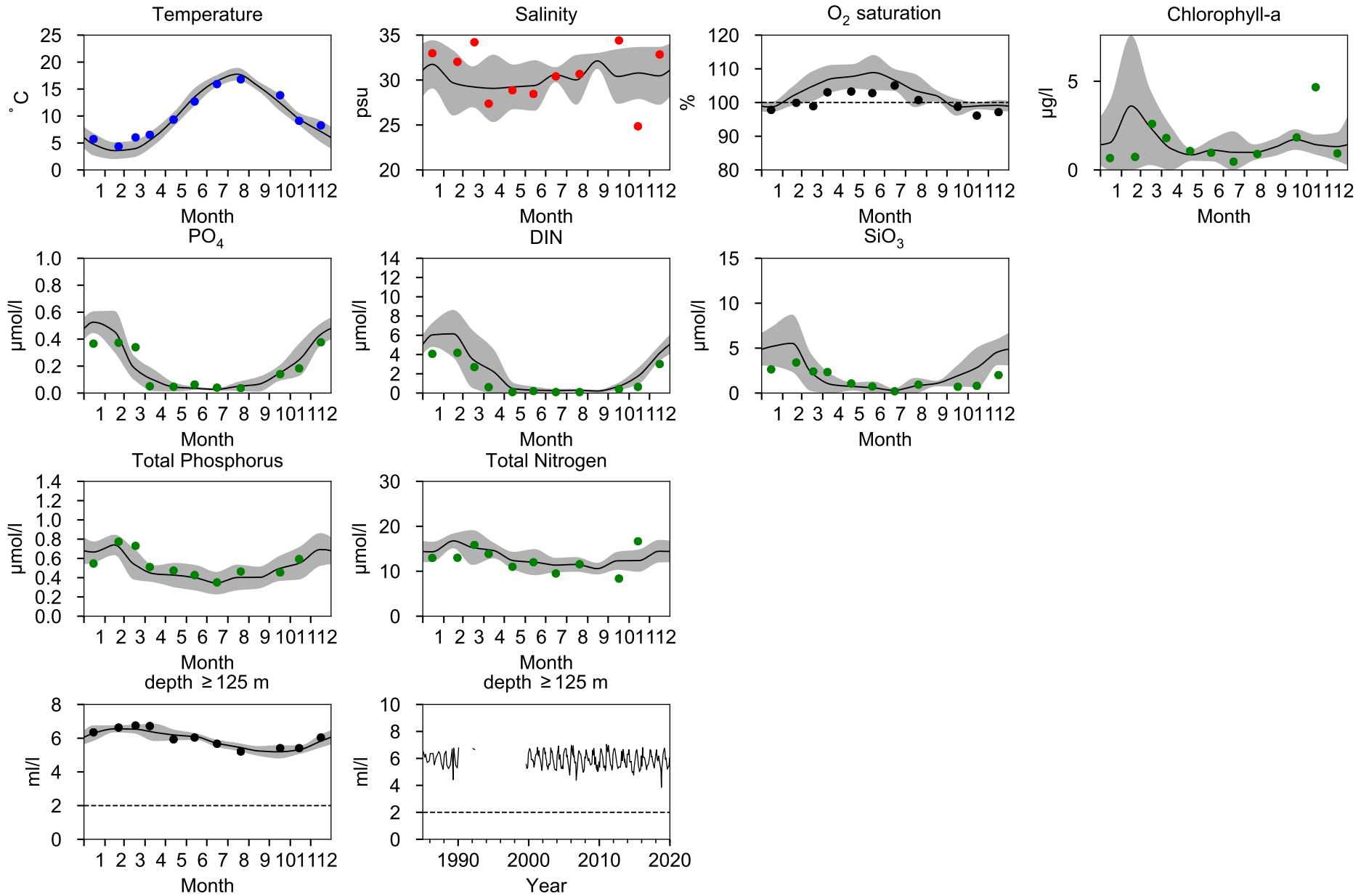
STATION Å13 SURFACE WATER (0-10 m)



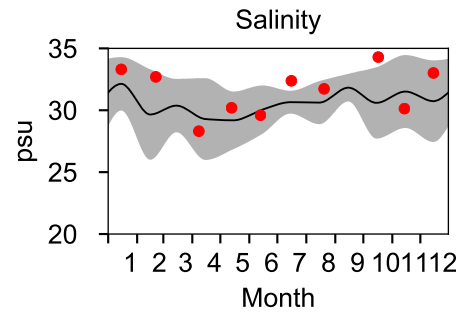
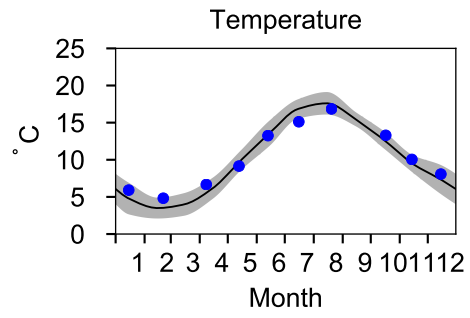
STATION Å14 SURFACE WATER (0-10 m)



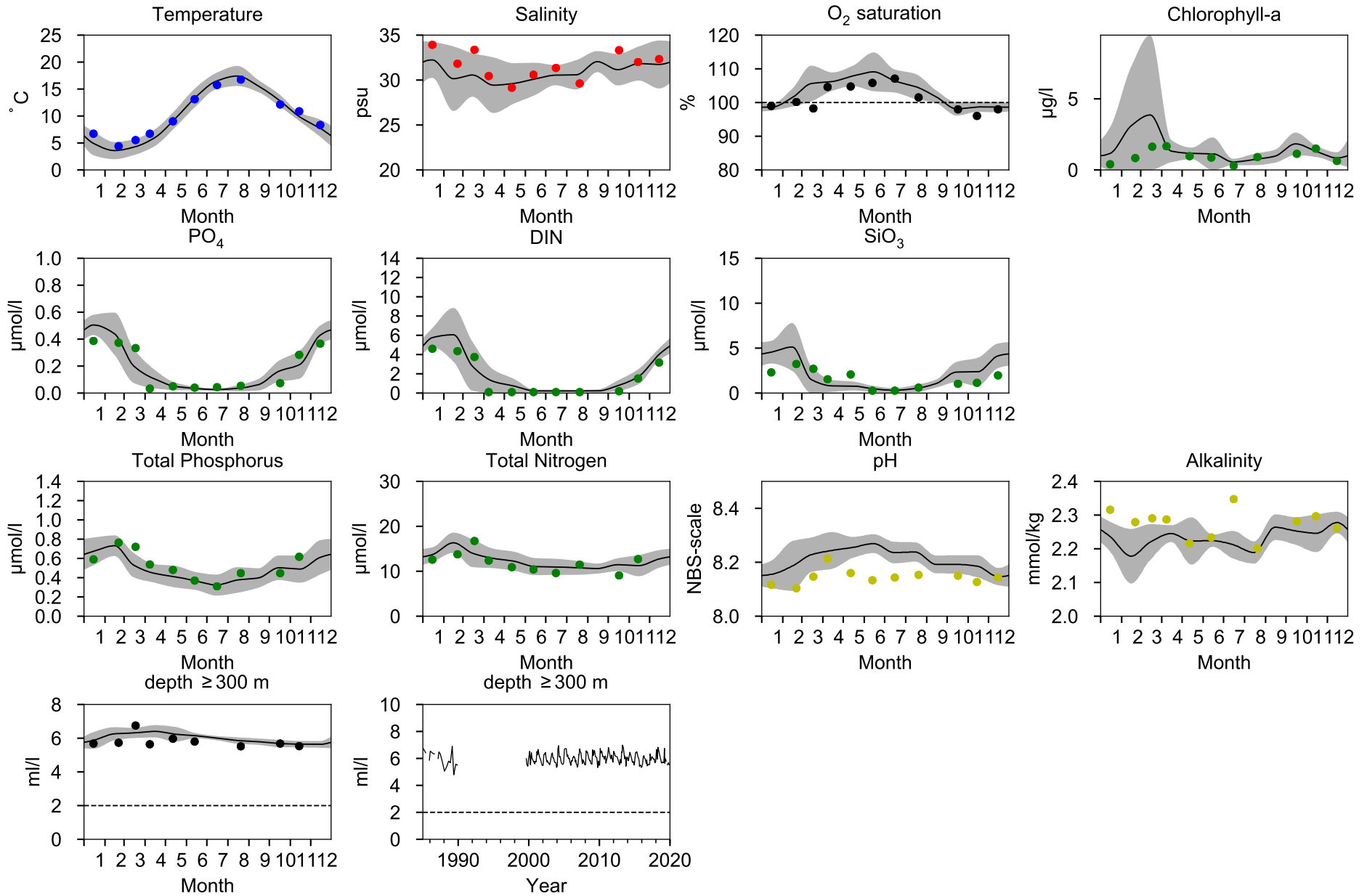
STATION Å15 SURFACE WATER (0-10 m)



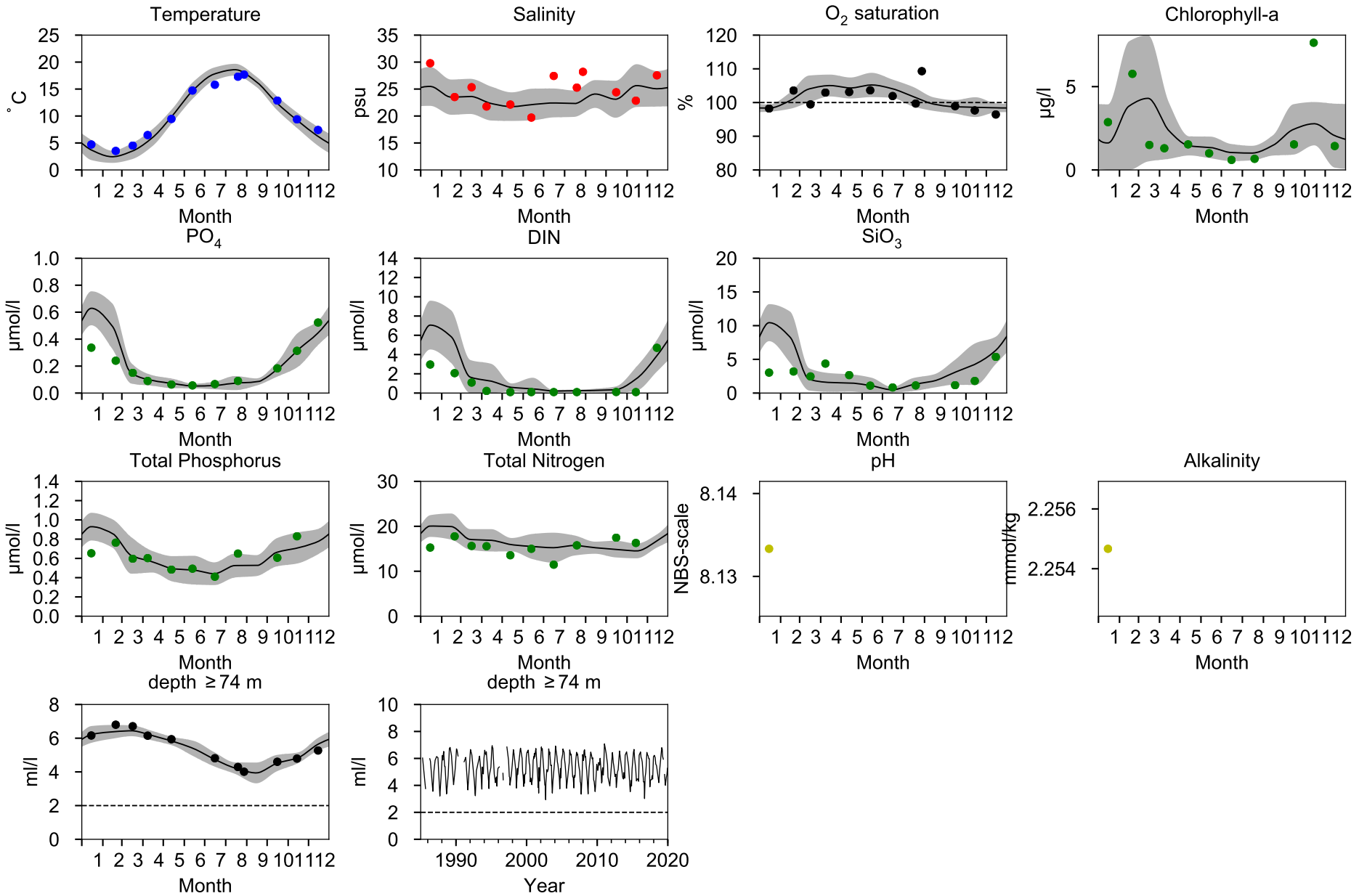
STATION Å16 SURFACE WATER (0-10 m)



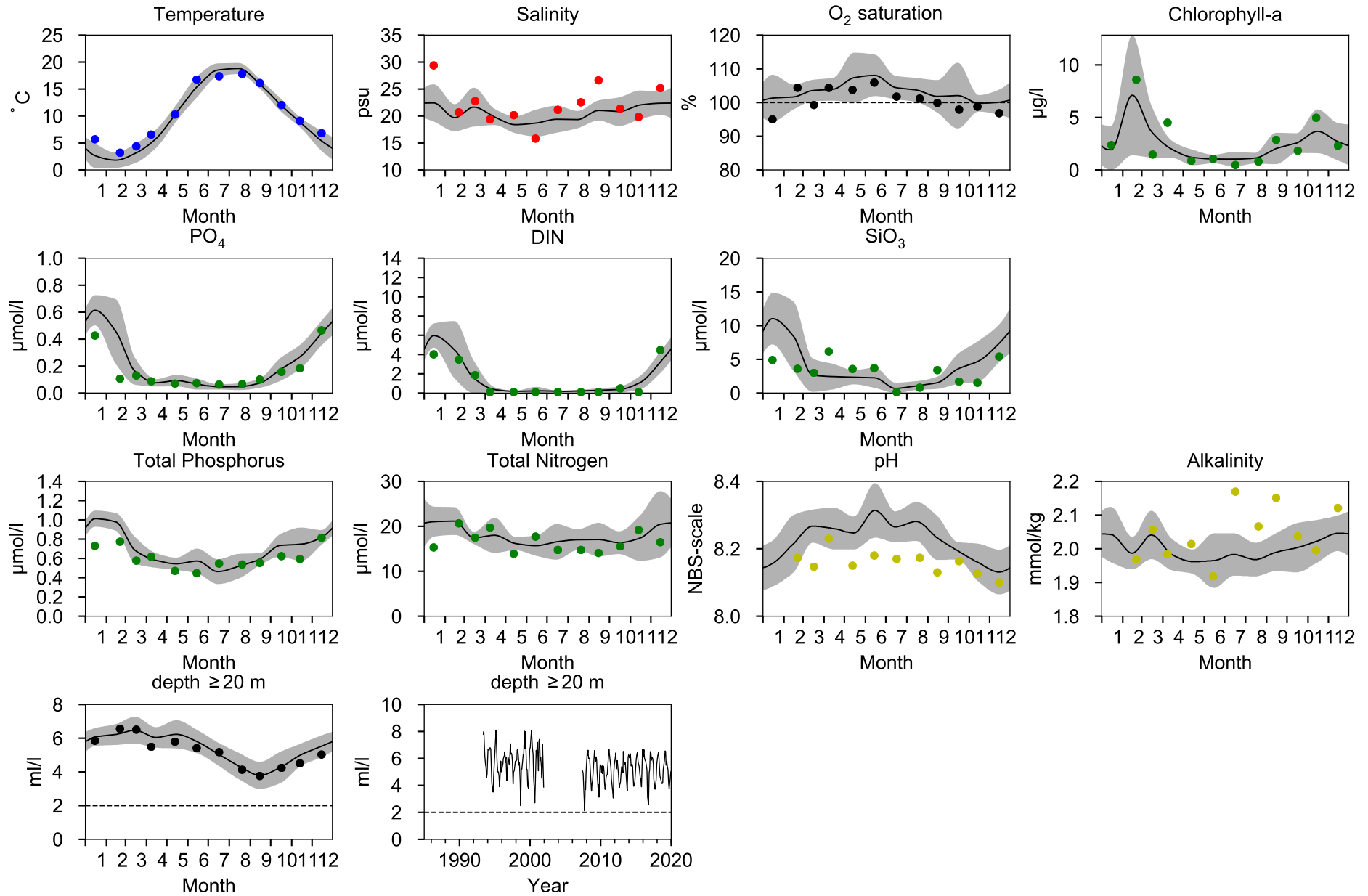
STATION Å17 SURFACE WATER (0-10 m)



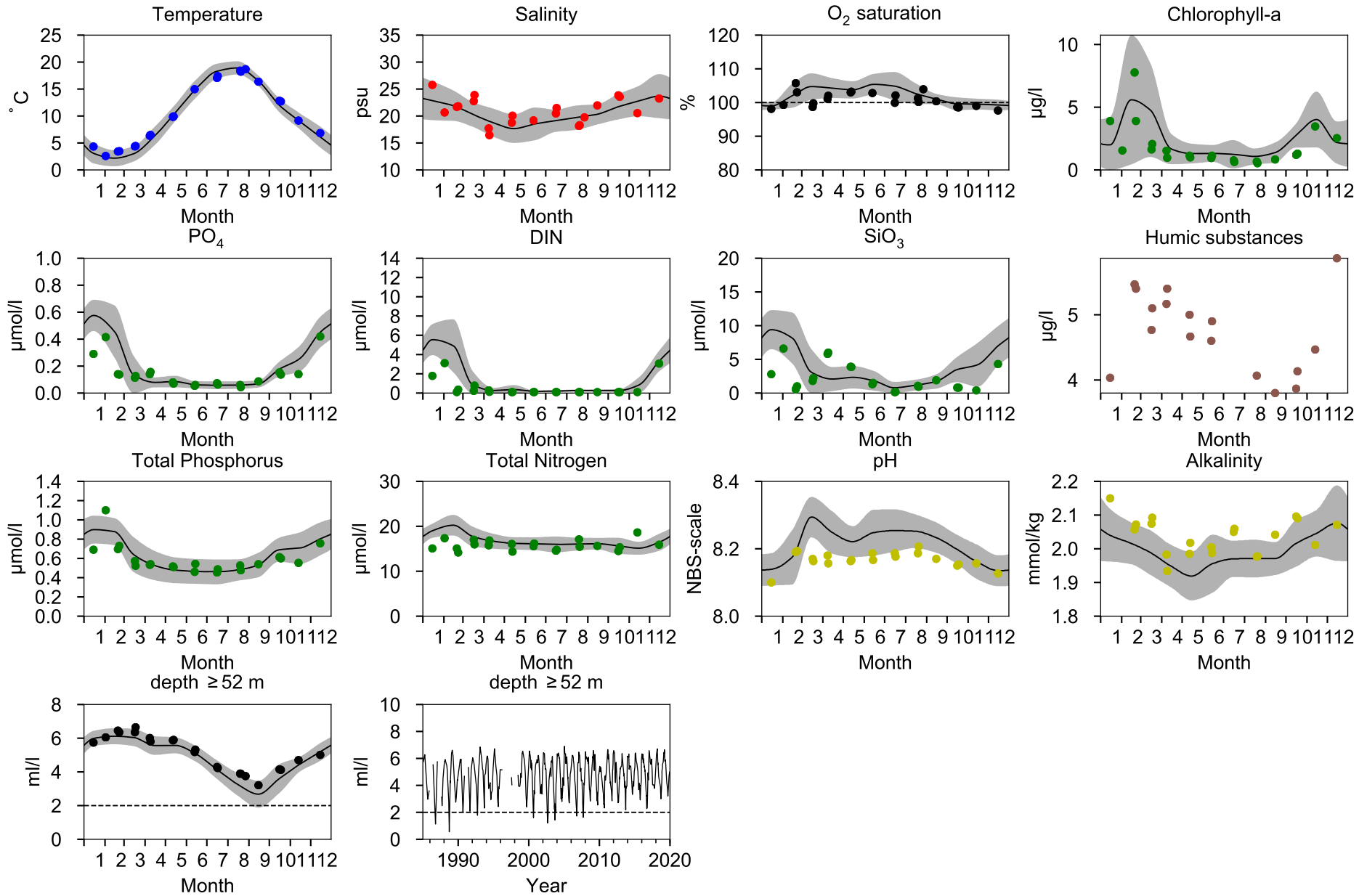
STATION FLADEN SURFACE WATER (0-10 m)



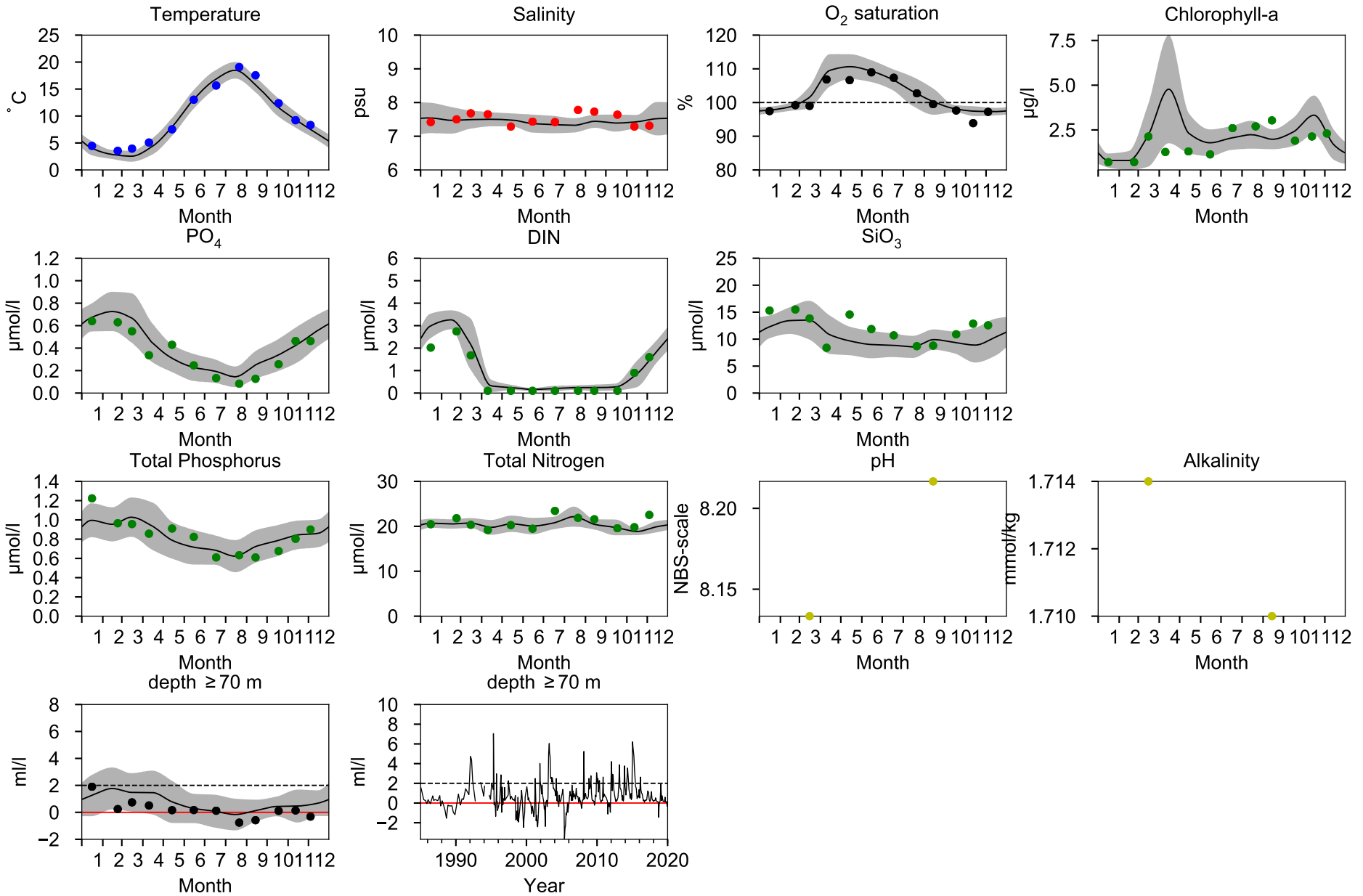
STATION N14 FALKENBERG SURFACE WATER (0-10 m)



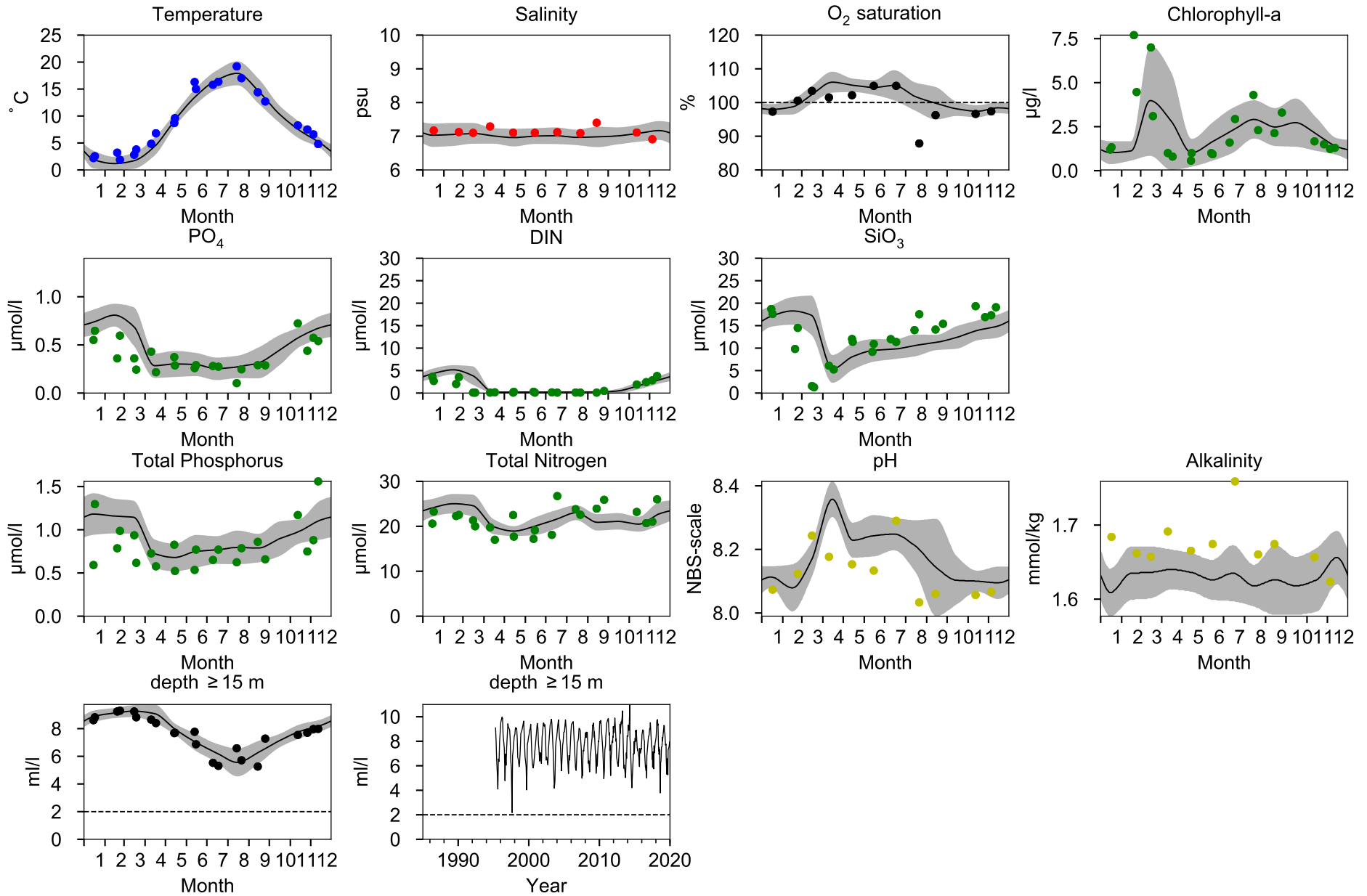
STATION ANHOLT E SURFACE WATER (0-10 m)



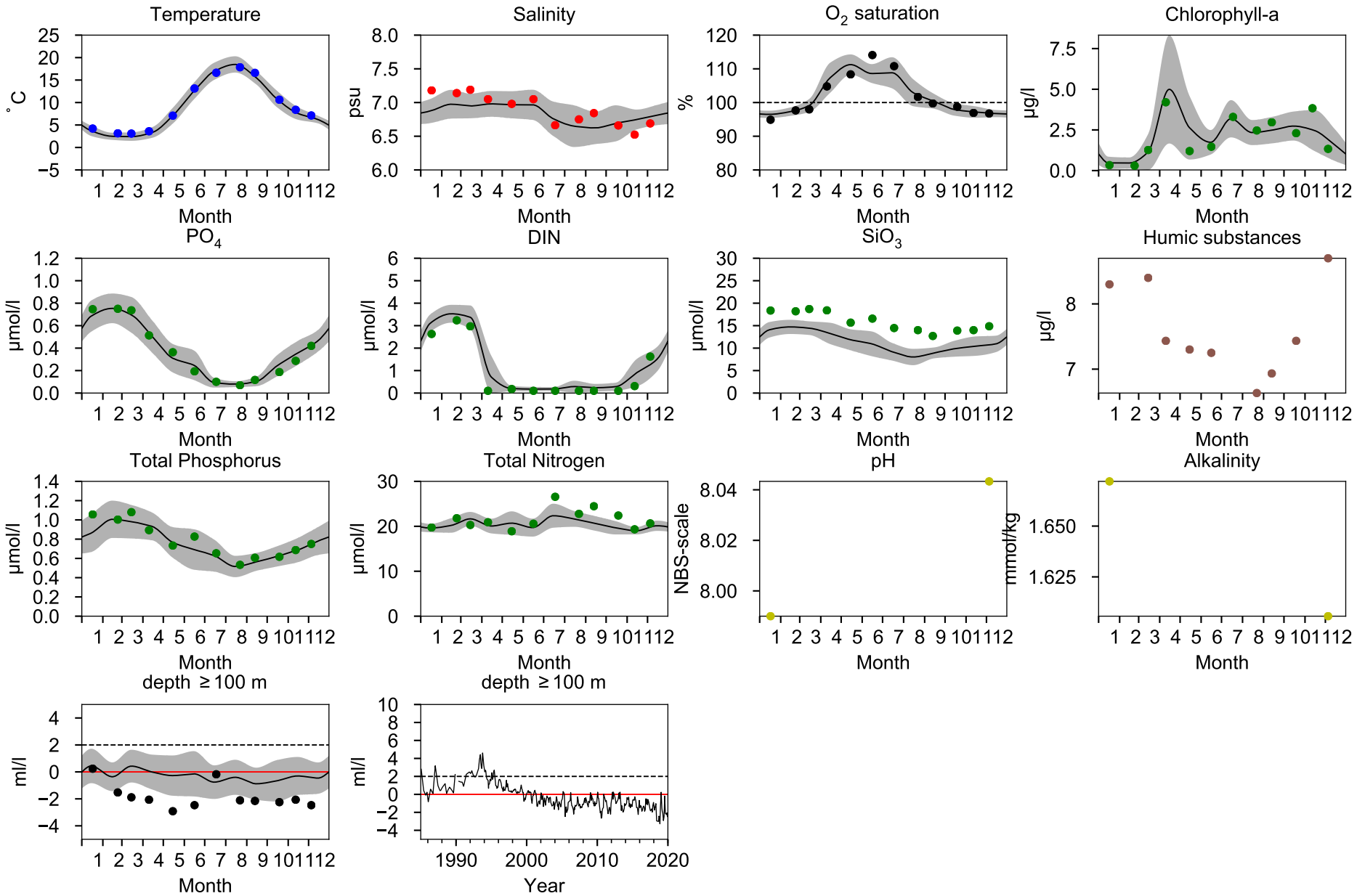
STATION HANÖBUKTEN SURFACE WATER (0-10 m)



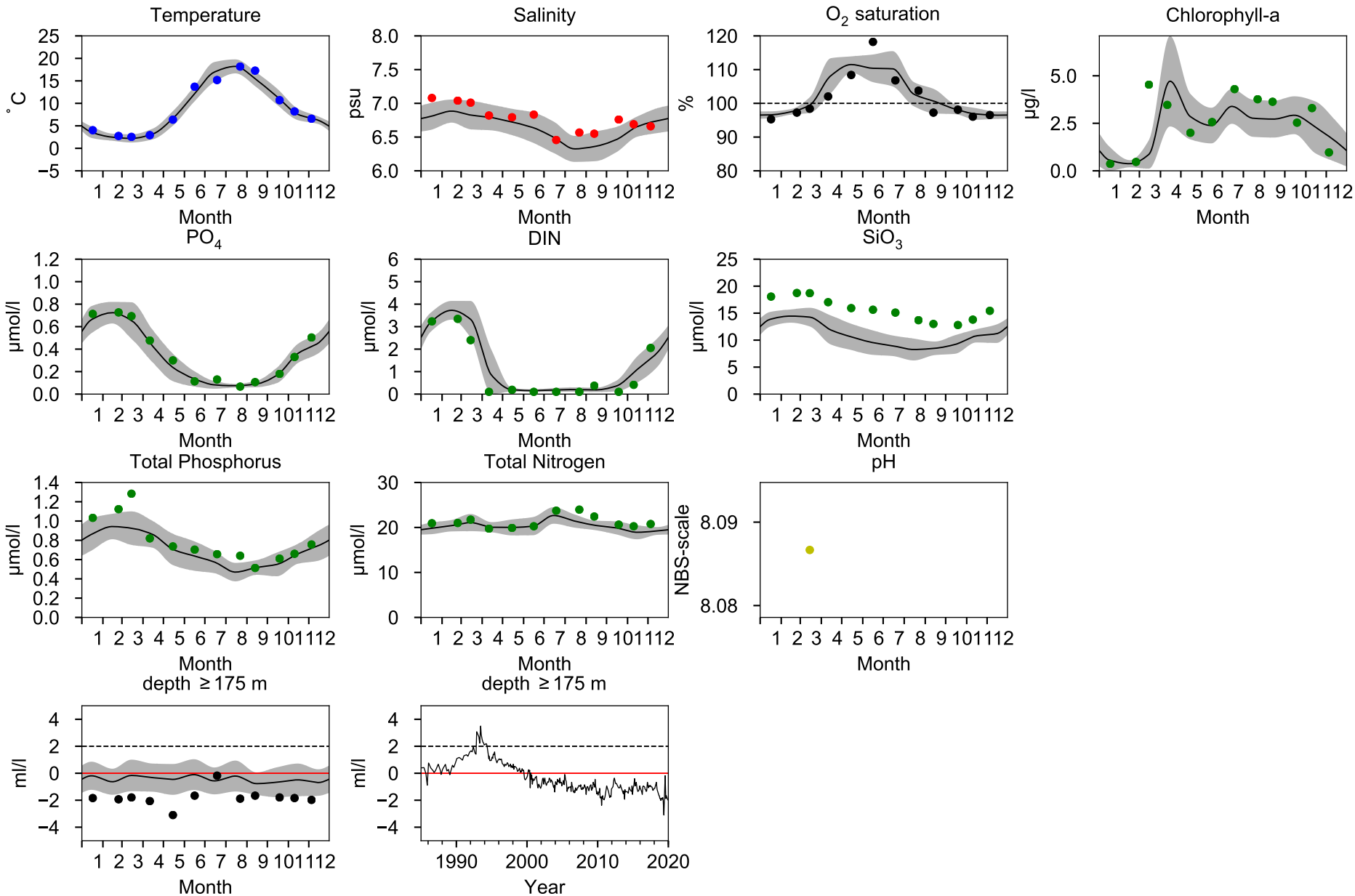
STATION REF M1V1 SURFACE WATER (0-10 m)



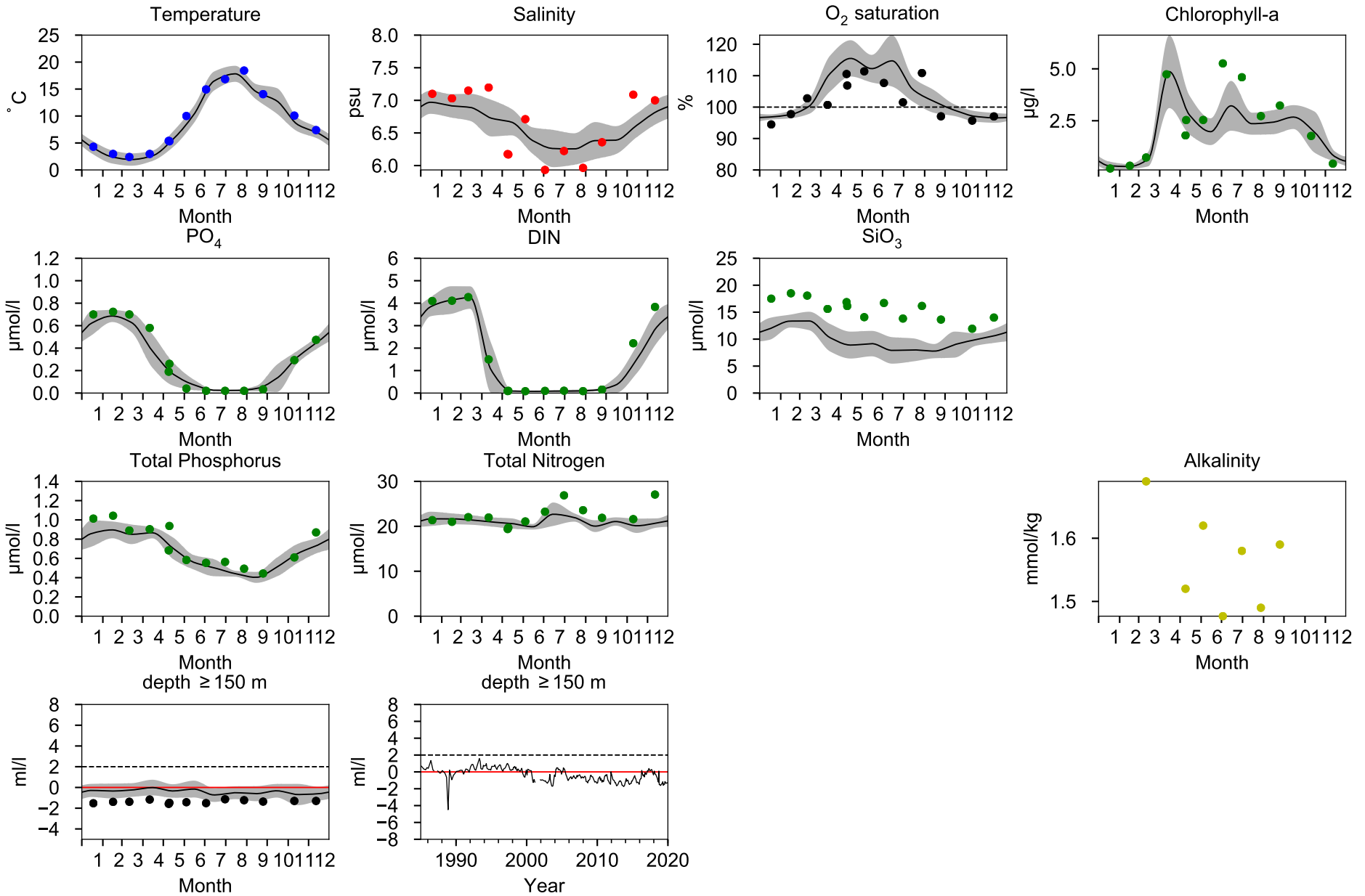
STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)



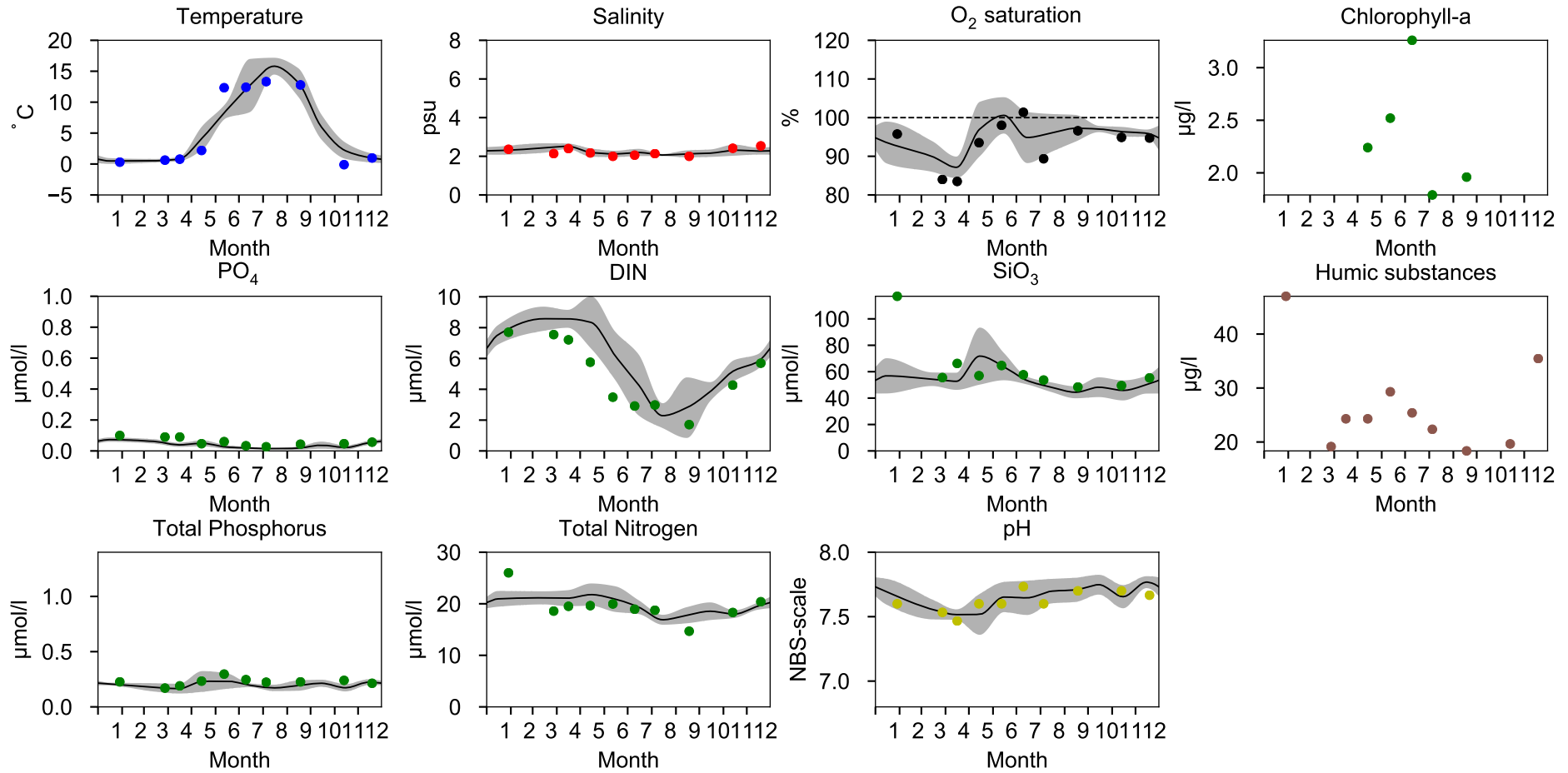
STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)



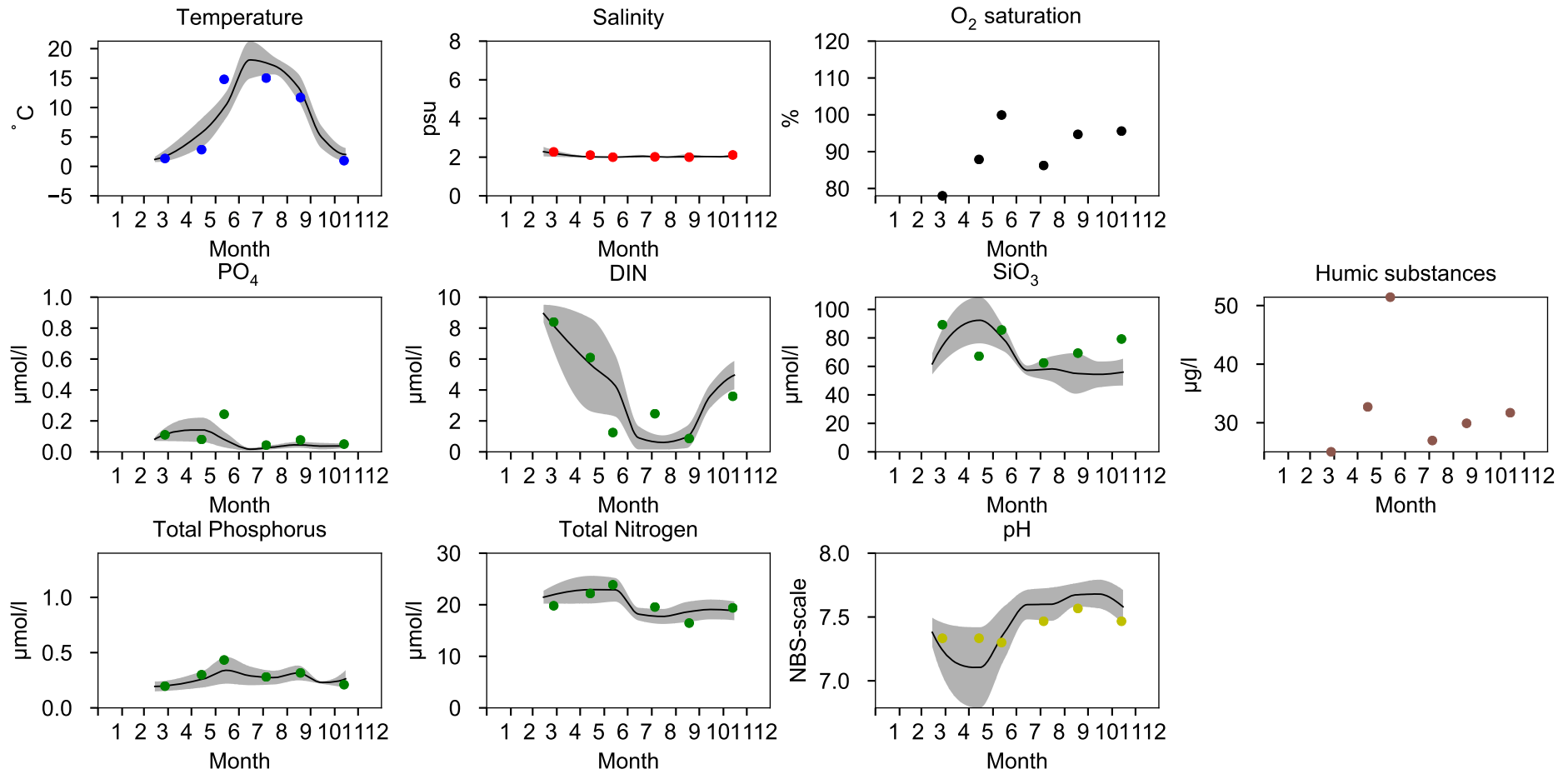
STATION BY29 / LL19 SURFACE WATER (0-10 m)



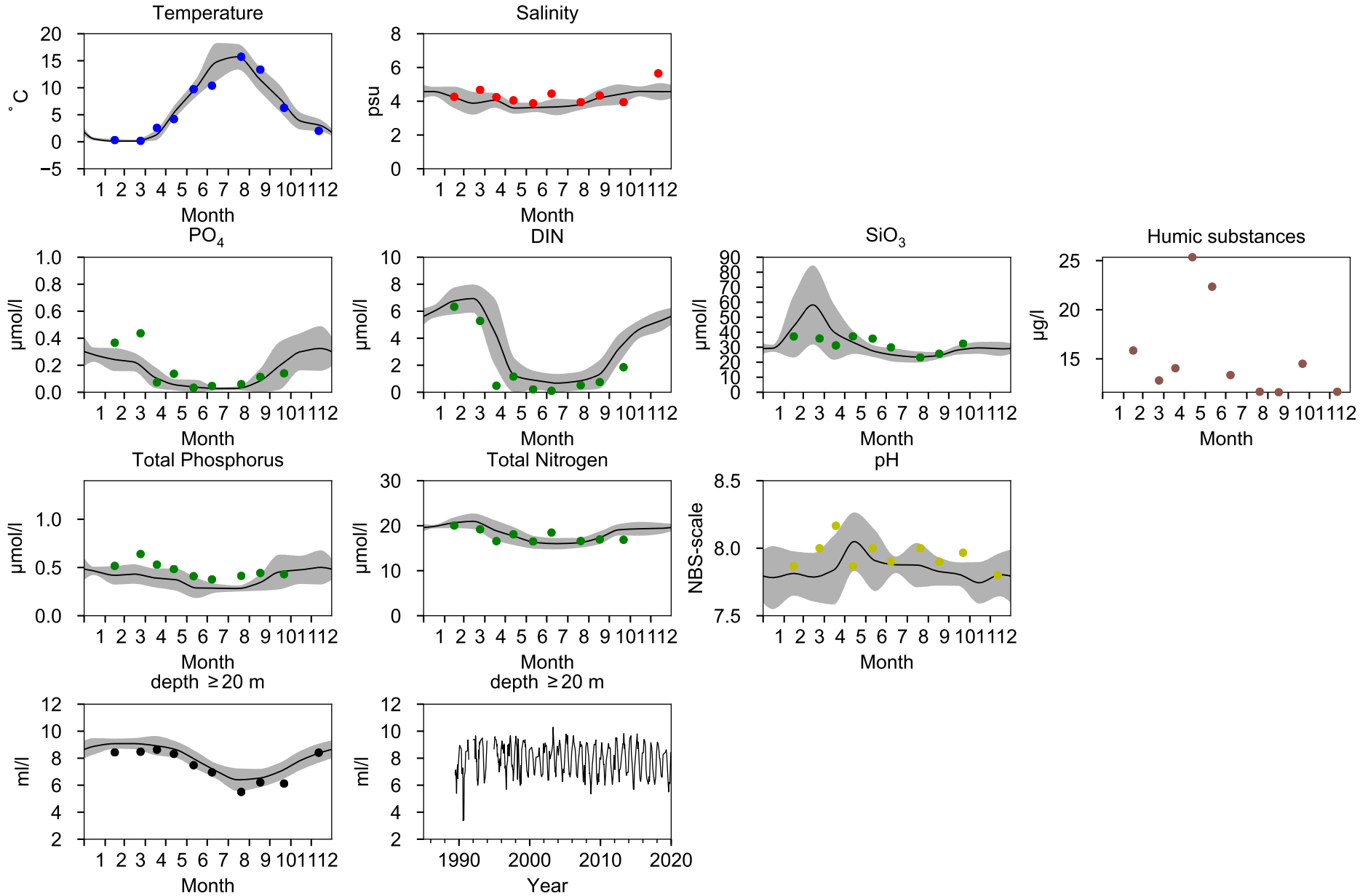
STATION RÅNEÅ-2 SURFACE WATER (0-10 m)



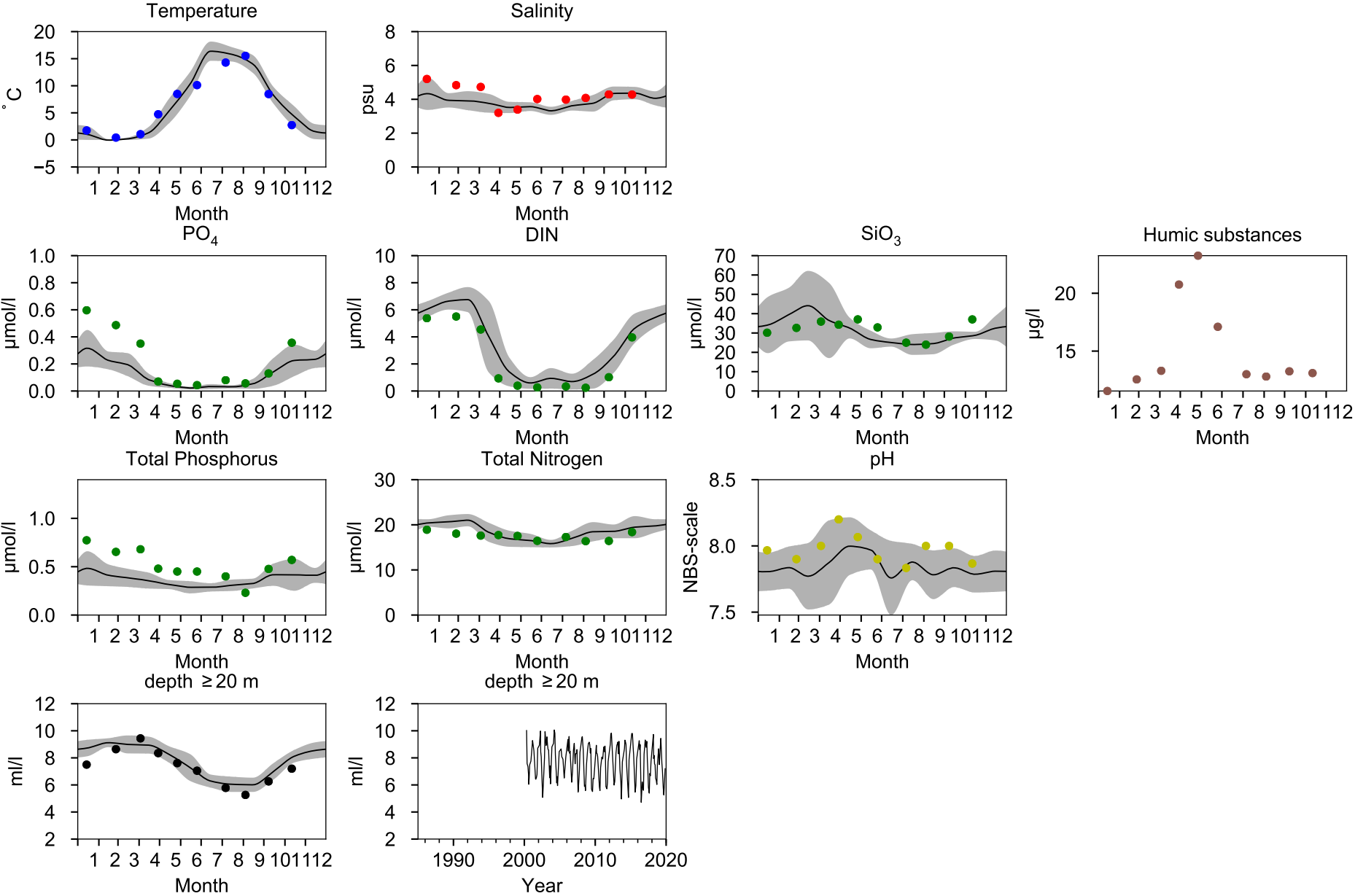
STATION RÂNEA-1 SURFACE WATER (0-10 m)



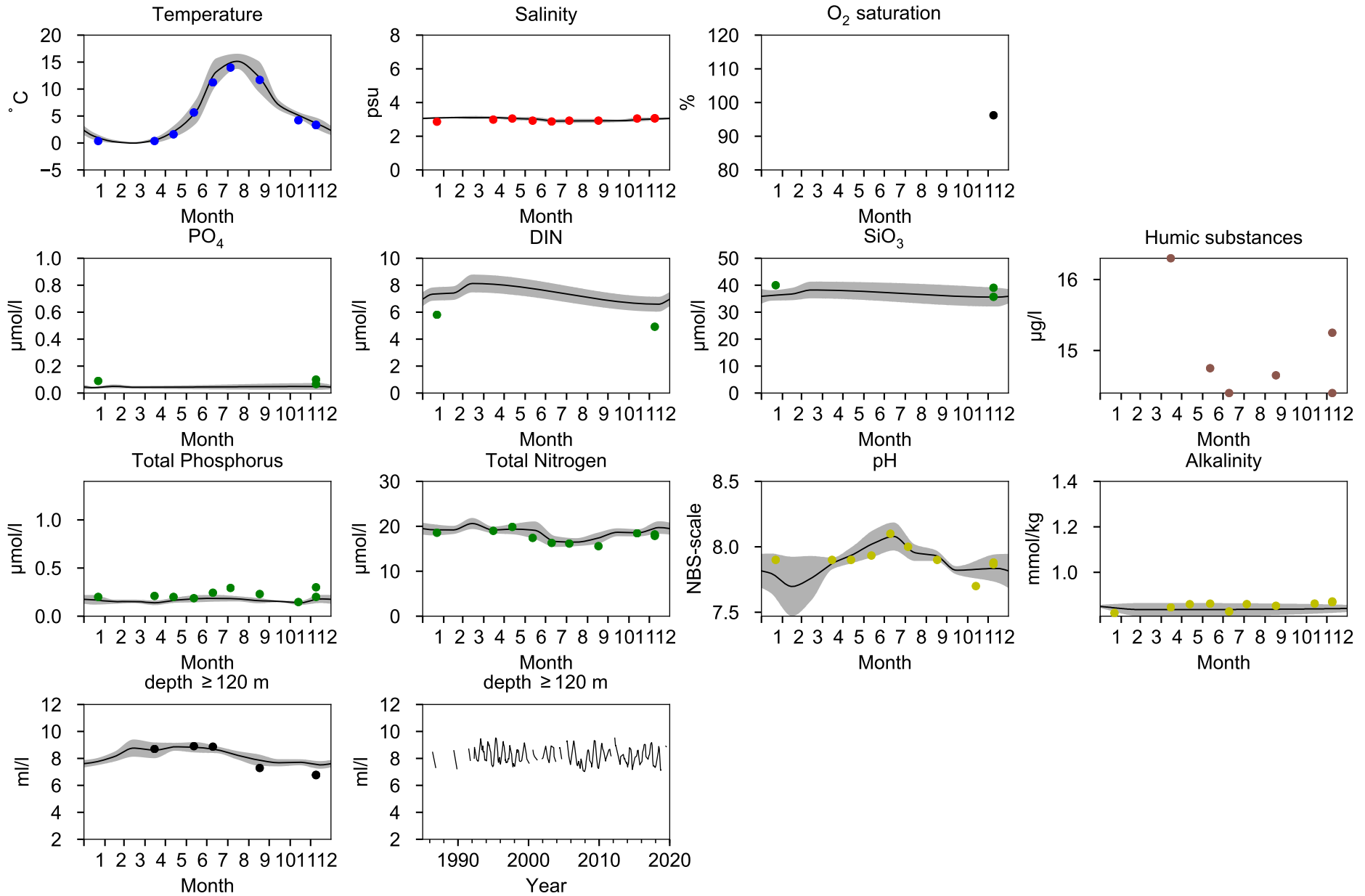
STATION NB1 / B3 SURFACE WATER (0-10 m)



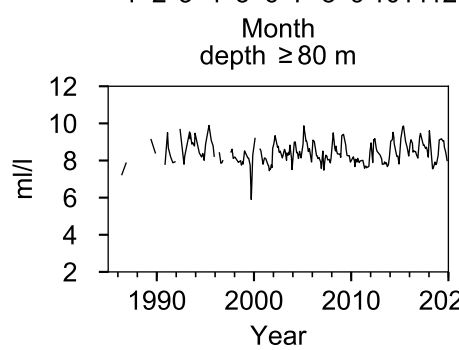
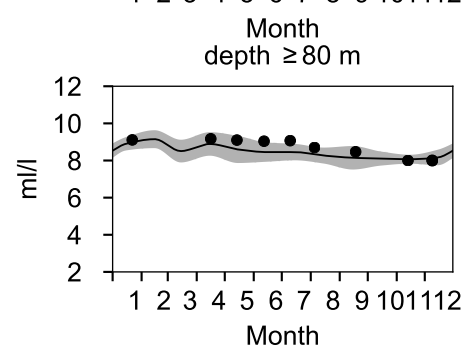
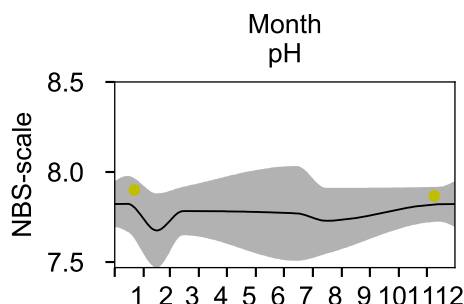
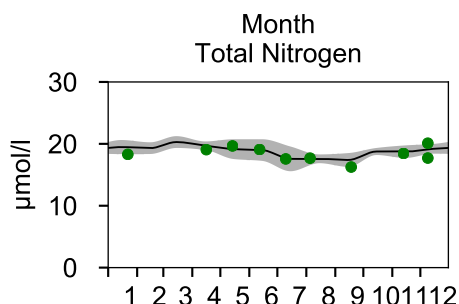
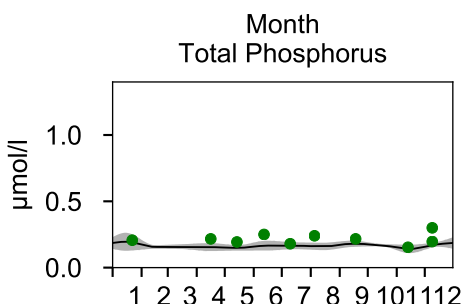
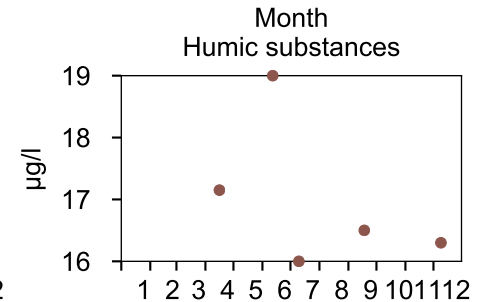
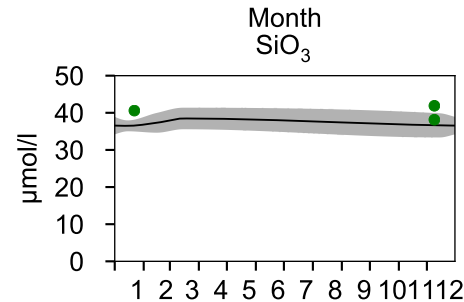
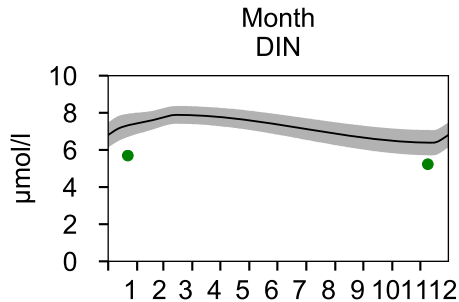
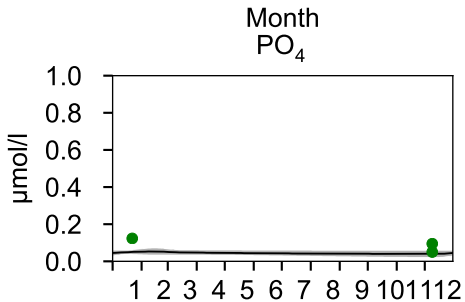
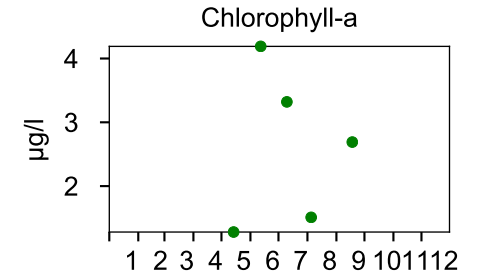
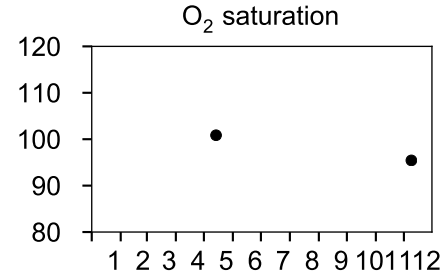
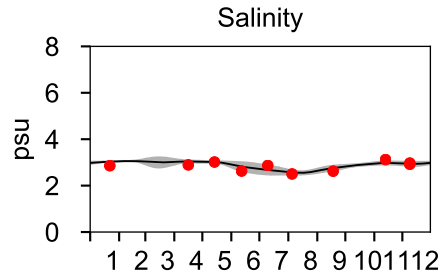
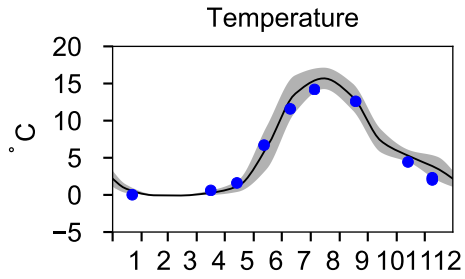
STATION B7 SURFACE WATER (0-10 m)



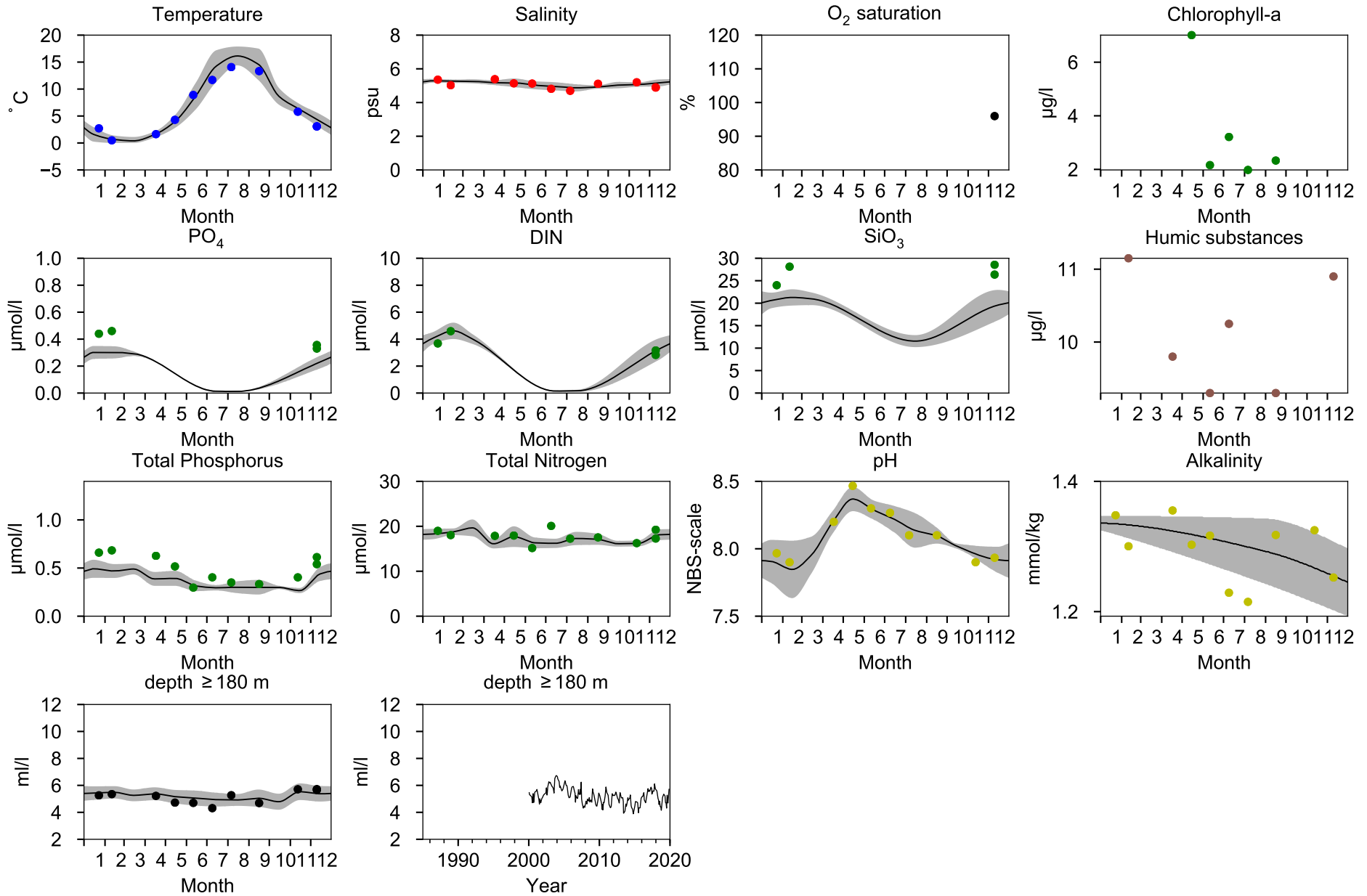
STATION F9 / A13 SURFACE WATER (0-10 m)



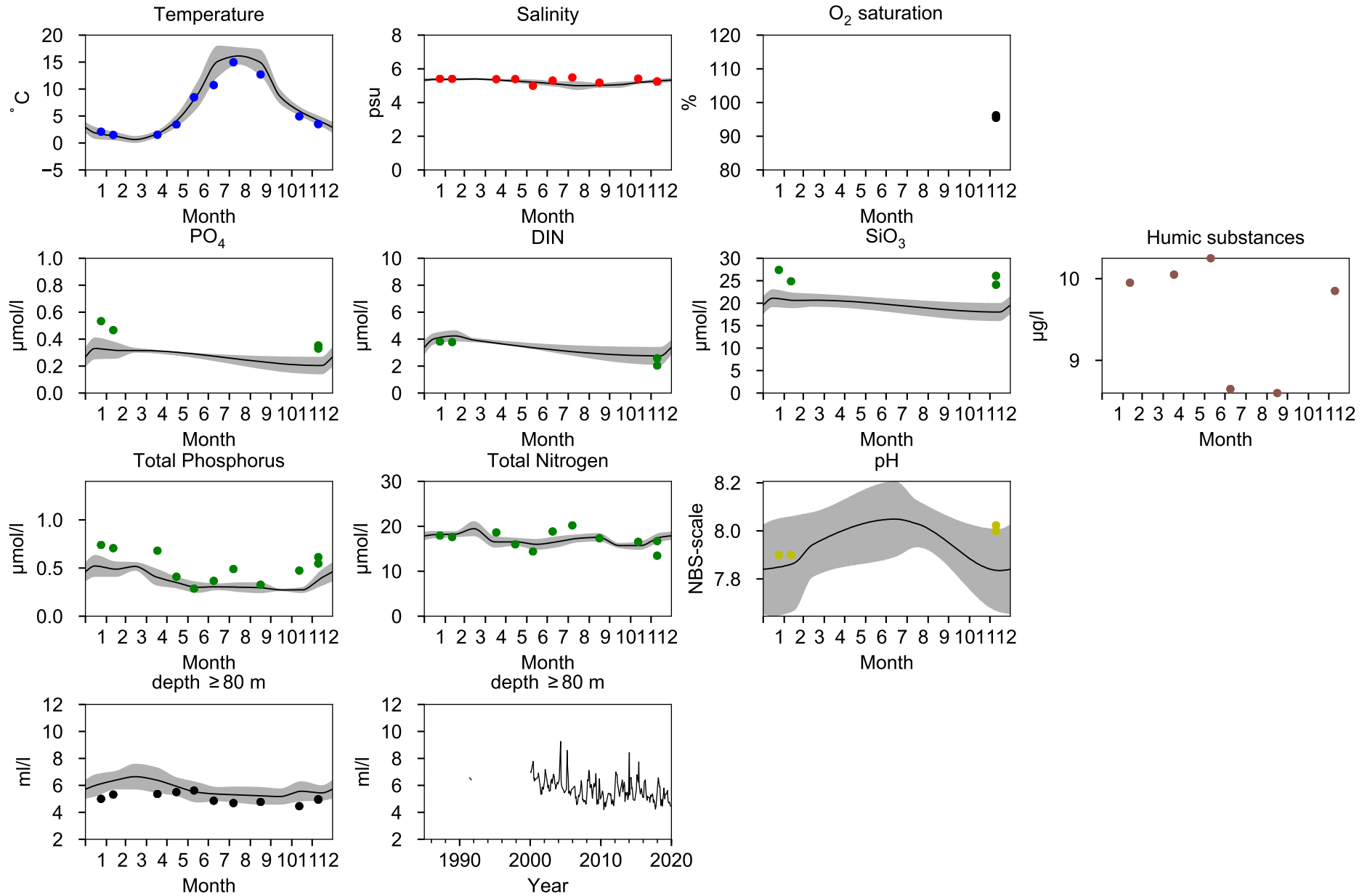
STATION F3 / A5 SURFACE WATER (0-10 m)



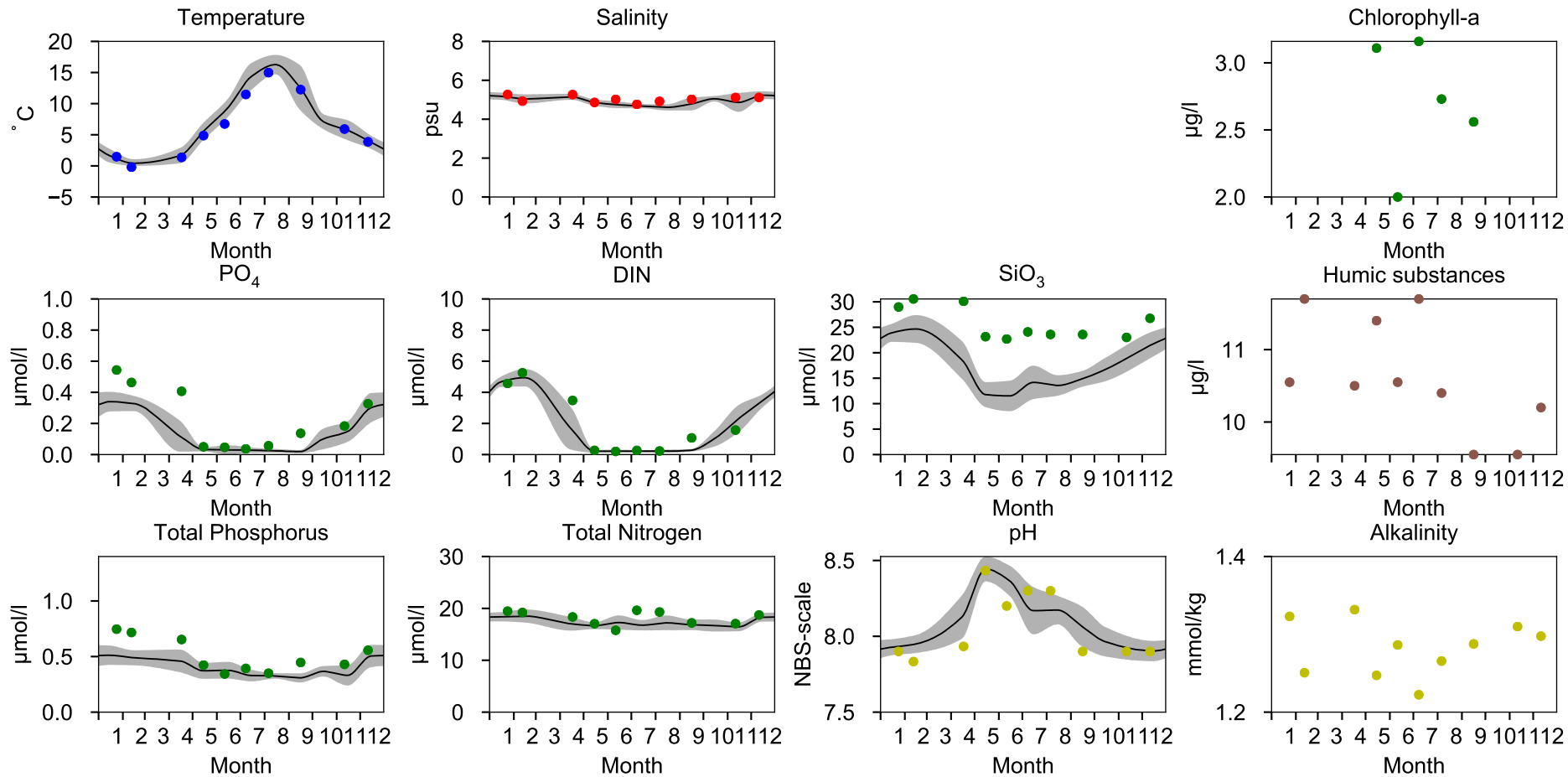
STATION C3 SURFACE WATER (0-10 m)



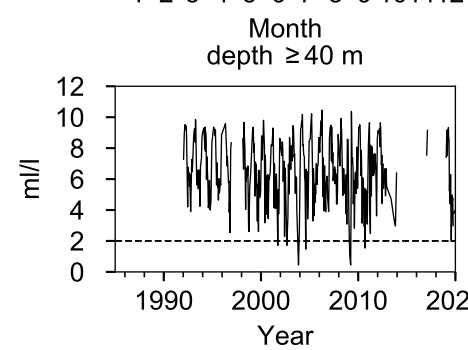
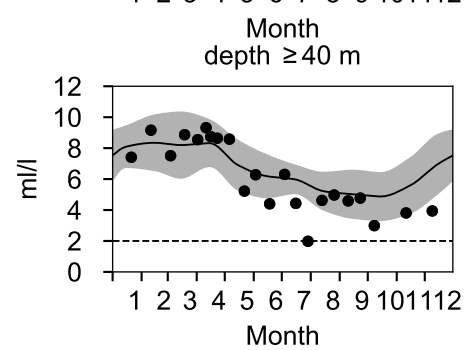
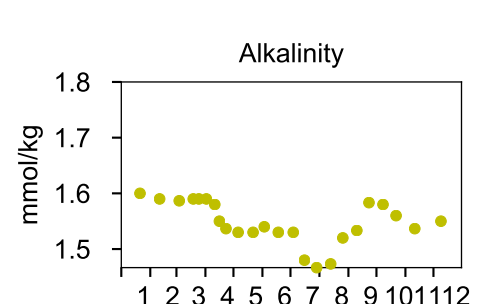
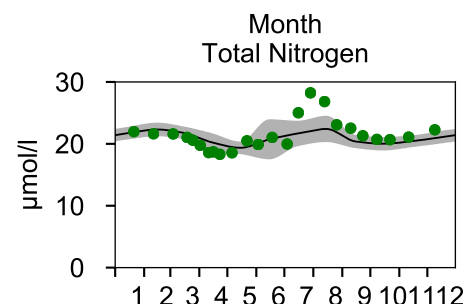
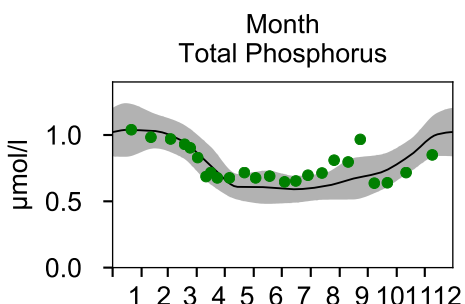
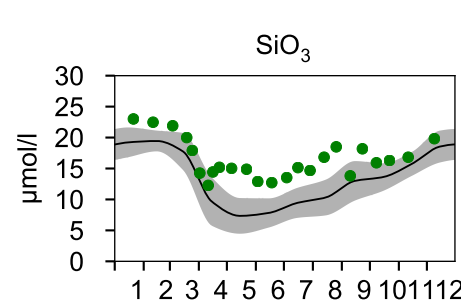
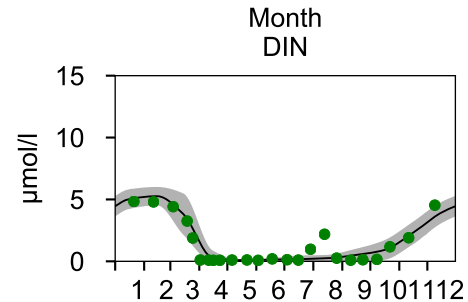
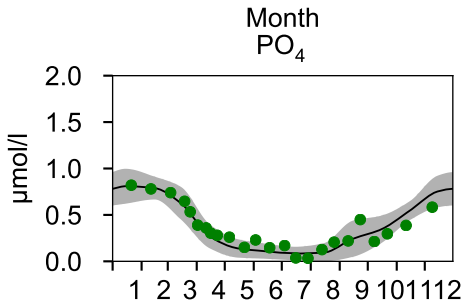
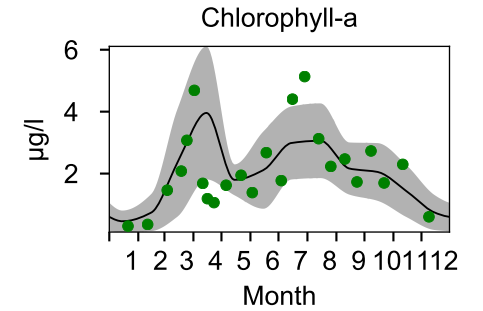
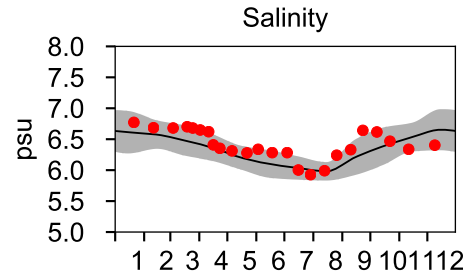
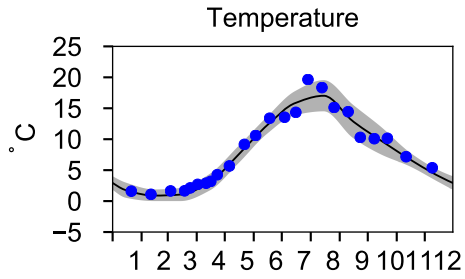
STATION MS4 / C14 SURFACE WATER (0-10 m)



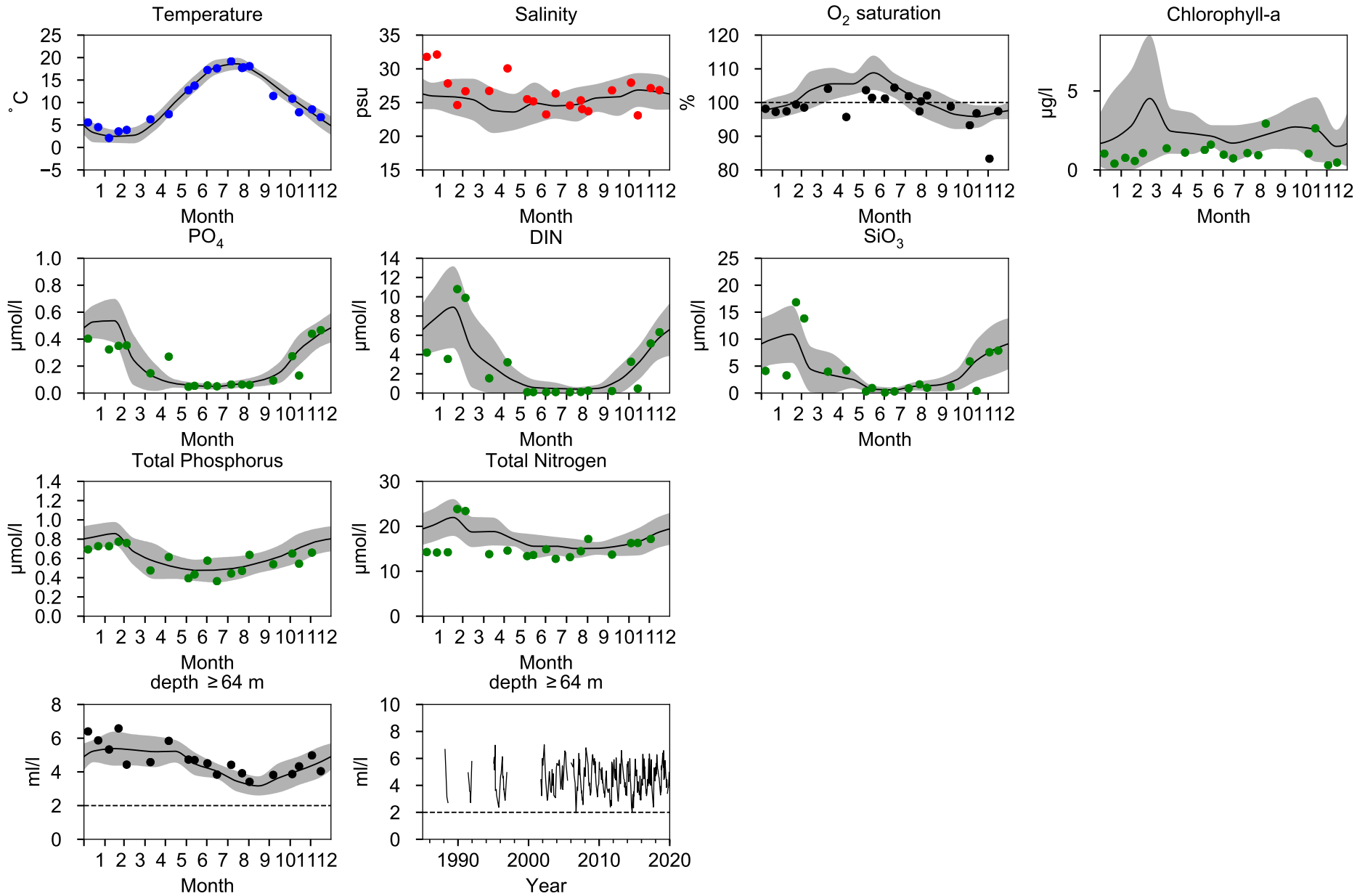
STATION GAVIK-1 SURFACE WATER (0-10 m)



STATION B1 SURFACE WATER (0-10 m)



STATION SLÄGGÖ SURFACE WATER (0-10 m)

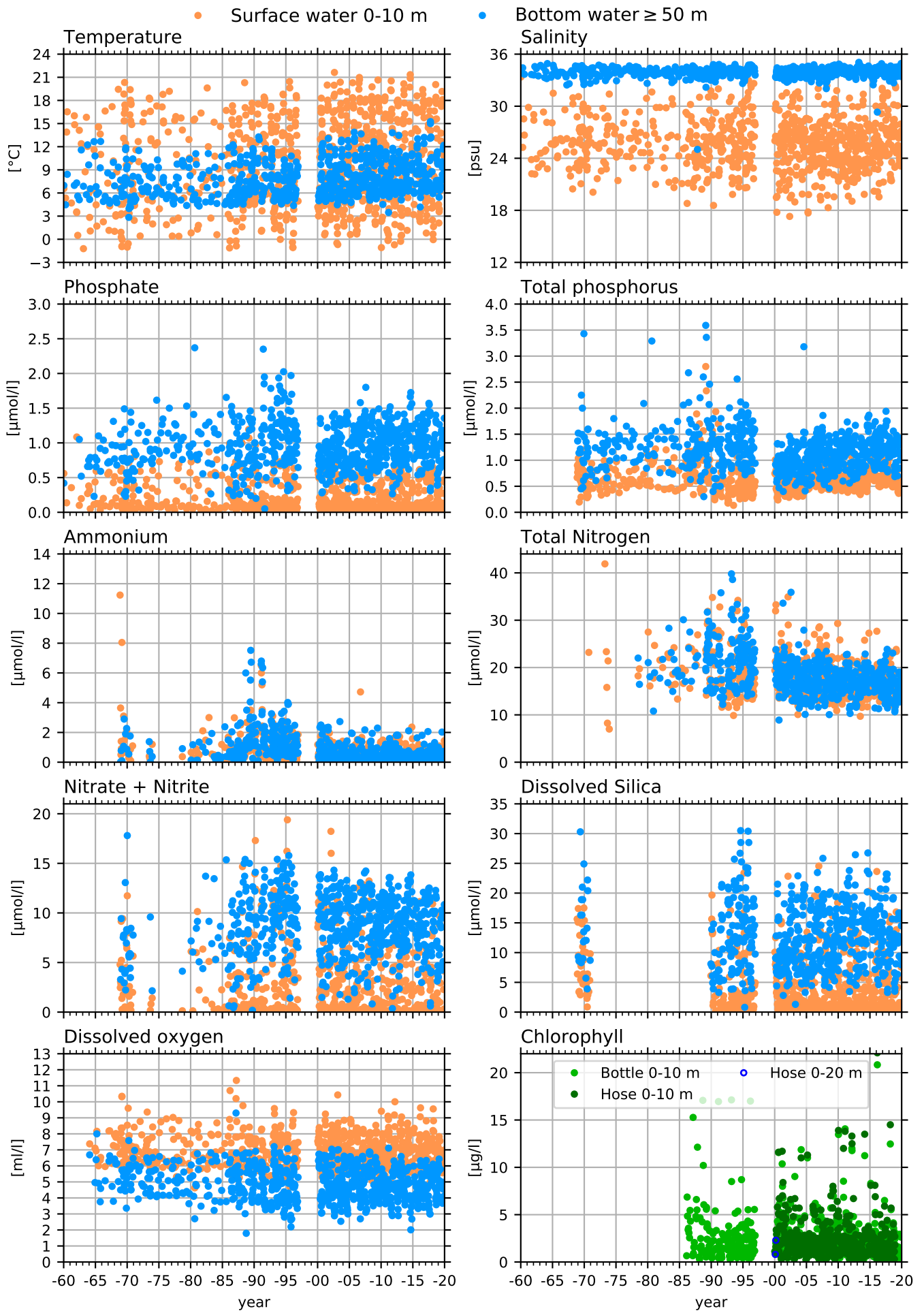


Appendix II

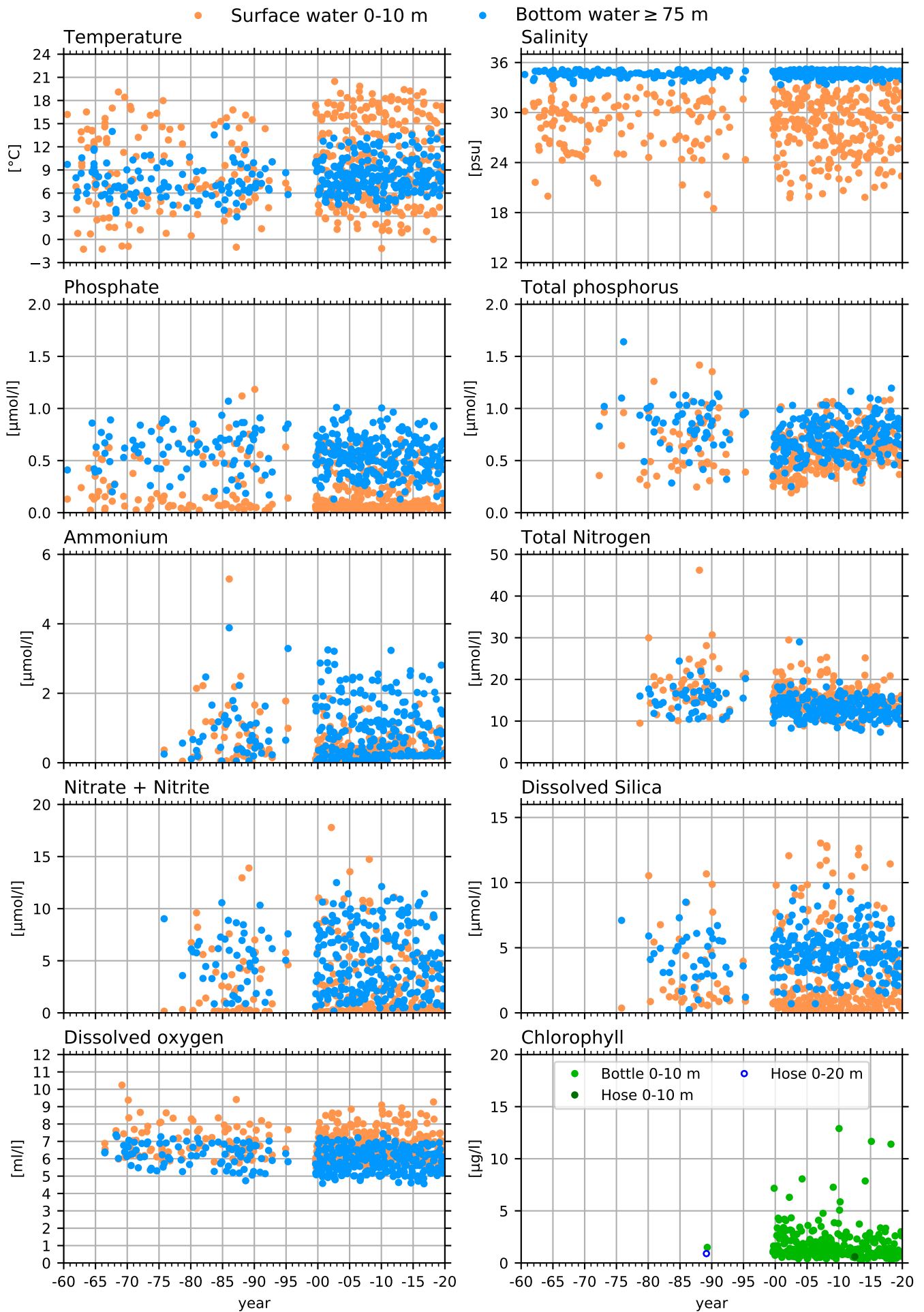
Time series (1960-2019) of surface water (0-10 m) and bottom water (station specific) for all monthly and high frequency stations sampled in 2019.

Included parameters are salinity, temperature, dissolved oxygen (including hydrogen sulphide as negative oxygen), dissolved inorganic phosphorus (DIP), total phosphorus, ammonium, sum of nitrate and nitrite, total nitrogen, dissolved silica and chlorophyll (hose sampling and mean from discrete depth 0-10 m). The station BCS III-10 was temporarily moved north-east of its correct position in 2017, this data is presented together with the BCS III-10 time series.

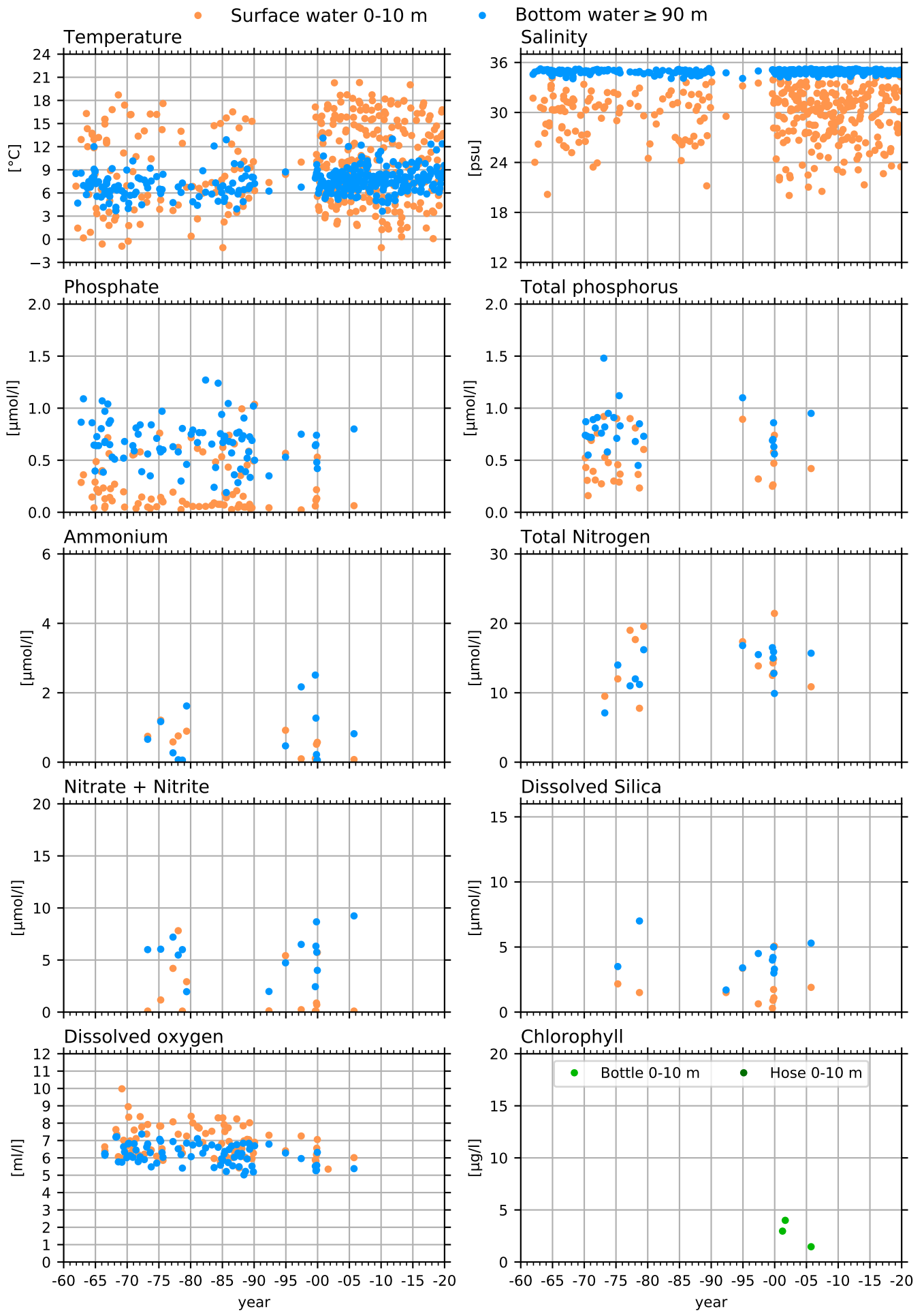
SLÄGGÖ, SKAGERACK COASTAL



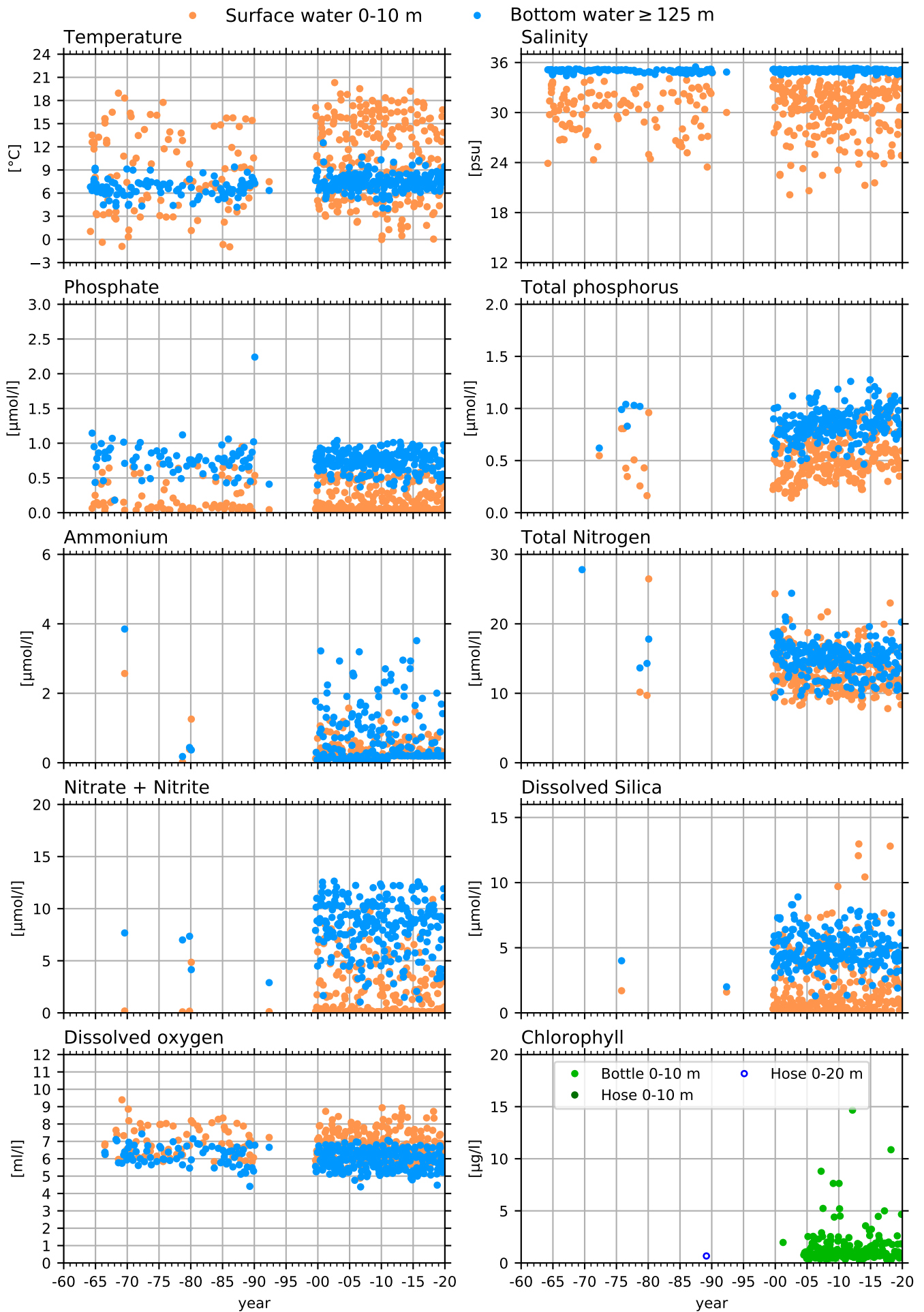
Å13, SKAGERACK



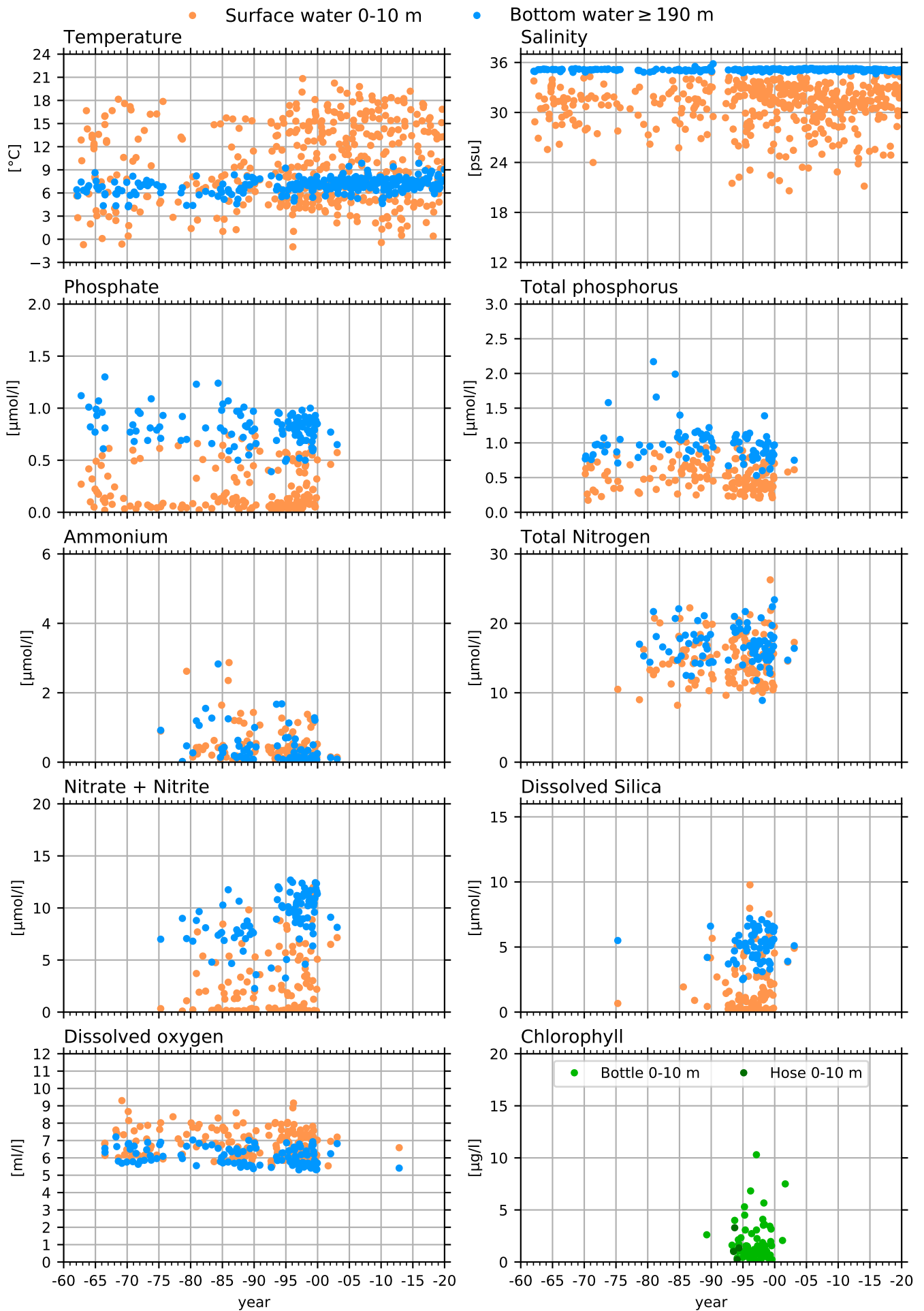
Å14, SKAGERACK



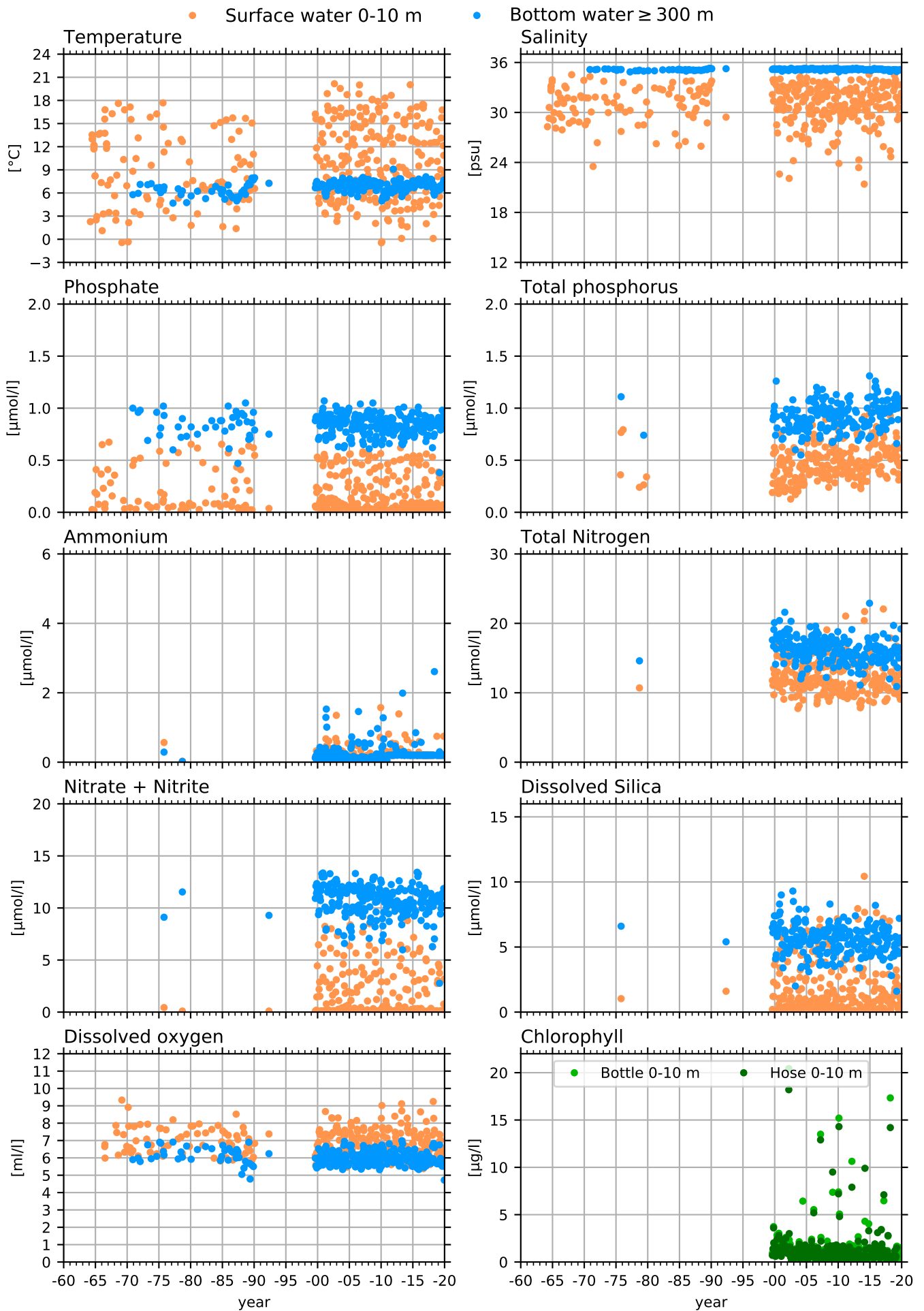
Å15, SKAGERACK



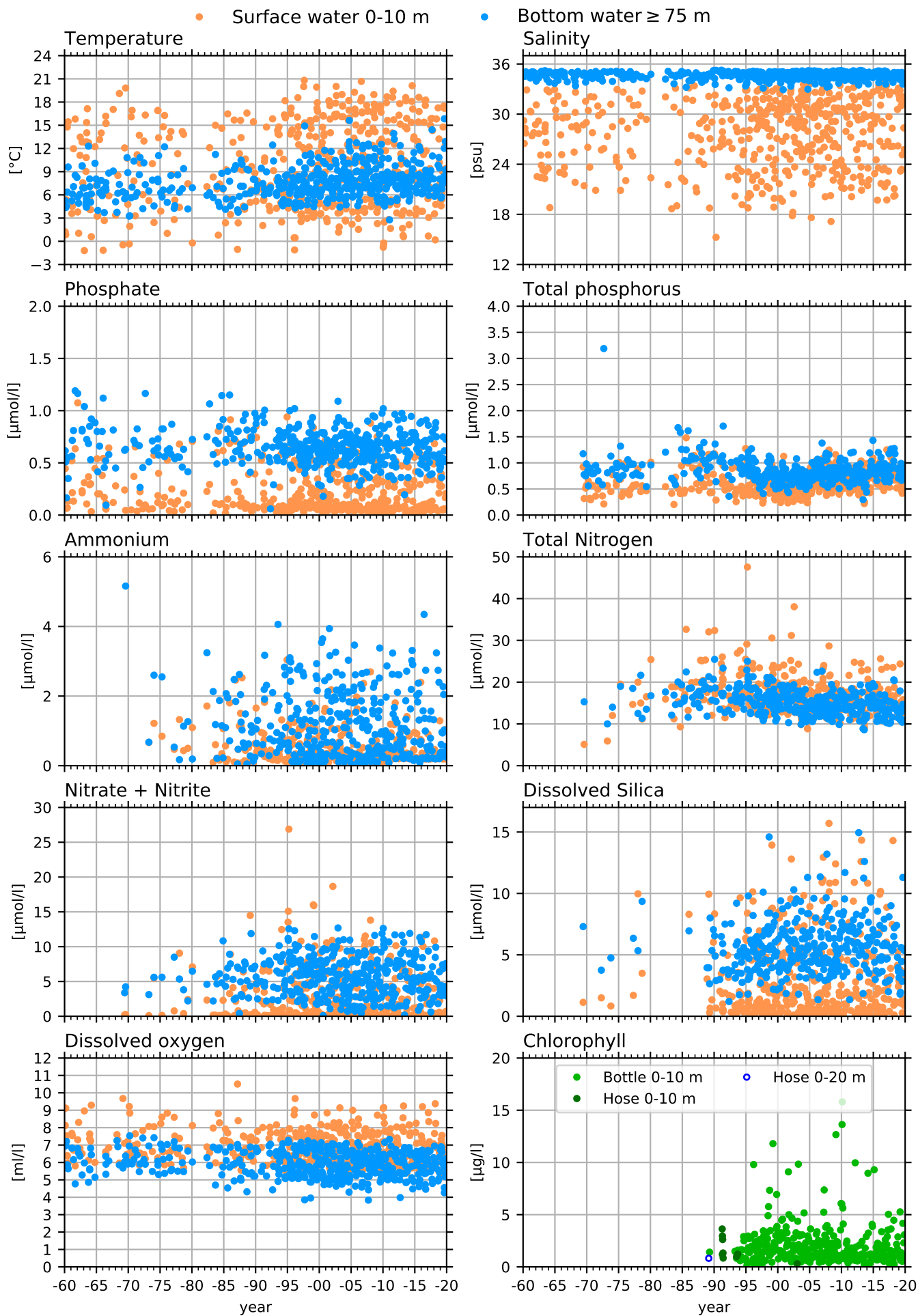
Å16, SKAGERACK



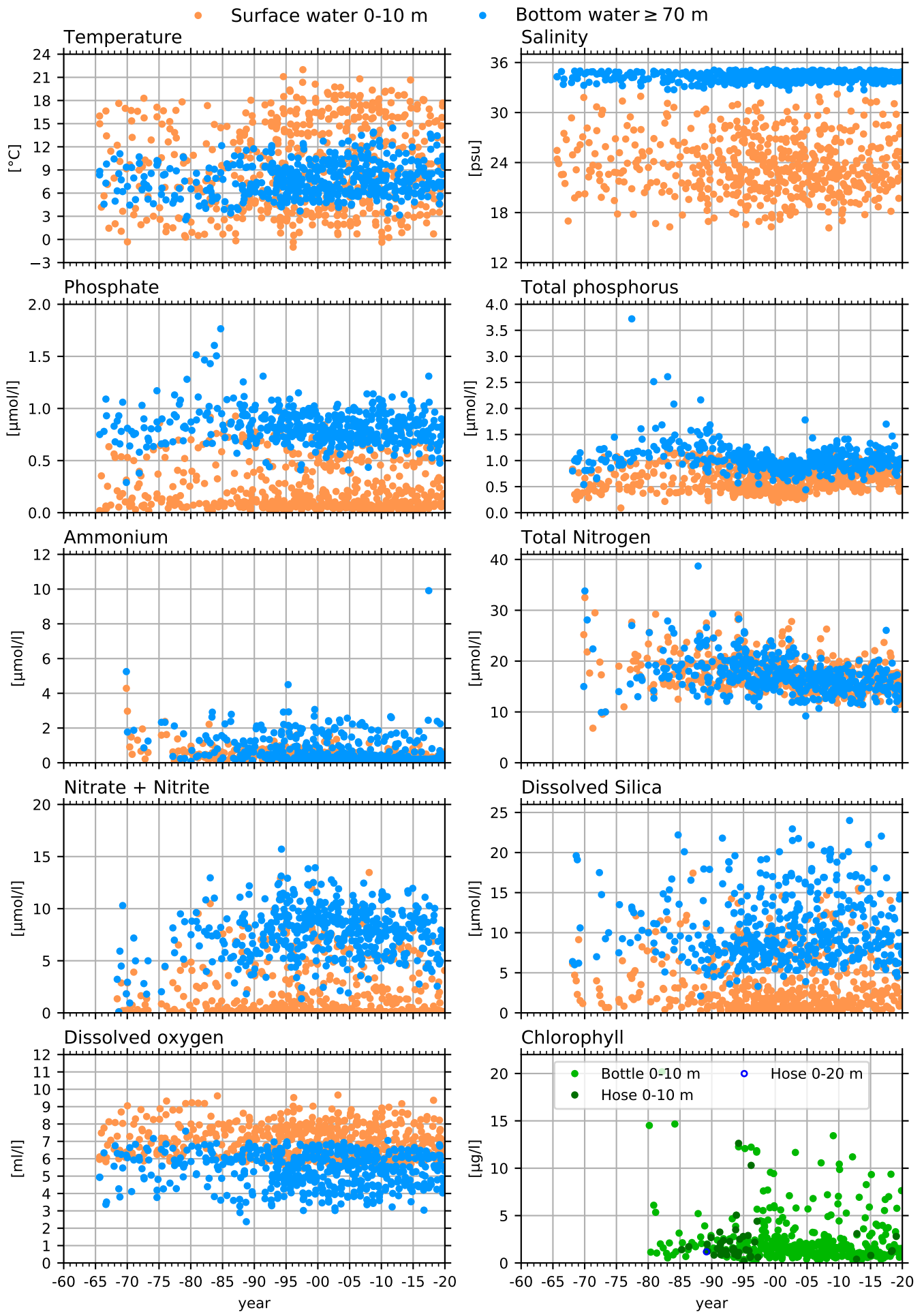
Å17, SKAGERACK



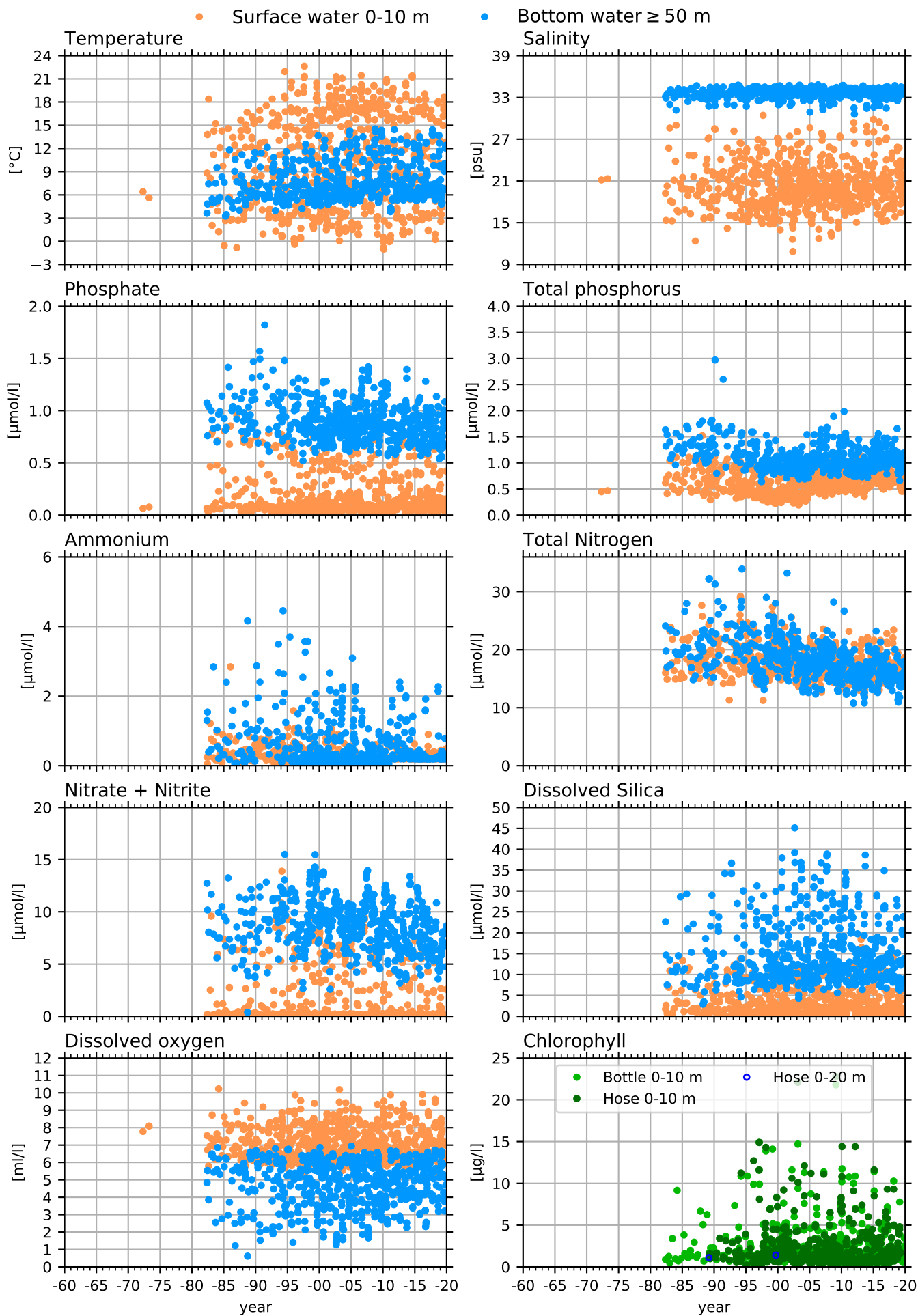
P2, SKAGERACK



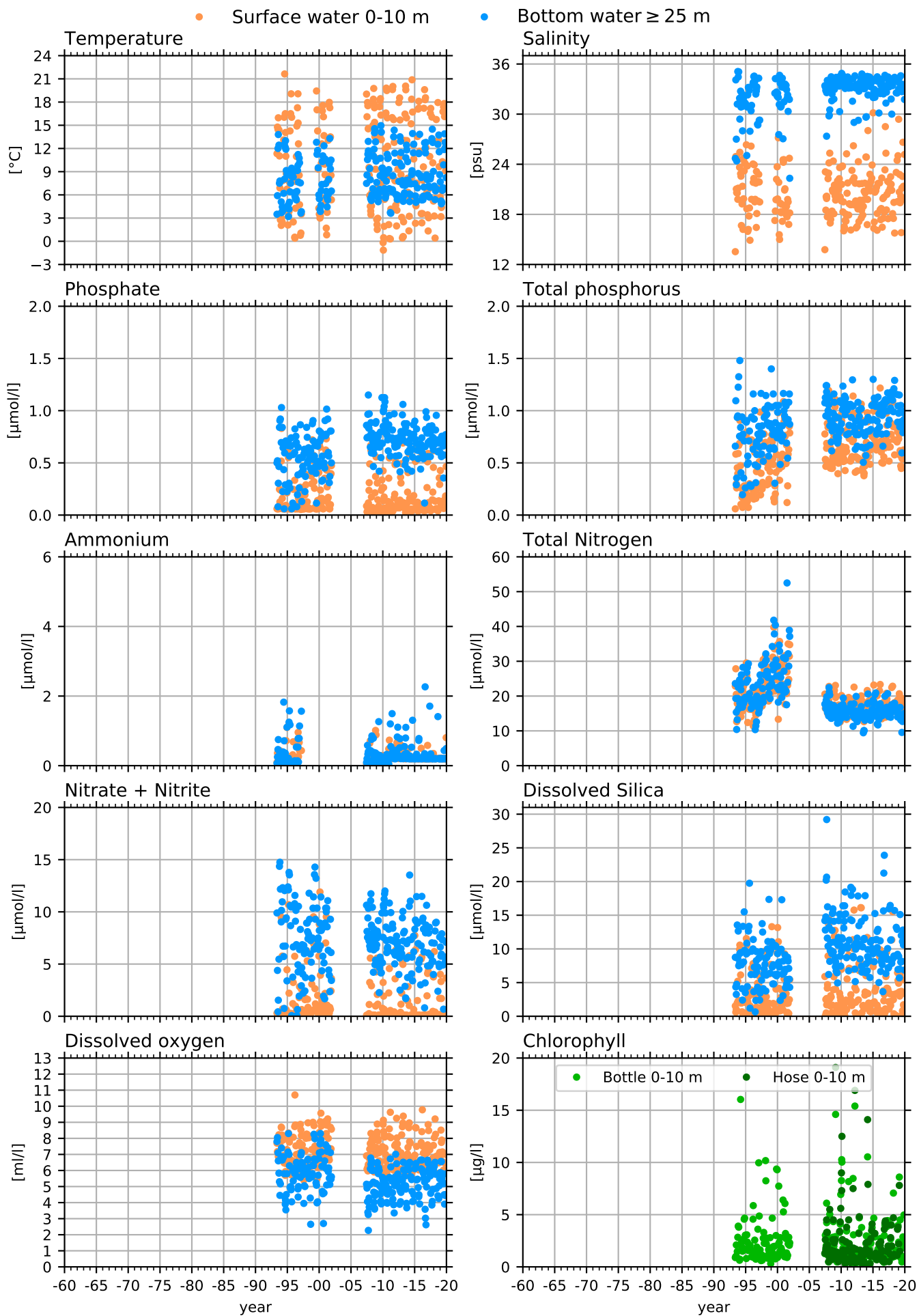
FLADEN, KATTEGAT



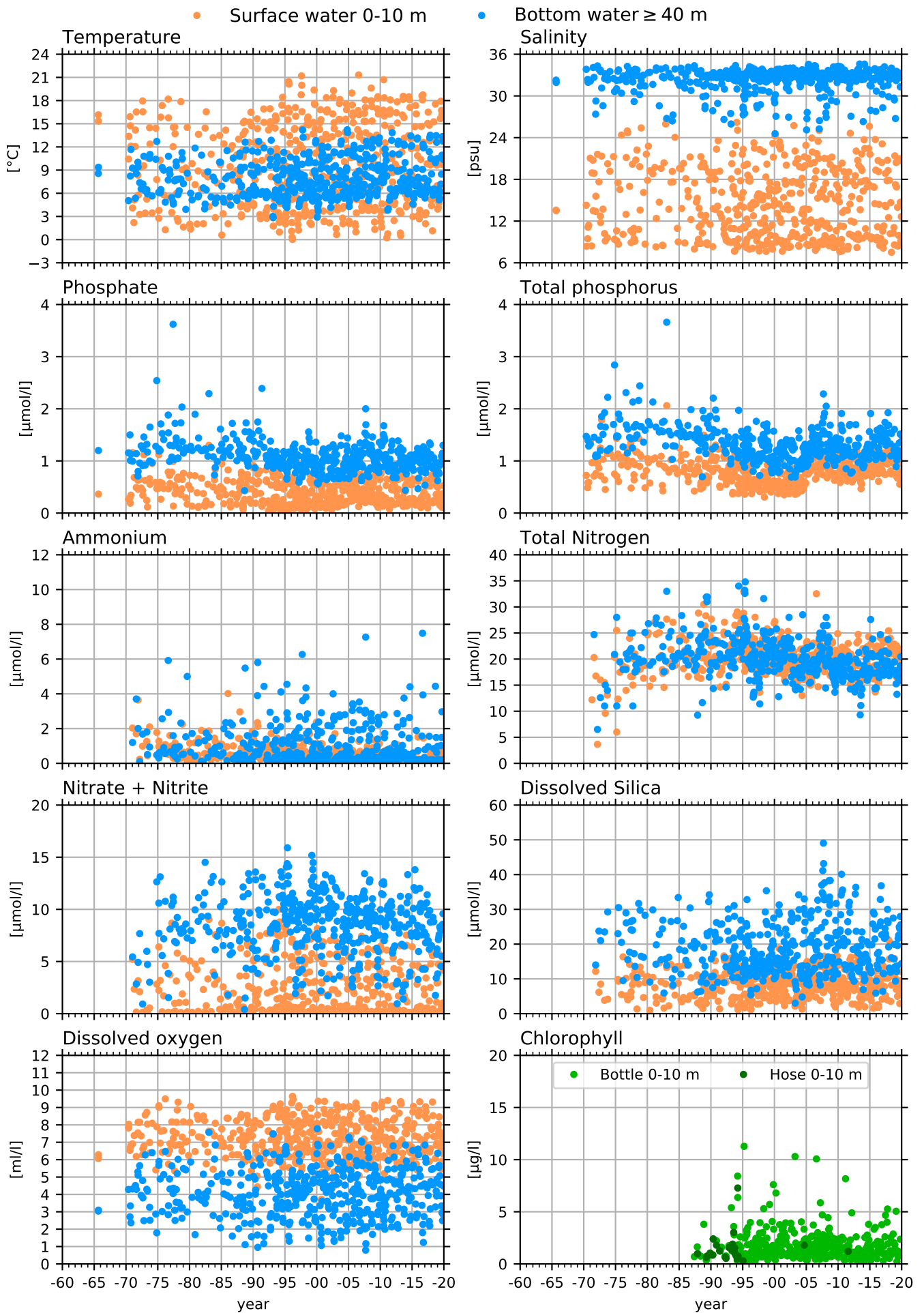
ANHOLT E, KATTEGAT



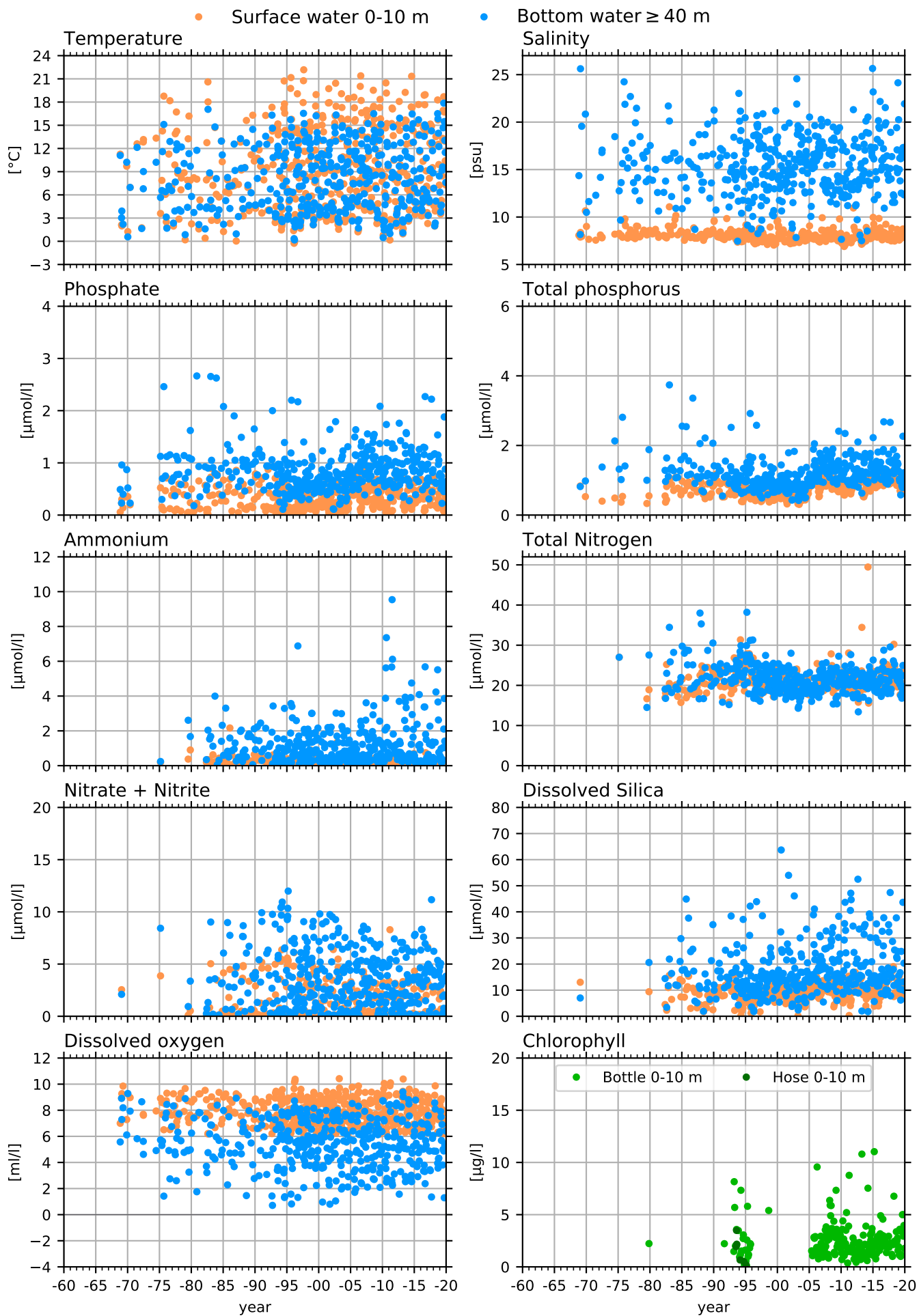
N14 FALKENBERG, KATTEGAT COASTAL



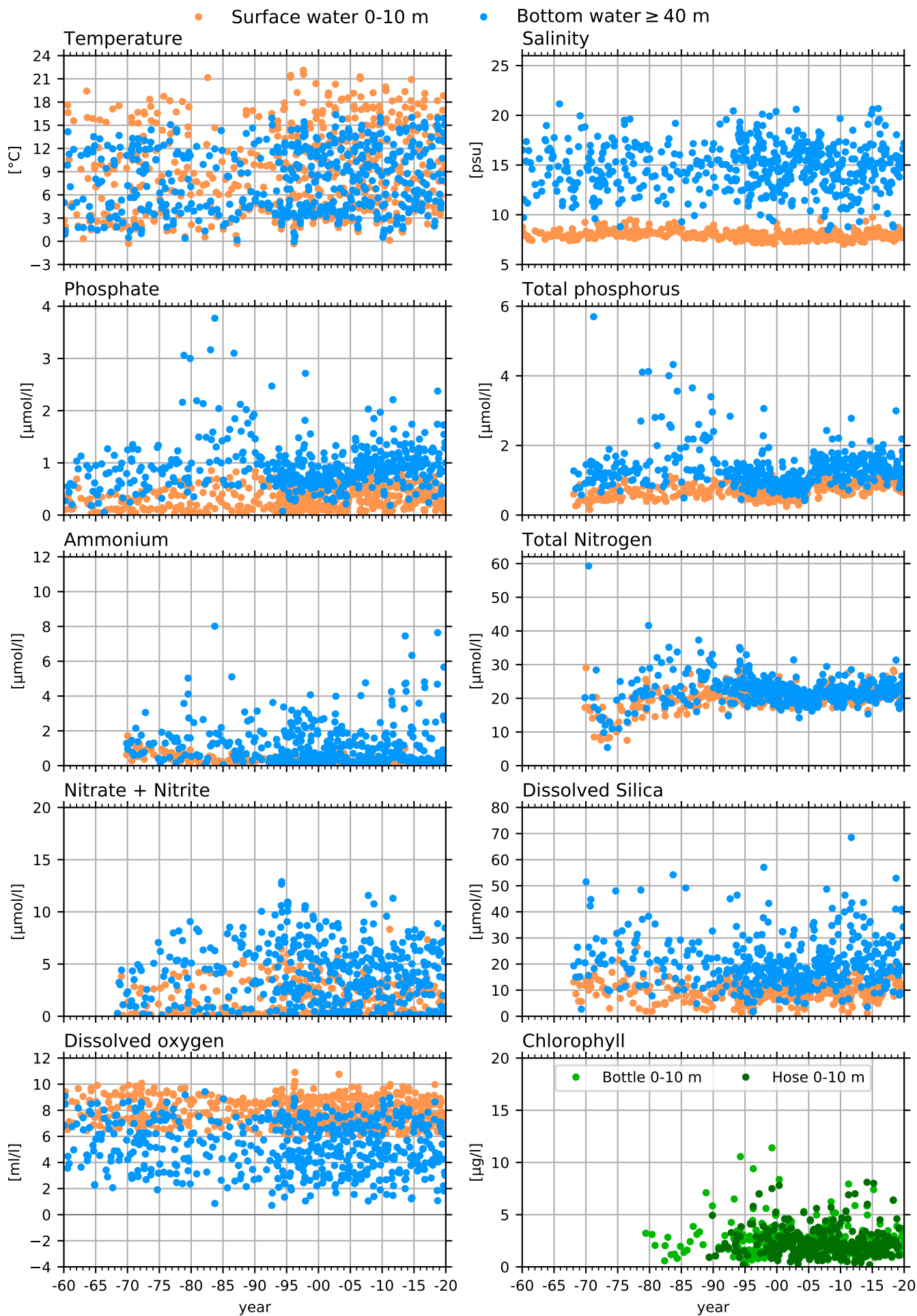
W LANDSKRONA, THE SOUND



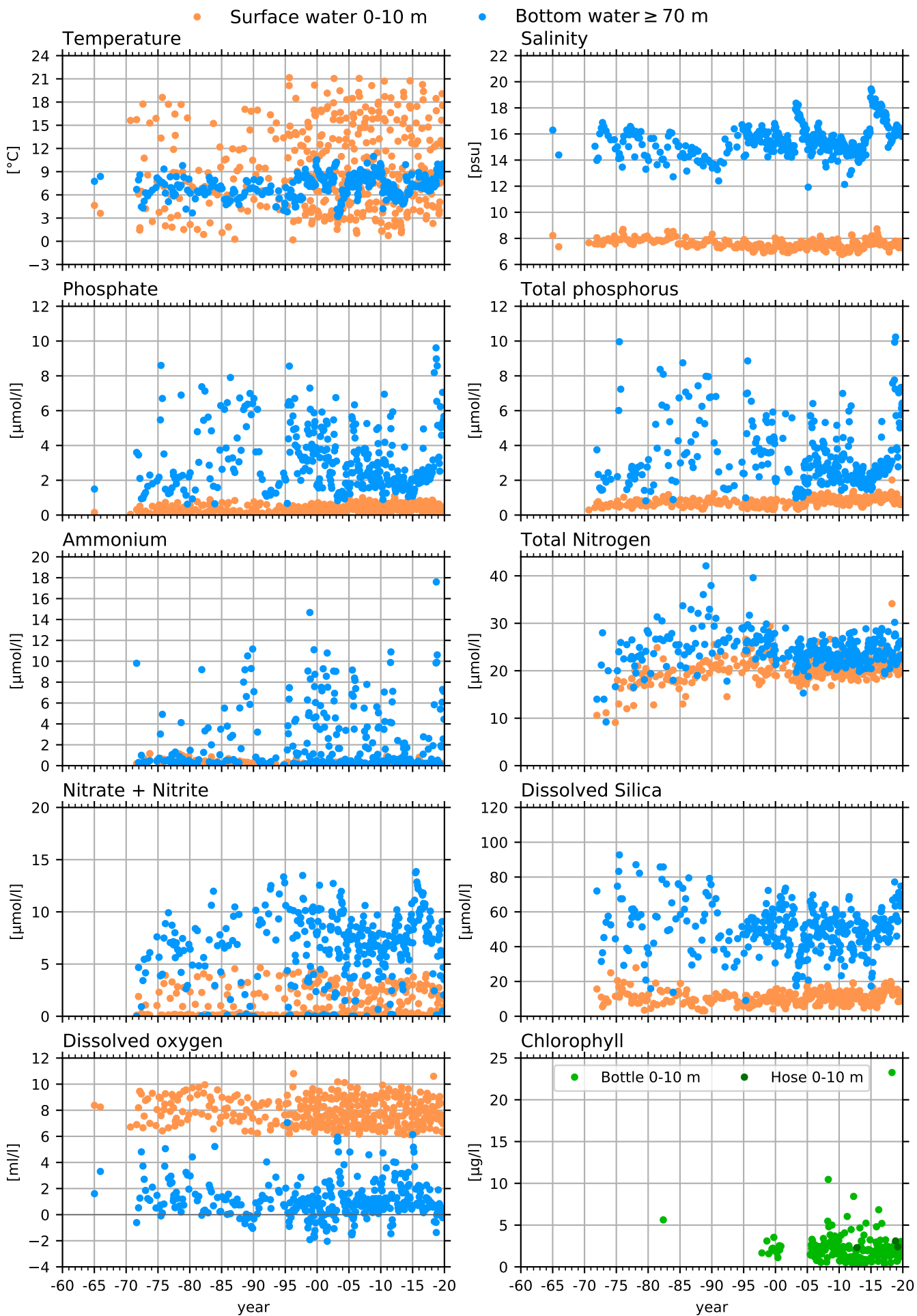
BY1, ARKONA



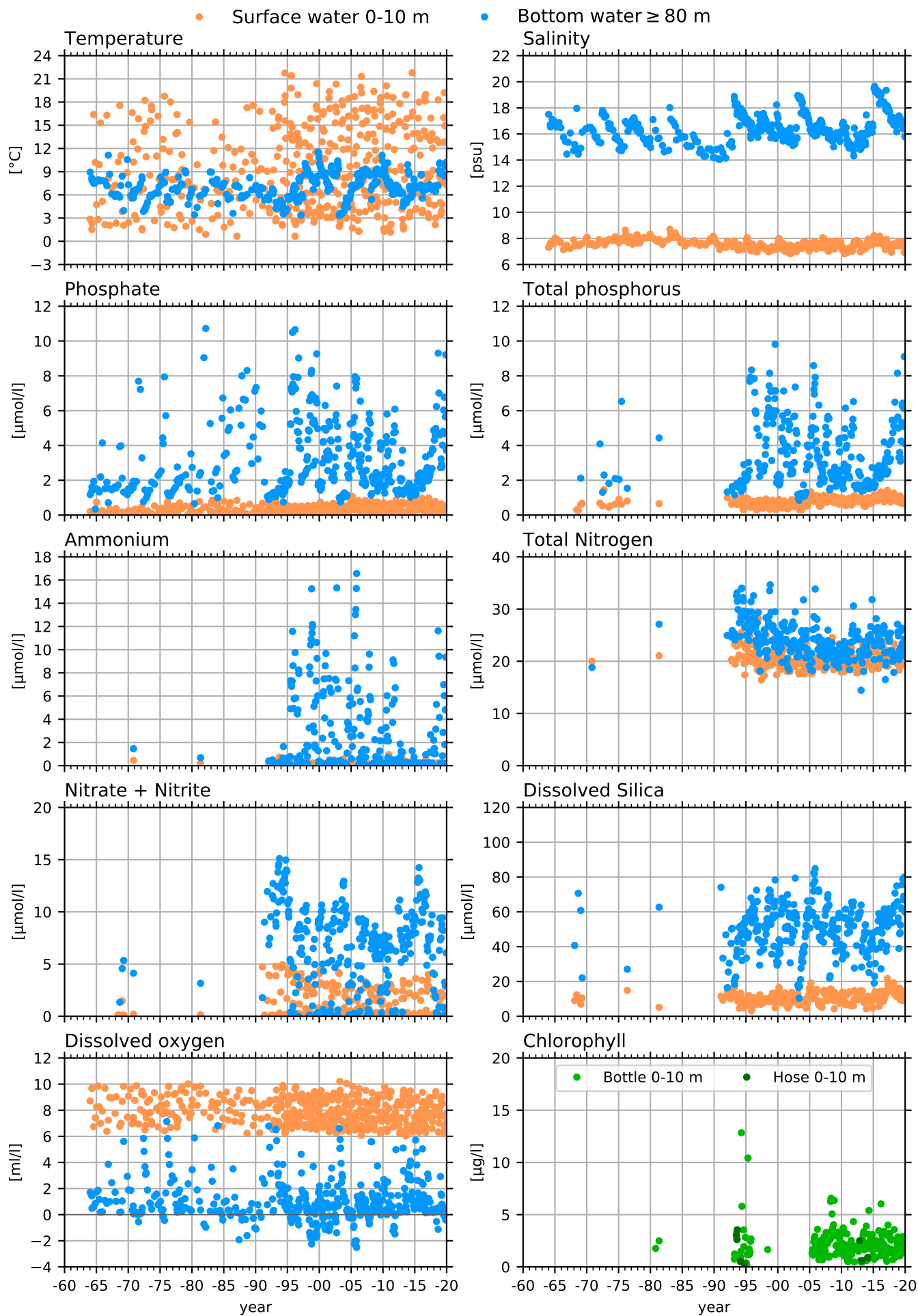
BY2 ARKONA, ARKONA



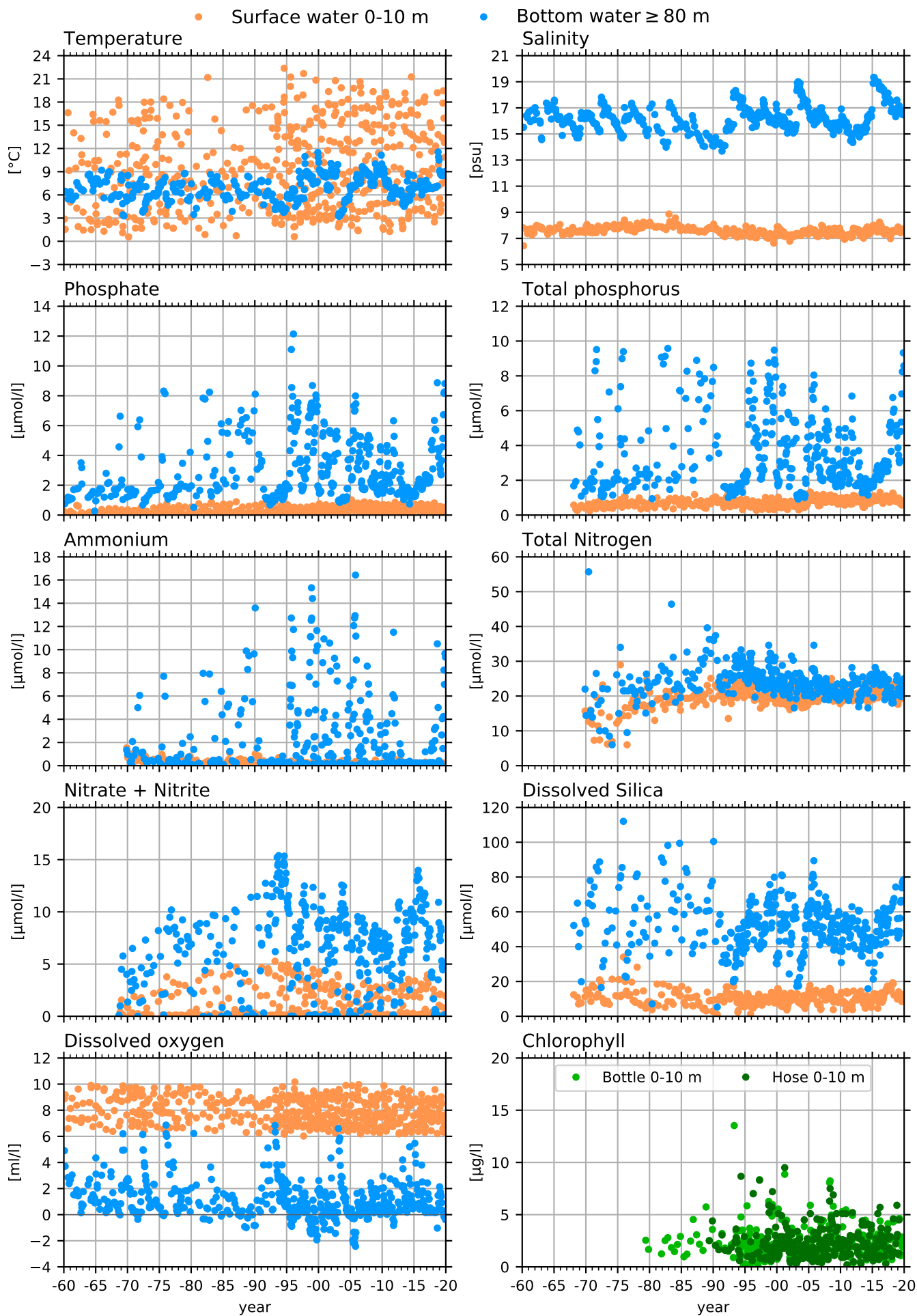
HANÖBUKTEN, BORNHOLM



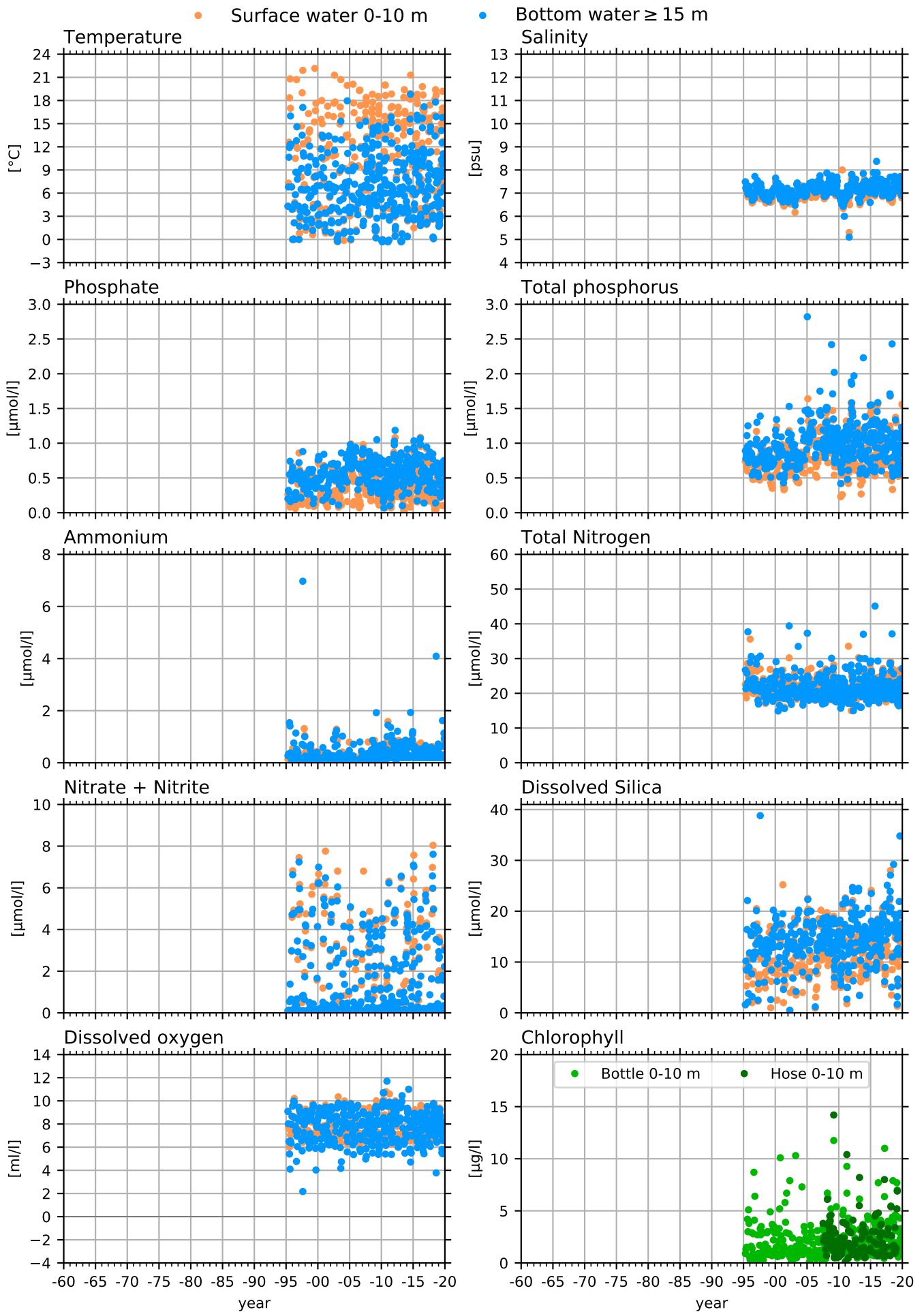
BY4 CHRISTIANSÖ, BORNHOLM



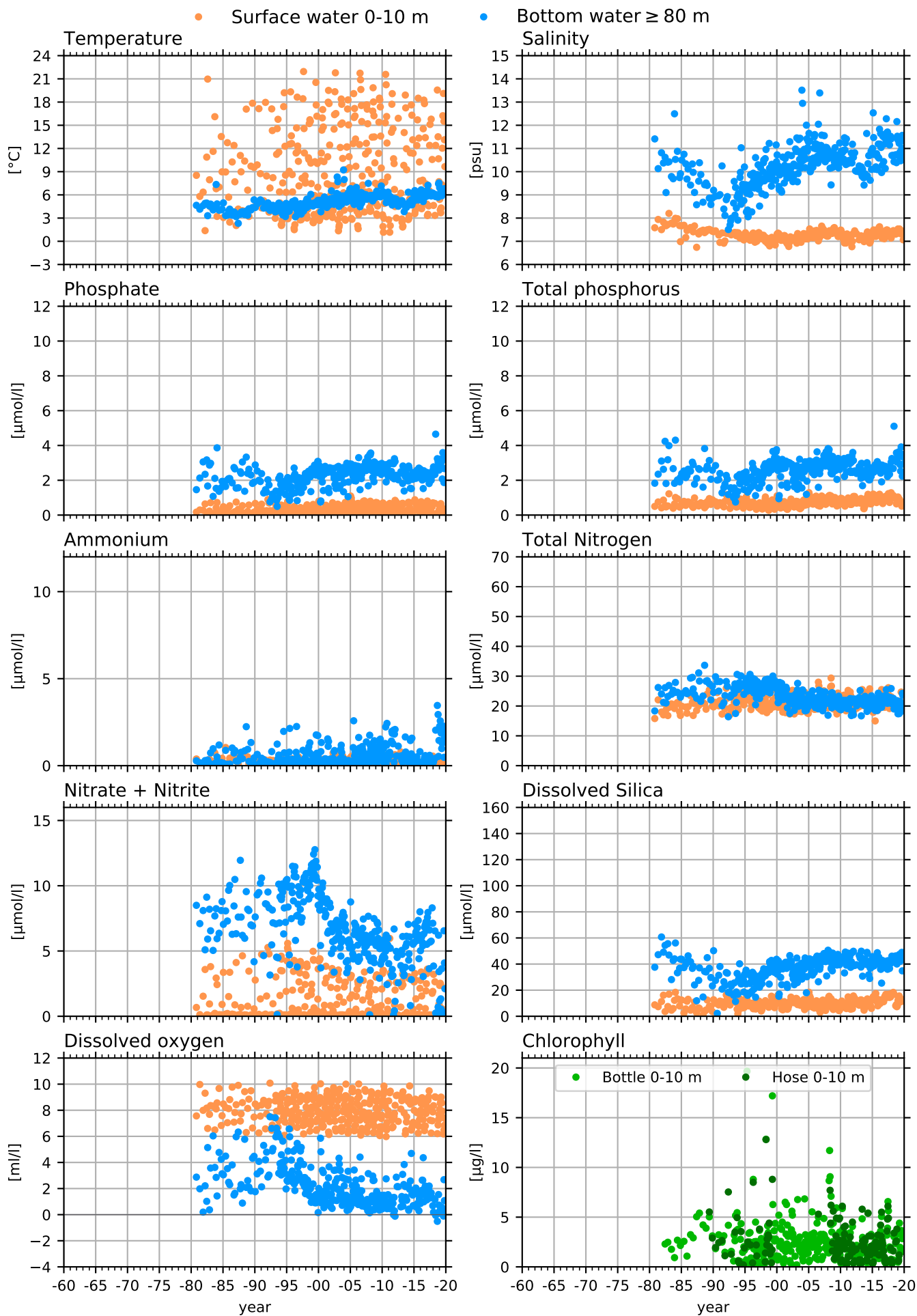
BY5 BORNHOLM DEEP, BORNHOLM



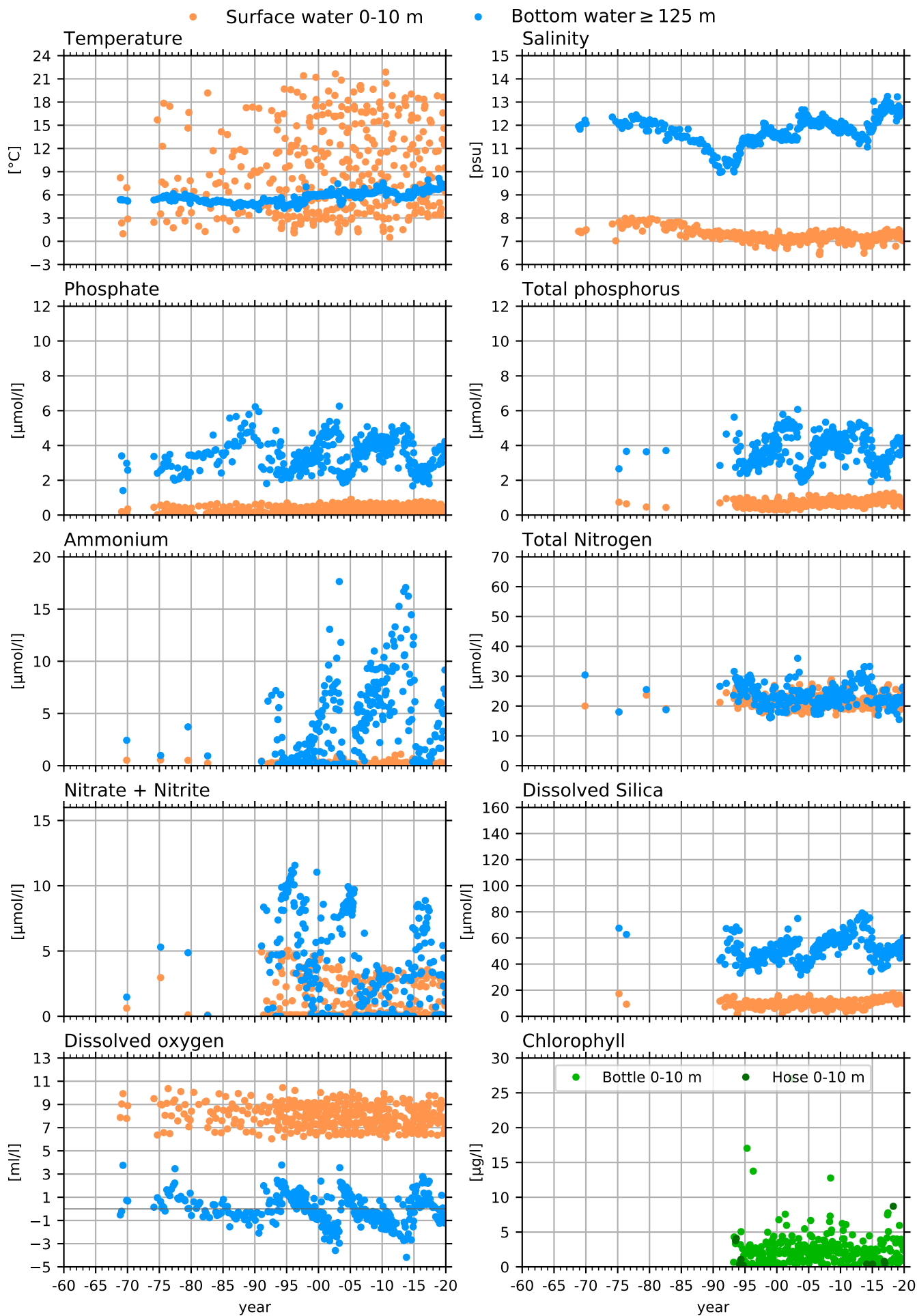
REF M1V1, BORNHOLM COASTAL



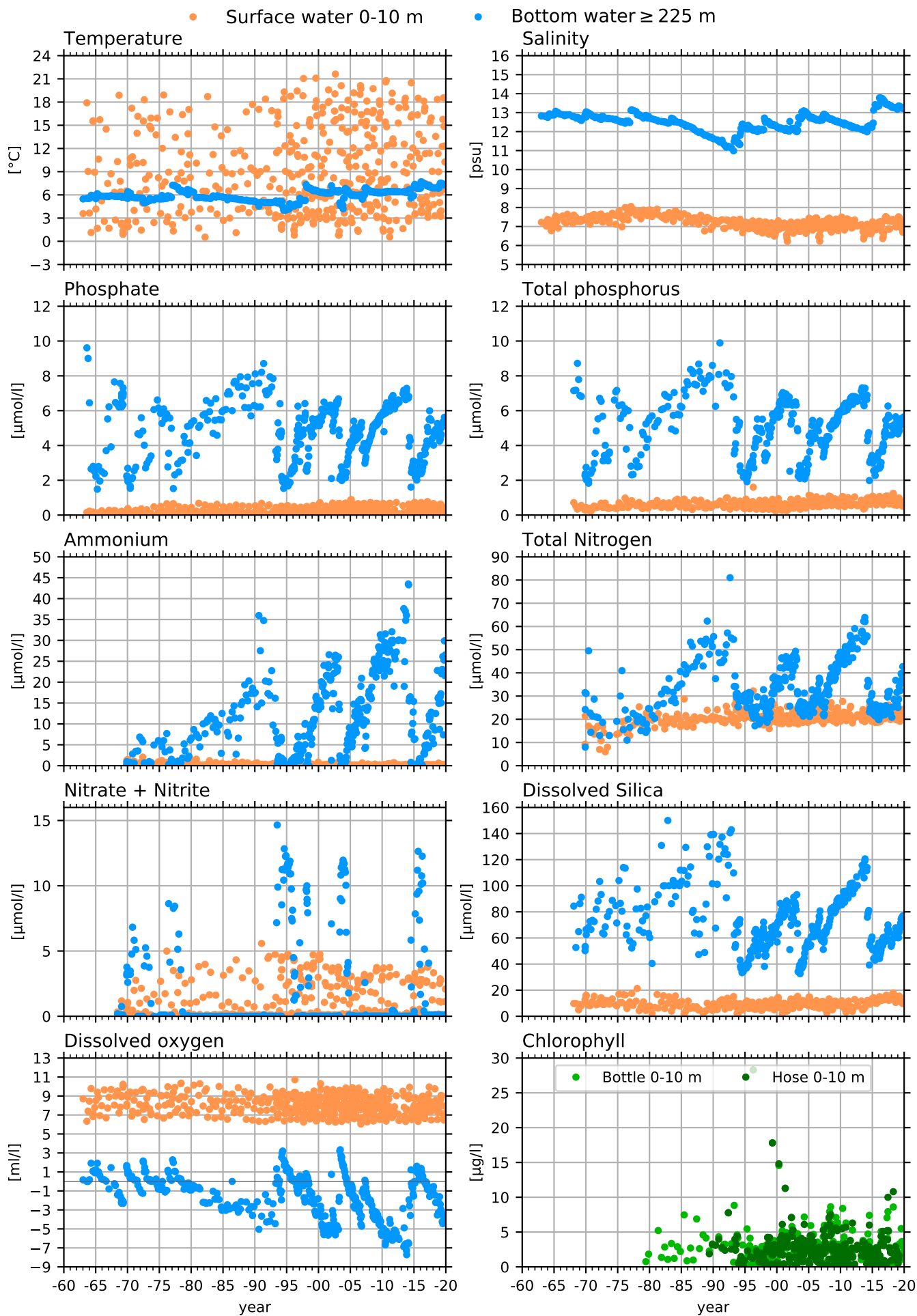
BCS III-10, EASTERN GOTLAND BASIN



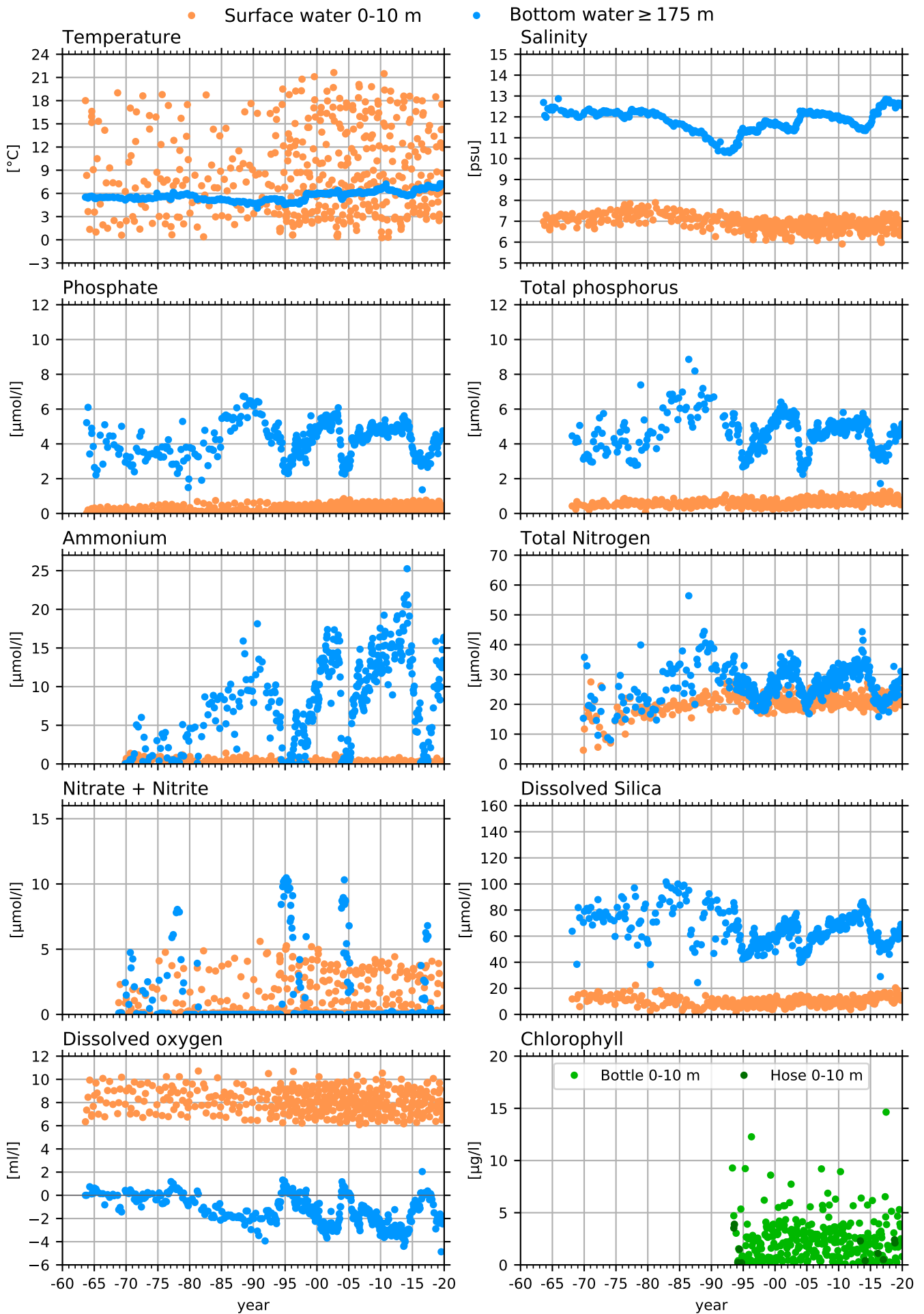
BY10, EASTERN GOTLAND BASIN



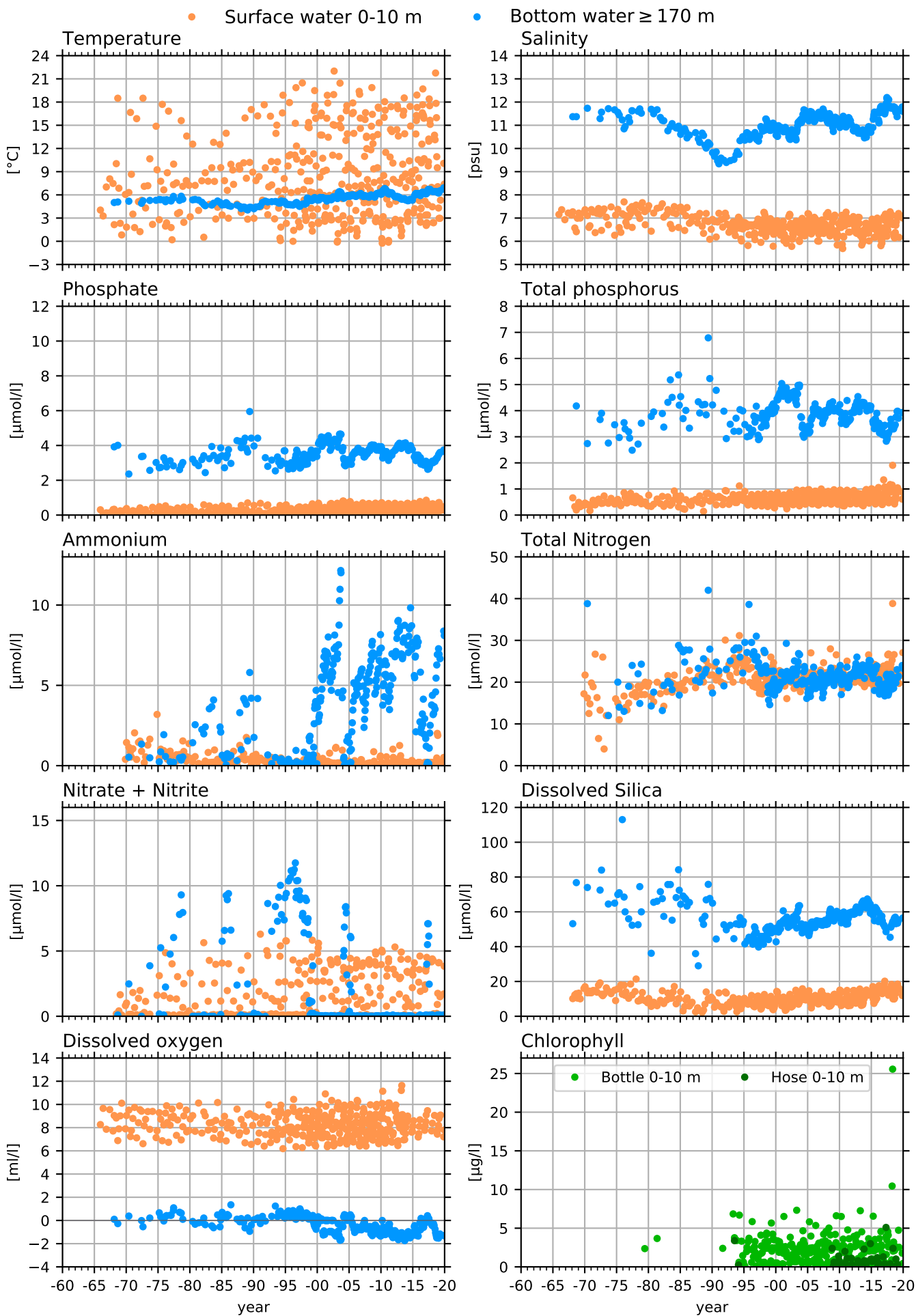
BY15 GOTLAND DEEP, EASTERN GOTLAND BASIN



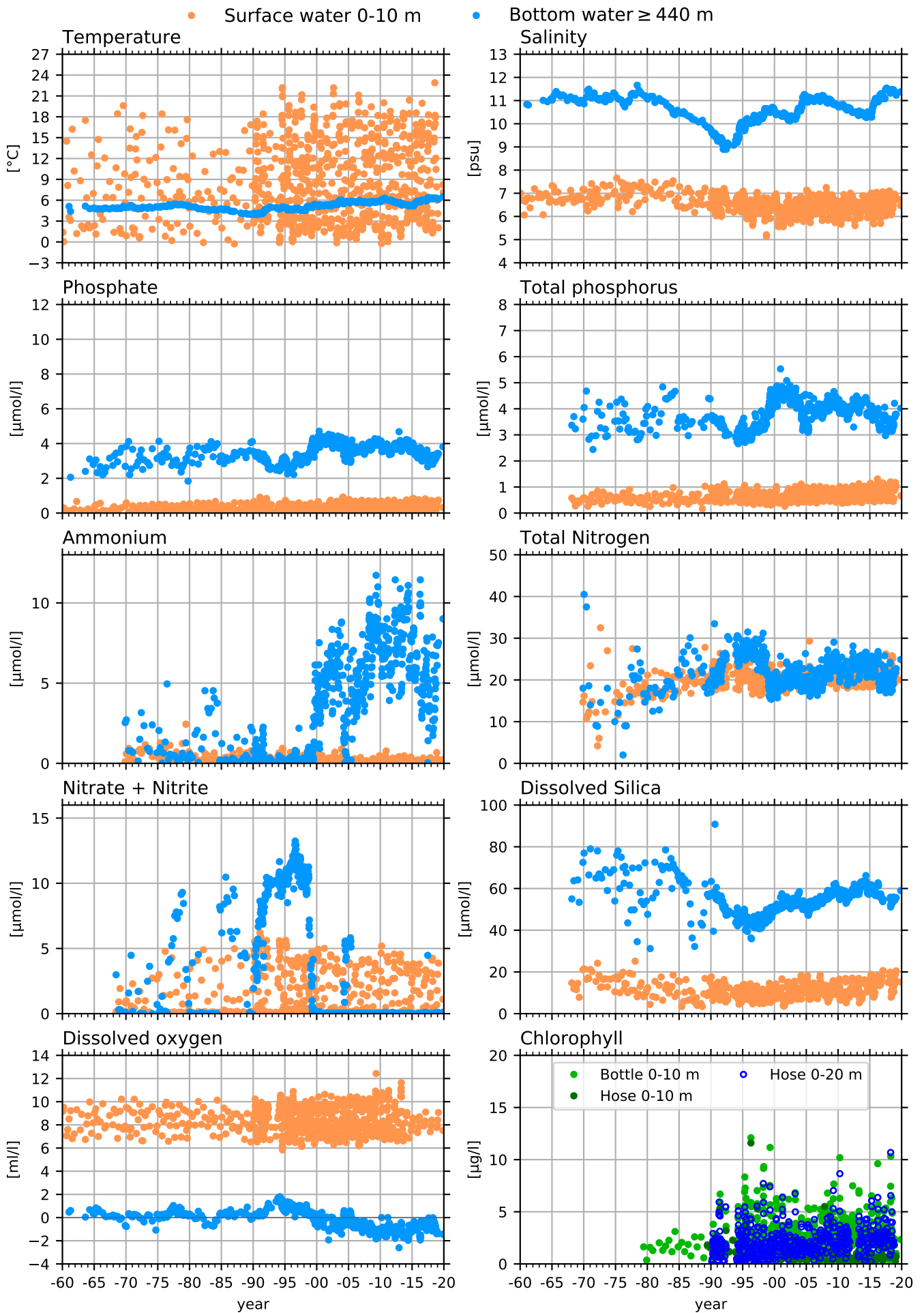
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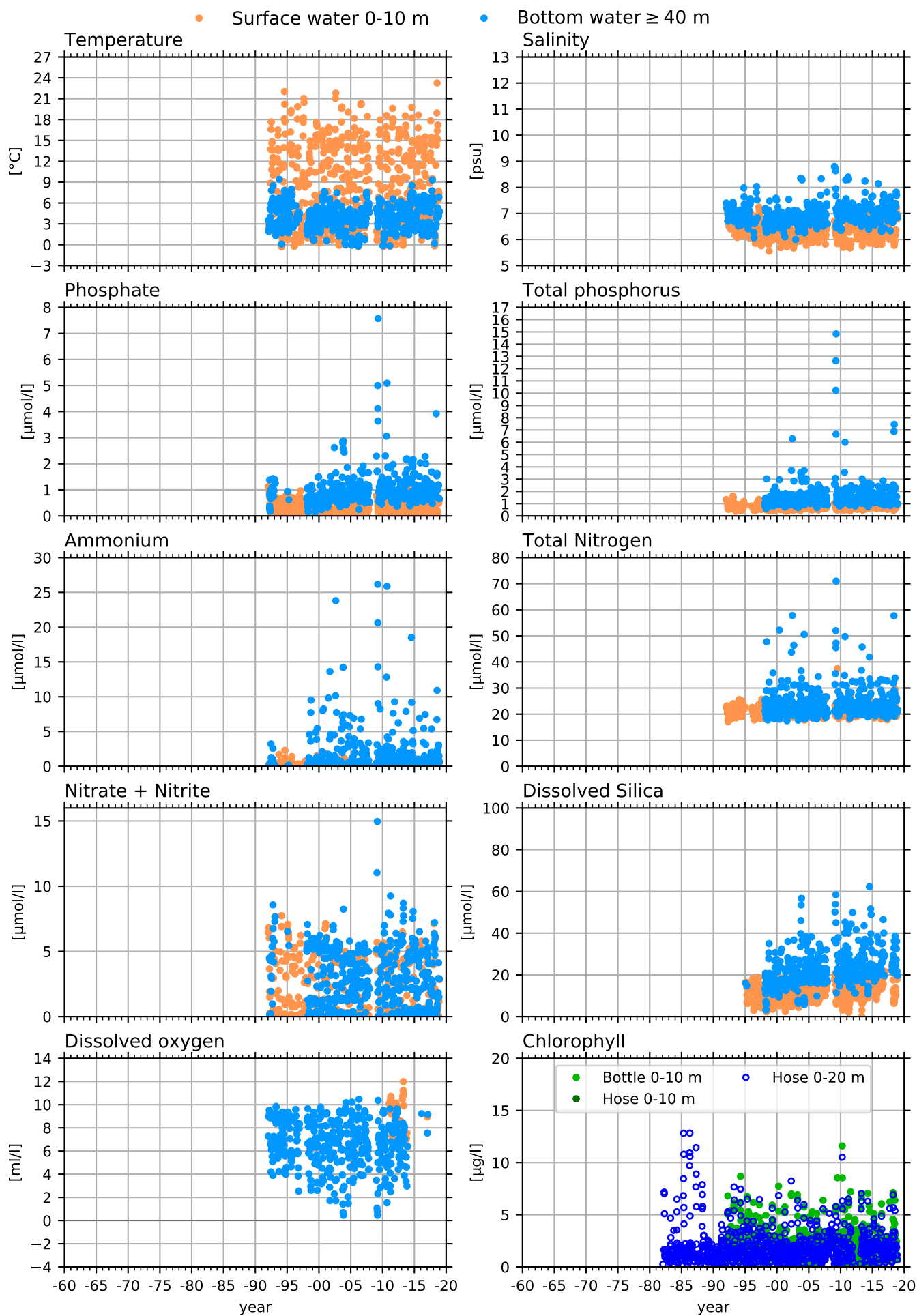
BY29 / LL19, NORTHERN BALTIC PROPER



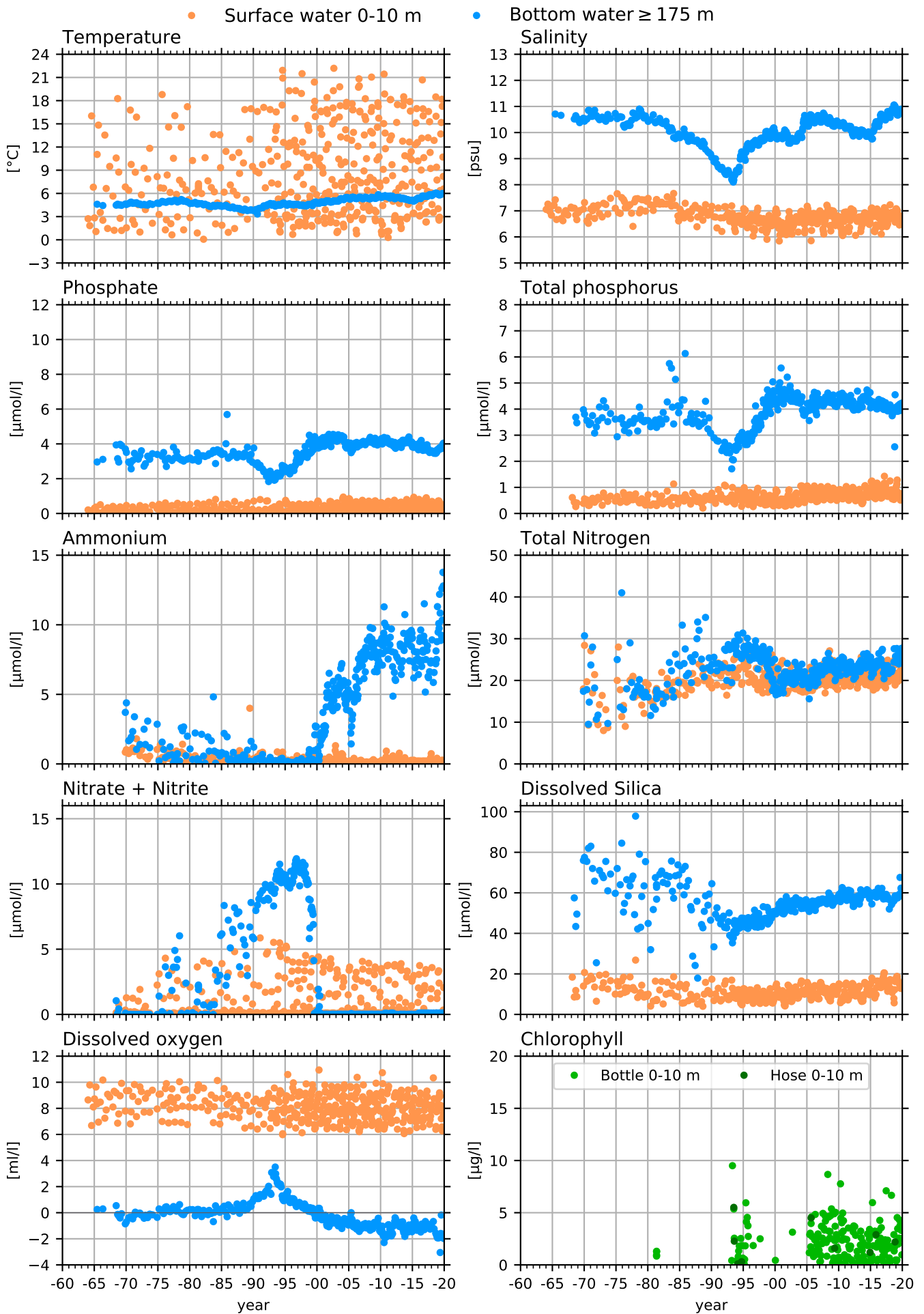
BY31 LANDSORT DEEP, WESTERN GOTLAND BASIN



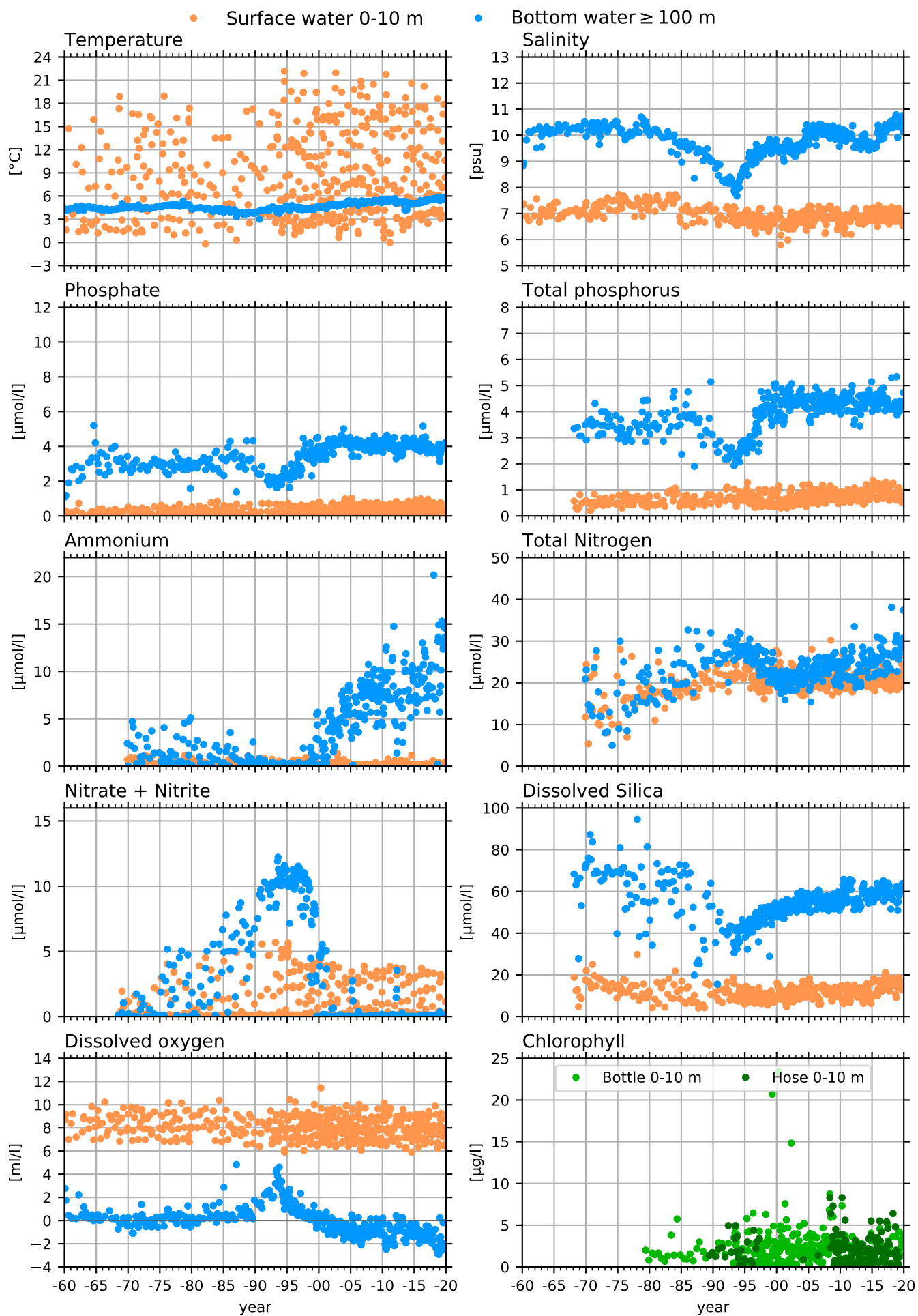
B1 (ASKÖ), WESTERN GOTLAND BASIN COASTAL



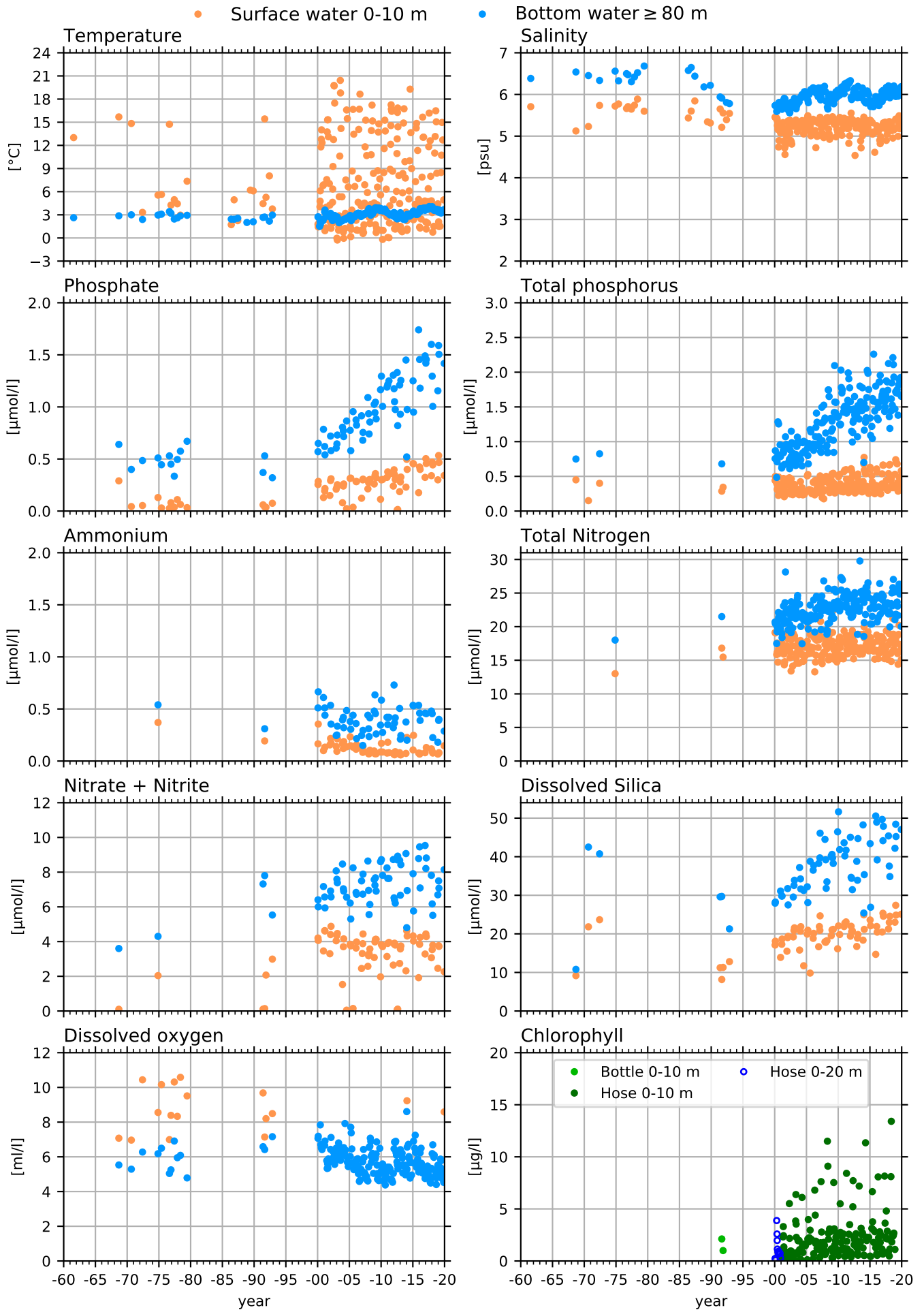
BY32 NORRKÖPING DEEP, WESTERN GOTLAND BASIN



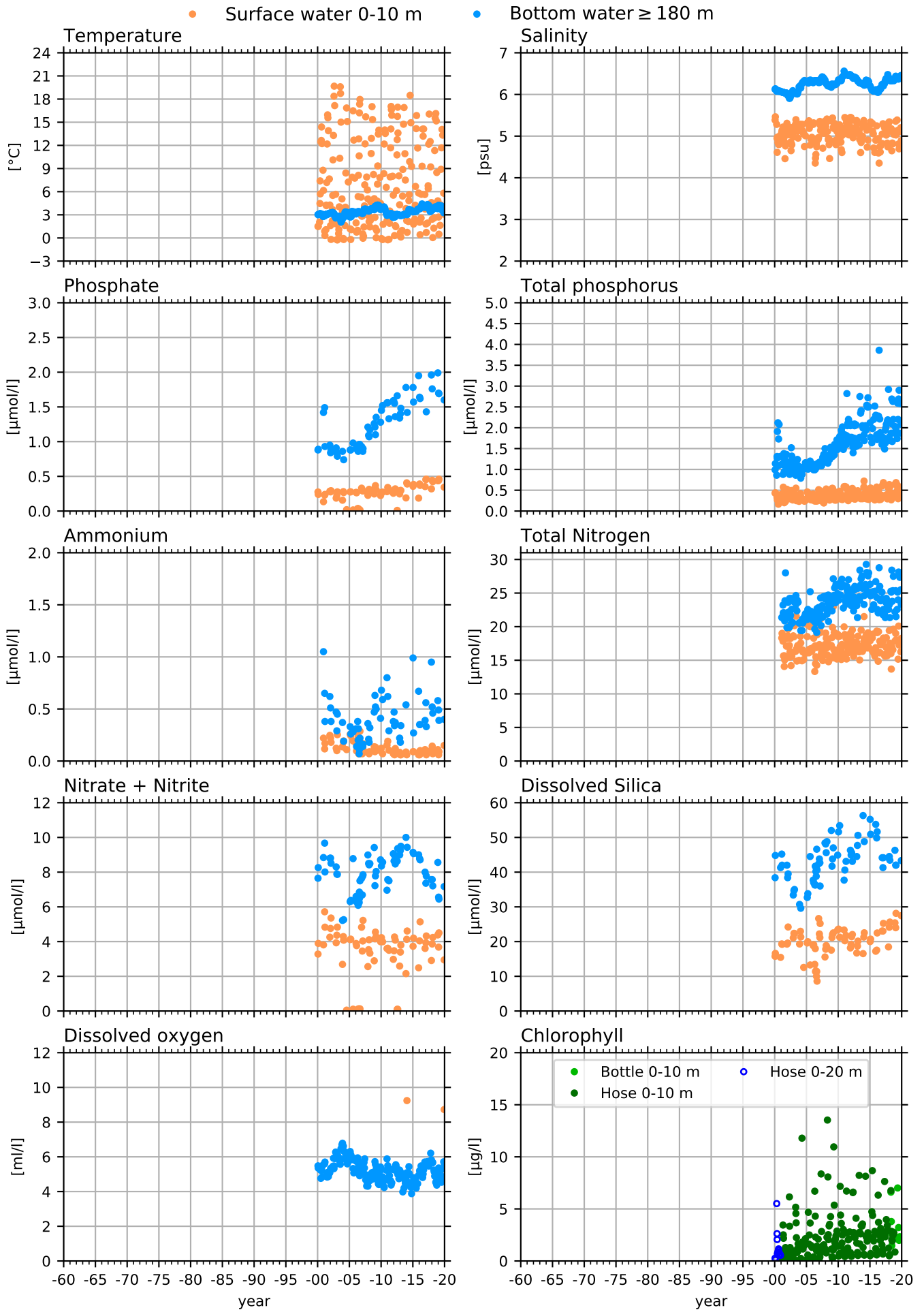
BY38 KARLSÖ DEEP, WESTERN GOTLAND BASIN



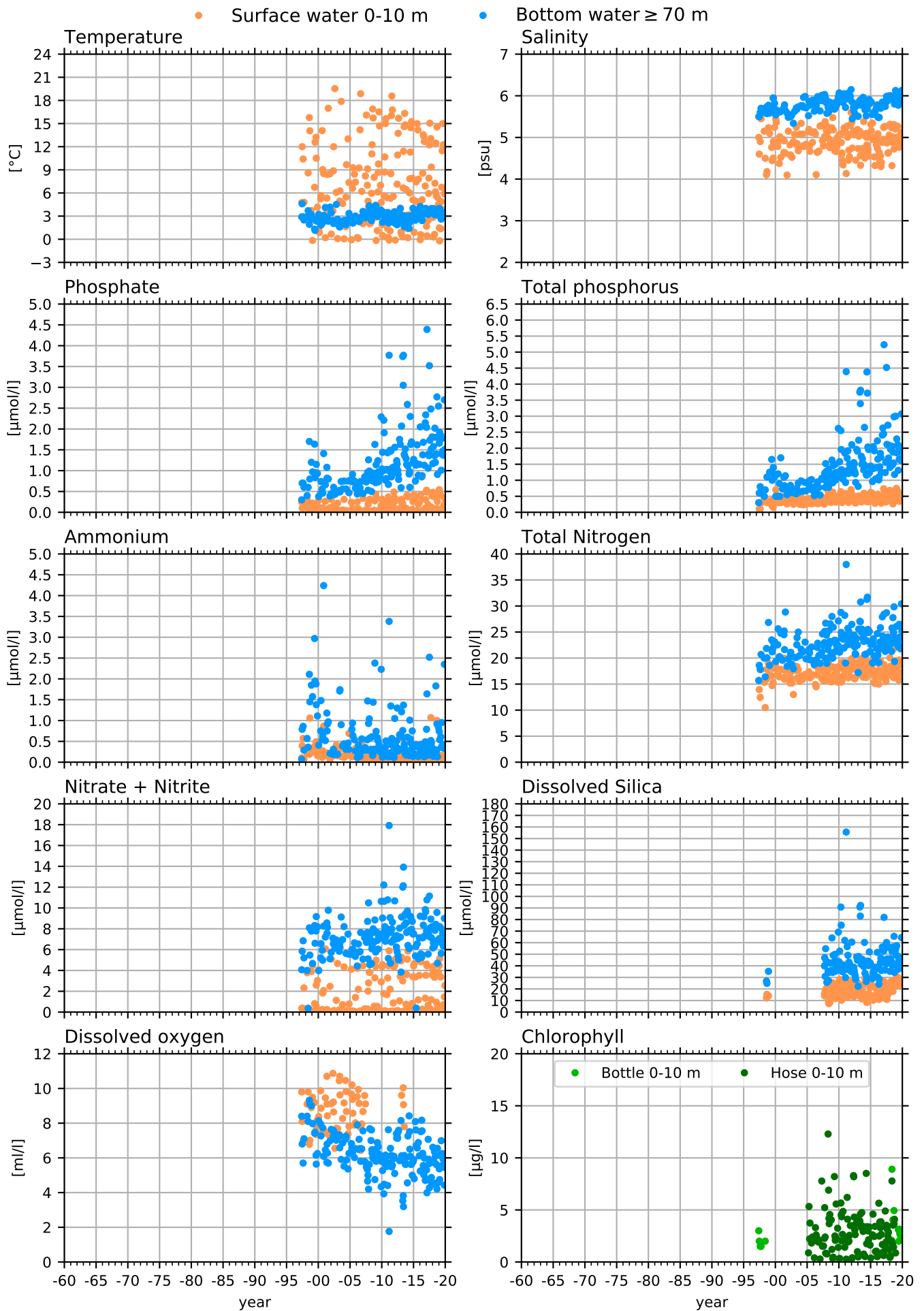
MS4 / C14, BOTHNIAN SEA



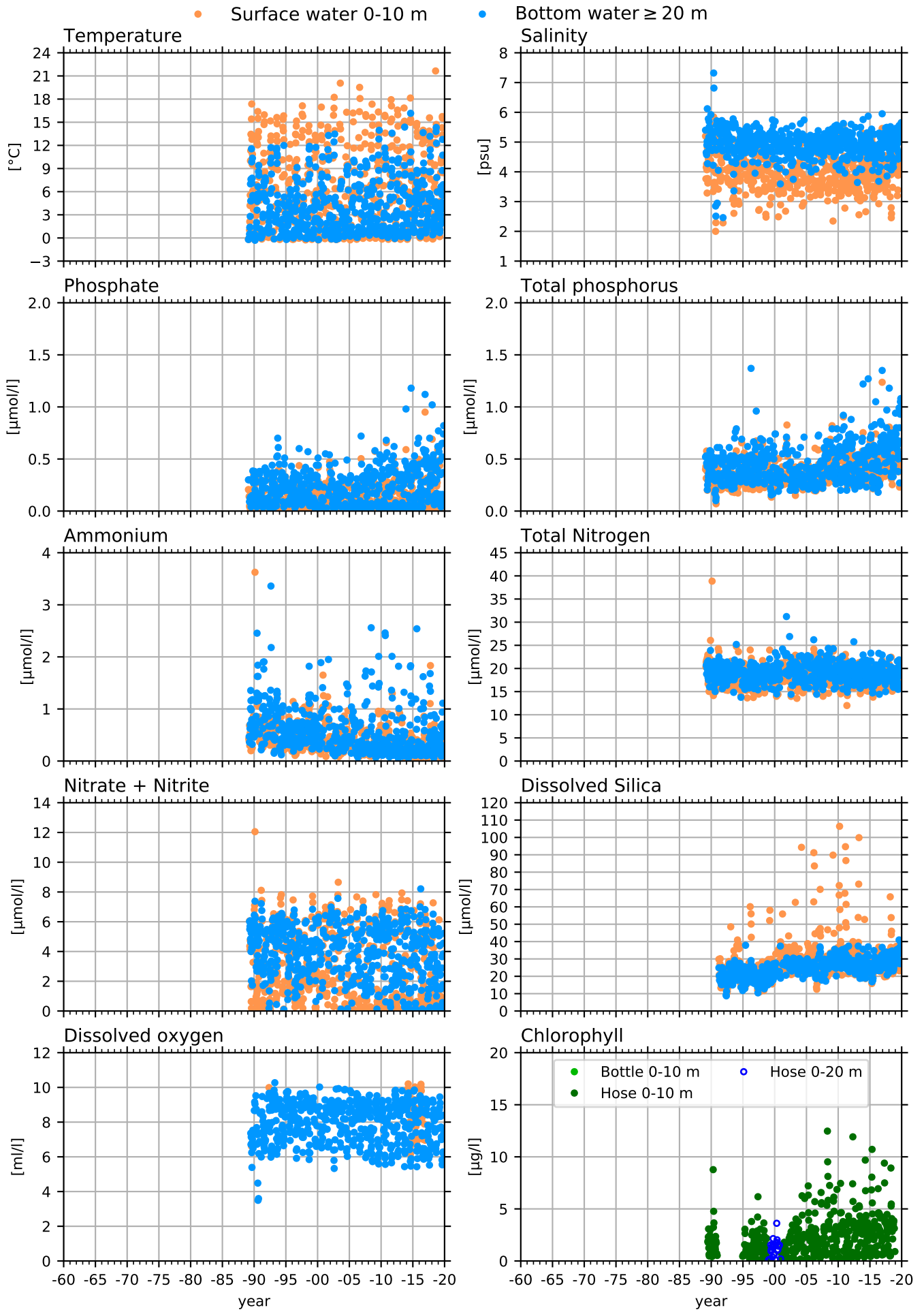
C3, BOTHNIAN SEA



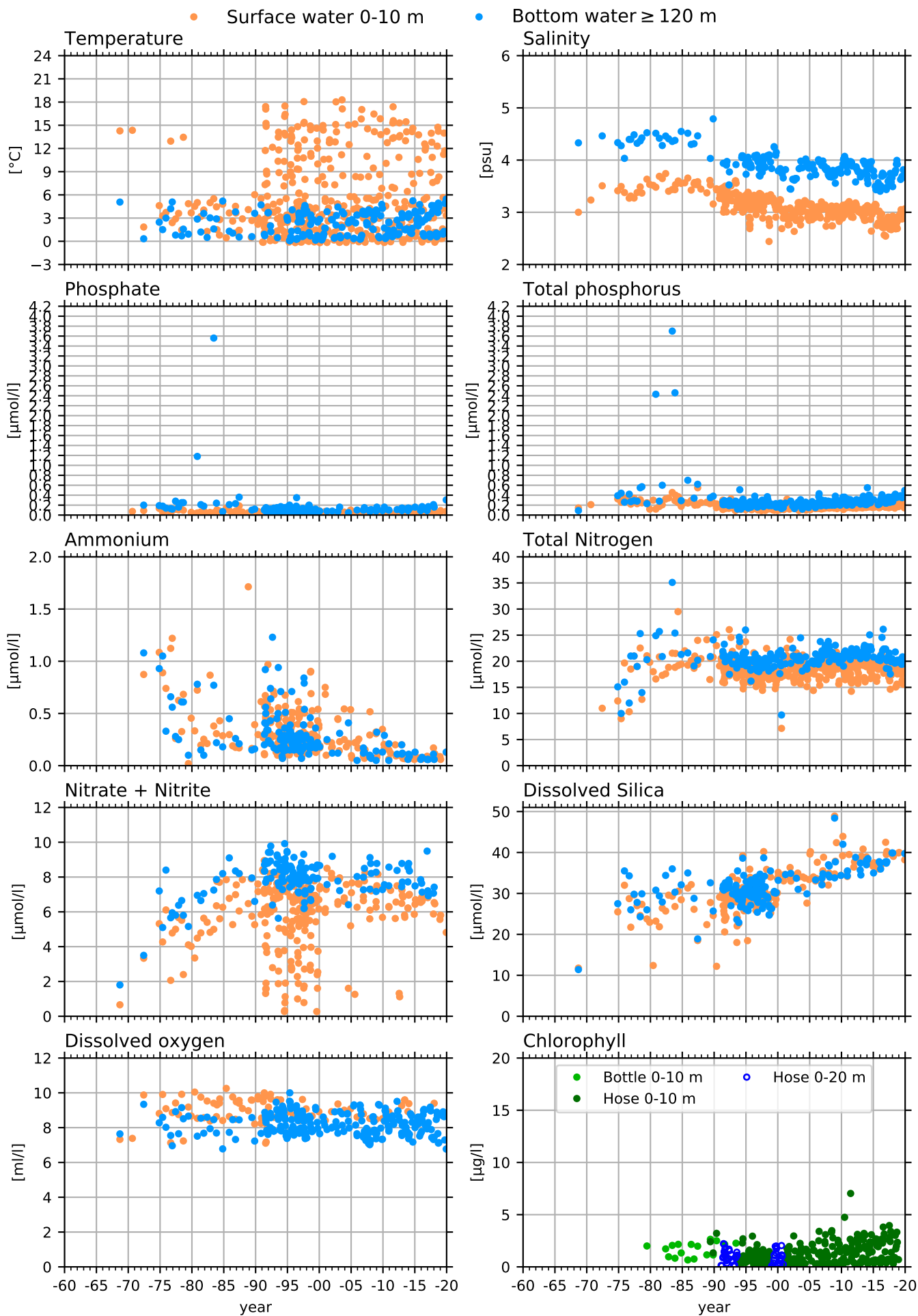
GAVIK-1, BOTHNIAN SEA COASTAL



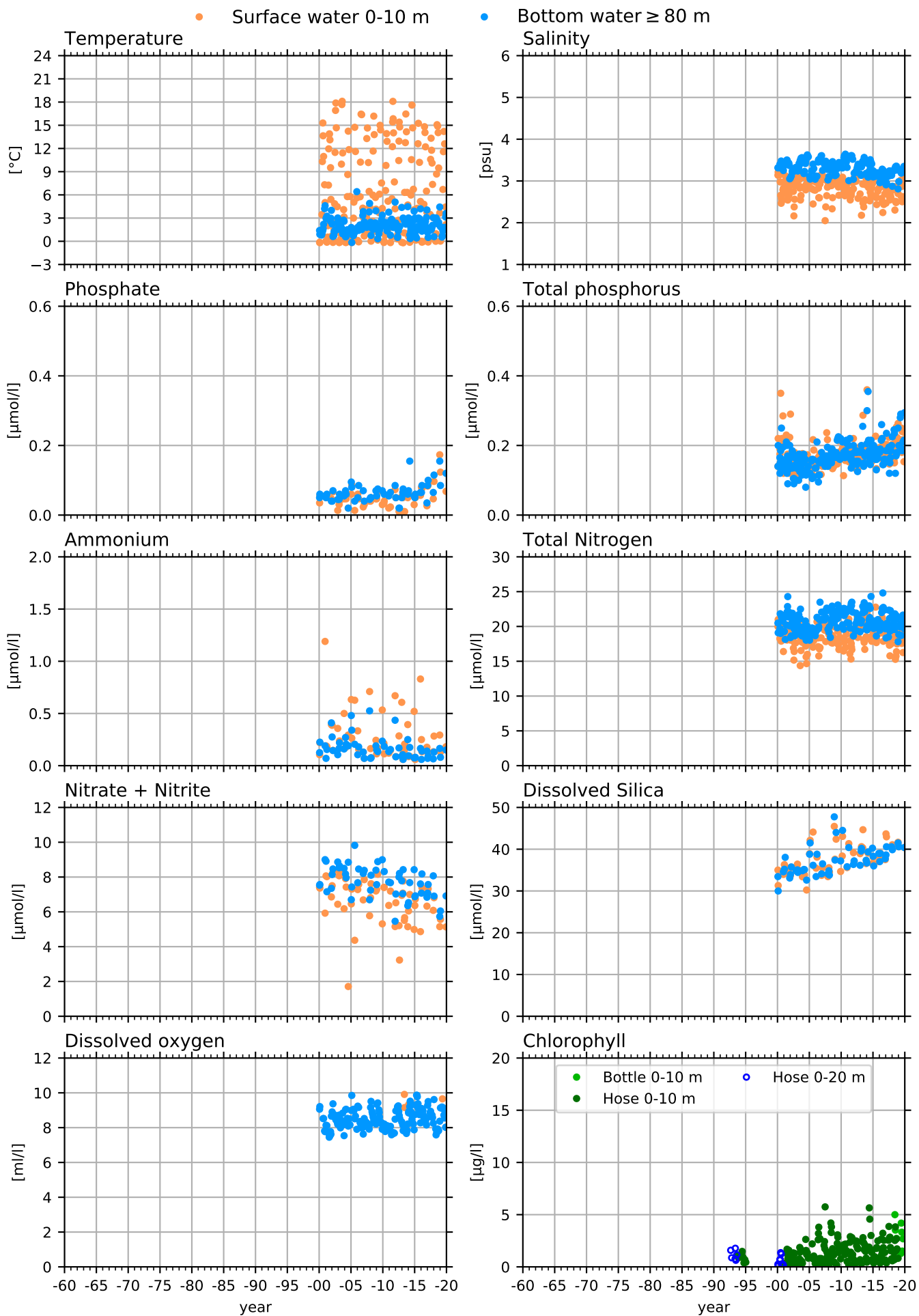
B7 & NB1 / B3, THE QUARK



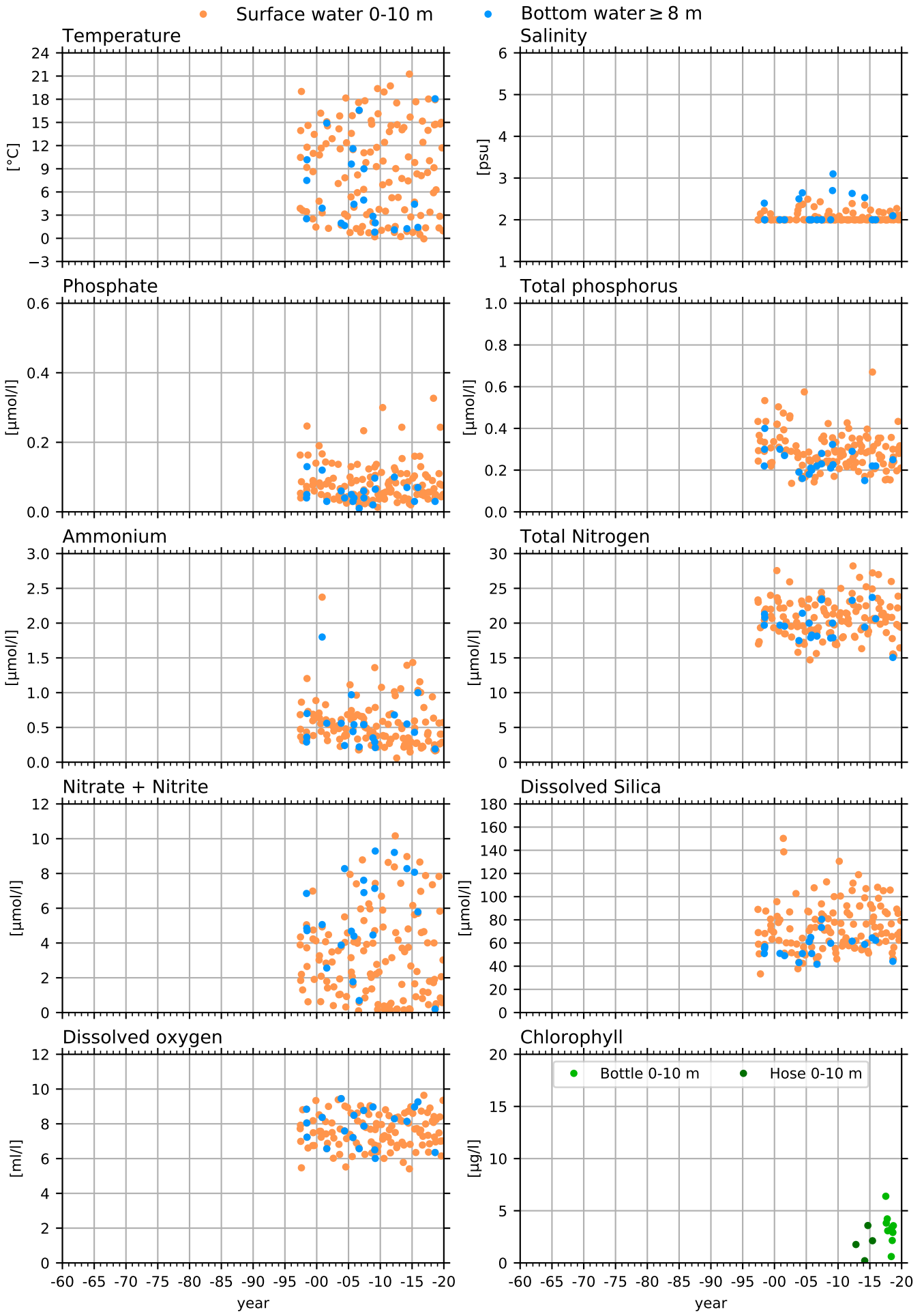
F9 / A13, BOTHNIAN BAY



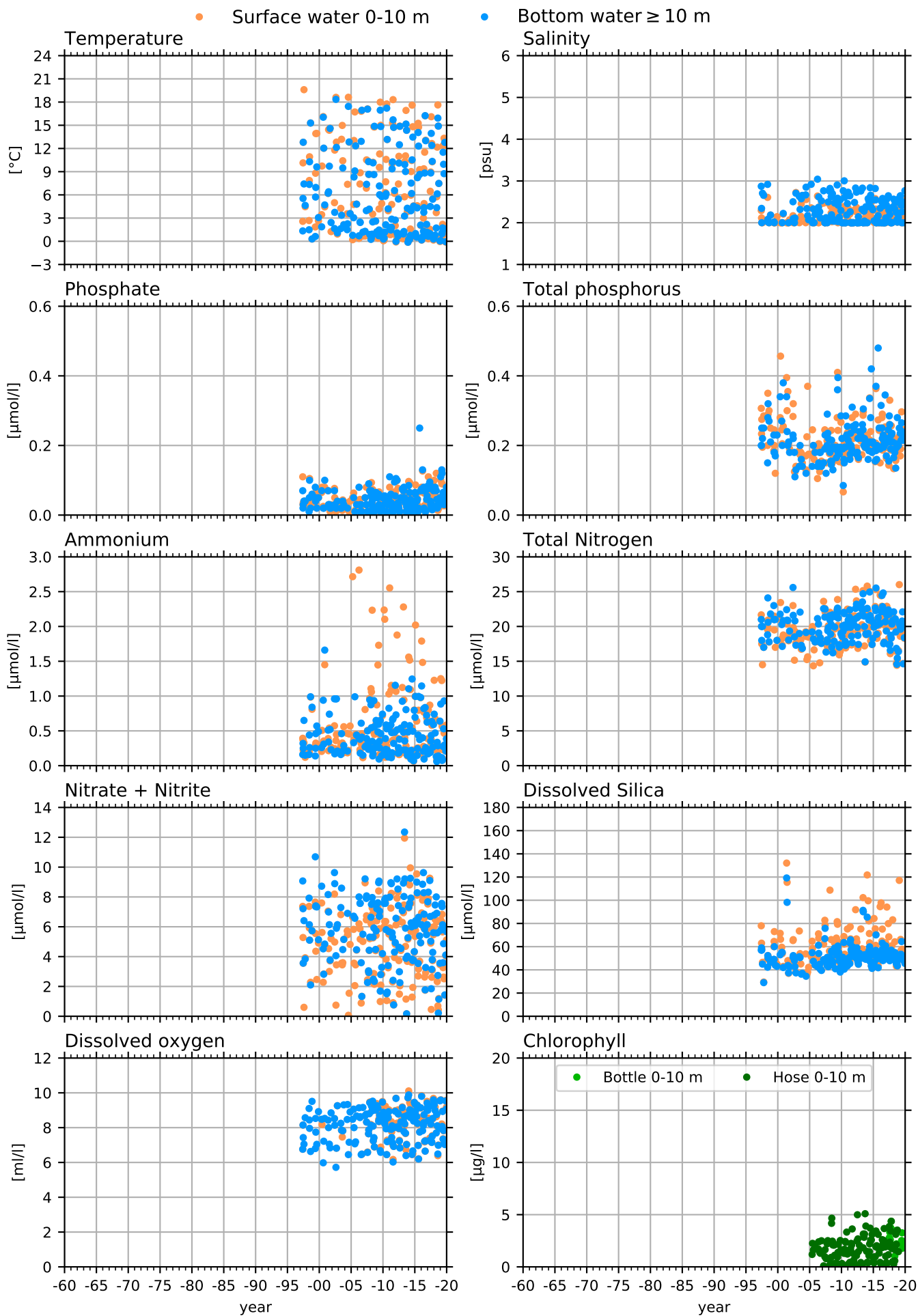
F3 / A5, BOTHNIAN BAY



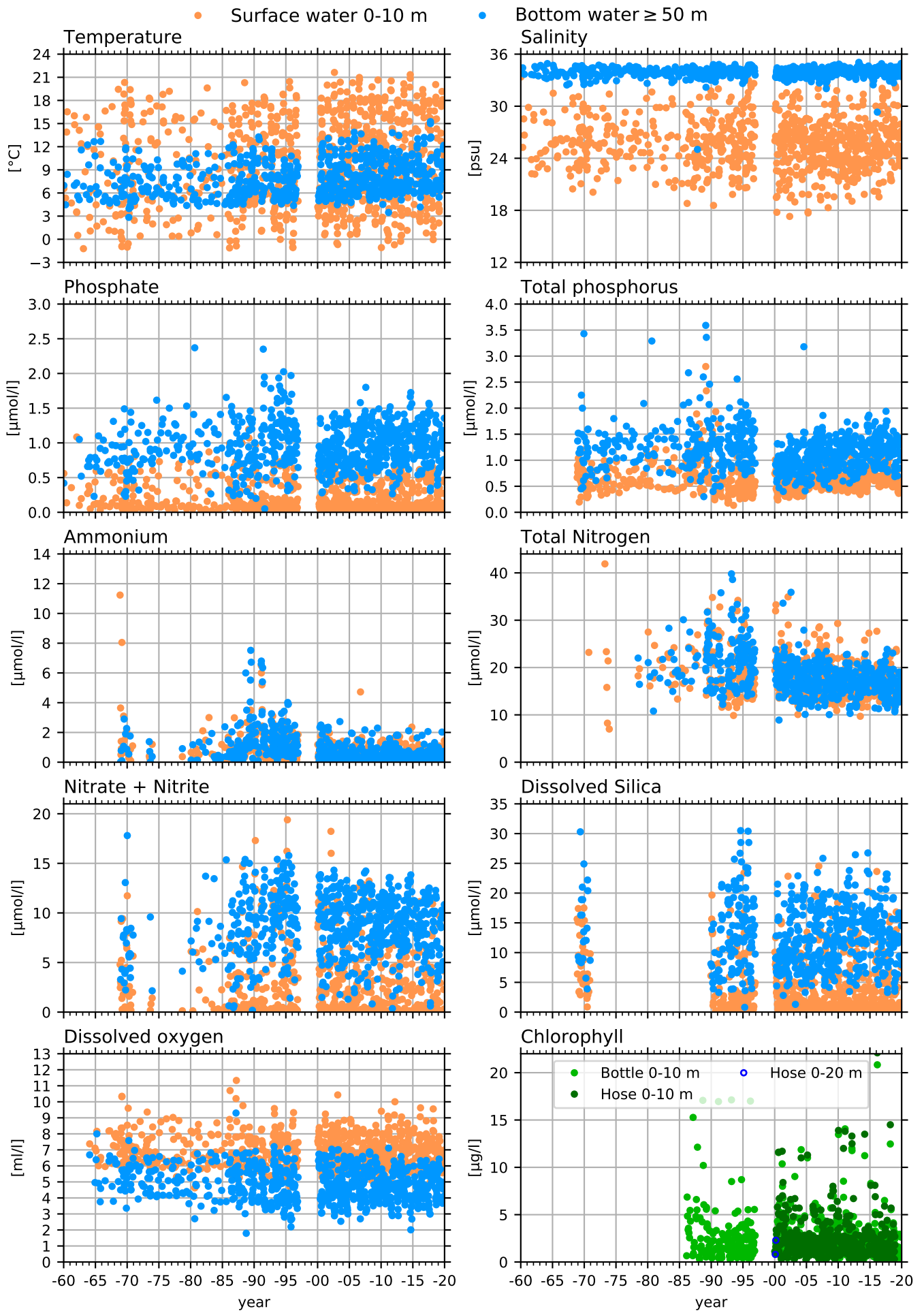
RÅNEÅ-1, BOTHNIAN BAY COASTAL



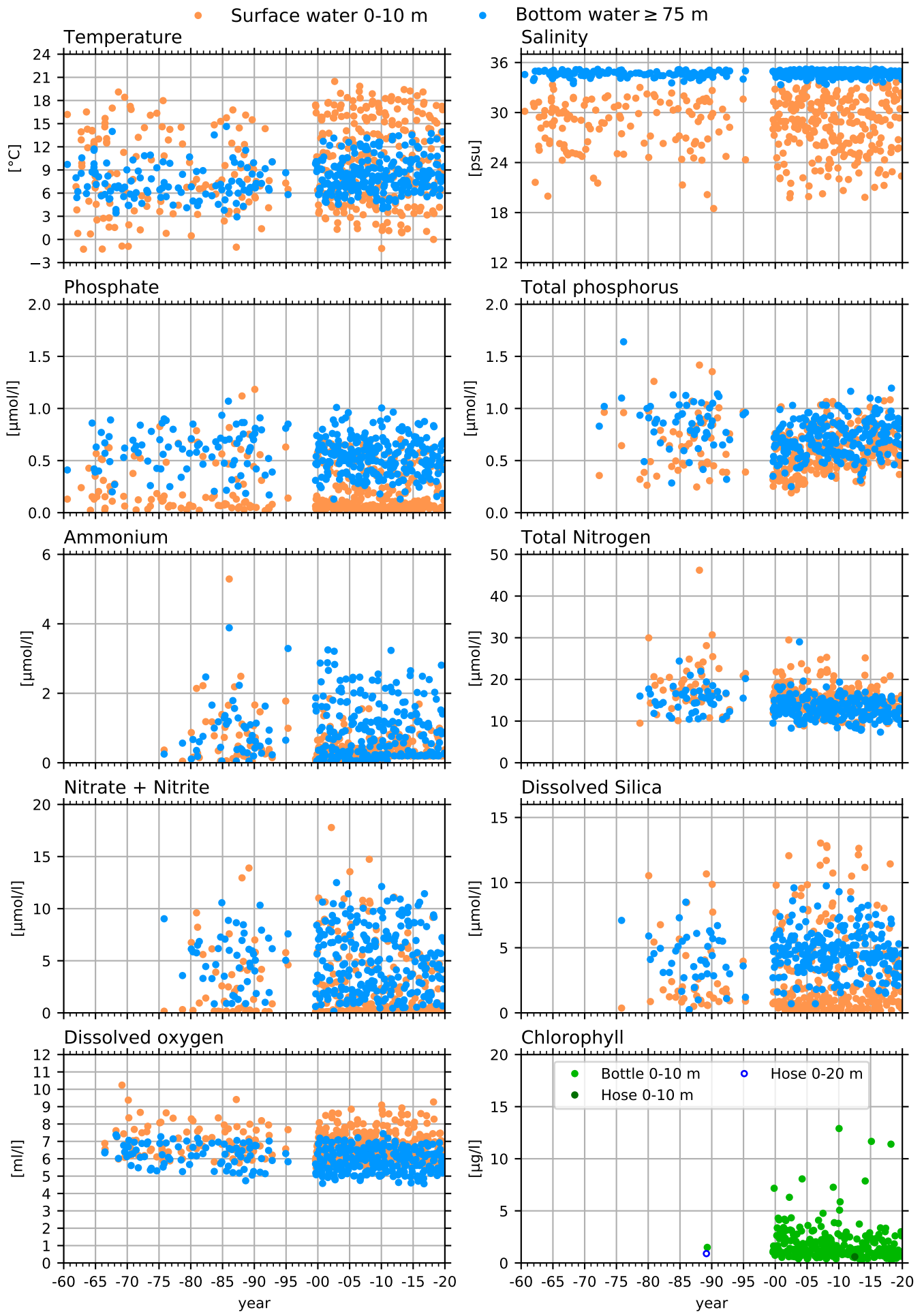
RÅNEÅ-2, BOTHNIAN BAY COASTAL



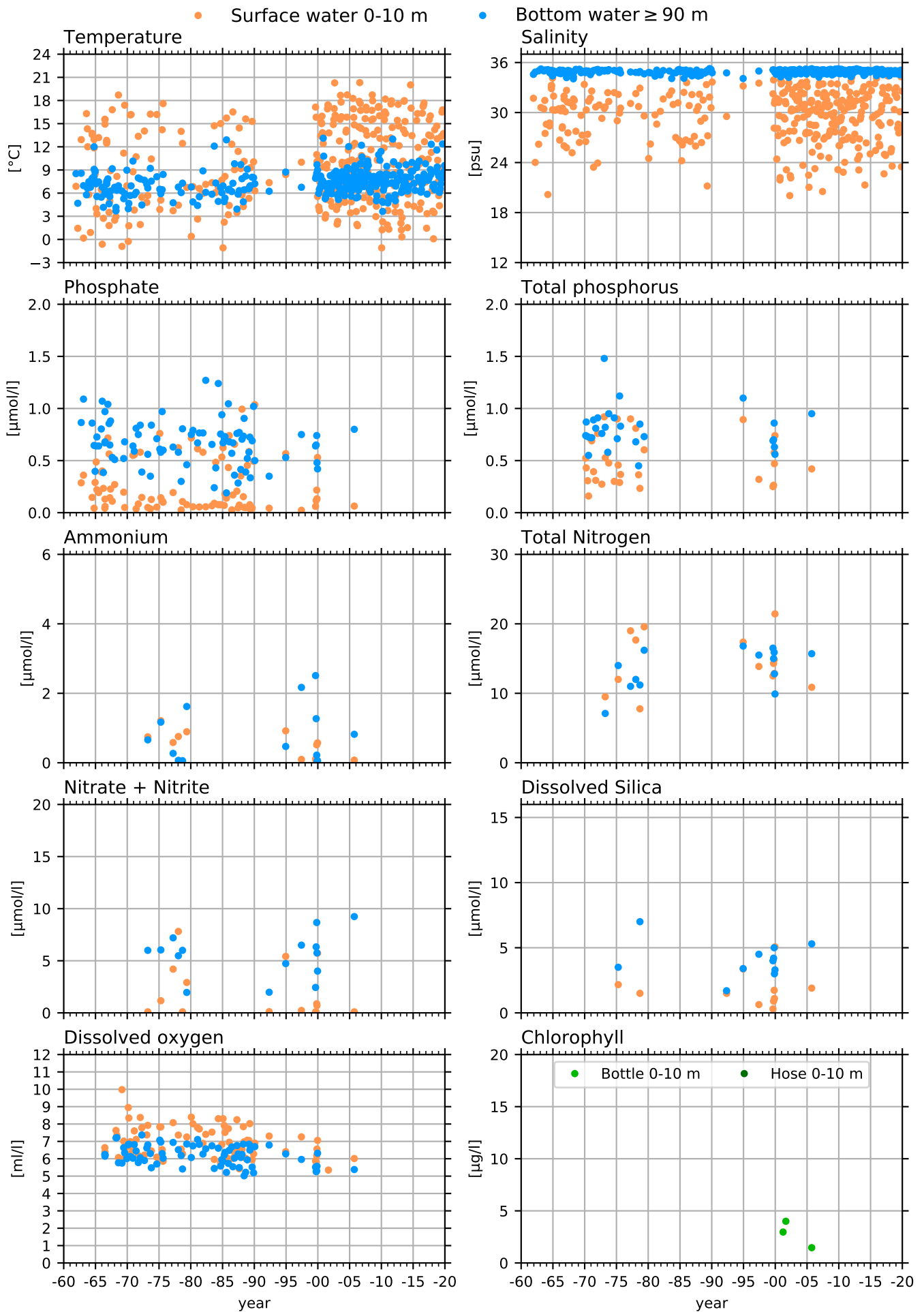
SLÄGGÖ, SKAGERACK COASTAL



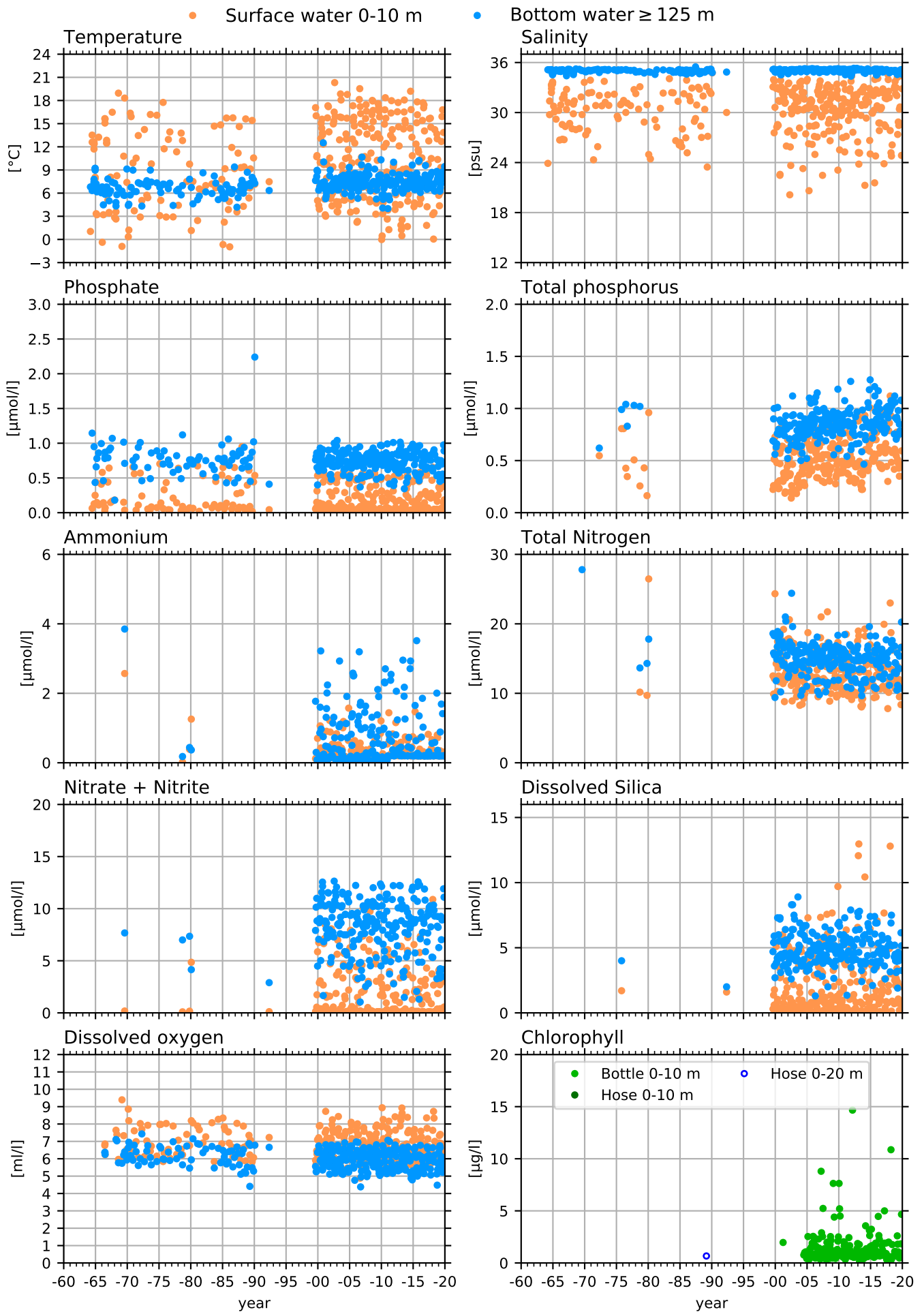
Å13, SKAGERACK



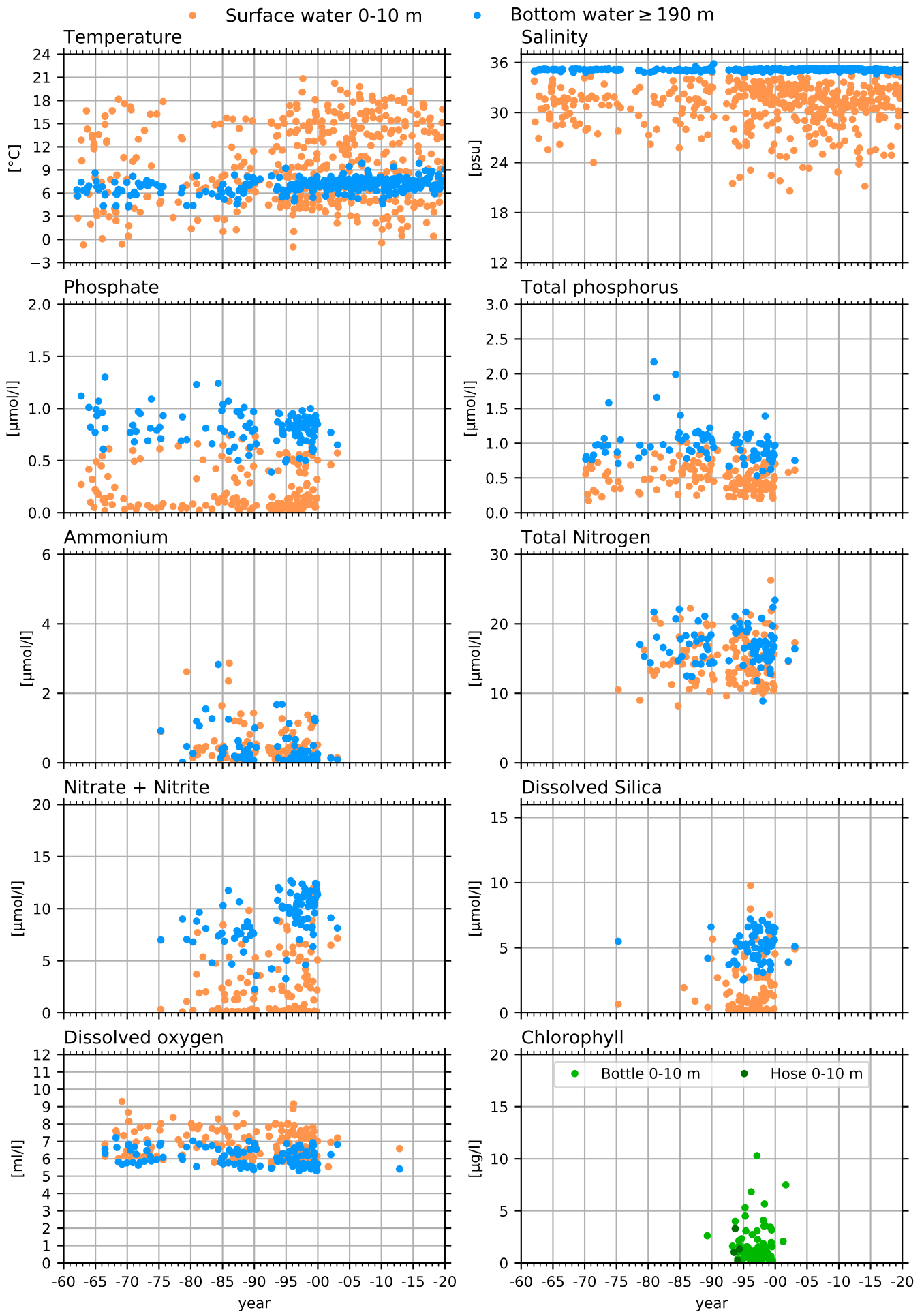
Å14, SKAGERACK



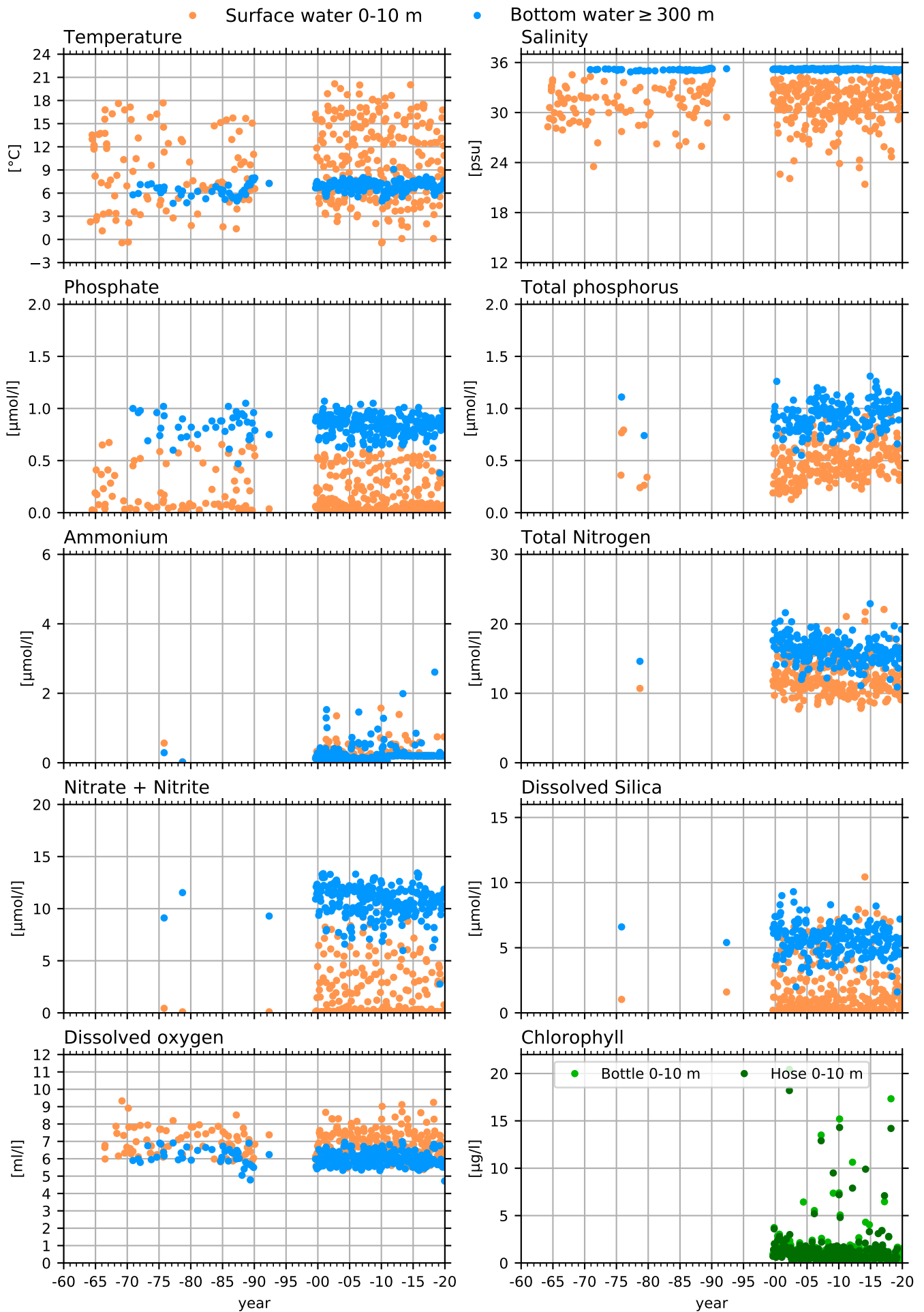
Å15, SKAGERACK



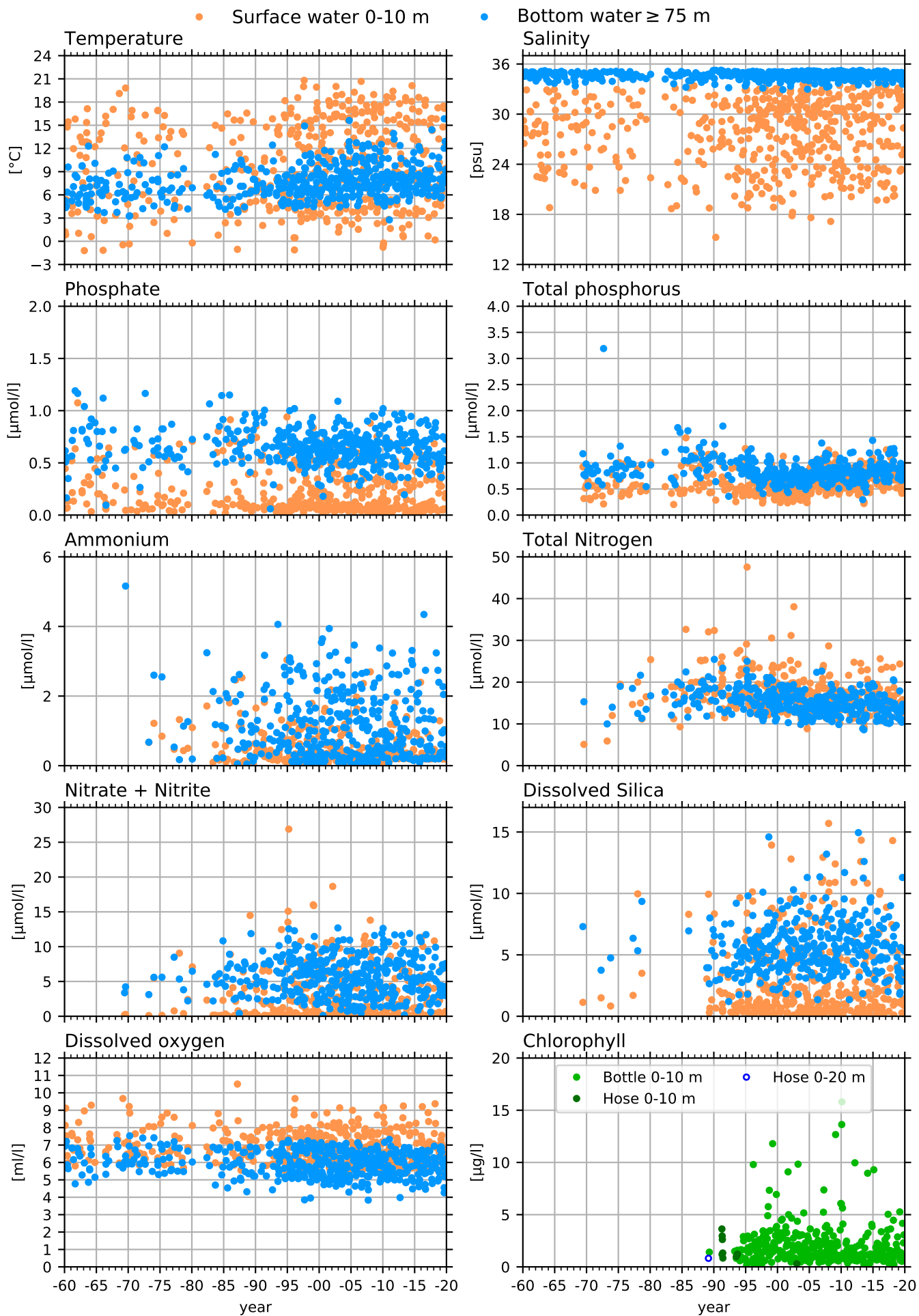
Å16, SKAGERACK



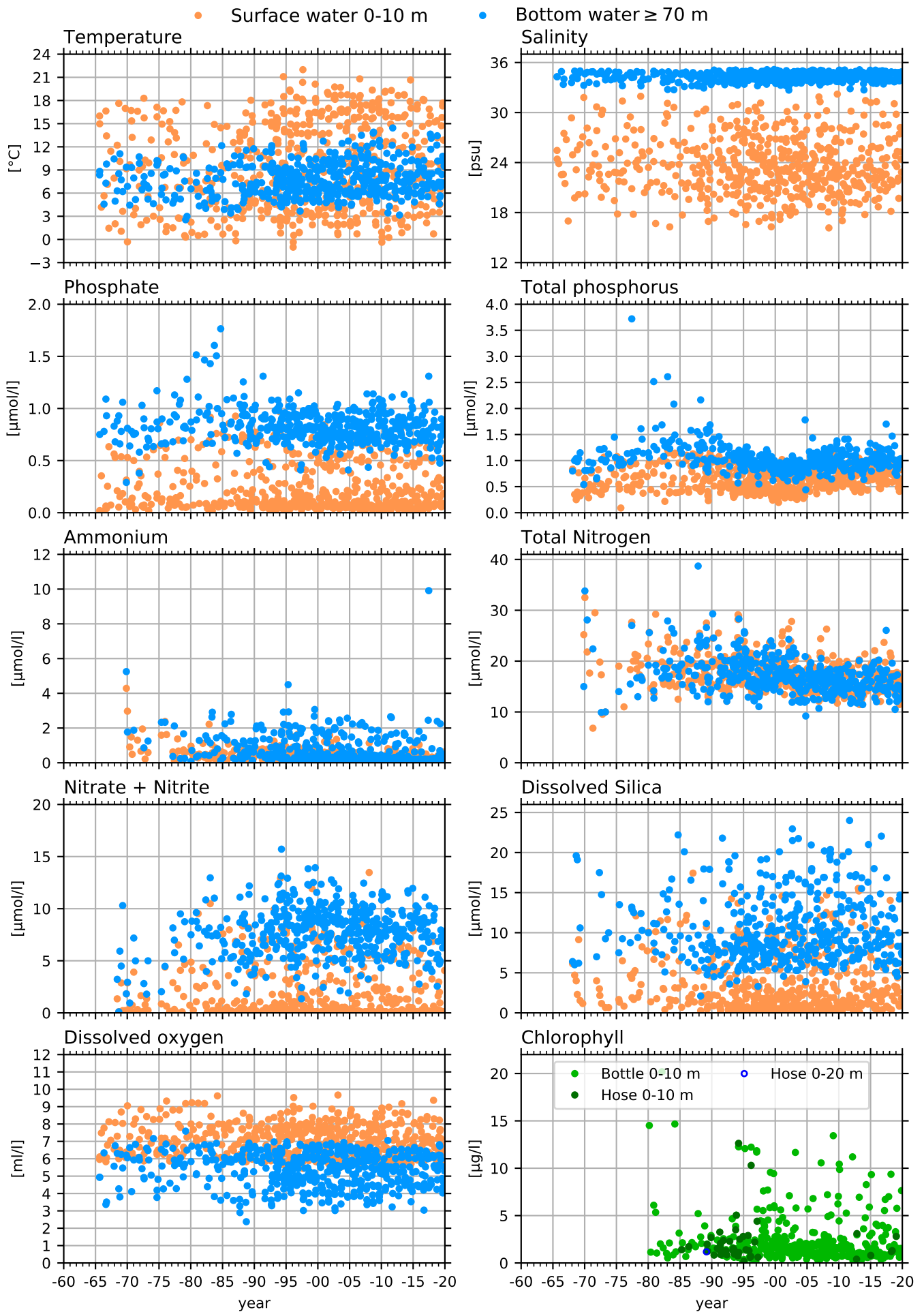
Å17, SKAGERACK



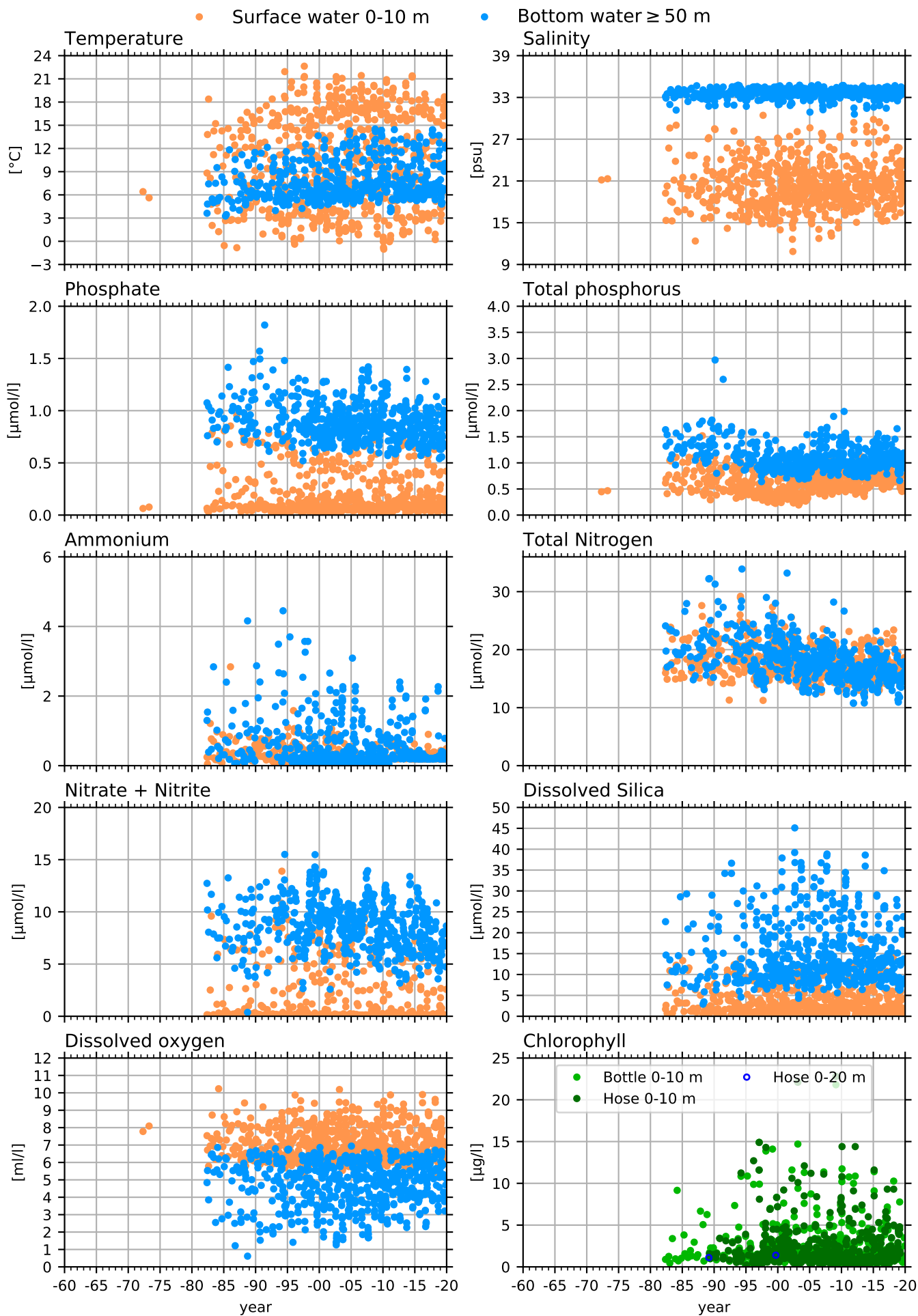
P2, SKAGERACK



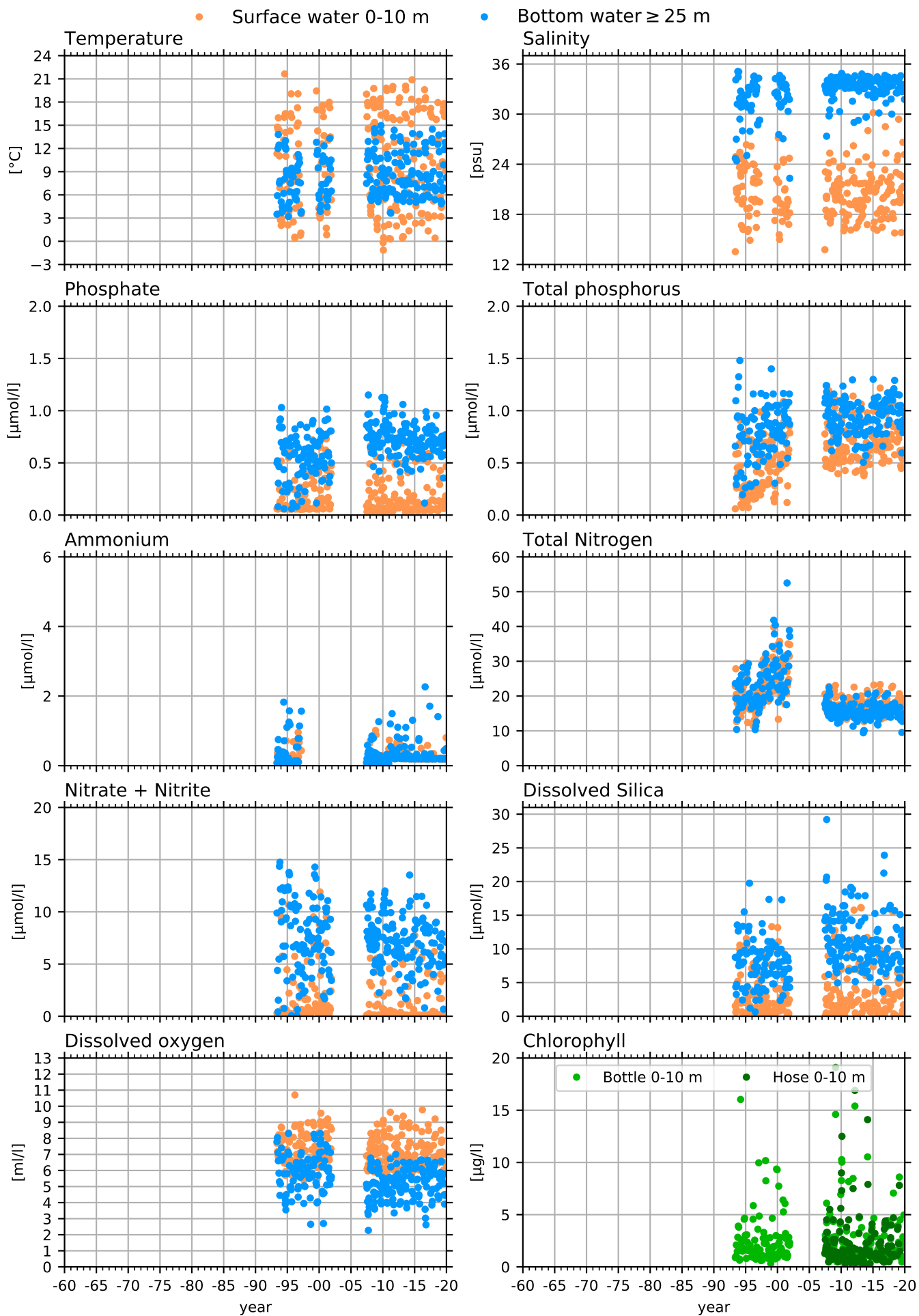
FLADEN, KATTEGAT



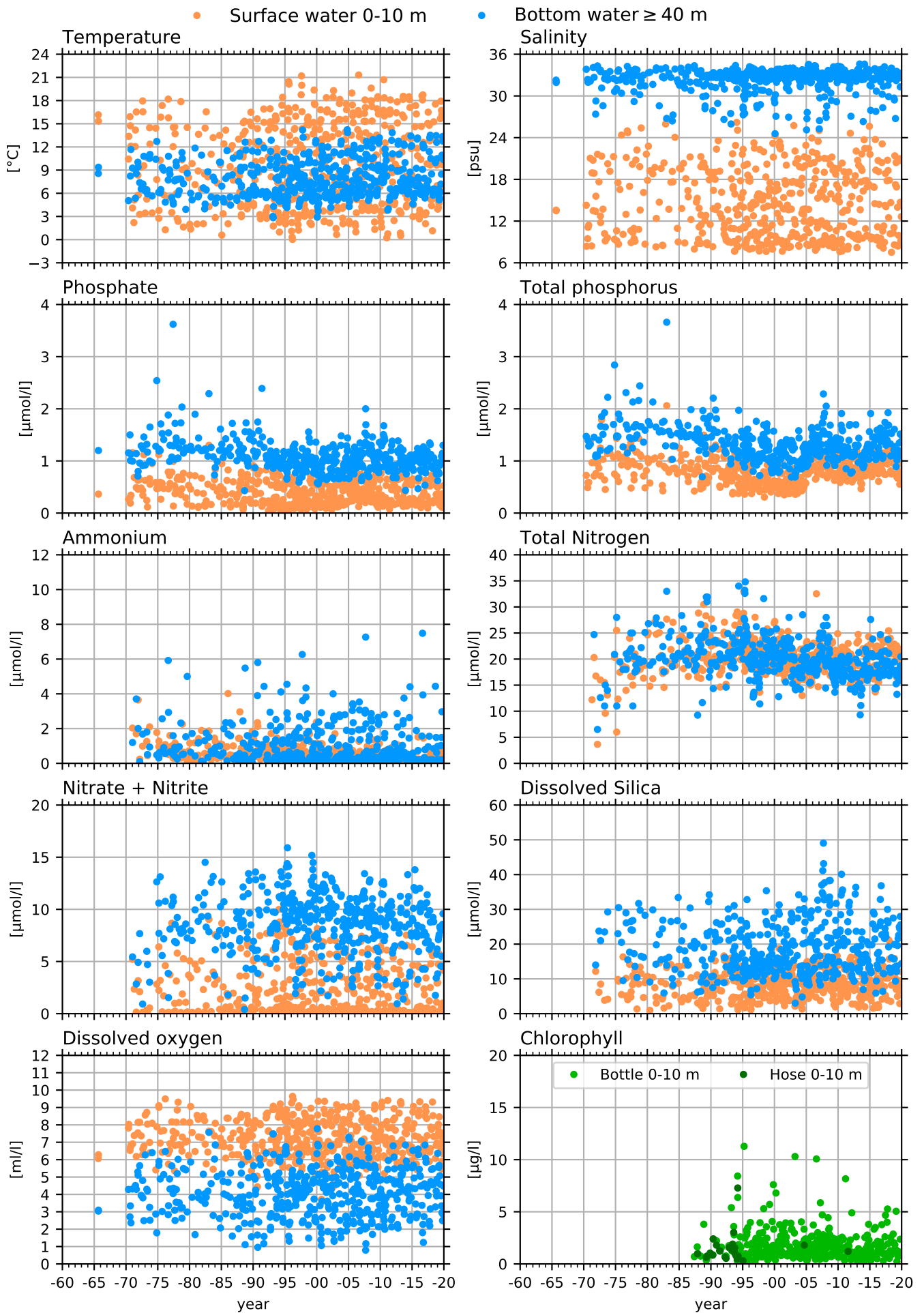
ANHOLT E, KATTEGAT



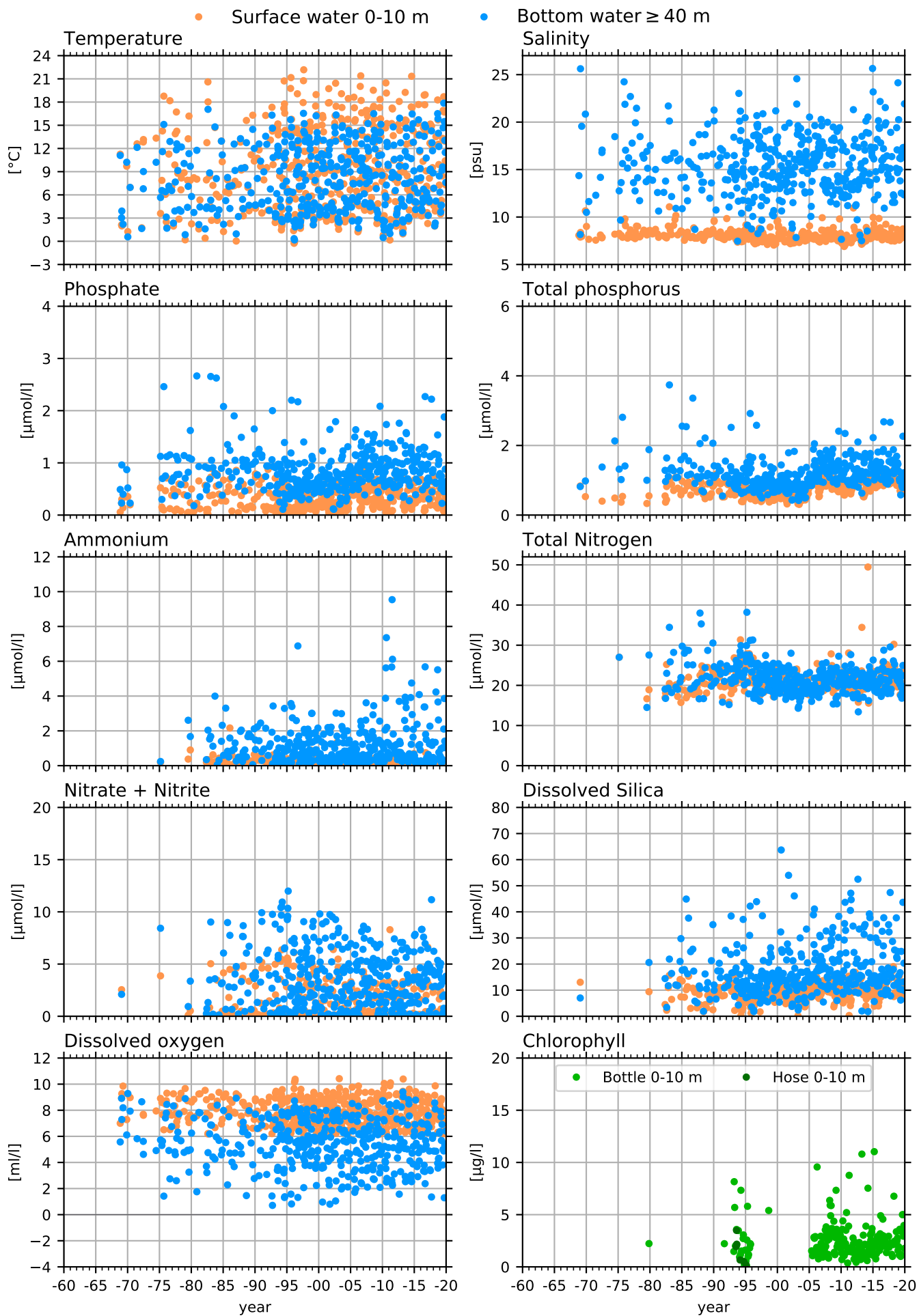
N14 FALKENBERG, KATTEGAT COASTAL



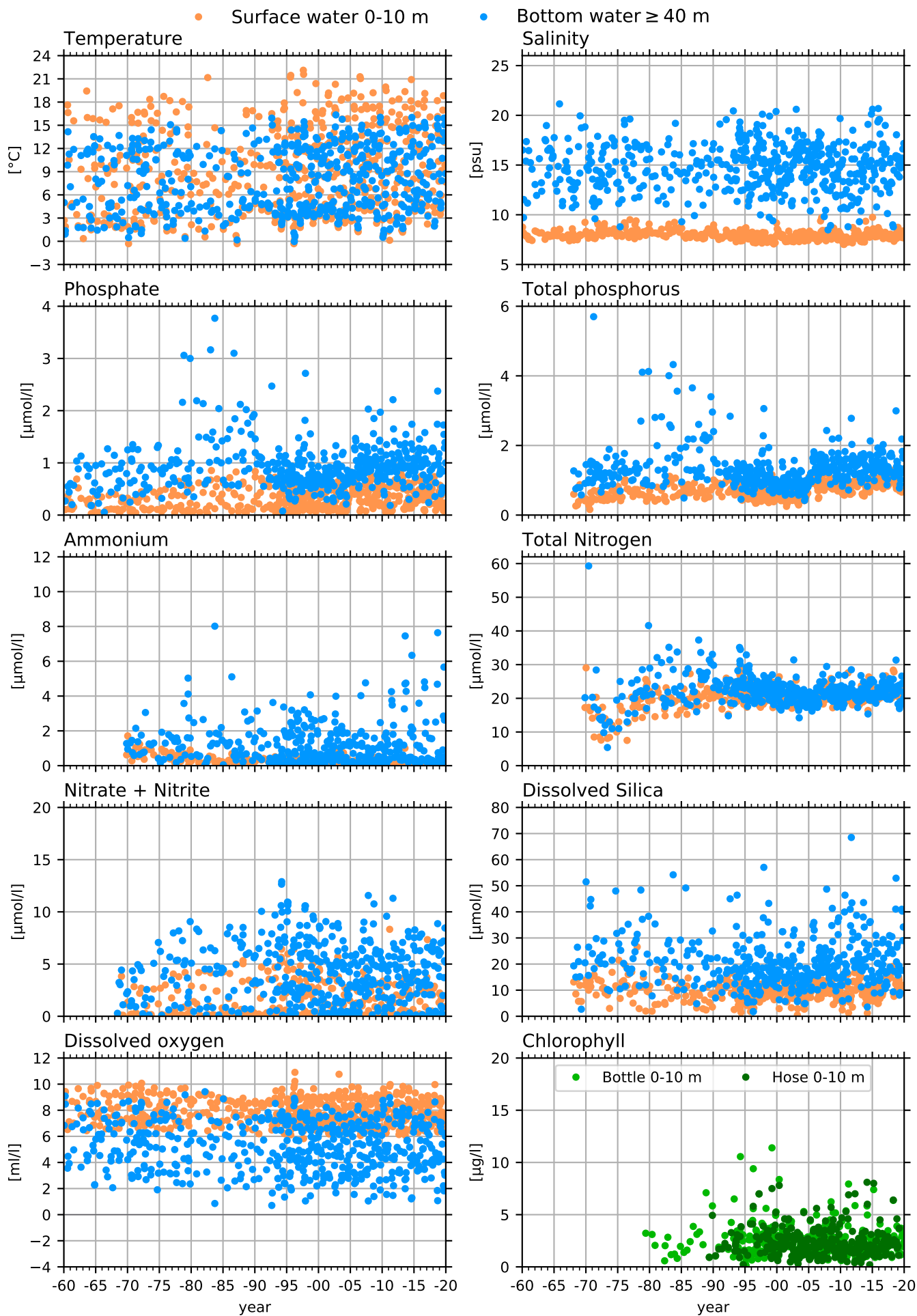
W LANDSKRONA, THE SOUND



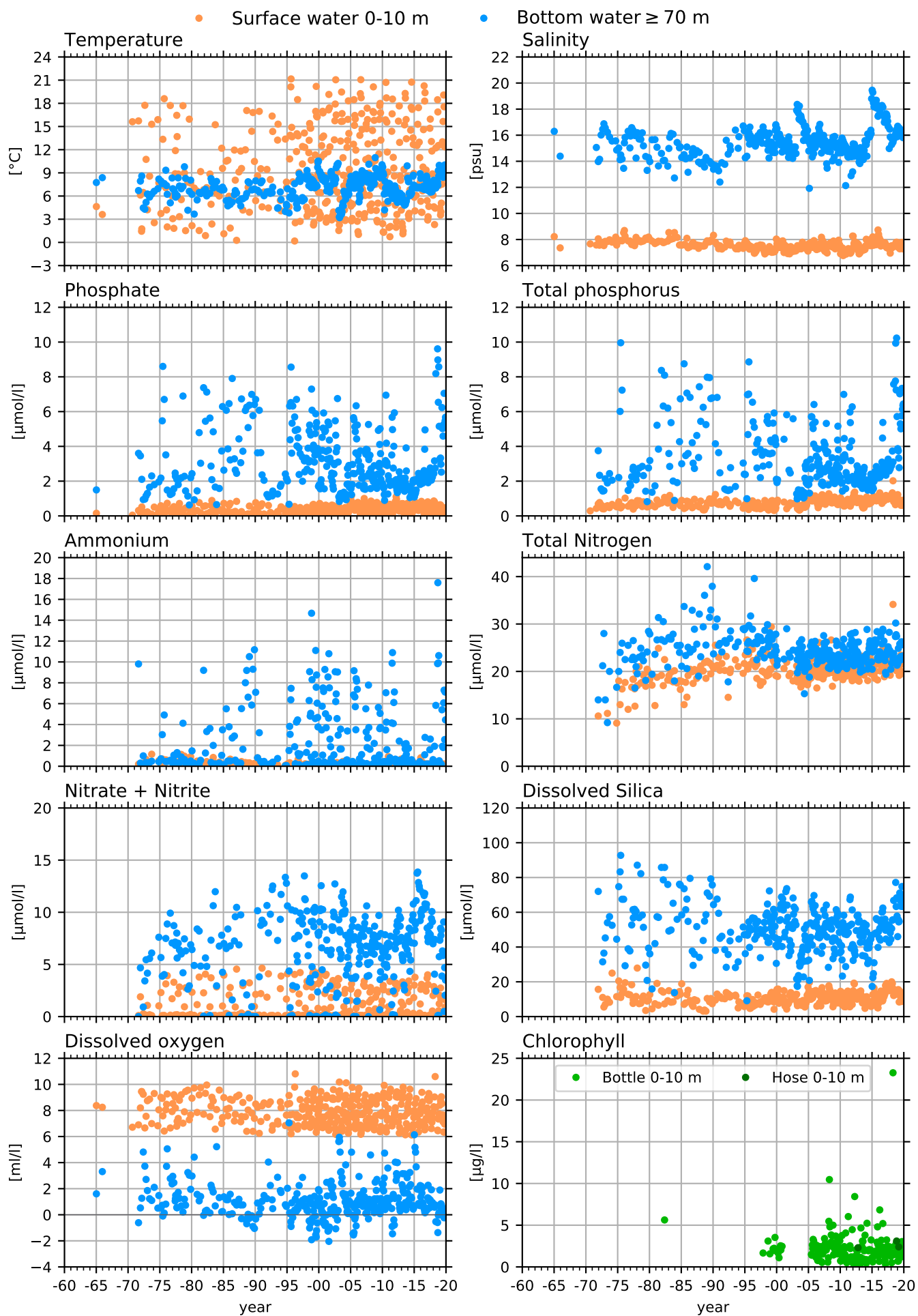
BY1, ARKONA



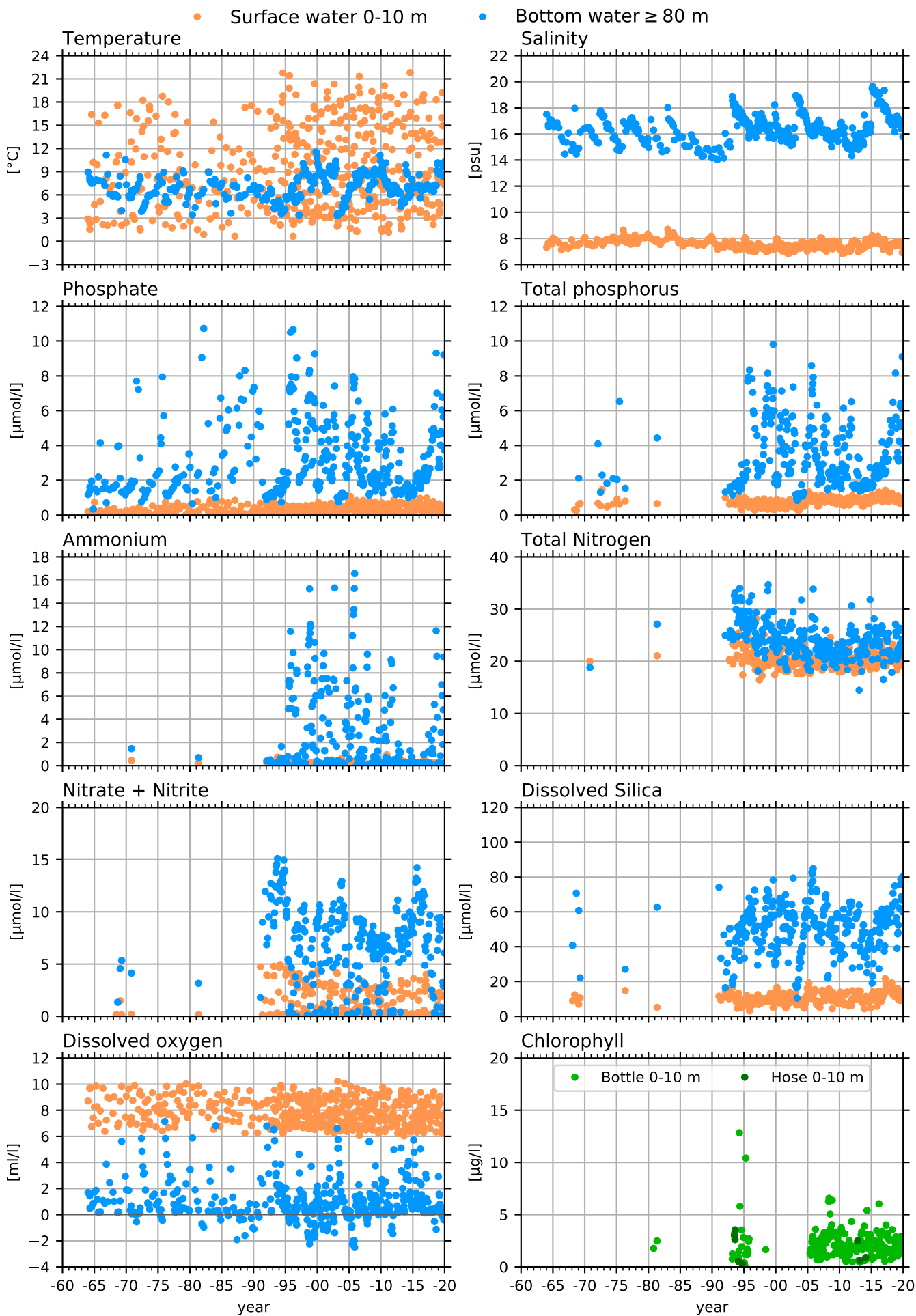
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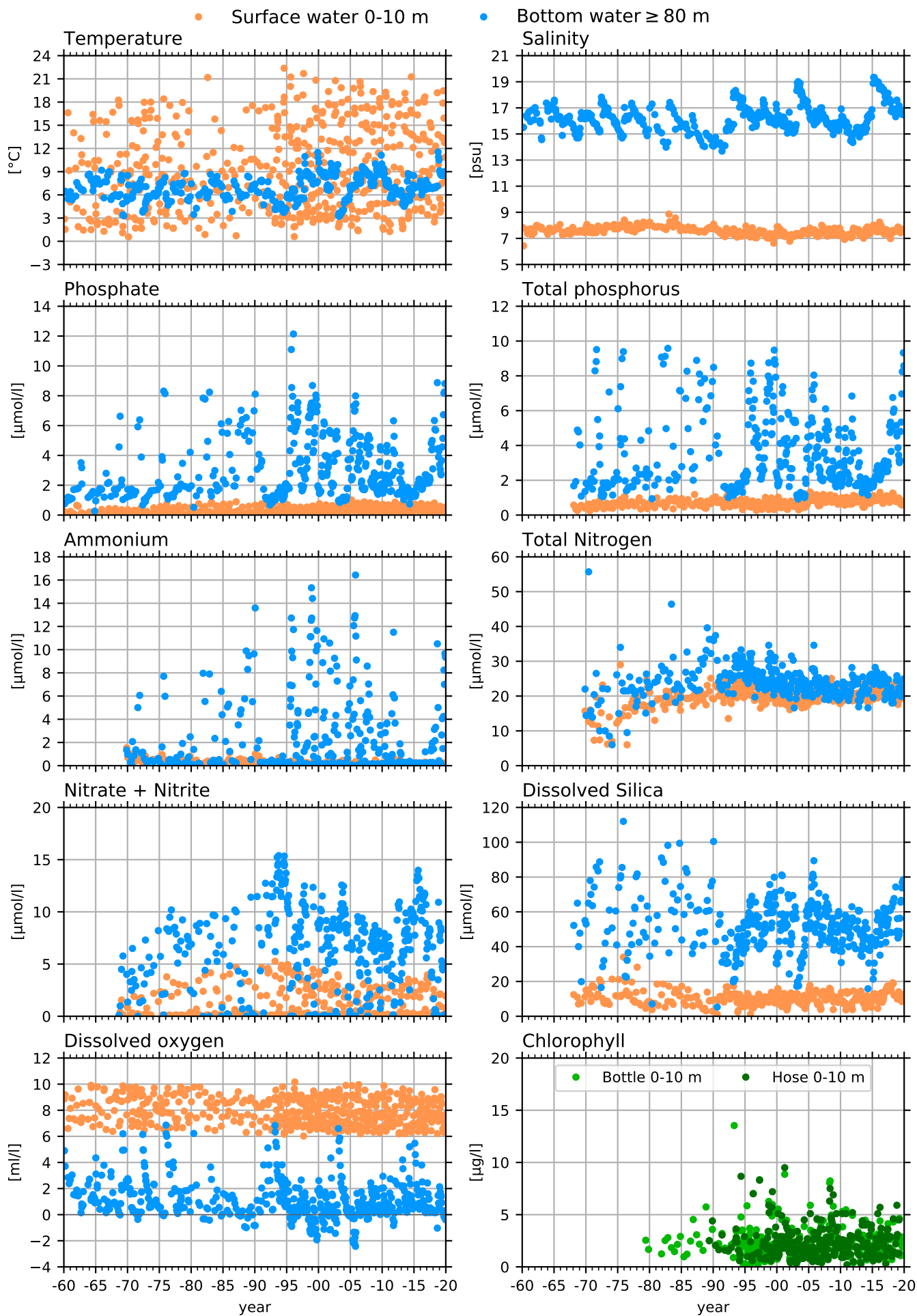
HANÖBUKTEN, BORNHOLM



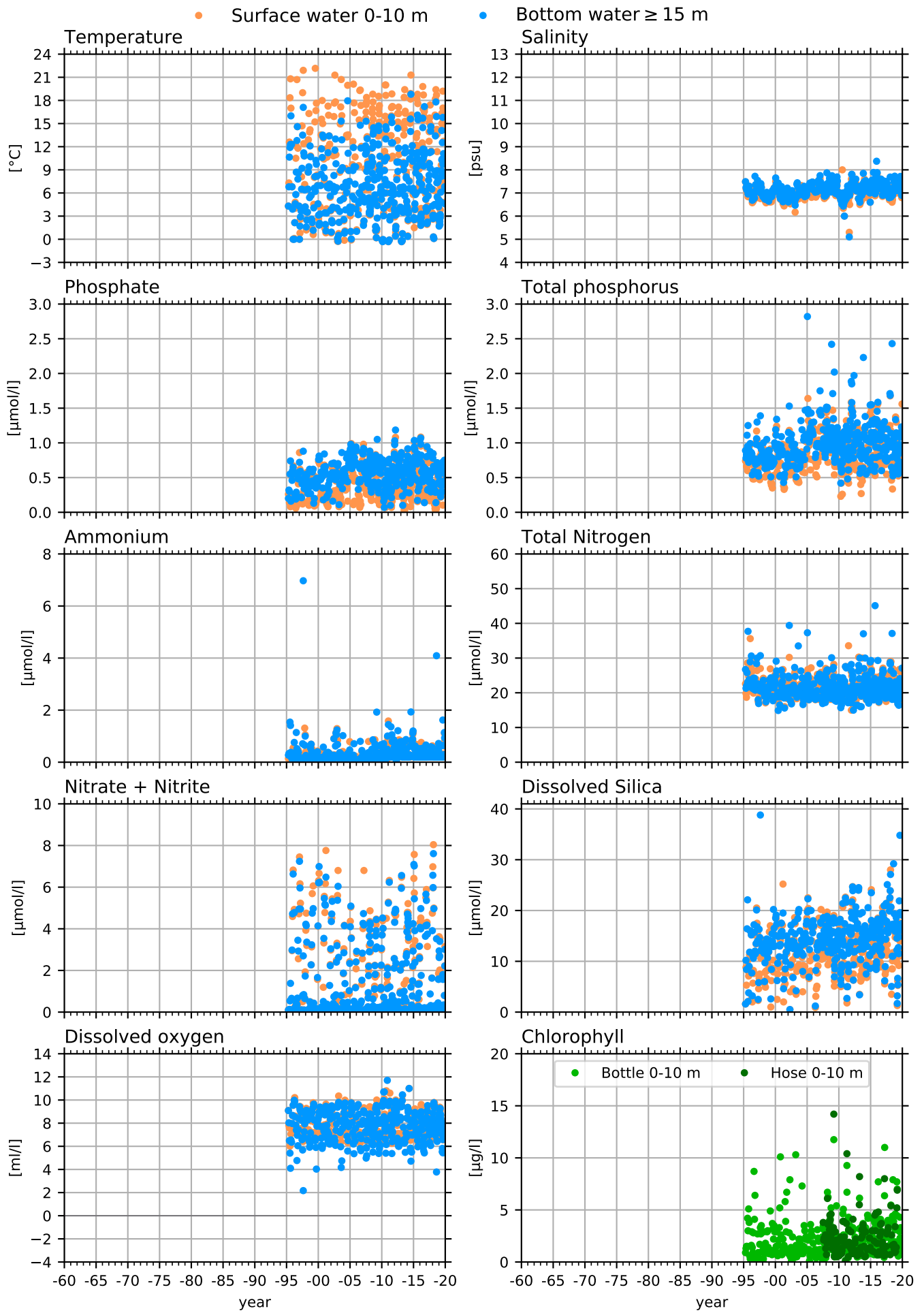
BY4 CHRISTIANSÖ, BORNHOLM



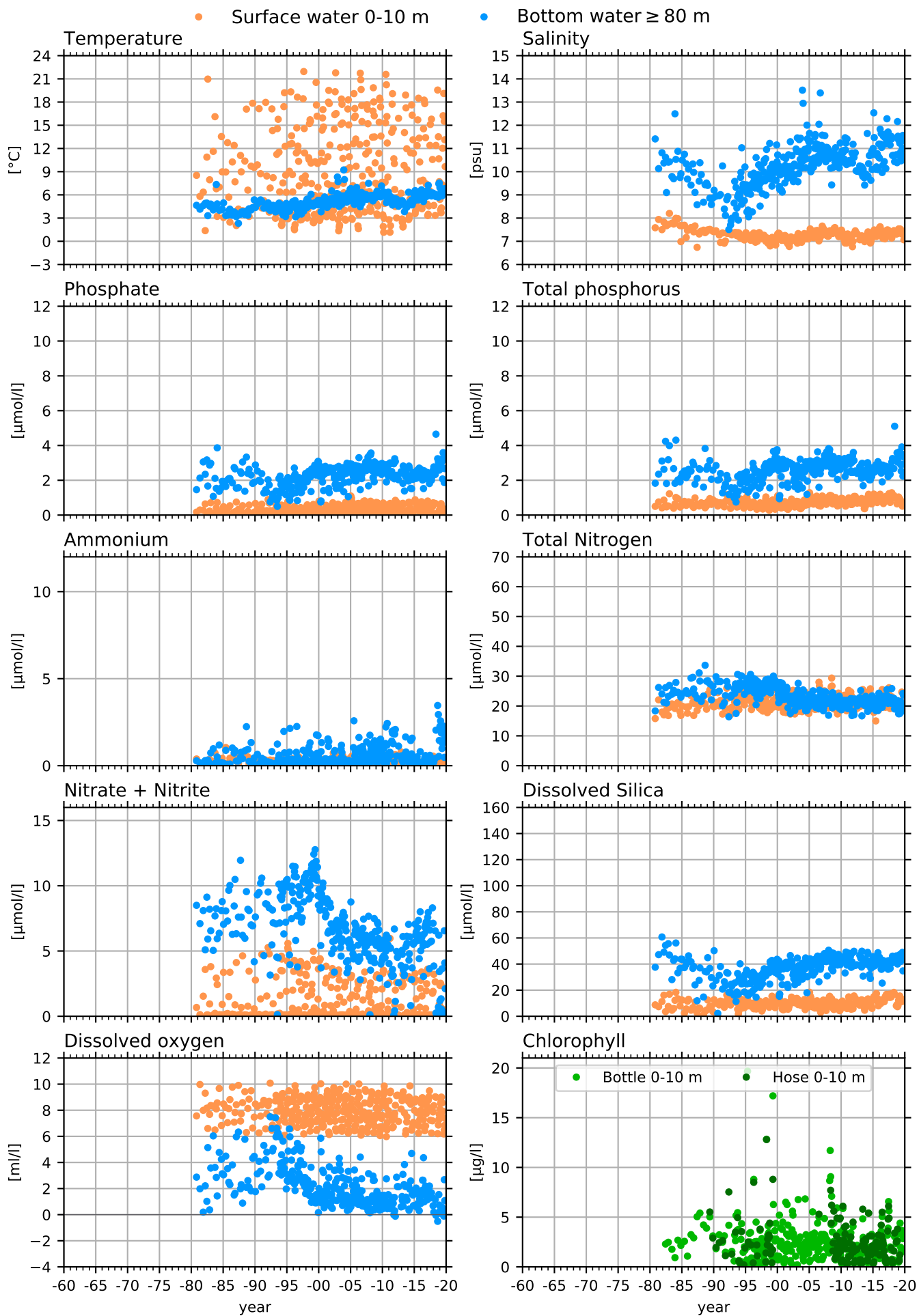
BY5 BORNHOLM DEEP, BORNHOLM



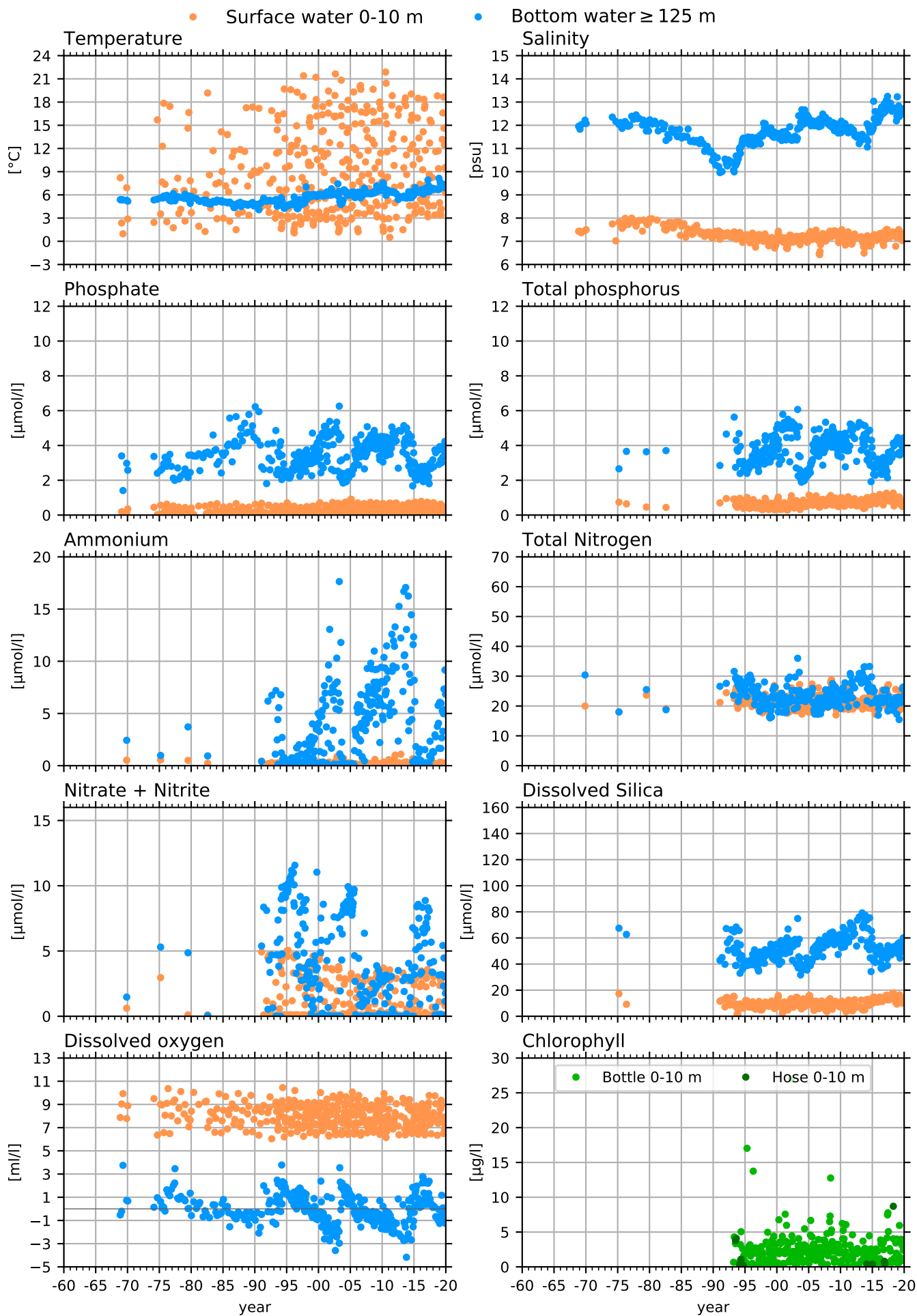
REF M1V1, BORNHOLM COASTAL



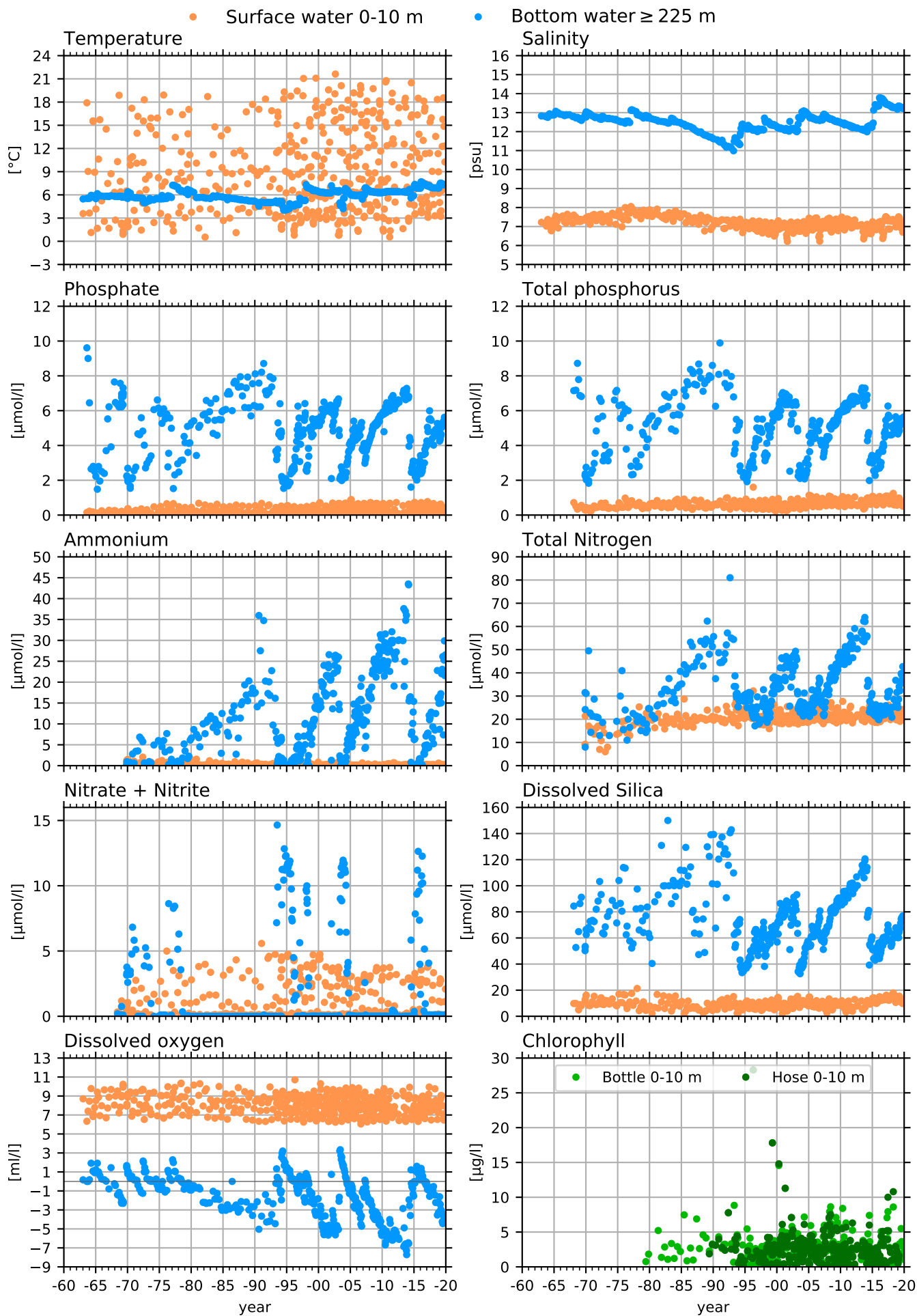
BCS III-10, EASTERN GOTLAND BASIN



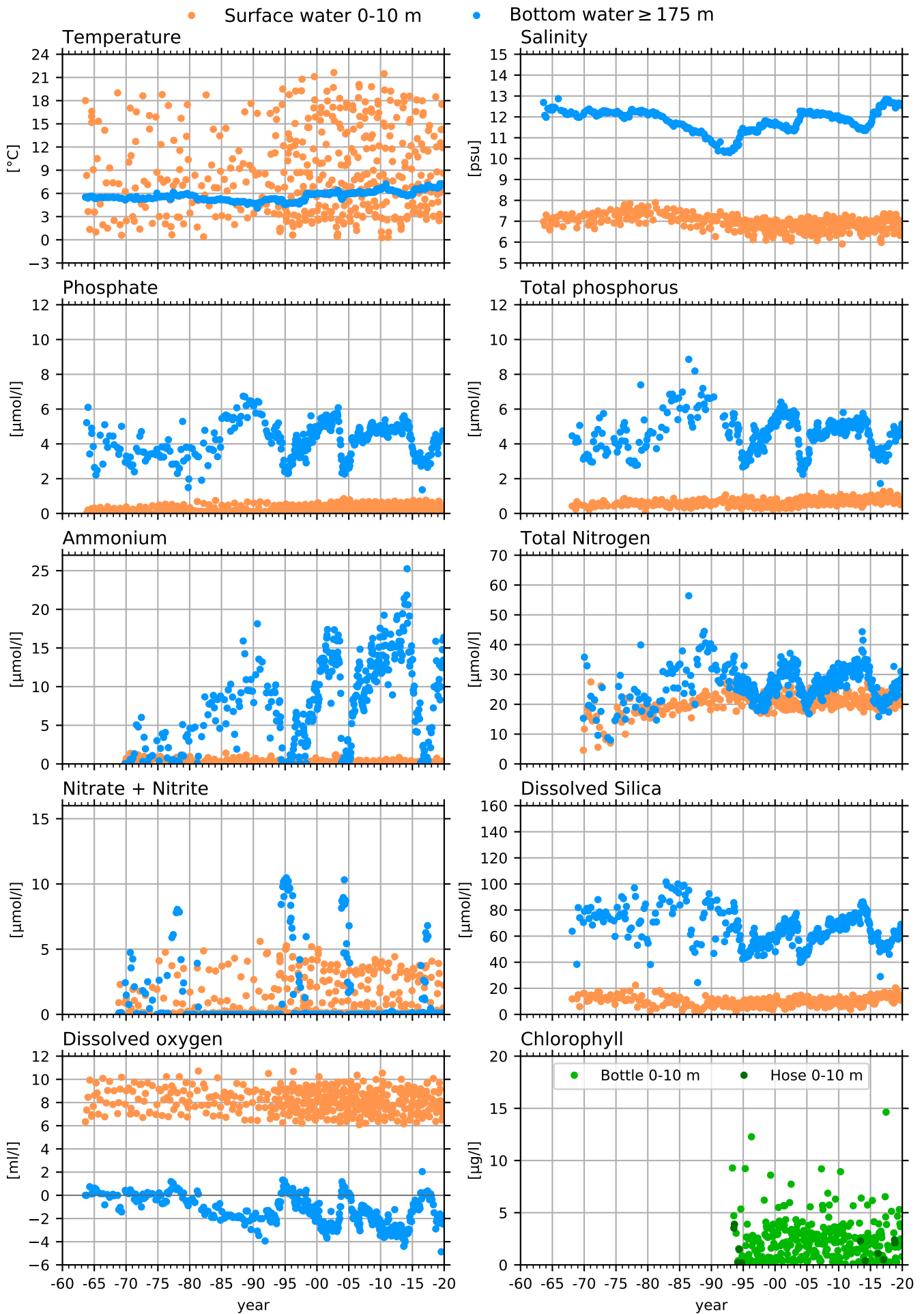
BY10, EASTERN GOTLAND BASIN



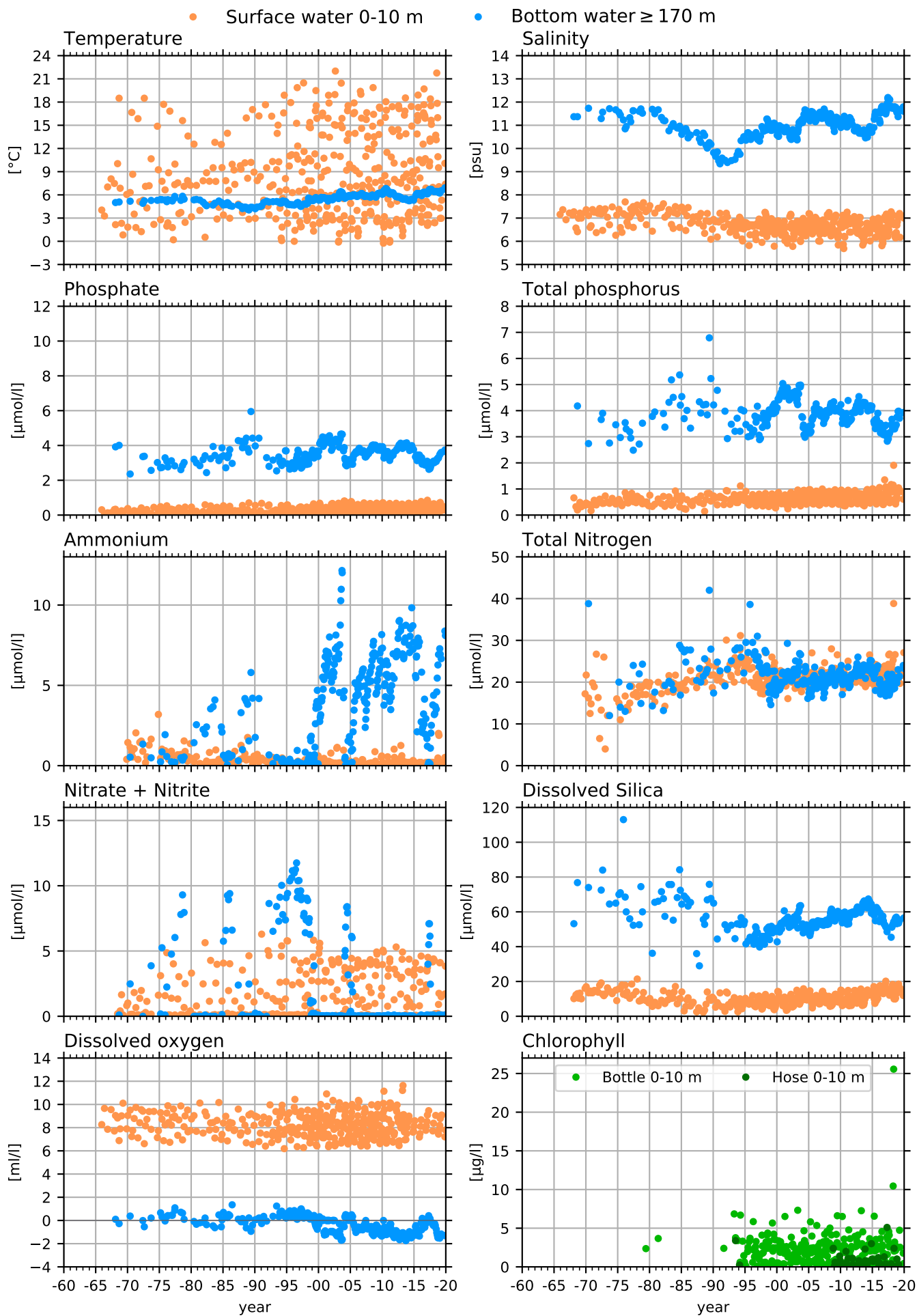
BY15 GOTLAND DEEP, EASTERN GOTLAND BASIN



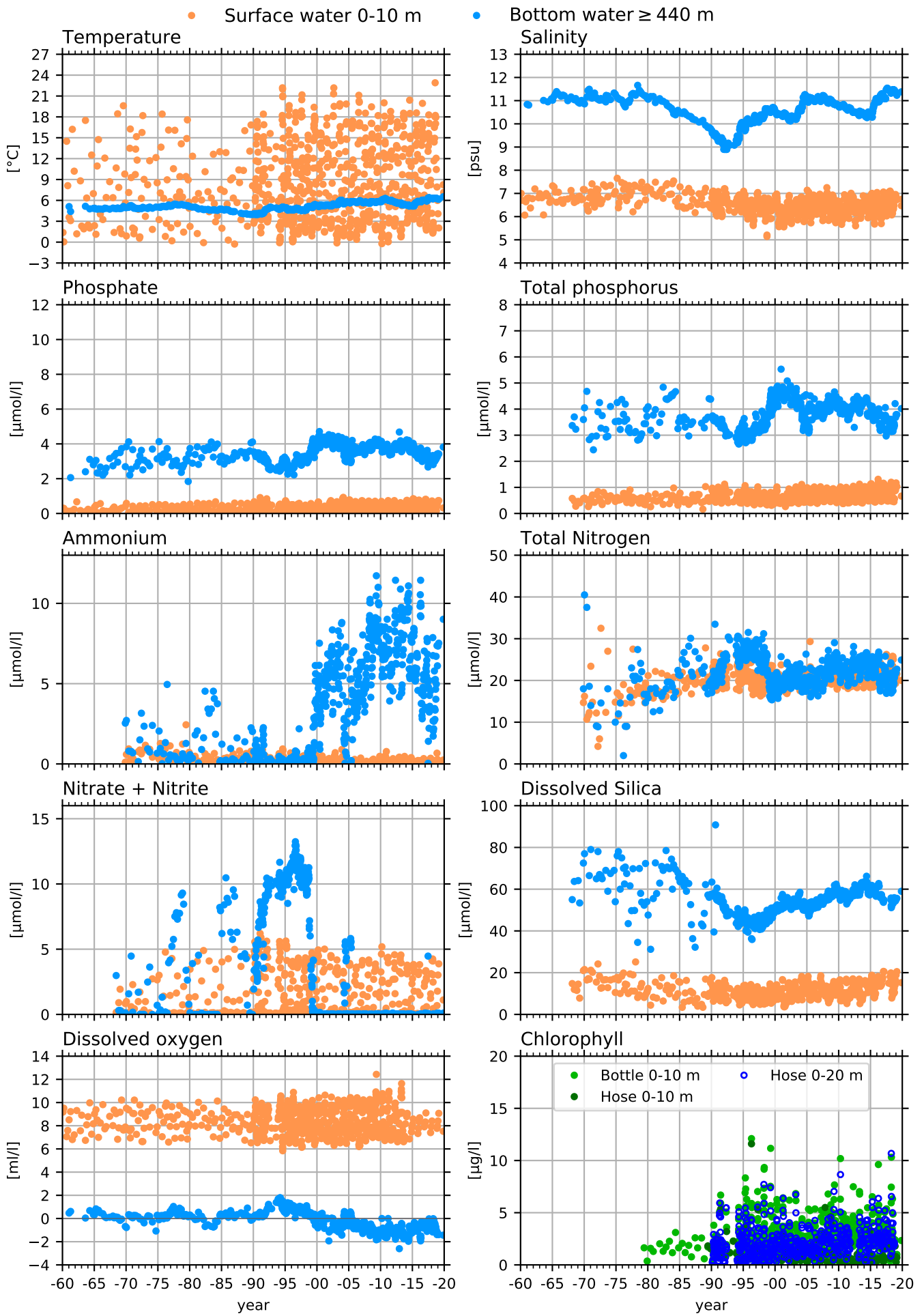
BY20 FÅRÖ DEEP, EASTERN GOTLAND BASIN



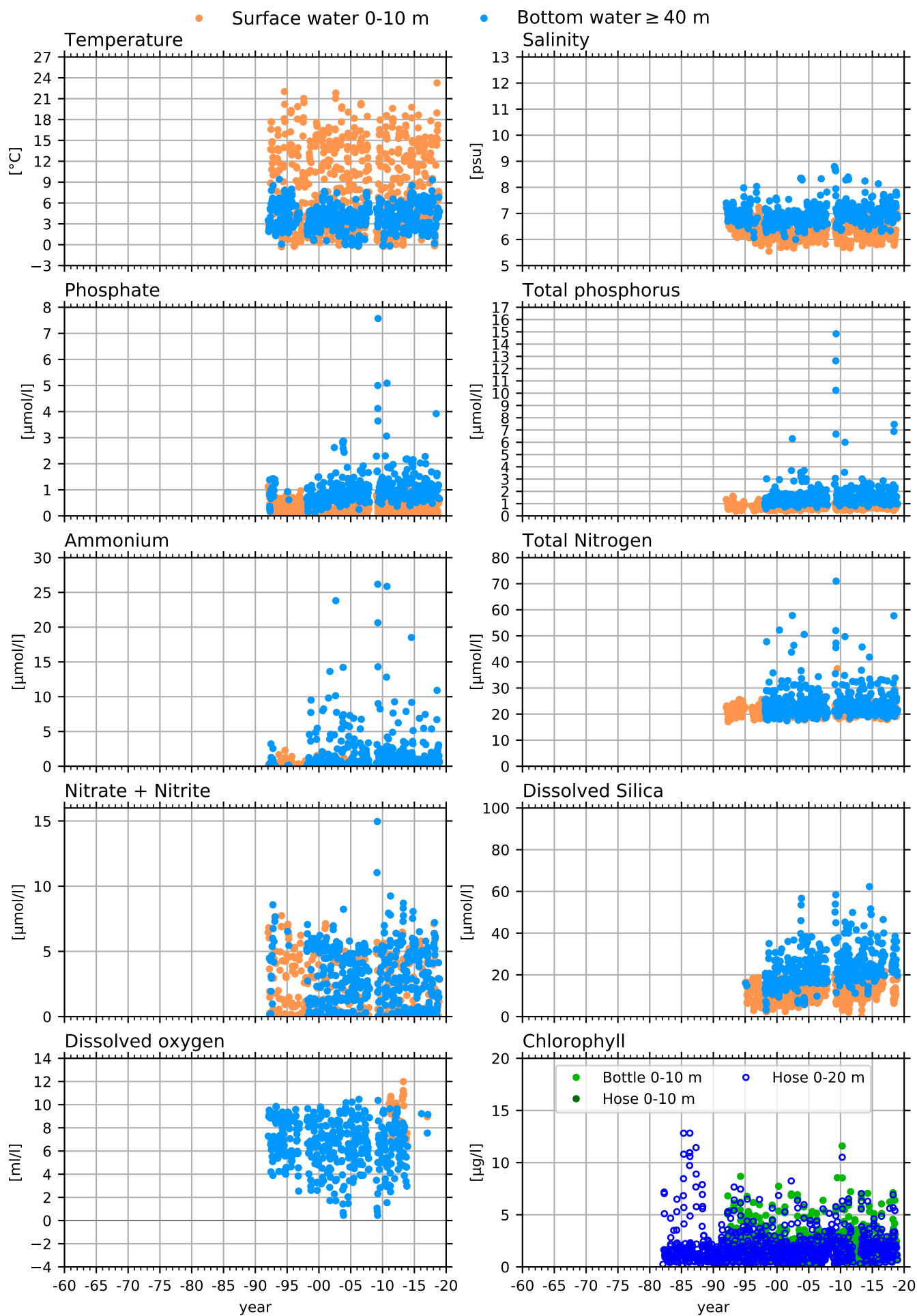
BY29 / LL19, NORTHERN BALTIC PROPER



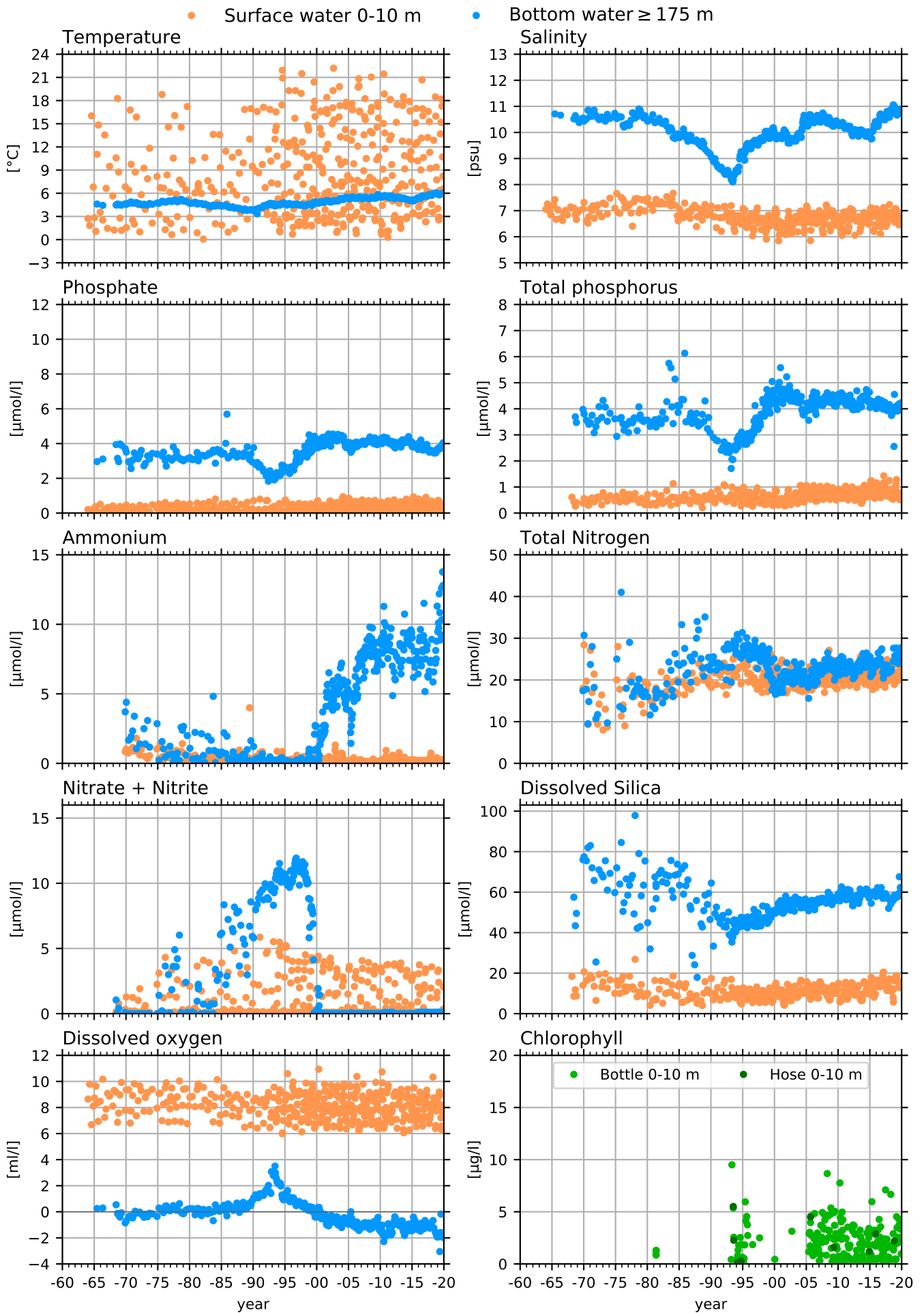
BY31 LANDSORT DEEP, WESTERN GOTLAND BASIN



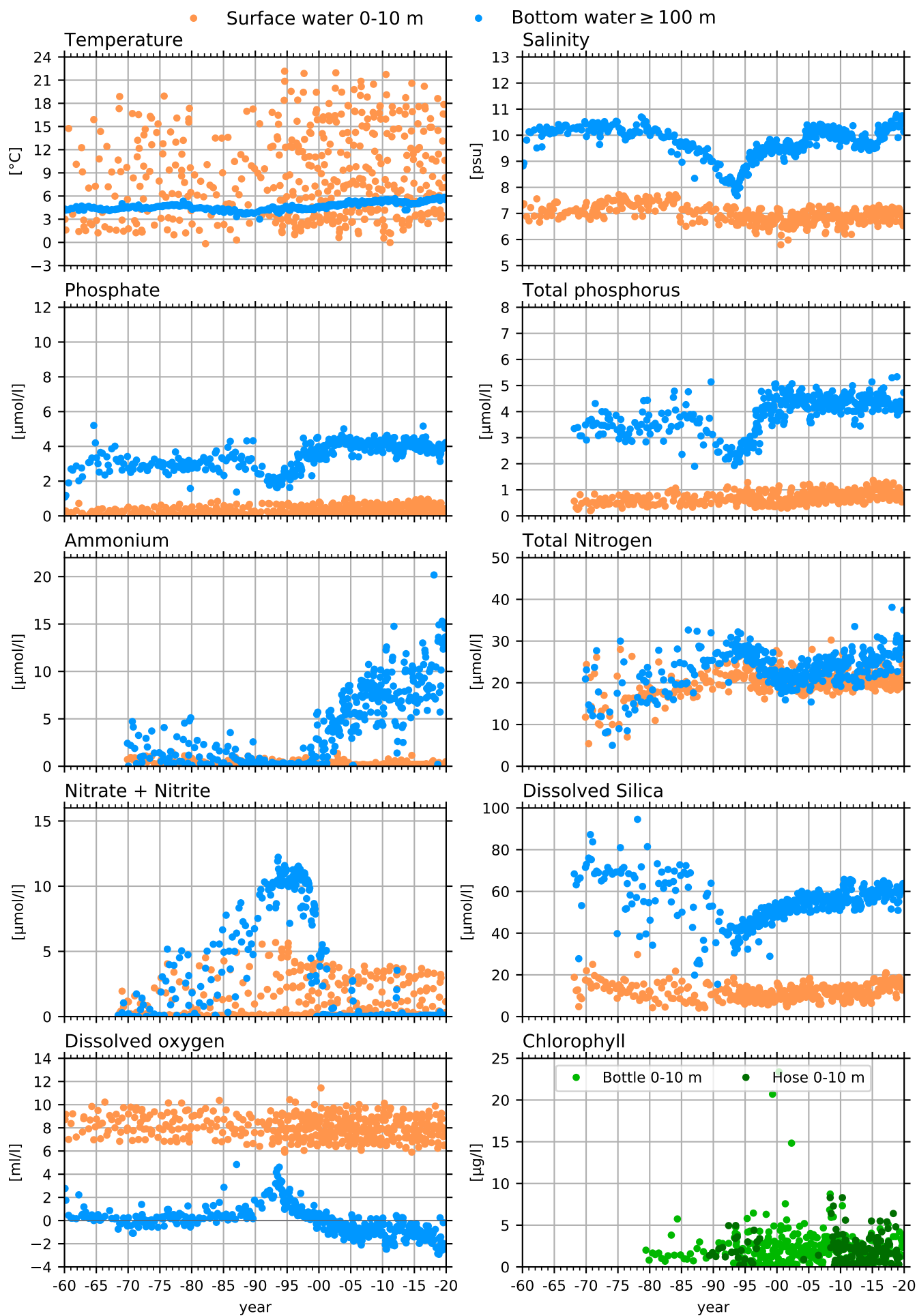
B1 (ASKÖ), WESTERN GOTLAND BASIN COASTAL



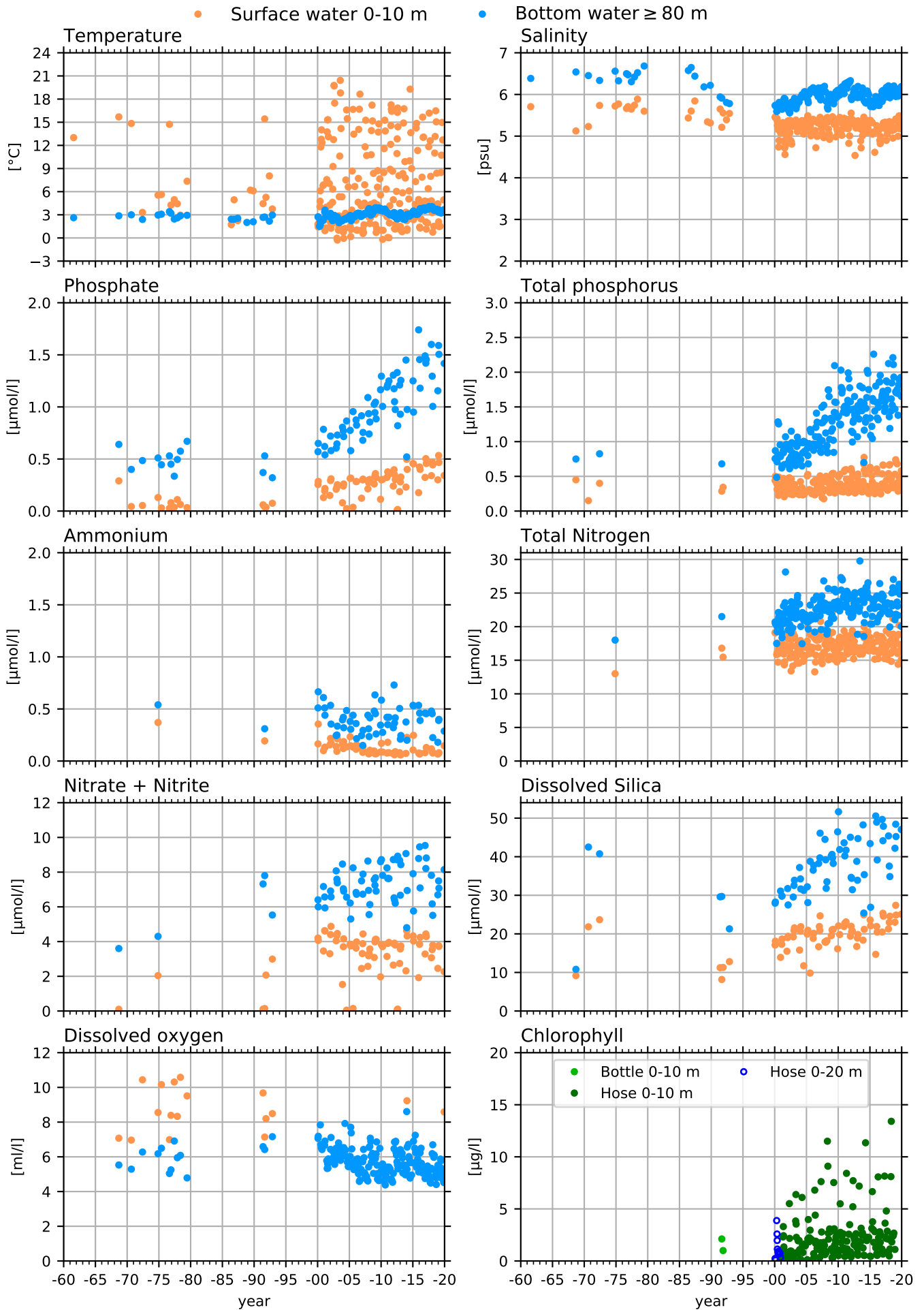
BY32 NORRKÖPING DEEP, WESTERN GOTLAND BASIN



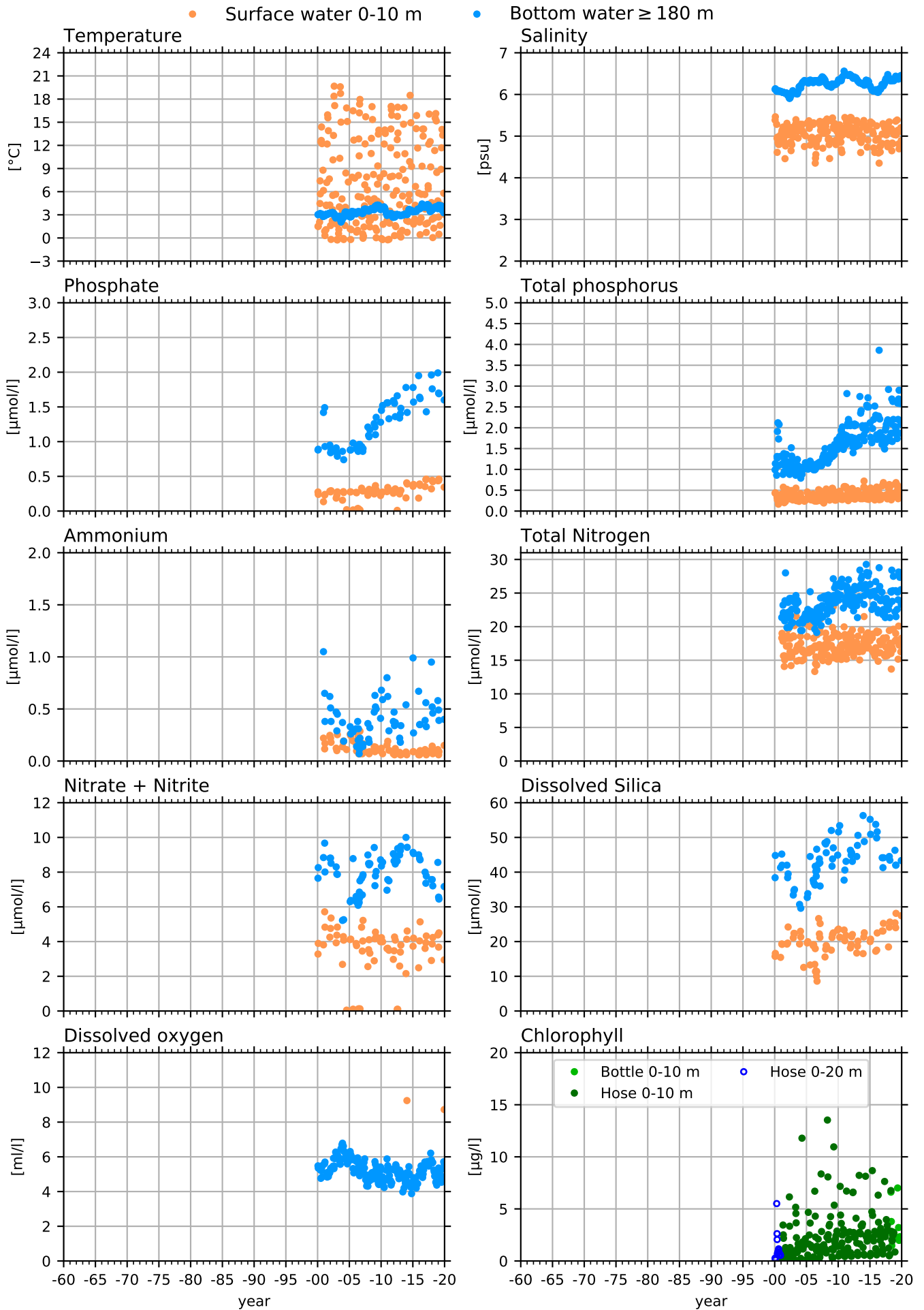
BY38 KARLSÖ DEEP, WESTERN GOTLAND BASIN



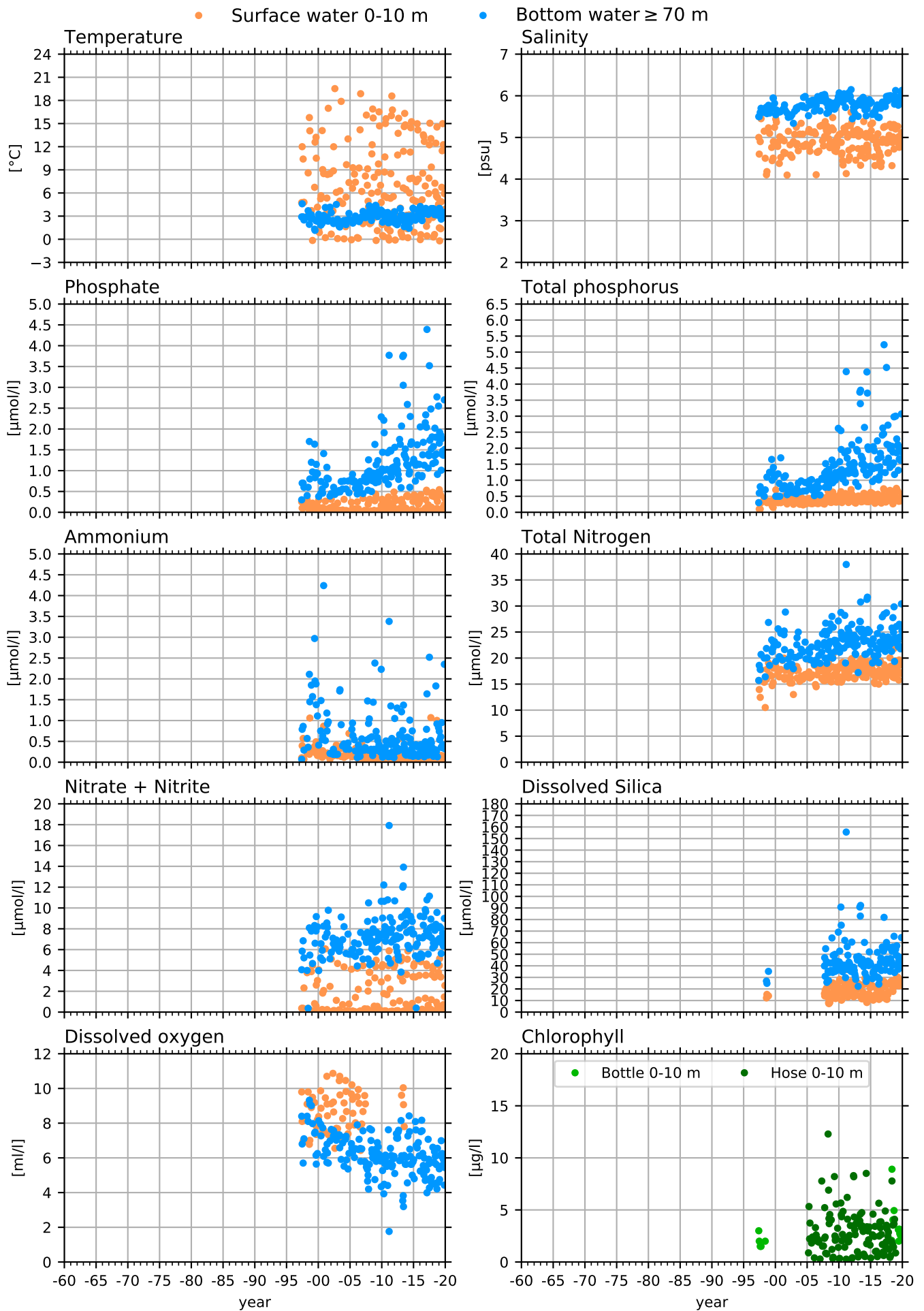
MS4 / C14, BOTHNIAN SEA



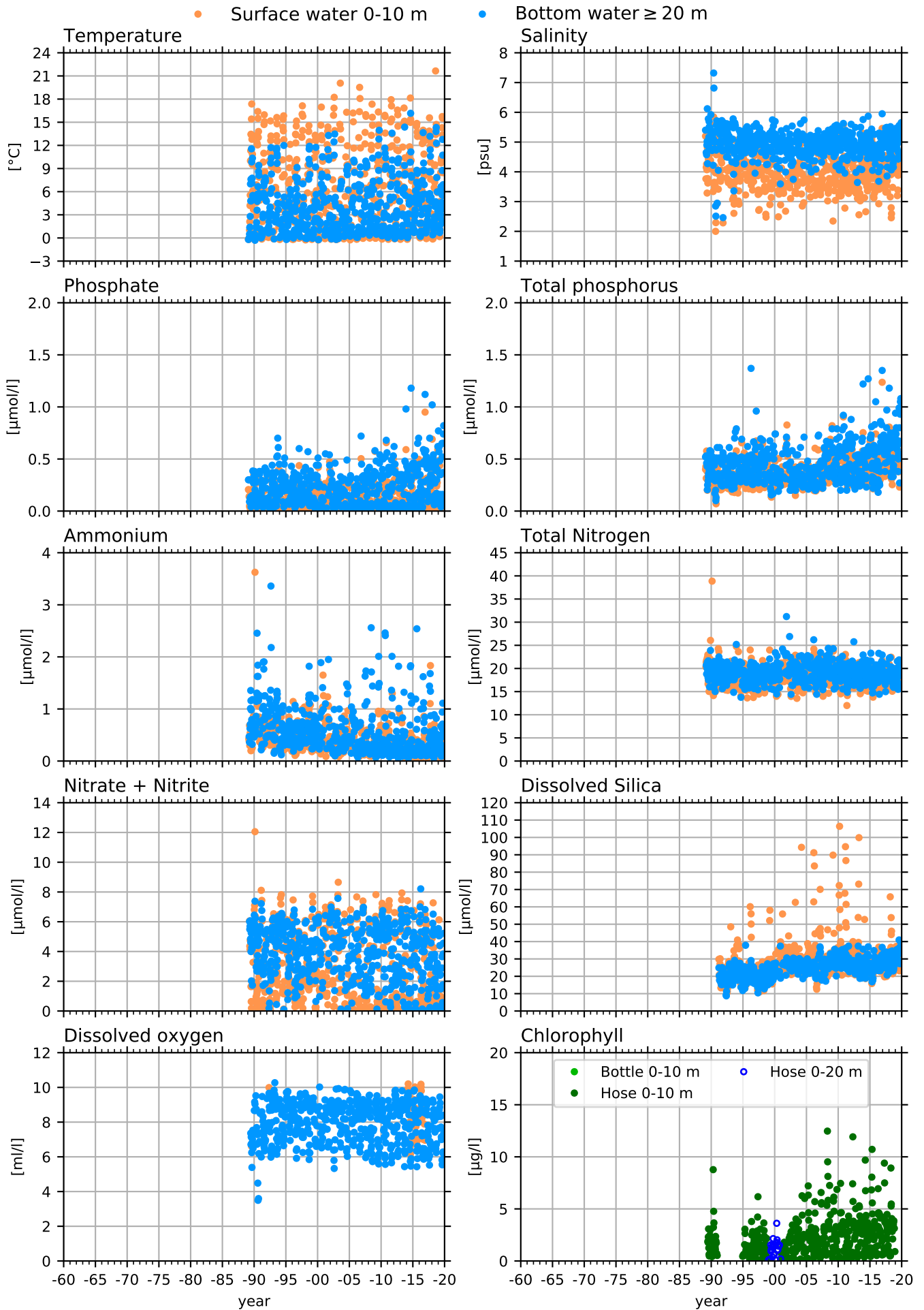
C3, BOTHNIAN SEA



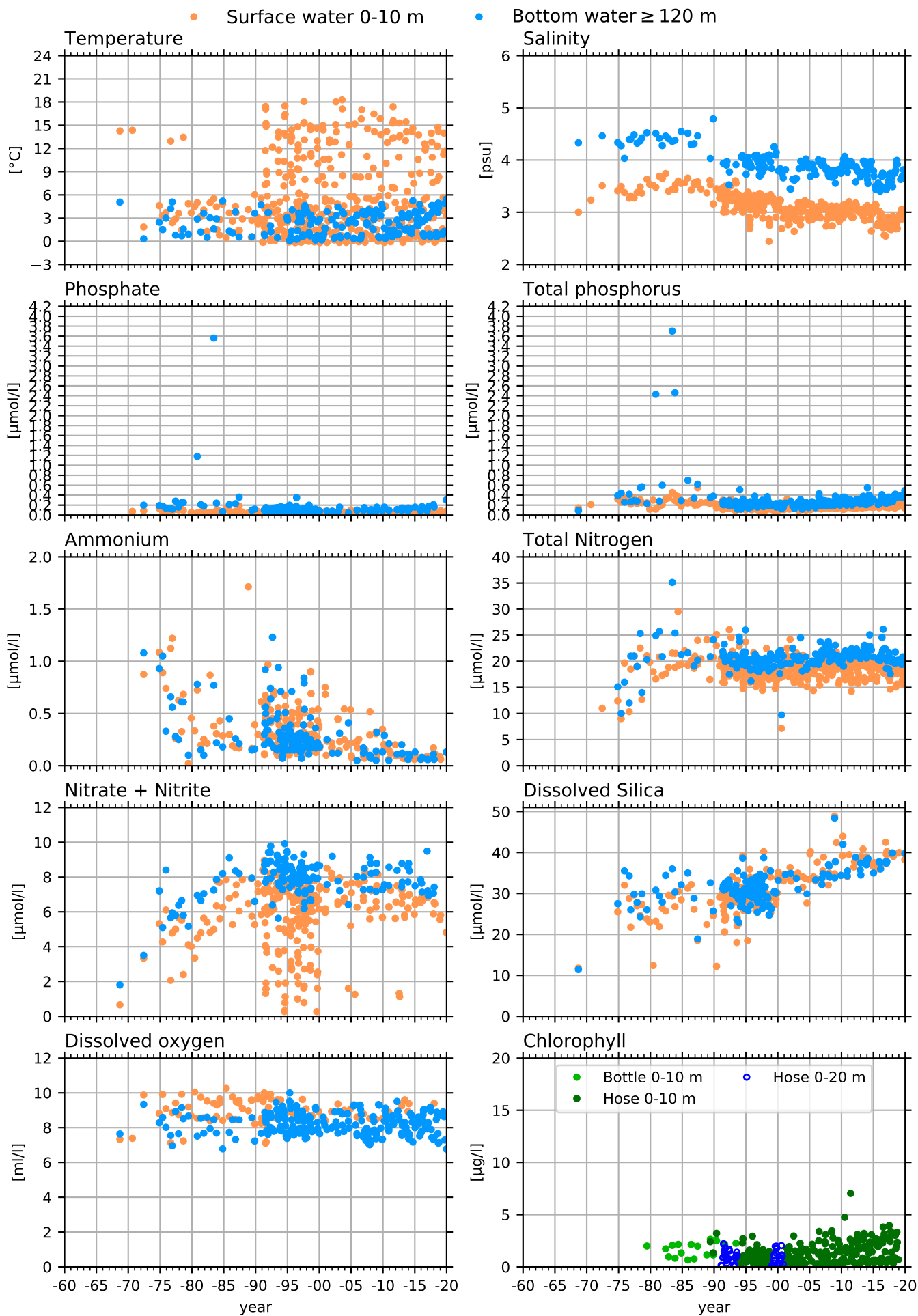
GAVIK-1, BOTHNIAN SEA COASTAL



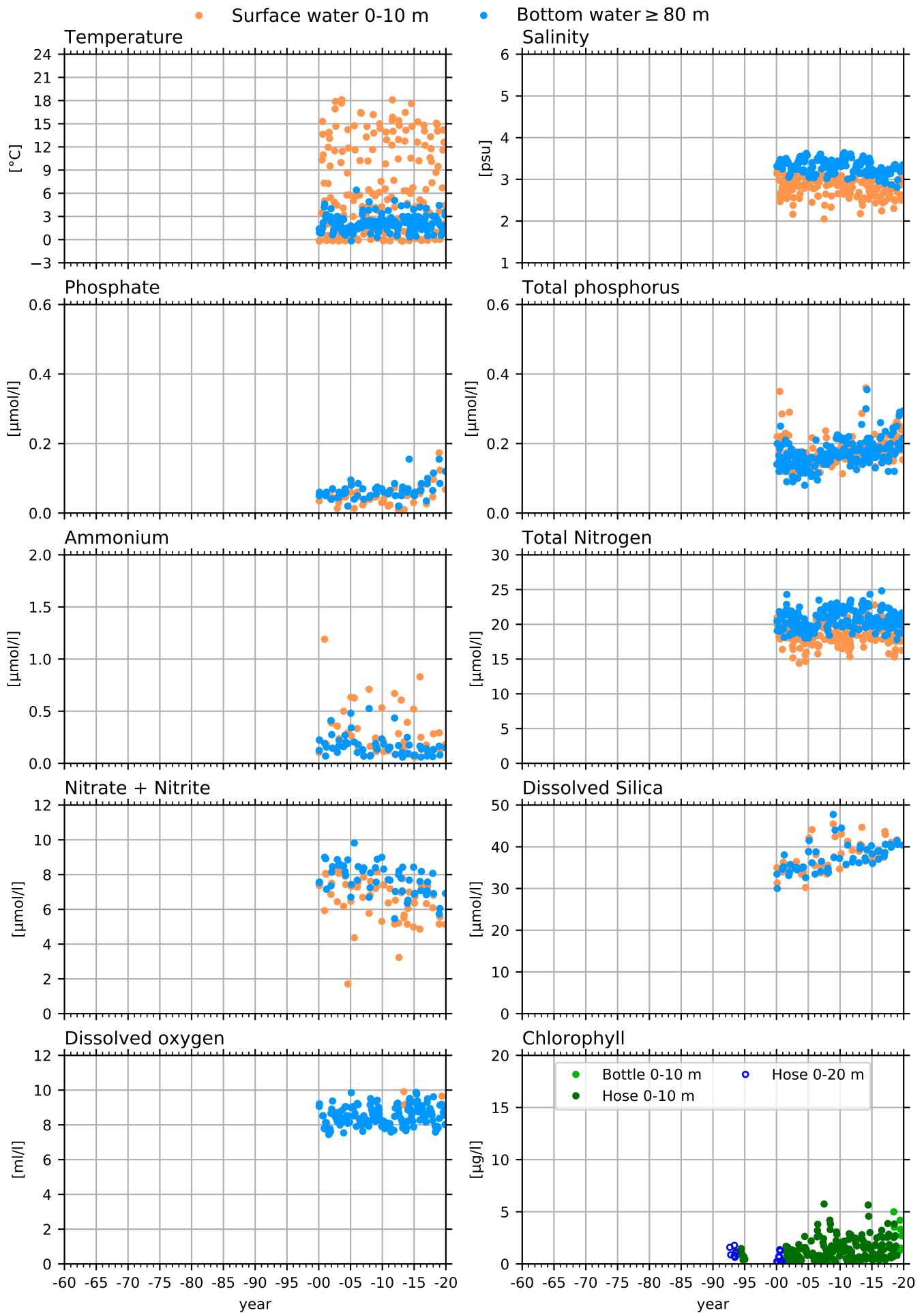
B7 & NB1 / B3, THE QUARK



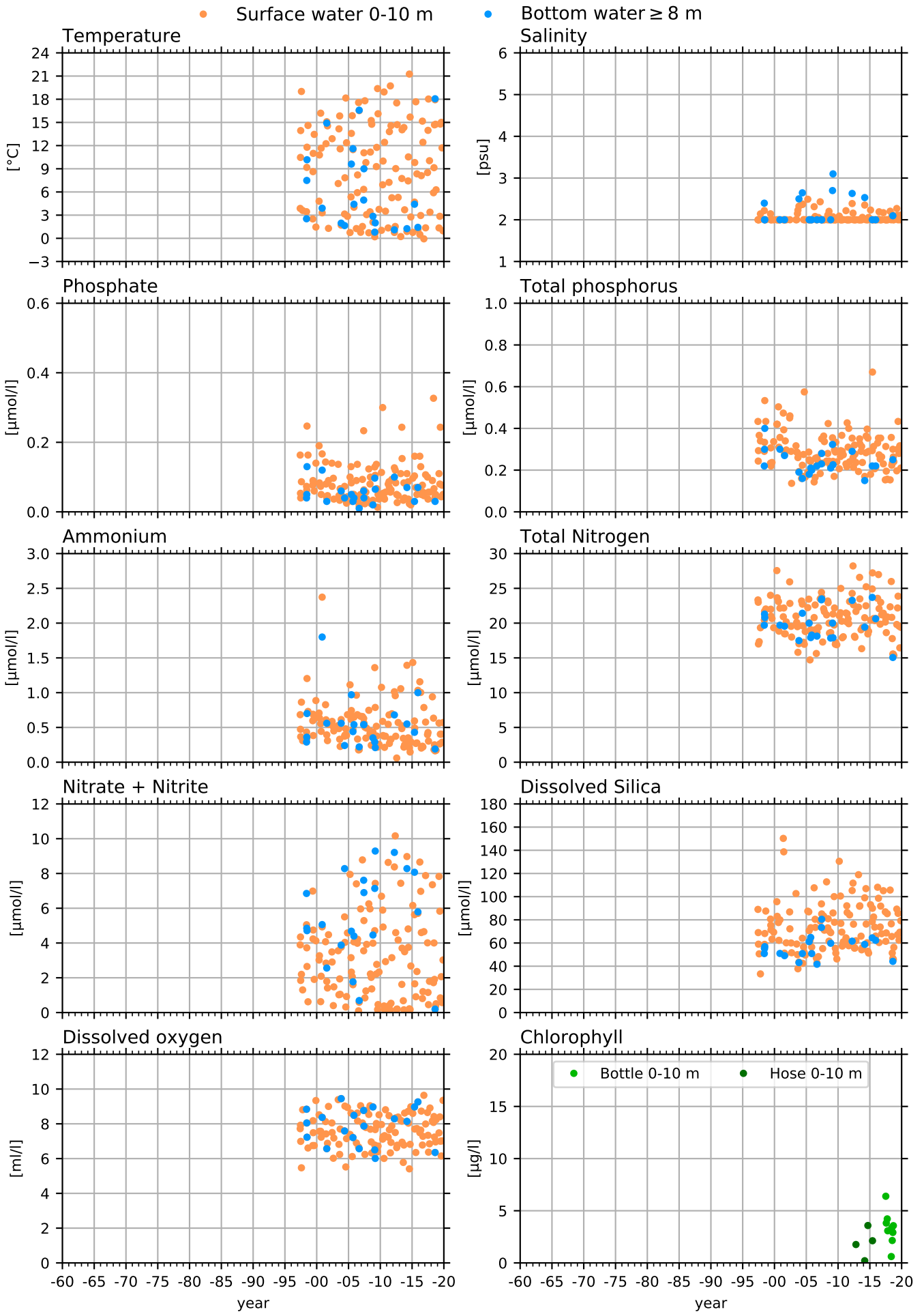
F9 / A13, BOTHNIAN BAY



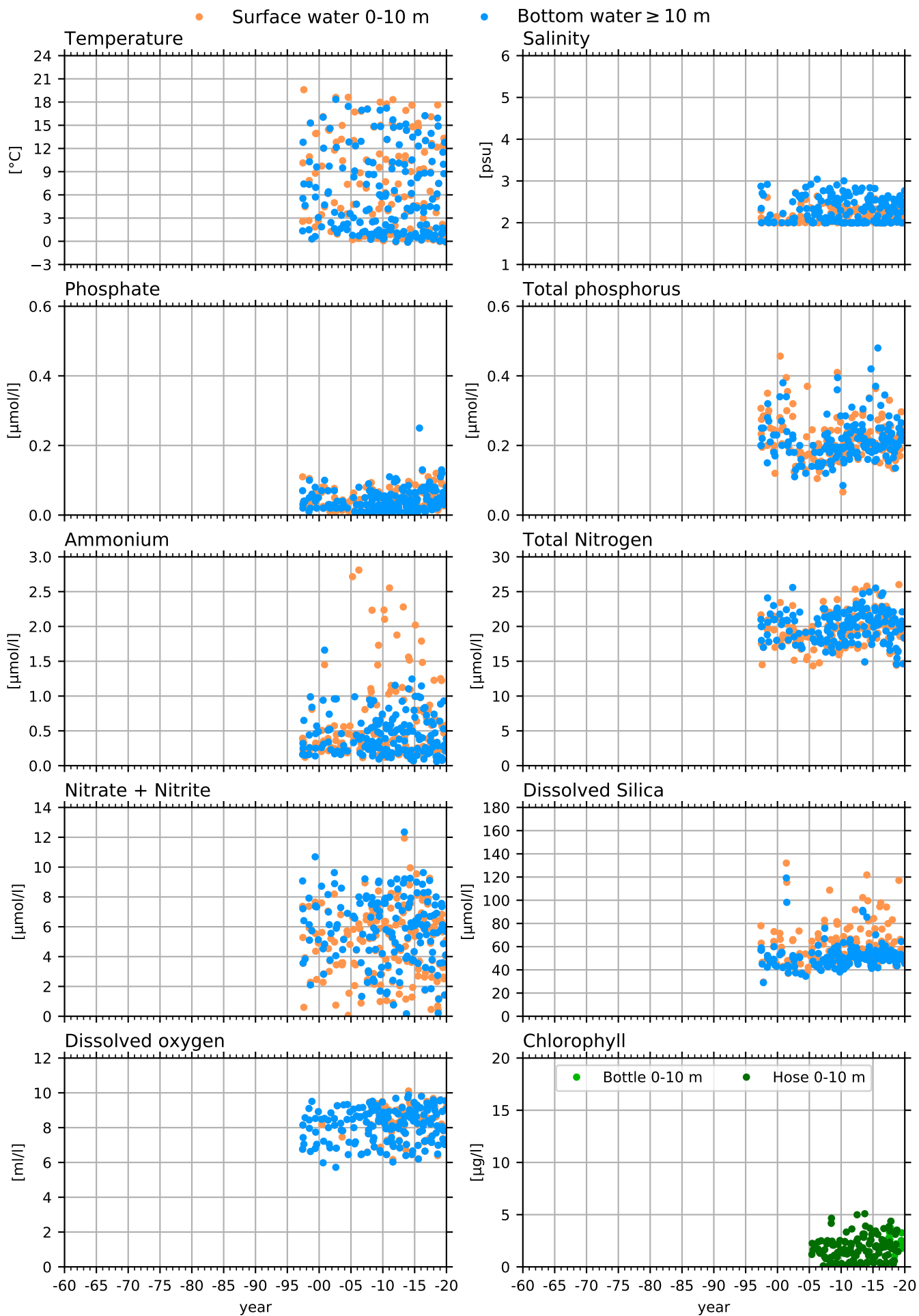
F3 / A5, BOTHNIAN BAY



RÅNEÅ-1, BOTHNIAN BAY COASTAL



RÅNEÅ-2, BOTHNIAN BAY COASTAL



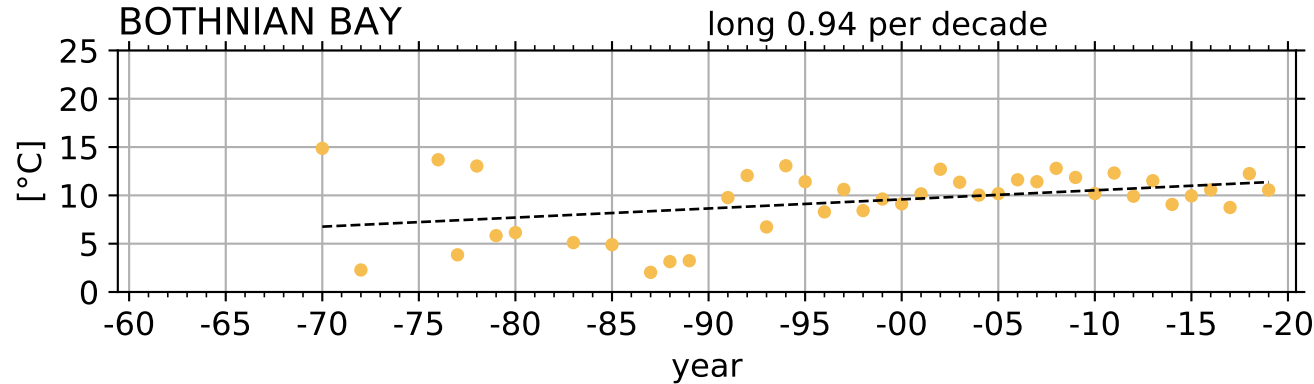
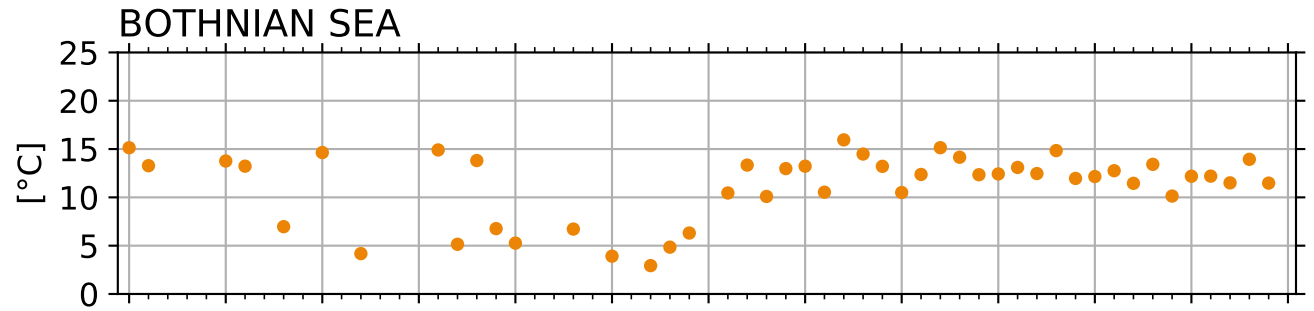
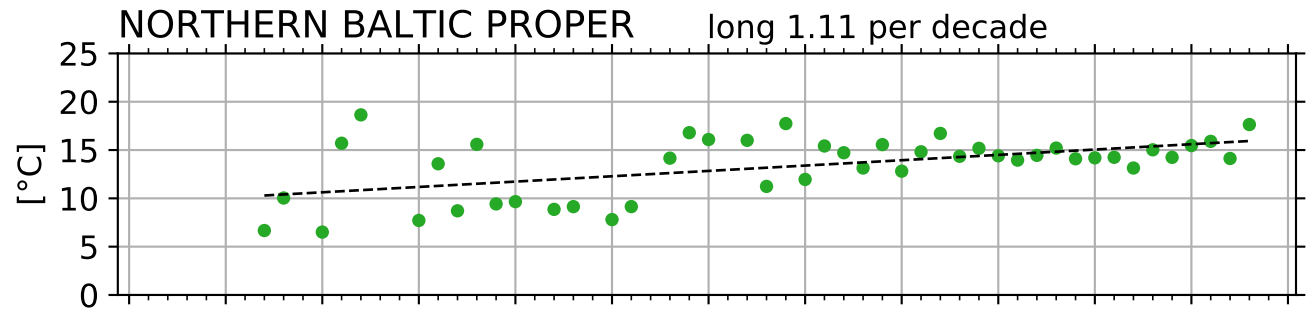
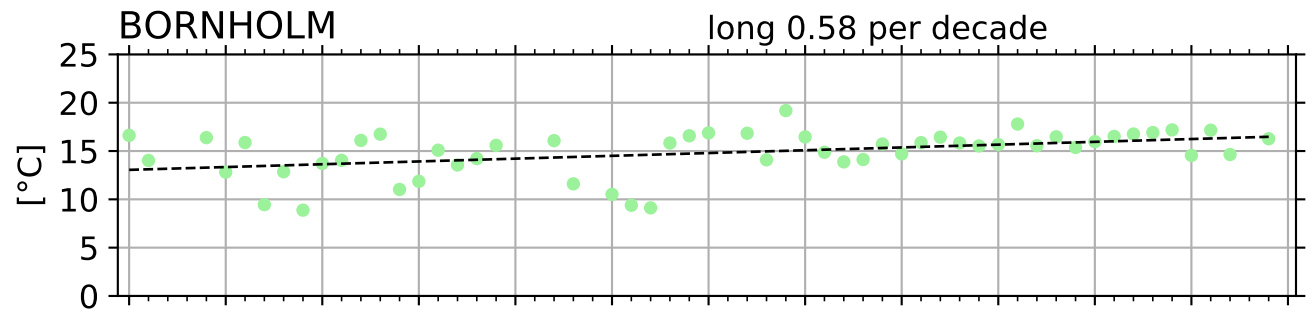
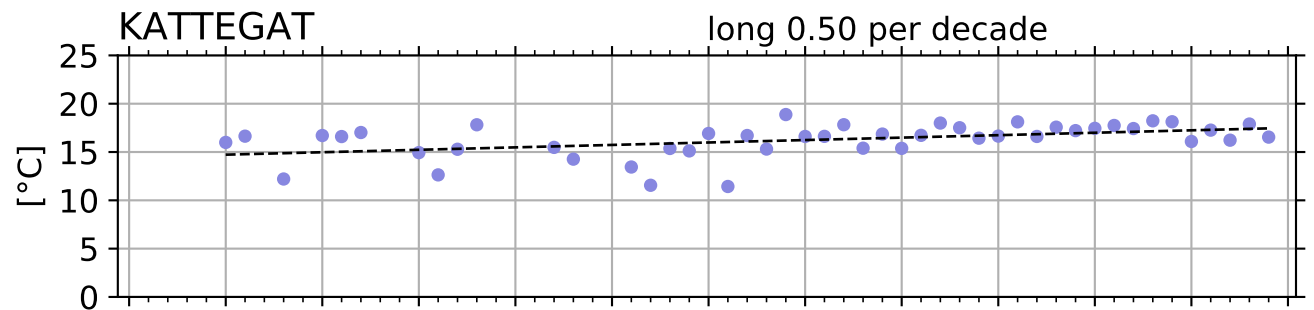
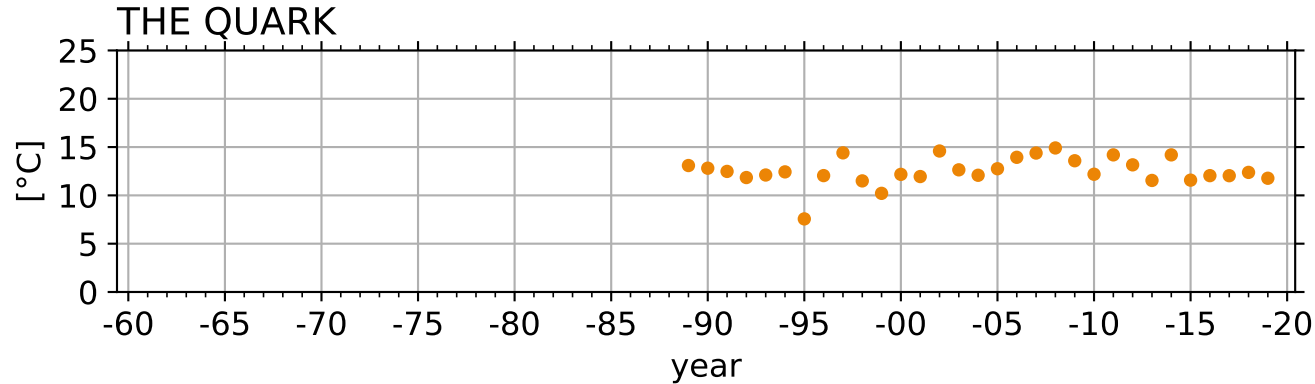
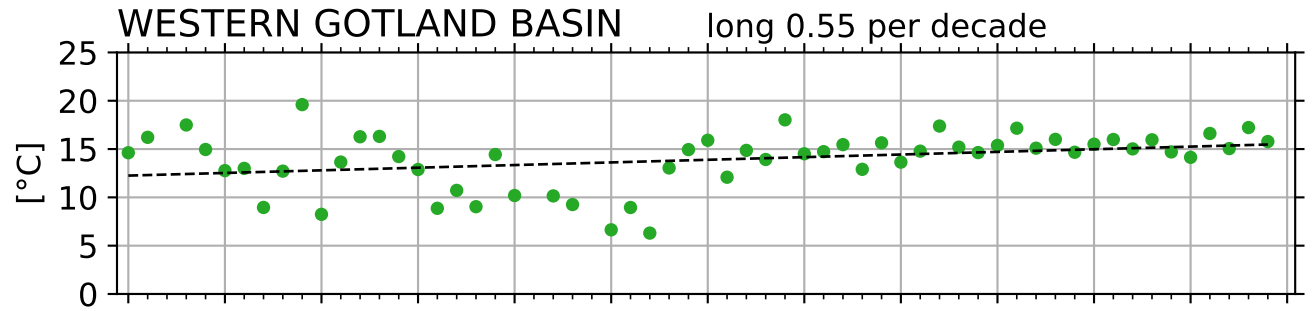
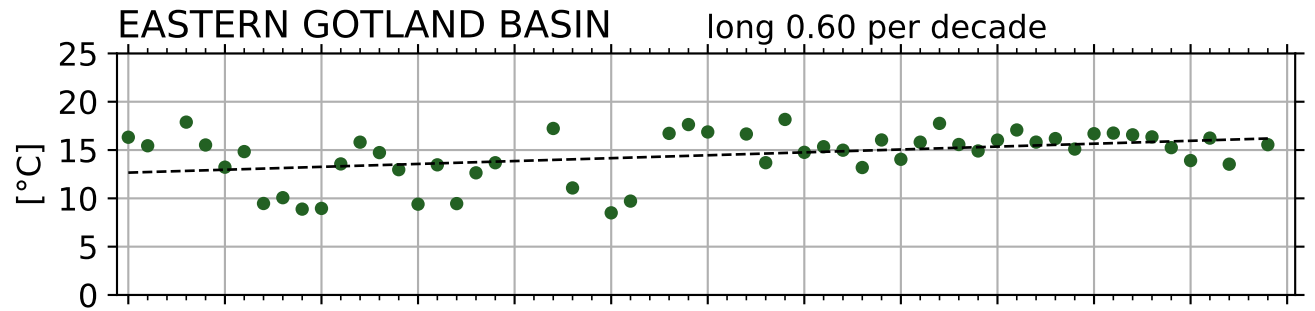
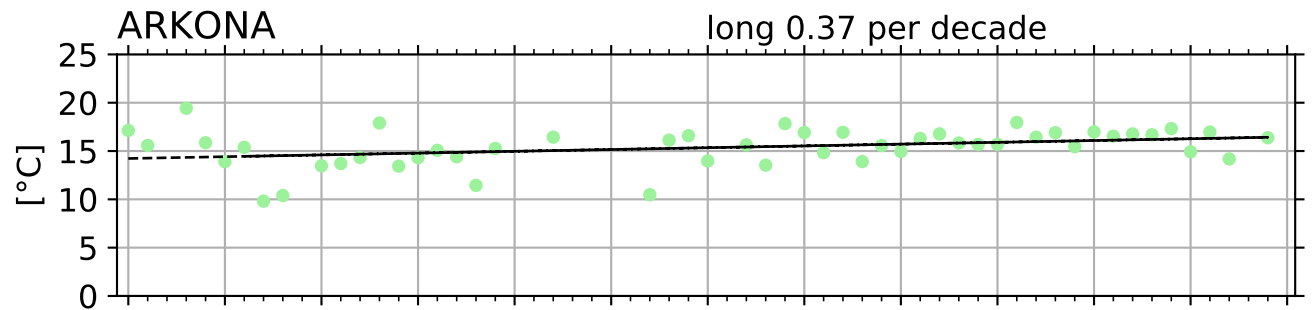
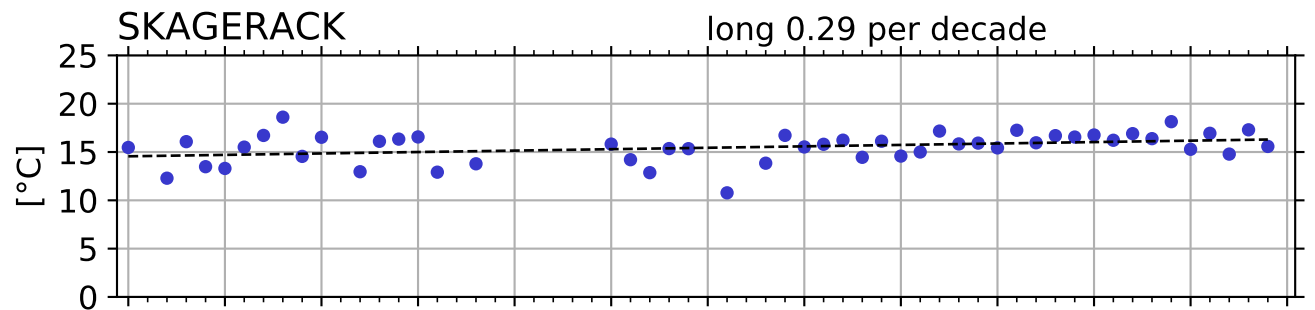
Appendix III

Trends in winter and summer for surface water (0-10 m) and bottom water (station specific)

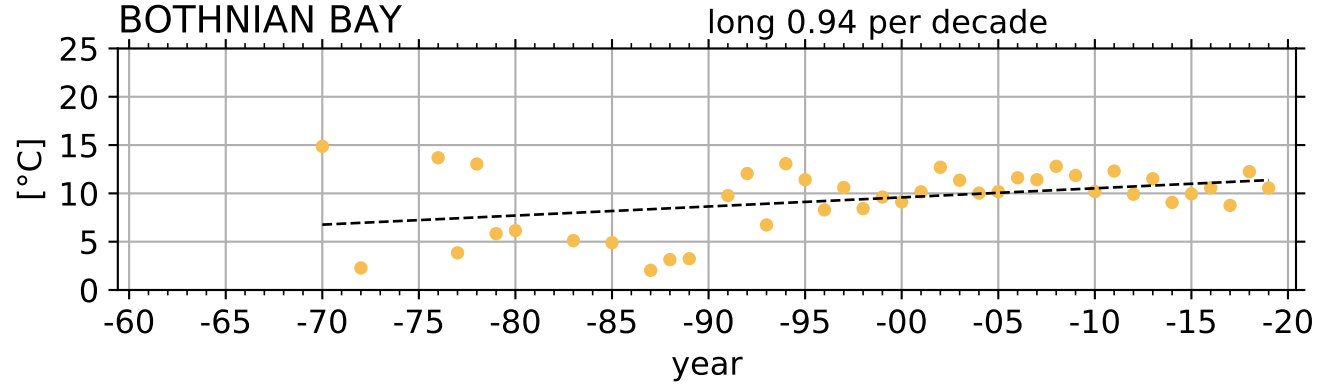
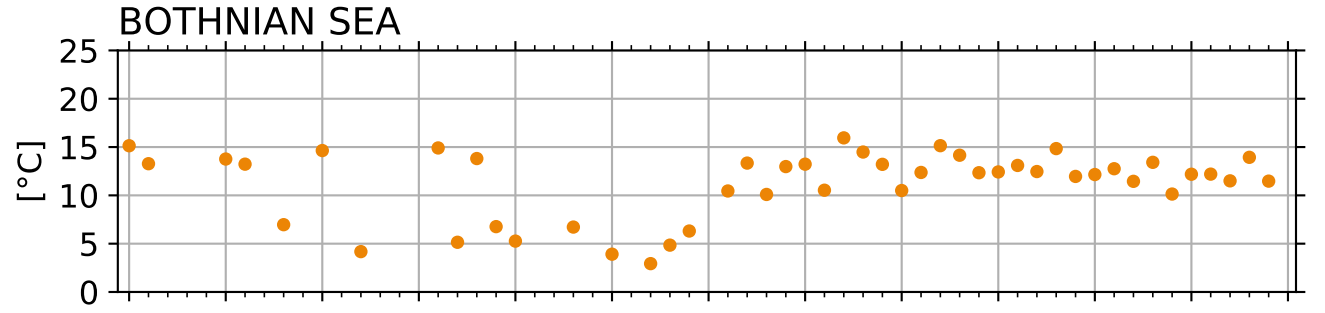
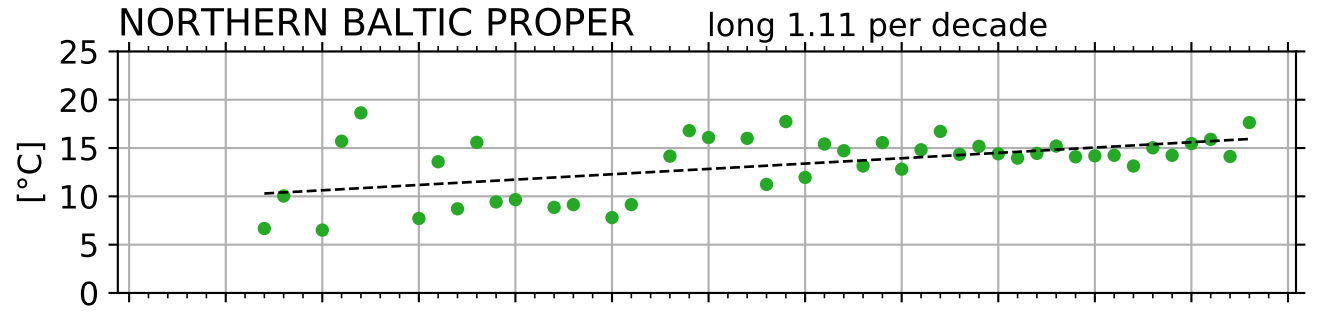
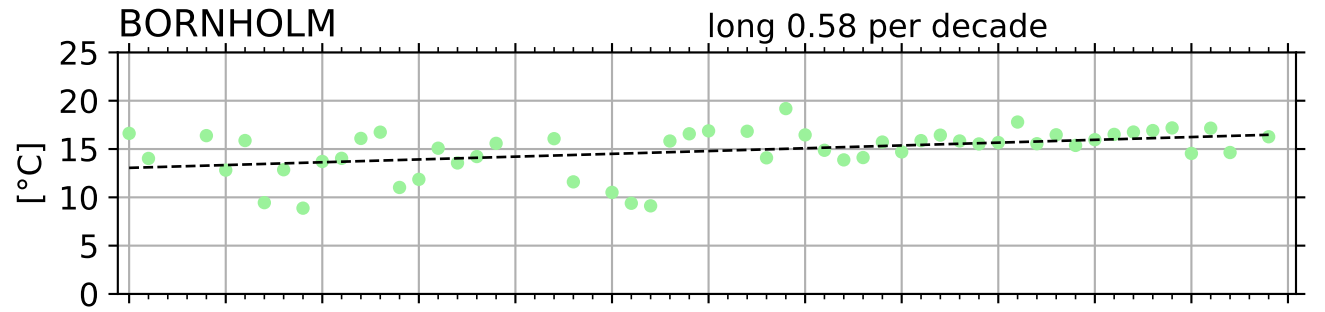
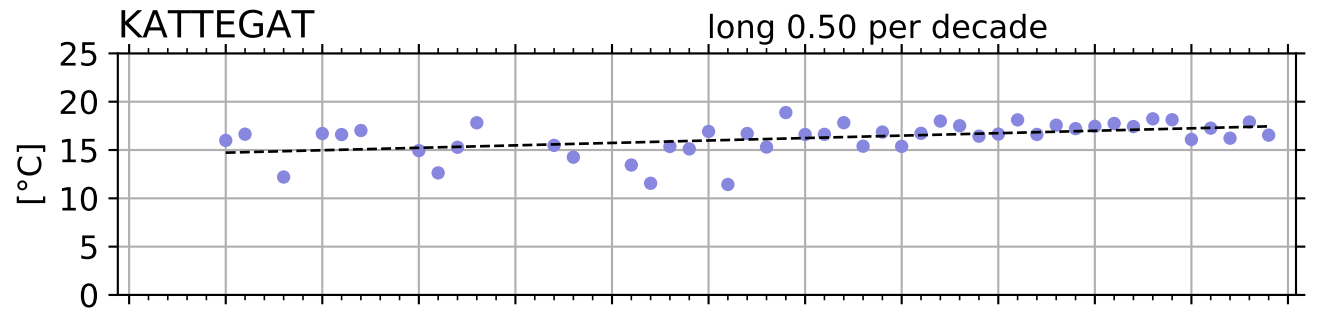
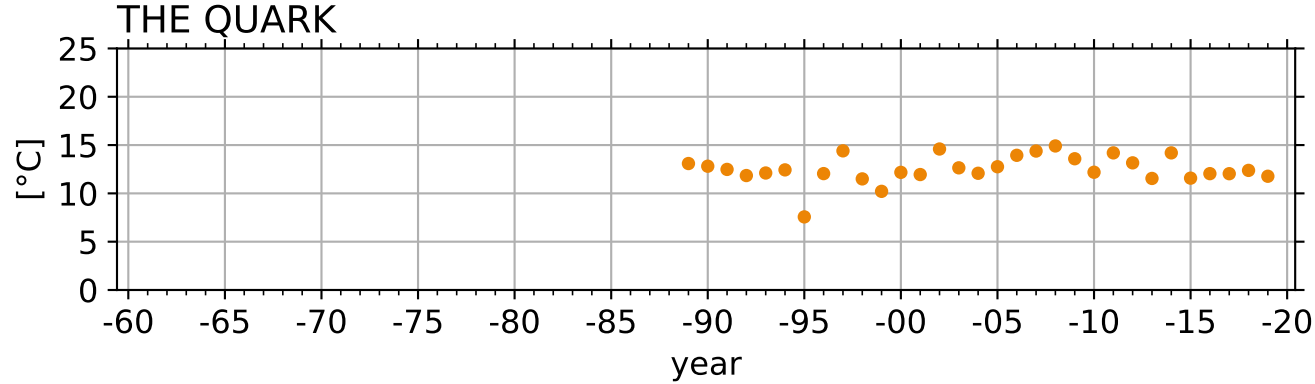
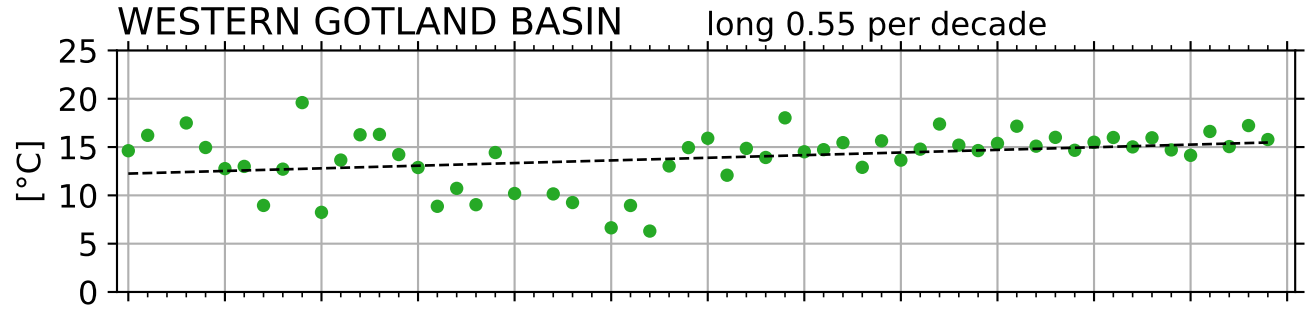
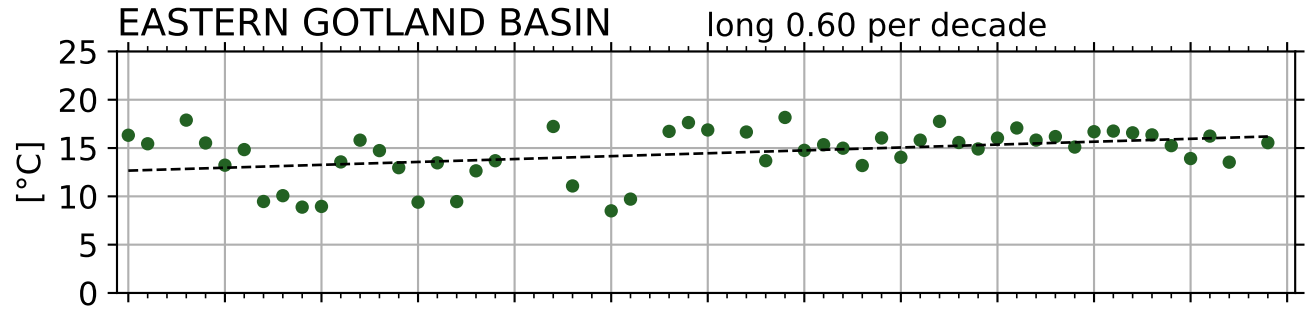
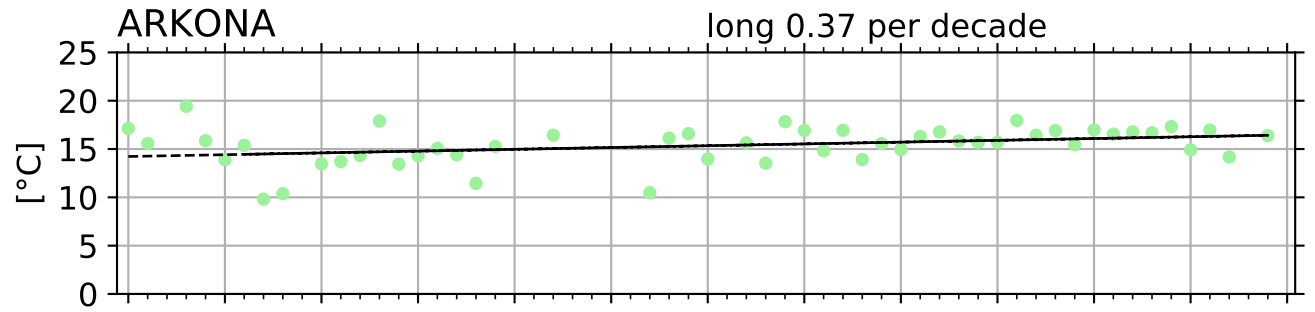
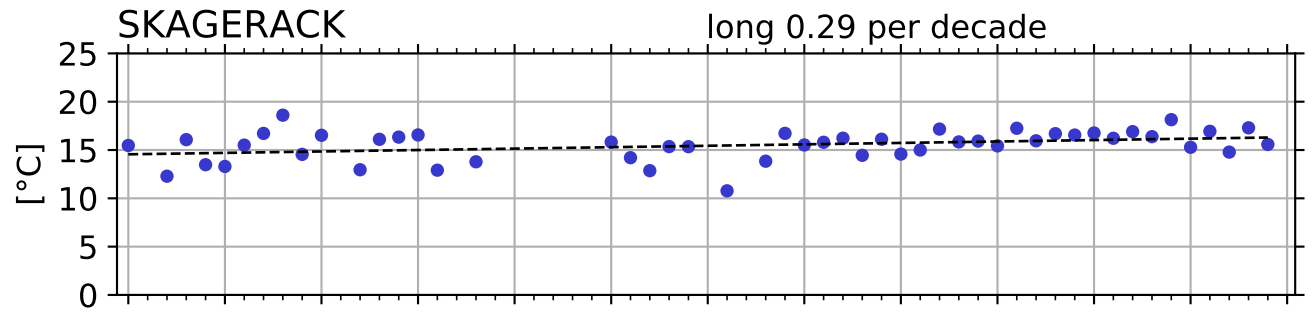
This appendix contains figures of winter mean values of all salinity, temperature and nutrients and summer mean values of temperature for each basin. To avoid biasing towards stations visited more frequently, averages were first calculated per month and station, then winter or summer season for each basin. The summer season was defined as June, July, August and winter as December, January, February. These months were used for all basins although the seasons differ somewhat between the Gulf of Bothnia and the Skagerrak and Kattegat. Linear trends are calculated for the winter and summer mean values for surface (0-10 m) and bottom waters for two periods, 1960-2019 and 1994-2019. Trends lines are shown in the figures when the p-value of the slope was ≤ 0.05 . The post-1994 trend analysis is based on years with mostly the same frequency of sampling, while the sampling frequency is more variable in the longer time series. For pH in the Skagerrak data are very scarce and no trends were calculated in there for pH.

For this analysis all current standard stations are included, but for the Bothnian Sea and Bothnian Bay additional stations that were sampled historically are also used in an effort to get more data prior to 1994.

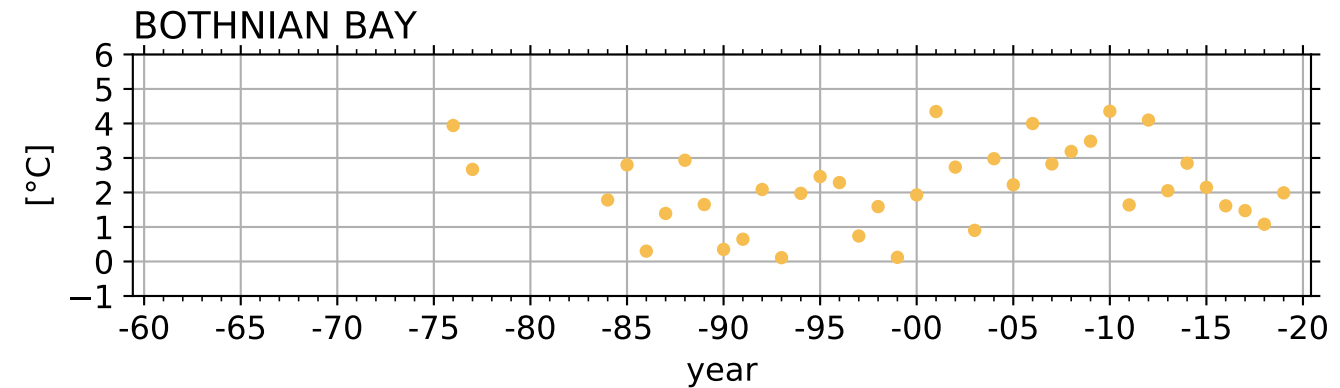
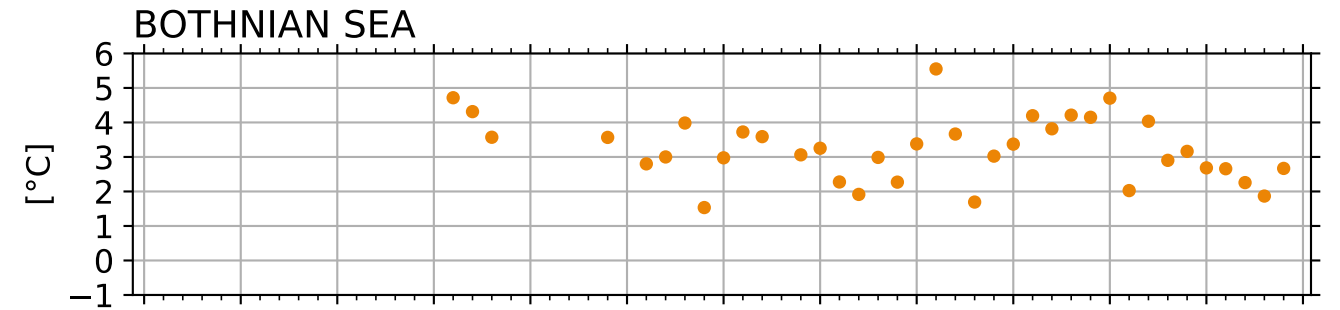
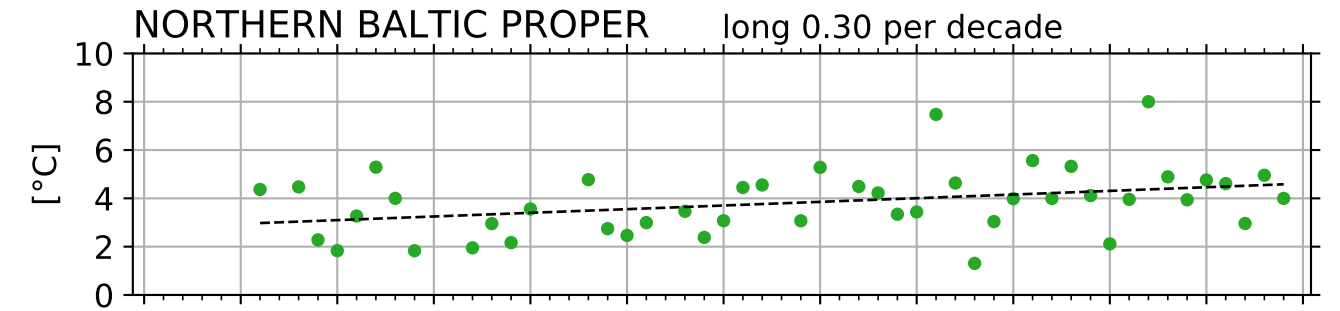
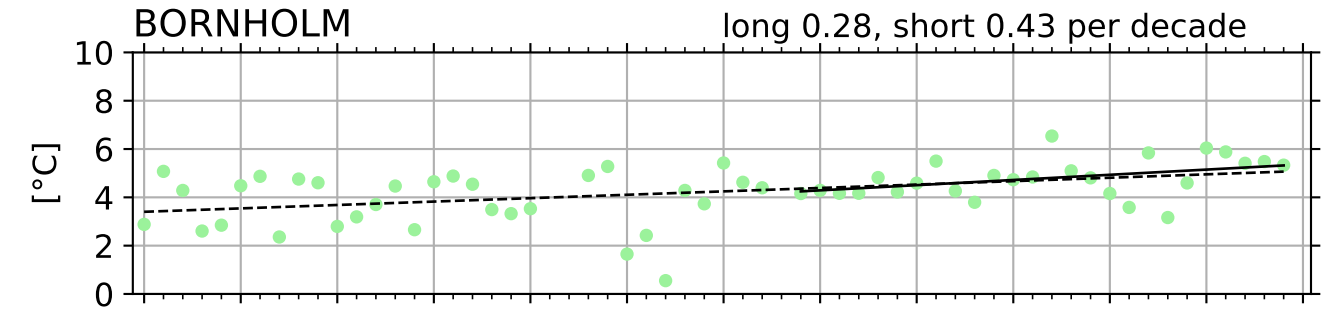
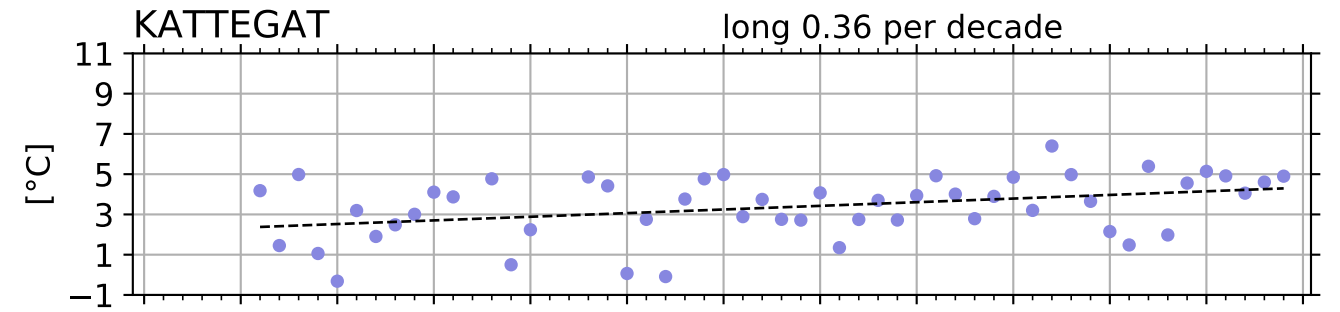
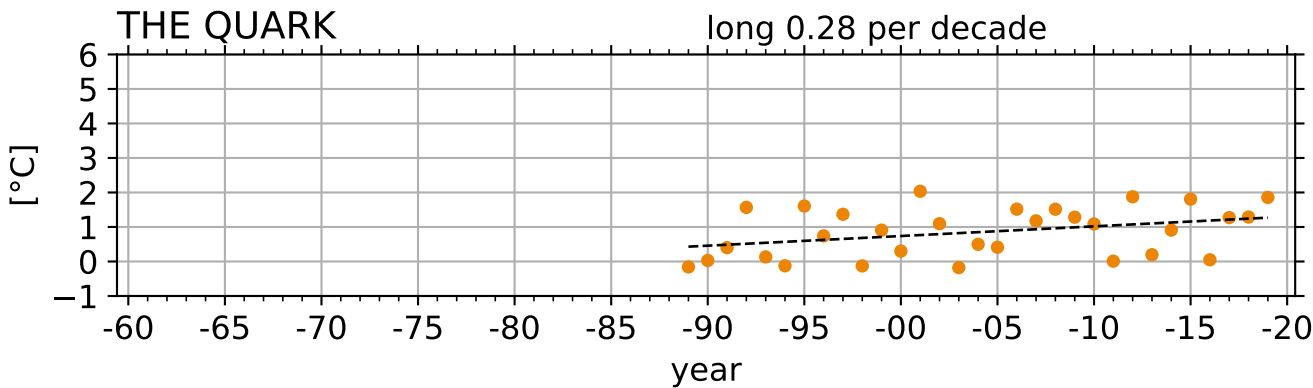
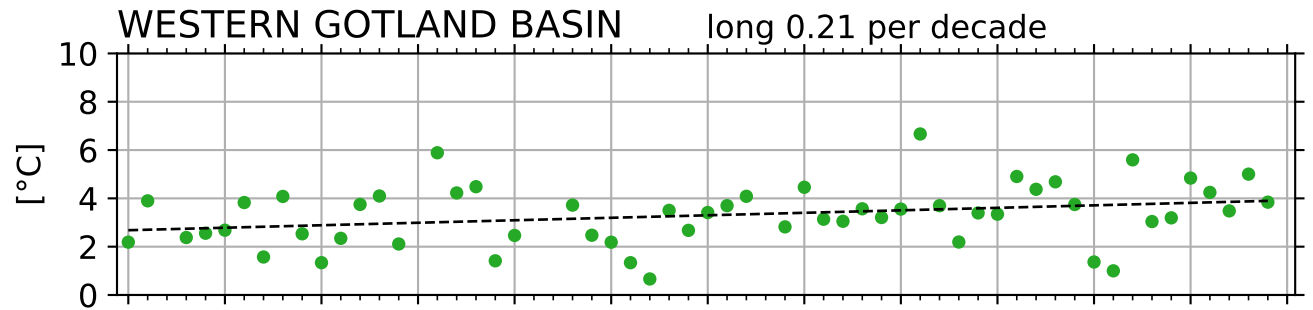
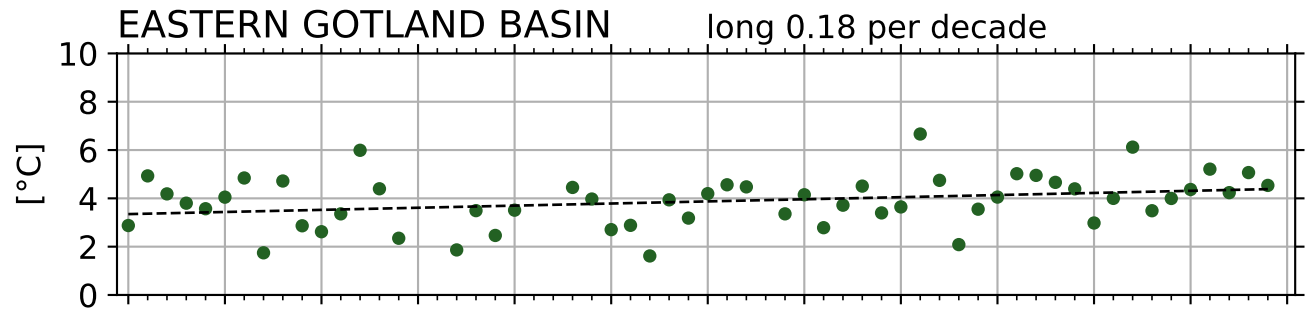
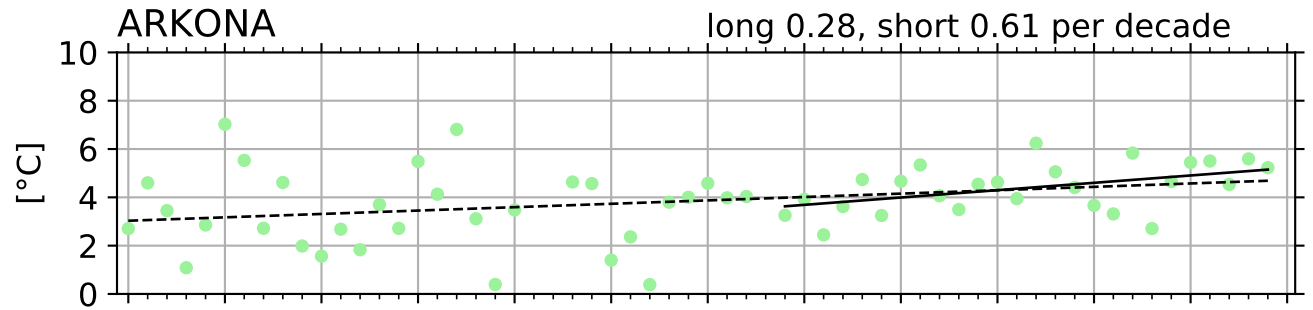
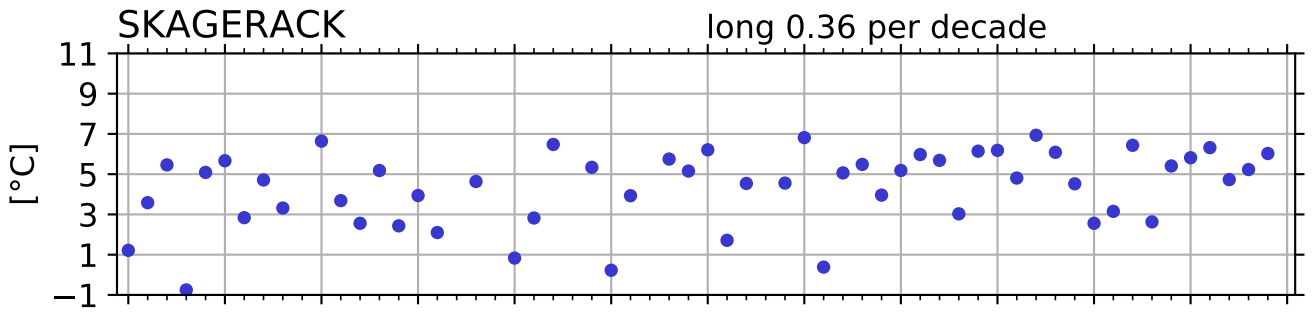
Temperature summer [°C] 0-10 m



Temperature summer [°C] 0-10 m

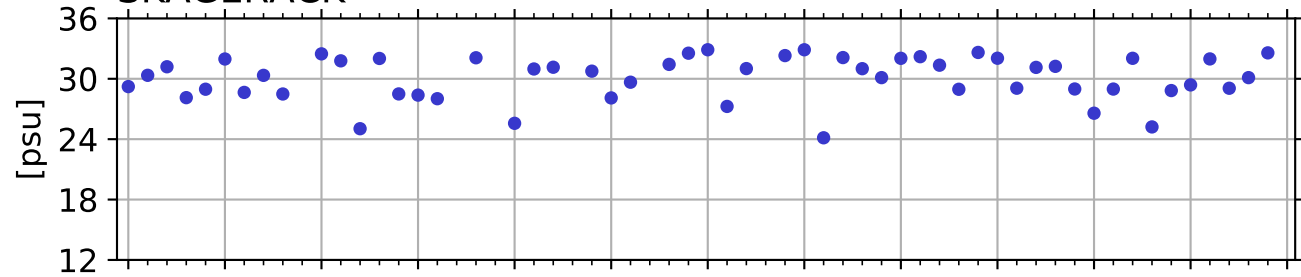


Temperature winter [°C] 0-10 m

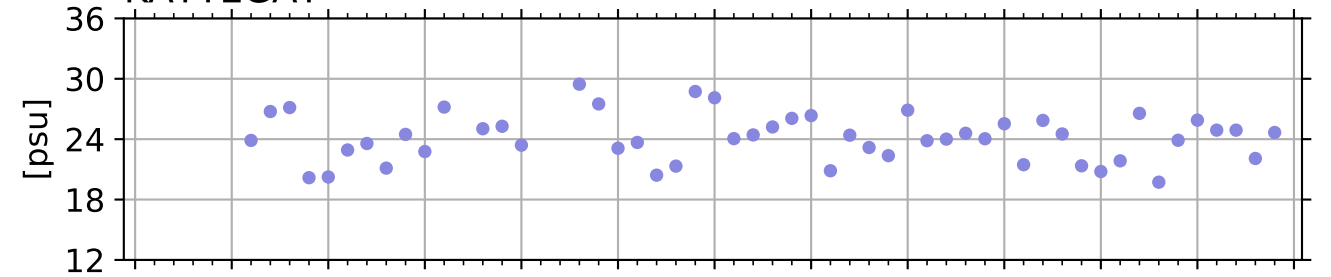


Salinity winter [psu] 0-10 m

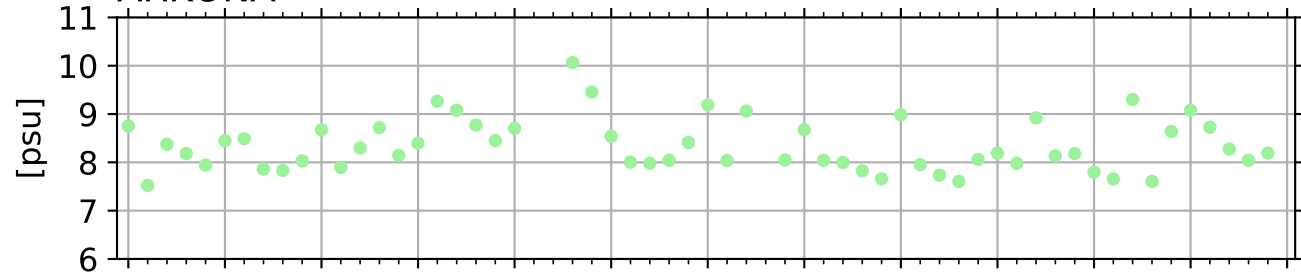
SKAGERACK



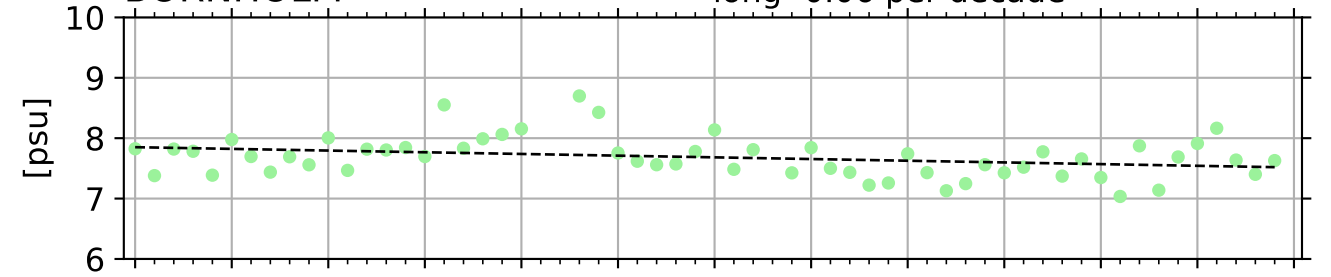
KATTEGAT



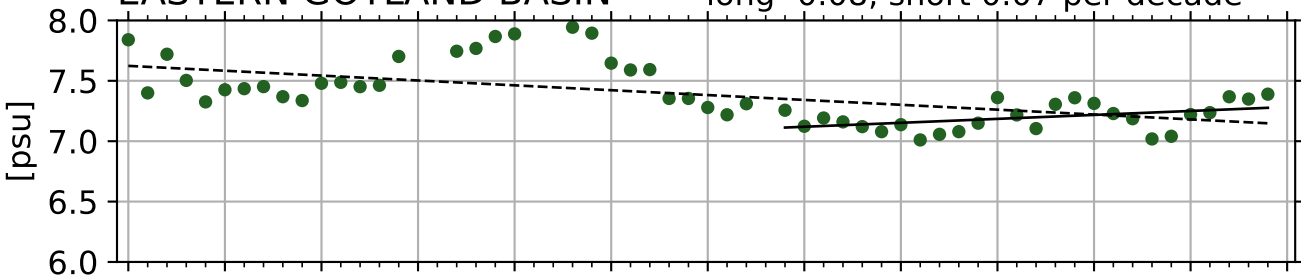
ARKONA



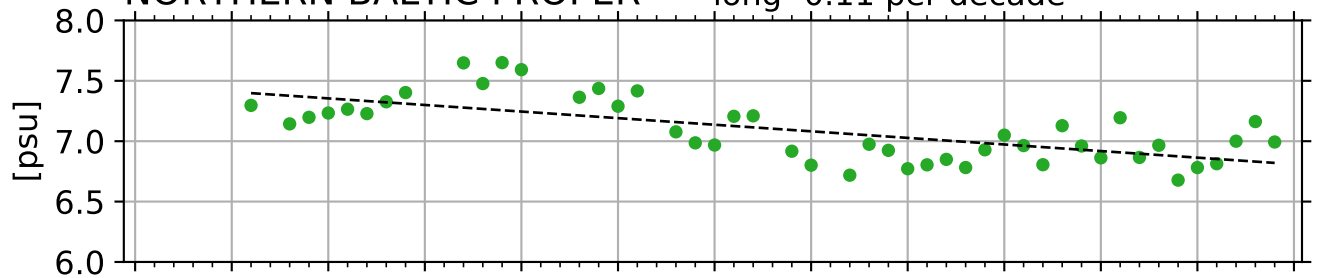
BORNHOLM



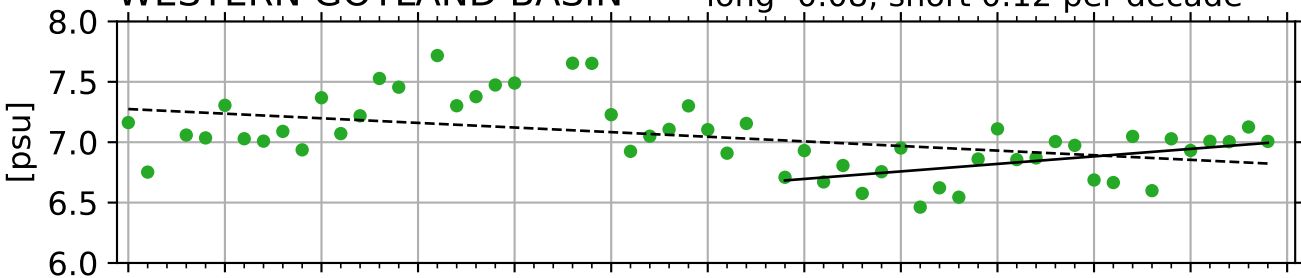
EASTERN GOTLAND BASIN



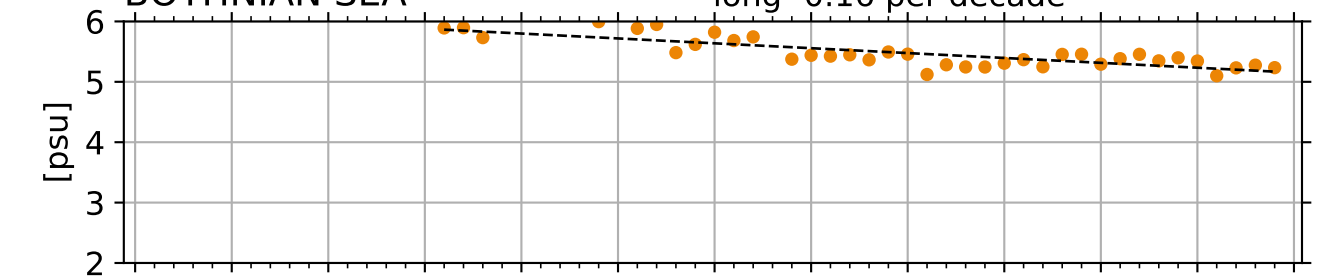
NORTHERN BALTIC PROPER



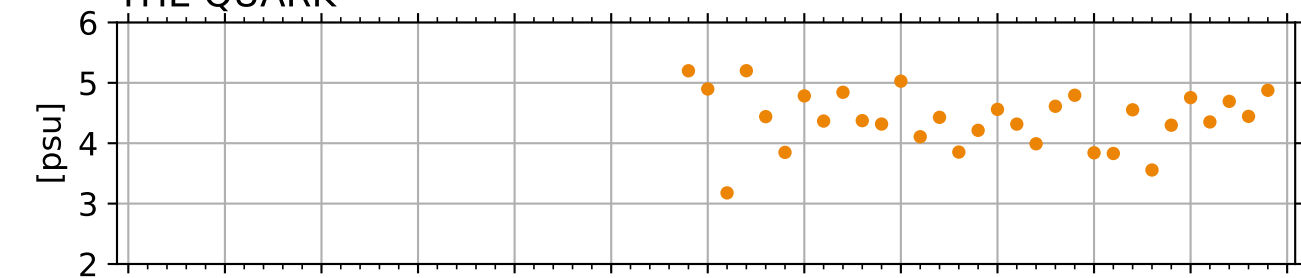
WESTERN GOTLAND BASIN



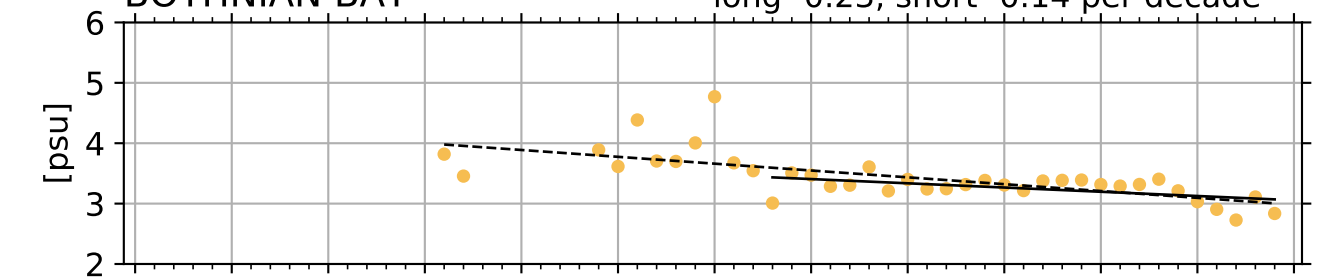
BOTHNIAN SEA



THE QUARK



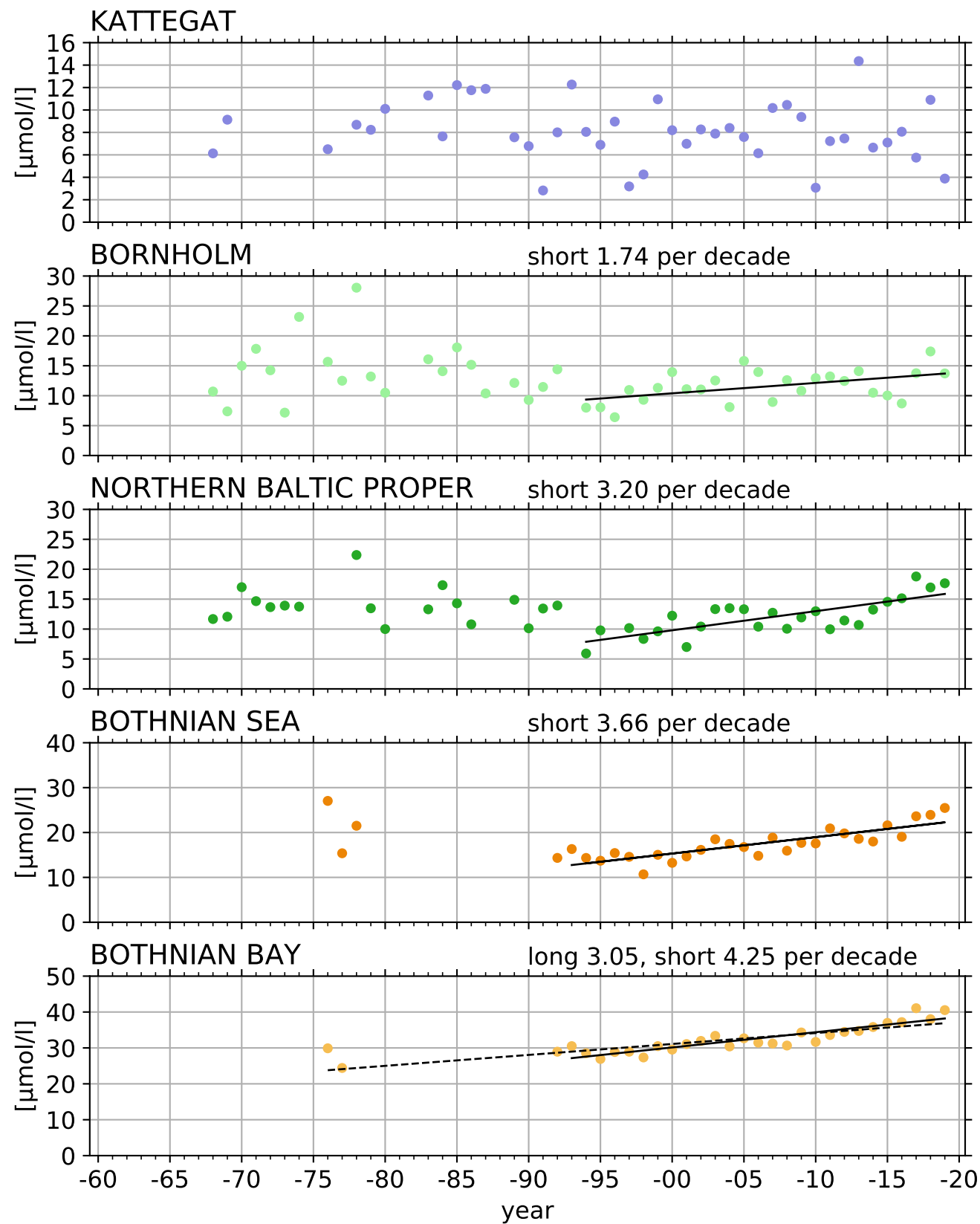
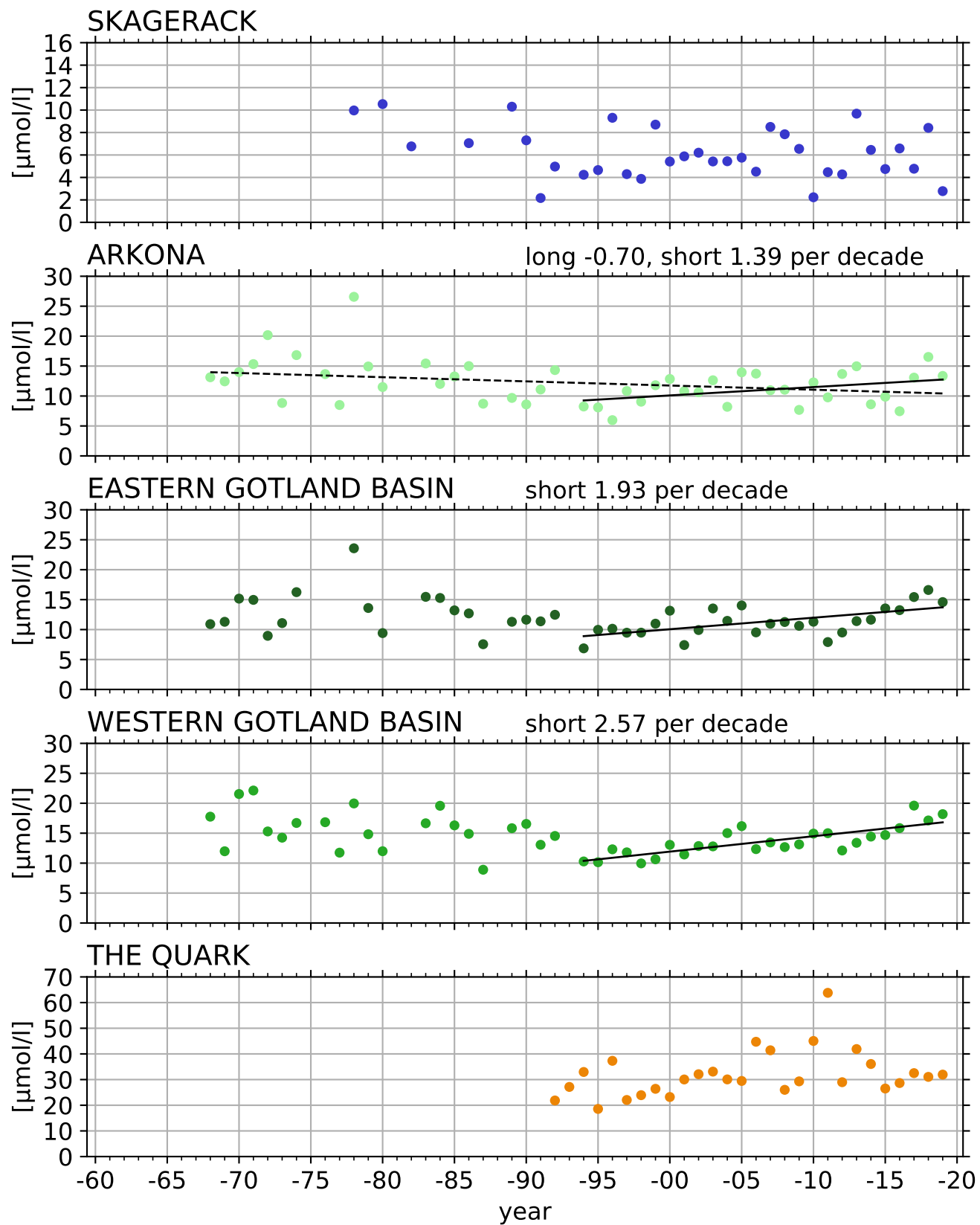
BOTHNIAN BAY



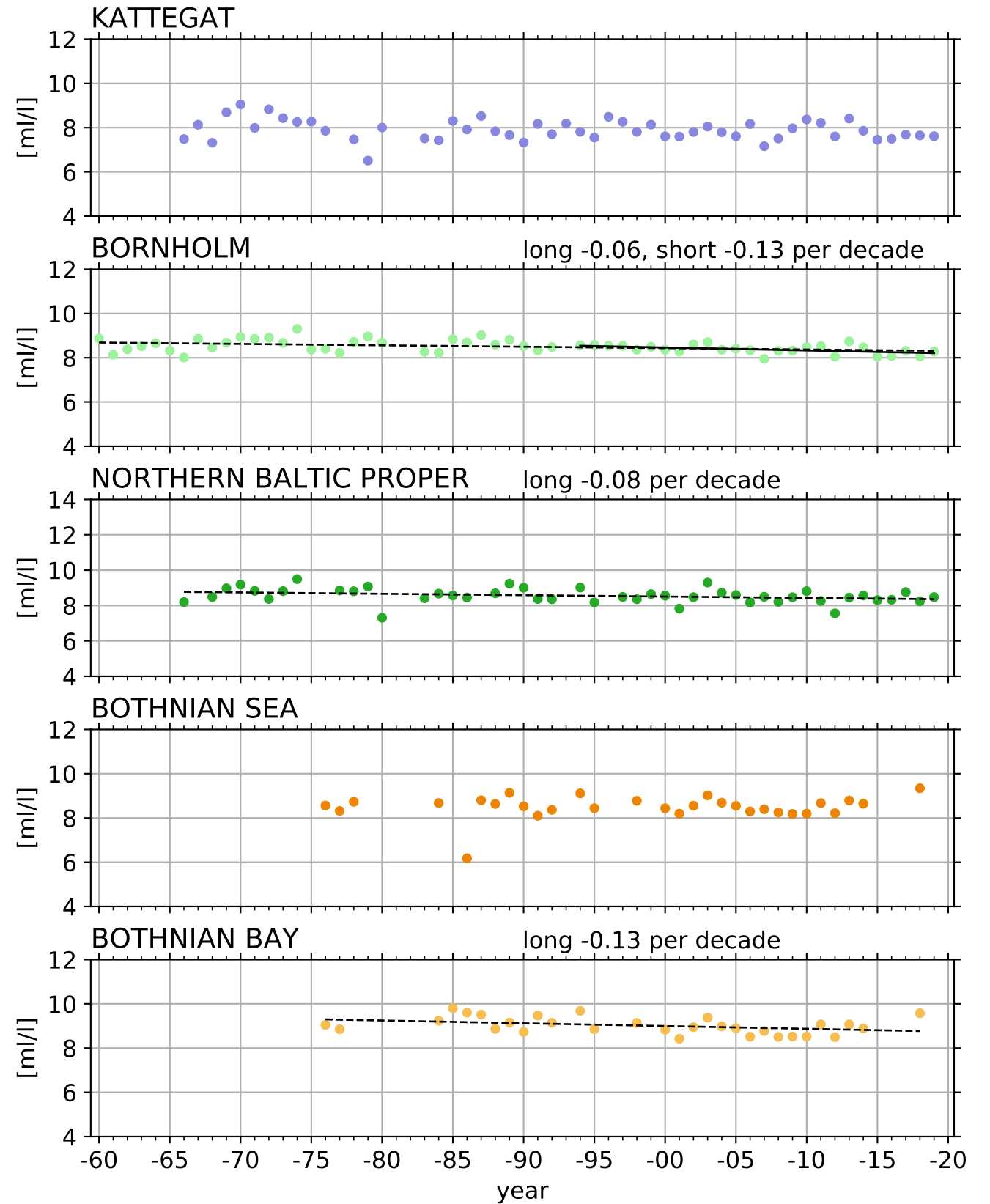
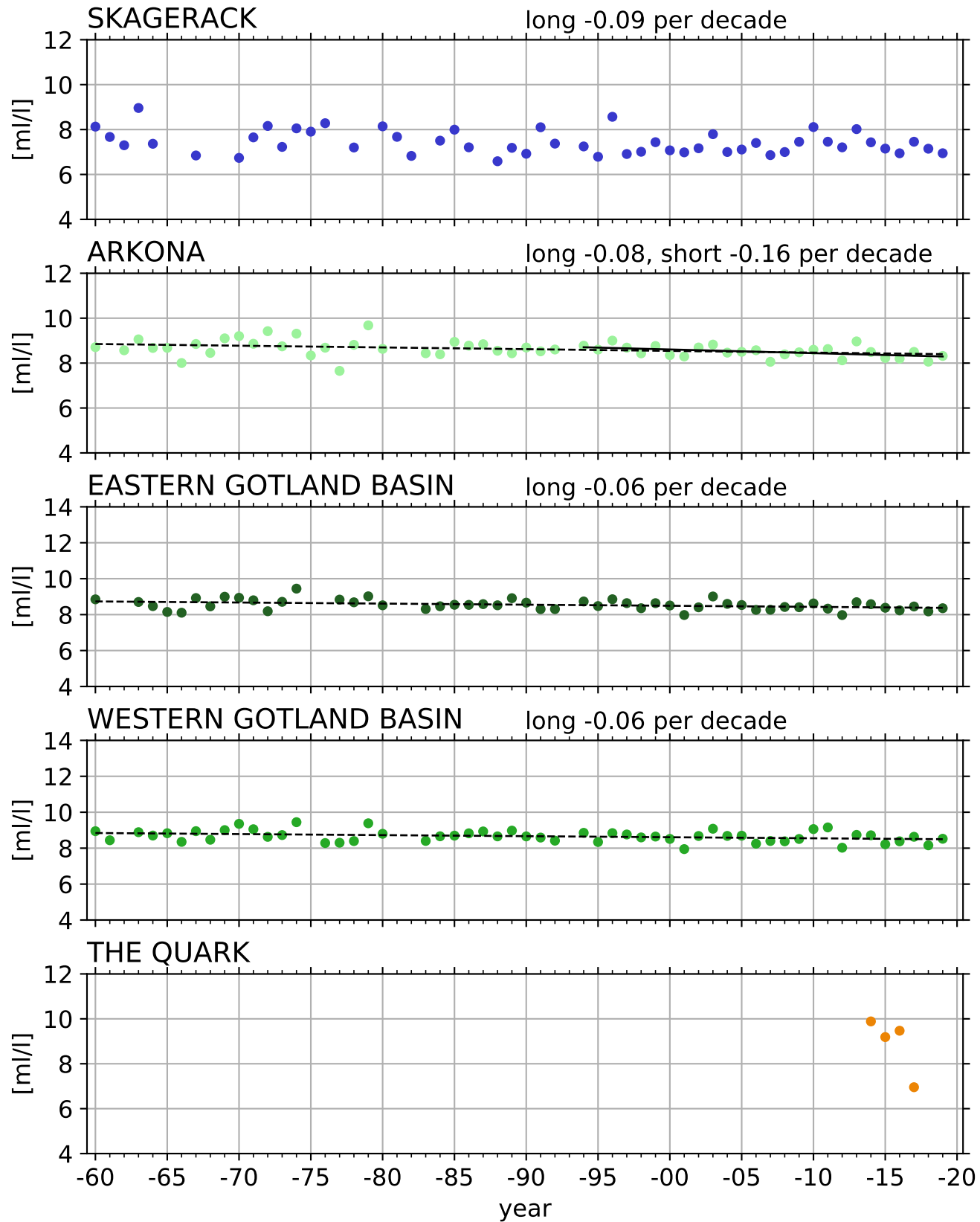
year

year

Dissolved Silica winter [$\mu\text{mol/l}$] 0-10 m



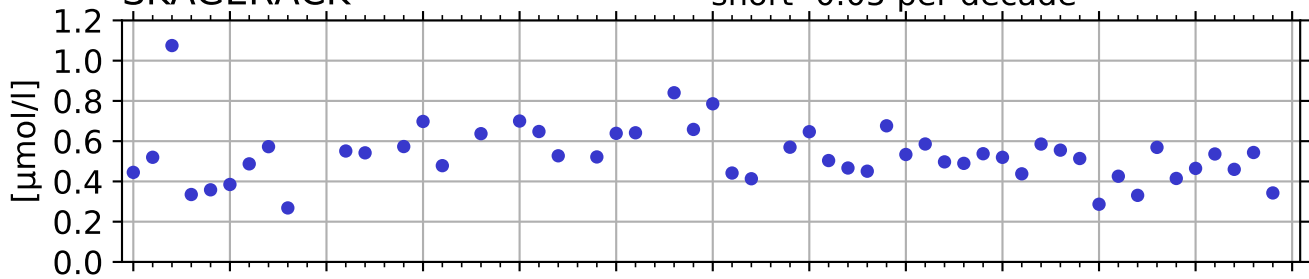
Dissolved oxygen winter [ml/l] 0-10 m



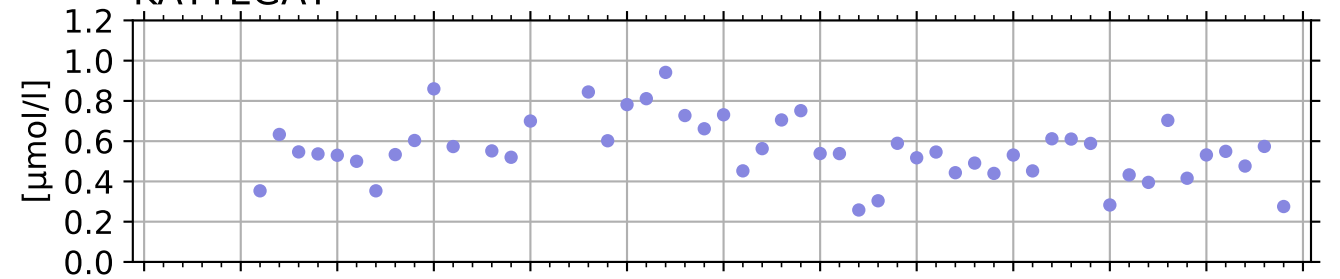
Phosphate winter [$\mu\text{mol/l}$] 0-10 m

SKAGERACK

short -0.05 per decade

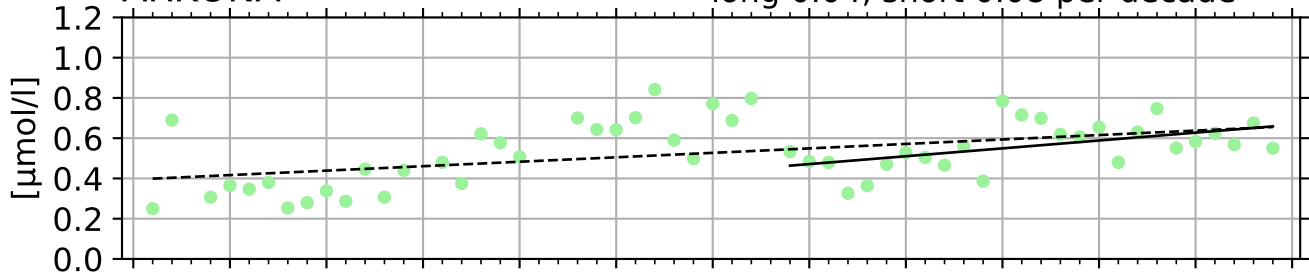


KATTEGAT



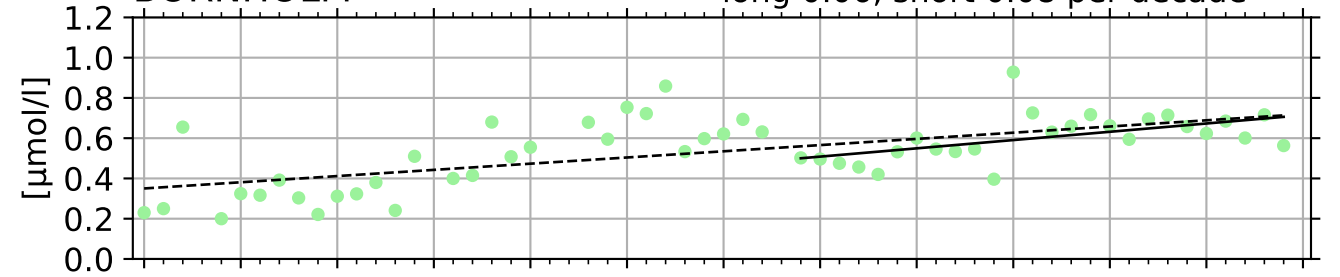
ARKONA

long 0.04, short 0.08 per decade



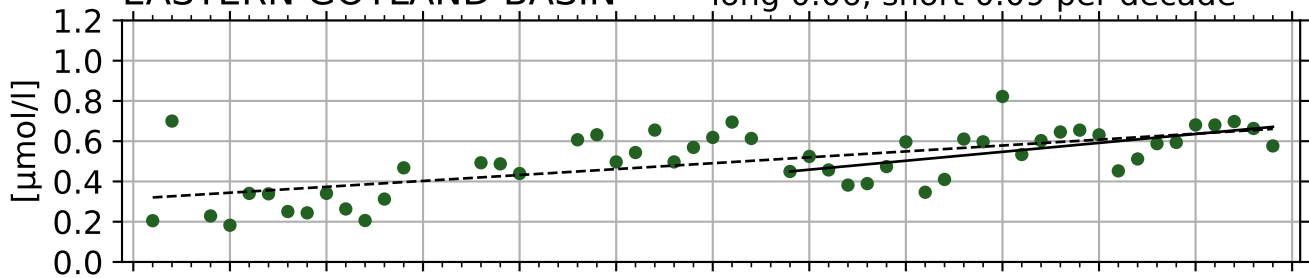
BORNHOLM

long 0.06, short 0.08 per decade



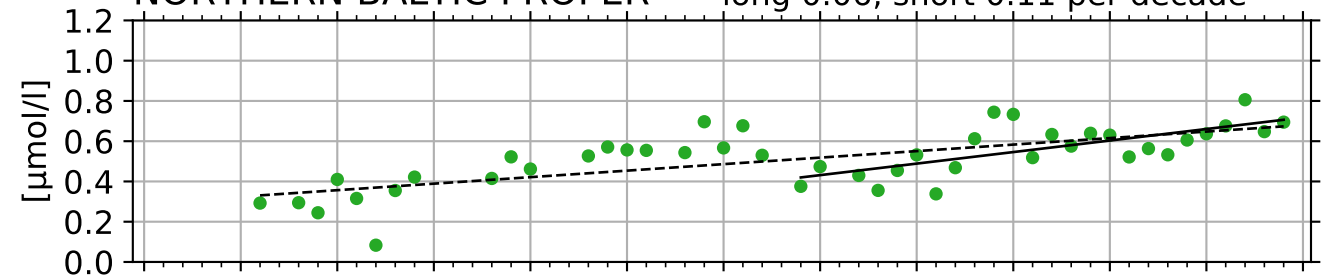
EASTERN GOTLAND BASIN

long 0.06, short 0.09 per decade



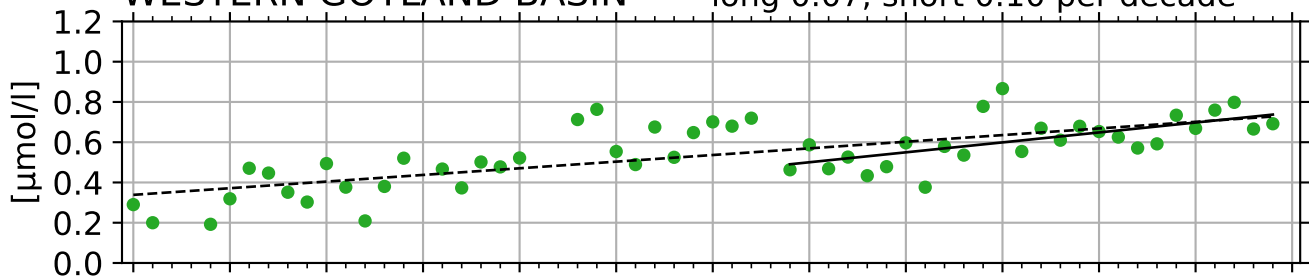
NORTHERN BALTIC PROPER

long 0.06, short 0.11 per decade



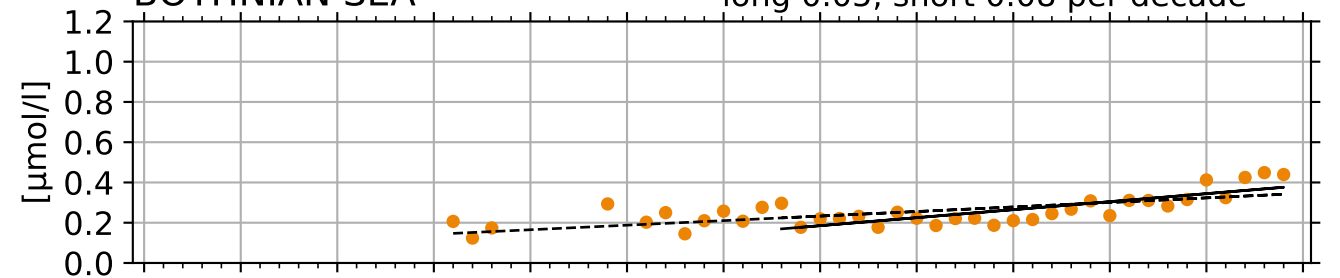
WESTERN GOTLAND BASIN

long 0.07, short 0.10 per decade



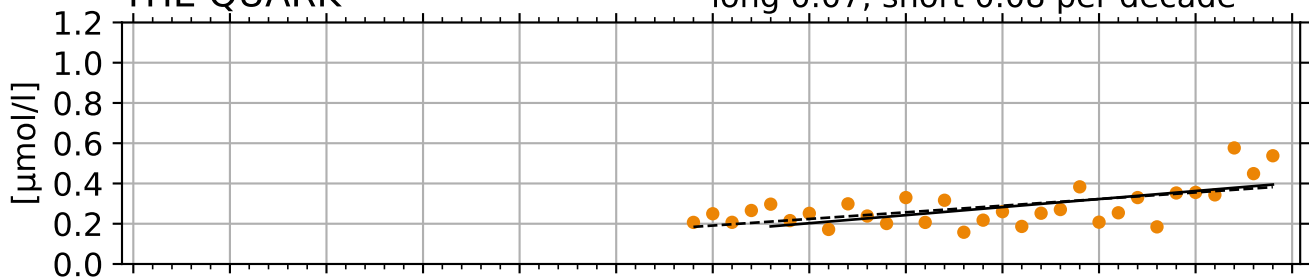
BOTHNIAN SEA

long 0.05, short 0.08 per decade

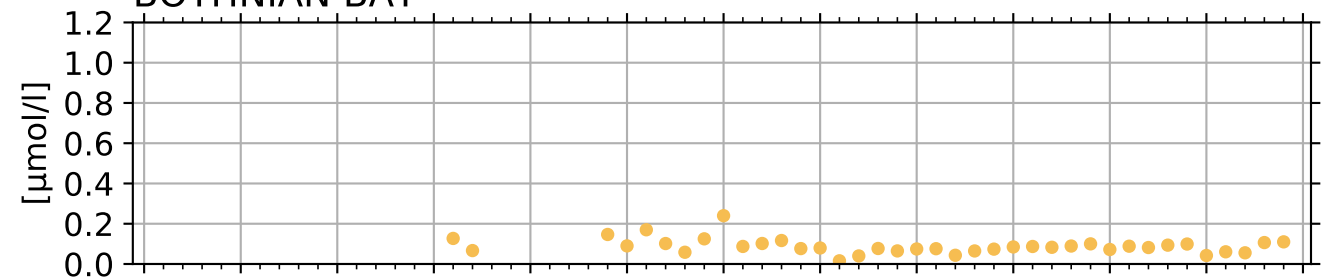


THE QUARK

long 0.07, short 0.08 per decade



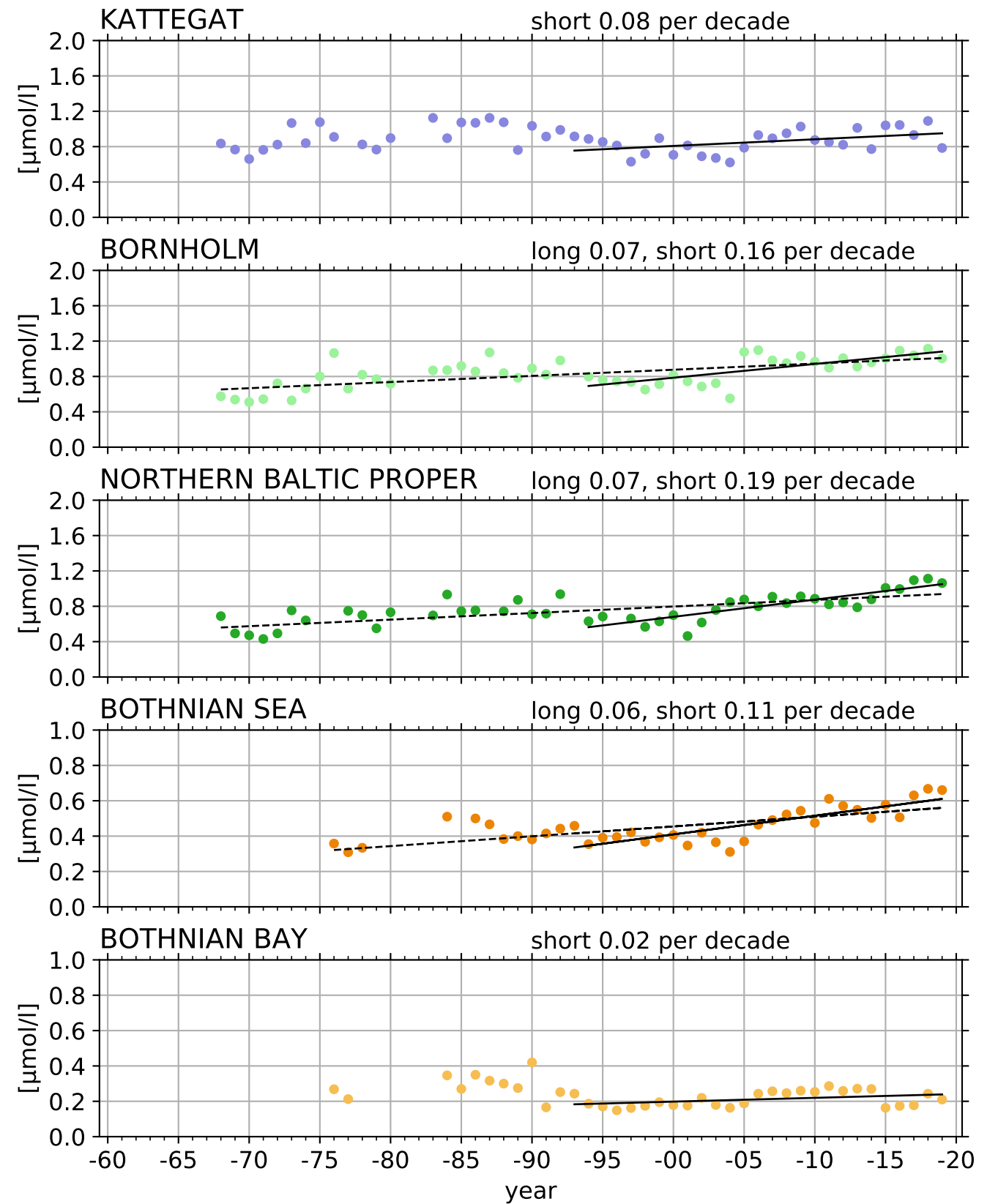
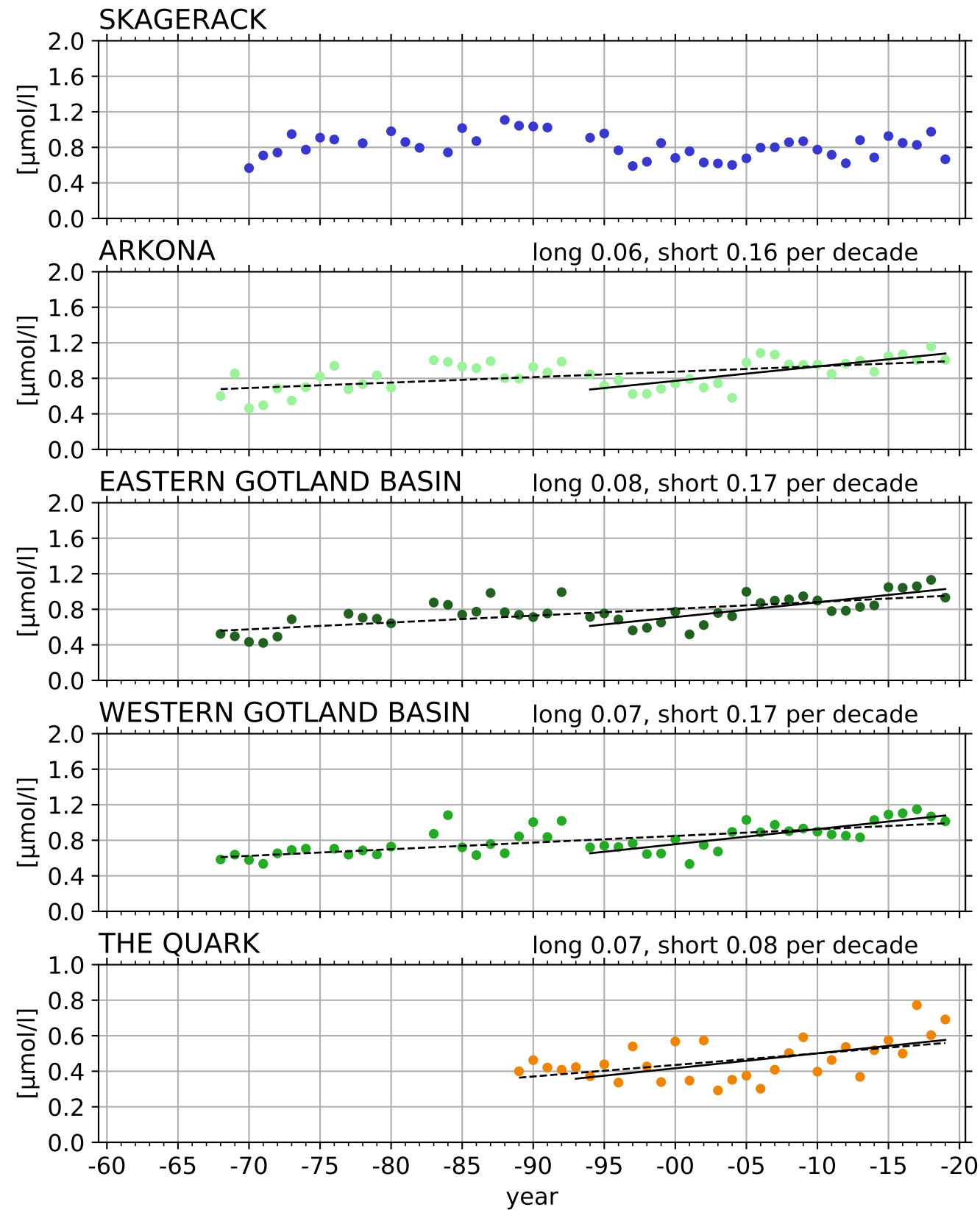
BOTHNIAN BAY



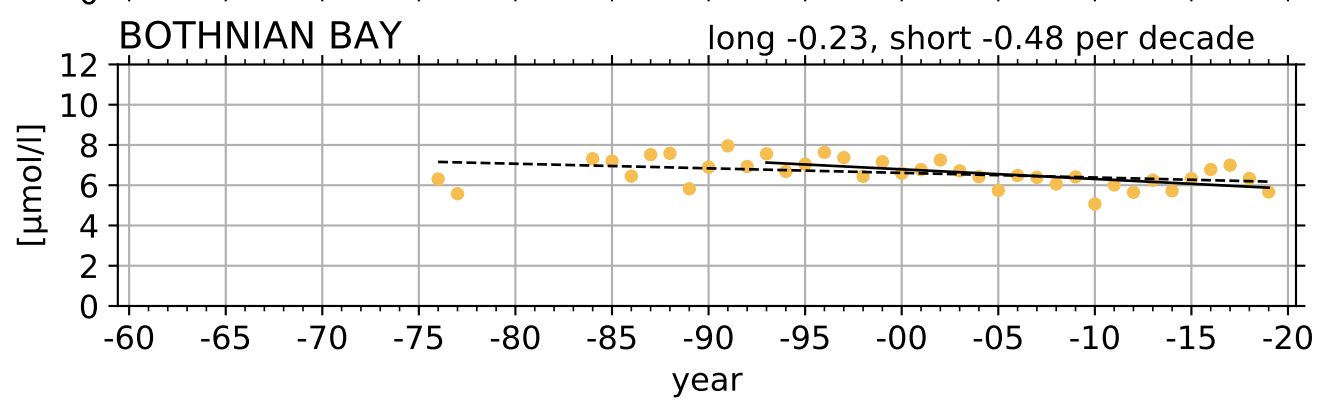
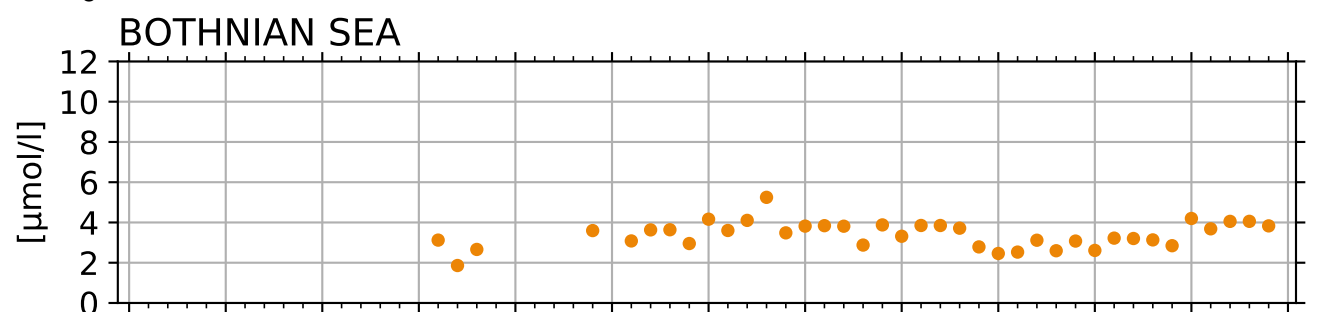
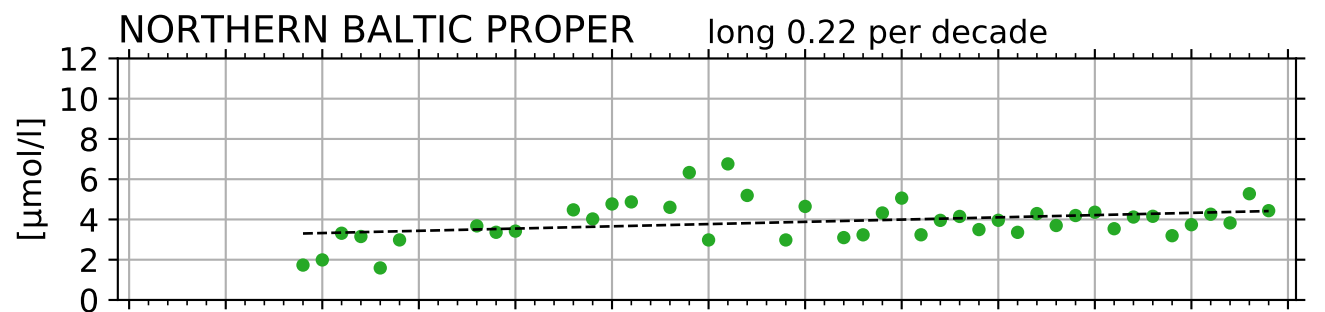
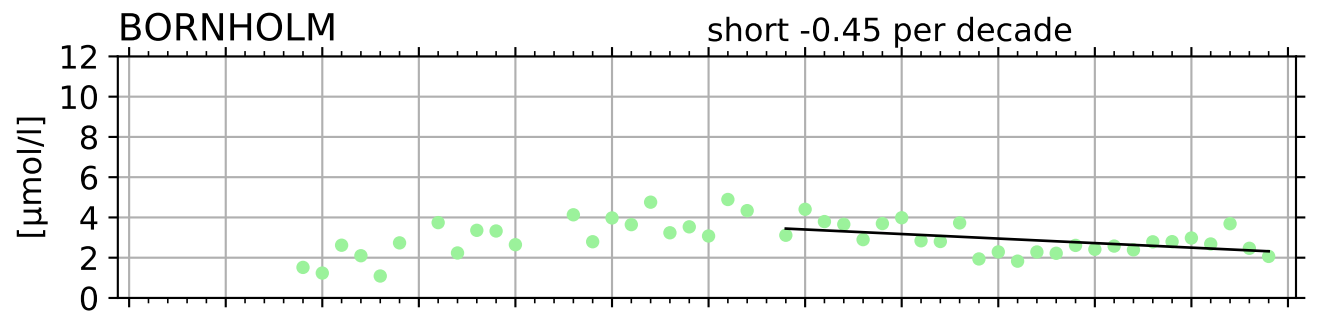
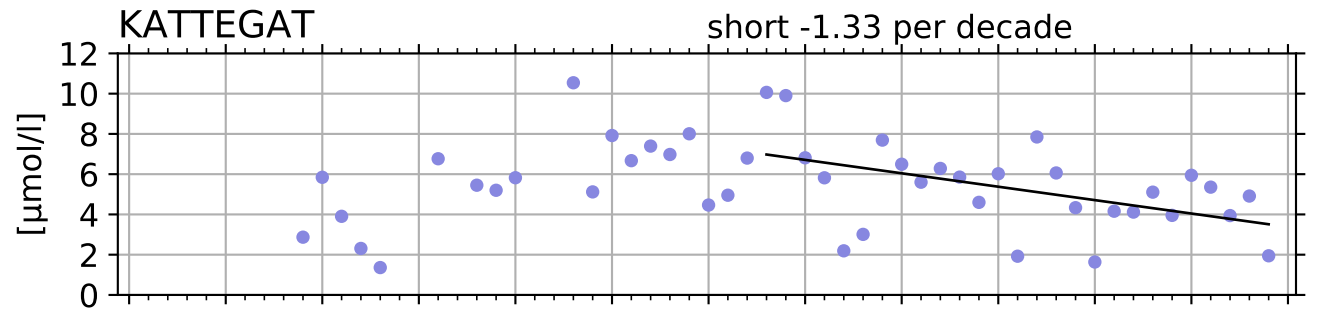
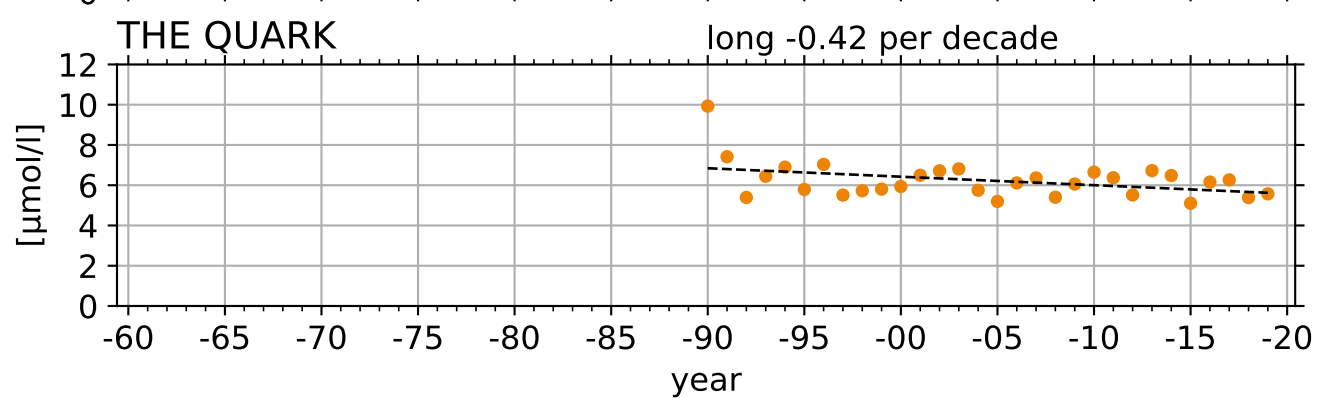
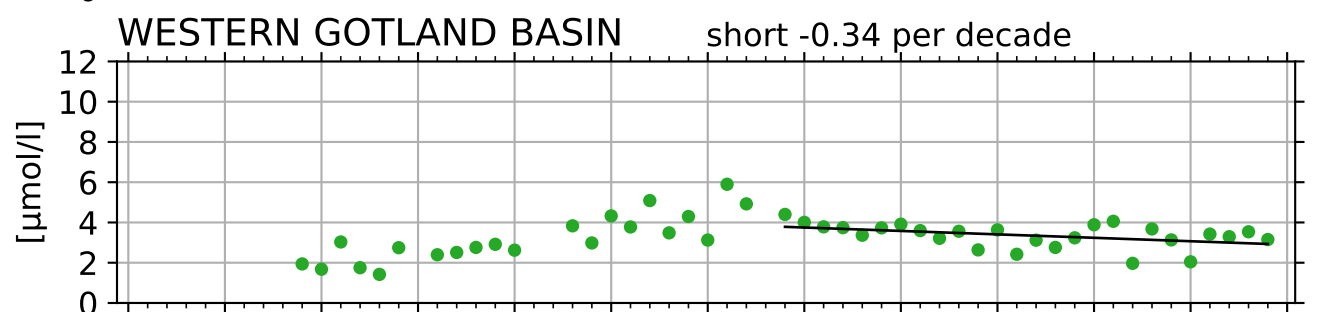
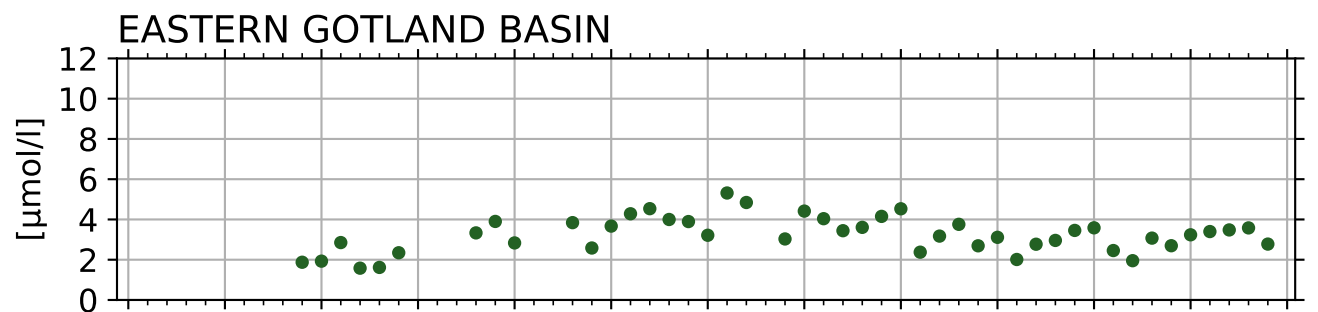
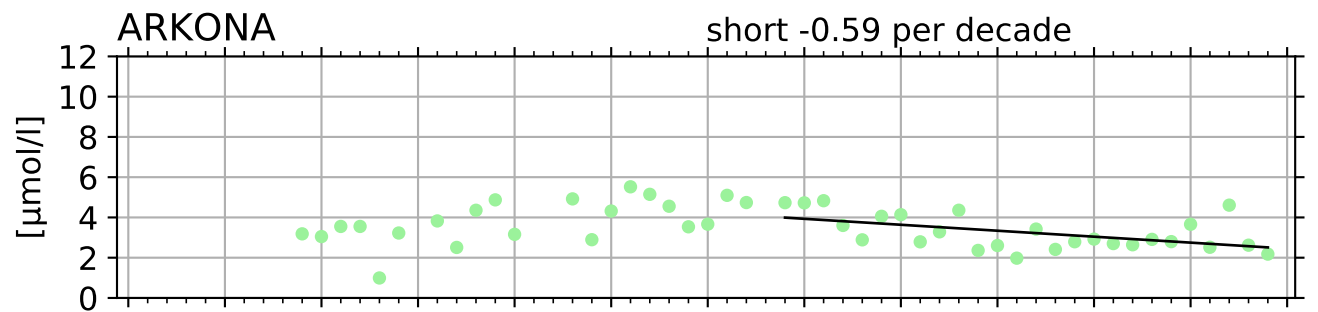
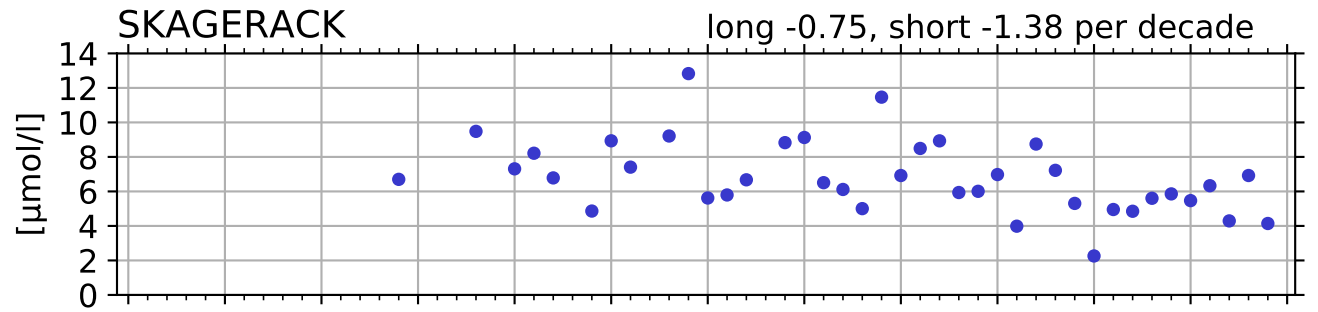
year

year

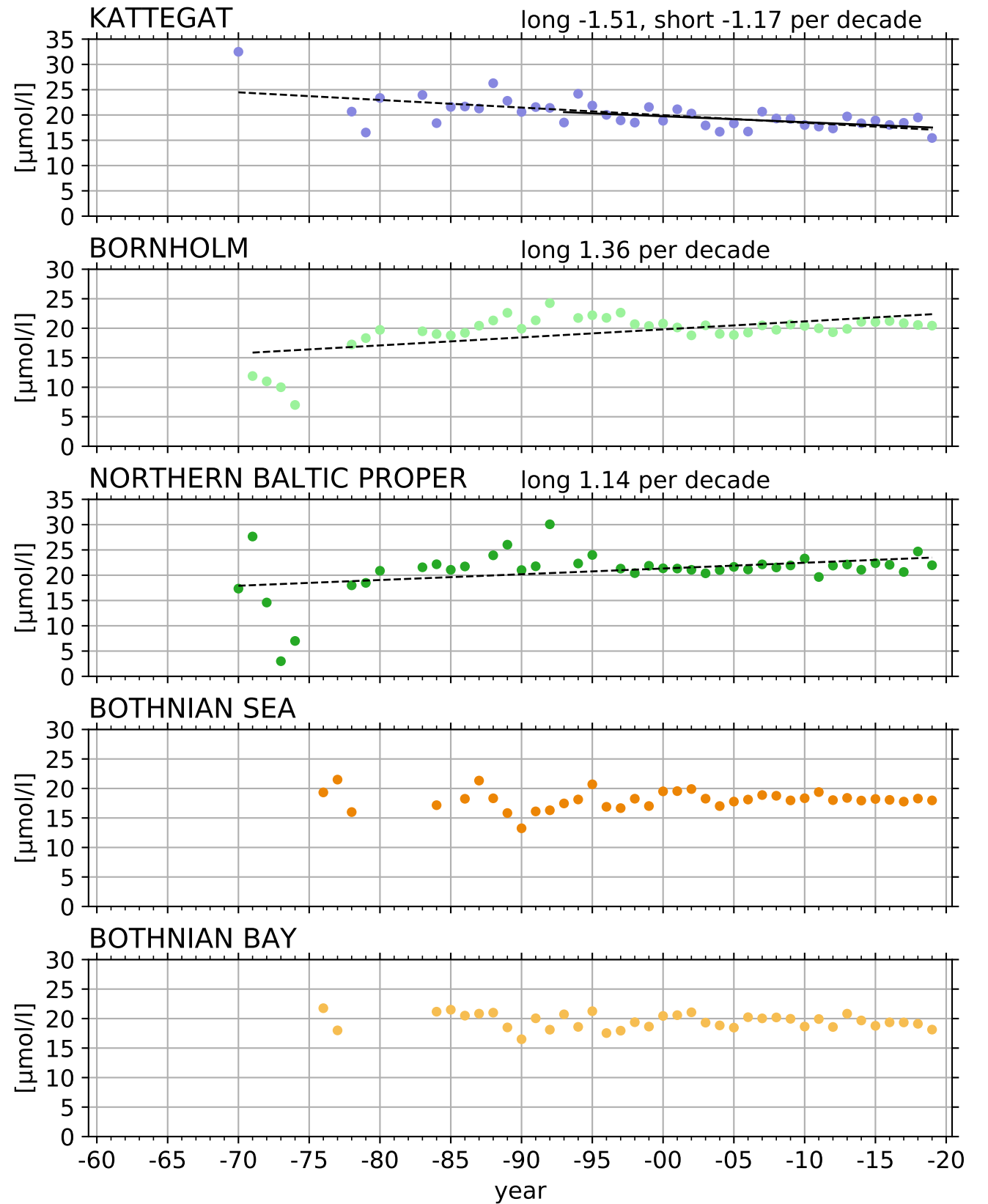
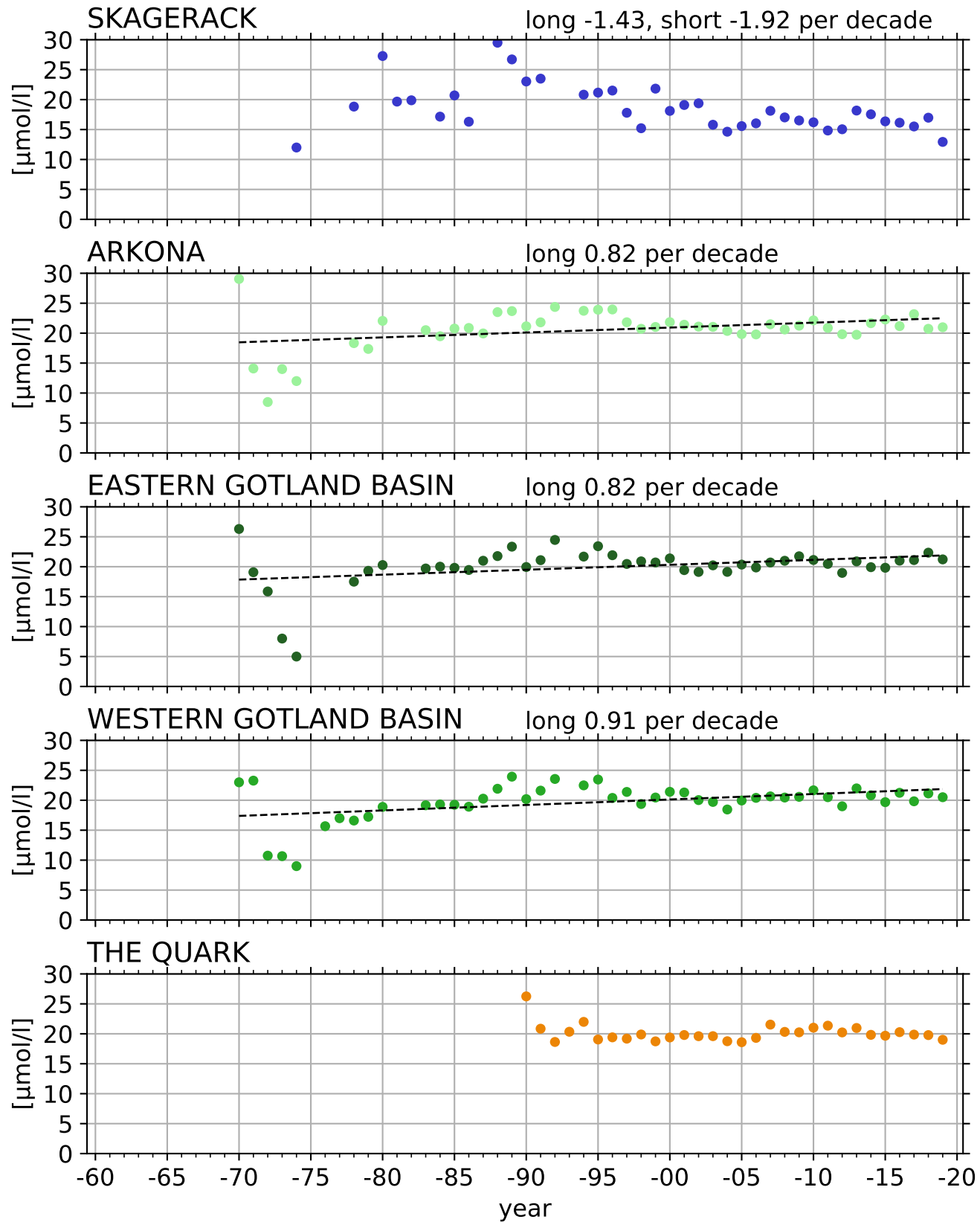
Total phosphorus winter [$\mu\text{mol/l}$] 0-10 m



DIN winter [$\mu\text{mol/l}$] 0-10 m



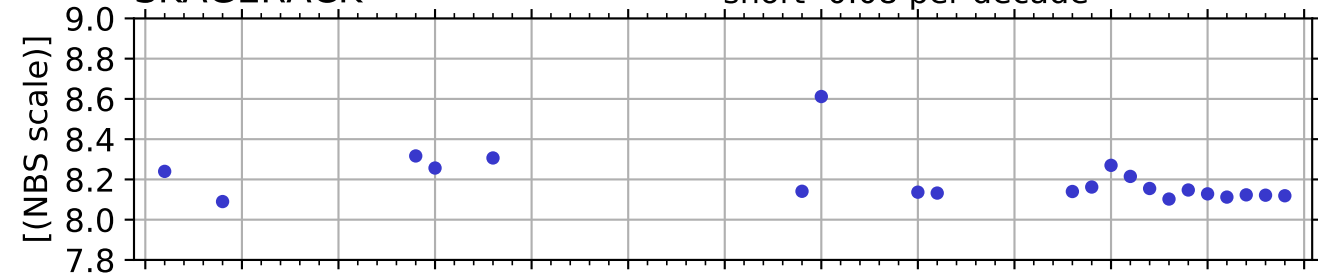
Total Nitrogen winter [$\mu\text{mol/l}$] 0-10 m



pH winter [(NBS scale)] 0-10 m

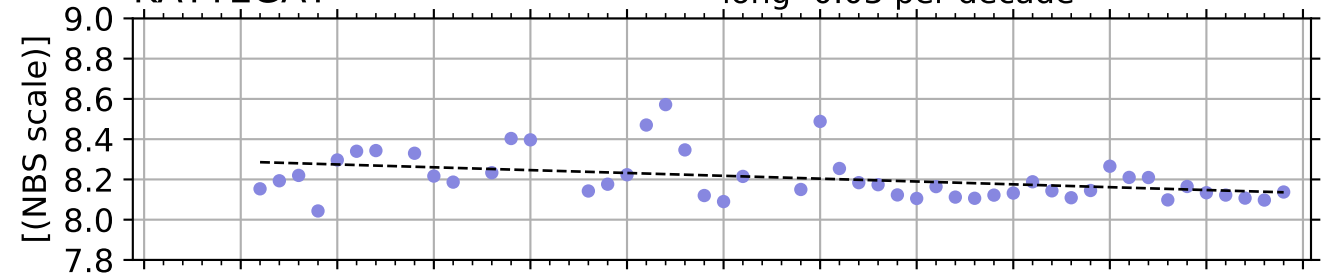
SKAGERACK

short -0.08 per decade

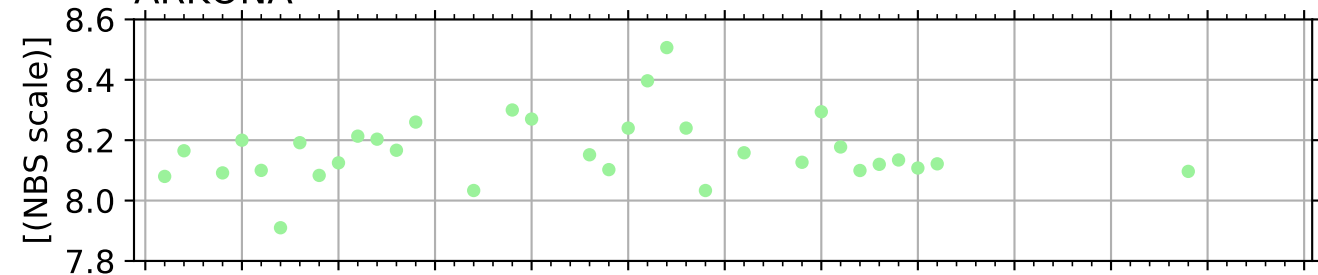


KATTEGAT

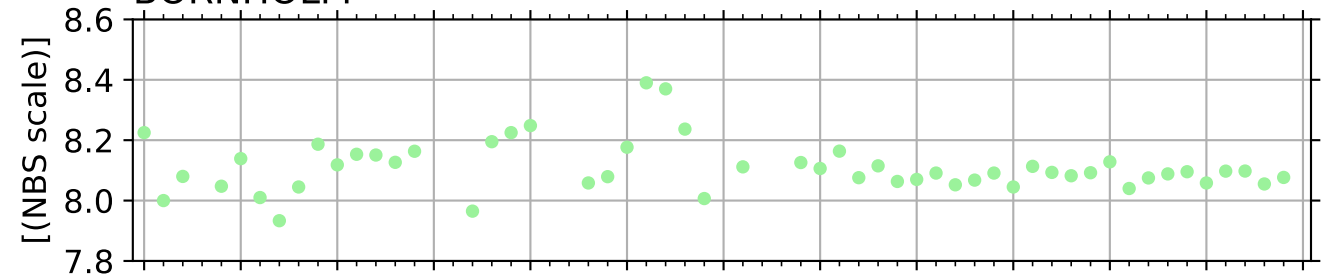
long -0.03 per decade



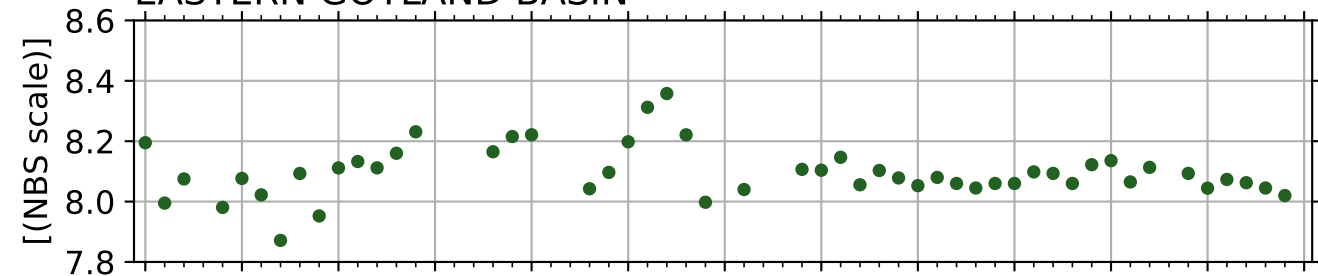
ARKONA



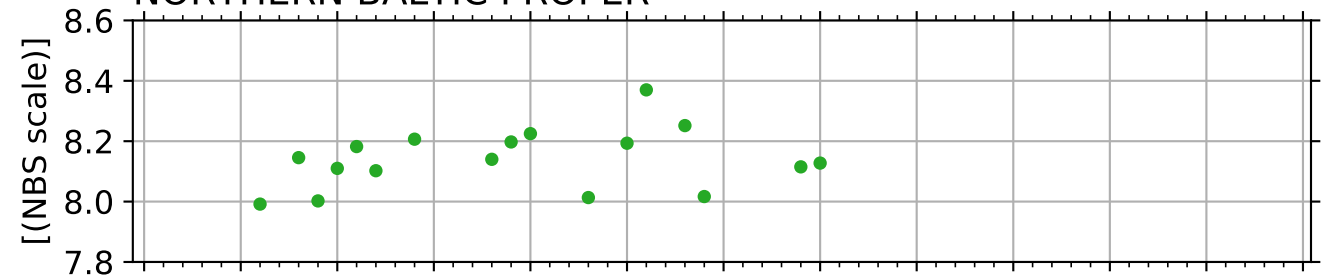
BORNHOLM



EASTERN GOTLAND BASIN

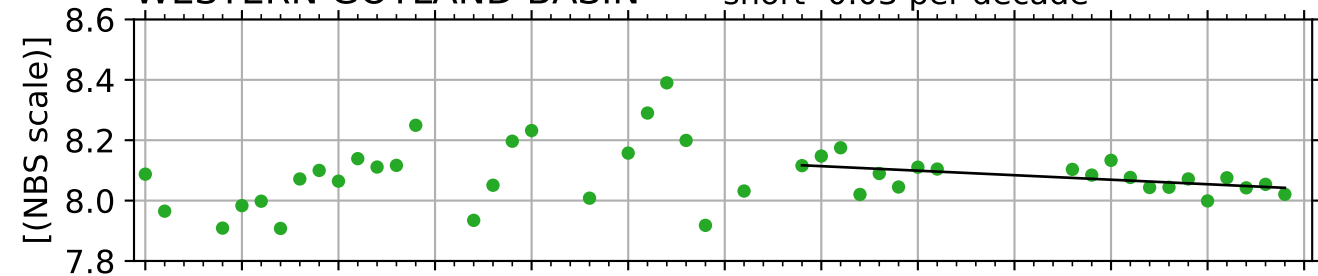


NORTHERN BALTIC PROPER

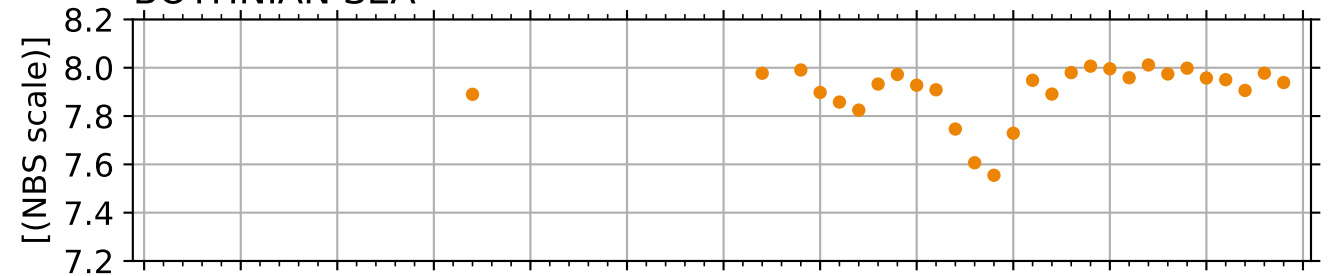


WESTERN GOTLAND BASIN

short -0.03 per decade

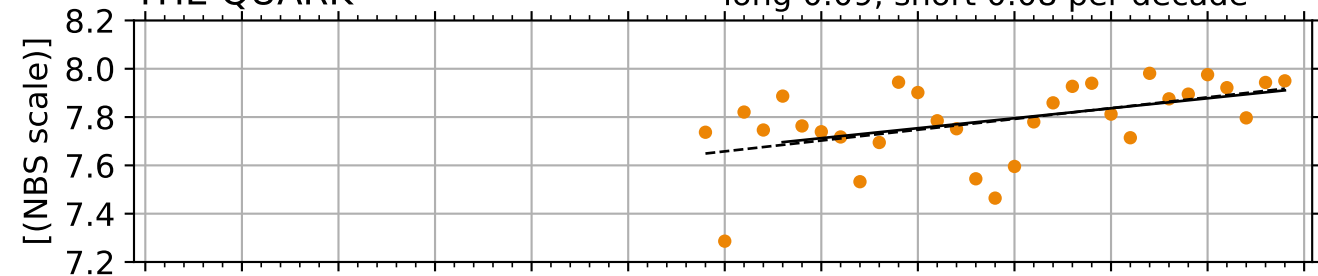


BOTHNIAN SEA

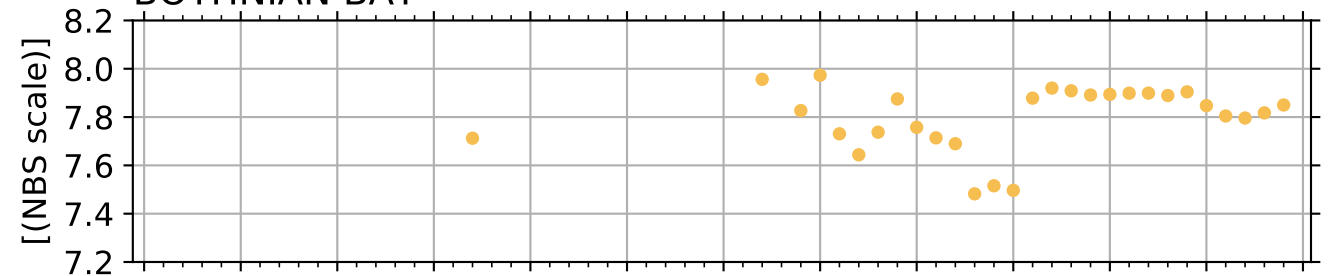


THE QUARK

long 0.09, short 0.08 per decade



BOTHNIAN BAY

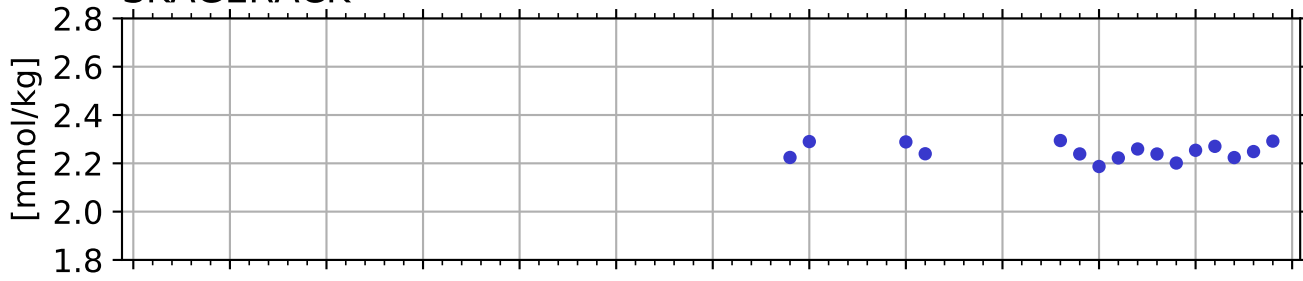


year

year

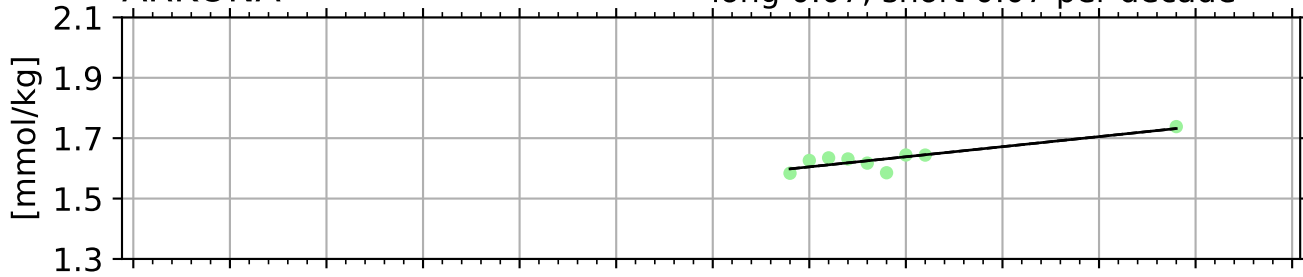
Alkalinity winter [mmol/kg] 0-10 m

SKAGERACK



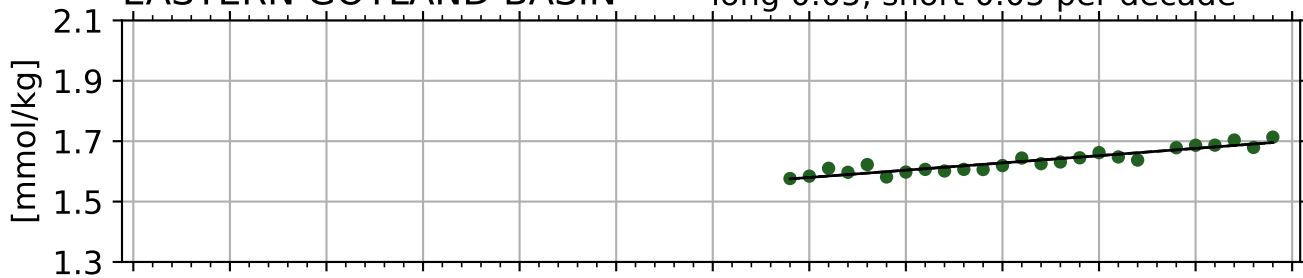
ARKONA

long 0.07, short 0.07 per decade



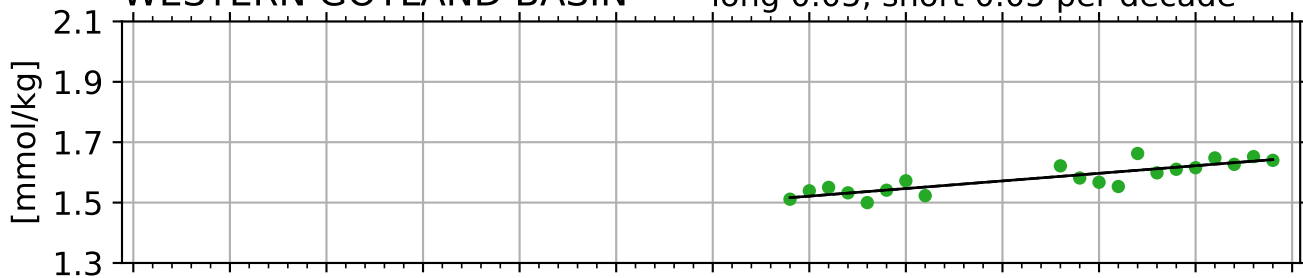
EASTERN GOTLAND BASIN

long 0.05, short 0.05 per decade

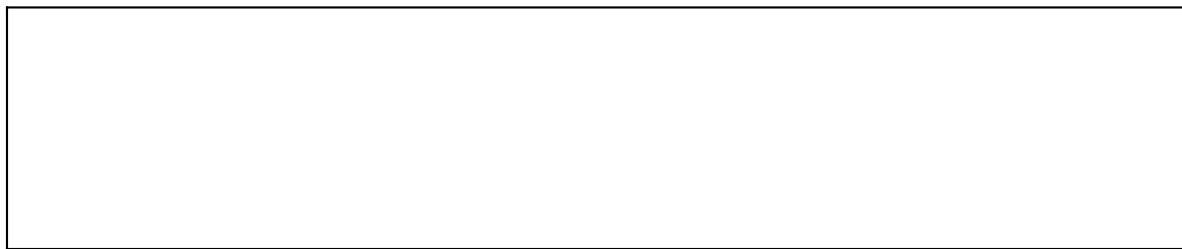


WESTERN GOTLAND BASIN

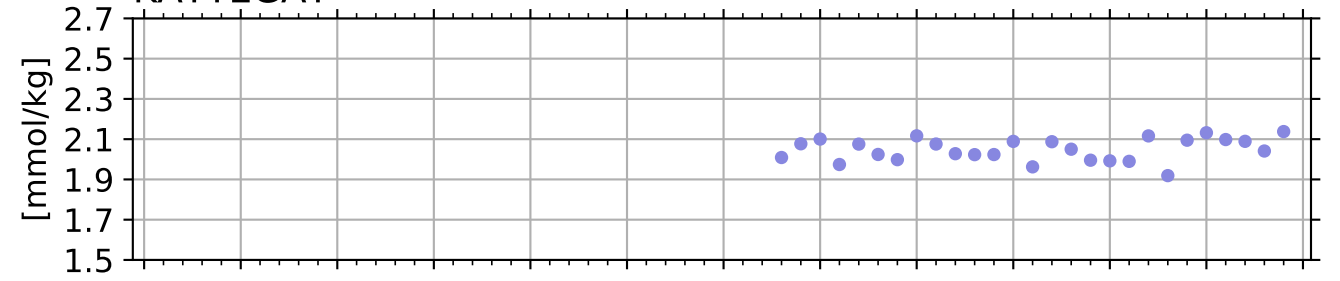
long 0.05, short 0.05 per decade



THE QUARK

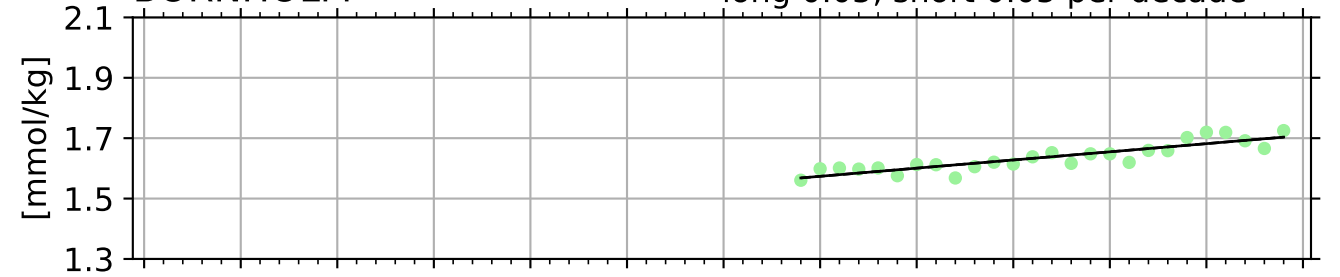


KATTEGAT

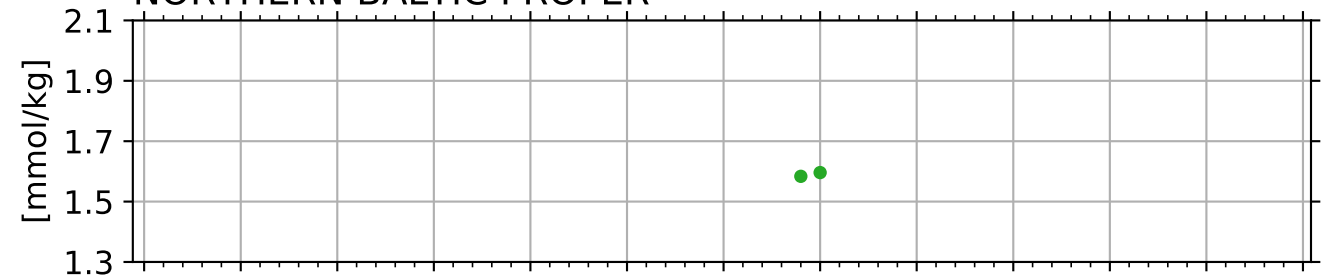


BORNHOLM

long 0.05, short 0.05 per decade

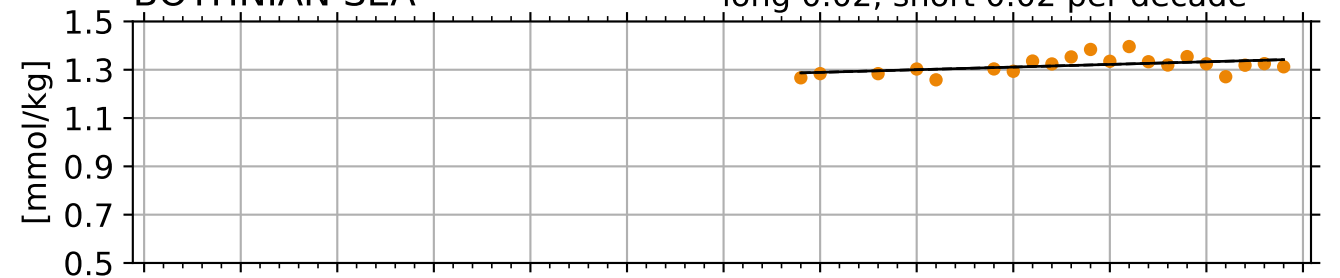


NORTHERN BALTIC PROPER

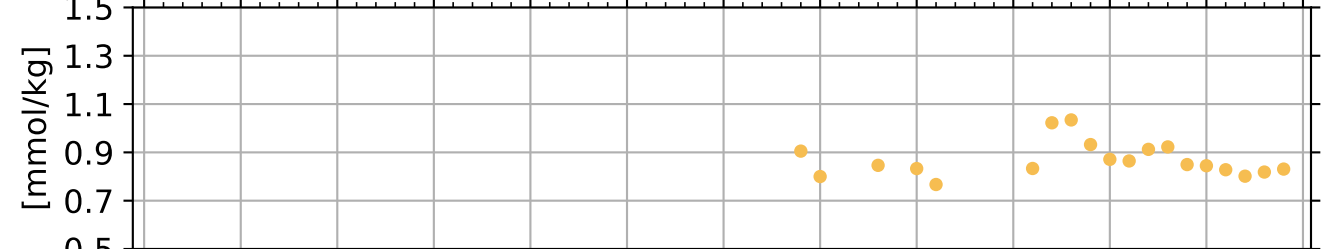


BOTHNIAN SEA

long 0.02, short 0.02 per decade



BOTHNIAN BAY

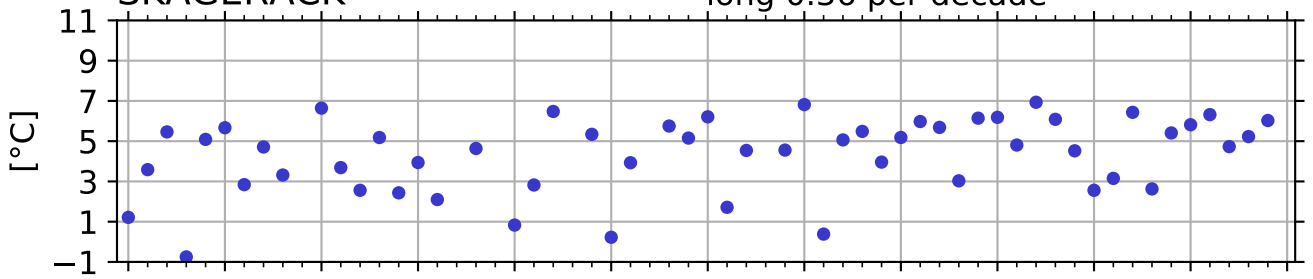


year

Temperature winter [°C] 0-10 m

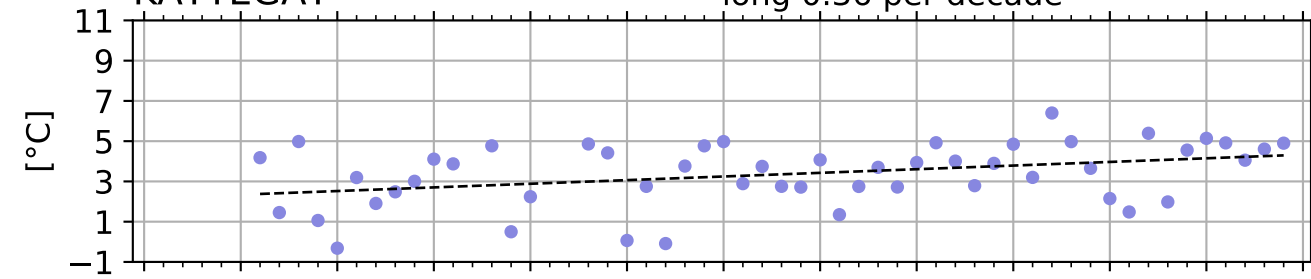
SKAGERACK

long 0.36 per decade



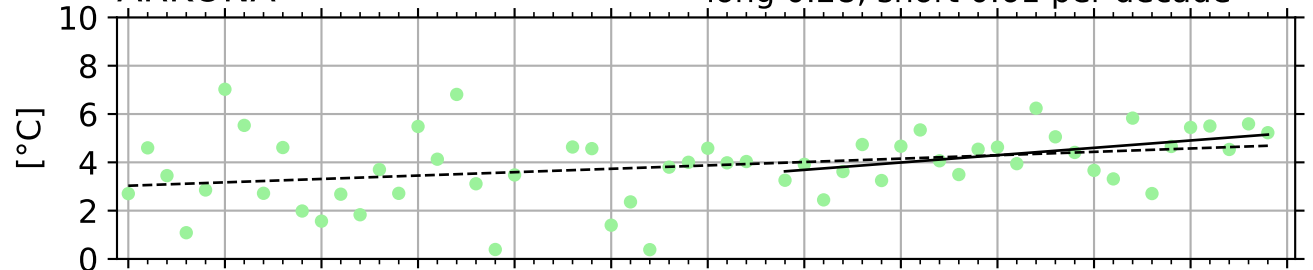
KATTEGAT

long 0.36 per decade



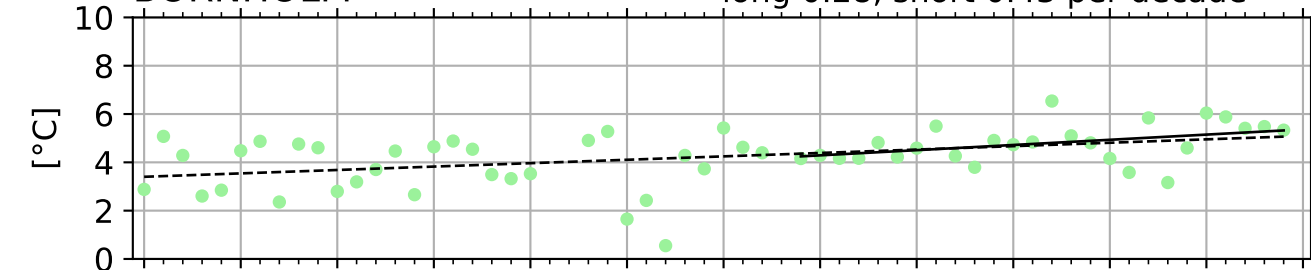
ARKONA

long 0.28, short 0.61 per decade



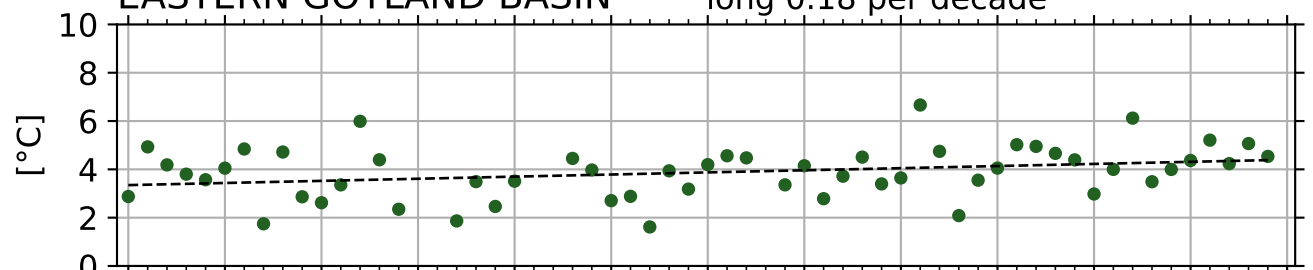
BORNHOLM

long 0.28, short 0.43 per decade



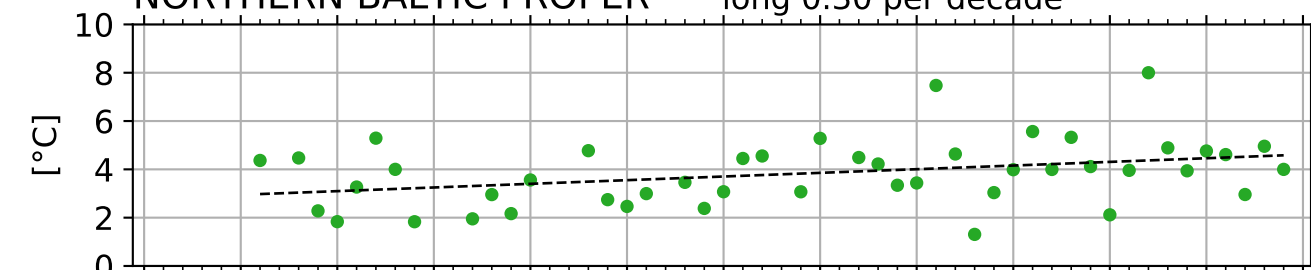
EASTERN GOTLAND BASIN

long 0.18 per decade



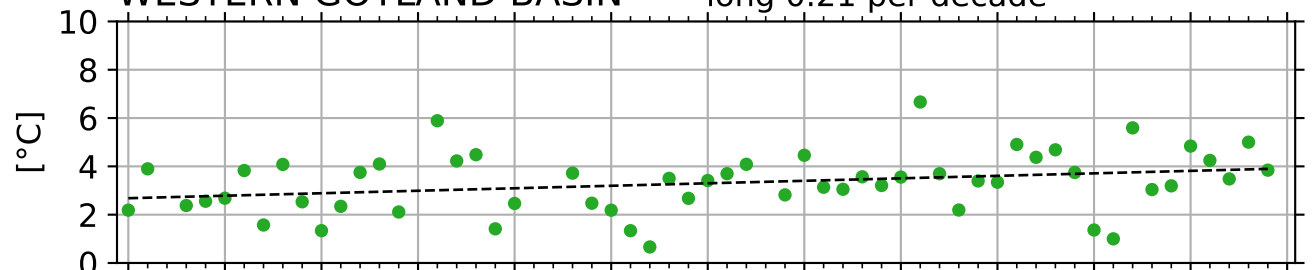
NORTHERN BALTIC PROPER

long 0.30 per decade

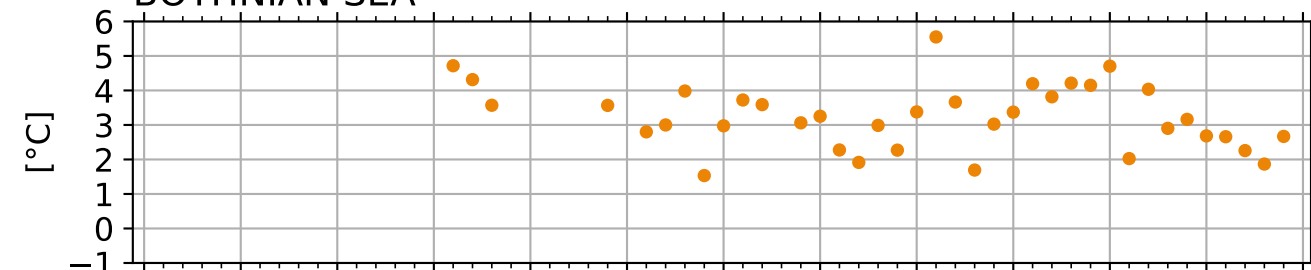


WESTERN GOTLAND BASIN

long 0.21 per decade

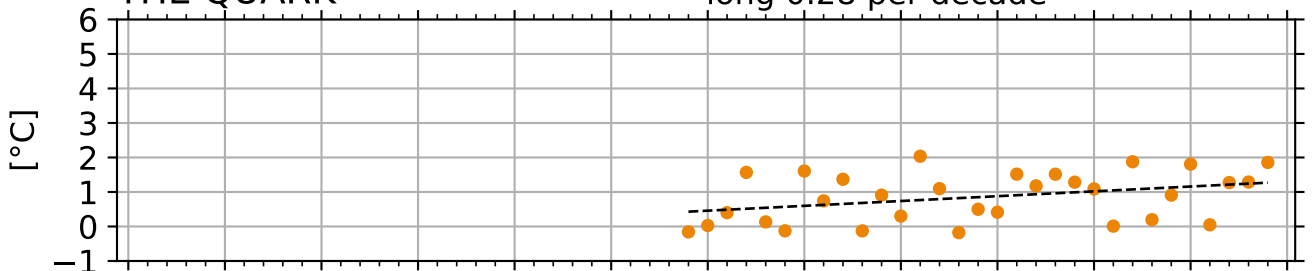


BOTHNIAN SEA

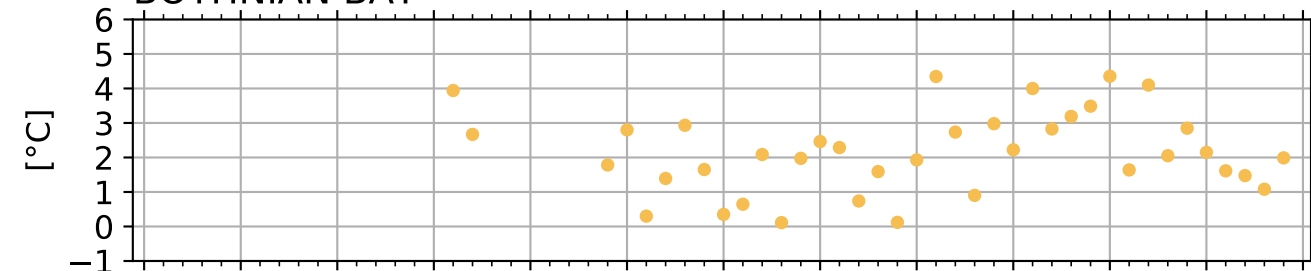


THE QUARK

long 0.28 per decade



BOTHNIAN BAY

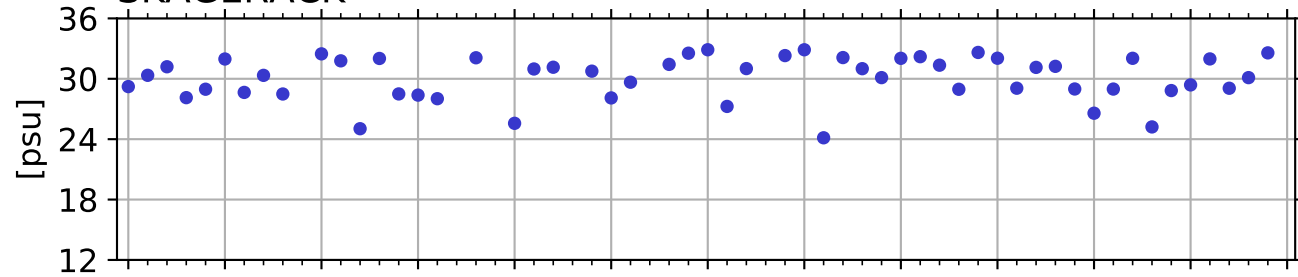


year

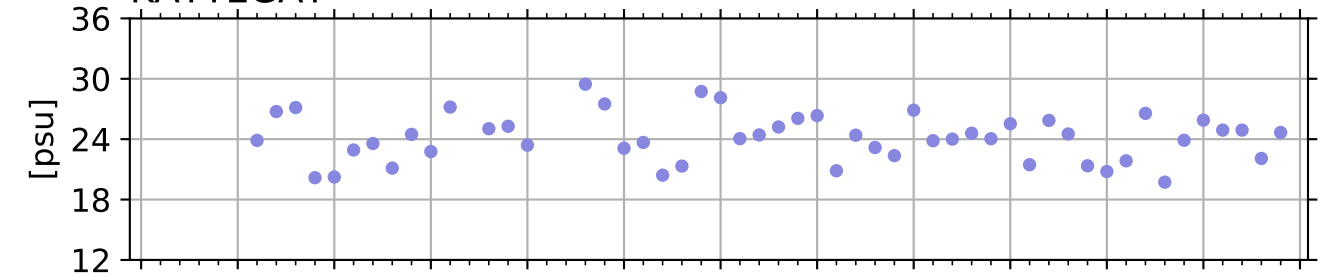
year

Salinity winter [psu] 0-10 m

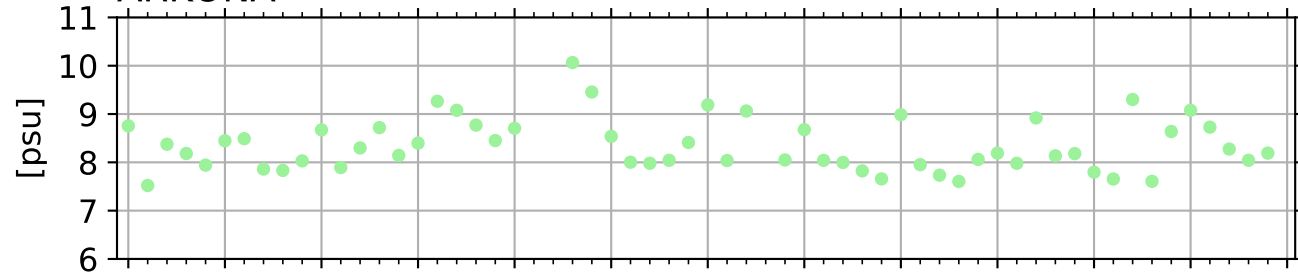
SKAGERACK



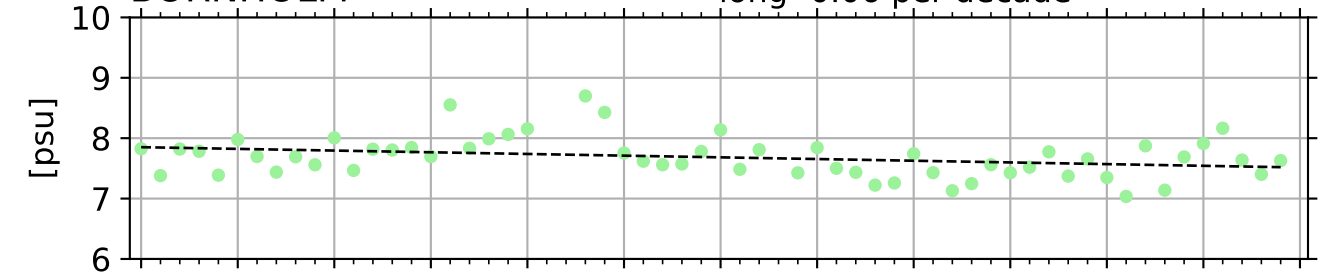
KATTEGAT



ARKONA

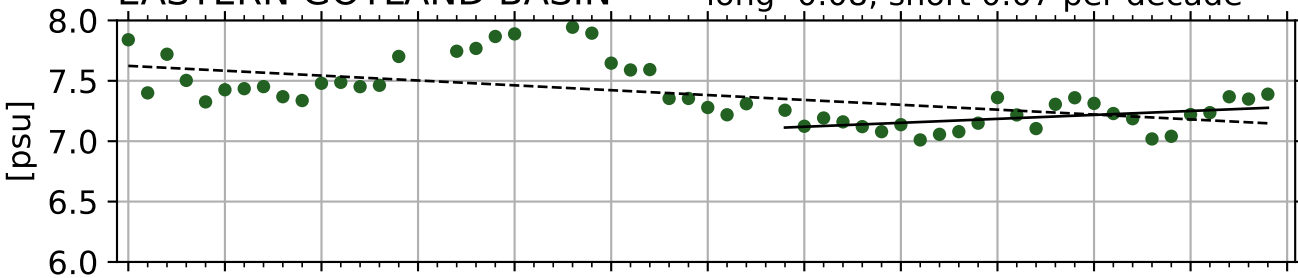


BORNHOLM



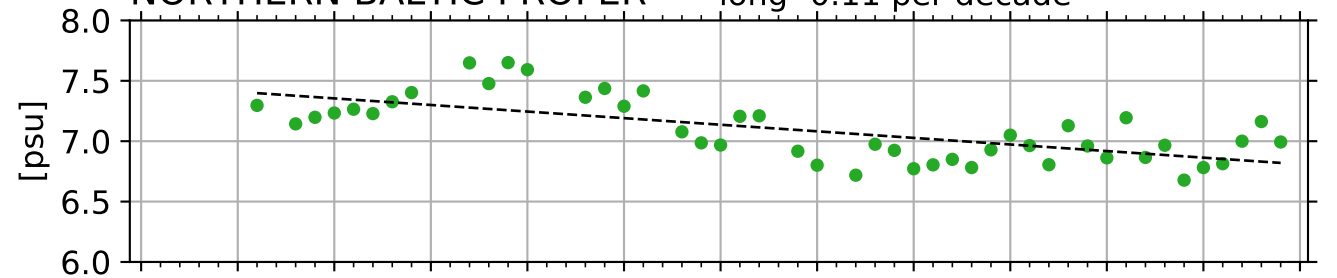
EASTERN GOTLAND BASIN

long -0.08, short 0.07 per decade



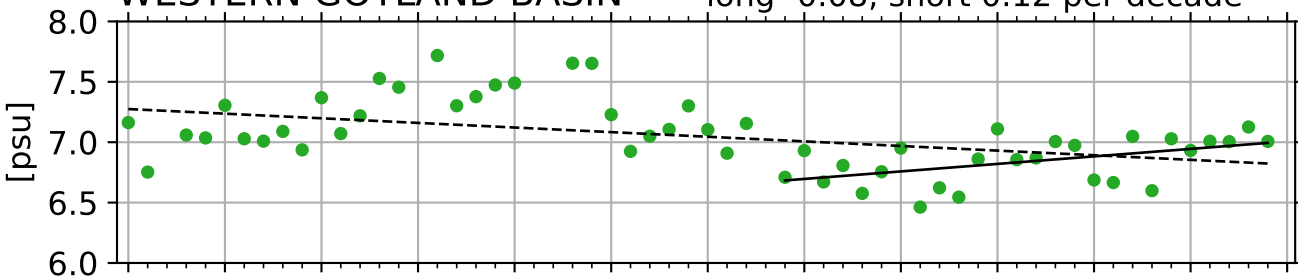
NORTHERN BALTIC PROPER

long -0.11 per decade



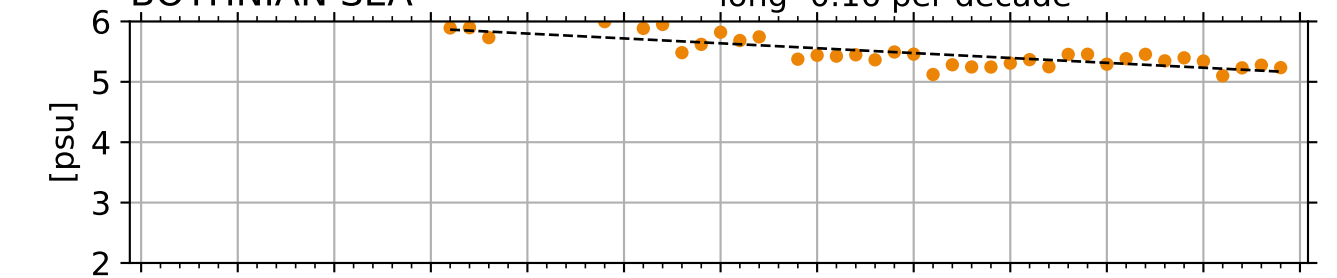
WESTERN GOTLAND BASIN

long -0.08, short 0.12 per decade

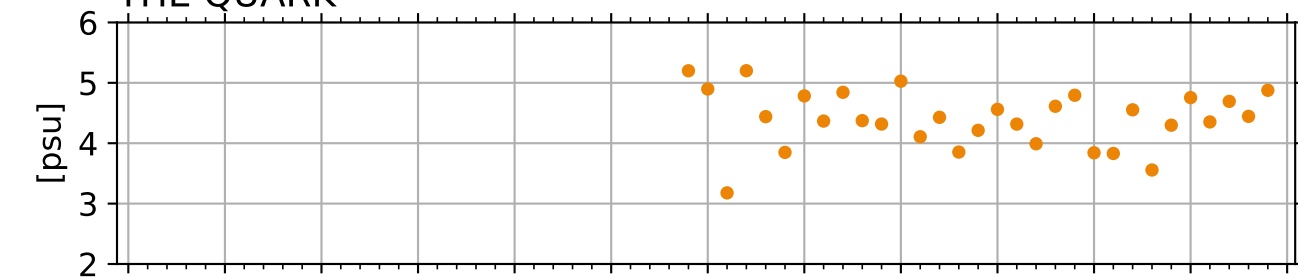


BOTHNIAN SEA

long -0.16 per decade

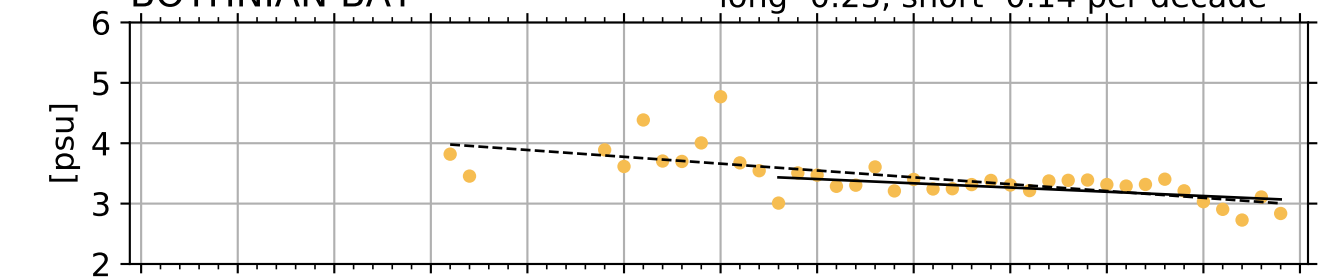


THE QUARK



BOTHNIAN BAY

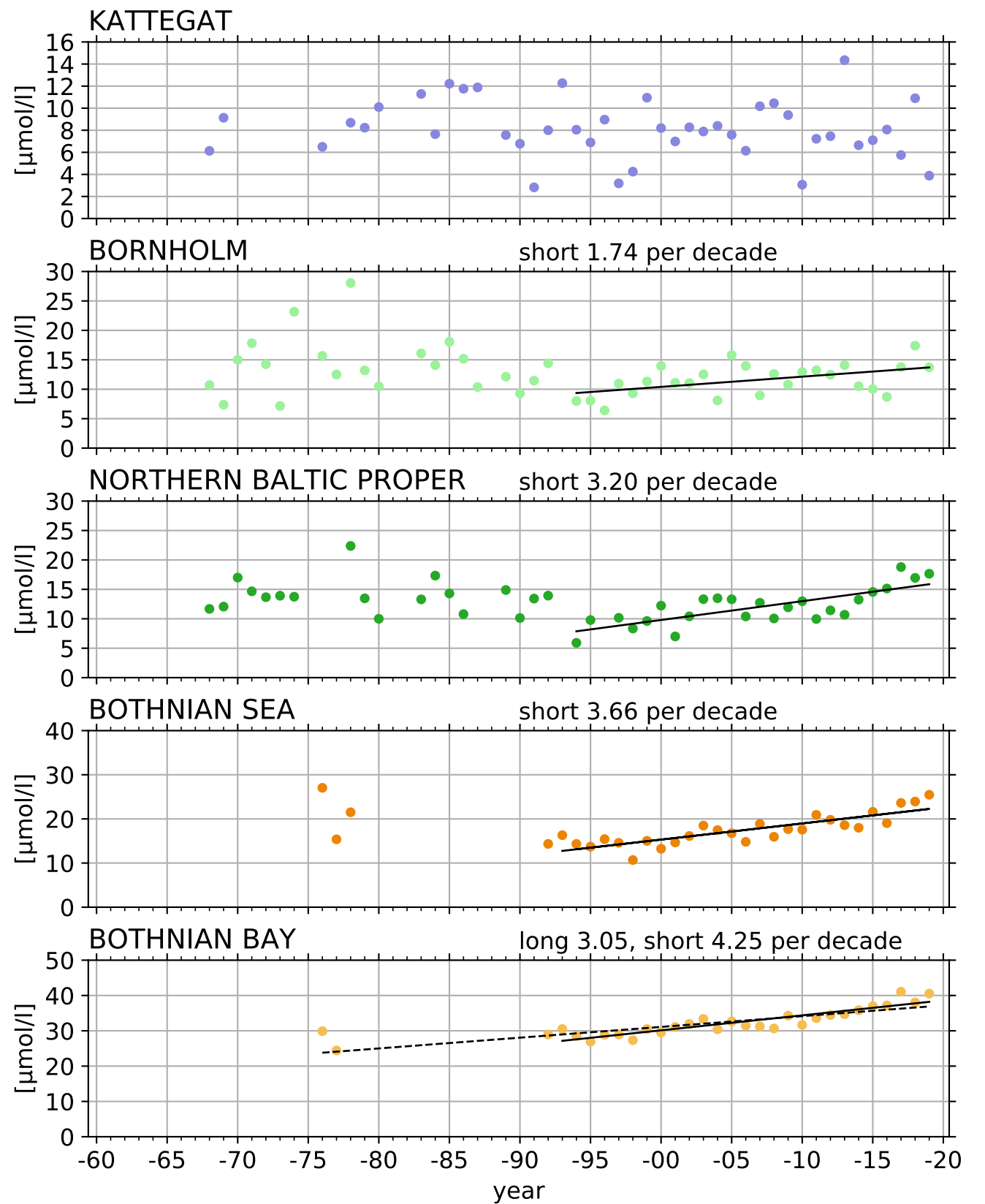
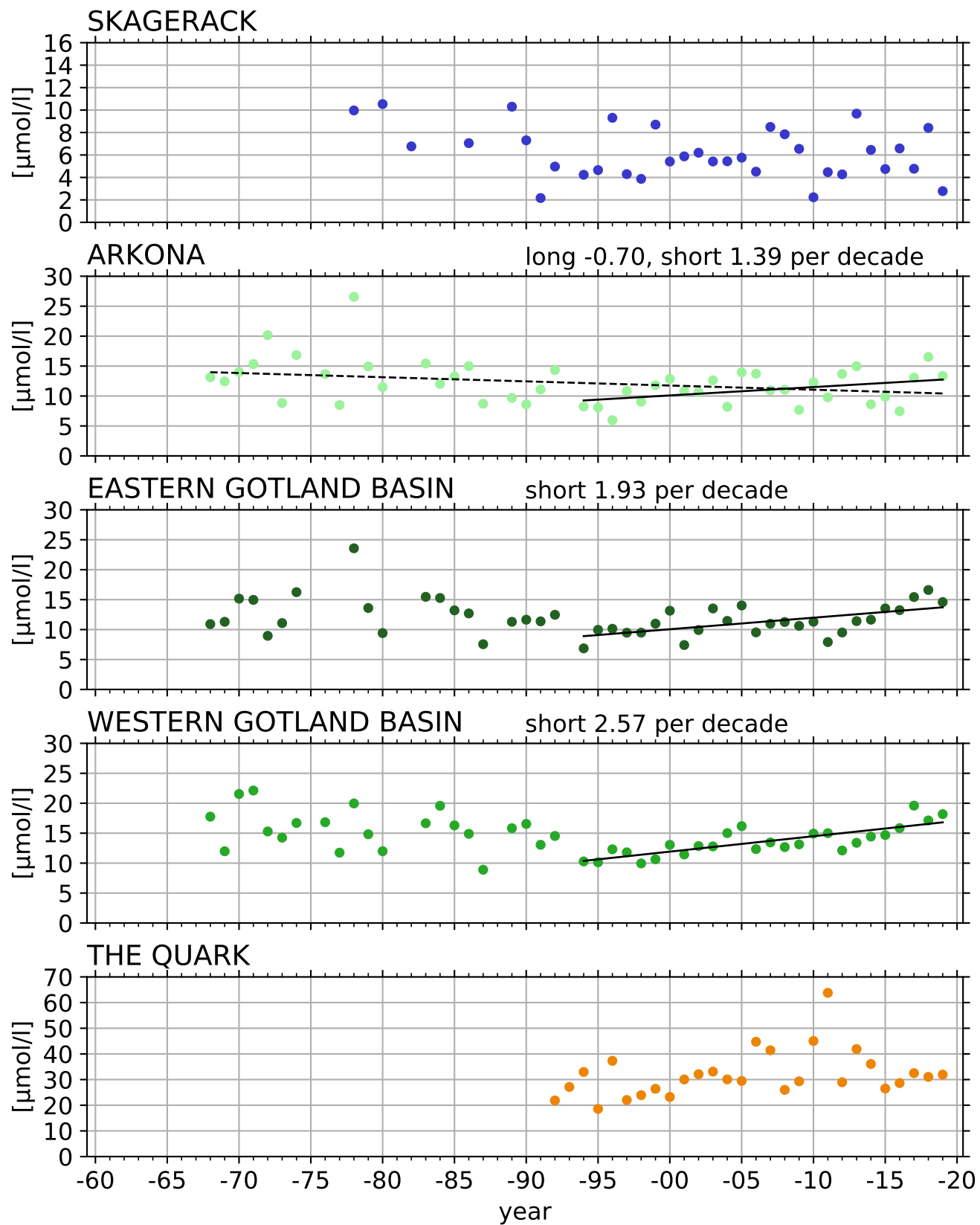
long -0.23, short -0.14 per decade



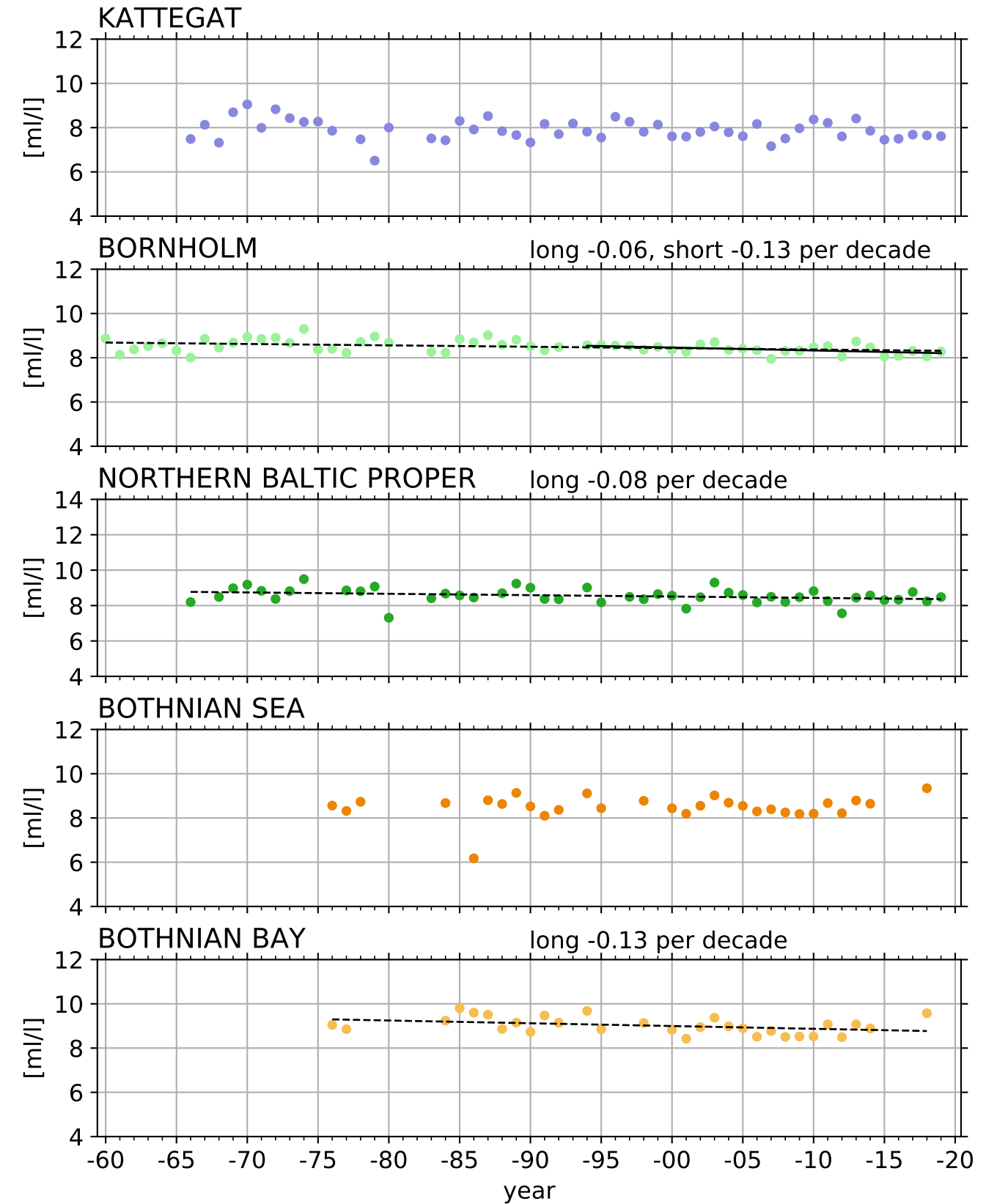
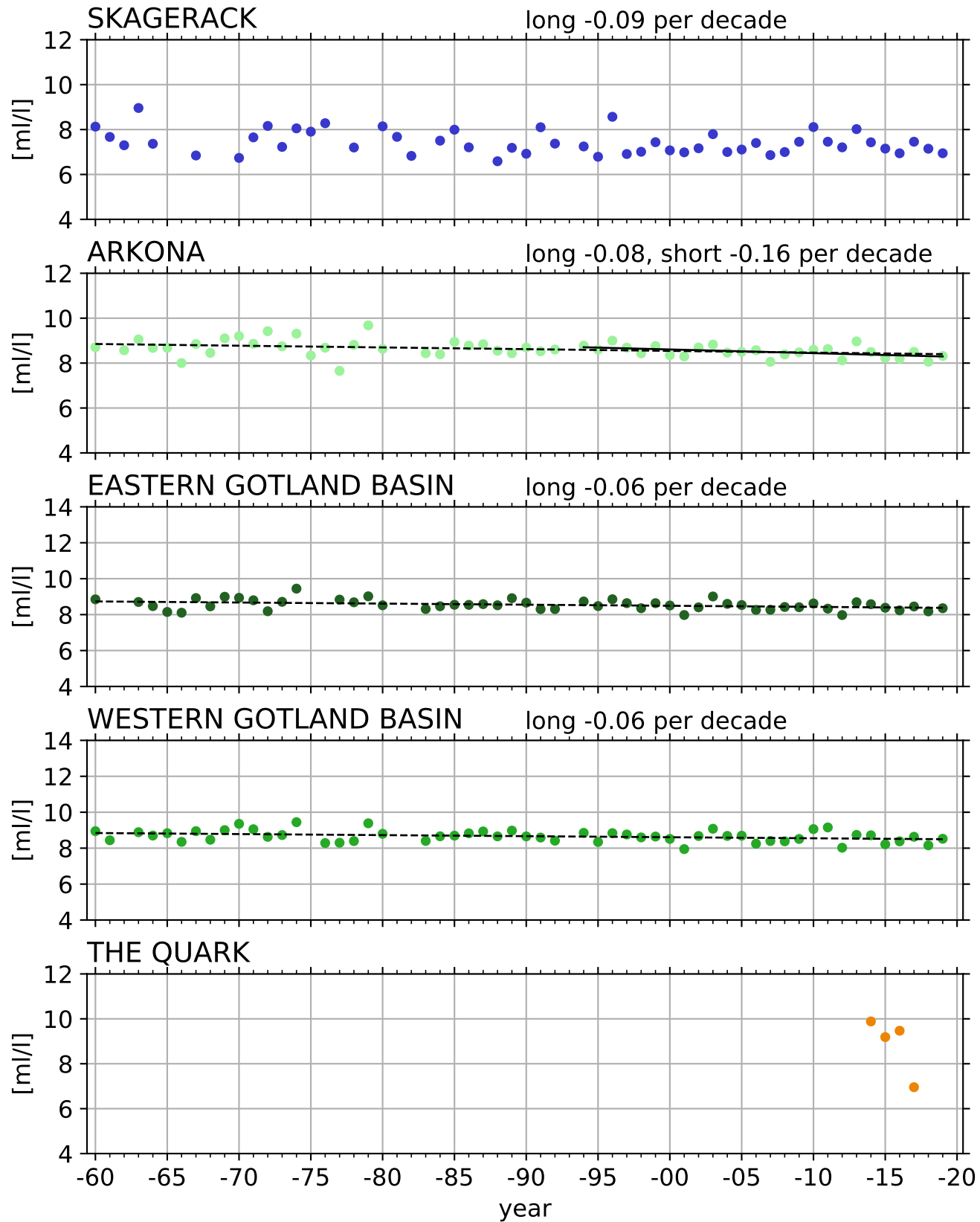
year

year

Dissolved Silica winter [$\mu\text{mol/l}$] 0-10 m



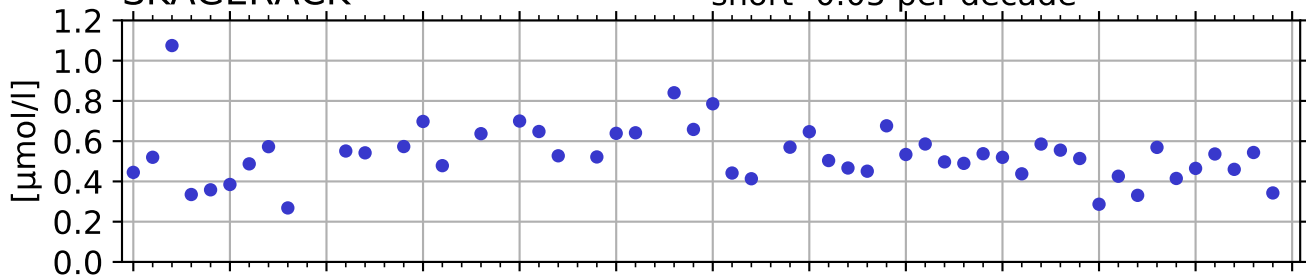
Dissolved oxygen winter [ml/l] 0-10 m



Phosphate winter [$\mu\text{mol/l}$] 0-10 m

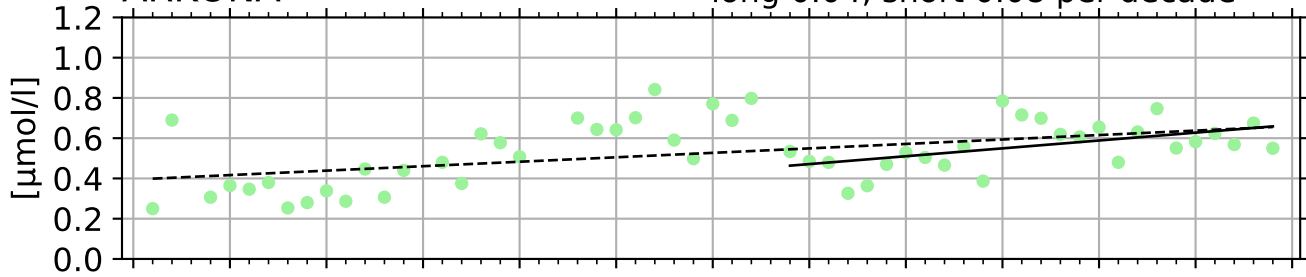
SKAGERACK

short -0.05 per decade



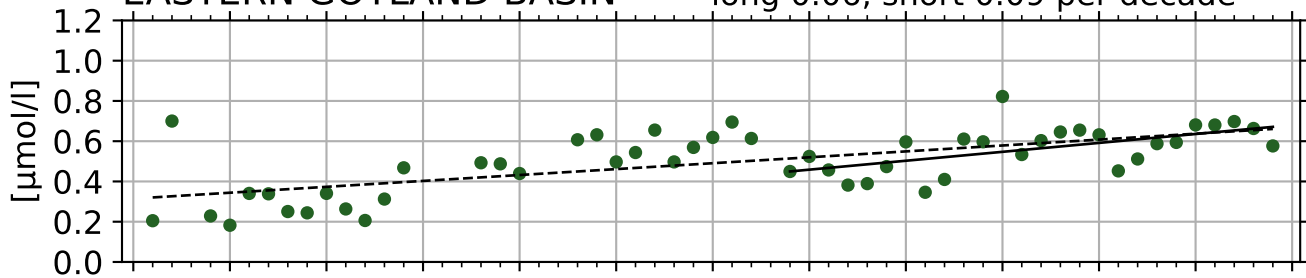
ARKONA

long 0.04, short 0.08 per decade



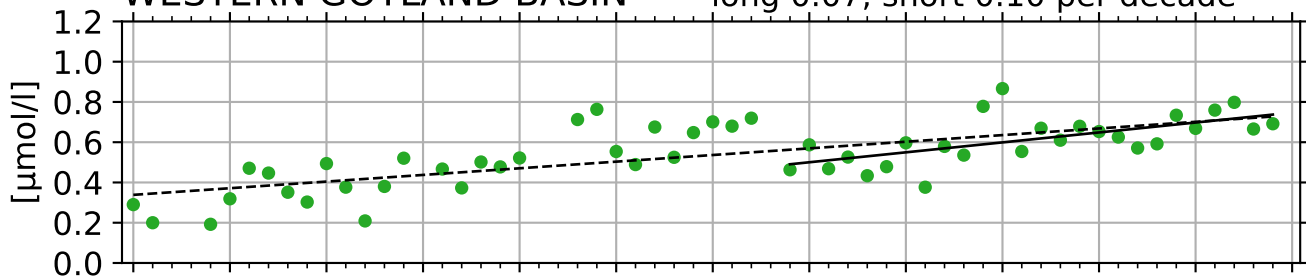
EASTERN GOTLAND BASIN

long 0.06, short 0.09 per decade



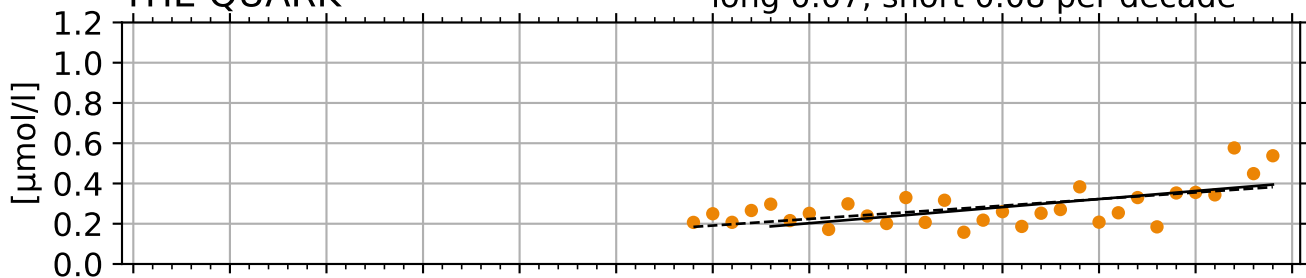
WESTERN GOTLAND BASIN

long 0.07, short 0.10 per decade

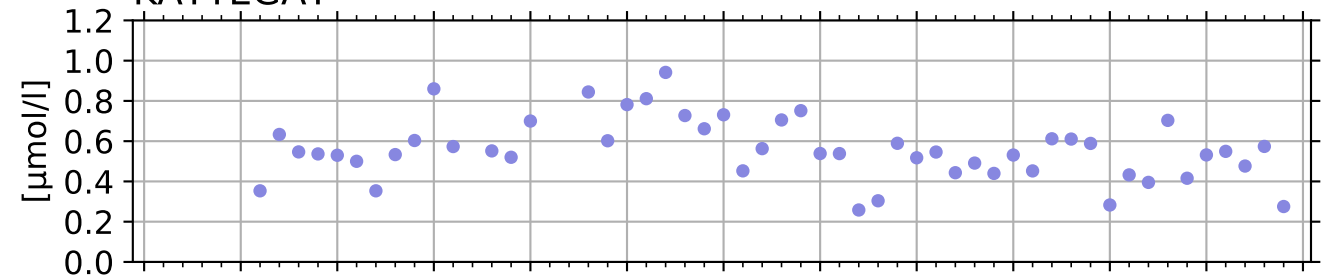


THE QUARK

long 0.07, short 0.08 per decade

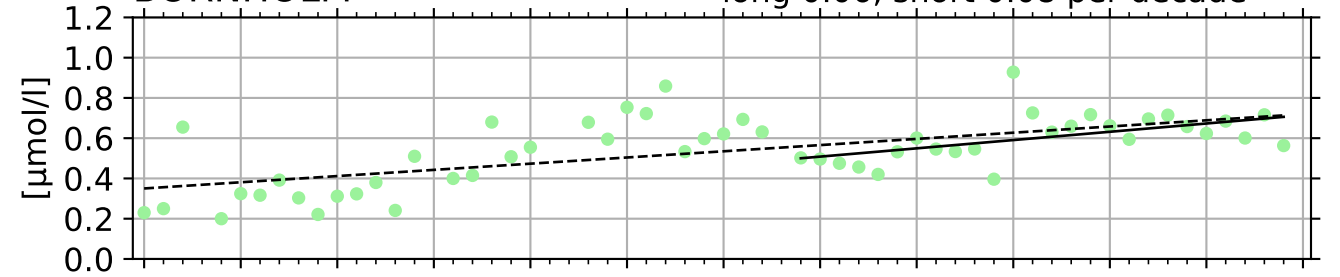


KATTEGAT



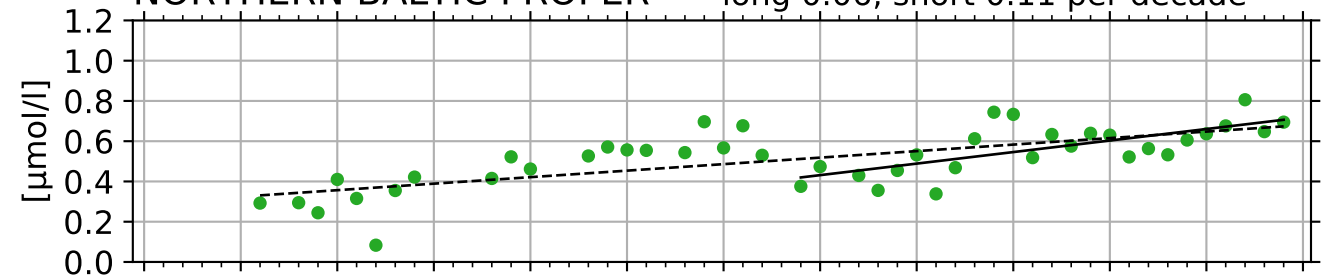
BORNHOLM

long 0.06, short 0.08 per decade



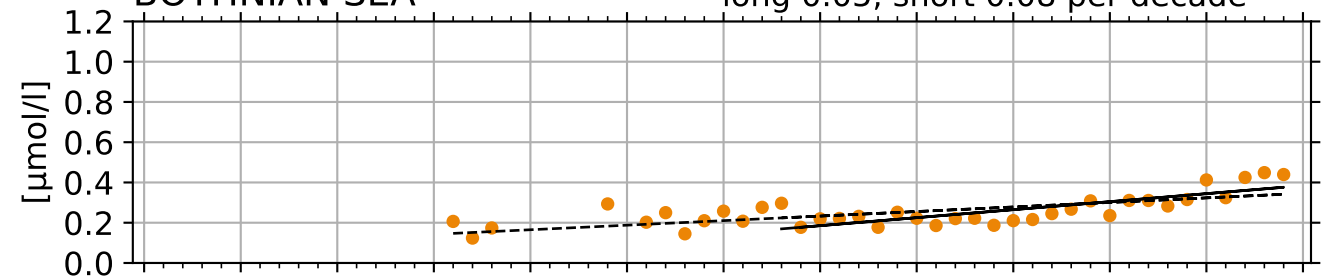
NORTHERN BALTIC PROPER

long 0.06, short 0.11 per decade

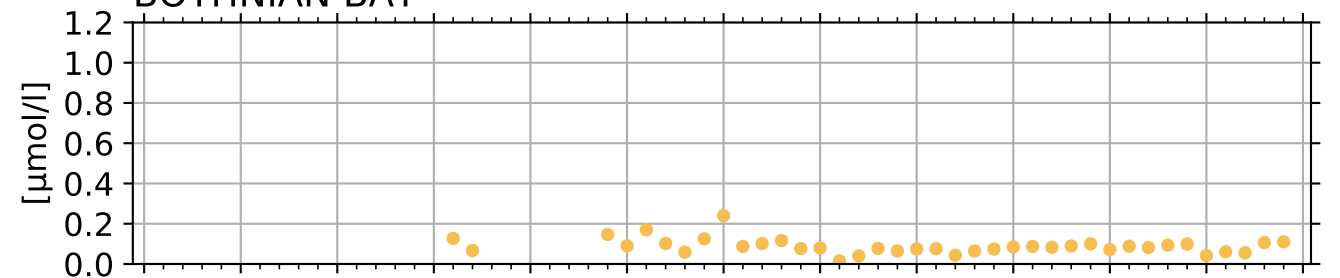


BOTHNIAN SEA

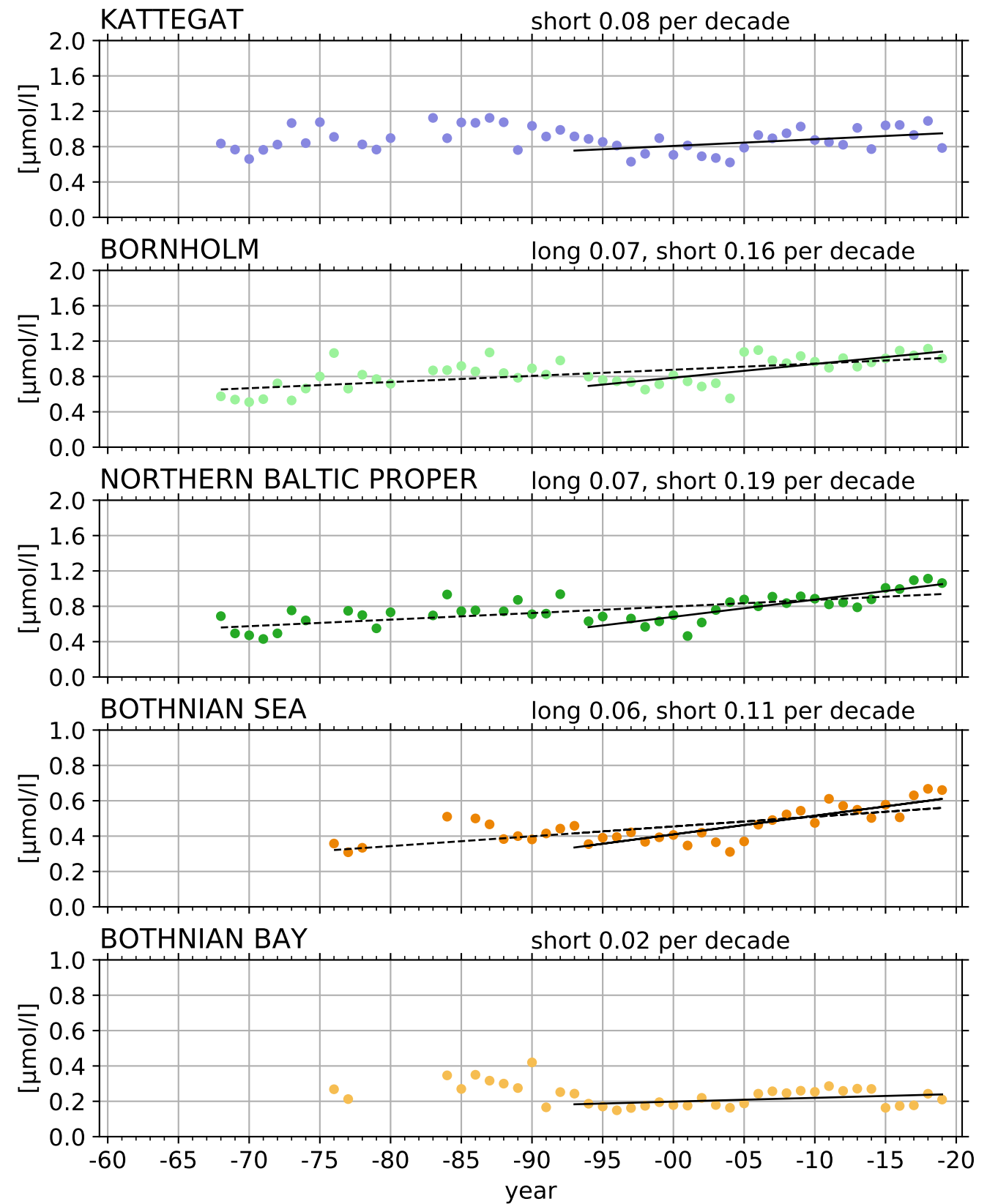
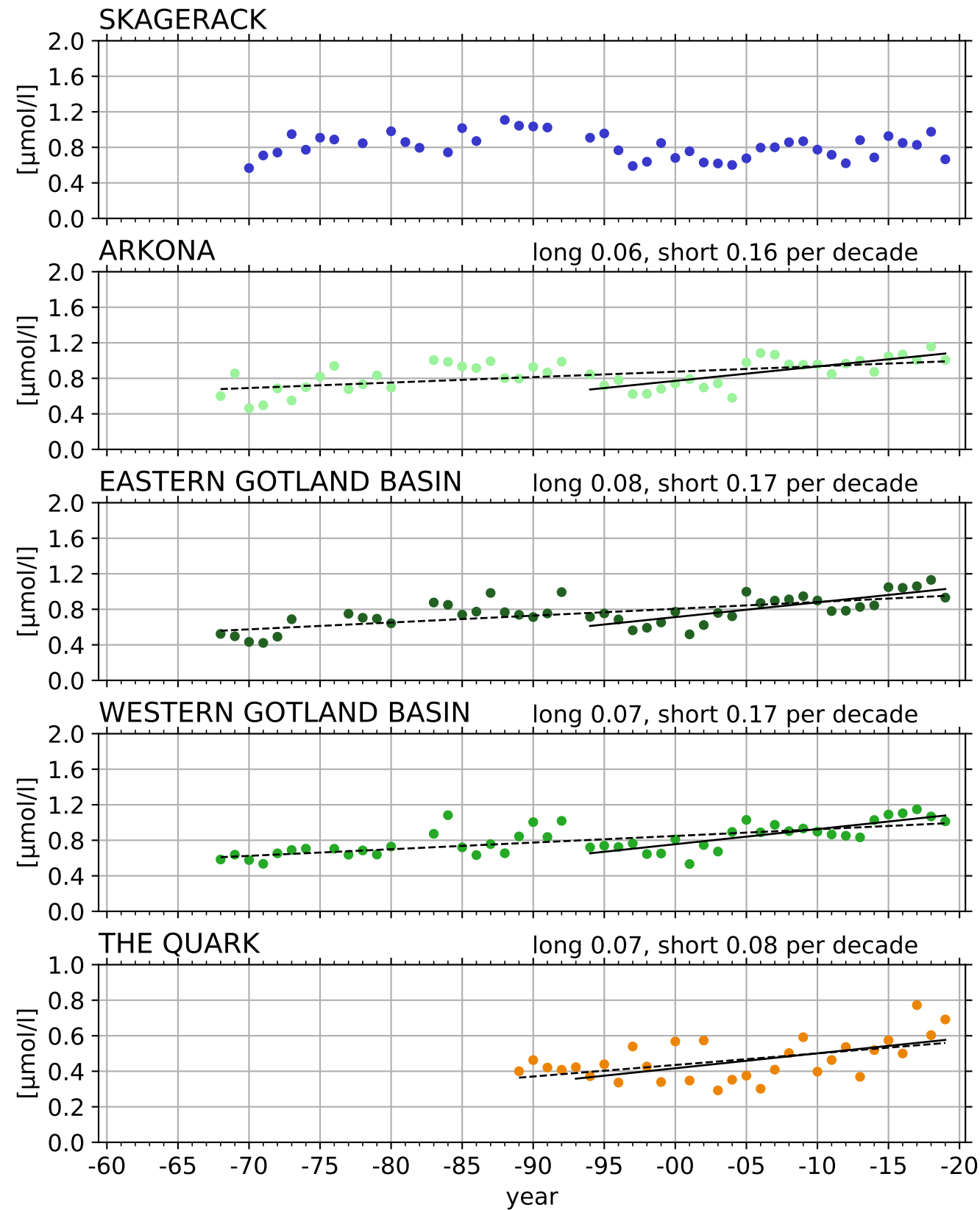
long 0.05, short 0.08 per decade



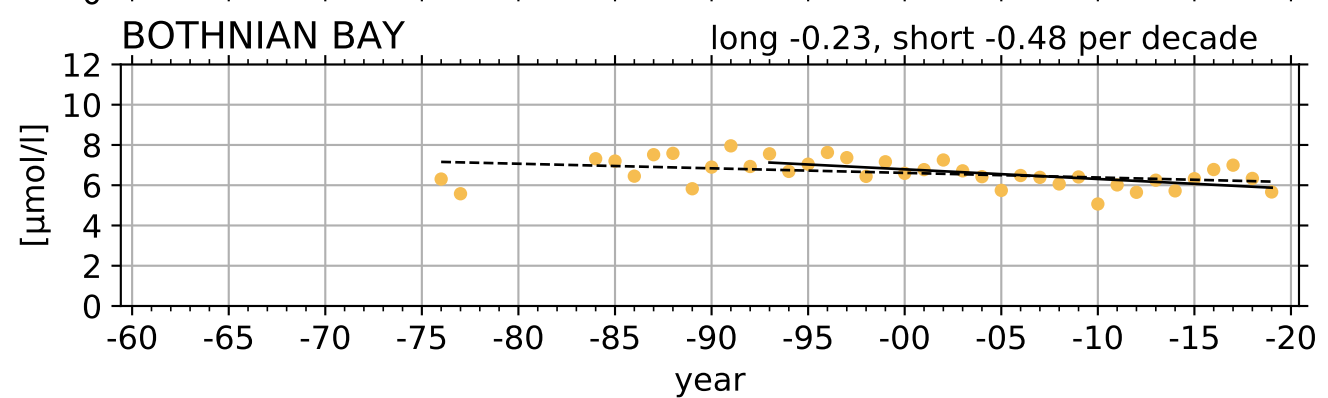
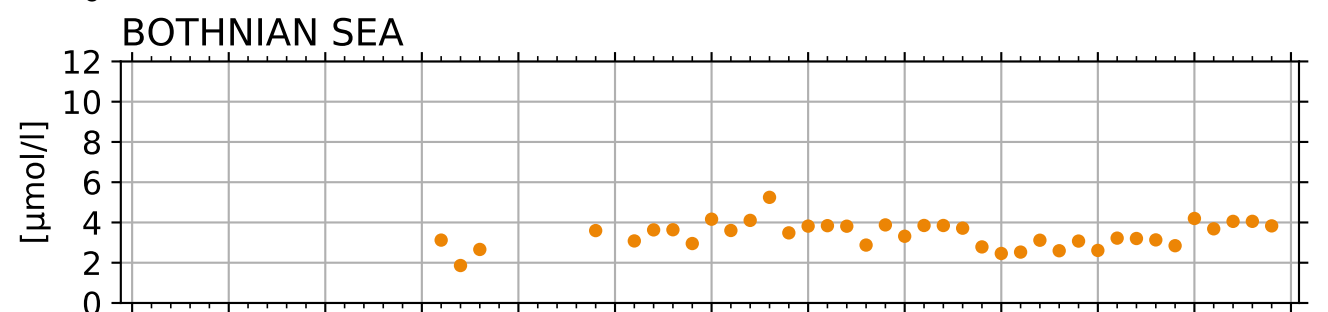
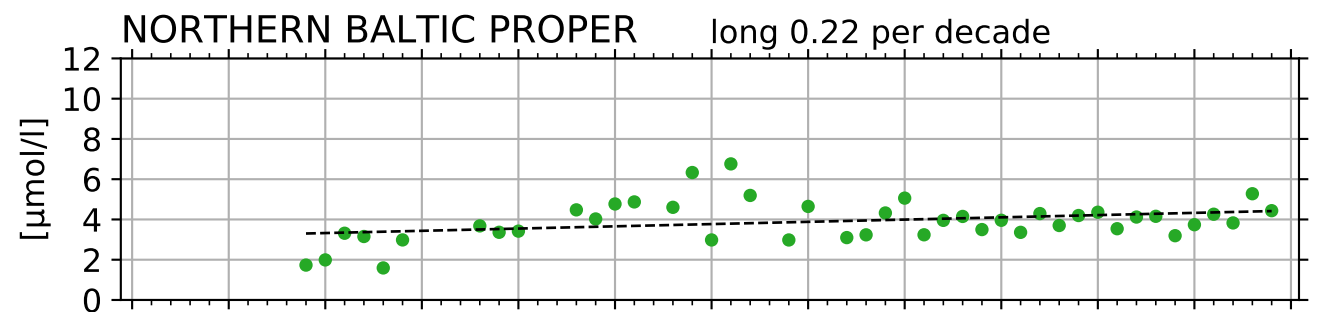
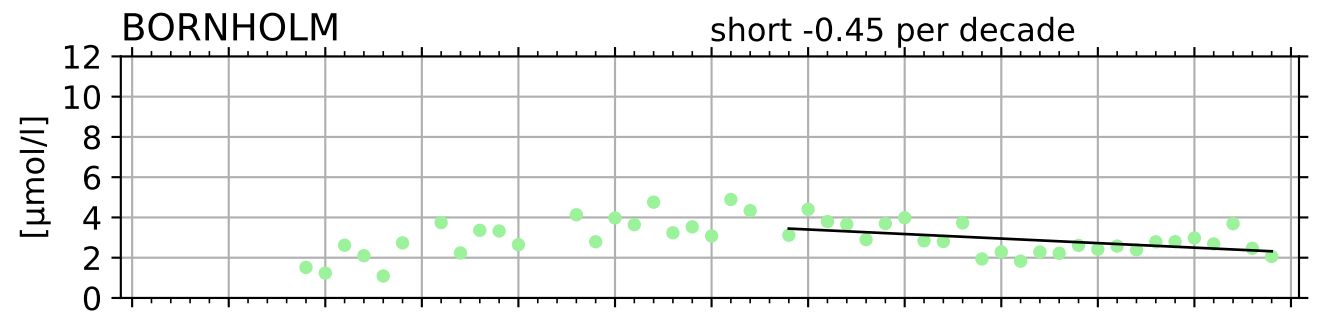
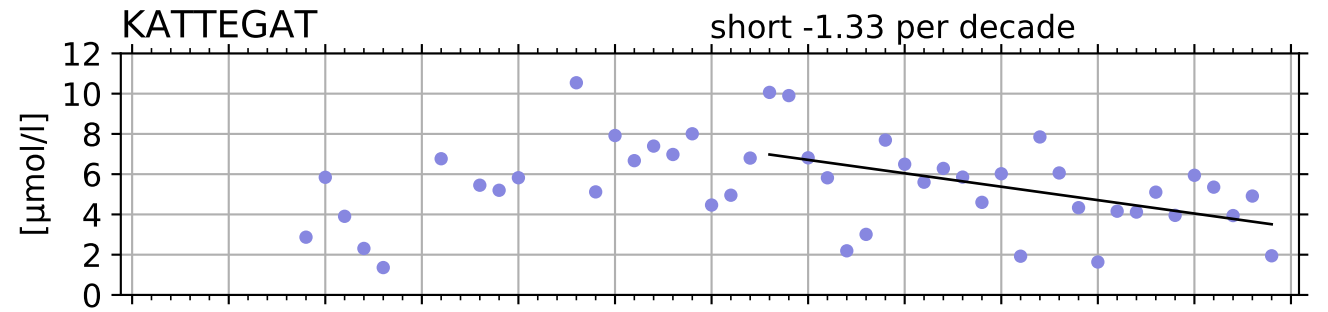
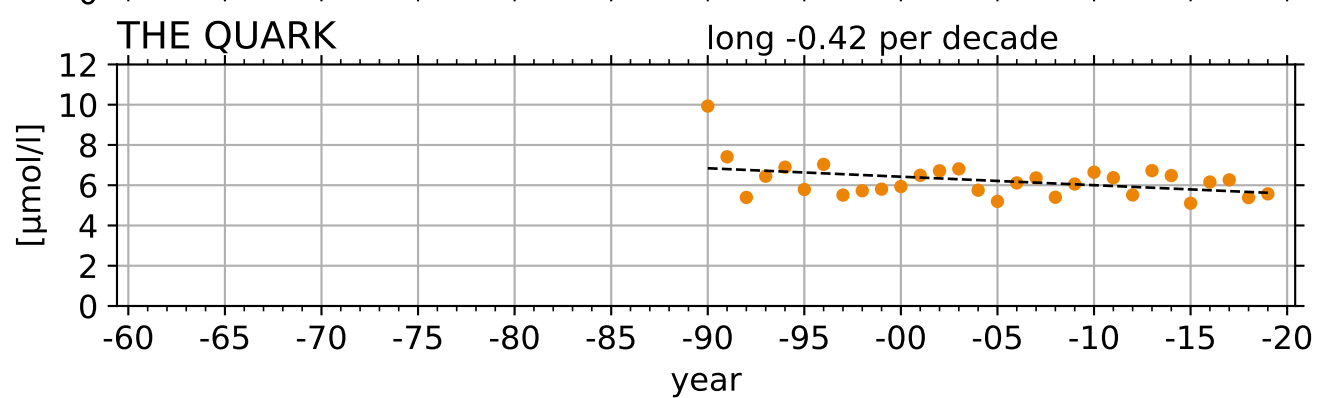
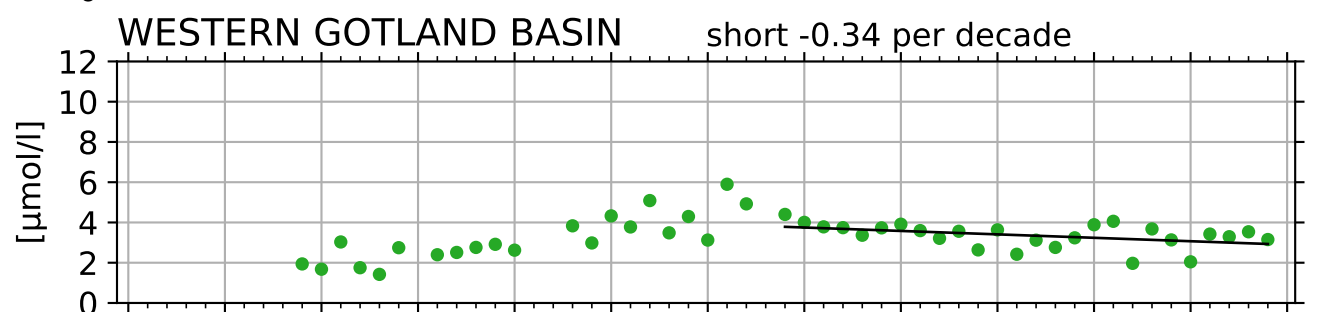
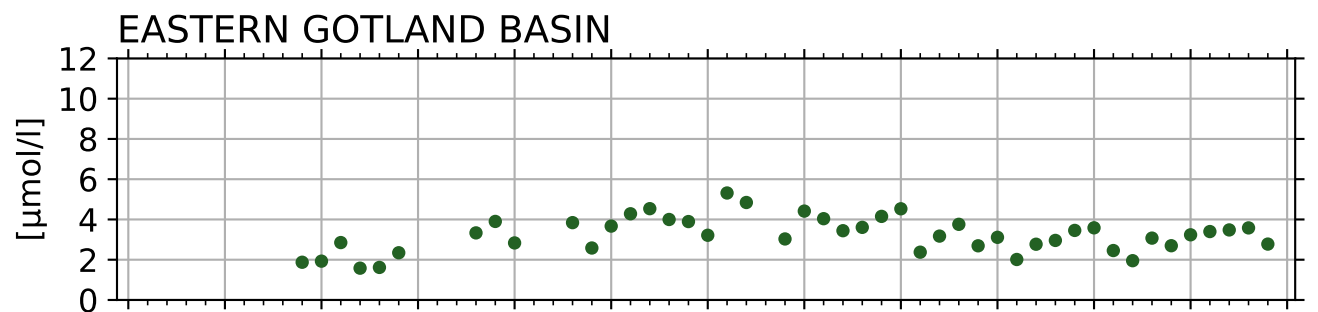
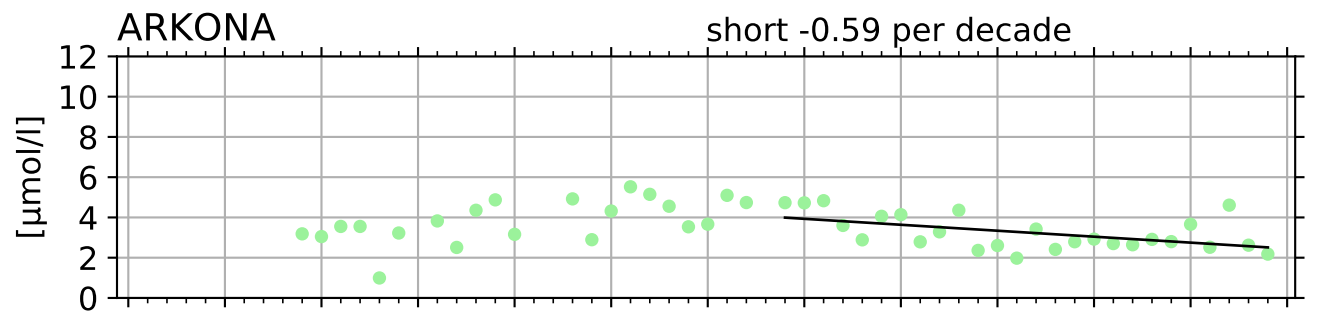
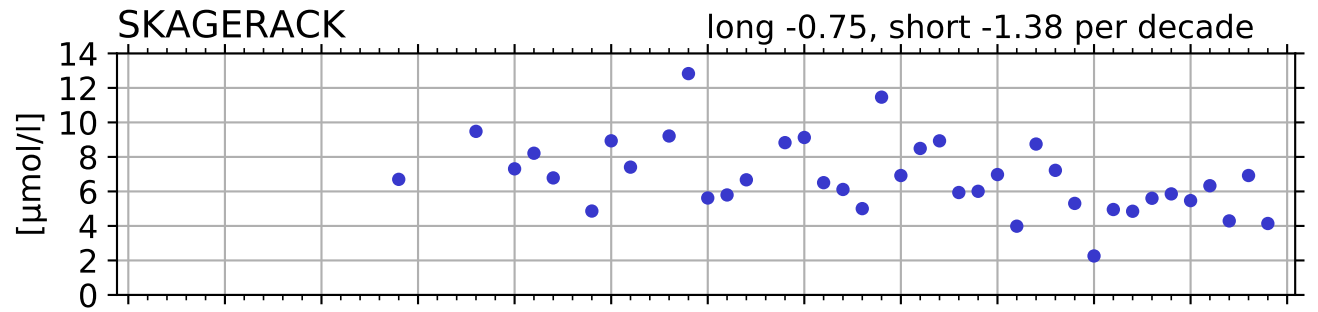
BOTHNIAN BAY



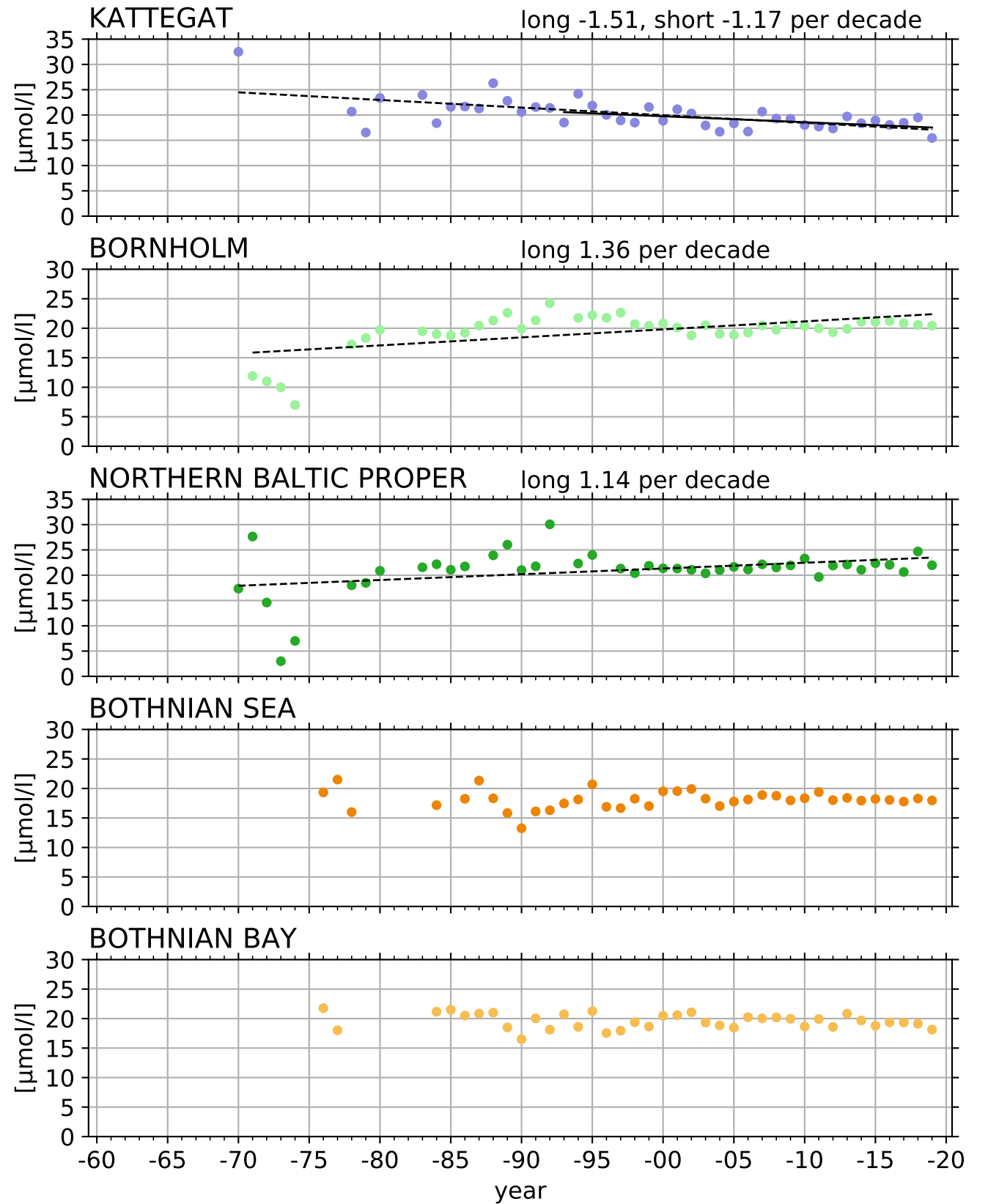
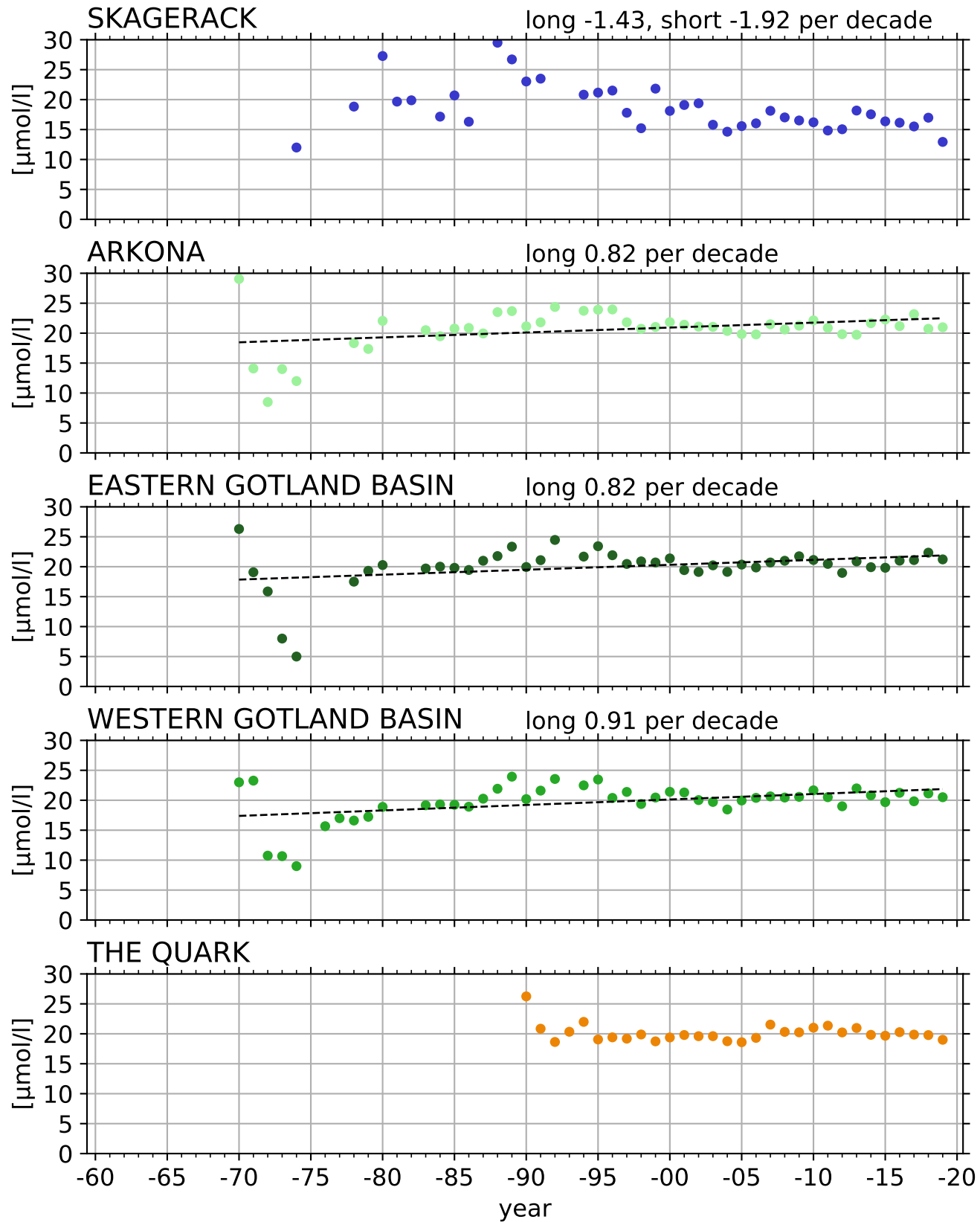
Total phosphorus winter [$\mu\text{mol/l}$] 0-10 m



DIN winter [$\mu\text{mol/l}$] 0-10 m



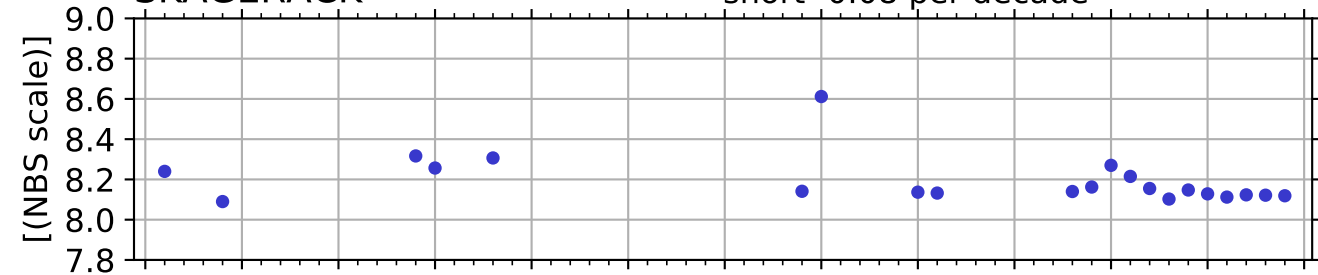
Total Nitrogen winter [$\mu\text{mol/l}$] 0-10 m



pH winter [(NBS scale)] 0-10 m

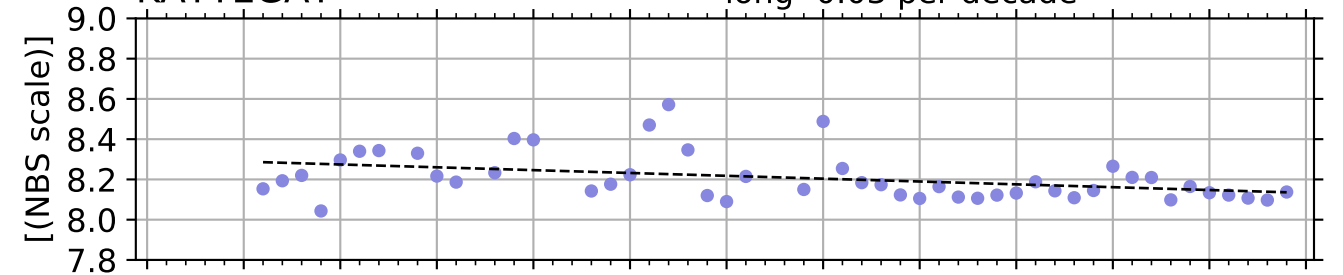
SKAGERACK

short -0.08 per decade

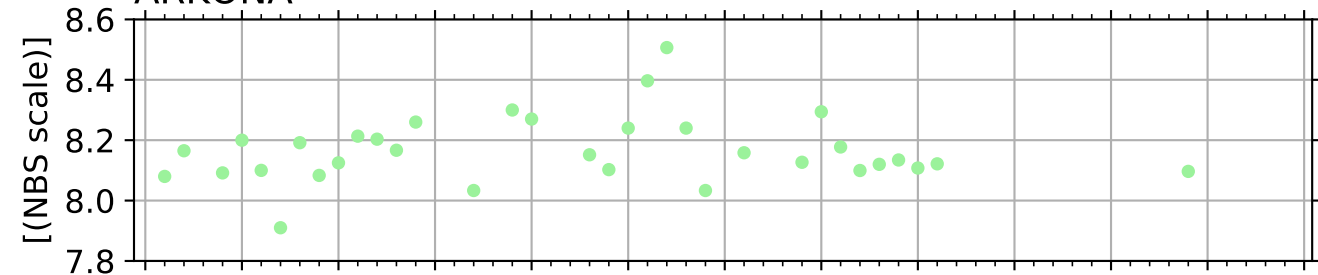


KATTEGAT

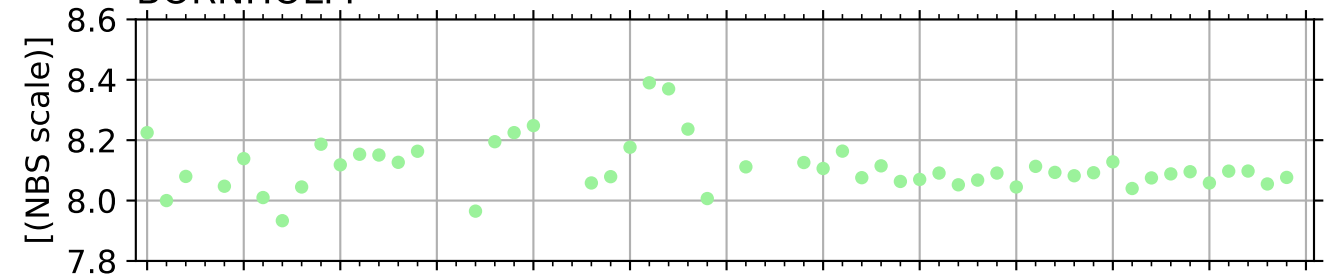
long -0.03 per decade



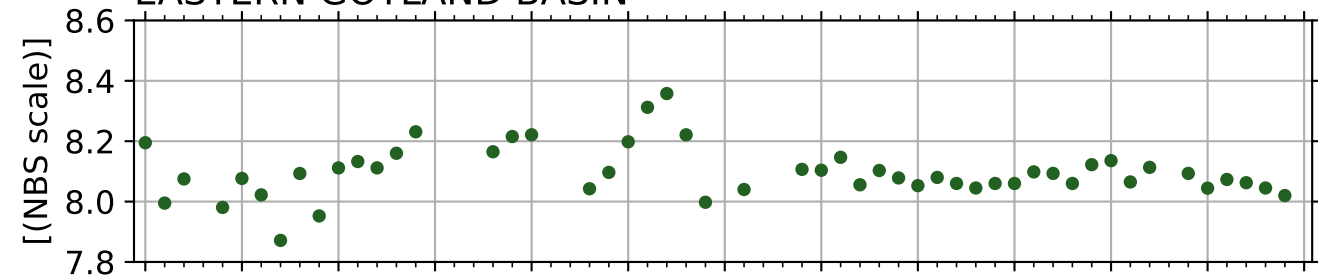
ARKONA



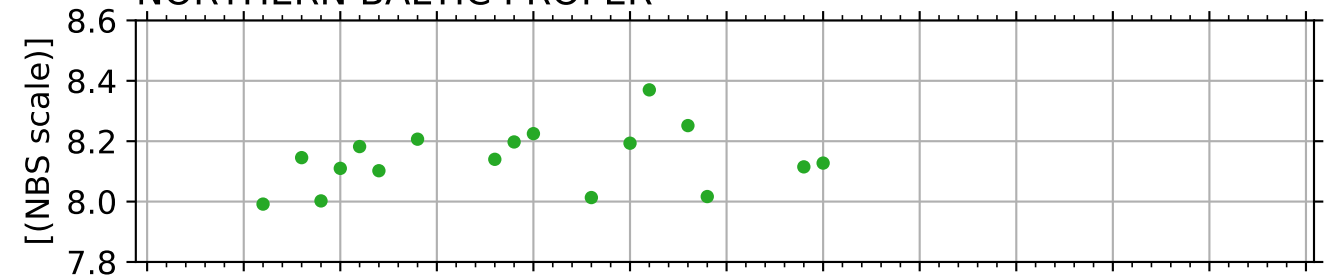
BORNHOLM



EASTERN GOTLAND BASIN

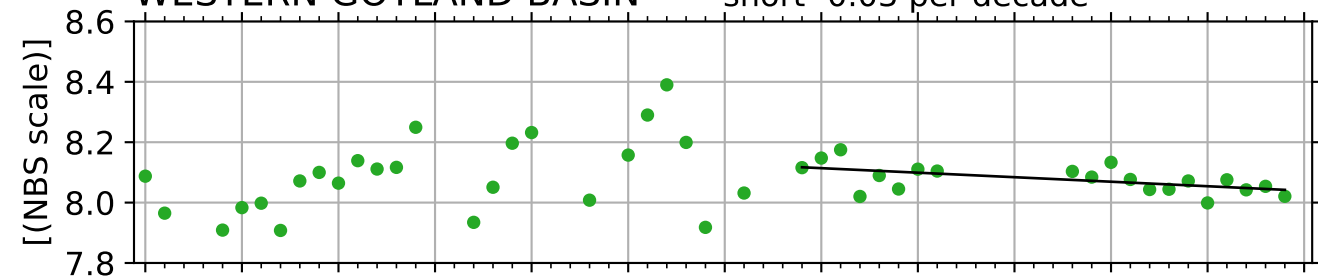


NORTHERN BALTIC PROPER

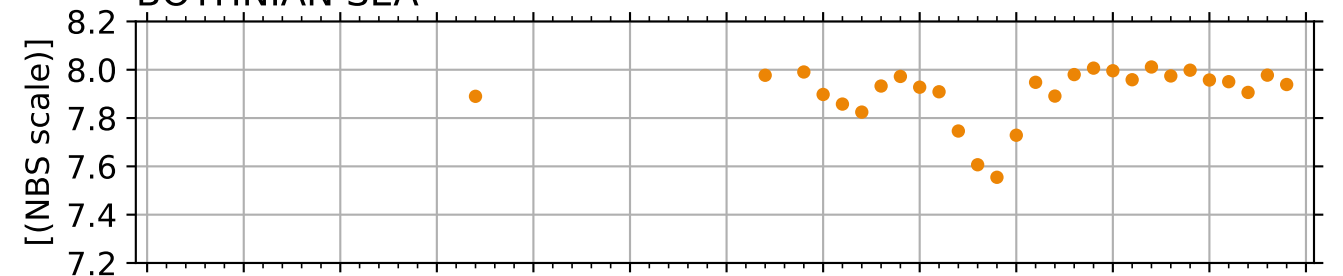


WESTERN GOTLAND BASIN

short -0.03 per decade

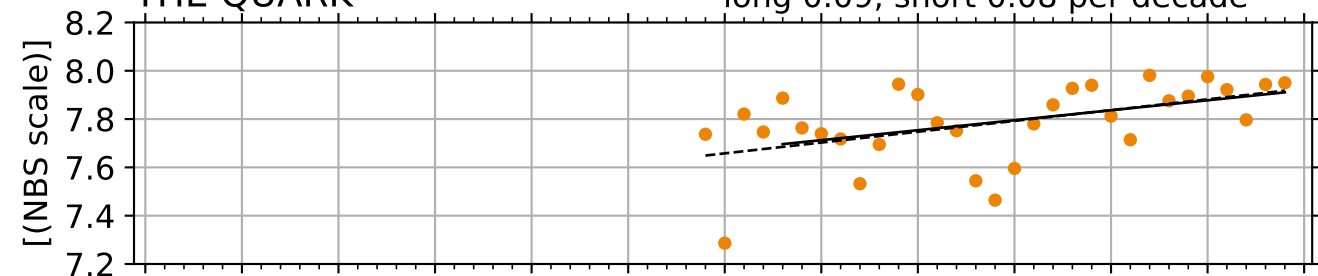


BOTHNIAN SEA

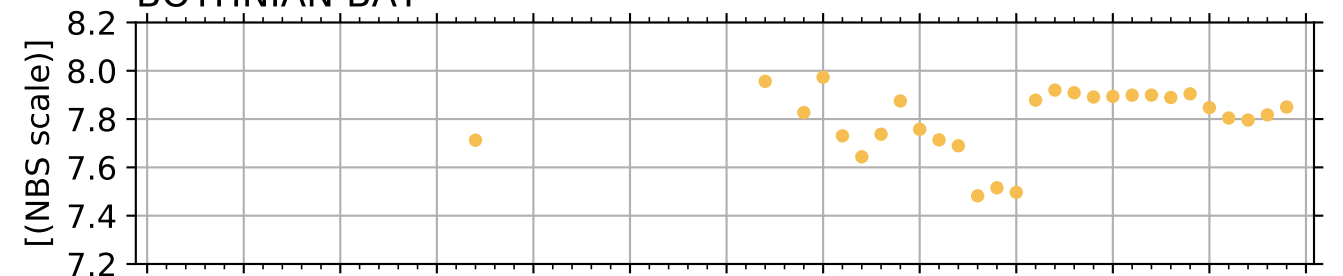


THE QUARK

long 0.09, short 0.08 per decade



BOTHNIAN BAY

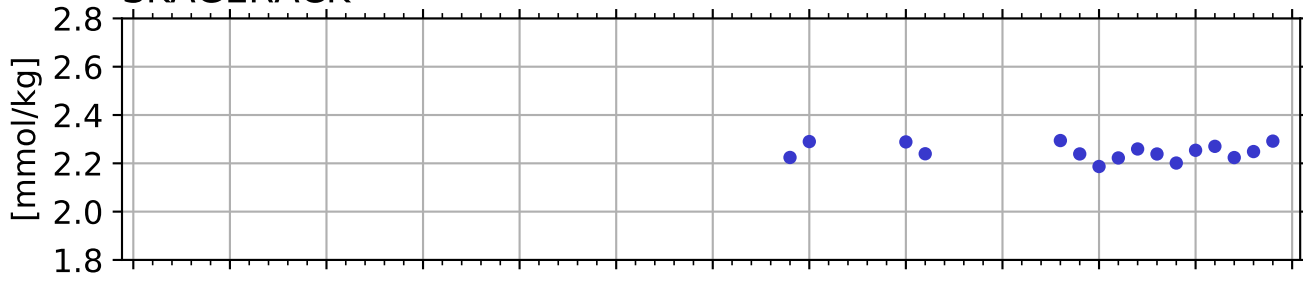


year

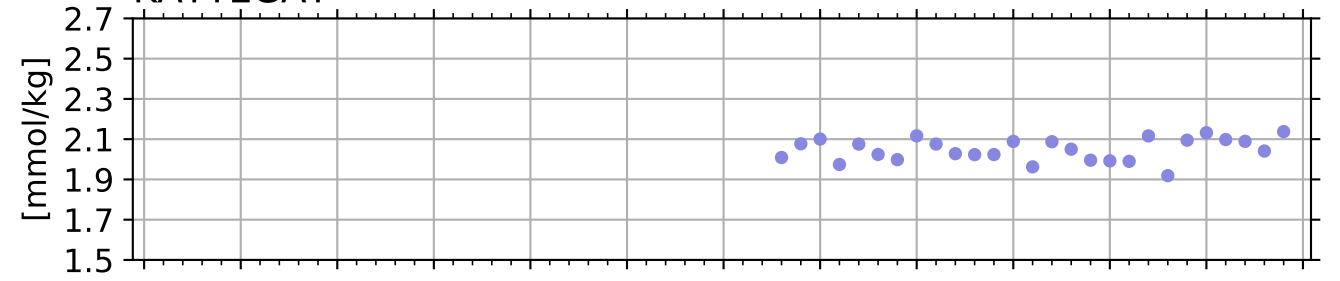
year

Alkalinity winter [mmol/kg] 0-10 m

SKAGERACK

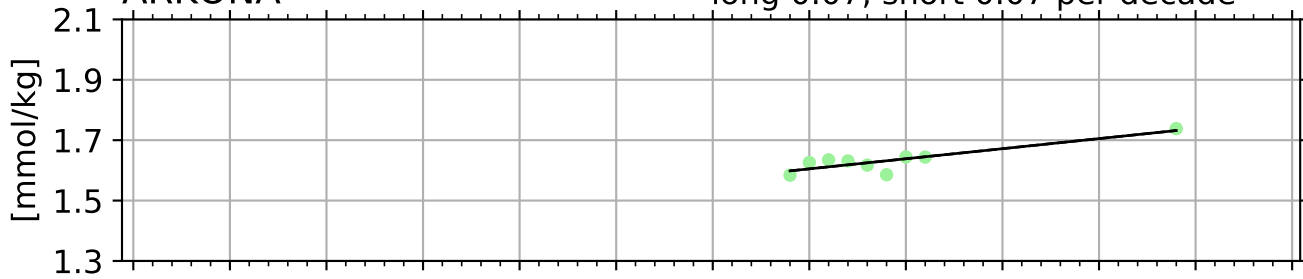


KATTEGAT



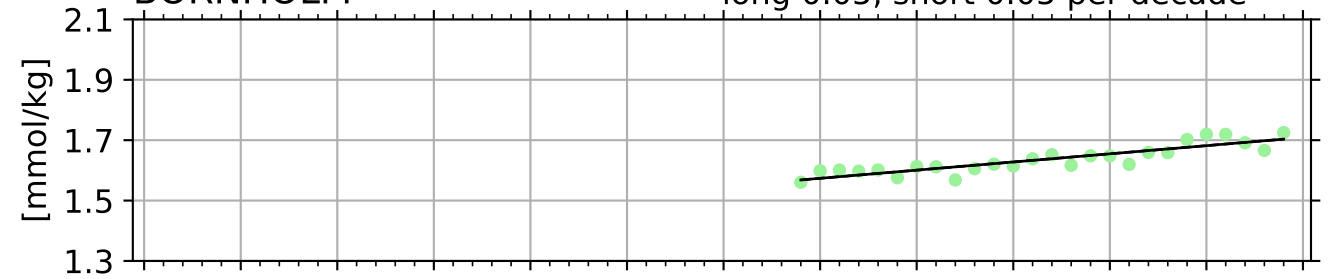
ARKONA

long 0.07, short 0.07 per decade



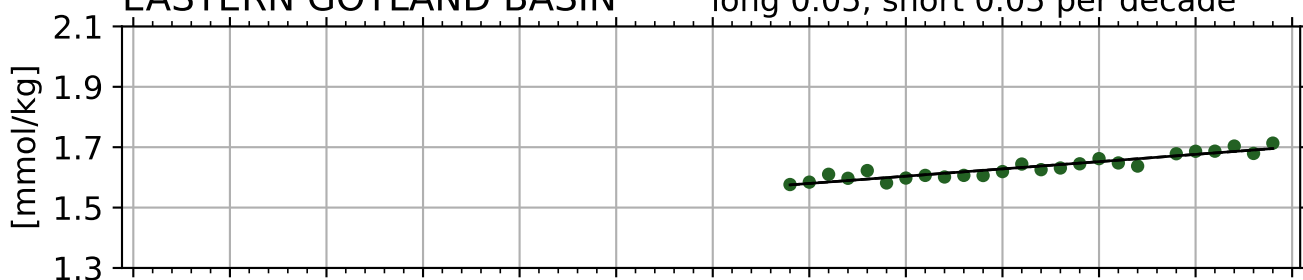
BORNHOLM

long 0.05, short 0.05 per decade

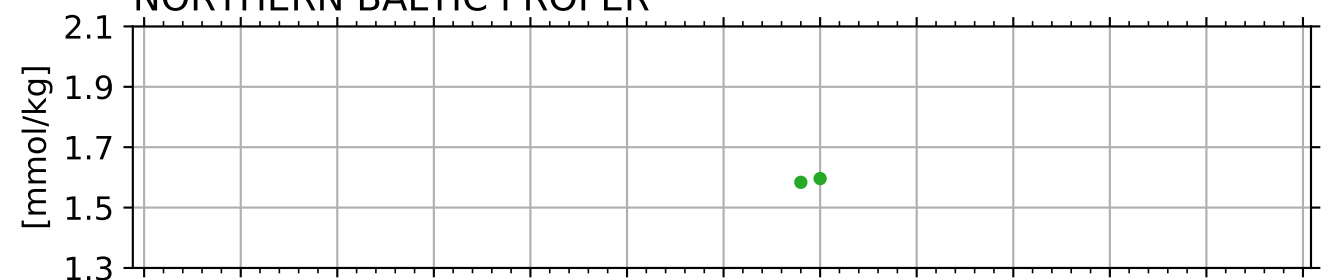


EASTERN GOTLAND BASIN

long 0.05, short 0.05 per decade

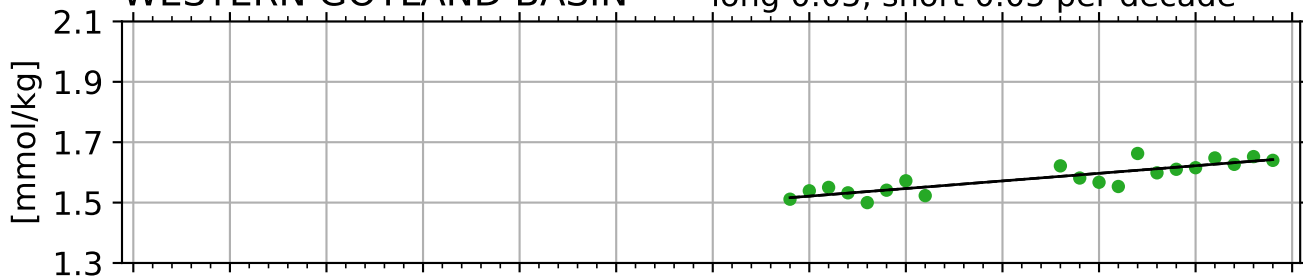


NORTHERN BALTIC PROPER



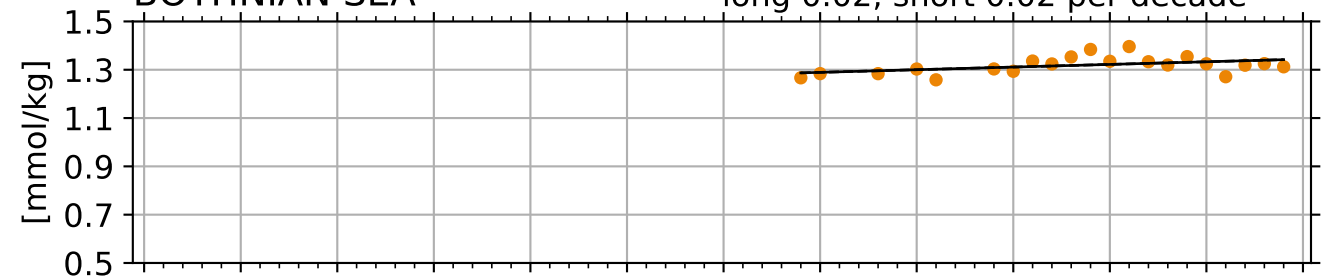
WESTERN GOTLAND BASIN

long 0.05, short 0.05 per decade



BOTHNIAN SEA

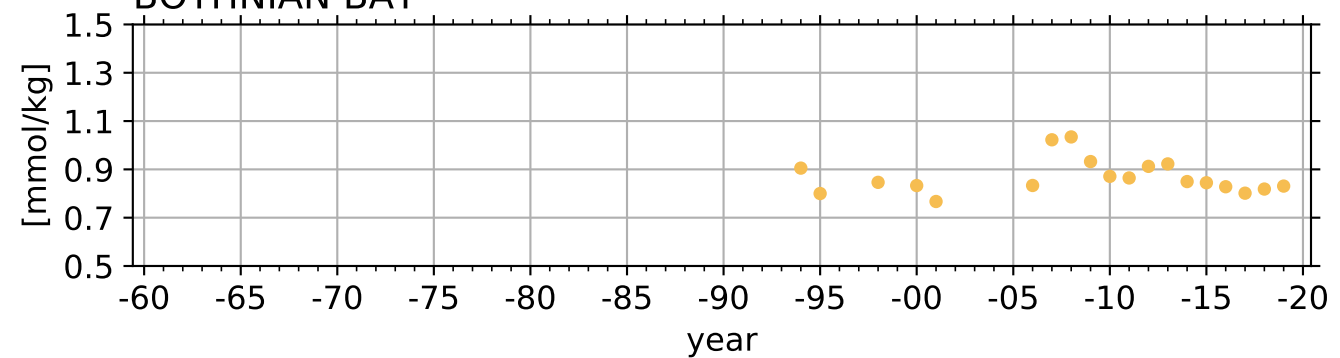
long 0.02, short 0.02 per decade



THE QUARK

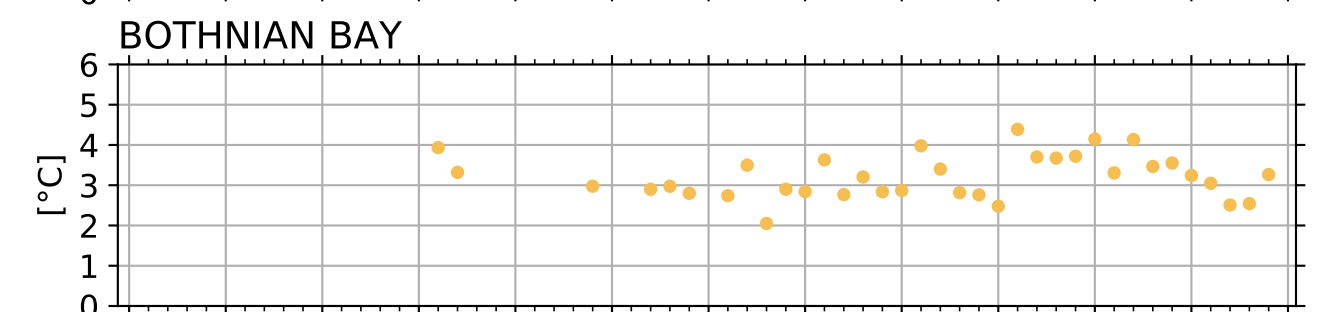
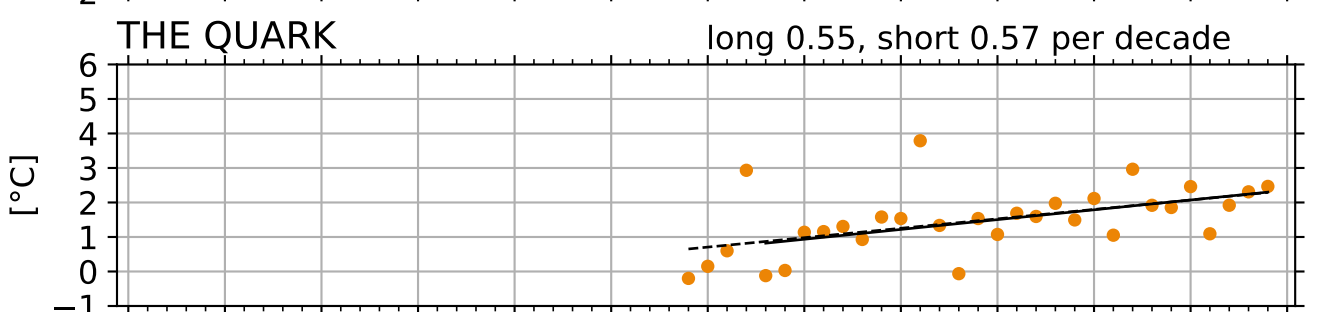
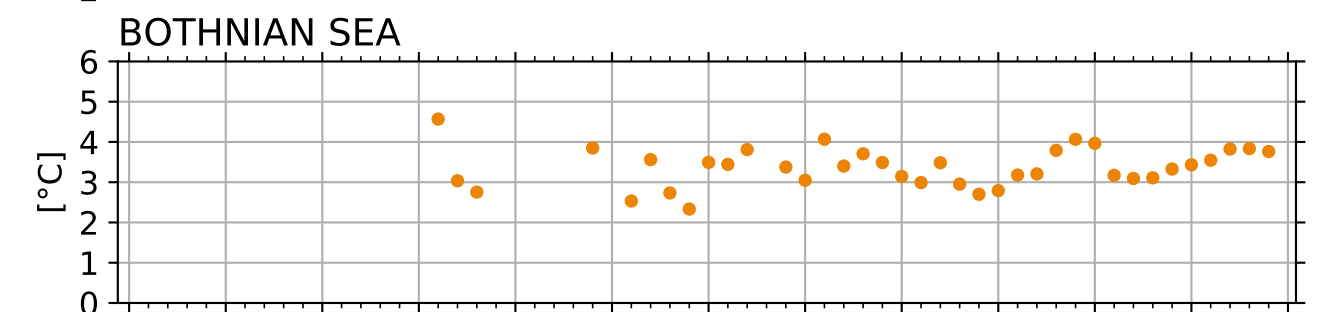
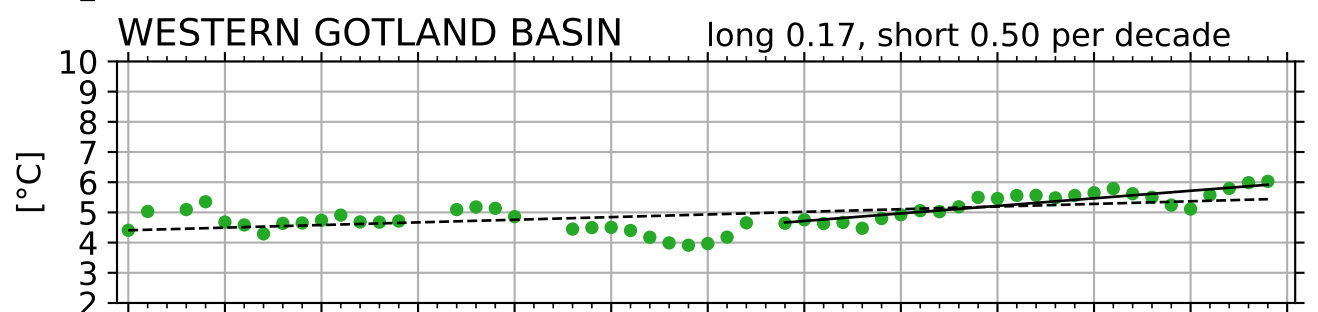
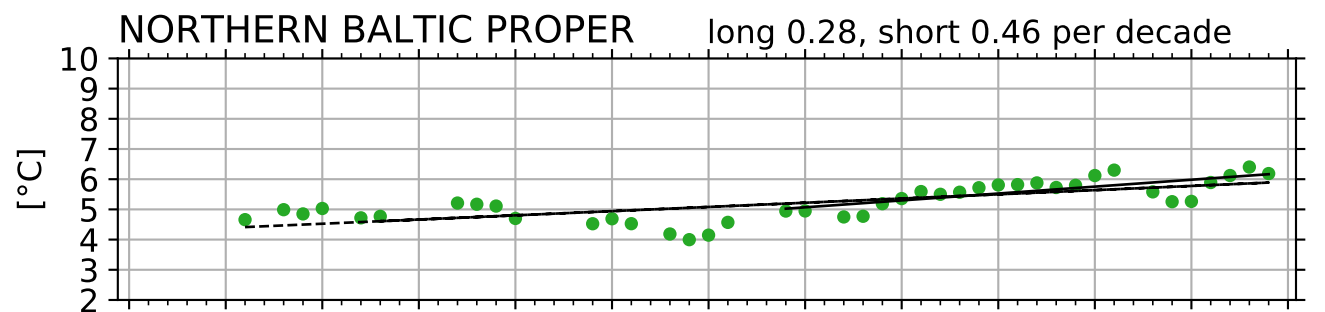
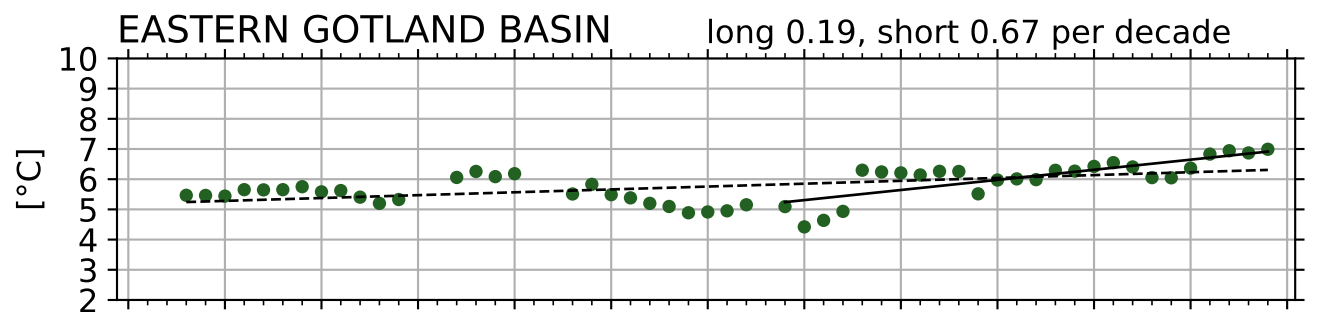
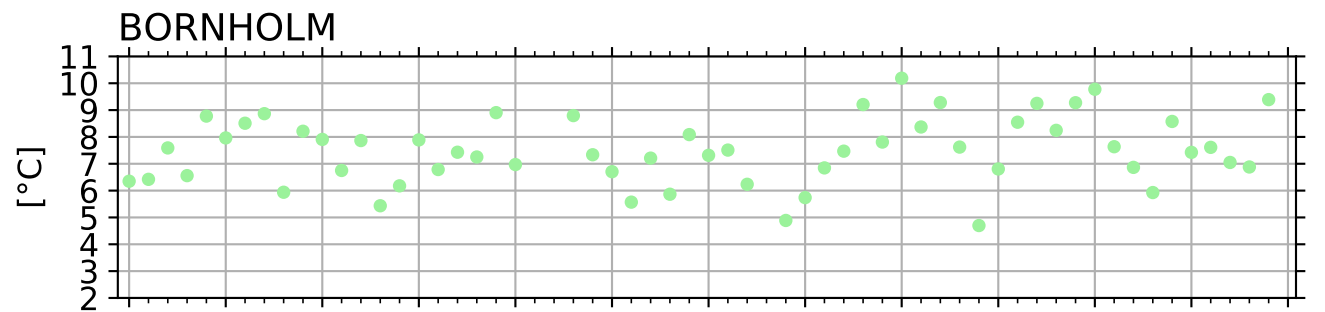
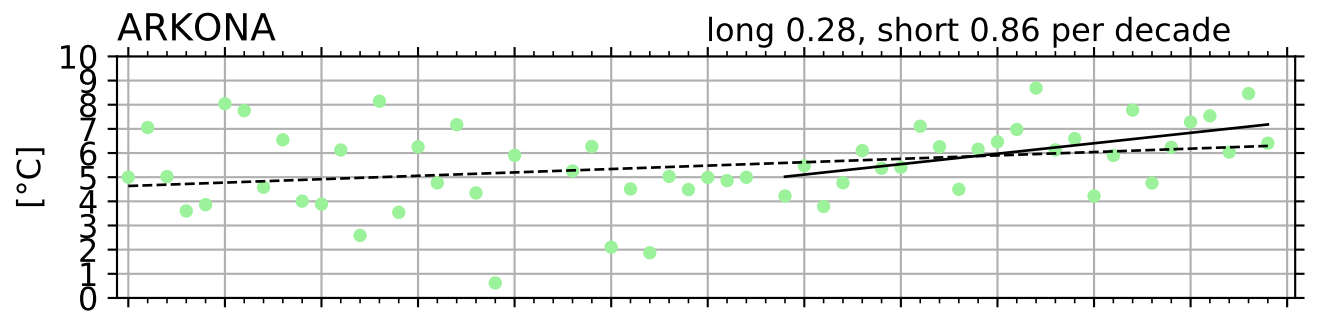
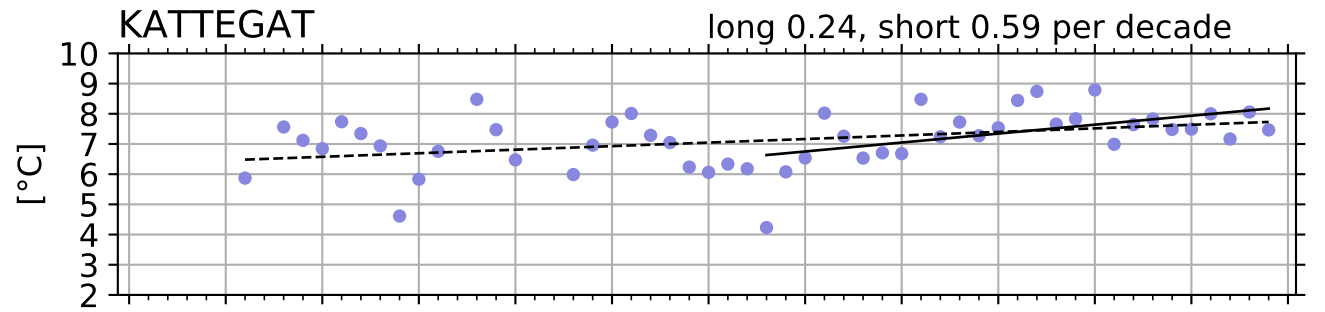
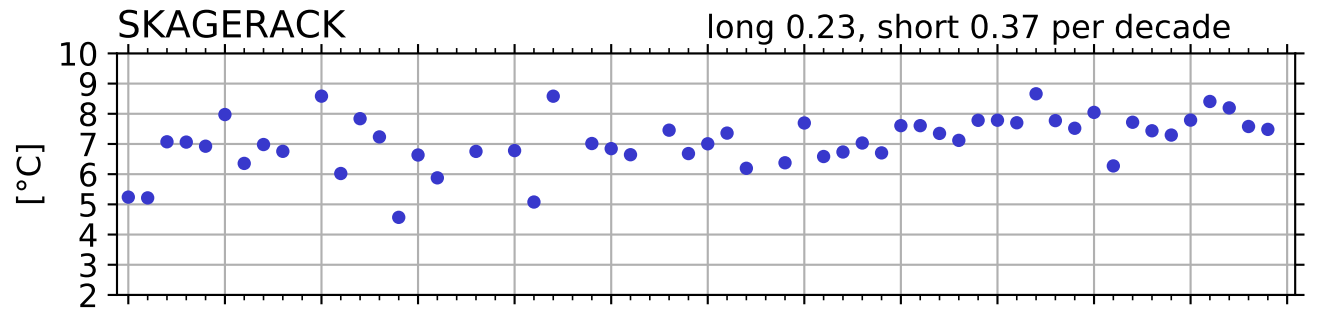


BOTHNIAN BAY

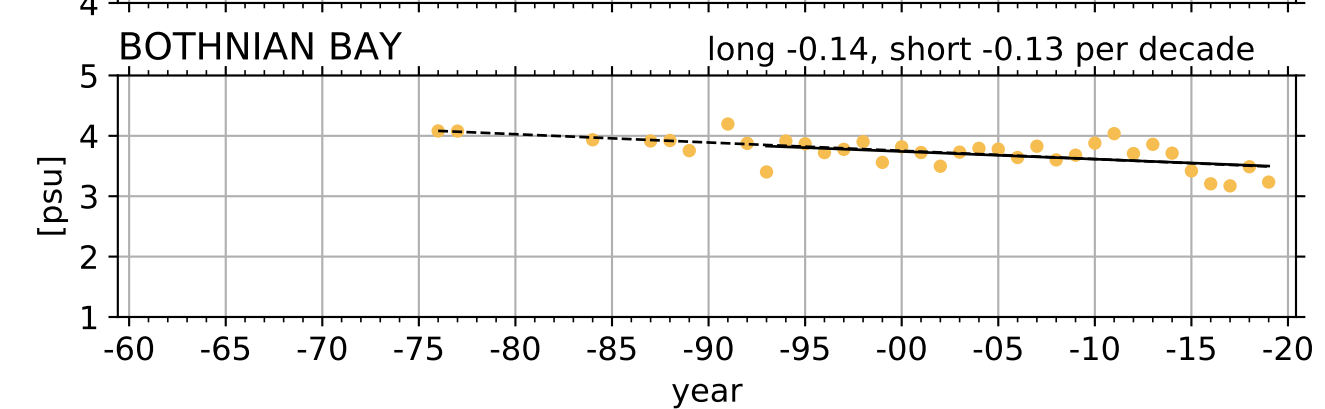
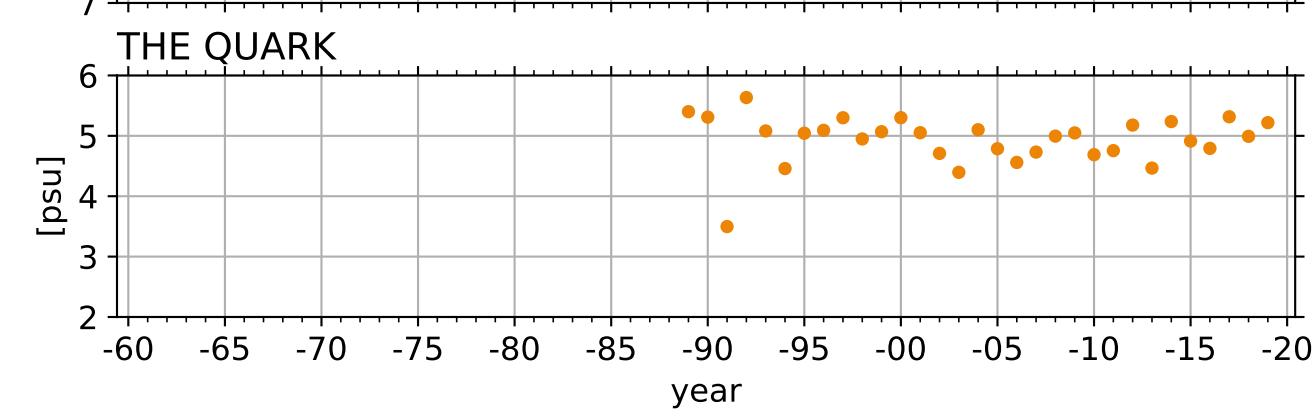
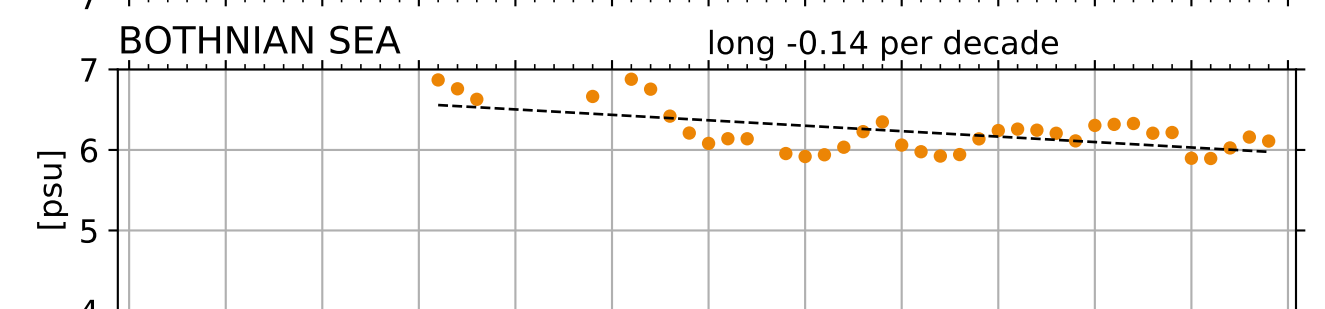
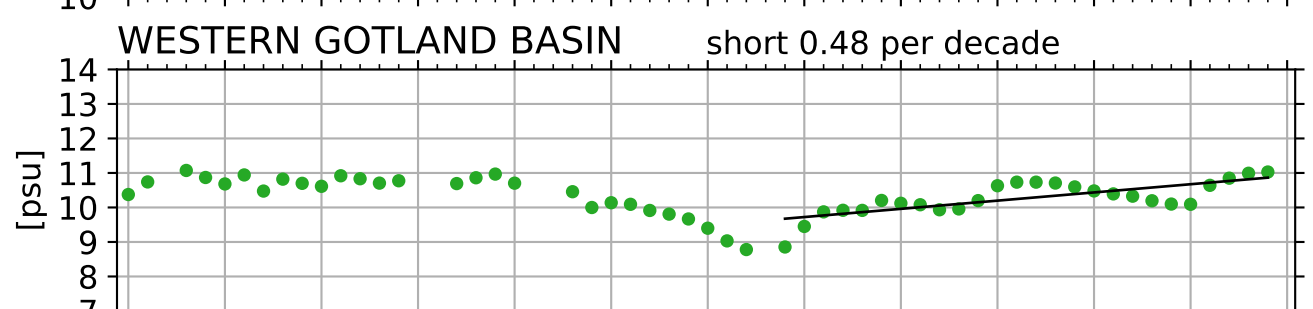
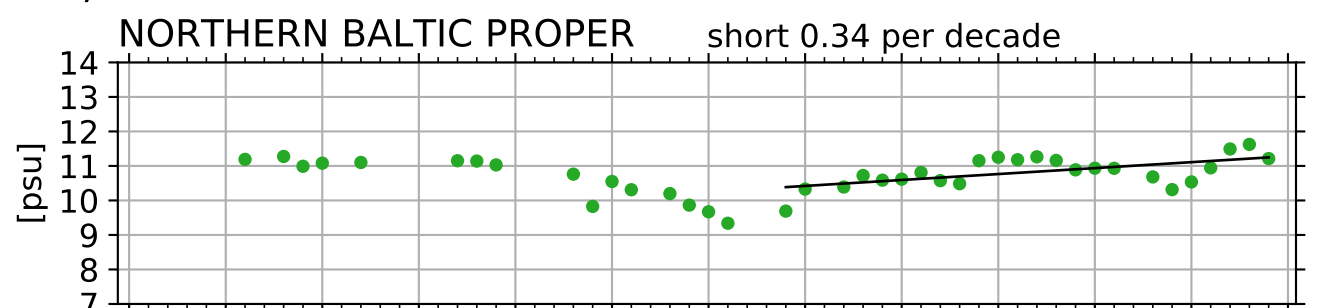
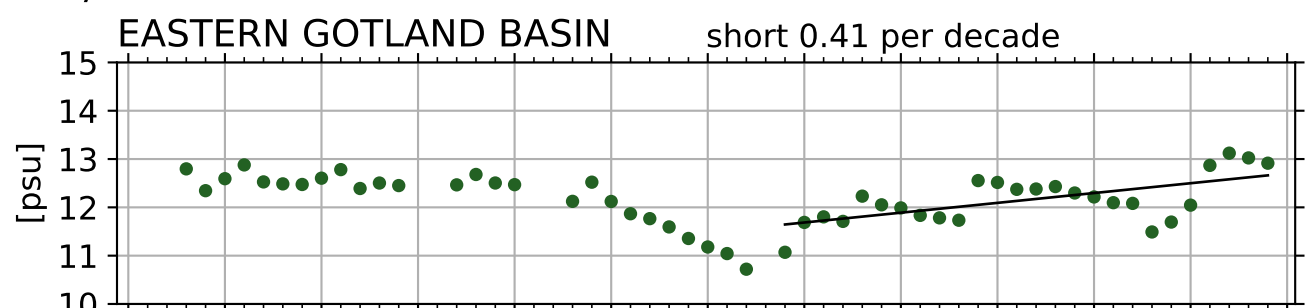
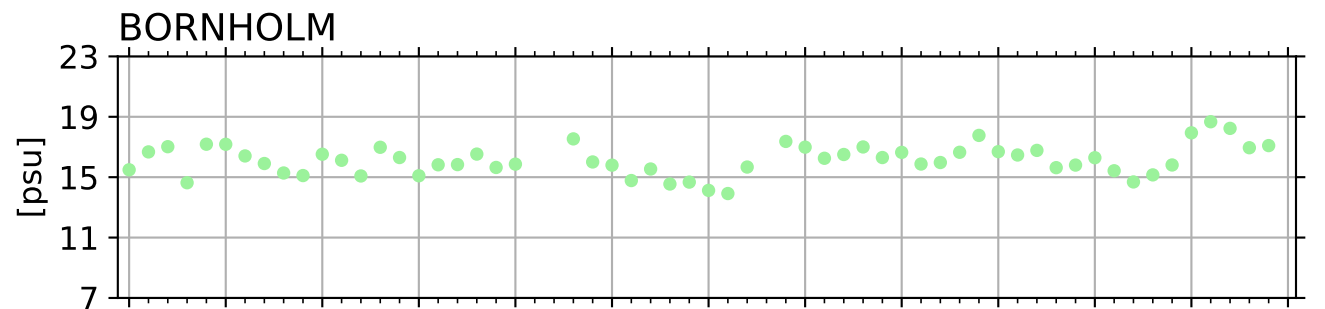
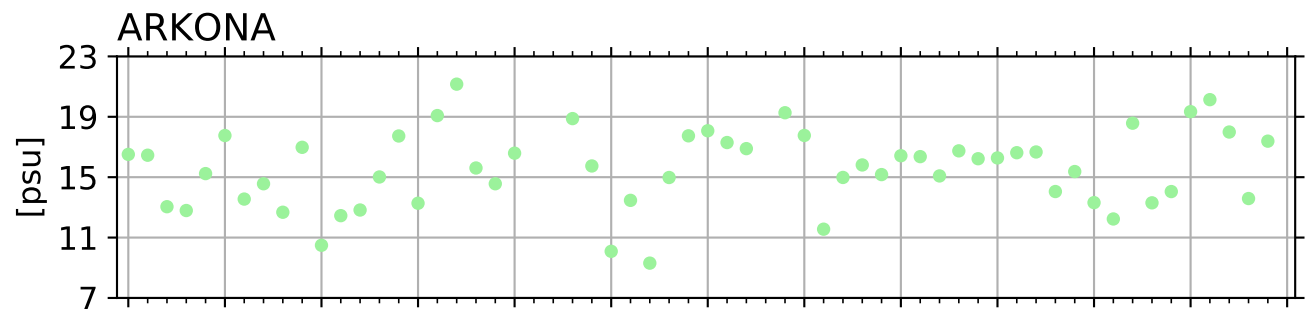
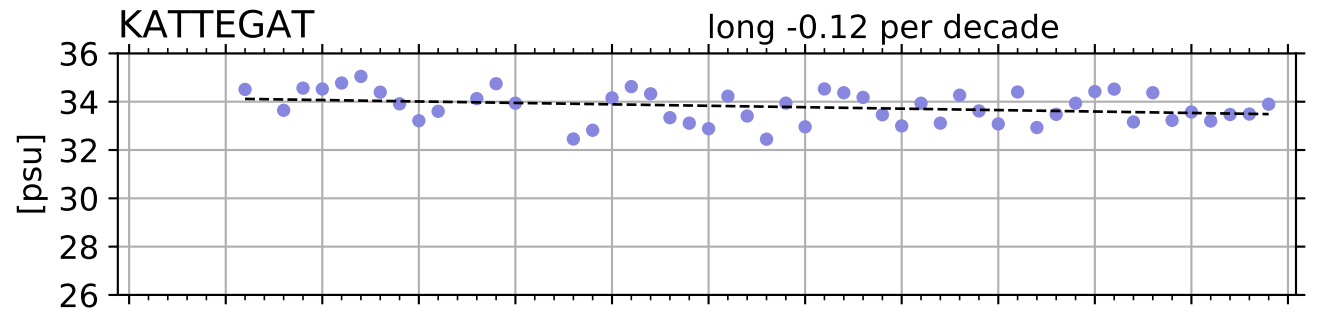
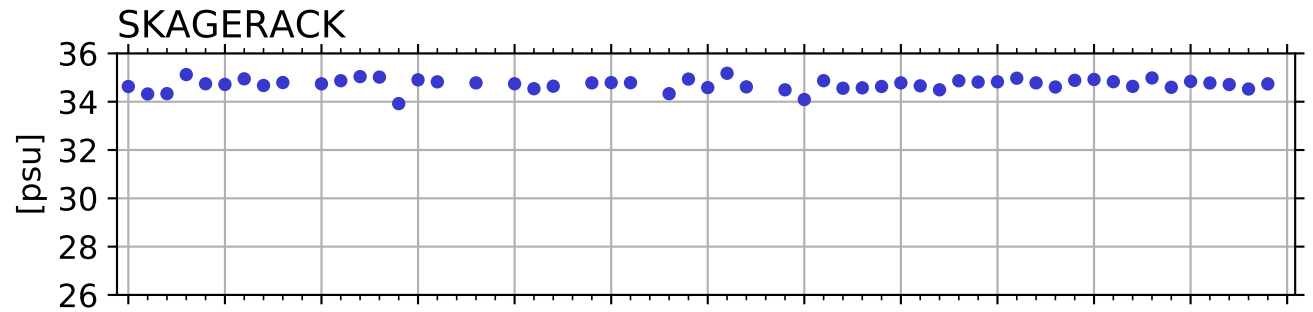


year

Temperature winter [°C] BW

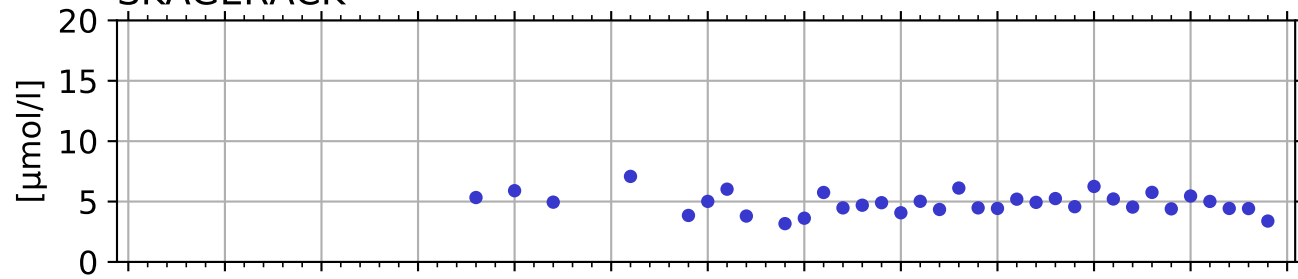


Salinity winter [psu] BW

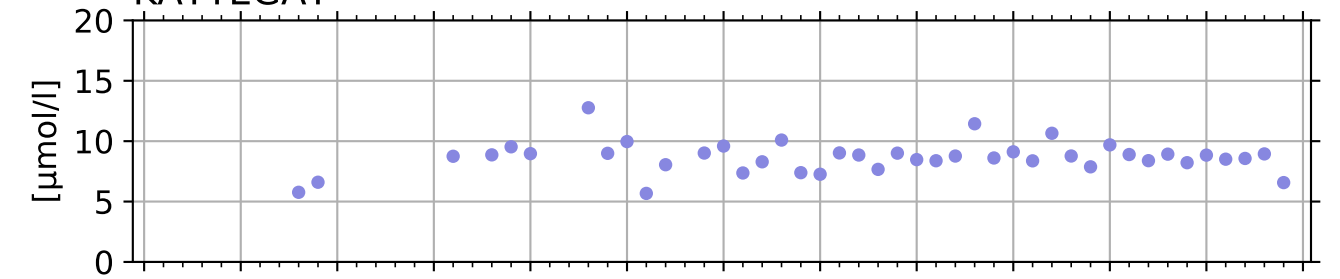


Dissolved Silica winter [$\mu\text{mol/l}$] BW

SKAGERACK

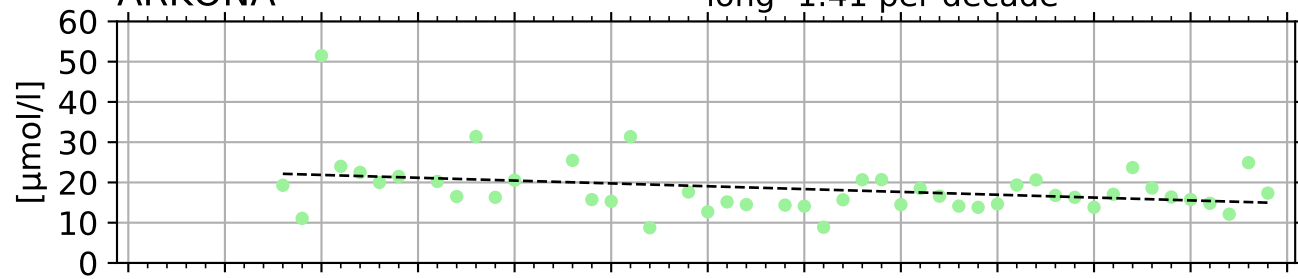


KATTEGAT

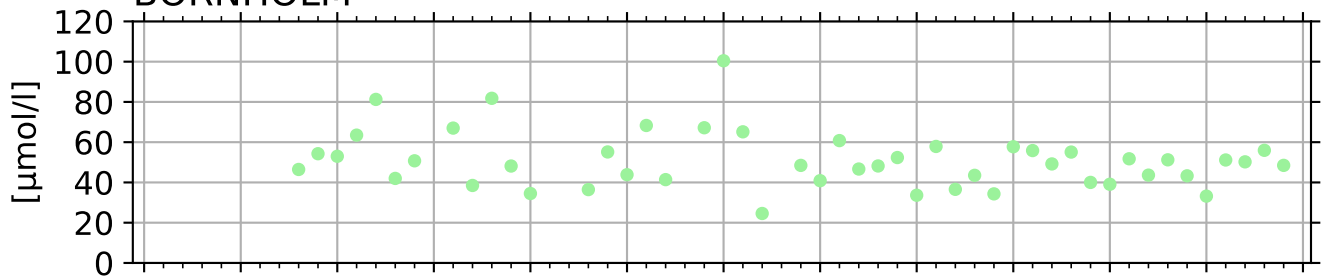


ARKONA

long -1.41 per decade

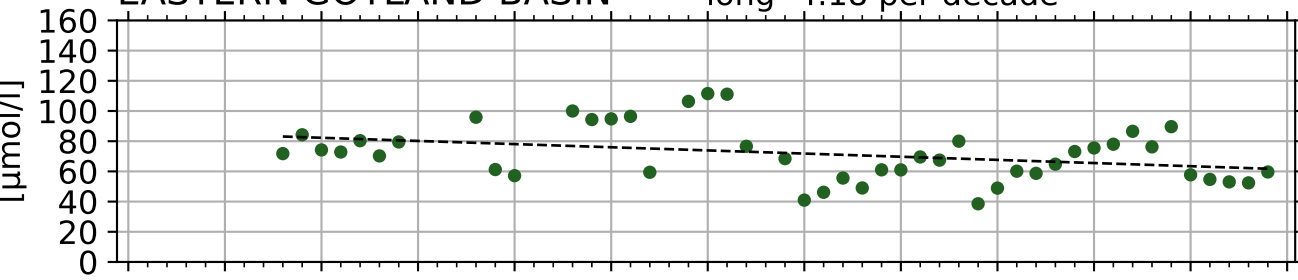


BORNHOLM



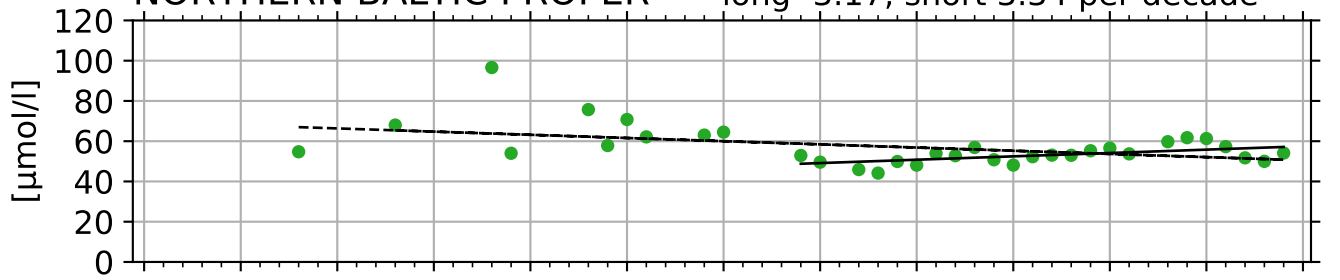
EASTERN GOTLAND BASIN

long -4.18 per decade



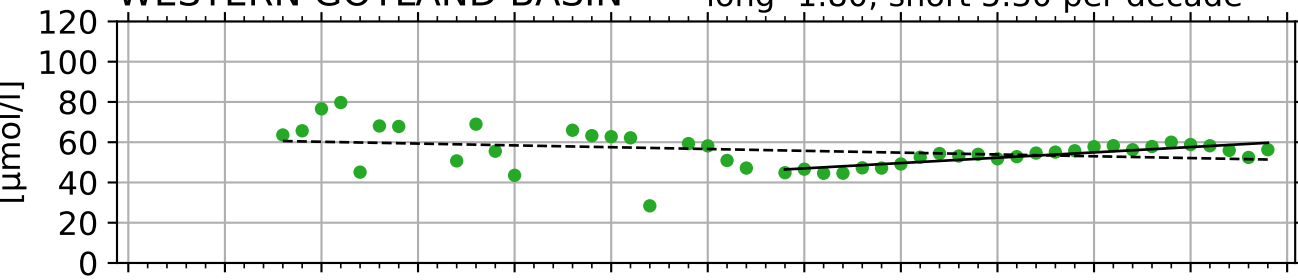
NORTHERN BALTIC PROPER

long -3.17, short 3.34 per decade



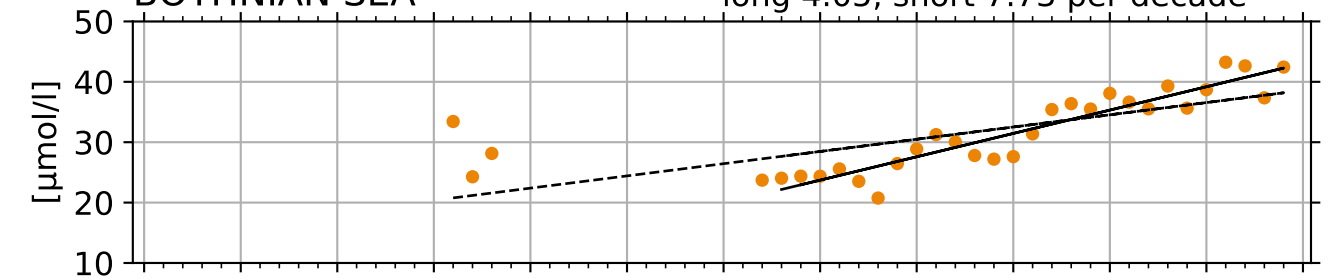
WESTERN GOTLAND BASIN

long -1.80, short 5.30 per decade



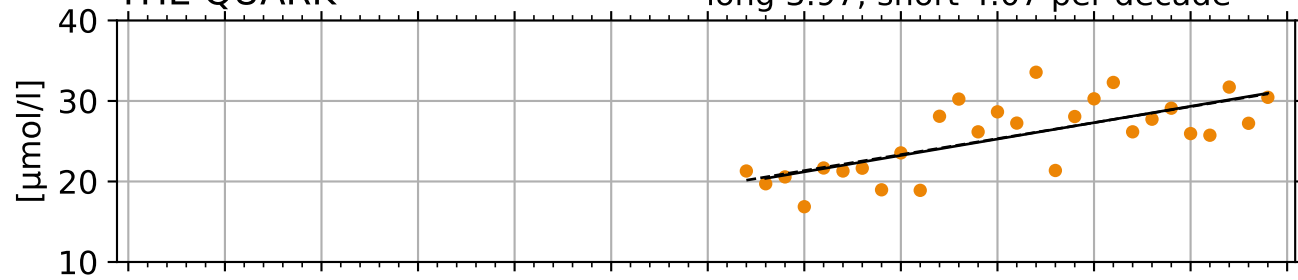
BOTHNIAN SEA

long 4.05, short 7.73 per decade



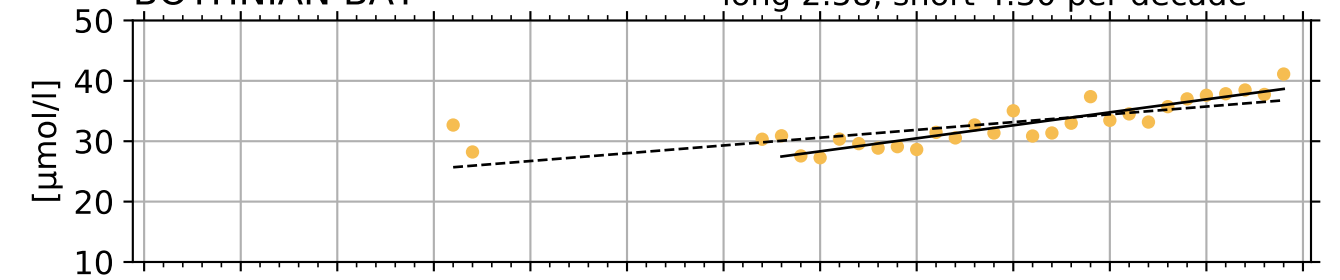
THE QUARK

long 3.97, short 4.07 per decade



BOTHNIAN BAY

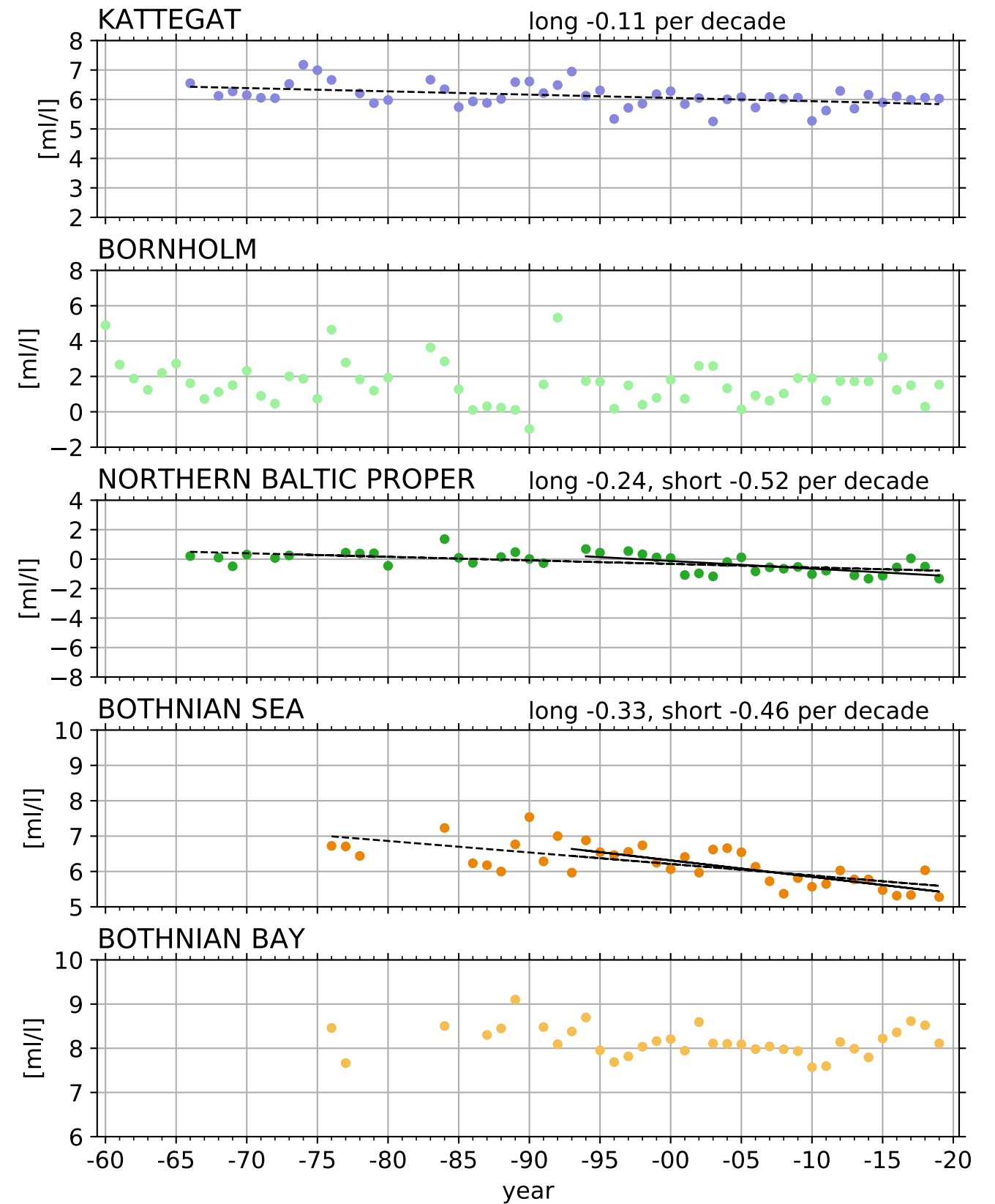
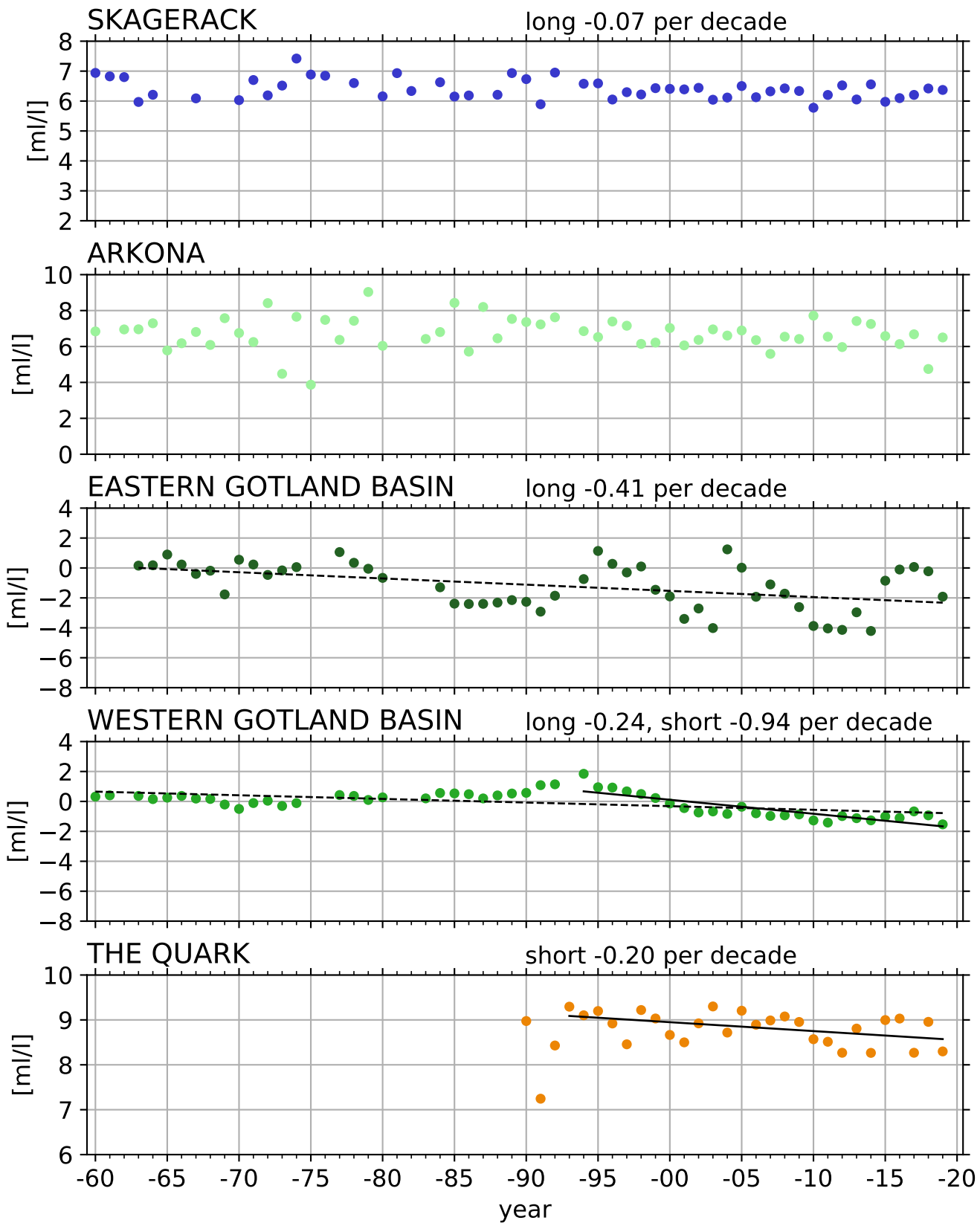
long 2.58, short 4.30 per decade



year

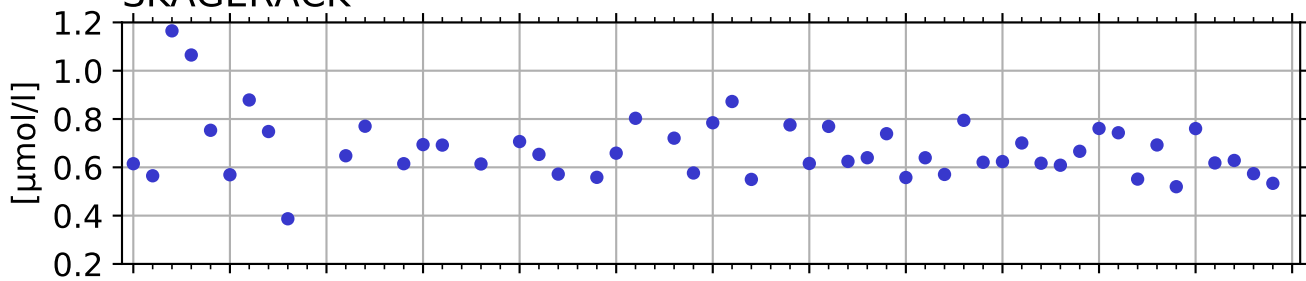
year

Dissolved oxygen winter [ml/l] BW



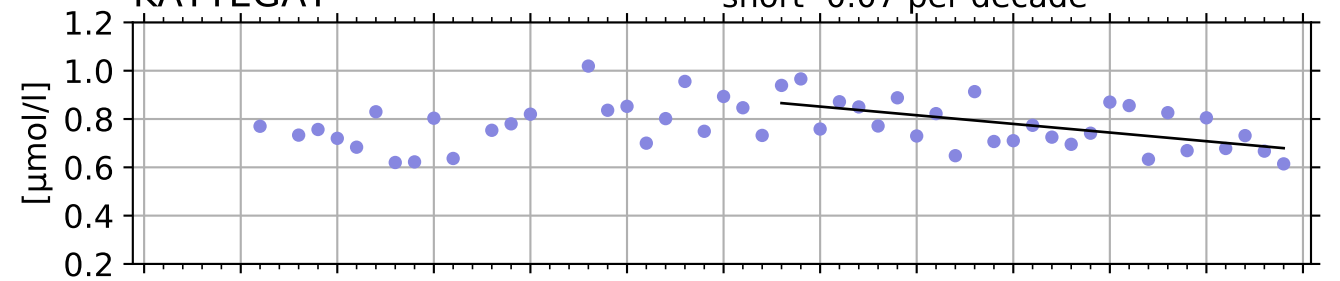
Phosphate winter [$\mu\text{mol/l}$] BW

SKAGERACK

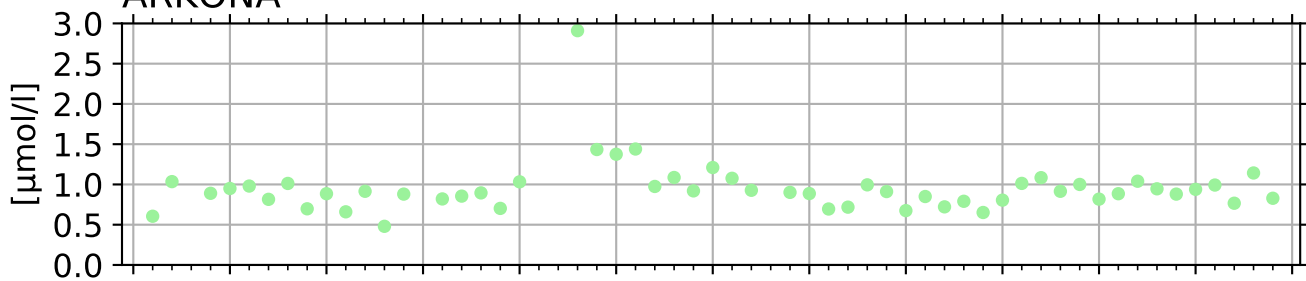


KATTEGAT

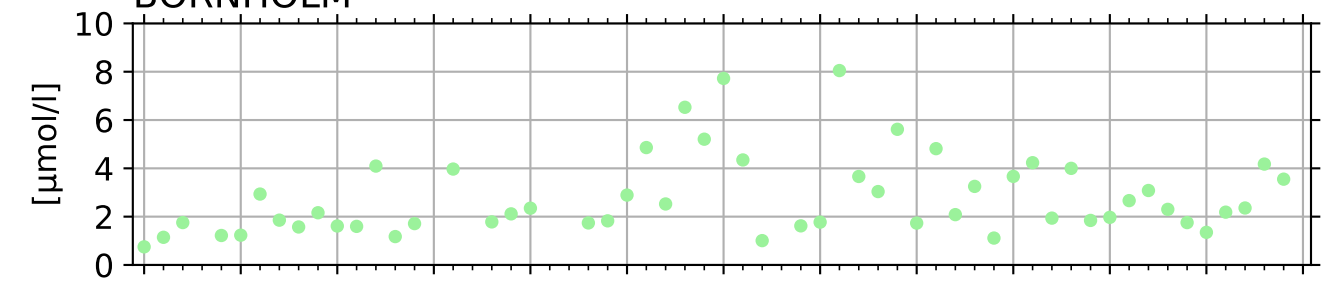
short -0.07 per decade



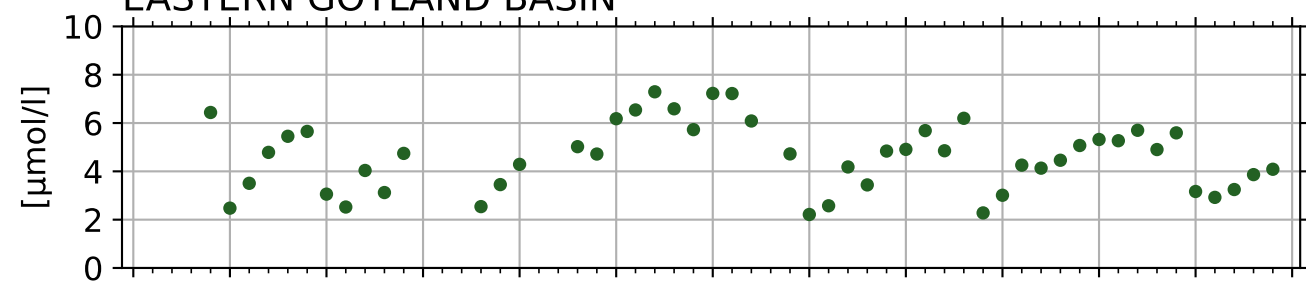
ARKONA



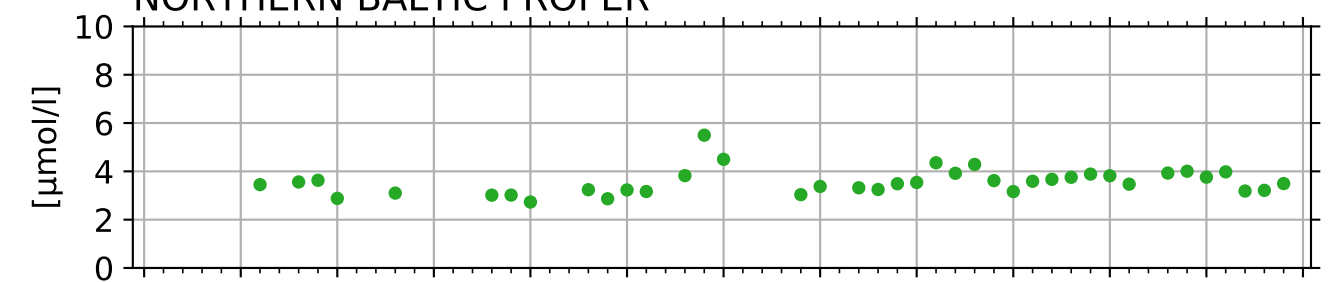
BORNHOLM



EASTERN GOTLAND BASIN

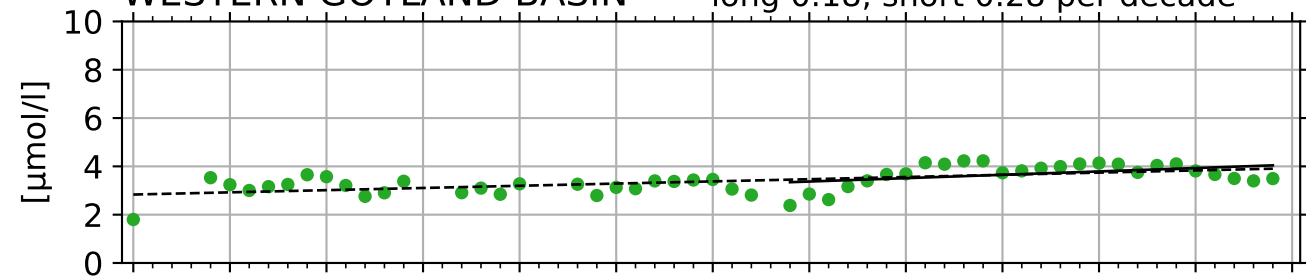


NORTHERN BALTIC PROPER



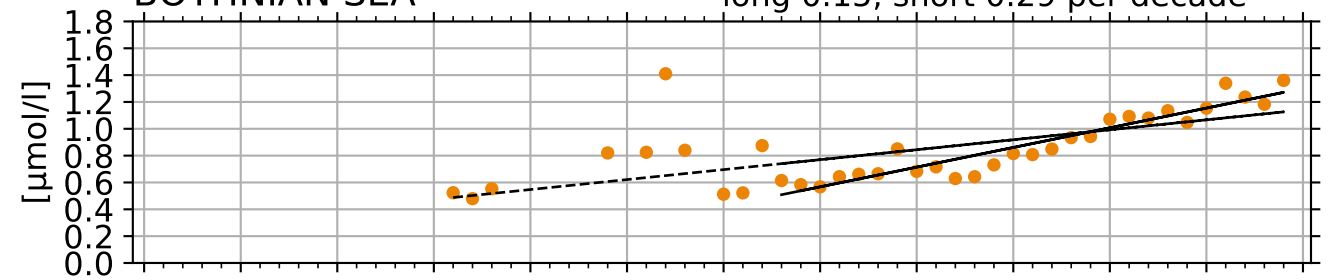
WESTERN GOTLAND BASIN

long 0.18, short 0.28 per decade



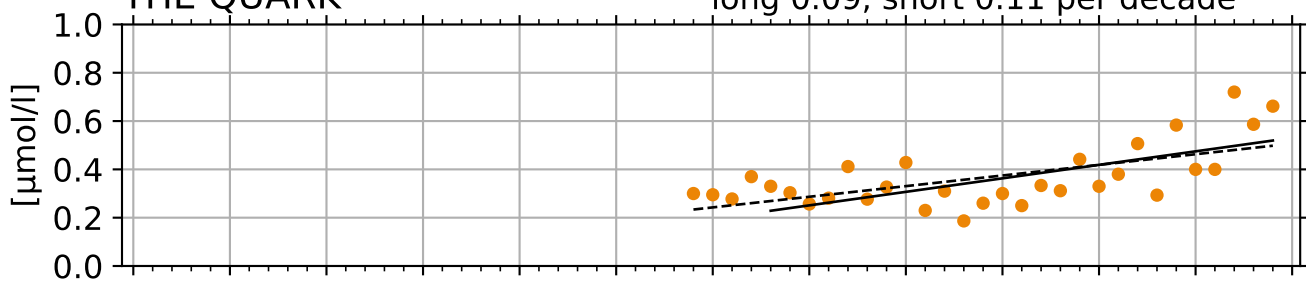
BOTHNIAN SEA

long 0.15, short 0.29 per decade

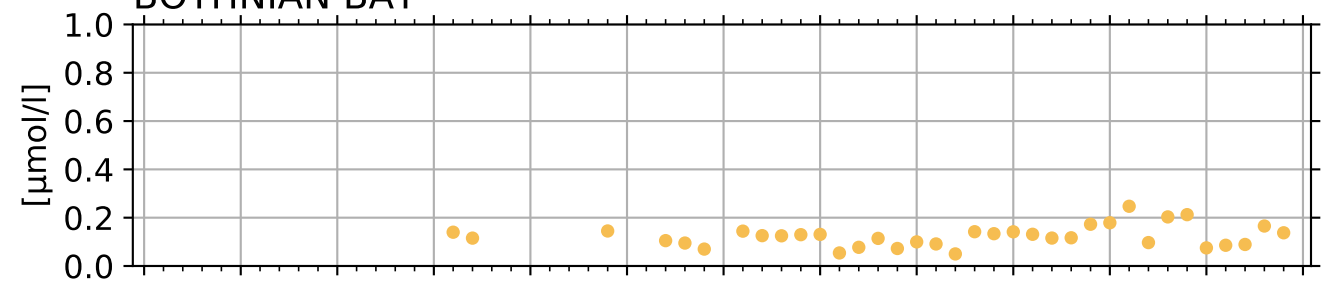


THE QUARK

long 0.09, short 0.11 per decade



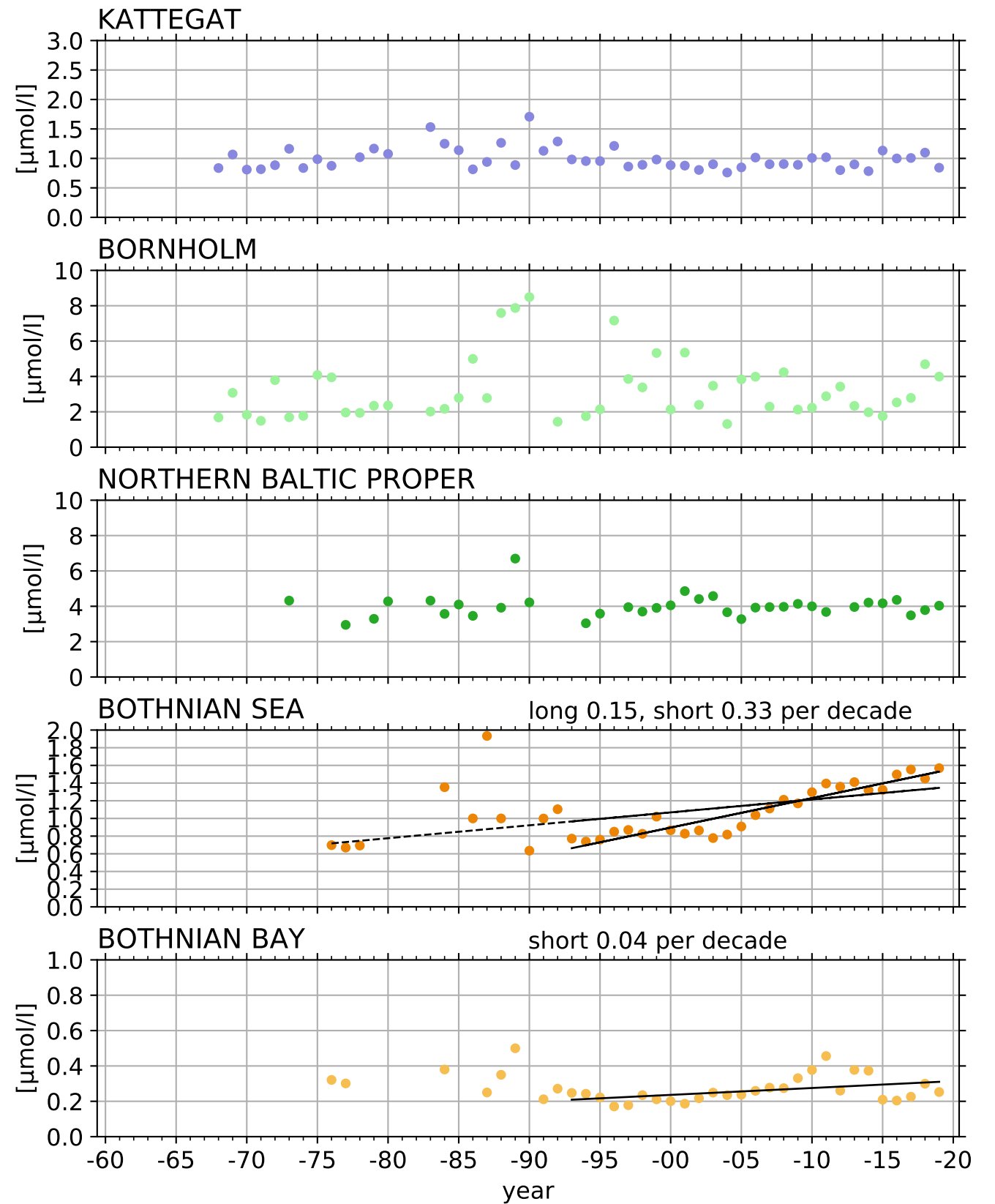
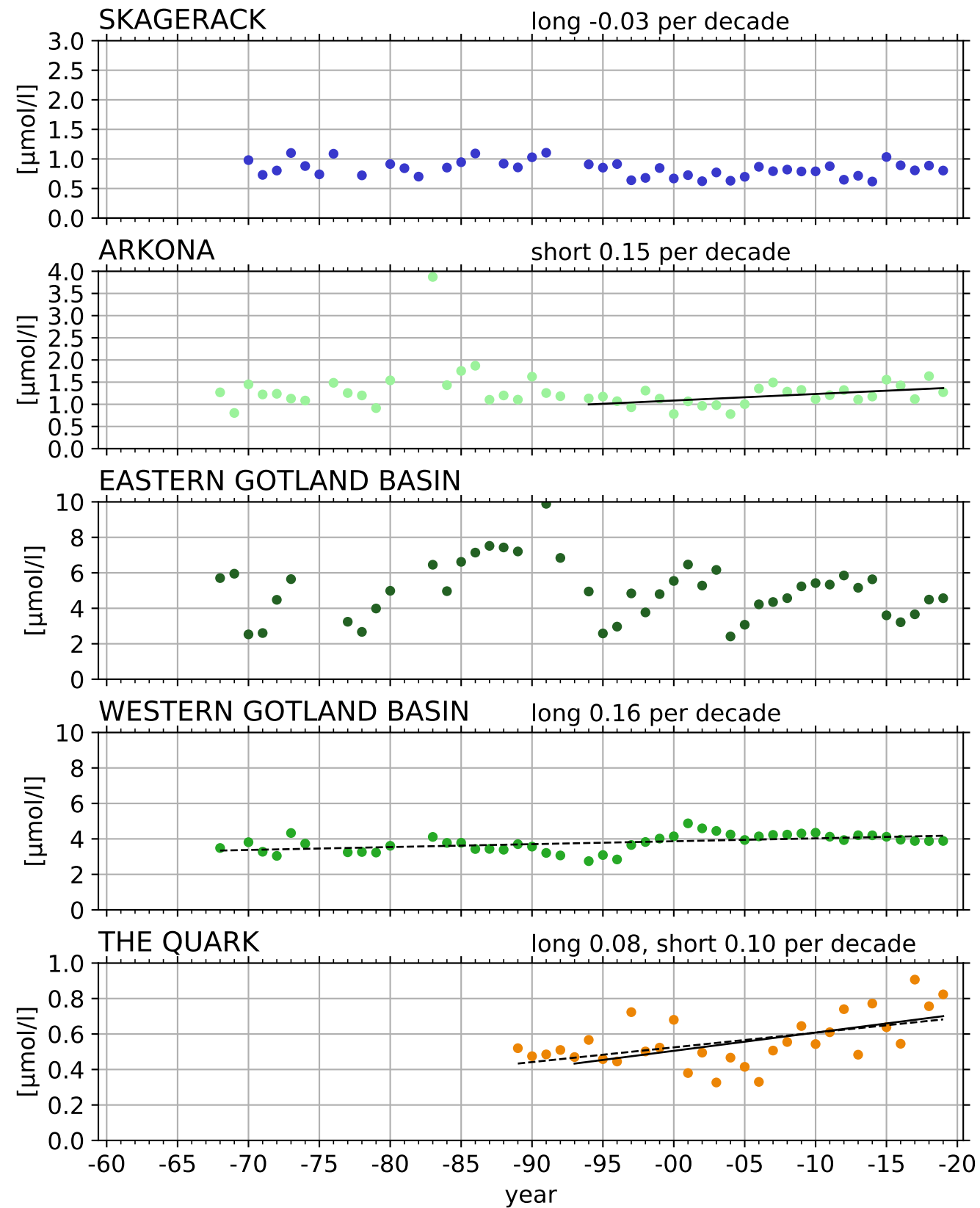
BOTHNIAN BAY



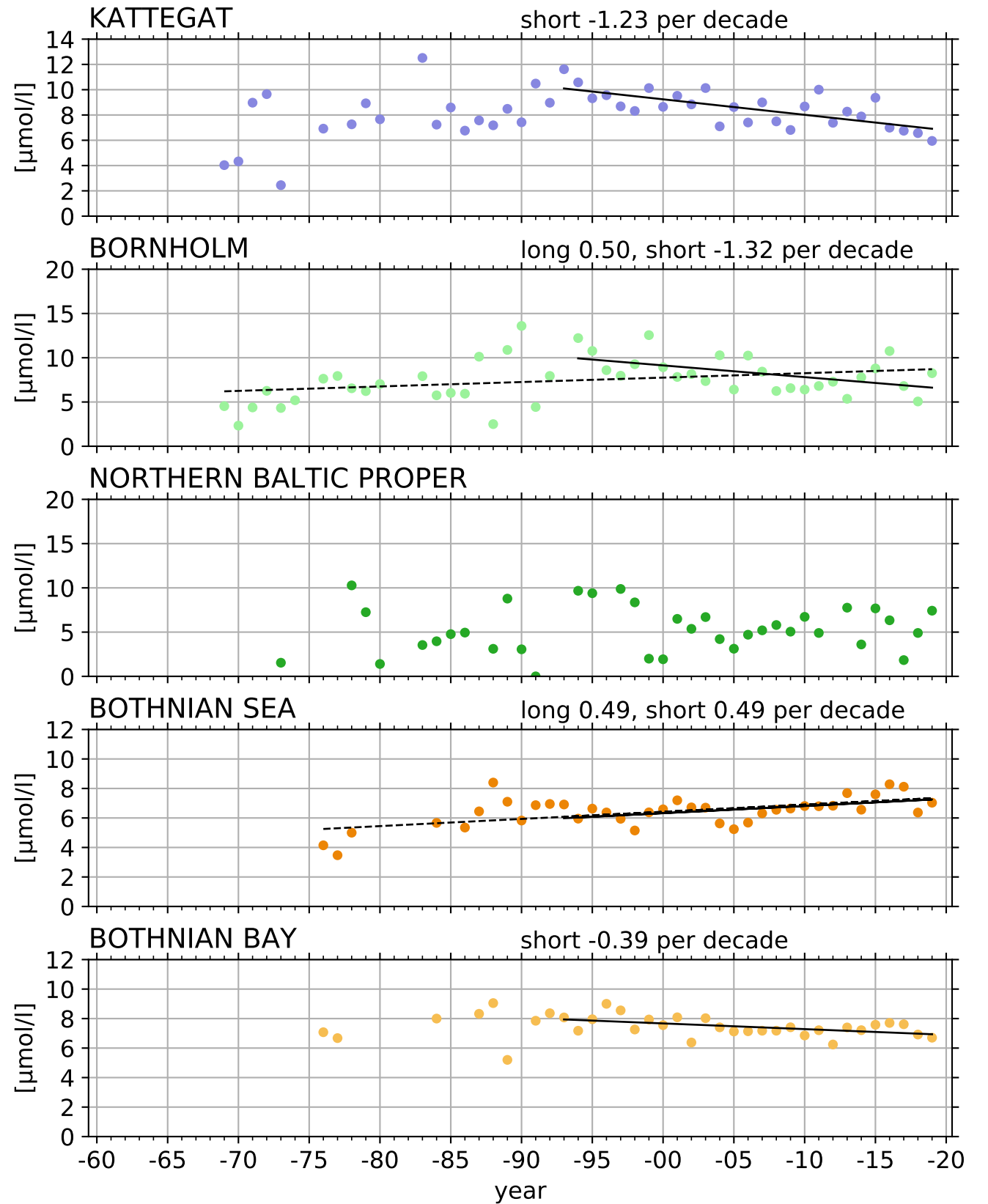
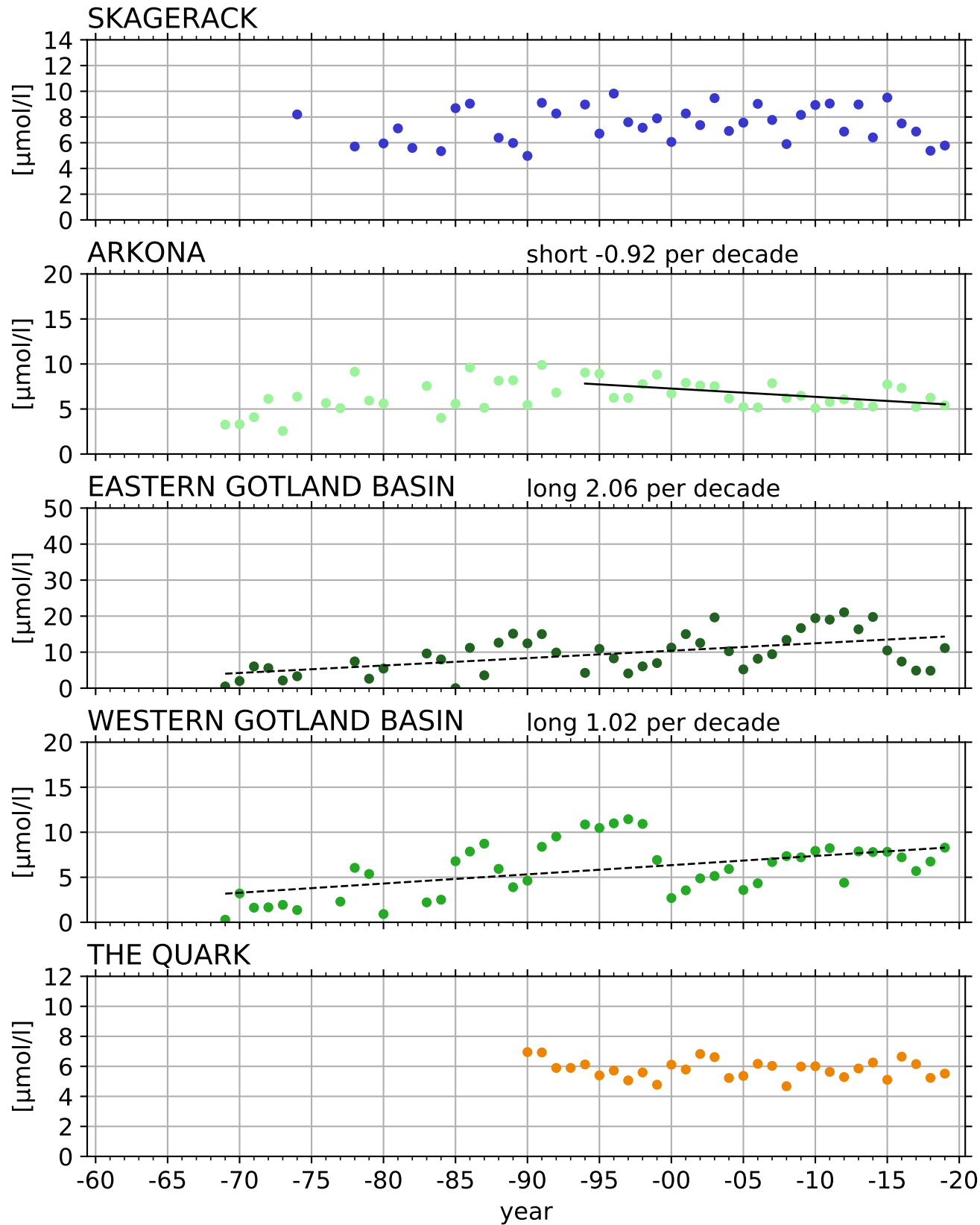
year

year

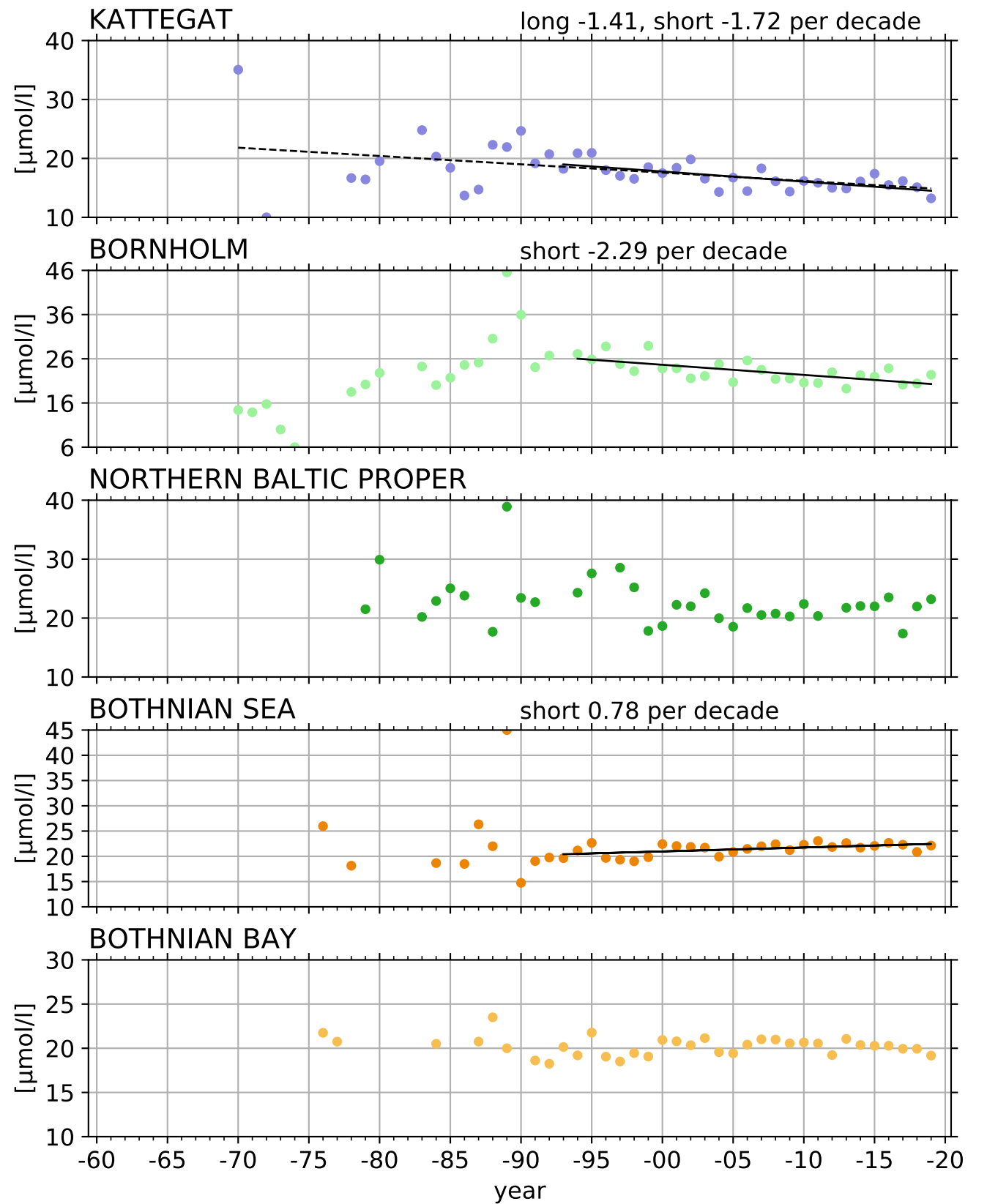
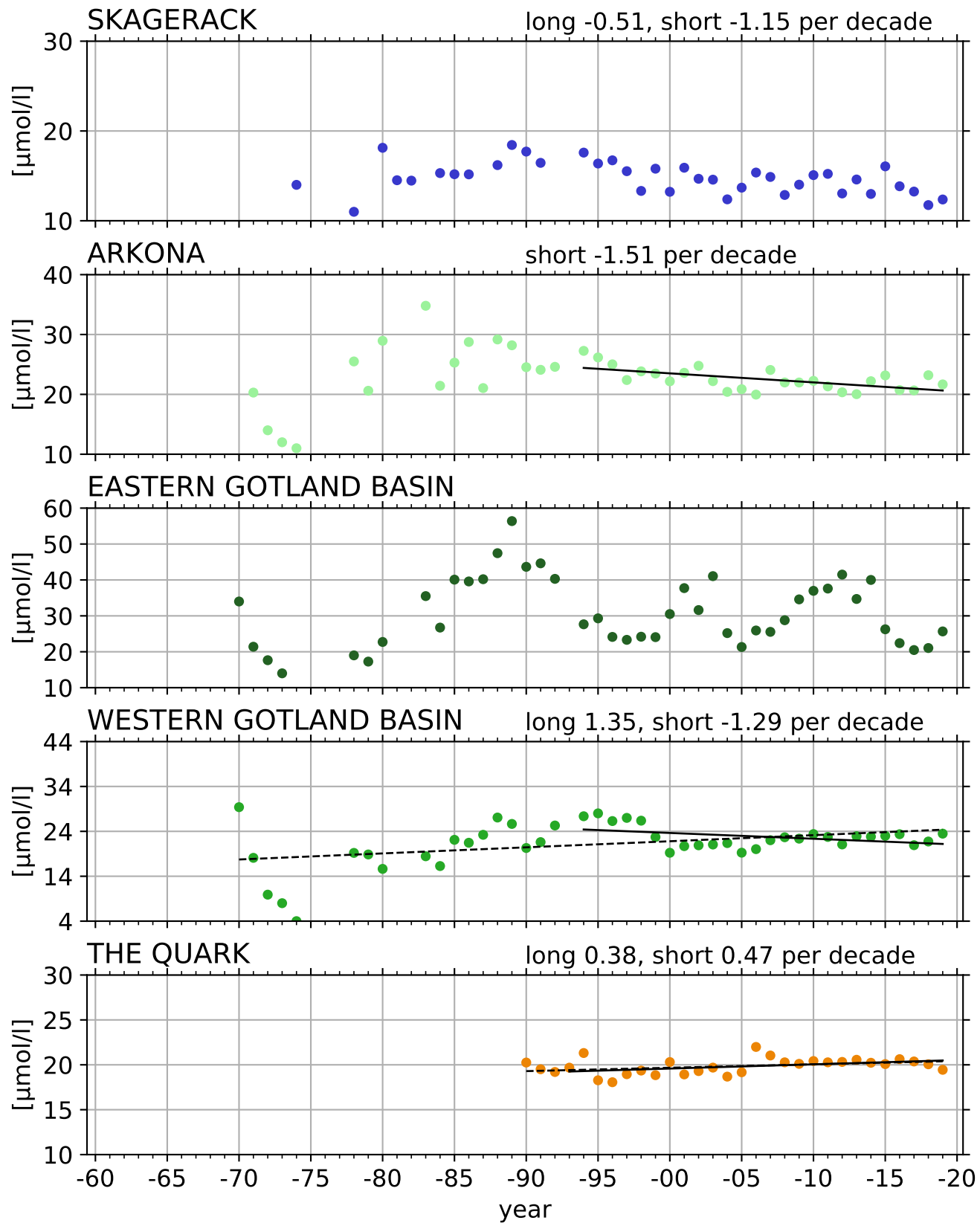
Total phosphorus winter [$\mu\text{mol/l}$] BW



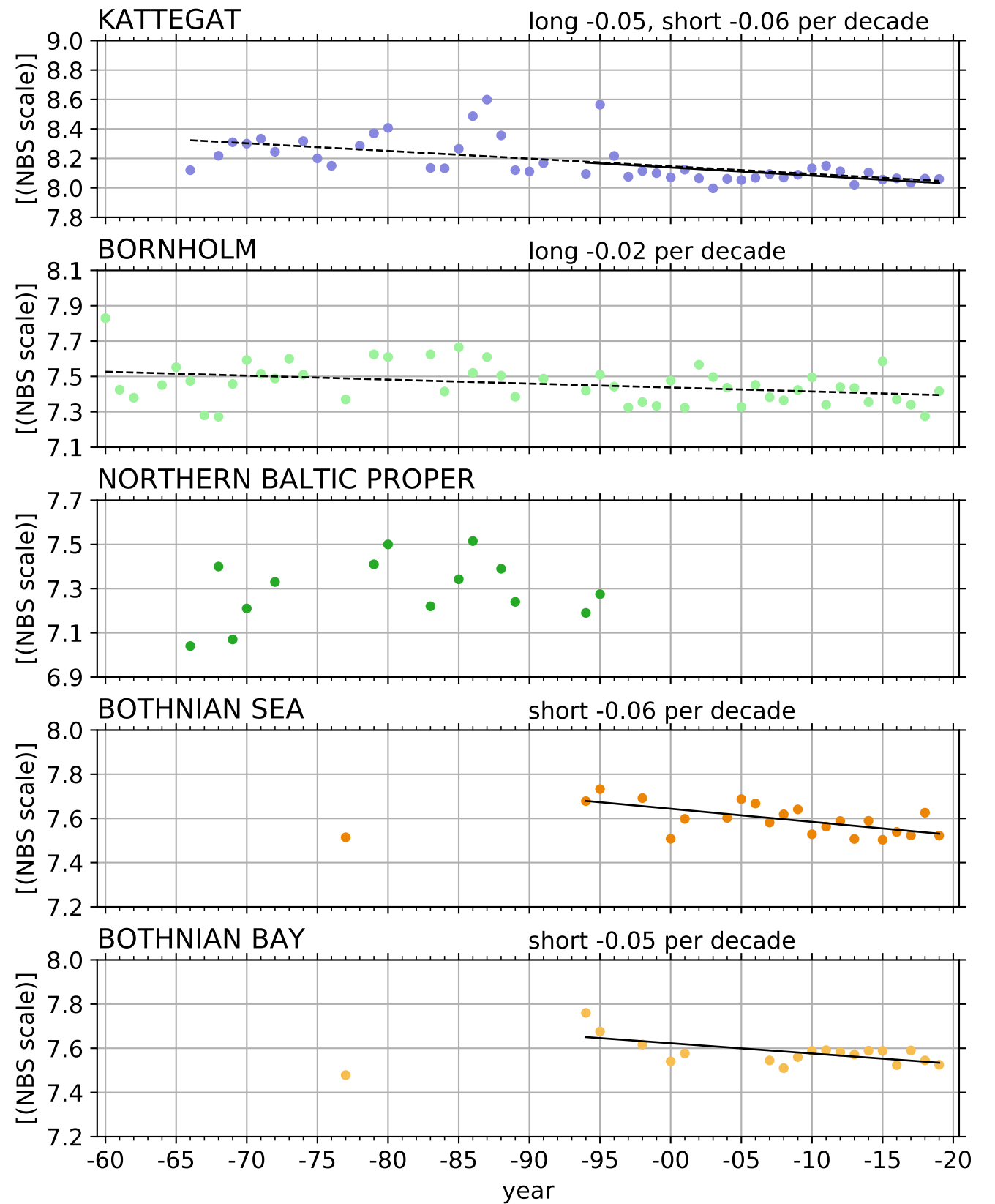
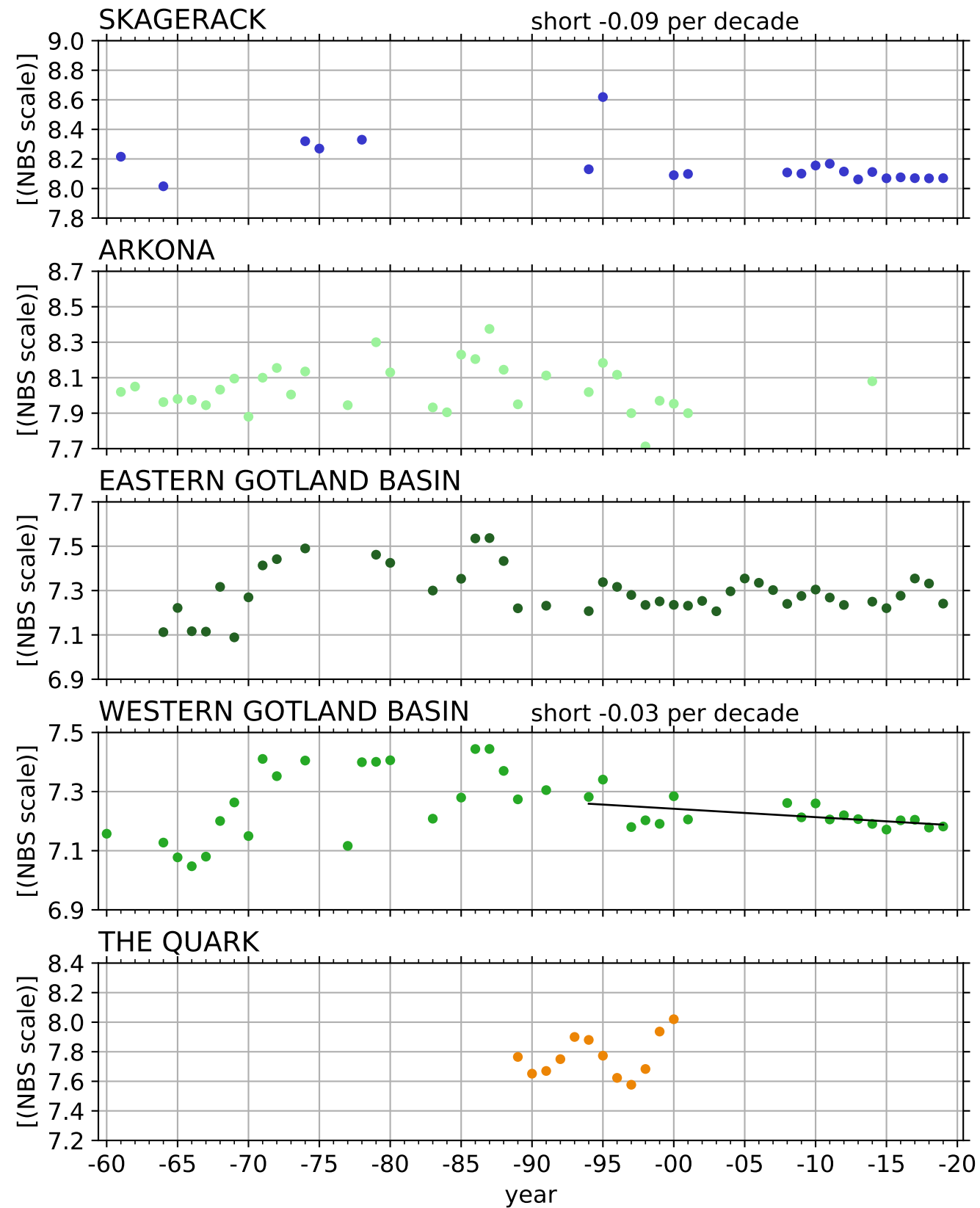
DIN winter [$\mu\text{mol/l}$] BW



Total Nitrogen winter [$\mu\text{mol/l}$] BW



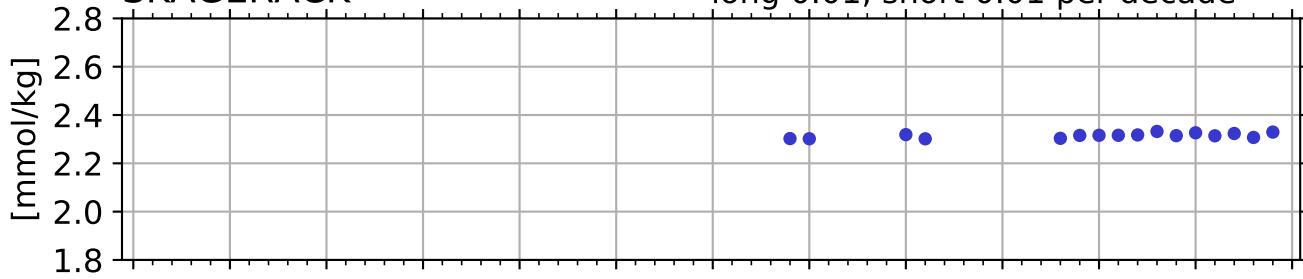
pH winter [(NBS scale)] BW



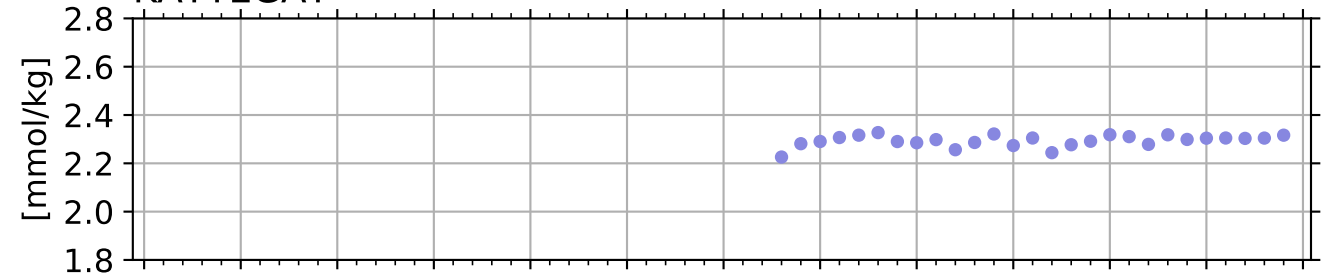
Alkalinity winter [mmol/kg] BW

SKAGERACK

long 0.01, short 0.01 per decade

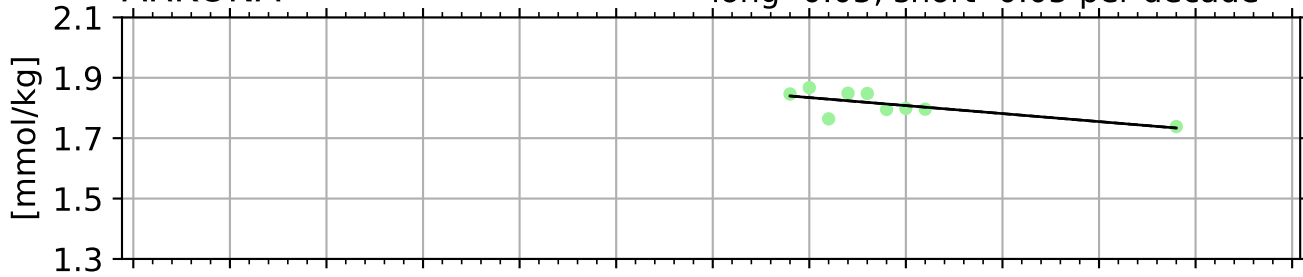


KATTEGAT



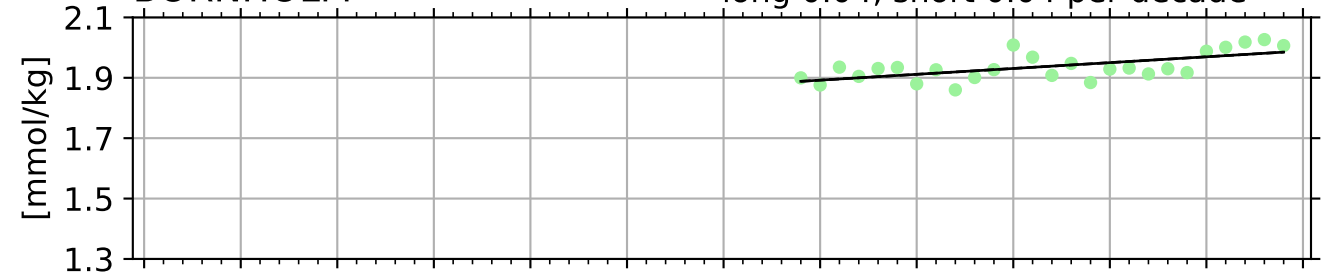
ARKONA

long -0.05, short -0.05 per decade



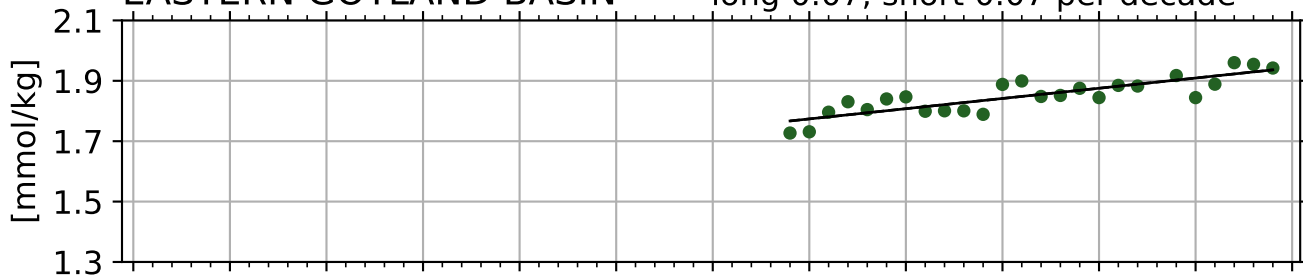
BORNHOLM

long 0.04, short 0.04 per decade

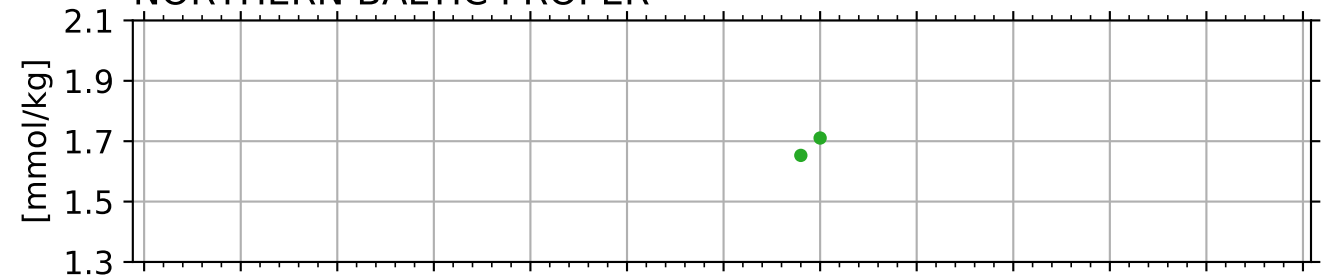


EASTERN GOTLAND BASIN

long 0.07, short 0.07 per decade

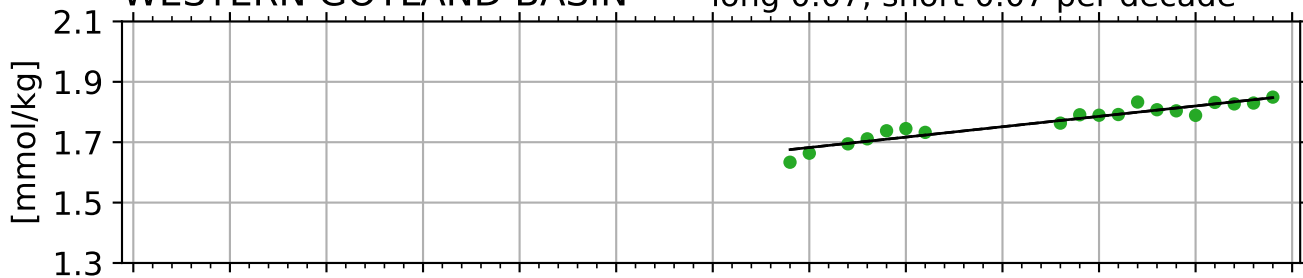


NORTHERN BALTIC PROPER



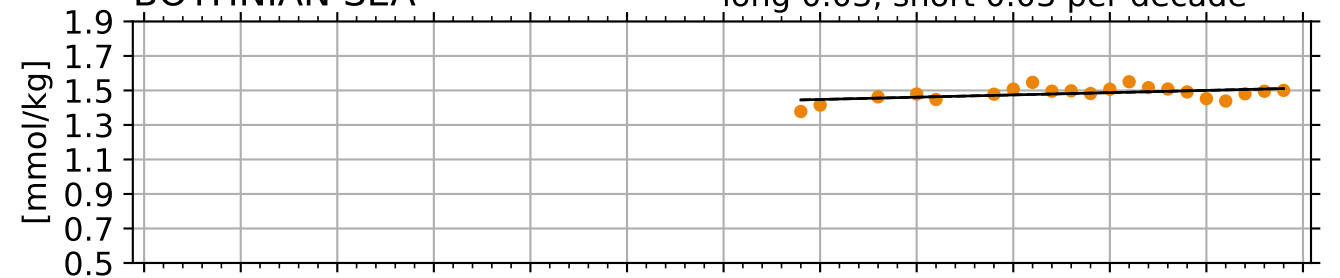
WESTERN GOTLAND BASIN

long 0.07, short 0.07 per decade

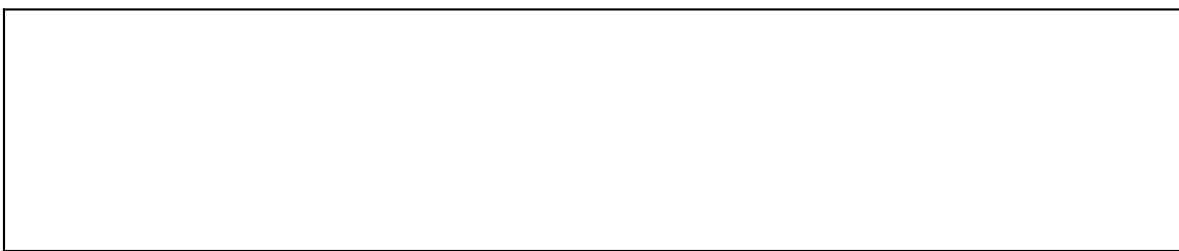


BOTHNIAN SEA

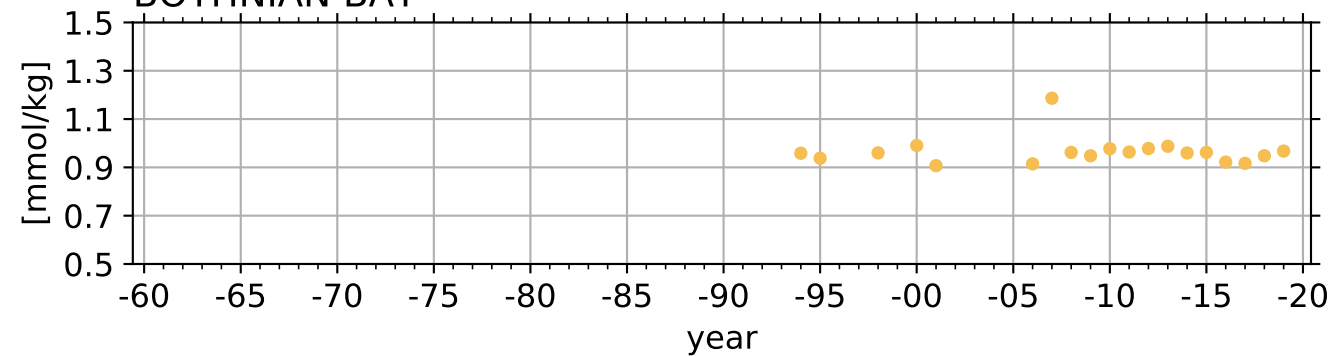
long 0.03, short 0.03 per decade



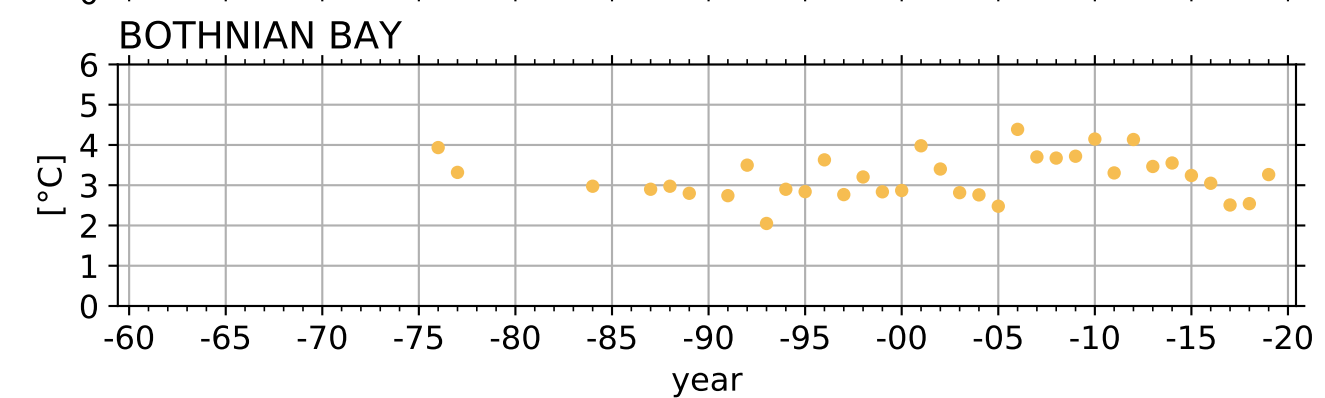
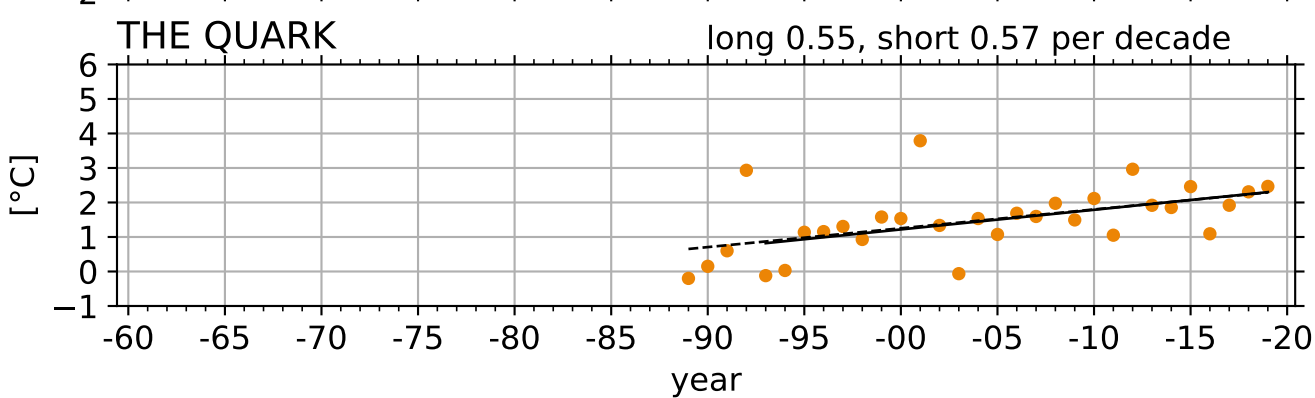
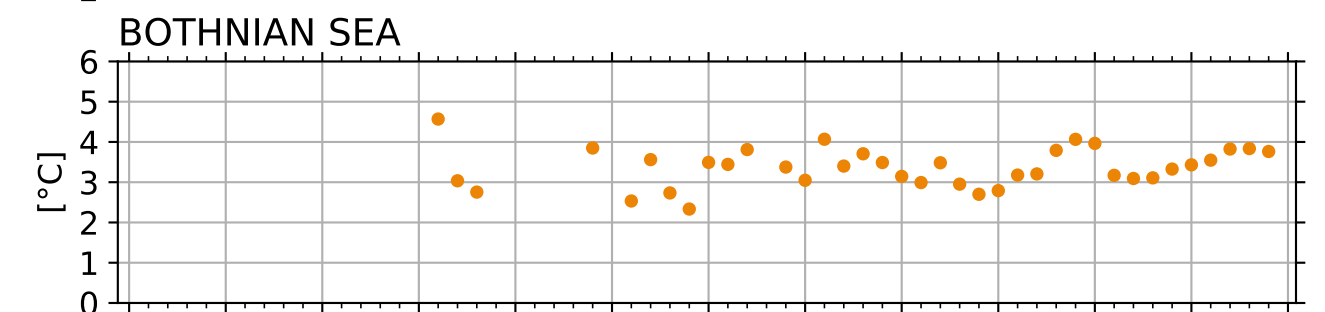
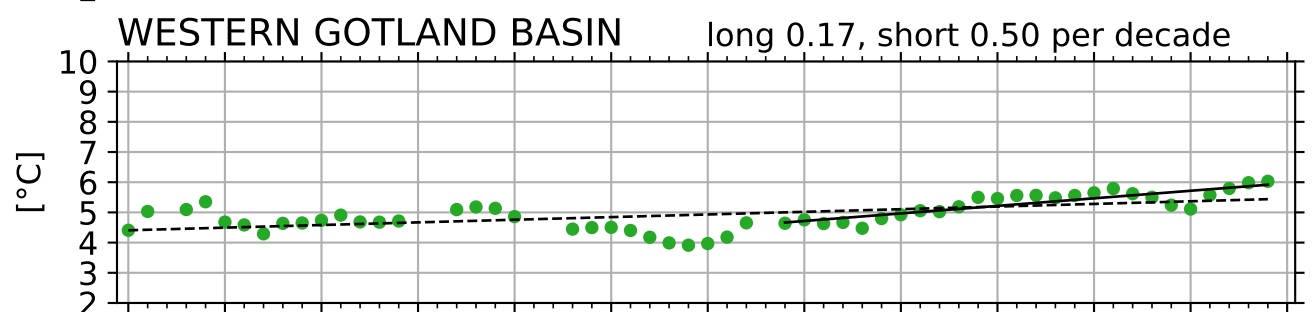
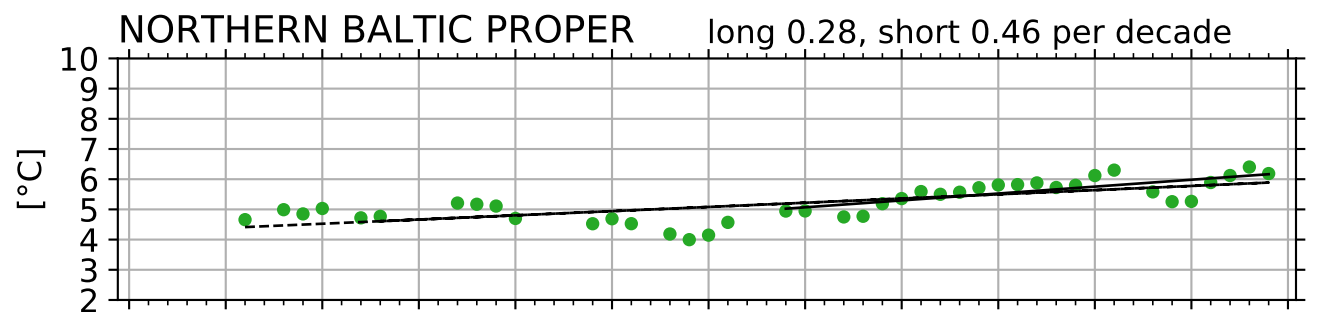
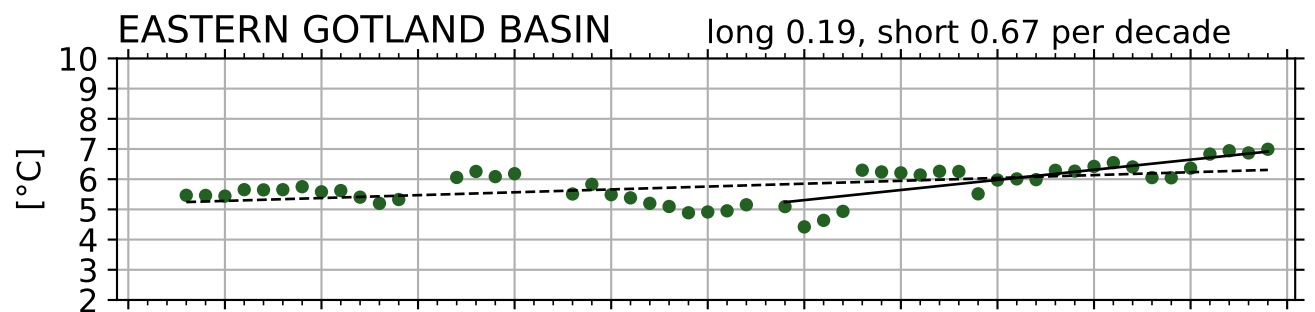
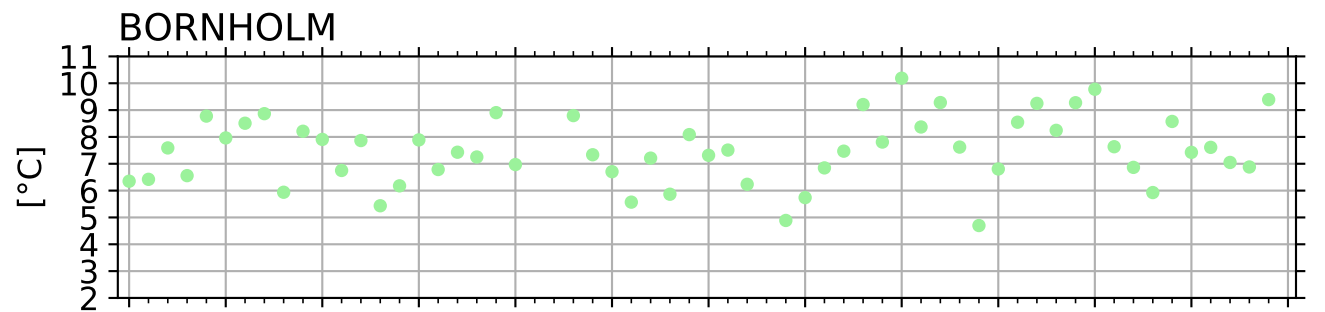
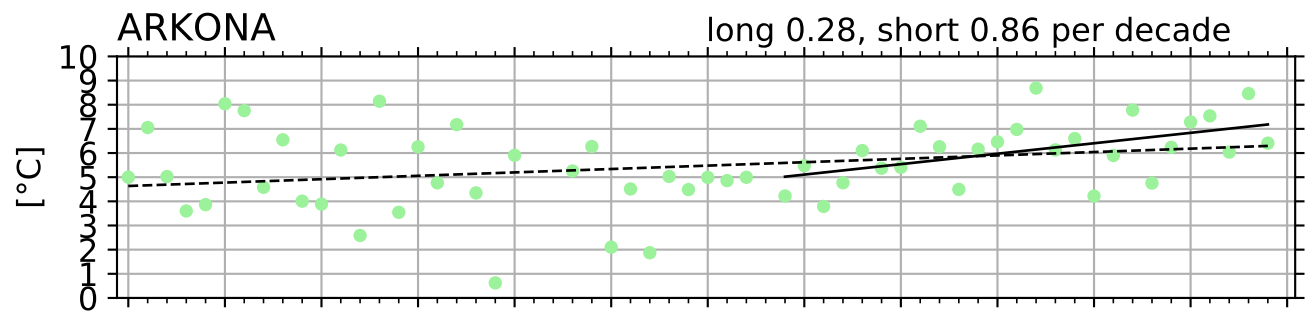
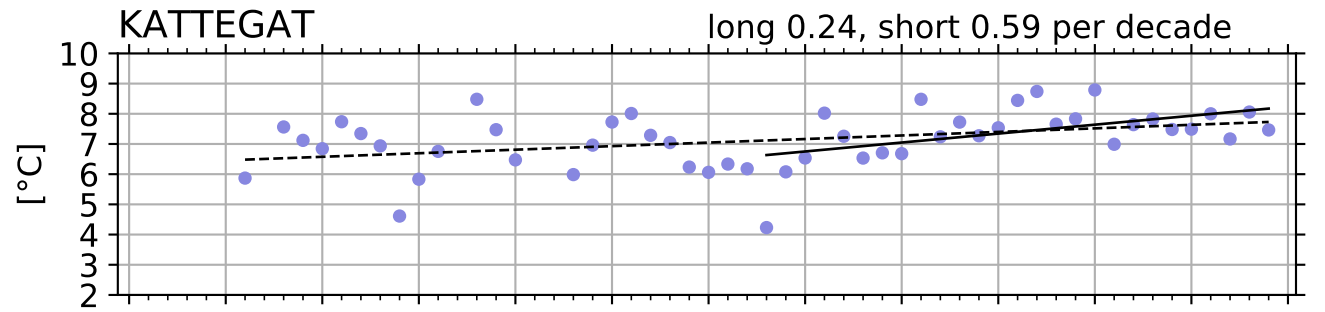
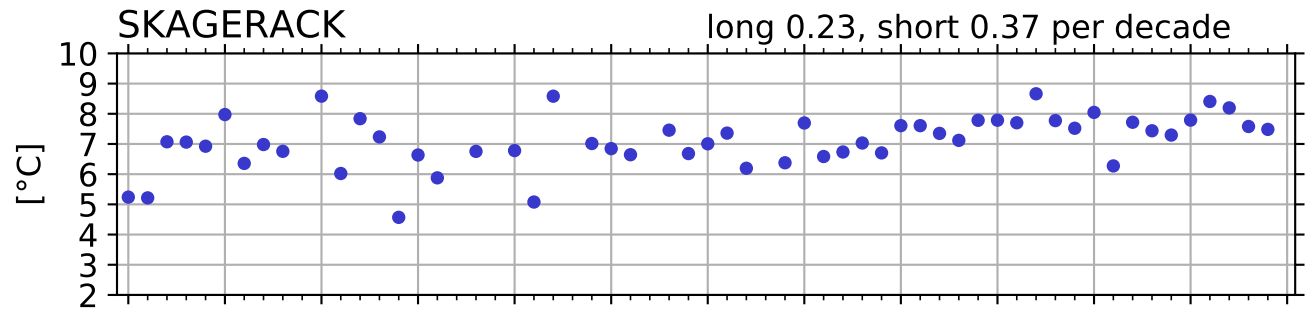
THE QUARK



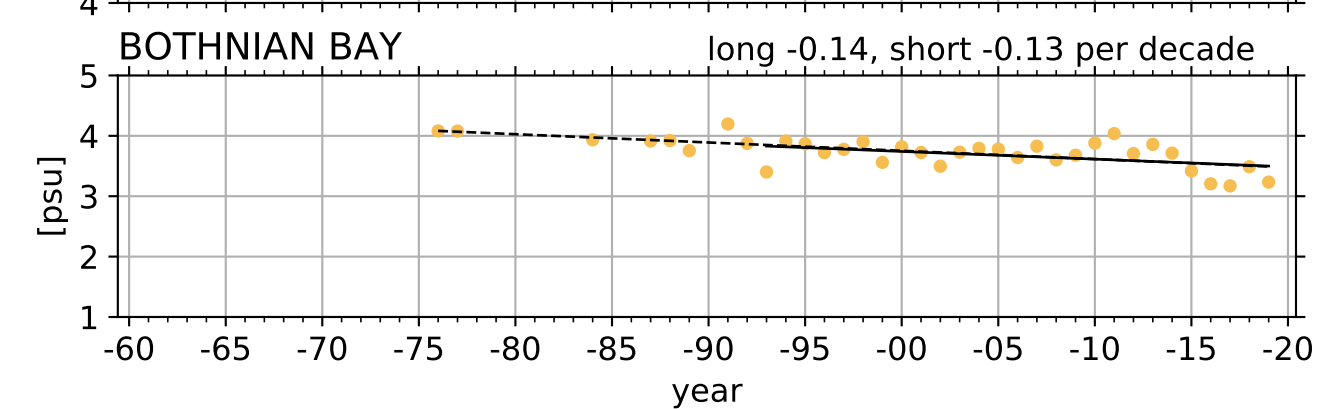
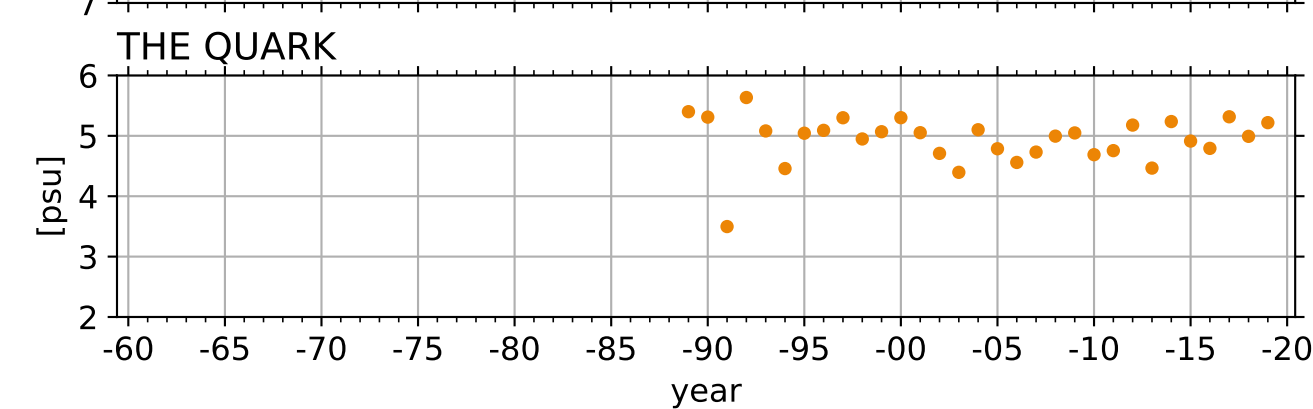
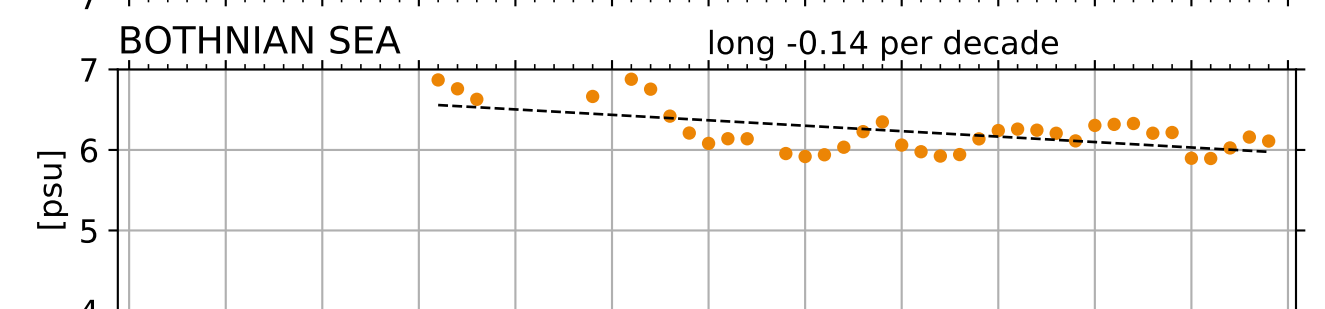
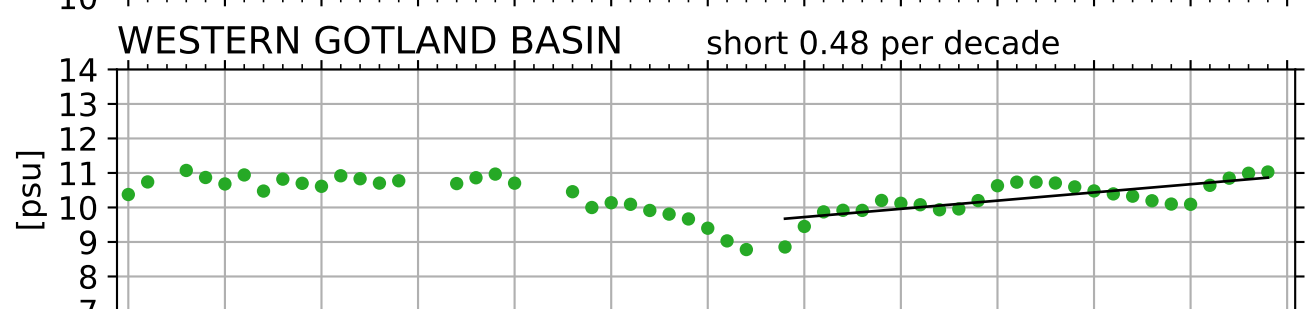
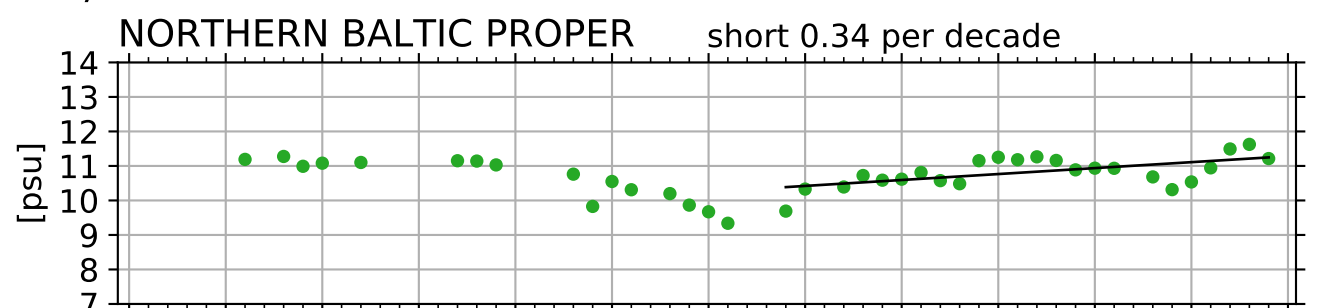
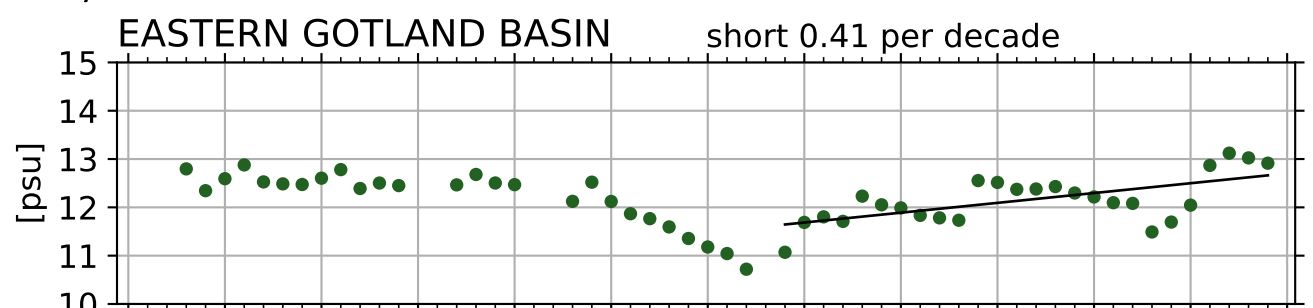
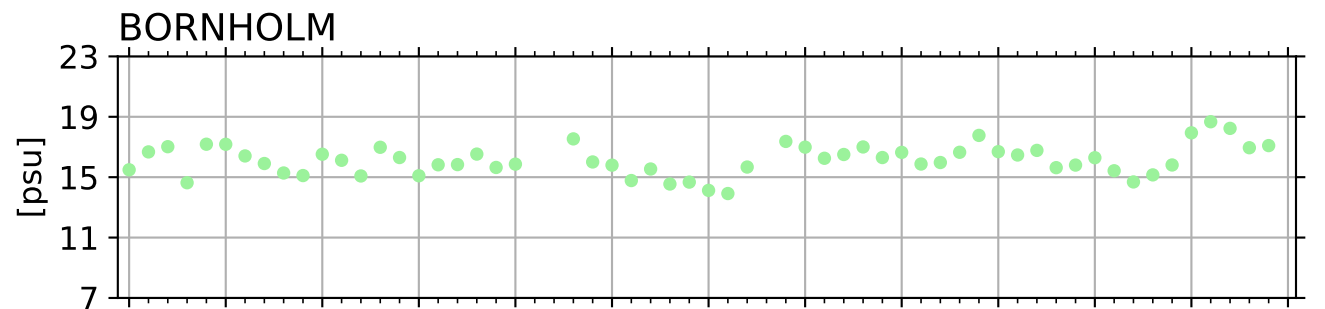
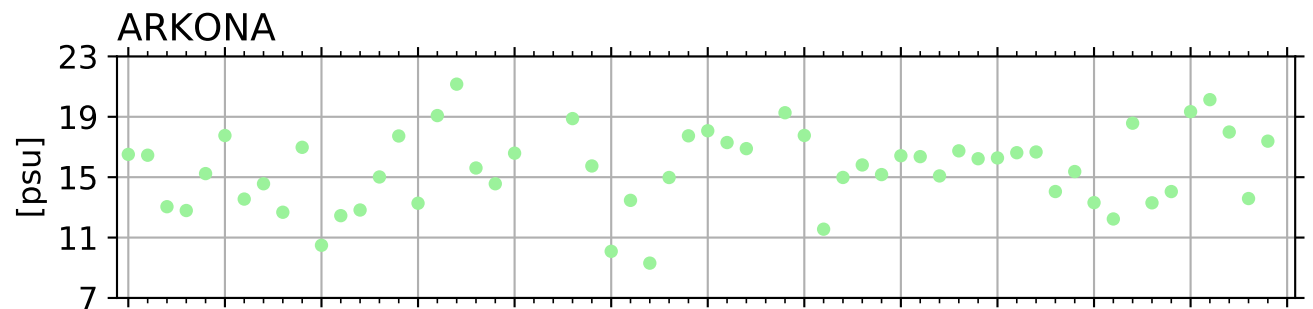
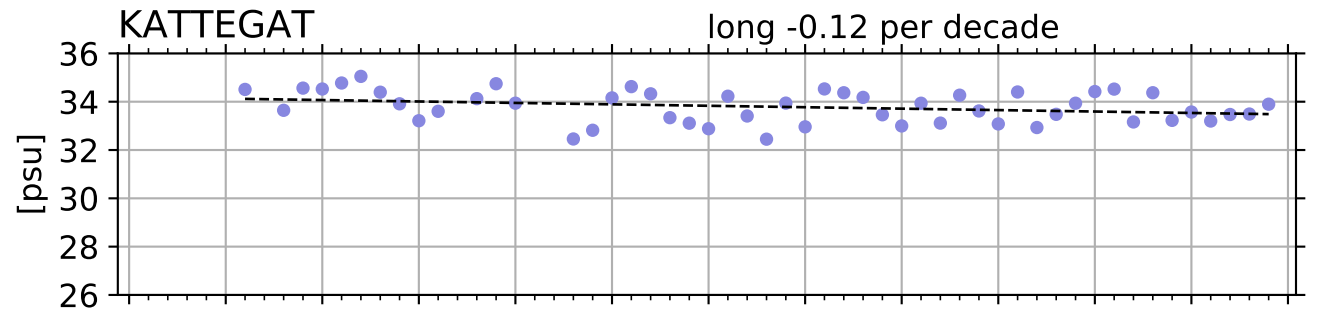
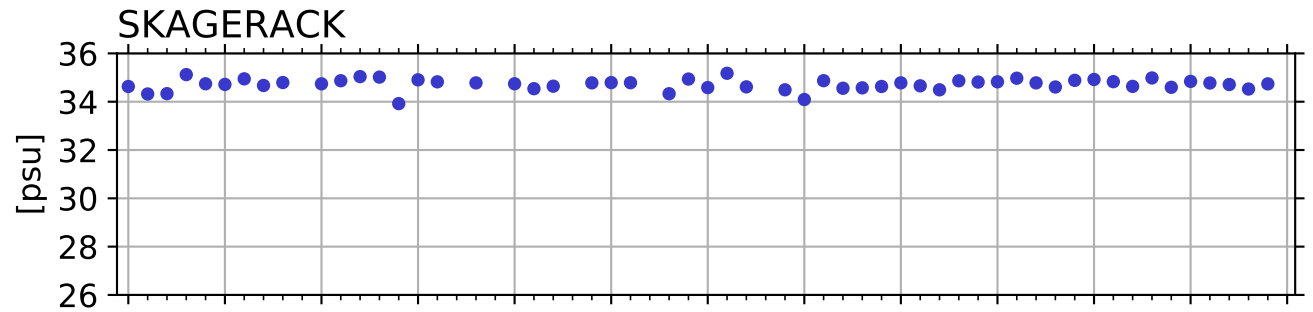
BOTHNIAN BAY



Temperature winter [°C] BW

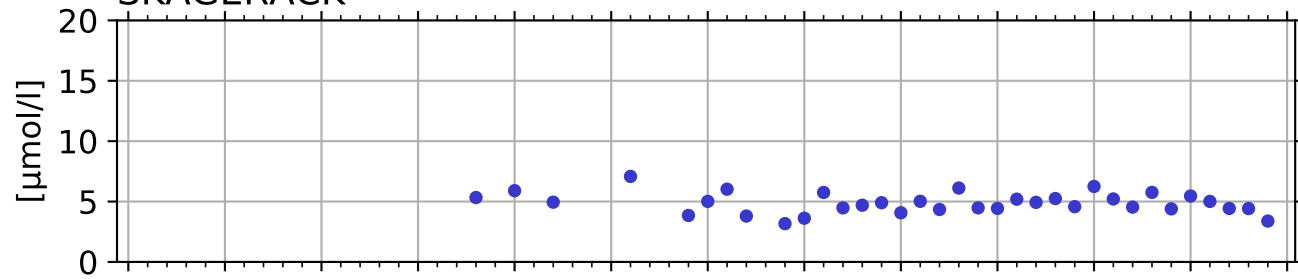


Salinity winter [psu] BW

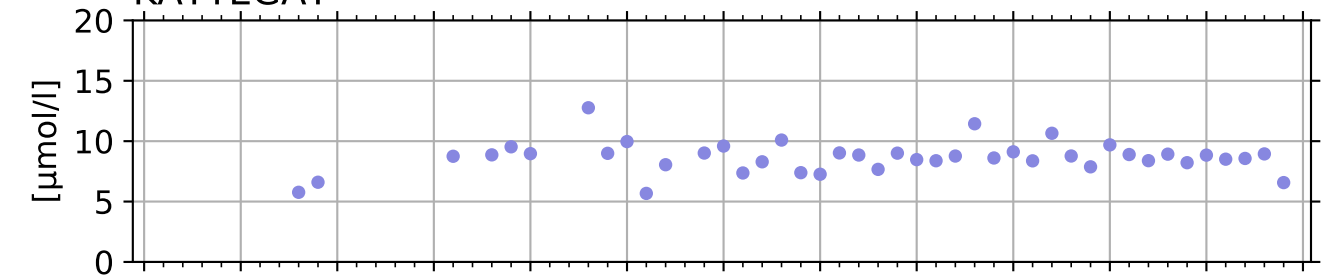


Dissolved Silica winter [$\mu\text{mol/l}$] BW

SKAGERACK

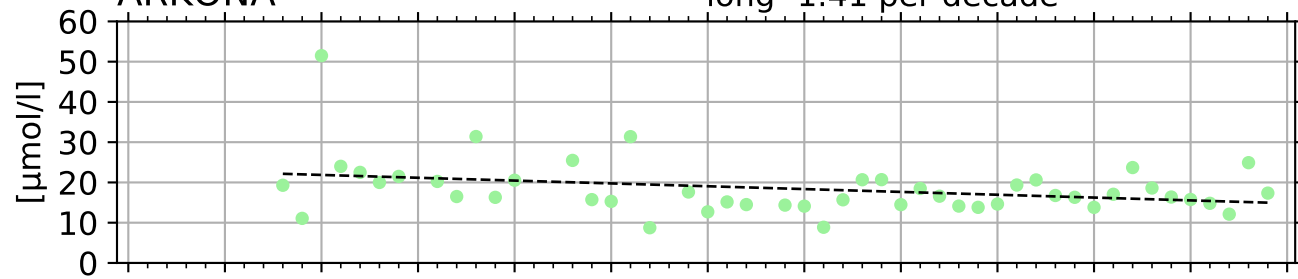


KATTEGAT

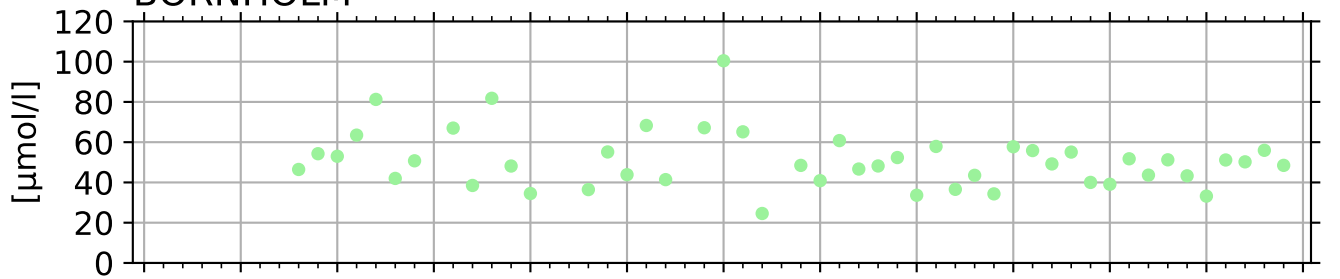


ARKONA

long -1.41 per decade

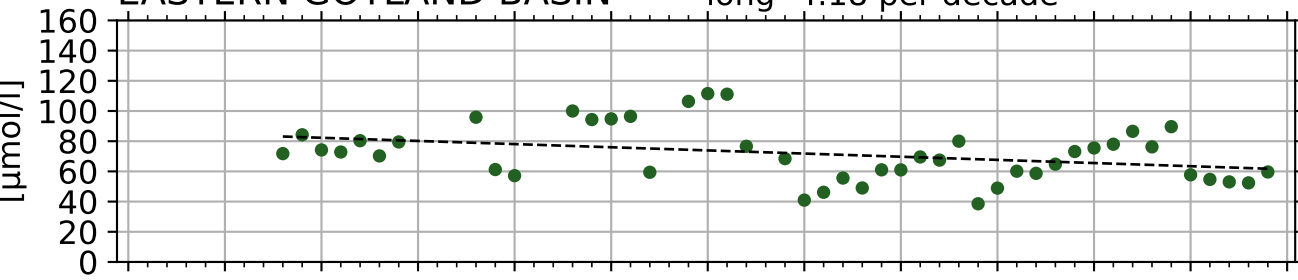


BORNHOLM



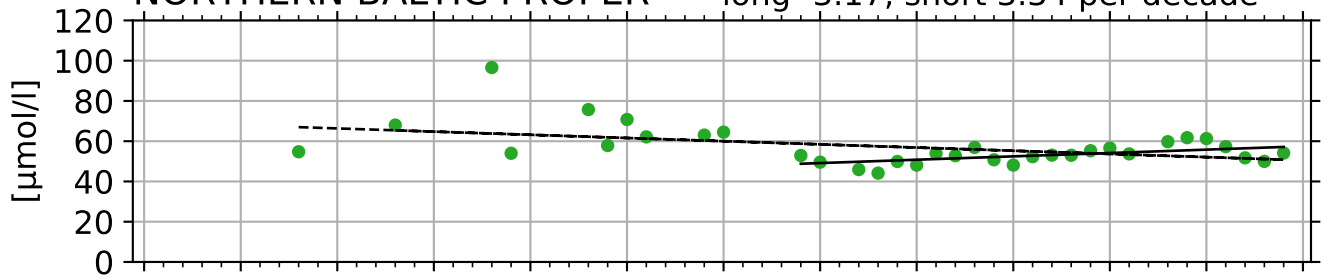
EASTERN GOTLAND BASIN

long -4.18 per decade



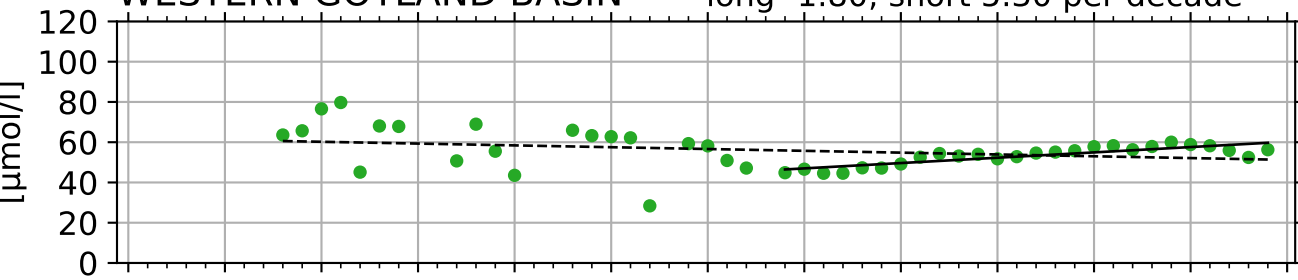
NORTHERN BALTIC PROPER

long -3.17, short 3.34 per decade



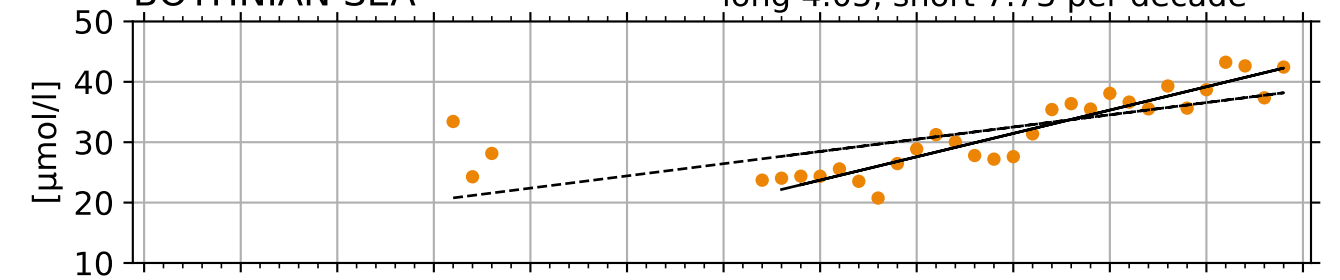
WESTERN GOTLAND BASIN

long -1.80, short 5.30 per decade



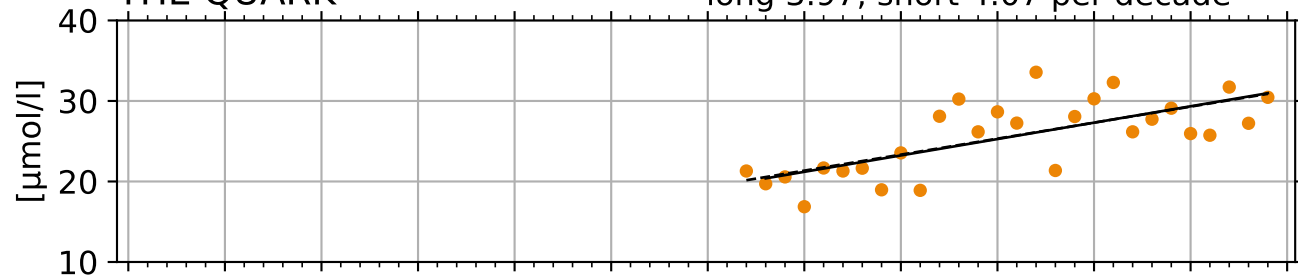
BOTHNIAN SEA

long 4.05, short 7.73 per decade



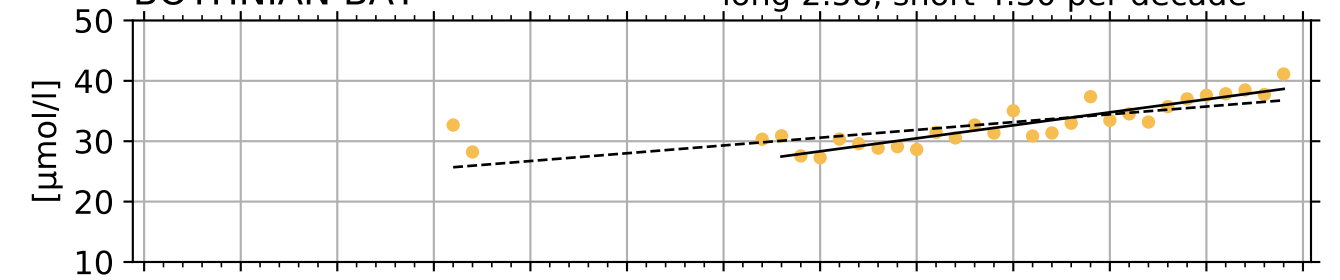
THE QUARK

long 3.97, short 4.07 per decade



BOTHNIAN BAY

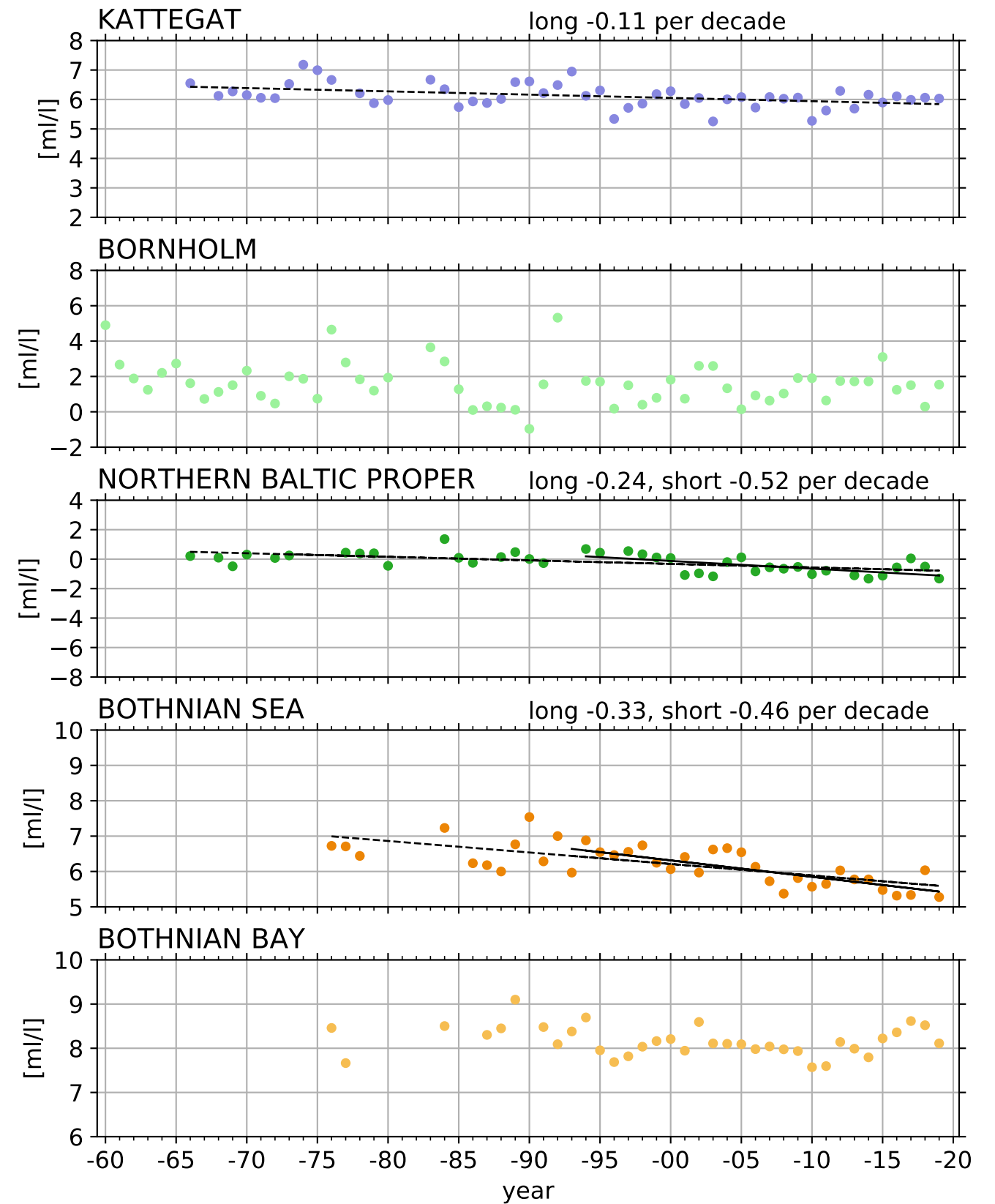
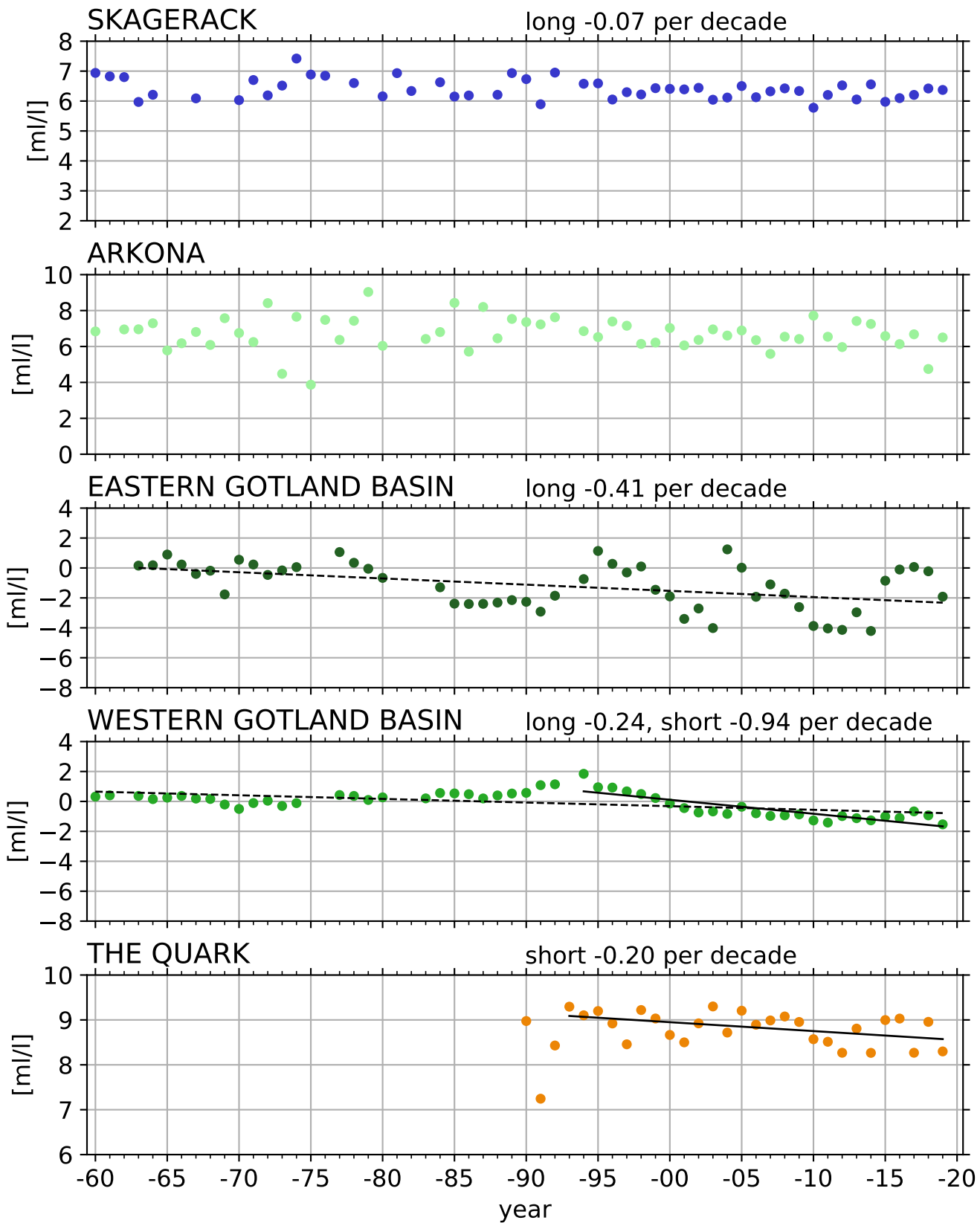
long 2.58, short 4.30 per decade



year

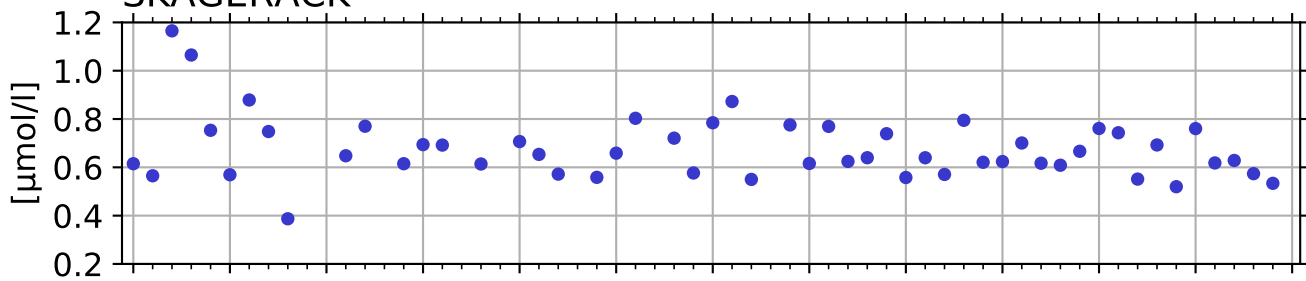
year

Dissolved oxygen winter [ml/l] BW



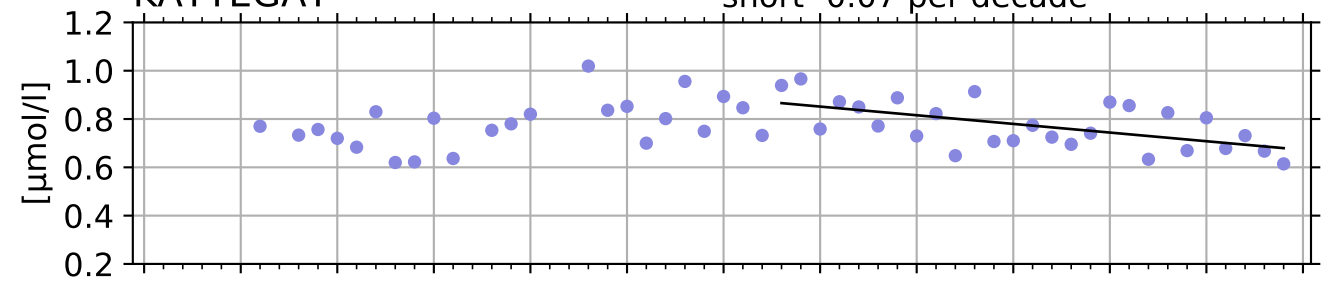
Phosphate winter [$\mu\text{mol/l}$] BW

SKAGERACK

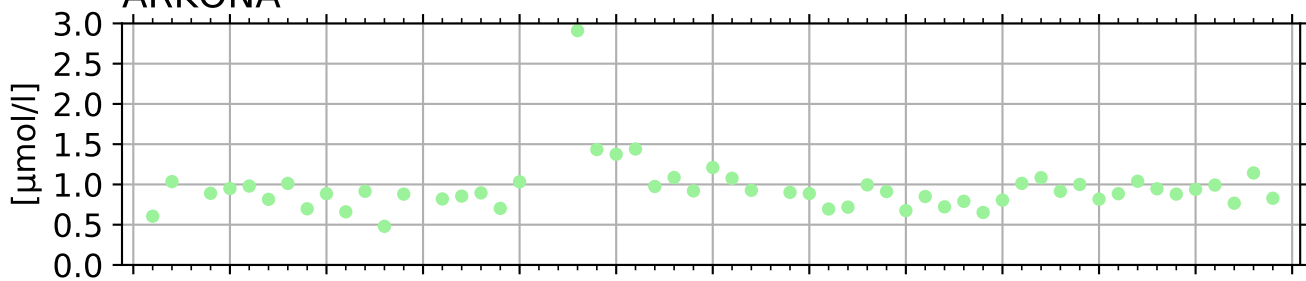


KATTEGAT

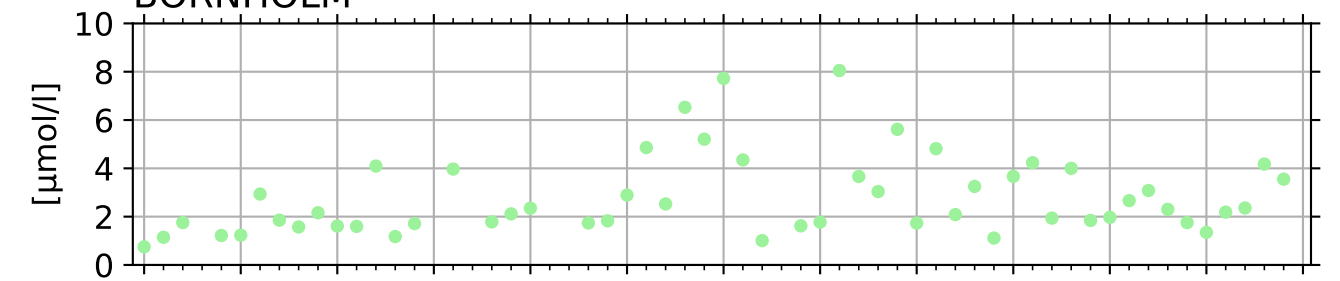
short -0.07 per decade



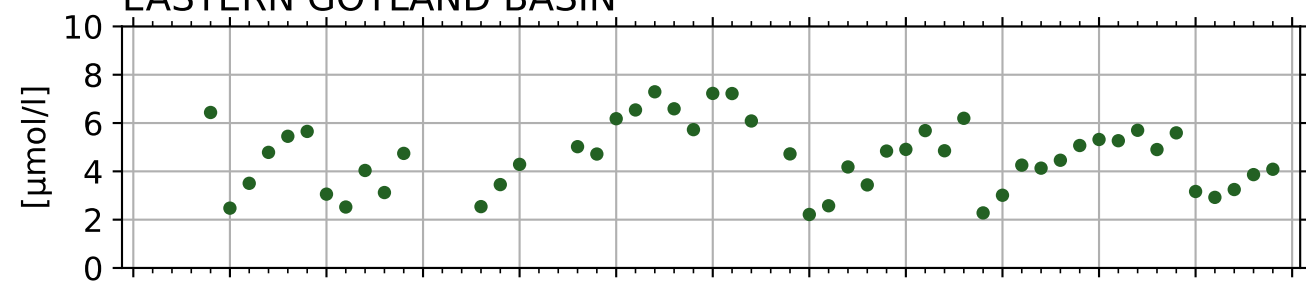
ARKONA



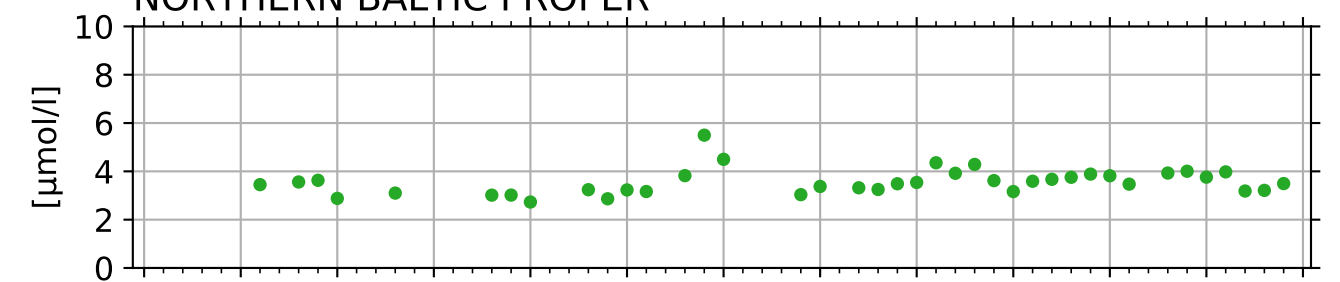
BORNHOLM



EASTERN GOTLAND BASIN

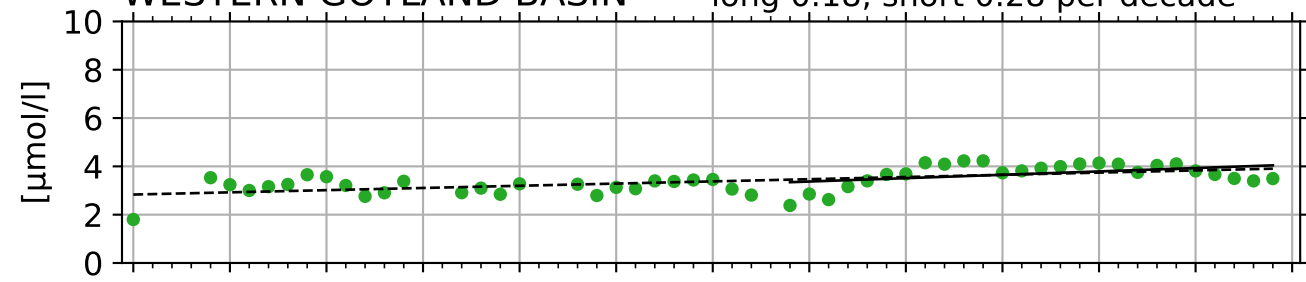


NORTHERN BALTIC PROPER



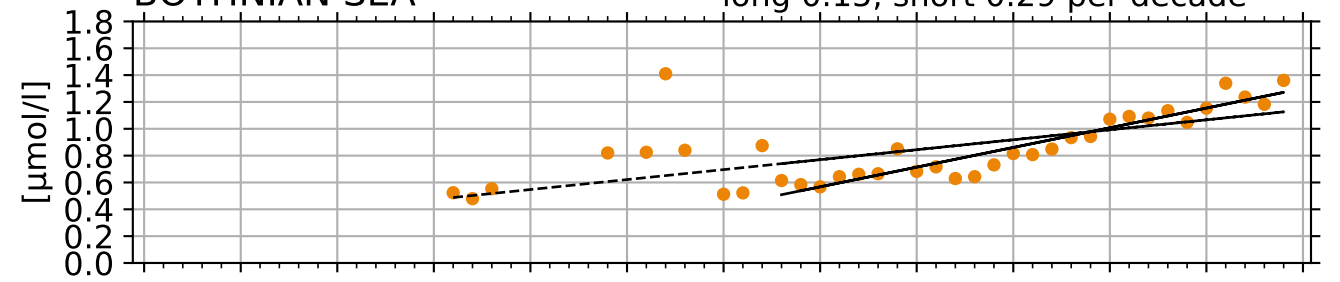
WESTERN GOTLAND BASIN

long 0.18, short 0.28 per decade



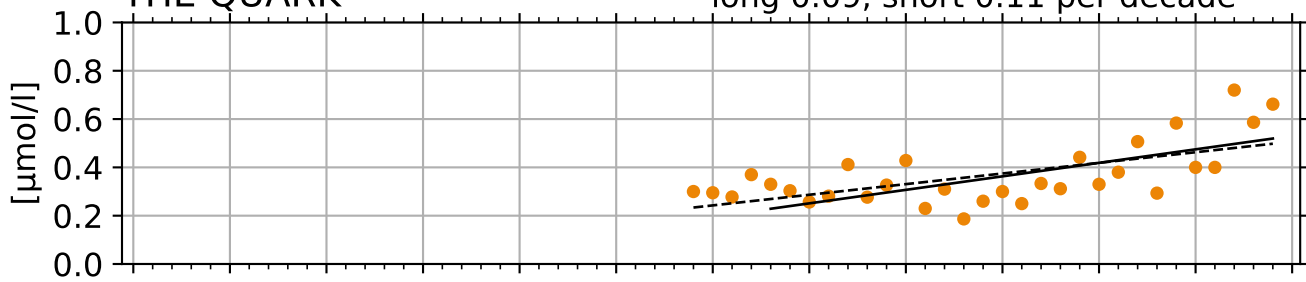
BOTHNIAN SEA

long 0.15, short 0.29 per decade

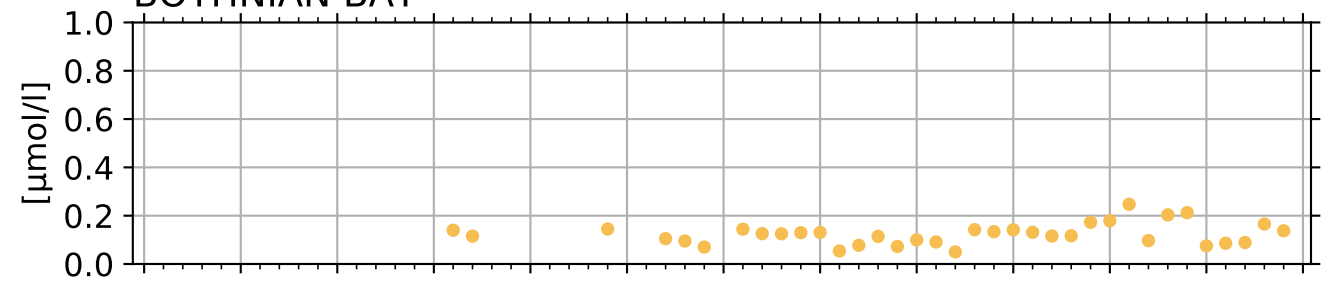


THE QUARK

long 0.09, short 0.11 per decade



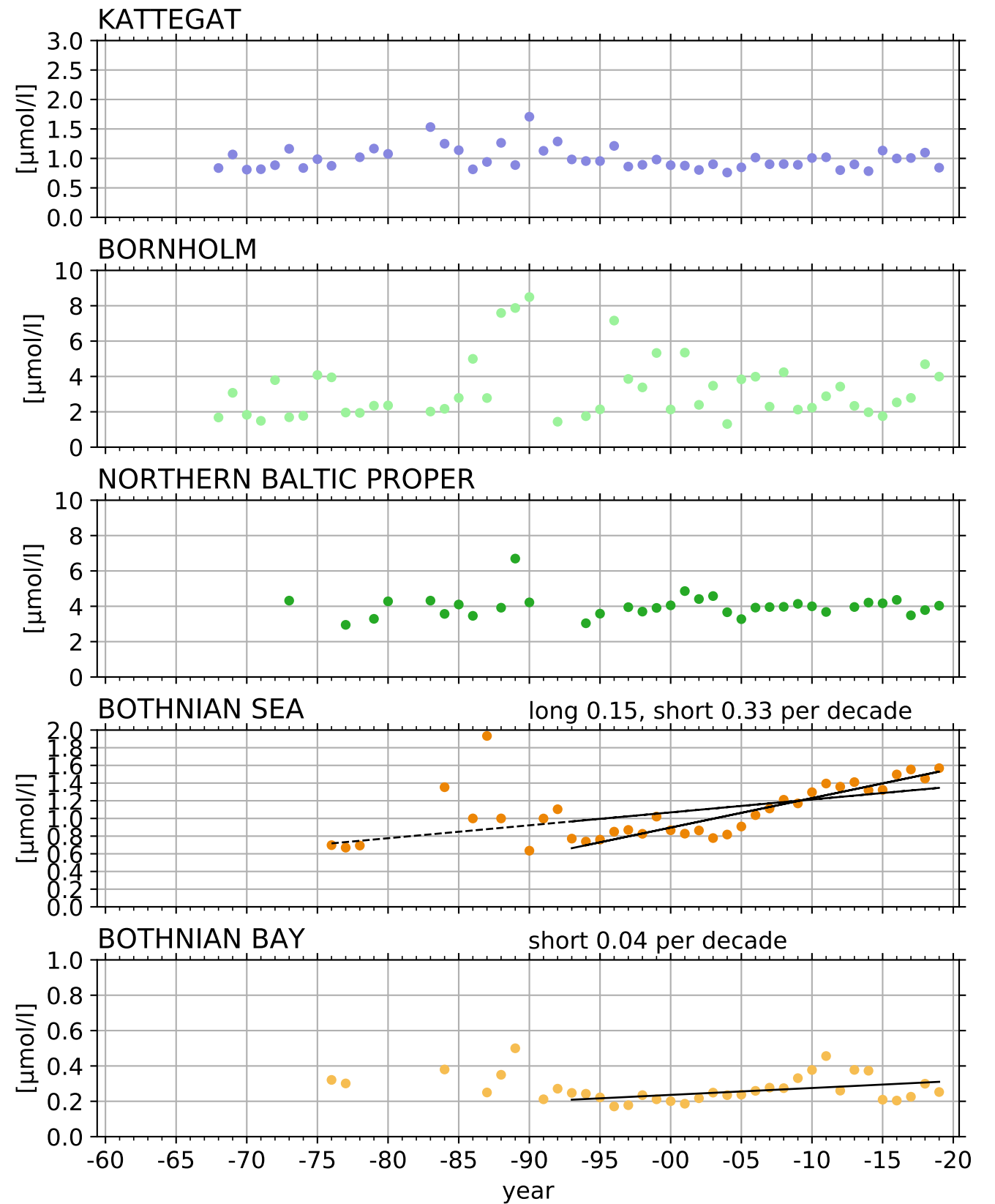
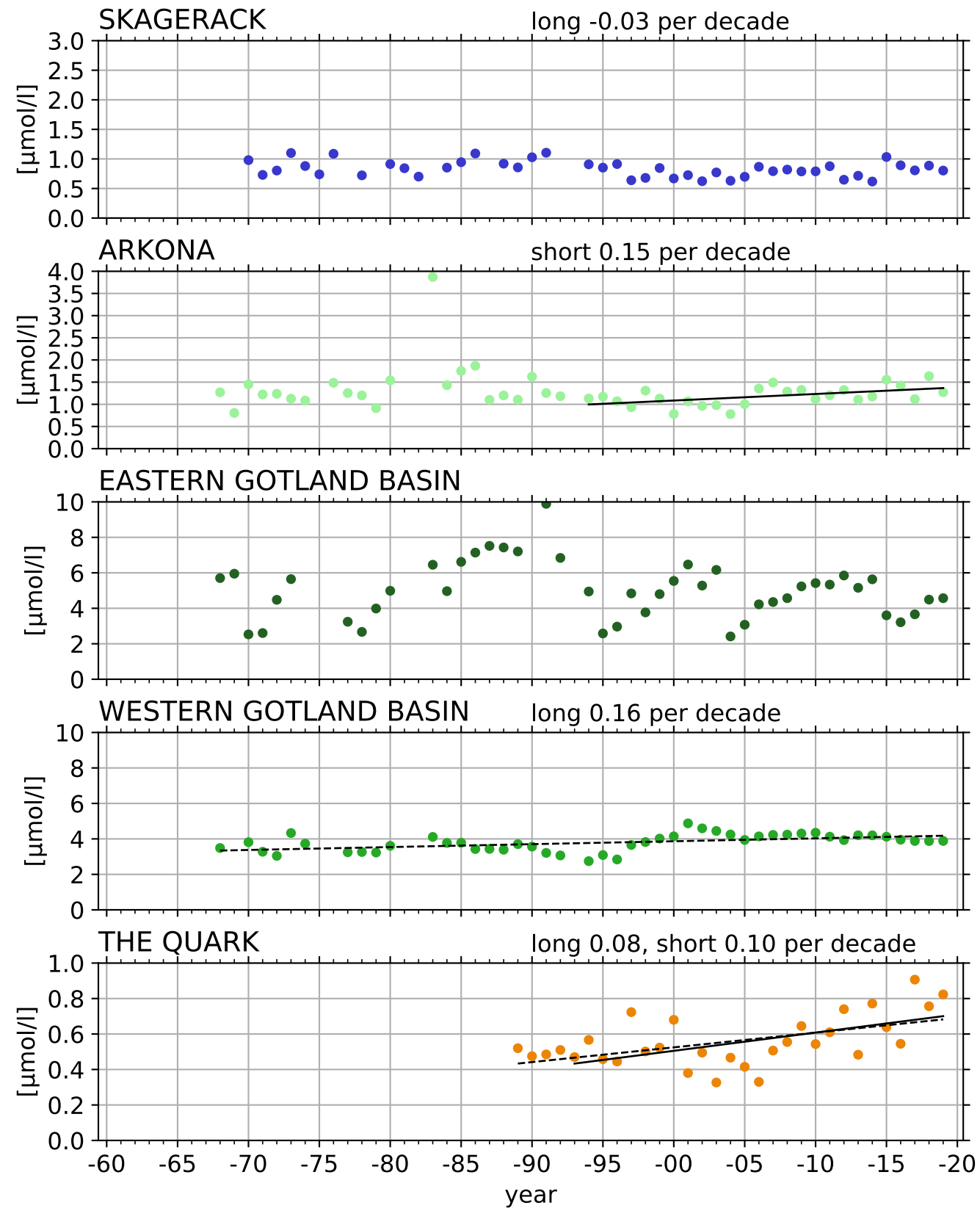
BOTHNIAN BAY



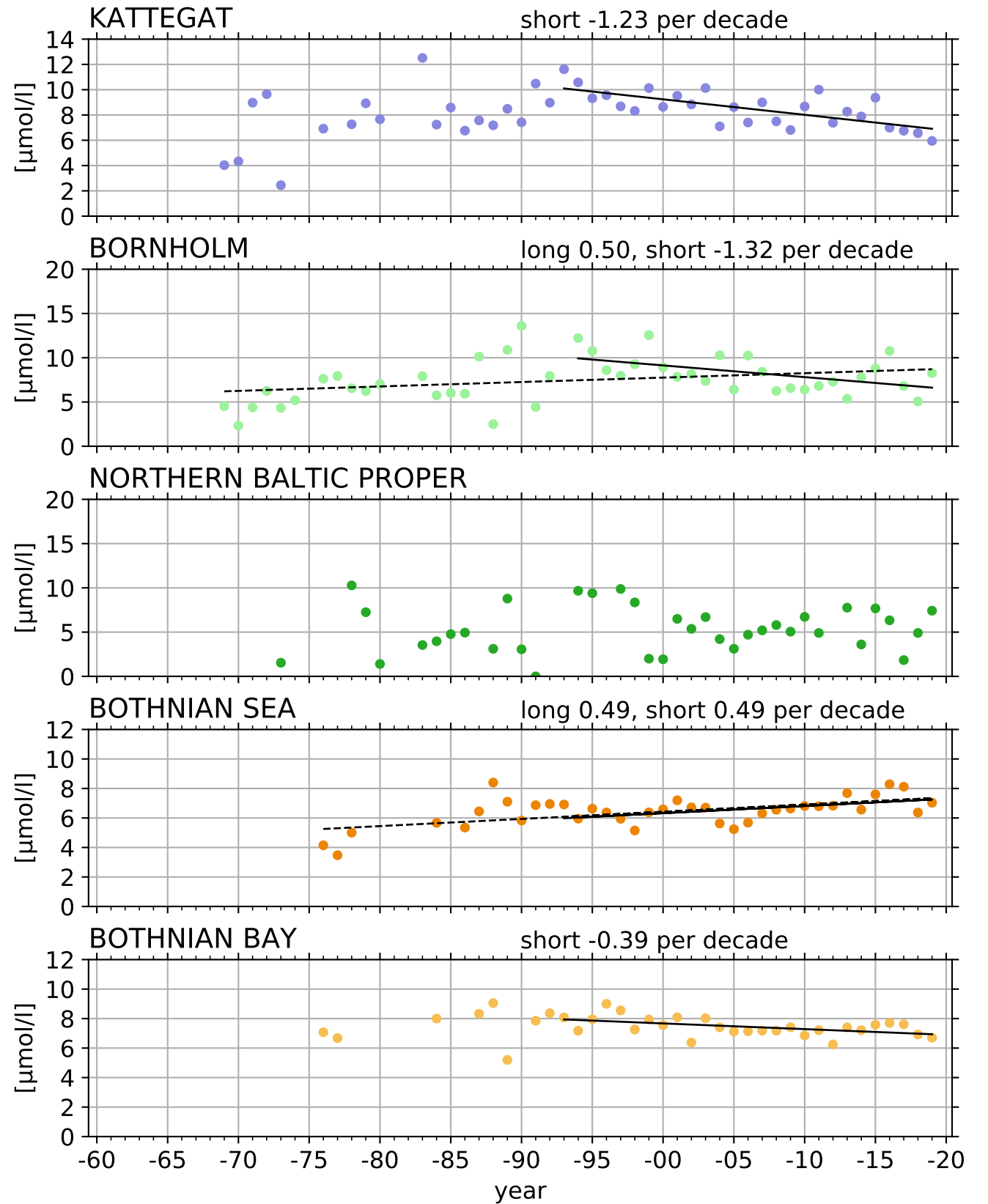
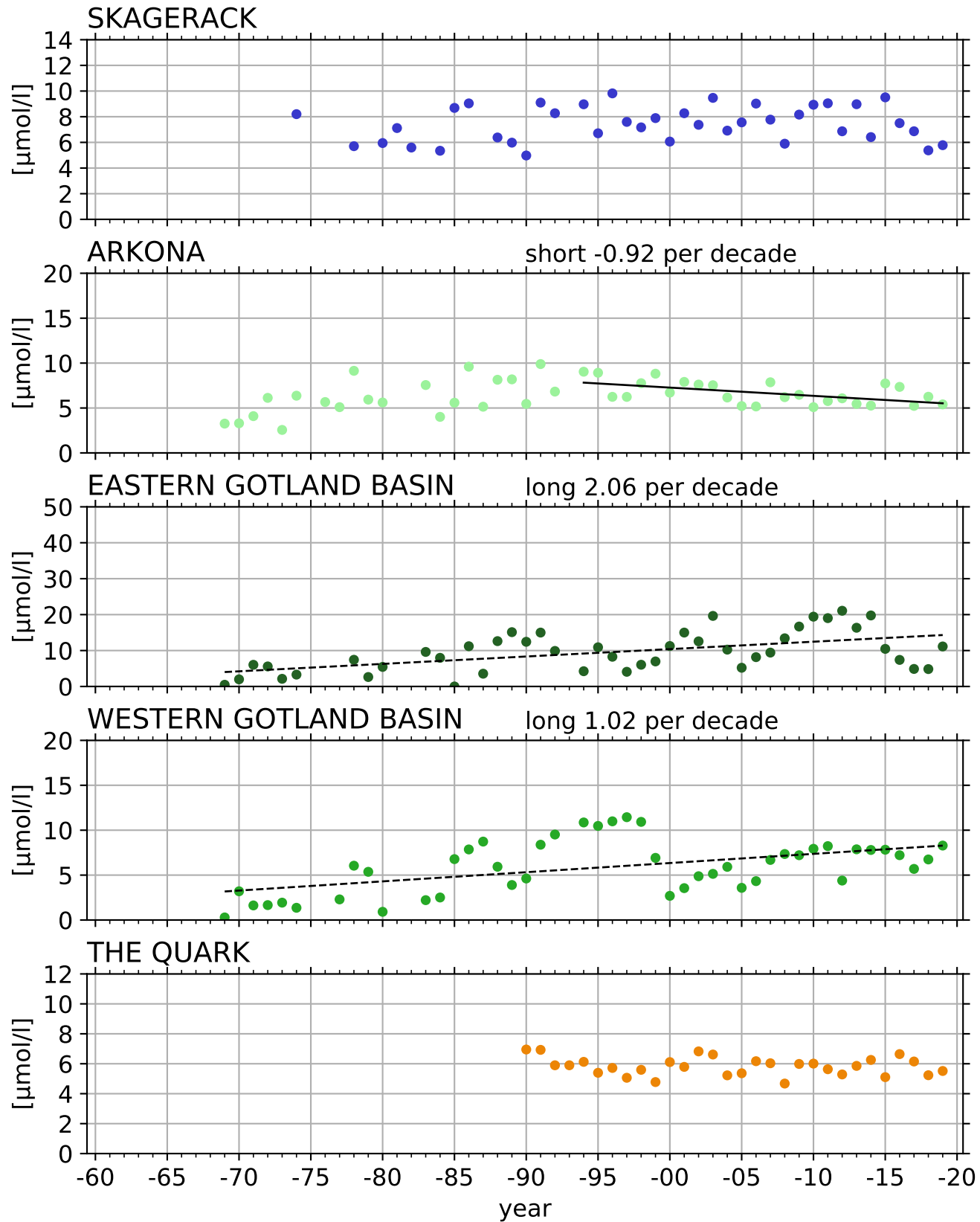
year

year

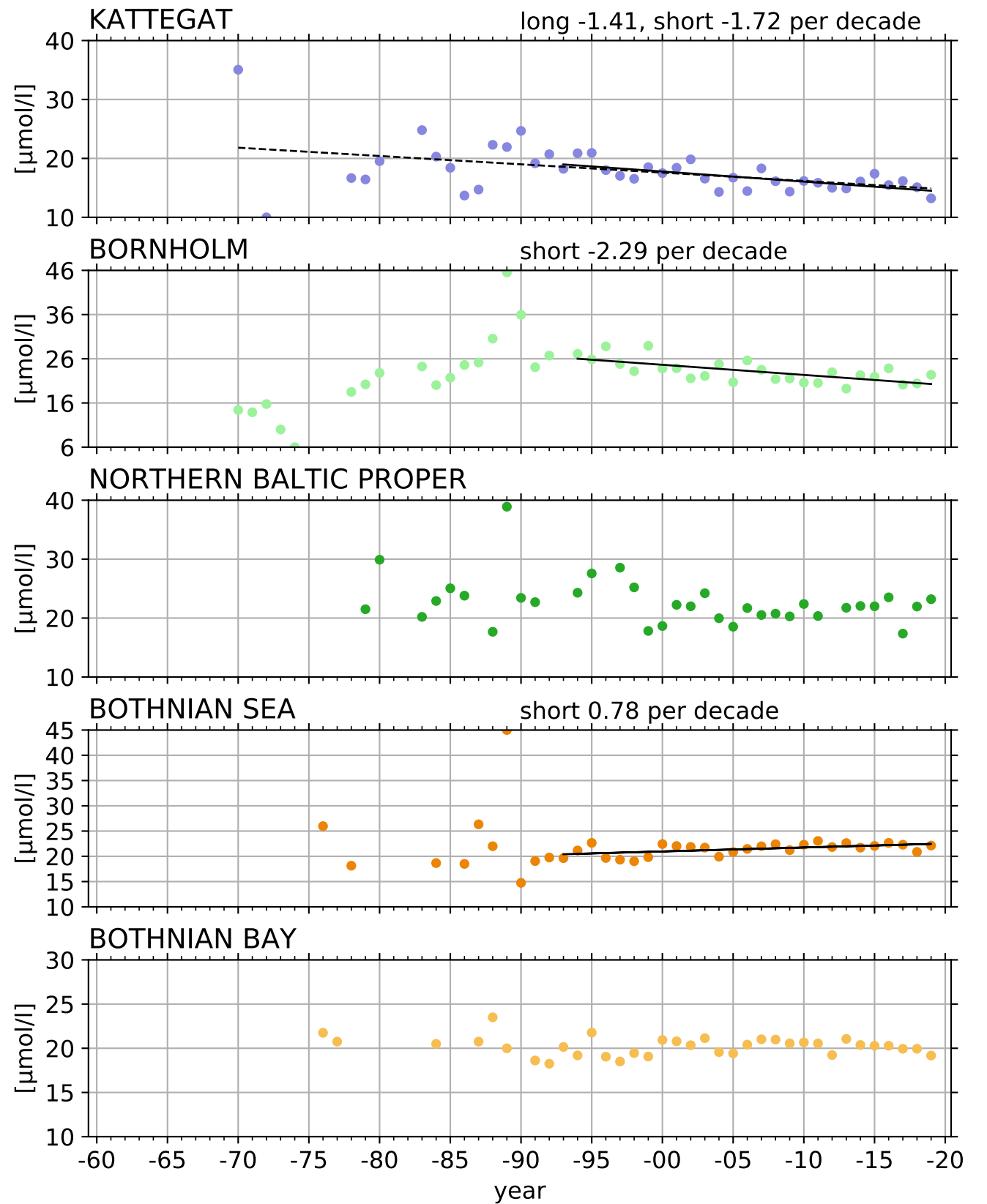
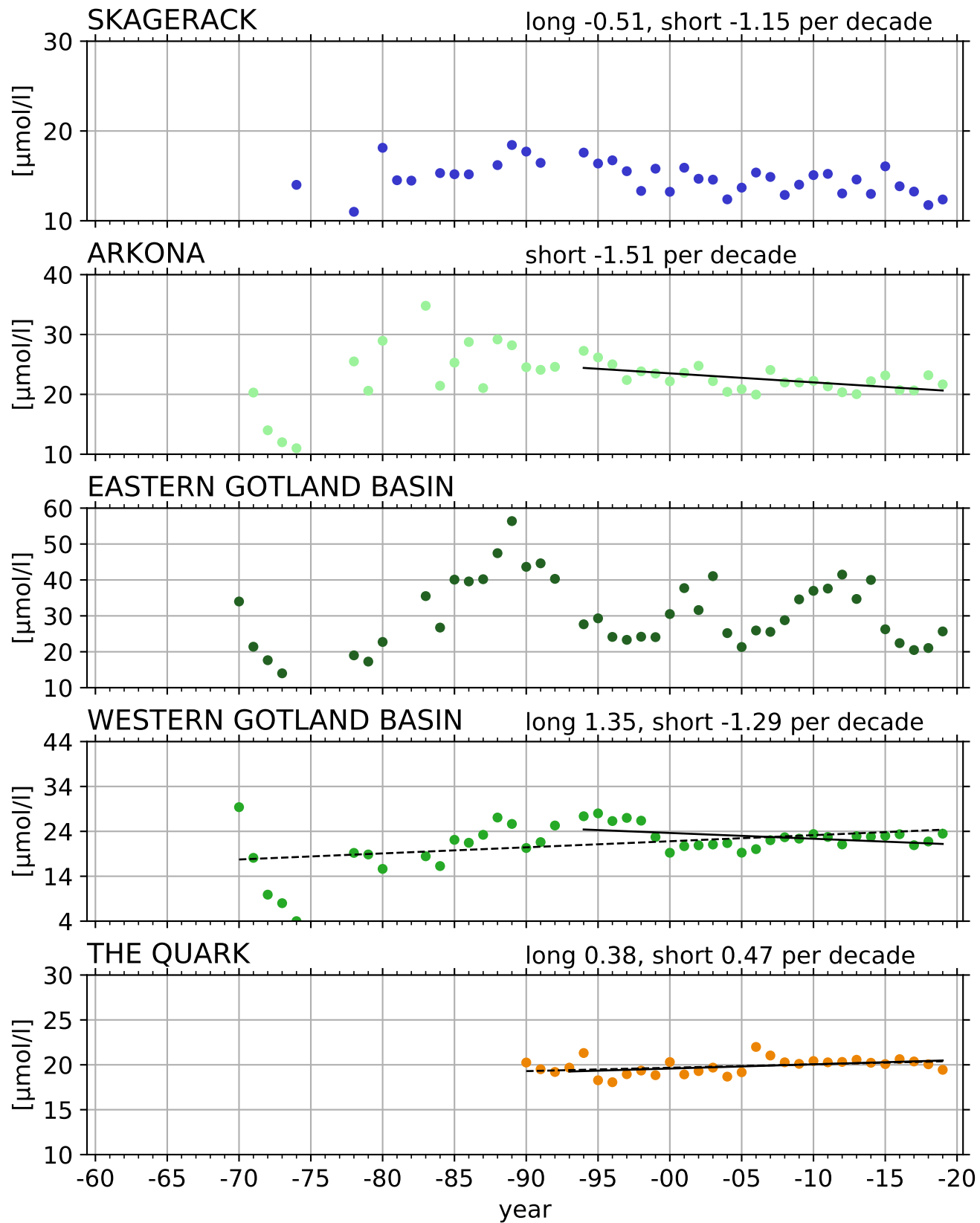
Total phosphorus winter [$\mu\text{mol/l}$] BW



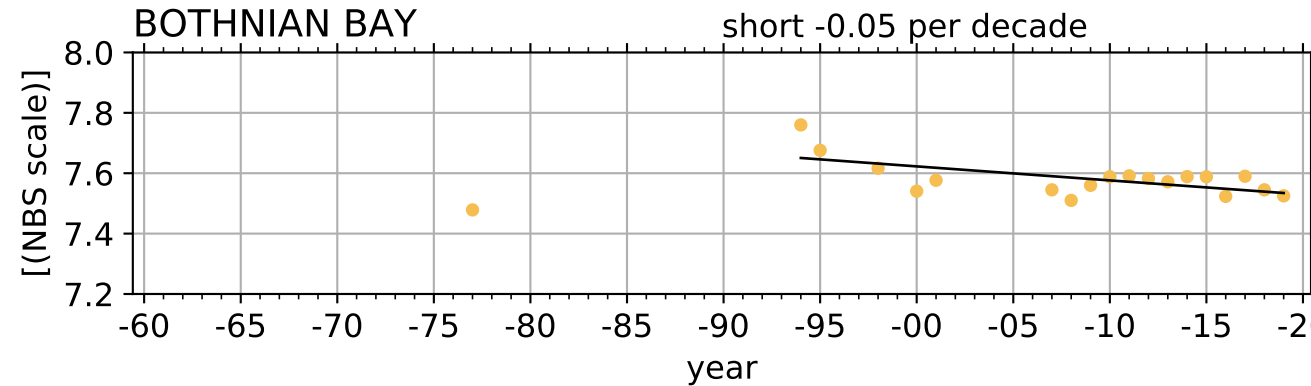
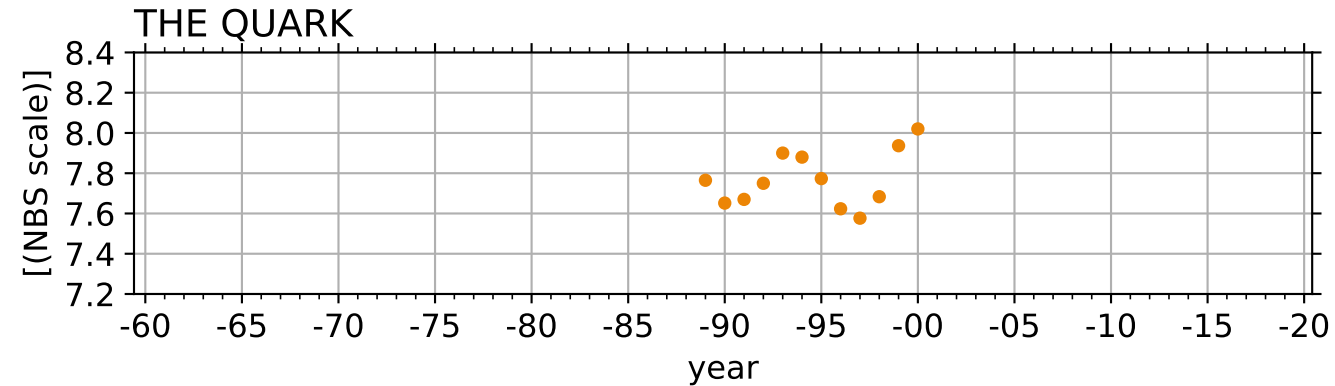
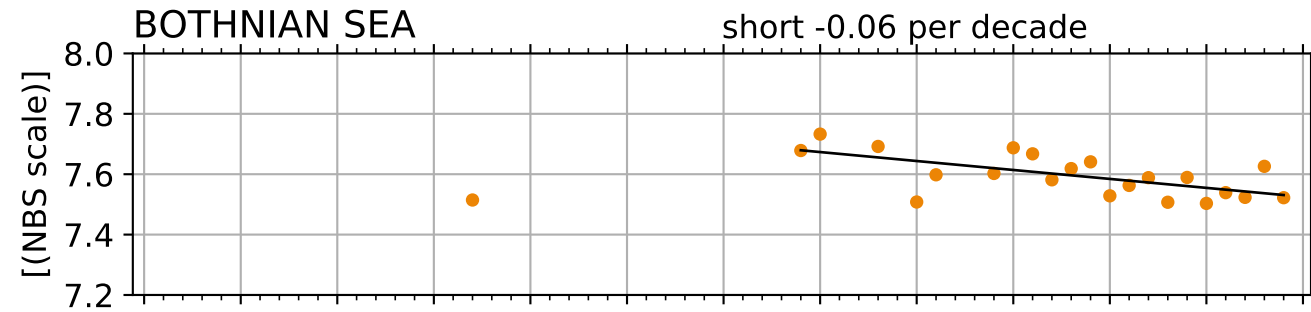
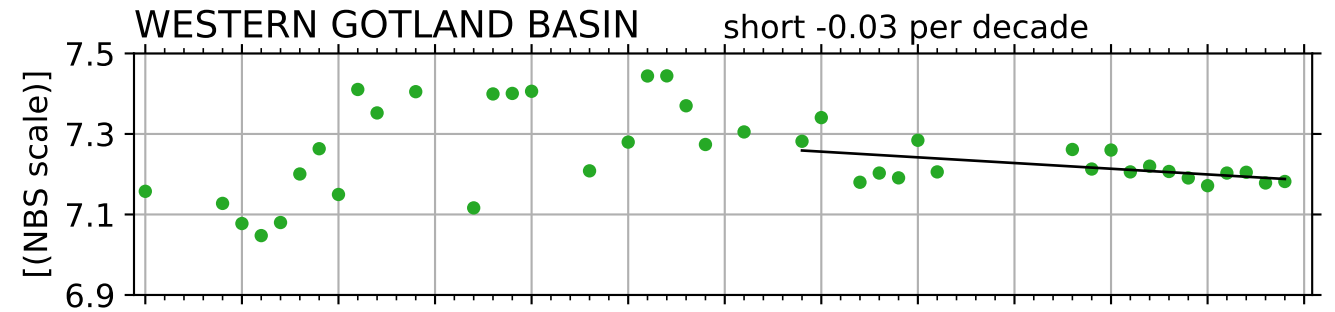
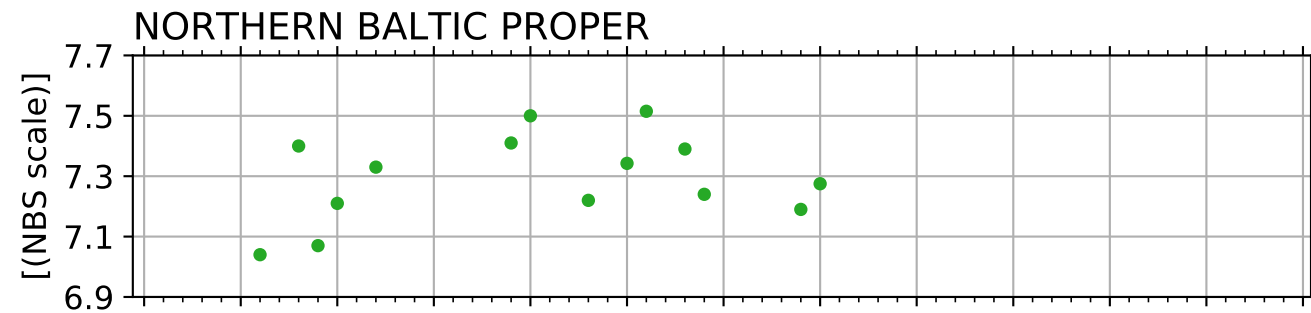
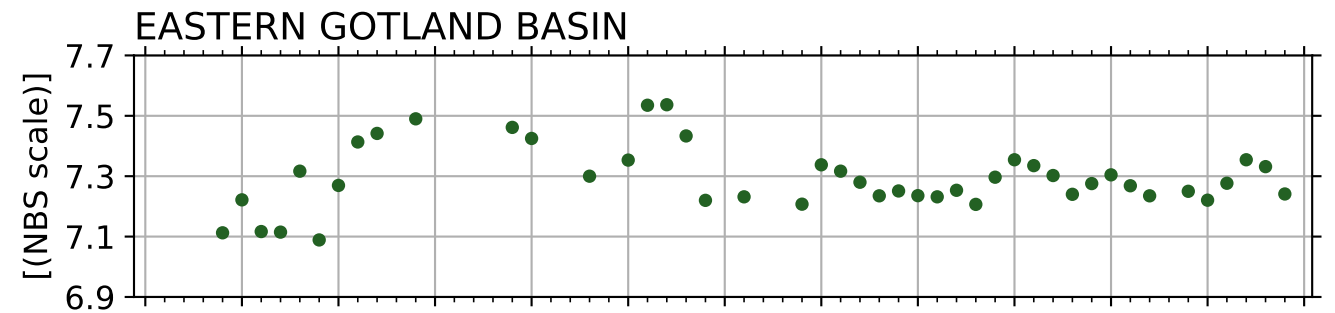
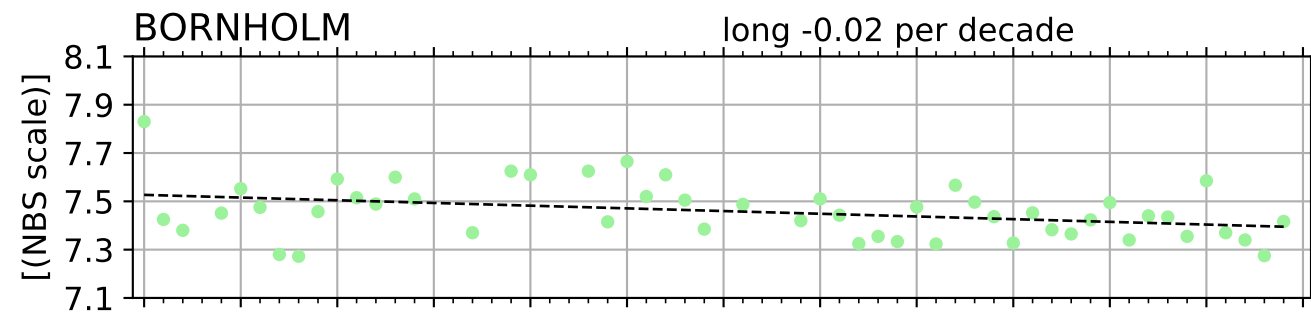
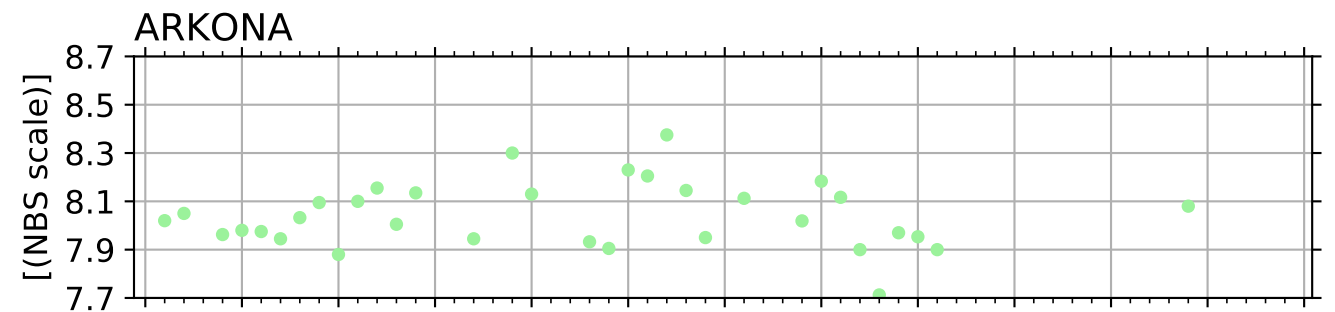
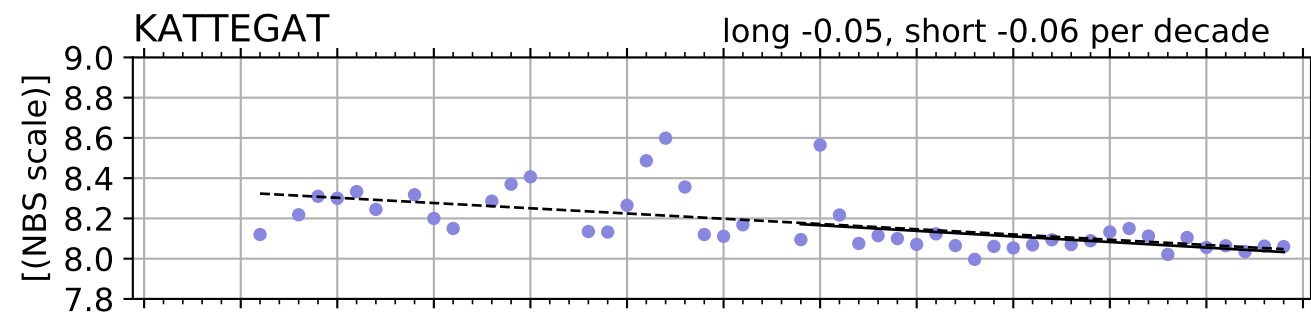
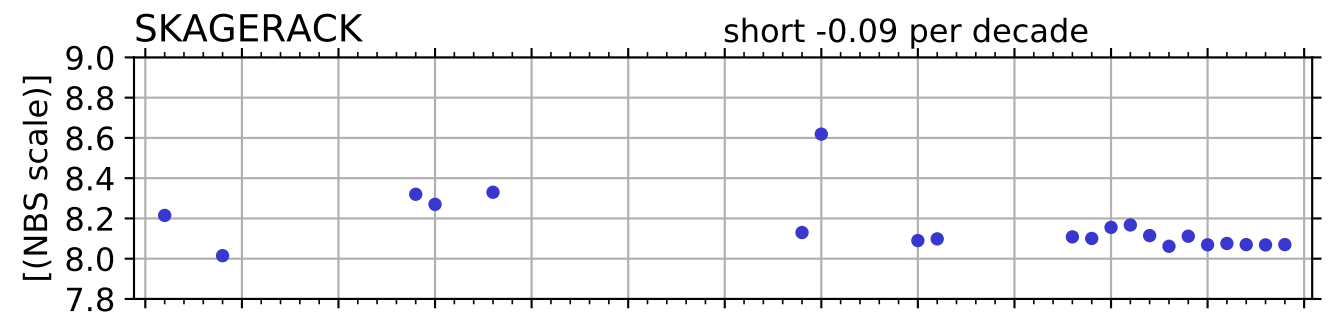
DIN winter [$\mu\text{mol/l}$] BW



Total Nitrogen winter [$\mu\text{mol/l}$] BW



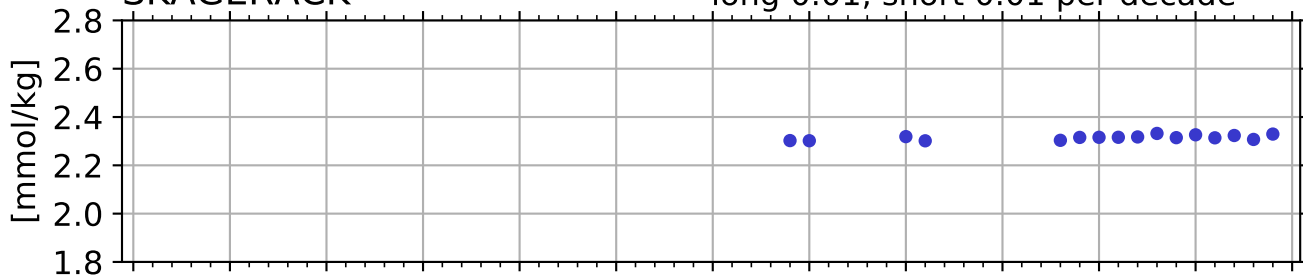
pH winter [(NBS scale)] BW



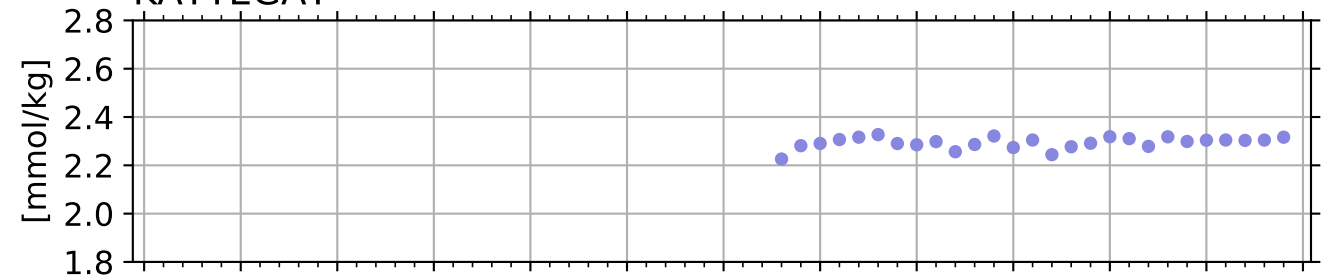
Alkalinity winter [mmol/kg] BW

SKAGERACK

long 0.01, short 0.01 per decade

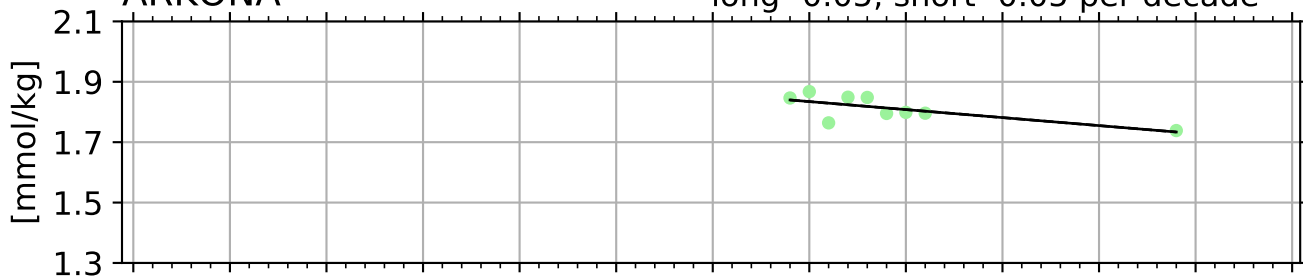


KATTEGAT



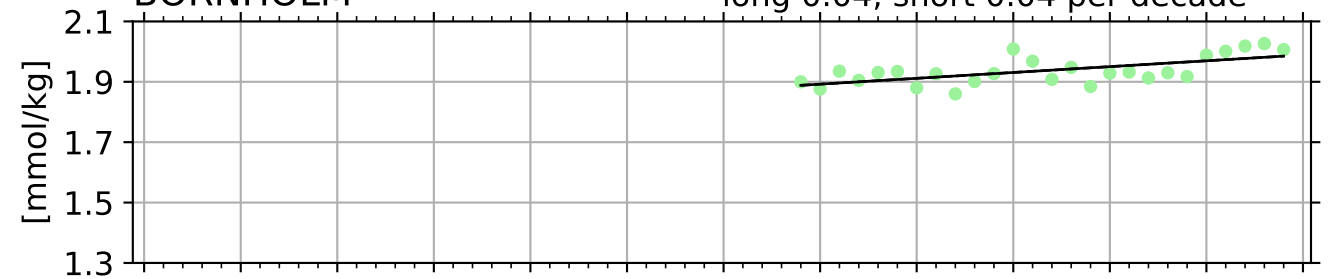
ARKONA

long -0.05, short -0.05 per decade



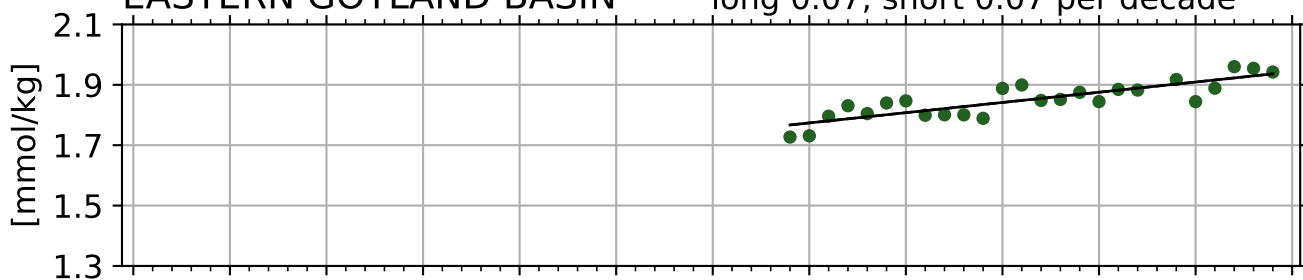
BORNHOLM

long 0.04, short 0.04 per decade

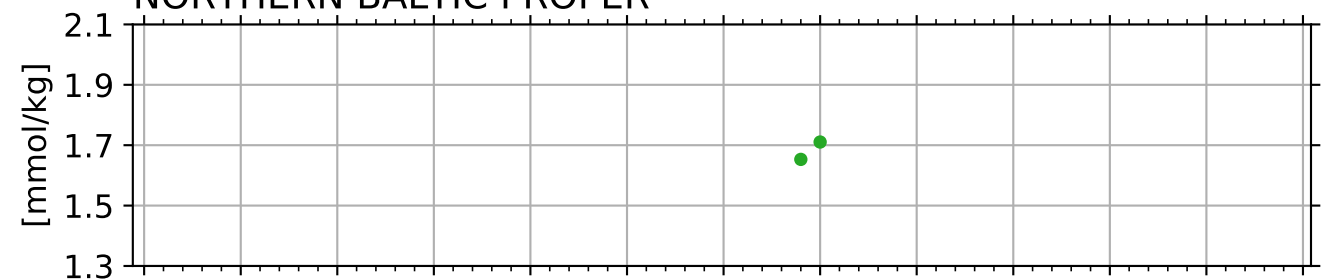


EASTERN GOTLAND BASIN

long 0.07, short 0.07 per decade

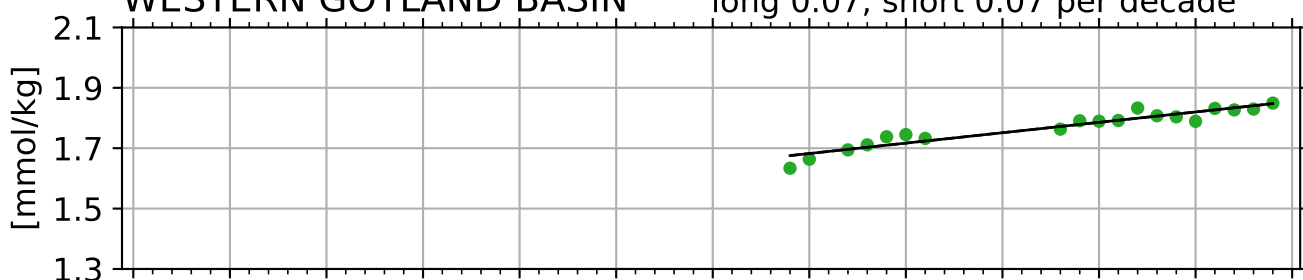


NORTHERN BALTIC PROPER



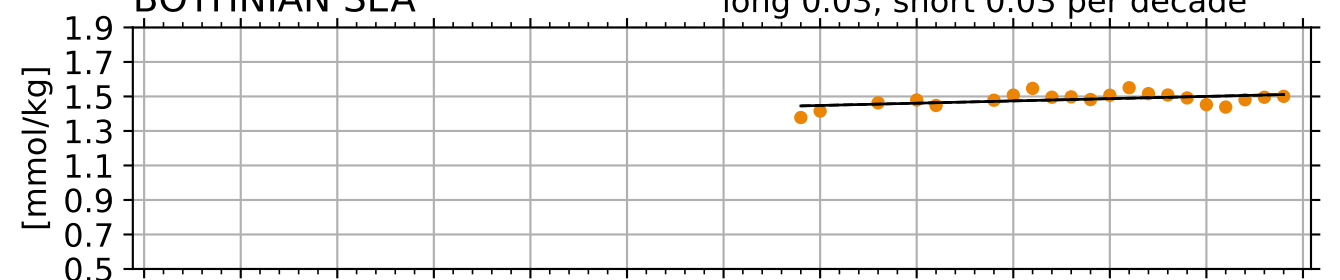
WESTERN GOTLAND BASIN

long 0.07, short 0.07 per decade



BOTHNIAN SEA

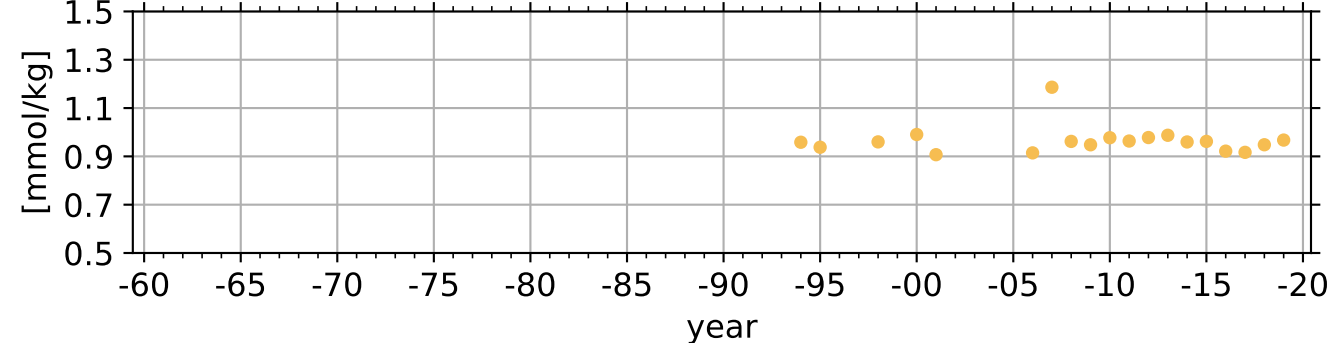
long 0.03, short 0.03 per decade



THE QUARK



BOTHNIAN BAY



Appendix IV

Nutrient content per basin in the Baltic Sea and the Gulf of Bothnia

Method

The basin content of nutrients was calculated from the same data set that was used for the time series presented in Appendix II. Each profile was interpolated (linearly) to retrieve concentrations in 1 m depth resolution from each station. Only complete profiles with data in the surface, intermediary and deep waters are used.

The data is divided into winter, spring, summer and autumn (winter: Dec-Feb, spring: Mar-May, summer: June-Aug, autumn: Sep-Nov). This means that 2019 winter was calculated from data collected in December 2018, January 2019 and February 2019.

For each basin the concentration at each depth is multiplied by the volume of that depth layer, thereby getting the content of each nutrient in that depth layer. All depth layers are then summed to give the content for the whole basin. In Bornholm Basin, Arkona Basin, Bothnian Sea and Bothnian Bay the average concentration of two stations is used for the calculation, assuming little horizontal variations in all depth layers. The Western Gotland Basin and the Eastern Gotland Basin are divided into three and four sub-basins respectively because the horizontal variations, especially in the deep waters, are larger here. The sub-basins are chosen based on bathymetry around the monitoring stations. Calculated content is shown both for the sub-basins and the whole basins.

The winter and summer content is shown for all basins on the last page. Note that the difference in content between the basins depends on their difference in size.

The volume of each depth layer was calculated from the bathymetry dataset iowotopo2 available by IOW at <https://www.io-warnemuende.de/topography-of-the-baltic-sea.html> and by using the open sea basin subdivision set by HELCOM. The sub-basin divisions were made with GIS-software and lines for these divisions were drawn with guidance from the bathymetry map. All basin subdivisions used are shown in the first figure of this Appendix (Figure 1).

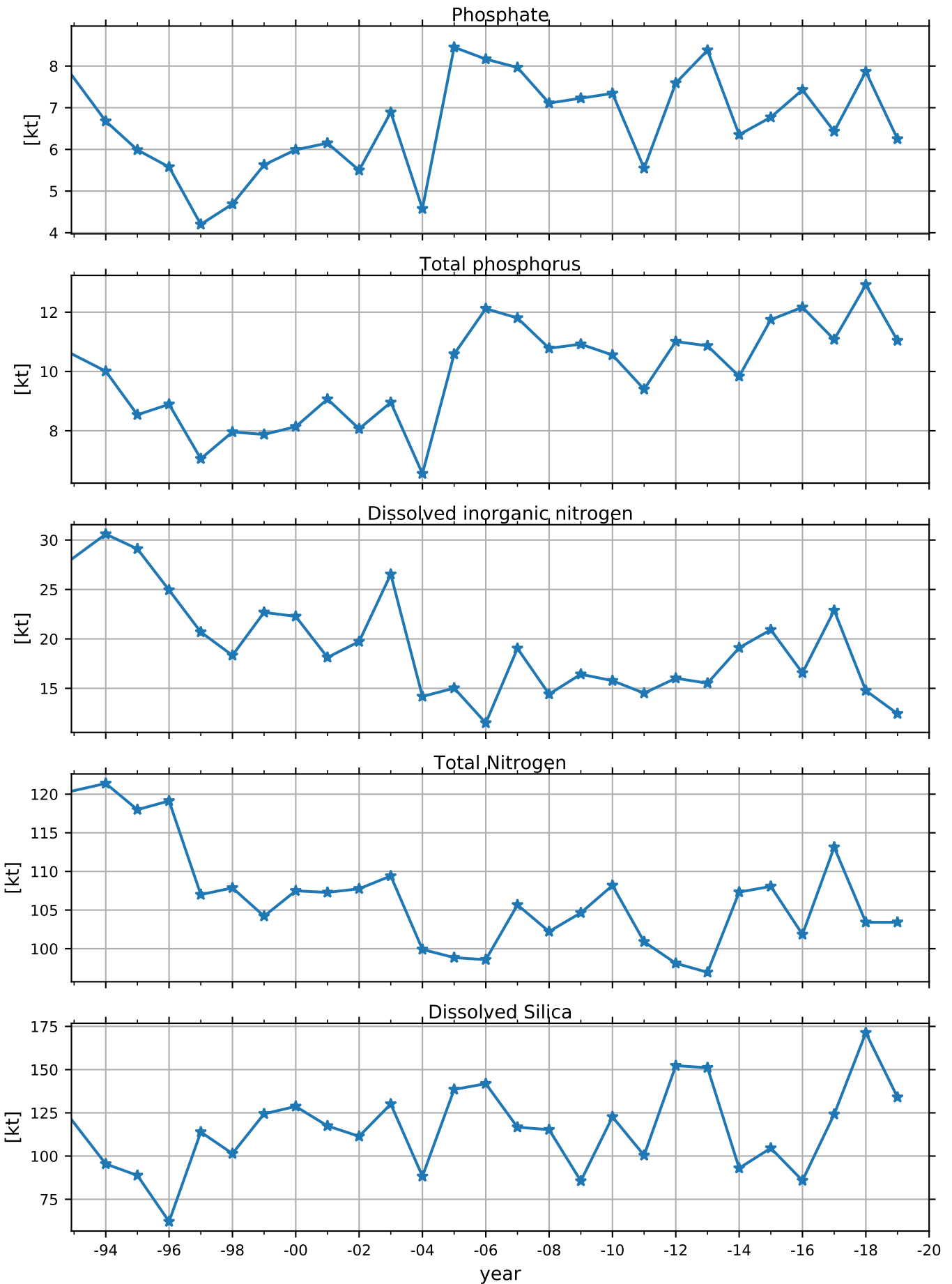


Figure 1 Basin subdivisions used for calculating hypsography and then basin content of sub-basins. The major basins shown in different colours are the HELCOM basin division revised in 2018. The previous basin division placed the station BY31 in the Northern Baltic Proper. The dashed lines showing the sub-basins were drawn to follow the bathymetry to get a smaller basin that the individual monitoring station better represents.

ARKONA BASIN

Offshore volume of basin: 353 km³

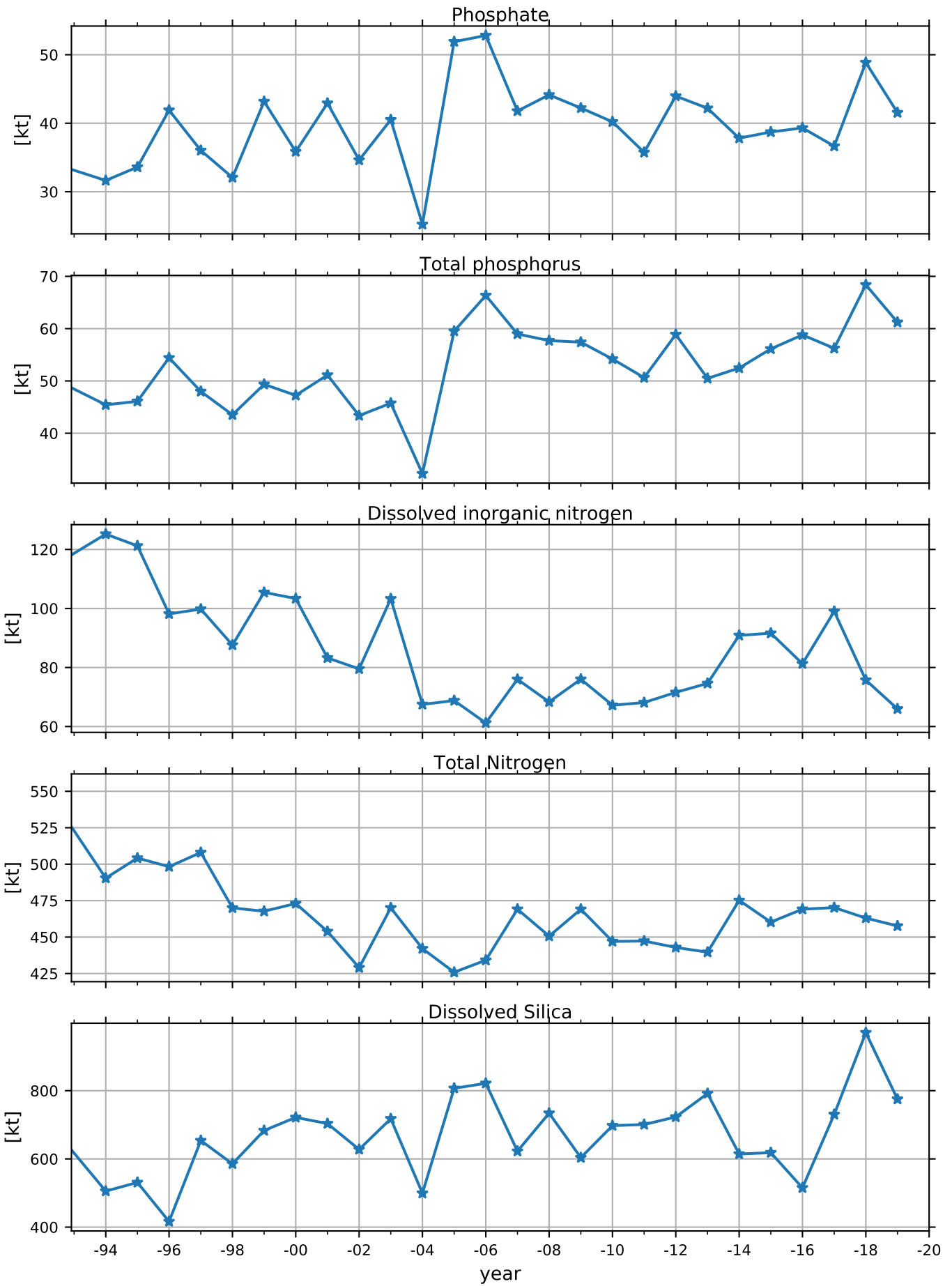
—*— winter



BORNHOLM BASIN

Offshore volume of basin: 1603 km³

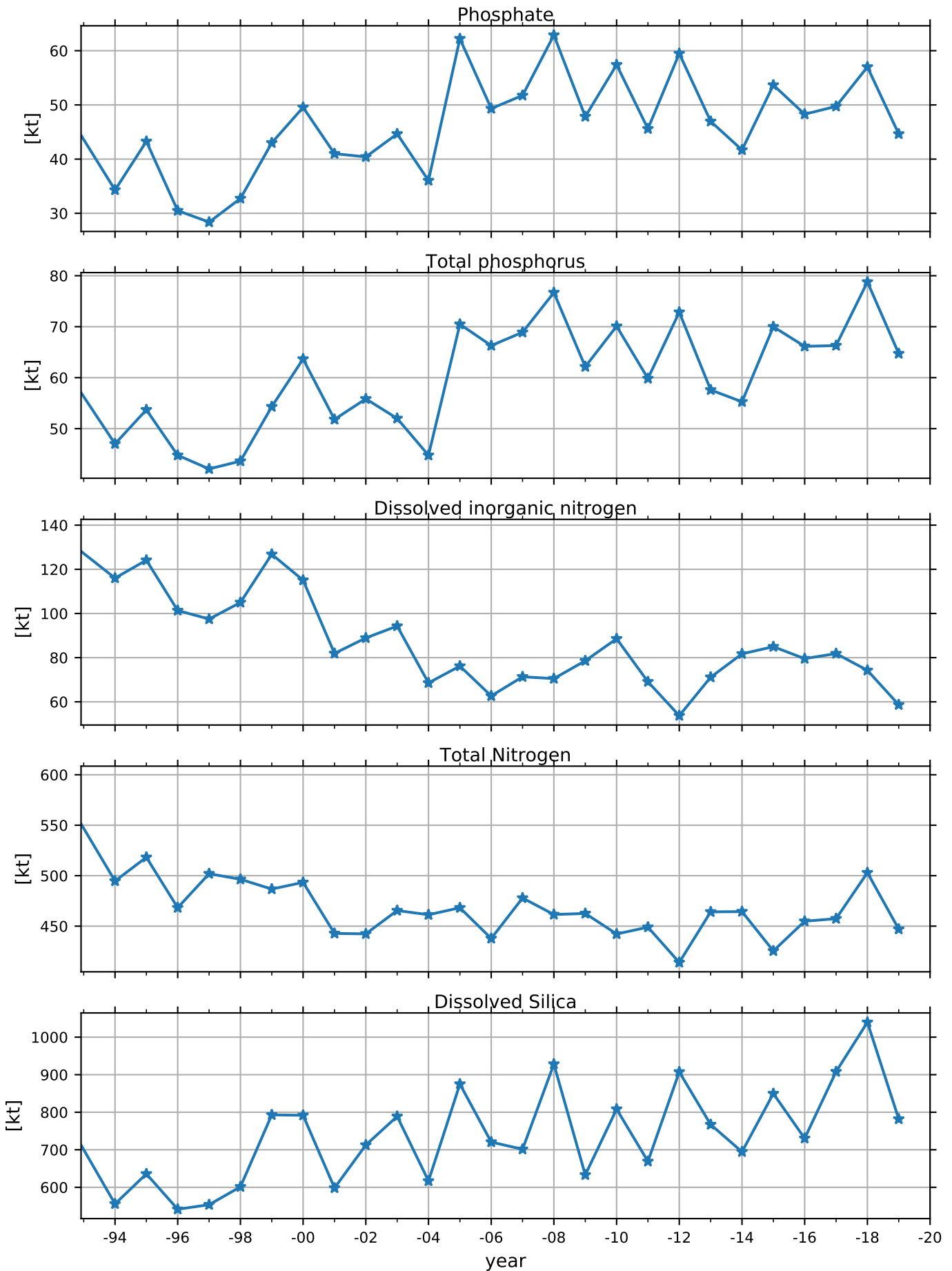
—*— winter



EASTERN GOTLAND BASIN BCS III-10

Offshore volume of basin: 1597 km³

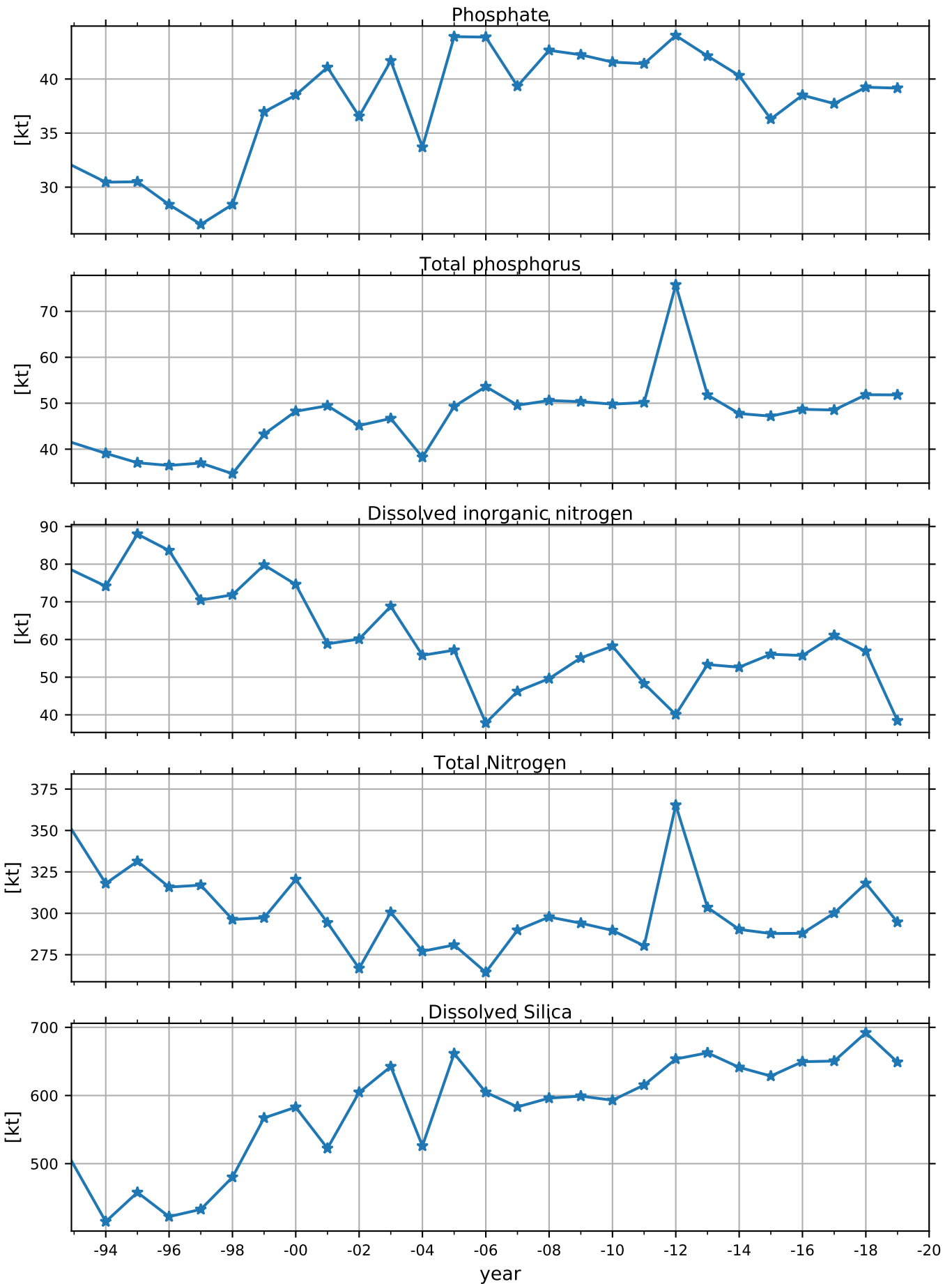
—*— winter



EASTERN GOTLAND BASIN BY10

Offshore volume of basin: 1007 km³

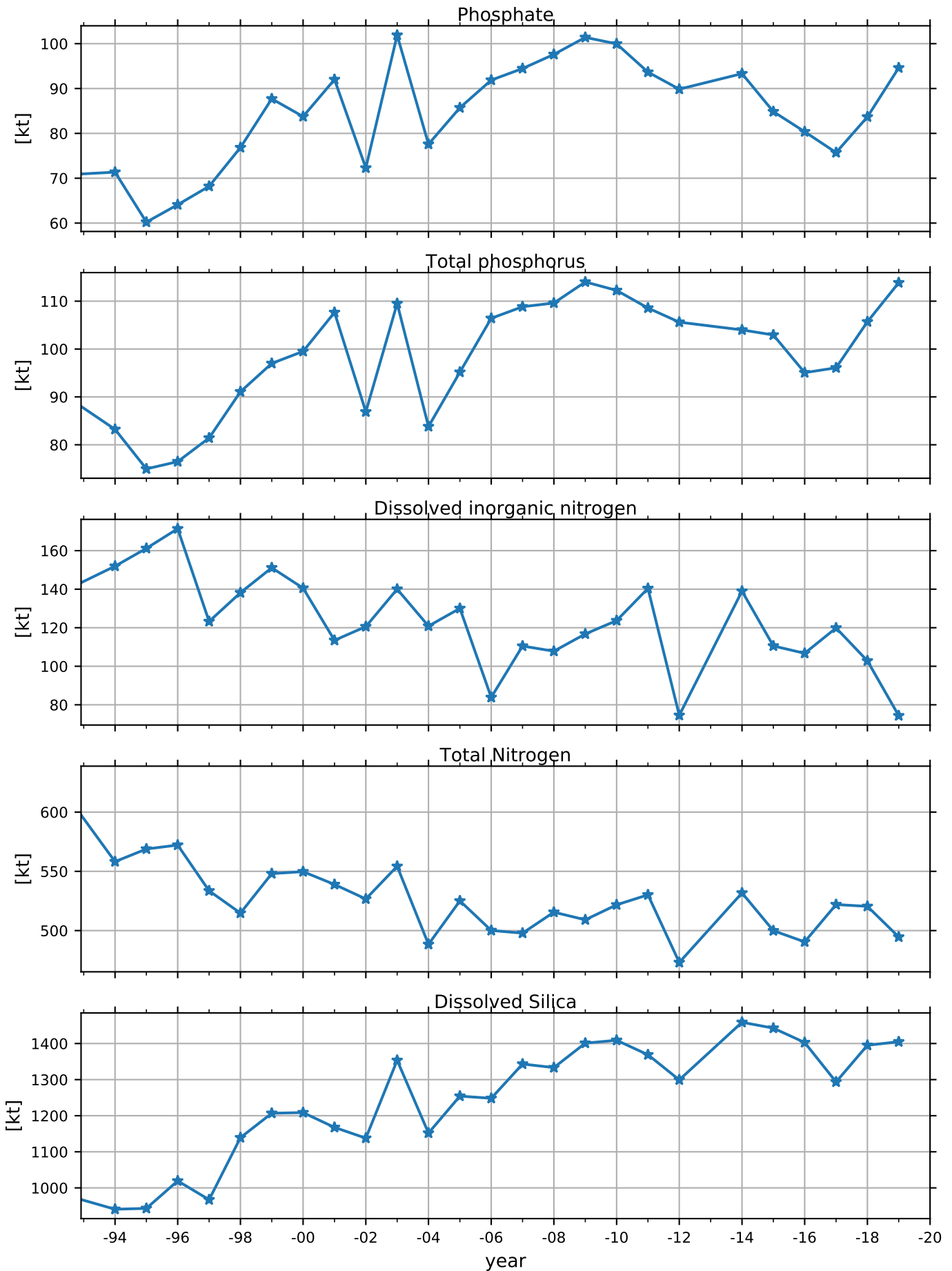
—*— winter



EASTERN GOTLAND BASIN BY15 GOTLANDSDJ

Offshore volume of basin: 1748 km³

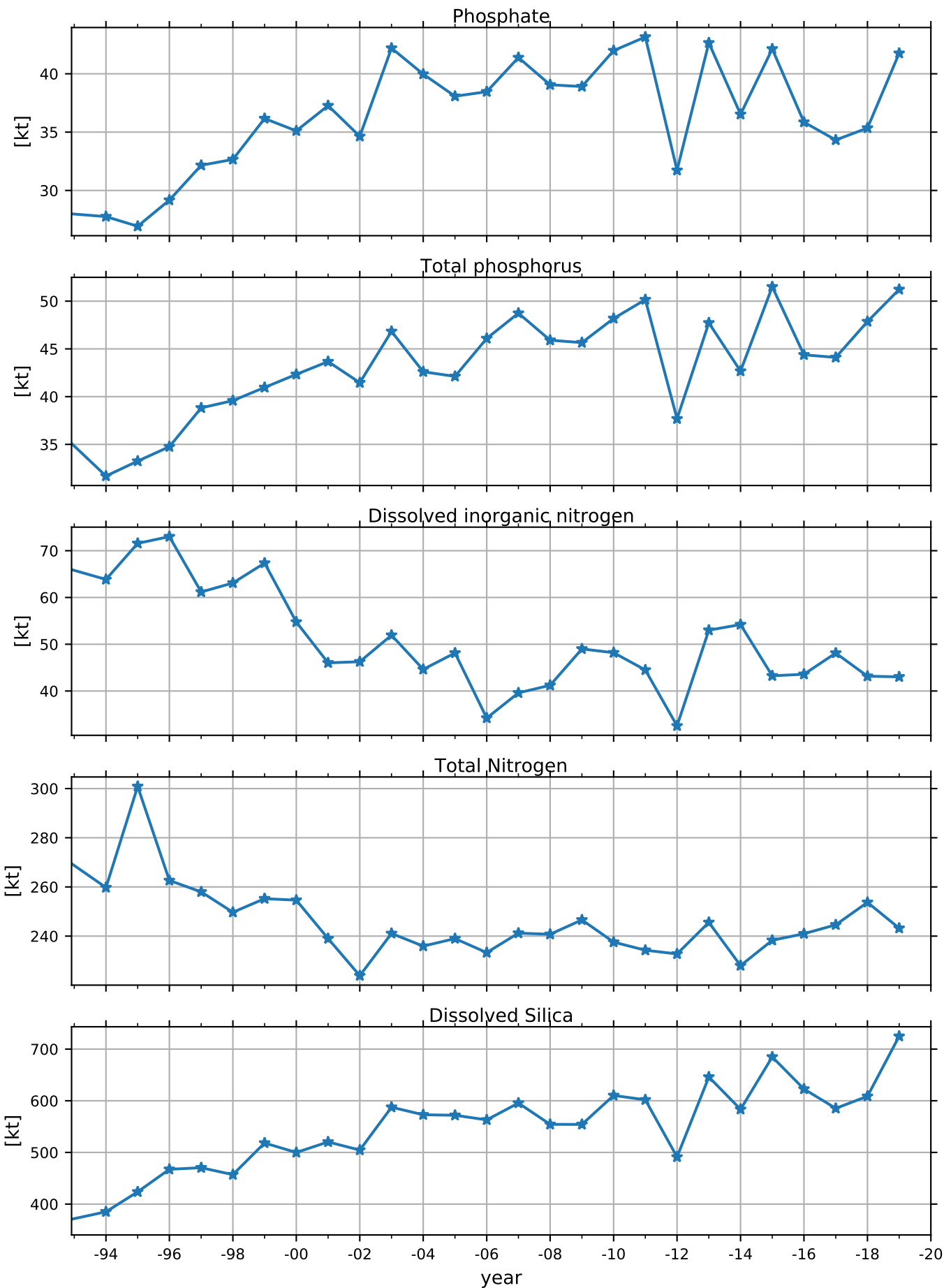
—*— winter



EASTERN GOTLAND BASIN BY20

Offshore volume of basin: 841 km³

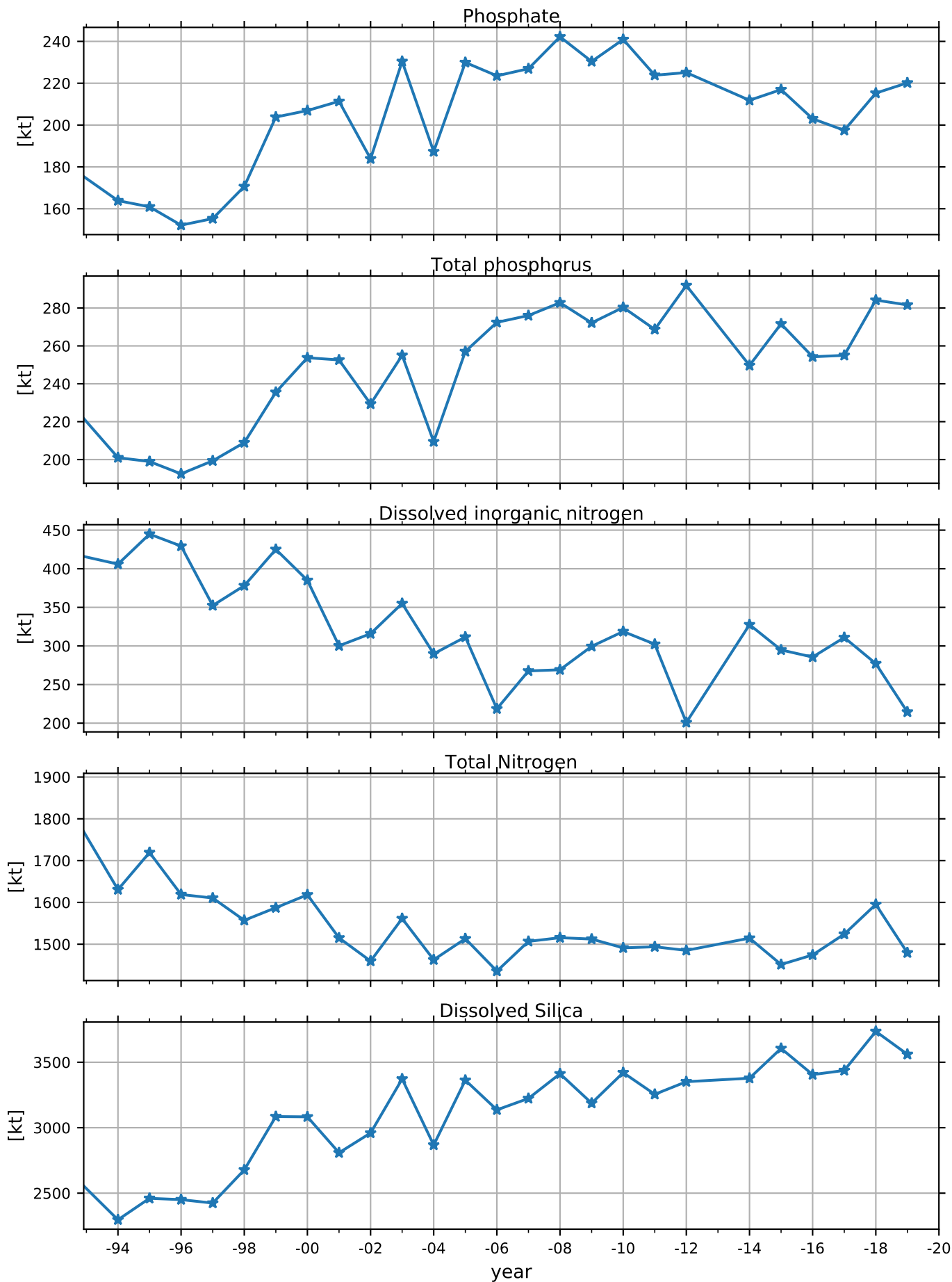
—*— winter



EASTERN GOTLAND BASIN

Offshore volume of basin: 5193 km³

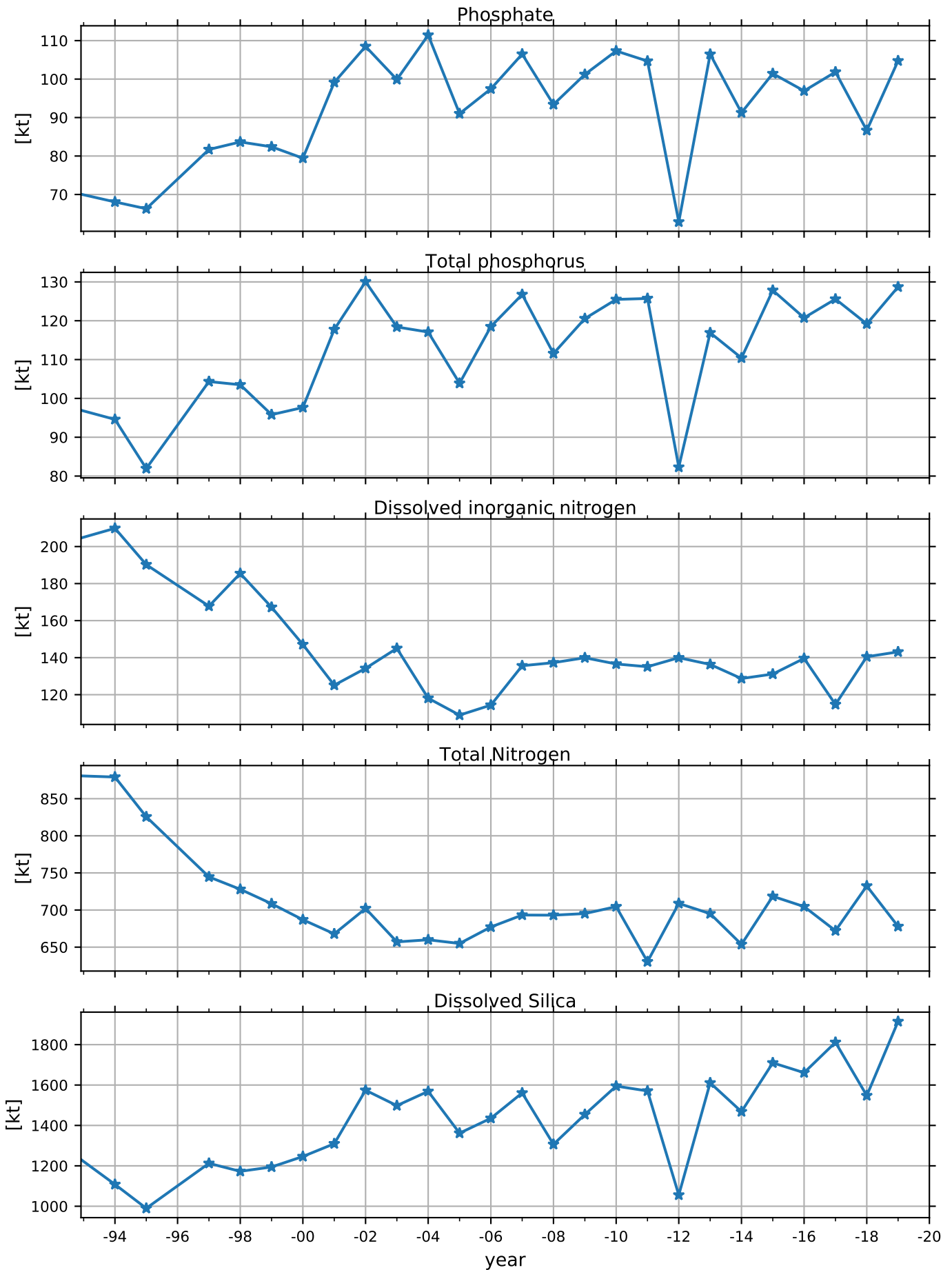
—*— winter



NORTHERN BALTIC PROPER

Offshore volume of basin: 2327 km³

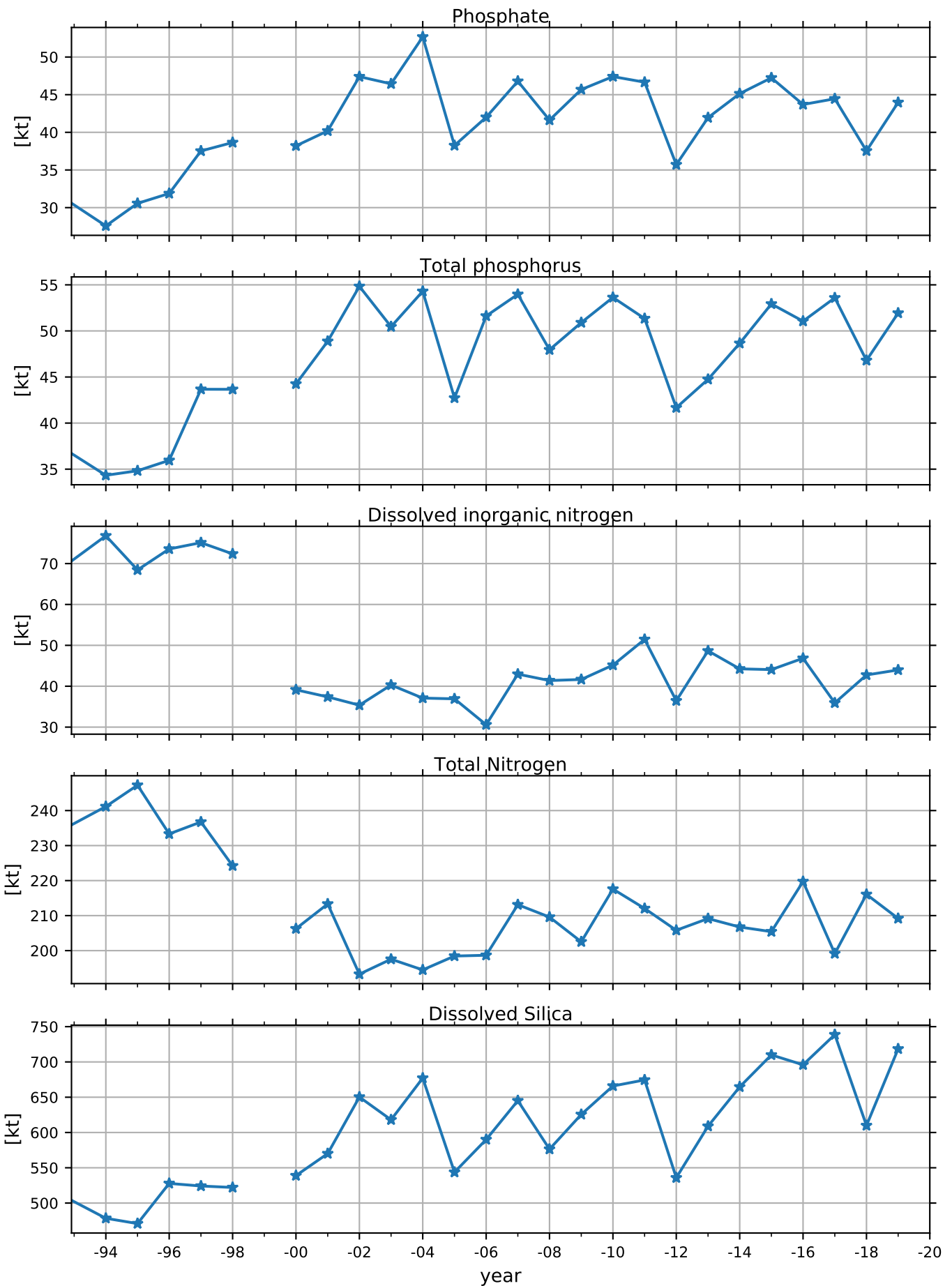
—*— winter



WESTERN GOTLAND BASIN BY31 LANDSORTSDJ

Offshore volume of basin: 723 km³

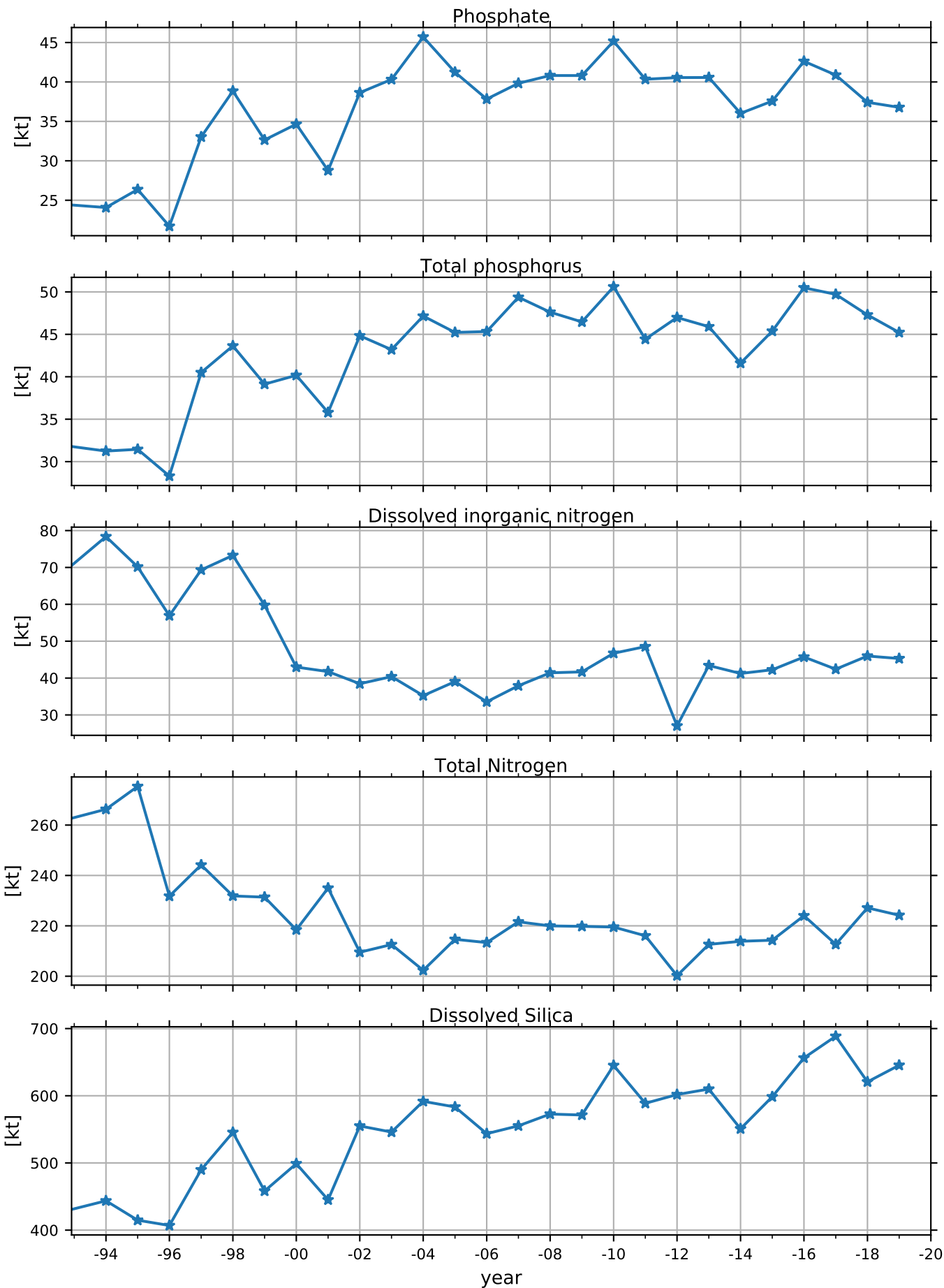
—*— winter



WESTERN GOTLAND BASIN BY32

Offshore volume of basin: 767 km³

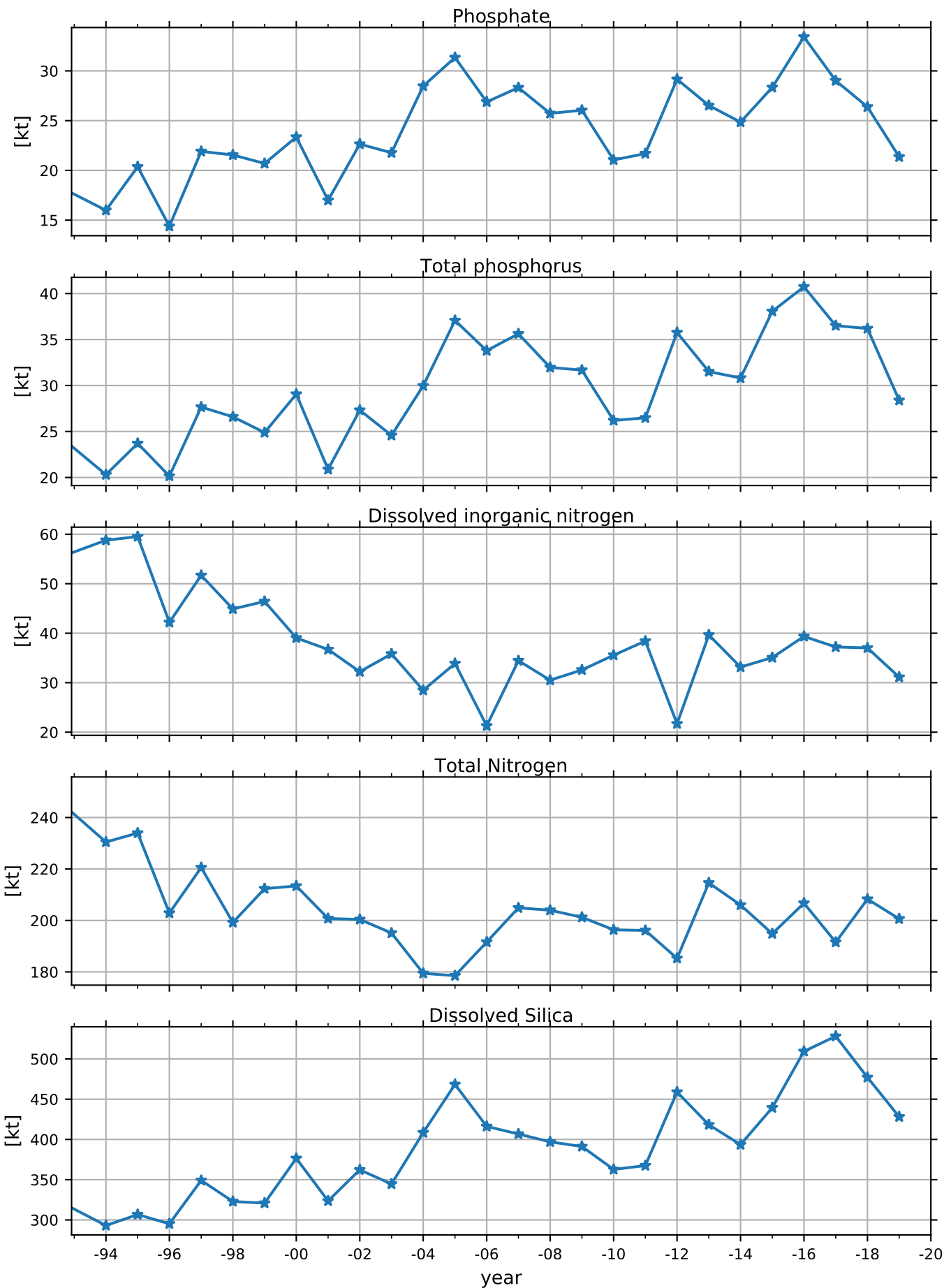
—*— winter



WESTERN GOTLAND BASIN BY38

Offshore volume of basin: 708 km³

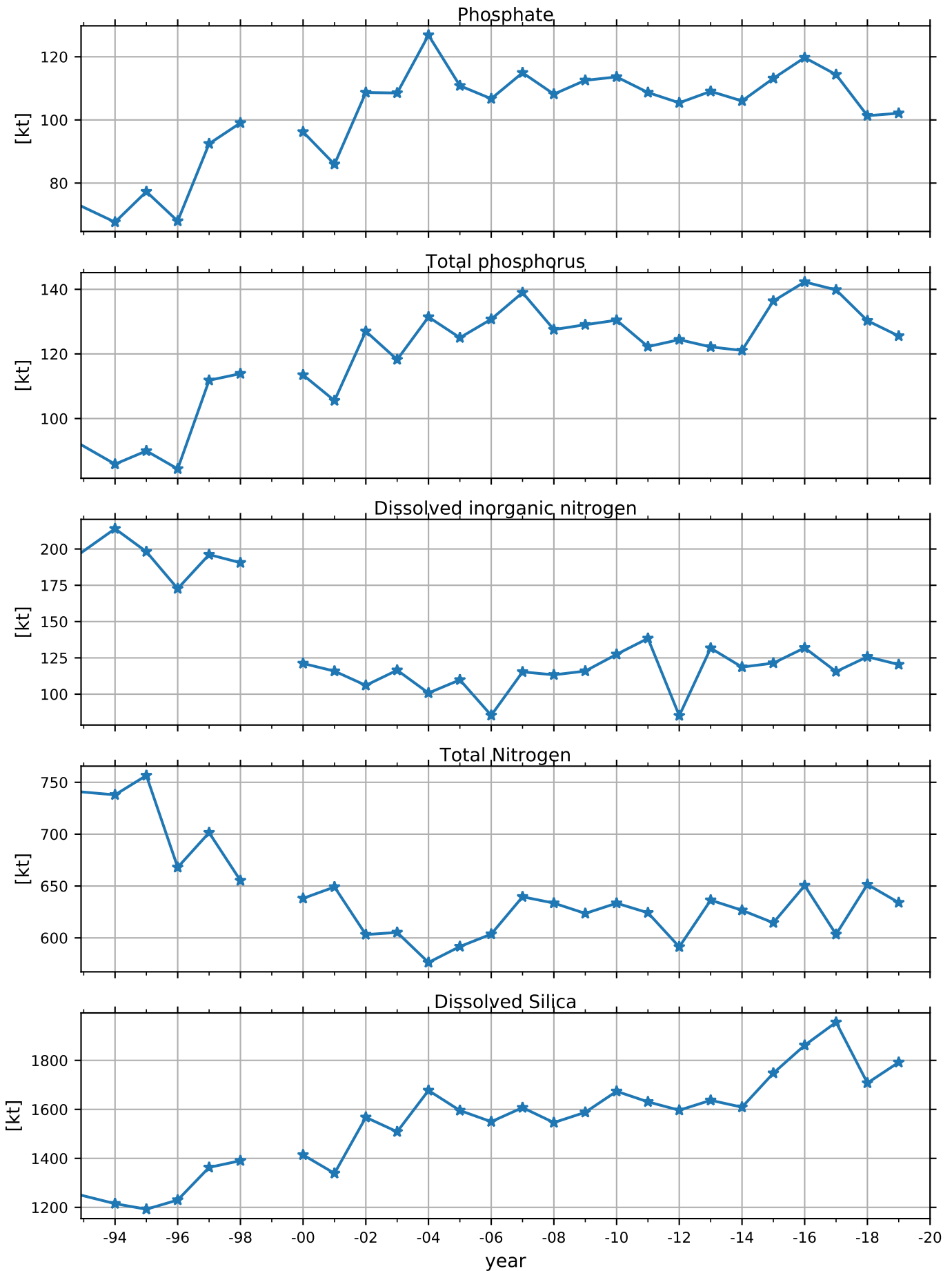
—*— winter



WESTERN GOTLAND BASIN

Offshore volume of basin: 2198 km³

—*— winter

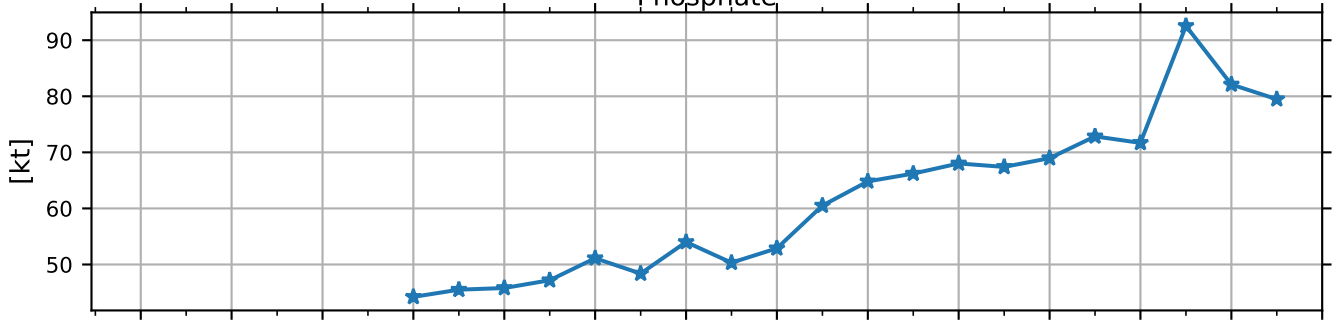


BOTHNIAN SEA

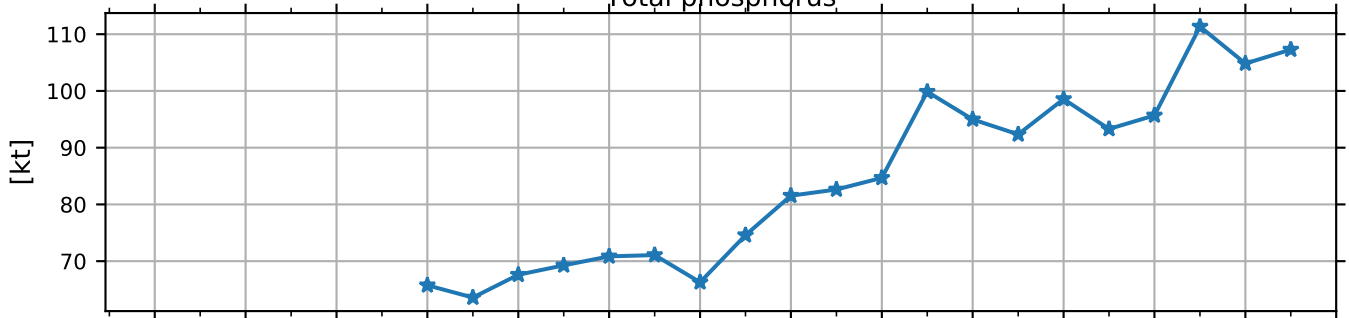
Offshore volume of basin: 4148 km³

—*— winter

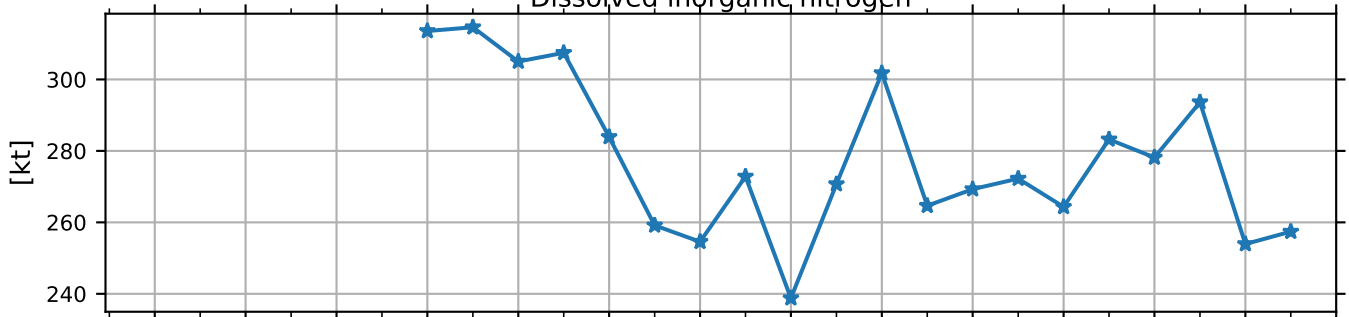
Phosphate



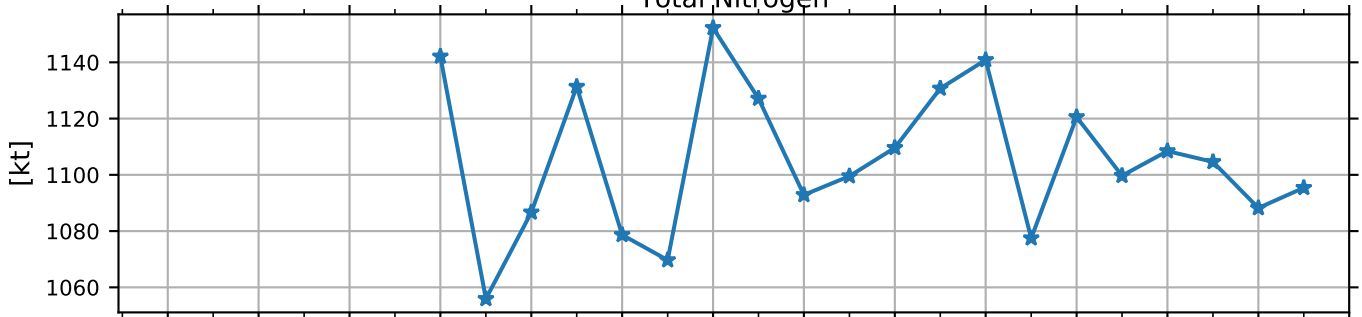
Total phosphorus



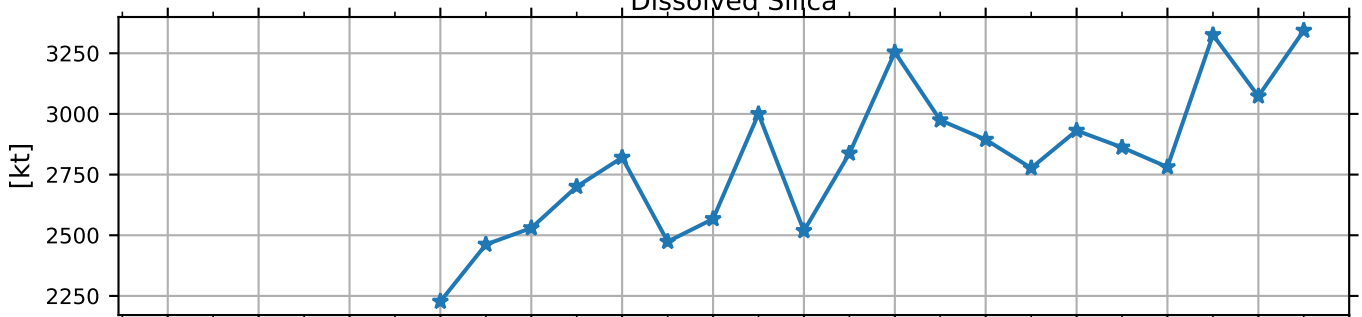
Dissolved inorganic nitrogen



Total Nitrogen



Dissolved Silica



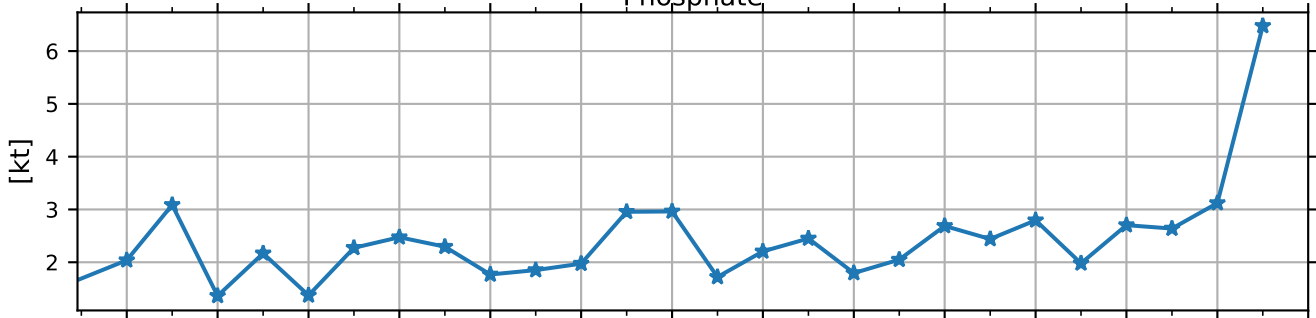
-94 -96 -98 -00 -02 -04 -06 -08 -10 -12 -14 -16 -18 -20
year

BOTHNIAN BAY

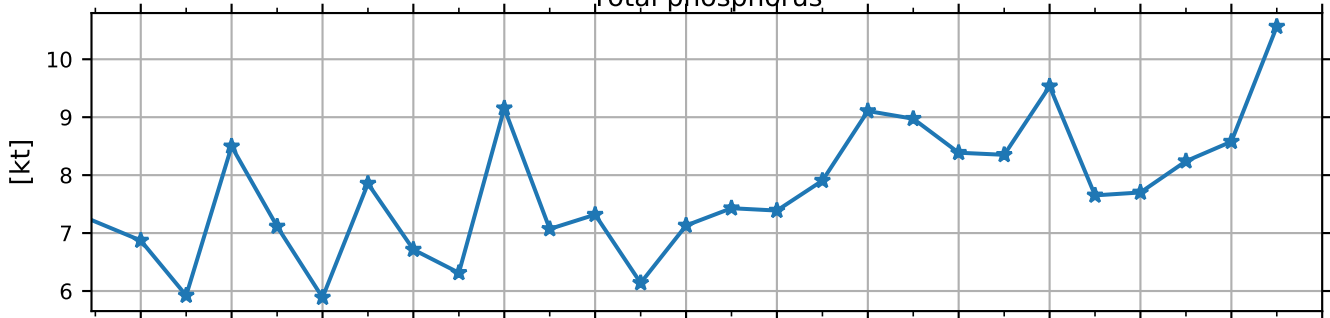
Offshore volume of basin: 1447 km³

—*— winter

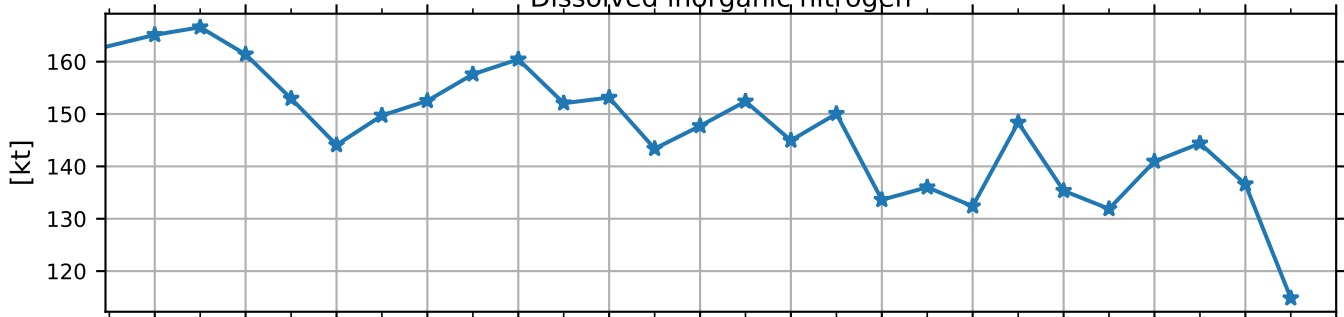
Phosphate



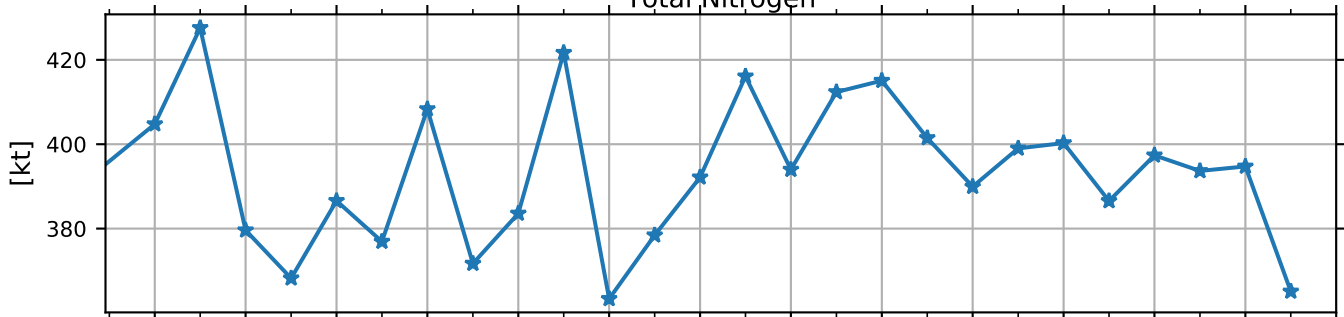
Total phosphorus



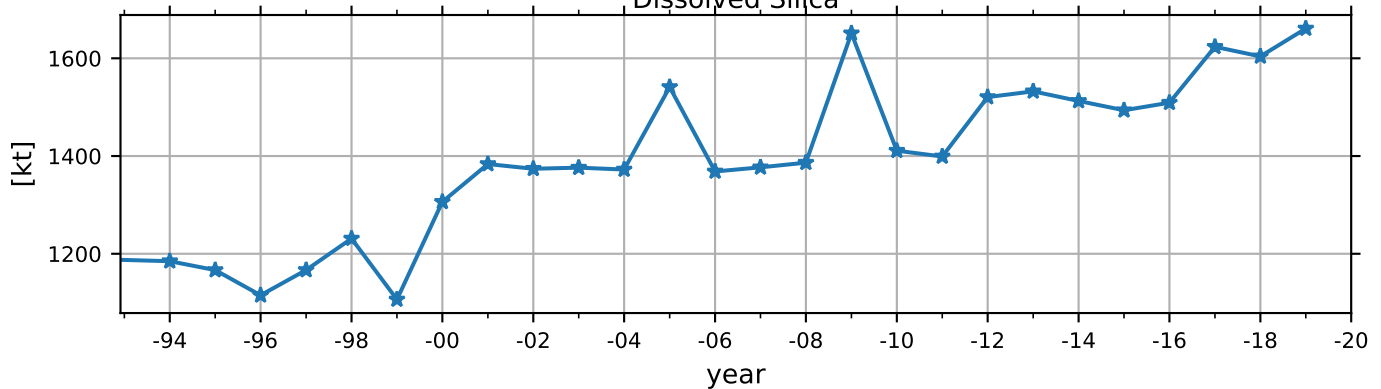
Dissolved inorganic nitrogen



Total Nitrogen



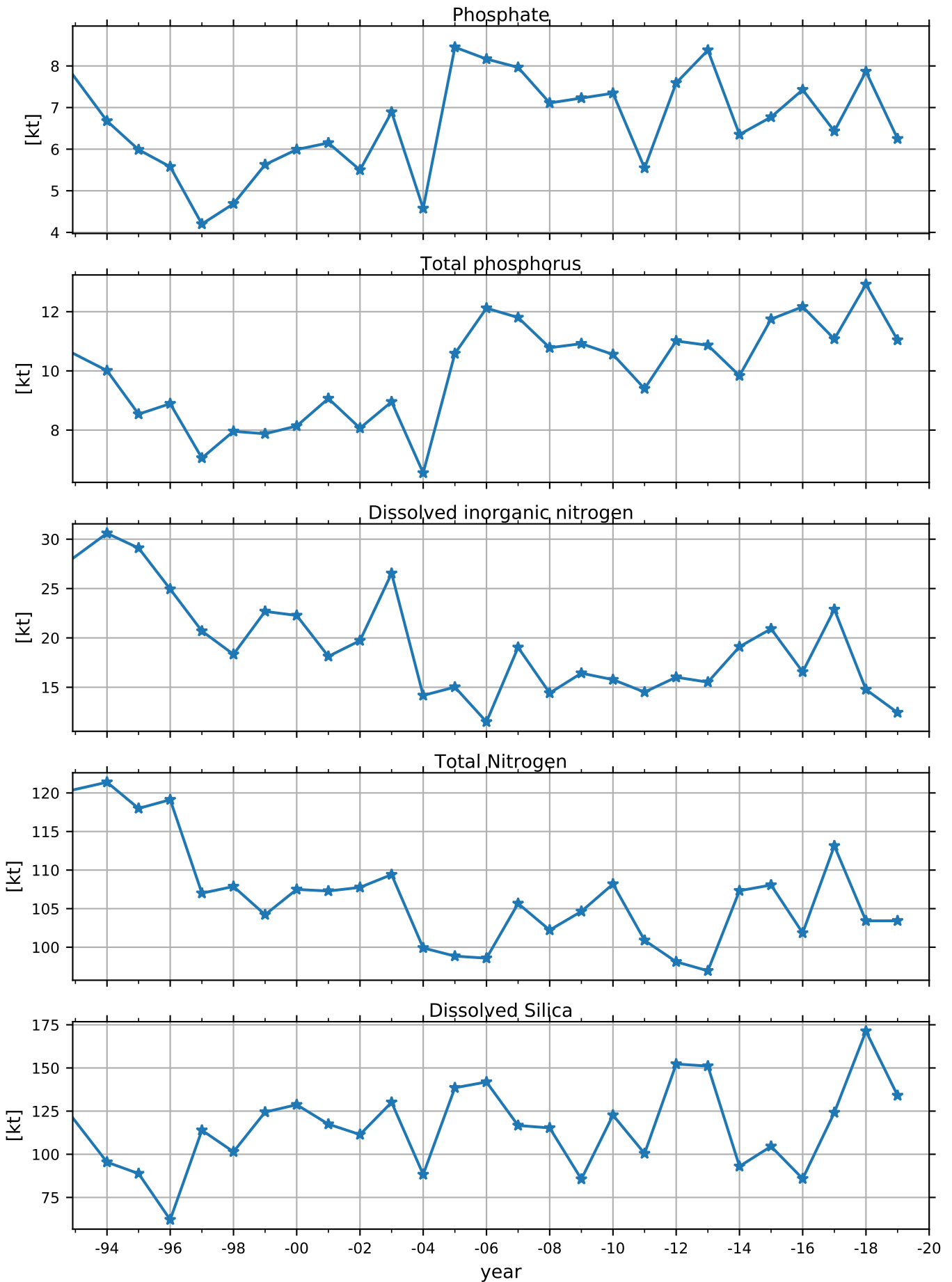
Dissolved Silica



ARKONA BASIN

Offshore volume of basin: 353 km³

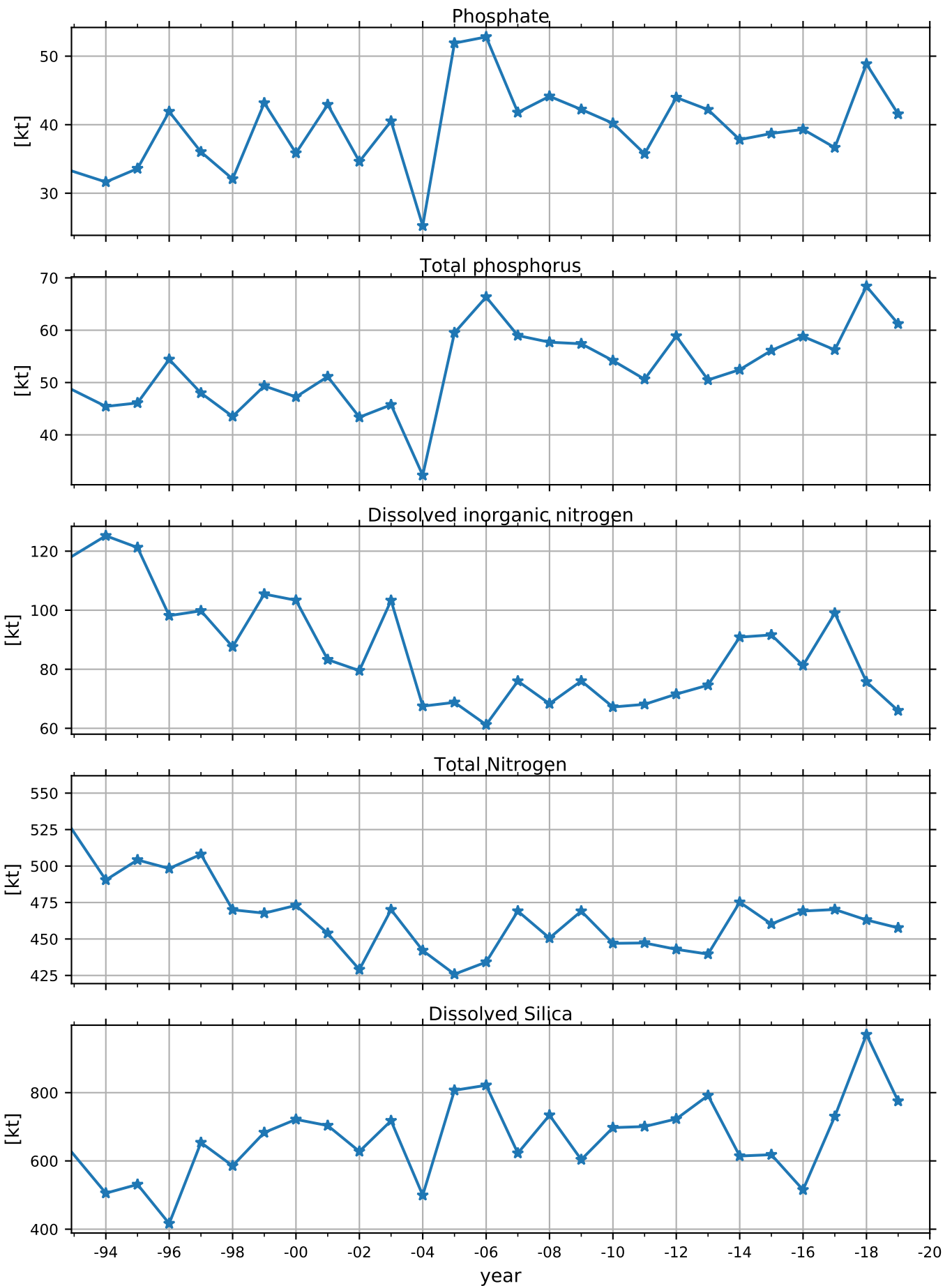
—*— winter



BORNHOLM BASIN

Offshore volume of basin: 1603 km³

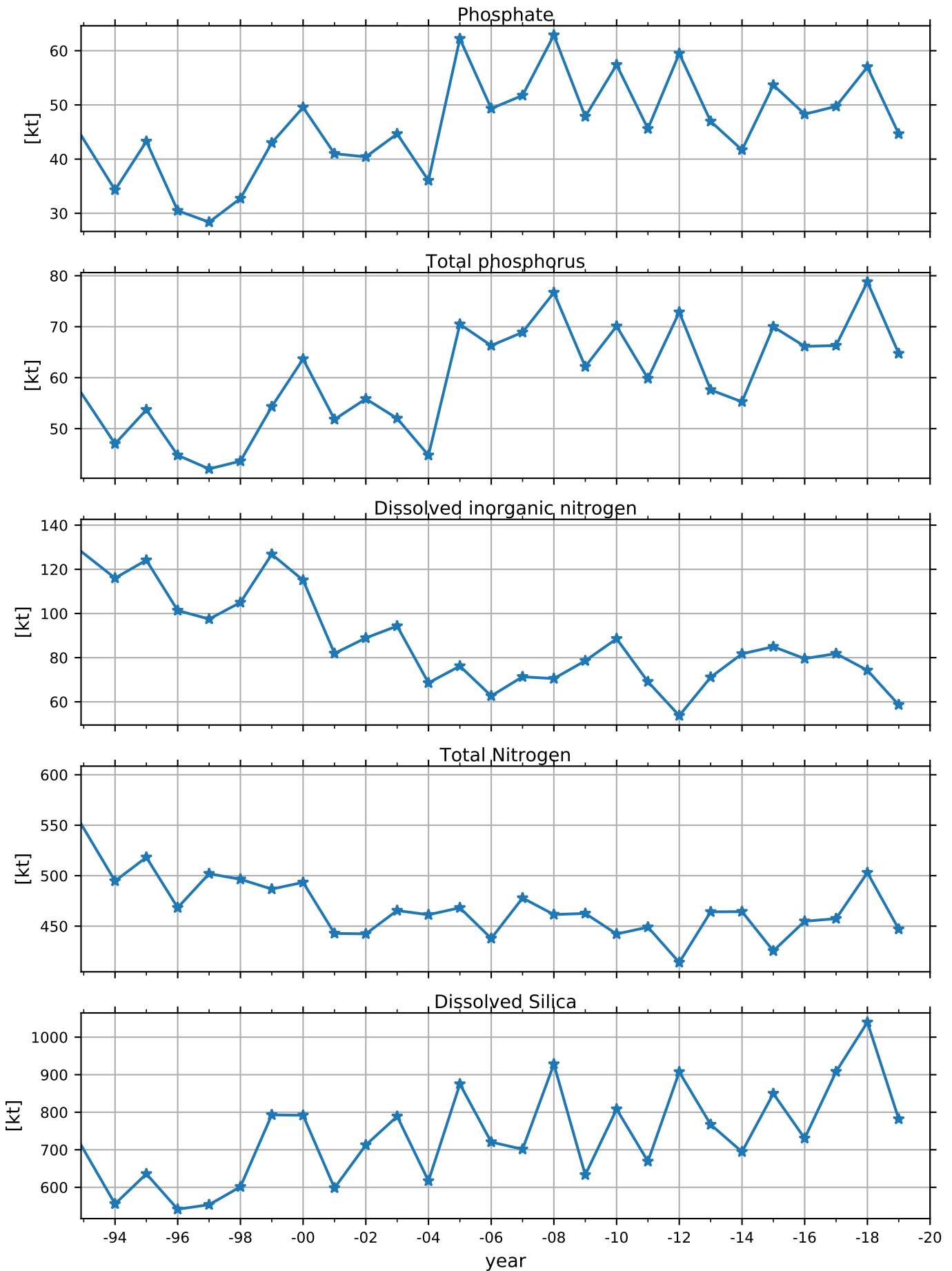
—*— winter



EASTERN GOTLAND BASIN BCS III-10

Offshore volume of basin: 1597 km³

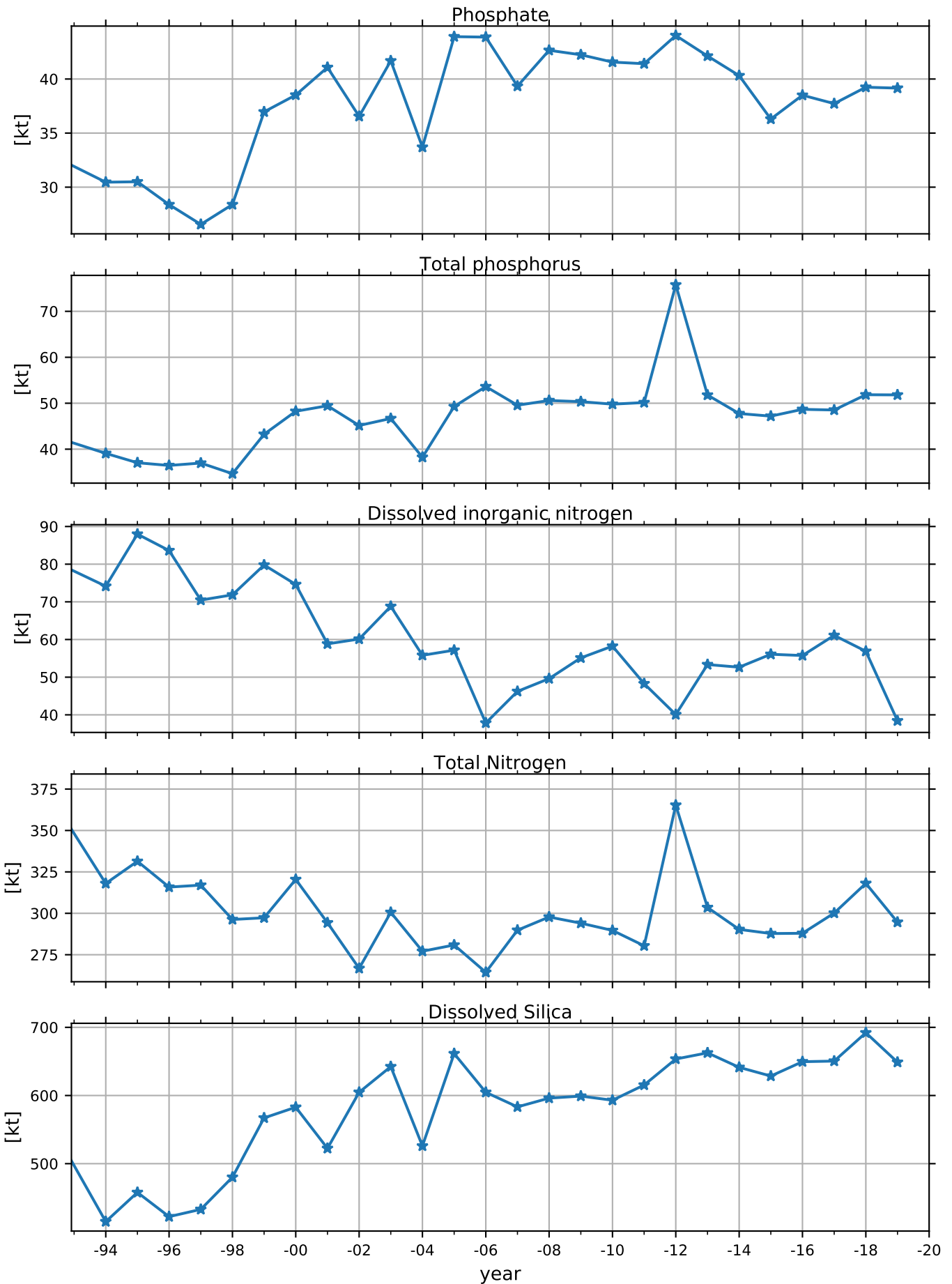
—*— winter



EASTERN GOTLAND BASIN BY10

Offshore volume of basin: 1007 km³

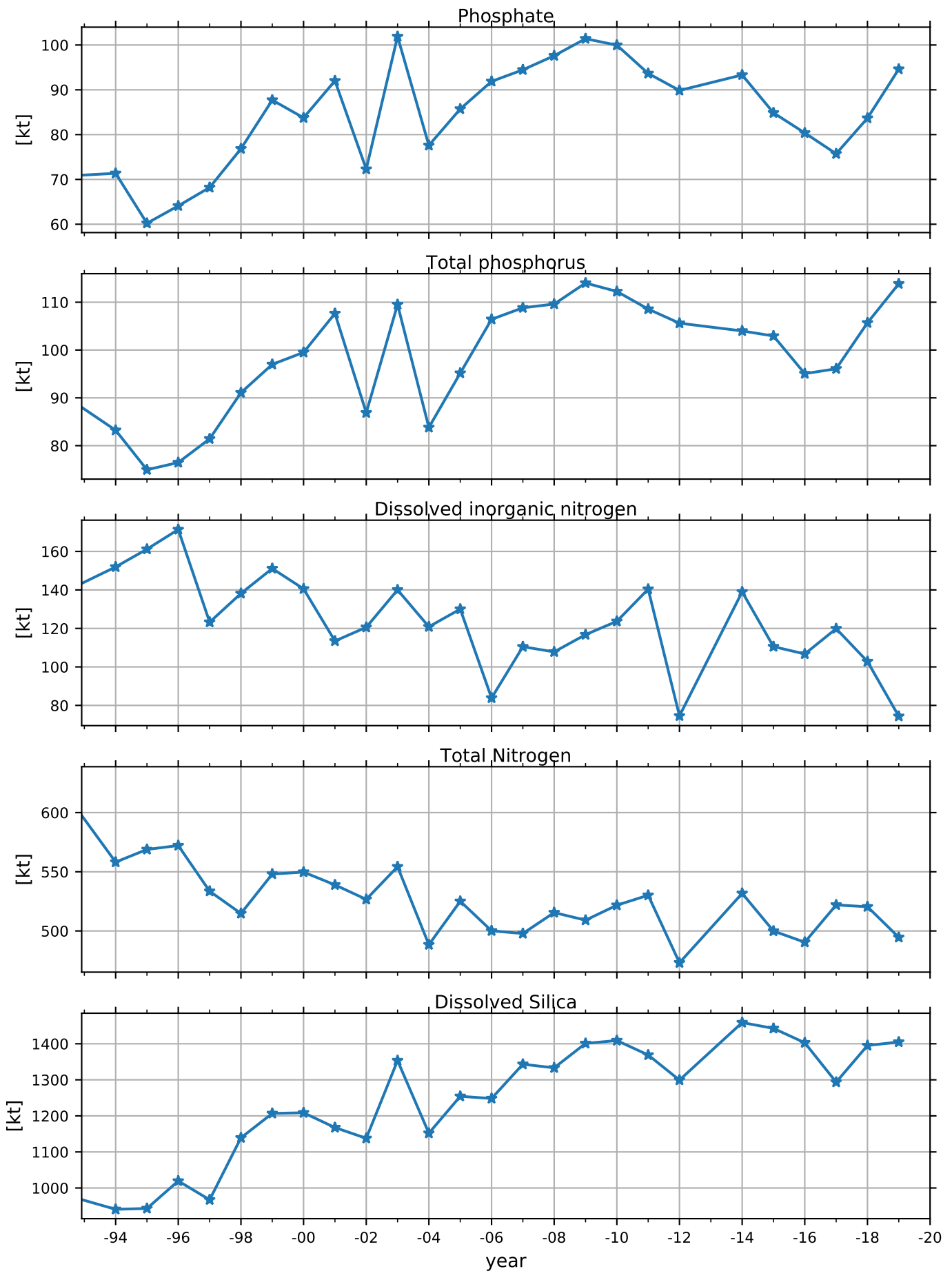
—*— winter



EASTERN GOTLAND BASIN BY15 GOTLANDSDJ

Offshore volume of basin: 1748 km³

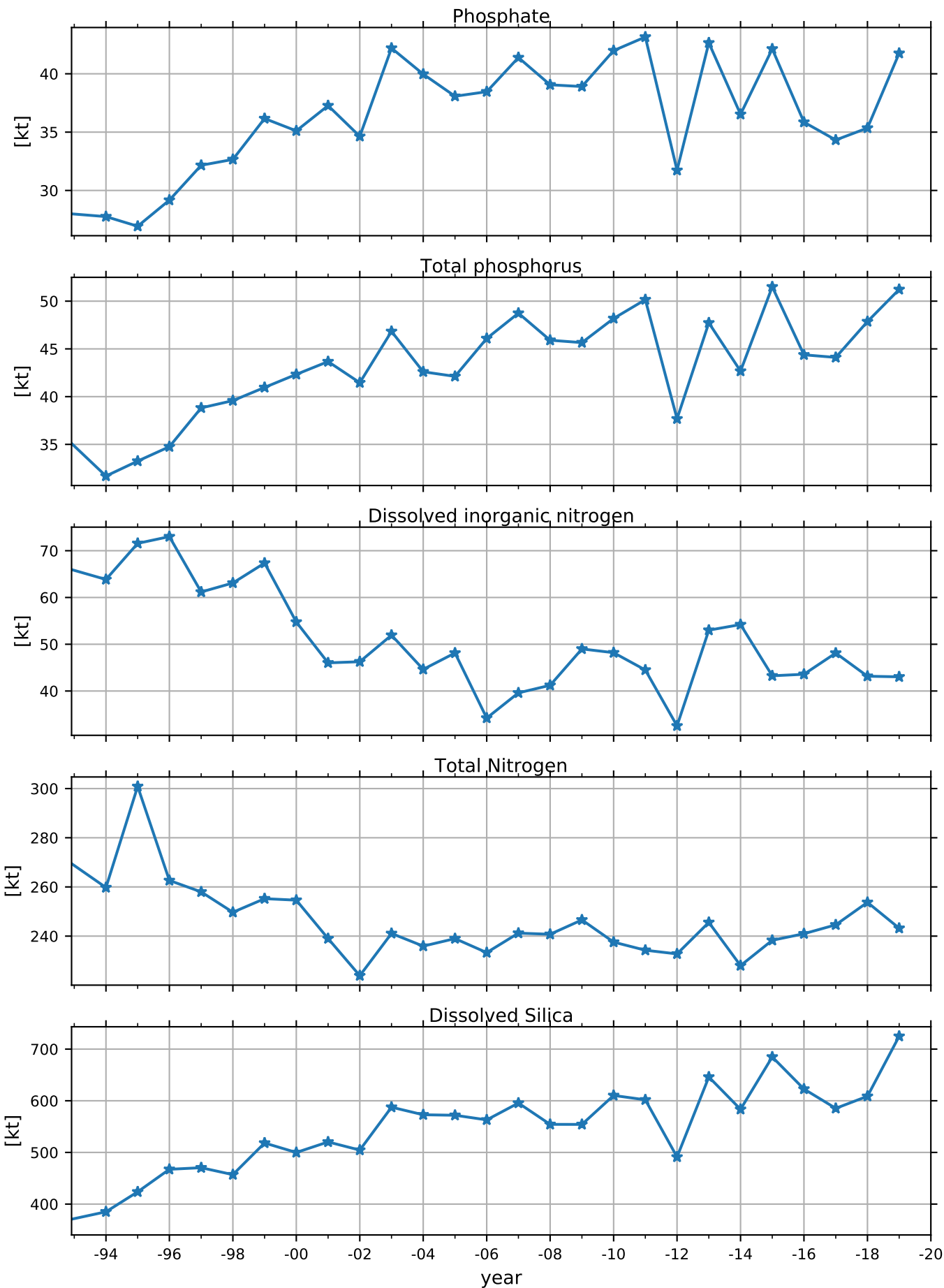
—*— winter



EASTERN GOTLAND BASIN BY20

Offshore volume of basin: 841 km³

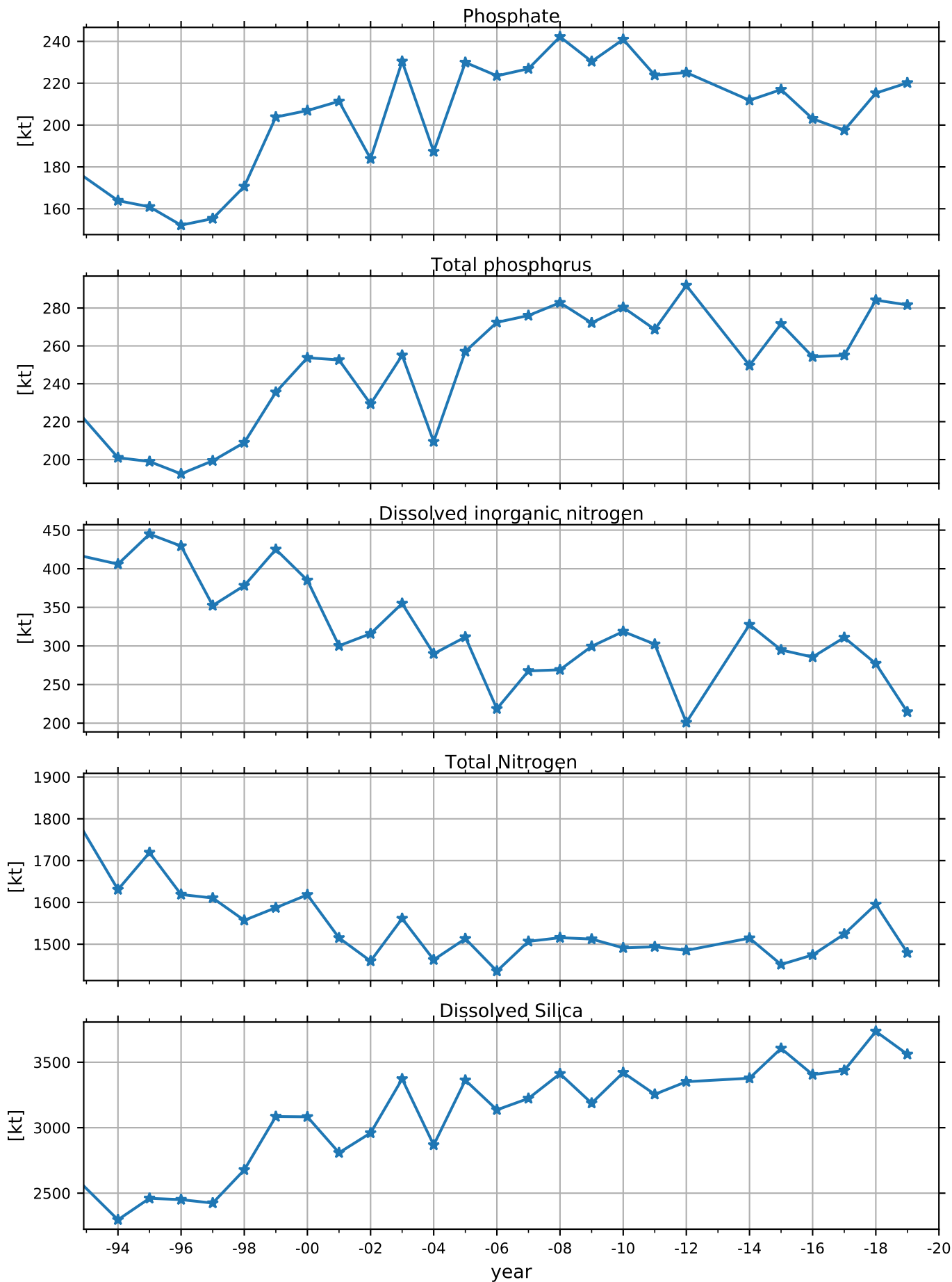
—*— winter



EASTERN GOTLAND BASIN

Offshore volume of basin: 5193 km³

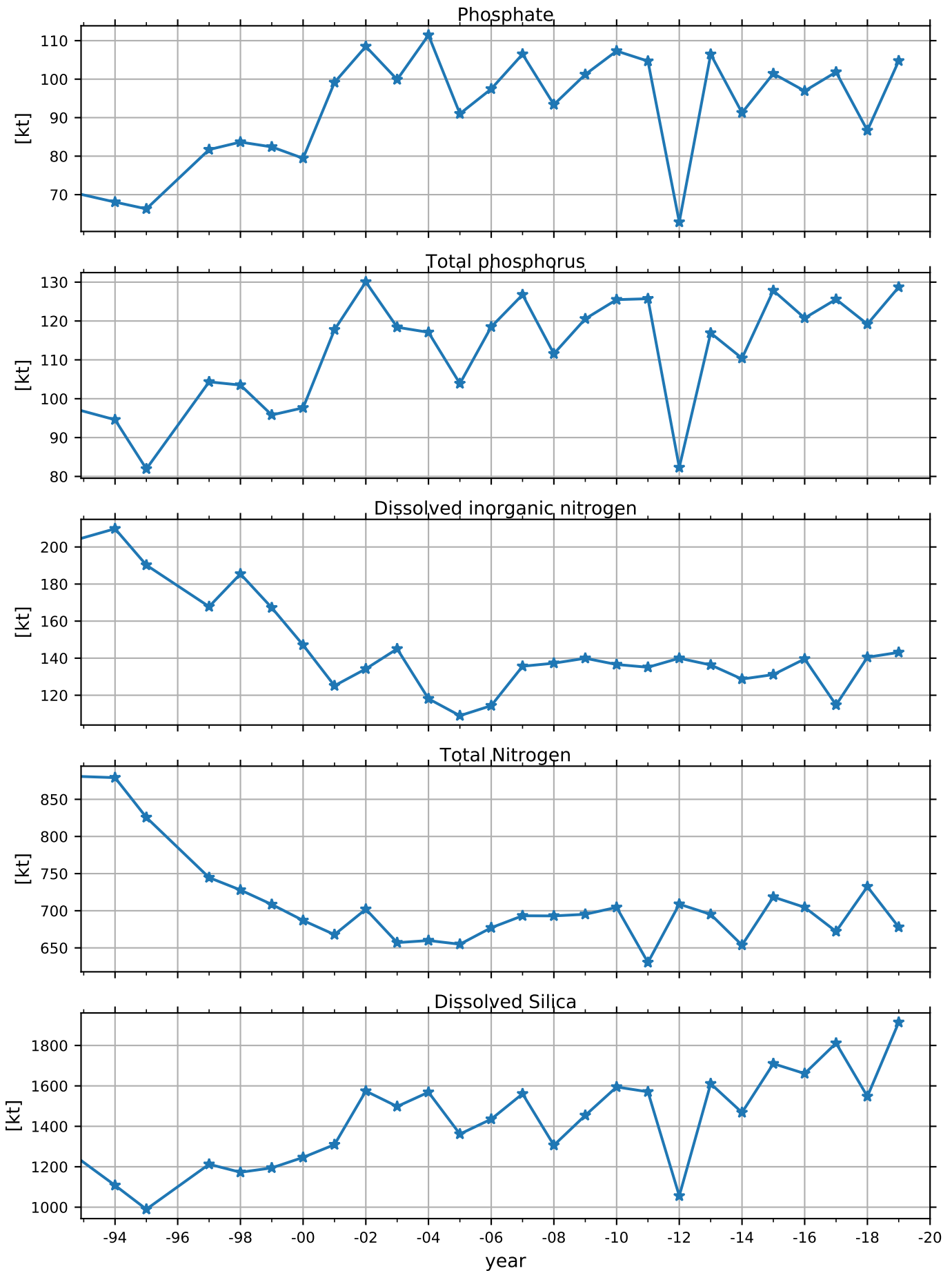
—*— winter



NORTHERN BALTIC PROPER

Offshore volume of basin: 2327 km³

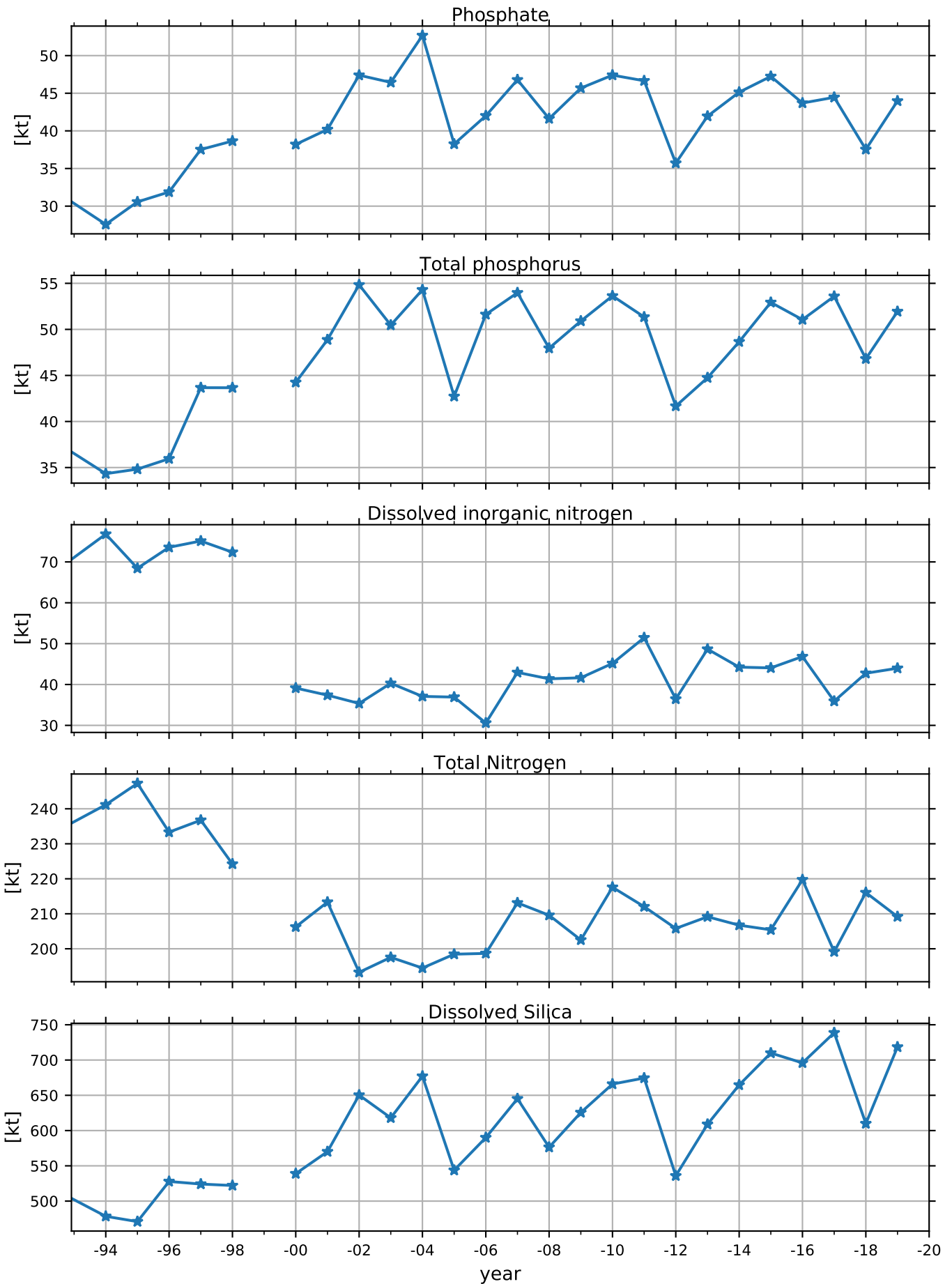
—*— winter



WESTERN GOTLAND BASIN BY31 LANDSORTSDJ

Offshore volume of basin: 723 km³

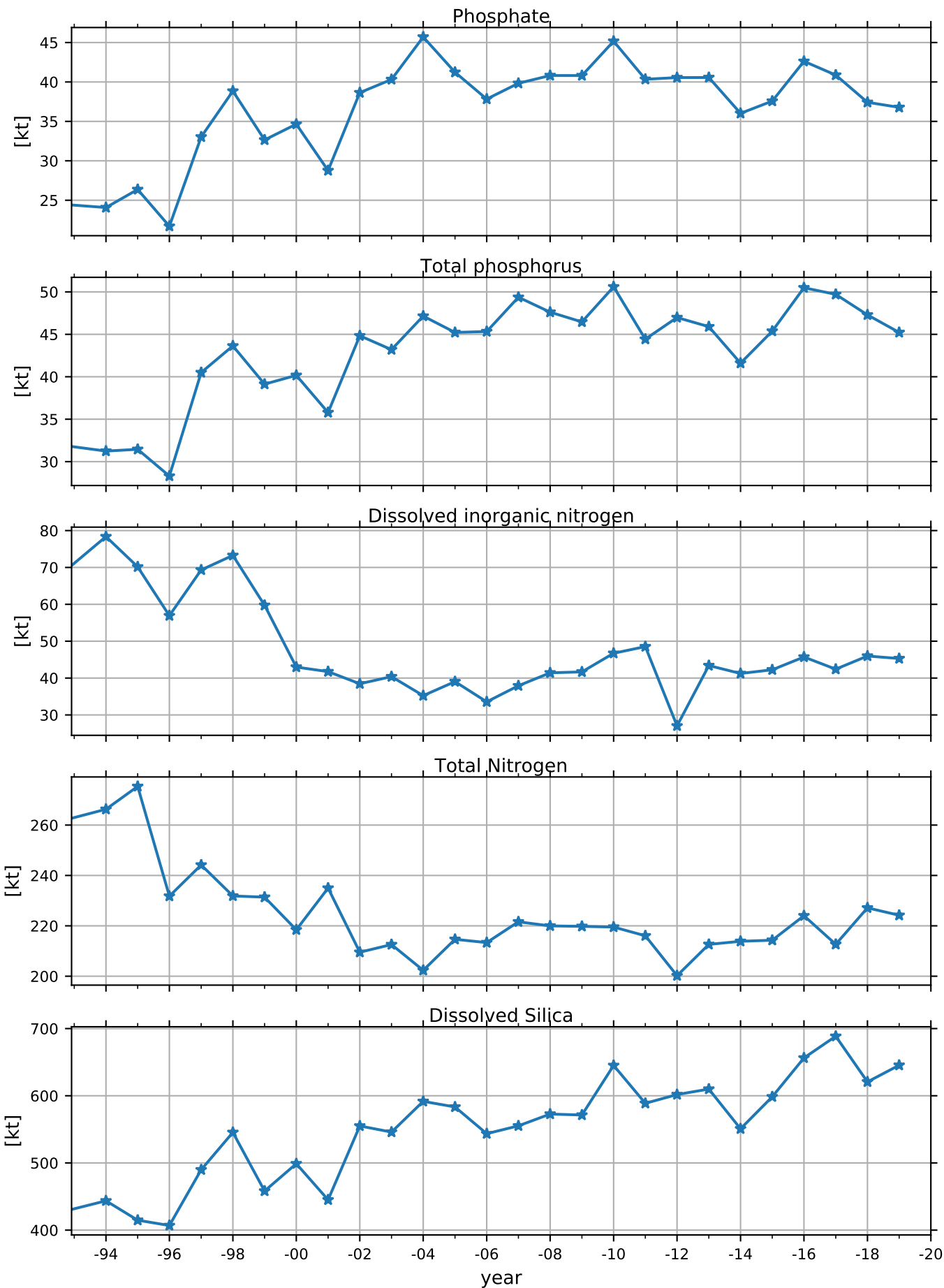
—*— winter



WESTERN GOTLAND BASIN BY32

Offshore volume of basin: 767 km³

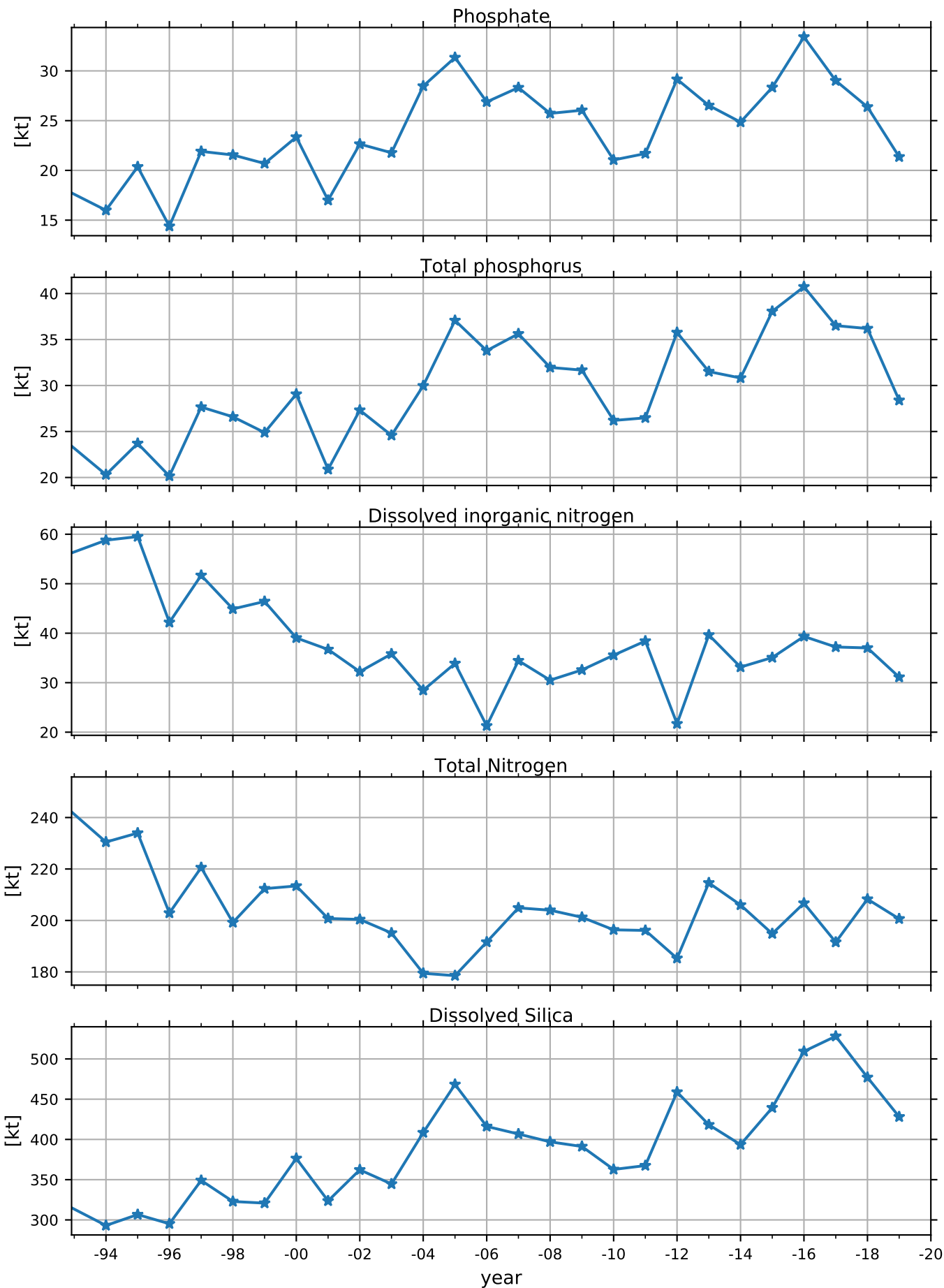
—*— winter



WESTERN GOTLAND BASIN BY38

Offshore volume of basin: 708 km³

—*— winter



WESTERN GOTLAND BASIN

Offshore volume of basin: 2198 km³

—*— winter

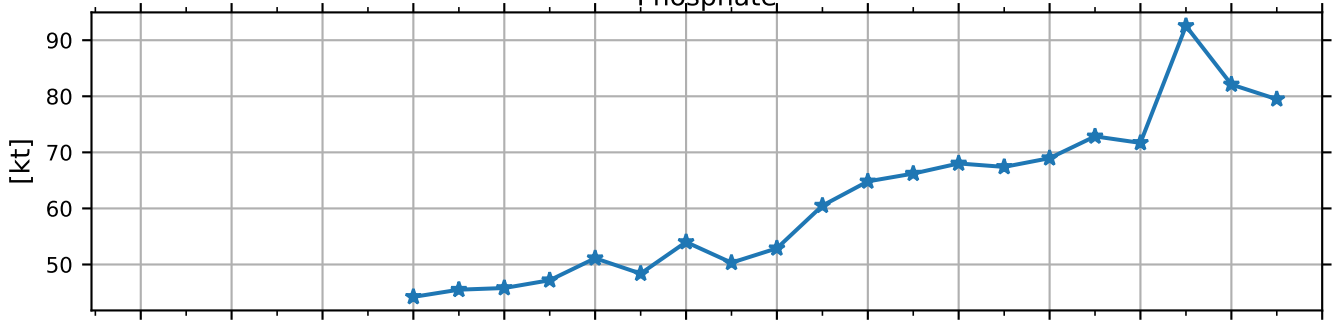


BOTHNIAN SEA

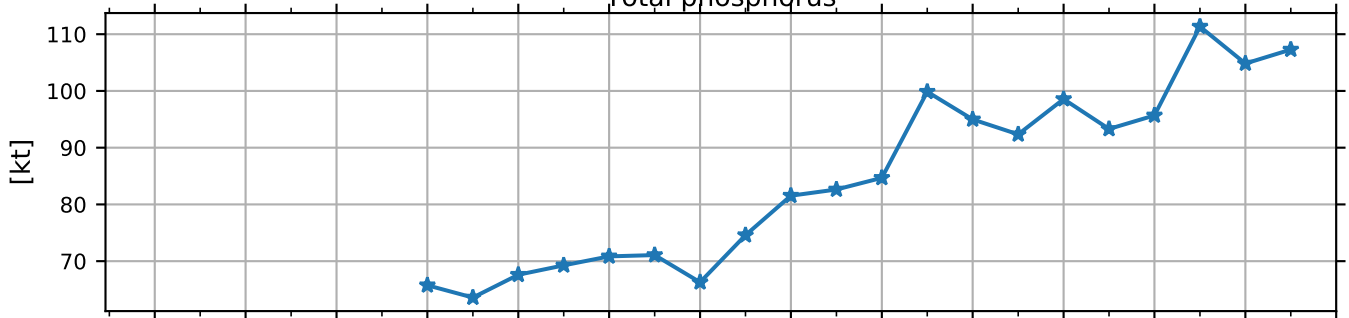
Offshore volume of basin: 4148 km³

—*— winter

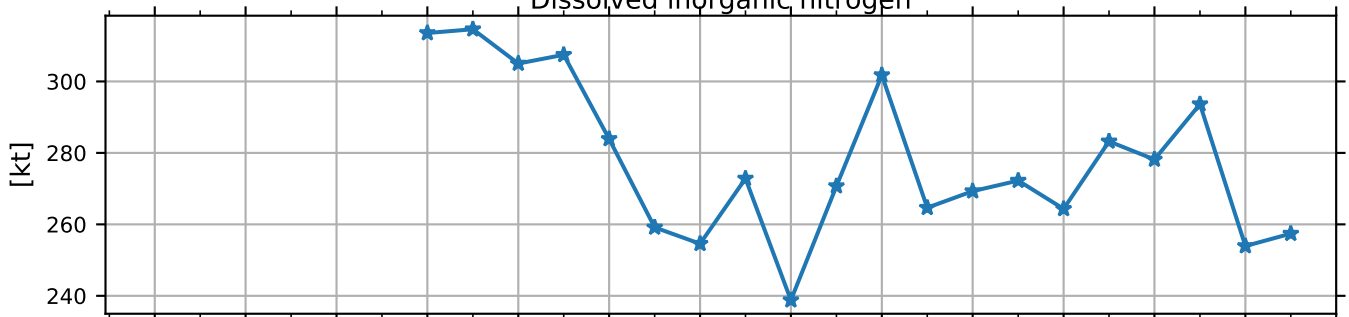
Phosphate



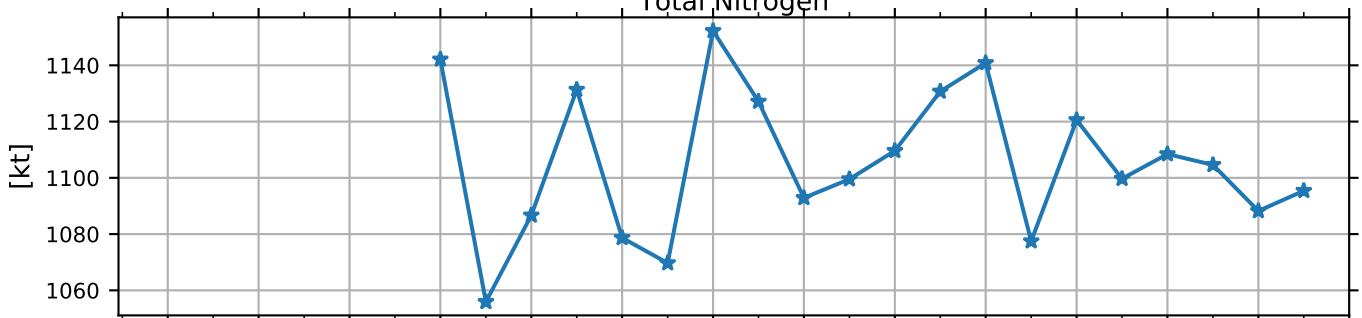
Total phosphorus



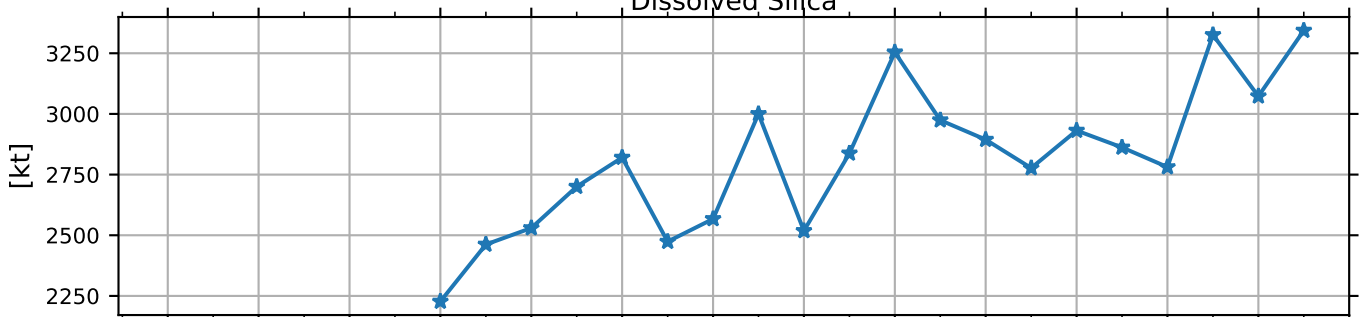
Dissolved inorganic nitrogen



Total Nitrogen



Dissolved Silica



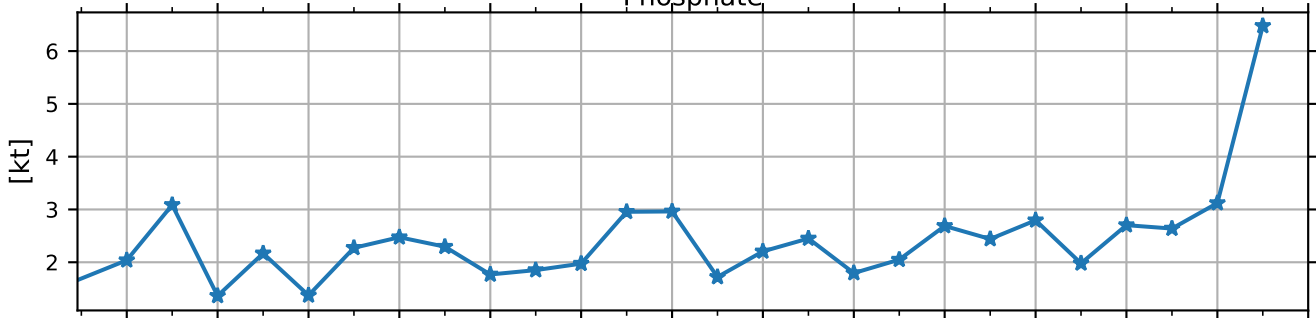
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year

BOTHNIAN BAY

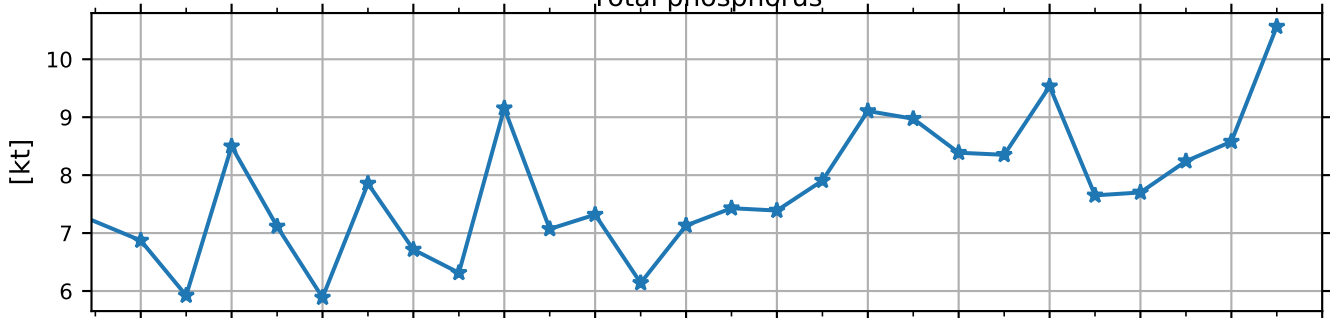
Offshore volume of basin: 1447 km³

—*— winter

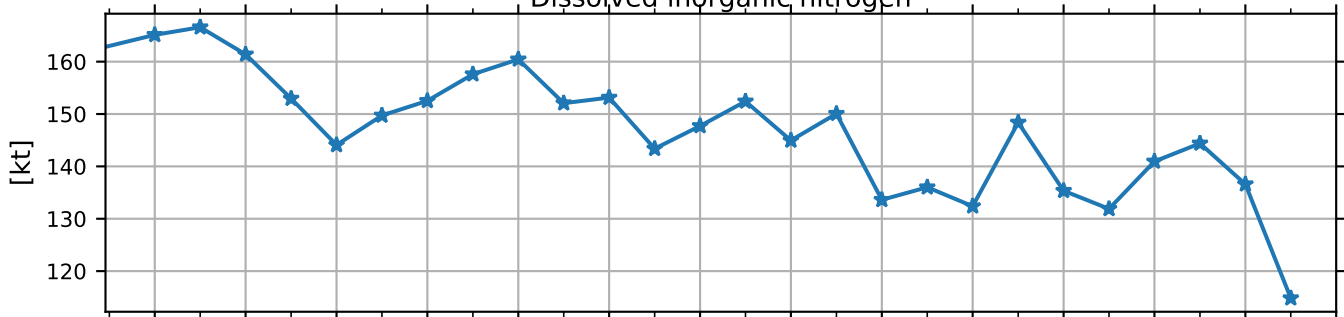
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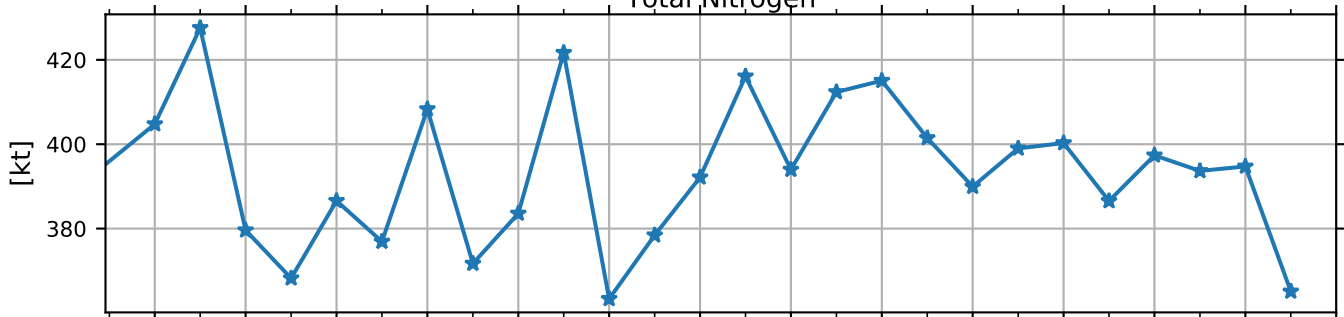
Total phosphorus



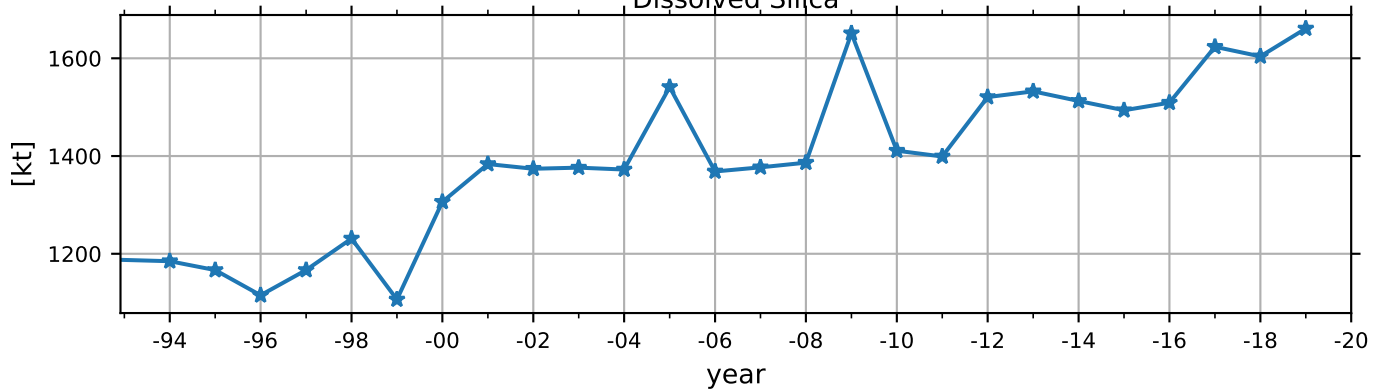
Dissolved inorganic nitrogen



Total Nitrogen



Dissolved Silica



Appendix V

Transects from the Skagerrak to the Western Gotland basin

Included parameters are salinity, temperature, density and dissolved oxygen from sensors on the CTD. Only data from SMHI cruises are included, data from the other institutes can hopefully be included when a national data host for CTD data is in place.

Transects are made with ODV (Schlitzer, R., Ocean Data View, <https://odv.awi.de>, 2019)

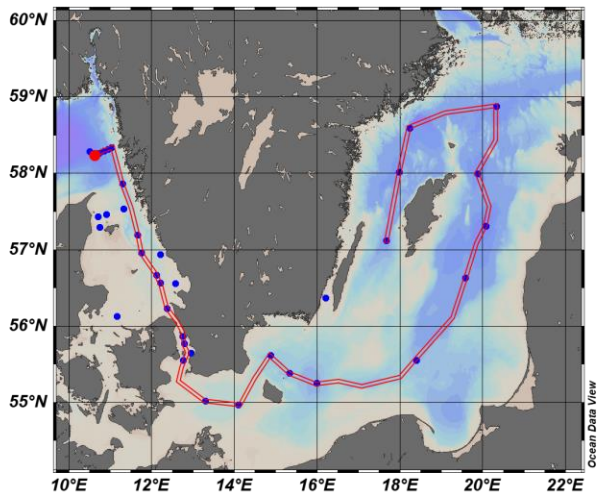
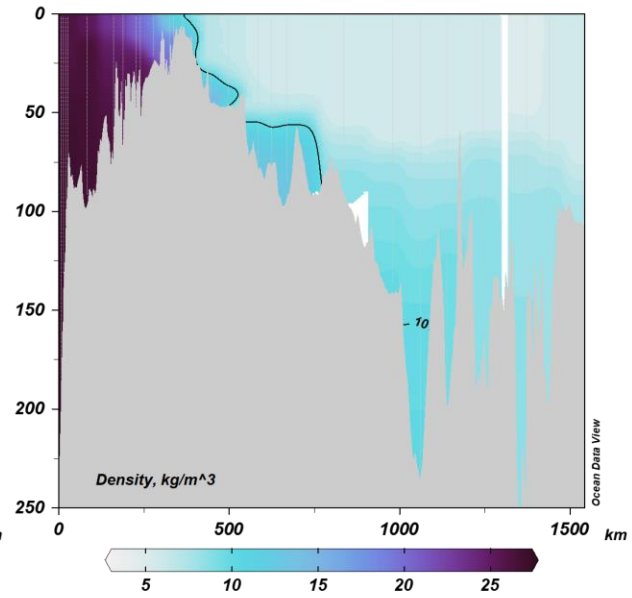
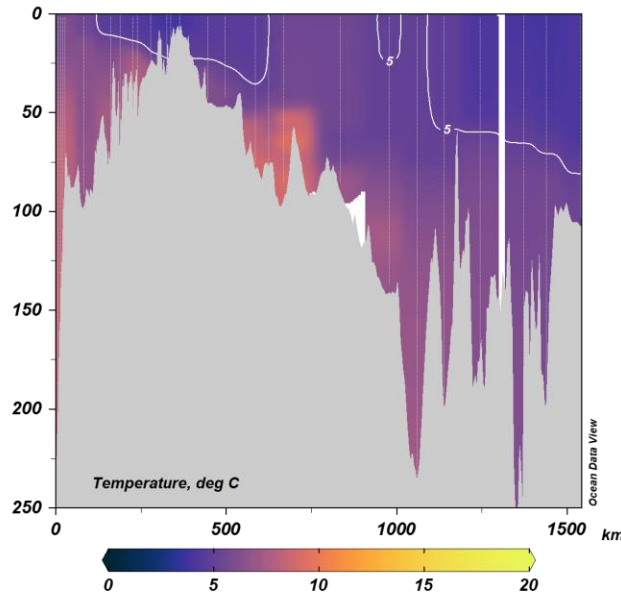
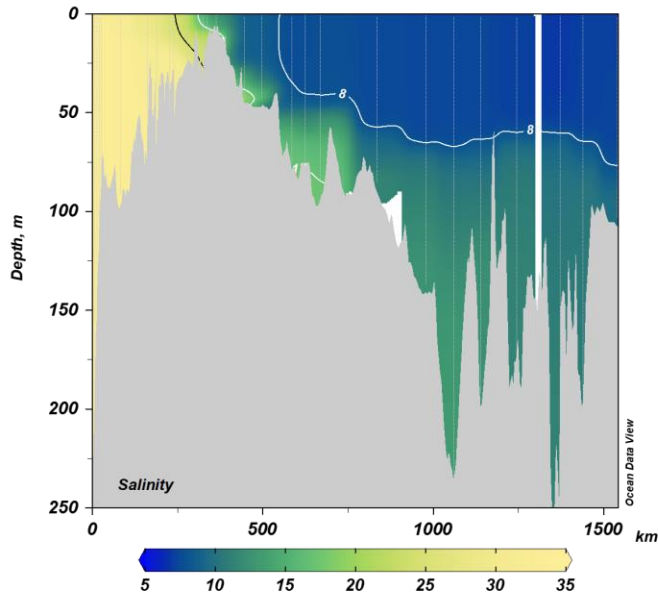
Appendix V

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Transects are made with ODV (Schlitzer, R., Ocean Data View, <https://odv.awi.de>, 2019)

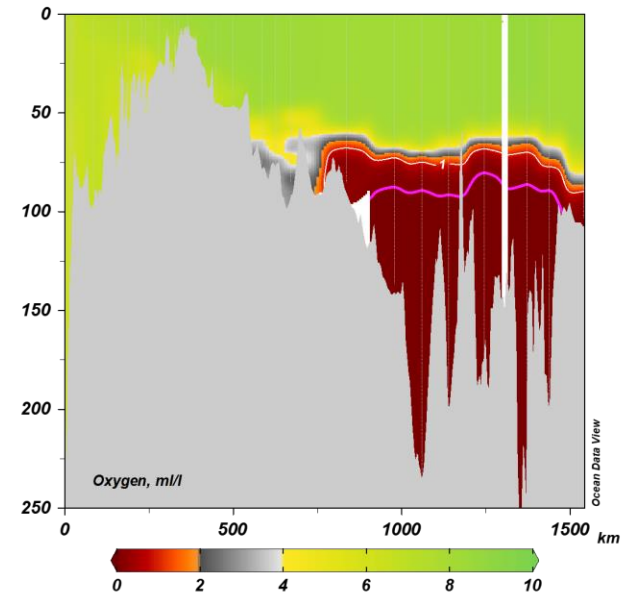
SMHI cruise January 20190110 – 20190119 CTD section



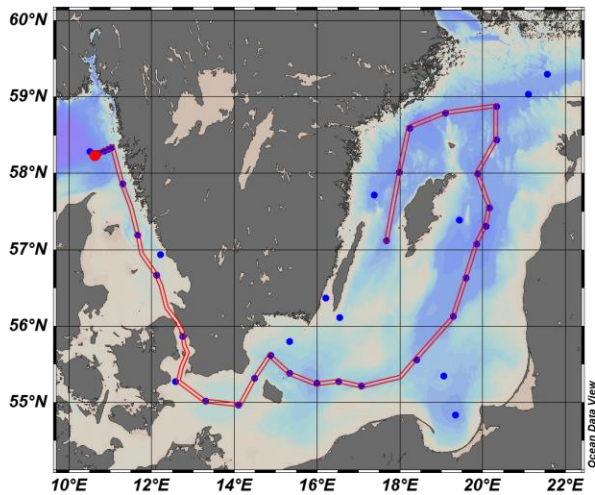
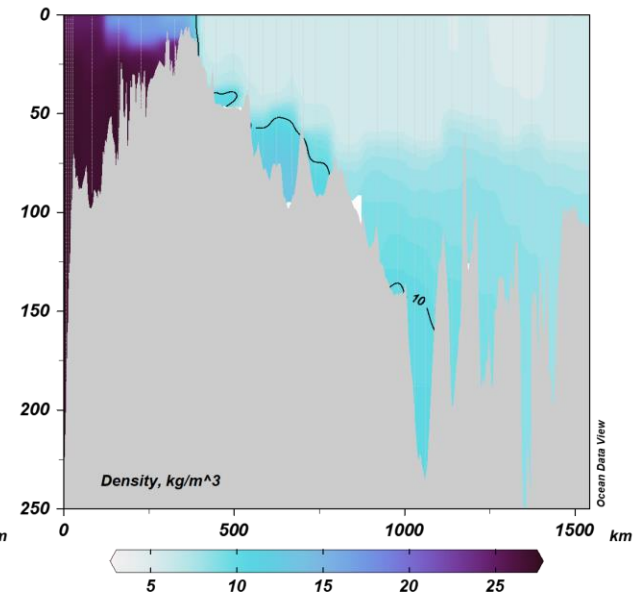
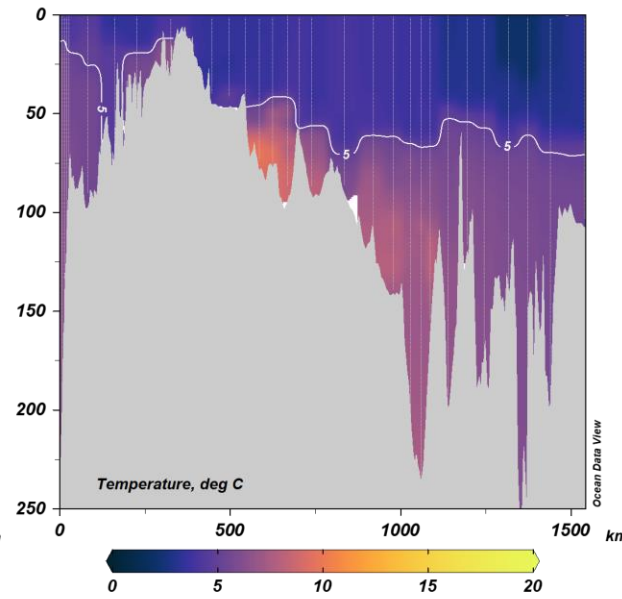
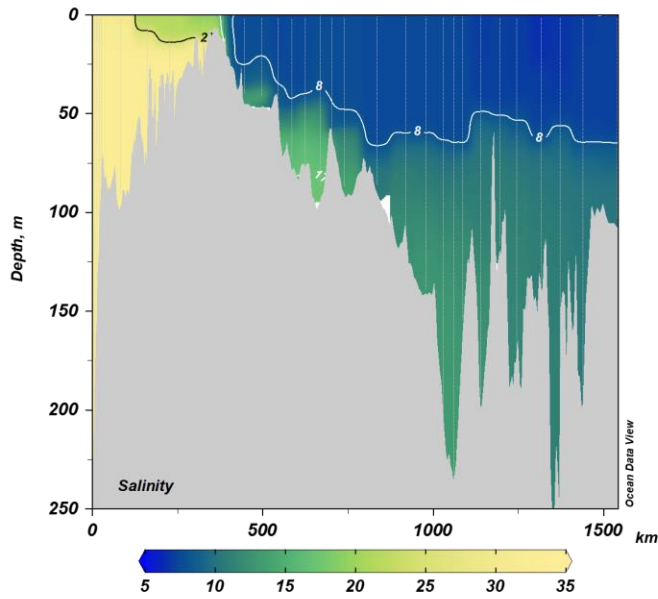
Isolines

Salinity: 6, 8, 17 (white), 25 (black)
 Temperature: 5
 Oxygen: 1 (white), 0.1 (pink)
 Density: 10

Thin vertical lines are stations



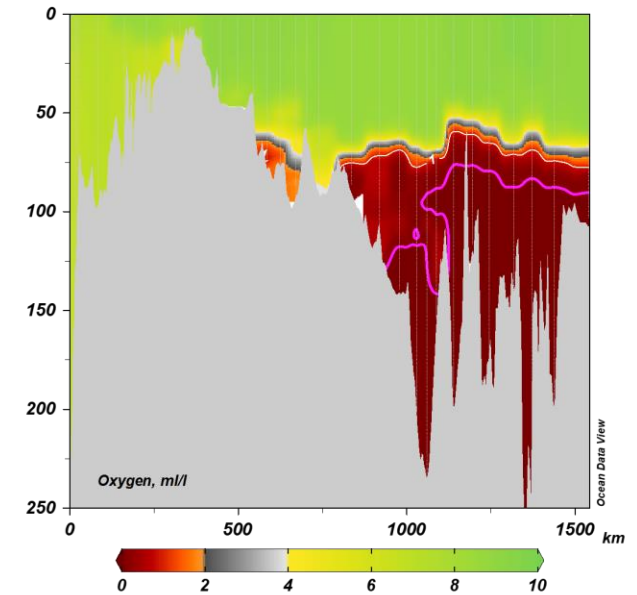
SMHI cruise February 20190215 – 20190225 CTD section



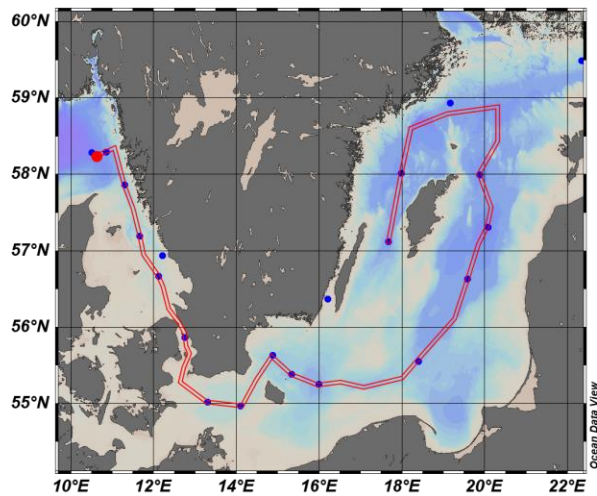
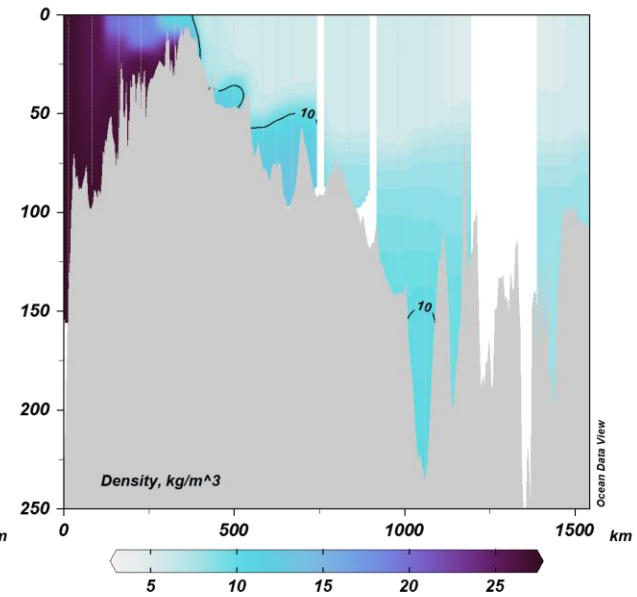
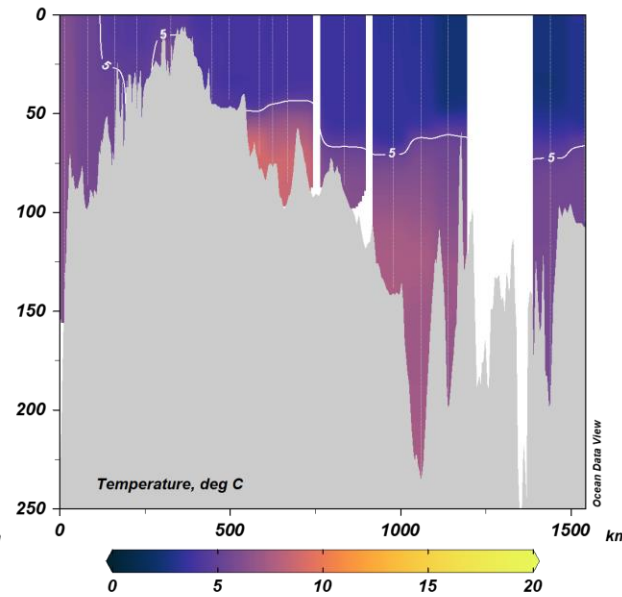
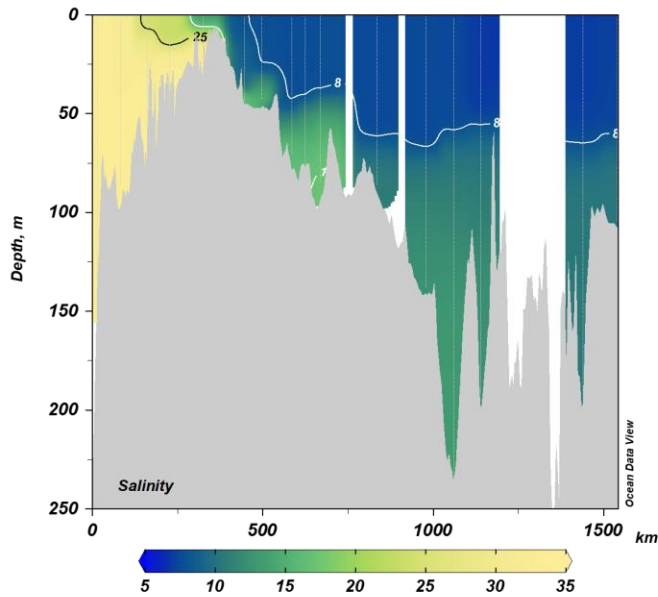
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



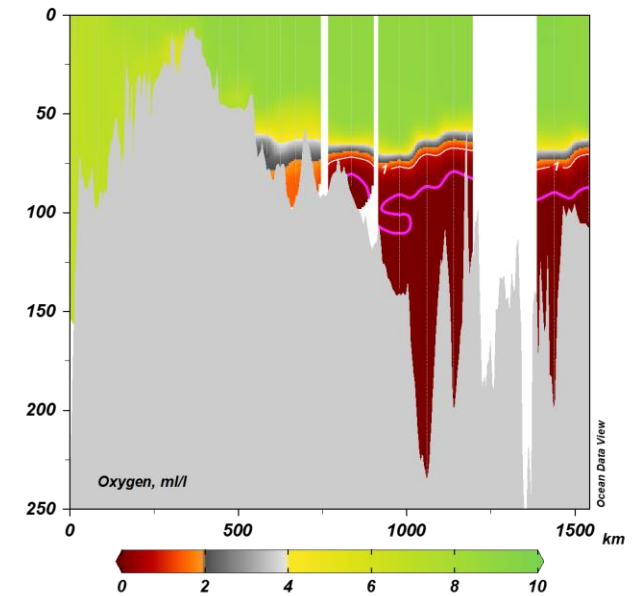
SMHI cruise March 20190314 – 20190320 CTD section



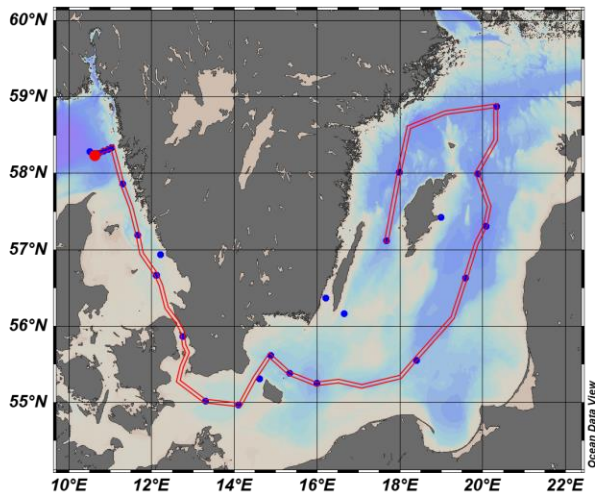
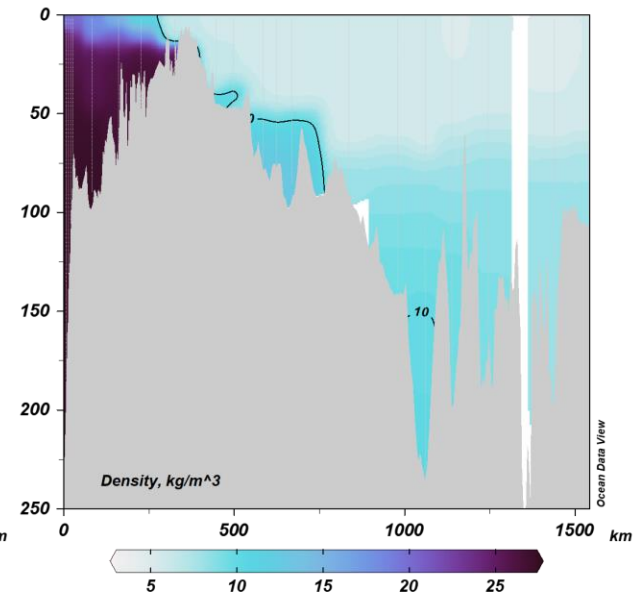
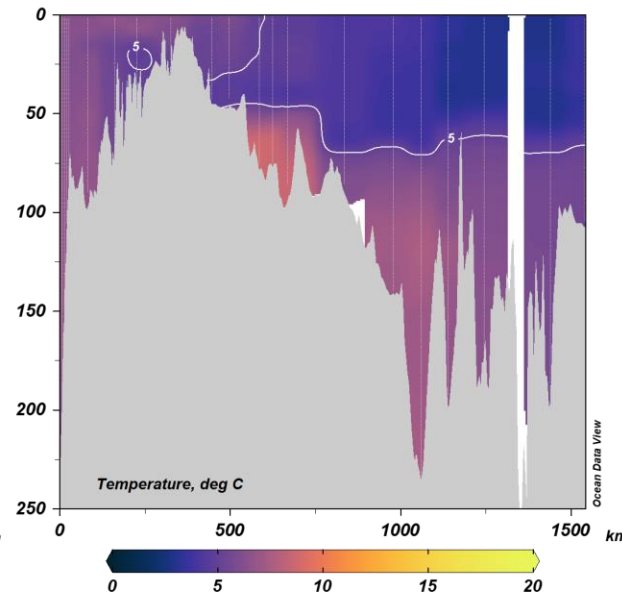
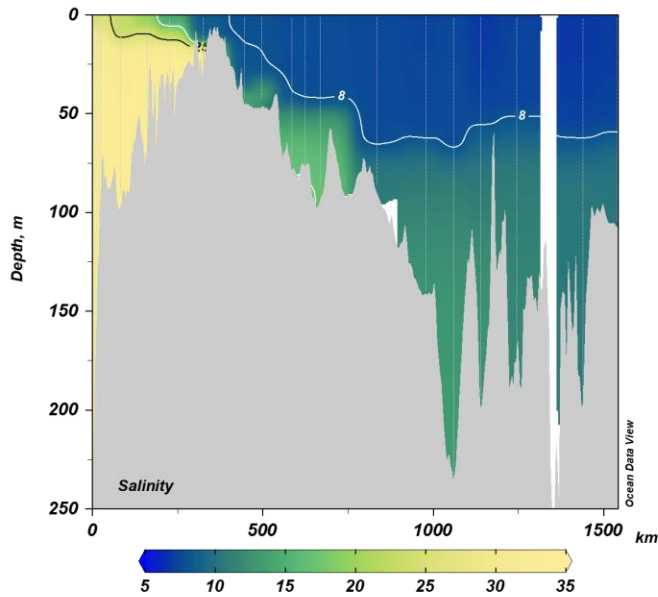
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



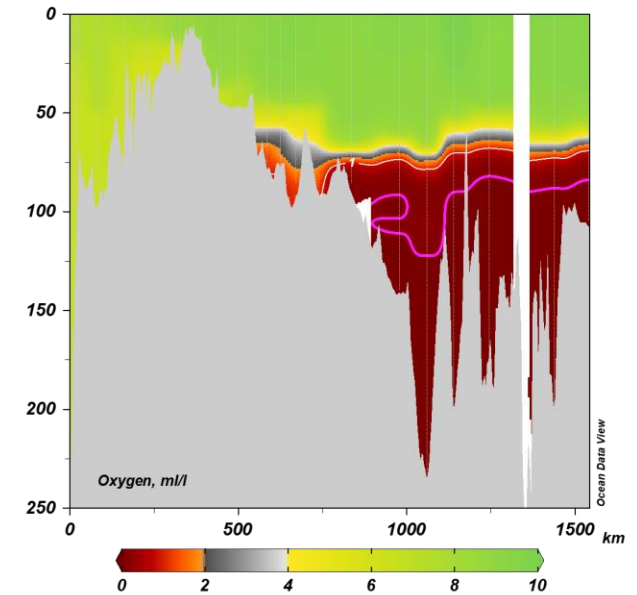
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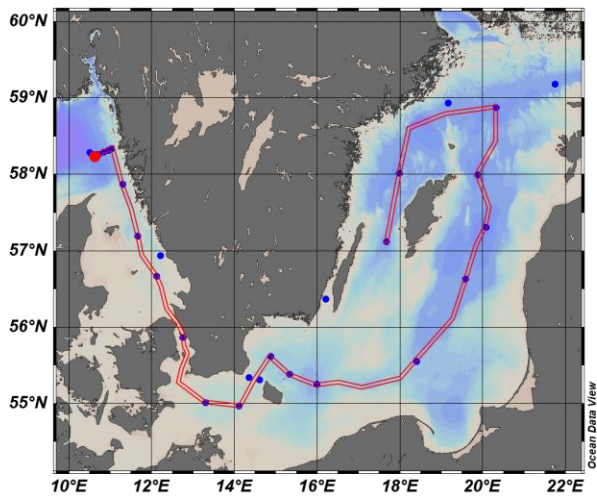
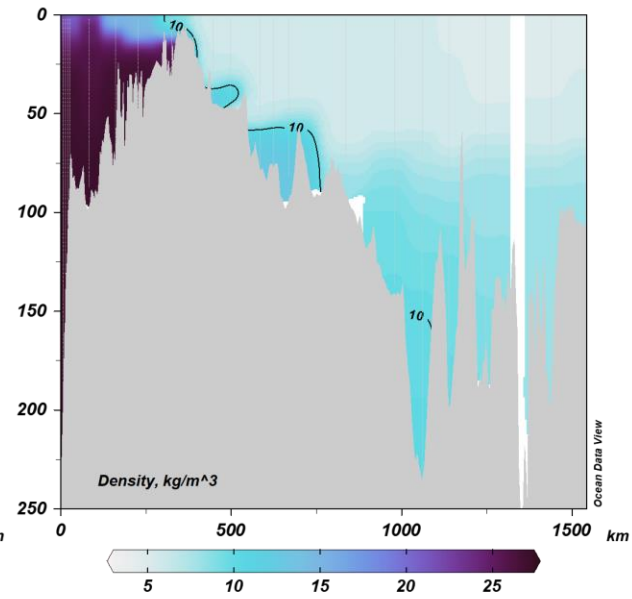
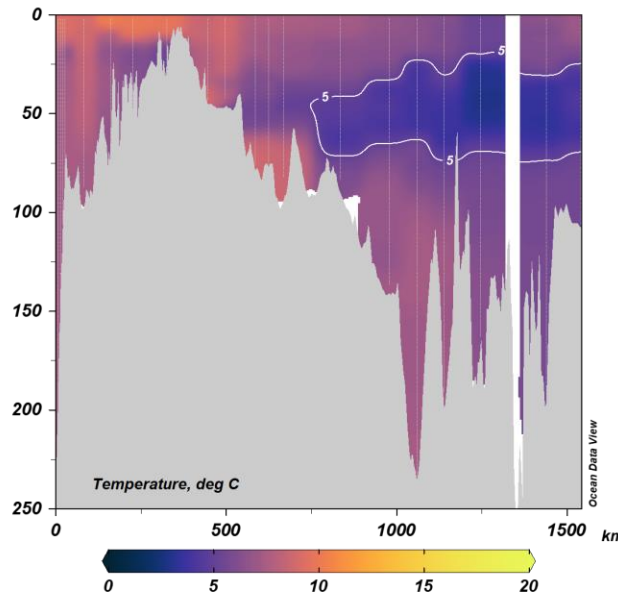
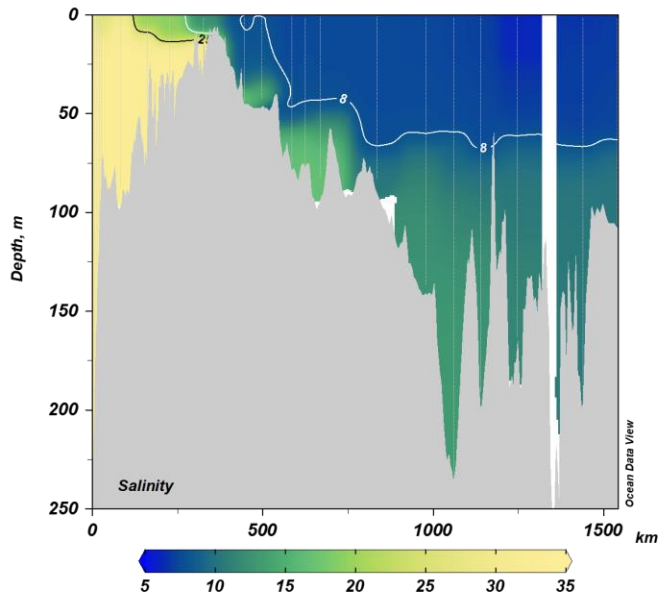
Isolines

Salinity: 6, 8, 17 (white), 25 (black)
 Temperature: 5
 Oxygen: 1 (white), 0.1 (pink)
 Density: 10

Thin vertical lines are stations



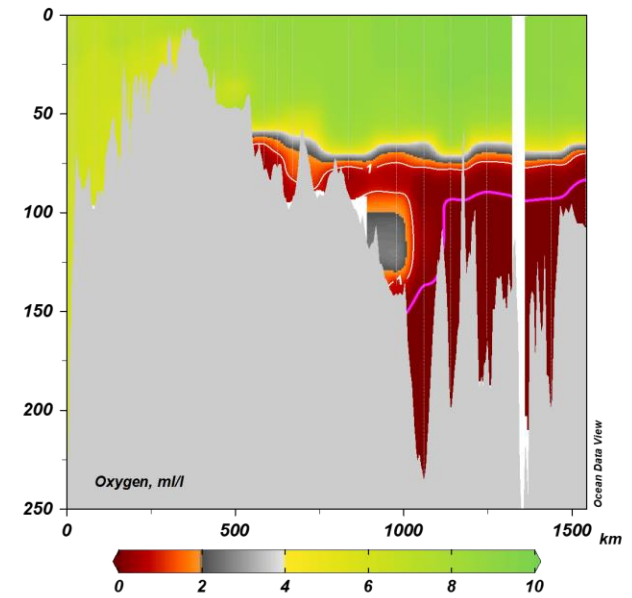
SMHI cruise May 20190509 – 20190516 CTD section



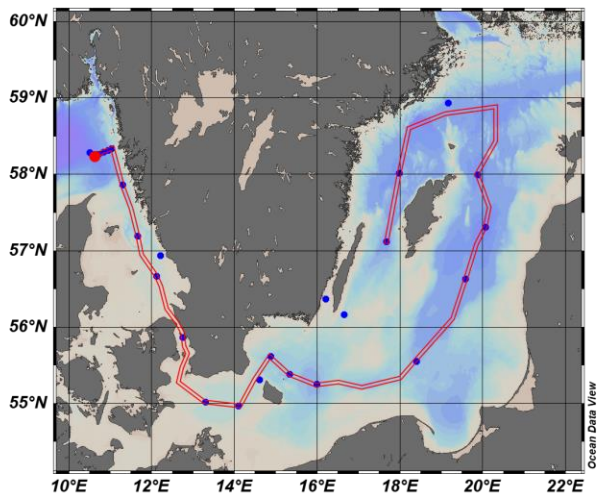
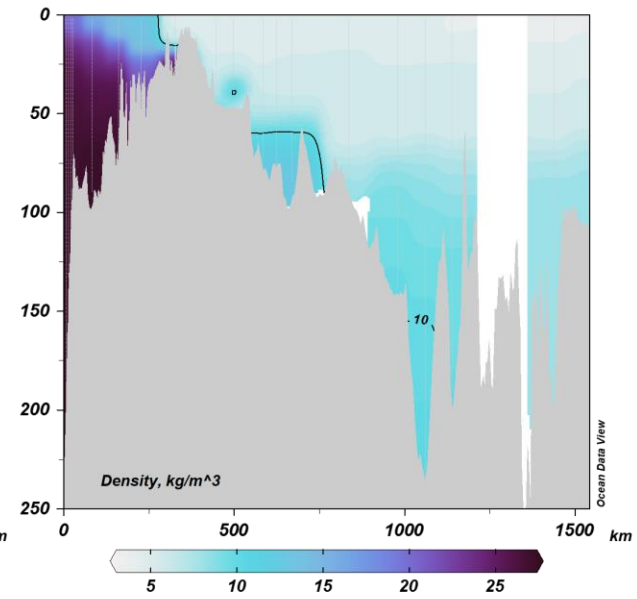
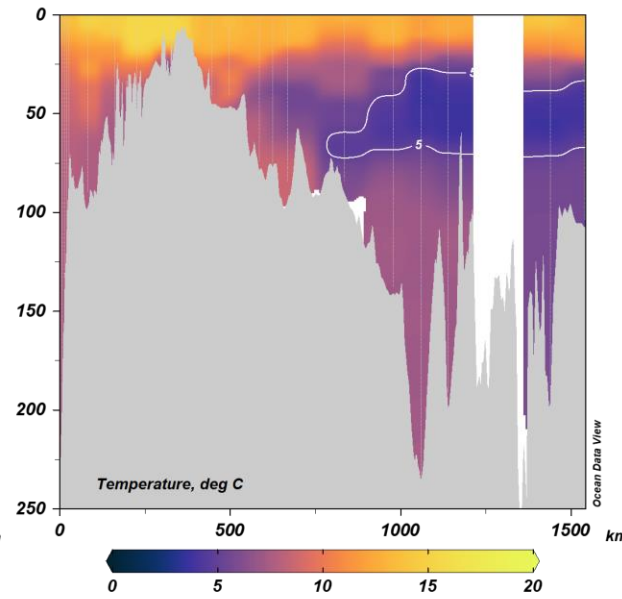
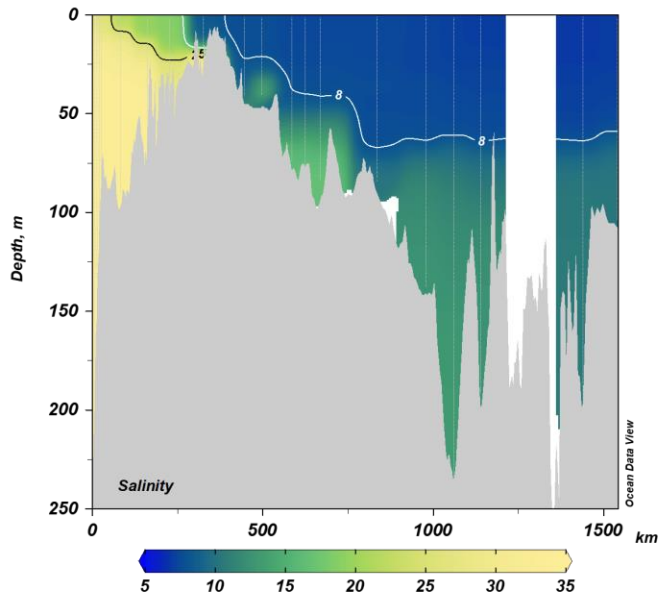
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



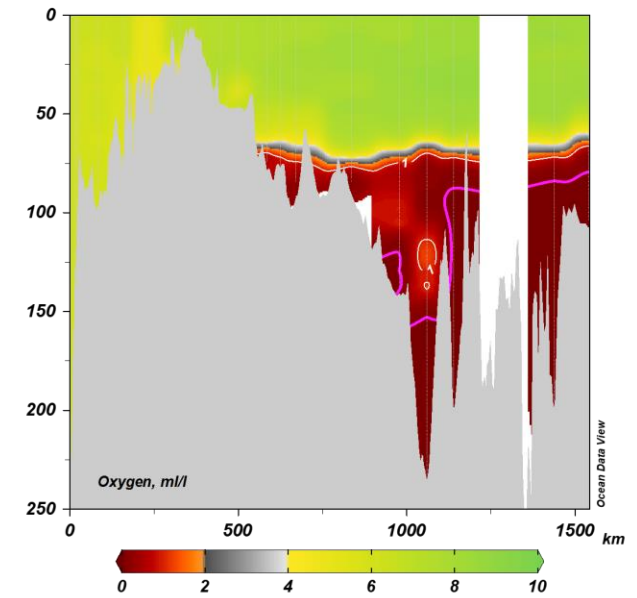
SMHI cruise June 20190610 – 20190616 CTD section



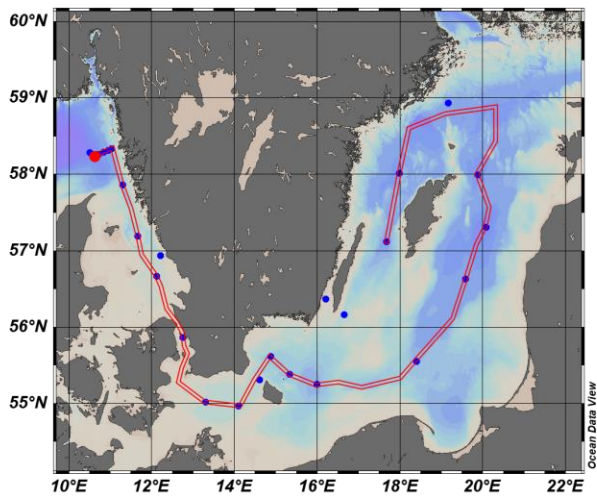
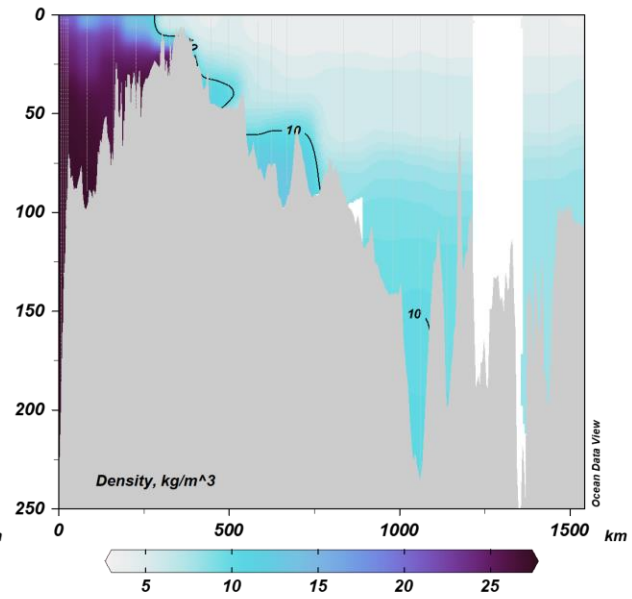
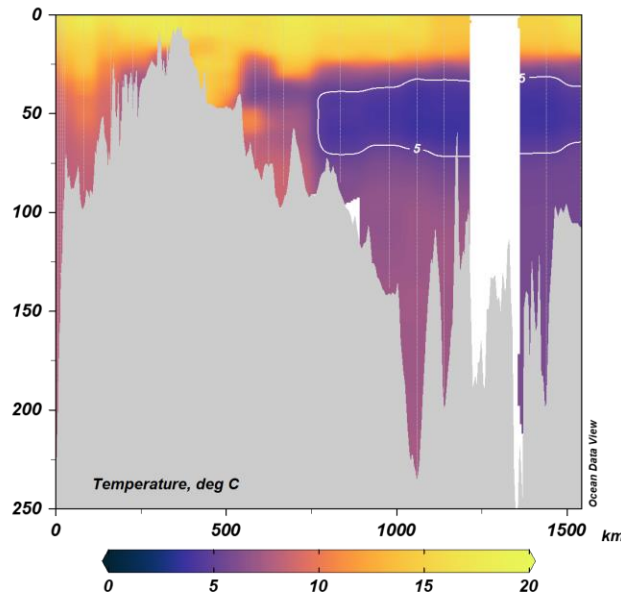
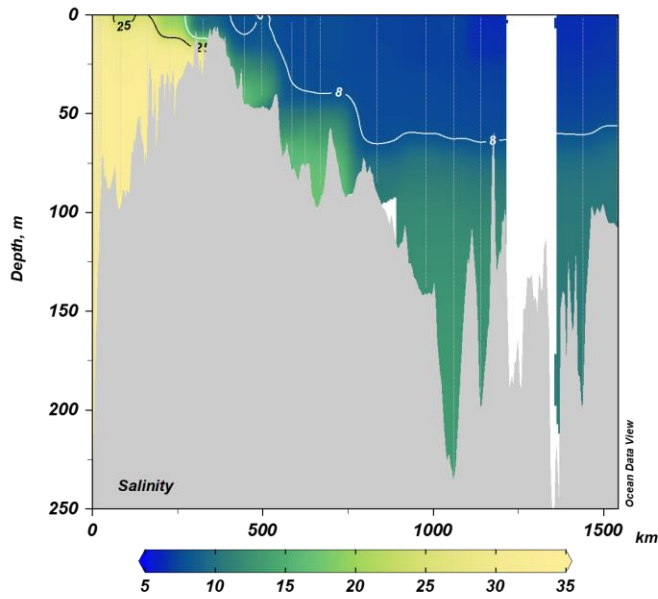
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



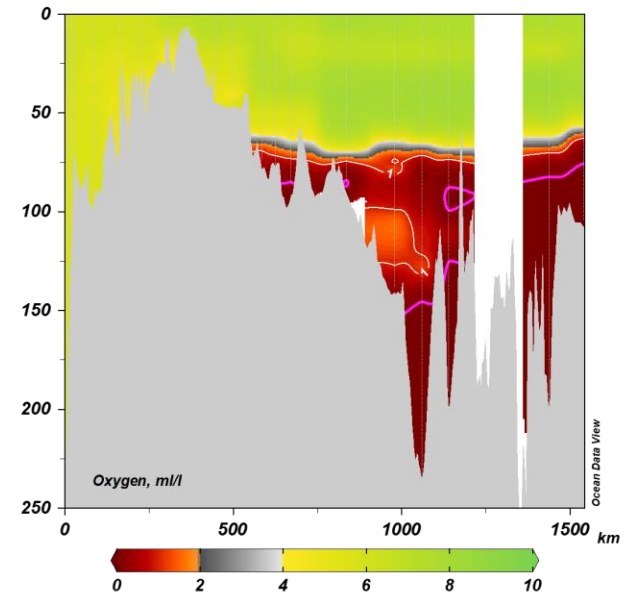
SMHI cruise July 20190713 – 20190719 CTD section



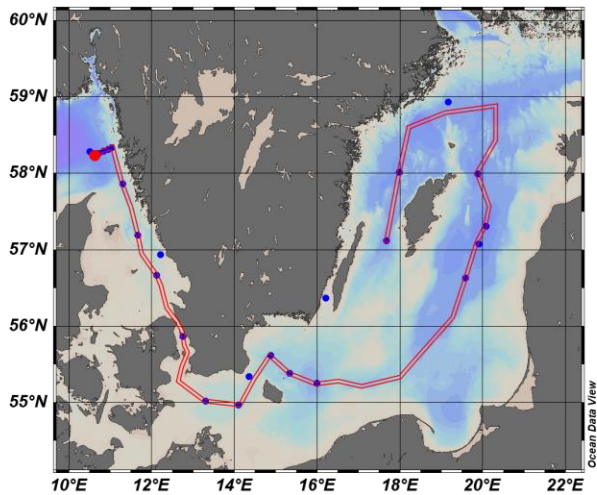
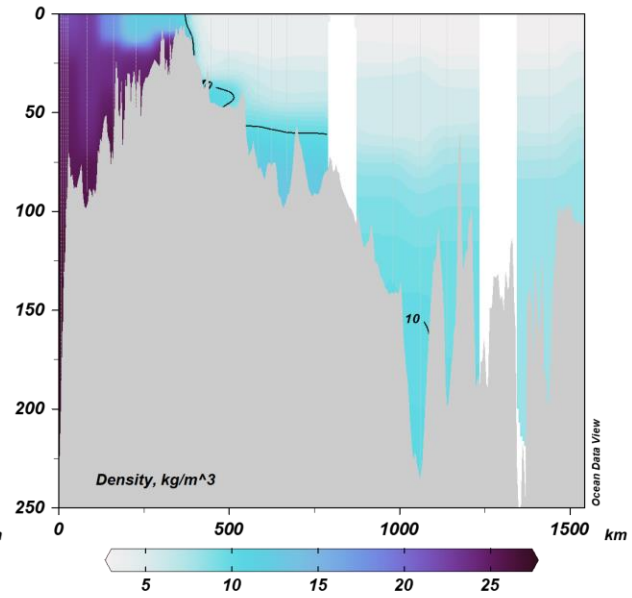
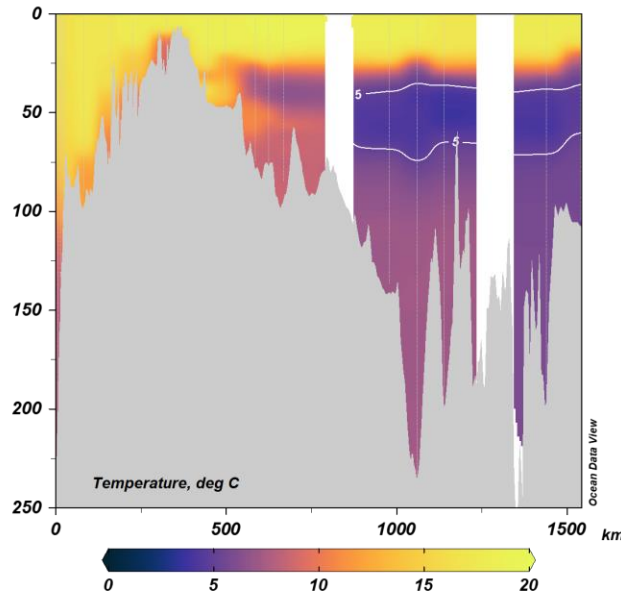
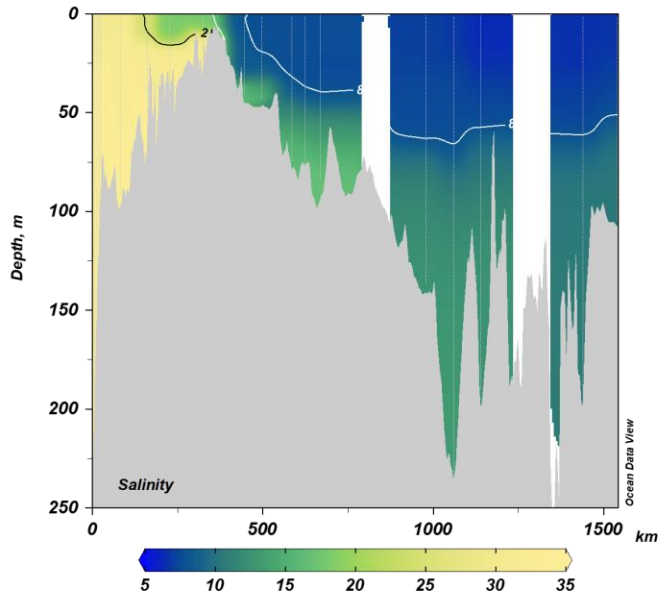
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



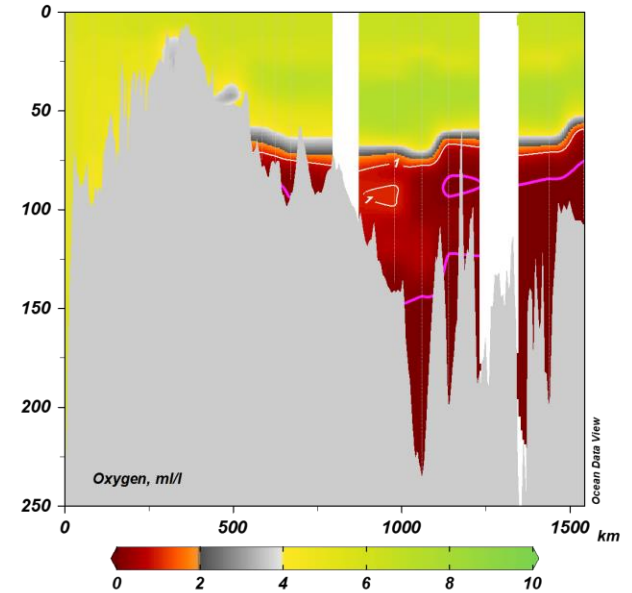
SMHI cruise August 20190816 – 20190823 CTD section



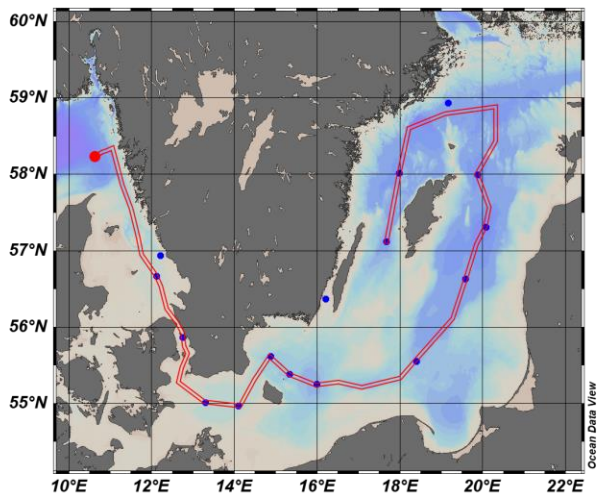
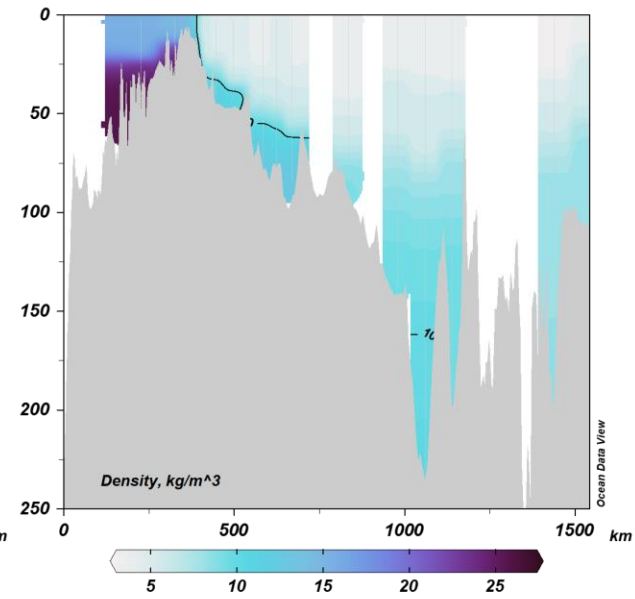
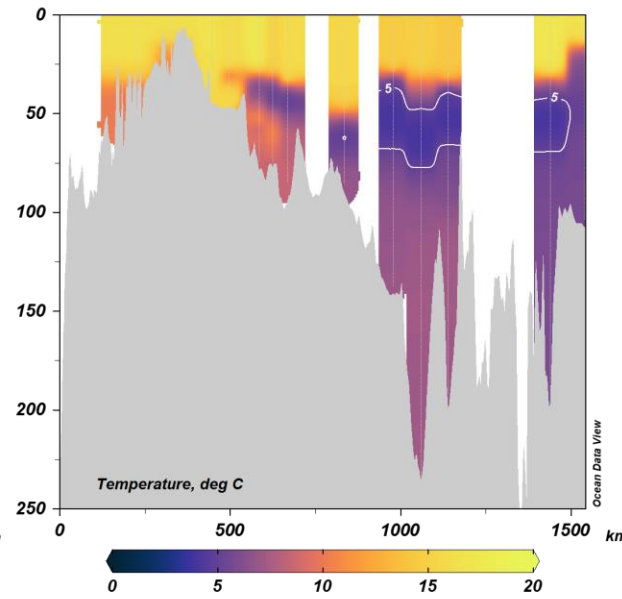
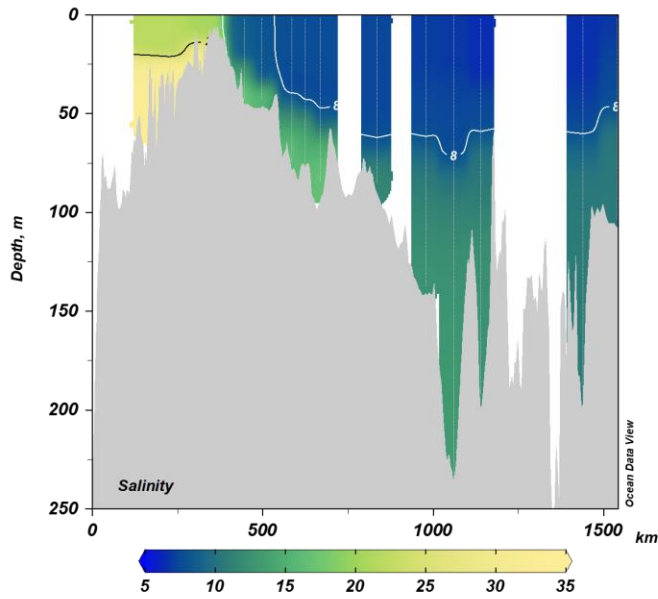
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



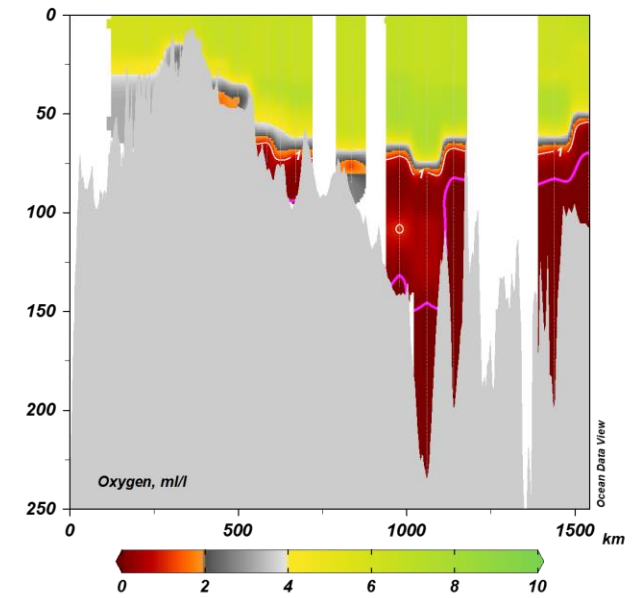
SMHI cruise September 20190912 – 20190919 CTD section



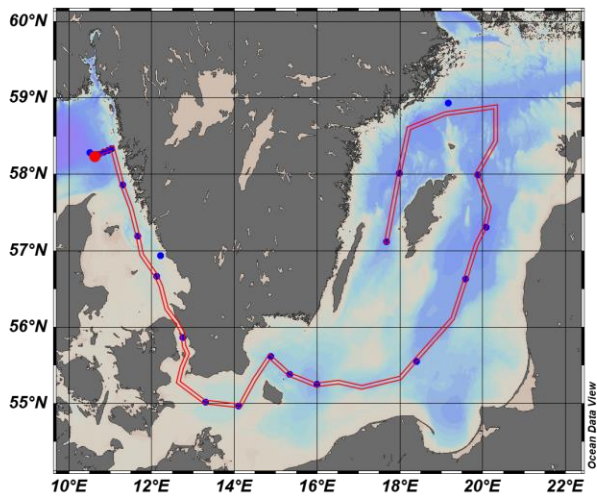
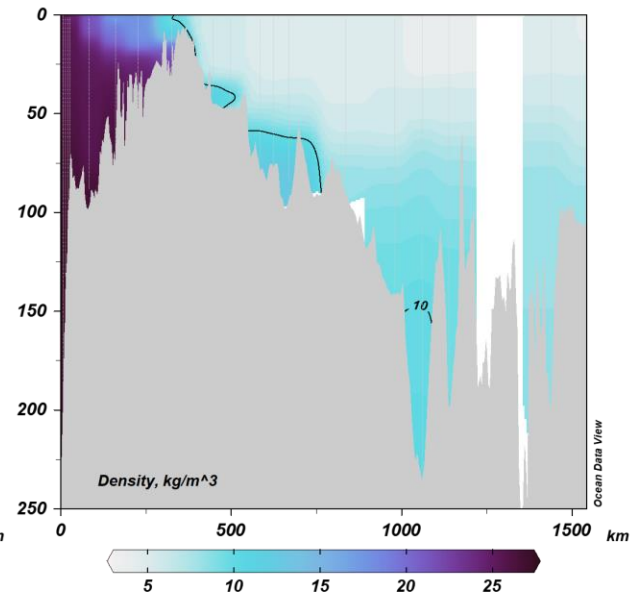
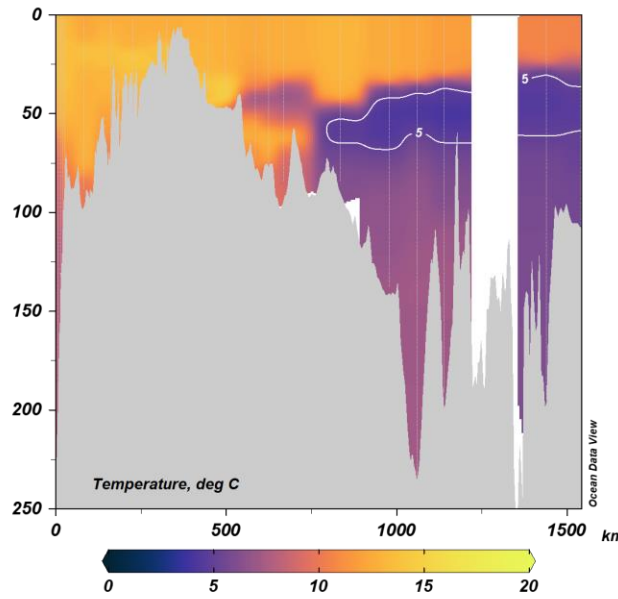
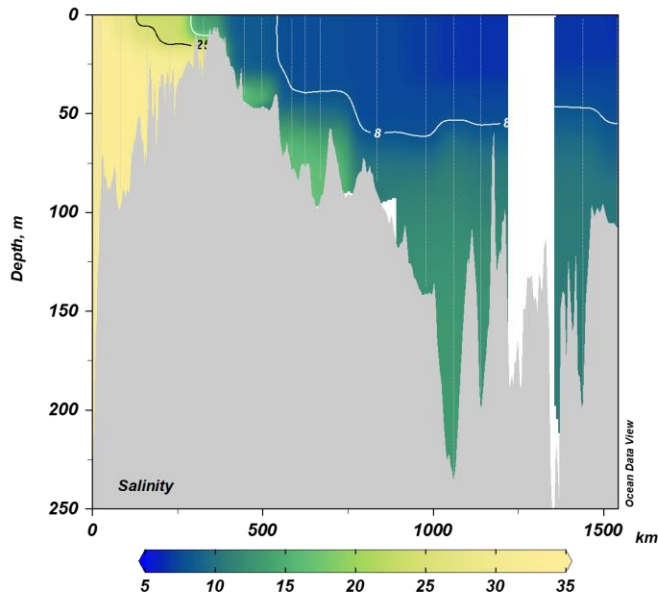
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



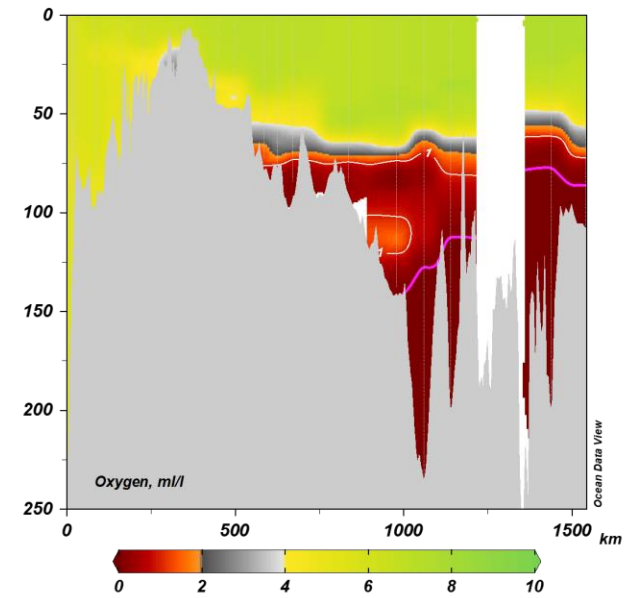
SMHI cruise October 20191013 – 20191020 CTD section



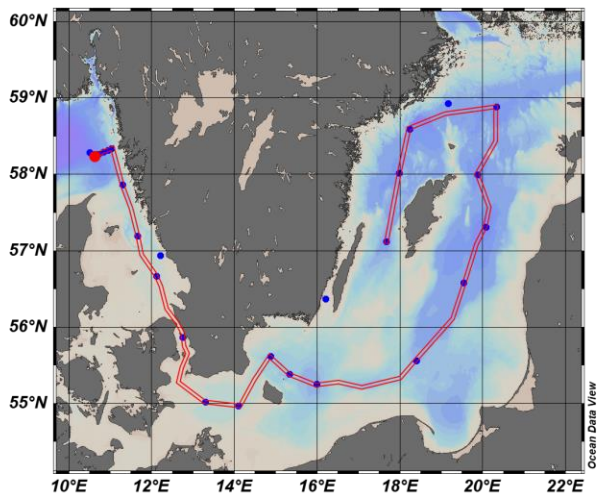
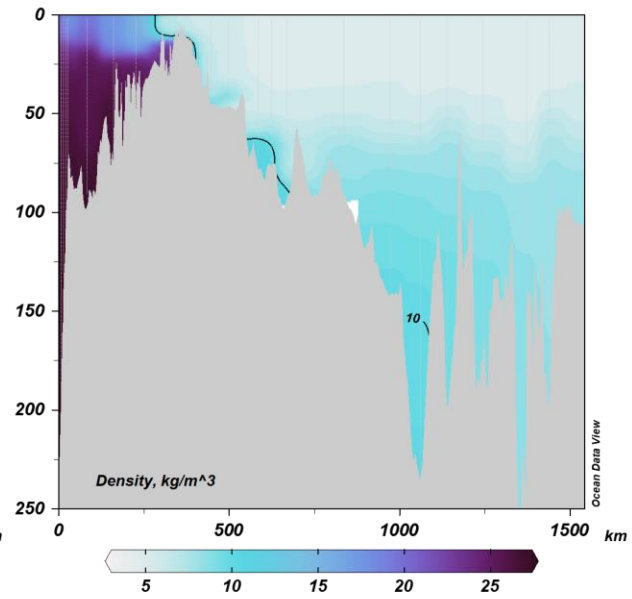
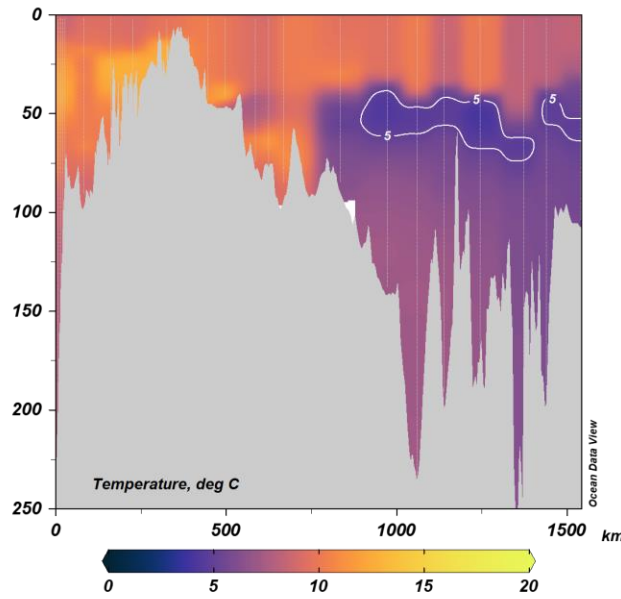
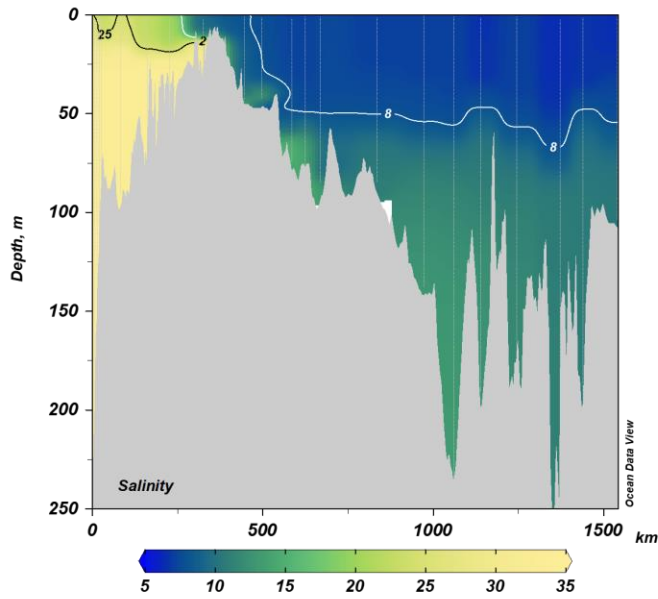
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



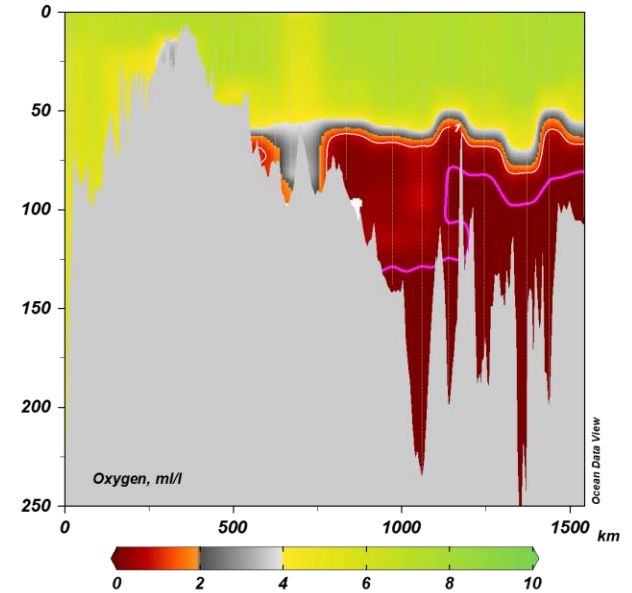
SMHI cruise November 20191109 – 20191114 CTD section



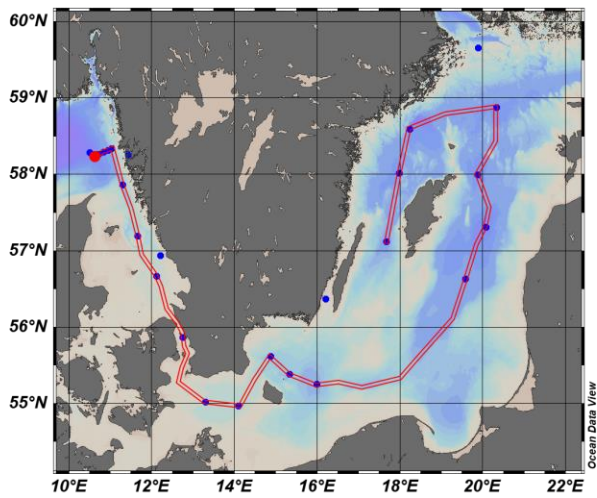
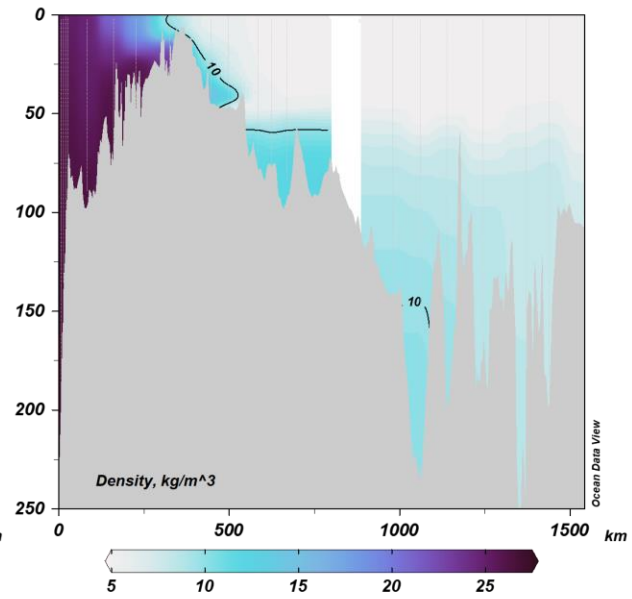
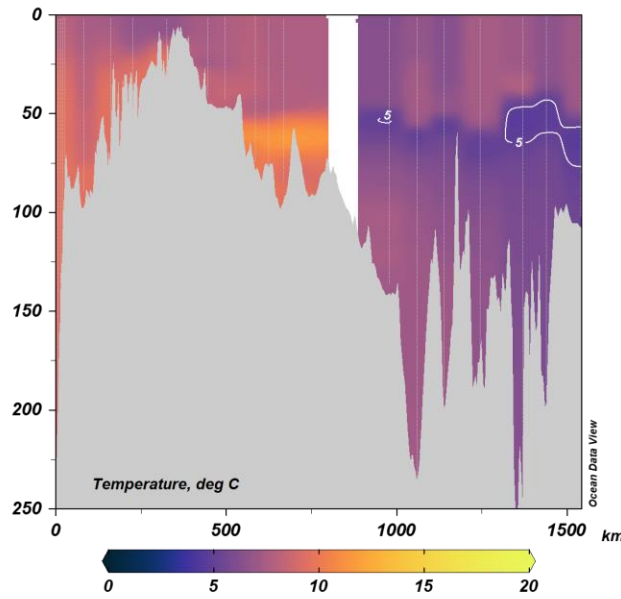
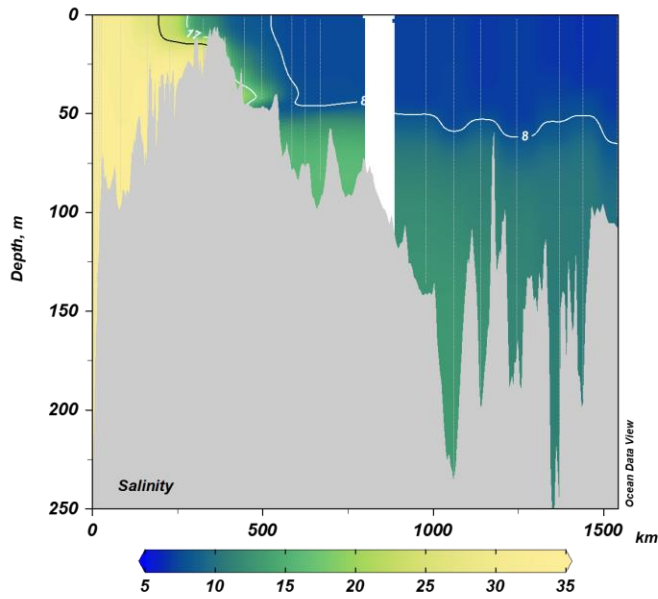
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



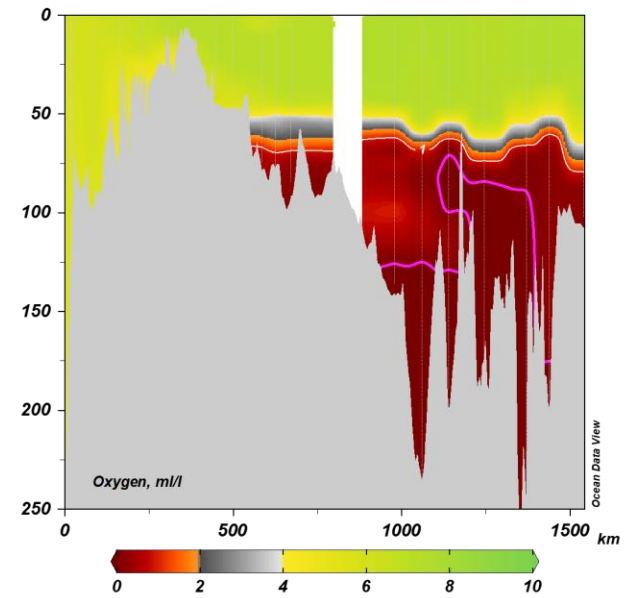
SMHI cruise December 20191204 – 20191216 CTD section



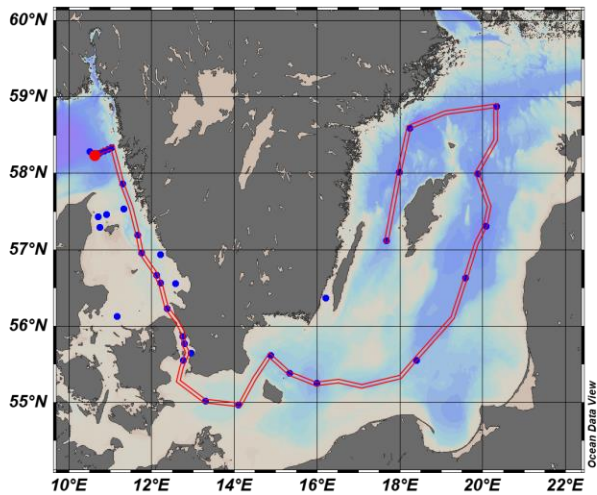
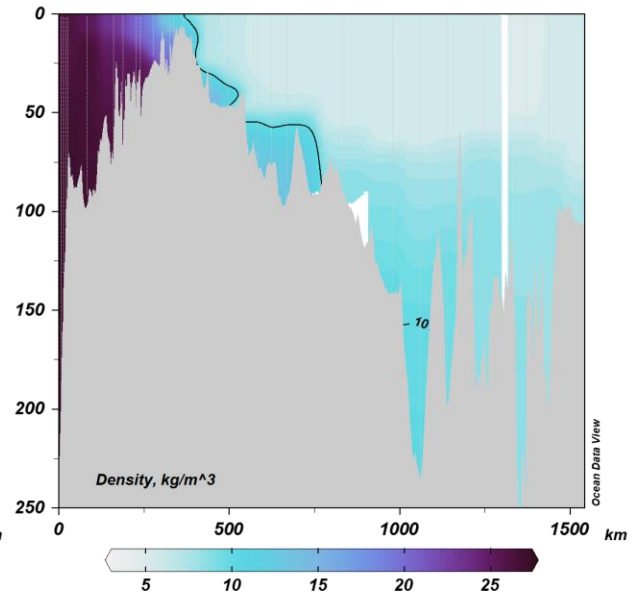
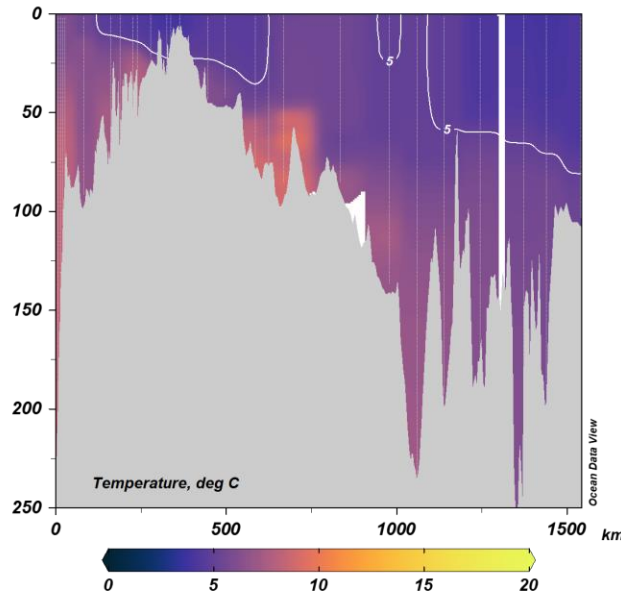
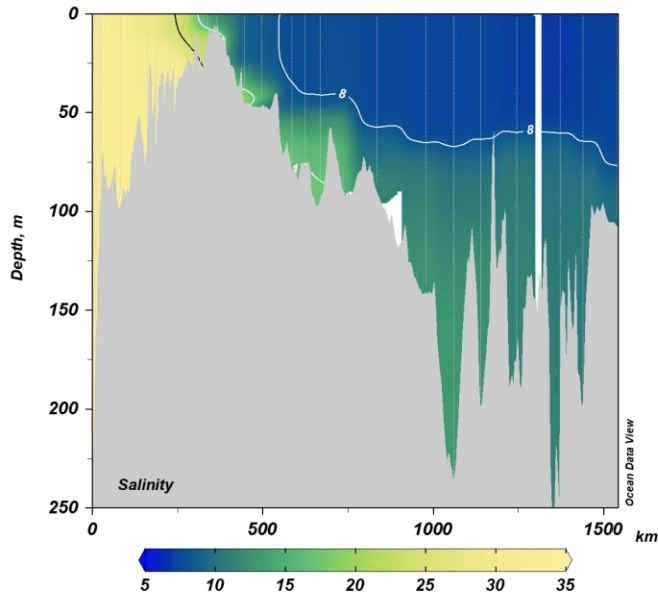
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



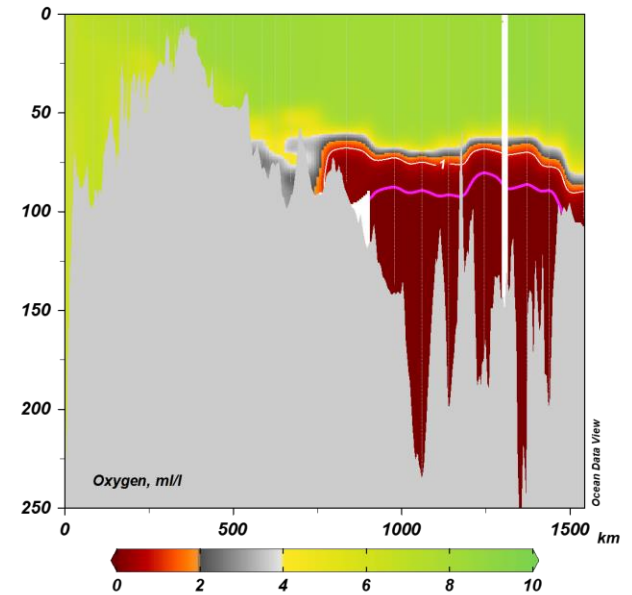
SMHI cruise January 20190110 – 20190119 CTD section



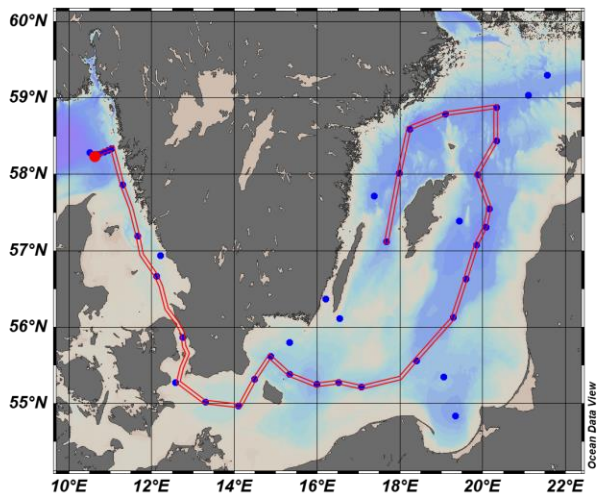
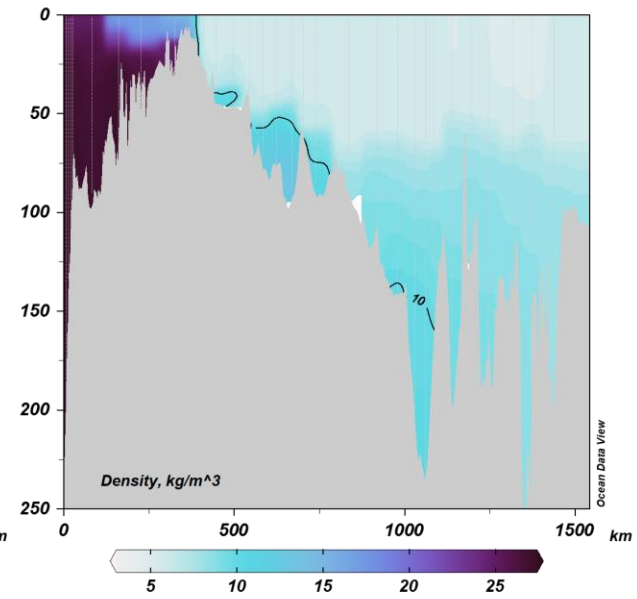
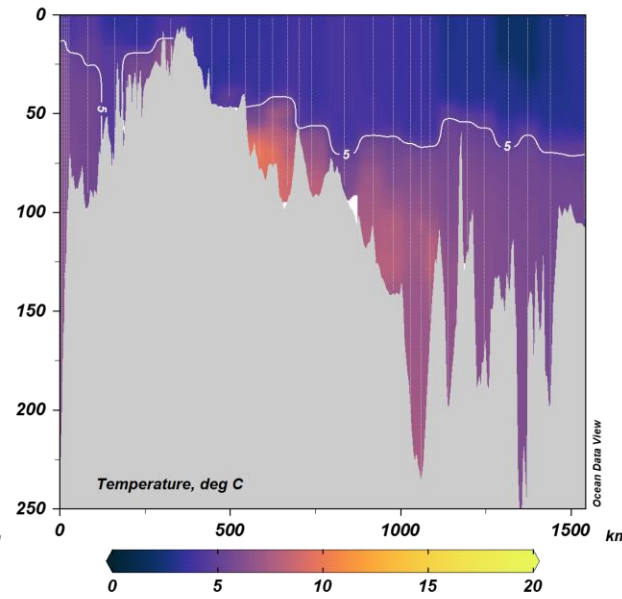
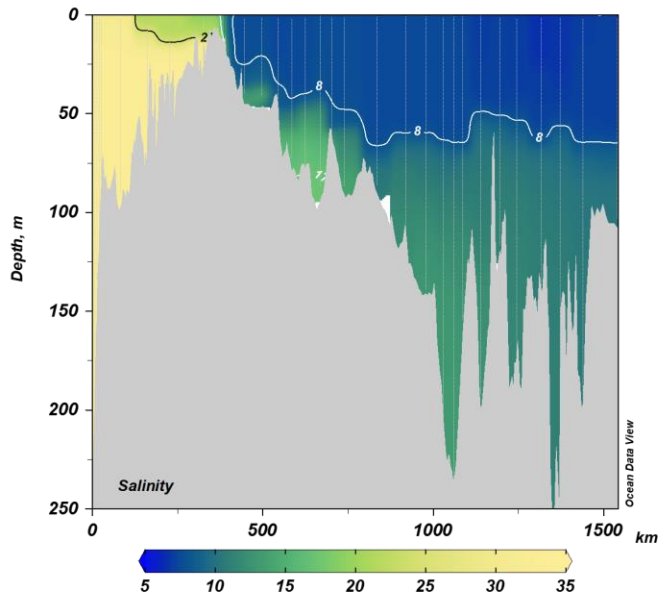
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



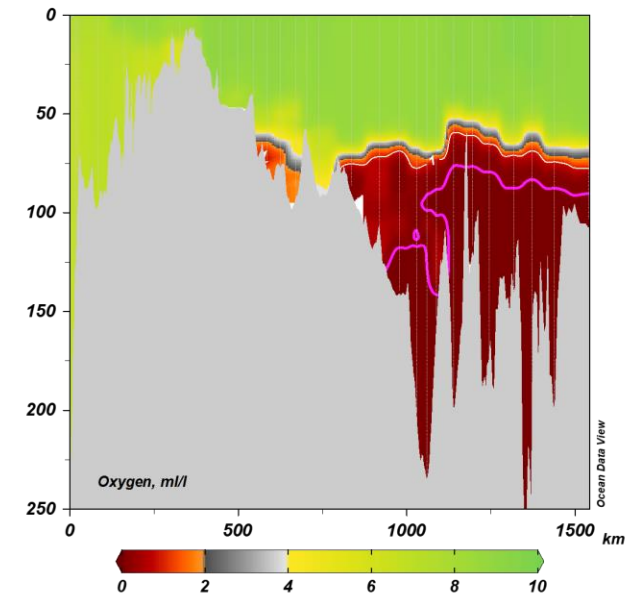
SMHI cruise February 20190215 – 20190225 CTD section



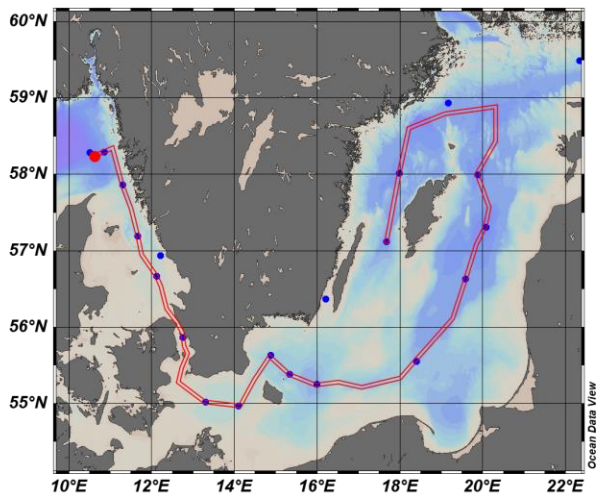
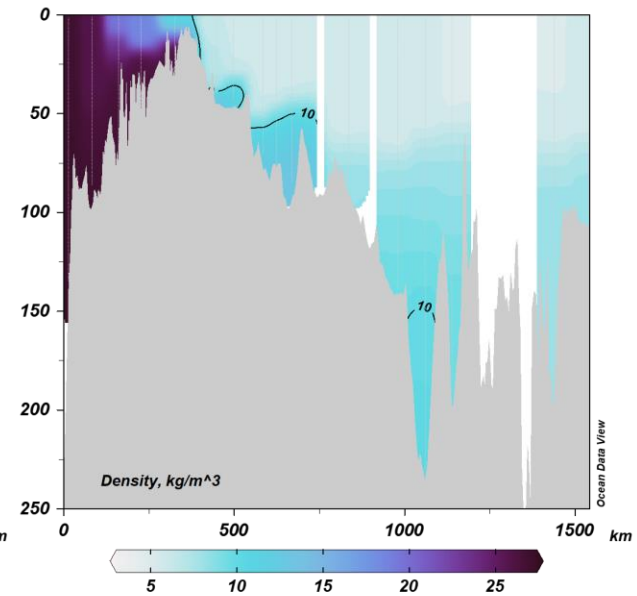
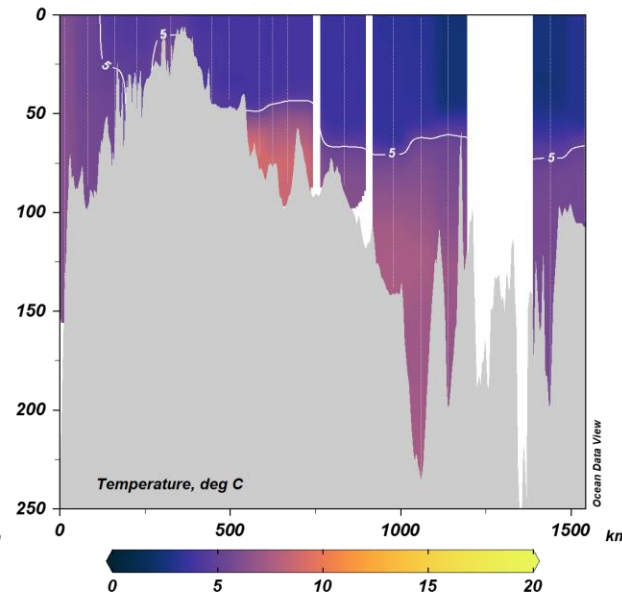
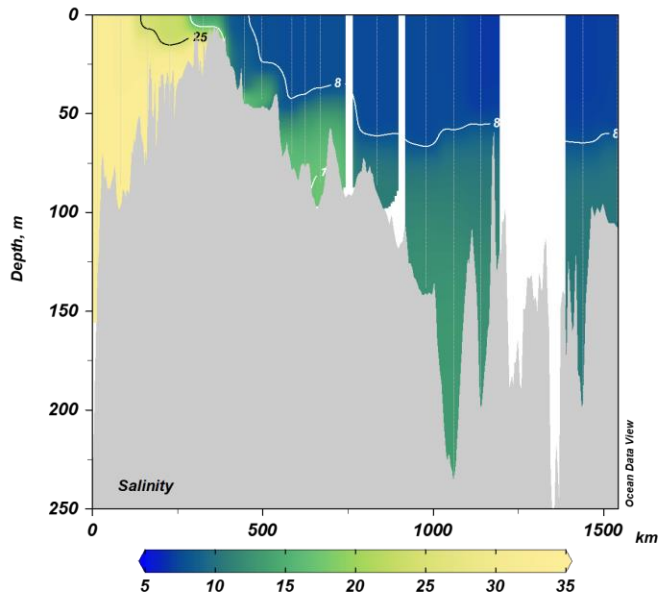
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



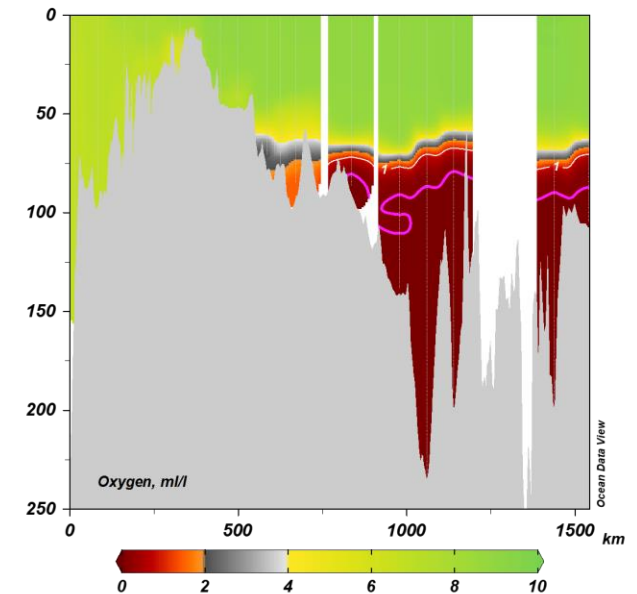
SMHI cruise March 20190314 – 20190320 CTD section



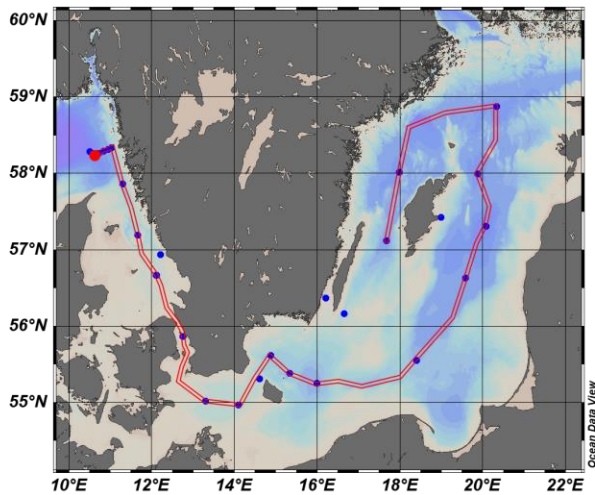
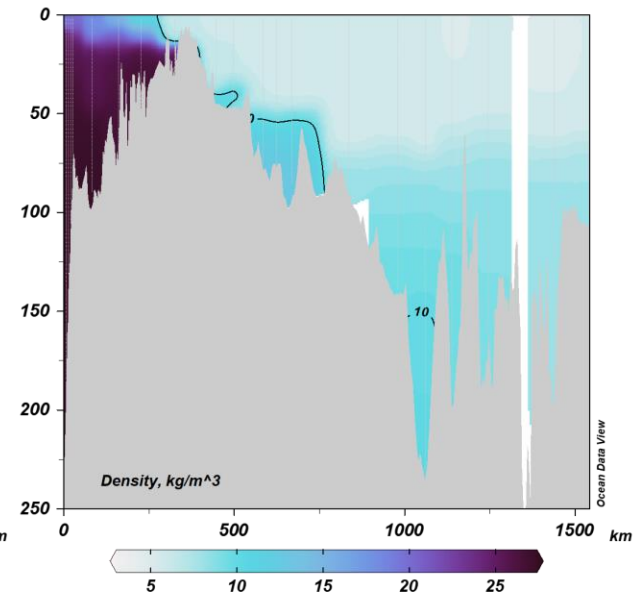
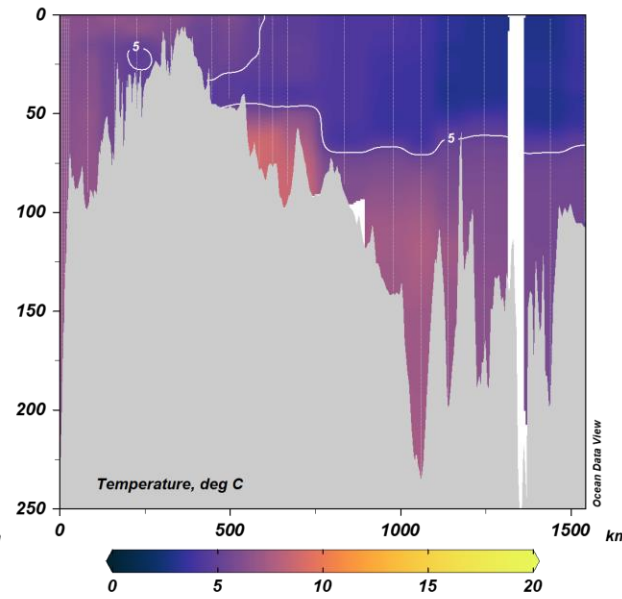
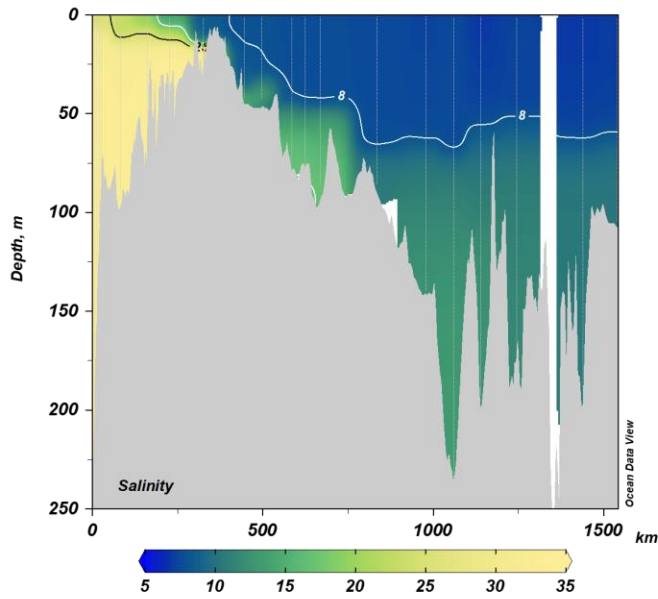
Isolines

Salinity: 6, 8, 17 (white), 25 (black)
 Temperature: 5
 Oxygen: 1 (white), 0.1 (pink)
 Density: 10

Thin vertical lines are stations



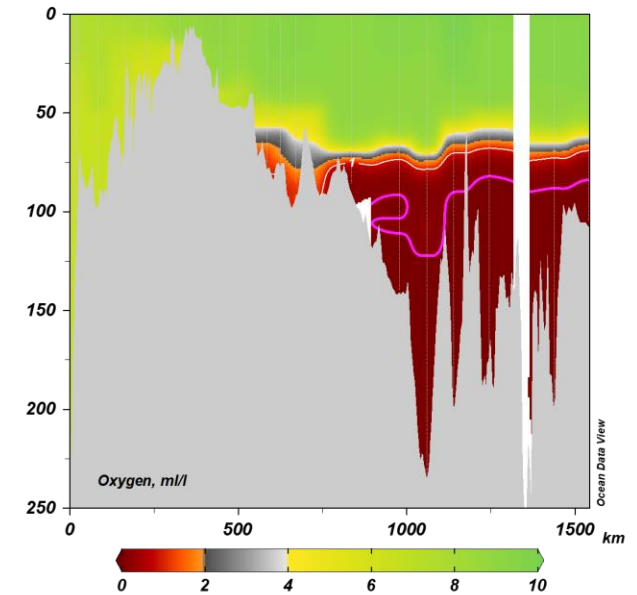
SMHI cruise April 20190405 – 20190412 CTD section



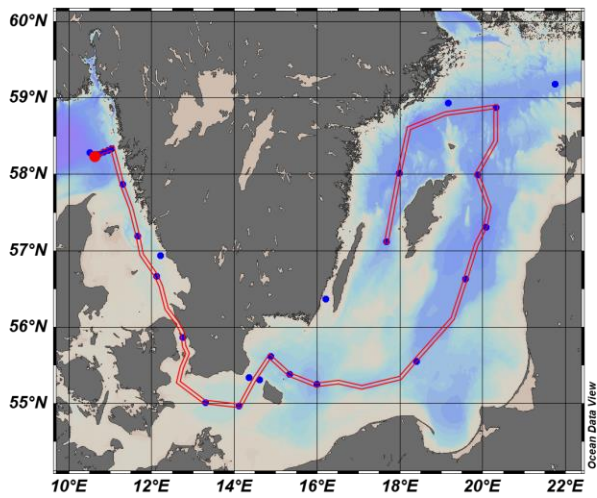
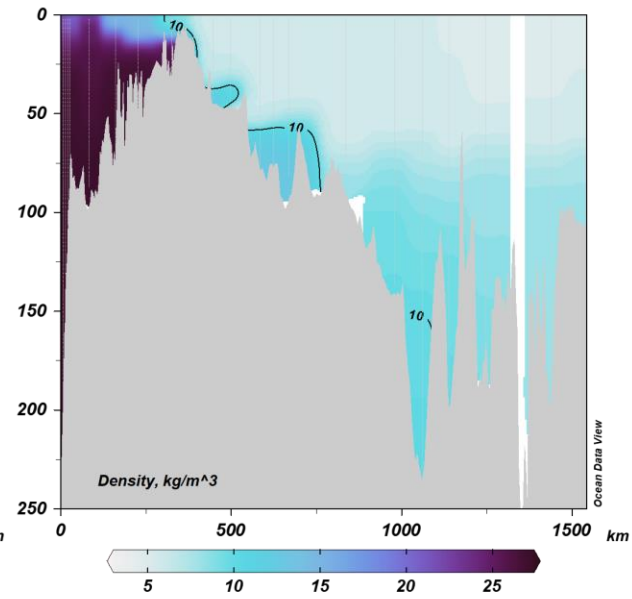
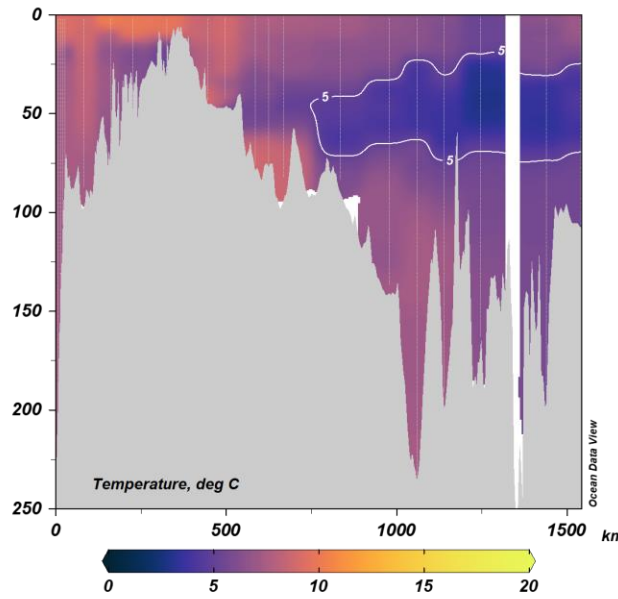
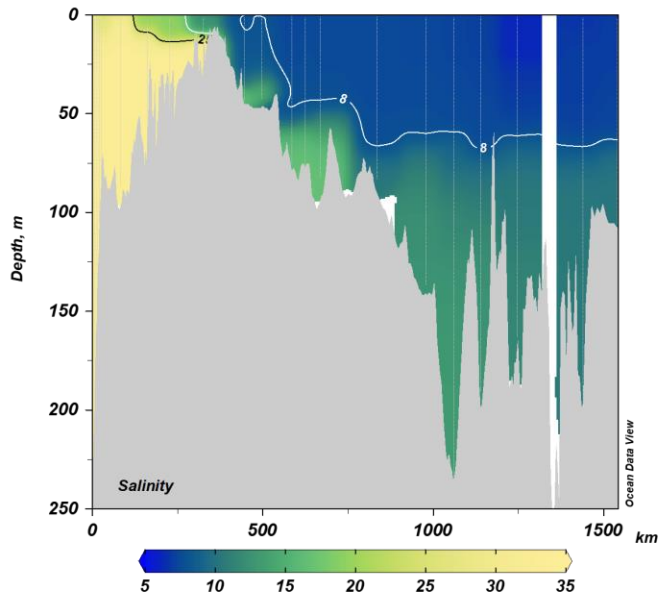
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



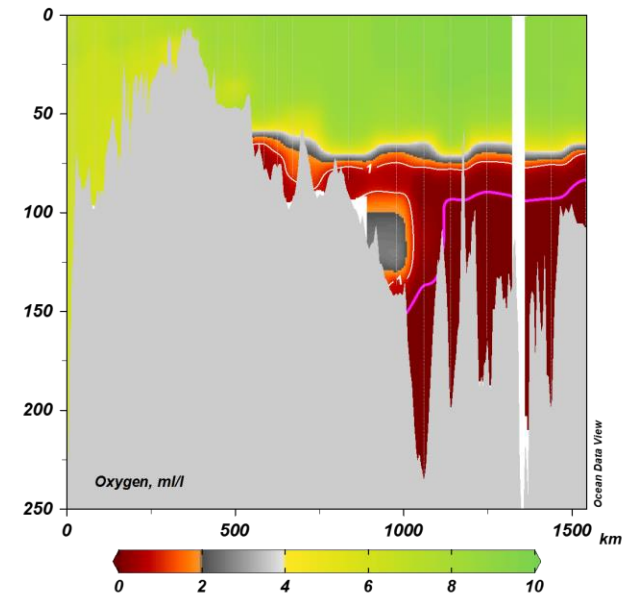
SMHI cruise May 20190509 – 20190516 CTD section



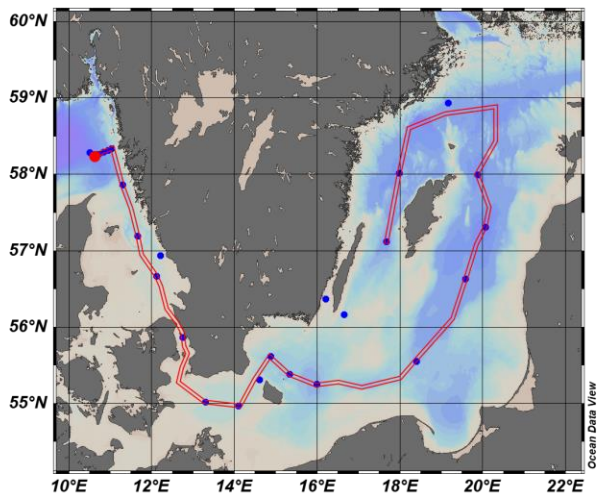
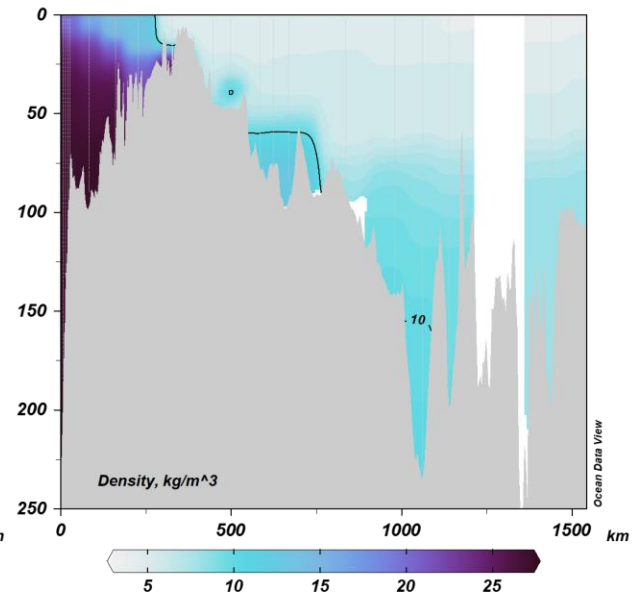
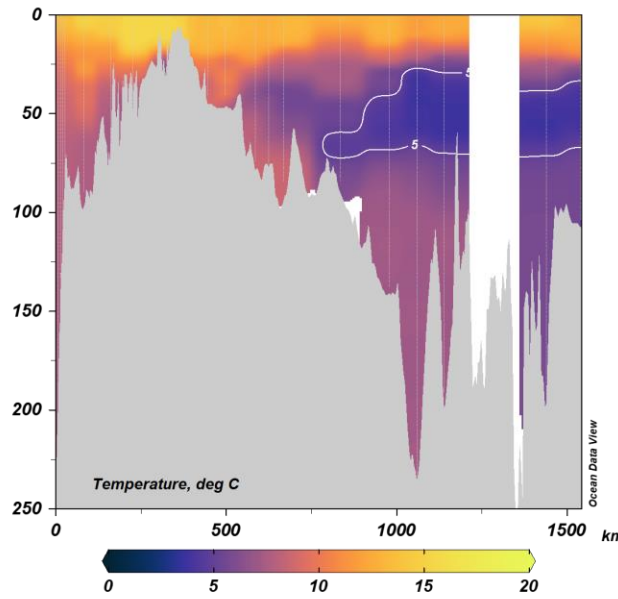
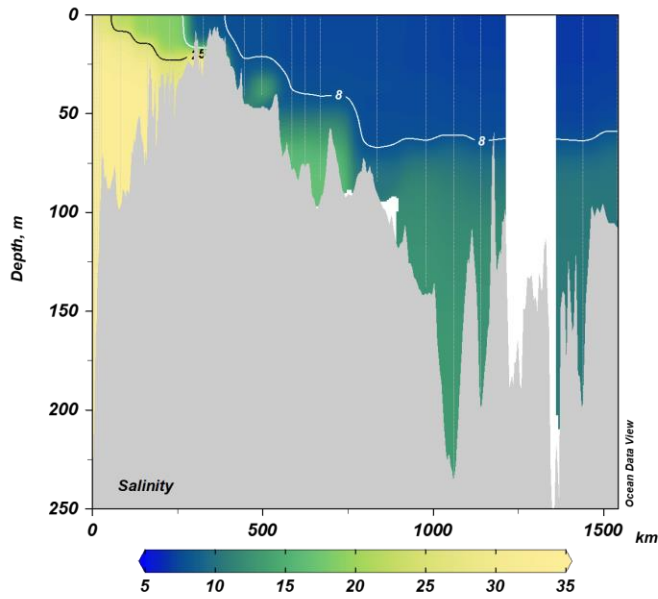
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



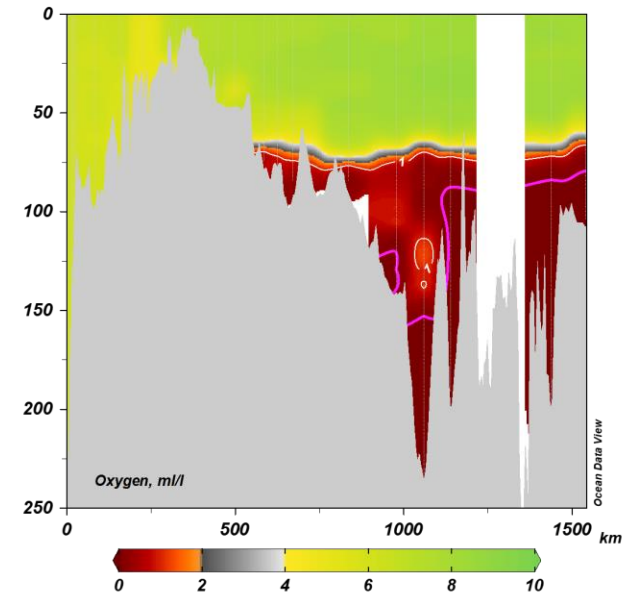
SMHI cruise June 20190610 – 20190616 CTD section



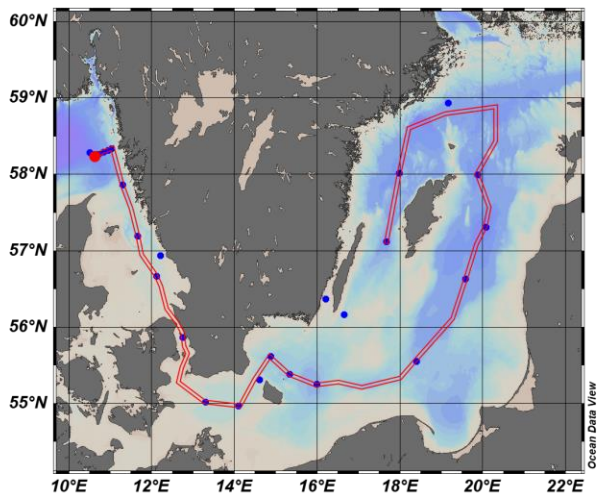
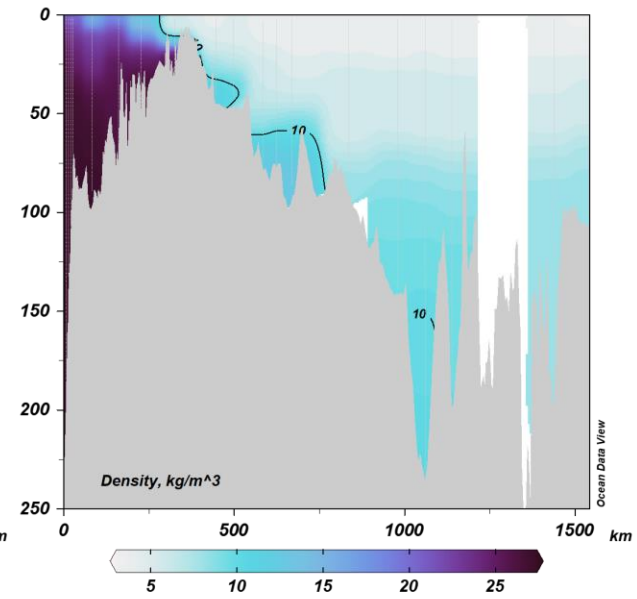
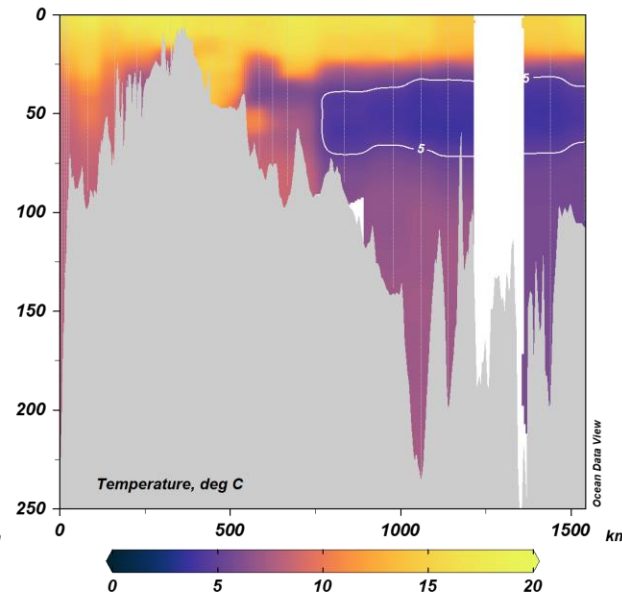
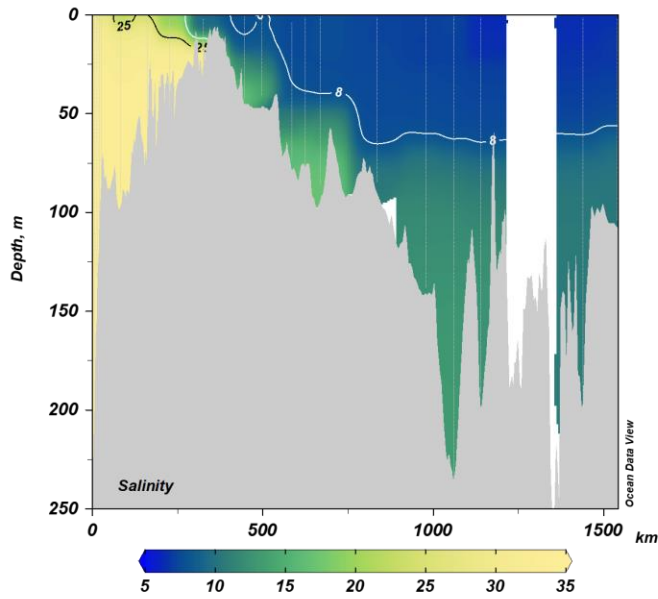
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



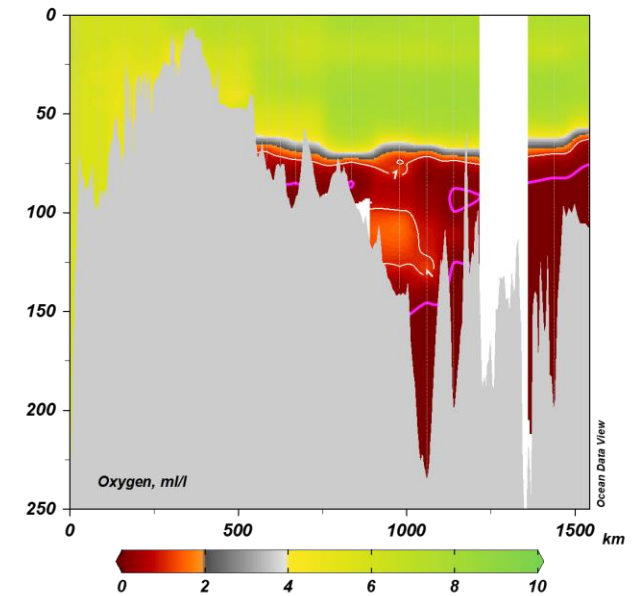
SMHI cruise July 20190713 – 20190719 CTD section



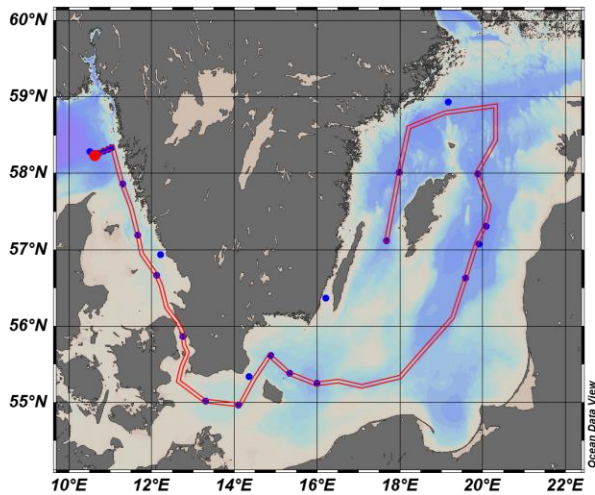
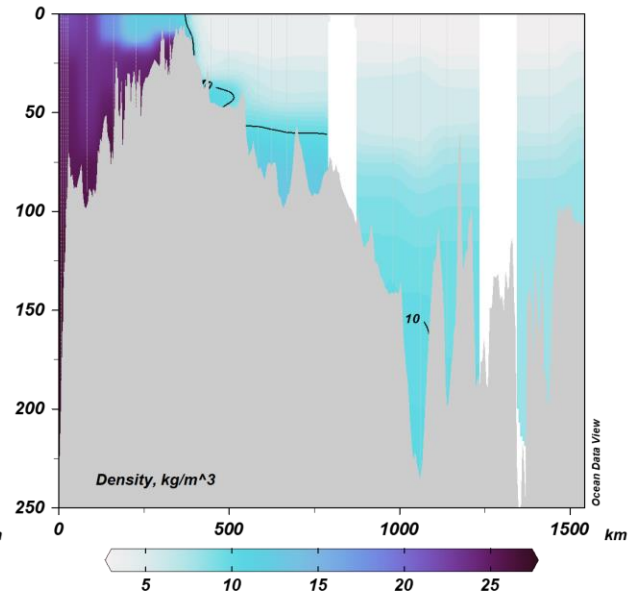
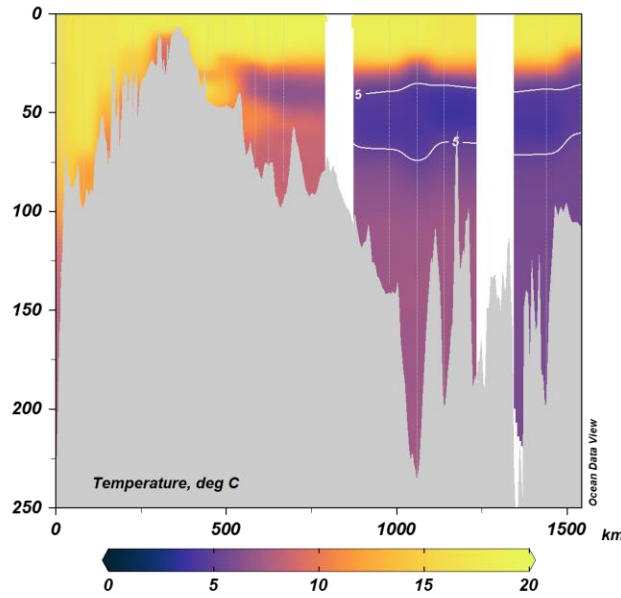
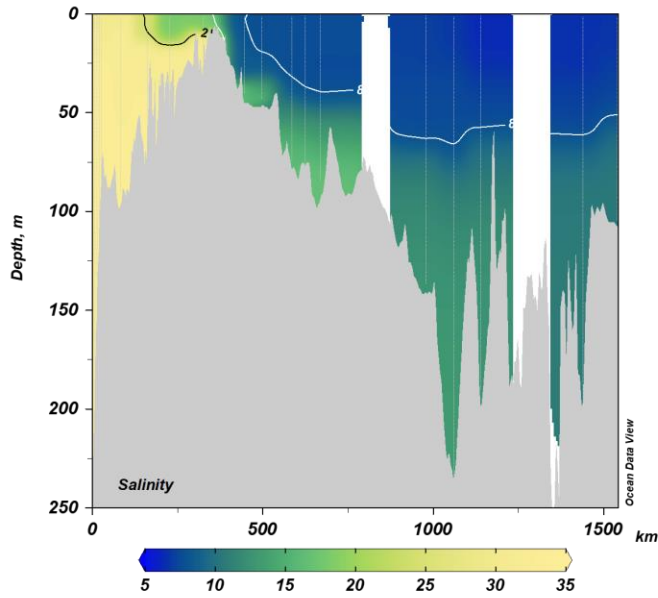
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



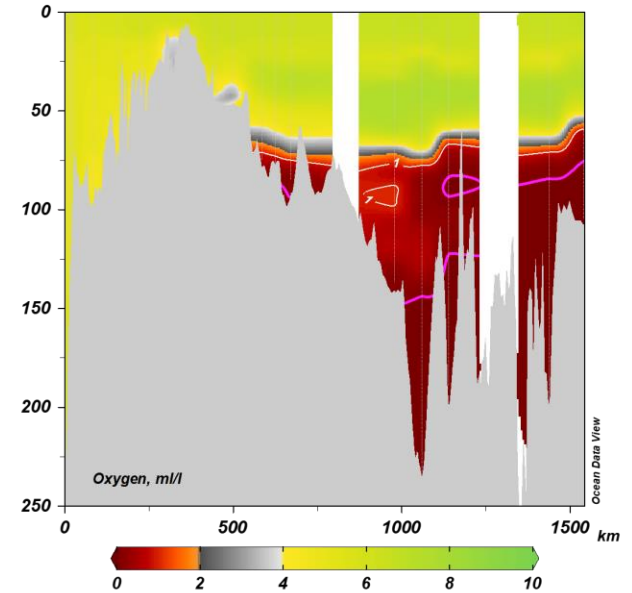
SMHI cruise August 20190816 – 20190823 CTD section



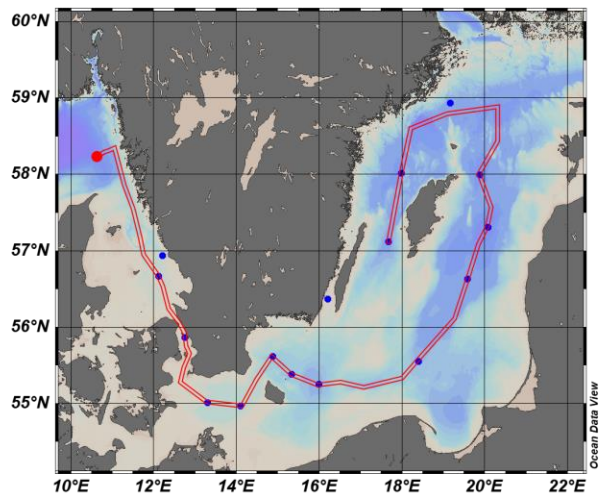
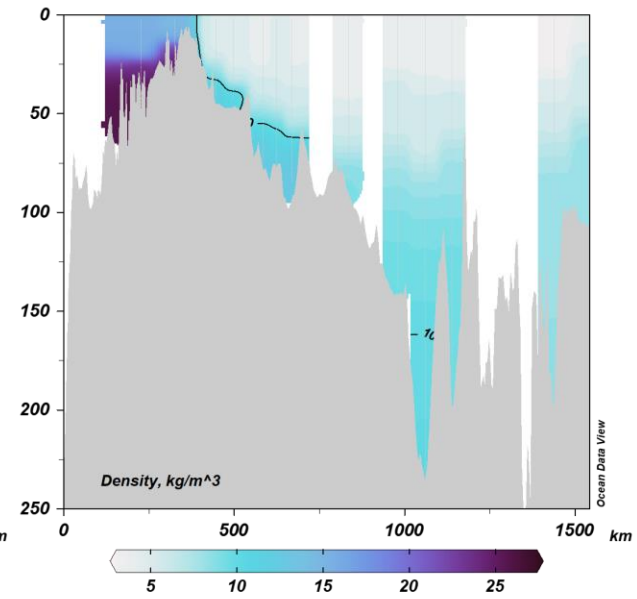
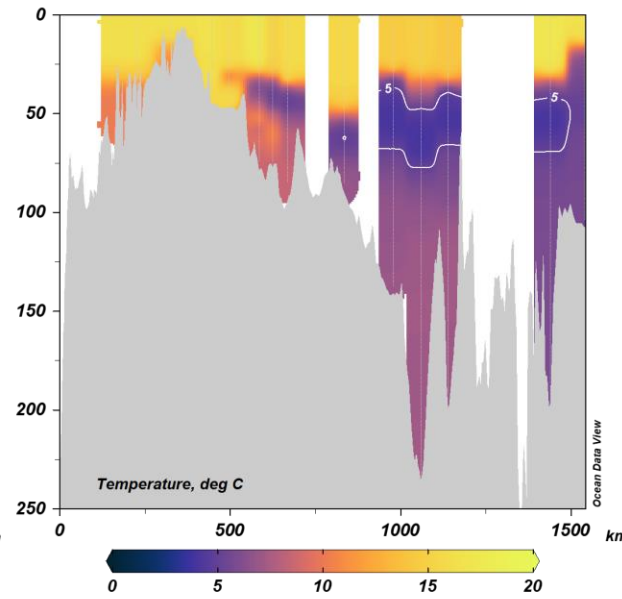
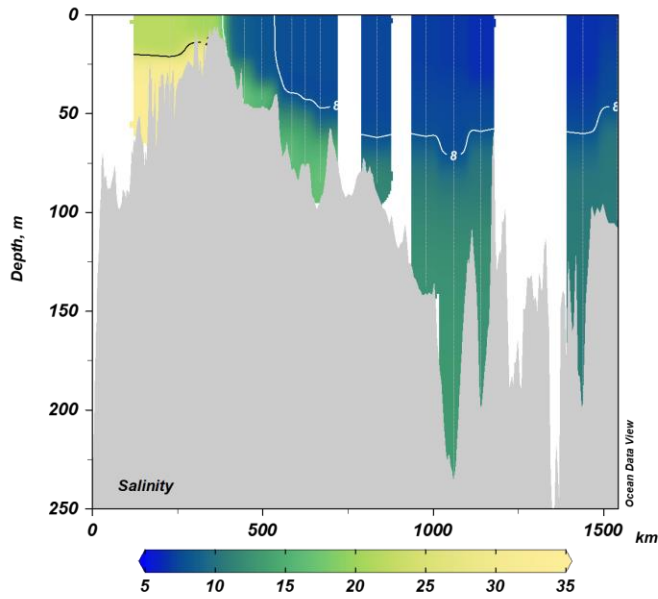
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



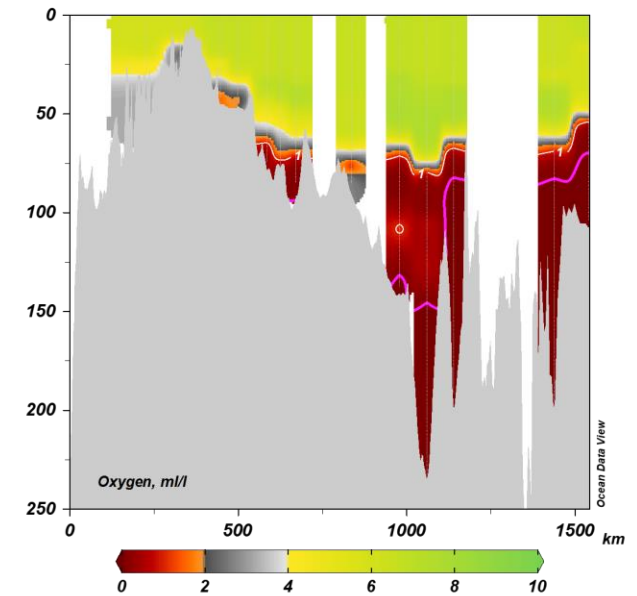
SMHI cruise September 20190912 – 20190919 CTD section



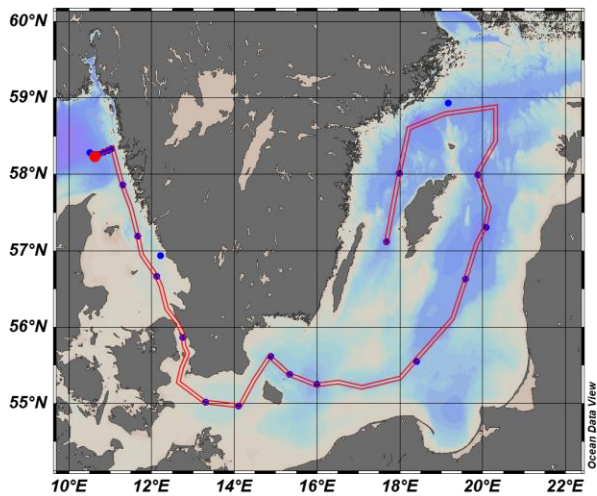
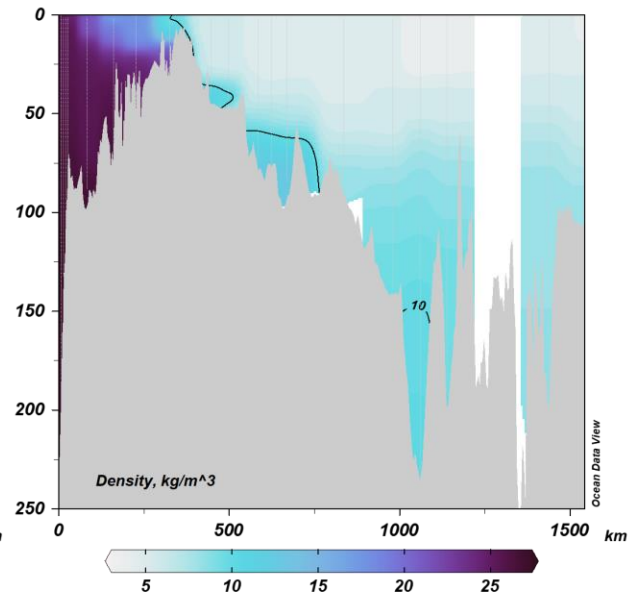
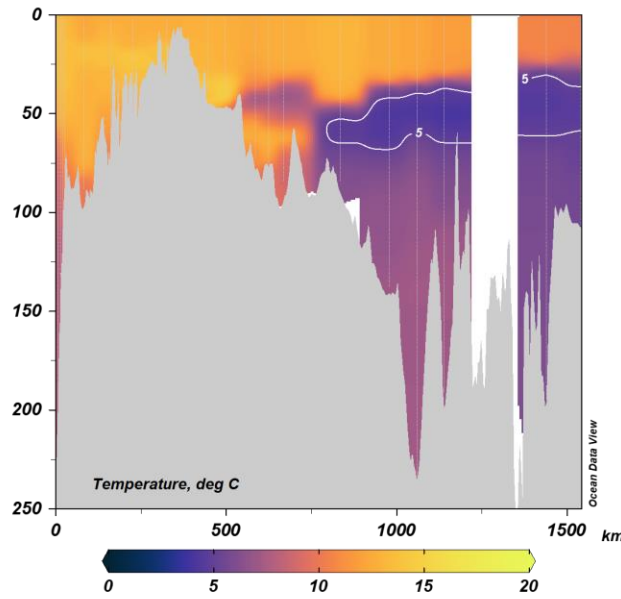
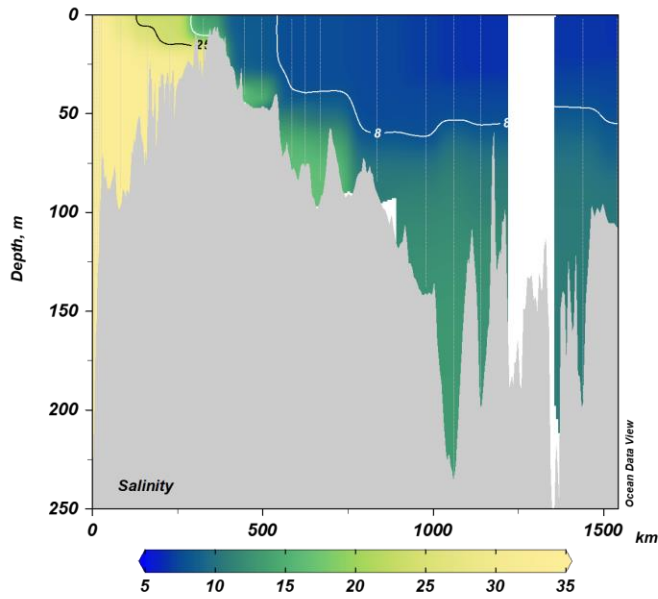
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



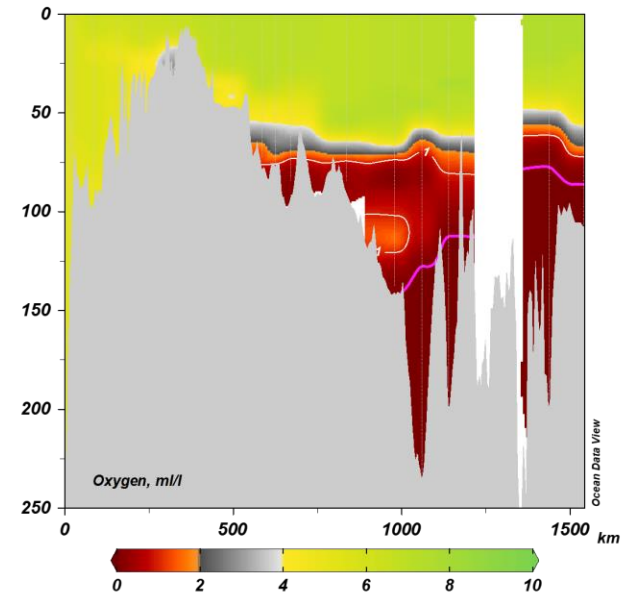
SMHI cruise October 20191013 – 20191020 CTD section



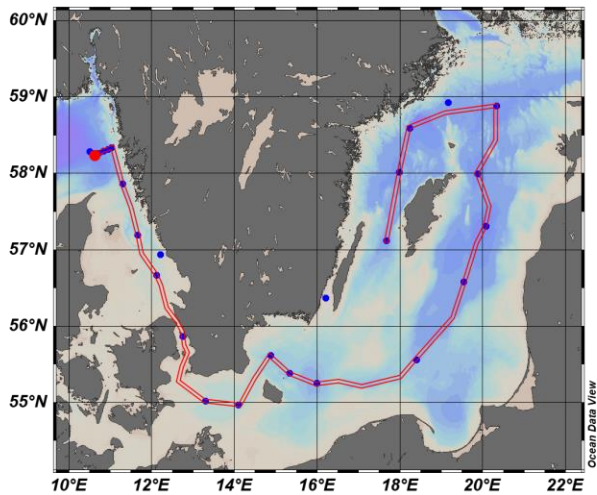
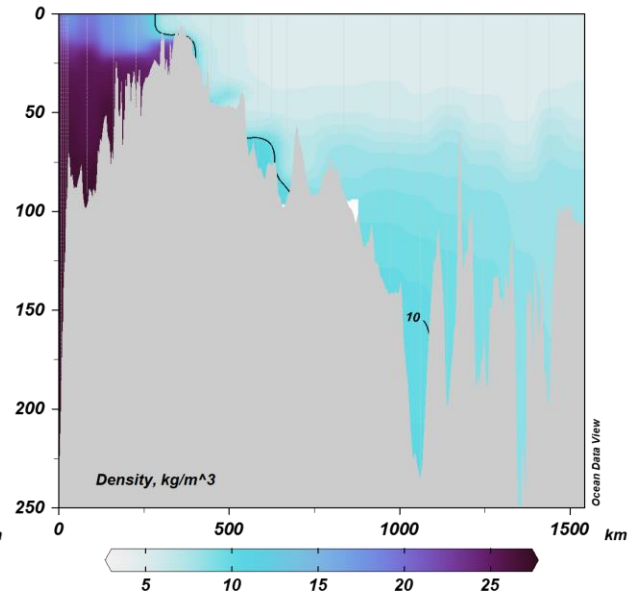
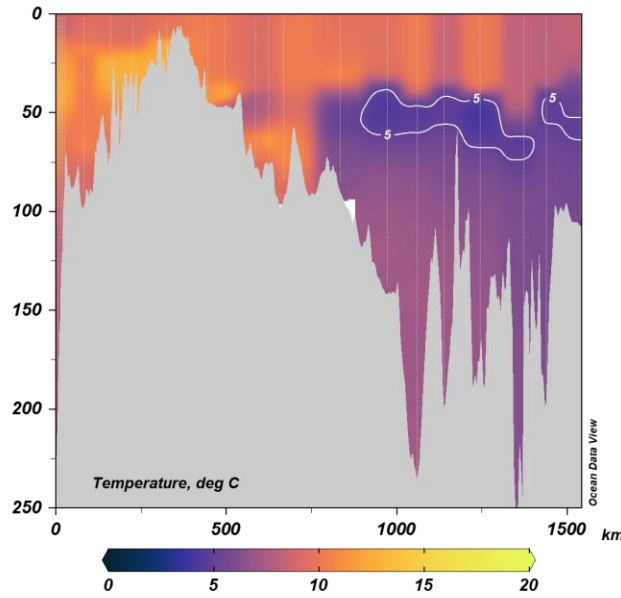
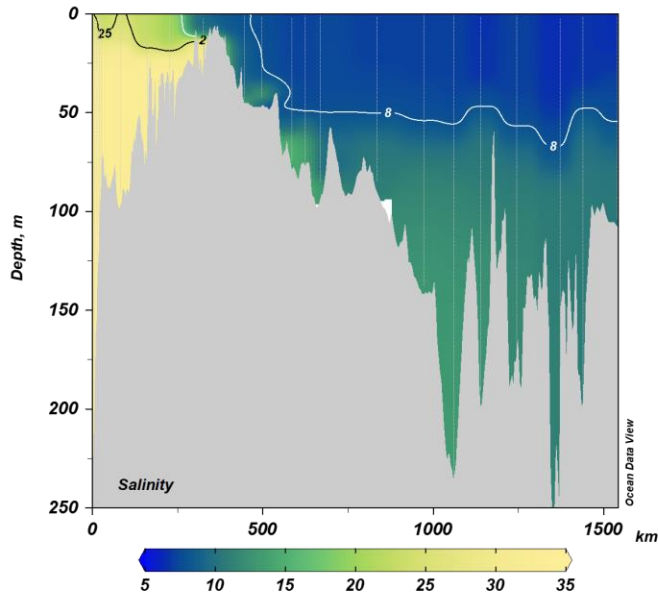
Isolines

Salinity: 6, 8, 17 (white), 25 (black)
 Temperature: 5
 Oxygen: 1 (white), 0.1 (pink)
 Density: 10

Thin vertical lines are stations



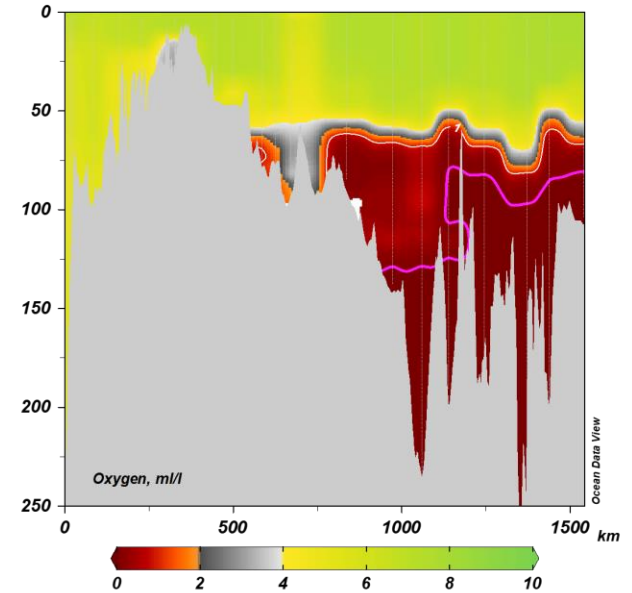
SMHI cruise November 20191109 – 20191114 CTD section



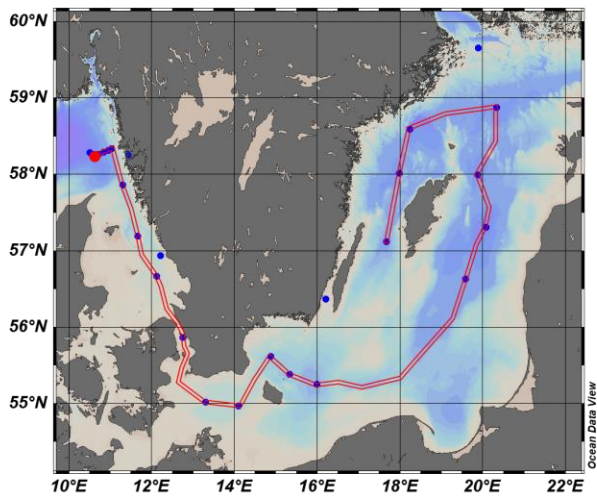
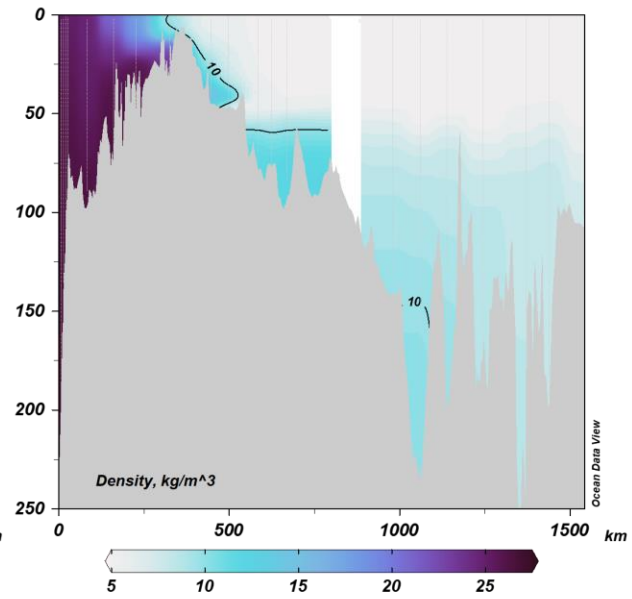
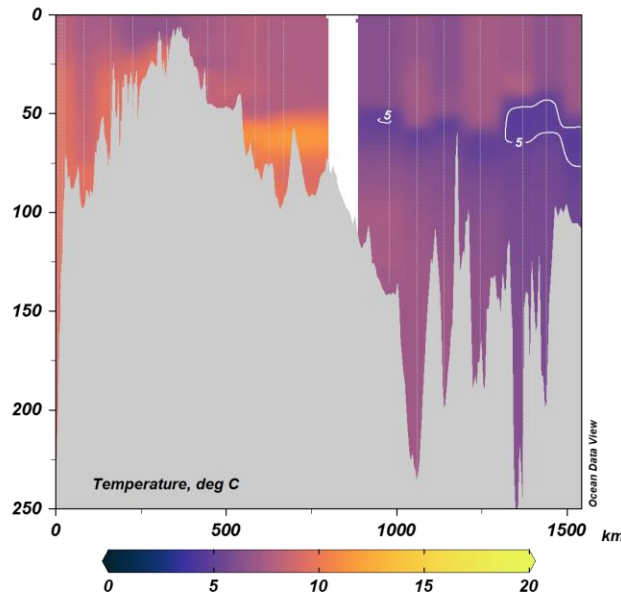
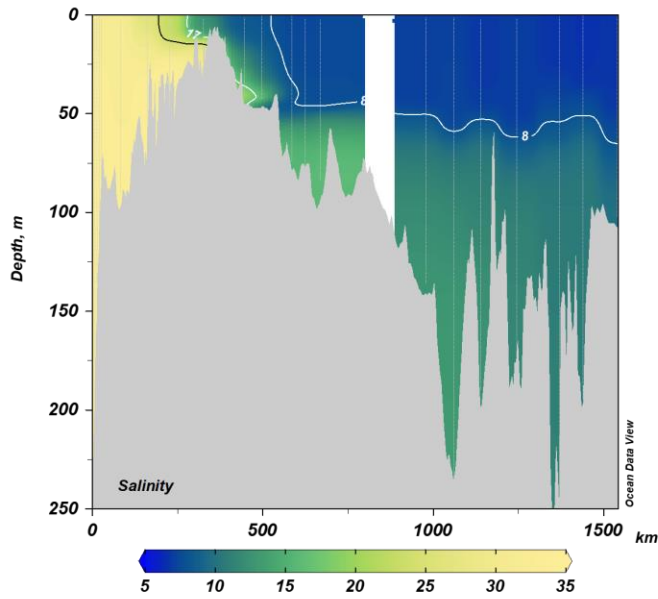
Isolines

Salinity: 6, 8, 17 (white), 25 (black)
 Temperature: 5
 Oxygen: 1 (white), 0.1 (pink)
 Density: 10

Thin vertical lines are stations



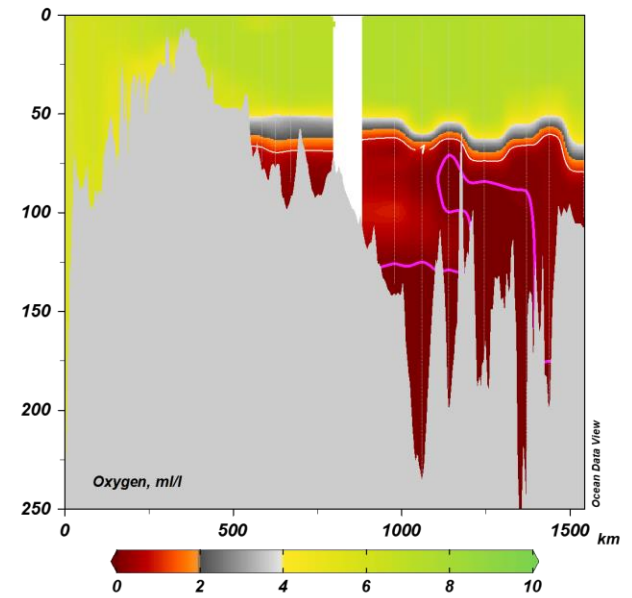
SMHI cruise December 20191204 – 20191216 CTD section



Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



Appendix I

Seasonal cycles from monthly and high frequency stations sampled 2019.

Surface water (0-10 m): including comparison to the mean and standard deviation for the period 2001-2015 for each month at each station. Included parameters are salinity, temperature, dissolved inorganic phosphorus (DIP), dissolved inorganic nitrogen (DIN; sum of ammonium, nitrate and nitrite), dissolved silica, total nitrogen, total phosphorus, chlorophyll, pH, alkalinity, humic substances, dissolved oxygen and oxygen saturation. Dissolved oxygen (including hydrogen sulphide expressed as negative oxygen) is presented for the bottom water.

Data for oxygen is primarily from the water sampling, but if data is missing, values from sensors on the CTD are presented instead. Data for salinity and temperature is primarily from sensors on the CTD. Data in the time series for bottom oxygen is only from water samples.

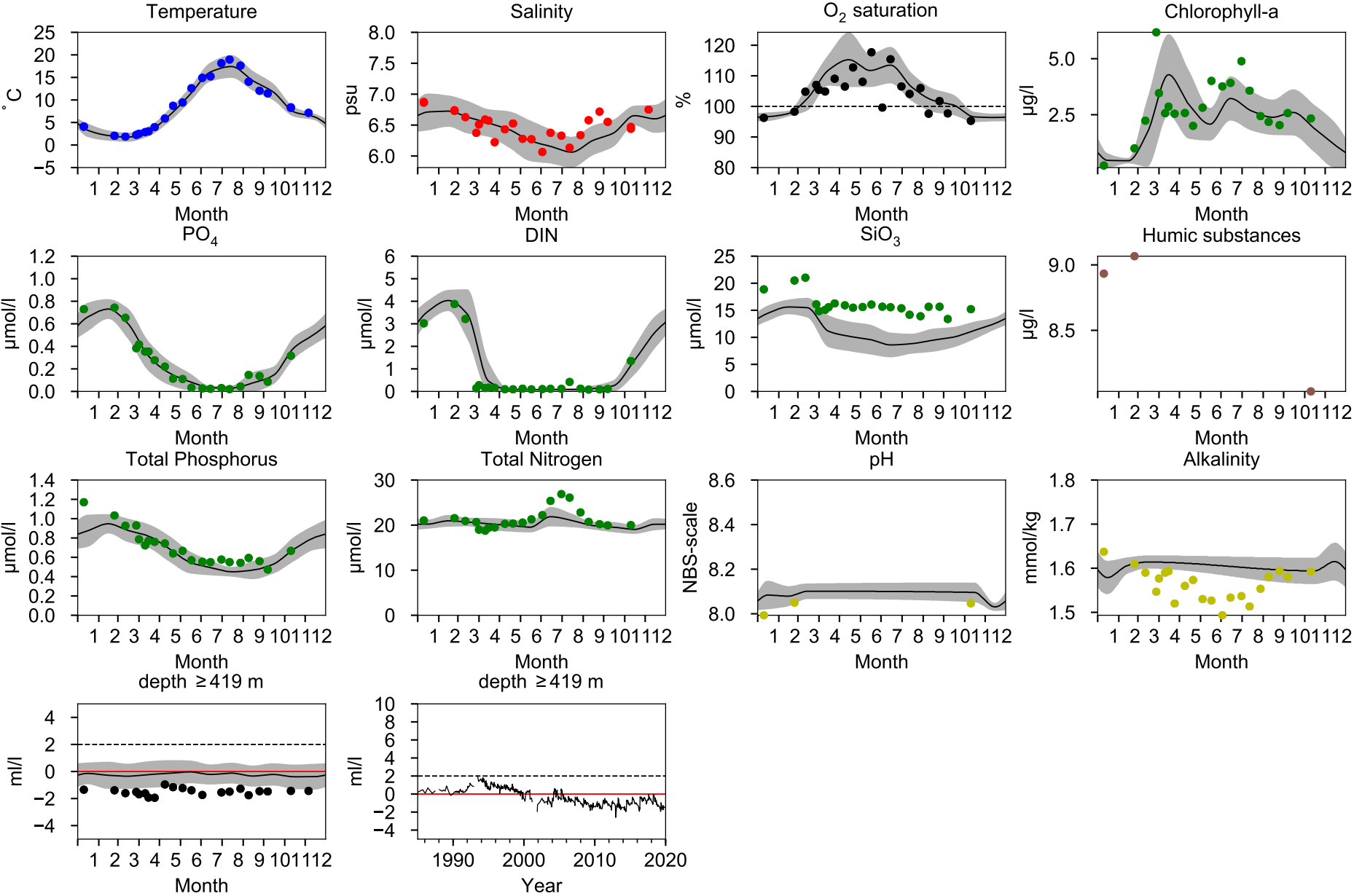
Appendix I

Seasonal cycles from monthly and high frequency stations sampled 2019.

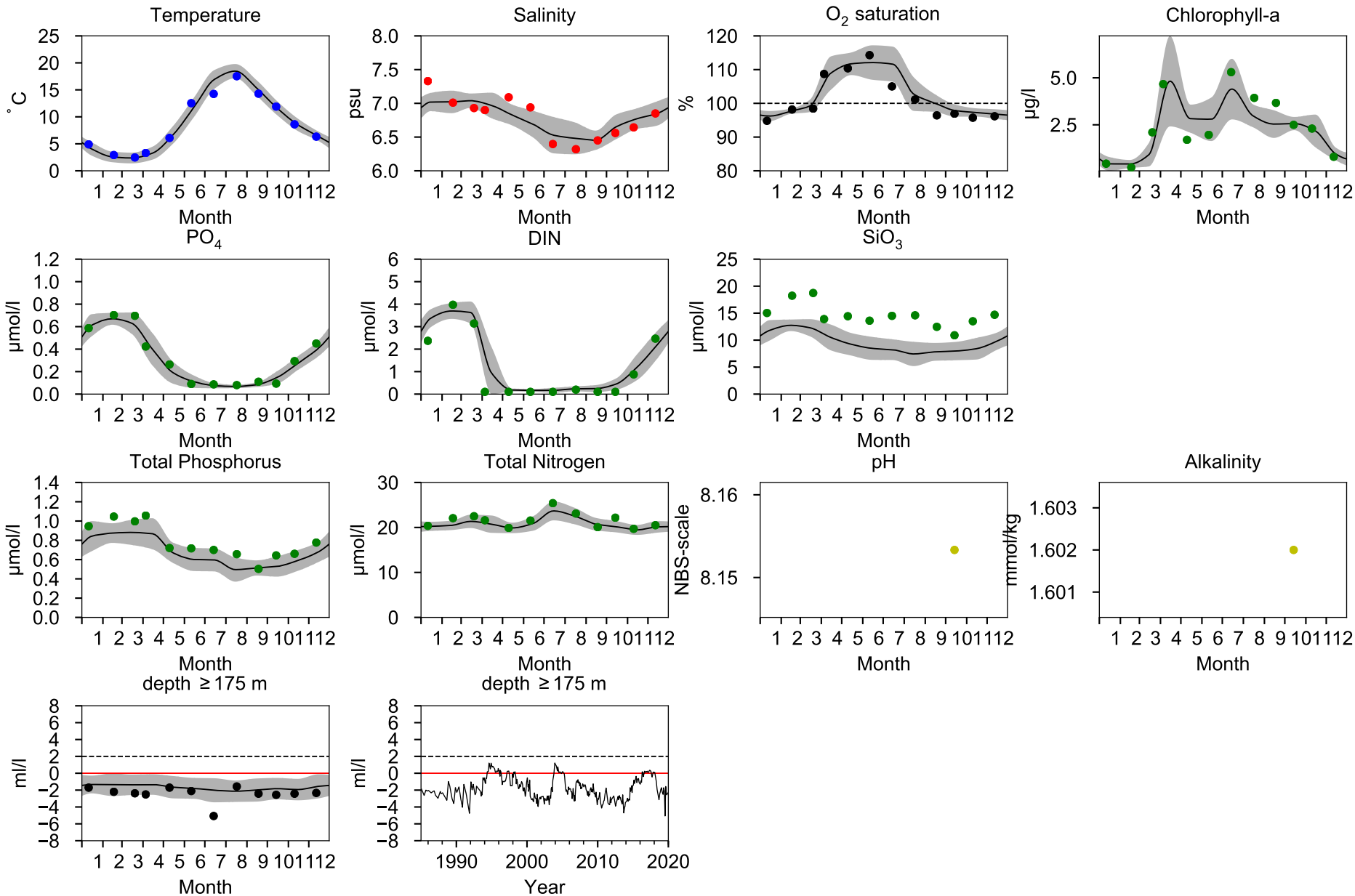
Surface water (0-10 m): including comparison to the mean and standard deviation for the period 2001-2015 for each month at each station. Included parameters are salinity, temperature, dissolved inorganic phosphorus (DIP), dissolved inorganic nitrogen (DIN; sum of ammonium, nitrate and nitrite), dissolved silica, total nitrogen, total phosphorus, chlorophyll, pH, alkalinity, humic substances, dissolved oxygen and oxygen saturation. Dissolved oxygen (including hydrogen sulphide expressed as negative oxygen) is presented for the bottom water.

Data for oxygen is primarily from the water sampling, but if data is missing, values from sensors on the CTD are presented instead. Data for salinity and temperature is primarily from sensors on the CTD. Data in the time series for bottom oxygen is only from water samples.

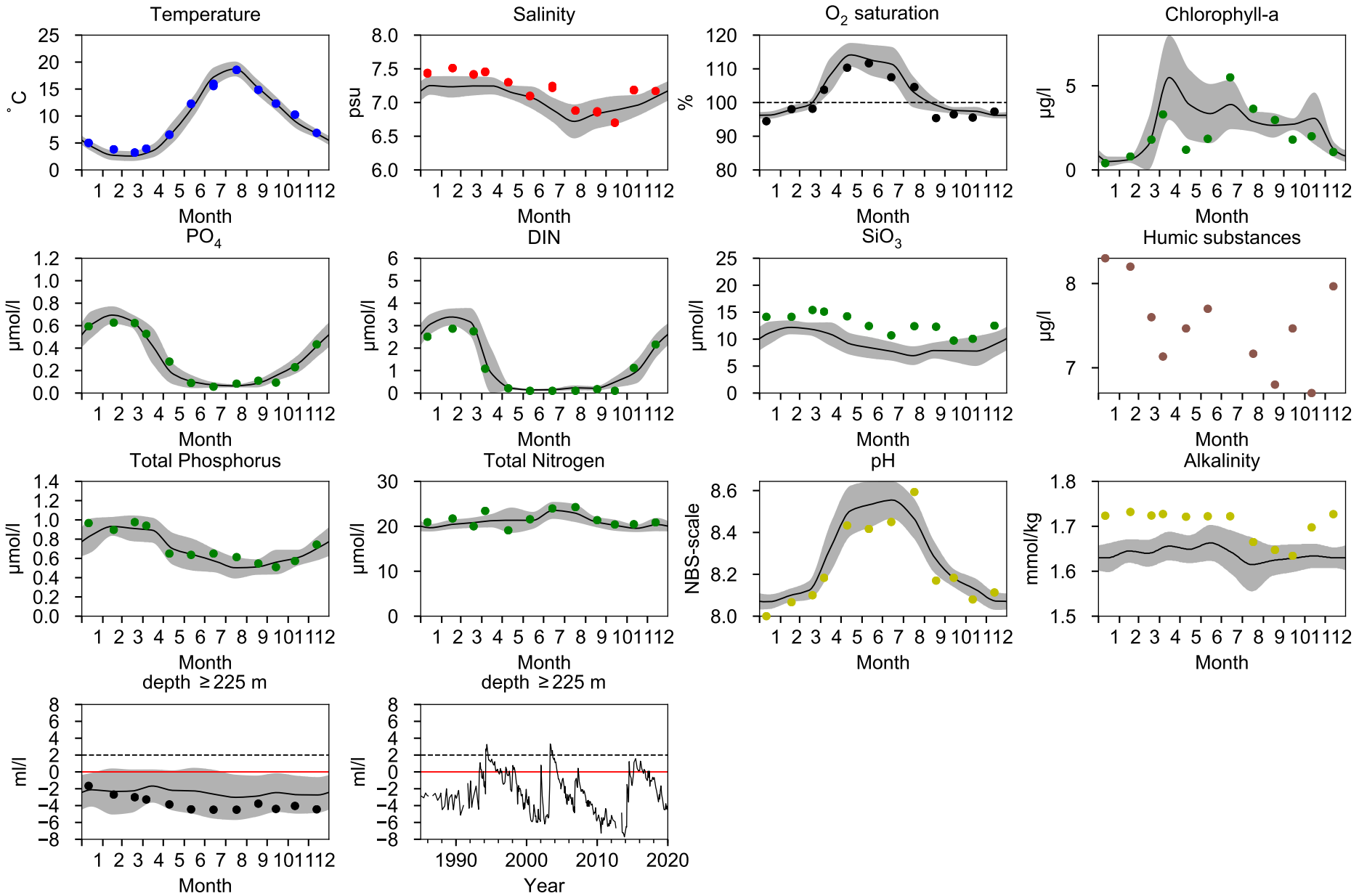
STATION BY31 LANDSORTSDJ SURFACE WATER (0-10 m)



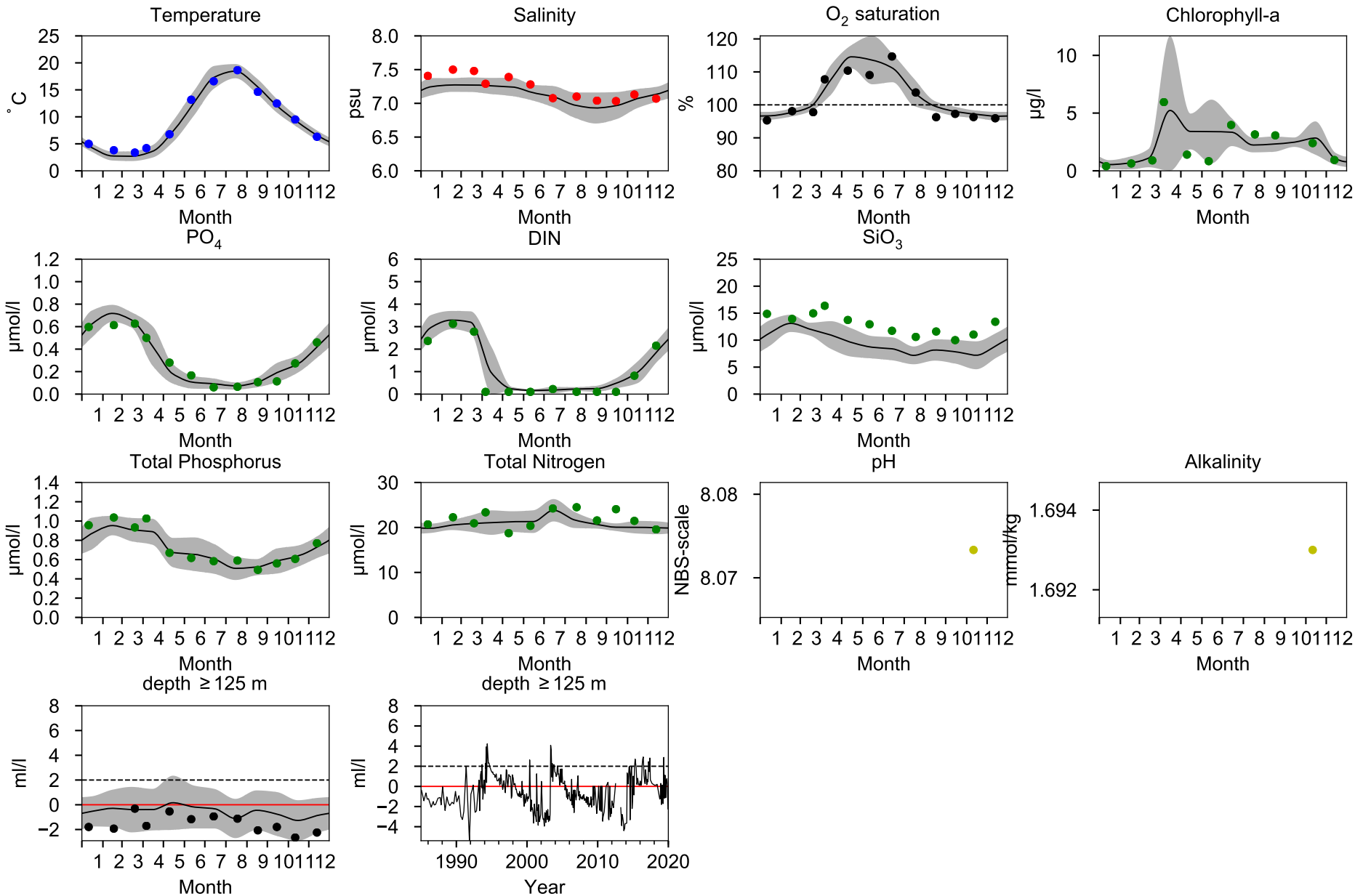
STATION BY20 FÄRÖDJ SURFACE WATER (0-10 m)



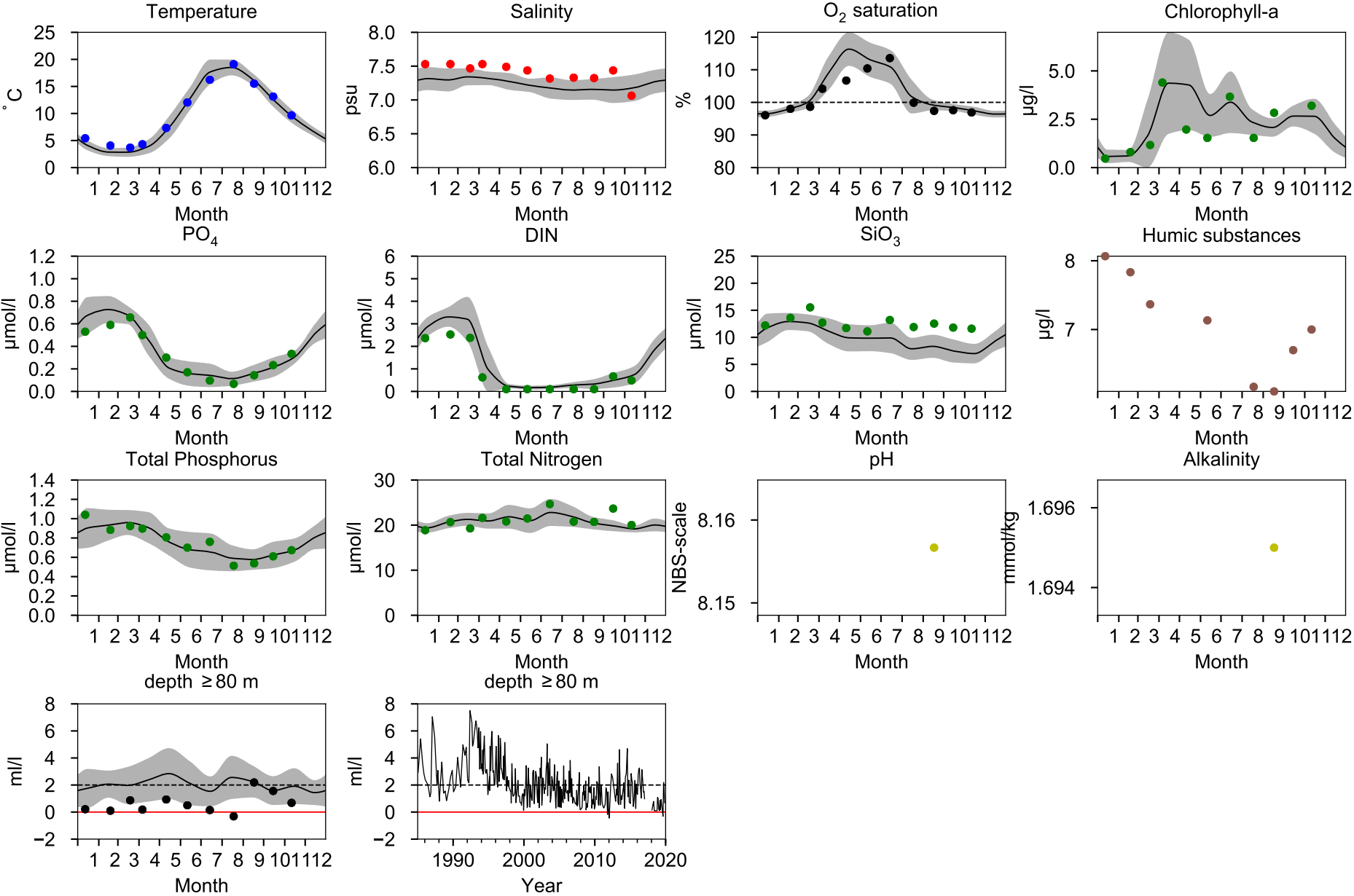
STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)



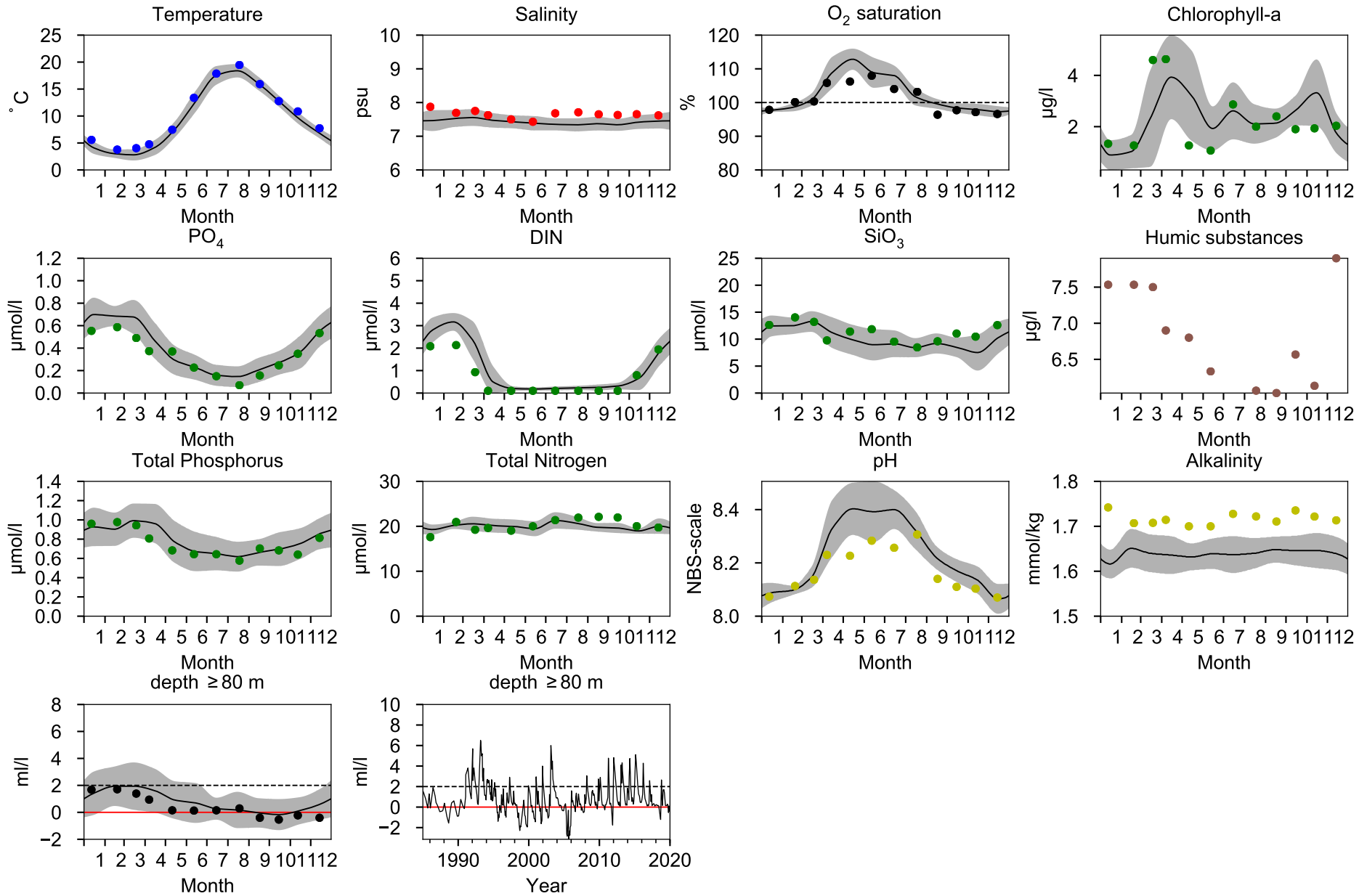
STATION BY10 SURFACE WATER (0-10 m)



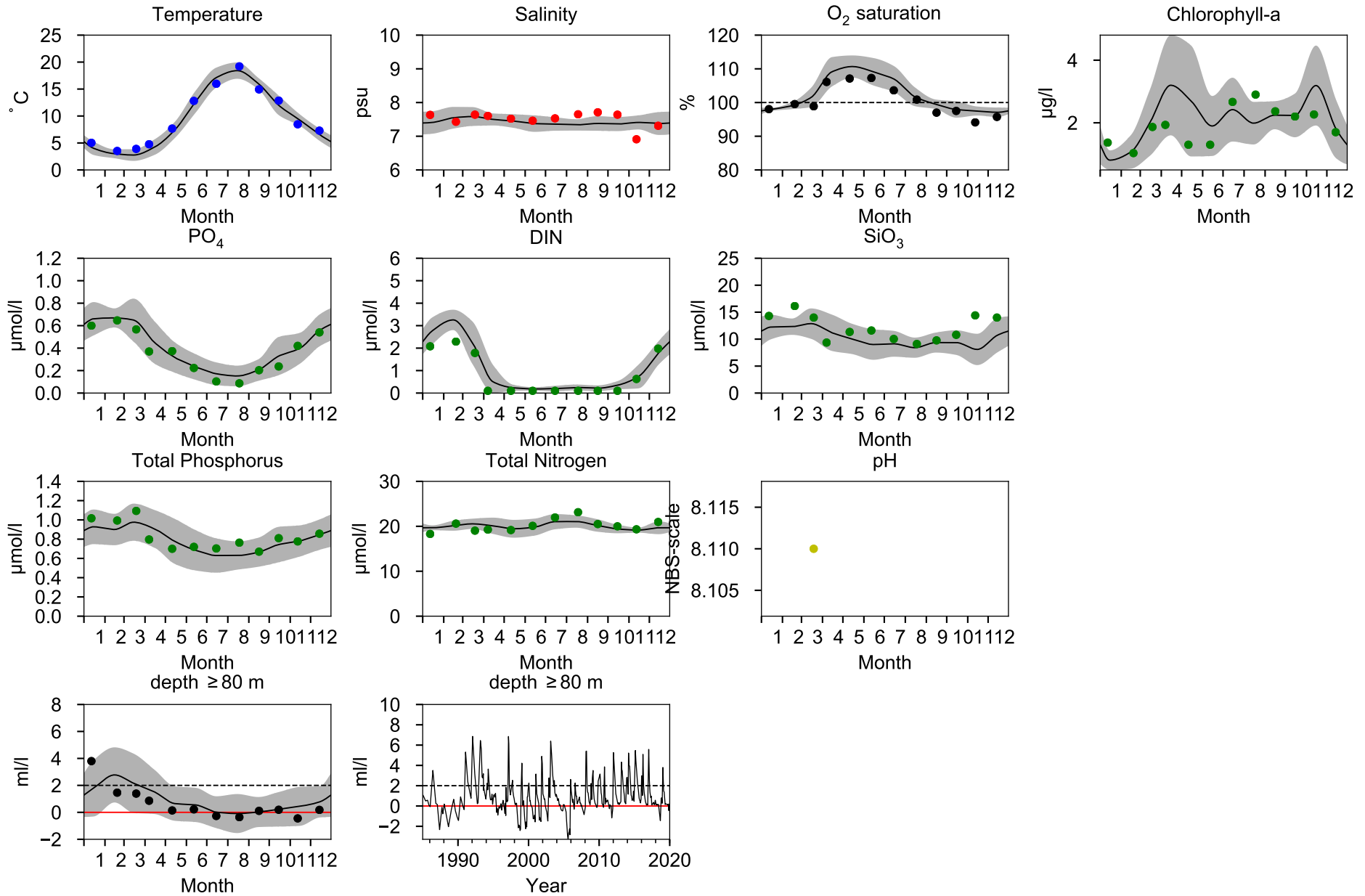
STATION BCS III-10 SURFACE WATER (0-10 m)



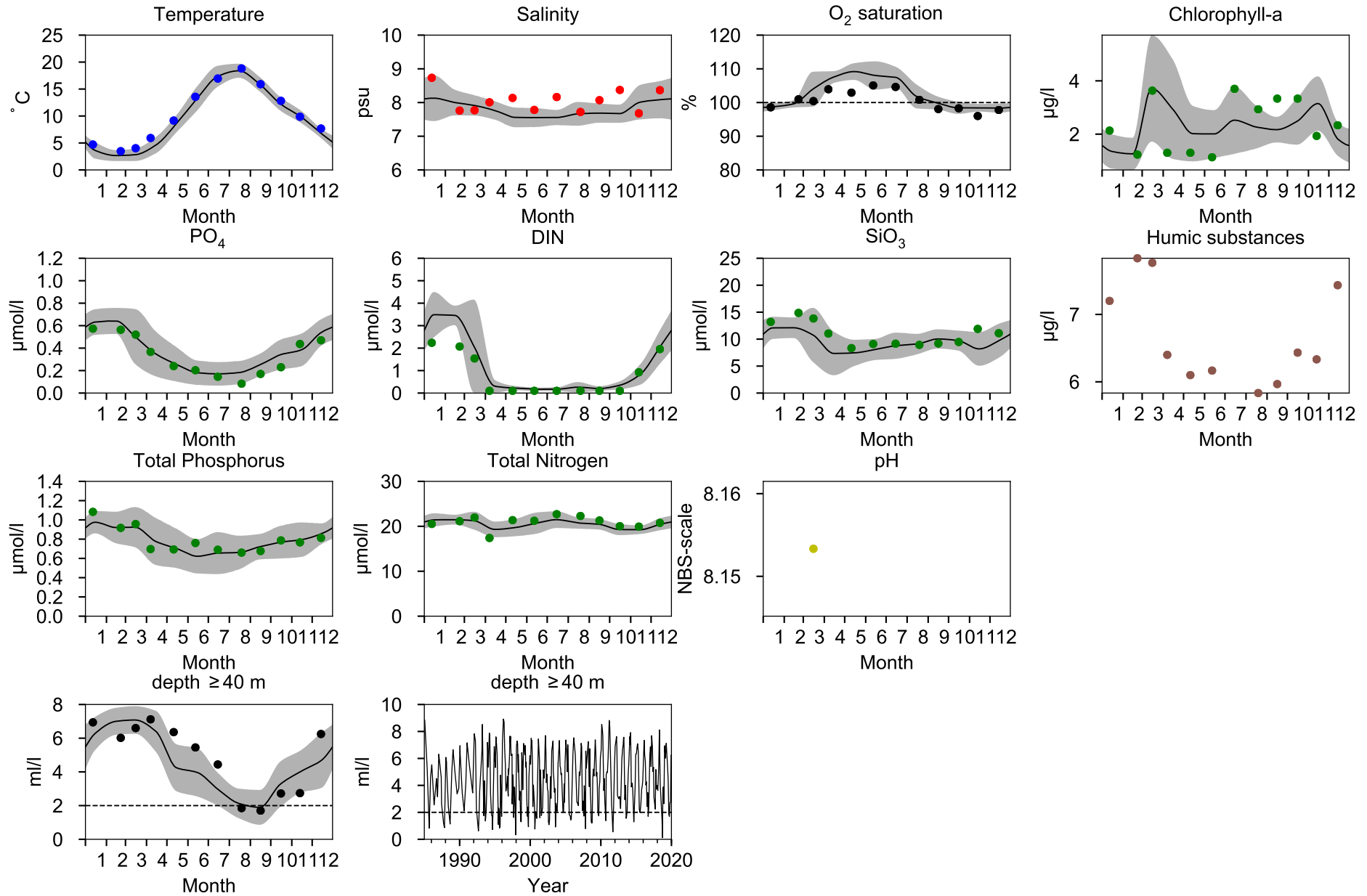
STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)



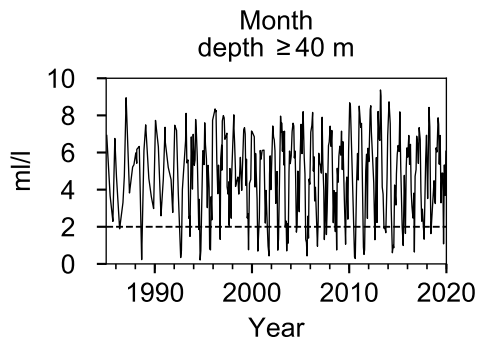
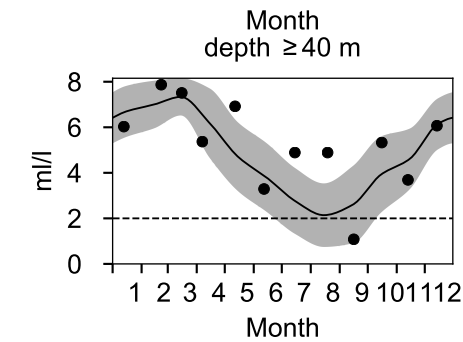
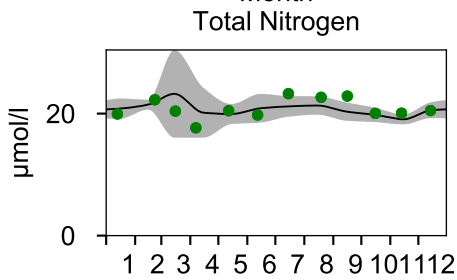
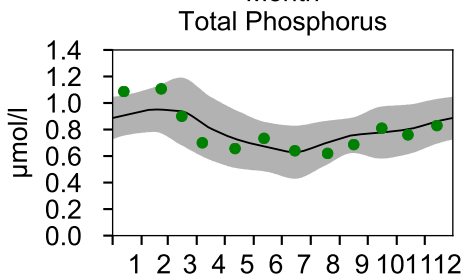
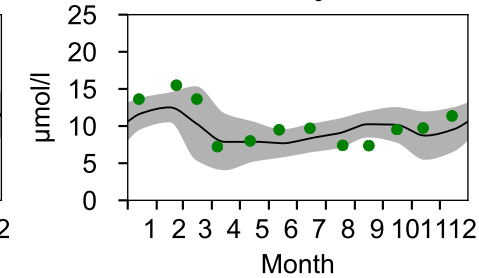
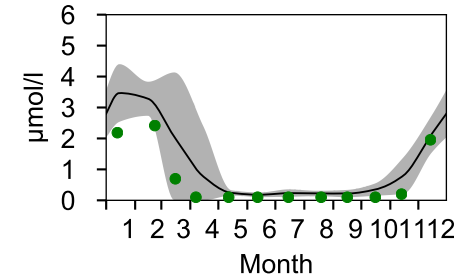
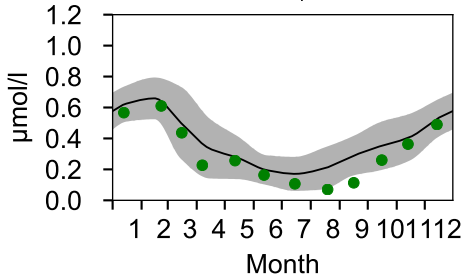
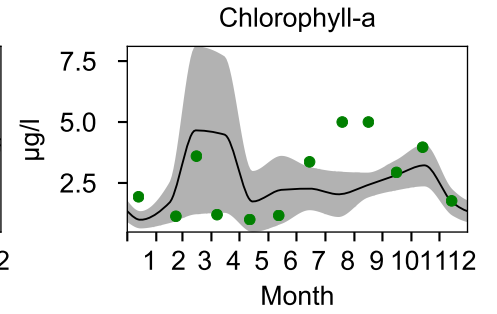
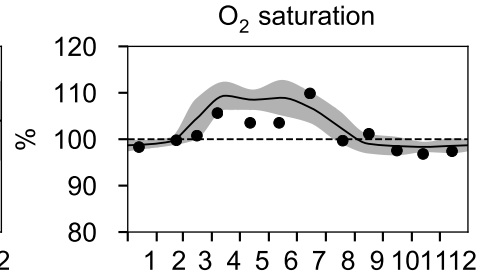
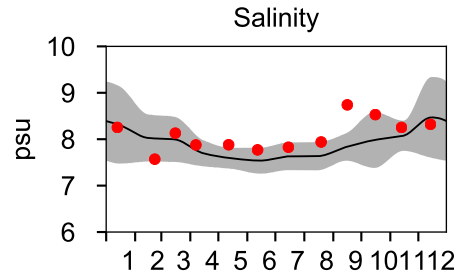
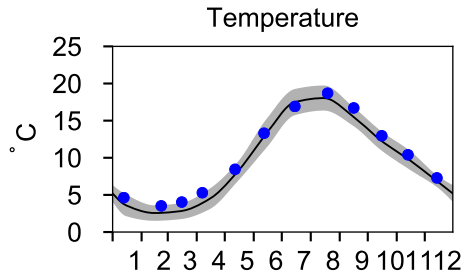
STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)



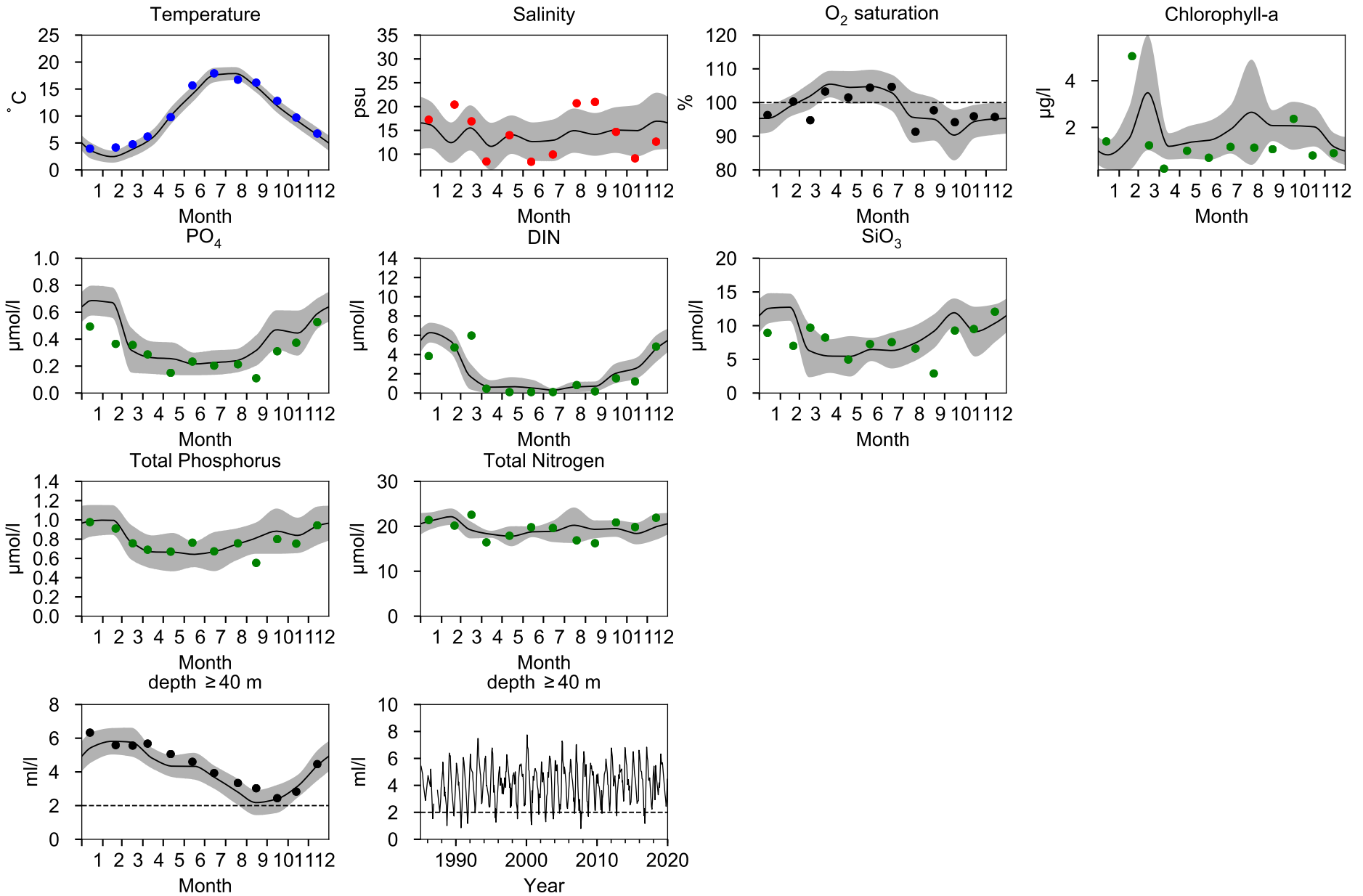
STATION BY2 ARKONA SURFACE WATER (0-10 m)



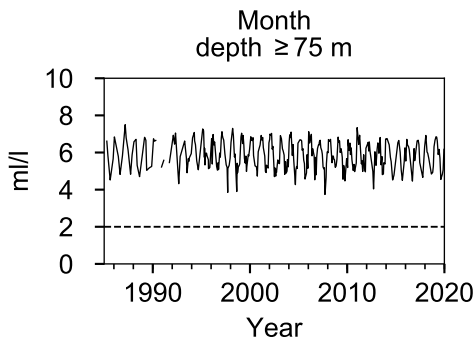
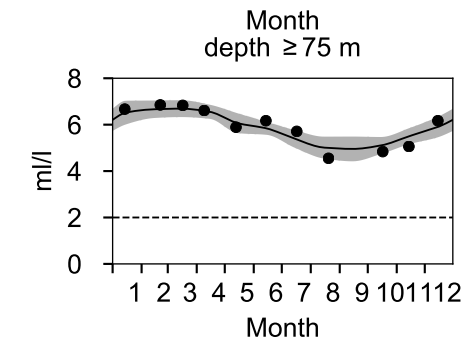
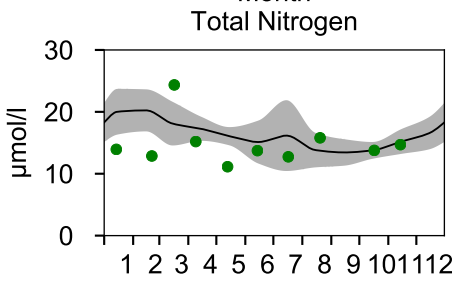
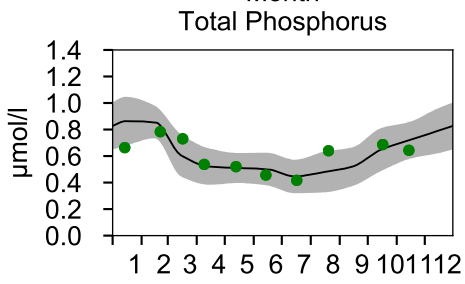
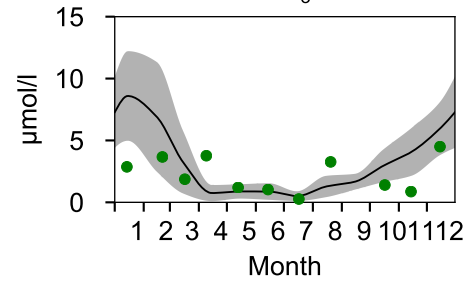
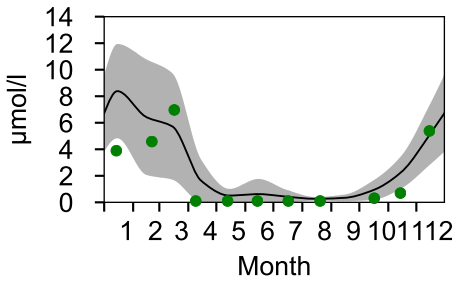
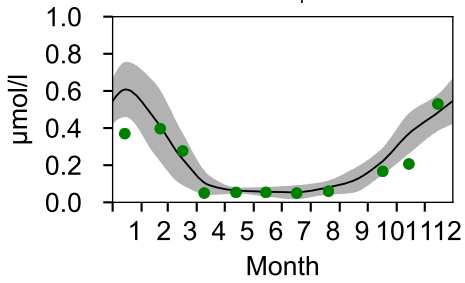
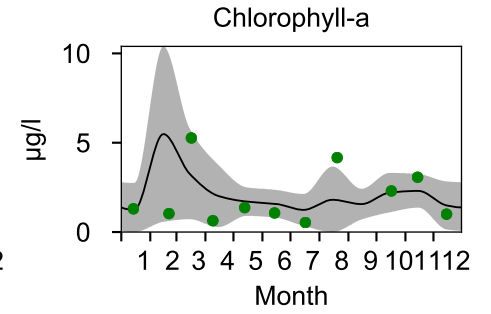
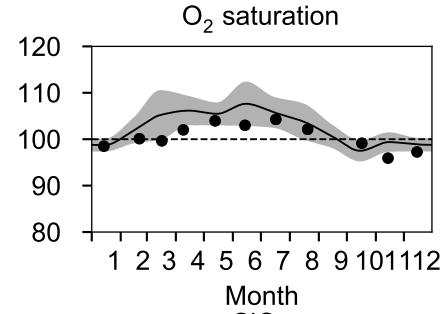
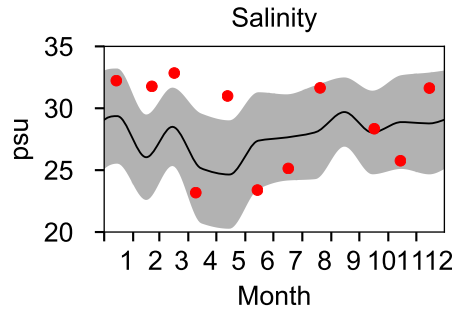
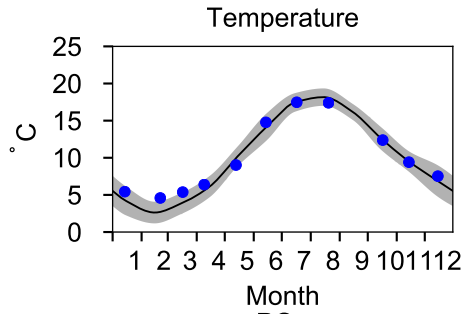
STATION BY1 SURFACE WATER (0-10 m)



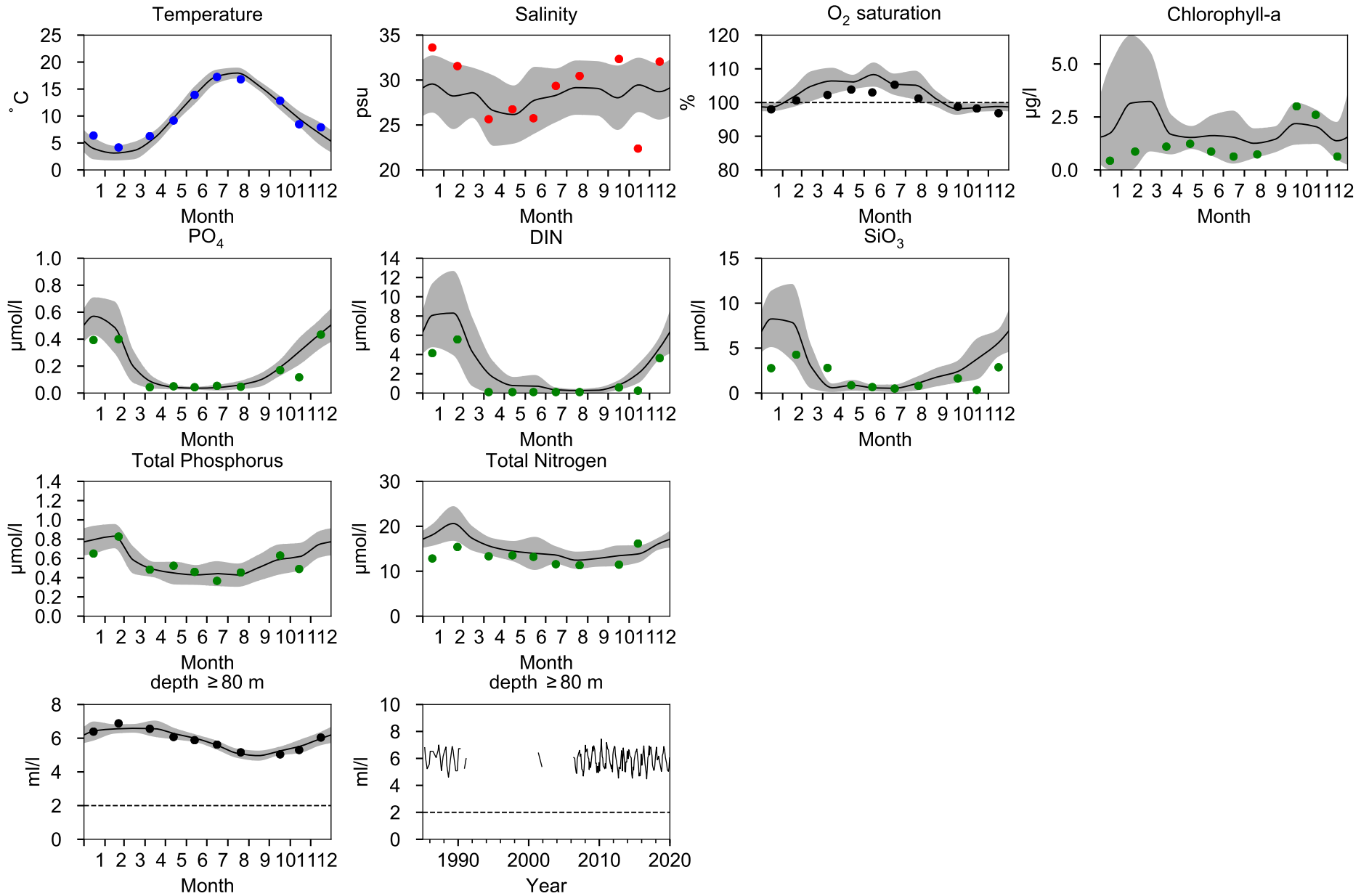
STATION W LANDSKRONA SURFACE WATER (0-10 m)



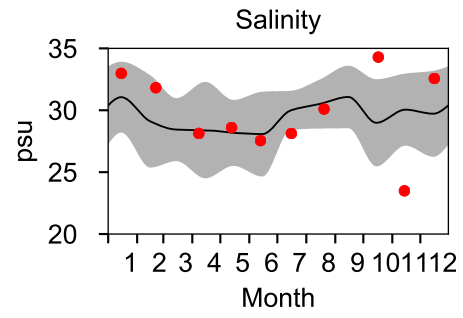
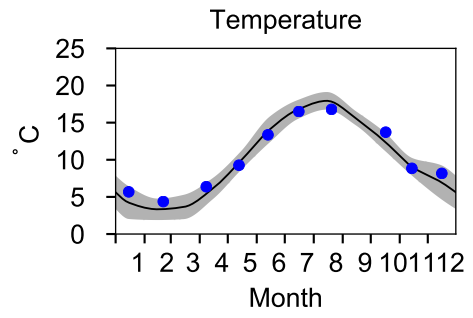
STATION P2 SURFACE WATER (0-10 m)



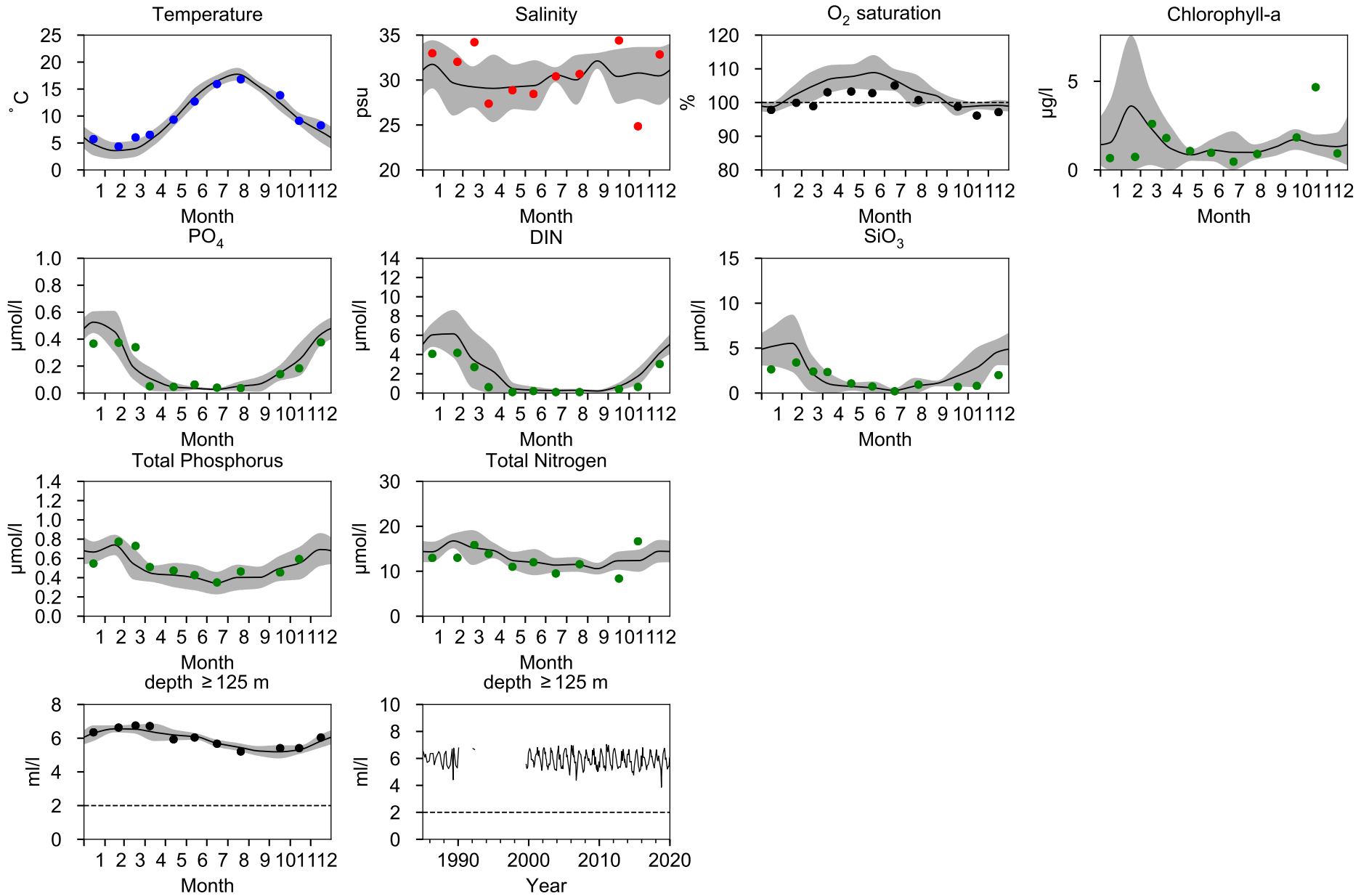
STATION Å13 SURFACE WATER (0-10 m)



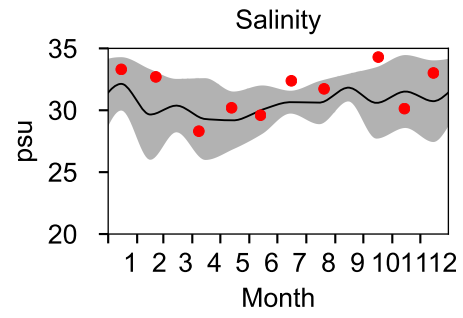
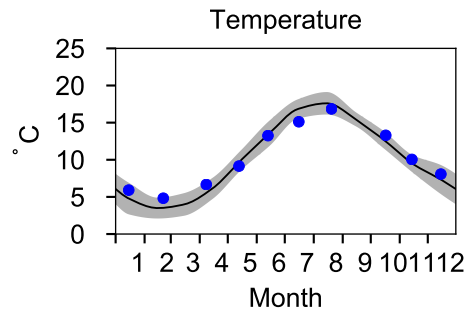
STATION Å14 SURFACE WATER (0-10 m)



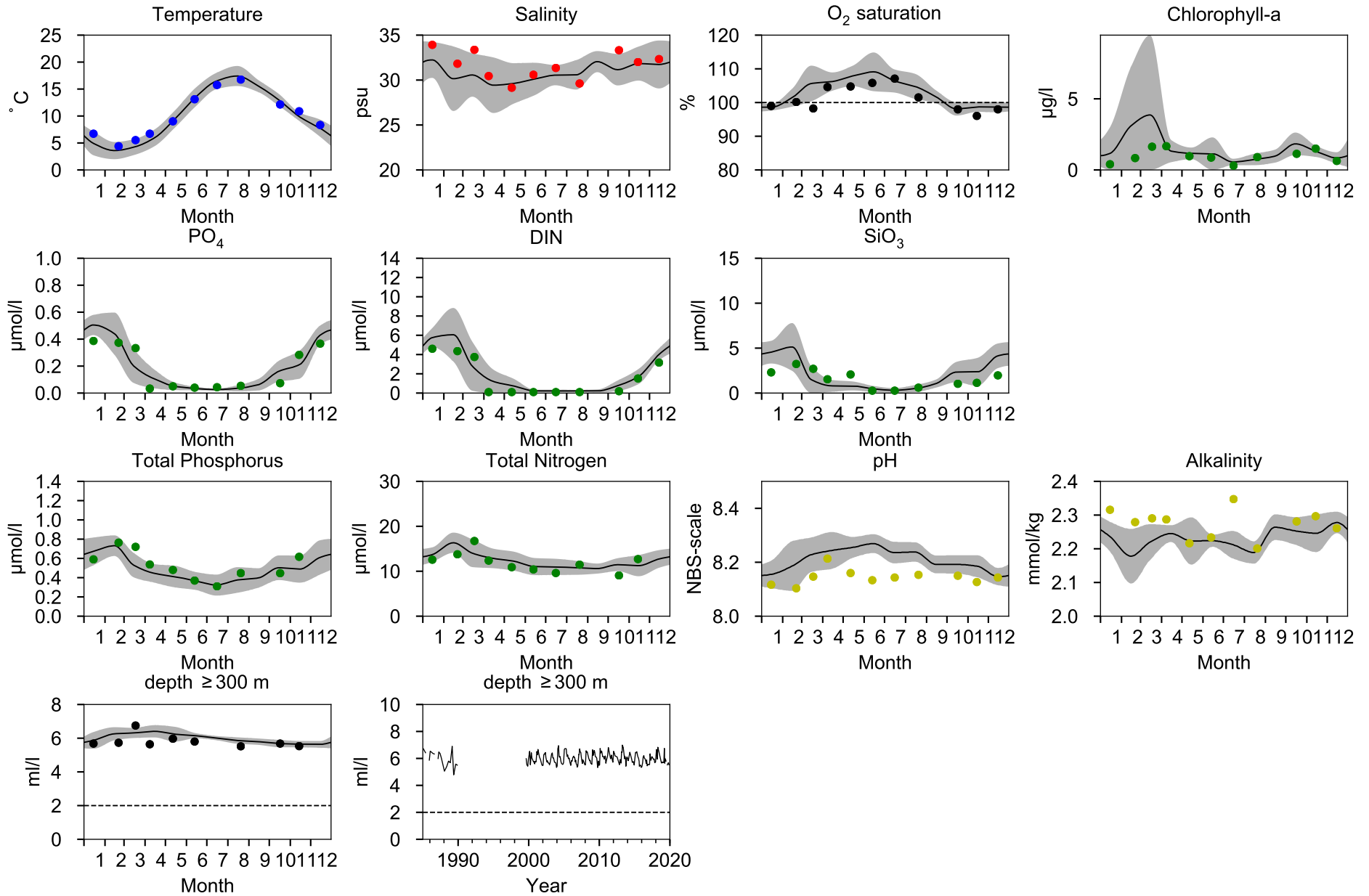
STATION Å15 SURFACE WATER (0-10 m)



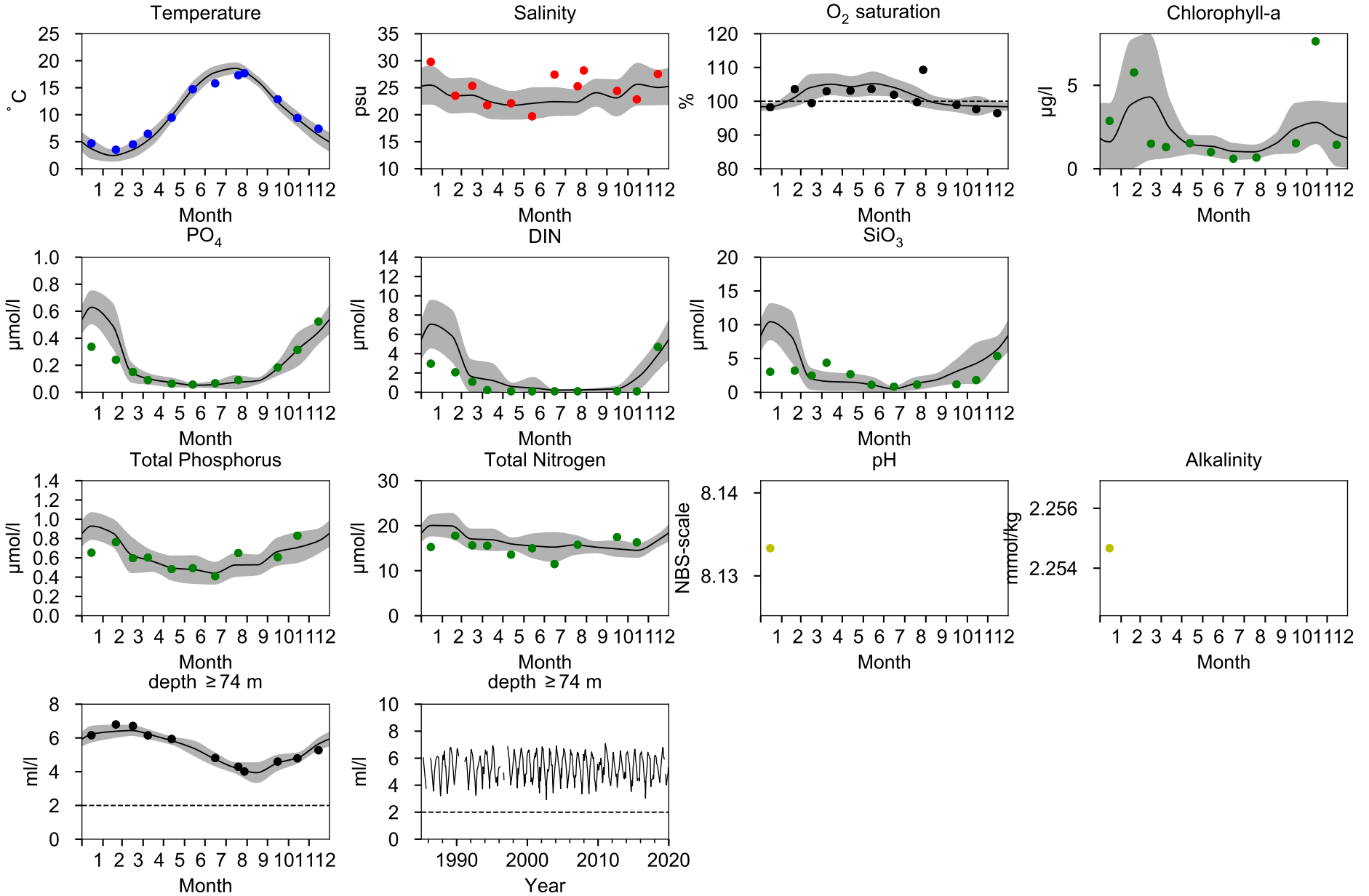
STATION Å16 SURFACE WATER (0-10 m)



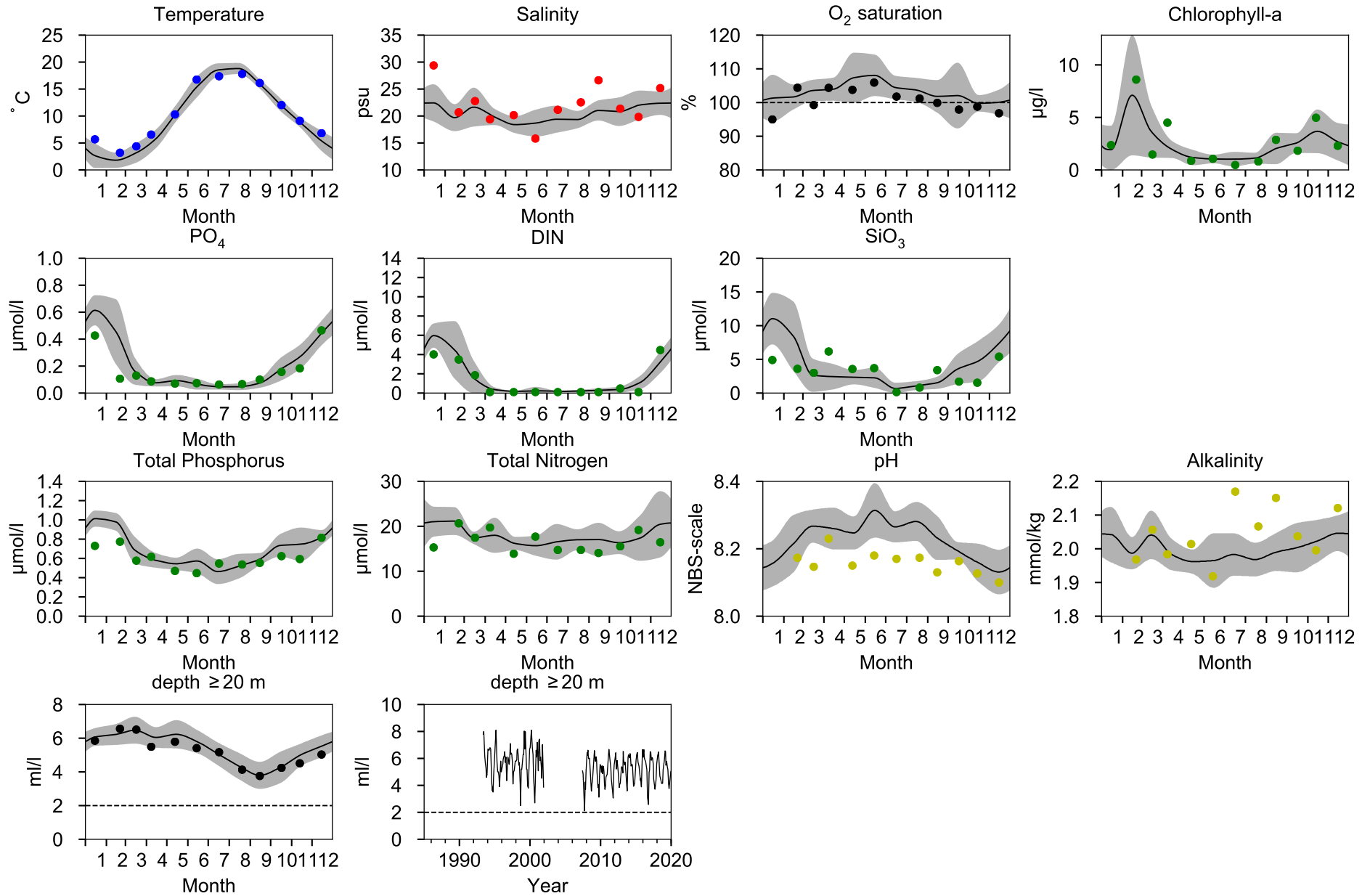
STATION Å17 SURFACE WATER (0-10 m)



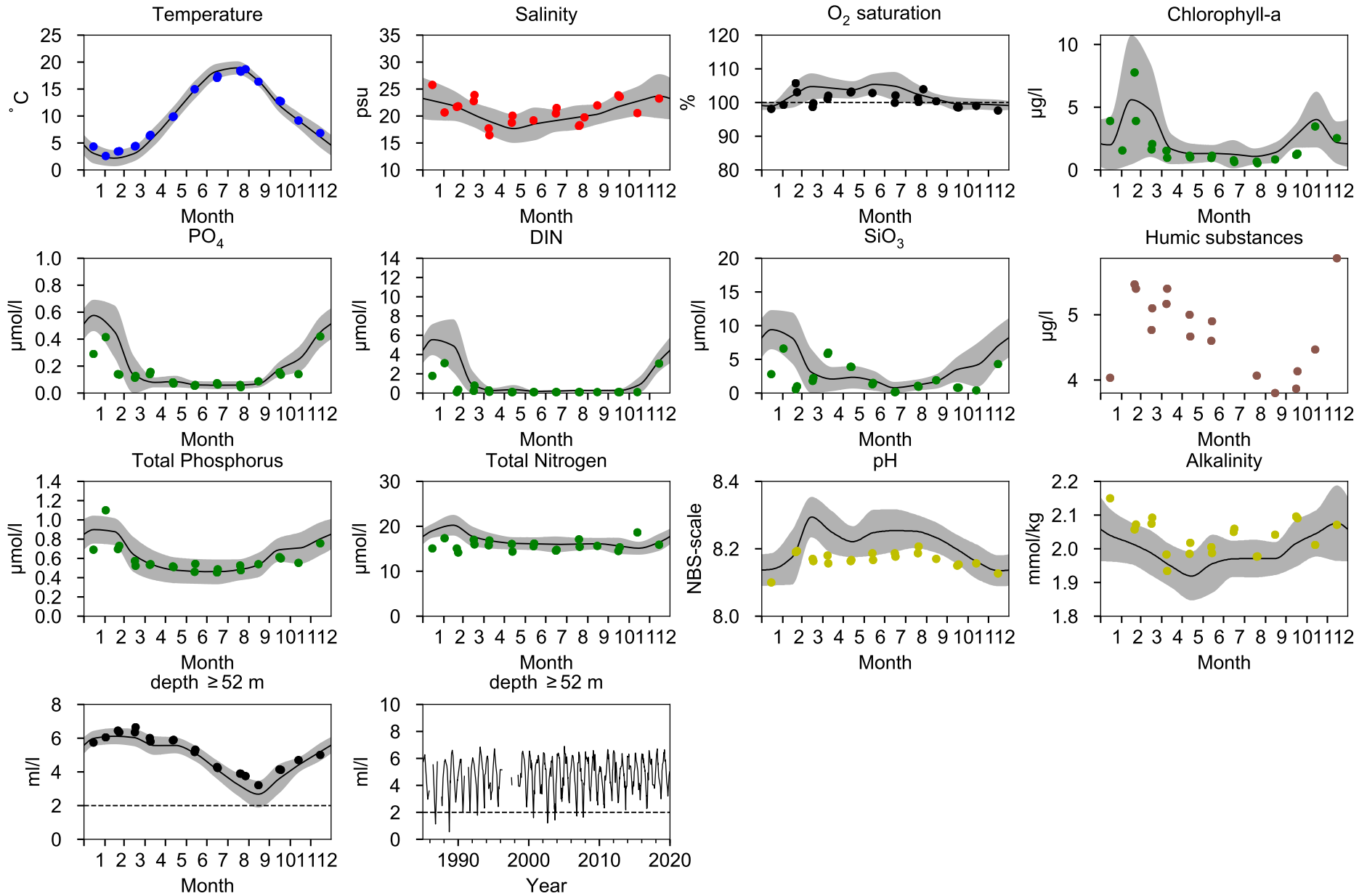
STATION FLADEN SURFACE WATER (0-10 m)



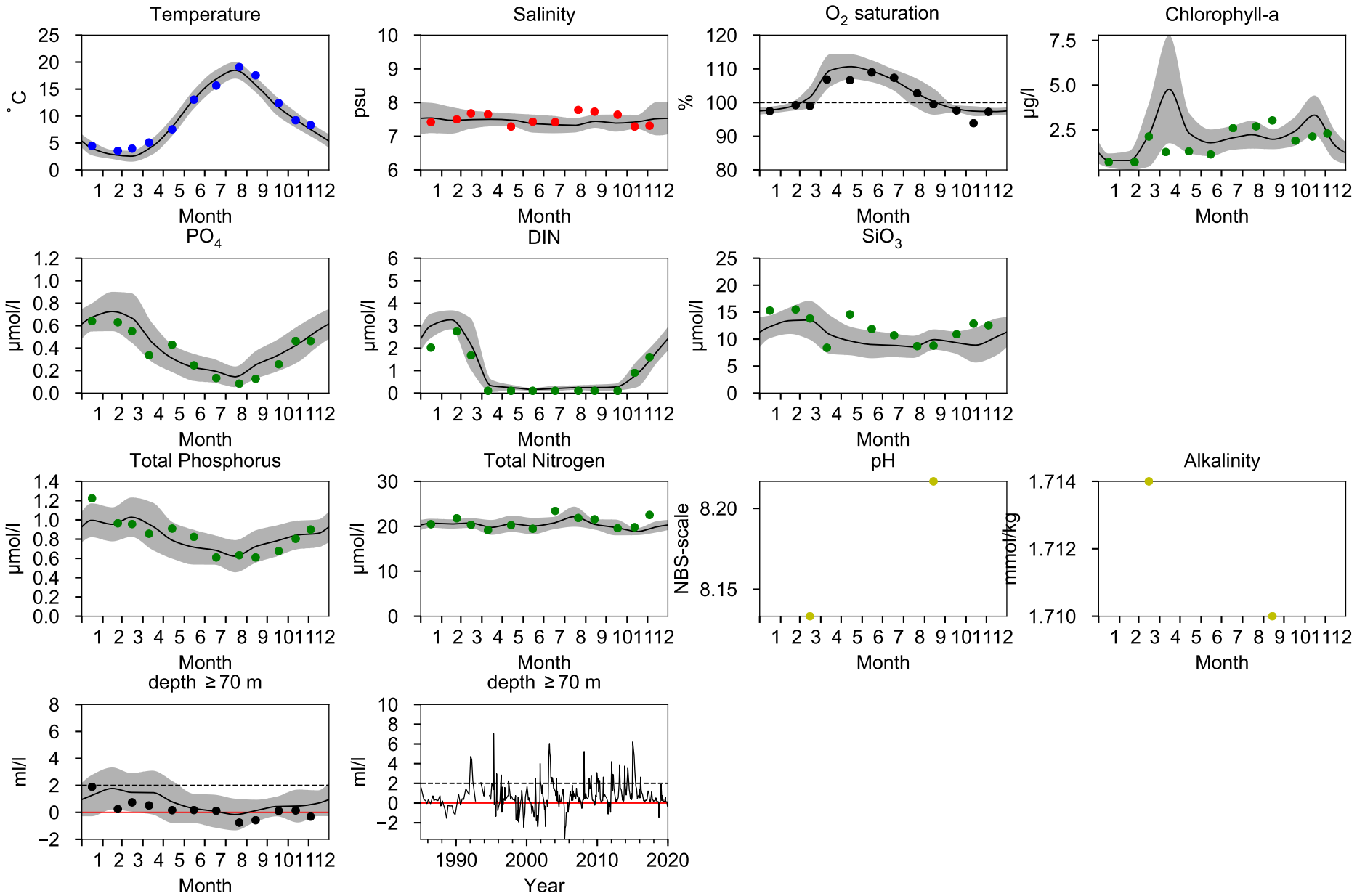
STATION N14 FALKENBERG SURFACE WATER (0-10 m)



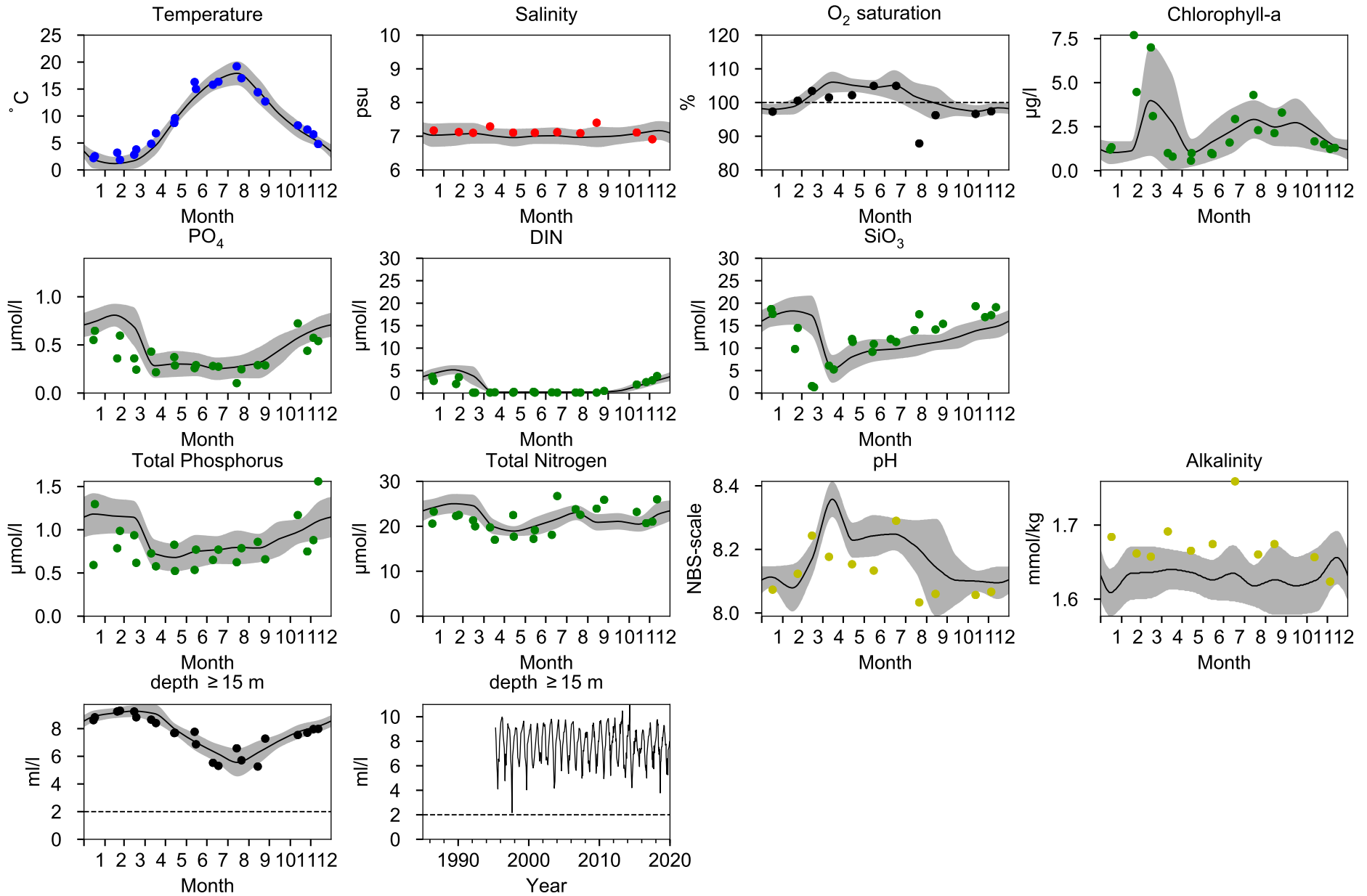
STATION ANHOLT E SURFACE WATER (0-10 m)



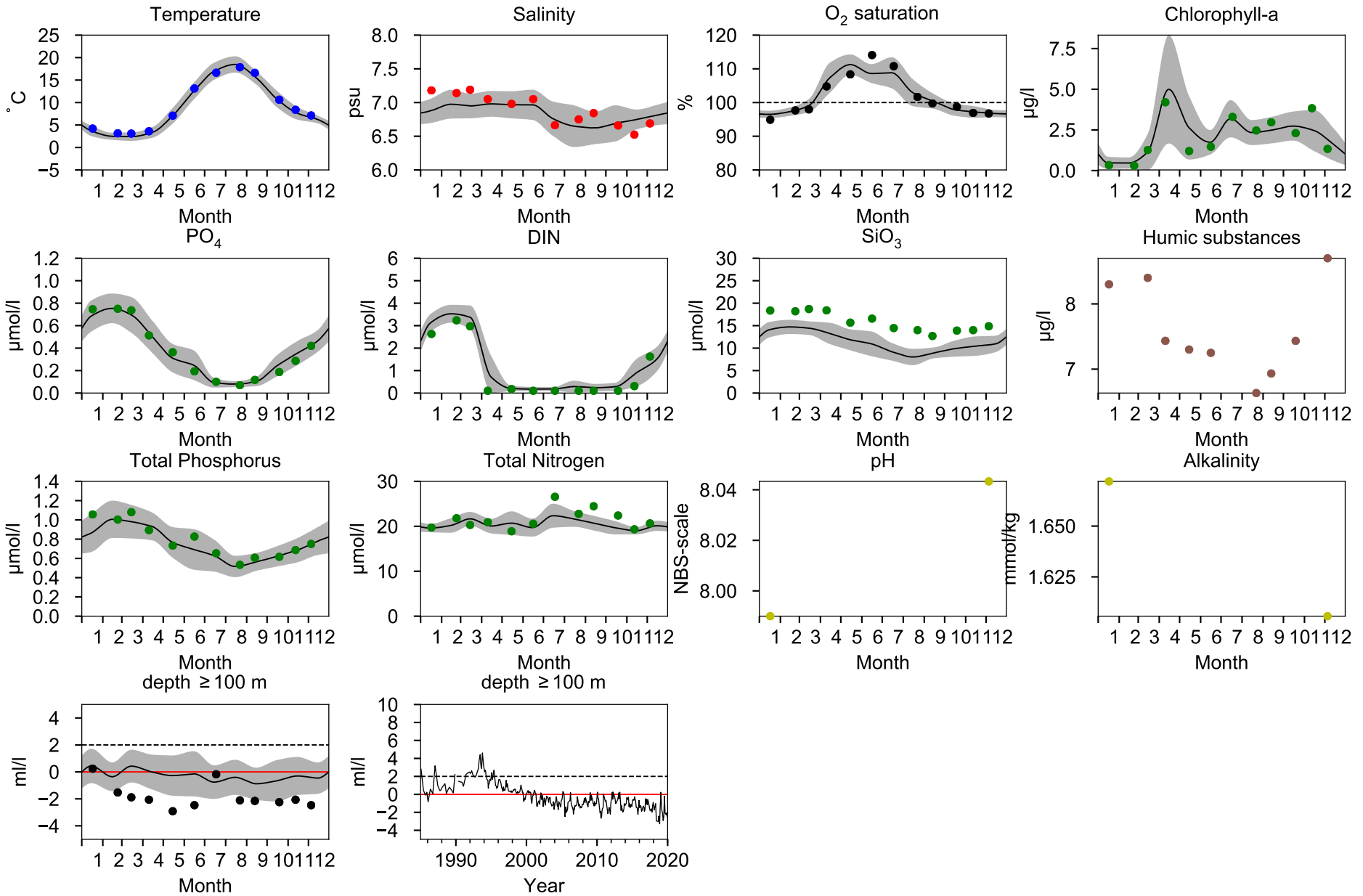
STATION HANÖBUKTEN SURFACE WATER (0-10 m)



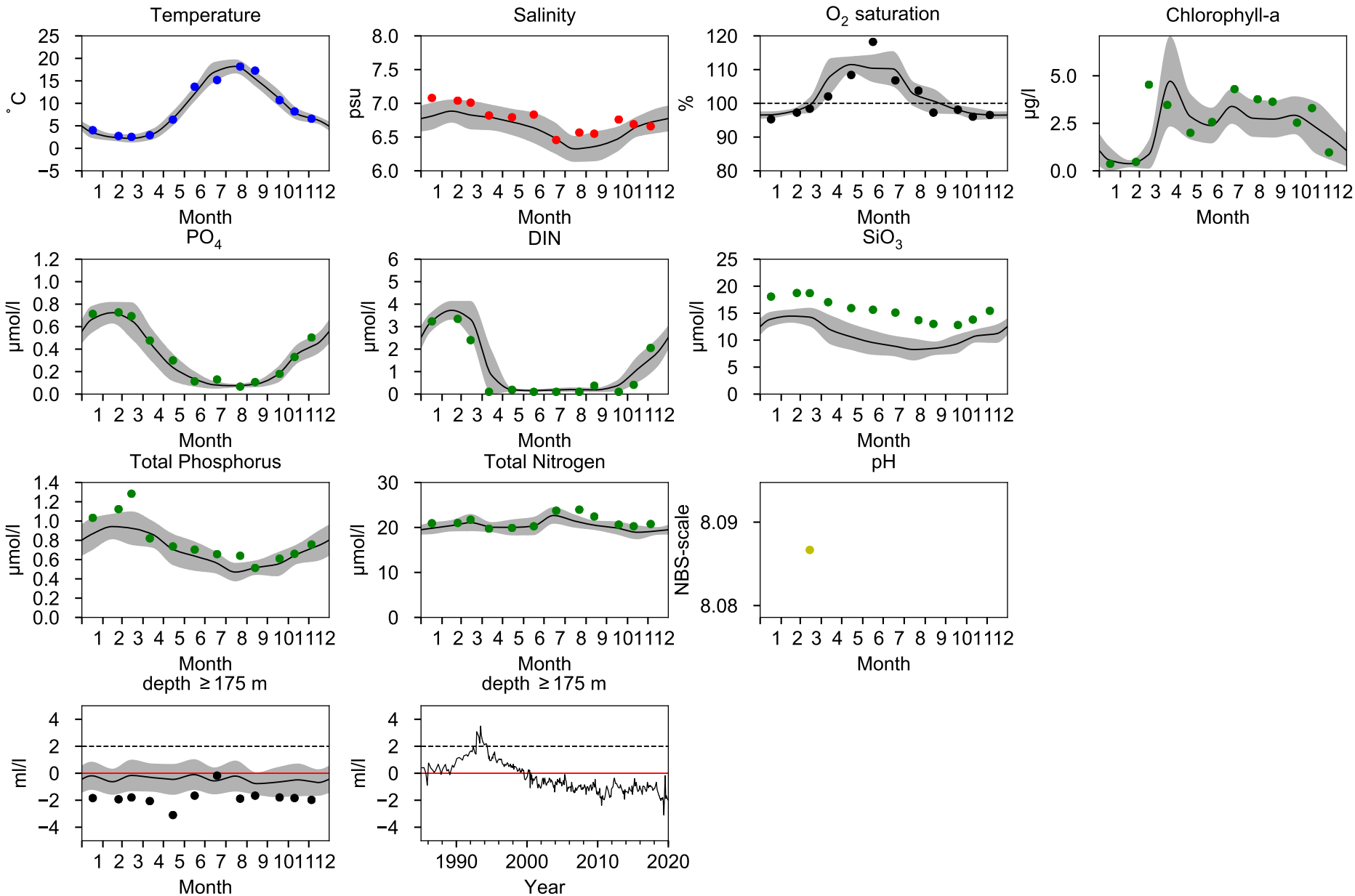
STATION REF M1V1 SURFACE WATER (0-10 m)



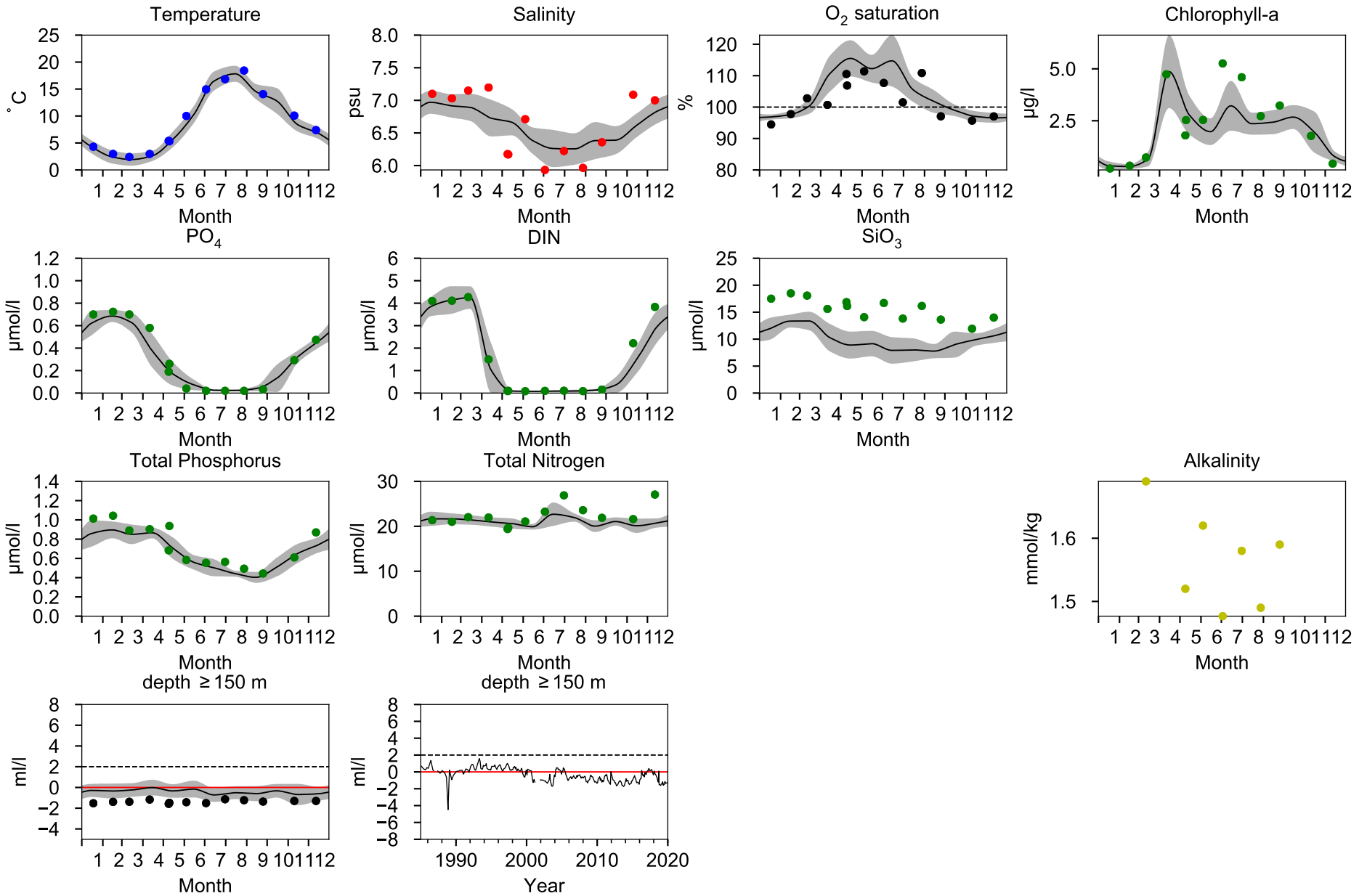
STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)



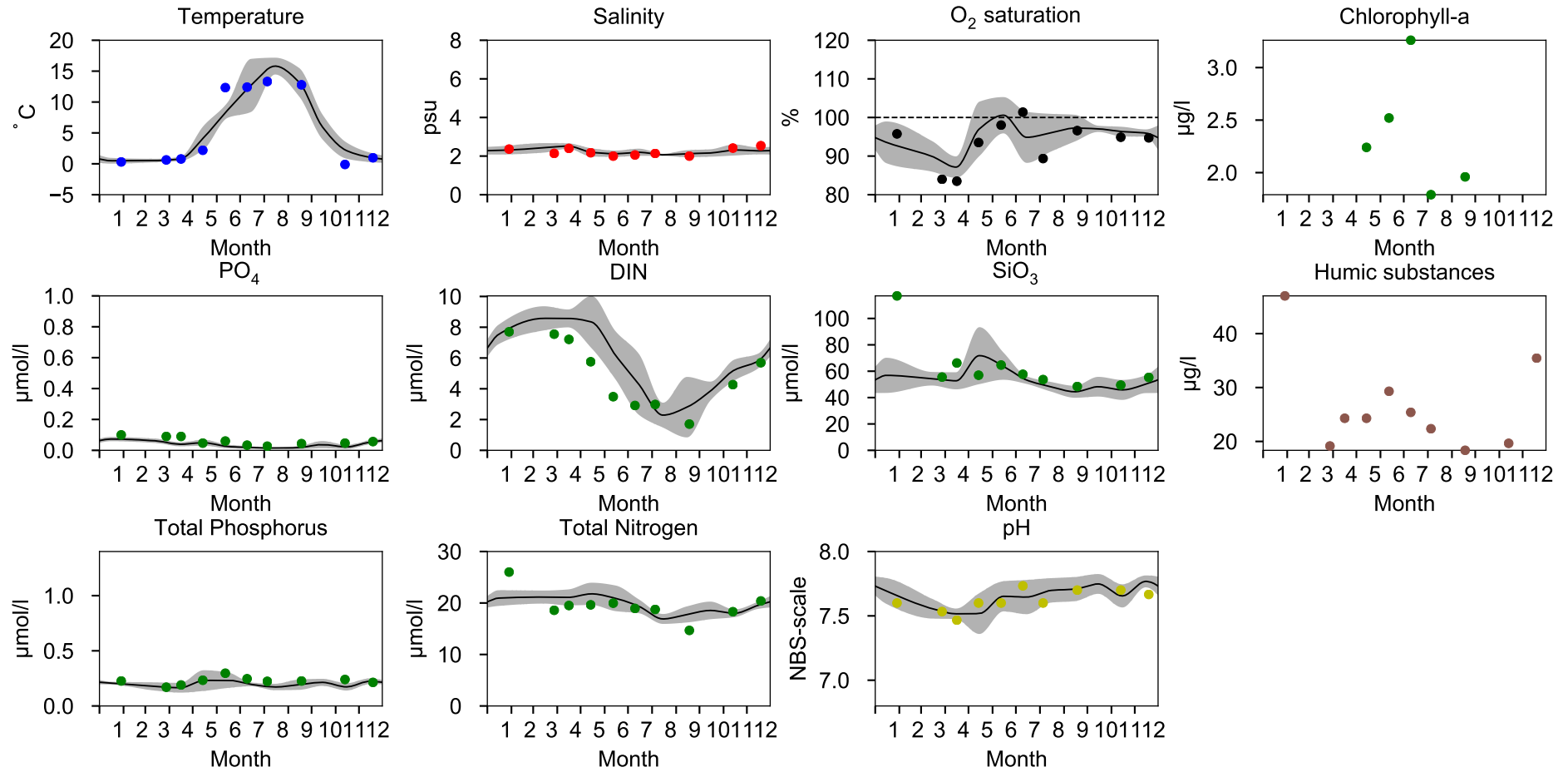
STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)



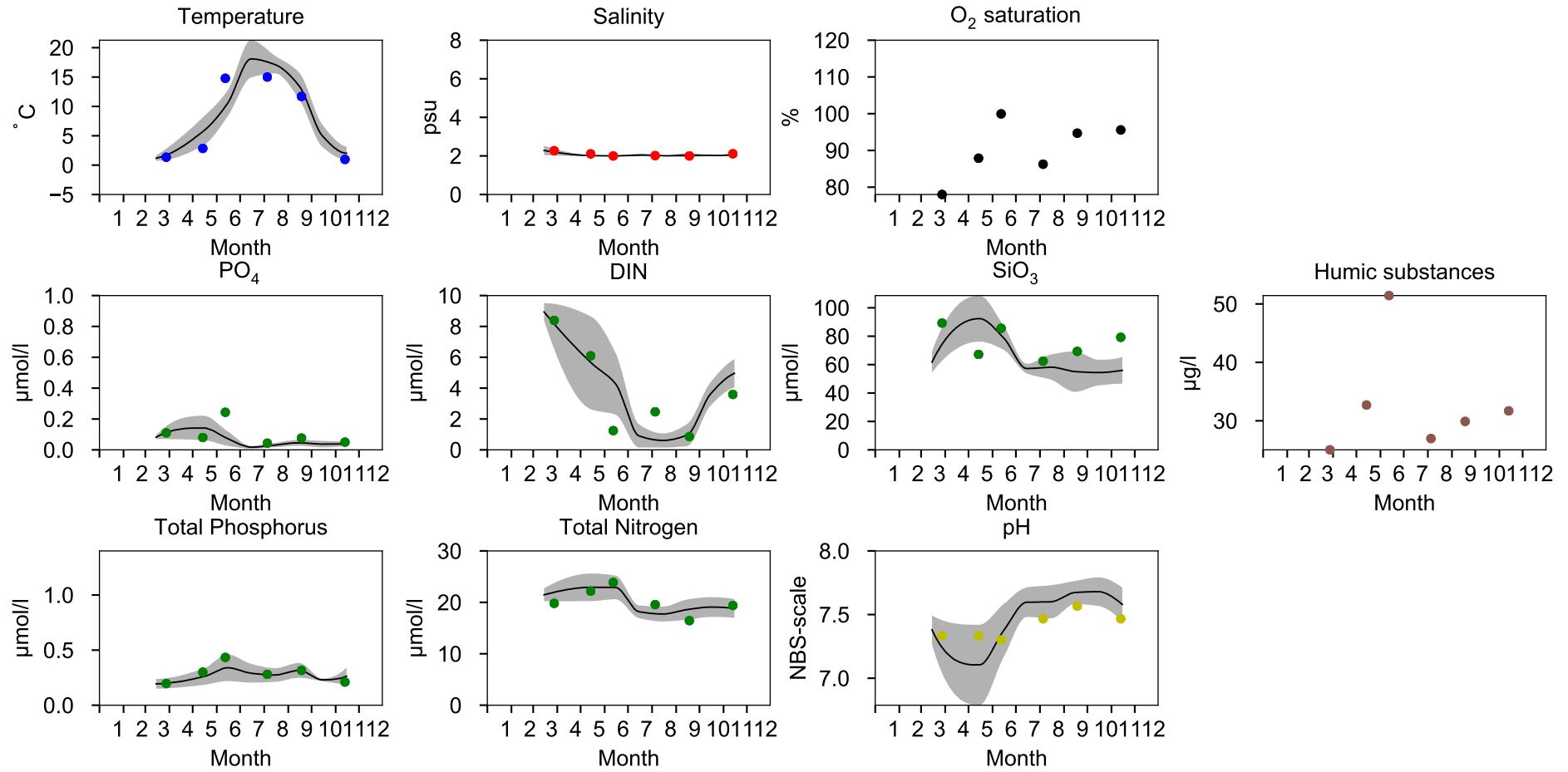
STATION BY29 / LL19 SURFACE WATER (0-10 m)



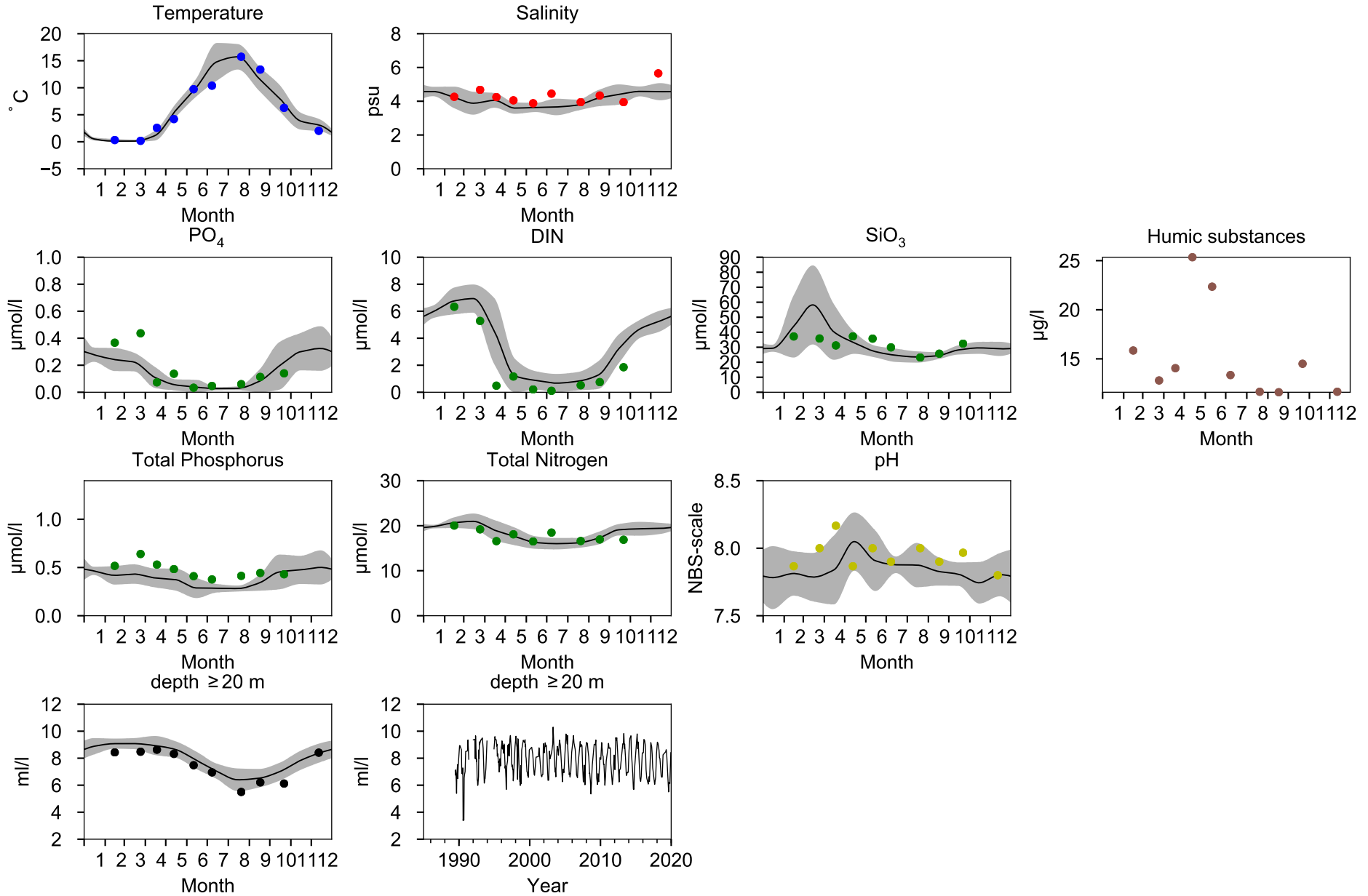
STATION RÅNEÅ-2 SURFACE WATER (0-10 m)



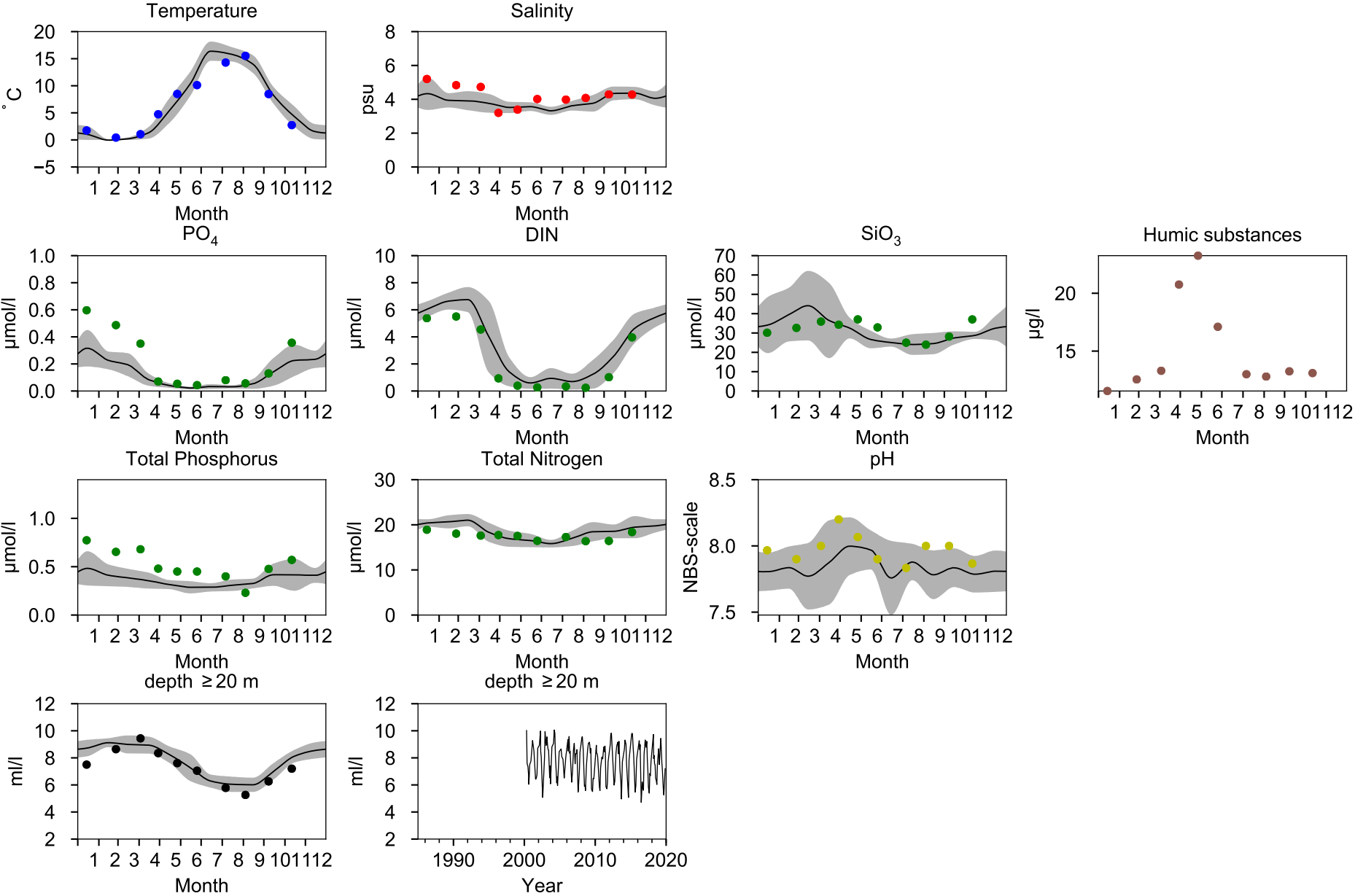
STATION RÂNEA-1 SURFACE WATER (0-10 m)



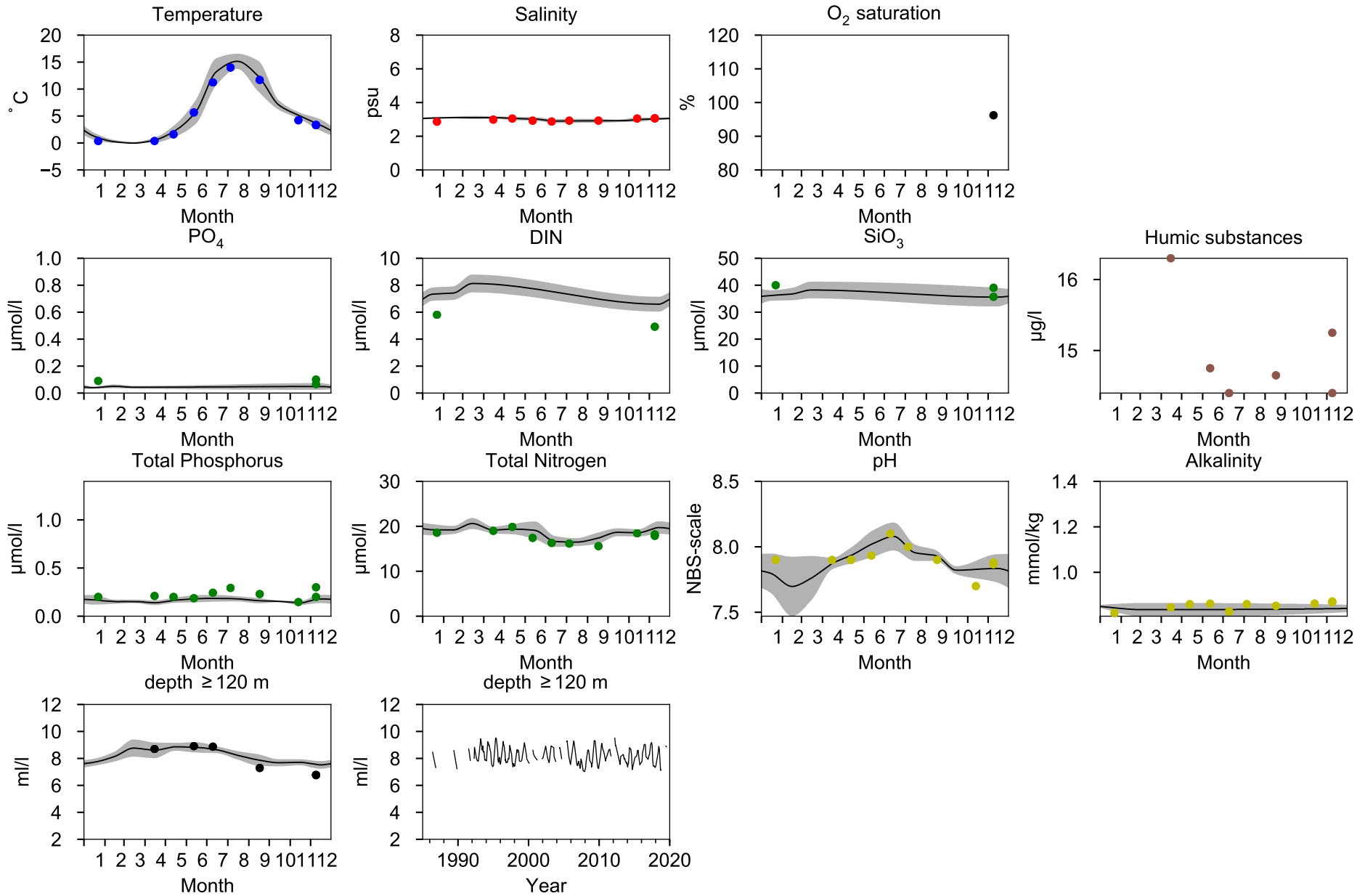
STATION NB1 / B3 SURFACE WATER (0-10 m)



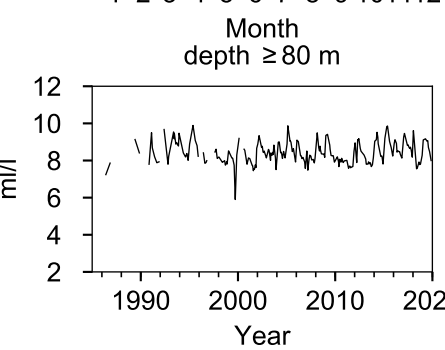
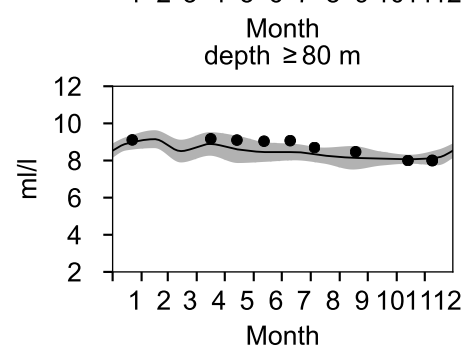
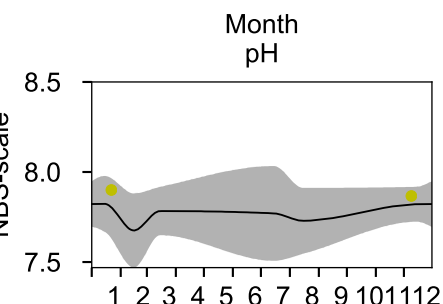
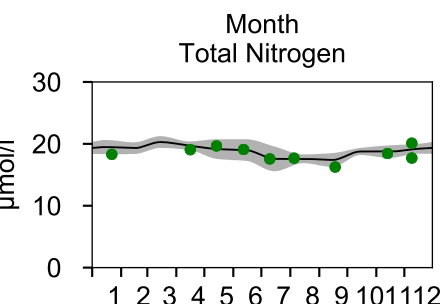
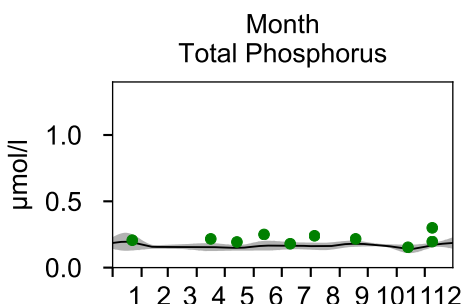
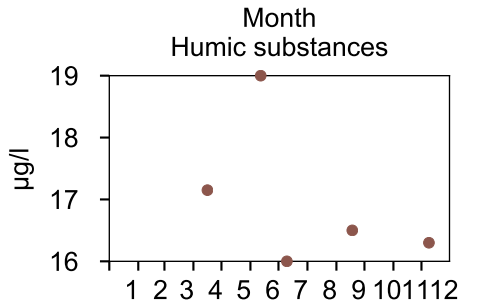
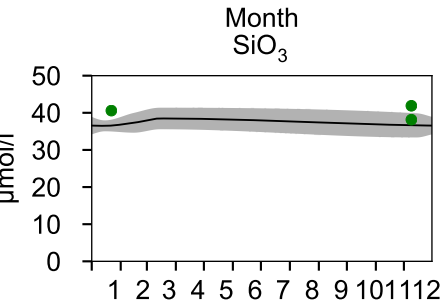
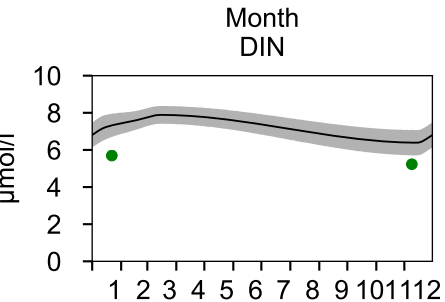
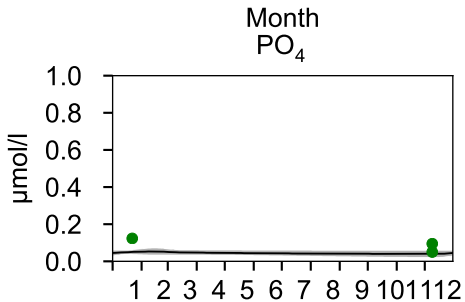
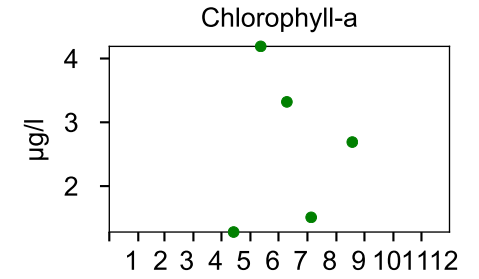
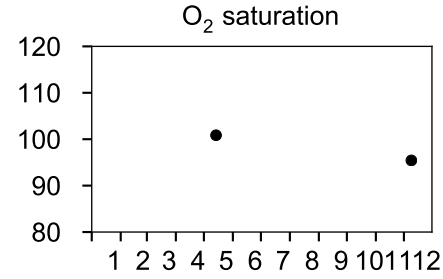
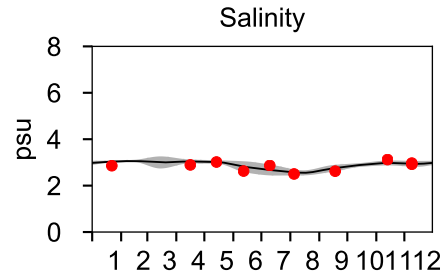
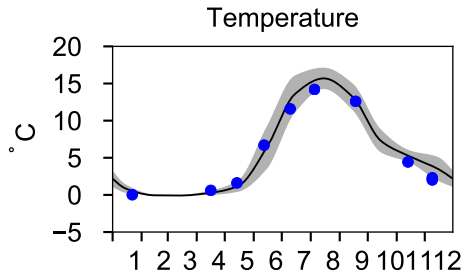
STATION B7 SURFACE WATER (0-10 m)



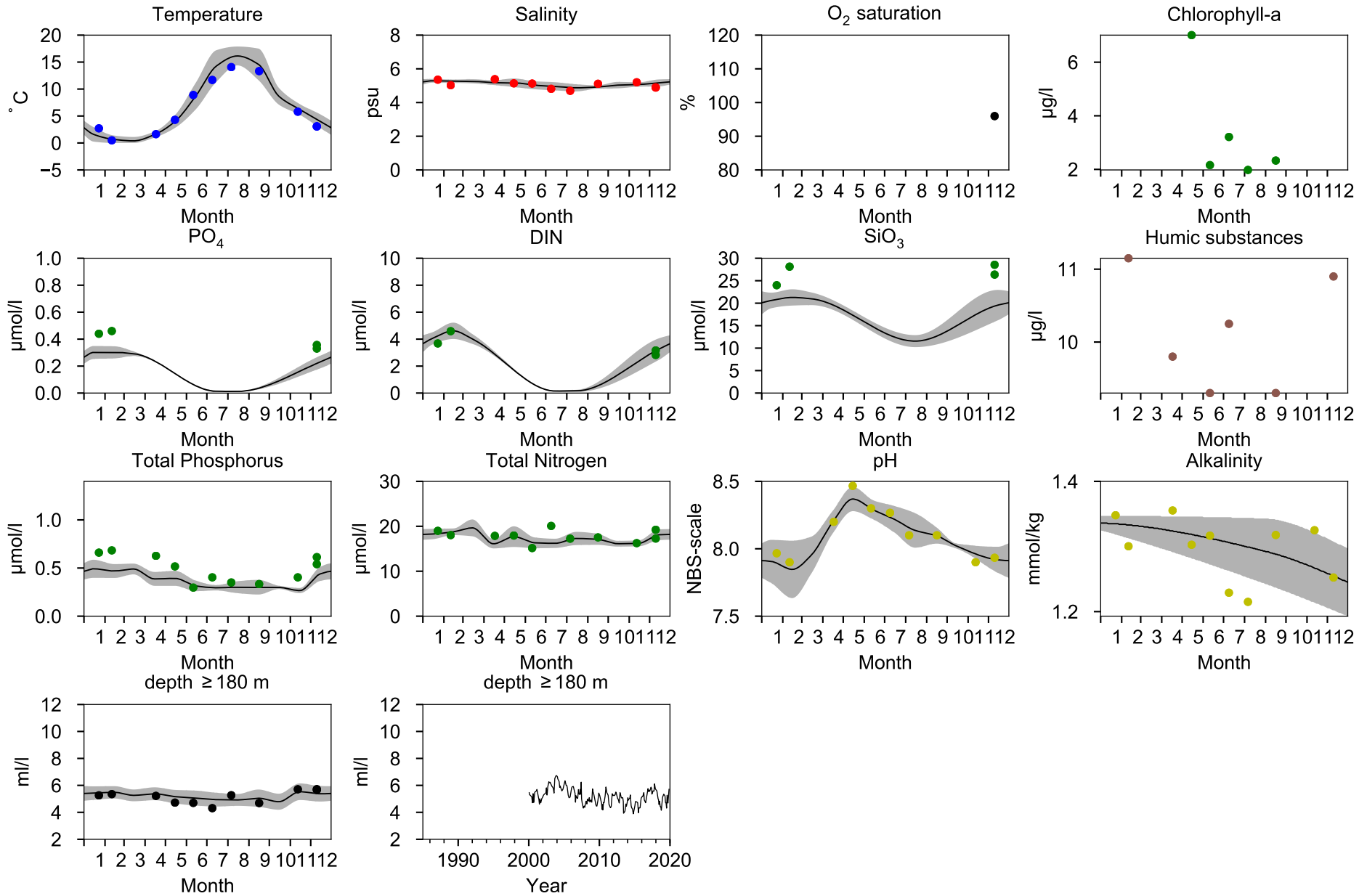
STATION F9 / A13 SURFACE WATER (0-10 m)



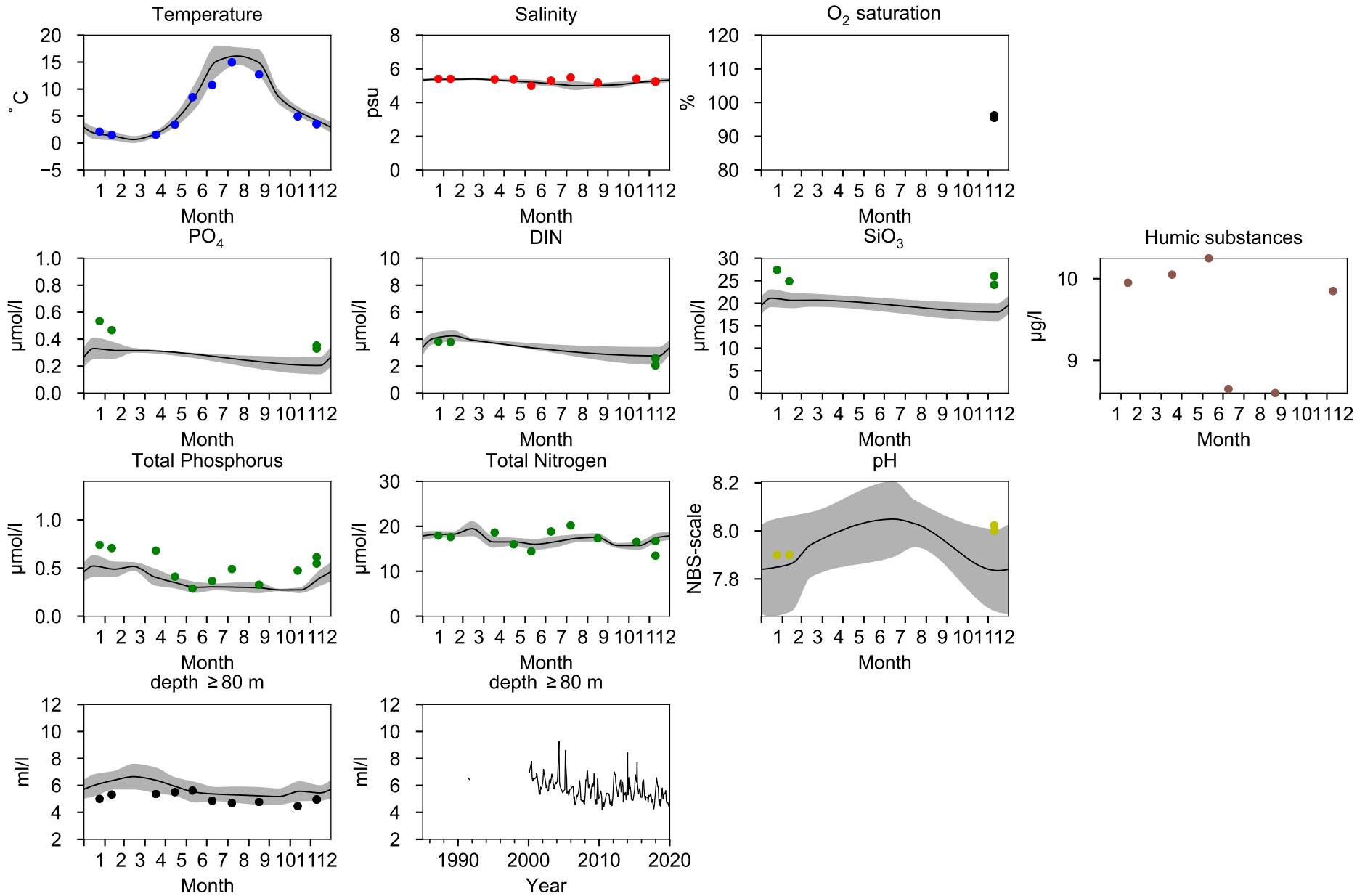
STATION F3 / A5 SURFACE WATER (0-10 m)



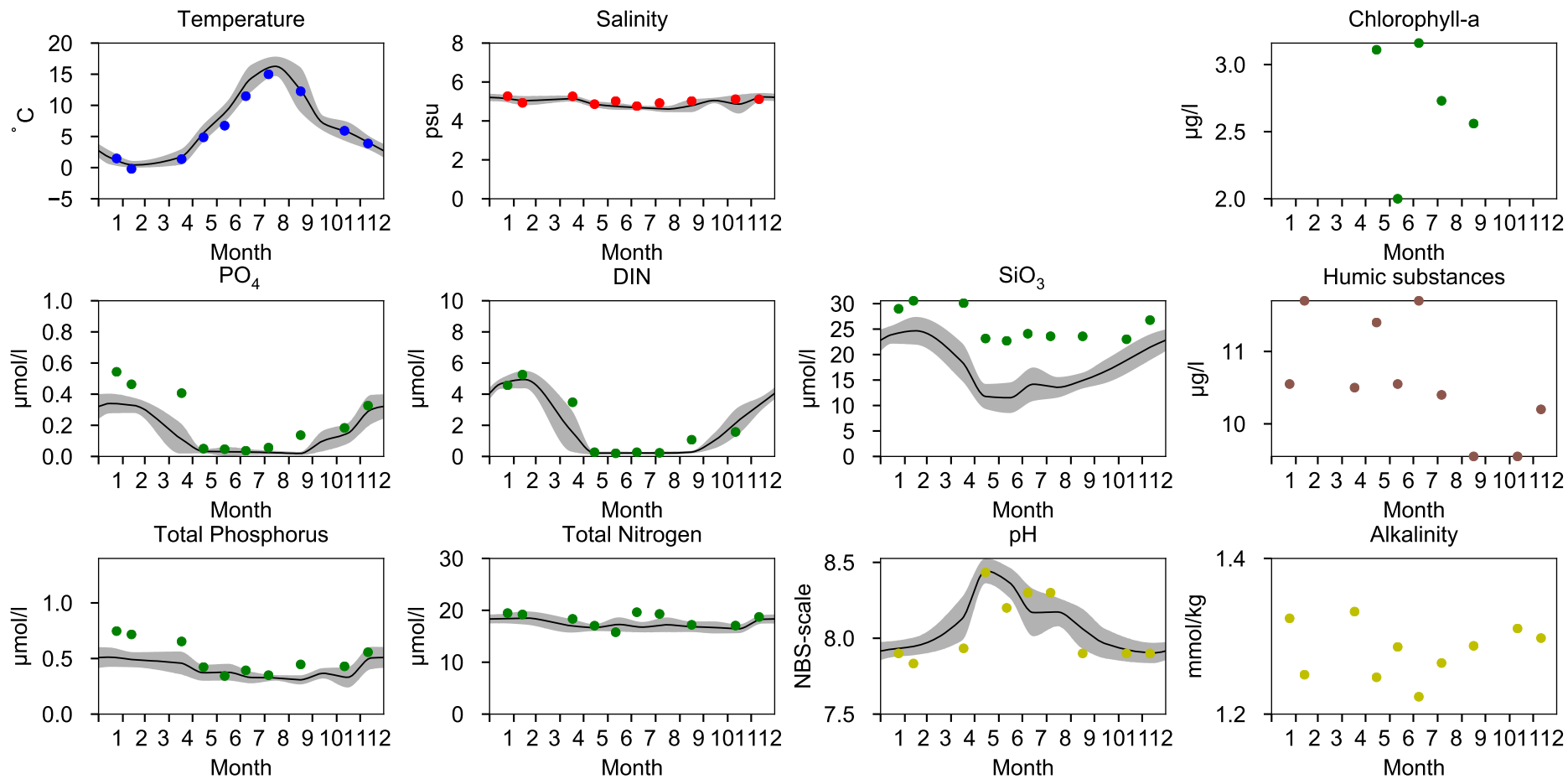
STATION C3 SURFACE WATER (0-10 m)



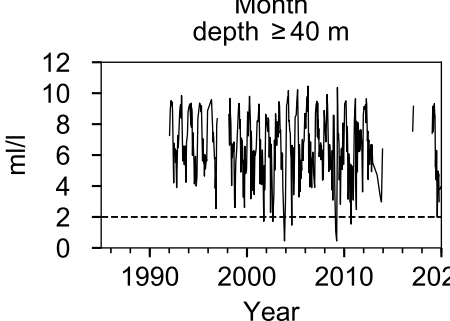
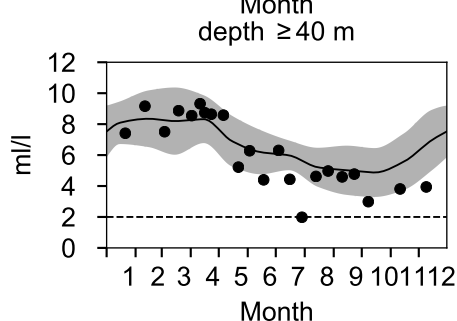
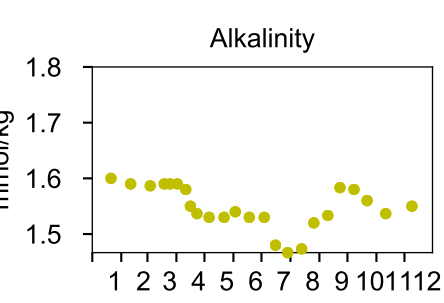
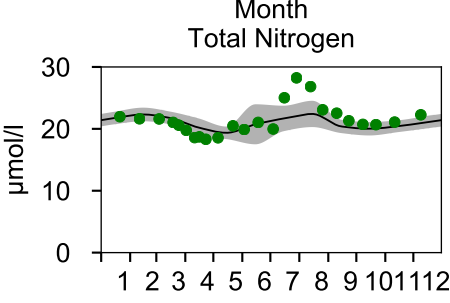
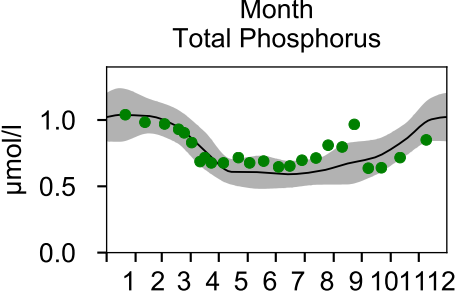
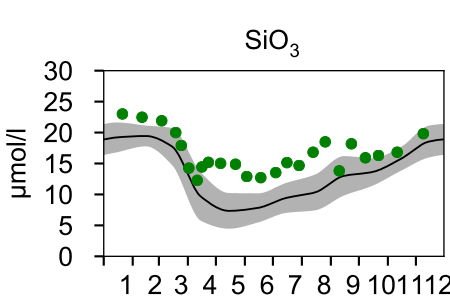
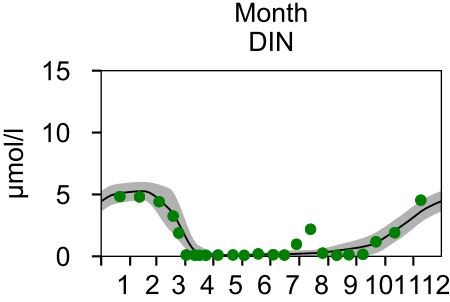
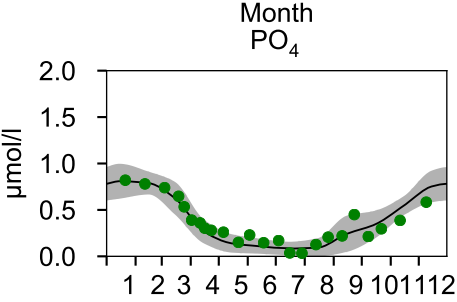
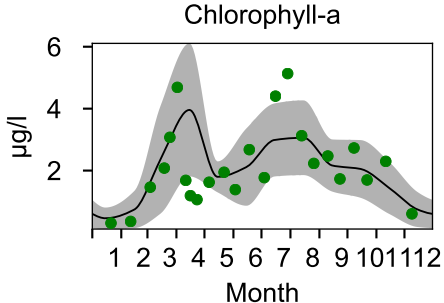
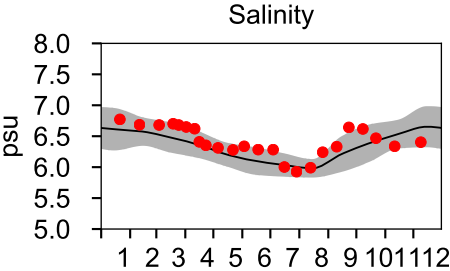
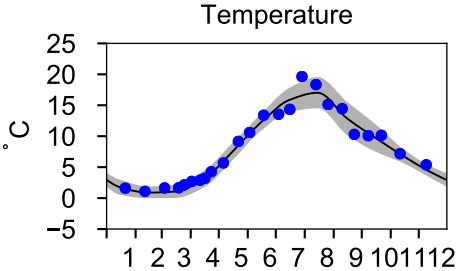
STATION MS4 / C14 SURFACE WATER (0-10 m)



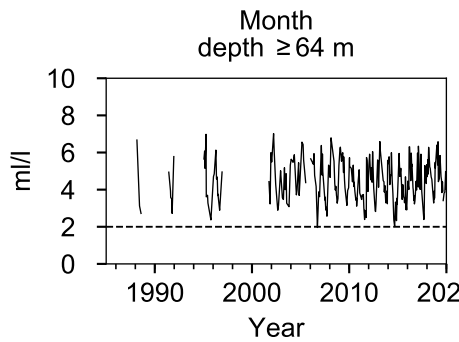
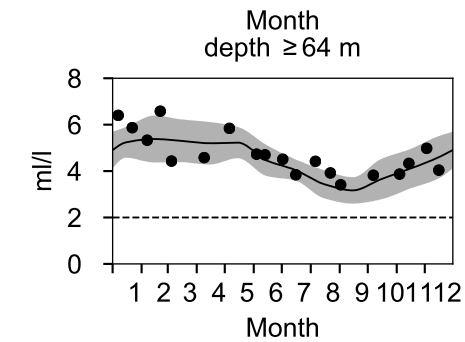
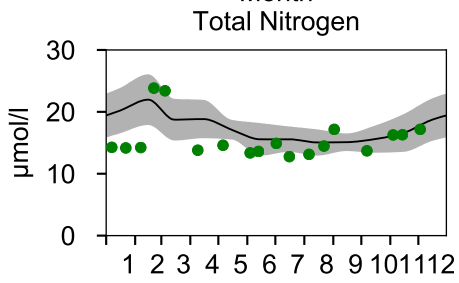
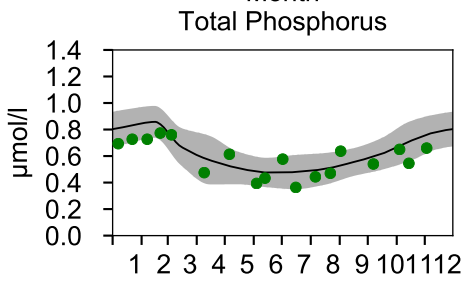
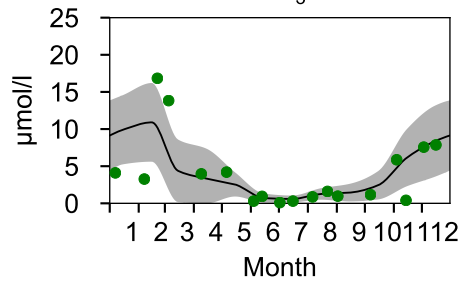
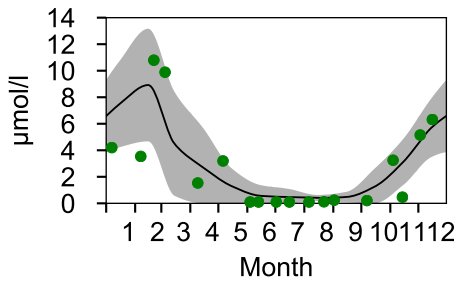
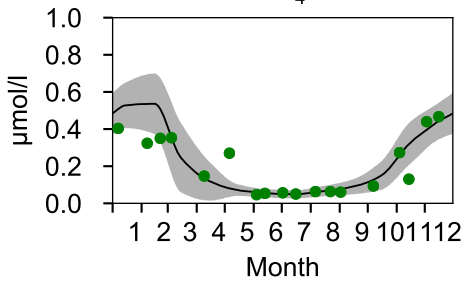
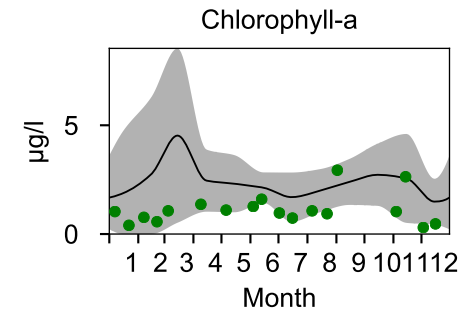
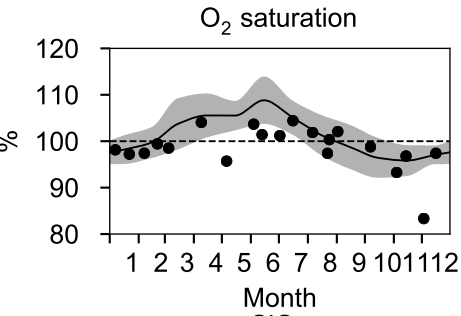
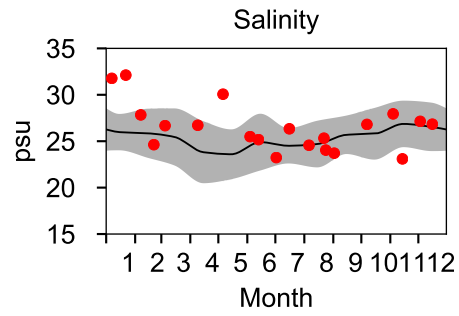
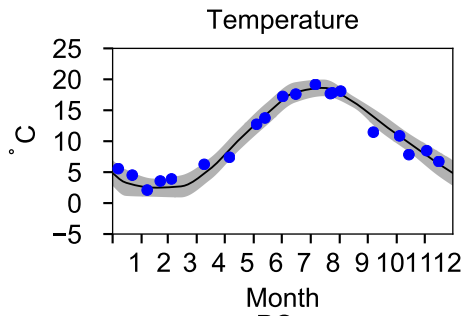
STATION GAVIK-1 SURFACE WATER (0-10 m)



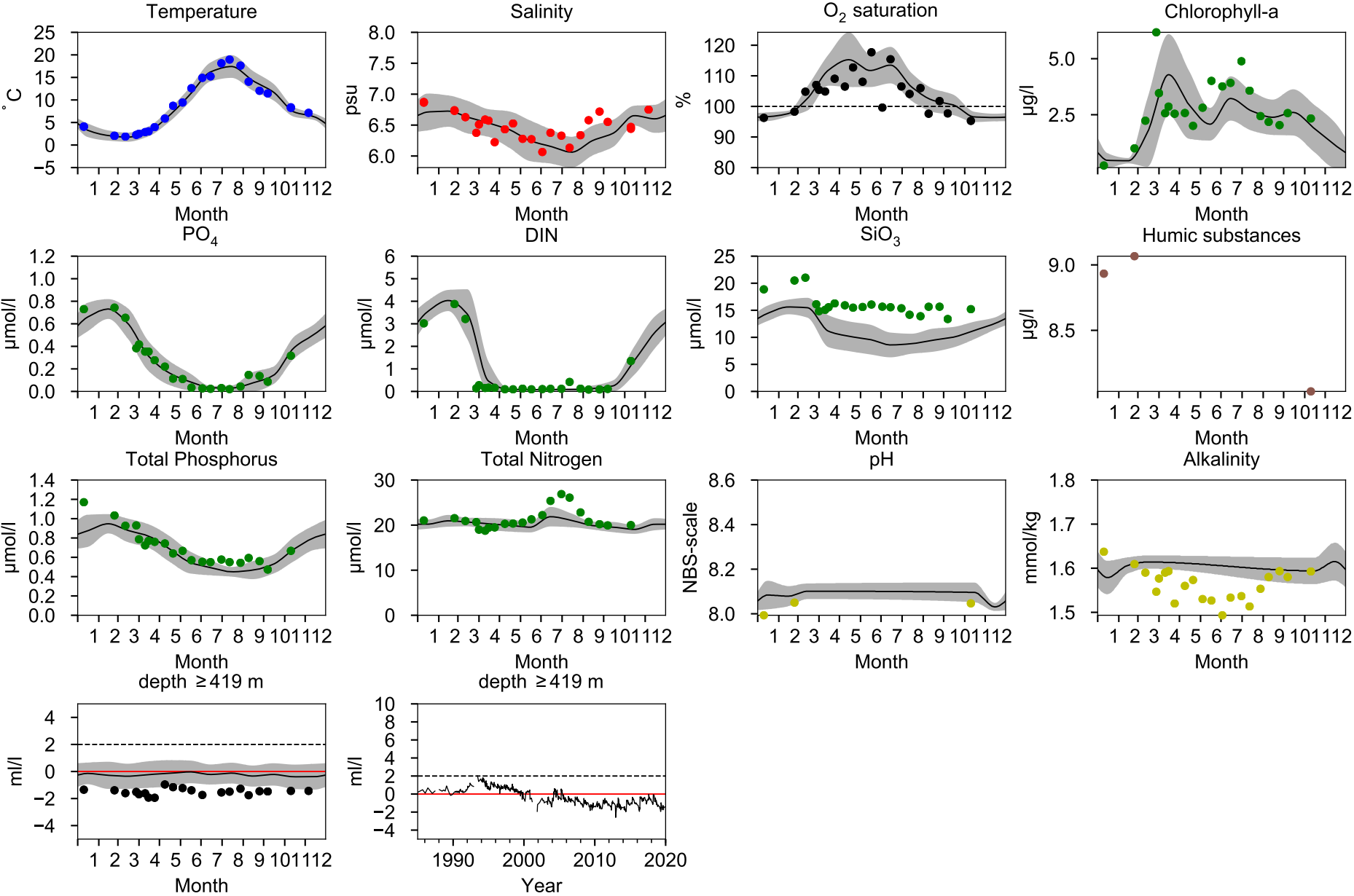
STATION B1 SURFACE WATER (0-10 m)



STATION SLÄGGÖ SURFACE WATER (0-10 m)



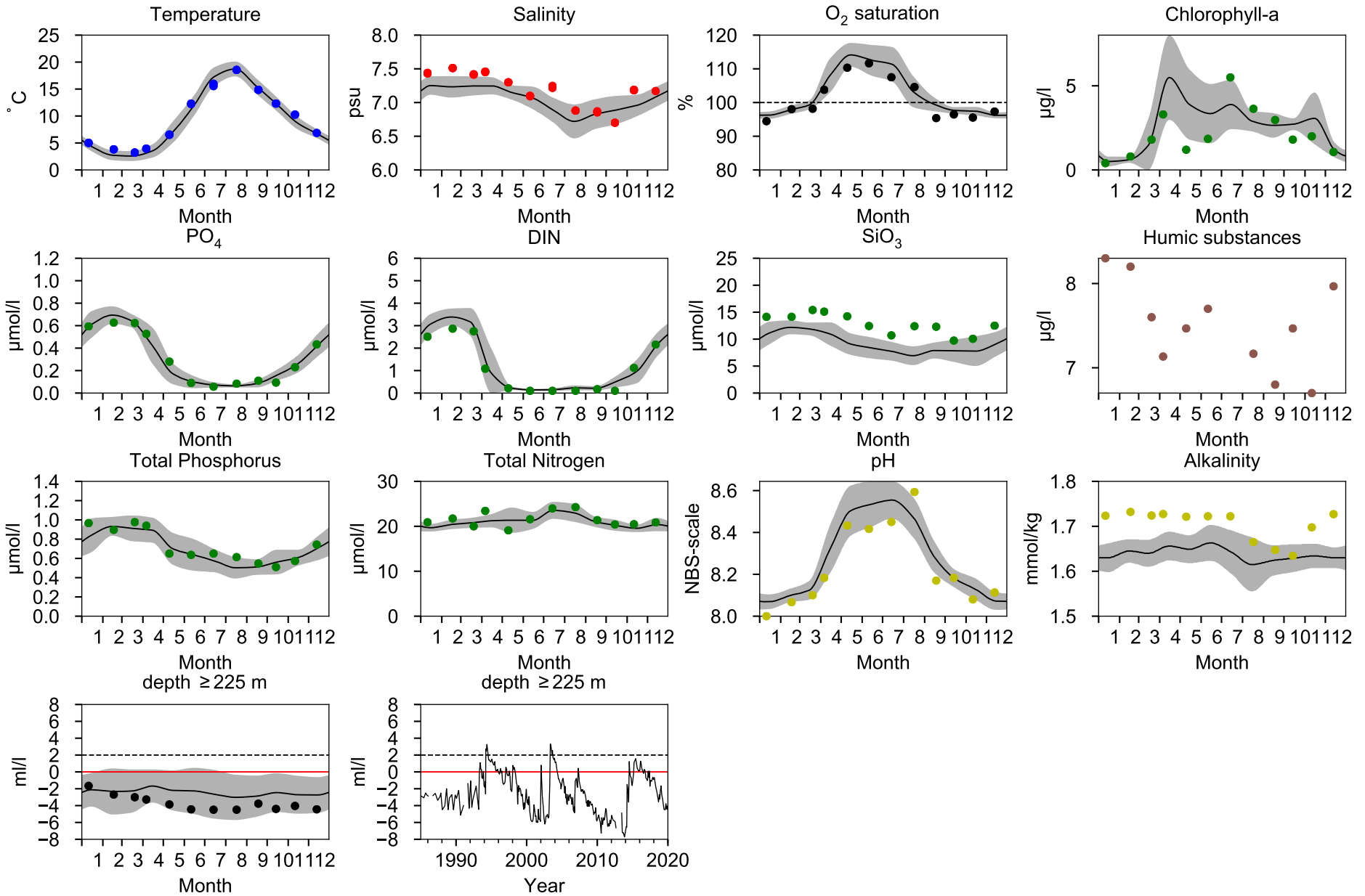
STATION BY31 LANDSORTSDJ SURFACE WATER (0-10 m)



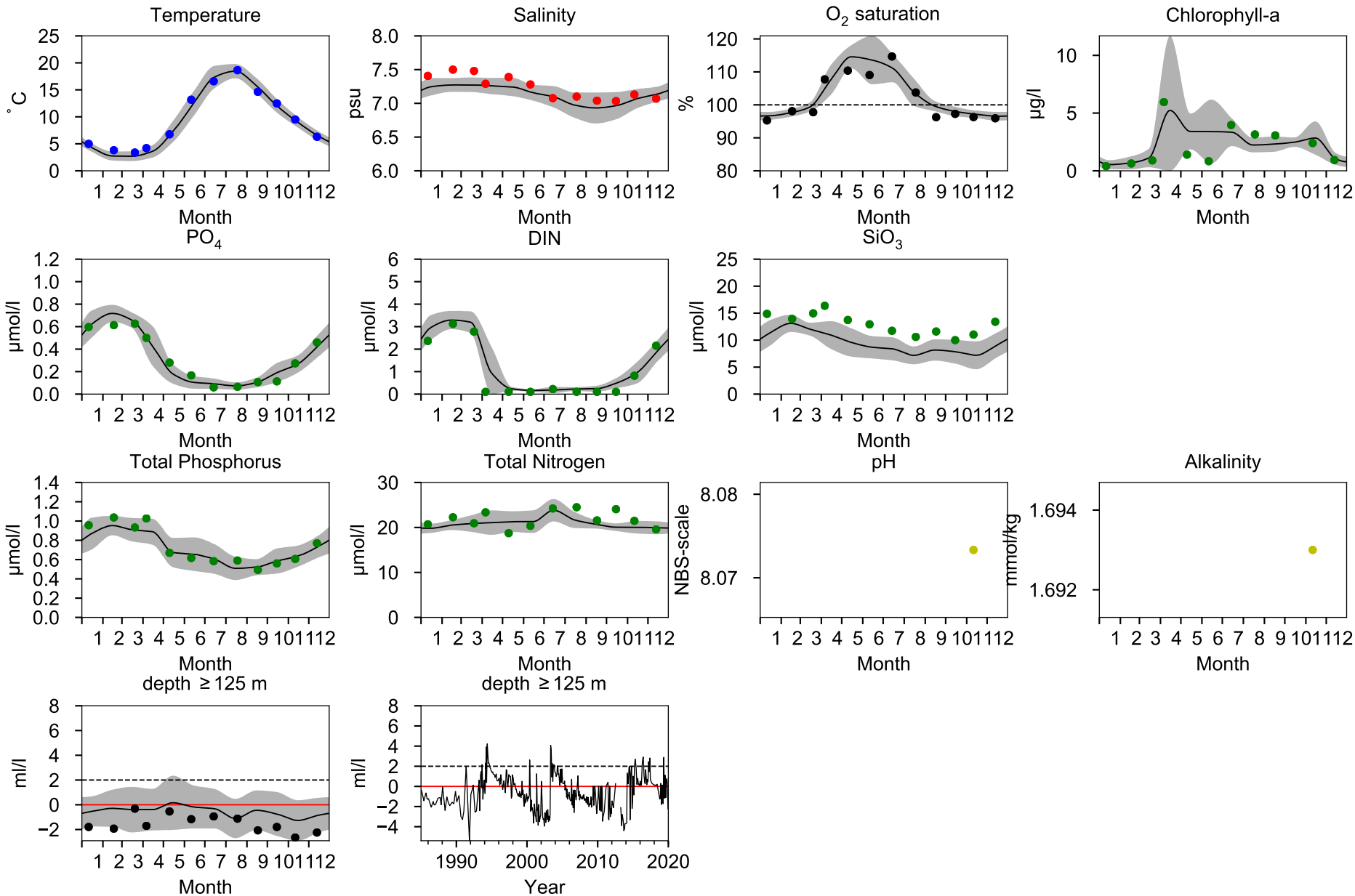
STATION BY20 FÄRÖDJ SURFACE WATER (0-10 m)



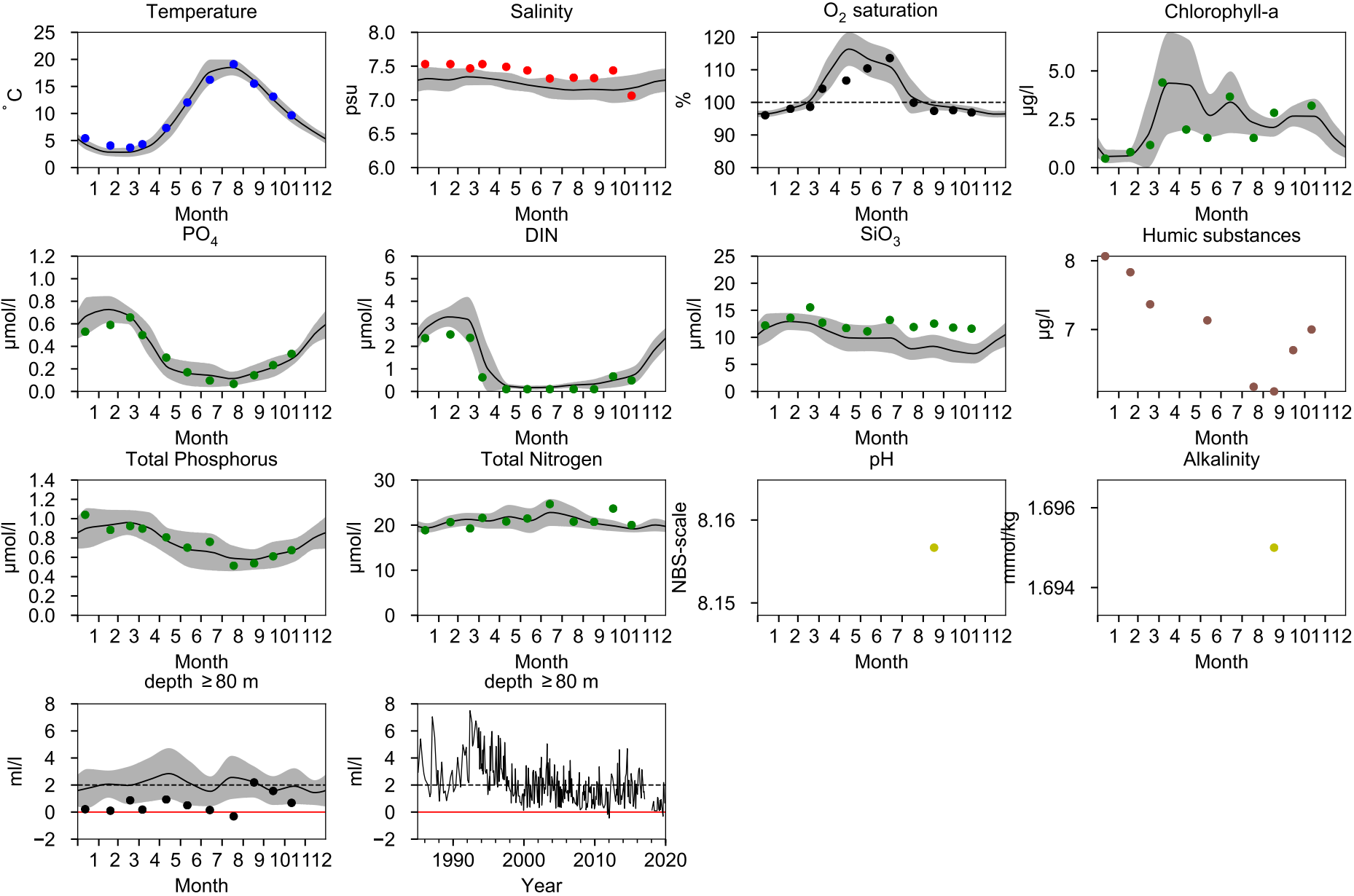
STATION BY15 GOTLANDSDJ SURFACE WATER (0-10 m)



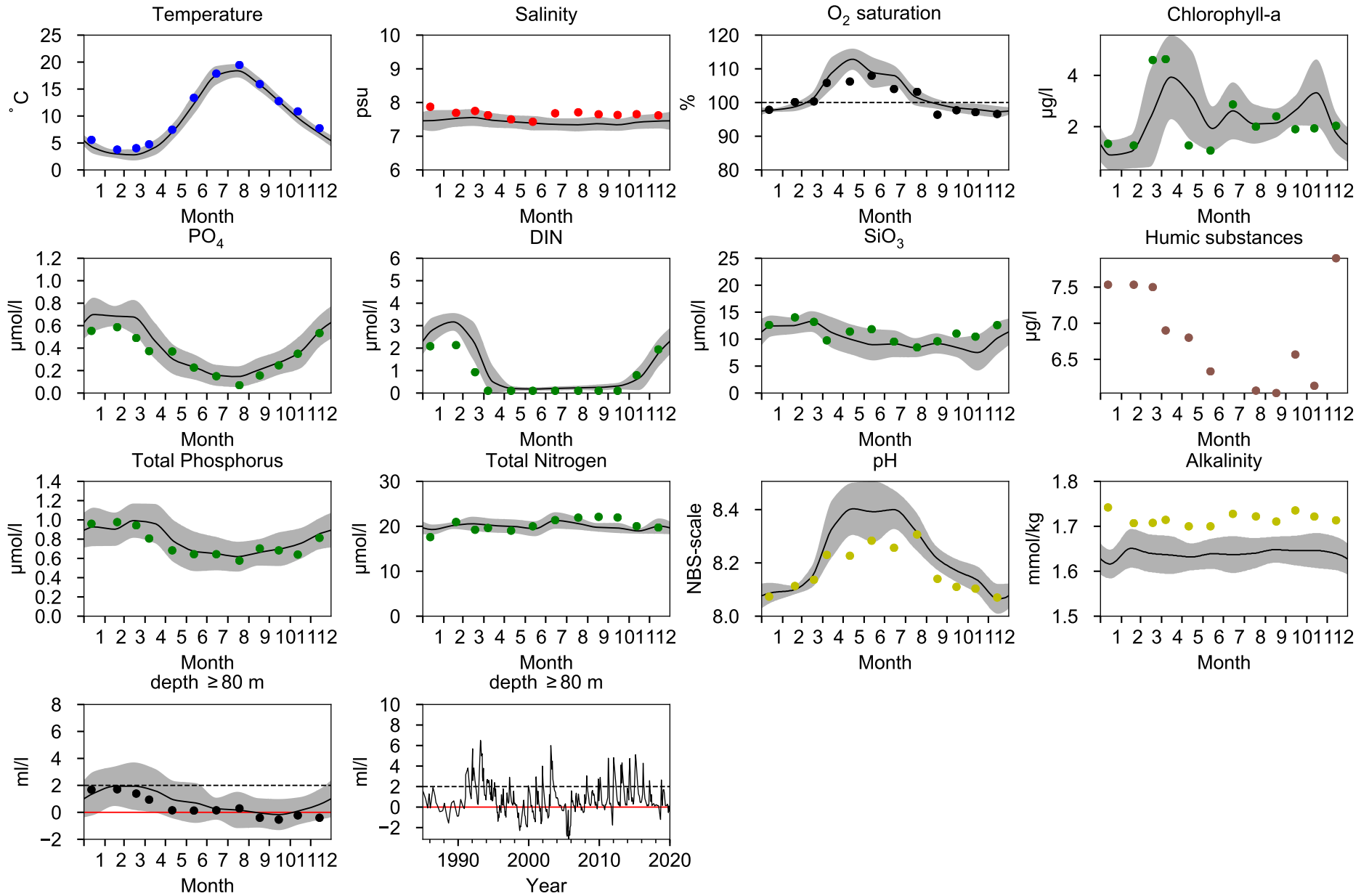
STATION BY10 SURFACE WATER (0-10 m)



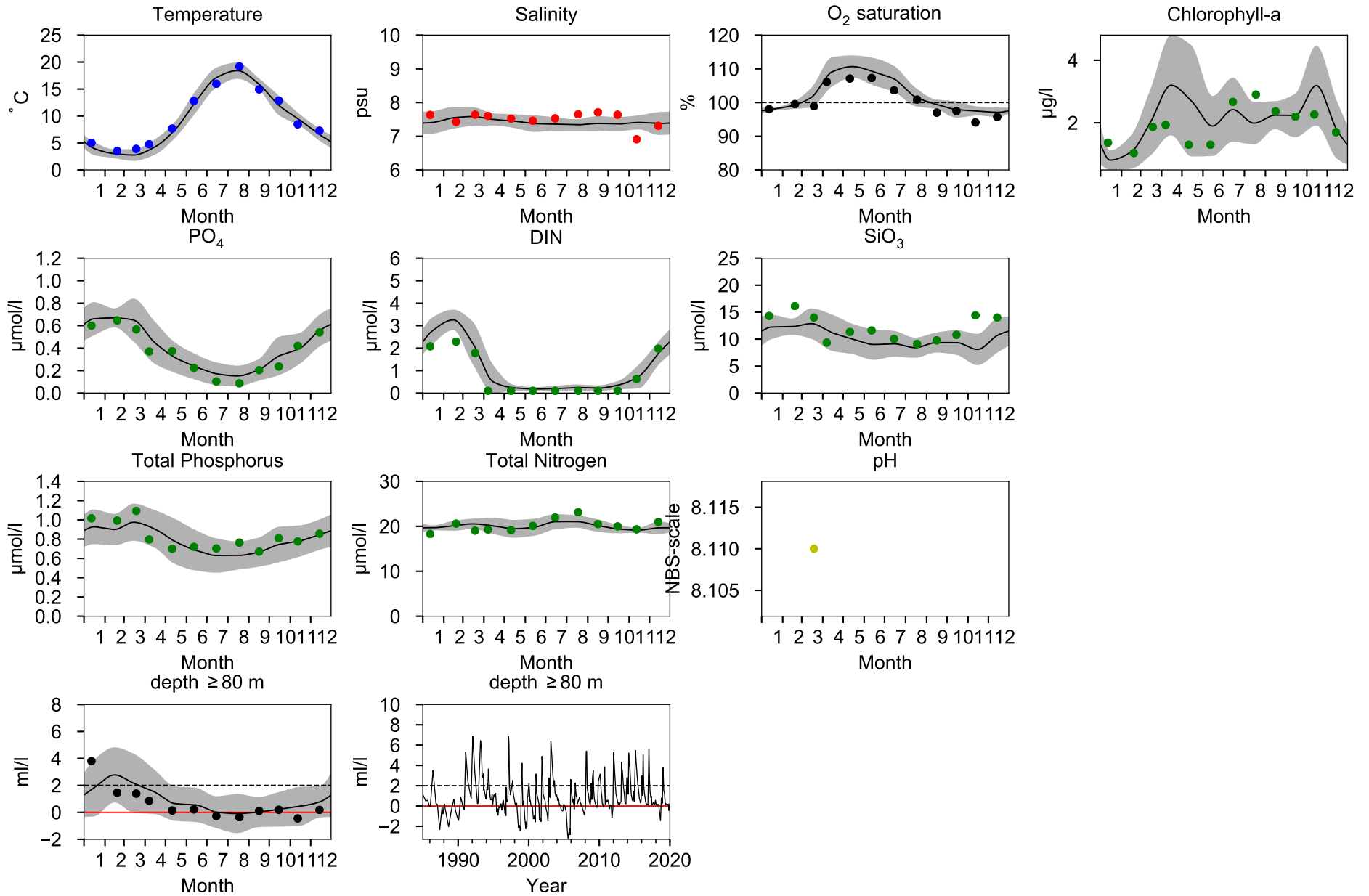
STATION BCS III-10 SURFACE WATER (0-10 m)



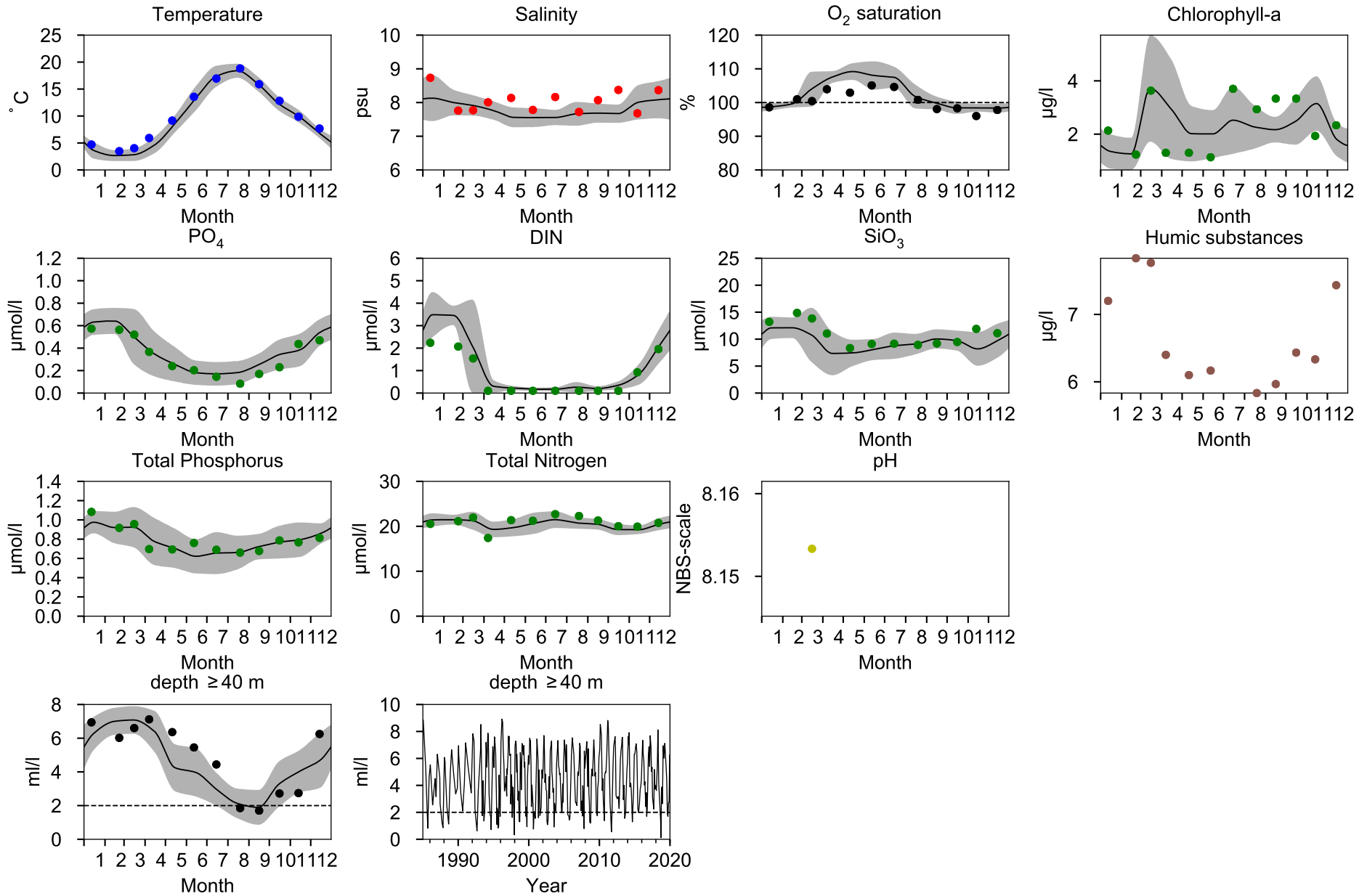
STATION BY5 BORNHOLMSDJ SURFACE WATER (0-10 m)



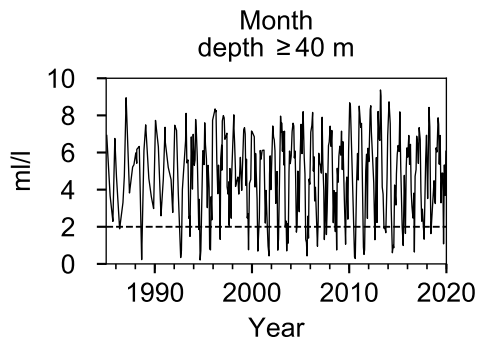
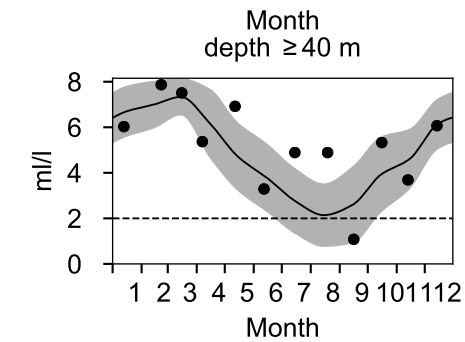
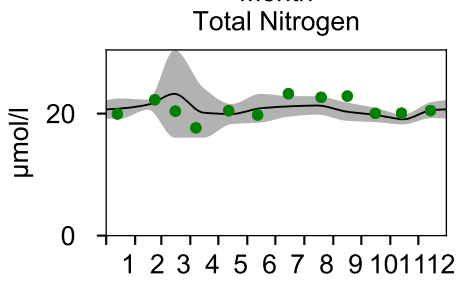
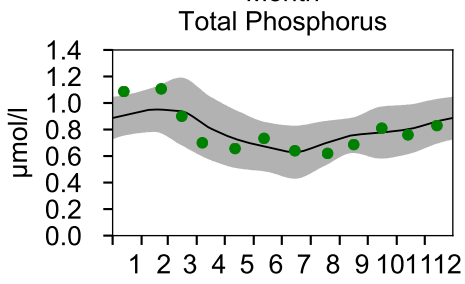
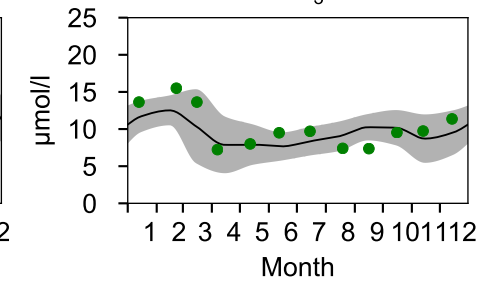
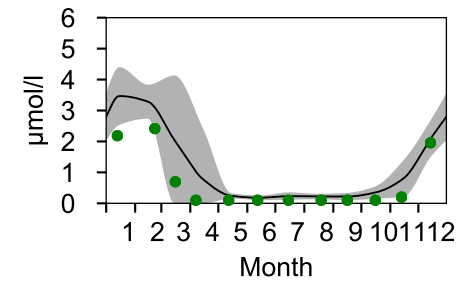
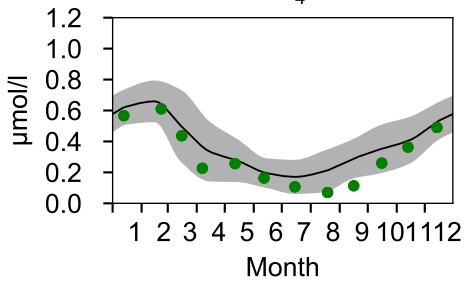
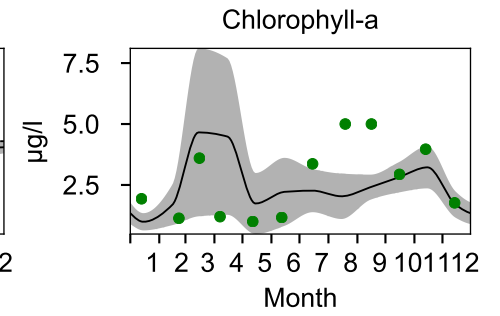
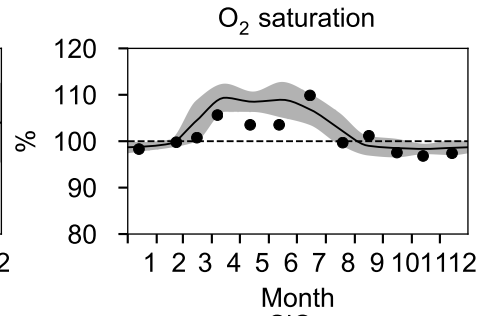
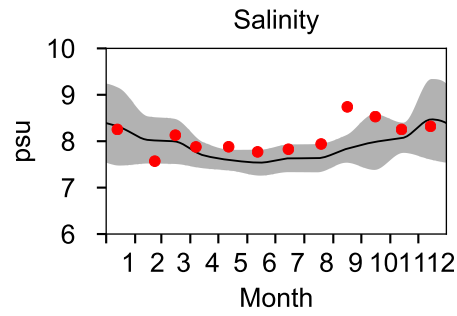
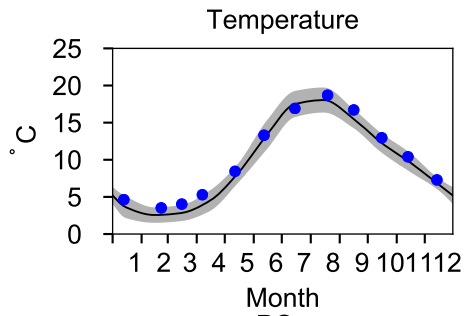
STATION BY4 CHRISTIANSÖ SURFACE WATER (0-10 m)



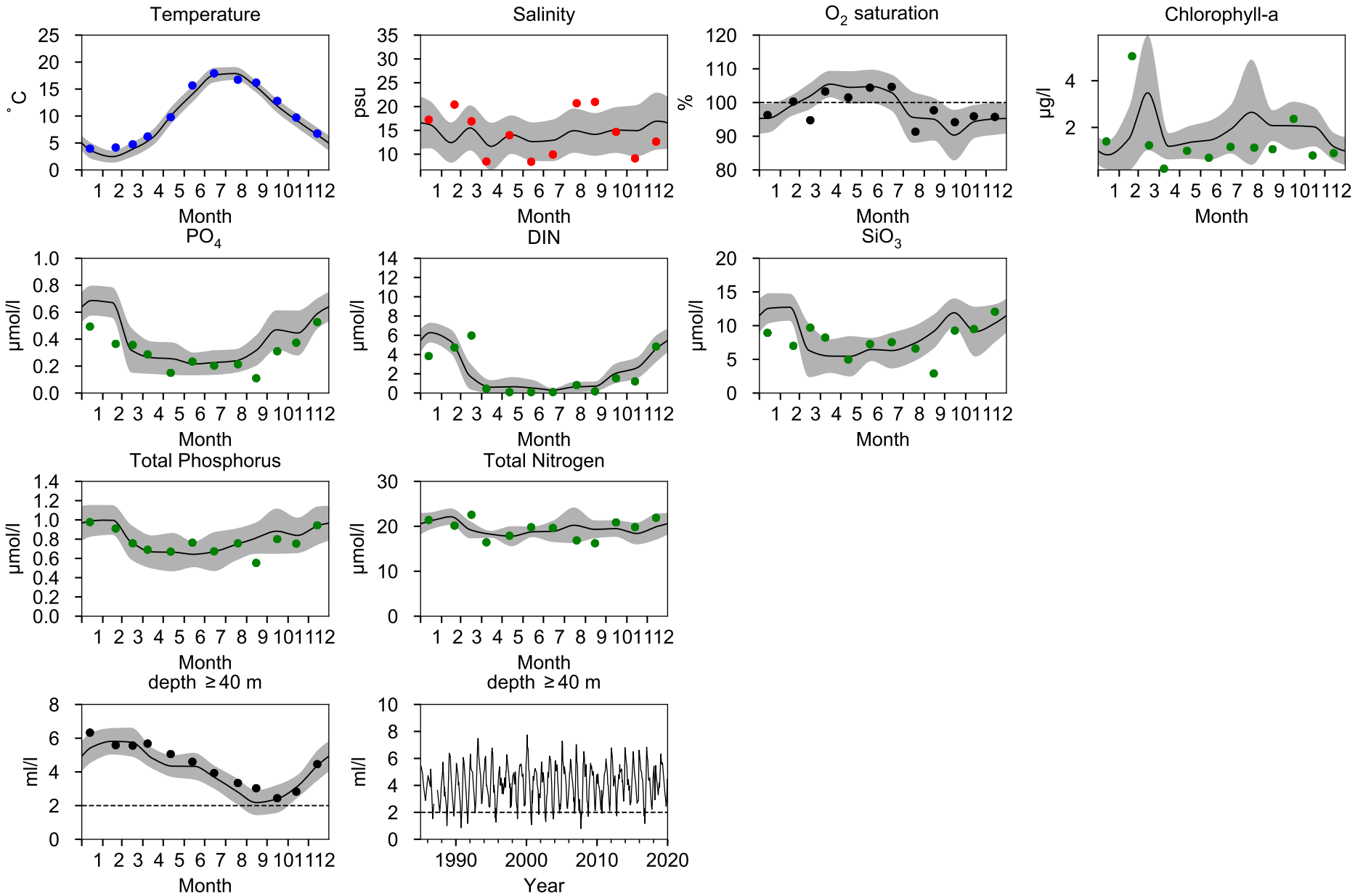
STATION BY2 ARKONA SURFACE WATER (0-10 m)



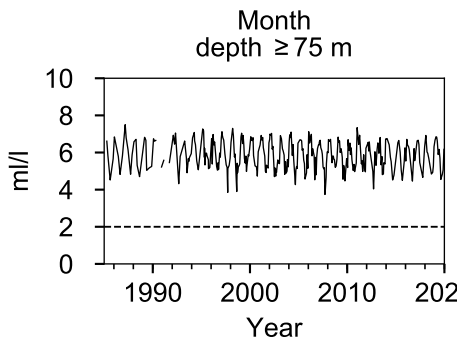
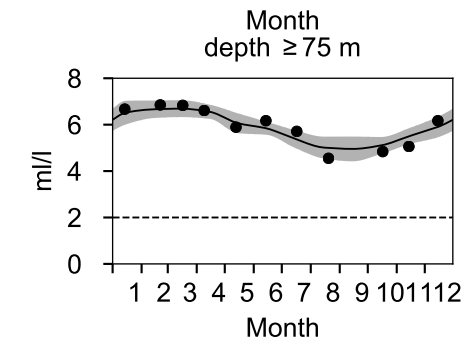
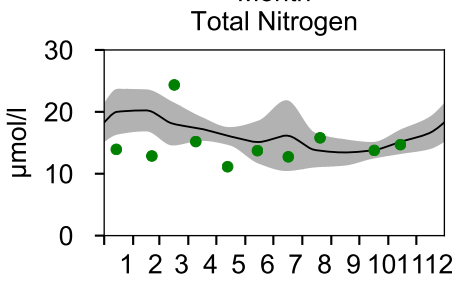
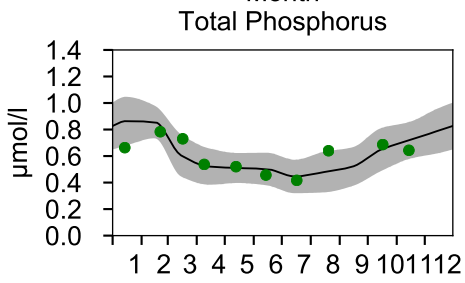
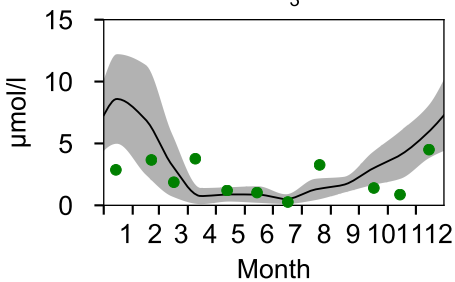
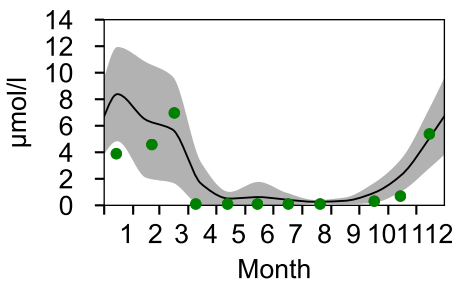
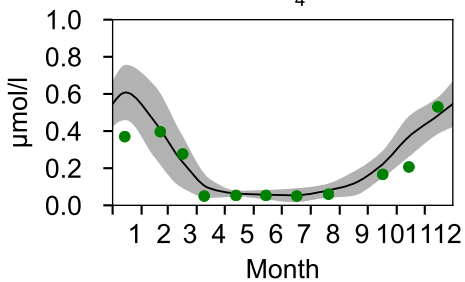
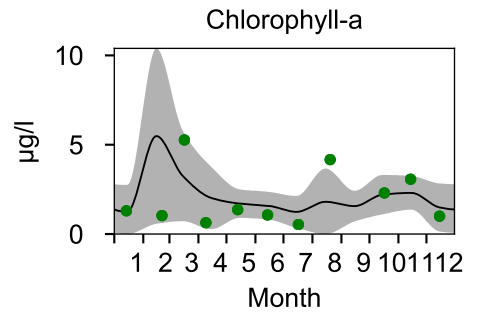
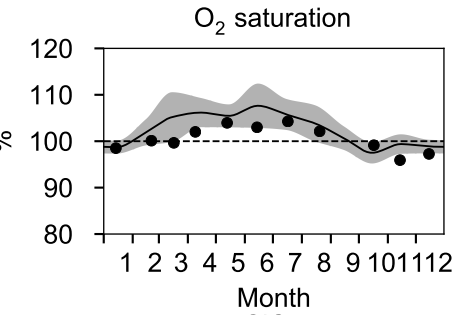
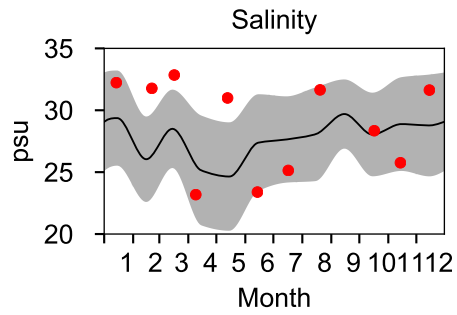
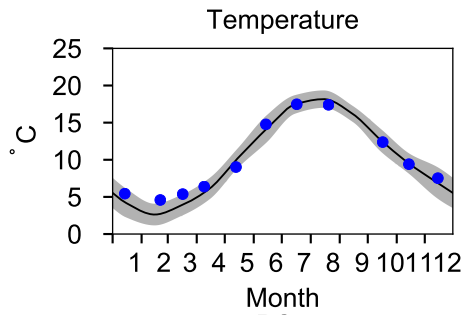
STATION BY1 SURFACE WATER (0-10 m)



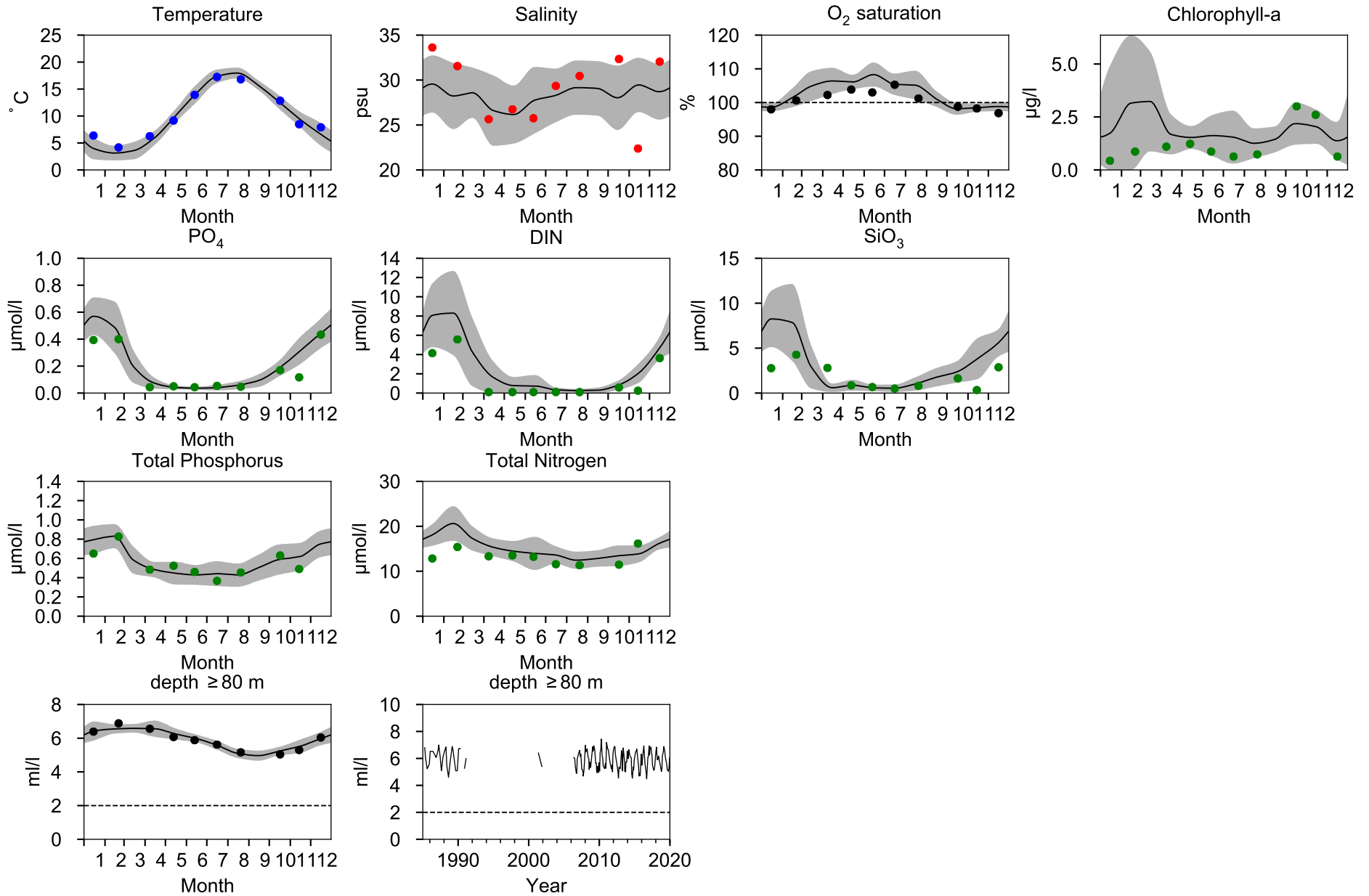
STATION W LANDSKRONA SURFACE WATER (0-10 m)



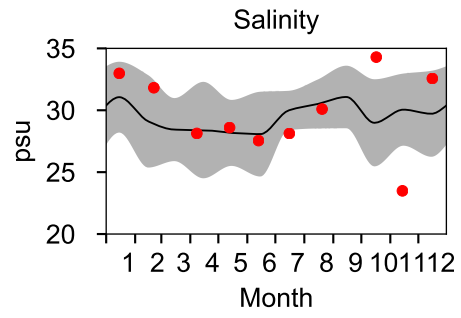
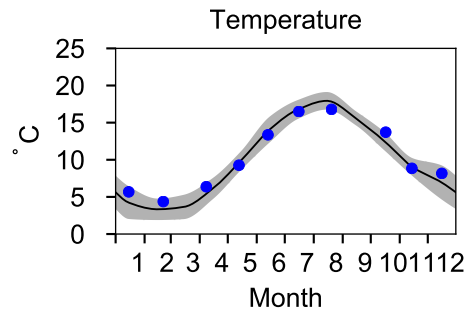
STATION P2 SURFACE WATER (0-10 m)



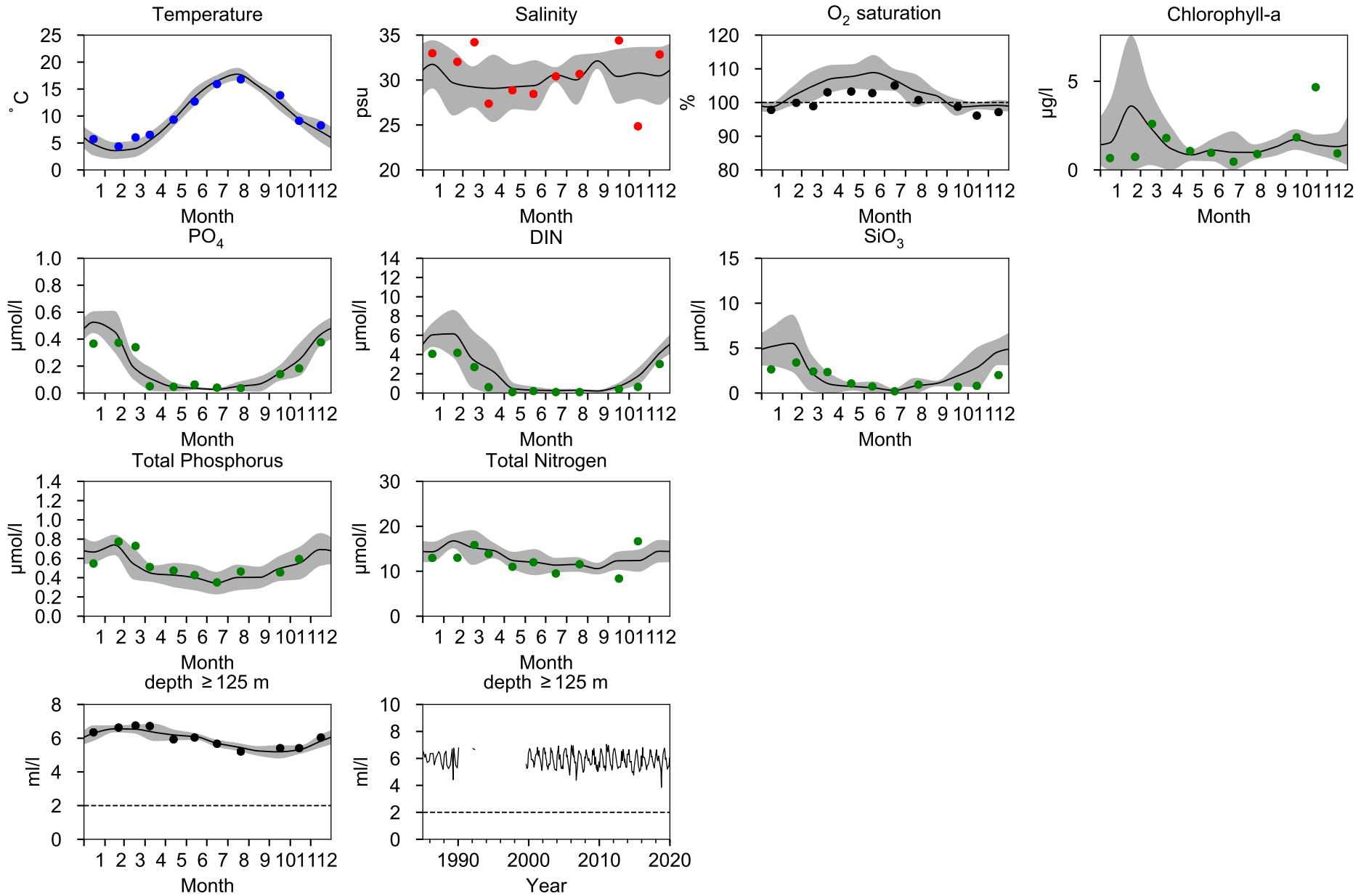
STATION Å13 SURFACE WATER (0-10 m)



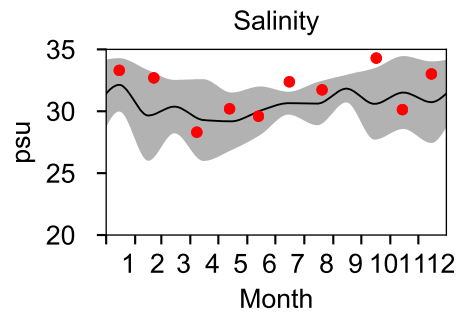
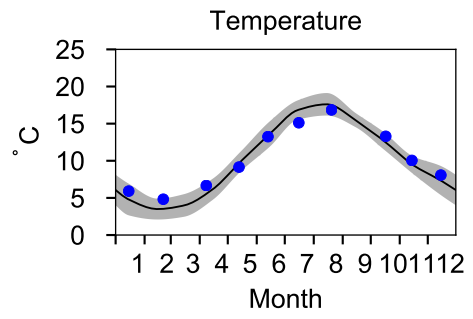
STATION Å14 SURFACE WATER (0-10 m)



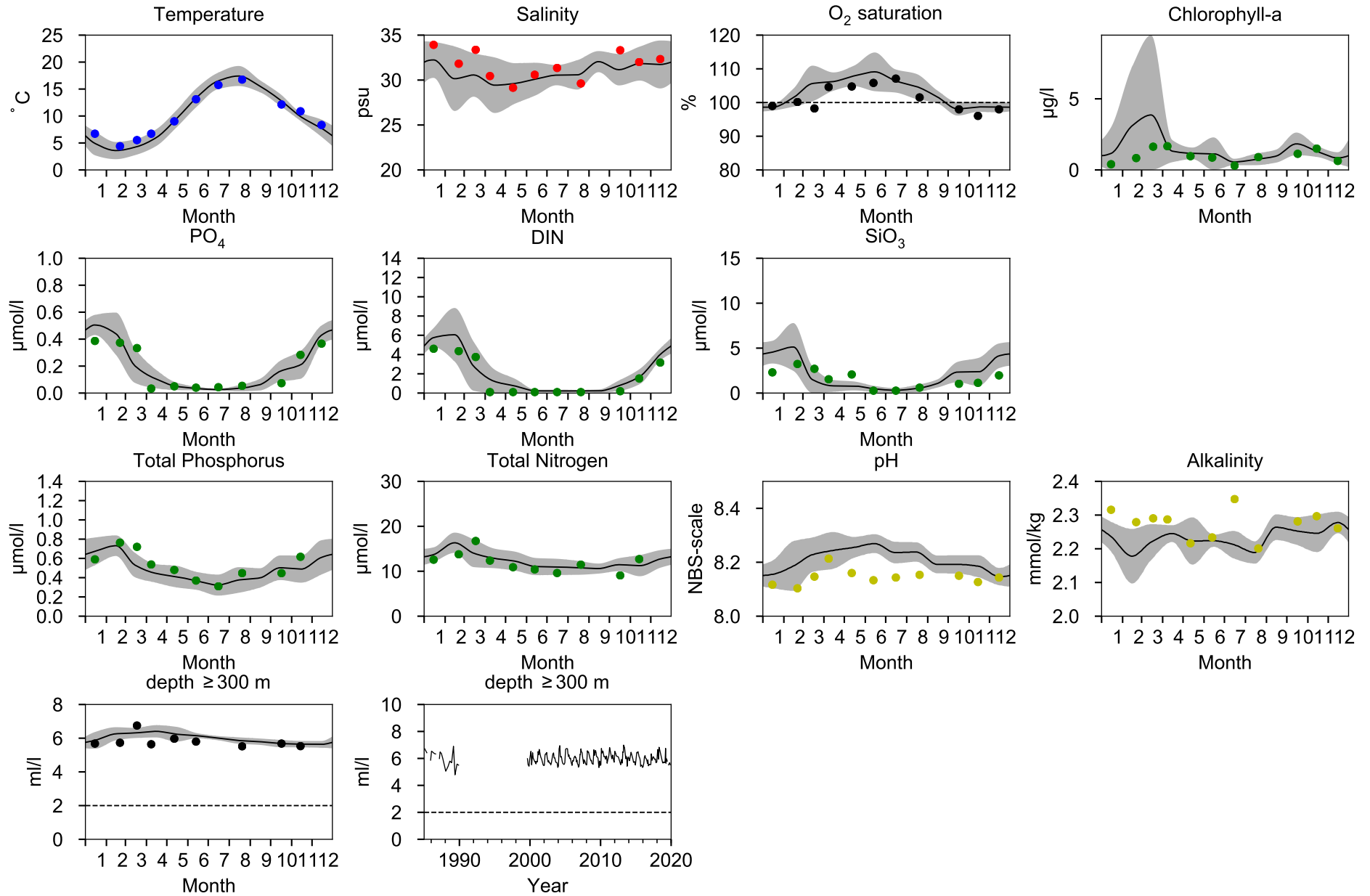
STATION Å15 SURFACE WATER (0-10 m)



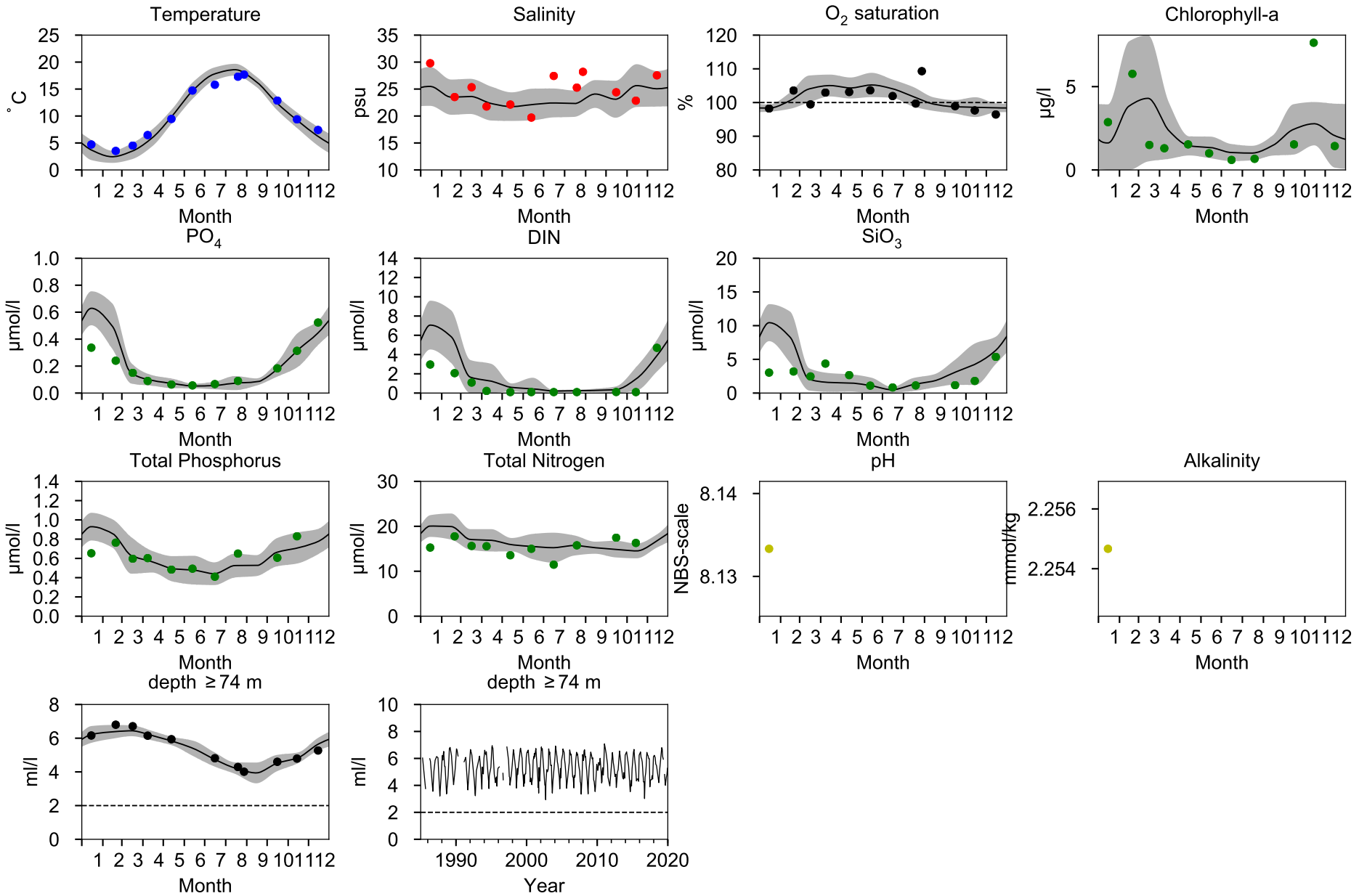
STATION Å16 SURFACE WATER (0-10 m)



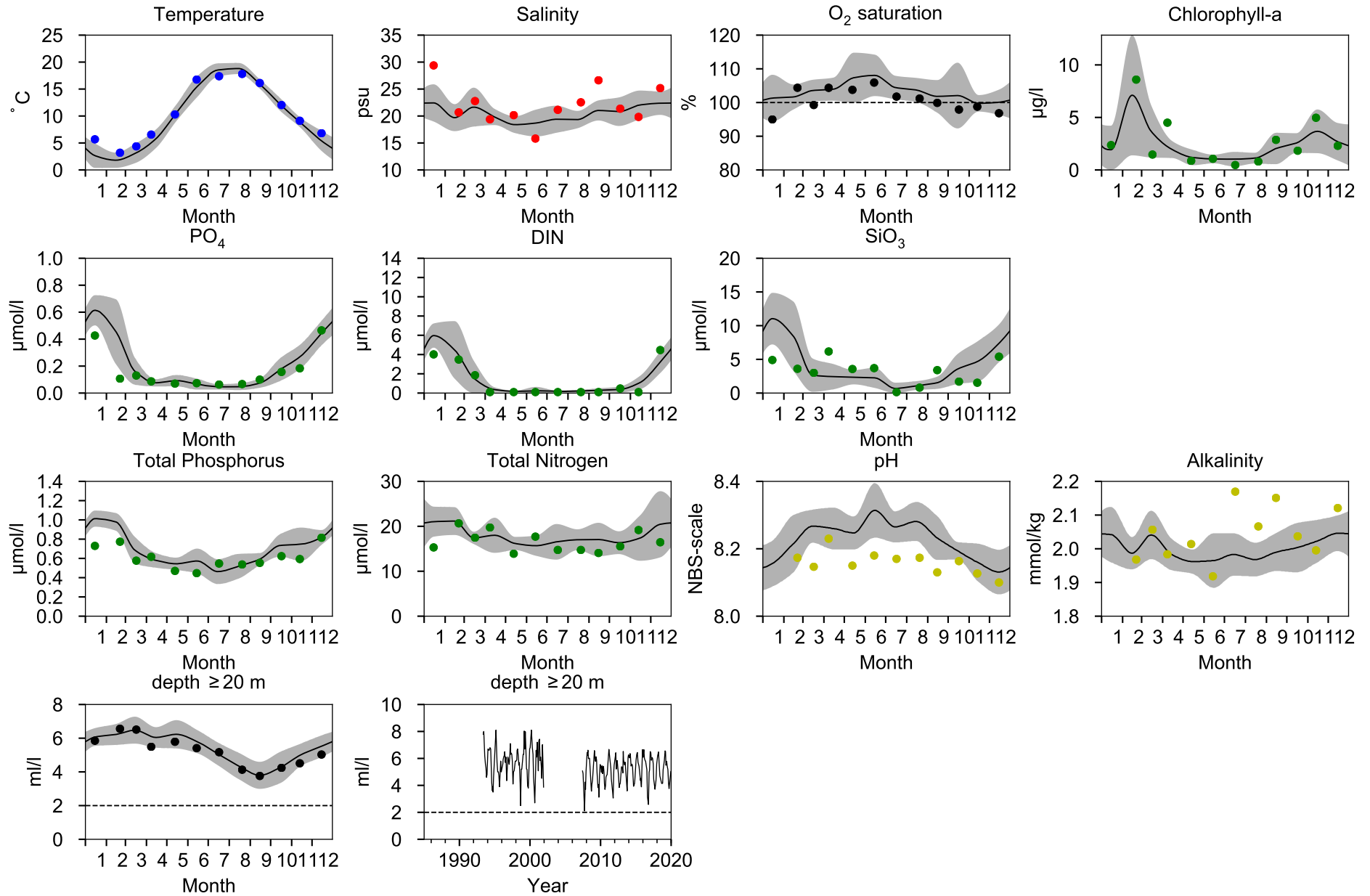
STATION Å17 SURFACE WATER (0-10 m)



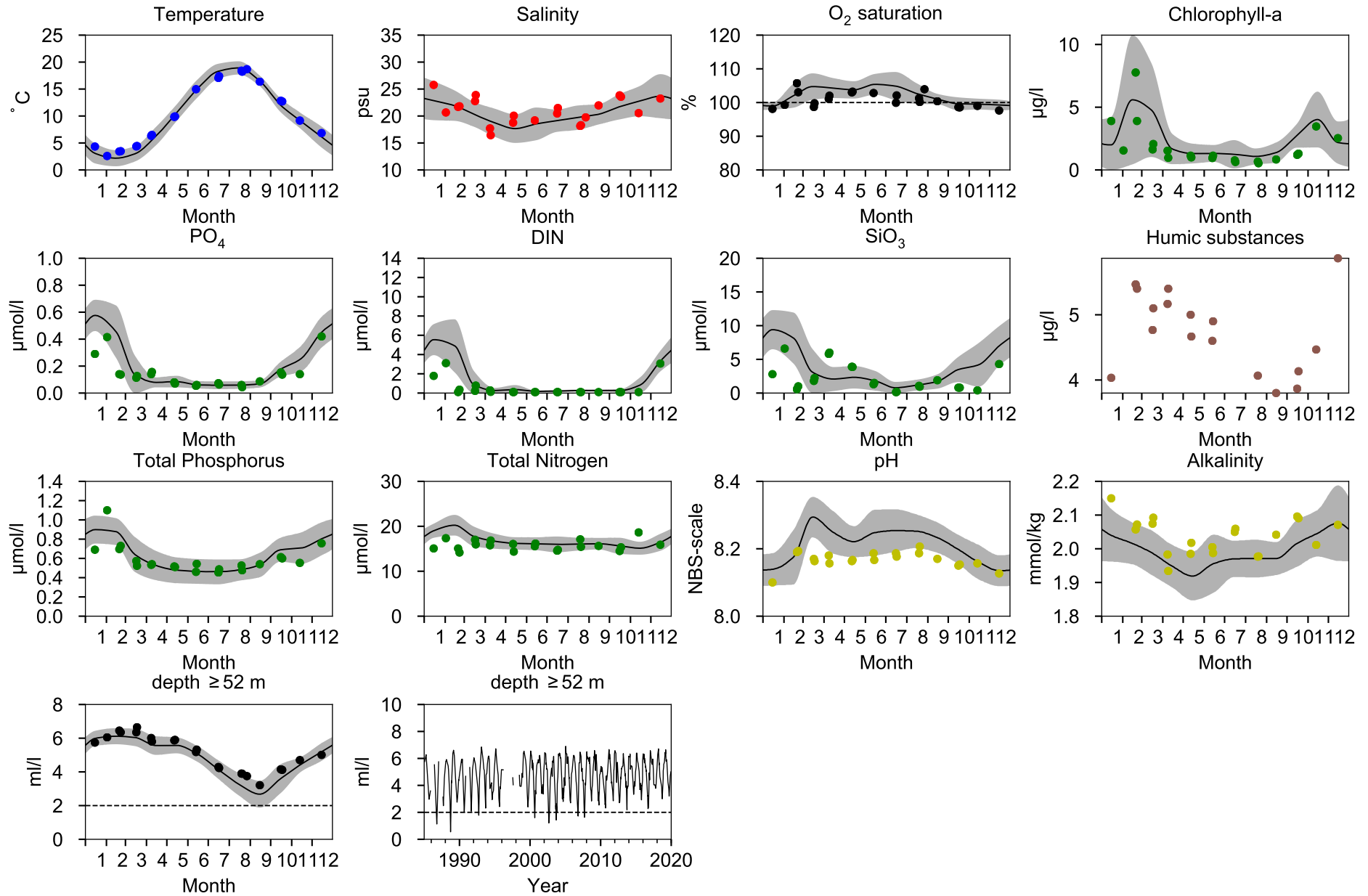
STATION FLADEN SURFACE WATER (0-10 m)



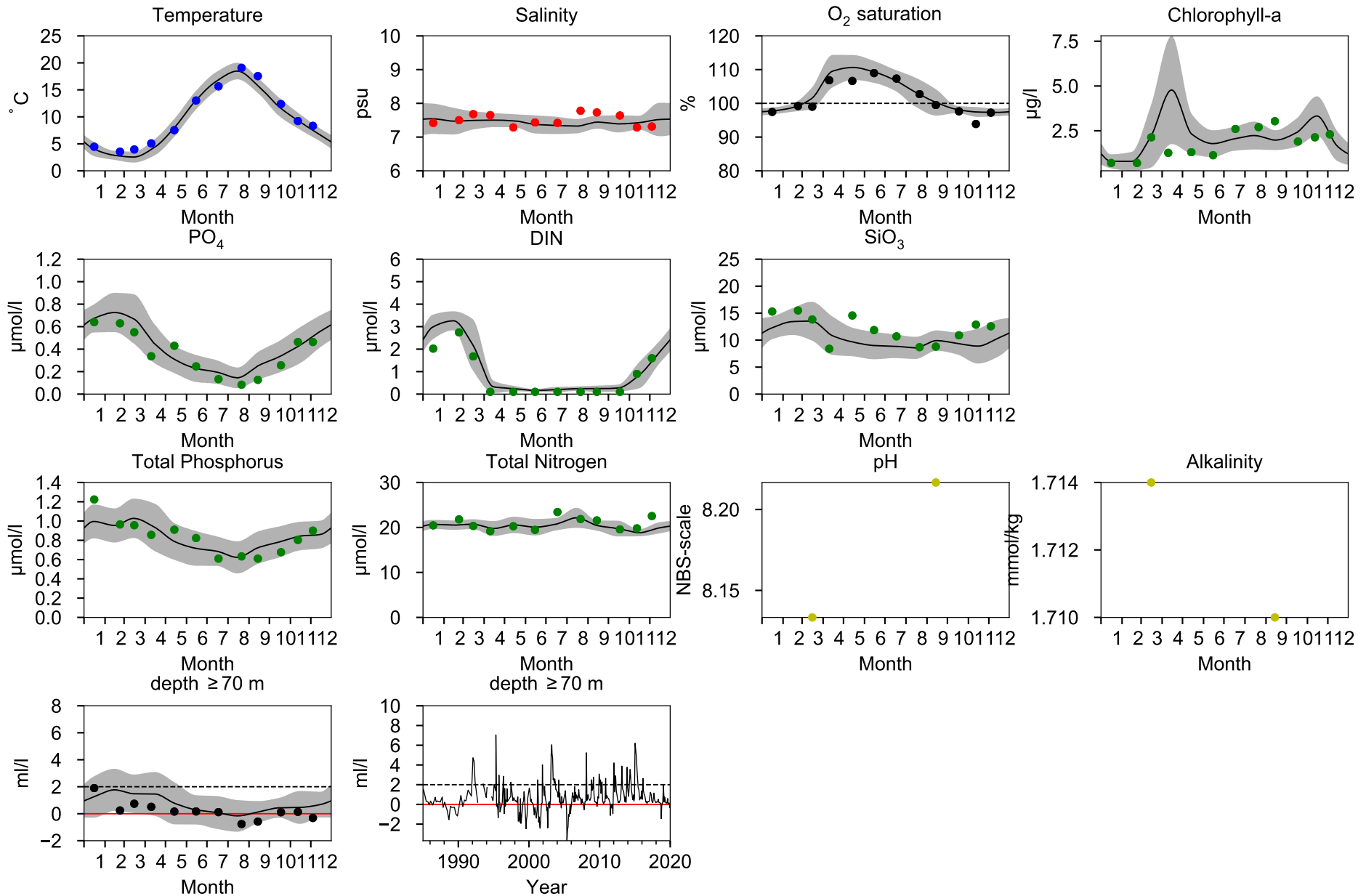
STATION N14 FALKENBERG SURFACE WATER (0-10 m)



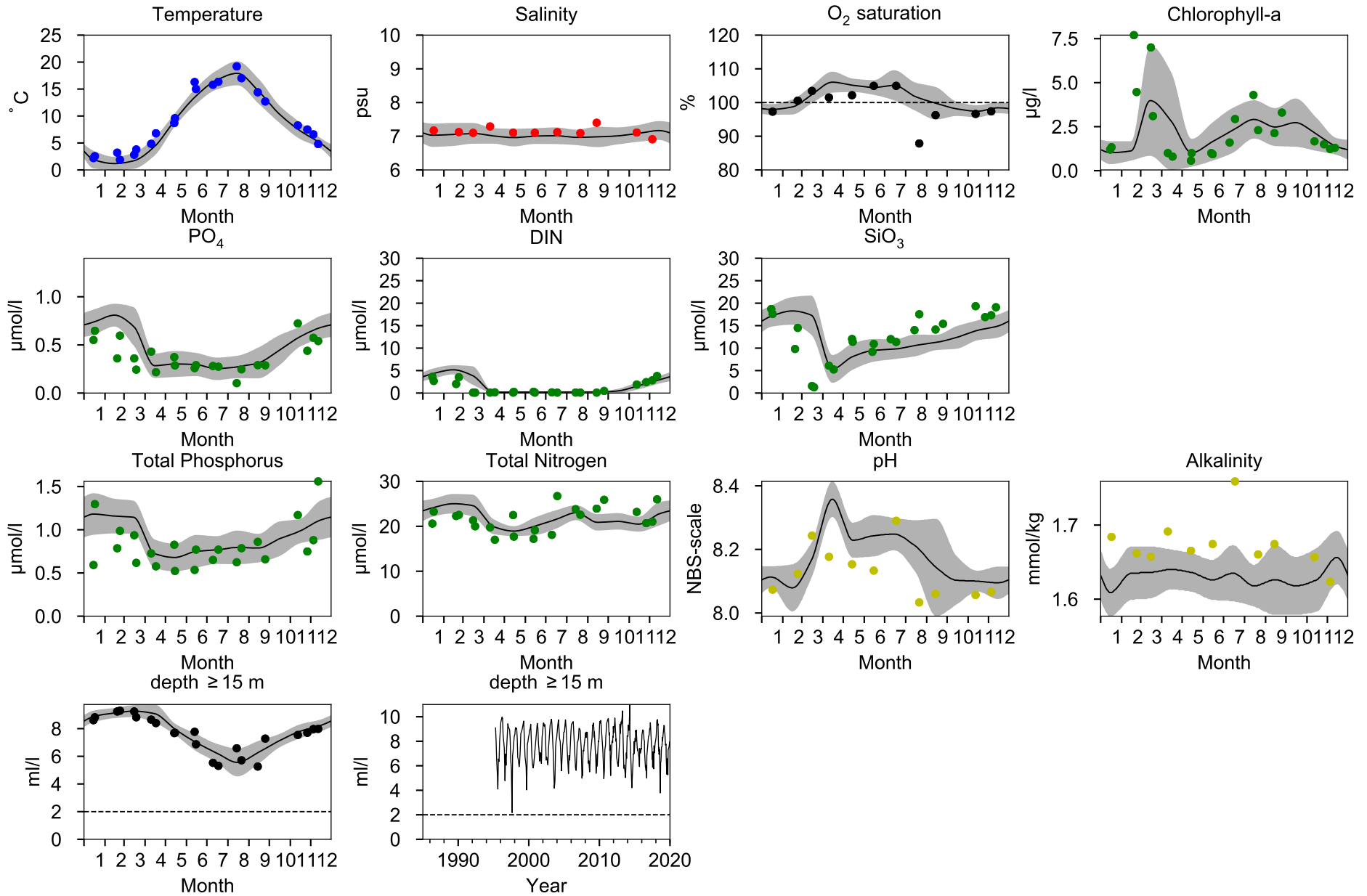
STATION ANHOLT E SURFACE WATER (0-10 m)



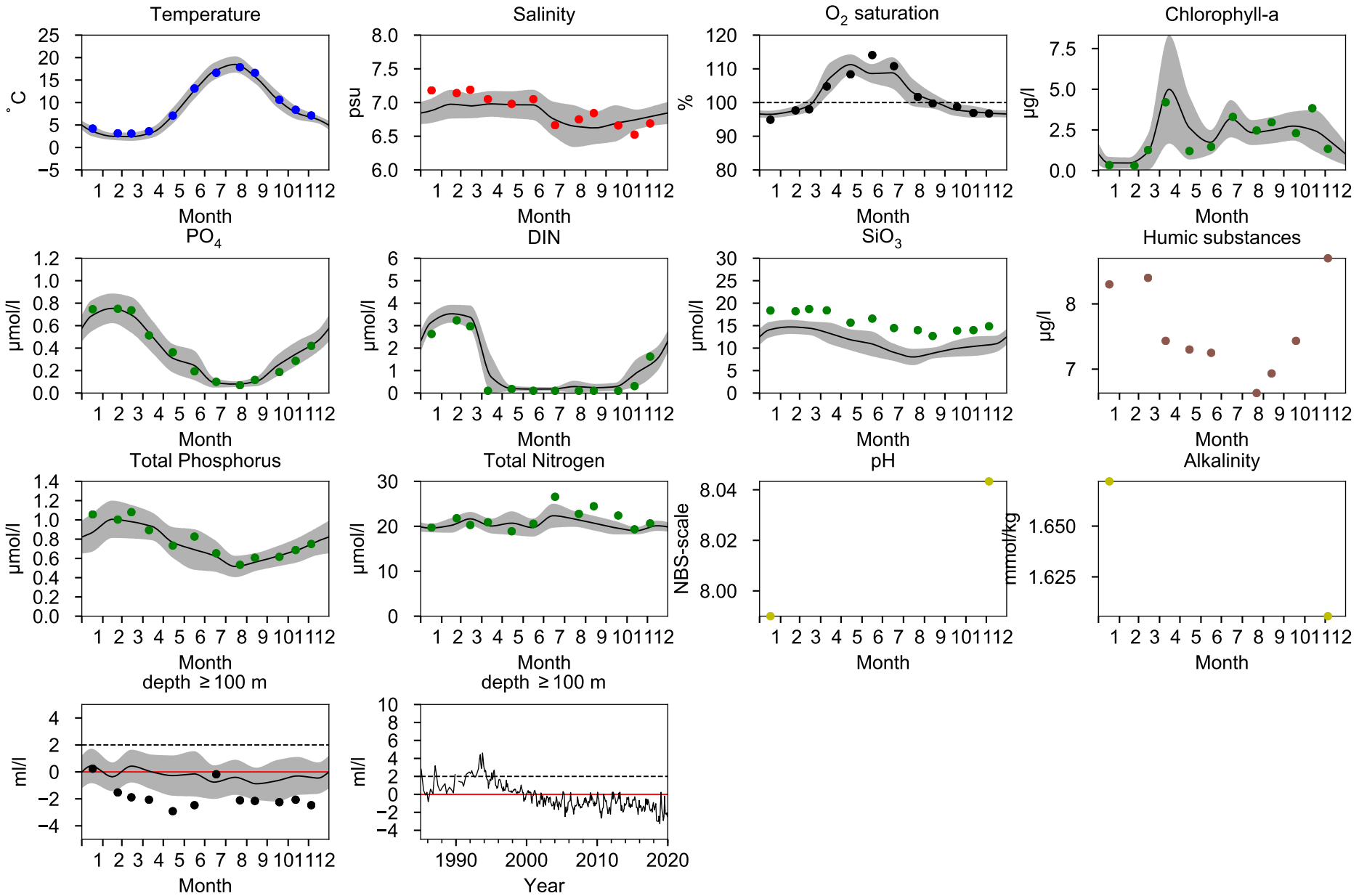
STATION HANÖBUKTEN SURFACE WATER (0-10 m)



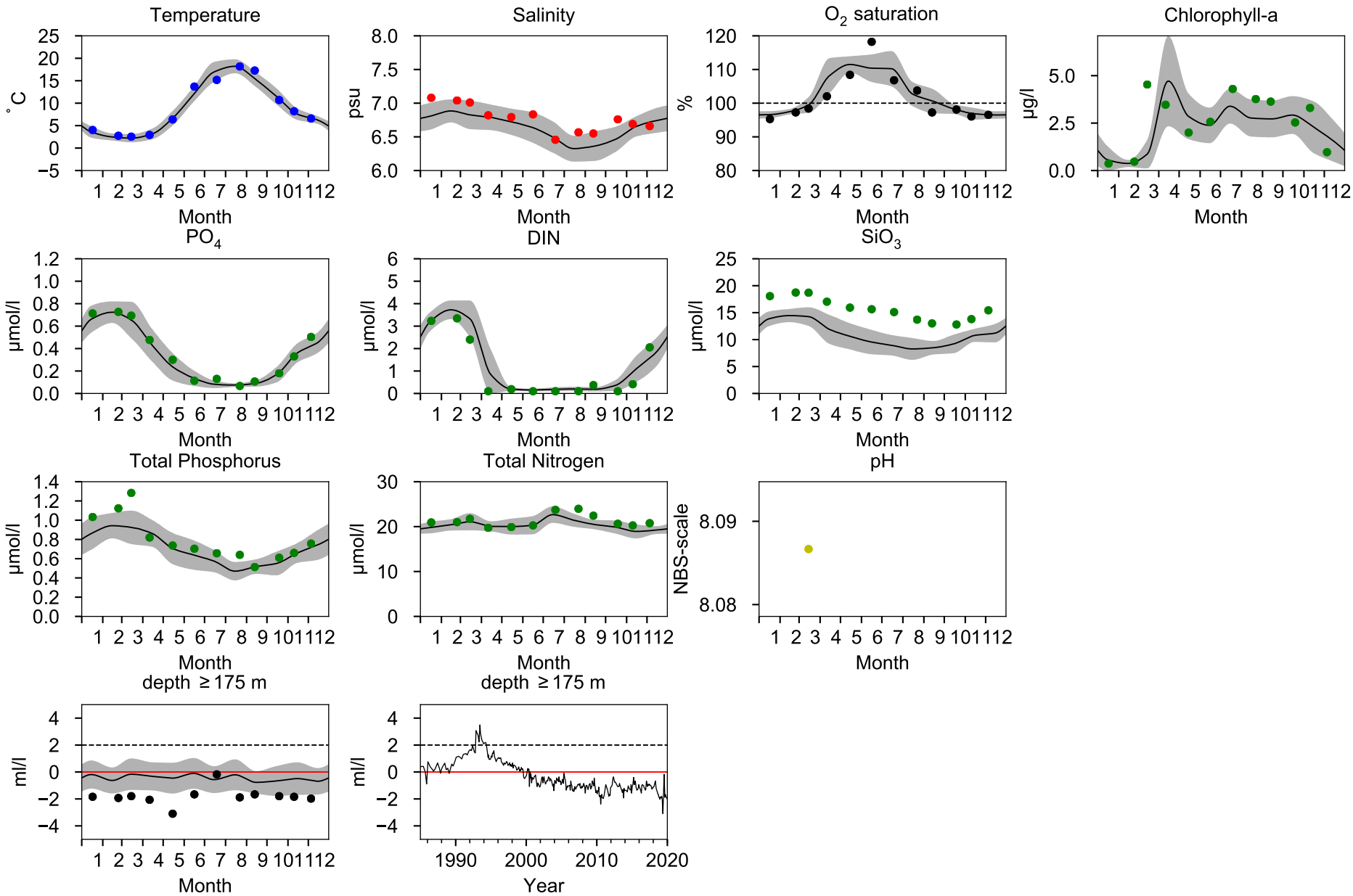
STATION REF M1V1 SURFACE WATER (0-10 m)



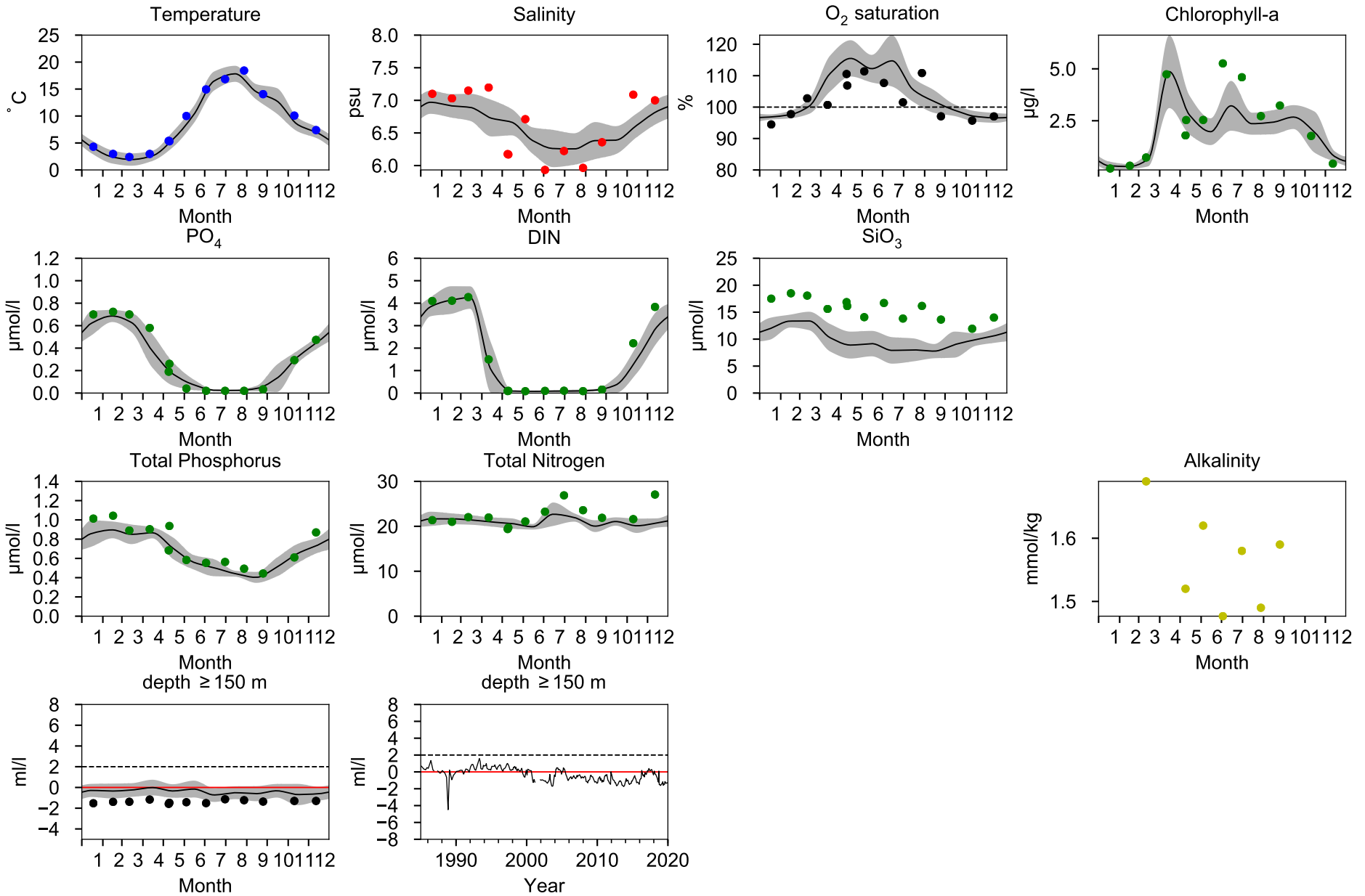
STATION BY38 KARLSÖDJ SURFACE WATER (0-10 m)



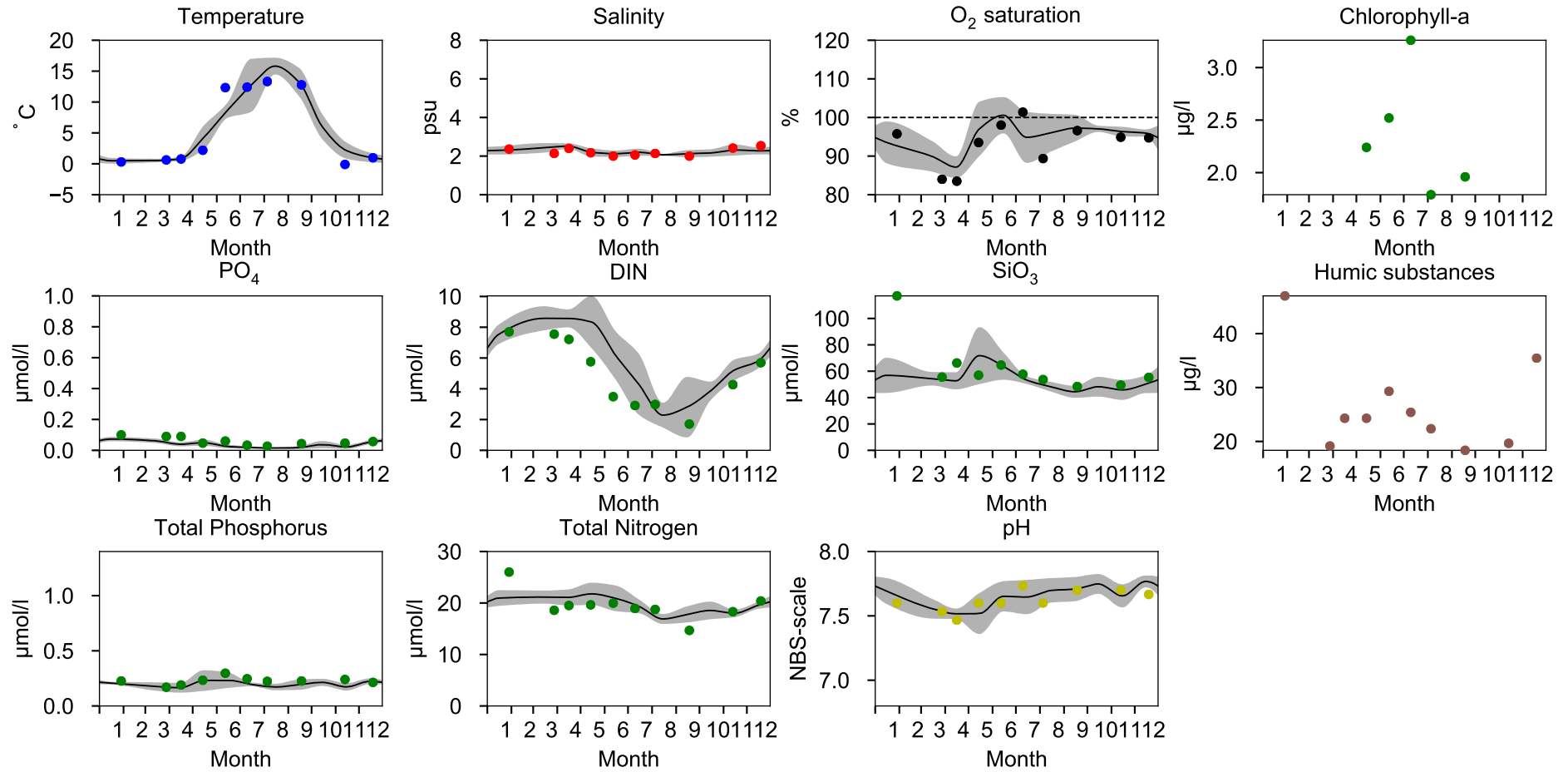
STATION BY32 NORRKÖPINGSDJ SURFACE WATER (0-10 m)



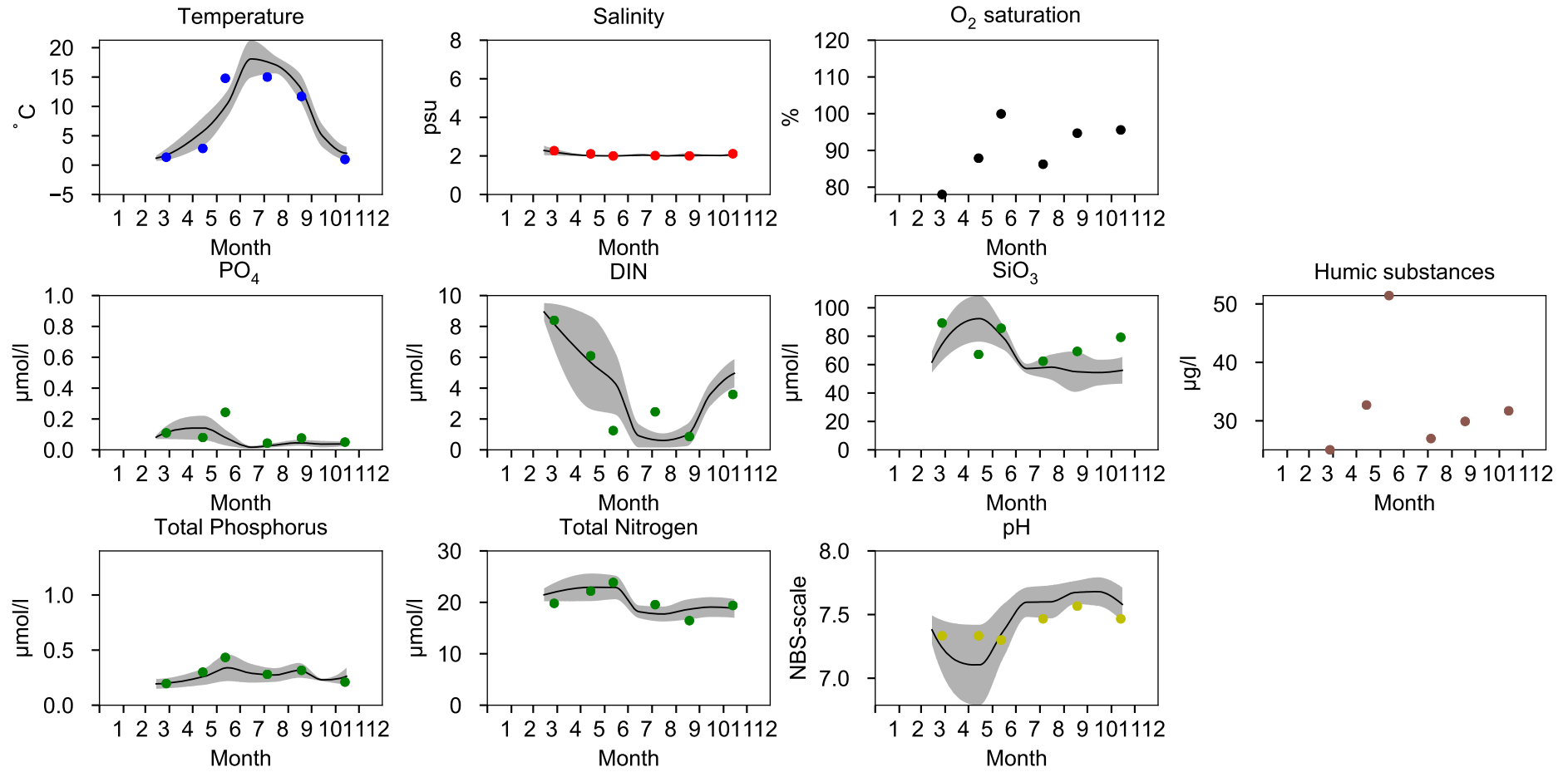
STATION BY29 / LL19 SURFACE WATER (0-10 m)



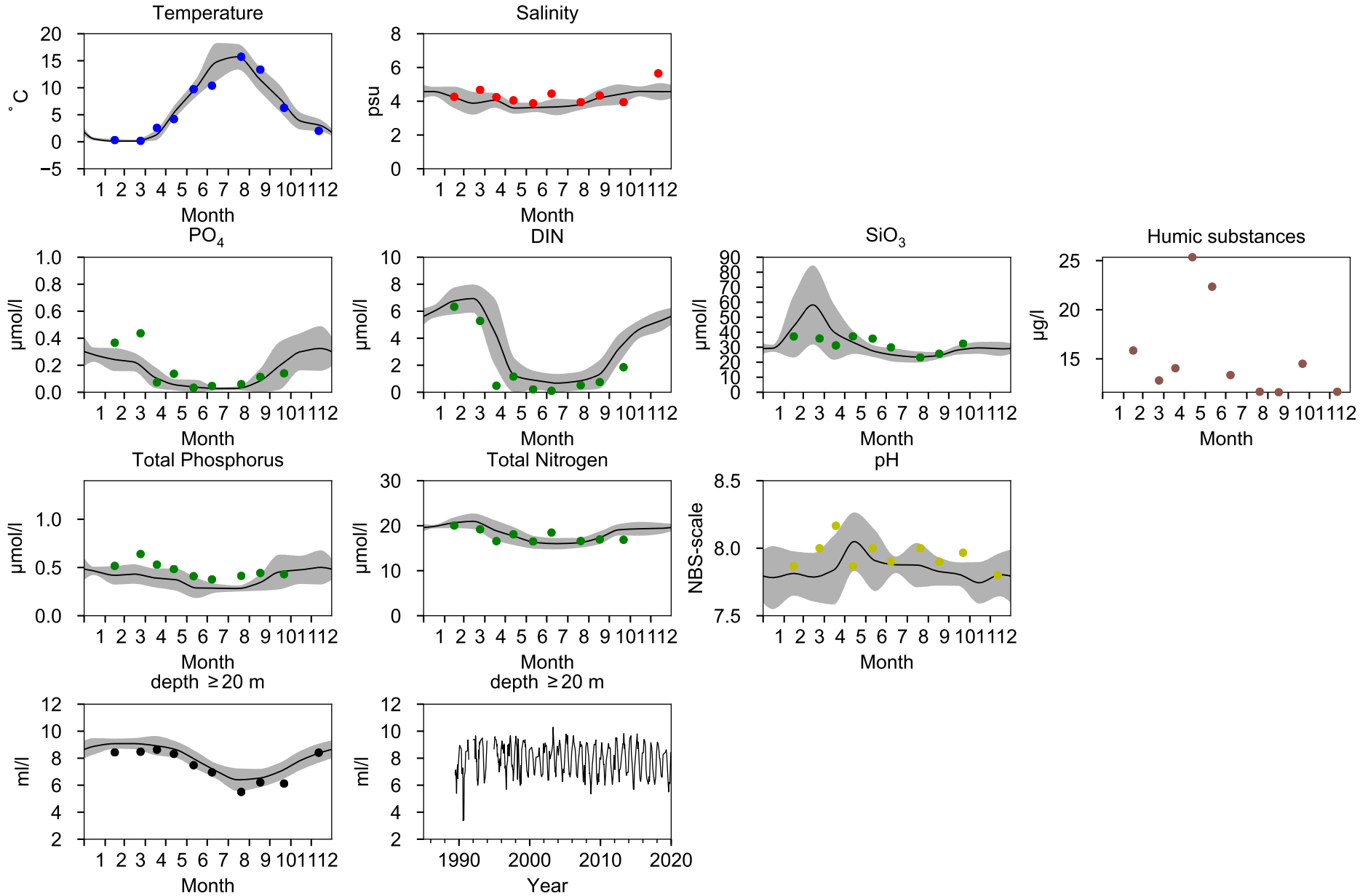
STATION RÅNEÅ-2 SURFACE WATER (0-10 m)



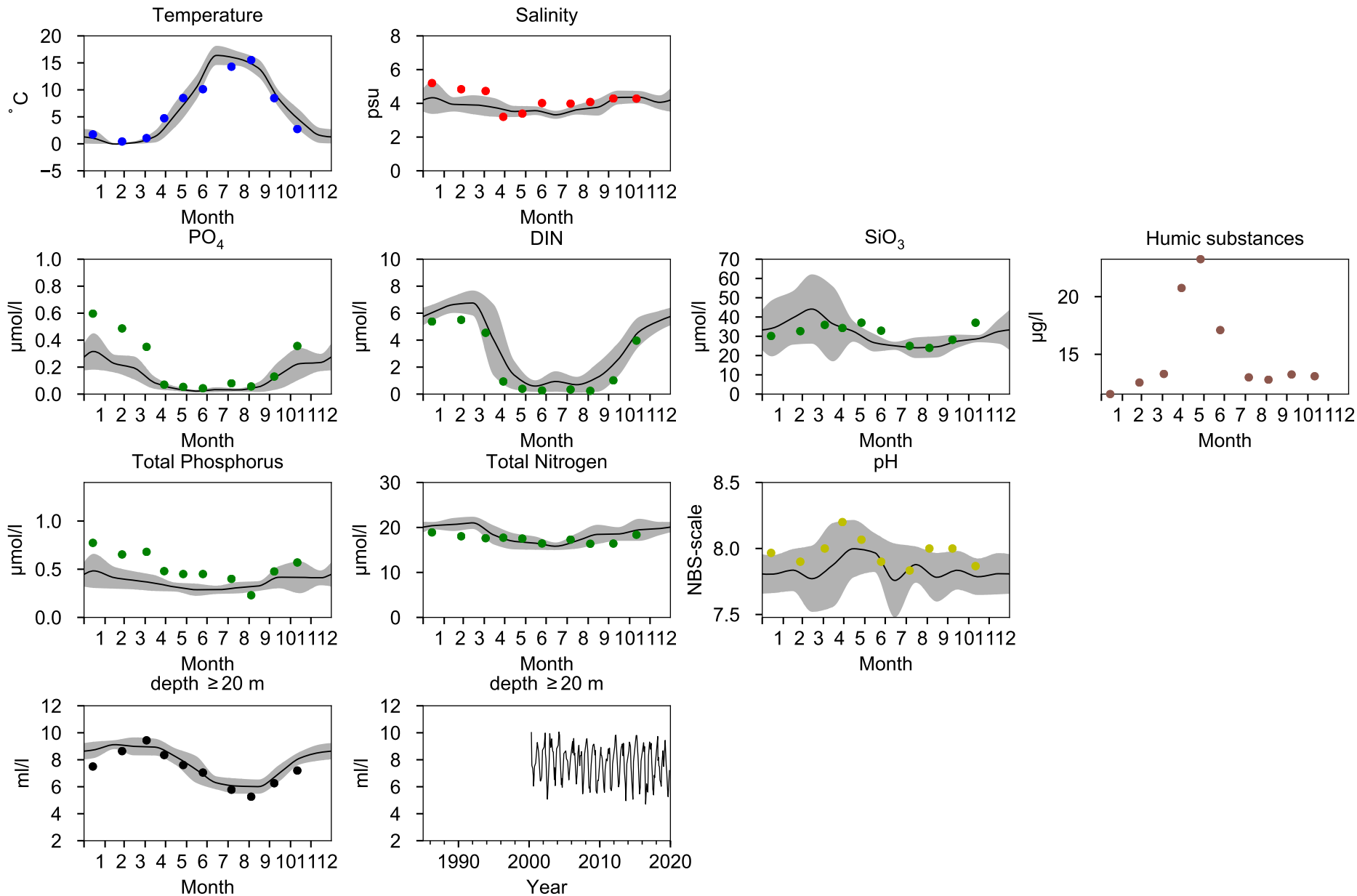
STATION RÂNEÅ-1 SURFACE WATER (0-10 m)



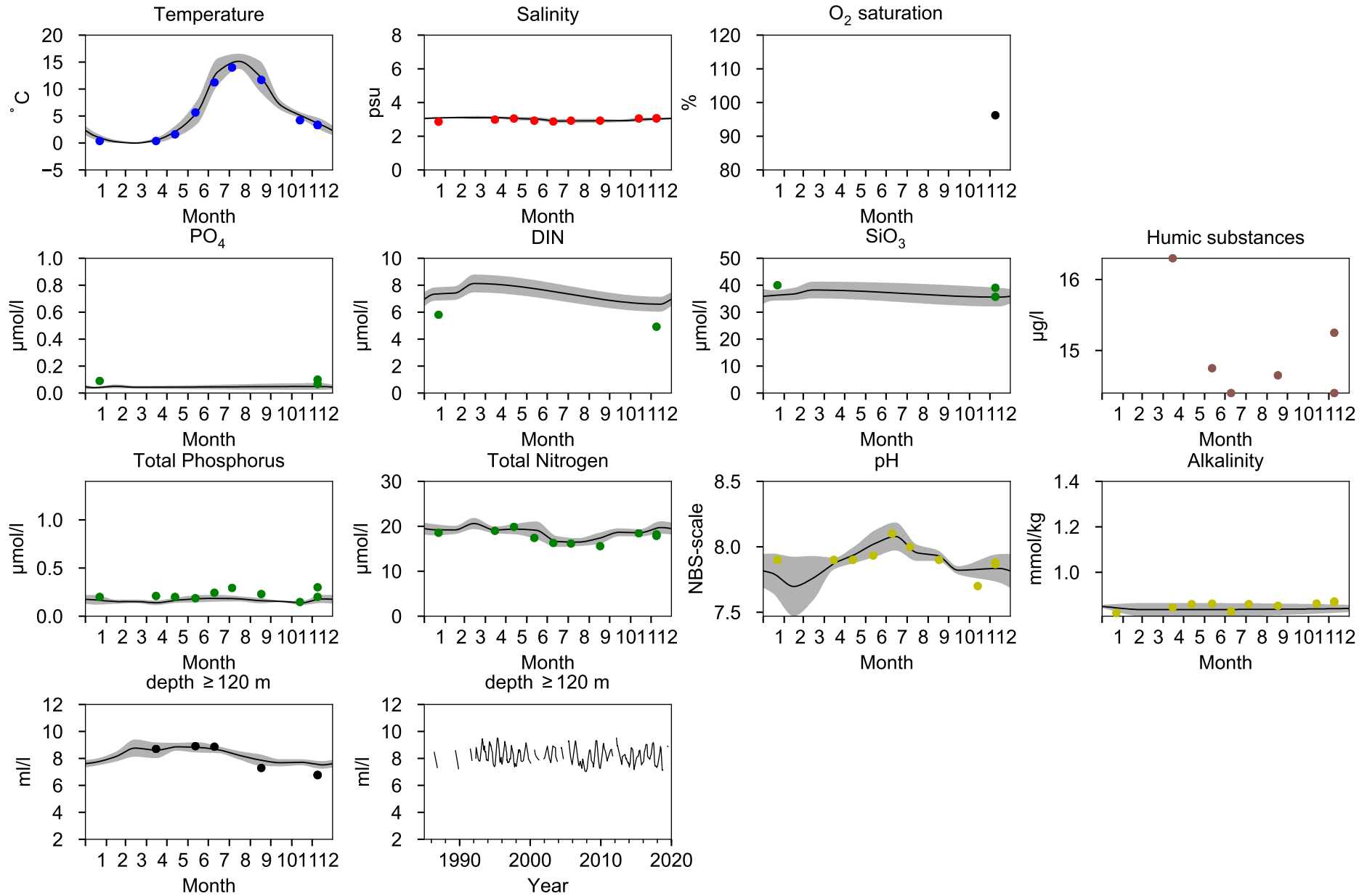
STATION NB1 / B3 SURFACE WATER (0-10 m)



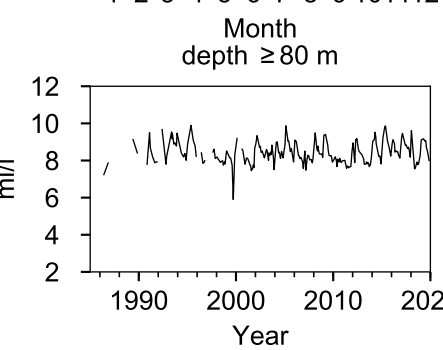
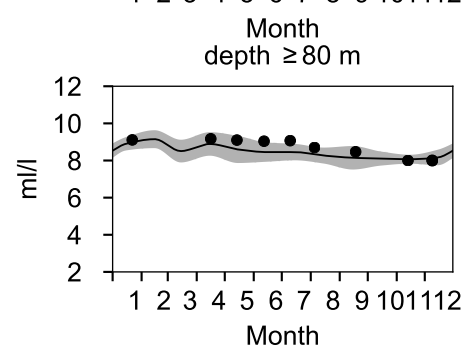
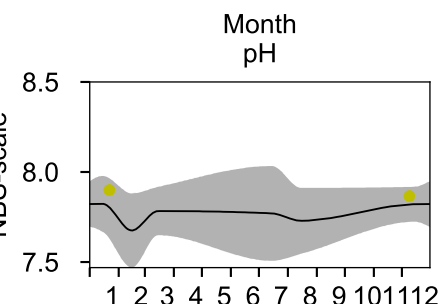
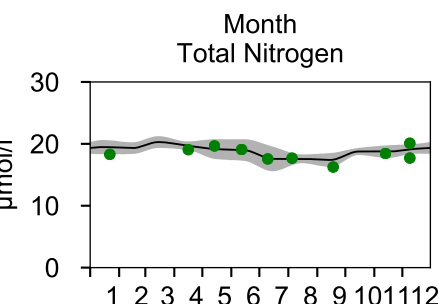
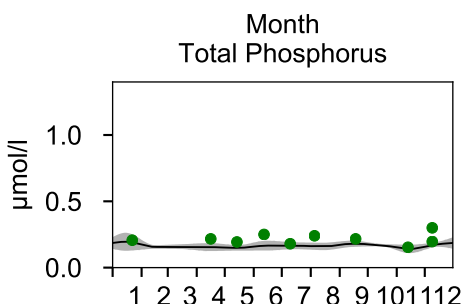
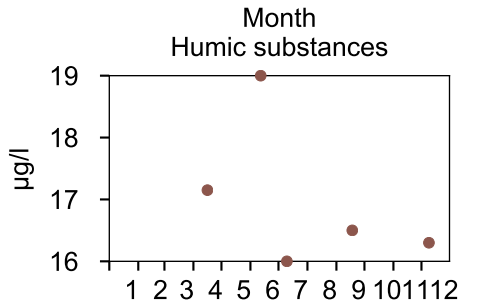
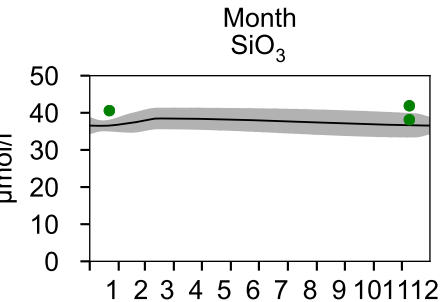
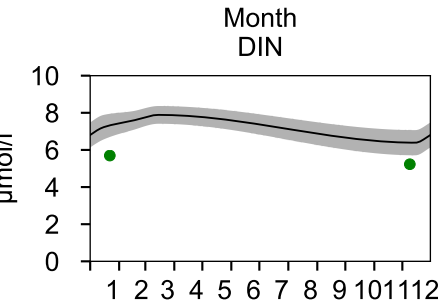
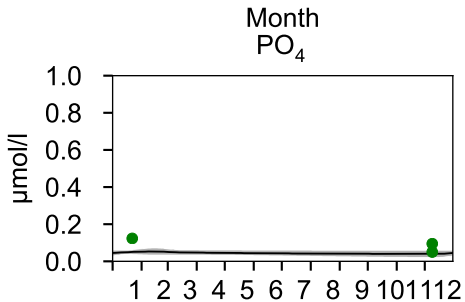
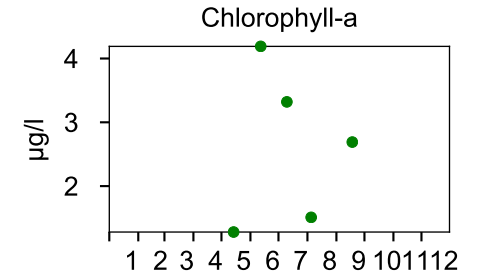
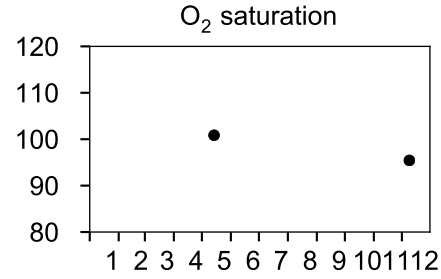
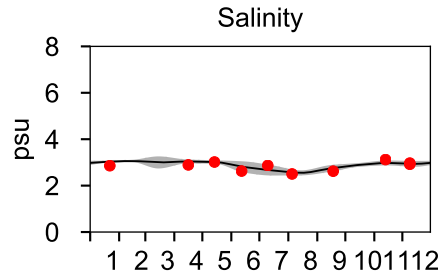
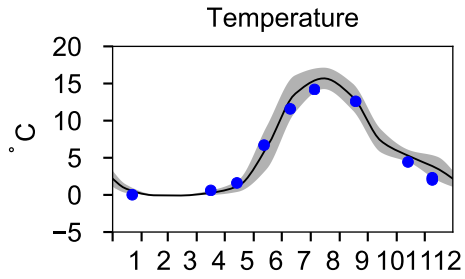
STATION B7 SURFACE WATER (0-10 m)



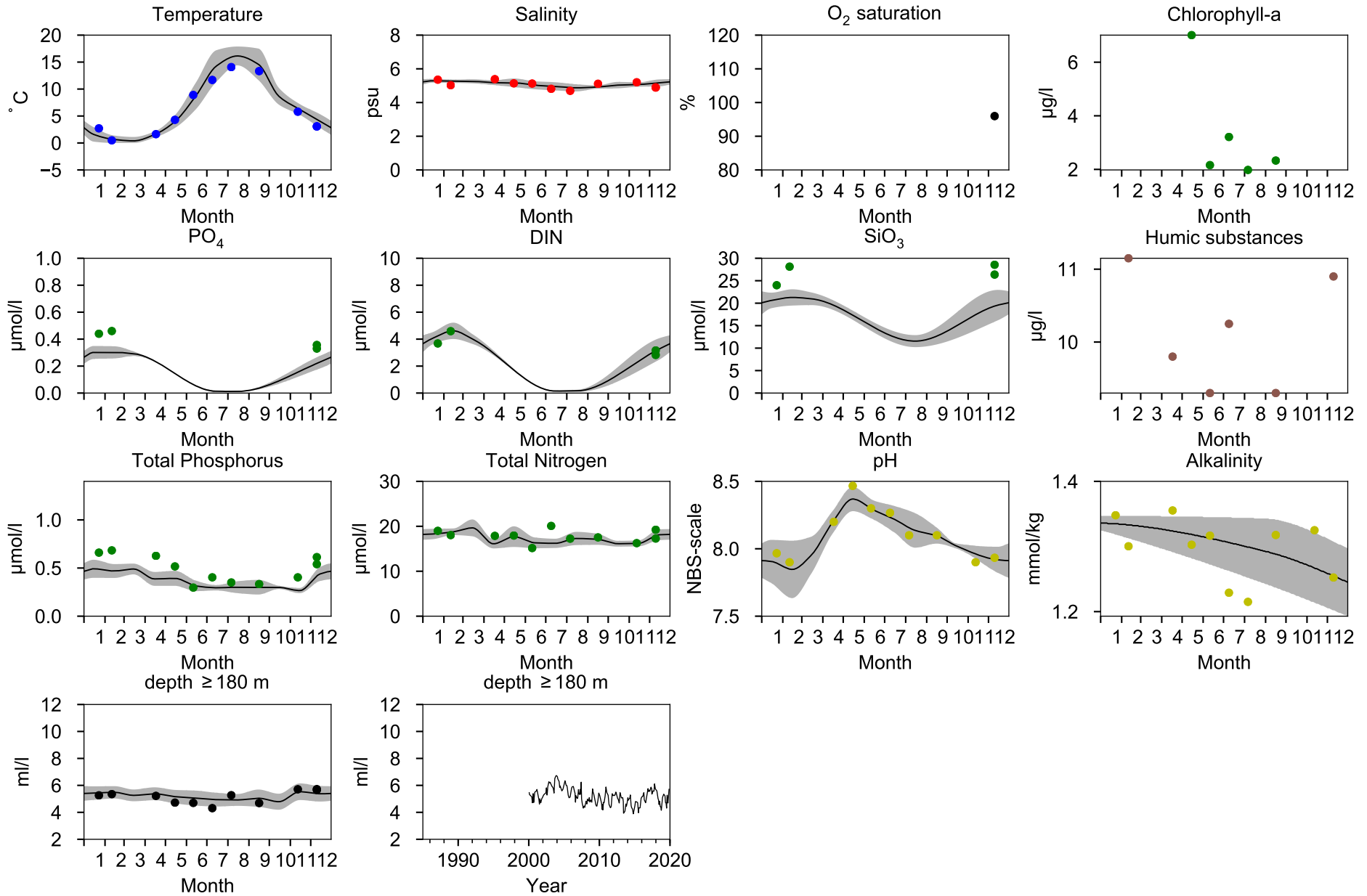
STATION F9 / A13 SURFACE WATER (0-10 m)



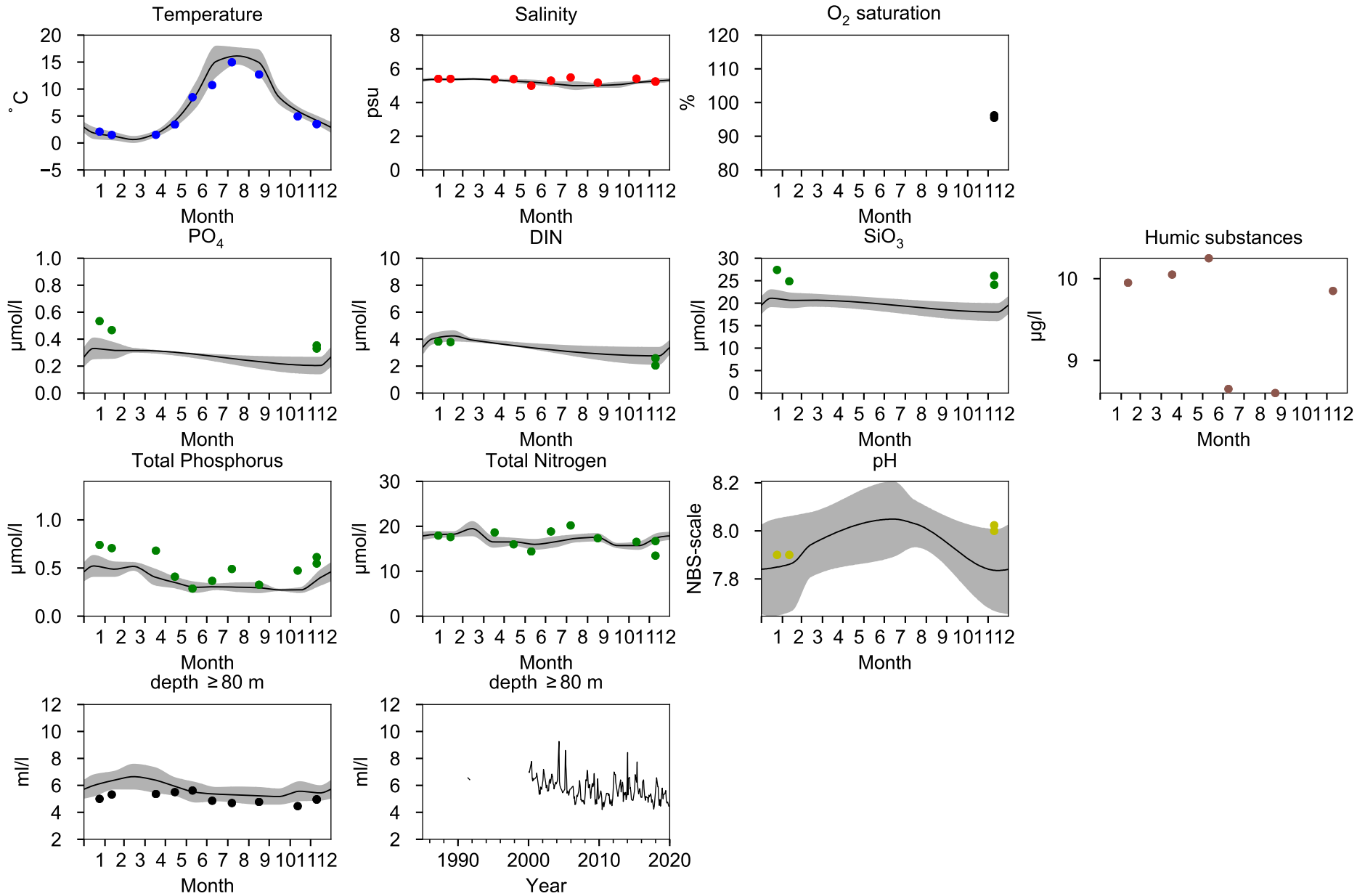
STATION F3 / A5 SURFACE WATER (0-10 m)



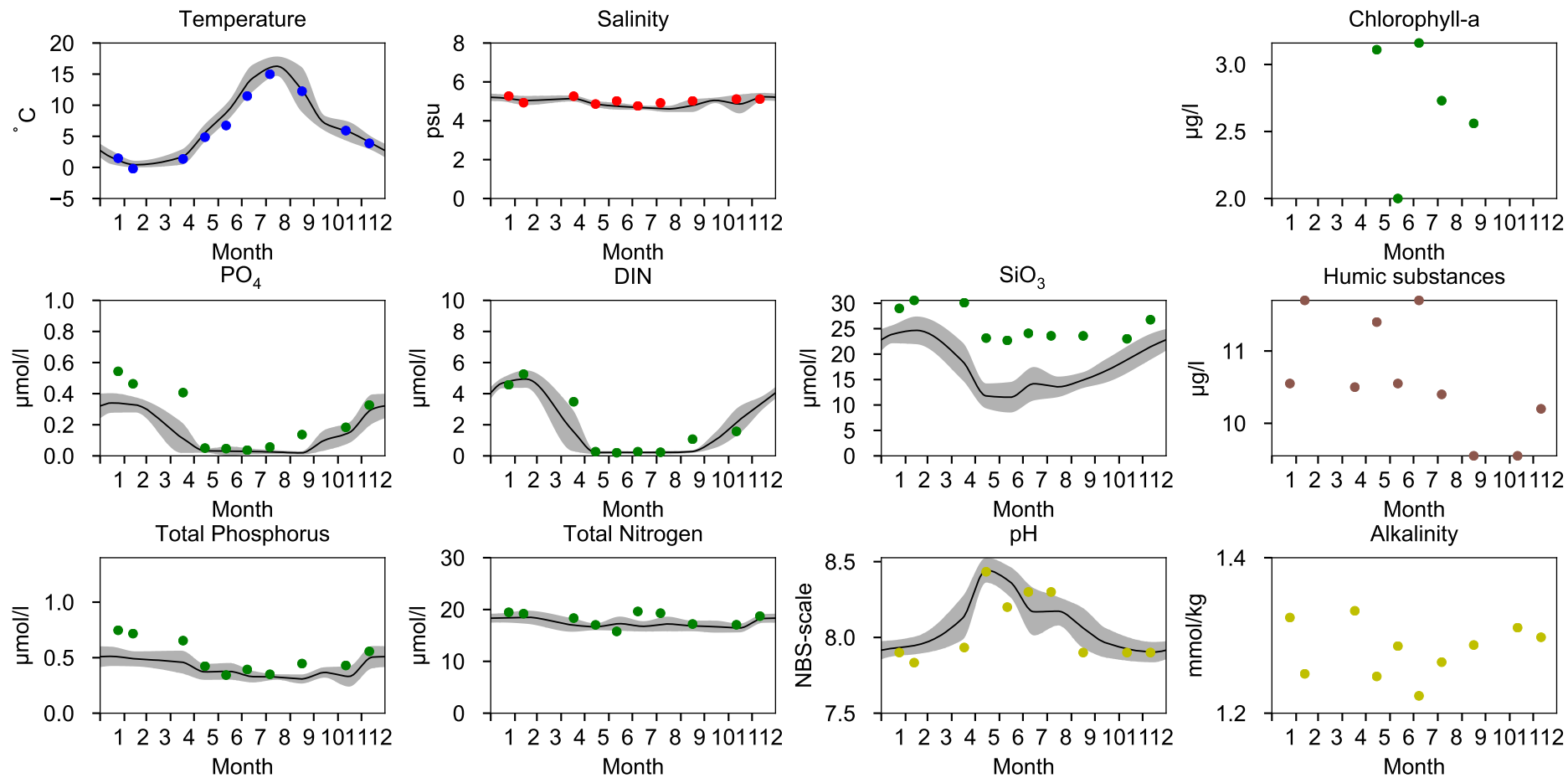
STATION C3 SURFACE WATER (0-10 m)



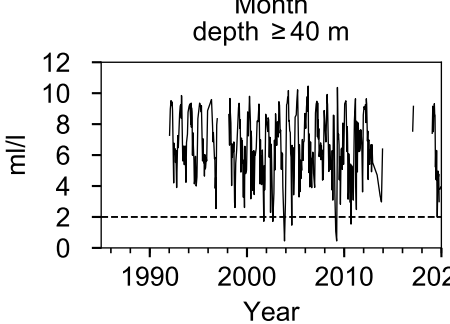
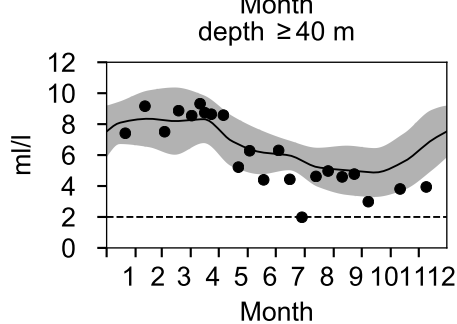
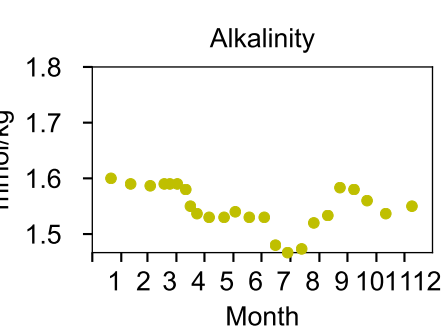
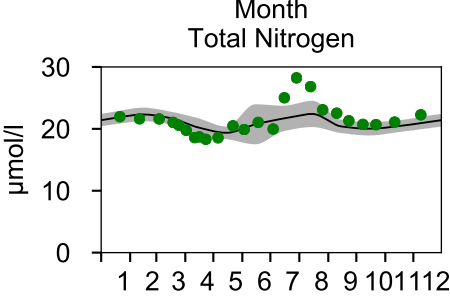
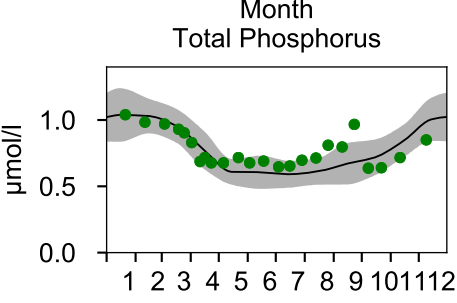
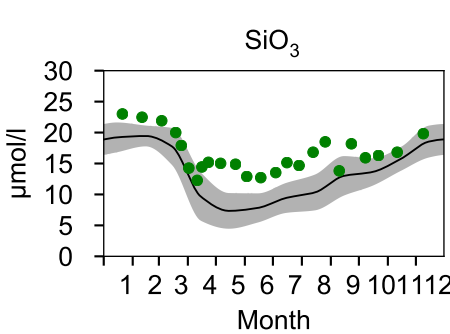
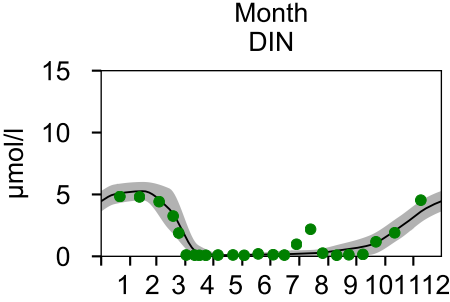
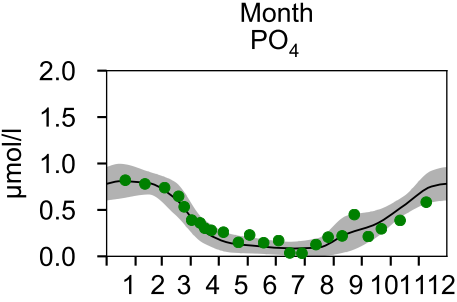
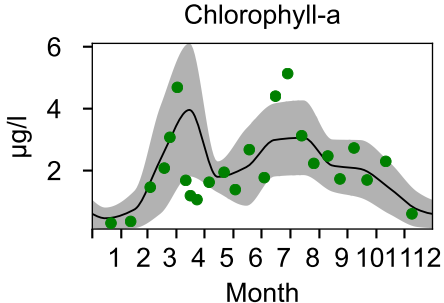
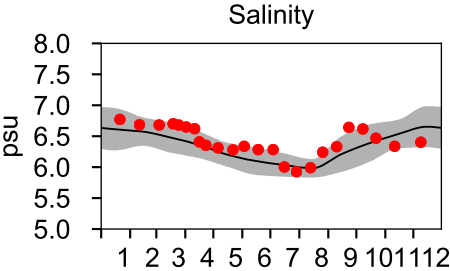
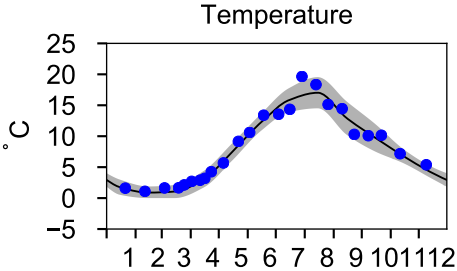
STATION MS4 / C14 SURFACE WATER (0-10 m)



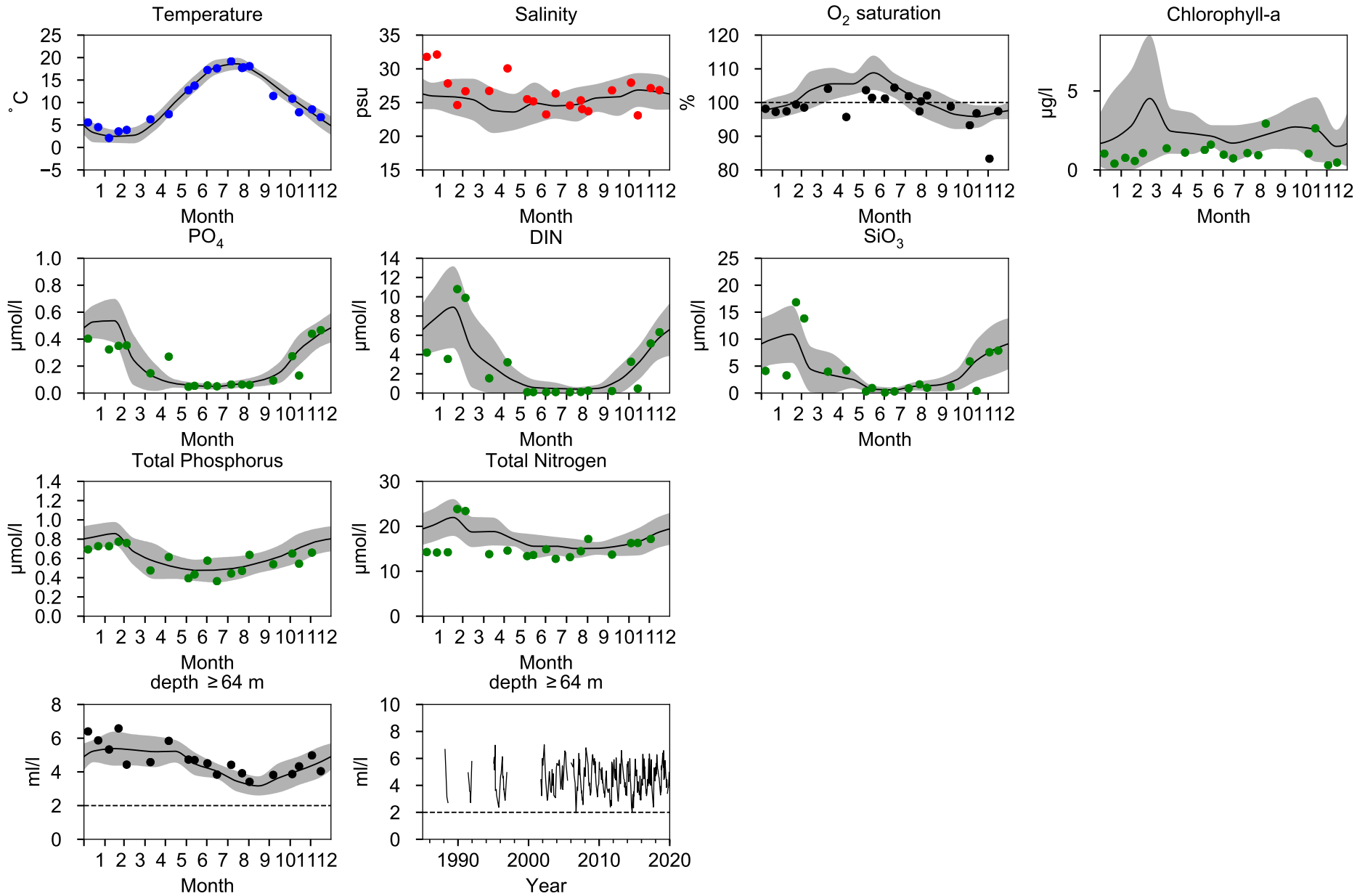
STATION GAVIK-1 SURFACE WATER (0-10 m)



STATION B1 SURFACE WATER (0-10 m)



STATION SLÄGGÖ SURFACE WATER (0-10 m)

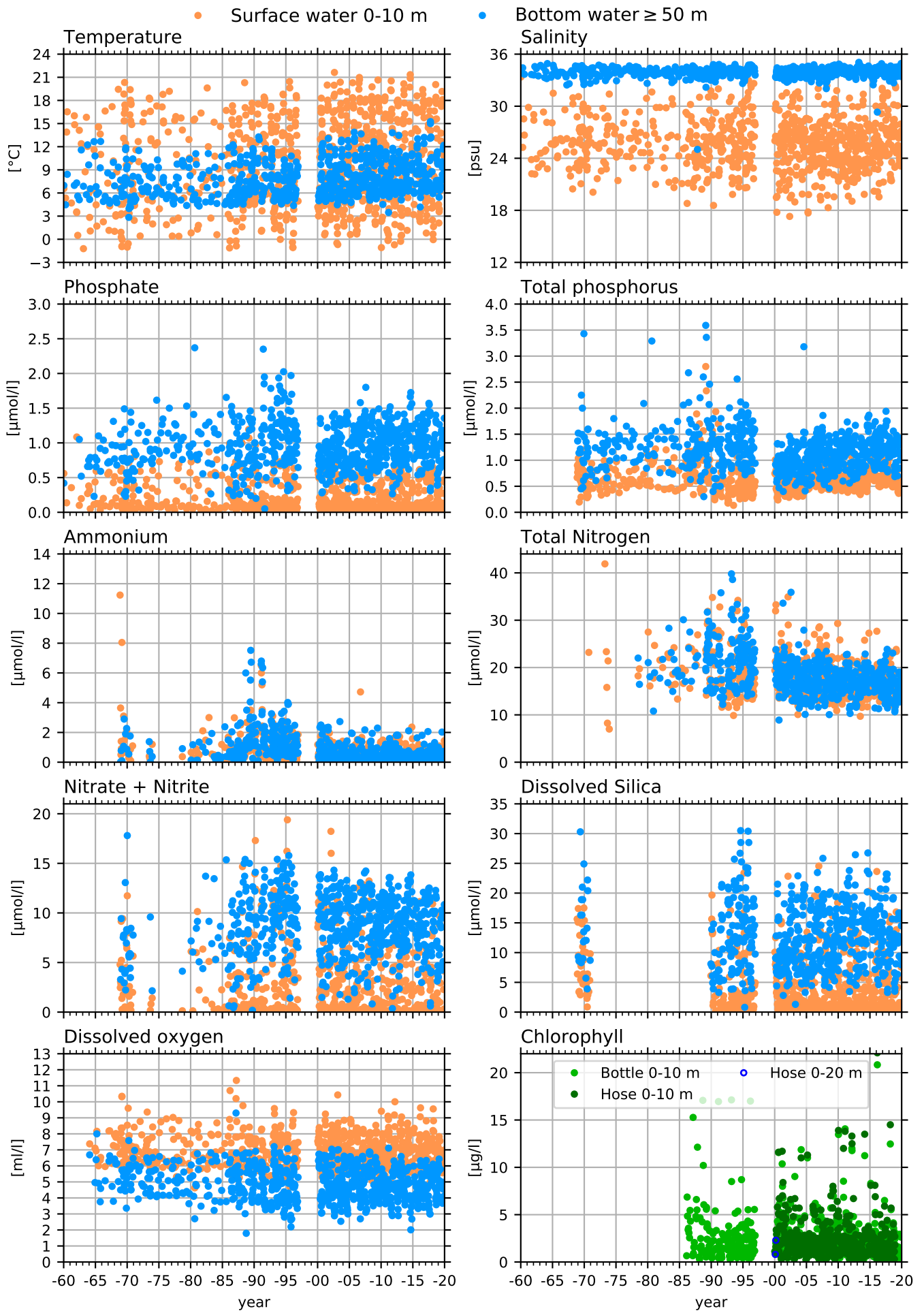


Appendix II

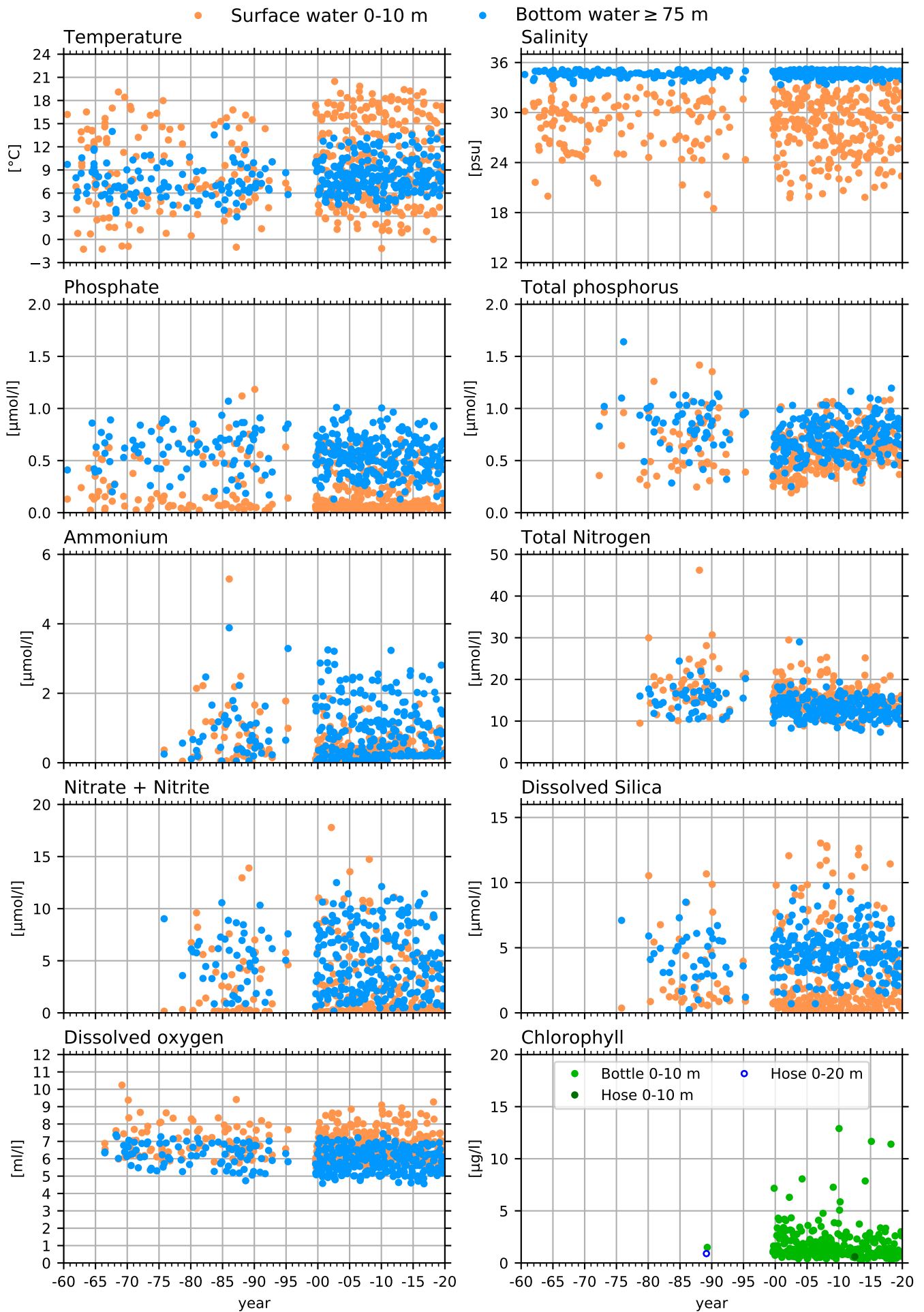
Time series (1960-2019) of surface water (0-10 m) and bottom water (station specific) for all monthly and high frequency stations sampled in 2019.

Included parameters are salinity, temperature, dissolved oxygen (including hydrogen sulphide as negative oxygen), dissolved inorganic phosphorus (DIP), total phosphorus, ammonium, sum of nitrate and nitrite, total nitrogen, dissolved silica and chlorophyll (hose sampling and mean from discrete depth 0-10 m). The station BCS III-10 was temporarily moved north-east of its correct position in 2017, this data is presented together with the BCS III-10 time series.

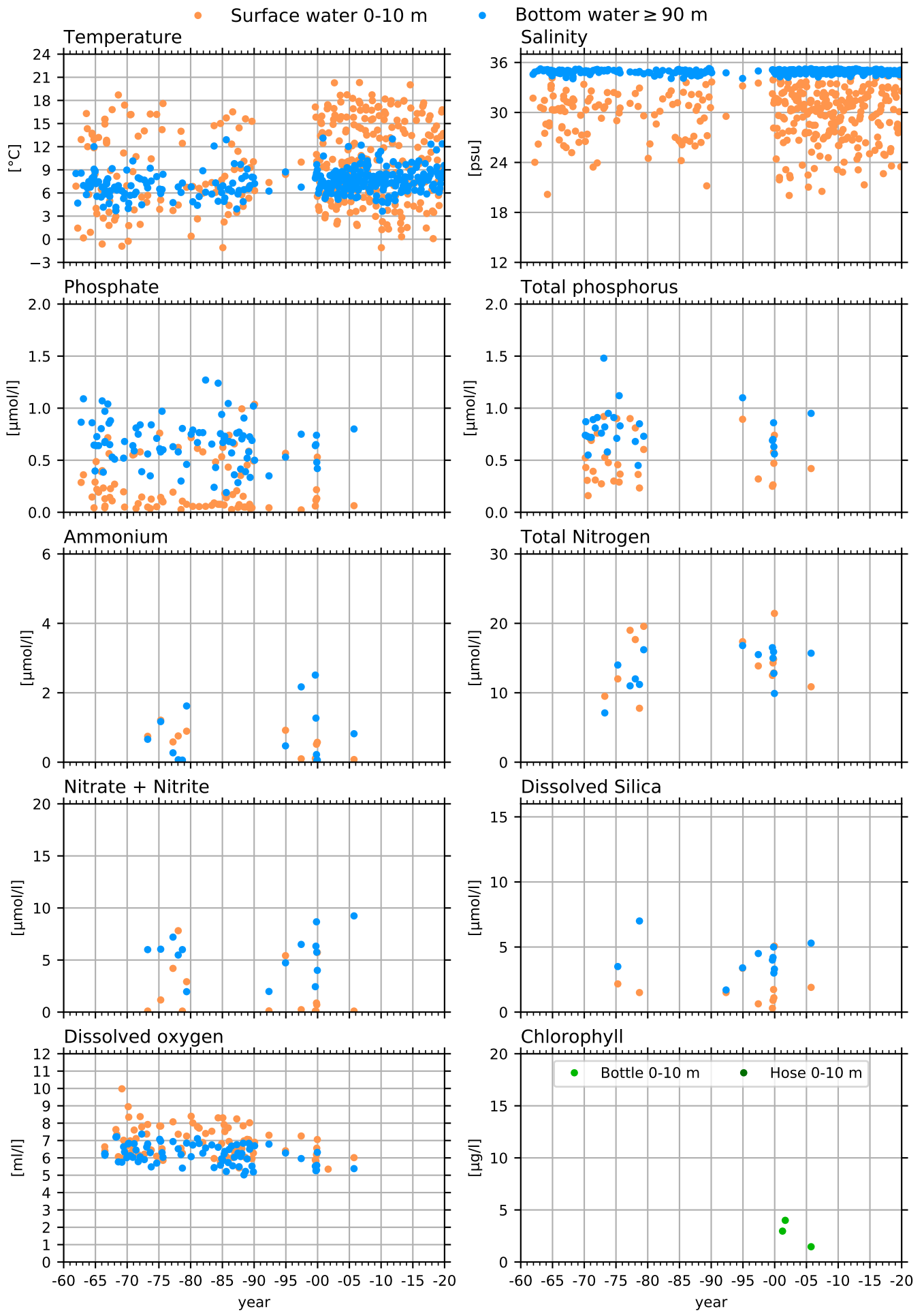
SLÄGGÖ, SKAGERACK COASTAL



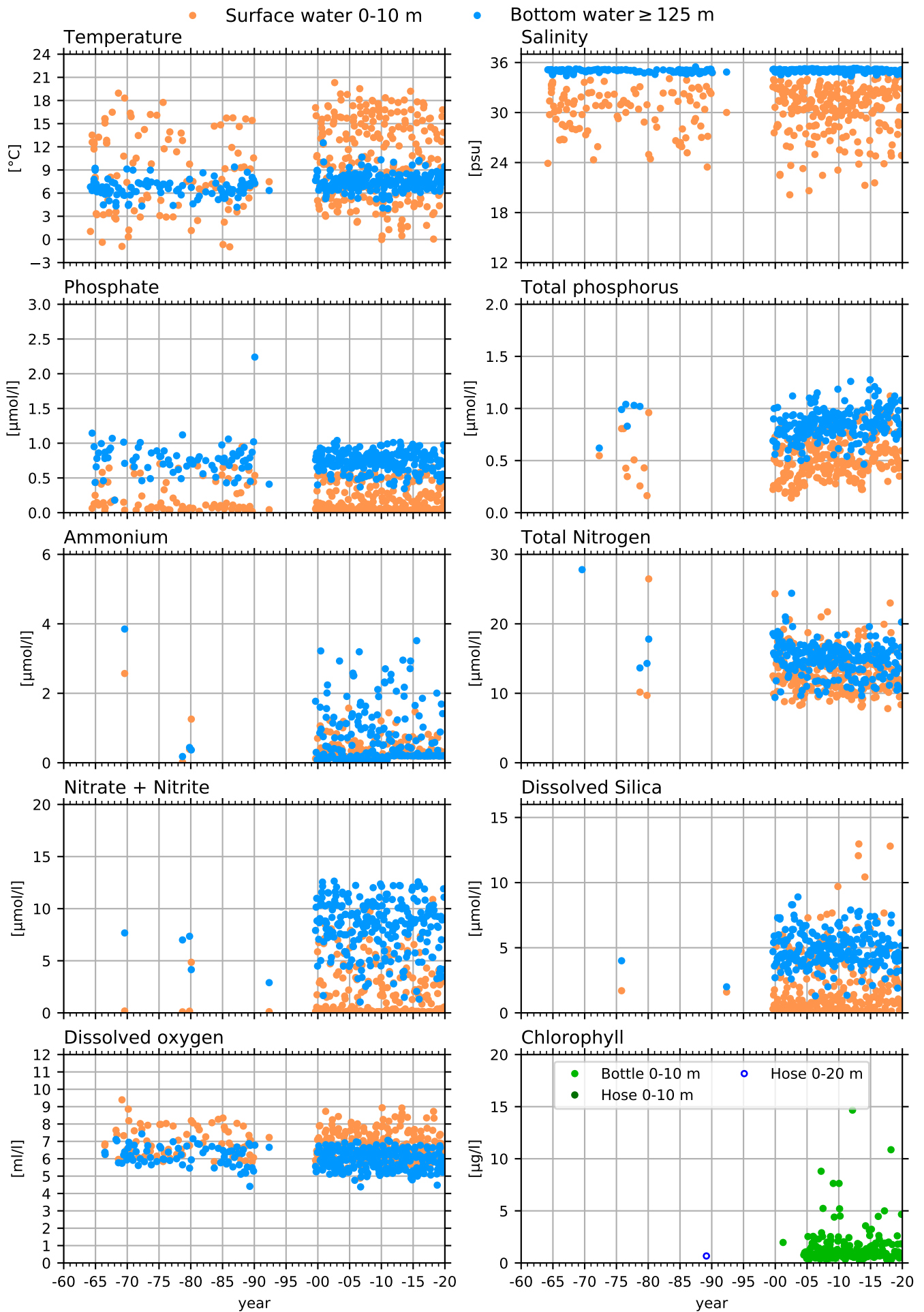
Å13, SKAGERACK



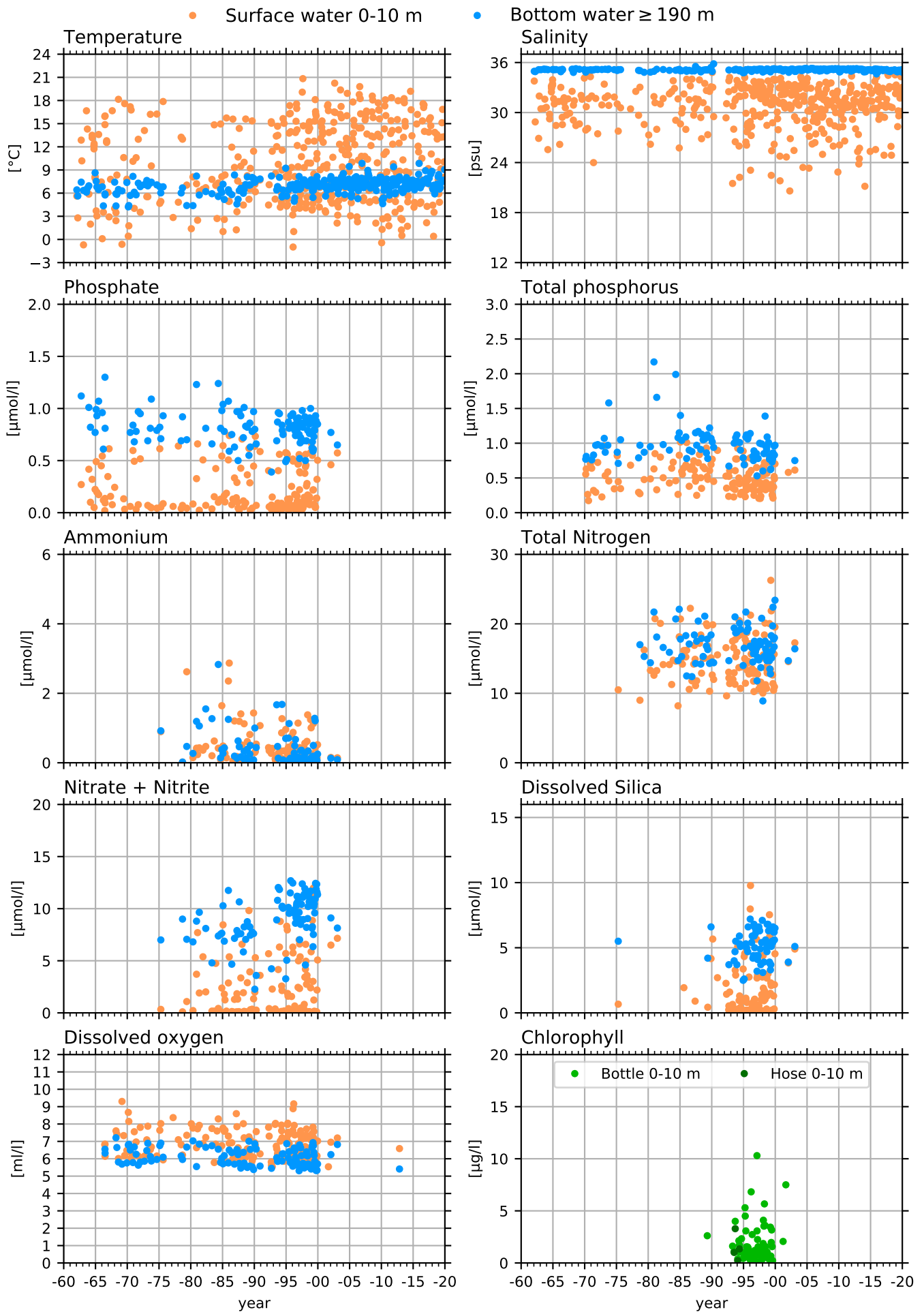
Å14, SKAGERACK



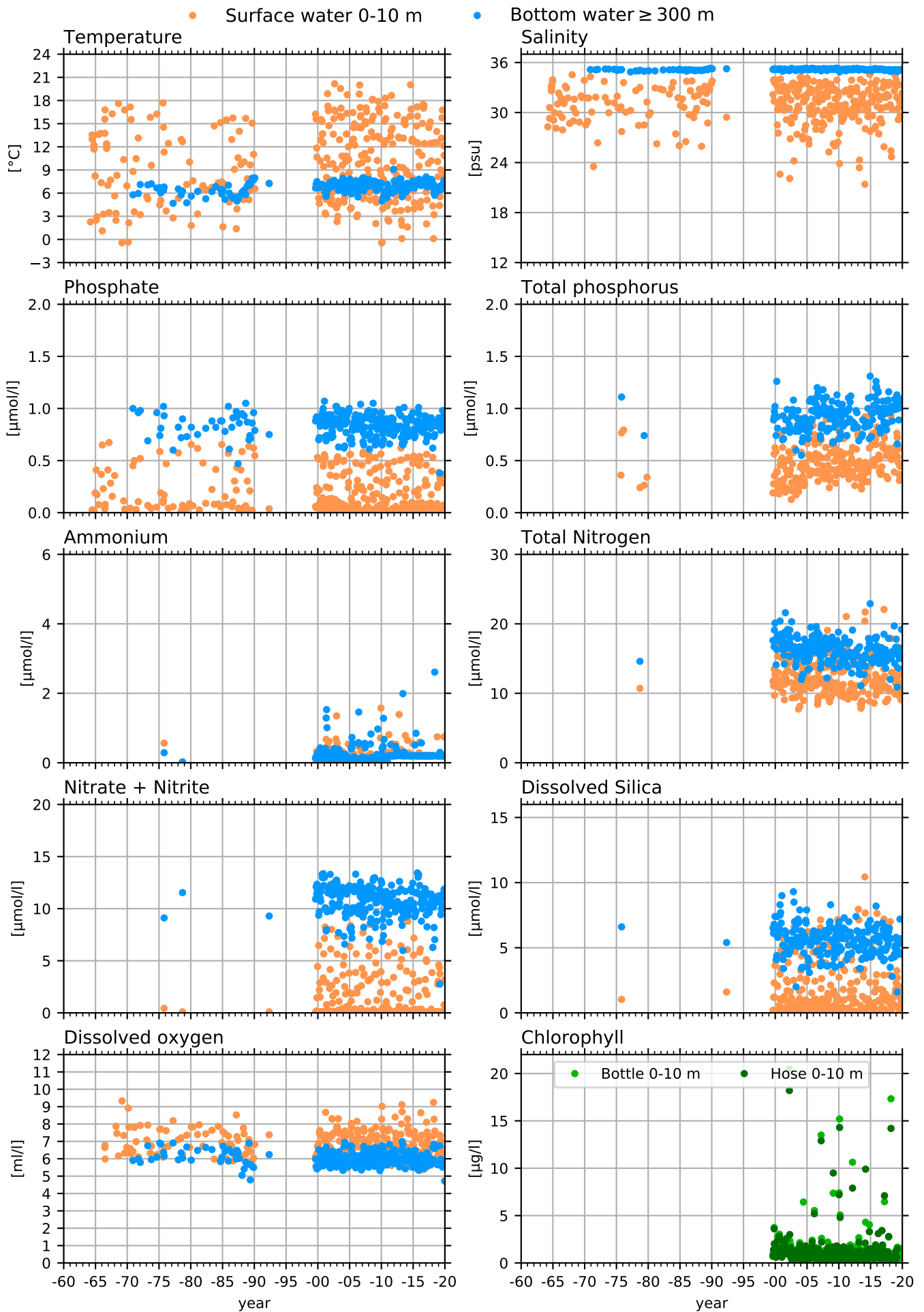
Å15, SKAGERACK



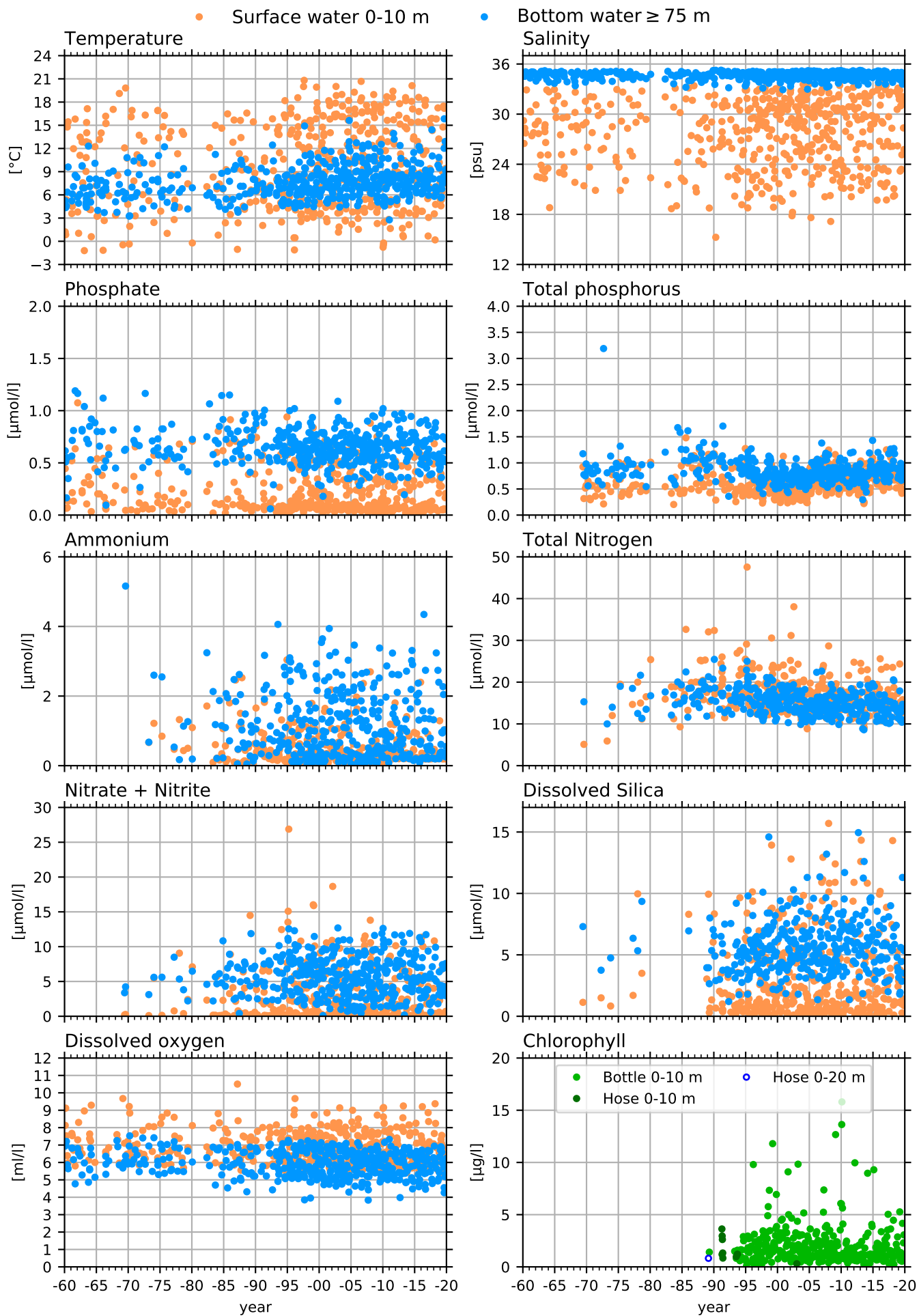
Å16, SKAGERACK



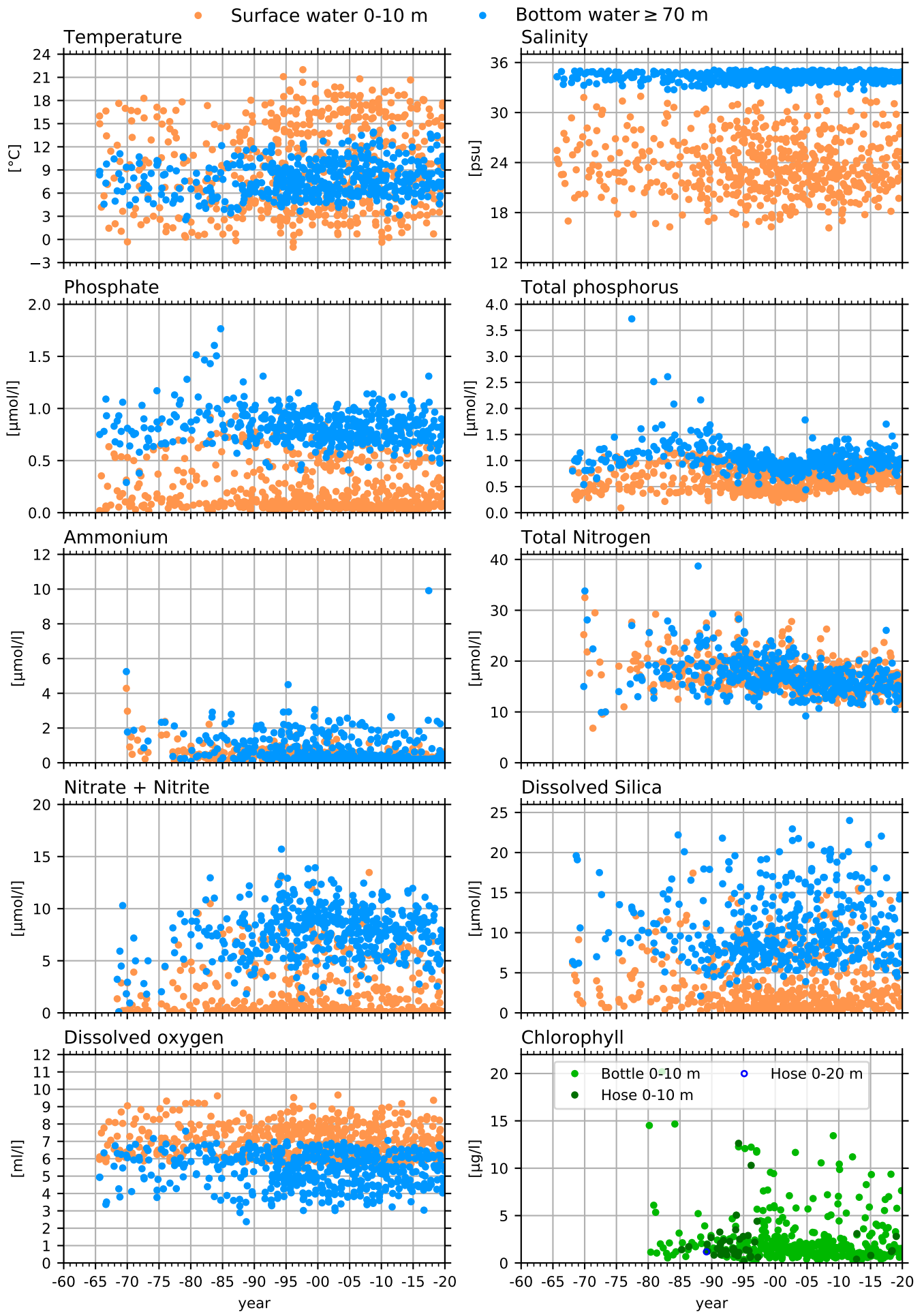
Å17, SKAGERACK



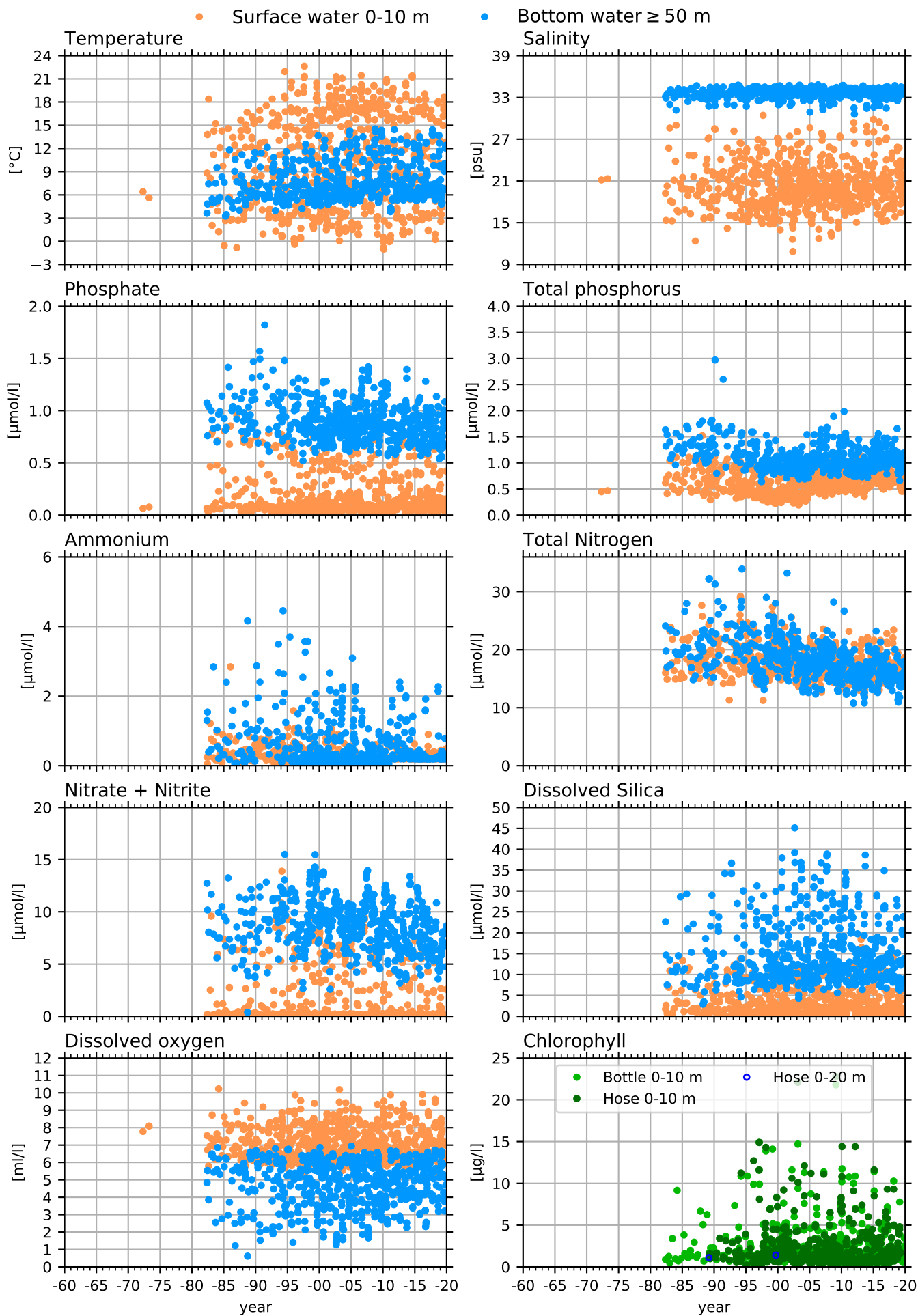
P2, SKAGERACK



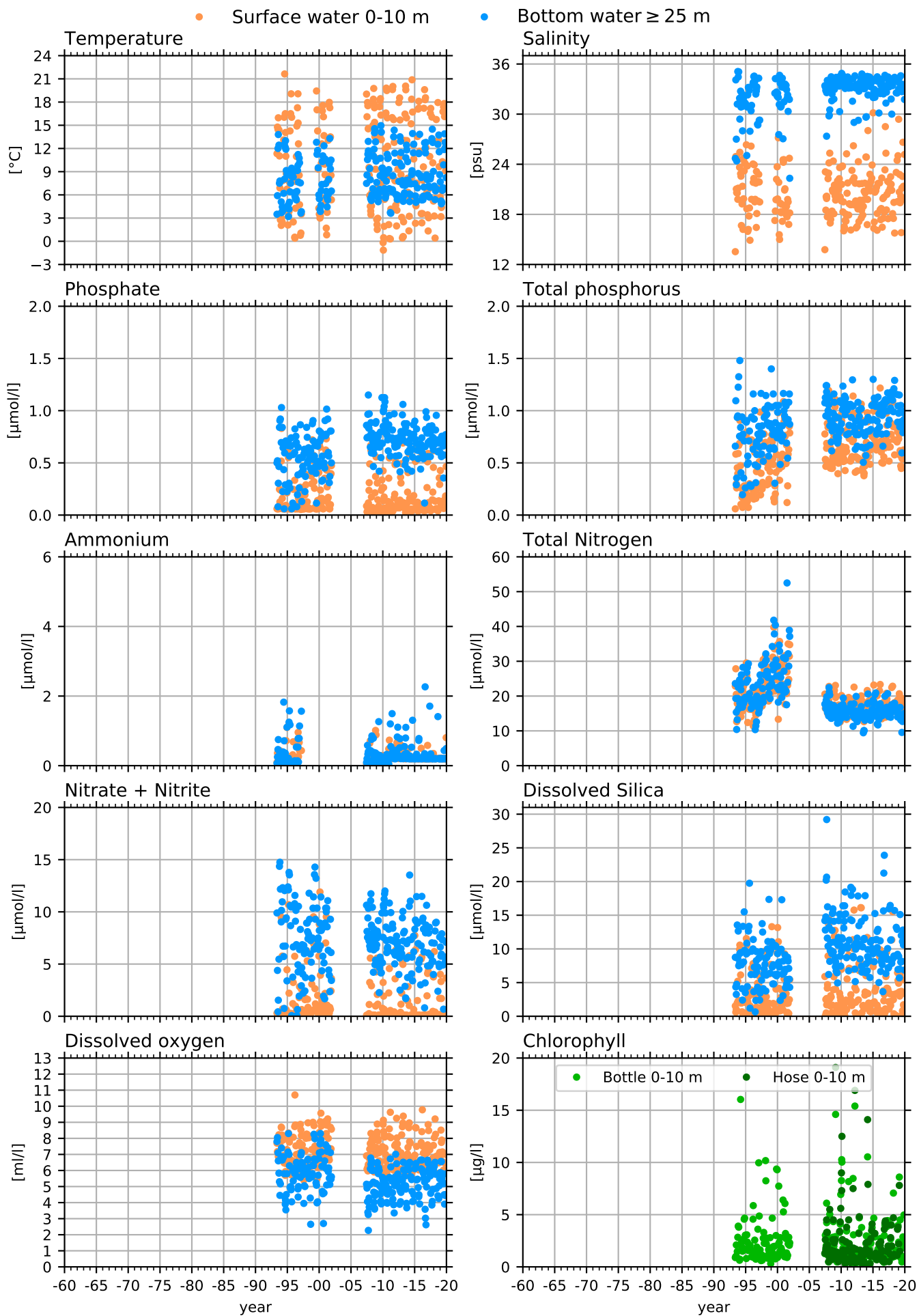
FLADEN, KATTEGAT



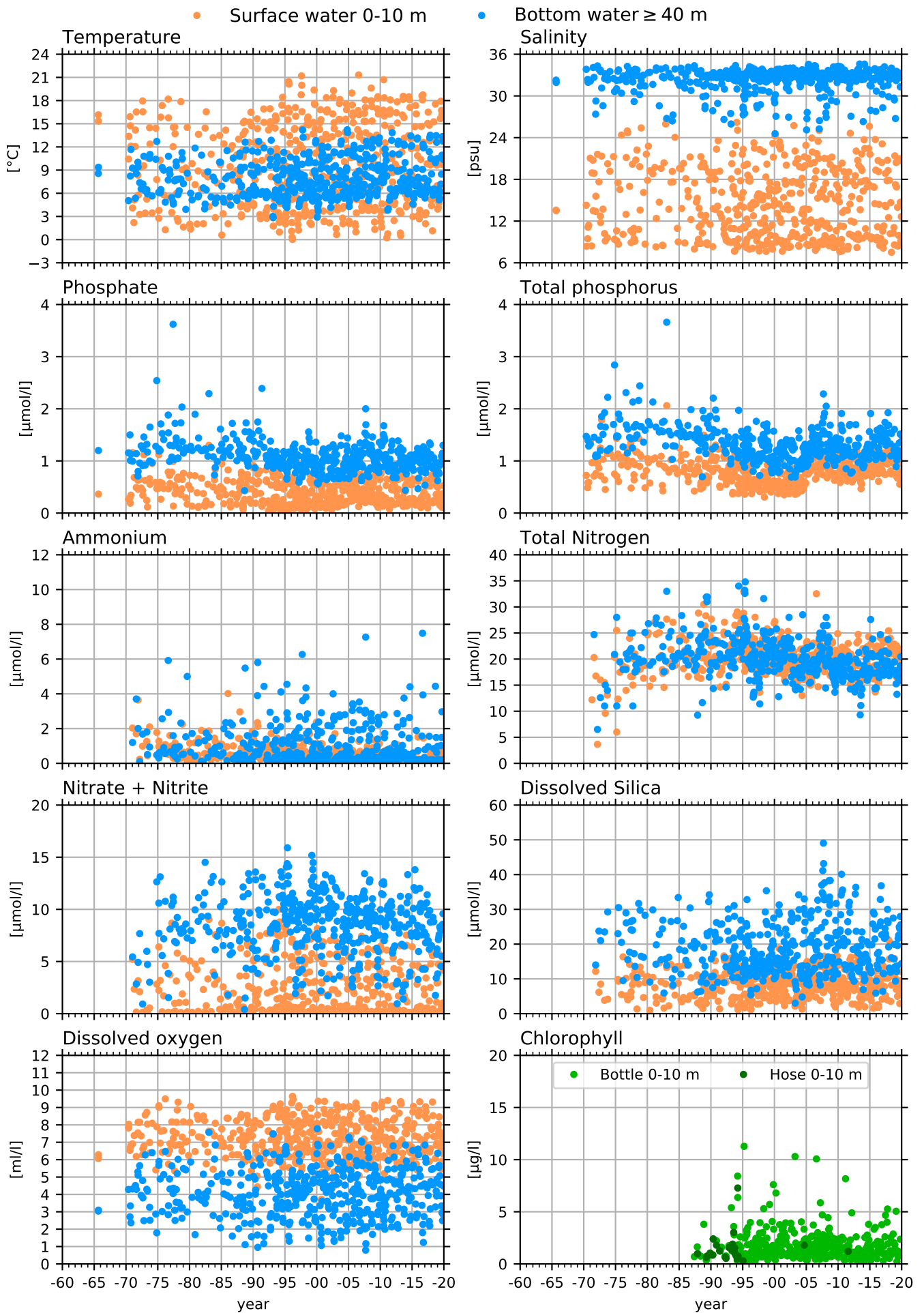
ANHOLT E, KATTEGAT



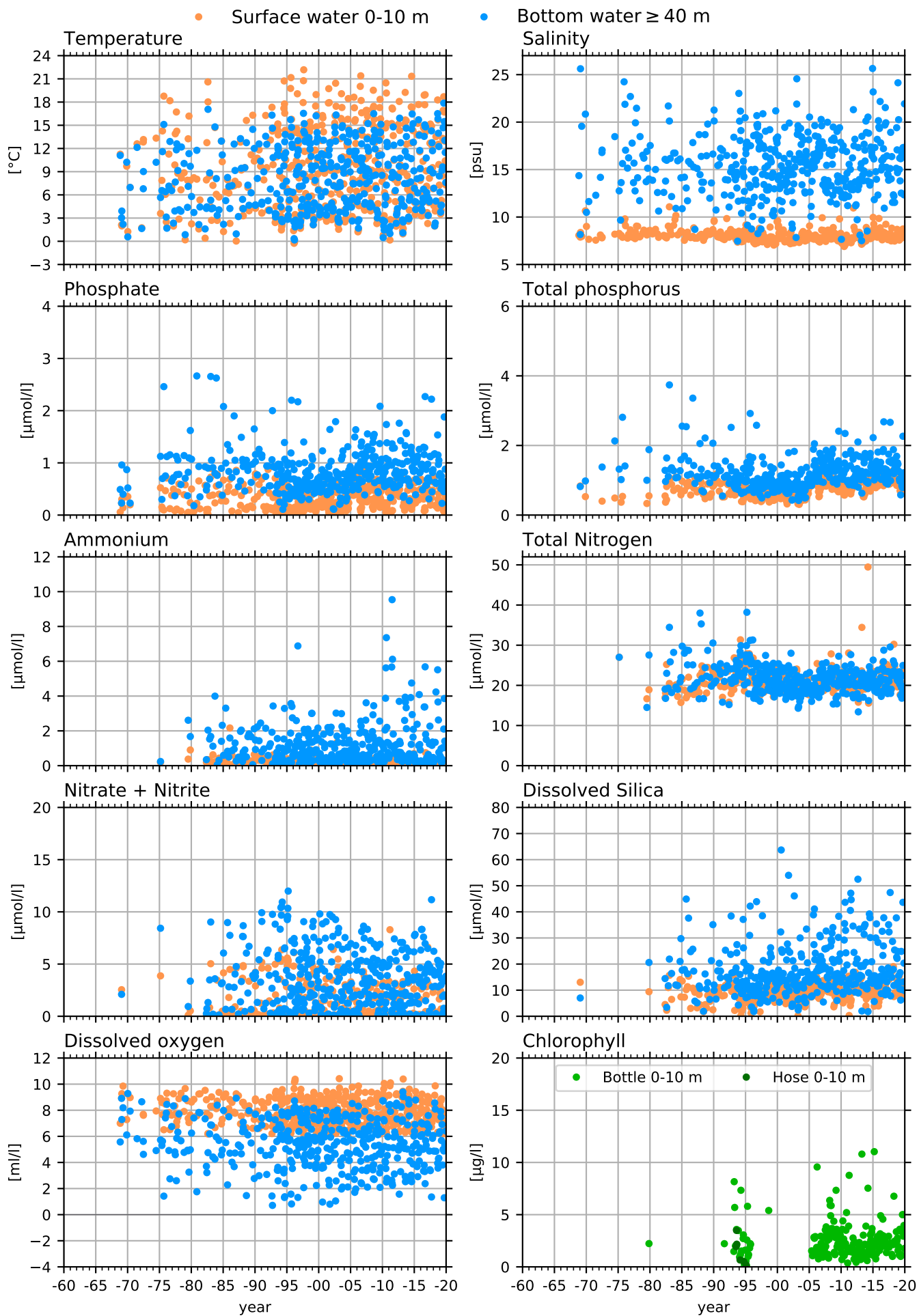
N14 FALKENBERG, KATTEGAT COASTAL



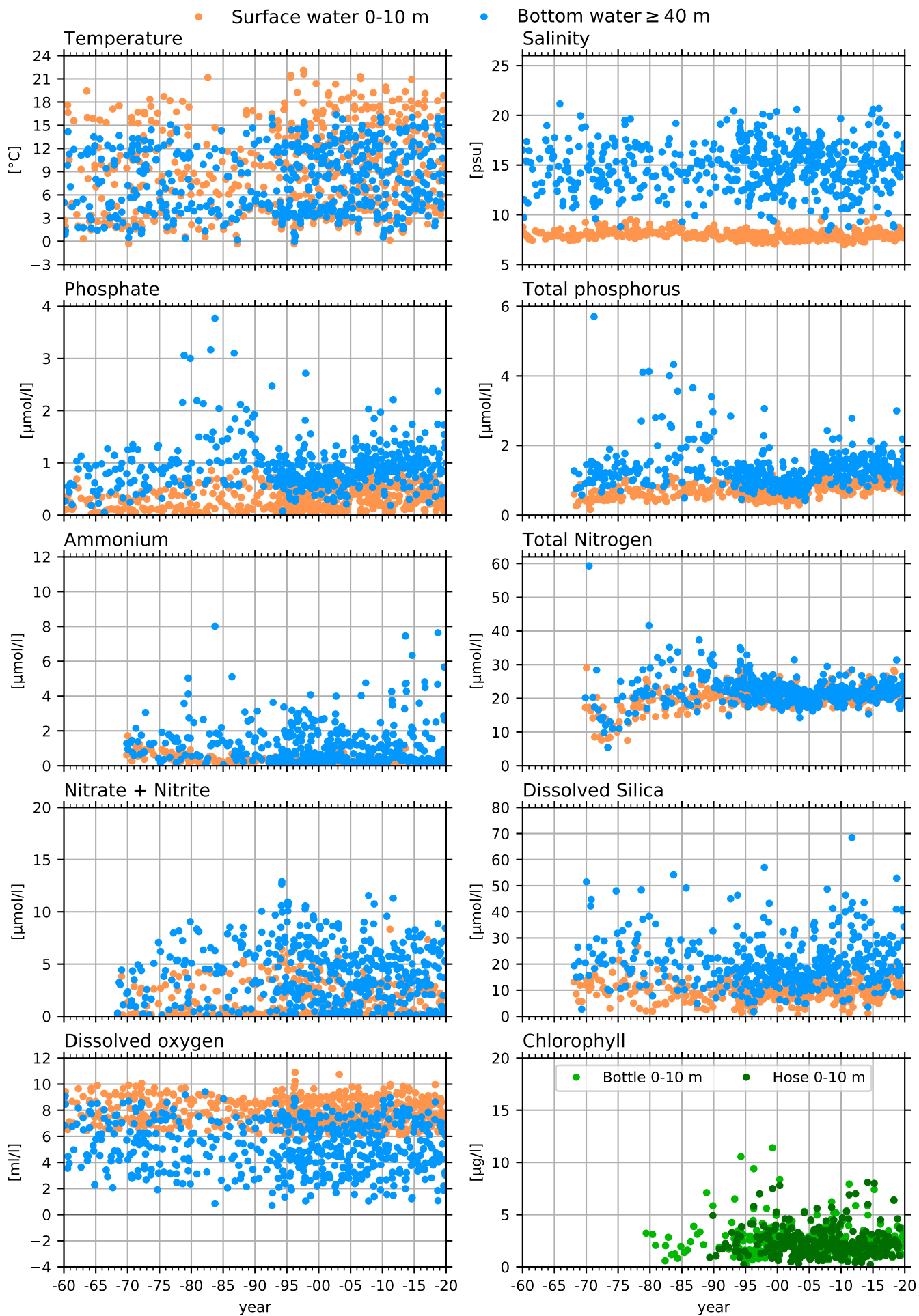
W LANDSKRONA, THE SOUND



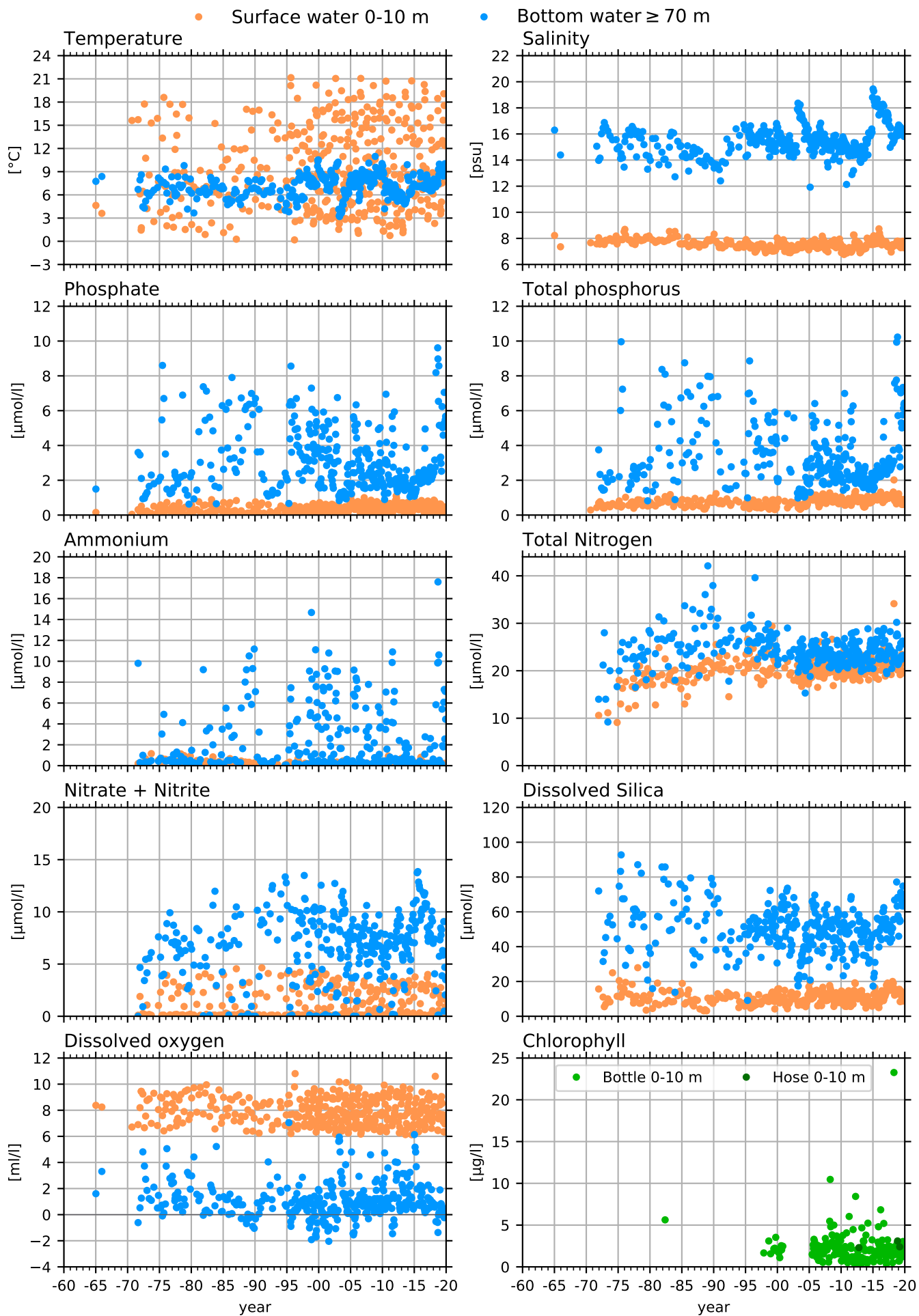
BY1, ARKONA



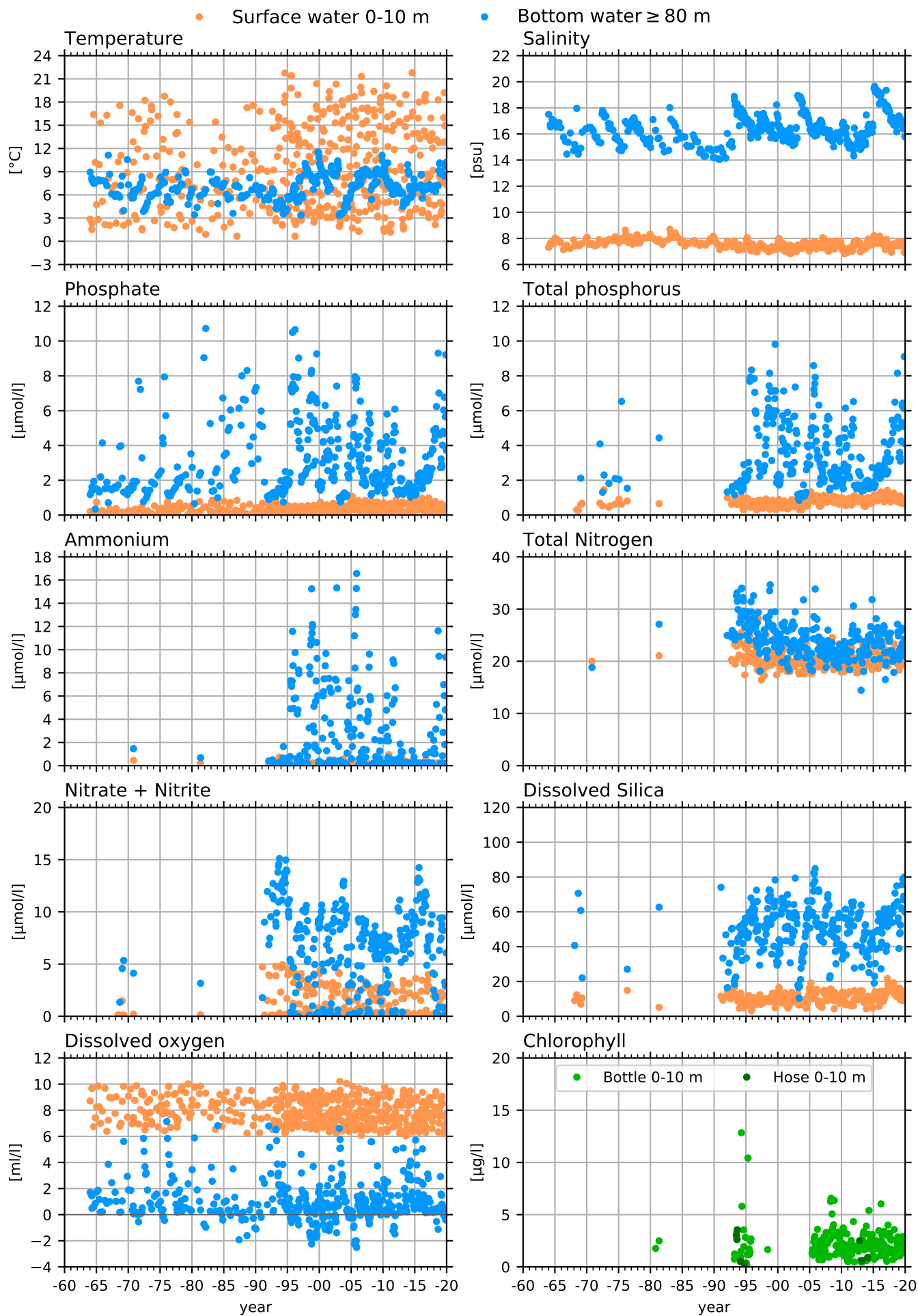
BY2 ARKONA, ARKONA



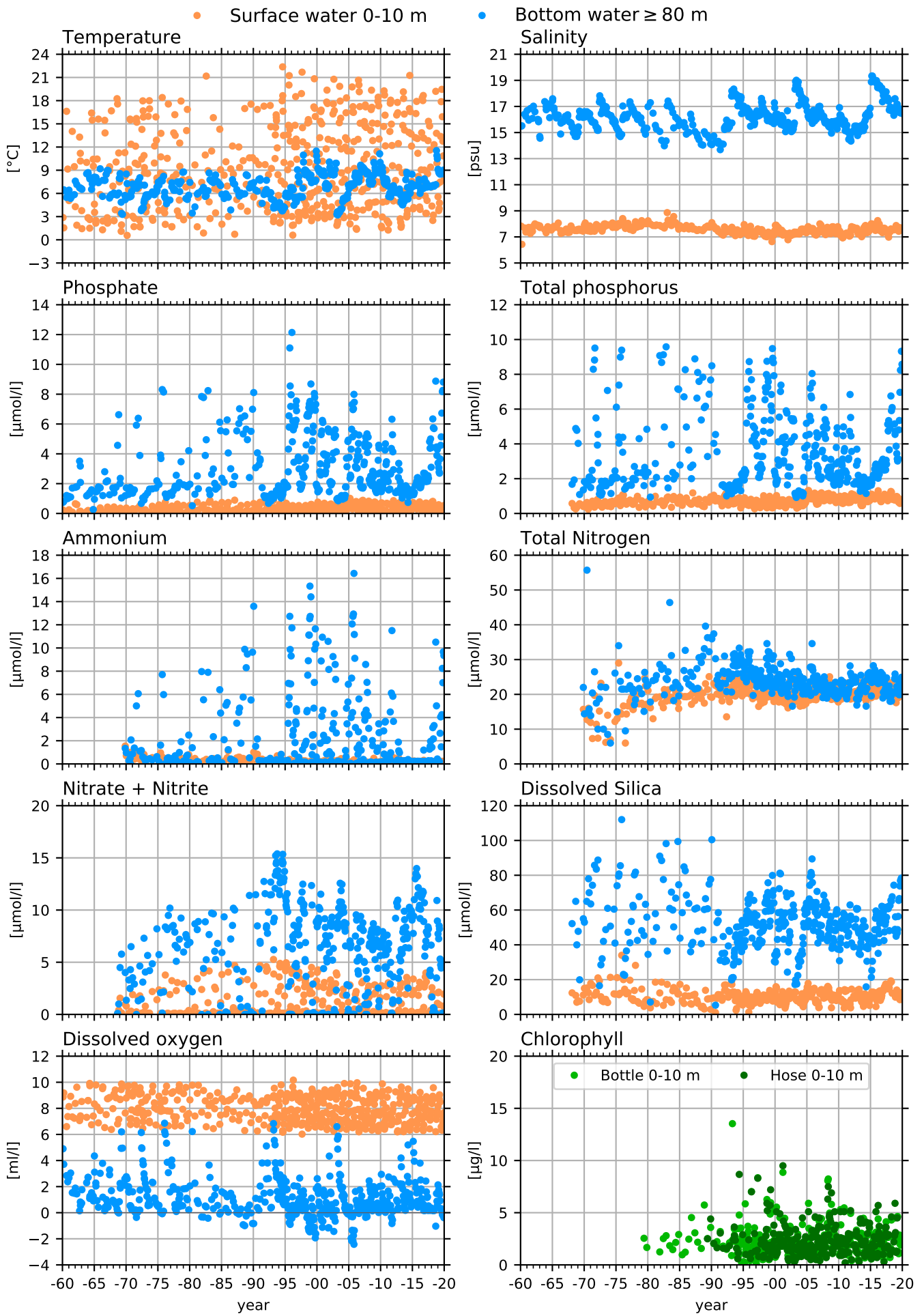
HANÖBUKTEN, BORNHOLM



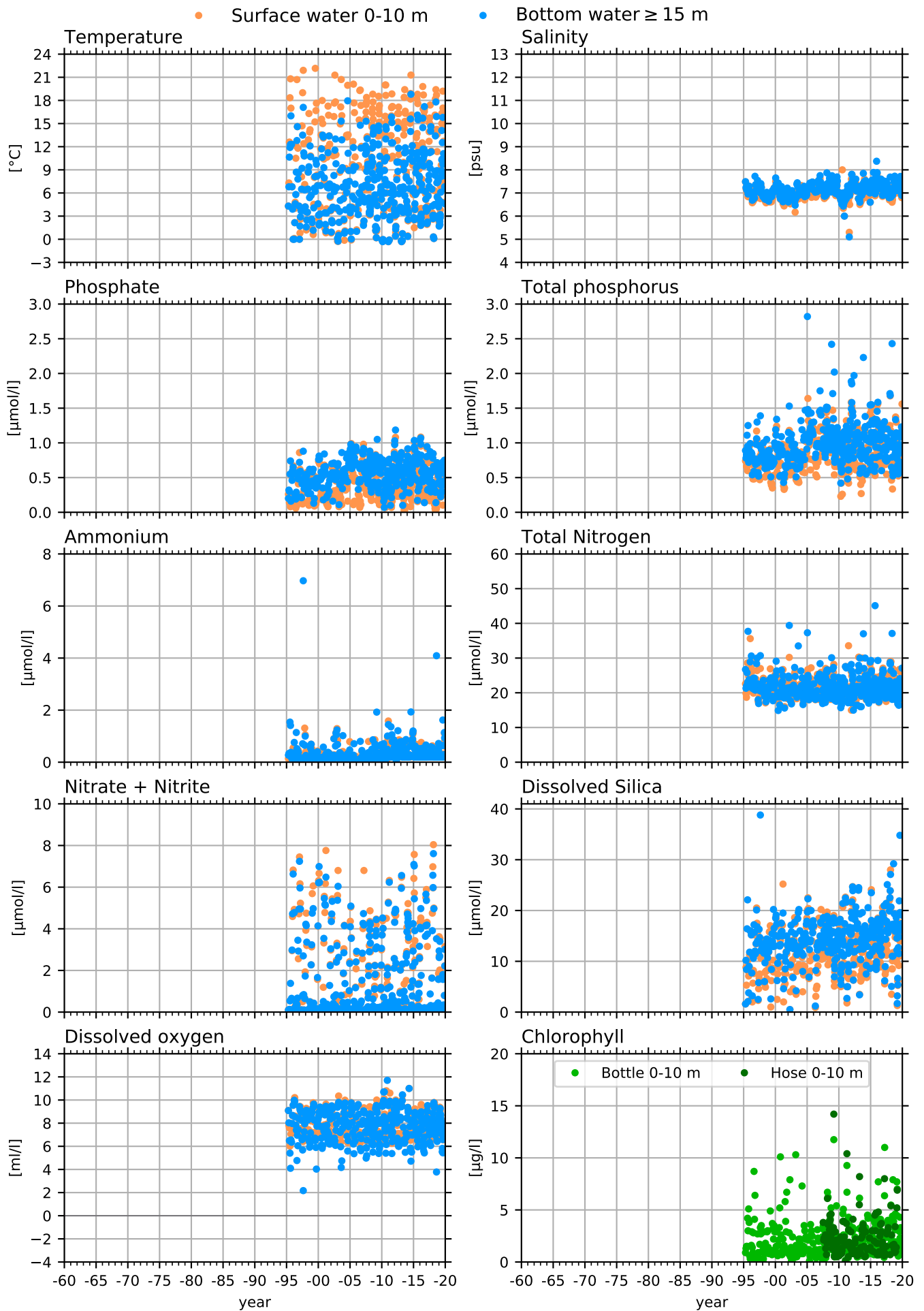
BY4 CHRISTIANSÖ, BORNHOLM



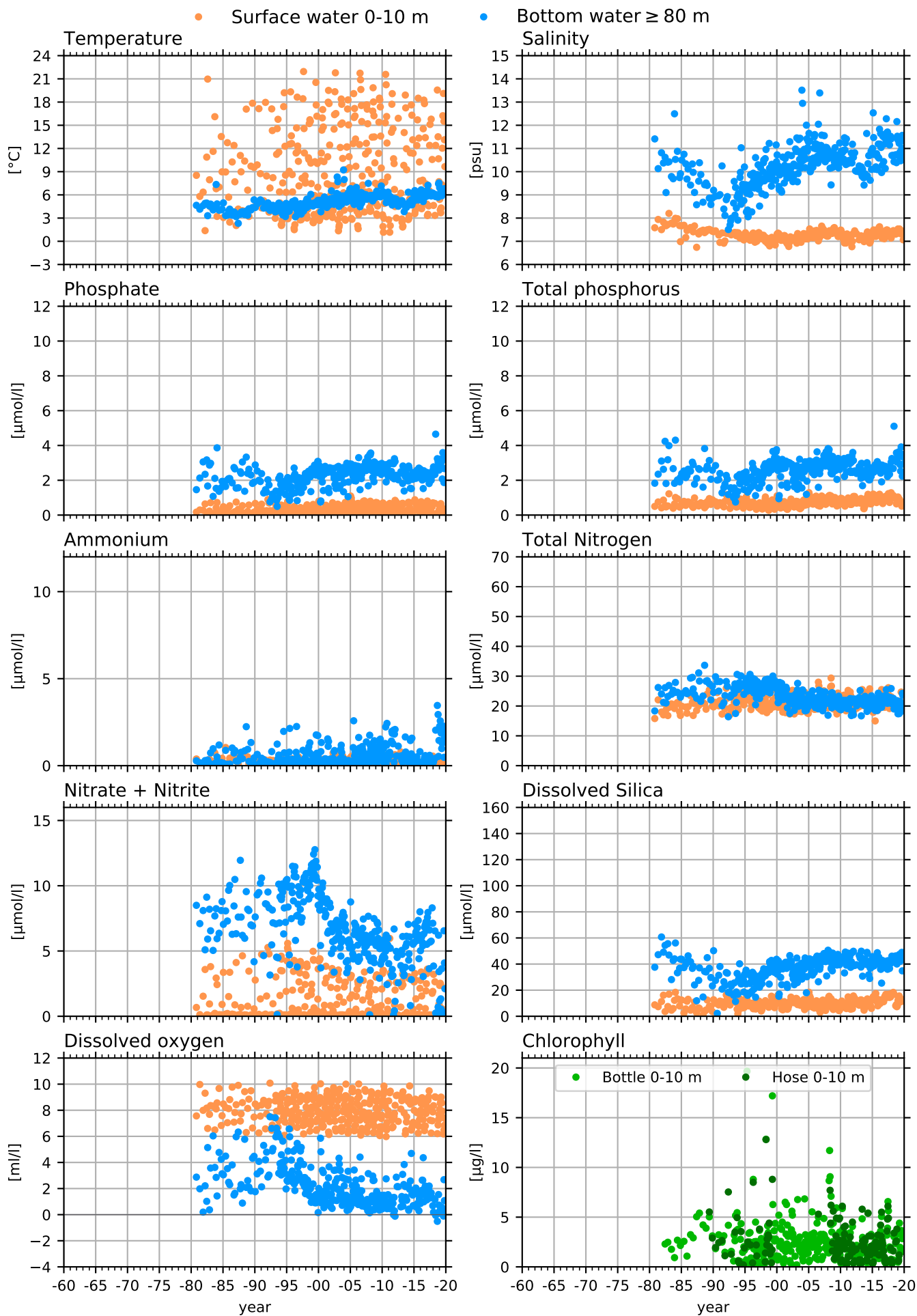
BY5 BORNHOLM DEEP, BORNHOLM



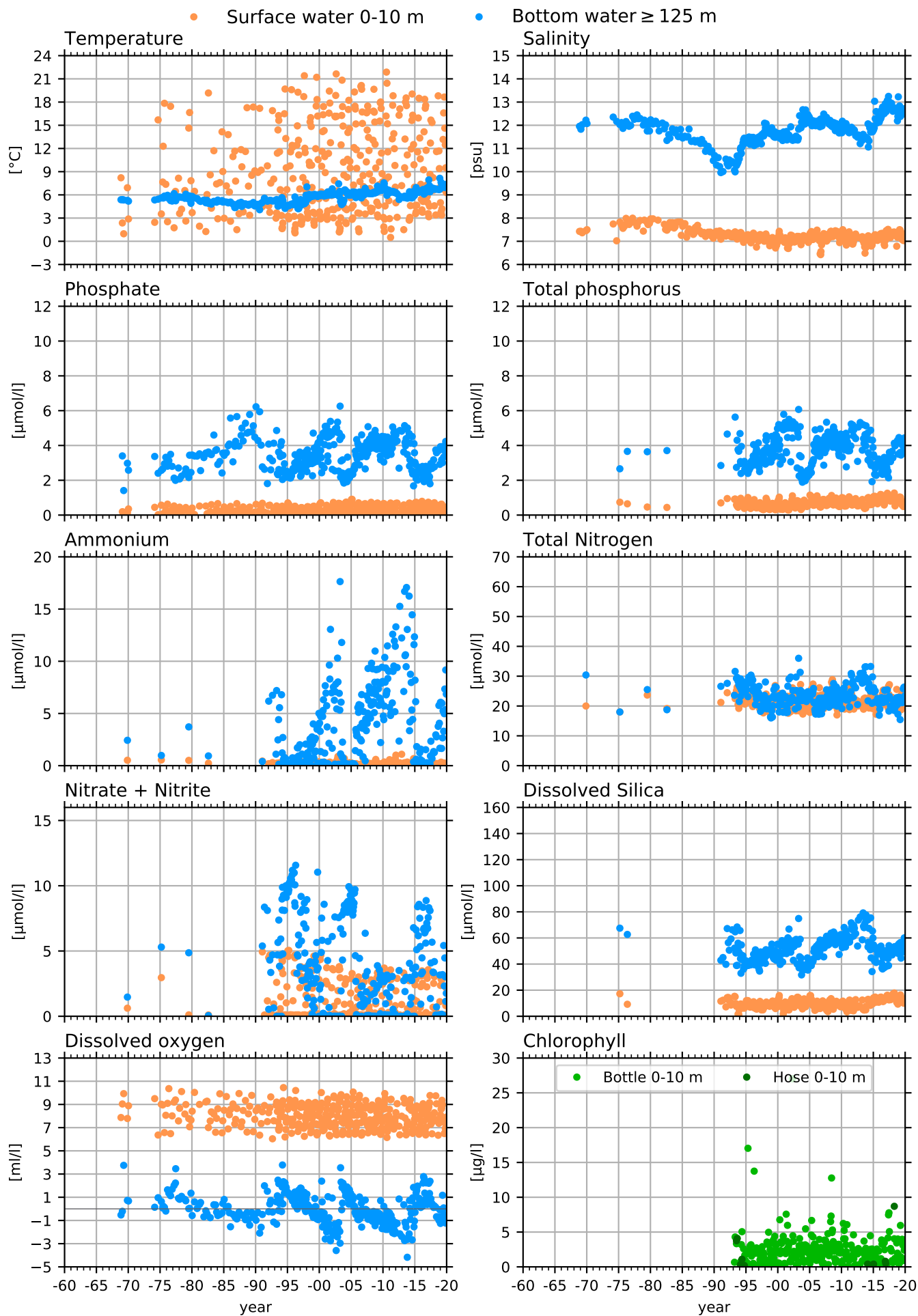
REF M1V1, BORNHOLM COASTAL



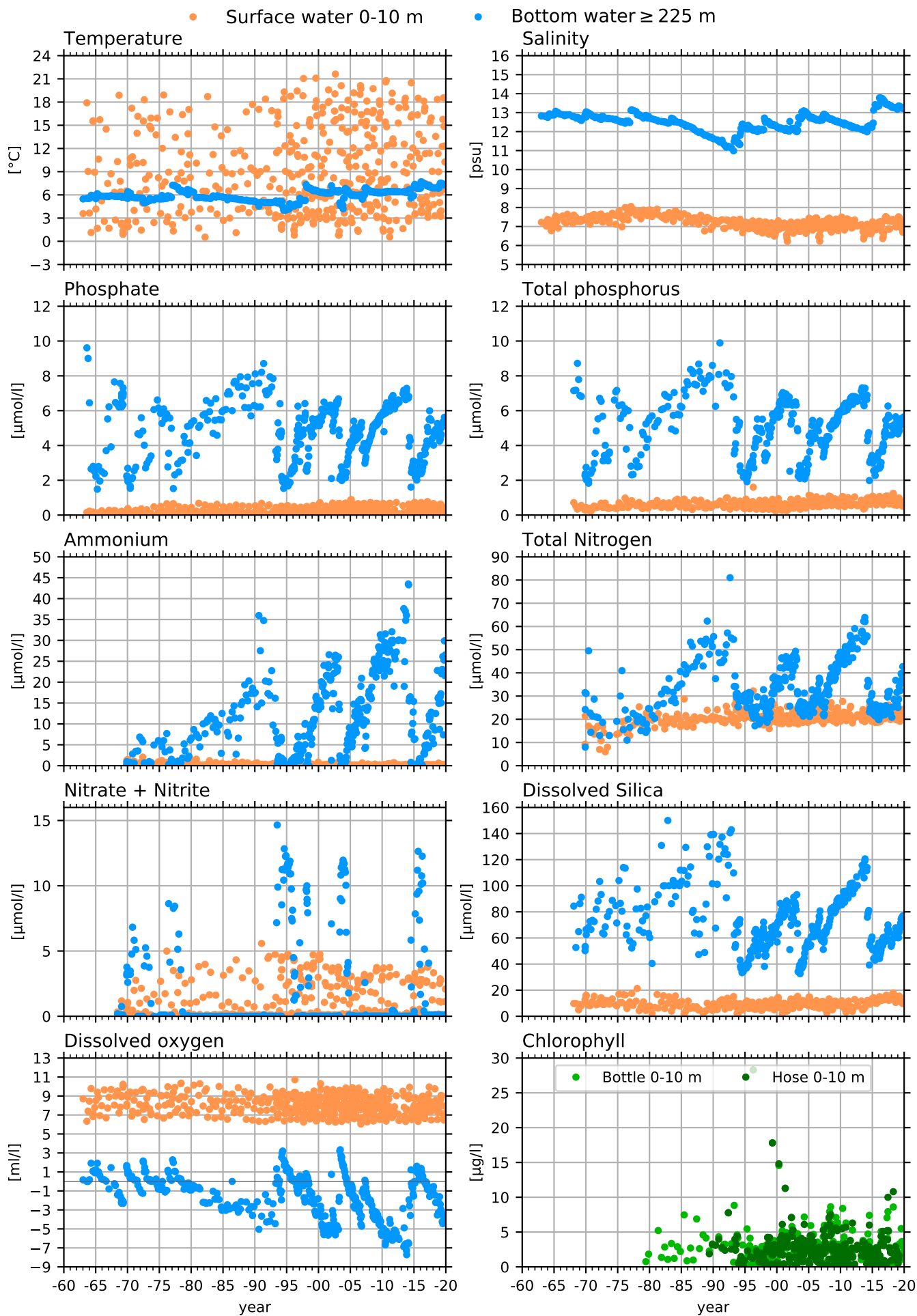
BCS III-10, EASTERN GOTLAND BASIN



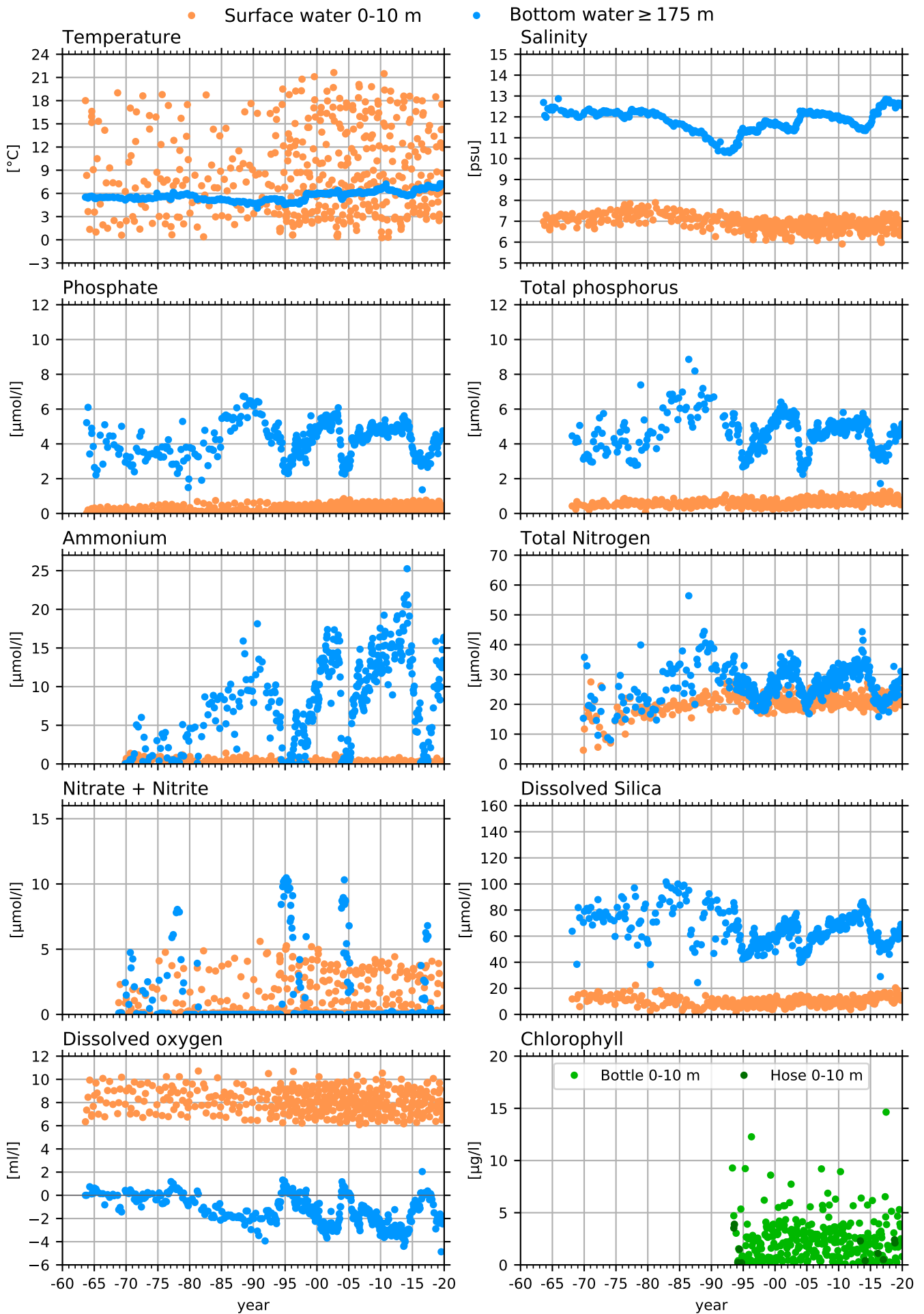
BY10, EASTERN GOTLAND BASIN



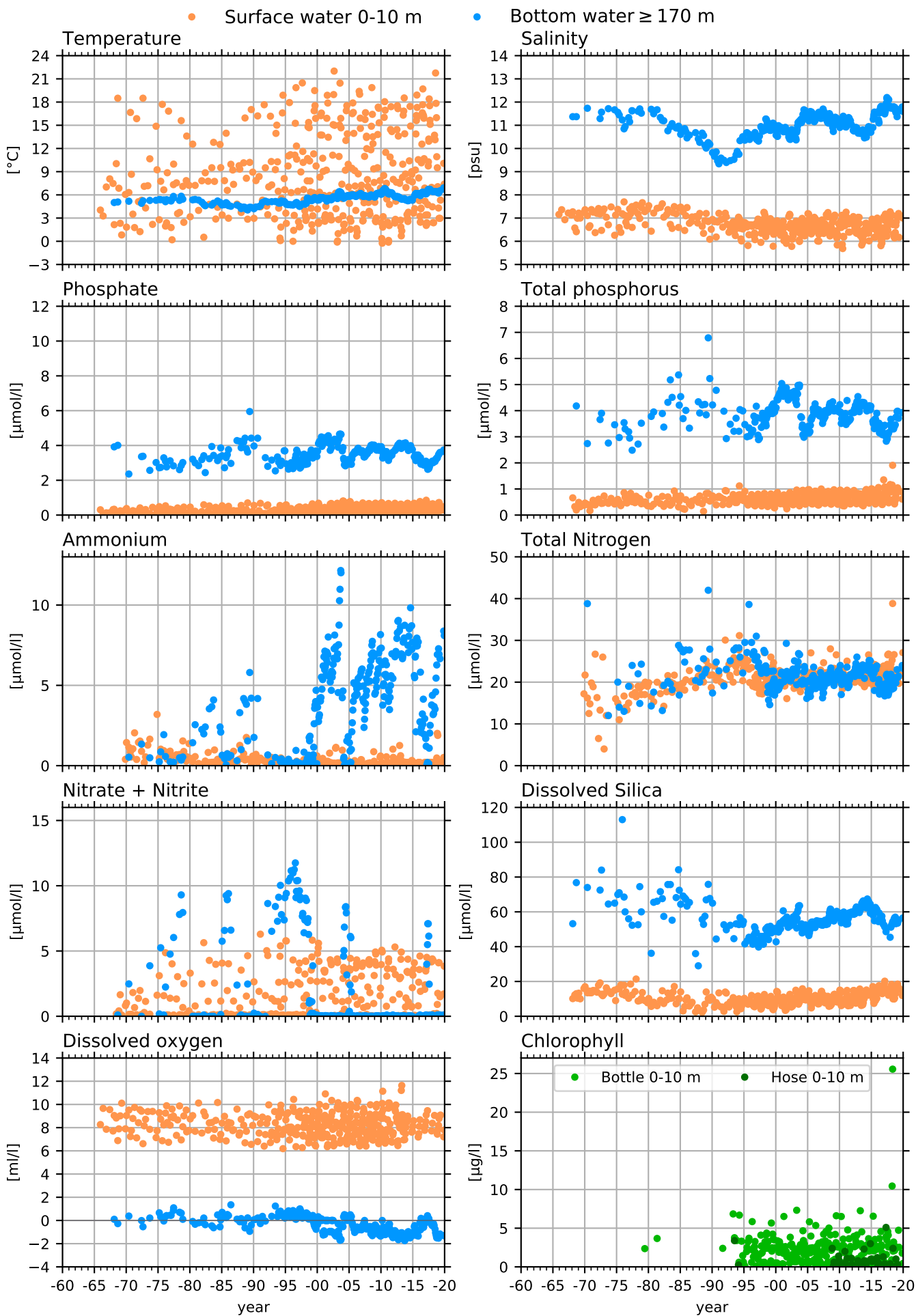
BY15 GOTLAND DEEP, EASTERN GOTLAND BASIN



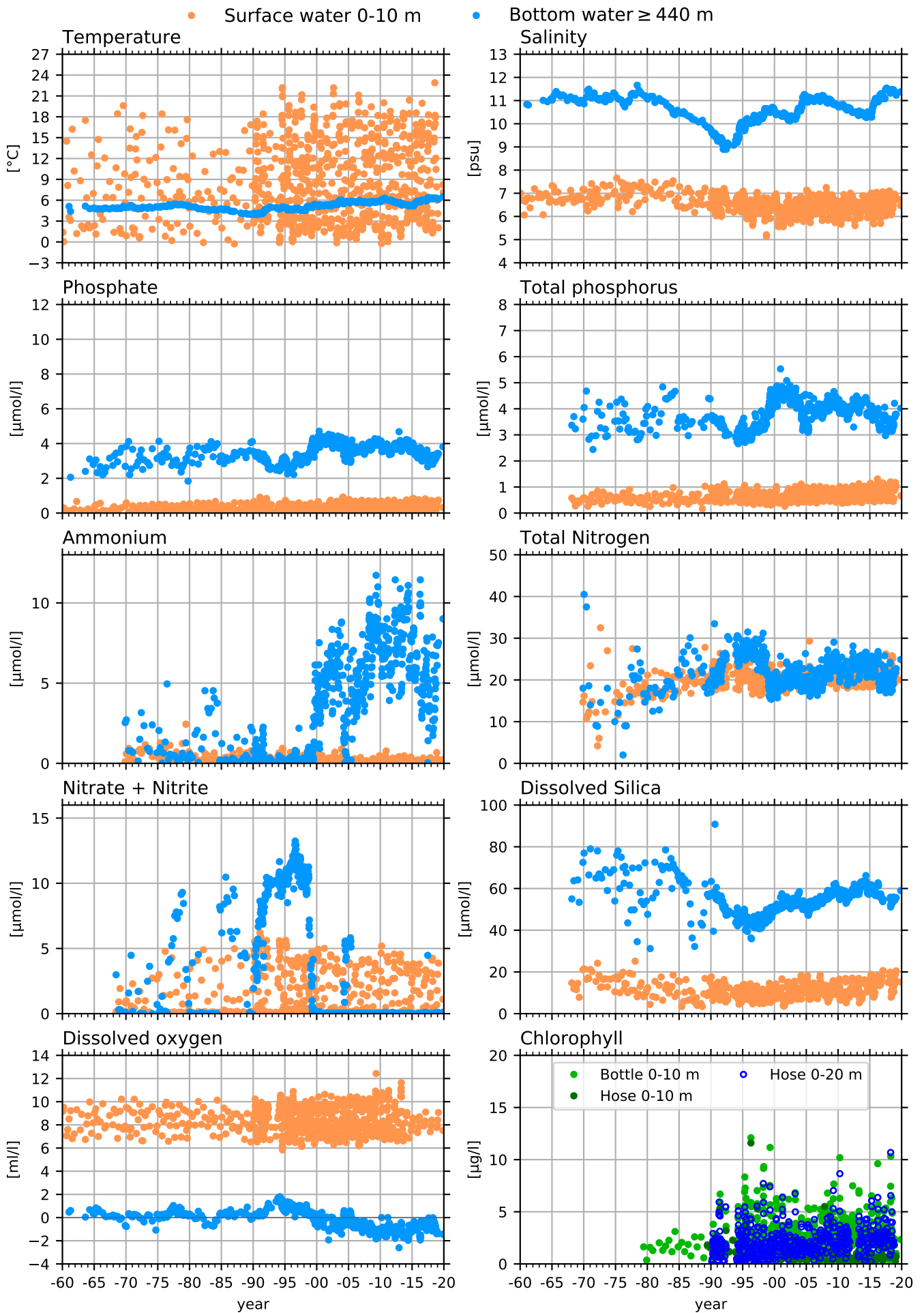
BY20 FÅRÖ DEEP, EASTERN GOTLAND BASIN



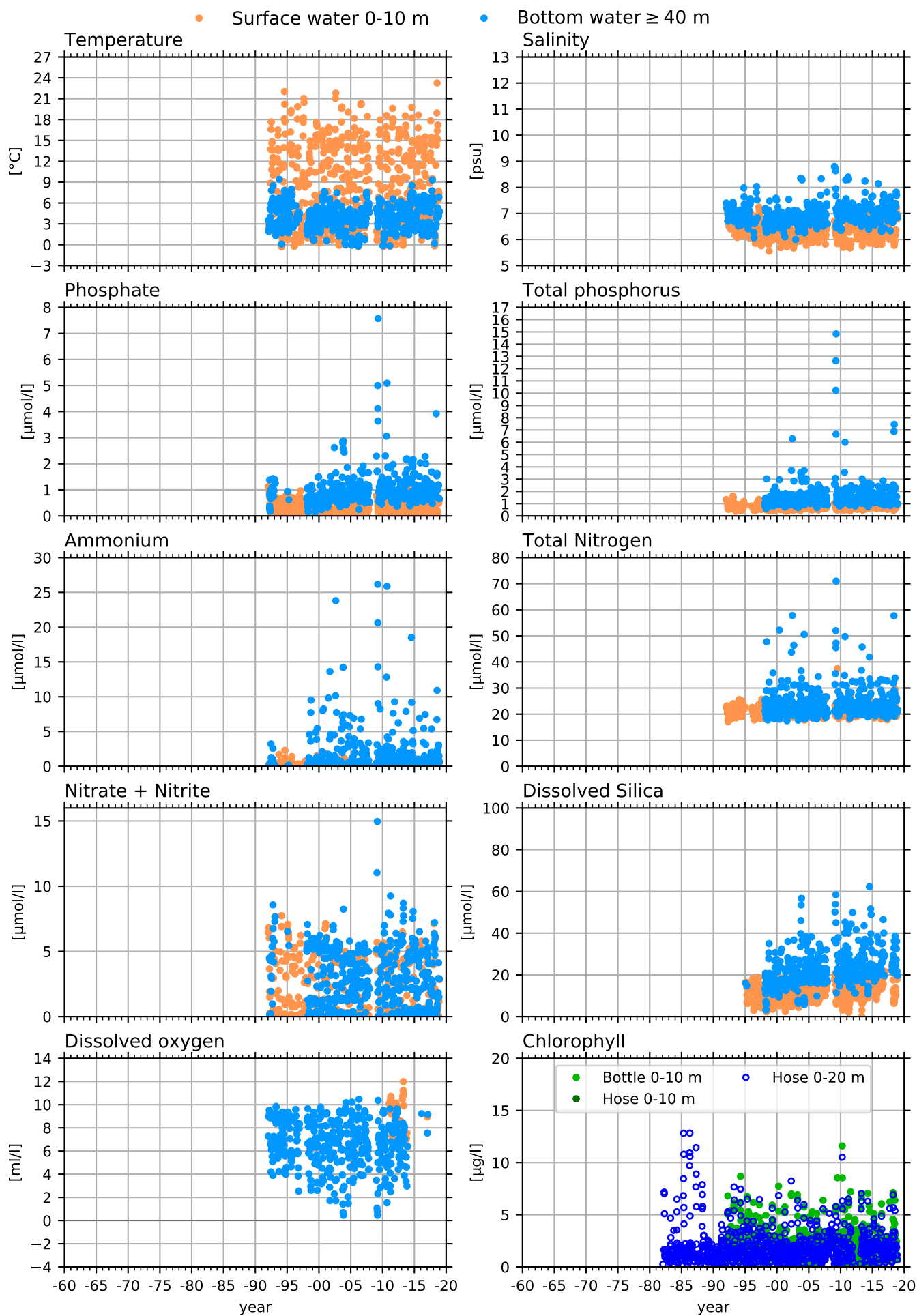
BY29 / LL19, NORTHERN BALTIC PROPER



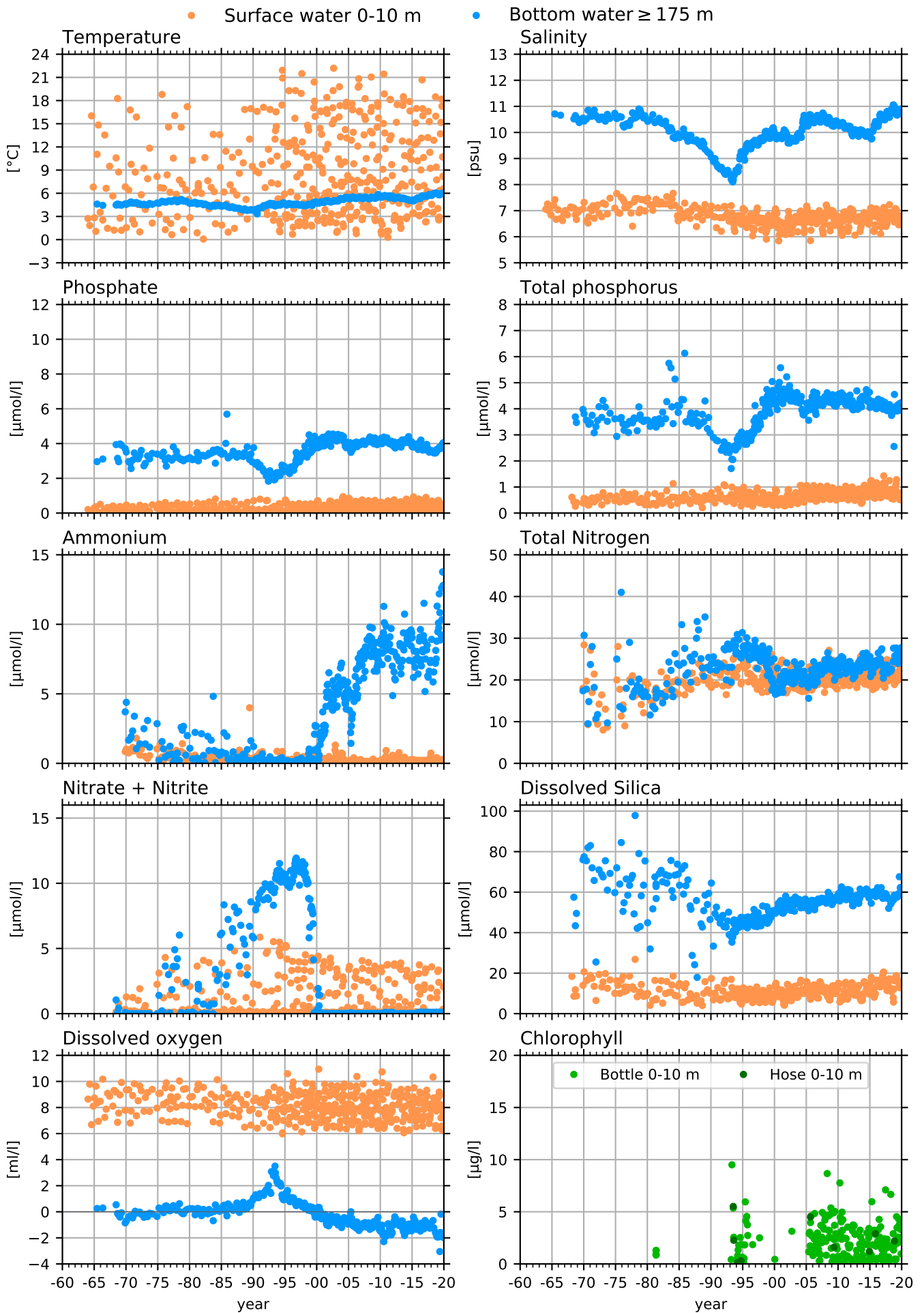
BY31 LANDSORT DEEP, WESTERN GOTLAND BASIN



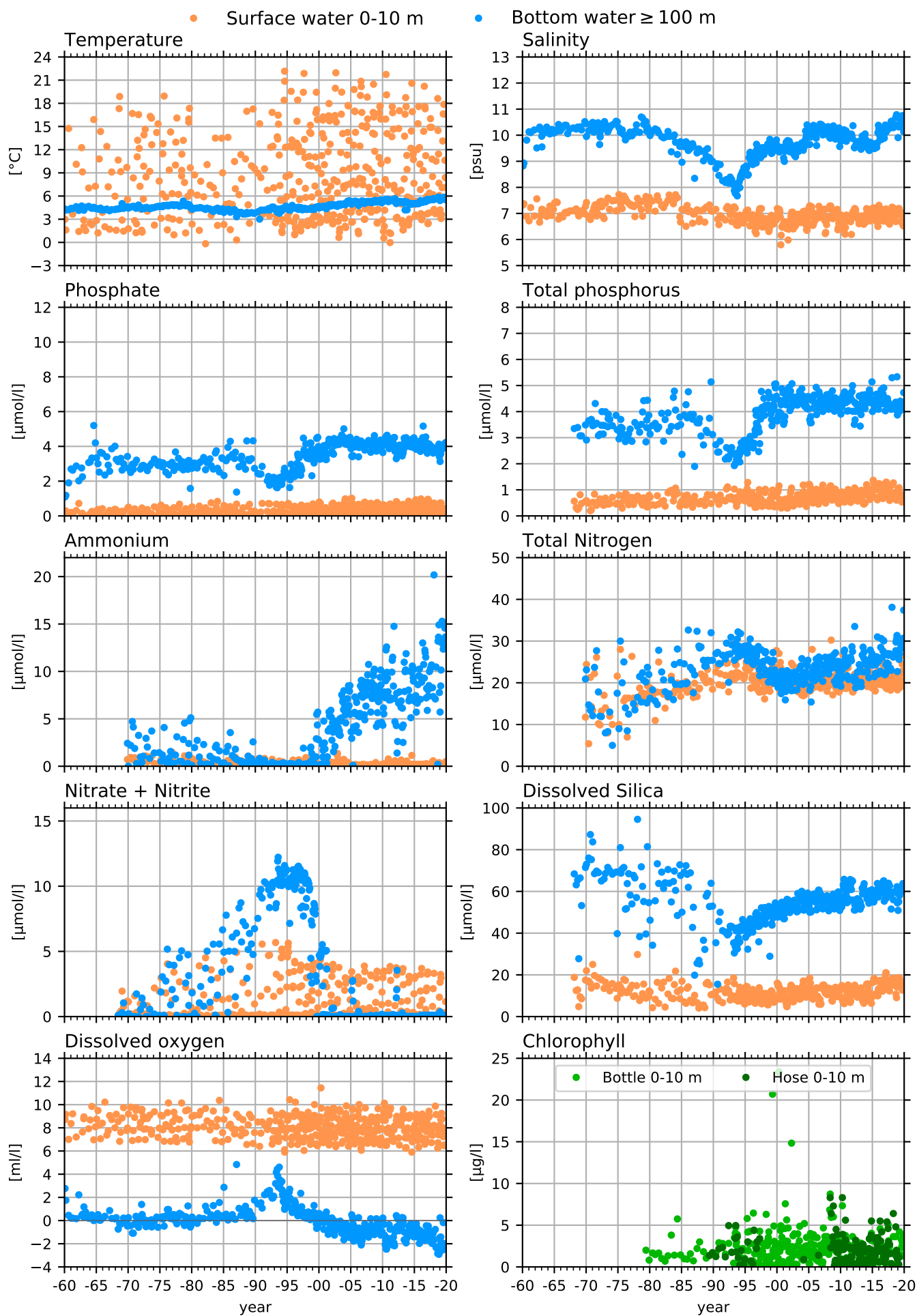
B1 (ASKÖ), WESTERN GOTLAND BASIN COASTAL



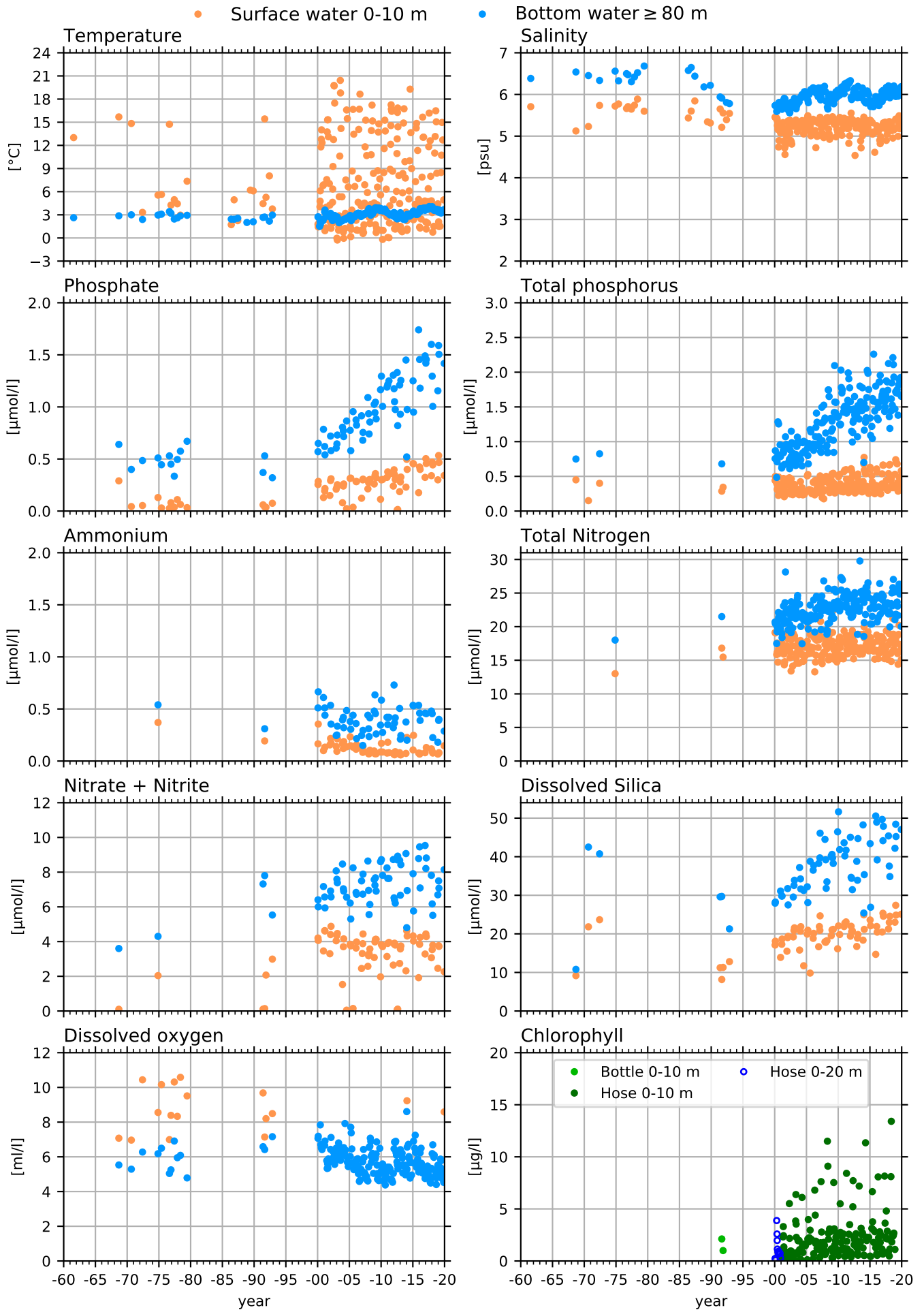
BY32 NORRKÖPING DEEP, WESTERN GOTLAND BASIN



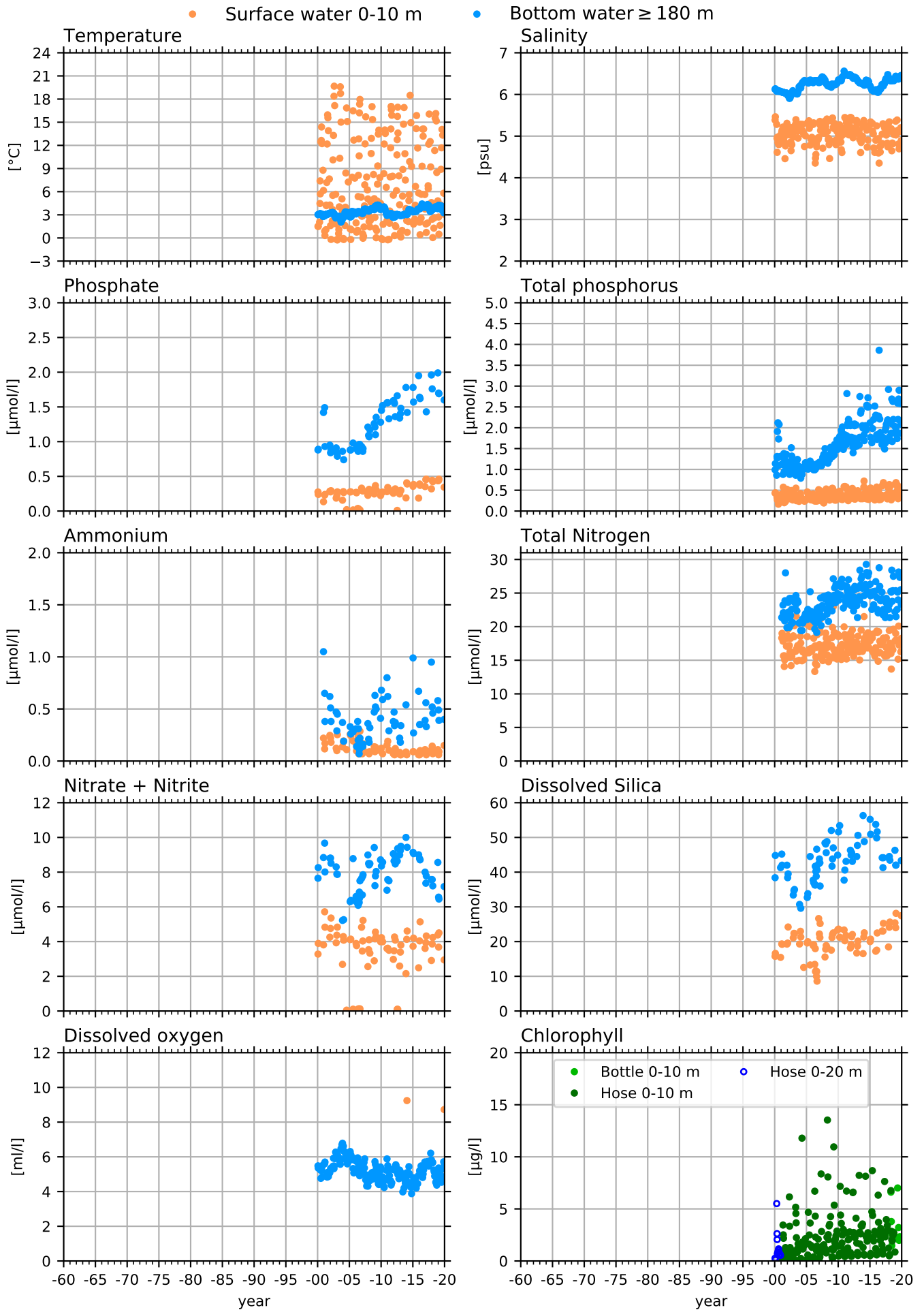
BY38 KARLSÖ DEEP, WESTERN GOTLAND BASIN



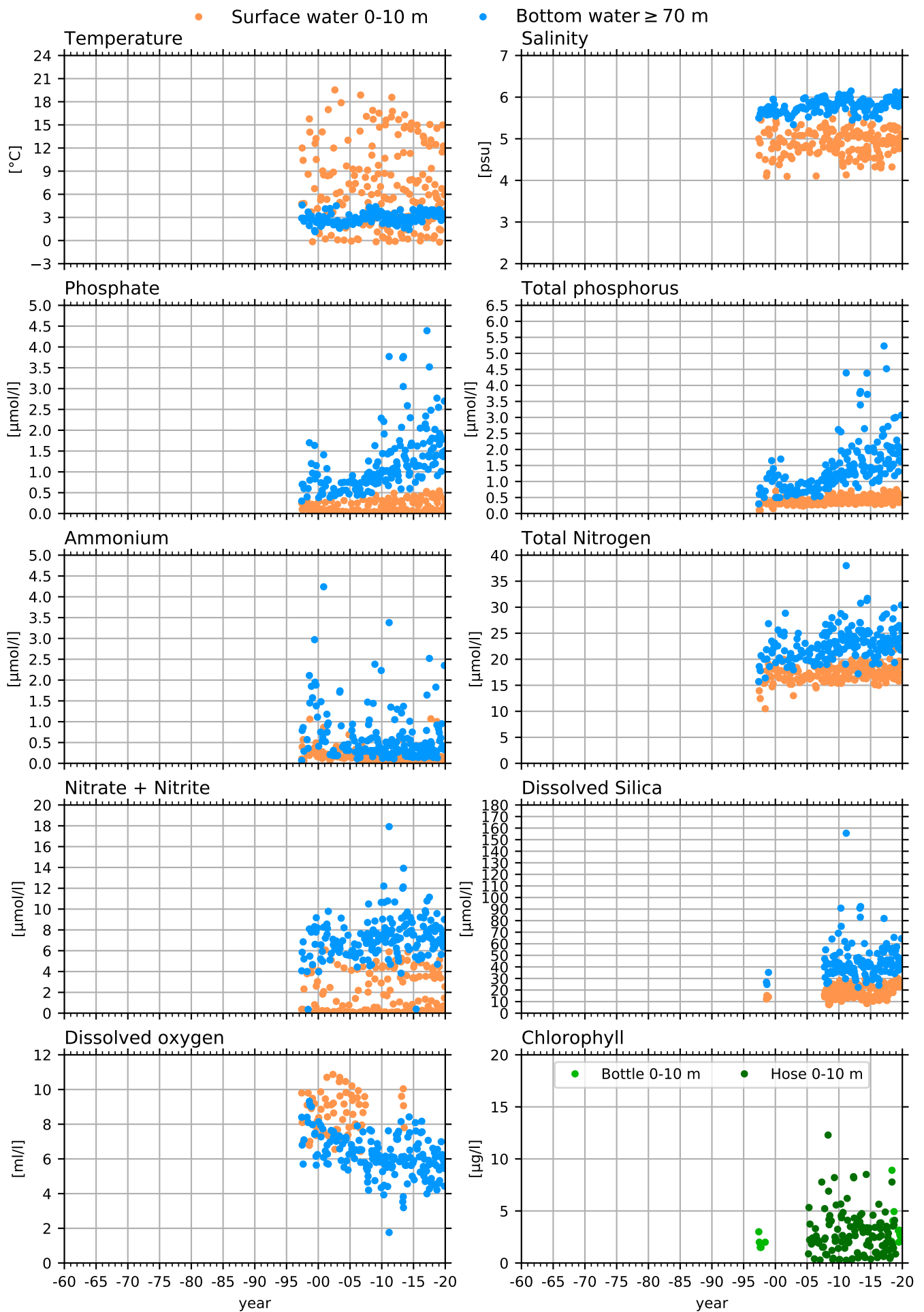
MS4 / C14, BOTHNIAN SEA



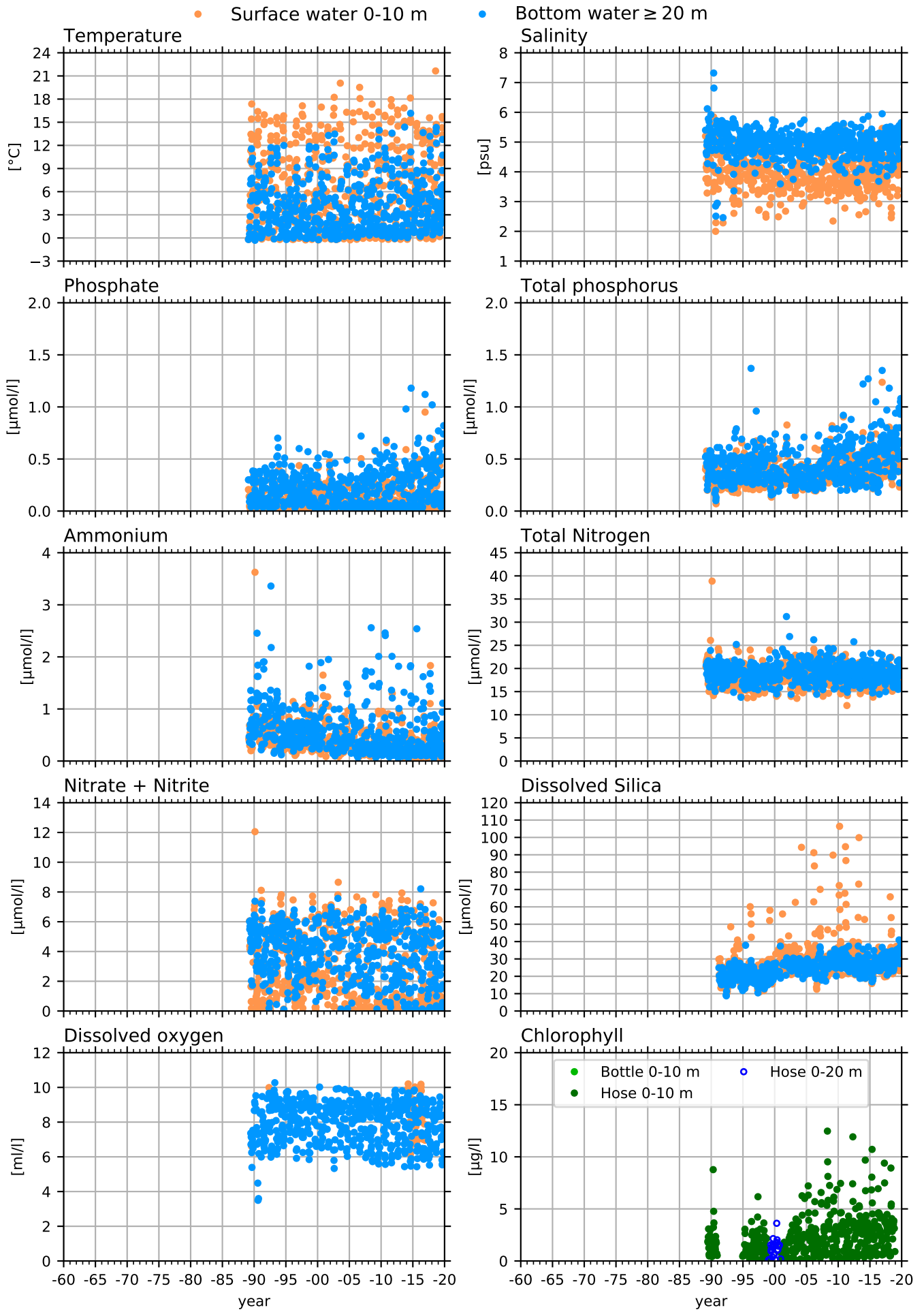
C3, BOTHNIAN SEA



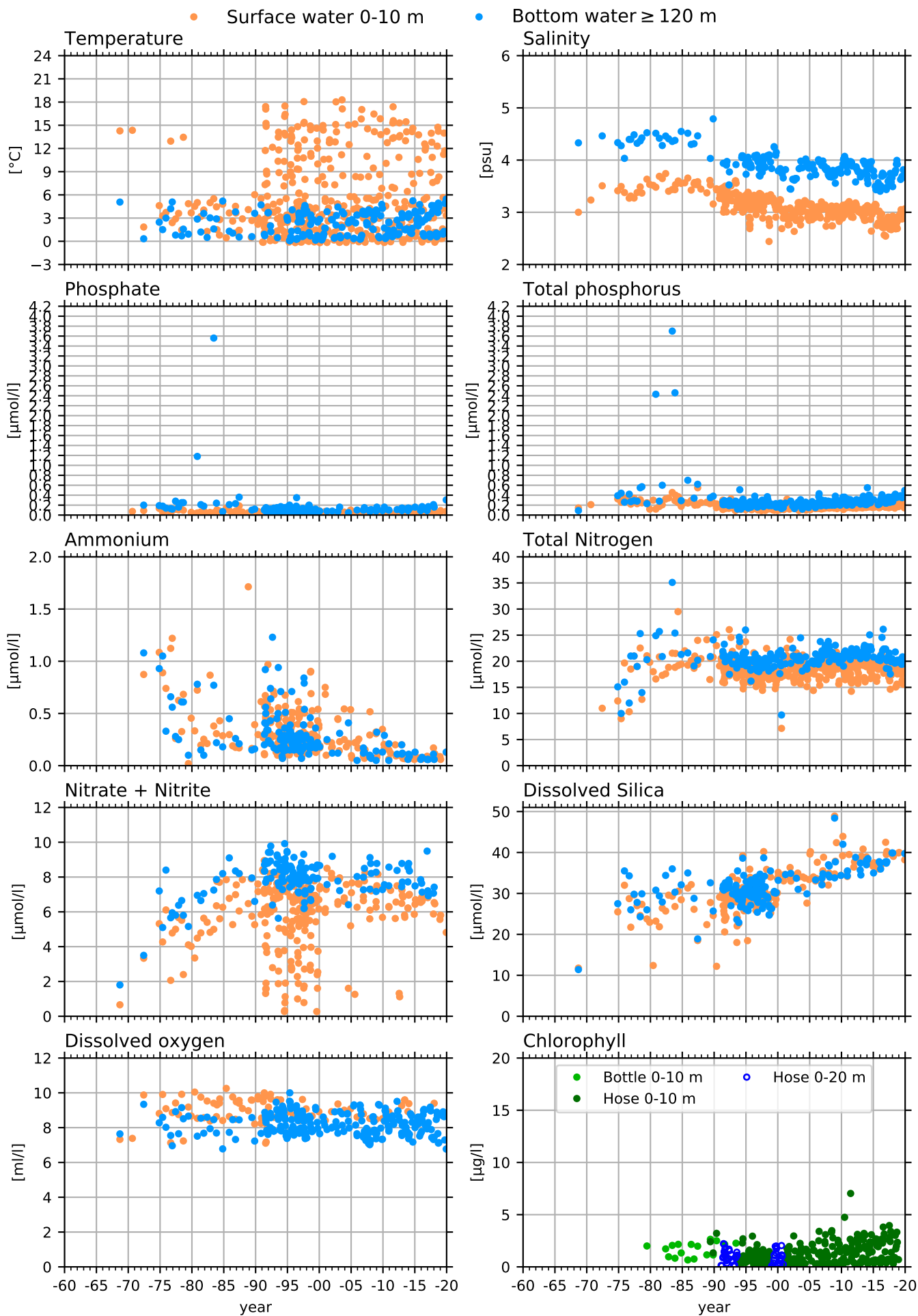
GAVIK-1, BOTHNIAN SEA COASTAL



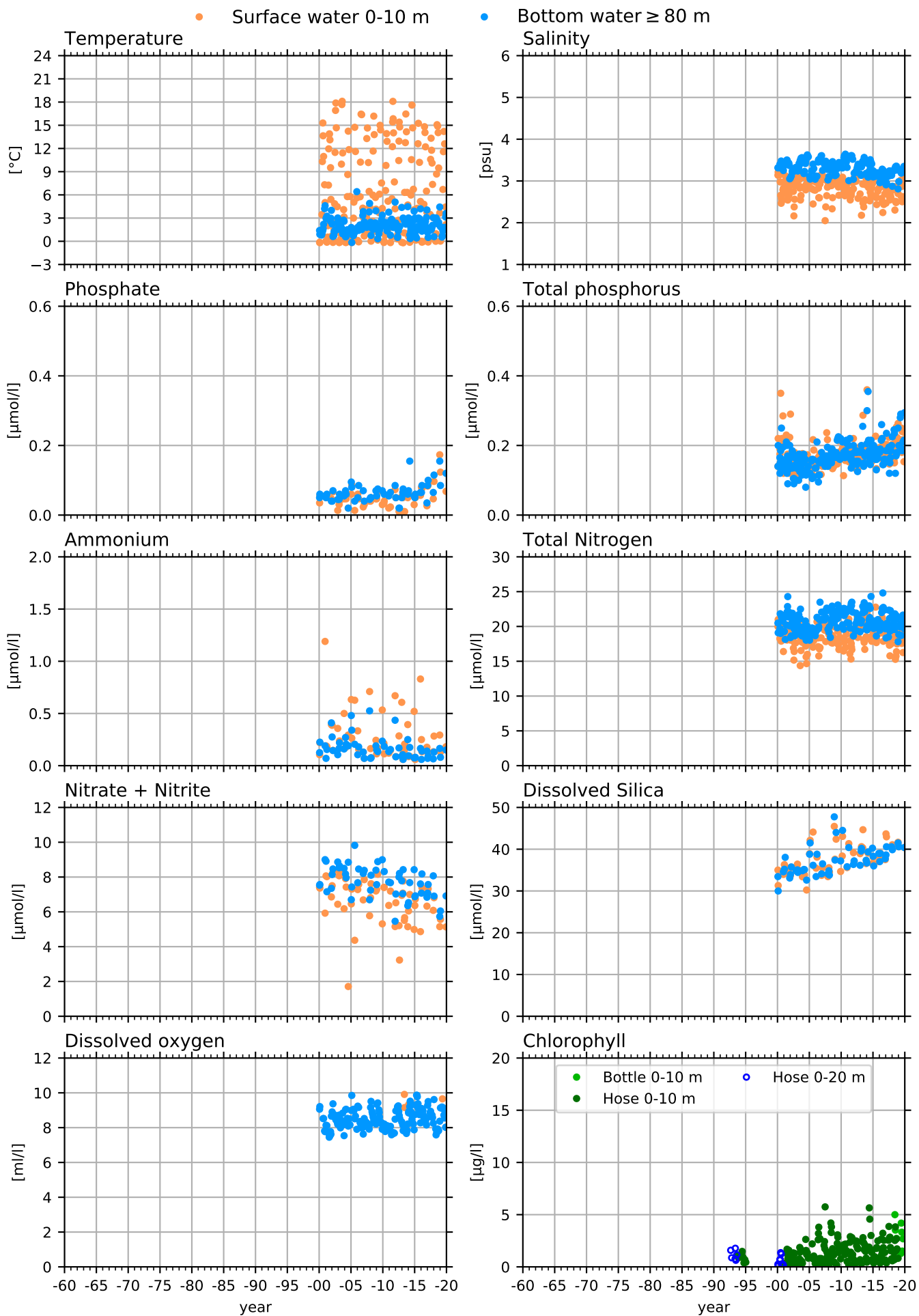
B7 & NB1 / B3, THE QUARK



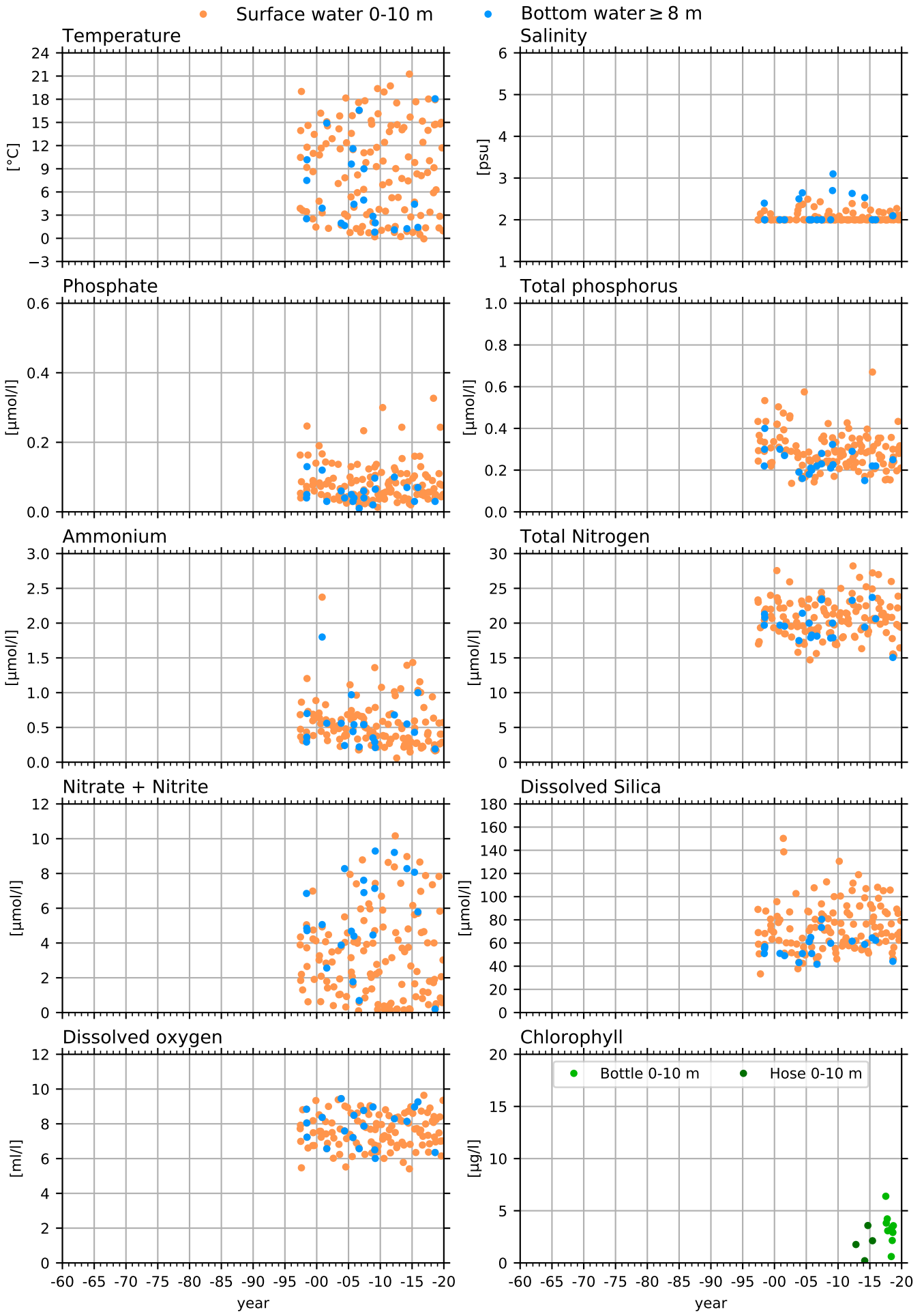
F9 / A13, BOTHNIAN BAY



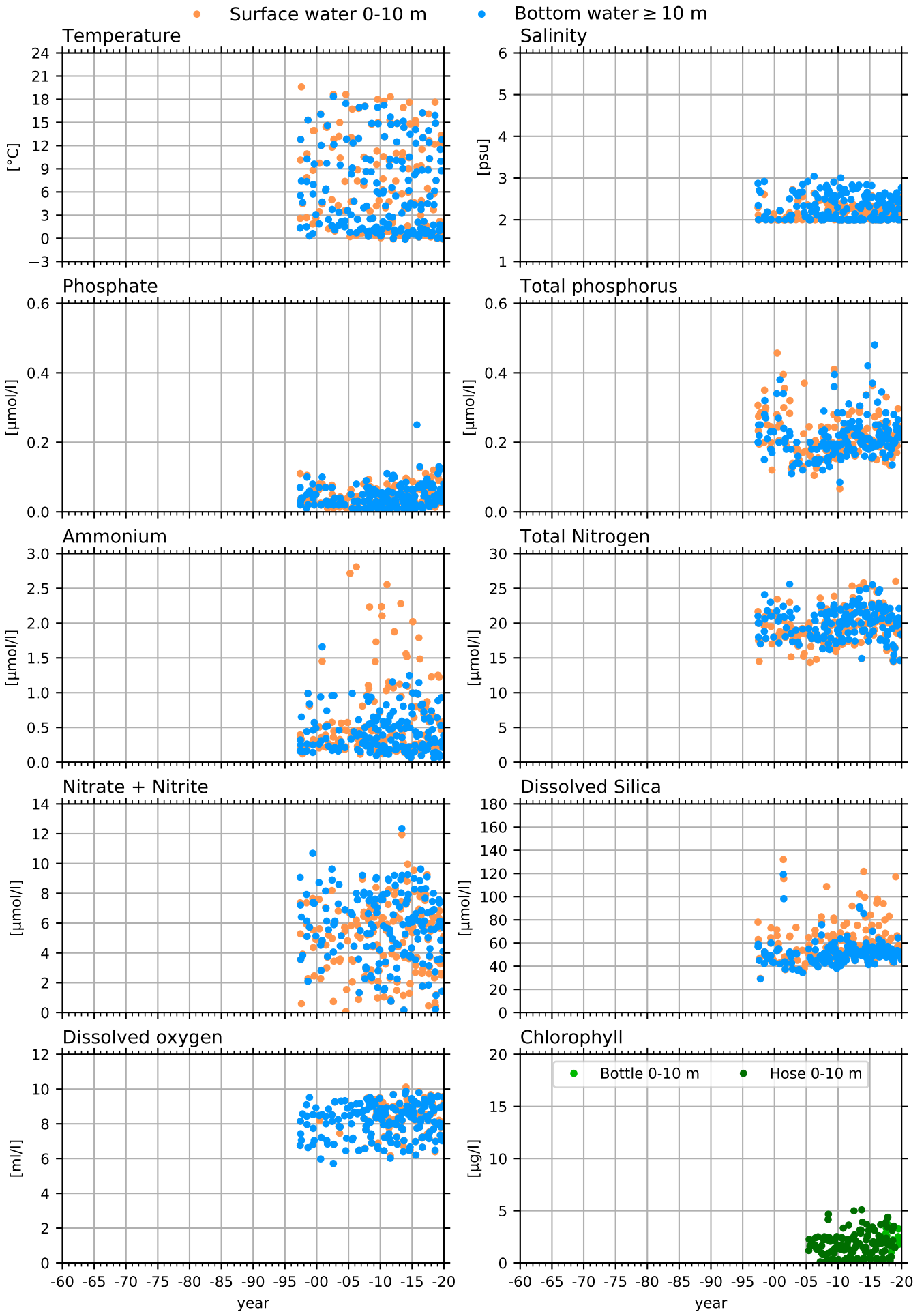
F3 / A5, BOTHNIAN BAY



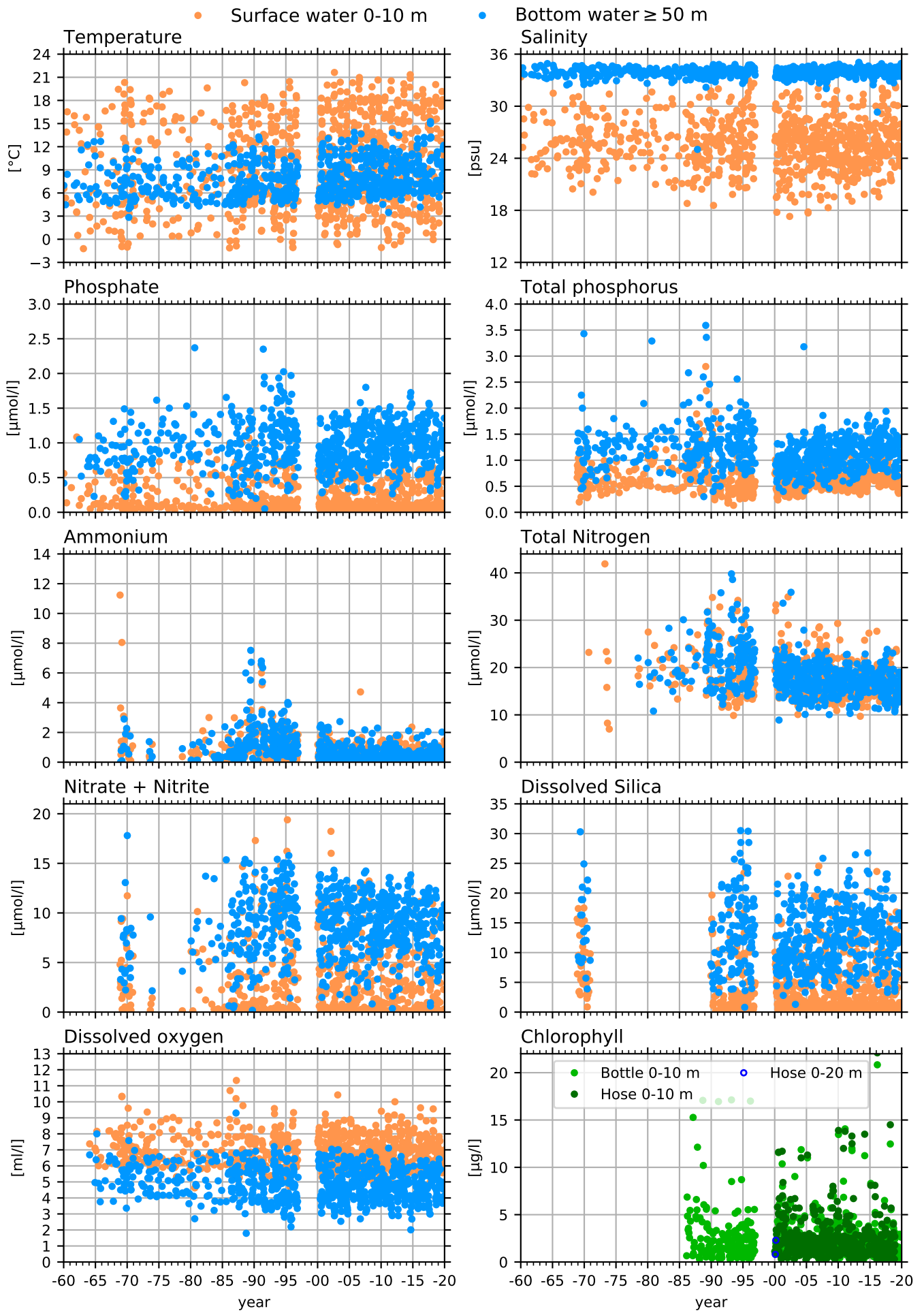
RÅNEÅ-1, BOTHNIAN BAY COASTAL



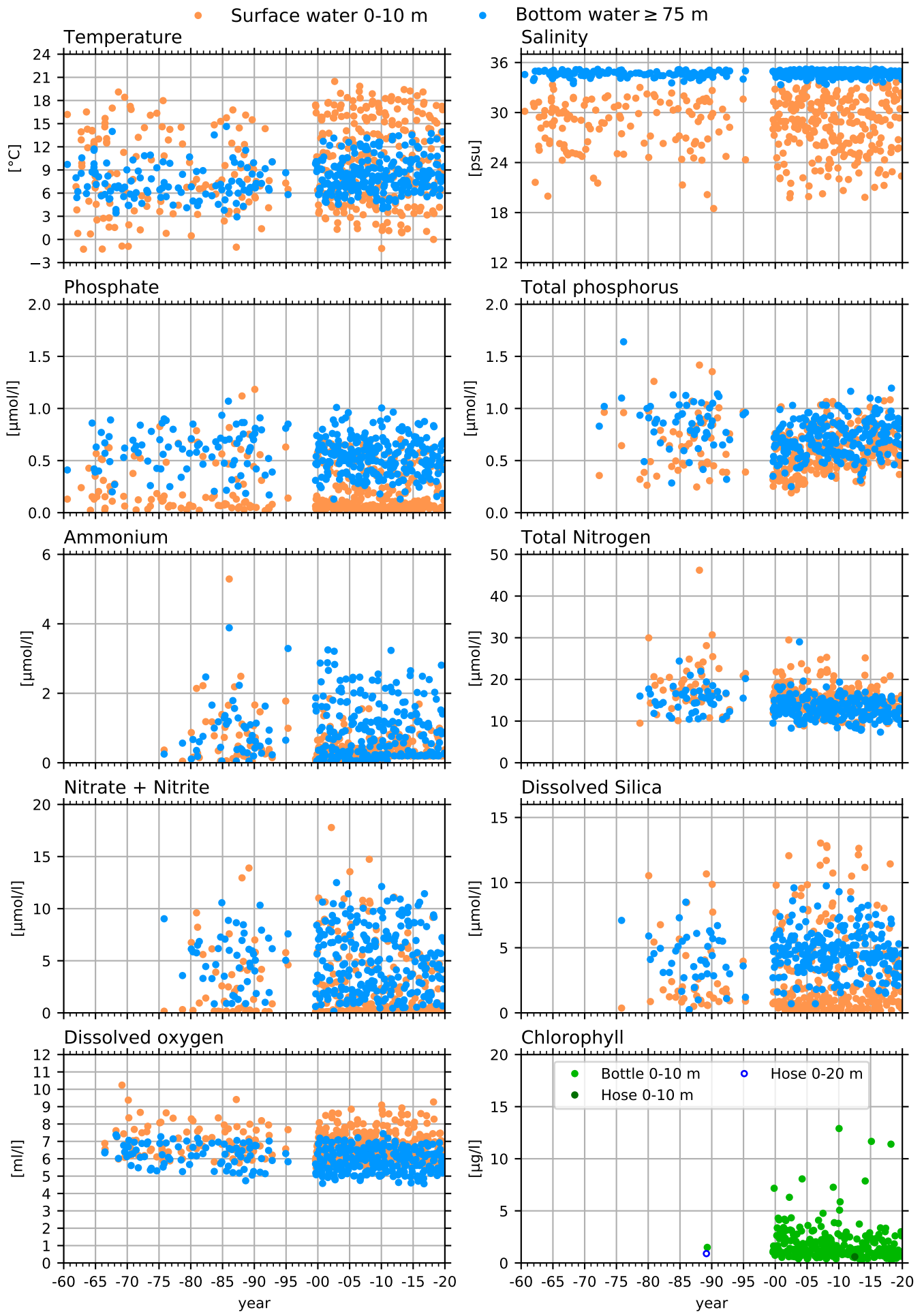
RÅNEÅ-2, BOTHNIAN BAY COASTAL



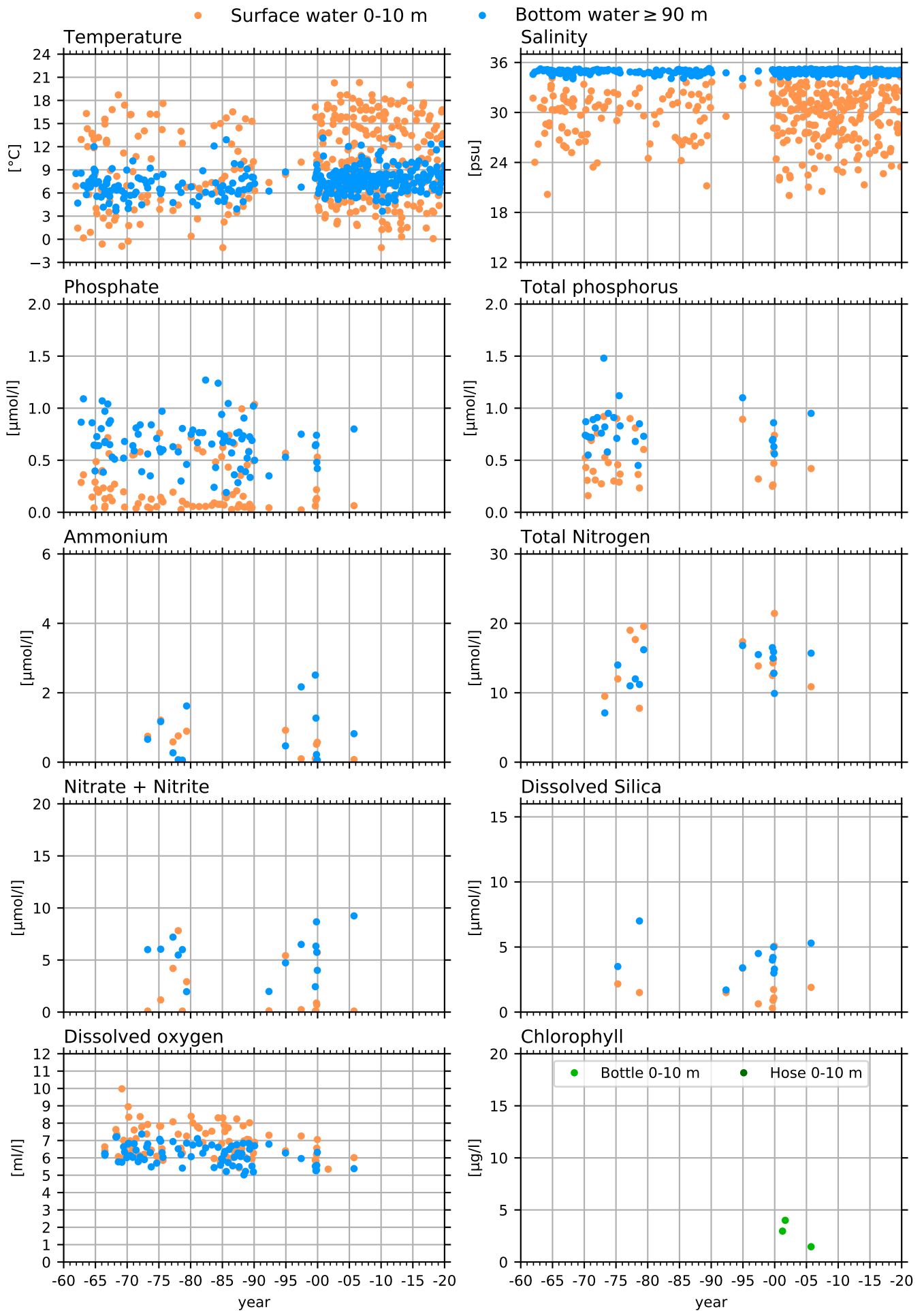
SLÄGGÖ, SKAGERACK COASTAL



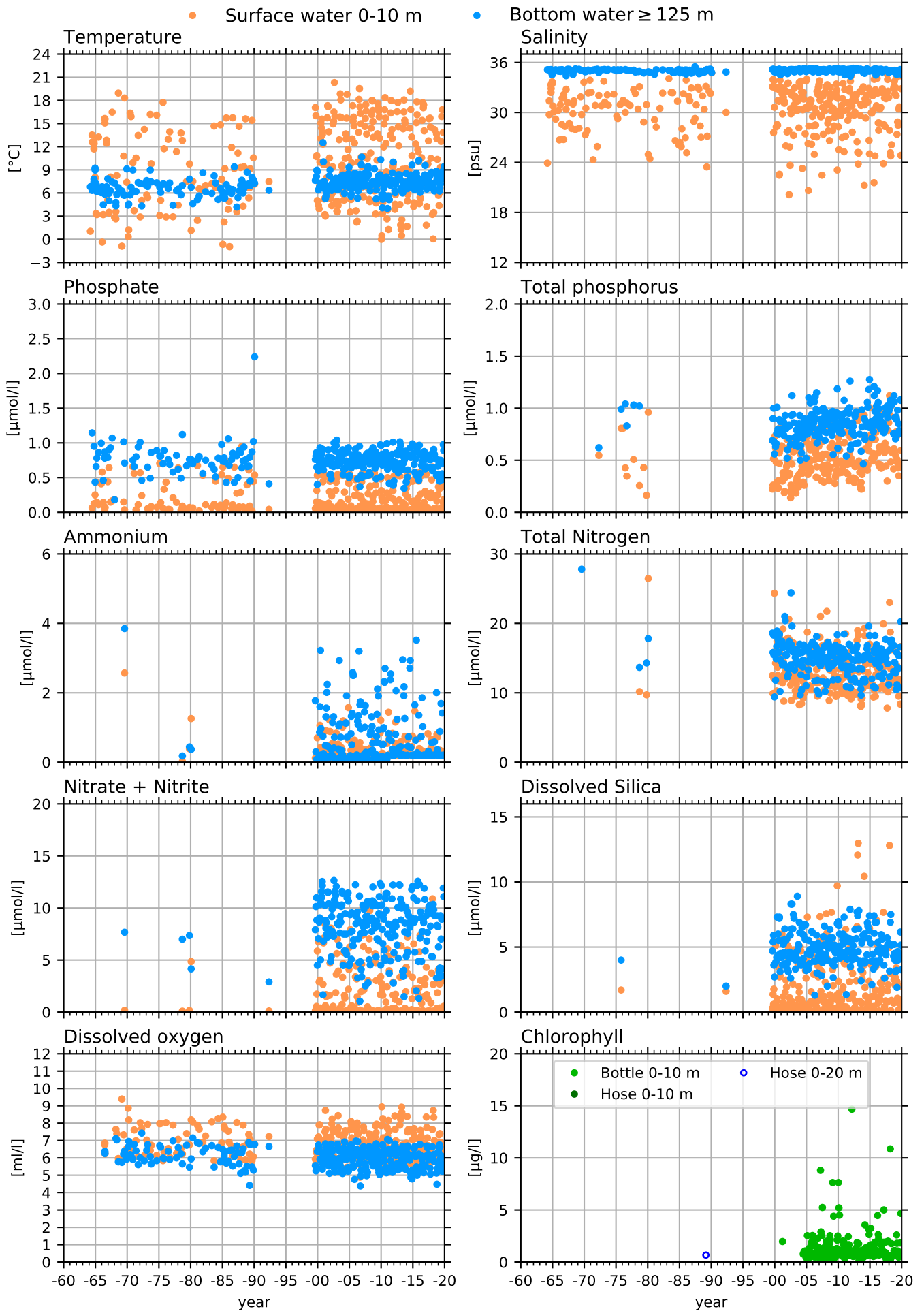
Å13, SKAGERACK



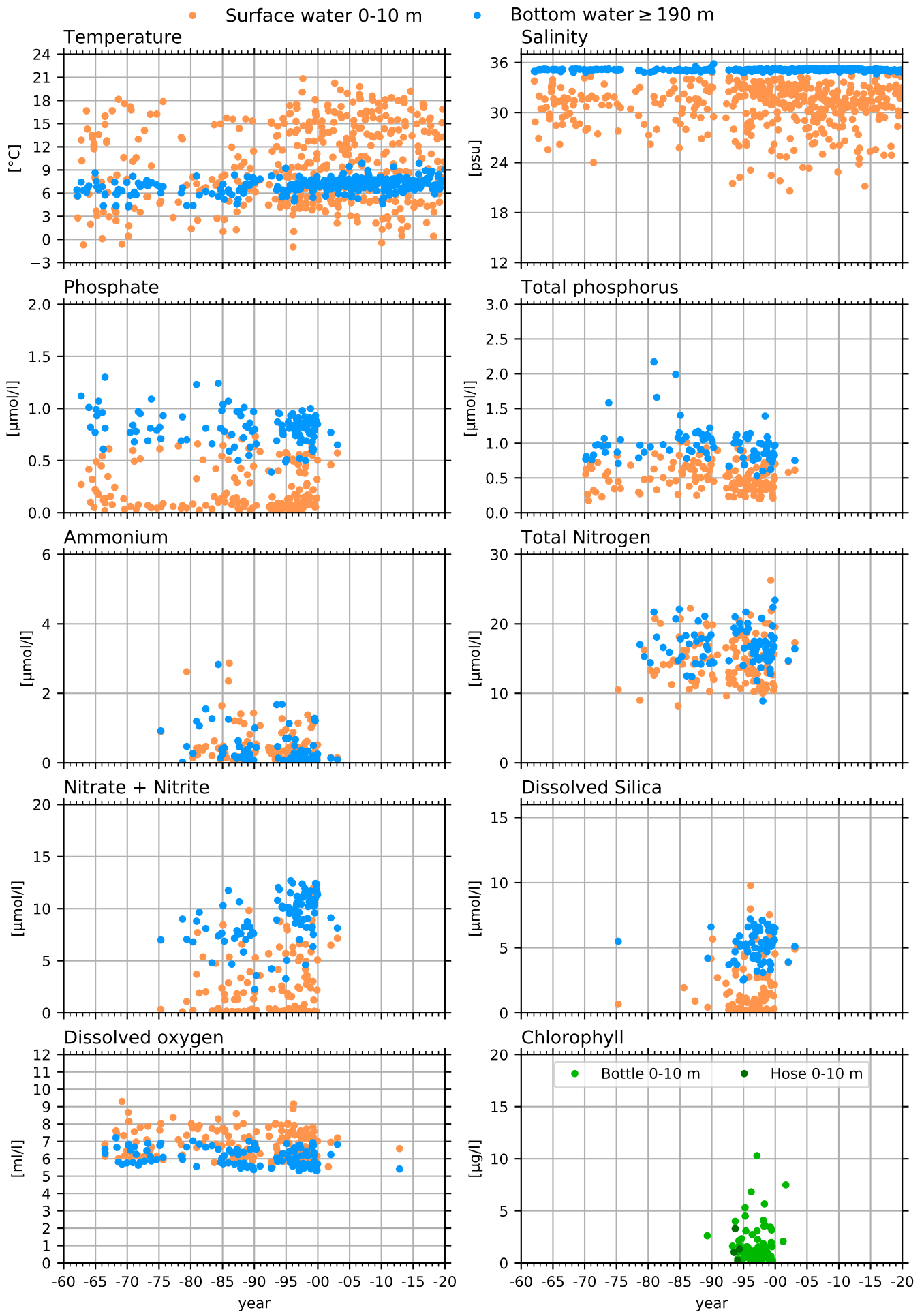
Å14, SKAGERACK



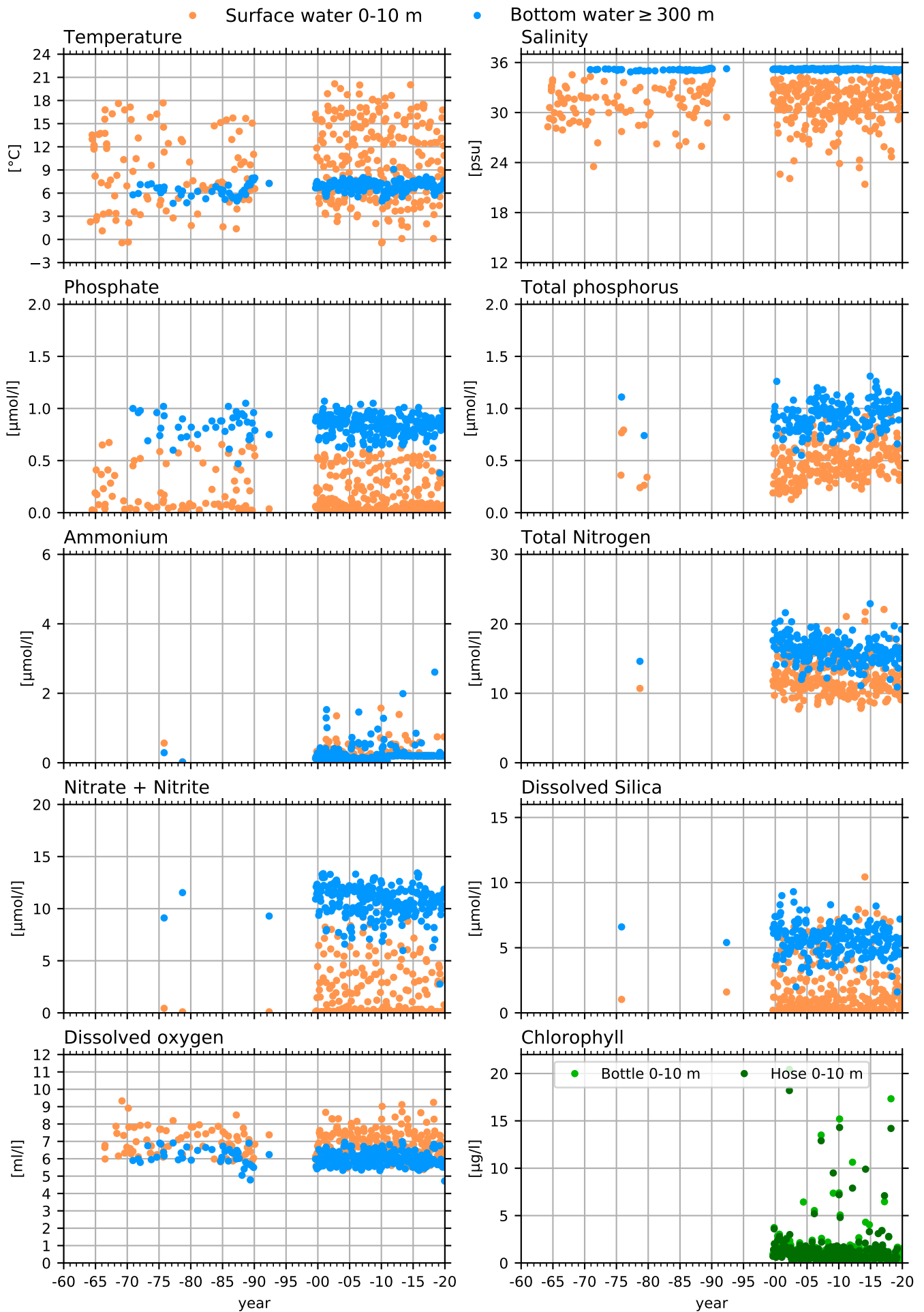
Å15, SKAGERACK



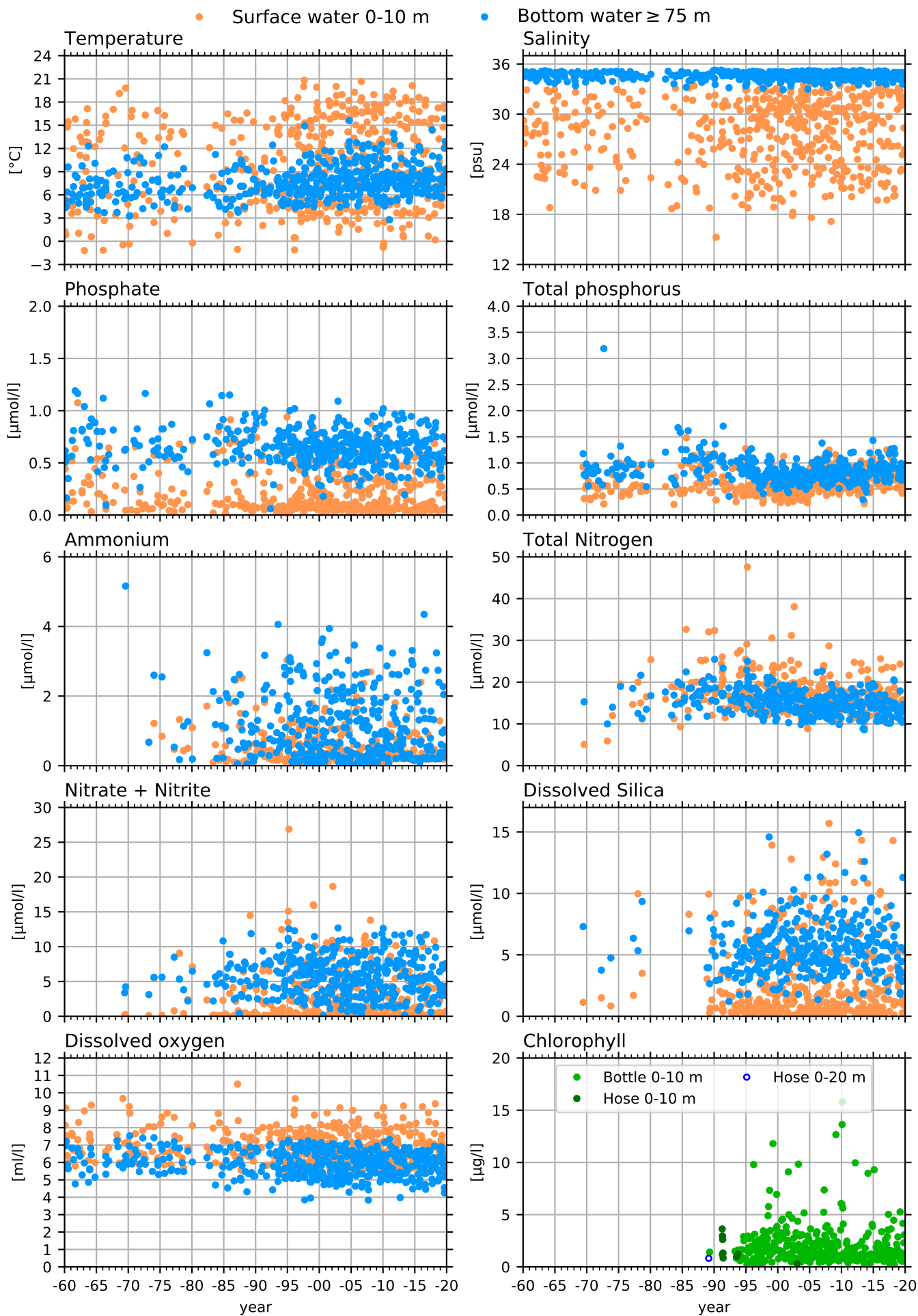
Å16, SKAGERACK



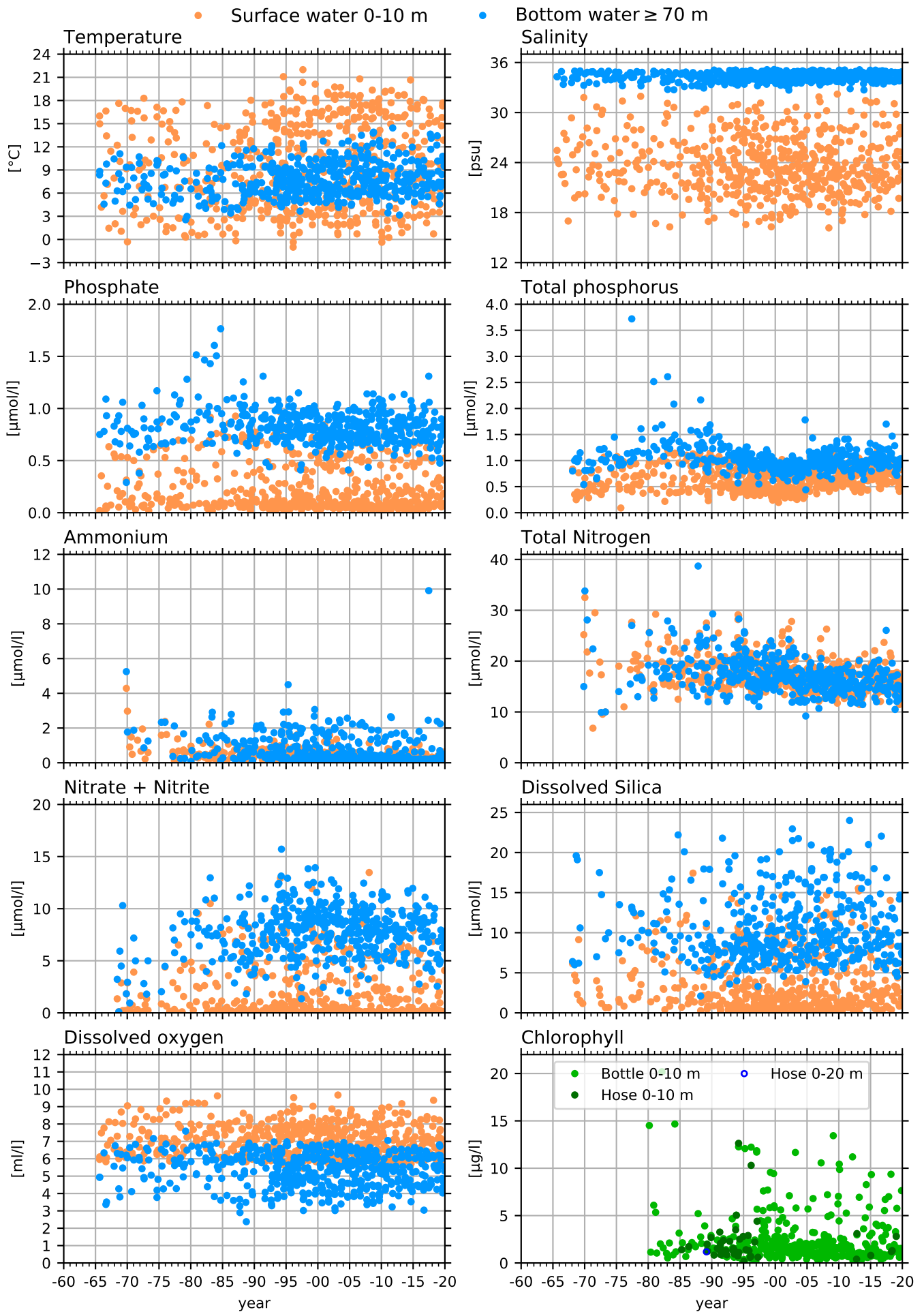
Å17, SKAGERACK



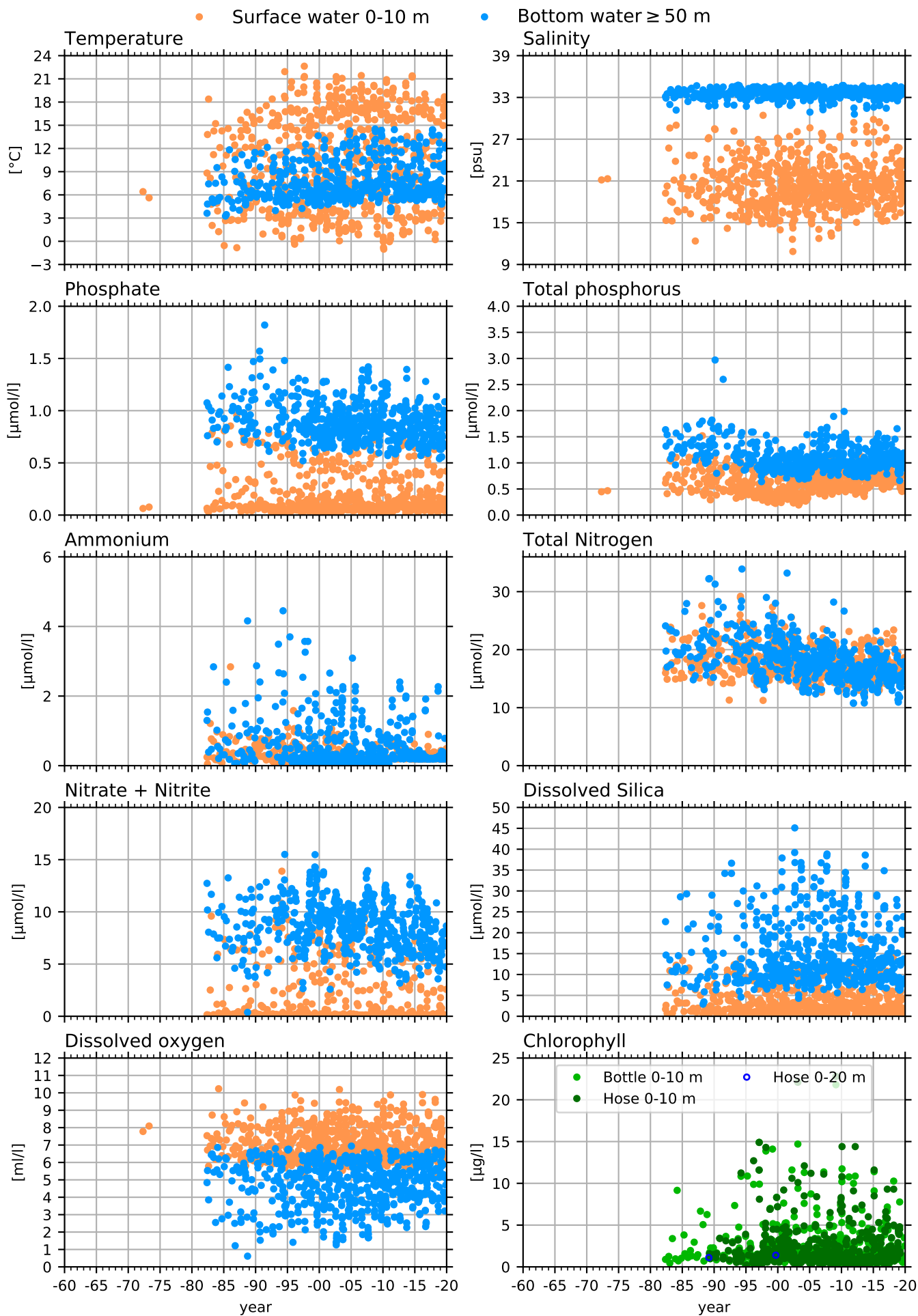
P2, SKAGERACK



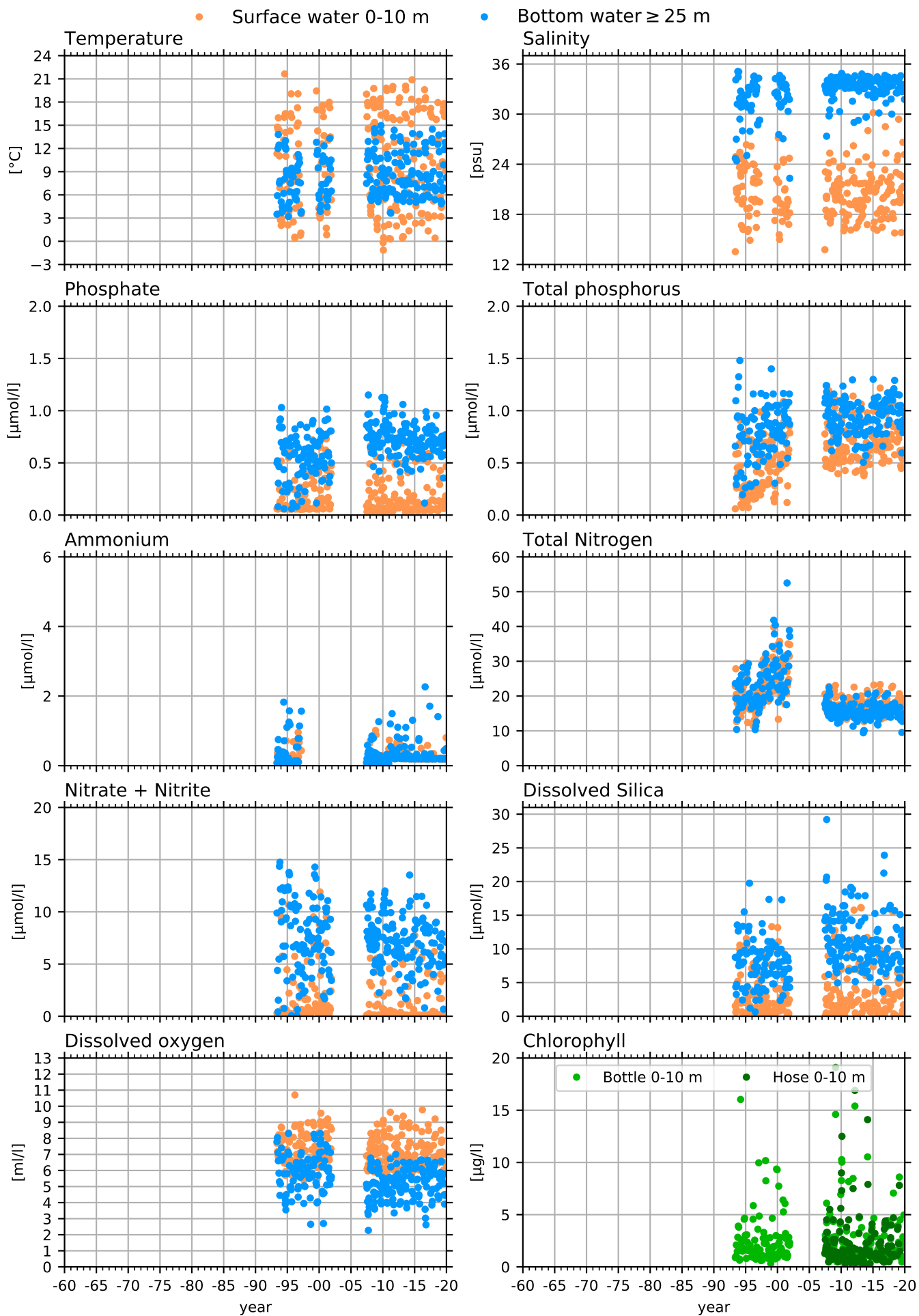
FLADEN, KATTEGAT



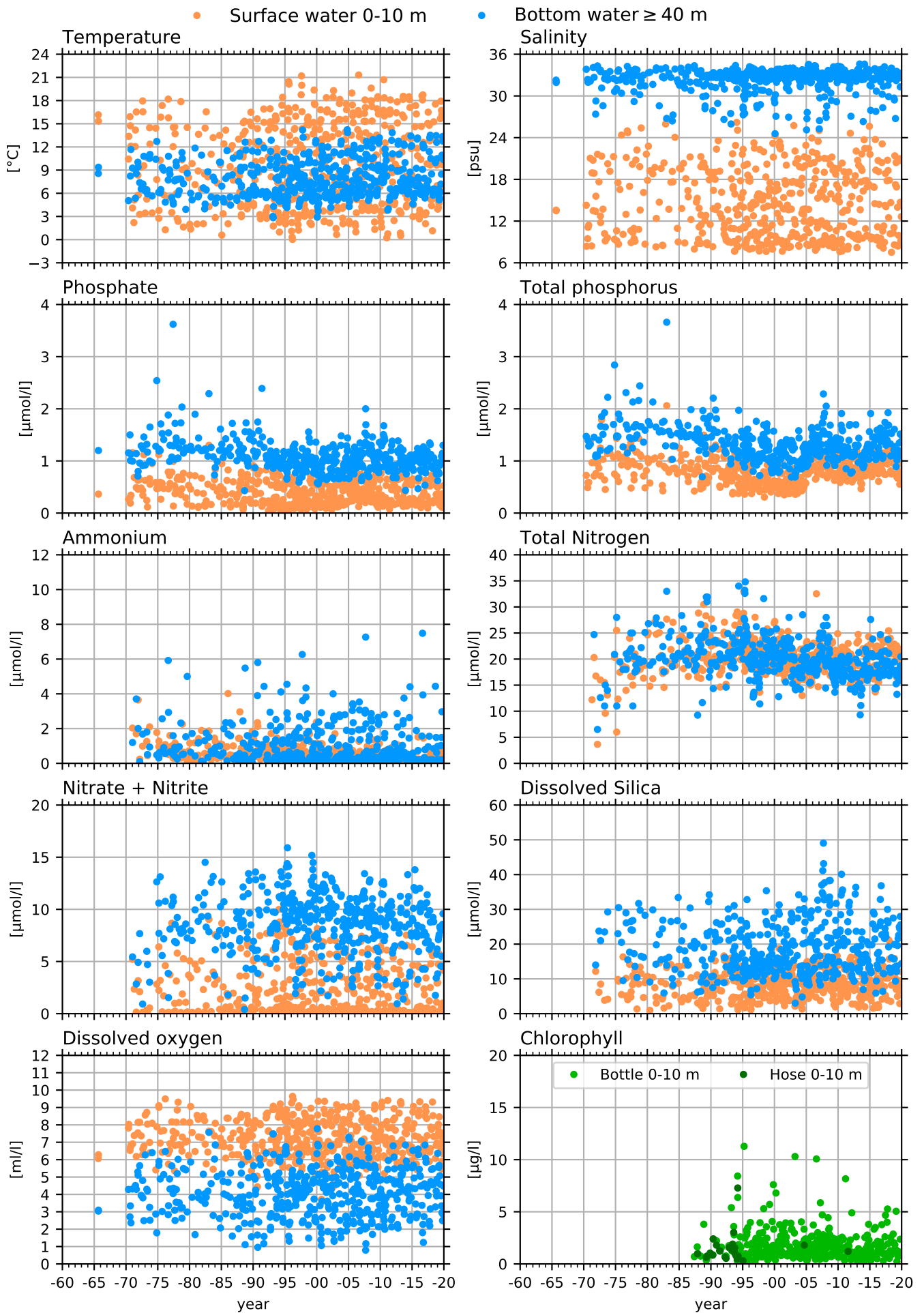
ANHOLT E, KATTEGAT



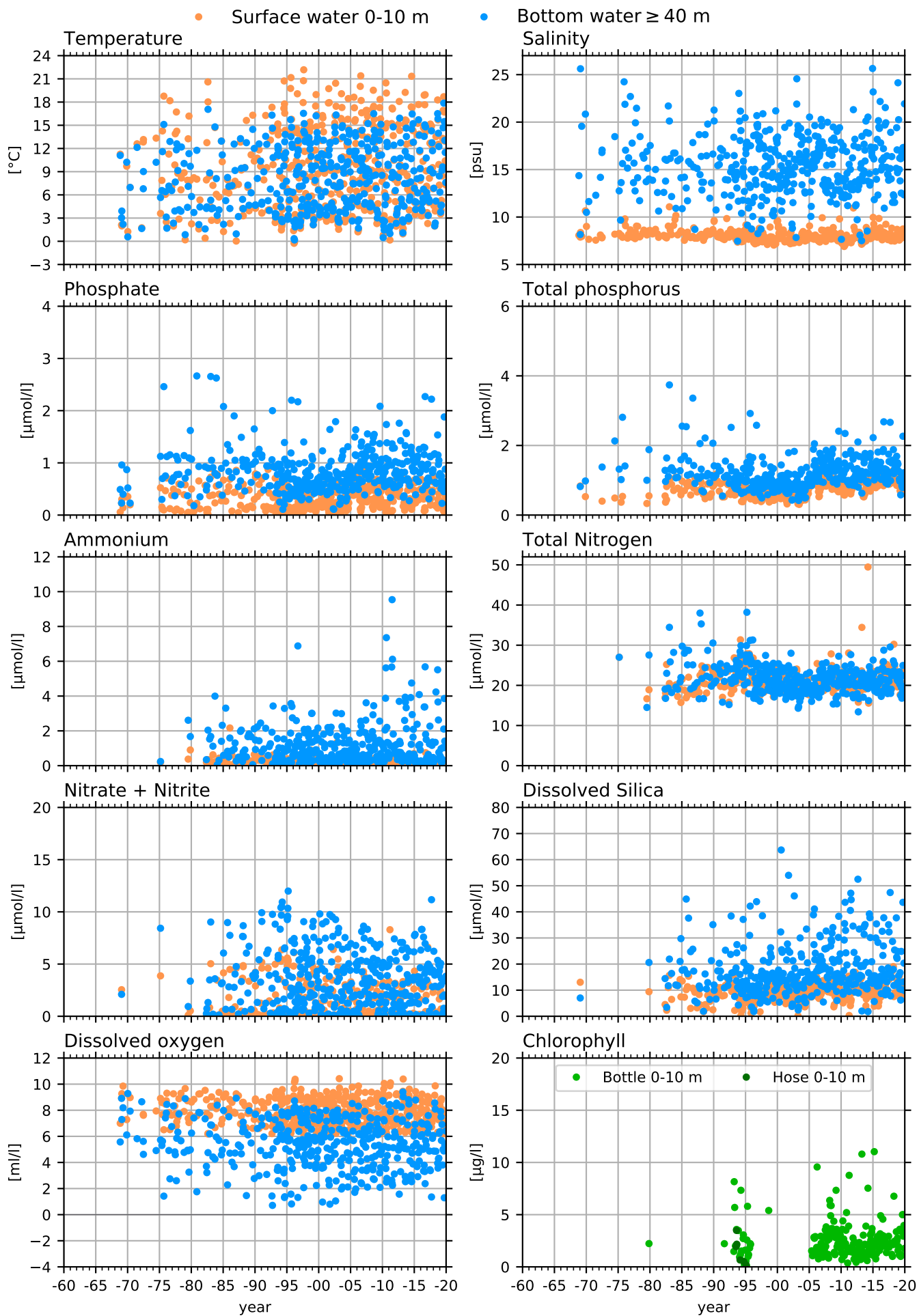
N14 FALKENBERG, KATTEGAT COASTAL



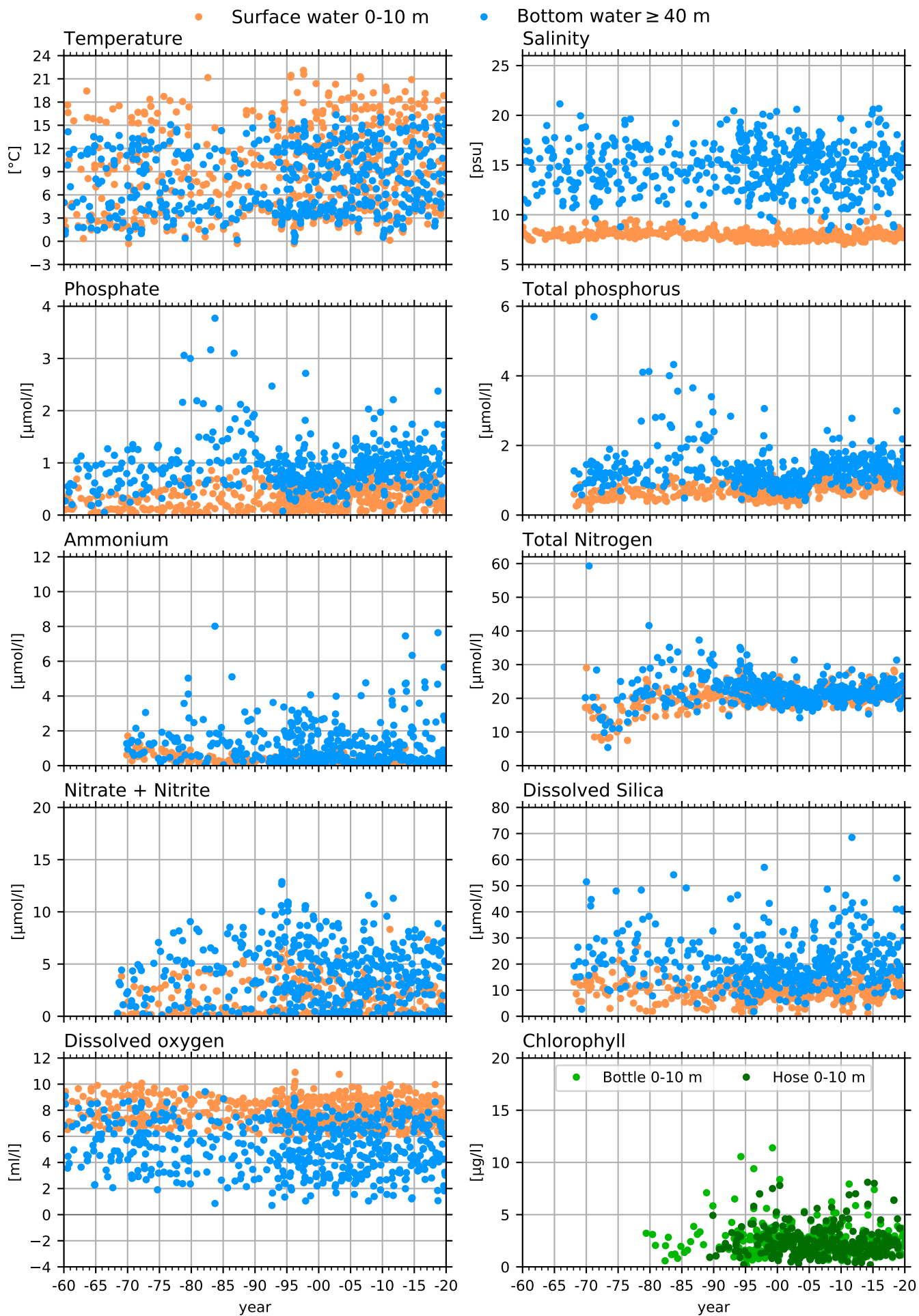
W LANDSKRONA, THE SOUND



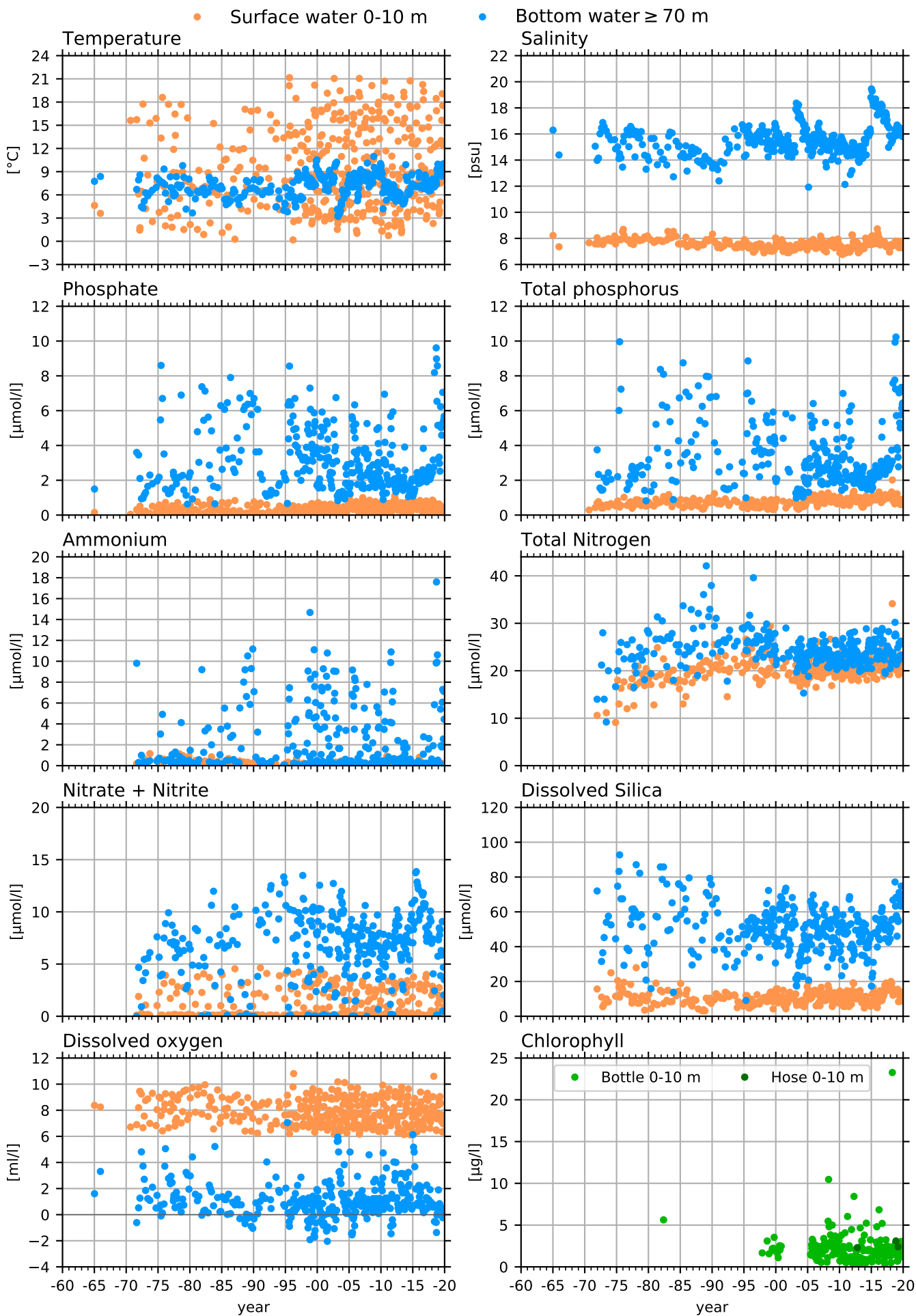
BY1, ARKONA



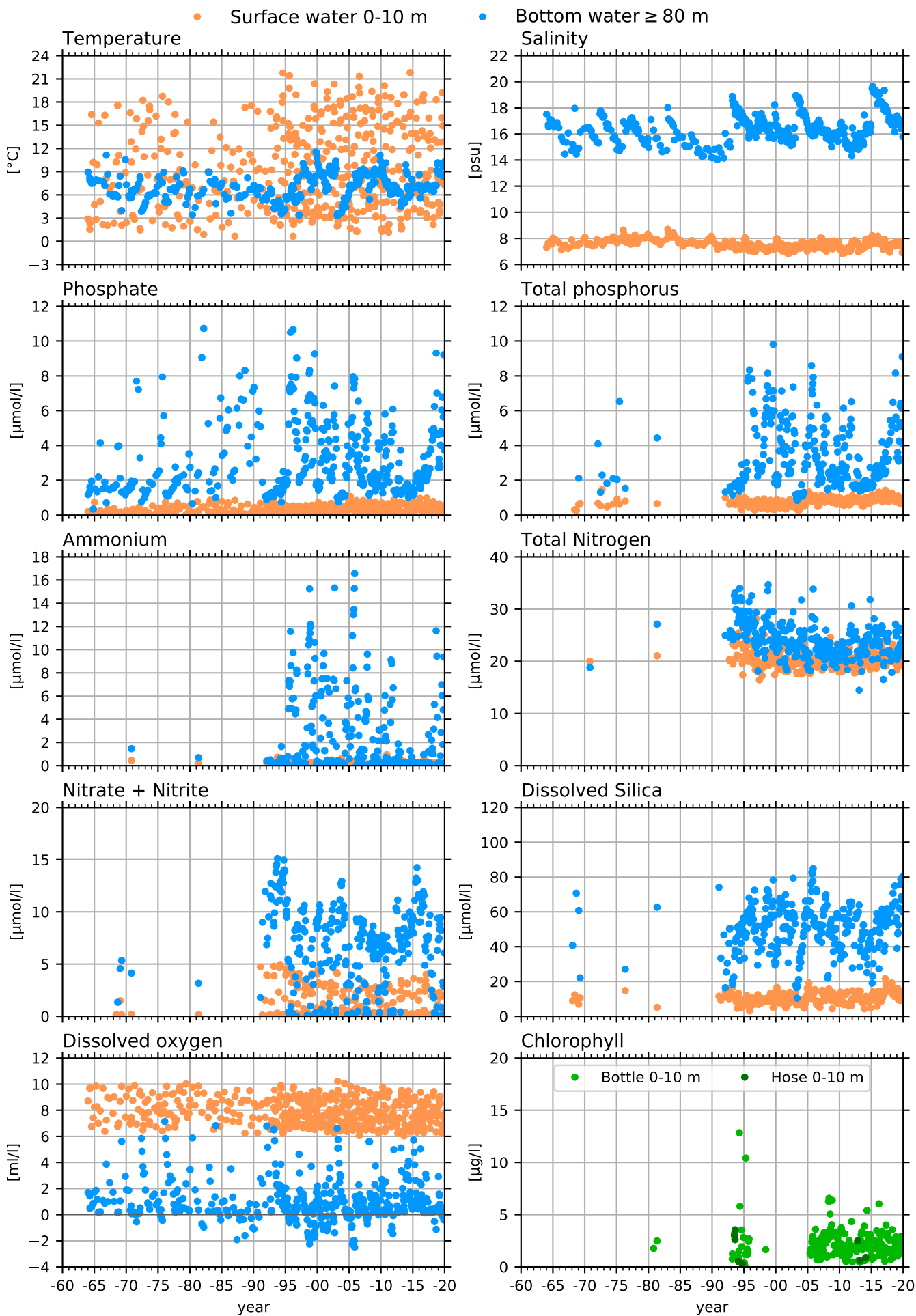
BY2 ARKONA, ARKONA



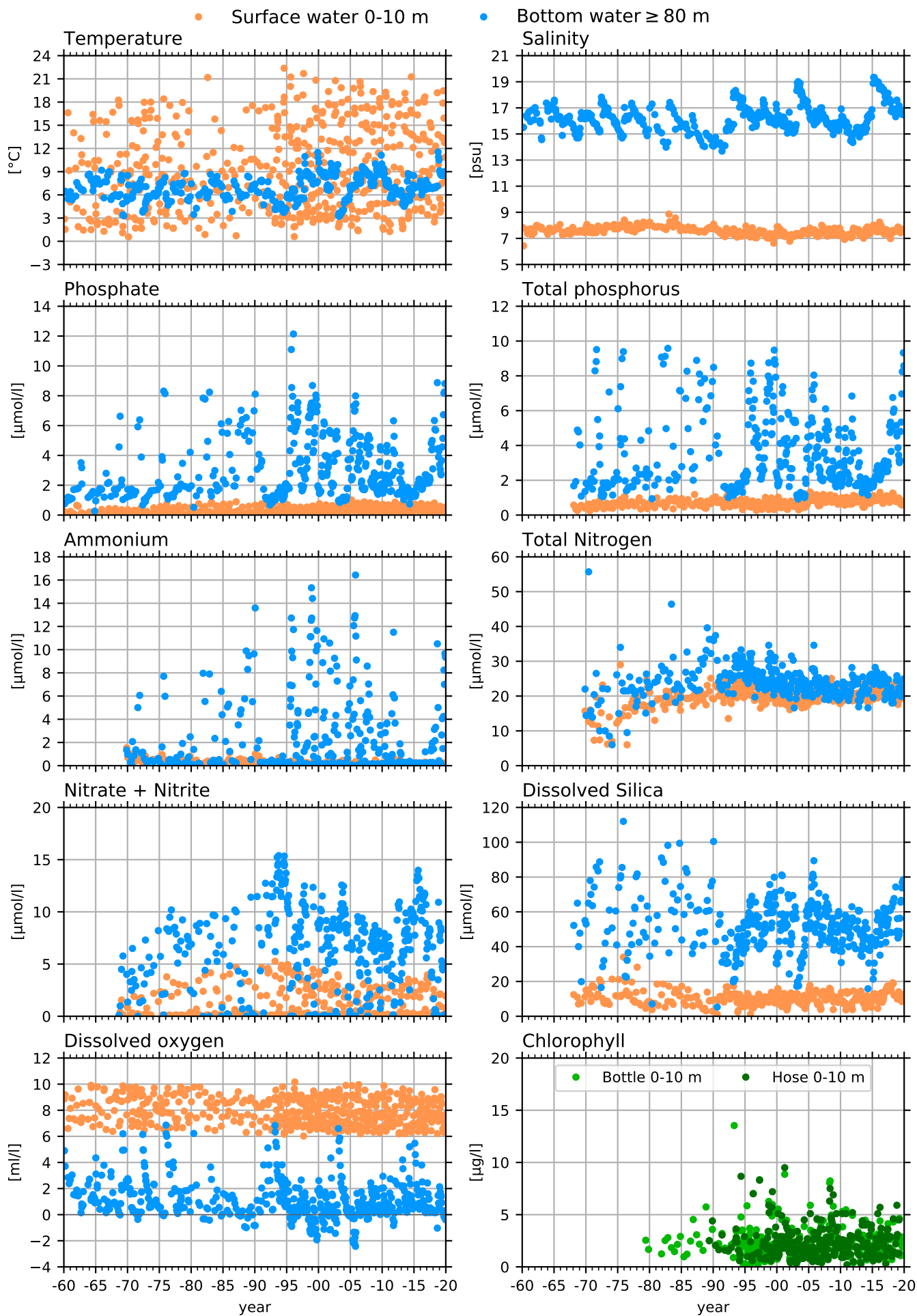
HANÖBUKTEN, BORNHOLM



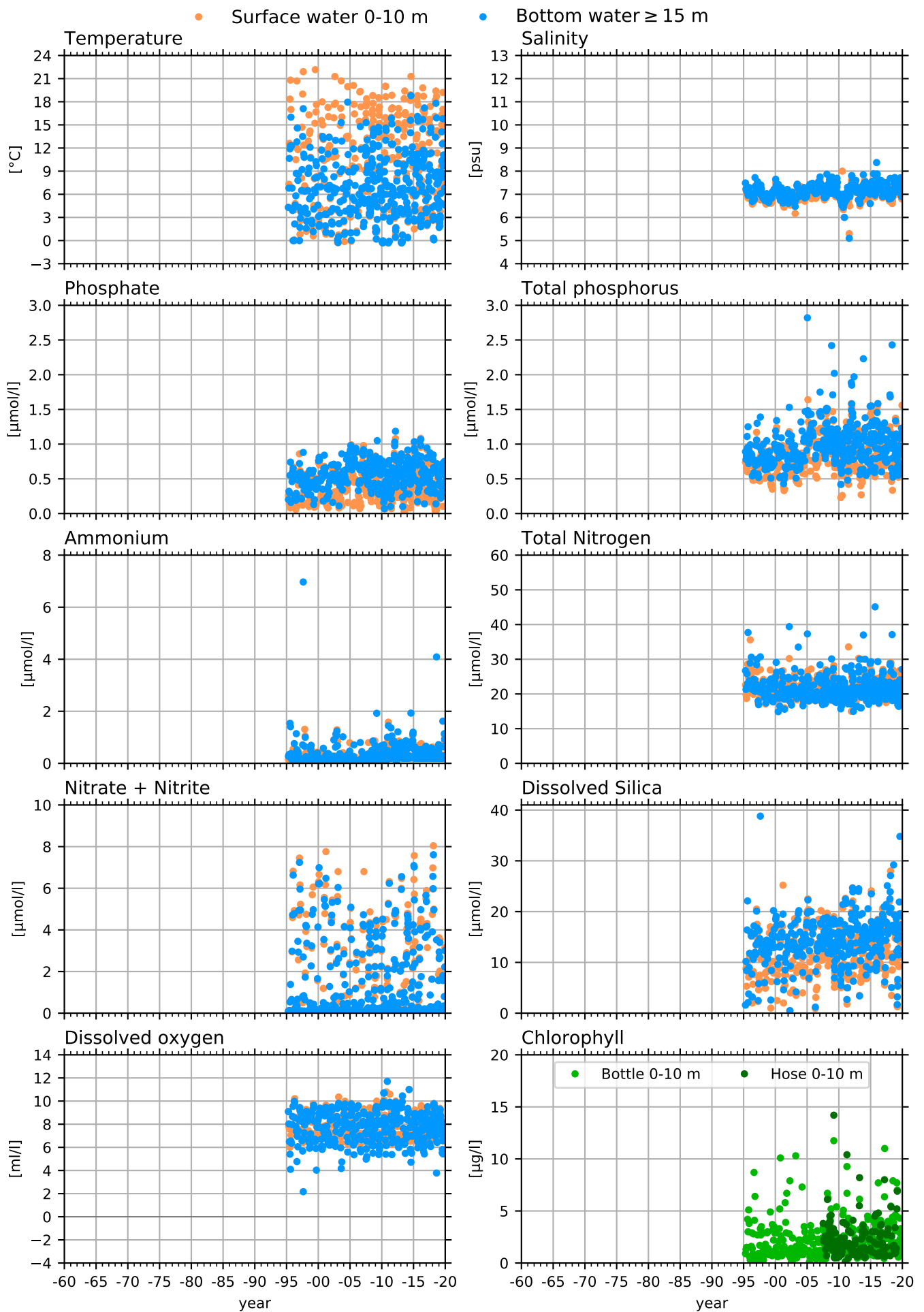
BY4 CHRISTIANSÖ, BORNHOLM



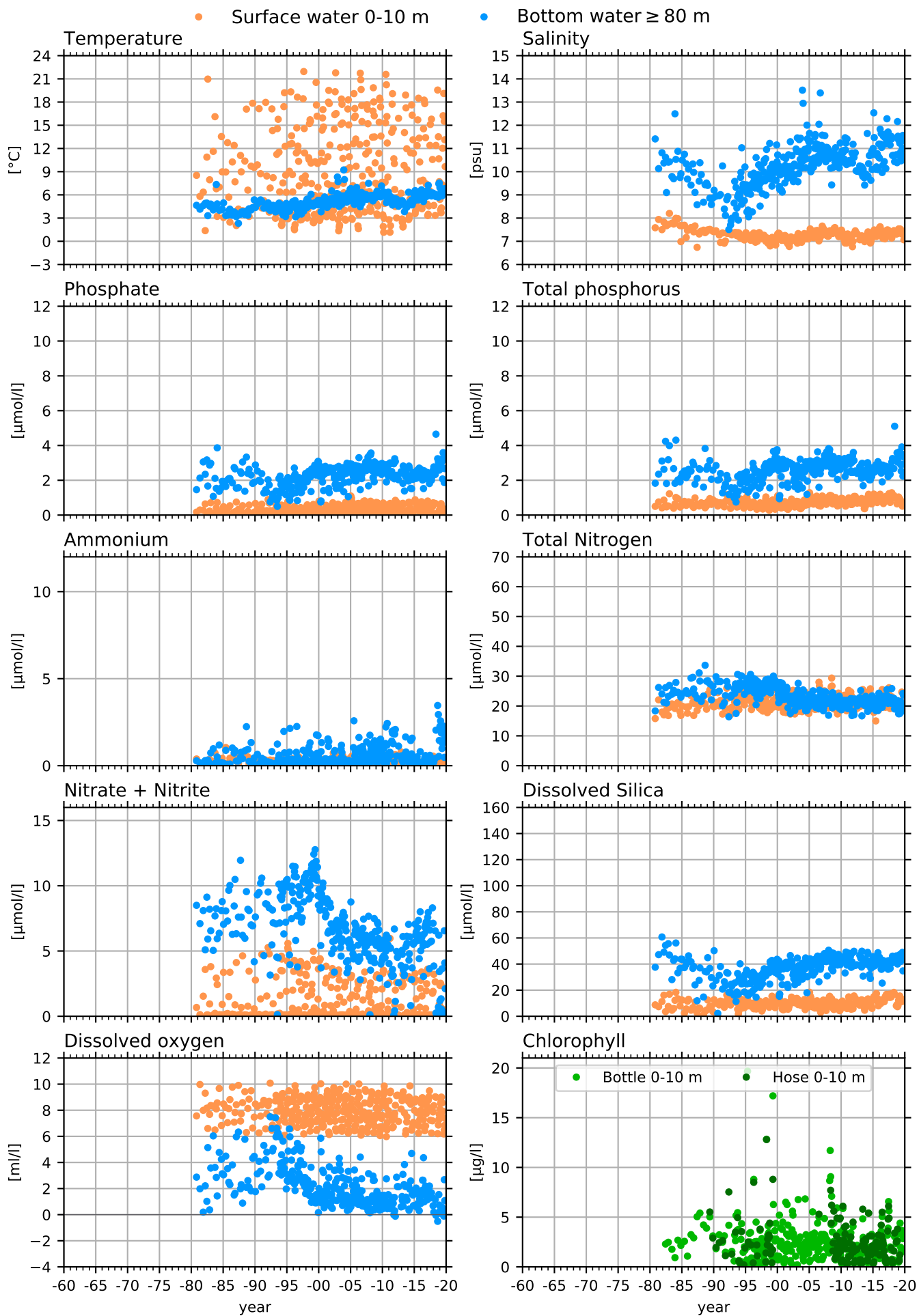
BY5 BORNHOLM DEEP, BORNHOLM



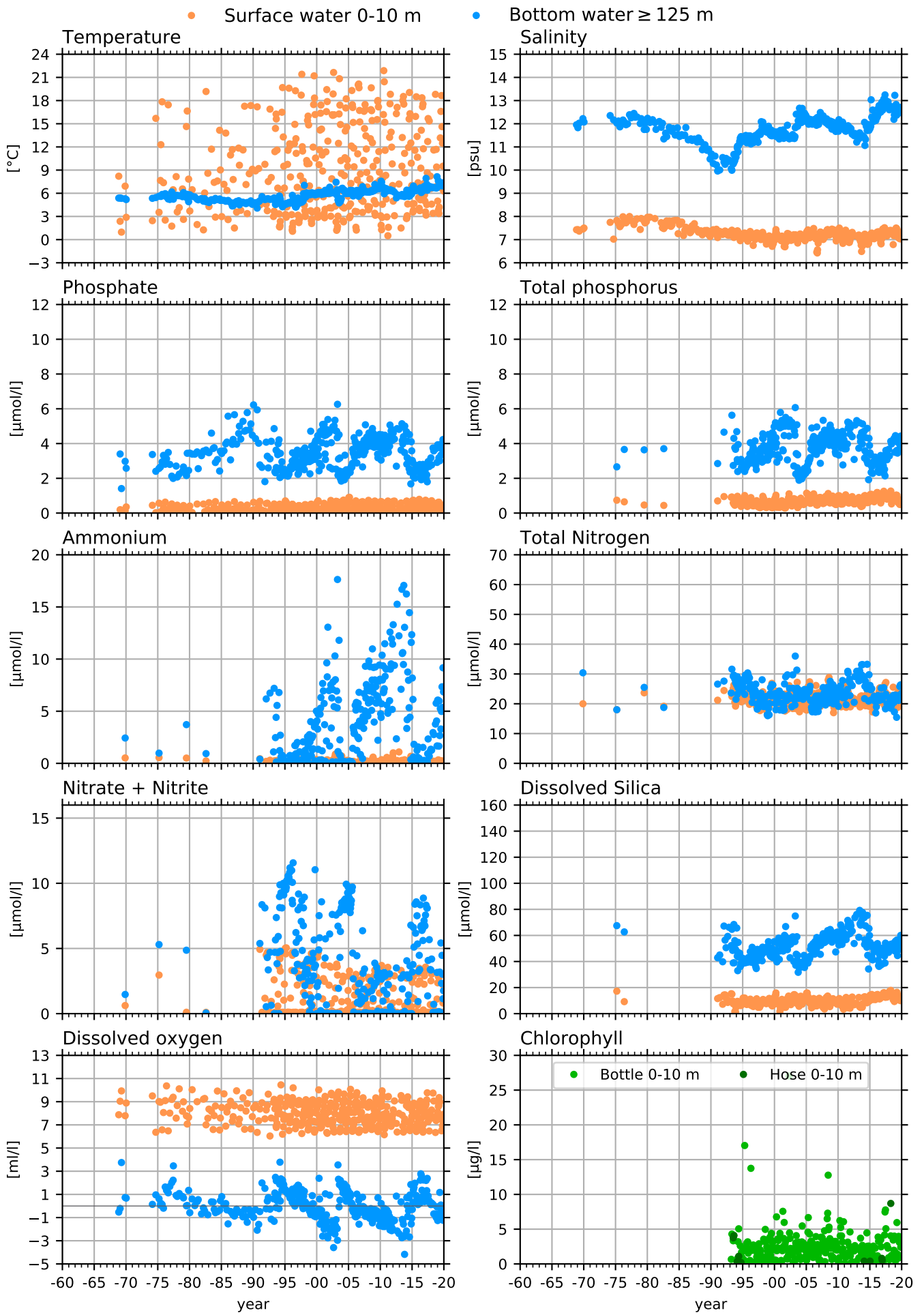
REF M1V1, BORNHOLM COASTAL



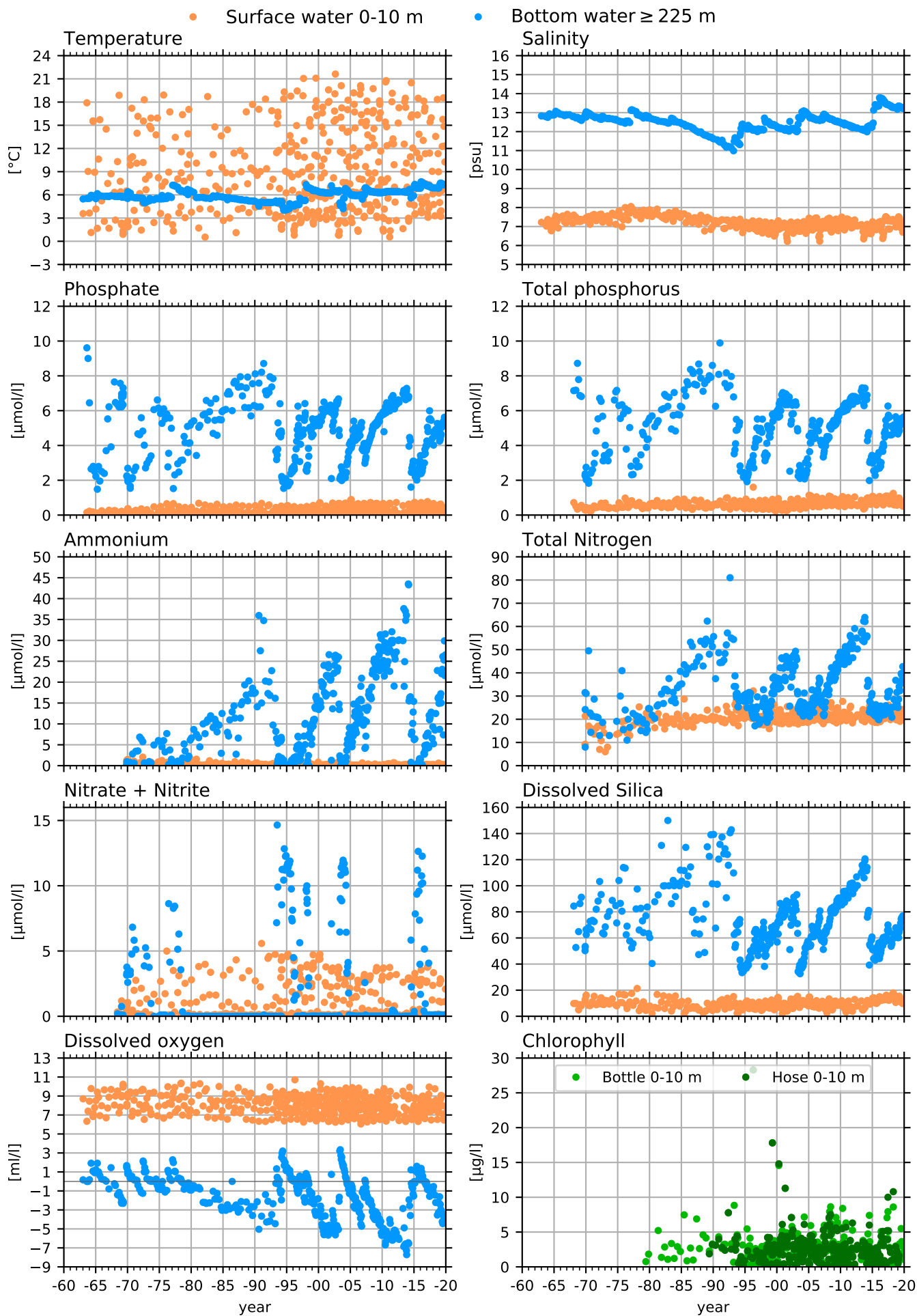
BCS III-10, EASTERN GOTLAND BASIN



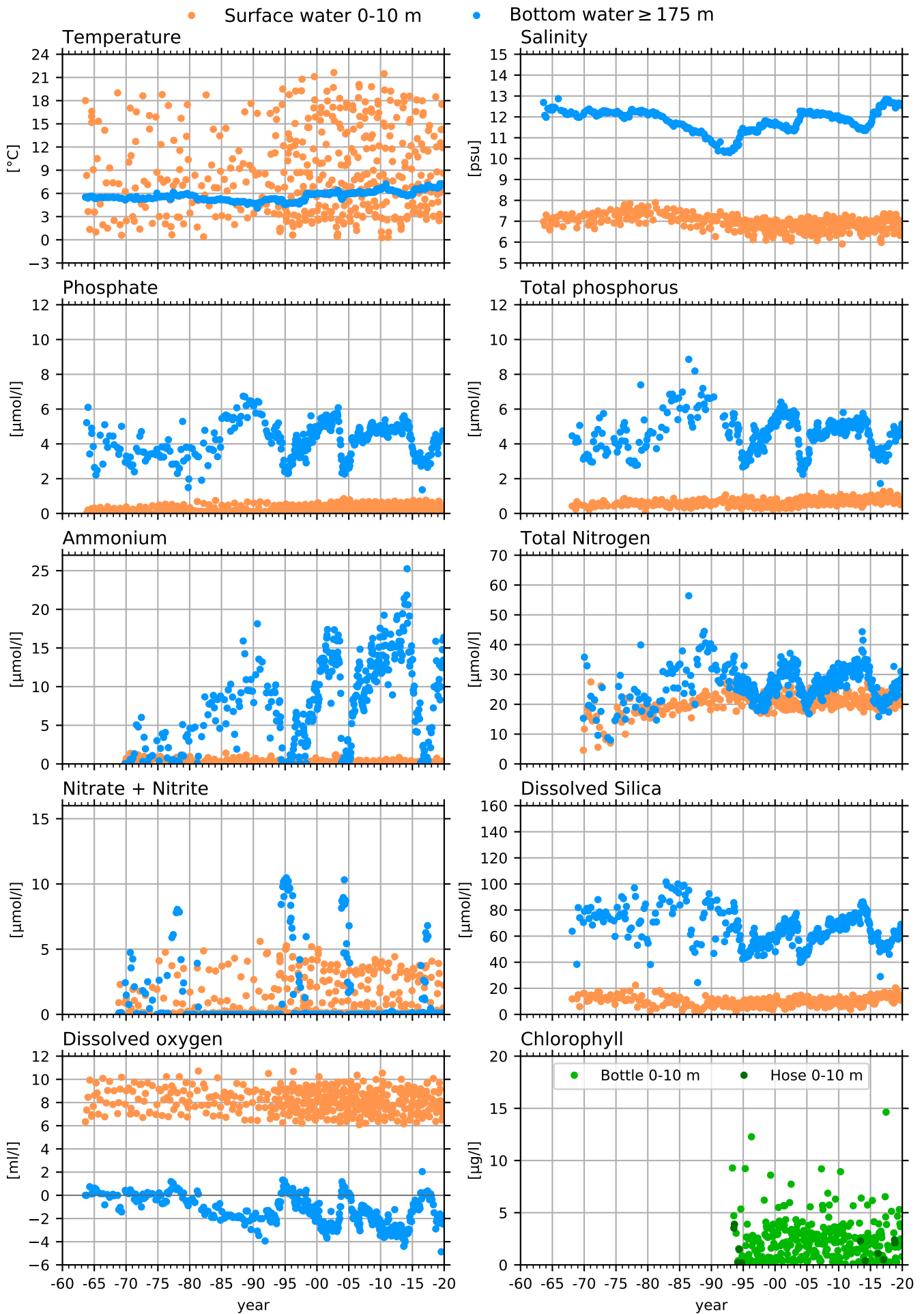
BY10, EASTERN GOTLAND BASIN



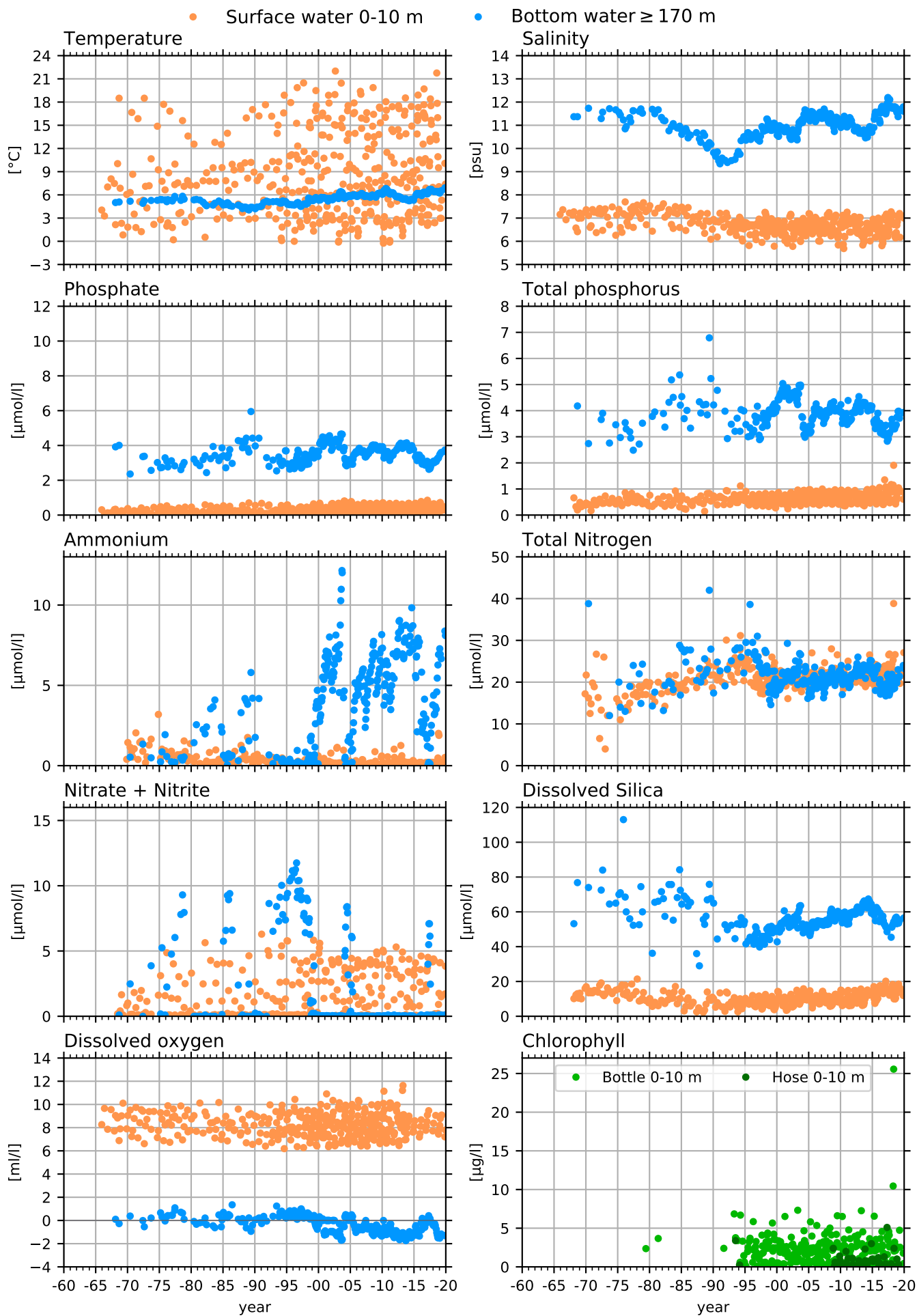
BY15 GOTLAND DEEP, EASTERN GOTLAND BASIN



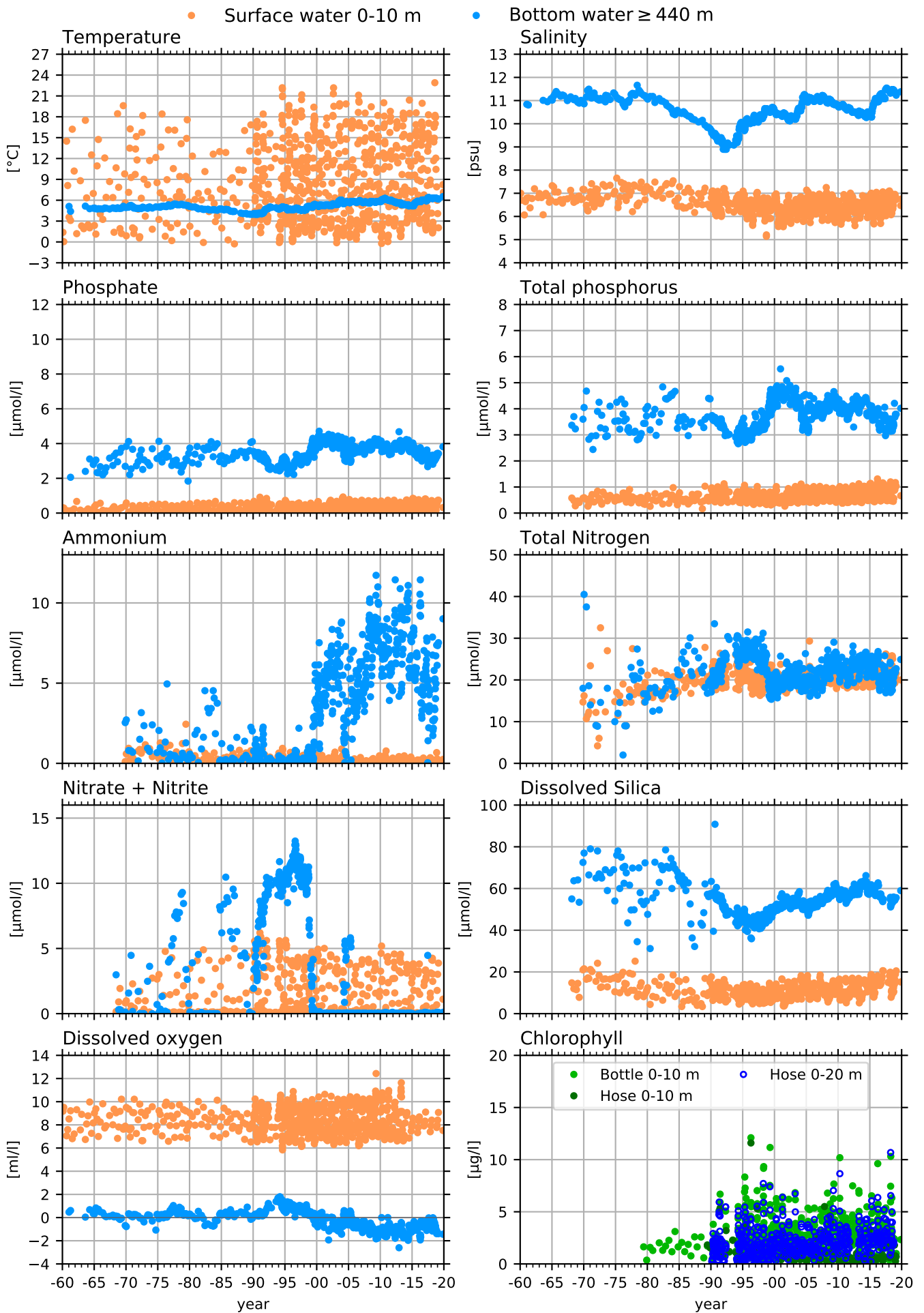
BY20 FÅRÖ DEEP, EASTERN GOTLAND BASIN



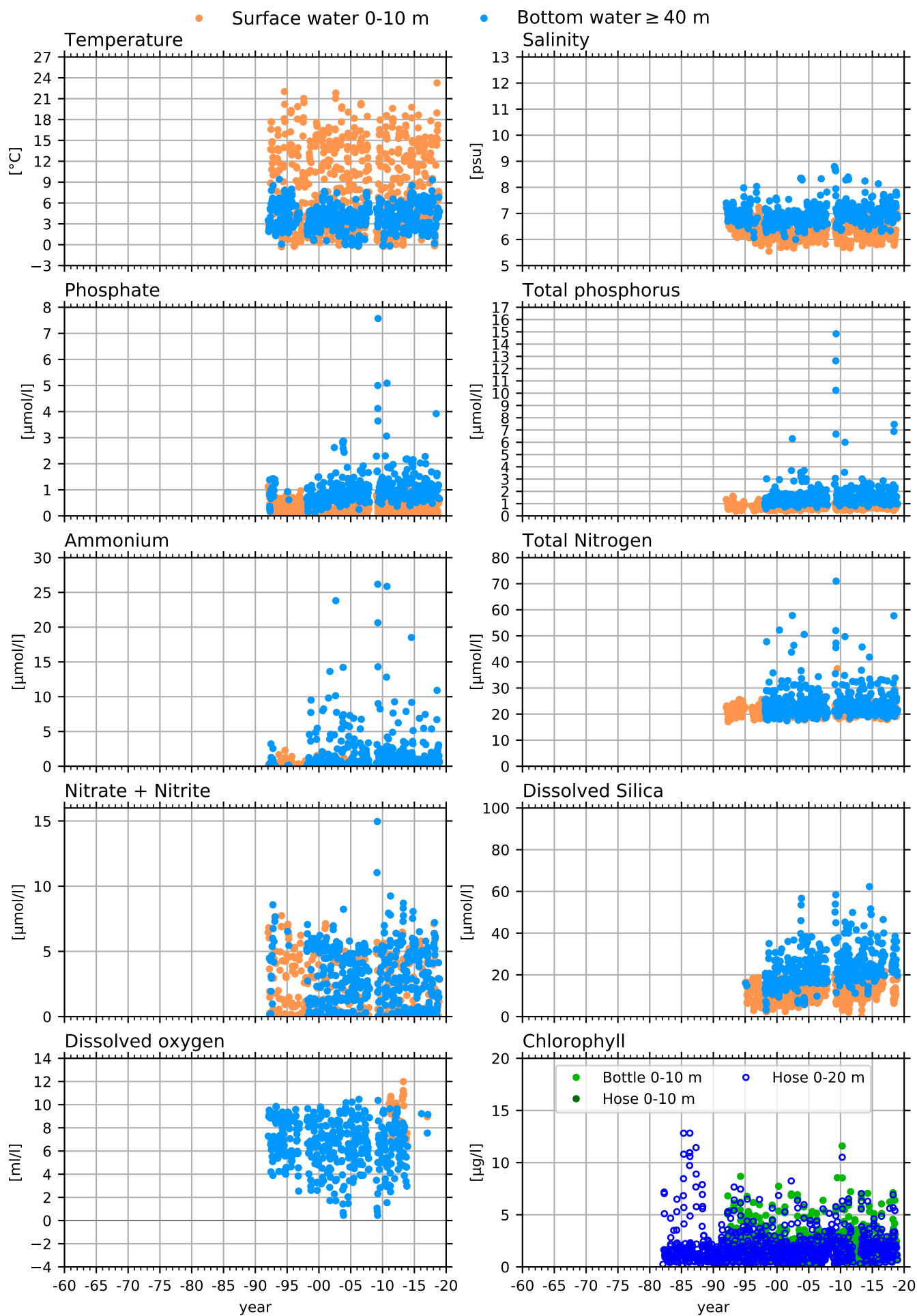
BY29 / LL19, NORTHERN BALTIC PROPER



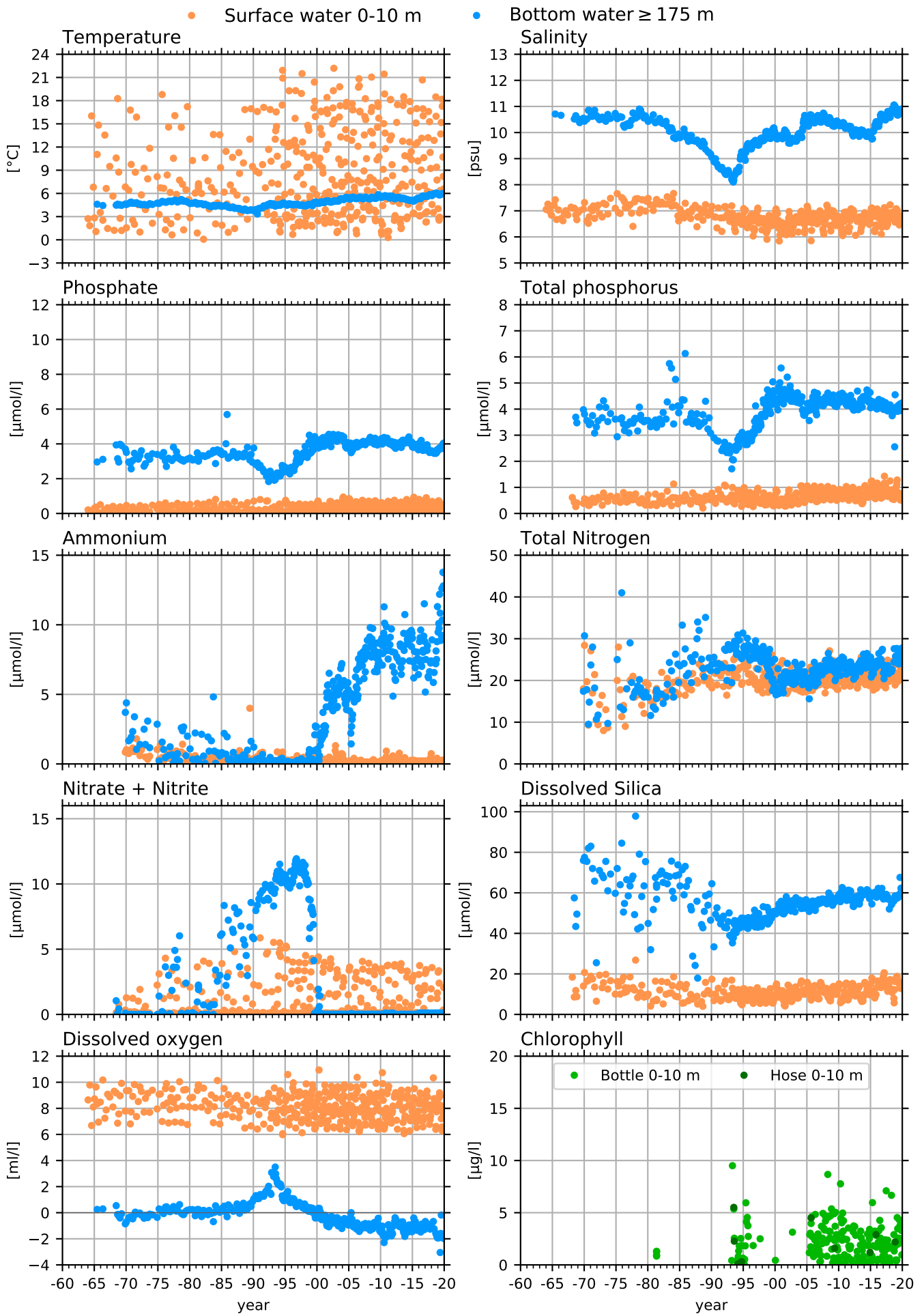
BY31 LANDSORT DEEP, WESTERN GOTLAND BASIN



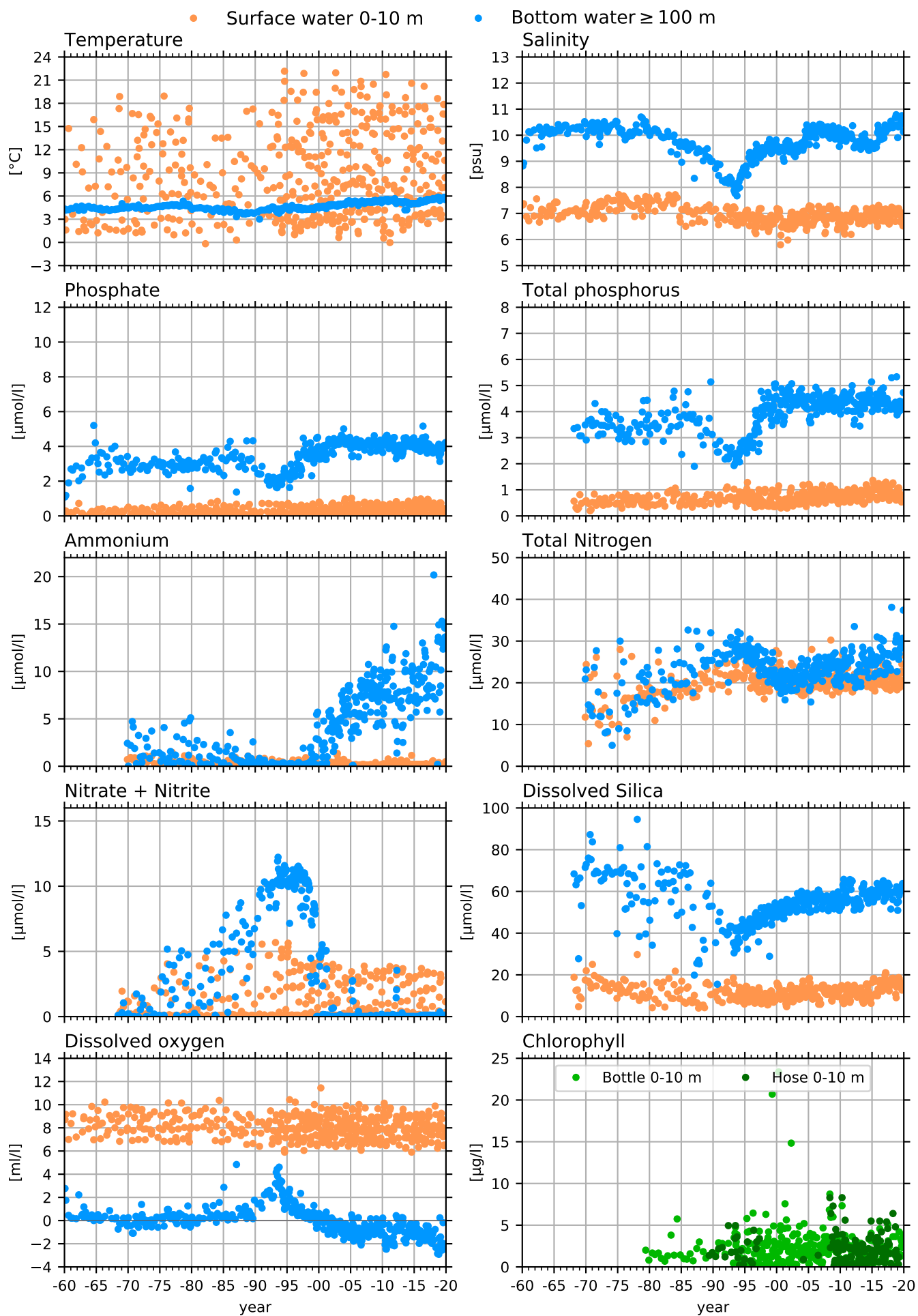
B1 (ASKÖ), WESTERN GOTLAND BASIN COASTAL



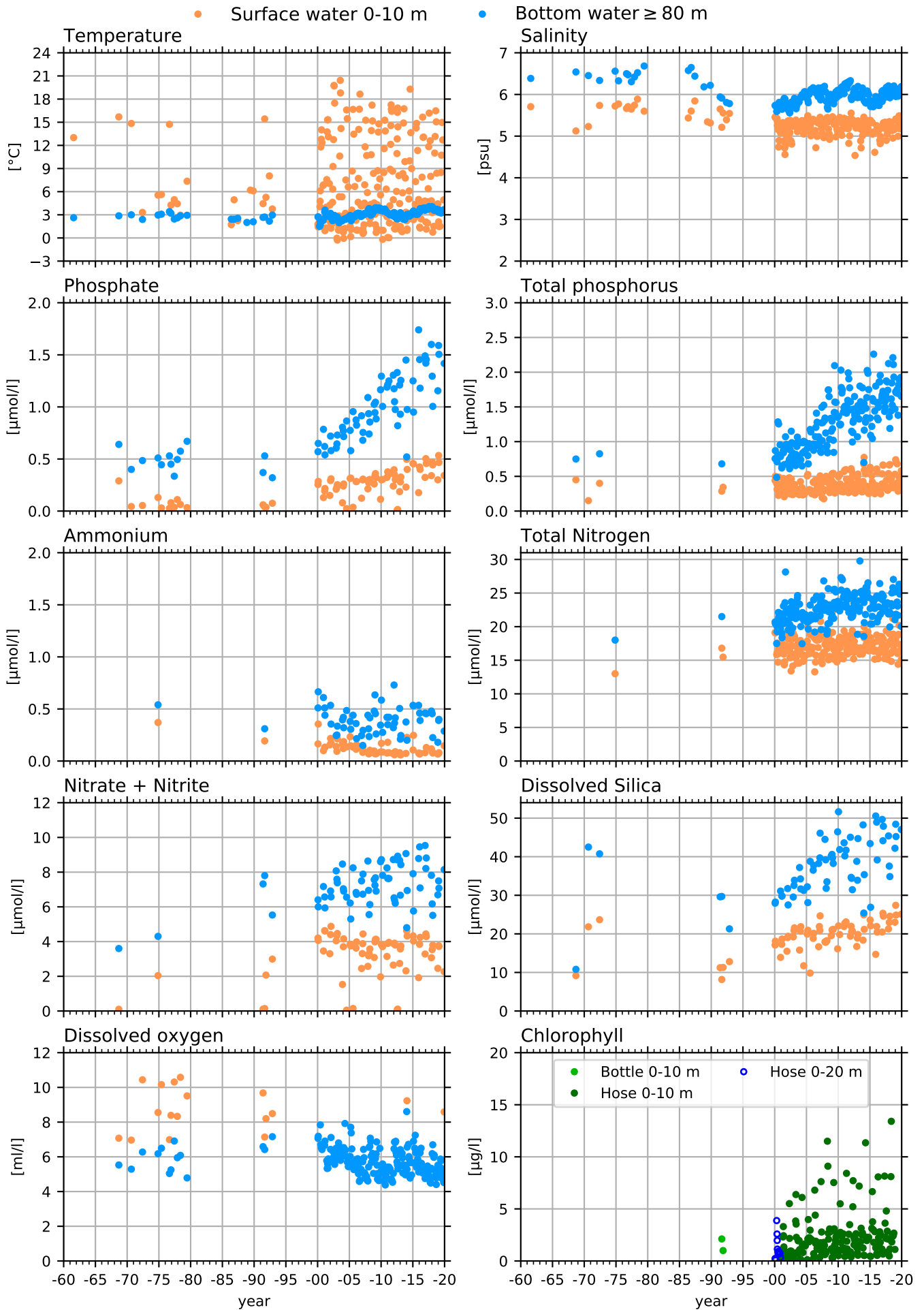
BY32 NORRKÖPING DEEP, WESTERN GOTLAND BASIN



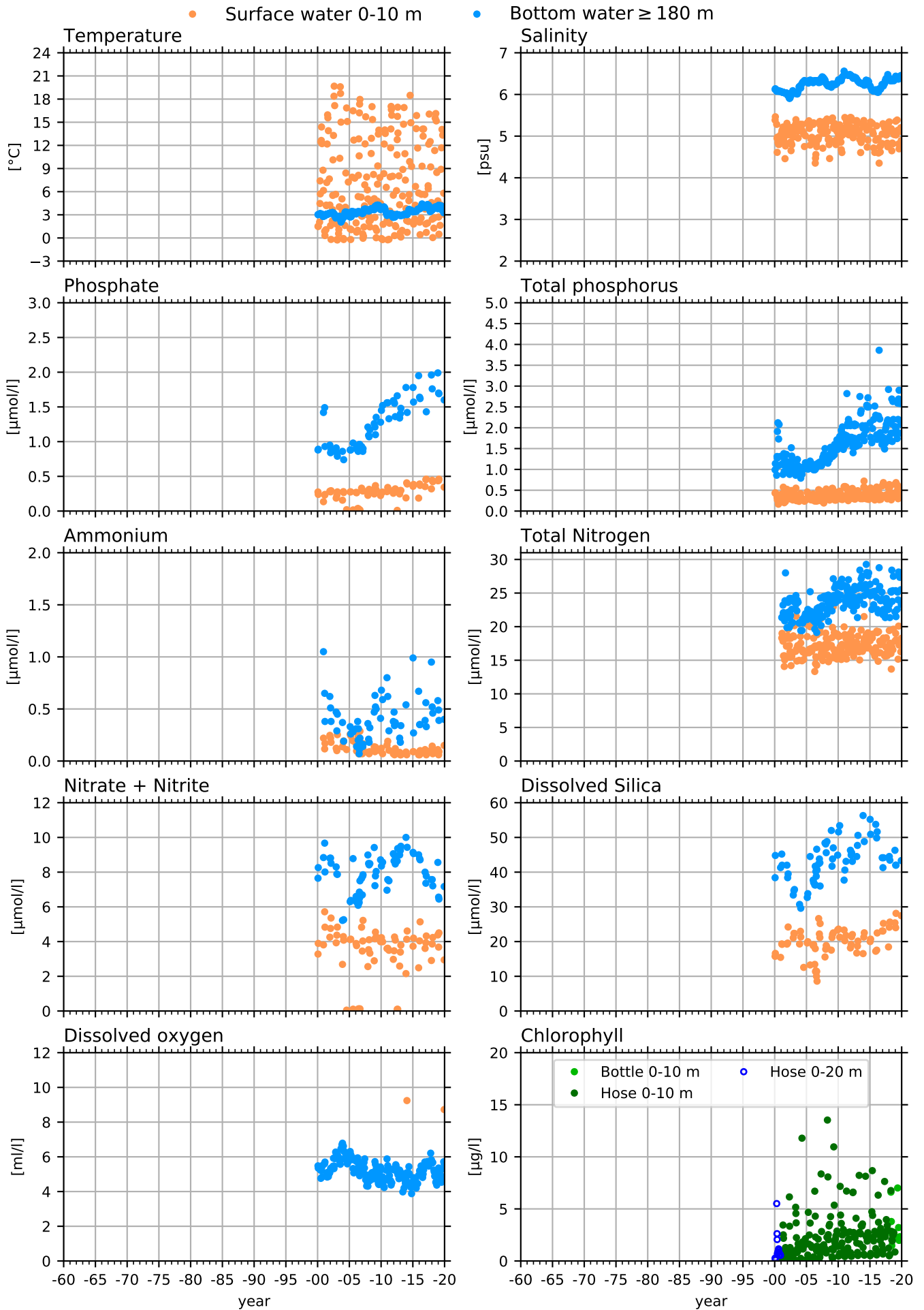
BY38 KARLSÖ DEEP, WESTERN GOTLAND BASIN



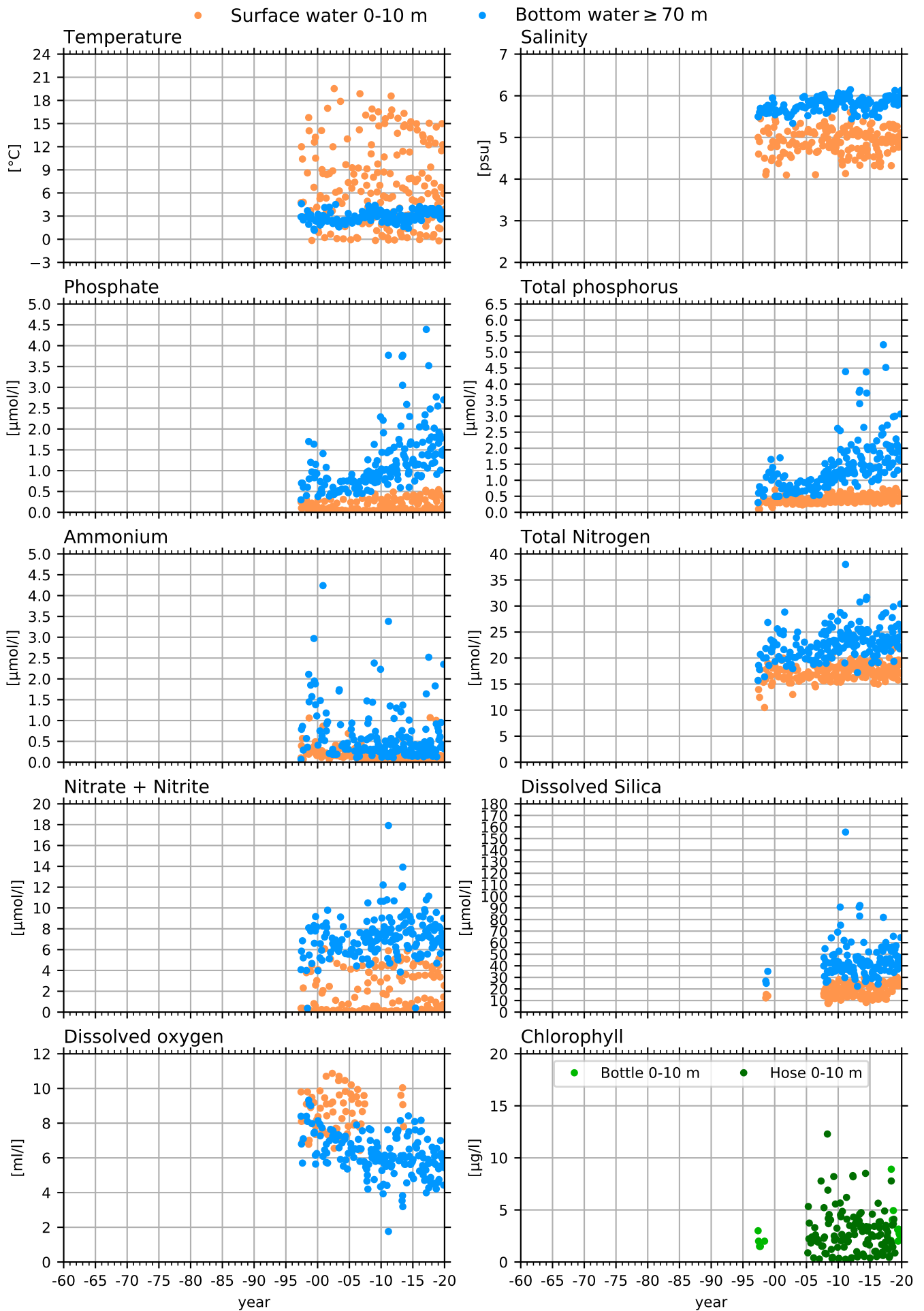
MS4 / C14, BOTHNIAN SEA



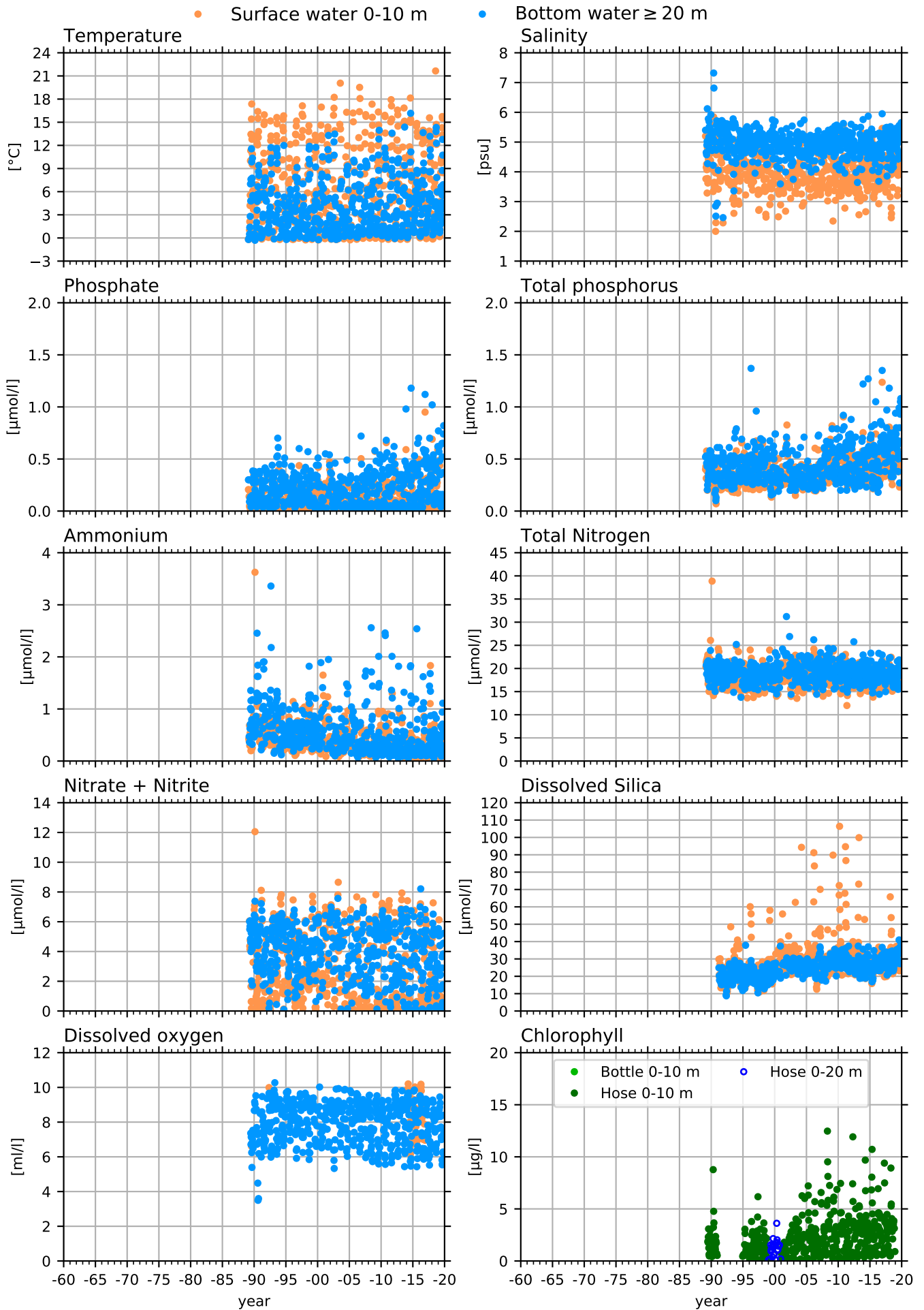
C3, BOTHNIAN SEA



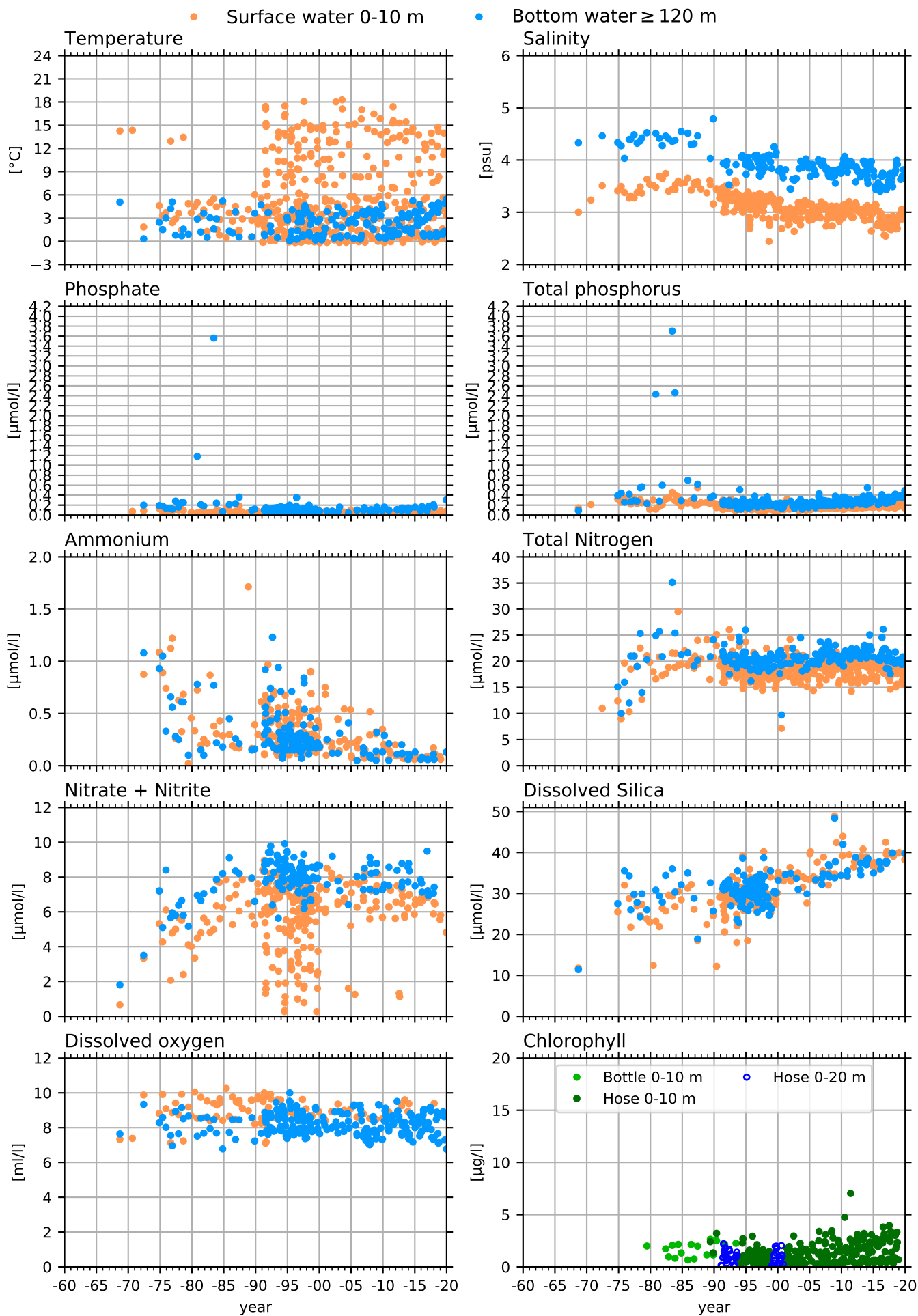
GAVIK-1, BOTHNIAN SEA COASTAL



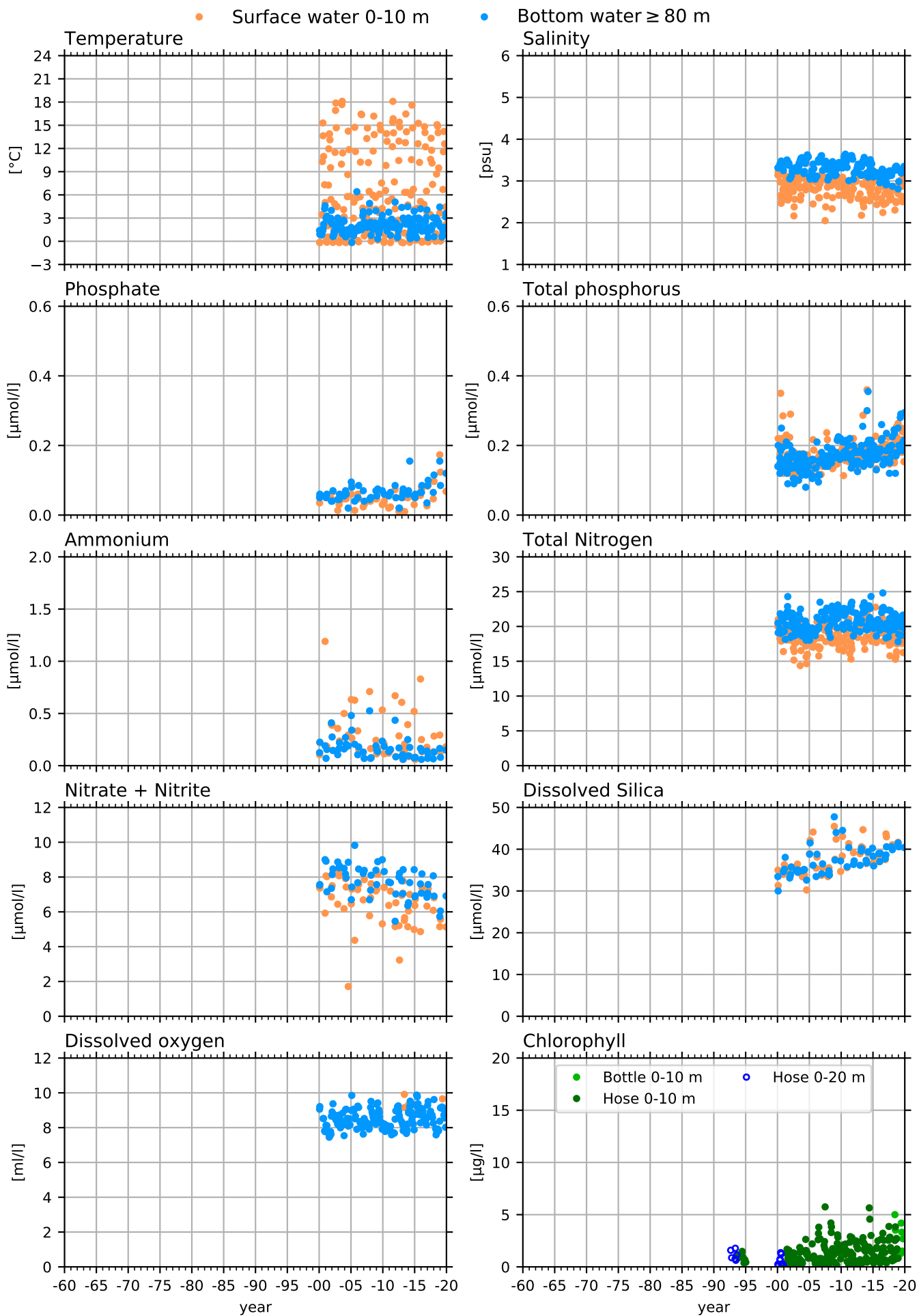
B7 & NB1 / B3, THE QUARK



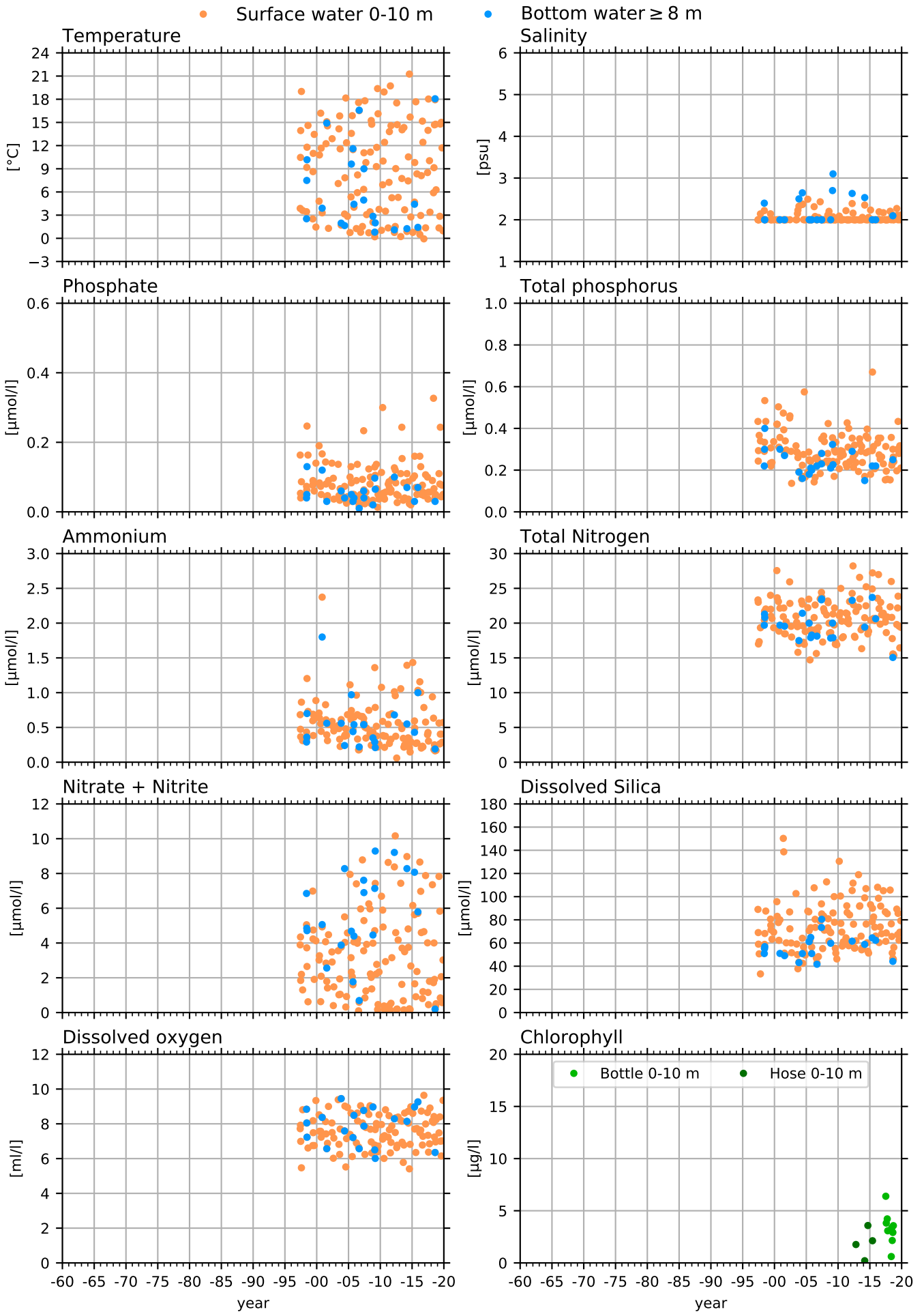
F9 / A13, BOTHNIAN BAY



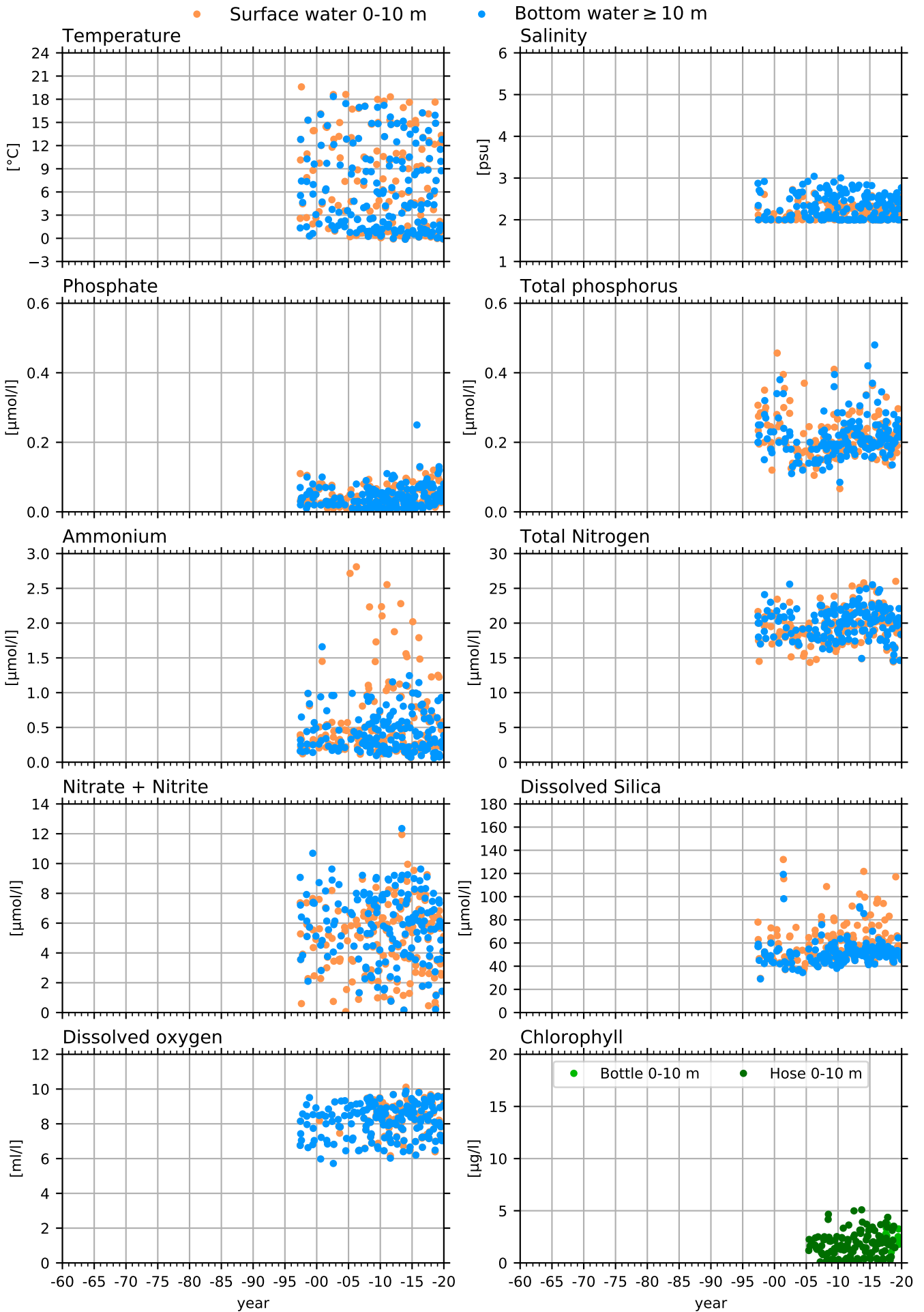
F3 / A5, BOTHNIAN BAY



RÅNEÅ-1, BOTHNIAN BAY COASTAL



RÅNEÅ-2, BOTHNIAN BAY COASTAL



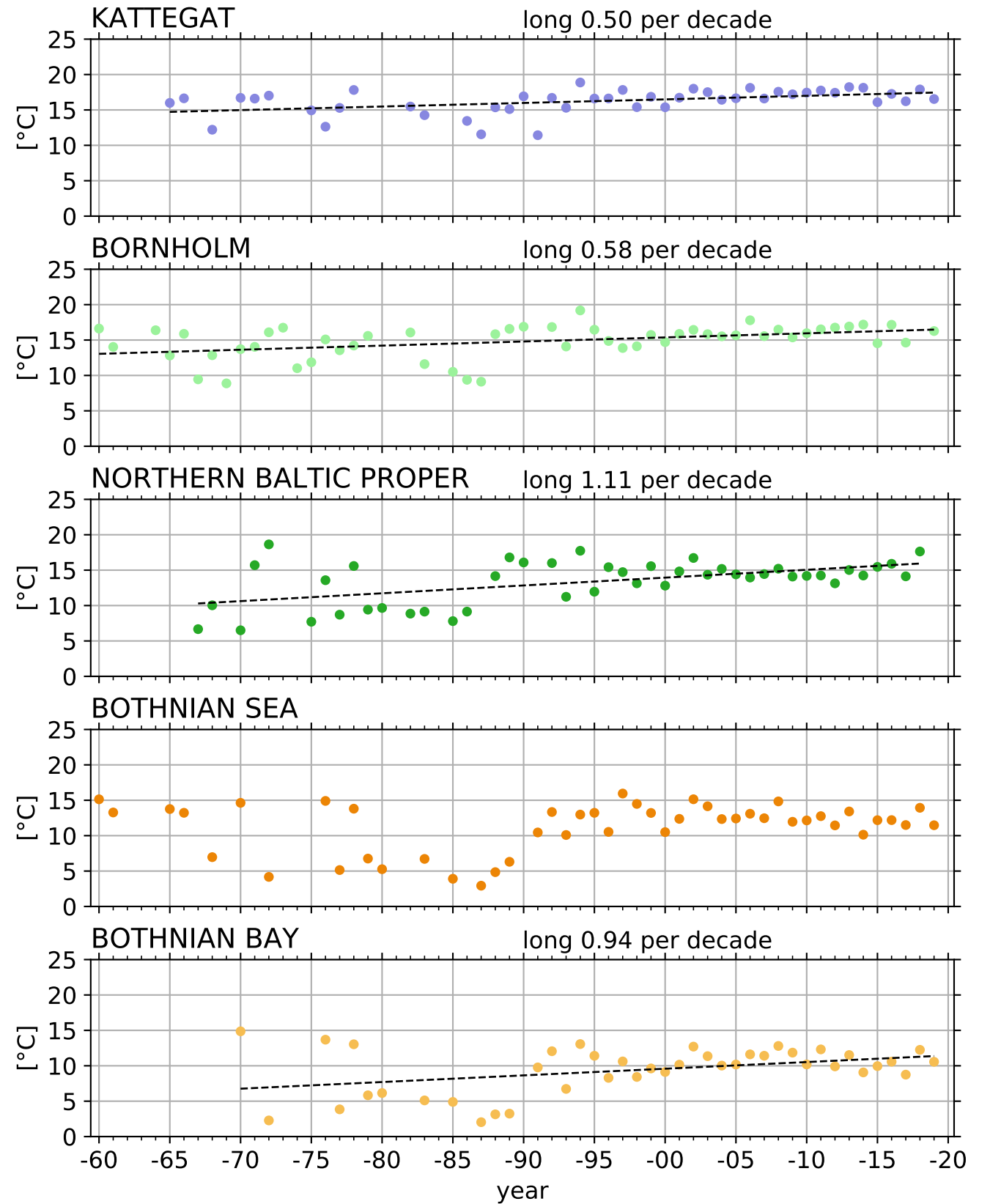
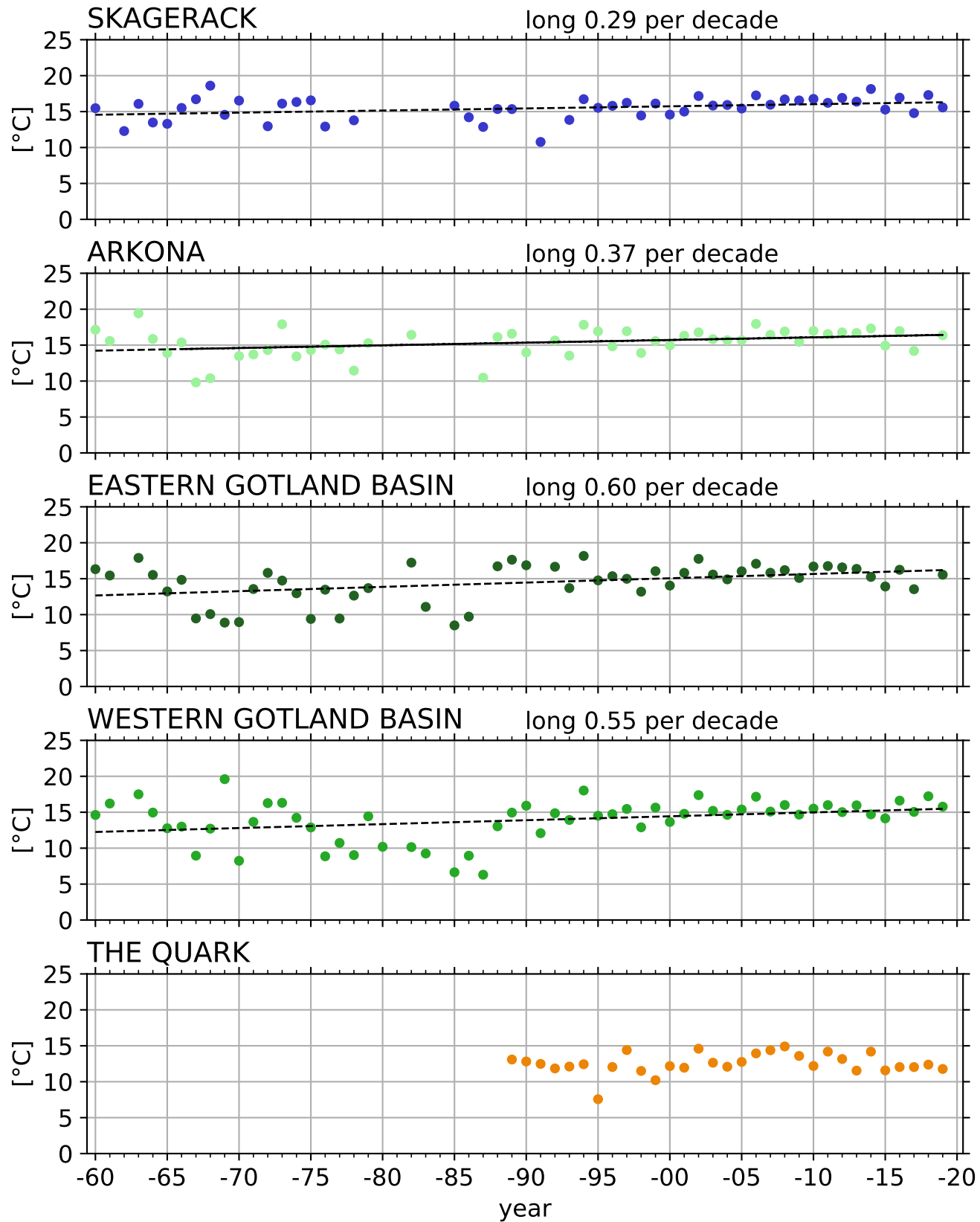
Appendix III

Trends in winter and summer for surface water (0-10 m) and bottom water (station specific)

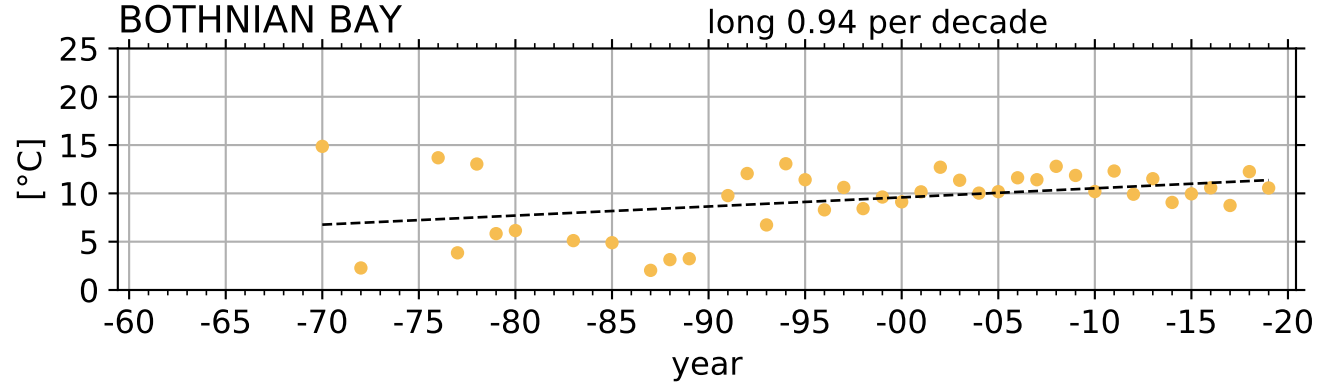
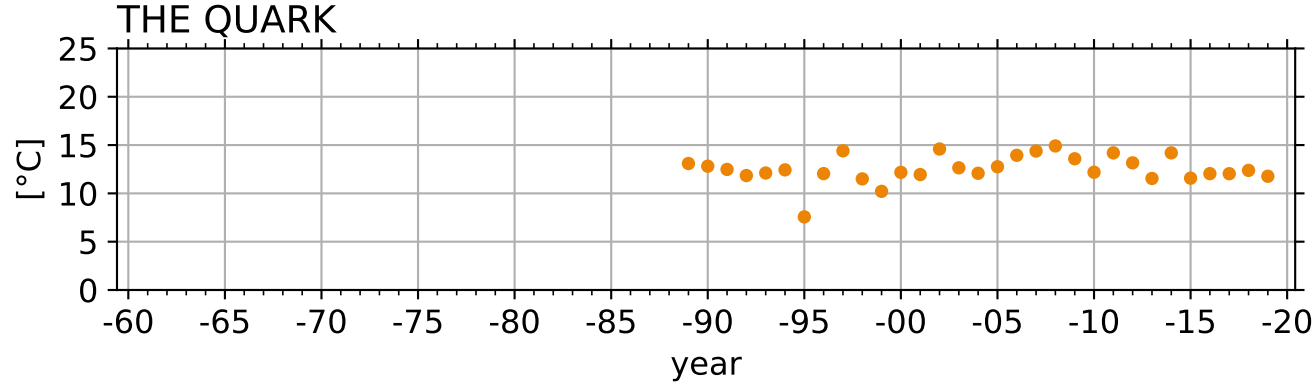
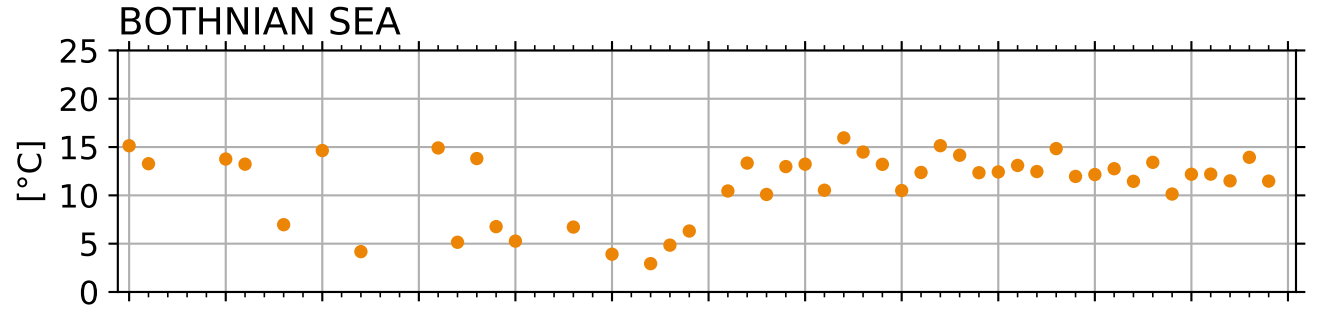
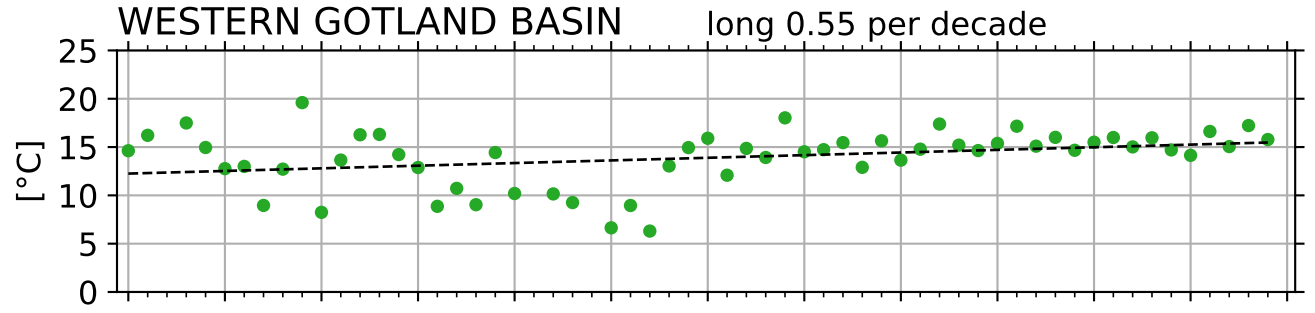
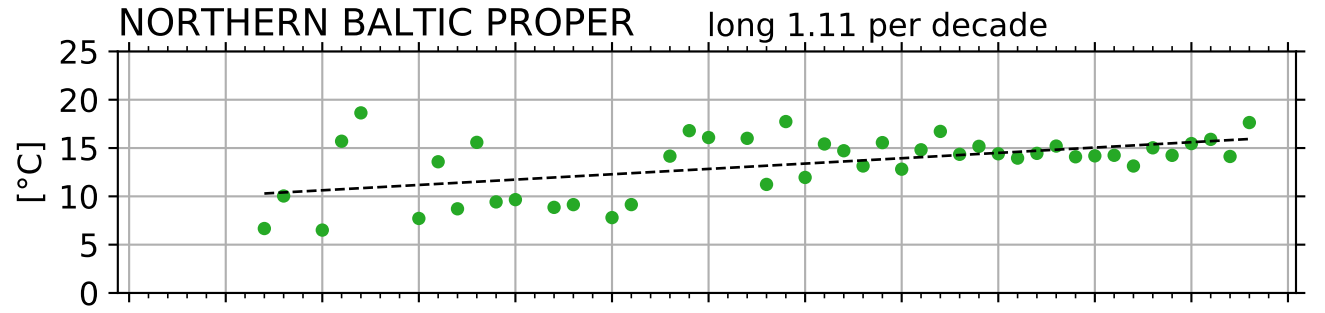
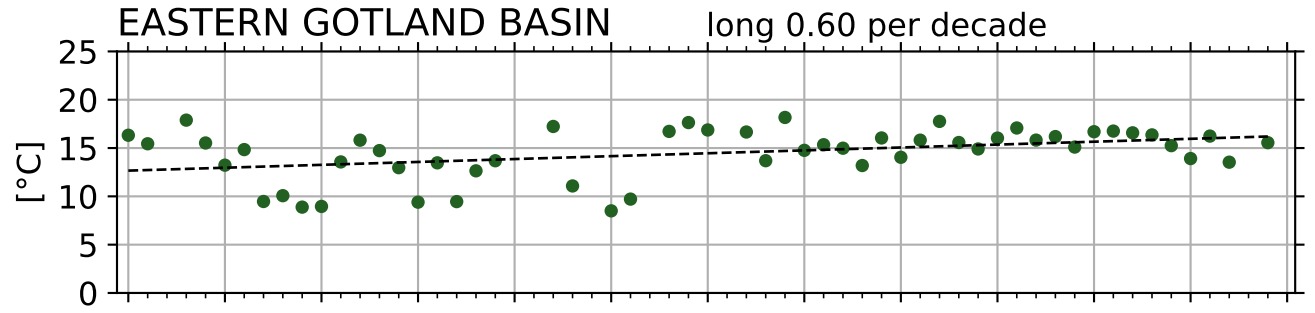
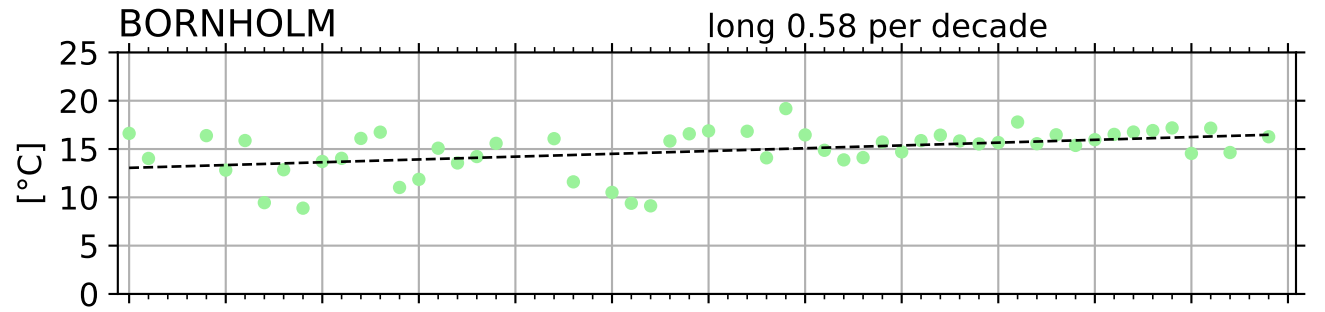
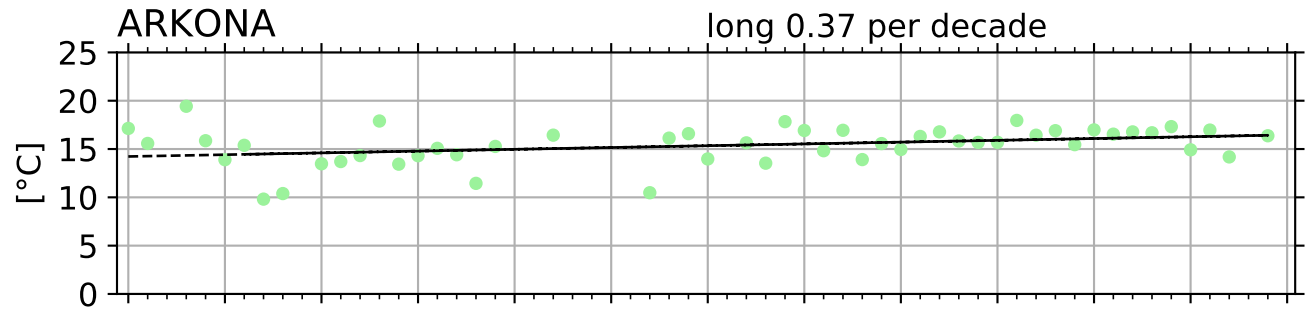
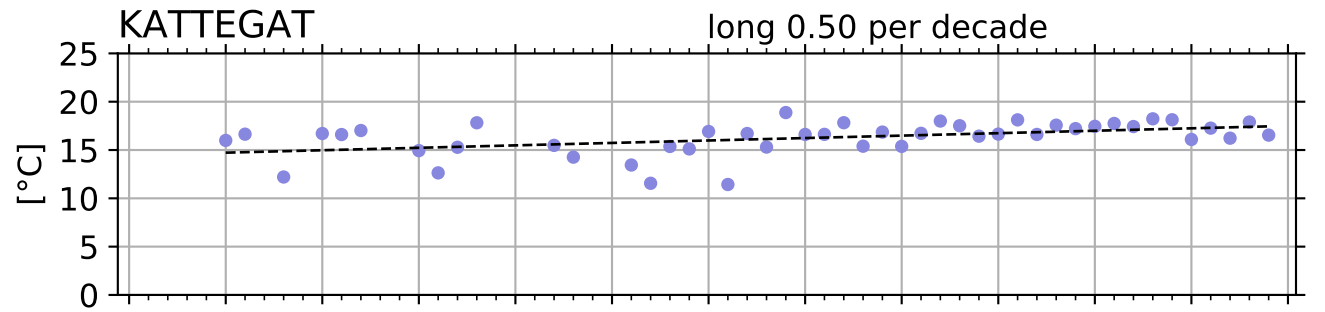
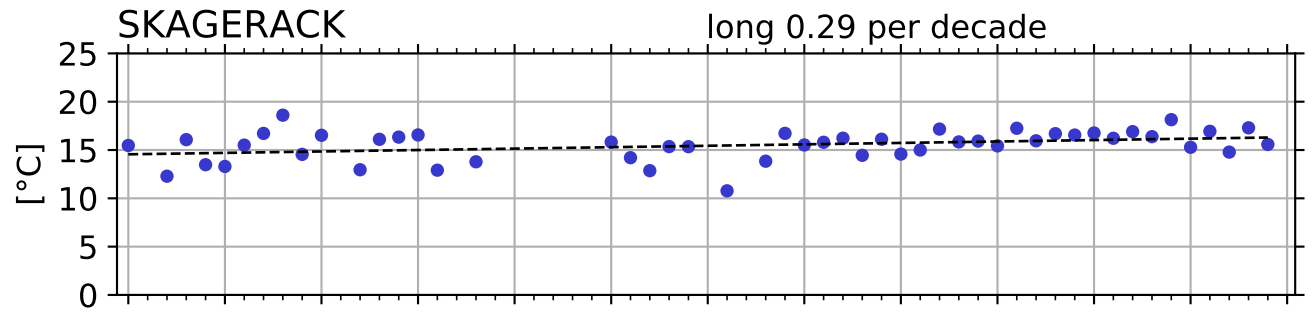
This appendix contains figures of winter mean values of all salinity, temperature and nutrients and summer mean values of temperature for each basin. To avoid biasing towards stations visited more frequently, averages were first calculated per month and station, then winter or summer season for each basin. The summer season was defined as June, July, August and winter as December, January, February. These months were used for all basins although the seasons differ somewhat between the Gulf of Bothnia and the Skagerrak and Kattegat. Linear trends are calculated for the winter and summer mean values for surface (0-10 m) and bottom waters for two periods, 1960-2019 and 1994-2019. Trends lines are shown in the figures when the p-value of the slope was ≤ 0.05 . The post-1994 trend analysis is based on years with mostly the same frequency of sampling, while the sampling frequency is more variable in the longer time series. For pH in the Skagerrak data are very scarce and no trends were calculated in there for pH.

For this analysis all current standard stations are included, but for the Bothnian Sea and Bothnian Bay additional stations that were sampled historically are also used in an effort to get more data prior to 1994.

Temperature summer [°C] 0-10 m



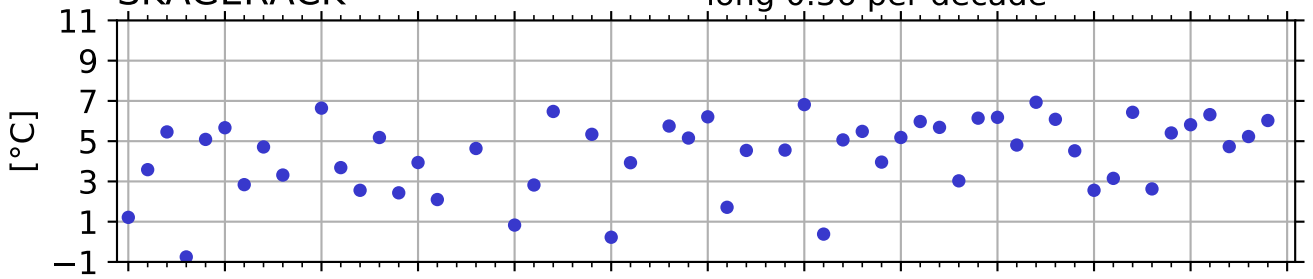
Temperature summer [°C] 0-10 m



Temperature winter [°C] 0-10 m

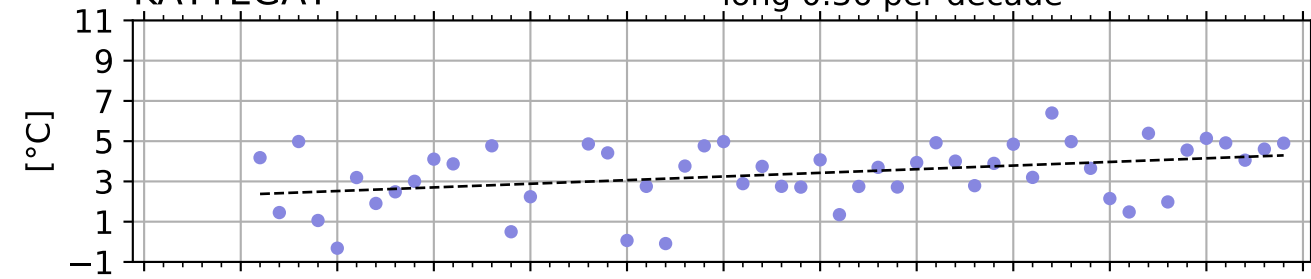
SKAGERACK

long 0.36 per decade



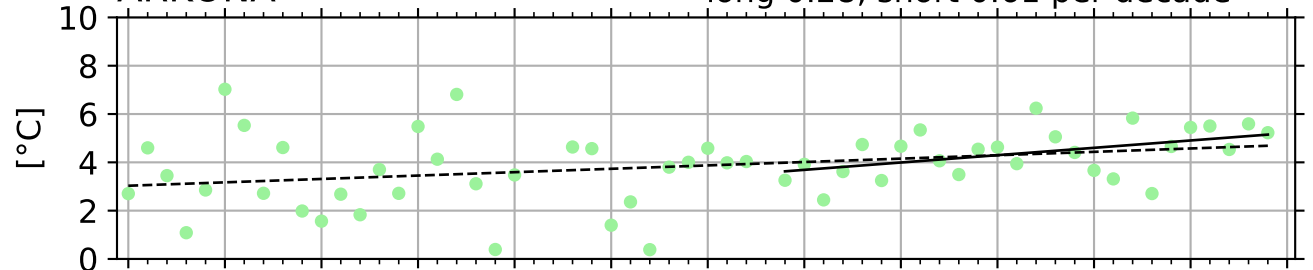
KATTEGAT

long 0.36 per decade



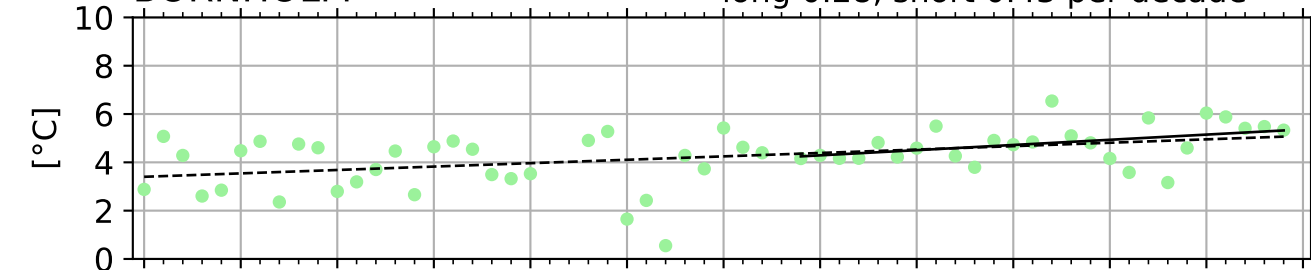
ARKONA

long 0.28, short 0.61 per decade



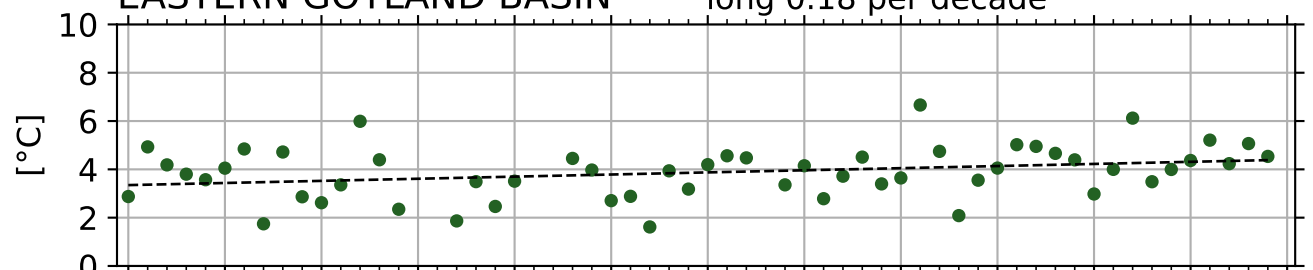
BORNHOLM

long 0.28, short 0.43 per decade



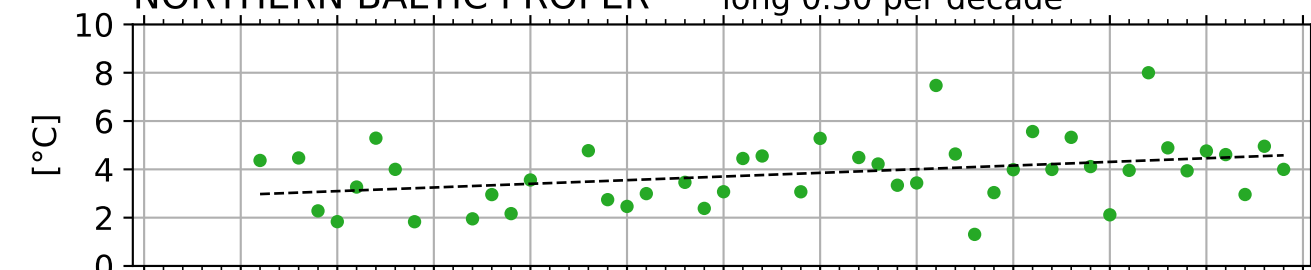
EASTERN GOTLAND BASIN

long 0.18 per decade



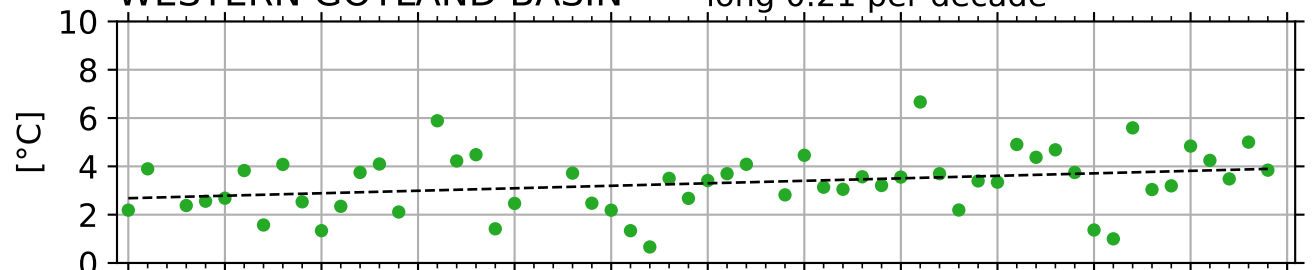
NORTHERN BALTIC PROPER

long 0.30 per decade

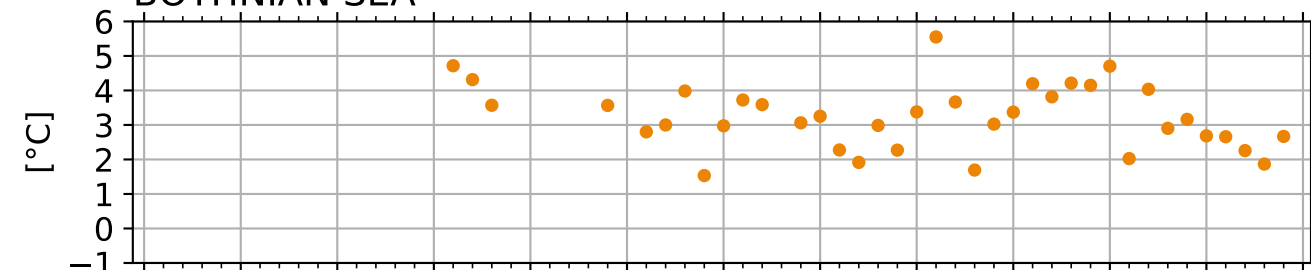


WESTERN GOTLAND BASIN

long 0.21 per decade

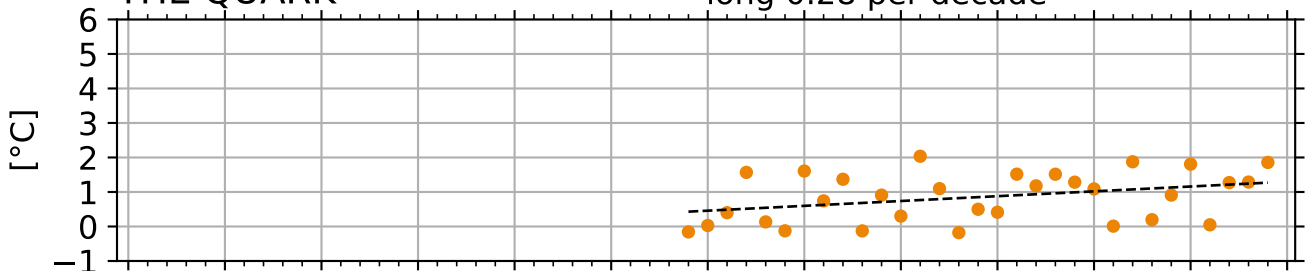


BOTHNIAN SEA

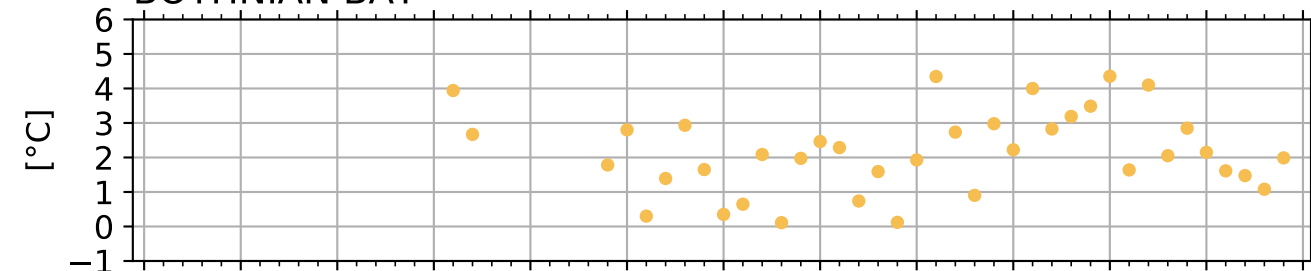


THE QUARK

long 0.28 per decade



BOTHNIAN BAY

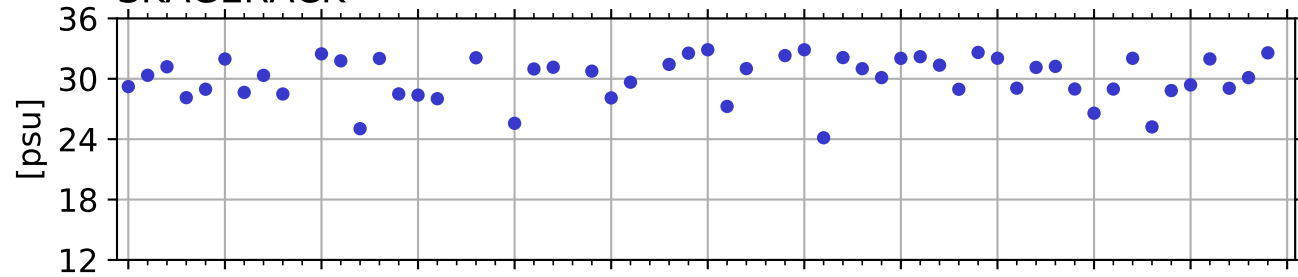


year

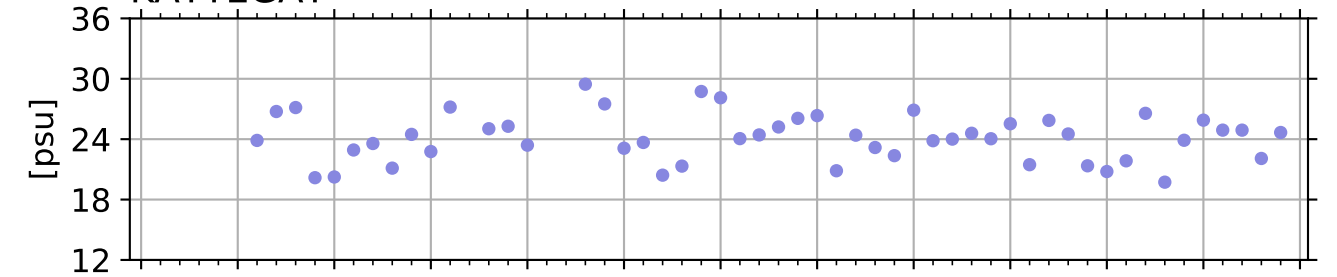
year

Salinity winter [psu] 0-10 m

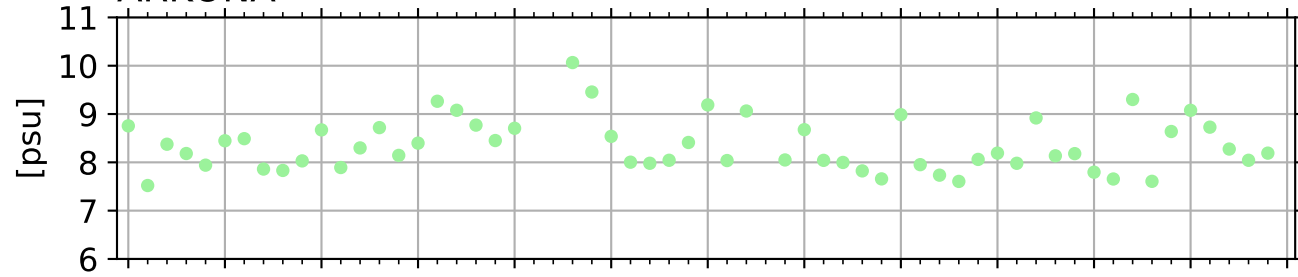
SKAGERACK



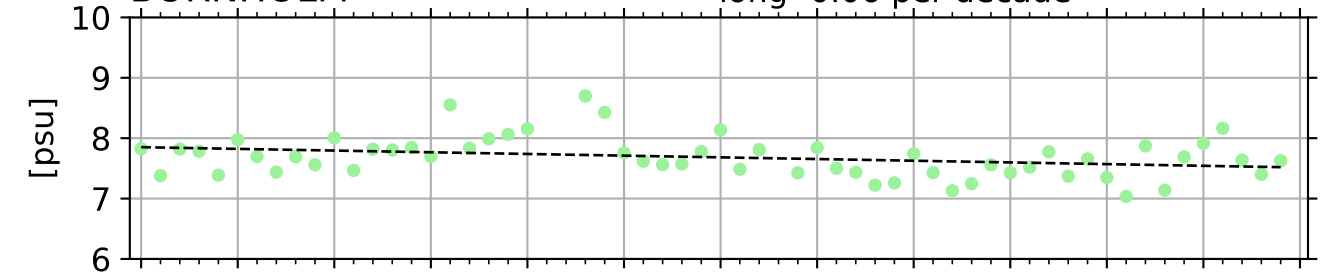
KATTEGAT



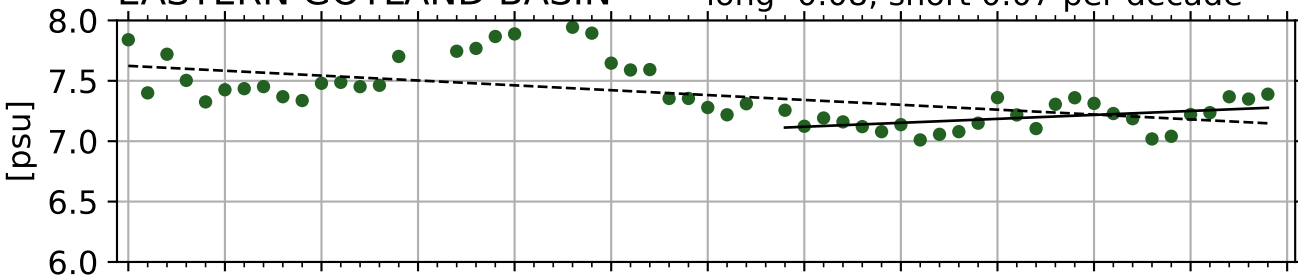
ARKONA



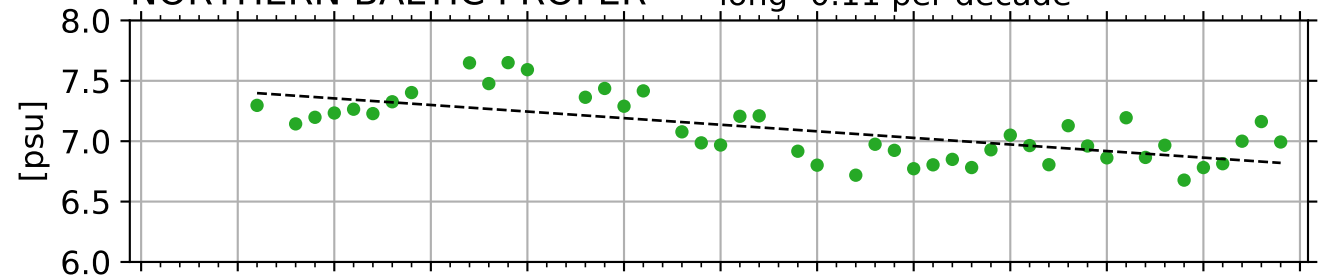
BORNHOLM



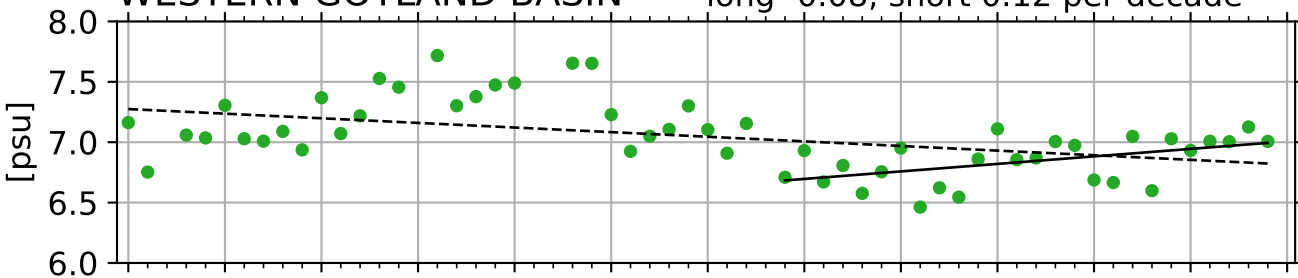
EASTERN GOTLAND BASIN



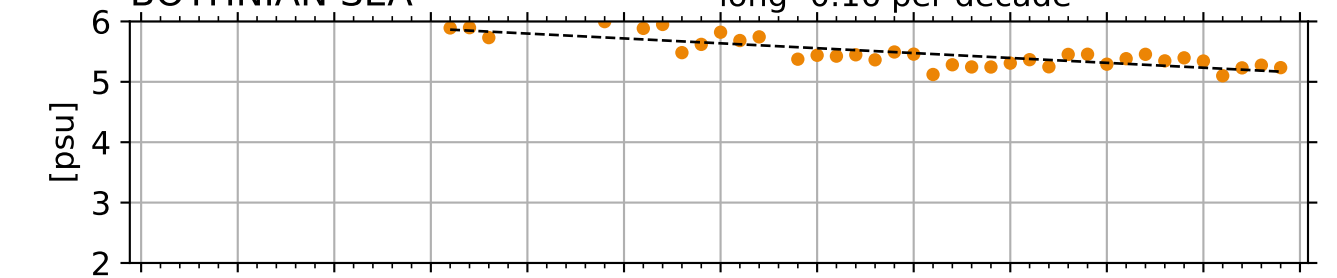
NORTHERN BALTIC PROPER



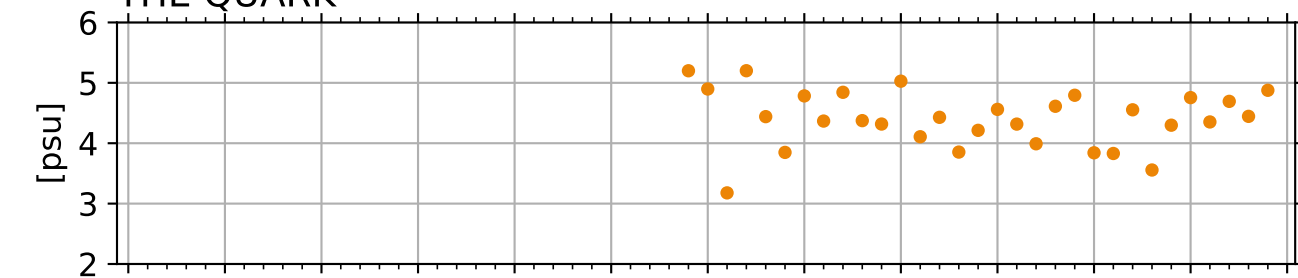
WESTERN GOTLAND BASIN



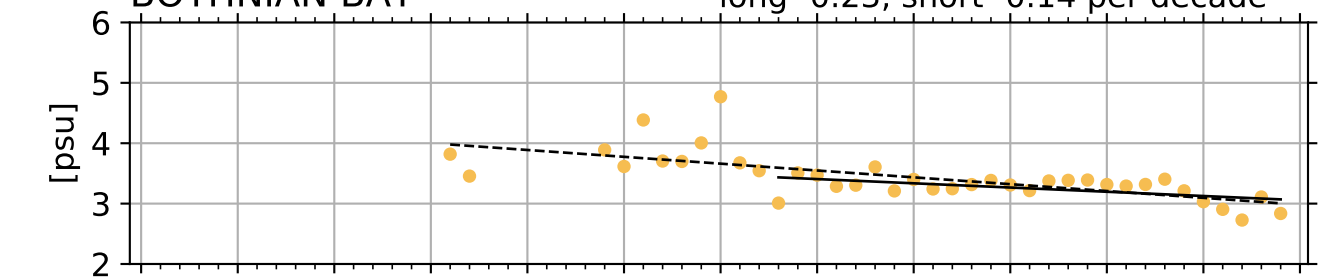
BOTHNIAN SEA



THE QUARK



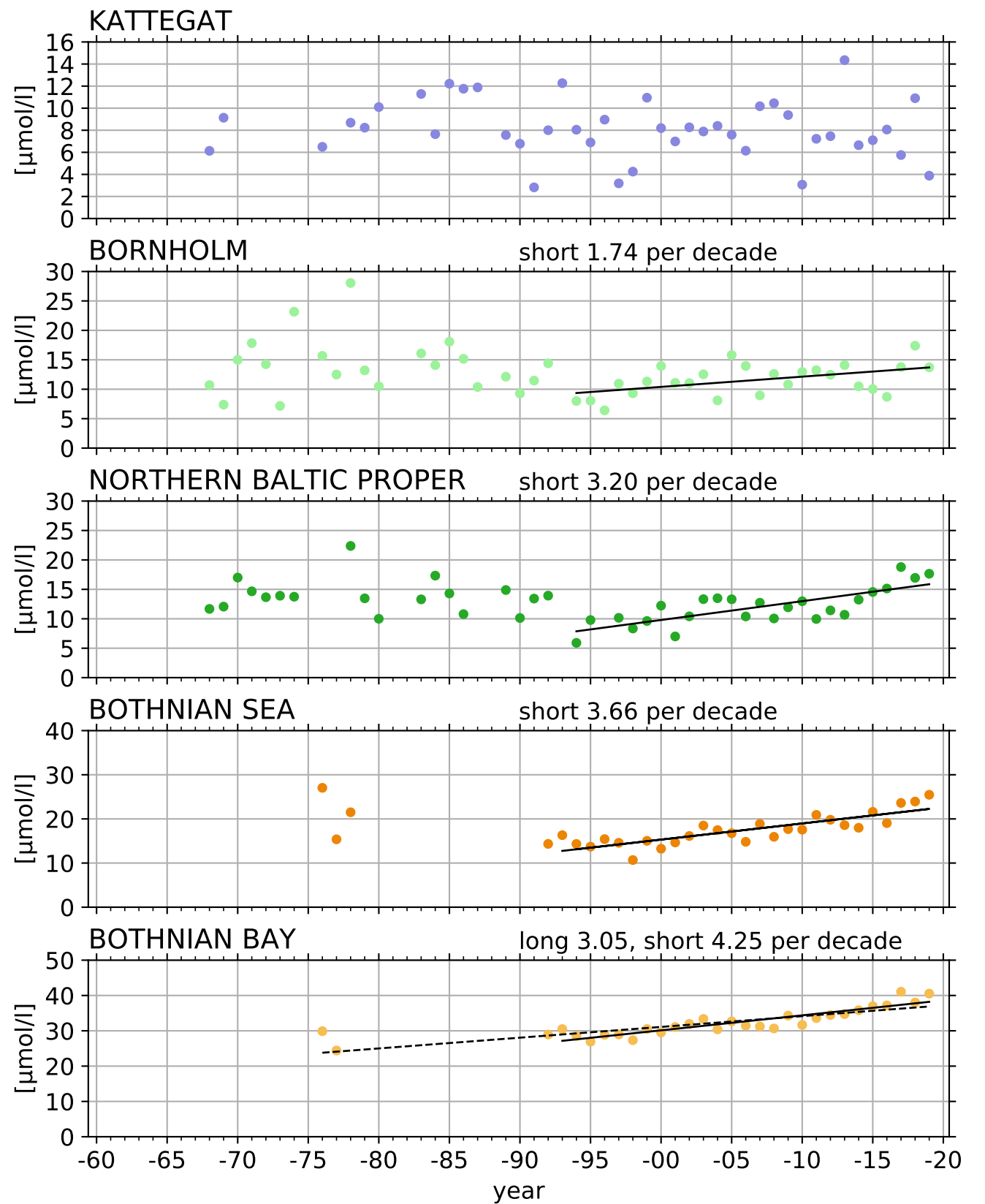
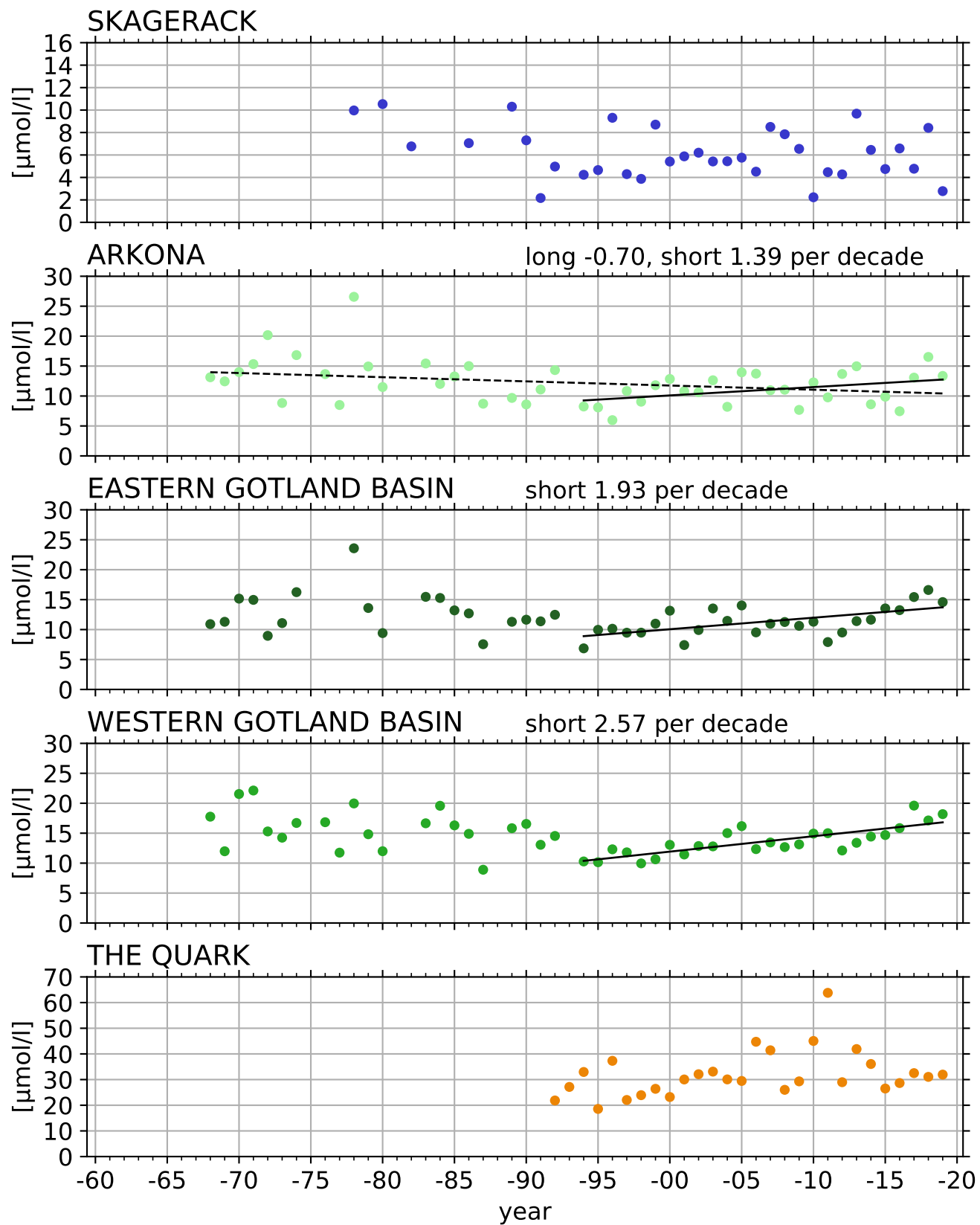
BOTHNIAN BAY



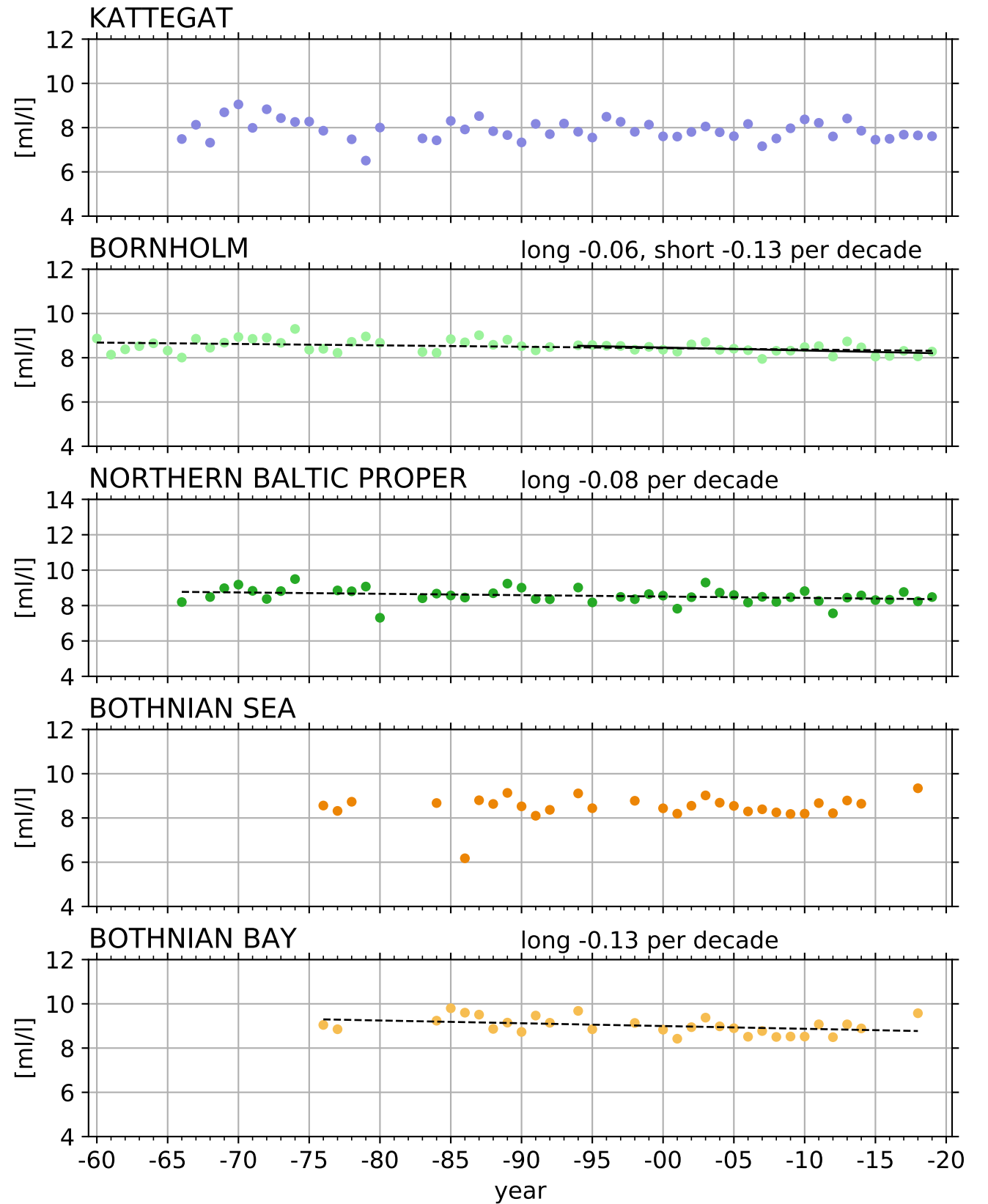
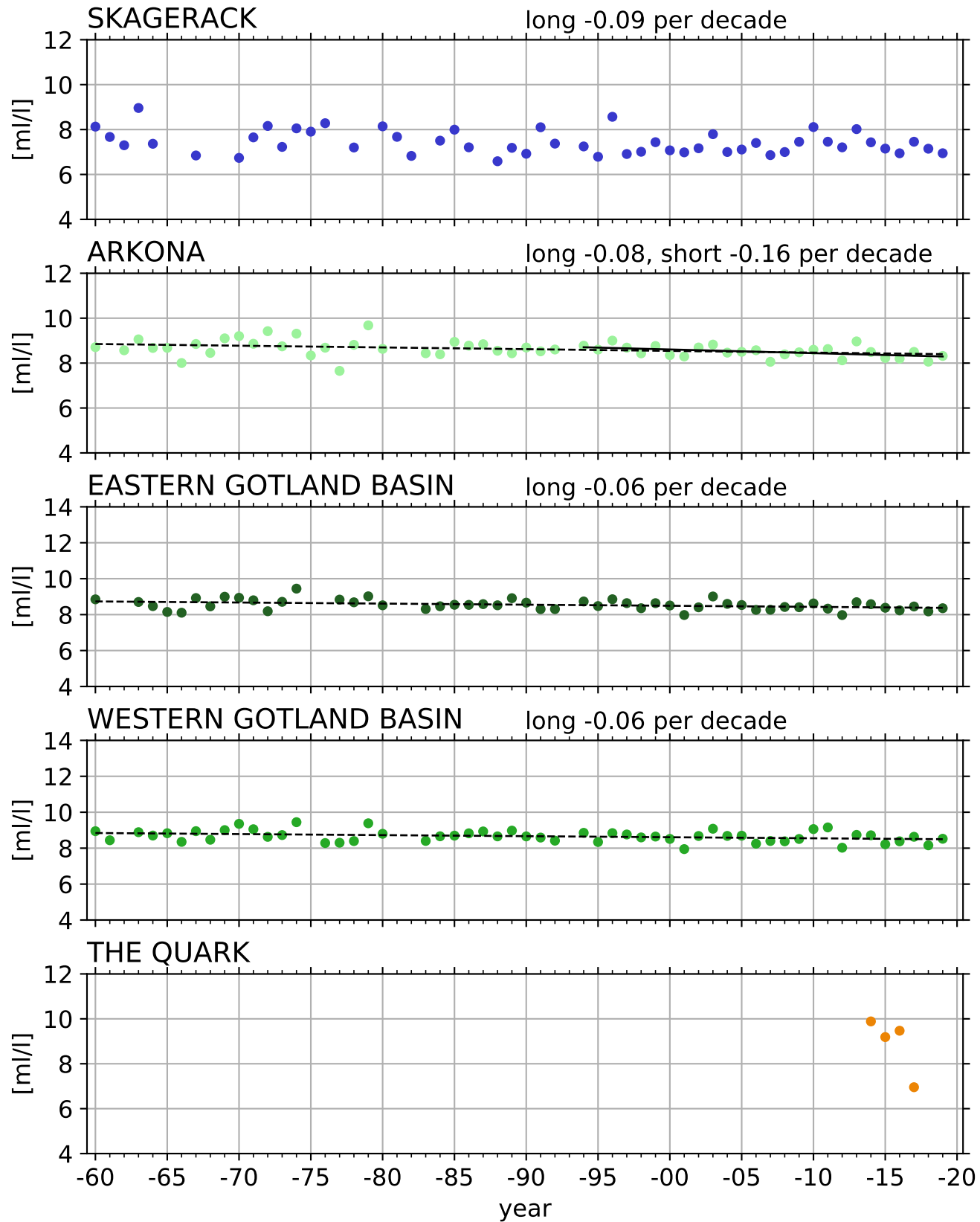
year

year

Dissolved Silica winter [$\mu\text{mol/l}$] 0-10 m



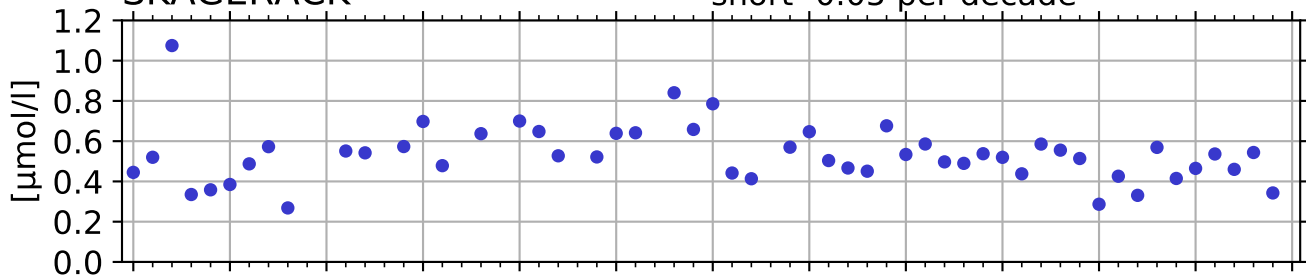
Dissolved oxygen winter [ml/l] 0-10 m



Phosphate winter [$\mu\text{mol/l}$] 0-10 m

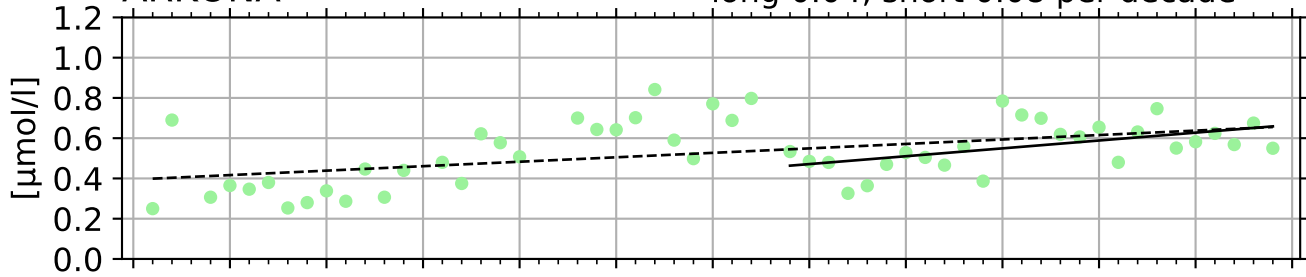
SKAGERACK

short -0.05 per decade



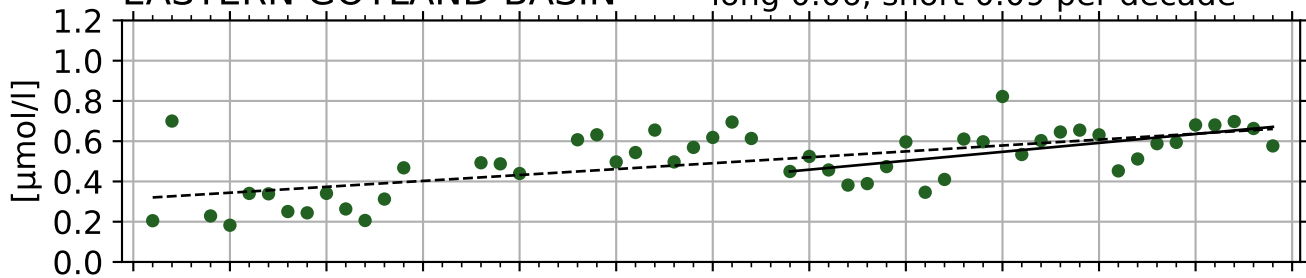
ARKONA

long 0.04, short 0.08 per decade



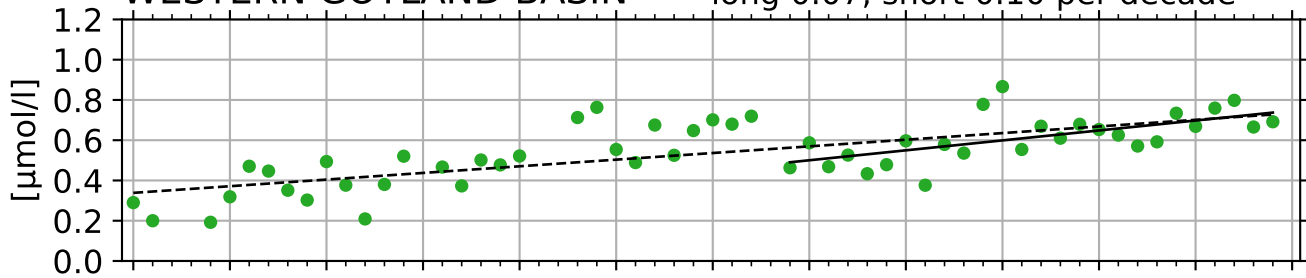
EASTERN GOTLAND BASIN

long 0.06, short 0.09 per decade



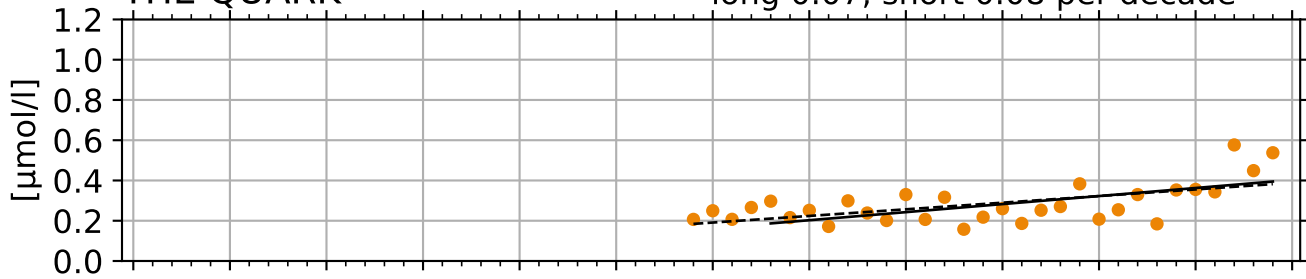
WESTERN GOTLAND BASIN

long 0.07, short 0.10 per decade

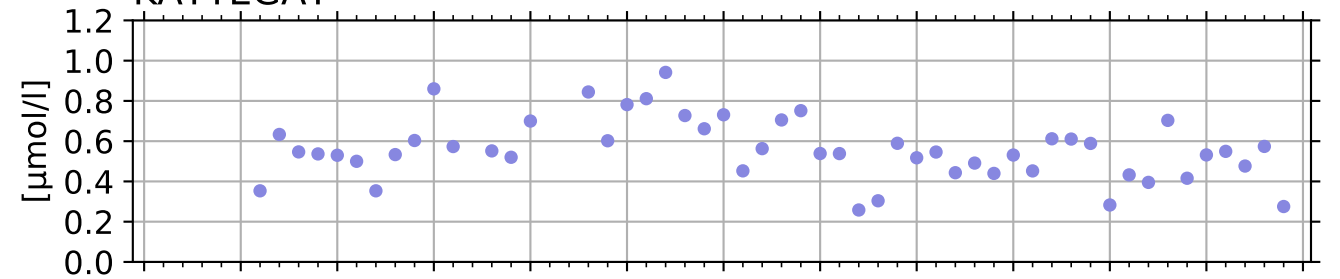


THE QUARK

long 0.07, short 0.08 per decade

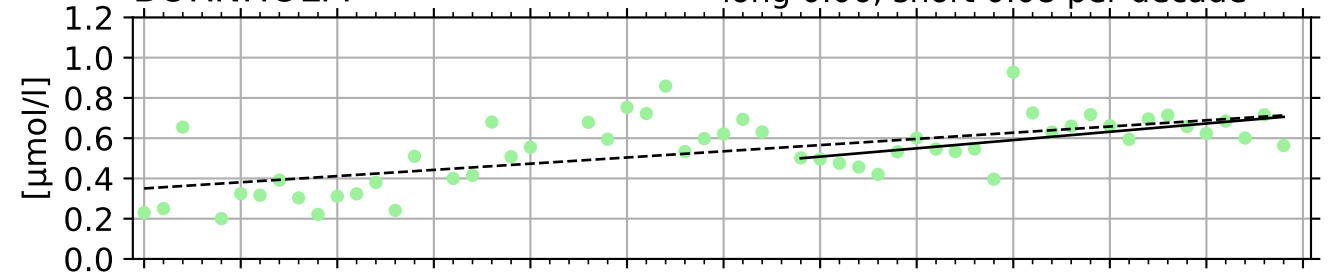


KATTEGAT



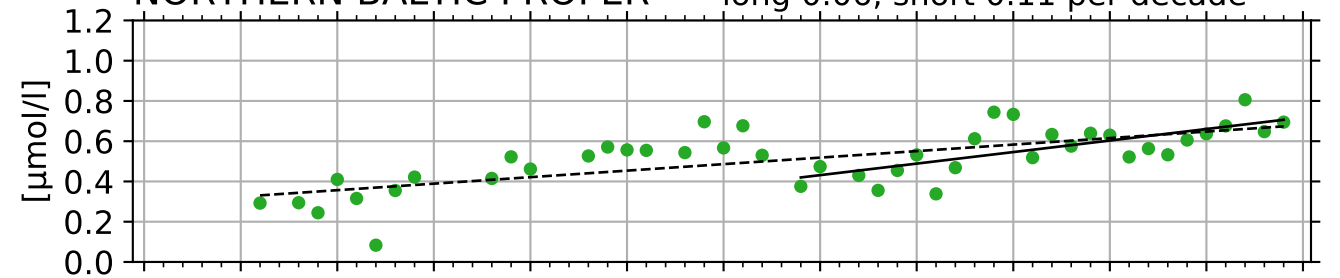
BORNHOLM

long 0.06, short 0.08 per decade



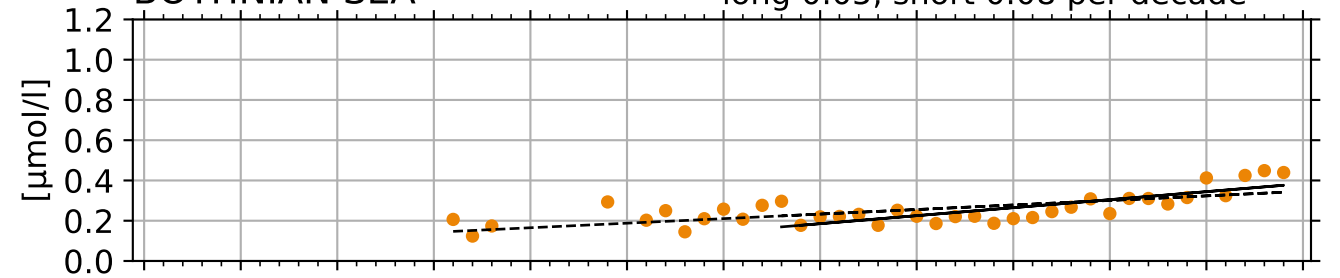
NORTHERN BALTIC PROPER

long 0.06, short 0.11 per decade

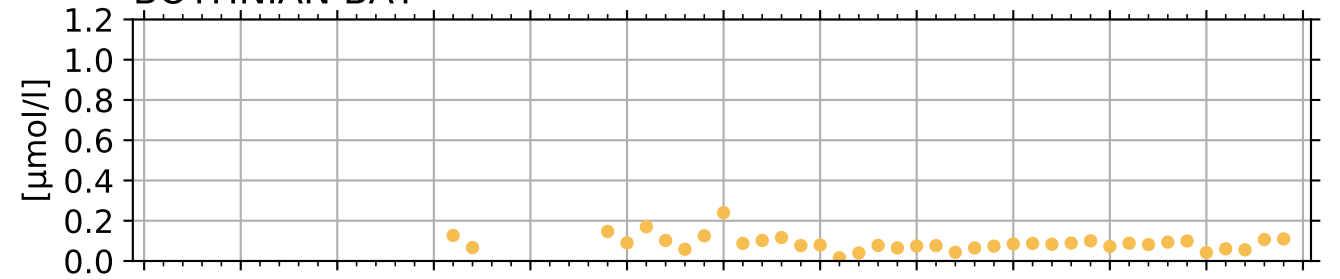


BOTHNIAN SEA

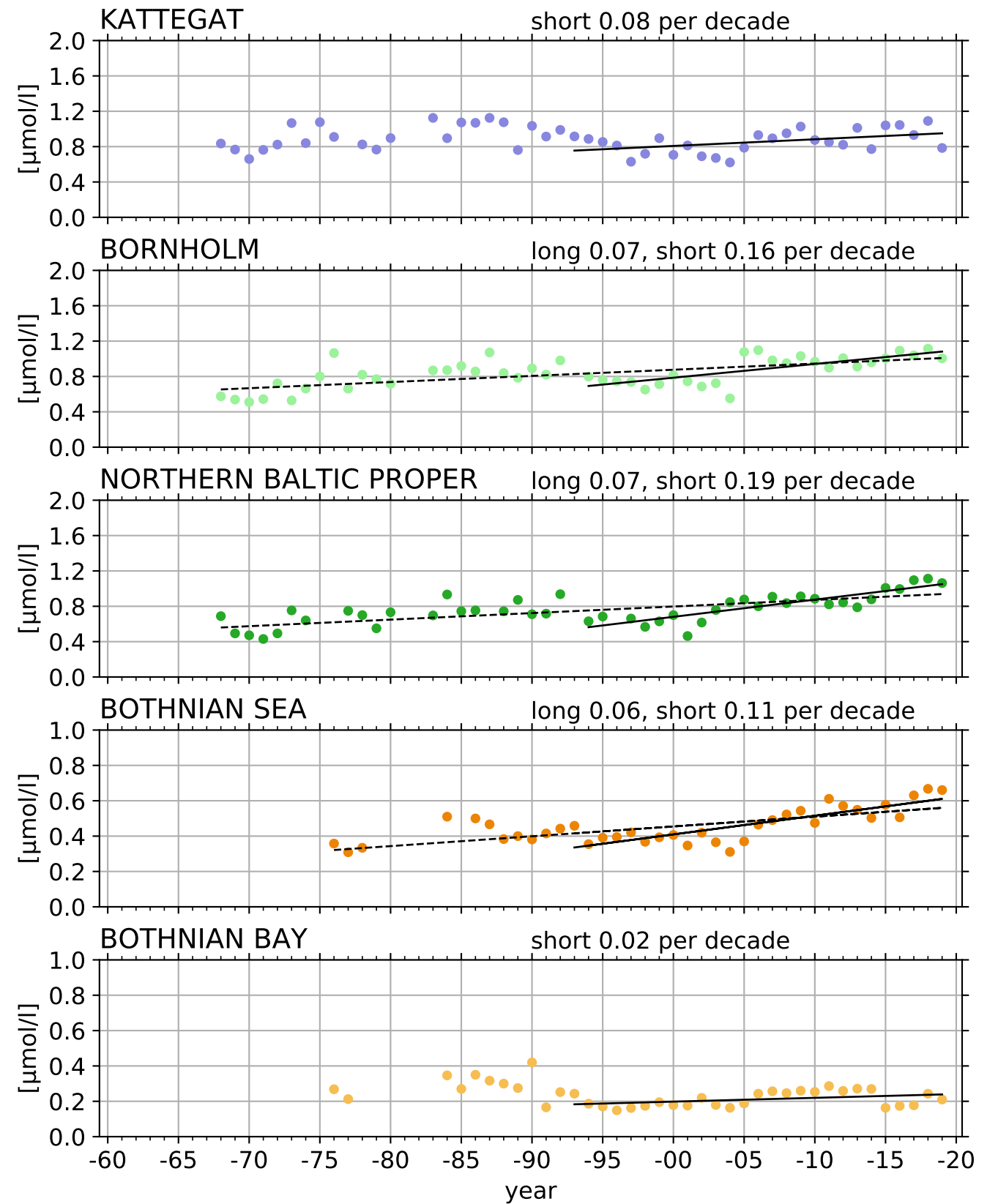
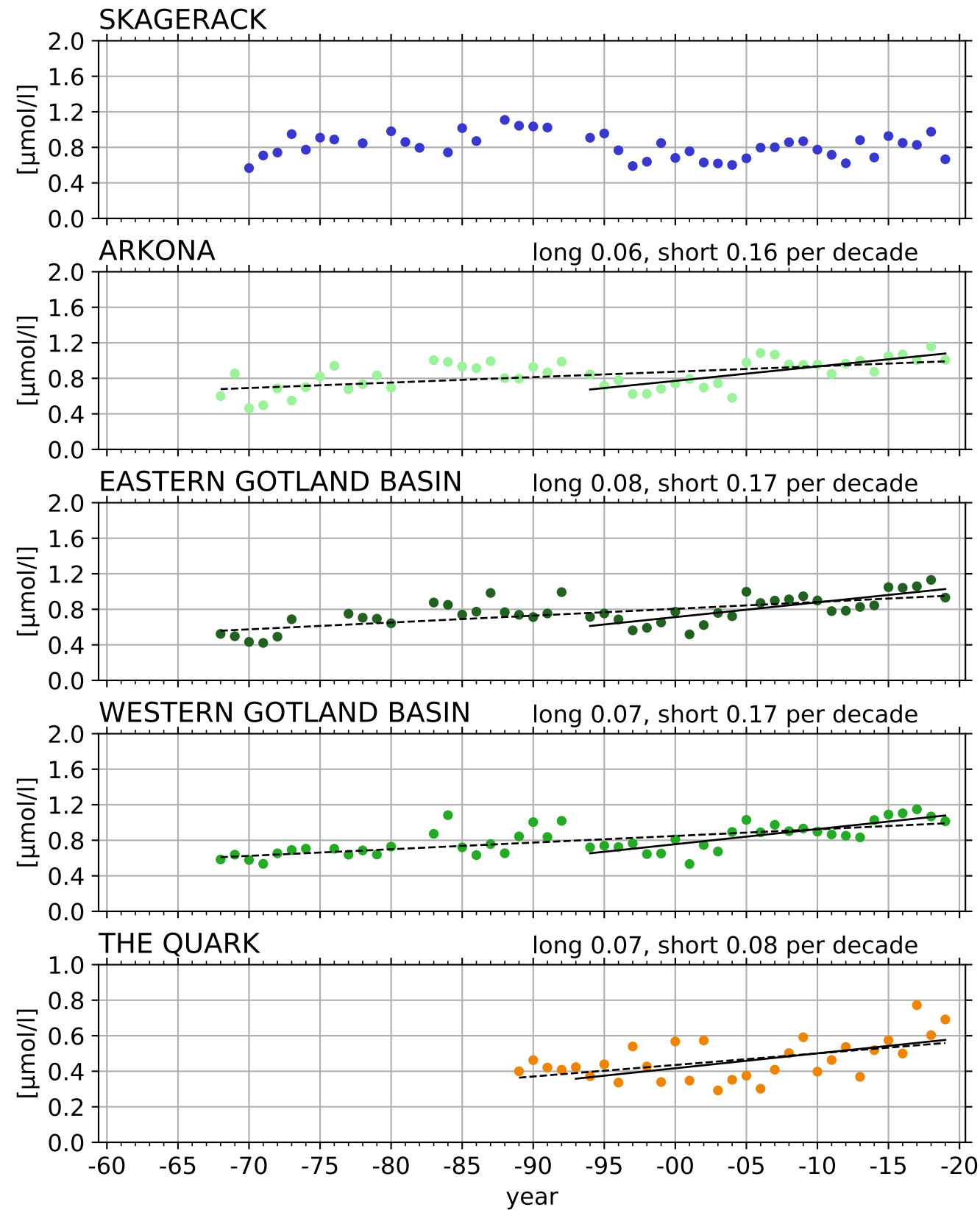
long 0.05, short 0.08 per decade



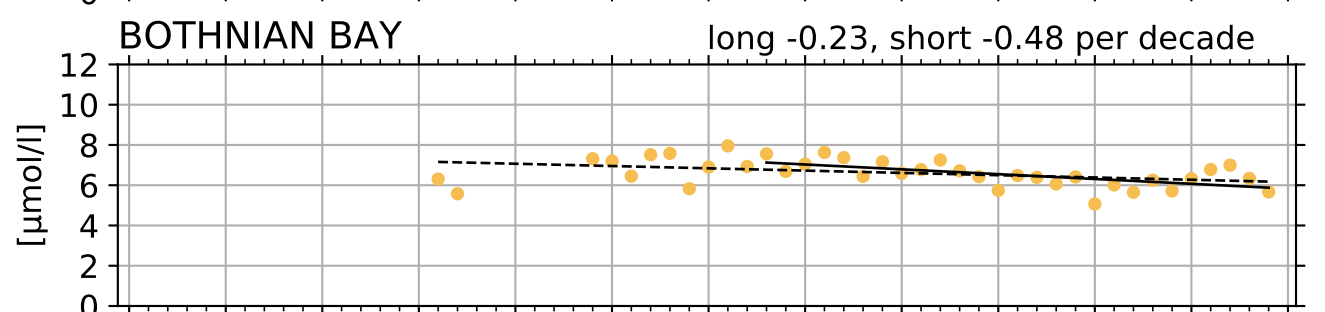
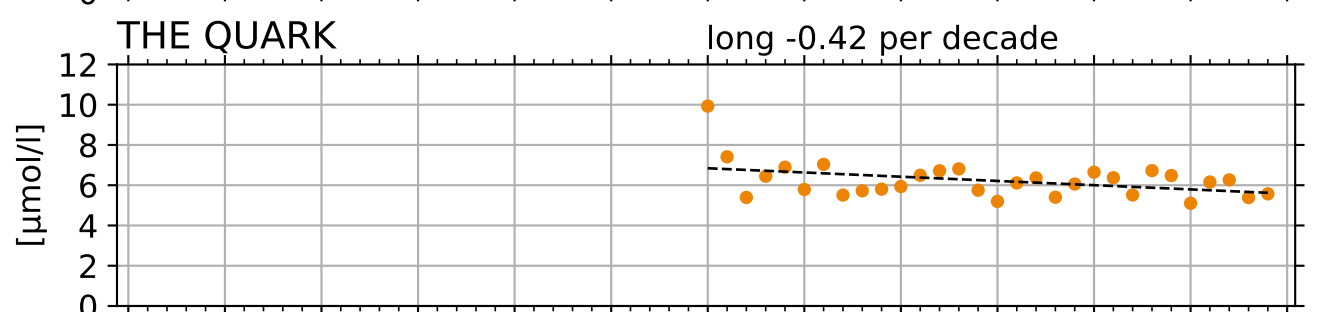
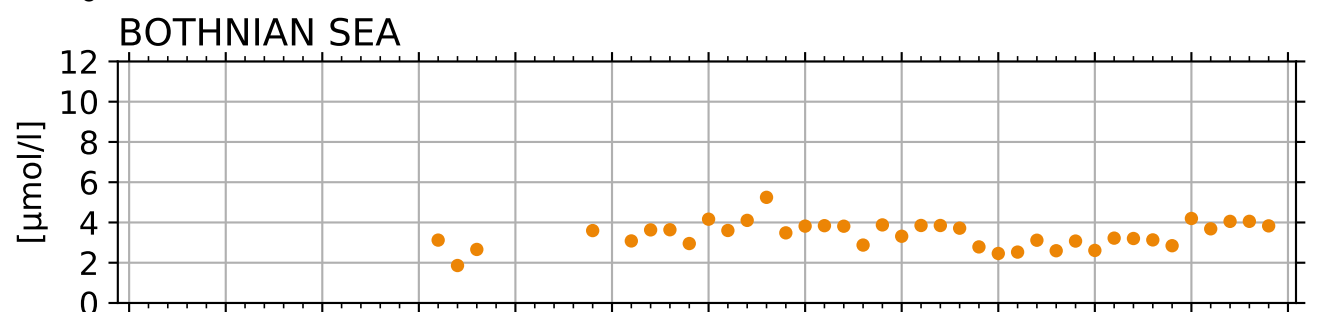
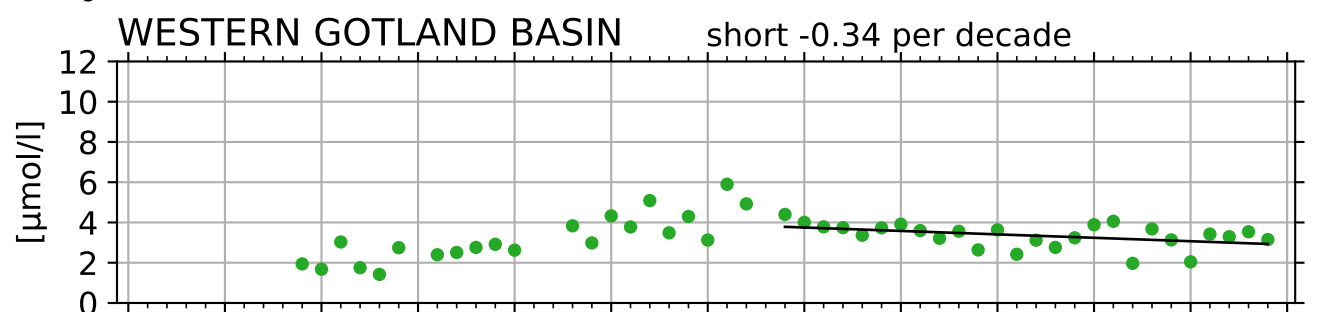
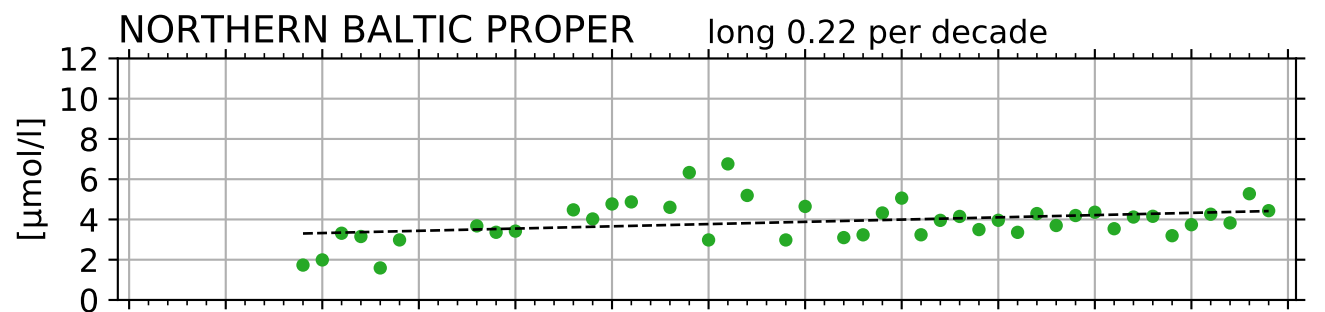
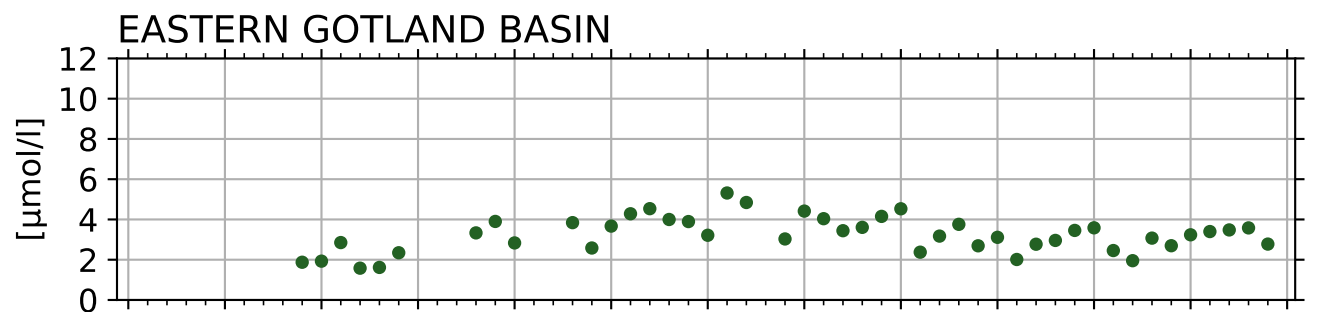
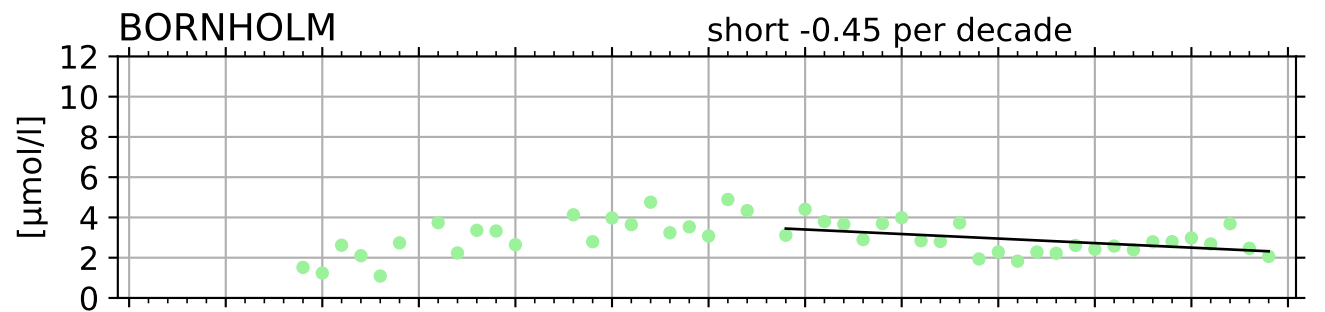
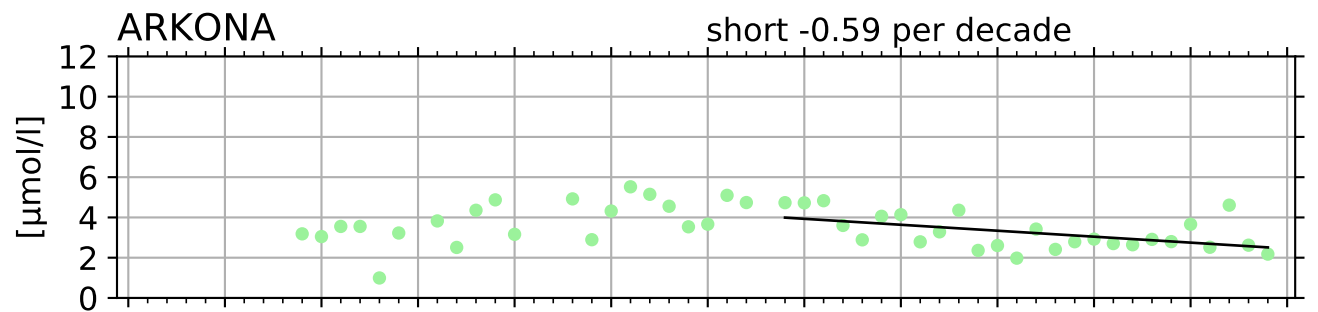
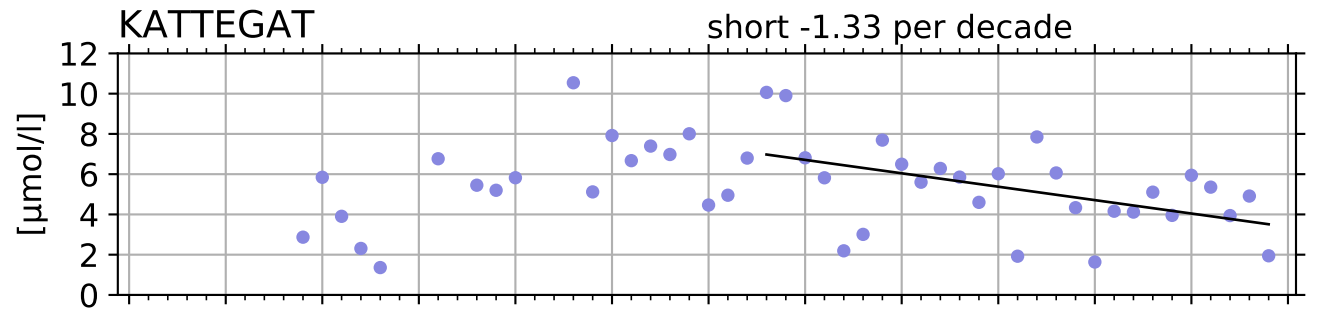
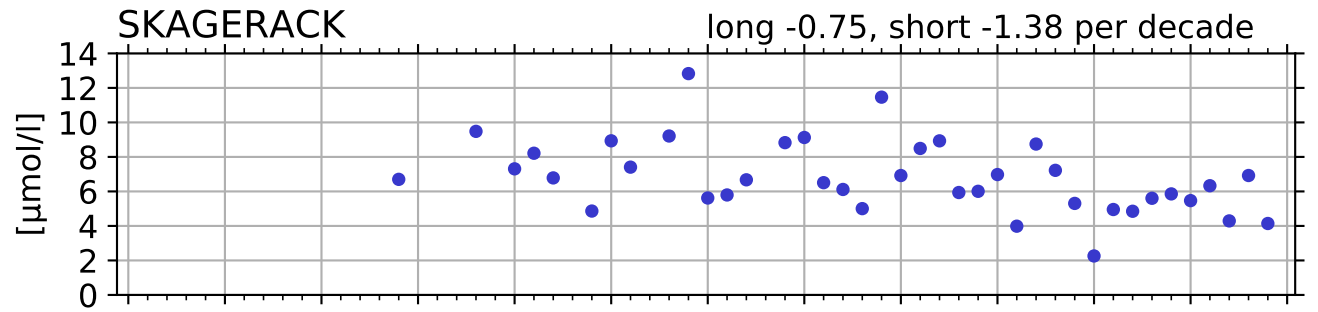
BOTHNIAN BAY



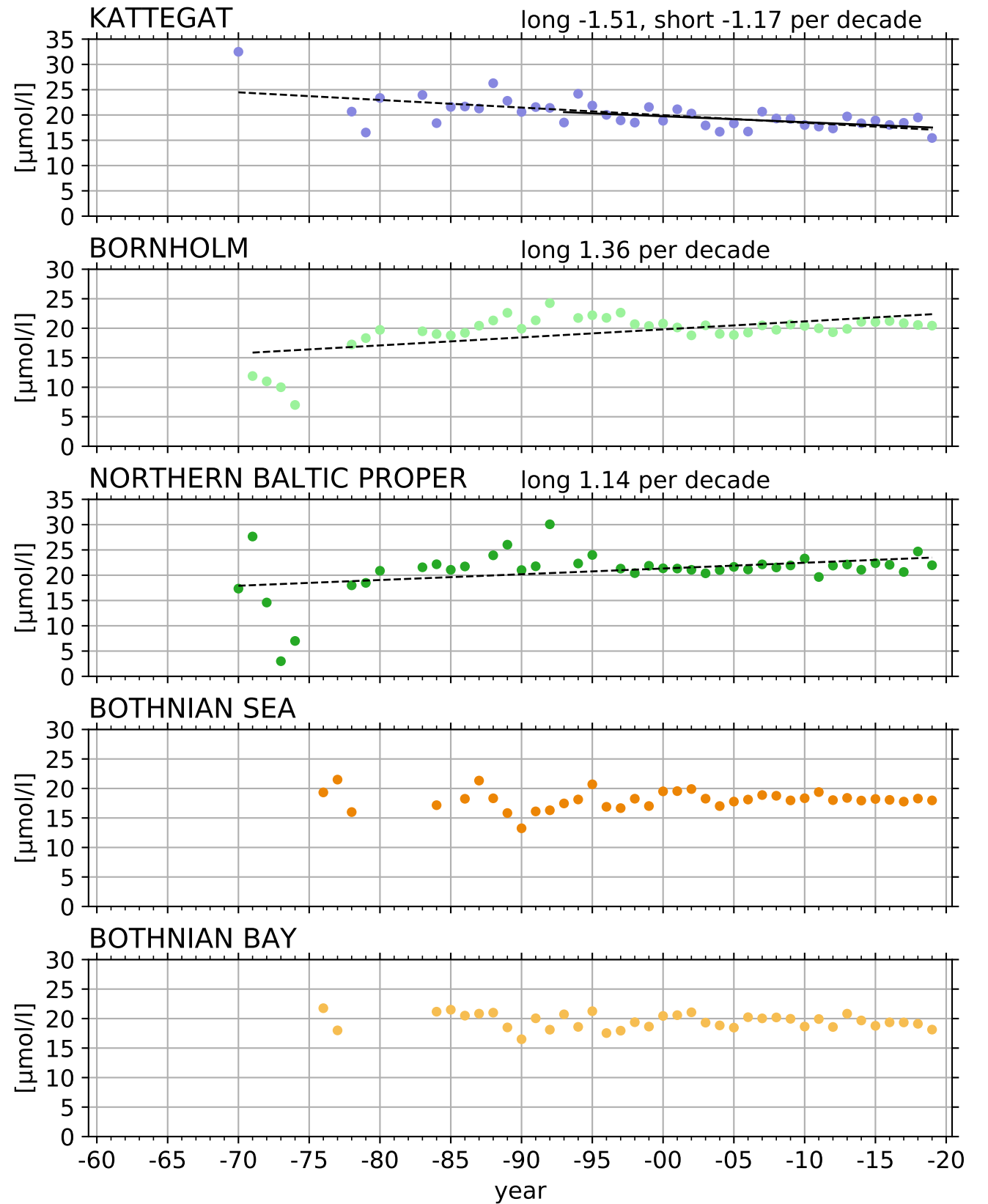
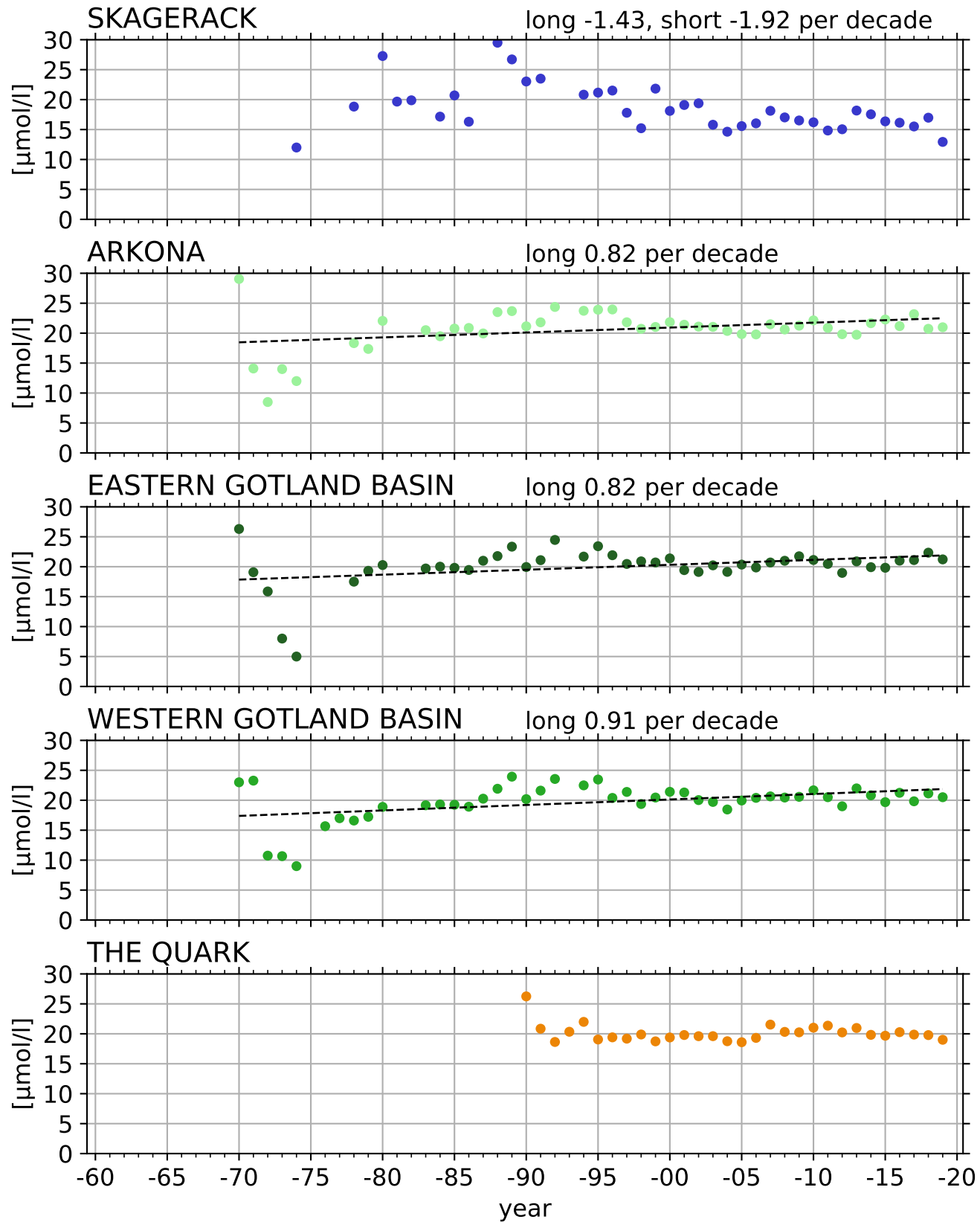
Total phosphorus winter [$\mu\text{mol/l}$] 0-10 m



DIN winter [$\mu\text{mol/l}$] 0-10 m



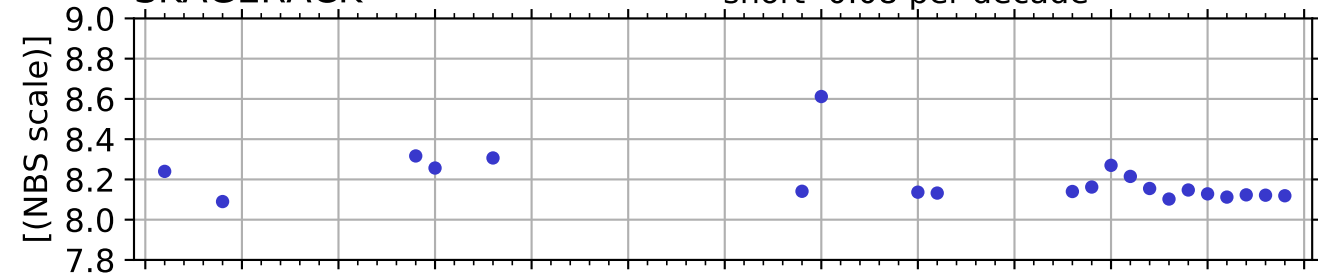
Total Nitrogen winter [$\mu\text{mol/l}$] 0-10 m



pH winter [(NBS scale)] 0-10 m

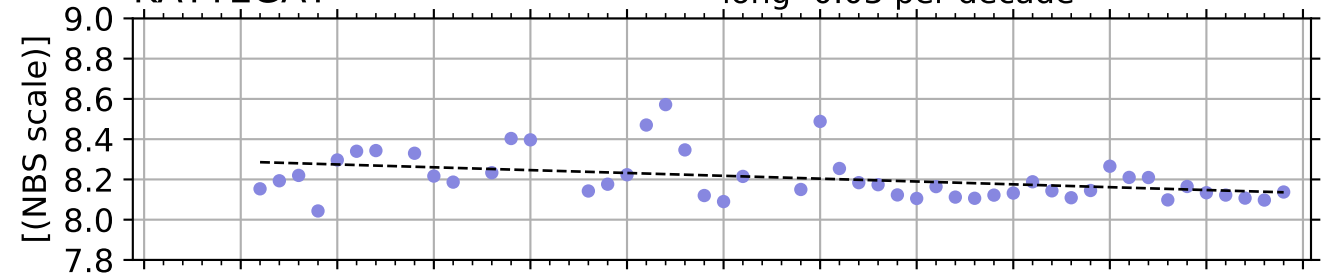
SKAGERACK

short -0.08 per decade

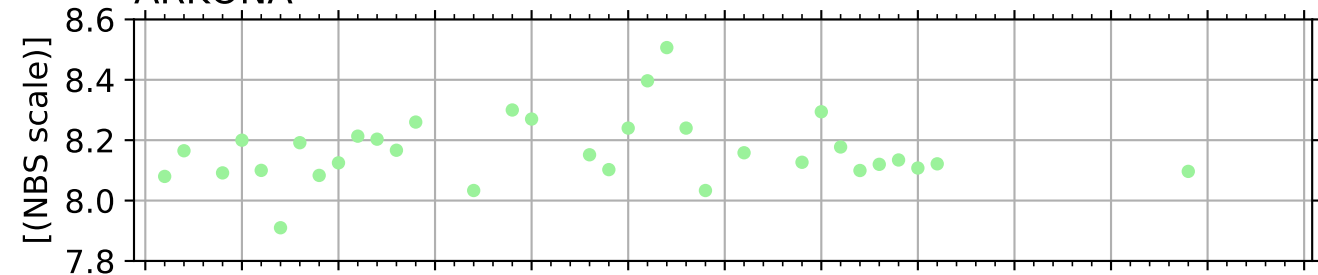


KATTEGAT

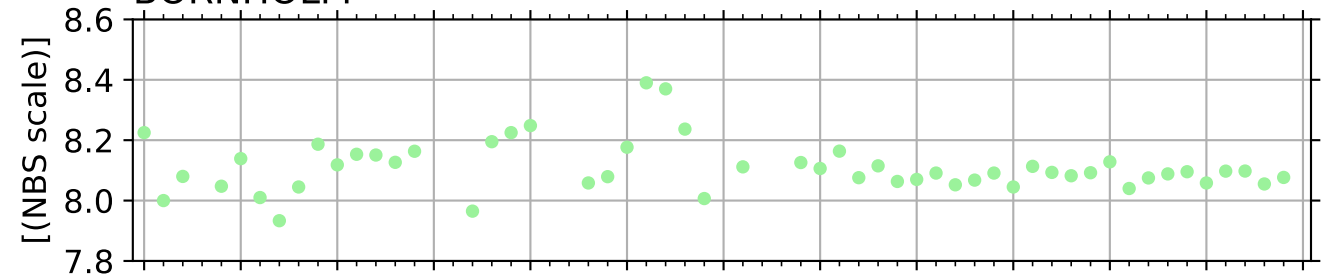
long -0.03 per decade



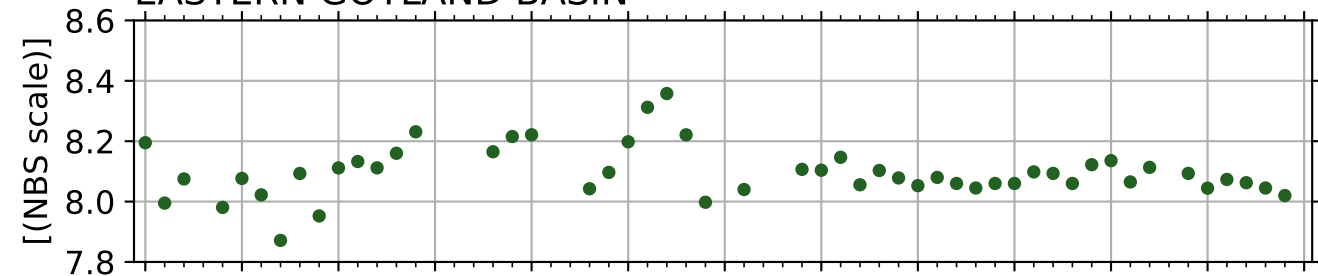
ARKONA



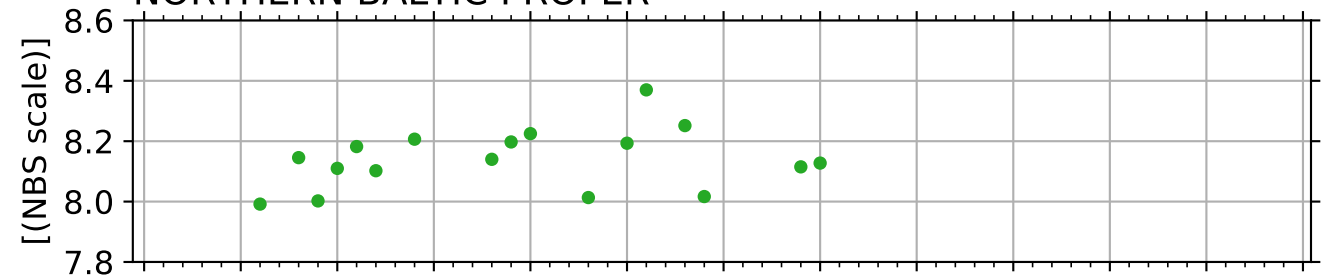
BORNHOLM



EASTERN GOTLAND BASIN

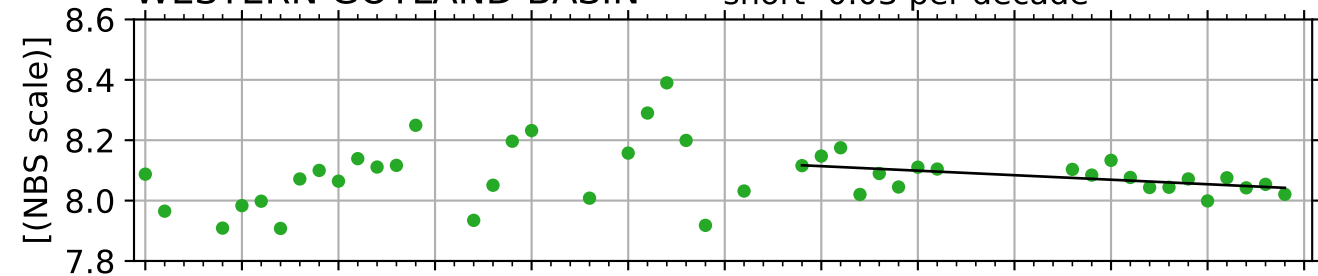


NORTHERN BALTIC PROPER

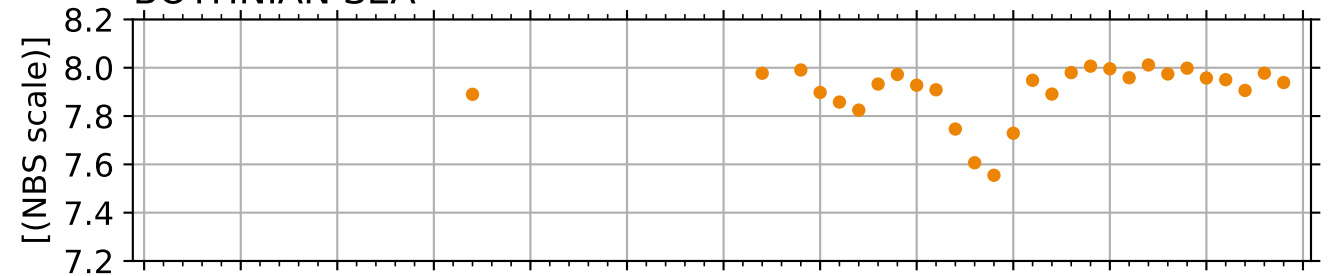


WESTERN GOTLAND BASIN

short -0.03 per decade

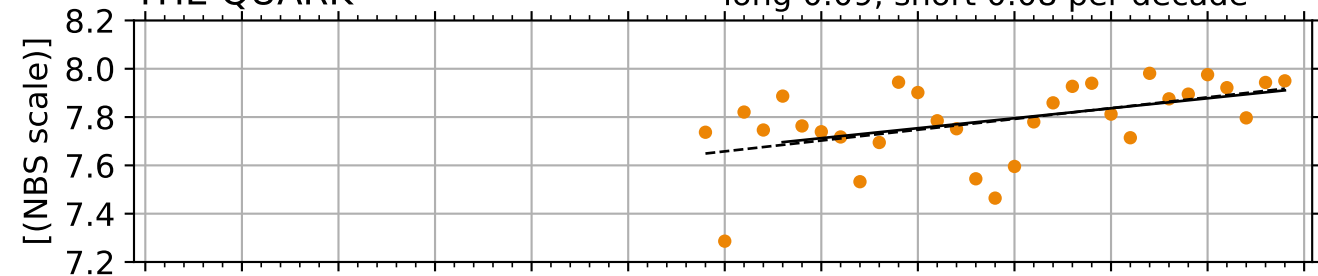


BOTHNIAN SEA

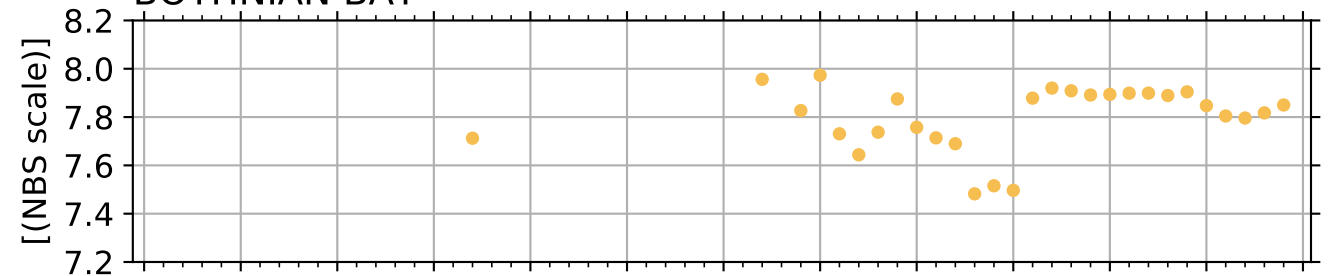


THE QUARK

long 0.09, short 0.08 per decade



BOTHNIAN BAY

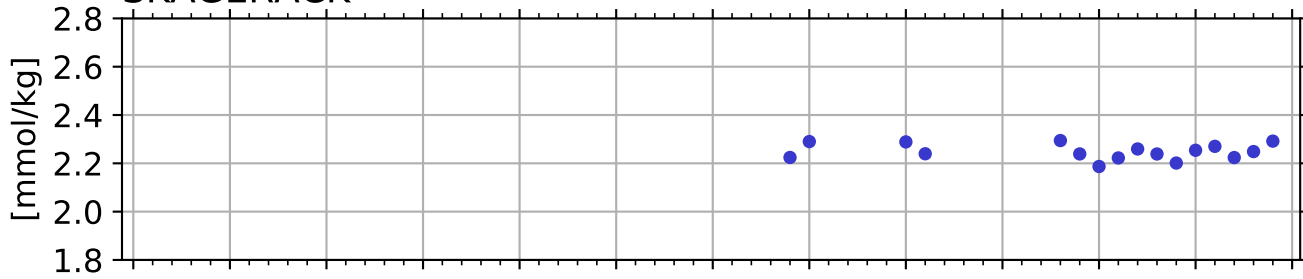


year

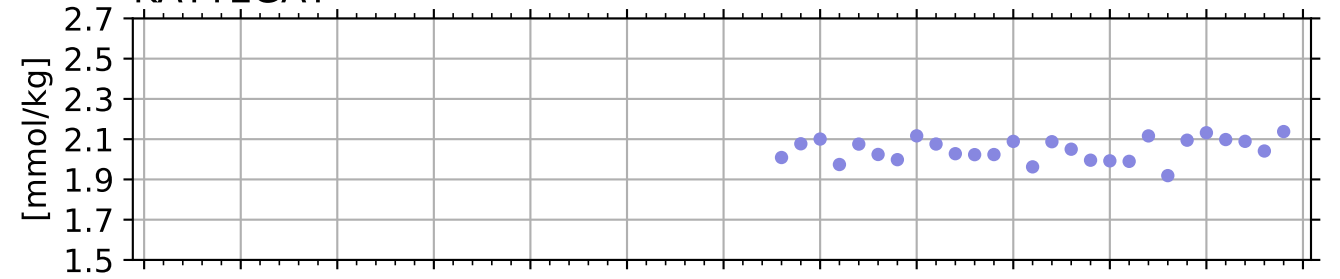
year

Alkalinity winter [mmol/kg] 0-10 m

SKAGERACK

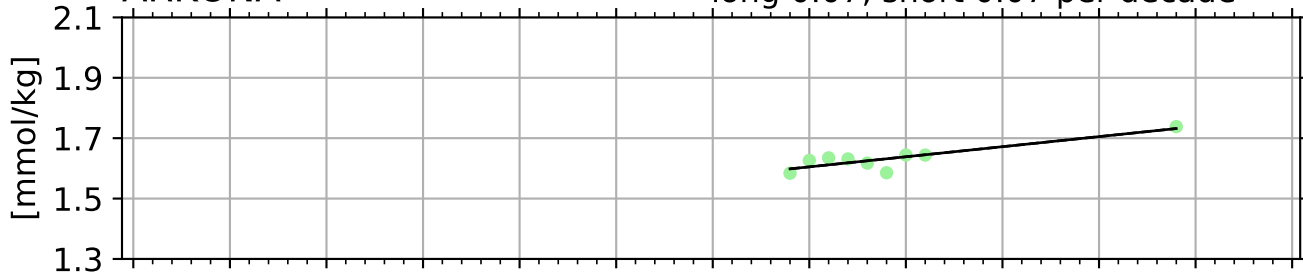


KATTEGAT



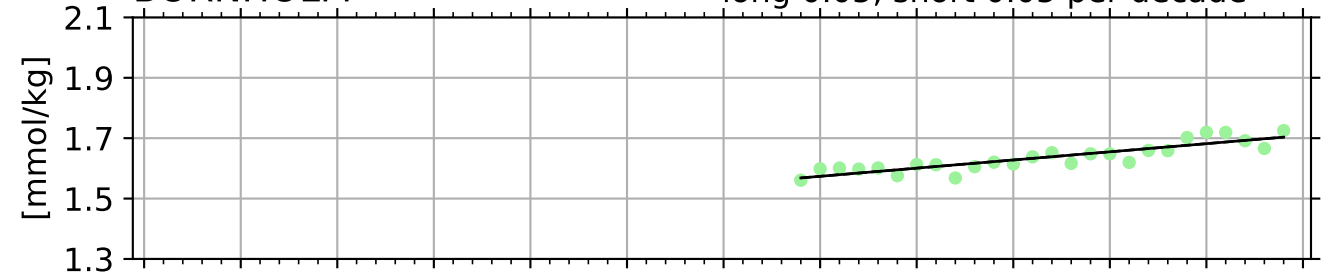
ARKONA

long 0.07, short 0.07 per decade



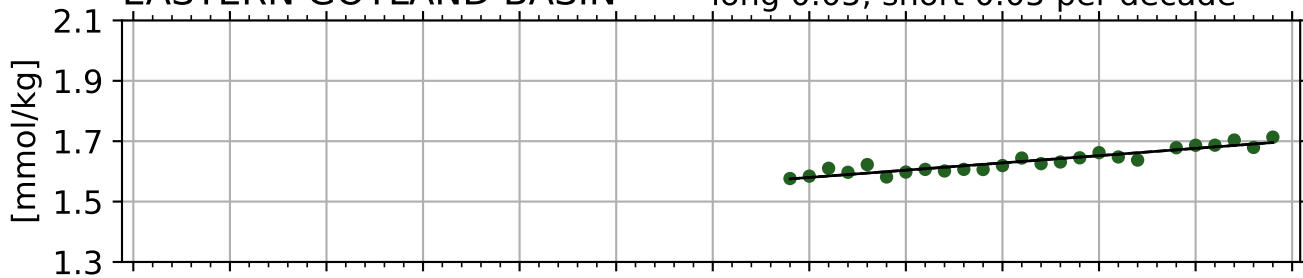
BORNHOLM

long 0.05, short 0.05 per decade

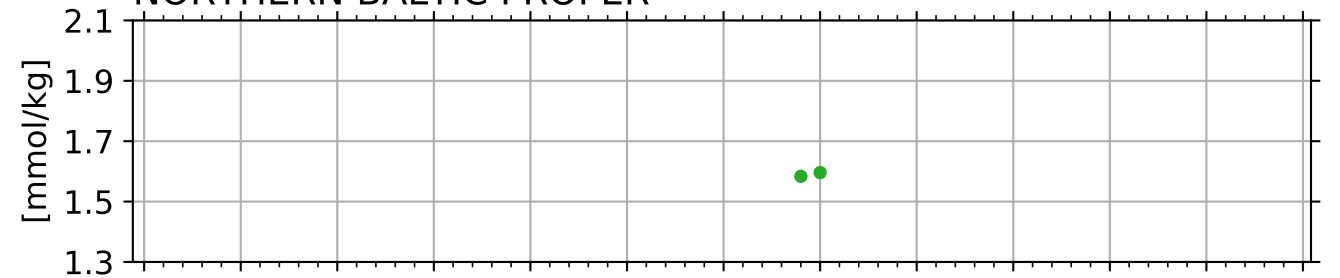


EASTERN GOTLAND BASIN

long 0.05, short 0.05 per decade

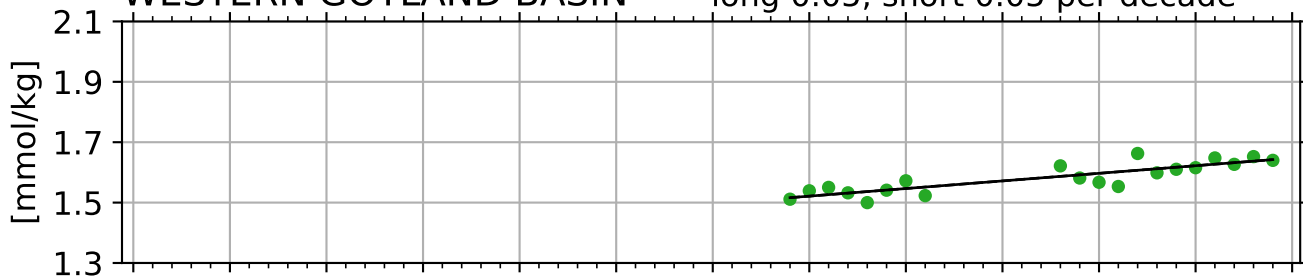


NORTHERN BALTIC PROPER



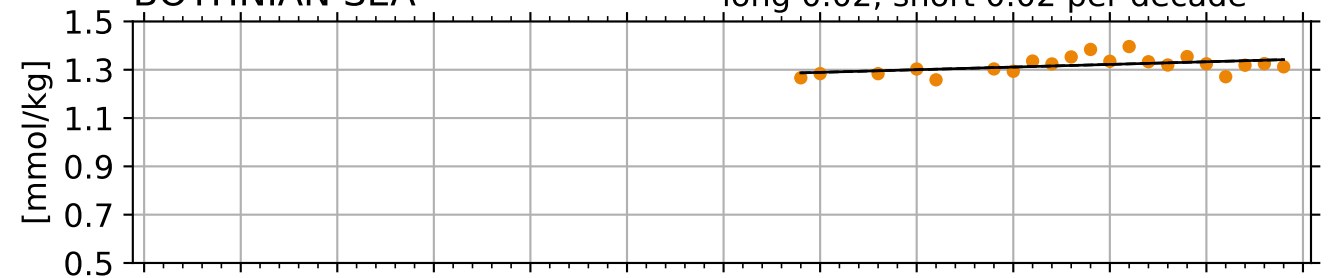
WESTERN GOTLAND BASIN

long 0.05, short 0.05 per decade

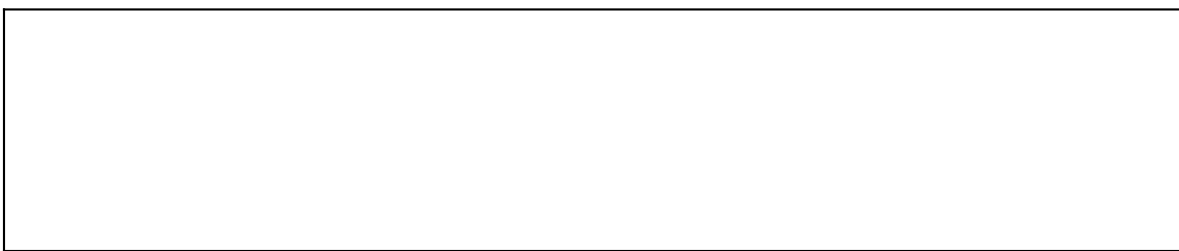


BOTHNIAN SEA

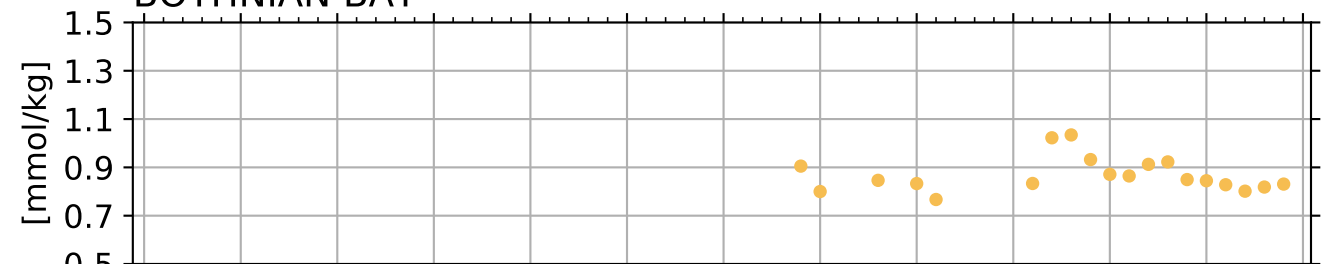
long 0.02, short 0.02 per decade



THE QUARK



BOTHNIAN BAY

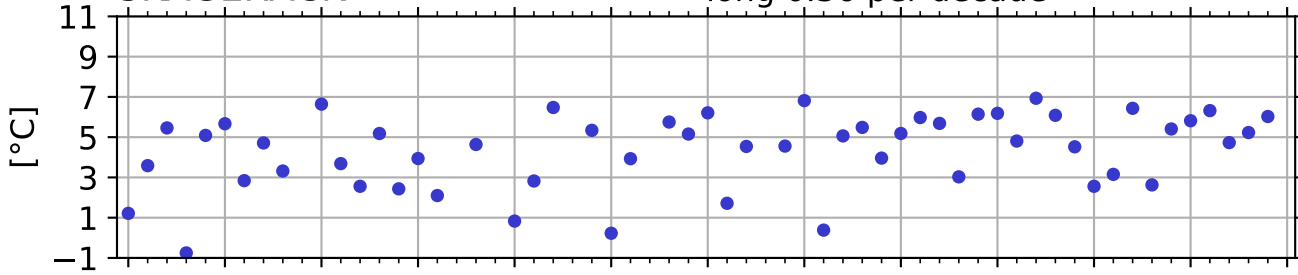


year

Temperature winter [°C] 0-10 m

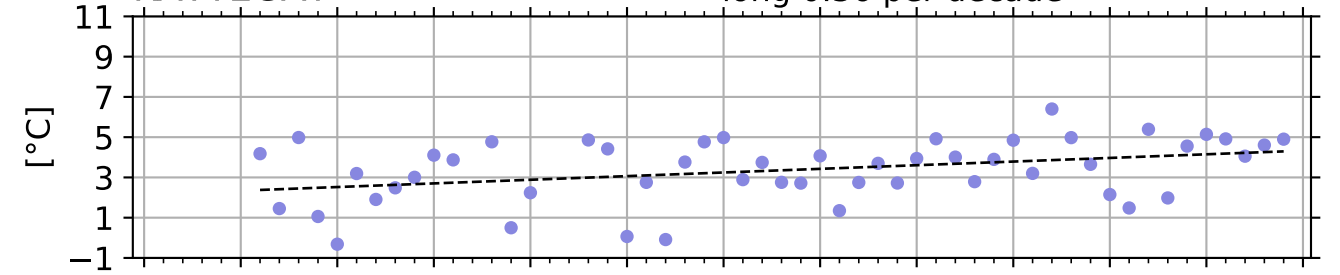
SKAGERACK

long 0.36 per decade



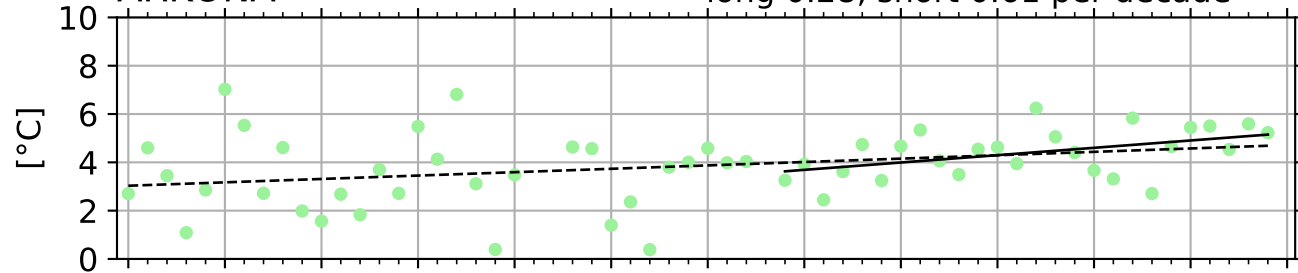
KATTEGAT

long 0.36 per decade



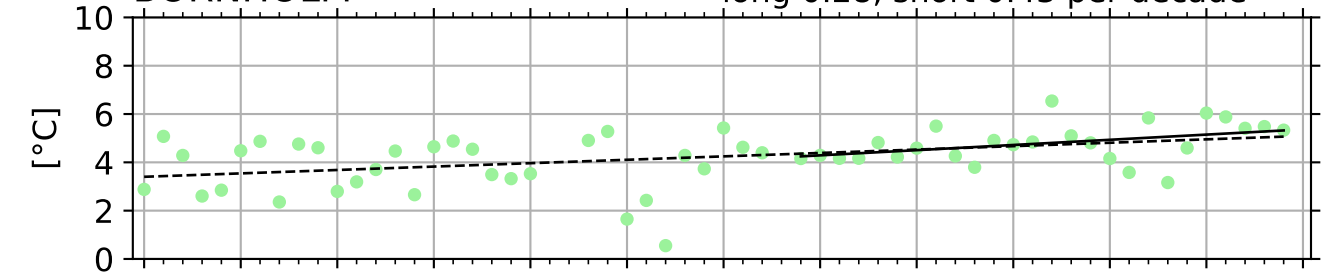
ARKONA

long 0.28, short 0.61 per decade



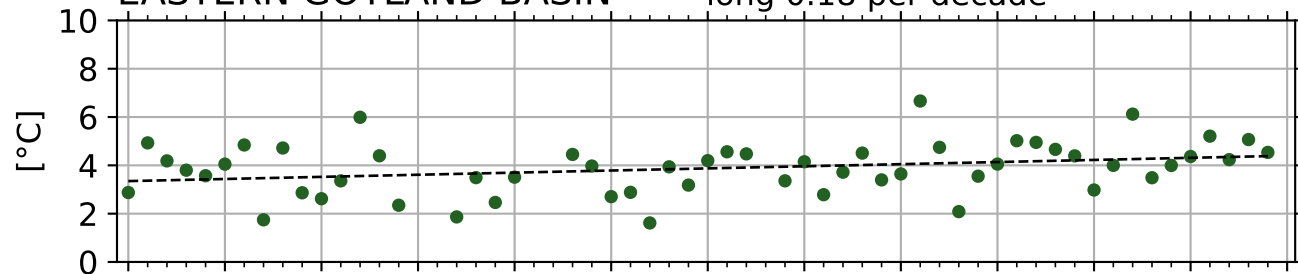
BORNHOLM

long 0.28, short 0.43 per decade



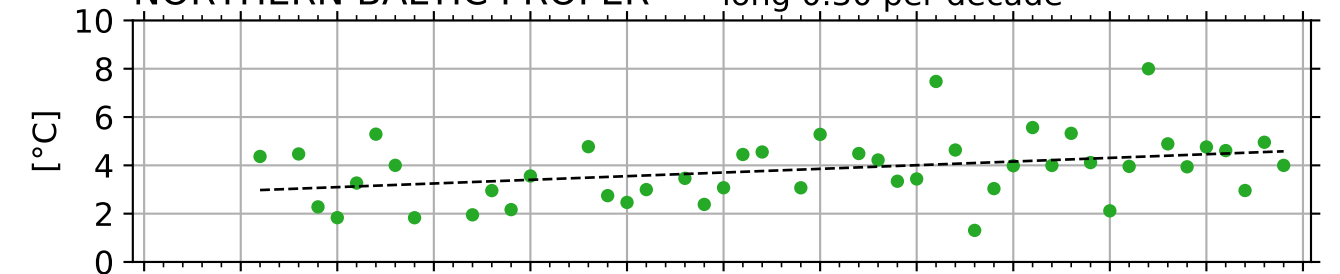
EASTERN GOTLAND BASIN

long 0.18 per decade



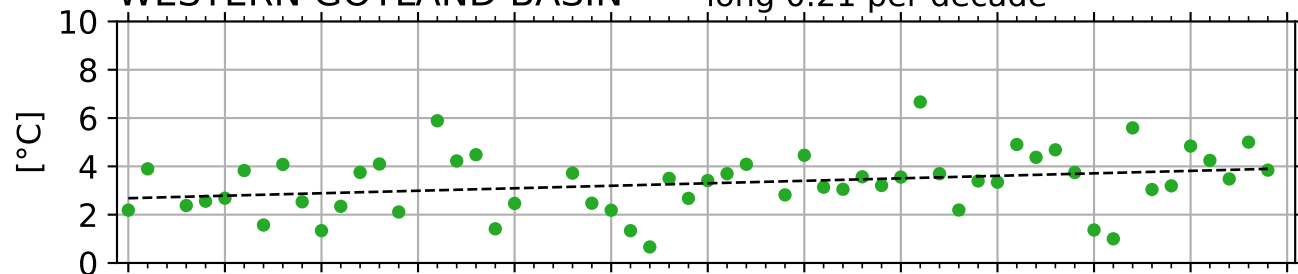
NORTHERN BALTIC PROPER

long 0.30 per decade

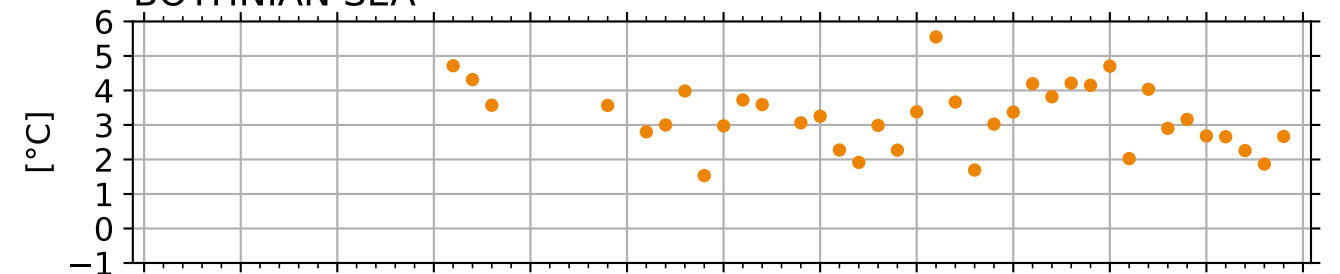


WESTERN GOTLAND BASIN

long 0.21 per decade

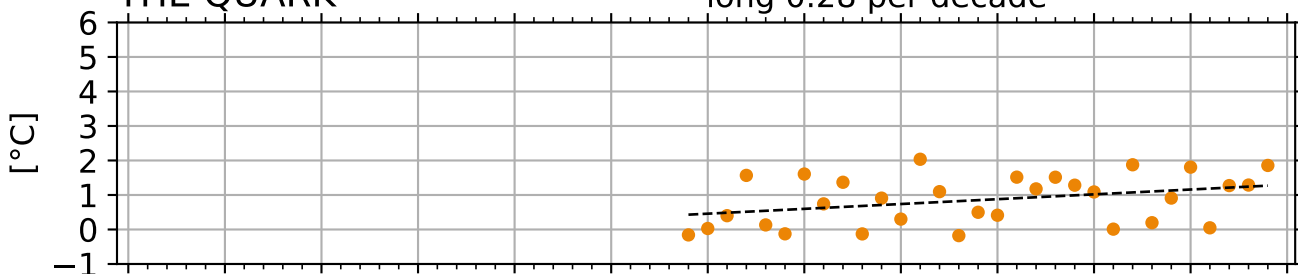


BOTHNIAN SEA

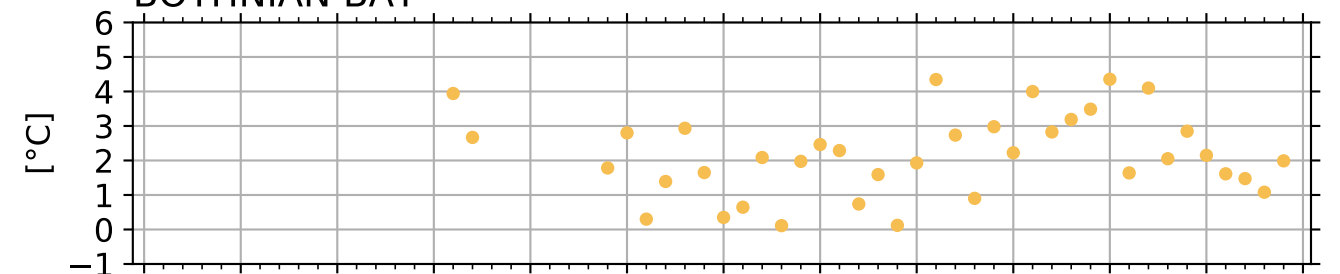


THE QUARK

long 0.28 per decade



BOTHNIAN BAY

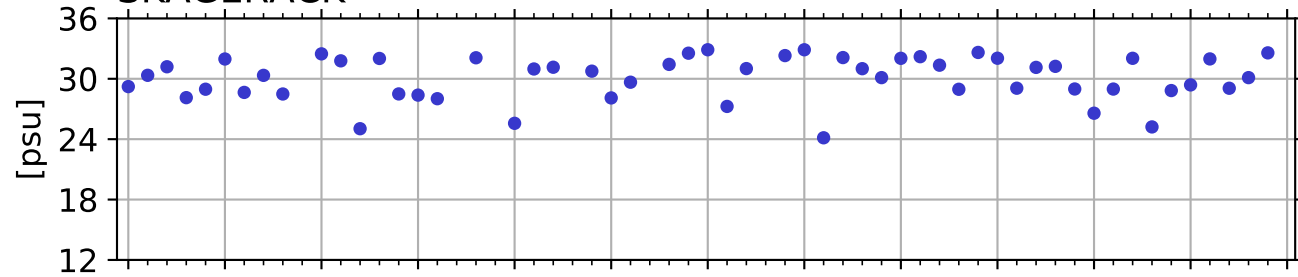


year

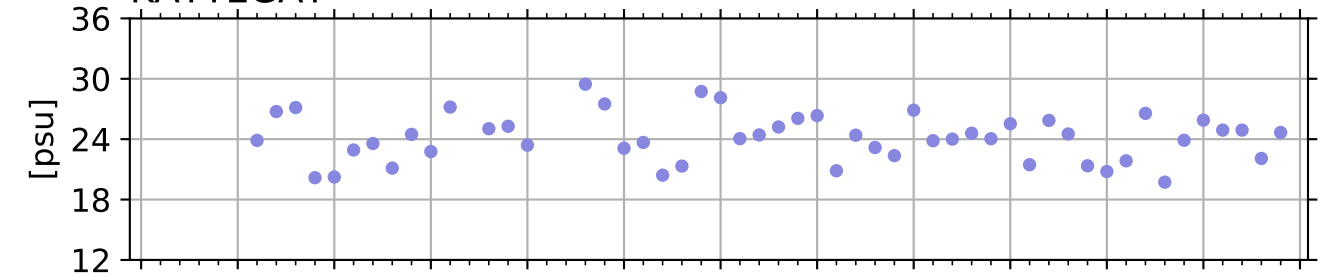
year

Salinity winter [psu] 0-10 m

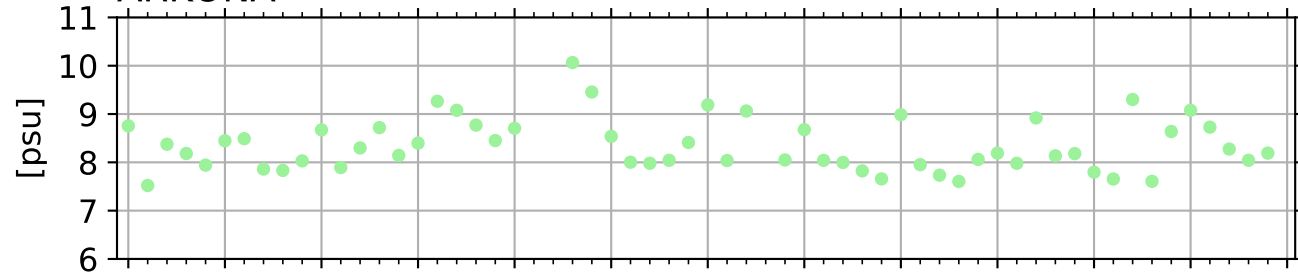
SKAGERACK



KATTEGAT

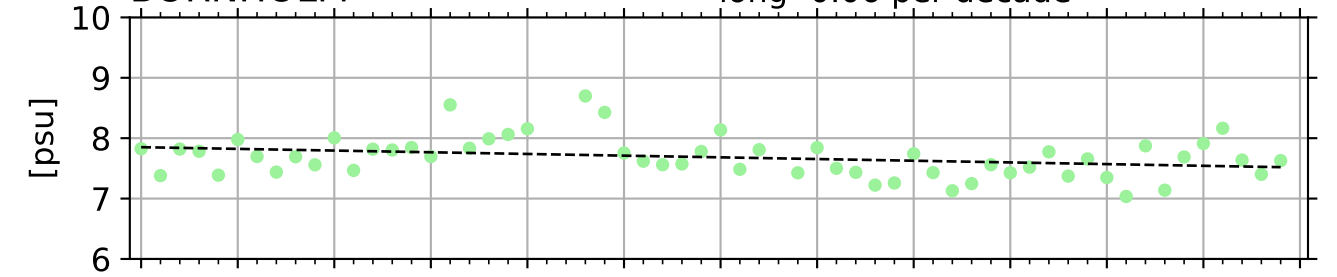


ARKONA



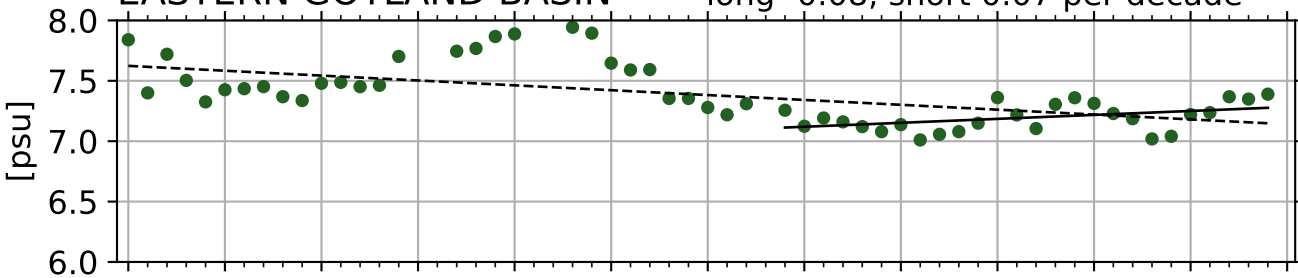
BORNHOLM

long -0.06 per decade



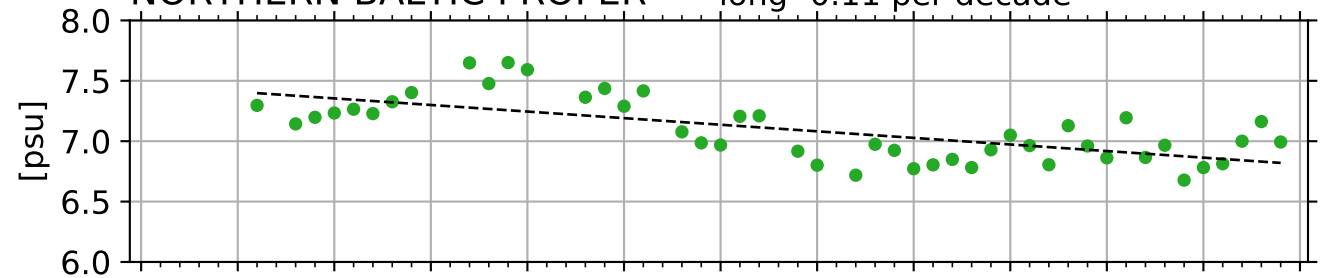
EASTERN GOTLAND BASIN

long -0.08, short 0.07 per decade



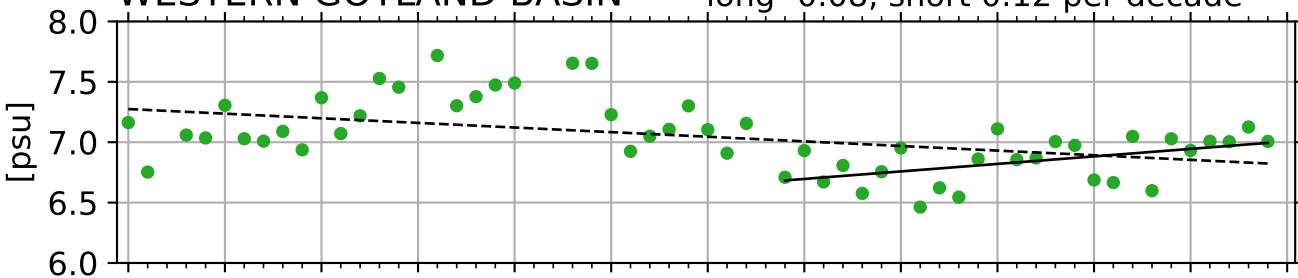
NORTHERN BALTIC PROPER

long -0.11 per decade



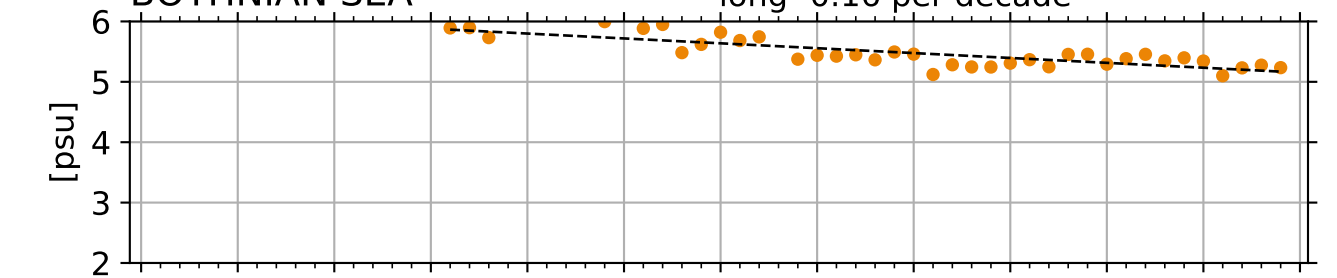
WESTERN GOTLAND BASIN

long -0.08, short 0.12 per decade

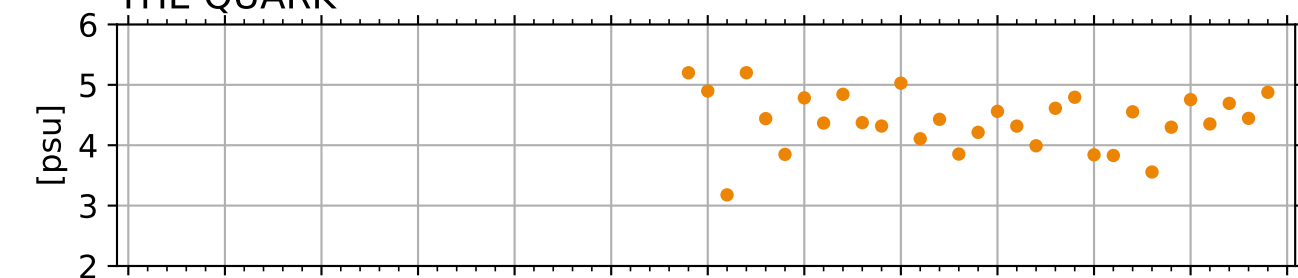


BOTHNIAN SEA

long -0.16 per decade

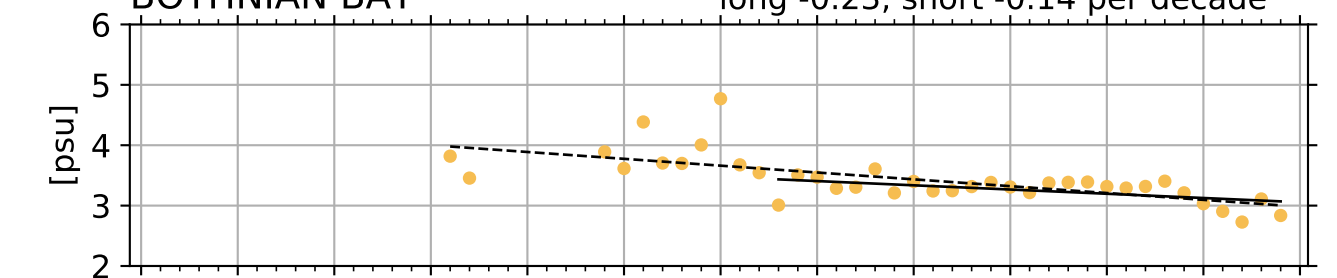


THE QUARK



BOTHNIAN BAY

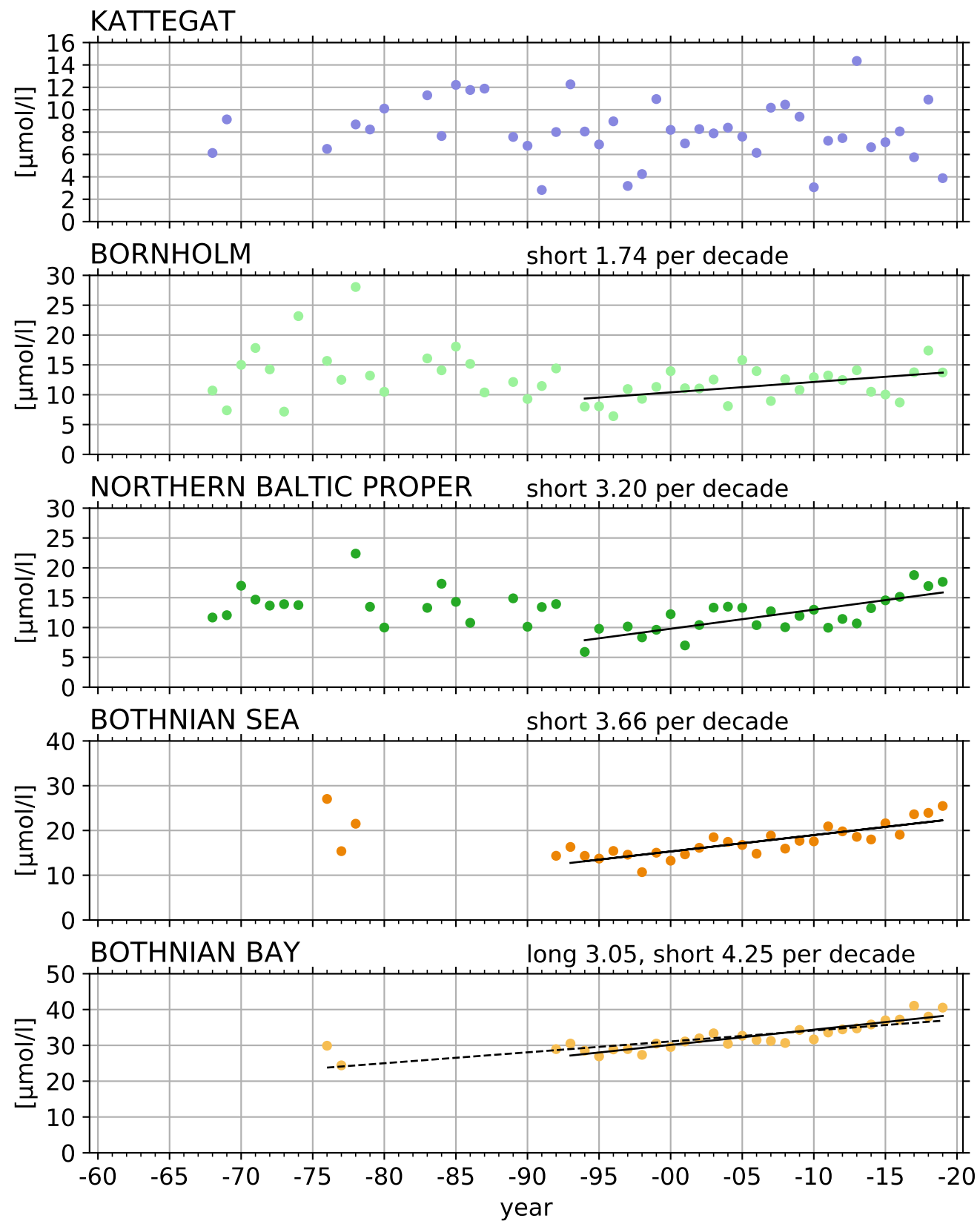
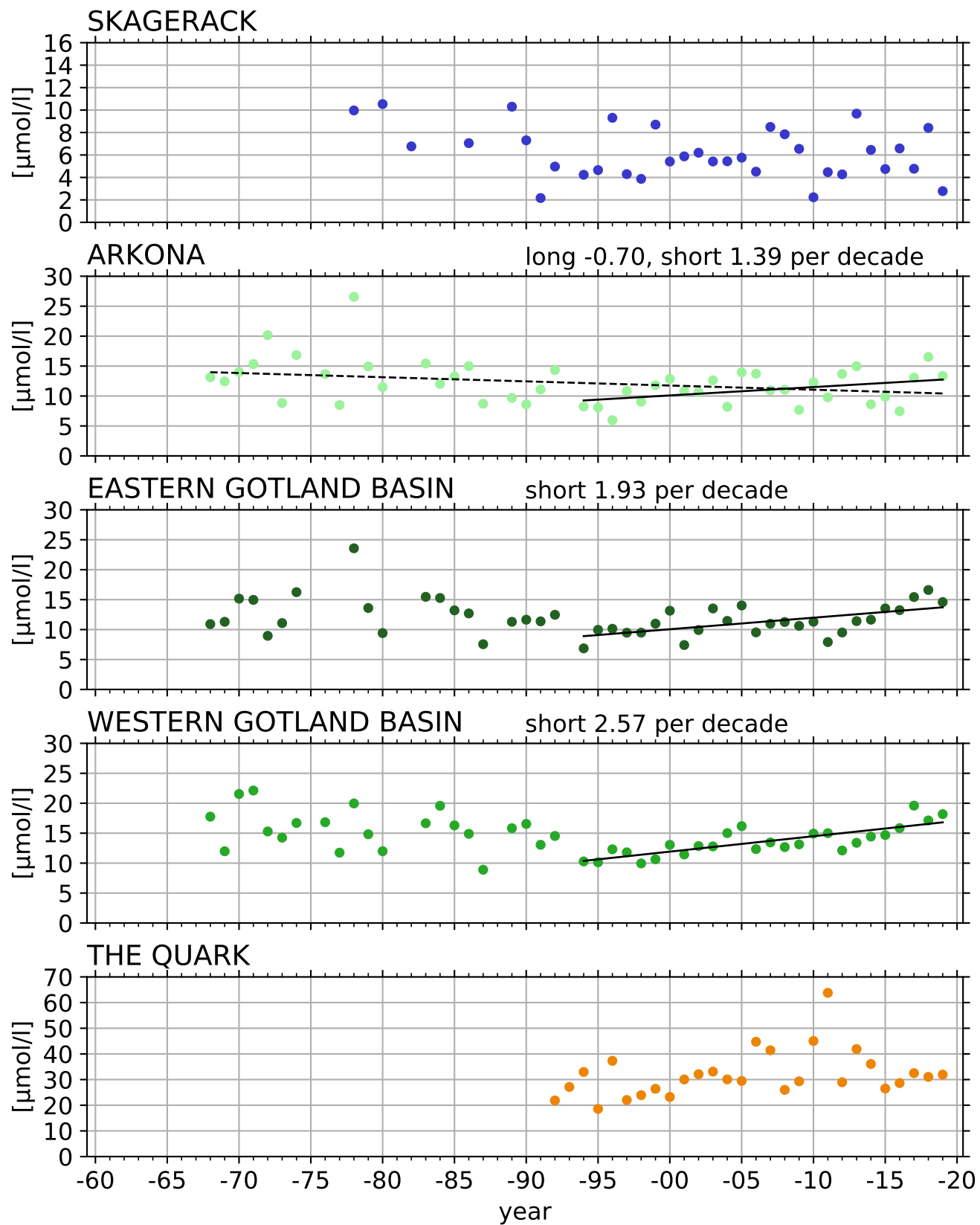
long -0.23, short -0.14 per decade



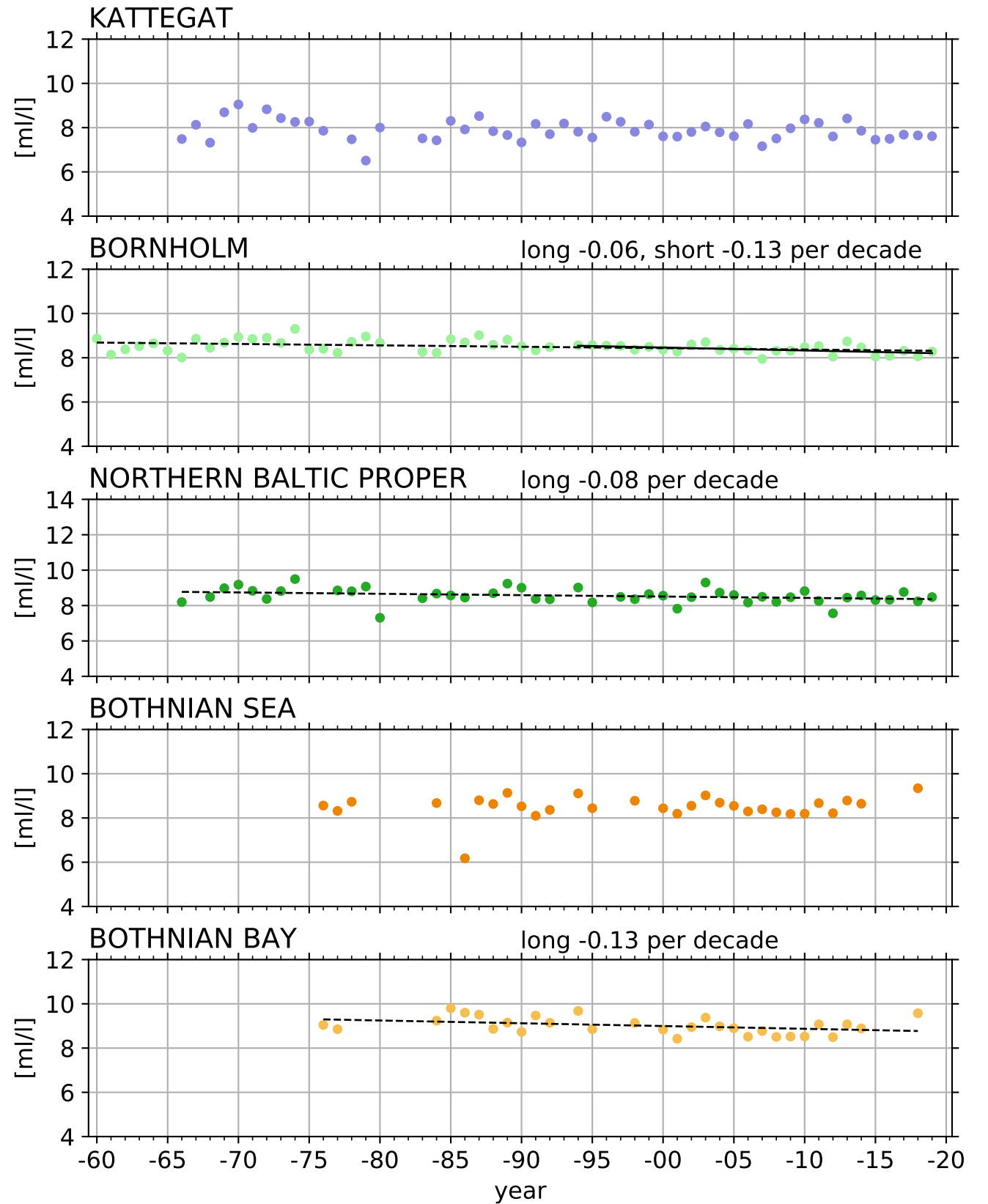
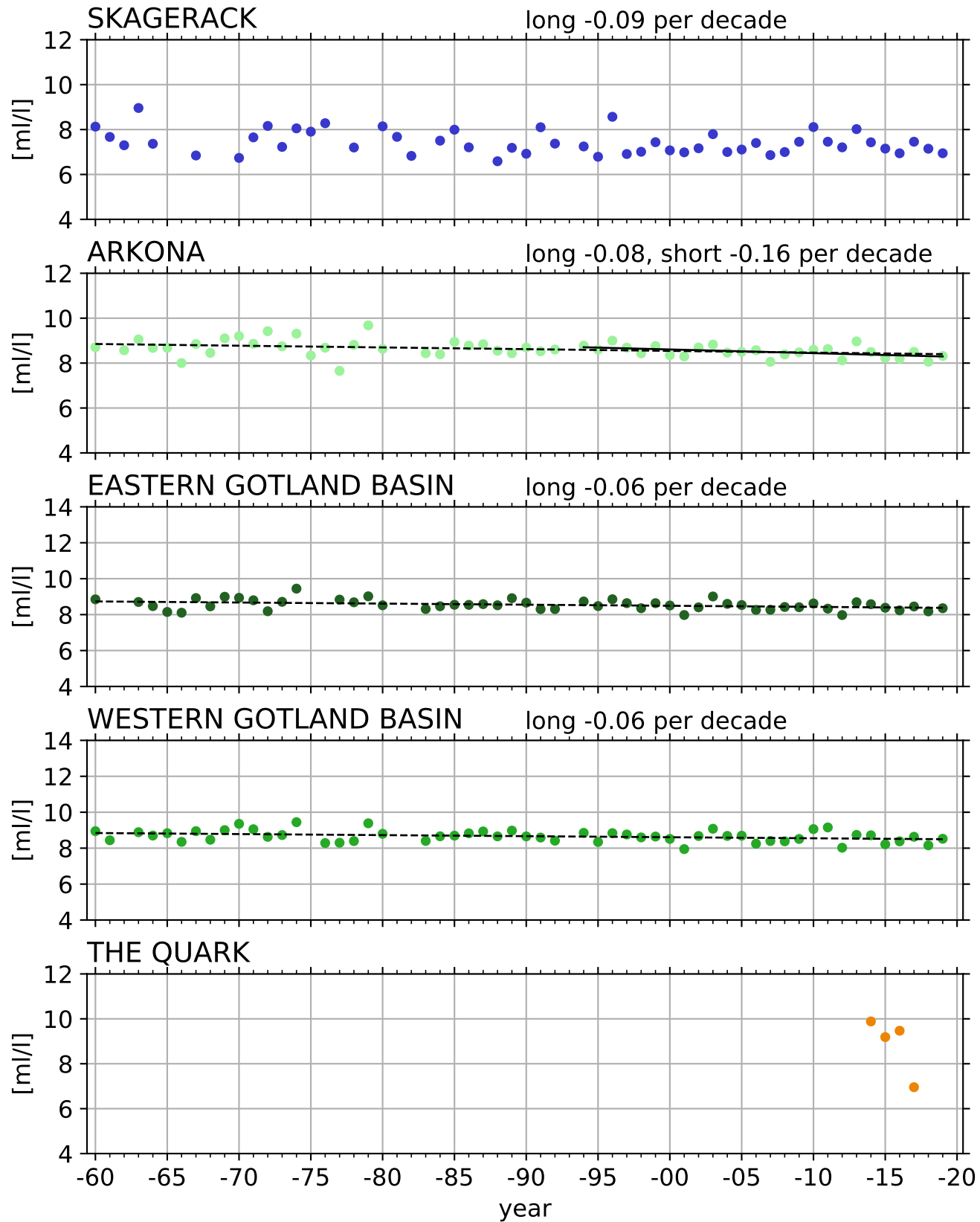
year

year

Dissolved Silica winter [$\mu\text{mol/l}$] 0-10 m



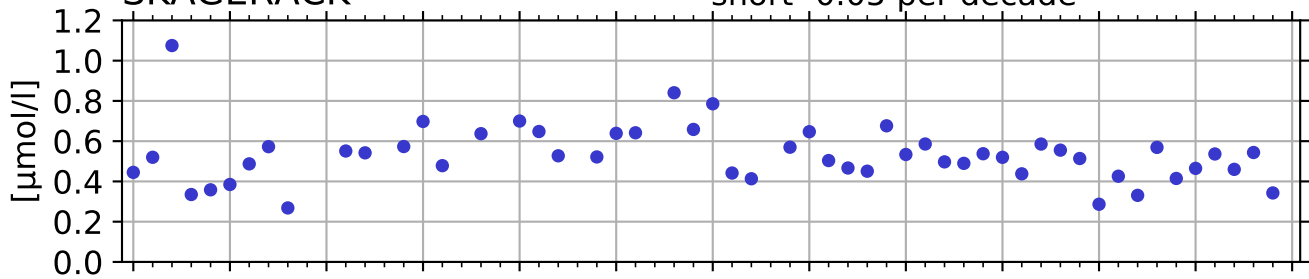
Dissolved oxygen winter [ml/l] 0-10 m



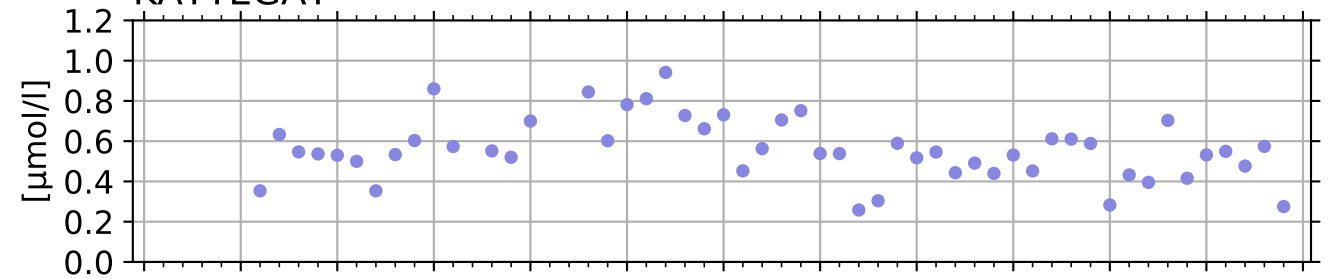
Phosphate winter [$\mu\text{mol/l}$] 0-10 m

SKAGERACK

short -0.05 per decade

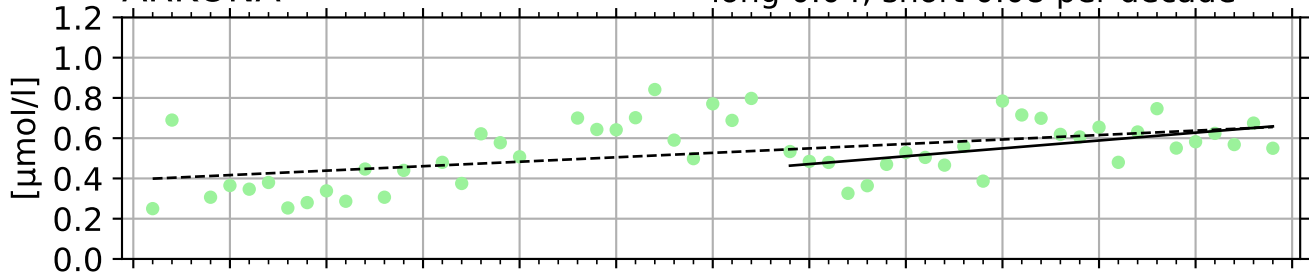


KATTEGAT



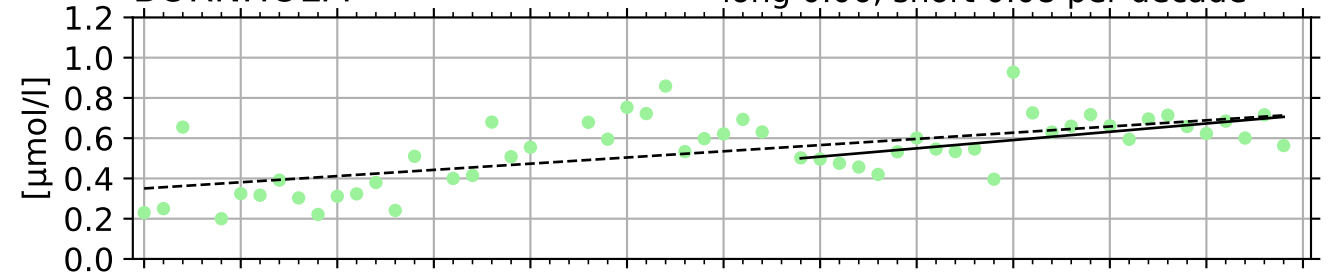
ARKONA

long 0.04, short 0.08 per decade



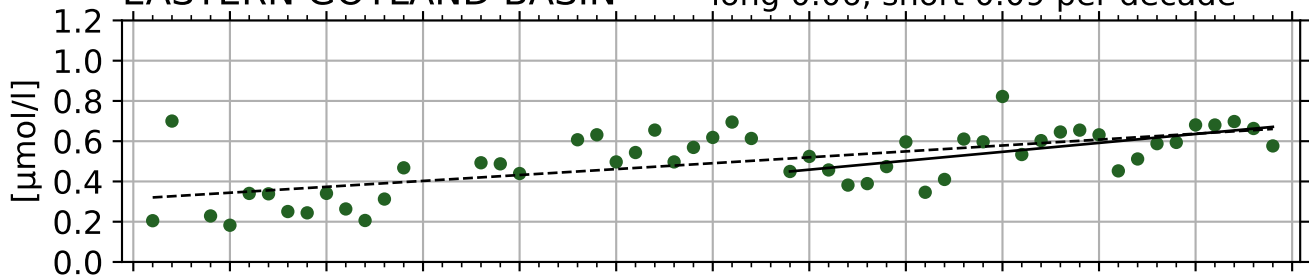
BORNHOLM

long 0.06, short 0.08 per decade



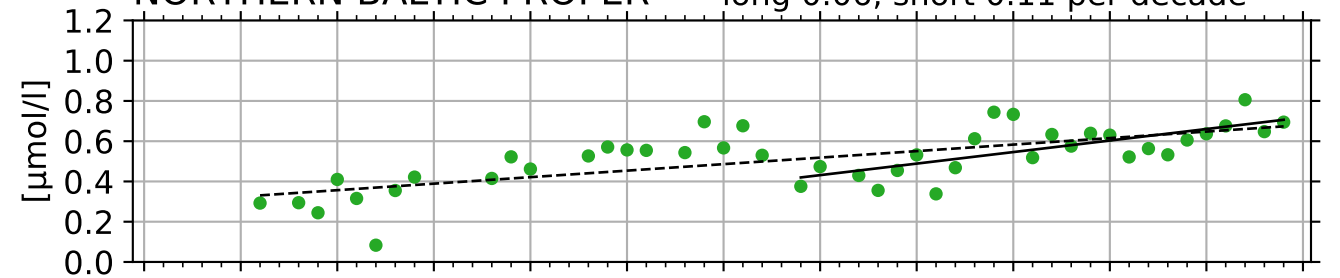
EASTERN GOTLAND BASIN

long 0.06, short 0.09 per decade



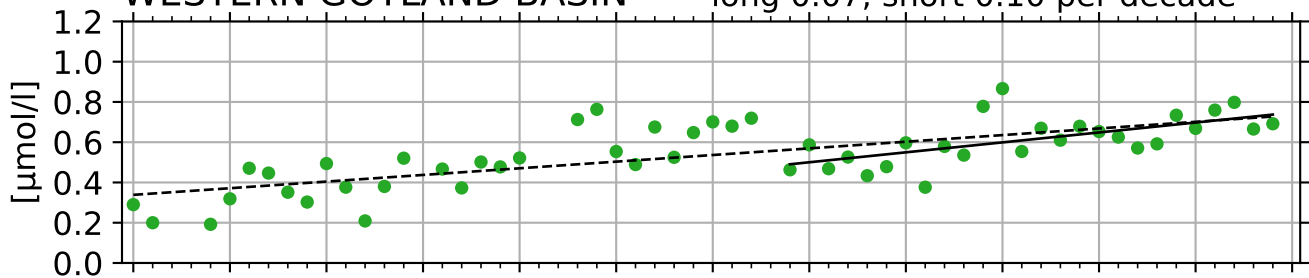
NORTHERN BALTIC PROPER

long 0.06, short 0.11 per decade



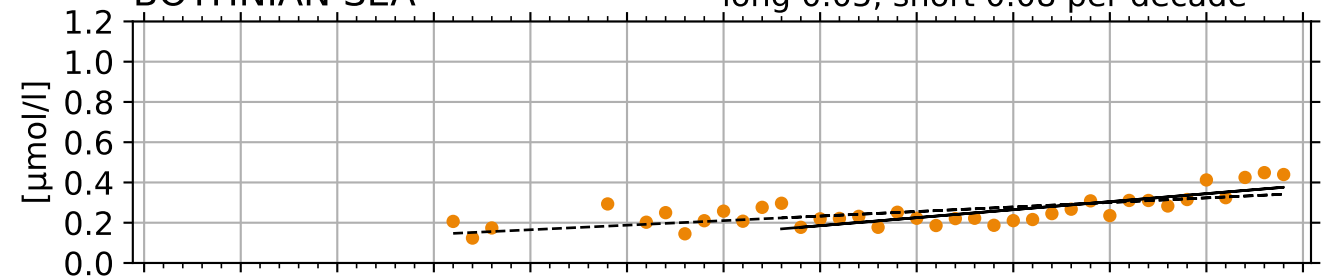
WESTERN GOTLAND BASIN

long 0.07, short 0.10 per decade



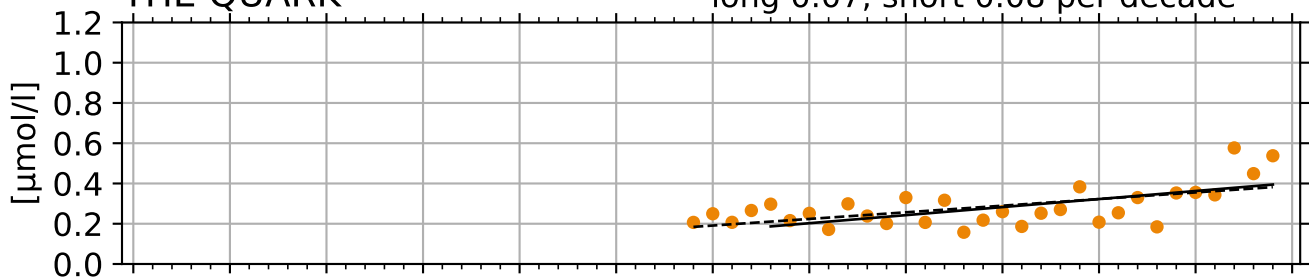
BOTHNIAN SEA

long 0.05, short 0.08 per decade

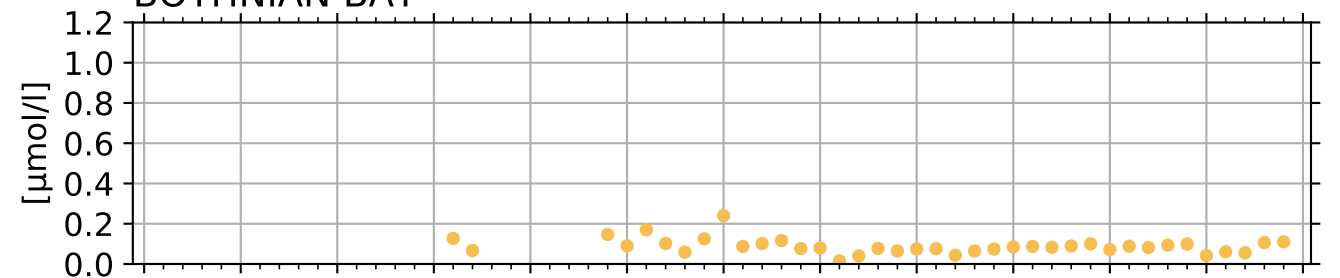


THE QUARK

long 0.07, short 0.08 per decade



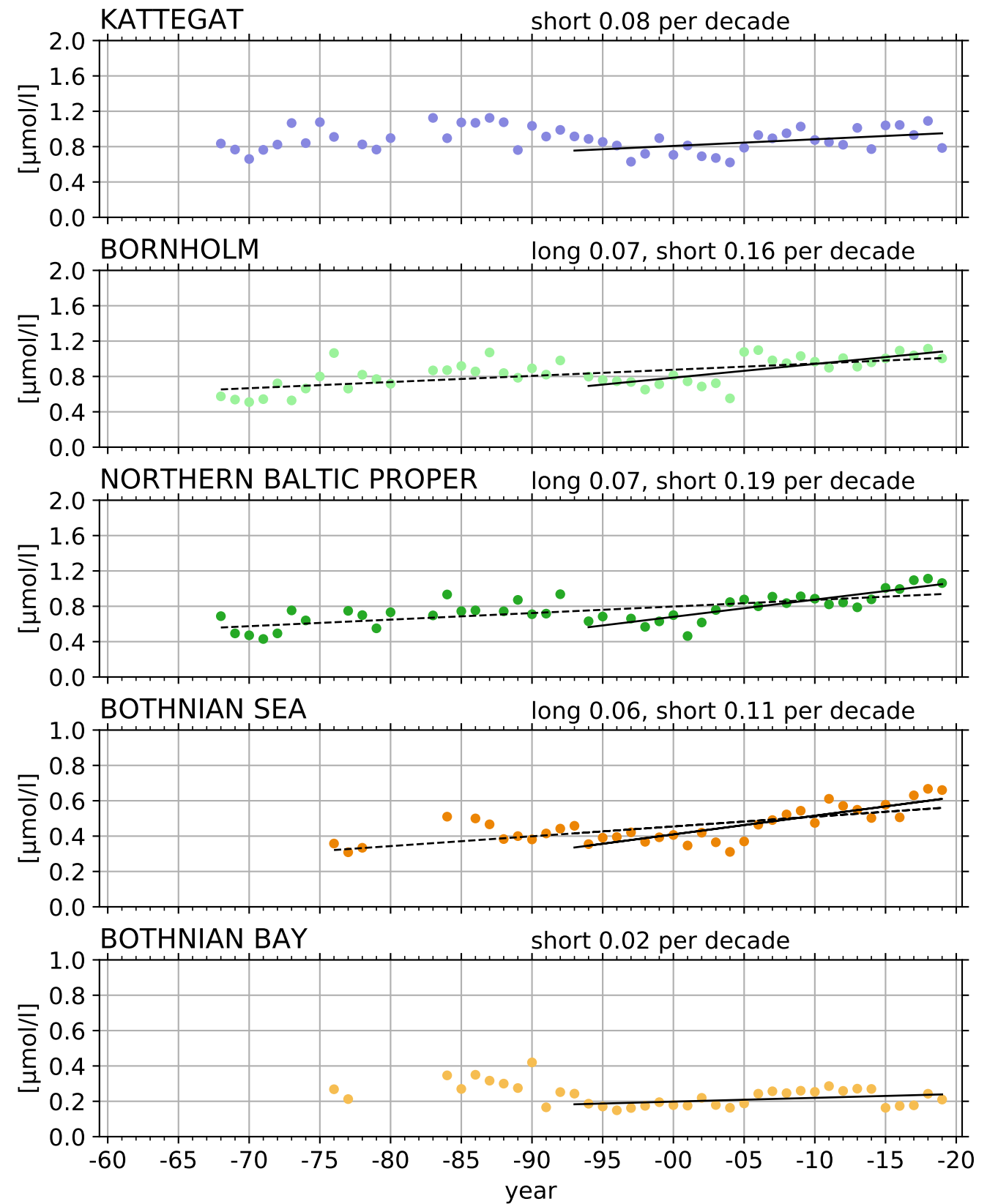
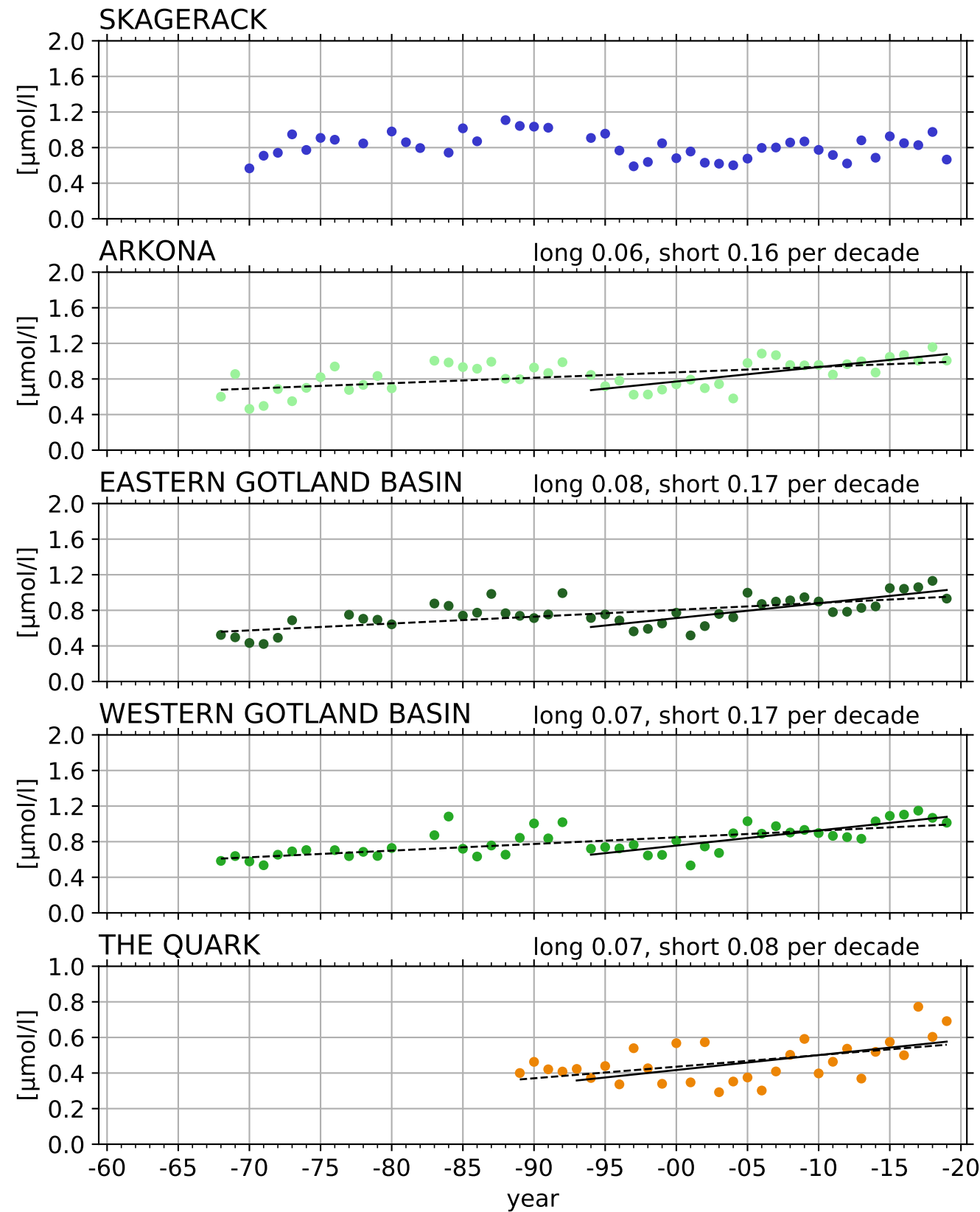
BOTHNIAN BAY



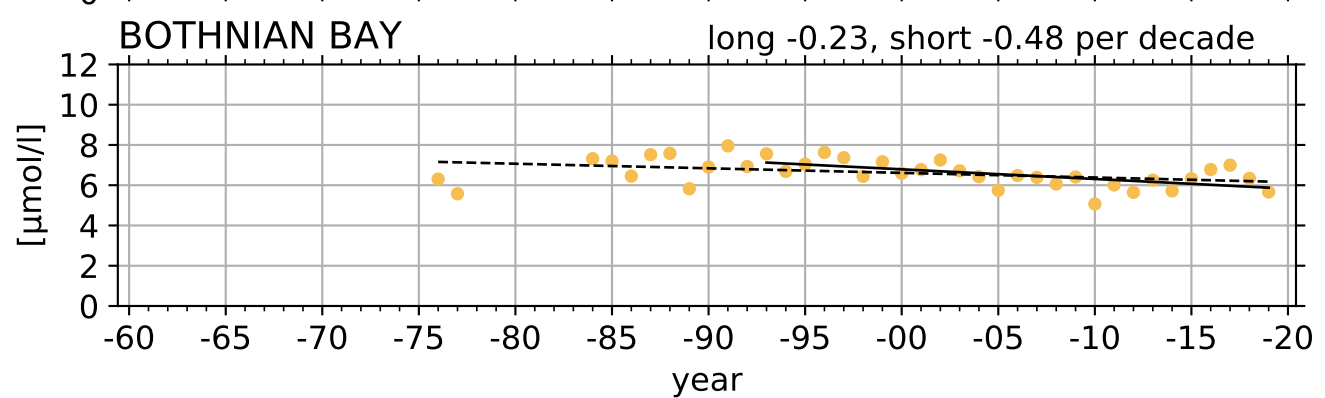
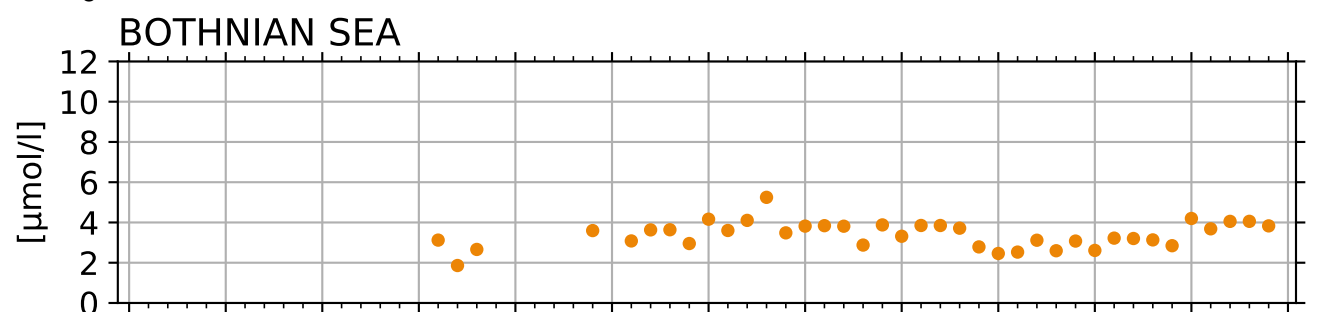
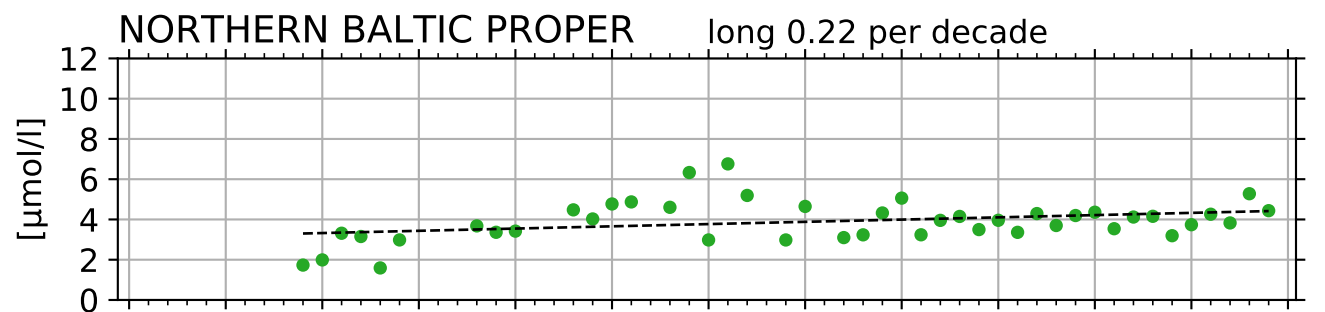
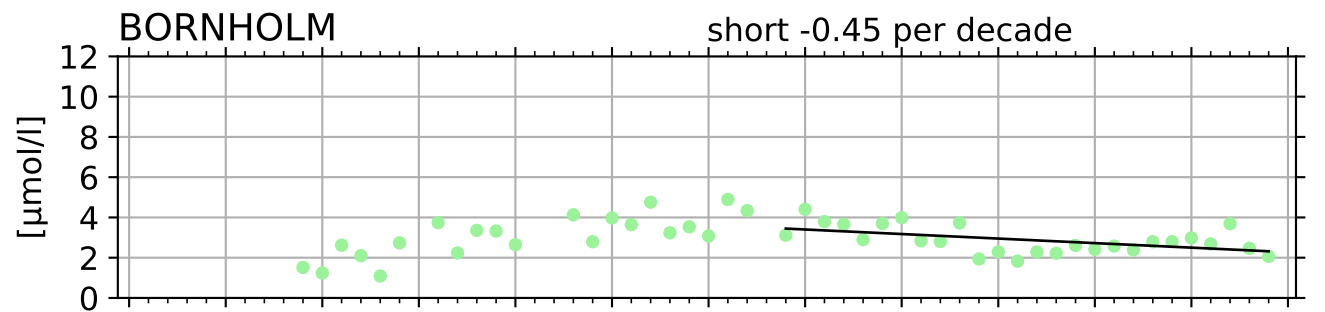
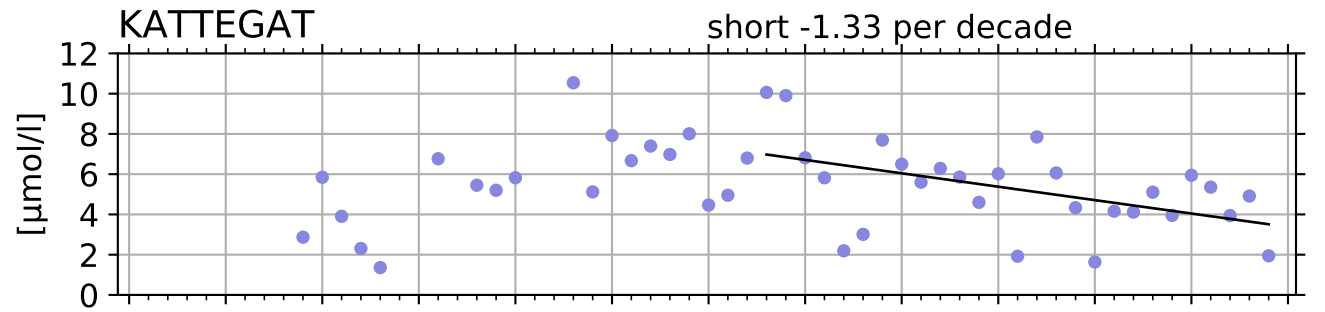
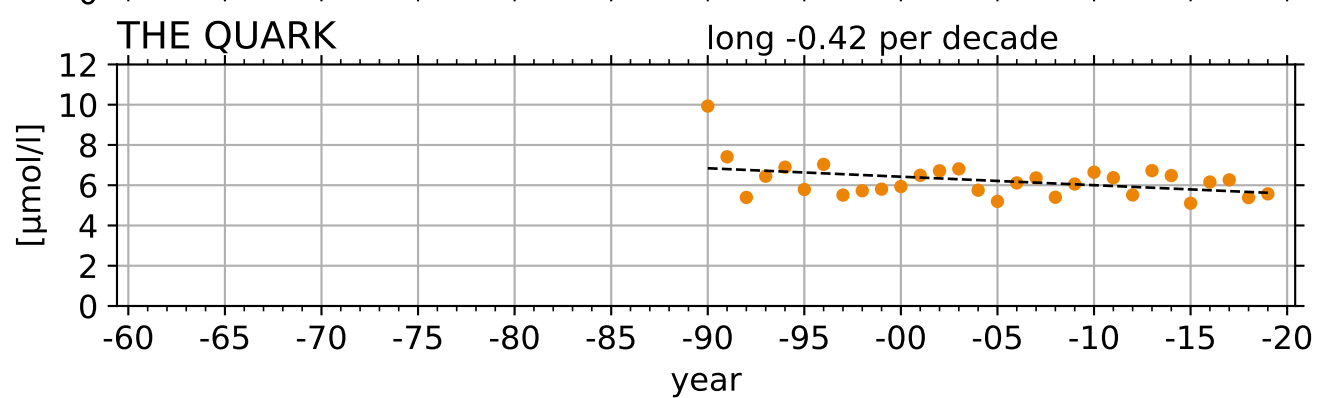
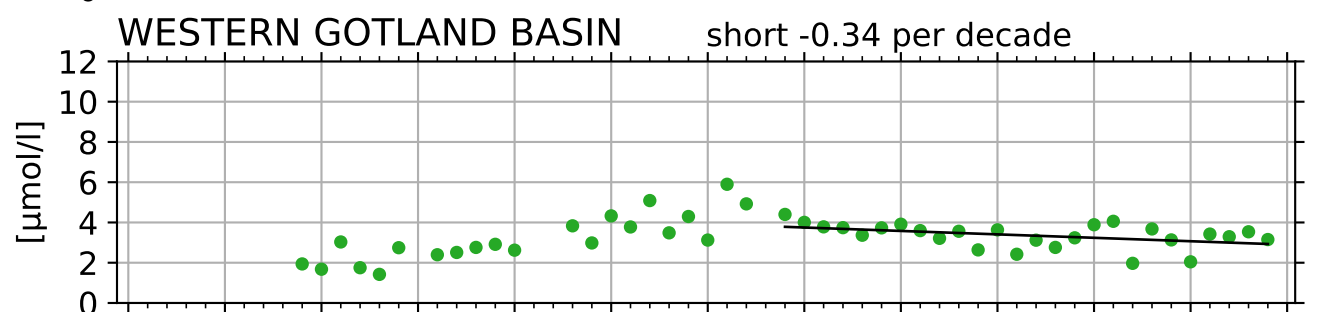
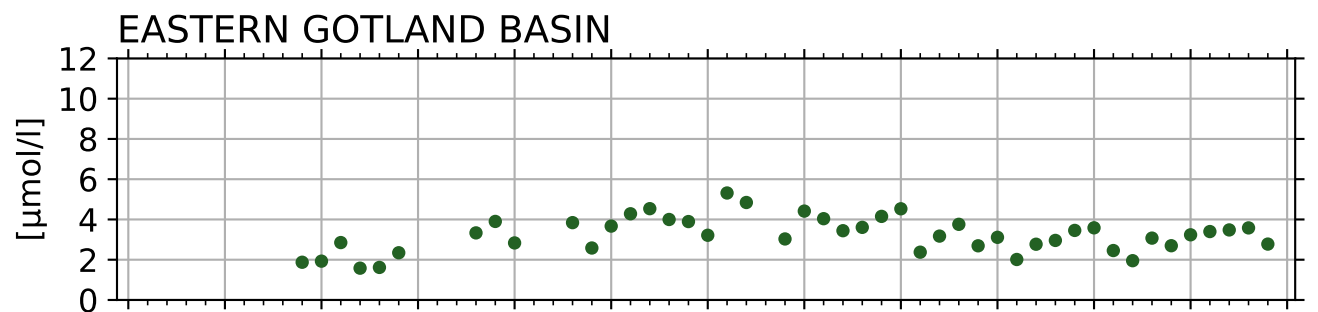
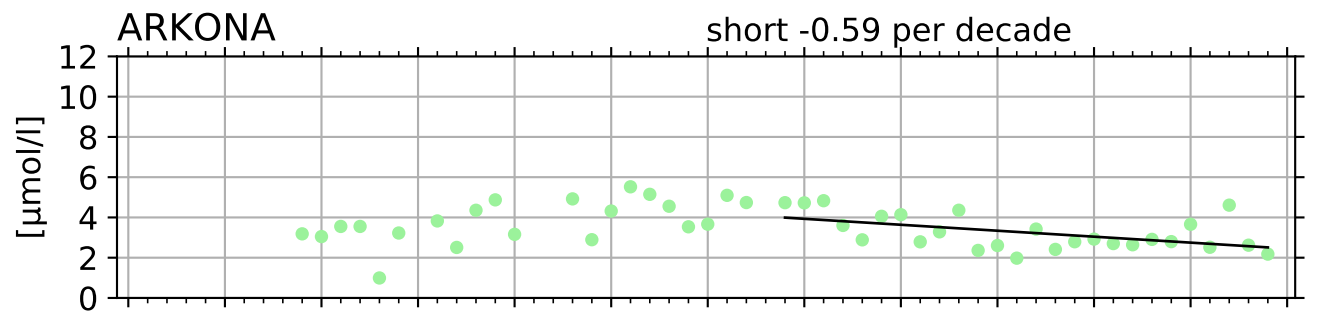
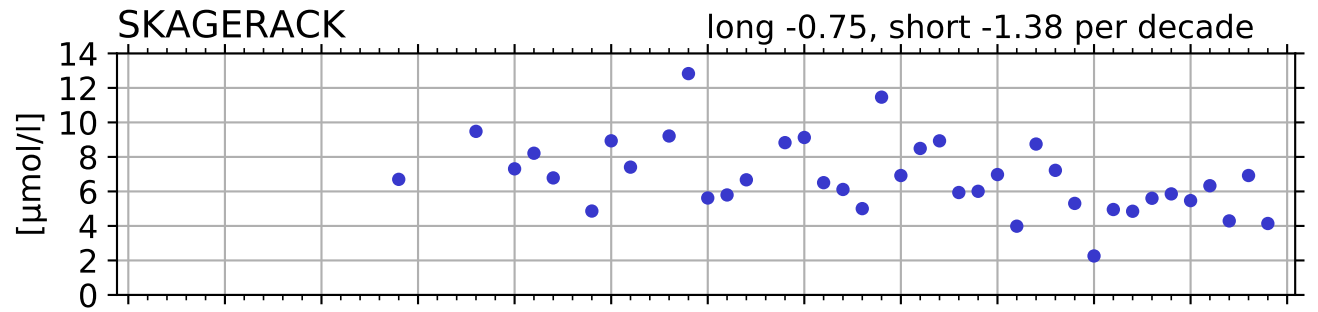
year

year

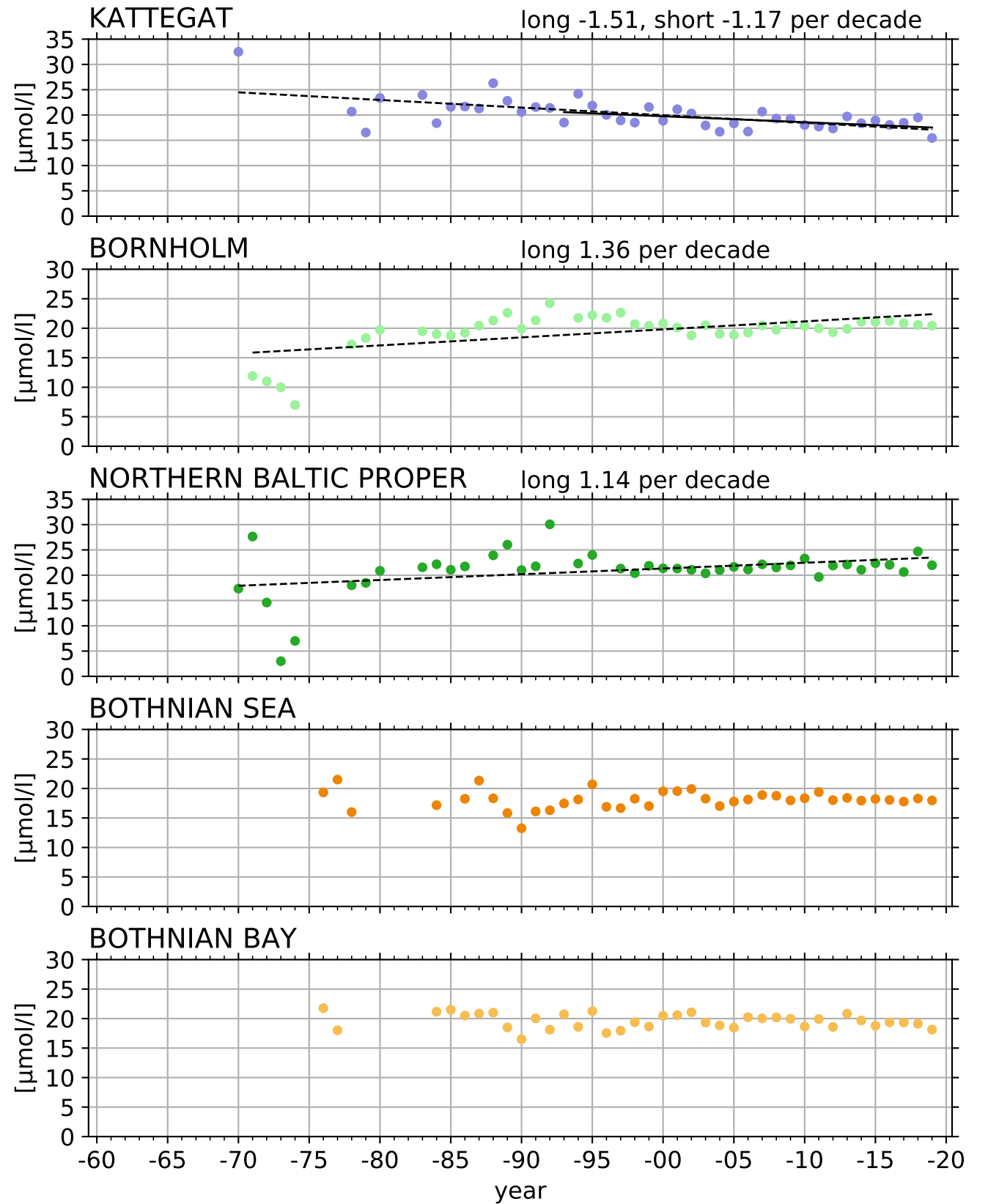
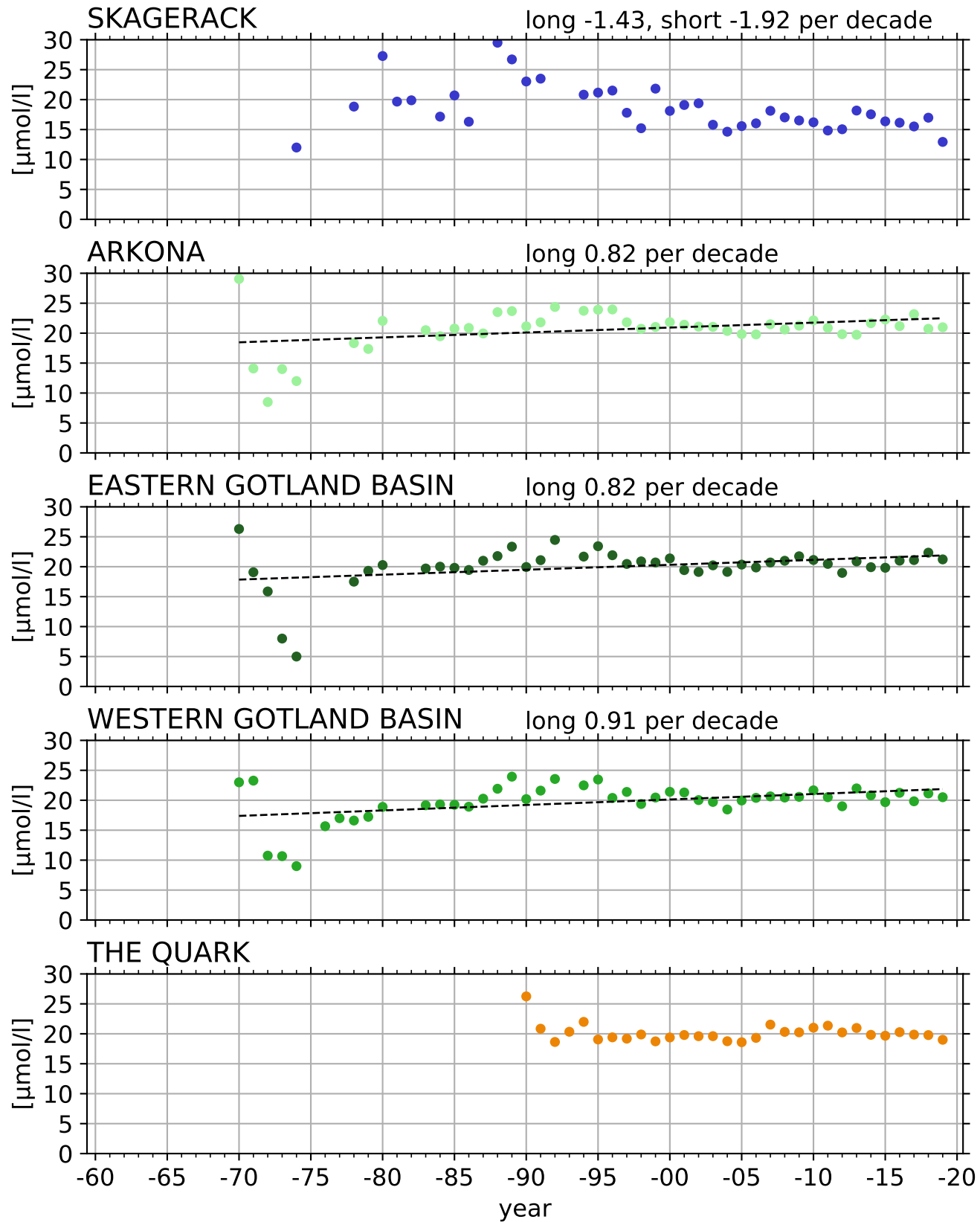
Total phosphorus winter [$\mu\text{mol/l}$] 0-10 m



DIN winter [$\mu\text{mol/l}$] 0-10 m



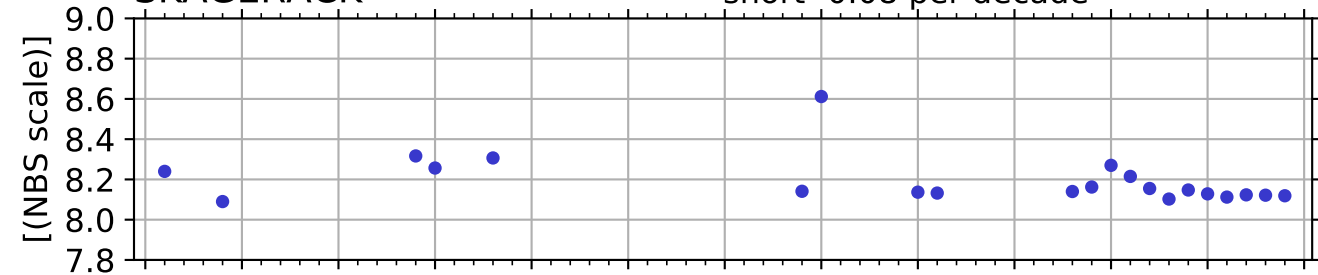
Total Nitrogen winter [$\mu\text{mol/l}$] 0-10 m



pH winter [(NBS scale)] 0-10 m

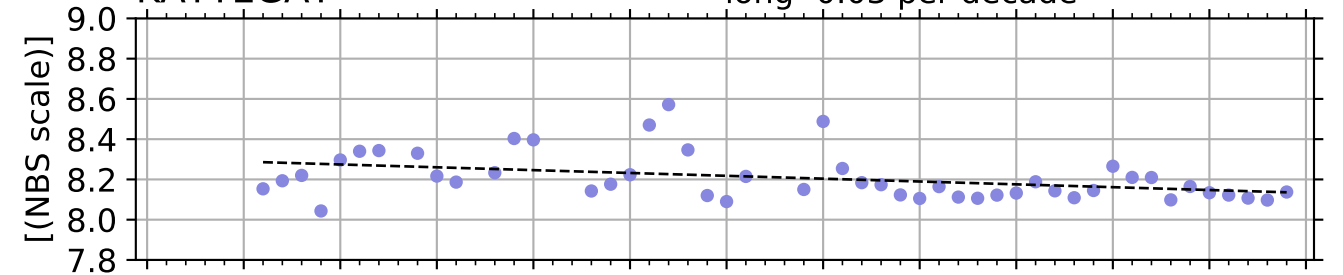
SKAGERACK

short -0.08 per decade

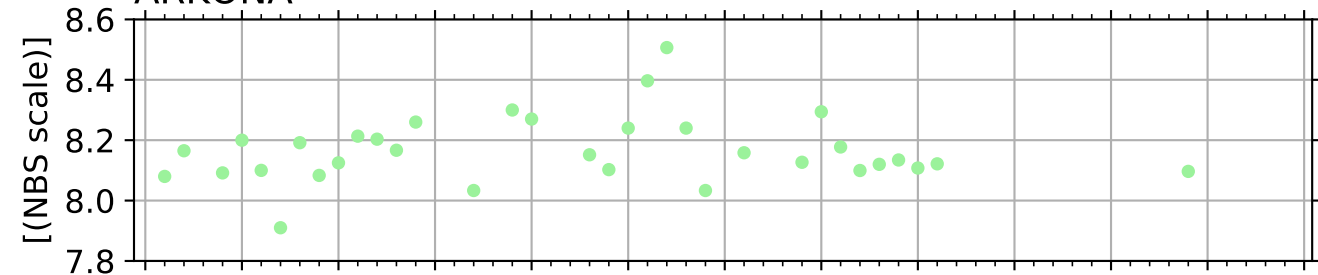


KATTEGAT

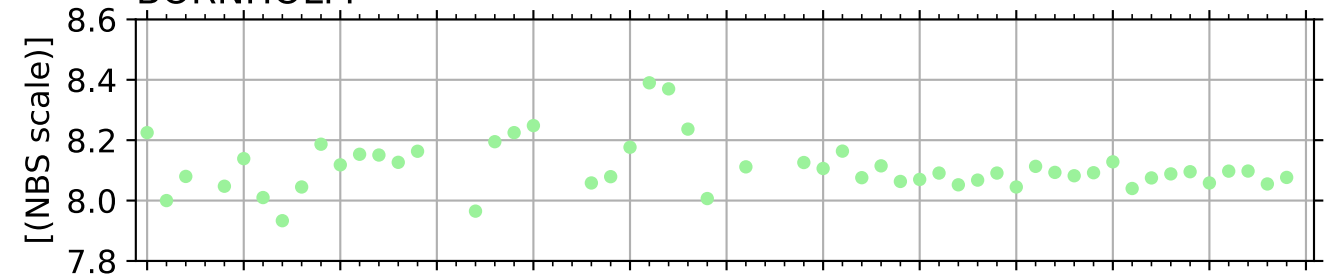
long -0.03 per decade



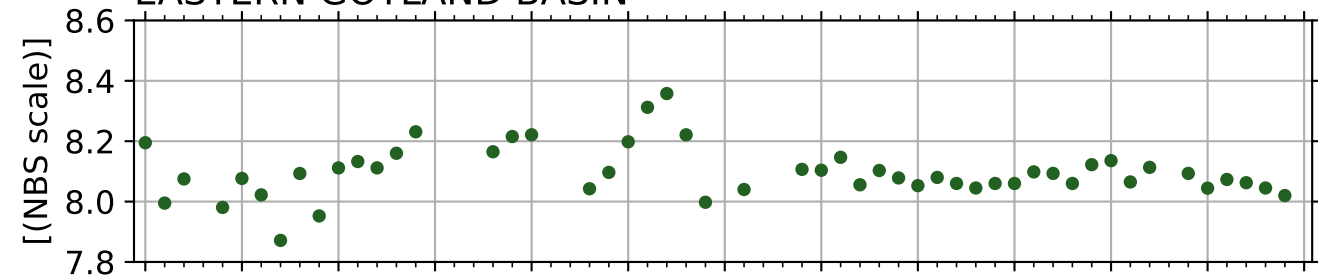
ARKONA



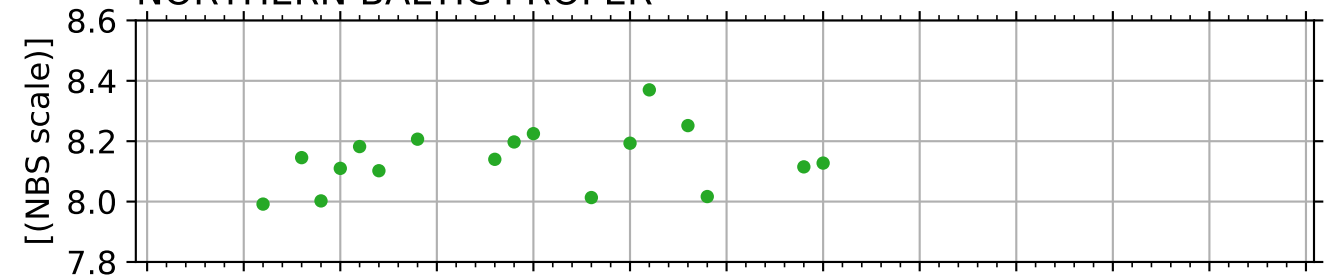
BORNHOLM



EASTERN GOTLAND BASIN

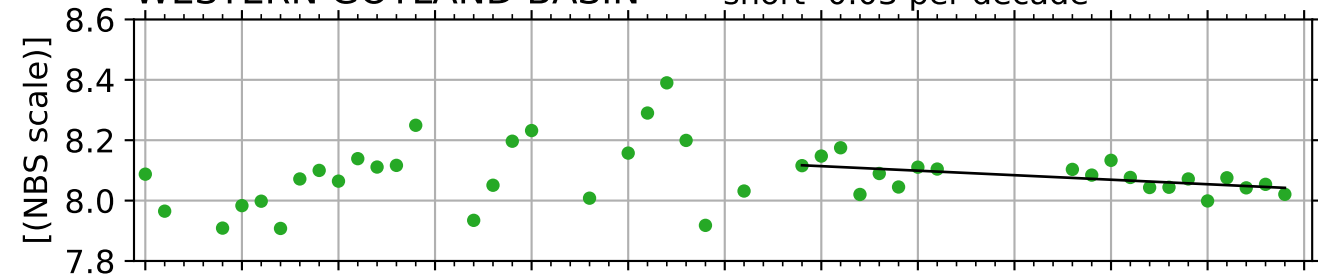


NORTHERN BALTIC PROPER

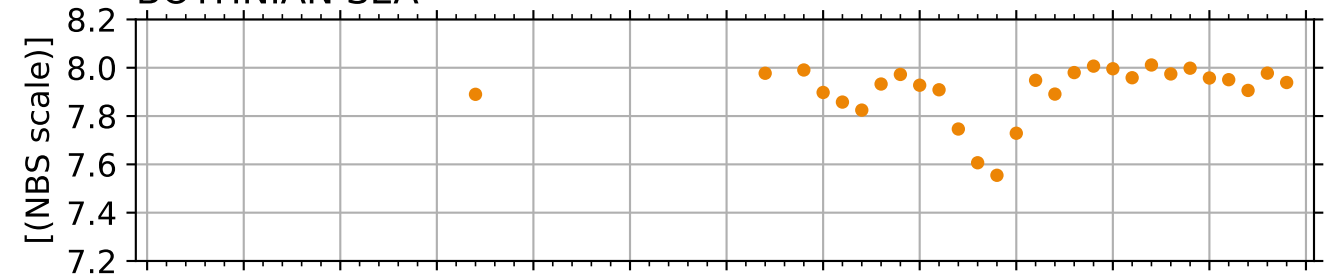


WESTERN GOTLAND BASIN

short -0.03 per decade

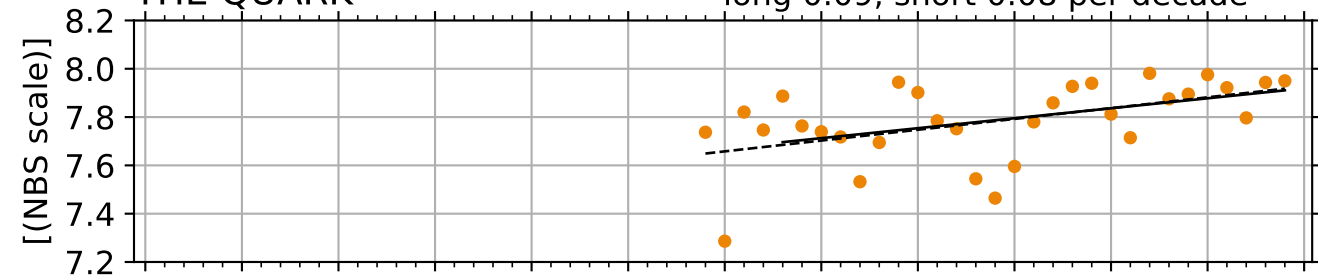


BOTHNIAN SEA

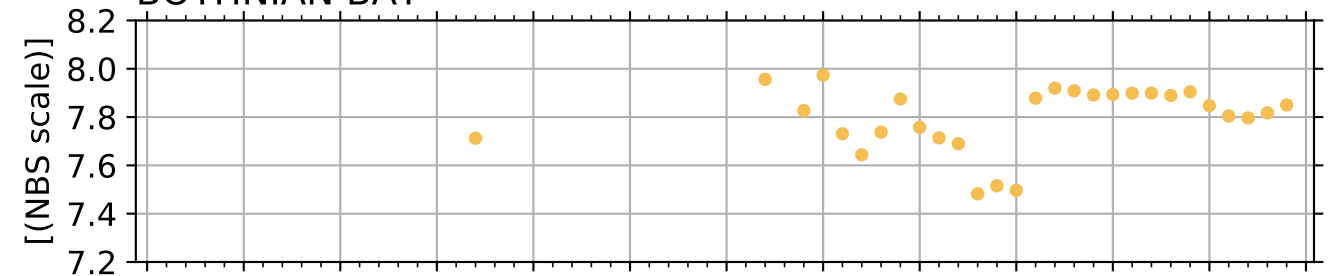


THE QUARK

long 0.09, short 0.08 per decade



BOTHNIAN BAY

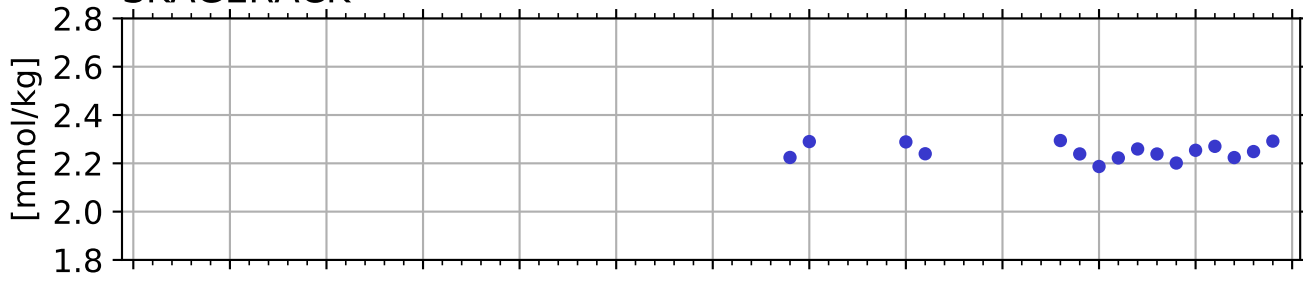


year

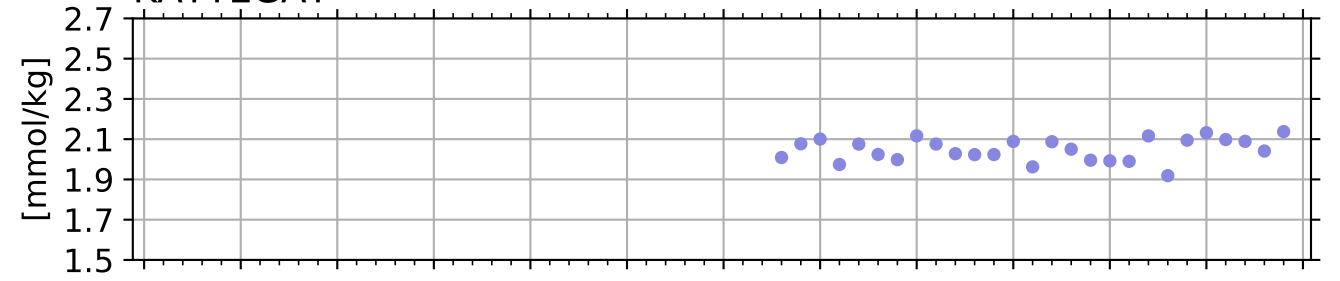
year

Alkalinity winter [mmol/kg] 0-10 m

SKAGERACK

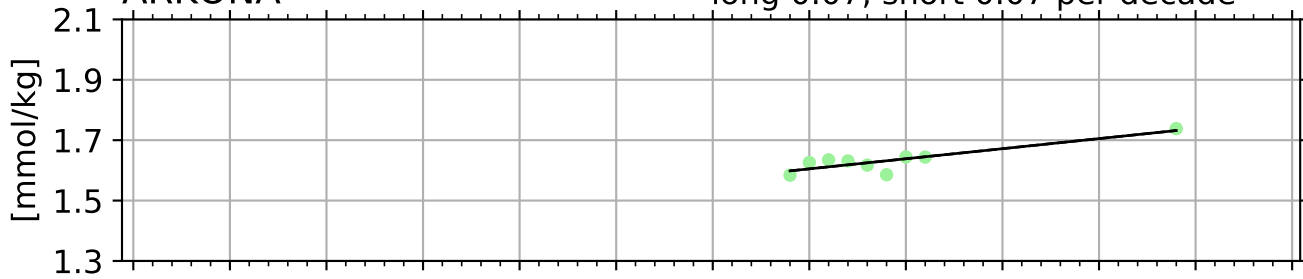


KATTEGAT



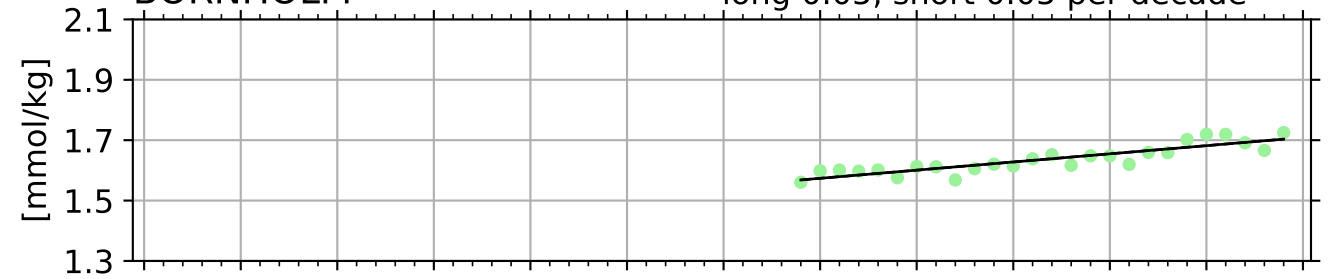
ARKONA

long 0.07, short 0.07 per decade



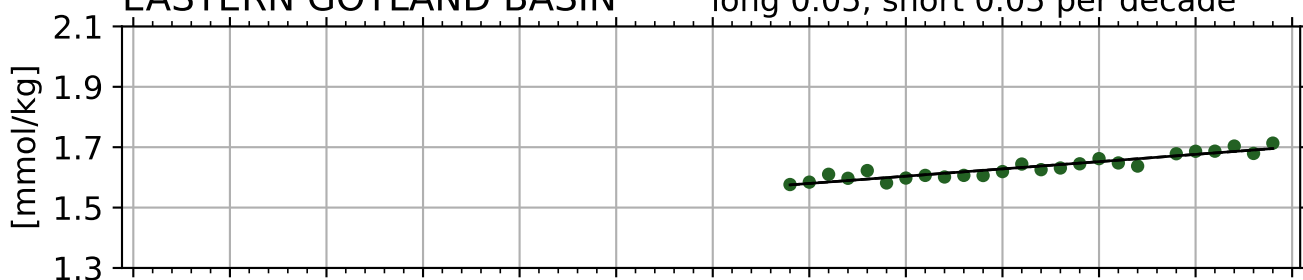
BORNHOLM

long 0.05, short 0.05 per decade

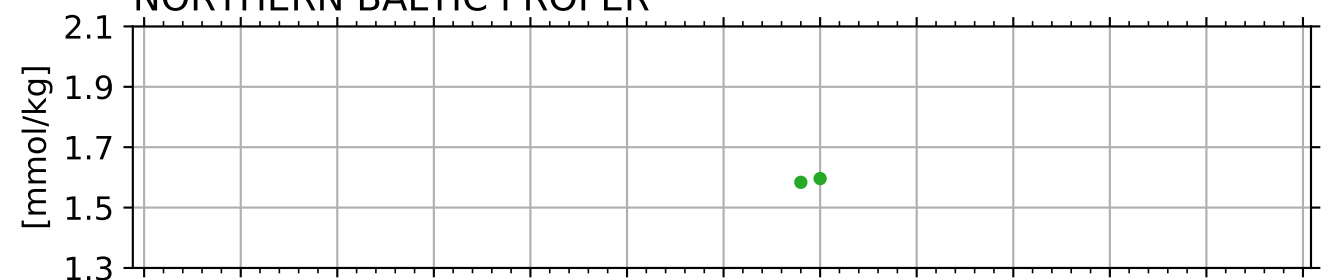


EASTERN GOTLAND BASIN

long 0.05, short 0.05 per decade

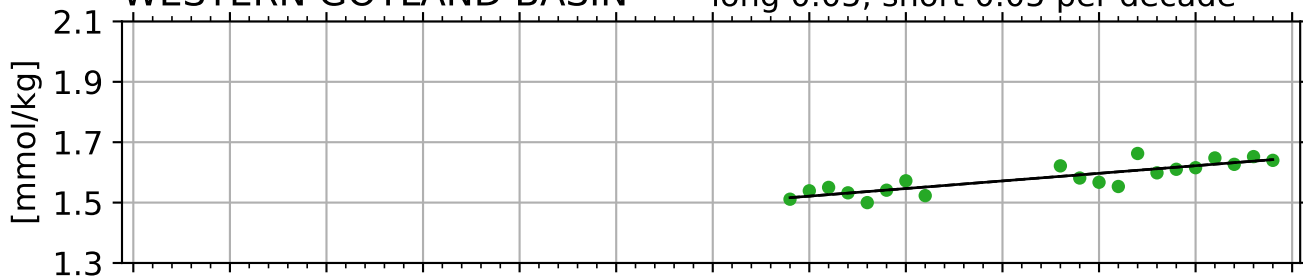


NORTHERN BALTIC PROPER



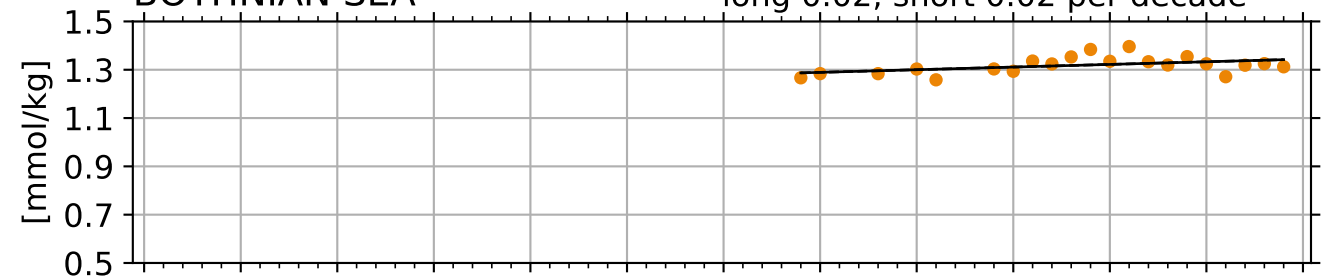
WESTERN GOTLAND BASIN

long 0.05, short 0.05 per decade



BOTHNIAN SEA

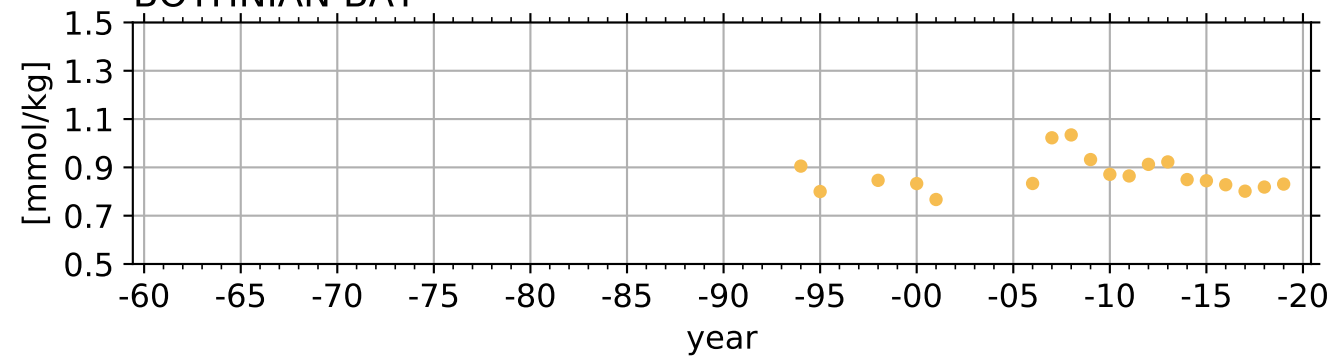
long 0.02, short 0.02 per decade



THE QUARK

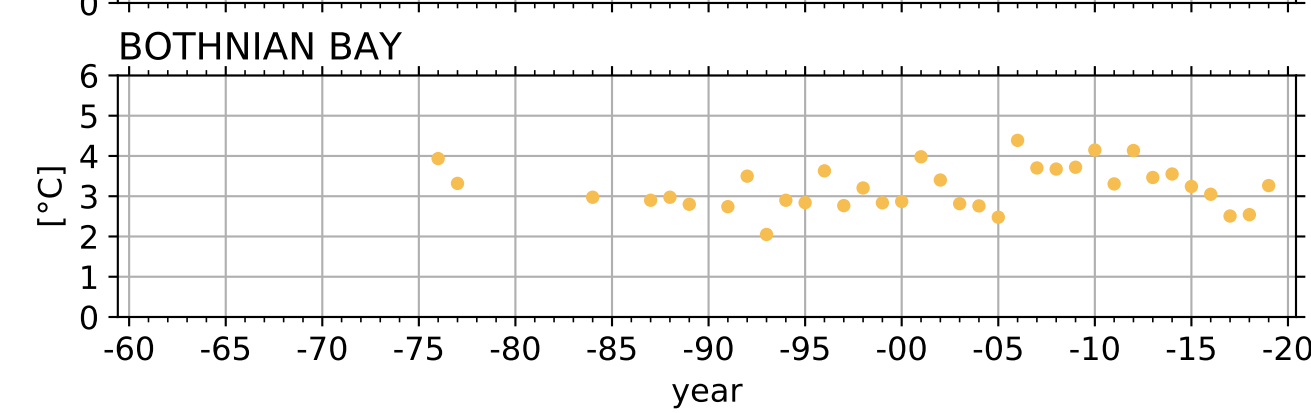
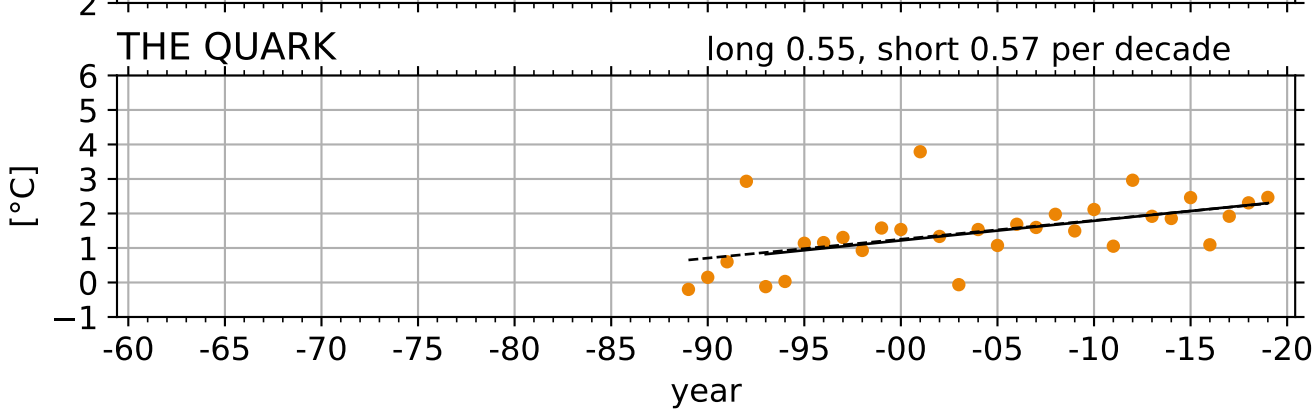
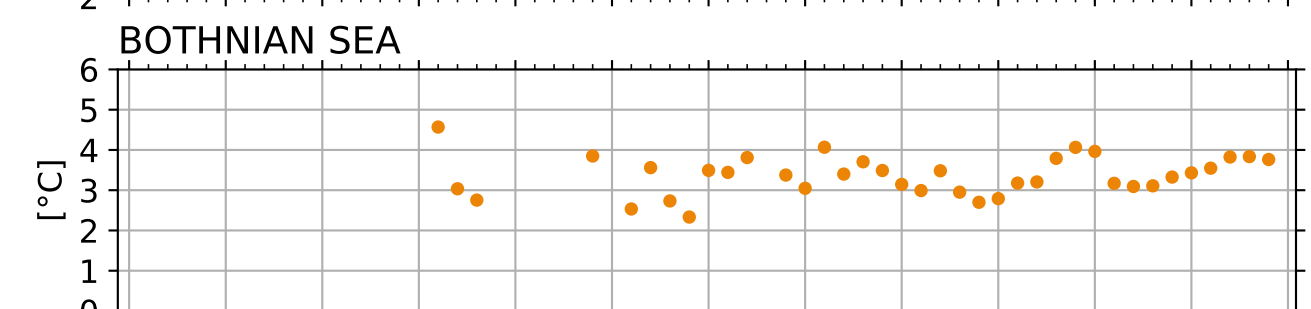
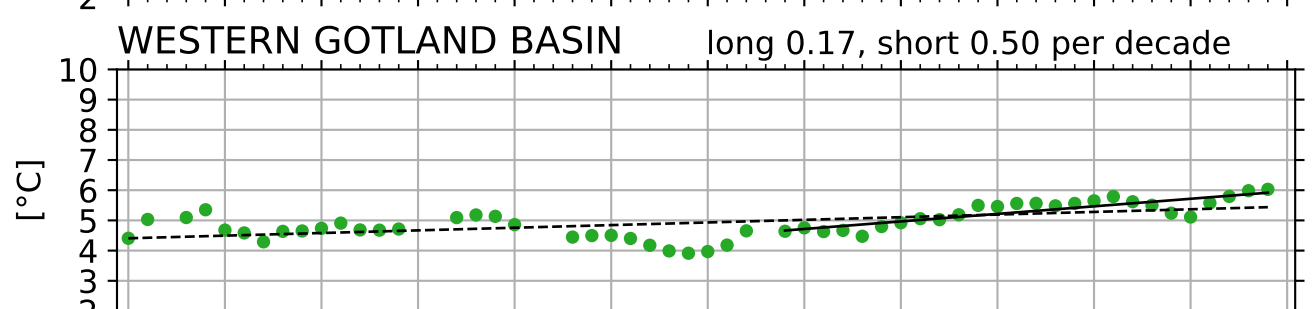
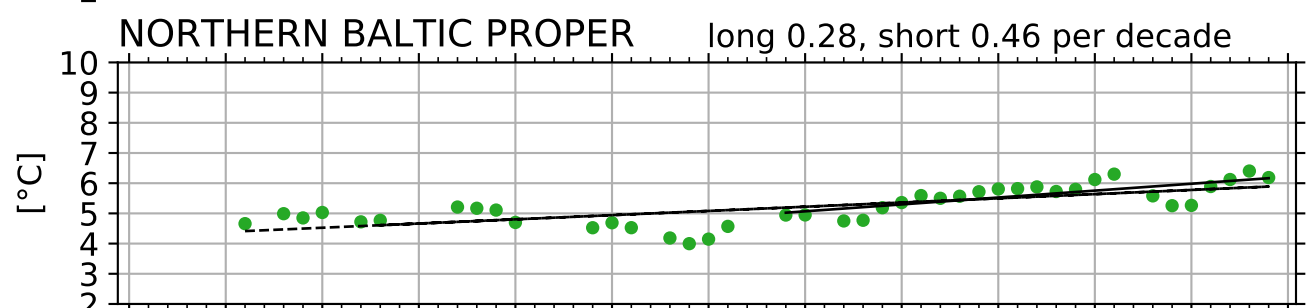
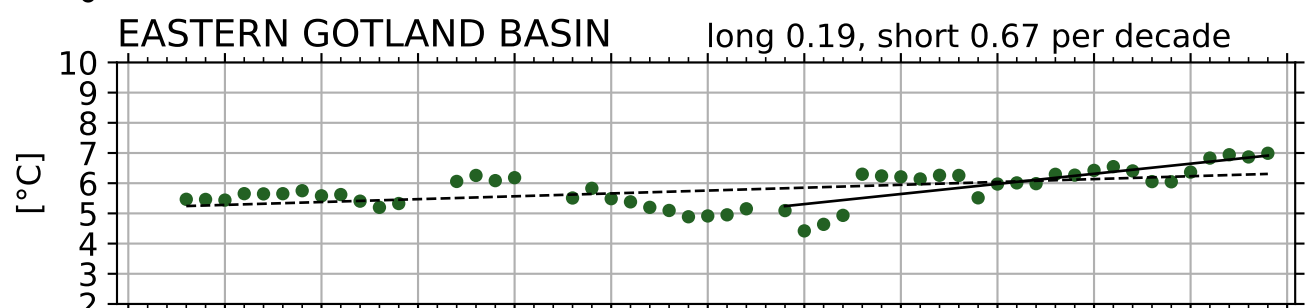
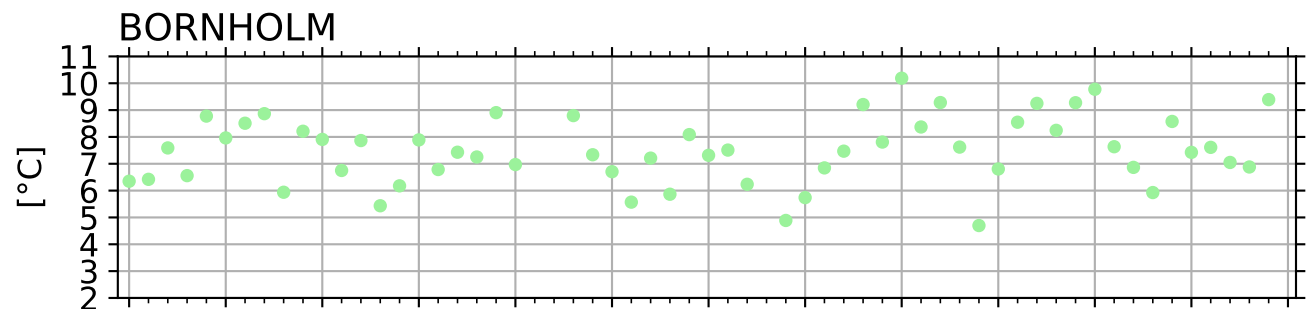
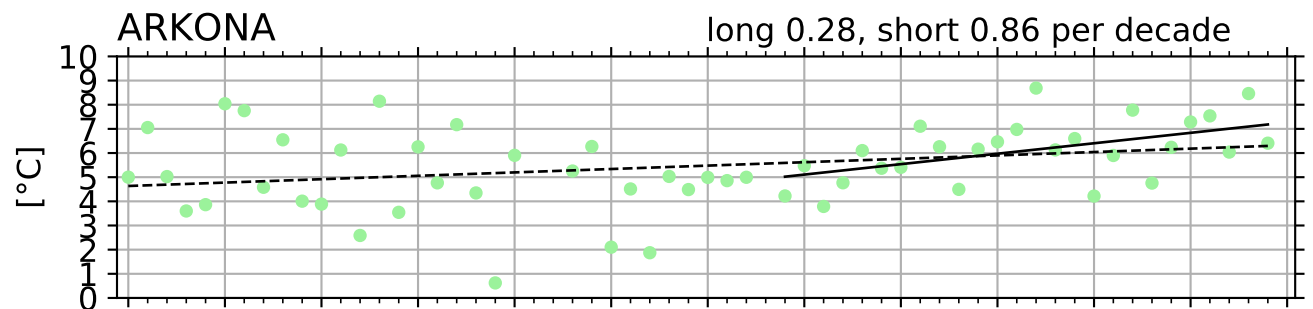
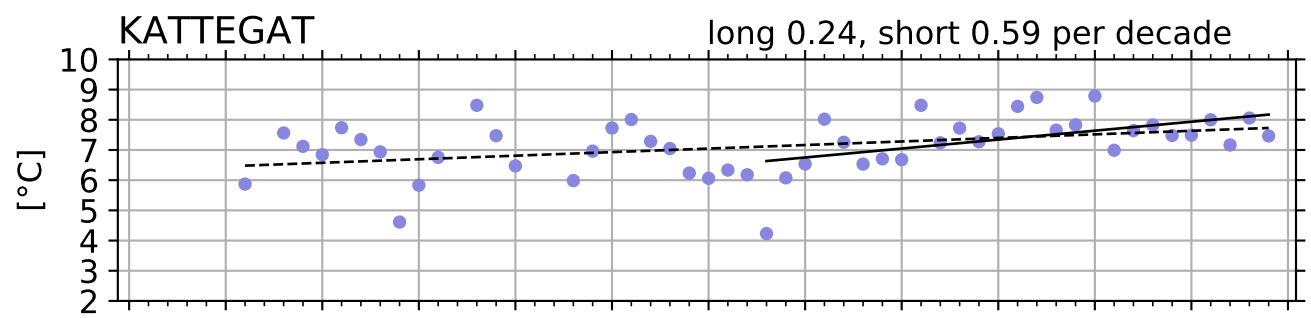
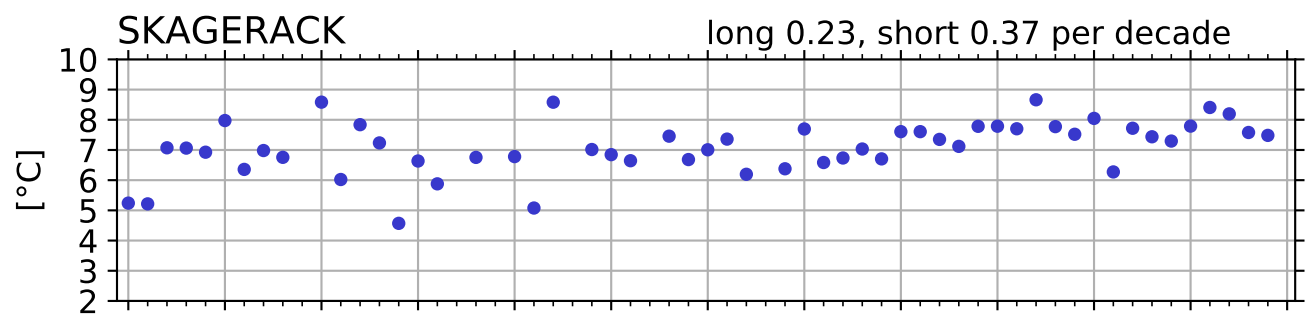


BOTHNIAN BAY

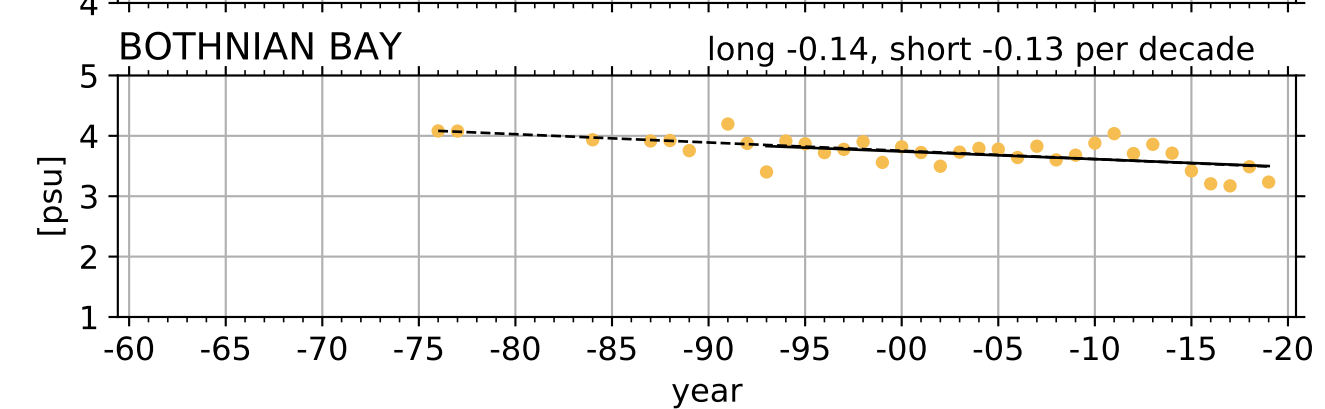
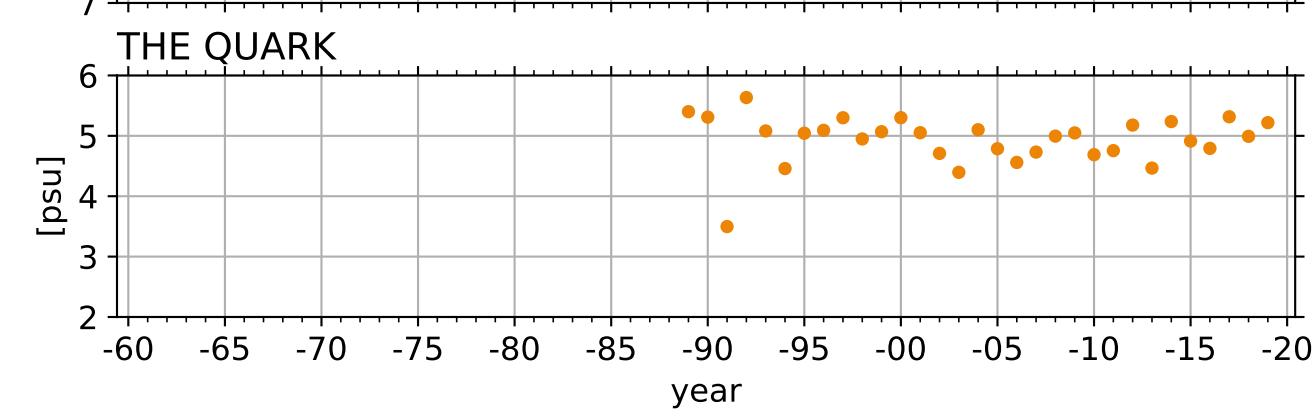
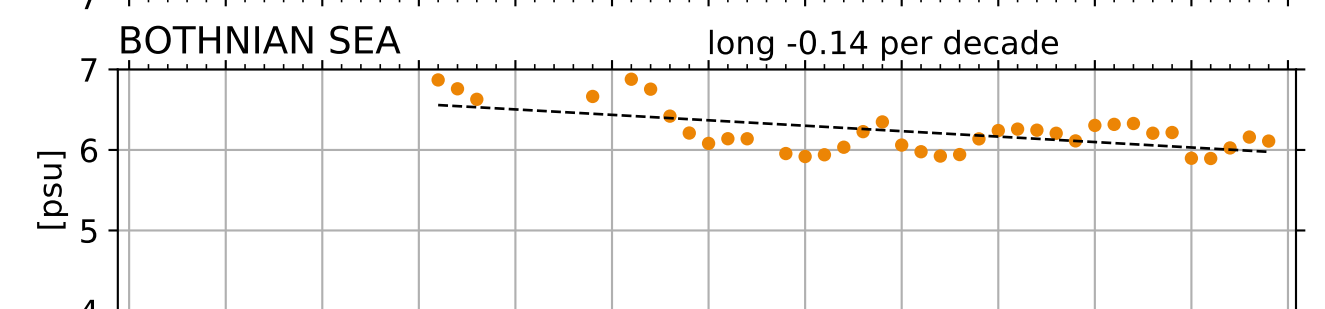
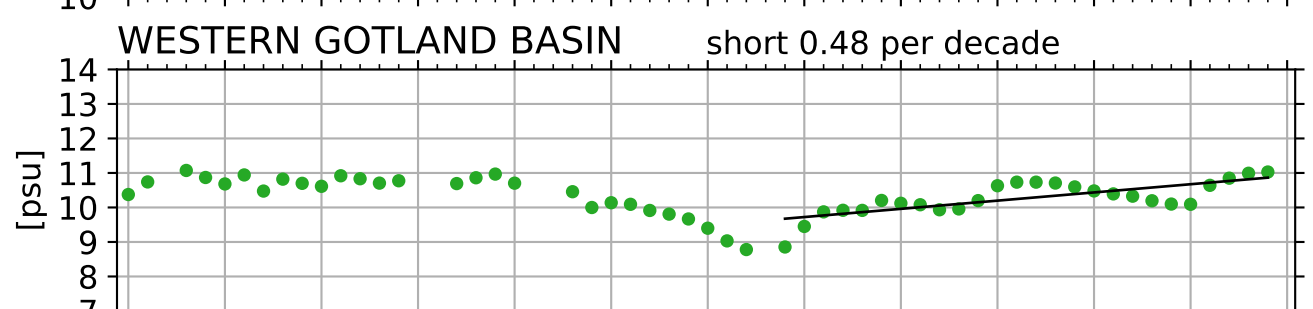
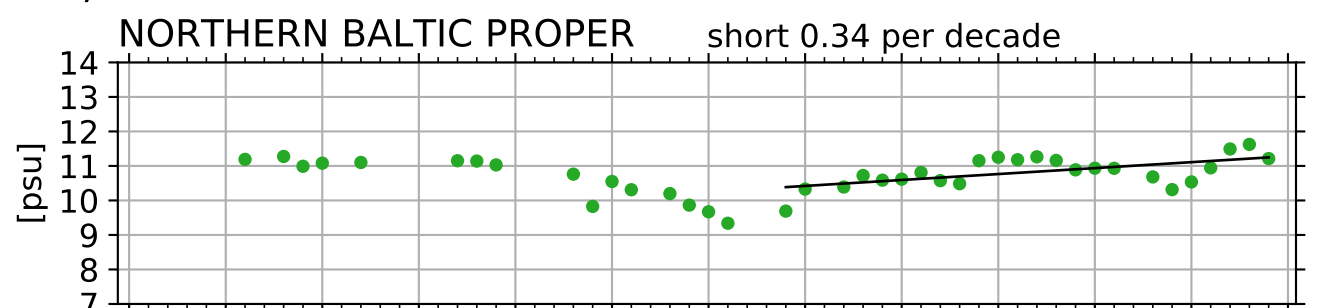
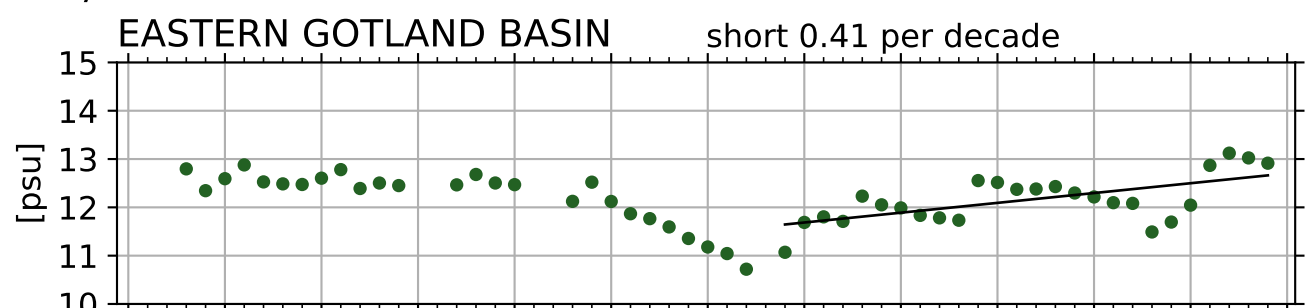
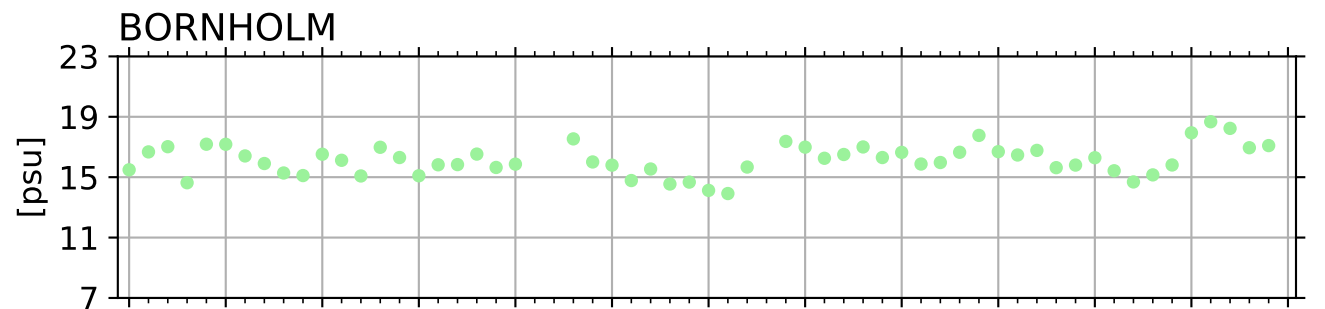
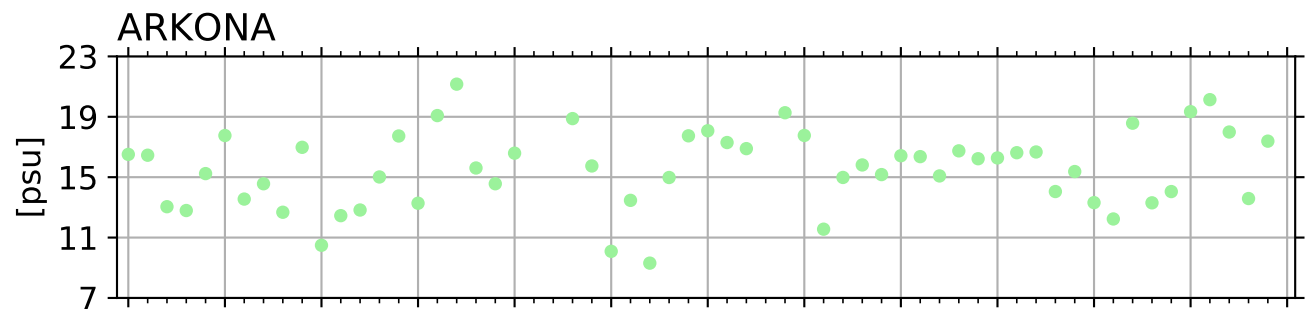
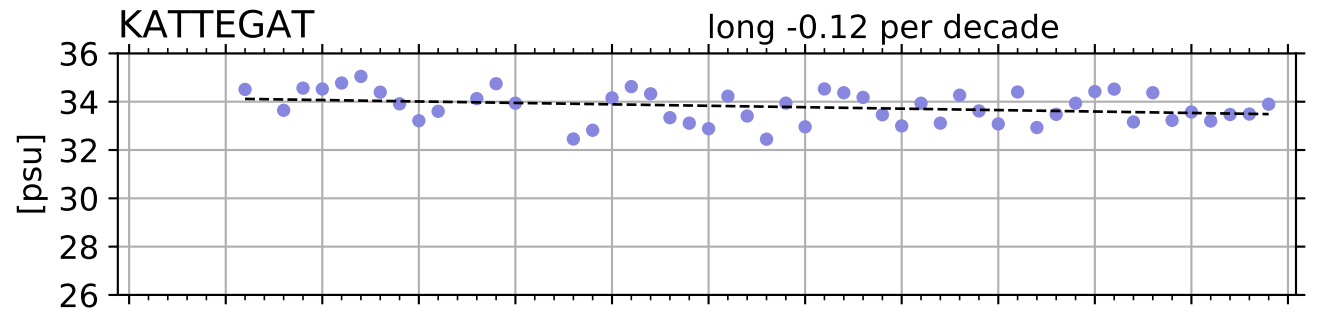
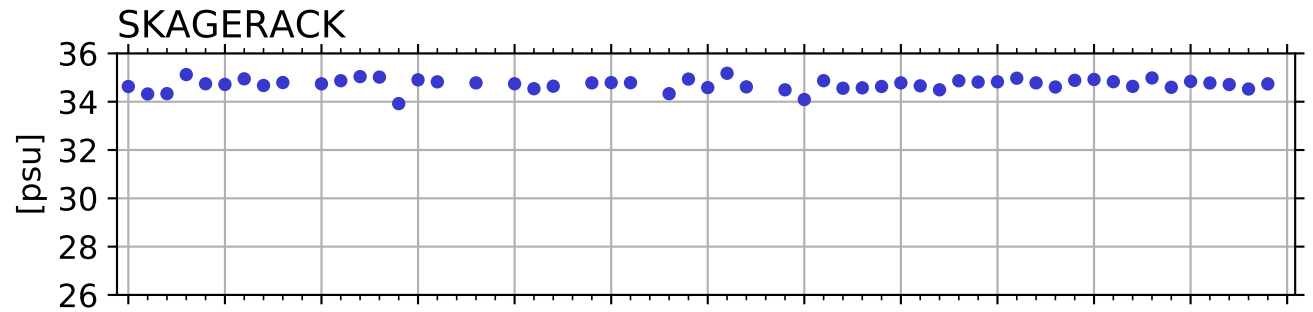


year

Temperature winter [°C] BW

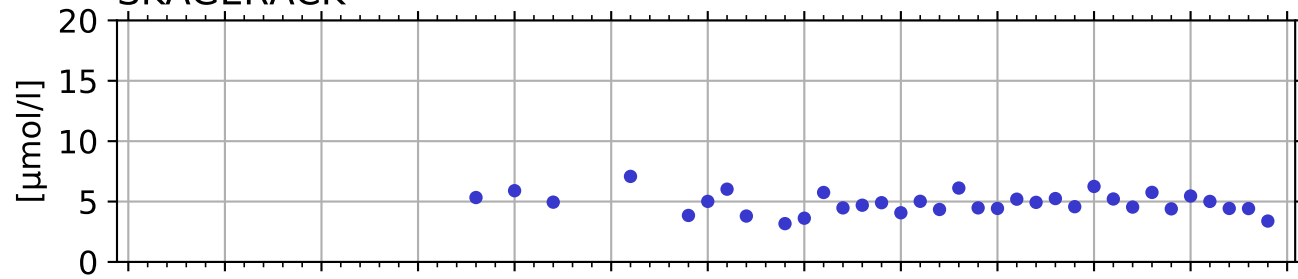


Salinity winter [psu] BW

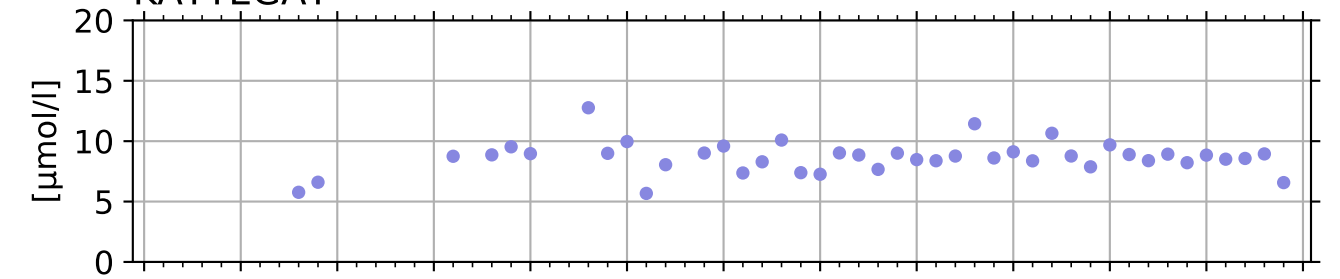


Dissolved Silica winter [$\mu\text{mol/l}$] BW

SKAGERACK

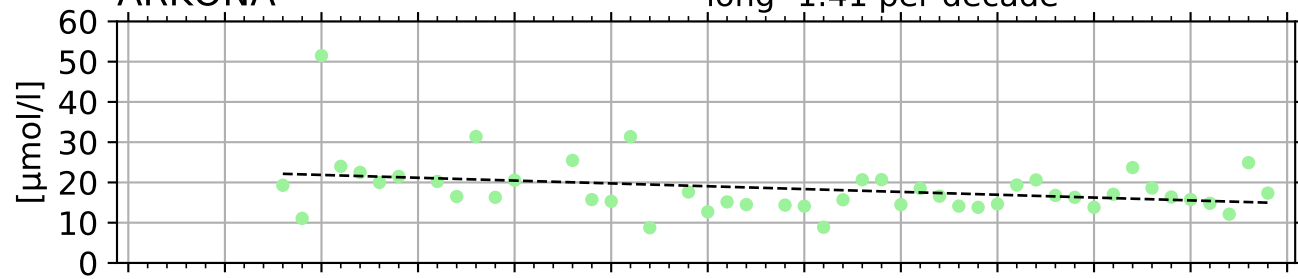


KATTEGAT

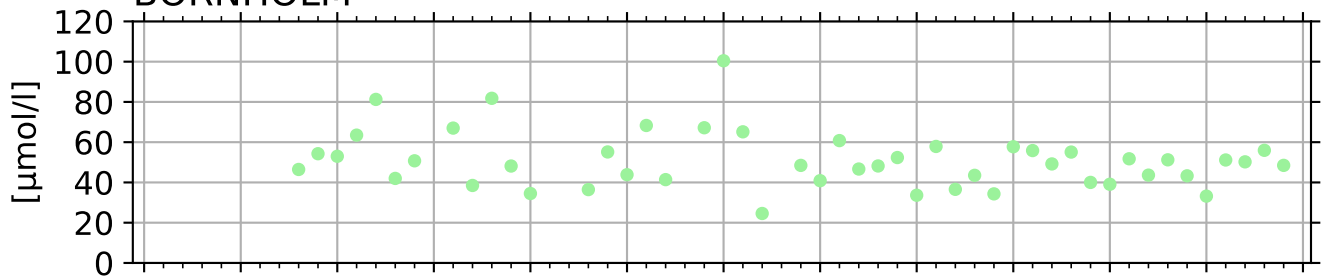


ARKONA

long -1.41 per decade

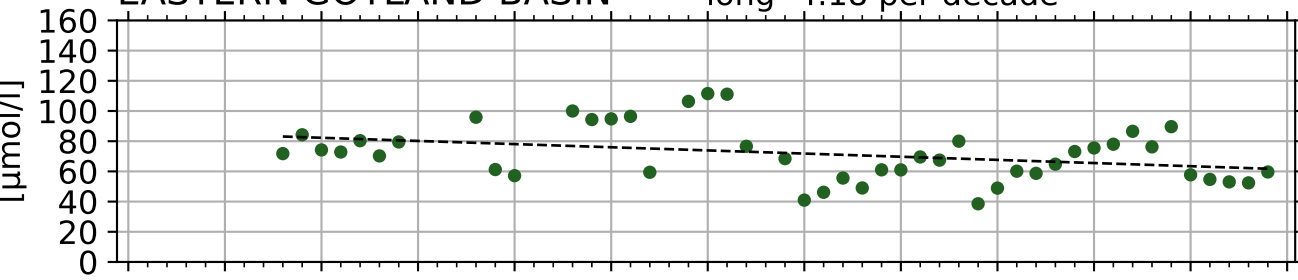


BORNHOLM



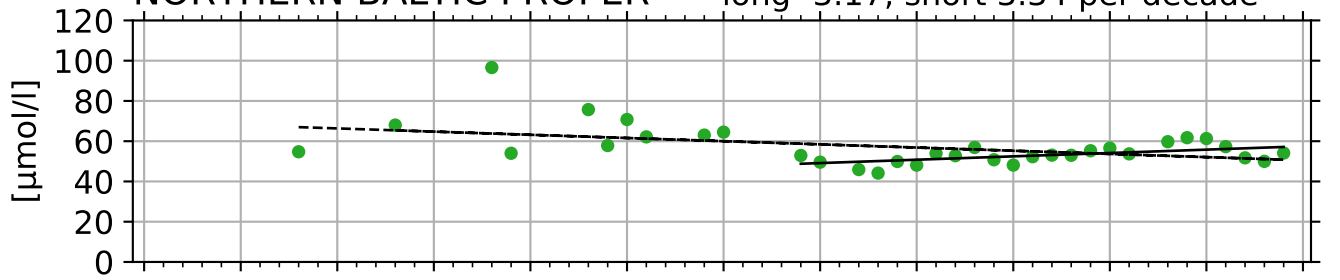
EASTERN GOTLAND BASIN

long -4.18 per decade



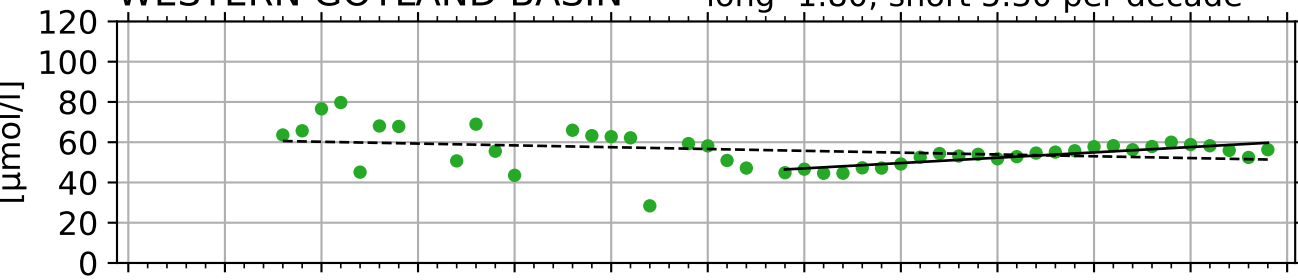
NORTHERN BALTIC PROPER

long -3.17, short 3.34 per decade



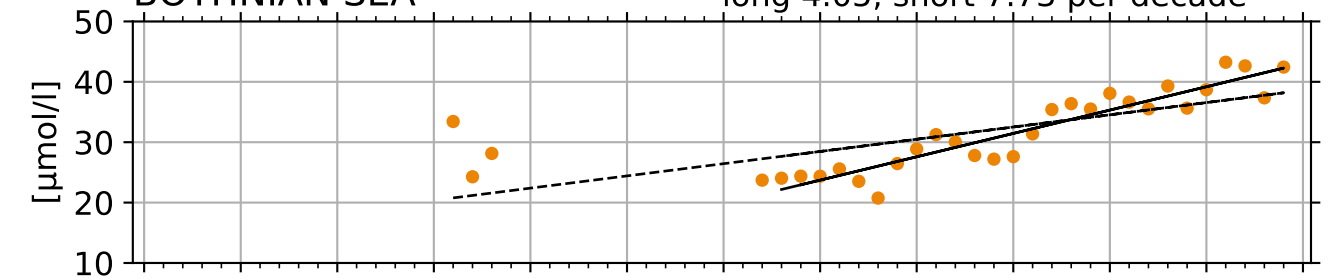
WESTERN GOTLAND BASIN

long -1.80, short 5.30 per decade



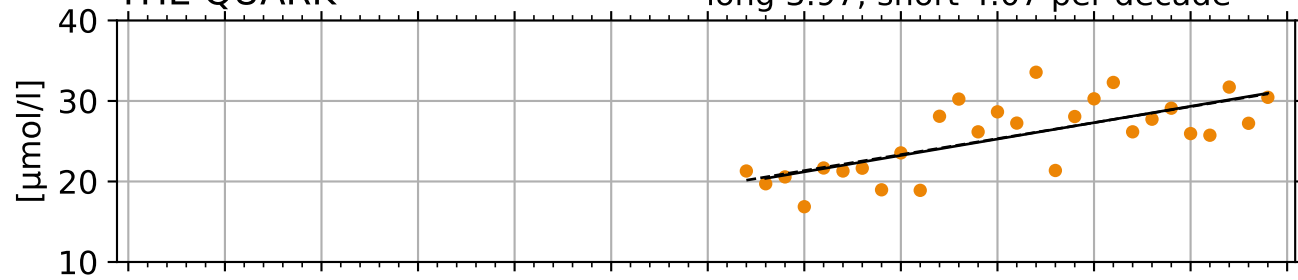
BOTHNIAN SEA

long 4.05, short 7.73 per decade



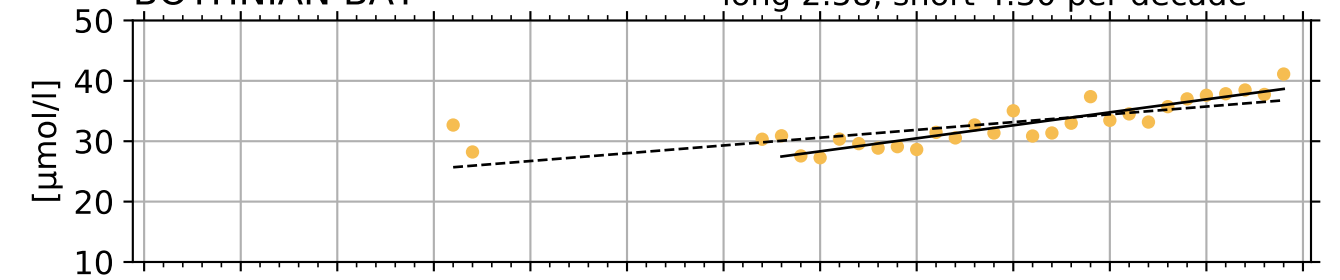
THE QUARK

long 3.97, short 4.07 per decade



BOTHNIAN BAY

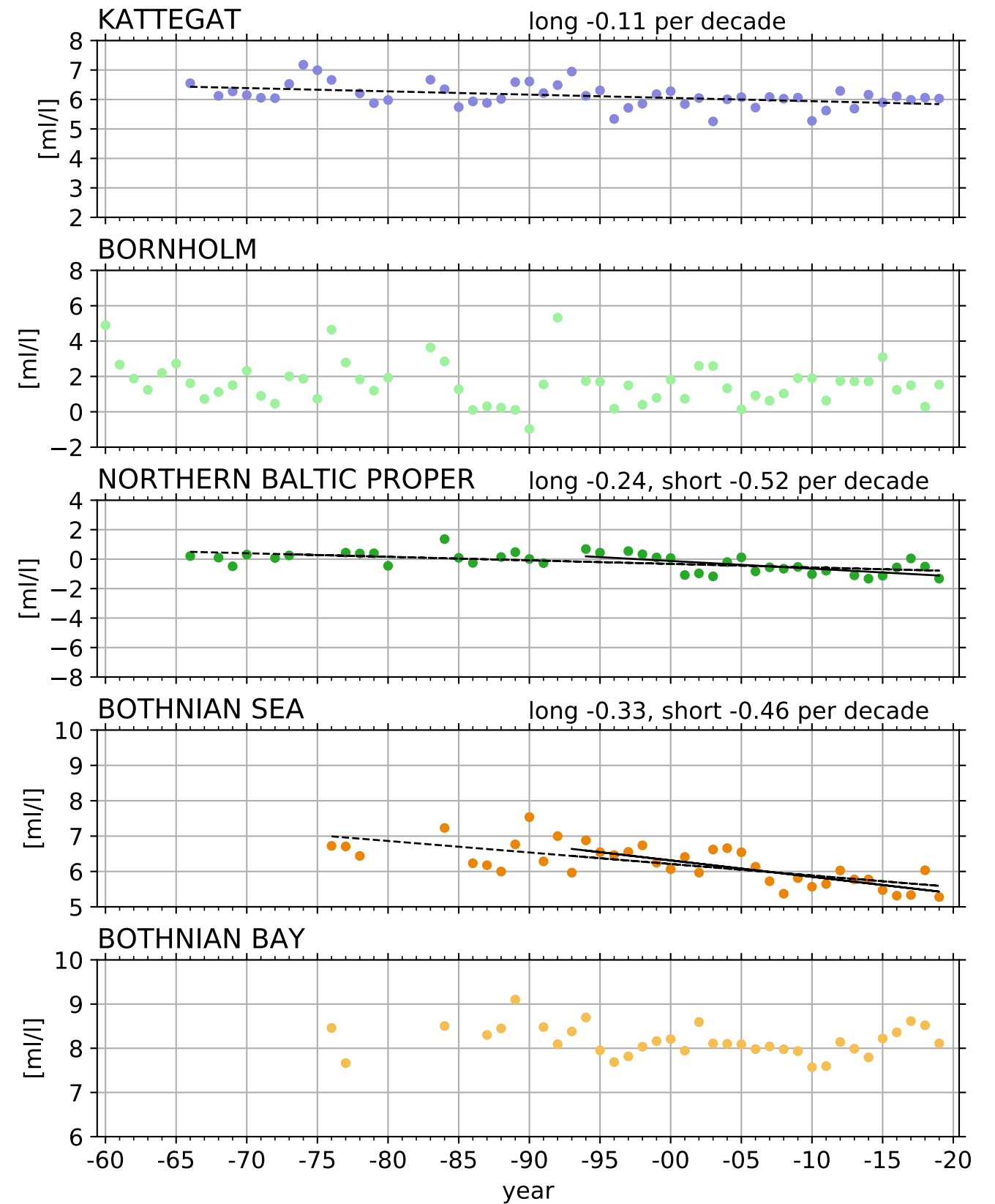
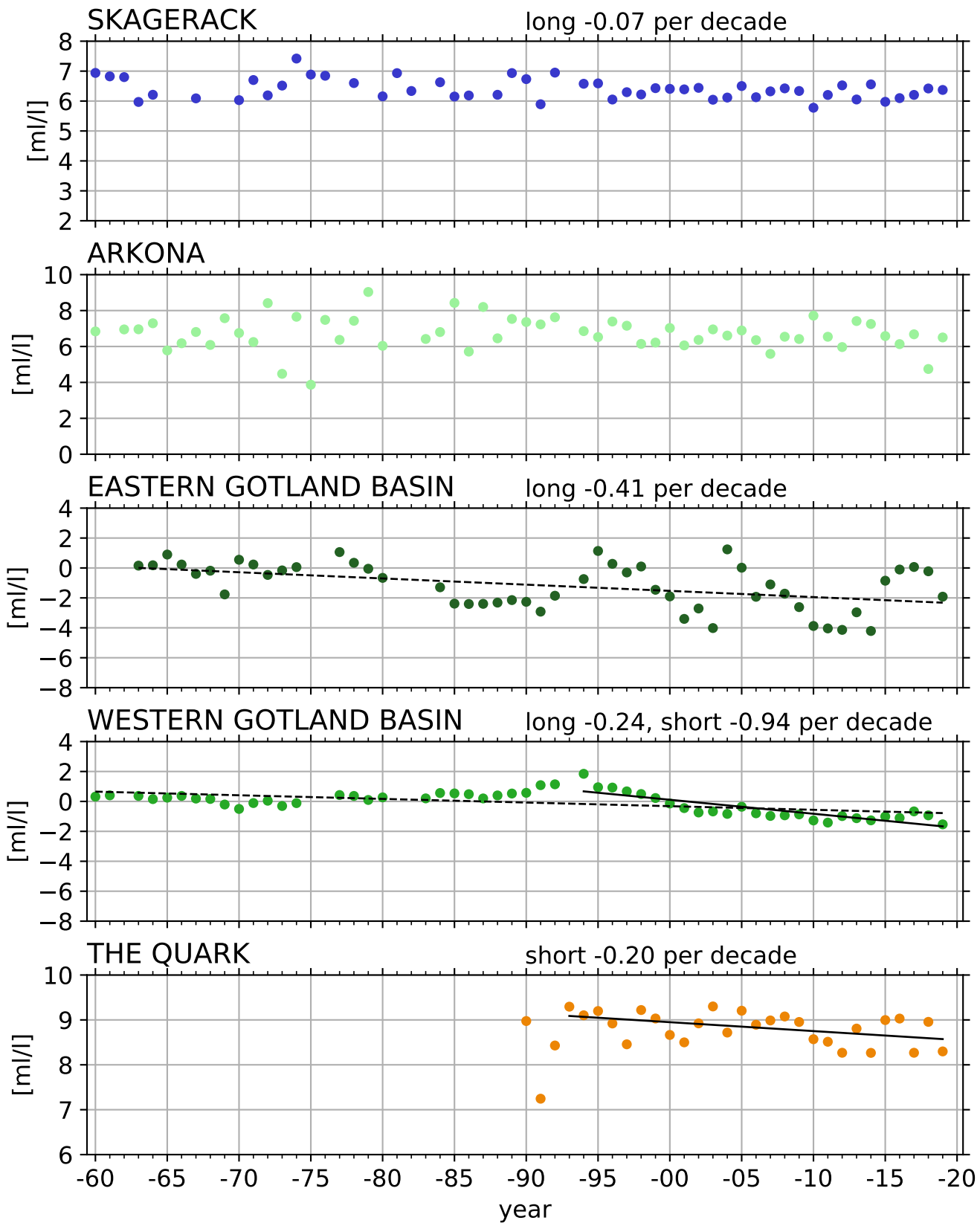
long 2.58, short 4.30 per decade



year

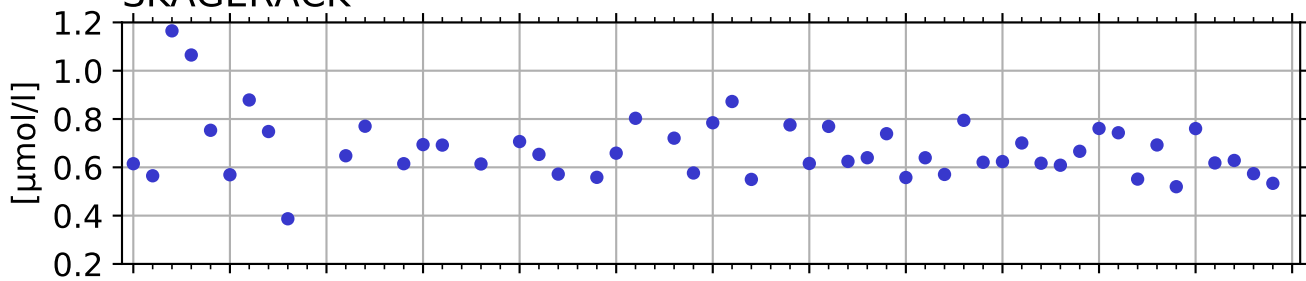
year

Dissolved oxygen winter [ml/l] BW



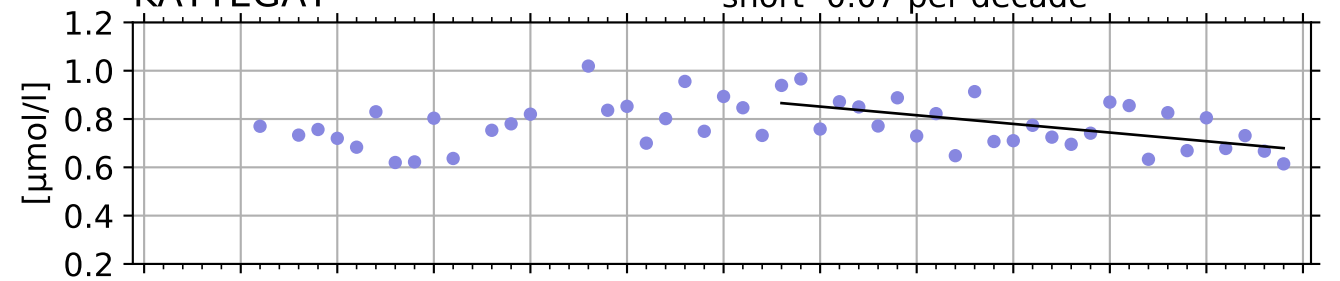
Phosphate winter [$\mu\text{mol/l}$] BW

SKAGERACK

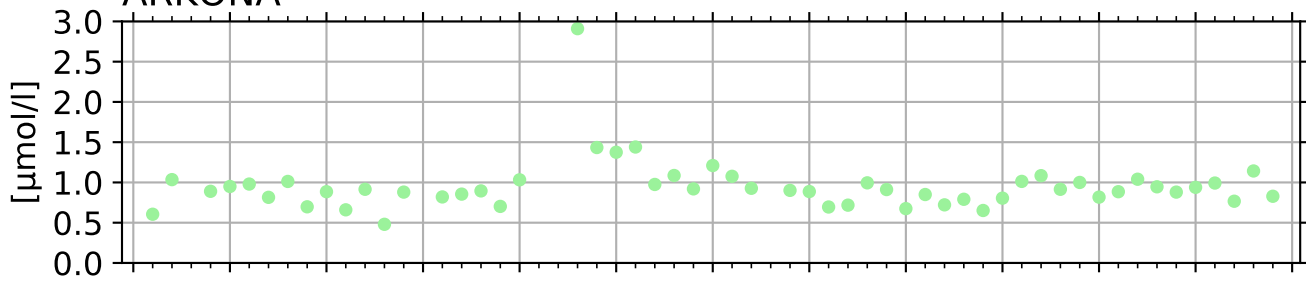


KATTEGAT

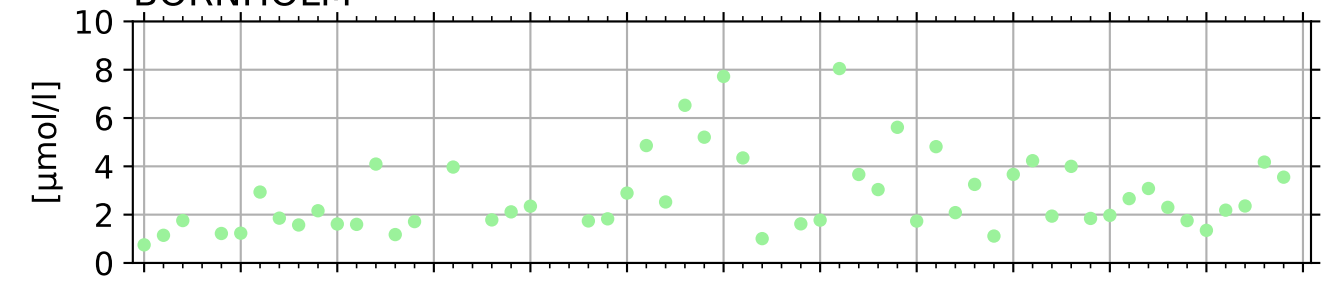
short -0.07 per decade



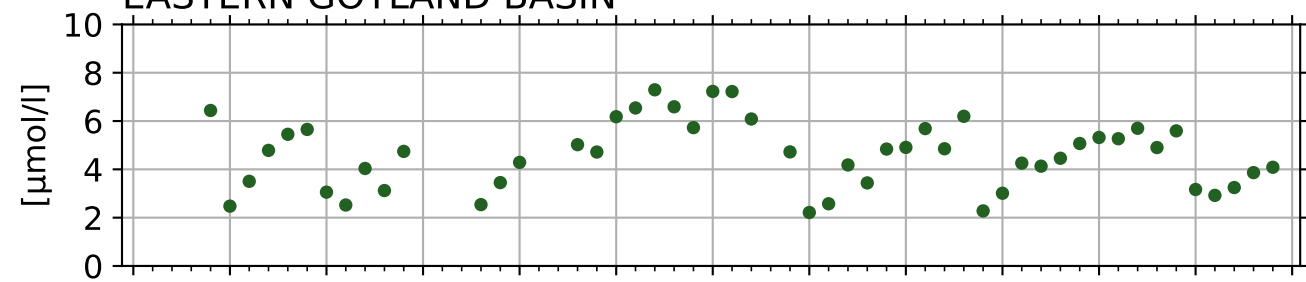
ARKONA



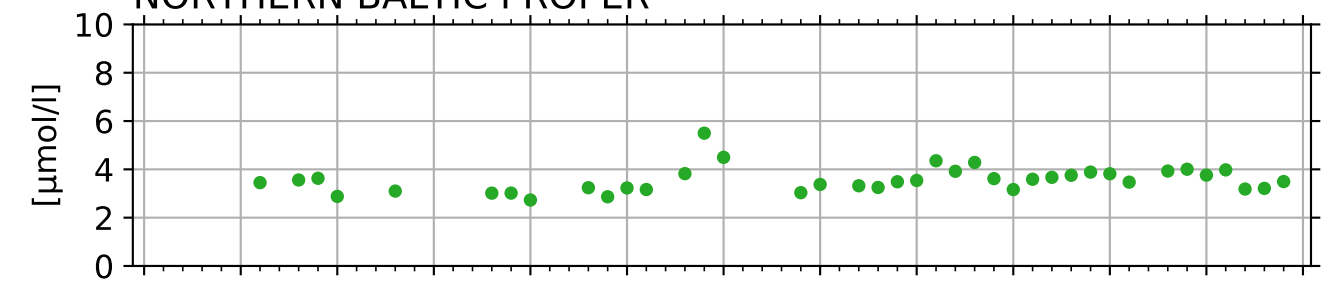
BORNHOLM



EASTERN GOTLAND BASIN

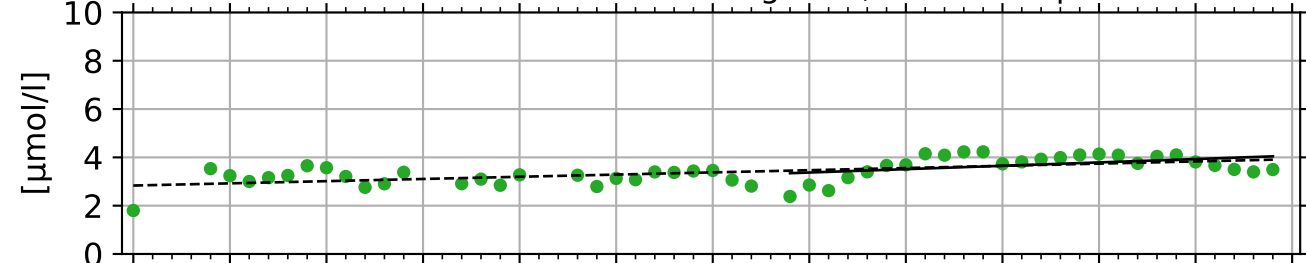


NORTHERN BALTIC PROPER



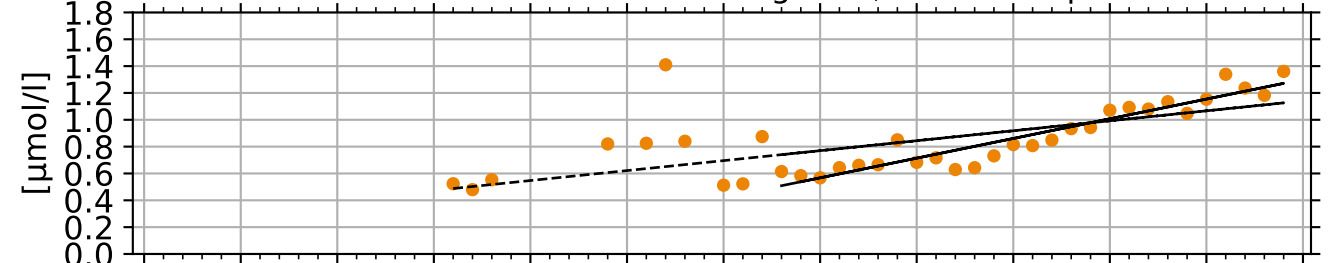
WESTERN GOTLAND BASIN

long 0.18, short 0.28 per decade



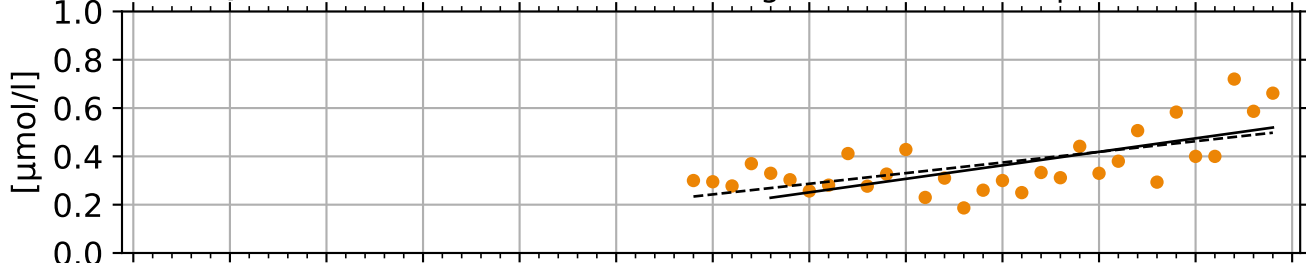
BOTHNIAN SEA

long 0.15, short 0.29 per decade

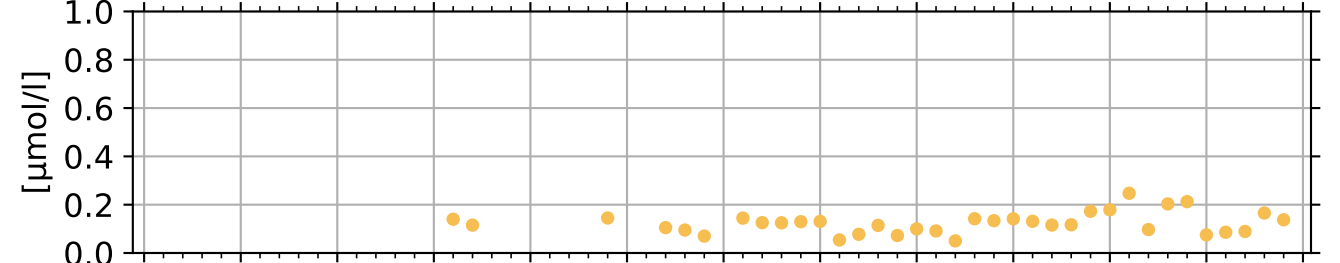


THE QUARK

long 0.09, short 0.11 per decade



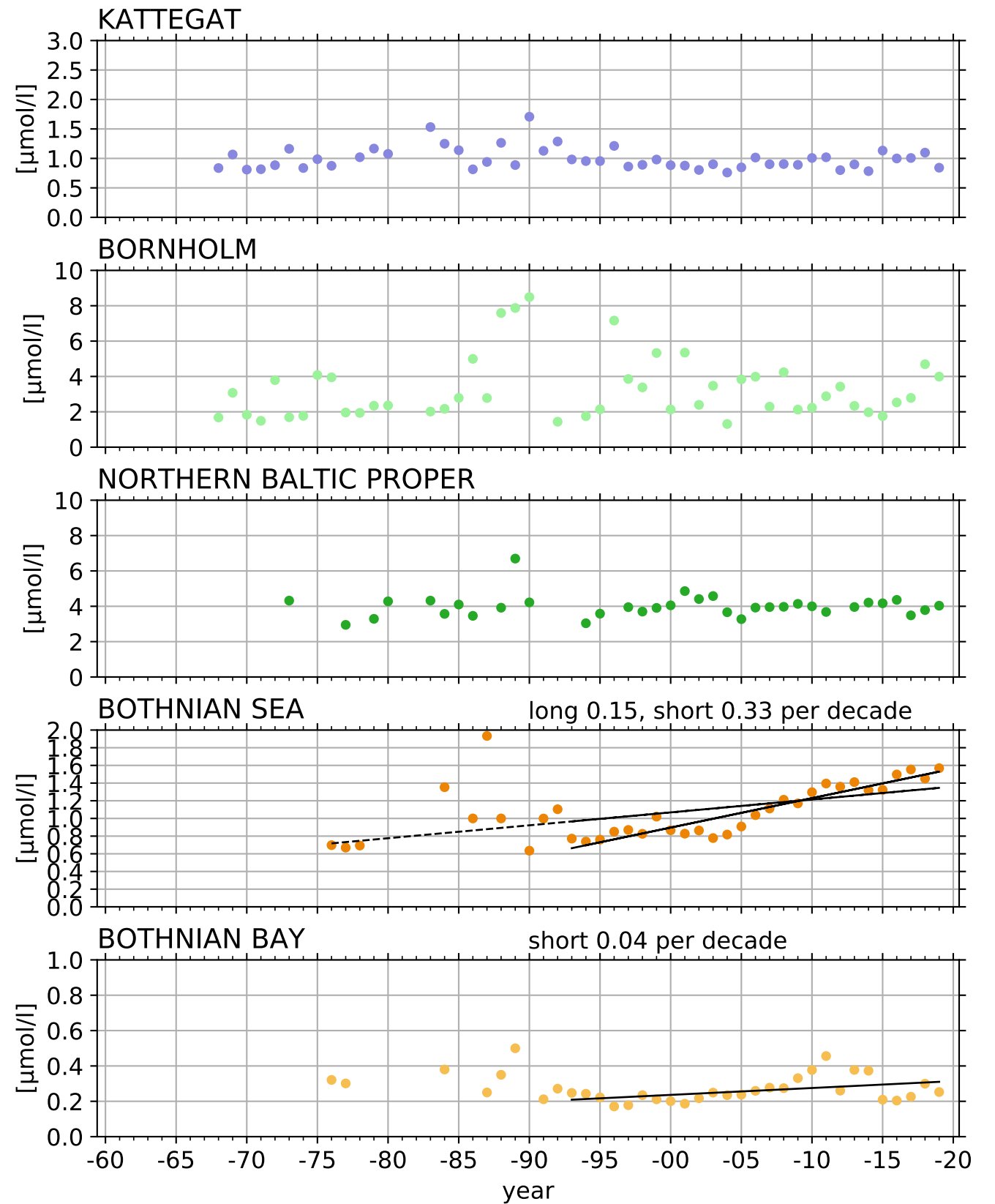
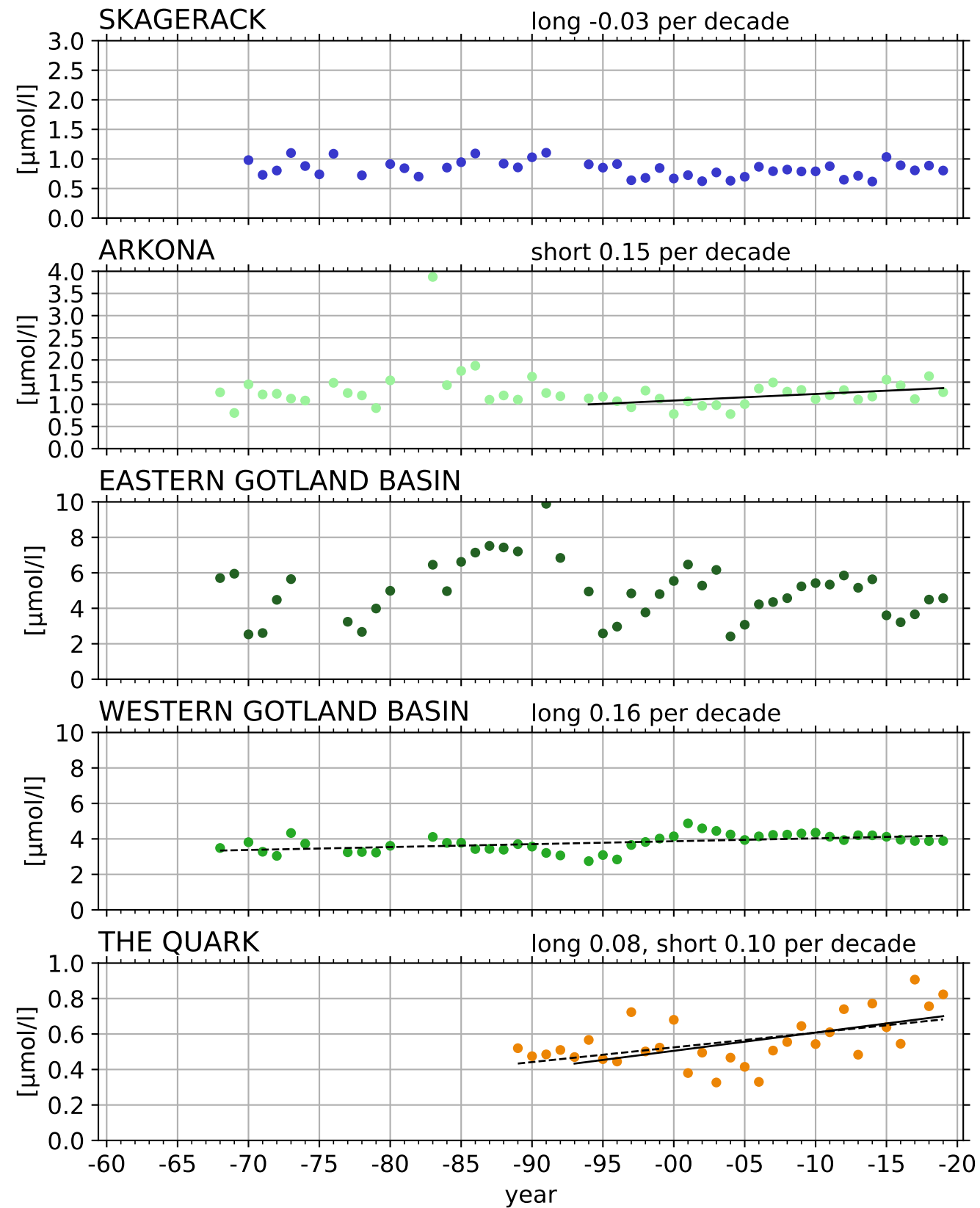
BOTHNIAN BAY



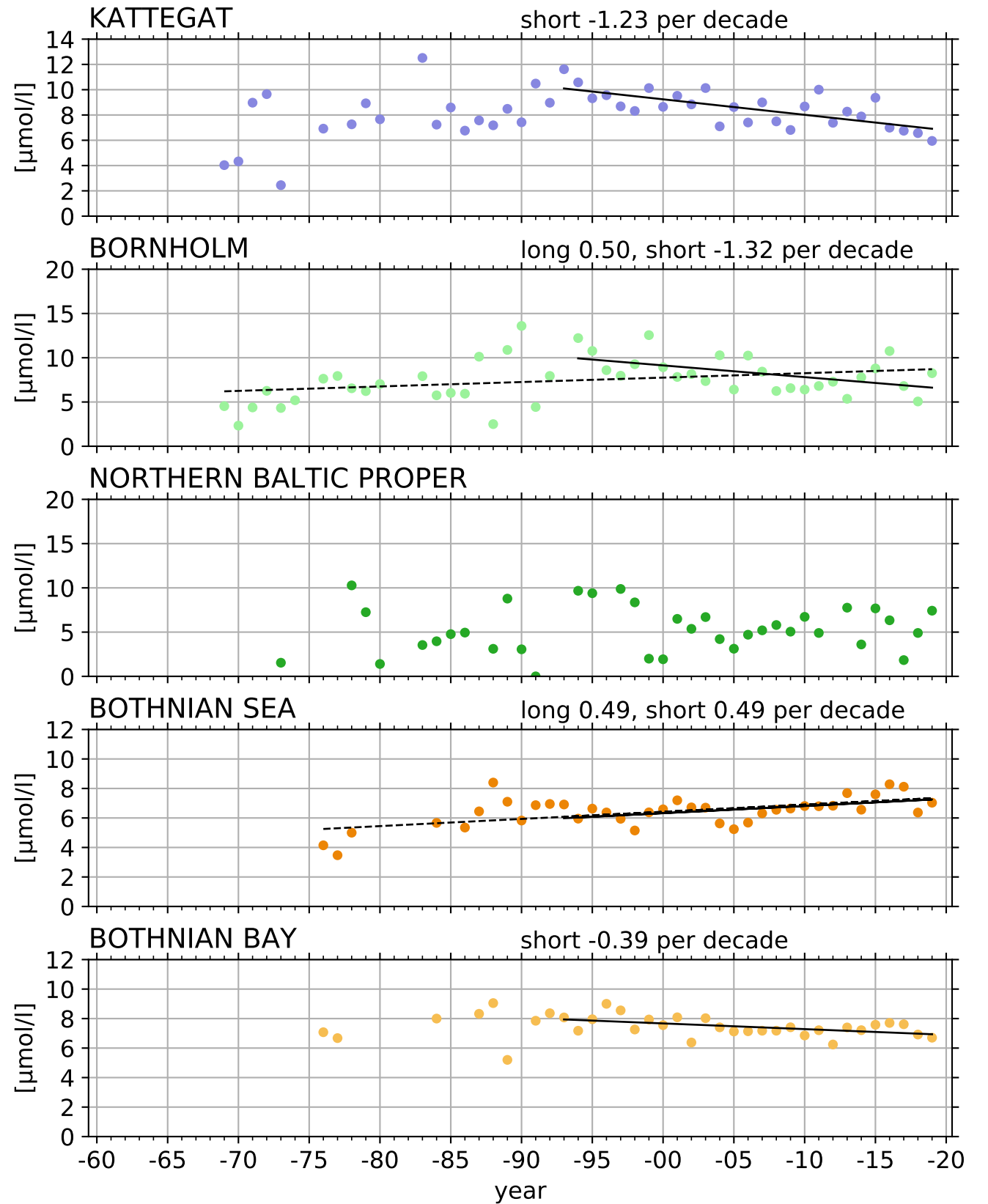
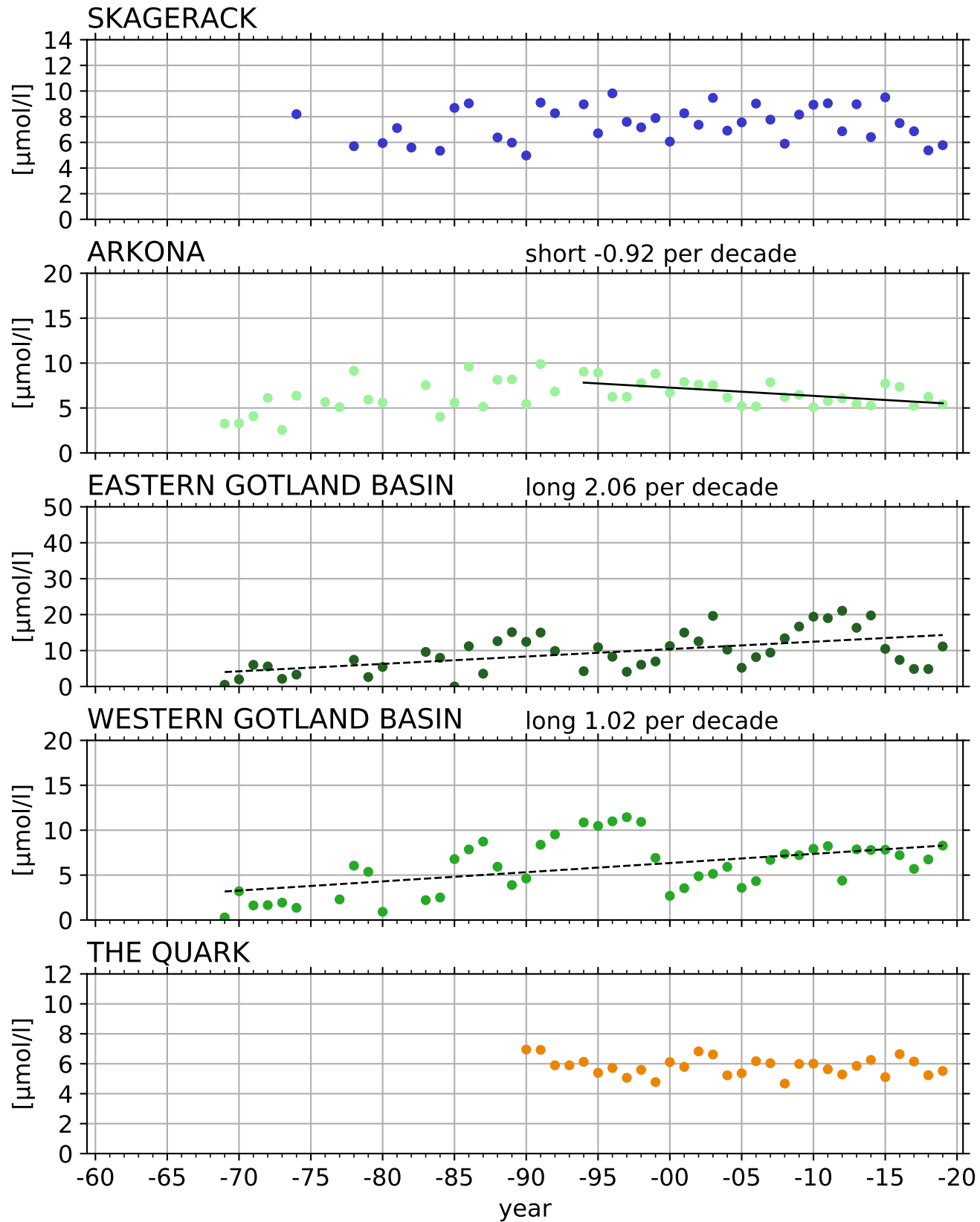
year

year

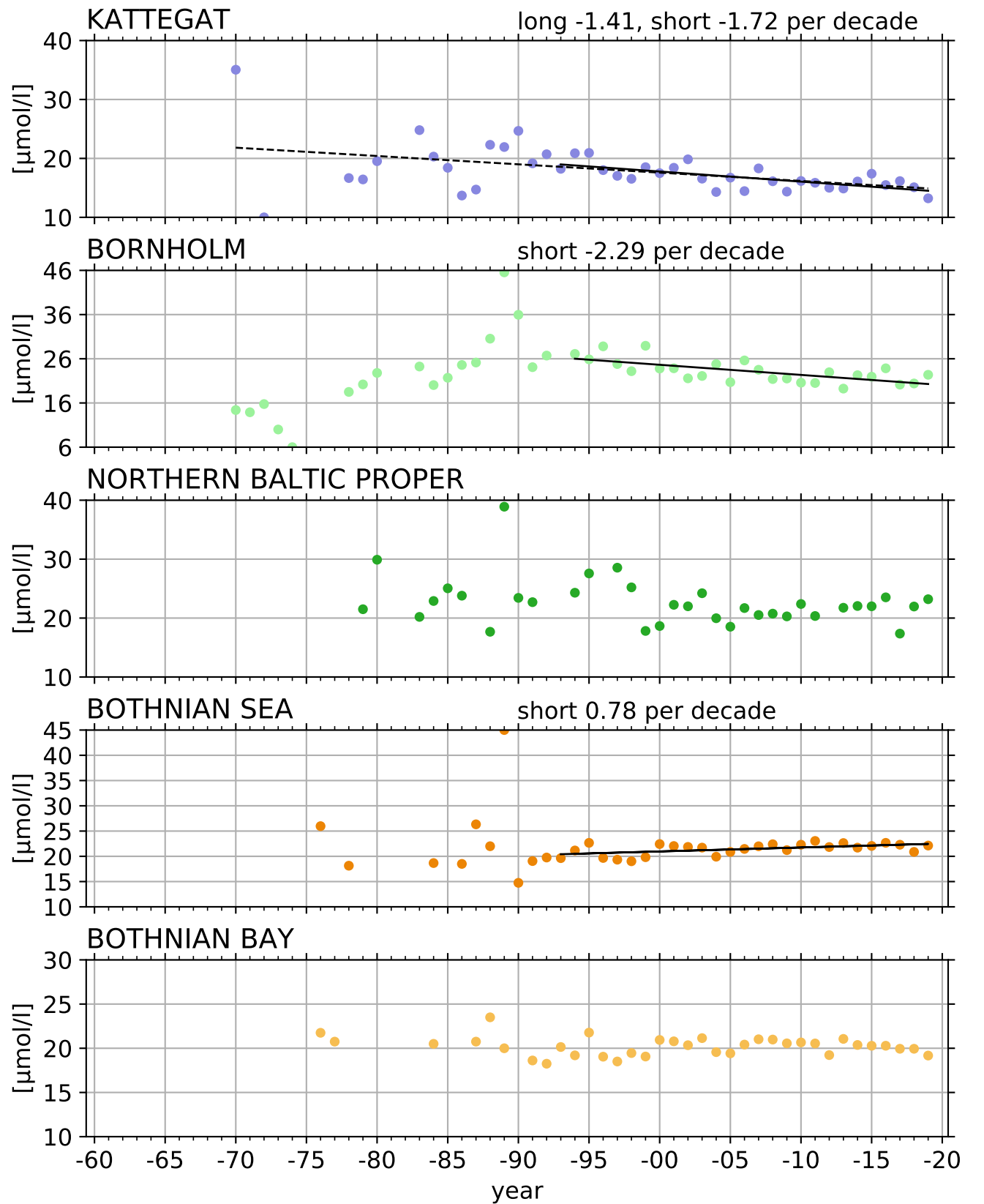
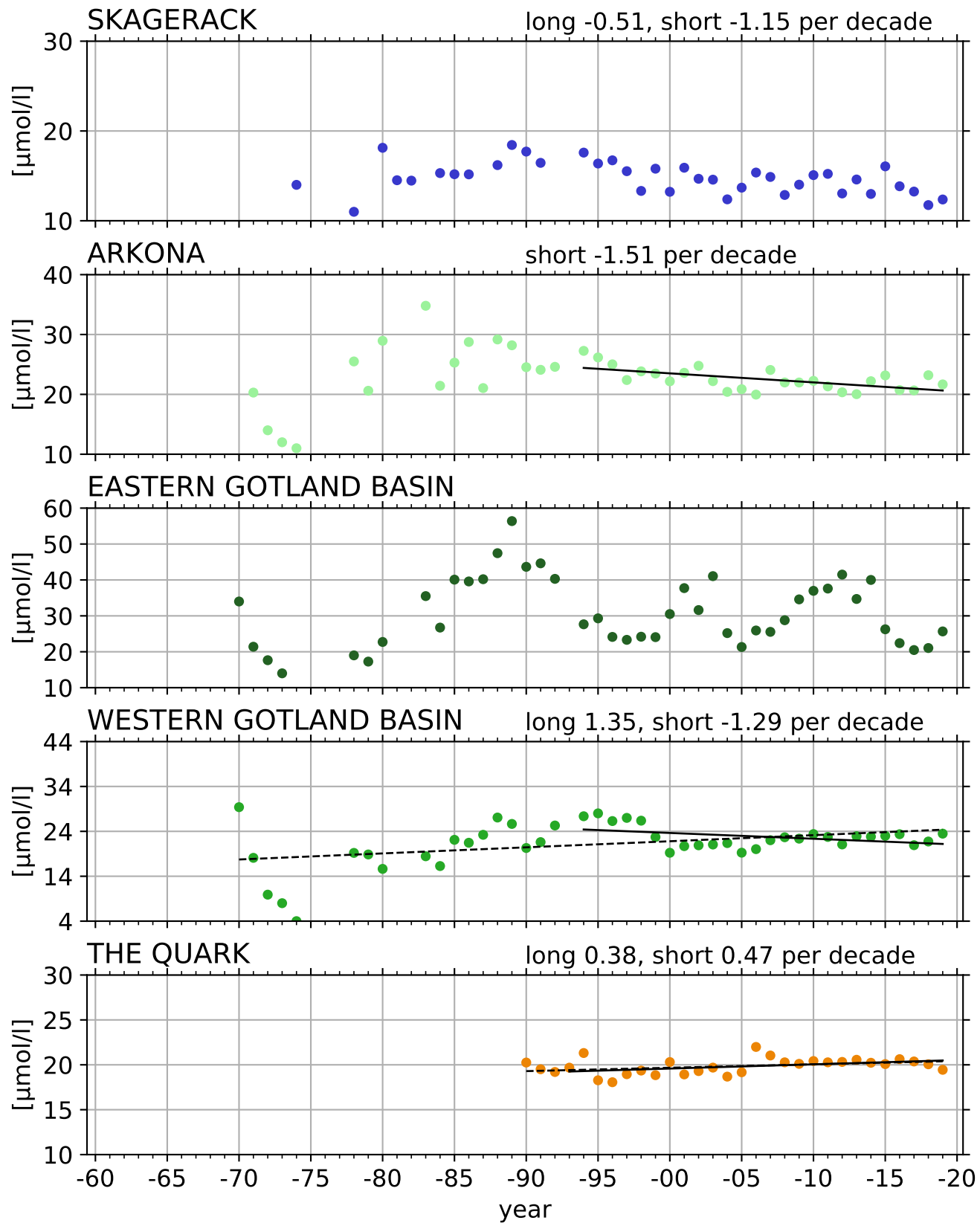
Total phosphorus winter [$\mu\text{mol/l}$] BW



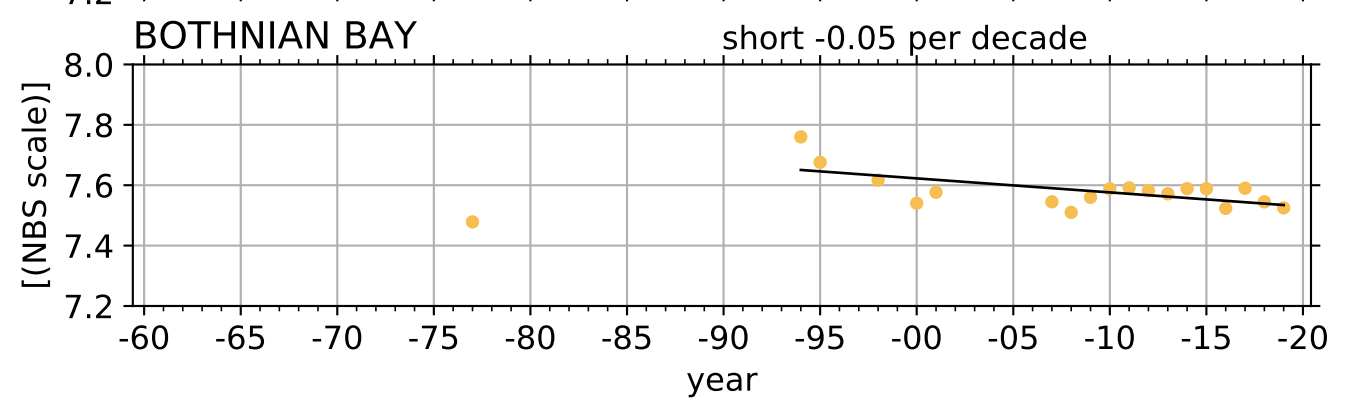
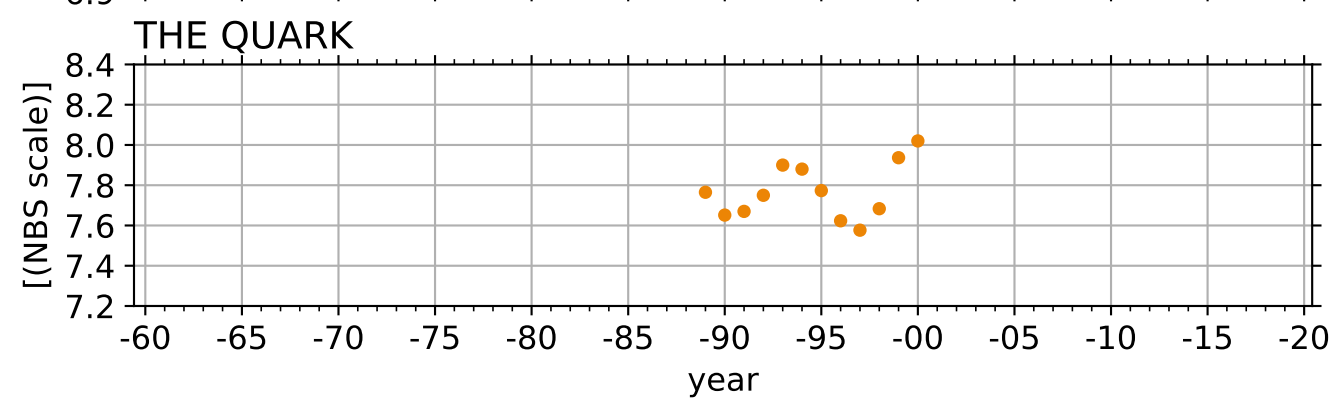
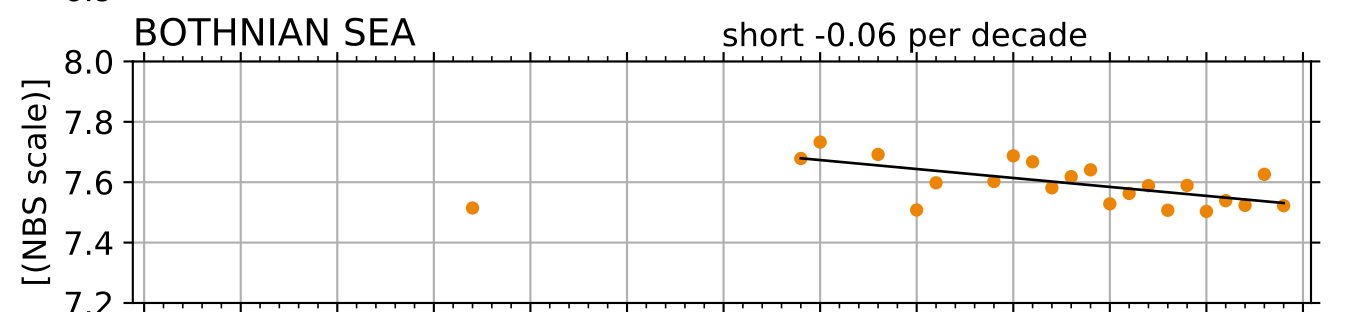
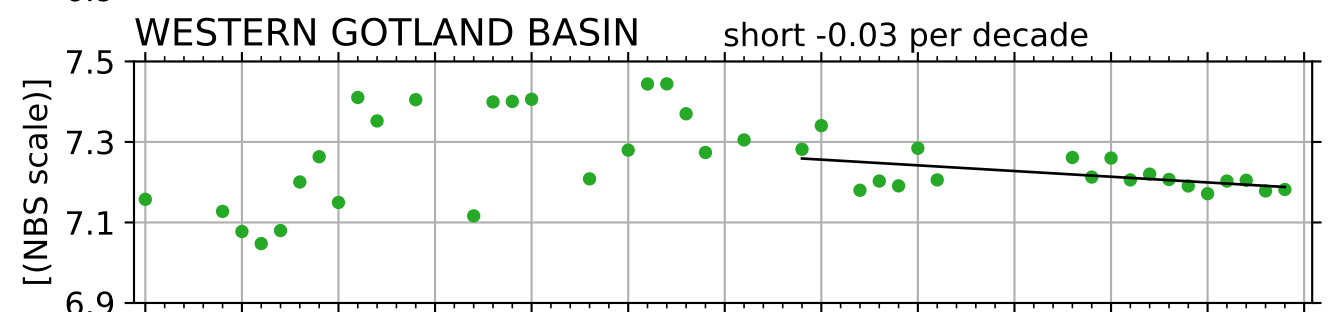
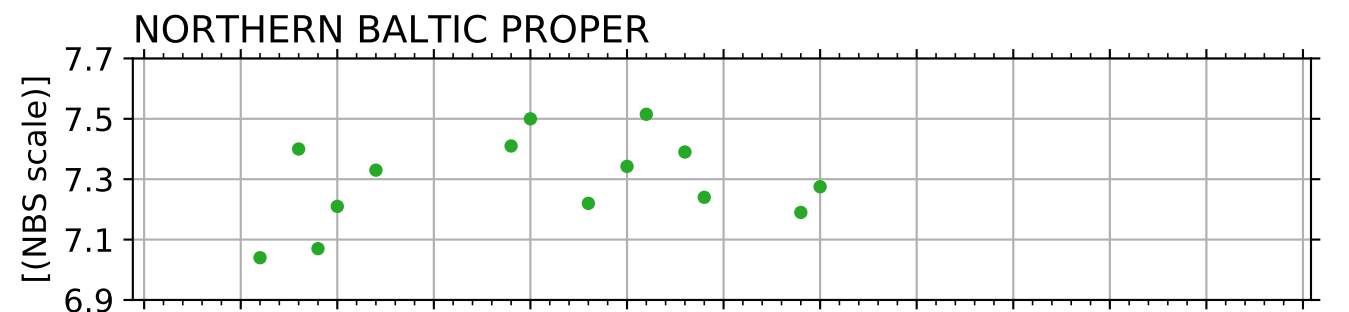
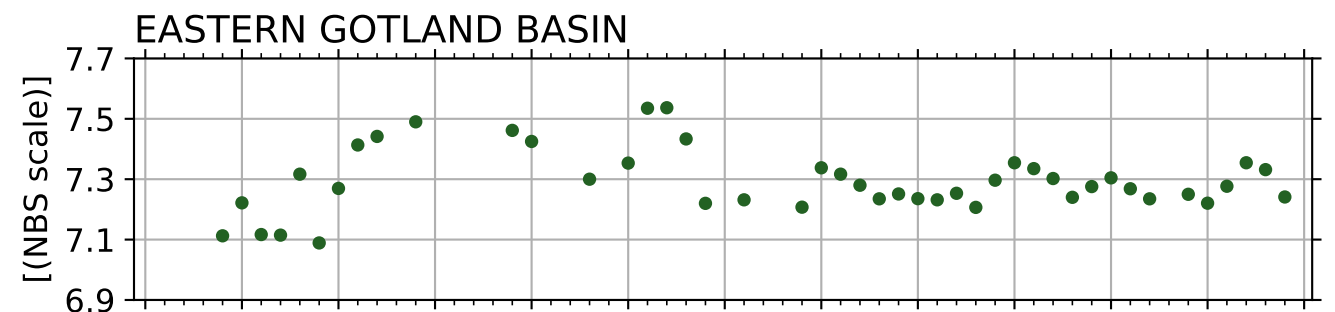
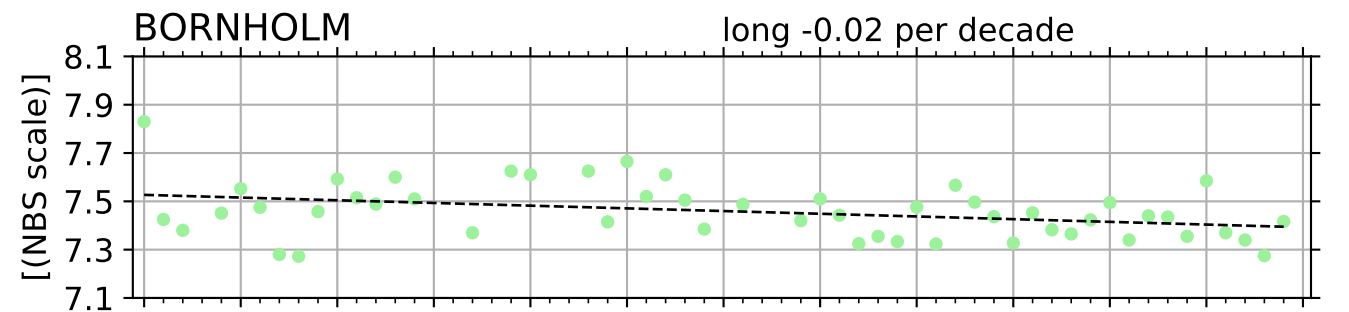
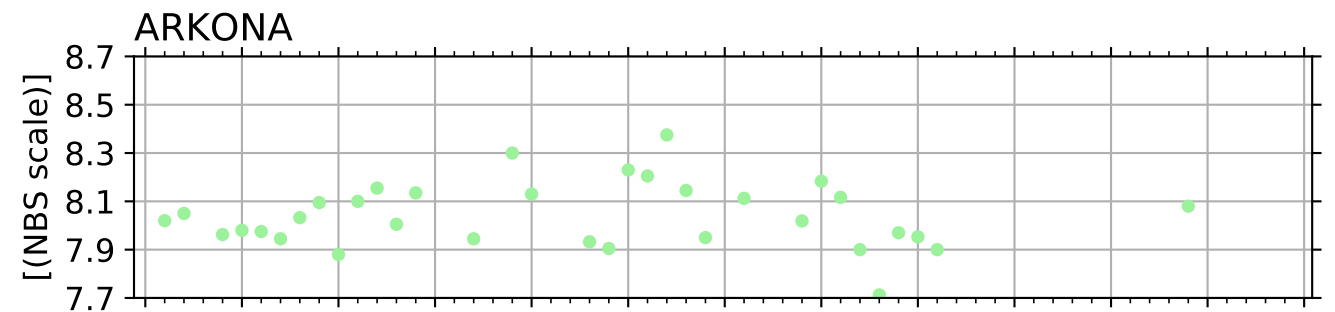
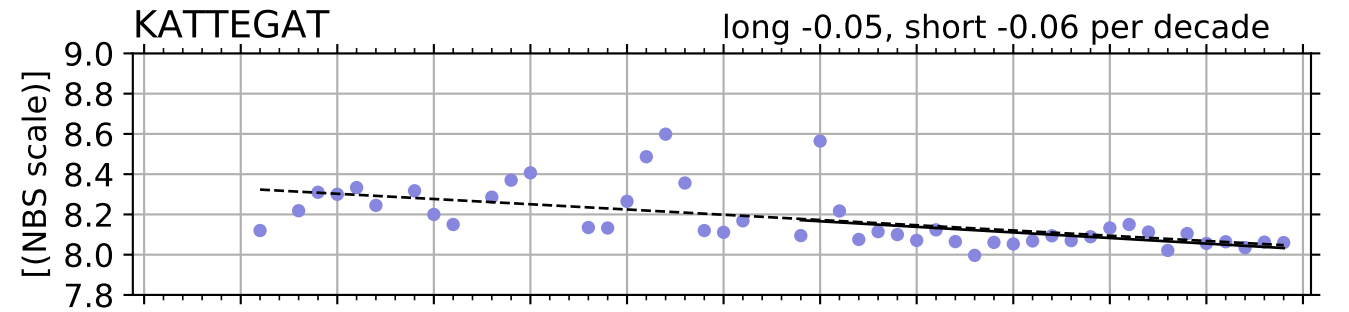
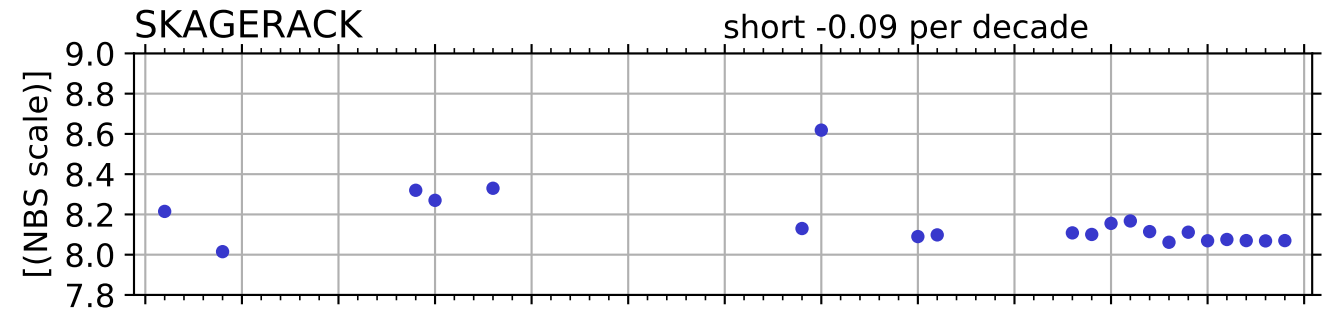
DIN winter [$\mu\text{mol/l}$] BW



Total Nitrogen winter [$\mu\text{mol/l}$] BW



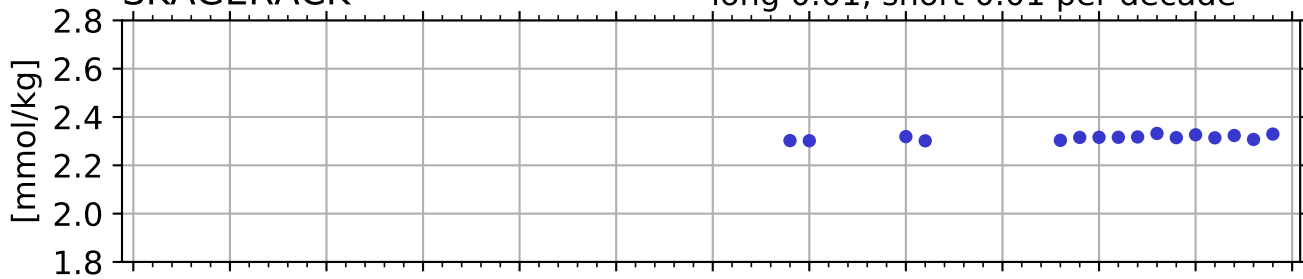
pH winter [(NBS scale)] BW



Alkalinity winter [mmol/kg] BW

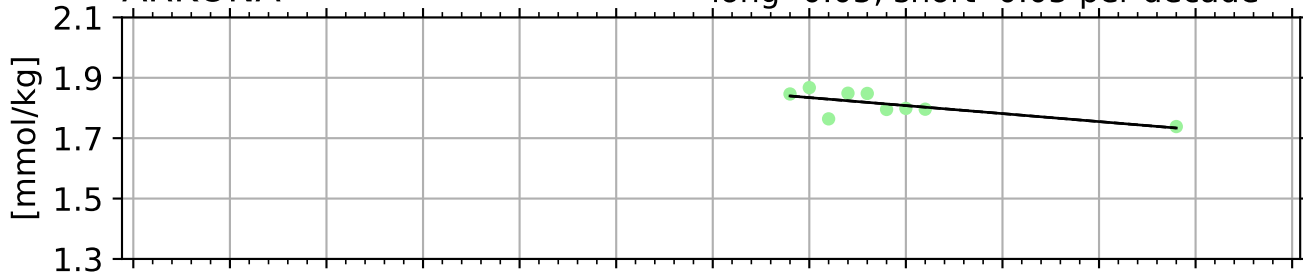
SKAGERACK

long 0.01, short 0.01 per decade



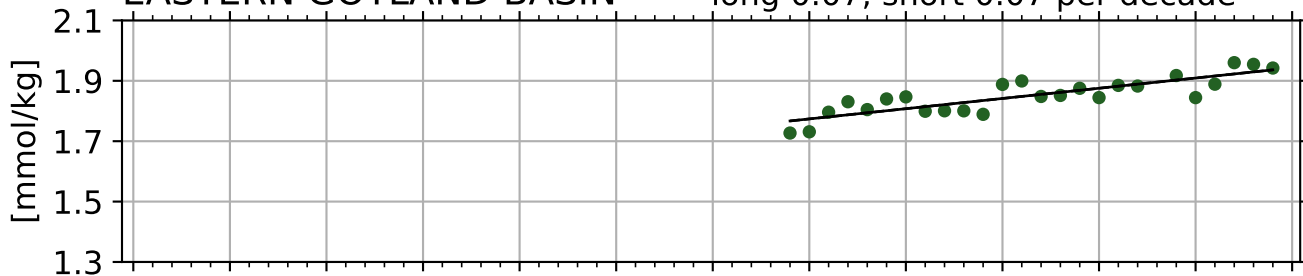
ARKONA

long -0.05, short -0.05 per decade



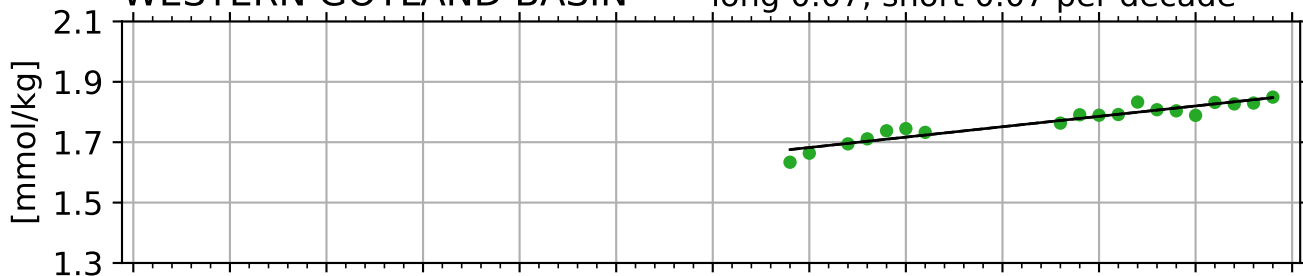
EASTERN GOTLAND BASIN

long 0.07, short 0.07 per decade

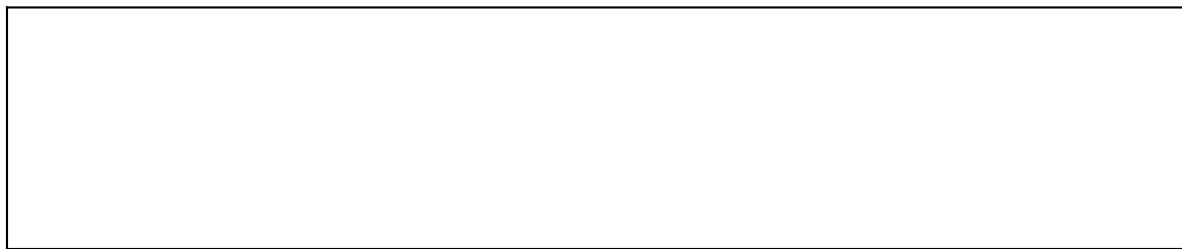


WESTERN GOTLAND BASIN

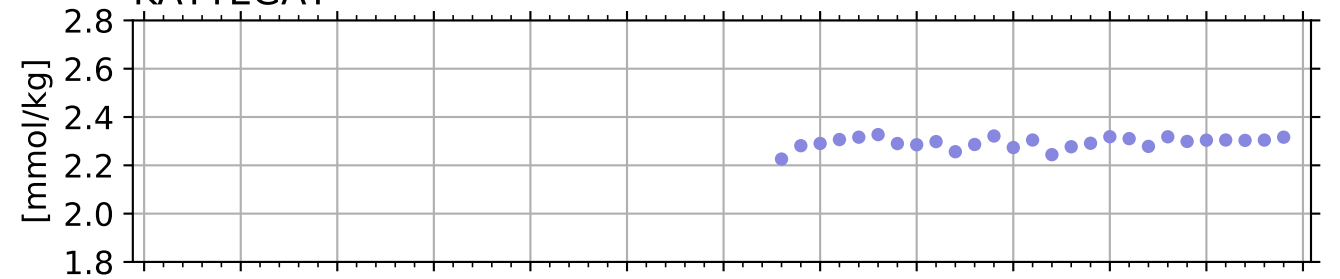
long 0.07, short 0.07 per decade



THE QUARK

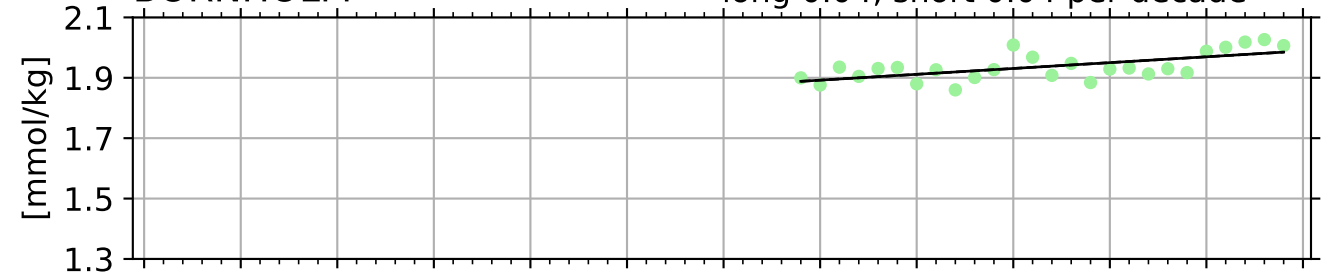


KATTEGAT

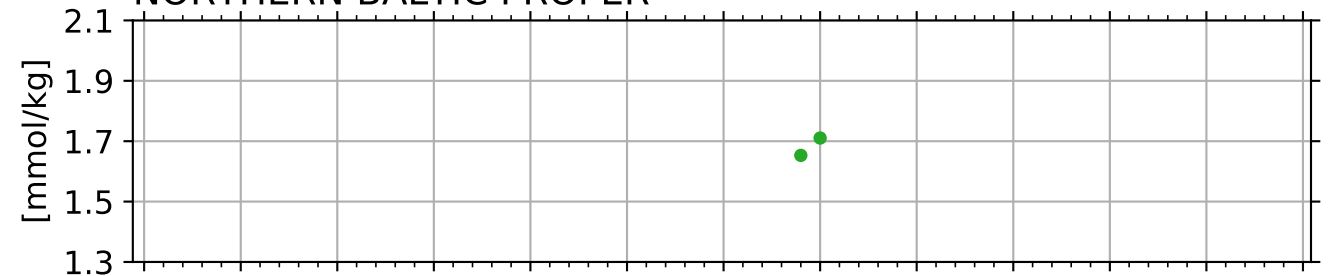


BORNHOLM

long 0.04, short 0.04 per decade

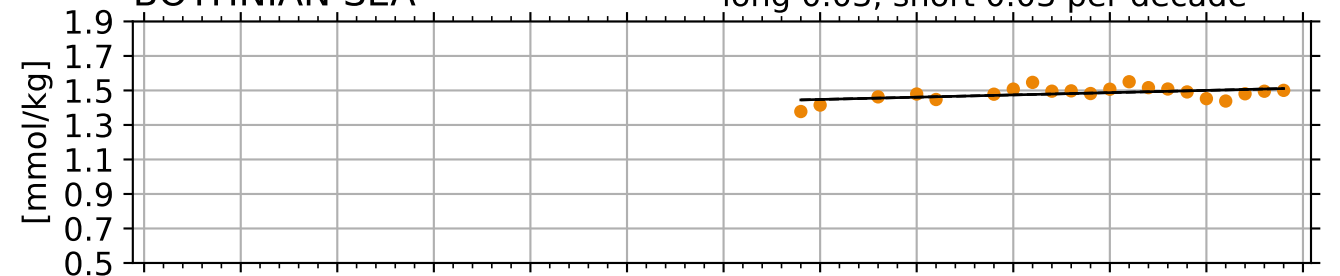


NORTHERN BALTIC PROPER

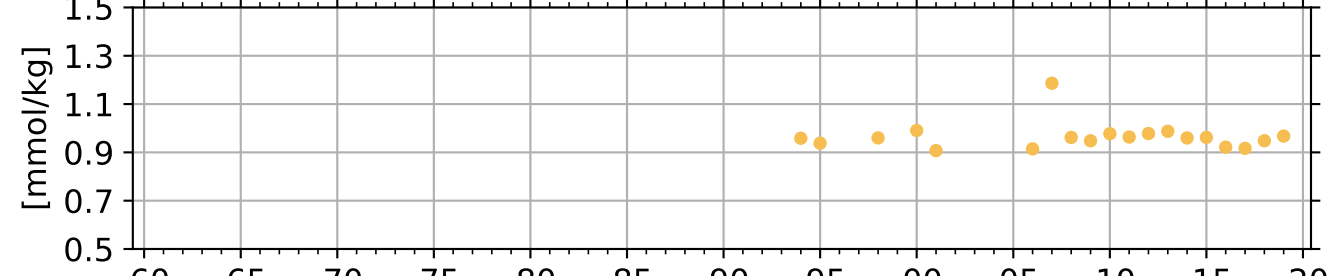


BOTHNIAN SEA

long 0.03, short 0.03 per decade

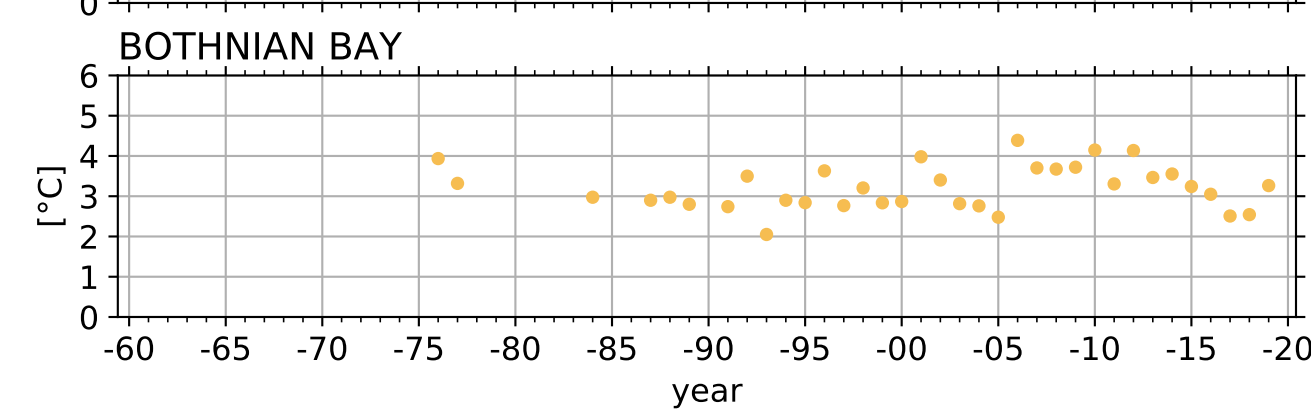
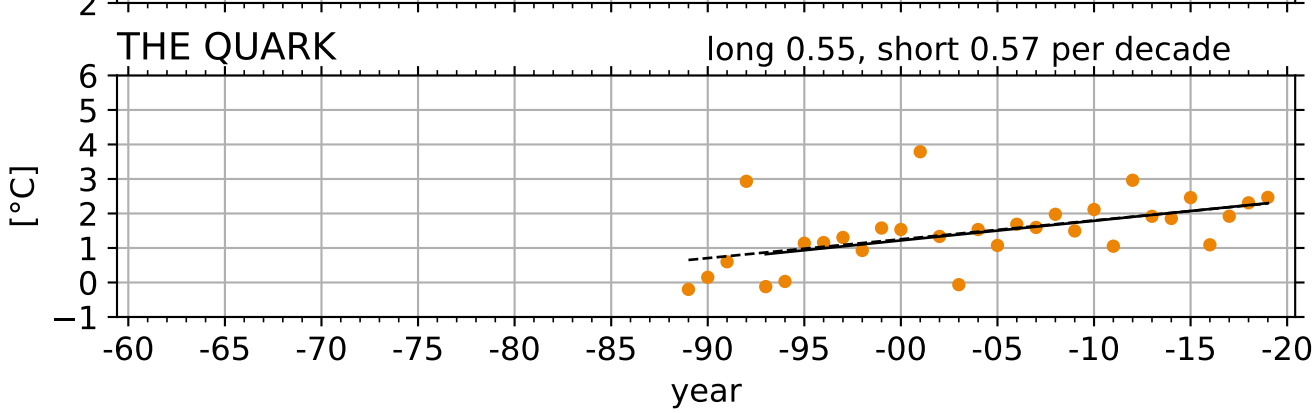
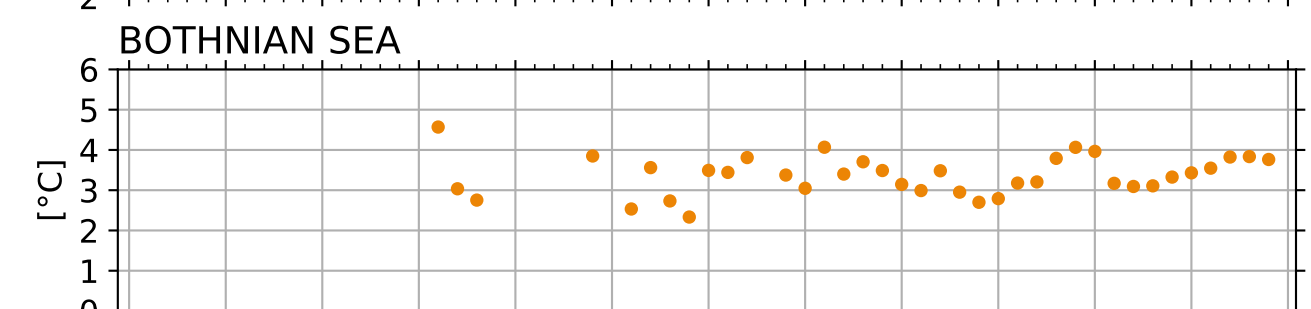
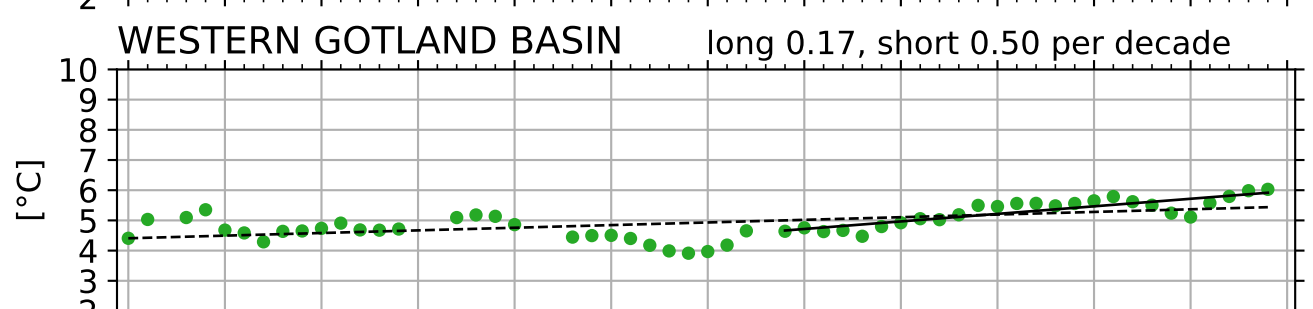
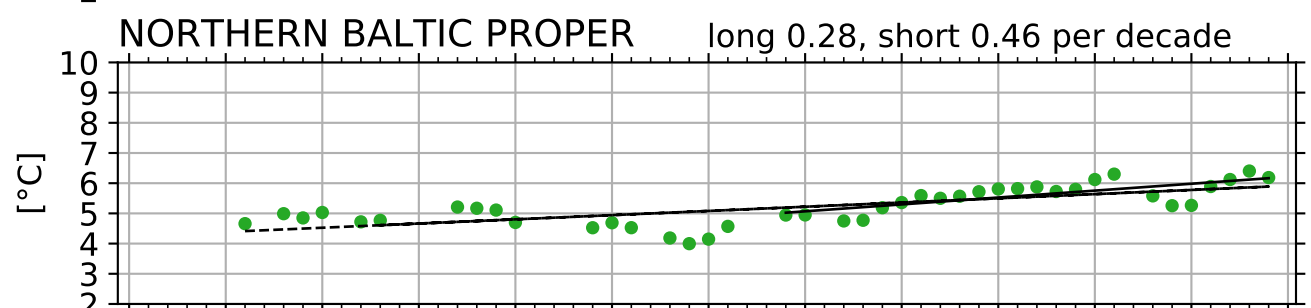
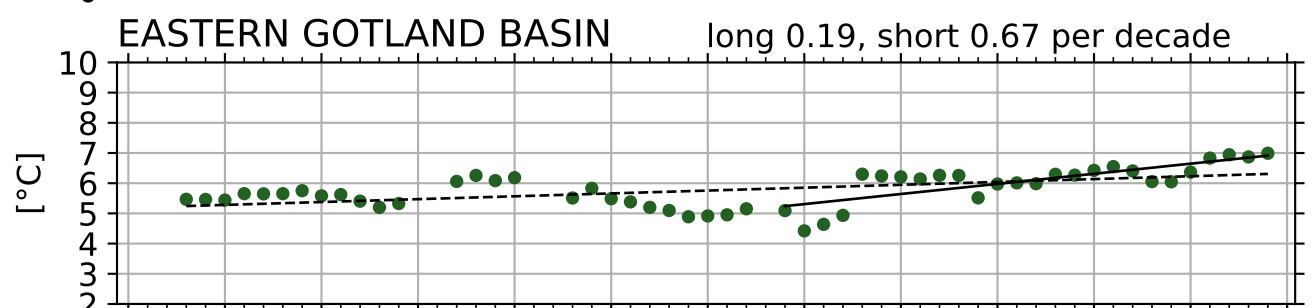
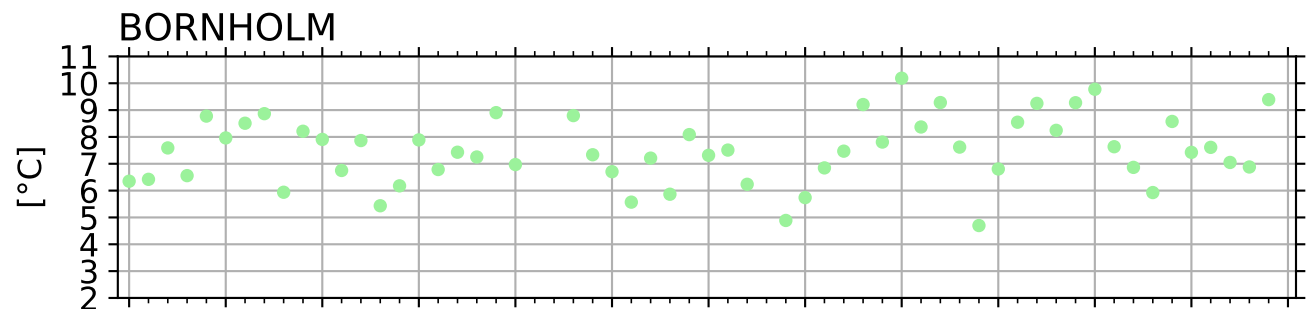
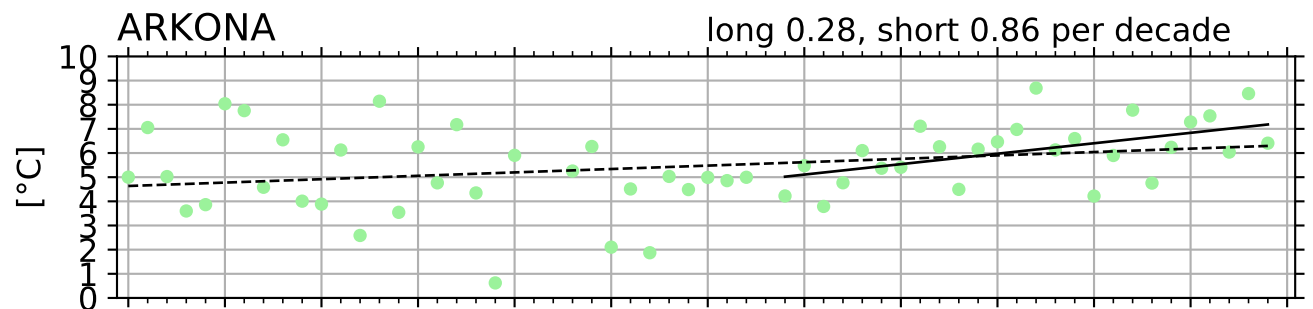
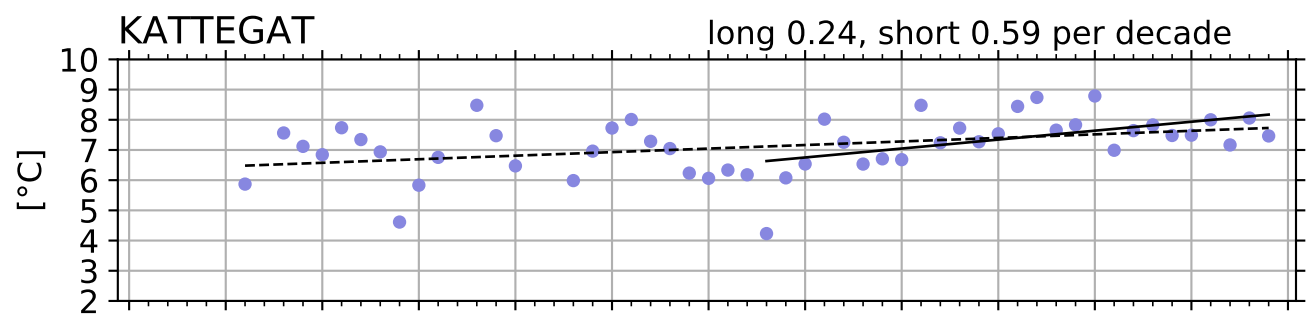
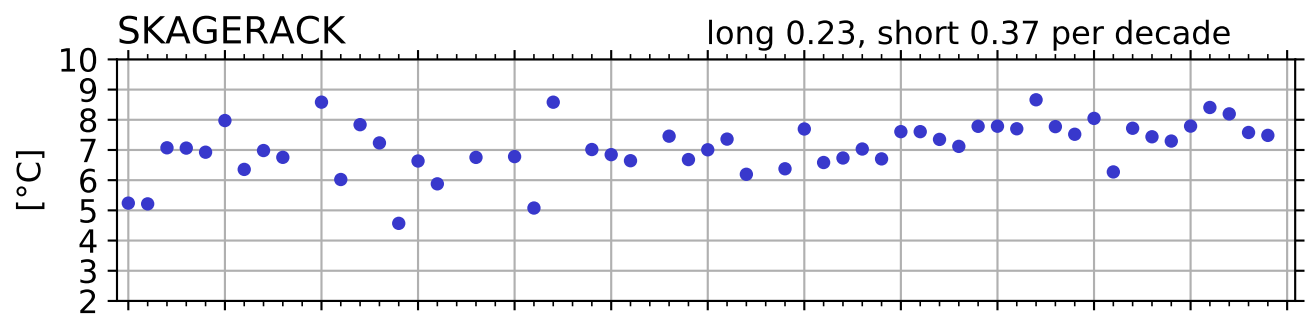


BOTHNIAN BAY

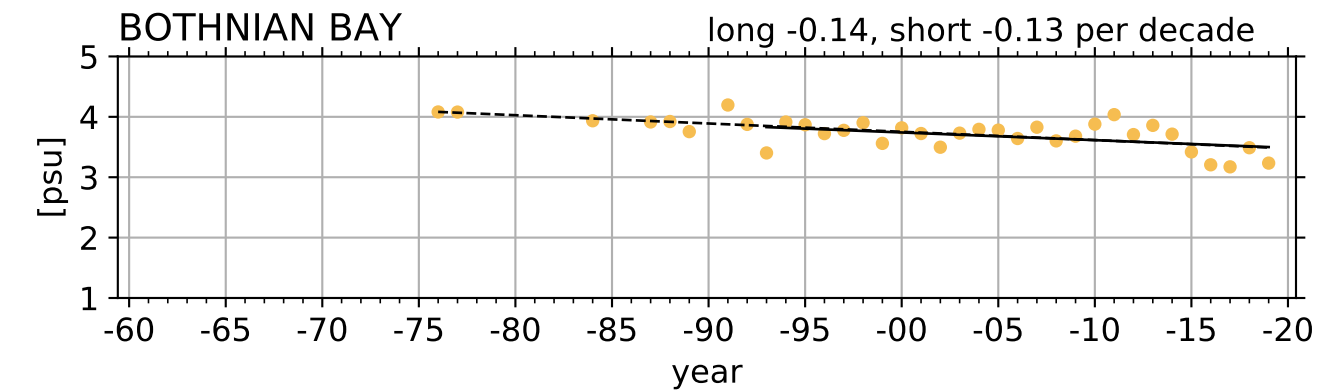
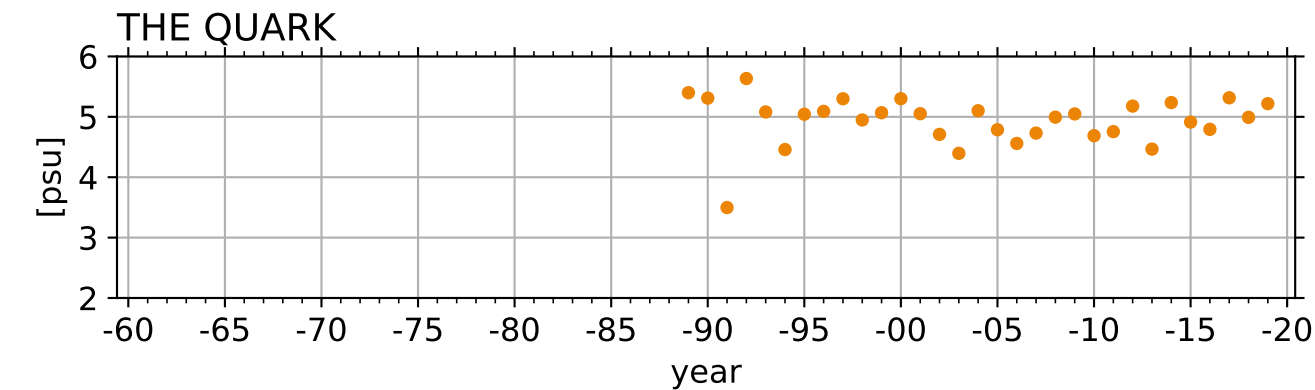
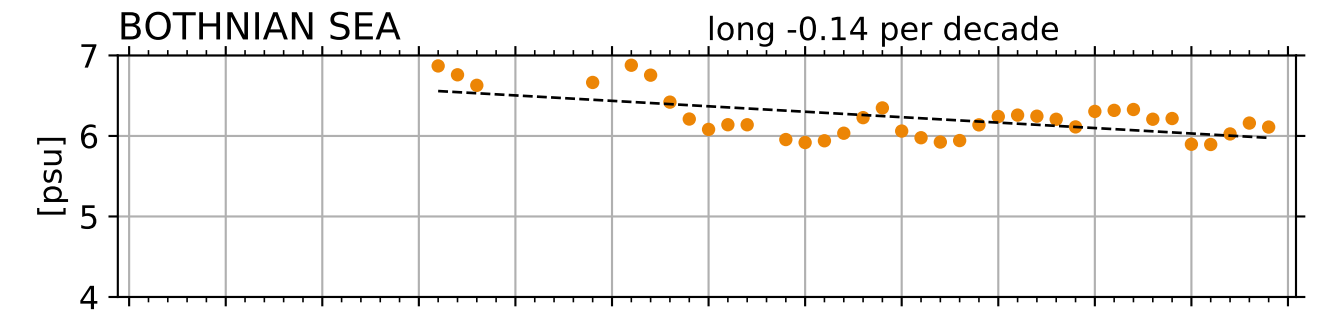
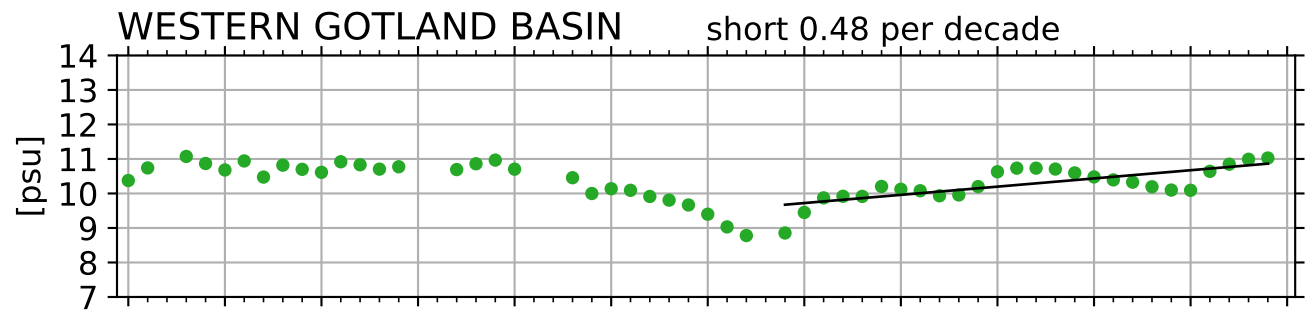
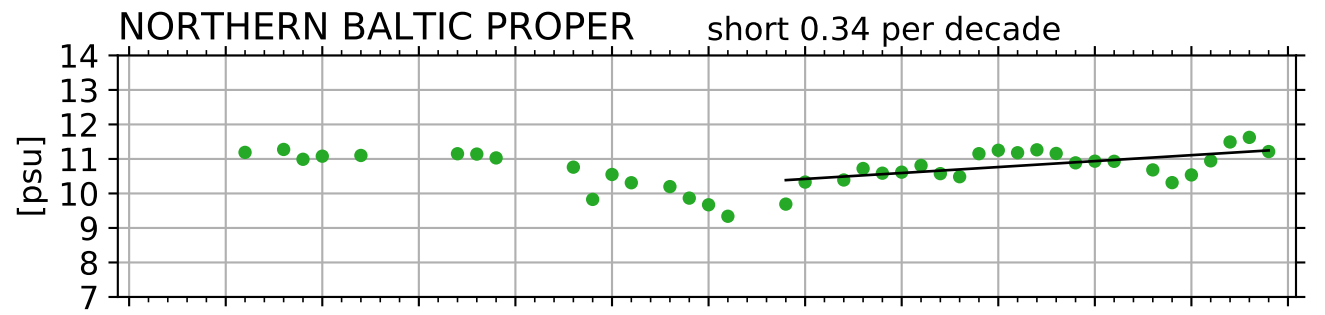
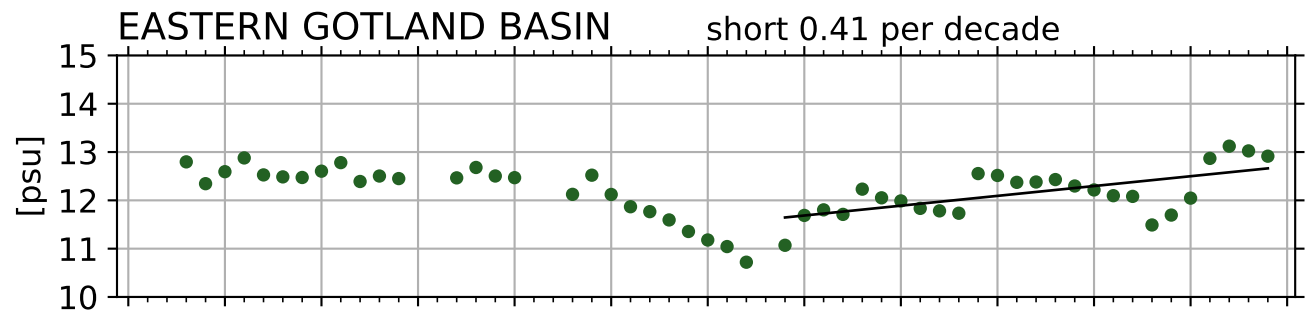
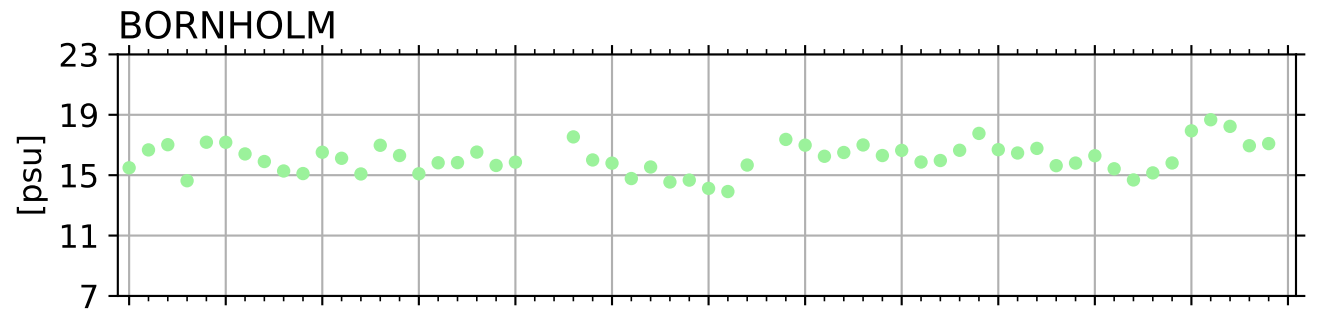
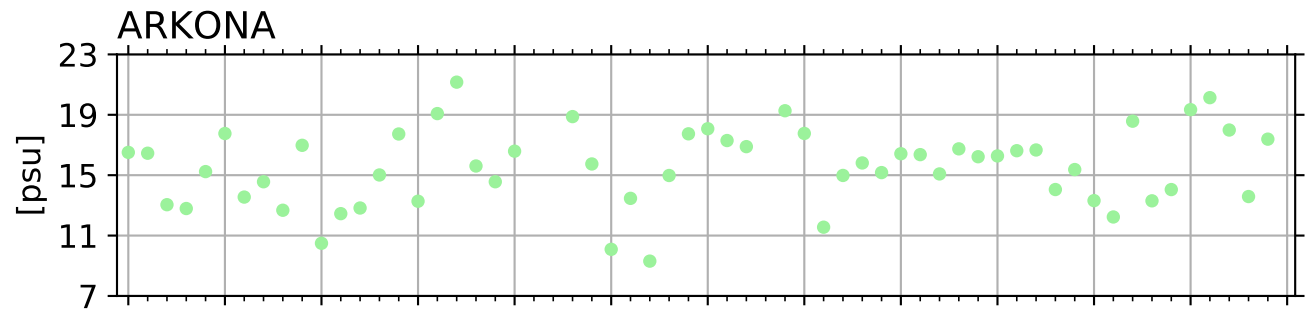
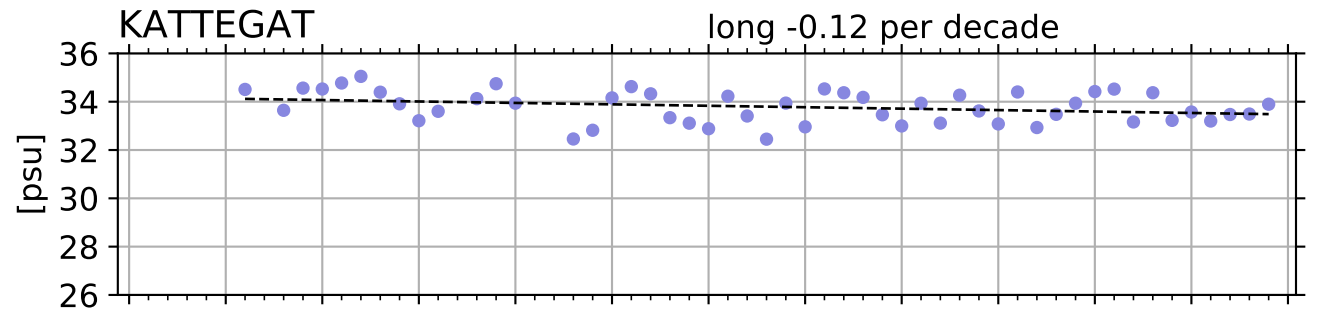
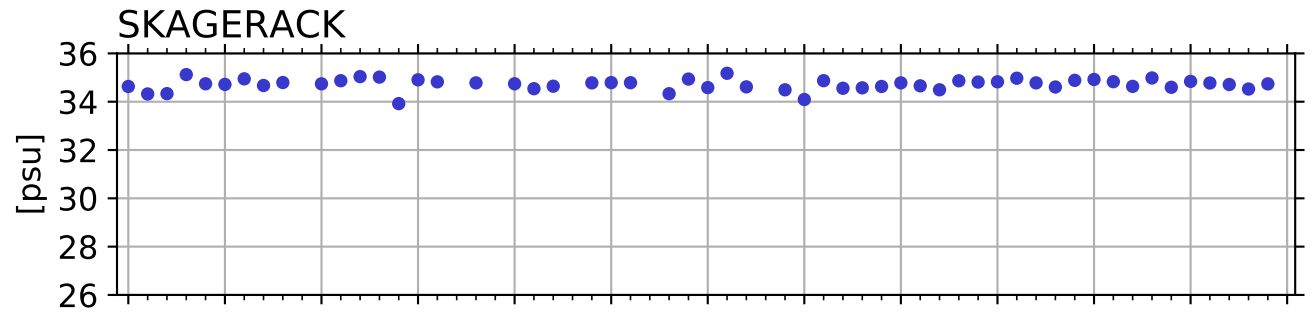


year

Temperature winter [°C] BW

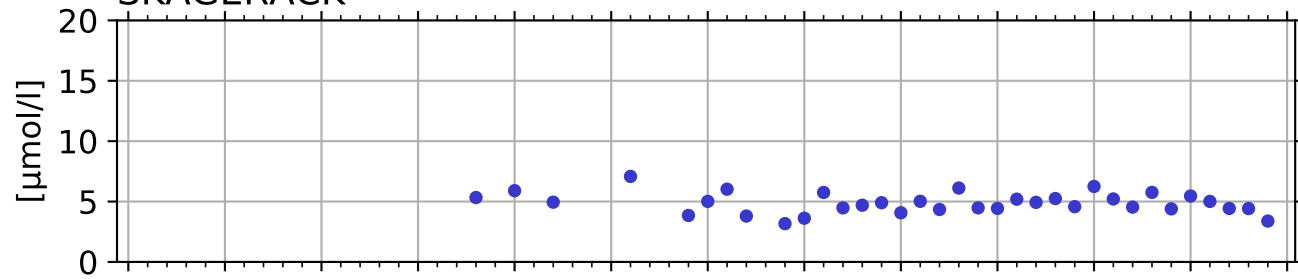


Salinity winter [psu] BW

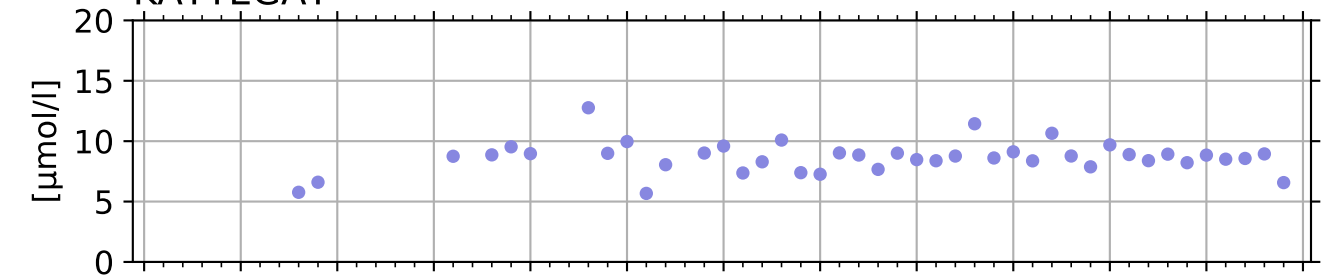


Dissolved Silica winter [$\mu\text{mol/l}$] BW

SKAGERACK

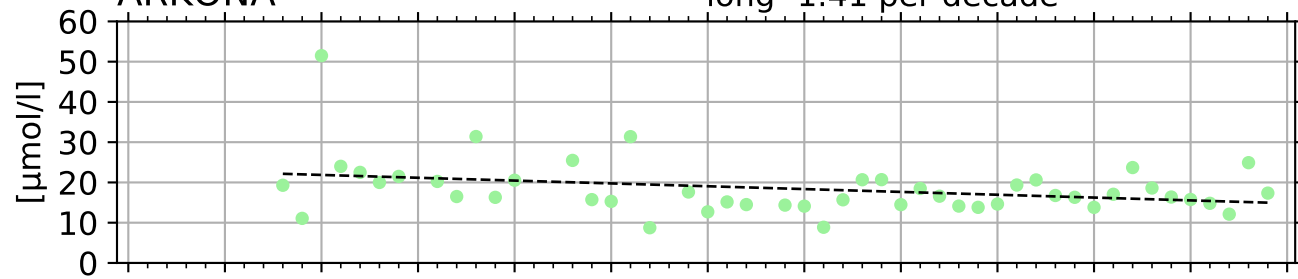


KATTEGAT

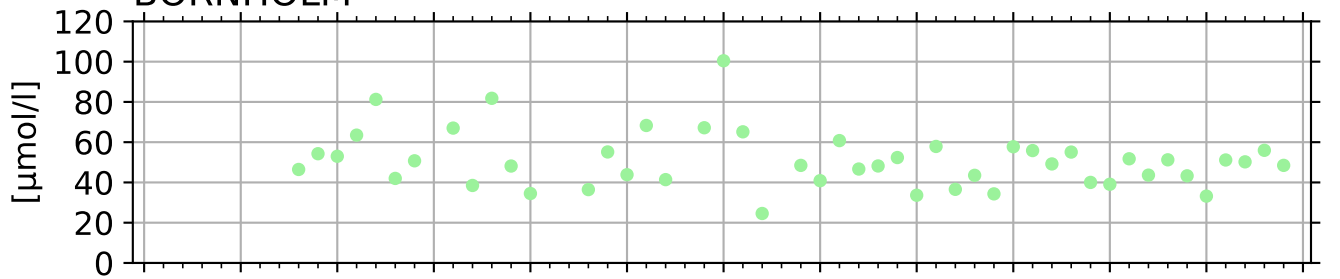


ARKONA

long -1.41 per decade

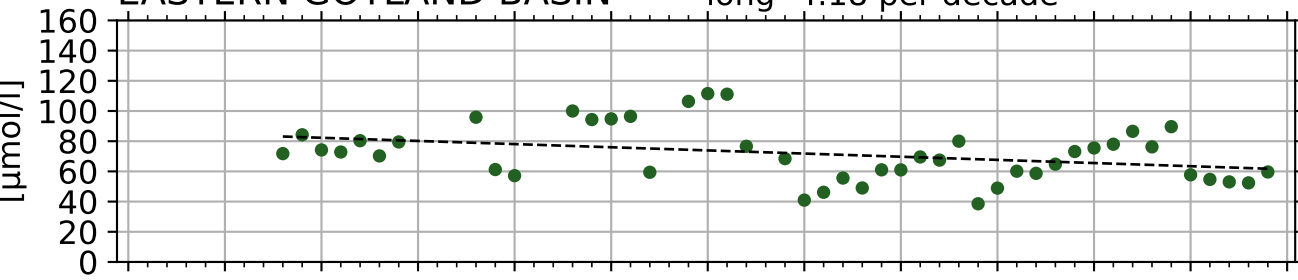


BORNHOLM



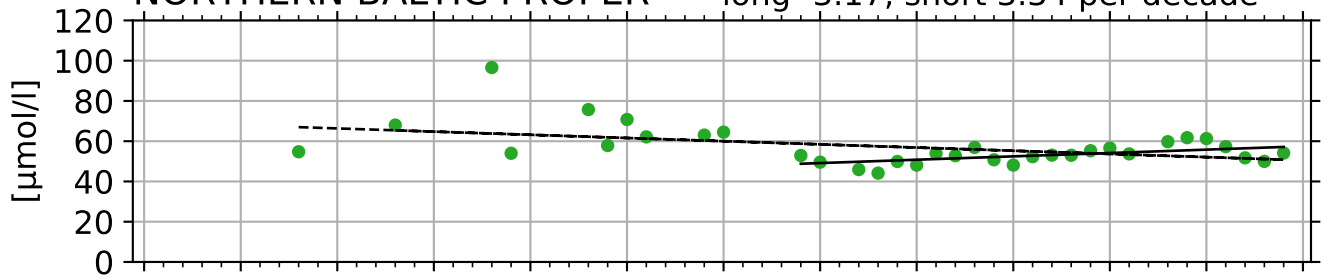
EASTERN GOTLAND BASIN

long -4.18 per decade



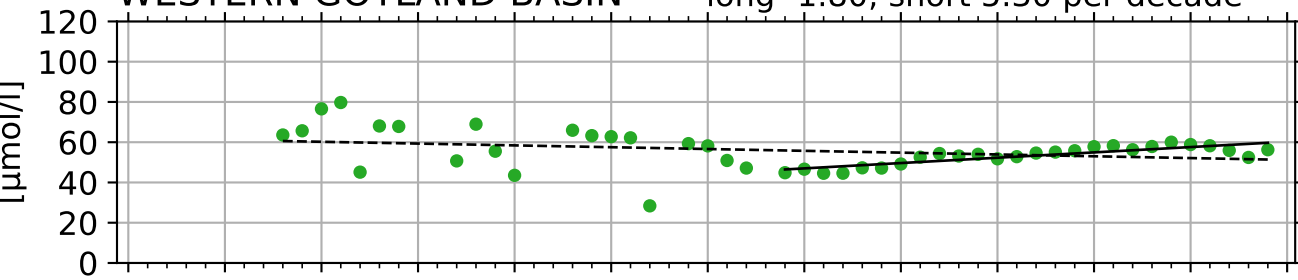
NORTHERN BALTIC PROPER

long -3.17, short 3.34 per decade



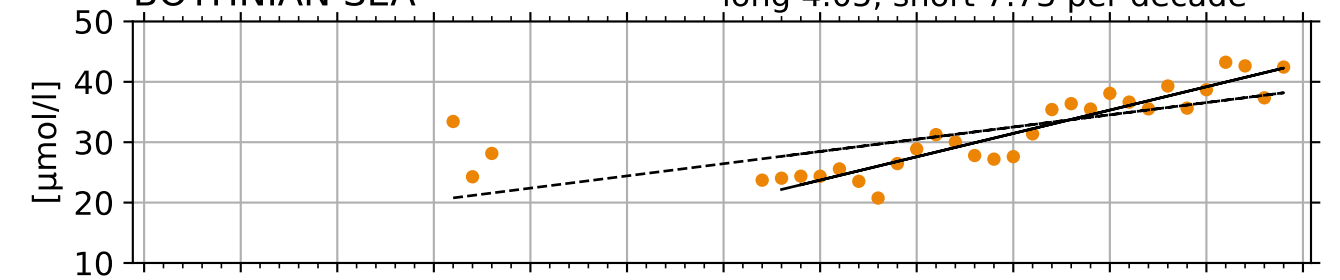
WESTERN GOTLAND BASIN

long -1.80, short 5.30 per decade



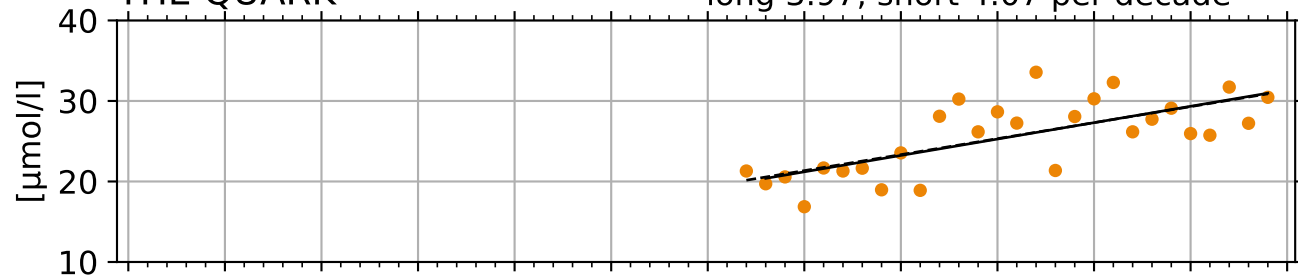
BOTHNIAN SEA

long 4.05, short 7.73 per decade



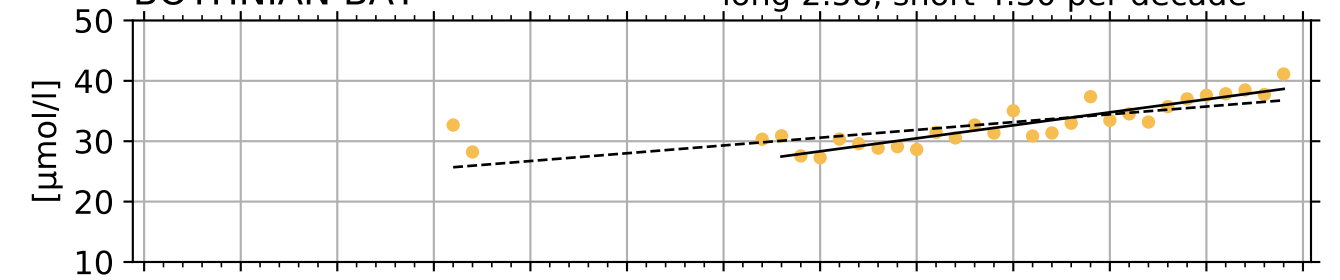
THE QUARK

long 3.97, short 4.07 per decade



BOTHNIAN BAY

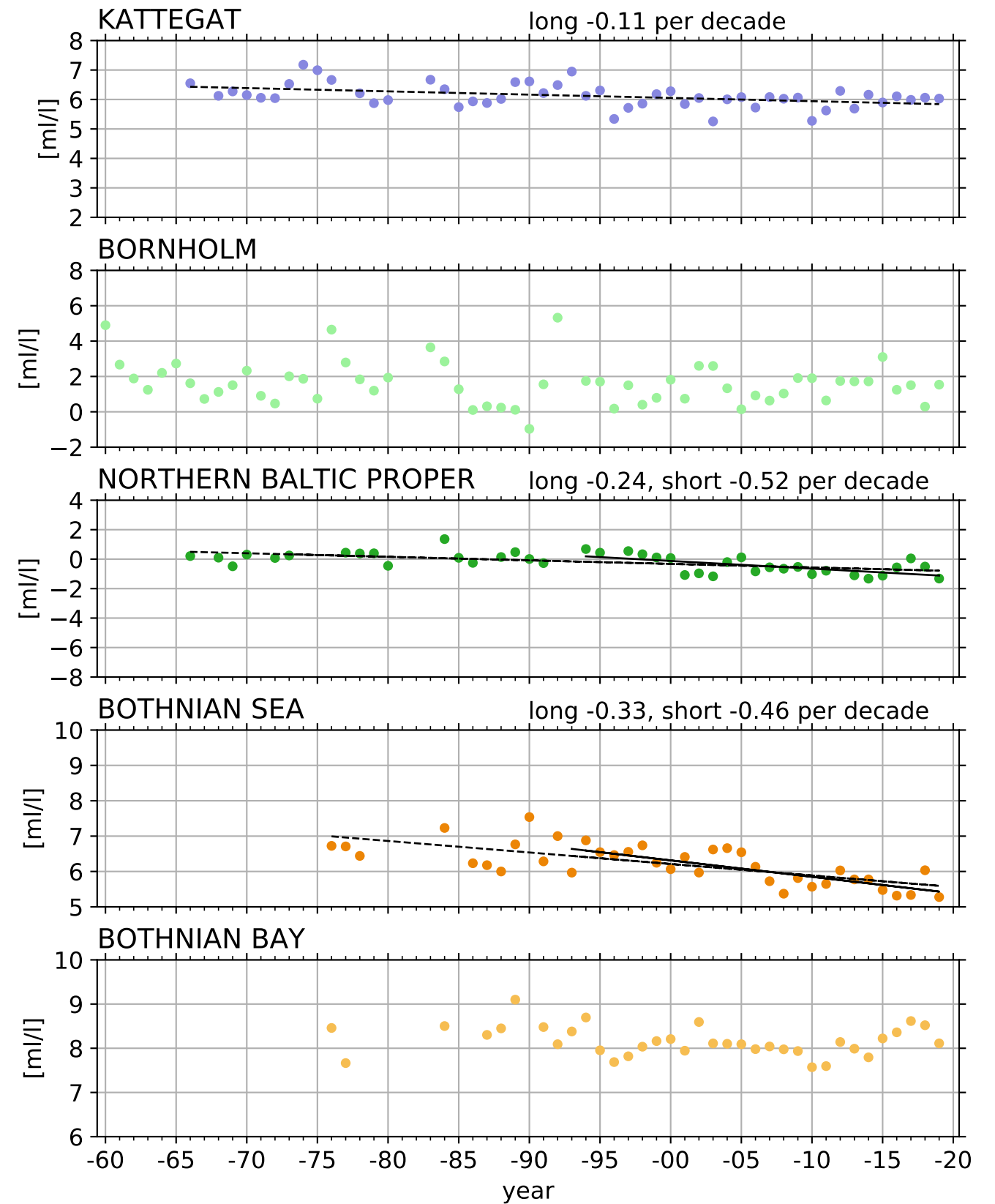
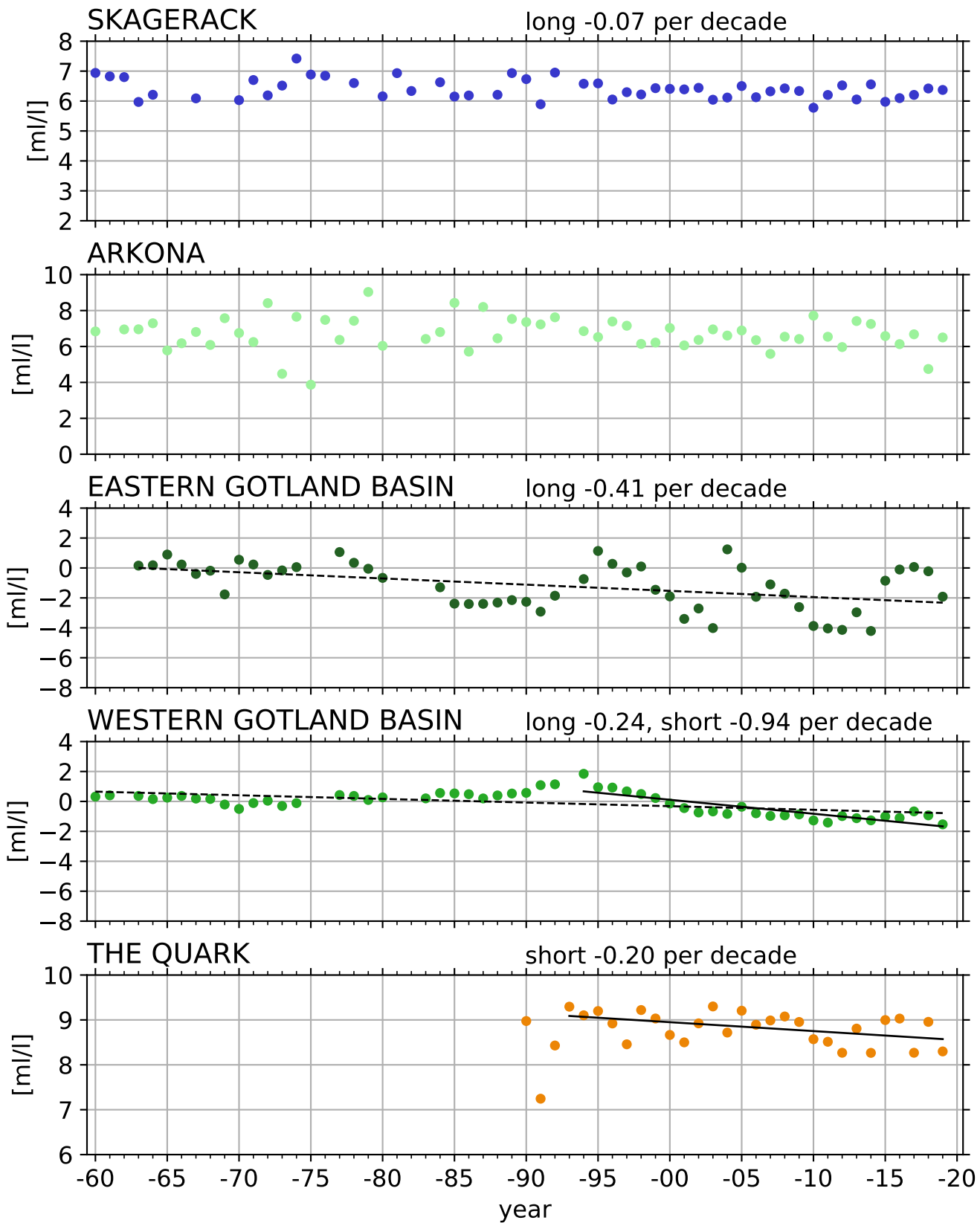
long 2.58, short 4.30 per decade



year

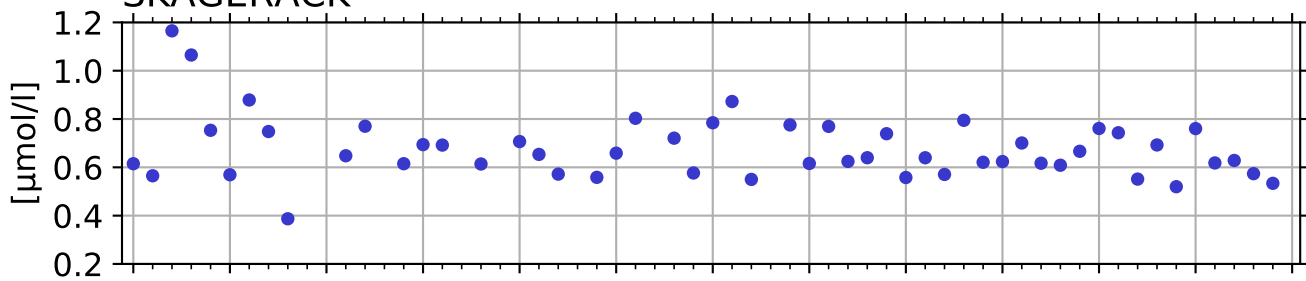
year

Dissolved oxygen winter [ml/l] BW



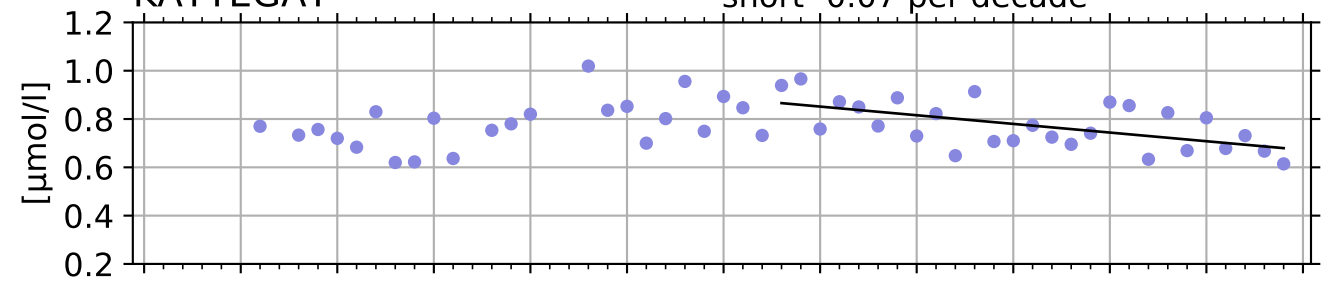
Phosphate winter [$\mu\text{mol/l}$] BW

SKAGERACK

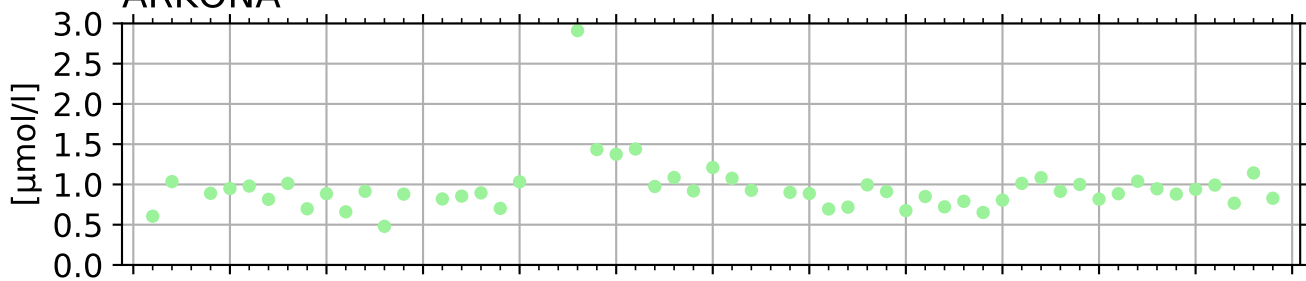


KATTEGAT

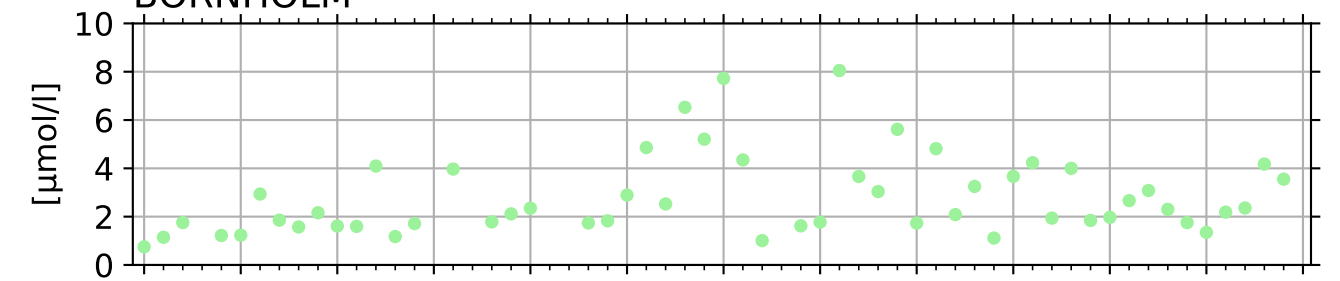
short -0.07 per decade



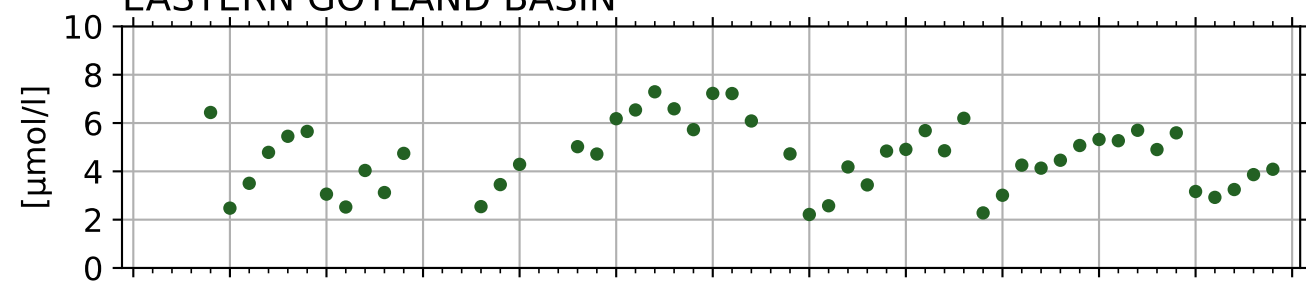
ARKONA



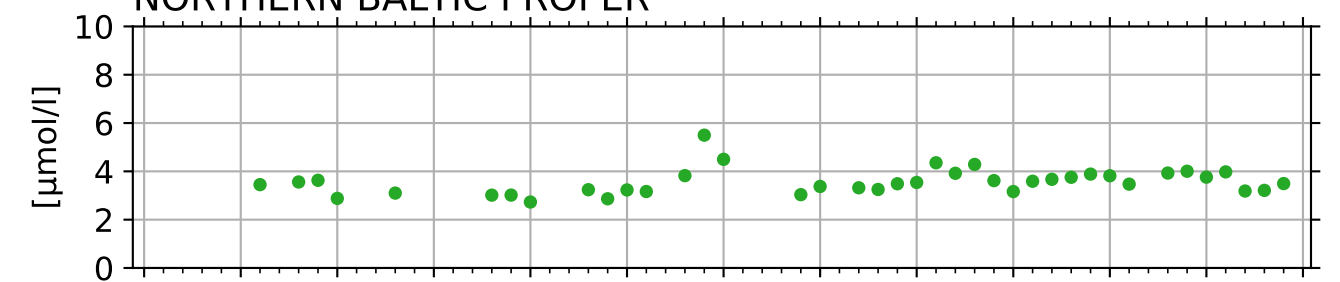
BORNHOLM



EASTERN GOTLAND BASIN

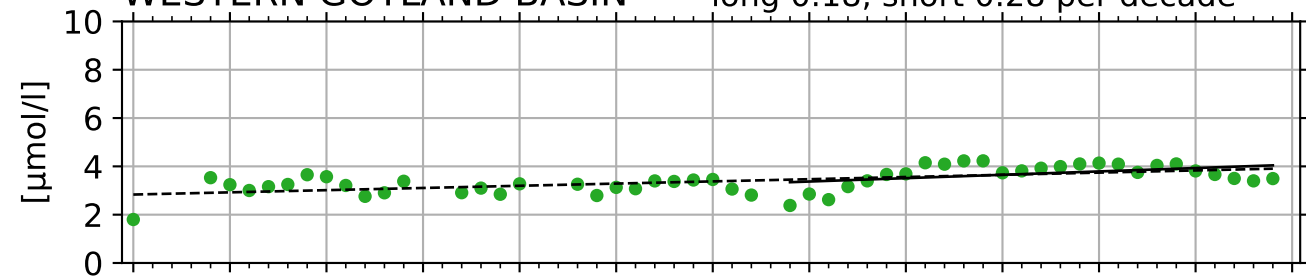


NORTHERN BALTIC PROPER



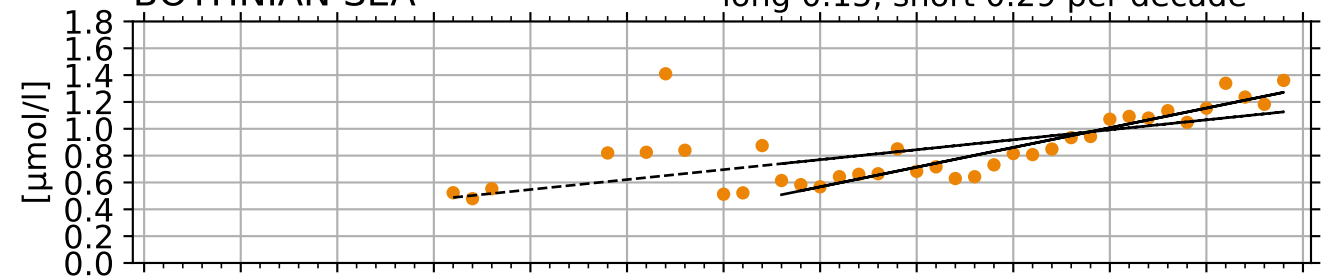
WESTERN GOTLAND BASIN

long 0.18, short 0.28 per decade



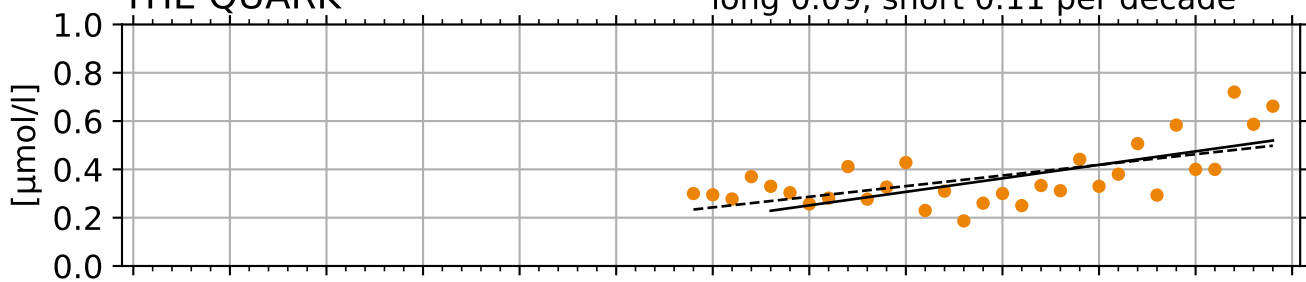
BOTHNIAN SEA

long 0.15, short 0.29 per decade

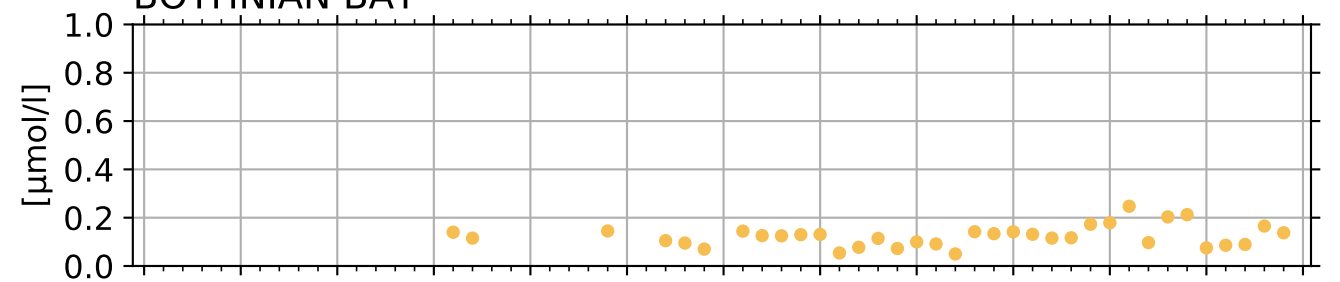


THE QUARK

long 0.09, short 0.11 per decade



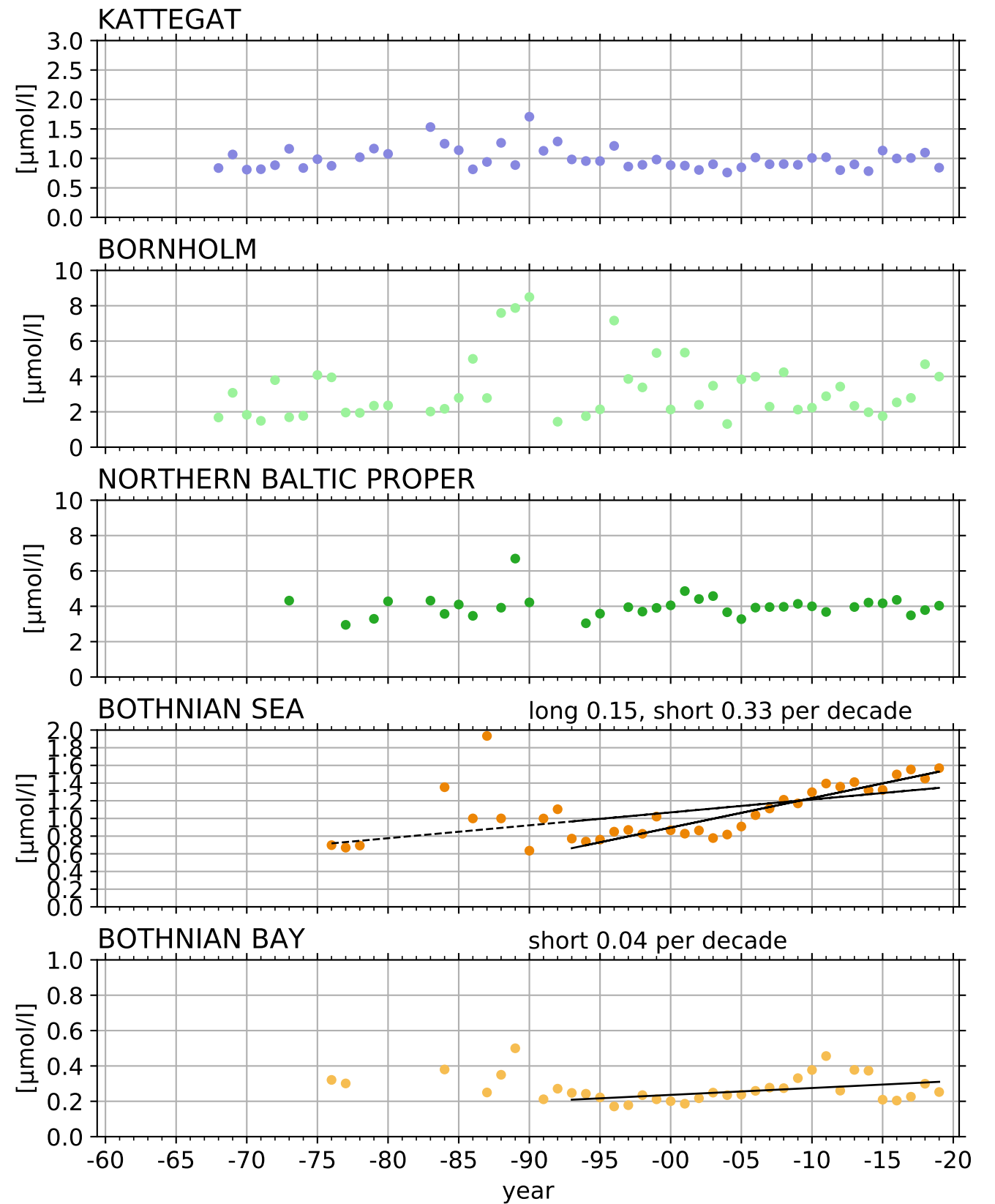
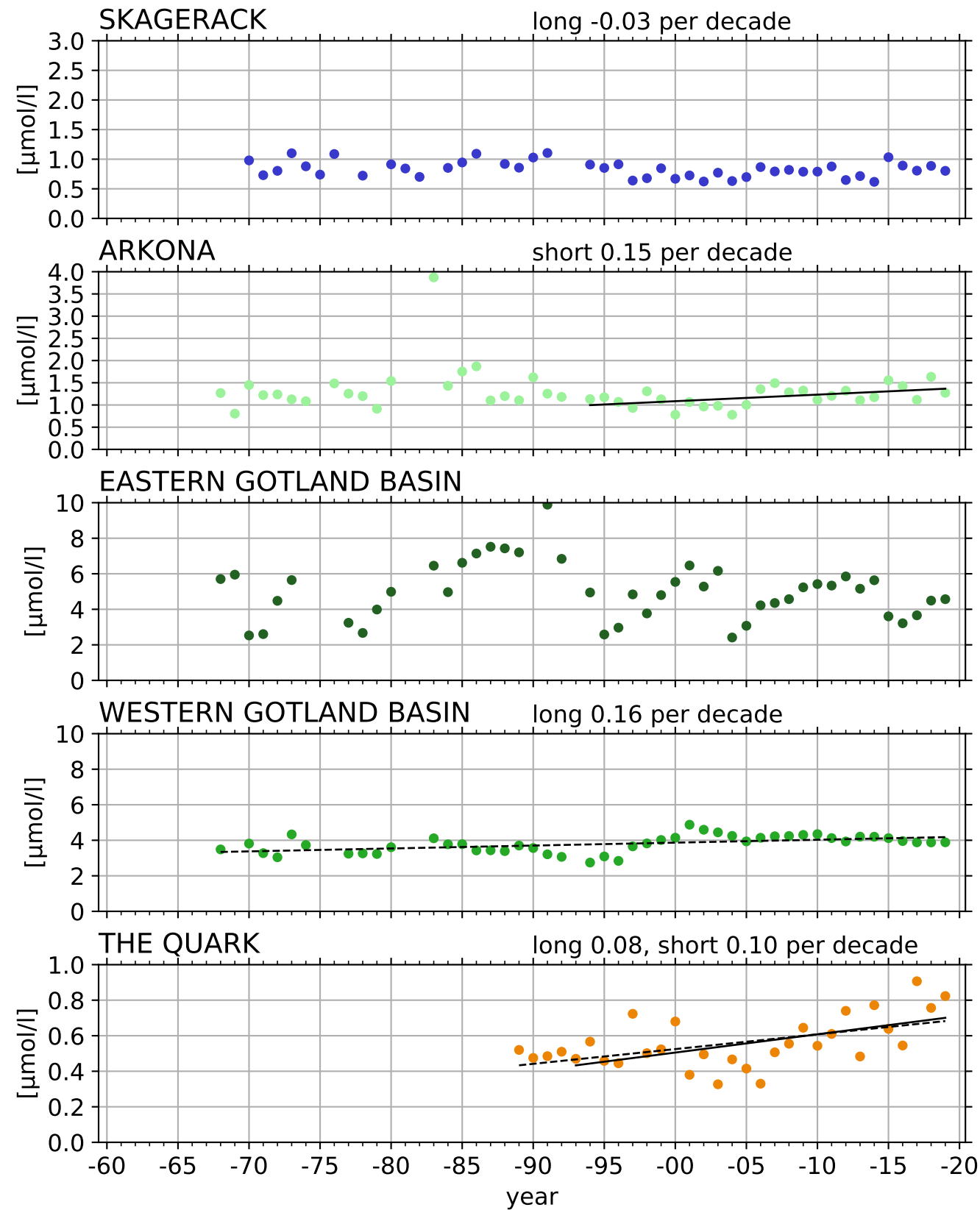
BOTHNIAN BAY



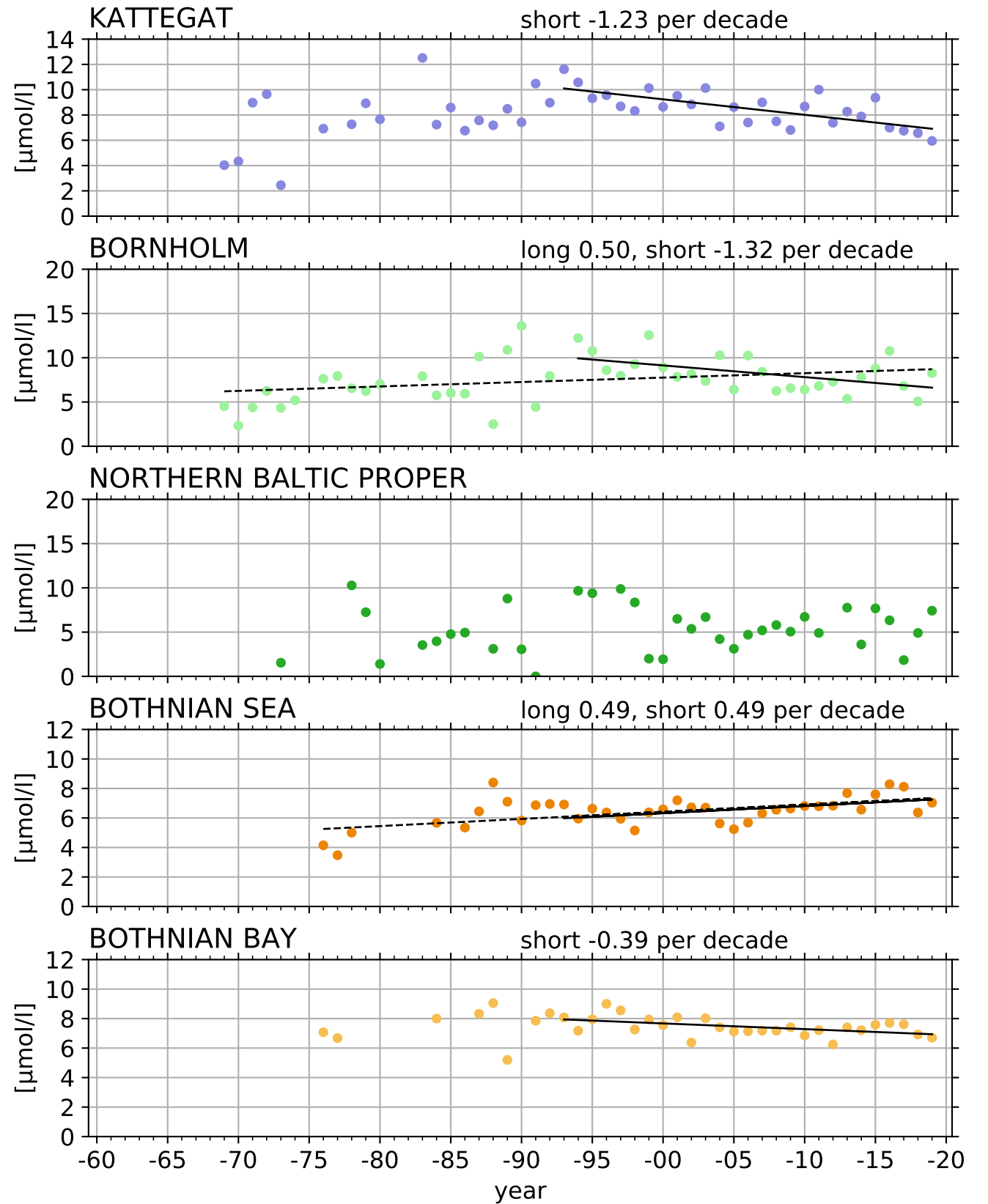
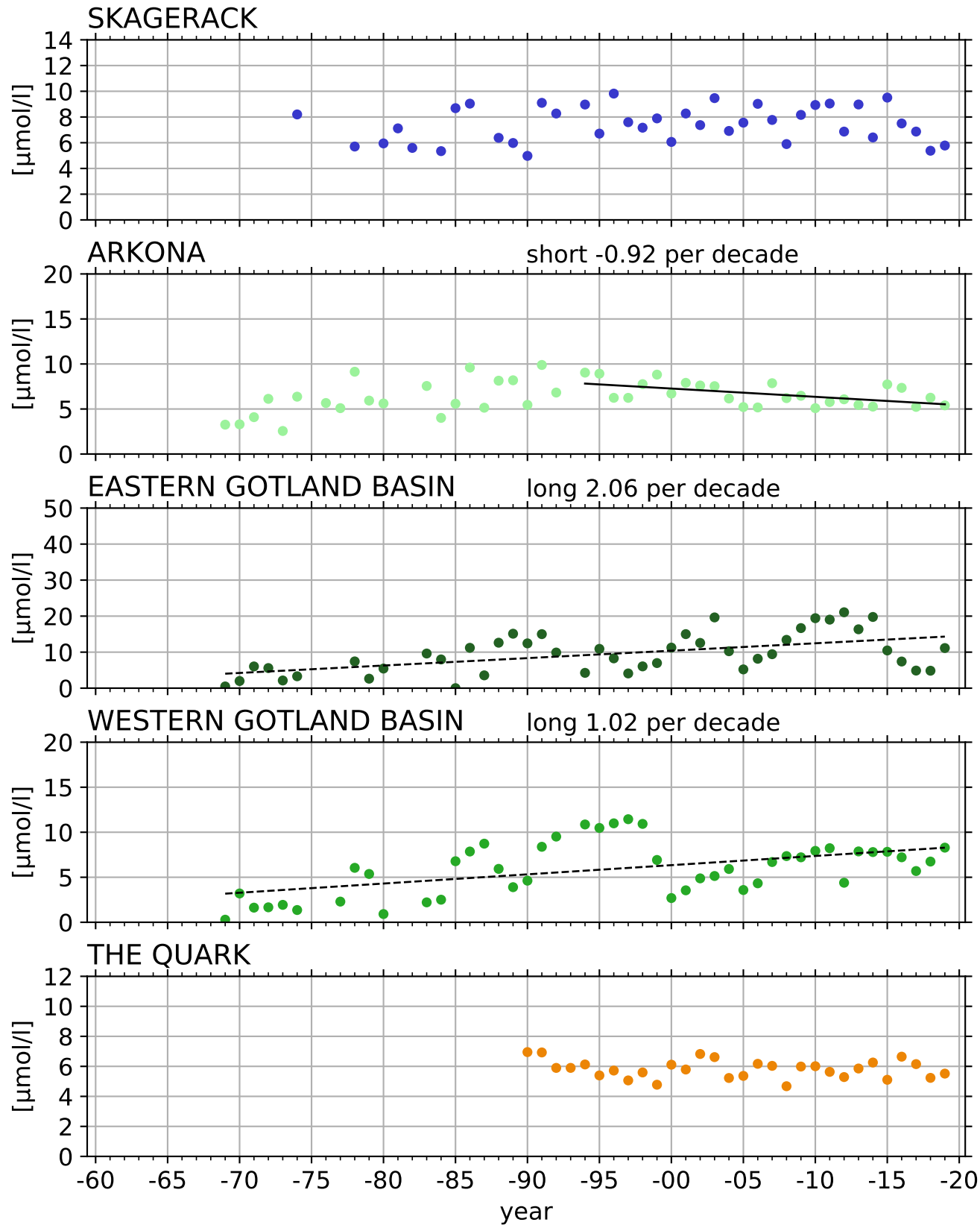
year

year

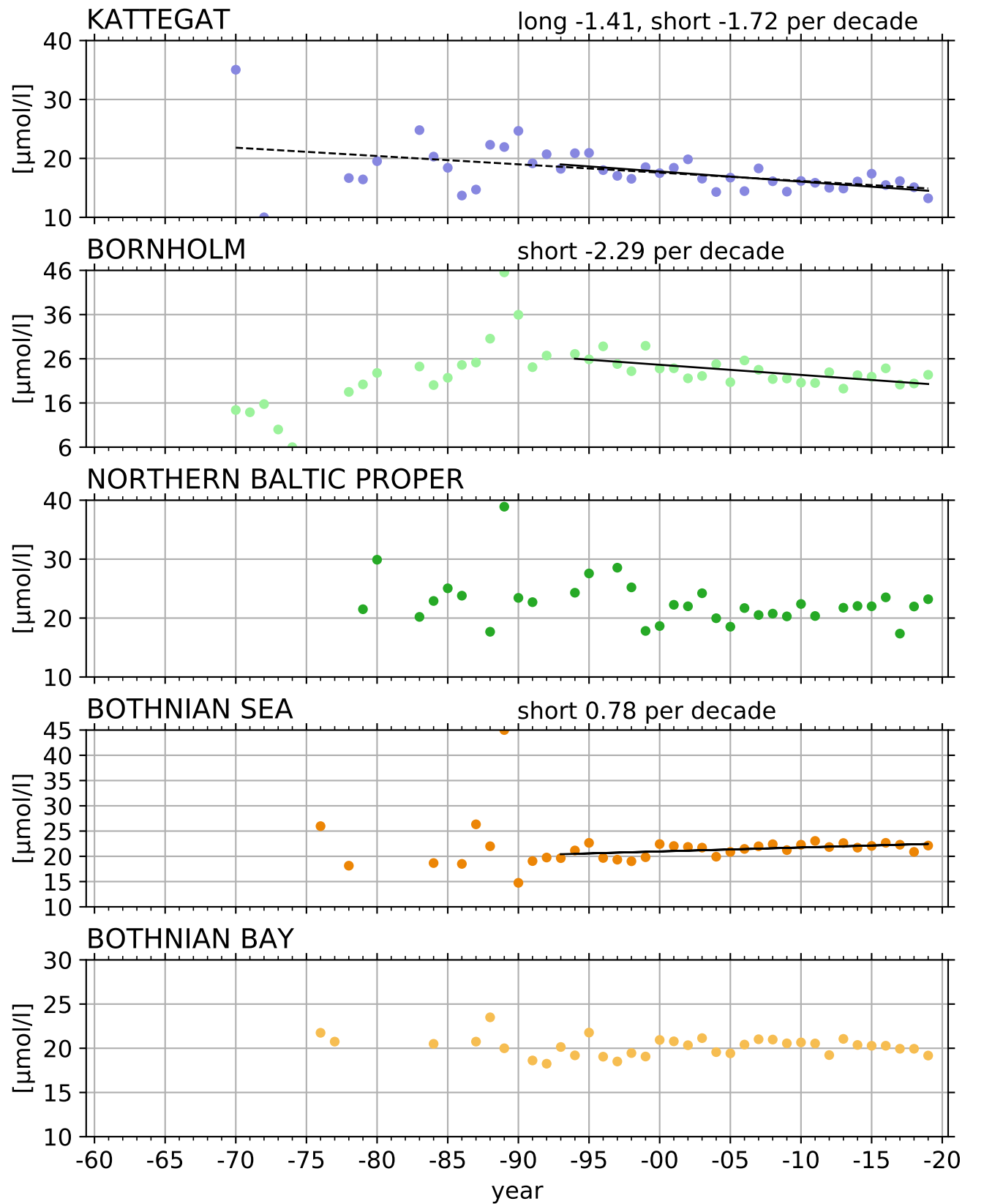
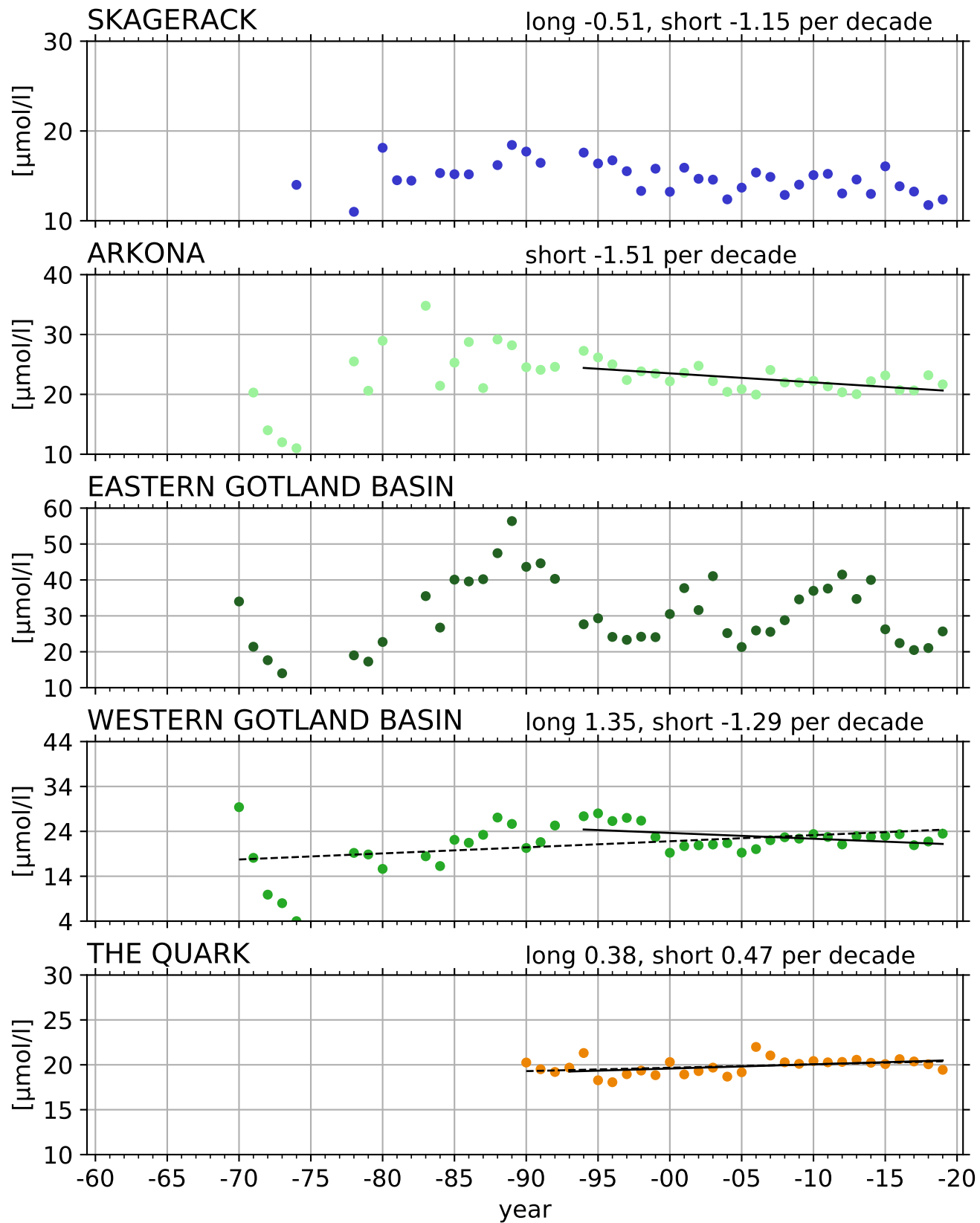
Total phosphorus winter [$\mu\text{mol/l}$] BW



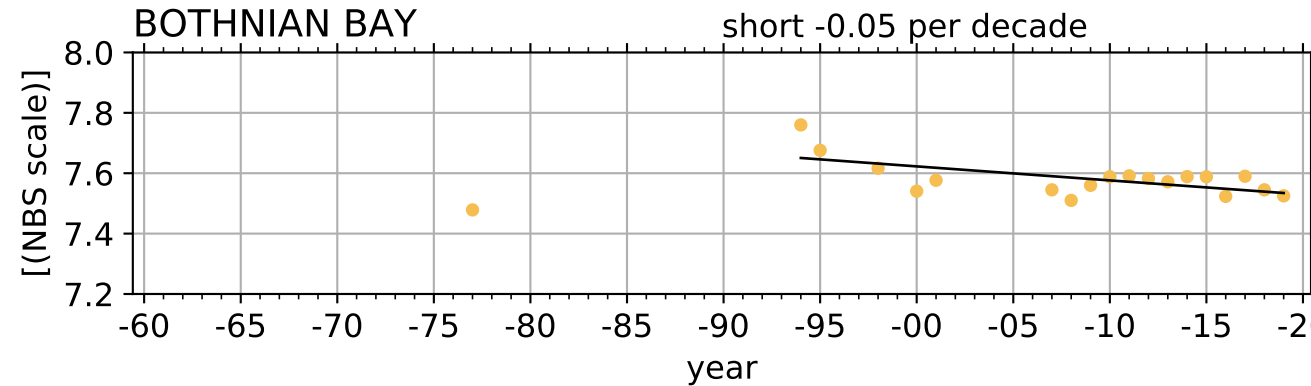
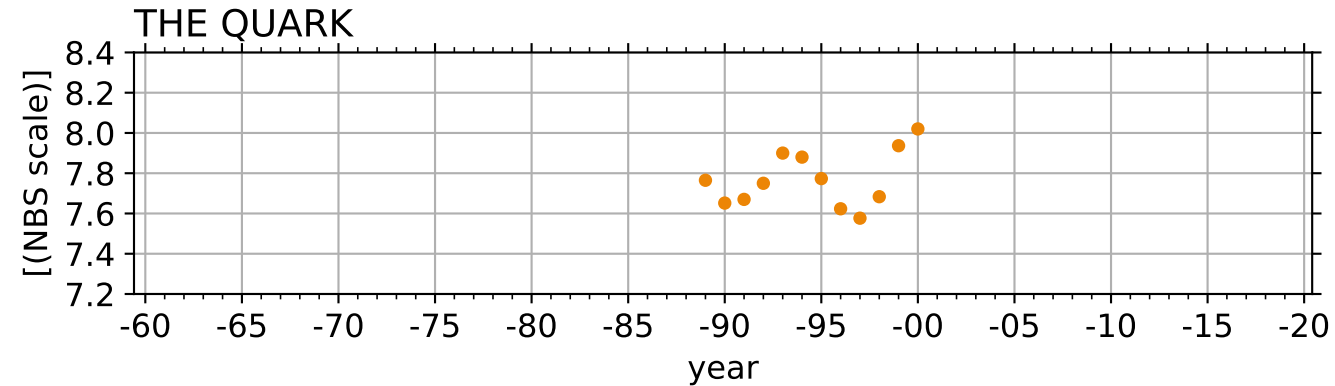
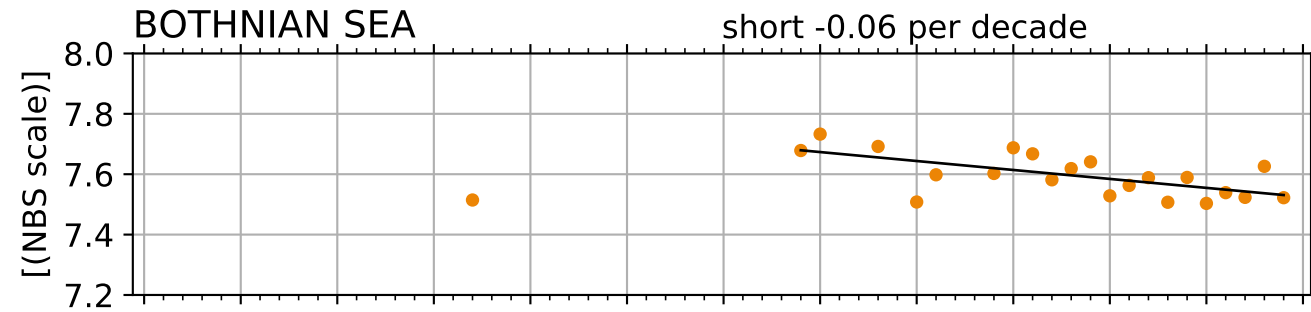
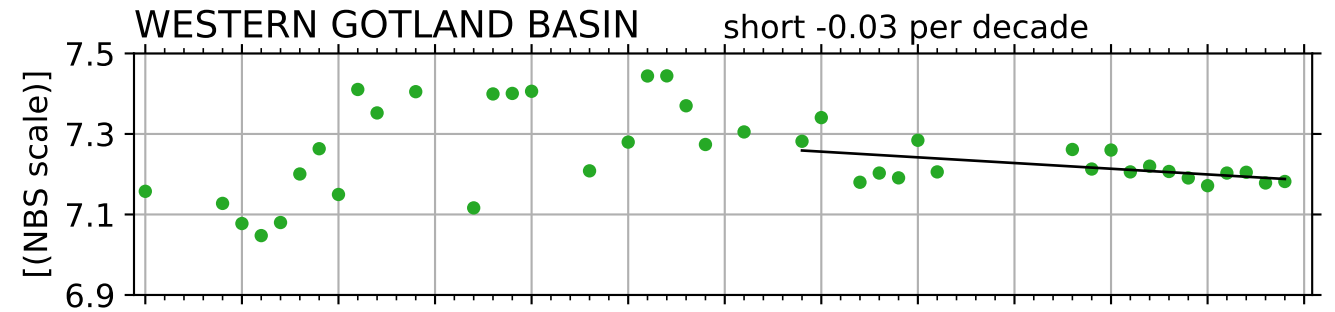
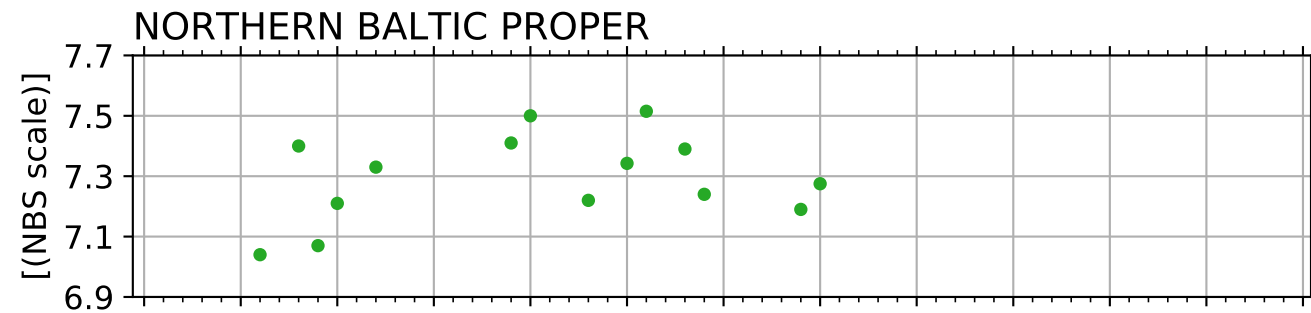
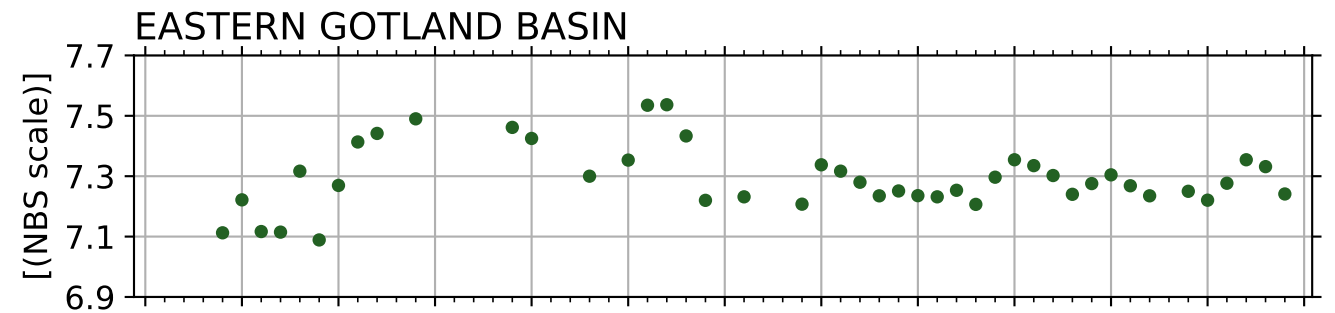
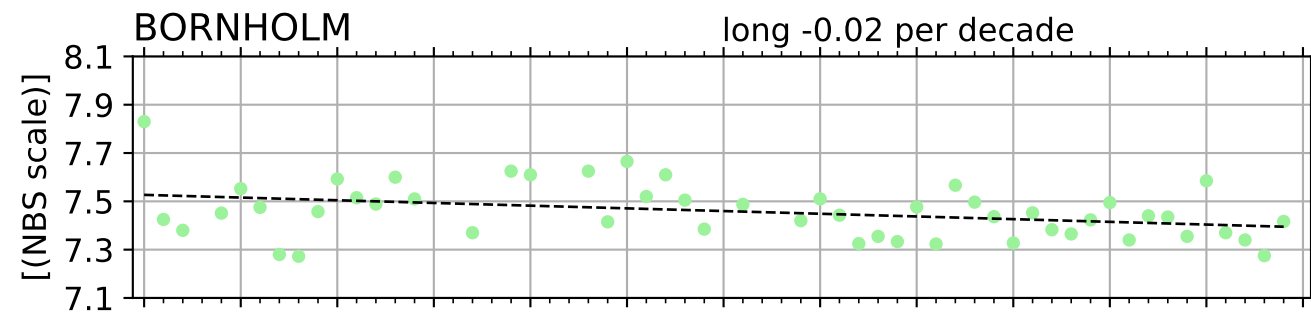
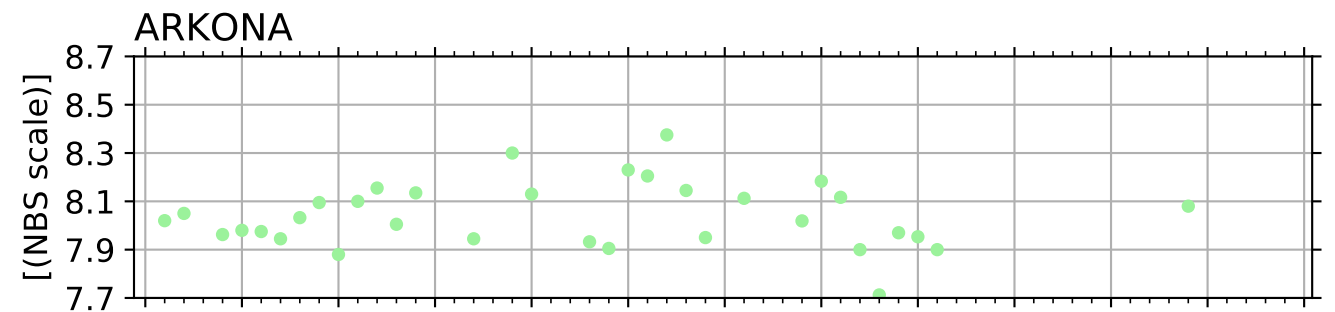
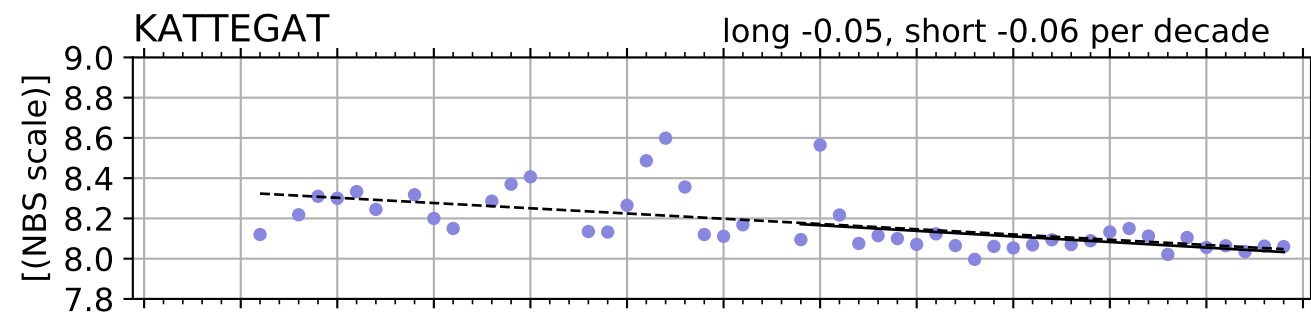
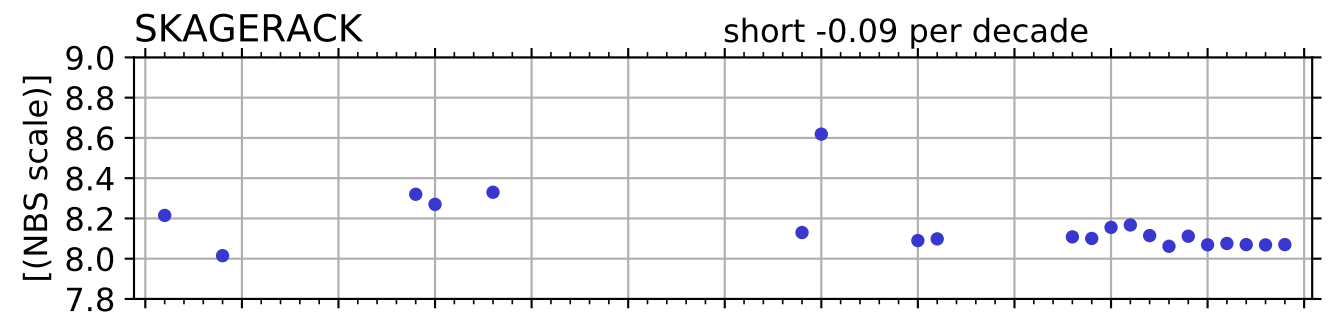
DIN winter [$\mu\text{mol/l}$] BW



Total Nitrogen winter [$\mu\text{mol/l}$] BW



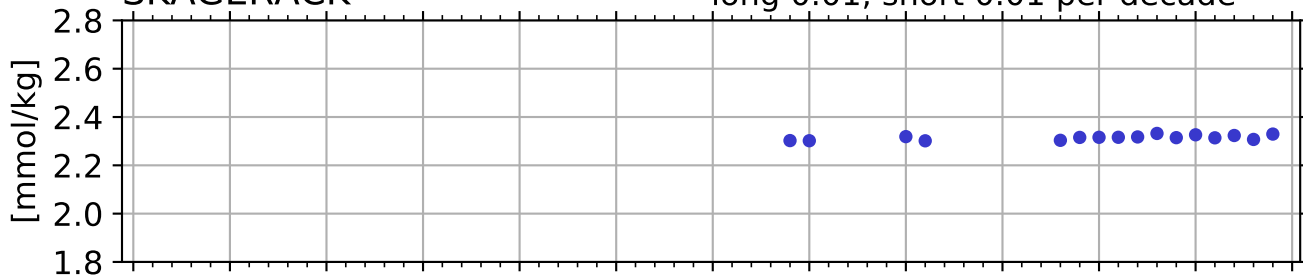
pH winter [(NBS scale)] BW



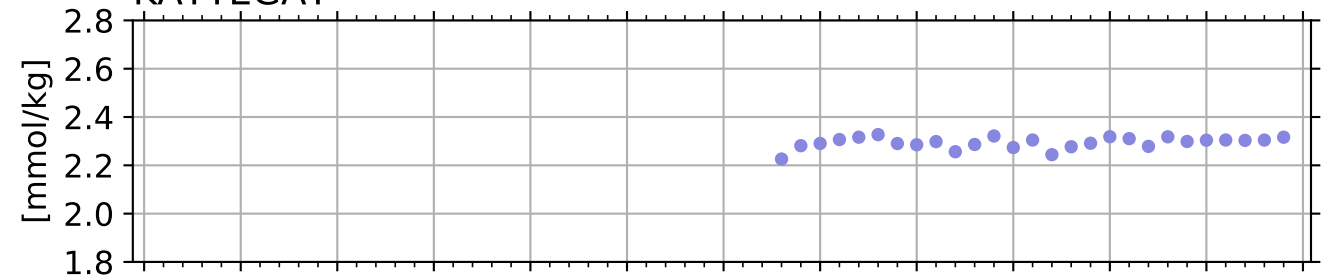
Alkalinity winter [mmol/kg] BW

SKAGERACK

long 0.01, short 0.01 per decade

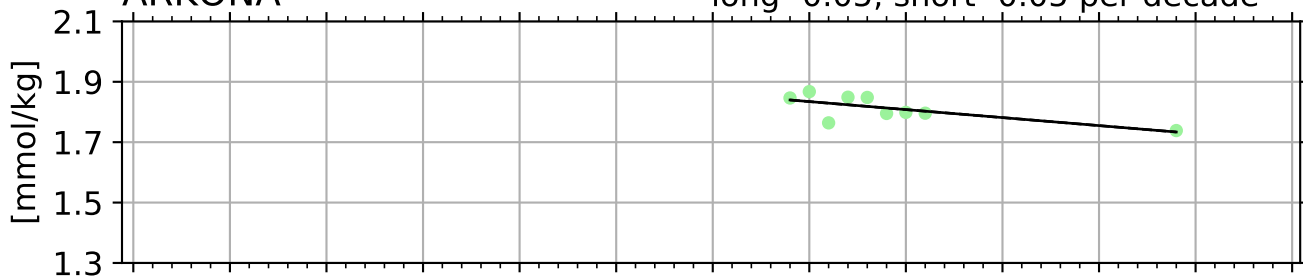


KATTEGAT



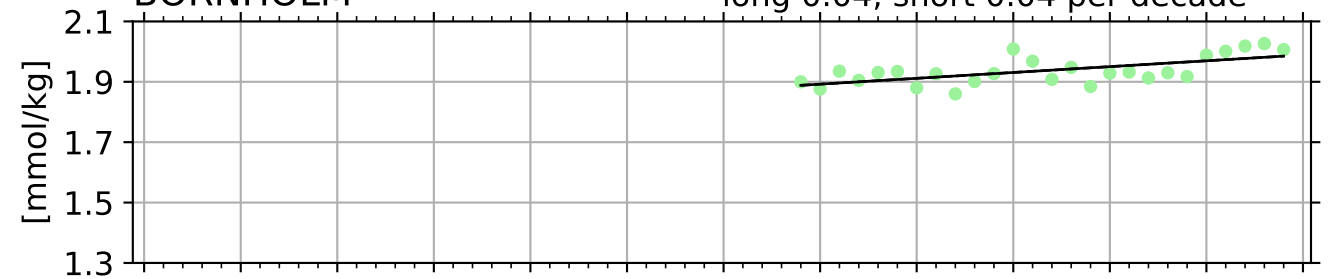
ARKONA

long -0.05, short -0.05 per decade



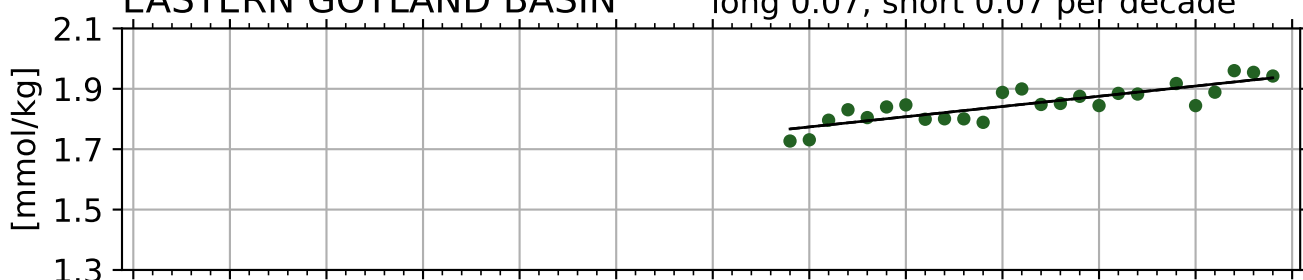
BORNHOLM

long 0.04, short 0.04 per decade

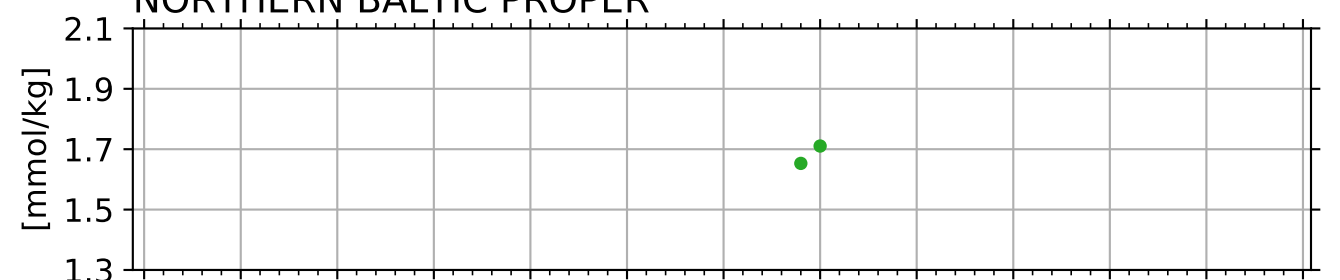


EASTERN GOTLAND BASIN

long 0.07, short 0.07 per decade

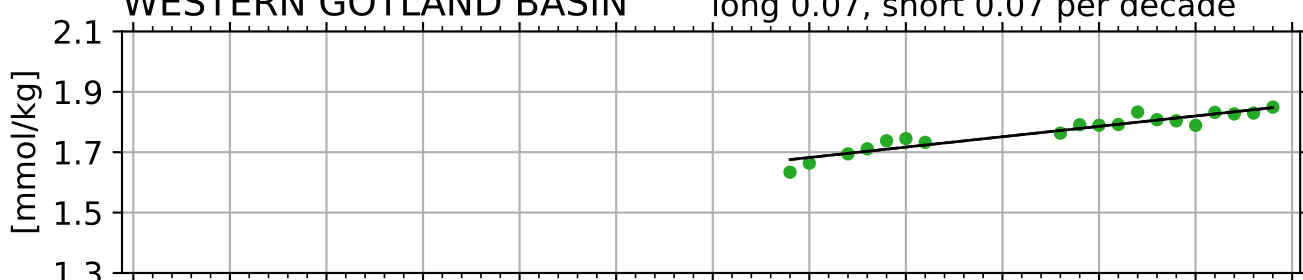


NORTHERN BALTIC PROPER



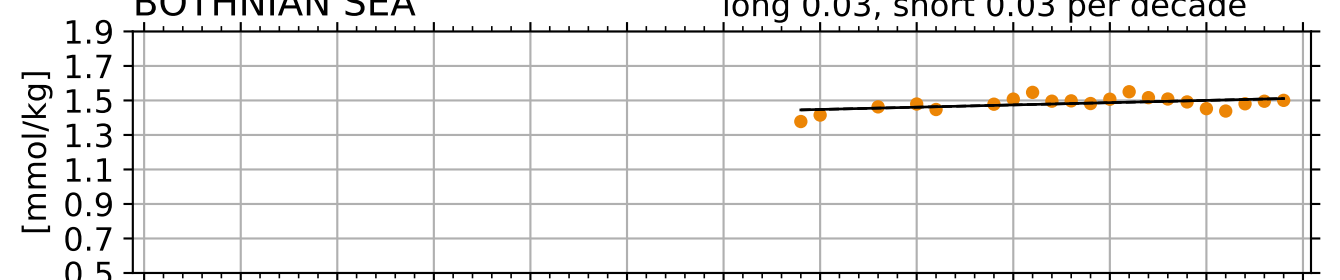
WESTERN GOTLAND BASIN

long 0.07, short 0.07 per decade



BOTHNIAN SEA

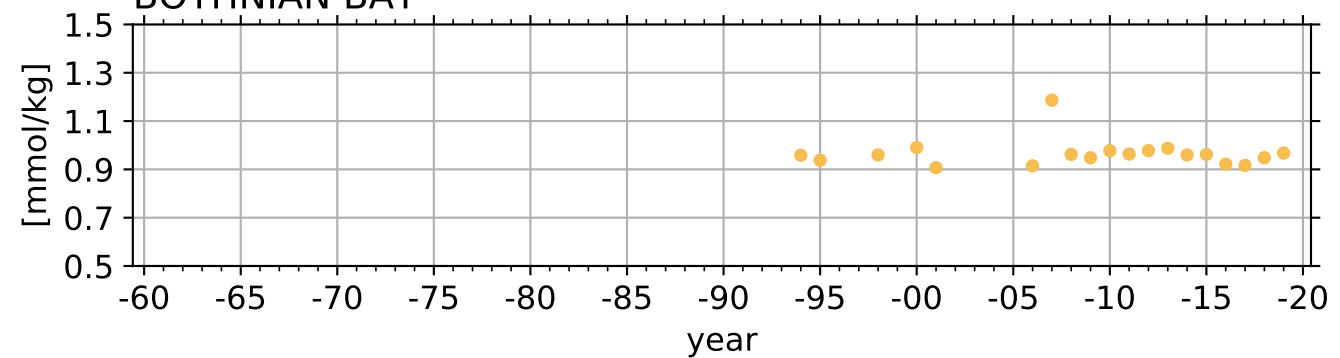
long 0.03, short 0.03 per decade



THE QUARK



BOTHNIAN BAY



Appendix IV

Nutrient content per basin in the Baltic Sea and the Gulf of Bothnia

Method

The basin content of nutrients was calculated from the same data set that was used for the time series presented in Appendix II. Each profile was interpolated (linearly) to retrieve concentrations in 1 m depth resolution from each station. Only complete profiles with data in the surface, intermediary and deep waters are used.

The data is divided into winter, spring, summer and autumn (winter: Dec-Feb, spring: Mar-May, summer: June-Aug, autumn: Sep-Nov). This means that 2019 winter was calculated from data collected in December 2018, January 2019 and February 2019.

For each basin the concentration at each depth is multiplied by the volume of that depth layer, thereby getting the content of each nutrient in that depth layer. All depth layers are then summed to give the content for the whole basin. In Bornholm Basin, Arkona Basin, Bothnian Sea and Bothnian Bay the average concentration of two stations is used for the calculation, assuming little horizontal variations in all depth layers. The Western Gotland Basin and the Eastern Gotland Basin are divided into three and four sub-basins respectively because the horizontal variations, especially in the deep waters, are larger here. The sub-basins are chosen based on bathymetry around the monitoring stations. Calculated content is shown both for the sub-basins and the whole basins.

The winter and summer content is shown for all basins on the last page. Note that the difference in content between the basins depends on their difference in size.

The volume of each depth layer was calculated from the bathymetry dataset iowotopo2 available by IOW at <https://www.io-warnemuende.de/topography-of-the-baltic-sea.html> and by using the open sea basin subdivision set by HELCOM. The sub-basin divisions were made with GIS-software and lines for these divisions were drawn with guidance from the bathymetry map. All basin subdivisions used are shown in the first figure of this Appendix (Figure 1).

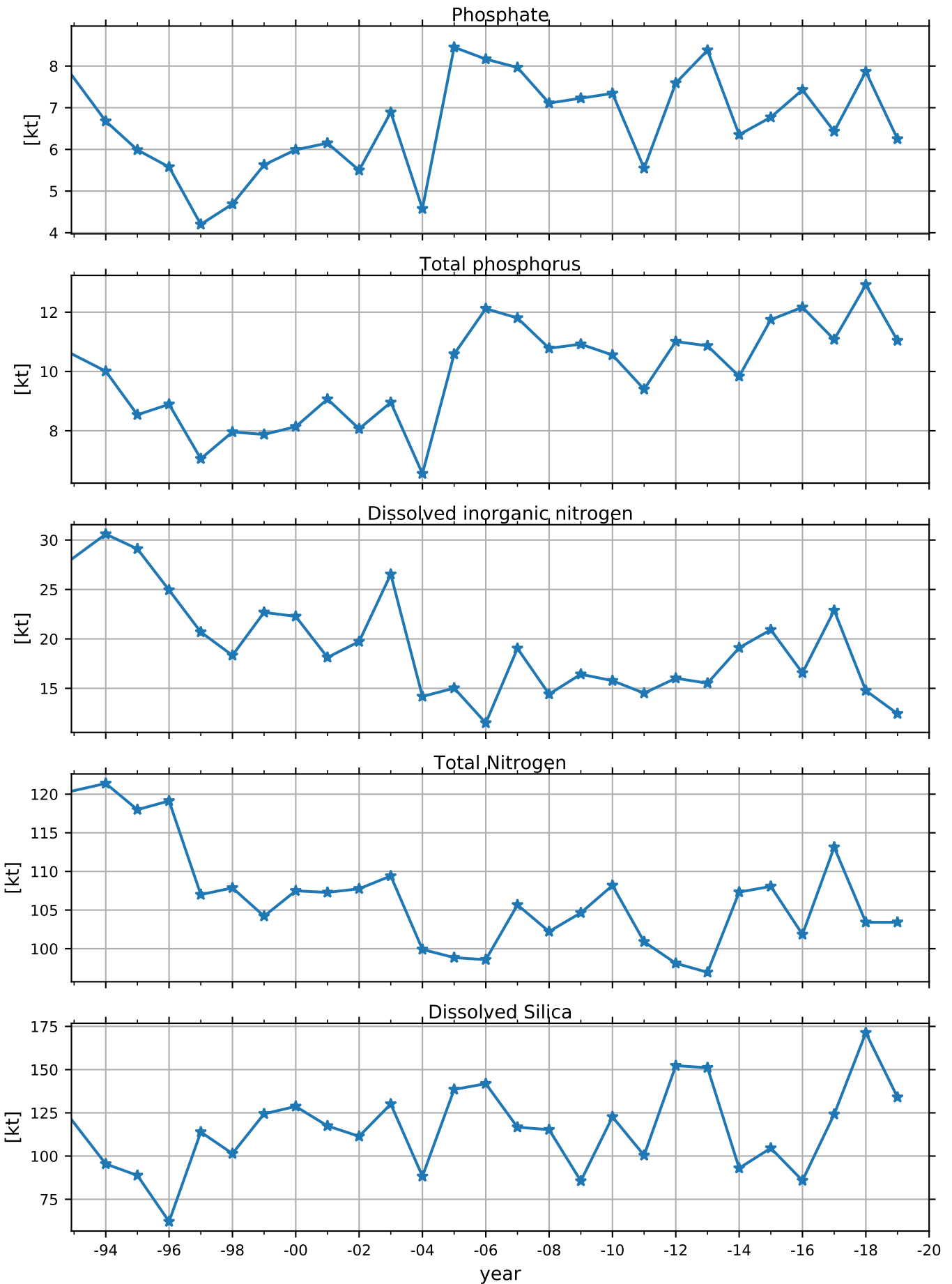


Figure 1 Basin subdivisions used for calculating hypsography and then basin content of sub-basins. The major basins shown in different colours are the HELCOM basin division revised in 2018. The previous basin division placed the station BY31 in the Northern Baltic Proper. The dashed lines showing the sub-basins were drawn to follow the bathymetry to get a smaller basin that the individual monitoring station better represents.

ARKONA BASIN

Offshore volume of basin: 353 km³

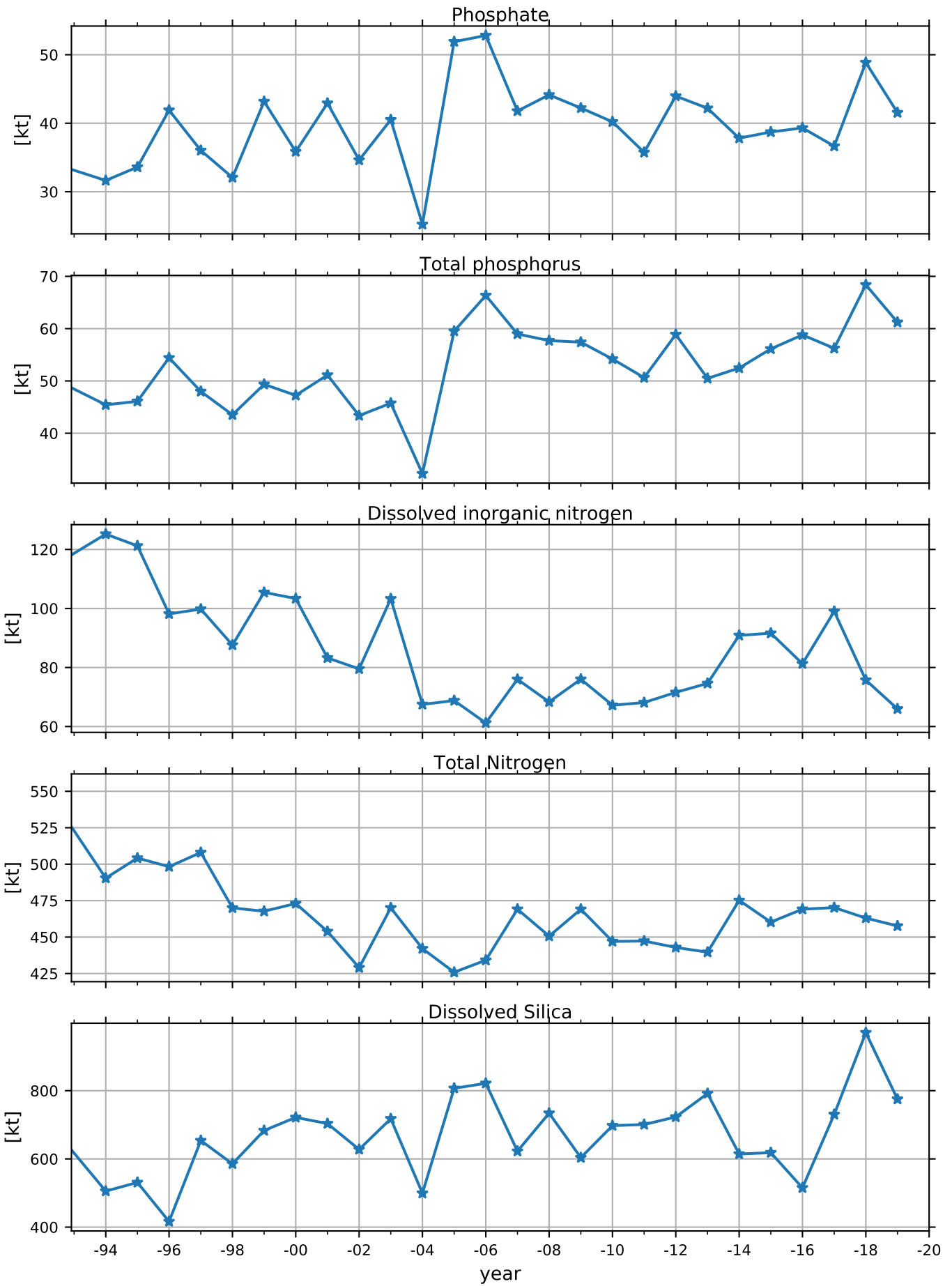
—*— winter



BORNHOLM BASIN

Offshore volume of basin: 1603 km³

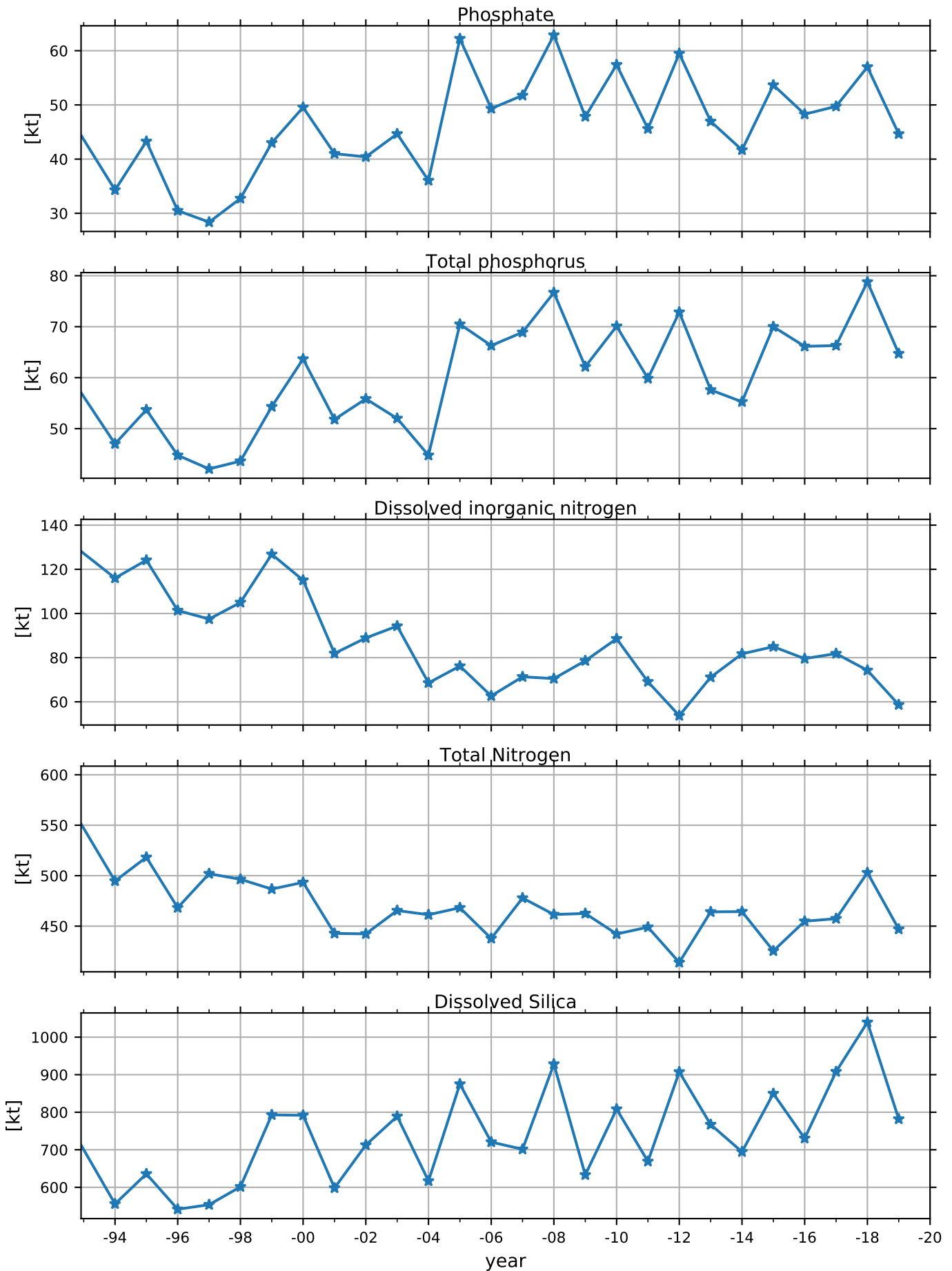
—*— winter



EASTERN GOTLAND BASIN BCS III-10

Offshore volume of basin: 1597 km³

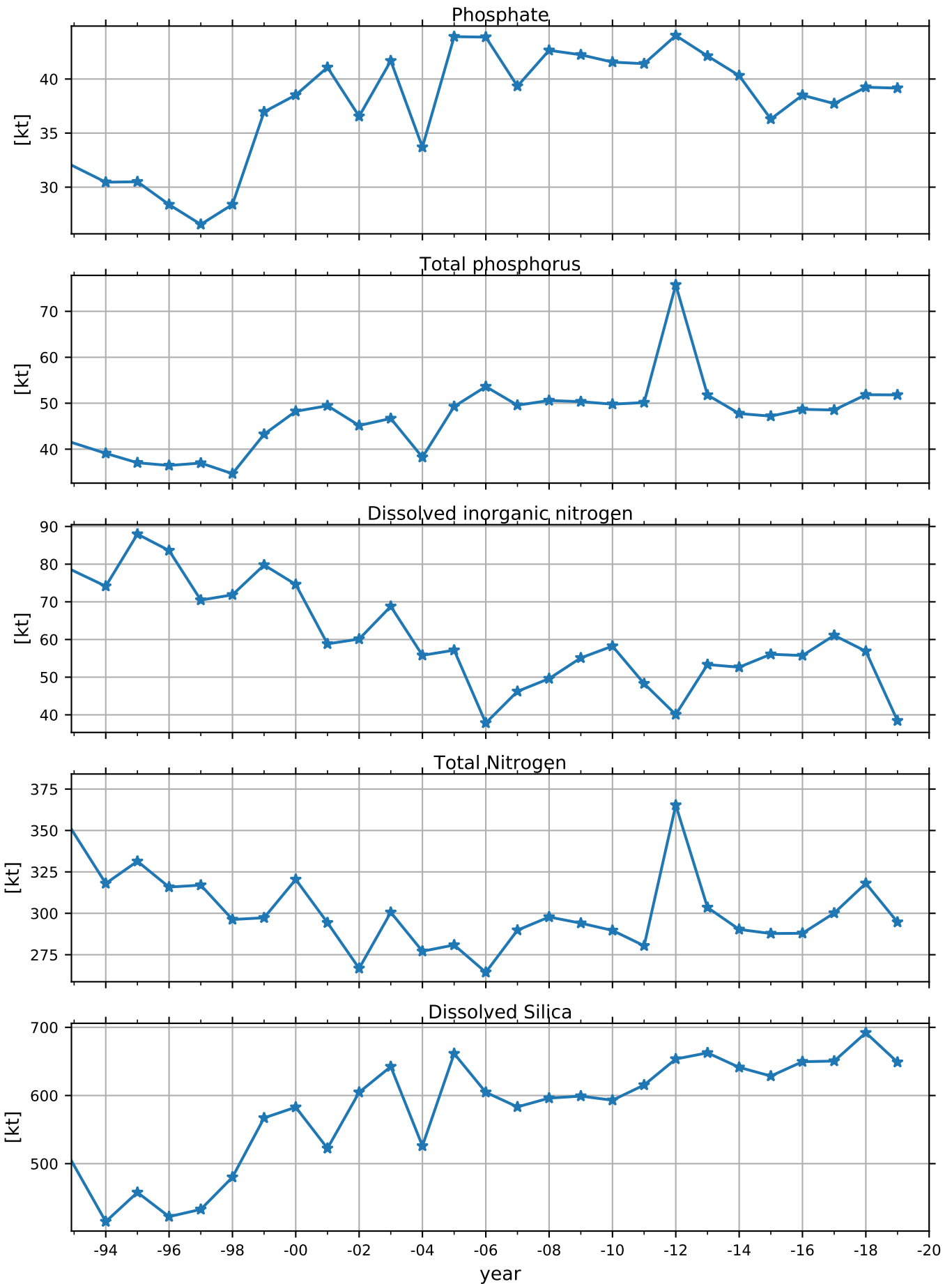
—*— winter



EASTERN GOTLAND BASIN BY10

Offshore volume of basin: 1007 km³

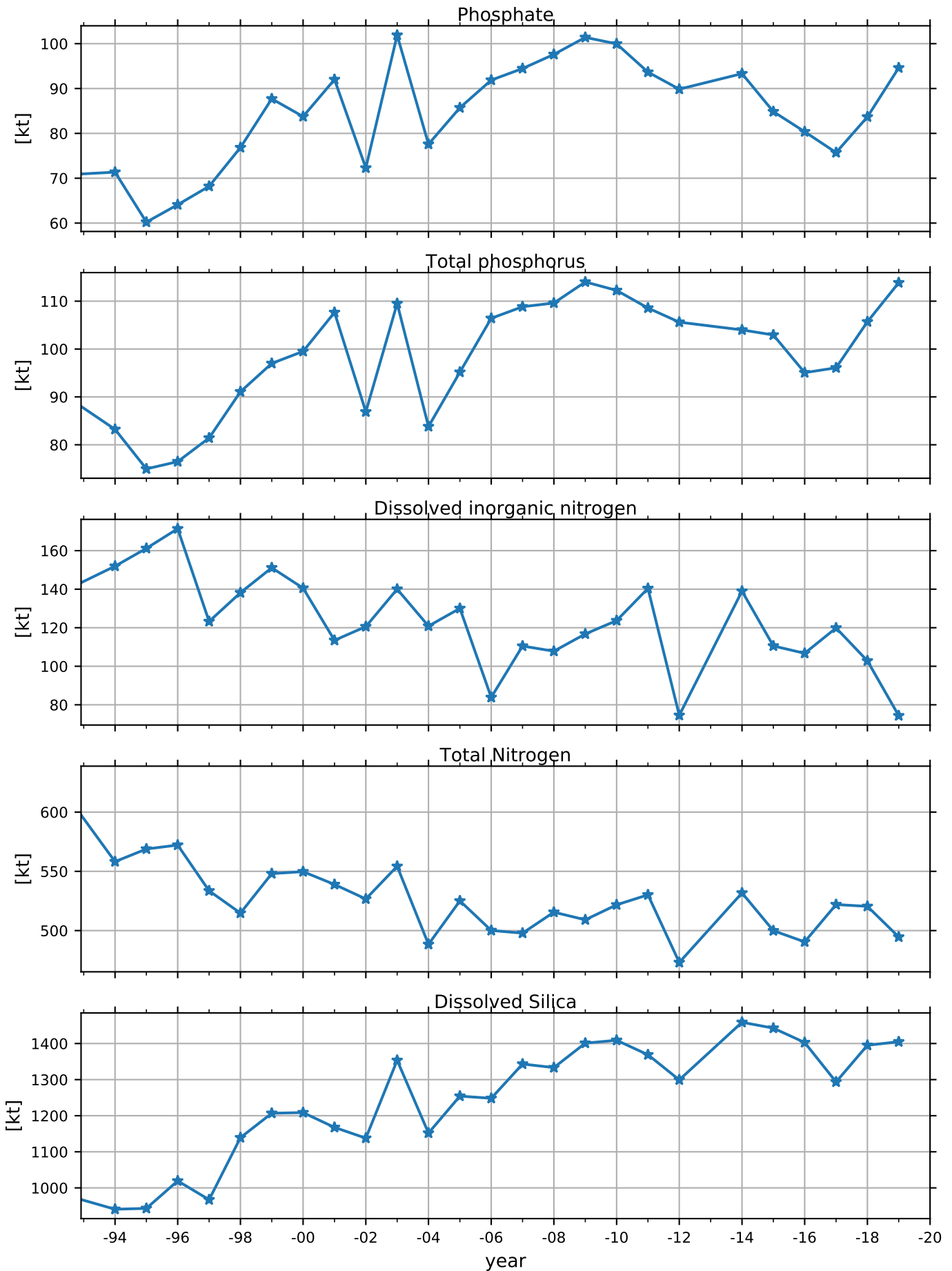
—*— winter



EASTERN GOTLAND BASIN BY15 GOTLANDSDJ

Offshore volume of basin: 1748 km³

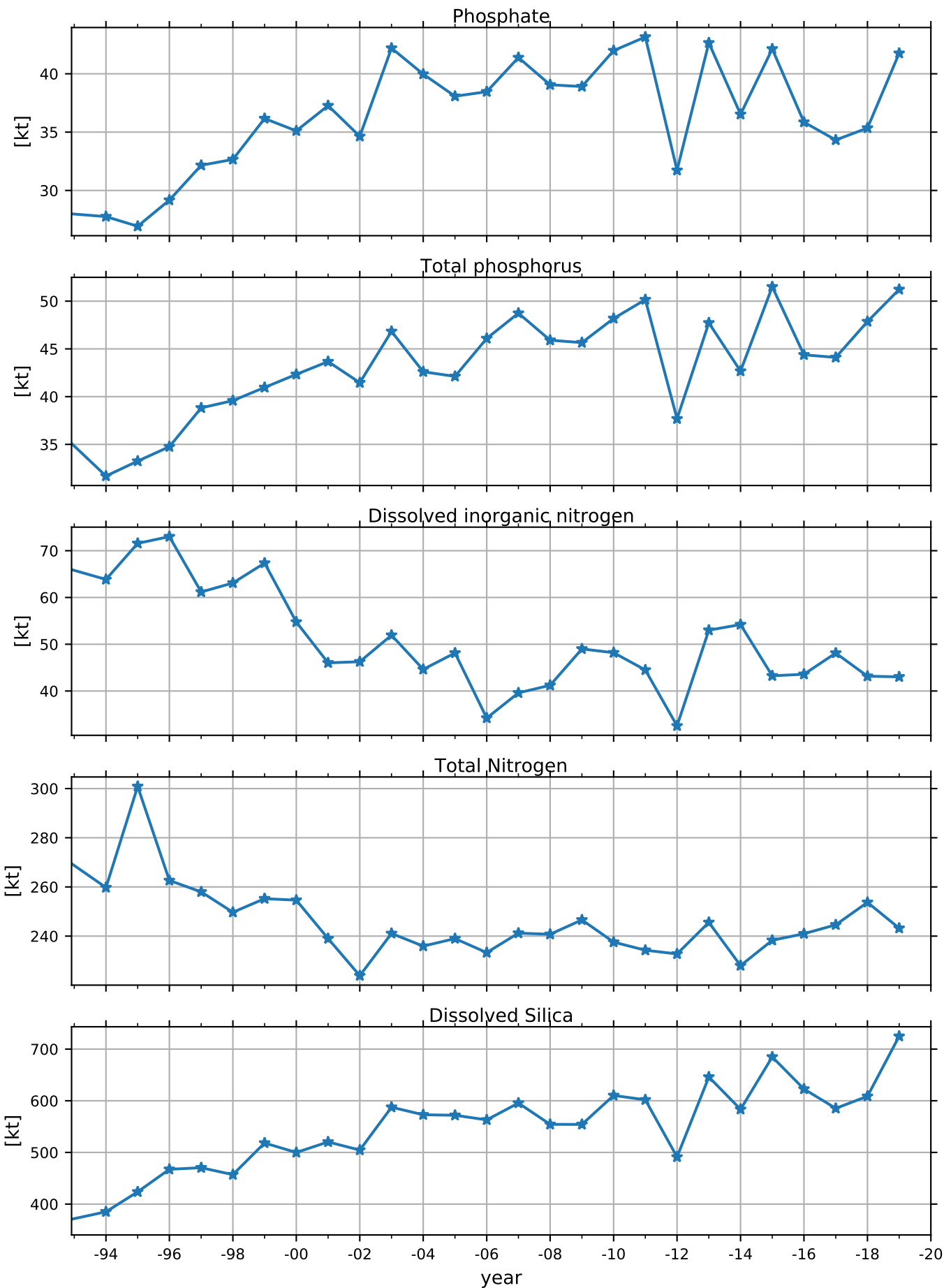
—*— winter



EASTERN GOTLAND BASIN BY20

Offshore volume of basin: 841 km³

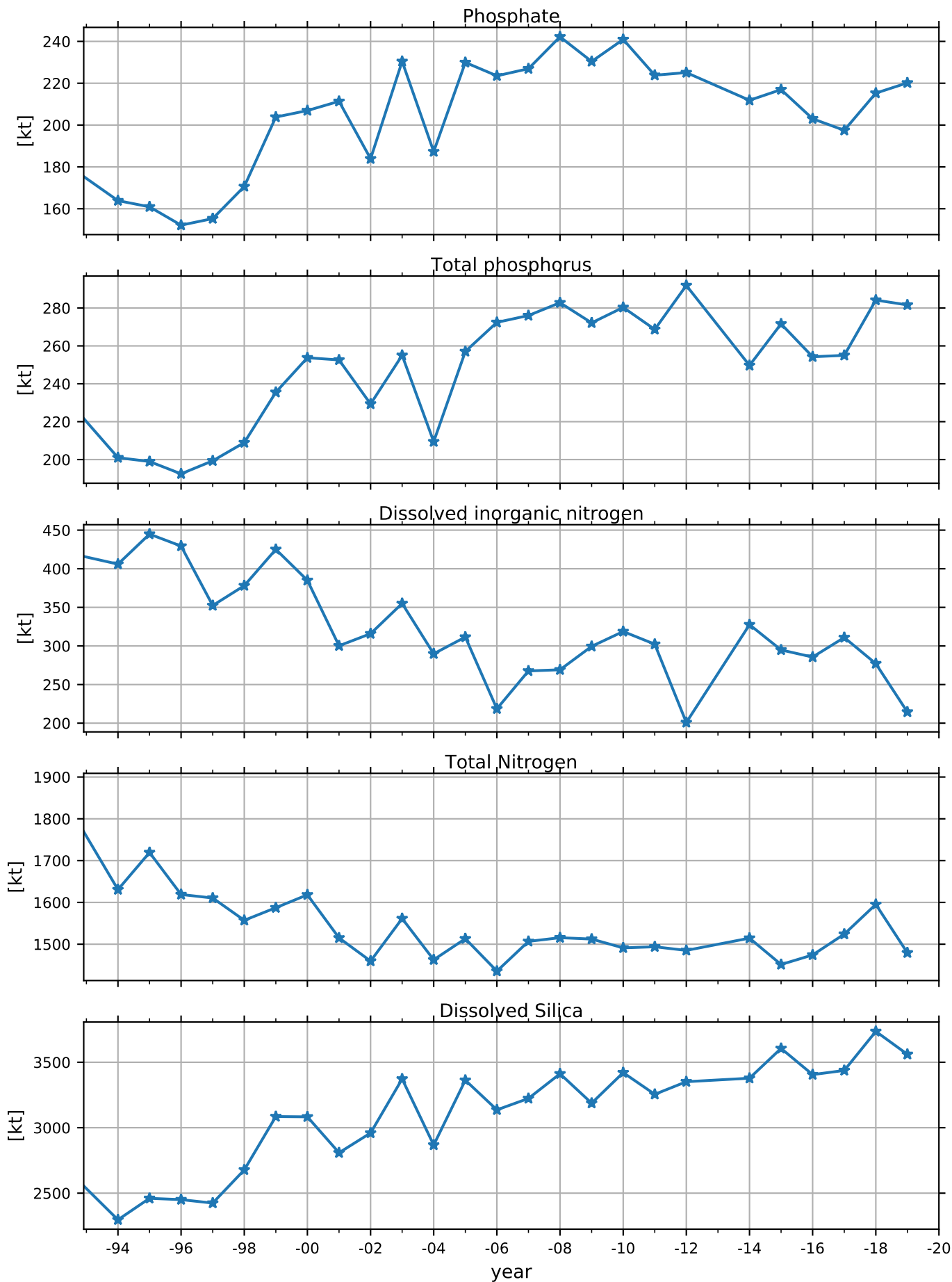
—*— winter



EASTERN GOTLAND BASIN

Offshore volume of basin: 5193 km³

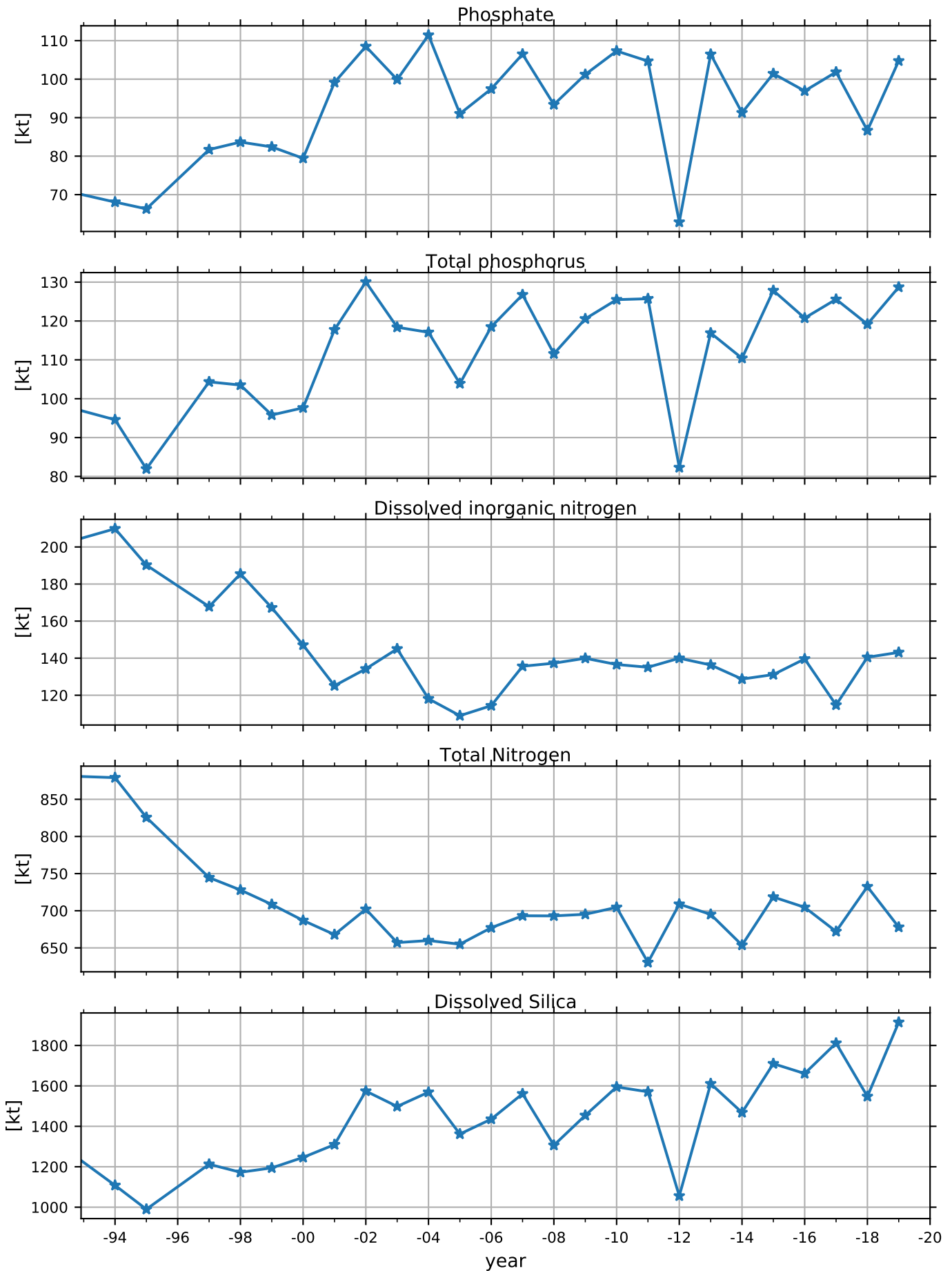
—*— winter



NORTHERN BALTIC PROPER

Offshore volume of basin: 2327 km³

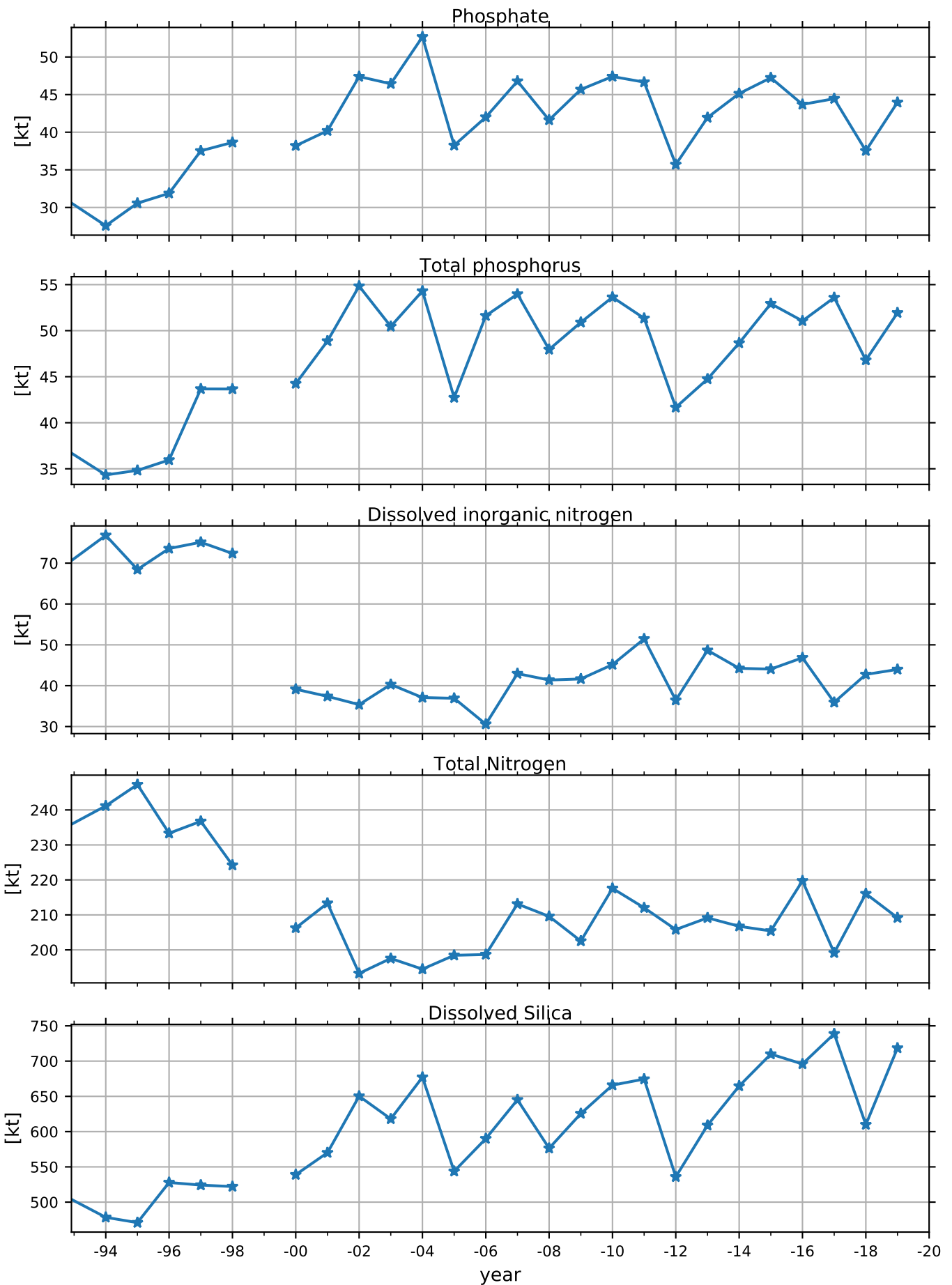
—*— winter



WESTERN GOTLAND BASIN BY31 LANDSORTSDJ

Offshore volume of basin: 723 km³

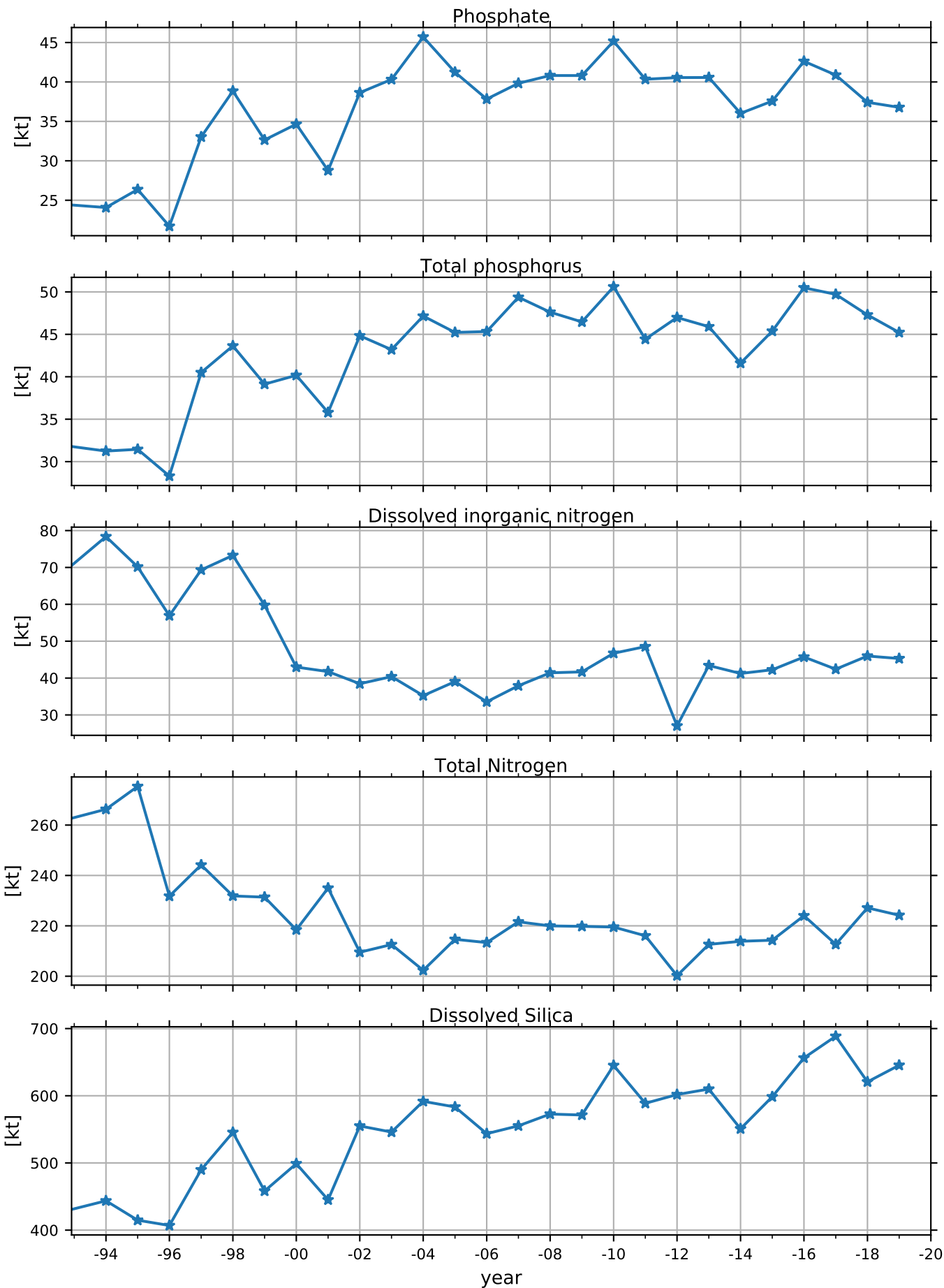
—*— winter



WESTERN GOTLAND BASIN BY32

Offshore volume of basin: 767 km³

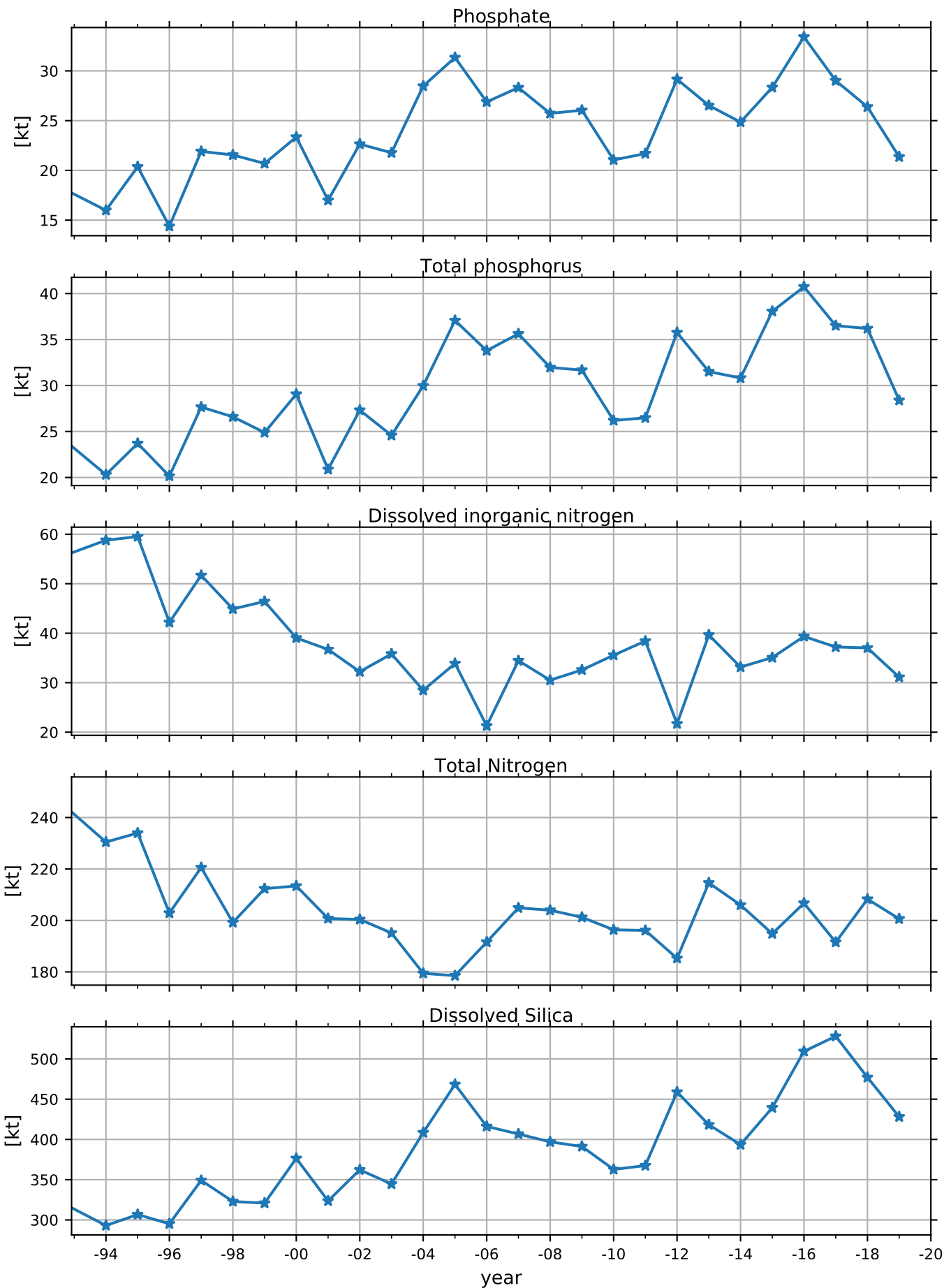
—*— winter



WESTERN GOTLAND BASIN BY38

Offshore volume of basin: 708 km³

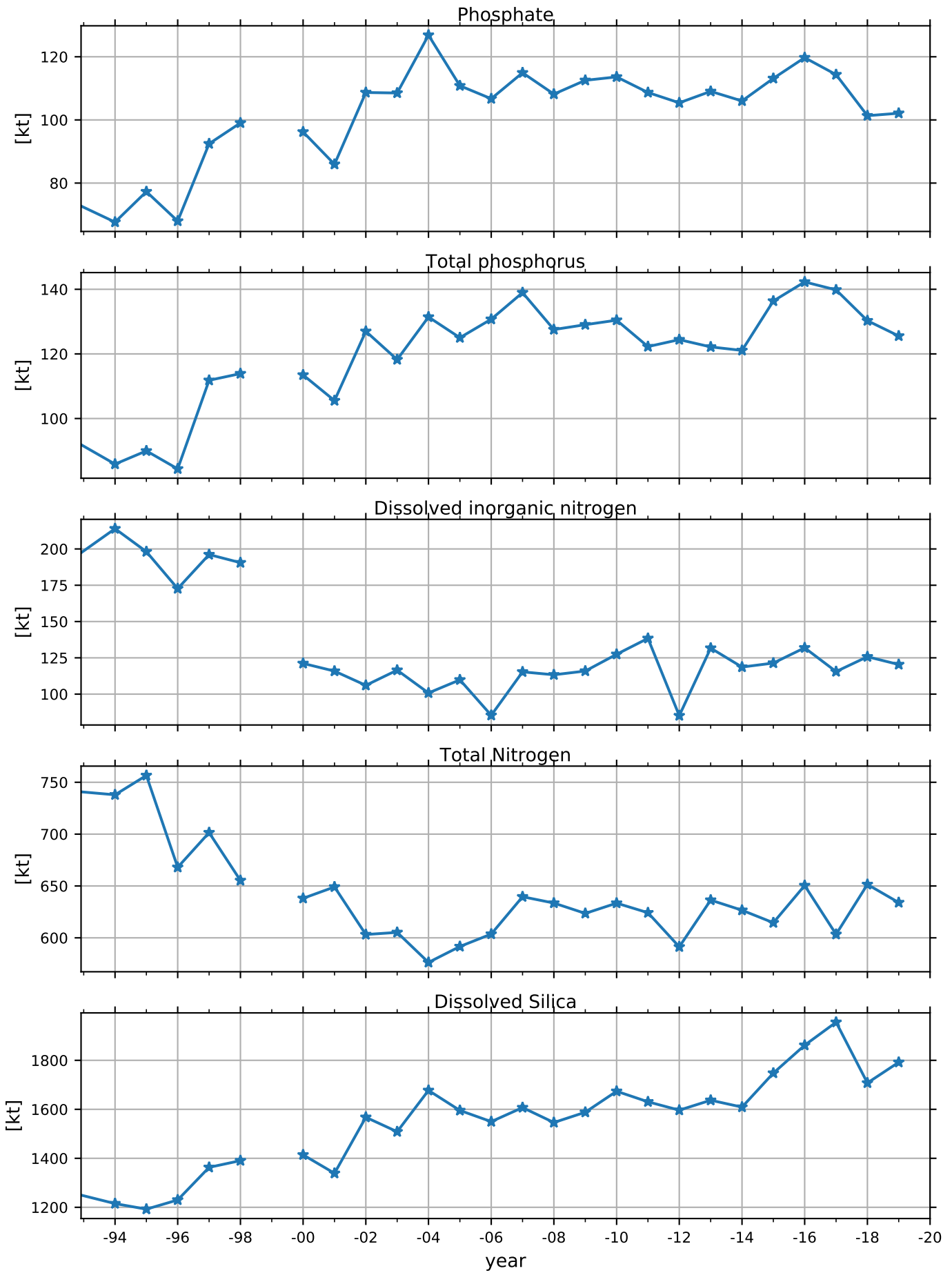
—*— winter



WESTERN GOTLAND BASIN

Offshore volume of basin: 2198 km³

—*— winter

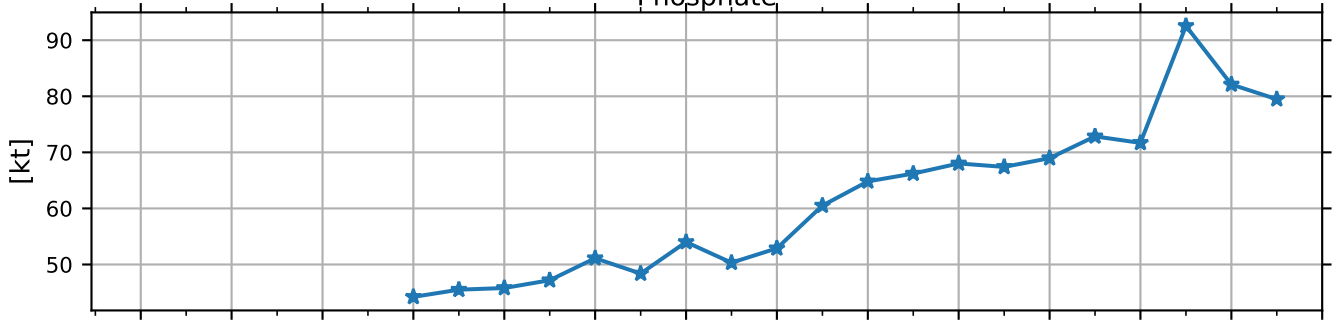


BOTHNIAN SEA

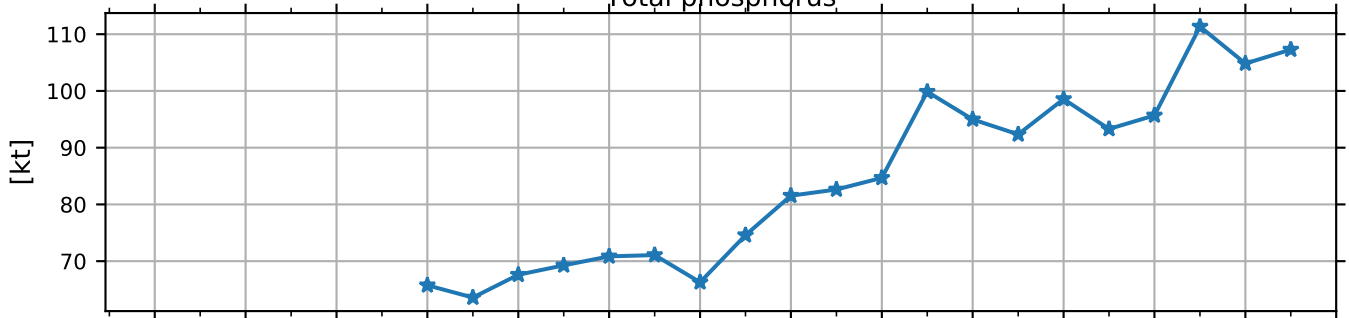
Offshore volume of basin: 4148 km³

—*— winter

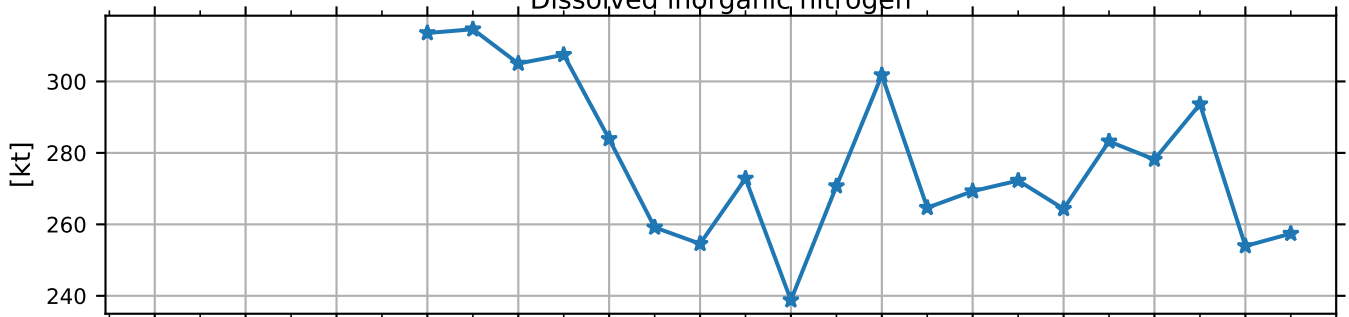
Phosphate



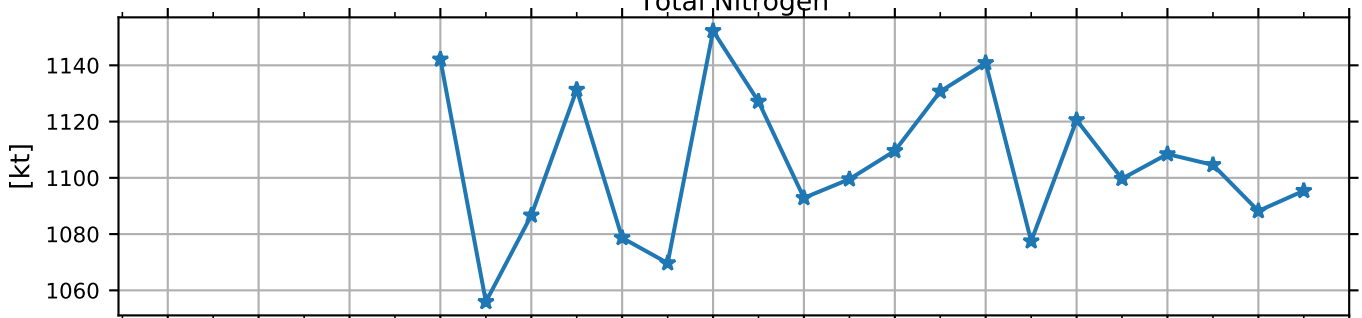
Total phosphorus



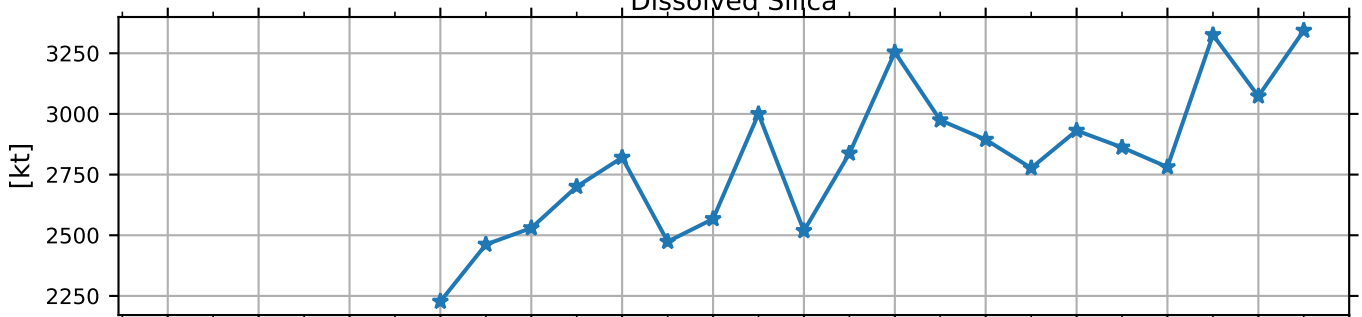
Dissolved inorganic nitrogen



Total Nitrogen



Dissolved Silica



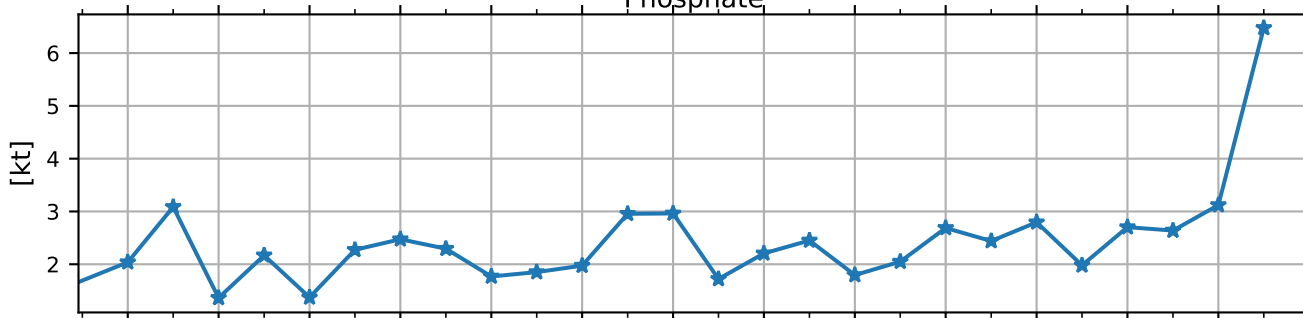
-94 -96 -98 -00 -02 -04 -06 -08 -10 -12 -14 -16 -18 -20
year

BOTHNIAN BAY

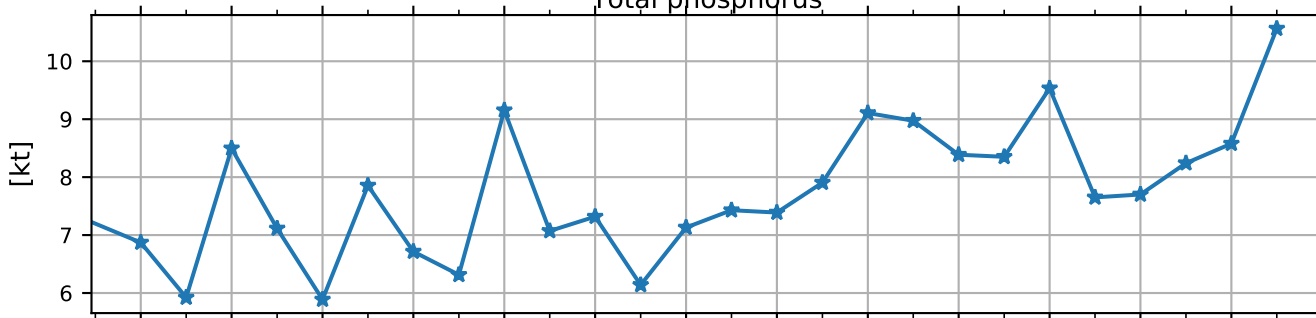
Offshore volume of basin: 1447 km³

—*— winter

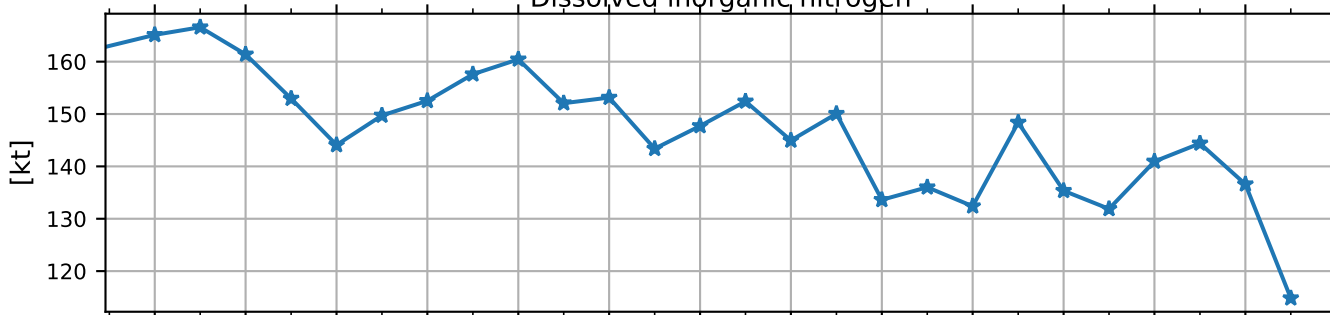
Phosphate



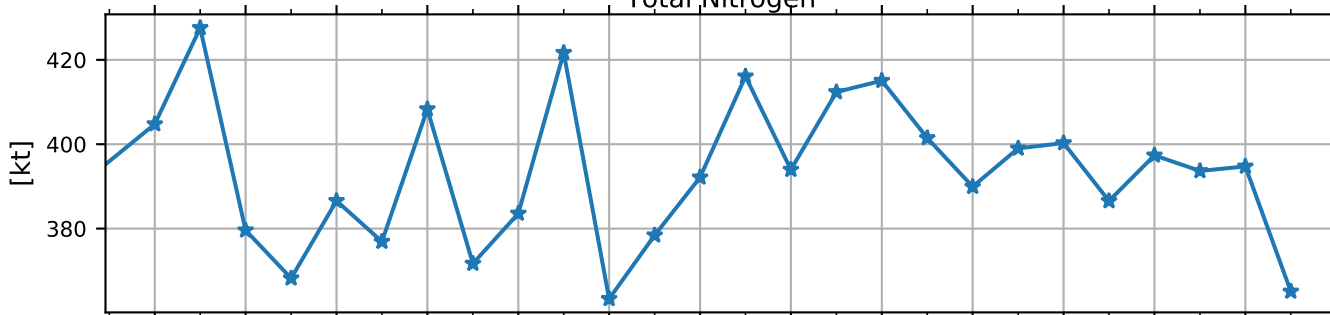
Total phosphorus



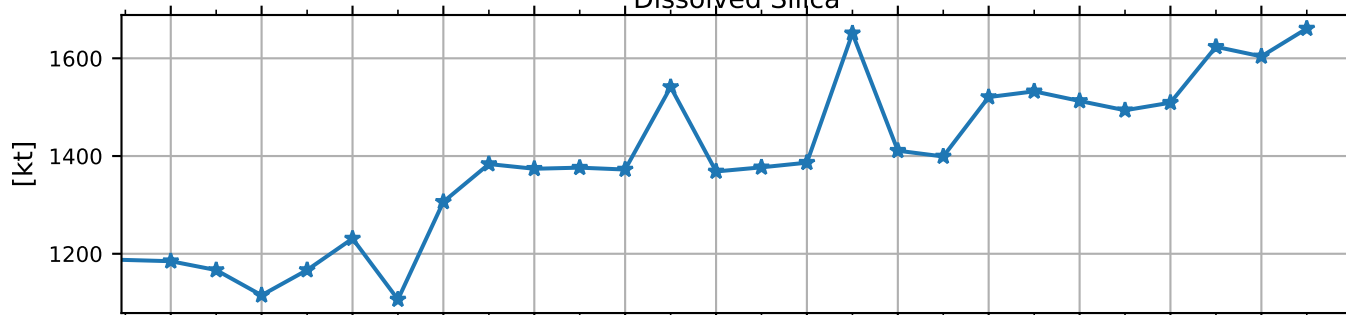
Dissolved inorganic nitrogen



Total Nitrogen



Dissolved Silica

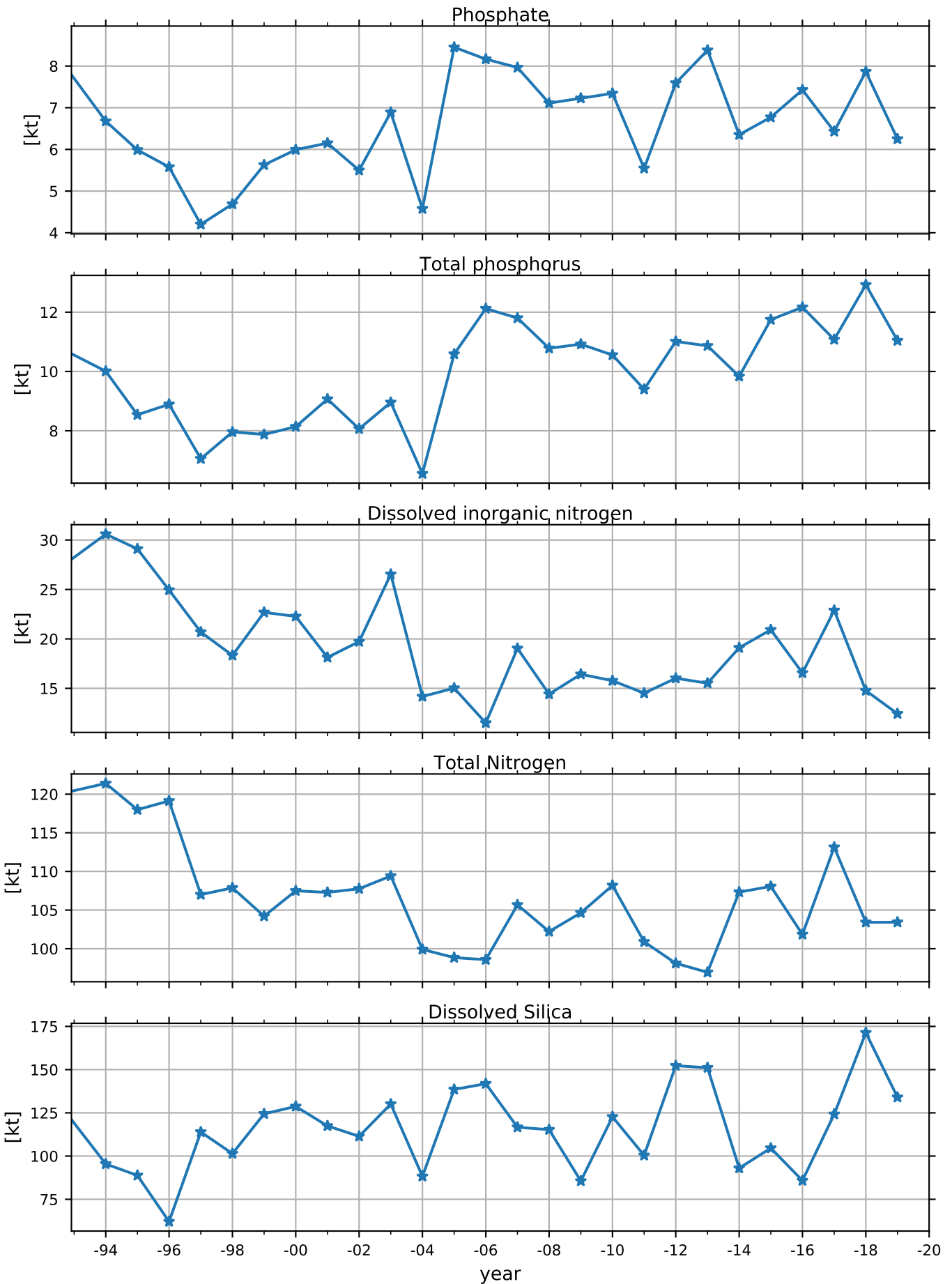


year

ARKONA BASIN

Offshore volume of basin: 353 km³

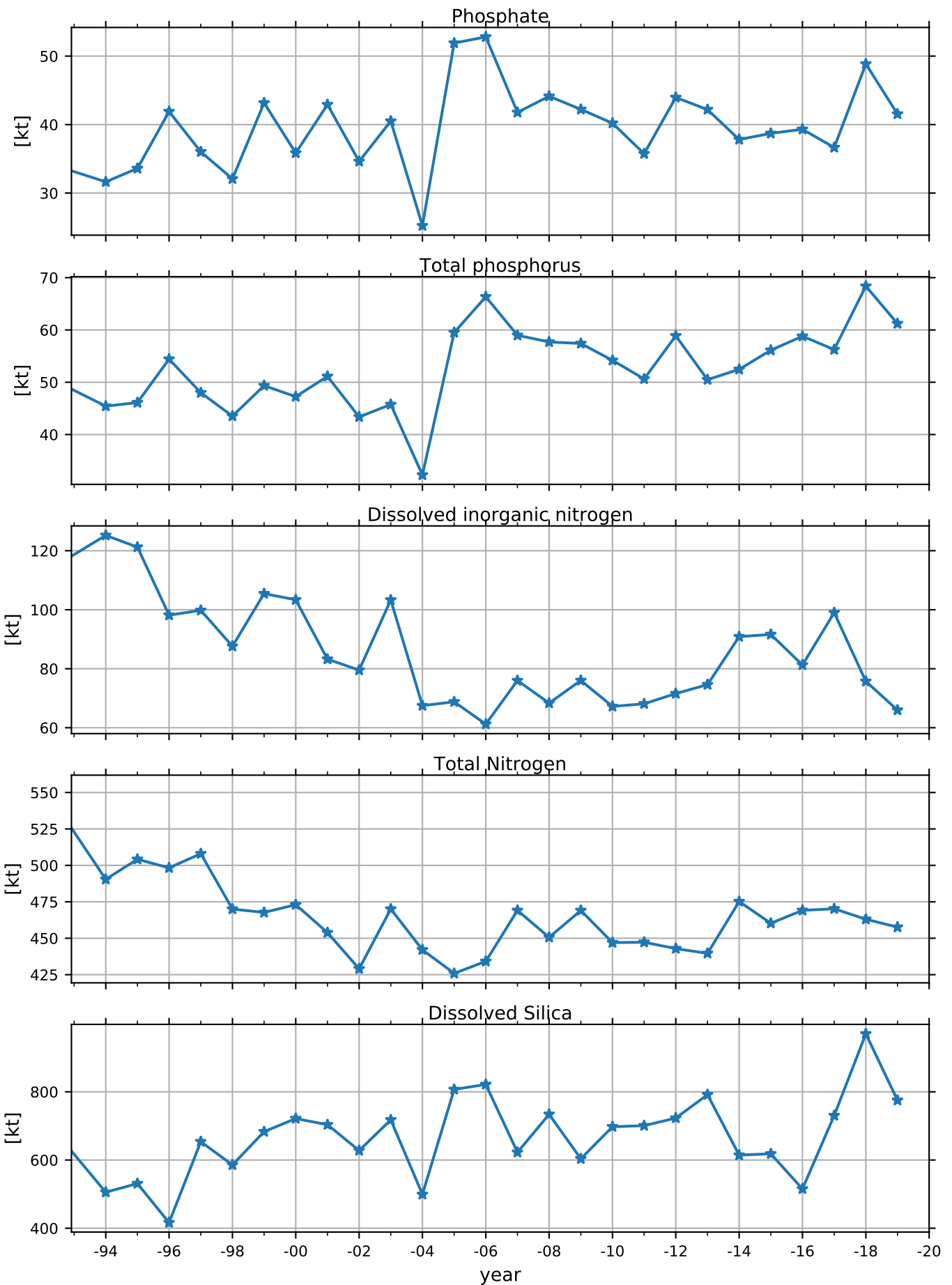
—*— winter



BORNHOLM BASIN

Offshore volume of basin: 1603 km³

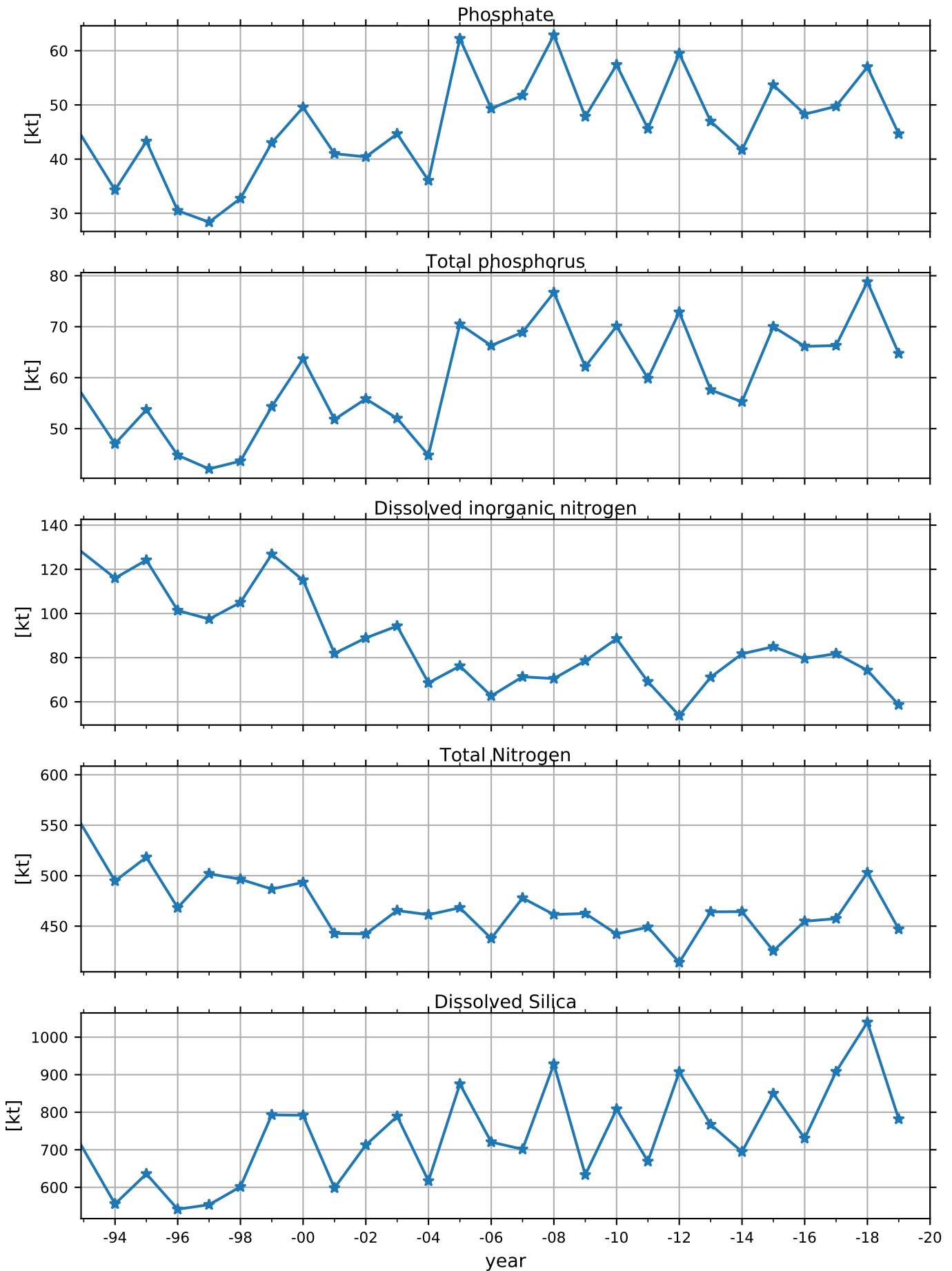
—*— winter



EASTERN GOTLAND BASIN BCS III-10

Offshore volume of basin: 1597 km³

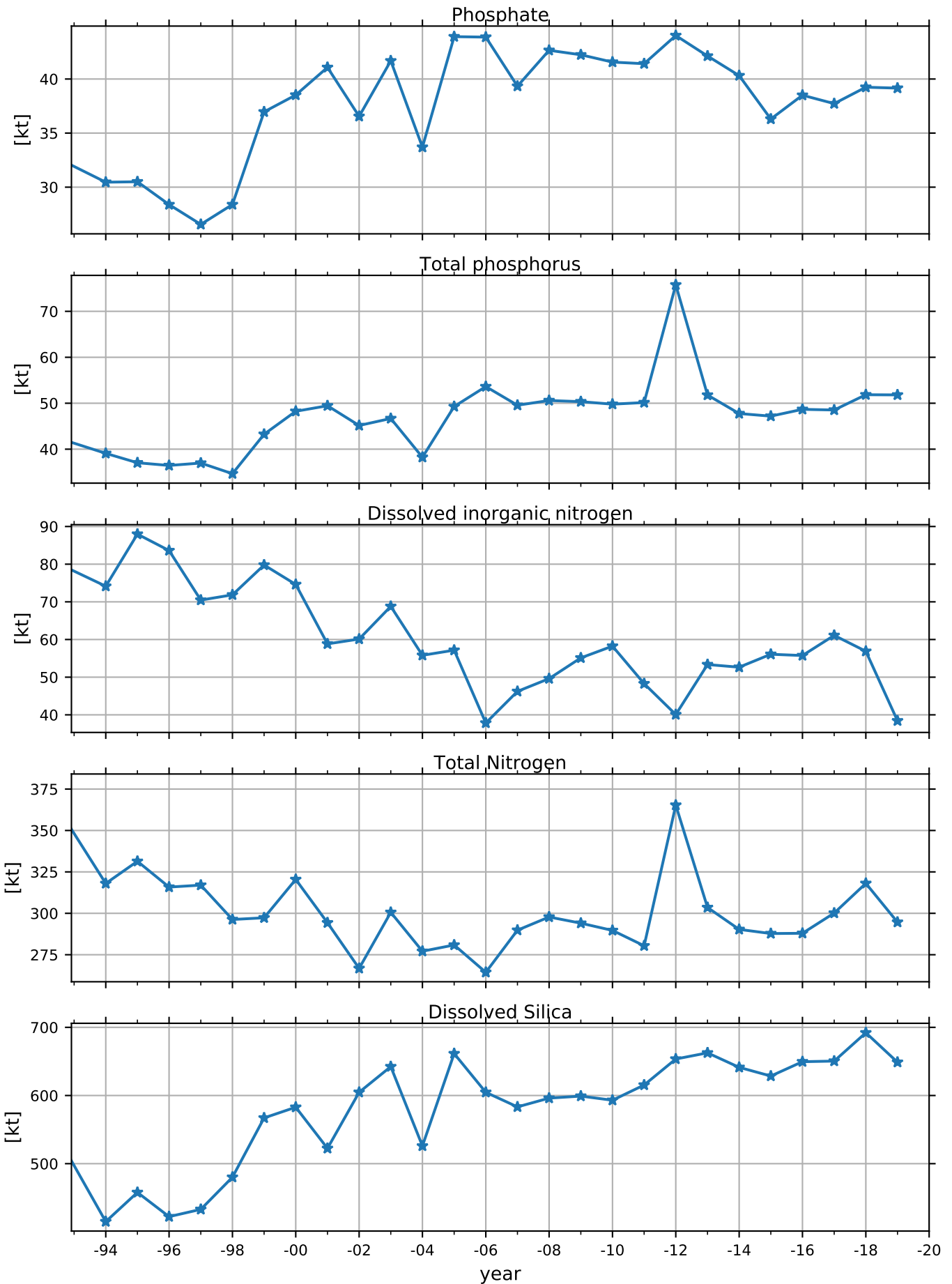
—*— winter



EASTERN GOTLAND BASIN BY10

Offshore volume of basin: 1007 km³

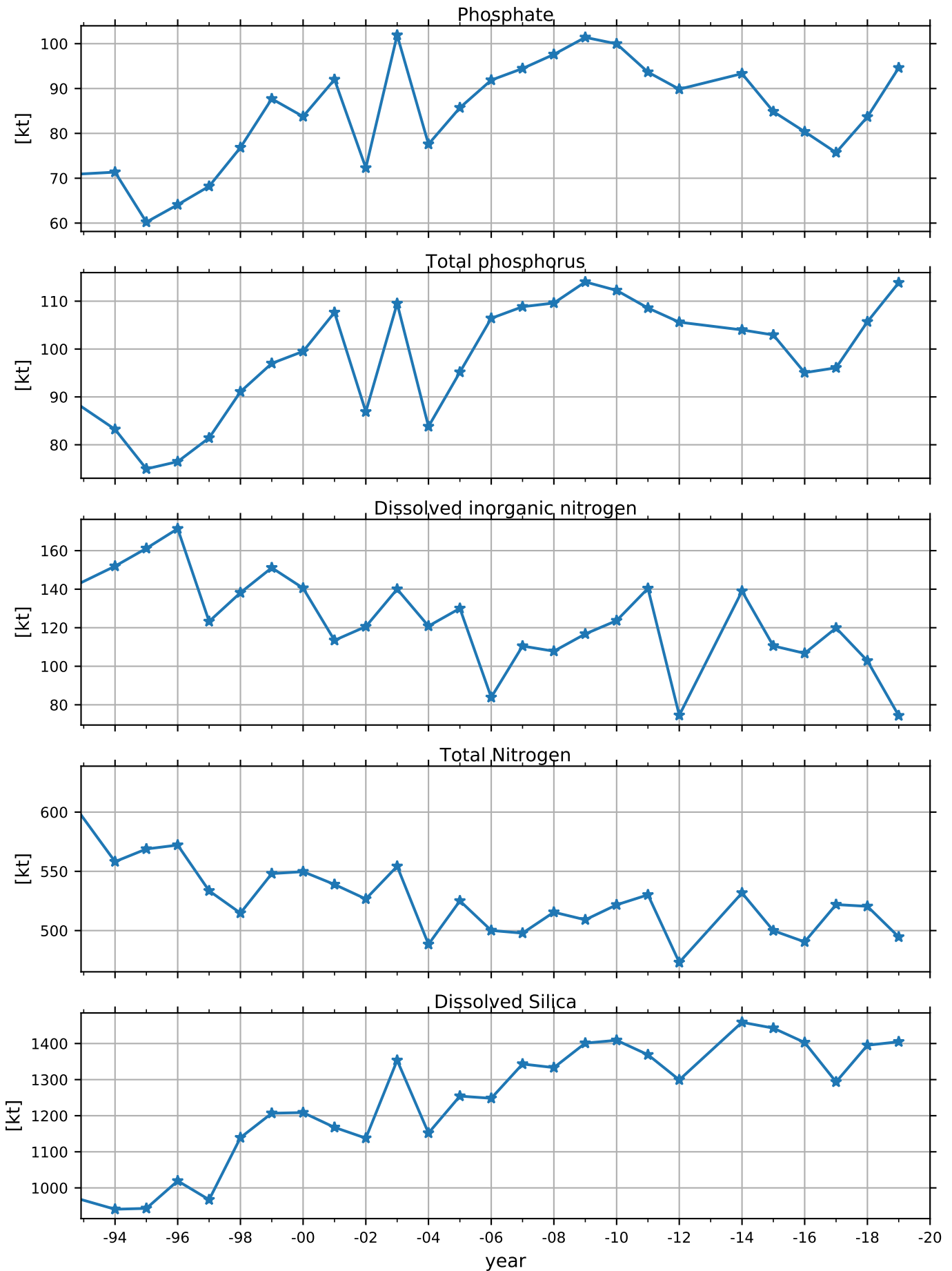
—*— winter



EASTERN GOTLAND BASIN BY15 GOTLANDSDJ

Offshore volume of basin: 1748 km³

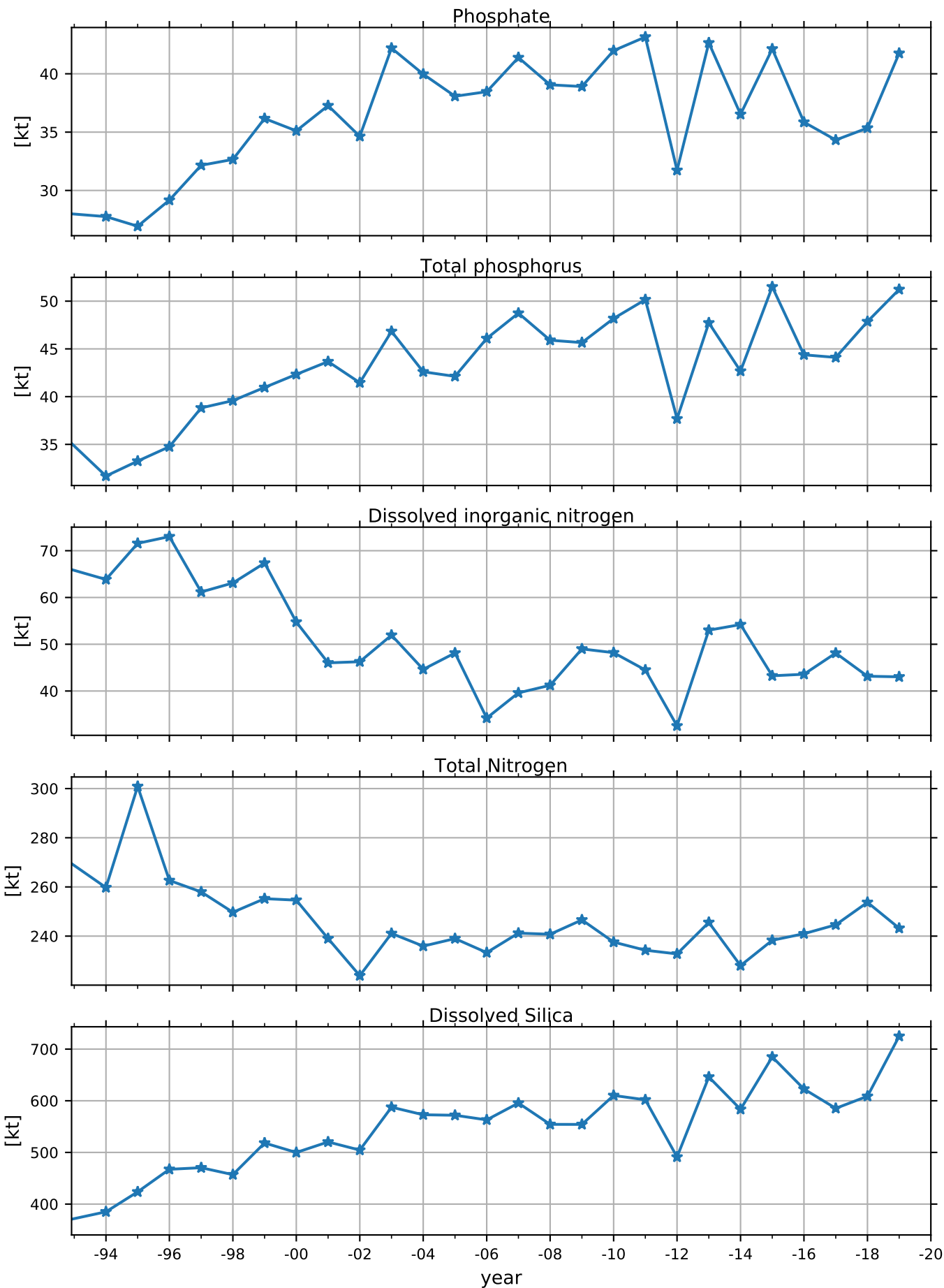
—*— winter



EASTERN GOTLAND BASIN BY20

Offshore volume of basin: 841 km³

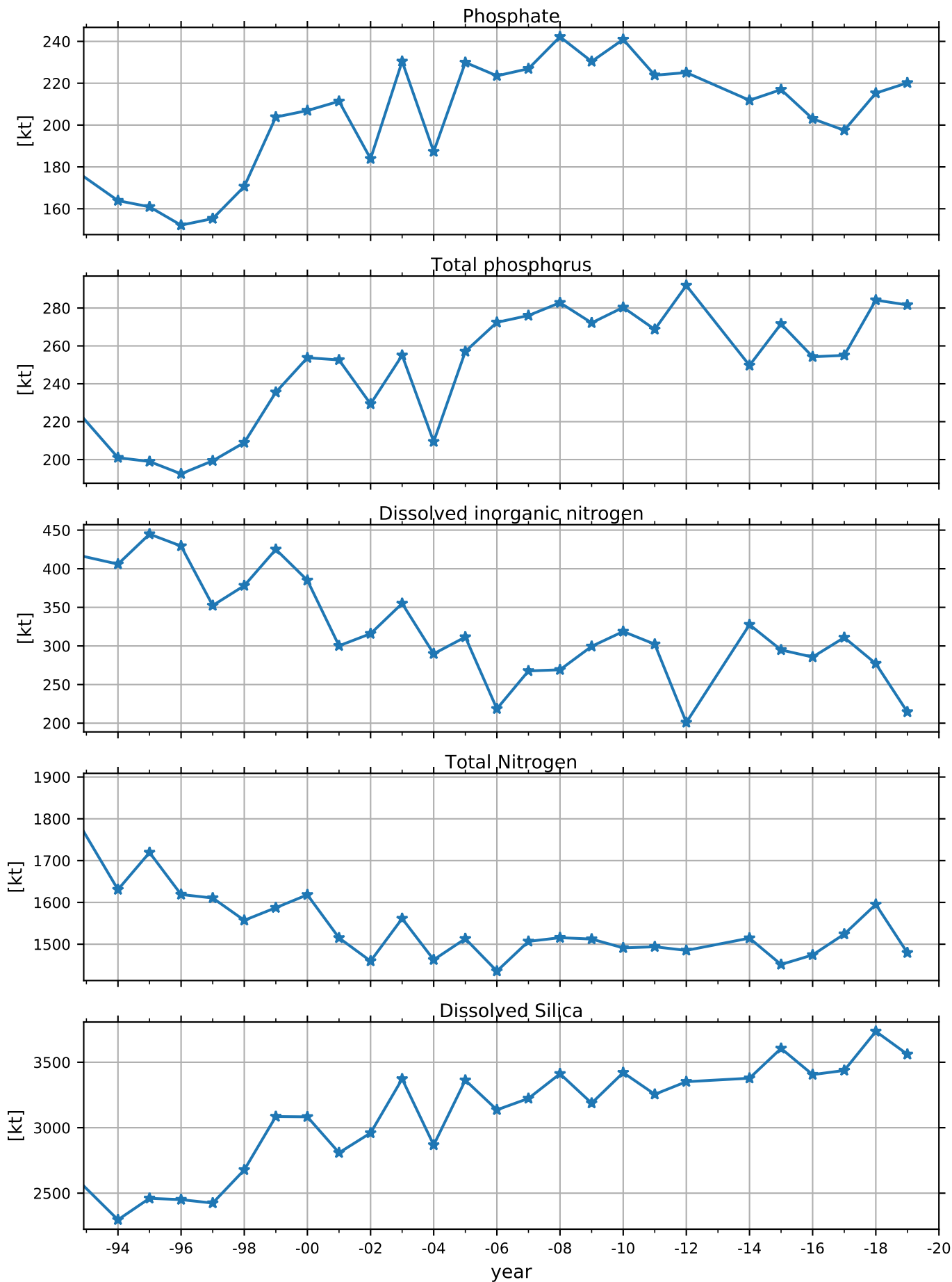
—*— winter



EASTERN GOTLAND BASIN

Offshore volume of basin: 5193 km³

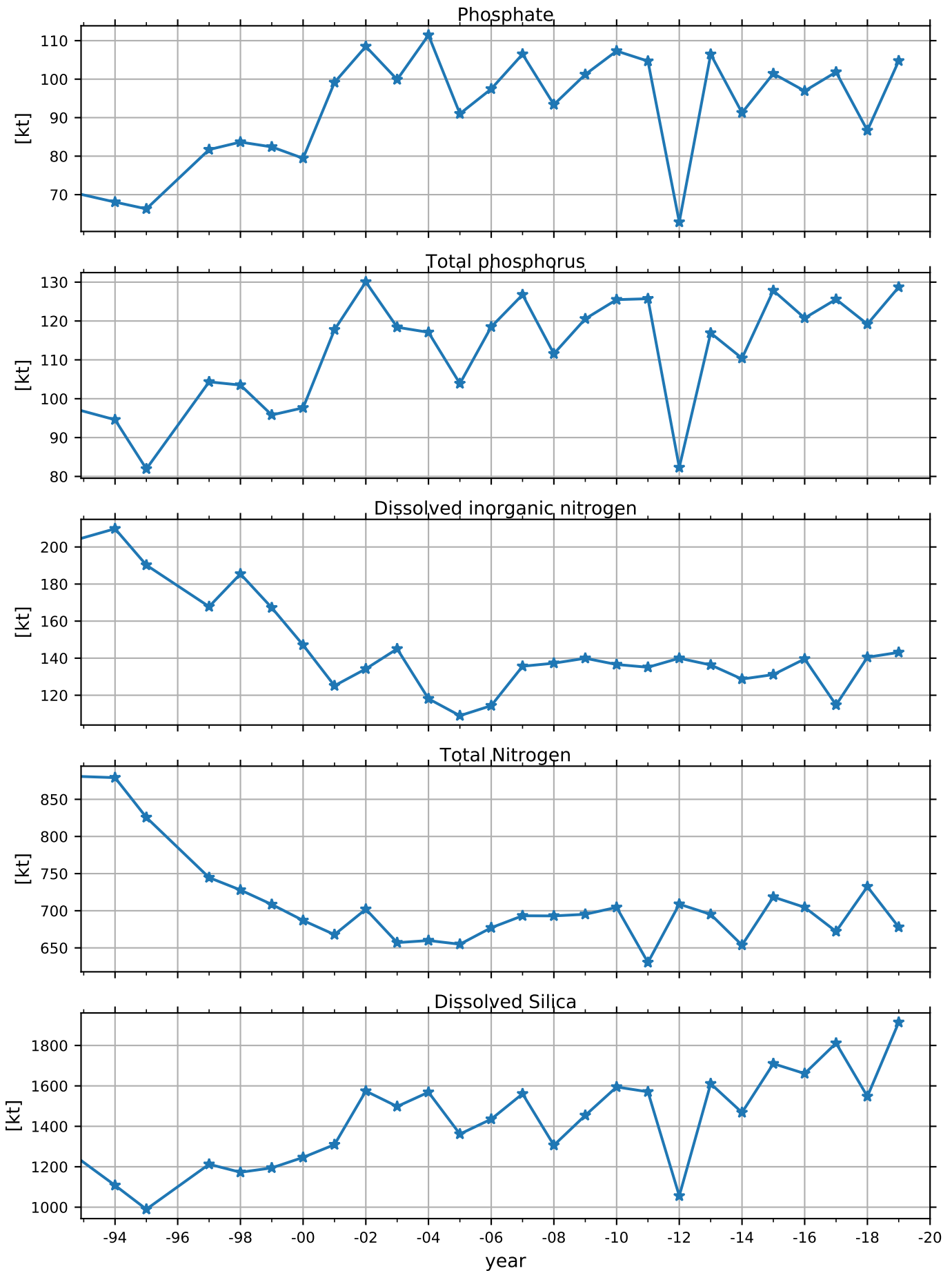
—*— winter



NORTHERN BALTIC PROPER

Offshore volume of basin: 2327 km³

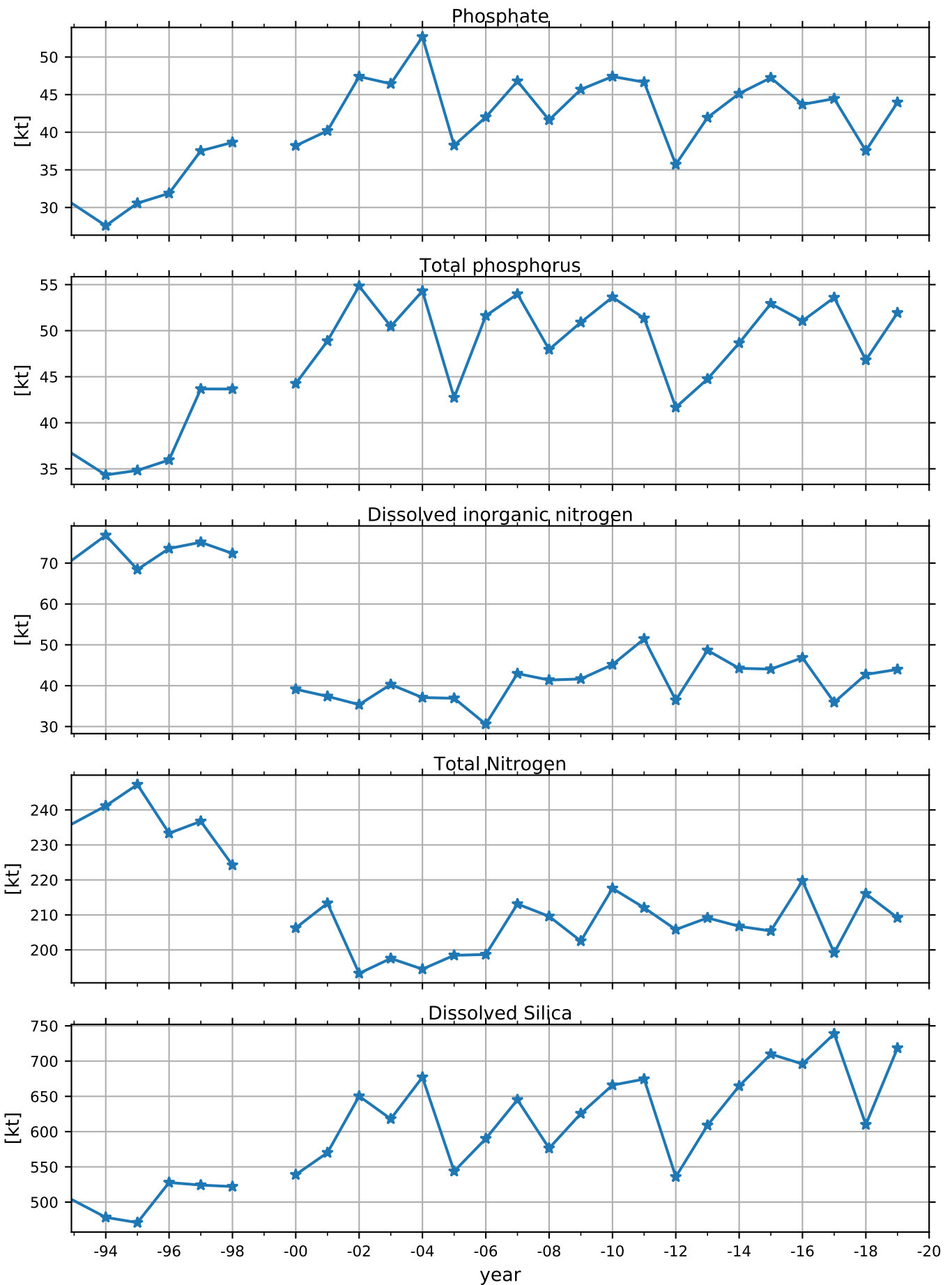
—*— winter



WESTERN GOTLAND BASIN BY31 LANDSORTSDJ

Offshore volume of basin: 723 km³

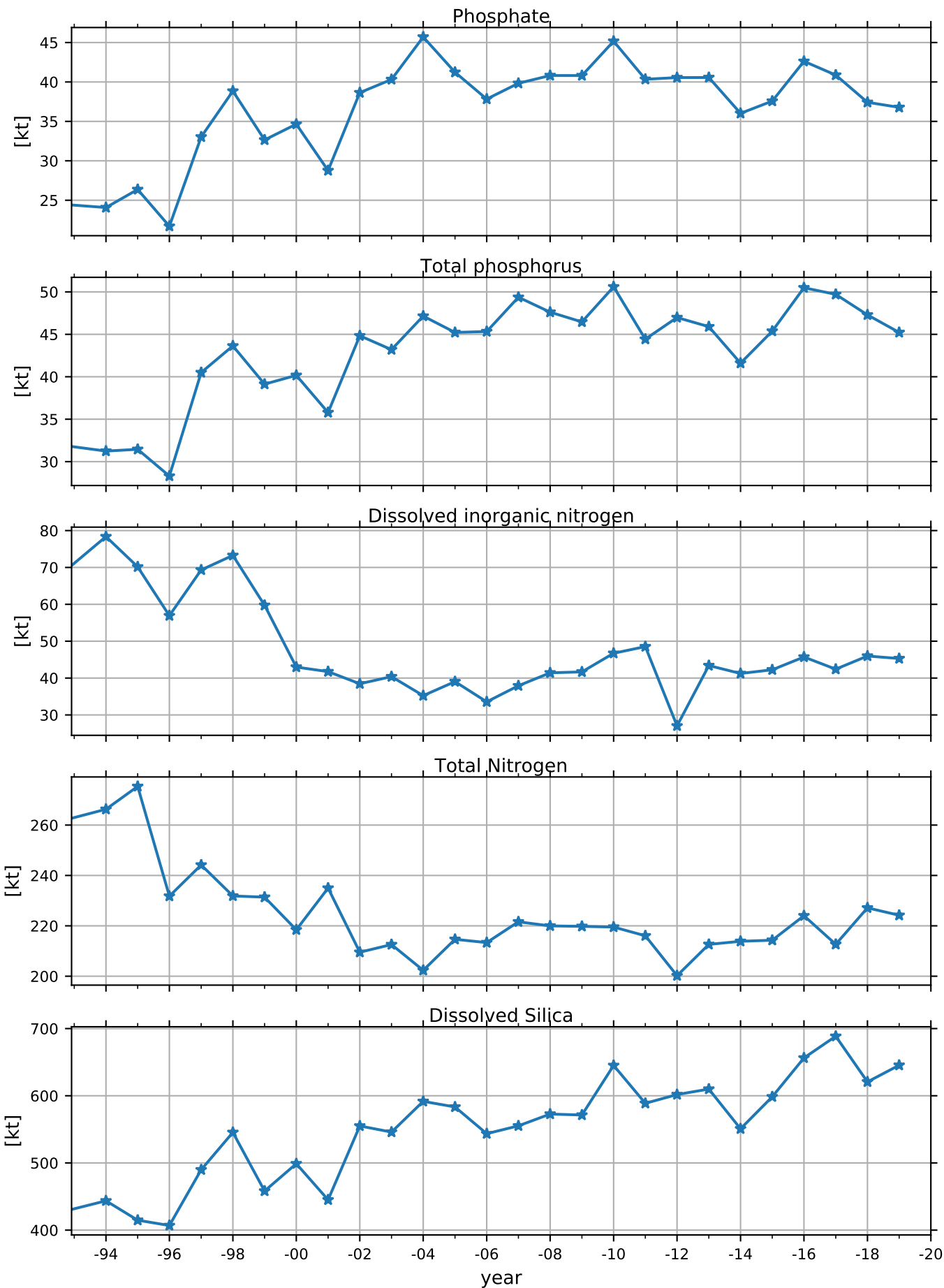
—*— winter



WESTERN GOTLAND BASIN BY32

Offshore volume of basin: 767 km³

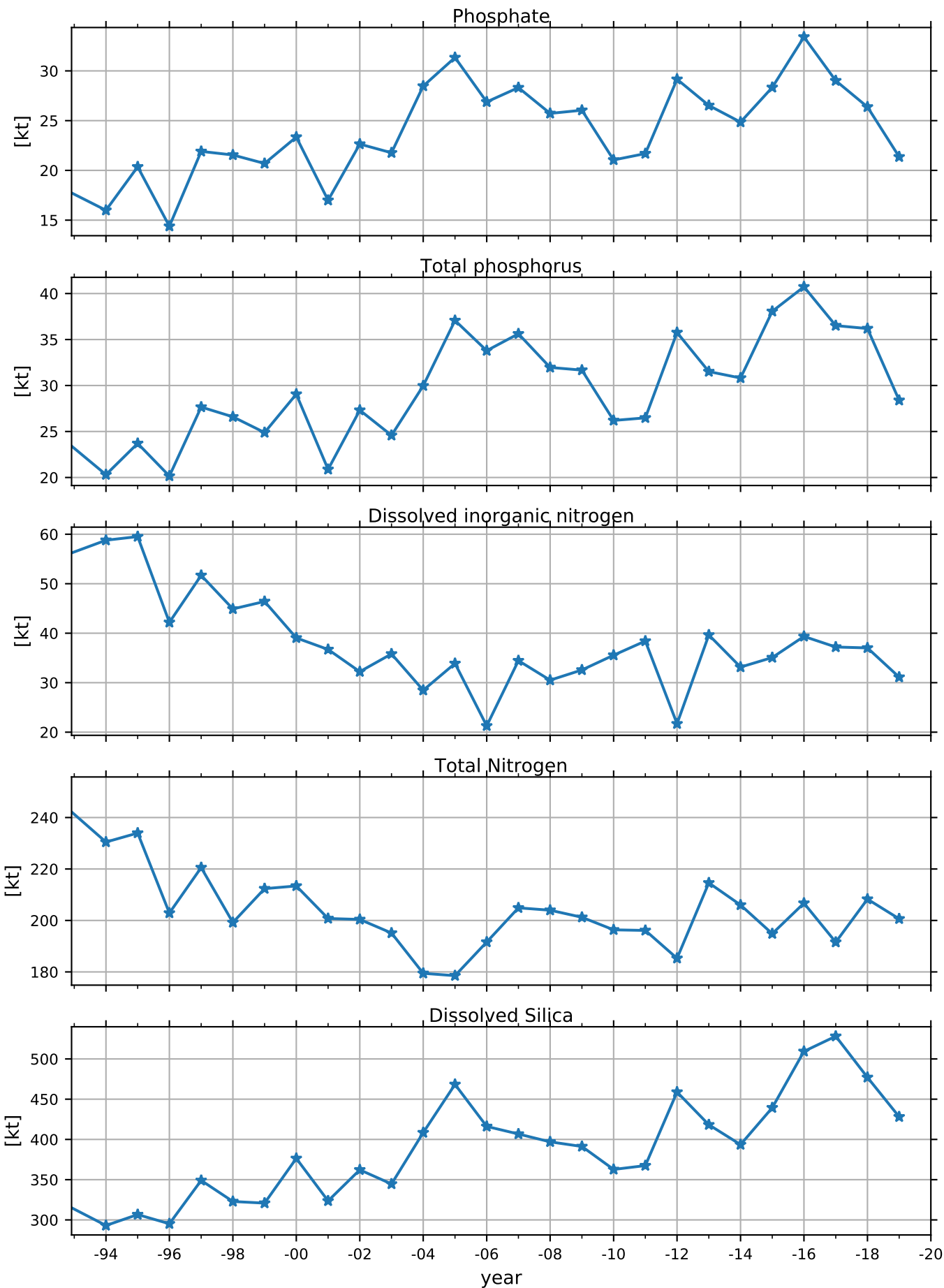
—*— winter



WESTERN GOTLAND BASIN BY38

Offshore volume of basin: 708 km³

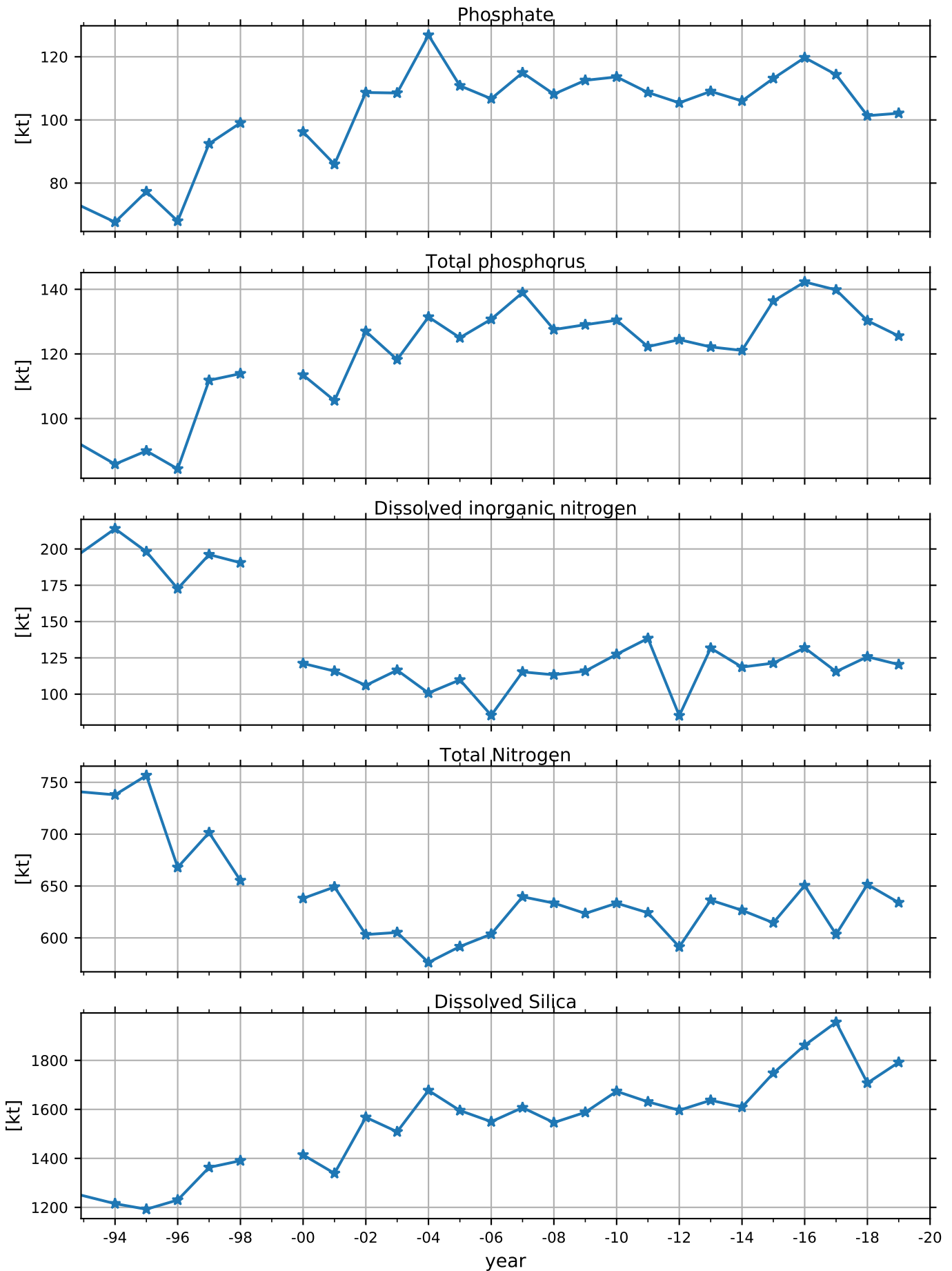
—*— winter



WESTERN GOTLAND BASIN

Offshore volume of basin: 2198 km³

—*— winter

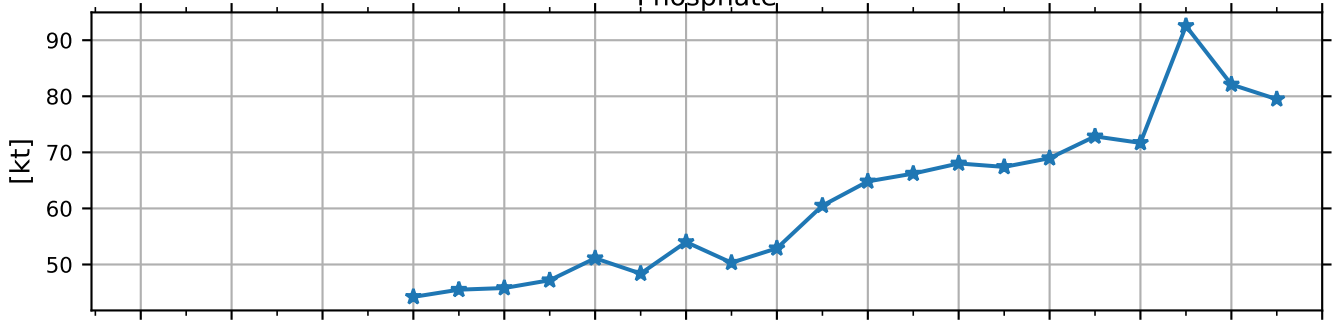


BOTHNIAN SEA

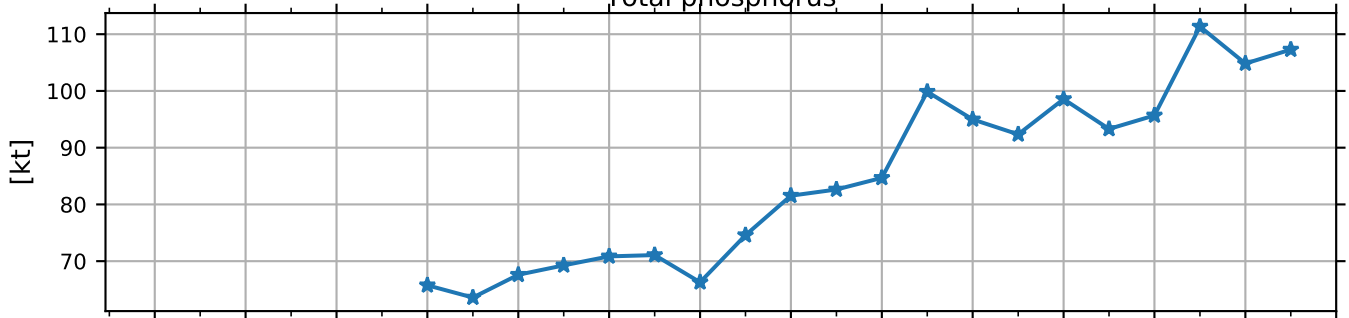
Offshore volume of basin: 4148 km³

—*— winter

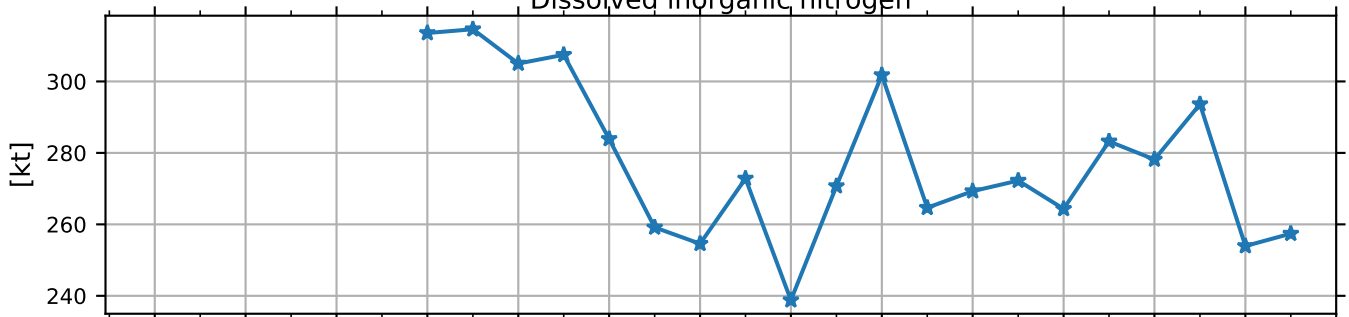
Phosphate



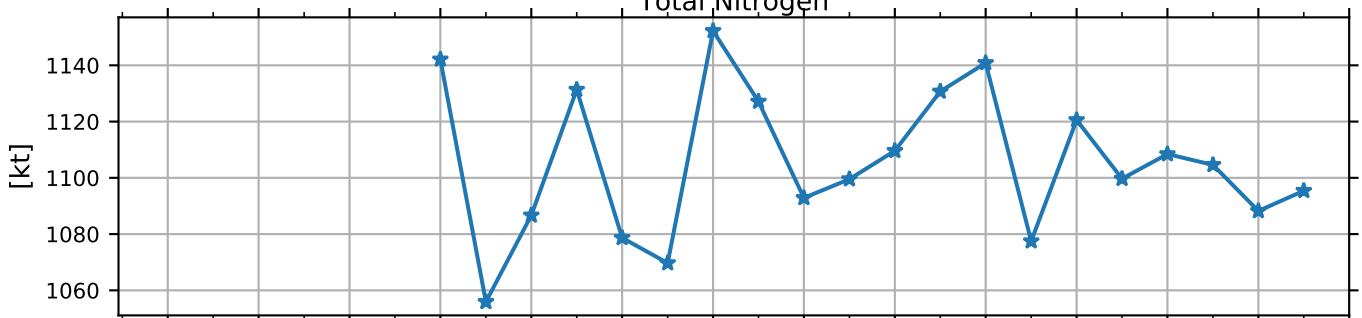
Total phosphorus



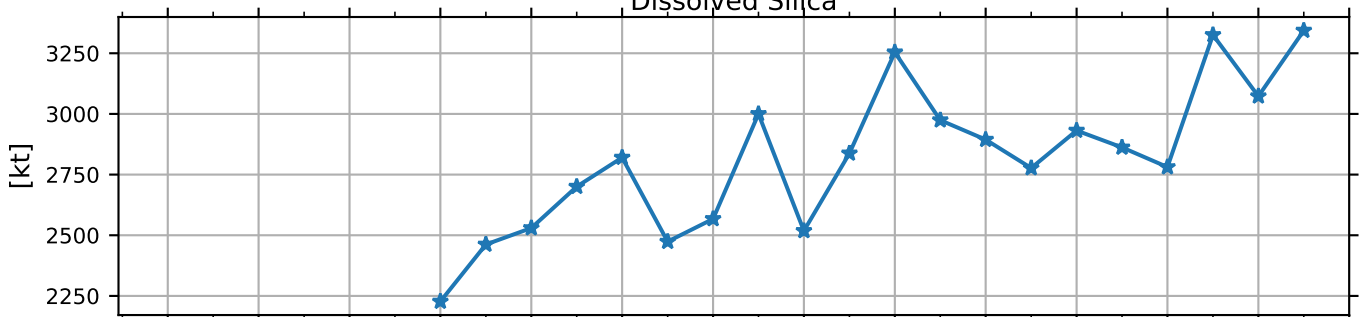
Dissolved inorganic nitrogen



Total Nitrogen



Dissolved Silica



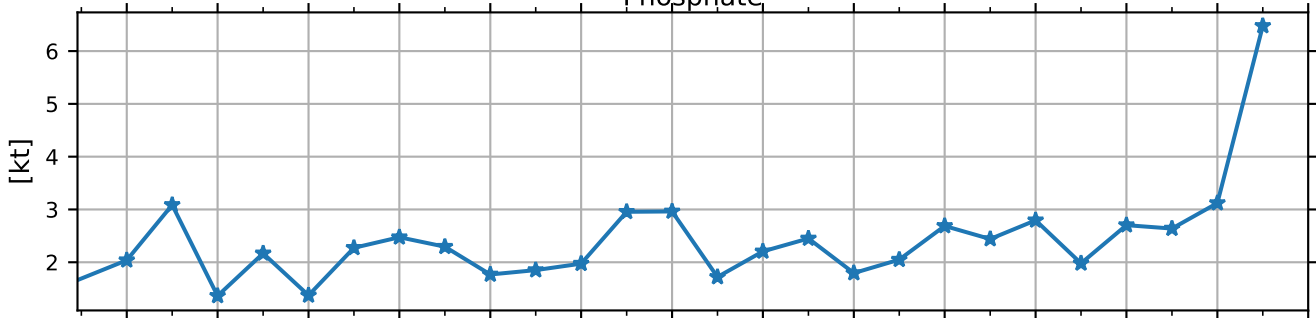
year

BOTHNIAN BAY

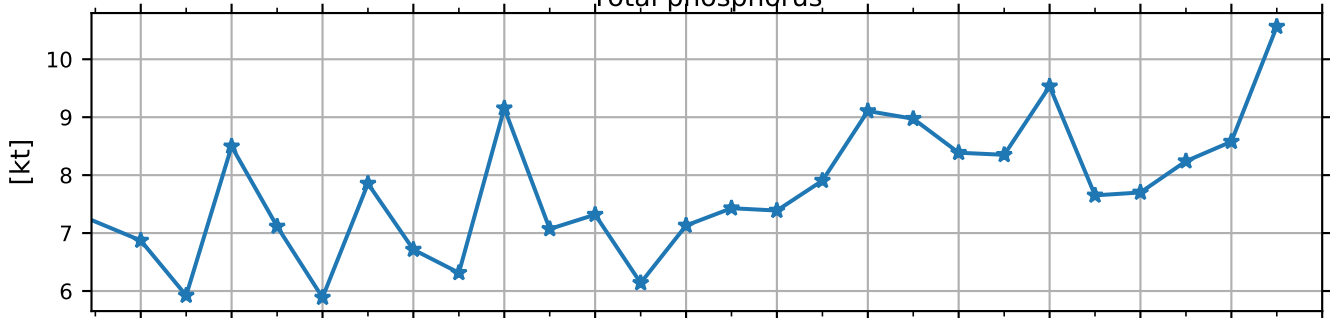
Offshore volume of basin: 1447 km³

—*— winter

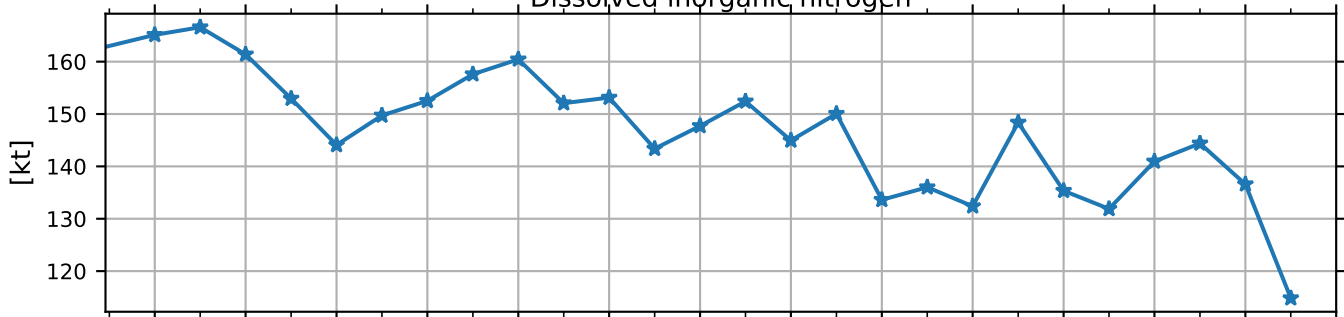
Phosphate



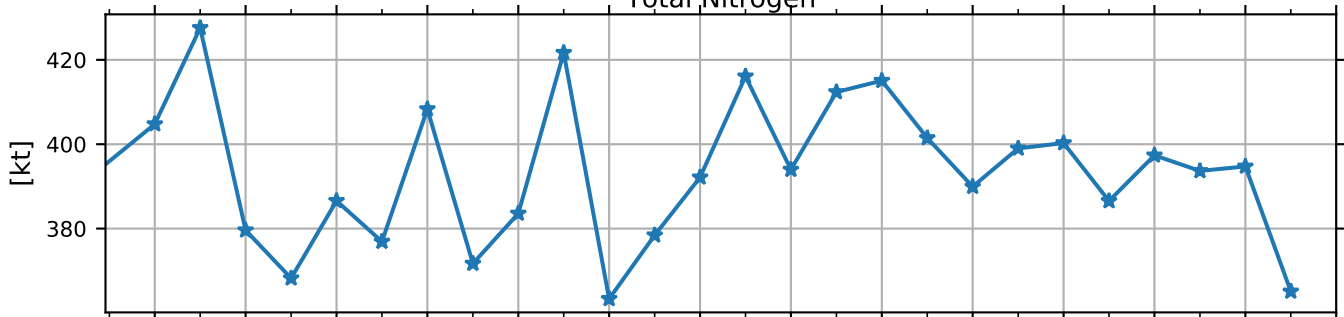
Total phosphorus



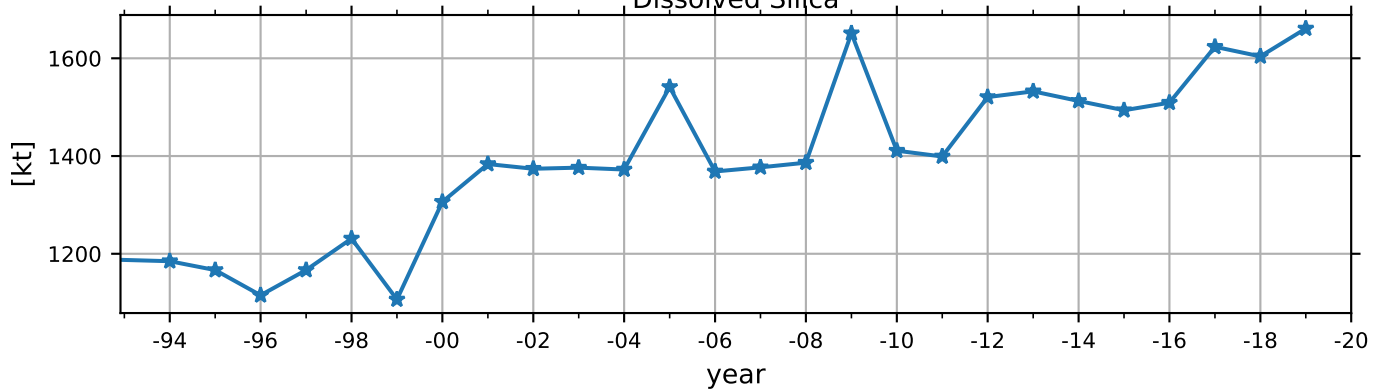
Dissolved inorganic nitrogen



Total Nitrogen



Dissolved Silica



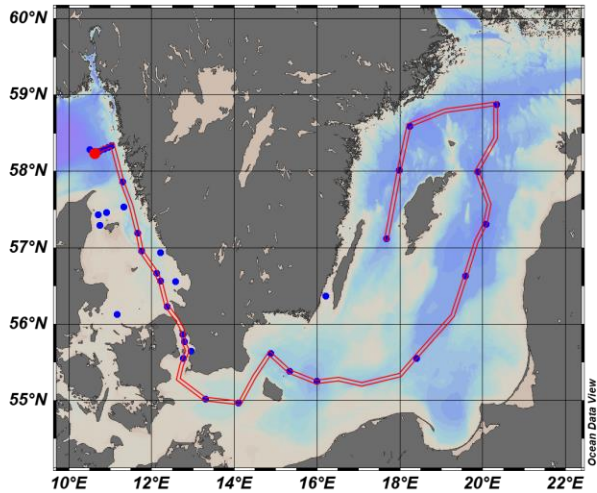
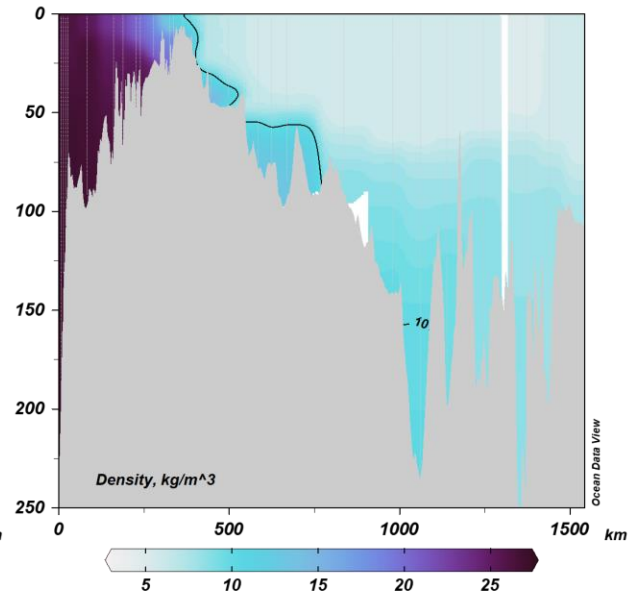
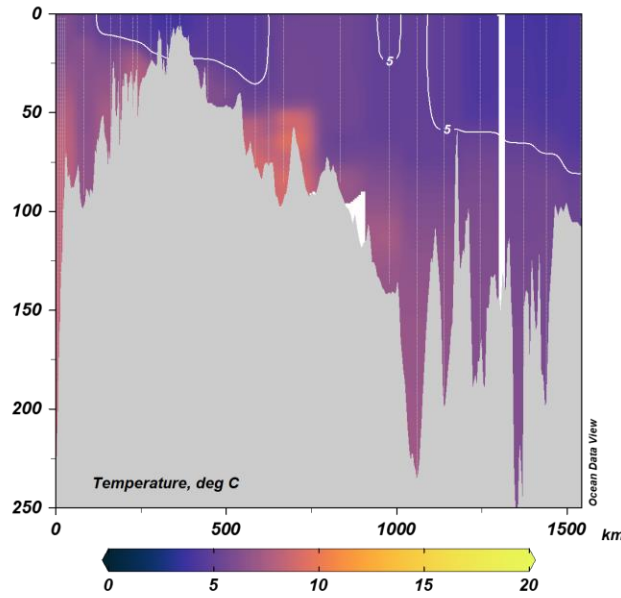
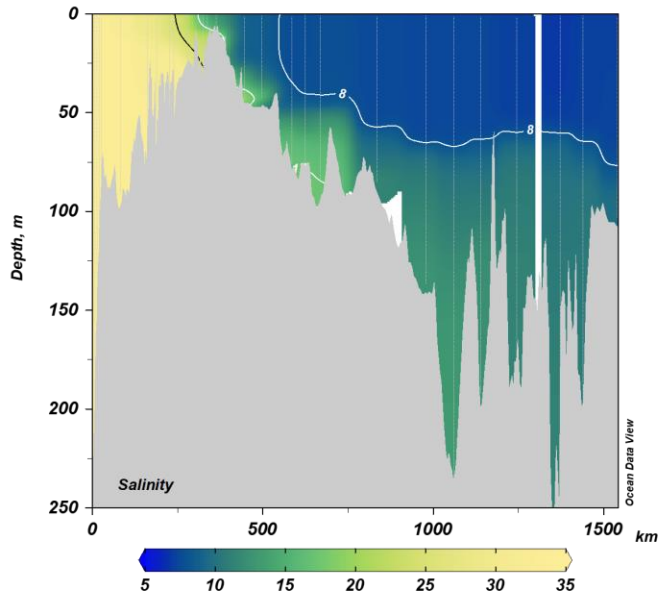
Appendix V

Transects from the Skagerrak to the Western Gotland basin

Included parameters are salinity, temperature, density and dissolved oxygen from sensors on the CTD. Only data from SMHI cruises are included, data from the other institutes can hopefully be included when a national data host for CTD data is in place.

Transects are made with ODV (Schlitzer, R., Ocean Data View, <https://odv.awi.de>, 2019)

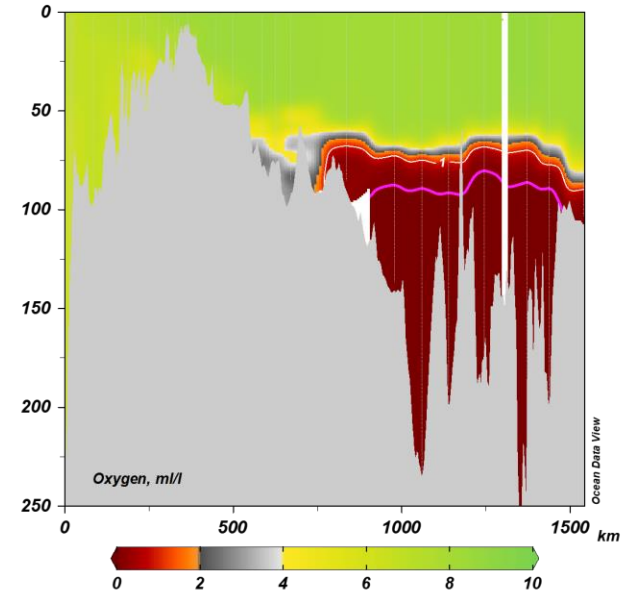
SMHI cruise January 20190110 – 20190119 CTD section



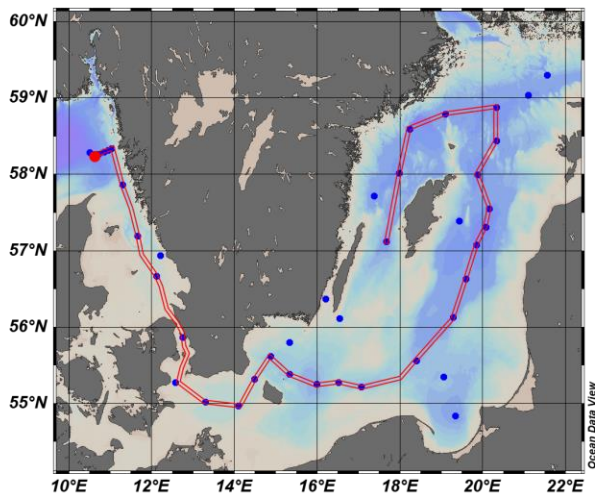
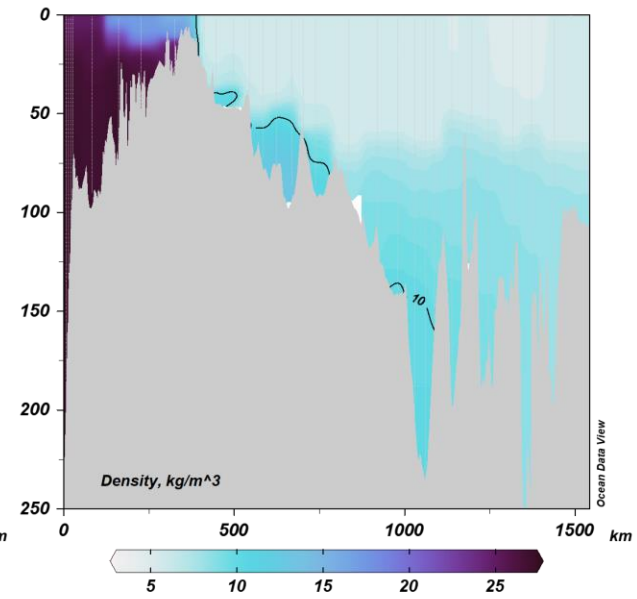
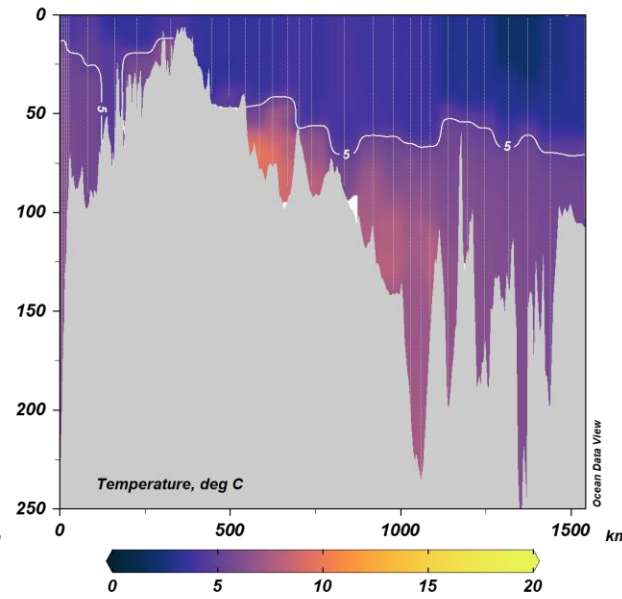
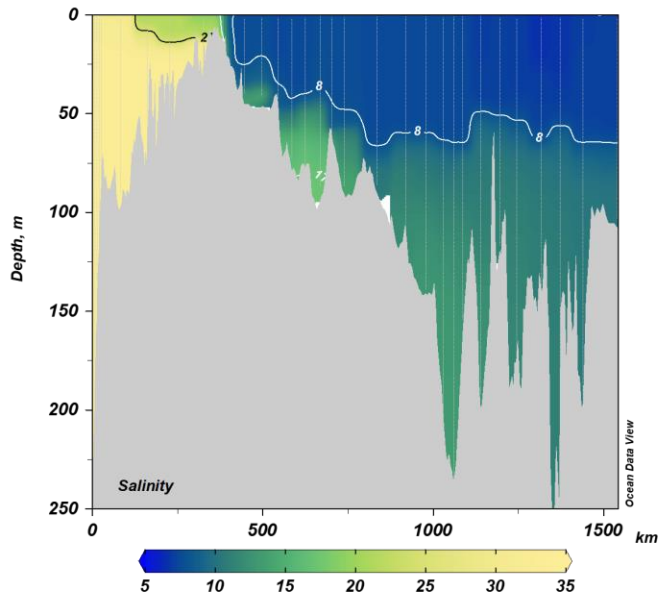
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



SMHI cruise February 20190215 – 20190225 CTD section



Isolines

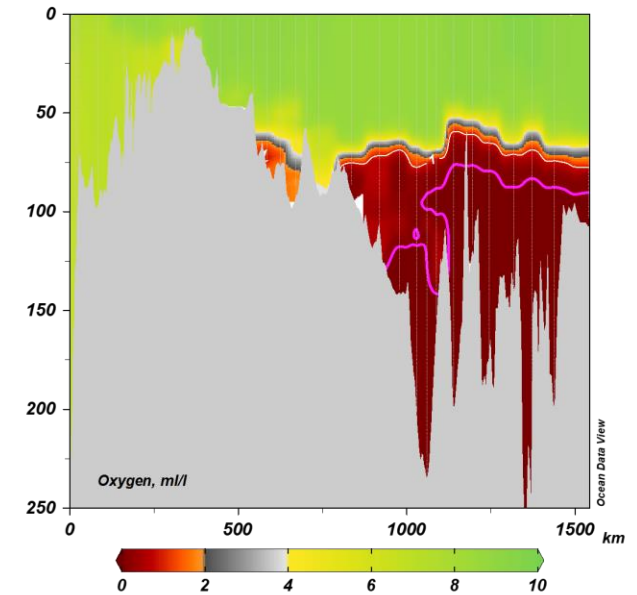
Salinity: 6, 8, 17 (white), 25 (black)

Temperature: 5

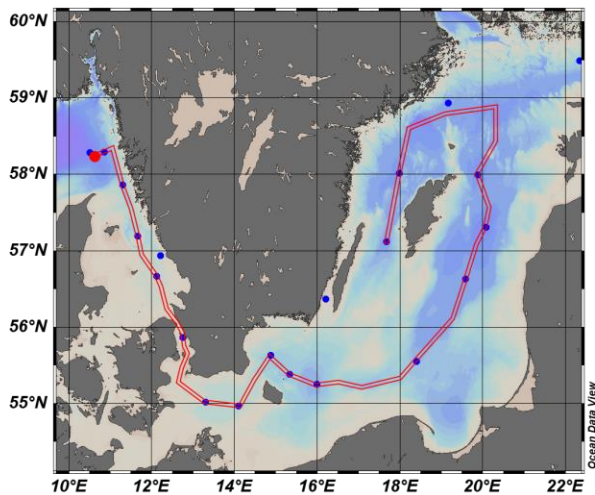
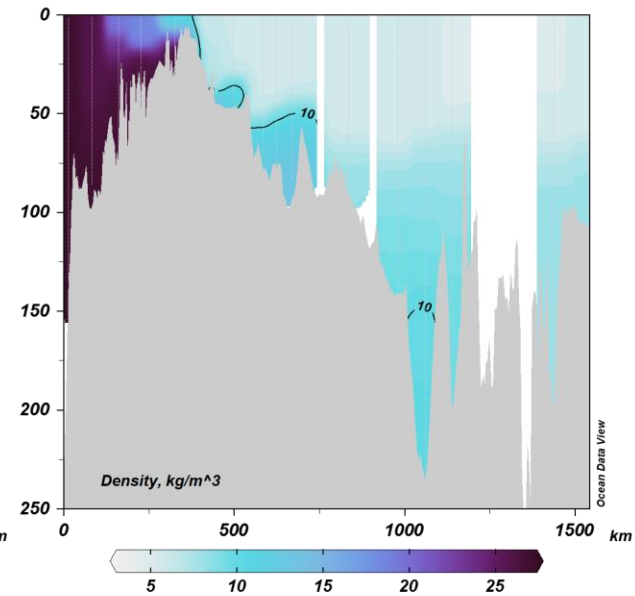
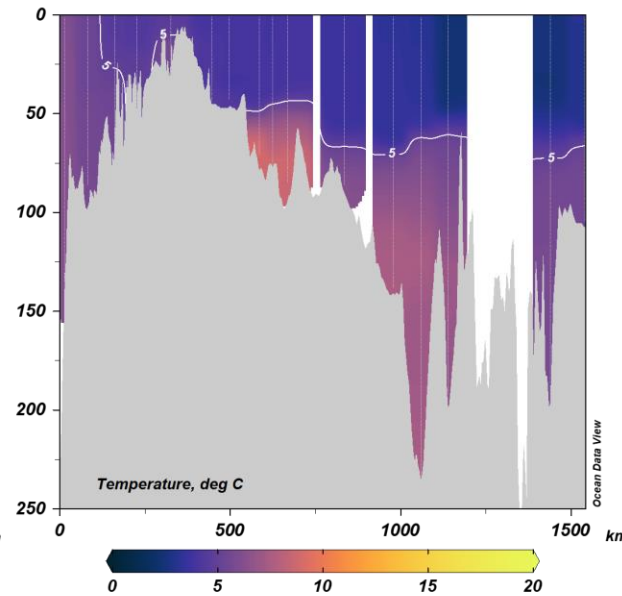
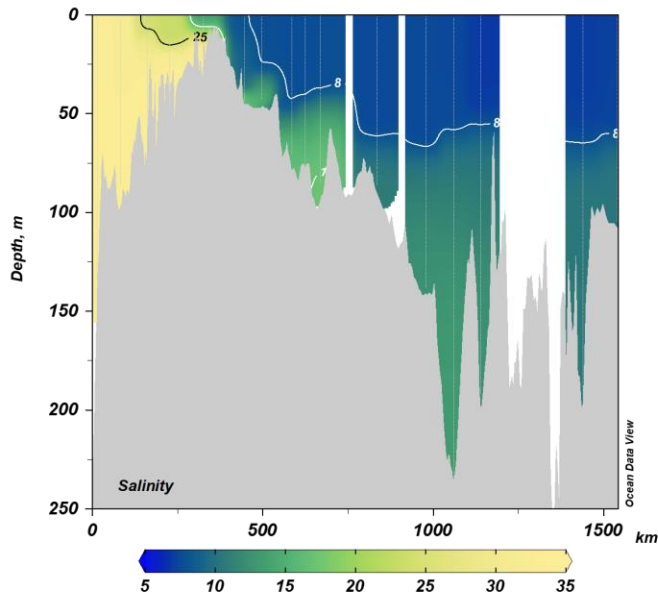
Oxygen: 1 (white), 0.1 (pink)

Density: 10

Thin vertical lines are stations



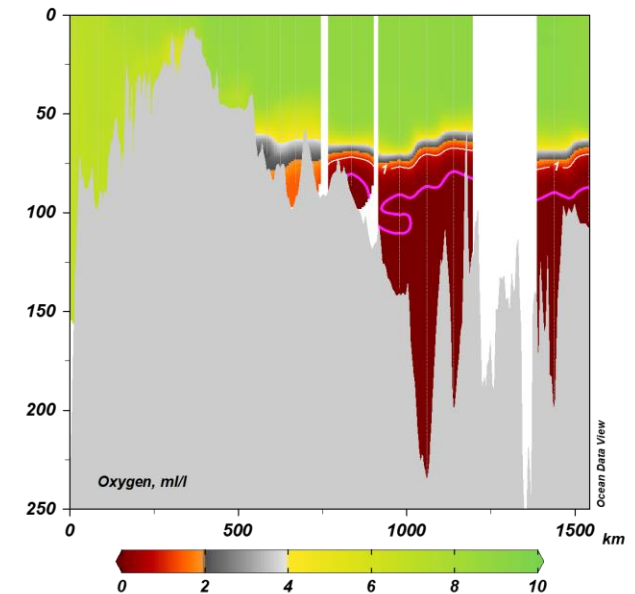
SMHI cruise March 20190314 – 20190320 CTD section



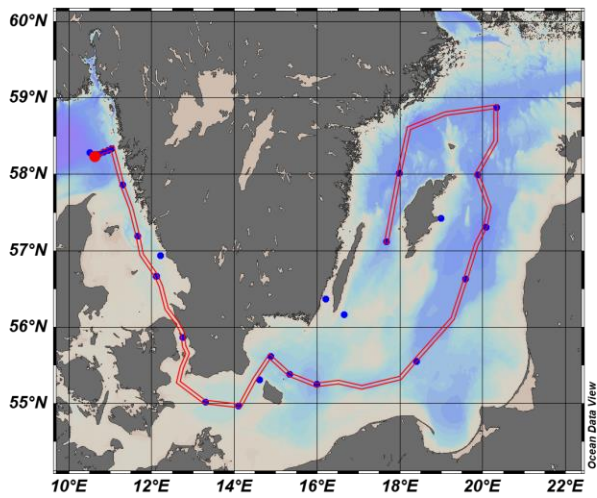
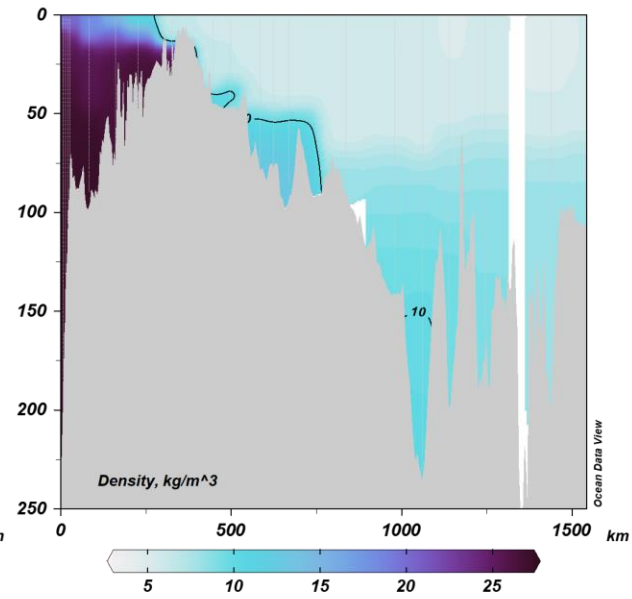
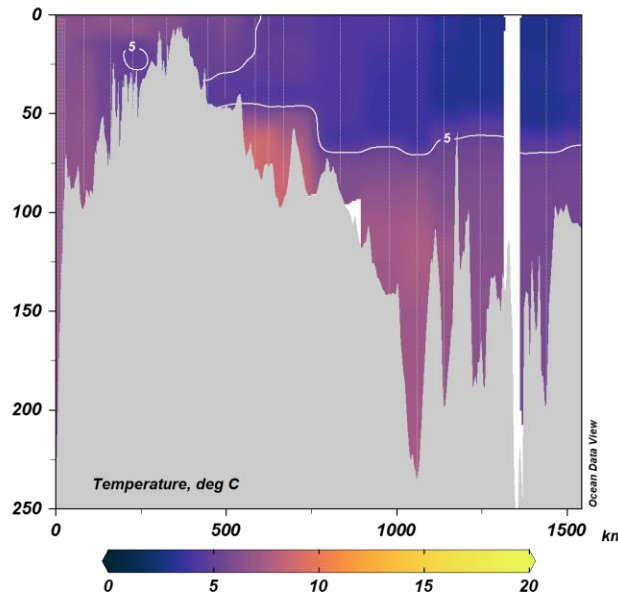
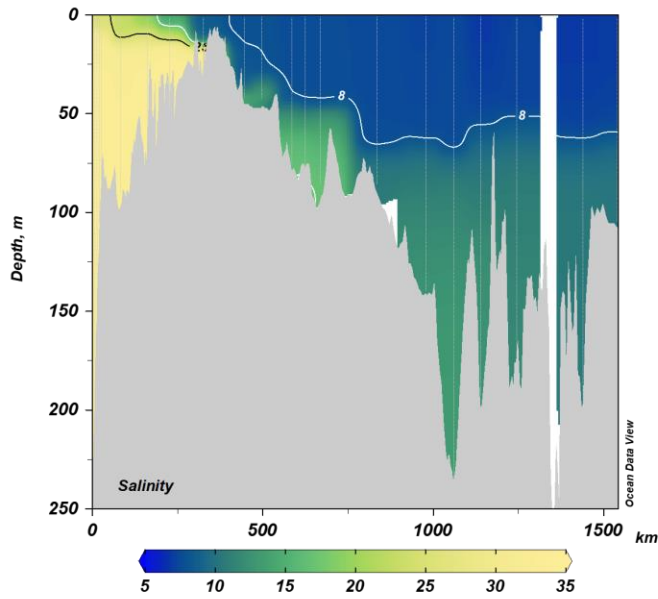
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



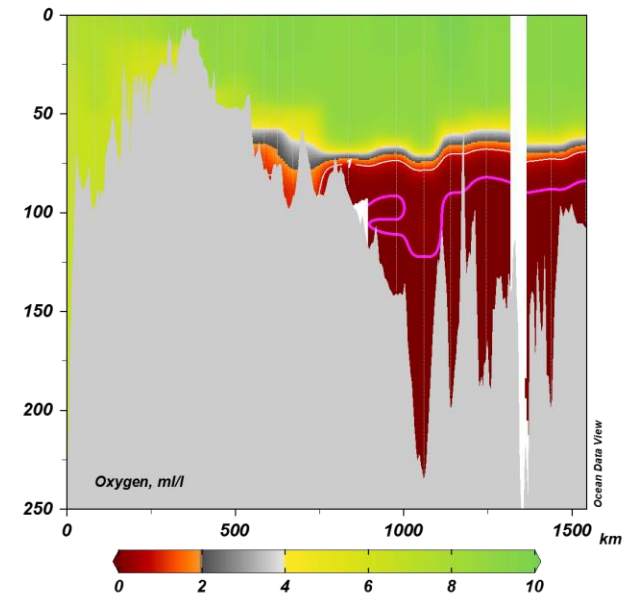
SMHI cruise April 20190405 – 20190412 CTD section



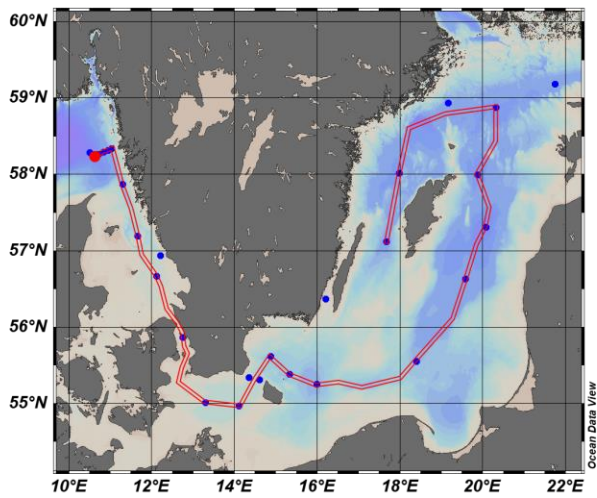
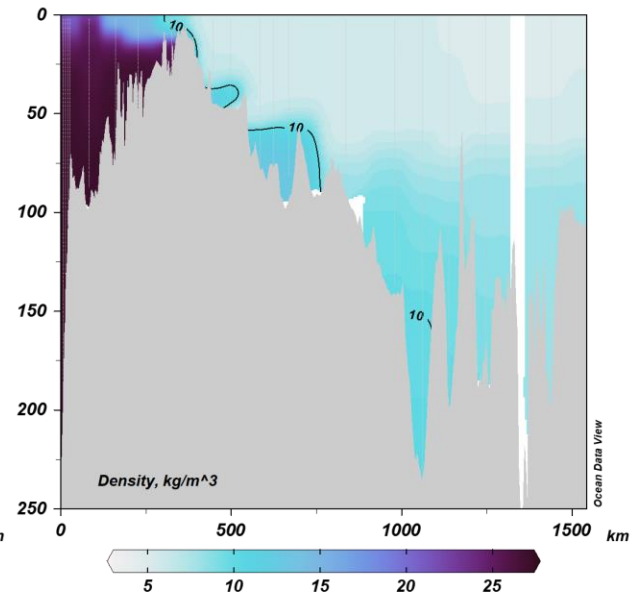
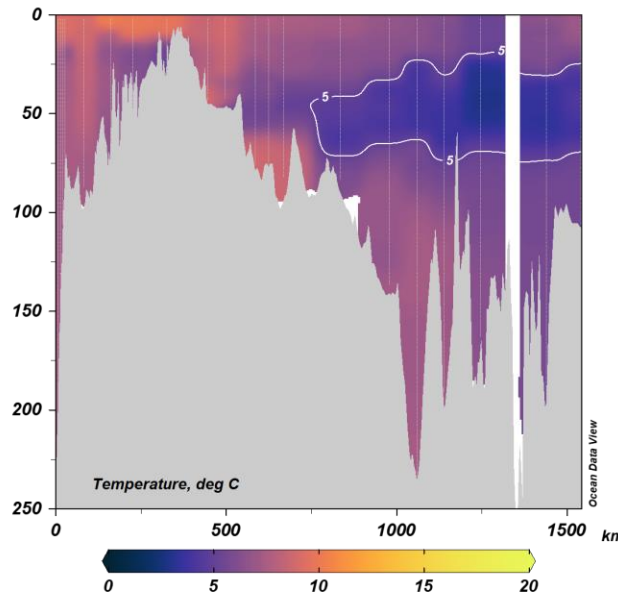
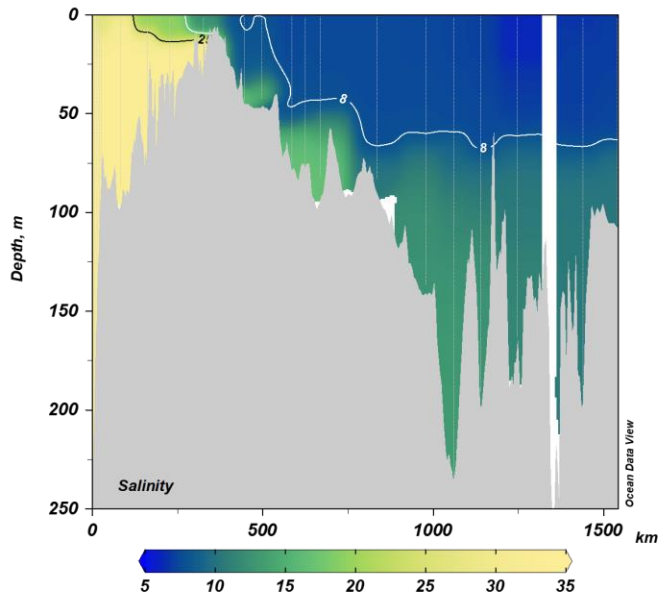
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



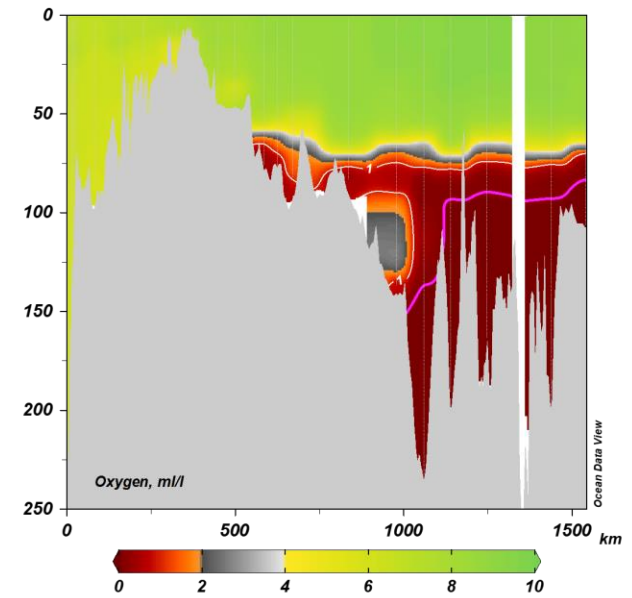
SMHI cruise May 20190509 – 20190516 CTD section



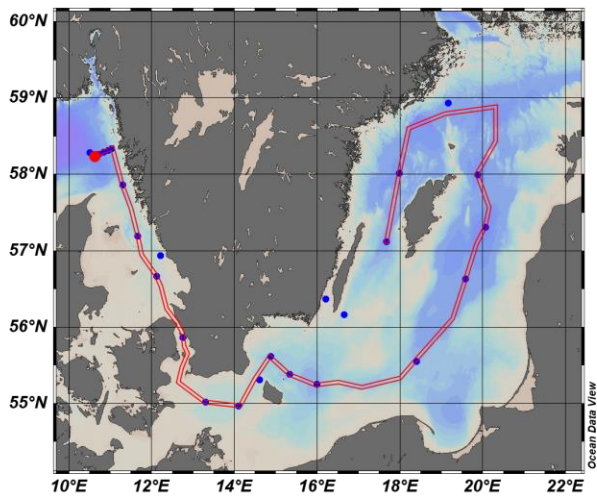
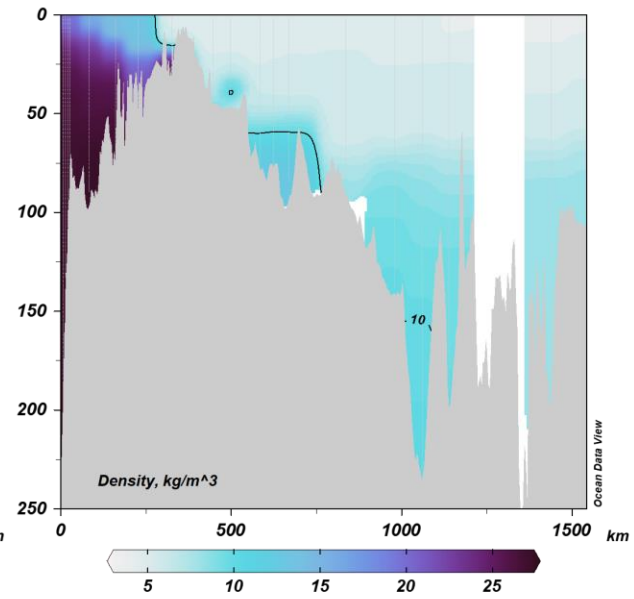
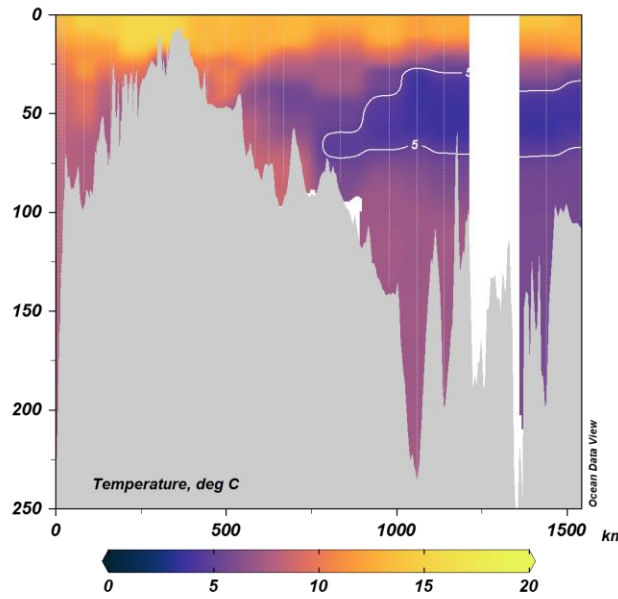
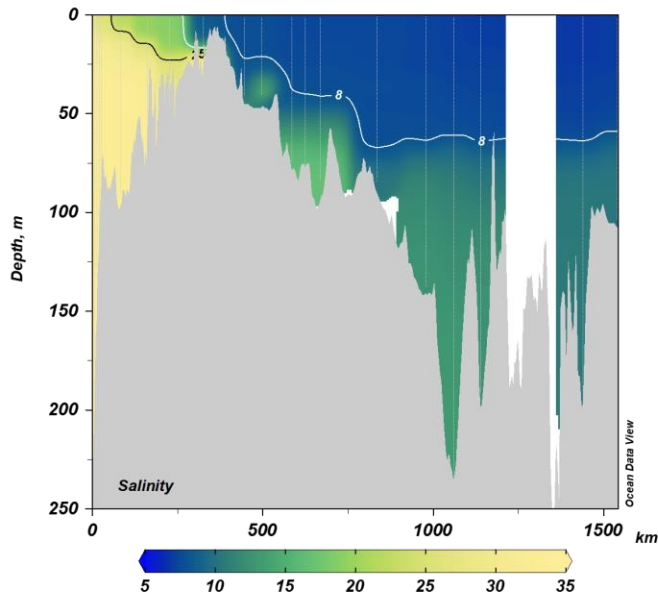
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



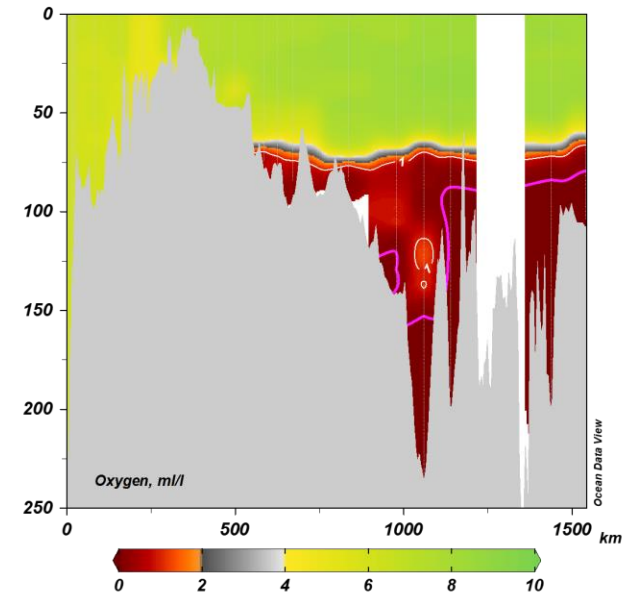
SMHI cruise June 20190610 – 20190616 CTD section



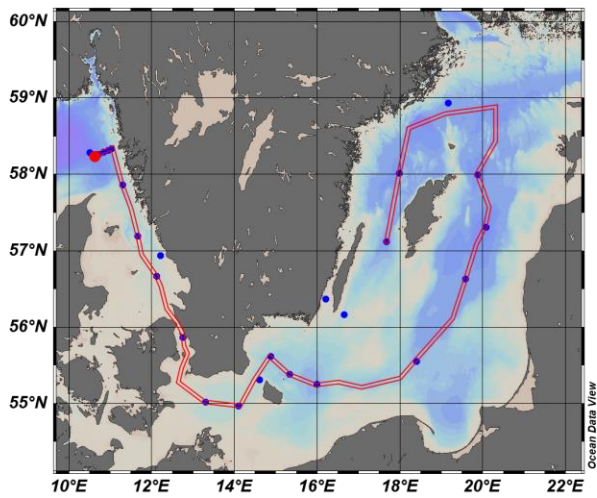
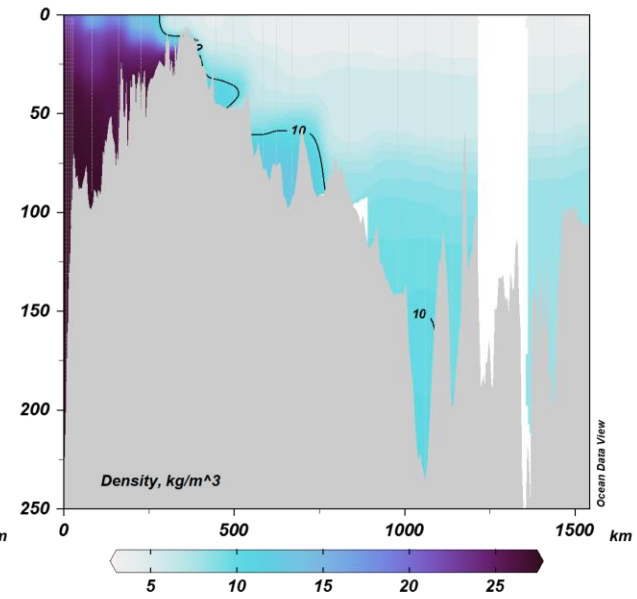
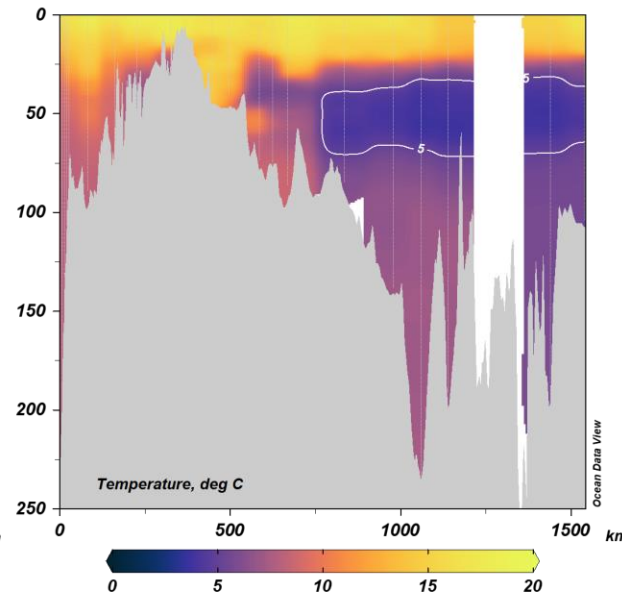
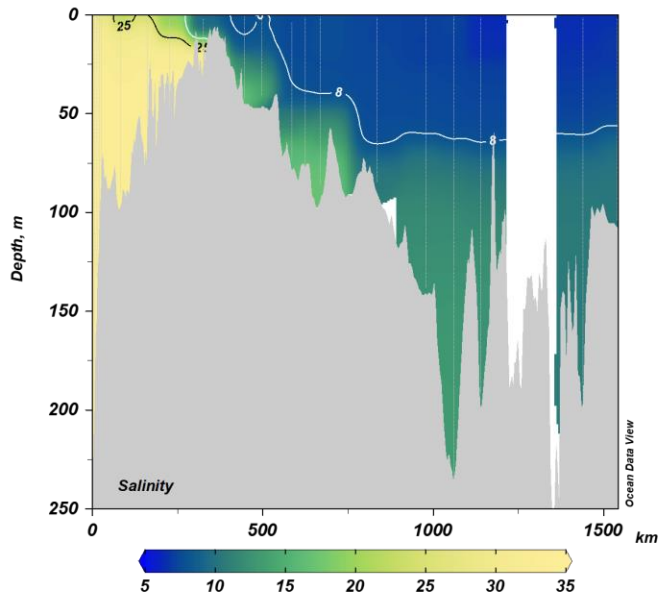
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



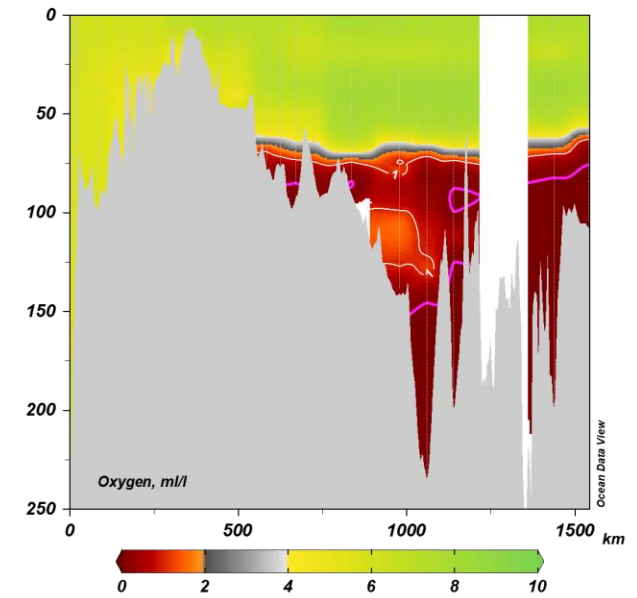
SMHI cruise July 20190713 – 20190719 CTD section



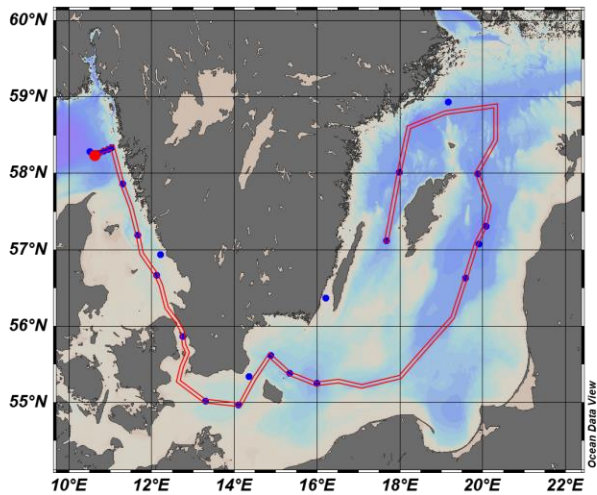
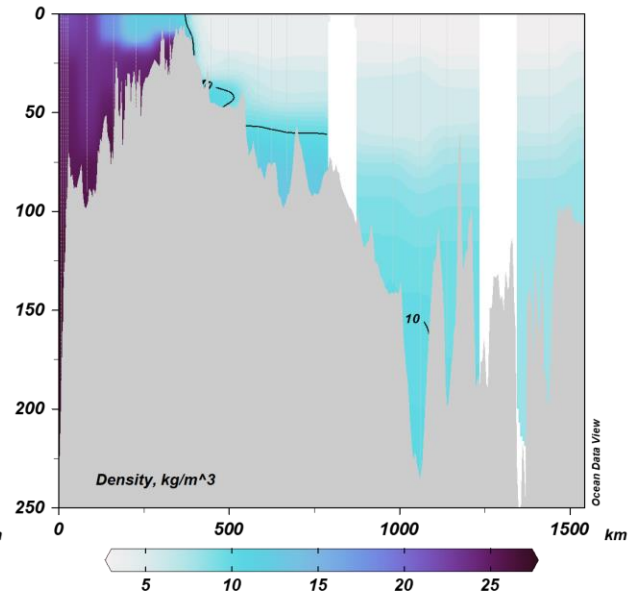
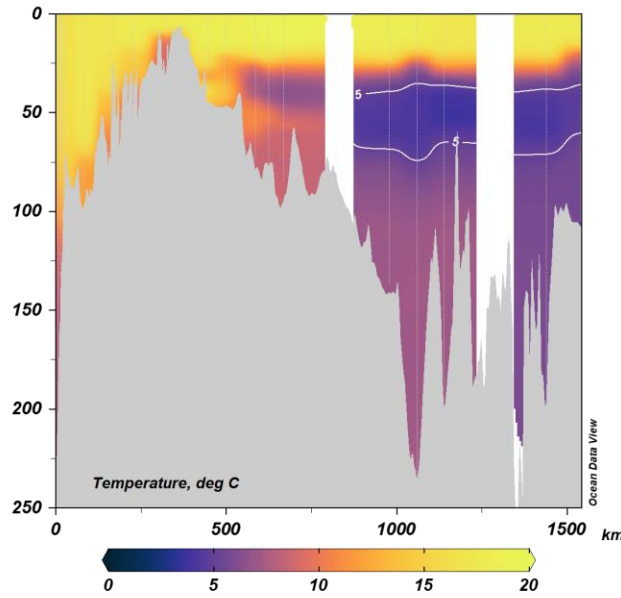
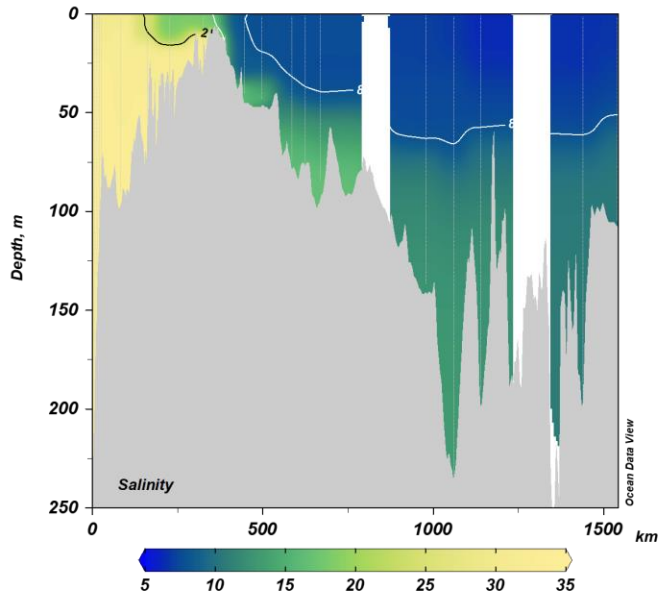
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



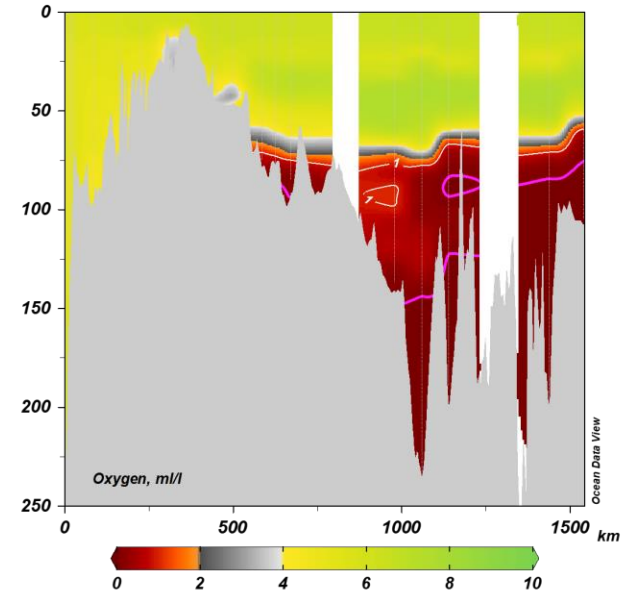
SMHI cruise August 20190816 – 20190823 CTD section



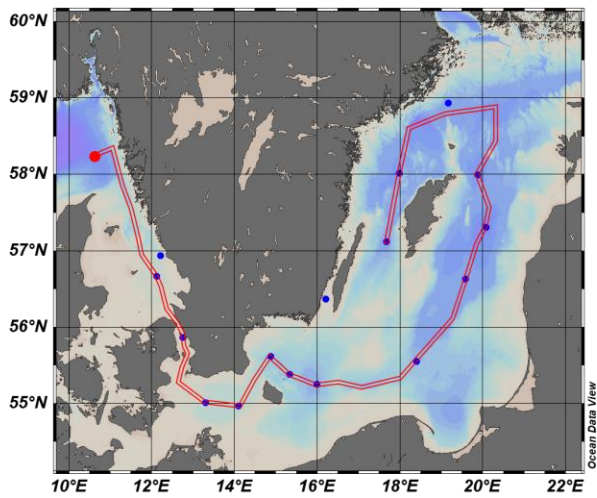
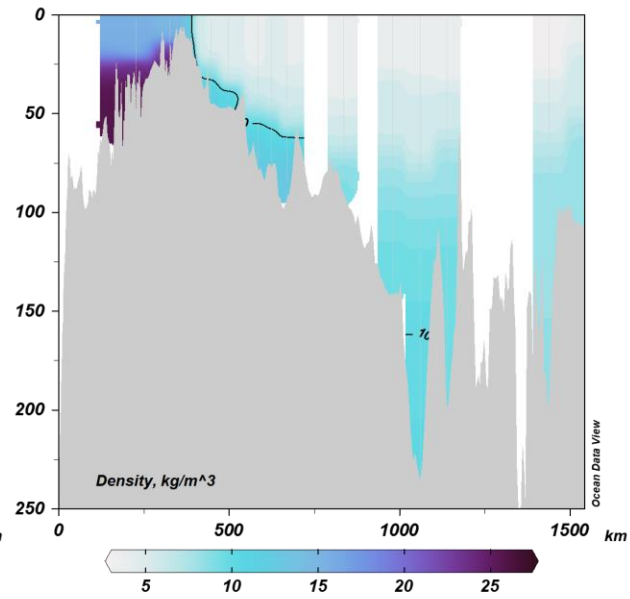
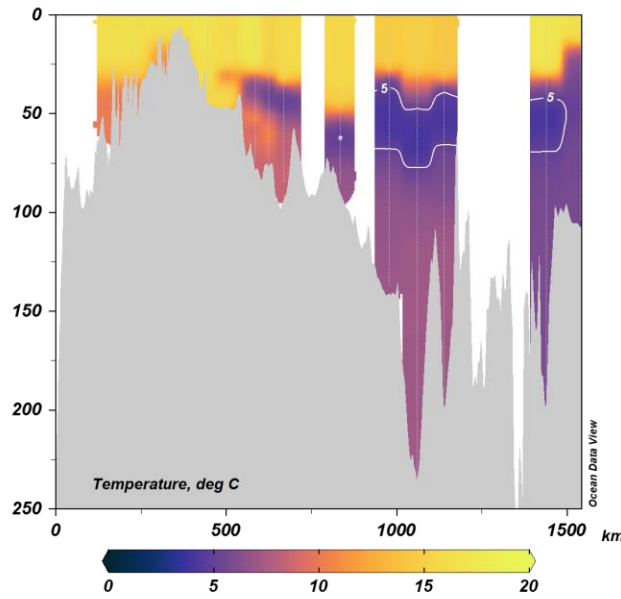
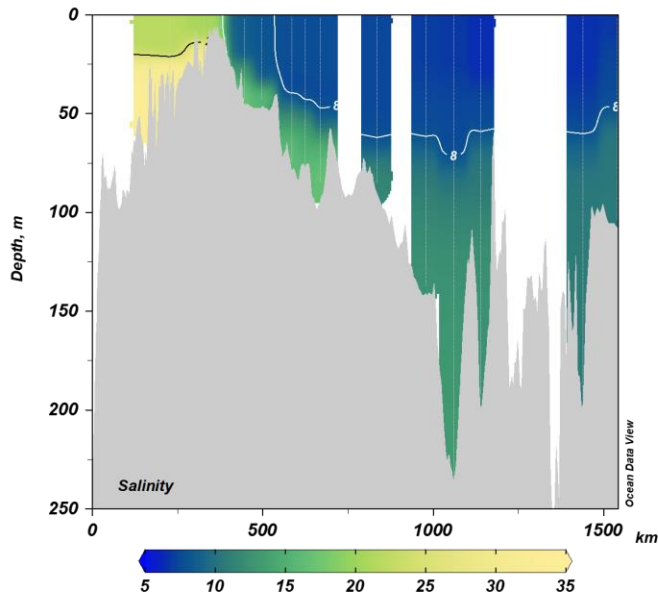
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



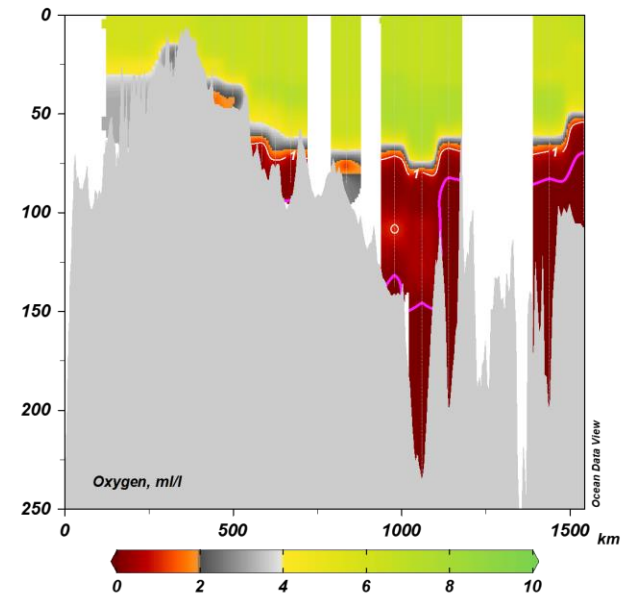
SMHI cruise September 20190912 – 20190919 CTD section



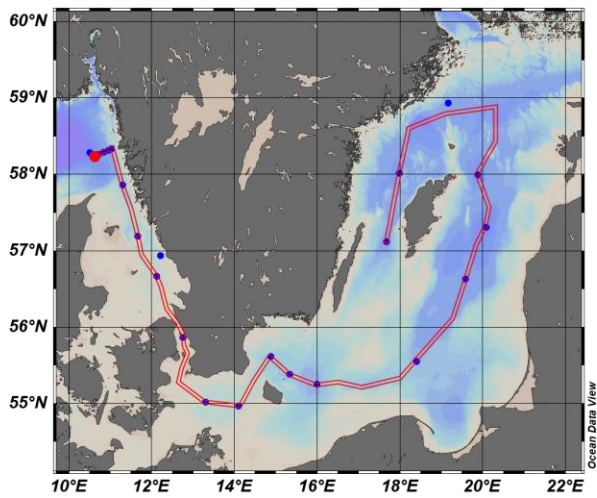
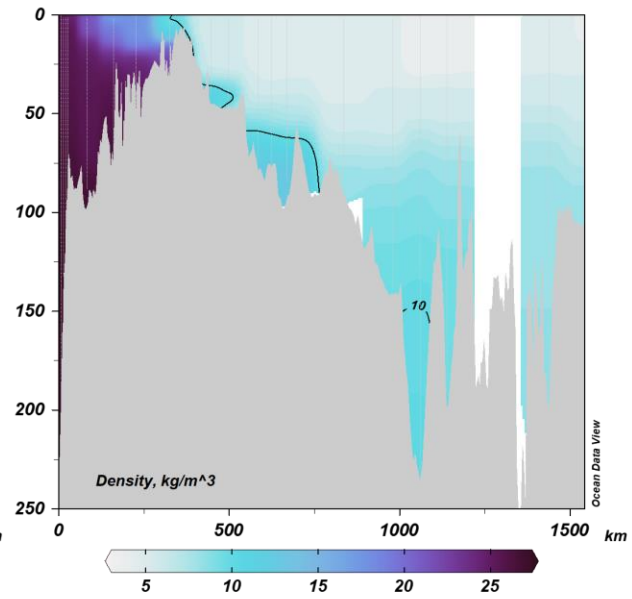
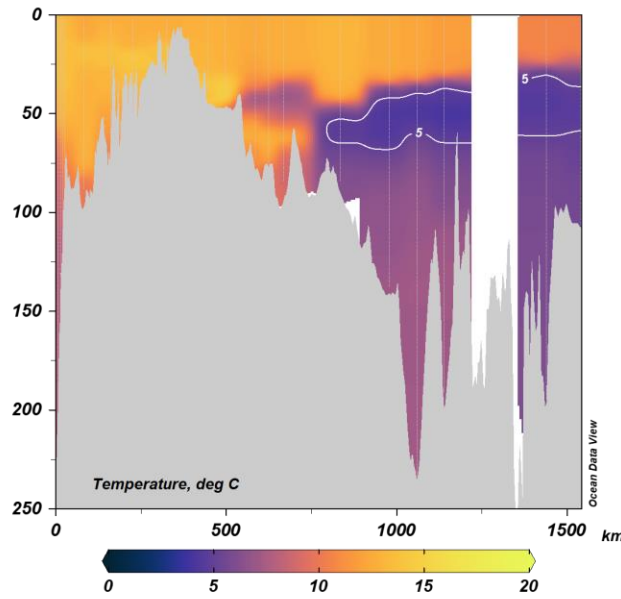
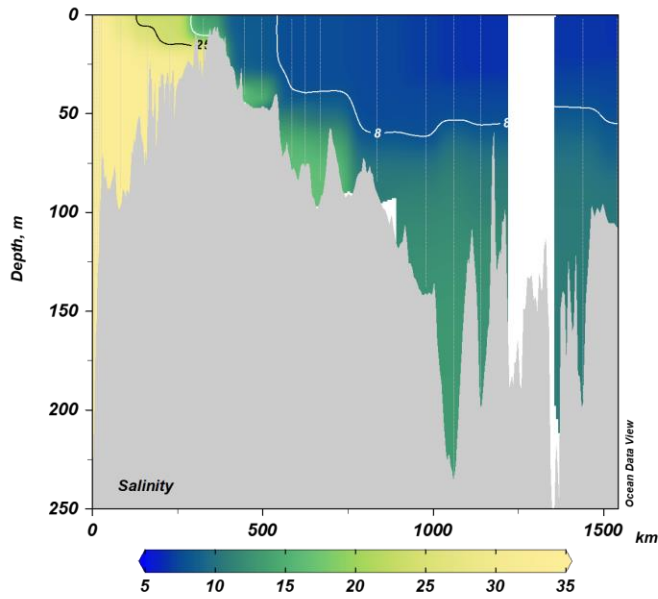
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



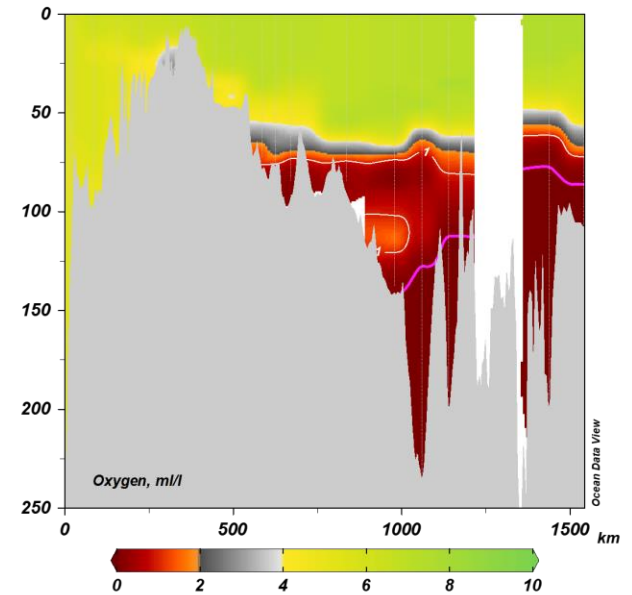
SMHI cruise October 20191013 – 20191020 CTD section



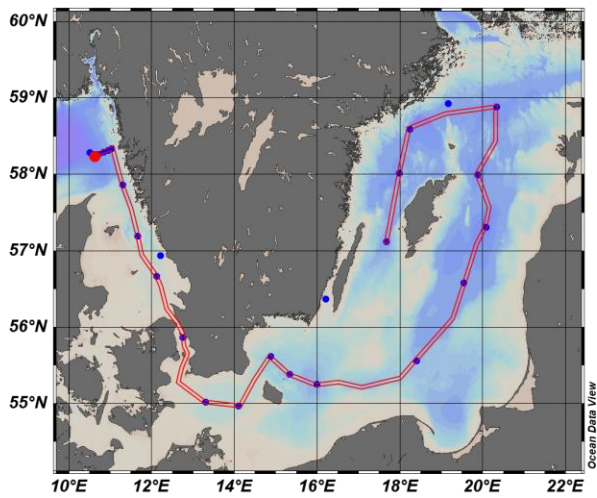
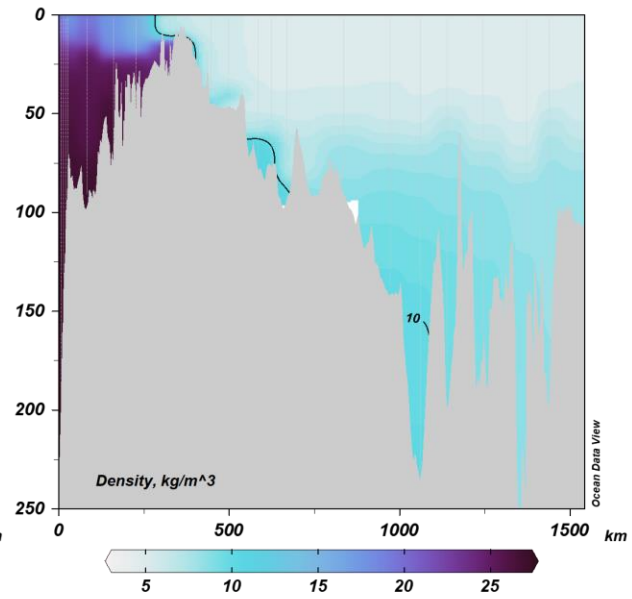
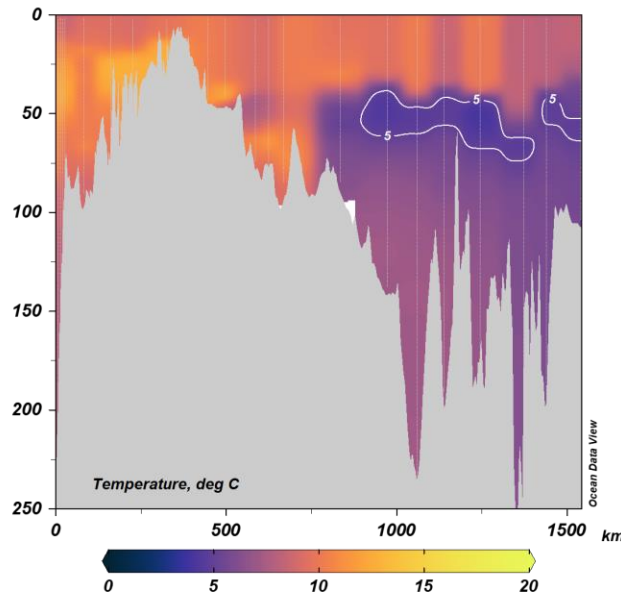
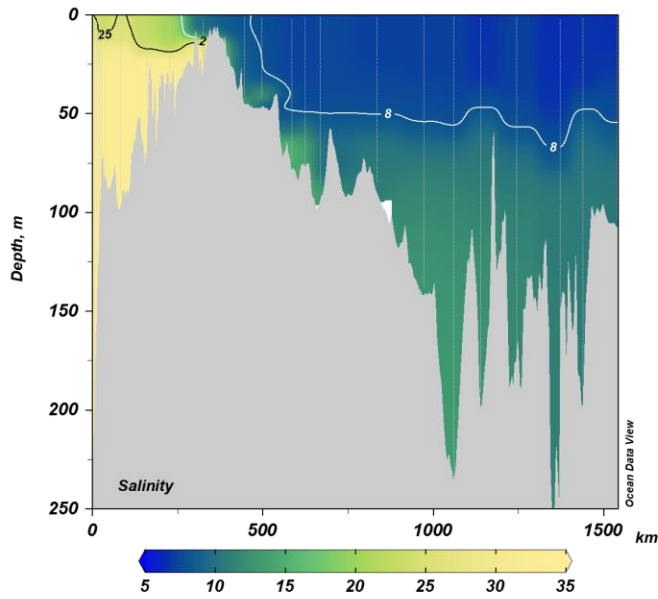
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



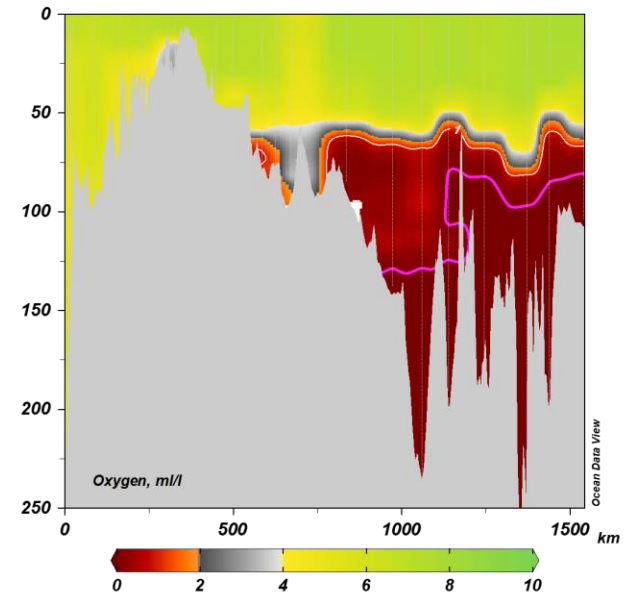
SMHI cruise November 20191109 – 20191114 CTD section



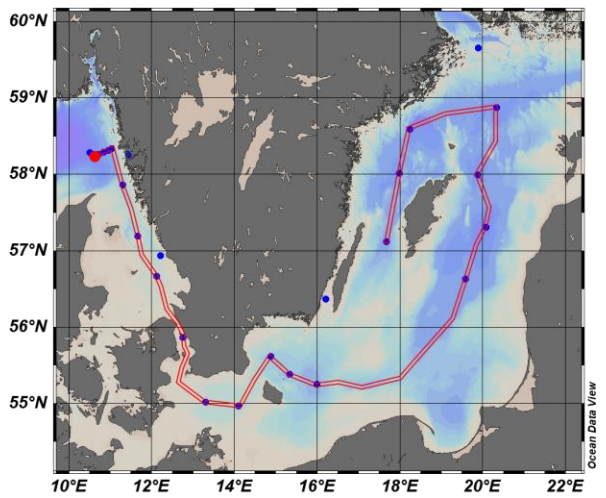
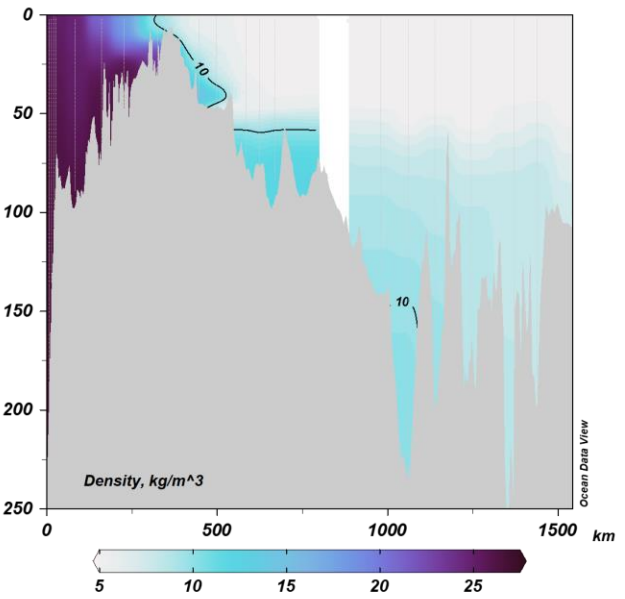
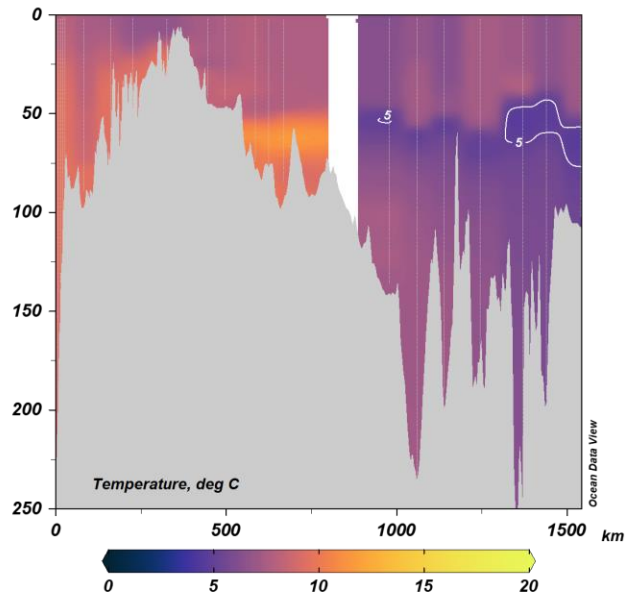
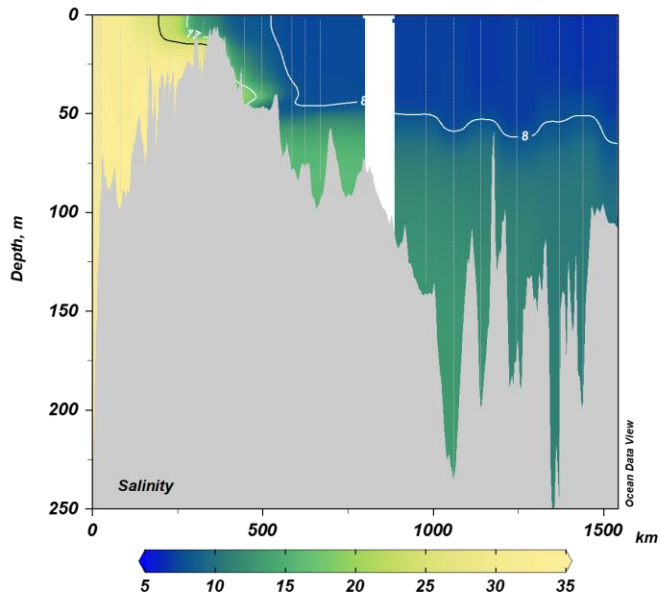
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations

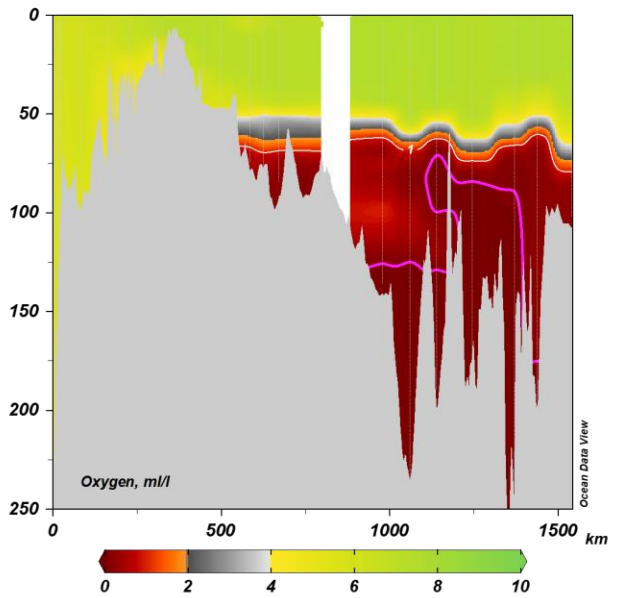


SMHI cruise December 20191204 – 20191216 CTD section

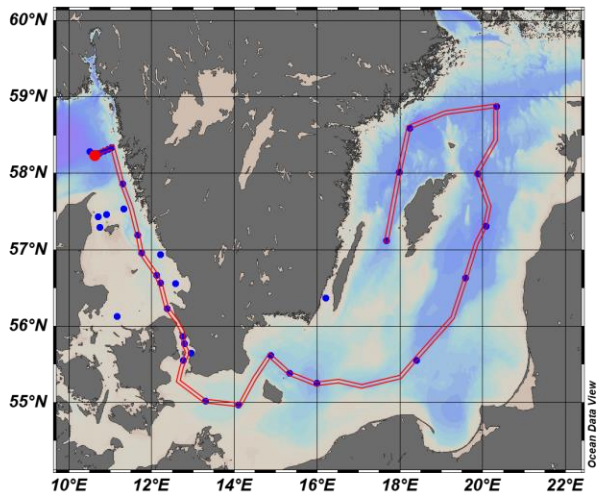
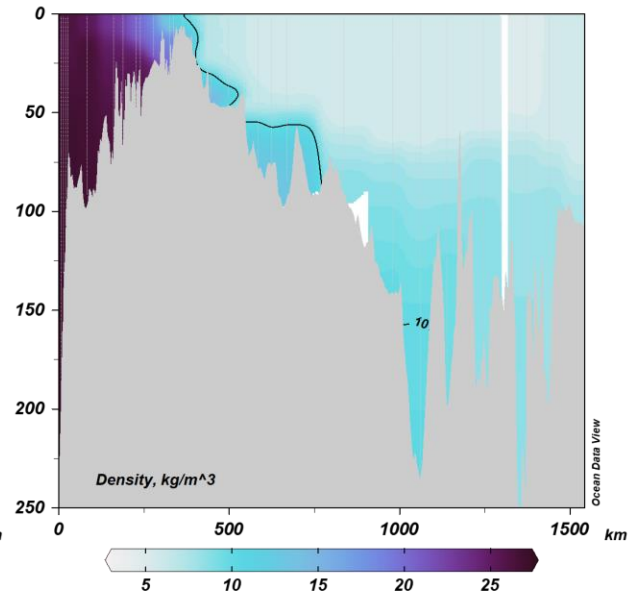
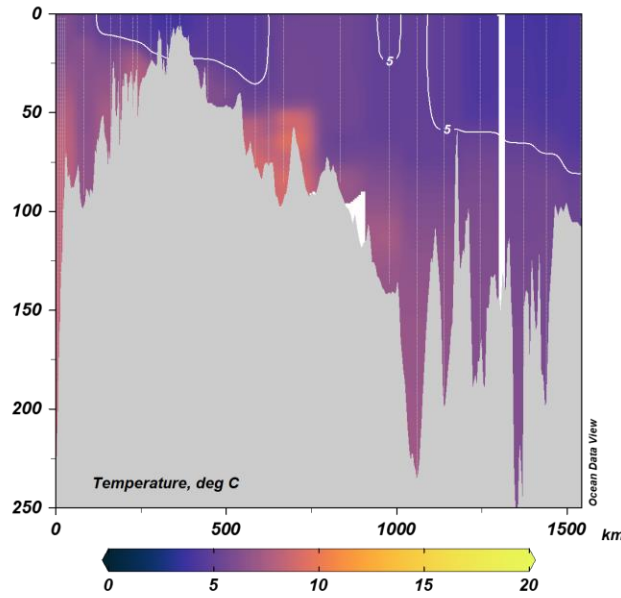
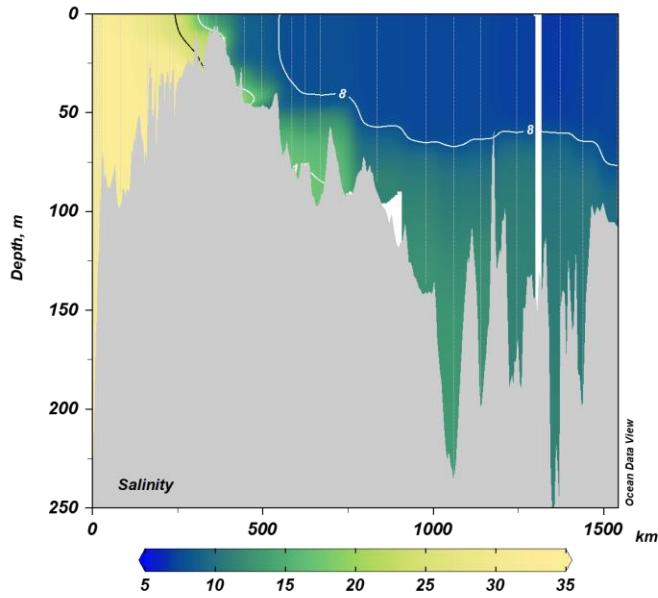


Isolines
 Salinity: 6, 8, 17 (white), 25 (black)
 Temperature: 5
 Oxygen: 1 (white), 0.1 (pink)
 Density: 10

Thin vertical lines are stations



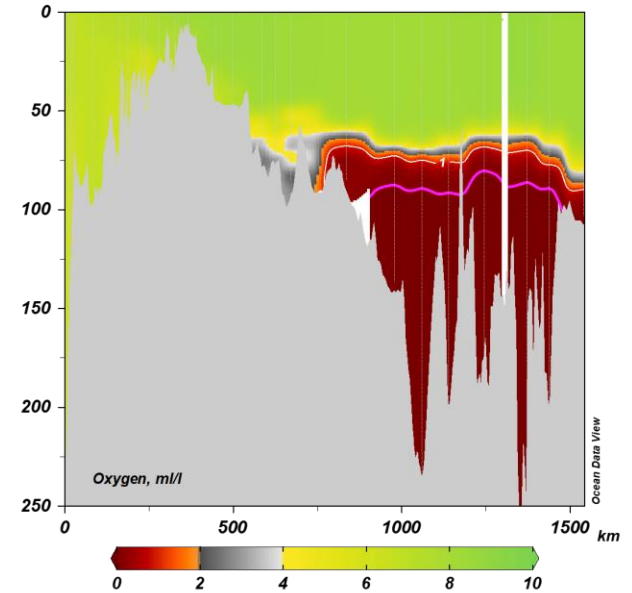
SMHI cruise January 20190110 – 20190119 CTD section



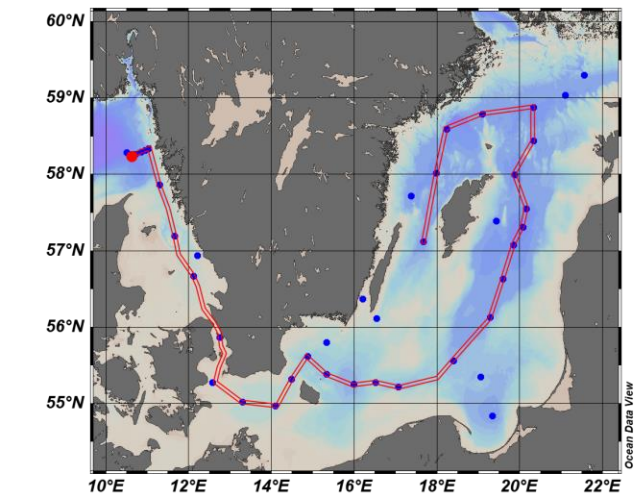
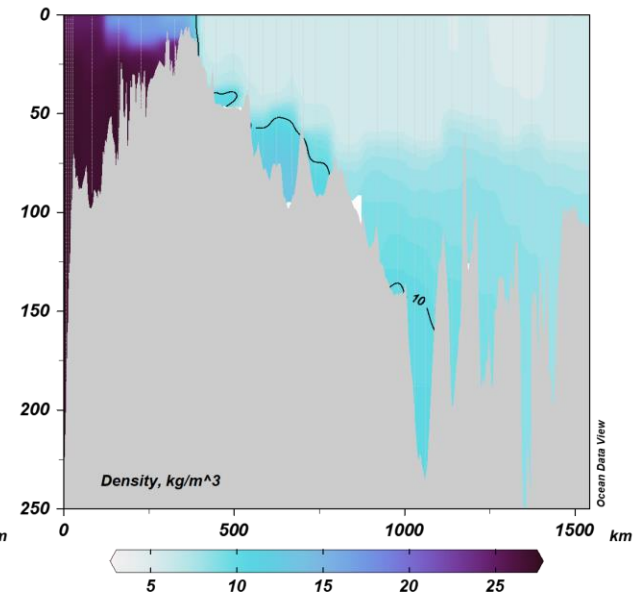
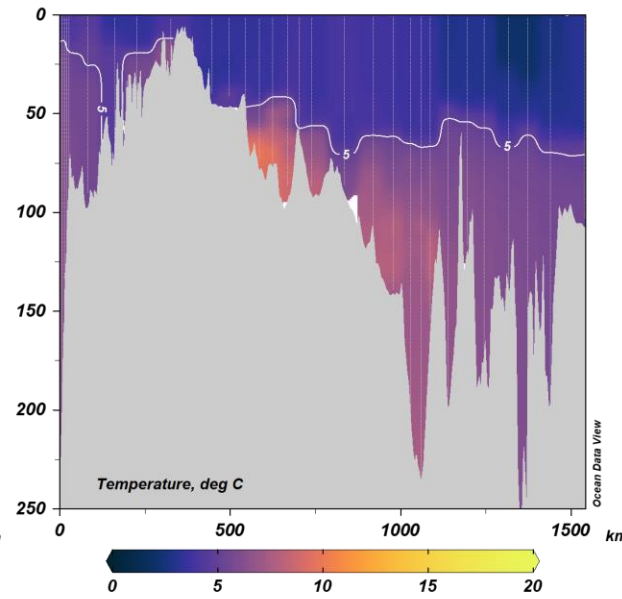
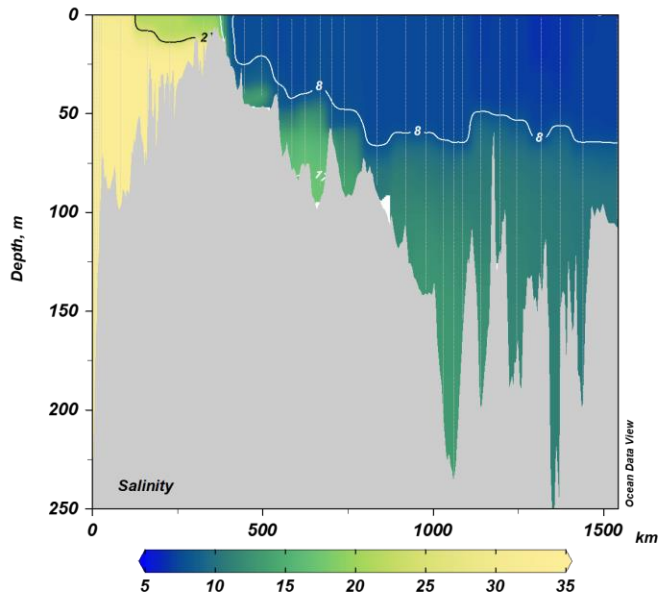
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



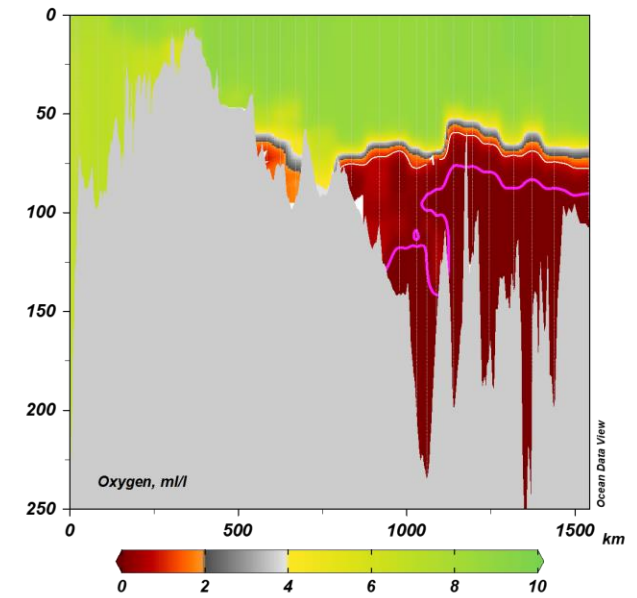
SMHI cruise February 20190215 – 20190225 CTD section



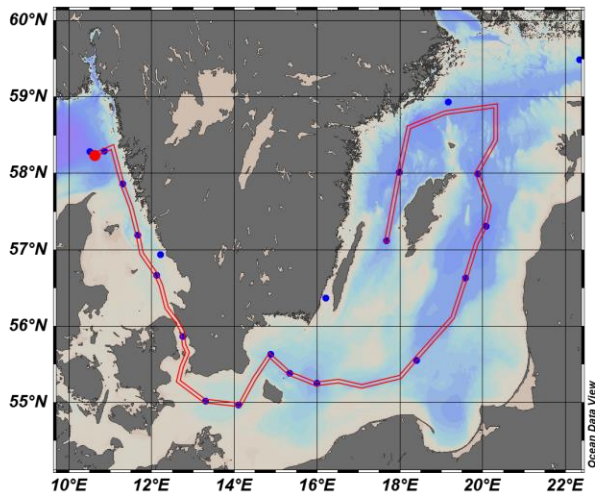
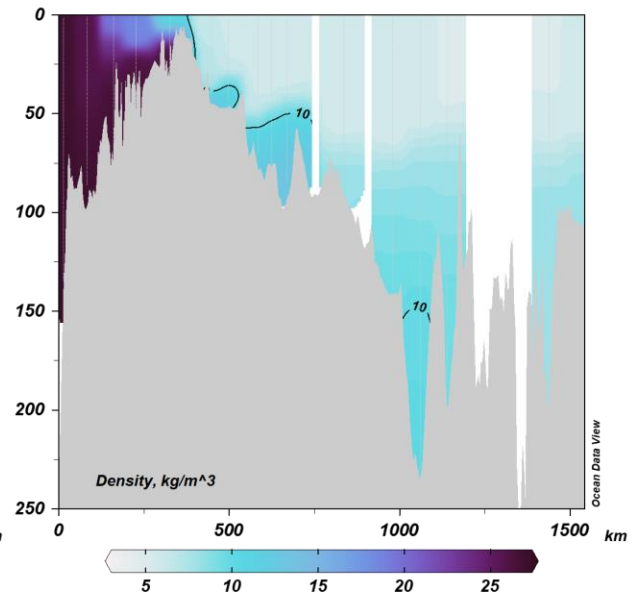
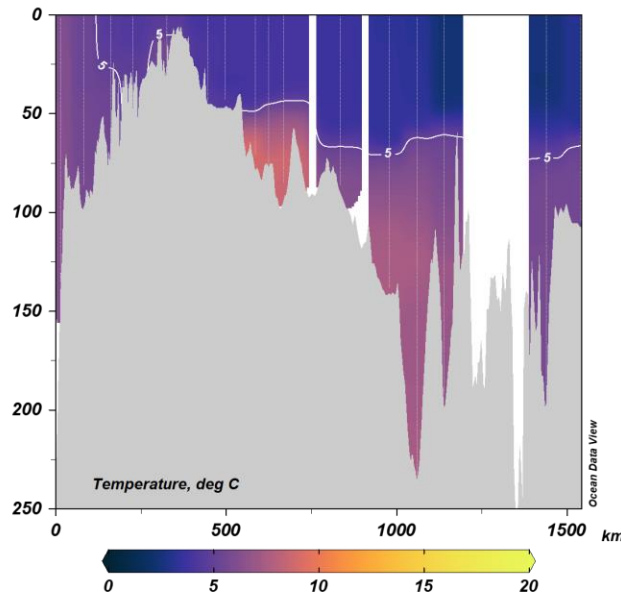
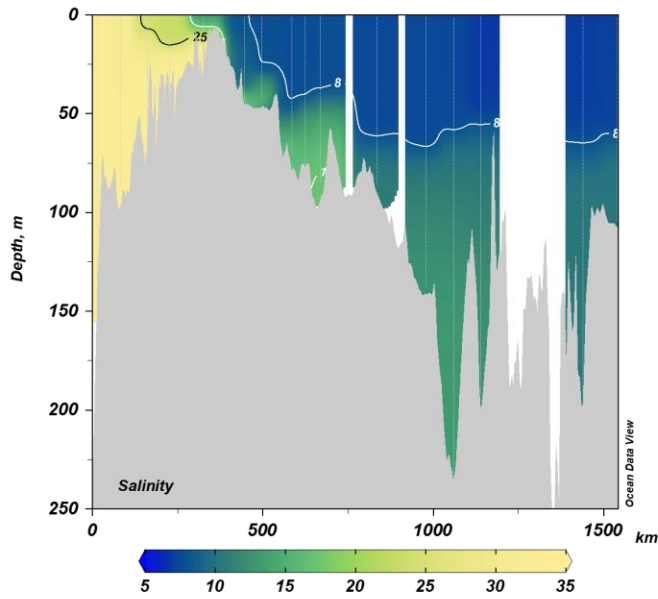
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



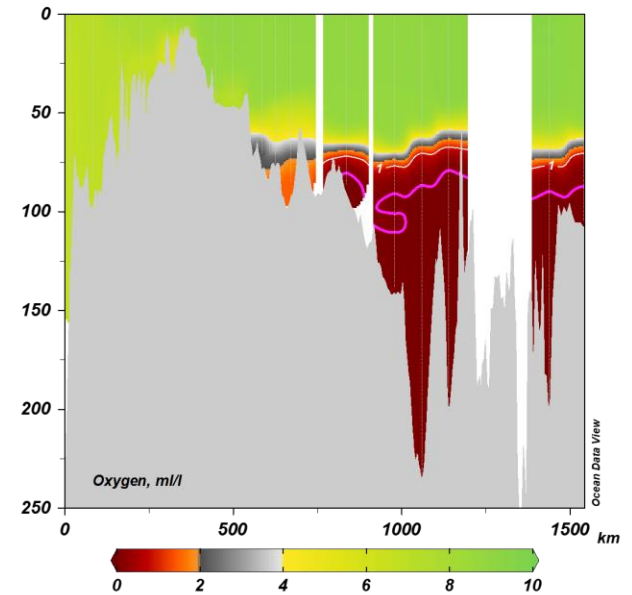
SMHI cruise March 20190314 – 20190320 CTD section



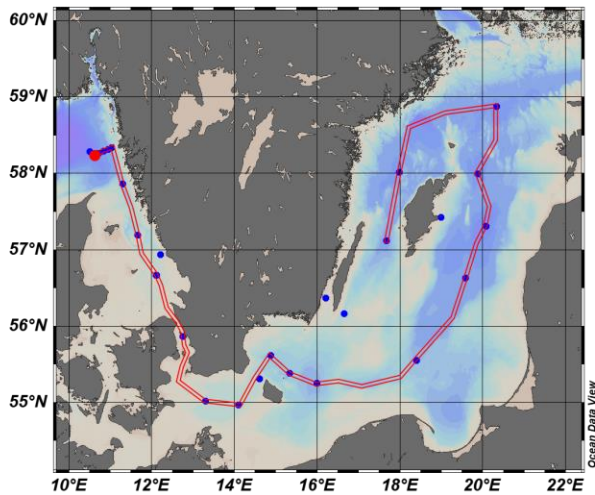
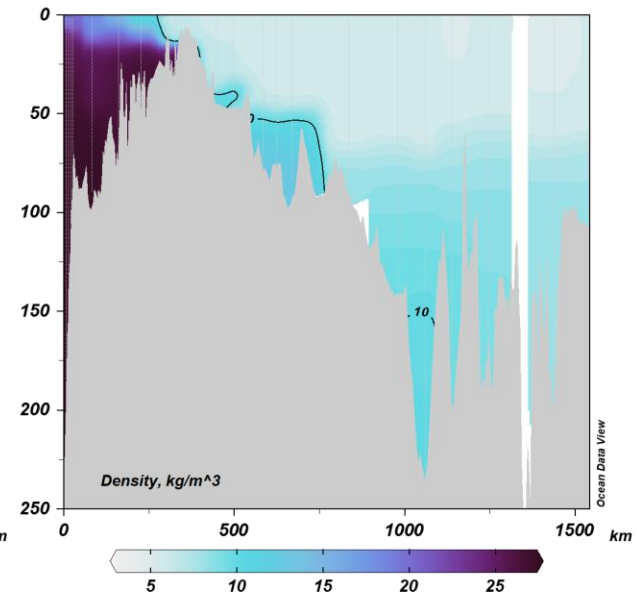
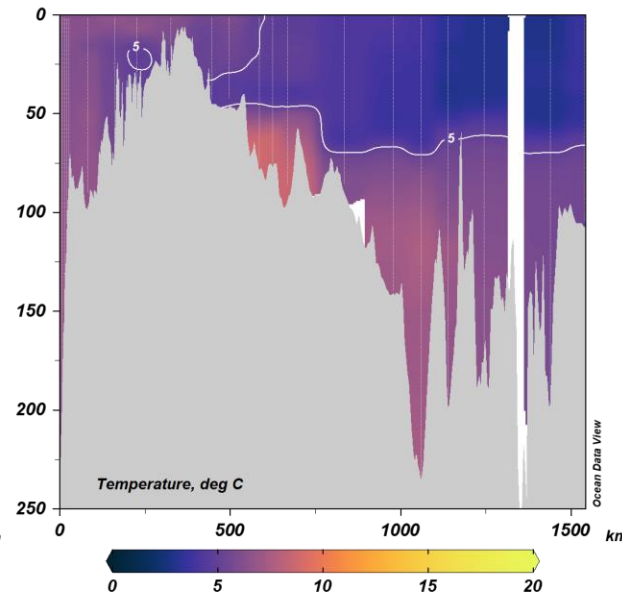
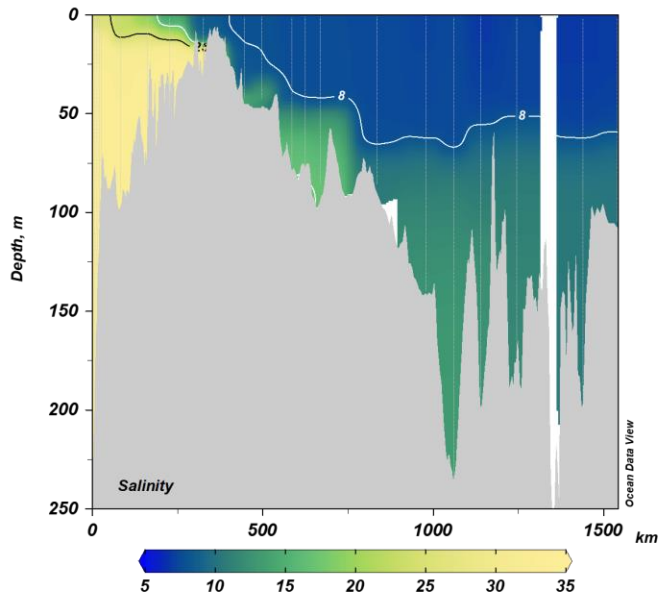
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



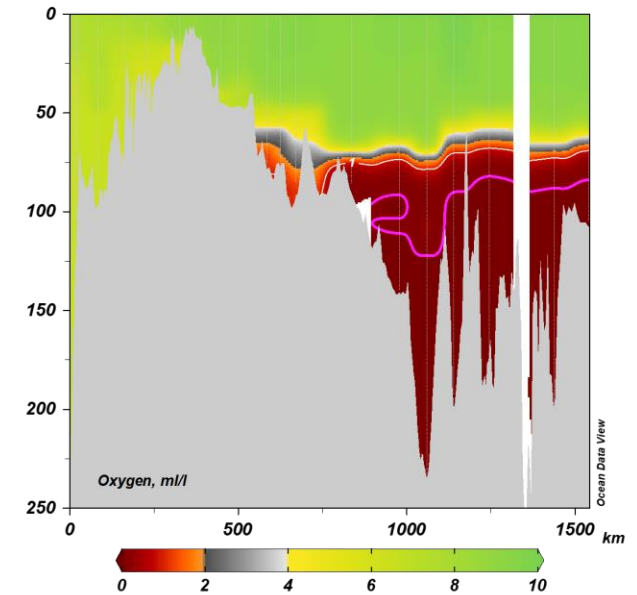
SMHI cruise April 20190405 – 20190412 CTD section



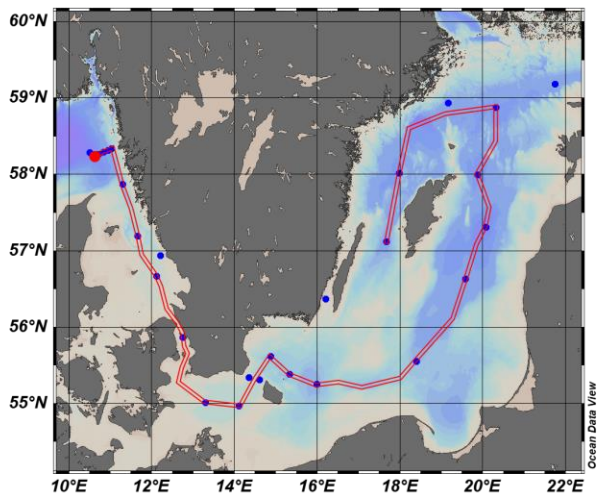
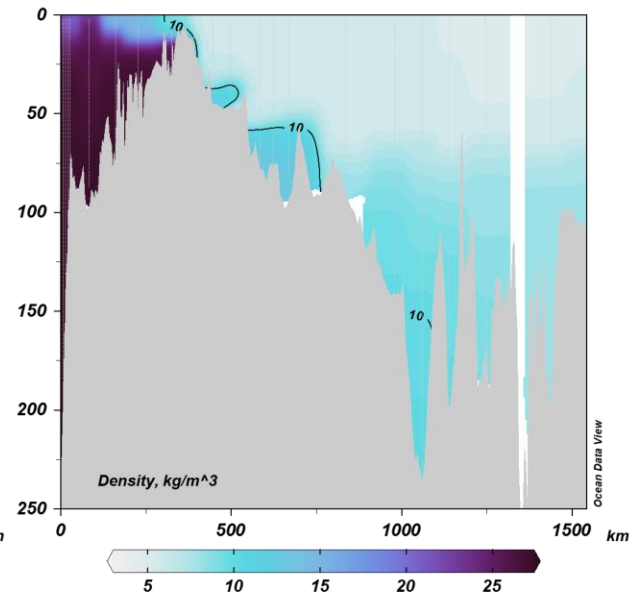
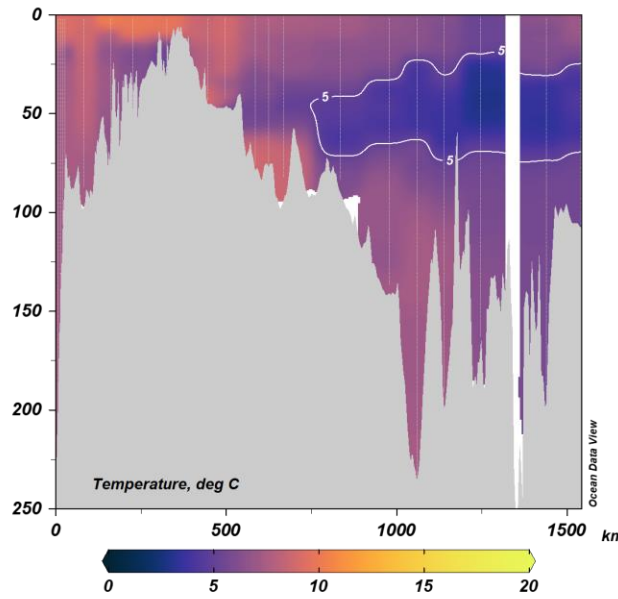
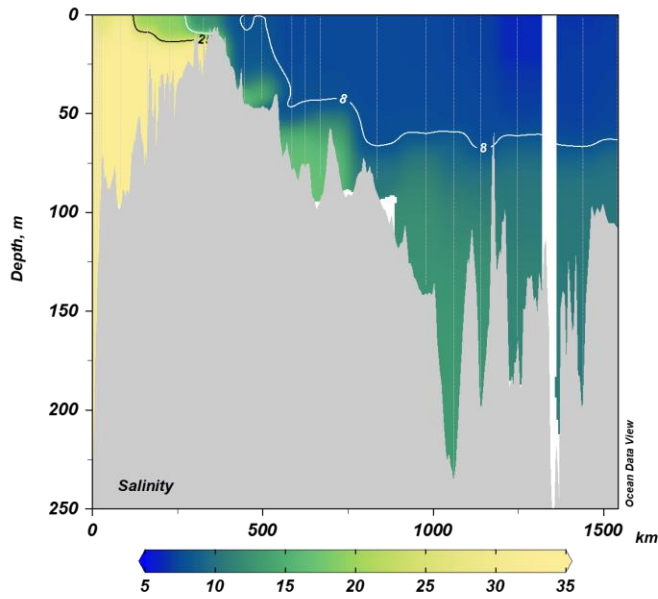
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



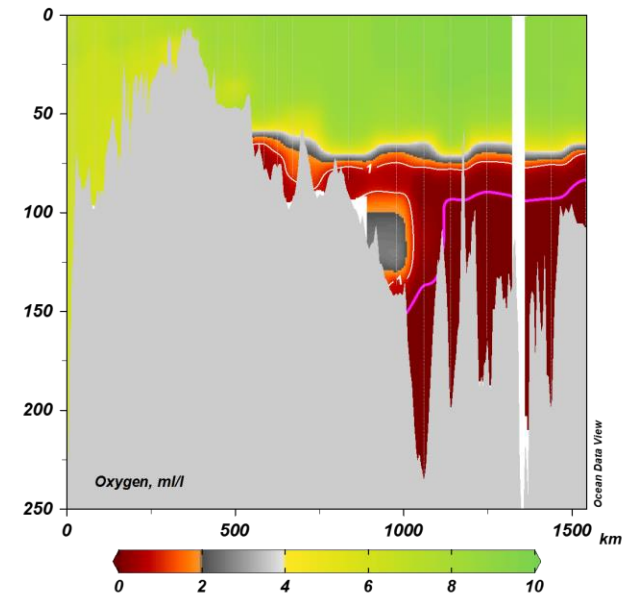
SMHI cruise May 20190509 – 20190516 CTD section



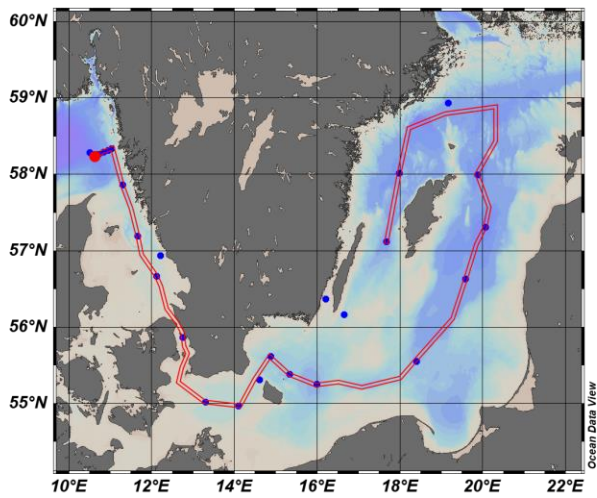
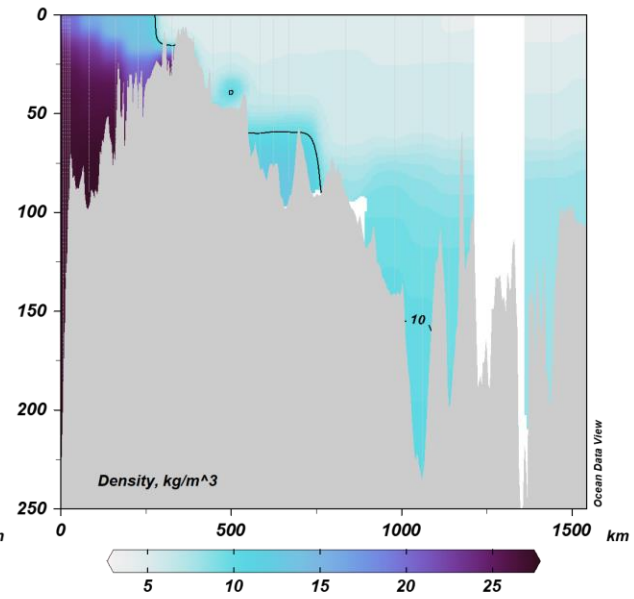
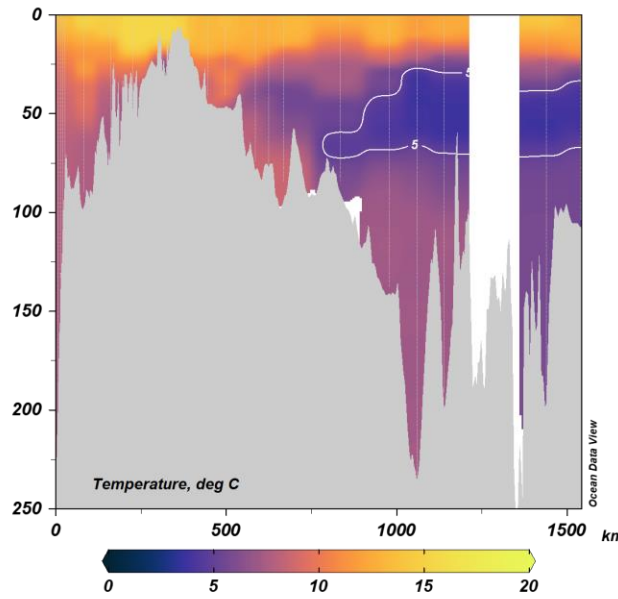
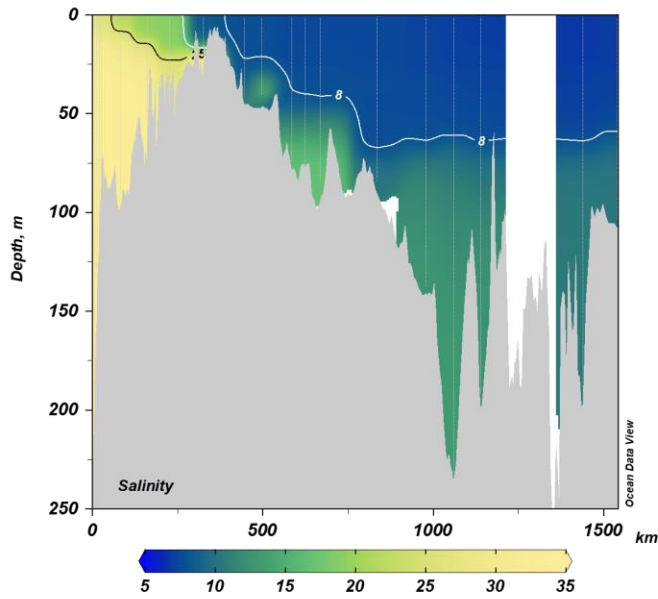
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



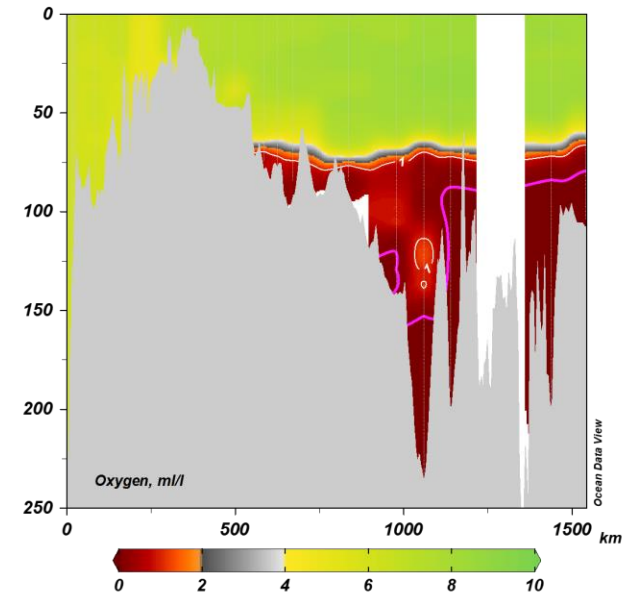
SMHI cruise June 20190610 – 20190616 CTD section



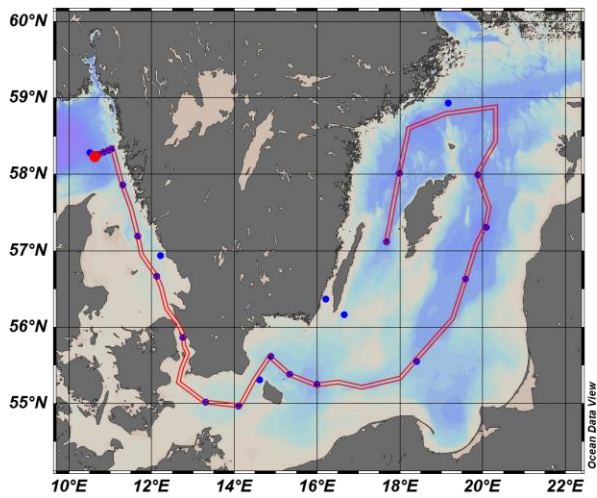
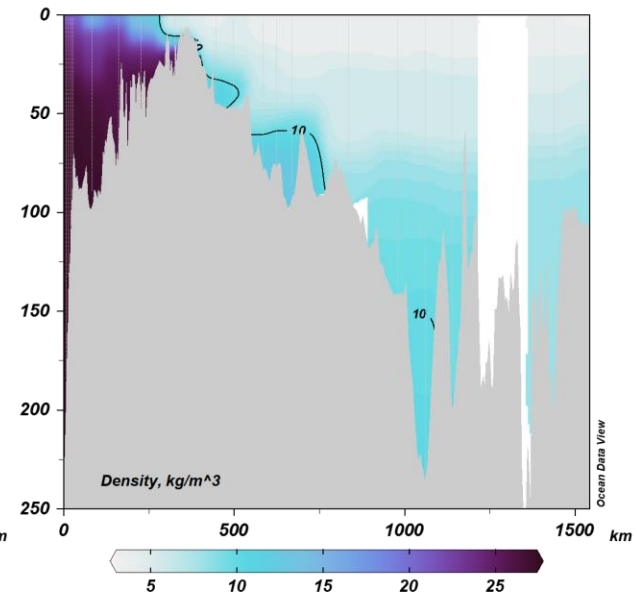
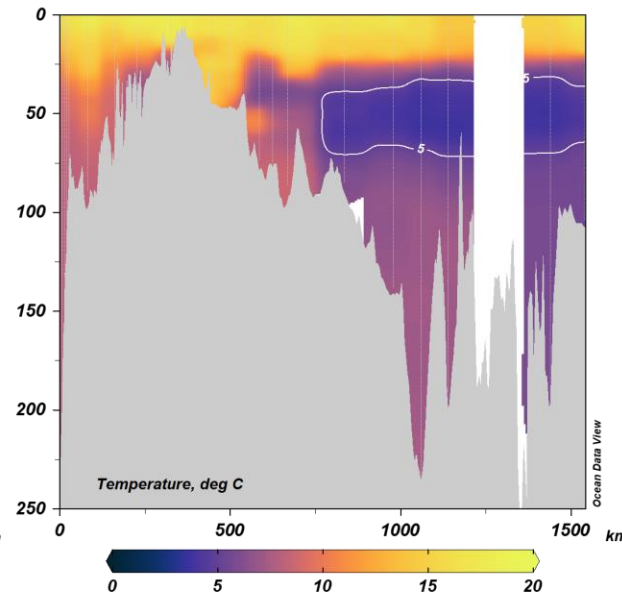
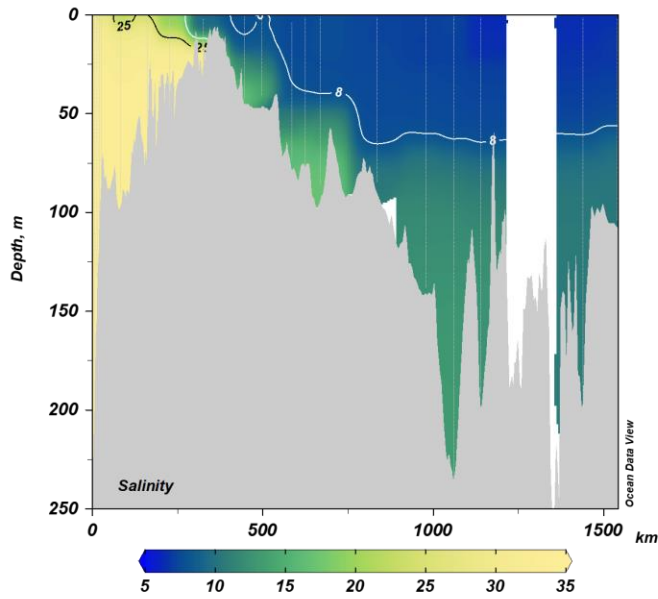
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



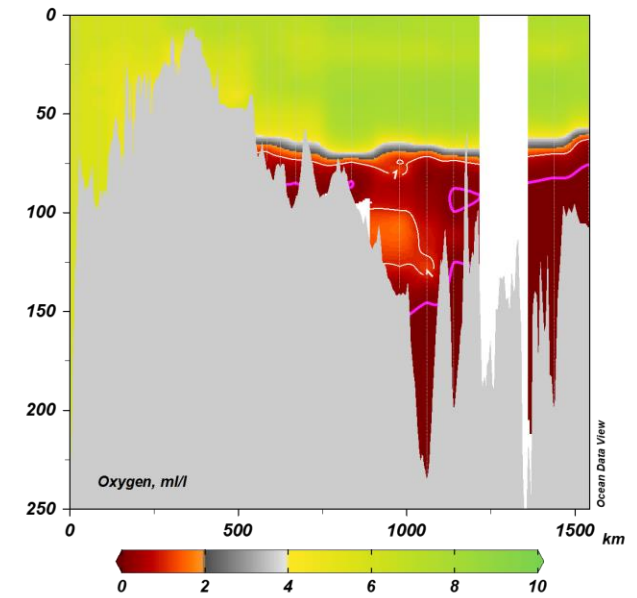
SMHI cruise July 20190713 – 20190719 CTD section



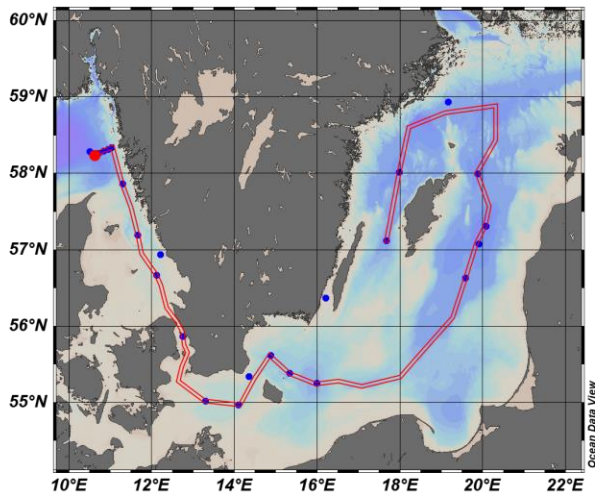
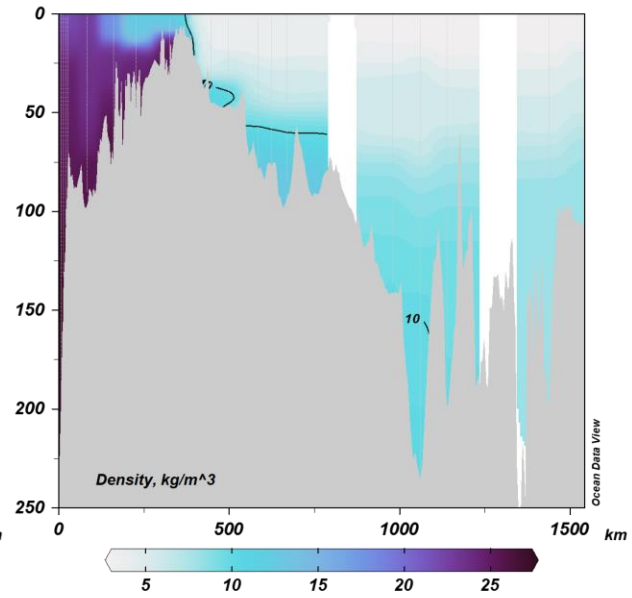
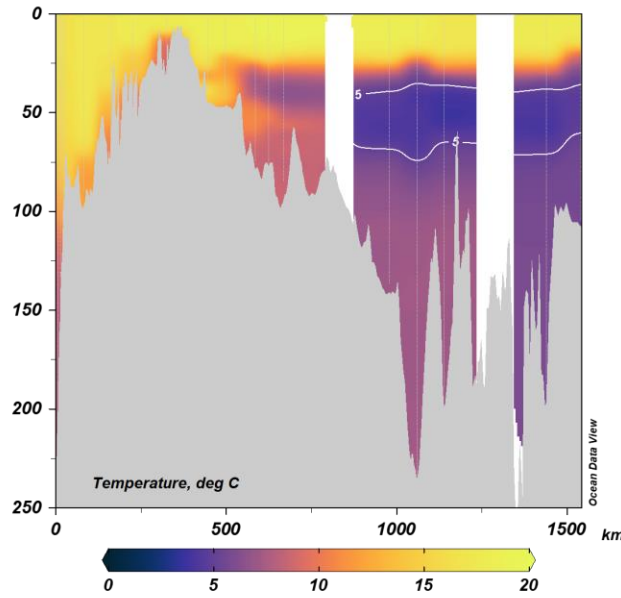
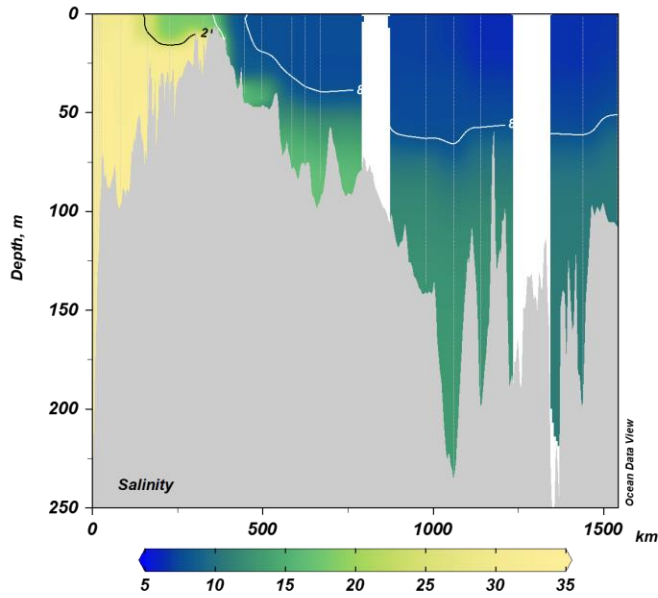
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



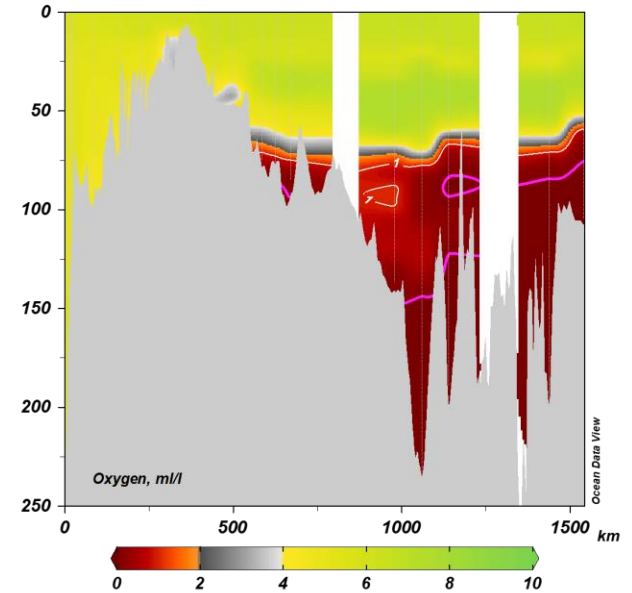
SMHI cruise August 20190816 – 20190823 CTD section



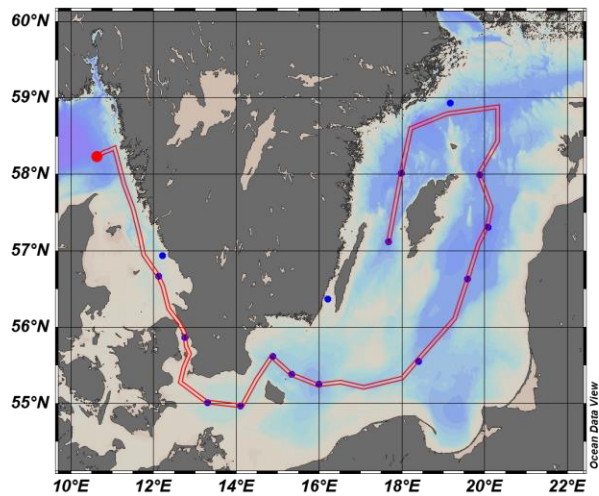
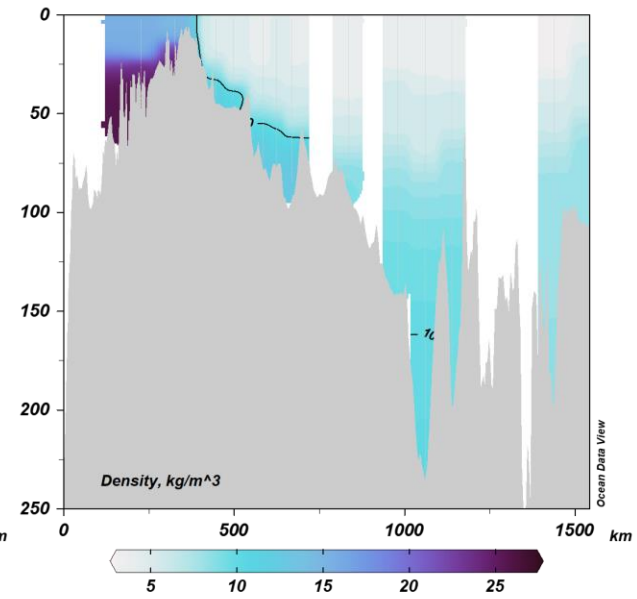
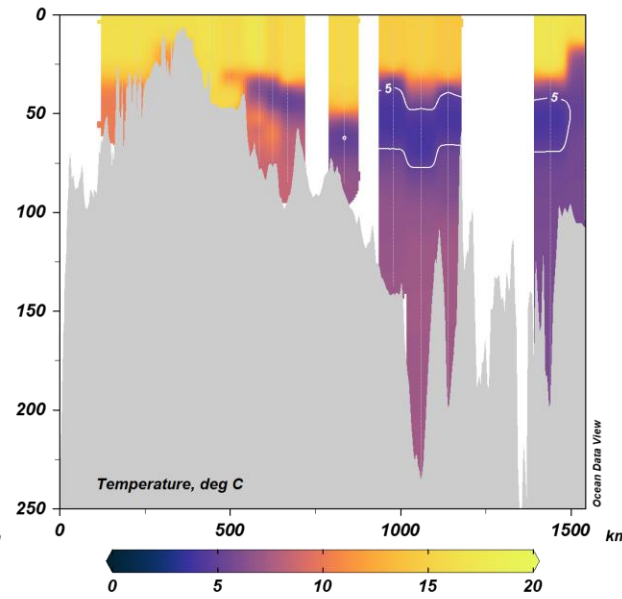
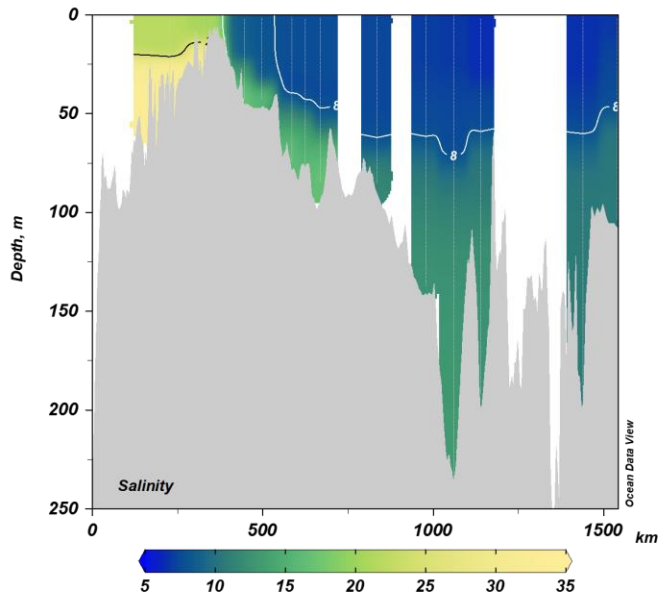
Isolines

Salinity: 6, 8, 17 (white), 25 (black)
 Temperature: 5
 Oxygen: 1 (white), 0.1 (pink)
 Density: 10

Thin vertical lines are stations



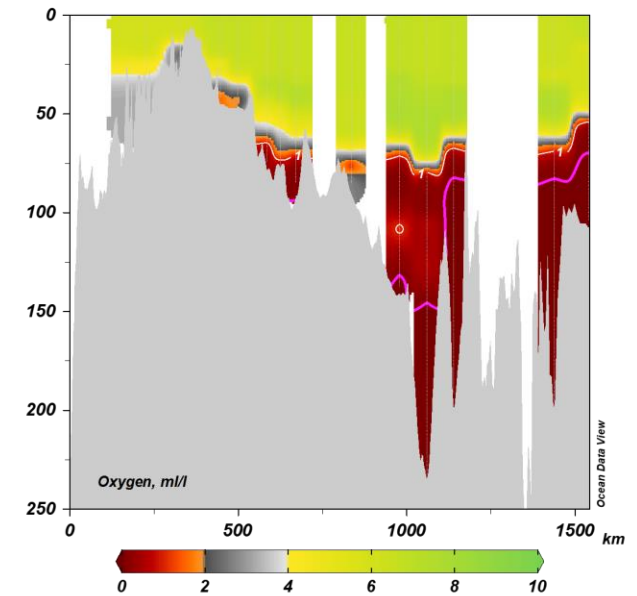
SMHI cruise September 20190912 – 20190919 CTD section



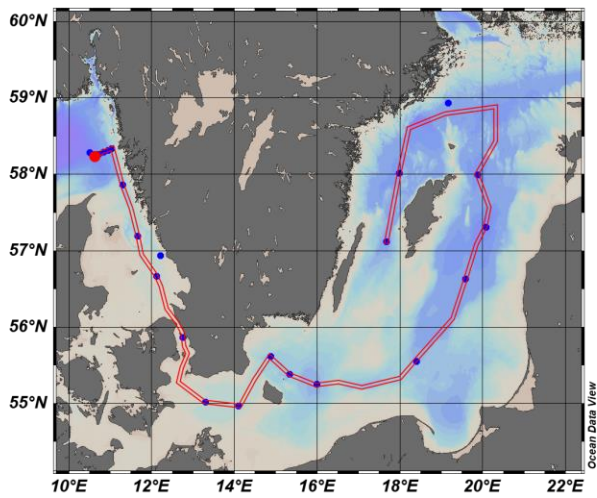
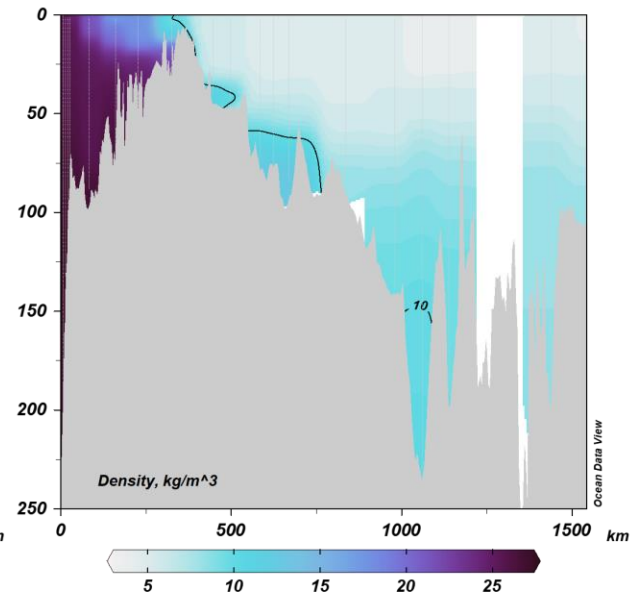
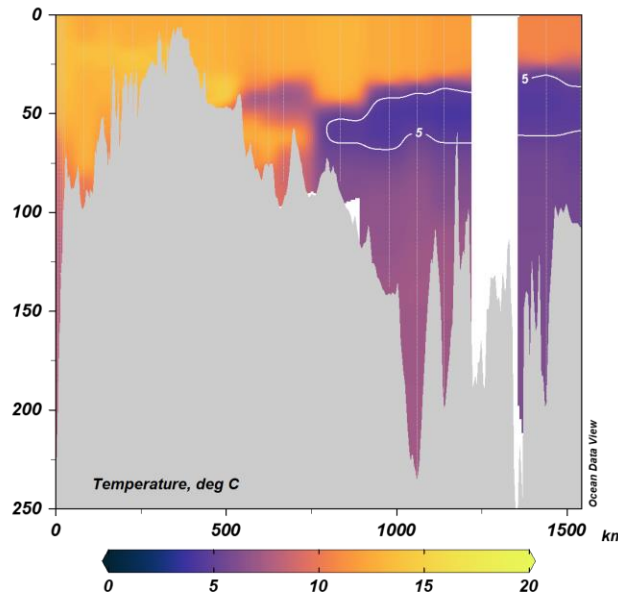
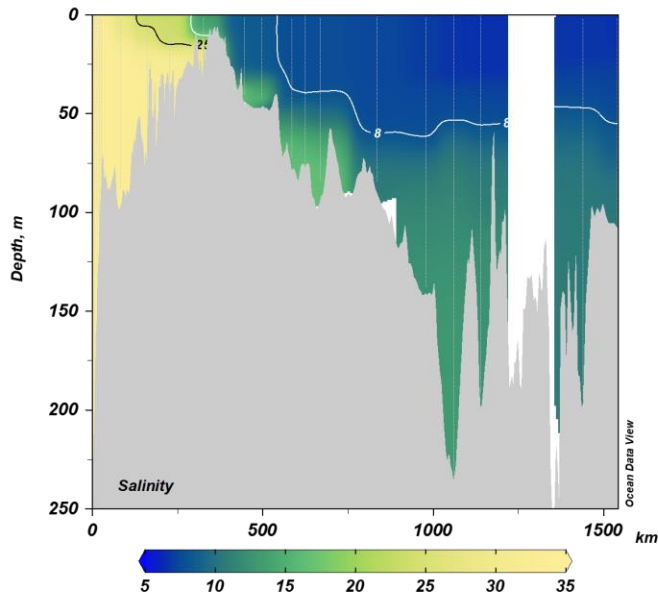
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



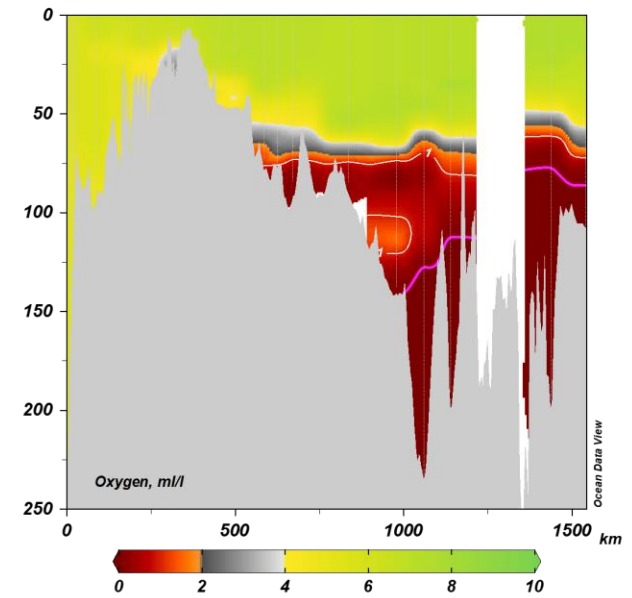
SMHI cruise October 20191013 – 20191020 CTD section



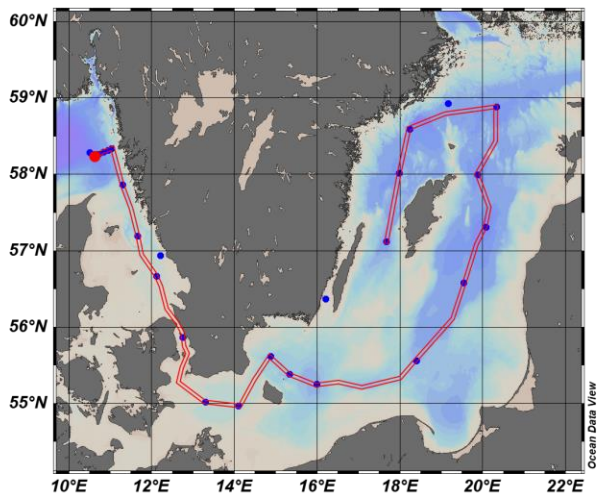
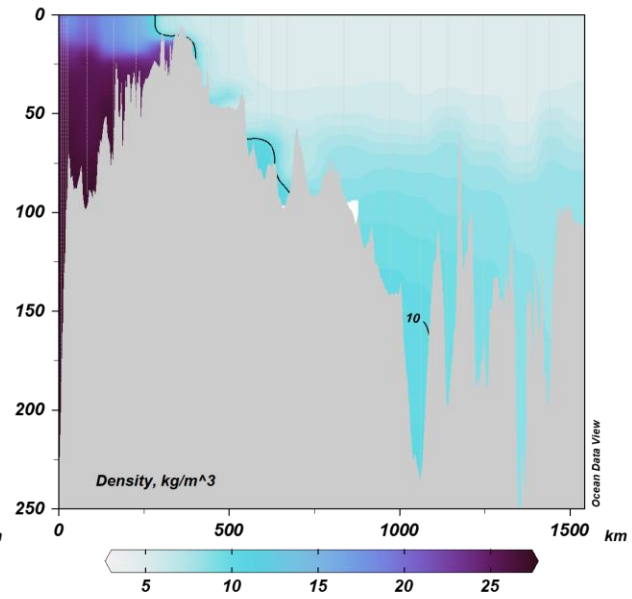
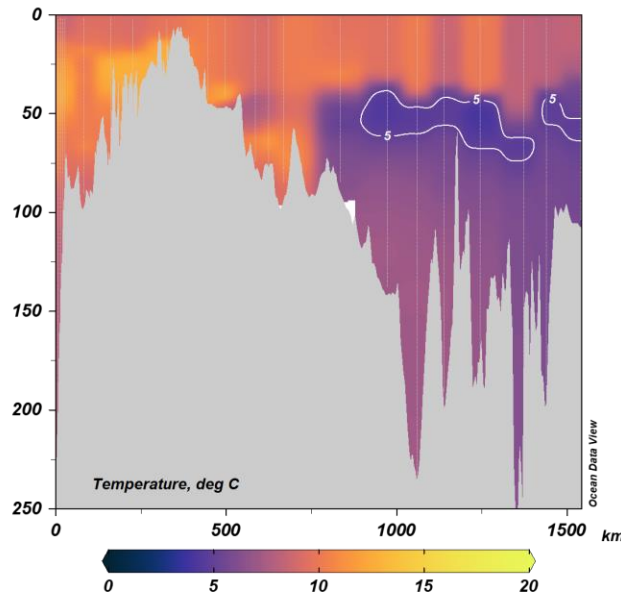
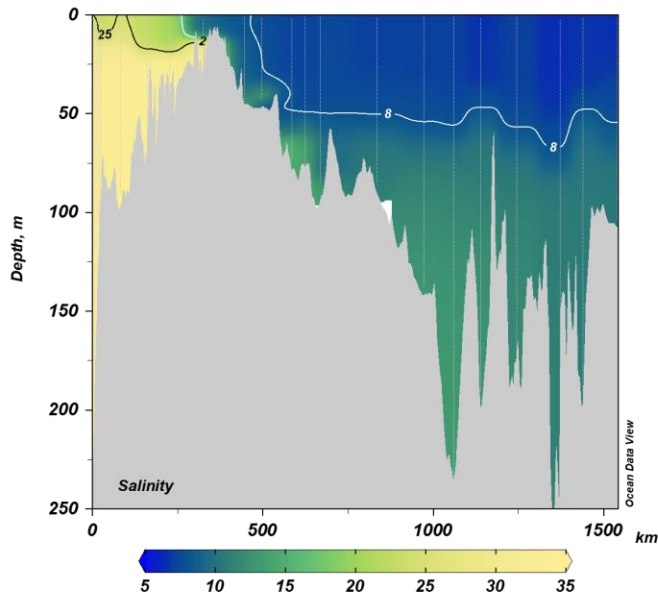
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



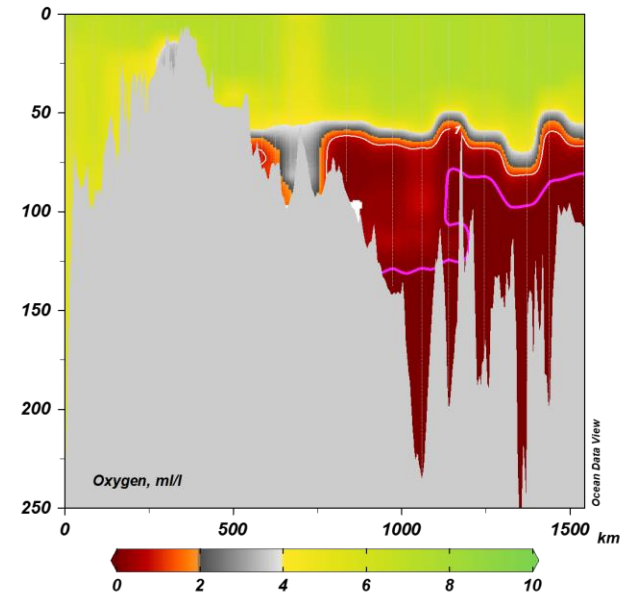
SMHI cruise November 20191109 – 20191114 CTD section



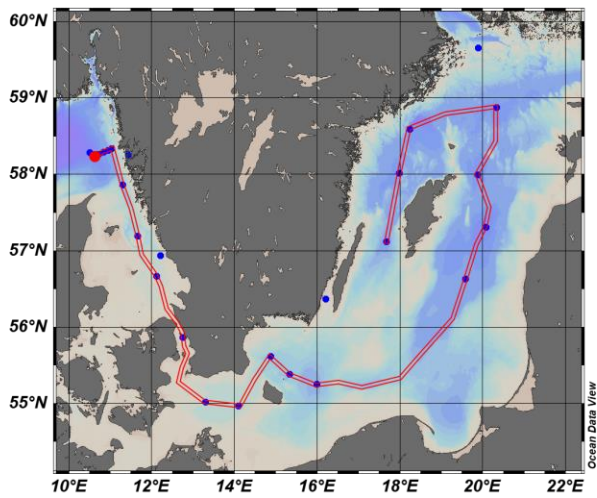
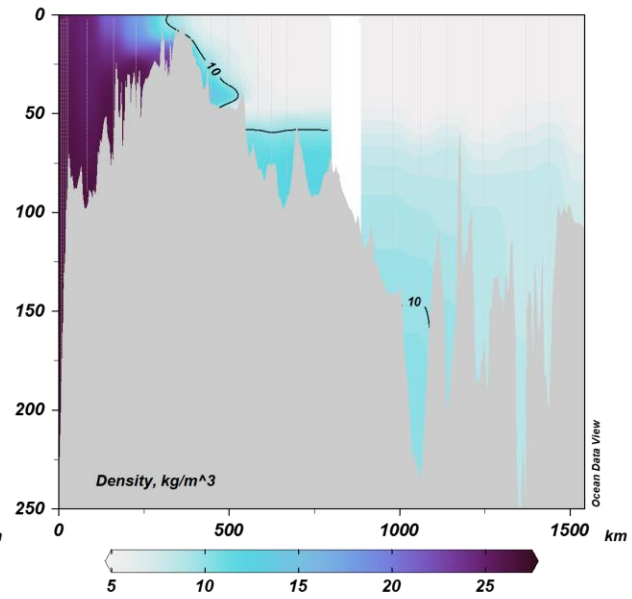
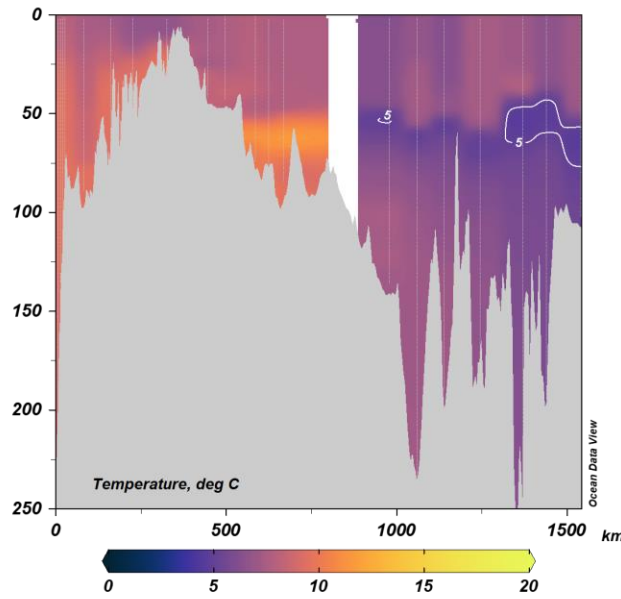
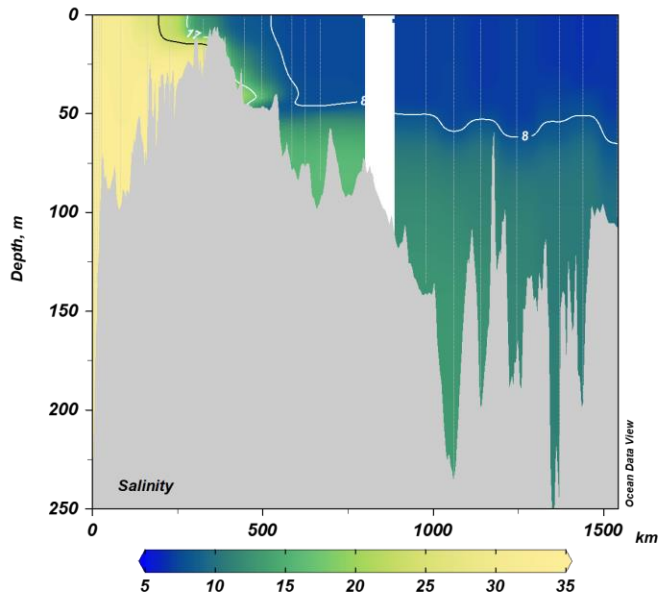
Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations



SMHI cruise December 20191204 – 20191216 CTD section



Isolines

- Salinity: 6, 8, 17 (white), 25 (black)
- Temperature: 5
- Oxygen: 1 (white), 0.1 (pink)
- Density: 10

Thin vertical lines are stations

