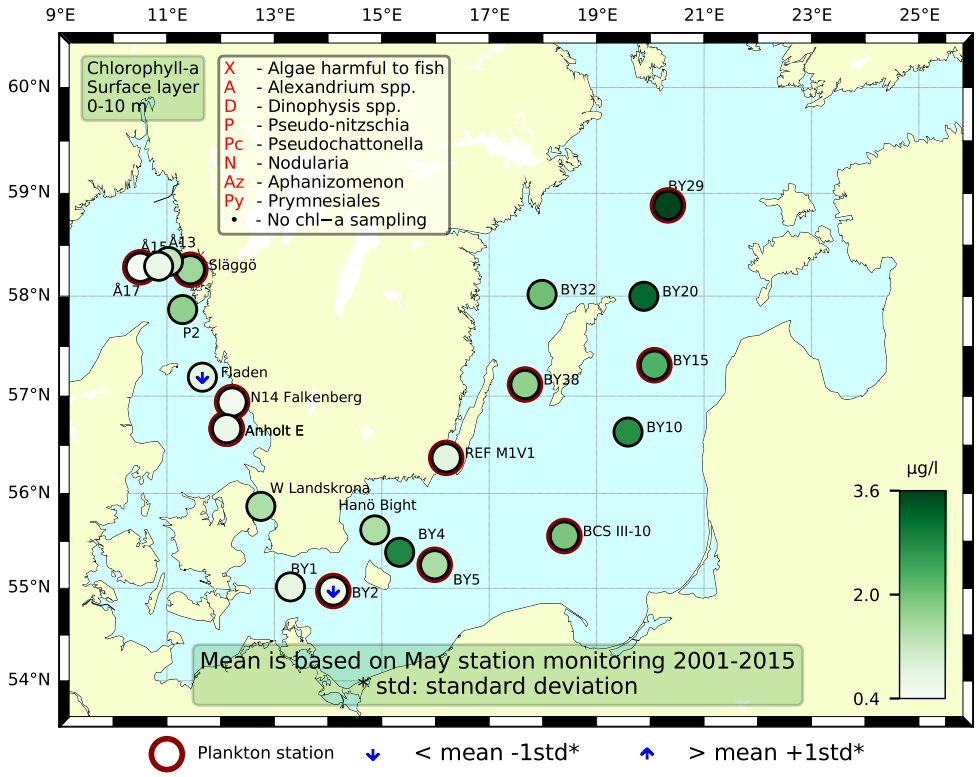
SMHI
Oceanographic Unit
No 5, May 2021

AlgAware
Dnr: S/Gbg-2021-80
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

Vid samtliga stationer i Västerhavet dominerade kiselalger och framför allt återfanns höga cellantal av *Skeletonema marinoi*. Bland de dinoflagellater som återfanns var det släktet *Tripos* som var vanligast. De integrerade klorofyllvärdena var normala för årstiden. Värt att nämna var att vid Anholt E som besöktes med två dagars mellanrum återfanns en klorofyllfluorescenstopp. Vid första besöket låg den vid 20 meter och bidrog till ett något förhöjt integrerat klorofyll (0-20 m). Vid det andra besöket hade klorofyllhalterna sjunkit något varvid det integrerade klorofyllet låg inom det normala för månaden.

En blomning av den potentiellt giftiga gruppen Prymnesiales observerades i södra och sydöstra Östersjön med högst cellantal vid station BY4. Den filamentösa cyanobakterien *Aphanizomenon flosaquae* fanns i ganska stor mängd vid stationerna BCSIII-10, BY15, BY29 och BY38. En klorofyllfluorescenstopp vid BY32 orsakades till stor del av prasinophyceén *Pterosperma* sp. De integrerade klorofyllvärdena låg inom det normala vid samtliga stationer förutom BY2 där de var under det normala för denna månaden.



Abstract

All stations along the west coast had a domination of diatoms and far most common was *Skeletonema marinoi*. Among the dinoflagellates the genus *Tripos* was most common. Chlorophyll concentrations at all stations were normal for this month. Worth mentioning is that Anholt E was visited twice. On both occasions a fluorescens peak was found at about 20 meters. On the first occasion it contributed to the integrated chlorophyll concentration (0-20 m) being a bit high. On the second occasion the chlorophyll concentrations were lower and consequently the integrated values were normal for this month.

A bloom of the potentially toxic group Prymnesiales was observed in the southern and southeastern Baltic with the highest cell numbers quantified at BY4. The filamentous cyanobacterium *Aphanizomenon flosaquae* was found in rather high amounts at the stations BCSIII-10, BY15, BY29 and BY38. A chlorophyll fluorescence maximum at BY32 was mainly caused by the Prasinophyceae *Pterosperma* sp. The integrated chlorophyll concentrations were within normal at all stations except BY2 where they were below 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) 20th of May

Both phytoplankton diversity and abundance were relatively high. The diatom *Skeletonema marinoi* dominated in numbers but the genus *Pseudo-nitzscha** and *Proboscia alata* were also common. Several species of the dinoflagellate genus *Tripos* were abundant. The smaller cells were mainly represented by the genus *Dinobryon* and the coccolithophore *Emiliania huxleyi.* The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

Släggö (Skagerrak coast) 20th of May

Both phytoplankton diversity and abundance were relatively high. The diatom *Skeletonema marinoi* dominated in cell numbers. Other common species were *Pseudo-nitzschia* sp.*, the dinoflagellates *Tripos muelleri* and *Dinophysis norvegica**. The smaller cells were quite low in numbers represented mainly by the genus *Dinobryon* and the order Cryptomonadales. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

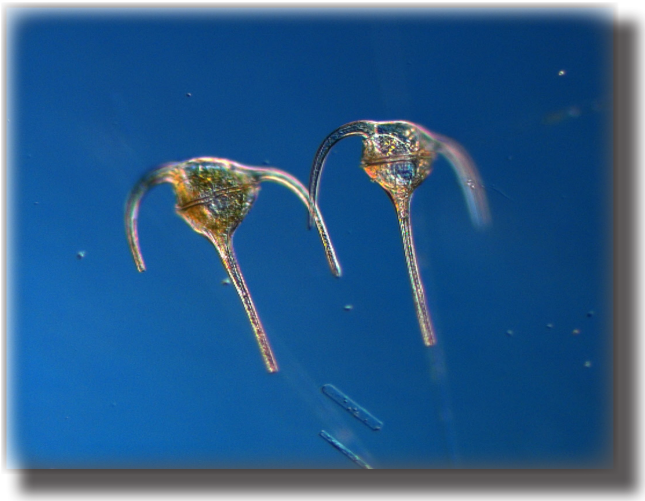


Figure 1. The dinoflagellate *Tripos muelleri* was abundant in the Skagerrak and Kattegat areas. Photo: Ann-Turi Skjevik.

The Kattegat

Anholt E 19th and 21st of May

The phytoplankton diversity was moderate whereas the total abundance was high on both occasions. The diatom *Skeletonema marinoi* had the highest cell numbers. Among the dinoflagellates *Tripos muelleri* was the most common. The smaller cells were dominated by cryptomonadales. A chlorophyll fluorescence peak was found at about 20 meters on both occasions and were dominated by diatoms of different species. *S. marinoi* was the most numerous, but other species were also abundant. The integrated (0-10 m) chlorophyll concentrations were within normal for this month. The deeper integrated (0-20 m) chlorophyll were in the higher region of what is normal on the first occasion but had decreased to normal on the second occasion.

N14 Falkenberg 19th of May

Both phytoplankton diversity and abundance were moderate. The community was dominated by *Skeletonema marinoi*. Diatoms dominated clearly and only a few dinoflagellates were recorded among those *Tripos muelleri* was found with the highest cell numbers. The smaller cells were dominated by different species of cryptomonadales. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

The Baltic

BY2 21st of May
Phytoplankton diversity and total cell concentrations were low. Various cyanobacteria colonies were abundant. Small cells of unidentified dinoflagellates and other flagellates were common. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were below normal for this month.

BY5 22nd of May
The sample was dominated by small flagellates of which the potentially harmful group Prymnesiales was a large part. Cyanobacteria colonies were abundant. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

BCSIII-10 22nd of May
The phytoplankton diversity was rather high among small cells of different groups. Prymnesiales and the diatom *Chaetoceros similis* were abundant. The filamentous cyanobacterium *Aphanizomenon flosaquae* was present in rather high amounts. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

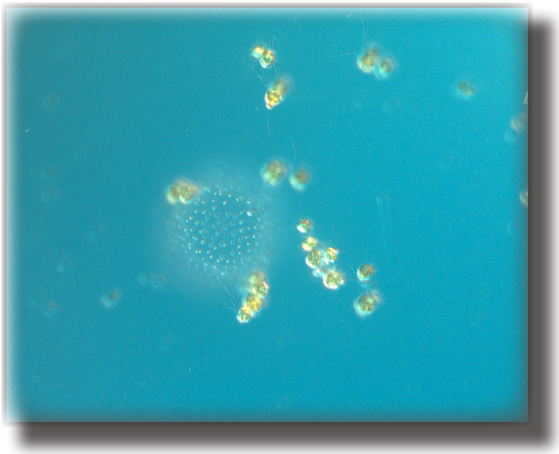


Figure 2. Prymnesiales and cyanobacteria colonies were abundant at several stations. Photo: Ann-Turi Skjevik.

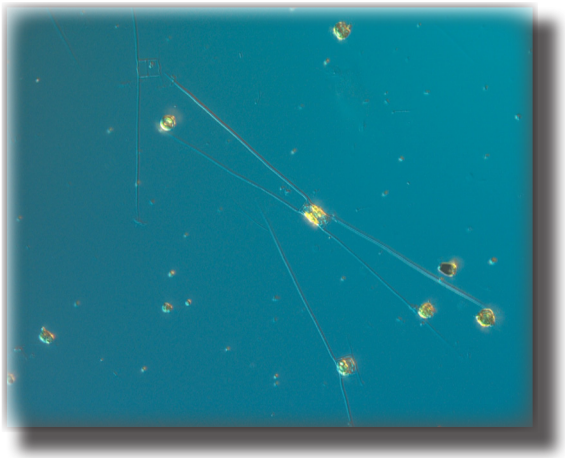


Figure 3. The diatom *Chaetoceros similis* was abundant at BCSIII-10. Photo: Ann-Turi Skjevik.

BY15 23rd of May
Ciliates and the Prasinophyceae *Pterosperma* sp. were found with the highest cell numbers. *A. flosaquae* and the green algae *Binuclearia lauterbornii* were rather numerous. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

BY29 24th of May
Aphanizomenon flosaquae and the dinoflagellate *Peridiniella catenata* were abundant.

BY38 24th of May
Moderate and more or less equal amounts of *A. flosaquae*, the potentially toxic dinoflagellate *Dinophysis acuminata,* ciliates and *Pterosperma* sp. were noted. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

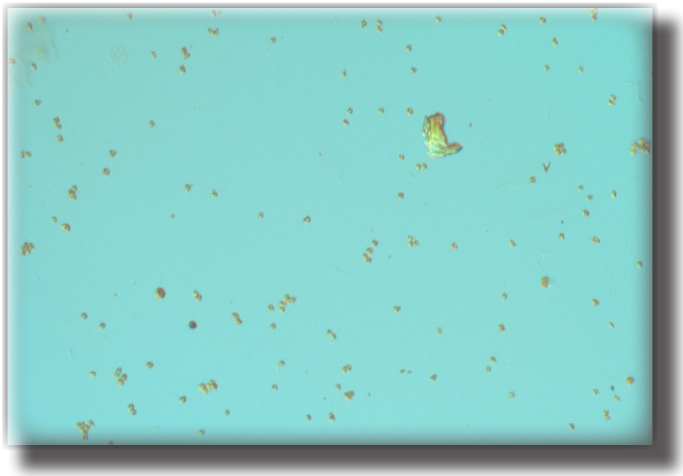
REFM1V1 18th of May
The phytoplankton diversity was low and there were mostly small cells in low cell numbers. The diatom S*keletonema marinoi* was however abundant. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

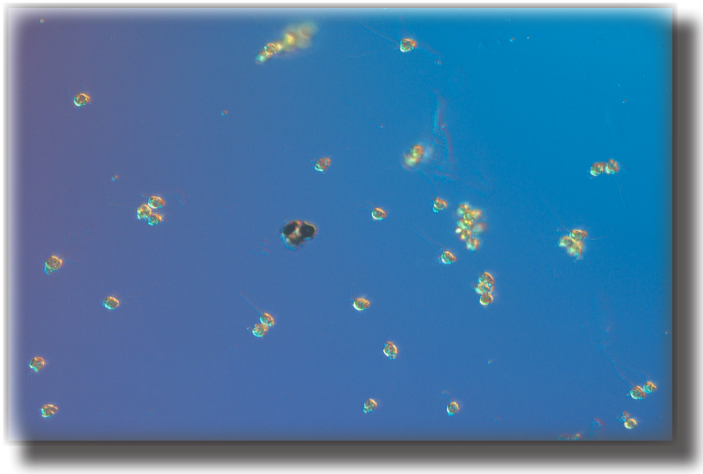
Chlorophyll fluorescence maxima

BY4 22nd of May
A bloom of the potentially harmful group Prymnesiales was observed at 10 meters depth with approximately 7.4 million cells per liter.

BY32 24th of May
Pterosperma sp. mainly caused the chlorophyll maximum at 20 meters depth.

W Landskrona 19th of May
Prymnesiales was observed in high cell numbers mixed with various diatoms at 10 meters depth.



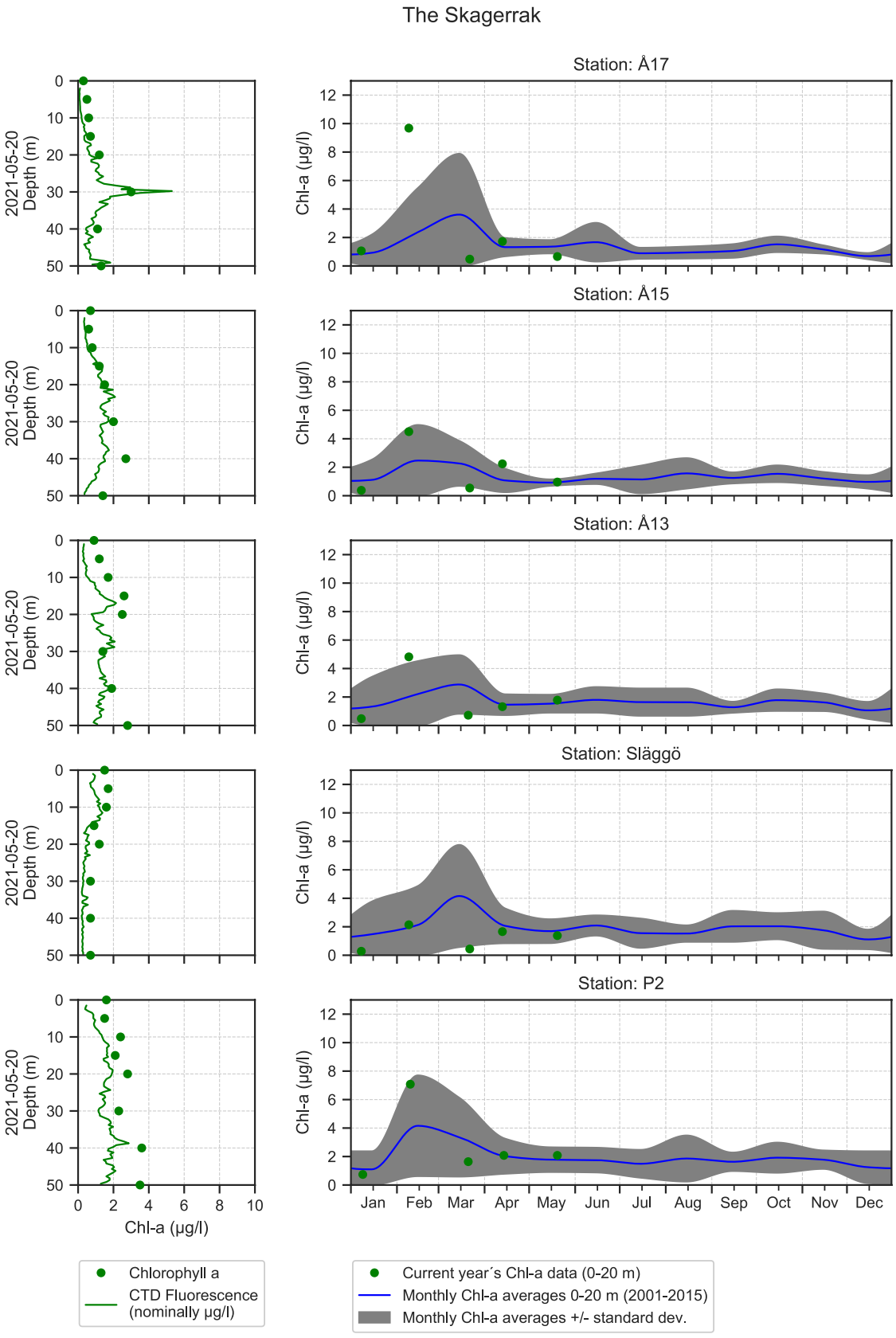


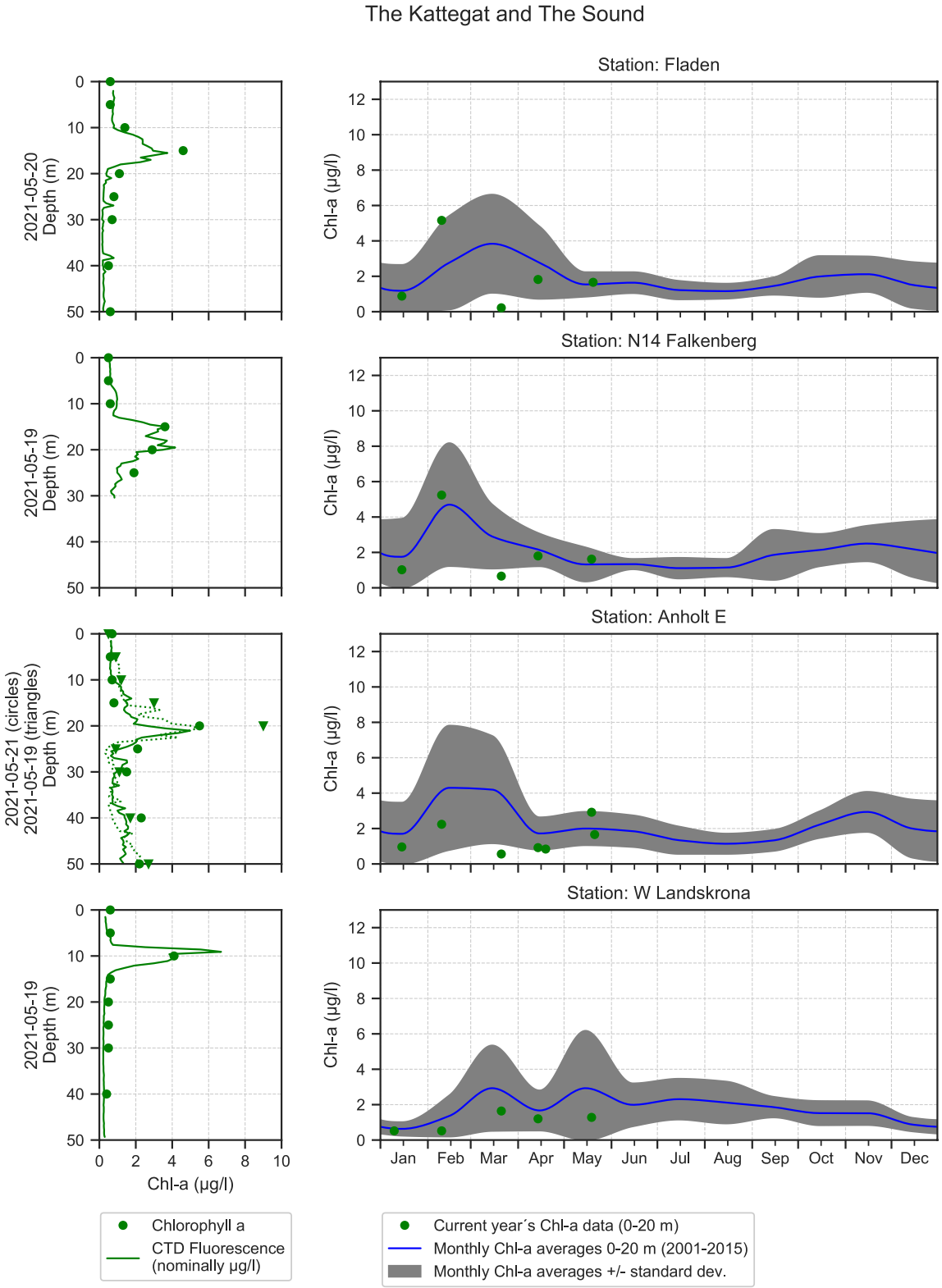
A bloom of the potentially toxic group Prymnesiales was observed in the southern and southeastern Baltic with a maximum at BY4.

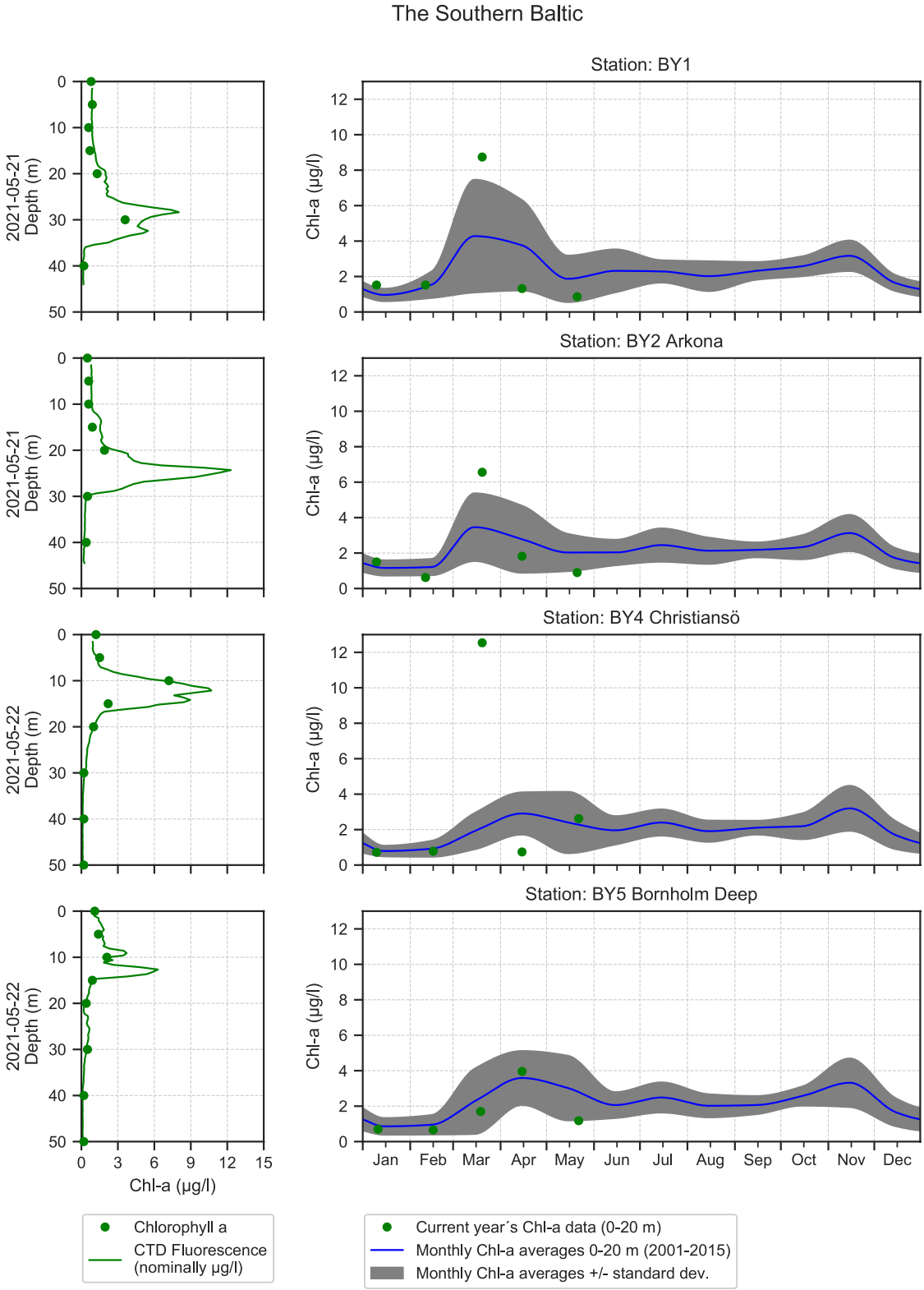
Phytoplankton analysis and text:
Ann-Turi Skjevik and Marie Johansen

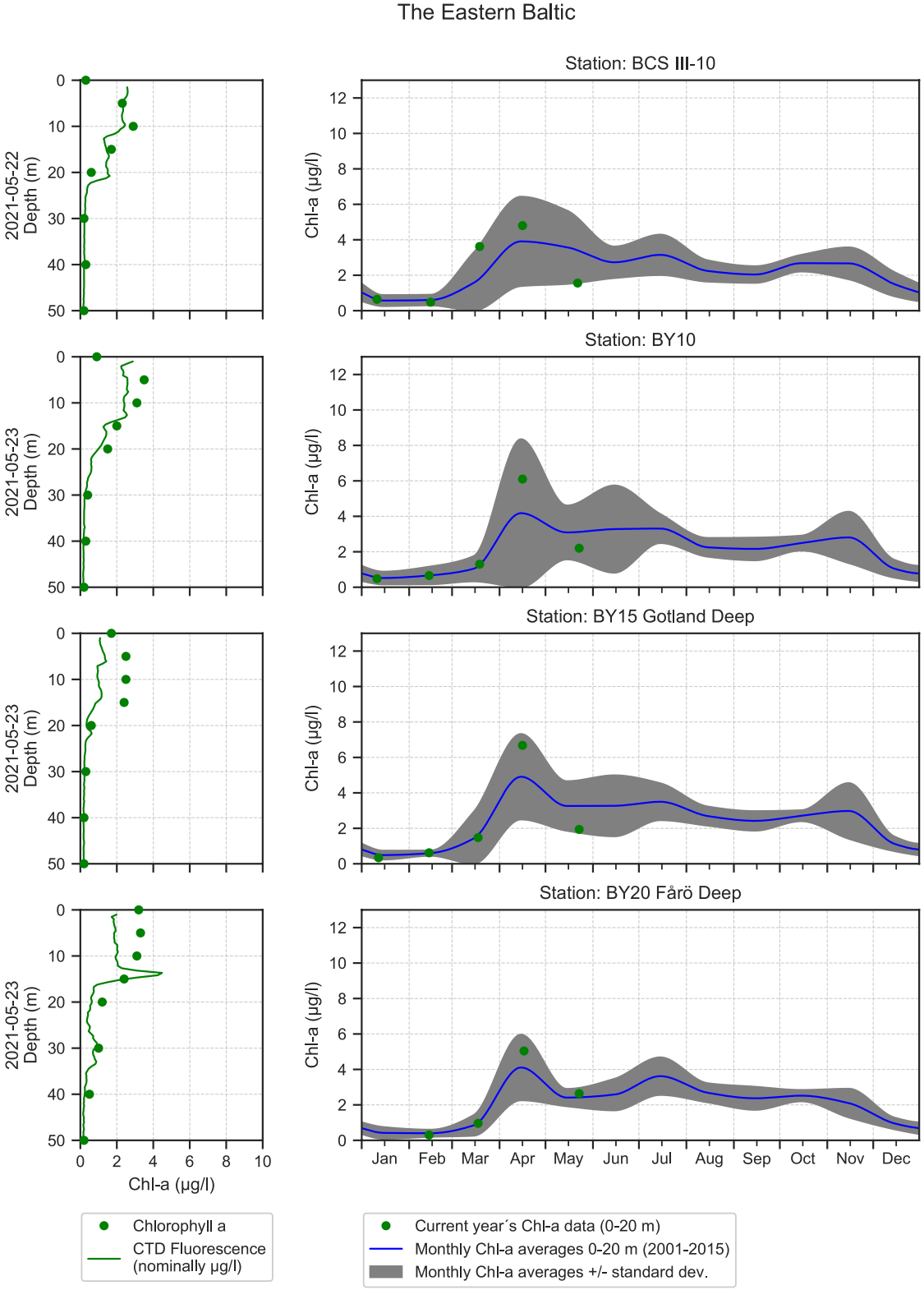
Selection of observed species	Anholt E	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	19/5	21/5	19/5	20/5	20/5
Hose 0-10 m	presence	presence	presence	presence	presence
Cerataulina pelagica				present	
Chaetoceros					present
Chaetoceros socialis	present				
Cylindrotheca closterium				present	present
Dactyliosolen fragilissimus	present	present	present	present	present
Guinardia delicatula	present		present		present
Lennoxia faveolata	present	present	present		
Leptocylindrus danicus					present
Nitzschia longissima		present		present	present
Proboscia alata	present	present	present	present	common
Pseudo-nitzschia	present	present	present	very common	very common
Rhizosolenia setigera		present			
Skeletonema marinoi	dominating	dominating	dominating	dominating	very common
Amphidinium		present			
cf. Azadinium			present		
Dinophysis norvegica				common	present
Gymnodiniales	present	present	present	present	present
Gyrodinium spirale				present	
Karlodinium veneficum				present	
Katodinium glaucum		present			
Lessardia elongata	present	present	present		
Peridiniales	present	present	present		present
Peridiniella danica	present	present	present		
Protoperidinium pallidum				present	
Protoperidinium pellucidum	present				
Protoperidinium steinii			present		
Scrippsiella cpx				present	present
Tripos fusus				present	present
Tripos longipes					present
Tripos macroceros					common
Tripos muelleri	common	common	present	common	common
Dinobryon				present	present
Dinobryon balticum				present	common
Emiliania huxleyi			present	present	common
Prymnesiales		present	present	present	
Chlorodendrales				present	
Cryptomonadales	common	common	common	present	
Leucocryptos marina	present	present	present	present	
Telonema subtile	present	present	present		
Eutreptiella					present
Pseudanabaena	present	present		present	
Choanoflagellatea	present	present	present		
Ebria tripartita			present		
Ciliophora	present		present	present	present
Mesodinium rubrum					present
Laboea strobila			present		present
Strombidium				present	present

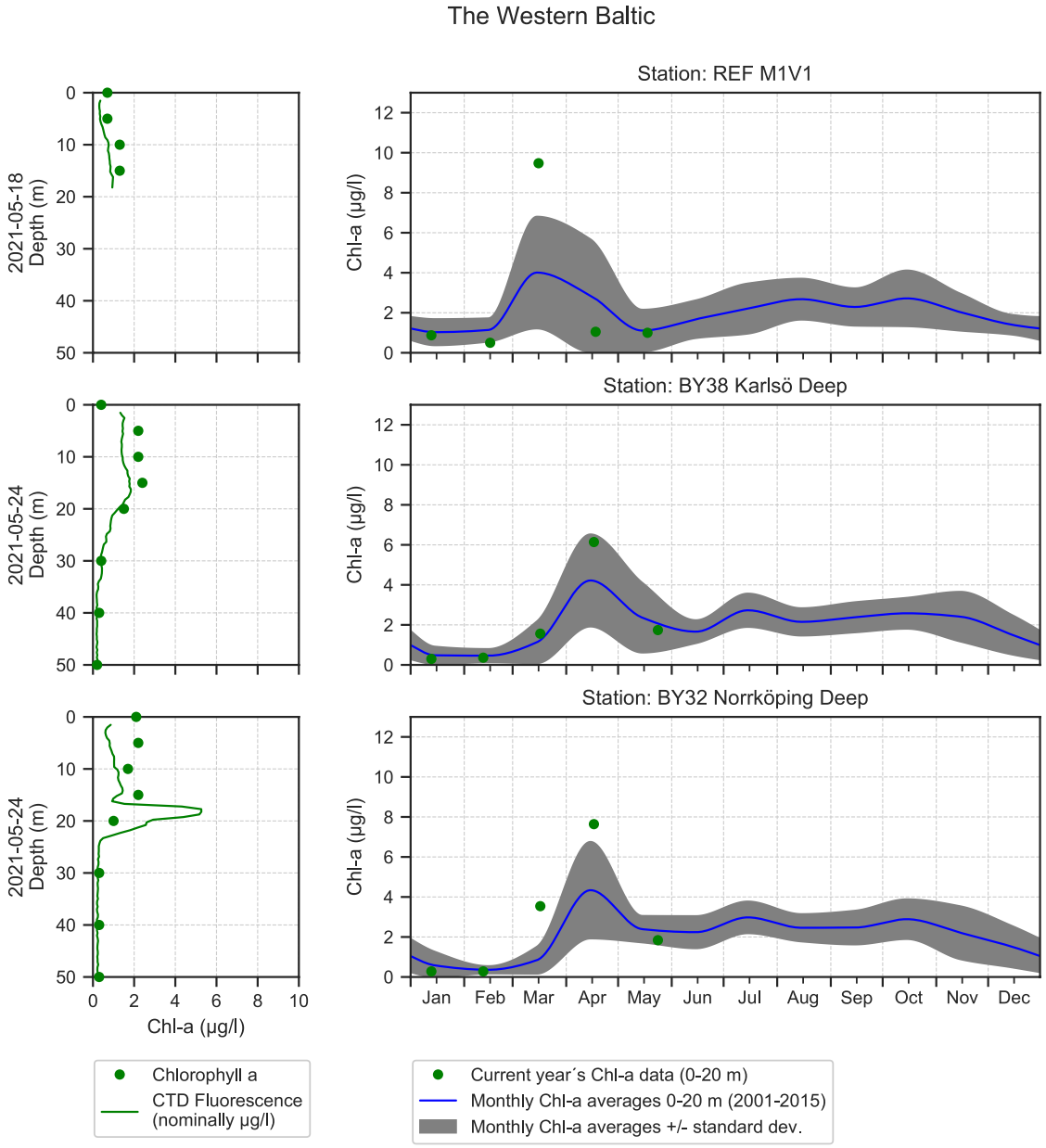
Selection of observed species	BCSIII-10	BY2	BY5	BY15	BY29	BY38	REFM1V1
Red=potentially toxic species	22/5	21/5	22/5	23/5	24/5	24/5	18/5
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence
Attheya septentrionalis					present	present	
Chaetoceros similis	common			present		present	present
Chaetoceros subtilis	present						
Skeletonema marinoi			present		present		common
Thalassiosira					present	present	
Amphidinium crassum					present		
Dinophysis acuminata	common		present	common	present	common	
Dinophysis norvegica	present			present		present	
Gymnodiniales	common	common	common	present	present	present	present
Gyrodinium spirale				present		present	
Heterocapsa				present	present	present	present
Heterocapsa rotundata				present	present	present	present
Katodinium glaucum						present	
Peridiniales		common			present		
Peridiniella catenata					common	present	
Phalacroma rotundatum						present	
Protoperidinium							present
Protoperidinium bipes						present	present
Prymnesiales	very common	common	very common	common			
Eutreptiella						present	
Pterosperma	common		present	very common		common	present
Pyramimonas	common			present		present	present
Apedinella radians						present	
Pseudopedinella pyriformis						present	
Aphanizomenon flosaquae	common			common	common	common	present
Aphanocapsa	common	common	common	present	present	present	
Aphanothece paralleliformis	present	present	present				
Lemmermanniella	present		present				
Snowella	common	present	present			present	
Binuclearia lauterbornii	present	present	present	common	present		
Cryptomonadales	common		present	present	present	present	present
Dinobryon	present			present	common	present	present
Monoraphidium					present		
Flagellates		common	common				
Ebria tripartita							present
Calliacantha longicaudata				present			
Calliacantha natans				present		present	
Choanoflagellatea		present	present		present	present	present
Leucocryptos marina				present			
Mesodinium rubrum	present				present	present	present
Ciliophora	common	common		very common	present	common	common


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
2021-05-20
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
2021-05-20
2021-05-19
2021-05-21 (circles)
2021-05-19 (triangles)
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
2021-05-21
2021-05-22
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
2021-05-22
2021-05-23
2021-05-23
2021-05-23
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.

Oversikt 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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Havs
och Vatten
myndigheten