SMHI
Oceanographic Unit
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AlgAware
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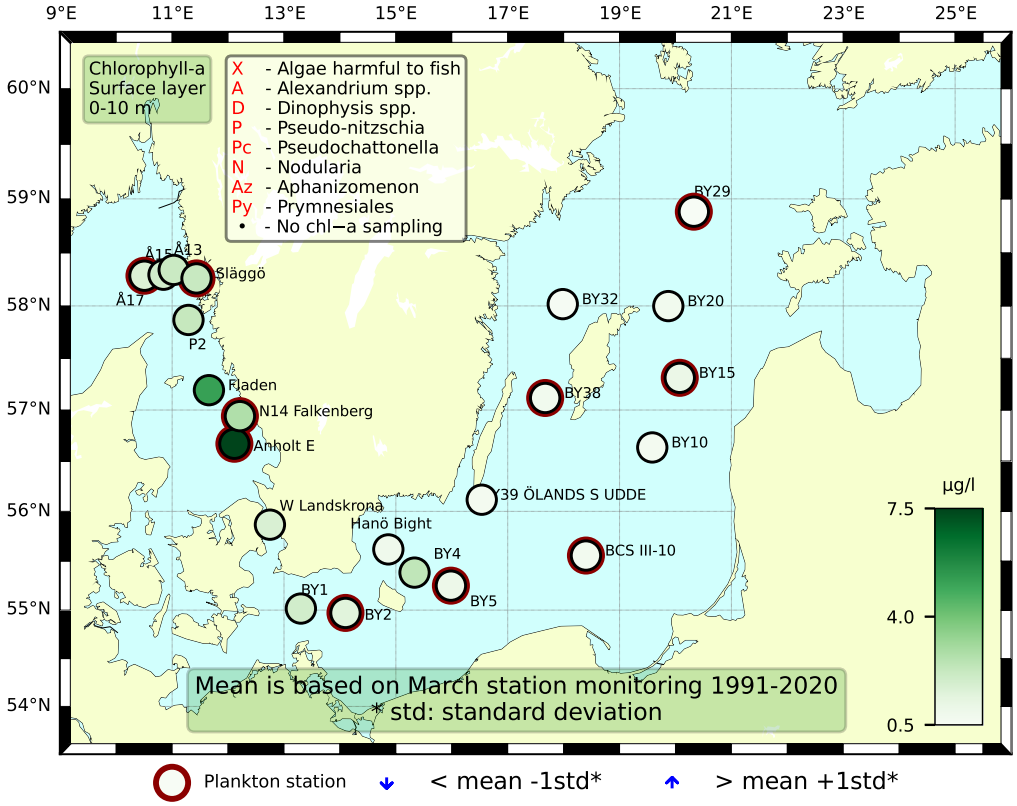
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning
Vårblomningen av kiselalger var pågående vid Anholt E och Fladen i Kattegatt, men vid övriga Västerhavsstationer var de totala cellantalen måttliga. ”Rätt” arter var dock på plats vid samtliga stationer inför blomning.

Cellantal och biodiversiteten var låg i Östersjön, förutom vid BY2 Arkona, där måttliga mängder av kiselalgen *Skeletonema marinoi* observerades.

De integrerade klorofyllhalterna (0–10 m och 0–20 m) var inom det normala för månaden vid alla stationer.



Abstract
The diatom spring bloom was ongoing at Anholt E and Fladen in the Kattegat, but at all other Kattegat and Skagerrak stations the total cell numbers were moderate although the scene was set when it comes to species.

The abundance and biodiversity were low in the Baltic Sea, although moderate amounts of *Skeletonema marinoi* were observed at BY2 Arkona.

The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal 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) 13th of March

The species diversity was rather high with many diatoms present but the total cell numbers were low. The diatoms *Guinardia delicatula* and the potentially toxic *Pseudo-nitzschia seriata** were found in moderate cell numbers. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

Släggö (Skagerrak coast) 13th of March

The species diversity was high, but the cell numbers had not reached spring bloom levels by far. The most abundant species were the diatoms *Thalassionema nitzschioides*, *P. seriata** and the heterotrophic dinoflagellate *Gyrodinium spirale*. Small species like cryptomonadales and the flagellate *Pseudopedinella pyriformis* were abundant. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were low but within normal for this month.

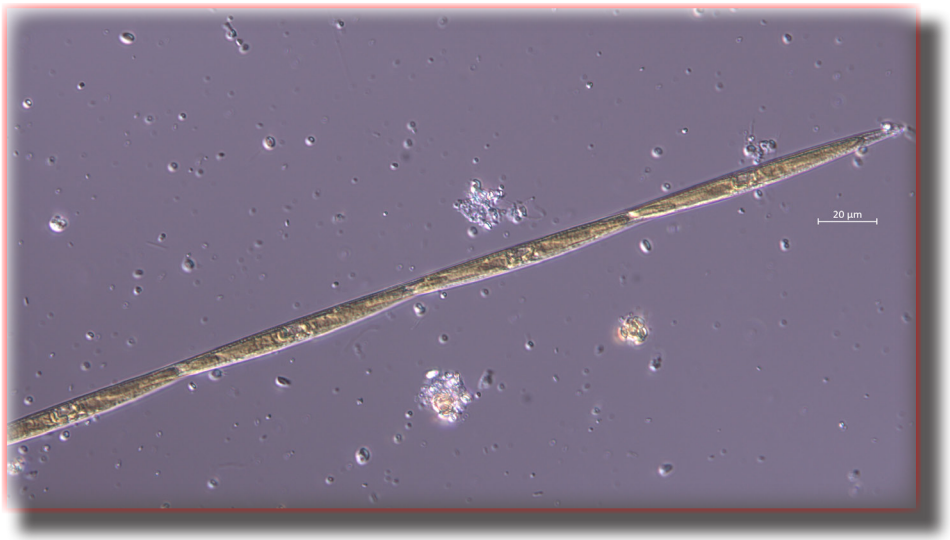


Fig 1. The potentially toxic diatom *Pseudo-nitzschia* cf. *seriata** was present at all of the Skagerrak and Kattegat stations. Photo: M. Karlberg.

The Kattegat

Anholt E 12th of March

The spring bloom of diatoms was ongoing with high cell numbers of several species, of which the diatom *Skeletonema marinoi* was the most numerous one. The diatom *P. seriata** was found in moderate cell numbers. The chlorophyll values in the surface water down to 10 meters were elevated. The integrated chlorophyll concentrations however (0–10 m and 0–20 m) were within normal for this month.

N14 Falkenberg 12th of March

The number of species was high, but the cell numbers were moderate. The diatoms *S. marinoi*, *T. nitzschioides* and *P. seriata** were found in rather high cell numbers. A chlorophyll fluorescence peak at around 12 meters was not examined further and the integrated chlorophyll concentrations (0–10 m and 0–20 m) were low but within normal for this month.

Fladen 12th of March, fluorescence maximum 5m

A variety of diatoms caused the chlorophyll fluorescence maximum at 5 meters. *S. marinoi* was the most numerous species, but several *Thalassiosira* species, *T. nitzschioides* and other species were also numerous. *P. seriata** was present in low amounts.

The Baltic

BY39 8th of March
The phytoplankton diversity and abundances were low with mainly small cells such as Cryptomonadales, *Eutreptiella* sp. and *Mesodinium rubrum*. The integrated (0–20 m and 0–10 m) chlorophyll concentrations were within the normal range for this month.

BY31 Landsort deep 9th of March
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and the ciliate *M. rubrum*. Some filaments of the genus *Aphanizomenon* were also observed. The integrated (0–20 m and 0–10 m) chlorophyll concentrations were within the normal range for this month.

BY29 9th of March
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and the ciliate *M. rubrum*. Some filaments of the genus *Aphanizomenon* were also observed. The integrated (0–20 m and 0–10 m) chlorophyll concentrations were within the normal range for this month.

Fig 2. The chain forming *Peridiniella catenata,* a common dinoflagellate in the spring bloom in the Baltic Sea, was found in low concentrations at BY38 and was common at BY5. Photo: A. Torstensson.

BCSIII-10 10th of March
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and the ciliate *M. rubrum*. The integrated (0–20 m and 0–10 m) chlorophyll concentrations were within the normal range for this month.

BY15 Gotland deep 10th of March
The phytoplankton diversity and abundances were low with mainly small cells such as Cryptomonadales and the ciliate *M. rubrum*. Some filaments of the genus *Aphanizomenon* were also observed. The integrated (0–20 m and 0–10 m) chlorophyll concentrations were within the normal range for this month.

BY2 Arkona 11th of March
The phytoplankton diversity was low, although the abundances were higher than in the rest of the Baltic Sea, mainly because of moderate amounts of *S. marinoi* as cells. The integrated (0–20 m and 0–10 m) chlorophyll concentrations were within the normal range for this month.

BY5 Bornholm deep 11th of March

The phytoplankton diversity and abundances were both low with mainly small cells such as Cryptomonadales, Gymnodiniales and the ciliate *M. rubrum*. The dinoflagellate *Peridiniella catenata* was however relatively common. The integrated (0–20 m and 0–10 m) chlorophyll concentrations were within the normal range for this month.

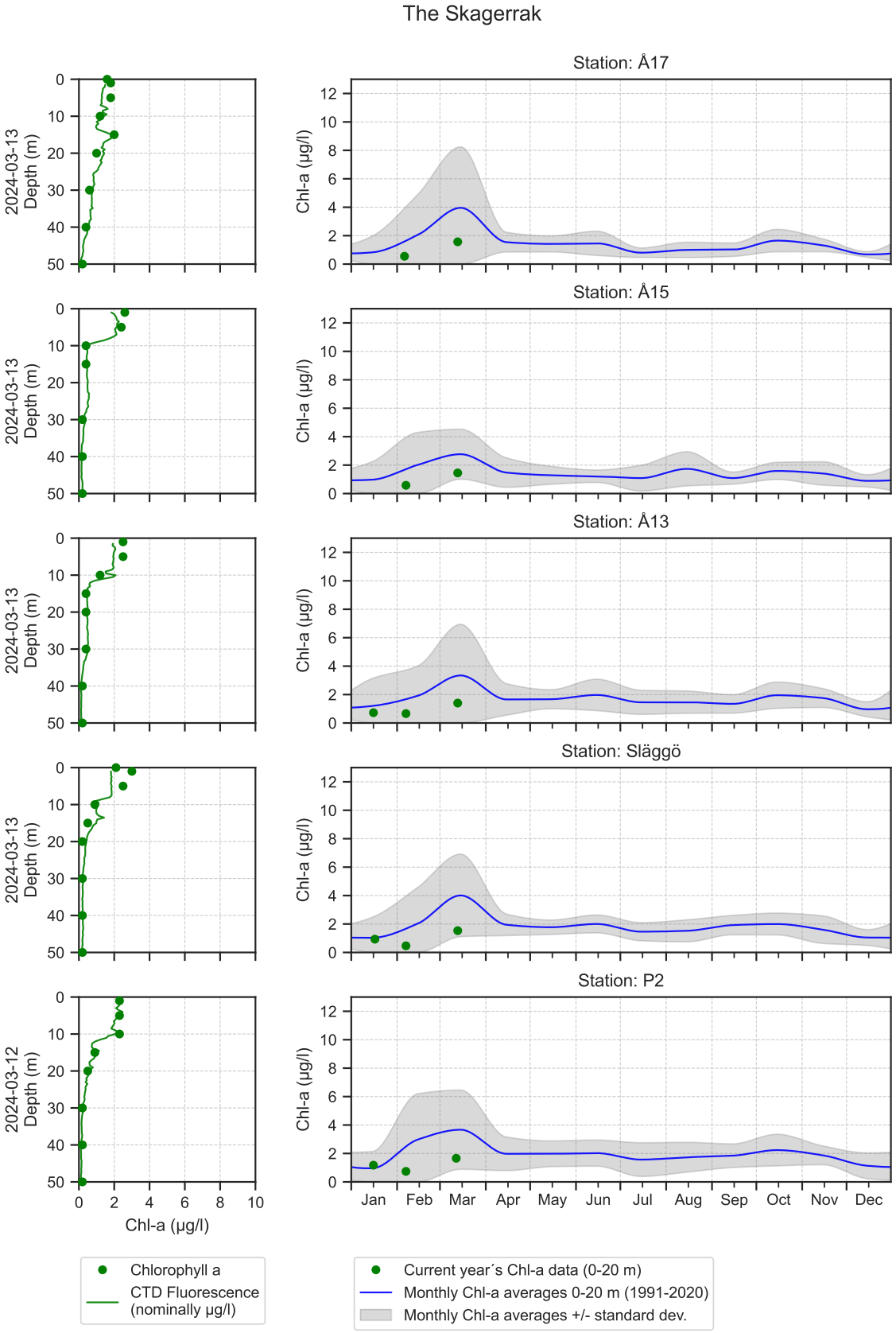
BY38 13th of March

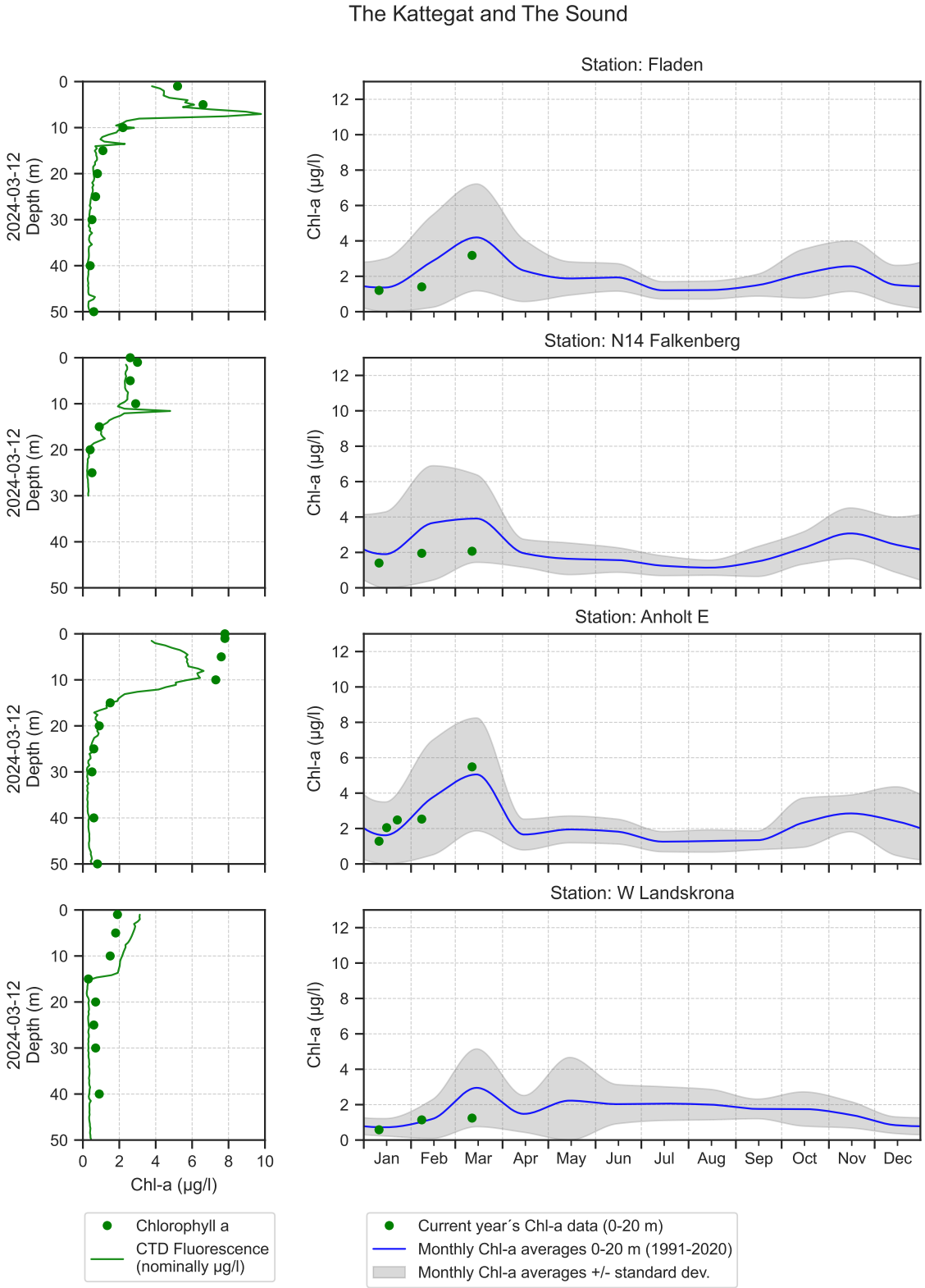
The phytoplankton diversity and abundances were low with mainly small cells such as Cryptomonadales and the ciliate *M. rubrum*. The integrated (0–20 m and 0–10 m) chlorophyll concentrations were within the normal range for this month.

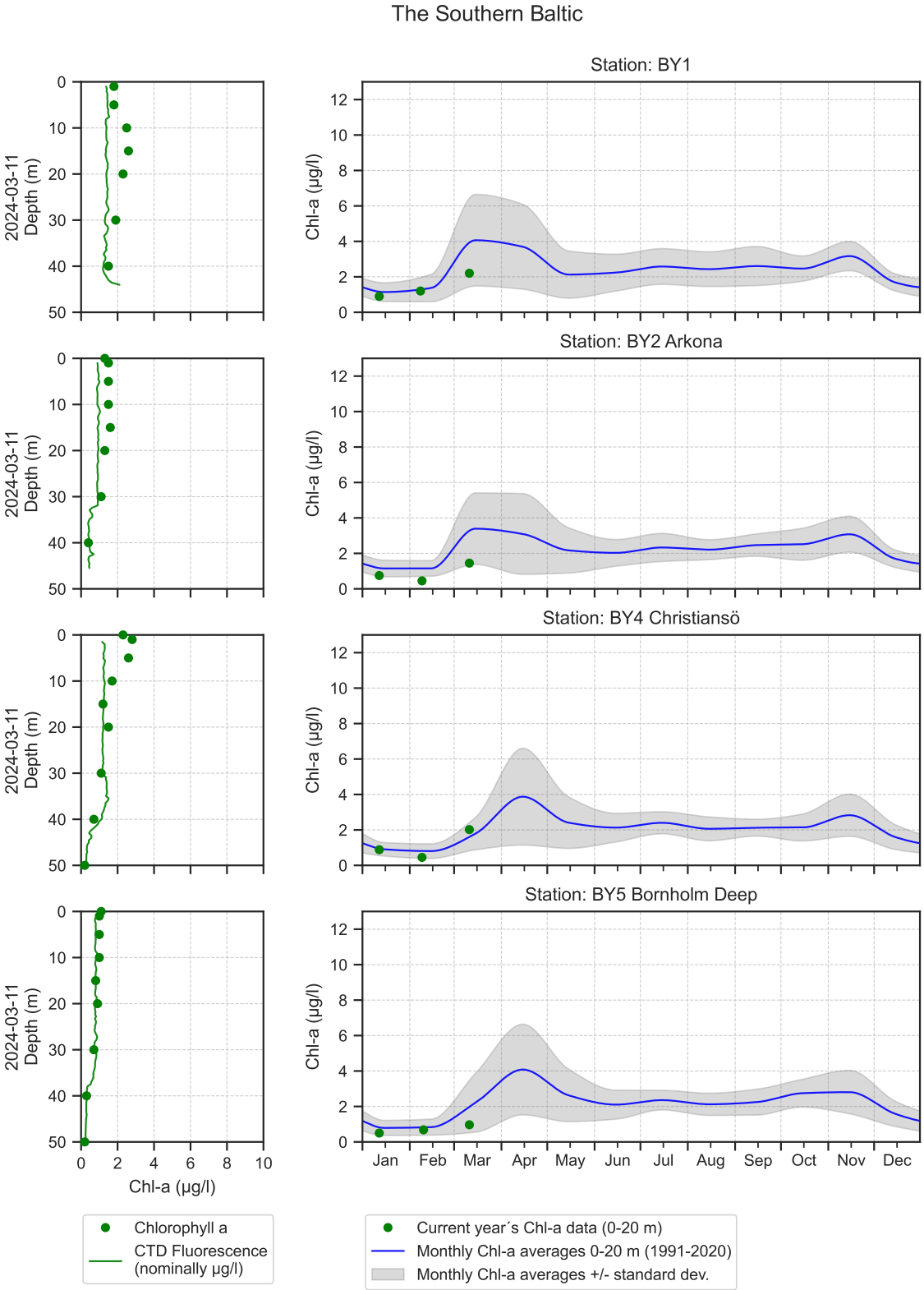
Phytoplankton analysis and text:
Ann-Turi Skjevik and Anders Torstensson.

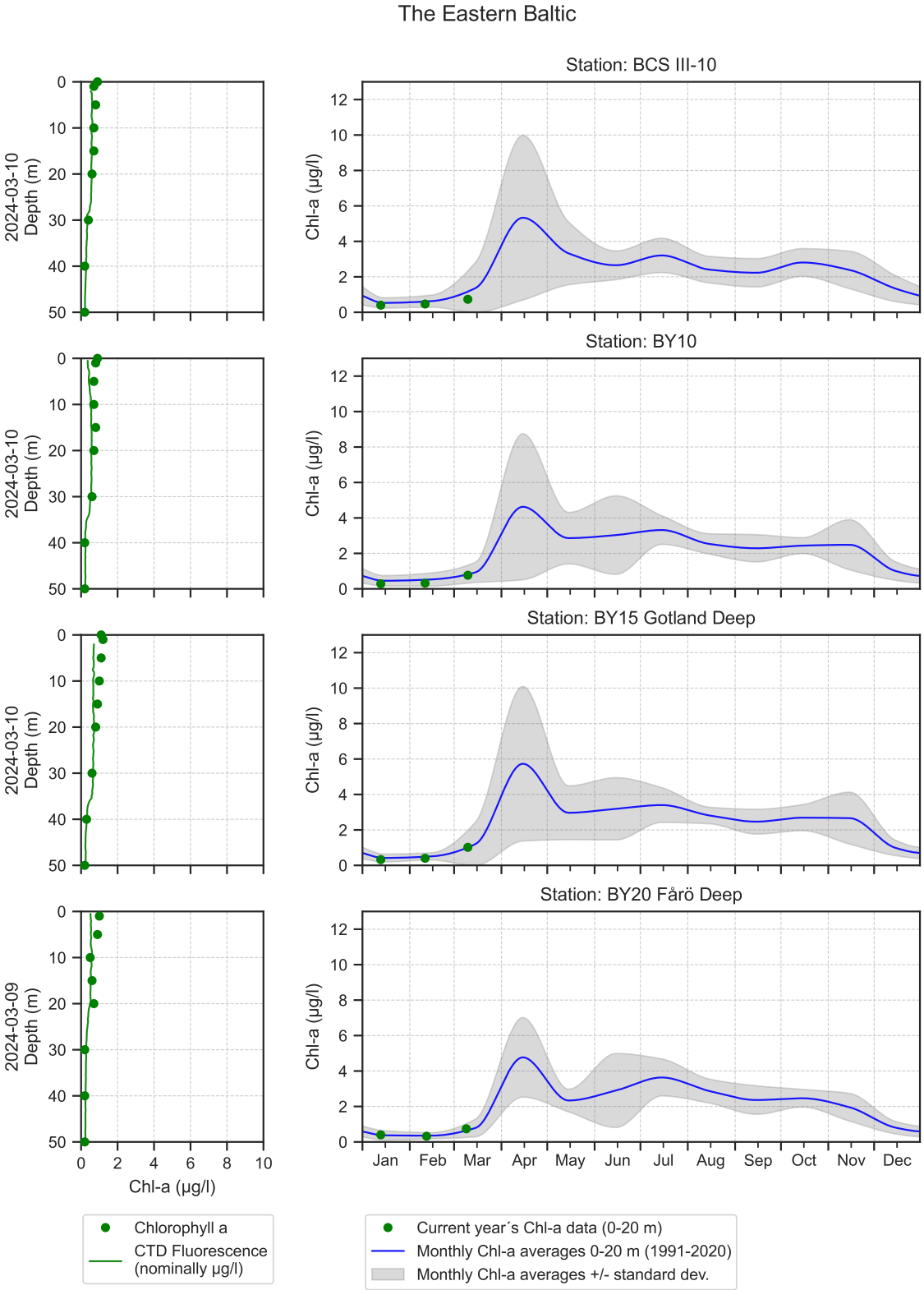
Selection of observed species	Anholt E	N14 Falkenberg	Släggö	Å17
Red=potentially toxic species	12/3	12/3	13/3	13/3
Hose 0-present0 m	presence	presence	presence	presence
Cerataulina pelagica		present		present
Chaetoceros cf. convolutus	present			
Chaetoceros danicus	present	present		
Chaetoceros debilis		present		
Chaetoceros decipiens		present		present
Chaetoceros similis		present		
Chaetoceros subtilis	present	present		
Chaetoceros wighamii		present		present
Coscinodiscus radiatus		present		
Dactyliosolen fragilissimus		present		
Eucampia zodiacus				present
Guinardia delicatula	common	present	common	common
Guinardia flaccida			present	present
Leptocylindrus minimus	present	present	present	present
Nitzschia longissima		present		present
Porosira glacialis	present			
Proboscia alata	present	present	present	present
Pseudo-nitzschia	common	present	present	present
Pseudo-nitzschia seriata	common	common	common	common
Pseudosolenia calcar-avis		present		
Rhizosolenia setigera	present	present	present	present
Skeletonema marinoi	dominating	common		present
Thalassionema nitzschioides	common	common	common	present
Thalassiosira angulata	present			
Thalassiosira anguste-lineata	present	present		
Thalassiosira nordenskioeldii	present	present		
Amphidinium sphenoides		present		
Azadinium caudatum var. margalefii				present
Dinophysis acuminata	present		present	present
Dinophysis norvegica	present	present	present	
Gyrodinium spirale		present	common	present
Heterocapsa rotundata	present	present	present	present
Heterocapsa triquetra	present			
Karlodinium veneficum	present	present	present	present
Katodinium glaucum		present		
Lingulodinium polyedra		present		present
Peridiniella danica		present		
Phalacroma rotundatum				present
Protoperidinium bipes			present	
Protoperidinium depressum			present	
Protoperidinium pallidum		present		
Protoperidinium pellucidum	present	present		
Tripos muelleri			present	
Cryptomonadales	common	common	very common	common
Leucocryptos marina	present	present	present	present
Rhodomonas	present	present		
Apedinella radians	present			present
Octactis speculum				present
Pseudochattonella	present	present	present	present
Pseudopedinella	present		present	
Pseudopedinella pyriformis	present	present	common	present
Eutreptiella	present	present		
Eutreptiella braarudii			present	
Pyramimonas	present	present		
Heterosigma akashiwo		present	present	
Oocystis		present		
Calliacantha longicaudata	present			
Calliacantha natans	present	present		
Choanoflagellatea	present			
Laboea strobila	present	present		
Mesodinium rubrum	present	present		present
Strombidium	present	present	present	present
Tintinnidae			present	
Ciliophora	common	present	present	present

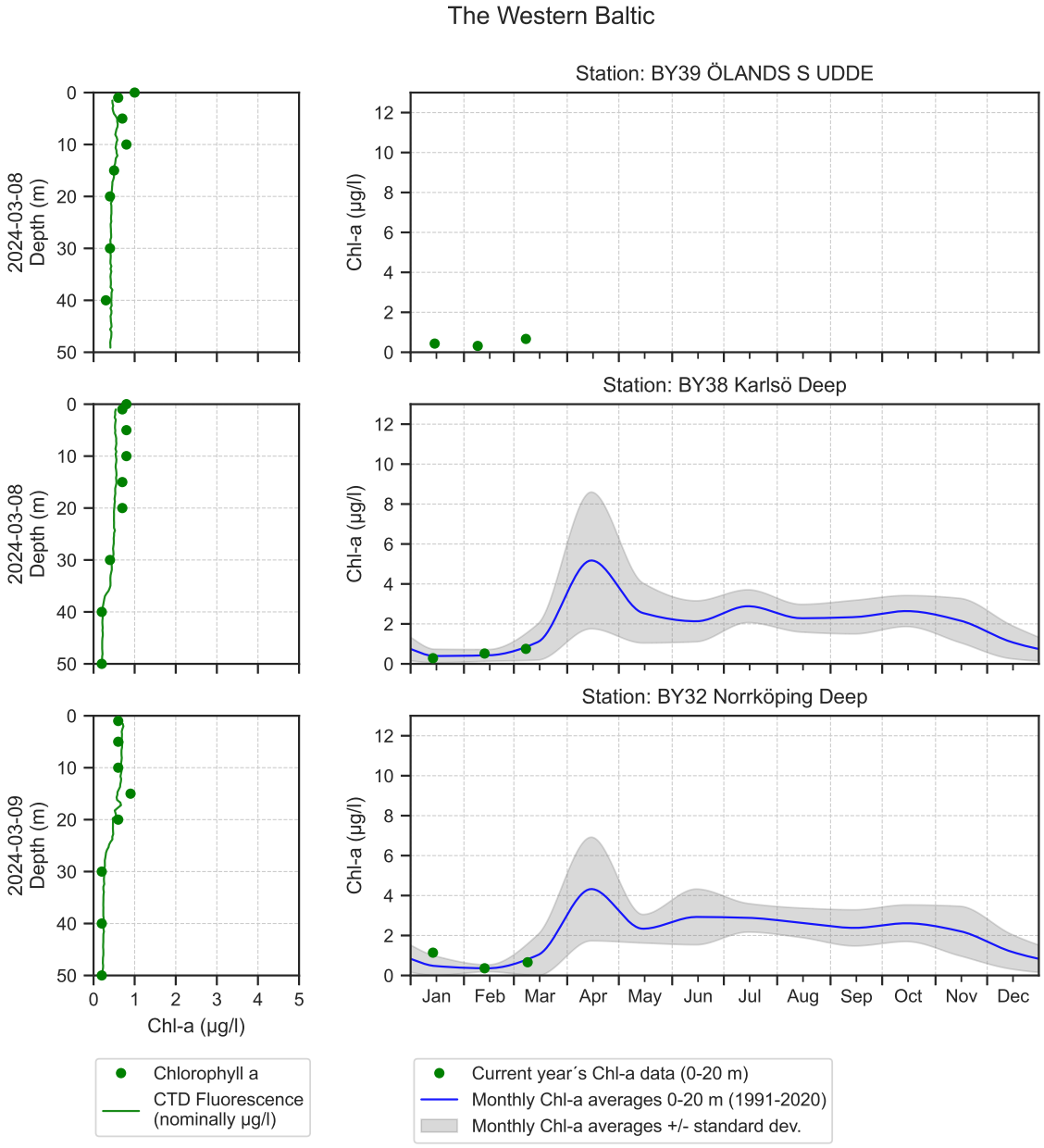
Selection of observed species	BCSIII-10	BY15	BY29	BY2	BY31	BY38	BY39	BY5
Red=potentially toxic species	10/3	10/3	9/3	11/3	9/3	13/2	8/3	11/3
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Ciliophora		present	present	present		present	present	
Chaetoceros		present		present				
Skeletonema marinoi	present	present	present	common	present	present	present	present
Prymnesiales							present	
Cryptomonadales	present	common	common	present	present	common	common	present
Aphanizomenon		present	present		present			
Snowella	present	present		present		present	present	present
Gymnodiniales			present	present			present	
Heterocapsa rotundata	present			present	present			present
Katodinium glaucum				present				
Peridiniales					present		present	present
Peridiniella catenata						present		common
Peridiniella danica						present		
Ebria tripartita	present							
Eutreptiella		present		present	present	present	common	
Mesodinium rubrum	present	common	present	present	present	common	common	present
Oocystis	present	present	present				present	present


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
2024-03-13
2024-03-12
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 Kattegat and The Sound
Station: Fladen
Station: N14 Falkenberg
Station: Anholt E
Station: W Landskrona
2024-03-12
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 Southern Baltic
Station: BY1
Station: BY2 Arkona
Station: BY4 Christiansö
Station: BY5 Bornholm Deep
2024-03-11
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 Eastern Baltic
Station: BCS III-10
Station: BY10
Station: BY15 Gotland Deep
Station: BY20 Fårö Deep
2024-03-10
2024-03-09
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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