SMHI
Oceanographic Unit
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AlgAware
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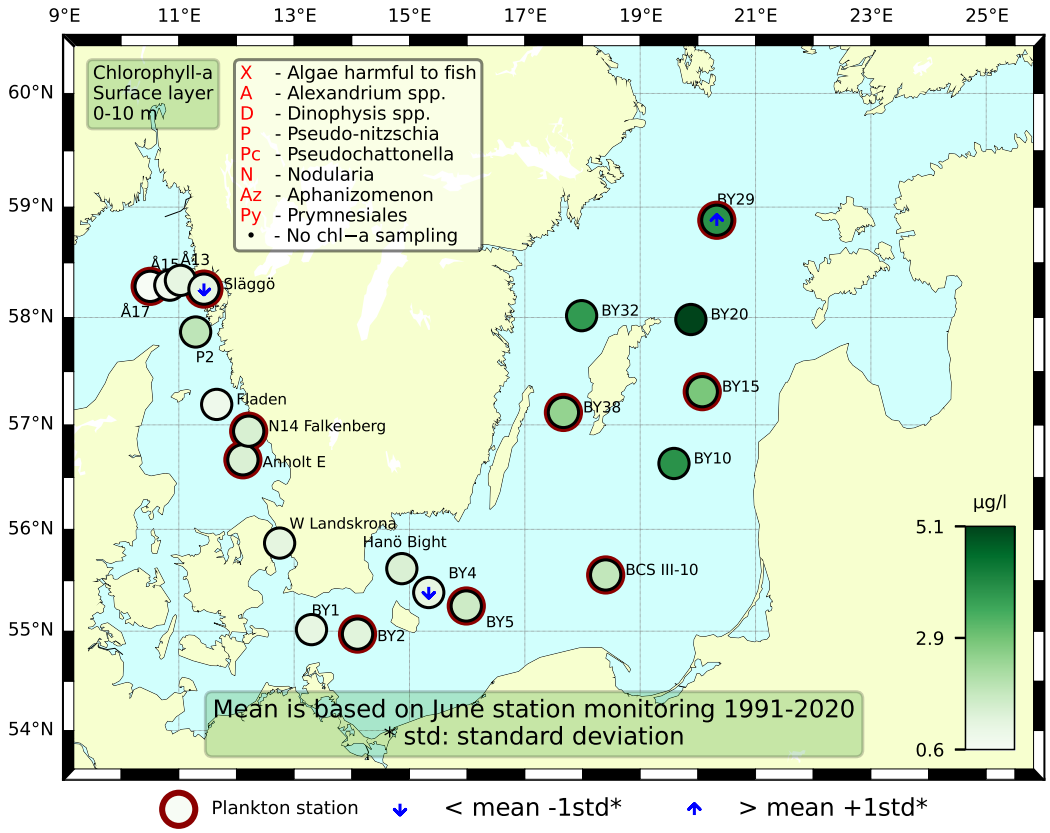
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

Diversiteten av växtplankton var hög medan de totala cellantalen var låga i Västerhavet, förutom vid Å17 där även diversiteten var låg. Kalkflagellaten *Emiliania huxleyi* var talrik och av kiselalgerna var *Dactyliosolen fragilissimus* vanligast förekommande. Det integrerade klorofyllvärdet (0-20m) var något hög vid W Landskrona på grund av en topp strax under 20 m orsakad av *Octactis speculum* och små oidentifierade celler. I övrigt var de integrerade värdena inom det normala för månaden.

I Östersjön hade mängden filamentösa cyanobakterier ökat jämfört med i maj och var högst vid BY38 väster om Gotland, samt vid den nordligaste stationen BY29. Klorofyllfluorescenstoppar vid BY5, BY20 och Hanöbukten orsakades till stor del av den potentiellt skadliga gruppen Prymnesiales*. De integrerade klorofyllvärdena (0-20 m) var över det normala vid BY32 och BCSIII-10, i övrigt inom det normala för månaden.



Abstract

The phytoplankton diversity was high whilst the total cell counts were low in the Kattegat and Skagerrak areas, except at Å17 where the diversity was low as well as the cell numbers. The coccolithophorid *Emiliania huxleyi* was numerous and *Dactyliosolen fragilissimus* was the most abundant diatom present. The integrated chlorophyll concentration (0-20 m) was somewhat high at W Landskrona because of a maximum just below 20 m caused by *Octactis speculum* and small unidentified cells.

The amounts of filamentous cyanobacteria in the Baltic was higher compared to May and was the highest at BY38 west of Gotland and at the most northern station BY29. Chlorophyll fluorescence peaks at BY5, BY20 and Hanö Bay were mainly caused by the potentially harmful group Prymnesiales*. The integrated chlorophyll concentrations (0-20 m) were above normal at BY32 and BCSIII-10, and within normal for the 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 (open Skagerrak) 18th of June
The phytoplankton diversity and the total cell numbers were low. No single species was abundant. Fluorescence peaks at 25 meters at Å17 and 30 meters at Å15 were caused by small species, like the coccolithophorid *Emiliania huxleyi*. The integrated chlorophyll concentration (0-20 m) was normal for this month.

Släggö (Skagerrak coast) 18th of June
The phytoplankton diversity was rather high with diatoms and the coccolithophorid *E. huxleyi* dominating the sample. Dinoflagellate species were also abundant although in low cell numbers. The integrated chlorophyll concentration (0-20 m) was normal for this month.

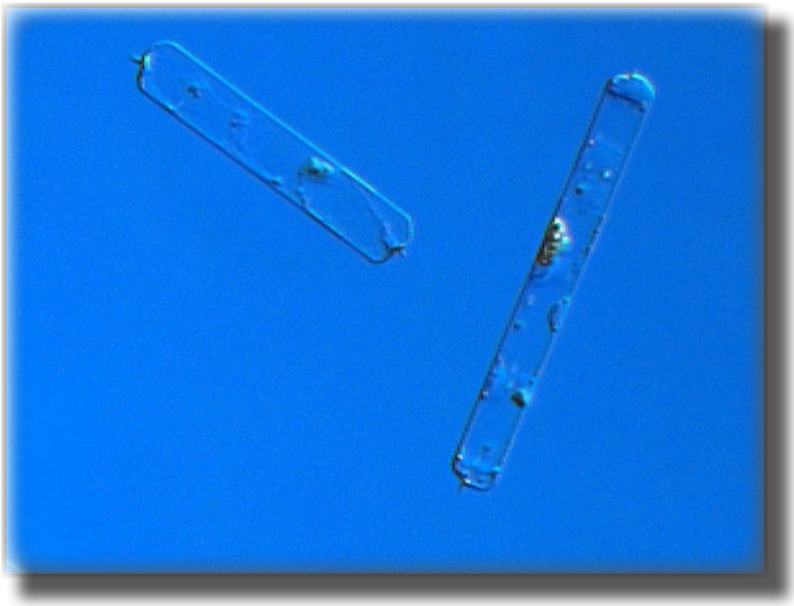


Fig 1. The diatom *Dactyliosolen fragilissimus* was abundant in the Skagerrak and Kattegat samples. Photo: A. Skjevik.

The Kattegat

Anholt E 17th of June
The phytoplankton diversity was rather high although the total cell numbers were low. Small species like the coccolithophorid *Emiliania huxleyi* were abundant, as was the diatom *Dactyliosolen fragilissimus*. The integrated chlorophyll concentration (0-20 m) was normal for this month.

N14 Falkenberg 17th of June
The number of phytoplankton species was rather high with low total cell numbers. The most numerous species were small ones like *E. huxleyi*, Prymnesiales* and *Dinobryon balticum* as well as the relatively large diatom *Dactyliosolen fragilissimus*. The integrated chlorophyll concentration (0-20 m) was normal for this month.

A fluorescence peak at W Landskrona was mainly caused by very small unidentified cells, possibly cyanobacteria and the flagellate *Octactis speculum*.

The Baltic

BY2 16th of June

The phytoplankton diversity was low with the highest abundance of small species like colony forming cyanobacteria, the diatom *Chaetoceros danicus,* cryptomonadales and small dinoflagellates. The green algae *Binuclearia lauterbornii* was rather abundant and a few threads of the filamentous cyanobacteria *Aphanizomenon flosaquae* and *Nodularia spumigena** were present. The integrated chlorophyll concentration (0-20 m) was normal for this month.

BY5 16th of June

The diversity was low with mostly small species present in addition to filamentous cyanobacteria. Moderate amounts of the cyanobacterium *A. flosaquae* was present as well as a few filaments of the potentially toxic cyanobacterium *N. spumigena**. Small cyanobacteria colonies were rather abundant. The integrated chlorophyll concentration (0-20 m) was normal for this month.

BY15 15th of June

The phytoplankton diversity was low and the cyanobacterium *A. flosaquae* was present in very low amounts. The green algae *Binuclearia lauterbornii*, the ciliate *Mesodinium rubrum* and the diatom *Chaetoceros castracanei* were abundant. The integrated chlorophyll concentration (0-20 m) was normal for this month.

Fig 2. The filamentous cyanobacteria *Aphanizomenon flosaquae* (left) and *Nodularia spumigena* (middle) were found at all stations in various amounts. The diatom *Chaetoceros castracanei* (right) was present in the southern and eastern Baltic. Photo: A. Skjevik.

BY38 14th of June

The phytoplankton diversity was low and the amounts of *A. flosaquae* were rather high. A few filaments of the potentially toxic cyanobacterium *N. spumigena** were found. Fluorescence peaks at 15 and 20 meters were caused by a diversity of small species. The integrated chlorophyll concentration (0-2 m) was normal for this month, although a bit elevated.

BCSIII-10 16th of June

The phytoplankton diversity was low with a few filaments of the cyanobacteria *A. flosaquae* and *N. spumigena** present. Small species like cryptomonads, Prymnesiales* and the dinoflagellate *Heterocapsa rotundata* were present in low cell numbers. The integrated chlorophyll concentration (0-20 m) was just above normal for this month.

BY29 13th of June

The phytoplankton diversity was generally low, *A. flosaquae* however was present in rather high amounts. A few filaments of *N. spumigena** were present as well as the dinoflagellates *Dinophysis norvegica** and *D. acuminata** as well as the diatom *Chaetoceros wighamii*.

Additional fluorescence maxima

Fluorescence peaks at BCSIII-10, BY29 and BY32 were mainly caused by very small unidentified cells, possibly cyanobacteria. At Hanö Bay and BY20, about 130 000 Prymnesiales* per liter were present at 25 meters depth. The same organism was quantified to approximately 2.9 million cells per liter at BY5 at 23 meters depth.

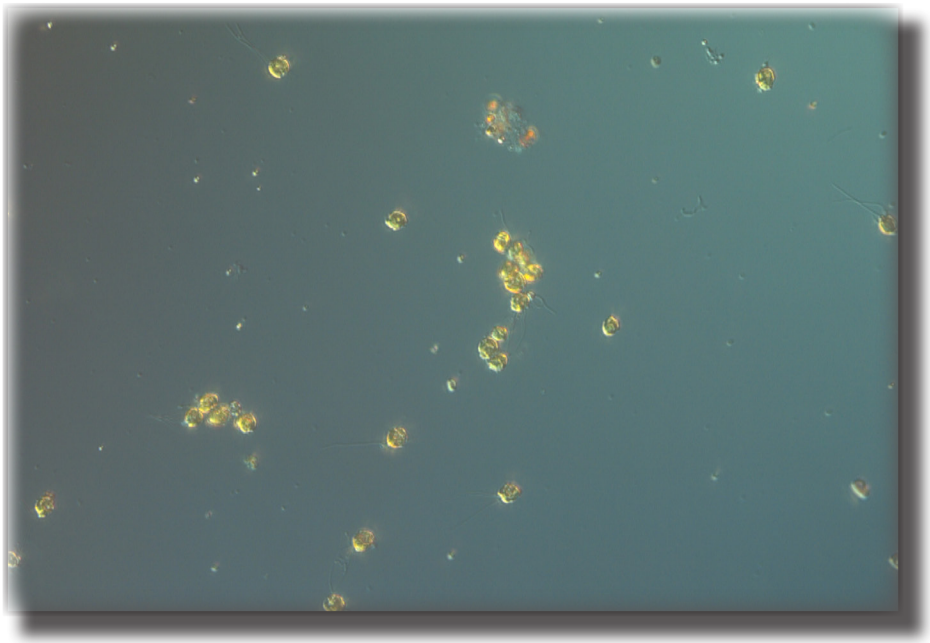
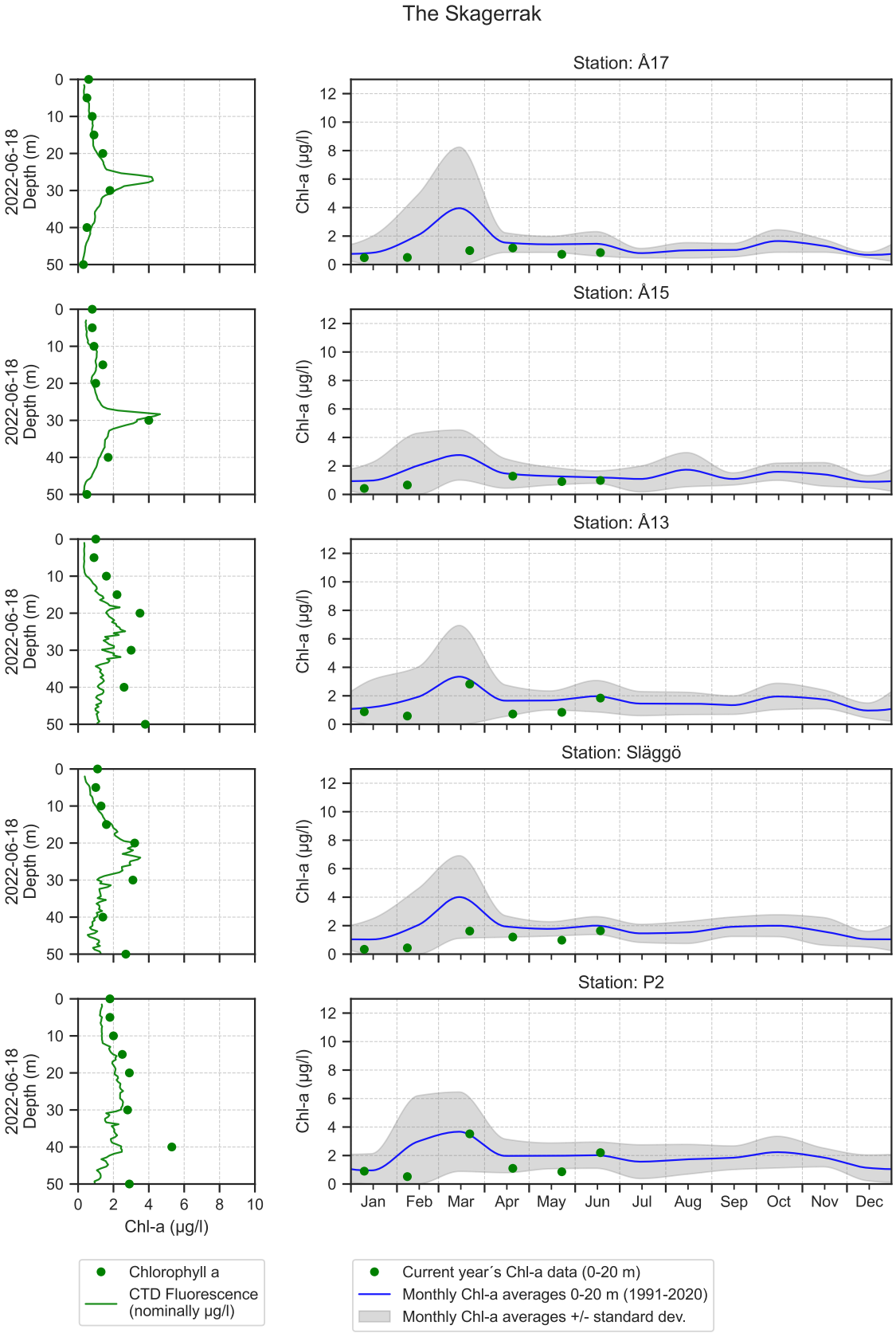


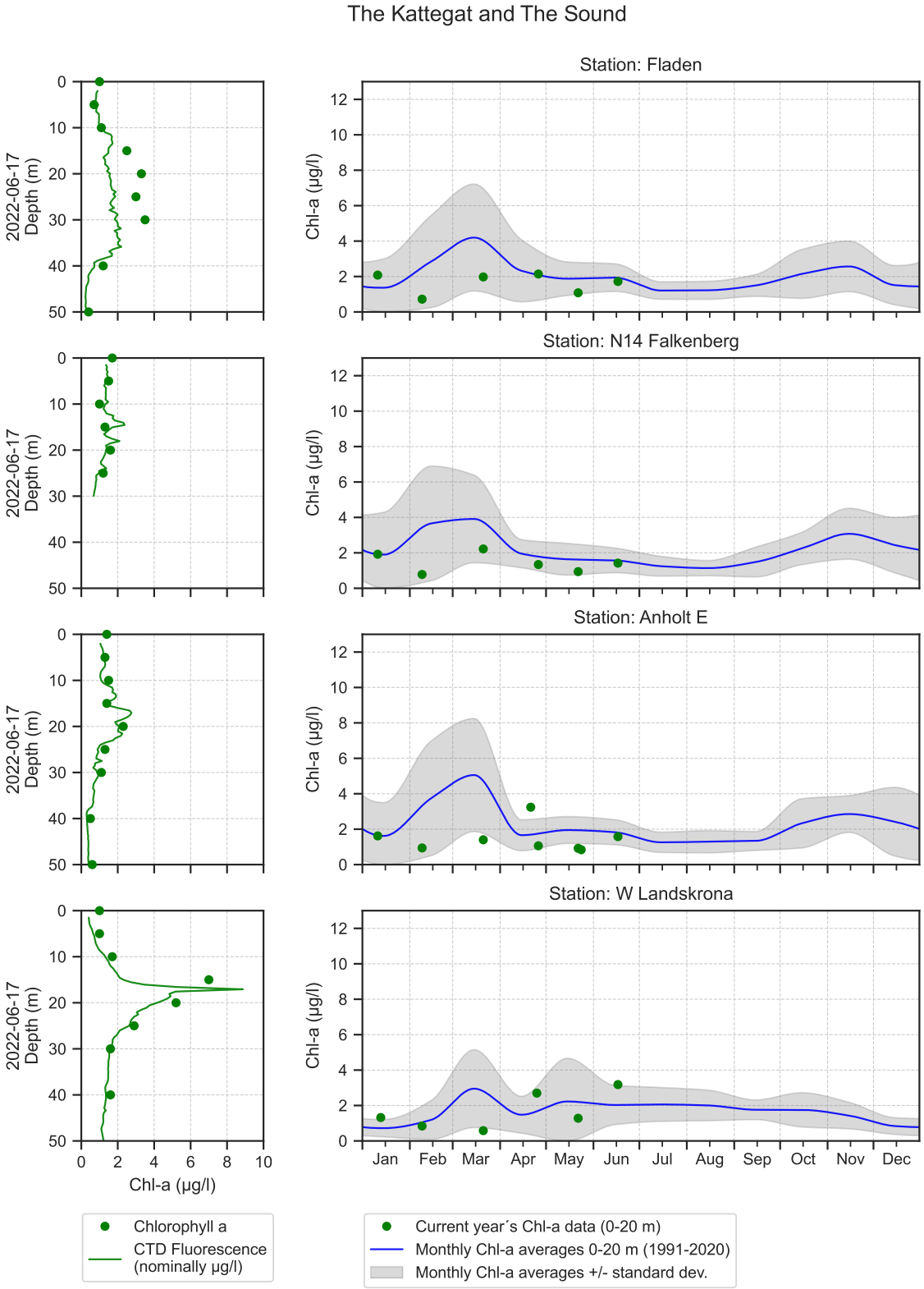
Fig 3. The potentially harmful flagellate Prymnesiales* was found in high cell numbers at BY2, Hanö Bay and BY20. Photo: A. Skjevik.

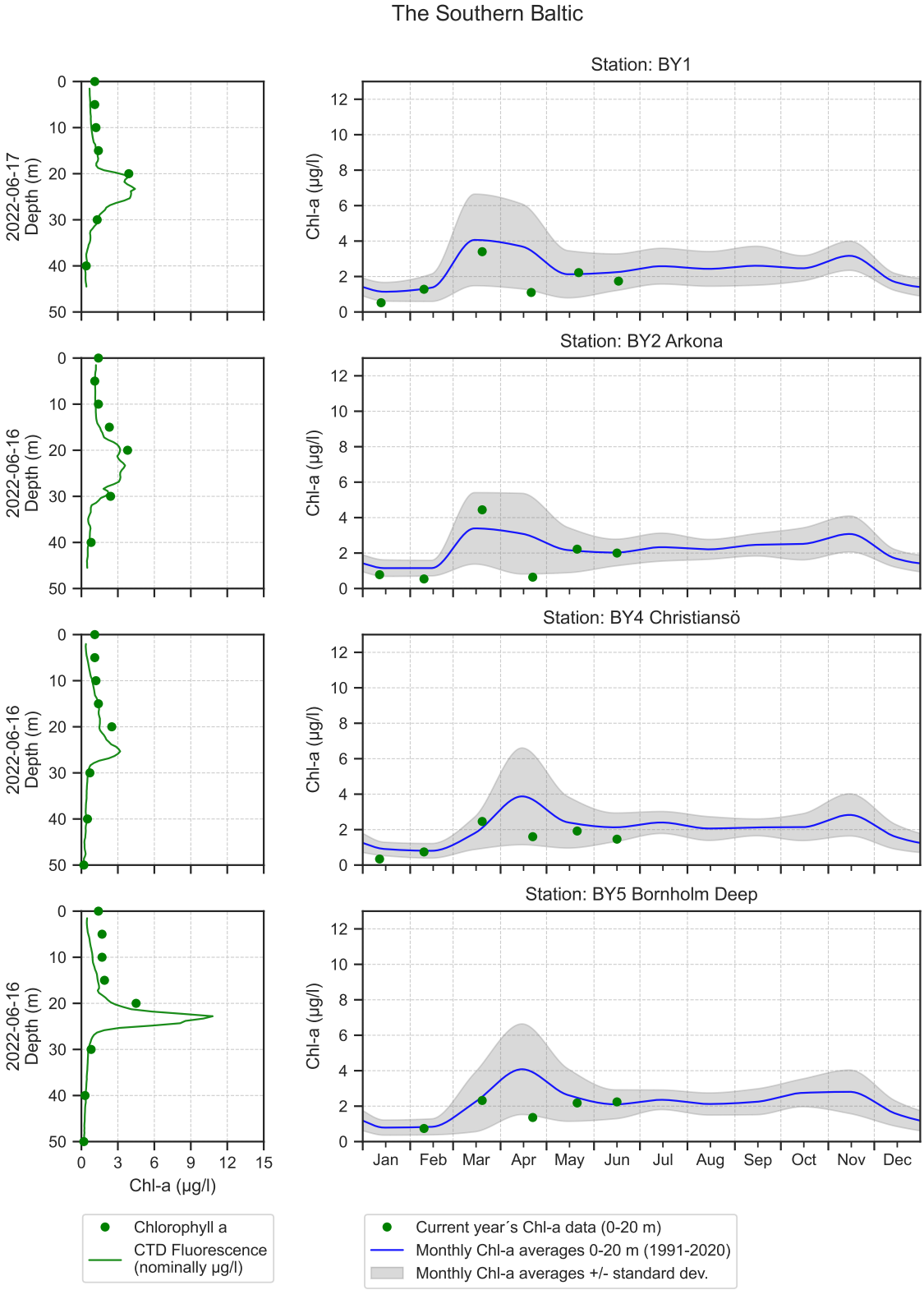
Phytoplankton analysis and text:
Ann-Turi Skjevik.

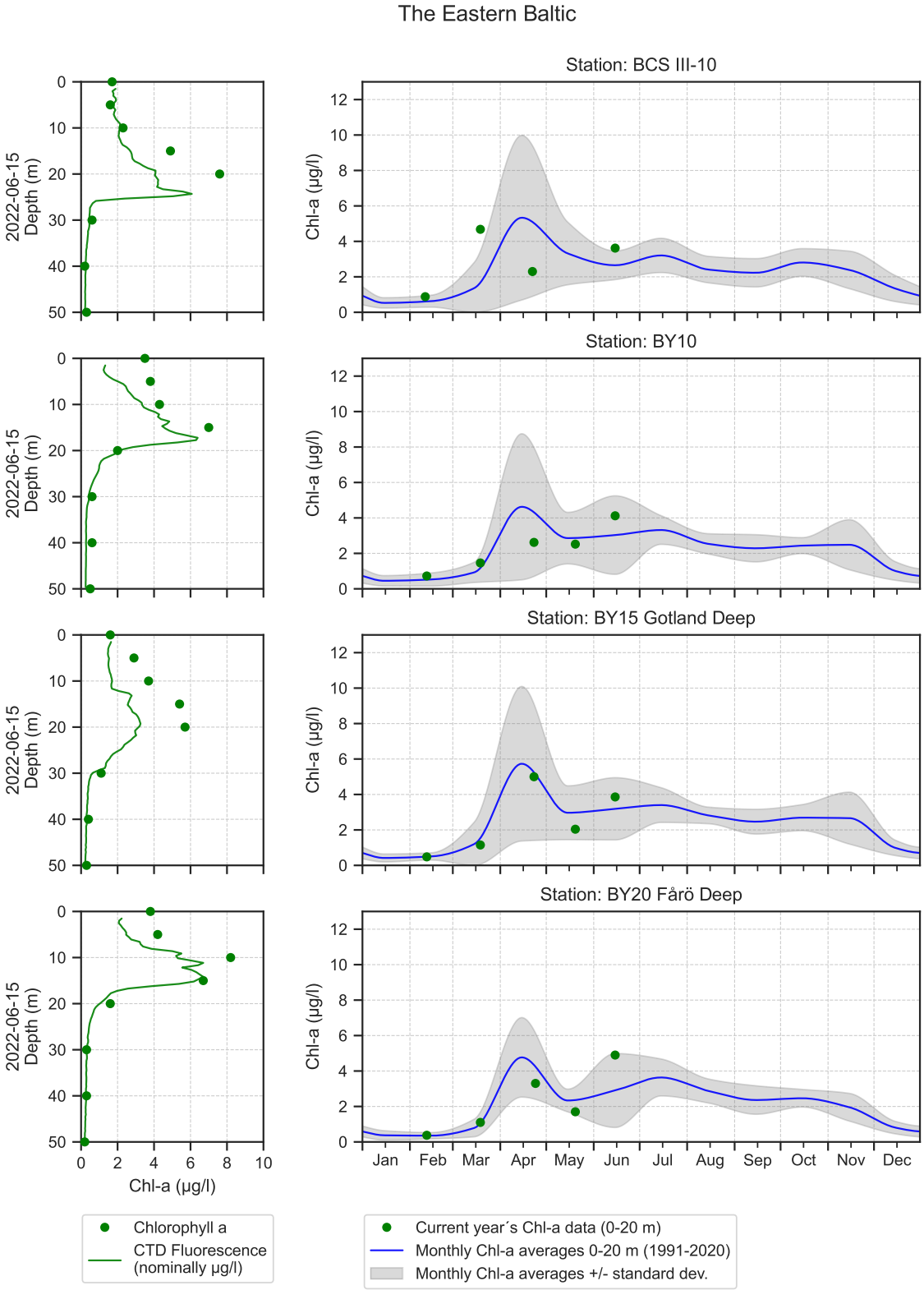
Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	18/6	17/6	18/6	18/6
Hose 0-10 m	presence	presence	presence	presence
Cerataulina pelagica			2	
Chaetoceros danicus	2	2	1	
Chaetoceros socialis				1
Chaetoceros throndsenii		1		
Cylindrotheca closterium	2	2	2	1
Dactyliosolen fragilissimus	3	3	3	1
Guinardia delicatula	2	1	2	1
Guinardia flaccida	1	1	2	1
Leptocylindrus danicus			2	
Leptocylindrus minimus				1
Licmophora			1	
Nitzschia longissima	2	2	2	
Proboscia alata	2	2	2	1
Pseudo-nitzschia	1		2	
Rhizosolenia hebetata f. semispina	1		1	1
Rhizosolenia imbricata			2	1
Skeletonema marinoi	2		2	2
Thalassionema nitzschioides		1	1	
Alexandrium pseudogonyaulax	1	1	2	
Dinophysis acuminata	1		2	
Dinophysis norvegica		1	2	1
Gymnodiniales	3	2		2
Gymnodinium verruculosum				1
Gyrodinium flagellare				1
Heterocapsa triquetra			1	
Karenia	1			
Katodinium glaucum			1	2
Oxytoxum criophilum		1		
Peridiniales		2		
Phalacroma rotundatum	1		1	
Prorocentrum micans				1
Protodinium simplex		1		
Tripos fusus			1	
Tripos longipes			1	2
Tripos macroceros			2	2
Tripos muelleri	2	2	2	2
Dinobryon		1		
Dinobryon balticum	2	3	1	1
Dinobryon faculiferum	1	1		1
Cryptomonadales	2	2	1	2
Emiliania huxleyi	3	3	3	2
Prymnesiales	2	3	2	2
Octactis speculum	2			
Pyramimonas				1
Oocystis	1			
Choanoflagellatea	1	2		
Telonema				1
Leucocryptos marina	2	1	2	2
Ebria tripartita	1			
Ciliophora	2	2	1	2
Mesodinium rubrum	1			1

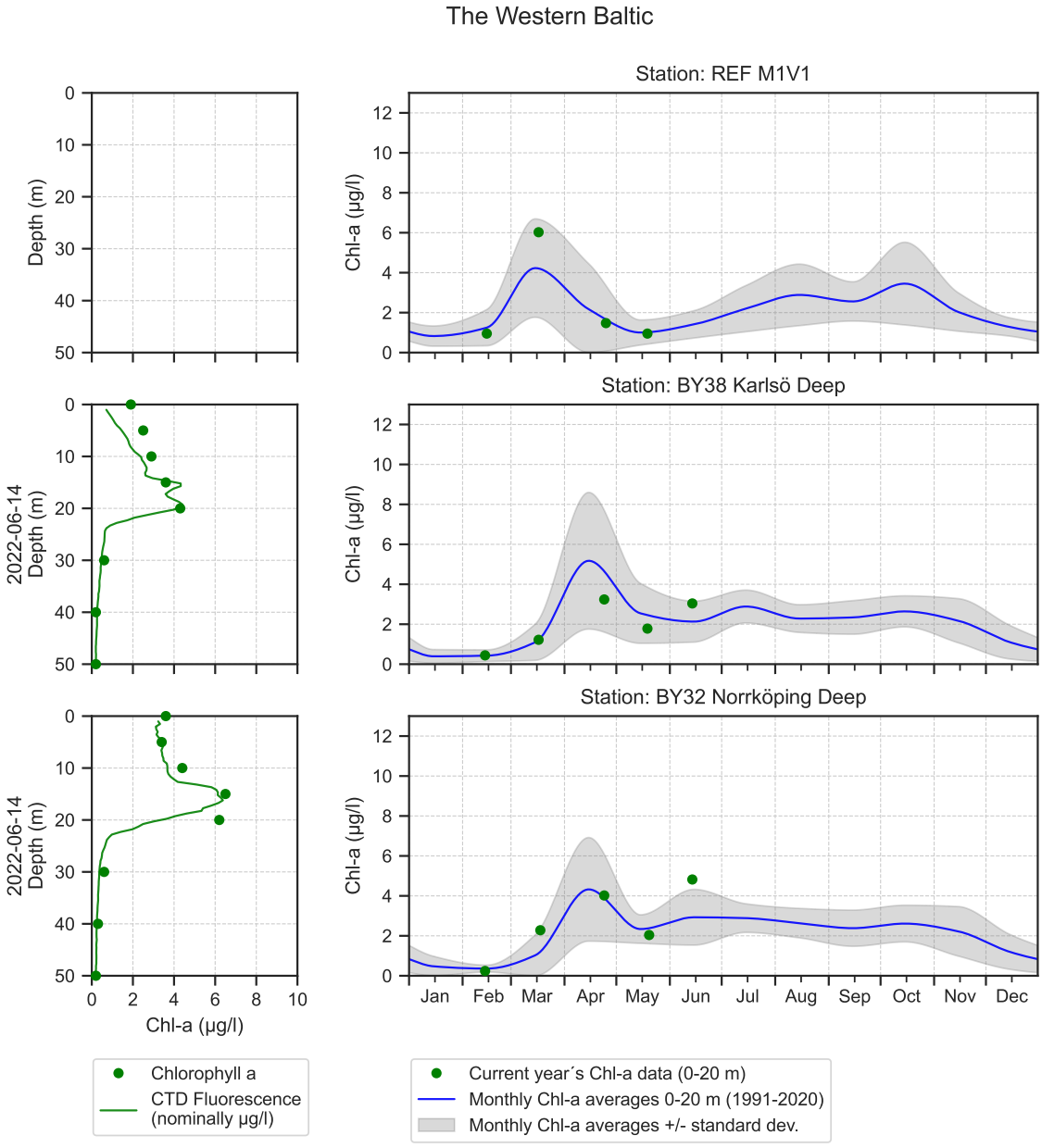
Selection of observed species	BY15	BY29	BY2	BY38	BY5	BCSIII-10
Red=potentially toxic species	15/6	13/6	16/6	14/6	16/6	16/6
Hose 0-10 m	presence	presence	presence	presence	presence	presence
Chaetoceros castracanei	3		2		1	2
Chaetoceros danicus			2			
Chaetoceros similis	2					
Chaetoceros wighamii		2				
Dinophysis acuminata	2	2				
Dinophysis norvegica	2	2				1
Gymnodiniales	3	2	2	2	3	2
Gymnodinium verruculosum			1			
Heterocapsa	2			1	1	1
Heterocapsa rotundata	1		2	1		2
Protoperidinium bipes				1		
Dinobryon		1		2		2
Dinobryon balticum				1		
Dinobryon faculiferum		2		2		
Cryptomonadales	1	1	3	2	2	3
Aphanizomenon flosaquae	1	3	2	3	3	2
Aphanothece paralleliformis			1	1		
Lemmermanniella	1		2	2	3	1
Nodularia spumigena	1	1	1	2	2	1
Snowella		1	2		2	
Binuclearia lauterbornii	3	1	3	1	2	2
Prymnesiales						2
Pseudopedinella pyriformis	1					
Eutreptiella		2				
Pyramimonas	2		2		2	2
Quadricoccus euryhalinicus						1
Choanoflagellatea						1
Leucocryptos marina						2
Telonema						1
Mesodinium rubrum	3	2			1	2
Ciliophora	2	2	2	2	2	2


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
2022-06-18
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
2022-06-17
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
2022-06-17
2022-06-16
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
2022-06-15
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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