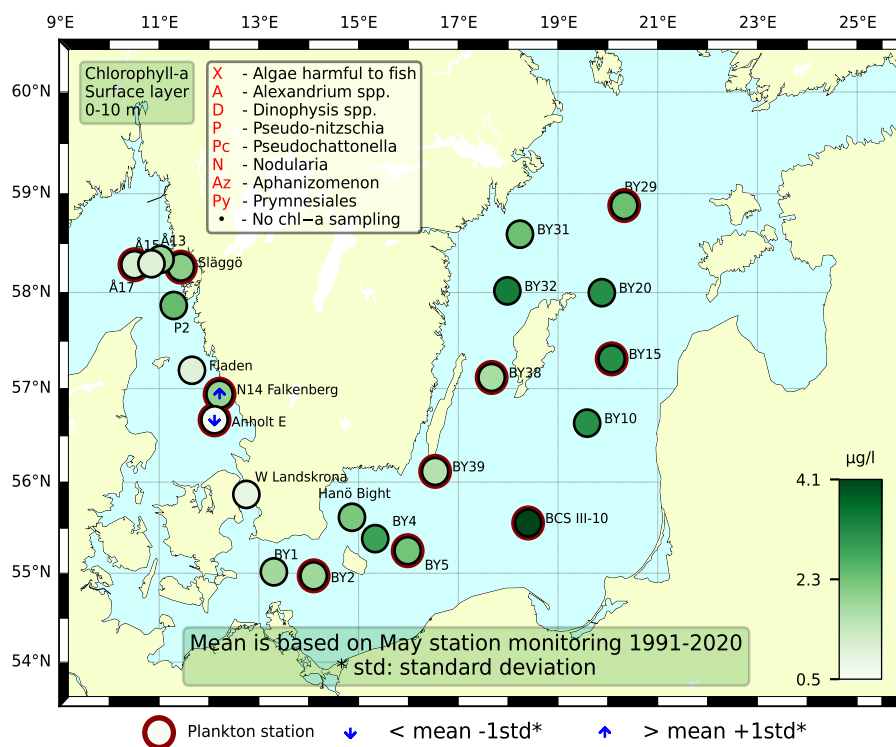


## Sammanfattning

Stationerna i Västerhavet varierade i både artrikedom samt totala cellantal. Vid båda stationerna i Skagerrak var artrikedomen höga medans endast den kustnära stationen hade samma artrikedom i Kattegatt. Totala cellantalen var även relativt höga förutom vid Anholt E, den yttre stationen i Kattegatt, där de var lägre. Framför allt var kiselalgerna *Dactyliosolen fragilissimus* och *Skeletonema marinoi* vanliga. Släktet *Chaetoceros* var också vanligt och speciellt dominant i den fluorescenstopp som återfanns i Öresund. Kalkalgen *Emiliania huxleyi* var vanlig vid alla stationer förutom Anholt E. Samtliga integrerade klorofyllvärdena var inom de normala i Skagerrak. De integrerade klorofyllvärdena (0-10 m) var däremot över det normala vid den kustnära stationen i Kattegatt medans den yttre stationen hade lägre klorofyllvärden än vad som är normalt.

Diversiteten och cellantalen av växtplankton var överlag låg vid samtliga stationer i Östersjön. Den giftiga arten *Dinophysis acuminata* förekom vid alla stationer och i relativt höga tätheter vid flertalet stationer. Olika grupper av kolonibildande cyanobakterier var även vanliga vid många stationer och framför allt den sydvästliga delen av Östersjön. Samtliga stationers integrerade klorofyllvärden var normala för säsongen.



## Abstract

The stations in the Skagerrak and Kattegat varied in both species richness and total cell counts. At both stations in the Skagerrak, species richness was high, while in the Kattegat, only the coastal station showed similarly high species richness. Total cell counts were also high, except at Anholt E, the offshore station in the Kattegat, where they were lower. The species *Dactyliosolen fragilissimus* and *Skeletonema marinoi* were particularly common. The genus *Chaetoceros* was also frequently observed and was especially dominant in the large fluorescence peak found in the Sound. The coccolithophore *Emiliania huxleyi* was very common at all stations except Anholt E. All integrated chlorophyll values were within the normal range in the Skagerrak. However, the integrated chlorophyll values (0–10 m) were above normal at the coastal station in the Kattegat, while the offshore station had lower chlorophyll concentrations than what is considered normal.

The diversity and cell abundances of phytoplankton were generally low in the Baltic Sea. The toxin producing *Dinophysis acuminata* was present at all stations and quite common at several stations. Various species of colony forming cyanobacteria were present at several stations and especially common in the south western part of the Baltic Sea. All Stations integrated chlorophyll concentrations were within normal for the 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) 5<sup>th</sup> of May

The total cell numbers and biodiversity were relatively high. The more common cells were for example *Skeletonema marinoi*, *Dactyliosolen fragilissimus* and the genus *Pseudo-nitzschia*\*. The smaller cells were dominated by *Emiliana huxleyi*. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

### Släggö (Skagerrak coast) 5<sup>th</sup> of May

The total cell numbers and biodiversity were both high. Diatoms dominated among the larger cells and *D. fragilissimus* was the most abundant species, but *S. marinoi* and *Chaetoceros danicus* were also common. Among the smaller cells the coccolithophore *E. huxleyi* was the most numerous. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

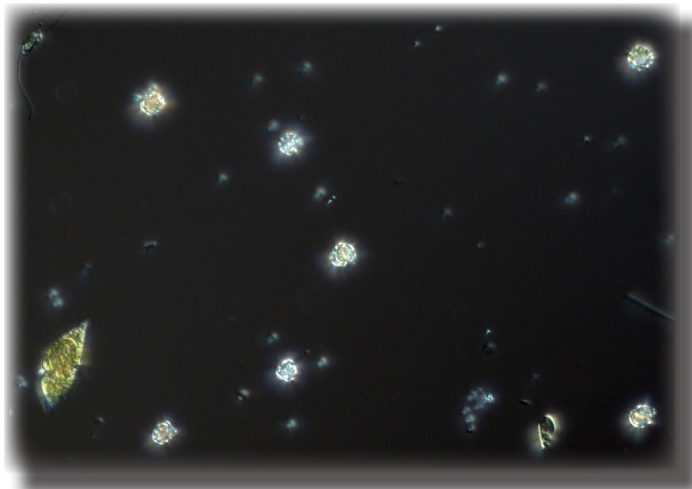


Fig 1. As tiny diamonds, *Emiliana huxleyi* appeared brightly and abundantly along the Swedish west coast. Photo: M. Johansen.

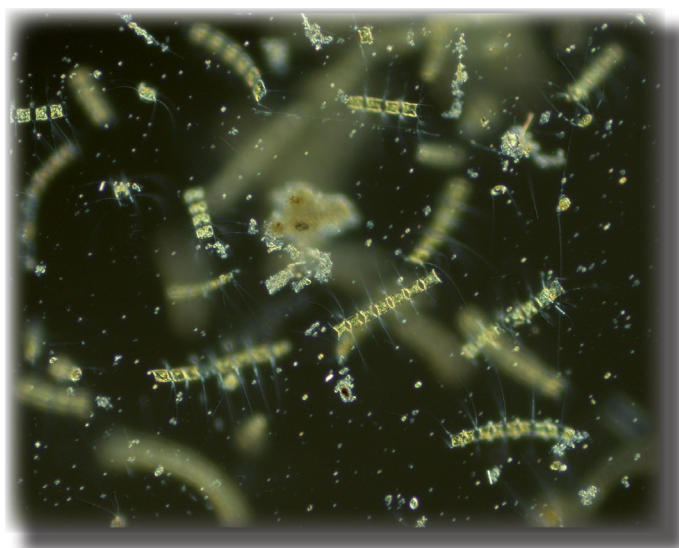


Fig 2. Several fluorescens maxima were found along the west coast and in the Sound they were dominated by the genus *Chaetoceros*. Photo: M. Johansen.

## The Kattegat

### Anholt E 6<sup>th</sup> of May

The species diversity and total cell numbers were relatively low. Among the larger cells the diatoms *Proboscia alata* and *D. fragilissimus* were found in highest cell numbers. The first 10 meters of the water column had an integrated mean chlorophyll concentration slightly less than normal for the month.

### N14 Falkenberg 6<sup>th</sup> of May

The species diversity and total cell numbers were relatively high. Diatoms dominated among the larger cells and especially *P. alata*, *S. marinoi* and *D. fragilissimus* were common. Among the smaller cells the coccolithophore *E. huxleyi* was the most numerous. The first 10 meters of the water column had an integrated mean chlorophyll concentration slightly higher than normal for the month.

## Fluorescence peaks

The genus *Chaetoceros* was clearly dominating in the Landskrona deep at 20 meters, especially *Chaetoceros curvisetus* was common. At Fladen, 15 meters, diatoms dominated and among those *S. marinoi* was the most common. At N14 Falkenberg a nice and beautiful diatom community with several species was present at 10 meters.

## The Baltic

### BY39 11<sup>th</sup> of May

The species diversity and total cell numbers were relatively low. Most common were, for example, *Chaetoceros similis* and *Dinophysis acuminata*\*. The smaller cells were represented by the colony-forming cyanobacterial genus *Lemmermanniella*. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

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

Phytoplankton diversity and total cell numbers were both low. The larger cells had most *D. acuminata*\* and the smaller cells were represented by the genus *Dinobryon*. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

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

Phytoplankton diversity and total cell numbers were both very low. Dinoflagellates were more numerous among the larger cells and *D. acuminata*\* was common, and *Peridiniella catenata* was also present. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

### BY38 11<sup>th</sup> of May

Phytoplankton diversity and abundances were both low. The toxin producing *D. acuminata*\* was found in high cell numbers, Cryptomonads and *S. marinoi* were also found in higher numbers. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

### BY15 Gotland deep 9<sup>th</sup> of May

Phytoplankton diversity and total cell numbers were both low. Only *D. acuminata*\* was present in higher cell numbers among the larger cells. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

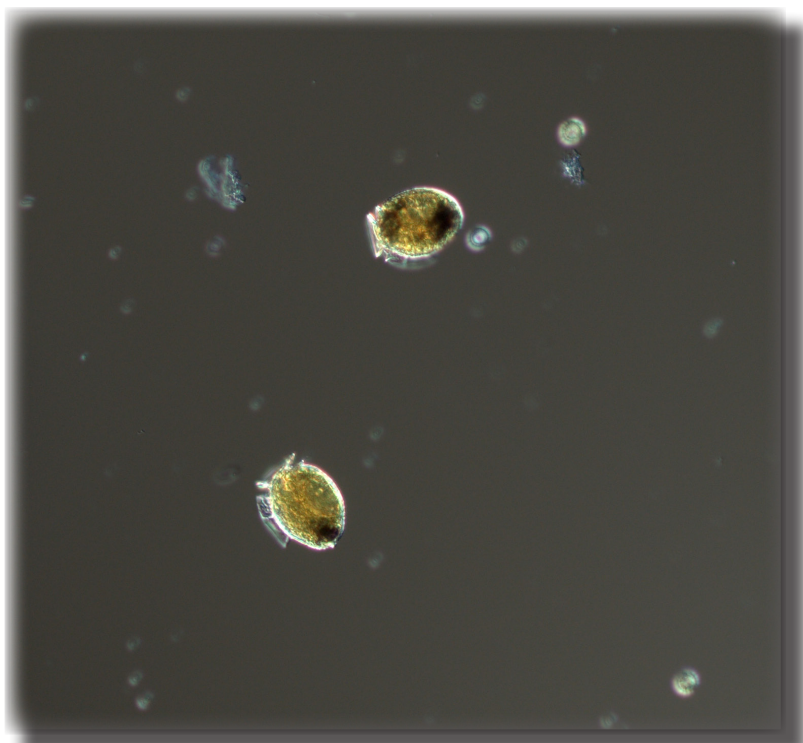


Fig. 3. The toxin producing dinoflagellate *Dinophysis acuminata*\* was present at all stations in the Baltic Sea, more abundant at several stations. Photo: M. Johansen

**BY2 Arkona 7<sup>th</sup> of May**

Phytoplankton diversity and total cell numbers were both low. Several colony-forming cyanobacteria were present and the genus *Lemmermanniella* was especially common. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

**BY5 Bornholm deep 8<sup>th</sup> of May**

Phytoplankton diversity and total cell numbers were both low. Several colony-forming cyanobacteria were present and the genus *Lemmermanniella* was especially common. The diatom *C. similis* was also found in higher cell numbers. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

**BCSIII-10 8<sup>th</sup> of May**

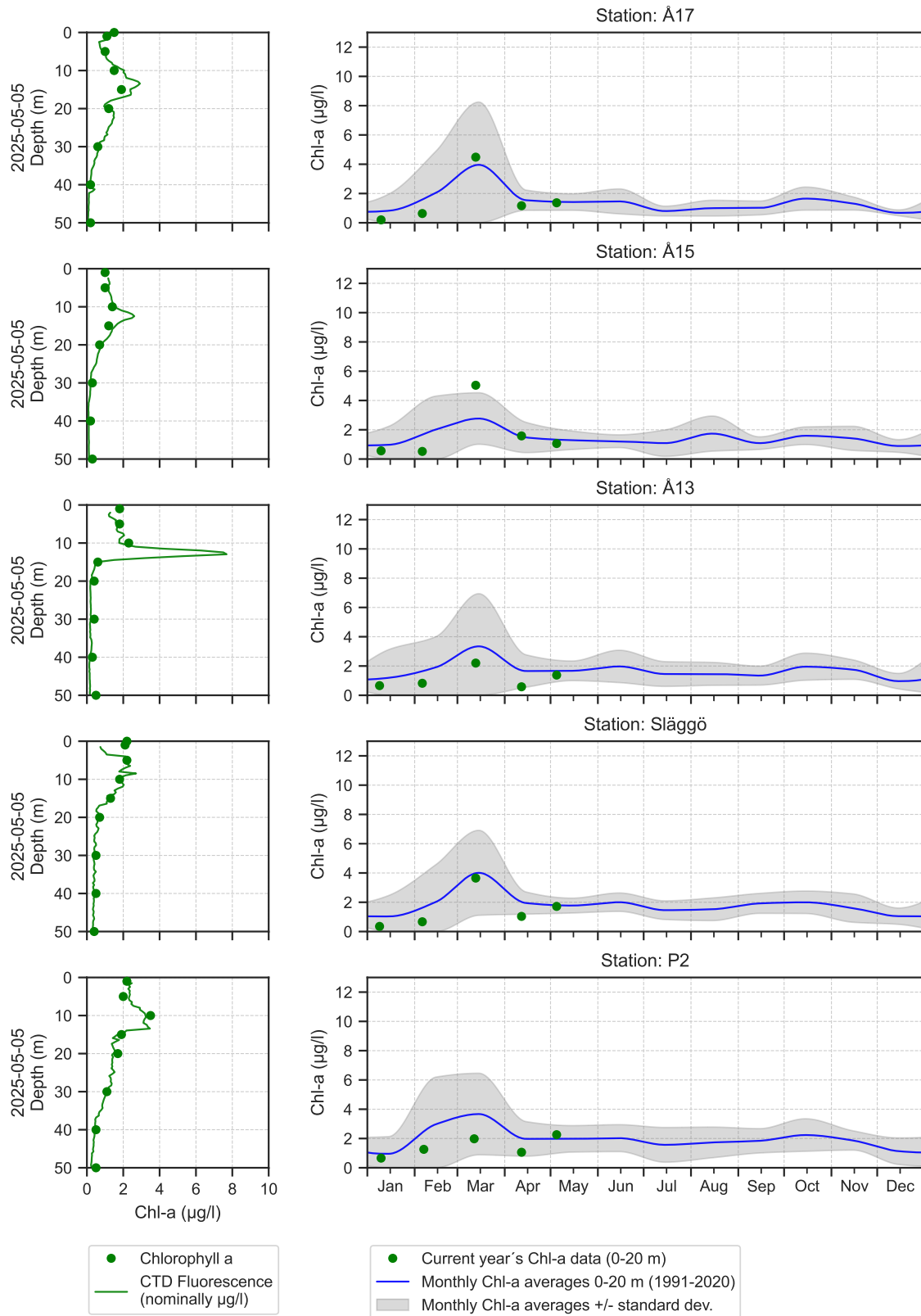
Phytoplankton diversity and total cell numbers were both low. The most common taxa was *D. acuminata*<sup>\*</sup>, and the genus *Dinobryon* was common among the smaller cells. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	6/5	6/5	5/5	5/5
Hose 0-10 m	presence	presence	presence	presence
Attheya septentrionalis		present		
Chaetoceros		present	present	present
Chaetoceros curvisetus		present	common	
Chaetoceros danicus	present			
Chaetoceros socialis			present	
Cylindrotheca closterium		present		
Dactyliosolen fragilissimus	common	common	very common	very common
Guinardia delicatula	present		present	present
Guinardia flaccida		present	present	present
Lennoxia faveolata	present			
Leptocylindrus danicus		present		
Leptocylindrus minimus			present	
Nitzschia longissima		present	common	present
Proboscia alata	common	common	present	present
Pseudo-nitzschia		present	present	common
Pseudo-nitzschia cf. seriata			present	
Rhizosolenia hebetata f. semispina	present	present	present	
Skeletonema marinoi		very common	common	very common
Thalassionema nitzschioides	present	present	present	present
Dinophysis acuminata			present	
Dinophysis norvegica		present	present	present
Gymnodiniales	present	present	present	present
Heterocapsa rotundata				present
Karenia mikimotoi				present
Karlodinium veneticum				present
Katodinium glaucum			present	
Peridiniella danica		present		
Prorocentrum balticum			present	present
Protoceratium reticulatum			present	
Protoperidinium bipes			present	present
Protoperidinium depressum				present
Protoperidinium pellucidum		present		present
Scrippsiella GRP		present		present
Tripos fusus	present	present	present	present
Tripos lineatus			present	
Tripos longipes		present		present
Tripos muelleri	present	present	present	present
Dinobryon		present	present	present
Dinobryon faculiferum		present		
Emiliania huxleyi	present	common	very common	very common
Cryptomonadales	present	present	common	common
Leucocryptos marina	present	present	present	
Telonema subtile	present			
Pseudanabaena	present	present	present	present
Choanoflagellata	present	present		
Ciliophora		present	common	common

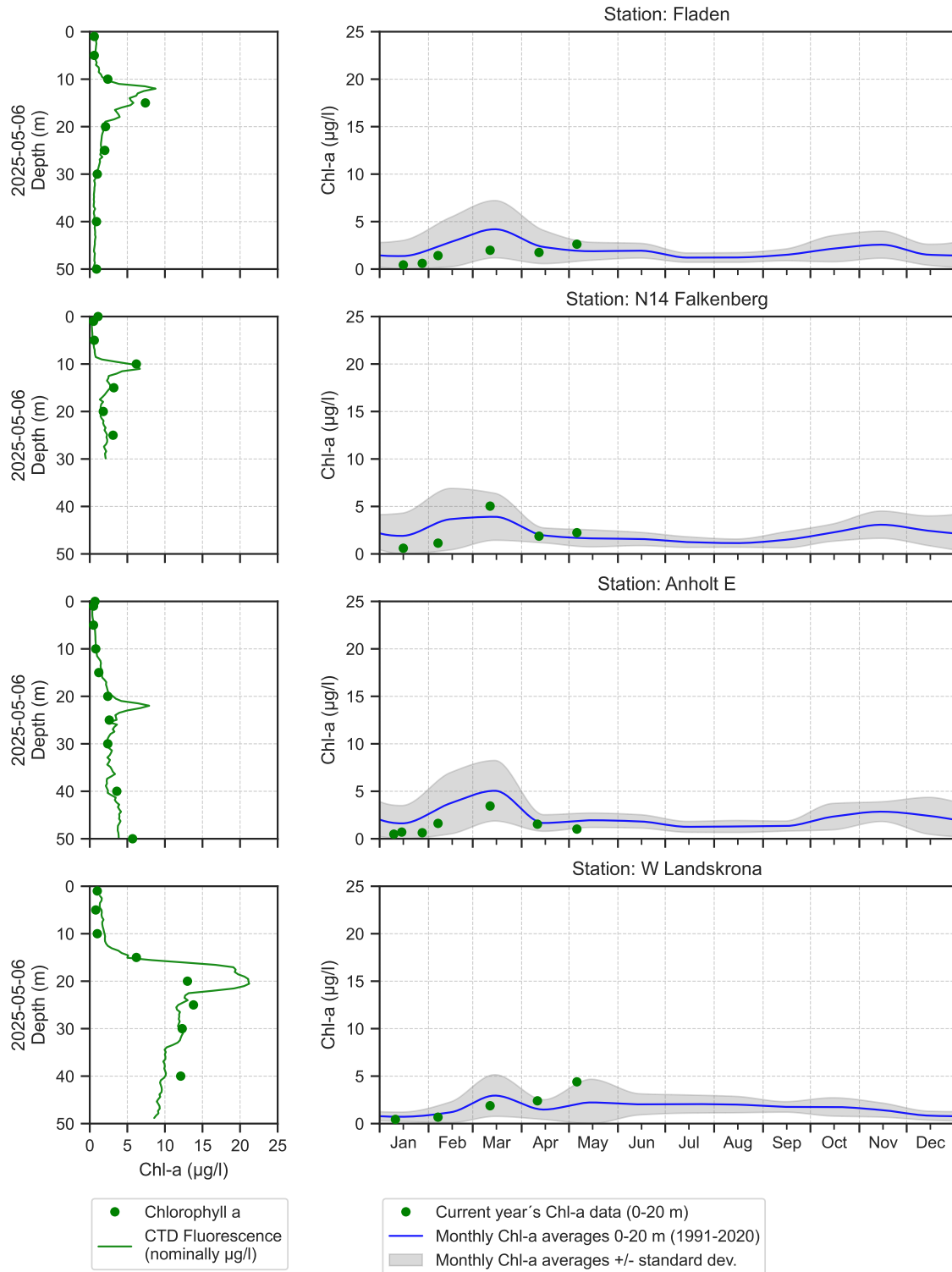
Selection of observed species	BY2	BY5	BCSIII-10	BY15	BY29	BY31	BY38	BY39
Red=potentially toxic species	7/5	8/5	8/5	9/5	10/5	10/5	11/5	11/5
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Ciliophora	common	common	common	common	present	common	present	common
Chaetoceros similis		common						common
Skeletonema marinoi	present	present		present			very common	
Amphidinium								present
Amphidinium longum							present	
Amphidinium sphenoides							present	
Amylax triacantha			present	present	present	present		
Dinophysis acuminata	present	present	common	common	common	common	common	common
Dinophysis norvegica		present	present				present	present
Gymnodiniales	present		present	present	present	present	common	
Gyrodinium spirale				present				
Heterocapsa rotundata		present	present		present	present		
Katodinium glaucum	present	present		present	present	present		common
Peridinales				present	present		present	
Peridiniella catenata			present		present	present	present	
Peridiniella danica						present		
Protoperidinium bipes					present	present		
Protoperidinium brevipes					present		present	present
Dinobryon			common	present	common			
Cryptomonadales	present	present	present	present	present	present	common	present
Aphanizomenon flos-aquae	present					present	present	
Aphanocapsa	present	present	present					present
Aphanothece	present	present						present
Aphanothece paralleliformis		present						present
Cyanodictyon								present
cf. Cyanonephron	present	present						present
Lemmermanniella	very common	common	present	present		present	present	common
Lemmermanniella parva								present
Pseudopedinella pyriformis							present	
Mesodinium rubrum		present	common	common	present	present	present	common
Oocystis	present	present					present	
Binuclearia lauterbornii	present	present	present				present	present



# The Skagerrak

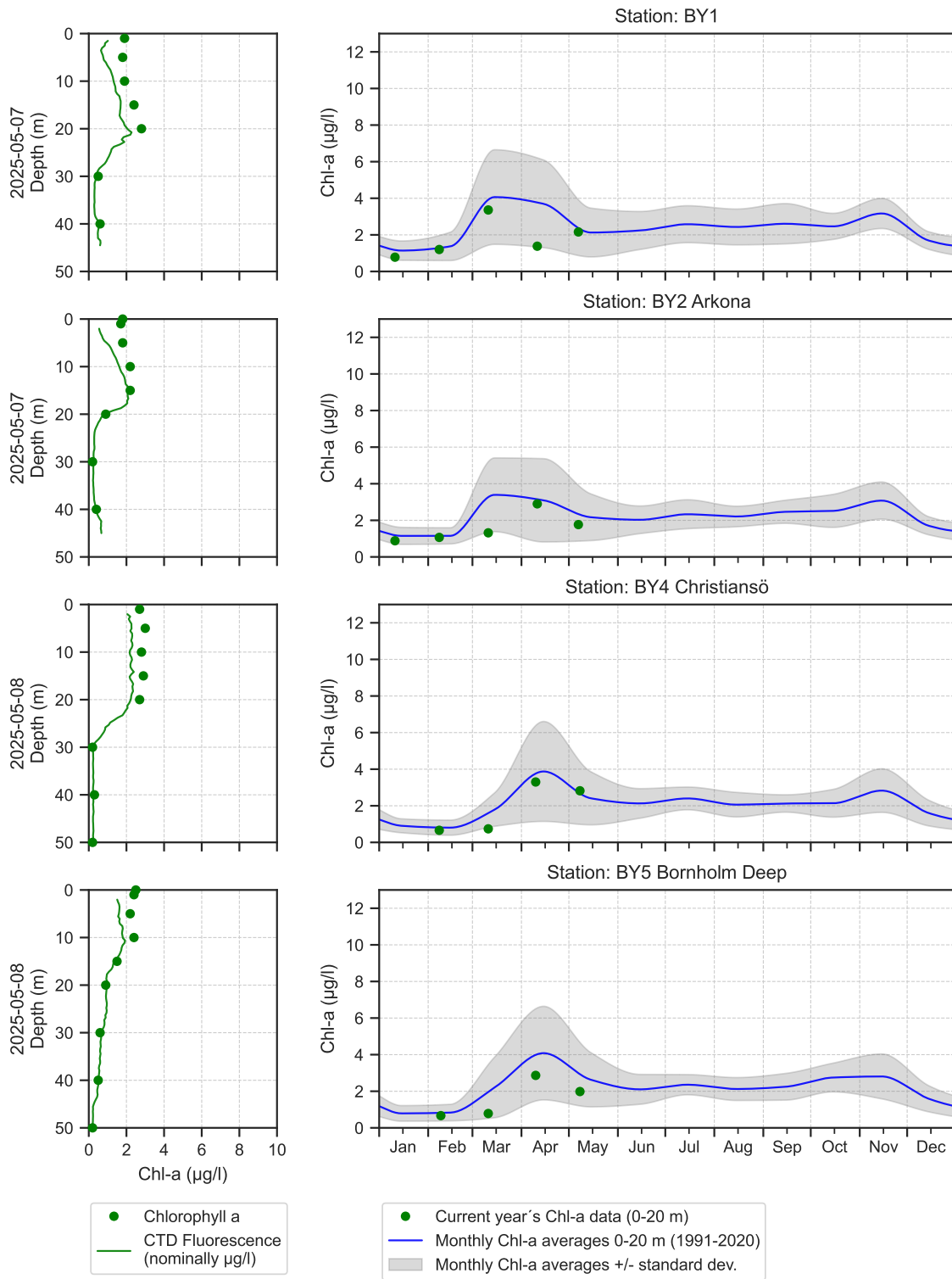


## The Kattegat and The Sound

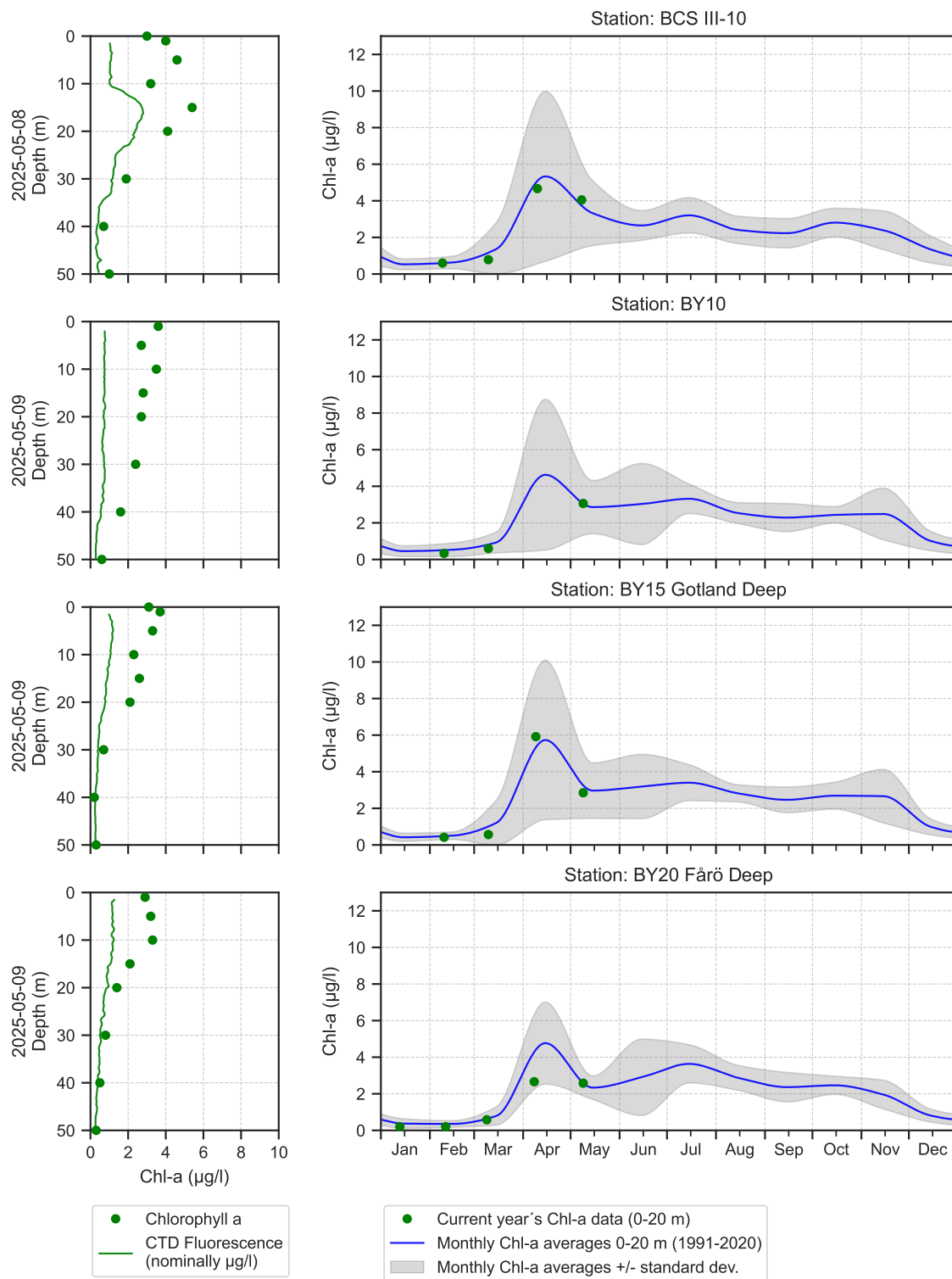




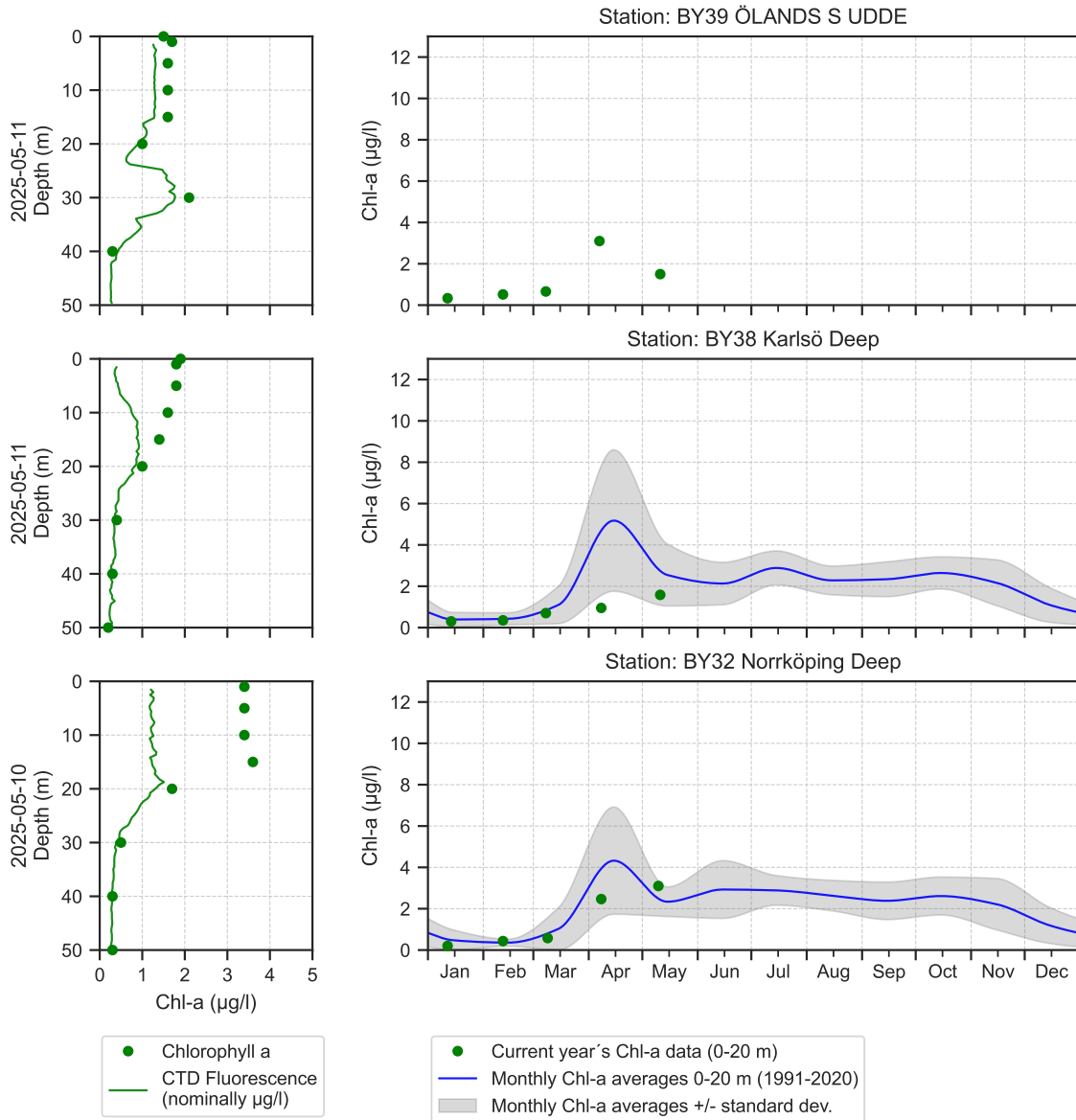
## The Southern Baltic



## 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 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 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.

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.



