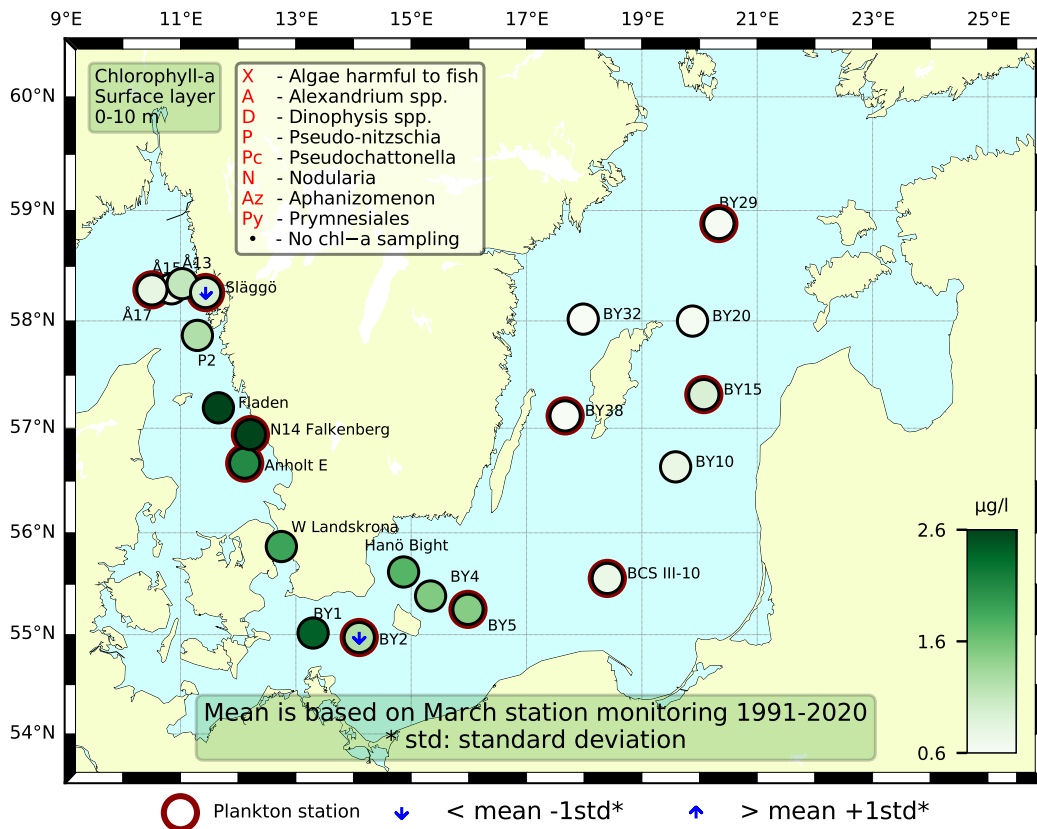


## Sammanfattning

Framför allt i Skagerrak var diversiteten av växtplankton mycket låg, i synnerhet vid den yttre stationen, Å17. I Kattegatt var antalet arter och totala cellantal högre än i Skagerrak. Bland kiselalgen var det högst cellantal av *Guinardia delicatula*, medan *Dinophysis norvegica*\* och *Tripos muelleri* var vanligast av de observerade dinoflagellaterna. Kalkflagellaten *Emiliania huxleyi* fanns med förhöjda cellantal i Kattegatt. De integrerade klorofyllhalterna var generellt låga, men ändå inom det normala för månaden i hela området. Bara vid Släggö i Kattegatt var det integrerade värdena (0–10 och 0–20 m) under det normala.

Diversiteten och cellantalen av växtplankton var låga vid de flesta stationerna i Östersjön, med undantag av de två södra där man kunde ana att vårbloomingen var i startgroparna; BY2 och BY5. Annars var det några, eller få, kedjor av kiselalgen *Skeletonema marinoi* och mest små celler såsom Cryptomonadales och mindre Gymnodiniales, samt olika ciliater och koloniformande cyanobakterier. De integrerade klorofyllhalterna (0–10 m och 0–20 m) var normala för månaden vid alla stationer förutom vid BY2 där koncentrationerna var lägre än normalt.



## Abstract

In the Skagerrak, the diversity of phytoplankton was low, especially at the outermost station, Å17. In the Kattegatt however, the number of species and the total cell numbers were higher than in the Skagerrak area. Among the diatoms, *Guinardia delicatula* was the most numerous species, while *Dinophysis norvegica*\* and *Tripos muelleri* were the most abundant dinoflagellates. The coccolithophorid *Emiliania huxleyi* was observed in elevated cell numbers in the Kattegatt. The integrated chlorophyll concentrations were generally low, though within normal for this month in both areas. Only at Släggö in the Kattegatt, the integrated concentrations (0-10 and 0-20 m) were below normal.

Diversity and cell abundance of phytoplankton were low at most stations in the Baltic Sea, with the exception of the two southern stations, where the spring bloom was ready to start; BY2 and BY5. Otherwise, there were some, or few, chains of the diatom *Skeletonema marinoi* and mostly small cells such as Cryptomonadales and smaller Gymnodiniales, as well as various ciliates and colony-forming cyanobacteria. The integrated chlorophyll concentrations (0-10m and 0-20 m) were normal for the month at all stations except at BY2 where 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) 15<sup>th</sup> of March

The phytoplankton diversity was very low and the integrated chlorophyll concentrations (0-10 and 0-20 m) were low but within normal for this month.

### Släggö (Skagerrak coast) 15<sup>th</sup> of March

The phytoplankton diversity was low, both in number of species and total cell numbers. Examples of observed species are the dinoflagellate genus *Tripes* and the diatoms *Thalassiosira nordenskiöldii* and *Guinardia delicatula*. The integrated chlorophyll concentrations (0-10 and 0-20 m) were below normal for this month.



Fig 1. The diatom *Guinardia delicatula*, bottom chain and the dinoflagellate *Dinophysis norvegica*\* were rather numerous in the Kattegat samples. Photo: A. Skjevik.

## The Kattegat

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

A rather low number of species was observed of which some were found in low cell numbers and a few had moderate cell numbers. *G. delicatula* was the most numerous diatom, *Dinophysis norvegica*\* and *Tripes muelleri* were the most abundant among the dinoflagellates as was *Emiliania huxleyi* among small flagellates. The integrated chlorophyll concentrations (0-10 and 0-20 m) were low but within normal for this month.

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

The phytoplankton situation was very much like the one at Anholt E, with somewhat more species observed and lower abundance of *D. norvegica*\*. The integrated chlorophyll concentrations (0-10 and 0-20 m) were low but within normal for this month.

## The Baltic

### BY38 9<sup>th</sup> of March

The phytoplankton diversity and abundances were very low with mainly small cells present. The diatoms were represented by a few chains of *Skeletonema marinoi*, some centric ones and *Chaetoceros similis*. Among the dinoflagellates there were some Gymnodiniales and *Heterocapsa rotundata* present. The colony-forming *Snowella* sp. and *Aphanocapsa* sp. represented the cyanobacteria, while *Mesodinium rubrum* and unidentified species were present and representing the ciliates. Among other phytoplankton there were some *Oocystis* sp., Cryptomonadales and *Eutreptiella* sp. present. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

### BY39 9<sup>th</sup> of March

The phytoplankton diversity and abundances were moderate. The diatoms were represented by a few chains of *S. marinoi*, some centric ones and *C. similis*. Among the dinoflagellates Gymnodiniales were most common, while *H. rotundata* and *Peridiniella catenata* came in second place. *Dinophysis acuminata*\* and *Karlodinium veneficum*\* were present. There were a few colony-forming cyanobacteria genera present, while various ciliates and *M. rubrum* were quite numerous. Cryptomonadales and *Eutreptiella* sp. were also quite numerous, while *Oocystis* sp., *Binuclearia lauterbornii* and *Telonema* sp. were present in low numbers.

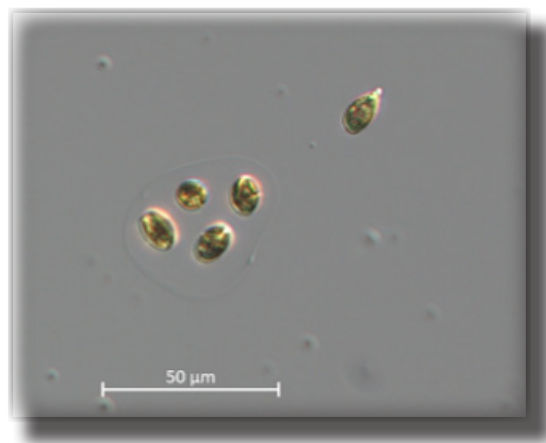


Fig. 2. Small cells, such as Cryptomonadales (top) and *Oocystis* sp. (bottom) were common at the Baltic stations. These cells are from BCSIII-10 12<sup>th</sup> of March. Photo: M. Karlberg.

### BY29 10<sup>th</sup> of March

The phytoplankton diversity and abundances were moderate. The diatoms were represented by several chains of *S. marinoi* and *C. similis*. Among the dinoflagellates there were some Gymnodiniales, *H. rotundata* and *K. veneficum*\*, but also a few other species present. The cyanobacteria were represented by low amounts of the filamentous *Aphanizomenon* sp. and the colony-forming *Snowella* sp. Various ciliates and *M. rubrum* were quite numerous. Cryptomonadales and *Eutreptiella* sp. were also quite numerous. The integrated (0-10 m) chlorophyll concentrations were within normal range for this month.

### BY31 Landsort deep 10<sup>th</sup> of March

The phytoplankton diversity and abundances were low. The diatoms were represented by several chains of *S. marinoi* and *C. similis*. Among the dinoflagellates *H. rotundata* were common and Gymnodiniales and *D. acuminata*\* were present in low cell numbers. There were a few colony-forming cyanobacteria genera present, while various ciliates and *M. rubrum* were quite numerous. Cryptomonadales and *Eutreptiella* sp. were also quite numerous, while *Pyramimonas* sp. and *Oocystis* sp. were present.

### **BY15 Gotland deep 11<sup>th</sup> of March**

The phytoplankton diversity and abundances were low. The diatoms were represented by several chains of *S. marinoi*, a few centric ones and *Chaetoceros castracanei*. The dinoflagellates Gymnodiniales, *H. rotundata* and *K. veneficum*\* were present. Among the colony-forming cyanobacteria *Snowella* sp. were quite common while several other genera were found in low numbers. Various ciliates and *M. rubrum* were quite numerous, as well as Cryptomonadales and *Eutreptiella* sp. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

### **BCSIII-10 12<sup>th</sup> of March**

The phytoplankton diversity and abundances were low. The diatoms were represented by a few chains of *S. marinoi* and a few centric ones. The dinoflagellates Gymnodiniales were the most abundant and *D. acuminata*\* was found in low counts. Among the colony-forming cyanobacteria *Snowella* sp. and *Lemmermanniella* sp. were quite common. Various ciliates and *M. rubrum* were present. Among other phytoplankton there were mainly Cryptomonadales, but also *Oocystis* sp., *B. lauterbornii*, *Telonema* sp. and *Eutreptiella* sp. were present. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

### **BY5 Bornholm deep 12<sup>th</sup> of March**

The phytoplankton diversity and abundances were moderate. Within the diatoms there were quite some variety with several chains of *S. marinoi*, but also *Actinocyclus octonarius*, *C. castracanei*, *C. similis*, *Navicula* sp., and *Thalassiosira levanderi*. Among the dinoflagellates there were mainly some Gymnodiniales and *H. rotundata*, but *P. catenata* was also present. There were some colony-forming cyanobacteria genera present as well as various ciliates and *M. rubrum*. Among other phytoplankton there were mainly Cryptomonadales and *Eutreptiella* sp., but also *Oocystis* sp. and *B. lauterbornii* present. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

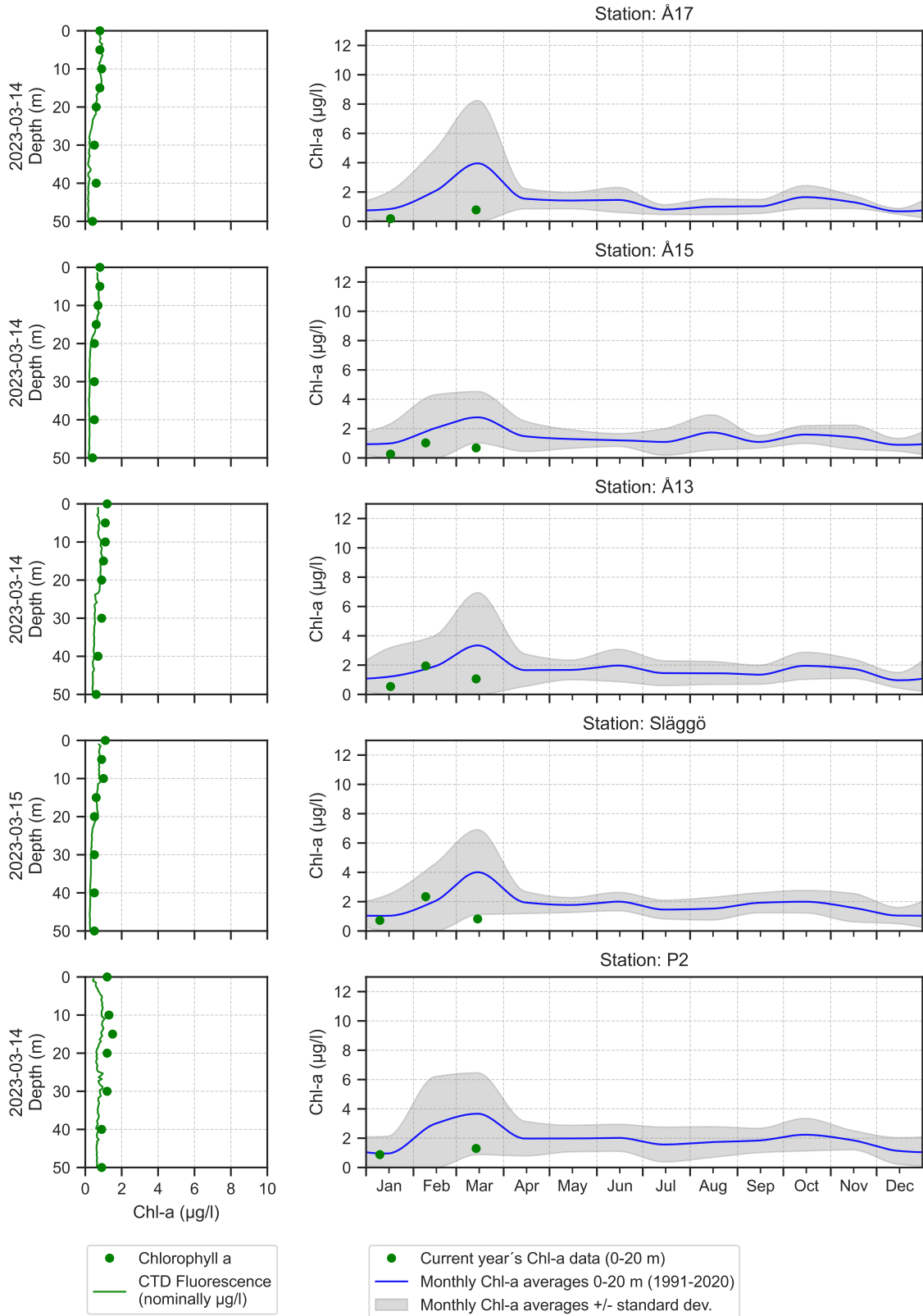
### **BY2 Arkona 13<sup>th</sup> of March**

The phytoplankton diversity and abundances were moderate. Within the diatoms there were quite some variety with many chains of *S. marinoi*, but also *C. similis*, *Chaetoceros subtilis*, *Navicula* sp., and *T. levanderi* present. Among the dinoflagellates there were mainly some Gymnodiniales and *H. rotundata*, but also *Katodinium glaucum* and *P. catenata* present. There were some colony-forming cyanobacteria genera present as well as various ciliates and *M. rubrum*. Among other phytoplankton there were mainly Cryptomonadales and *Eutreptiella* sp., but also *B. lauterbornii* and *Pyramimonas* sp., Choanoflagellates and *Ebria tripartita* present. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were below the normal range for this month.

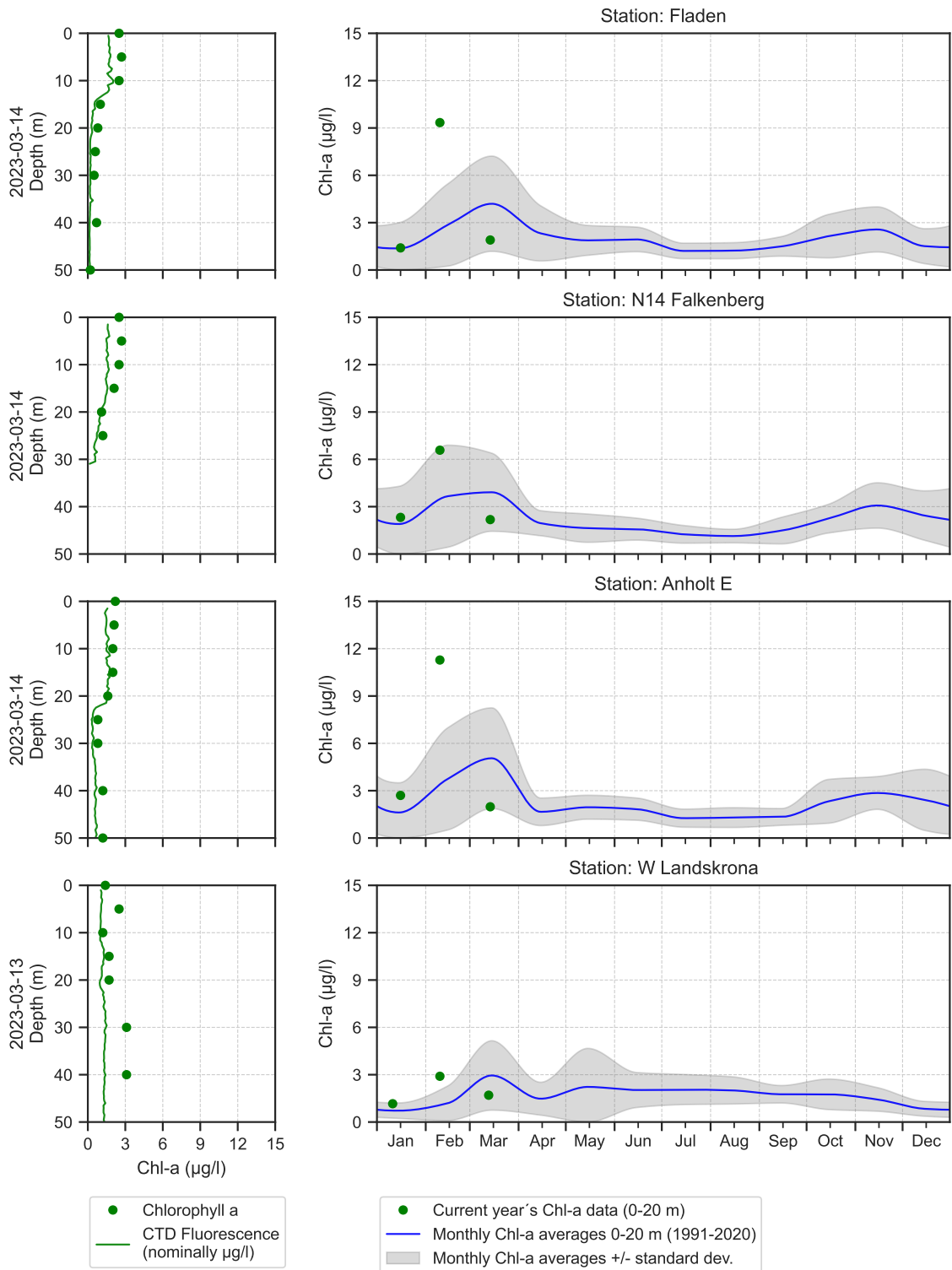
Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	13/3	14/3	15/3	15/3
Hose 0-10 m	presence	presence	presence	presence
Chaetoceros similis			present	
Cylindrotheca closterium	present		present	present
Guinardia delicatula	common	common	present	
Guinardia flaccida		present		
Lennoxia faveolata	present	present	present	
Leptocylindrus minimus		present		
Proboscia alata	present		present	
Pseudo-nitzschia	present	present		
Pseudo-nitzschia seriata		present		
Rhizosolenia hebetata f. semispina	present	present		
Skeletonema marinoi	present	present		
Thalassiosira nordenskiöldii	present	common	present	
Dinophysis acuminata		present	present	
Dinophysis norvegica	common	present	present	present
Gymnodiniales	common	present	present	present
Gymnodinium verruculosum				present
Gyrodinium flagellare				present
Heterocapsa		present		
Heterocapsa rotundata		present		
Katodinium glaucum		present		
Peridiniella danica	present		present	
Protoperidinium	present			
Protoperidinium depressum		present		
Protoperidinium pallidum	present			
Tripos furca				present
Tripos fusus				present
Tripos lineatus	present	present	present	present
Tripos longipes	present	present	present	present
Tripos muelleri	common	common	present	present
Cryptomonadales	present	present	present	common
Teleaulax amphioxeia				present
Pseudochattonella	present	present		
Pseudopedinella	present	present	present	present
Pseudopedinella pyriformis	present	present		present
Eutreptiella	present	present	present	present
Emiliana huxleyi	common	present	present	common
Prymnesiales				present
Heterosigma		present	present	
Heterosigma akashiwo		present	present	
Calliakantha longicaudata		present		
Calliakantha natans			present	
Choanoflagellata			present	present
Laboea strobila				present
Mesodinium rubrum	present	present	present	present
Ciliophora	present	present	present	present

Selection of observed species	BY38	BY39	BY29	BY31	BY15	BCSIII-10	BY5	BY2
Red=potentially toxic species	9/3	9/3	10/3	10/3	11/3	12/3	12/3	13/3
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Actinocyclus octonarius							present	
Centrales	present	present			present	present	present	present
Chaetoceros castracanei					present		present	
Chaetoceros similis	present	present	present	present			present	present
Chaetoceros subtilis								present
Cylindrotheca closterium							present	
Navicula							present	present
Skeletonema marinoi	present	present	common	common	common	present	common	very common
Thalassiosira levanderi							present	present
Amphidinium crassum			present			present		
cf. Biecheleria baltica			present					
<b>Dinophysis acuminata</b>		present		present		present		
Gymnodiniales	present	common	present	present	present	common	common	common
Gyrodinium spirale		present						
Heterocapsa rotundata	present	present	present	common	present		common	common
<b>Karlodinium veneficum</b>		present	present		present			
Katodinium glaucum		present				present	present	present
Peridiniella catenata		present	present				present	present
Monoraphidium			present	present				
Oocystis	present	present	present	present	present	present	present	
Binuclearia lauterbornii		present	present			present	present	present
Pyramimonas				present				present
Cryptomonadales	present	common	common	common	common	common	common	common
Telonema		present			present	present		
Eutreptiella	present	common	common	common	common	present	common	common
Aphanizomenon			present					
Aphanocapsa	present	present			present			
Aphanothece				present	present	present	present	present
Lemmermanniella		present			present	common		
Snowella	present	present	present	present	common	common	present	present
Choanoflagellata		present		present				present
Ebria tripartita			present				present	present
Ciliophora	present	common	common	common	common	present	present	common
Mesodinium rubrum	present	common	common	common	common	present	present	common

# The Skagerrak

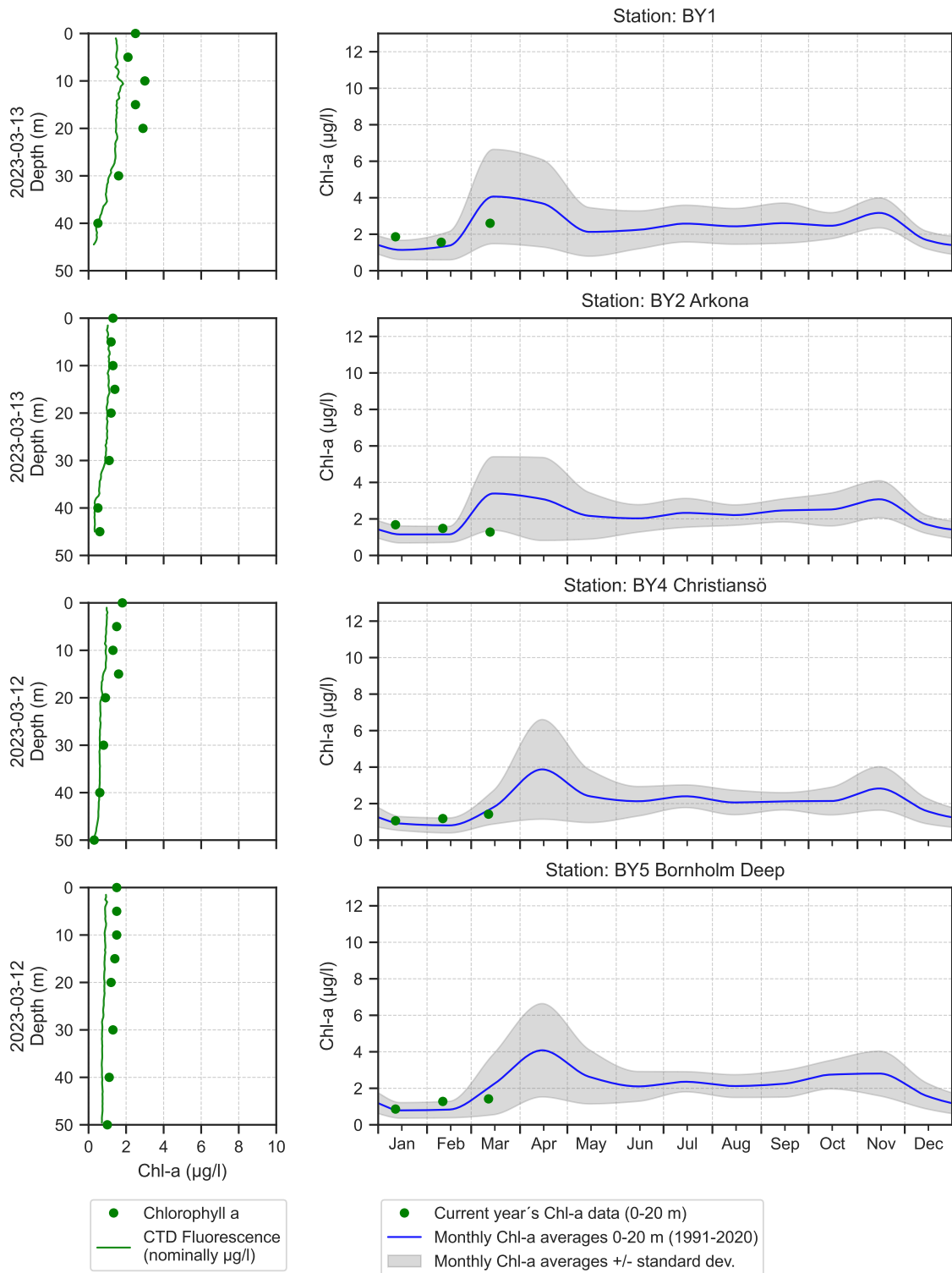


# The Kattegat and The Sound

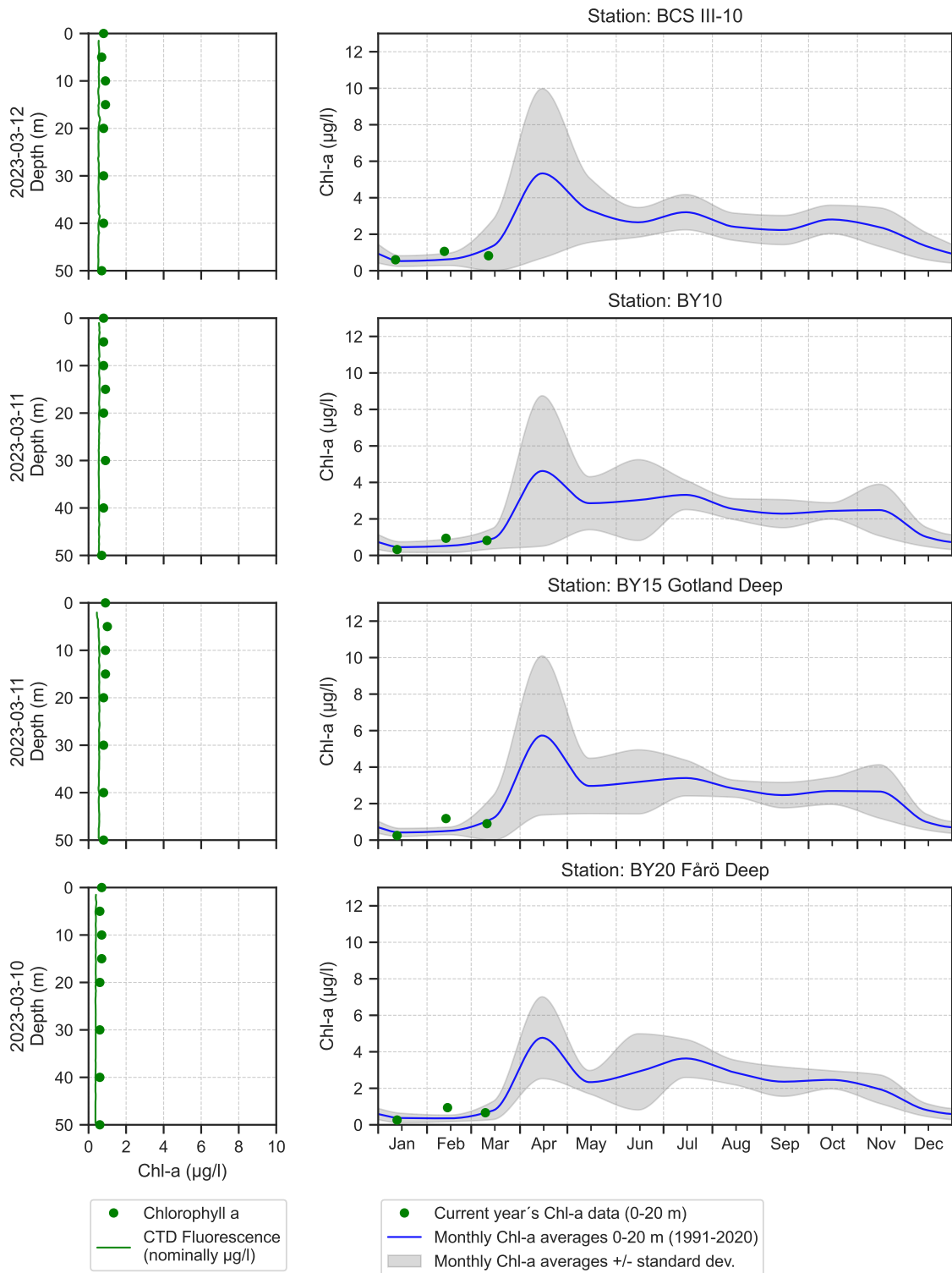




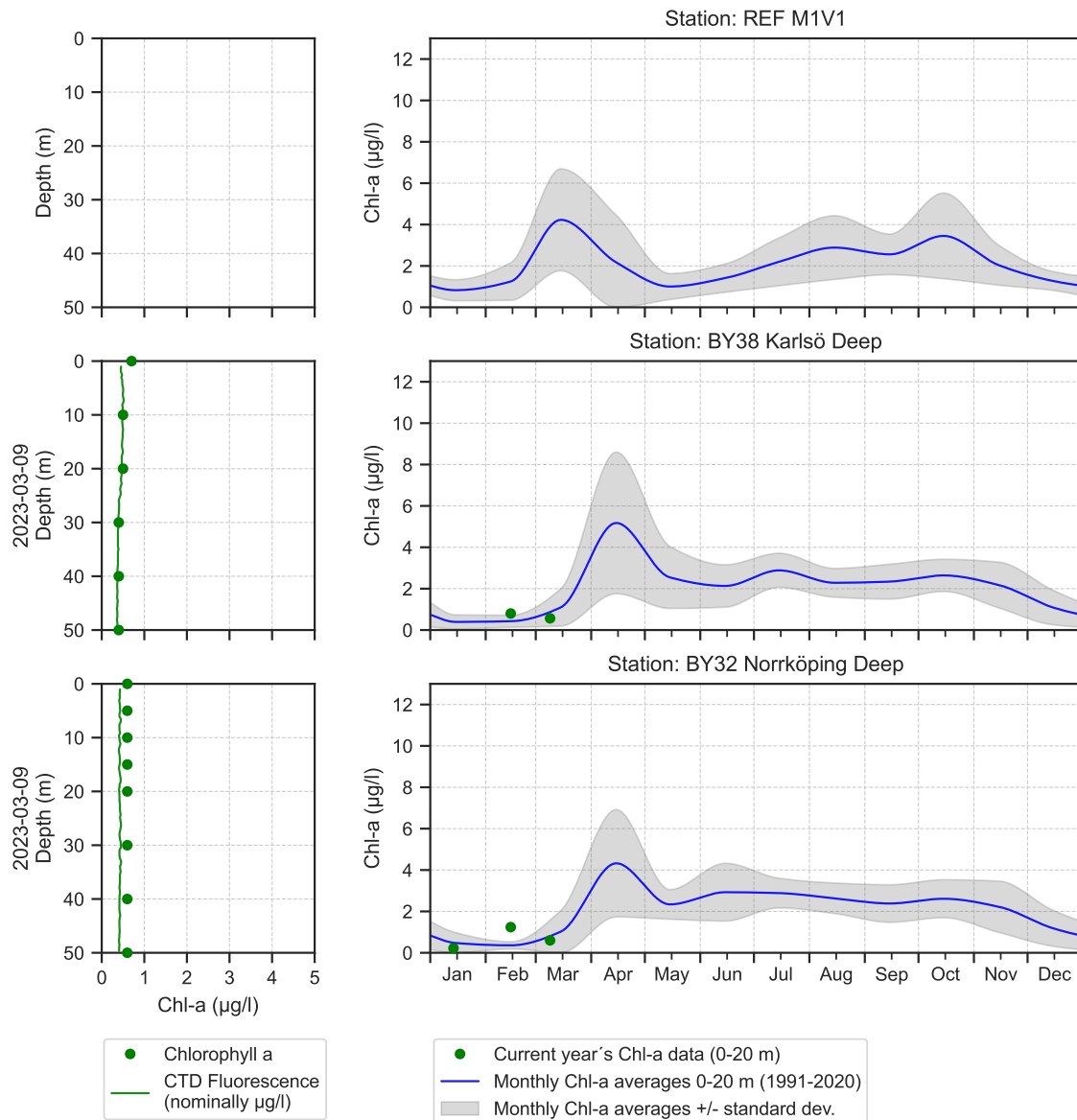
# The Southern Baltic



### 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, 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.



