SMHI
Oceanographic Unit
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AlgAware
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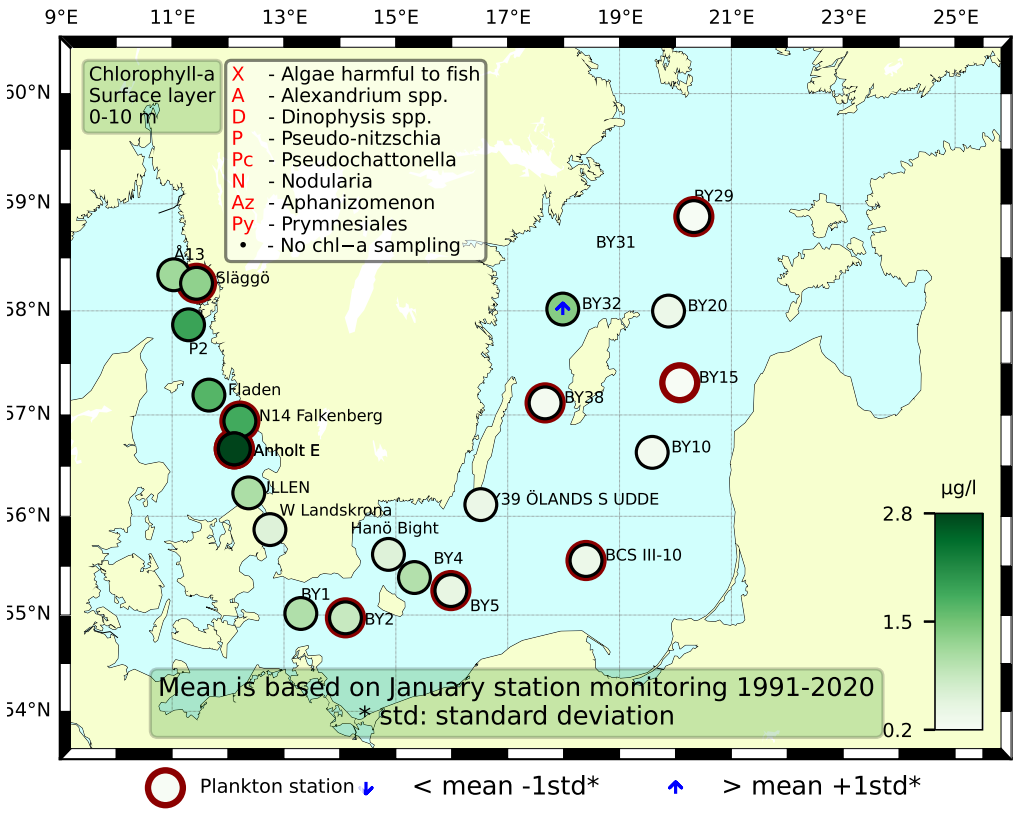
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

I Kattegatt var artdiversiteten av växtplankton hög med tanke på årstiden, men de totala cellantalen var låga. I Skagerrak var artdiversiteten något lägre. I Skagerrak besöktes endast Släggö, den mer kustnära stationen. Planktonsamhället i Västerhavet var ett typiskt vintersamhälle med mestadels kiselalger med högsta celltätheter av *Skeletonema marinoi* samt släktet *Pseudo-nitzschia*. 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. Den centriska kiselalgen *Actinocyclus octonarius* fanns vid samtliga stationer. Vid stationerna BY31 och BY38 förekom den toxinbildande *Dinophysis acuminata** med enstaka celler. De integrerade klorofyllhalterna (0–10 m och 0–20 m) var inom det normala för månaden vid alla stationer, förutom vid BY32 där de var högre än normalt.



Abstract

The species diversity was high in the Kattegat when considering the season but the total cell numbers were low. In the Skagerrak the diversity was a bit lower. Only Släggö could be sampled in Skagerrak during this cruise. The Plankton community along the Swedish west coast had a traditional winter composition with a dominance of diatoms. Both *Skeletonema marinoi* and the genus *Pseudo-nitzschia* dominated at all stations. 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. The centric diatom *Actinocyclus octonarius* was present at all stations. At BY31 and BY38 the toxin-producing *Dinophysis acuminata** was present. The integrated chlorophyll concentrations (0-10m and 0-20 m) were within the normal range for this month at all stations, except at BY32 where they were higher than normal.

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

The Skagerrak

Å17 (open Skagerrak) January
The station could not be sampled due to high wind stress.

Släggö (Skagerrak coast) 17th of January
The species diversity was moderate and the total cell numbers were low. The most abundant species among the larger cells were the diatom *Skeletonema marinoi* and the genus *Pseudo-nitzschia.* The majority of the smaller cells belonged to the order cryptomonadales. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were within normal for this month.

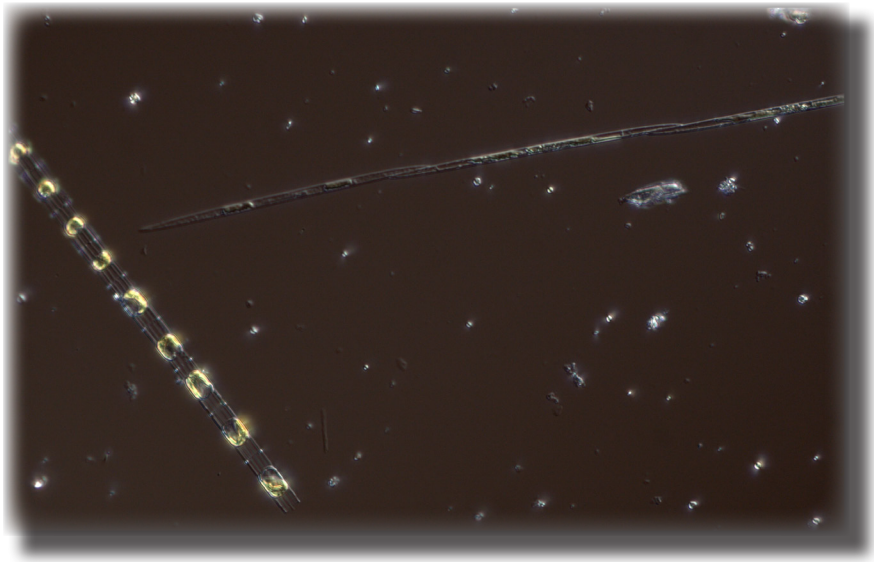


Fig 1. The diatoms *Skeletonema marinoi* (left) and *Pseudo-nitzschia* spp.* were abundant at the west coast stations. Photo: M. Johansen.

The Kattegat

Anholt E 11th and 16th of January
The species diversity was moderate, even a bit high considering the month, although the total cell numbers were low. The diatoms *Pseudo-nitzschia** and *S. marinoi* were abundant. Other species that were abundant were relatively small flagellates, like different cryptomonadales and *Heterosigma akashiwo.* The integrated chlorophyll concentrations (0-10 m and 0-20 m) were within normal for this month.

N14 Falkenberg 11th of January
The phytoplankton situation was similar to the one at Anholt E, with relative high diversity but low total cell numbers. The diatoms *Pseudo-nitzschia**, *S. marinoi* and *Proboscia alata* were abundant as well as different species of the order Cryptomonadales and *H. akashiwo.* The integrated chlorophyll concentrations (0-10 m and 0-20 m) were within normal for this month.

The Baltic

BY2 Arkona 12th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and Gymnodiniales. There were a few diatom cells of *Actinocyclus octonarius*, *Skeletonema marinoi* and *Thalassionema nitzschioides* as well. 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 Cryptomonadales, Gymnodiniales, Pyramimonas sp. and Choanoflagellates. There were a few diatom cells of *A. octonarius*. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BCSIII-10 13th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales, Gymnodiniales, Snowella sp. and *Mesodinium rubrum*. The amount of *A. octonarius* was quite high. 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 Cryptomonadales and Gymnodiniales. The amount of *A. octonarius* was quite high. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BY29 14th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and Gymnodiniales. There were a few diatom cells of *A. octonarius.* The integrated (0-10 m) chlorophyll concentrations were within the normal range for this month.

Fig 2. The centric diatom *Actinocyclus octonarius* in valve view (left) and girdle view (right) was common at all Baltic stations in January. These are from BY5 12th of January. Photo: M. Karlberg.

BY31 Landsort deep 14th of January
The phytoplankton diversity and abundances were very low. There were a few cells of *Melosira arctica*, *S. marinoi* and the potentially toxic *Dinophysis acuminata**. In addition to the normal 0-10 m sample, a 0-20 m sample was analysed. This was very similar to the surface sample except it lacked the large diatoms; *A. octonarius* and *Chaetoceros danicus*.

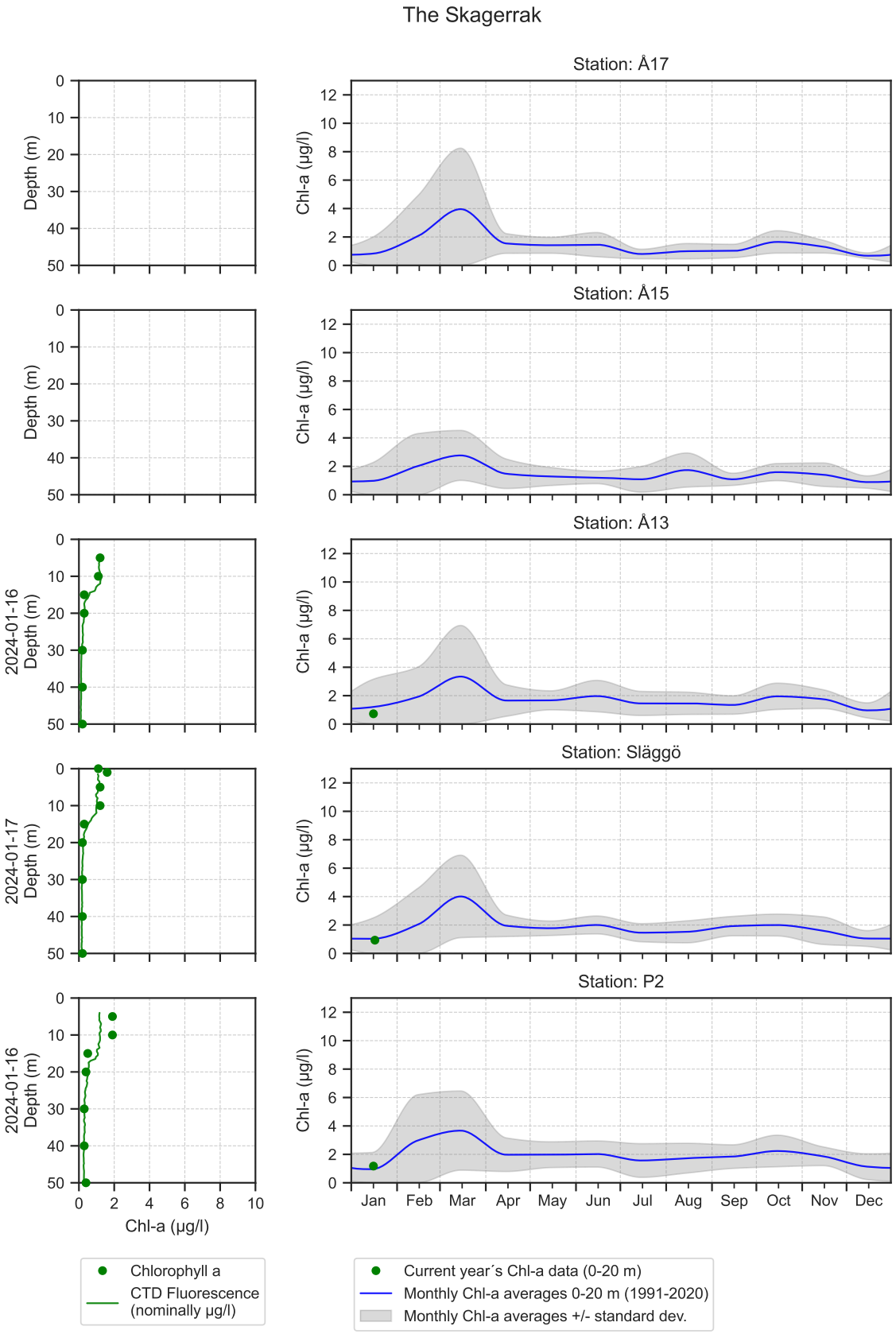
BY38 14th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and Gymnodiniales. There were a few diatom cells of *A. octonarius*, *S. marinoi* and the potentially toxic dinoflagellate *D. acuminata**. Several genera of cyanobacteria were also present. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

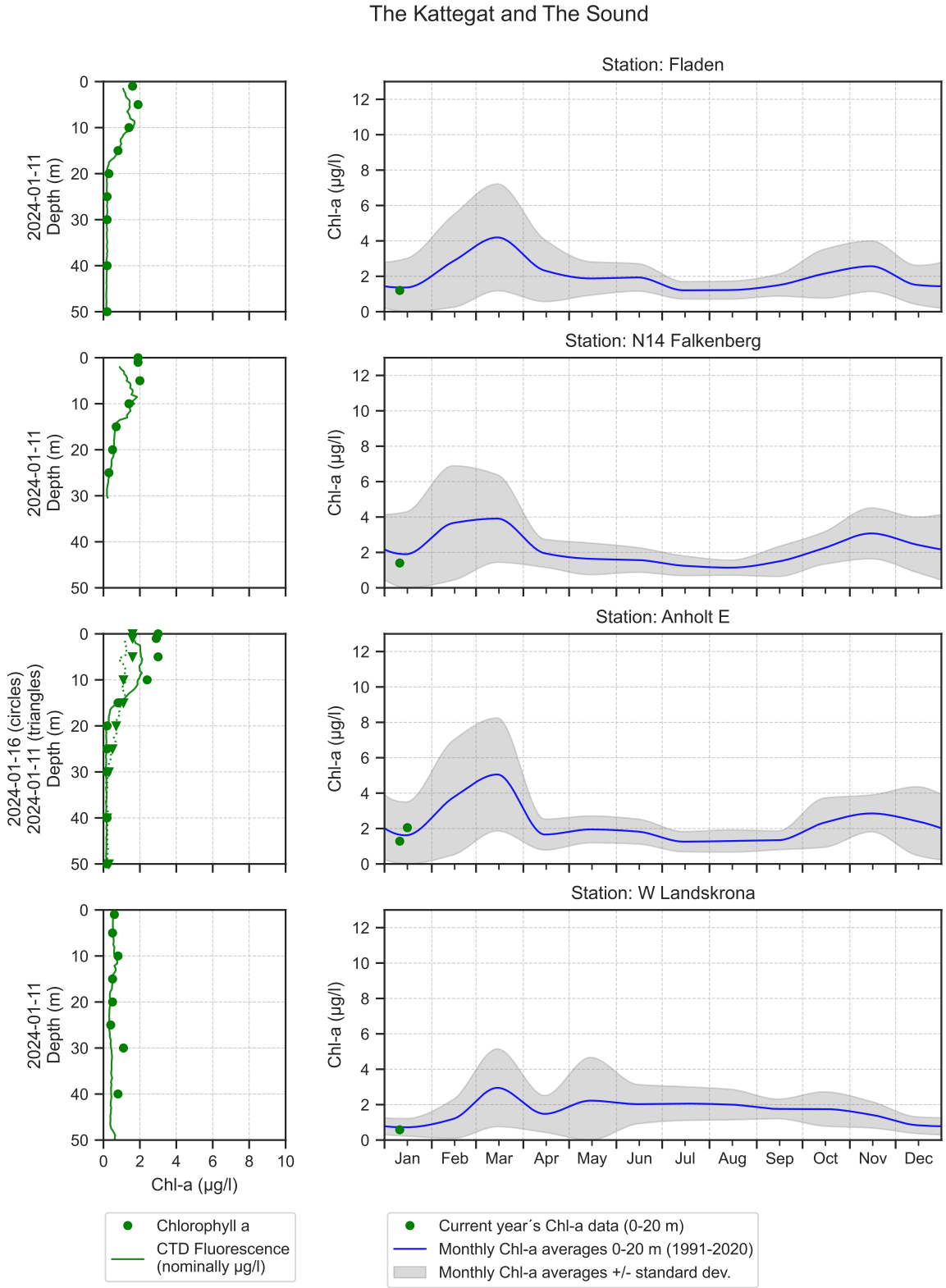
BY39 15th of January
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and Gymnodiniales. There were a few diatom cells of *A. octonarius* and *S. marinoi* and a few dinoflagellates of the order Peridiniales. The integrated (0-10 m) chlorophyll concentrations were within the normal range for this month.

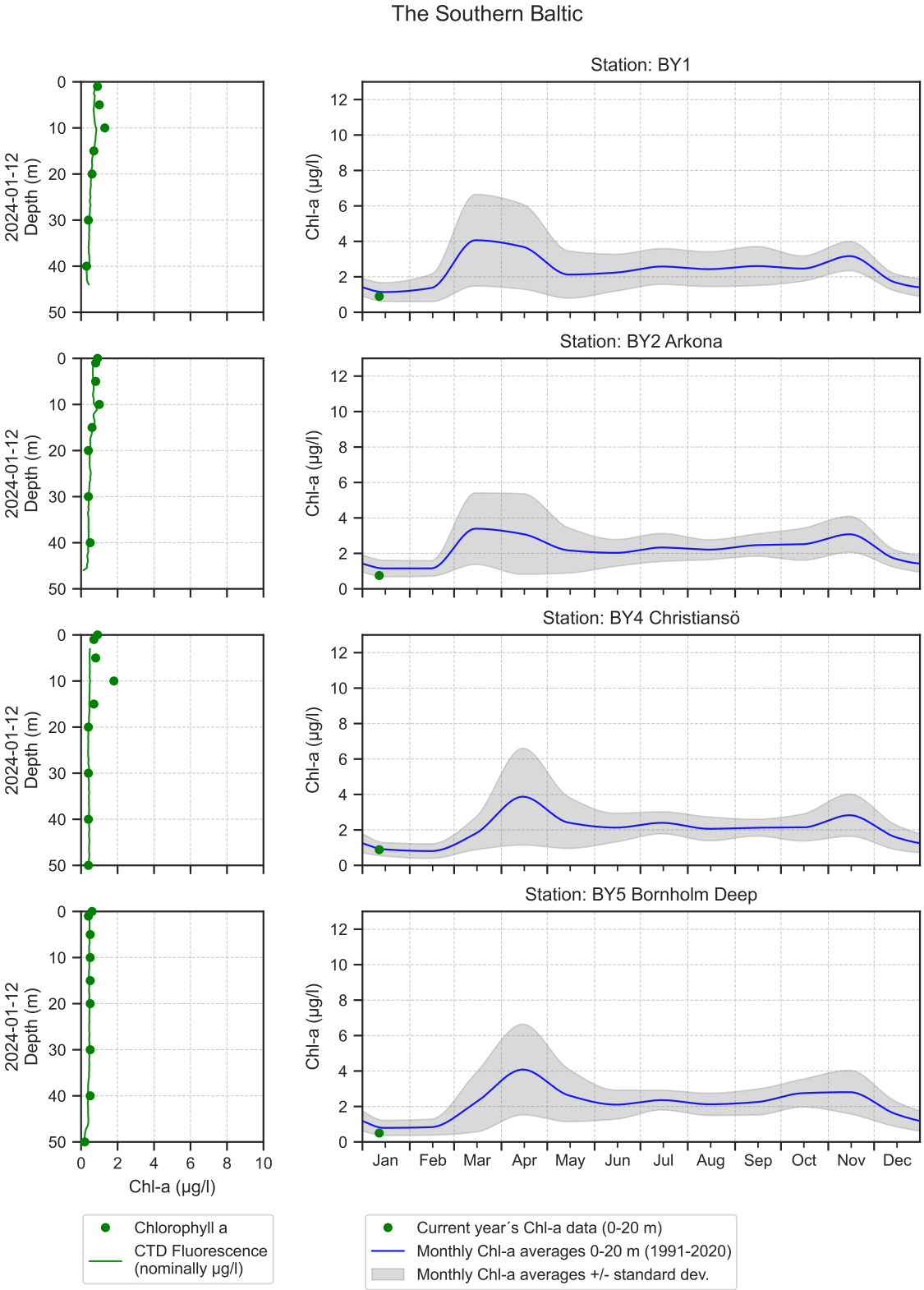
Phytoplankton analysis and text:
Marie Johansen and Maria Karlberg.

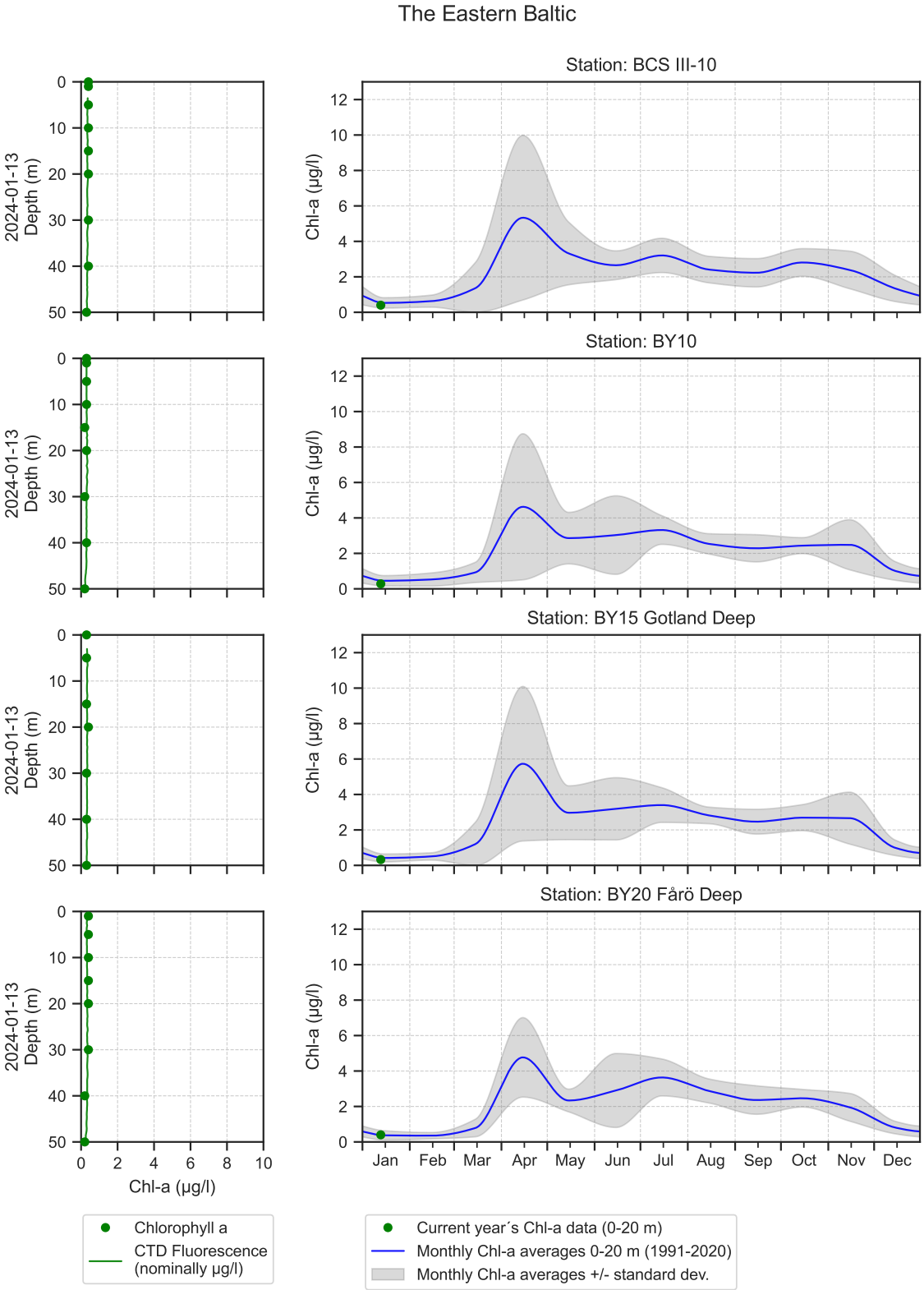
Selection of observed species	Anholt E	Anholt E	N14	Släggö
Red=potentially toxic species	11/1	16/1	11/1	17/1
Hose 0-10 m	presence	presence	presence	presence
Chaetoceros	present			
Chaetoceros convolutus	present	present	present	
Chaetoceros danicus		present	common	present
Chaetoceros debilis	present			
Coscinodiscus	present			
Coscinodiscus radiatus				present
Detonula pumila	present	present	present	
Ditylum brightwellii		present		
Eucampia zodiacus		present		
Nitzschia longissima	present		present	present
Proboscia alata	present	present	common	present
Pseudo-nitzschia	common	common	very common	common
Pseudosolenia calcar-avis		present	present	present
Skeletonema marinoi	common	very common	very common	very common
Thalassionema nitzschioides	present	present	present	present
Thalassiosira	present			present
Thalassiosira angulata		present	present	
Thalassiosira anguste-lineata		present		
Thalassiosira nordenskioeldii		common	present	
Thalassiosira punctigera				present
Dinophysis acuminata	present			
Dinophysis norvegica		present	present	
Gymnodiniales	present	present	present	present
Gyrodinium spirale	present		present	present
Protoperidinium bipes		present		
Protoperidinium conicum	present			
Protoperidinium depressum	present			
Tripos muelleri	present		present	
Emiliania huxleyi			present	present
Heterosigma akashiwo	present	common	common	present
Cryptomonadales	common	common	common	common
Telonema subtile		present		
Octactis speculum	present	present	present	present
Pseudochattonella		present		
Eutreptiella gymnastica	present			
Pseudanabaena			present	present
Choanoflagellatea		present		
Cryothecomonas scybalophora	present	present		present
Ciliophora	present		present	present

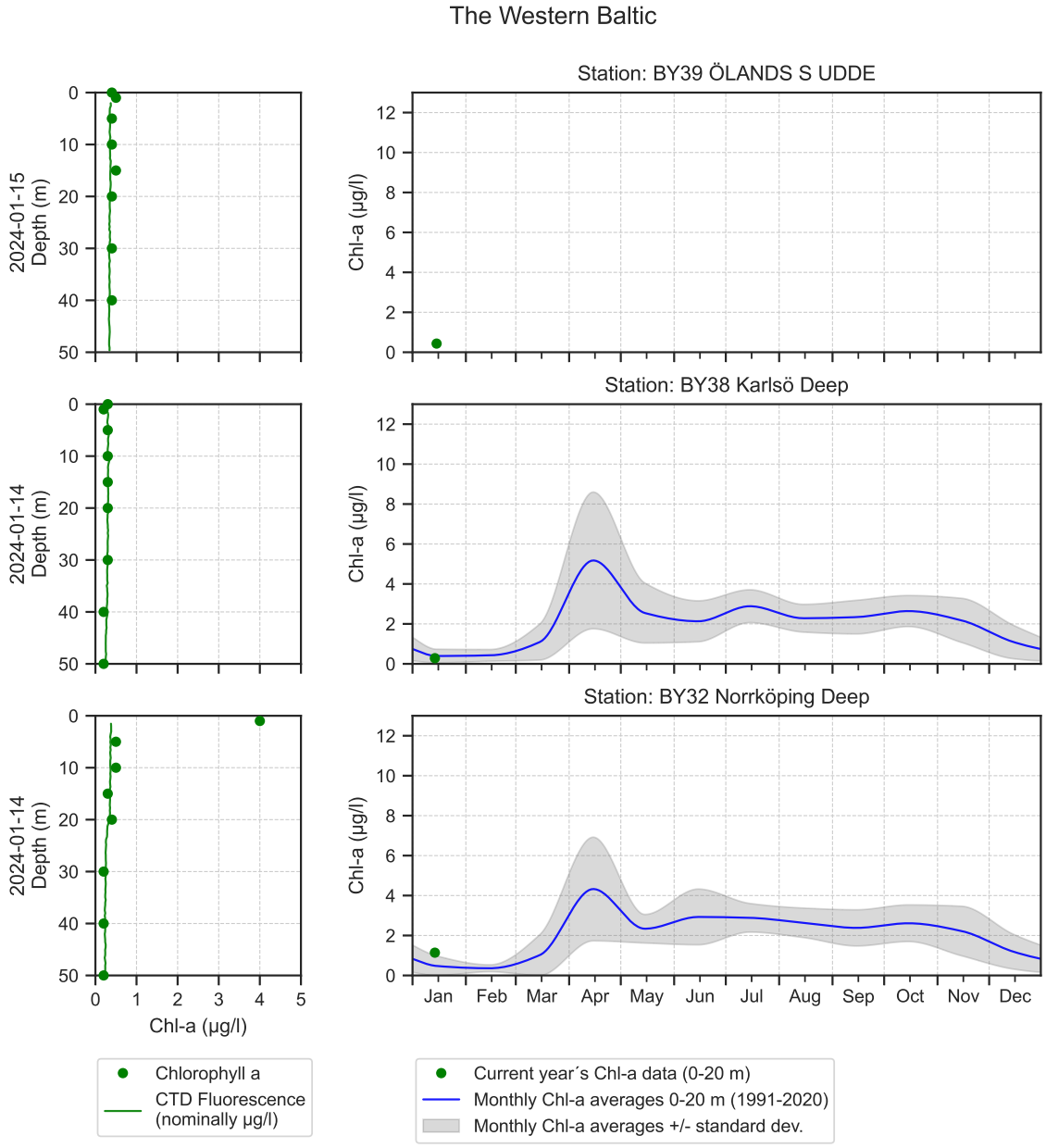
Selection of observed species	BY2	BY5	BCSIII-10	BY15	BY29	BY31	BY38	BY39
Red=potentially toxic species	12/1	12/1	13/1	13/1	14/1	14/1	14/1	15/1
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Actinocyclus octonarius	present	present	common	common	present	present	present	present
Chaetoceros danicus			present			present		
Chaetoceros similis		present						
Coscinodiscus radiatus			present					
Melosira arctica						present		
Skeletonema marinoi	present					present	present	present
Thalassionema nitzschioides	present							
Amphidinium sphenoides	present							
Dinophysis acuminata						present	present	
Gymnodiniales	present	present	common	common	present	present	common	common
Gymnodinium verruculosum			present	present				
Peridiniales								present
Peridiniella catenata								present
Protoperidinium							present	
Monoraphidium					present	present		
Oocystis	present	present		present	present	present	present	present
Binuclearia lauterbornii				present	present			
Pyramimonas		present						
Cryptomonadales	common	common	common	common	common	present	common	common
Telonema		present						present
Eutreptiella		present		present				
Lemmermanniella				present			present	
Pseudanabaena						present	present	present
Snowella		present	common			present	present	
Calliacantha natans								present
Choanoflagellatea		present				present		
Mesodinium rubrum	present	present	common	present	present	present	present	present


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
Depth (m)
2024-01-16
2024-01-17
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
2024-01-11
Depth (m)
2024-01-16 (circles)
2024-01-11 (triangles)
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
2024-01-12
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
2024-01-13
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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