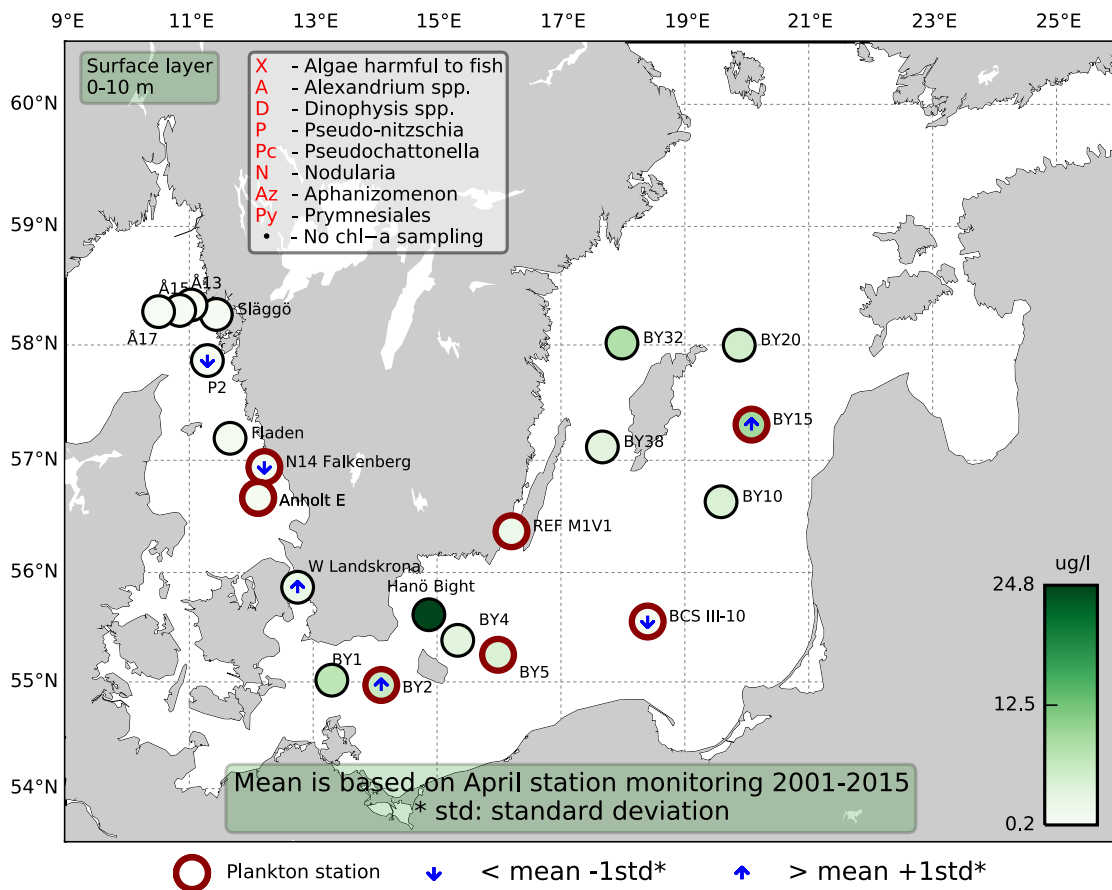


## Sammanfattning

De integrerade (0-20 m) klorofyllvärdena var inom det normala för månaden vid de flesta stationerna i Västerhavet och de klorofyllfluorescensmaxima som återfanns orsakades av kiselalger. Framför allt dominerade olika arter av *Rhizosolenia* spp i dessa toppar men även *Chaetoceros decipiens* och *Thalassionema nitzschioides* återfanns i betydande mängder vid vissa fluorescensmaxima.

De integrerade klorofyll *a*-koncentrationerna i Östesjön var över lag inom det normala förutom vid Hanöbukten och BY32 där de var högre än normalt. Vid Hanöbukten återfanns stora celler av *Mesodinium rubrum* som är en mixotrof ciliat tillsammans med relativt små dinoflagellater. Dinoflagellaten *Peridiniella catenata* återfanns i höga celltätheter vid flertalet stationer. Även större mängder av den filamentösa cyanobakterien *Aphanizomenon flos-aquae* återfanns vid flera stationer. Vid REF M1V1 där man förra tillfället provtagit en begynnande vårbloomning kunde en avslutande vårbloomning observeras.



## Abstract

The integrated (0-20 m) chlorophyll concentrations were within normal for this month at most stations in the Kattegat and Skagerrak and chlorophyll fluorescence maxima in these areas were caused by diatoms. The diatoms *Rhizosolenia* spp., *Chaetoceros decipiens* and *Thalassionema nitzschioides* were most abundant in these peaks.

The integrated chlorophyll *a* concentrations in the Baltic Sea were within normal at most of the stations except for Hanö bight and BY32 where the concentrations were above normal. The dinoflagellate *Peridiniella catenata* was found in relatively high numbers at most stations. Several filaments of the cyanobacterium *Aphanizomenon flos-aquae* were also recorded at several stations. The beginning of the spring bloom at REF M1V1 recorded on the previous cruise was now at the end at this station.

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

## The Skagerrak

### Å17 (open Skagerrak) 16<sup>th</sup> of April.

The total cell concentration was low. Some cells of the diatom genus *Rhizosolenia* were found together with *Thalassionema nitzschioides*. A fluorescence maximum was found at 15 meters at both Å17 and Å15 (closer to the coast) where high cell numbers of the genus *Rhizosolenia* spp. dominated. The integrated (0-20 m) chlorophyll *a* concentration was within normal for the month at Å17 but above normal at Å15 due to the fluorescence peak found at 15 meters.

### Släggö (Skagerrak coast) 16<sup>th</sup> of April.

The total cell concentration was low. The community was dominated by small cells belonging to the order cryptomonadales. Among the larger cells dinoflagellates were most abundant such as the toxic dinoflagellate *Dinophysis norvegica*\* and *Protoperidinium pellucidum*. The integrated chlorophyll *a* concentration was low.

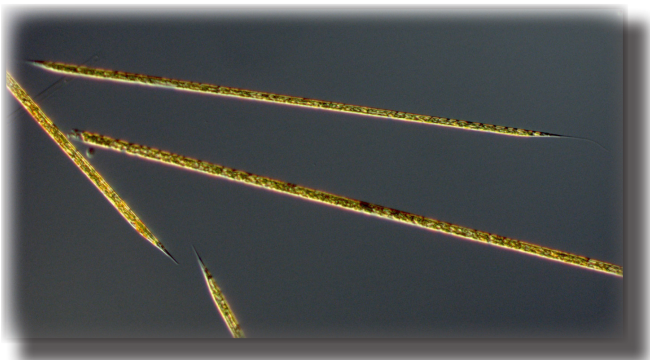


Fig 1. The diatom genus *Rhizosolenia* spp. was found at all sampled fluorescence peaks along the Swedish west coast.

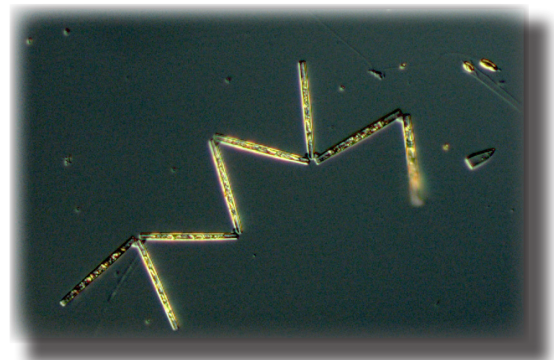


Fig 2. The diatom *Thalassionema nitzschioides* was found at many sampled fluorescence peaks along the Swedish west coast.

## The Kattegat

### Anholt E 16<sup>th</sup> and 21<sup>st</sup> of April

The plankton community was dominated by diatoms. Among the diatoms different species of the genus *Rhizosolenia* spp. and *Thalassionema nitzschioides* were most common. Several species belonging to the genus *Chaetoceros* spp. was also common. The chrysophyte *Dinobryon balticum* was also abundant. At the second sampling occasion fewer cells were found than at the first occasion but the communities were similar in their compositions. One fluorescence maximum was found on each sampling occasion at 15 and 20 meters. Both maxima contained high numbers of the genus *Rhizosolenia* at 15 meters together with high numbers of *Chaetoceros decipiens* and at 20 meters with *Thalassionema nitzschioides*. The integrated (0-20 m) chlorophyll *a* concentrations were within normal.

### N14 Falkenberg 16<sup>th</sup> of April

The total cell numbers found were low. The diatom *Thalassionema nitzschioides* and the chrysophyte *Dinobryon balticum* dominated the sample. One fluorescence maximum was found at 16 meters and high numbers of the genus *Rhizosolenia* and *Thalassionema nitzschioides* dominated. The integrated (0-20 m) chlorophyll *a* concentrations were within normal.

## The Baltic Sea

### BY2 17<sup>th</sup> of April

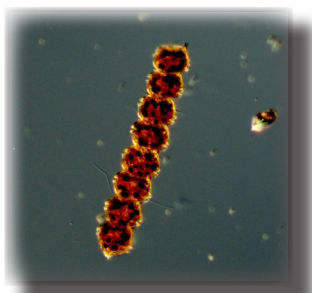
The plankton community was dominated by different diatoms. Several species belonging to the genus *Chaetoceros* such as *C. subtilis*, *C. similis* and *C. whighamii* were most common. Also the diatom *Skeletonema marinoi*, common in the spring bloom, was present in quite high cell numbers. The integrated (0-20 m) chlorophyll *a* concentrations were within normal.

### BY5 17<sup>th</sup> of April

A lot of ciliates were found in the sample together with high cell concentrations of the diatoms *Chaetoceros similis*, *Thalassiosira baltica* and the dinoflagellate *Peridiniella catenata*. The integrated (0-20 m) chlorophyll *a* concentrations were within normal.

### BY15 18<sup>th</sup> and BY20 19<sup>th</sup> of April

The community was dominated by the dinoflagellate *Peridiniella catenata*. A lot of filaments of the cyanobacterium *Aphanizomenon flos-aquae* were observed. One fluorescence maximum was found at 5 meters and high cell numbers of *Peridiniella catenata* were found. The integrated (0-20 m) chlorophyll *a* concentration at BY15 was in the higher part of what is considered normal for the month.



### BY32 19<sup>th</sup> of April

Three fluorescence maximum were sampled. One surface sample contained many filaments of *Aphanizomenon flos-aquae*. Another maximum was found at 5 meters and mainly contained the dinoflagellate *Peridiniella catenata*. A third maximum was found at 30 meters and here the diatom *Thalassiosira baltica* was most abundant. The integrated (0-20 m) chlorophyll *a* concentration was above normal for the month.

Fig 3. The dinoflagellate *Peridiniella catenata*.

### BY38 19<sup>th</sup> of April

The phytoplankton community was dominated by different thecate dinoflagellates, the chain forming dinoflagellate *Peridiniella catenata* being the dominating species among these. Quite small thecate dinoflagellates of unknown genera were also common. The small dinoflagellate *Heterocapsa rotundata* was also common. A few filaments of the cyanobakterium *Aphanizomenon flos-aquae* were also present. The integrated (0-20 m) chlorophyll *a* concentration was within normal.

### REF M1V1 Kalmar Sound 20<sup>th</sup> of April

Diatoms dominated the phytoplankton community. The diatom *Skeletonema marinoi* dominated in cell numbers among the diatoms but *Thalassiosira baltica*, *Melosira arctica*, *Chaetoceros bolsaticus* and *Chaetoceros whighamii* were also found in high numbers. The integrated (0-20 m) chlorophyll *a* concentration was within normal.

### Hanö Bight 20<sup>th</sup> of April

The chlorophyll fluorescence was high in the first 10 meters and an integrated sample was collected. Large cells of the mixotrophic ciliate *Masodinium rubrum* were found together with unidentifiable small cells of dinoflagellates.

### BCSIII-10 Kalmar Sound 20<sup>th</sup> of April

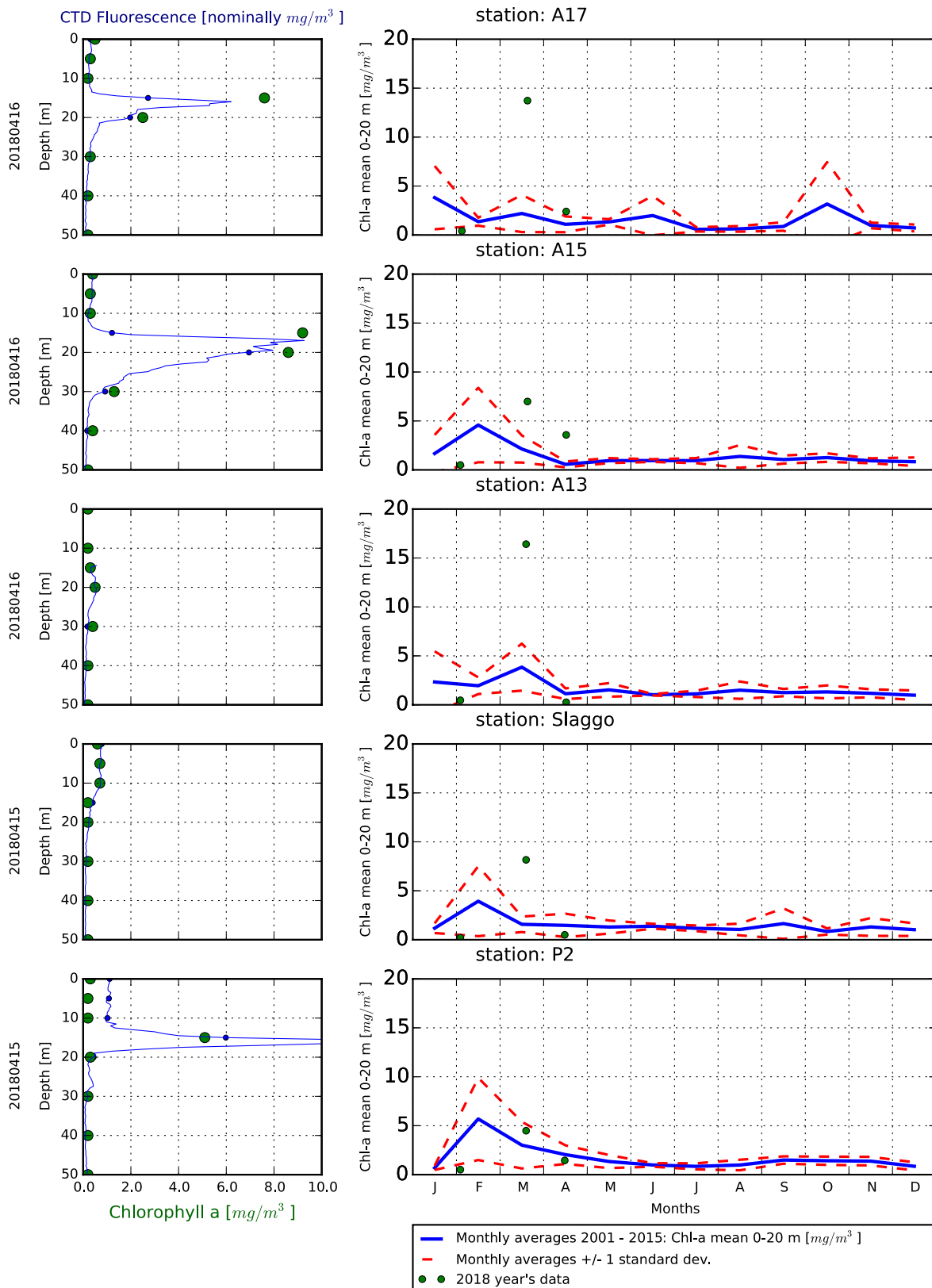
Few species and low total cell numbers were found in the sample. The sample mostly contained different colony forming cells of cyanobacteria. The dinoflagellate *Peridiniella catenata* was also found in high cell numbers.

Phytoplankton analysis and text by:  
Marie Johansen

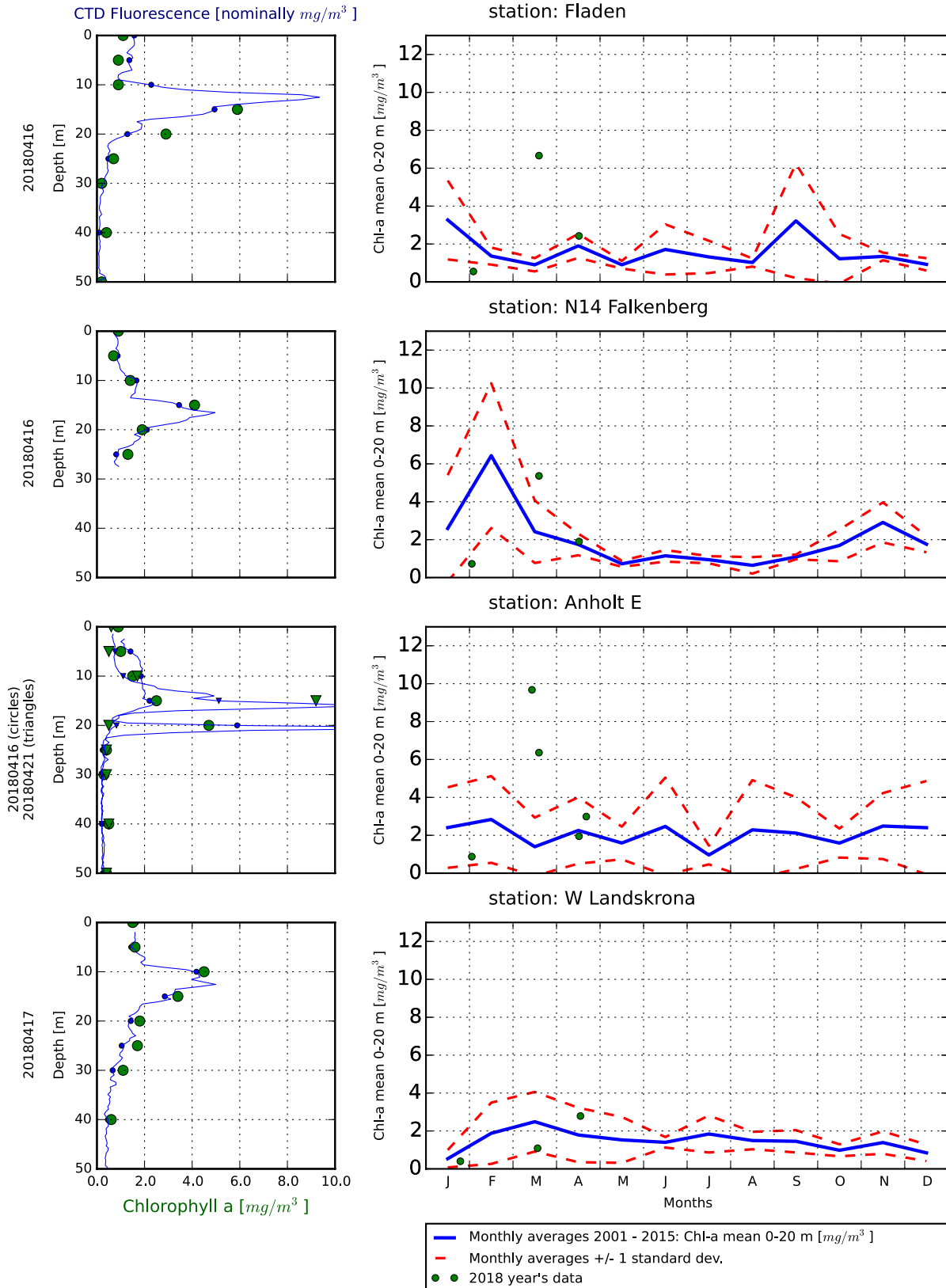
Selection of observed species	Anholt E	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	16/4	21/4	16/4	16/4	16/4
Hose 0-10 m	presence	presence	presence	presence	presence
Chaetoceros	present	common	common		
Chaetoceros brevis	present				
Chaetoceros convolutus	present				
Chaetoceros danicus	present	present	present		
Chaetoceros debilis		present			
Chaetoceros decipiens	present	common	common		
Chaetoceros diadema	present				
Dactyliosolen fragilissimus		present			
Leptocylindrus minimus				present	
Melosira arctica	present	present			
<b>Pseudo-nitzschia</b>	<b>common</b>	<b>common</b>		<b>present</b>	
Rhizosolenia hebetata f. semispina	common	common	common	present	
Rhizosolenia setigera			present		
Skeletonema marinoi	present	present			
Thalassionema nitzschioides	common	common	common		present
Thalassiosira	present				
Ceratium tripos		present			present
<b>Dinophysis acuminata</b>	<b>present</b>				
<b>Dinophysis dens</b>					<b>present</b>
<b>Dinophysis norvegica</b>		<b>present</b>	<b>present</b>	<b>common</b>	<b>common</b>
Gymnodiniales	present	common	present	present	
Gyrodinium spirale	present	present			
Peridinales	present			present	
Proto-peridinium pallidum	present		common		
Proto-peridinium pellucidum	common	common	common	common	present
Proto-peridinium steinii			present		
Cryptomonadales	present	common	common	common	
Dinobryon balticum	common	common	common	present	
Pseudopedinella pyriformis				present	
Ebria tripartita			present		
Mesodinium rubrum	present				
Ciliophora	common	present	common	common	common

Selection of observed species	BY2	BY5	BY10	BCSIII-10	BY15	BY20	BY38	REFM1V1
Red=potentially toxic species	17/4	17/4	18/4	18/4	18/4	19/4	19/4	20/4
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Achnanthes						present		
Attheya longicornis	present							
Chaetoceros	common					present		present
Chaetoceros ceratosporus	common							
Chaetoceros danicus		present	present				present	present
Chaetoceros holsaticus	present							common
Chaetoceros similis	common	common	present	common			common	
Chaetoceros subtilis	common	present		present				present
Chaetoceros thronsenii	present							
Chaetoceros wighamii	common					common		common
Melosira arctica	present					present		common
Skeletonema marinoi	common	present		present	present	present		common
Thalassiosira		present						present
Thalassiosira baltica	present	common			common	common	common	common
Alexandrium								present
Amphidinium					present			
Amylax triacantha				common			present	
<b>Dinophysis acuminata</b>		<b>present</b>			<b>present</b>	<b>present</b>	<b>present</b>	
Gymnodiniales	present	common	common	common	common	common	present	present
Gyrodinium spirale		present	present		present	present	present	
Heterocapsa				present		present		
Heterocapsa rotundata	present		present	present	present	present	common	
Katodinium glaucum						present		
Peridinales		common	common		present	present	common	
Peridiniella catenata	present	common	very common	present	common	common	common	common
Protoperidinium					present			present
Protoperidinium bipes						present		present
Ebria tripartita		present			present	present		present
Eutreptiella gymnastica		present		present	present		present	
Cryptomonadales	common	common	common	common	common	common	common	present
Aphanizomenon flosaquae	present		present	present	common	common	present	
Aphanocapsa	present			common			present	
Aphanothece				common	present			
Dinobryon		present					present	
Dinobryon faculiferum								common
Monoraphidium	present					present		
Pyramimonas							present	
Planctonema lauterbornii		present	present	present			present	
Mesodinium rubrum	common	common	present	common	present		present	
Ciliophora	common	common	common	common		common	common	
Choanoflagellata							present	

# The Skagerrak

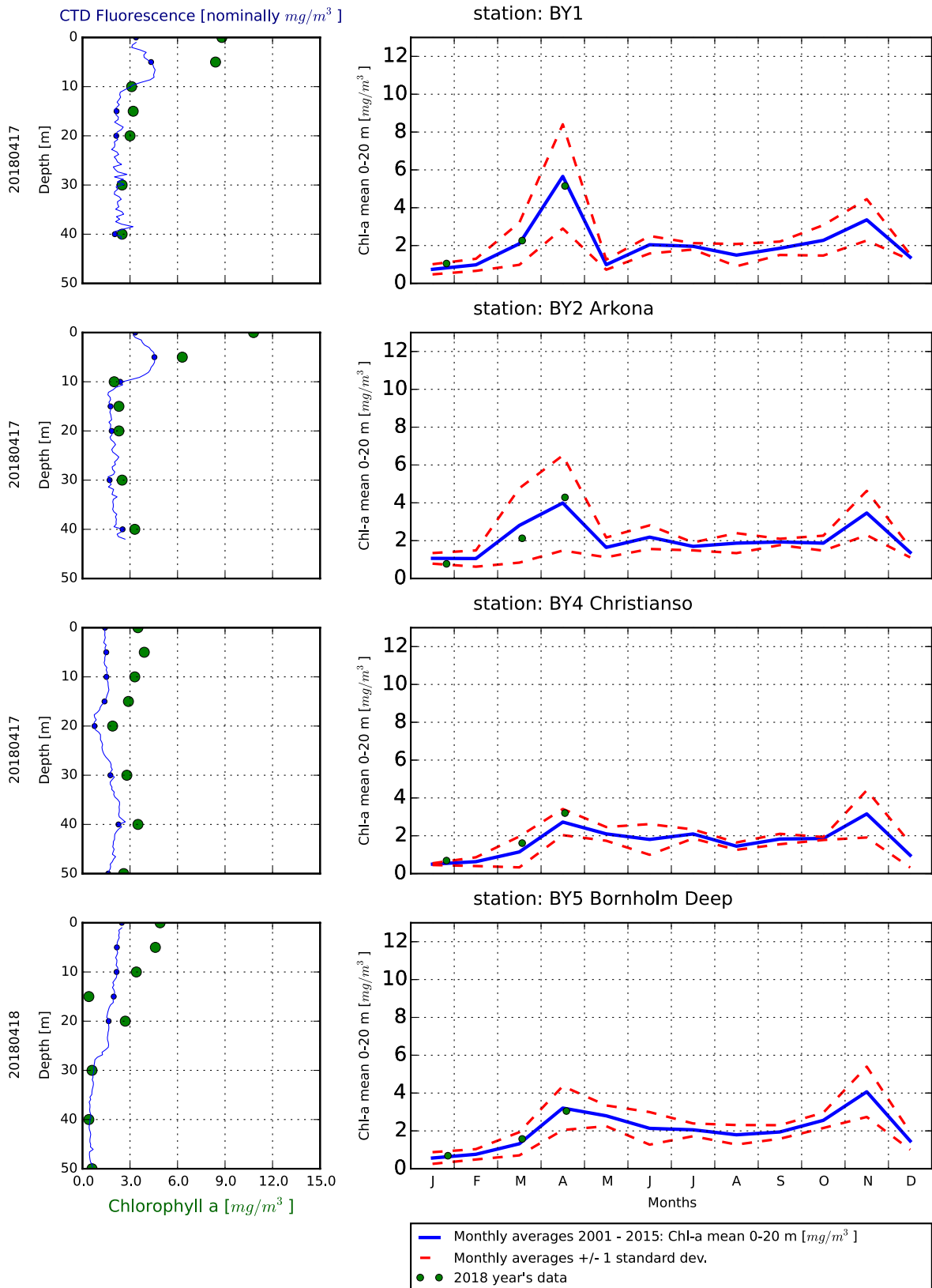


# The Kattegat and The Sound



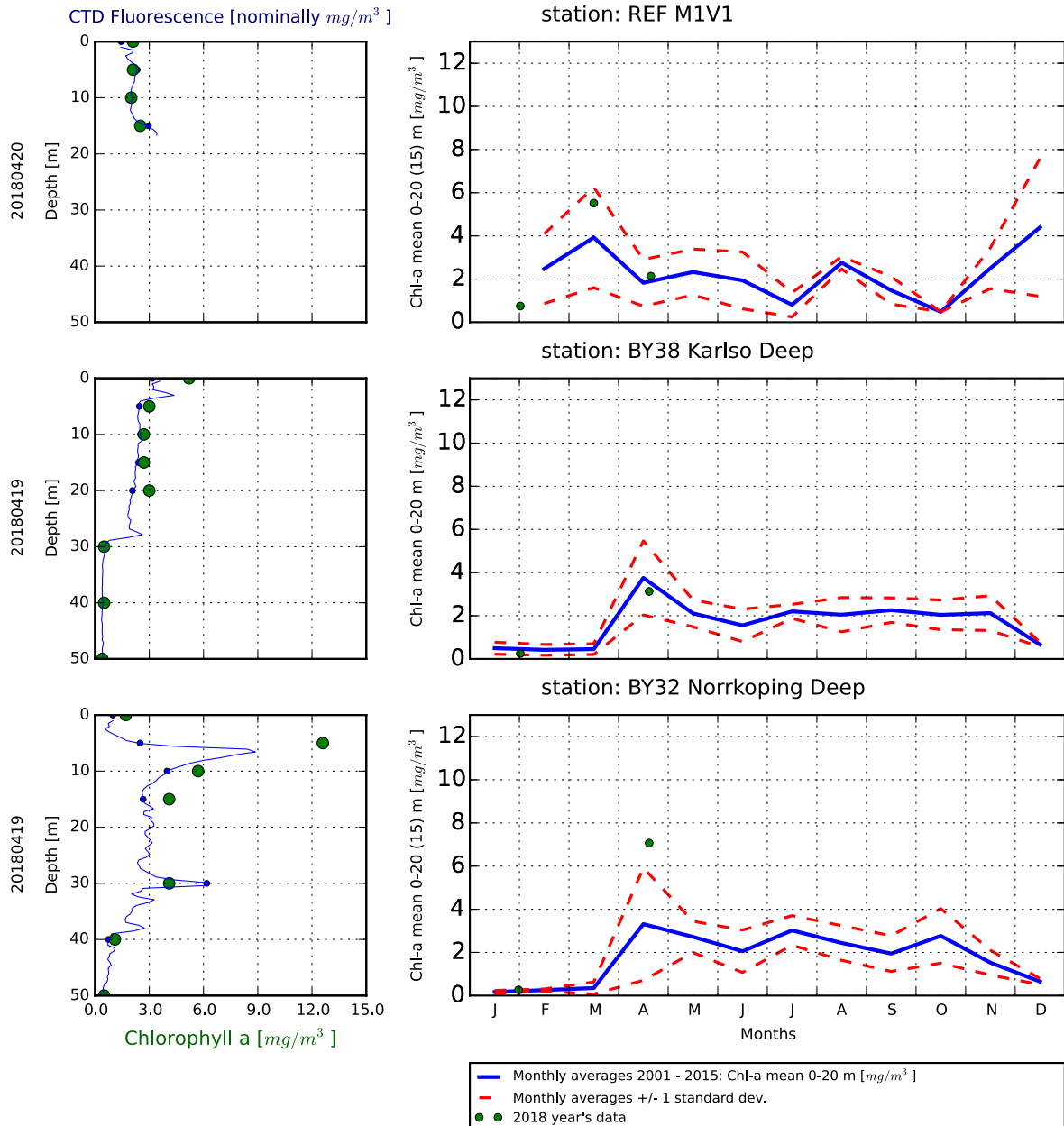


# The Southern Baltic





## 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 algblomningar finns under perioden juni-augusti på [www.smhi.se](http://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](http://www.smhi.se) during the period June-August.

Art / Species	Gift / Toxin	Eventuella symptom	Clinical symptoms
<i>Alexandrium</i> spp.	Paralytic shellfish poisoning (PSP)	<b>Milda symptom:</b> 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 <b>Extrema symptom:</b> 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.	<b>Mild case:</b> 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. <b>Extreme case</b> 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)	<b>Milda symptom:</b> Efter cirka 30 minuter till några timmar: yrsel, illamående, kräkningar, diarré, magont <b>Extrema symptom:</b> Upprepad exponering kan orsaka cancer	<b>Mild case:</b> Within 30 min-a few hours: dizziness, nausea, vomiting, diarrhoea, abdominal pain. <b>Extreme case:</b> Repeated exposure may cause cancer.
<i>Pseudo-nitzschia</i> spp.	Amnesic shellfish poisoning (ASP)	<b>Milda symptom:</b> Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramp <b>Extrema symptom:</b> Yrsel, hallucinationer, förvirring, förlust av korttidsminnet, kramper	<b>Mild case:</b> Within 3-5 hours: dizziness, nausea, vomiting, diarrhoea, abdominal cramps. <b>Extreme case:</b> dizziness, hallucinations, confusion, loss of memory, cramps.
<i>Chaetoceros concavicornis</i> / <i>C.convolutus</i>	Mechanical damage through hooks on setae	<b>Låg celltäthet:</b> Ingen påverkan. <b>Hög celltäthet:</b> Fiskens gälar skadas, fisken dör.	<b>Low cell numbers:</b> No effect on fish. <b>High cell numbers:</b> Fish death due to gill damage.
<i>Pseudochattonella</i> spp.	Fish toxin	<b>Låg celltäthet:</b> Ingen påverkan. <b>Hög celltäthet:</b> Fiskens gälar skadas, fisken dör.	<b>Low cell numbers:</b> No effect on fish. <b>High cell numbers:</b> 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.



