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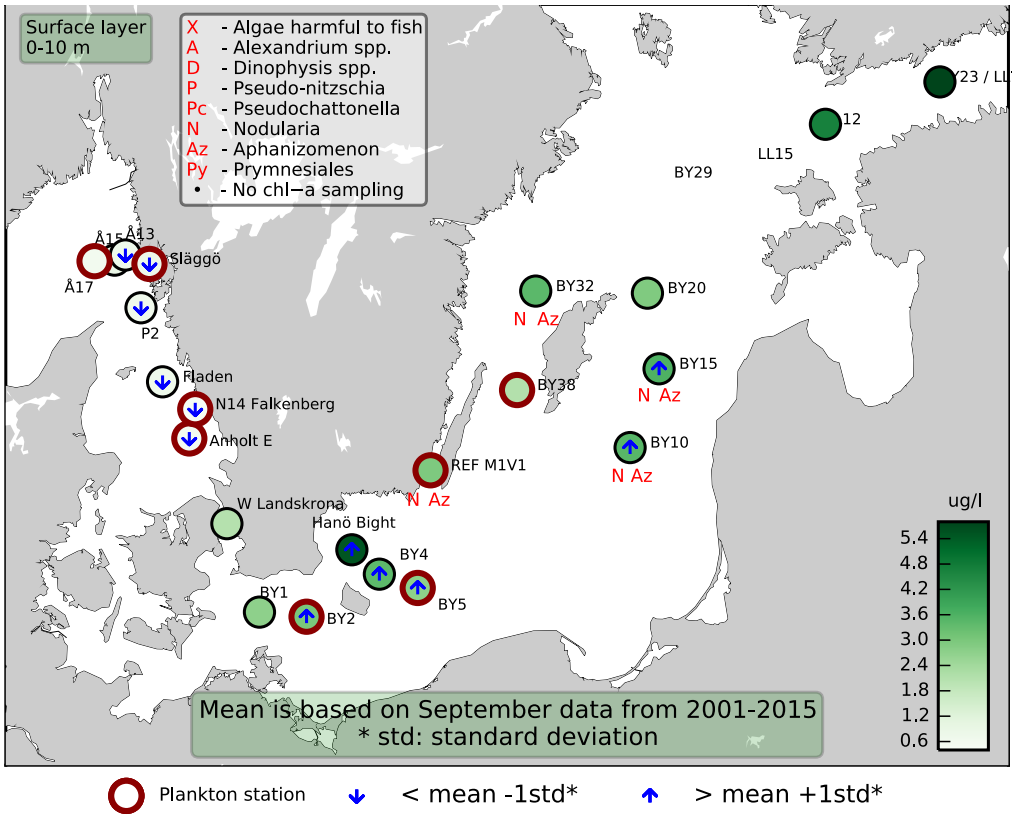
SMHI
Oceanographic Unit
No 9, September 2016

AlgAware
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

Växtplanktondiversiteten var låg i Skagerrak och vid Släggö var klorofyllhalterna under det normala för månaden. Antalet arter och deras cellantal var högre i Kattegatt än i Skagerrak, men även här var klorofyllhalterna låga.

I Östersjön var det fortfarande gott om filamentösa cyanobakterier. Ytansamlingar observerades vid REF M1V1, BY15 och BY32. Dinoflagellaten *Prorocentrum minimum** fanns i höga cellantal vid flera stationer, högst antal uppmättes vid BY15. Klorofyllhalterna (0-10 meter) var över det normala för månaden i södra Östersjön och vid stationerna BY10 och BY15.



Abstract

The phytoplankton diversity was low in the Skagerrak area and at the station Släggö, the chlorophyll *a* concentrations were below normal for this month. The number of species and the number of cells were higher in the Kattegat than in the Skagerrak, but chlorophyll *a* concentrations were low.

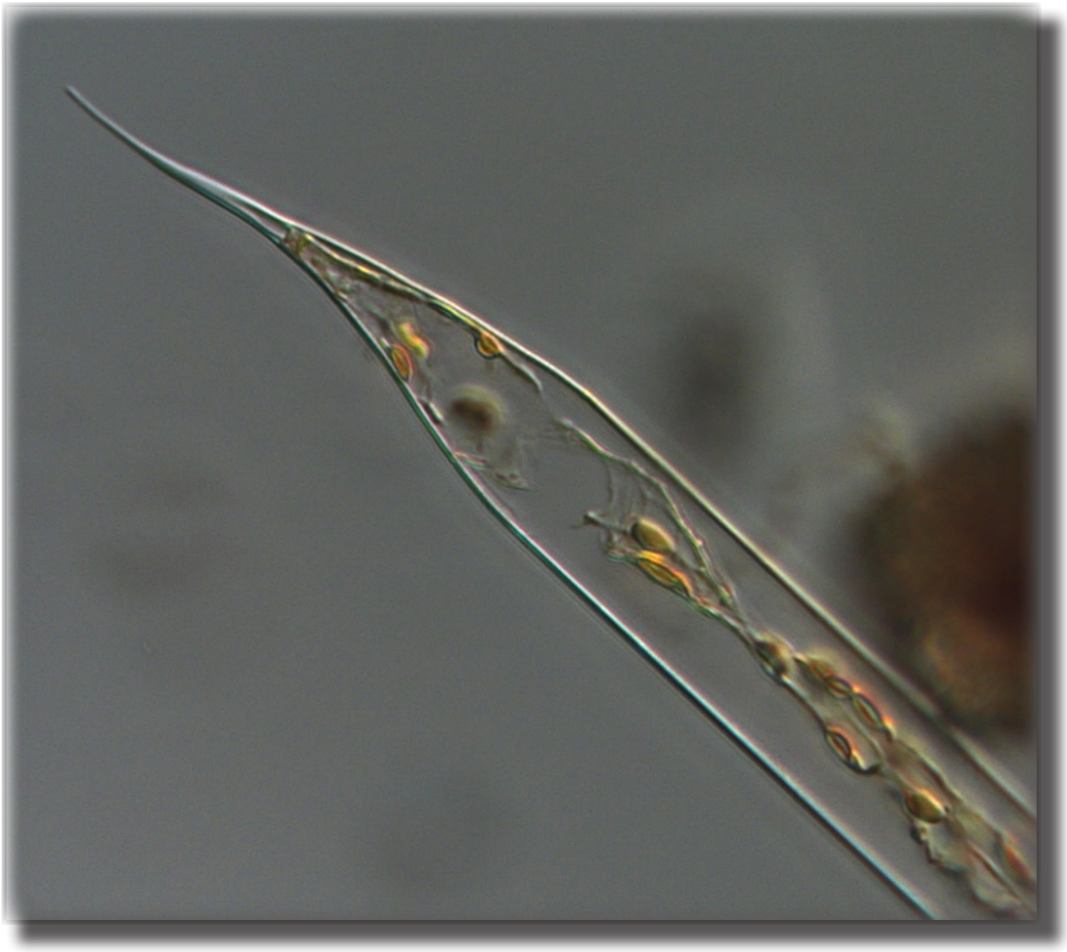
In the Baltic Sea, filamentous cyanobacteria were abundant and surface accumulations were observed at REF M1V1, BY15 and at BY32. The dinoflagellate *Prorocentrum minimum** was abundant at several stations, the highest cell number was found at BY15. The integrated chlorophyll *a* concentrations (0-10 meters) were above normal for this month in the southern Baltic and at the stations BY10 and BY15.

More detailed information on species composition and abundance.

The Skagerrak

Å17 (open Skagerrak) 15th of September
The phytoplankton diversity was very low. The integrated chlorophyll *a* concentrations were within normal for this month, both 0-10 meters (map front page) and 0-20 meters (page 6).

Släggö (Skagerrak coast) 16th of September
The phytoplankton diversity was low, the large diatom *Pseudosolenia calcar-avis* and small cryptomonads were rather numerous though. The integrated chlorophyll *a* concentrations were below normal for this month, both 0-10 meters (map) and 0-20 meters (plot).



The diatom *Pseudosolenia calcar-avis* was found at Släggö.

The Kattegat

Anholt E 15th September
The most diatom and dinoflagellate rich sample was found here. The genus *Pseudo-nitzschia* spp.* was the most abundant diatom, whereas *Ceratium fusus*, *C. lineatum* and *Dinophysis norvegica** were the most numerous dinoflagellates. The integrated chlorophyll *a* concentrations were below normal for this month.

N14 Falkenberg 15th of September
The dinoflagellates *Ceratium tripos* and *C. lineatum* were quite numerous in the rather species poor phytoplankton sample. The integrated chlorophyll *a* concentration from 0-10 meters was below normal for this month, whereas the concentration from 0-20 meters was low but within the lower standard deviation curve.

The Baltic Sea

BY2 and BY5 14th and 17th of September, BY38 Karlsö Deep 13th of September

Aphanizomenon flosaquae was the most abundant filamentous cyanobacterium, *Dolichospermum* spp. and *Nodularia spumigena** were present in low cell numbers. The cyanobacteria observed looked vital. The diatoms *Ceratoneis closterium* and *Dactyliosolen fragilissimus* were found in high cell numbers at BY2, the dinoflagellate *Prorocentrum minimum** was abundant at all of the stations.

REF M1V1 Kalmar Sound 14th of September

The cyanobacteria *A. flosaquae* and *Dolichospermum* spp. were more abundant than *N. spumigena** in the hose sample, 0-10 meters. Several pico cyanobacteria species were found in high cell numbers. A surface sample was taken due to visually observed accumulations of cyanobacteria. The sample contained very much of all three of the most common filamentous cyanobacteria. The cyanobacteria were in aggregations and within and around them there were high abundances of various diatoms, dinoflagellates, ciliates, flagellates etc.

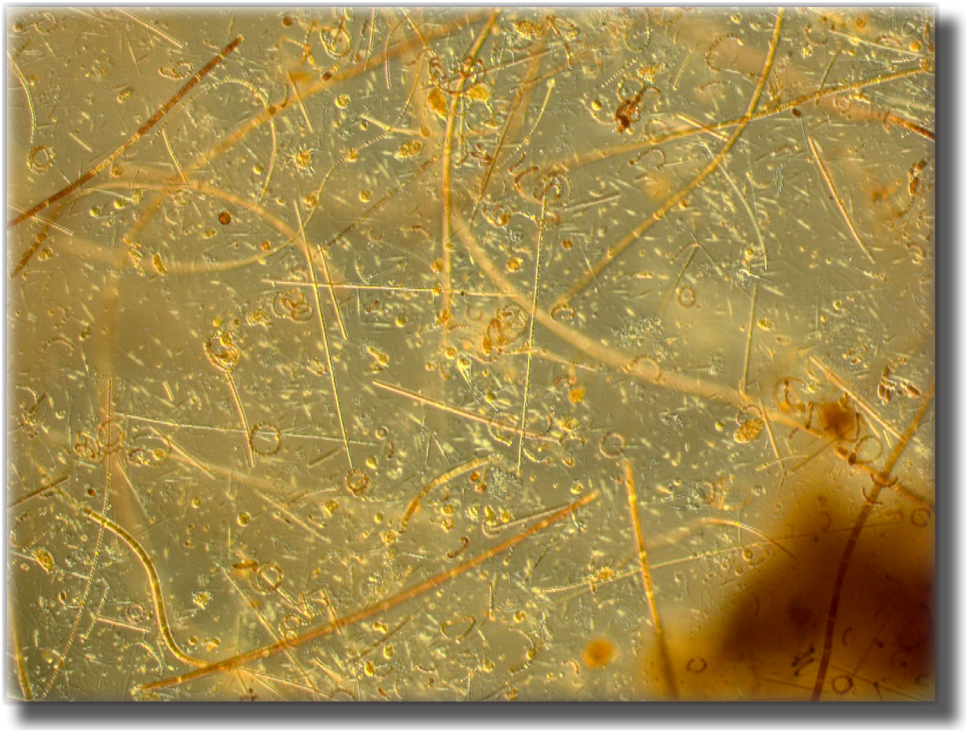
BY15 18th of September

The filamentous cyanobacteria *N. spumigena**, *A. flosaquae* and *Dolichospermum* spp. were abundant. The diatom *Chaetoceros impressus* and the dinoflagellate *Prorocentrum minimum** were found in high cell numbers. A surface sample was taken due to visually observed accumulations of cyanobacteria and contained mostly *A. flosaquae*. *Dolichospermum* spp. and *Nodularia spumigena** were present in low cell numbers. *P. minimum** was very abundant.

BY32 13th of September

A surface sample was taken due to visually observed accumulations of cyanobacteria and contained large amounts of the three filamentous cyanobacteria *A. flosaquae*. *Dolichospermum* spp. and *Nodularia spumigena**.

The integrated chlorophyll *a* concentrations (0-10 meters) were above normal for this month at the southern Baltic stations and at the stations BY10 and BY15.



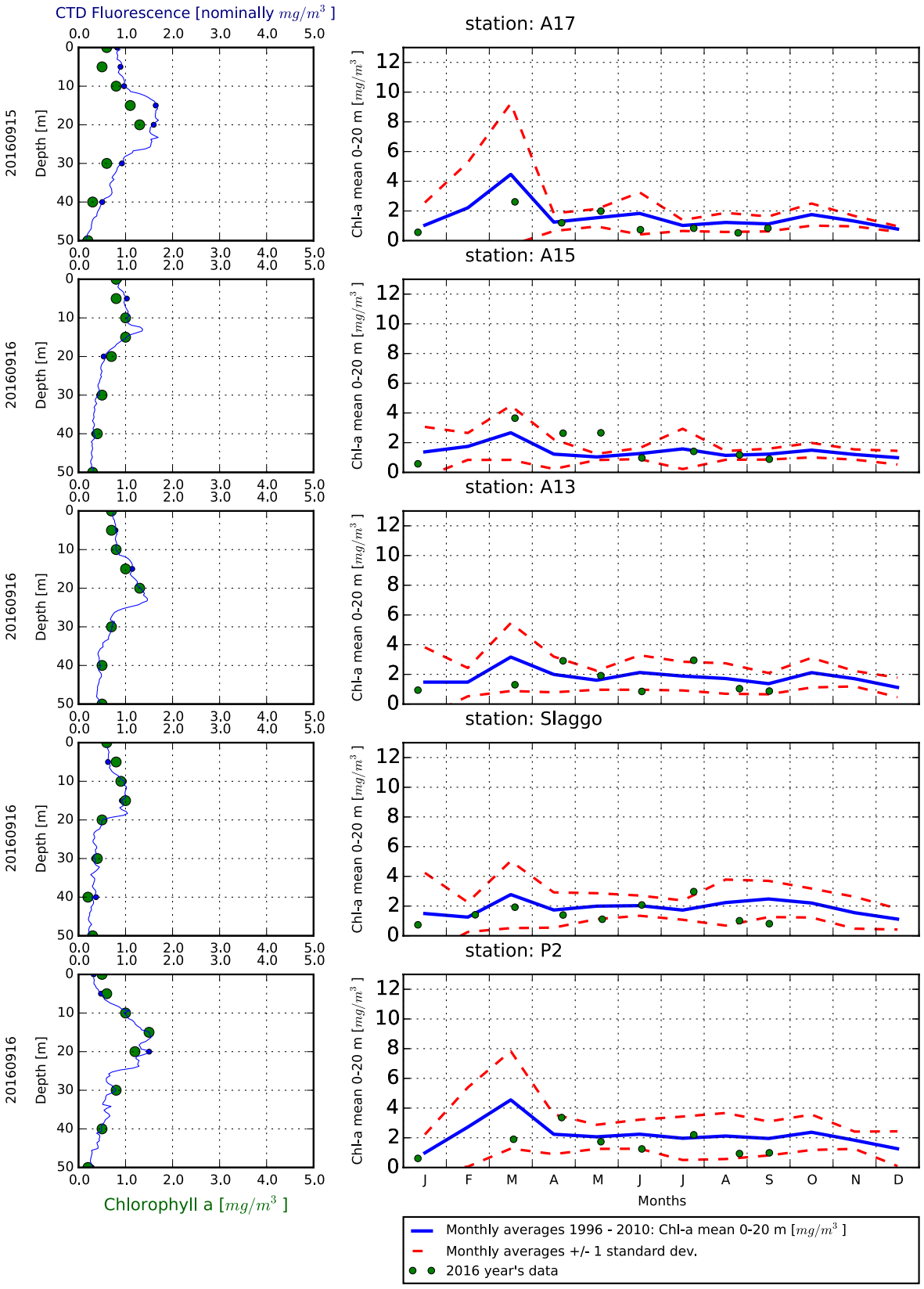
The surface sample at REF M1V1 was very rich in cyanobacteria, diatoms, dinoflagellates, ciliates and more.

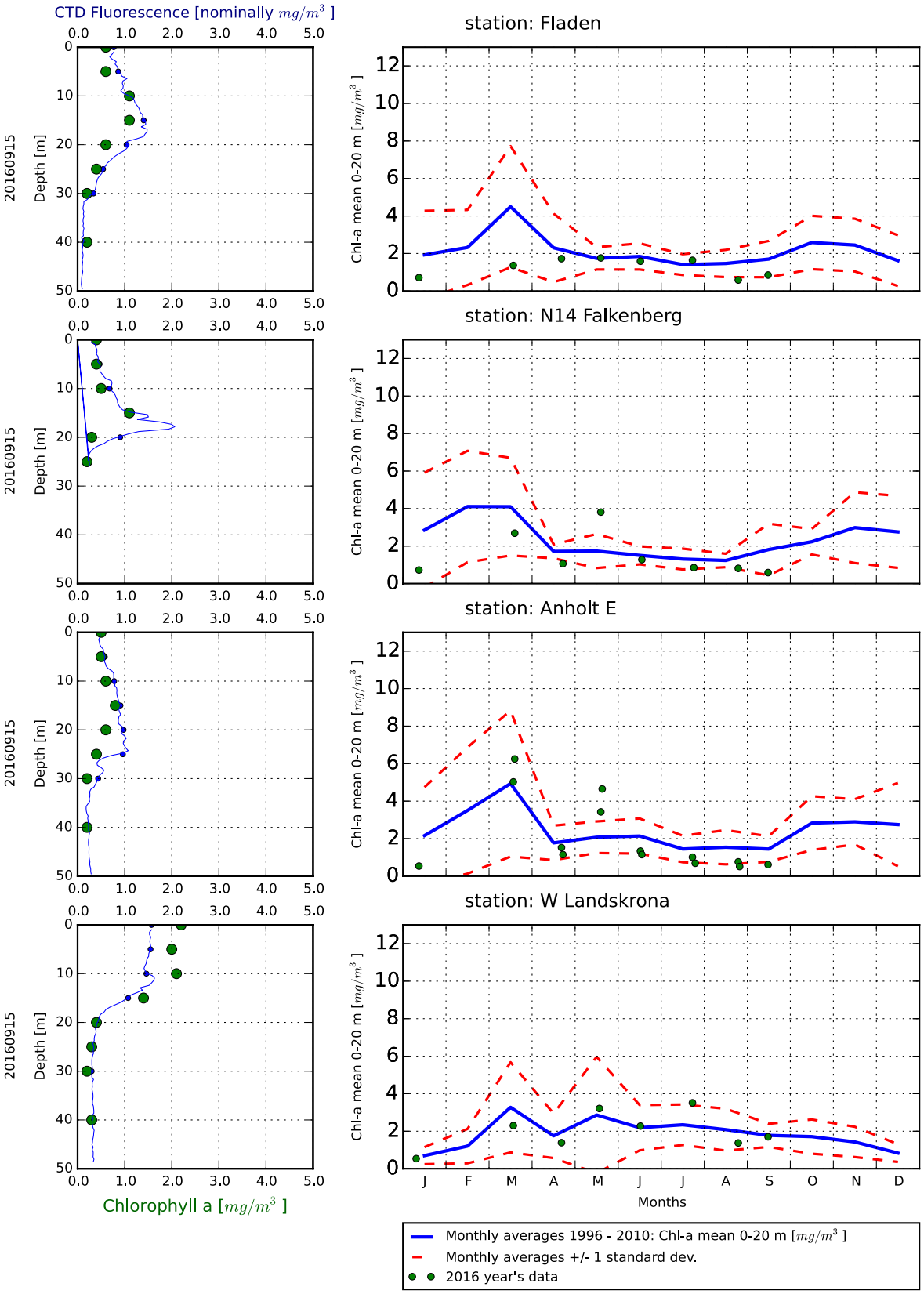
Phytoplankton analysis and text by:
Ann-Turi Skjevik

Selection of observed species	Å17	Släggö	N14	Anholt E
Red=potentially toxic species	15/9	16/9	15/9	15/9
Hose 0-10 m	presence	presence	presence	presence
Cerataulina pelagica		present		present
Chaetoceros spp	present			present
Chaetoceros affinis			present	present
Chaetoceros curvisetus				present
Chaetoceros debilis			present	present
Chaetoceros tenuissimus	present			
Ceratoneis closterium		present	present	present
Dactyliosolen fragilissimus	present			
Guinardia delicatula		present		
Leptocylindrus danicus	present			present
Nitzschia longissima			present	present
Pseudo-nitzschia spp			present	common
Pseudosolenia calcar-avis		common		
Skeletonema marinoi	present			
Alexandrium spp				present
Azadinium spp				present
Ceratium furca				present
Ceratium fusus		present	present	common
Ceratium lineatum		present	common	common
Ceratium longipes		present	present	present
Ceratium tripos		present	common	present
Dinophysis acuminata		present	present	present
Dinophysis acuta			present	
Dinophysis norvegica				common
Gymnodiniales	present		present	
Gyrodinium flagellare	present			
Heterocapsa spp	present	present	present	present
Heterocapsa rotundata	present			
Katodinium glaucum		present		present
Lingulodinium polyedrum		present	present	present
Oxytoxum gracile	present			
Peridiniales	present			
Phalacroma rotundatum			present	present
Prorocentrum micans		present	present	present
Prorocentrum triestinum		present		
Protoceratium reticulatum				present
Protoperidinium spp		present	present	present
Protoperidinium pallidum			present	present
Torodinium robustum		present		
Dinobryon spp	present			
Acanthoica quattrospina		present		
Emiliania huxleyi	present		present	
Prymnesiales	present	present	present	present
Cryptomonadales	present	common	common	present
Commation spp				present
Dictyocha fibula		present		
Pseudopedinella spp		present		
Eutreptiella spp		present		
Cymbomonas tetramitiformis	present			
Pyramimonas spp				present
Monosiga spp				present
Ebria tripartita			present	present
Laboea strobila		present		
Mesodinium rubrum			present	present
Strombidium spp		present	present	
Ciliophora	present	common	common	common

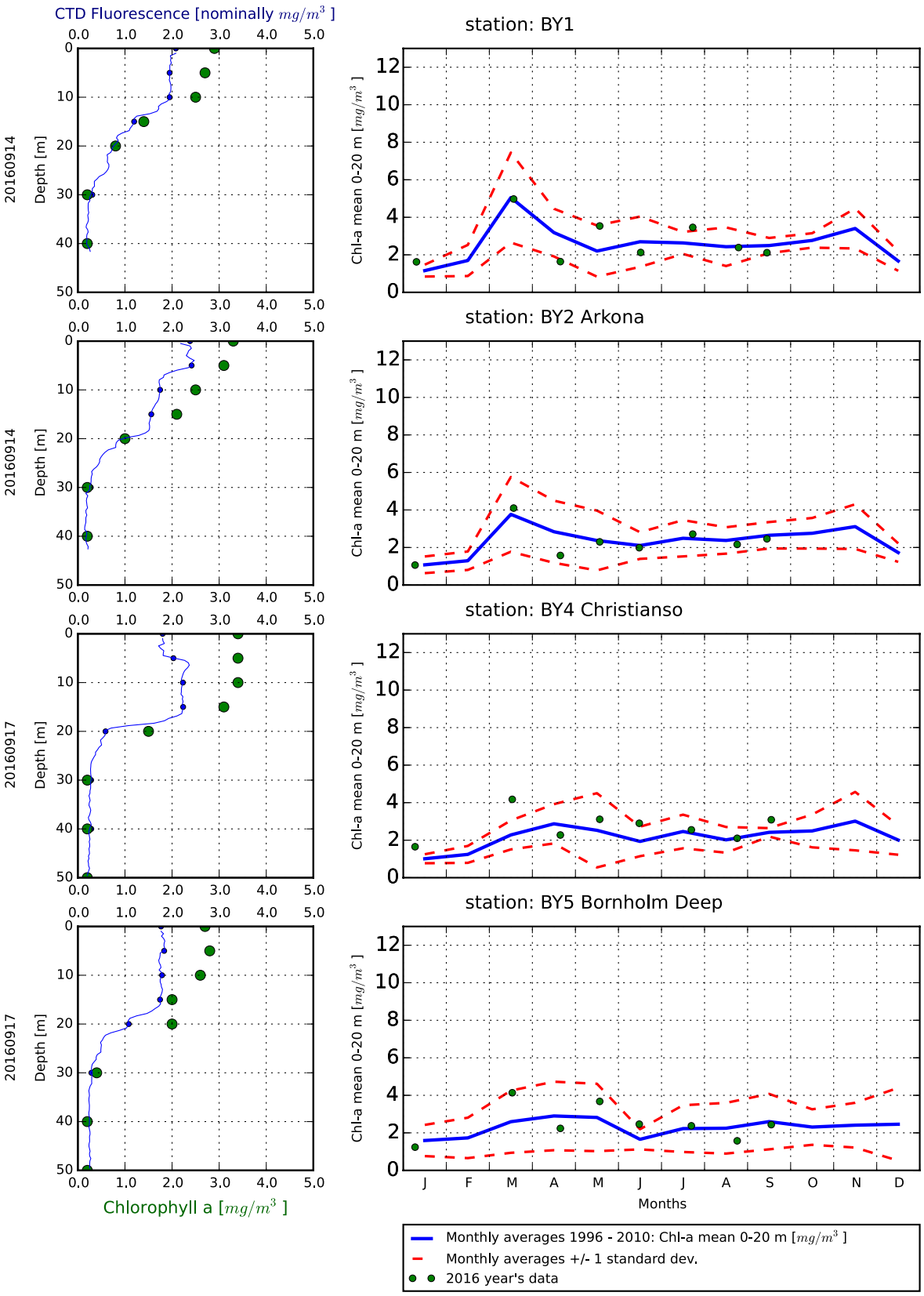
Selection of observed species	BY2	BY5	BY15	REF M1V1	BY38
Red=potentially toxic species	14/9	17/9	18/9	14/9	13/9
Hose 0-10 m	presence	presence	presence	presence	presence
Attheya septentrionalis		present			
Chaetoceros danicus				present	
Chaetoceros impressus	present		common	present	present
Chaetoceros throndsenii					present
Chaetoceros wighamii				present	
Ceratoneis closterium	common			common	
Dactyliosolen fragilissimus	common				
Amphidinium crassum		present			
Ceratium tripos	present	present			
Dinophysis norvegica					present
Gymnodiniales		common	present		present
Gymnodinium verruculosum	present	present			present
Heterocapsa spp	present	present		present	present
Heterocapsa triquetra				common	present
Katodinium glaucum			present		
Peridiniales					present
Prorocentrum minimum	common	common	141065	present	common
Prymnesiales spp				present	present
Dinobryon faculiferum	present	present			present
Cryptomonadales	common	common	common	common	common
Dolichospermum spp	present	present	present	common	present
Aphanizomenon flosaquae	common	common	common	common	common
Aphanothece paralleliformis		present		common	
Aphanothece spp			present	common	common
Cyanodictyon spp				present	
Lemmermanniella spp				common	
Nodularia spumigena	present	present	common	present	present
Snowella spp				present	
Planctonema lauterbornii			present	present	
Pseudopedinella spp		present	present		present
Cymbomonas tetramitiformis		present			present
Pterosperma spp	present		present	present	present
Pyramimonas spp	common	present	present	present	present
Eutreptiella spp	common	common	present		present
Ebria tripartita	present			common	present
Mesodinium rubrum	present				
Strombidium spp					present
Ciliophora	common	common	present	common	common

The Skagerrak

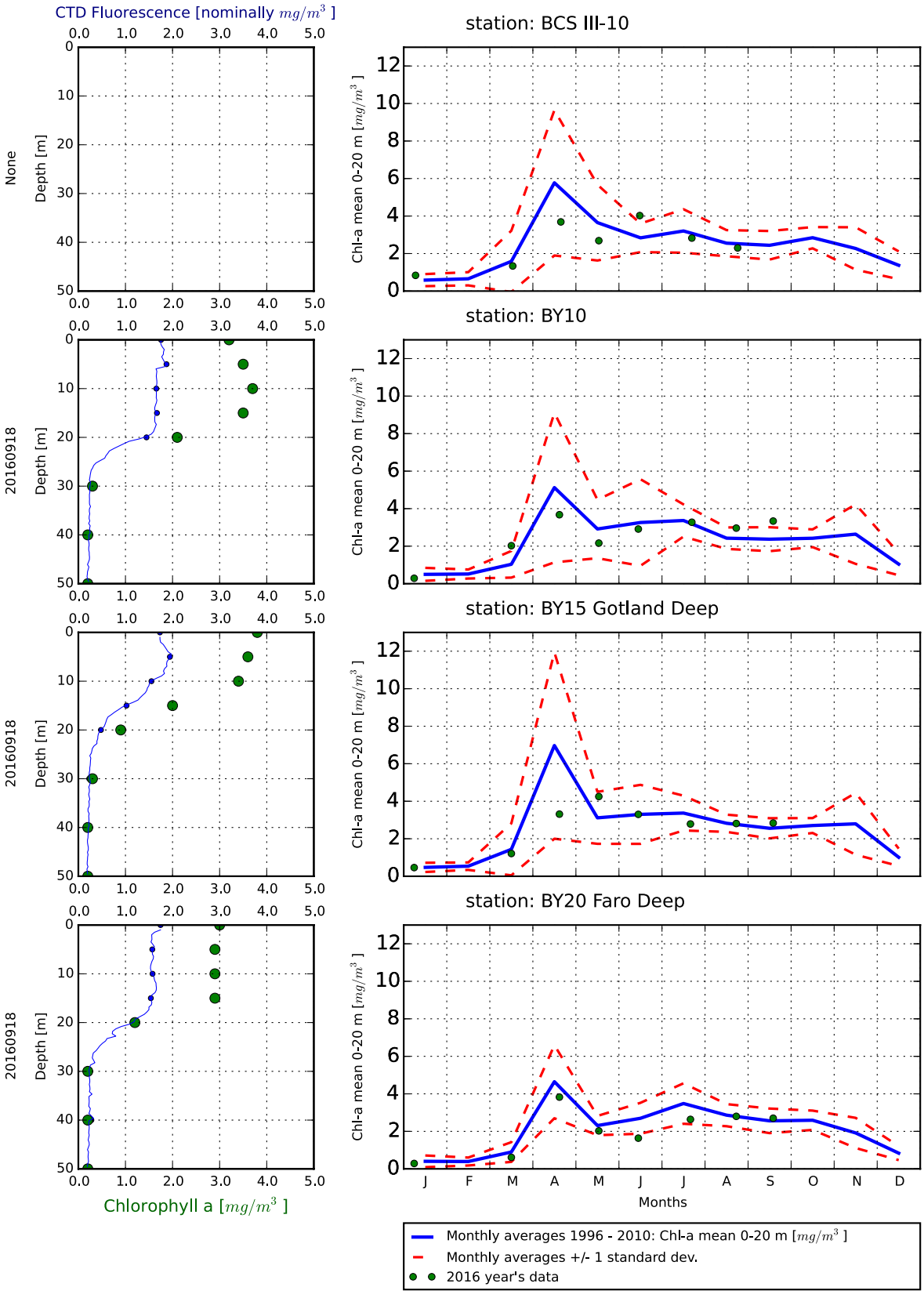



CTD Fluorescence [nominally mg/m^3]
20160915
Depth [m]
Chlorophyll a [mg/m^3]
station: Fladen
station: N14 Falkenberg
station: Anholt E
station: W Landskrona
Chl-a mean 0-20 m [mg/m^3]
J F M A M J J A S O N D
Months
Monthly averages 1996 - 2010: Chl-a mean 0-20 m [mg/m^3]
Monthly averages +/- 1 standard dev.
2016 year's data

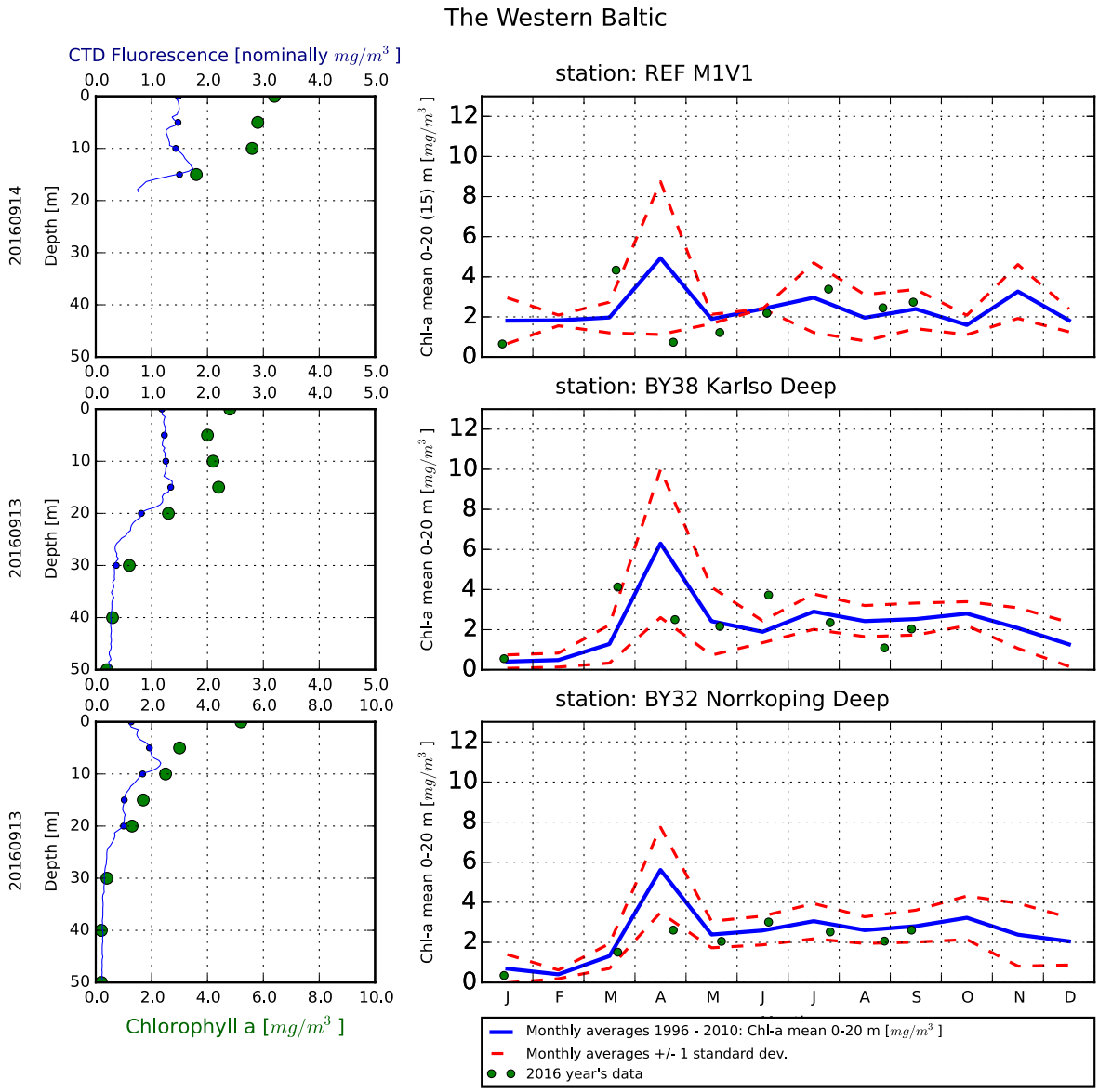
The Southern Baltic



The Eastern Baltic



*Note that BCS III-10 was not visited during the cruise.



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.