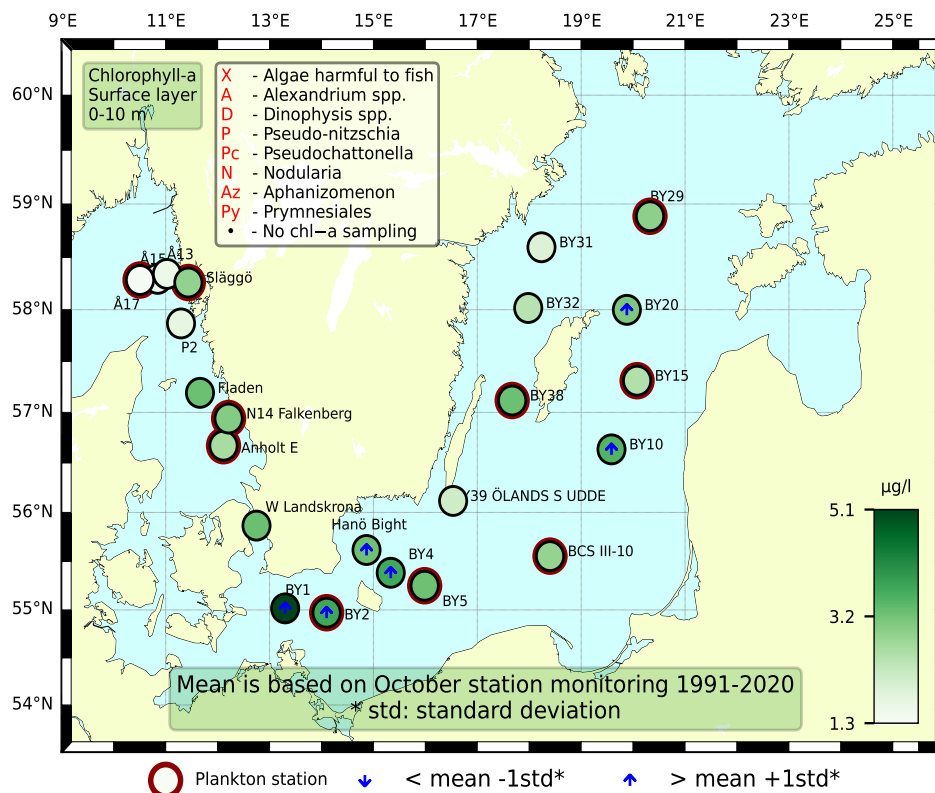


Sammanfattning

Samtliga stationer i Västerhavet hade relativt höga totala cellantal förutom Å17 som hade väldigt låga cellantal. Artsammansättningen var överlag hög vid samtliga stationer. Kiselalger var dominerande vid samtliga stationer och särskilt vanliga var *Pseudosolenia calcar-avis* och *Cerataulina pelagica*. Kalkalgen *Emiliania huxleyi* förekom vid samtliga stationer och oftast i höga cellantal. Dinoflagellater förekom endast i låga celltätheter. De integrerade klorofyllkoncentrationerna var inom det normala vid samtliga stationer i Västerhavet.

Alla stationer i Östersjön under denna provtagningsperiod uppvisade låg till måttlig artsammansättning, med generellt höga celltätheter observerade. Kiselalgen *Dactyliosolen fragilissimus* var vanlig på flera stationer, särskilt vid BY38 samt i östra Östersjön, vilket bidrog till höga cellantal trots låg övergripande artsammansättning. *Cerataulina pelagica* var framträdande vid de södra stationerna och dominerade särskilt samhället vid BY5 (Bornholm Deep). Klorofyllkoncentrationerna var över det normala vid flera stationer i södra och östra Östersjön. Av dessa stationer undersöktes dock endast proverna från BY2 i mikroskop. Planktonbilder tagna av Imaging Flow Cytobot (IFCB) ombord på R/V Svea bekräftade att *C. pelagica* blomade vid stationerna med höga klorofyllhalter i södra Östersjön, och att *D. fragilissimus* bidrog till de förhöjda klorofyllhalter i östra Östersjön. Ciliater och mindre taxa som cryptomonadales och gymnodiniales var närvarande vid samtliga stationer. De integrerade klorofyllhalter (0–10 m) var över det normala vid BY1, BY2, BY4 och Hanöbukten, samt vid BY10 och BY20.



Abstract

All stations along the Swedish west coast had quite high total cell numbers except Å17 that had very low total cell numbers. All stations had moderate to high biodiversity. Diatoms were generally the most abundant group across sites, particularly *Pseudosolenia calcar-avis* and *Cerataulina pelagica*. The coccolithophore *Emiliania huxleyi* was consistently present. Dinoflagellate presence was low across all locations, with only a few species noted. The integrated chlorophyll concentrations were within normal for this month.

All stations in the Baltic Sea during this sampling period exhibited low to moderate species diversity, with generally high cell abundances observed. The diatom *Dactyliosolen fragilissimus* was common at several stations, particularly at BY38 and in the eastern Baltic Sea, contributing to high cell counts despite low overall species diversity. *Cerataulina pelagica* was prominent in the southern stations, notably dominating the community at BY5 (Bornholm Deep). Chlorophyll concentrations were above normal at multiple stations in the southern and eastern Baltic Sea. However, of these stations, only BY2 samples were examined using the microscope. Plankton images from the Imaging Flow Cytobot (IFCB) onboard R/V Svea confirmed that *C. pelagica* was blooming at the stations with elevated chlorophyll concentrations in the southern Baltic Sea, and that *D. fragilissimus* was the main contributor to the high chlorophyll levels in the eastern Baltic Sea. Ciliates and small taxa such as cryptomonadales and gymnodiniales were consistently present across stations, adding to the diversity. The integrated chlorophyll levels (0–10 m) were above normal at BY1, BY2, BY4, and Hanö Bight, as well as at BY10 and BY20.

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

The Skagerrak

Släggö (Skagerrak coast) 24th of October

The species diversity and the total cell number were moderate. Diatoms dominated in cell numbers among the relatively large cells and *Pseudosolenia calcar-avis*, *Leptocylinthus minimus*, the genus *Rhizosolenia* and *Cerataulina pelagica* were the most common. Only a few cells of dinoflagellates were present and among these *Prorocentrum micans* and *Akashiwo sanguinea* were found. The relatively small cells were dominated by *Emiliana huxleyi* and different cryptomonadales. The integrated chlorophyll concentrations were normal for this month.

Å17 (Skagerrak coast) 23rd of October

The total cell number was very low but species diversity was moderate. Most taxa occurred with just a few cells. Small cells dominated and among these the coccolithophore *Emiliana huxleyi* was common. Several species of diatoms were present but only in low numbers, *Pseudo-nitzschia** being the only exception. The integrated chlorophyll concentrations were normal for this month.

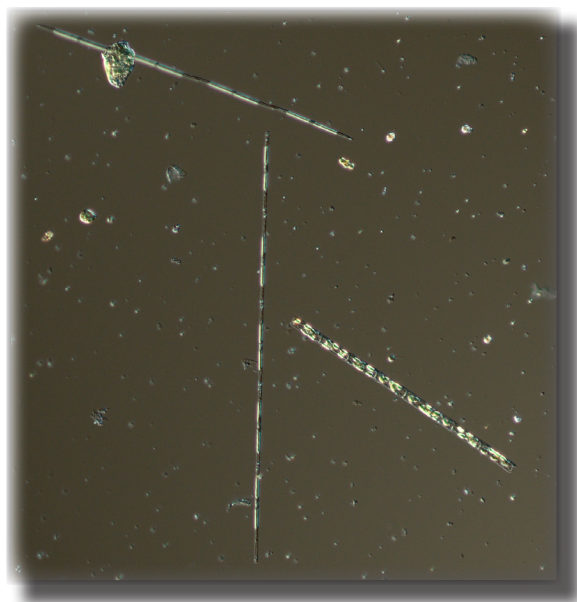


Fig 1. Diatoms dominated along the Swedish west coast. The potential toxic genus *Pseudo-nitzschia* (top chain), *Leptocylinthus minimus* (left chain) and *Leptocylinthus danicus* (right hand chain). Photo: M. Johansen.

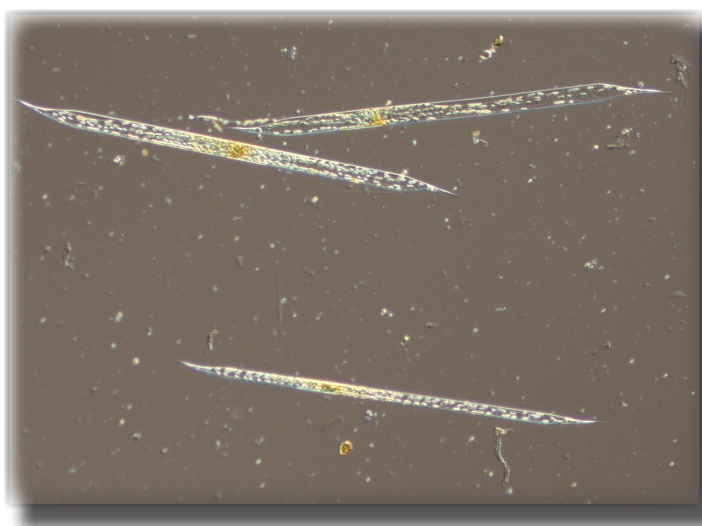


Fig 2. The diatom *Pseudosolenia calcar-avis* was common at all stations along the Swedish west coast. Photo: M. Johansen.

The Kattegat

Anholt E 23rd of October

The species diversity and total cell number were both moderate. Diatoms dominated and *Pseudosolenia calcar-avis* clearly the most, but *Cerataulina pelagica*, *Leptocylinthus danicus* and *Dactyliosolen fragilissimus* were abundant too. The relatively small cells were dominated by *E. huxleyi*. The integrated chlorophyll concentrations were normal for this month.

N14 Falkenberg 23rd of October

The species diversity and total cell number were both moderate. Diatoms dominated and *Nitzschia longissima*, *Cerataulina pelagica* and *Pseudosolenia calcar-avis* were the most abundant species. The dinoflagellates were few but some cells of *Prorocentrum micans* were noted. The relatively small cells constituted mostly of *Emiliana huxleyi*. The integrated chlorophyll concentrations were normal for this month.

The Baltic

BY39 18th of October

Species diversity was low but the cell abundance was high. The diatom *Dactyliosolen fragilissimus* was observed in moderate numbers. Chlorophyll concentrations for the 0–10 m integrated sample were within the expected range for this period.

BY38 19th of October

Species diversity was low but the total cell numbers were high, *D. fragilissimus* being particularly common. Notable ciliate presence and observations of gymnodiniales and *Mesodinium rubrum* contributed to the diversity. No bloom forming filamentous cyanobacteria were detected, and chlorophyll levels were typical for this time of year.

BY31 Landsort Deep 19th of October

Species diversity and cell abundance were very low. The filamentous cyanobacterium *Aphanizomenon flosaquae* was detected in low amounts, along with the green algae *Oocystis* spp. Integrated chlorophyll levels were typical for this time of year.

BY29 20th of October

Species diversity was moderate and the cell counts were low. Ciliates were observed along with cryptomonadales, and *Phalacroma rotundatum** was observed in low numbers. The cyanobacterium *Aphanizomenon flosaquae* was present. Chlorophyll levels in the 0–10 m range were consistent with the seasonal average.

BY15 20th of October

Moderate diversity and low total cell counts were recorded, with a prevalence of small cells, particularly cryptomonadales, and small gymnodiniales cells. Species such as *Chaetoceros castracanei* were observed, while larger species like *Coscinodiscus* were also present. Chlorophyll concentrations in the upper 20 m were within expected limits for the seasonal norm.

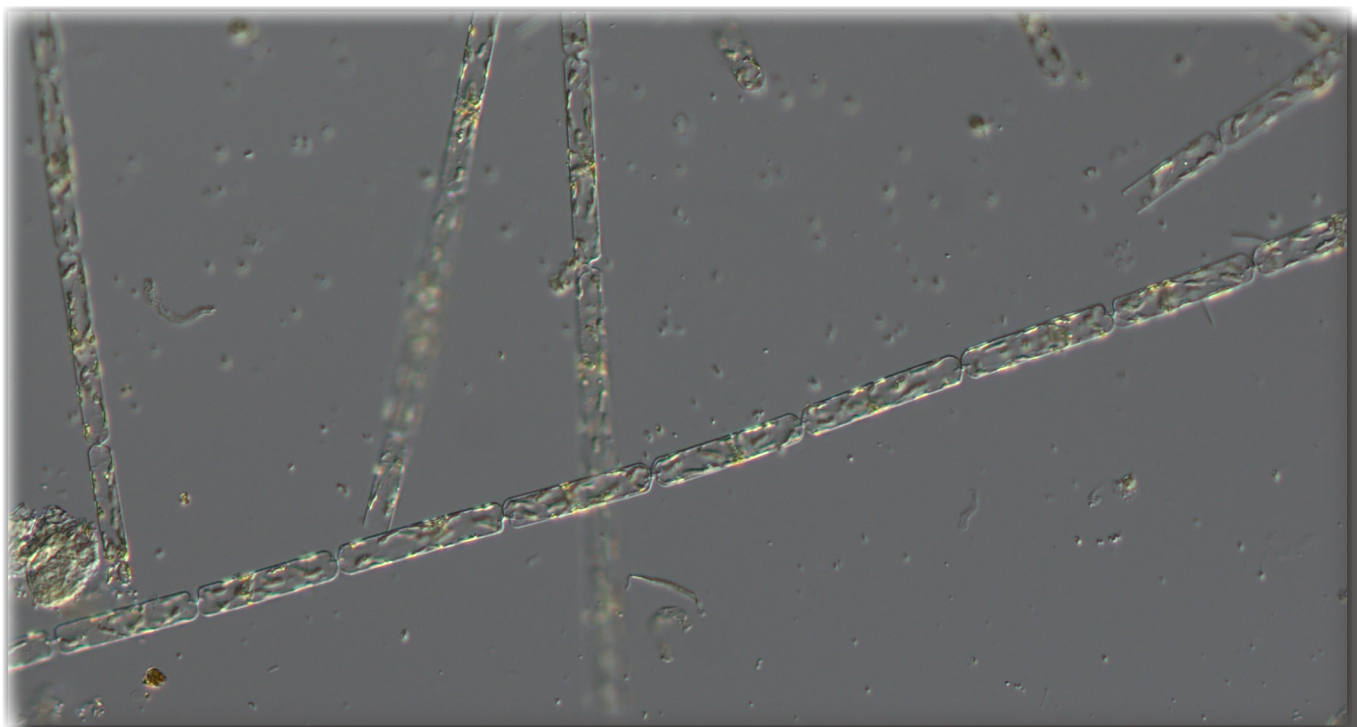


Fig 3. The diatom *Dactyliosolen fragilissimus* was very common at station BY38 in the Baltic Sea.
Photo: A. Torstensson.

BY5 Bornholm Deep 21st of October

Species diversity was, though cell numbers were high, dominated by *Cerataulina pelagica*. Chlorophyll levels were within expected range for this season.

BCS III-10 21st of October

Moderate species diversity and cell numbers were recorded, with common occurrences of the diatom *D. fragilis-simus* and the green algae *Binuclearia lauterbornii*. Small cryptomonadales and dinoflagellate cells were also present, together with *C. pelagica* and *Prorocentrum cordatum*. Chlorophyll levels were within expected limits for this season.

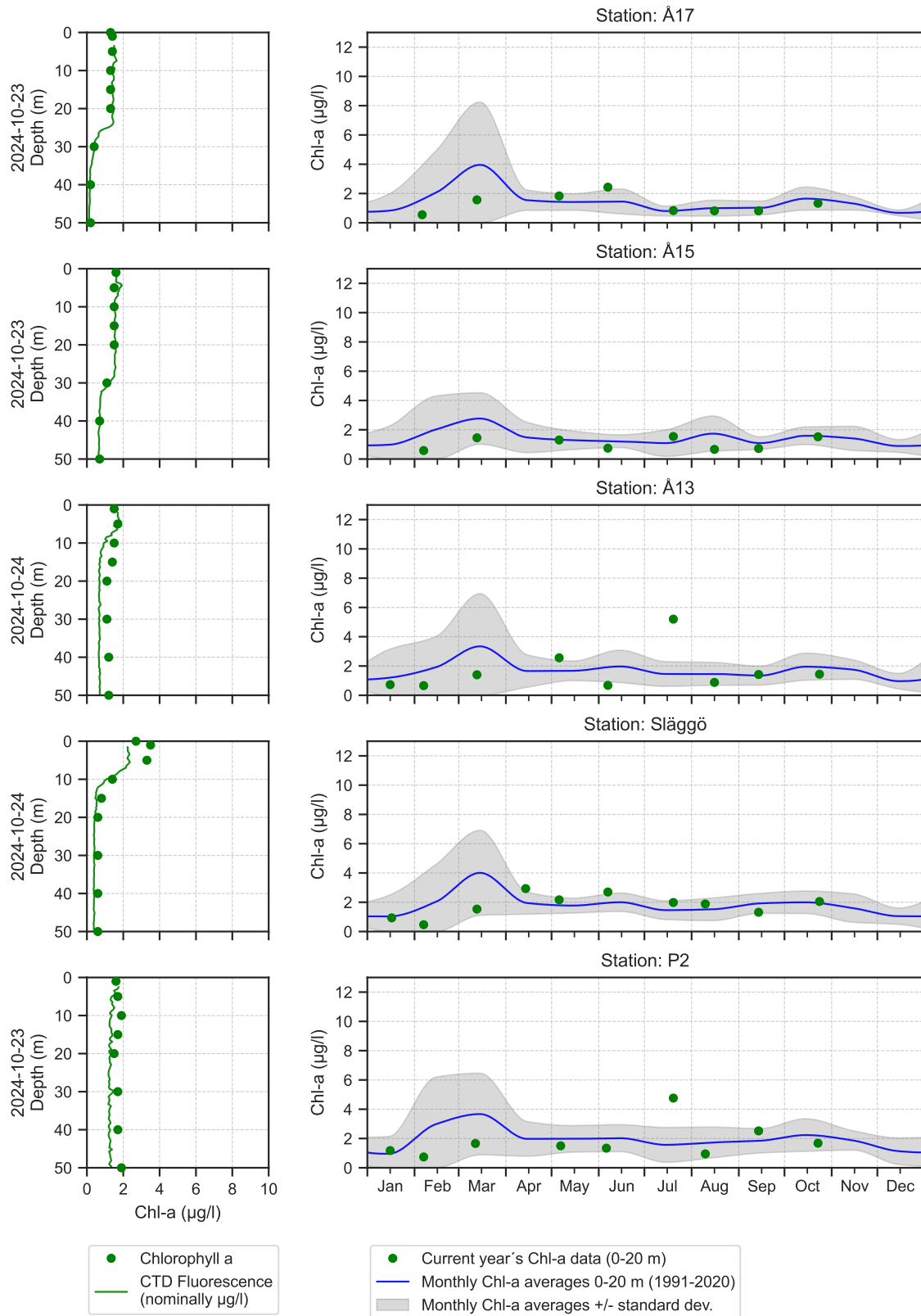
BY2 Arkona 22nd of October

Low species diversity and high cell counts were observed, with the diatom *C. pelagica* and several species from the order cryptomonadales being prominent. Chlorophyll concentrations in the upper 10 m were above the normal for October, yet remained within normal levels between 0–20 m.

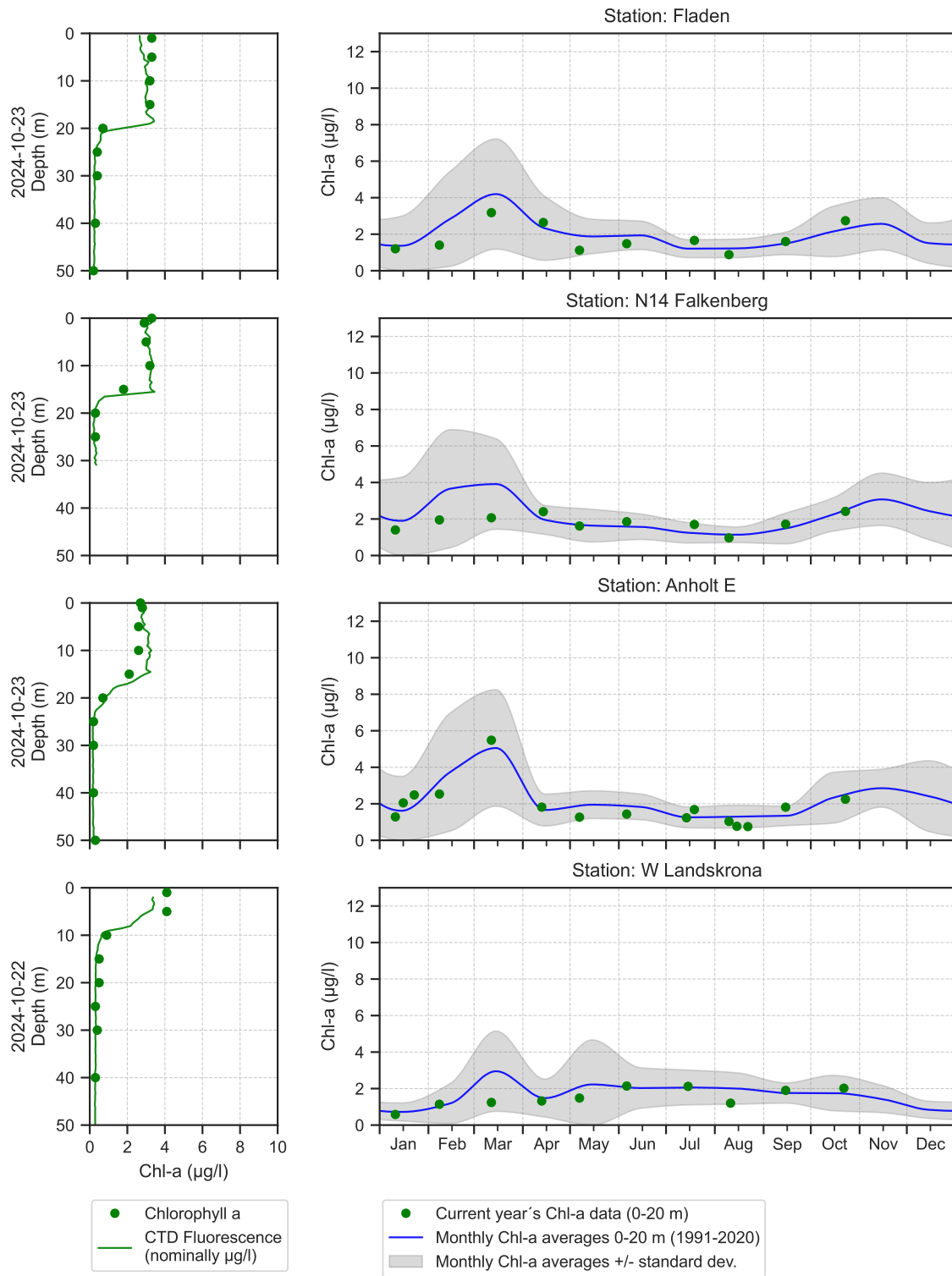
Selection of observed species	Anholt E	N14 Falkenberg	Släggö	Å17
Red=potentially toxic species	23/10	23/10	24/10	23/10
Hose 0-10 m	presence	presence	presence	presence
<i>Cerataulina pelagica</i>	common	very common	common	
<i>Chaetoceros</i>				present
<i>Chaetoceros affinis</i>				present
<i>Chaetoceros peruvianus</i>	present			
<i>Chaetoceros cf. peruvianus</i>		present		
<i>Cyclotella</i>			present	
<i>Cyclotella choctawhatcheeana</i>		present		
<i>Cylindrotheca closterium</i>	present			
<i>Dactyliosolen fragilissimus</i>	common	present	present	present
<i>Ditylum brightwellii</i>	present	present	present	
<i>Leptocylindrus danicus</i>	common	present	present	present
<i>Leptocylindrus minimus</i>		present	common	present
<i>Nitzschia longissima</i>	present	very common	common	present
<i>Proboscia alata</i>	present			
<i>Pseudo-nitzschia</i>	present	present		common
<i>Pseudosolenia calcar-avis</i>	very common	common	very common	present
<i>Rhizosolenia setigera</i>	present		present	present
<i>Rhizosolenia setigera f. pungens</i>		present	common	present
<i>Skeletonema marinoi</i>			present	
<i>Thalassiosira</i>		present		present
<i>Thalassiosira gravida</i>			present	
<i>Akashiwo sanguinea</i>	present	present	present	
<i>Azadinium</i>			present	present
<i>Dinophysis acuminata</i>		present		
Gymnodiniales			present	common
<i>Gymnodinium verruculosum</i>	present	present	present	
<i>Gyrodinium spirale</i>			present	
Peridinales			present	
<i>Prorocentrum balticum</i>		present	present	
<i>Prorocentrum cordatum</i>				present
<i>Prorocentrum micans</i>	present	present	present	
<i>Tripos macroceros</i>				present
<i>Tripos muelleri</i>			present	
<i>Dinobryon faculiferum</i>		present		
<i>Ollicola vangoorii</i>			present	
<i>Emiliana huxleyi</i>	common	very common	common	very common
<i>Pleurochrysis</i>				present
Prymnesiales			present	
<i>Heterosigma akashiwo</i>		present	present	
Chlorodendrales			present	
Cryptomonadales	present	common	common	present
<i>Apedinella radians</i>			present	
<i>Dictyocha fibula</i>	present	present	present	
Dictyochaes		common	common	
<i>Octactis speculum</i>	present	present	present	
<i>Pseudopedinella pyriformis</i>			present	present
Ciliophora	present		present	present
<i>Laboea strobila</i>	present	present	present	

Selection of observed species	BY39	BY38	BY31	BY29	BY15	BY5	BCSIII-10	BY2
Red=potentially toxic species	18/10	19/10	19/10	20/10	20/10	21/10	21/10	22/10
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Ciliophora	present	present		present	present	present	present	present
Actinocyclus	present	present	present	present				present
Centrales		present		present	present			
Cerataulina pelagica					present	very common	present	very common
Chaetoceros					present			
Chaetoceros castracanei	present		present	present	present	present	present	
Chaetoceros convolutus								present
Chaetoceros danicus							present	
Chaetoceros decipiens							present	
Coscinodiscus					present			
Coscinodiscus concinnus			present	common	present			
Dactyliosolen fragilissimus	common	very common			present		common	common
Pseudosolenia calcar-avis	present						present	
Pyramimonas					present			
Cryptomonadales	present			present	common	present	present	present
Aphanizomenon flosaquae			present	present	present	present	present	present
Dolichospermum						present		
Lemmermanniella		present				present		
Snowella			present	present		present		
Dinophysis acuminata			present					
Dissodinium pseudolunula							present	
Gymnodiniales	present	present		present	common	present	present	
Heterocapsa rotundata		present		common	present		present	
Phalacroma rotundatum				present				
Prorocentrum cordatum						present	present	
Ebria tripartita		present	present	present		present		
Eutreptiella				present	present		present	
Mesodinium rubrum	present	present	present	present	present		present	present
Oocystis			present					
Binuclearia lauterbornii							common	

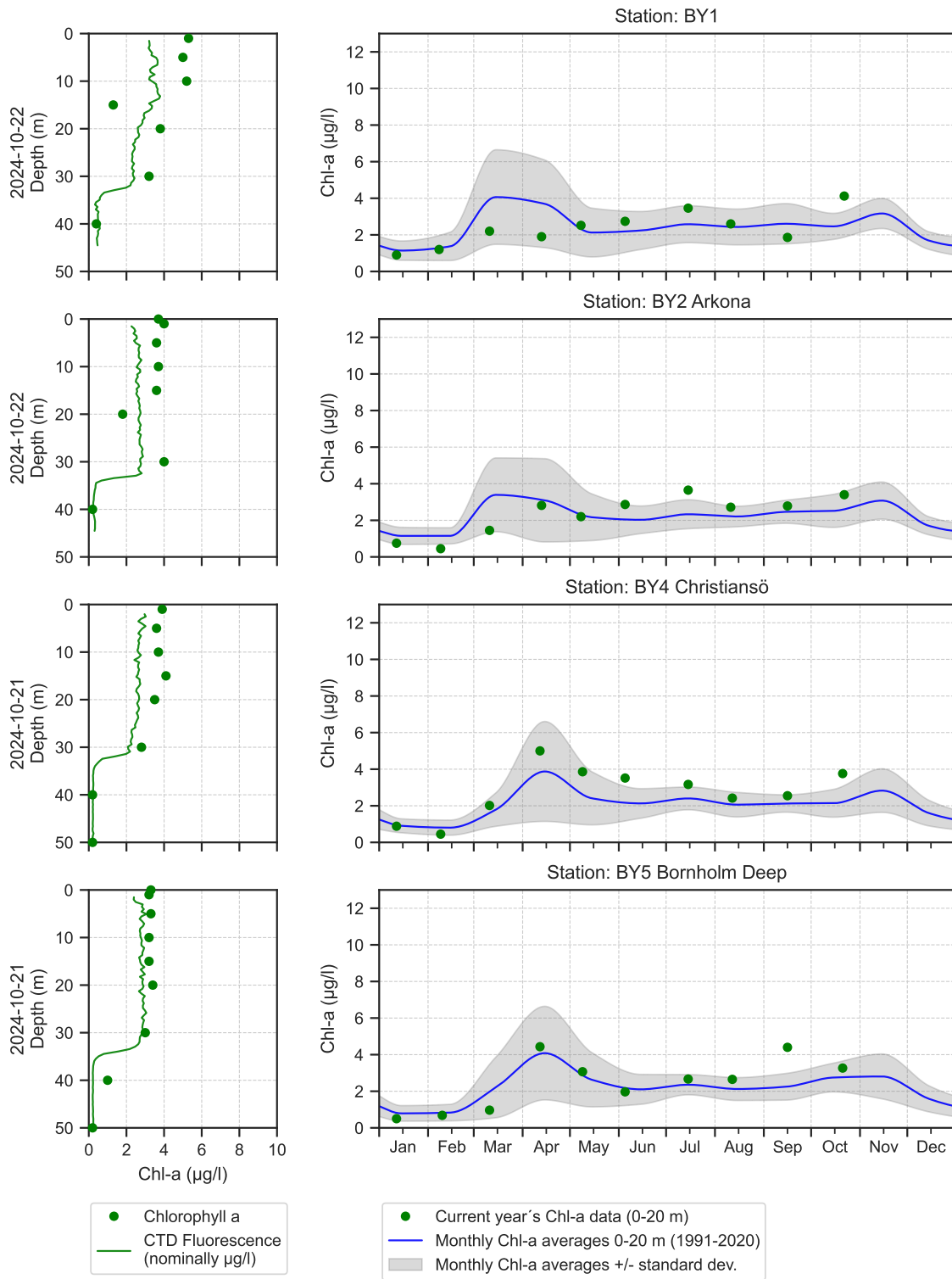
The Skagerrak



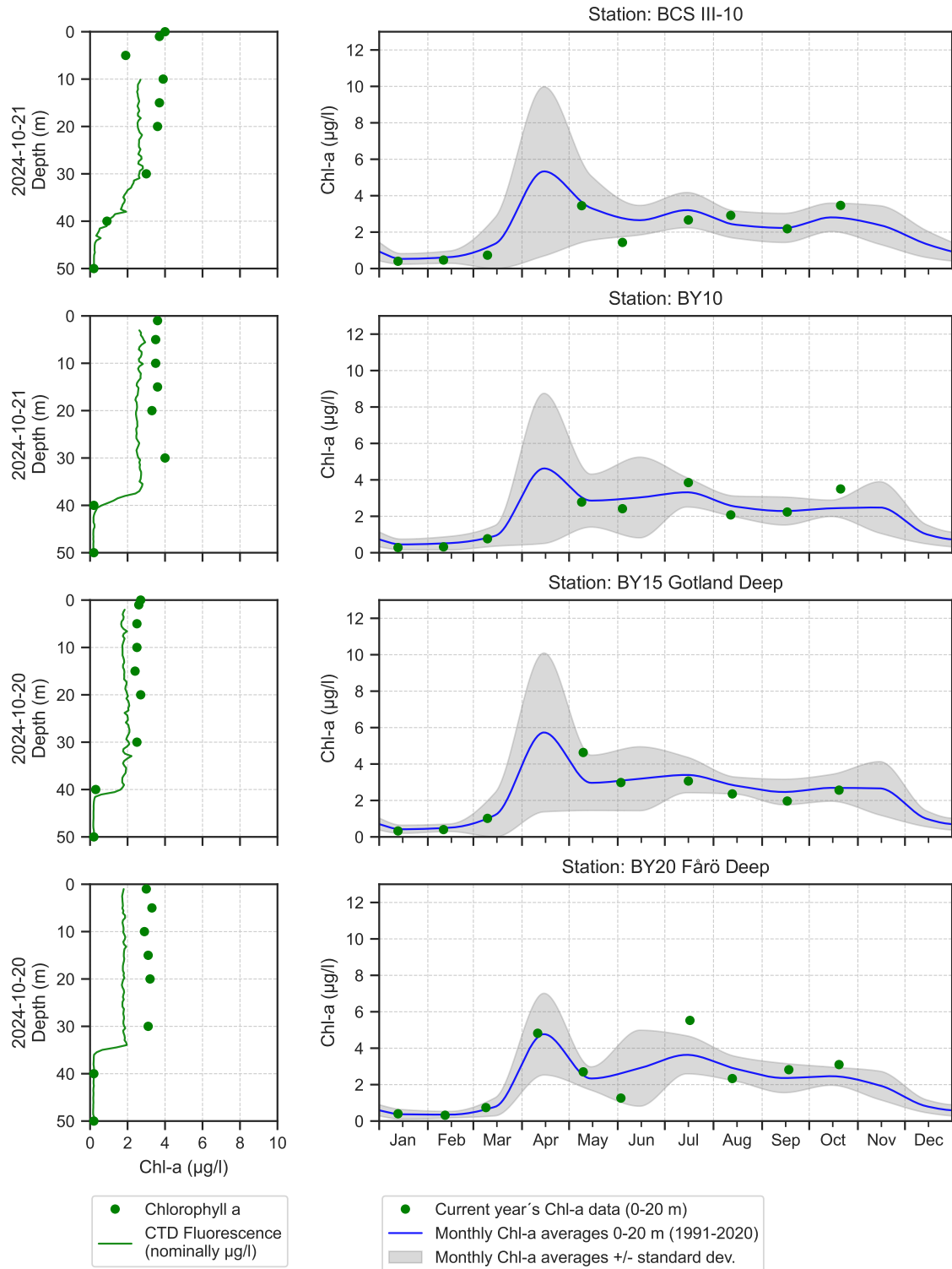
The Kattegat and The Sound



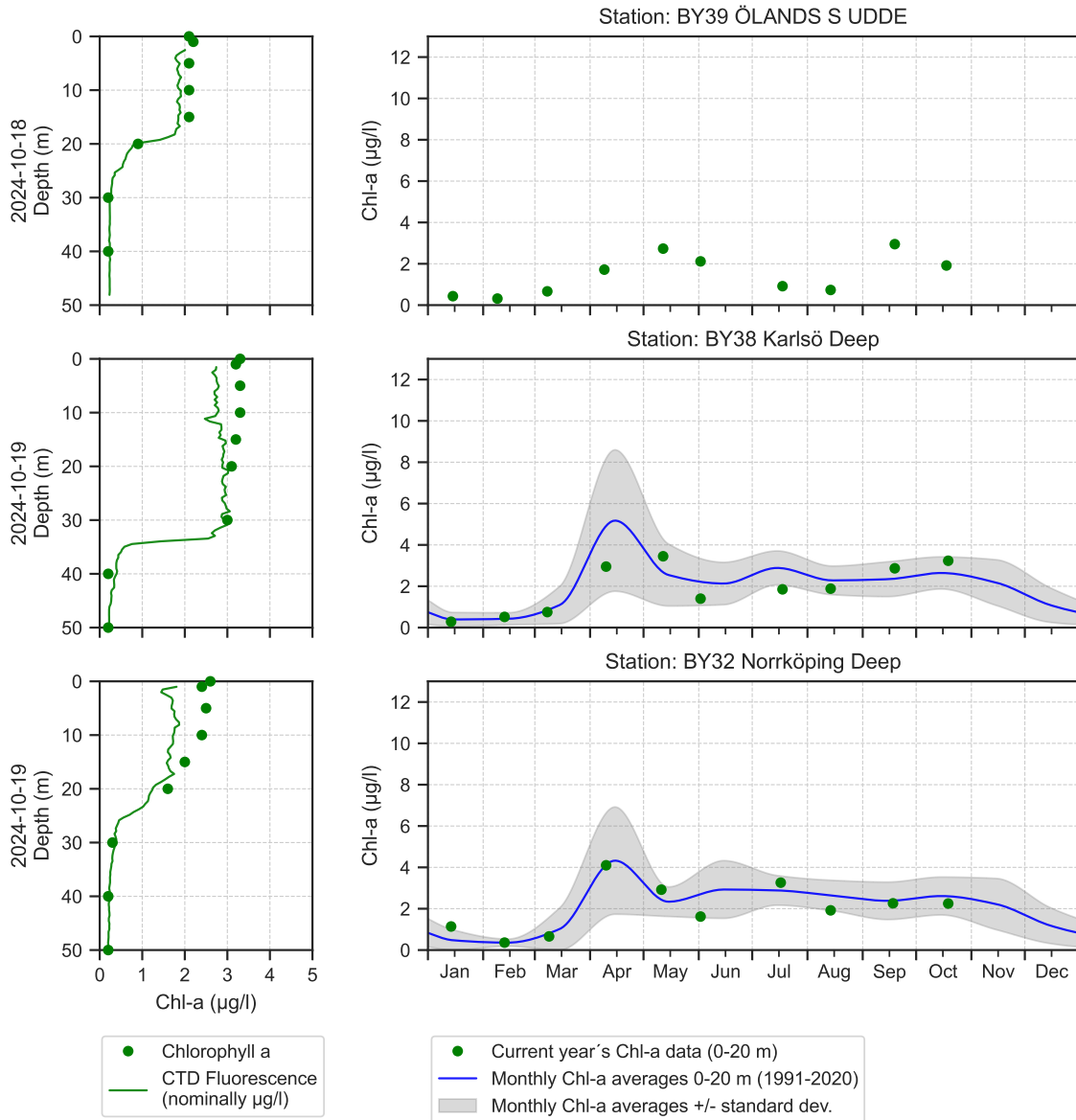
The Southern Baltic



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 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 algbloomningar finns under perioden juni-augusti på www.smhi.se. Resultat från provtagningarna kan hämtas från SMHI:s databas på 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 during the period June-August. Results from the expeditions are found in the SMHI database, 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)	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, magkramp Extrema symptom: Yrsel, hallucinationer, förvirring, förlust av korttidsminnet, kramp	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.

Översikt 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.

