

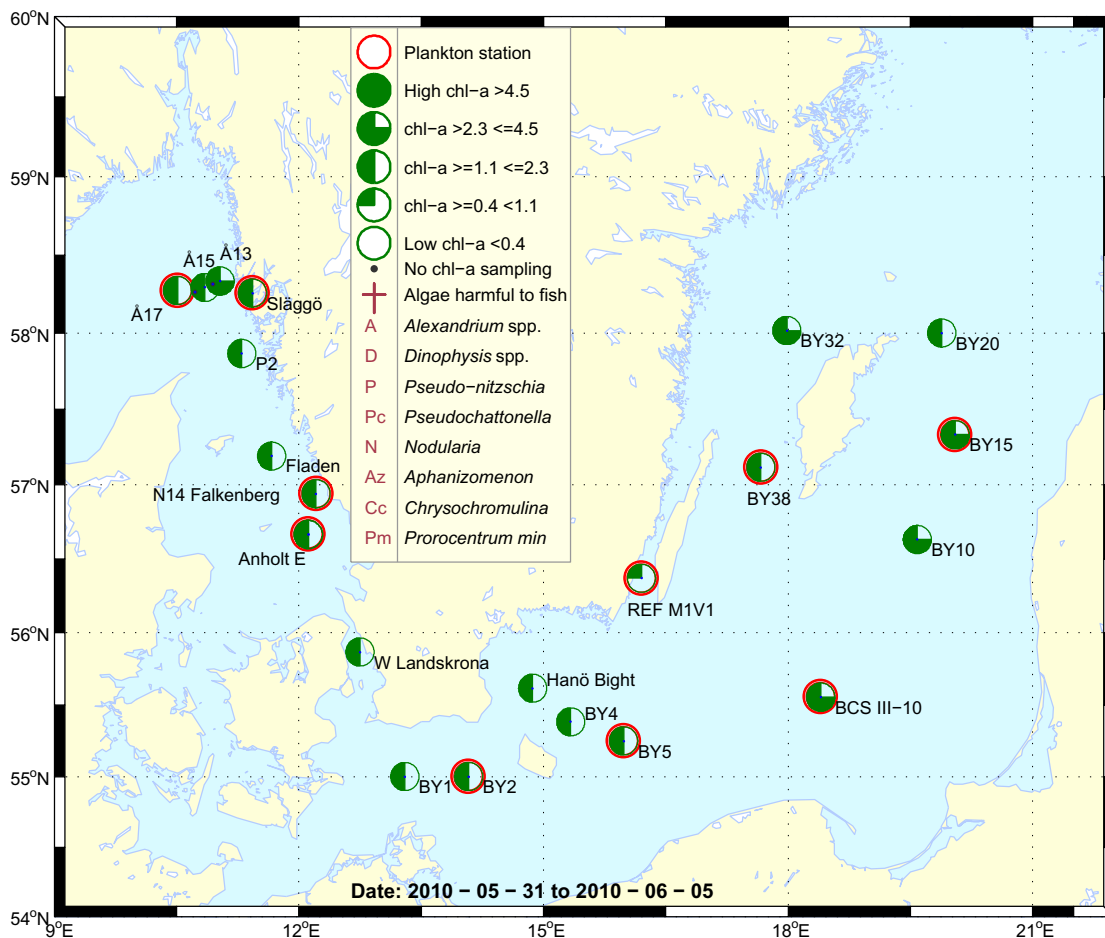
Sammanfattning

Planktonsamhället i Skagerrak och Kattegatt innehöll höga koncentrationer av coccolithophoriden *Emiliana huxleyi*. Vid Skagerraks yttre station, Å17, dominerade *Emiliana huxleyi* helt. Vid de andra planktonstationerna var dominansen inte lika tydlig även om *Emiliana huxleyi* återfanns i höga tätheter men nu tillsammans med andra små flagellater.

Klorofyll *a* koncentrationerna var inom det normala för säsongen och uppvisade relativt låga värden för hela området.

I Östersjön dominerades samhället av små flagellater vid de flesta stationer. Guldalgläktet *Dinobryon* var vanligt vid Gotlandsbassängen (BY38) samt Kalmar sund (Ref. M1-V1) som även innehöll relativt hög abundans av kiselalgen *Skeletonema costatum* complex.

De integrerade (0-20 m) klorofyll *a* koncentrationerna var relativt låga i hela området vilket är normalt för säsongen.



Abstract

The phytoplankton community in both Skagerrak and Kattegat contained high abundances of the coccolithophorid *Emiliana huxleyi*. The outer station in Skagerrak, Å17, was totally dominated by *Emiliana huxleyi*. The dominance was less profound at the other stations even if it was still found in substantial amounts but together with other small flagellates.

The integrated (0-20 m) chlorophyll *a* concentrations were within normal for the season resulting in relatively low concentrations at all stations.

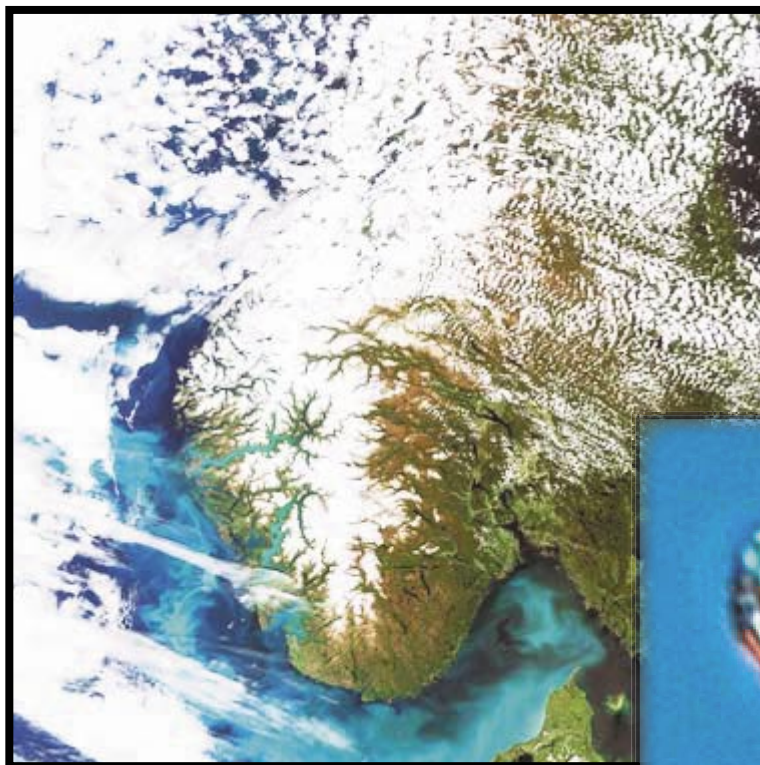
In the Baltic Sea small flagellates dominated the samples at most stations. The Chrysophyte genus *Dinobryon* was quite common at the Gotland deep and in Kalmar sound where the diatom *Skeletonema costatum* complex was also found in relatively high abundances.

The integrated chlorophyll *a* concentrations were rather low in the whole area, which is normal for the season.

More detailed information on species composition and abundance

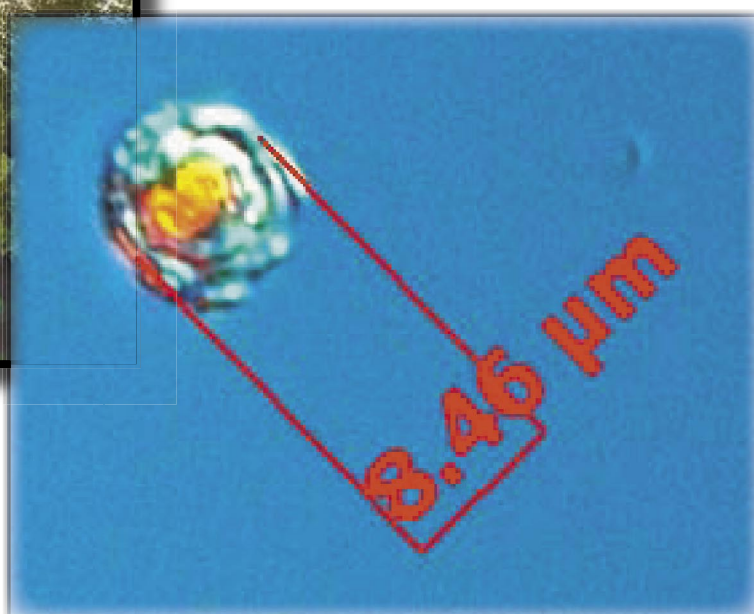
The Skagerrak

Å17 31th of May (open Skagerrak)



The coccolithophorid *Emilian huxleyi* was clearly dominating, making the cell counts high in this area. Satellite images taken during the same period could also reveal the same bloom with the light blue colouring of the water. Otherwise the sample contained few species, mostly small flagellates such as cryptophytes and only a few cells of dinoflagellates and diatoms. The chlorophyll *a* concentrations were within normal for the season.

A satellite image from ESA_ 4th of June showing the extensive coccolithophorid bloom.



Släggö 31th of May (Skagerrak coast)

The species diversity was much higher at this station compared to the previous. *Emiliana huxleyi* was found, but in much lower concentrations than at Å17. Cryptophytes were more common here with different species of the genus *Teleaulax* present. *Leucocryptus marina*, belonging to the *insertae sedis* taxa, was also found in quite high amounts. Several species of dinoflagellates were found but each species in low concentrations. The chlorophyll *a* concentrations were within normal for the season.

The small species *Emiliana huxleyi* causes the beautiful turquoise waters in the Skagerrak and the North Sea. Photo: A-T Skjevik.

The Kattegat

N14 Falkenberg 1st of June

The species composition was quite high. Cryptophytes and the coccolithophorid *Emiliana huxleyi* were abundant at this station as they were in the Skagerrak samples. The diatoms *Dactyliosolen fragilissimus* and *Skeletonema costatum* complex were also quite abundant.

Anholt E 1st and 5th of June

The species diversity was quite high. The coccolithophorid, *Emiliana huxleyi*, was the most abundant on the first sampling occasion. The diatoms *Dactyliosolen fragilissimus* and *Skeletonema costatum* complex were also quite abundant. Small flagellates belonging to the cryptophytes were common and especially *Plagioselmis prolunga*. Some cells of the prymnesiophyte genus *Chrysochromulina* were also found. The chlorophyll *a* concentrations were within normal for the season.

The Baltic Sea

Arkona Basin BY2 1st of June

The species diversity was relatively high but only a few cells of each species were found making the total cell count quite low. Small flagellates such as different species of the genus *Chrysochromulina* and various cryptophytes dominated the sample. The dinoflagellate *Heterocapsa rotundata* was quite common.

South East Baltic BCS III-10 2nd of June

Only a few species were found and quite low cell numbers were recorded. The prasinophyte genus *Pyramimonas* was found with the highest concentrations. Quite high abundances of different ciliates were observed. The chlorophyll *a* concentrations were within normal for the season.

Eastern Gotland Basin BY15 3rd of June

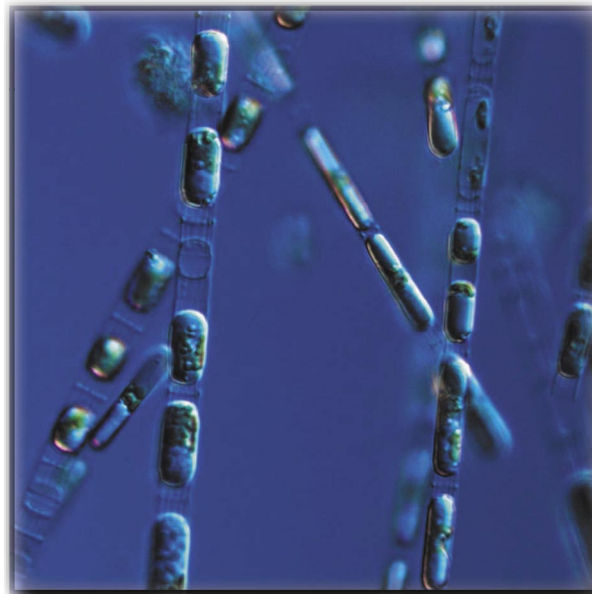
The prasinophyte genus *Pterosperma* was found in relatively high cell numbers at this sampling site as well as different ciliate species and some cryptophytes. The total cell count was quite low. The chlorophyll *a* concentrations were within normal for the season.

Western Gotland Basin BY 38 4th of June

The species diversity was quite high at this sampling site. The sample was dominated by different species of the chrysophyte genus *Dinobryon* followed by different species of the genus *Chrysochromulina*. Low abundance of the cyanophyte genus *Aphanizomenon* was also recorded. The chlorophyll *a* concentrations were within normal for the season.

Kalmar Sound Ref. M1-V1 4th of June

The species diversity was quite low. The diatom *Skeletonema costatum* complex was found in highest abundance at this sampling site. The genus *Dinobryon* was also found in quite high cell numbers.

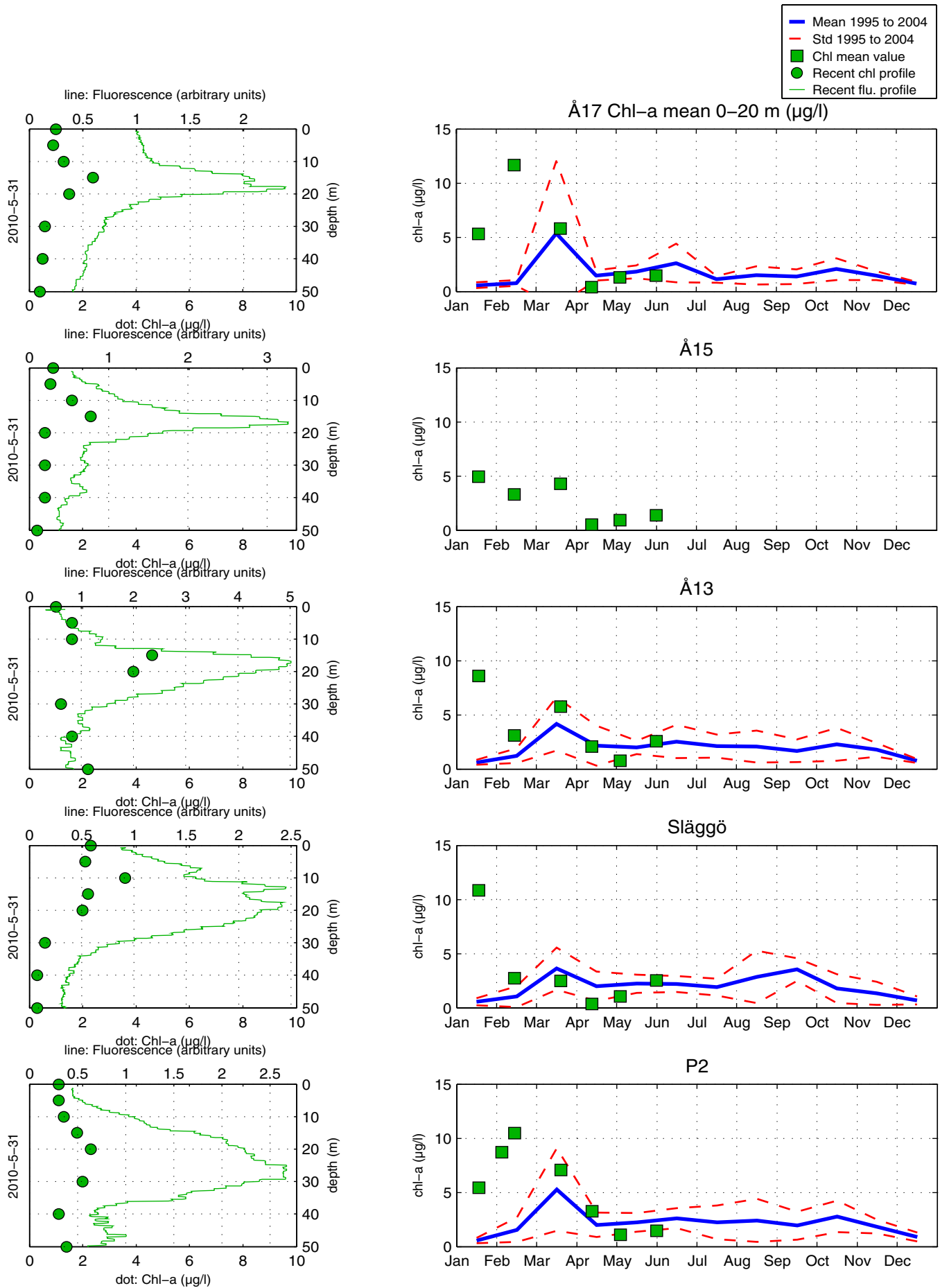


The diatom *Skeletonema costatum* complex was common in the Kalmar Sound. Photo: A-T Skjevik.

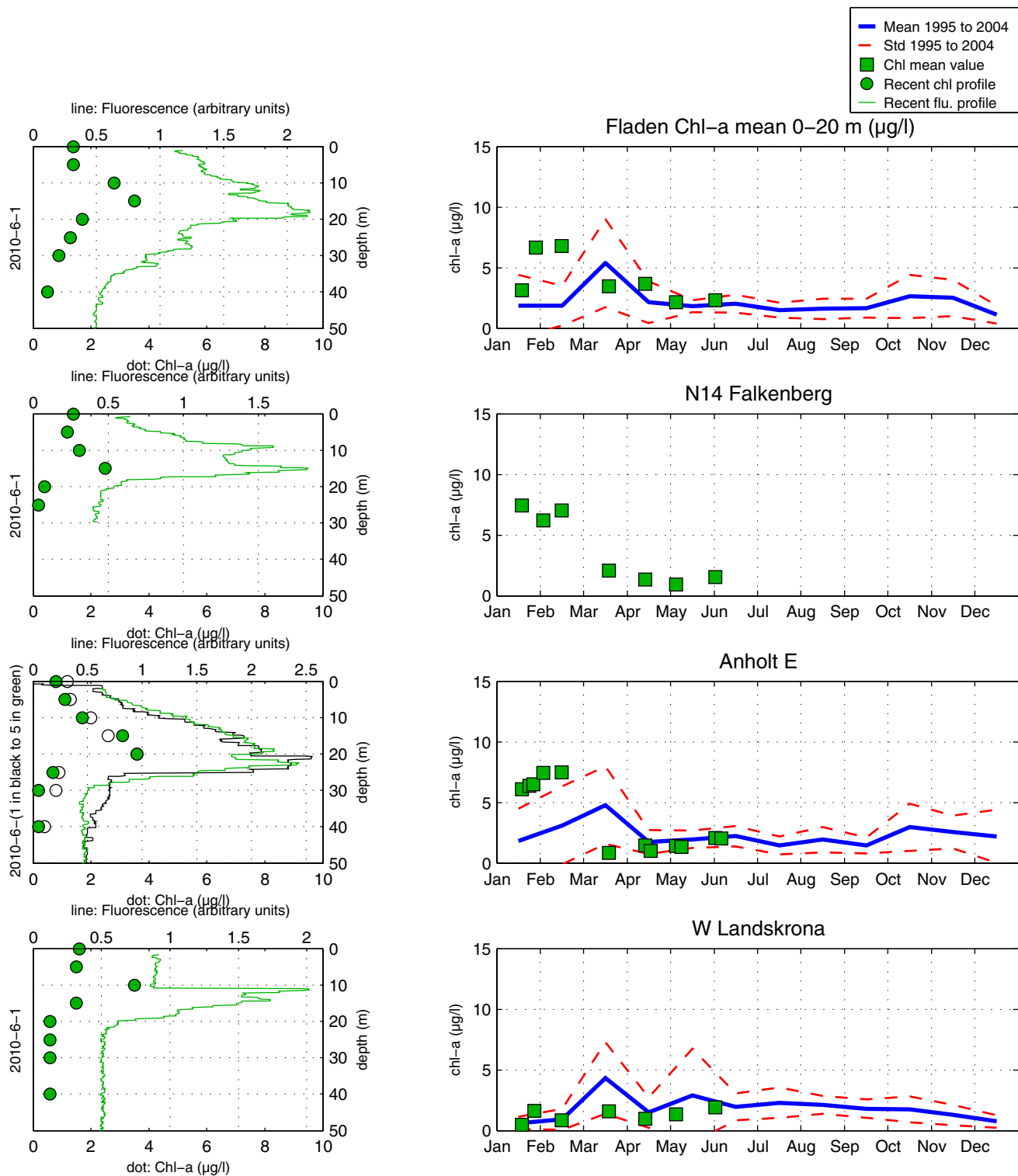
Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	2010-05-31	2010-05-31	2010-06-01	2010-06-01	2010-06-05
	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Chaetoceros danicus</i>			present		
<i>Cylindrotheca closterium</i>	present	present	present	present	present
<i>Dactyliosolen fragilissimus</i>		present	abundant	common	abundant
<i>Guinardia delicatula</i>		present		present	
<i>Leptocylindrus minimus</i>			common	present	
<i>Nitzschia longissima</i>		present			
<i>Proboscia alata</i>	present	present	common	present	present
<i>Pseudo-nitzschia delicatissima</i> -group			common	present	
<i>Rhizosolenia hebetata</i>	present			present	
<i>Skeletonema costatum</i> complex			abundant	common	present
<i>Thalassionema nitzschioides</i>		present	common	present	common
<i>Thalassiosira</i> spp.		present			
<i>Ceratium fusus</i>	present	present		present	present
<i>Ceratium lineatum</i>		present			
<i>Ceratium longipes</i>		present			
<i>Ceratium tripos</i>		present		present	
<i>Azadinium spinosum</i>		present			
<i>Dinophysis acuminata</i>		present			
<i>Dinophysis norvegica</i>	present	present	present	present	
<i>Dinophysis rotundata</i>		present			
<i>Gymnodinium simplex</i>	present	present		present	
Gymnodiniales spp.	present	present	present		
<i>Heterocapsa rotundata</i>		present		present	
<i>Katodinium glaucum</i>	present		present		
<i>Protoceratium reticulatum</i>		present		present	present
<i>Protoperdinium bipes</i>	present				
<i>Protoperdinium brevipes</i>		present			
<i>Protoperdinium depressum</i>		present			
<i>Protoperdinium pellucidum</i>		present			present
<i>Protoperdinium steinii</i>	present	present			
<i>Protoperdinium</i> spp.	present	present	present		present
<i>Scrippsiella</i> -complex spp.		present		present	present
<i>Chrysochromulina</i> spp.			common	common	present
Cryptomonadales spp.	common	abundant	abundant	abundant	abundant
<i>Teleaulax</i> spp.					present
<i>Teleaulax acuta</i>		present	present	present	
<i>Teleaulax amphioxeia</i>	present	present	present	present	present
<i>Plagioselmis prolonga</i>	present	common	common	common	common
<i>Pterosperma</i> spp.		present			present
<i>Pyramimonas</i> spp.		present	common		present
<i>Dinobryon faculiferum</i>					present
<i>Dinobryon</i> spp.	present	present	common	common	present
<i>Leucocryptos marina</i>	present	common	present	common	common
<i>Emiliana huxleyi</i>	dominating	common	abundant	abundant	present
Ciliophora spp.		present	present	present	present
<i>Mesodinium rubrum</i>		present	present		present

<i>Selection of observed species</i>	BY2	BCS III-10	BY15	BY38	Ref. M1-V1
Red=potentially toxic species	2010-06-01	2010-06-02	2010-06-03	2010-06-04	2010-06-04
	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Chaetoceros danicus</i>	present				
<i>Chaetoceros similis</i>		present	present		present
<i>Chaetoceros</i> spp.	present				
<i>Leptocylindricus danicus</i>	present				
<i>Skeletonema costatum</i> complex	common				abundant
<i>Thalassiosira</i> spp.	present				
<i>Amylax triacantha</i>				present	
<i>Cladopyxis claytonii</i>				present	
<i>Dinophysis acuminata</i>	present	present	present	present	
<i>Dinophysis norvegica</i>	present	present	present		
<i>Gymnodinium</i> spp.	present		present	present	present
<i>Gyrodinium spirale</i>				present	
<i>Heterocapsa rotundata</i>	common		present		present
<i>Katodinium glaucum</i>	present	present	present		
<i>Peridiniella catenata</i>				present	
<i>Protoperidinium bipes</i>				present	present
<i>Protoperidinium brevipes</i>		present		present	
<i>Protoperidinium</i> spp.	present			present	present
<i>Scripsiella</i> complex	present	present			
<i>Chrysochromulina polylepis</i>		common			
<i>Chrysochromulina</i> spp.	common		present	common	present
Cryptomonadales spp.	common	common	common	present	present
<i>Plagioselmis prolunga</i>	present			present	present
<i>Teleaulax amphioxeia</i>	present		present	present	present
<i>Pyramimonas</i> spp.	common				
<i>Dinobryon balticum</i>				common	
<i>Dinobryon faculiferum</i>				common	common
<i>Dinobryon</i> spp.	present	present	present	abundant	common
<i>Meringosphaera</i> spp.				present	
<i>Pterosperma</i> spp.		abundant	abundant	common	present
<i>Anabaena</i> spp.		present			
<i>Aphanizomenon</i> spp.		present	present	present	
<i>Calliacantha natans</i>					common
Ciliophora spp.	common	common	common	common	present
<i>Mesodinium rubrum</i>	present	common	common	present	present

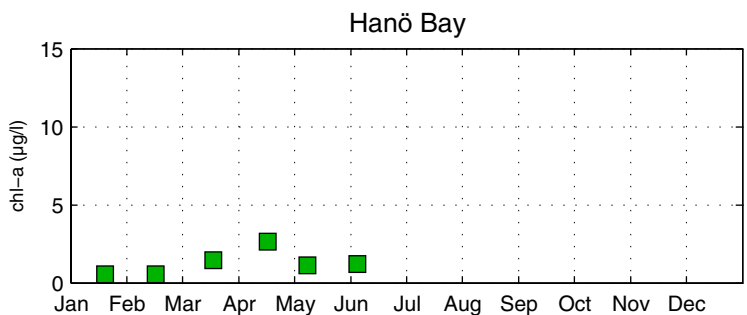
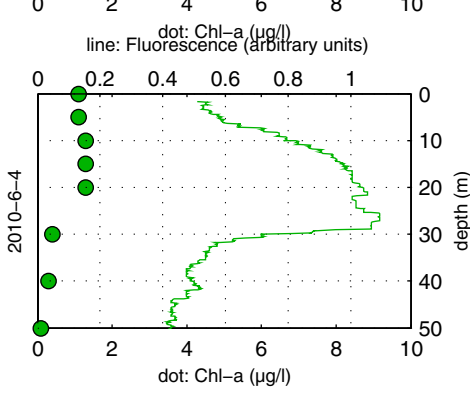
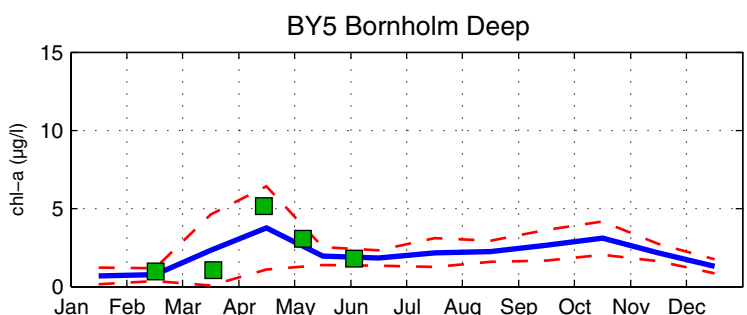
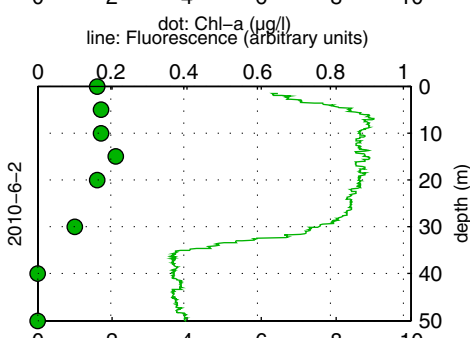
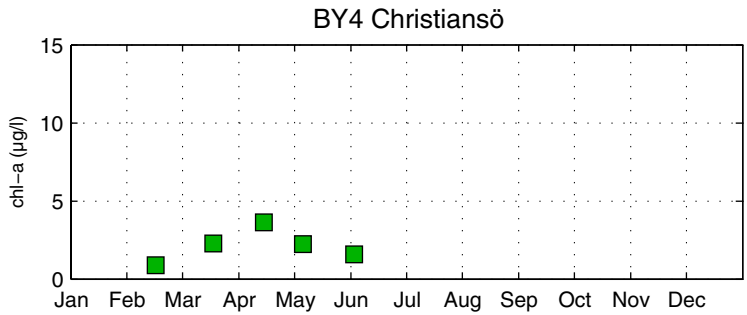
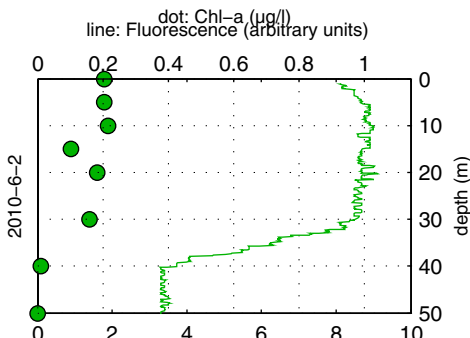
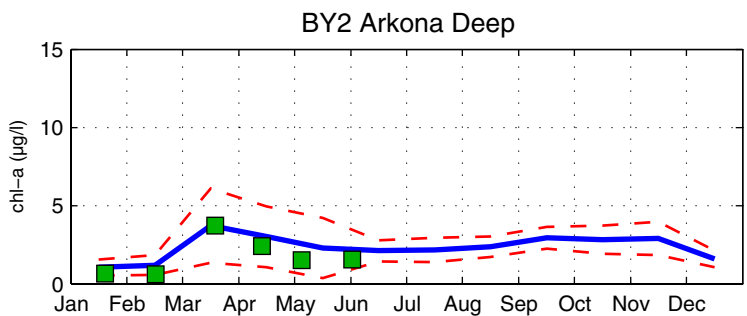
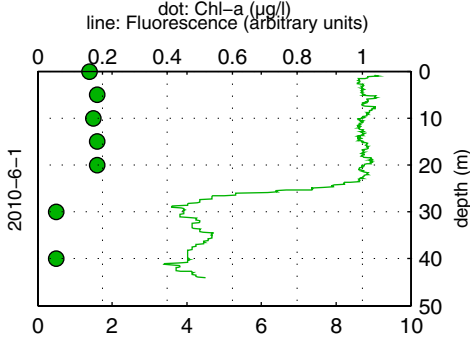
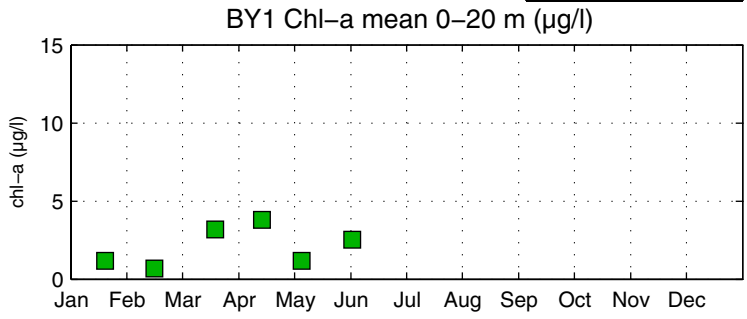
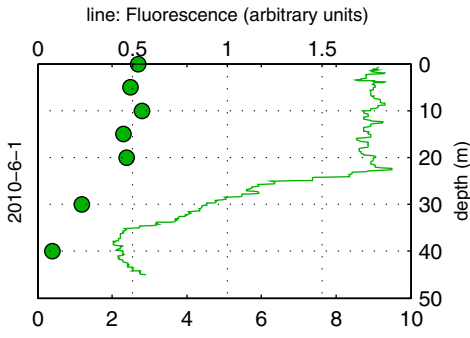
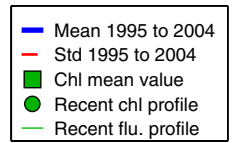
The Skagerrak



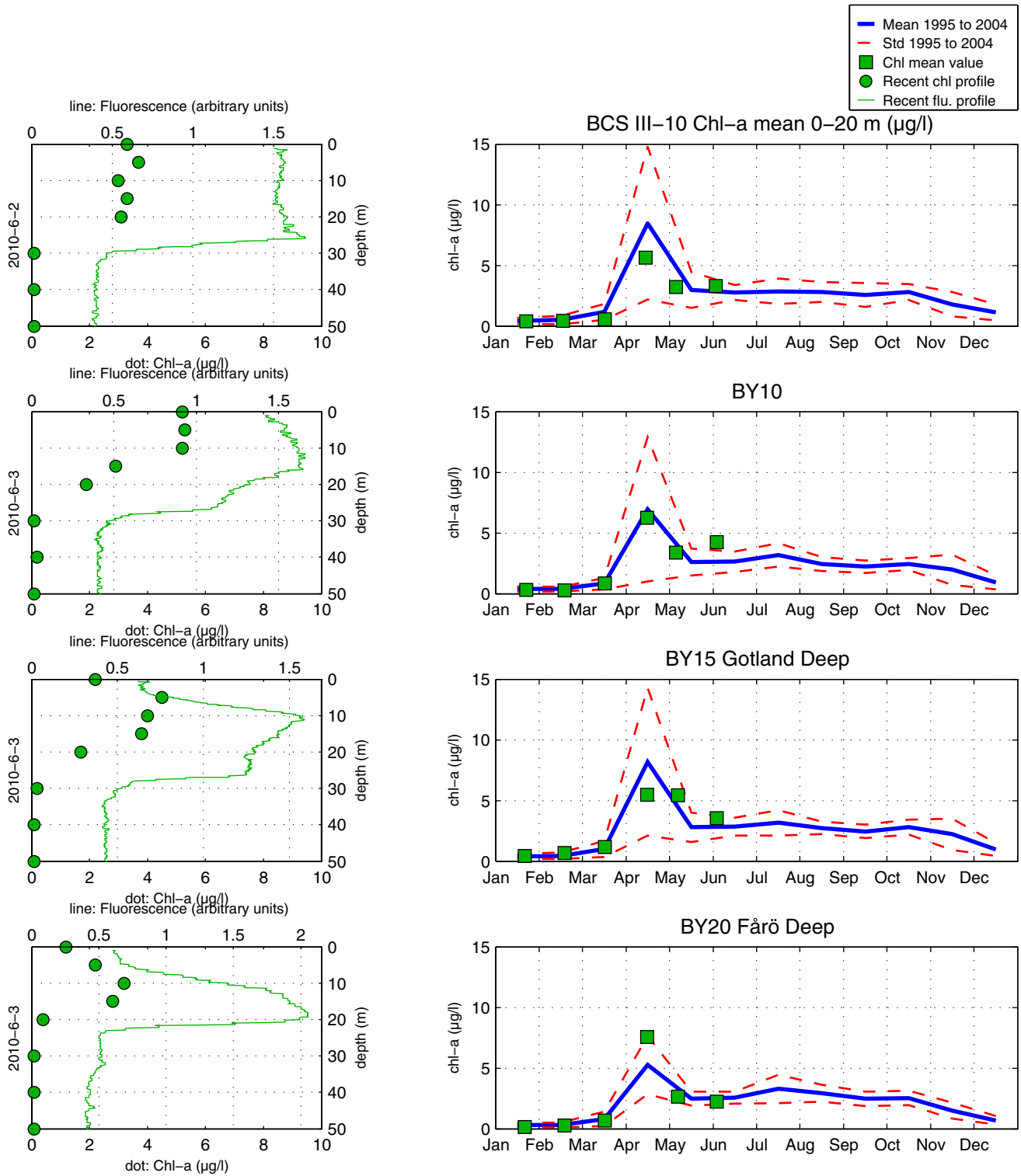
The Kattegat and the Sound



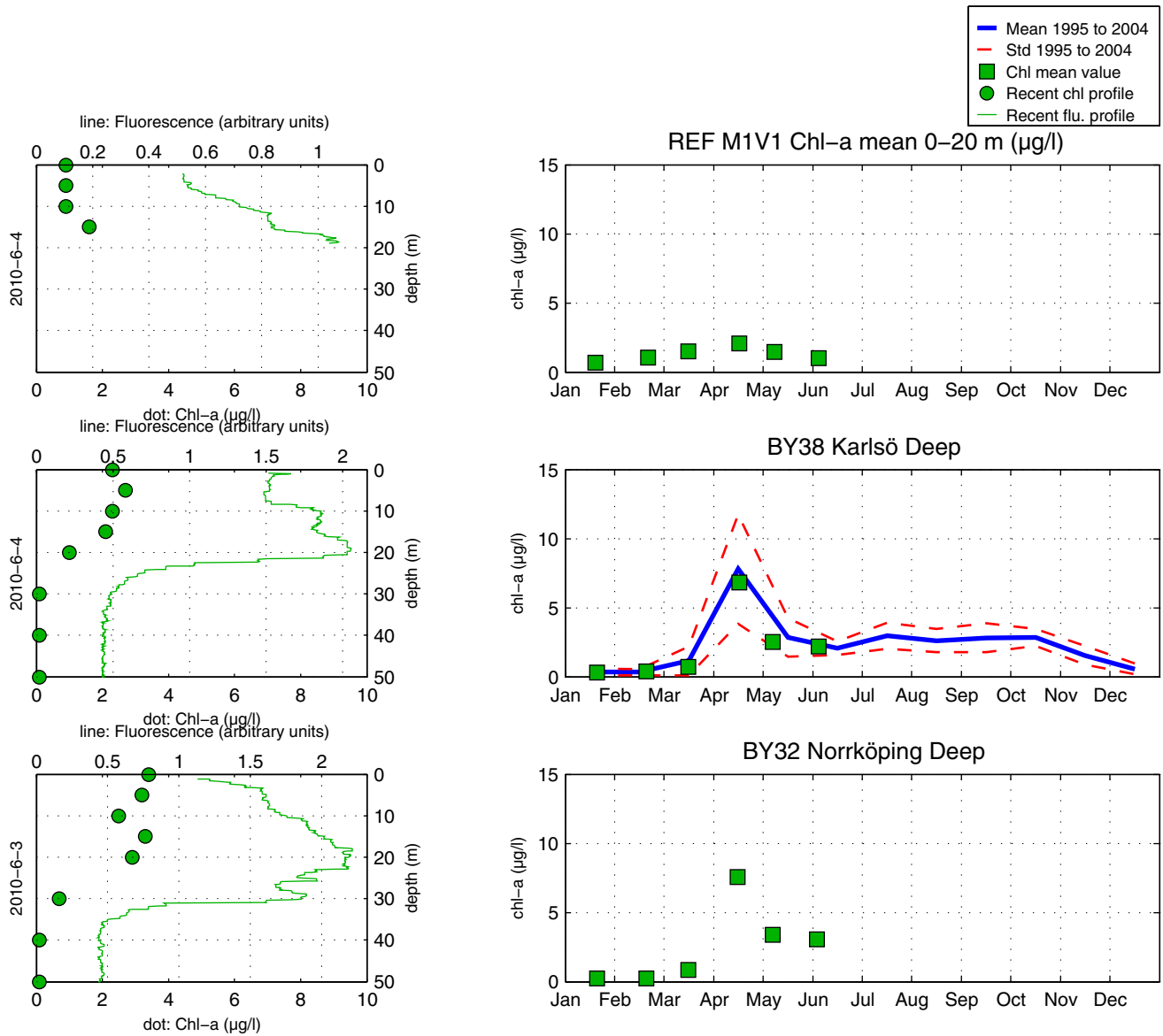
The Southern Baltic



The Eastern Baltic



The Western Baltic



Om klorofylldiagrammen

Klorofyll *a* är ett mått på mängden växtplankton. Prover tas från ett antal djup från U/F Argos. 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 from the R/V Argos. Data is 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 ca en gång per månad expeditioner med U/F Argos i Östersjön och Västerhavet. Resultat baserade på semikvantitativ mikroskopanalys av planktonprover samt klorofyllmätningar presenteras kortfattat i denna rapport. Information från SMHI:s satellitövervakning av algbloomningar finns på www.smhi.se.

About AlgAware

SMHI carries out monthly cruises with R/V Argos 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 SMHI:s satellite monitoring of algal blooms is found on www.smhi.se.

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>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.
<i>Pseudo-nitzschia</i> 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.

Översikt av 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. Då cirkeln är tom innebär detta att stationen inte provtagits.

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. An empty circle indicates that there has been no sampling at that station.

