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SMHI

Oceanographic Unit
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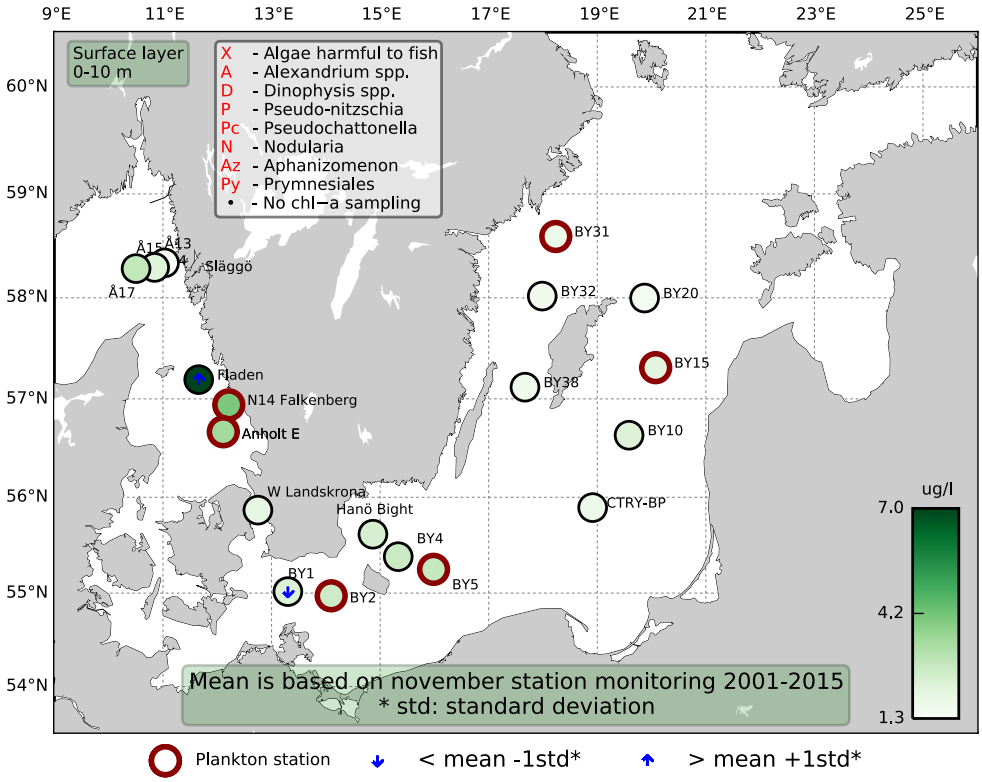
AlgAware

ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

Artdiversiteten var hög i både Skagerrak och Kattegatt under novemberprovtagningen och flest antal arter observerades vid Släggö i Skagerrak. Kiselalger var särskilt artrika och bland dessa fanns *Pseudo-nitzschia* med högst antal celler. Det var också gott om dinoflagellater och andra arter i proverna. Det nakna stadiet av *Dictyocha* fanns i låga antal även denna månad vid alla Västerhavsstationer. De integrerade klorofyllvärdena (0-20m) låg över vad som är normalt för denna månad vid Fladen och N14 i Kattegatt samt vid Å17 i Skagerrak.

I Östersjön var situationen en helt annan, med typiskt vinterläge, det vill säga små arter i låga antal. Bara BY38 såg lite annorlunda ut med bland annat rätt stor mängd av kiselalgsläktet *Coscinodiscus*. Klorofyllhalterna var låga, vilket är normalt för denna månad.



Abstract

The species diversity was high in the Skagerrak and Kattegat areas during the November cruise. The largest number of species were found at Släggö in the Skagerrak. Diatoms were especially species rich amongst which *Pseudo-nitzschia* was found to have the highest cell numbers. Dinoflagellates and other species were also abundant, and the naked stage of *Dictyocha* was present in low cell numbers at all of the stations in the Skagerrak and Kattegat areas. The integrated chlorophyll concentrations (0-20m) were above what is normal for this month at Fladen and N14 in the Kattegat, as well as at Å17 in the Skagerrak.

In the Baltic Sea the situation was quite different, showing a typical winter stage among the phytoplankton, meaning small species of different kinds in low cell numbers. Only BY38 was slightly different with a rather high abundance of the diatom genus *Coscinodiscus*. The chlorophyll concentrations were low, which is normal for this month.

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

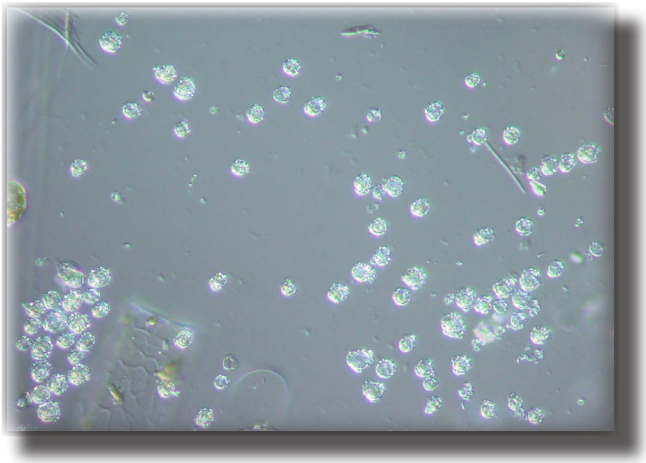
The Skagerrak

Å17 (open Skagerrak) 8th of November

The species diversity was high for the season and diatoms dominated the phytoplankton flora. *Pseudo-nitzschia* spp was rather abundant and the flagellate *Emiliania huxleyi* was found with quite high cell numbers. The integrated (0-20m) chlorophyll concentration was above normal for this month.

Släggö (Skagerrak coast) 8th of November

Släggö had the most species rich sample this month. Diatoms dominated and several species within the group had high cell numbers. Dinoflagellates were abundant as well, *Akashiwo sanguinea** and *Ceratium furca* being the most numerous species.



In a live sample of phytoplankton, *Emiliania huxleyi* shines like precious stones when present. Note that this picture was taken at another occassion. It was not as numerous this month, but the cell counts were high for the season.

The potentially harmful dinoflagellate *Akashiwo sanguinea* was present in the Skagerrak and Kattegat samples.

The Kattegat

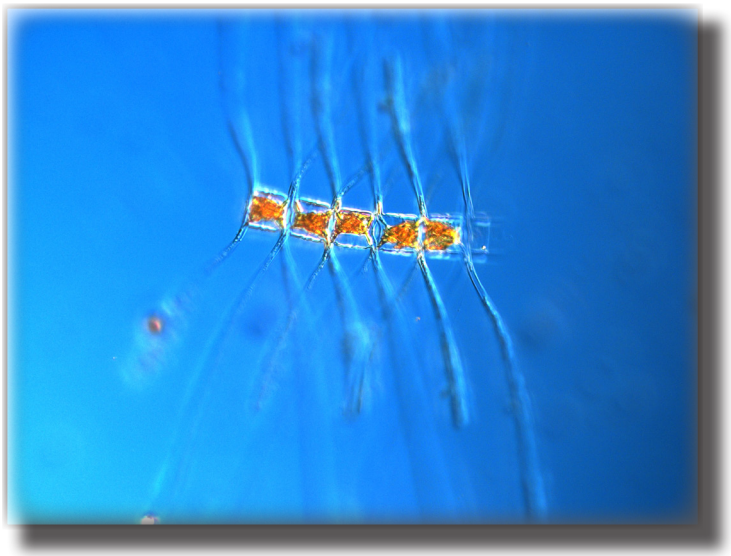
Anholt E and N14 Falkenberg 9th of November

Just like the previous month, species diversity was high at both stations and dominated by diatoms. Species with high cell number generally differed a bit between the stations, but *Pseudo-nitzschia* spp.* was found with high cell numbers at both Anholt E and N14 Falkenberg. At the latter, the integrated chlorophyll concentration was above what is normal for this month.

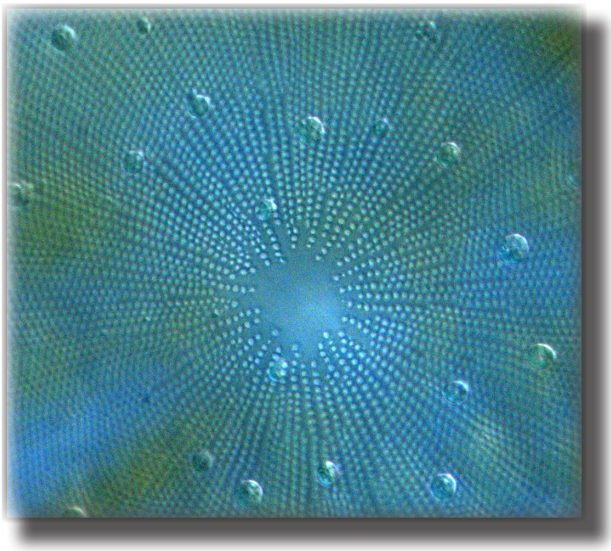
The Baltic Sea

BY2, BY5, BY15, 4CTRY-BP, BY31 and BY38 10th - 13th of November

Small species in low numbers were found in the phytoplankton samples. Colonies of pico sized cyanobacteria were found present or common at all stations. The sample from BY38 differed from the other stations by containing more diatom species, some of which had rather high cell numbers. Chlorophyll concentrations were low at all stations which is normal for this month.



The diatom *Chaetoceros castracanei* was present at all of the Baltic phytoplankton stations.

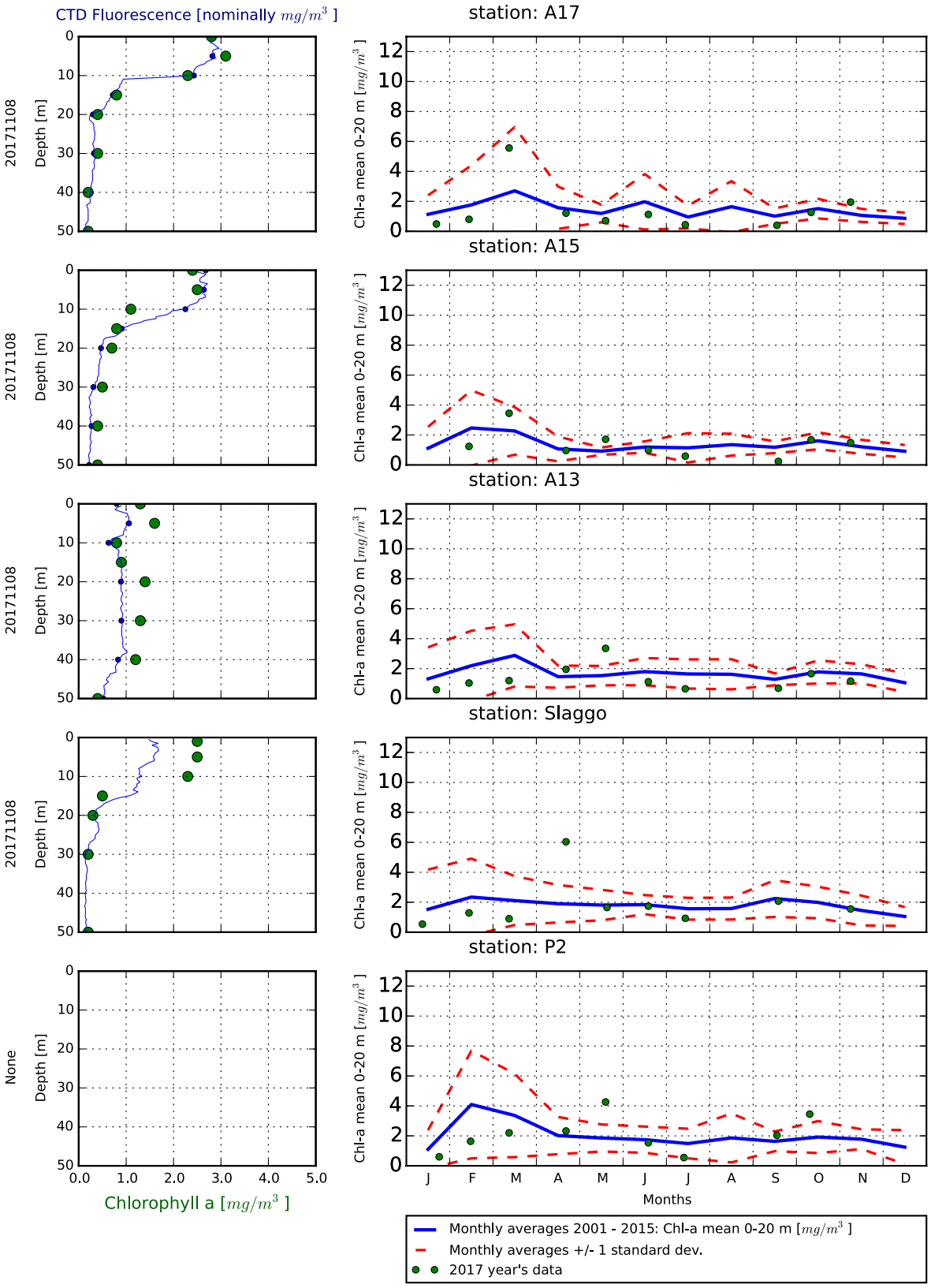


A close up of the diatom *Coscinodiscus concinnus,* which was present at BY38.

Phytoplankton analysis and text by:
Ann-Turi Skjevik

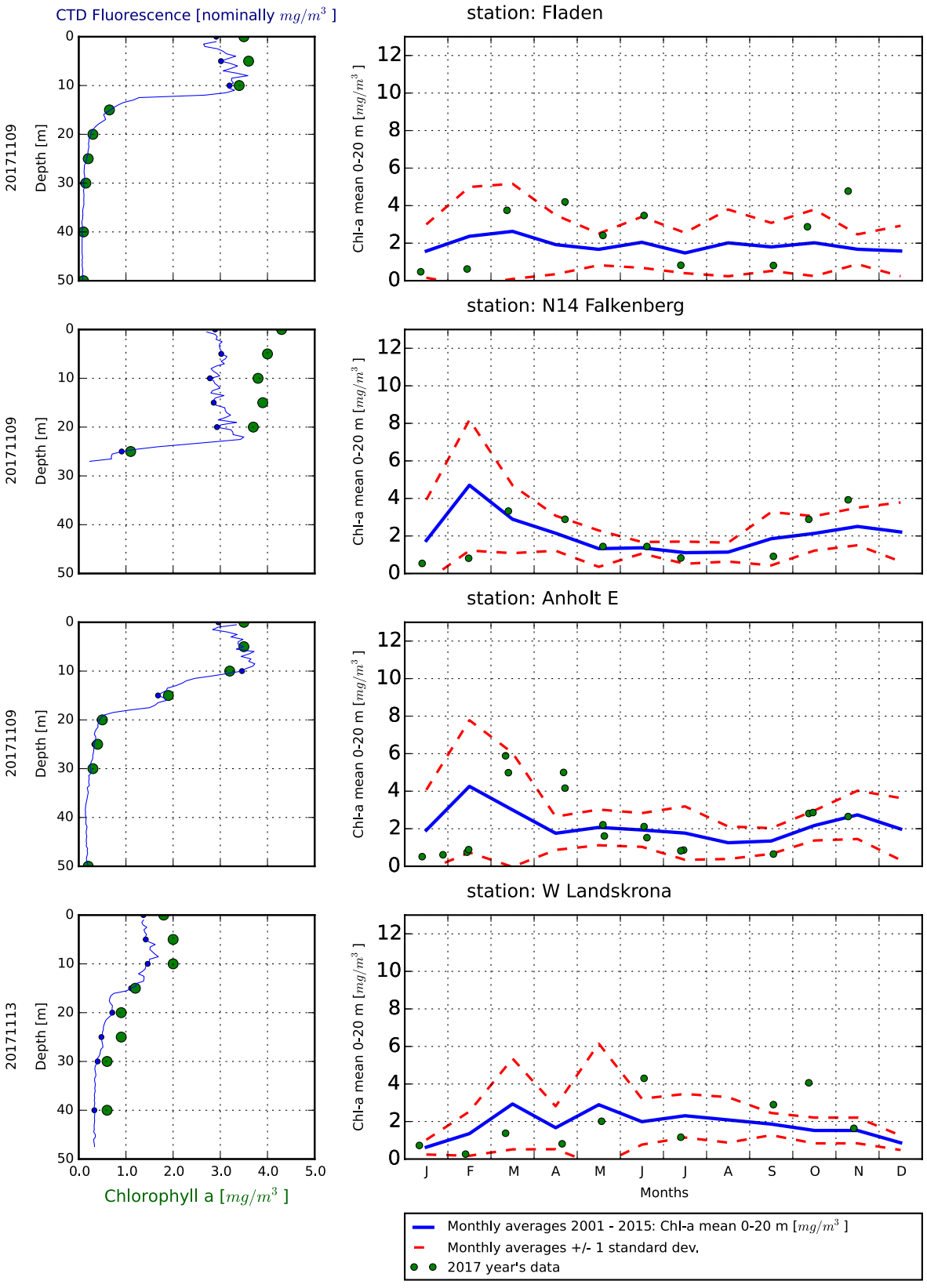
Selection of observed species	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	9/11	9/11	8/11	8/11
Hose 0-10 m	presence	presence	presence	presence
Asterionellopsis glacialis		present		
Attheya septentrionalis	present	present		
Cerataulina pelagica	present	present	present	present
Cylindrotheca closterium				present
Chaetoceros curvisetus		present	present	
Chaetoceros danicus	present	present	present	present
Chaetoceros socialis	present		present	present
Chaetoceros subtilis	present	present		present
Chaetoceros wighamii				present
Coscinodiscus concinnus			present	
Coscinodiscus wailesii			present	
Dactyliosolen fragilissimus	present	present		
Ditylum brightwellii	present	present	common	present
Eucampia zodiacus			present	
Guinardia delicatula	present	present	present	present
Guinardia flaccida		present	present	
Lauderia annulata			present	
Leptocylindrus danicus	common	present	present	present
Leptocylindrus minimus			present	present
Nitzschia longissima	present	present	common	present
Odontella sinensis			present	
Proboscia alata	common	present	common	present
Pseudo-nitzschia spp	very common	very common	common	common
Pseudo-nitzschia seriata				present
Pseudosolenia calcar-avis	present	present	present	common
Rhizosolenia pungens	present	common	present	
Rhizosolenia setigera	present	present	present	present
Skeletonema marinoi	present	present	common	present
Thalassionema nitzschioides	present	present	common	present
Thalassiosira angulata		present	present	present
Thalassiosira anguste-lineata			present	
Thalassiosira nordenskioeldii		present		
Thalassiosira punctigera	present			
Thalassiosira rotula	present	present	present	
Akashiwo sanguinea	present	present	common	
Azadinium spp				present
Ceratium furca	present	present	common	present
Ceratium fusus	present	present	present	present
Ceratium lineatum	present	present	present	present
Ceratium longipes	present		present	present
Ceratium macroceros			present	
Ceratium tripos	present	present		present
Dinophysis acuminata			present	
Dinophysis acuta		present		
Dinophysis norvegica	present	present	present	
Dinophysis tripos			present	present
Gyrodinium flagellare	present			present
Karlodinium veneficum			present	
Katodinium glaucum	present			
Noctiluca scintillans			present	
Polykrikos schwartzii	present		present	
Prorocentrum micans	present	present		
Protoperidinium spp	present	present		
Protoperidinium bipes			present	
Protoperidinium depressum	present		present	
Protoperidinium divergens			present	
Protoperidinium oblongum			present	
Acanthoica quattrospina	present			
Emiliania huxleyi	common	present		common
Pleurochrysis carterae				common
Prymnesiales	present			present
Pyramimonas spp				present
Dictyocha naked stage	present	present	present	present
Dictyocha speculum	present	common	present	present
Pseudopedinella pyriformis	present			
Pseudanabaena spp				present
Cryptomonadales	common	common	common	common
Choanoflagellatea				present
Leucocryptos marina	present	present		present
Eutintinnus spp			present	
Laboea strobila	present	present	present	
Mesodinium rubrum			present	
Strombidium spp	present			
Tiarina fusus		present	present	
Ciliophora	common	present	present	common

Selection of observed species	BY2	BY5	BY15	4CTRY-BP	BY31	BY38
Red=potentially toxic species	13/11	10/11	11/11	10/11	11/11	12/11
Hose 0-10 m	presence	presence	presence	presence	presence	presence
Attheya septentrionalis				present		
Chaetoceros castracanei	present	present	present	present	present	common
Chaetoceros danicus	present	present	present	present	present	common
Chaetoceros similis						present
Chaetoceros subtilis					present	
Coscinodiscus spp						common
Coscinodiscus centralis						common
Coscinodiscus concinnus						present
Coscinodiscus granii						present
Skeletonema marinoi	present					
Ceratium tripos	present					
Dinophysis acuminata						present
Dinophysis norvegica						present
Gymnodinium verruculosum		present			present	
Heterocapsa spp		present			present	
Heterocapsa rotundata			present			
Peridiniales						present
Phalacroma rotundatum					present	present
Aphanizomenon flos-aquae					present	present
Nodularia spumigena						present
Cyanophyceae pico colonies	common	common	common	present	present	common
Planctonema lauterbornii	present	present	present		present	present
Cryptomonadales	present	common	common	present	common	present
Eutreptiella spp	present		present			
Prymnesiales		present				
Pterosperma spp		present				present
Pyramimonas spp	present	present				
Leucocryptos marina	present		present			
Choanoflagellatea					present	
Helicostomella subulata			present			
Mesodinium rubrum	present	present	present	present	present	
Strombidium spp	present					
Ciliophora	present	common	present	present	present	present

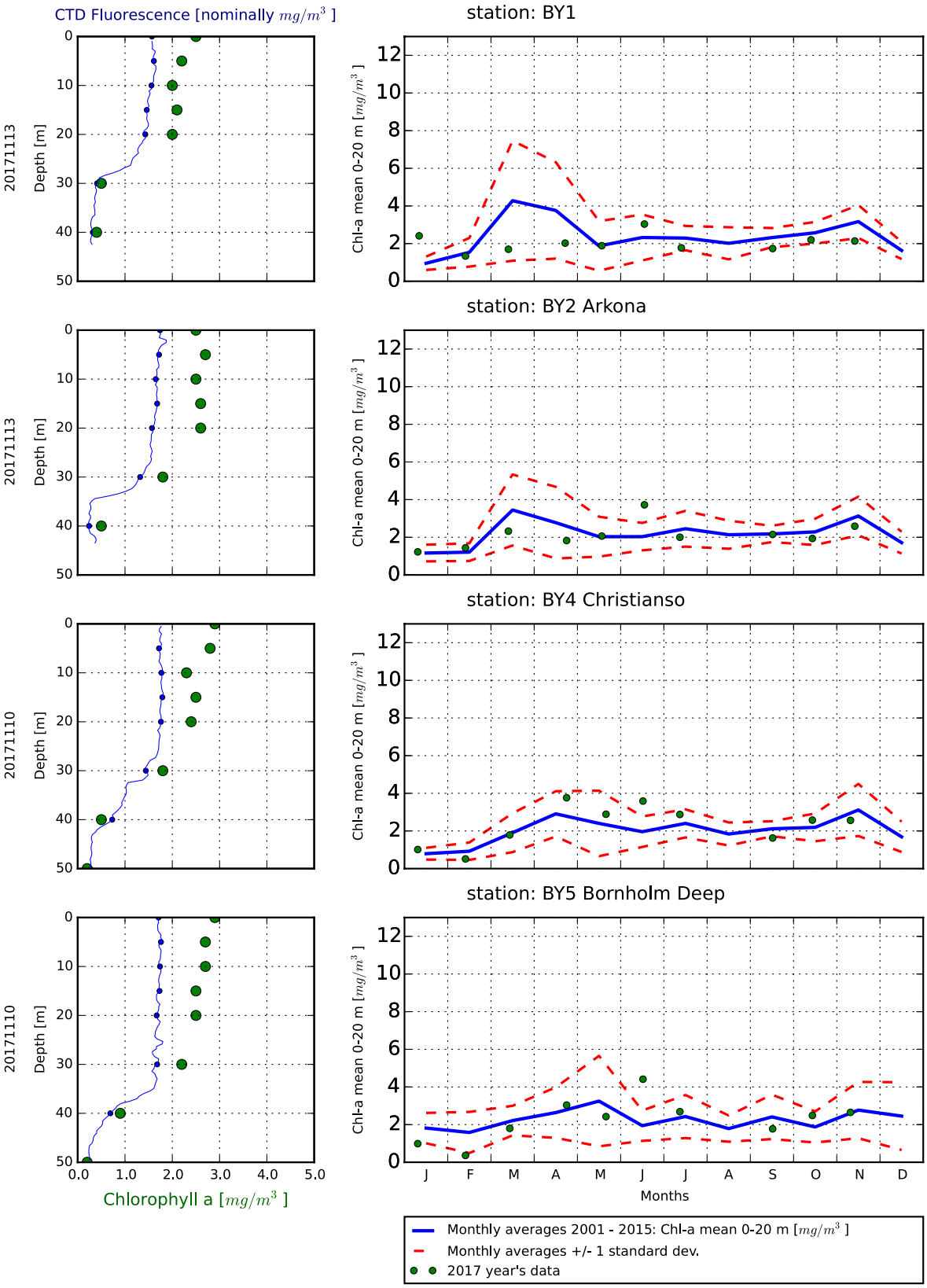


Station P2 was not visited during the expedition due to lack of cruise time.

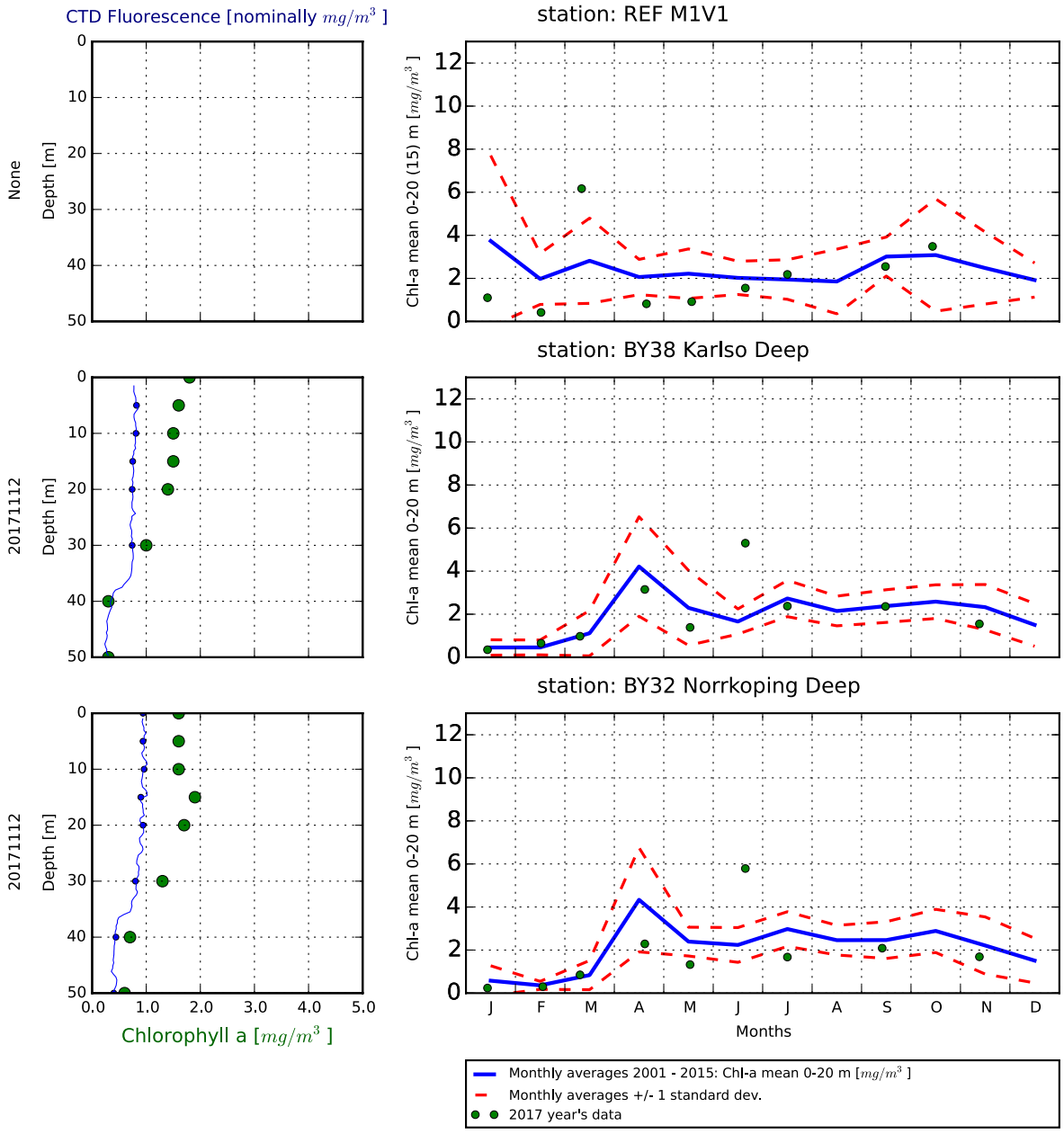
The Kattegat and The Sound



The Southern Baltic



The Western Baltic



Station REF M1V1 was not visited during the expedition due to lack of cruise time.

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.

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
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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