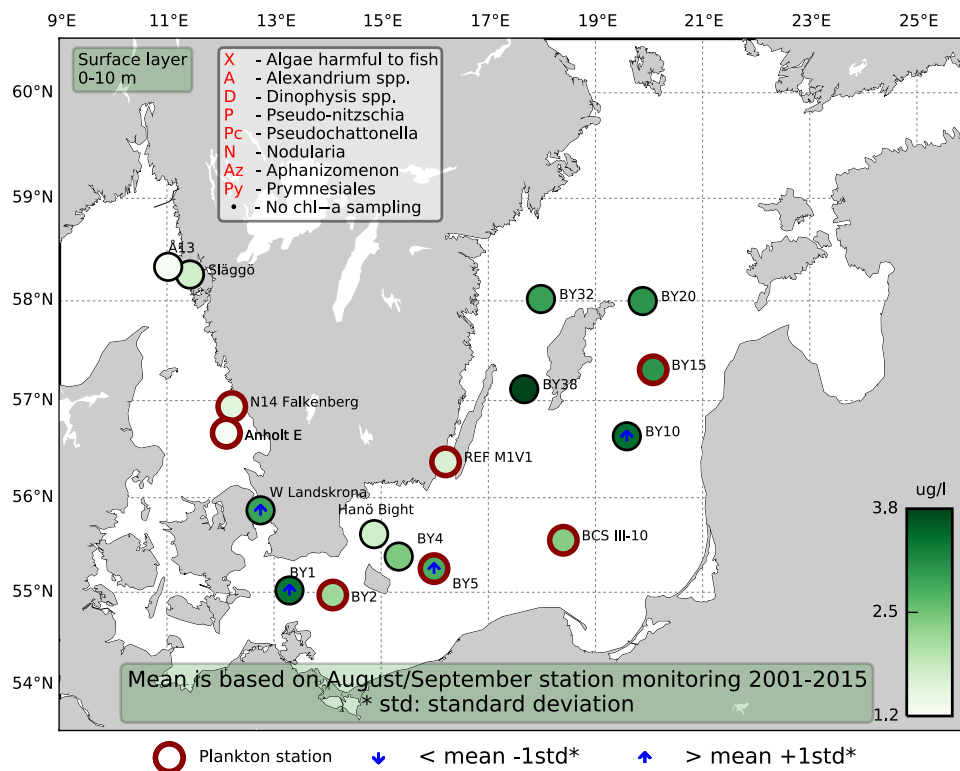


Sammanfattning

Denna provtagningsomgång var inte en fullskalig expedition med samtliga växtplanktonstationer, utan bara en växtplanktonstation provtogs på västkusten och sex i Östersjön. Västkuststationen (Anholt E) uppvisade ett höstblomningssamhälle med flera olika arter av dinoflagellater, samt en del kiselalger, ciliater och flagellater. De integrerade (0-10 m och 0-20 m) klorofyllvärdena var låga men inom det normala för månaden vid alla stationer i Västerhavet, förutom W Landskrona där de var högre än normalt.

Vid Östersjöstationerna var växtplanktonsamhället ett typiskt efter-sommarblomningssamhälle, med fortfarande en del filamentösa cyanobakterier, ibland med ganska högt cellantal, samt flagellater, ciliater, kolonibildande cyanobakterier samt två stora arter av släktet *Chaetoceros*. De integrerade (0-10 m och 0-20 m) klorofyllvärdena var höga men inom det normala för månaden vid de flesta stationer i Östersjön, förutom vid BY10, BY1 och BY5 där de var högre än normalt.

Expeditionen genomfördes på R/V Dana.



Abstract

This sampling occasion was not a full cruise with all phytoplankton stations, only one west coast phytoplankton station and six in the Baltic Sea were sampled. The west coast station (Anholt E), displayed an autumn bloom community with several species of dinoflagellates, as well as some diatoms, ciliates and flagellates. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were low but within normal for this month at all stations in the Kattegat and the Skagerrak, except for W Landskrona where chlorophyll concentrations were higher than normal.

At the Baltic Sea stations the phytoplankton community was a typical post summer bloom community, with still some filamentous cyanobacteria, occasionally at high cell numbers, as well as flagellates, ciliates, colony forming cyanobacteria and two large species of the genus *Chaetoceros*. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were high but within normal for this month at all stations in the Baltic Sea, except for BY10, BY1 and BY5 where chlorophyll concentrations were higher than normal for September.

The cruise was performed on the R/V Dana.

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

The Skagerrak

Släggö, Å13 and P2, 20th, 25th and 30th of August

These stations were visited during an earlier cruise, in the end of August, phytoplankton have not been analysed at Släggö. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were within normal for this month at all three stations.

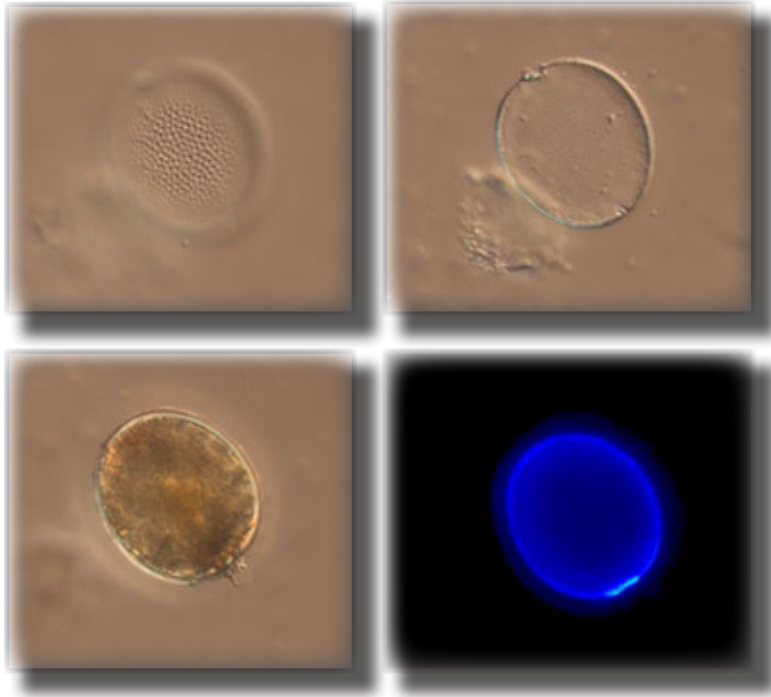


Photo 1: The dinoflagellate *Prorocentrum compressum* was abundant at Anholt E. The two upper pictures show empty thecas, and in the left one, the typically ornamented plates are visible. The lower pictures show a living cell, and the right one how it appears in the fluorescence microscope.

The Kattegat

N14 Falkenberg 29th of August

N14 was visited during an earlier cruise. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were within normal for this month.

Anholt E 2nd of September

The phytoplankton community was dominated by the dinoflagellate *Prorocentrum compressum* (*Photo 1*), while *Heterocapsa rotundata*, *Prorocentrum micans*, some diatoms, flagellates and ciliates were also in high numbers. A few cells of *Karenia mikimotoi** were found. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were within normal at station Anholt E, but higher than normal in 0-10 m at W Landskrona.

The Baltic Sea

BY2 3rd of September

Aphanizomenon flos-aquae was found in quite high cell numbers, as well as *Dolichospermum* sp. The third bloom forming filamentous cyanobacteria species, *Nodularia spumigena**, was present. The large diatoms *Chaetoceros castracanei* and *C. danicus*, as well as *Dactyliosolen fragilissimus* and small flagellates were common. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were slightly higher than normal at station BY1 and normal at BY2.

BY5 3rd of September

This was the least diverse sample, consisting mostly of Cryptomonadales, *Aphanizomenon flos-aquae* and *Nodularia spumigena**, with some gymnodiniales, flagellates and ciliates. A single cell of *Dinophysis acuminata** was observed. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were within normal at station BY4, but higher than what are considered normal for September in 0-10 m at BY5.

REF M1V1 Kalmar Sound 9th of September

The community at this station was very diverse. The diatom *Skeletonema marinoi* and flagellates were present in high cell concentrations. This station had a high concentration of cyanobacteria, both filamentous and colony forming ones. Gymnodiniales, *Heterocapsa triquetra*, *Mesodinium rubrum* and ciliates were also abundant. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were within normal.

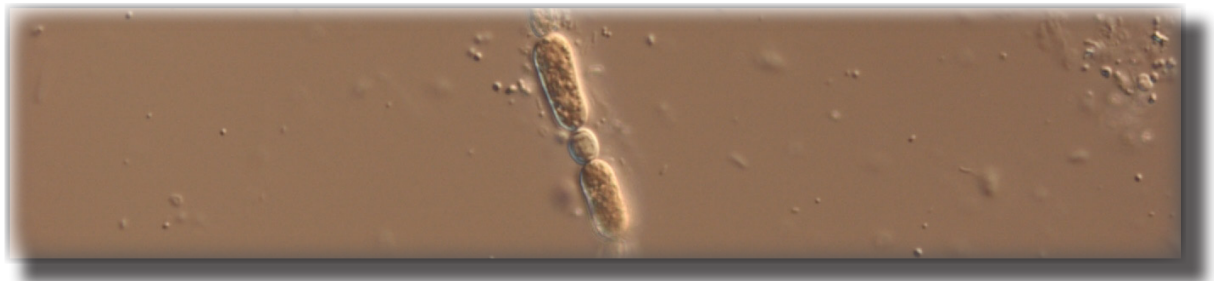


Photo 2: A heterocyst, a specialized cell where N₂-fixation takes place, situated between two akinetes (resting cells), which is typical for the filamentous cyanobacterium *Dolichospermum lemmermannii*.

BCSIII-10 Kalmar Sound 4th of September

Low total cell numbers of cyanobacteria were found in the sample, there were only a few filaments of *Aphanizomenon flos-aquae*. The sample was however dominated by different small organisms, such as flagellates, *Pyramimonas* sp., Cryptomonadales, as well as the diatom *Coscinodiscus concinnus* and large ciliates, such as *Mesodinium rubrum*, *Helicostomella subulata* and *Strombidium* sp. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were within normal.

BY15 4th of September

At this station the community was dominated by *Aphanizomenon flos-aquae*, with *Nodularia spumigena** and *Dolichospermum* sp. in relatively high cell numbers. Some of the filaments of *Dolichospermum* could be identified to *D. lemmermannii* due to the so called akinetes being situated on both sides of the heterocyst (Photo 2). *Chaetoceros castracanei*, small flagellates and ciliates were common. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations at BY10 were higher than what is considered normal for this month and within normal at BY15.

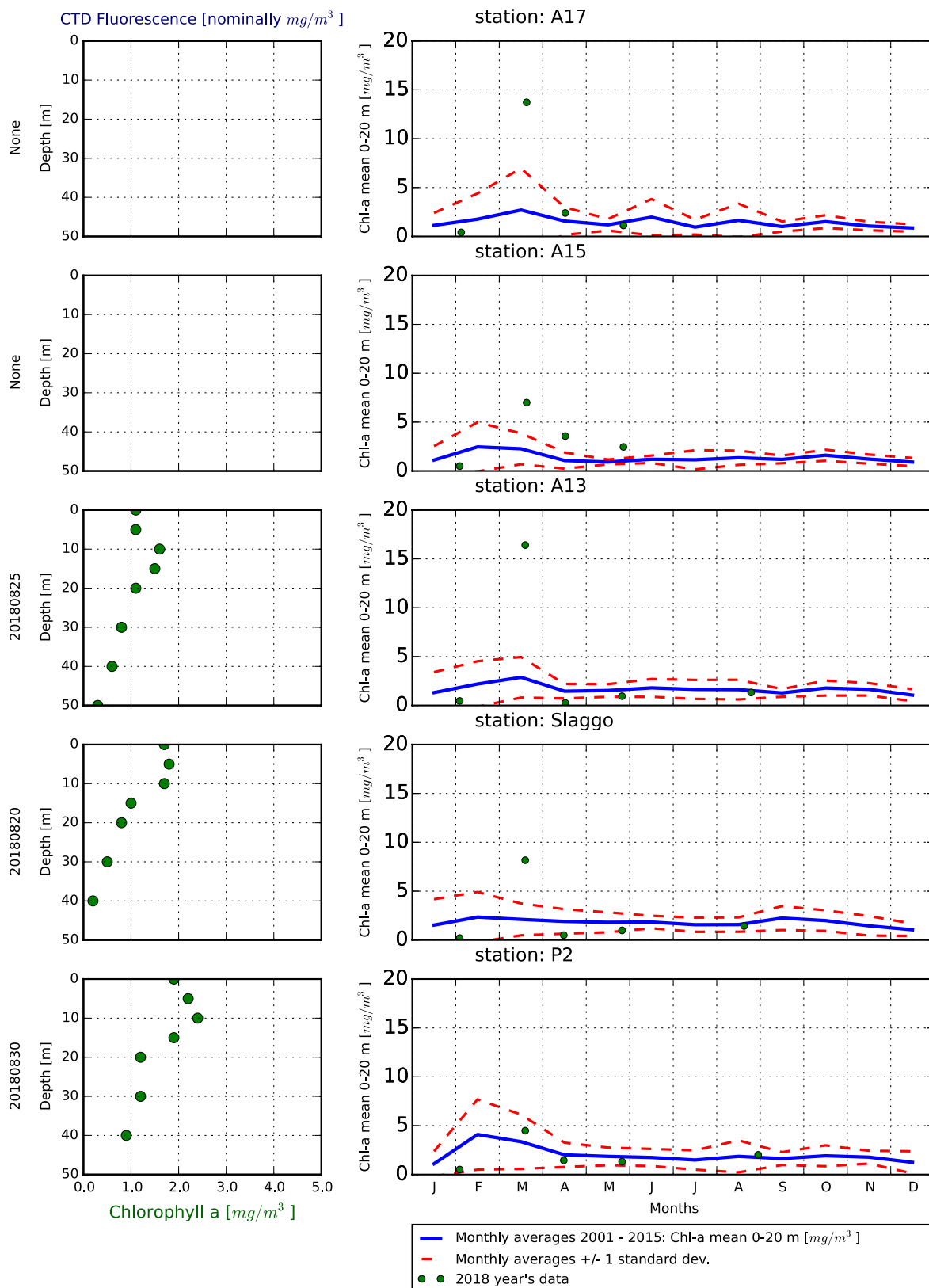
BY38 5th of September

This was the only Baltic Sea station where the filamentous cyanobacteria were completely absent, and only a few colonies of *Woronichinia* sp. were present. Two diatom species had high cell numbers; *Chaetoceros castracanei* and *Coscinodiscus centralis*. Otherwise the sample displayed some flagellates, ciliates and the dinoflagellate *Heterocapsa rotundata*. The integrated (0-10 m and 0-20 m) chlorophyll *a* concentrations were within normal for BY38 and BY32, BY29 and BY20 in September.

Selection of observed species	Anholt E
Red=potentially toxic species	2/9
Hose 0-10 m	presence
Cerataulina pelagica	present
Chaetoceros sp.	present
Cylindrotheca closterium	common
Leptocylindrus minimus	common
Nitzschia longissima	common
Proboscia alata	present
Pseudo-nitzschia seriata	present
Pseudo-nitzschia sp.	present
Pseudosolenia calcar-avis	very common
Skeletonema marinoi	common
Gymnodiniales	present
Gyrodinium spp.	present
Heterocapsa rotundata	common
Karenia mikimotoi	present
Lingulodinium polyedrum	present
Prorocentrum micans	common
Prorocentrum compressum	very common
Protoceratium reticulatum	present
Dinobryon faculiferum	present
Pyramimonas sp.	present
Cryptomonadales	present
Flagellates	common
Ciliophora	common
Eutintinnus sp.	present

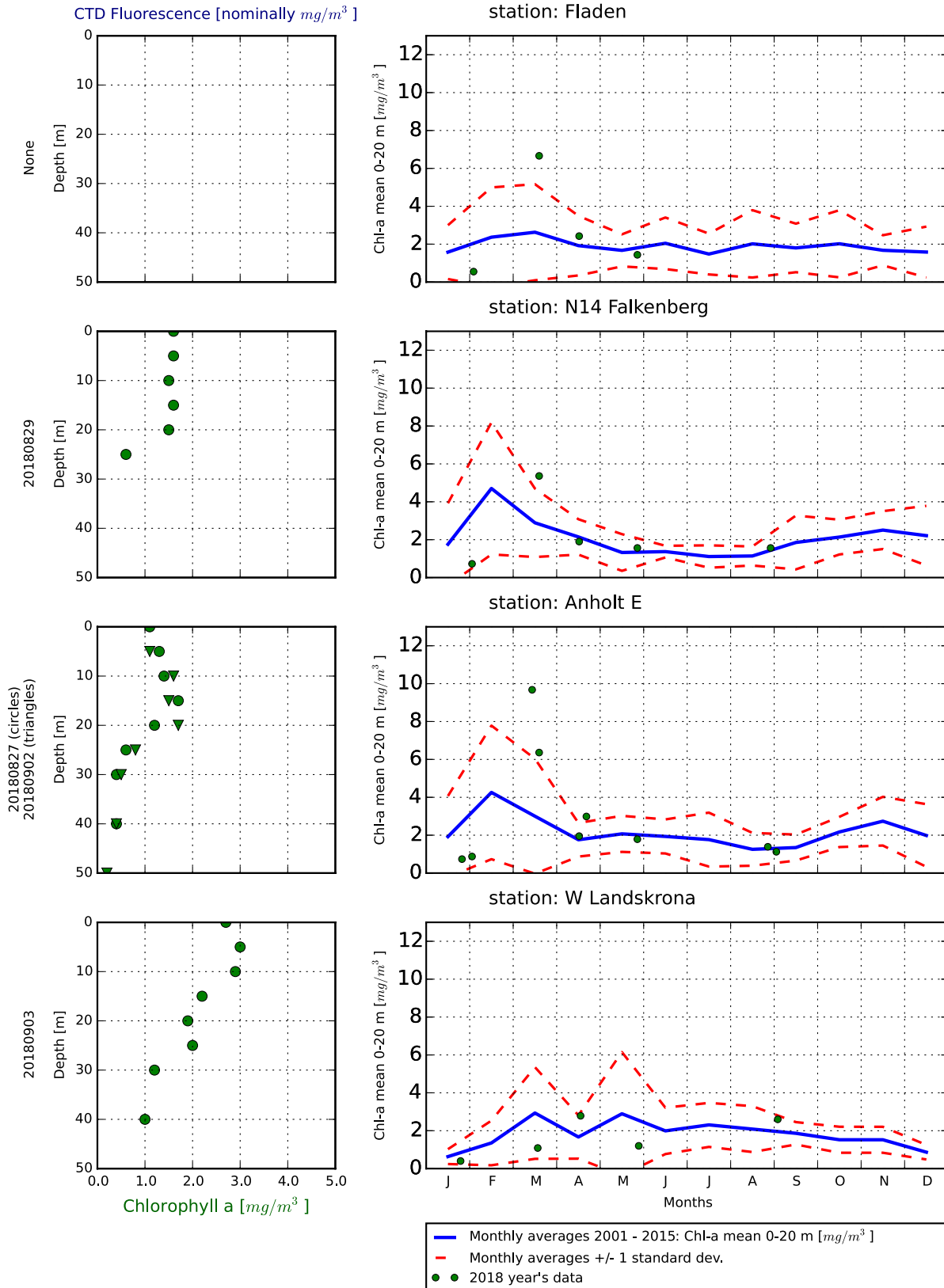
Selection of observed species	BY2	BY5	BCSIII-10	BY15	BY38	REFM1V1
Red=potentially toxic species	3/9	3/9	4/9	4/9	5/9	5/9
Hose 0-10 m	presence	presence	presence	presence	presence	presence
<i>Cerataulina pelagica</i>	present					
<i>Chaetoceros castracanei</i>	common		present	common	very common	present
<i>Chaetoceros danicus</i>	common			present	common	present
<i>Chaetoceros decipiens</i>	present					
<i>Coscinodiscus centralis</i>			present	present	very common	present
<i>Coscinodiscus concinnus</i>			common			
<i>Cylindrotheca closterium</i>	present					
<i>Dactyliosolen fragilissimus</i>	common					
Pennales				present		
<i>Skeletonema marinoi</i>	present					very common
<i>Thalassiosira</i> sp.	present			present	present	present
<i>Dinophysis acuminata</i>		present				
<i>Diplopsalis</i> sp.					present	
Gymnodiniales	present	present	common	present		common
<i>Gyrodinium</i> spp.						present
<i>Heterocapsa rotundata</i>			common		present	
<i>Heterocapsa triquetra</i>						common
<i>Prorocentrum cordatum</i>	common					
<i>Prorocentrum micans</i>	present					present
<i>Dinobryon faculiferum</i>	common					present
<i>Oocystis</i> sp.				present	common	present
<i>Pyramimonas</i> sp.	present	present	common	present	common	present
Cryptomonadales		common	common	common	common	present
<i>Leucocryptos marina</i>				present	present	
<i>Telonema subtile</i>						present
<i>Aphanizomenon flosaquae</i>	very common	common	present	very common		common
<i>Aphanothece</i> sp.	present					common
<i>Cyanodictyon</i> sp.	present					common
<i>Dolichospermum lemmermannii</i>				present		
<i>Dolichospermum</i> sp.	common			common		present
<i>Nodularia spumigena</i>	present	common		present		
<i>Pseudanabaena</i> sp.				common		present
<i>Snowella litoralis</i>				present		common
<i>Woronichinia</i> sp.					present	
Choanoflagellata	present					present
<i>Ebria tripartita</i>		present				
Flagellates	common	present	common	common	common	very common
<i>Mesodinium rubrum</i>	present		common		common	common
Ciliophora		present	common	common	present	common
<i>Helicostomella subulata</i>		present	common	present	present	
<i>Strombidium</i> sp.	present		common	present	present	present

The Skagerrak



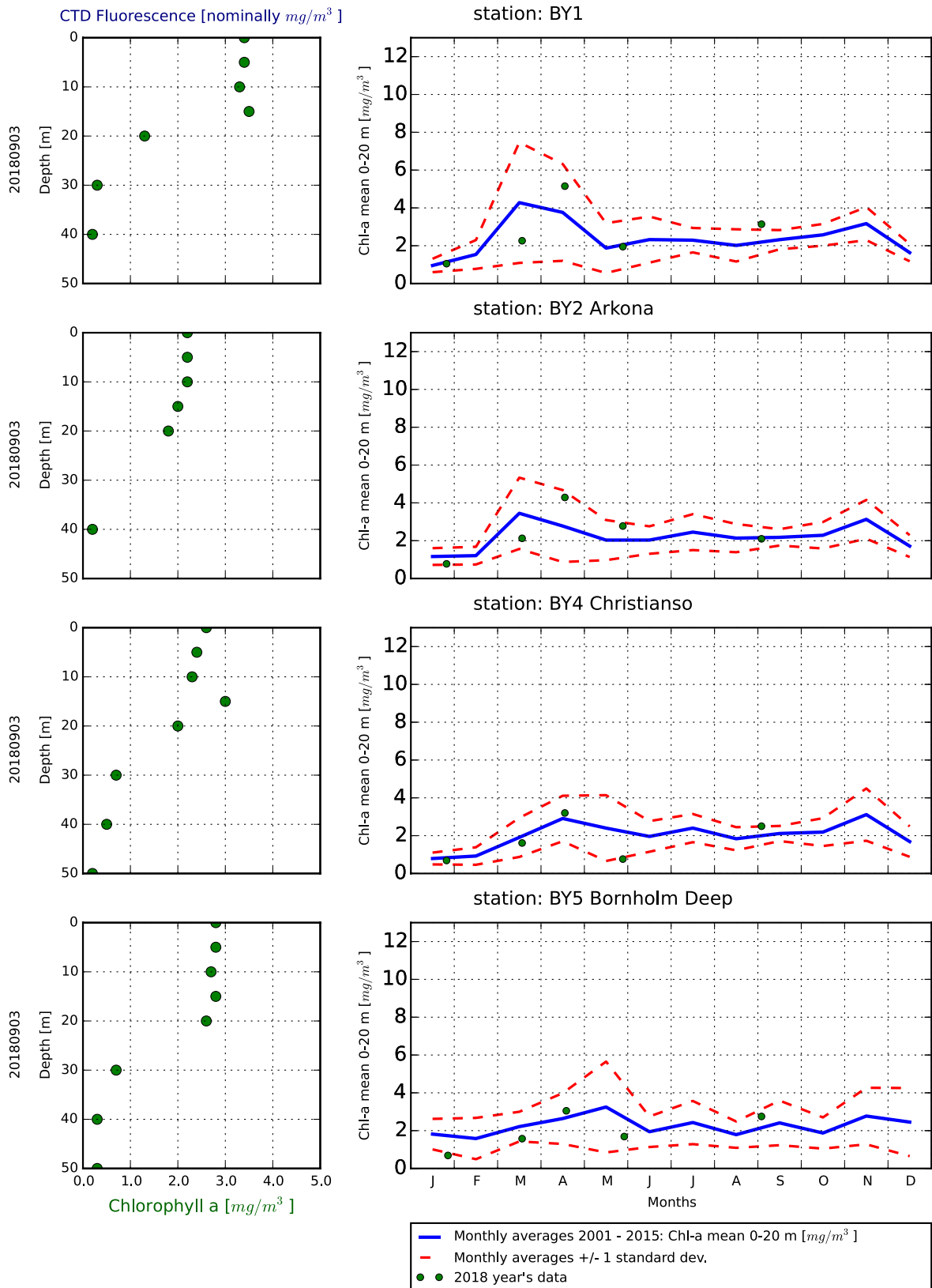
The stations Å17 and Å15 have not been visited since May. Å13, Släggö and P2 were visited during a cruise with R/V Dana in the end of August. The CTD diagrams are not presented in this report. The Danish CTD is probably calibrated in a different way than the Swedish CTD and is not compatible to the measured chlorophyll data.

The Kattegat and The Sound



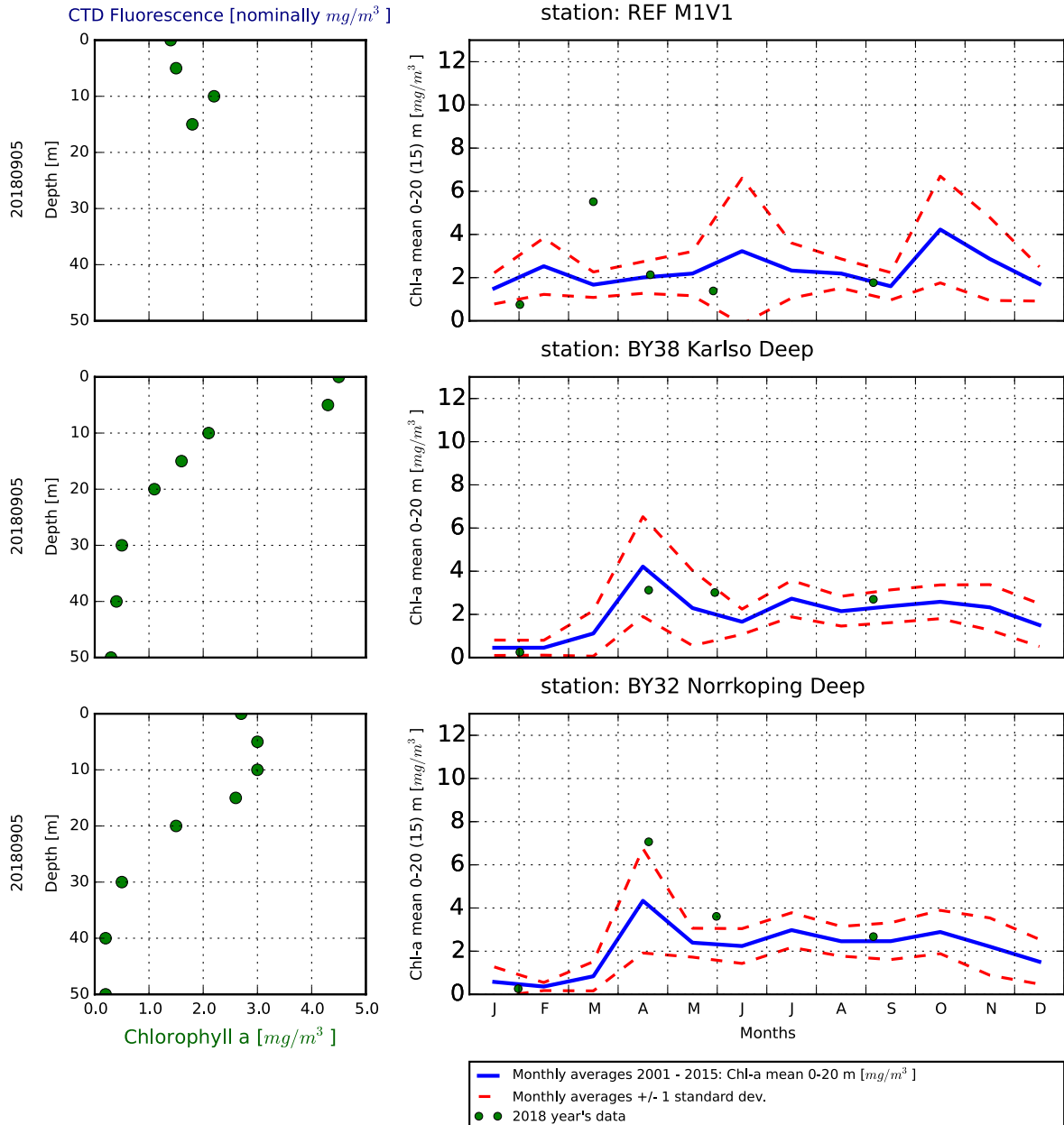
The station Fladen has not been visited since May. N14 was visited during a cruise with R/V Dana in the end of August. The CTD diagrams are not presented in this report. The Danish CTD is probably calibrated in a different way than the Swedish CTD and is not compatible to the measured chlorophyll data.

The Southern Baltic



The CTD diagrams are not presented in this report. The Danish CTD is probably calibrated in a different way than the Swedish CTD and is not compatible to the measured chlorophyll data.

The Western Baltic



The CTD diagrams are not presented in this report. The Danish CTD is probably calibrated in a different way than the Swedish CTD and is not compatible to the measured chlorophyll data.

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 algbloomningar finns under perioden juni-augusti på www.smhi.se.

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.

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, magkramp 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.

