SMHI
Oceanographic Unit
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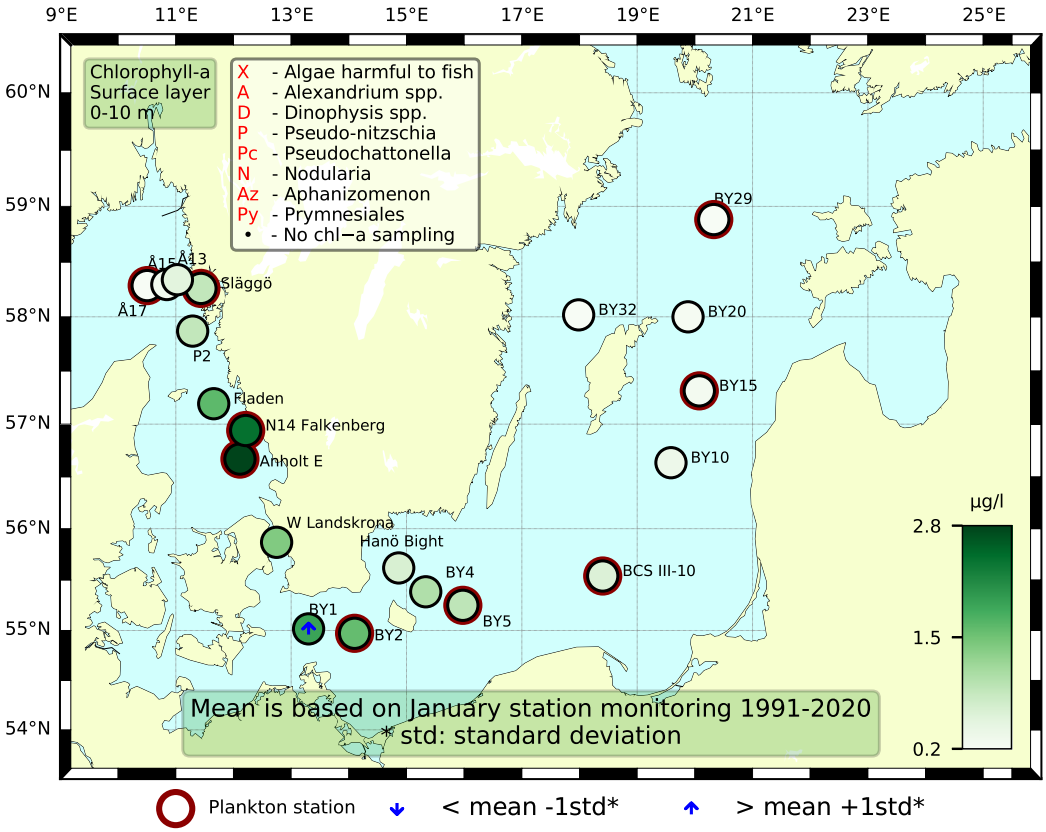
AlgAware
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Dnr: S/Gbg-2023-8

Sammanfattning

I Kattegatt var artdiversiteten av växtplankton hög, men de totala cellantalen var låga. I Skagerrak var artdiversiteten något lägre. Allt ligger dock till rätta för vårblomning och med tanke på att den brukar starta söderifrån så blir det troligtvis så även i år när vi ser den högre artdiversiteten av framför allt kiselalger i Kattegatts jämfört med Skagerraks växtplanktonprover. De integrerade klorofyllhalterna (0–10 m och 0–20 m) var inom det normala för månaden vid alla stationer.

Diversiteten och cellantalen av växtplankton var låga i Östersjön, med mest små celler såsom Cryptomonadales och mindre Gymnodiniales, samt olika ciliater. Tre stationer: BY4, BY15 och BY29, hade flertalet filament av cyanobakterien *Aphanizomenon* sp. Station BY31 hade högst diversitet, med bland annat förekomst av den toxinbildande *Dinophysis acuminata**. De integrerade klorofyllhalterna (0–10 m och 0–20 m) var inom det normala för månaden vid alla stationer.



Abstract

The species diversity was high in the Kattegat although the total cell numbers were low. In the Skagerrak the diversity was lower. Everything is well adjusted for spring bloom to occur which usually begins in the southern Kattegat moving northwards. It will probably be the same scenario this year considering the relatively higher species diversity in the Kattegat compared to the Skagerrak phytoplankton samples. The integrated chlorophyll concentrations (0-10m and 0-20 m) were within normal for this month at all stations.

Diversity and cell abundance of phytoplankton were low in the Baltic Sea, with mostly smaller cells such as Cryptomonadales and smaller Gymnodiniales as well as various ciliates. Three stations: BY4, BY15 and BY29, had several filaments of the cyanobacteria *Aphanizomenon* sp. Station BY31 had the highest diversity with, among all, presence of the toxin-producing *Dinophysis acuminata**. The integrated chlorophyll concentrations (0-10m and 0-20 m) were within the normal range for this month at all 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) 10th of January
Phytoplankton was not sampled due to bad weather.

Släggö (Skagerrak coast) 10th of January
The species diversity was moderate and the total cell numbers were low. The most abundant species were the dinoflagellate *Tripos muelleri* and the flagellate *Octactis speculum.* The integrated chlorophyll concentrations (0-10 m and 0-20 m) were within normal for this month.

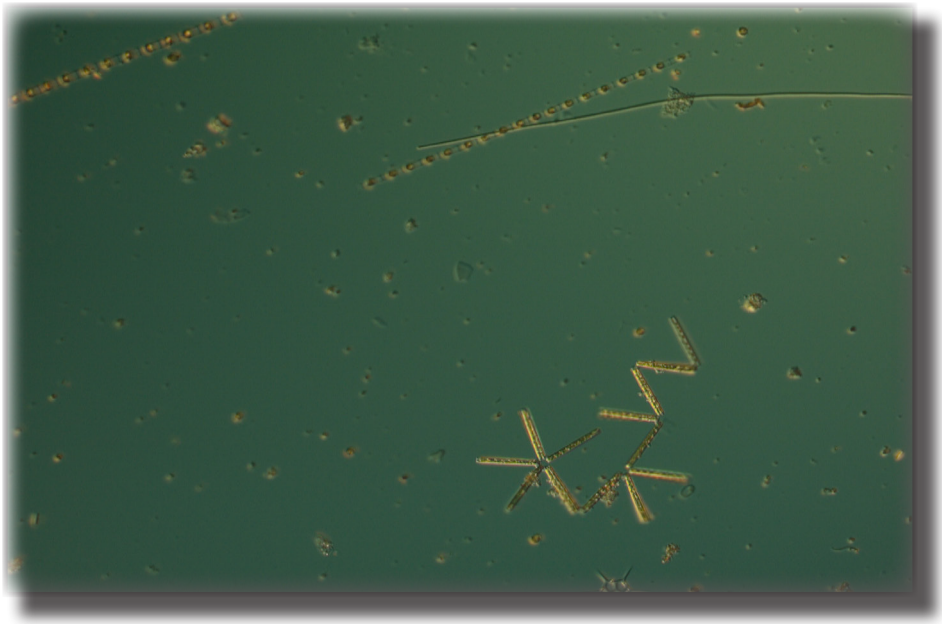


Fig. 1: The diatoms *Skeletonema marinoi* (top) and *Thalassionema nitzschioides* were abundant at Anholt E and N14 Falkenberg. Photo: A-T Skjevik.

The Kattegat

Anholt E 16th of January
The species diversity was rather high although the total cell numbers were low. The diatoms *Pseudo-nitzschia** and *Thalassionema nitzschioides* were abundant. Other species that were abundant were relatively small flagellates, like Cryptomonadales, *Octactis speculum* and *Emiliania huxleyi.* The integrated chlorophyll concentrations (0-10 m and 0-20 m) were within normal for this month.

N14 Falkenberg 16th of January
The phytoplankton situation was similar to the one at Anholt E, with high diversity and low total cell numbers. The diatoms *Pseudo-nitzschia**, *Skeletonema marinoi* and *T. nitzschioides* were abundant as well as the flagellates Cryptomonadales and *O. speculum*. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were within normal for this month.

The Baltic

BCSIII-10 12th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as the colony forming cyanobacterium *Snowella* sp. There were also Gymnodiniales, Cryptomonadales and various ciliates. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BY2 Arkona 12th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and ciliates. There were also some cells of *Chaetoceros castracanei*, *Heterocapsa rotundata*, *Snowella* sp. and Gymnodiniales. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BY4 Christiansö 12th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales, Gymnodiniales and various ciliates. The filamentous cyanobacterium *Aphanizomenon* sp. was quite abundant. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BY5 Bornholm deep 12th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as ciliates and Cryptomonadales. There were some cells of *Actinocyclus octonarius*, *Chaetoceros danicus*, *Oocystis* sp. and *Snowella* sp. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BY15 Gotland deep 13th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as Gymnodiniales, Cryptomonadales and *Snowella* sp. *Aphanizomenon* sp. was quite abundant. There were also some cells of *A. octonarius*, *Oocystis* sp. and *Binuclearia lauterbornii*. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

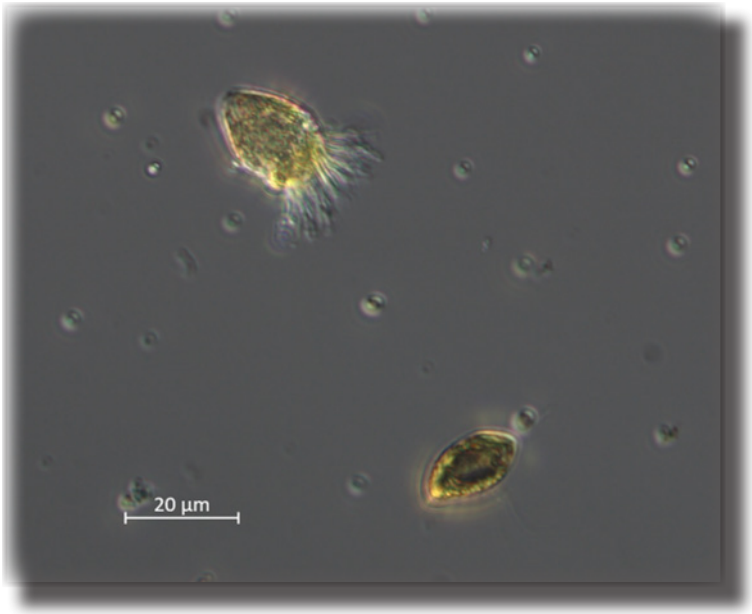


Fig. 2: Ciliates (top) and Cryptomonadales (bottom) were common at all Baltic stations in January. These are from BY5 12th of January. Photo: M. Karlberg.

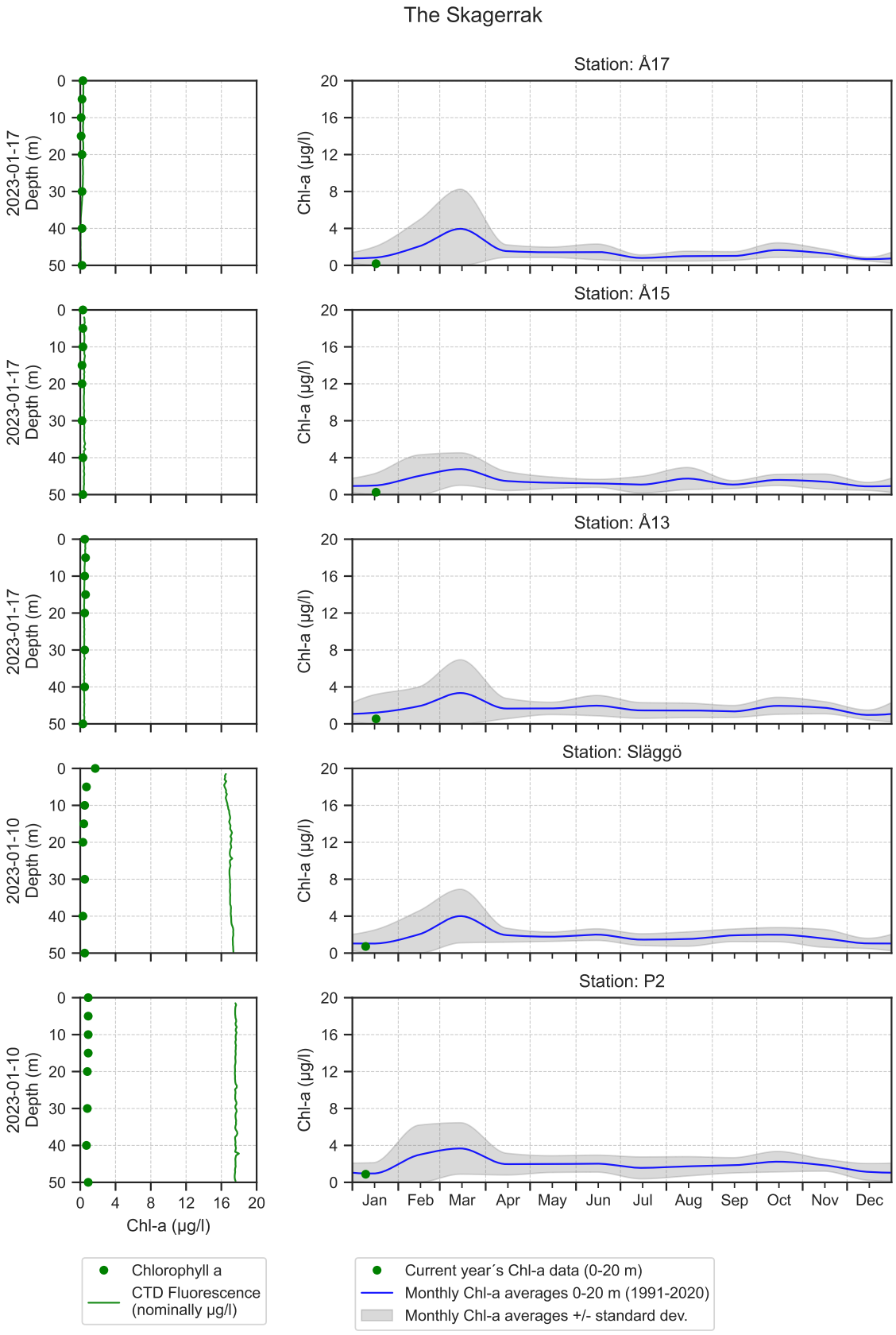
BY29 14th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as Gymnodiniales. *Aphanizomenon* sp. was quite abundant. There were some cells of *Oocystis* sp., Cryptomonadales, *Snowella* sp. and choanoflagellates. The integrated (0-10 m) chlorophyll concentrations were within the normal range for this month.

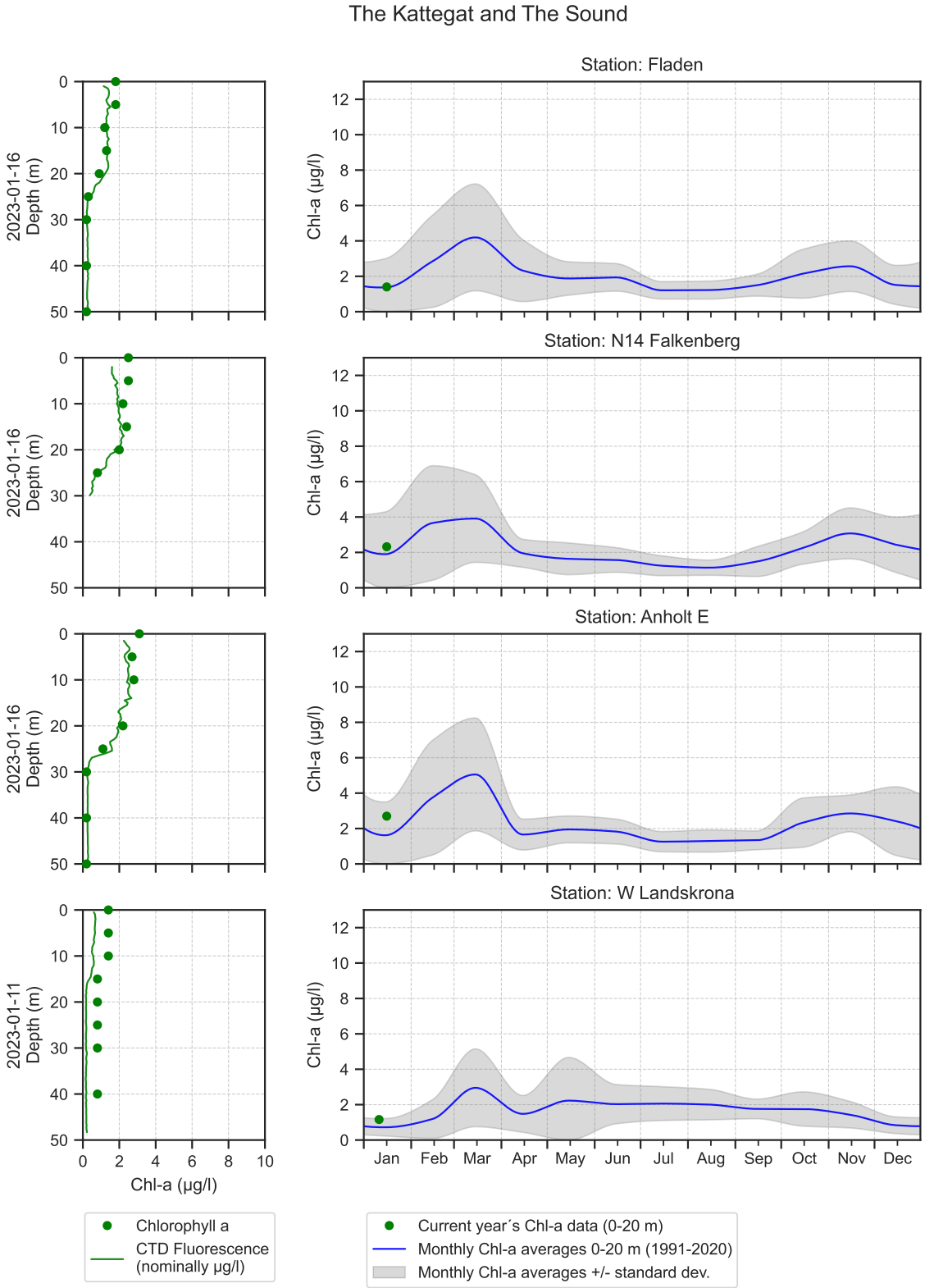
BY31 Landsort deep 14th of January
The phytoplankton diversity and abundances were moderate with mainly small cells such as Cryptomonadales, *Snowella* sp. and Choanoflagellates. There were some cells of *Skeletonema marinoi*, *Dinophysis acuminata** and *Peridiniella catenata* present.

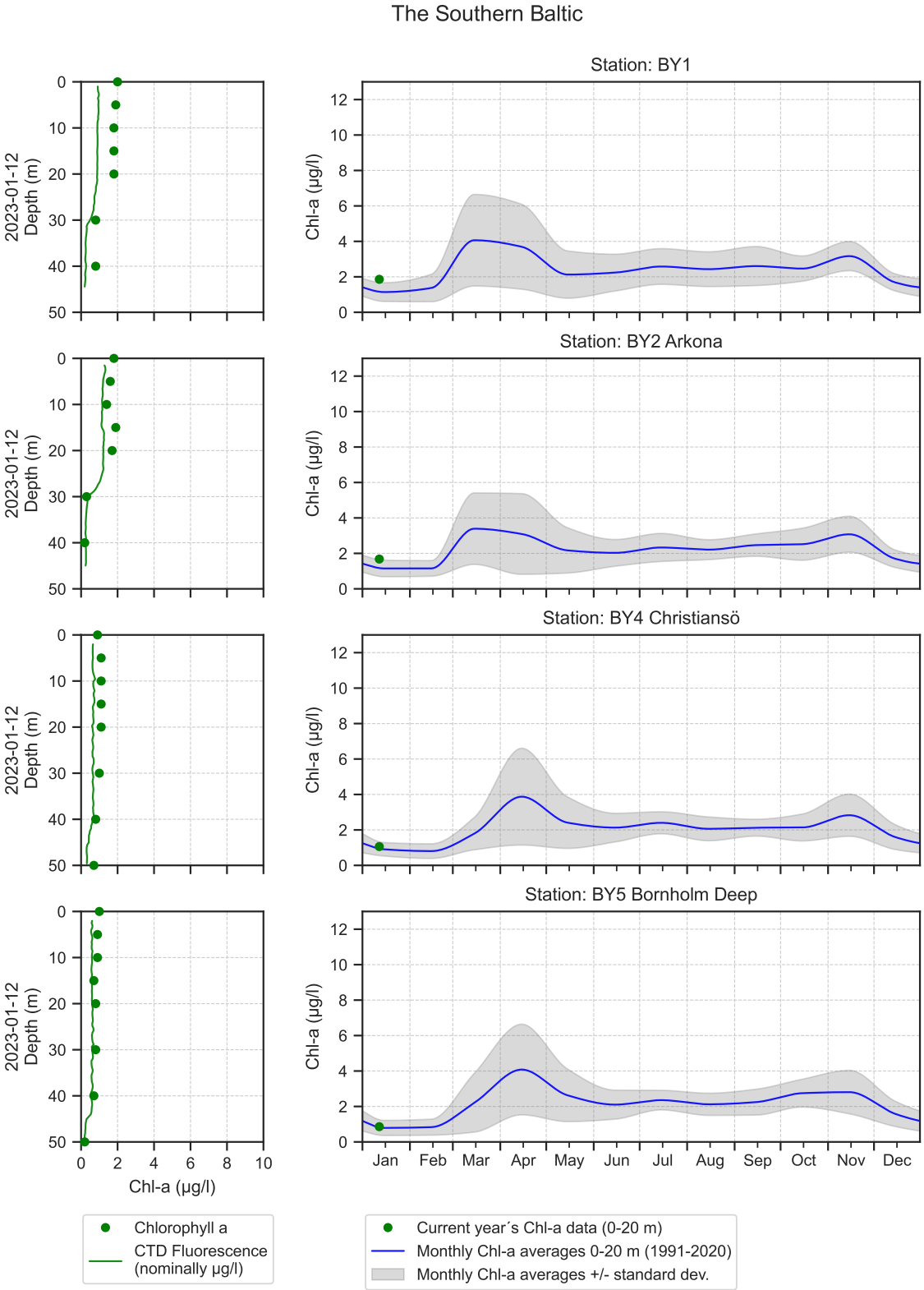
Phytoplankton analysis and text:
Ann-Turi Skjevik and Maria Karlberg.

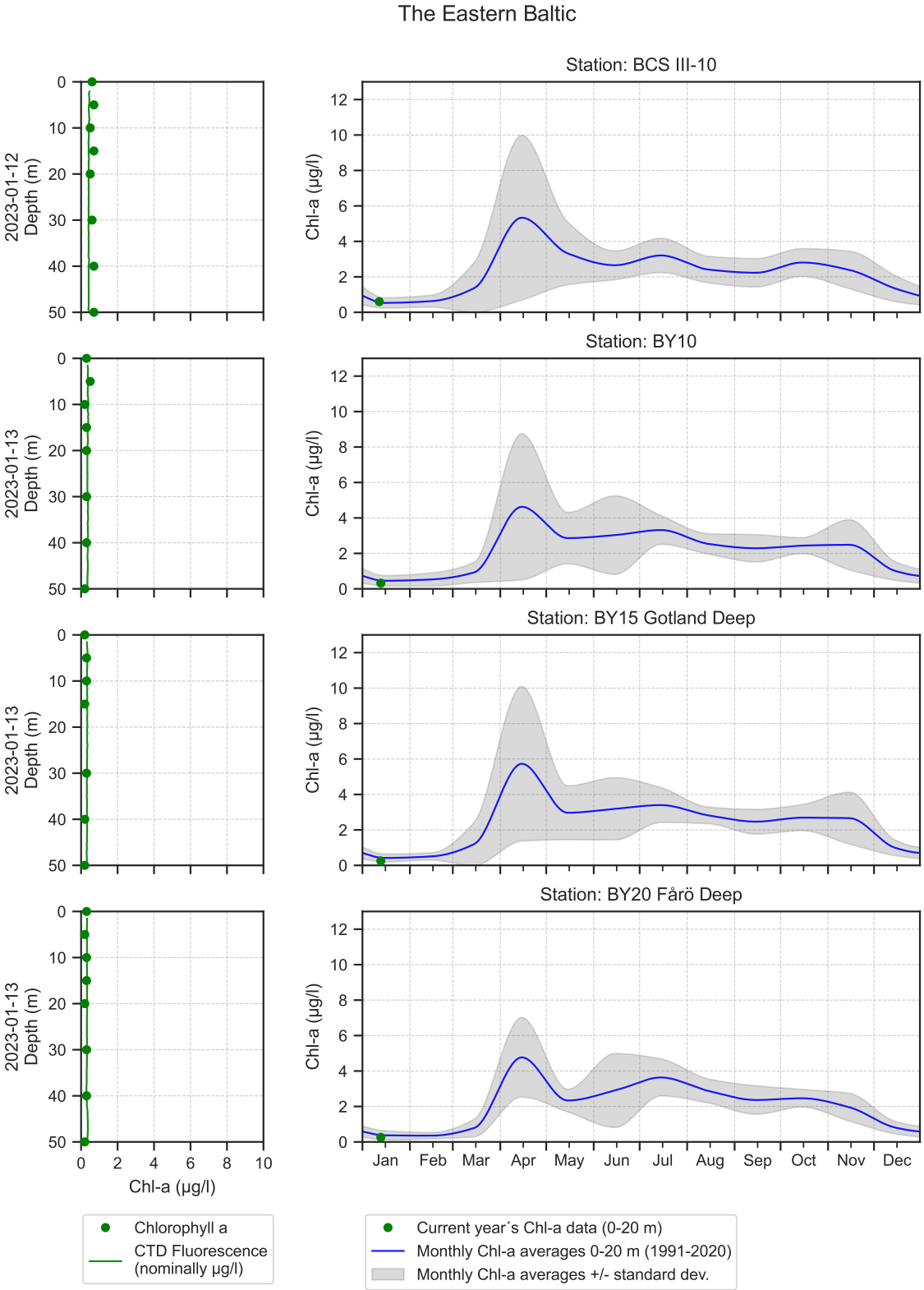
Selection of observed species	Anholt E	N14	Släggö
Red=potentially toxic species	16/1	16/1	10/1
Hose 0-10 m	presence	presence	presence
Cerataulina pelagica	present	present	present
Chaetoceros convolutus	present		
Chaetoceros curvisetus	present	present	
Chaetoceros danicus	present	present	present
Chaetoceros similis	present	present	
Coscinodiscus wailesii			present
Cylindrotheca closterium	present		present
Dactyliosolen fragilissimus	present	present	present
Ditylum brightwellii			present
Guinardia delicatula	present	present	
Guinardia flaccida		present	
Lauderia annulata		present	present
Lennoxia faveolata	present		
Leptocylindrus minimus	present	present	
Nitzschia longissima	present	present	
Proboscia alata	present	present	present
Pseudo-nitzschia	common	common	present
Pseudosolenia calcar-avis		present	
Rhizosolenia imbricata			present
Rhizosolenia setigera	present		
Skeletonema marinoi	present	common	present
Thalassionema nitzschioides	common	common	
Thalassiosira angulata	present	present	
Thalassiosira anguste-lineata	present	present	
Thalassiosira constricta		present	
Thalassiosira nordenskioeldii	present	present	present
Thalassiosira punctigera	present	present	
Akashiwo sanguinea			present
Amphidinium crassum		present	
Dinophysis acuta	present	present	
Dinophysis norvegica			present
Dinophysis tripos			present
Gymnodinium verruculosum			present
Katodinium glaucum	present		
Oxytoxum			present
Peridiniella danica		present	
Phalacroma rotundatum		present	
Prorocentrum micans		present	
Protoperidinium bipes	present		
Protoperidinium brevipes			present
Protoperidinium pellucidum	present		
Tripos furca		present	present
Tripos lineatus	present	present	present
Tripos longipes		present	
Tripos muelleri	present	present	common
Cryptomonadales	common	common	present
Pseudanabaena	present	present	
Octactis speculum	common	common	common
Pseudopedinella	present		
Emiliania huxleyi	common	present	present
Heterosigma akashiwo	present	present	present
Laboea strobila		present	
Mesodinium rubrum		present	present

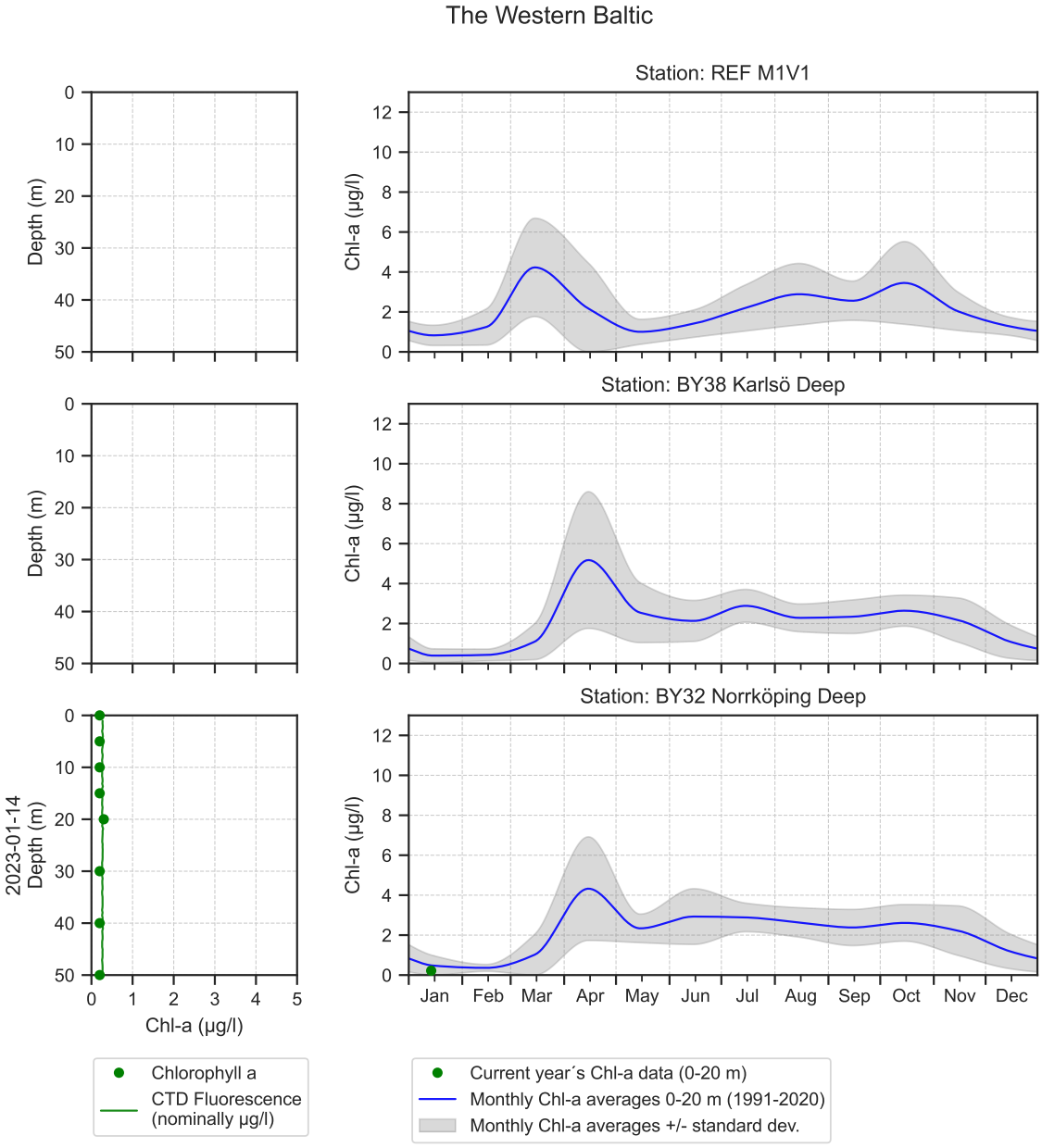
Selection of observed species	BCSIII-10	BY2	BY4	BY5	BY15	BY29	BY31
Red=potentially toxic species	12/1	12/1	12/1	12/1	13/1	14/1	14/1
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence
Actinocyclus octonarius		present		present	present		
Centrales	present	present	present	present			present
Chaetoceros							present
Chaetoceros castracanei		present	present				present
Chaetoceros danicus				present			
Lennoxia faveolata					present		
Skeletonema marinoi							present
Dinophysis acuminata							present
Gymnodiniales	present	present	present	present	common	common	present
Heterocapsa rotundata		present					
Peridiniella catenata							present
Oocystis	present			present	present	present	present
Binuclearia lauterbornii	present		present		present		
Cryptomonadales	present	very common	common	common	common	present	common
Telonema		present		present			
Eutreptiella		present					
Aphanizomenon			common		common	common	
Aphanocapsa	present						
Aphanothece			present				present
Lemmermanniella cf. parva					present	present	present
Snowella	common	present		present	common	present	common
Calliacantha natans							present
Choanoflagellatea			present	present		present	common
Ciliophora	present	common	present	common	present	present	present
Mesodinium rubrum	present	present	present	present	present	present	present
Flagellates	present	present	present	present	present	present	present


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
2023-01-17
2023-01-10
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
2023-01-16
2023-01-11
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
2023-01-12
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
2023-01-12
2023-01-13
2023-01-13
2023-01-13
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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