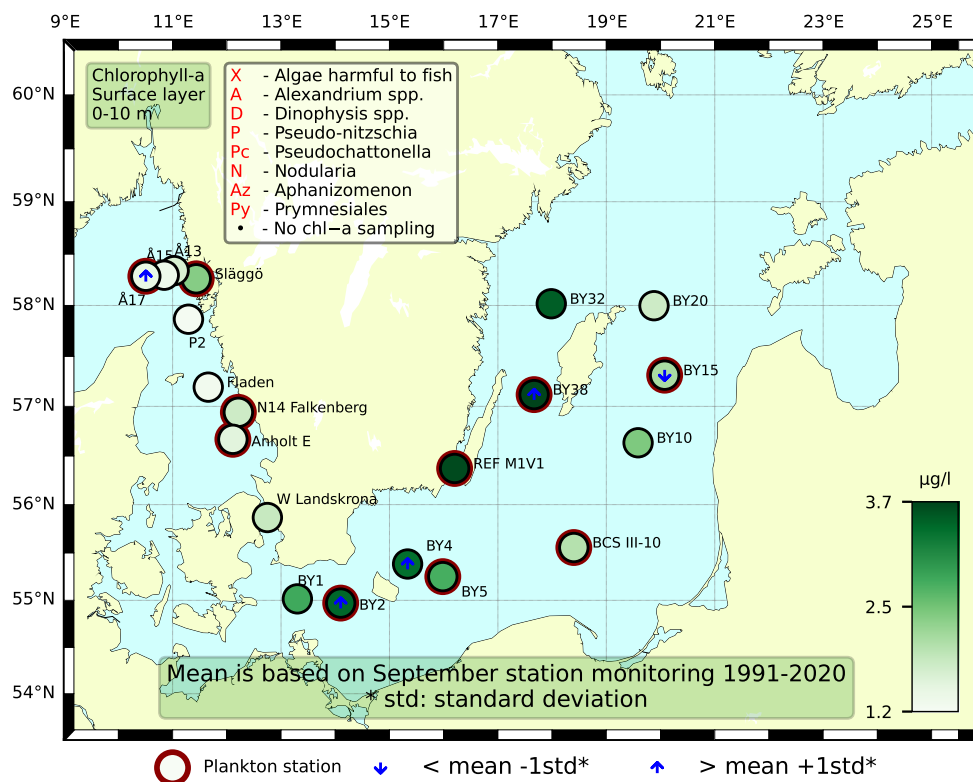


Sammanfattning

Diversiteten av växtplankton var hög vid samtliga stationer i Västerhavet. Kiselalger dominerade överlag i cellantal och framför allt var *Pseudosolenia calcar-avis* vanlig. I Skagerrak förekom dinoflagellaten *Dinophysis acuta** i relativt höga antal. Kalkalgen *Emiliania huxleyi* var vanligt förekommande. Samtliga integrerade klorofyllvärden var låga men inom det normala för månaden förutom vid Å17 där de var något förhöjda.

Diversiteten och cellantal av växtplankton var generellt låga i Östersjön, men med högst diversitet vid BY5. BY5 var den enda stationen där alla de tre arterna av filamentösa cyanobakterier som bildar blomningar under sommaren fortfarande fanns. Den potentiellt giftiga arten *Prorocentrum cordatum** fanns med förhöjda cellantal vid BY5. Generellt var det gott om små arter och grupper, så som *Gymnodiniales*, *Pyramimonas* spp., *Heterocapsa rotundata*, *Cryptomonadales* och ciliater. Dinoflagellaten *Dinophysis norvegica** fanns vid BY15. De integrerade klorofyllvärdena i det övre skiktet (0–10 m) var under det normala vid BY15, medan klorofyllvärdena i de båda integrerade skikten (0–10 m och 0–20 m) var över det normala på BY2, BY4 och BY38. I övrigt var värdena inom det normala för månaden.



Abstract

The phytoplankton diversity was high at all stations along the Swedish west coast. Diatoms dominated in cell numbers and *Pseudosolenia calcar-avis* was common. In Skagerrak the potentially toxic dinoflagellate *Dinophysis acuta** was common. The coccolithophore *Emiliania huxleyi* was found in high cell numbers at all stations. The integrated chlorophyll concentrations (0-10m and 0-20 m) were low, but within normal for this month at all stations except at Å17 where it was a bit elevated.

Diversity and cell abundance of phytoplankton were generally low in the Baltic Sea, but with highest diversity at BY5. BY5 was the only station where all three species of the summer bloom forming cyanobacteria were still present. The potentially toxic dinoflagellate *Prorocentrum cordatum** was common at BY5. Generally, there were plenty of small species and groups, such as *Gymnodiniales*, *Pyramimonas* spp., *Heterocapsa rotundata*, *Cryptomonadales* and ciliates. The dinoflagellate *Dinophysis norvegica** was present at BY15. The integrated chlorophyll concentration in the interval closest to the surface (0-10 m) was below normal at BY15, while the concentrations in both of the intervals (0-10 m and 0-20 m) were above normal at BY2, BY4 and BY38. Otherwise the 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.

The Skagerrak

Å17 (open Skagerrak) 16th of September

The phytoplankton diversity and the total cell numbers were moderate. The larger cells were dominated by the dinoflagellate *Dinophysis acuta** and the diatom *Pseudosolenia calcar-avis* was the most abundant. Among the diatoms, the potentially toxic genus *Pseudo-nitzschia** and *Cerataulina pelagica* were common. The smallest cells were dominated by the coccolithophore *Emiliania huxleyi*. The integrated chlorophyll concentration (0-10 m) was higher than normal whereas 0-20 m was low but within normal for this month.

Släggö (Skagerrak coast) 16th of September

The phytoplankton diversity was high but the total cell numbers were moderate. The larger cells were dominated by the genus *Dinophysis** of which *D. acuta** was the most common. Among the diatoms the toxic genus *Pseudo-nitzschia** was common. The smallest cells were dominated by cryptomonadales and the coccolithophore *E. huxleyi*. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were low but within normal for this month.



Fig 1. The beautiful chain forming diatom *Asterionellopsis glacialis* was found for the first time this autumn. Photo: M. Johansen.

The Kattegat

Anholt E 17th of September

Both the phytoplankton diversity and the total cell numbers were moderate. Only a few larger cells were encountered of which mainly *P. calcar-avis* was found. Several smaller diatoms were common such as *Skeletonema marinoi*, *Dactyliosolen fragilissimus* and *C. pelagica*. Among the smallest cells *E. huxleyi* was the most common. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were low but within normal for this month.

N14 Falkenberg 17th of September

The phytoplankton diversity was high and total cell numbers were moderate. Diatoms dominated in cell counts and *P. calcar-avis* was abundant. Several smaller diatoms were common such as *S. marinoi*, *Nitzschia longissima* and the genus *Pseudo-nitzschia**. Among the smallest cells *E. huxleyi* was the most common. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were low but within normal for this month.

The Baltic

BY2 18th of September

The cell abundance and diversity were quite low with mostly small species, such as *Gymnodiniales*, *Cryptomonadales*, *Pseudanabaena* sp. and ciliates. Of the larger cells *Chaetoceros castracanei* and *Dissodinium pseudolunula* were present with a few cells each. *Aphanizomenon* sp. was still present with a few filaments in the water column. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were above the normal range for this month.

BY5 18th of September

The cell abundance was quite low but diversity was quite high with many small species, such as *Gymnodiniales*, *Cryptomonadales*, *Heterocapsa rotundata*, *Pyramimonas* spp. and ciliates. The potentially toxic dinoflagellate *Prorocentrum cordatum**, the harmless diatom *Dactyliosolen fragilissimus* as well as *Aphanizomenon* sp. were all quite numerous at this station. A few cells of the potentially harmful group *Prymnesiales** and some filaments of *Nodularia spumigena** were also present. This station is the only station where all three species of the bloom forming filamentous cyanobacteria were present. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were within the normal range for this month.

BY15 19th of September

The cell abundance and diversity were quite low with mostly small species, such as *Cryptomonadales*, *H. rotundata*, *Pyramimonas* spp. and ciliates. The tintinnid (ciliate within a shell) *Heliocostomella subulata* was quite abundant. Among the larger species the diatoms *Actinocyclus* sp. and *C. castracanei* were present, as well as the toxin producing dinoflagellate *Dinophysis norvegica**. 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.

BCSIII-10 19th of September

The phytoplankton diversity and abundances were very low with mainly small cells of *Gymnodiniales*, *Cryptomonadales* and ciliates. There were a few filaments of *N. spumigena** present. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were within the normal range for this month.

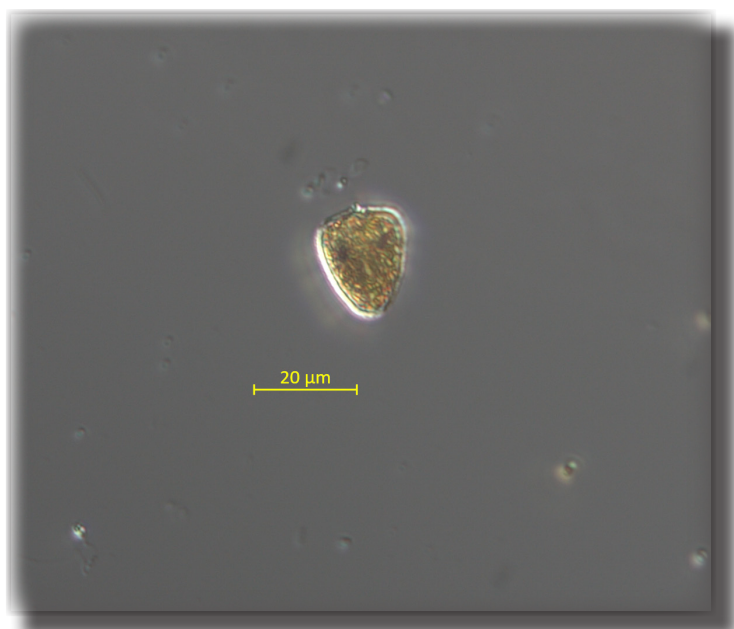


Fig 2. The potentially toxic dinoflagellate *Prorocentrum cordatum** was quite numerous at BY5 in September.
Photo: M. Karlberg.

BY38 20th of September

The cell abundances were quite low but the diversity was quite high with many small species, such as *Gymnodiniales*, *Cryptomonadales* and ciliates. There were also some larger species, such as the diatom *Coscinodiscus granii*, the filamentous cyanobacteria *Pseudanabaena* sp. and *Aphanizomenon* sp. that were quite numerous. A few cells of the potentially harmful group *Prymnesiales*^{*} were present. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were above the normal range for this month.

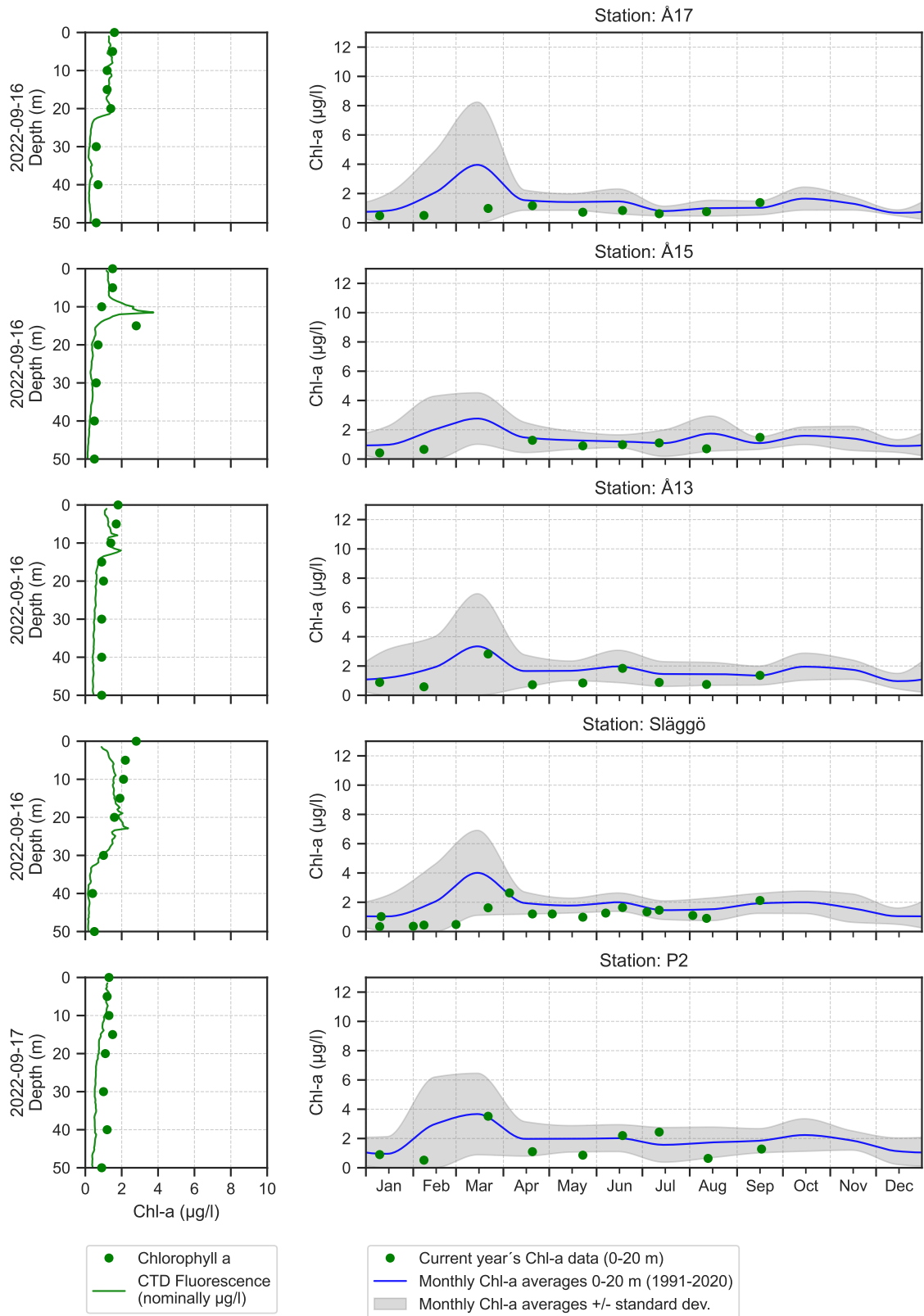
REFM1V1 21st of September

The cell abundances were quite low but diversity was quite high with many small species, such as *Cryptomonadales*. There were also some larger species, such as the diatom *C. granii* and the filamentous cyanobacterium *Pseudanabaena* sp. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were within the normal range for this month.

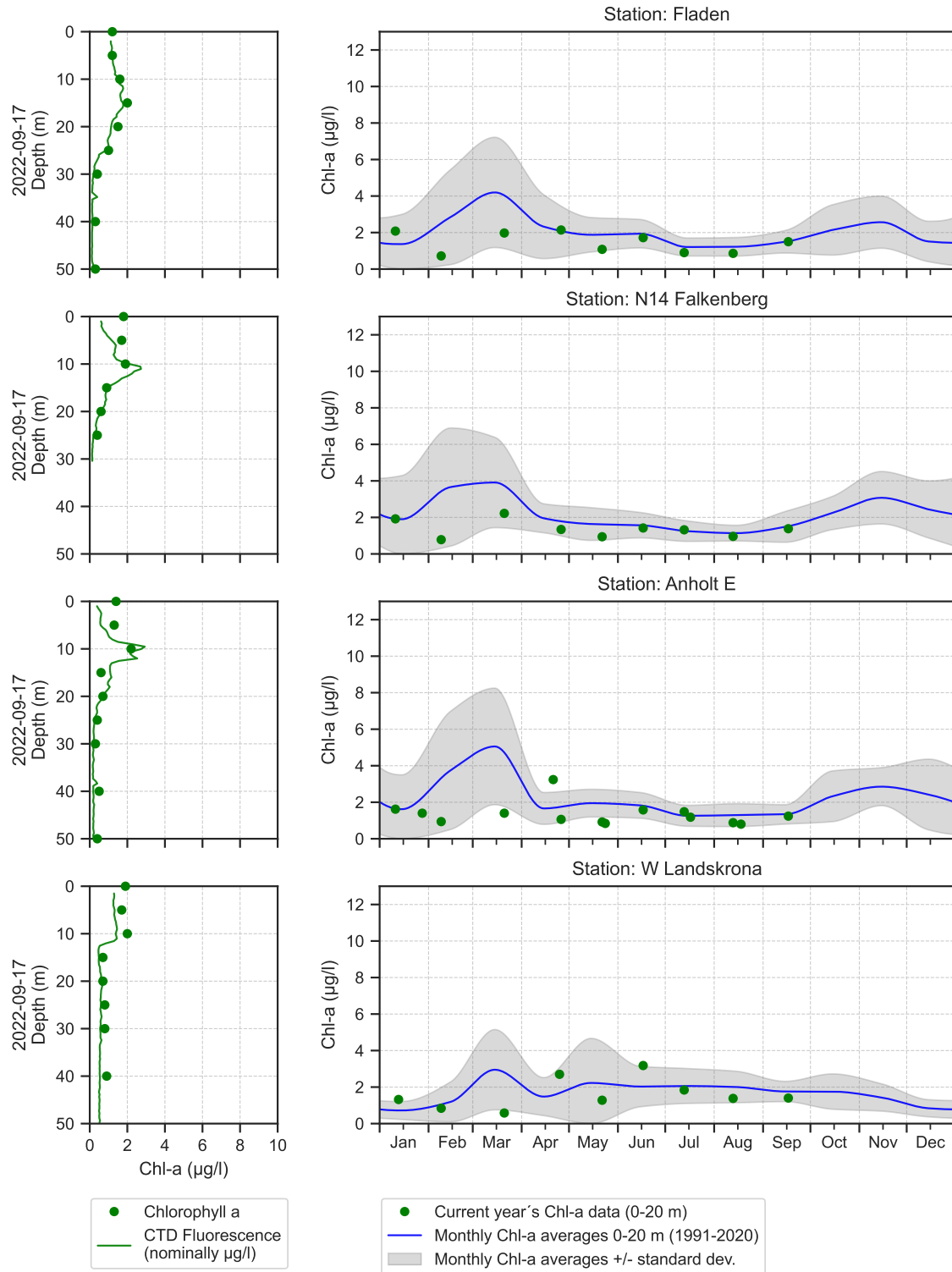
Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	17/9	17/9	16/9	16/9
Hose 0-10 m	presence	presence	presence	presence
Asterionellopsis glacialis		present		
Cerataulina pelagica	common	present		common
Chaetoceros			present	present
Chaetoceros affinis		present	present	present
Chaetoceros contortus		present	present	
Chaetoceros convolutus	present	present	present	present
Chaetoceros coronatus				present
Chaetoceros curvisetus	present	present	present	
Chaetoceros danicus				present
Chaetoceros lorenzianus			present	
Chaetoceros socialis	present	present	present	present
Chaetoceros tenuissimus				present
Cylindrotheca closterium	common		present	present
Dactyliosolen fragilissimus	common	present	present	present
Ditylum brightwellii	present	present	present	present
Guinardia flaccida	present	present		
Leptocylindrus danicus	common		present	present
Nitzschia longissima	common	common	common	common
Pleurosigma		present		
Proboscia alata			present	
Pseudo-nitzschia	present	common	common	common
Pseudosolenia calcar-avis	common	common	present	common
Rhizosolenia setigera f. pungens		present	common	
Skeletonema marinoi	common	common	present	common
Thalassionema nitzschioides		present		present
Thalassiosira angulata		present		
Thalassiosira gravida			present	
Alexandrium		present		
Alexandrium pseudogonyaulax		present		
Azadinium				present
Dinophysis acuminata	present		common	
Dinophysis acuta			common	common
Dinophysis norvegica				present
Gymnodiniales	common	common	present	common
Gyrodinium spirale	present			
Heterocapsa rotundata		present		
Peridinales	present	present		
Prorocentrum micans	common	present		present
Protoperidinium		present		
Protoperidinium bipes			present	
Protoperidinium crassipes				present
Scrippsiella		present		present
Torodinium				present
Tripos furca	present			
Tripos fusus	present		present	present
Tripos lineatus	present	present	present	present
Tripos longipes			present	present
Tripos macroceros			present	present
Tripos muelleri	present	present	present	
Dinobryon balticum	common	present		
Emiliania huxleyi	very common	very common	common	very common
Prymnesiales	present			
Cryptomonadales	present		common	present
Octactis speculum		present	present	
Dolichospermum	present	present		
Nodularia spumigena	present	present		present
Woronichinia			present	
Ciliophora	present		present	present
Laboea strobila		present		

Selection of observed species	BY2	BY5	BY15	BCSIII-10	BY38	REFM1V1
Red=potentially toxic species	18/9	18/9	19/9	19/9	20/9	21/9
Hose 0-10 m	presence	presence	presence	presence	presence	presence
Actinocyclus			present	present	present	
Chaetoceros castracanei	present	present	present		present	
Chaetoceros danicus						present
Chaetoceros thronsdennii		present				
Coscinodiscus granii					common	common
Cylindrotheca closterium	present	present				
Dactyliosolen fragilissimus		common				
Skeletonema marinoi						present
<i>Dinophysis norvegica</i>			present			
Dissodinium pseudolunula	present					
Gymnodiniales	common	common	present	common	common	present
Gymnodinium verruculosum	present	present	present			
Heterocapsa rotundata		common	common		present	present
<i>Prorocentrum cordatum</i>		common				
Prorocentrum micans	present					
Tripes muelleri						present
<i>Prymnesiales</i>		present			present	
Monoraphidium					present	
Oocystis					present	
Halosphaera						present
Pyramimonas	present	common	common	present	present	present
Cryptomonadales	common	common	common	common	common	common
Telonema	present		present			
Pseudopedinella		present	present		present	
Eutreptiella	present					present
Aphanizomenon	present	common			common	
Dolichospermum		present				
<i>Nodularia spumigena</i>		present		present		
Pseudanabaena	common	present	present	present	common	common
Snowella				present		
Ebria tripartita	present	present				present
Ciliophora	common	common	common	common	common	present
Mesodinium rubrum					present	present
Helicostomella subulata			common	present	present	

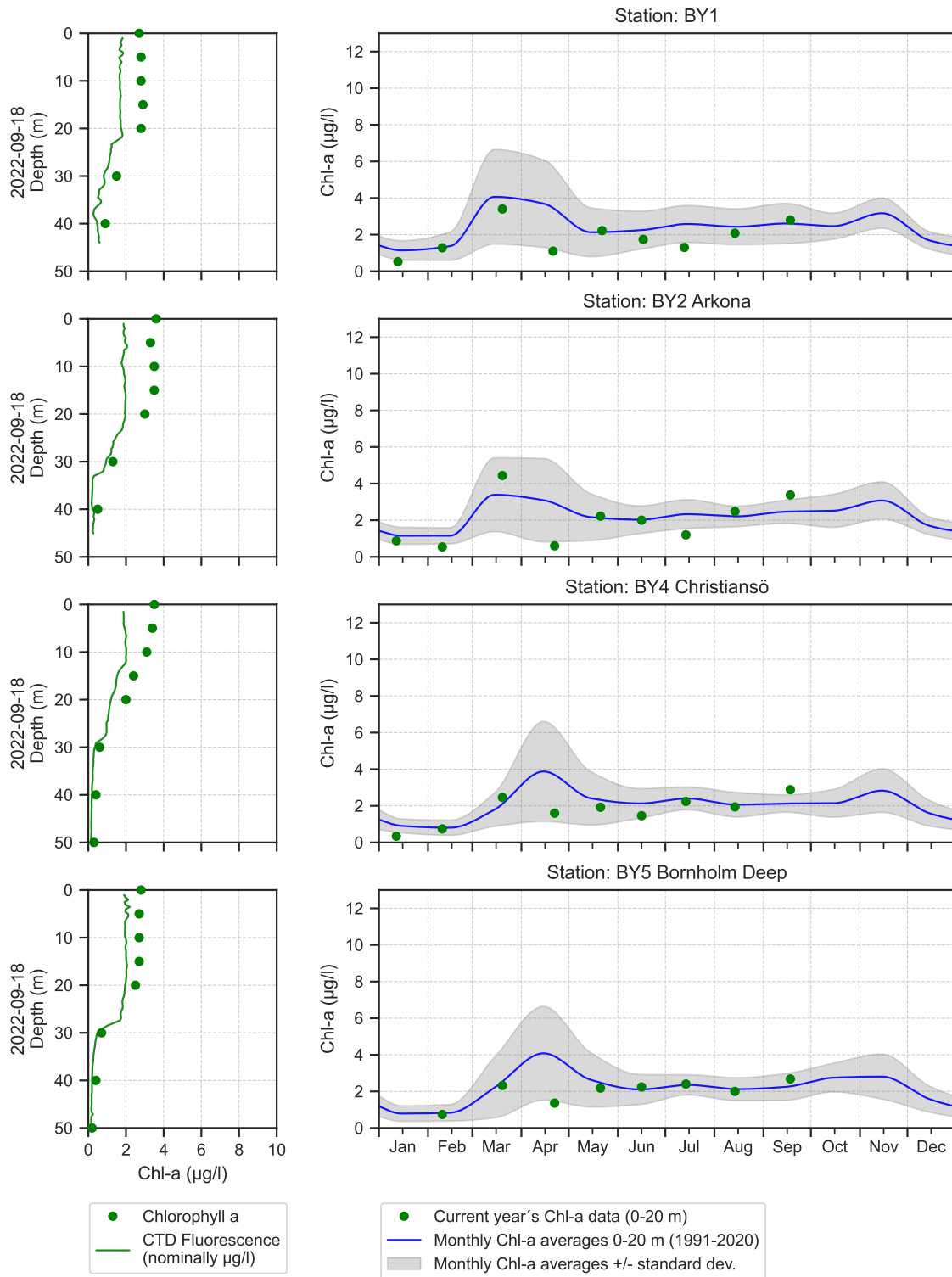
The Skagerrak



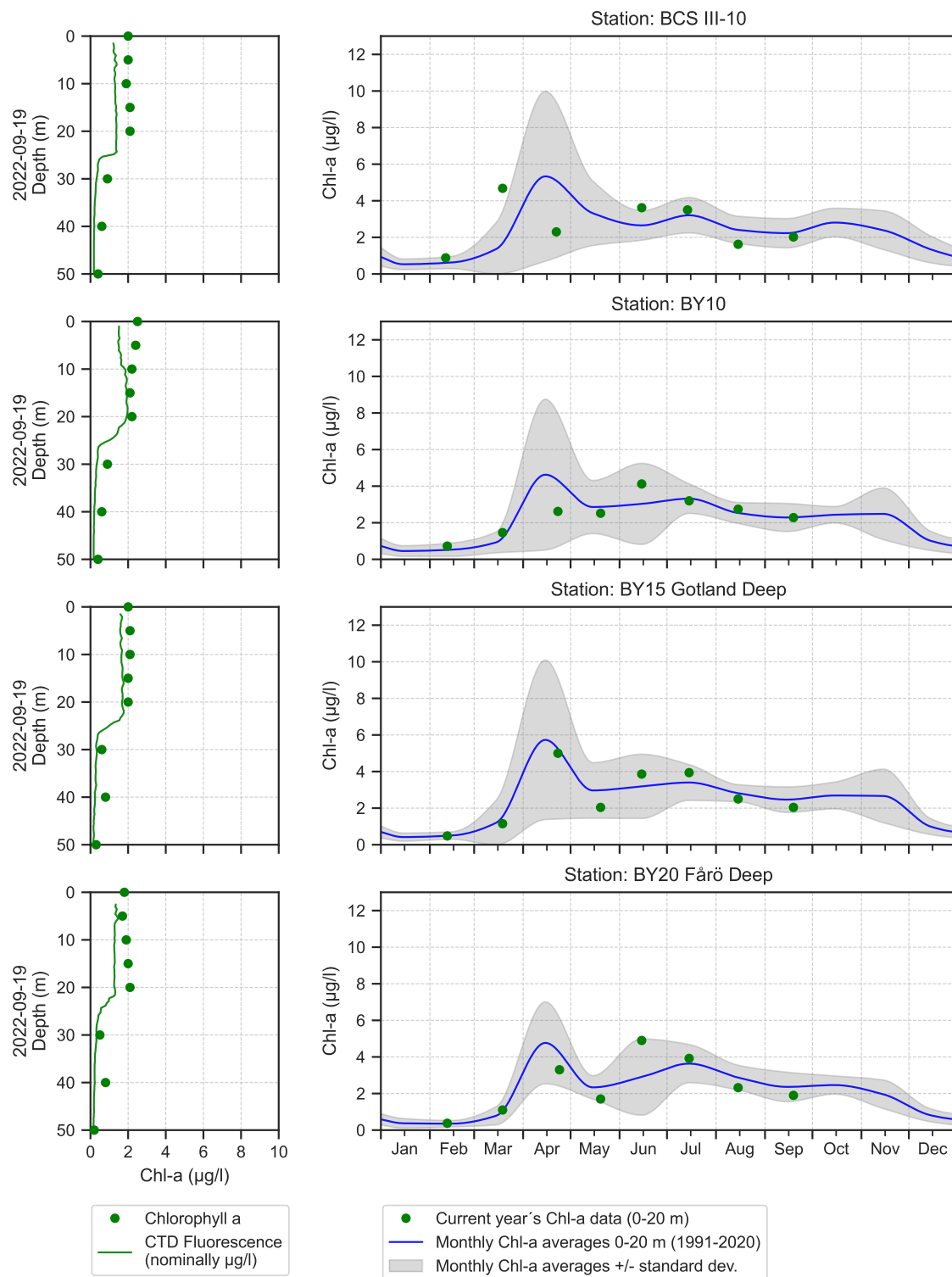
The Kattegat and The Sound



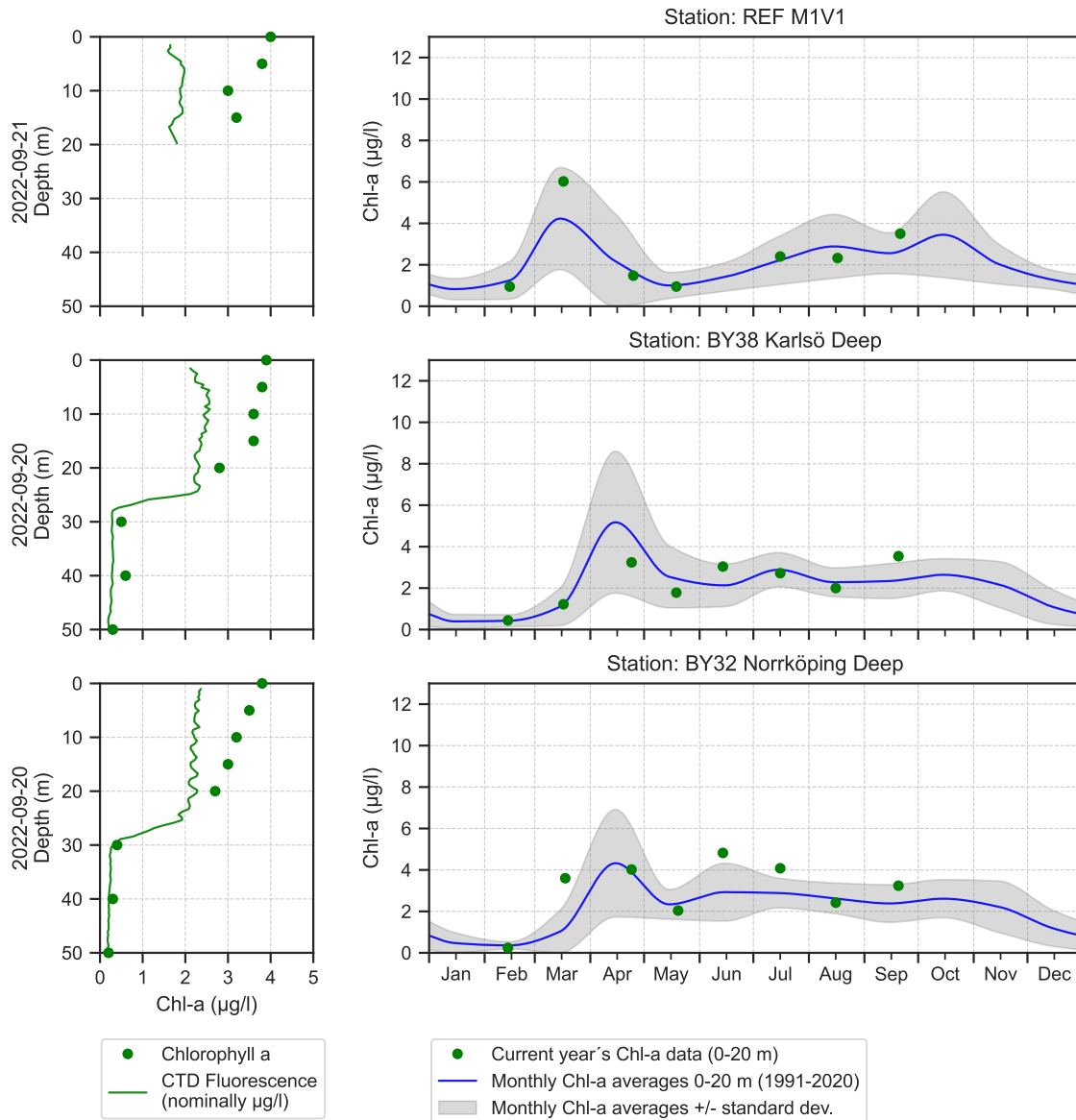
The Southern Baltic



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 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.

