Dnr: S/Gbg-2020-19

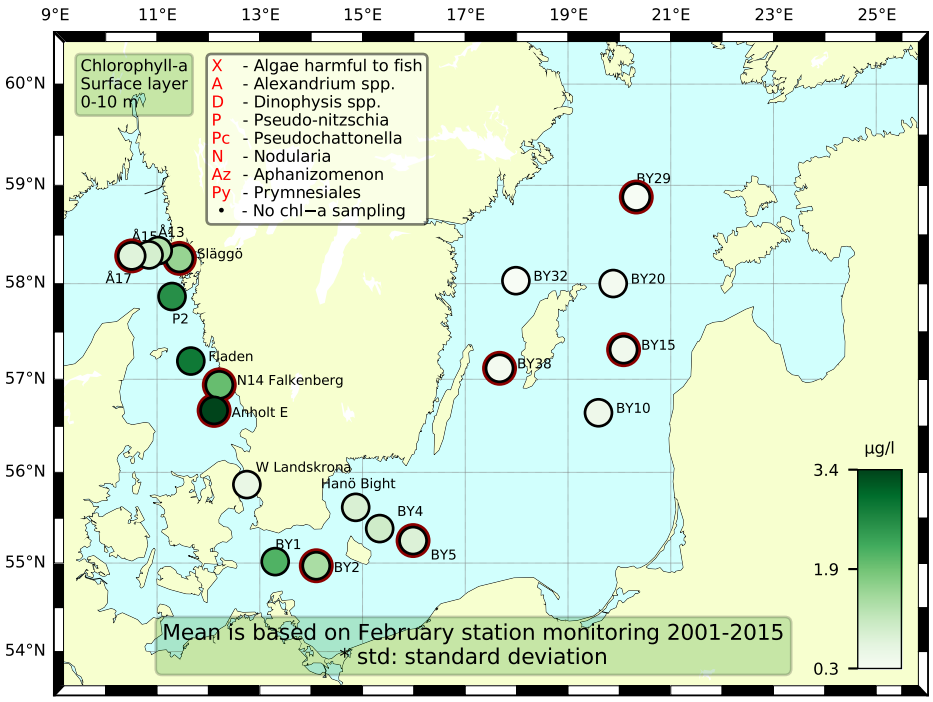
SMHI
Oceanographic Unit
No 2, February 2020

AlgAware
ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

Sammanfattning
Under expeditionen blev flertalet stationer strukna. Ett par ströks på grund av dåligt väder, övriga på grund av att delar av en bojs förankring trasslade in sig i en av fartygets propellrar och expeditionen fick avbrytas med hamnstopp i Oxelösund innan återfärd mot Lysekil.

Vid Å17 längst ut i Skagerrak samt Släggö vid kusten var diversiteten av växtplankton och klorofyllhalterna låga, vilket är normalt för månaden. Vid stationerna i Kattegatt var totala cellkoncentrationen högre. Vid Anholt E var klorofyllhalterna relativt höga och det fanns indikationer på att en begynnande vårblomning var på gång. Vid N14 Falkenberg var detta inte lika tydligt.

Få arter i låga cellantal präglade växtplanktonsamhällena i Östersjön. Dinoflagellaten *Peridiniella catenata* och kiselalgen *Chaetoceros castracanei* som båda brukar finnas i höga cellantal under vårblomning observerades vid BY15, så de är redo så snart förhållandena är de rätta. Den trådlika cyanobakterien *Aphanizomenon flosaquae* fanns vid tre av fem stationer och grönalgen *Binuclearia lauterbornii* observerades vid samtliga stationer. Klorofyllhalterna var normala för denna månad.



Abstract
A number of stations were cancelled during the cruise. Some because of the bad weather, others due to the fact that parts of the anchoring from a buoy got stuck in one of the ships propellers, which caused cancellation of the cruise and a safety stop in Oxelösund prior to the detour to Lysekil.

At Å17, the most westerly Skagerrak station and at Släggö at the coast, the phytoplankton diversity and chlorophyll concentrations were low which is normal for this month. The stations in the Kattegat had higher total cell concentrations. The chlorophyll concentrations at Anholt E gave an indication of a soon to be spring bloom. N14 Falkenberg did not give the same indication.

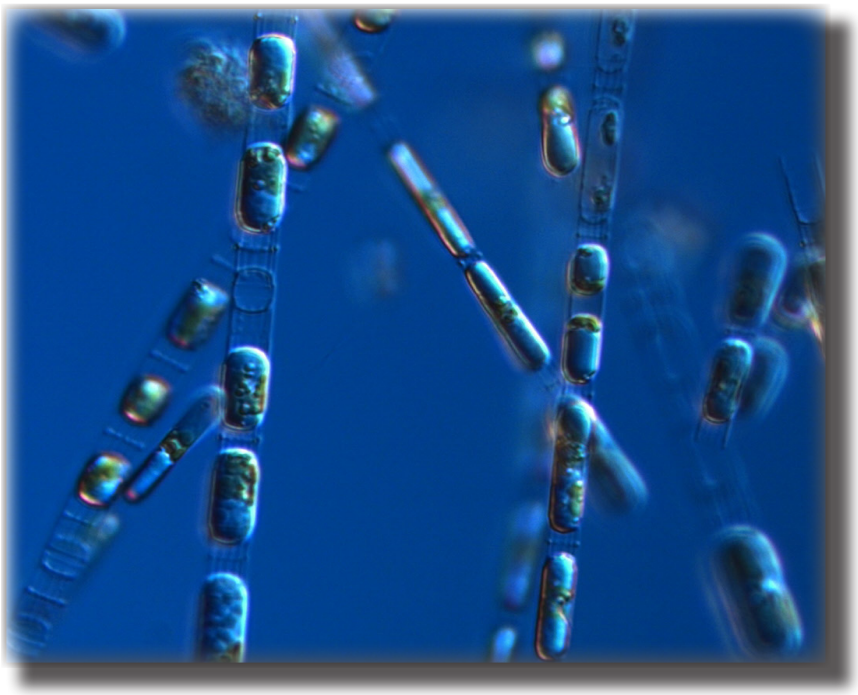
A few species in low cell numbers were found at the Baltic phytoplankton stations. The dinoflagellate *Peridiniella catenata* and the diatom *Chaetoceros castracanei* that often are found in high cell numbers during spring bloom were present so they are ready to go as soon as the conditions are right. The threadlike cyanobacterium *Aphanizomenon flosaquae* was found at three out of five stations and the green algae *Binuclearia lauterbornii* was found at all five stations. The chlorophyll concentrations were normal for this 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) 6th of February
The phytoplankton diversity and the total cell concentrations were low. Diatoms dominated and among these *Skeletonema marinoi* and *Pseudo-nitzschia** were most abundant. The integrated chlorophyll concentration (0-20m) was within normal for this month.

Släggö (Skagerrak coast) 6th of February
The phytoplankton diversity and the total cell concentrations were moderate. Among the diatoms, *Skeletonema marinoi* was found in the highest cell numbers. The dinoflagellate *Karenia mikimotoi* was found with quite high cell numbers. The integrated chlorophyll concentration (0-20m) was normal for this month.

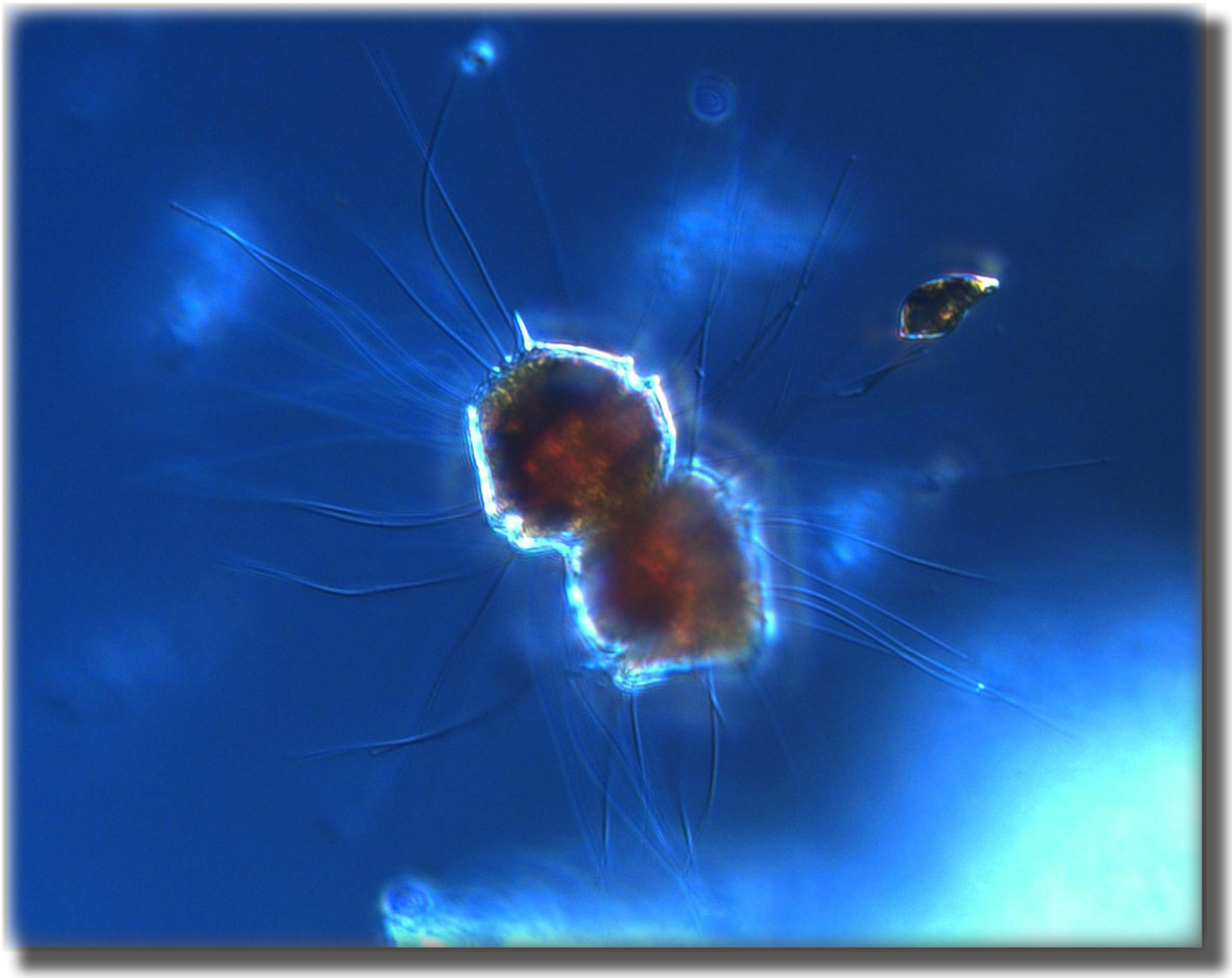


The diatom *Skeletonema marinoi* was abundant in the Skagerrak and Kattegat phytoplankton samples. Photo: A-T Skjevik.

Anholt E and N14 Falkenberg 7th of February
Both the phytoplankton diversity and the total cell concentrations were moderate. The phytoplankton communities had a slight dominance of diatoms. The species *Skeletonema marinoi* was found with the highest cell numbers but *Guinardia delicatula* was also abundant. Different species of the dinoflagellate genus *Ceratium* were common among the dinoflagellates. Some single cells of the genus *Phaeocystis* were found at Anholt E. The integrated chlorophyll concentrations (0-20m) were in the lower range of what is normal at N14 Falkenberg and within normal for this month at Anholt E.

The Baltic

No further information is provided from the Baltic due to the low amounts of phytoplankton.

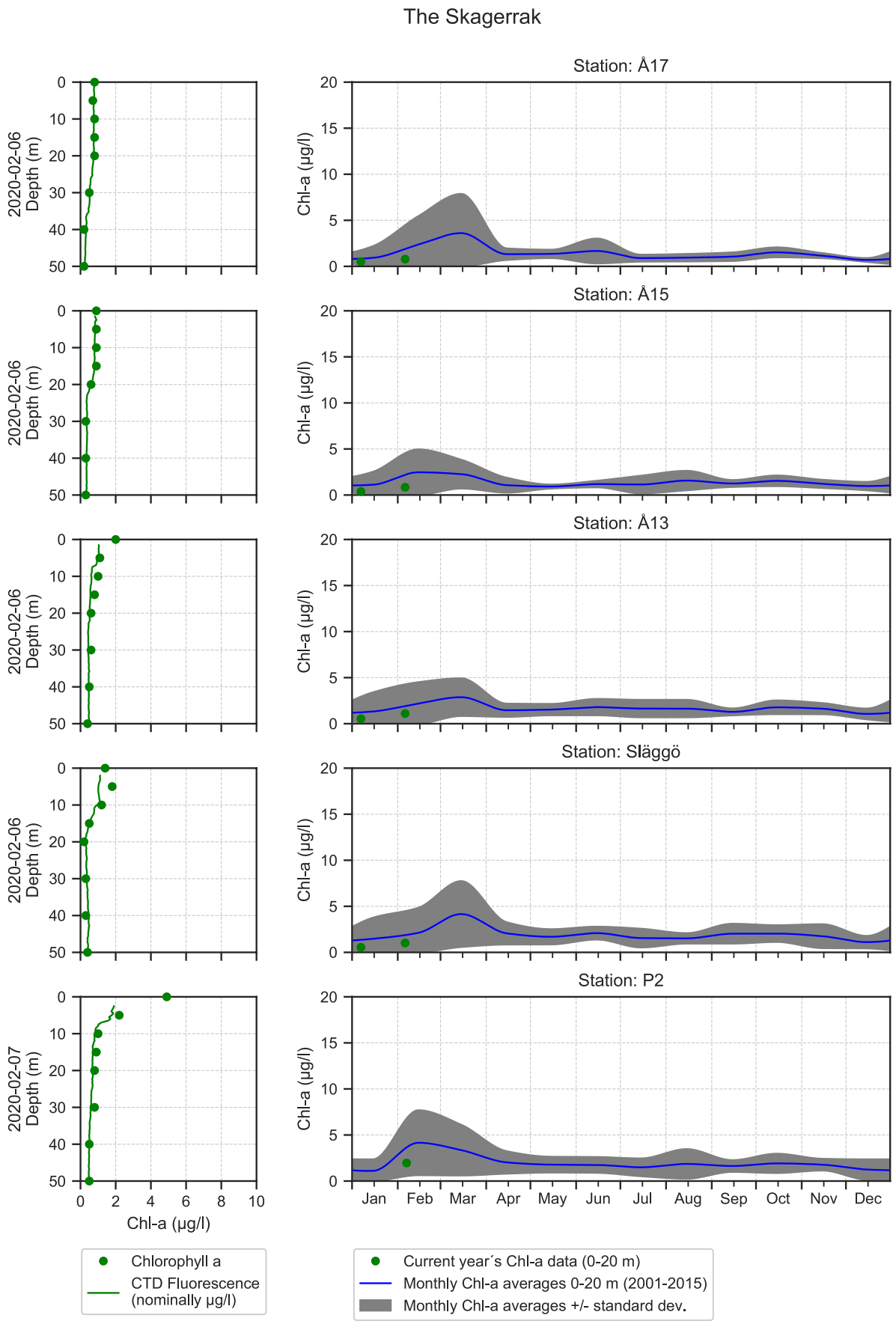


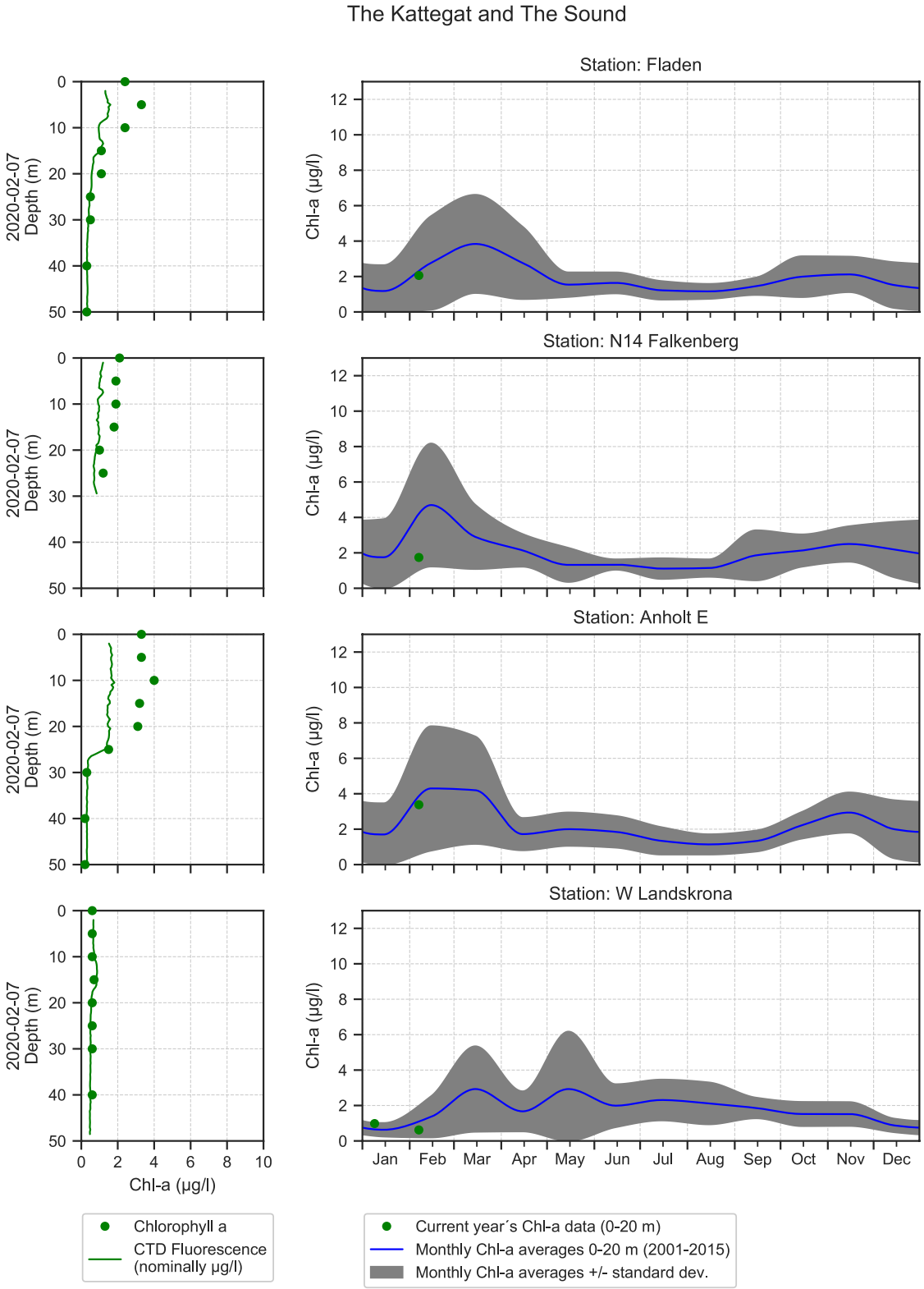
The dinoflagellate *Peridiniella catenata* was found at BY15 and BCSIII-10. The cell to the right is a cryptomonad. Photo: A-T Skjevik.

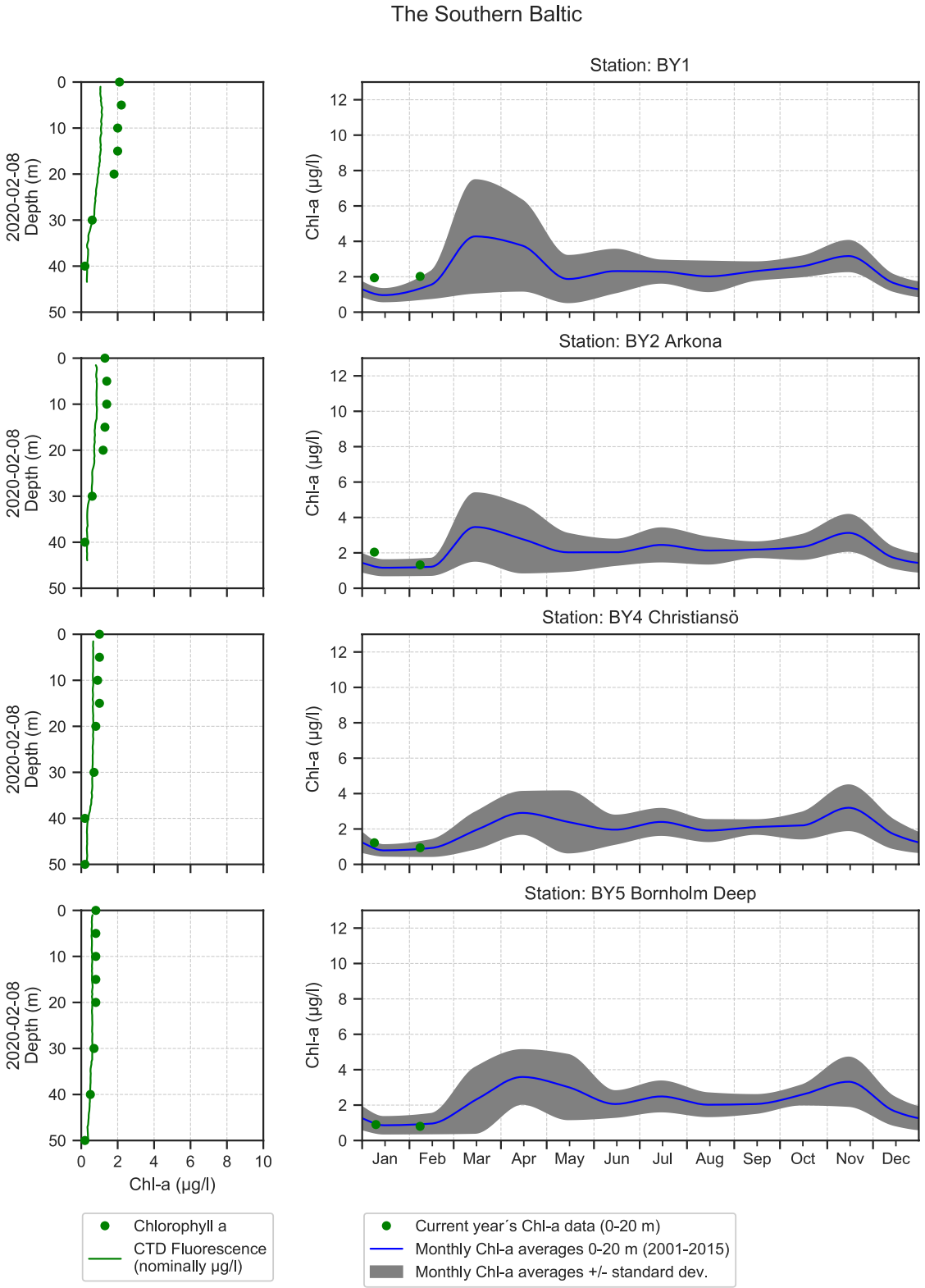
Phytoplankton analysis and text:
Ann-Turi Skjevik and Marie Johansen

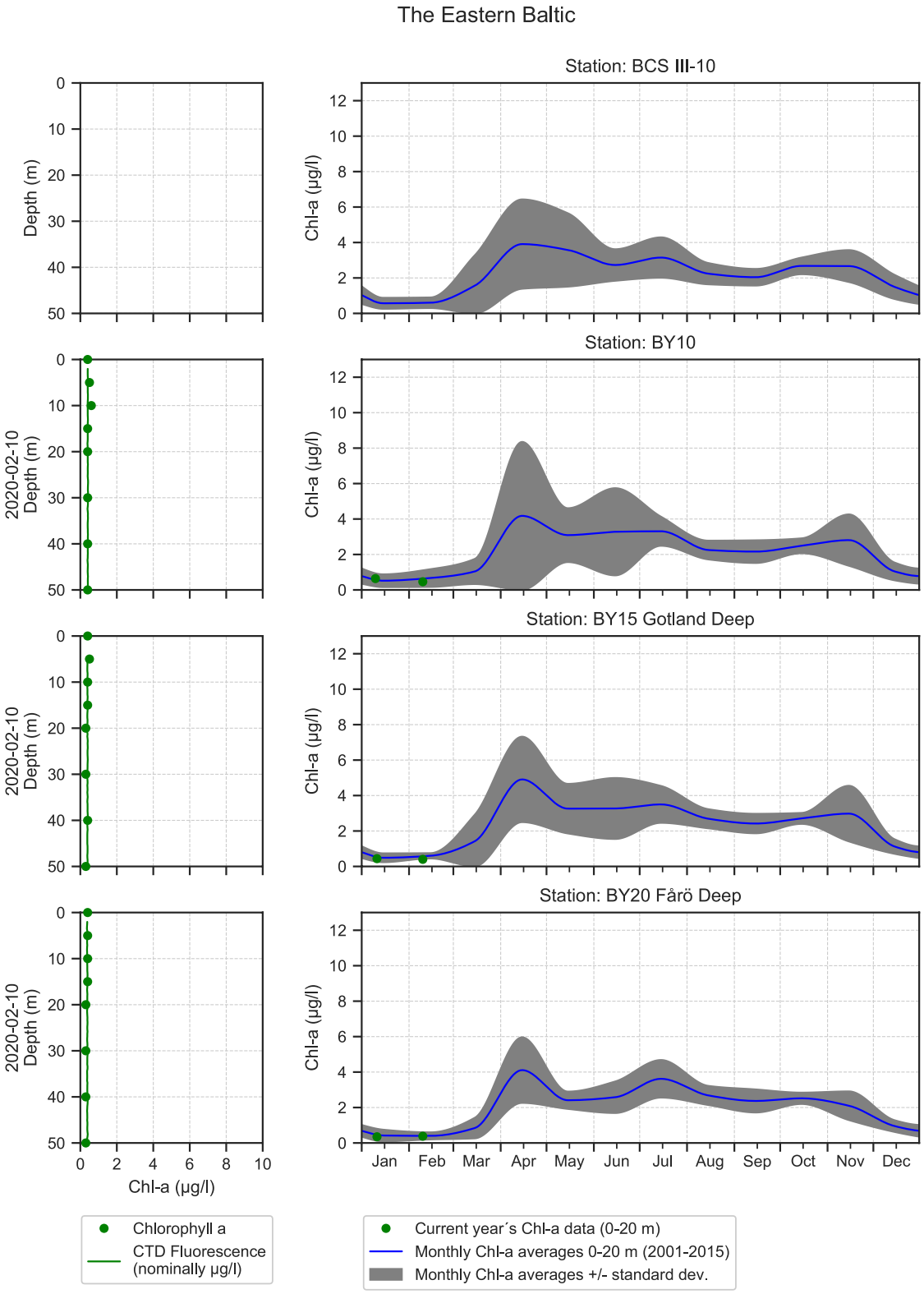
Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	7/2	7/2	6/2	6/2
Hose 0-10 m	presence	presence	presence	presence
Centrales	present	common	present	
Chaetoceros			present	present
Chaetoceros brevis			present	
Chaetoceros danicus			present	
Chaetoceros subtilis		present		present
Coscinodiscus radiatus	present			
Cylindrotheca closterium		present		common
Dactyliosolen fragilissimus	present	present		
Guinardia delicatula	common	very common	present	
Guinardia flaccida	present	present		
Nitzschia longissima	present	present		
Porosira glacialis		present		
Proboscia alata	present	present	present	
Pseudo-nitzschia				very common
Rhizosolenia imbricata			present	
Rhizosolenia setigera	present			
Skeletonema marinoi	very common	very common	very common	very common
Thalassionema nitzschioides			present	
Thalassiosira	present	present	present	present
Thalassiosira angulata	common	common	present	
Thalassiosira anguste-lineata	present	present		
Thalassiosira gravida	present	present	present	
Amphidinium	present			
Ceratium lineatum	common	common	common	present
Ceratium longipes	present	present		
Ceratium macroceros			present	
Ceratium tripos	common	common	present	present
Dinophysis norvegica	present		present	present
Gymnodiniales		present	present	present
Gyrodinium spirale		present	present	
Karenia mikimotoi	present	present	common	
Katodinium glaucum	present			
Peridiniales	present	present		present
Cryptomonadales	present	present	present	common
Emiliania huxleyi				present
Phaeocystis	present			
Dictyocha speculum	present			present
Heterosigma akashiwo	present			present
Pseudanabaena			present	
Telonema subtile	present			
Choanoflagellatea			present	
Ciliophora	present		present	common
Mesodinium rubrum				present

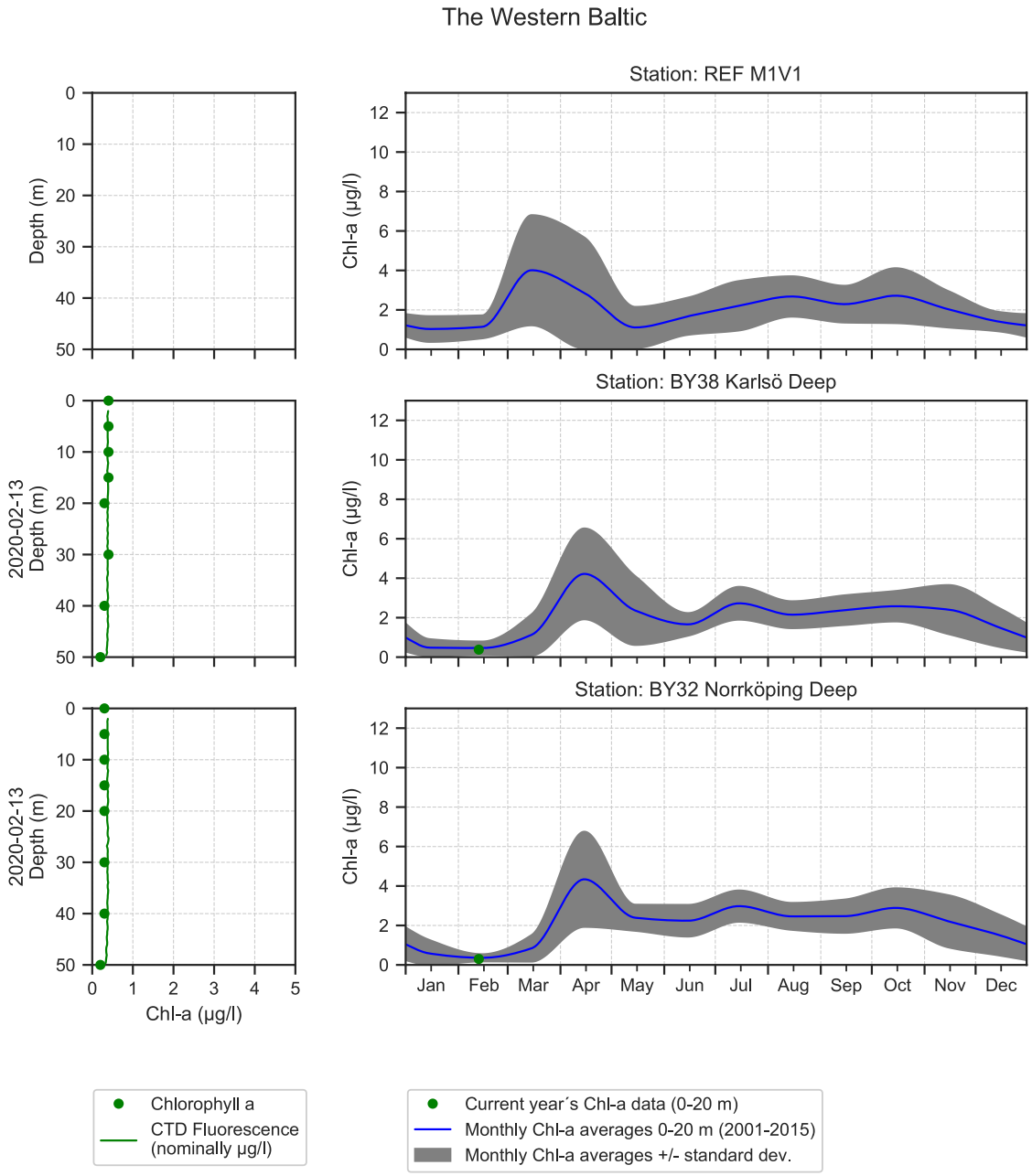
Selection of observed species	BCSIII-10	BY2	BY5	BY15	BY29
Red=potentially toxic species	10/2	11/2	8/2	13/2	8/2
Hose 0-10 m	presence	presence	presence	presence	presence
Centrales		present	present	present	common
Chaetoceros castracanei				present	
Chaetoceros danicus	present	present	present		present
Cyclotella			present	present	
Dactyliosolen fragilissimus			present		
Guinardia delicatula	present				
Pseudo-nitzschia seriata	present				
Skeletonema marinoi	present	present	present	present	present
Thalassiosira	present				
Ceratium tripos	present				
Dinophysis acuminata		present		present	
Dinophysis norvegica	present				
Gymnodiniales	present	present	present	present	present
Gymnodinium verruculosum		present			
Gyrodinium	present				
Gyrodinium spirale		present			
Heterocapsa	present		present		
Heterocapsa rotundata			present		present
Peridiniales			present		present
Peridiniella catenata	present			present	
Monoraphidium	present	present			
Cryptomonadales	present	present	present	present	present
Binuclearia lauterbornii	present	present	present	present	present
Aphanizomenon flosaquae	present		present	common	
Aphanocapsa			present	present	present
Aphanothece					present
Snowella	present		present	present	present
Woronichinia			present		
Oocystis	present	present	present		present
Eutreptiella		present	present		present
Pterosperma		present	present	present	present
Pyramimonas			present		present
Prymnesium polylepis			present		
Leucocryptos marina	present				present
Telonema					present
Calliacantha natans		present			
Ciliophora		present	present	present	common
Mesodinium rubrum		present	common	present	present
Strombidium			present	present	present


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
2020-02-06
2020-02-07
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 (2001-2015)
Monthly Chl-a averages +/- standard dev.


The Kattegat and The Sound
Station: Fladen
Station: N14 Falkenberg
Station: Anholt E
Station: W Landskrona
2020-02-07
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 (2001-2015)
Monthly Chl-a averages +/- standard dev.


The Southern Baltic
Station: BY1
Station: BY2 Arkona
Station: BY4 Christiansö
Station: BY5 Bornholm Deep
2020-02-08
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 (2001-2015)
Monthly Chl-a averages +/- standard dev.


The Eastern Baltic
Station: BCS III-10
Station: BY10
Station: BY15 Gotland Deep
Station: BY20 Fårö Deep
Depth (m)
2020-02-10
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 (2001-2015)
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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