Dnr: S/Gbg-2016-71

SMHI

Oceanographic Unit
No 5, May 2016

AlgAware

ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

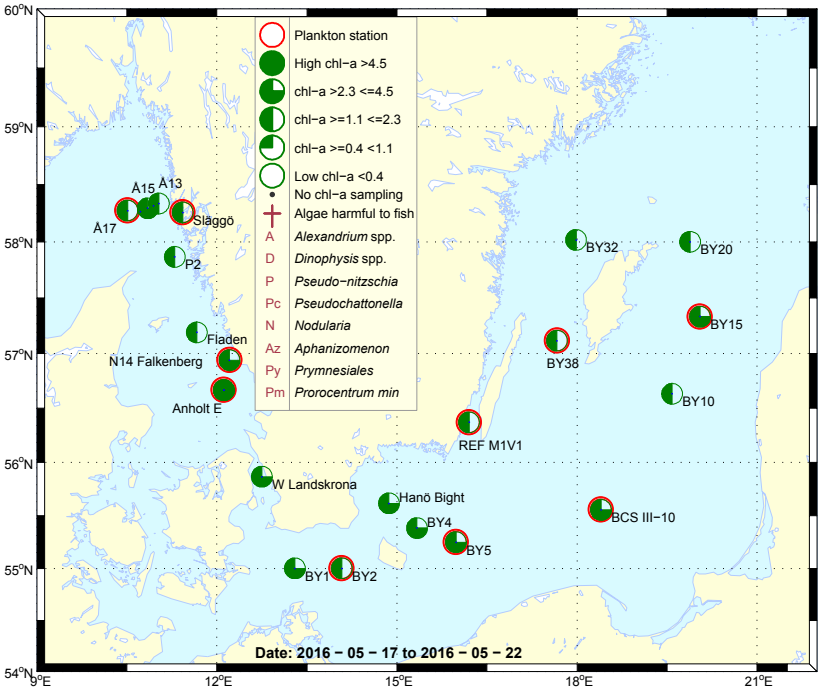
Sammanfattning

Kiselalgsarter som vanligtvis brukar finnas i förhöjda mängder under sommaren var vanligt förekommande i proverna både i Kattegatt och i Skagerrak. Sommararterna, samt kiselalgen *Chaetoceros danicus,*dominerade också i de prover som togs i klorofyllfluorescensmaxima. Flagellaten *Emiliania huxleyi* blommar i Nordsjön, vilket kan ses i satellitbilder: https://lance.modaps.eosdis.nasa.gov/imagery/subsets/?subset=Southern_Norway_and_Sweden.2016151.aqua.250m. *E. huxleyis* kalkplattor orsakar att havet skiftar i turkosblått när den blommar. Arten har nått Skagerrak och Kattegatt med strömmarna. Den är inte skadlig.

De integrerade klorofyllvärdena (0-20m) var över det normala för maj vid Anholt E och N14 i Kattegatt och vid Å15 i Skagerrak, i övrigt inom det normala.

I Östersjön var artdiversiteten av växtplankton relativt låg vilket är vanligt i maj. Mängden av små kolonibildande cyanobakterier var däremot hög, och flagellaten cf. *Prymnesium polylepis* fanns vid många stationer. Den trådlika cyanobakterien *Aphanizomenon flos-aquae* fanns i de flesta prover och uppmättes till högst antal vid BY38.

De integrerade klorofyllvärdena (0-20m) var inom det normala för maj vid samtliga stationer förutom REF M1V1 där den var lägre än normalt.



Abstract

Diatom species, often blooming during summer, were rather abundant in the Kattegat and Skagerrak samples. These summer species, as well as the diatom *Chaetoceros danicus,* also dominated in the samples from the chlorophyll fluorescence maxima. The flagellate *Emiliania huxleyi* is blooming in the North Sea, visible in satellite images. Just click on the link above. The cell surface of *E. huxleyi* causes a bright turquoise coloring of the water when blooming. The species has reached Skagerrak and Kattegat with the currents. It is not harmful.

The integrated (0-20m) chlorophyll concentrations were above normal for this month at Anholt E and N14 in the Kattegat and at Å15 in the Skagerrak, and within normal at the other stations.

The species diversity was quite low in the Baltic Sea which is normal for the month of May. The amount of pico cyanobacteria colonies was high though, and the flagellate cf. *Prymnesium polylepis* was present at many stations. The threadlike cyanobacterium *Aphanizomenon flos-aquae* was present in most samples, and the highest cell counts of the species was found at BY38.

The integrated (0-20m) chlorophyll concentrations were normal for this month at all stations in the Baltic except at REF M1V1 where it was below normal.

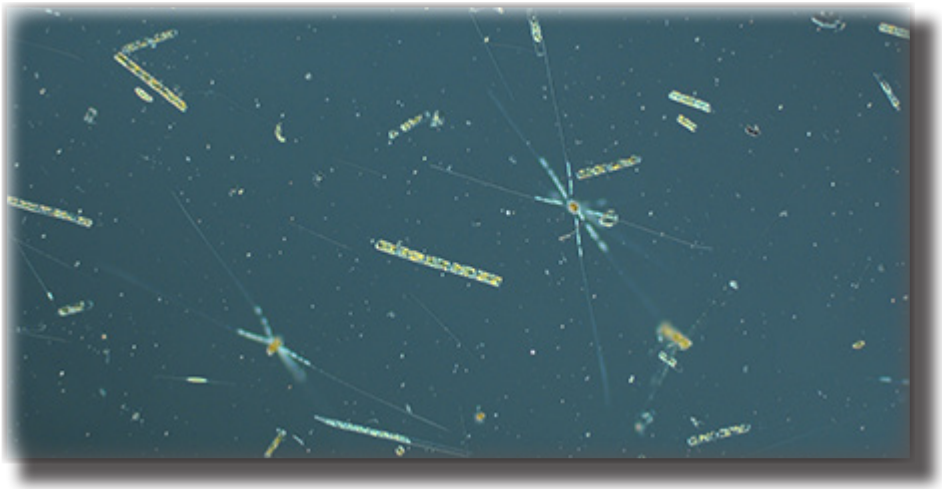
More detailed information on species composition and abundance

The Skagerrak

Å17 (open Skagerrak) 19th of May
The phytoplankton diversity was high being the month of May. The diatoms *Guinardia delicatula* and *Proboscia alata*, typical summer species, were common. There is an ongoing bloom of the small flagellate *Emiliania huxleyi* in the North Sea, visible in satellite images. The algae have reached the Skagerrak and Kattegat areas with the currents and the highest cell counts of *E. huxleyi* were found in the Skagerrak, both open sea and coastal stations.

Släggö (Skagerrak coast) 20th of May
The phytoplankton situation was very similar to the one at Å17.

P2 19th of May
A chlorophyll fluorescence maximum at 15 meters depth was mainly caused by diatoms.



Diatoms dominated the sample from the chlorophyll fluorescence peak at 17 meters depth at Anholt E.

The Kattegat

Anholt E 19th and 20th of May
Diatoms typically dominating the phytoplankton biomass during summer were very common at both visits in the hose samples (0-10 m) as well as in the sample from a chlorophyll fluorescence peak at 17 meters. In the latter, the diatom *Chaetoceros danicus* dominated, however. The integrated chlorophyll concentrations (0-20 m) were above normal for this month.

N14 Falkenberg 19th of May
The phytoplankton situation was very similar to the one at Anholt E, the flagellate *Emiliania huxleyi* was common. The integrated chlorophyll concentration (0-20 m) was above normal for this month.

West Landskrona 18th of May
A chlorophyll fluorescence maximum at 20 meters depth was mainly caused by diatoms, of which *Chaetoceros danicus* was the most abundant species.

The Baltic

BY2 Arkona Basin and BY5 Bornholm Basin 18th of May

The species diversity was rather low, but pico cyanobacteria colonies were abundant. The flagellate cf. *Prymnesium polylepis** was common. A chlorophyll fluorescence peak at BY2 at 15 meters depth was partly caused by the flagellate cf. *Prymnesium polylepis** and pico cyanobacteria colonies.

Hanö Bight 21st of May

A chlorophyll fluorescence peak at 20 meters depth was partly caused by the flagellate cf. *Prymnesium polylepis** and pico cyanobacteria colonies.

REF M1V1 Kalmar Sound 21st of May

The phytoplankton diversity was low. Naked dinoflagellates, pico cyanobacteria colonies and the chrysophyte *Dinobryon* sp. were common.

BY38 Karlsö Deep 21st of May

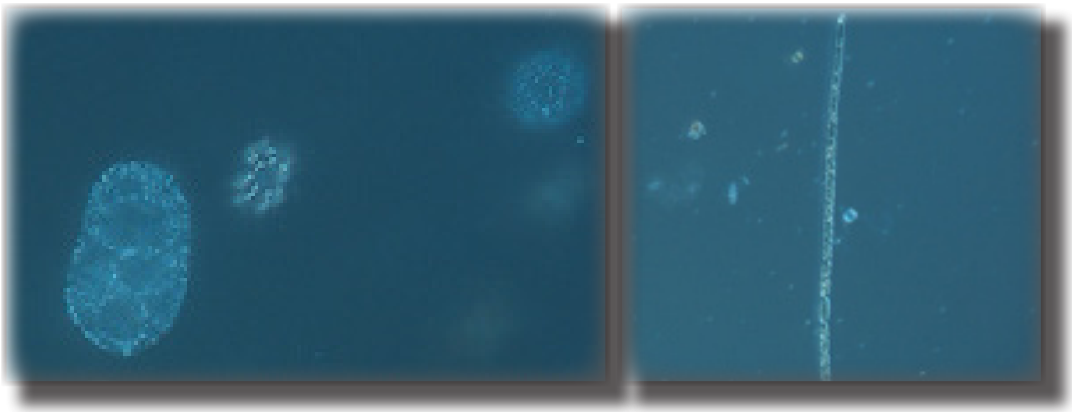
The phytoplankton diversity was rather low, the filamentous cyanobacterium *Aphanizomenon flos-aquae* was common though.

BY15 and BCS III-10 17th of May

The species diversity was rather high although the cell counts were generally low. Pico cyanobacteria colonies were common.

A chlorophyll fluorescence peak at BY15 at x meters depth was partly caused by the chrysophyte *Dinobryon* cf. *divergens*.

The integrated chlorophyll concentrations were normal for this month in the Baltic samples except at Ref M1V1 where the concentration was below normal.



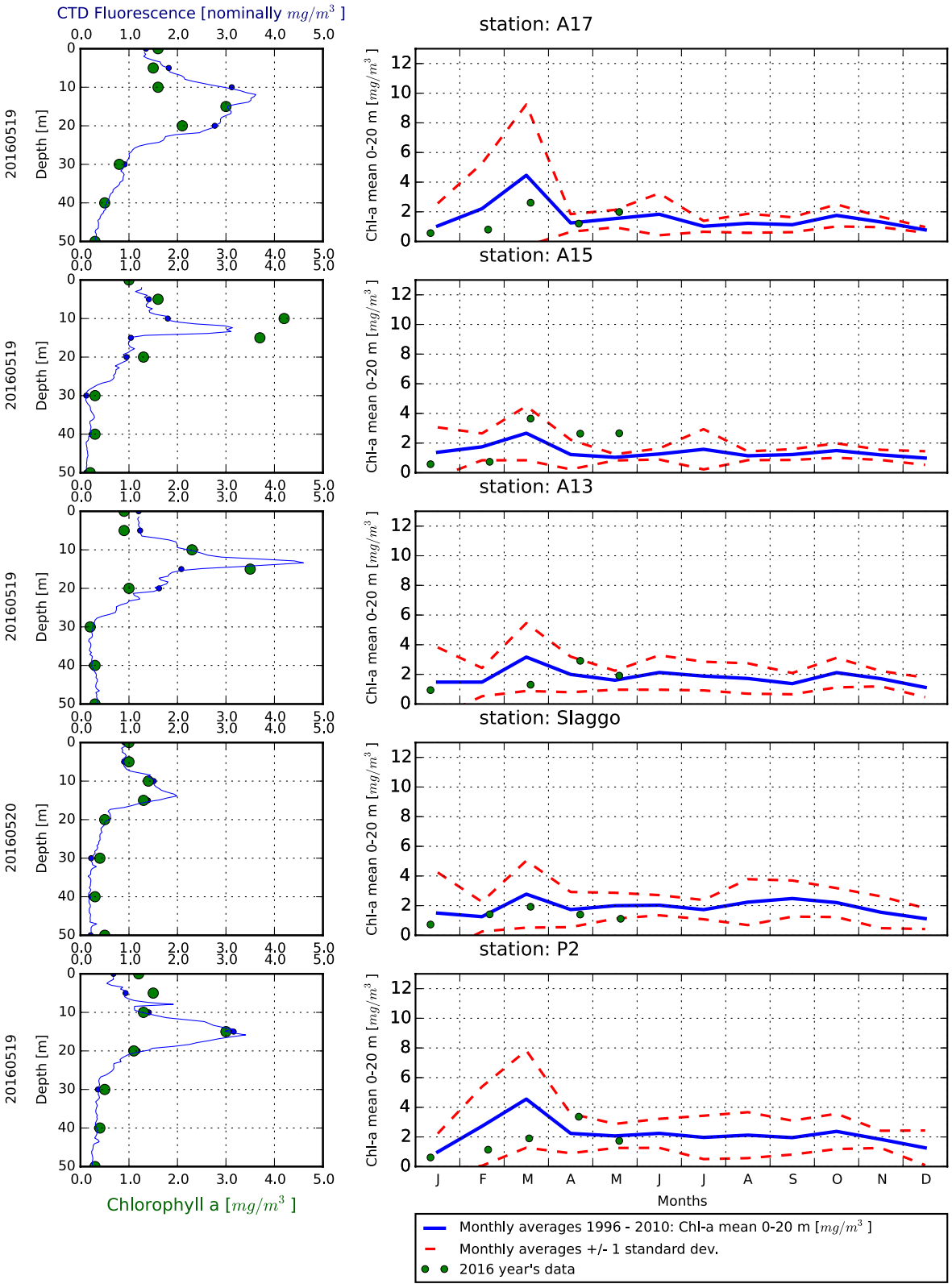
Pico cyanobacteria colonies, like *Aphanocapsa* sp., *Snowella* sp. and *Lemmermanniella* sp., were abundant in the Baltic samples. The filamentous cyanobacterium *Aphanizomenon flos-aquae* (right photo) was present in most samples.

Phytoplankton analysis and text by:
Ann-Turi Skjevik

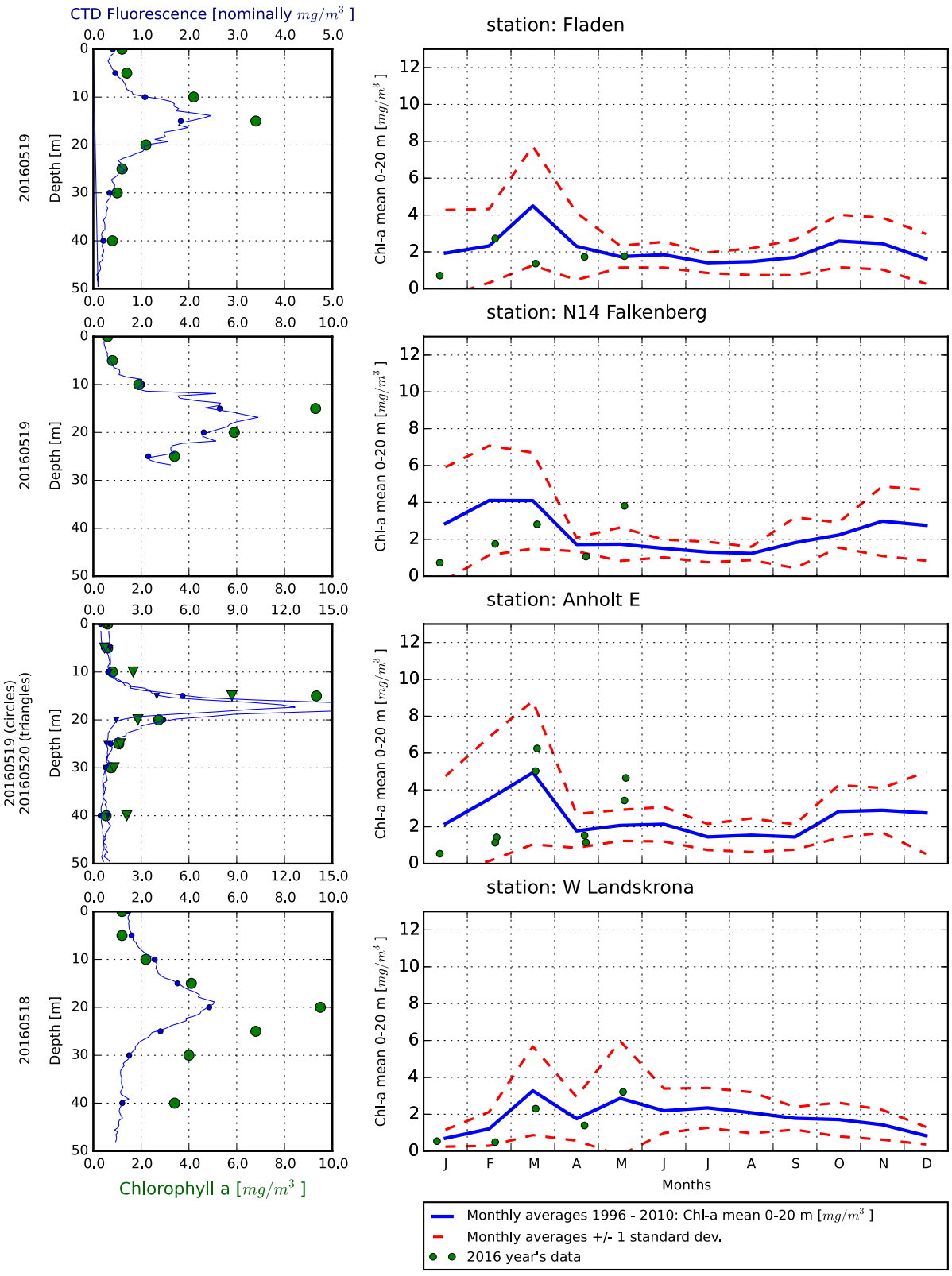
Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	19/5	20/5	19/5	19/5	20/5
Hose 0-10 m	presence or cells/l	presence or cells/l	presence or cells/l	presence or cells/l	presence or cells/l
Attheya septentrionalis			present		
Cerataulina pelagica	present	present	present	present	present
Chaetoceros danicus			present	present	present
Chaetoceros decipiens	present				
Cylindrotheca closterium	present	present	present	common	present
Dactyliosolen fragilissimus		present	present	present	common
Guinardia delicatula	common	common	common	very common	common
Nitzschia longissima					present
Phaeodactylum tricornutum	present	present	present	common	
Proboscia alata	common	common	common	very common	common
Pseudo-nitzschia spp		present	present		present
Rhizosolenia hebetata			present		
Rhizosolenia imbricata	present				
Rhizosolenia setigera			present		
Skeletonema marinoi			present		
Ceratium fusus	present		present		
Ceratium horridum	present				
Ceratium longipes		present	present		
Ceratium tripos	present			present	
Dinophysis acuminata		present			present
Dinophysis norvegica					present
Gymnodiniales	common	present	present	present	
Heterocapsa rotundata	present				
Karlodinium micrum	present	present	present		present
Katodinium glaucum	present				
Peridiniales	present				
Peridiniella danica			present	present	
Prorocentrum minimum	present				
Protoceratium reticulatum			present		present
Protoperidinium bipes	present				
Protoperidinium depressum		present			
Protoperidinium pellucidum		present	present		
Scrippsiella complex		present			
Dinobryon spp		present	present	present	
Dinobryon faculiferum		present	present	present	
Cryptomonadales	common	common	common	present	
Leucocryptos marina	present	present	present	common	
Apedinella radians	present	present			
Pseudopedinella spp	present	present	present	present	
Pseudopedinella pyriformis		present		present	
Emiliania huxleyi	237 046	141 532	common	present	present
Prymnesiales	common		present	present	
Heterosigma akashiwo				present	
Eutreptiella spp		present		present	
Pterosperma spp		present		present	
Pyramimonas spp	present		present		
Craspedophyceae	present	present		present	
Ebria tripartita	present				
Ciliophora	common	common	present	present	present
Favella spp	present				
Laboea strobila		present			present
Strombidium spp	present	present	present	present	

Selection of observed species	BY2	BY5	BCS III-10	BY15	REF M1V1	BY38
Red=potentially toxic species	18/5	18/5	17/5	17/5	21/5	21/5
Hose 0-10 m	presence	presence	presence	presence	presence	presence
Attheya septentrionalis				present		
Skeletonema marinoi					present	
Amylax triacantha			present			
Cladopyxis claytonii				present		
Dinophysis acuminata			present	present		present
Dinophysis norvegica			common	present	present	common
Gymnodiniales	common	common	present	common	common	common
Gyrodinium spirale				present		
Heterocapsa spp			present			
Heterocapsa rotundata			present			present
Heterocapsa triquetra			present			
Karlodinium micrum	present	present			present	
Katodinium glaucum			present	present		present
Peridiniales			present	common		present
Peridiniella catenata			present	present		
Peridiniella danica	present					
Dinobryon spp			present	very common	common	present
Cryptomonadales			present			
Cf. Prymnesium polylepis	common	common		present		
Prymnesiales	present	present	present	present	present	present
Aphanizomenon flos-aquae		present	present	present	present	common
Aphanocapsa spp	very common	very common	common	common	common	present
Aphanothece paralleliformis			present			
Cyanodictyon spp		common				
Lemmermanniella spp	common		present	present	present	
Snowella spp	common	common	common		present	present
Pseudopedinella spp	present		present			
Pseudopedinella pyriformis	present			present		
Eutreptiella spp						present
Pterosperma spp	present	present	common	present	present	very common
Pyramimonas spp						present
Planctonema lauterbornii			present			
Calliacantha natans				present		
Craspedophyceae		present	present	present		
Ebria tripartita			present			
Ciliophora	present	common	common	common	present	present
Mesodinium rubrum		present	common	common		present

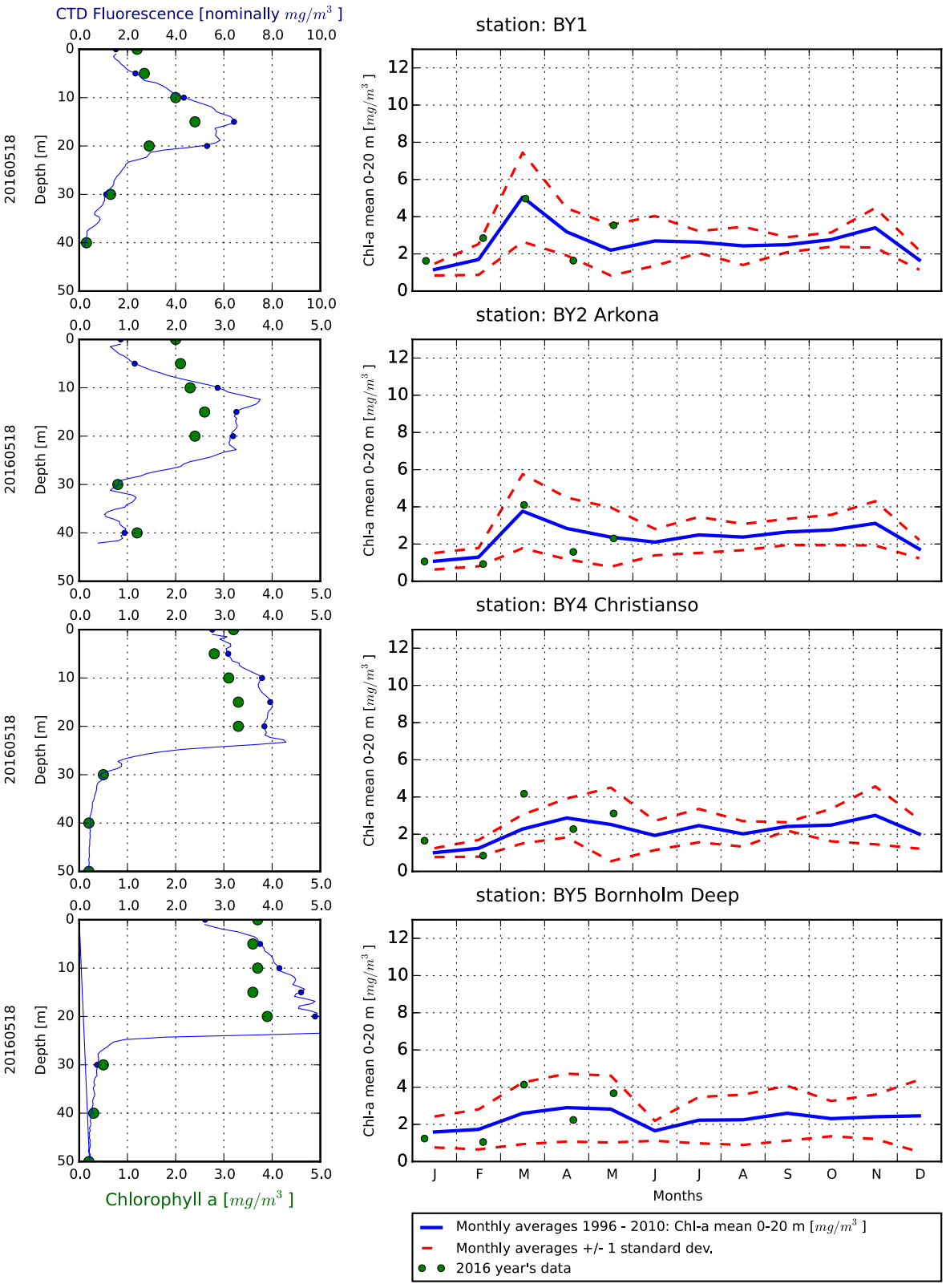
The Skagerrak



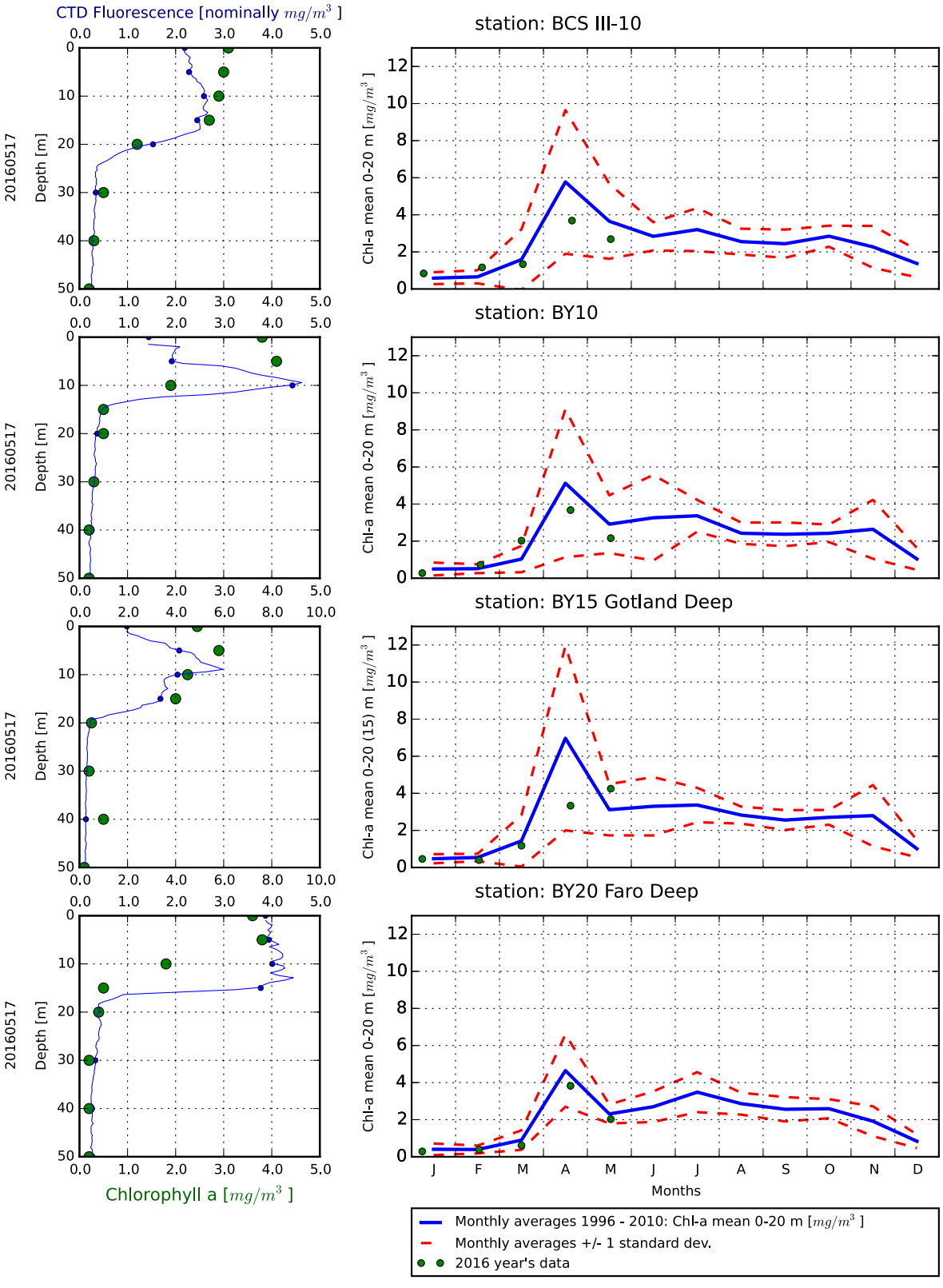
The Kattegat and The Sound

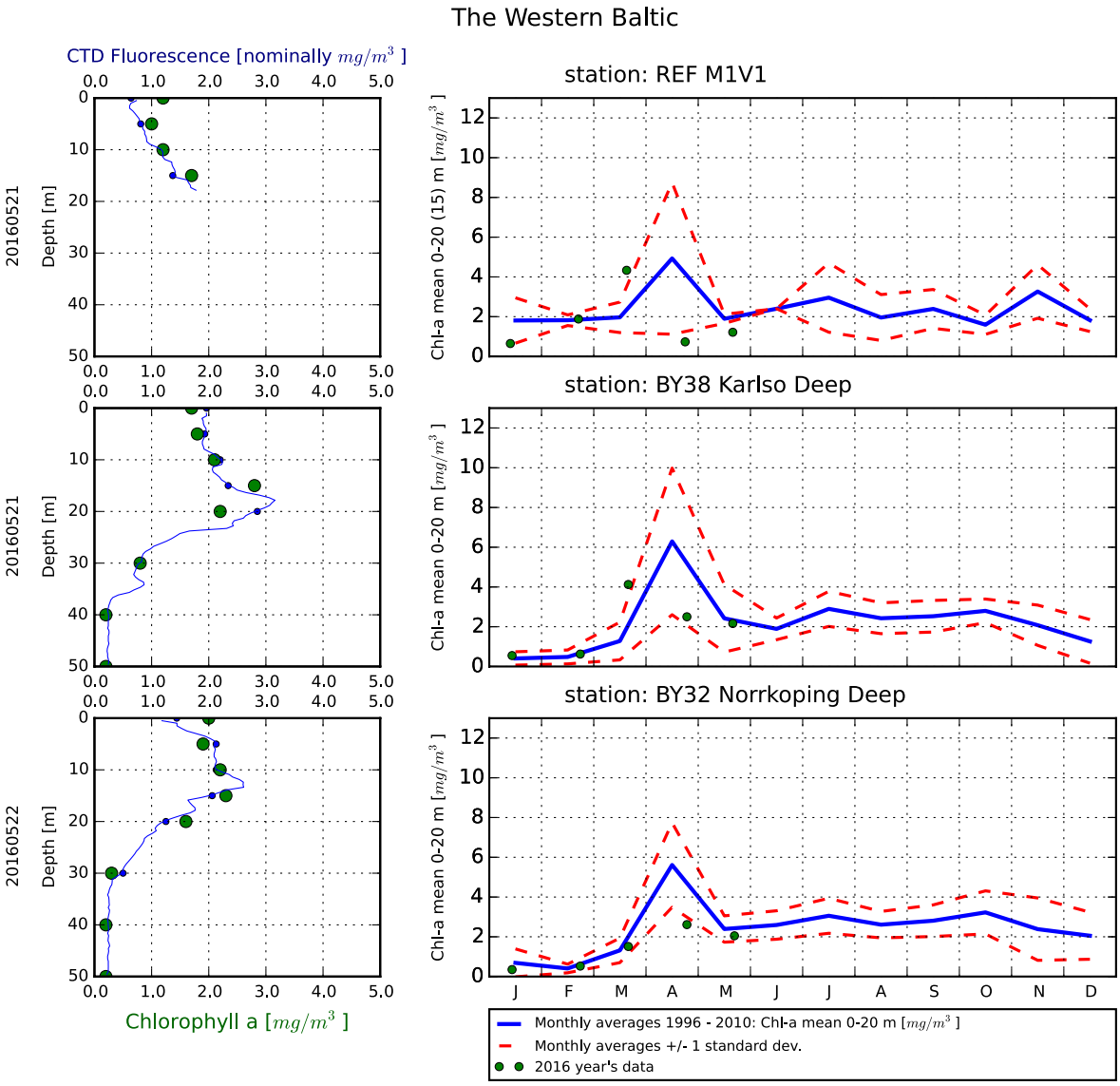


The Southern Baltic



The Eastern 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 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 (0-20 m) vid de olika stationerna. 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 (0-20 m) at sampling stations. Presence of harmful algae at stations where species analysis is performed is shown with a symbol.