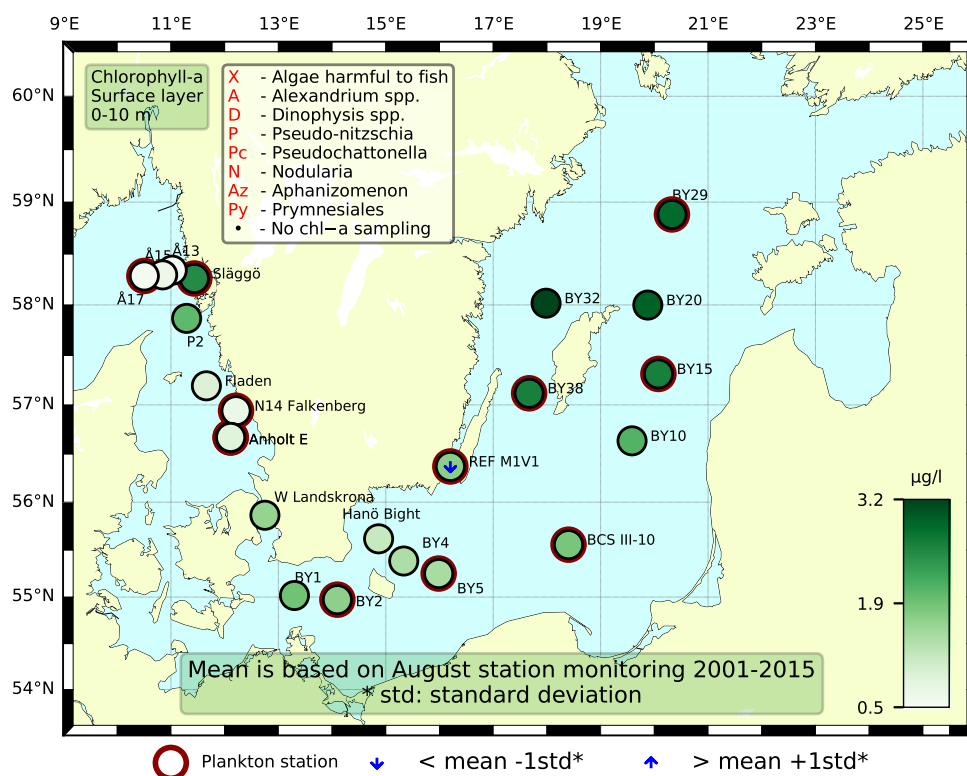


Sammanfattning

Artdiversiteten var överlag relativt hög vid flertalet stationer i Västerhavet även om totala cellantalerna var ganska låga. Olika kiselalger återfanns i höga cellantal och exempelvis *Pseudo-nitzschia** var vanlig vid alla provtagna stationer. Bland dinoflagellater återfanns *Karenia mikimotoi* i höga cellantal vid ett par stationer. Ett fluorescensmaximum återfanns framför allt vid 20 - 25 meter vid flertalet stationer. Den art som framför allt dominerade i Skagerrak var dinoflagellaten *Karenia mikimotoi* medans släktet *Tripos* dominerade i Kattegatt. Vid flertalet stationer återfanns relativt höga cellantal av coccolitoforen *Emiliania huxleyi*. De integrerade klorofyllvärdena var normala för årstiden.

Den filamentösa cyanobakterien *Aphanizomenon flosaquae* fanns i relativt stora mängder i norra Egentliga Östersjön och vid REFM1V1 i Kalmar sund. I de sydöstra och sydvästra delarna fanns det inga eller bara enstaka filamentösa cyanobakterier i proverna. I övrigt dominerades proverna av ciliater, cryptomonader och små kolonibildande cyanobakterier. De integrerade klorofyllvärdena var normala för denna månaden vid alla stationer förutom vid REFM1V1 i Kalmar sund där de var under det normala.



Abstract

The species diversity was overall high at most stations sampled along the west coast even if the total cell numbers were not. Different diatoms were found in relatively high cell numbers and for example the genus *Pseudo-nitzschia** was common at all stations. Among the dinoflagellates, *Karenia mikimotoi* was common at a couple of stations. A fluorescens maximum was found at about 20 - 25 meters at most stations. In Skagerrak the maximum was dominated by the dinoflagellate *Karenia mikimotoi* and in Kattegat the genus *Tripos* dominated. The coccolithophore *Emiliania huxleyi* was found in relatively high numbers at several stations. The integrated chlorophyll concentrations were normal at all stations for this month.

The filamentous cyanobacterium *Aphanizomenon flosaquae* was abundant in the northern Baltic Proper and at REFM1V1 in the Kalmar sound. Filamentous cyanobacteria were absent or in very low amounts in the southeastern and southwestern parts of the Baltic Proper. Ciliates, cryptomonads and small colony forming cyanobacteria were numerous. The integrated chlorophyll concentrations were below normal for this month at REFM1V1 in the Kalmar sound and within normal at all of the other Baltic stations.

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

Å17 (open Skagerrak) 14th of August

Both phytoplankton diversity and total cell numbers were low. Diatoms dominated slightly and among those the genus *Pseudo-nitzschia** and *Leptocylindrus danicus* were most common. Only a few dinoflagellates were present and mostly naked dinoflagellates. The small cells were dominated by the coccolithophore *Emiliania huxleyi*. A fluorescens maxima was recorded at about 25 meters. The extra sample collected mainly contained dinoflagellates where *Karenia mikimotoi* was most abundant but also *Tripes macroceros* was common. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

Släggö (Skagerrak coast) 14th of August

Phytoplankton diversity was relatively high whereas total cell numbers was moderate. The sample had no clear species that dominated but the dinoflagellates *Karenia mikimotoi* and *Prorocentrum micans* and the diatom genus *Pseudo-nitzschia* and *Cerataulina pelagica* were all common. A few cells of the potentially toxic *Dinophysis acuminata** were also present. Among the smaller cells different cryptomonads were common. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.



Figure 1. The dinoflagellate *Tripes fusus* dominated in the fluorescens maximum found at Anholt E on the first sampling occasion.

Photo: Marie Johansen.

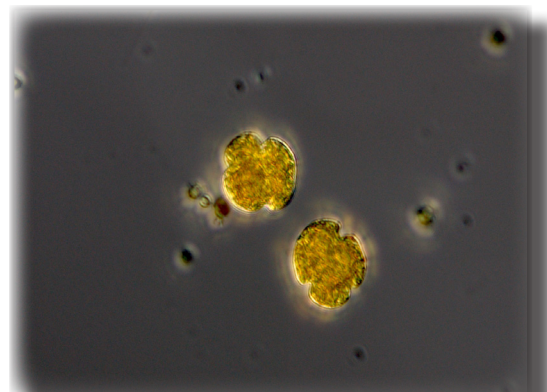


Figure 2. The dinoflagellate *Karenia mikimotoi* was common at a couple of stations along the Swedish west coast. Photo: Marie Johansen.

The Kattegat

Anholt E 15th and 20th of August

Phytoplankton diversity was moderate whereas total cell numbers was relatively low on the first occasion whereas diversity had increased slightly on the second occasion. On the first sampling occasion filamentous cyanobacteria were most common and the genus *Dolichospermum* dominated. A few filaments of *Nodularia spumigena* was also present. On the last sampling occasion the filaments of cyanobacteria had decreased substantially. Different diatoms were common on both occasions where *Pseudosolenia calcar-avis*, *Dactyliosolen fragilissimus* and the genus *Pseudo-nitzschia** were common. The dinoflagellate *Karenia mikimotoi* was common on the second occasion. Among the smaller cells *Emiliania huxleyi* and different cryptomonads were common. A fluorescens maxima was recorded at about 23 meters on the first sampling occasion. The extra sample collected mainly contained dinoflagellates where the genus *Tripes* dominated and especially *T. fusus* was most common. The integrated (0-10 m) chlorophyll concentrations were within normal for this month.

N14 Falkenberg 15th of August

Phytoplankton diversity was moderate whereas total cell numbers was relatively low. The sample was dominated by the cyanobacteria genus *Dolichospermum*. Different diatoms were also common where *Rhizosolenia setigera f. pungens*, *Guinardia flaccida* and the genus *Pseudo-nitzschia** were most common. Among the smaller cells *Emiliania huxleyi* and different cryptomonads were common. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

The Baltic

BY2 16th of August

Diatoms dominated the sample with *D. fragilissimus* being the most abundant species. Filamentous cyanobacteria were present, mostly by *Aphanizomenon flosaquae*. A few specimens of *Nodularia spumigena** were present. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

BY5 16th of August

Small unidentified species were abundant as were ciliates and Gymnodiniales i.e. athecate dinoflagellates. No filamentous cyanobacteria were found. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

BCSIII-10 10th of August

The diatom *Chaetoceros castracanei*, ciliates and Cryptomonadales were abundant. Filamentous cyanobacteria were absent. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

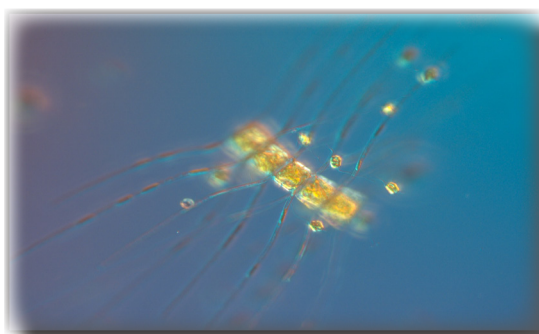


Figure 3. The diatom *Chaetoceros castracanei* was abundant at BCSIII-10. The small cells on the “setae” are the diatom *Attheya septentrionalis*. Photo: Ann-Turi Skjevik.



Figure 4. Small cells from various phytoplankton groups were abundant in the Baltic Sea samples; Arrow: *Monoraphidium* sp., arrowhead: *Pyramimonas* sp. and star: *Pseudanabaena* sp. Photo: Ann-Turi Skjevik.

BY15 17th of August

Small cells like *Pyramimonas*, cryptomonadales and cyanobacteria colonies were abundant. Filamentous cyanobacteria were present, of which *A. flosaquae* was the most numerous. A few specimens of *N. spumigena** and *Dolichospermum* were present. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

BY29 and BY31 17th and 18th of August

Small colony forming cyanobacteria and *A. flosaquae* were abundant. Ciliates and cryptomonads were numerous in samples with very few species. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

BY38 19th of August

Small cells like colony forming cyanobacteria dominated the sample. The filamentous cyanobacterium *A. flosaquae* was abundant and a few specimens of *N. spumigena** and *Dolichospermum* were found. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

REFMIV1 19th of August

The largest number of species were found here although the total cell numbers were low. *A. flosaquae* was abundant as well as small colony forming cyanobacteria. A few specimens of *N. spumigena** and *Dolichospermum* were present. Several diatom species were present, e.g. *Chaetoceros castracanei*, *Skeletonema marinoi* and *Coscinodiscus*, however in low cell numbers. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were below normal for this month.

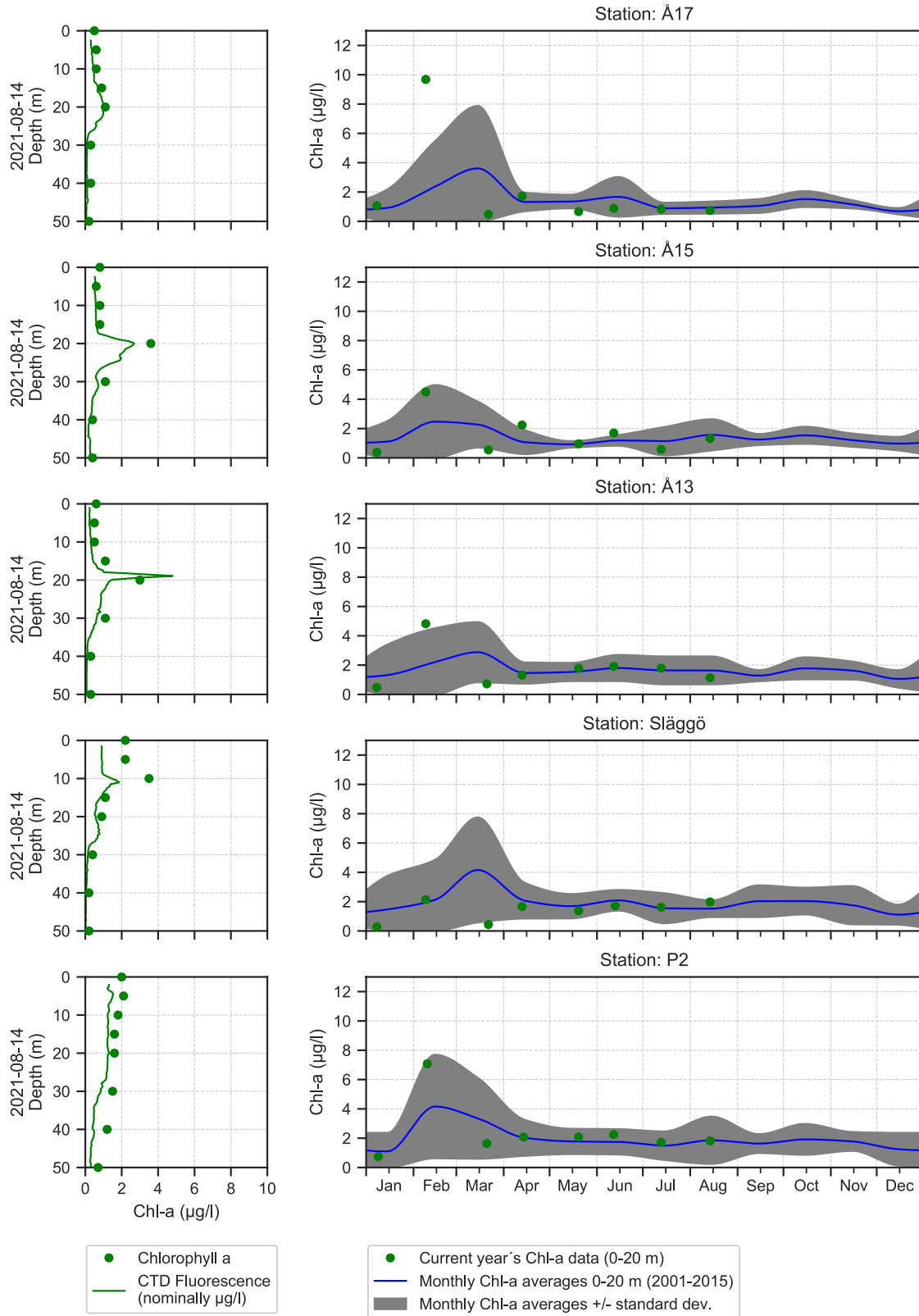
Phytoplankton analysis and text:

Ann-Turi Skjevik and Marie Johansen

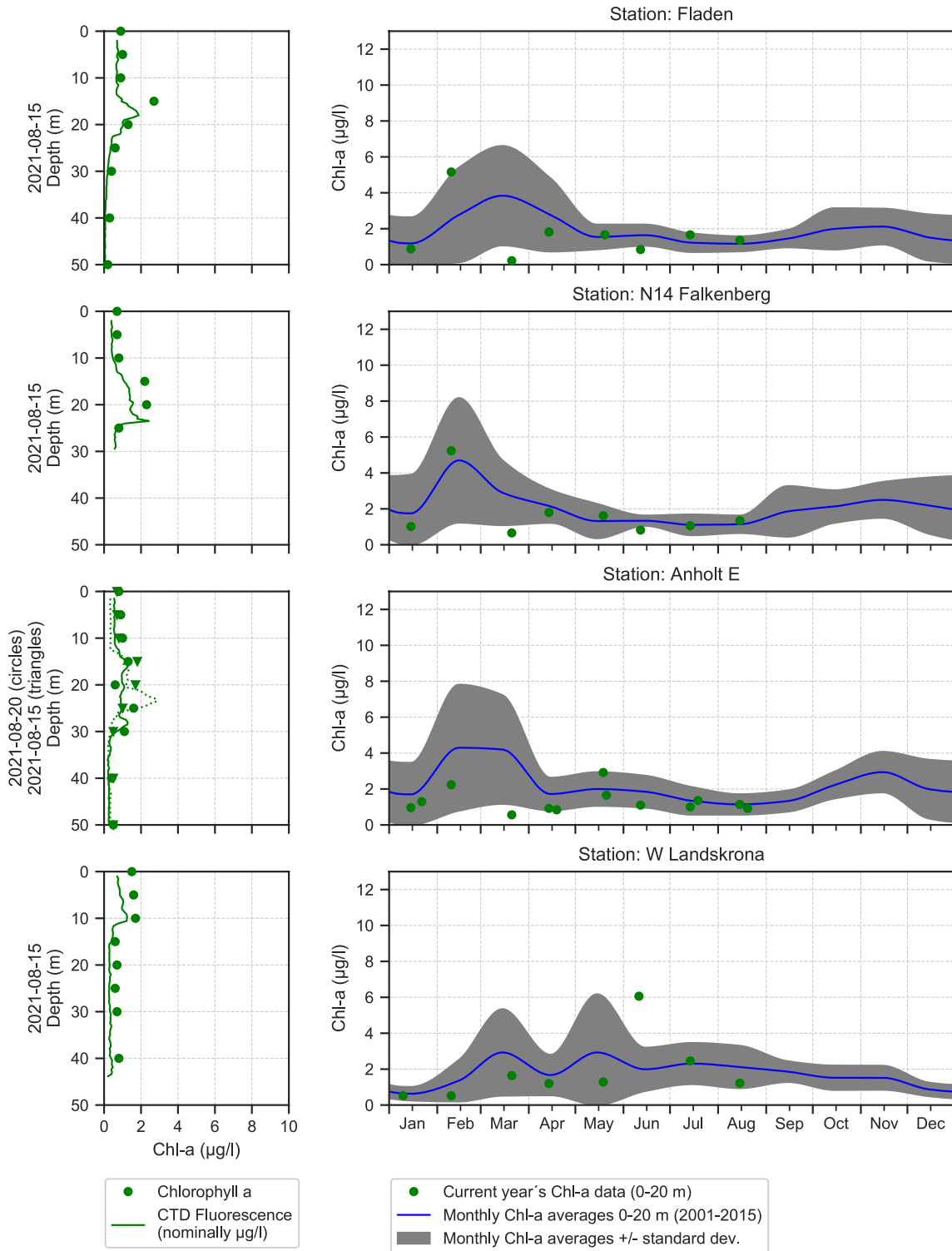
Selection of observed species	Anholt E	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	15/8	20/8	15/8	14/8	14/8
Hose 0-10 m	presence	presence	presence	presence	presence
Cerataulina pelagica		present			
Chaetoceros	present		present	present	
Chaetoceros affinis	present	present	present		
Chaetoceros curvisetus		present			
Chaetoceros socialis				present	
Chaetoceros tenuissimus		present			
Dactyliosolen fragilissimus	common	common	present	present	
Guinardia flaccida	present		common		
Leptocylindrus danicus		present		present	common
Nitzschia longissima				present	
Proboscia alata		present	present	present	
Pseudo-nitzschia	common	common	common	common	common
Pseudosolenia calcar-avis	common	common	present	present	
Rhizosolenia setigera f. pungens	common	common	common	present	
Skeletonema marinoi		present		present	
Amphidinium longum				present	
Dinophysis acuminata				present	
Gymnodiniales	common	common	common	common	common
Gyrodinium					present
Gyrodinium spirale				present	
Heterocapsa rotundata			present	present	present
Karenia mikimotoi		common		common	
Katodinium glaucum			present	present	present
Oxytoxum criophilum		present		present	present
Peridinales	present	present	present		present
Phalacroma rotundatum	present	present	present		
Polykrikos schwartzii	present	present	present		
Prorocentrum micans	present	present	present	common	present
Proto-peridinium	present	present	present	present	
Proto-peridinium crassipes					present
Proto-peridinium divergens		present		present	
Proto-peridinium pellucidum	present	present			
Proto-peridinium steinii	present		present		
Torodinium robustum		present			
Tripes furca		present		present	
Tripes fusus		present	present	present	present
Tripes lineatus	present	present		present	
Tripes macroceros	present				
Tripes muelleri	present	present			
Dinobryon balticum	present				
Dinobryon faculiferum		present	present		
Cryptomonadales	common	common	common	common	present
Emiliania huxleyi	present	common	common	present	common
Prymnesiales		present			
Chlorodendrales				present	
Pyramimonas		present			
Leucocryptos marina			present		present
Dictyocha fibula		present			
Dolichospermum	very common	present	very common	present	
Nodularia spumigena	present	present		present	
Laboea strobila					present
Ciliophora	common	common	common	present	common

Selection of observed species	BCSIII-10	BY2	BY5	BY15	BY38	REFM1V1	BY29	BY31
Red=potentially toxic species	16/8	16/8	16/8	17/8	19/8	19/8	17/8	18/8
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Attheya septentrionalis	present	present	present					
Cerataulina pelagica		present						
Chaetoceros castracanei	very common			present		present		
Chaetoceros danicus		present		present				
Chaetoceros thronsenii						present		
Chaetoceros wighamii						present		
Coscinodiscus								present
Cyclotella choctawhatcheeana						present	present	present
Cylindrotheca closterium						present		
Dactyliosolen fragilissimus		very common						
Leptocylindrus danicus		present						
Nitzschia					present			
Nitzschia longissima						present		present
Skeletonema marinoi						present		
Amphidinium crassum					present			
Dinophysis acuminata		present						present
Dinophysis norvegica				present	present	present		present
Gymnodiniales		present	common		common	present		
Gymnodinium verruculosum	present	present	present					
Heterocapsa	present	present	present			present		
Heterocapsa triquetra						present		present
Phalacroma rotundatum					present	present		
Tripes muelleri		present	present					
Cryptomonadales	common	common	common	common	common	common	common	common
Pyramimonas	common	present	present	present	present	present	present	present
Prymnesiales	present							
Dinobryon faculiferum						present		
Quadricoccus euryhalinicus					present	present		
Monoraphidium							present	present
Binuclearia lauterbornii						present		
Aphanizomenon flosaquae		present		common	very common	very common	very common	very common
Aphanothece								present
Aphanothece paralleliformis						present	present	present
Dolichospermum lemmermannii				present	present	present	present	present
Lemmermanniella				present	common	common	common	common
Nodularia spumigena		present		present	present	present		present
Pseudanabaena						present		common
Snowella				present			present	present
Pseudopedinella					present		present	
Ebria tripartita	present	present	present					present
Leucocryptos marina				present				
Ciliophora	common	common	common	common	common	common	common	common
Coxiella helix	present	common	present	present	present		present	
Helicostomella subulata			present					
Mesodinium rubrum				present	present	present	present	present

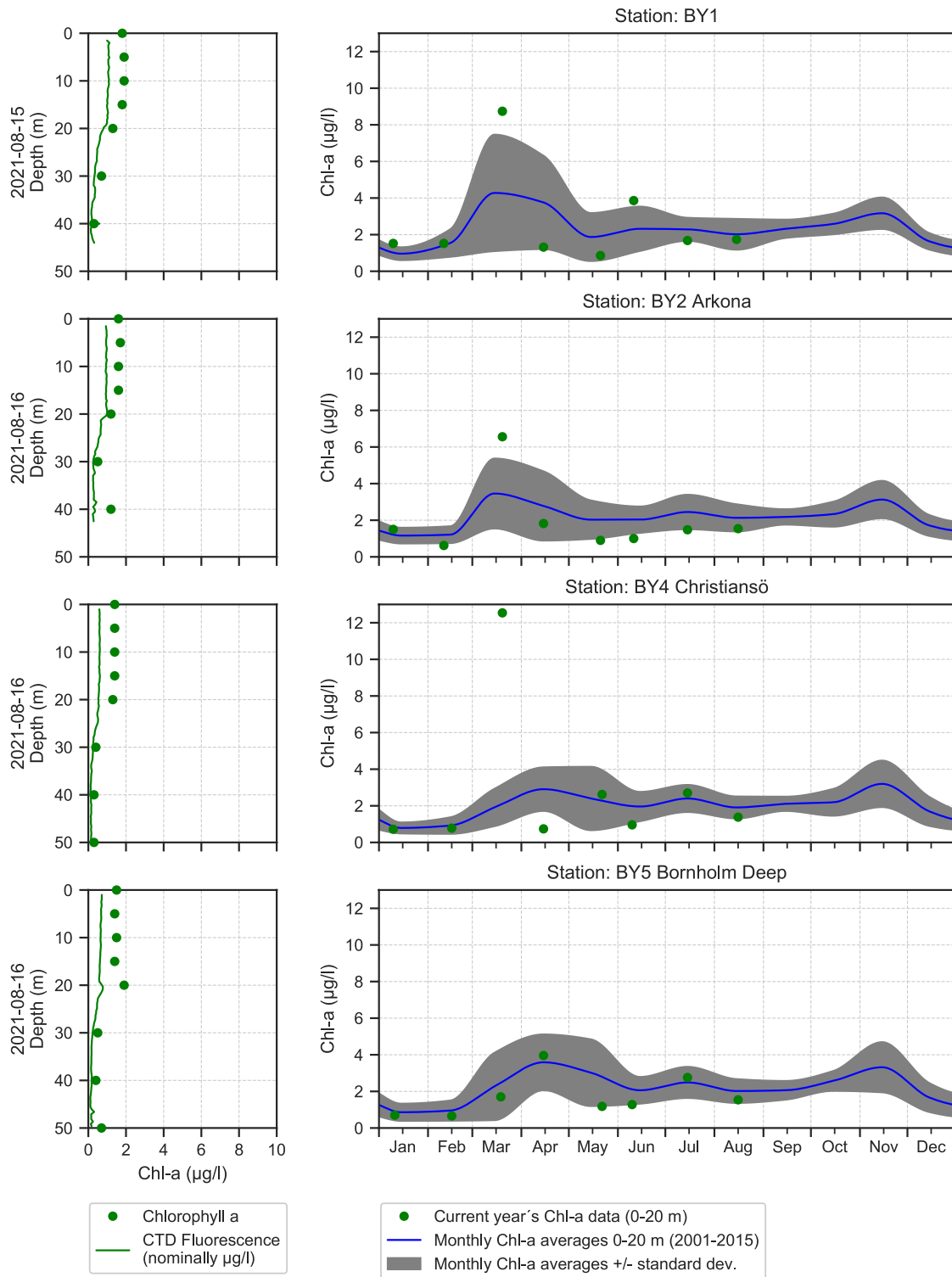
The Skagerrak



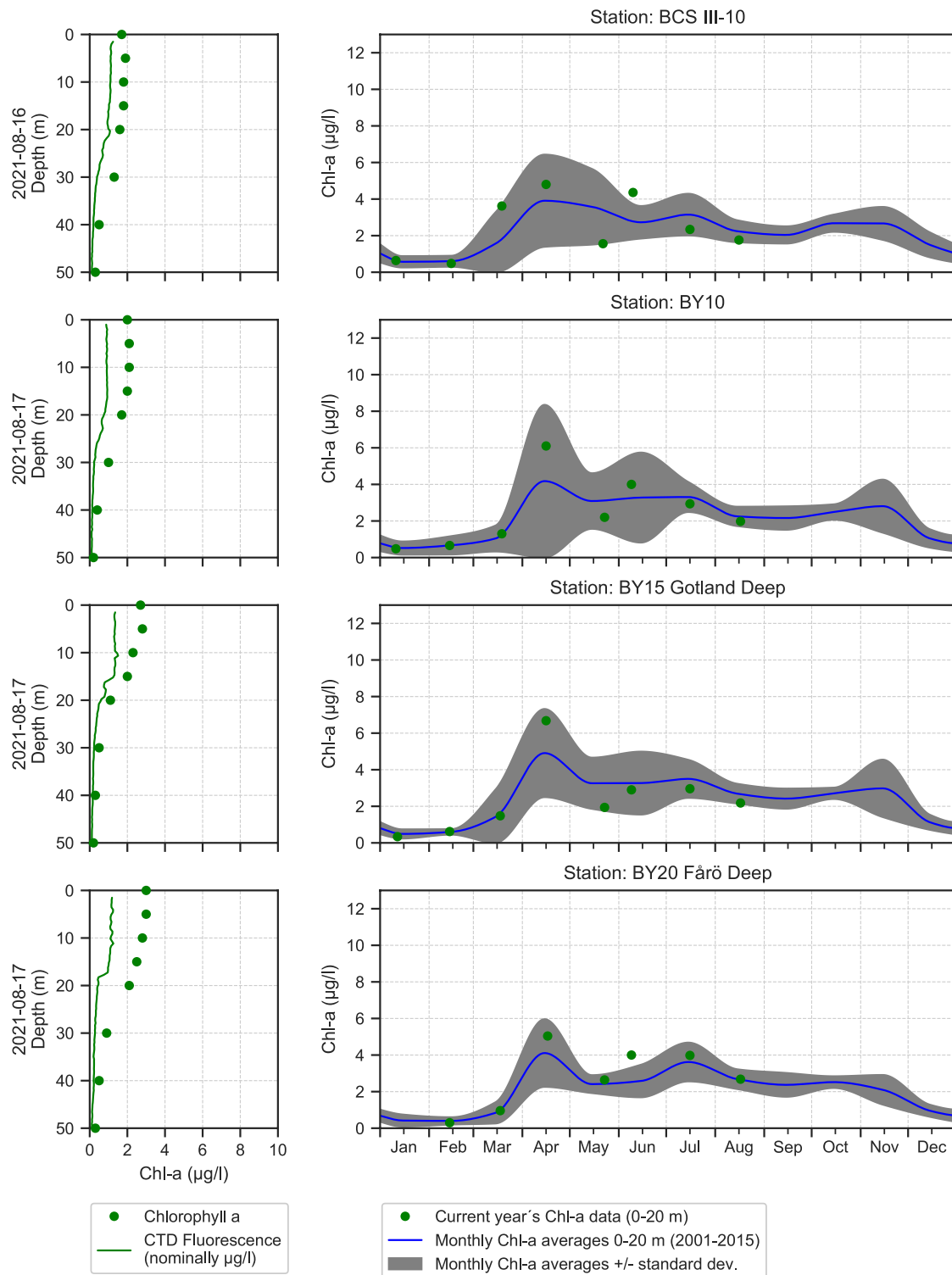
The Kattegat and The Sound



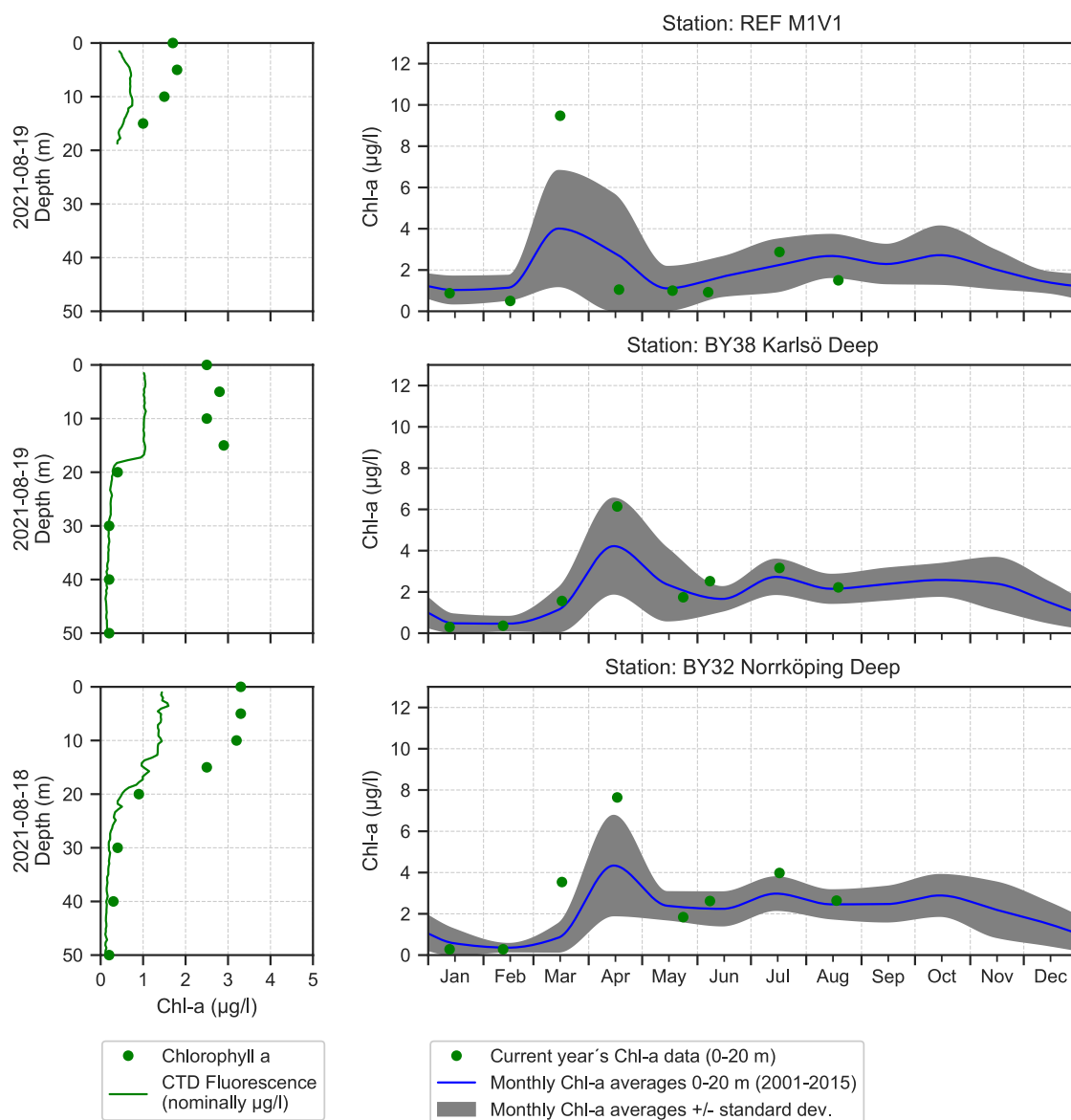
The Southern Baltic



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 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.

