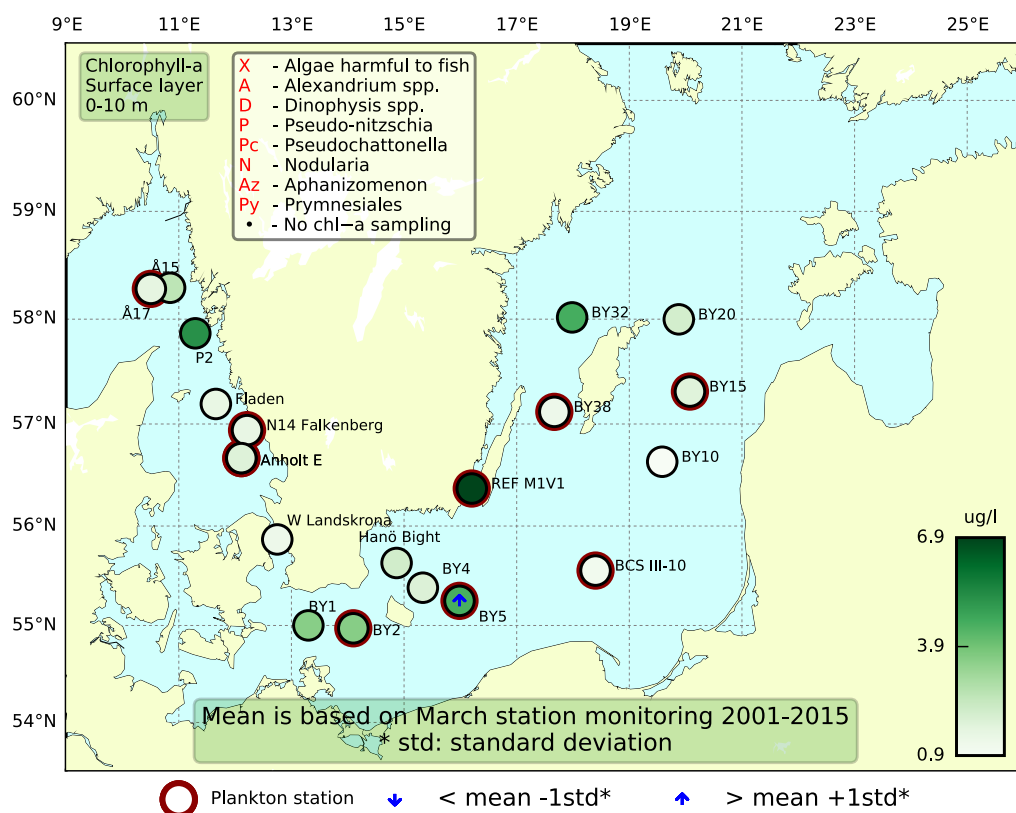


Sammanfattning

I Skagerrak och Kattegatt var diversiteten av växtplankton låg och klorofyllhalterna normala. Vårblomningen var i sitt sista skede med rätt mycket *Guinardia delicatula* och ett fåtal kedjor av *Skeletonema marinoi*. Dessutom var det flagellater, såsom flera arter av *Pyramimonas* spp., som uppvisade högt cellantal. I norra Skagerrak, på Å17, hade kalkflagellaten *Emiliania huxleyi* högst cellantal. Även i Kattegatt dominerade *Guinardia delicatula*, men det fanns även dinoflagellater såsom *Dinophysis acuminata** och ciliater. Det var många arter av små flagellater. Klorofyllhalterna vid alla stationer var normala för mars månad, förutom vid Fladen 0-20 m där de var något högre än normalt.

Det fanns tecken till vårblomning vid alla växtplanktonstationer i Östersjön med tanke på observerade arter av kiselalger, ciliaten *Mesodinium rubrum* och dinoflagellaten *Peridiniella catenata*. Mest påtaglig var blomningen vid BY5 och Ref M1V1 i södra Egentliga Östersjön, där både klorofyllhalter och cellantal var förhöjda. Vid BY5, Ref M1V1, BY32 och BY38 var de integrerade klorofyllhalterna (0-20 m) över det normala för denna månaden.



Abstract

In the Skagerrak and the Kattegat the biodiversity in the phytoplankton community was low and the chlorophyll concentrations were normal. The spring bloom was in its final days with quite high amounts of *Guinardia delicatula* and a few chains of *Skeletonema marinoi*. Furthermore, flagellates, such as several species of *Pyramimonas* spp. were found in high cell numbers. In the northern Skagerrak, Å17 displayed the highest cell number of *Emiliania huxleyi*. In the Kattegat *Guinardia delicatula* dominated, but there were also dinoflagellates such as *Dinophysis acuminata** and ciliates. The flagellate community showed quite high diversity. The chlorophyll concentrations were normal for March at all stations, except at Fladen 0-20 m where it was slightly higher than normal.

Signs of spring bloom were found at all phytoplankton stations in the Baltic, considering the observed species of diatoms, the ciliate *Mesodinium rubrum* and the dinoflagellate *Peridiniella catenata*. The bloom was the most intense at BY5 and Ref M1V1 in the southern Baltic Proper where both chlorophyll concentrations and cell numbers were high. At BY5, Ref M1V1, BY32 and BY38, the integrated chlorophyll concentrations (0-20 m) were above normal 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) 18th of March

The phytoplankton diversity was relatively low but some groups were dominant and found in high cell numbers. Among the diatoms *Guinardia delicatula* dominated over *Skeletonema marinoi*. There was a high concentration of flagellates, where *Pyramimonas* spp. was conspicuous. Some ciliates and the dinoflagellate *Karenia mikimotoi** were also present in relatively high cell numbers. The coccolithophorid *Emiliania huxleyi* were also present in quite high numbers. The chlorophyll concentrations were normal for this month at Å17 and Å15. Å13 was not sampled this month.

Släggö (Skagerrak coast) 19th of March

The phytoplankton diversity and the total cell numbers were low. The cell numbers in the sample were dominated by small flagellates and *Guinardia delicatula*. The chlorophyll concentrations were not available at the time of writing, but at station P2 the chlorophyll was high but within the normal range.

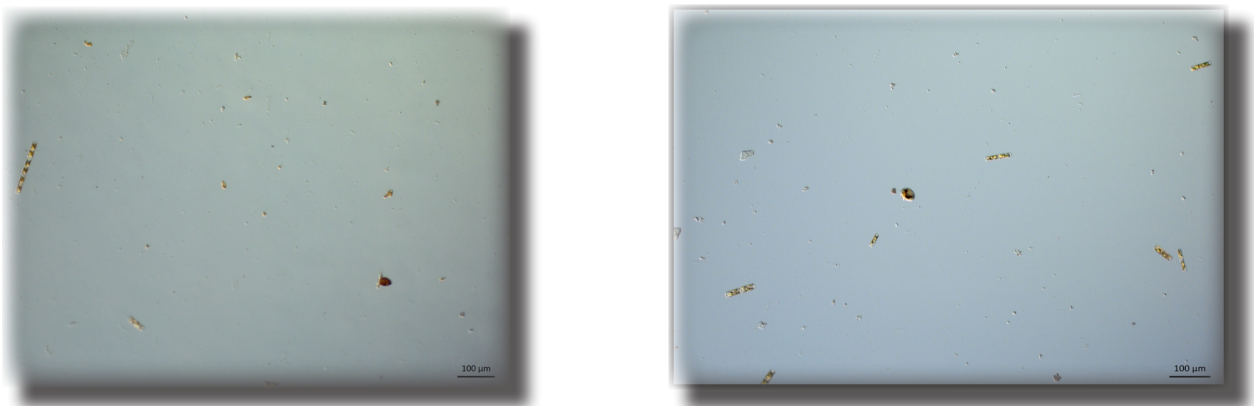


Photo 1: The photos display the differences in the phytoplankton community at Anholt E on the two sampling occasions. At the first visit (left picture), the community was dominated by *Guinardia delicatula*, with *Pseudochattonella* sp.* and ciliates. At the second visit, there were *G. delicatula* but also high amounts of *Dinophysis acuminata**. Both pictures are in 100x magnification. Photo: M. Karlberg.

The Kattegat

Anholt E 17th and 18th of March

The two sampling occasions at Anholt E differed quite a lot. On both occasions, the spring bloom was in its final days with high cell numbers of *Guinardia delicatula**, but only a few, if any, chains of *Skeletonema marinoi*. Among the dinoflagellates *Dinophysis acuminata** was common. Additionally, on the first sampling occasion, ciliates, *Pseudochattonella* sp.*, Cryptomonadales, *Leucocryptos marina*, *Pyramimonas* spp. and other smaller flagellates were all in relatively high numbers. On the second sampling occasion the ciliates and all flagellates had reduced in numbers significantly. The chlorophyll concentration was normal for the month on both sampling occasions, but slightly higher on the first occasion in the upper 5 meters in the water column. At station W Landskrona chlorophyll concentration was low but within the normal range.

N14 Falkenberg 17th of March

The phytoplankton diversity was relatively low but some groups were dominant and found in high cell numbers. The diatom *Guinardia delicatula* and ciliates dominated the sample, but *Skeletonema marinoi*, *Dinophysis acuminata*, *Gyrodinium spirale*, *Pseudochattonella* sp. and flagellates as well as *Leucocryptos marina* were present in quite high cell numbers. The integrated chlorophyll concentrations were low but normal for this month. At station Fladen chlorophyll concentration was high but within the normal range at 0-10 m but above normal concentrations in the integrated 0-20 m sample.

The Baltic Sea

BY2 16th and BY5 19th of March

Spring bloom had started with high cell numbers of the diatoms *Skeletonema marinoi*, *Thalassiosira* spp. and the ciliate *Mesodinium rubrum*. The species variety was rich, both diatoms and dinoflagellates as well as other algae groups were represented. The integrated (0-20 m) chlorophyll concentrations were within normal for this month at BY2 and BY5.

BCSIII-10 19th and BY15 20th of March

The tendencies of spring bloom were present considering the high cell numbers of *Skeletonema marinoi* and *Mesodinium rubrum*, at BY15 especially. The integrated chlorophyll concentrations were within normal, although somewhat elevated at BY15, where the highest concentration was found at 20 meters depth.

Ref M1V1 16th of March

Spring bloom was ongoing. The species diversity was low, but the diatoms *Skeletonema marinoi* and *Thalassiosira* spp. and the ciliate *Mesodinium rubrum* were found in high cell numbers. The integrated (0-20 m) chlorophyll concentration was above normal for this month, being high from the surface to the bottom at this shallow station.

BY38 15th of March

The chlorophyll concentrations were a lot lower than at Ref M1V1 although the integrated concentration was above normal at BY38 as well. The species diversity was higher at BY38 and high cell numbers were noted of the diatom *Skeletonema marinoi*, the dinoflagellate *Peridiniella catenata* and the flagellate *Eutreptiella* sp.

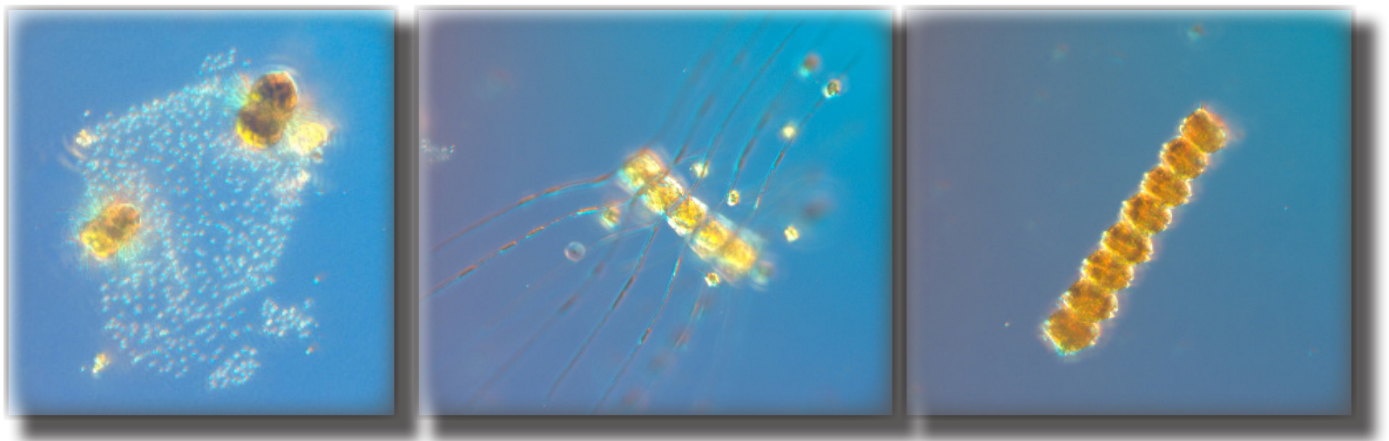
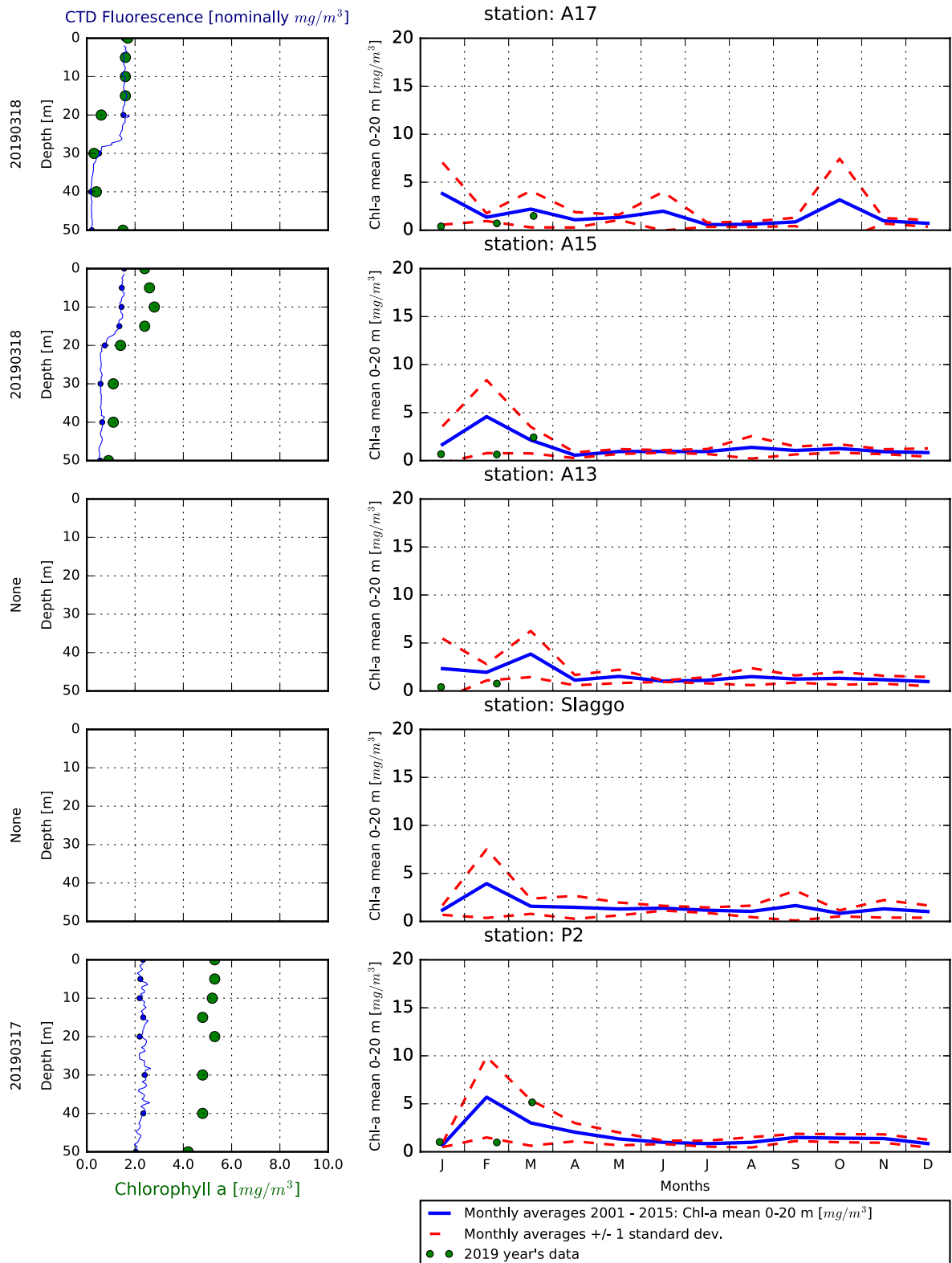


Photo 3-5: The ciliate *Mesodinium rubrum* and the cyanobacterium *Aphanocapsa* sp.(left), the diatom *Chaetoceros castracanei* (middle) and *Peridiniella catenata* were found at most of the Baltic stations. Photos: A-T Skjevik

Selection of observed species	Anholt E	Anholt E	N14 Falkenberg	Släggö	Å17
Red=potentially toxic species	17/3	18/3	17/3	19/3	18/3
Hose 0-10 m	presence	presence	presence	presence	presence
<i>Cerataulina pelagica</i>				present	
<i>Chaetoceros pseudobrevis</i>					present
<i>Coscinodiscus radiatus</i>			present		
<i>Cylindrotheca closterium</i>			present	present	present
<i>Dactyliosolen fragilissimus</i>	present				
<i>Ditylum brightwellii</i>					present
<i>Entomoneis</i> spp					present
<i>Guinardia delicatula</i>	very common	very common	very common	common	very common
<i>Navicula</i> spp		present		present	
<i>Nitzschia</i> spp				present	
<i>Nitzschia longissima</i>	present	present	present		present
<i>Proboscia alata</i>	present			present	
<i>Pseudo-nitzschia</i> spp					present
<i>Skeletonema marinoi</i>		present	common	present	common
<i>Thalassiosira angulata</i>				present	
<i>Thalassiosira rotula</i>				present	present
<i>Amphidinium</i> spp	present	present	present		present
<i>Ceratium fusus</i>		present			
<i>Ceratium horridum</i>		present		present	
<i>Ceratium lineatum</i>					present
<i>Ceratium longipes</i>	present		present		
<i>Ceratium tripos</i>	present	present	present	present	
Dinophyceae	present	present	present		present
<i>Dinophysis acuminata</i>	common	common	common	present	present
<i>Dinophysis norvegica</i>		present	present		
Gymnodiniales	present	common	present	present	present
<i>Gyrodinium</i> spp	present	present			present
<i>Gyrodinium spirale</i>	present		common		
<i>Heterocapsa rotundata</i>	present		present		
<i>Karenia mikimotoi</i>	present			present	common
<i>Katodinium glaucum</i>	present	present			
<i>Phalacroma rotundatum</i>	present				
<i>Protoperidinium</i> spp	present				
<i>Protoperidinium bipes</i>	present	present	present		
<i>Protoperidinium brevipes</i>	present				
<i>Protoperidinium depressum</i>	present		present		
<i>Protoperidinium pellucidum</i>	present	present	present	present	
<i>Protoperidinium steinii</i>		present			
<i>Scrippsiella complex</i>	present	present	present	present	present
Cryptomonadales	present	common	present	present	present
<i>Dinobryon faculiferum</i>	present	present			
<i>Pseudanabaena</i> spp			present		
<i>Apedinella radians</i>		present			present
<i>Dictyocha speculum</i>				present	
<i>Emiliana huxleyi</i>	present	present	present	present	present
<i>Pseudochattonella</i> spp	common		common		
<i>Heterosigma</i> spp		present			
<i>Euglena</i> spp	present			present	common
<i>Pterosperma</i> spp				present	
<i>Pyramimonas</i> spp	very common	present	common	present	very common
<i>Ebria tripartita</i>		present			
<i>Leucocryptos marina</i>	common	common	common	present	present
<i>Telonema</i> spp			present		
<i>Telonema subtile</i>					present
Flagellates	very common	common	common	common	very common
<i>Bicosta minor</i>		present			
Ciliophora	very common	present	very common	present	common
<i>Laboea strobila</i>	present	present	present	present	present
<i>Mesodinium rubrum</i>	present	present	present		present

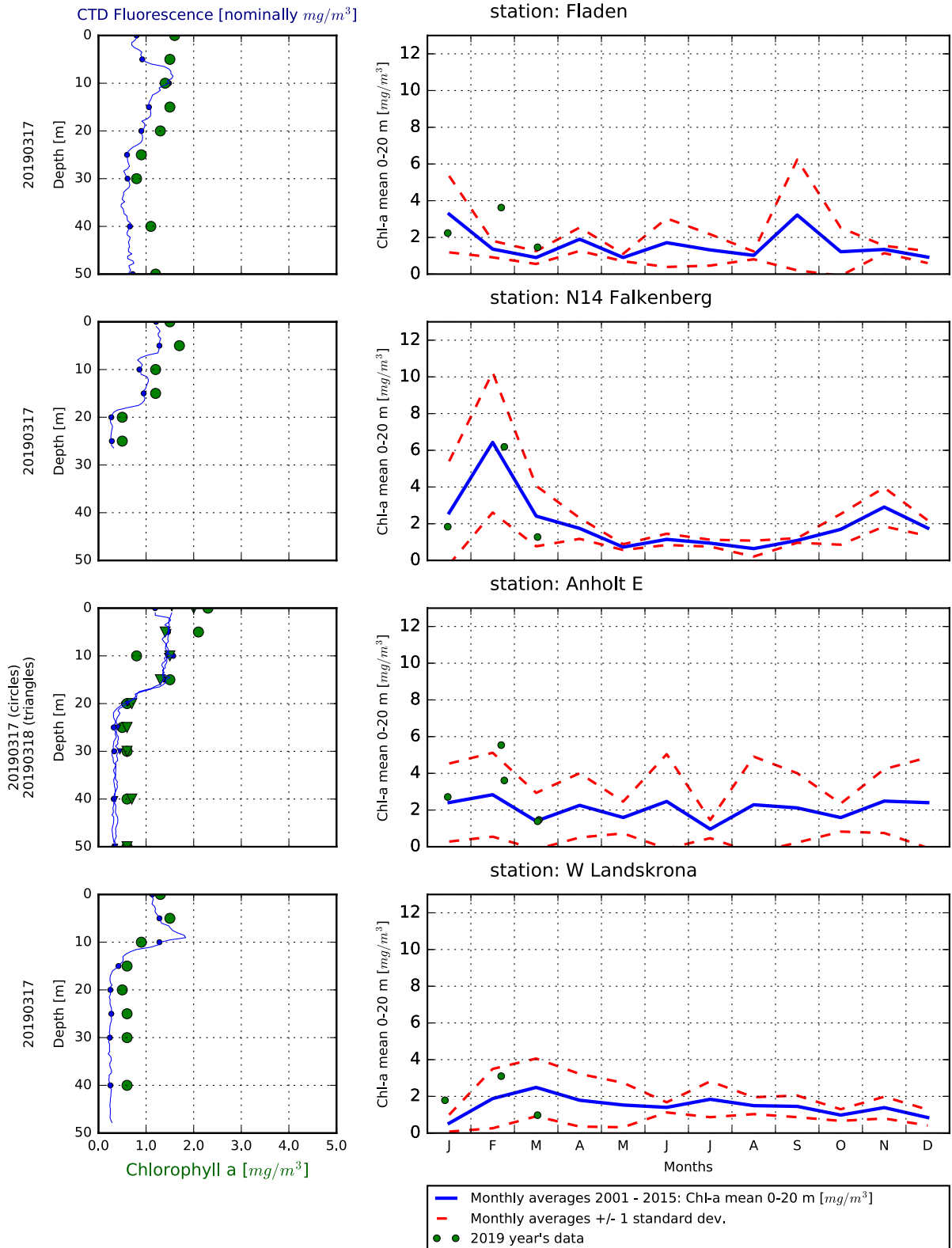
Selection of observed species	BY2	BY5	BCSIII-10	BY15	BY38	Ref M1V1
Red=potentially toxic species	16/3	19/3	19/3	20/3	15/3	16/3
Hose 0-10 m	presence	presence	presence	presence	presence	presence
Attheya septentrionalis		present			present	
Chaetoceros spp			present	present	present	
Chaetoceros castracanei	present	present			present	
Chaetoceros danicus	present		present	present		
Chaetoceros similis	present	present		present	present	
Chaetoceros subtilis		present	present		present	
Chaetoceros wighamii					present	
Coscinodiscus spp		present				present
Melosira nummuloides	present				present	
Nitzschia longissima		present			present	present
Skeletonema marinoi	common	very common	common	common	common	very common
Thalassiosira spp	common	present		present	present	common
Amphidinium spp	present					
Amylax triacantha				present		
Dinophysis norvegica					present	
Gymnodiniales		present				present
Gyrodinium spp		present				
Gyrodinium spirale					present	
Heterocapsa spp	present	present	present	present	present	
Heterocapsa rotundata		present		present		present
Karlodinium veneticum				present		
Katodinium glaucum	present	present		present	present	
Peridiniella catenata	present	present	present	present	common	present
Peridiniella danica					present	
Protoperidinium bipes				present	present	present
Cryptomonadales	present	present	present	present	present	present
Prymnesiales		present		present		
Aphanocapsa spp	present	present		present		
Aphanothece paralleliformis			present			
Lemmermanniella spp		present				
Snowella spp	present	present	present	present	present	
Planctonema lauterbornii	present	present	present	present	present	
Pseudopedinella spp		present			present	
Eutreptiella spp	common	common	present	present	common	present
Ebria tripartita	present	common		present	present	present
Leucocryptos marina			present			
Choanoflagellata	present	present				
Oocystis spp	present	present	present	present	present	
Pterosperma spp			present			
Pyramimonas spp		present		present	present	
Mesodinium rubrum	common	common	present	common	present	common
Strombidium spp		present		present		present
Ciliophora	present	common	present	common	present	present

The Skagerrak

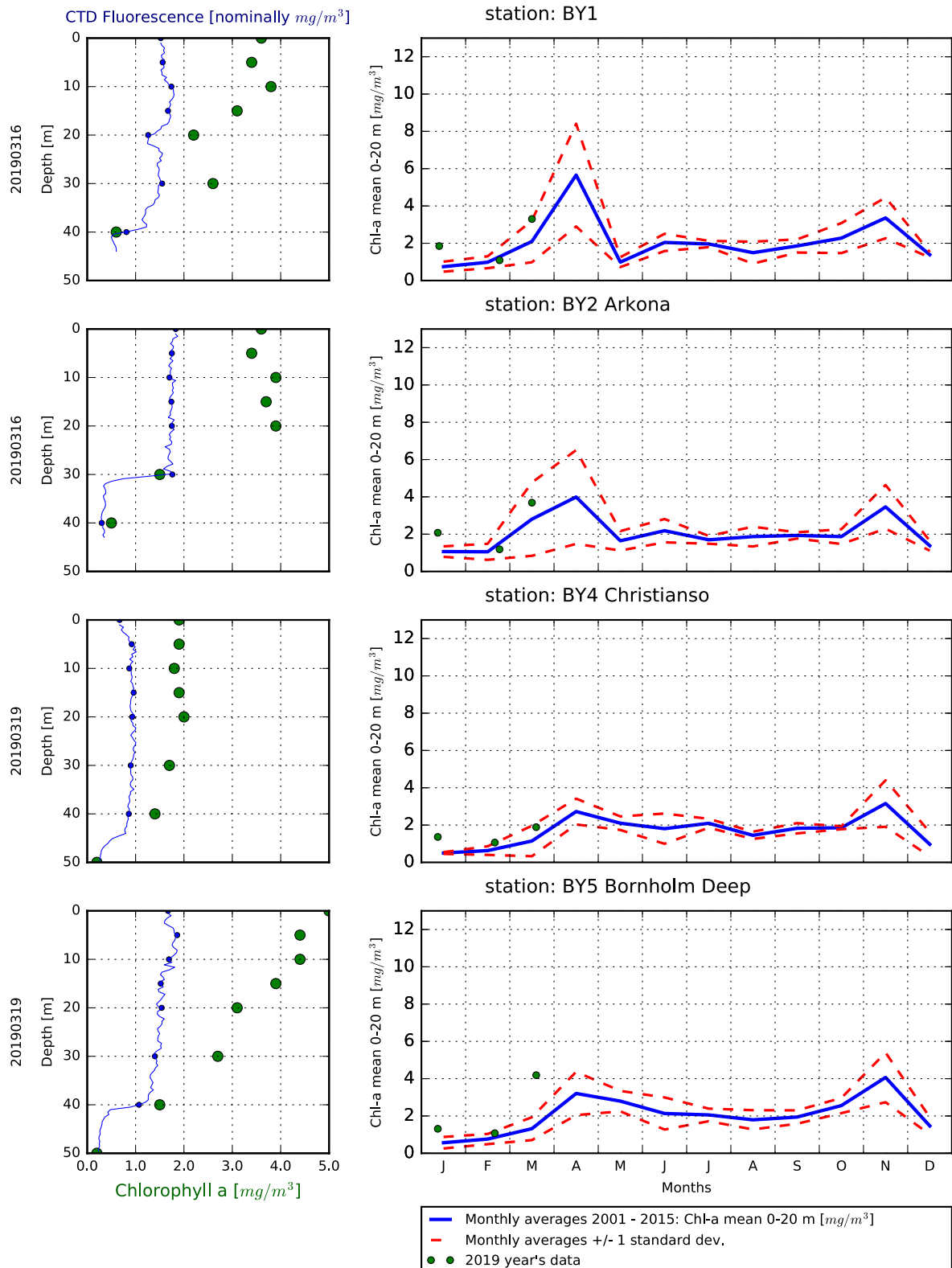


No permission was granted to sample at Släggö close to the Skagerrak coast due to using the foreign vessel R/V Aranda. Släggö was visited later with another ship and the results were not ready to be used in this diagram. Å13 was not visited due to bad weather conditions.

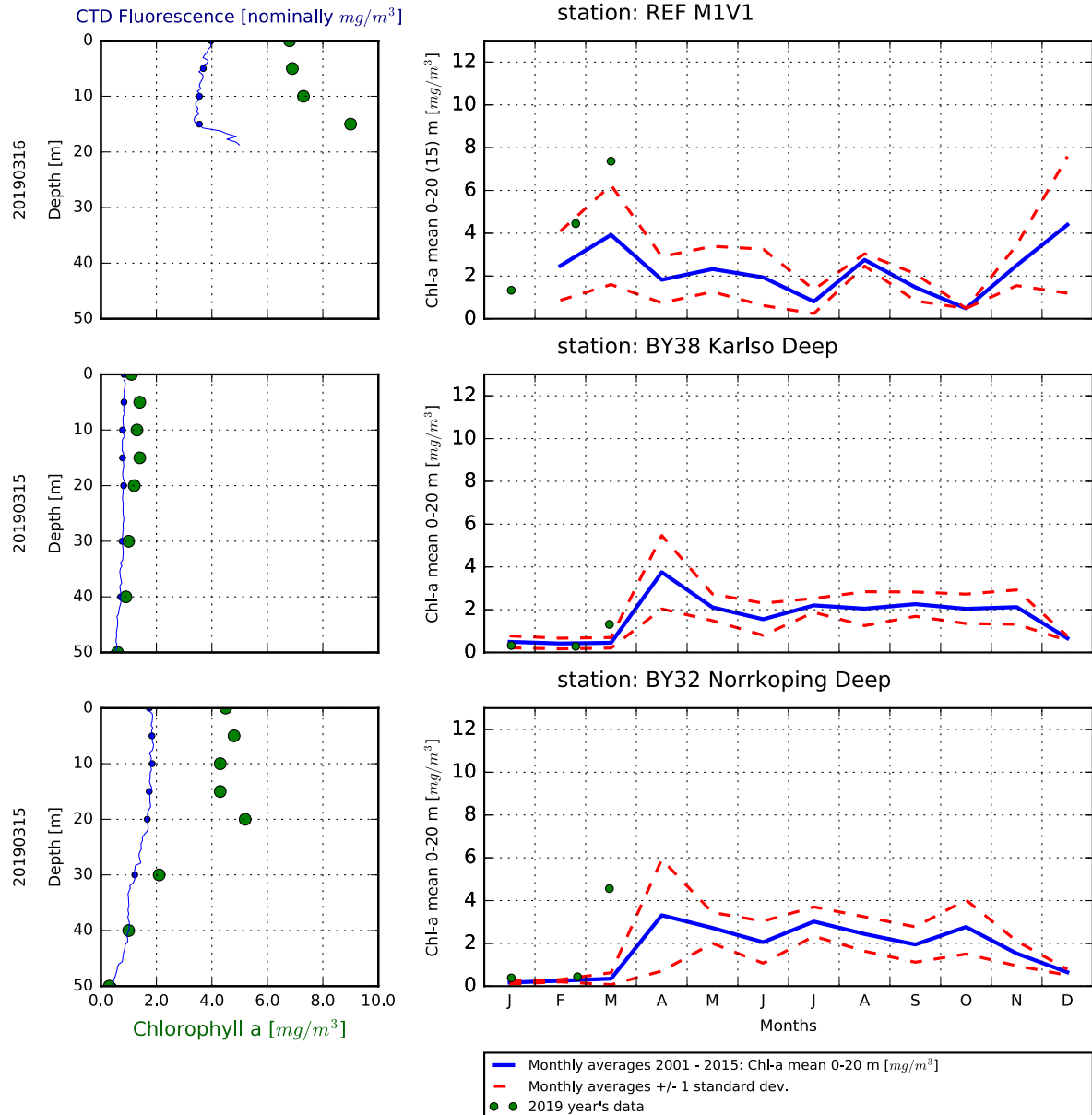
The Kattegat and The Sound



The Southern 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.

