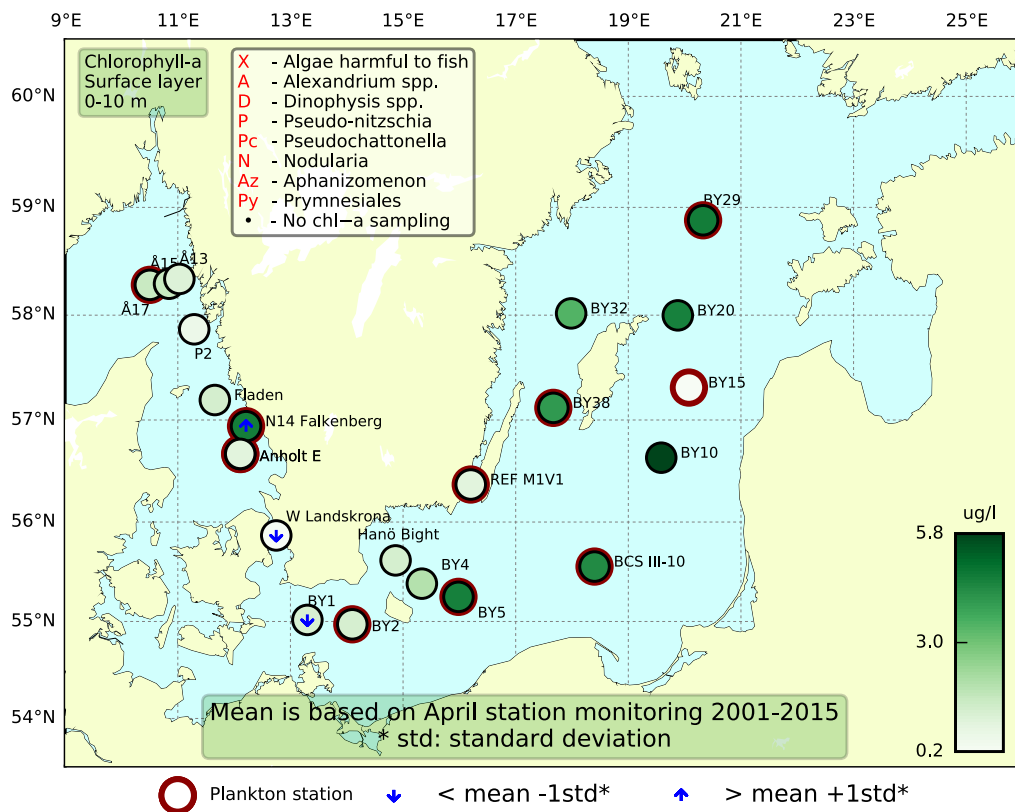


Sammanfattning

Vid de flesta växtplanktonstationer i Västerhavet var proverna präglade av en typisk efter vårbloomingssituation med låga totala cellantal och relativt stort antal av heterotrofa arter som framför allt dinoflagellaten *Peridiniella danica*. Vid N14 däremot blommade *Pseudochattonella* spp, en flagellat som är potentiellt skadlig för fisk, samtidigt med den heterotrofa dinoflagellaten *P. danica*, och orsakade förhöjda klorofyllvärden.

I Östersjön observerades vårblooming vid BY5 i södra och BCSIII-10 i östra Egentliga Östersjön med höga cellantal av kiselalger och dinoflagellaten *Peridiniella catenata*. Artdiversiteten var relativt hög vid de övriga stationerna också, men cellantalen var låga och indikerade att vårbloomingen just börjat eller var i sin slutfas. Det fanns hur som helst näringsämnen kvar för vidare växtplankton tillväxt.



Abstract

A post spring bloom situation was observed at most of the phytoplankton stations in the Skagerrak and Kattegat areas with low total cell counts and relatively high numbers of heterotrophic species like the dinoflagellate *Peridiniella danica*. At N14 though, a *Pseudochattonella* bloom was ongoing simultaneously with the heterotrophic dinoflagellate *P. danica*, causing elevated chlorophyll concentrations.

In the Baltic Sea, spring bloom was observed at BY5 in the southern and BCSIII-10 in the eastern Proper Baltic with high cell numbers of diatoms and the dinoflagellate *Peridiniella catenata*. The species diversity was relatively high at the other Baltic stations as well, but cell numbers were low suggesting a pre or post bloom situation. There were definitely nutrients available for phytoplankton growth.

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

The Skagerrak

Å17 (open Skagerrak) 8th of April

The diatom *Guinardia delicatula* was found in moderate cell numbers as was the small potentially toxic dinoflagellate *Azadinium* sp.*. Total cell numbers were otherwise low and the integrated chlorophyll concentrations were within normal for this month.

Släggö (Skagerrak coast) 9th of April

The sample was taken during another surveillance program, the BVVF. The chlorophyll results are not shown in this report.

The species diversity was high, although the total cell numbers were not. *Skeletonema marinoi* and *Cylindrotheca closterium* were the most abundant diatoms. Among the dinoflagellates, the heterotrophic species *Katodinium glaucum*, *Peridiniella danica* and *Protoperidinium bipes* were found with the highest cell numbers, mirroring a typical post bloom situation. Small flagellates were numerous, both autotrophic and heterotrophic types.

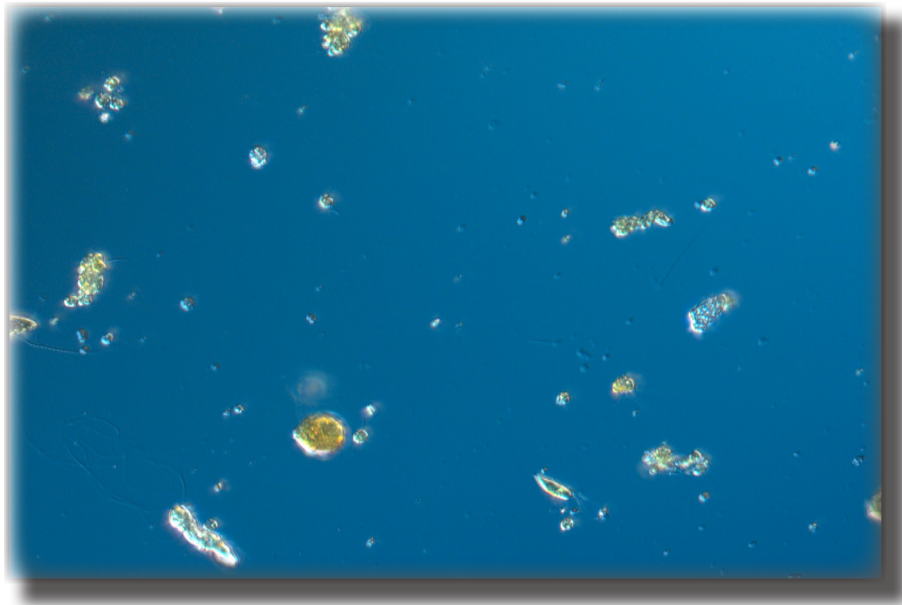


Photo 1: The flagellate *Pseudochattonella* sp* was found in high cell numbers at N14 Falkenberg.

The Kattegat

Anholt E 8th and 9th of April

The phytoplankton diversity was low. The most common species were dinoflagellates like the heterotrophic *Peridiniella danica* and the potentially toxic *Dinophysis acuminata**. Small species were abundant. The integrated (0-10 and 0-20 m) chlorophyll concentrations were within normal for this month.

N14 Falkenberg 8th of April

The flagellate *Pseudochattonella* spp*, potentially toxic for fish and the heterotrophic dinoflagellate *Peridiniella danica* was found in high cell numbers. Considering that other cells were found in low cell numbers, *Pseudochattonella* spp* ought to have caused the high integrated (0-10 m) chlorophyll concentration, which was above normal for this month.

The Baltic Sea

BY2 7th of April

A few species were present of which the diatom *Skeletonema marinoi* was the most abundant one. Ciliates were present in high cell numbers, as well as the dinoflagellate genus *Heterocapsa* and small flagellates from the cryptomonadales group. The heterotrophic flagellate *Ebria tripartita* was present, devouring chains of *S. marinoi*. (Photo 4). The integrated (0-20 m) chlorophyll concentration was low but within normal for this month.

BCSIII-10 6th and BY5 7th of April

Spring bloom was ongoing with high cell numbers of the diatoms *Skeletonema marinoi* and *Thalassiosira* spp. and the dinoflagellate *Peridiniella catenata*. The chlorophyll concentrations were consequently high and above normal for this month at BY5.

BY15 6th, RefM1V1 and BY38 10th of April

The dinoflagellate *Peridiniella catenata* was abundant and the diatom *S. marinoi* was present in low cell numbers. The species diversity was high although total cell numbers were low. The integrated (0-10 and 0-20 m) chlorophyll concentrations were within normal for this month.



Photo 2: The dinoflagellates *Peridiniella catenata* and *Dinophysis acuminata** captured at RefM1V1.

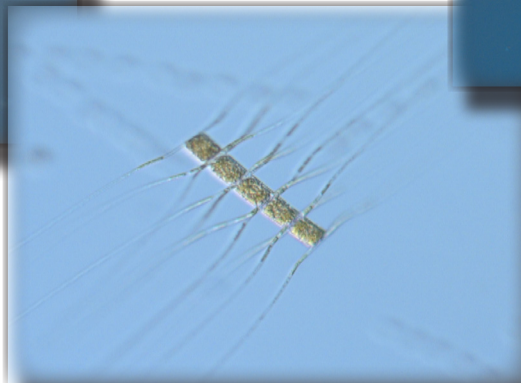


Photo 3: The diatom *Chaetoceros castracanei* was present at BY5 and BCSIII-10. The shadowy chains on the photo are *Skeletonema marinoi*, which was very abundant at the two stations.

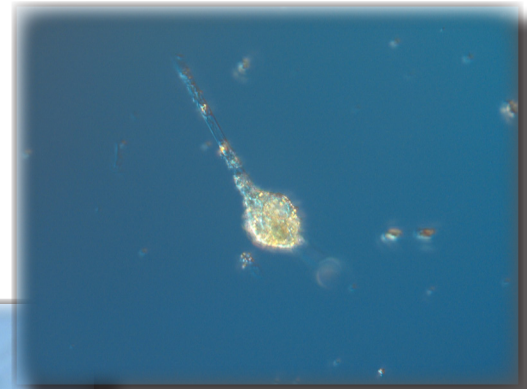
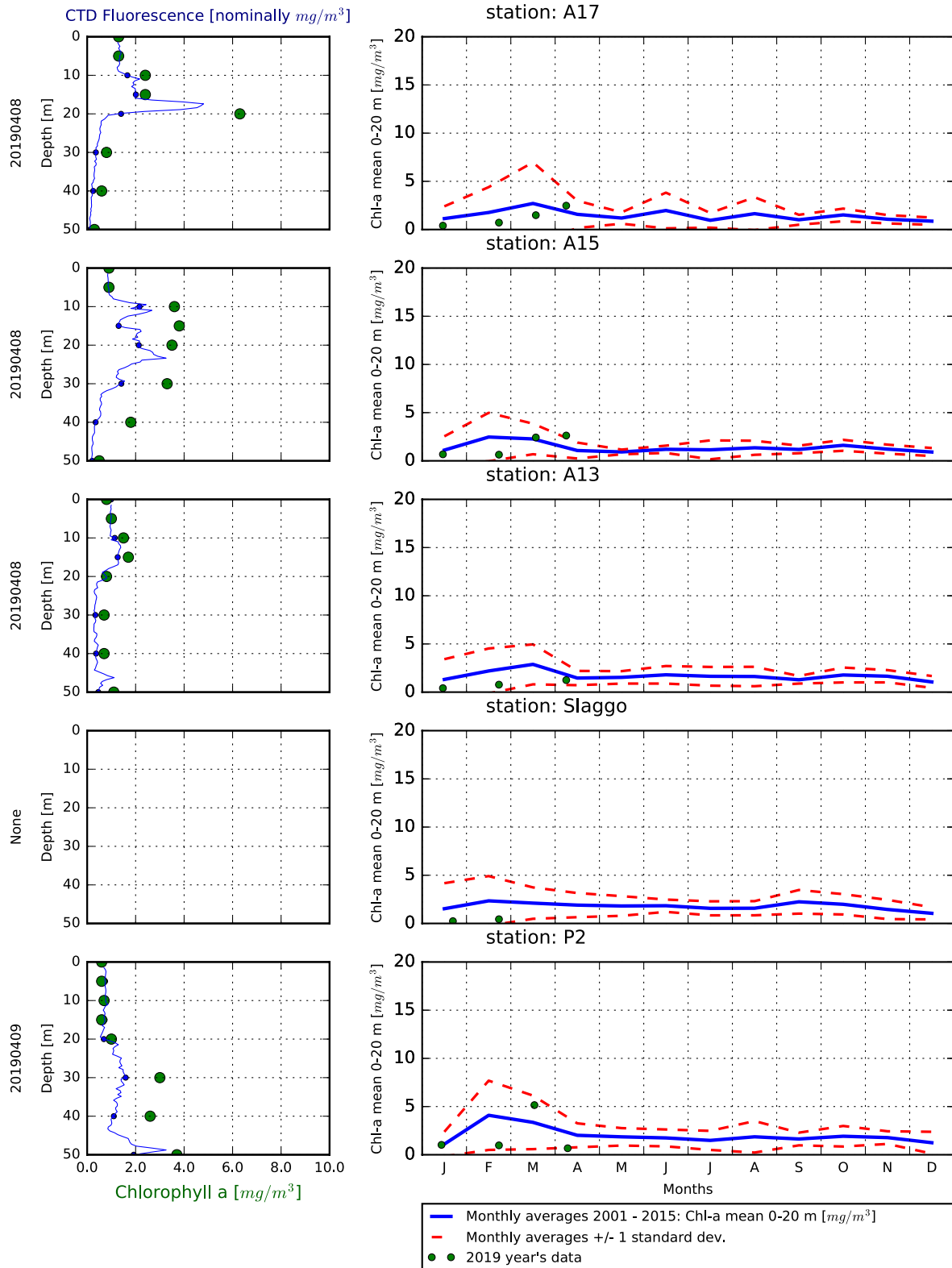


Photo 4: The flagellate *Ebria tripartita* feeding on the diatom *Skeletonema marinoi*, was found at BY2.

Selection of observed species	Anholt E	Anholt E	N14 Falkenberg	Släggö	Å17
Red=potentially toxic species	8/4	9/4	8/4	9/4	8/4
Hose 0-10 m	presence	presence	presence	presence	presence
Chaetoceros spp		present	present		
Chaetoceros compressus				present	
Chaetoceros danicus				present	
Chaetoceros debilis	present				
Cylindrotheca closterium		present	present	common	present
Dactyliosolen fragillissimus		present			
Guinardia delicatula	present	present	present	common	common
Guinardia flaccida				present	present
Leptocylindrus danicus		present			
Leptocylindrus minimus		present			present
Licmophora spp	present				
Nitzschia longissima		present	present		
Skeletonema marinoi	present	common	present	common	
Amphidinium sphenoides		present			
Azadinium spp		present		present	common
Ceratium fusus	present	present		present	
Ceratium lineatum				present	present
Ceratium longipes	present	present	present	present	
Ceratium tripos	present	present	present	present	
Dinophysis acuminata	common	common	present	present	present
Dinophysis norvegica	present	present		present	present
Gyrodinium spirale	present	present	present		
Heterocapsa spp	present	present			
Heterocapsa rotundata			present	present	present
Karlodinium veneficum		present	present		
Katodinium glaucum	present	present	present	common	present
Peridiniella danica	common	present	very common	common	present
Phalacroma rotundatum					present
Prorocentrum compressum					present
Protoperidinium spp			present		
Protoperidinium bipes				common	present
Protoperidinium brevipes	present				present
Protoperidinium depressum		present	present	present	
Protoperidinium pallidum	present				
Protoperidinium pellucidum		present	present	present	present
Scrippsiella complex				present	
Apedinella radians	present			present	present
Dictyocha speculum				present	
Pseudochattonella spp		present	very common	present	
Pseudopedinella spp	present	present	present	present	
Pseudopedinella pyriformis				present	
Pyramimonas spp		present		common	present
Emiliana huxleyi					present
Eutreptiella spp				present	present
Prymnesiales		present	very common		present
Heterosigma akashiwo		present	present		
Binuclearia lauterbornii	present				
Cryptomonadales	common	present	present	common	common
Leucocryptos marina	present	present	common	common	present
Choanoflagellata	present	present	present	present	
Ciliophora	common	present	common	common	common
Didinium spp					present
Laboea strobila		present		present	present
Mesodinium rubrum	present	present		present	present
Strombidium spp	present	present	present	present	present
Tintinnopsis spp				present	present

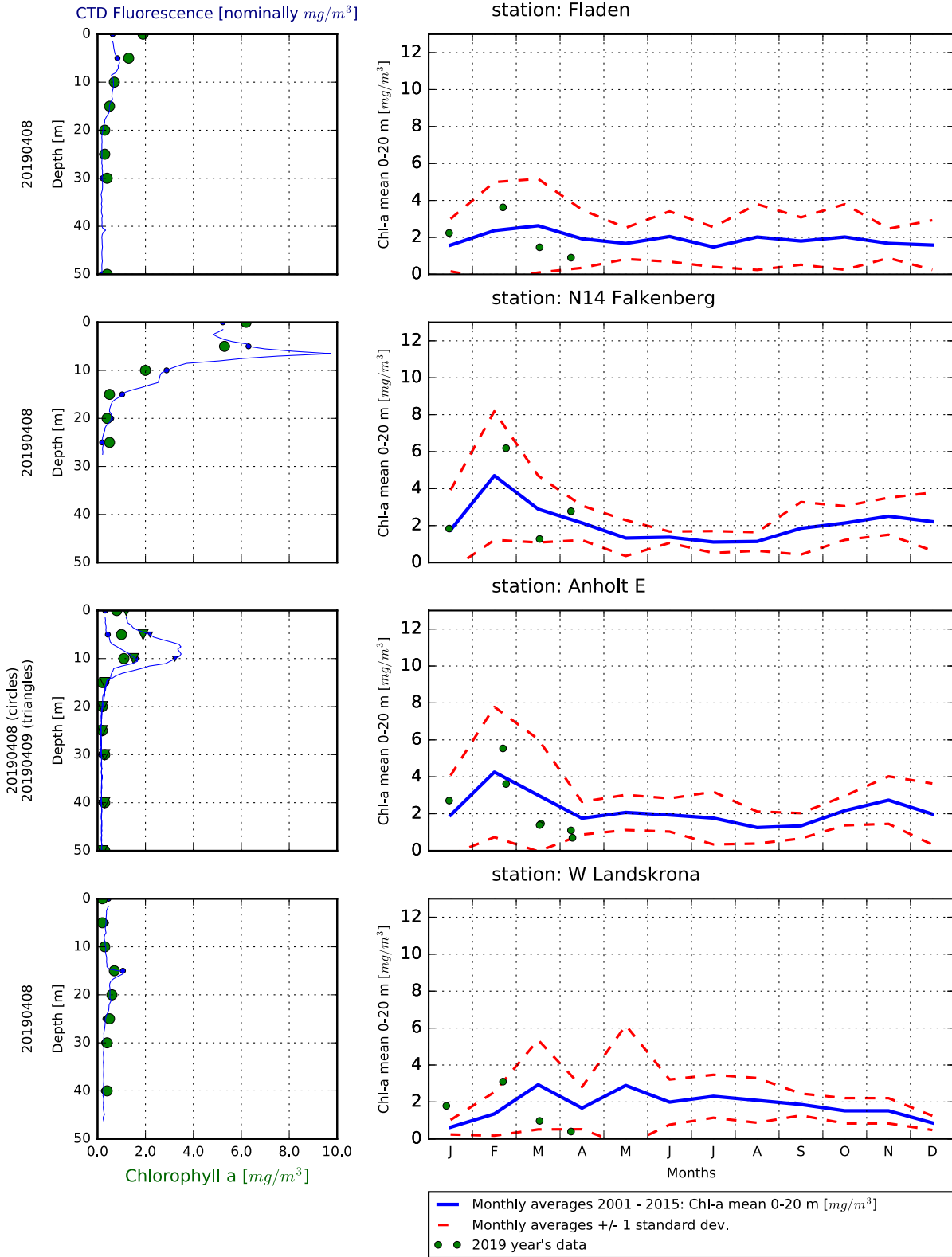
Selection of observed species	BY2	BY5	BCSIII-10	BY15	BY38	BY29	Ref M1V1
Red=potentially toxic species	7/4	7/4	6/4	6/4	10/4	11/4	10/4
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence
<i>Attheya septentrionalis</i>		present	present			present	
Centrales	present						
<i>Chaetoceros</i> spp		present	present				
<i>Chaetoceros castracanei</i>		present	present				
<i>Chaetoceros danicus</i>					present		
<i>Chaetoceros subtilis</i>	present		present	present	present		
<i>Chaetoceros wighamii</i>			present			present	
<i>Coscinodiscus</i> spp						present	
<i>Melosira nummuloides</i>		present	present	present			
<i>Skeletonema marinoi</i>	common	very common	very common	present	present	present	present
<i>Thalassiosira</i> spp		common	common		present	present	
<i>Amphidinium sphenoides</i>		present	present		present		present
<i>Amylax triacantha</i>		present		present		present	
<i>Dinophysis acuminata</i>				present	present	present	present
<i>Dinophysis norvegica</i>					present		
<i>Gymnodinium simplex</i>							present
<i>Gyrodinium spirale</i>				present	present		present
<i>Heterocapsa</i> spp	present		present	present	present		present
<i>Heterocapsa rotundata</i>	common	present	present	present	present	present	present
<i>Karlodinium veneficum</i>						present	
<i>Katodinium glaucum</i>		present	present	present		present	present
<i>Peridiniella catenata</i>	present	common	common	common	common	common	present
<i>Peridiniella danica</i>				present			
<i>Protoperidinium</i> spp							present
<i>Protoperidinium bipes</i>		present		present	present	present	common
<i>Protoperidinium brevipes</i>				present			
<i>Pseudopedinella</i> spp					present		
<i>Pseudopedinella pyriformis</i>	present						
Cryptomonadales	common	common	common	common	common	present	common
<i>Dinobryon</i> spp							present
<i>Aphanizomenon flosaquae</i>				present	present	present	
<i>Aphanocapsa</i> spp			present				
<i>Aphanothece</i> spp				present			
<i>Snowella</i> spp	present		present	present	present	present	present
<i>Woronichinia</i> spp		present					present
<i>Binuclearia lauterbornii</i>		present	present	present	present	present	present
<i>Eutreptiella</i> spp	common	present	present	present	common	present	present
Prymnesiales			present	present	present	present	present
<i>Prymnesium polylepis</i>						present	present
<i>Pterosperma</i> spp				present			
<i>Pyramimonas</i> spp	present	present	present	present	present		
<i>Oocystis</i> spp		present	present	present	present	present	
<i>Ebria tripartita</i>	present	present	present	present	present		
<i>Leucocryptos marina</i>						present	
<i>Calliacantha natans</i>				present			
Choanoflagellata				present			
Ciliophora	common	present	common	common	present	common	common
<i>Didinium</i> spp					present		
<i>Mesodinium rubrum</i>	present	present	present	present	present	present	present
<i>Strombidium</i> spp	present			present	present		present
<i>Tintinnopsis</i> spp							present

The Skagerrak

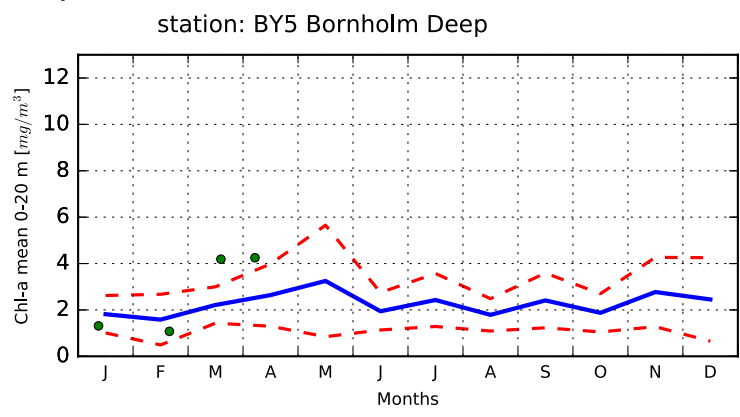
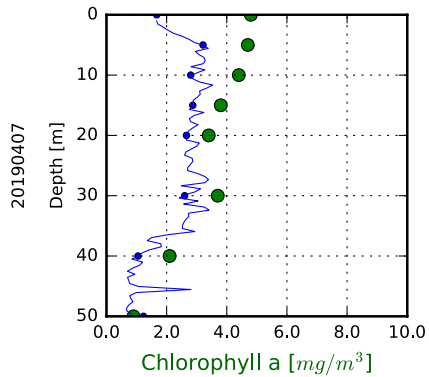
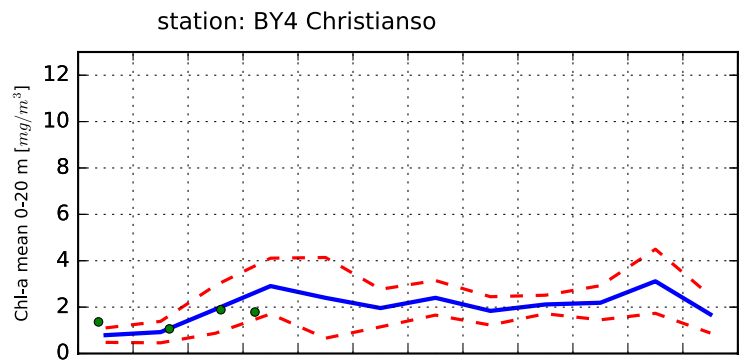
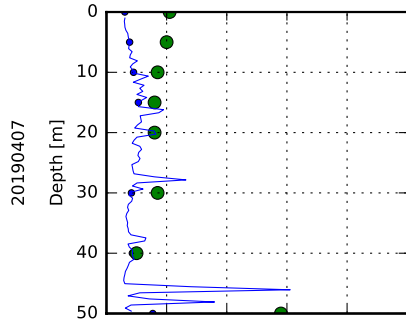
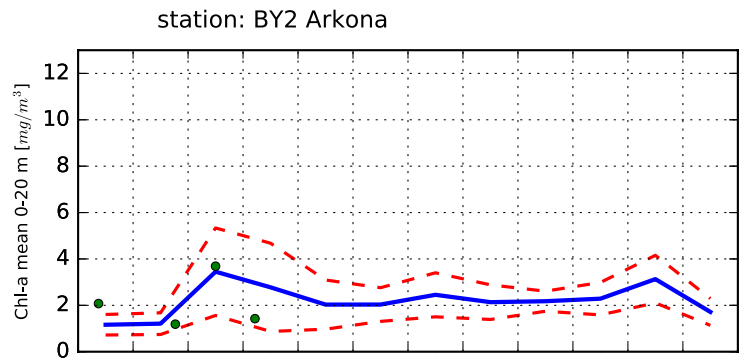
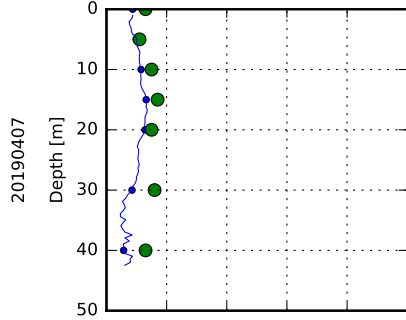
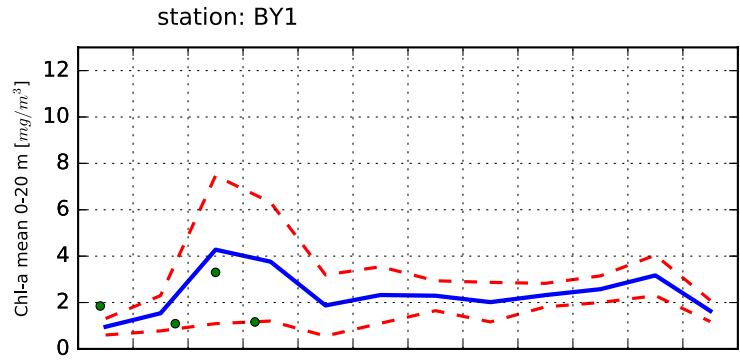
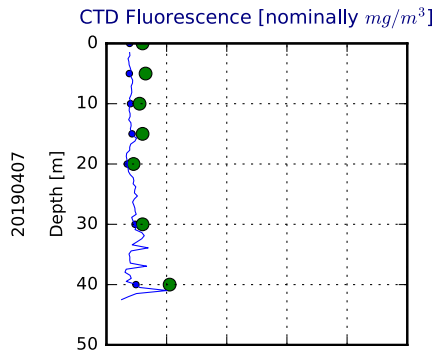


No permission was granted to sample at Släggö close to the Skagerrak coast due to using the foreign vessel R/V Aranda.

The Kattegat and The Sound

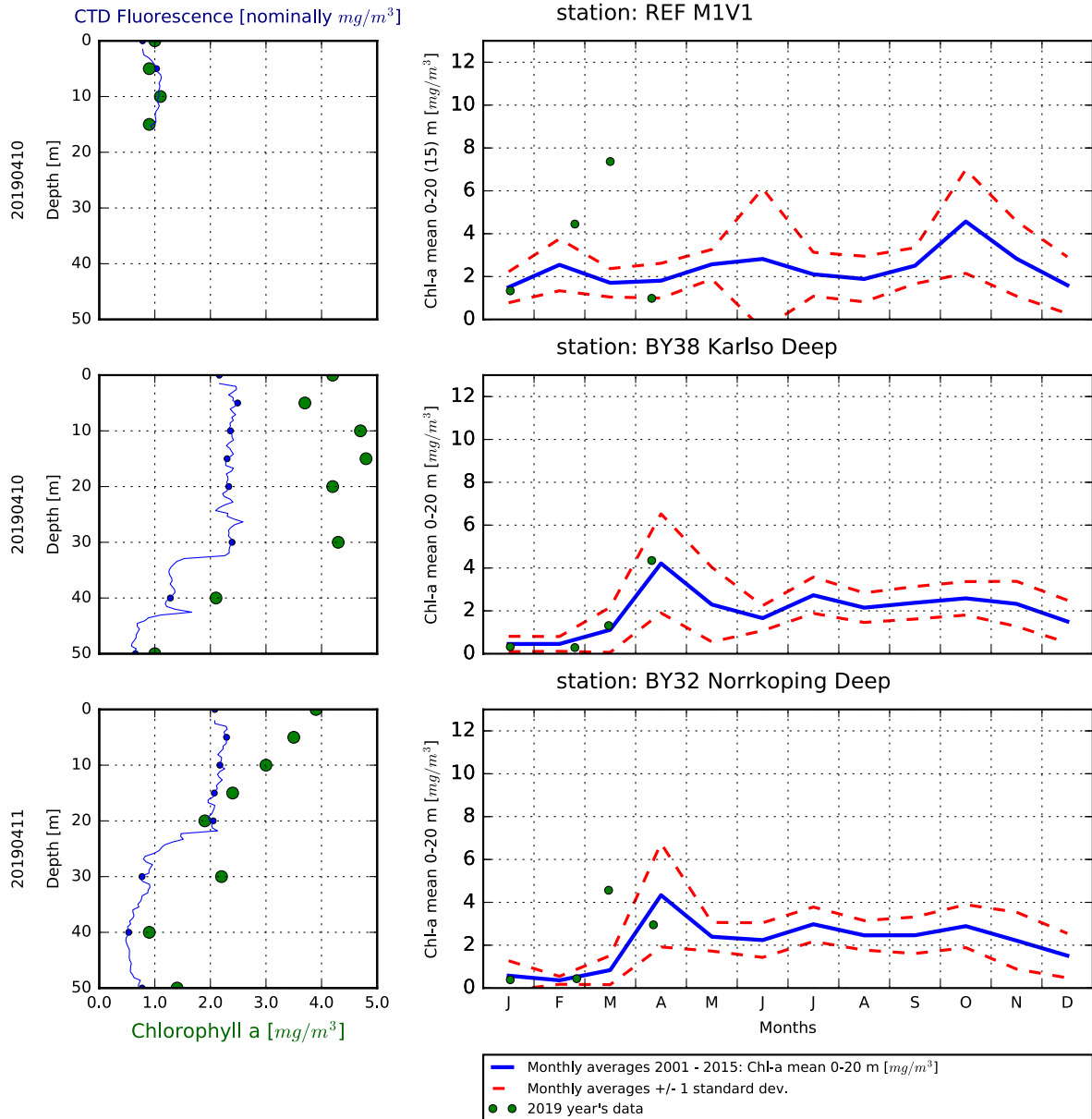


The Southern Baltic



— Monthly averages 2001 - 2015: Chl-a mean 0-20 m [mg/m^3]
- - - Monthly averages +/- 1 standard dev.
● 2019 year's data

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 mikroskopisk analys av planktonprover samt klorofyllmätningar presenteras kortfattat i denna rapport. Information från SMHIs satellitövervakning av algbloomingar 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, 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.

Oversikt 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.

