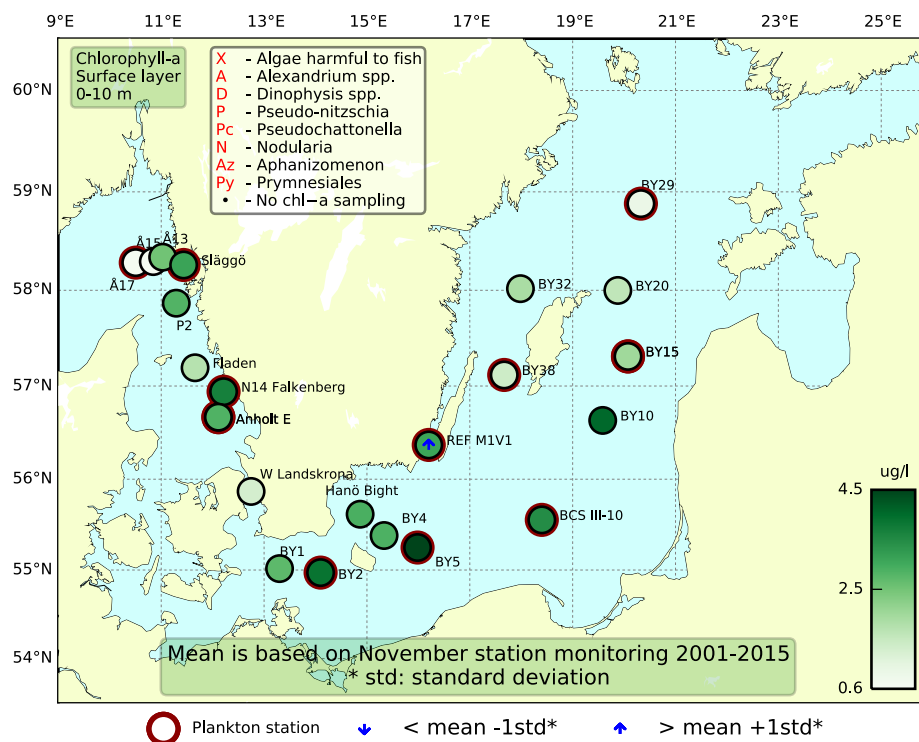


## Sammanfattning

Artdiversiteten var hög på flertalet stationer i Västerhavet. De totala cellantalen var däremot relativt låga. Kiselalger dominerade, och framför allt släktet *Pseudo-nitzschia*\*, som dominerade i cellantal vid samtliga stationer. Kalkalgen *Emiliania huxleyi* fanns vid de flesta stationer i höga koncentrationer.

De integrerade (0-10 m och 0-20 m) klorofyll *a*-koncentrationerna var låga men inom det normala för månaden vid de flesta stationer i Västerhavet. Koncentrationerna var strax över vad som är normalt vid de kustnära stationerna i Skagerrak.

I Östersjön var både celltätheten och biodiversiteten relativt låg. Enda undantaget var den kustnära stationen Ref M1V1 där relativt höga koncentrationer av ciliaten *Mesodinium rubrum* återfanns tillsammans med olika arter av cryptomonader. Vid ett par stationer fanns enstaka trådar av filamentösa cyanobakterier. Vid stationerna öster om Gotland var de integrerade (0-10 m och 0-20 m) klorofyll *a*-koncentrationerna strax under vad som är normalt för månaden.



## Abstract

The species diversity was rather high at most stations along the Swedish west coast. The total cell numbers were rather low. Diatoms dominated and the genus *Pseudo-nitzschia*\* was found in then highest concentrations. The coccolithophorid *Emiliania huxleyi* was abundant at most stations.

The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were within normal for the month at most stations, although just above normal at the stations close to the southern Skagerrak coast.

Both the cell numbers and species diversity was generally low in the Baltic Sea. The only exception was the coastal station REF M1VI, where high cell numbers were recorded. At REF M1VI the mixotrophic ciliate *Mesodinium rubrum* was abundant as well as different cells of cryptomonads. A few cyanobacteria filaments were present at some Baltic stations.

The stations east of Gotland had slightly lower integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations than what is 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) 11<sup>th</sup> of November

Low total cell numbers and species diversity was recorded. The diatom genus *Pseudo-nitzschia*\* and the coccolithophore *Emiliana huxleyi* dominated the sample. A few cells of the flagellate *Pseudocabottonella*\* were found.

### Släggö (Skagerrak coast) 12<sup>th</sup> of November

The cell numbers were quite low but the species diversity was high. The diatom *Pseudo-nitzschia*\* and the dictyochophyceae *Dictyocha speculum* dominated. The diatom *Dactyliosolen phuketensis*, which is rare at the Swedish coast, were present. The coccolithophore *Emiliana huxleyi* and the dinoflagellate *Ceratium lineatum* were abundant.

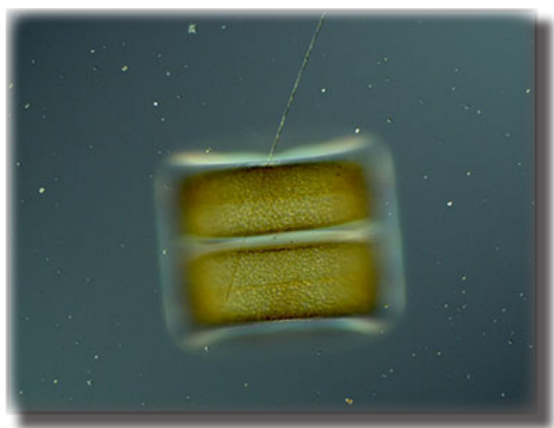


Photo 1: The diatoms *Coscinodiscus wailesii* and *Pseudo-nitzschia*\* were observed. The picture shows the gigantic difference in size between the two. *Pseudo-nitzschia* is the thin chain.

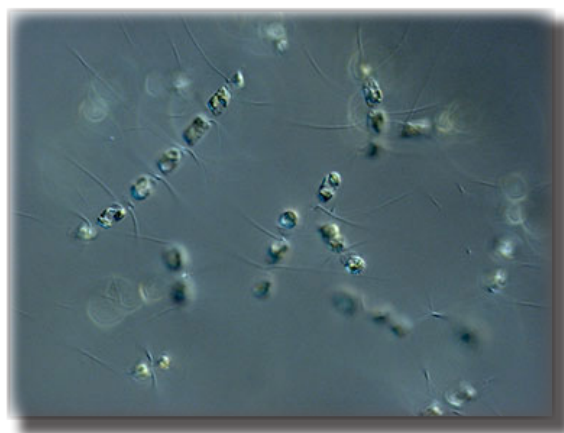


Photo 2: The diatom *Chaetoceros socialis* was found in most of the samples from the Kattegat and the Skagerrak.

## The Kattegat

### Anholt E 11<sup>th</sup> and 13<sup>th</sup> of November

The cell numbers were quite low but the species diversity was high and dominated by different diatoms at both visits. The diatoms *Pseudo-nitzschia*\* and *Chaetoceros socialis* were the most abundant taxa. The dictyochophyceae *Dictyocha speculum* was also found in quite high concentrations where some of them were found in the naked stage. The coccolithophore *Emiliana huxleyi* was numerous

### N14 Falkenberg 12<sup>th</sup> of November

The species diversity was high although the cell numbers were low. The most abundant species were diatoms, of which *Pseudo-nitzschia* spp.\* was the most numerous genus. The flagellate *Dictyocha speculum* was abundant and its naked stage was present as well.

## The Baltic Sea

### BY2 11<sup>th</sup> and BY5 10<sup>th</sup> of November

The cell numbers and species diversity were low. Among the large cells the diatom genera *Coscinodiscus* and *Actinocyclus* dominated in cell numbers and biovolume. The highest cell numbers were however represented by different species belonging to the Cryptomonadales. The ciliate *Mesodinium rubrum* was abundant at BY5. A few chains of the diatom *Chaetoceros castracanei* (previously called *C. impressus*) were found at both stations.

### BY15 9<sup>h</sup> of November

The cell numbers and species diversity were low. Among the large cells the diatom genus *Chaetoceros castracanei* (previously called *C. impressus*) was most abundant together with various ciliates. The highest cell numbers were represented by different species belonging to the Cryptomonadales. Quite a few cyanobacteria colonies were present such as the genera *Aphanocapsa* and *Snowella*.



Photo 3: The cyanobacterium *Nodularia spumigenas*\* was present at REF M1V1.

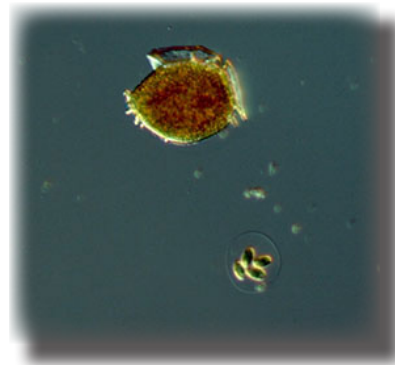


Photo 4: The dinoflagellate *Dinophysis norvegica*\* and the chlorophyte *Oocystis* sp. were found at BY15.

### BY29 9<sup>th</sup> of November

The cell numbers and species diversity were very low: Some filaments of the cyanobacterium genus *Aphanizomenon* together with the chlorophyte *Binuclearia lauterbornii* dominated the sample.

### REF M1V1 Kalmar Sound 13<sup>th</sup> of November

The total cell concentrations in the sample were low. The species diversity was moderate. The sample consisted mainly of different colony forming cyanobacteria of different sorts. Small cells of the mixotrophic ciliate *Mesodinium rubrum* were abundant. A few threads of the filamentous cyanobacteria *Nodularia spumigena*\* and *Aphanizomenon* were present.

### BY15 9<sup>th</sup> of November

The species diversity and total cell abundance were moderate. The dominant species were the dinoflagellate *Dinophysis norvegica*\*, and the diatom *Chaetoceros castracanei* (previously called *C. impressus*). The chlorophyte *Oocystis* was present.

### BCSIII-10 10<sup>th</sup> of November

The cell numbers and species diversity were low. The larger cells in the phytoplankton community were dominated by centric diatoms where *Actinocyclus* spp. and *Coscinodiscus granii* dominated. Various cryptomonads were the most numerous group.

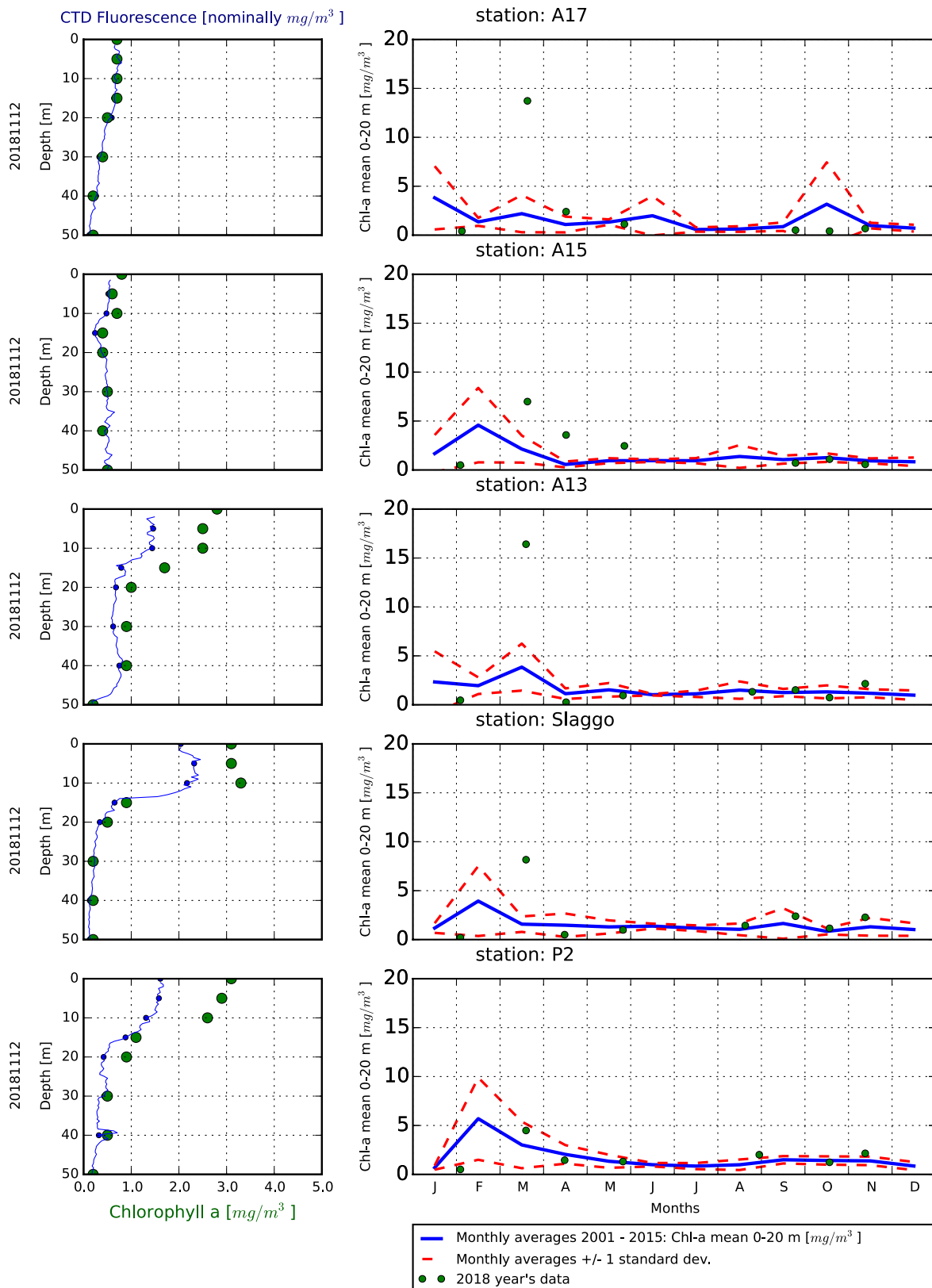
### BY31 and BY38 14<sup>th</sup> of November

The species diversity and total cell numbers were low. Both samples mainly consisted of various colony forming cyanobacteria, although small cells of the mixotrophic ciliate *Mesodinium rubrum* were abundant at BY31.

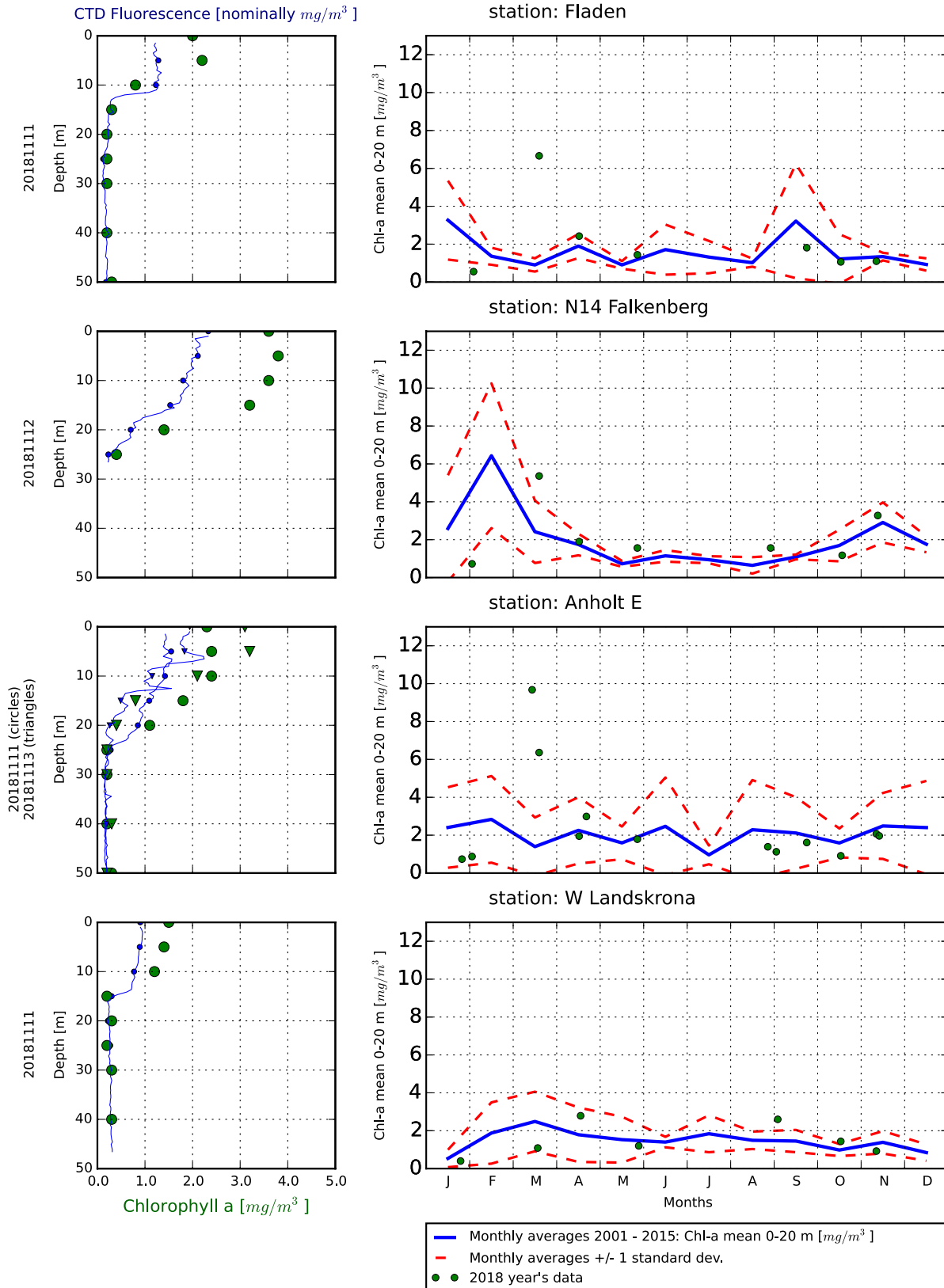
Selection of observed species	Anholt E	Anholt E	N14 Falkenberg	Släggö	Å17
Red=potentially toxic species	11/11	13/11	12/11	12/11	11/11
Hose 0-10 m	presence	presence	presence	presence	presence
Attheya septentrionalis			present		
Centrales				present	
Cerataulina pelagica	common	present	present	present	
Chaetoceros convolutus		present			
Chaetoceros danicus	present	present	present	present	
Chaetoceros similis		present			
Chaetoceros socialis	very common	present	common	present	
Coscinodiscus radiatus				present	
Coscinodiscus wailesii		present		present	
Cylindrotheca closterium		present			
Dactyliosolen fragilissimus	present	present	present		present
Dactyliosolen phuketensis				present	
Ditylum brightwellii	present	present	present		
Guinardia delicatula	present	present	common	common	
Guinardia flaccida	present				
Gyrosigma		present			
Lauderia annulata		present			
Leptocylindrus danicus				common	
Leptocylindrus minimus		present	present	present	
Nitzschia longissima	present	present	present	present	present
Pleurosigma					present
Porosira glacialis		present			
Proboscia alata		present	present		
Pseudo-nitzschia	dominating	very common	very common	very common	very common
Pseudo-nitzschia seriata			present		
Pseudosolenia calcar-avis		present	present	present	
Rhizosolenia imbricata				present	
Rhizosolenia pungens	present	present	common	present	
Rhizosolenia setigera	present		present	present	
Skeletonema marinoi	dominating	present	common	common	present
Thalassionema nitzschioides		present	present		
Thalassiosira	present			common	present
Thalassiosira angulata		present	present		
Thalassiosira anguste-lineata		present		present	
Thalassiosira punctigera		present	present	present	
Thalassiosira rotula		present	present	present	
Akashiwo sanguinea				present	
Amphidinium					present
Azadinium		present	present	present	
Ceratium horridum				present	
Ceratium lineatum	present	common	present	common	
Ceratium lineatum					present
Ceratium tripos	present	present	present	present	
Dinophysis acuminata	present	present		present	
Dinophysis norvegica	present	present			
Gymnodiniales				present	present
Gymnodinium verruculosum		present	present		
Gyrodinium flagellare					present
Gyrodinium spirale		present		present	
Karenia mikimotoi					present
Katodinium glaucum		present			
Peridinales				present	
Phalacroma rotundatum			present		
Prorocentrum compressum	present	present	present	present	present
Prorocentrum cordatum		present			
Prorocentrum micans			present		
Protoperidinium	present	present	present	present	
Protoperidinium bipes			present		
Protoperidinium steinii			present		
Emiliana huxleyi	very common	very common	common	common	very common
Pleurochrysis carterae					present
Heterosigma akashiwo	present	present	present	present	
Pyramimonas longicauda				present	
Cryptomonadales	common	present	present	common	present
Leucocryptos marina		present			
Dictyocha	present	present	present	present	
Dictyocha fibula	present	present		present	
Dictyocha speculum	common	common	common	common	
Pseudochattonella					present
Pseudopedinella			present		
Pseudanabaena	present	present		present	
Choanoflagellata	present			present	
Meringosphaera					present
Mesodinium rubrum				present	
Laboea strobila	present		present	present	
Strombidium			present		
Tiarina fusus		present	present	present	
Ciliophora	common	common		present	present
Rhizomonas setigera					present

Selection of observed species	BCSIII-10	BY2	BY5	BY15	BY29	BY31	BY38	Ref M1V1
Red=potentially toxic species	10/11	11/11	10/11	09/11	09/11	14/11	14/11	13/11
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Actinocyclus	present	common	common	present				present
Centrales	present	present	present	present			present	present
Chaetoceros castracanei	present	present	present	common			present	present
Chaetoceros danicus	present	present	present		present	present	present	present
Coscinodiscus					present			
Coscinodiscus centralis		present	present					
Coscinodiscus granii	common	present	present				present	present
Skeletonema marinoi					present	present		present
<i>Dinophysis acuminata</i>								present
<i>Dinophysis norvegica</i>				common	present		present	
Gymnodiniales	present	present		present	present	present	present	present
Heterocapsa				present				
Heterocapsa rotundata								present
Peridinales						present		present
<i>Phalacroma rotundatum</i>					present			
Prorocentrum balticum		present						
Binuclearia lauterbornii					common			
cf Botryococcus								present
Oocystis				common	common	common	present	present
Cryptomonadales	common	present	very com- mon	common	present	present	present	common
Telonema subtile							present	
Eutreptiella gymnastica					present			
Aphanizomenon					common			present
Aphanocapsa				present		present		present
Lemmermanniella						present	present	present
<i>Nodularia spumigena</i>								present
Pseudanabaena					present			
Woronichinia/snowella CPX	present			present	present	common	present	present
Choanoflagellata		present		present				
Ciliophora	present	present	present	common	present	present	common	present
Mesodinium rubrum	present		common	present		common	present	common
Helicostomella subulata				present				

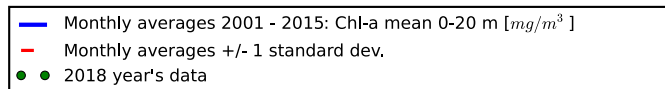
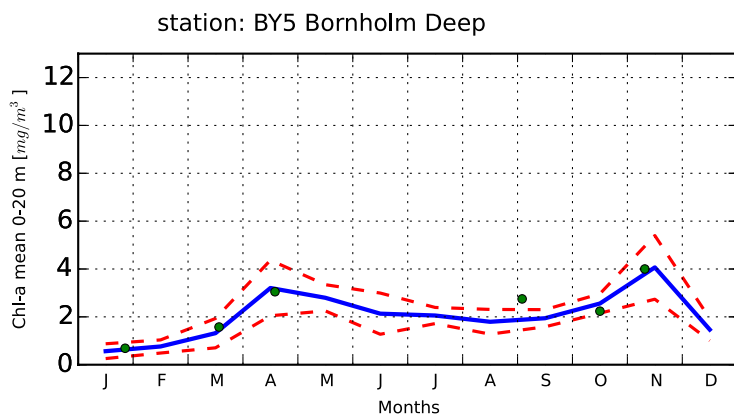
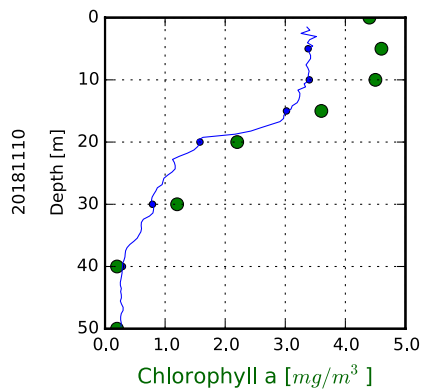
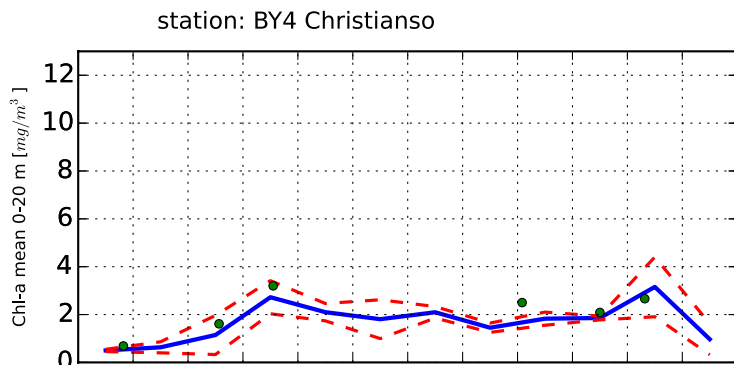
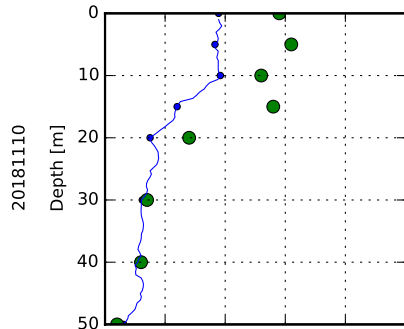
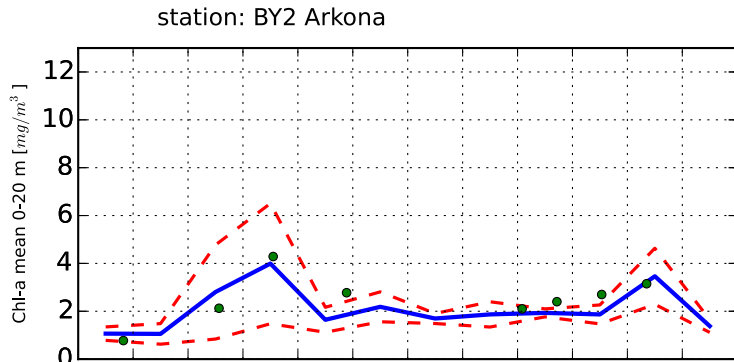
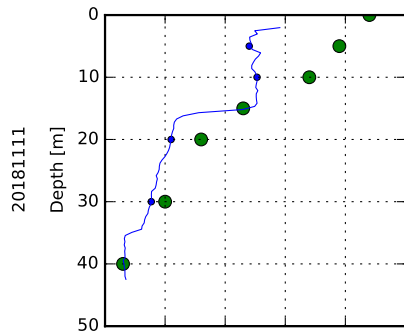
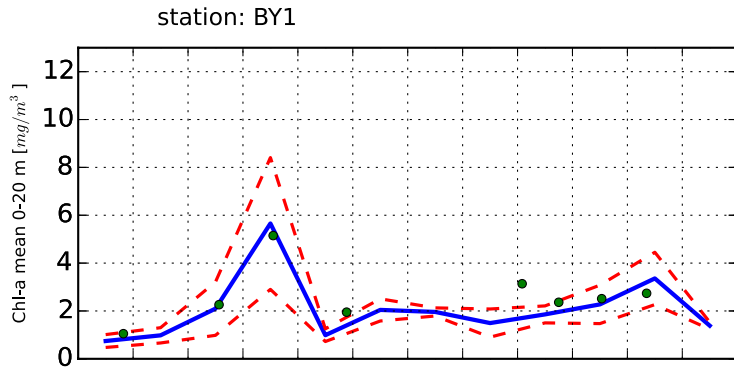
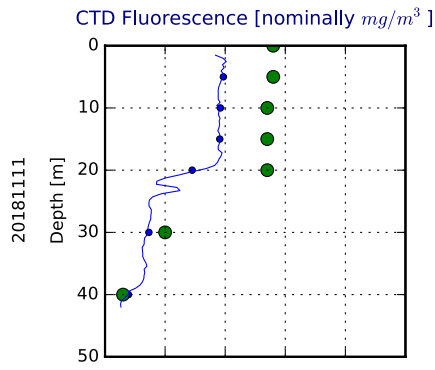
# The Skagerrak



# The Kattegat and The Sound

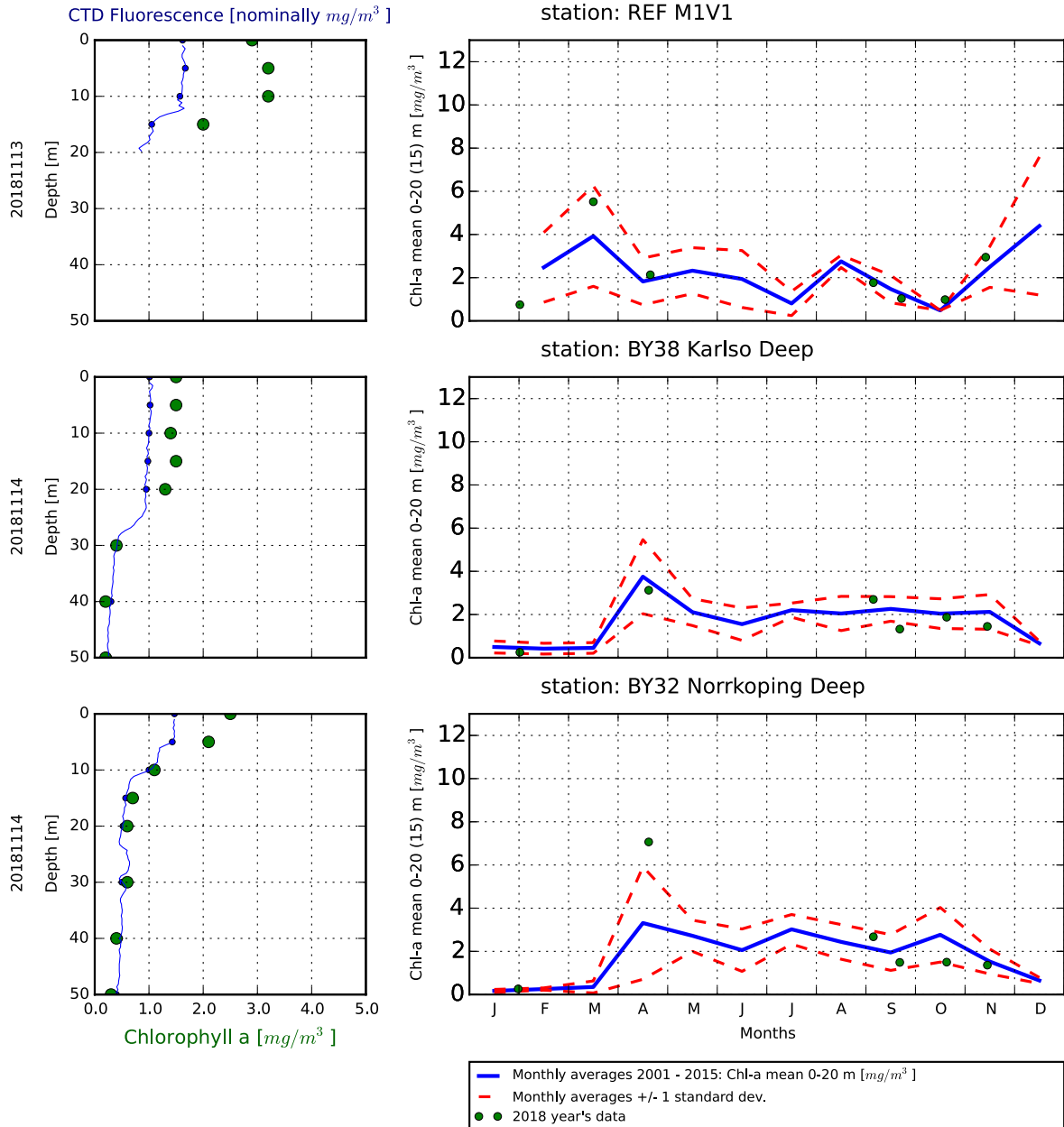


# The Southern Baltic





## 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.



