SMHI
Oceanographic Unit
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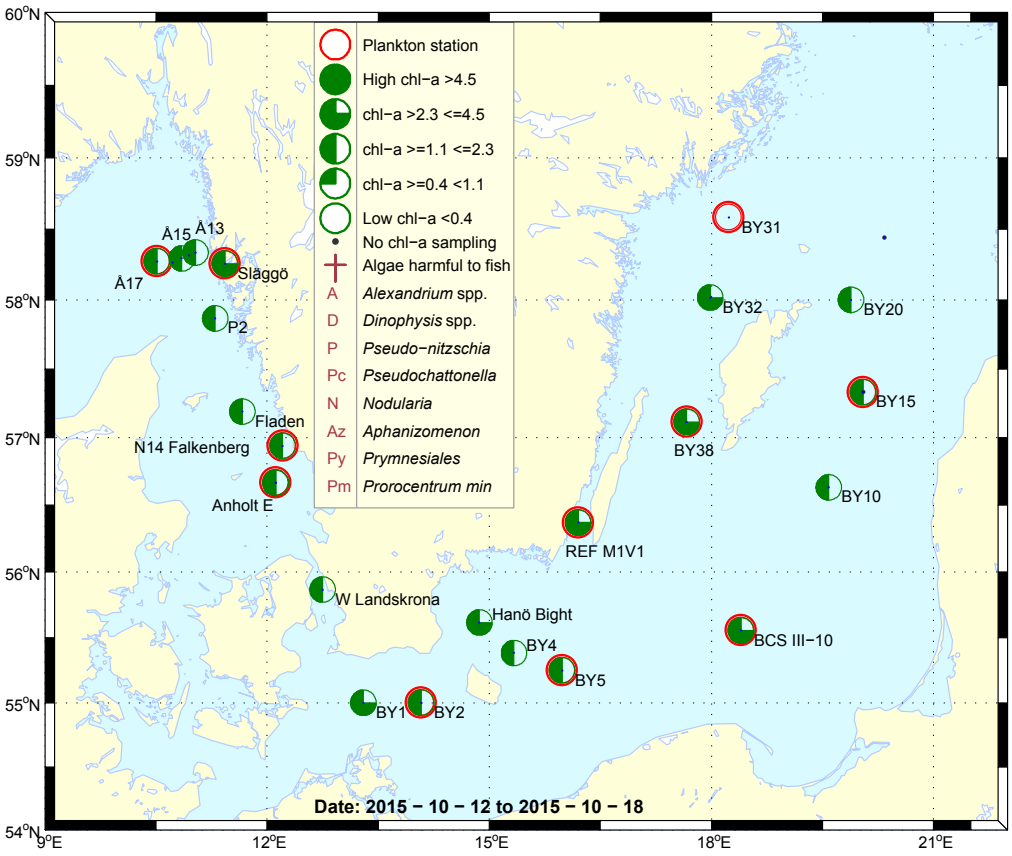
AlgAware

ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

I Skagerrak och Kattegatt var det framför allt kalkflagellaten *Emiliania huxleyi* och kiselalgen *Pseudo-nitzschia* spp som dominerade växtplanktonsamhället. De potentiellt toxiska nakna dinoflagellaterna *Karenia mikimotoi* och *Karlodinium veneficum* var också vanliga, mycket vanliga vid Släggö. De integrerade (0-10 m) klorofyll *a*-värdena var normala för denna månad.

Stora delar av Östersjön dominerades främst av kolonier med mycket små cyanobakterier och andra icke kolonibildande små celler. I de östra och södra delarna av Östersjön var även stora kiselalger vanliga. De integrerade (0-10 m) klorofyll *a*-värdena var normala för denna månad med undantag av Kalmarsund, där halterna var högre än normalt.



Abstract

The phytoplankton community in the Skagerrak and the Kattegat was dominated by a small coccolithophore, *Emiliania huxleyi*, and a diatom, *Pseudo-nitzschia* spp. The potentially harmfull naked dinoflagellates *Karenia mikimotoi* and *Karlodinium veneficum* were common and particularly at Släggö. The integrated (0-10 m) chlorophyll *a* concentrations were normal for this month.

The Baltic Sea was mainly dominated by colonies of small cyanobacteria and other small unicells. Large diatoms were common in the Eastern and Southern part of the Baltic Sea. The integrated (0-10 m) chlorophyll *a* concentrations were normal for this month with an exception of Kalmar Sound, where the concentration was higher than normal for this time of the year.

More detailed information on species composition and abundance

The Skagerrak

Å17 (open Skagerrak) and Släggö (Skagerrak coast) 16th of October

Emiliania huxleyi and *Pseudo-nitzschia* spp. dominated the phytoplankton community in the Skagerrak area. The potentially harmfull dinoflagellates *Karenia mikimotoi* and *Karlodinium veneficum* were common in the Skagerrak and *K. mikimotoi* was very common at Släggö (Fig 1). The raphidophyceae *Heterosigma akashiwo* was present and the diatom *Pseudosolenia calcar-avis* was numerous at Släggö.

The integrated (0-10 m) chlorophyll *a* concentrations were normal for this month.

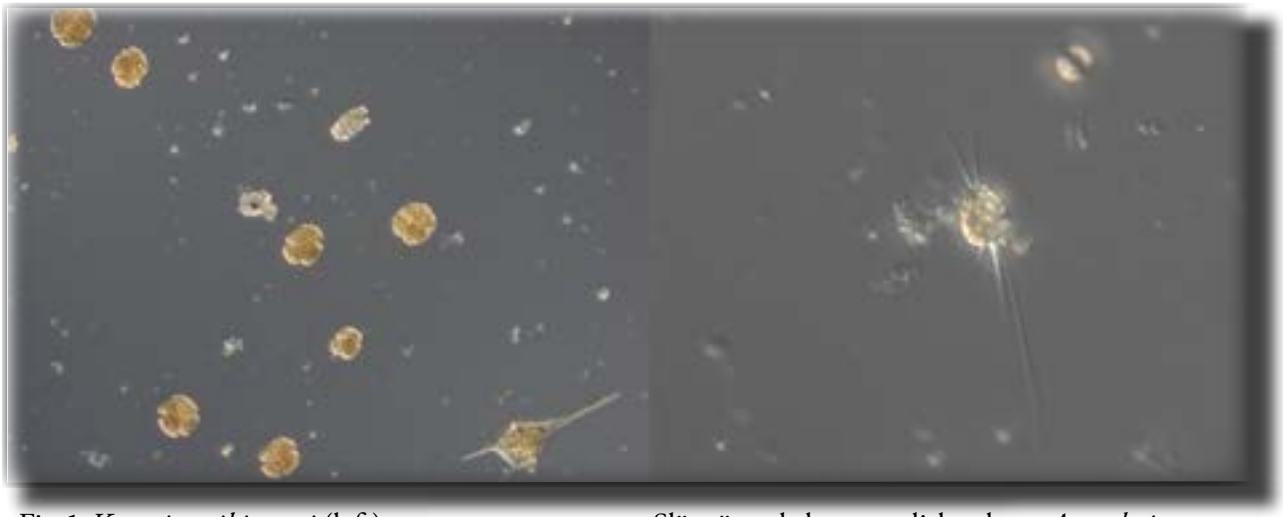


Fig.1 *Karenia mikimotoi* (left) was very common at Släggö and the coccolithophore *Acanthoica spinifera* (right) was present in both the Skagerrak and the Kattegat.

Anholt E 15th and 17th of October and N14 Falkenberg 15th of October

The phytoplankton community in the Kattegat area was divers, particularly at Anholt. As in the Skagerrak, *E. huxleyi* and *Pseudo-nitzschia* spp. (Fig 2) were very common in the Kattegat and *P. calcar-avis* was found in large amounts. The potentially harmfull dinoflagellates *K. mikimotoi* and *K. veneficum* were observed. Several potentially harmfull species from the class Prymnesiales were very common in the Kattegat. *Heterosigma akashiwo* (raphidophyceae) was present at Anholt and the coccolithophore *Acanthoica spinifera* (Fig 1) at N14 Falkenberg.

The integrated (0-10 m) chlorophyll *a* concentrations were low but normal for this month.

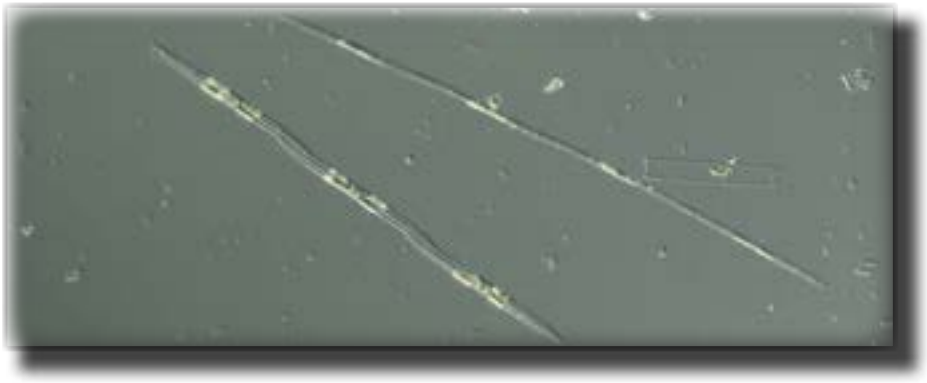
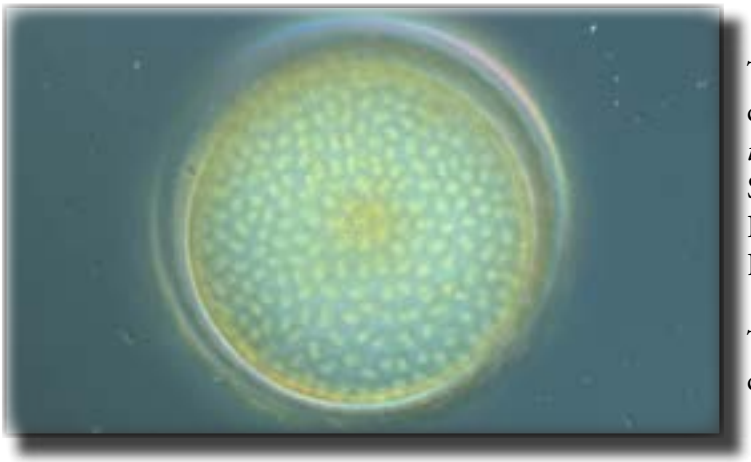


Fig.2 *Pseudo-nitzschia* spp. was one of the dominating species at Anholt E.

The Baltic Sea

The phytoplankton community in the Baltic Sea was mainly dominated by colonies of small cyanobacteria and other small unicells. The species composition and cell concentrations varied in the different areas of the Baltic Sea.

BY2 Arkona Basin and BY5 Bornholm Basin 14th of October



The large diatom *Coscinodiscus centralis* was very common and the dinoflagellate *Heterocapsa triquetra* was common in The Arkona Basin. Several potentially harmfull species from the class Prymnesiales were common in the Bornholm Basin.

The integrated (0-10 m) chlorophyll *a* concentrations were normal for this month.

Fig.3 The large diatom *Coscinodiscus centralis* was very common at BY2.

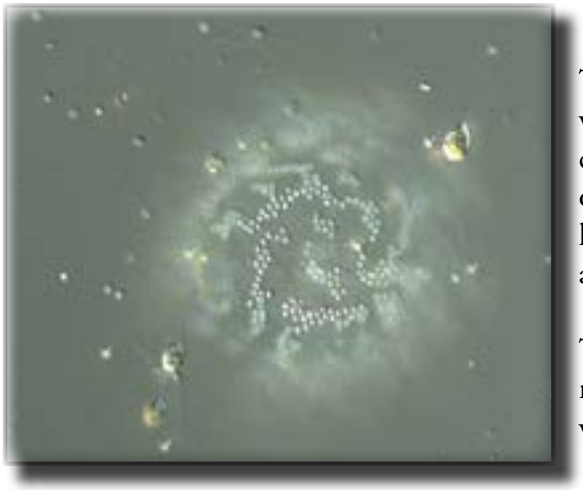
BY15 13th of October and BCS III-10 14th of October

Small unicells dominated at BCSIII-10 and the large diatom *Coscinodiscus centralis* and other centric diatoms where common. The dinoflagellate *Heterocapsa triquetra* was common as well as several species from the dinoflagellate class Peridiniales.

Snowella spp., *Woronoschinia* spp., *Cyanodictyon* spp. and other colony forming small cyanobacteria dominated the phytoplankton community at BY15. Several potentially harmfull species from the class Prymnesiales were common at BY15.

The integrated (0-10 m) chlorophyll *a* concentrations were normal for this month.

BY38 and REF M1V1 Kalmar Sound 18th of October



The phytoplankton composition in The Western Gotland Basin was similar to the one found at BY15. Numerous amounts of colony forming small cyanobacteria were found as well as colonies of the genus cf. *Coelosphaerium* spp. (Fig 4). Several potentially harmful species from the class Prymnesiales were present in low amounts in the Kalmar Sound.

The integrated (0-10 m) chlorophyll *a* concentrations were normal for this month, except at BY38 where the concentration was higher than normal.

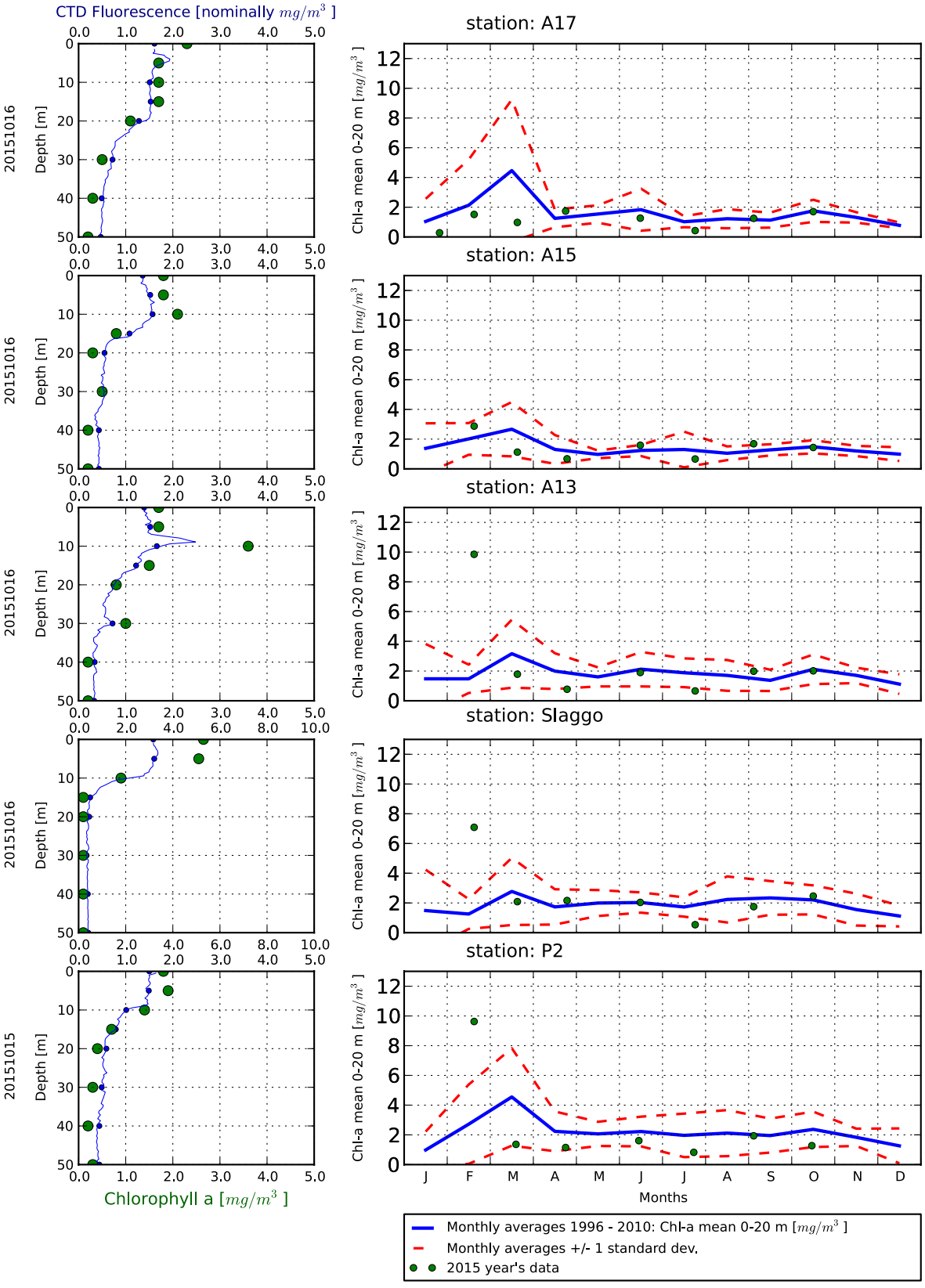
Fig.4 cf. *Coelosphaerium* spp., a common cyanobacterium genus in The Western Gotland Basin.

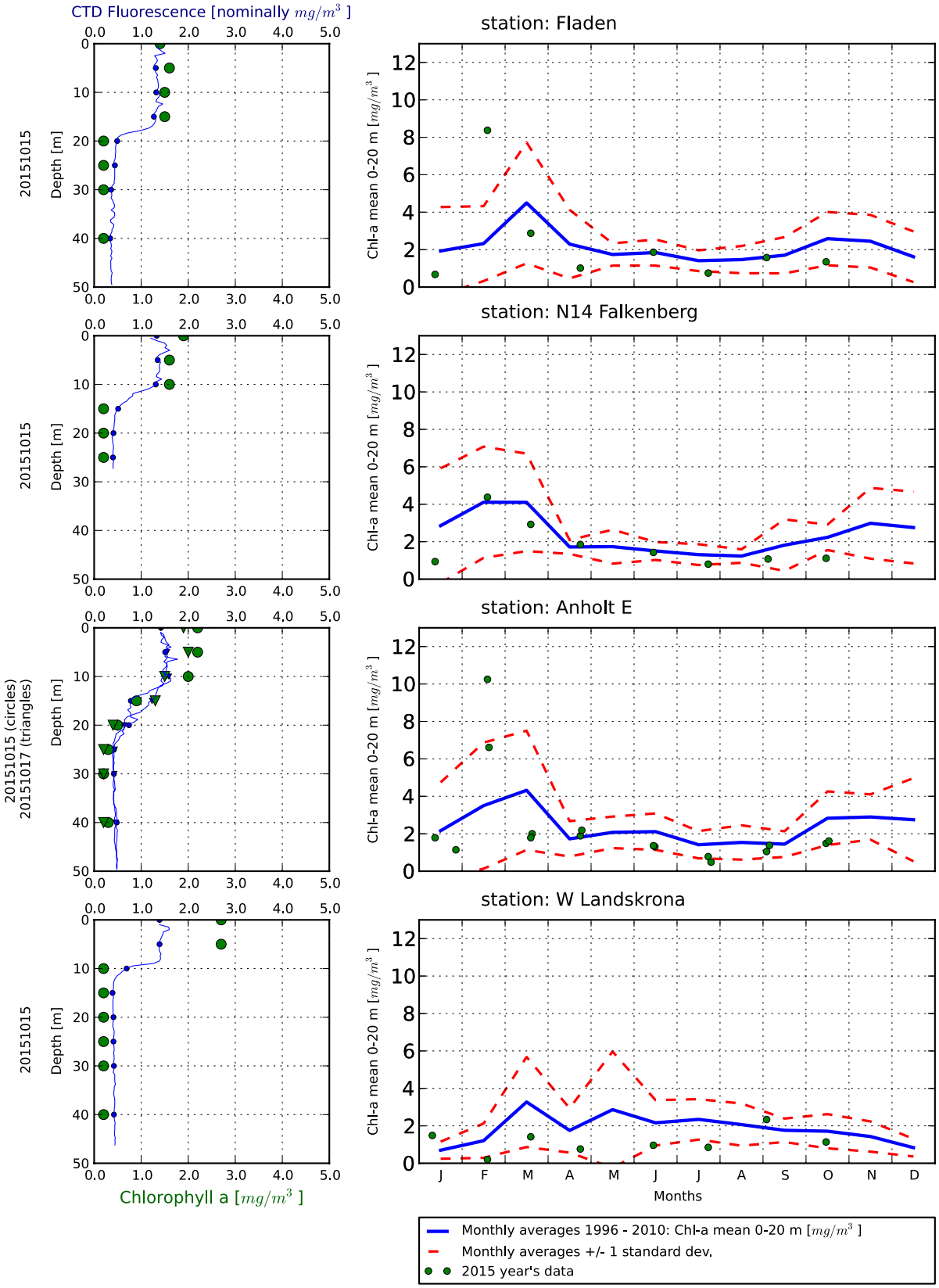
Phytoplankton analysis and text by:
Malin Mohlin.

Selection of observed species	Anholt E	Anholt E	N14 Falkenberg	Släggö	Å17
Red=potentially toxic species	15/10	17/10	15/10	16/10	16/10
Hose 0-10 m	presence	presence	presence	presence	presence
Cerataulina pelagica	common	present	present		
Chaetoceros danicus			present		
Chaetoceros decipiens	present				
Chaetoceros spp		present			
Coscinodiscus spp			present		
Coscinodiscus centralis	present	present			
Ditylum brightwellii		present			
Guinardia delicatula		present	present		
Leptocylindrus danicus	common	present	present		
Leptocylindrus minimus				common	present
Nitzschia longissima	common	present			
Pseudo-nitzschia spp	very common	very common	very common	common	very common
Pseudosolenia calcar-avis	very common	common	present	common	present
Rhizosolenia pungens		present			
Rhizosolenia setigera				present	
Skeletonema marinoi	common				
Ceratium furca		present	present	present	present
Ceratium fusus	present			present	present
Ceratium lineatum	common	present	present	present	present
Ceratium longipes					present
Ceratium tripos		present	present		
Dinophysis acuminata	present	present	present		
Dinophysis acuta		present			
Gymnodiniales	common	present	present		
Gyrodinium spirale		present			
Gyrodinium spp	present				
Heterocapsa triquetra		present			
Karenia mikimotoi		present	present	very common	common
Karlodinium veneficum			present	common	common
Katodinium glaucum	common	present	present		present
Peridiniales		present	present		
Polykrikos schwartzii	present			present	
Prorocentrum micans	present	present			
Prorocentrum triestinum				present	
Protoperidinium bipes		present			
Protoperidinium spp	present	present	present		
Scrippsiella cpx	common		present	present	
Torodinium spp			present		
Acanthoica quattrospina			present	present	
Emiliania huxleyi		very common	very common	very common	very common
Prymnesiales		common	very common	present	
Heterosigma akashiwo		present		present	
Pyramimonas spp			present		
Ebria tripartita	present	present			
Dictyocha speculum	common	present		present	present
Pseudopedinella spp		common			
Cryptomonadales					present
Ciliophora	present	present	present	present	present
Laboea strobila	common	present		present	
Mesodinium rubrum				present	
Tiarina fusus			present		

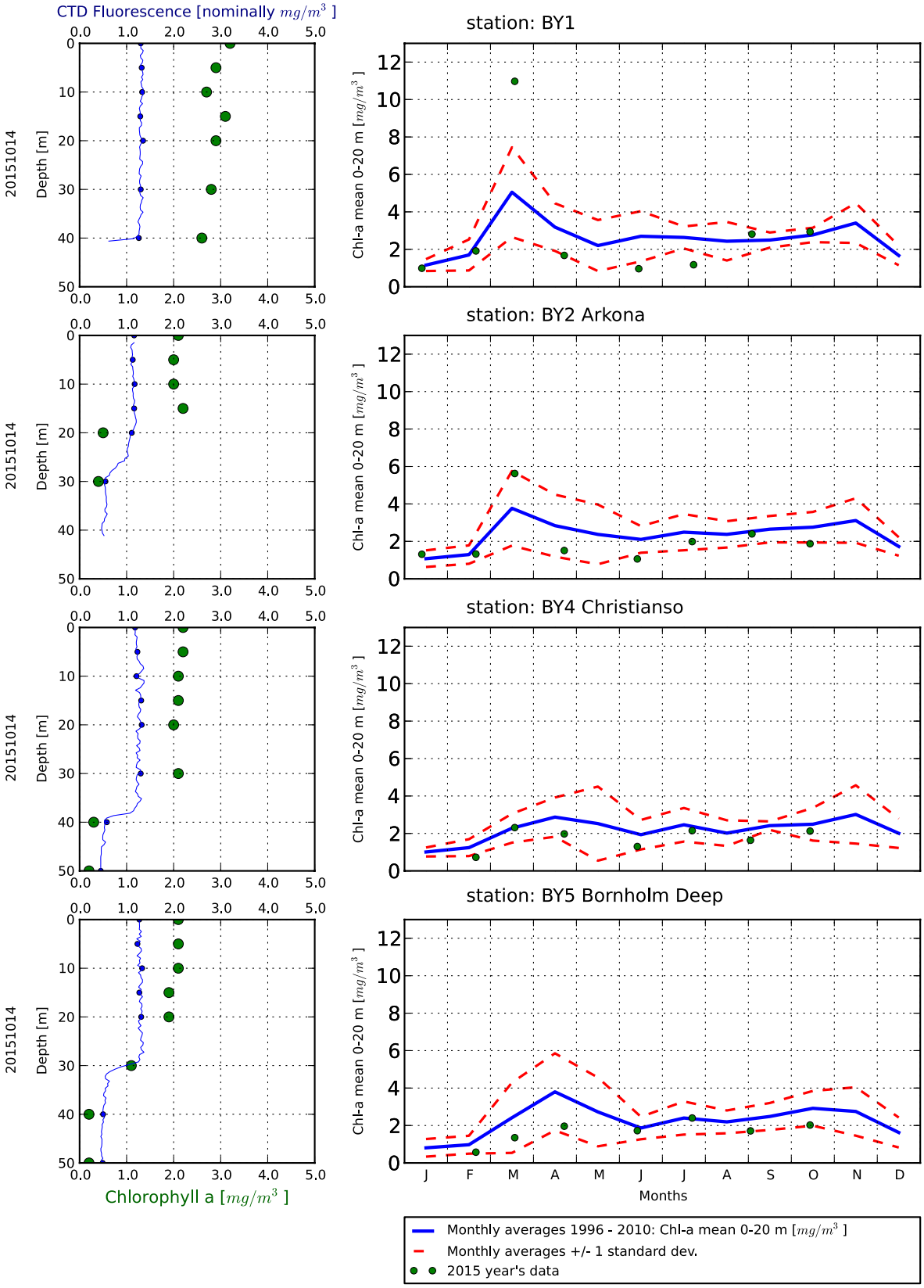
Selection of observed species	BCS III-10	BY2	BY5	BY15	BY38	REF M1-V1
Red=potentially toxic species	14/10	14/10	14/10	13/10	18/10	18/10
Hose 0-10 m	presence	presence	presence	presence	presence	presence
Attheya septentrionalis		present				
Cerataulina pelagica		present				
Chaetoceros danicus	present					
Chaetoceros impressus			present			
Chaetoceros wighamii		common				
Coscinodiscophyceae	common		common			
Coscinodiscus centralis	very common	very common	common	present		common
Coscinodiscus spp	present					
Porosira glacialis		present				
Skeletonema marinoi						common
Dinophysis acuminata	present					
Dinophysis norvegica	present			present		
Gymnodiniales	present		present	present		present
Heterocapsa rotundata						present
Heterocapsa triquetra	common	present				present
Katodinium glaucum			present		present	present
Peridiniales	common		present			present
Prorocentrum minimum		present			present	present
Aphanizomenon flos-aquae		common		present	present	
Aphanocapsa spp				common	common	common
Aphanothece paralleliformis					common	common
Aphanothece spp				common	common	common
Coelosphaerium spp					very common	common
Cyanobacteria						very common
Cyanodictyon spp				common	common	common
Lemmermanniella					common	
Nodularia spumigena			present			
Snowella spp			common	common	common	present
Woronichinia spp				common	common	present
Pyramimonas spp	present	common	present	common		present
Prymnesiales			common	common		common
Oocystis spp					present	present
Planctonema lauterbornii				common	common	
Ebria tripartita	present	present		present		
Calliacantha natans						common
Calliacantha spp			common	present		
Cryptomonadales	present	present	present	common		common
Ciliophora	present		present	common	common	present
Helicostomella subulata	present					
Mesodinium rubrum	present		present		common	present
Unicell	very common		very common		very common	very common

The Skagerrak

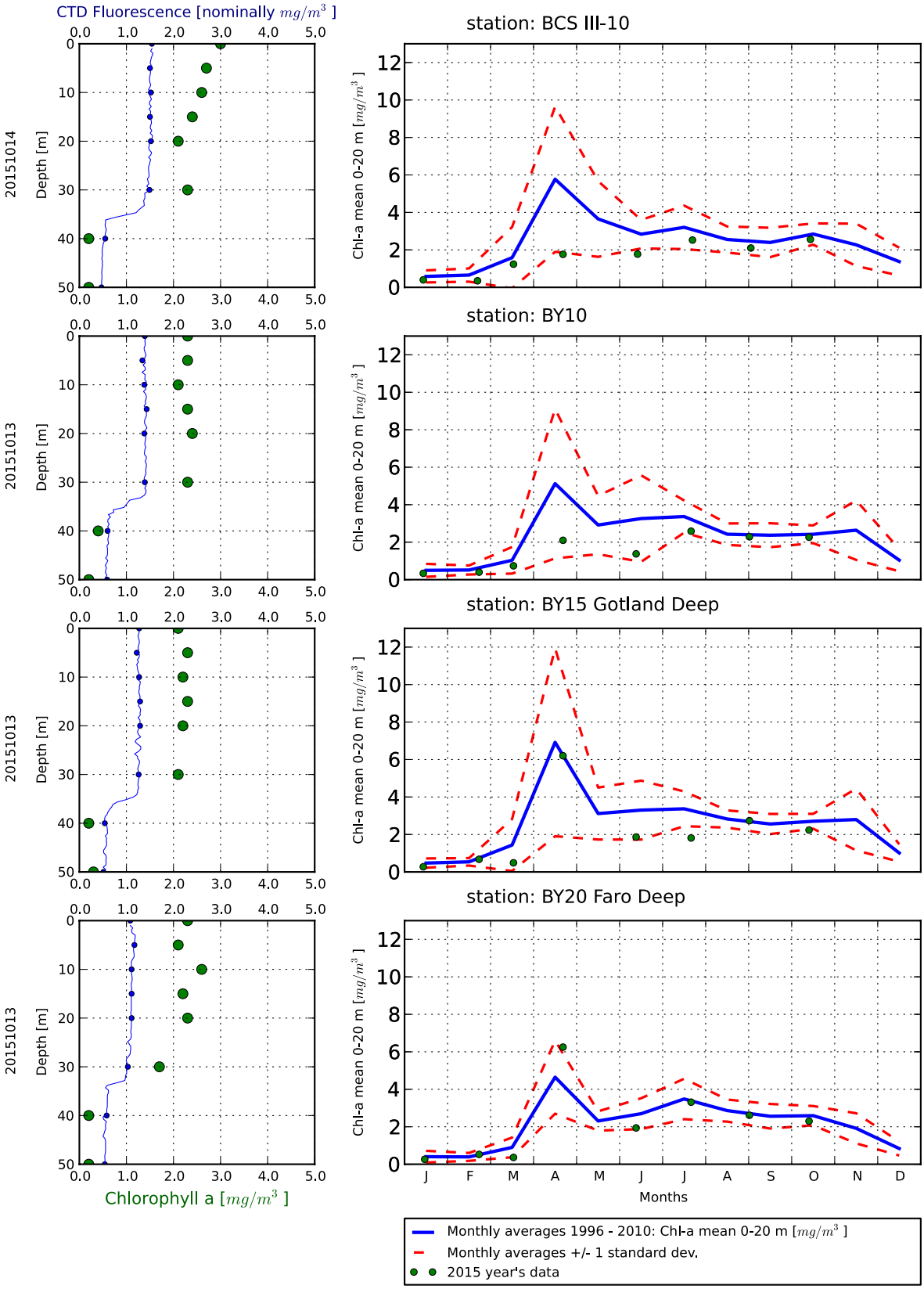


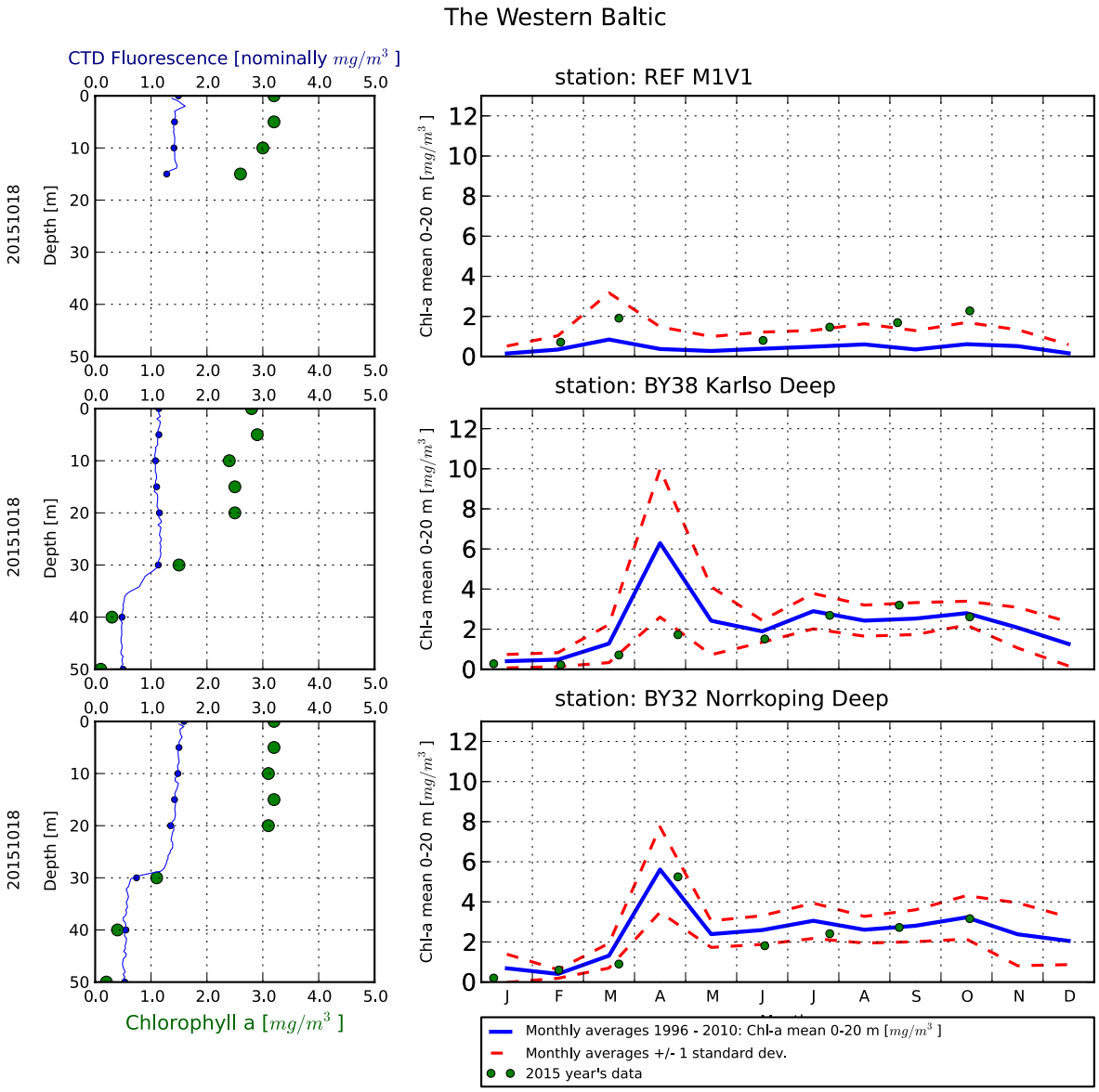

CTD Fluorescence [nominally mg/m^3]
20151015
Depth [m]
20151015 (circles)
20151017 (triangles)
Chlorophyll a [mg/m^3]
station: Fladen
station: N14 Falkenberg
station: Anholt E
station: W Landskrona
Chl-a mean 0-20 m [mg/m^3]
J F M A M J J A S O N D
Months
Monthly averages 1996 - 2010: Chl-a mean 0-20 m [mg/m^3]
Monthly averages +/- 1 standard dev.
2015 year's data

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.