SMHI
Oceanographic Unit
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AlgAware
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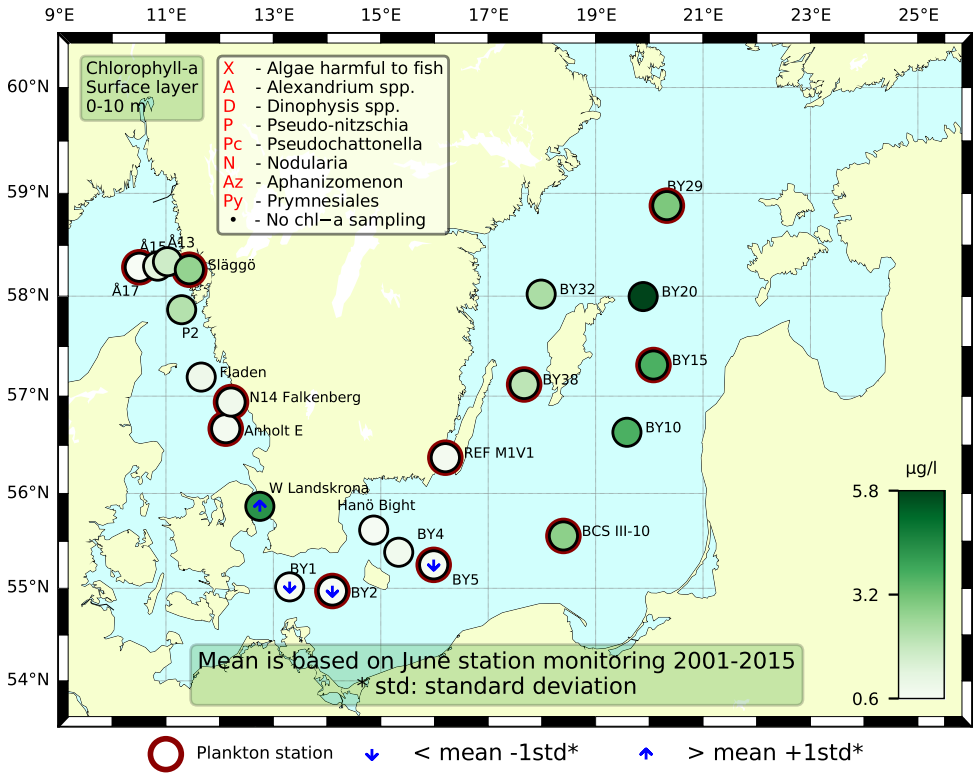
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning
Vid samtliga stationer i Västerhavet dominerade kiselalger i olika grad och framför allt återfanns höga cellantal av *Dactyliosolen fragilissimus.* Bland de få dinoflagellater som noterades var det släktet *Tripos* som var vanligast. Vid flertalet stationer återfanns relativt höga cellantal av coccolitophoriden *Emiliania huxleyi*. De integrerade klorofyllvärdena var normala för årstiden förutom vid W Landskrona där de var förhöjda.

Blomningen av Prymnesiales* som det rapporterades om förra månaden var fortfarande kraftig och orsakade höga klorofyllfluorescensmaxima vid många stationer. Maxima låg så pass djupt att de har bara påverkat och gett integrerade (0-20 m) värden över det normala för månaden vid ett fåtal stationer. De integrerade värdena på kartan på framsidan (0-10 m) är för grunda för att ha påverkats och var i stället under det normala i södra Östersjön. Den filamentösa cyanobakterien *Aphanizomenon flosaquae* fanns i ganska stor mängd vid stationerna BCSIII-10, BY15, BY29 och BY38 precis som förra månaden. Enstaka trådar av *Nodularia spumigena** fanns vid BY2.



Abstract
All stations along the west coast had a domination of diatoms to some extent. Most common was *Dactyliosolen fragilissimus*. The dinoflagellates were not common and mostly represented by the genus *Tripos*. The coccolithophorid *Emiliania huxleyi* was found in relatively high numbers at several stations. The integrated chlorophyll concentrations were normal at all stations for this month only exception was W Landskrona where they were above normal.

The reported Prymnesiales* bloom from last month was still heavy and caused high chlorophyll fluorescence peaks at many stations. The peaks were too deep to affect most integrated chlorophyll concentrations, both 0-10 (map on front page) and 0-20 meters. In the southern Baltic some stations actually had integrated 0-10-concentrations below normal. A few stations had integrated chlorophyll concentrations (0-20 m) above normal for this month. The filamentous cyanobacterium *Aphanizomenon flosaquae* was found in rather high amounts at BCSIII-10, BY15, BY29 and BY38, just like last month. A few filaments of *Nodularia spumigena** were present at BY2.

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

The Skagerrak

Å17 (open Skagerrak) 12th of June

Both phytoplankton diversity and abundance were low. Diatoms dominated and among those the genus *Pseudo-nitzschia**, *Guinardia flaccida*, *Dactyliosolen fragilissimus* and *Proboscia alata* were most common. Only a few dinoflagellates were present and mostly of the genus *Tripos* The small cells were dominated by the coccolithophore *Emiliania huxleyi*. A thin fluorescens maxima was recorded at about 40 meters. The extra sample collected might however have missed the maxima as nothing special was recorded in the sample. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

Släggö (Skagerrak coast) 13th of June

Phytoplankton diversity was low whereas total cell numbers were high. The sample was clearly dominated by the diatom *Dactyliosolen fragilissimus* but *Cerataulina pelagica* was also common. Only a few dinoflagellates were present for example a few cells of the genus *Dinophysis**. Among the smaller cells *Emiliania huxleyi* and different cryptomonads were common. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

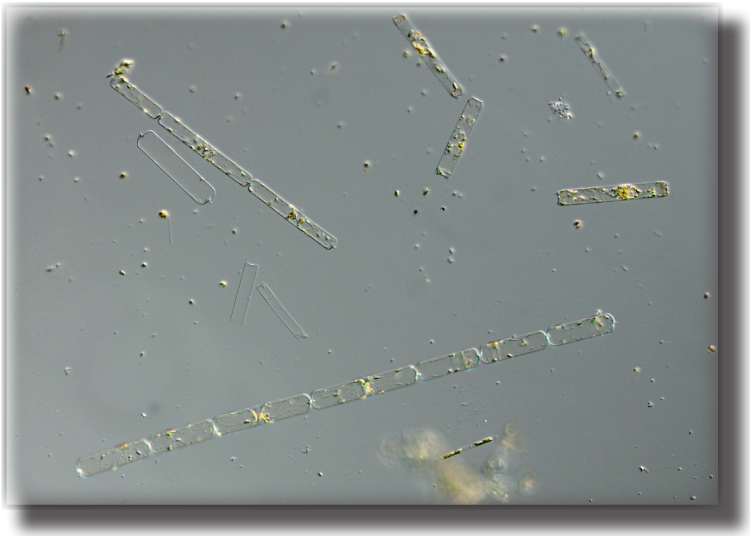


Figure 1. The diatoms *Dactyliosolen fragilissimus* and *Cerataulina pelagica* (upper right corner) were common at the Skagerrak stations. Photo: Marie Johansen.

The Kattegat

Anholt E 11th of June

Both phytoplankton diversity and abundance were low. Some diatoms were relatively common such as *Dactyliosolen fragilissimus*, *Proboscia alata* and *Thalassionema nitzschioides.* Small cells were most common in the sample and a lot of different colony-forming cyanobacteria were present together with different cells of cryptomonads and the genus *Dinobryon.* The integrated (0-10 m) chlorophyll concentrations were within normal for this month.

N14 Falkenberg 12th of June

Phytoplankton diversity was low whereas total cell numbers was relatively high. The sample was clearly dominated by the diatom *Dactyliosolen fragilissimus* but *Proboscia alata* was also common. Only a few dinoflagellates were present for example a few cells of *Amphidinium crassum***.** Among the smaller cells *Emiliania huxleyi* and different cryptomonads were common. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

The Baltic

BY2 11th of June

Phytoplankton diversity and total cell concentrations were very low. A few specimens of the filamentous cyanobacteria *Aphanizomenon flosaquae* and *Nodularia spumigena** were present. Various cyanobacteria colonies were abundant. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were below normal for this month.

BY5 10th of June

The species diversity was low, cyanobacteria colonies and Prymnesiales* were however abundant. A few filaments of *A. flosaquae* were found. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

A chlorophyll fluorescence peak at 23 meters was caused by a dense bloom of Prymnesiales*.

BCSIII-10 10th of June

The filamentous cyanobacterium *A. flosaquae* was present in rather high amounts and cyanobacteria colonies and Prymnesiales* were abundant. The dinoflagellates *Dinophysis norvegica** and *D. acuminata** were numerous. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

A chlorophyll fluorescence peak at 17 meters was mainly caused by a Prymnesiales* bloom.

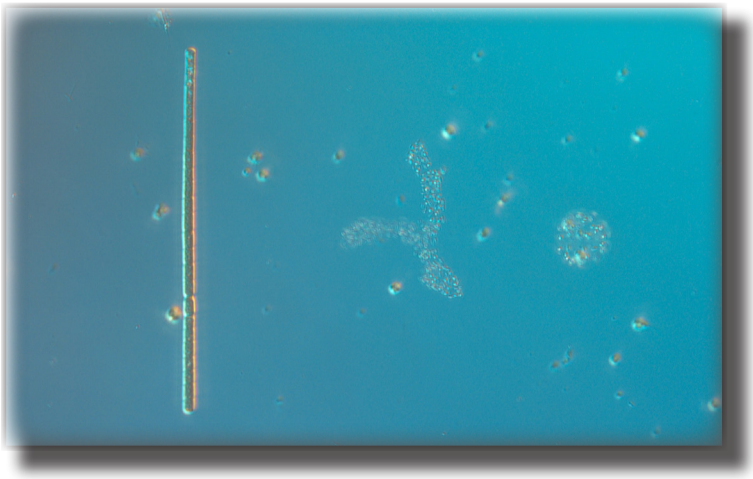


Figure 2. The filamentous cyanobacterium *Aphanizomenon flosaquae* and various cyanobacteria colonies were numerous. Photo: Ann-Turi Skjevik.

BY15 9th of June

The filamentous cyanobacterium *A. flosaquae* was present in rather high amounts and cyanobacteria colonies and Prymnesiales* were abundant The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

A chlorophyll fluorescence peak at 15 meters was to a great extent caused by a mix of Prymnesiales*, *Dinophysis acuminata** and *D. norvegica** Not as many Prymnesiales* as at the maxima at the southern Baltic stations though.

BY29 9th of June

A. flosaquae was found in elevated amounts and small flagellates like *Pseudopedinella* were abundant. Cysts from the colony forming flagellate *Dinobryon balticum* were numerous.

BY38 8th of June

The phytoplankton diversity was low, although elevated amounts of *A. flosaquae* were found. Prymnesiales* and cyanobacteria colonies were present. The integrated chlorophyll concentrations, 0-10 and 10-20 m, were within normal for this month.

Chlorophyll fluorescence maxima

Chlorophyll fluorescence maxima were, in addition to at some of the ordinary phytoplankton stations, sampled at BY1, BY4, BY10 and at the Hanö Bight and were mainly caused by a dense bloom of Prymnesiales*, with the highest cell numbers at the most southwestern stations, BY1 - BY5 and the Hanö Bight. At BY10 the cell numbers were somewhat lower and here the dinoflagellates *Dinophysis acuminata** and *D. norvegica** were numerous as well as the Prymnesiales*.

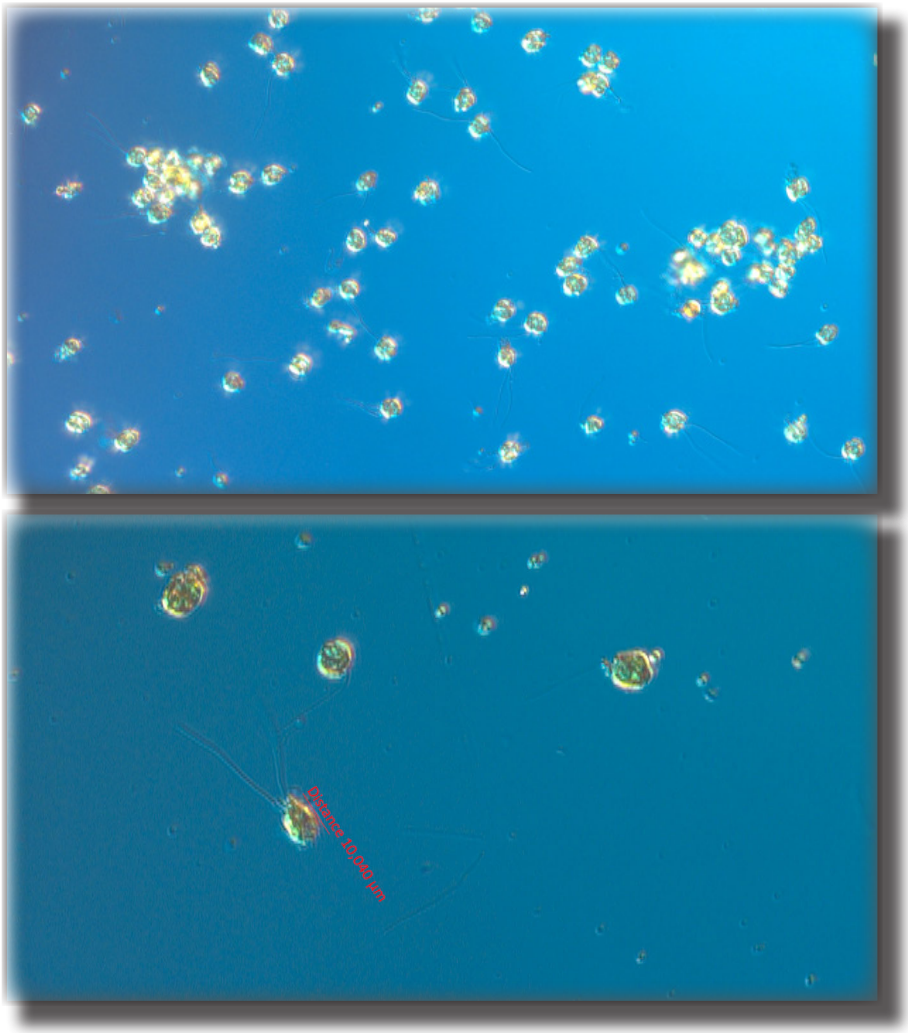
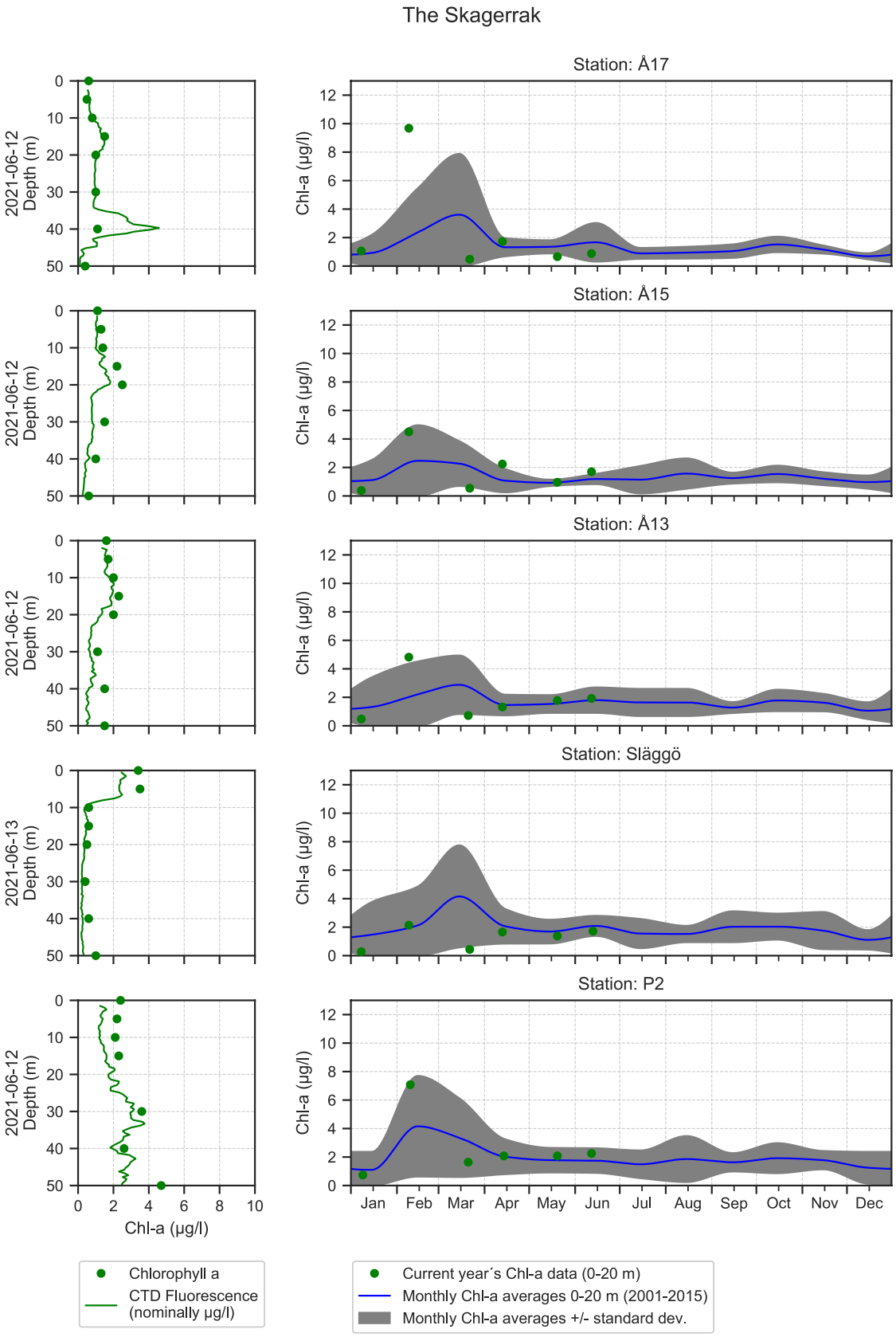


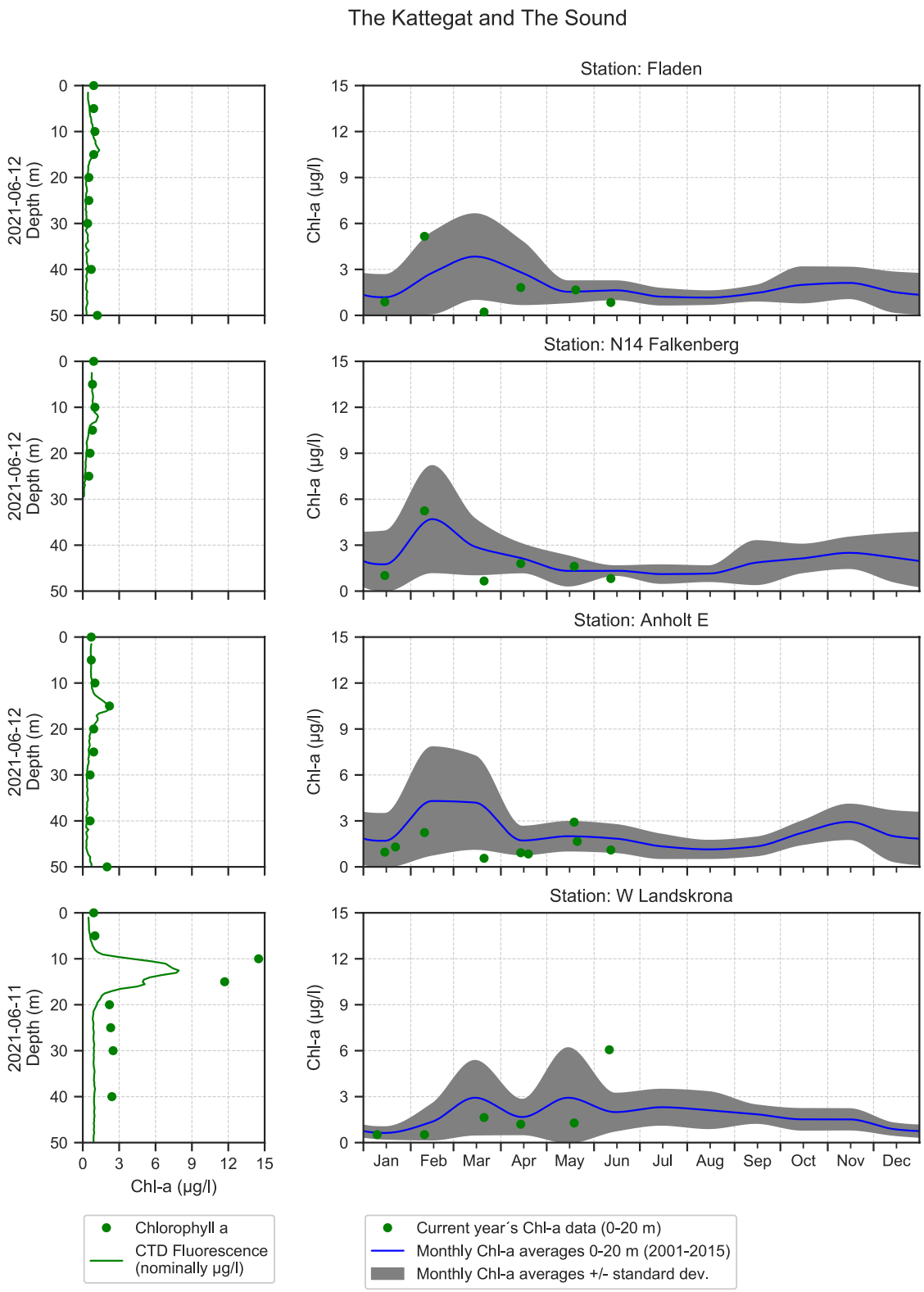
Figure 3 and 4. An extensive bloom of Prymnesiales* caused chlorophyll fluorescence peaks at most of the Baltic stations. Photo: Ann-Turi Skjevik.

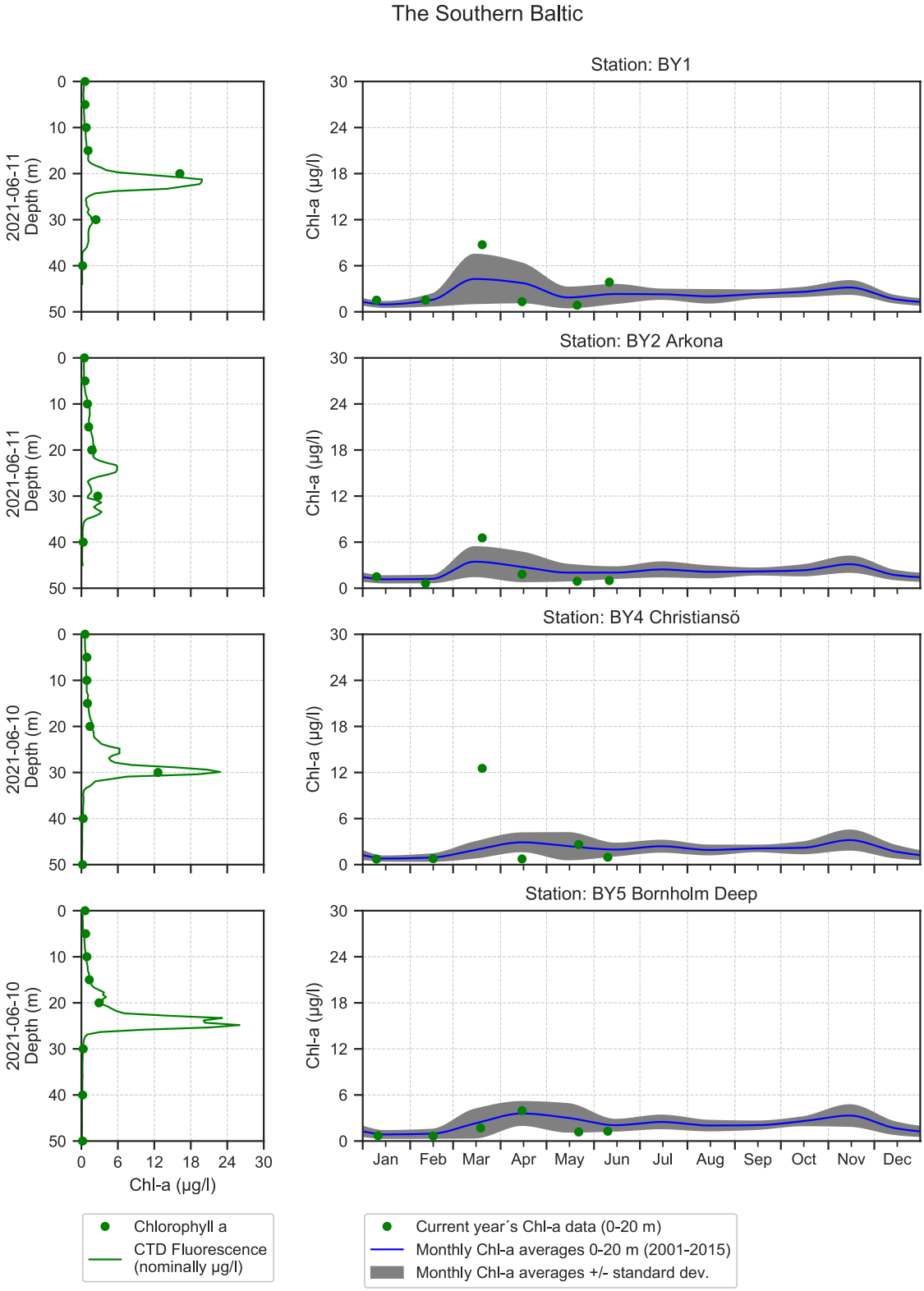
Phytoplankton analysis and text:
Ann-Turi Skjevik and Marie Johansen

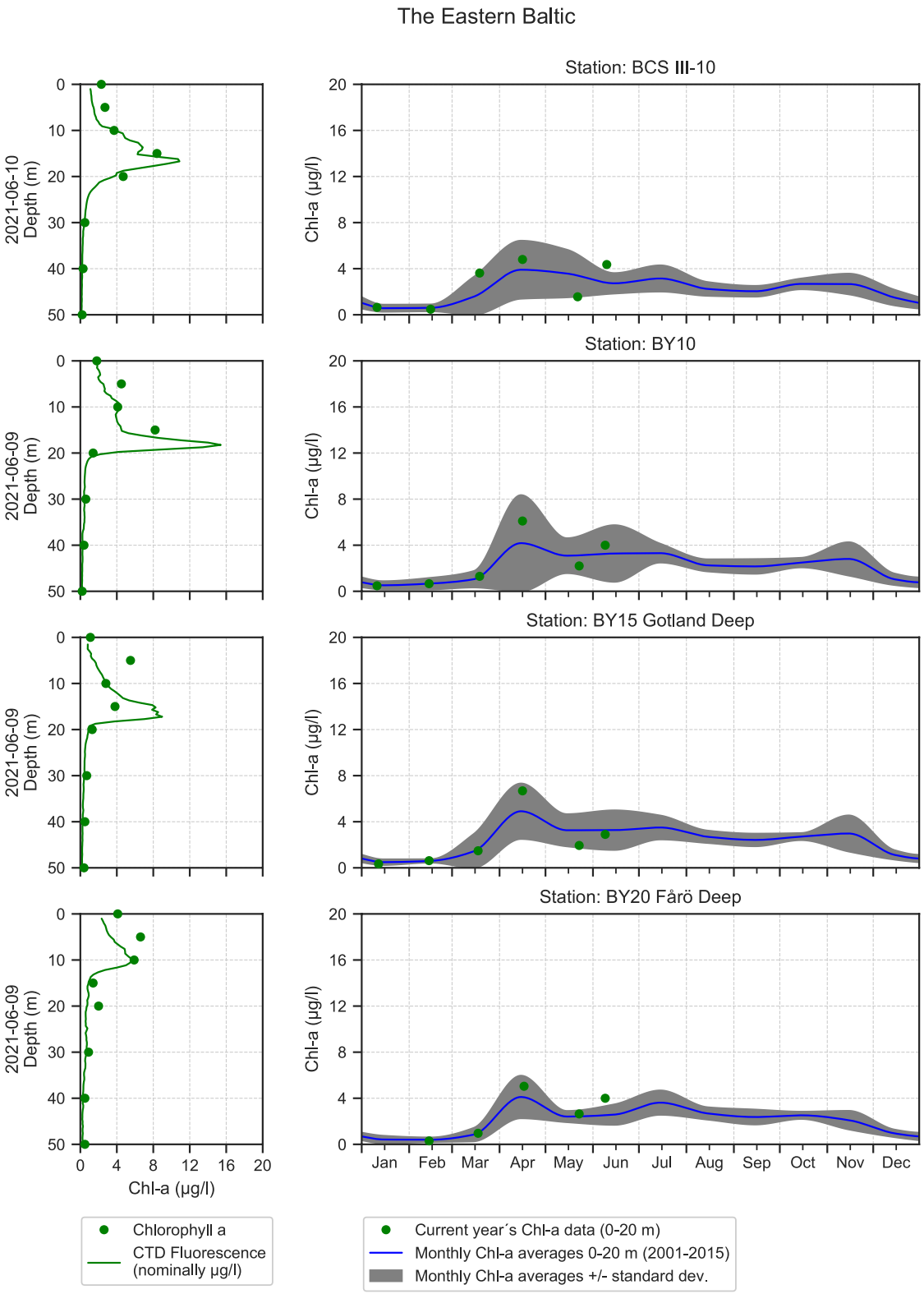
Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	12/6	12/6	13/6	12/6
Hose 0-10 m	presence	presence	presence	presence
Centrales	common	present		
Cerataulina pelagica			very common	
Chaetoceros danicus	common	common		
Cylindrotheca closterium			present	present
Dactyliosolen fragilissimus	common	dominating	dominating	common
Guinardia delicatula	present	present		
Guinardia flaccida				common
Lennoxia faveolata			present	
Proboscia alata	common	common	common	common
Pseudo-nitzschia			common	very common
Rhizosolenia imbricata				present
Skeletonema marinoi	present	present	present	
Thalassionema nitzschioides	common	common	present	
Amphidinium crassum		present		
Azadinium		present		
Dinophysis acuminata			present	present
Dinophysis norvegica			present	present
Gymnodiniales	present	present	present	present
Peridiniales	common	present		present
Protoperidinium curtipes				present
Protoperidinium pallidum			present	
Scrippsiella cpx				present
Tripos furca				present
Tripos fusus				present
Tripos longipes	present		present	present
Tripos macroceros				present
Tripos muelleri	present	present	present	present
Dinobryon	present			
Dinobryon balticum			present	
Dinobryon faculiferum	present			
Emiliania huxleyi	present	common	common	very common
Prymnesiales	present		present	present
Oocystis		present		
Cryptomonadales	present	common	common	present
Leucocryptos marina			present	
Telonema subtile		present	present	
Aphanothece	present			
cf. Lemmermanniella	common	present		
Pseudanabaena	present			
Snowella	present			
Choanoflagellatea	present	present		present
Ebria tripartita	present			
Ciliophora	present	present	present	present
Laboea strobila			present	

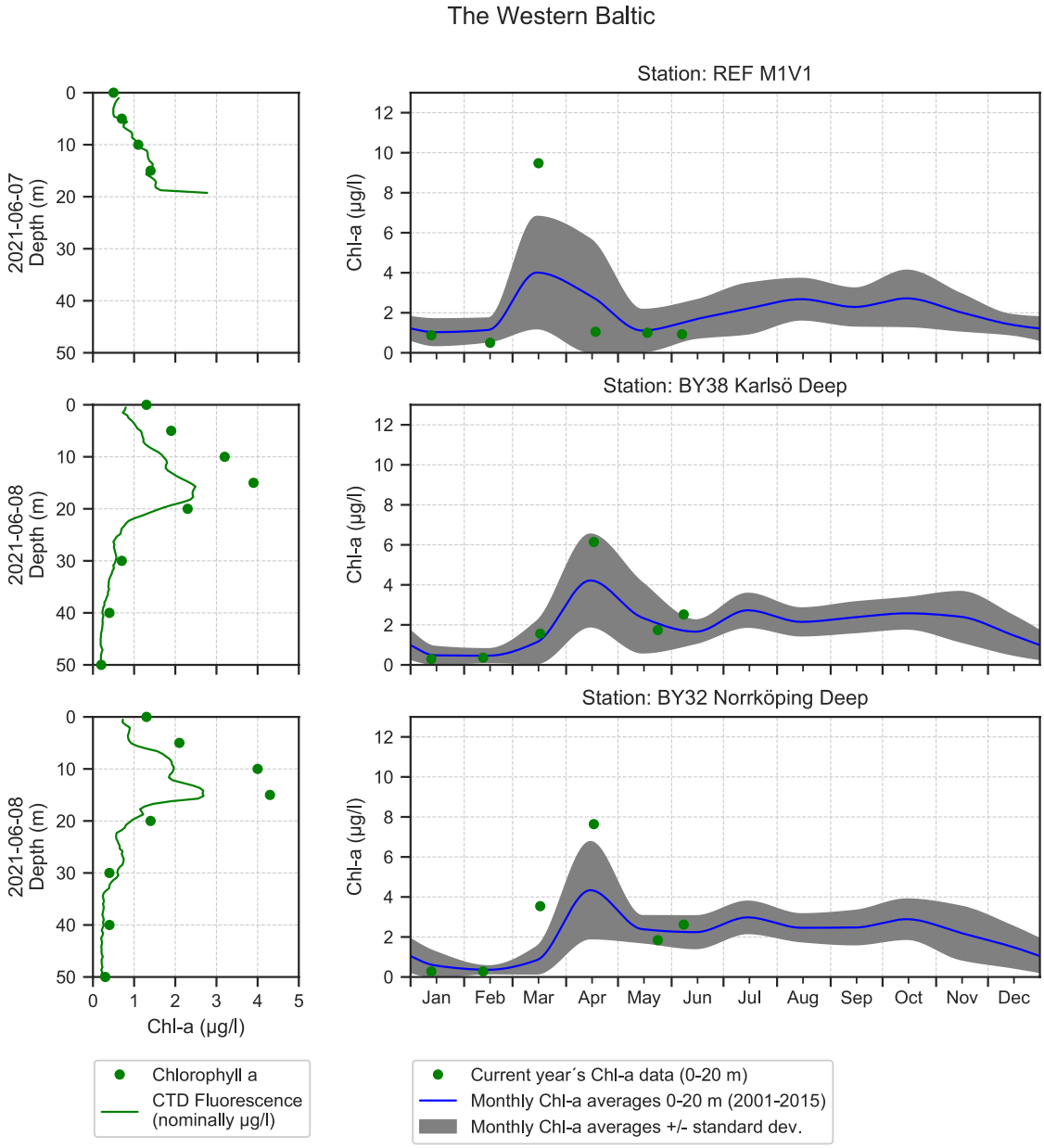
Selection of observed species	BCSIII-10	BY2	BY5	BY15	BY29	BY38
Red=potentially toxic species	10/6	11/6	10/6	9/6	9/6	8/6
Hose 0-10 m	presence	presence	presence	presence	presence	presence
Attheya longicornis					present	
Chaetoceros castracanei						present
Chaetoceros similis	present				present	
Chaetoceros wighamii					present	
Alexandrium ostenfeldii				present		
Amphidinium crassum					present	
Amylax triacantha				present	present	
Dinophysis acuminata	present			present	present	present
Dinophysis norvegica	common			present	present	present
Gymnodiniales	present	present	present	common	common	present
Heterocapsa	present	present	present	present	present	present
Heterocapsa rotundata				present	present	present
Karlodinium veneficum					present	
Katodinium glaucum			present	present		
Peridiniales	present	present	present	present	present	present
Peridiniella catenata					present	
Phalacroma rotundatum						present
Prorocentrum cordatum	present					
Protoperidinium bipes					present	present
Aphanizomenon flosaquae	common	present	present	common	common	common
Aphanocapsa	present		present			
Aphanothece	common	common		present		
Aphanothece paralleliformis	present	present	present			
Lemmermanniella	present	common	present	very common	present	present
Nodularia spumigena		present				
Snowella	present	present	common	present	present	
Binuclearia lauterbornii	present		present	present	present	present
Pseudopedinella					common	
Pseudopedinella pyriformis					present	present
Scenedesmus	present					
Dinobryon	present					
Dinobryon faculiferum	present	present	present		present	
Cryptomonadales	present		present		present	present
Eutreptiella		present		present		present
Pyramimonas				present	present	present
Prymnesiales	common	common	common	common	present	present
Telonema					present	
Ebria tripartita					present	present
Choanoflagellatea		present			present	
Katablepharis remigera				present		
Ciliophora	common	present	common	very common	common	common
Mesodinium rubrum				present	present	present
Flagellates	common	common	present		common	common
Unicell						present


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
2021-06-12
2021-06-13
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 (2001-2015)
Monthly Chl-a averages +/- standard dev.


The Kattegat and The Sound
Station: Fladen
Station: N14 Falkenberg
Station: Anholt E
Station: W Landskrona
2021-06-12
2021-06-11
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 (2001-2015)
Monthly Chl-a averages +/- standard dev.


The Southern Baltic
Station: BY1
Station: BY2 Arkona
Station: BY4 Christiansö
Station: BY5 Bornholm Deep
2021-06-11
2021-06-10
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
2021-06-10
2021-06-09
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.



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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Havs
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myndigheten