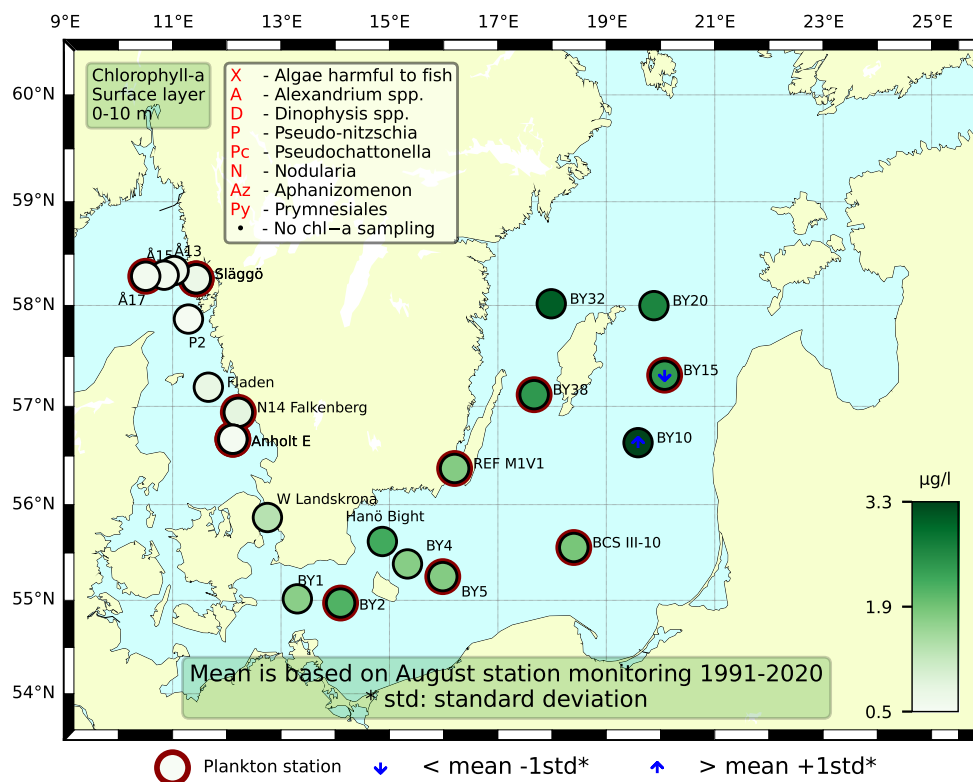


Sammanfattning

Diversiteten av växtplankton och totala cellantal var låga i Västerhavet, förutom vid Släggö där diversiteten var något högre. Den giftiga arten *Dinophysis acuta** återfanns i relativt höga celltätheter vid Släggö. Kiselalgen *Proboscia alata* var annars vanligast förekommande bland de större cellerna vid samtliga stationer. Vid Anholt E återfanns relativt höga antal av kalkalgen *Emilia huxleyi* vid båda provtagningstillfällena. Samtliga integrerade klorofyllvärden var låga men inom det normala för månaden.

Diversiteten och cellantal av växtplankton var höga i de sydvästra delarna av Östersjön, vid BY2 och BY5, samt vid den kustnära stationen REFM1V1. Vid de övriga stationerna var cellantalen och diversiteten lägre. Cyanobakterien *Aphanizomenon flosaquae* återfanns vid samtliga stationer, ibland i höga cellantal (BY2, BY5 och BY38), medan *Dolichospermum* sp. hade höga cellantal vid REFM1V1, BY2 och BY15. *Nodularia spumigena** var det bara enstaka filament av vid de flesta stationerna. BY2 och BY5 hade högt cellantal av kiselalgen *Dactyliosolen fragilissimus*. Vid BY2 fanns även flertalet *Dinophysis acuminata** och celler av ordern *Prymnesiales**. De integrerade klorofyllvärdena (0–10 m) var under det normala vid BY15, i övrigt inom det normala för månaden.



Abstract

The phytoplankton diversity and total cell counts were low in the Kattegat and Skagerrak areas, except at Släggö where the diversity was a bit higher. The toxic species *Dinophysis acuta** was found in relatively high cell numbers at Släggö. The diatom *Proboscia alata* was common at all stations along the Swedish west coast. At Anholt E quite a few of the coccolithophore *Emiliania huxleyi* on both sampling occasions. The integrated chlorophyll concentrations (0-10m and 0-20 m) were low at all stations but within normal for the month.

Diversity and cell abundance of phytoplankton were high in the south-western parts of the Baltic, at BY2 and BY5, and at the coastal station REFM1V1. At the other stations both numbers and diversity were lower. The cyanobacterium *Aphanizomenon flosaquae* was present at all stations, sometimes in high cell numbers (BY2, BY5 and BY38), while *Dolichospermum* sp. had high cell numbers at REFM1V1, BY2 and BY15. *Nodularia spumigena** was only present with a few filaments at most stations. At BY2 and BY5, the diatom *Dactyliosolen fragilissimus* was present in high cell numbers. At BY2 there were also several *Dinophysis acuminata** and cells of the order *Prymnesiales**. The integrated (0-10 m) chlorophyll concentration was below normal at BY15, otherwise concentrations were within the normal range for this month.

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

Å17 (open Skagerrak) 12th of August

The phytoplankton diversity and the total cell numbers were very low. The larger cells were dominated by a few *Proboscia alata*. Small naked dinoflagellates were most common among the smaller cells. The integrated chlorophyll concentration (0-10 m and 0-20 m) was low but within normal for this month.

Släggö (Skagerrak coast) 12th of August

The phytoplankton diversity was moderate but total cell numbers was low. Mostly smaller cells were found. Diatoms dominated in cell numbers and *Cerataulina pelagica* was found in highest cell numbers. Among the dinoflagellates quite a few cells of *Dinophysis acuta** was found. The smallest cells were dominated by cryptomonadales. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were low but within normal for this month.

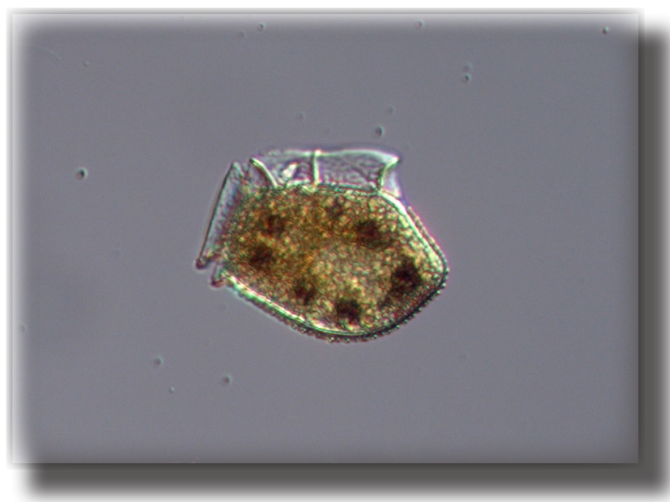


Fig 1. The potentially toxic dinoflagellate *Dinophysis acuta**, which is the most potent species of the genus, has been absent from the coast for many years. Several cells were found at station Släggö. Photo: M. Johansen.

The Kattegat

Anholt E 13th and 18th of August

Both the phytoplankton diversity and the total cell numbers were low on both occasions. Only a few larger cells were encountered and mainly *Proboscia alata* was found. Among the smaller cells several cells of *Emiliania huxleyi* were found. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were low but within normal for this month.

N14 Falkenberg 13th of August

The number of phytoplankton species was quite low and with low total cell numbers. The most numerous species were small naked dinoflagellates. Only a few larger cells were found and mainly consisted of *Proboscia alata*. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were low but within normal for this month.

The Baltic

BY2 14th of August

The cell abundance and diversity were quite high with many small species, *Gymnodiniales*, the diatom *Dactyliosolen fragilissimus* and the filamentous cyanobacteria *Aphanizomenon flosaquae* and *Dolichospermum* sp. in abundance. The toxic species *Nodularia spumigena*^{*}, *Dinophysis acuminata*^{*} and cells in the order *Prymnesiales*^{*} were present. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were within the normal range for this month.

BY5 14th of August

The cell abundance and diversity were quite high with many small species, *Gymnodiniales*, the diatom *D. fragilissimus* and the filamentous cyanobacteria *A. flosaquae* in abundance. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were within the normal range for this month.

BY15 15th of August

The phytoplankton diversity was low and abundance moderate. The cyanobacteria *A. flosaquae* and *Pseudanabaena* sp. were quite abundant, while *Dolichospermum* sp. and *N. spumigena*^{*} were present in lower amounts. Also, some smaller colony-forming cyanobacteria were present in high amounts. The integrated chlorophyll concentration (0-20 m) was within the normal range for this month, while concentrations at the surface (0-10 m) was lower than normal.

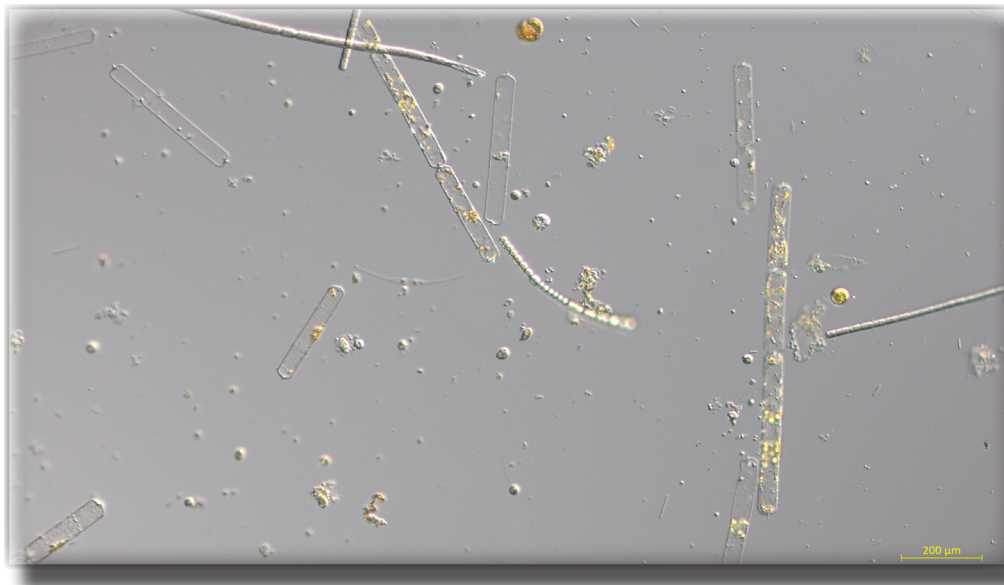


Fig 2. The diatom *Dactyliosolen fragilissimus*, various dinoflagellates in the order *Gymnodiniales* as well as filamentous cyanobacteria of *Dolichospermum* sp. and *Aphanizomenon flosaquae* were present in high amounts at BY2 in August. Photo: M. Karlberg.

BY38 16th of August

The phytoplankton diversity was low and the amounts of *A. flosaquae* was rather high. *N. spumigena*^{*} was also quite abundant. The tintinnid (ciliate within a shell) *Heliocostomella subulata* was quite abundant. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were within the normal range for this month.

BCSIII-10 15th of August

The phytoplankton diversity and abundance were low with a few filaments of the cyanobacteria *A. flosaquae* and *N. spumigena** present. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were within the normal range for this month.

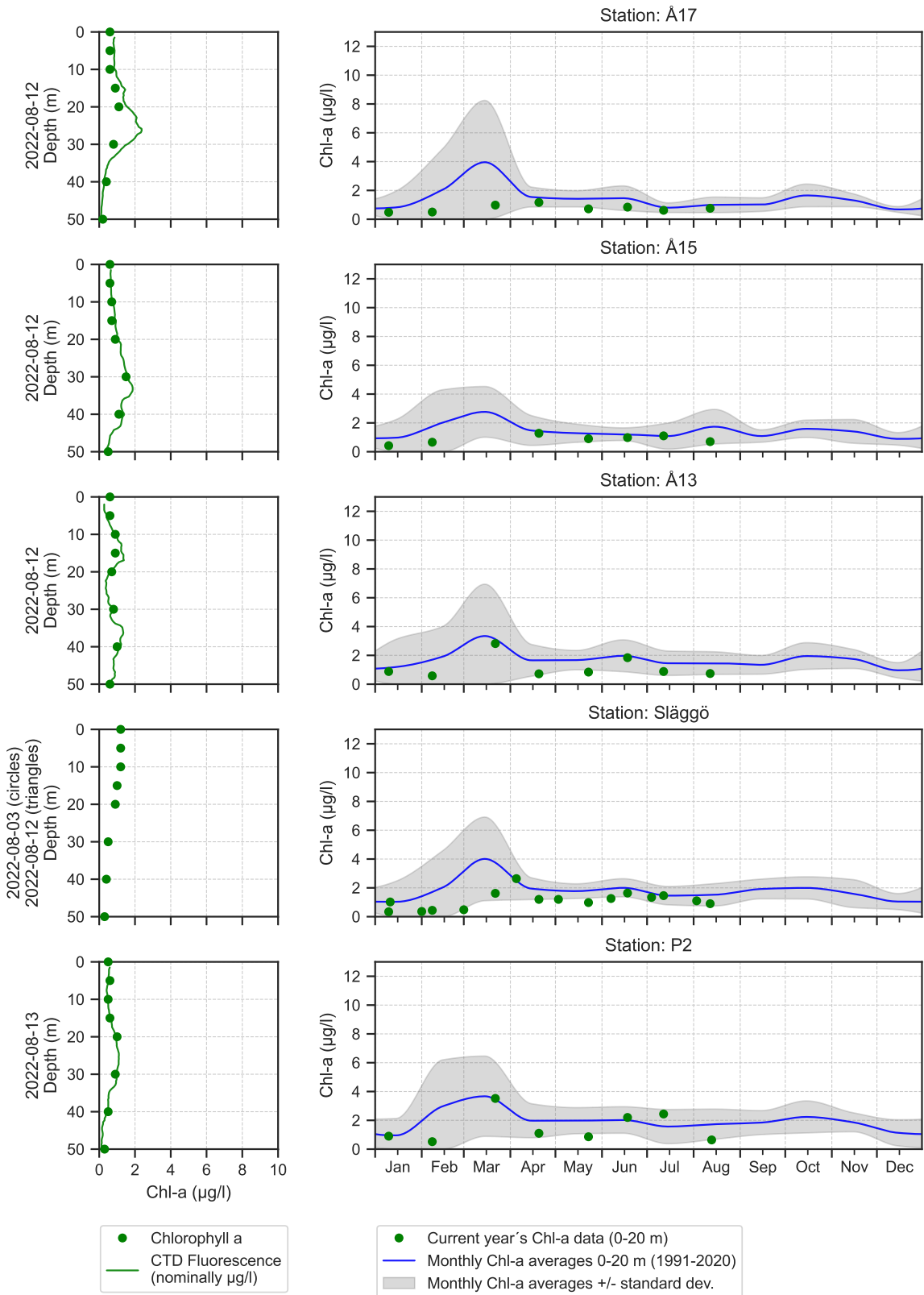
REFM1V1 17th of August

Both the phytoplankton diversity and abundance were high. The amount of the filamentous cyanobacteria *Dolichospermum* sp. was high, but there was also *Aphanizomenon* sp. and a few *N. spumigena**. Various cells of *Gymnodiniales* were abundant and *Dinophysis norvegica** was present. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were within the normal range for this month.

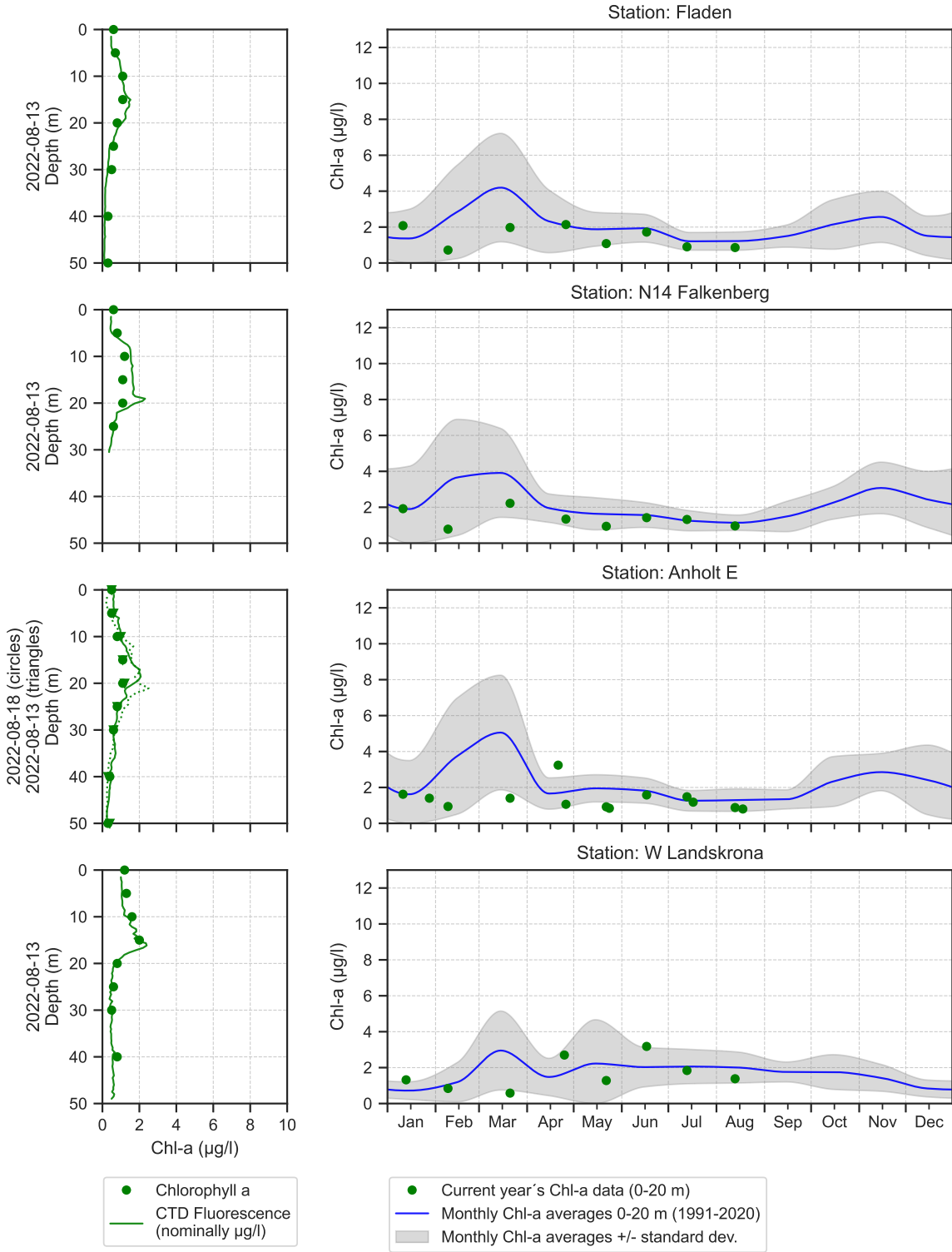
Selection of observed species	Anholt E	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	13/8	18/8	12/6	12/8	12/8
Hose 0-10 m	presence	presence	presence	presence	presence
<i>Cerataulina pelagica</i>				very common	
<i>Chaetoceros</i>				present	
<i>Chaetoceros affinis</i>				present	
<i>Chaetoceros socialis</i>				present	
<i>Cylindrotheca closterium</i>		present	present		
<i>Dactyliosolen fragilissimus</i>	present	present	present	common	present
<i>Guinardia delicatula</i>				present	
<i>Guinardia flaccida</i>	present	present	present	present	
<i>Leptocylindrus danicus</i>				present	present
<i>Proboscia alata</i>	common	common	common	common	common
<i>Pseudo-nitzschia</i>				present	present
<i>Skeletonema marinoi</i>				present	
<i>Dinophysis acuminata</i>				present	
<i>Dinophysis acuta</i>				common	
Gymnodiniales	common	common	common	present	very common
<i>Gyrodinium flagellare</i>			present		present
<i>Katodinium glaucum</i>					present
Peridiniales					present
<i>Phalacroma rotundatum</i>				present	
<i>Prorocentrum micans</i>	common	present	present	common	
<i>Protoperidinium</i>			present		
<i>Protoperidinium pellucidum</i>				present	
<i>Protoperidinium steinii</i>		present			
<i>Scrippsiella</i>					present
<i>Torodinium</i>			present		
<i>Tripos furca</i>	present		present		
<i>Tripos fusus</i>			present	present	
<i>Tripos lineatus</i>				present	
<i>Tripos muelleri</i>	present		present	present	
<i>Emiliana huxleyi</i>	common	common	present	present	present
<i>Pterosperma</i>			present		
<i>Pyramimonas</i>				present	
Cryptomonadales	common	present	common	common	present
<i>Telonema subtile</i>				present	
<i>Dolichospermum</i>	present	present	present		
<i>Ebria tripartita</i>		present			
Ciliophora		present		present	present

Selection of observed species	BY15	BY2	BY38	BY5	BCSIII-10	REFM1V1
Red=potentially toxic species	15/8	14/8	16/8	14/8	15/8	17/8
Hose 0-10 m	presence	presence	presence	presence	presence	presence
<i>Chaetoceros castracanei</i>			present	present		
<i>Chaetoceros thronsenii</i>		present		present		common
<i>Chaetoceros wighamii</i>						present
<i>Cylindrotheca closterium</i>		present		present		
<i>Dactyliosolen fragilissimus</i>		very common		very common		
<i>Nitzschia longissima</i>		present		present		
<i>Dinophysis acuminata</i>		present				
<i>Dinophysis norvegica</i>						present
Gymnodiniales	common	very common	common	very common	common	very common
<i>Gymnodinium verruculosum</i>		present		present		present
<i>Heterocapsa rotundata</i>			present			common
<i>Karlodinium veneficum</i>	present	present		present		present
Peridinales				present		present
<i>Prorocentrum cordatum</i>		present		present		
<i>Prorocentrum micans</i>						present
<i>Scrippsiella</i>				present		
<i>Tripos muelleri</i>		present		common		
<i>Dinobryon faculiferum</i>		present		present		present
Prymnesiales		present				
<i>Monoraphidium</i>			present	present		present
Oocystis	present	present	common	present	present	
<i>Binuclearia lauterbornii</i>	present					
<i>Pyramimonas</i>	common	present	common	common	common	common
Cryptomonadales	present	common	common	common	common	common
<i>Pseudopedinella</i>				common		present
<i>Aphanizomenon</i>	common	common	present	present	present	present
<i>Aphanizomenon flosaquae</i>	very common	very common	very common	very common	present	common
<i>Aphanocapsa</i>	common					
<i>Aphanothece</i>	very common		present			
<i>Dolichospermum</i>	common	very common				very common
<i>Nodularia spumigena</i>	present	present	common		present	present
<i>Pseudanabaena</i>	very common		common		common	common
<i>Snowella</i>	present					present
Choanoflagellatea						present
<i>Ebria tripartita</i>			common	present		present
Ciliophora	common	common	common	common	common	common
<i>Mesodinium rubrum</i>			present	present		present
<i>Helicostomella subulata</i>			common			

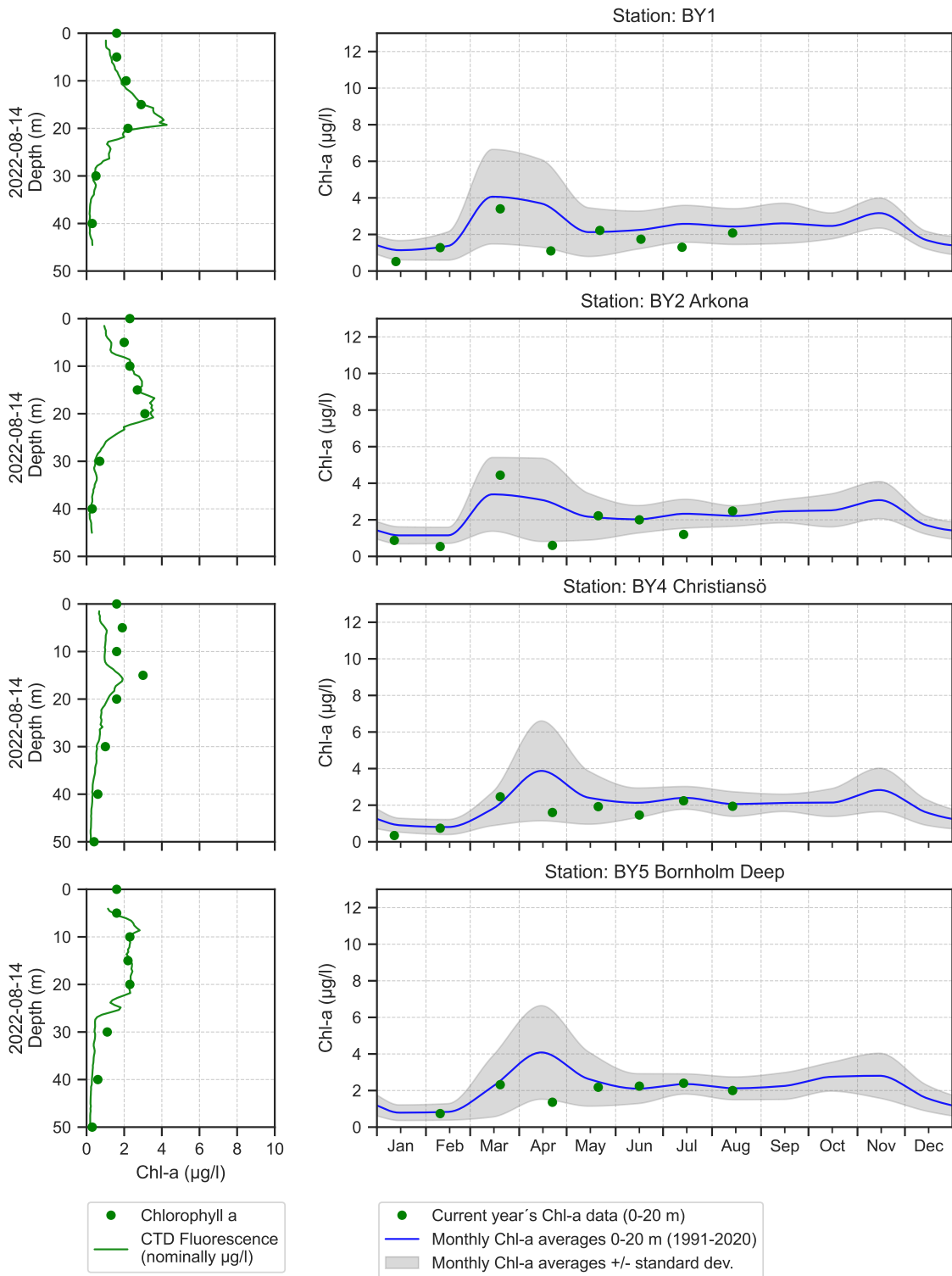
The Skagerrak



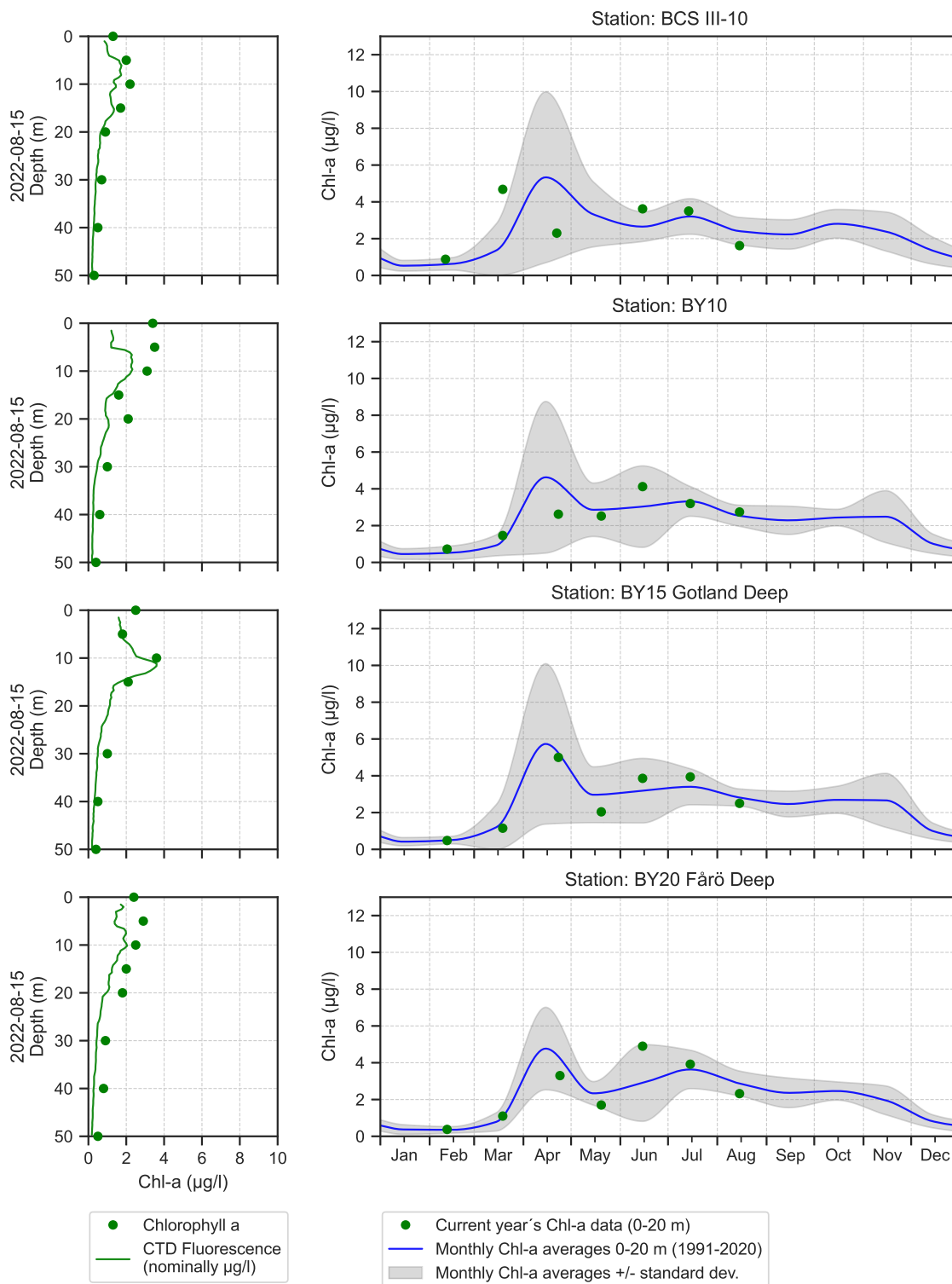
The Kattegat and The Sound



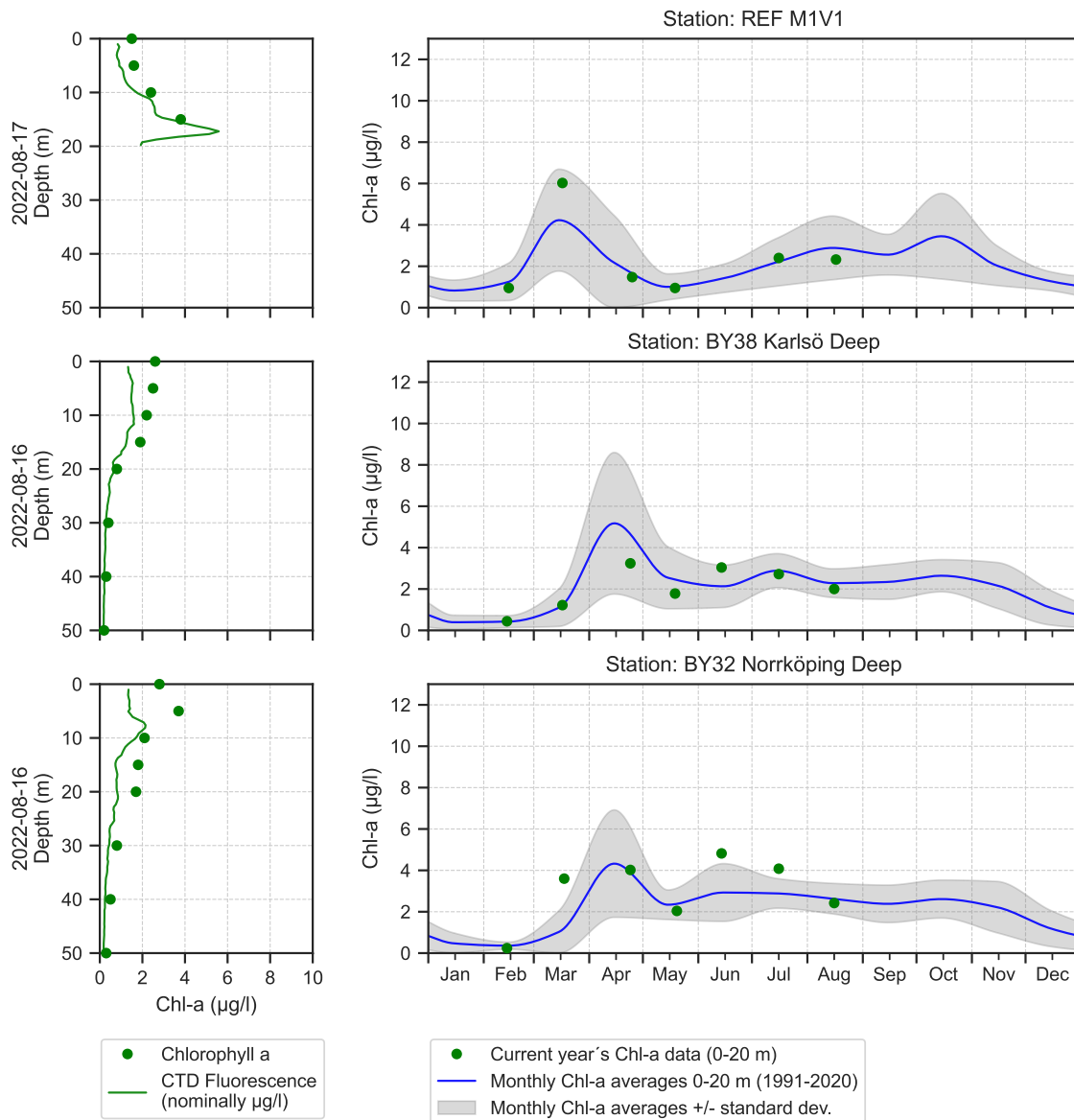
The Southern Baltic



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 algblomningar 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, 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.

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.

