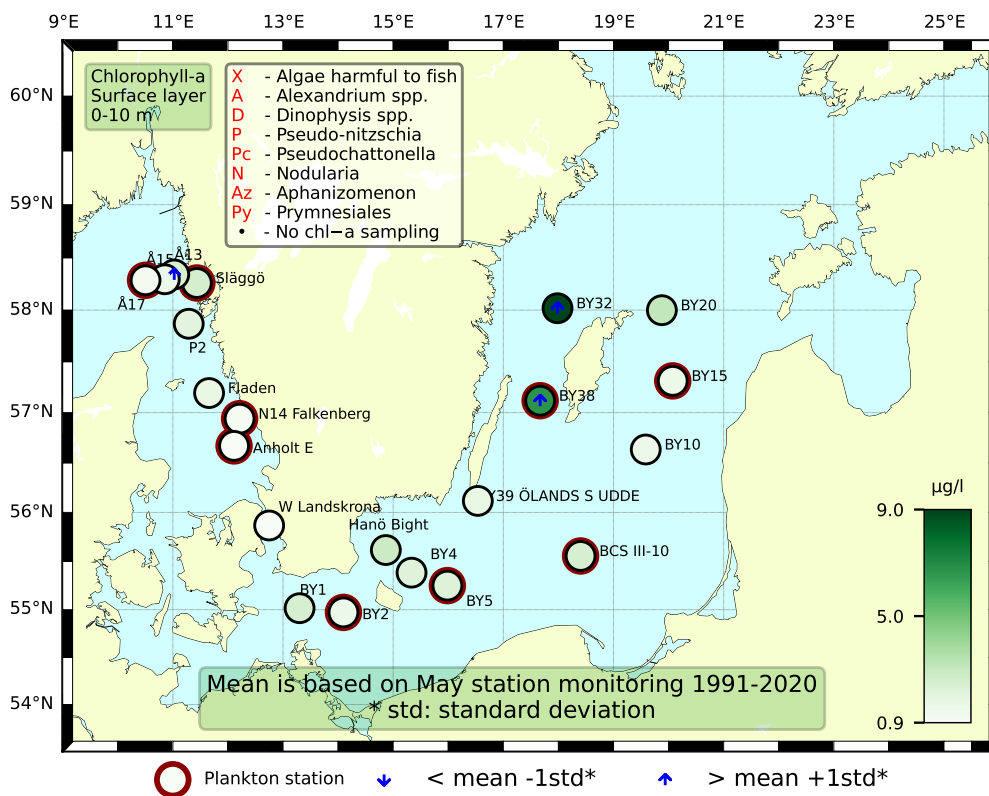


## Sammanfattning

Diversiteten och de totala cellantalen var generellt låga vid samtliga stationer i västerhavet. Små celler dominerade överlag i antal vilket är vanligt på våren i västerhavet. Vid Å17 återfanns höga celltätheter av coccolitoforiden *Emiliana huxleyi*. I Kattegatt återfanns fortfarande höga celltätheter av kiselalgen *Guinardia delicatula*, som månaden innan. Vid N14 Falkenberg återfanns en hel del av dinoflagellaten *Tripos muelleri* men i övrigt bestod proverna från Kattegatt mest av små celler av olika sorter. Den integrerade klorofyllhalten (0–20 m) var strax över det normala för månaden vid Släggö, i övrigt inom det normala.

Diversiteten och cellantalen av växtplankton var normala vid alla stationer i Östersjön med ett efter-vårblomning-samhälle. Flera dinoflagellatsläkten fanns med höga cellantal vid de flesta stationer, såsom Gymnodiniales, *Heterocapsa rotundata* och *Peridiniella catenata*. Det fanns dessutom ganska mycket av guldalgen *Dinobryon balticum* (med det svenska släktnamnet Strutgull) samt den filamentösa cyanobakterien *Aphanizomenon* sp. Både *Dinophysis acuminata*\* och *D. norvegica*\* var närvarande vid nästan alla stationer, och vid BCSIII-10 i rätt höga antal. De integrerade klorofyllhalterna (0–10 m och 0–20 m) var normala för månaden vid alla stationer, förutom vid BY38 där de var högre än normalt.



## Abstract

The diversity and total cell numbers were generally low at all stations along the Swedish West coast. Small cells dominated in cell numbers which is common during late spring. At Å17 the coccolithophore *Emiliana huxleyi* was found in high cell numbers. The samples from the Kattegat still contained a lot of cells of the diatom *Guinardia delicatula*, just like in April. At N14 some cells of *Tripos muelleri* was found but besides that the samples mainly contained small cells of different sorts. The integrated chlorophyll concentration (0-20 m) was slightly above normal for this month at Släggö, and within normal at all other stations.

The diversity and cell abundances of phytoplankton were normal at all stations in the Baltic Sea with a post spring bloom community. Several dinoflagellate genera were present in high numbers at most stations, such as Gymnodiniales, *Heterocapsa rotundata*, and *Peridiniella catenata*. There were also plenty of the golden algae *Dinobryon balticum* and the filamentous cyanobacterium *Aphanizomenon* sp. Both *Dinophysis acuminata*\* and *D. norvegica*\* were present at almost all stations, at BCSIII-10 in quite high amounts. The integrated chlorophyll concentrations (0-10m and 0-20 m) were normal for the month at all stations, except at BY38 where they were above the normal range.

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

## The Skagerrak

### Å17 (open Skagerrak) 8<sup>th</sup> of May

The phytoplankton diversity was low and total cell numbers were moderate, mainly consisting of small cells. The coccolithophore *Emiliana huxleyi* dominated in cell numbers. Among the larger cells the dinoflagellate genus *Tripes* was most common together with different species of ciliates. The integrated chlorophyll concentrations (0-10 and 0-20 m) were normal for this month.

### Släggö (Skagerrak coast) 8<sup>th</sup> of May

The phytoplankton diversity and total cell numbers were both low. The sample mainly consisted of small cells. Most numerous were *Skeletonema marinoi*, the order cryptomonadales and *Emiliana huxleyi*. Only a few dinoflagellates were found and mainly small naked forms. The integrated chlorophyll concentrations (0-10 and 0-20 m) were normal for this month.

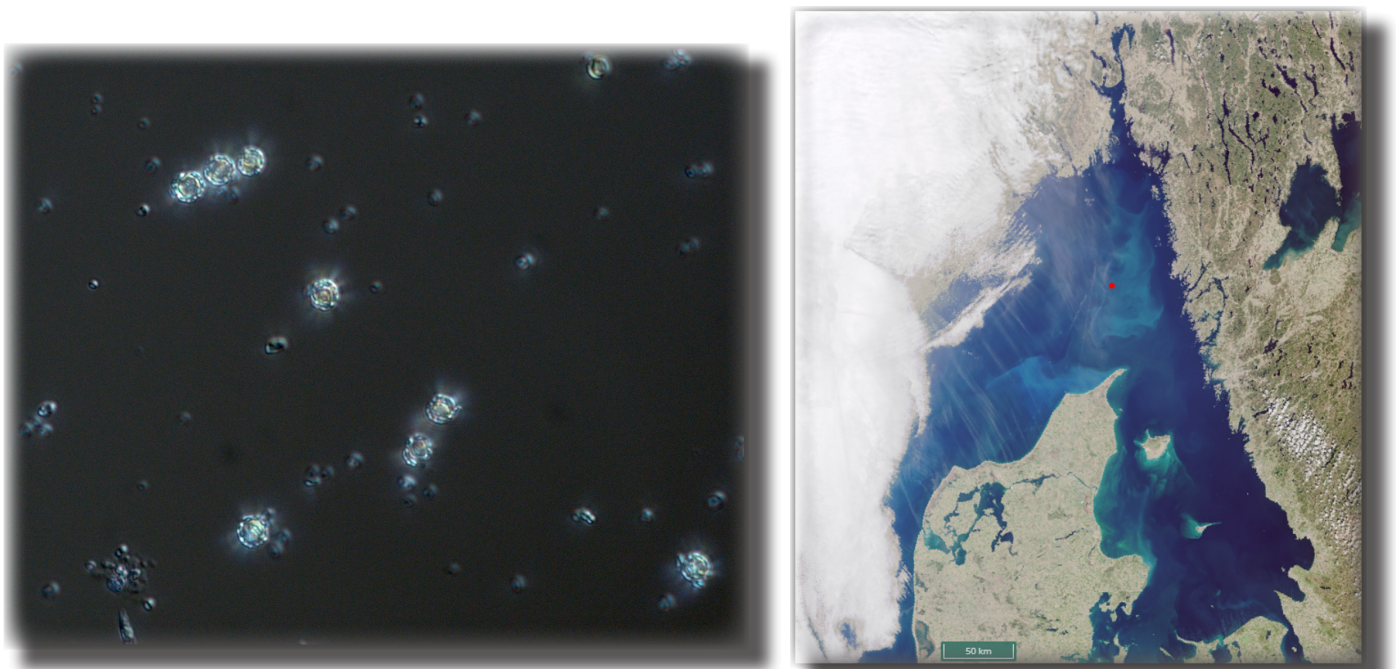


Fig 1. The coccolithophore *Emiliana huxleyi* dominated clearly in cell numbers at Å17. On this occasion the cell numbers were so high that they made the water look blue due to the sun's reflections onto the coccolithophores. Photos: M. Johansen and NASA.

## The Kattegat

### Anholt E 9<sup>th</sup> of May

The number of species were low and cell numbers moderate. The diatom *Guinardia delicatula* was still found in high cell numbers, just like last month. Among the small cells, flagellates of unknown taxa were found in high cell numbers together with plenty of cryptomonadales. Among the dinoflagellates, *Tripes muelleri* was common. The integrated chlorophyll concentrations (0-10 and 0-20 m) were normal for this month.

### N14 Falkenberg 9<sup>th</sup> of May

The number of species were low and cell numbers were moderate. The diatom *Guinardia delicatula* was still found in high cell numbers, like the month before. Among the small cells, flagellates of unknown taxa were found in high cell numbers together with cryptomonadales. The integrated chlorophyll concentrations (0-10 and 0-20 m) were normal for this month.

## The Baltic

### BY2 Arkona 10<sup>th</sup> of May

The phytoplankton diversity and abundances were low. Among the diatoms there were a few chains of *Skeletonema marinoi* and some *Chaetoceros similis*. Among the dinoflagellates there were mainly *Heterocapsa rotundata*, but also several different Gymnodiniales and some *Karlodinium veneficum*\* present. There were several colony-forming cyanobacteria genera present, as well as *Aphanizomenon* sp. Various ciliates were in moderate numbers. Among other phytoplankton *Pyramimonas* sp., Cryptomonadales and *Telonema* sp. were numerous. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

### BY5 Bornholm deep 11<sup>th</sup> of May

The phytoplankton diversity and abundances were low. The diatoms were represented by several species of *Chaetoceros*. Among the dinoflagellates Gymnodiniales and *H. rotundata* were present in high cell numbers and there were some cells of *D. acuminata*\* and *D. norvegica*\*. There were several colony-forming cyanobacteria genera present as well as a few filaments of *Aphanizomenon* sp. Among other phytoplankton there were mainly *Binuclearia lauterbornii* and cryptomonadales that were observed. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

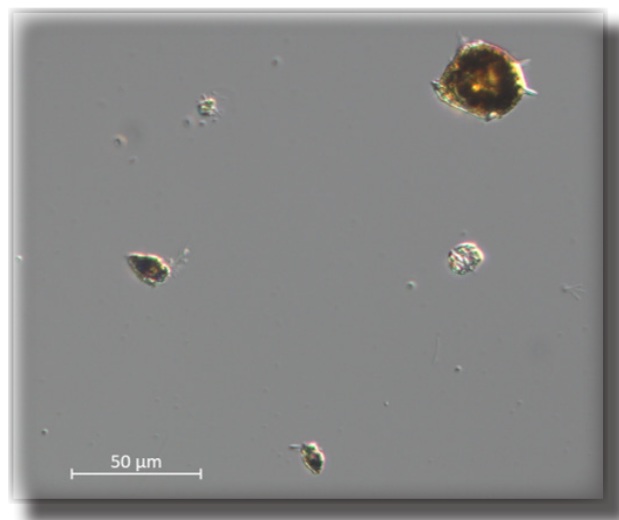


Fig 2. Dinoflagellates come in various forms and sizes. The top one is *Peridiniella catenata* and the two smaller ones are *Heterocapsa rotundata*. Both species were numerous at BY38 on the 13<sup>th</sup> of May. Photo: M. Karlberg.

### BCSIII-10 11<sup>th</sup> of May

The phytoplankton diversity and abundances were high. The diatoms were represented by several species of *Chaetoceros*. Among the dinoflagellates Gymnodiniales were the most abundant, but *Dinophysis acuminata*\* and *H. rotundata* were found in high numbers. *D. norvegica*\* was present in low counts, as was *Amylax triacantha*, *Katodinium glaucum*, *Peridiniella catenata* and *P. danica*. There were several colony-forming cyanobacteria genera present, and *Aphanizomenon* sp. in high amounts. Various ciliates were present. Among other phytoplankton *Dinobryon balticum* and *Pyramimonas* sp. were numerous, but also cryptomonadales. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

### BY15 Gotland deep 12<sup>th</sup> of May

The phytoplankton diversity and abundances were high. The diatoms were represented by several species of *Chaetoceros*. Within the dinoflagellates Gymnodiniales and *P. catenata* were in moderate numbers and there were some cells of *D. acuminata*\* and *D. norvegica*\*. There were several colony-forming cyanobacteria genera present and in quite high numbers, as well as *Aphanizomenon* sp. Among other phytoplankton *D. balticum* was numerous, but also *Pyramimonas* sp. and cryptomonadales. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

### **BY38 13<sup>th</sup> of May**

The phytoplankton diversity and abundances were high. There were however no diatoms present. Among the dinoflagellates *P. catenata* was very common, but there were plenty of Gymnodiniales and *H. rotundata*. Both *D. acuminata*\* and *D. norvegica*\* were present in low amounts. There were some colony-forming cyanobacteria genera present, as well as a few filaments of *Aphanizomenon* sp. Among other phytoplankton there were mainly *D. balticum*. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were above the normal range for this month. A fluorescence peak was sampled at BY32 on May 13<sup>th</sup> and the sample was very similar to both abundance and diversity to BY38. However, the chains and cells of *P. catenata* were looking a lot healthier at BY32 than at BY38. The chlorophyll concentrations at BY32 were also above the normal range for this month.

### **BY39 14<sup>th</sup> of May**

The phytoplankton diversity and abundances were high. There were however no diatoms present. Among the dinoflagellates Gymnodiniales and *H. rotundata* were very common, but also *Protoperidinium bipes* was numerous. Both *D. acuminata*\* and *D. norvegica*\* were present in low amounts. There were a few colony-forming cyanobacteria genera present, as well as *Aphanizomenon* sp. Among other phytoplankton there were mainly *D. balticum* present.

Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	9/5	9/5	8/5	8/5
Hose 0-10 m	presence	presence	presence	presence
Chaetoceros		present		
Chaetoceros muelleri	present			
Chaetoceros subtilis			present	
Dactyliosolen fragilissimus	present	present		
Guinardia delicatula	common	common	present	present
Guinardia flaccida	present	present		
Leptocylindrus minimus				present
Proboscia alata		present		
Rhizosolenia hebetata f. semispina		present		
Skeletonema marinoi		present	common	
<i>Dinophysis norvegica</i>	present			present
Gymnodiniales	common	common	present	present
Heterocapsa rotundata			present	present
Katodinium glaucum	present		present	present
Peridinales		present		
Tripos fusus	present	present		present
Tripos longipes	present	present		common
Tripos macroceros				present
Tripos muelleri	common	present		present
Emiliana huxleyi		present	common	dominant
<i>Prymnesiales</i>	present			
Cryptomonadales	very common	common	very common	present
Leucocryptos marina	present		present	present
Telonema subtile	present	present	present	
Choanoflagellata	present			present
Ebria tripartita	present		present	
Ciliophora	common	common	common	common
Mesodinium rubrum		present	present	common
Laboea strobila	present	present		
Flagellates		very common		

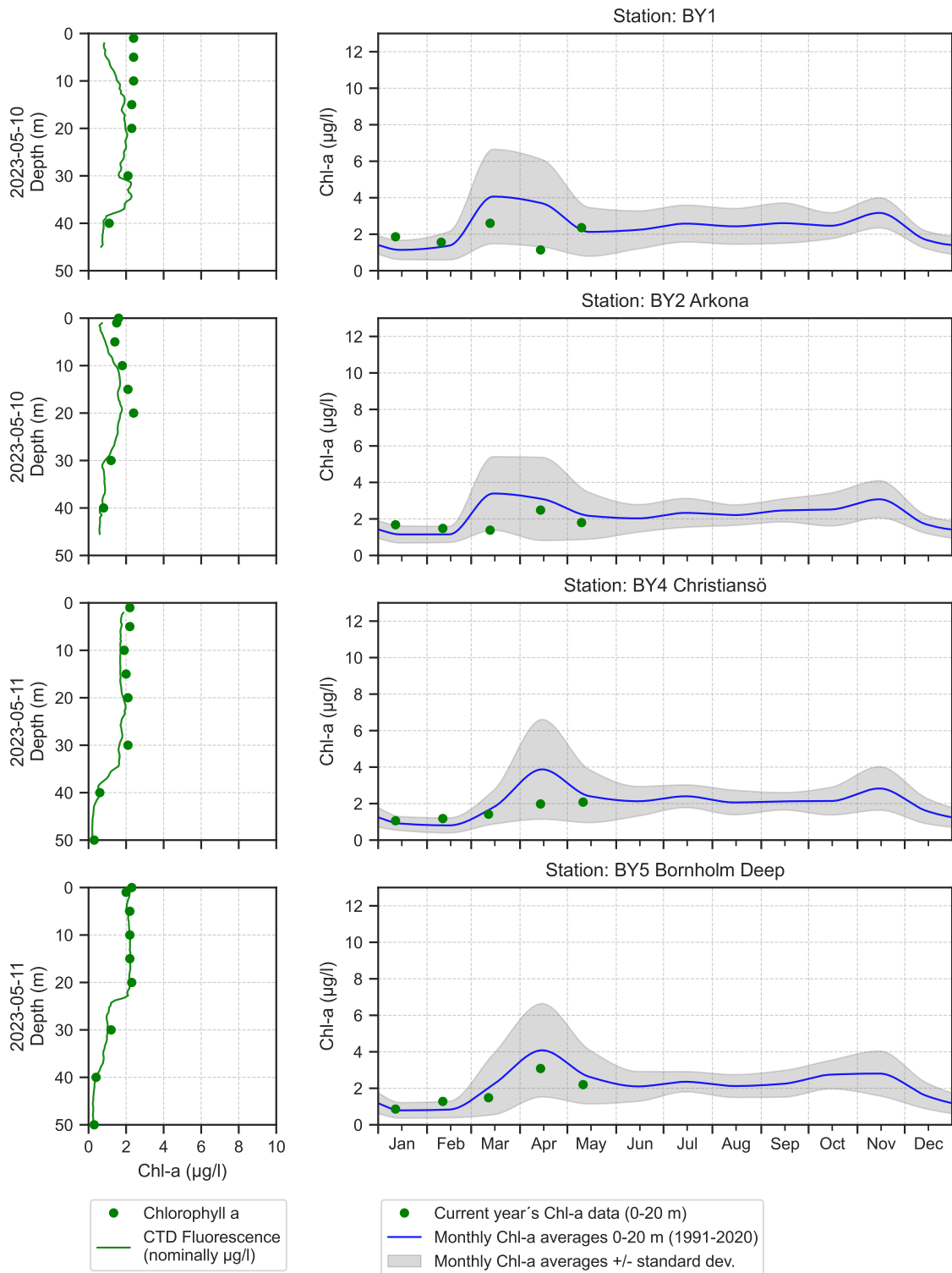
Selection of observed species	BY2	BY5	BCSIII-10	BY15	BY38	BY39
Red=potentially toxic species	10/5	11/5	11/5	12/5	13/5	14/5
Hose 0-10 m	presence	presence	presence	presence	presence	presence
Chaetoceros				present		
Chaetoceros castracanei		present				
Chaetoceros danicus		present	present	present		
Chaetoceros similis	present	present	present	present		
Chaetoceros subtilis			present			
Chaetoceros wighamii				present		
Skeletonema marinoi	present					
Amylax triacantha			present			
<i>Dinophysis acuminata</i>		present	common	present	present	present
<i>Dinophysis norvegica</i>		present	present	present	present	present
Gymnodiniales	present	common	very common	common	common	very common
Gyrodinium spirale						present
Heterocapsa rotundata	common	common	common	present	common	very common
<i>Karlodinium veneficum</i>	present				present	present
Katodinium glaucum		present	present	present		present
Peridinales						present
Peridiniella catenata			present	common	very common	present
Peridiniella danica		present	present		present	present
Protoperidinium				present		
Protoperidinium bipes					present	common
Protoperidinium brevipes					present	
Dinobryon balticum			very common	very common	common	common
Oocystis	present	present		present		present
Binuclearia lauterbornii	present	common	present	present	present	present
Pyramimonas	common	present	very common	common	present	present
Cryptomonadales	common	common	common	common	present	present
Telonema	common	present			present	present
Eutreptiella	present				present	
Aphanizomenon	present	present	very common	common	present	present
Aphanocapsa	present	present	present	common		
Aphanothece paralleliformis					present	
Lemmermanniella	common	present	common	common	present	present
Snowella	common	present	present	common	present	present
Ebria tripartita	present					
Ciliophora	common	common	common	common	common	common
Mesodinium rubrum				present	present	



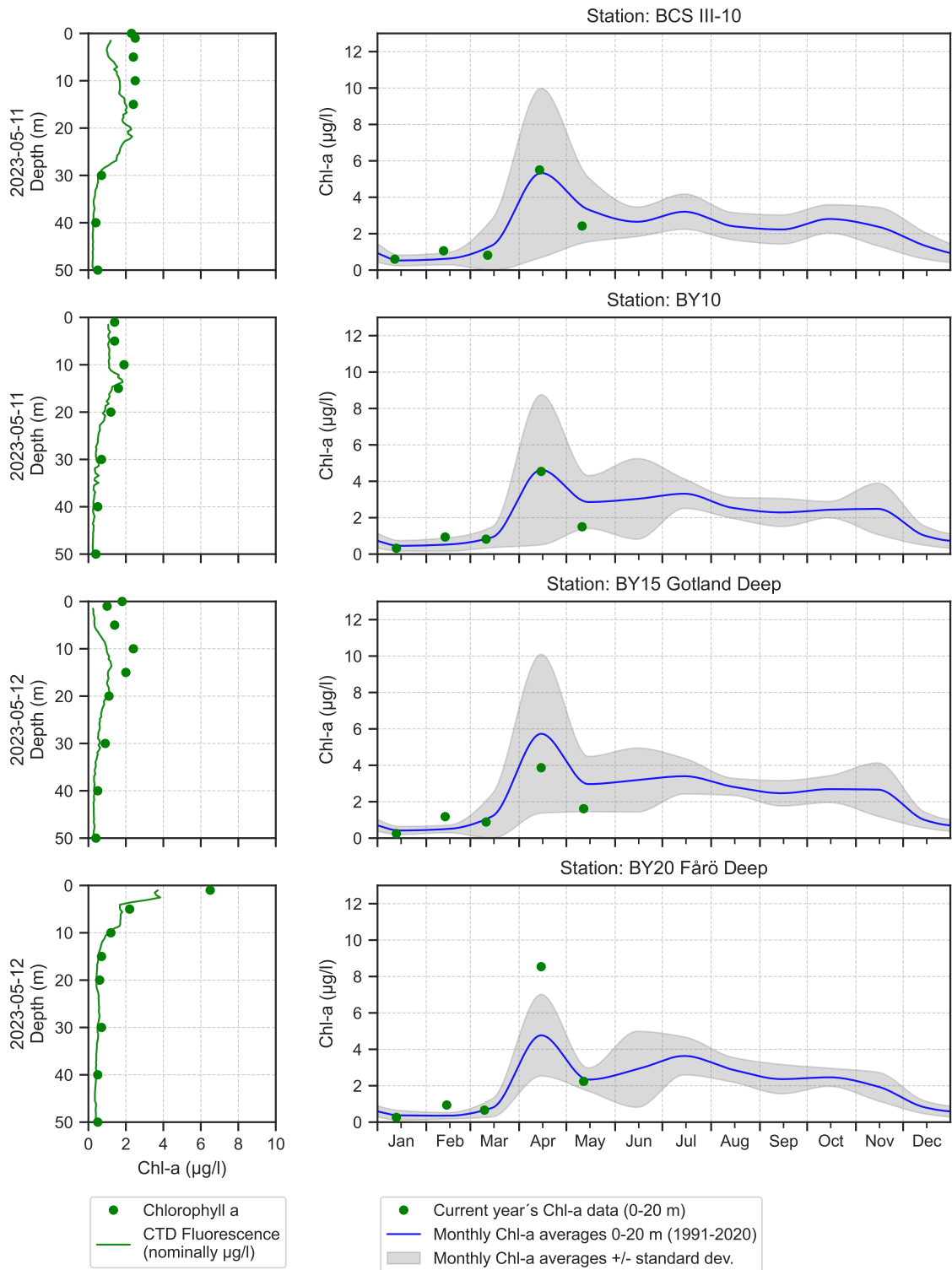




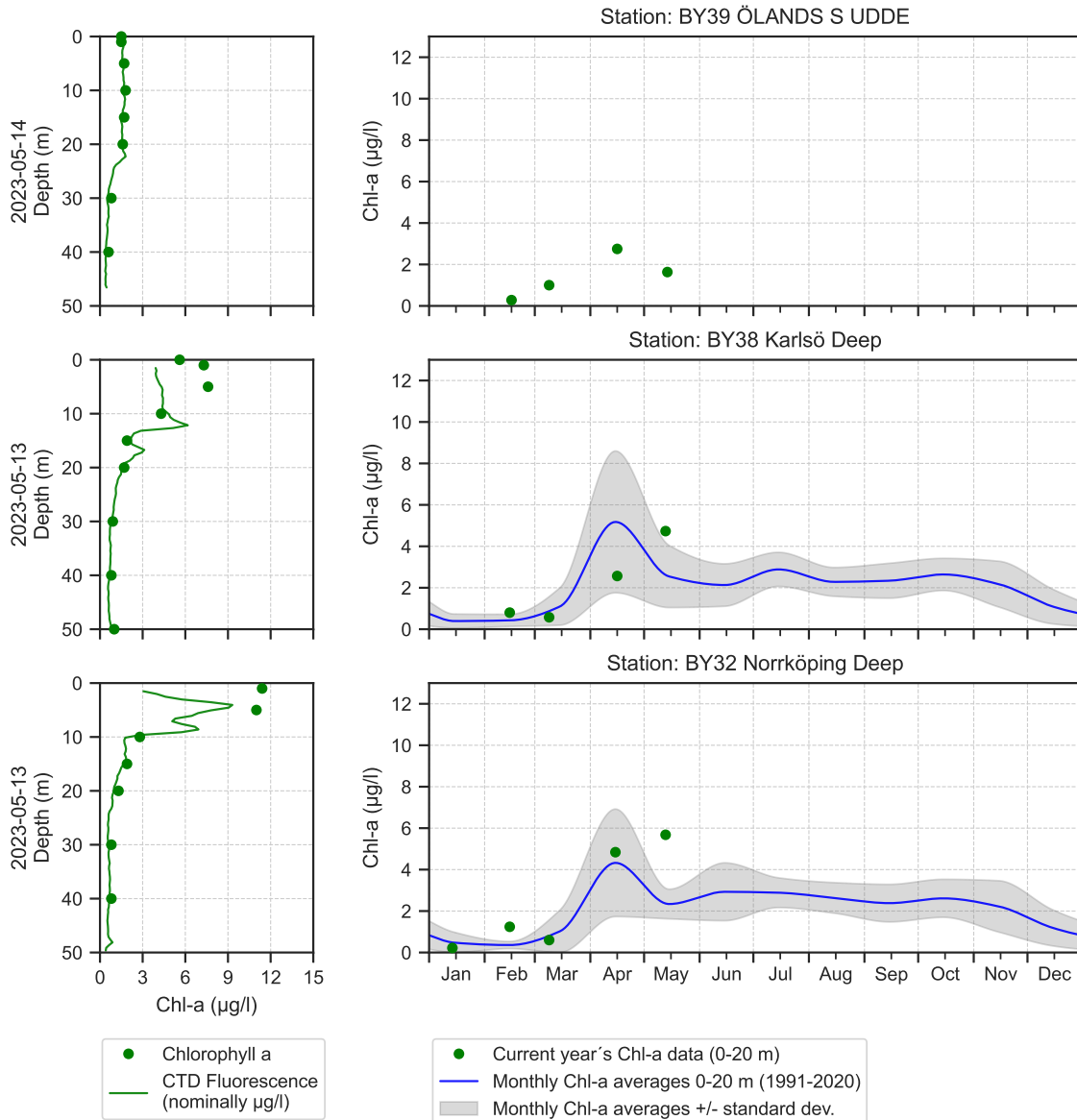
# The Southern Baltic



### The Eastern 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 medelvärdet 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 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, kramp	<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.



