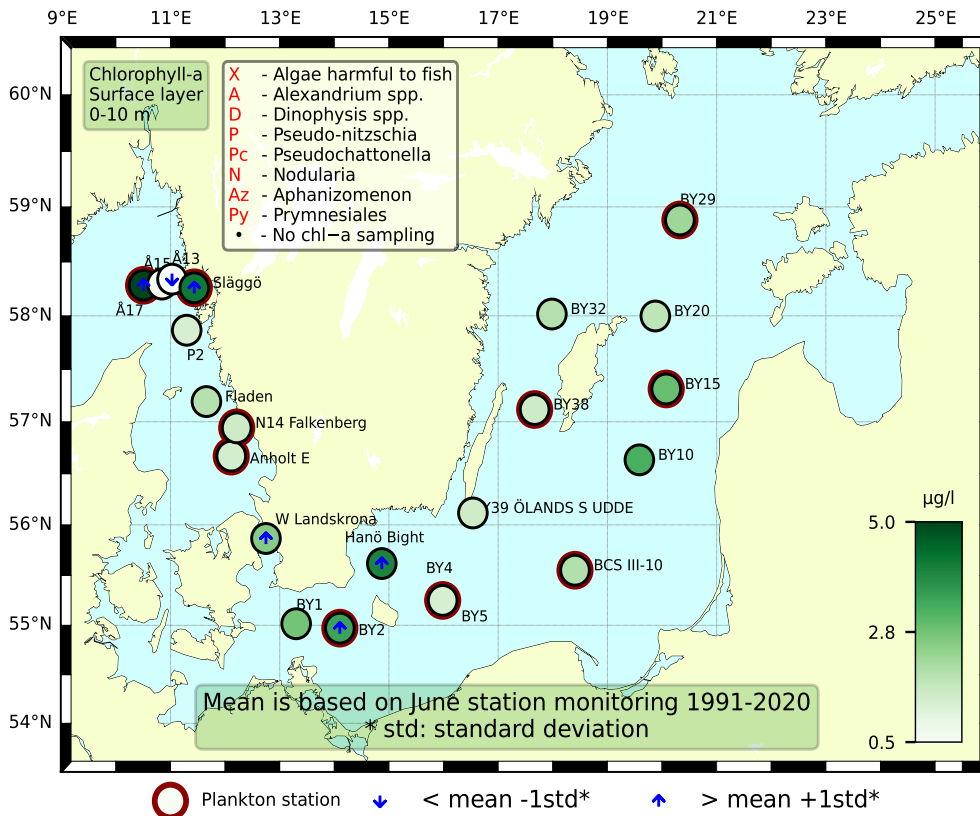


Sammanfattning

Samtliga stationer i Västerhavet hade en dominans av kiselalger. Lite uppseendeväckande var att finna relativt många celler av mareldsdjuret *Noctiluca scintillans* vid samtliga stationer. Övriga arter var mest små flagellater av olika sorter där kalkalgen *Emiliana huxleyi* var talrik i Skagerrak. De integrerade klorofyllkoncentrationerna var över det normala vid stationerna i Skagerrak men normala för denna månaden i Kattegatt.

I Östersjön var växtplanktonsituationen påfallande lik vid de olika stationerna. Det var genomgående förhöjda mängder av den filamentösa cyanobakterien *Aphanizomenon flosaquae*. Den potentiellt skadliga cyanobakterien *Nodularia spumigena**, även den filamentös, fanns i mycket låga antal vid stationerna BCS III-10, BY29 och BY39. Den potentiellt skadliga dinoflagellaten *Dinophysis acuminata** fanns vid samtliga stationer och i högst antal vid BY31. Kolonibildande cyanobakterier var genomgående förekommande i höga cellantal. Klorofyllfluorescensmaxima orsakades huvudsakligen av en art inom gruppen prymnesiales*. De integrerade klorofyllhalterna från 0–10 meter var över det normala vid BY2 och Hanöbukten. För de integrerade värdena från 0–20 meter låg BCSIII-10 under det normala, övriga stationer inom det normala för denna månaden.



Abstract

All stations along the Swedish west coast had a dominance of diatoms. A bit surprising was also to find several cells of the bioluminescent dinoflagellate *Noctiluca scintillans*, at all stations. Except for this, small flagellates of various taxa were the most common, and in Skagerrak *Emiliana huxleyi* was common. The integrated chlorophyll concentrations were above normal at the Skagerrak stations but normal for this month in the Kattegatt.

The phytoplankton situation was extraordinary similar at the various sampling stations in the Baltic Sea. The filamentous cyanobacterium *Aphanizomenon flosaquae* was found in enhanced amounts at all stations. The potentially toxic cyanobacterium *Nodularia spumigena*, also filamentous, was found in low amounts at stations BCS III-10, BY29 and BY39. The potentially toxic dinoflagellate *Dinophysis acuminata** was present at all stations and was found with the highest cell numbers at BY31. Colony forming cyanobacteria were generally numerous. Chlorophyll fluorescence maxima were mainly caused by a prymnesiales* species. The integrated chlorophyll concentrations from 0–10 meters were above normal at BY2 and the Hanö Bight. The 0–20 meters concentration was below normal at BCSIII-10, otherwise within normal for this month at all other stations.

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

The Skagerrak

Å17 (Skagerrak coast) 7th of June

The species diversity and total cell number were both moderate. The diatoms *Guinardia delicatula* and *Dactyliosolen fragilissimus* were both very common. The dinoflagellate genus *Tripes* was common with several species. Small cells were quite numerous and *Emiliana huxleyi* was the most common species. The integrated chlorophyll concentrations were above normal for this month.

Släggö (Skagerrak coast) 7th of June

The species diversity and total cell number were both moderate. Diatoms dominated and *Cerataulina pelagica* was the most abundant followed by *D. fragillissimus*. The dinoflagellate genus *Tripes* was common with several species but mainly *Tripes fusus*. Small cells were quite numerous and *Emiliana huxleyi* was common. The integrated chlorophyll concentrations were above normal for this month.

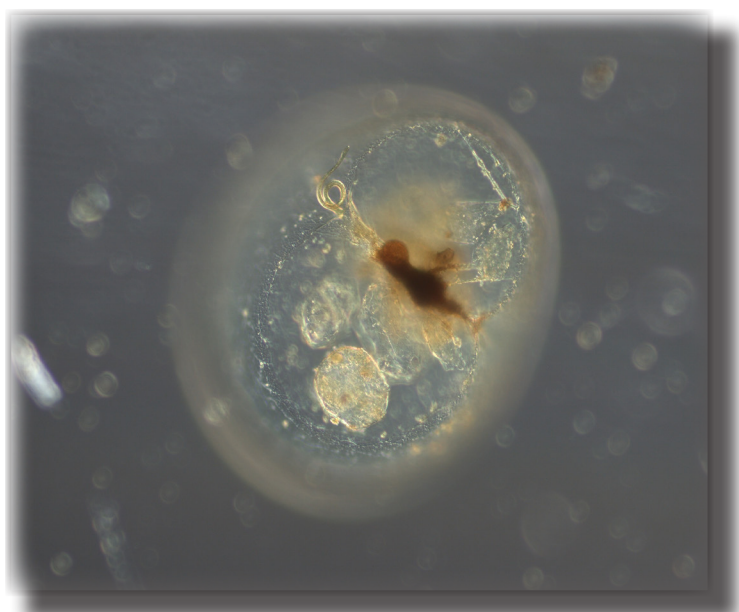


Fig 1. The dinoflagellate *Noctiluca scintillans*, known for its bioluminescence giving the water a bright blue glow when dark, was found in moderate amounts at all stations along the Swedish west coast. Photo M. Johansen.

The Kattegat

Anholt E 6th of June

The species diversity was moderate and total cell numbers were relatively high. Diatoms dominated the cell counts with for example *D. fragilissimus* and *C. pelagica*. A bit unusual was that several cells of the heterotrophic dinoflagellate *Noctiluca Scintillans* were noted in the sample together with some cells of the genus *Tripes*. The smaller cells were dominated by the order cryptomonadales. A fluorescence peak was noted at 12 meters and contained more or less the same community but higher cell numbers. The chlorophyll (0–10 m and 0–20 m) were within normal for this month.

N14 Falkenberg 6th of June

The species diversity and total cell numbers were both moderate. The diatoms *D. fragilissimus* and *C. pelagica* were the most abundant. A bit unusual was that several cells of the heterotrophic dinoflagellate *N. Scintillans* were noted in the sample together with some cells of the genus *Tripes*. The smaller cells were moderate and cells from the order cryptomonadales were common. A fluorescence peak at 13 meters contained a rich community with a lot of different taxa and with a high total cell number. The chlorophyll (0–10 m and 0–20 m) were within normal for this month.

The Baltic

BY2 Arkona 5th of June

There were moderate amounts of the filamentous cyanobacterium *Aphanizomenon flosaquae*, the potentially toxic flagellate order prymnesiales, the dinoflagellate group gymnodiniales and ciliates. The flagellate order cryptomonadales was also found in moderate cell counts. Several species of colony forming cyanobacteria were numerous. The integrated (0–10 m) chlorophyll concentration was above normal for this month, whereas the 0-20 integration was normal.

BY5 Bornholm deep 5th of June

There were moderate amounts of the filamentous cyanobacterium *A. flosaquae*, the potentially toxic flagellate order prymnesiales, the dinoflagellate order gymnodiniales and ciliates. A chlorophyll fluorescence peak at 18 meters was mainly caused by a prymnesiales* species. The integrated (0–10 m and 0–20 m) chlorophyll concentrations were within the normal range for this month.

BCS III-10 4th of June

All of the three filamentous cyanobacteria were present. There were moderate amounts of *A. flosaquae*, and *Dolichospermum* and *Nodularia spumigena**, were found in very low amounts. The potentially toxic dinoflagellate *Dinophysis acuminata** was found in enhanced cell numbers. Several species of colony forming cyanobacteria were numerous. The integrated (0–10 m) chlorophyll concentration was normal, whilst the 0-20 integration was below normal for this month.

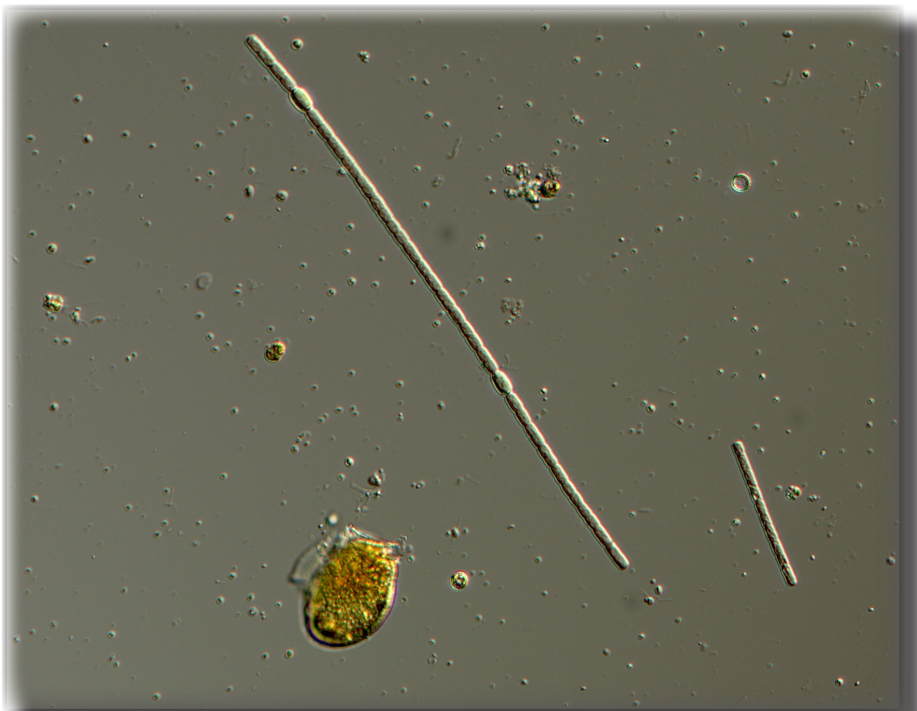


Fig 2. The filamentous cyanobacterium *Aphanizomenon flosaquae* and the potentially toxic dinoflagellate *Dinophysis acuminata* were abundant at all stations in the Baltic Sea. Photo: A-T Skjevik.

BY15 4th of June

There were moderate amounts of the filamentous cyanobacterium *A. flosaquae*, the green algae *Binuclearia lauterbornii* and the diatom *Chaetoceros danicus*. The potentially toxic dinoflagellate *D. acuminata** was found in enhanced cell numbers. Several species of colony forming cyanobacteria were numerous. The integrated (0–10 m and 0–20 m) chlorophyll concentrations were within the normal range for this month.

BY29 3rd of June

There were moderate amounts of the filamentous cyanobacterium *A. flosaquae*, the dinoflagellates *D. acuminata** and gymnodiniales and ciliates. The fluorescence peak at 15 meters was mainly caused by a prymnesiales* species.

BY31 Landsort deep 3rd of June

The dinoflagellate *D. acuminata** was numerous and moderate amounts of the filamentous cyanobacterium *A. flosaquae*, gymnodiniales, choanoflagellates and ciliates were found.

BY38 2nd of June

There were moderate amounts of the filamentous cyanobacterium *A. flosaquae*, the potentially toxic flagellate order prymnesiales and of the dinoflagellate order gymnodiniales in an otherwise “thin” sample of few taxa in low cell counts. A significant chlorophyll fluorescence peak was found at 15 meters, but the integrated (0–10 m and 0–20 m) chlorophyll concentrations were both still within the normal range for this month.

BY39 2nd of June

The phytoplankton situation was similar to the one at BY38, the amount of colony forming cyanobacteria was however higher.

Chlorophyll maxima at otherwise none phytoplankton sampling stations

BY32 2nd of June

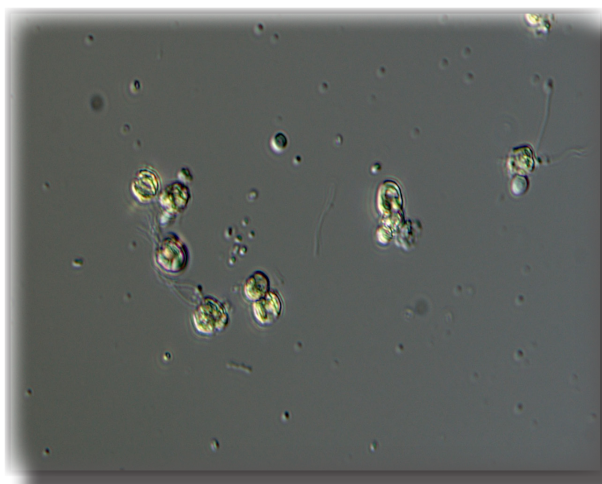
A chlorophyll fluorescence maximum at 15 meters was dominated by *Dinobryon* cysts.

BY10 4th of June

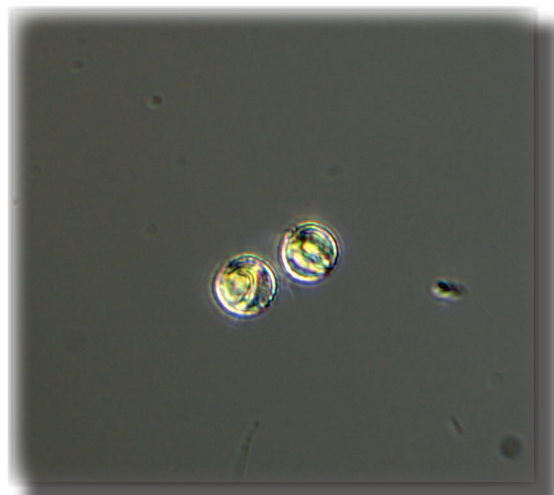
A chlorophyll fluorescence maximum at 12 meters was mainly caused by prymnesiales*, but there were also gymnodiniales and various cyanobacteria colonies in high abundances, as well as several species in low cell counts.

Hanö Bight 5th of June

A chlorophyll fluorescence maximum at 12 meters was mainly caused by prymnesiales*, but there were also gymnodiniales and various cyanobacteria colonies in high abundances, as well as several species in low cell counts. Heterotrophic (no chloroplasts, hence do not contribute to the chlorophyll concentrations) choanoflagellates were present in high cell numbers.



The potentially toxic order prymnesiales* dominated most of the chlorophyll fluorescence maxima samples. Photo: A-T Skjevik.

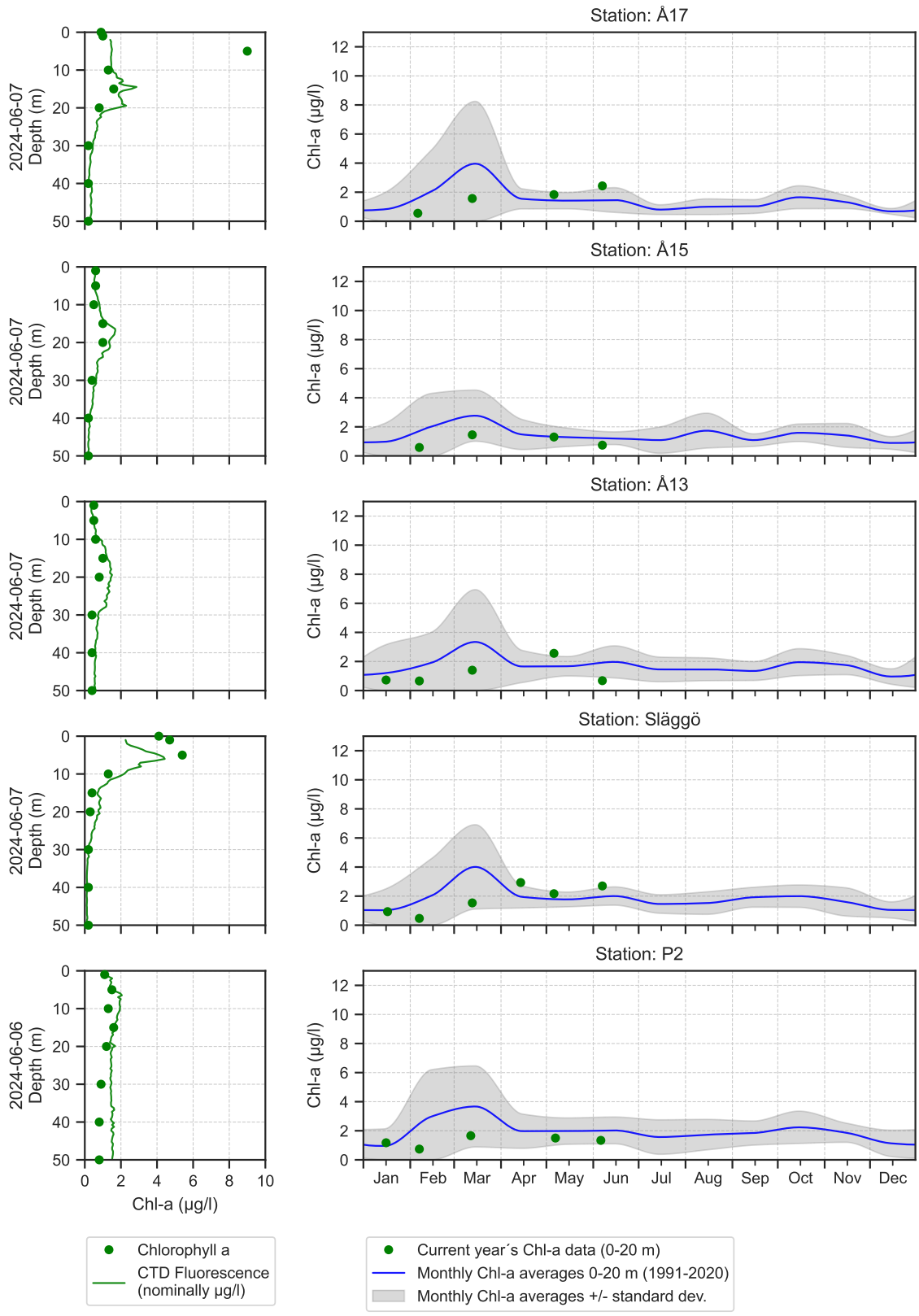


Dinobryon cysts dominated the chlorophyll fluorescence peak sample at BY32. Photo: A-T Skjevik.

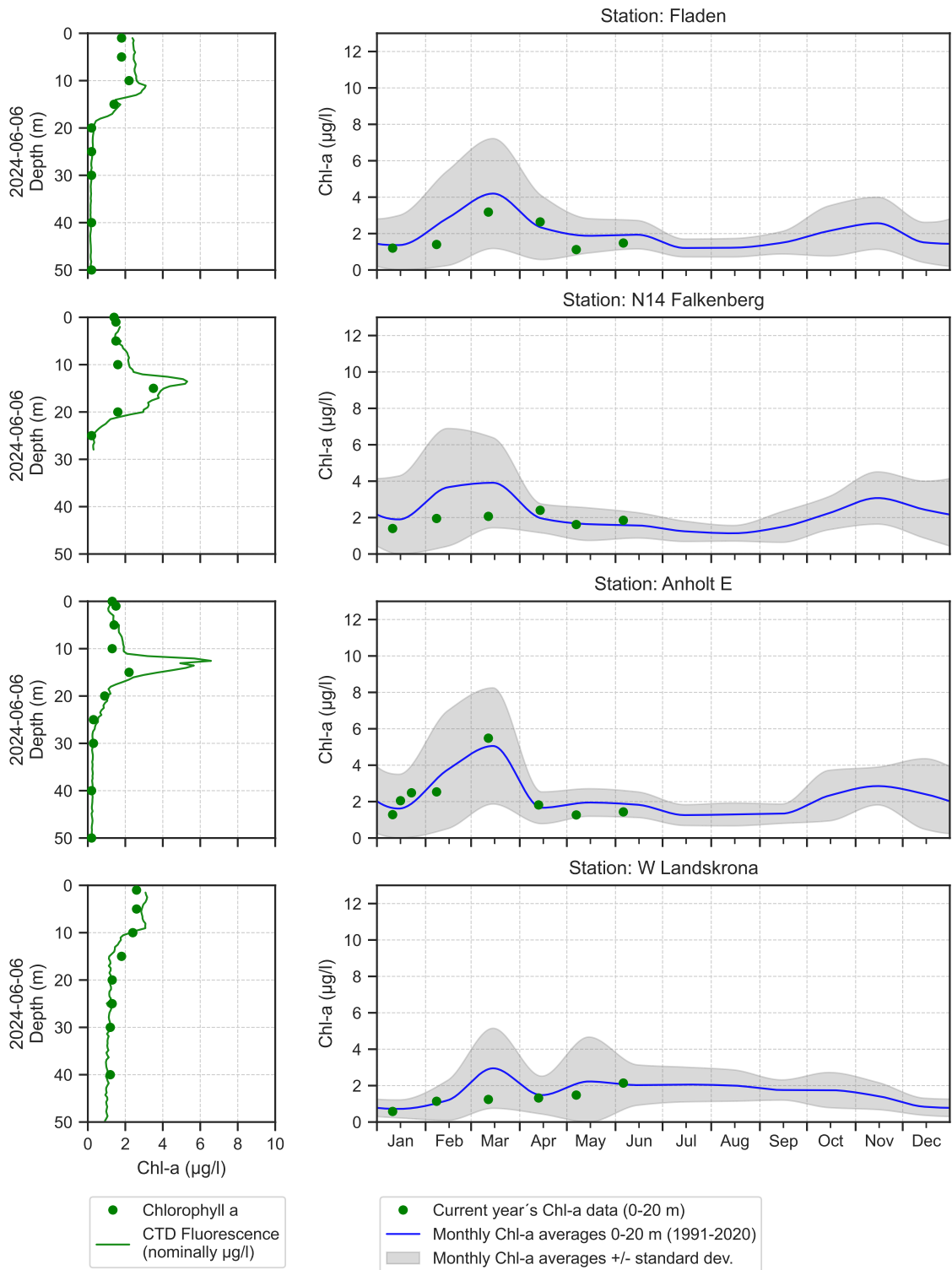
Selection of observed species	Anholt E	N14 Falkenberg	Släggö	Å17
Red=potentially toxic species	6/6	6/6	7/6	7/6
Hose 0-10 m	presence	presence	presence	presence
Actinocyclus	present	present		present
Centrales	common	present		
Cerataulina pelagica	very common	common	dominating	very common
Coscinodiscus radiatus		present		
Cylindrotheca closterium			present	
Dactyliosolen fragilissimus	dominating	dominating	common	very common
Guinardia delicatula	present	present	present	
Guinardia flaccida	present			
Nitzschia longissima		present		
Proboscia alata	present	common	present	present
Pseudo-nitzschia				present
Skeletonema marinoi		present	present	present
Thalassionema nitzschioides		present		
Dinophysis acuminata	present			
Dinophysis norvegica	present		present	present
Gymnodiniales	present	present	present	
Noctiluca scintillans	common	present	present	present
Peridinales	present			present
Prorocentrum cordatum	present	present	present	present
Proto-peridinium depressum			present	
Scrippsiella GRP				present
Tripos furca				present
Tripos fusus	present		common	present
Tripos longipes			present	present
Tripos macroceros			present	present
Tripos muelleri	common	present	present	present
Dinobryon faculiferum	present	present	present	present
Emiliana huxleyi	present	present	common	common
Prymnesiales	present			
Chlorodendrales			present	
Oocystis	present	present		present
Cryptomonadales	common	common	common	present
Leucocryptos marina	present	present		
Telonema subtile	present	present		present
Dolichospermum		present		
Lemmermanniella		present		
Pseudanabaena		present		

Selection of observed species	BCS III-10	BY2	BY5	BY15	BY29	BY31	BY38	BY39
Red=potentially toxic species	4/6	5/6	5/6	4/6	3/6	3/6	2/6	2/6
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Centrales		present						
Chaetoceros castracanei	present							
Chaetoceros danicus				common				
Chaetoceros similis			present			present		present
Chaetoceros subtilis								present
Chaetoceros thronsenii		present						present
Coscinodiscus					present			
Cyclotella choctawhatcheeana								present
Skeletonema marinoi								present
Amphidinium crassum	present				present			
Amylax triacantha					present	present		
Dinophysis acuminata	common	present	present	common	common	very common	present	present
Dinophysis norvegica	present				present		present	
Gymnodiniales	present	common	common	present	common	common	common	present
Heterocapsa	present	present	present	present	present	present		present
Heterocapsa rotundata					present			
Karlodinium veneficum	present	present	present			present	present	present
Katodinium glaucum	present				present	present	present	
Peridinales		present	present					
Peridiniella danica		present	present					
Prorocentrum balticum							present	
Binuclearia lauterbornii	present	common	present	common	present	present	present	present
Pseudopedinella pyriformis	present					common		
Aphanizomenon flosaquae	common	common	common	common	common	common	common	common
Aphanocapsa	present	common	present					
Aphanothece	present	present	present	common			present	present
Aphanothece paralleliformis	present	present	present	present				present
Cyanodictyon	present							
Dolichospermum	present		present	present	present			
Lemmermanniella	present	common	present	common	present			common
Nodularia spumigena	present				present			present
Pseudanabaena	present	present						
Snowella	present	present	present	common		present		present
Prymnesiales	common	common	common	present	present	present	common	common
Monoraphidium	present	present						
Scenedesmus	present							
Dinobryon	present	present	present	present	present			
Dinobryon faculiferum	present				present			
Cryptomonadales	present	common		present	present	present	present	present
Pyramimonas	present	present	present	present	present	present	present	present
Eutreptiella		common		present				
Oocystis		present	present	present	present			
Telonema subtile	present							
Katablepharis remigera	present			present				
Paulinella ovalis					present			
Calliacantha natans					present	present		
Choanoflagellata	present				present	common	present	present
Mesodinium rubrum	present	present	present	present	present	common	present	present
Strombidium	present		present					present
Ciliophora	present	common	common	common	common	common	present	present

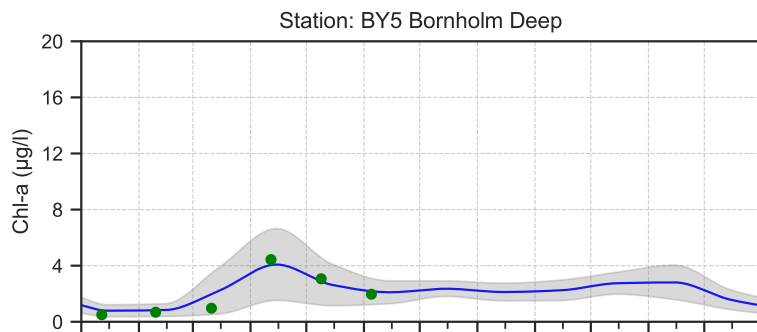
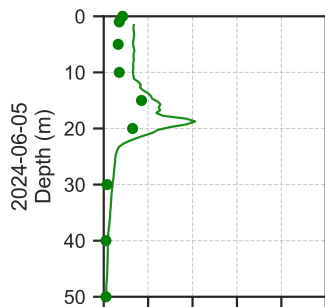
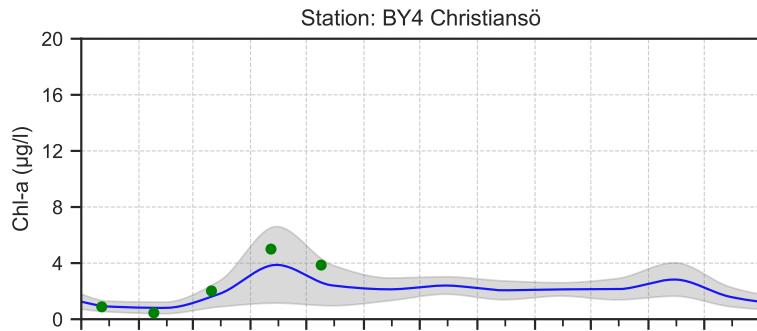
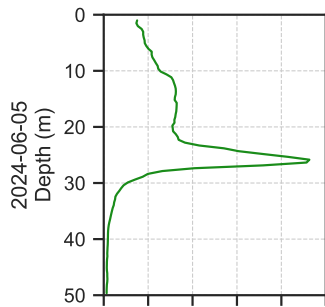
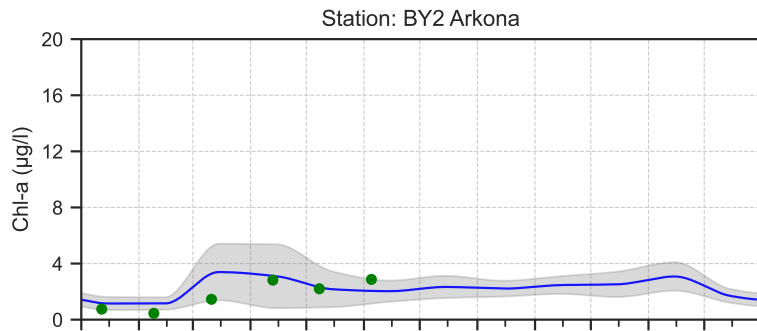
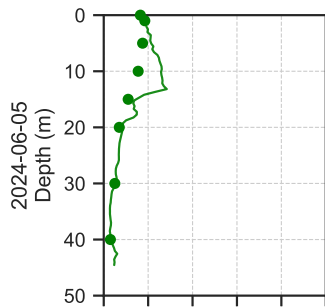
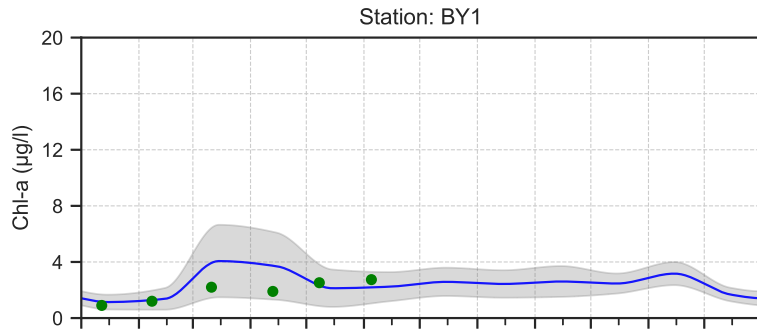
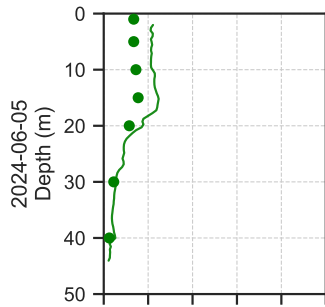
The Skagerrak



The Kattegat and The Sound



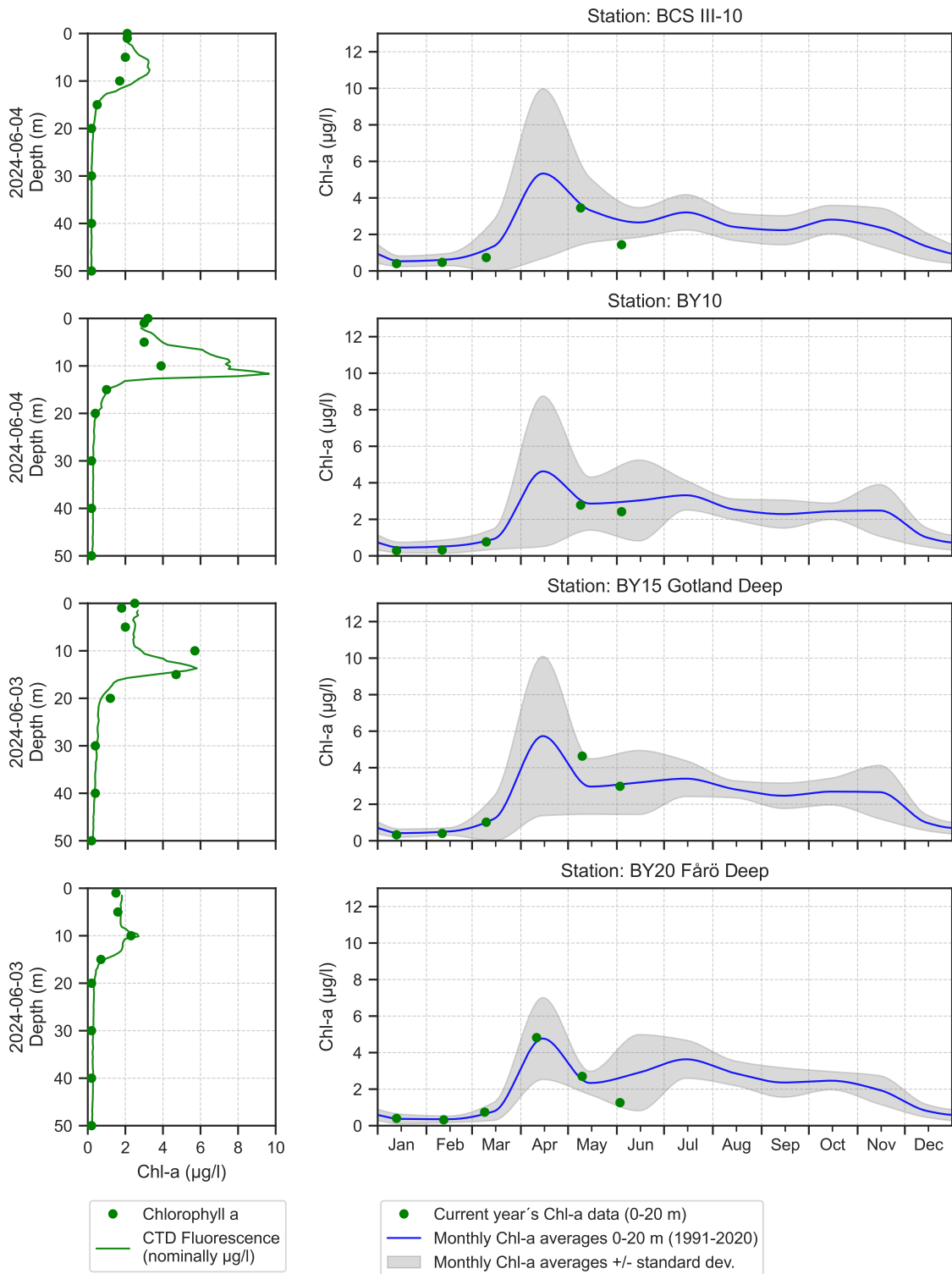
The Southern Baltic



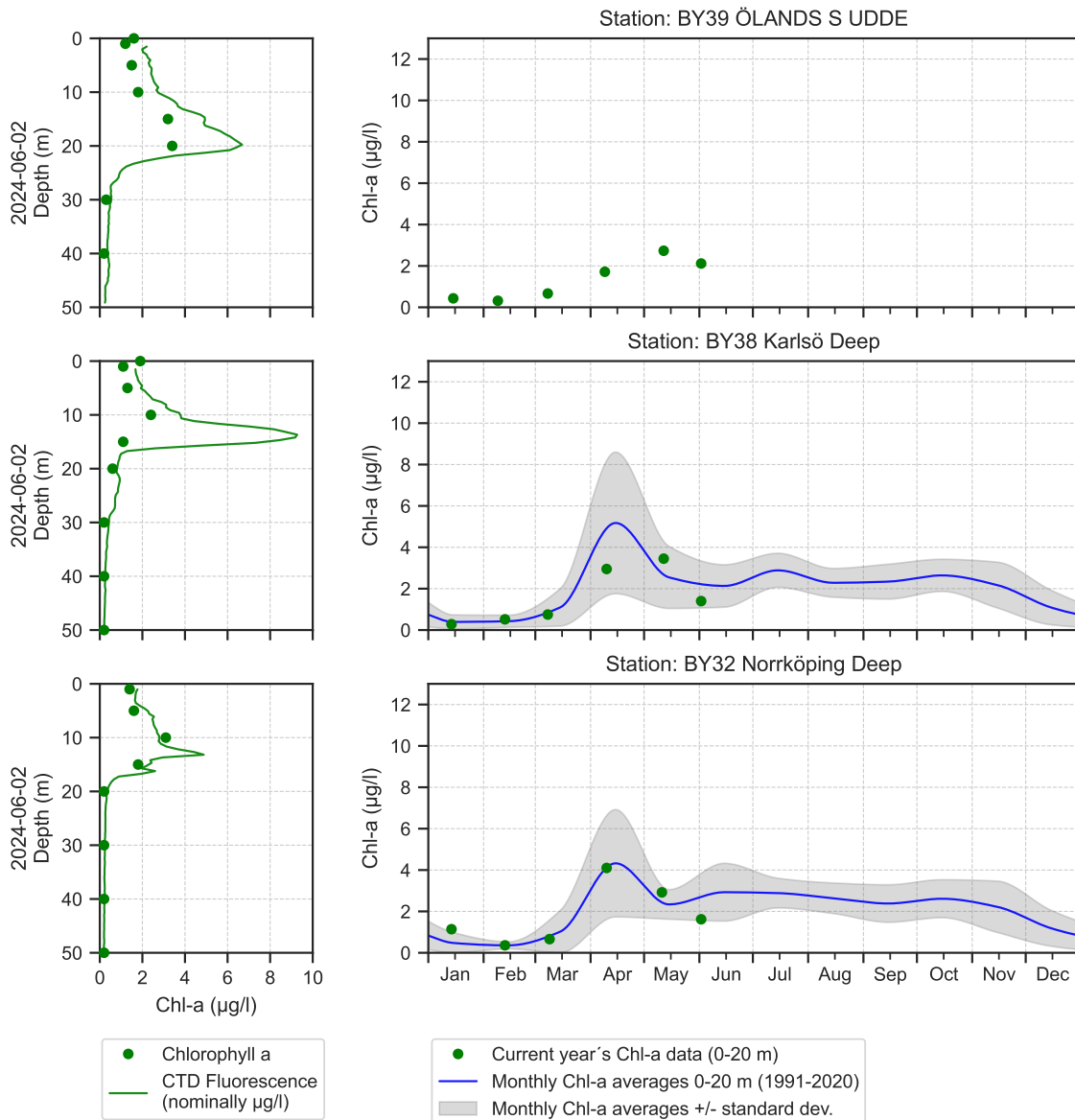
● Chlorophyll a
— CTD Fluorescence (nominally µg/l)

● Current year's Chl-a data (0-20 m)
— Monthly Chl-a averages 0-20 m (1991-2020)
■ Monthly Chl-a averages +/- standard dev.

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 algbloomingar finns under perioden juni-augusti på www.smhi.se. Resultat från provtagningarna kan hämtas från SMHI:s databas på 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 during the period June-August. Results from the expeditions are found in the SMHI database, 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)	Milda symptom: 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 Extrema symptom: 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.	Mild case: 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. Extreme case 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)	Milda symptom: Efter cirka 30 minuter till några timmar: yrsel, illamående, kräkningar, diarré, magont Extrema symptom: Upprepad exponering kan orsaka cancer	Mild case: Within 30 min-a few hours: dizziness, nausea, vomiting, diarrhoea, abdominal pain. Extreme case: Repeated exposure may cause cancer.
<i>Pseudo-nitzschia</i> spp.	Amnesic shellfish poisoning (ASP)	Milda symptom: Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramp Extrema symptom: Yrsel, hallucinationer, förvirring, förlust av korttidsminnet, kramper	Mild case: Within 3-5 hours: dizziness, nausea, vomiting, diarrhoea, abdominal cramps. Extreme case: dizziness, hallucinations, confusion, loss of memory, cramps.
<i>Chaetoceros concavicornis</i> / <i>C. convolutus</i>	Mechanical damage through hooks on setae	Låg celltäthet: Ingen påverkan. Hög celltäthet: Fiskens gälar skadas, fisken dör.	Low cell numbers: No effect on fish. High cell numbers: Fish death due to gill damage.
<i>Pseudochattonella</i> spp.	Fish toxin	Låg celltäthet: Ingen påverkan. Hög celltäthet: Fiskens gälar skadas, fisken dör.	Low cell numbers: No effect on fish. High cell numbers: 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.

