SMHI
Oceanographic Unit
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AlgAware
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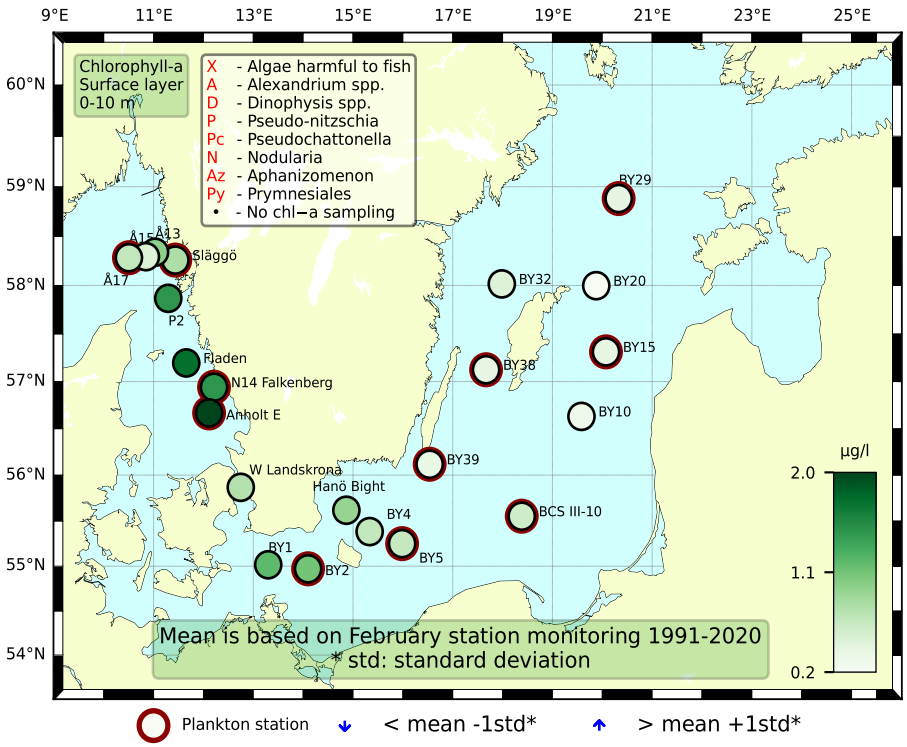
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

I Kattegatt kunde man skönja en antydan till vårblomning men troligtvis bara i sin startgrop. Vid provtagning i slutet av januari var det inte så tydligt men redan 10 dagar senare vid andra provtagningen vid Anholt E så hade andelen kedjor av *Skeletonema marinoi* som är vanligt förekommande i vårblomningen ökat men inte till blomningsnivåer. I Skagerrak indikerade inte förekomsten av antal celler och arter på att en tydlig vårblomning var på gång. 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 mycket låga i Östersjön med mest små celler såsom Cryptomonadales och mindre Gymnodiniales. Den kedjebildande kiselalgen *Skeletonema marinoi* återfanns vid de mer nordliga stationerna. Vid östra delen av Gotland och de nordliga stationerna återfanns även något enstaka filament av cyanobakterien *Aphanizomenon flosaquae* enligt bilder tagna av Imaging Flow Cytobot men de prover som togs med slang i samma område och analyserades i mikroskop innehöll inga filament. De integrerade klorofyllhalterna (0–10 m och 0–20 m) inom det normala för månaden vid alla stationer.



Abstract

In Kattegat the spring bloom seemed to be just around the corner. Anholt E was sampled in late January with low cell numbers. Only 10 days later, in February, there was an increase in chains of the common spring bloom species *Skeletonema marinoi*, but not yet in amounts characteristic of a bloom. The stations in the Skagerrak showed no signs of a spring bloom, as neither the total cell number nor the species composition provided any indication. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month at all stations.

Diversity and cell abundance of phytoplankton were very low in the Baltic Sea, dominated by smaller cells such as Cryptomonadales and smaller Gymnodiniales. The chain-forming diatom *Skeletonema marinoi* was present at the more northerly stations. Along the eastern part of Gotland and in the northern parts of the cruise, filaments of *Aphanizomenon flosaquae* was present according to images from the Imaging Flowcytobot. However, hose samples collected in the same area and analysed under microscope contained no filaments. The integrated chlorophyll concentrations (0–10 m 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) 6th of February

The species diversity and the total cell numbers were very low. Smaller cells dominated and different species of Cryptomonadales, the diatom *Cylindrotheca closterium* and *Emiliania huxleyi* were common. Different species of naked dinoflagallates of varying size were also common. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

Släggö (Skagerrak coast) 6th of February

The species diversity was moderate but the total cell numbers were quite low. Some cells of the diatoms *S. marinoi* and *Thalassiosira angulata* were present. Among the dinoflagellates *Akashiwo sanginuea* and *Tripos lineatus* were recorded. Among the smaller cells Cryptomonadales and *E. huxleyi* were most abundant. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

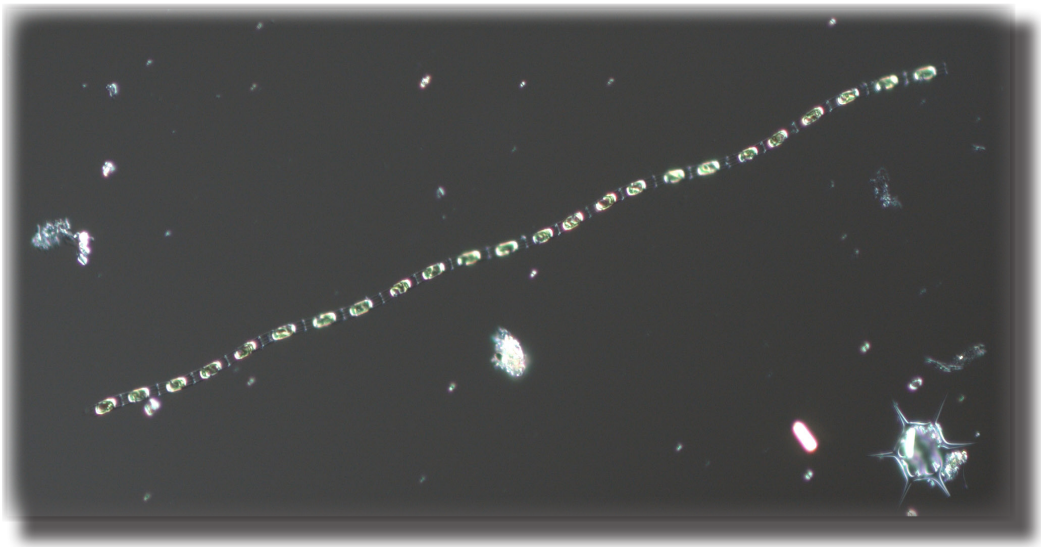


Fig 1. The diatom *Skeletonema marinoi* was found in relatively high amounts on the second occasion at Anholt E, indicating the onset of an upcoming spring bloom. Photo: M. Johansen.

The Kattegat

Anholt E 28th of January and 7th of February

The species diversity and total cell numbers were both low on the first occassion. The diatoms dominated in the sample and *T. angulata, S. marinoi* and some *Nitzschia longissima* were abundant. Among the smaller cells Cryptomonadales and *E. huxleyi* were most abundant. On the second occasion, ten days later, a slight hint of an upcoming spring bloom was noted. Mostly diatoms were present in larger amounts and especially chains of *S. marinoi* were common. Other common diatoms were different species of *Thalassiosira*. The dinoflagellates were represented by *T. lineatus*. The smaller cells were mainly represented by different Cryptomonadales. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

N14 Falkenberg 7th of February

The species diversity and the total cell numbers were low. Relatively small cells dominated in the sample and different species of Cryptomonadales and the dinoflagellate *Heterocapsa rotundata* were present in higher amounts. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

The Baltic

BY2 Arkona 8th BY5 Bornholm deep 9th of February
The phytoplankton diversity and abundances were very low. mainly small cells such as Cryptomonadales, Gymnodiniales, *Eutreptiella gymnastica* and small ciliates were noted. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

BCSIII-10 9th of February
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and Gymnodiniales. A few colonies of the cyanobacteria genus *Lemmermaniella* were also recorded. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

BY15 Gotland deep 10th of February
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and Gymnodiniales. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

BY29 11th of February
The phytoplankton diversity and abundances were low. Diatoms were dominating and several chains of *S. marinoi* were observed Among the small cells Cryptomonadales were found in highest numbers. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

BY31 Landsort deep 12th of February
The phytoplankton diversity and abundances were very low. There were however quite a few chains of the diatom *S. marinoi*. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

BY38 12th of February
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and ciliates. There were a few diatom cells of *S. marinoi* and the potentially toxic dinoflagellate *Dinophysis acuminata** and *Peridiniella catenella.* The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

BY39 12th of February
The phytoplankton diversity and abundances were very low. There were a few dinoflagellate cells of *Peridiniella catenata* and some *S. marinoi* chains. The integrated chlorophyll concentrations (0–10 m and 0–20 m) were within normal for this month.

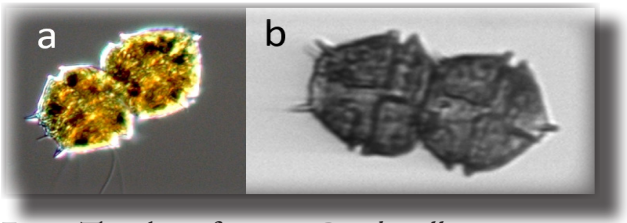
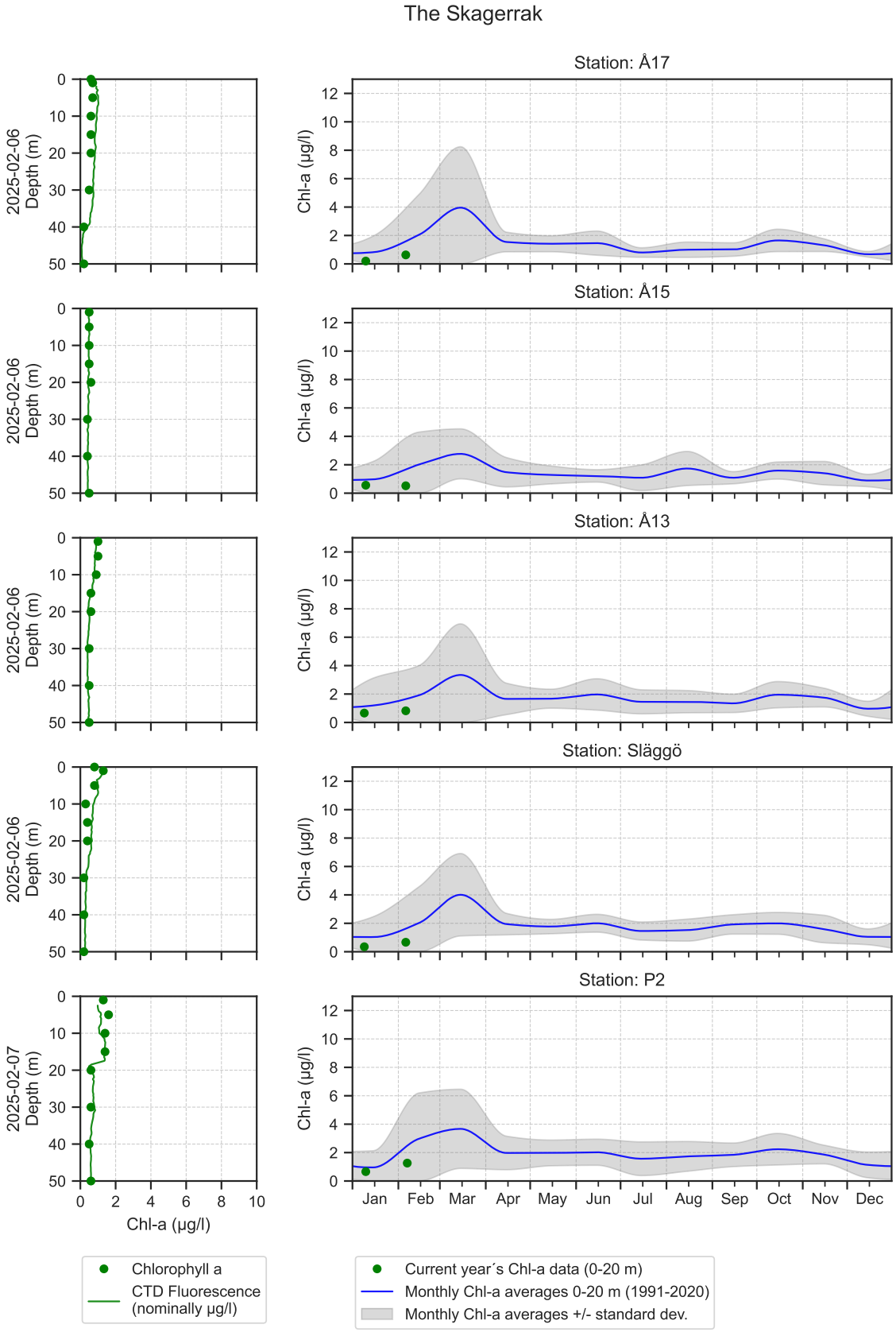


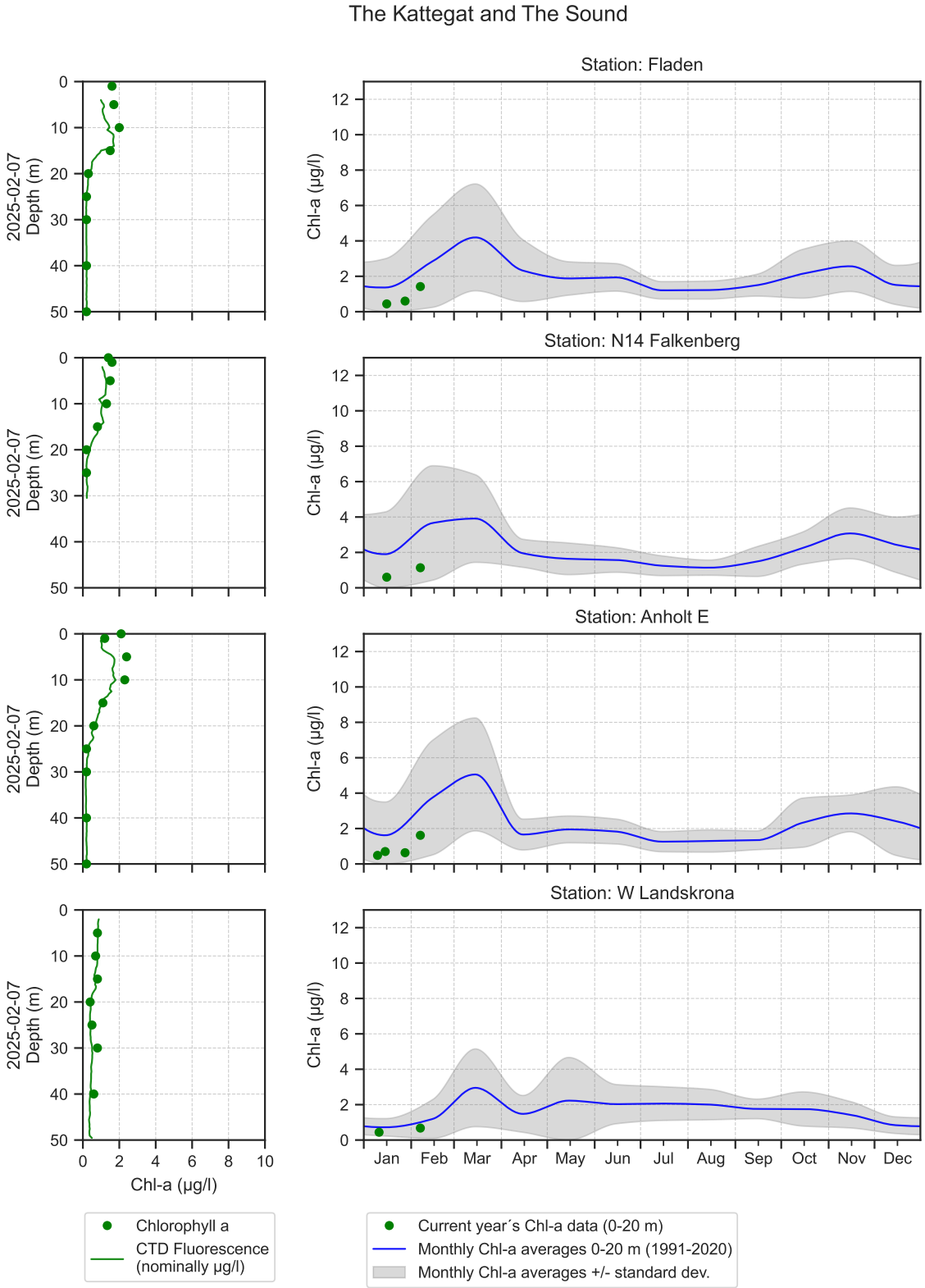
Fig 2. The chain forming *Peridiniella catenata,* a common dinoflagellate in the spring bloom in the Baltic proper, was found in low concentrations at the northern stations in the Baltic Proper. Figure a) present a picture taken by microscope and figure b) is from the Imaging Flow Cytobot photographed when passing through the system. Photo on the left: M. Johansen.

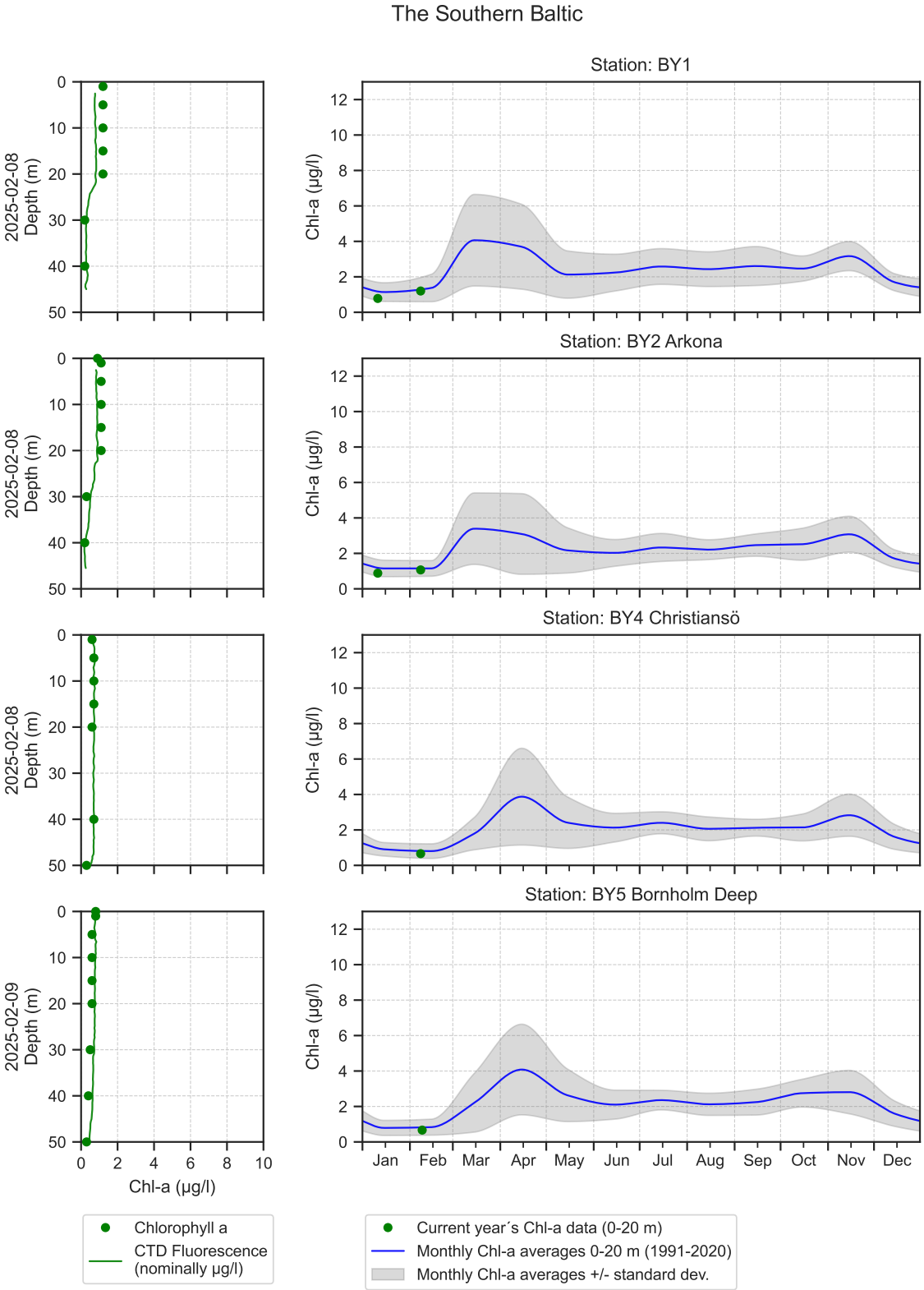
Phytoplankton analysis and text:
Marie Johansen.

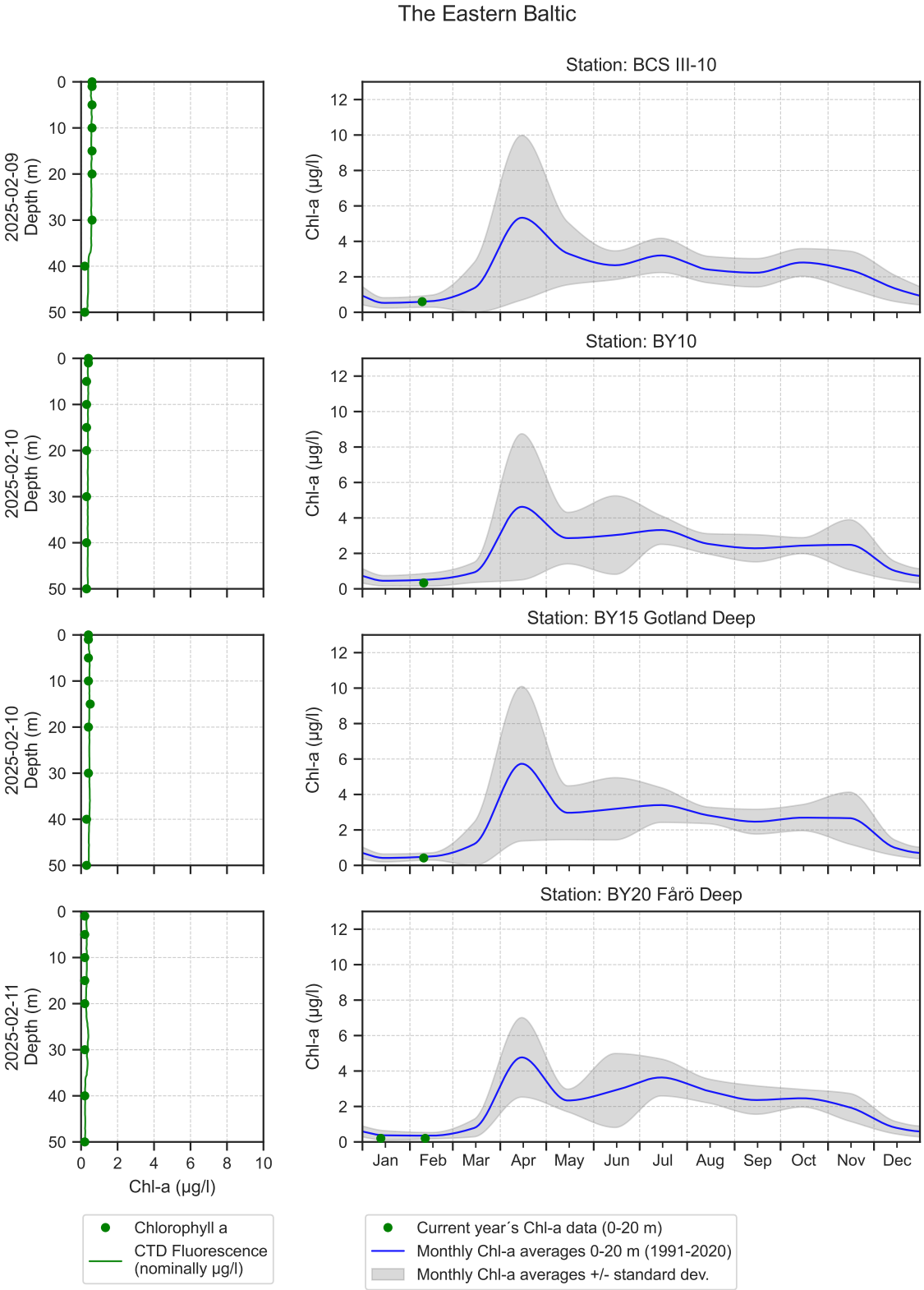
Selection of observed species	Anholt E	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	28/1	7/2	7/2	6/2	6/2
Hose 0-10 m	presence	presence	presence	presence	presence
Cerataulina pelagica	present				
Chaetoceros debilis		present			
Chaetoceros similis		common	present	present	
Chaetoceros subtilis			present		
Chaetoceros tenuissimus			present		
Coscinodiscus radiatus	present	present			
Cylindrotheca closterium					common
Ditylum brightwellii		present			
Guinardia delicatula			present		
Leptocylindrus danicus		present			
Leptocylindrus minimus				present	
Nitzschia longissima	common	present	present	present	present
Pleurosigma				present	
Proboscia alata	present				
Skeletonema marinoi	common	very common		present	present
Thalassionema nitzschioides		present		present	
Thalassiosira angulata	common	present		common	
Thalassiosira anguste-lineata		present			
Thalassiosira gravida	present	present			
Akashiwo sanguinea	present			common	
Dinophysis acuminata				present	
Dinophysis norvegica	present				
Gymnodiniales					common
Gymnodinium verruculosum	present			present	
Heterocapsa rotundata			common	present	
Karenia					present
Peridiniales					present
Polykrikos schwartzii				present	
Protoperidinium pellucidum			present		
Tripos lineatus	common	common		common	
Tripos muelleri	present			present	present
Emiliania huxleyi	common	present		common	common
Pleurochrysis					present
Heterosigma akashiwo			present		present
Cryptomonadales	common	present	common	common	common
Apedinella radians			present		
Octactis speculum	common	present		present	
Pseudochattonella			present		
Diaphanoeca sphaerica				present	
Paulinella ovalis	present			present	
Cryothecomonas scybalophora			present	present	
Ciliophora	present		common	common	present
Mesodinium rubrum		present			

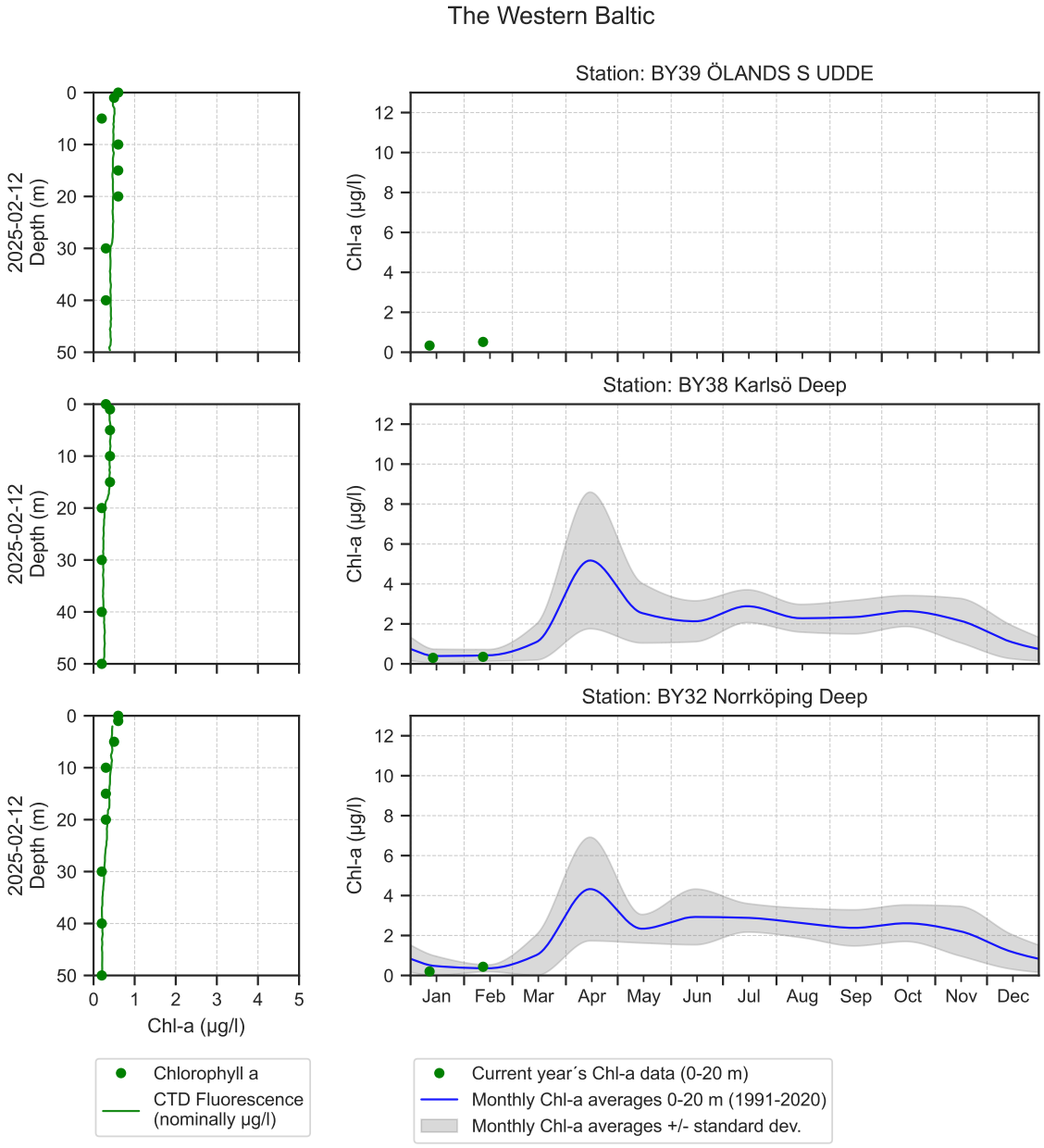
Selection of observed species	BCS III-10	BY2	BY5	BY29	BY31	BY38	BY39
Red=potentially toxic species	9/2	8/2	9/2	11/2	12/2	12/2	12/2
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence
Actinocyclus		present			present		present
Chaetoceros				present	present		
Chaetoceros danicus				present			
Cylindrotheca closterium			present				
Melosira nummuloides				present			
Nitzschia longissima			present				
Skeletonema marinoi				common	common	present	present
Dinophysis acuminata						present	present
Gymnodiniales	present	common	present		present		present
Heterocapsa rotundata	present						
Peridiniella catenata						present	present
Oocystis		present				present	
Cryptomonadales	common	common	common	common	present	common	common
Eutreptiella gymnastica		present	present			present	
Aphanocapsa						present	
Aphanothece	present	present					
Lemmermanniella	present					present	present
Snowella				present			
Ciliophora	present	present	common	present	present	present	present
Mesodinium rubrum	present	present	present	present	present	common	present


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
2025-02-06
2025-02-07
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 (1991-2020)
Monthly Chl-a averages +/- standard dev.


The Kattegat and The Sound
Station: Fladen
Station: N14 Falkenberg
Station: Anholt E
Station: W Landskrona
2025-02-07
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 (1991-2020)
Monthly Chl-a averages +/- standard dev.


The Southern Baltic
Station: BY1
Station: BY2 Arkona
Station: BY4 Christiansö
Station: BY5 Bornholm Deep
2025-02-08
2025-02-09
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 (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
2025-02-09
2025-02-10
2025-02-10
2025-02-11
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.



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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