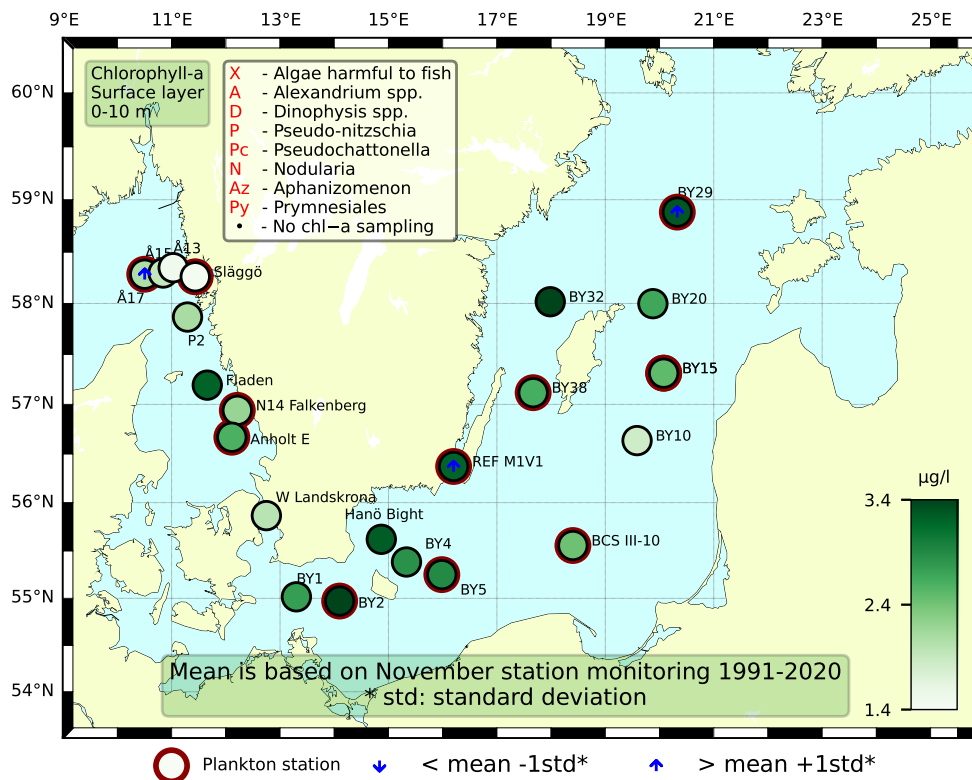


Sammanfattning

Diversiteten och de totala cellantal av växtplankton var relativt höga vid flertalet stationer i Västerhavet. Enda undantaget var vid Å17 där det totala cellantalet var lågt. Kiselalger dominerade överlag i cellantal och framför allt var *Pseudosolenia calcar-avis* vanlig i Kattegatt. Kalkalgen *Emiliania huxleyi* var vanligt förekommande. Samtliga integrerade klorofyllvärden var låga men inom det normala för månaden förutom vid Å17 där de var något förhöjda i det integrerade provet från 0–20 m.

Diversiteten och cellantalen av växtplankton var generellt moderata i Östersjön, med mest *Chaetoceros danicus*, Gymnodiniales, Cryptomonadales, den kolonibildande cyanobakterien *Snowella* sp. samt olika ciliater. Vid stationerna i de södra delarna av Östersjön; BY2, BY5, Hanöbukten och BCIII-10, fanns filamentösa cyanobakterier. Potentiellt toxinbildande arter återfanns i låga cellantal här och var i Östersjön. De integrerade klorofyllhalterna (0–10 m och 0–20 m) var inom det normala för månaden vid alla stationer utom vid REF M1V1 där halten var högre än normalt från 0–10 meter.



Abstract

The phytoplankton diversity and the total cell numbers were relatively high at most stations along the Swedish west coast. The only exception was Å17 where total cell numbers were low. Diatoms dominated overall in cell numbers and *Pseudosolenia calcar-avis* was common in the Kattegat. The coccolithophore *Emiliania huxleyi* was found in relatively high cell numbers at all stations. The integrated chlorophyll concentrations (0-10m and 0-20 m) were low, but within normal for this month at all stations except at Å17 where it was a bit elevated in the integrated sample (0-10 m and 0-20 m).

Diversity and cell abundance of phytoplankton were generally moderate in the Baltic Sea, with mostly *Chaetoceros danicus*, Gymnodiniales, Cryptomonadales, the colony-forming cyanobacterium *Snowella* sp. and various ciliates. At the stations in the southern parts of the Baltic Sea; BY2, BY5, Hanö bight and BCIII-10, filamentous cyanobacteria were present. Of potentially toxin-producing species there were only a few cells at various stations in the Baltic Sea. The integrated chlorophyll concentrations (0-10m and 0-20 m) were within the normal range for this month at all stations except at REF M1V1 where the concentration was higher than normal from 0-10 meters.

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

The Skagerrak

Å17 (open Skagerrak) 9th of November

The phytoplankton diversity was moderate but the total cell numbers were quite low. A few larger cells were found and mainly cells of the genus *Tripos*. Among the diatoms, the potentially toxic genus *Pseudo-nitzschia** was common. The smallest cells were dominated by the coccolithophore *Emiliana huxleyi* and cryptomonadales. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were both a bit higher than normal for this month.

Släggö (Skagerrak coast) 9th of November

The phytoplankton diversity and the total cell numbers were moderate. The larger cells were very few and represented by a few *Pseudosolenia calcar-avis* and some cells belonging to the genus *Tripos*. Among the diatoms the toxic genus *Pseudo-nitzschia** was the most common. Quite a few cells of the flagellate *Octactis speculum* were also found. Among the smallest, cells of *E. huxleyi* were present. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were within normal for this month.

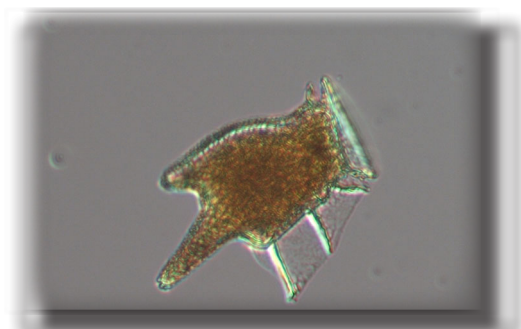


Fig 1. The dinoflagellate *Dinophysis tripos* was found at Å17. Photo: M. Johansen.

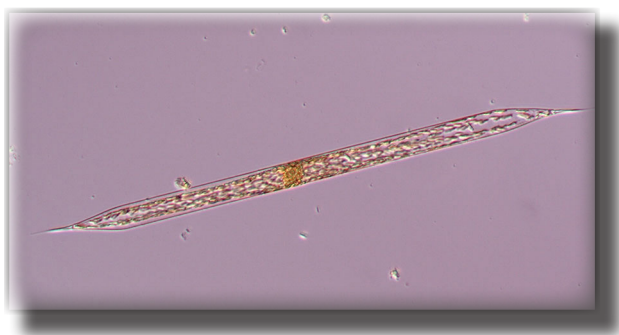


Fig 2. The diatom *Pseudosolenia calcar-avis* was common at both stations in the Kattegat. Photo: M. Johansen.

The Kattegat

Anholt E 10th of November

Both the phytoplankton diversity and the total cell numbers were relatively high. Diatoms dominated the sample. The larger cells were clearly dominated by *P. calcar-avis*. Several small diatoms were common such as *Pseudo-nitzschia** and *Cerataulina pelagica*. Among the smallest cells *E. huxleyi* was found in high cell numbers. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were low but within normal for this month.

N14 Falkenberg 10th of November

The phytoplankton diversity and total cell numbers were moderate. Diatoms dominated in cell counts and *P. calcar-avis* was most abundant. Several smaller diatoms were common such as *C. pelagica*, *Dactyliosolen fragilissimus* and the genus *Pseudo-nitzschia**. *Octactis speculum* were also common. Among the smallest cells *E. huxleyi* and cryptomonadales were found. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were low but within normal for this month.

The Baltic

BY2 Arkona 11th of November

The cell abundances and diversity were quite moderate with mostly *Chaetoceros danicus*, Gymnodiniales, *Triplos muelleri*, Cryptomonadales, *Ebria tripartita* and ciliates. There was also quite high amounts of the filamentous cyanobacterium *Aphanizomenon* sp. and a few cells of the dinoflagellate *Dinophysis acuminata**. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BY5 Bornholm deep 11th of November

The cell abundances and diversity were quite low with mostly *C. danicus*, Gymnodiniales, Cryptomonadales, *E. tripartita* and ciliates. There was a single filament of the cyanobacterium *Nodularia spumigena**. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

Hanö bight 11th of November

The cell abundances were low but the diversity was quite high, with mostly *C. danicus*, Gymnodiniales, Cryptomonadales and ciliates. The filamentous cyanobacteria *Aphanizomenon* sp. and *N. spumigena** were both present, as well as the potentially toxic species *Prorocentrum cordatum**. The integrated (0-10 m) chlorophyll concentrations were within the normal range for this month.

BCSIII-10 12th of November

The phytoplankton diversity and abundances were very low with mainly small cells of Gymnodiniales, Cryptomonadales and ciliates. There were a few filaments of *N. spumigena** present. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BY10 12th of November

The phytoplankton diversity and abundances were moderate with mainly Gymnodiniales, Cryptomonadales, ciliates, *Mesodinium rubrum* and the colony forming cyanobacterium *Snowella* sp. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BY15 Gotland deep 12th of November

The phytoplankton diversity and abundances were moderate with mainly ciliates and *Snowella* sp. but also *Chaetoceros castracanei*, Gymnodiniales and Cryptomonadales. The toxin-producing species *Dinophysis norvegica** and *Phalacrocoma rotundatum** were both present at the station. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BY29 13th of November

The phytoplankton diversity and abundances were quite high with mainly *Snowella* sp., Gymnodiniales, *Binuclearia lauterbornii*, Cryptomonadales, ciliates and *M. rubrum*. In addition to *Snowella* sp. there were several genera of colony forming cyanobacteria present. The integrated (0-10 m) chlorophyll concentrations were above the normal range for this month.

BY31 13th of November

The cell diversity and abundances were quite moderate with mainly *C. centralis*, Gymnodiniales, *Oocystis* sp., Cryptomonadales, ciliates and *M. rubrum*, as well as several genera of colony forming cyanobacteria.

BY38 14th of November

The cell abundances and diversity were moderate with mainly Gymnodiniales, Cryptomonadales, *Snowella* sp., *Calliacantha natans* and ciliates. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

REFM1V1 14th of November

The cell abundances and diversity were quite high with mainly *C. danicus*, *Coscinodiscus centralis*, *Skeletonema marinoi*, Gymnodiniales, Cryptomonadales and ciliates. *D. acuminata** and *P. cordatum** were present in small amounts. The integrated (0-20 m) chlorophyll concentration was normal while (0-10 m) was higher than the normal range for this month.

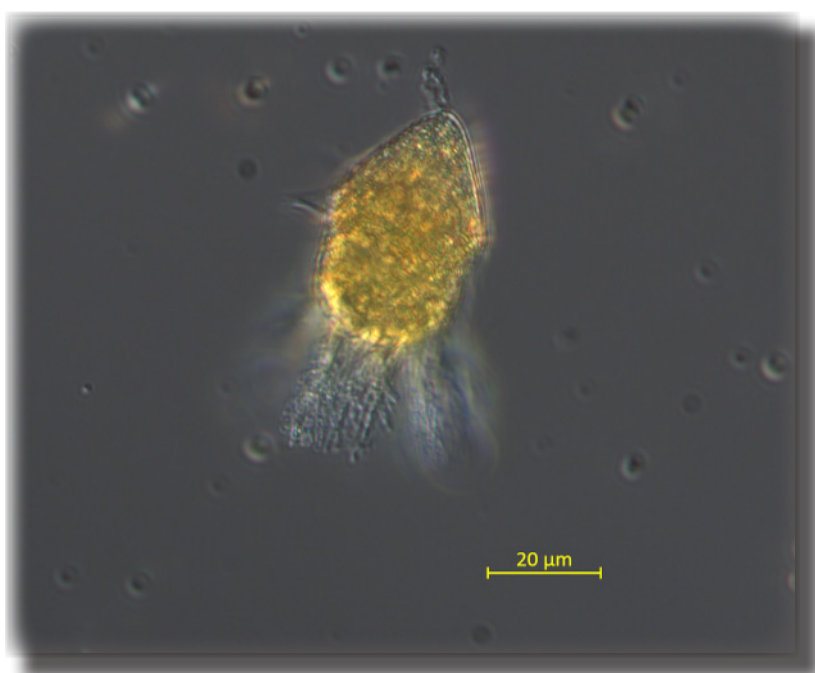
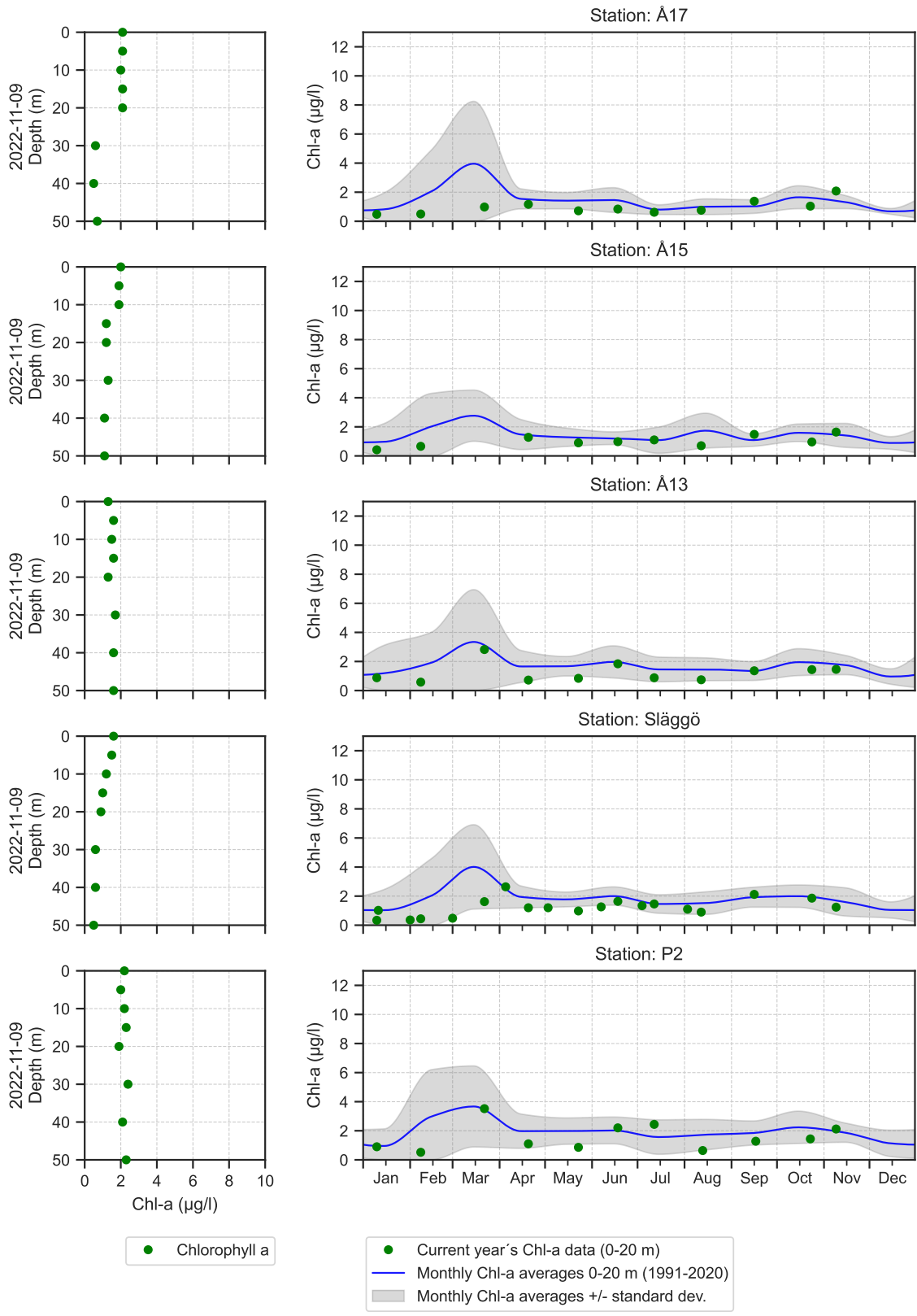


Fig 3. Not phytoplankton, but micro-zooplankton, such as ciliates, are present in samples throughout the year. In November ciliates of different shapes and sizes were numerous at all stations. This specimen is from REFM1V1 on 14th of November. Photo: M. Karlberg.

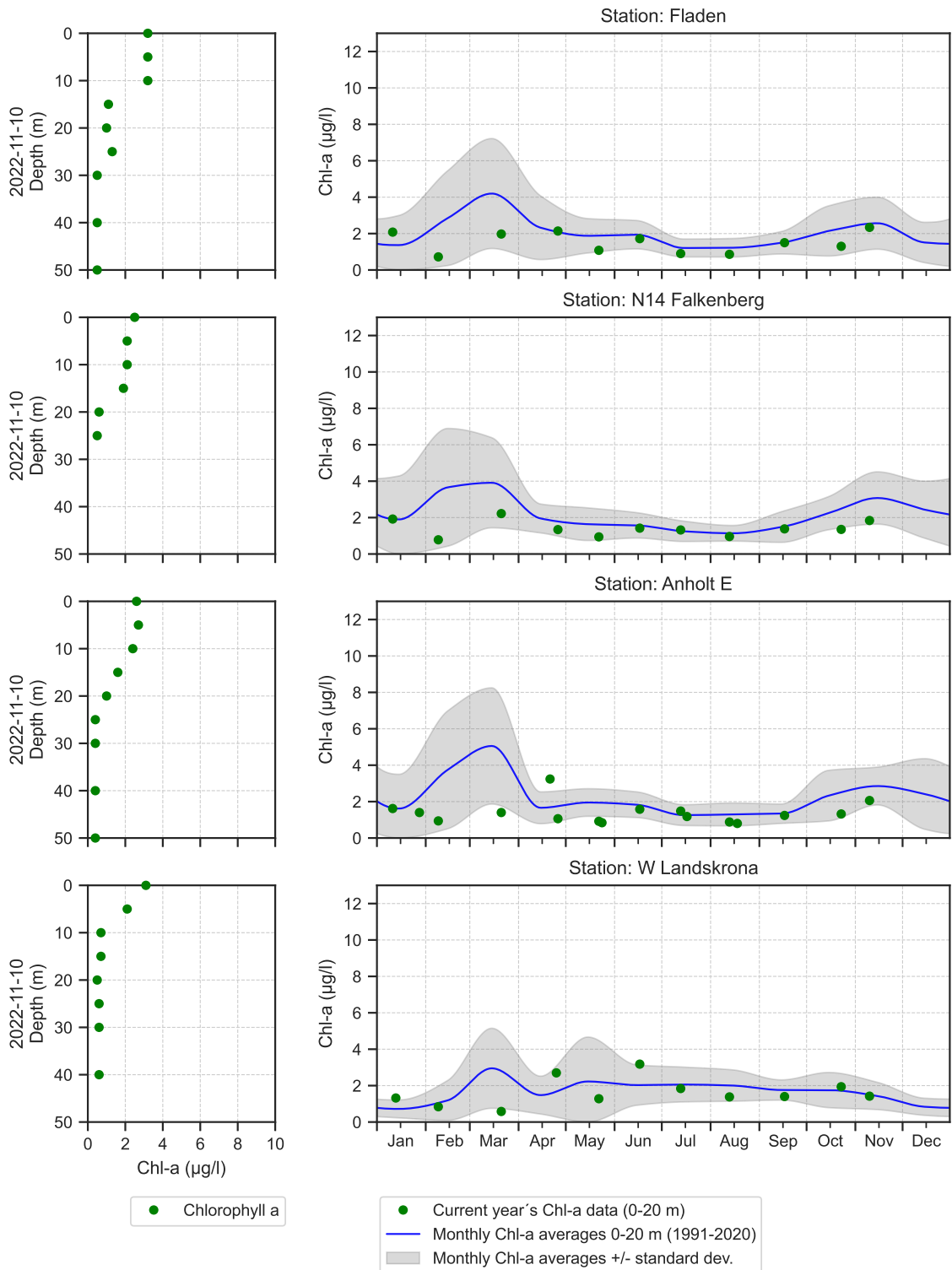
Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	10/11	10/11	9/11	9/11
Hose 0-10 m	presence	presence	presence	presence
<i>Cerataulina pelagica</i>	present	common		
<i>Chaetoceros affinis</i>		present		
<i>Chaetoceros cf. convolutus</i>	common	present		
<i>Chaetoceros danicus</i>				present
<i>Chaetoceros socialis</i>				present
<i>Cyclotella</i>				present
<i>Dactyliosolen fragilissimus</i>	present	common		
<i>Ditylum brightwellii</i>	present	present	present	present
<i>Guinardia delicatula</i>				present
<i>Guinardia flaccida</i>	present		present	
<i>Lauderia annulata</i>			present	
<i>Leptocylindrus danicus</i>	present		present	
<i>Leptocylindrus minimus</i>			present	present
<i>Nitzschia longissima</i>			present	
<i>Pseudo-nitzschia</i>	very common	common	present	common
<i>Pseudosolenia calcar-avis</i>	very common	very common	present	
<i>Rhizosolenia setigera</i>	present	present	present	
<i>Skeletonema marinoi</i>	present		present	present
<i>Thalassiosira</i>	present		present	present
<i>Thalassiosira gravida</i>			present	
<i>Dinophysis acuminata</i>	present			
<i>Dinophysis acuta</i>				present
<i>Dinophysis tripos</i>				present
<i>Diplopsalis cpx</i>		present		
Gymnodiniales	present	present	present	present
Gyrodinium	present			
<i>Gyrodinium flagellare</i>				present
<i>Gyrodinium spirale</i>				present
<i>Katodinium glaucum</i>				present
Peridinales	present			
<i>Prorocentrum micans</i>	present			
<i>Tripos fusus</i>		present	present	present
<i>Tripos lineatus</i>		present		
<i>Tripos longipes</i>				present
<i>Tripos macroceros</i>		present	present	present
<i>Tripos muelleri</i>	present	present	present	present
<i>Laboea strobila</i>		present		
<i>Emiliania huxleyi</i>	common	common	present	common
<i>Pleurochrysis</i>				present
Prymnesiales				present
Cryptomonadales	present	common	present	common
Dictyochales	present	common	common	present
<i>Octactis speculum</i>	present	common	common	common
<i>Pseudanabaena</i>		present	present	
Ciliophora	present	present		present

Selection of observed species	BY2	BY5	Hanöbukten	BCSIII-10	BY10	BY15	BY29	BY31	BY38	REFM1V1
Red=potentially toxic species	11/11	11/11	11/11	12/11	12/11	12/11	13/11	13/11	14/11	14/11
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence	presence	presence
Actinocyclus	present	present	present	present	present	present		present		
Centrales			present		present	present	present			present
Cerataulina pelagica										present
Chaetoceros castracanei	present		present	present	present	common	present		present	
Chaetoceros convolutus		present								present
Chaetoceros danicus	common	common	common	present	present	present	present			very common
Coscinodiscus centralis	present	present	present		present	present	present	common	present	common
Coscinodiscus granii			present						present	
Dactyliosolen fragilissimus	present		present							present
Nitzschia longissima										present
Pseudosolenia calcar-avis	present									
Skeletonema marinoi										common
Amphidinium crassum					present			present		
Dinophysis acuminata	present							present		present
Dinophysis norvegica						present				
Gymnodiniales	common	common	common	common	common	common	common	common	common	common
Gyrodinium spirale					present		present			
Heterocapsa rotundata			present	present	present	present	present	present	present	present
Katodinium glaucum	present	present	present	present	present	present		present	present	present
Peridinales							present			
Phalacroma rotundatum						present				
Prorocentrum cordatum			present						present	present
Prorocentrum micans	present		present							
Tripos muelleri	common		present							
Monoraphidium							present			
Oocystis					present	present	present	common	present	
Binuclearia lauterbornii					present	present	common	present		
Pyramimonas			present							present
Cryptomonadales	common	common	common	common	common	common	common	common	common	common
Octactis speculum	present									
Pseudopedinella		present								
Eutreptiella	present		present							
Aphanizomenon	common		present							
Aphanocapsa								common		
Aphanothece					present	present	common	common	present	
Lemmermanniella							present			
Merismopedia							present			
Nodularia spumigena		present	present	present						
Pseudanabaena							present	present		present
Snowella	present	present	present		common	very common	very common	common	common	present
Calliakantha natans		present					present	present	common	present
Choanoflagellata	present				present		present		present	present
Ebria tripartita	common	common	present		present	present				
Ciliophora	common	common	common	common	common	very common	common	common	common	common
Mesodinium rubrum			present	present	common	present	common	common	present	present

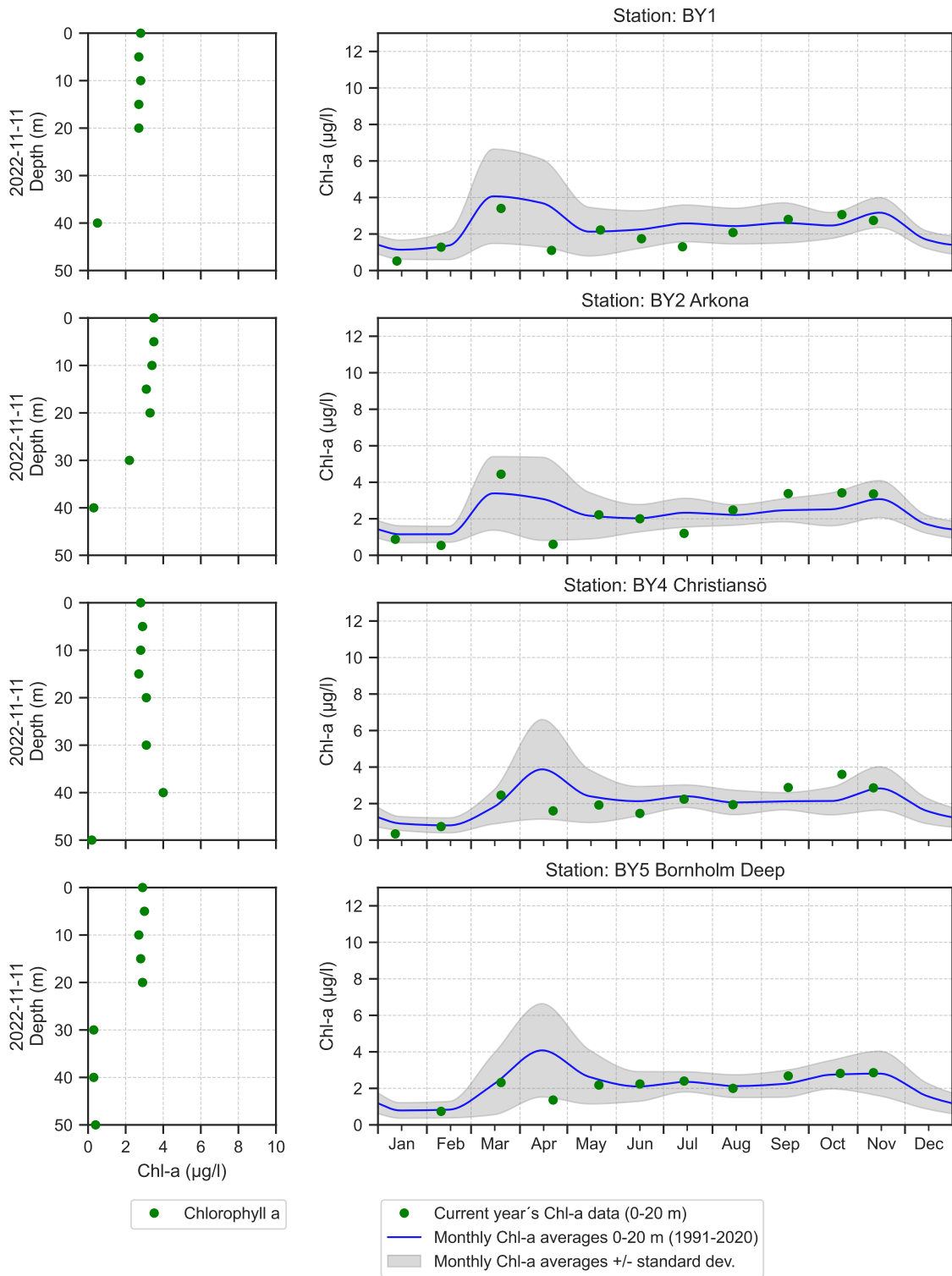
The Skagerrak



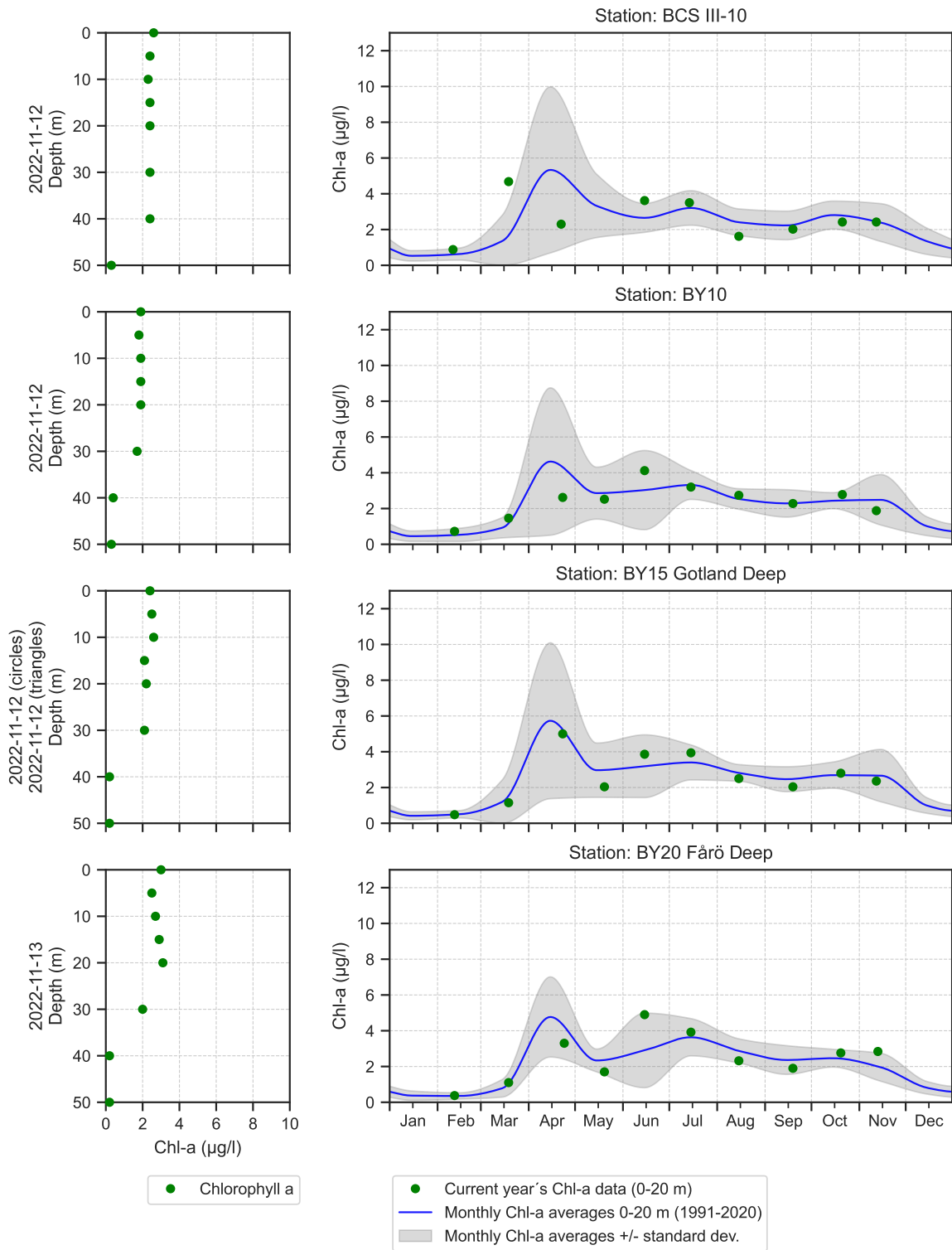
The Kattegat and The Sound



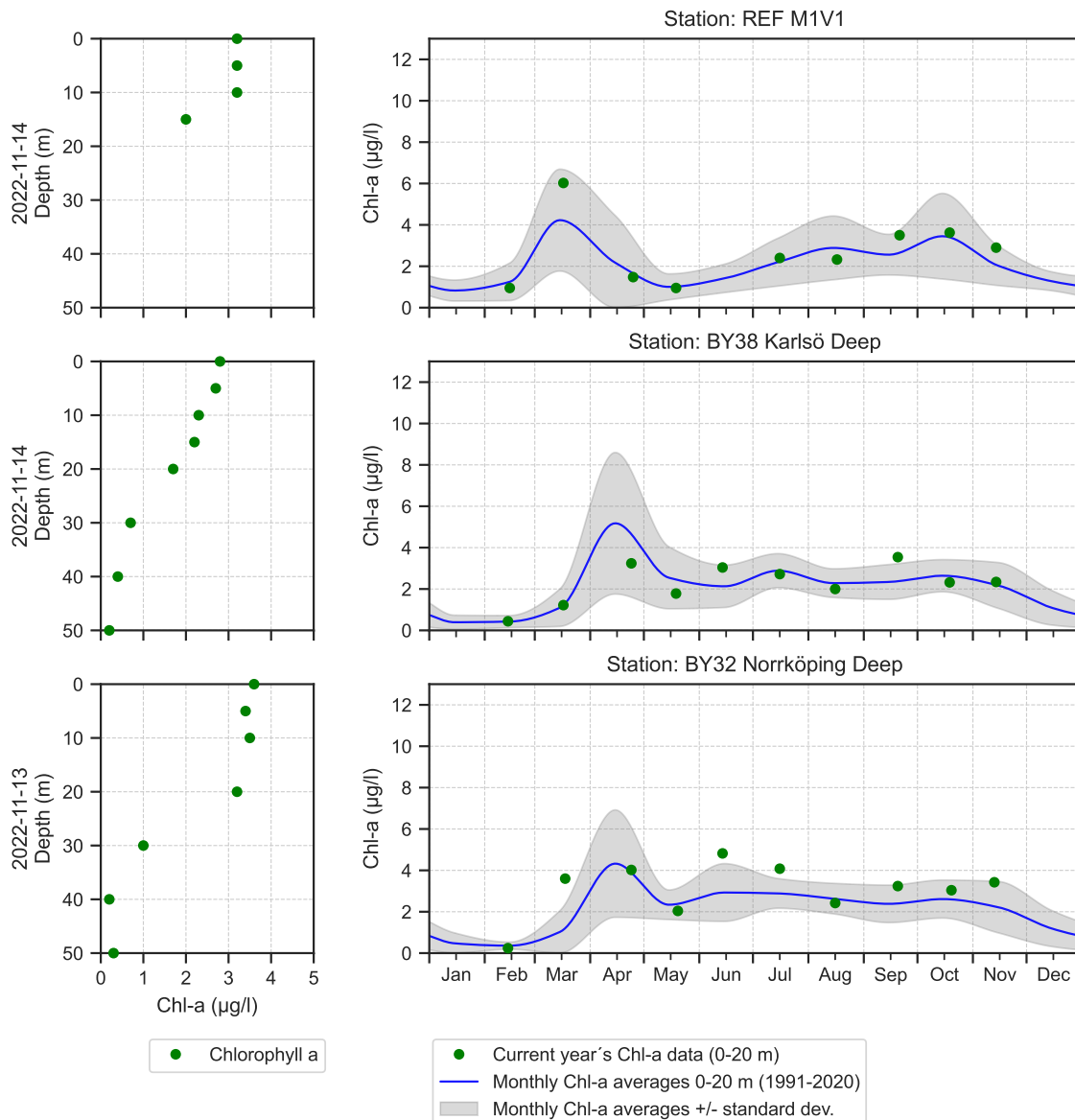
The Southern Baltic



The Eastern Baltic



The Western Baltic



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 occurring 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 algbloomingar 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
<i>Alexandrium</i> 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; headache, dizziness, nausea, vomiting, diarrhoea. Extreme case Muscular paralysis; pronounced respiratory difficulty; choking sensation; death through respiratory paralysis may occur within 2-24 hours after ingestion.
<i>Dinophysis</i> spp.	Diarrhetic 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.
<i>Pseudo-nitzschia</i> 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.
<i>Chaetoceros concavicornis</i> / <i>C. convolutus</i>	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.
<i>Pseudochattonella</i> 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.

