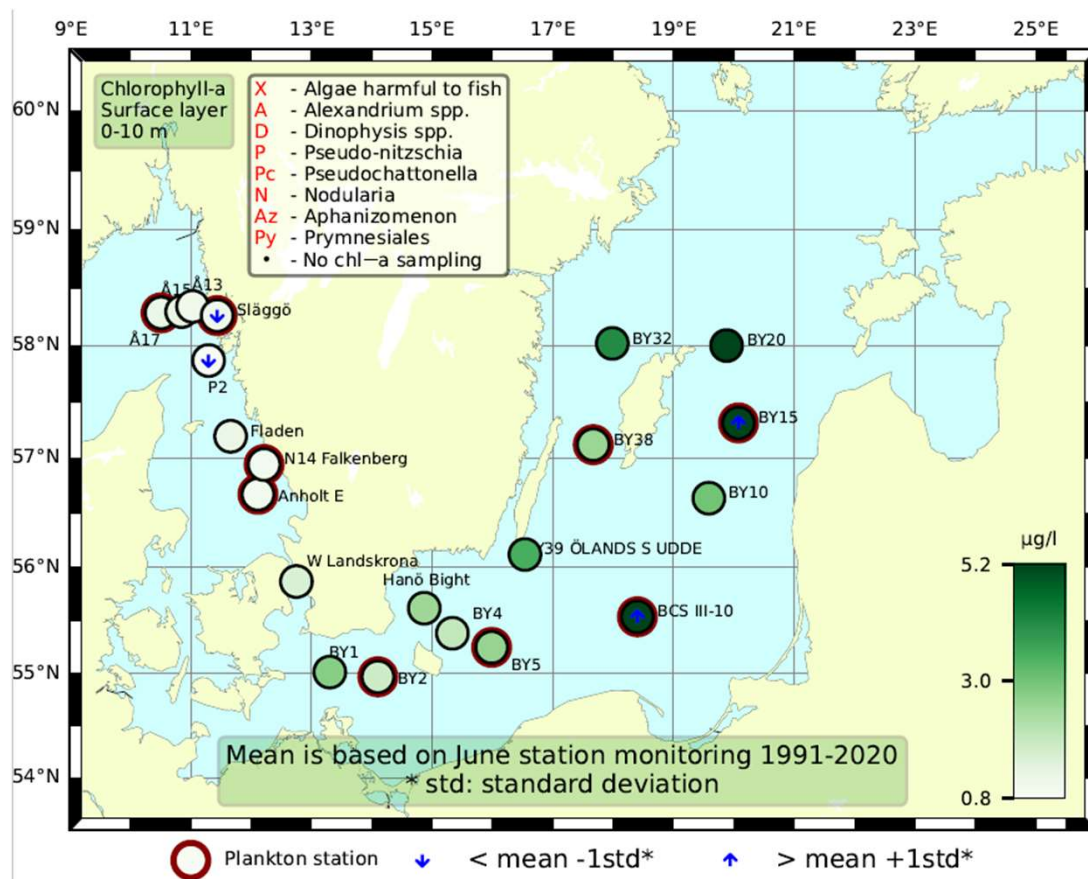


Sammanfattning

Diversiteten var generellt låg vid samtliga stationer i västerhavet. Cellantalen var däremot normala och vid Å17 var de snudd på höga med en dominans av kiselalger. Samtliga stationer i västerhavet hade höga cellantal av kiselalgen *Dactyliosolen fragilissimus* som är vanlig på sommaren. Små celler var även vanliga vid samtliga stationer och *Emiliania huxleyi* var vanlig förutom vid Å17. De integrerade klorofyllhalten (0–10 samt 0–20 m) var generellt normala för månaden vid samtliga stationer.

Diversiteten och cellantalen av växtplankton var normala vid alla stationer i Östersjön med ett försommarblomningssamhälle. Flera dinoflagellatsläkten fanns med ganska höga cellantal vid de flesta stationer, såsom Gymnodiniales och *Heterocapsa rotundata*, samt enstaka celler av de toxinbildande *Dinophysis norvegica** och *D. acuminata**. Av de sommarblommande filamentösa cyanobakterierna var *Aphanizomenon flosaquae* mycket vanlig, främst i de norra och östra delarna av Östersjön, men återfanns i samtliga prover. Även mindre mängder av *Nodularia spumigena** fanns på samtliga stationer. De integrerade klorofyllhalten (0–10 m och 0–20 m) var generellt över det normala för månaden vid flertalet stationer, förutom vid de södra stationerna där det var normalt. De provtagna fluorescensstopparna visade på en artsammansättning liknande provet tagit från slagprovet (0–10 m) fast med signifikant mindre andel filamentösa cyanobakterier.



Abstract

The diversity was quite low at all stations along the Swedish west coast. The cell numbers were however normal and almost high at Å17 with a dominance of diatoms. All stations had high cell numbers of *Dactyliosolen fragilissimus* which is normal for summer. Small cells were common and *Emiliana huxleyi* was common at all stations except Å17. The integrated chlorophyll concentration (0-10 and 0-20 m) were generally normal at all stations.

The diversity and cell numbers of phytoplankton were normal at all Baltic Sea stations with a pre-summer bloom community. Several dinoflagellate taxa were present in quite high cell numbers at all stations, such as Gymnodiniales and *Heterocapsa rotundata*, and a few cells of the toxin producing *Dinophysis norvegica** and *D. acuminata**. Of the summer blooming filamentous cyanobacteria *Aphanizomenon flosaquae* was very common, mainly in the northern and eastern parts of the Baltic Sea, but was found in all samples. Also, smaller amounts of *Nodularia spumigena** were present at all stations. The integrated chlorophyll concentration (0-10 and 0-20 m) were generally over the normal range for this month at several stations, except at the southern stations where the concentration was normal. The fluorescent peaks sampled displayed a similar species composition as the hose sample (0-10 m) but with significantly lower amount of filamentous cyanobacteria.

The Skagerrak

Å17 (open Skagerrak) 18th of June

The phytoplankton diversity was low but total cell numbers were high, mainly consisting of diatoms. The diatom *Dactyliosolen fragilissimus* dominated clearly in cell numbers. But other diatoms were also common. Among the smaller cells coccolithophore *Emiliana huxleyi* were found in high cell numbers. The integrated chlorophyll concentrations (0-10 and 0-20 m) were normal for this month.

Släggö (Skagerrak coast) 18th of June

The number of species were low and cell numbers moderate. The diatom *Guinardia delicatula* was still found in high cell numbers, just like previous months. Quite a few cells of *Guinardia flaccida* and *Proboscia alata* were also found. Among the small cells different cryptomonadales and *E. huxleyi* was found. Among the dinoflagellates, *Tripos muelleri* was found. The integrated chlorophyll concentrations (0-10 m) were a bit lower than normal for the month whereas the integrated (0-20 m) was normal for this month.

The Kattegat

Anholt E 17th of June

The number of species were low and cell numbers moderate. Small cells dominated the sample. Among the larger cells the diatom *Guinardia delicatula* was still found in high cell numbers, just like previous months. Among the small cells different cryptomonadales and *E. huxleyi* was found. Only a few cells of the dinoflagellate *T. muelleri* was found. The integrated chlorophyll concentrations (0-10 and 0-20 m) were normal for this month.

N14 Falkenberg 17th of June

The number of species were low and cell numbers were moderate. Small cells dominated the sample. Among the diatoms *G. delicatula* and *P. alata* were found in higher cell numbers. Among the small cells, flagellates of unknown taxa were found in high cell numbers together with cryptomonadales and *E. huxleyi*. The integrated chlorophyll concentrations (0-10 and 0-20 m) were normal for this month.

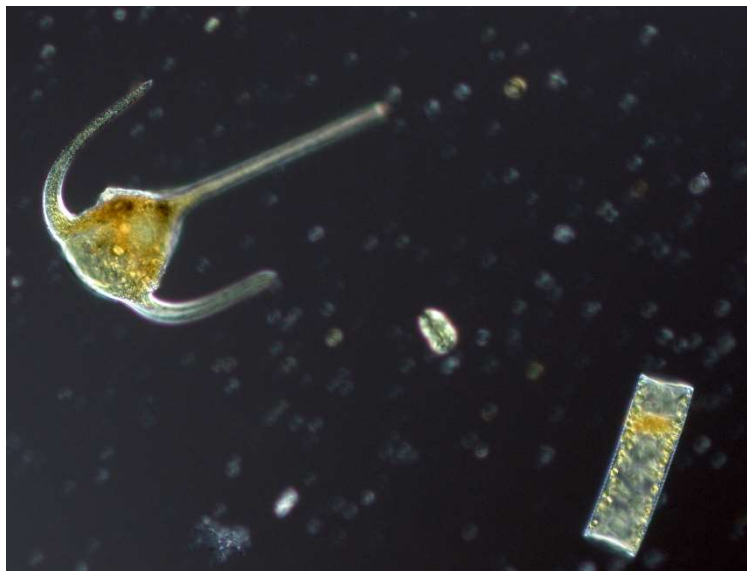


Fig. 1. At station P2, in the southern part of the Skagerrak close to Kattegat, a sharp fluorescens peak was noted at 20 m depth. An extra sample was collected and the sample mainly contained the diatom *Guinardia flaccida* (right) and several species of the genus *Tripes* (left). Photo: M. Johansen.

The Baltic

BY31 13th of June

The phytoplankton diversity and abundances were moderate. There were however no diatoms present. Among the dinoflagellates Gymnodiniales was very common and both *D. acuminata** and *D. norvegica** were present in low amounts. *Aphanizomenon flosaquae* was abundant and there were just a few filaments of *Nodularia spumigena**. Smaller ciliates, flagellates and other phytoplankton were present. There was a fluorescent peak at 20 m with a similar phytoplankton community as 0-10 m but with significantly less filamentous cyanobacteria.

BY38 14th of June

The phytoplankton diversity and abundances were moderate. There were however no diatoms present. Among the dinoflagellates Gymnodiniales was very common and also *Heterocapsa rotundata* were in high amounts. The amount of *A. flosaquae* was moderate and there were also some *Dolichospermum* sp. and *N. spumigena**. There were plenty of various taxa of other smaller phytoplankton, such as *Dinobryon* spp., *Pyramimonas* spp., Cryptomonadales and flagellates. The integrated (0-10 m) chlorophyll concentrations was within the normal range for this month, while the concentration at 0-20 m was above normal. The fluorescent peak at 20 m had a similar phytoplankton community as 0-10 m but with significantly less filamentous cyanobacteria.

BCSIII-10 15th of June

The phytoplankton diversity and abundances were moderate. The diatoms were represented by a few cells of *Chaetoceros danicus*. Among the dinoflagellates Gymnodiniales was very common and also *H. rotundata* were in high amounts. There were some *D. norvegica** present as well. *A. flosaquae* was abundant and there were several filaments of both *Dolichospermum* sp. and *N. spumigena**. Smaller ciliates, Cryptomonadales, flagellates and other phytoplankton were abundant. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were above the normal range for this month.

BY10 15th of June

The fluorescent peak at 25 m had a similar phytoplankton community BCSIII-10 and BY15 but with significantly less filamentous cyanobacteria.

BY15 Gotland deep 15th of June

The phytoplankton diversity and abundances were moderate. The diatoms were represented by a few cells of *C. danicus*. Among the dinoflagellates Gymnodiniales was very common and there were some *D. norvegica** present. *A. flosaquae* was abundant and there were several filaments of *Dolichospermum* sp. and a few of *N. spumigena**. Smaller ciliates, flagellates and the green algae *Binuclearia lauterbornii* were abundant. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were above the normal range for this month and the fluorescent peak at 20 m had a similar phytoplankton community as 0-10 m but with significantly less filamentous cyanobacteria.

BY2 Arkona 16th of June

The phytoplankton diversity and abundances were moderate. The diatoms were represented by a few cells of *C. danicus* and some cells belonging to Centrales. Among the dinoflagellates Gymnodiniales and *H. rotundata* were common. There were some *A. flosaquae* but both *Dolichospermum* sp. and *N. spumigena** were in low amounts. There were various taxa of other smaller phytoplankton present. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

Hanö Bight and BY4 16th of June

Fluorescent peaks were sampled at 26 m and 25 m respectively and had a similar phytoplankton community as BY2 and BY5 but with significantly less filamentous cyanobacteria.

BY5 Bornholm deep 16th of June

The phytoplankton diversity and abundances were low. The diatoms were represented by a few cells of *Coscinodiscus radiatus*. Among the dinoflagellates there were some Gymnodiniales and *H. rotundata* present. The amount of *A. flosaquae* was moderate and there were also a few filaments of *N. spumigena**. There were various taxa of other smaller phytoplankton present. The integrated (0-10 m) chlorophyll concentrations was within the normal range for this month, while the concentration at 0-20 m was above normal.

BY39 16th of June

The phytoplankton diversity and abundances were moderate. There were however no diatoms present. Among the dinoflagellates Gymnodiniales and *H. rotundata* were very common and both *D. acuminata** and *D. norvegica** were present in low amounts. The amount of *A. flosaquae* and *N. spumigena** were moderate. There were various taxa of other smaller phytoplankton present. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month the fluorescent peak at 25 m had a similar phytoplankton community as 0-10 m but with significantly less filamentous cyanobacteria.

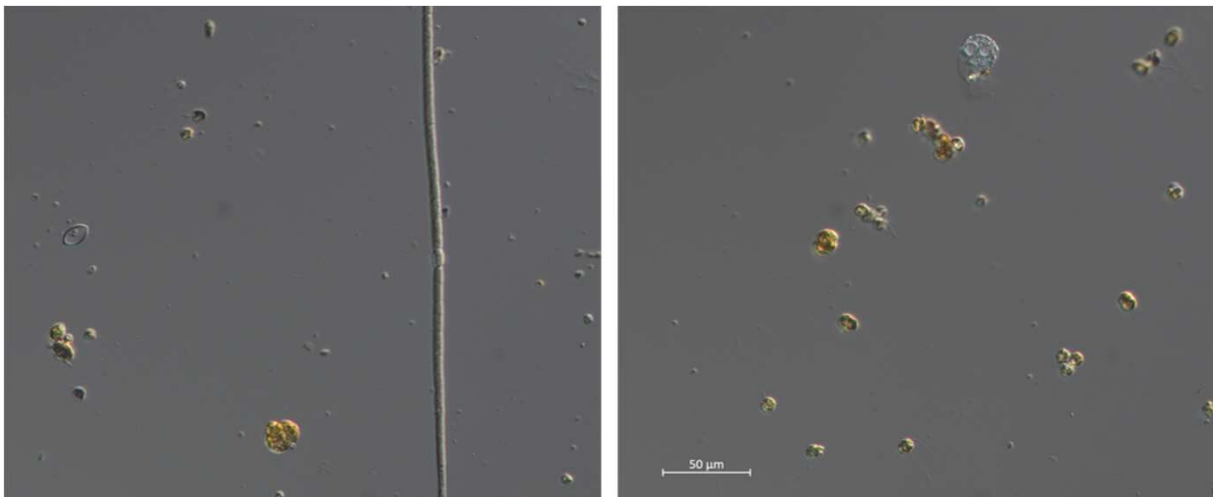
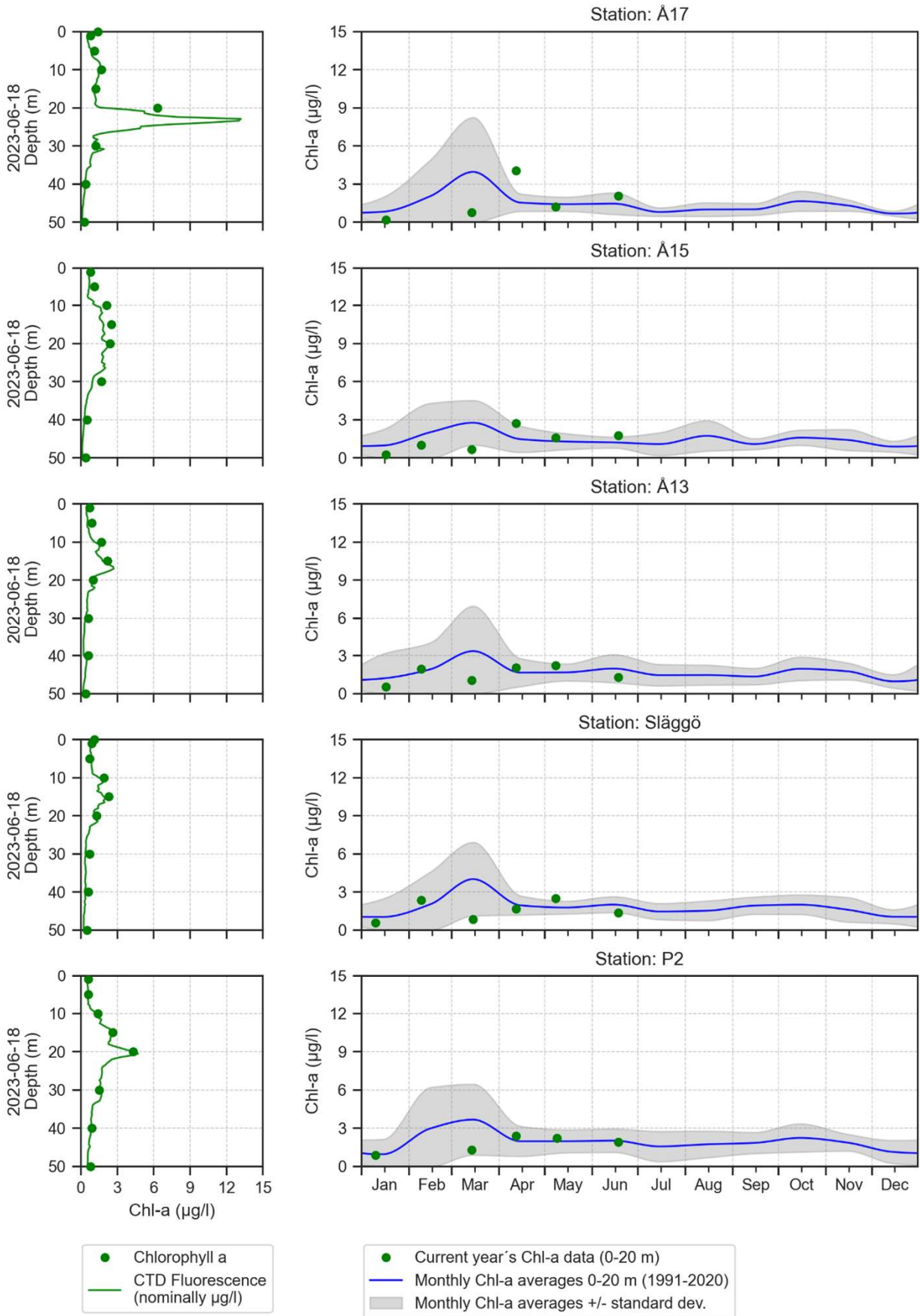


Fig. 2. BY38 hose sample 0-10 m (left) and fluorescent peak at 20 m (right). Both samples are similar with Gymnodiniales, *Heterocapsa rotundata*, flagellates and *Pyramimonas* spp. but with the exception of *Aphanizomenon flosaquae* being present in the 0-10 m sample. Photos: M. Karlberg.

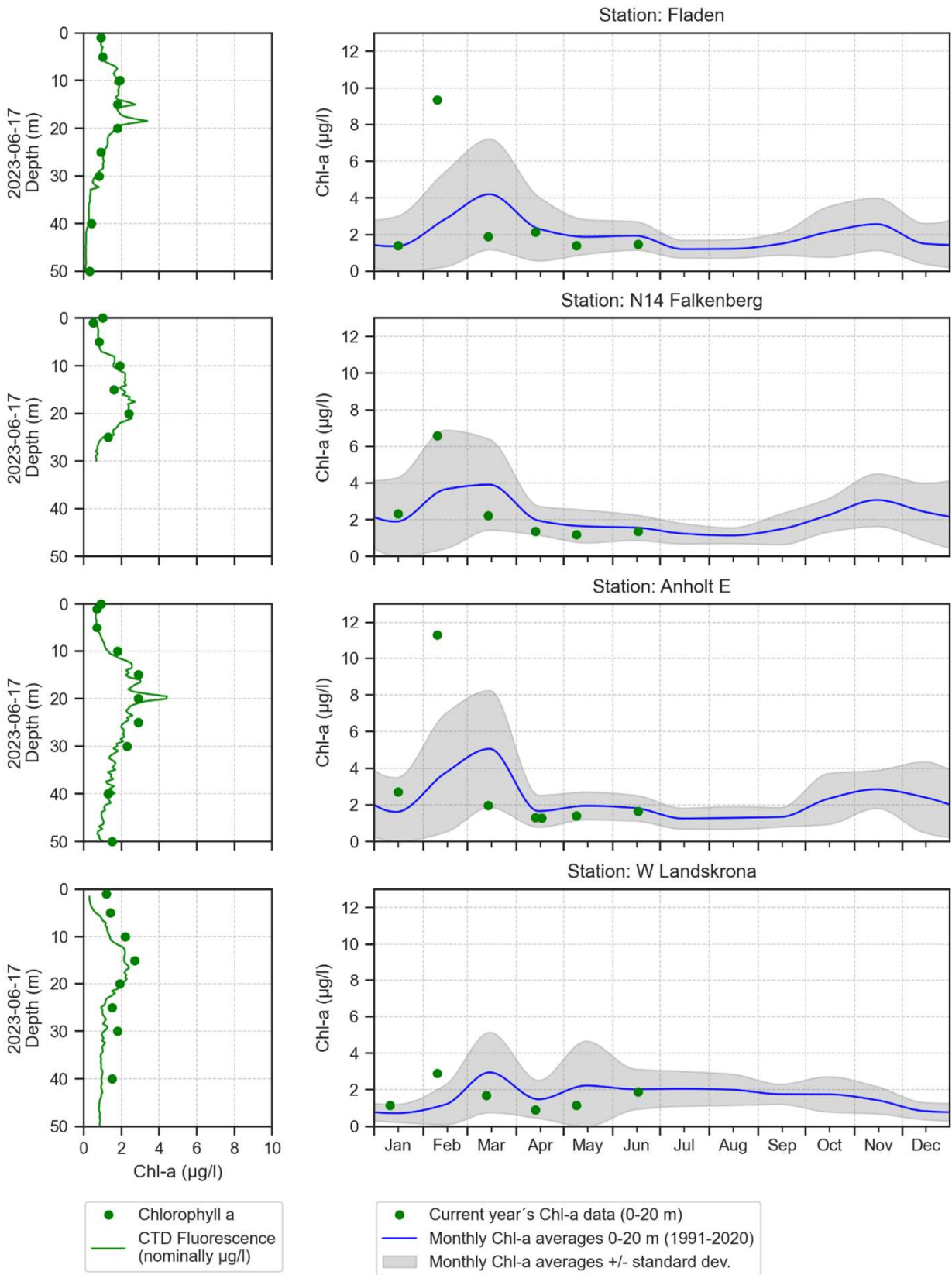
Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	17/6	17/6	18/6	18/6
Hose 0-present0 m	presence	presence	presence	presence
<i>Cerataulina pelagica</i>			present	present
<i>Chaetoceros danicus</i>	common	present	common	
<i>Chaetoceros subtilis</i>			present	
<i>Dactyliosolen fragilissimus</i>	very common	common	dominating	very common
<i>Guinardia delicatula</i>		present	common	
<i>Guinardia flaccida</i>		present	common	present
<i>Proboscia alata</i>	present	common	common	present
<i>Rhizosolenia hebetata</i> f. <i>semispina</i>		present	present	common
<i>Amphidinium crassum</i>		present		
Gymnodiniales	common		common	present
<i>Gyrodinium flagellare</i>		present		
<i>Karenia mikimotoi</i>	present			
<i>Karlodinium veneficum</i>	present			
<i>Katodinium glaucum</i>				present
Peridinales			present	present
<i>Protoperidinium claudicans</i>			present	
<i>Scrippsiella</i> GRP	present			
<i>Tripos fusus</i>			present	present
<i>Tripos longipes</i>				present
<i>Tripos muelleri</i>	present	common	common	common
Dinobryon		present		
<i>Emiliana huxleyi</i>	common	common	common	present
Prymnesiales	present			present
Oocystis		present		
Cryptomonadales	common	common	common	common
<i>Leucocryptos marina</i>	present	present	present	present
<i>Telonema subtile</i>		present	present	present
Ciliophora	present	present	present	present
<i>Laboea strobila</i>	present	present		

Selection of observed species	BY31	BY38	BCSIII-10	BY15	BY2	BY5	BY39
Red=potentially toxic species	13/6	14/6	15/6	15/6	16/6	16/6	16/6
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence
Centrales					present		
Chaetoceros castracanei					present		
Chaetoceros danicus			present	present			
Coscinodiscus radiatus						present	
<i>Dinophysis acuminata</i>	present						present
<i>Dinophysis norvegica</i>	present	present	present	present			present
Gymnodiniales	very common	very common	very common	very common	common	common	very common
Heterocapsa rotundata	present	common	common	present	common	common	very common
<i>Karlodinium veneficum</i>	present	present	present	present	present	present	present
Peridinales	present		present	present			
Protoperidinium bipes	present						
Dinobryon	present	common	present	present	present		present
Dinobryon faculiferum	present	present	present	present			present
Ollicola vangoorii					present	present	
Oocystis			present		present		present
Binuclearia lauterbornii	present	present	present	common	present	present	present
Pyramimonas	present	common	present	present	present	present	present
Cryptomonadales	present	common	common	present	present	present	present
Telonema	present	present			present		present
Eutreptiella	present					present	present
Aphanizomenon	common	common	common	common	present	present	present
Aphanizomenon flosaquae	very common	common	very common	very common	common	common	common
Aphanocapsa			common				present
Dolichospermum		present	present	present	present		
Lemmermanniella	present	present	common	common	common	common	common
<i>Nodularia spumigena</i>	present	present	present	present	present	present	common
Pseudanabaena					present		
Snowella	present	present	common	present	present	present	present
Ebria tripartita			present		present		
Ciliophora	common	common	common	common	present	common	common
Mesodinium rubrum			present	present			
Flagellates	common	common	very common	common	common	common	common

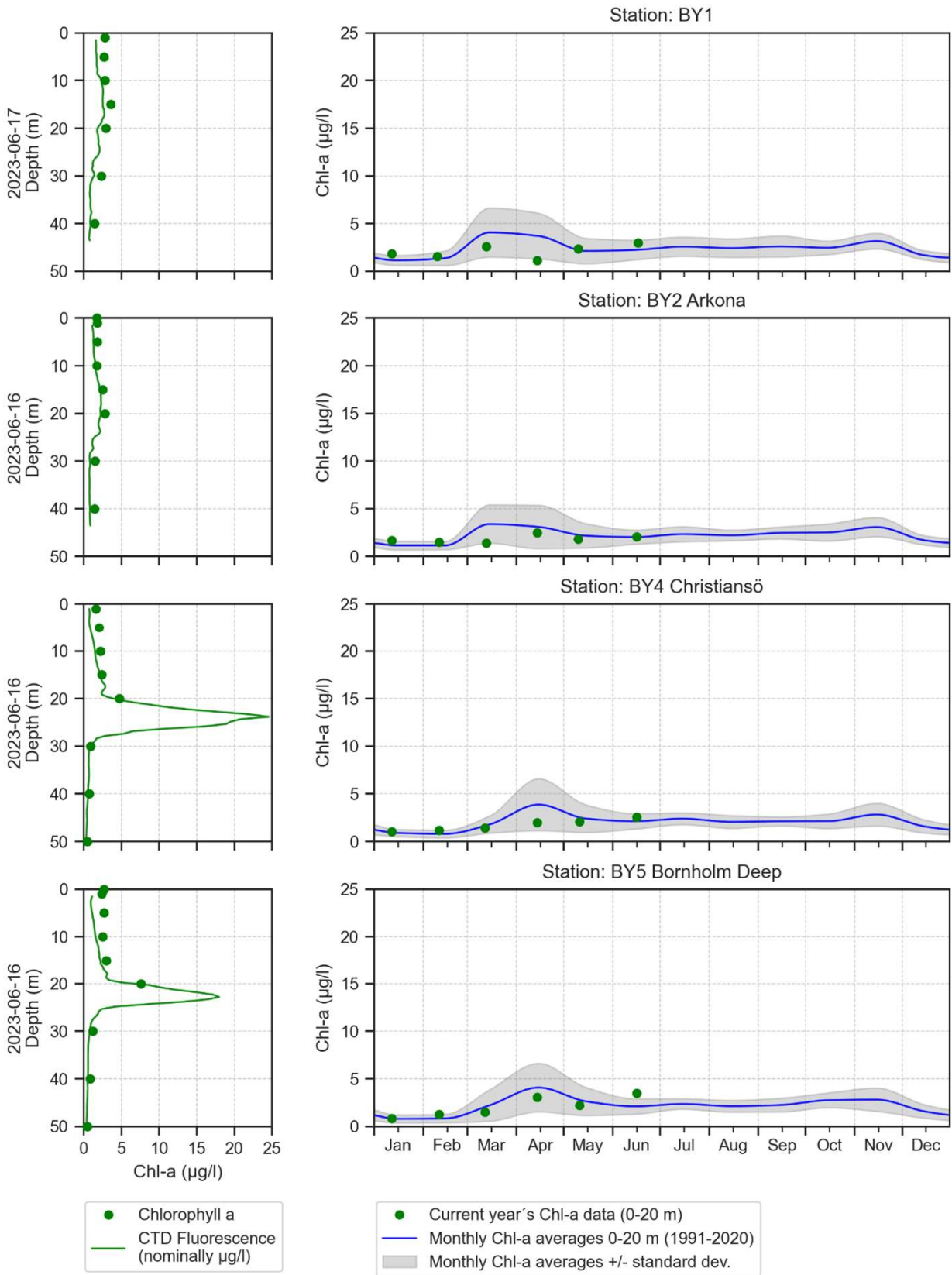
The Skagerrak



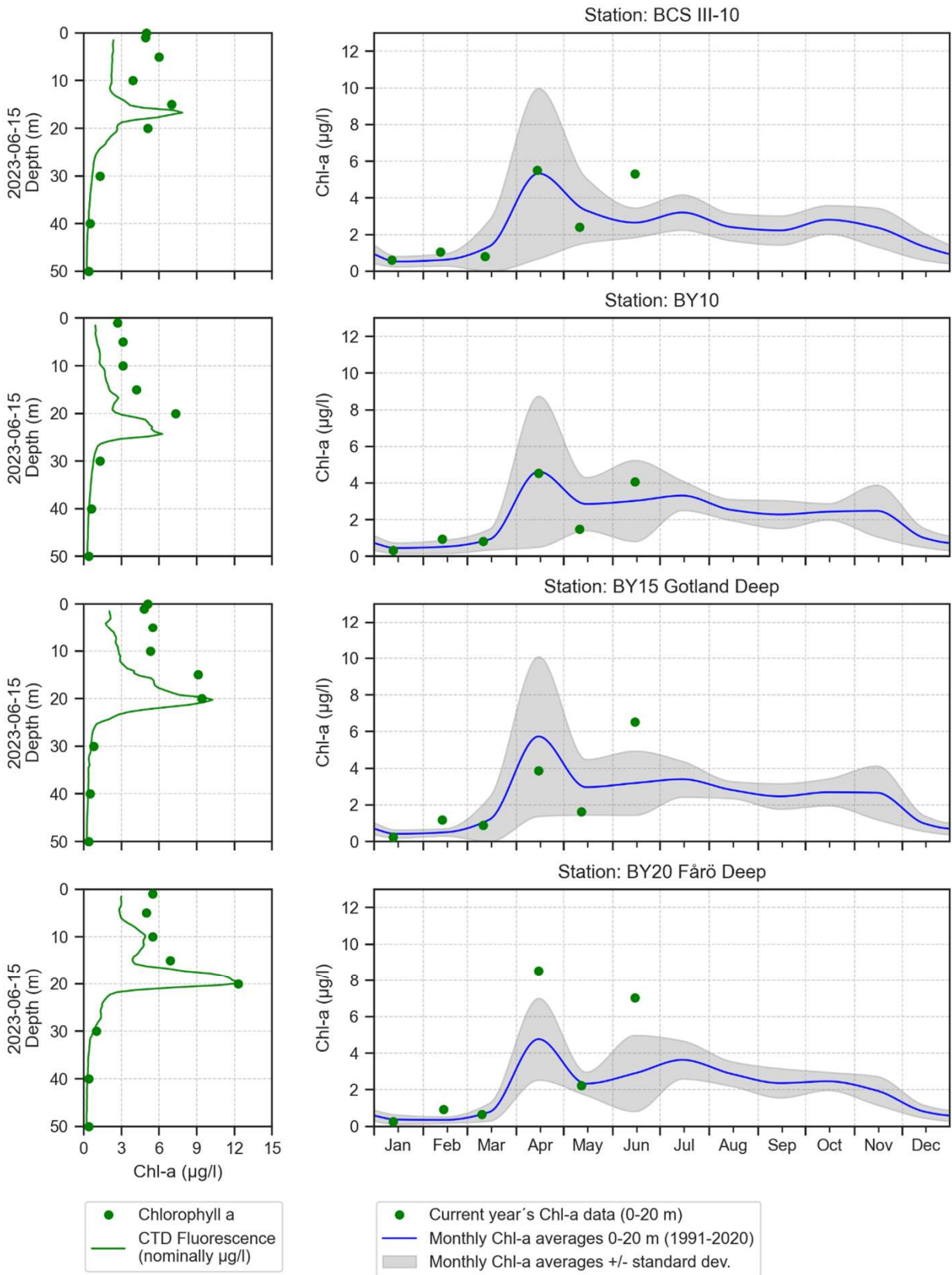
The Kattegat and The Sound



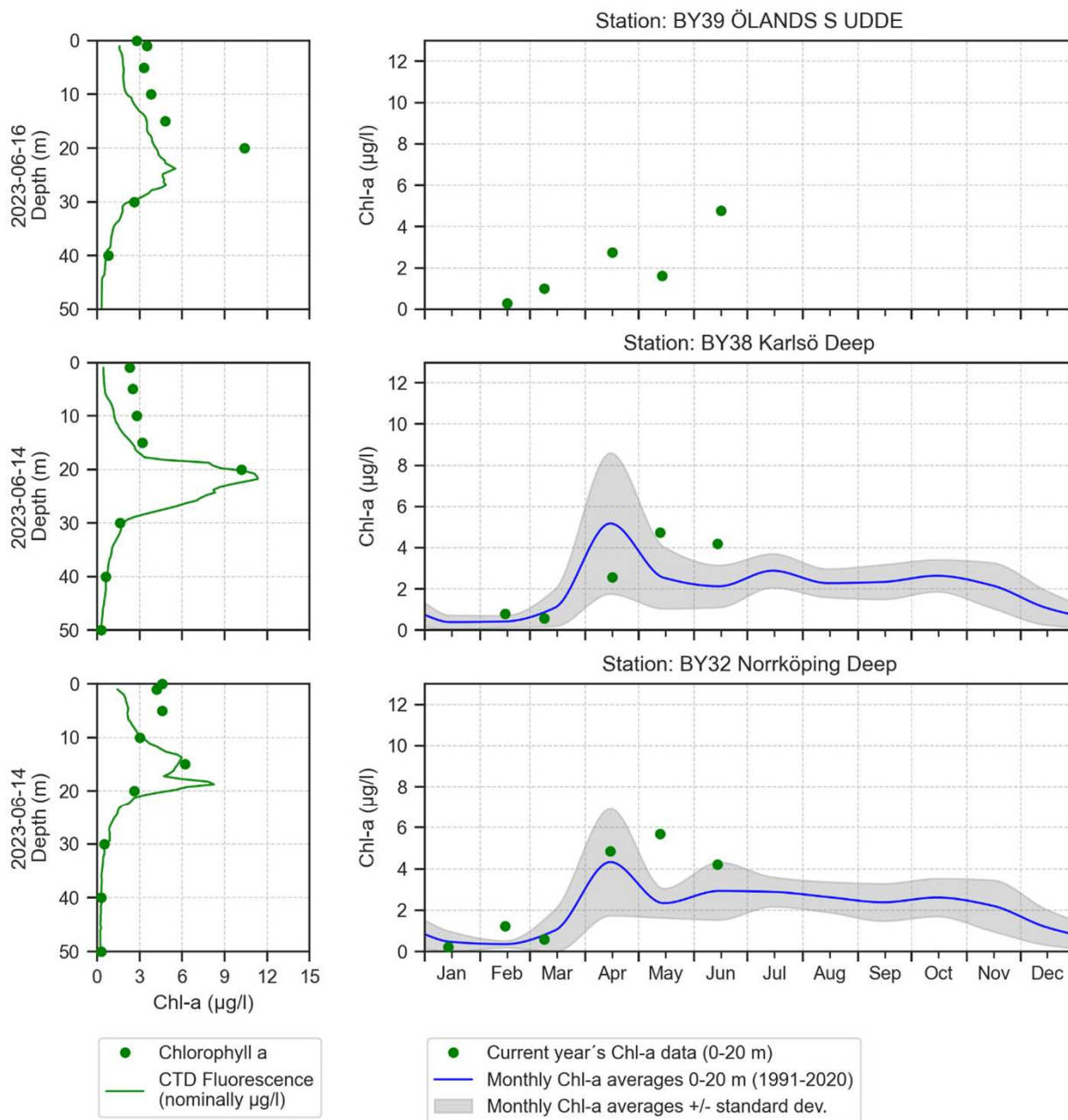
The Southern Baltic



The Eastern Baltic



The Western Baltic



Om klorofylldiagrammen

Klorofyll *a* är ett mått på mängden växtplankton. Prover tas från ett antal djup. Data presenteras både från de fasta djupen och som medelvärden 0–20 m. Utöver resultaten från laboratorieanalyserna av vattenprover mäts klorofyll *a* som fluorescens från ett automatiskt instrument som sänks ned från fartyget. På så sätt kan djupt liggande, ibland tunna lager av växtplankton observeras.

About the chlorophyll graphs

Chlorophyll *a* is sampled from several depths. Data are presented both from the discrete depths and as an average 0–20 m. In addition to the laboratory analysis from the water samples chlorophyll *a* fluorescence is measured in continuous depth profiles from the ship. This is a way to observe thin layers of phytoplankton occurring below the surface.

Om AlgAware

SMHI genomför månatliga expeditioner i Östersjön och Västerhavet. Resultat, baserade på semikvantitativ mikroskopanalys av planktonprover samt klorofyllmätningar, presenteras kortfattat i denna rapport. Information från SMHIs satellitövervakning av cyanobakterieblomningar finns under perioden juni–augusti på smhi.se/vader/observationer/alsituationen/algae. Resultat från provtagningarna kan hämtas från SMHIs databas på sharkweb.smhi.se/hamta-data/. Hydrografiska data läggs ut varje månad, växtplanktondata läggs ut en gång per år.

About AlgAware

SMHI carries out monthly cruises in the Baltic Sea, the Kattegat and the Skagerrak. Results from semi-quantitative microscopic analysis of phytoplankton samples as well as chlorophyll measurements are presented in brief in this report. Information from SMHIs satellite monitoring of cyanobacterial blooms are found at smhi.se/en/weather/observations/the-algae-situation/algae during the period June-August. Results from the expeditions are found in the SMHI database at sharkweb.smhi.se/hamta-data/. Hydrographic data are published monthly, phytoplankton data are published once a year.

Översikt över några potentiellt skadliga alger och det aktuella giftets effekt.

Overview of potentially harmful algae and effects of toxins.

2003, UNESCO Publishing, Manual on harmful marine microalgae

Art/Species	Gift/Toxin	Eventuella symptom	Clinical symptoms
<i>Alexandrium</i> spp.	Paralytic shellfish poisoning (PSP)	Milda symptom: Inom 30 min: Stickningar eller en känsla av bedövning runt läpparna, som sprids gradvis till ansiktet och nacken; stickningar i fingertoppar och tår; Huvudvärk; yrsel, illamående, kräkningar, diarré Extrema symptom: Muskelförlamning; andningssvårigheter; känsla av att kvävas; Man kan vara död inom 2-24 timmar efter att ha fått i sig giftet, på grund av att andningsmuskulaturen förlamas.	Mild case: Within 30 min: Tingling sensation or numbness around lips, gradually spreading to face and neck; prickly sensation in fingertips and toes; headache, dizziness, nausea, vomiting, diarrhoea. Extreme case Muscular paralysis; pronounced respiratory difficulty; choking sensation; death through respiratory paralysis may occur within 2-24 hours after ingestion.
<i>Dinophysis</i> spp.	Diarrhetic shellfish poisoning (DSP)	Milda symptom: Efter cirka 30 minuter till några timmar: yrsel, illamående, kräkningar, diarré, magont Extrema symptom: Upprepad exponering kan orsaka cancer	Mild case: Within 30 min-a few hours: Dizziness, nausea, vomiting, diarrhoea, abdominal pain. Extreme case: Repeated exposure may cause cancer.
<i>Pseudo-nitzschia</i> spp.	Amnesic shellfish poisoning (ASP)	Milda symptom: Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramper Extrema symptom: Yrsel, hallucinationer, förvirring, förlust av korttidsminnet, kramper	Mild case: Within 3-5 hours: dizziness, nausea, vomiting, diarrhoea, abdominal cramps. Extreme case: Dizziness, hallucinations, confusion, loss of memory, cramps.
<i>Chaetoceros concavicornis</i> / <i>C. convolutus</i>	Mechanical damage through hooks on setae	Låg celltäthet: Ingen påverkan. Hög celltäthet: Fiskens gälar skadas, fisken dör.	Low cell numbers: No effect on fish. High cell numbers: Fish death due to gill damage.
<i>Pseudochattonella</i> spp.	Fish toxin	Låg celltäthet: Ingen påverkan. Hög celltäthet: Fiskens gälar skadas, fisken dör.	Low cell numbers: No effect on fish. High cell numbers: Fish death due to gill damage.

Kartan på framsidan visar viktat medelvärde för klorofyll *a*, µg/l (0–10 m) vid de olika stationerna. Pil upp eller ned indikerar om resultatet är över eller under en standardavvikelse från medel. Medel är beräknat utifrån aktuell månad under perioden 2001–2015. Förekomst av skadliga alger vid stationer där arter analyseras markeras med symbol.

The map on the front page shows weighted mean of chlorophyll *a*, µg/l (0-10 m) at sampling stations. The arrow up or down indicate whether the result is above or below one standard deviation from mean. The mean value is calculated using results from the current month during the period 2001-2015. Presence of harmful algae at stations where species analysis is performed is shown with a symbol.

SMHI

**Havs
och Vatten
myndigheten**