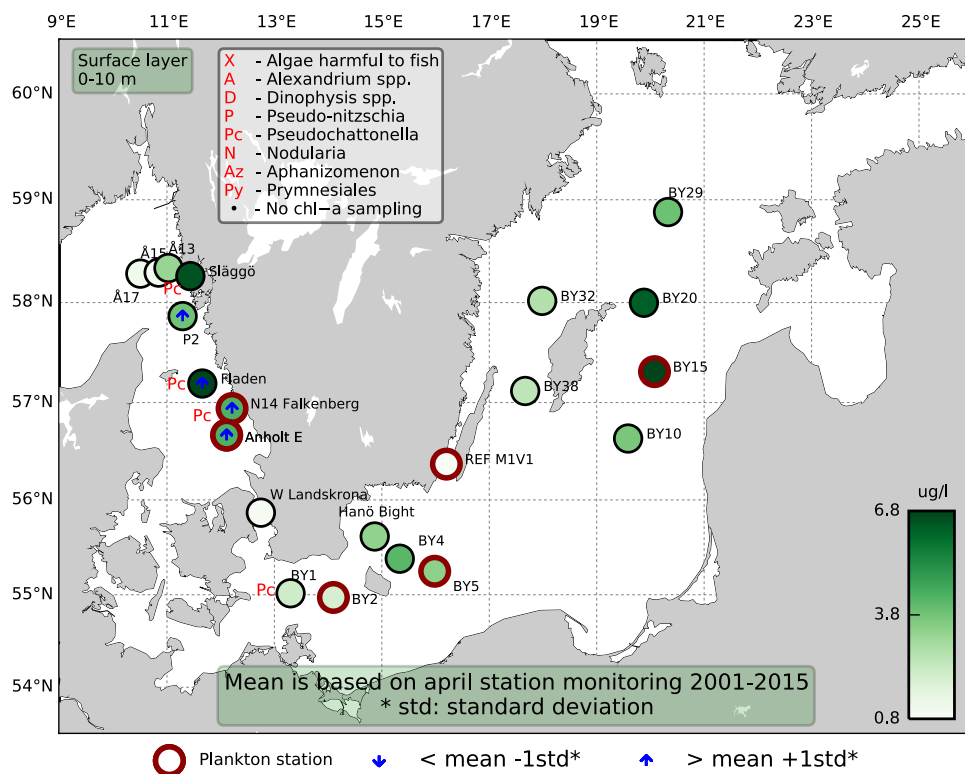


Sammanfattning

Klorofyllfluorescenstoppar och en del höga uppmätta klorofyllhalter i Västerhavet visade sig till stor del orsakas av den för fisk skadliga flagellaten *Pseudochattonella* spp.^{*}, som även observerats under de två föregående expeditionerna. Cellerna hade nu ändrat form och var mindre och rundare jämfört med vad de var i början av observationerna. Formändringen indikerar slutet på blomningsfasen. Kiselalgen *Chaetoceros similis* var talrik vid de flesta av Västerhavsstationerna. Vid Släggö i Skagerrak var det mycket kiselalger jämfört med de andra stationerna.

Ett planktonprov från en klorofyllfluorescenstoppp vid BY1 visade på en sjunkande blomning av *Pseudochattonella* spp. Övriga fluorescenstoppar från Östersjöstationerna orsakades av vårblooming i olika stadier. Bland annat så fanns dinoflagellaten *Peridiniella catenata* i höga cellantal, ett typiskt inslag i Östersjöns vårblooming. Relativt höga antal av den filamentösa cyanobakterien *Aphanizomenon flos-aquae* fanns i östra Egentliga Östersjön. I Finska Viken försiggick vårblooming med kiselalger, dinoflagellaten *P. catenata* och *Aphanizomenon flos-aquae* som dominerande arter.



Abstract

Chlorophyll fluorescence maxima and some high measured chlorophyll concentrations in the Kattegat and Skagerrak areas were mainly caused by the flagellate *Pseudochattonella* spp.^{*}, potentially harmful for fish. The flagellate has been observed during the two previous cruises as well. The cells were smaller and rounder now compared to the earlier observations which indicates the end of the bloom phase. The diatom *Chaetoceros similis* was numerous at most stations and at Släggö in the Skagerrak, diatoms were more common compared to the other stations.

A chlorophyll fluorescence peak at BY1 was caused by the sinking bloom of the flagellate *Pseudochattonella* spp.^{*}. The other fluorescence peaks in the Baltic Sea were caused by the spring bloom in different stages. The dinoflagellate *Peridiniella catenata* which is a typical Baltic spring bloom species, was abundant. Rather high cell numbers of the filamentous cyanobacterium *Aphanizomenon flos-aquae* was found in the Eastern Proper Baltic. Spring bloom was observed in the Gulf of Finland and dominated by diatoms, the dinoflagellate *P. catenata* and *Aphanizomenon flos-aquae*.

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

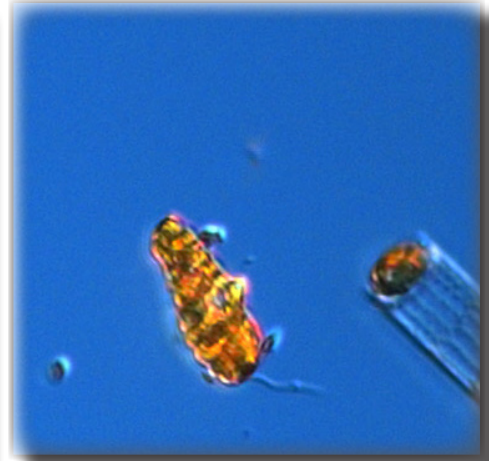
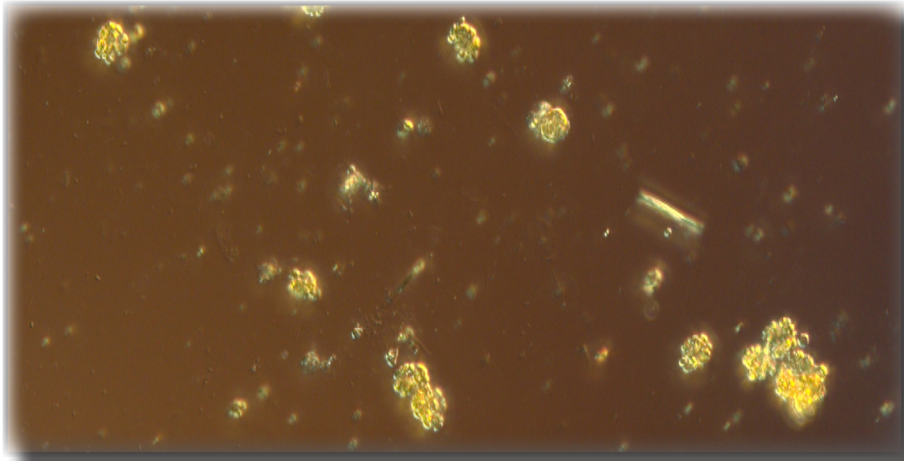
The Skagerrak

Å17 (open Skagerrak) 21st of April

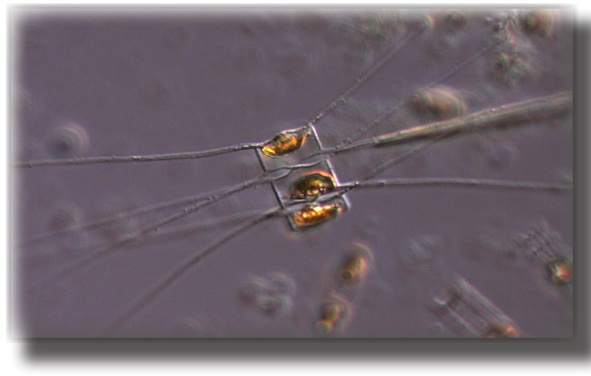
The phytoplankton diversity was very low at Å17 this month.

Släggö (Skagerrak coast) 21st of April

The flagellate genus *Pseudochattonella**, potentially harmful for fish, was found in high cell numbers. Diatoms were abundant, *Chaetoceros similis* being the most numerous species. The integrated (0-20 m) chlorophyll concentration was above normal for this month.



The flagellate *Pseudochattonella* spp.* was abundant in the Kattegat and the Skagerrak and at BY1. The cells were small and round (left picture). The right hand picture shows how the cells were shaped in the beginning of the bloom.



The diatom *Chaetoceros similis* was very abundant in the Kattegat and Skagerrak areas.

The Kattegat

Anholt E and N14 Falkenberg 22nd of April

The flagellate *Pseudochattonella* spp.* was found in high cell numbers at both stations. At a chlorophyll fluorescence maximum at Anholt E at 15 meters depth, *Pseudochattonella* spp. was estimated to more than 2 million cells per liter. A few diatom and dinoflagellate species were abundant.

Chlorophyll fluorescence maxima at W Landskrona and Fladen were mainly caused by *Chaetoceros similis* and *Pseudochattonella* spp.* respectively.

The Baltic Sea

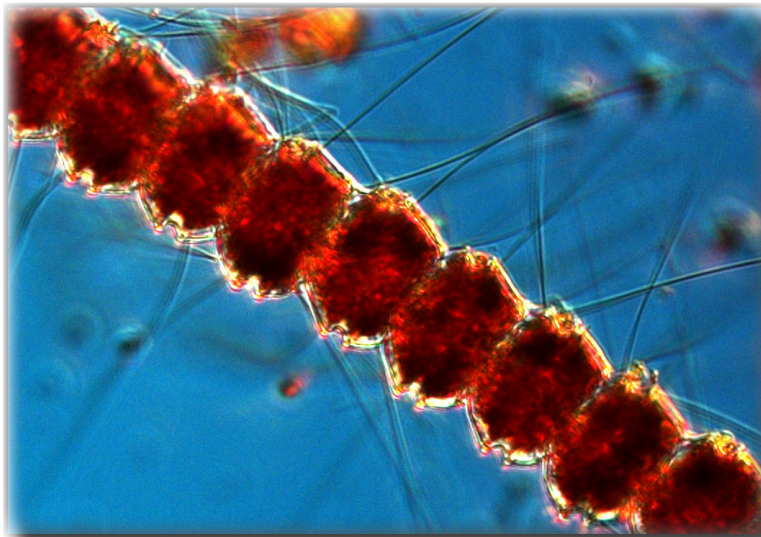
BY2 and BY5 22nd and 23rd of April

The dinoflagellate *Peridiniella catenata*, the chrysophyte *Dinobryon balticum* and the chlorophyte *Planctonema lauterbornii* were abundant. The chlorophyll concentrations were somewhat high at certain depths at BY5, but the integrated concentrations were normal for this month.

A chlorophyll fluorescence maximum at 33 meters depth at BY1 was mainly caused by *Pseudocbattonella* spp.*.

REF M1V1 Kalmar Sound 20th of April

The phytoplankton diversity was very low, the integrated (0-20m) chlorophyll concentration was below normal for this month.



The dinoflagellate *Peridiniella catenata* is a typical spring bloom species in the Baltic, and was abundant at many stations.

4CTRY BP 23rd of April

This station is sampled instead of BCSIII-10 for the time being.

A few species were observed, among them the dinoflagellate *Peridiniella catenata*, the filamentous cyanobacterium *Aphanizomenon flos-aquae* and the chlorophyte *Planctonema lauterbornii* were rather abundant.

BY15 22nd of April

The chlorophyll concentrations were rather high and the phytoplankton sample was dominated by the dinoflagellate *P. catenata*. The chlorophyte *Planctonema lauterbornii* and naked unidentified dinoflagellates were rather abundant.

BY38 19th of April

The number of species observed was low, among them however, the dinoflagellates *P. catenata* and *Heterocapsa* spp. were abundant.

BY29 24th of April

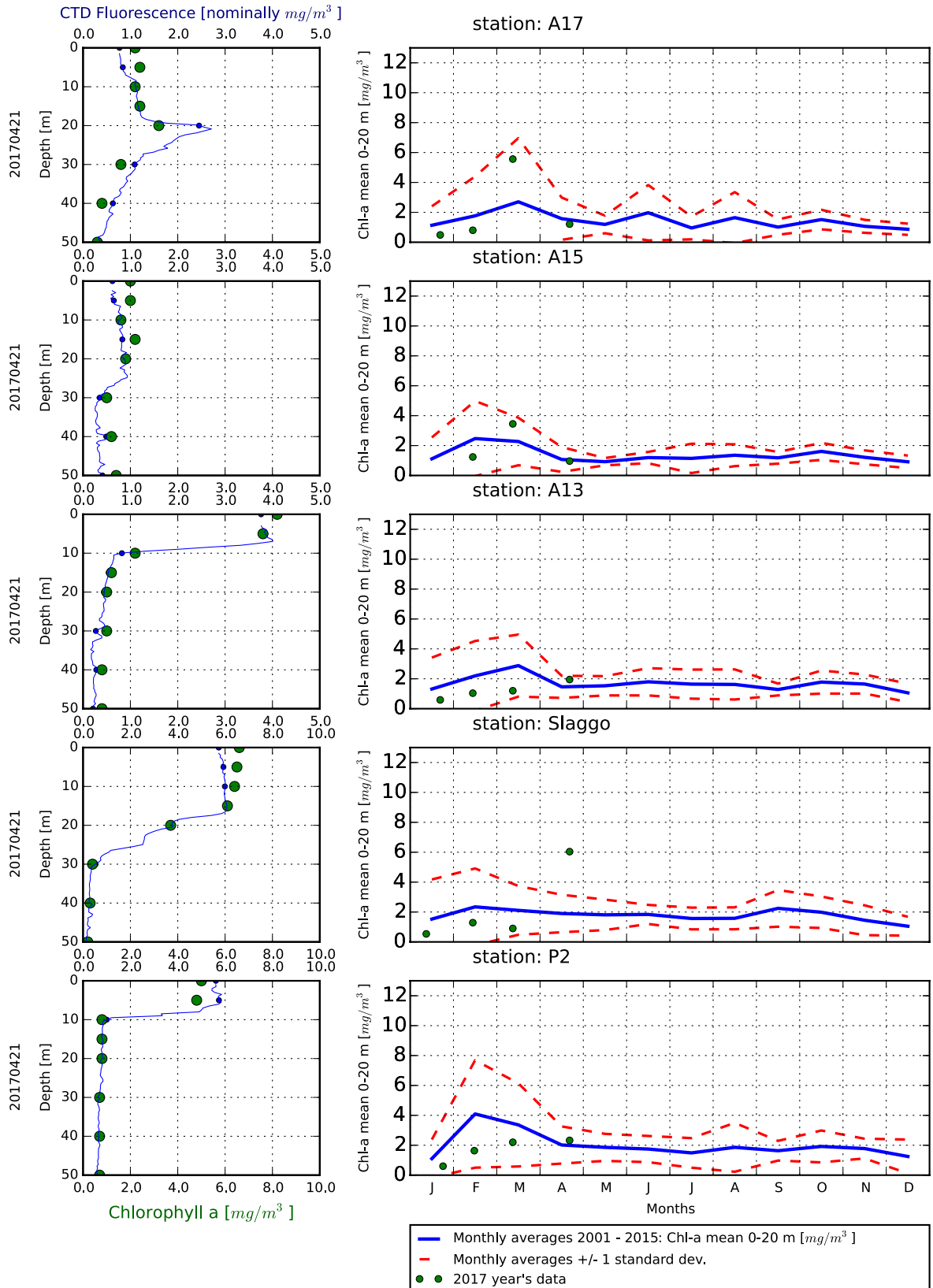
The most species rich phytoplankton sample was noted here. Dinoflagellates dominated, among which *P. catenata* was the most abundant species.

Phytoplankton analysis and text by:
Ann-Turi Skjevik

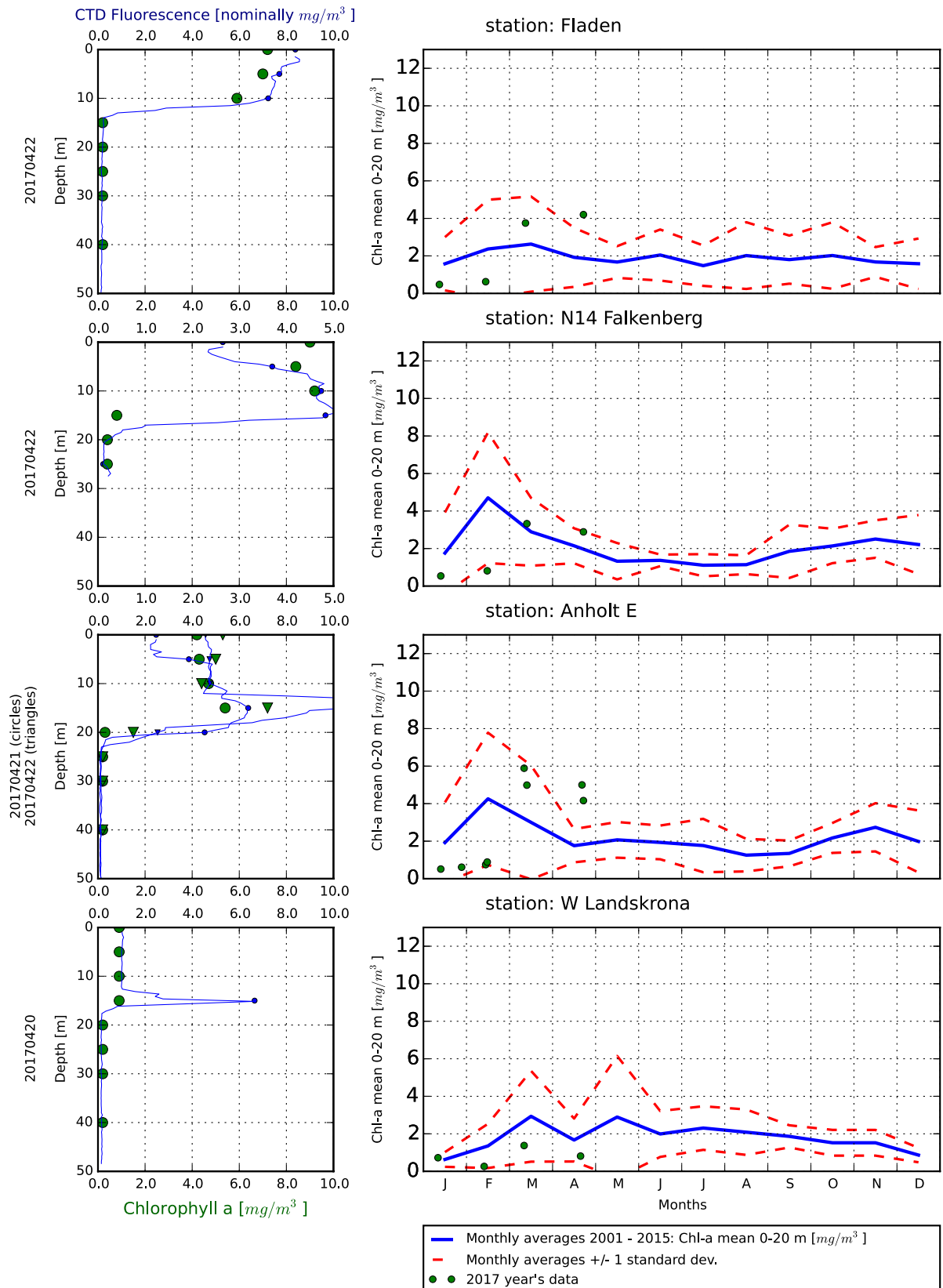
Selection of observed species	N14	Anholt E	Släggö	Å17
Red=potentially toxic species	22/4	22/4	21/4	21/4
Hose 0-10 m	presence or cells per l	presence or cells per l	presence or cells per l	presence or cells per l
Chaetoceros similis	common	common	very common	present
Chaetoceros tenuissimus			present	
Dactyliosolen fragilissimus	common	common	present	
Guinardia delicatula	present	present	present	
Leptocylindrus minimus			common	
Licmophora spp			present	
Nitzschia longissima	present		present	
Phaeodactylum tricornutum			present	
Pseudo-nitzschia spp	present		present	
Skeletonema marinoi	common	common	present	
Thalassionema nitzschioides	present	present	present	
Thalassiosira angulata			present	
Alexandrium spp				present
Ceratium fusus				present
Ceratium longipes			present	
Dinophysis norvegica		present		
Dinophysis rotundata				present
Diplopsalis complex	present		present	
Gymnodiniales				present
Gyrodinium spirale	present	present		
Heterocapsa spp				present
Karlodinium veneticum	common	common	common	
Peridiniella danica	common	common	common	
Emiliania huxleyi			present	present
Dictyocha speculum	present	present		
Pseudochattonella spp	1 092 470	841 400	1 184 360	
Pseudopedinella pyriformis	present			
Cryptomonadales		common	common	common
Eutreptiella spp				present
Pyramimonas spp				present
Aphanothece spp	present			
Pseudanabaena spp		present		
Ciliophora	common	common	common	common
Mesodinium rubrum			present	
Strombidium spp	present	present	present	

Selection of observed species	BY2	BY5	BCS III-10_NE	BY15	REF M1V1	BY38	BY29
Red=potentially toxic species	22/4	23/4	23/4	22/4	20/4	19/4	24/4
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence
Chaetoceros danicus				present			
Chaetoceros similis		present					
Skeletonema marinoi	present				present		present
Thalassiosira spp	present	present	common				present
Amphidinium spp							present
Amylax triacantha	present	present	present	present			present
Dinophysis acuminata	present			present		present	
Gymnodiniales	common		common	common			common
Gyrodinium spirale							common
Heterocapsa spp	present	present	present	present	present	common	present
Karlodinium veneficum						present	present
Katodinium glaucum		present			present		present
Peridiniella catenata	present	common	common	very common		very common	very common
Protoperidinium bipes	present			present		present	present
Protoperidinium brevipes		present					
Protoperidinium pellucidum				present			
Dinobryon balticum	common	common			present		present
Pseudopedinella spp							present
Cryptomonadales	present	common	present	present	present		present
Pyramimonas spp							present
Planctonema lauterbornii	present	common	common	common			present
Aphanizomenon flos-aquae	present	present	common	present		present	present
Aphanothece spp	present			present			
Aphanothece paralleliformis	present	present		present		present	present
Lemmermanniella spp		present					present
Oocystis spp				present			
Ebria tripartita			present				present
Ciliophora	common	common	common	common	common	common	common
Mesodinium rubrum		present	present	present	present	present	present
Strombidium spp						present	

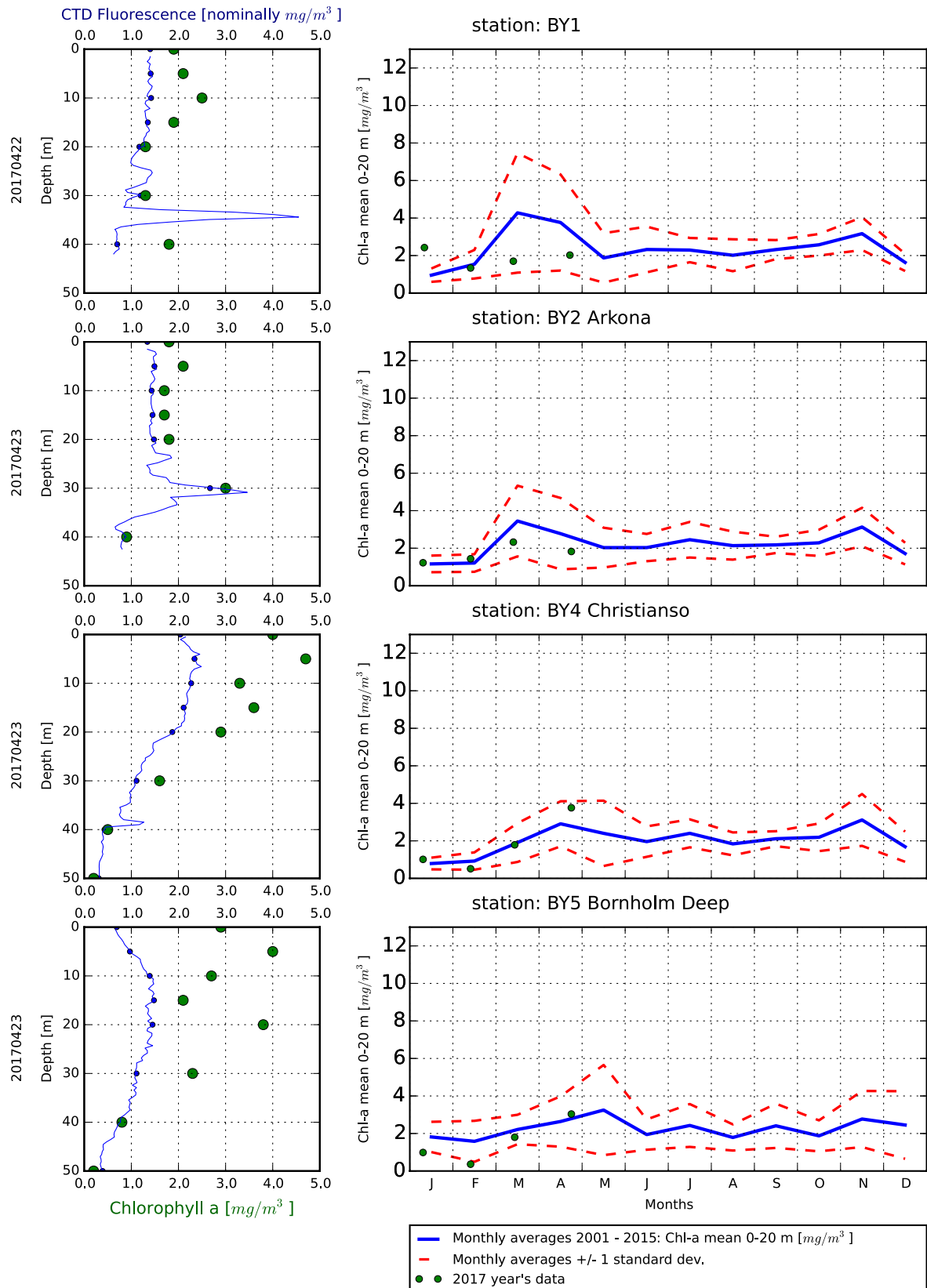
The Skagerrak



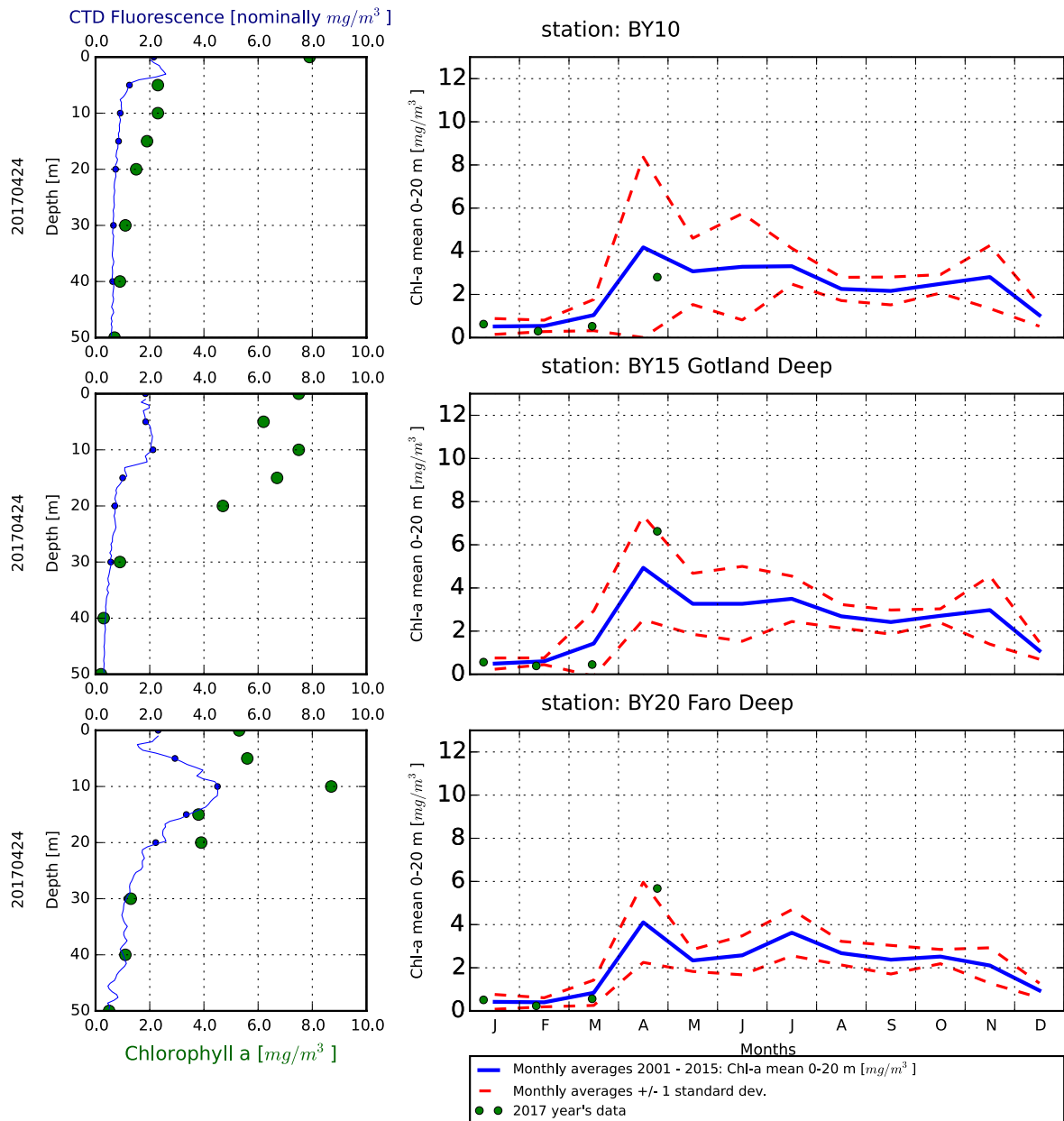
The Kattegat and The Sound



The Southern Baltic

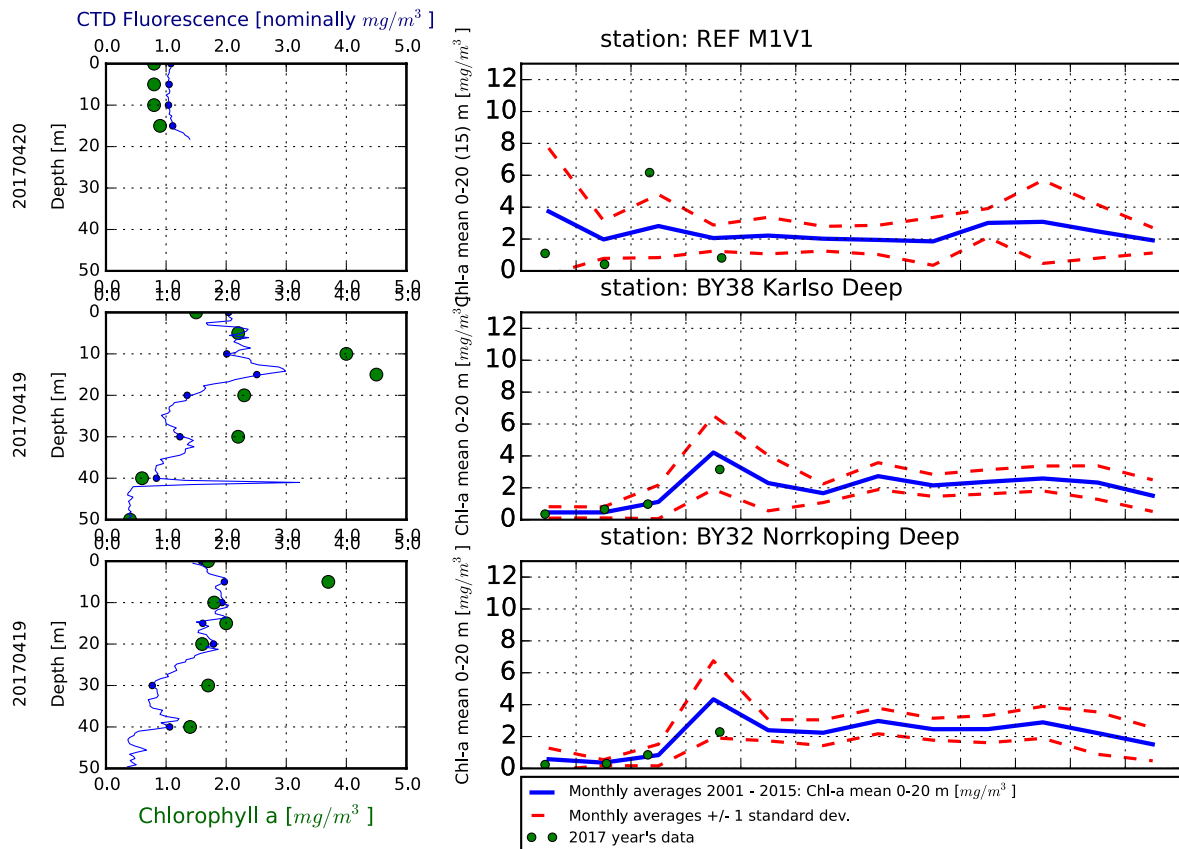


The Eastern Baltic



Due to new Polish regulations, BCSIII-10 can not be visited for the time being.

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.

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.

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.

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.

