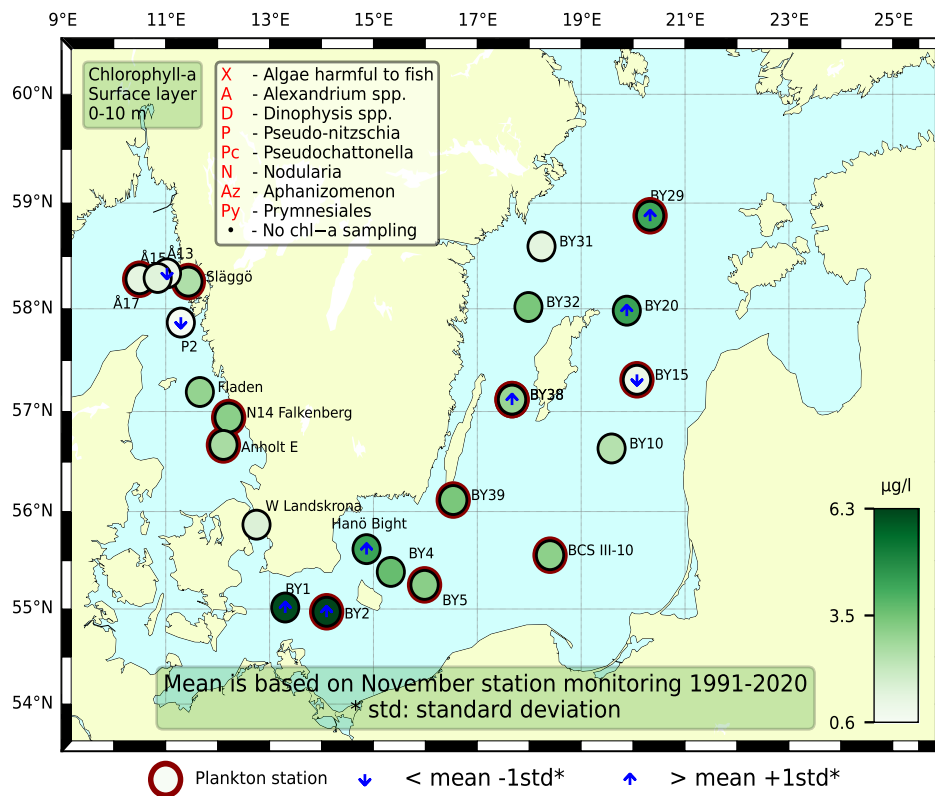


## Sammanfattning

Samtliga stationer i Västerhavet hade relativt hög biodiversitet för säsongen men de flesta arter återfanns i låga cellantal. Ordningen Dictyochales var vanligt förekommande vid samtliga stationer förutom vid Å17 både i sitt nakna stadium men även i de formerna vi känner som *Dictyocha fibula* samt *Octactis speculum*. Kalkalger var vanliga vid samtliga stationer och vi Å17 var även en annan art vanlig; släktet *Pleurochrysis*. De integrerade klorofyllkoncentrationerna var låga men inom det normala vid samtliga stationer i Västerhavet.

Diversiteten av växtplankton var generellt låg i Östersjön, med något förhöjda antal arter vid BY2 och BCSIII–10. Kiselalgen *Cerataulina pelagica* var väldigt talrik i södra Östersjön, vilket också stämde väl överens med de foton IFCBn (Imaging Flow CytoBot), tog på R/V Svea under expeditionen. Integrerade klorofyllkoncentrationer över det normala för månaden noterades vid BY2, BY29 och BY38.



## Abstract

All stations along the Swedish west coast had quite high species diversity when considering the season but most cells were only found in low cell numbers. The order Dictyochales was common at all stations except at Å17. The order was present in both its naked form but also in the forms known as *Dictyocha fibula* and *Octactis speculum*. The coccolithophores were common at all stations and at Å17 they consisted of both *Emiliania huxleyi* and the genus *Pleurochrysis*. The integrated chlorophyll concentrations were low but within normal for this month.

The phytoplankton diversity was generally low in the Baltic with somewhat high species numbers at BY2 and at BCSIII–10. The diatom *Cerataulina pelagica* was numerous in the Southern Baltic, coinciding well with images taken by the IFCB (Imaging Flow CytoBot), onboard the R/V Svea during the cruise. Integrated chlorophyll concentrations above normal for this month were found at BY2, BY29 and BY38.

Below follows a more detailed information on species composition and abundance. Species marked with \* are potentially toxic or harmful.

## The Skagerrak

### Släggö (Skagerrak coast) 8<sup>th</sup> of November

The species diversity was surprisingly high being so late in the year but the total cell number was quite low. The large naked dinoflagellate *Akashiwo sanguinea* was most prominent among the larger cells some cells of *Dinophysis tripos* were also found. Different forms of the order Dictyochales were also common. The smaller cells were dominated by the coccolithophore *Emiliania huxleyi*. The integrated chlorophyll concentrations were low but within normal for this month.

### Å17 (Skagerrak coast) 8<sup>th</sup> of November

The total cell number was very low but species diversity was relatively high when considering the time of the year. Many taxa were only found in few cells. Two coccolithophore taxa were common, the genus *Pleurochrysis* and the species *E. huxleyi*. The integrated chlorophyll concentrations were low but within normal for this month.

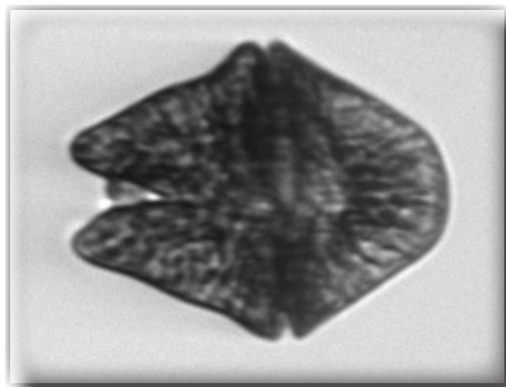


Fig 1. The potentially toxic dinoflagellate *Akashiwo sanguinea* was abundant at Släggö in the Skagerrak. Photo: IFCB\_134.

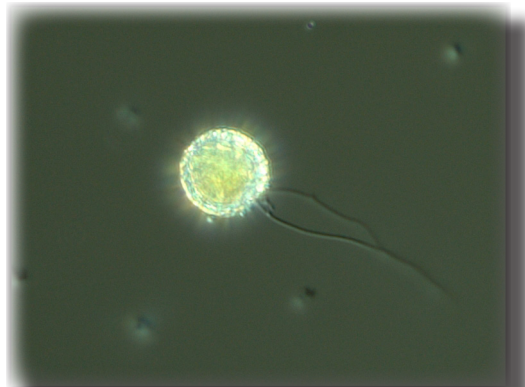


Fig 2. The coccolithophore genus *Pleurochrysis* was abundant at Å17 in the Skagerrak. Photo: M. Johansen.

## The Kattegat

### Anholt E 9<sup>th</sup> of November

The species diversity was quite high but total cell number was quite low. Different forms of the order Dictyochales dominated but quite a few cells of different diatoms were also present such as *Cerataulina pelagica* and *Pseudosolenia calcar-avis*. The relatively small cells were clearly dominated by *E. huxleyi*. The integrated chlorophyll concentrations were low but within normal for this month.

### N14 Falkenberg 9<sup>th</sup> of November

The species diversity was quite high but total cell number was quite low. Different forms of the order Dictyochales dominated but quite a few cells of the diatom *P. calcar-avis* were also present. The relatively small cells were dominated by *E. huxleyi*. The integrated chlorophyll concentrations were low but within normal for this month.

## The Baltic

### BY2 Arkona 10<sup>th</sup> of November

The most species rich phytoplankton sample was found at BY2 although most of the species were present in very low cell numbers. The diatom *Cerataulina pelagica* however was found in very high cell numbers and the flagellate order cryptomonadales was abundant. The integrated chlorophyll concentrations were high and far above normal for this month.

### BY5 Bornholm Deep 10<sup>th</sup> of November

The species diversity was low but the diatoms *C. pelagica* and *Chaetoceros castracanei* and cryptomonadales were found in high cell numbers. The chlorophyll concentrations were enhanced but the integrated results were within normal for this month.

### BCS III-10 11<sup>th</sup> of November

The species diversity was moderate with enhanced cell numbers of the diatom *C. pelagica* and the green algae *Binnuclearia lauterbornii*. Cryptomonadales and small dinoflagellate cells were abundant. The integrated chlorophyll concentrations were within normal for this month.

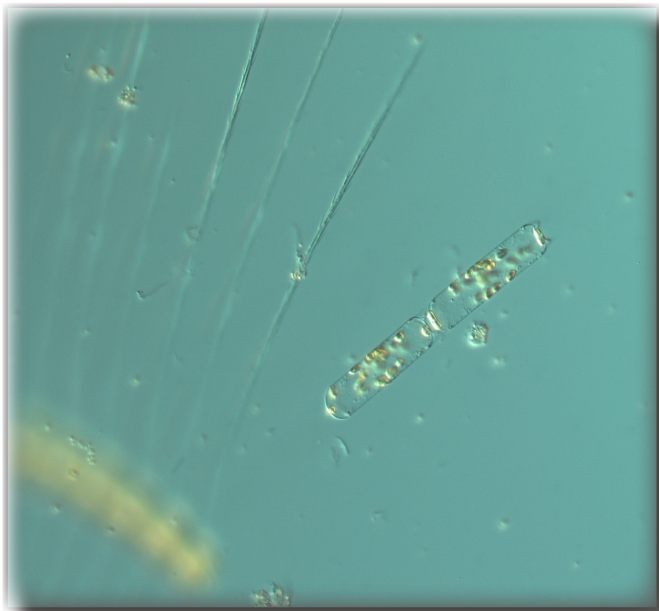


Fig 3. The diatom *Cerataulina pelagica* was abundant in the Southern Baltic samples. Photo: A. Skjevik.

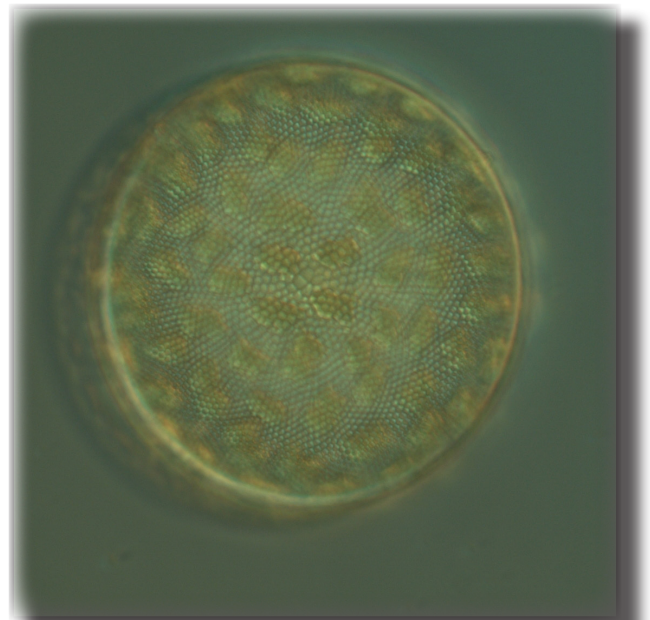


Fig 4. The large centric diatom *Coscinodiscus granii* was numerous in the Northern Baltic Proper samples. Photo: A. Skjevik.

### BY15 11<sup>th</sup> of November

The species diversity and total cell counts were low, with enhanced cell numbers of the relatively large diatom *Coscinodiscus granii*. The integrated chlorophyll concentrations were consequently low for this month.

### BY29 12<sup>th</sup> of November

The species diversity and total cell numbers were low, only the diatom *C. granii* and small naked dinoflagellates, Gymnodiniales, were somewhat abundant. The integrated chlorophyll concentration (0–20m) was above normal for this month.

### BY31 Landsort Deep 12<sup>th</sup> of November

The phytoplankton situation was very similar to the one at BY29, although the number of species was higher. The integrated chlorophyll concentration (0–20 m) was within normal for this month.

**BY38 13<sup>th</sup> of November**

The species diversity and cell counts were low, the most abundant species were centric diatoms, small Gymnodiniales cells, and the ciliate *Mesodinium rubrum*. The chlorophyll concentrations were high in the upper ten meters causing the integrated concentration (0–10 m) to be above normal for this month.

**BY39 13<sup>th</sup> of November**

The species diversity was low but the diatom *C. pelagica* was found in very high cell numbers. The surface chlorophyll concentrations were enhanced, but the integrated (0–10 m) was within normal for this month.

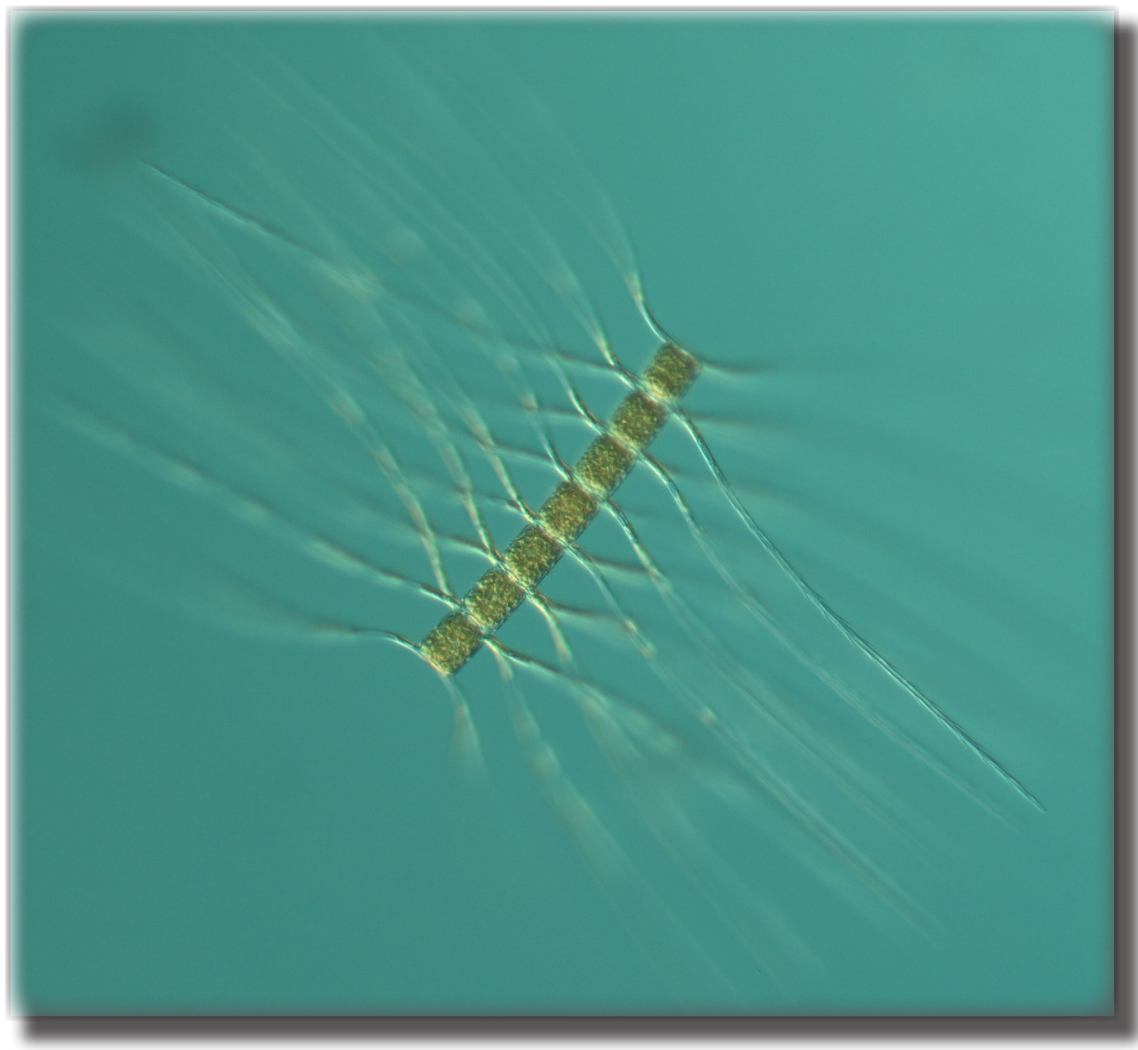
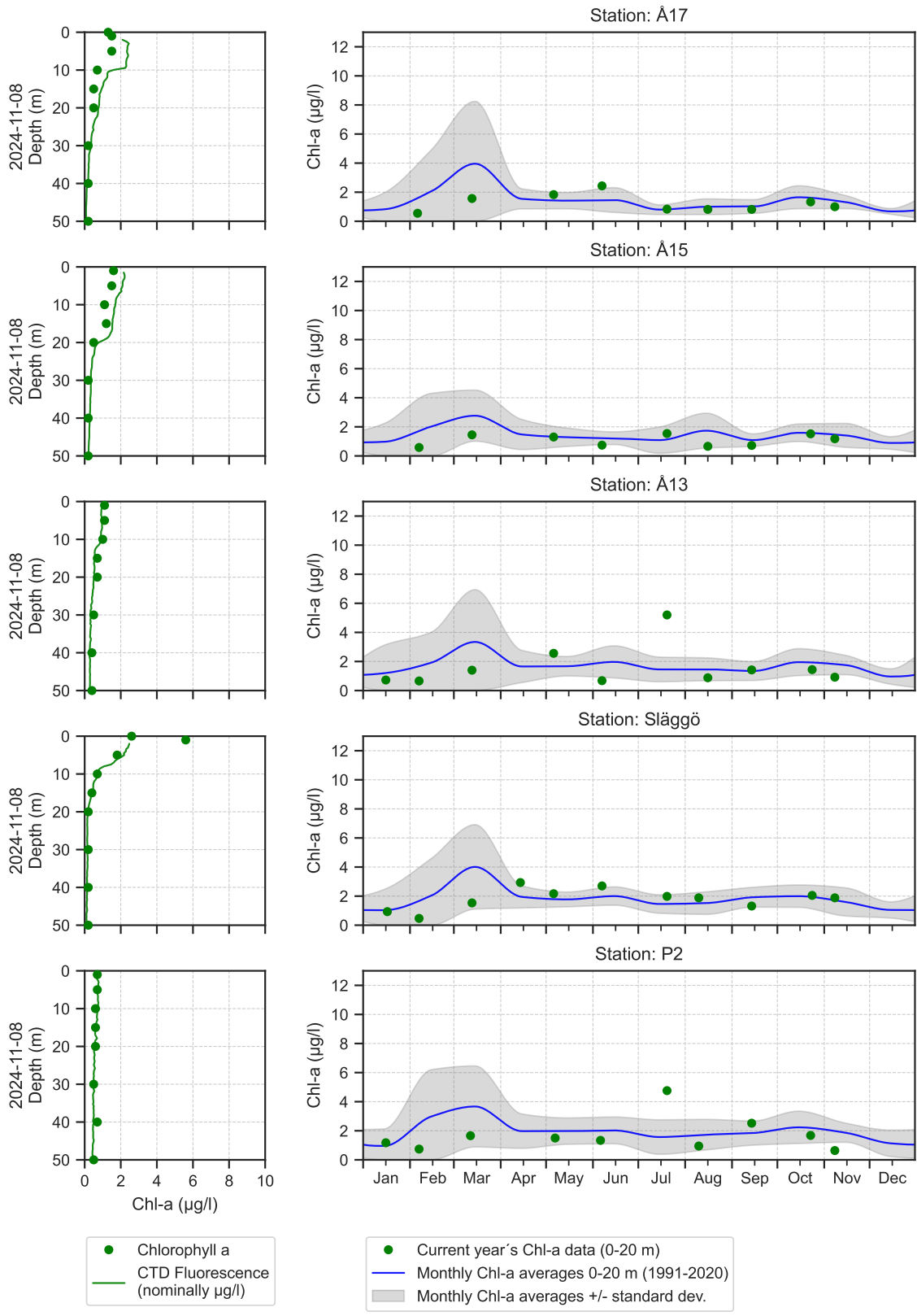


Fig 5. The diatom *Chaetoceros castracanei* was abundant at BY5 in the Southern Baltic.  
Photo: A. Skjevik.

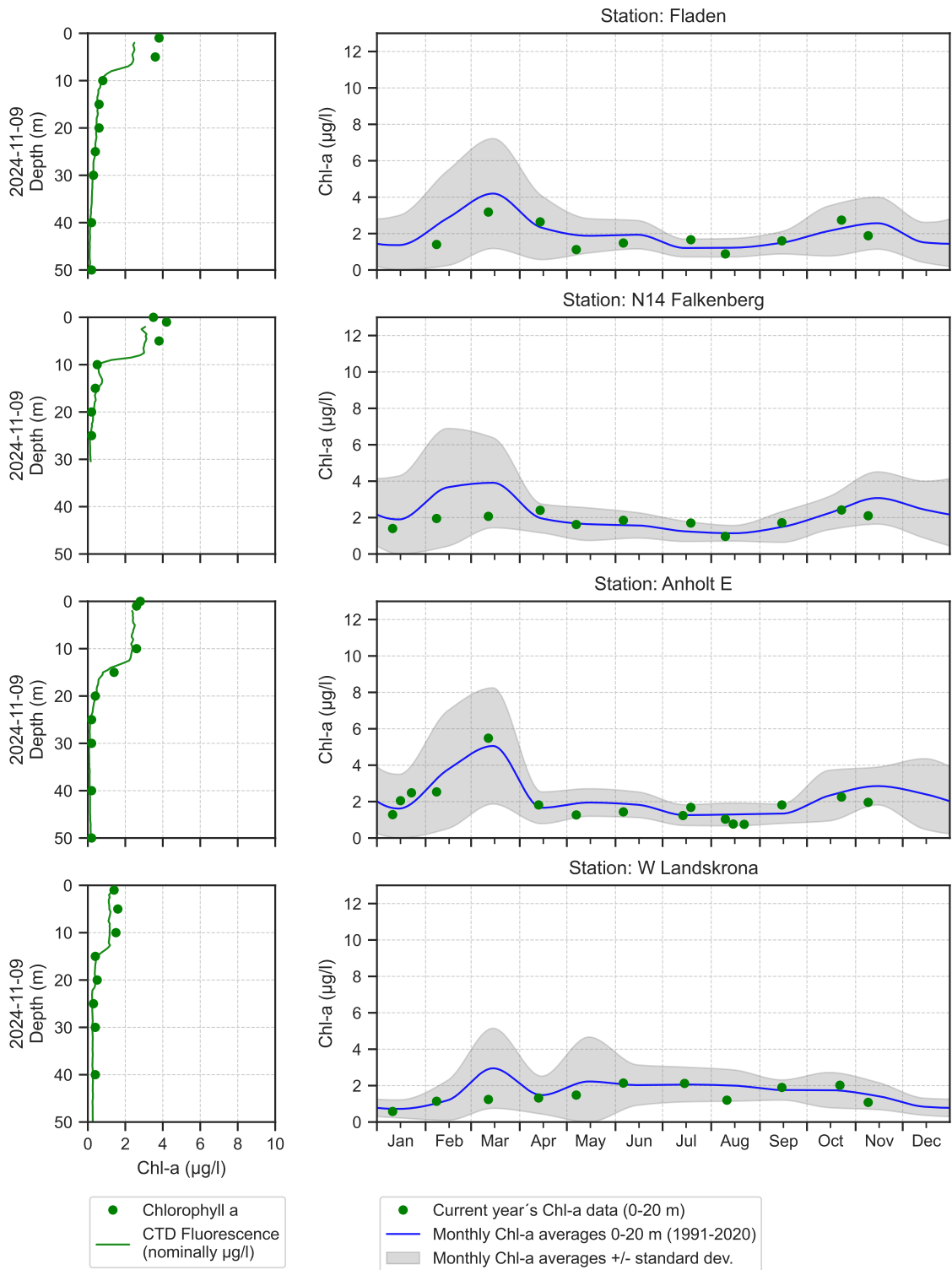
Selection of observed species	Anholt E	N14 Falkenberg	Släggö	Å17
Red=potentially toxic species	9/11	9/11	8/11	8/11
Hose 0-10 m	presence	presence	presence	presence
<i>Cerataulina pelagica</i>	common			present
<i>Chaetoceros affinis</i>				present
<i>Coscinodiscus</i>	present			
<i>Dactyliosolen fragilissimus</i>			present	
<i>Ditylum brightwellii</i>				present
<i>Guinardia flaccida</i>			present	
<i>Leptocylindrus danicus</i>		present	present	
<i>Leptocylindrus minimus</i>	present	present		
<i>Nitzschia longissima</i>	present			
<i>Pleurosigma</i>	present			present
<i>Pseudo-nitzschia</i>	present			
<i>Pseudosolenia calcar-avis</i>	common	common		
<i>Rhizosolenia imbricata</i>				present
<i>Rhizosolenia setigera</i>			present	
<i>Rhizosolenia setigera f. pungens</i>	present	present		
<i>Thalassiosira</i>				present
<i>Thalassiosira gravida</i>				present
<i>Akashiwo sanguinea</i>		present	common	
<i>Azadinium</i>				present
<i>Dinophysis acuminata</i>		present	present	
<i>Dinophysis tripos</i>			common	
Gymnodiniales		present	common	common
<i>Gymnodinium verruculosum</i>	present	present	present	present
<i>Gyrodinium spirale</i>	present	present		
<i>Karenia mikimotoi</i>			present	
<i>Katodinium glaucum</i>	present	present		present
<i>Oxytoxum gracile</i>				present
<i>Phalacroma rotundatum</i>		present		
<i>Polykrikos schwartzii</i>			present	
<i>Prorocentrum micans</i>	present		present	
<i>Protoperidinium crassipes</i>			present	
<i>Protoperidinium divergens</i>			present	
<i>Tripos furca</i>			common	present
<i>Tripos fusus</i>				present
<i>Tripos lineatus</i>			present	
<i>Tripos longipes</i>			present	
<i>Tripos muelleri</i>	present	present	present	present
<i>Heterosigma akashiwo</i>	present	present		present
<i>Pyramimonas</i>			present	
<i>Dictyocha fibula</i>	present	present	present	
Dictyochales	common	common	common	
<i>Octactis speculum</i>	common	common	common	present
<i>Pseudochattonella</i>	common	present	present	
<i>Pseudopedinella pyriformis</i>			present	present
<i>Paulinella ovalis</i>		present		
Ciliophora		present	present	common
<i>Laboea strobila</i>	present		present	
<i>Chrysochromulina</i>			present	
<i>Emiliana huxleyi</i>	very common	common	common	common
<i>Pleurochrysis</i>			present	common
Cryptomonadales	common	common	common	present
<i>Leucocryptos marina</i>			present	present

Selection of observed species	BY2	BY5	BCSIII-10	BY15	BY29	BY31	BY38	BY39
Red=potentially toxic species	10/11	10/11	10/11	11/11	12/11	12/11	13/11	13/11
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Actinocyclus			present			present		
Attheya septentrionalis	present					present	present	present
Centrales			present		present	present	common	
Cerataulina pelagica	very common	very common	common				present	very common
Chaetoceros castracanei	present	common	present		present	present	present	present
Chaetoceros danicus	present	present	present	present	present	present	present	present
Chaetoceros decipiens	present							
Chaetoceros similis						present		
Coscinodiscus				present				
Coscinodiscus granii			present	common	common	common	present	
Coscinodiscus concinnus								present
Cyclotella						present		
Cylindrotheca closterium	present							
Dactyliosolen fragilissimus		present	present	present	present	present	present	present
Pseudosolenia calcar-avis	present		present					
Skeletonema marinoi	present							present
Amphidinium crassum						present		present
Dinophysis acuminata	present				present	present	present	
Gymnodiniales	present		common		common	common	common	common
Gymnodinium verruculosum	present	present	present	present	present	present	present	present
Gyrodinium flagellare	present			present				
Gyrodinium spirale		present	present					
Heterocapsa					present	present		
Heterocapsa rotundata	present		present	present	present	present	present	present
Katodinium glaucum			present			present		present
Peridiniella danica	present							
Prorocentrum cordatum	present	present	present					present
Prorocentrum micans	present							
Protoperidinium pellucidum								present
Tripes muelleri	present							
Octactis speculum	present							
Pseudopedinella	present	present				present	present	
Aphanizomenon flosaquae		present						
Snowella					present	present	present	
Binuclearia lauterbornii	present		common			present		
Eutreptiella			present	present	present	present	present	present
Pyramimonas	present	present	present			present		present
Oocystis						present	present	
Cryptomonadales	common	common	common	present	present	present	present	present
Katablepharis remigera				present				
Leucocryptos marina			present					
Prymnesiales		present		present		present		present
Ebria tripartita	present	present					present	
Calliacantha					present			
Choanoflagellata	present		present					
Mesodinium rubrum		present	present	present	present	present	common	present
Ciliophora	present	common	present	present	present	common	common	common
Helicostomella subulata	present	present	present	present	present			
Strombidium	present			present				present

# The Skagerrak

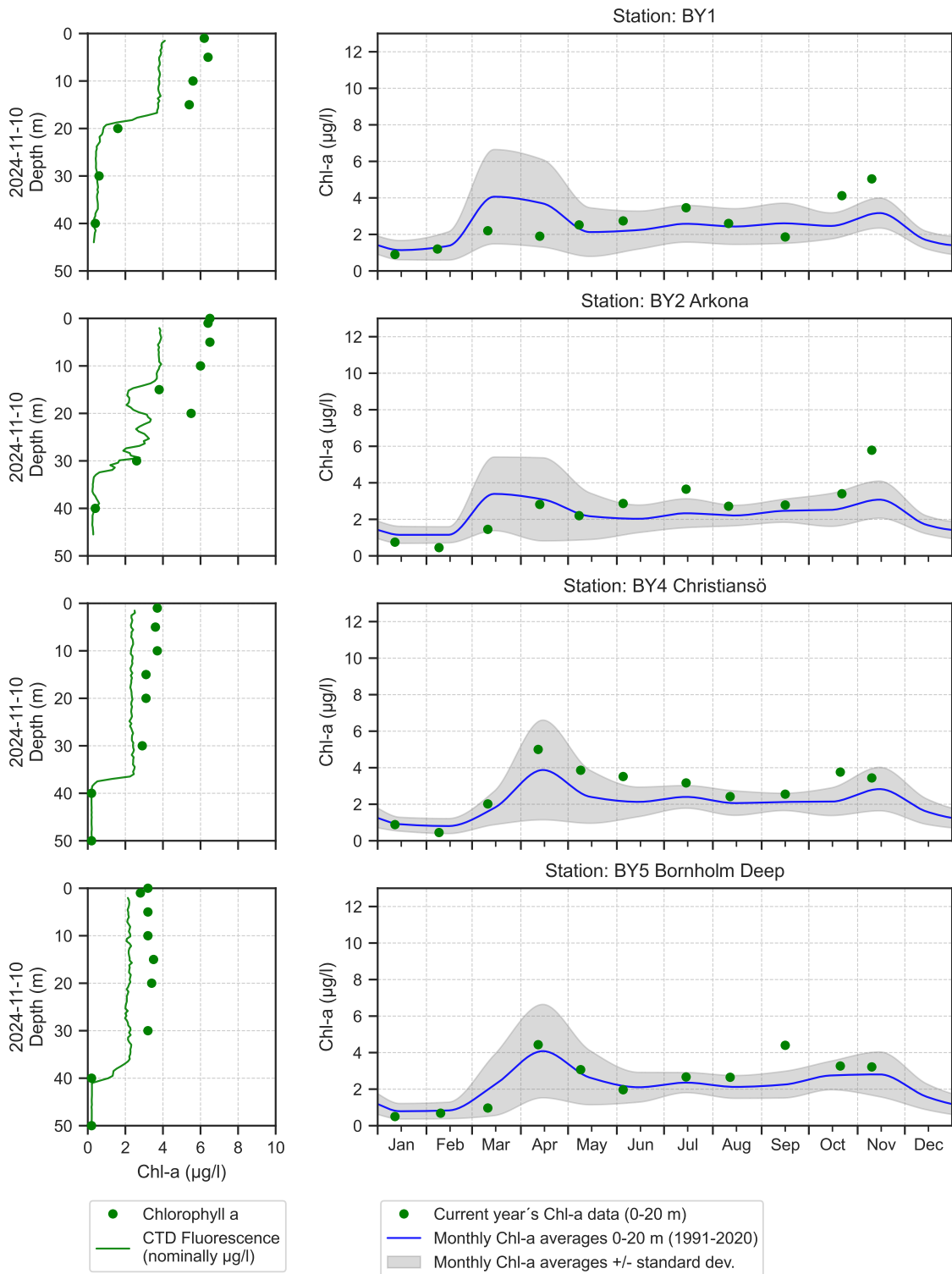


## The Kattegat and The Sound

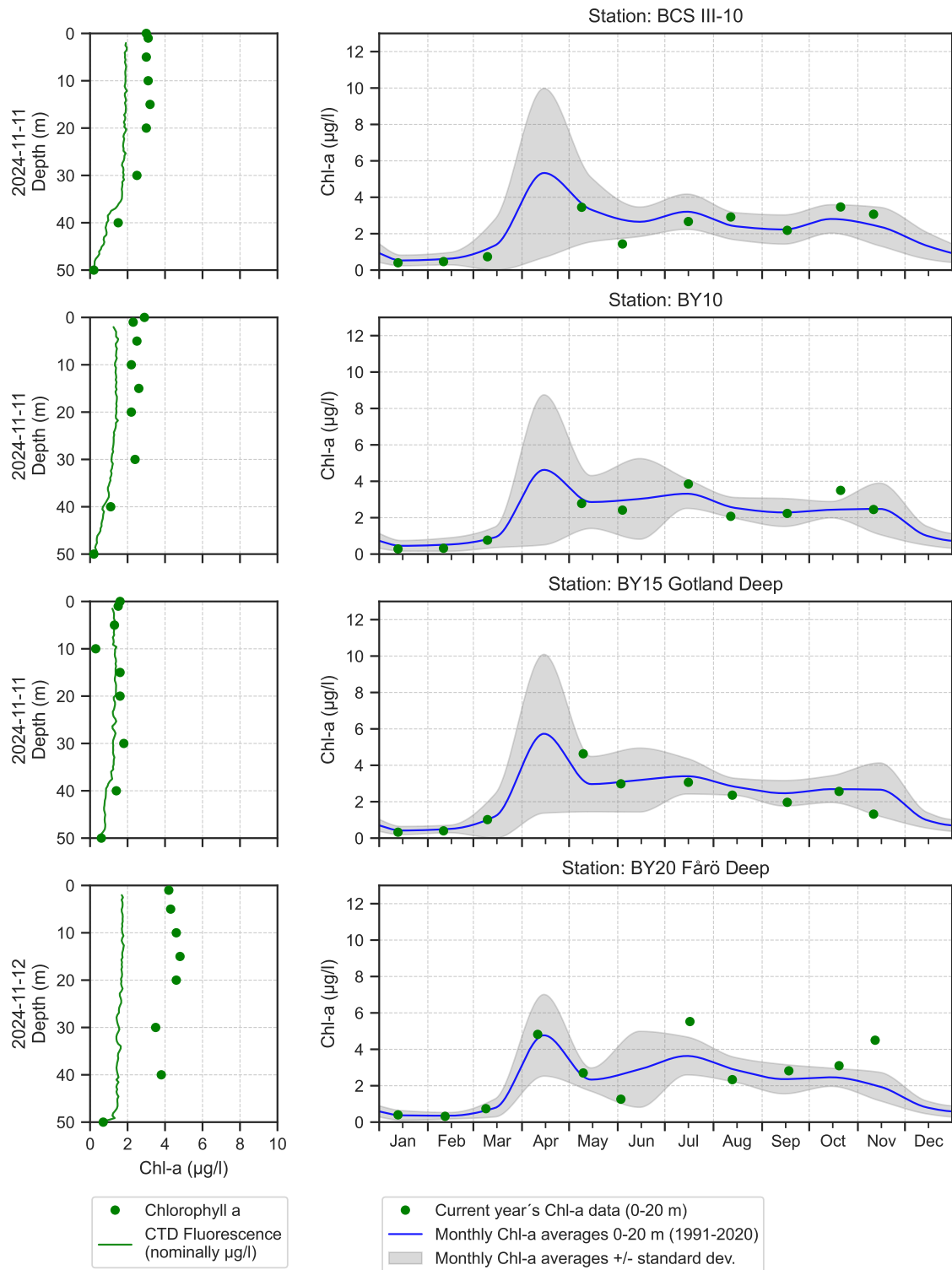




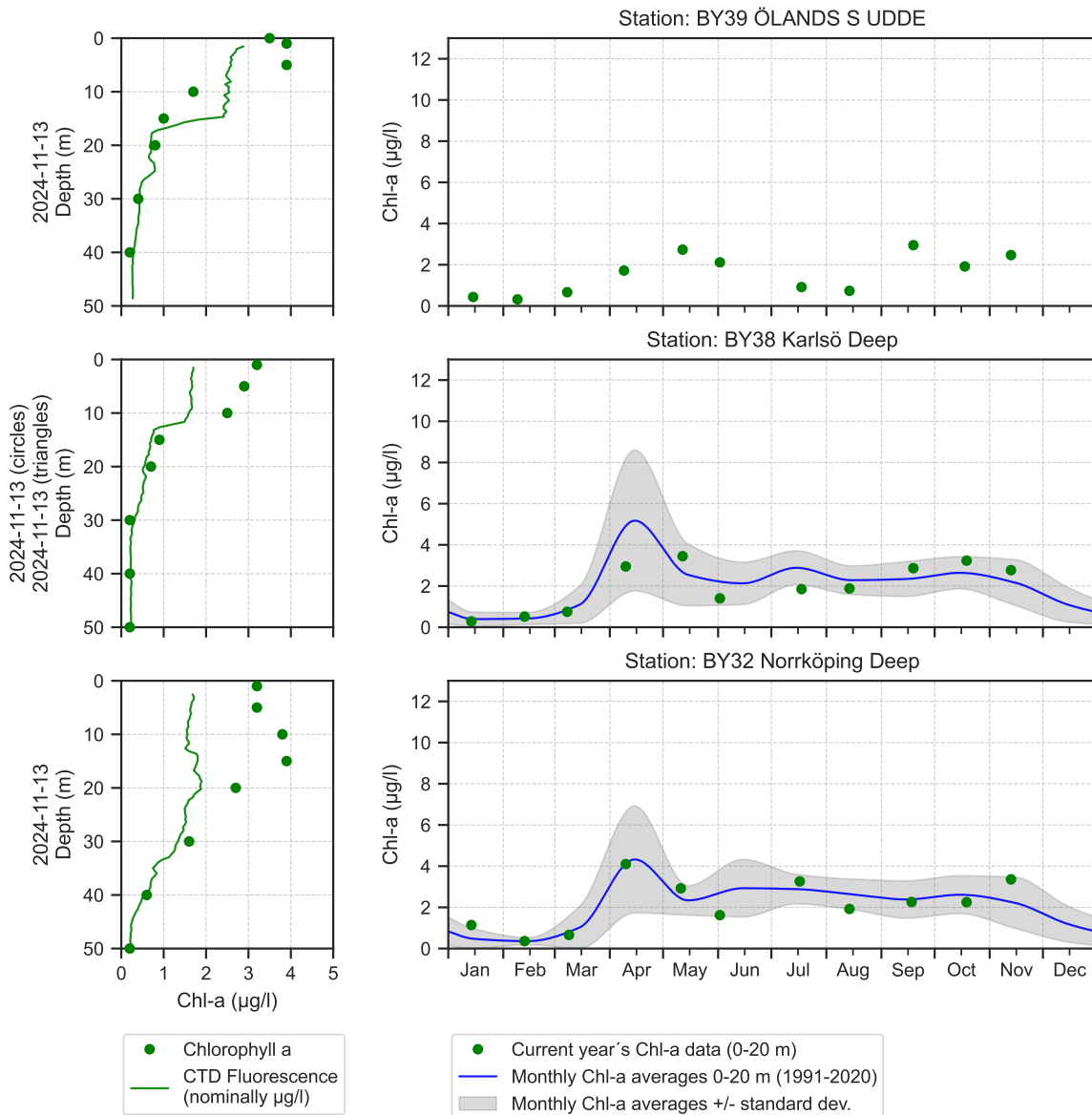
# The Southern Baltic



## 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 medelvärdet 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 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 mikroskopisk analys av planktonprover samt klorofyllmätningar presenteras kortfattat i denna rapport. Information från SMHIs satellitövervakning av algbloomningar finns under perioden juni-augusti på [www.smhi.se](http://www.smhi.se). Resultat från provtagningarna kan hämtas från SMHI:s databas på [sharkweb.smhi.se](http://sharkweb.smhi.se). Hydrografidata läggs ut varje månad, växtplanktondata läggs ut en gång per år.

## About AlgAware

SMHI carries out monthly cruises in the Baltic and the Kattegat/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 algal blooms is found on [www.smhi.se](http://www.smhi.se) during the period June-August. Results from the expeditions are found in the SMHI database, [sharkweb.smhi.se](http://sharkweb.smhi.se). Data are published monthly, phytoplankton data however, are published once a year.

Art / Species	Gift / Toxin	Eventuella symptom	Clinical symptoms
<i>Alexandrium</i> spp.	Paralytic shellfish poisoning (PSP)	<b>Milda symptom:</b> 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 <b>Extrema symptom:</b> 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.	<b>Mild case:</b> 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. <b>Extreme case</b> 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)	<b>Milda symptom:</b> Efter cirka 30 minuter till några timmar: yrsel, illamående, kräkningar, diarré, magont <b>Extrema symptom:</b> Upprepad exponering kan orsaka cancer	<b>Mild case:</b> Within 30 min-a few hours: dizziness, nausea, vomiting, diarrhoea, abdominal pain. <b>Extreme case:</b> Repeated exposure may cause cancer.
<i>Pseudo-nitzschia</i> spp.	Amnesic shellfish poisoning (ASP)	<b>Milda symptom:</b> Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramp <b>Extrema symptom:</b> Yrsel, hallucinationer, förvirring, förlust av korttidsminnet, kramper	<b>Mild case:</b> Within 3-5 hours: dizziness, nausea, vomiting, diarrhoea, abdominal cramps. <b>Extreme case:</b> dizziness, hallucinations, confusion, loss of memory, cramps.
<i>Chaetoceros concavicornis</i> / <i>C. convolutus</i>	Mechanical damage through hooks on setae	<b>Låg celltäthet:</b> Ingen påverkan. <b>Hög celltäthet:</b> Fiskens gälar skadas, fisken dör.	<b>Low cell numbers:</b> No effect on fish. <b>High cell numbers:</b> Fish death due to gill damage.
<i>Pseudochattonella</i> spp.	Fish toxin	<b>Låg celltäthet:</b> Ingen påverkan. <b>Hög celltäthet:</b> Fiskens gälar skadas, fisken dör.	<b>Low cell numbers:</b> No effect on fish. <b>High cell numbers:</b> Fish death due to gill damage.

Oversikt över några potentiellt skadliga alger och det aktuella giftets effekt. Overview of potentially harmful algae and effects of toxins. Manual on harmful marine microalgae (2003 - UNESCO Publishing).

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 actual month during the period 2001-2015. Presence of harmful algae at stations where species analysis is performed is shown with a symbol.



