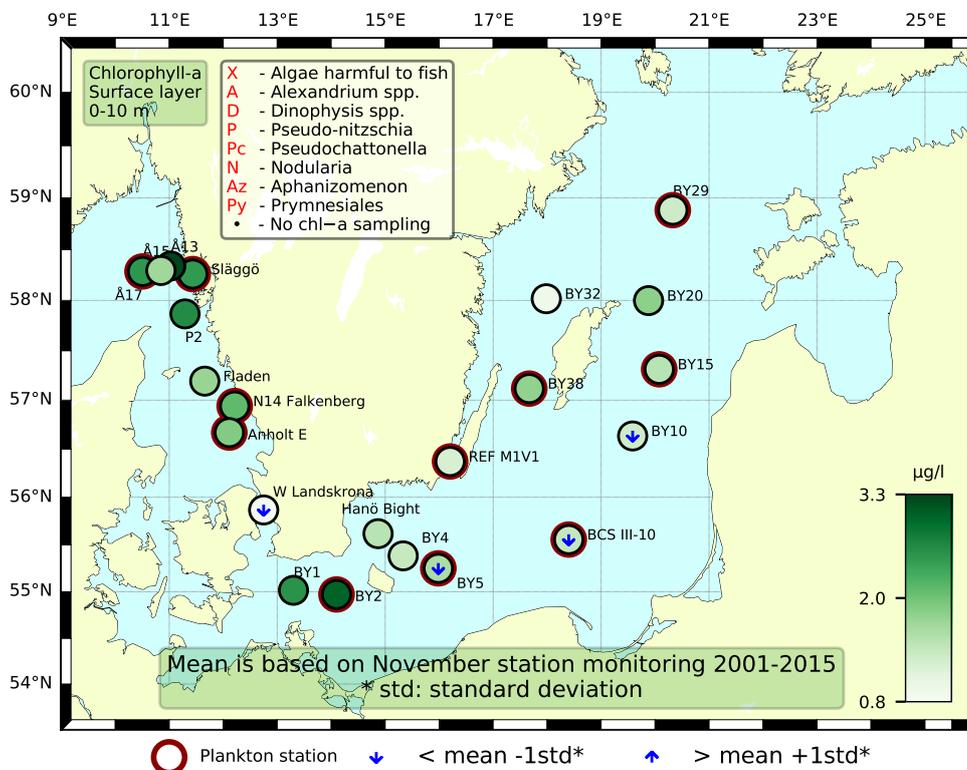


## Sammanfattning

Diversiteten av växtplankton och totalt antal celler var som man kan förvänta sig av årstiden relativt låg. Å17 stack ut lite med relativt hög artdiversitet. Kiselalger dominerade i antal vid samtliga stationer förutom vid Släggö där dinoflagellater var mer vanliga. Framför allt var kiselalgsläktet *Pseudo-nitzschia*\* vanlig vid samtliga stationer. Vid Å17, den yttersta stationen i Skagerrak återfanns enstaka celler av arter som normalt förekommer i Nordsjön. De integrerade klorofyllvärdena (0-10 m) som sammanfaller i djup med slangproverna var normala för månaden. I de integrerade klorofyllvärdena (0-20 m) återfanns förhöjda värden vid N14 Falkenberg och Å17. Vid Anholt E var de strax under det normala för månaden.

Diversiteten var allmänt låg vid Östersjöstationerna och de flesta stationerna var dominerade av små celler och ciliater, samt ett fåtal större kiselalger. BY15 och BY29 hade högst diversitet, där det förutom allt smått även hittades flertalet arter större kiselalger samt olika grönalger. Överlag var de integrerade klorofyllvärdena normala för månaden, utom för de sydöstra stationerna BY5, BCS III-10 och BY10 där de var lägre än normalt.



## Abstract

The phytoplankton diversity and total cell numbers were relatively low as can be expected for the season. The only exception was Å17 that had quite high biodiversity. Diatoms dominated at all stations except at Släggö where dinoflagellates were more abundant. Overall the diatom *Pseudo-nitzschia*\* was common. At Å17, the outer most station in the Skagerrak, a few cells of species more commonly found in the North Sea were found. The integrated (0-10 m) chlorophyll concentrations that coincide with the depth of the hose samples were within normal for all stations. The integrated (0-20 m) chlorophyll concentrations were above normal at N14 Falkenberg and Å17 whereas they were just below normal at Anholt E.

The phytoplankton diversity was generally low at the Baltic stations and most stations were dominated by small cells and ciliates, and a few larger diatoms. BY15 and BY29 had highest diversity, where in addition to all small cells, several larger diatom species and green algae were found. Overall, the integrated chlorophyll concentrations were normal for the month, except for the South-Eastern stations BY5, BCS III-10 and BY10, where the concentrations were lower than normal.

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

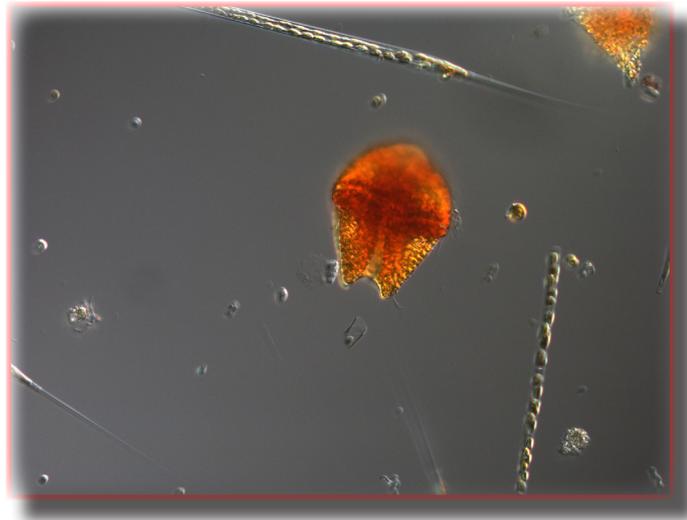
## The Skagerrak

### Å17 (open Skagerrak) 12<sup>th</sup> of November

The biodiversity was relatively high but total cell numbers were low. Diatoms dominated in cell numbers and among them the potentially toxic genus *Pseudo-nitzschia*\* was most abundant. The diatom *Proboscia indica*, normally found in the North Sea, was also common. The integrated (0-20 m) chlorophyll concentration was above normal for this month but the integrated (0-10 m) that coincides with the hose sampling was within normal.

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

The biodiversity and total cell numbers were both moderate. The larger cells were clearly dominated by dinoflagellates where *Akashiwo sanguinea* was the most common. Among the diatoms the genus *Pseudo-nitzschia*\* and *Pseudosolenia calcar-avis* were common. The integrated (0-10 m and 0-20 m) chlorophyll concentrations were within normal for this month.



The dinoflagellate *Akashiwo sanguinea* was common at station Släggö.

## The Kattegat

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

The species diversity and total cell numbers were moderate. Diatoms dominated with several species in high cell numbers such as the genus *Rhizosolenia*, *Pseudosolenia calcar-avis* and *Pseudo-nitzschia*\*. Among the dinoflagellates both *Dinophysis tripos* and *D. odiosa* were present. The smaller cells were mainly represented by different cryptomonadales. The integrated (0-10 m) chlorophyll concentration was normal for this month whereas the integrated (0-20 m) was above normal for this month.

### N14 Falkenberg 13<sup>th</sup> of November

The species diversity and cell numbers were moderate. Diatoms dominated clearly with several species with high cell numbers. *Pseudosolenia calcar-avis* had the highest cell numbers, but the genus *Pseudo-nitzschia*\* and *Dactyliosolen fragilissimus* were also abundant. The dinoflagellates were quite few in numbers and represented by different naked cells. The integrated (0-10 m) and (0-20 m) chlorophyll concentrations were both within normal for this month

## The Baltic

### BY2 14<sup>th</sup> of November

This station had relatively high diversity with several large diatom and dinoflagellate species, as well as the smaller community of ciliates, Cryptomonadales and flagellates, but without any small colony-forming cyanobacteria. This was the only station without the two *Chaetoceros* species (*C. castracanei* and *C. danicus*) but had two *Coscinodiscus* species (*C. centralis* and *C. radiatus*), as well as *Dactyliosolen fragilissimus* and the dinoflagellates *Prorocentrum cordatum* and *Tripes muelleri*. Both the integrated (0-20 m) and (0-10 m) chlorophyll concentrations were normal for this month.

### BY5 14<sup>th</sup> of November

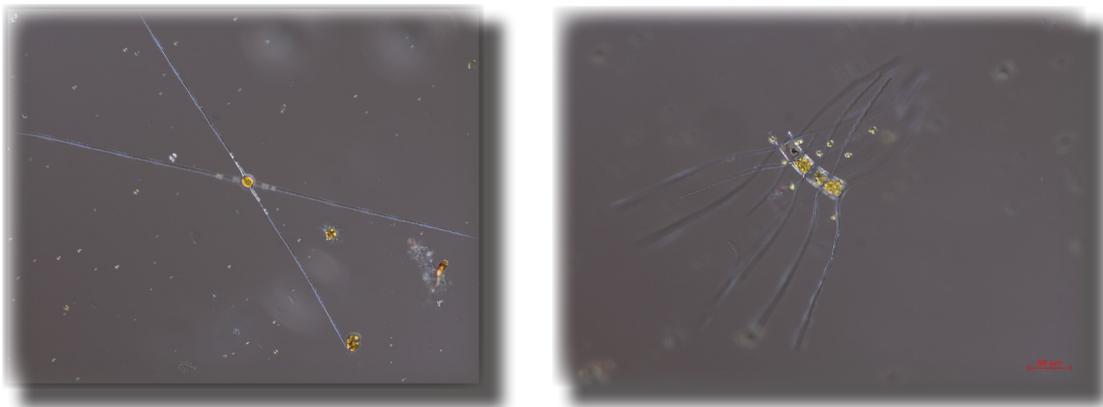
Both phytoplankton diversity and abundance were low. There were however some ciliates, *Leucocryptos marina* and other Cryptomonadales, as well as flagellates and unicells. Some Centrales and *Chaetoceros danicus* were found, as well as the ASP-producing genus *Pseudo-nitzschia*. Both the integrated (0-20 m) and (0-10 m) chlorophyll concentrations were below normal for this month.

### BCSIII-10 15<sup>th</sup> of November

Both phytoplankton diversity and abundance were low. There were however some ciliates, *Leucocryptos marina* and other Cryptomonadales, as well as flagellates and unicells. Some Centrales, *Chaetoceros castracanei* and *Skeletonema marinoi* were found. Both the integrated (0-20 m) and (0-10 m) chlorophyll concentrations were below normal for this month.

### BY15 15<sup>th</sup> of November and BY29 16<sup>th</sup> of November

BY15 and BY29 had a bit higher diversity and abundance than the other Baltic stations. In addition to all the smaller cells, both stations had some larger diatoms, such as *Chaetoceros danicus*, *C. castracanei*, *Pseudosolenia calcaravis* and *Rhizosolenia hebetata f. semispina*. Furthermore, at both stations, the small colony-forming cyanobacteria *Lemmermanniella cf. parva*, *Snowella* sp., and *Woronichinia* sp. were in quite high numbers. Both the integrated (0-20 m) and (0-10 m) chlorophyll concentrations were low but within normal for this month.



Two large diatoms found in some Baltic Sea stations in November and where you clearly can see their difference. *Chaetoceros danicus* (left) with straight setae and *C. castracanei* (right) with curved setae. Scale bar represent both pictures.

**BY31 16<sup>th</sup> of November**

Both phytoplankton diversity and abundance were low. There were however some ciliates of various sizes, *Leucocryptos marina* and other Cryptomonadales, as well as flagellates and unicells. Some Centrales, *Chaetoceros danicus* and *Coscinodiscus centralis* were found.

**BY38 17<sup>th</sup> of November**

Both phytoplankton diversity and abundance were low. There were however some ciliates, *Leucocryptos marina* and other Cryptomonadales, as well as flagellates and unicells. Some Centrales, *Chaetoceros danicus* and *Coscinodiscus centralis* were found. Both the integrated (0-20 m) and (0-10 m) chlorophyll concentrations were within normal for this month.

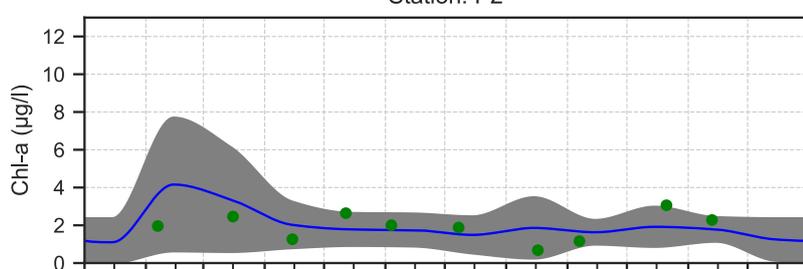
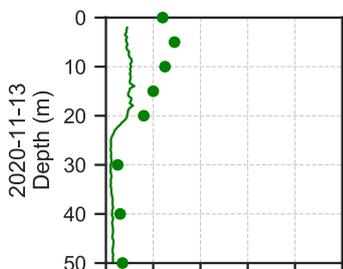
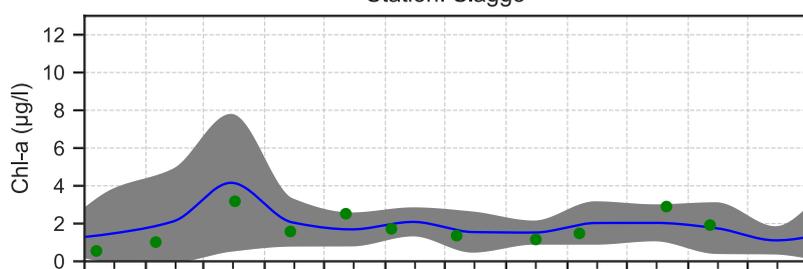
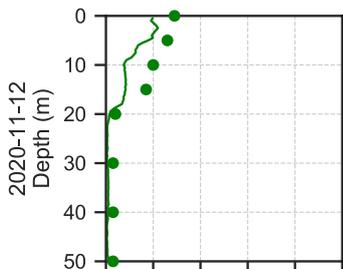
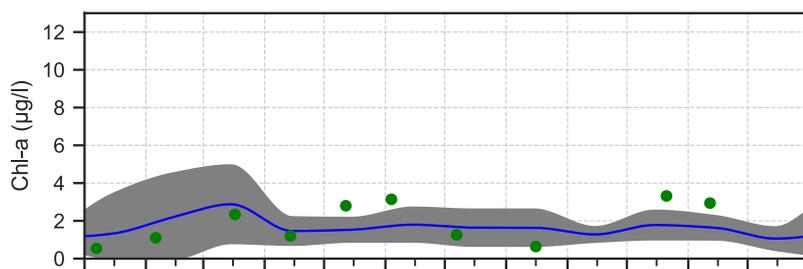
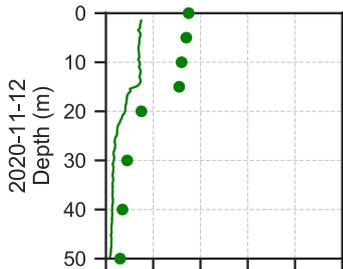
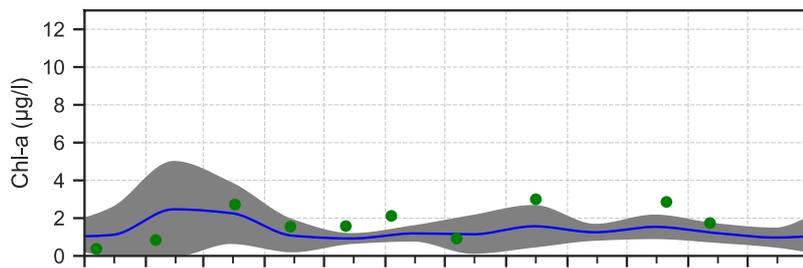
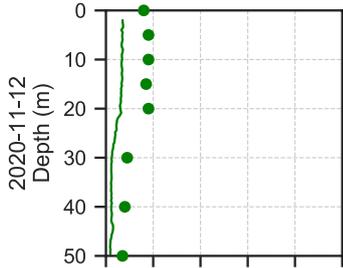
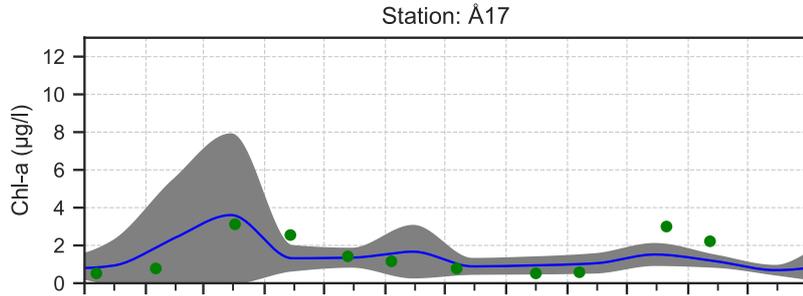
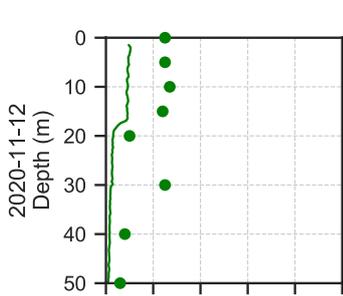
**REFM1V1 17<sup>th</sup> of November**

The diversity was low but abundance for the smaller Cryptomonadales and flagellates was quite high. *Skeletonema marinoi* was also represented in somewhat high numbers. Both the integrated (0-20 m) and (0-10 m) chlorophyll concentrations were low but within normal for this month.

Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	13/11	13/11	12/11	12/11
Hose 0-10 m	presence	presence	presence	presence
Cerataulina pelagica	present	present	present	present
Chaetoceros convolutus	present		present	present
Chaetoceros danicus	present	present	present	
Chaetoceros socialis	present			
Chaetoceros tenuissimus				present
Cylindrotheca closterium			present	present
Dactyliosolen fragilissimus	common	common	present	present
Ditylum brightwellii		present	present	present
Eucampia zodiacus	present			
Guinardia delicatula		present		
Guinardia flaccida	present	present		
Leptocylindrus danicus	common	common	present	present
Leptocylindrus minimus				present
Nitzschia longissima		present	present	present
Proboscia indica			present	present
Pseudo-nitzschia	common	very common	common	common
Pseudosolenia calcar-avis	very common	very common	common	present
Rhizosolenia setigera	common	common	common	common
Rhizosolenia setigera f. pungens	common	common	present	
Rhizosolenia styliformis				present
Skeletonema marinoi		present		present
Thalassiosira		present	present	present
Thalassiosira gravida	present	present		
Akashiwo sanguinea			very common	
Dinophysis acuminata	present	present		present
Dinophysis odiosa	present			
Dinophysis tripos	present			
Gymnodiniales	present	present	present	
Gymnodinium litoralis	present	present		
Gymnodinium verruculosum				present
Gyrodinium flagellare	present	present		present
Gyrodinium spirale		present		
Karenia mikimotoi		present		
Noctiluca scintillans		present	present	
Polykrikos schwartzii			present	
Proocentrum micans		present		
Protoperidinium	present			
Protoperidinium crassipes				present
Protoperidinium pallidum		present		
Scripsiella CPX		present	present	
Torodinium robustum				present
Tripos furca		present	present	present
Tripos lineatus	present	present	present	
Tripos longipes				present
Tripos macroceros			present	present
Tripos muelleri	present		present	present
Emiliana huxleyi	present		present	present
Cryptomonadales	present	common	present	present
Dictyocha fibula				present
Octactis speculum	present			common
Dictyochales	present	present		present
Pseudochattonella	present	present		
Pseudopedinella pyriformis		present		
Pseudanabaena	present		present	
Choanoflagellata	present			
Ciliophora	present	present		present
Laboea strobila		present	present	
Tiarina fusus	present			

Selection of observed species	BCSIII10	BY2	BY5	BY15	BY29	BY31	BY38	REFM1V1
Red=potentially toxic species	15/11	14/11	14/11	15/11	16/11	16/11	17/11	17/11
Hose 0-10 m	presence							
Attheya (cf. genus)				present				
Centrales	common	common	common	present	present	present	present	present
Chaetoceros castracanei	present			present	common			
Chaetoceros danicus			present	present	present	common	present	present
Coscinodiscus centralis		common		present	present	present	present	present
Coscinodiscus radiatus		present						
Cylindrotheca closterium								present
Dactyliosolen fragilissimus		present						
Leptocylindrus minimus							present	
Pseudo-nitzschia			present					
Pseudosolenia calcar-avis				present	present			
Rhizosolenia hebetata f. semispina				present	present			
Skeletonema marinoi	present							common
Gymnodiniales	present	present	present	common	present	present	common	present
Gymnodinium verruculosum	present	present	present	present				
Heterocapsa rotundata					present			present
Heterocapsa triquetra								present
Katodinium glaucum						present		
Peridinales				present	present			
Peridiniella danica								present
Phalacroma rotundatum					present			
Prorocentrum cordatum		present				present		
Scrippsiella CPX								present
Tripos muelleri		present						
Ollicola vangoorii		present						
Monoraphidium					present			
Oocystis sp.	present			present	present	present	present	
Binuclearia lauterbornii	present			common	common	present	present	
Pyramimonas sp.		present	present				present	common
Cryptomonadales	present	common	present	common	common	present		very common
Leucocryptos marina	common	present						
Pseudopedinella sp.					present			
Eutreptiella sp.		present					present	
Aphanocapsa sp.					common			
Cyanodictyon sp.						present		
Lemmermanniella cf. parva				present	common		present	
Snowella sp.	present		present	common	common	present	common	
Woronichinia sp.			present	present	present	present		present
Calliantha natans		common	present	present	present	present		
Choanoflagellatea						present	present	present
Ebria tripartita		present						
Ciliophora	common	present						
Mesodinium rubrum	present		present	common	common	common	common	
Flagellates	common	very common						
Unicell	common							

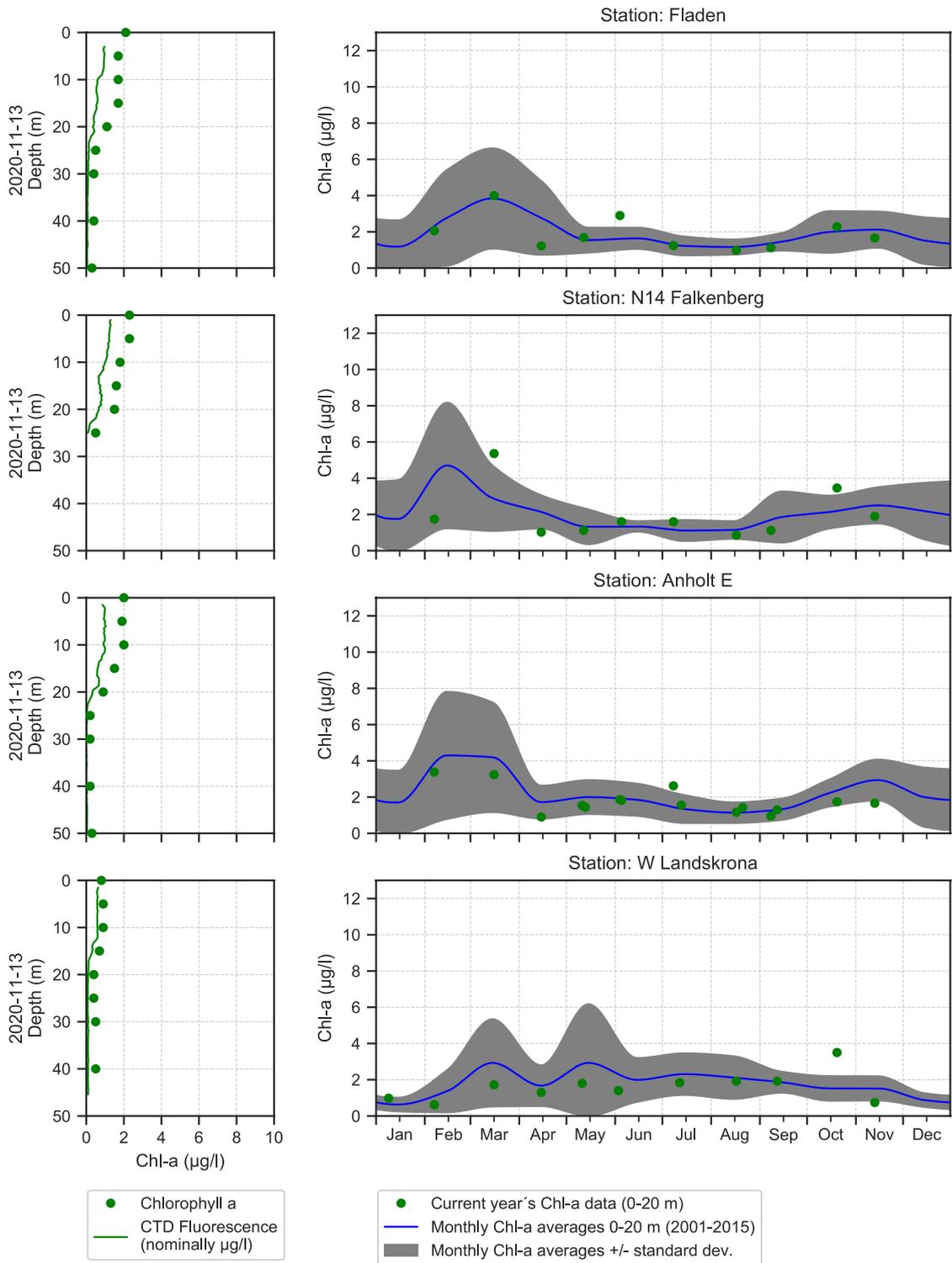
# The Skagerrak



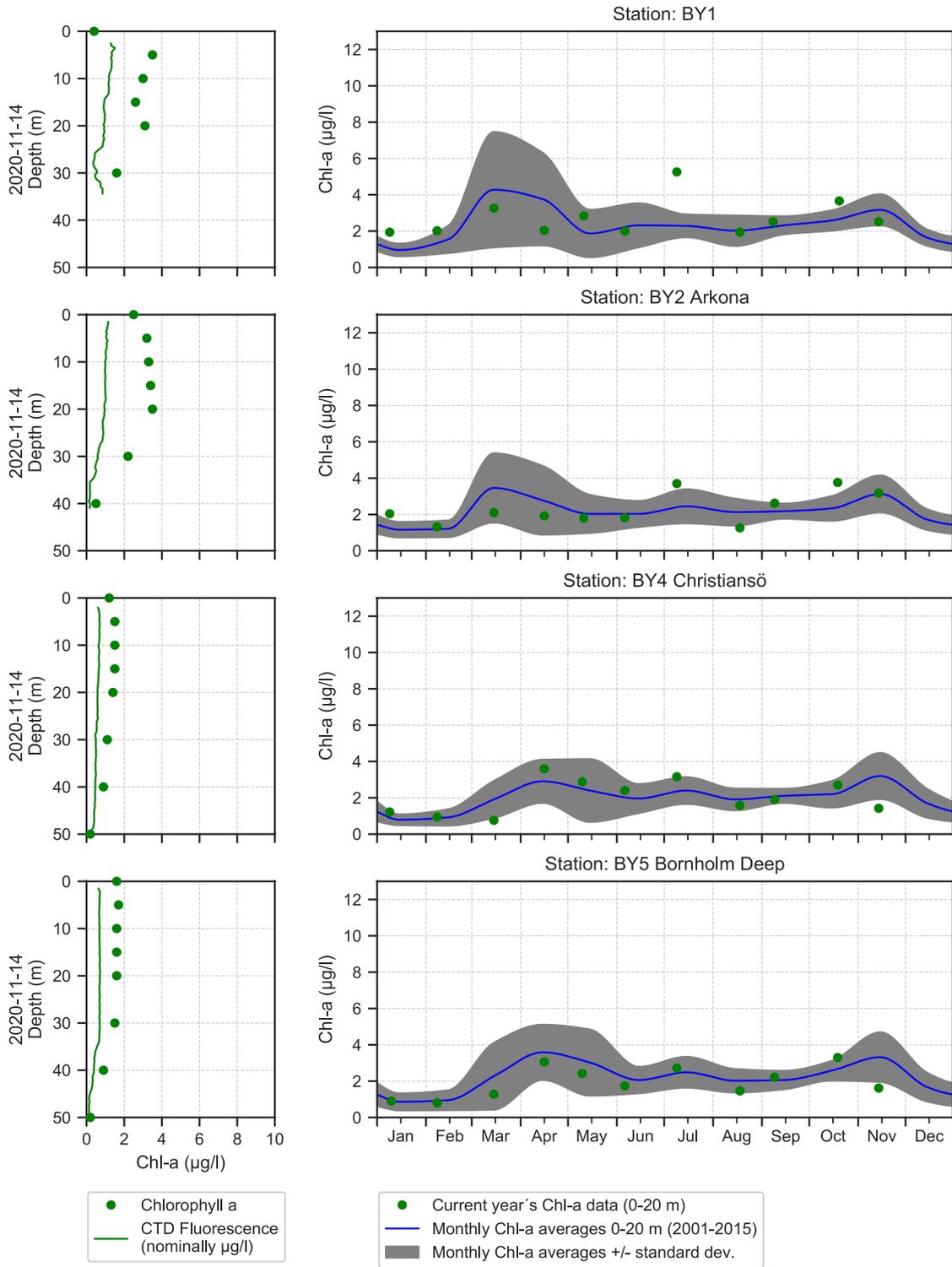
● Chlorophyll a  
— CTD Fluorescence (nominally µg/l)

● Current year's Chl-a data (0-20 m)  
— Monthly Chl-a averages 0-20 m (2001-2015)  
 Monthly Chl-a averages +/- standard dev.

## The Kattegat and The Sound



# The Southern Baltic







## 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 algbloomningar finns under perioden juni-augusti på [www.smhi.se](http://www.smhi.se). Resultat från provtagningarna kan hämtas från SMHI:s databas på [sharkweb.smhi.se](http://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](http://www.smhi.se) during the period June-August. Results from the expeditions are found in the SMHI database, [sharkweb.smhi.se](http://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)	<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.

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.



