SMHI
Oceanographic Unit
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AlgAware
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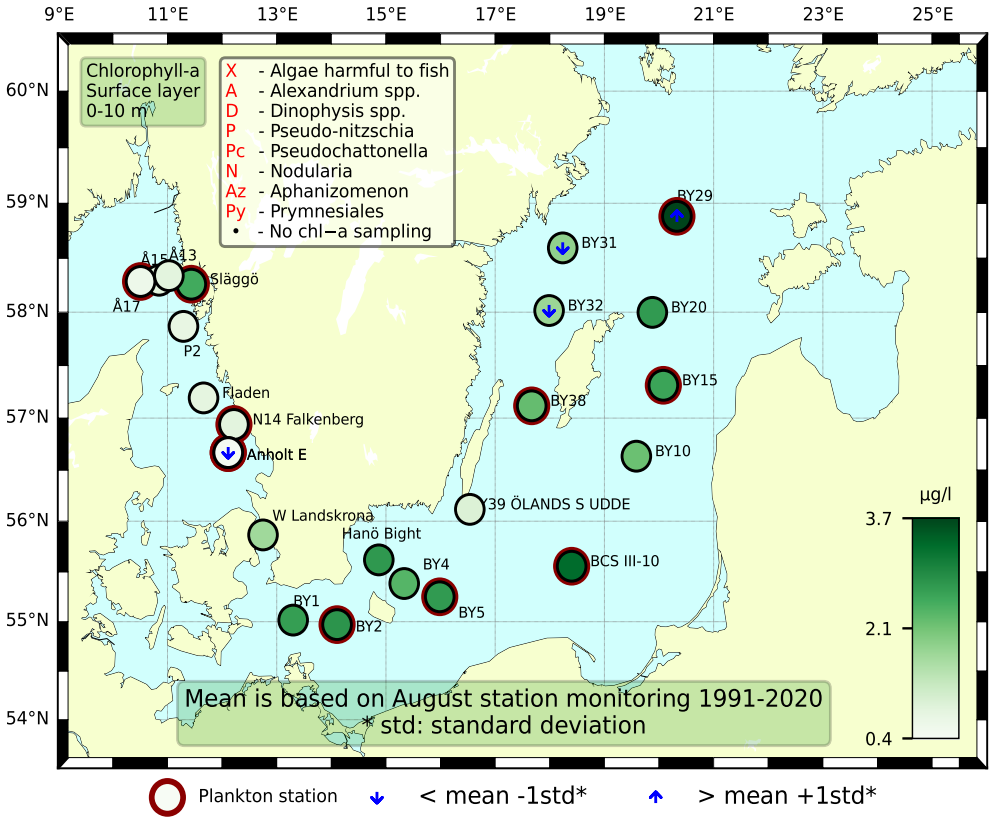
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

Samtliga stationer i Västerhavet hade ganska låg artdiversitet och låga totala cellantal. Små celler dominerade och kalkalgen *Emiliana huxleyi* var talrikast vid samtliga stationer förutom Å17 där dinoflagellaten *Heterocapsa rotundata* förekom i högst antal. Vid Å17 återfanns ett fluorescensmaximum vid 25 meters djup som till stor del orsakades av dinoflagellaten *Karenia mikimotoi**. De integrerade klorofyllkoncentrationerna var inom det normala vid samtliga stationer i Västerhavet.

I Östersjöns sydvästra del dominerade kiselalgen *Dactyliosolen fragilissimus* i växtplanktonproverna, men även en hel del enskilda filament av *Aphanizomenon flosaquae* noterades. Vid övriga stationer var både celltäthet och biodiversitet låga. *Aphanizomenon flosaquae* fanns i moderata antal vid de flesta stationer men endast ett par filament av *Nodularia spumigena** observerades totalt. De integrerade klorofyllhalterna från 0–10 meter var över det normala vid BCS III-10 och vid BY29. För de integrerade värdena från 0–20 meter låg alla stationer inom det normala för denna månaden.



Abstract

All stations along the Swedish west coast had low total cell numbers and low biodiversity. Small cells dominated and the coccolithophore *Emiliania huxleyi* was found in highest amount at all stations except Å17 where the dinoflagellate *Heterocapsa rotundata* was the most common. A chlorophyll fluorescence maximum was found at Å17 at 25 meters depth and was mainly caused by the dinoflagellate *Karenia mikimotoi**. The integrated chlorophyll concentrations were normal at all stations.

The southwestern part of the Baltic Sea had a clear dominance of the diatom *Dactyliosolen fragilissimus* but several filaments of *Aphanizomenon flosaquae* were also present there. *A. flosaquae* was found in low amounts at almost all stations whereas only a couple of filaments of *Nodularia spumigena** were found all together. The integrated chlorophyll concentrations from 0–10 meters were above normal at BCS III-10 and BY29. The 0–20 meters concentrations were within normal at all stations.

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

The Skagerrak

Släggö (Skagerrak coast) 10th of August

The species diversity and the total cell number were low. Dinoflagellates dominated in cell numbers among the larger cells and *Prorocentrum micans* and different naked athecate dinoflagellate cells belonging to gymnodiniales were the most common. Some chains of the diatom *Skeletonema marinoi* were found. The smaller cells were dominated by *Emiliania huxleyi* but *Chaetoceros tenuissimus* were also present in high cell numbers. The integrated chlorophyll concentrations were normal for this month.

Å17 (Skagerrak coast) 16th of August

The species diversity and the total cell number were both very low. Small cells dominated and among these the dinoflagellate *Heterocapsa rotundata* was common. Different naked dinoflagellates of a bit larger sizes were also common. Only a few diatoms were present. A fluorescence maximum at 25 meters was mainly caused by the dinoflagellate *Karenia mikimotoi**. The integrated chlorophyll concentrations were normal for this month.

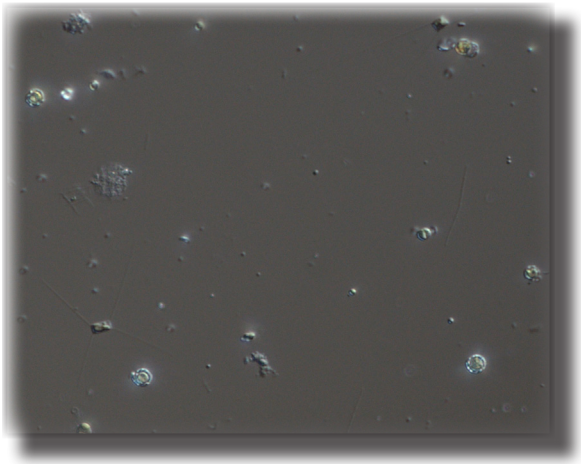


Fig 1. The coccolithophore *Emiliania huxleyi* was common at most stations along the Swedish west coast. Photo: M Johansen.

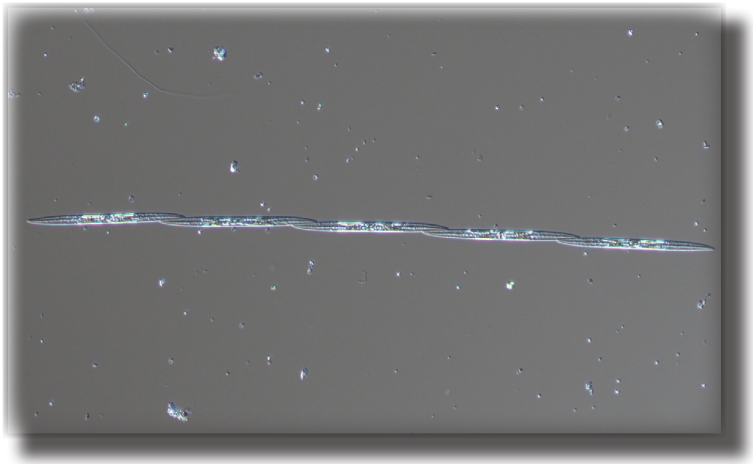


Fig 2. The diatom genus *Pseudo-nitzschia* was common at N14 Falkenberg. Photo: M Johansen.

The Kattegat

Anholt E 10th and 15th of August

Both the species diversity and total cell numbers were moderate on both occasions. At both sampling events small cells dominated and among these *E. huxleyi* was common. At the first sampling event the larger cells were represented by diatoms but no species appeared in higher cell numbers. Some filaments of the cyanobacterium *Aphanizomenon flosaquae* were found. On the second occasion an increase in dinoflagellates were noted and *Prorocentrum micans* was common. The integrated chlorophyll concentrations were normal for this month.

N14 Falkenberg 10th of August

The species diversity and total cell number were both moderate. The diatom genus *Pseudo-nitzschia** was common. A few filaments of *A. flosaquae* were found. The integrated chlorophyll concentrations were normal for this month.

The Baltic

BY2 Arkona 11th of August
The species diversity was low but the total cell number was high. The diatom *Dactyliosolen fragilissimus* dominated clearly in the sample. The cyanobacterium *A. flosaquae* was also quite abundant but only separate filaments were noted. The integrated chlorophyll concentrations were normal for this month.

BY5 Bornholm deep 12th of August
The species diversity was low but the total cell number was high. The diatom *D. fragilissimus* dominated clearly in the sample. The smaller cells were dominated by different cryptomonads but the diatom genus *Attheya* was also quite common. The integrated chlorophyll concentrations were normal for this month.

BCS lll-10 12th of August
The species diversity and total cell number were both low. Small cells dominated and among these the diatom genus *Actinocyclys* and different cells of cryptomonads were common. The integrated (0–10 m) chlorophyll concentration was above normal, whilst the 0–20 integration was normal for this month.

BY15 13th of August
The species diversity and total cell number were both low. Small cells dominated and among these different cells of cryptomonads were common. The diatom genus *Chaetoceros* was also quite common. The cyanobacterium *A. flosaquae* was quite abundant but only separate filaments were noted. The integrated chlorophyll concentrations were normal for this month.

BY20 13th of August
The species diversity and total cell number were both low. Small cells dominated and among these the diatom genus *Actinocyclys* and different cells of cryptomonads were common. The cyanobacterium *A. flosaquae* was quite abundant but only separate filaments were noted.

BY29 13th of August
The biodiversity was low but the total cell number was relatively high. There were relatively high amounts of the filamentous cyanobacterium *A. flosaquae*, the ciliate *Mesodinium rubrum* and different cryptomonads. The integrated (0–10 m) chlorophyll concentration was above normal.

Fig 3. The diatom *Dactyliosolen fragilissimus* was common in the south western part of the Baltic Sea. Photo: M Johansen.

BY31 Landsort deep 13th of August
Quite low cell numbers and biodiversity were observed. There were relatively high amounts of the filamentous cyanobacterium *A. flosaquae*. Some oocystis were present.

BY39 14th of August
The biodiversity was relatively high and the total cell number was high. Several filaments of *A. flosaquae* was found and colony forming cyanobacteria were numerous such as *Aphanothece*, *Lemmermaniella* and *Aphanocapsa*.

Hanö Bight 15th of August
A chlorophyll fluorescence maximum at 20 meters depth was mainly caused by the diatom *D. fragilissimus* that was also found dominating at BY2 and BY5.

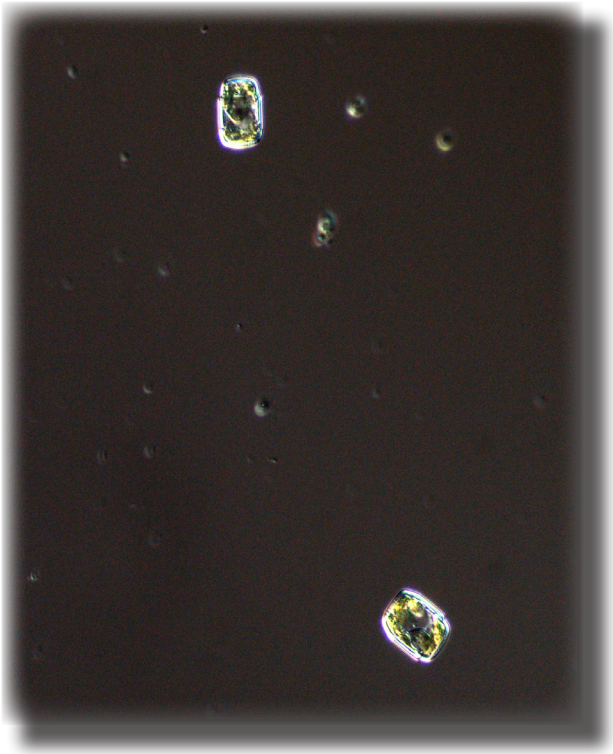
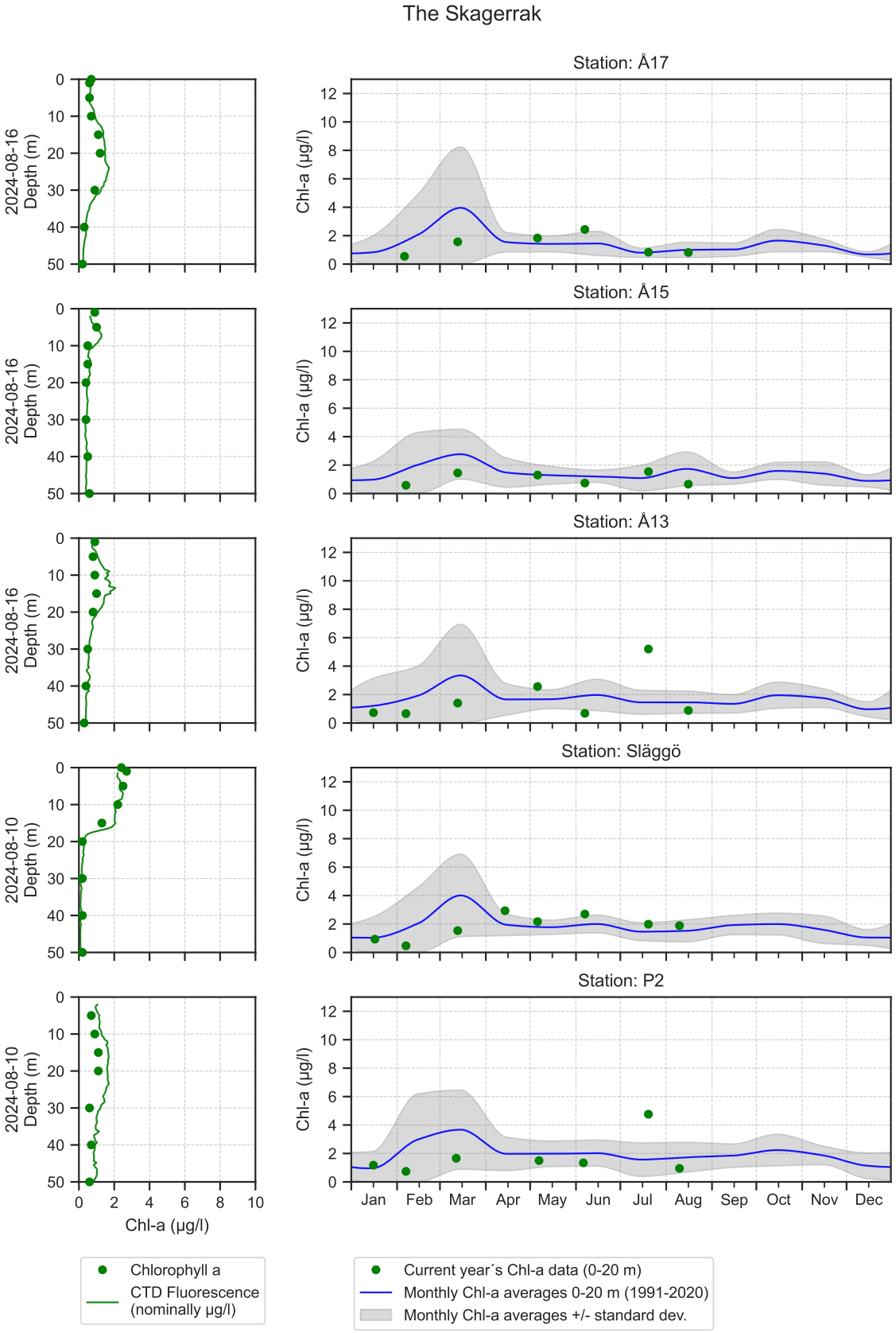


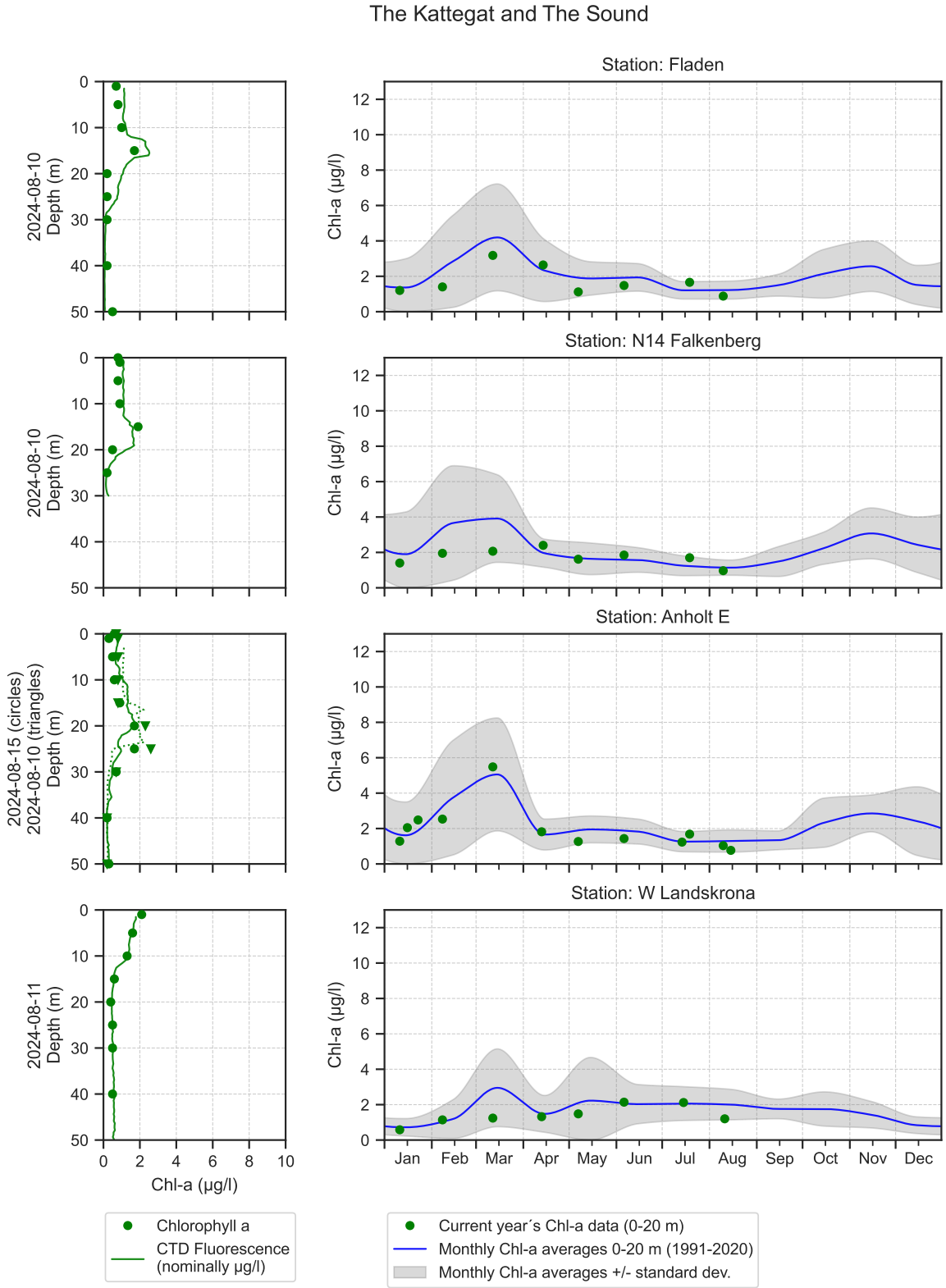
Fig 4. The centric diatom genus *Actinocyclus* with its characteristic difference in frustule size was found at several stations in the Baltic Sea. Photo: M Johansen.

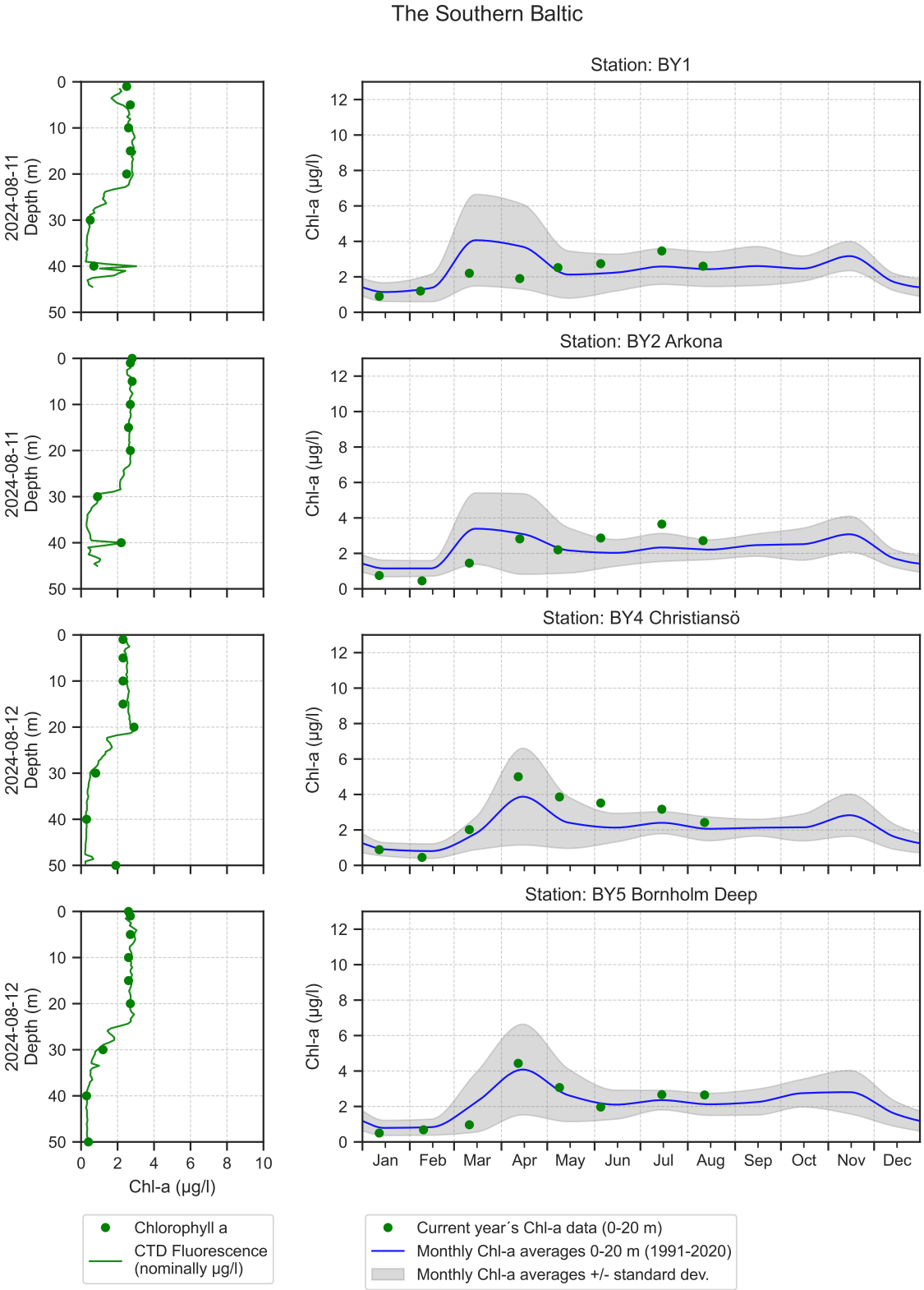
Phytoplankton analysis and text:
Marie Johansen.

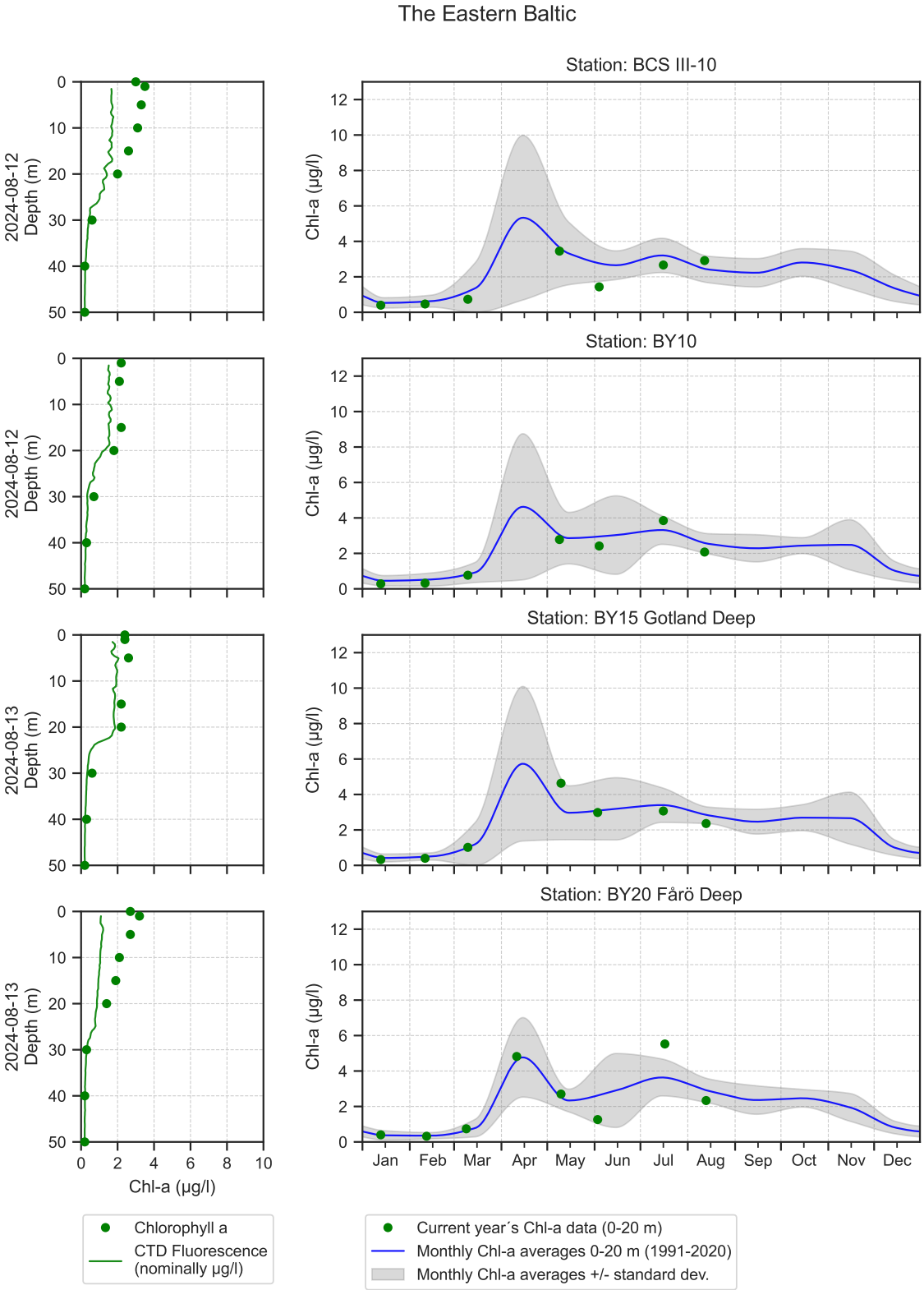
Selection of observed species	Anholt E	Anholt E	N14 Falkenberg	Släggö	Å17
Red=potentially toxic species	10/8	15/8	10/8	10/8	16/8
Hose 0-10 m	presence	presence	presence	presence	presence
Chaetoceros		present			
Chaetoceros cf. circinalis				present	
Chaetoceros contortus	present				
Chaetoceros minimus				present	
Chaetoceros tenuissimus				common	present
Cyclotella				present	
Cylindrotheca closterium				present	
Dactyliosolen fragilissimus	present	present	present	present	present
Guinardia flaccida	present				
Leptocylindrus danicus				present	
Nitzschia longissima	present		present	present	
Proboscia alata	present	present	present	present	
Pseudo-nitzschia			common		
Pseudosolenia calcar-avis			present		
Skeletonema marinoi	present			common	
Alexandrium pseudogonyaulax	present				
Amphidinium crassum		present			
Azadinium	present				present
Dinophysis acuminata		present		present	
Gymnodiniales	present	common	common	common	common
Heterocapsa rotundata					common
Karenia mikimotoi			present		present
Noctiluca scintillans		present			
Oxytoxum gracile					present
Peridiniales			present		present
Phalacroma rotundatum	present	present	present		
Prorocentrum micans	present	common	present	common	
Protoceratium reticulatum	present				
Protoperidinium claudicans	present				
Scrippsiella GRP			present		
Tripos furca				present	
Tripos fusus				present	
Tripos lineatus				present	
Tripos muelleri	present	present			
Emiliania huxleyi	common	common	common	very common	present
Pleurochrysis					present
Chlorodendrales	present			present	
Oocystis	present				
Cryptomonadales	present	present		common	
Dolichospermum	present		present		
Ebria tripartita				present	present
Ciliophora	present	present	common	present	present

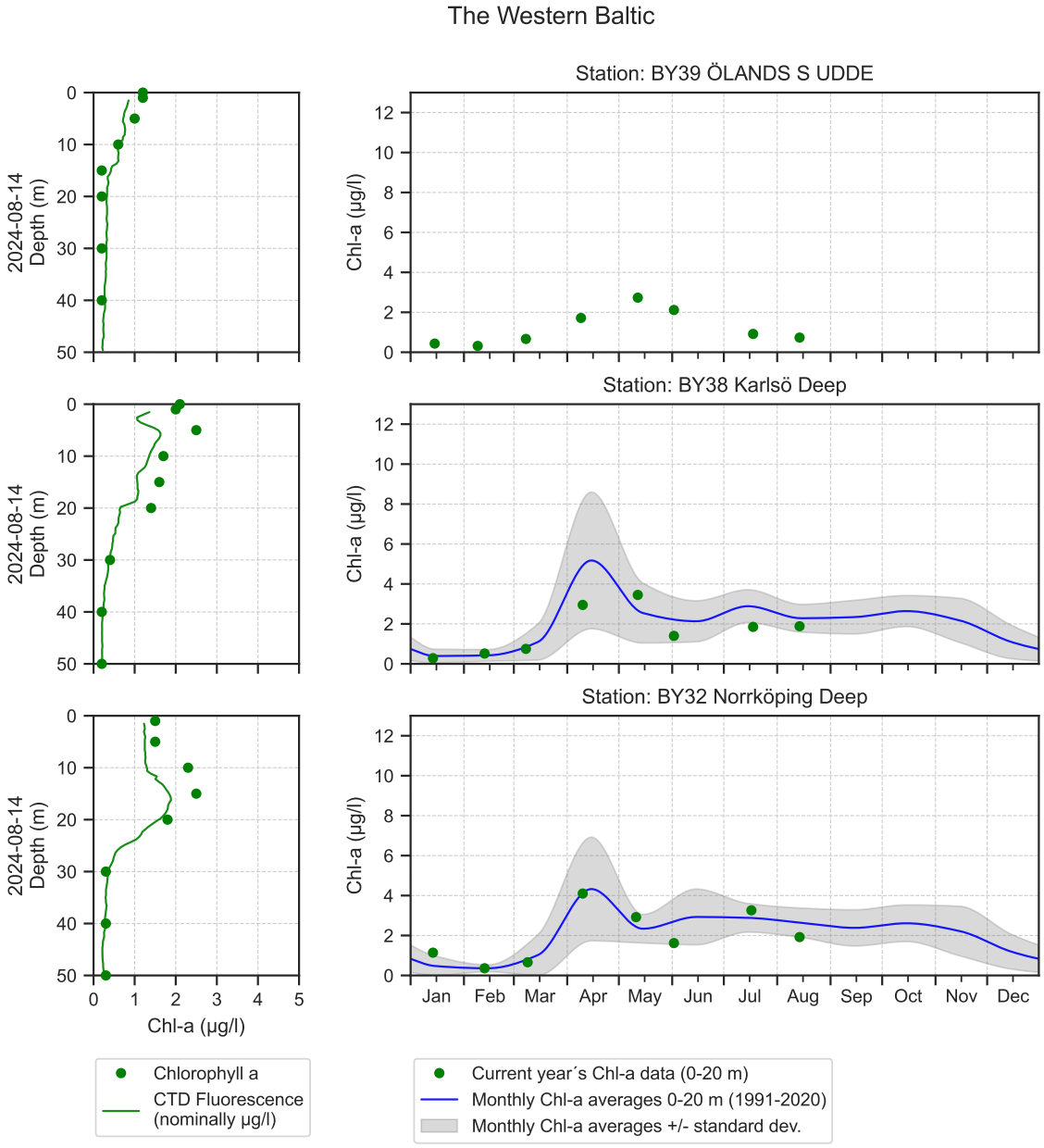
Selection of observed species	BCS III-10	BY2	BY5	BY15	BY29	BY31	BY39
Red=potentially toxic species	12/8	11/8	12/8	13/8	13/8	13/8	14/8
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence
Actinocyclus	common				present	present	present
Attheya longicornis			present	present			
Attheya septentrionalis			present				
Chaetoceros castracanei				present	present	present	present
Chaetoceros danicus		present	present	common	present	present	present
Dactyliosolen fragilissimus		dominating	dominating				
Dinophysis acuminata		present			present	present	
Dinophysis norvegica							present
Gymnodiniales	common	present	present	present		present	present
Gymnodinium verruculosum		present	present				
Heterocapsa rotundata						present	
Prymnesiales	present	present					
Oocystis	present			present	present	common	
Binuclearia lauterbornii							present
Pyramimonas	present		common	present			
Cryptomonadales	common	common	common	very common	very common	present	present
Eutreptiella gymnastica							present
Aphanizomenon flosaquae		common		common	very common	common	common
Aphanocapsa							present
Aphanothece							common
Aphanothece cf. paralleliformis							present
Cyanodictyon							present
Dolichospermum							present
Lemmermanniella							common
Nodularia spumigena						present	present
Snowella							present
Snowella cf. lacustris							present
Ebria tripartita		present					
Ciliophora	common	present	common	common	present		common
Mesodinium rubrum	common	present	present		common		
Helicostomella subulata		present	present		present	present	


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
2024-08-16
2024-08-10
Depth (m)
Chl-a (µg/l)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
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 Kattegat and The Sound
Station: Fladen
Station: N14 Falkenberg
Station: Anholt E
Station: W Landskrona
2024-08-10 Depth (m)
2024-08-15 (circles) 2024-08-10 (triangles) Depth (m)
2024-08-11 Depth (m)
Chl-a (µg/l)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
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 Southern Baltic
Station: BY1
Station: BY2 Arkona
Station: BY4 Christiansö
Station: BY5 Bornholm Deep
2024-08-11
2024-08-12
Depth (m)
Chl-a (µg/l)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
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
Station: BCS III-10
Station: BY10
Station: BY15 Gotland Deep
Station: BY20 Fårö Deep
2024-08-12
2024-08-13
Depth (m)
Chl-a (µg/l)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
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.



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 occuring 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 algblomningar 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
Alexandrium 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; headake, dizziness, nausea, vomiting, diarrhoea. **Extreme case** Muscular paralysis; pronounced respiratory difficulty; choking sensation; death trough respiratory paralysis may occur within 2-24 hours after ingestion.
Dinophysis spp.	Diarrehetic 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.
Pseudo- niztschia spp.	Amnesic shellfish poisoning (ASP)	**Milda symptom:** Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramper **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.
Chaetoceros concavicornis/ C.convolutus	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.
Pseudochattonella 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.

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.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