SMHI
Oceanographic Unit
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AlgAware
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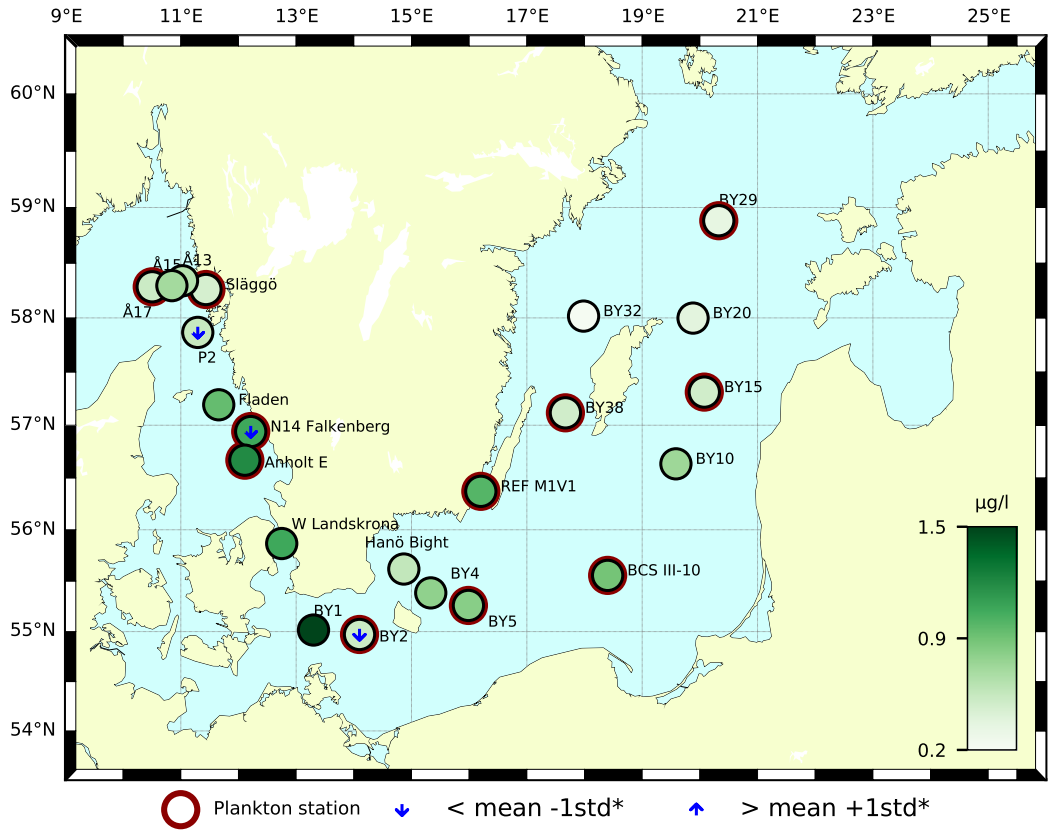
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

I Skagerrak var totala cellantalen låga så även biodiversiteten. Ingen indikation på en närstående vårblomning återfanns. Framför allt förekom små celler och mestadels olika cryptomonader. Den för vårblomningen vanliga kiselalgen *Skeletonema marinoi* återfanns endast i låga antal vid båda stationerna. I Kattegatt var både totala cellantal och biodiversiteten högre men ingen tydlig tendens till vårblomning noterades. Bland de större arterna var dinoflagellaten *Tripos lineatus* vanligast. De integrerade klorofyllvärdena var vid samtliga stationer i de lägre områdena av vad som är normalt.

Bland Östersjöstationerna återfanns låga cellantal i vattnet med relativt låg artdiversitet. Framför allt dominerade små celler. Vid de nordliga stationerna och i Kalmar sund återfanns en del kedjor av *Skeletonema marinoi.* De integrerade klorofyllvärdena var vid samtliga stationer generellt sett i de lägre områdena av vad som är normalt.



Abstract

Both stations in the Skagerrak had low total cell abundance and low biodiversity. No indication of an upcoming spring bloom was found. Small cells dominated and different cells of cryptomonads were most commonly found. The diatom *Skeletonema marinoi*, commonly dominating the spring bloom was found in low amounts. The two stations in Kattegat had higher total cell numbers and also higher biodiversity but still no clear notion of a spring bloom. Among the larger cells the dinoflagellate *Tripos lineatus* was most numerous. The integrated chlorophyll concentrations were, generally speaking, in the lower region of what is normal for this month.

Among the Baltic stations both low total cell numbers and low biodiversity were recorded. The communities were mainly dominated by small cells. Some chains of *Skeletonema marinoi* were observed at the stations located in the northern part as well as in Kalmar sound. The integrated chlorophyll concentrations were in the lower region of what is 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) 8th of February
The total cell number was very low. Larger cells were almost absent in the sample. Among the smaller cells cryptomonads were common, but also the coccolithophore *Emiliania huxleyi* was common. The integrated chlorophyll concentrations were in the lower region of what is normal for this month.

Släggö (Skagerrak coast) 8th of February
The total cell number was very low. Some chains of the diatom *Skeletonema marinoi* were present and some cells of the dinoflagellate *Tripos lineatus* were also found. Cryptomonads were most common among the smaller cells. The integrated chlorophyll concentrations were in the lower region of what is normal for this month.

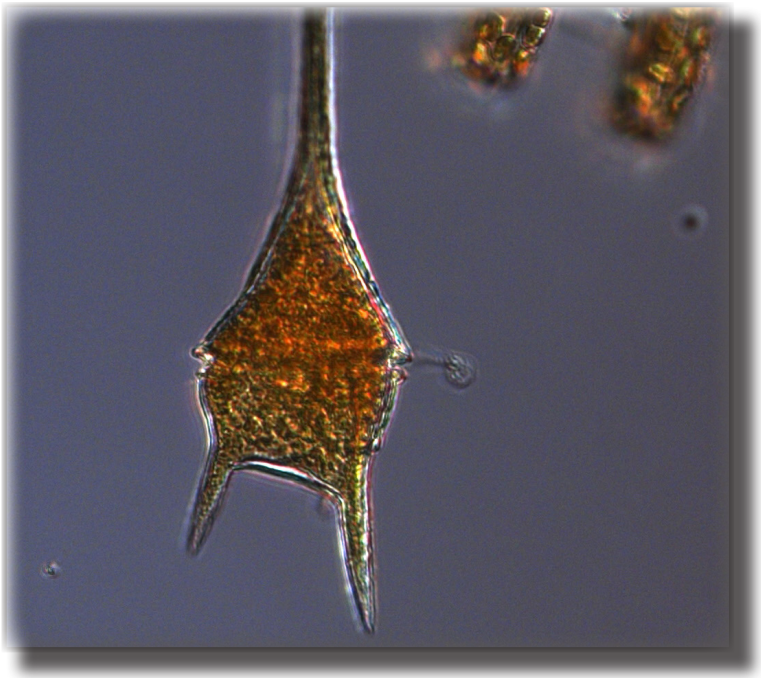


Figure 1. The dinoflagellate *Tripos lineatus* was common along the Swedish west coast. Photo: Ann-Turi Skjevik.

The Kattegat

Anholt E 9th of February
The total cell numbers and biodiversity were both relatively high but no sign of a spring bloom yet. The larger cells were dominated by the dinoflagellate *Tripos lineatus*. Other cells that were found in higher numbers were *Octactis speculum* and *Dinophysis acuminata**. The smaller cells were quite numerous and cryptomonads together with *Emiliania huxleyi* were common. The diatom *Skeletonema marinoi,* which is a regular spring bloom species, were also found in moderate numbers of chains. The integrated chlorophyll concentrations were in the lower region of what is normal for this month.

N14 Falkenberg 9th of February
The total cell numbers and biodiversity were both relatively high but no indication of a spring bloom was recorded. The larger cells consisted mainly of dinoflagellates such as *Tripos lineatus* and other species belonging to the same genus. *Dinophysis norvegica** was also common. Different diatoms were also found and the genus *Pseudo-nitzschia** was most common. The smaller cells were dominated by different cryptomonads. The integrated chlorophyll concentrations were below what is normal for this month.

The Baltic

BY2 10th of February
Both phytoplankton diversity and abundance were very low. There were only small taxa present, of which cryptomonads and ciliates were the most numerous organisms. Both the integrated (0-20 m) and (0-10 m) chlorophyll concentrations were lower than normal for this month.

BY5 10th of February
Both phytoplankton diversity and abundance were low. The phytoplankton community mainly consisted of cryptomonads and colonies of *Snowella* sp. Both the integrated (0-20 m) and (0-10 m) chlorophyll concentrations were low but within normal for this month.

BCSIII-10 11th of February
Both phytoplankton diversity and abundance were low. The phytoplankton community mainly consisted of cryptomonads. Some of the smaller cells such as Gymnodiniales (< 20 μm), *Mesodinium rubrum*, ciliates and unicells were also present. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were low but within normal for this month.

BY15 12th of February
Both phytoplankton diversity and abundance were low. The phytoplankton community mainly consisted of cryptomonads. Smaller cells of Gymnodiniales (< 20 μm), *M. rubrum*, ciliates, centric diatoms, as well as unicells were also found. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were low but within normal for this month.

BY29 13th of February
Both phytoplankton diversity and abundance were low. The phytoplankton community mainly consisted of *S. marinoi*, and contained small cells of cryptomonads, small Gymnodiniales (< 20 μm), *M. rubrum*, centric diatoms (< 20 μm) and ciliates.

BY31 14th of February
Both phytoplankton diversity and abundance were very low. No taxon was clearly dominating the phytoplankton community, which mainly consisted of small Gymnodiniales cells (< 20 μm), cryptomonads, *Snowella* sp., *B. lauterbornii*, *S. marinoi*, small centric diatoms (< 20 μm), *M. rubrum*, *Peridiniella catenata* and ciliates.

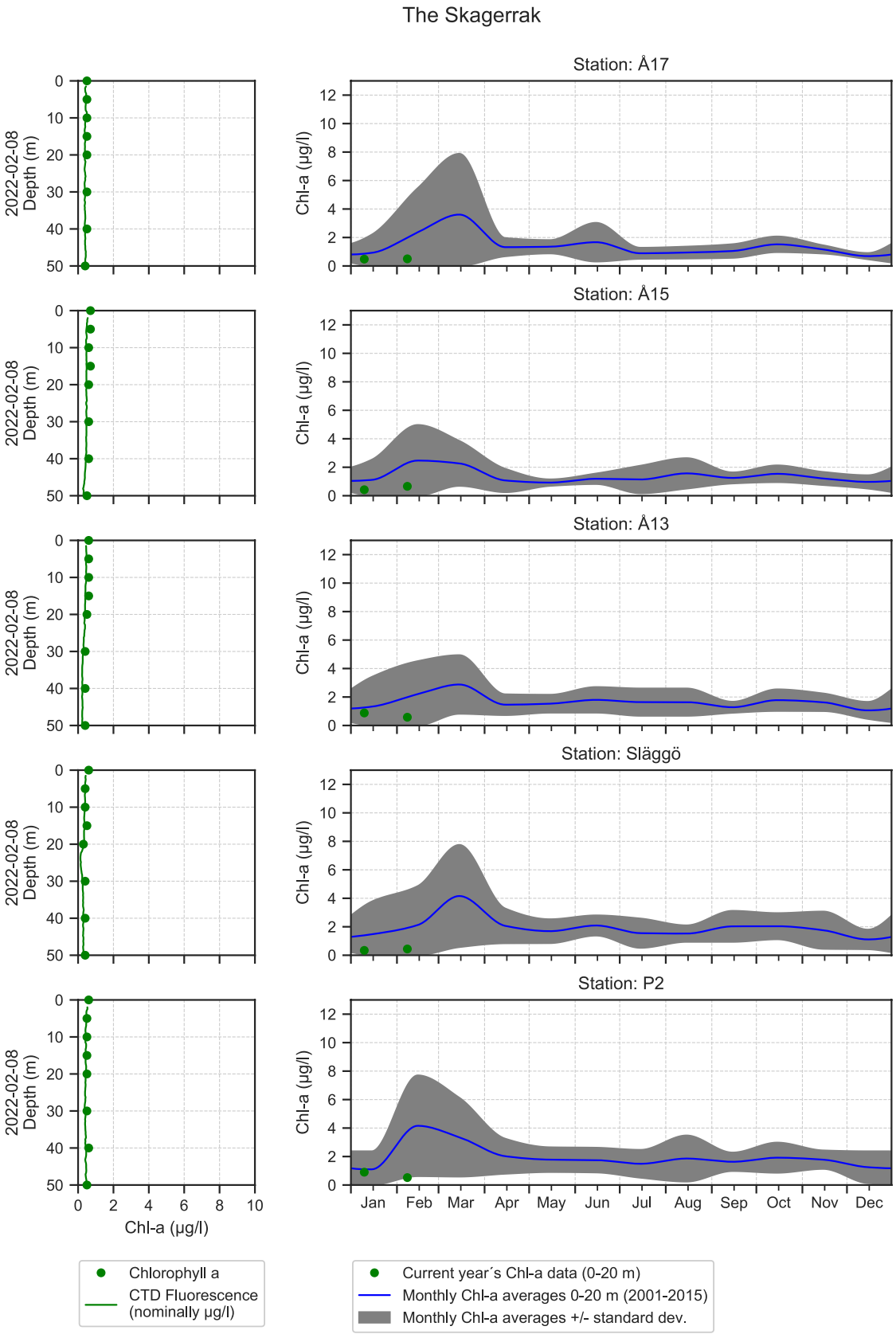
BY38 14th of February
Both phytoplankton diversity and abundance were low. The community mainly consisted of small Gymnodiniales cells (< 20 μm), cryptomonads, small centric diatoms (< 20 μm) and *M. rubrum*. Other taxa that had high relative abundances were *P. catenata*, *Oocystis* sp., *Planktolyngbya* sp., ciliates, flagellates and unicells. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were low but within normal for this month.

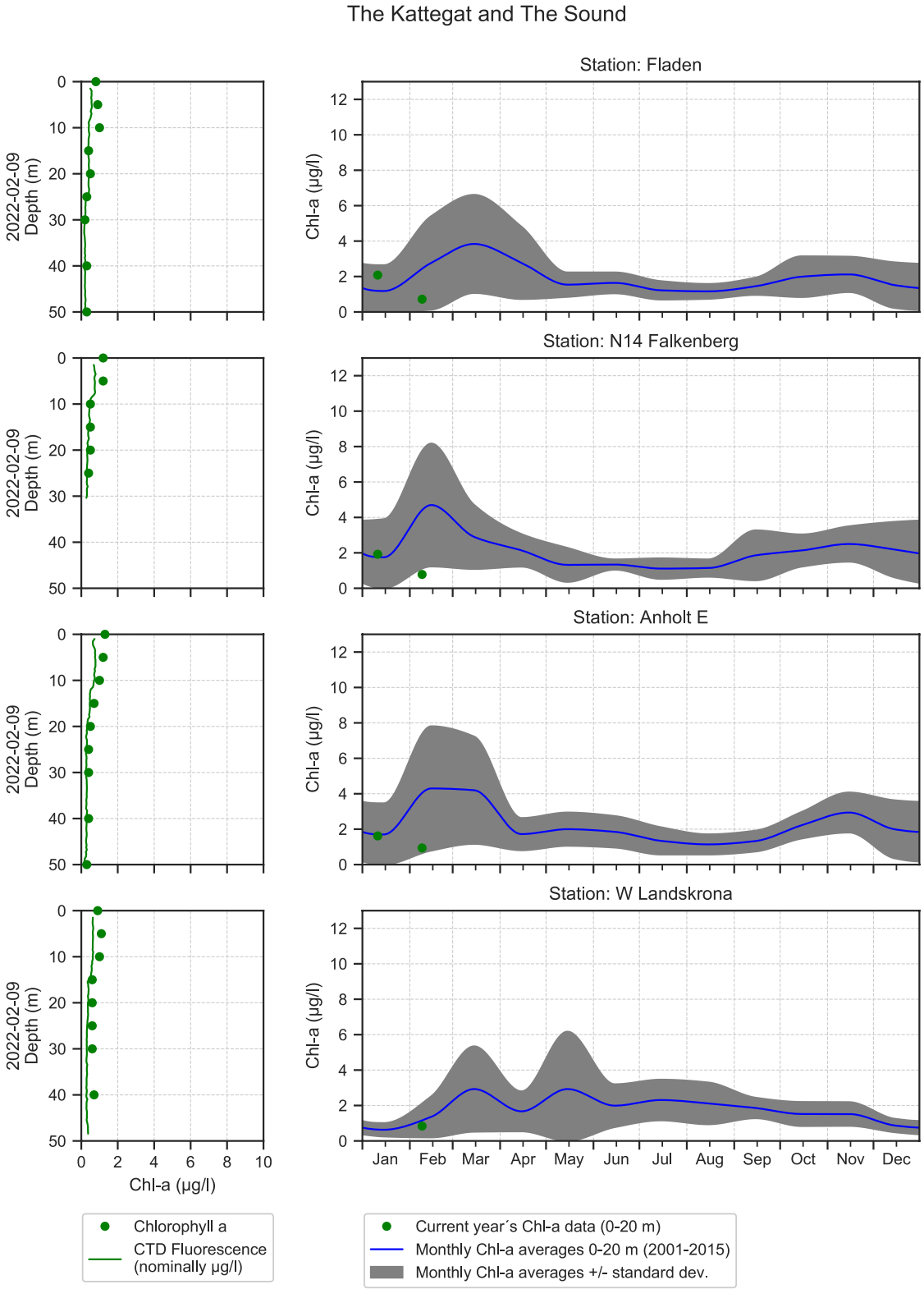
REFM1V1 15th of February
Phytoplankton diversity was low but the abundance was quite high compared to the other stations in the Baltic Sea. This was mainly due to higher abundances of the chain forming diatom *S. marinoi*. The remaining phytoplankton community mainly consisted of small cells such as centric diatoms (< 20 μm), cryptomonads, *M. rubrum*, ciliates as well as unicells. The integrated (0-20 m) and (0-10 m) chlorophyll concentrations were low but within normal for this month.

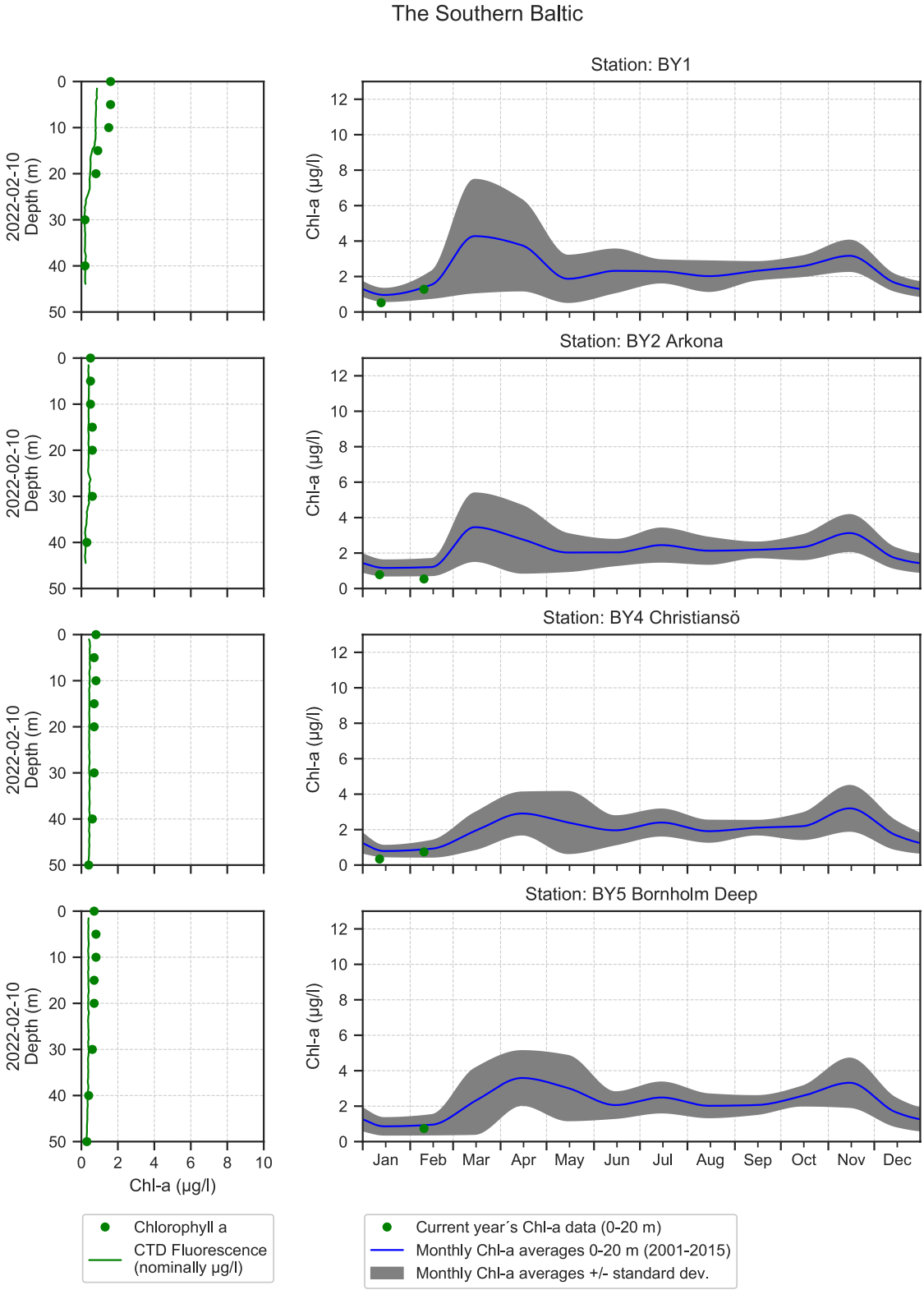
Phytoplankton analysis and text:
Anders Torstensson and Marie Johansen.

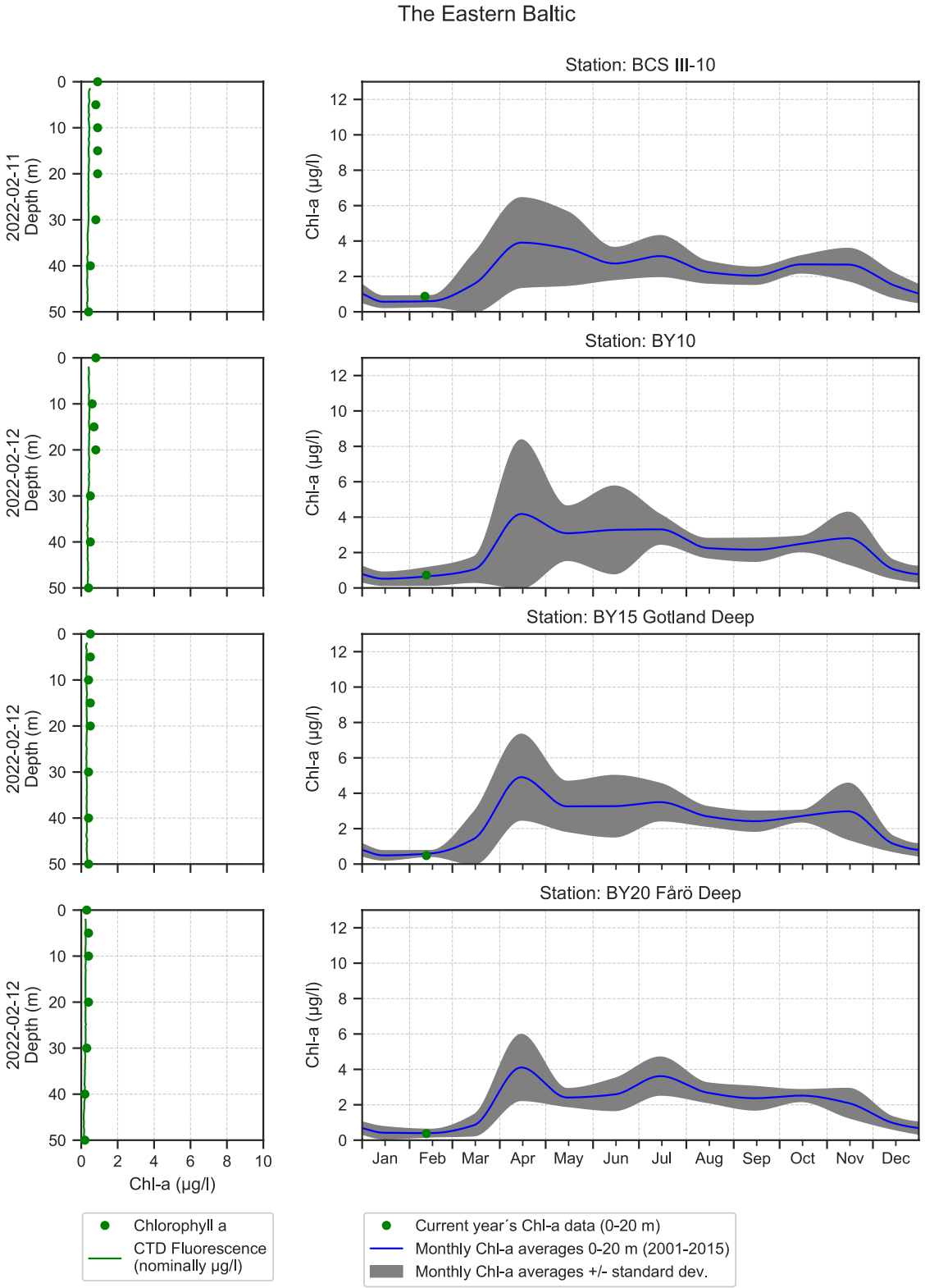
Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	9/2	9/2	8/2	8/2
Hose 0-10 m	presence	presence	presence	presence
Cerataulina pelagica		present		
Chaetoceros	present	present		
Chaetoceros danicus	common	present		
Chaetoceros debilis	present			
Chaetoceros subtilis	present			
Coscinodiscus		present		
Coscinodiscus radiatus	present			
Cylindrotheca closterium				present
Guinardia delicatula	present	present		
Guinardia flaccida		present		
Leptocylindrus minimus	present	present		
Nitzschia longissima		present		
Proboscia alata	present	present	present	
Pseudo-nitzschia	common	common	present	present
Rhizosolenia hebetata f. semispina	present			
Skeletonema marinoi	common	present	common	present
Thalassiosira				present
Dinophysis acuminata	common	present	present	
Dinophysis norvegica	present	common	present	
Gymnodiniales		common		present
Gyrodinium spirale		present		
Heterocapsa rotundata			present	
Katodinium glaucum	present			
Phalacroma rotundatum	present	present		
Protoperidinium conicum	present	present		
Tripos furca		present		
Tripos fusus	present	present		
Tripos lineatus	very common	common	common	present
Tripos longipes	present	present	present	
Tripos muelleri	present	present		
Emiliania huxleyi	common	present	present	common
Pleurochrysis				present
Pterosperma				present
Cryptomonadales	common	common	present	common
Dictyochales		present		
Octactis speculum	common	present		
Pseudanabaena		present		
Ciliophora	present	present	present	present

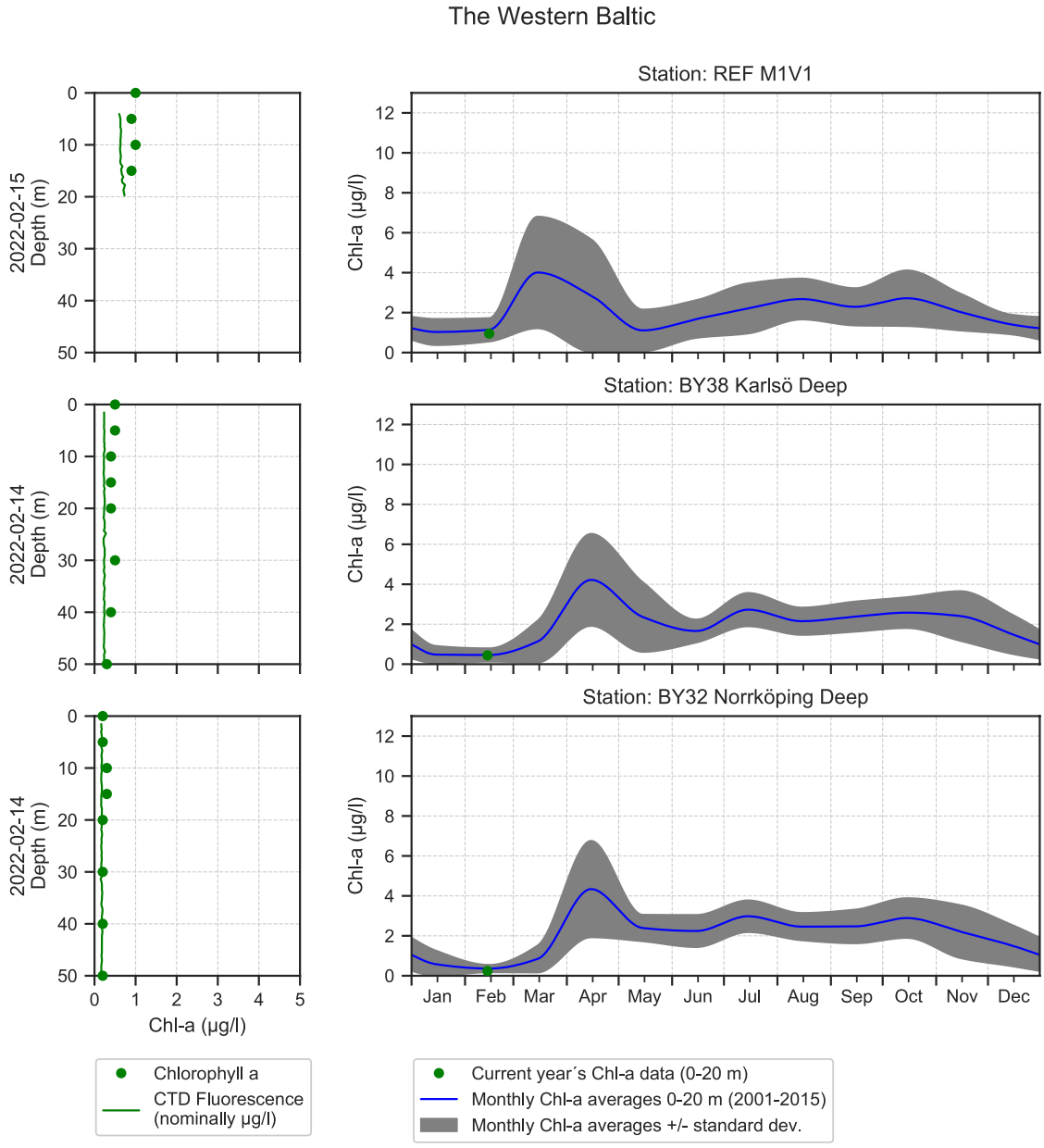
Selection of observed species	BCSIII-10	BY2	BY5	BY15	BY29	BY31	BY38	REFM1V1
Red=potentially toxic species	11/2	10/2	10/2	12/2	13/2	14/2	14/2	15/2
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Centrales	Present	Present		Present	Present	Present	Common	Common
Chaetoceros								Present
Chaetoceros subtilis		Present	Present					
Cylindrotheca closterium								Present
Pennales		Present						Present
Skeletonema marinoi	Present	Present	Present	Present	Common	Present	Present	Common
Gymnodiniales	Present	Present	Common	Present	Present	Present	Common	Present
Heterocapsa rotundata	Present	Present	Present		Present			Present
Peridiniales		Present	Present	Present	Present	Present		
Peridiniella catenata	Present					Present	Present	
Oocystis	Present	Present	Present	Present	Present	Present	Present	
Binuclearia lauterbornii						Present		
Cryptomonadales	Common	Common	Common	Common	Present	Present	Common	Common
Eutreptiella		Present			Present		Present	
Aphanothece	Present							
Oscillatoriales					Present			
Planktolyngbya					Present		Present	
Snowella	Present	Present	Common	Present	Present	Present	Present	
Unicell	Present	Present	Present	Present	Present		Present	Common
Flagellates							Present	
Ciliophora	Present	Present	Present	Present	Present	Present	Present	Present
Mesodinium rubrum	Present	Common	Present	Present	Present	Present	Common	Present


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
2022-02-08
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 Kattegat and The Sound
Station: Fladen
Station: N14 Falkenberg
Station: Anholt E
Station: W Landskrona
2022-02-09
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 (2001-2015)
Monthly Chl-a averages +/- standard dev.


The Southern Baltic
Station: BY1
Station: BY2 Arkona
Station: BY4 Christiansö
Station: BY5 Bornholm Deep
2022-02-10
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.


The Eastern Baltic
Station: BCS III-10
Station: BY10
Station: BY15 Gotland Deep
Station: BY20 Fårö Deep
2022-02-11
2022-02-12
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 (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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