

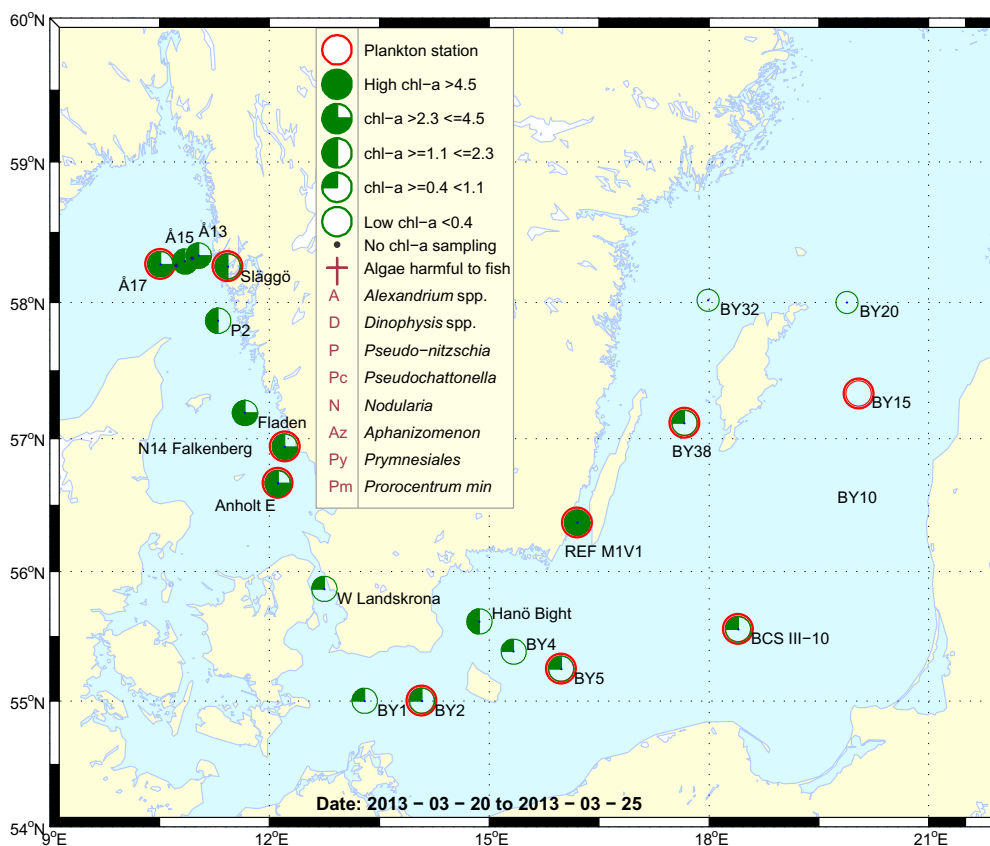
Sammanfattning

I Skagerrak återfanns resterna av vårbloomingen i ytvattnet. Klorofyllfluorescensprofilen visade ett maximum vid ca 15 meter. Kiselalger dominerade i ytvattnet och framför allt *Skeletonema marinoi* samt *Detonula confervacea* var vanliga. I Kattegatt var vårbloomingen i full fart men vid andra provtagningen vid Anholt E hade algera vid ytan börjat sjunka ner mot djupet. Även här återfanns fram för allt *Skeletonema marinoi* men även *Detonula confervacea* i höga tätheter.

De integrerade (0-20 m) klorofyll *a*-värdena var inom det normala för månaden. Relativt höga klorofyllvärden uppmättes på enskilda djup, mellan 10-20 meter vid de flesta stationer i Skagerrak och Kattegatt.

Vårbloomingen av kiselalger hade startat i Kalmarsund, men i egentliga Östersjön var cellantalen väldigt låga och det fanns inga kiselalger. Runt Bornholm kunde man ana en begynnande kiselalgsblooming, men cellantalen var fortfarande låga.

De integrerade klorofyll *a*-värdena var låga i Östersjön och under medel vid många stationer. Bara i Kalmarsund var klorofyllvärdena förhöjda.



Abstract

Remnants of the spring bloom were found in the surface water at both stations in the Skagerrak. The chlorophyll fluorescence maxima indicated that the bloom was sinking down considering they were found at approximately 15 meters. Diatoms dominated in the surface water and *Skeletonema marinoi* and *Detonula confervacea* were the most abundant. The spring bloom was present at both stations in the Kattegat. The bloom had however emerged downwards on the second sampling occasion at Anholt E. *Skeletonema marinoi* and *Detonula confervacea* were the most abundant species.

The integrated (0-20 m) chlorophyll *a* concentrations were within normal for this month. Quite high concentrations were found at single depths between 10-20 meters at most of the stations in the Skagerrak and Kattegat areas.

The diatom spring bloom had started in the Kalmar Sound, but not yet in the Baltic proper where the cell densities were very low and no diatoms were found in the samples. Diatoms were present in the area around Bornholm with low cell numbers.

The integrated (0-20m) chlorophyll *a* concentrations were low in the Baltic Sea and below average at many stations. In the Kalmar Sound, the chlorophyll concentrations were rather high.

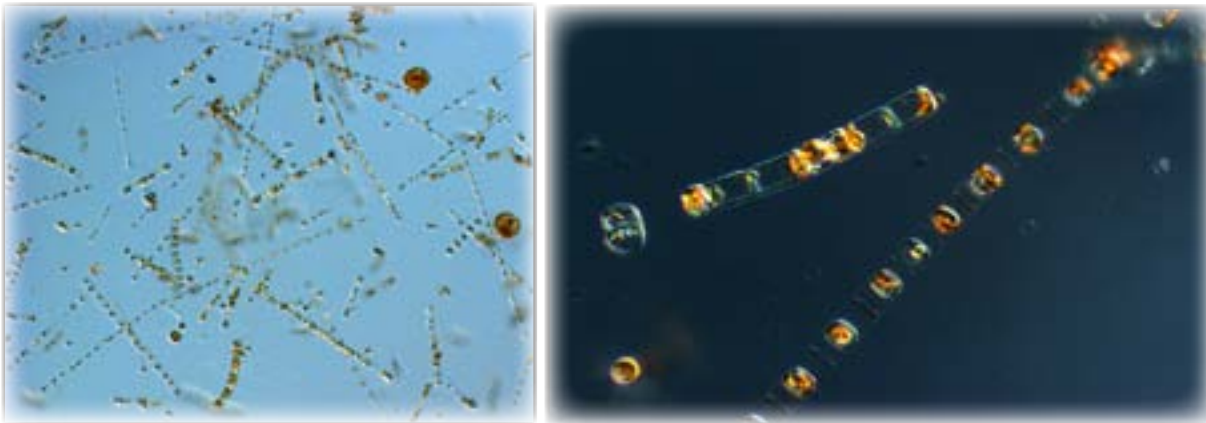
More detailed information on species composition and abundance

The Skagerrak

Å17 (open Skagerrak) and Släggö (Skagerrak coast)

The species diversity was high. The phytoplankton community was dominated by the diatoms *Skeletonema marinoi*, *Detonula confervacea*, *Rhizosolenia hebetata* f. *semispina* and several species of the genus *Chaetoceros*. The chlorophyll fluorescence profile indicated that a previous bloom was sinking down considering a fluorescence peak was observed at 15 meters. Extra water samples were taken at the depth of the fluorescence peak. More or less the same species were found compared to the surface water (0-10 m) but with higher cell numbers.

The integrated (0-20 m) chlorophyll *a* concentrations were within normal for this month and the maxima were found at 20 meters at Å17 and at 10 meters at Släggö.



The diatom bloom found at the Skagerrak and Kattegat stations was dominated by the diatoms *Detonula confervacea* and *Skeletonema marinoi* (Picture to the right, *S. marinoi* is the lower chain).
Photos: Marie Johansen.

The Kattegat

N14 Falkenberg and Anholt E

A diatom bloom was present at both stations. The species diversity was high and the diatom *Skeletonema marinoi* was the most common with more than 2 million cells per liter. Other diatoms that were common were *Detonula confervacea*, *Chaetoceros debilis* and the genus *Thalassiosira*. The bloom intensity in the surface water (0-10) had decreased on the second sampling occasion at Anholt E. The chlorophyll fluorescence peaked at about 14 meters at the second visit and indicated that the bloom was sinking down.

The integrated (0-20 m) chlorophyll *a* concentrations were within normal for this month.

The Baltic Sea

BY2 Arkona, BY5 Bornholms Deep, BCS III-10 21st - 22nd of March

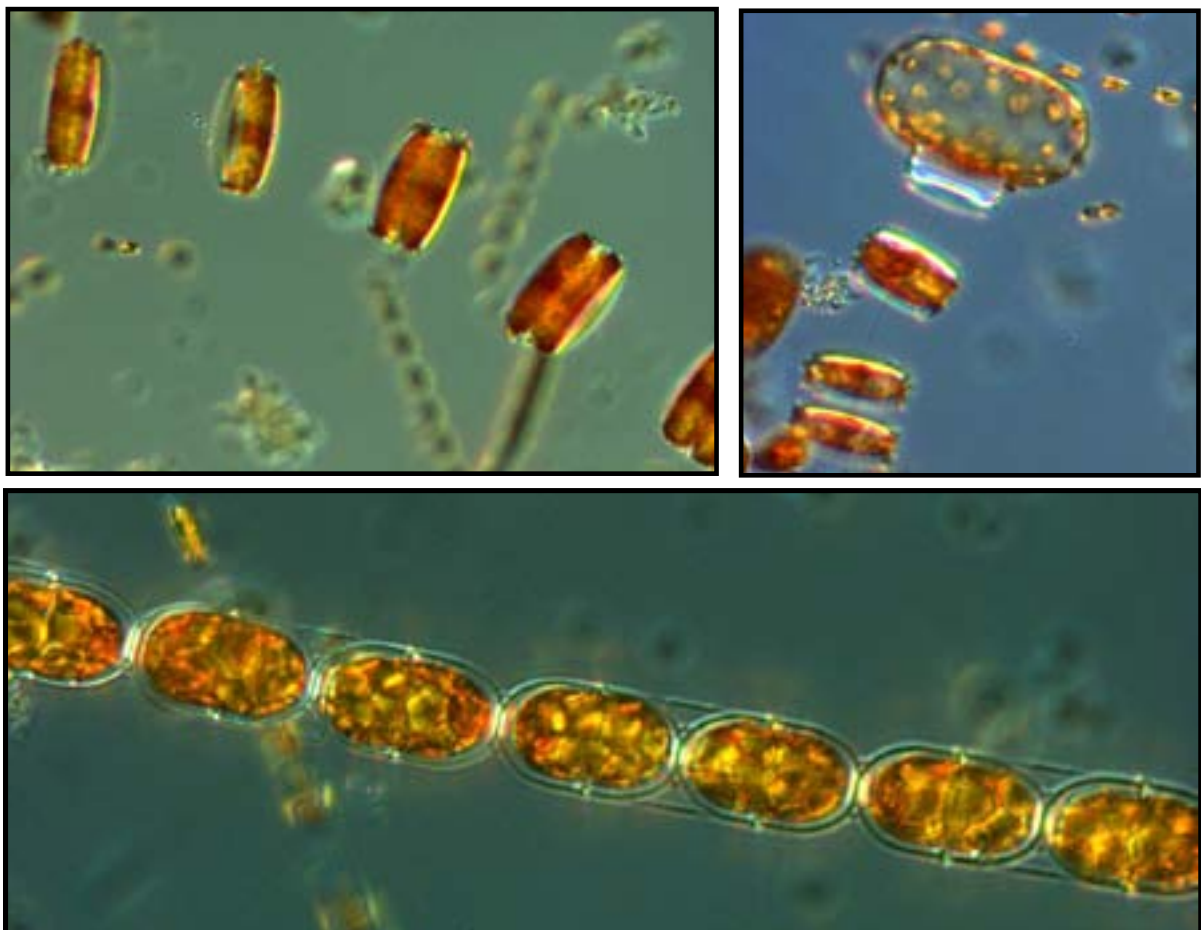
These stations had a similar species composition. *Skeletonema marinoi* and cryptomonads dominated and the cell densities were low.

BY15 and BY38, 22nd – 23rd of March

The phytoplankton diversity was very low. Cryptomonads dominated at both stations and *Aphanizomenon flos-aquae* was present at BY38 (Karlsö Deep).

Ref M1V1 Kalmar Sound 23rd of March

The diatom spring bloom had started in the Kalmar Sound. The chlorophyll *a* concentrations were high compared to other stations in The Baltic Sea. The diatom *Skeletonema marinoi* was blooming and species from the genus *Thalassiosira* were common. There were also several species from the genus *Chaetoceros*.



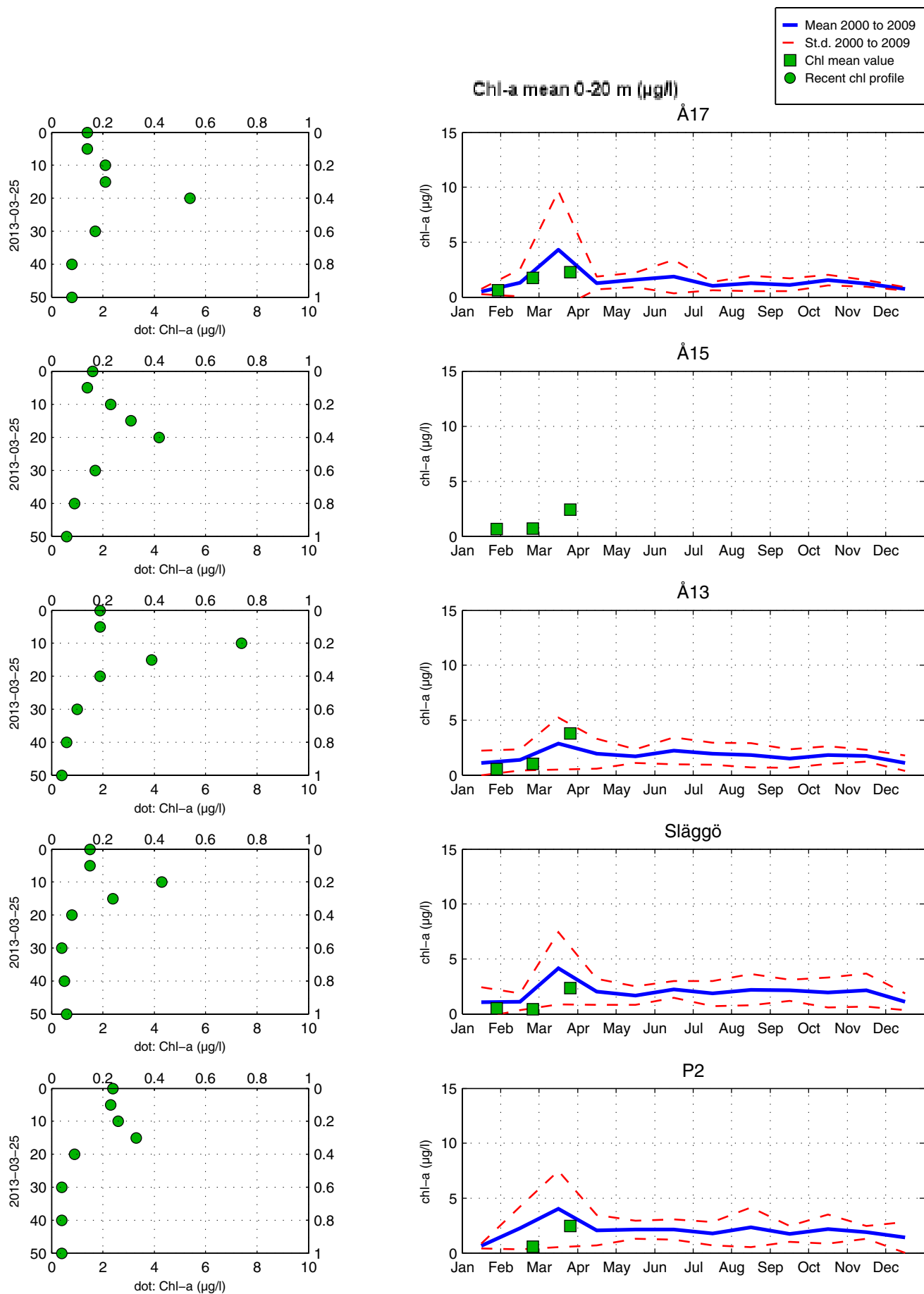
The diatoms *Thalassiosira* cf. *eccentrica* and *Melosira arctica* were present at Ref M1V1 in Kalmar Sound. Left: *T.* cf. *eccentrica*, right: *T.* cf. *eccentrica* with resting cyst, below: *Melosira arctica*.
Photos: Malin Mohlin.

Phytoplankton analysis and text by:
Malin Mohlin and Marie Johansen

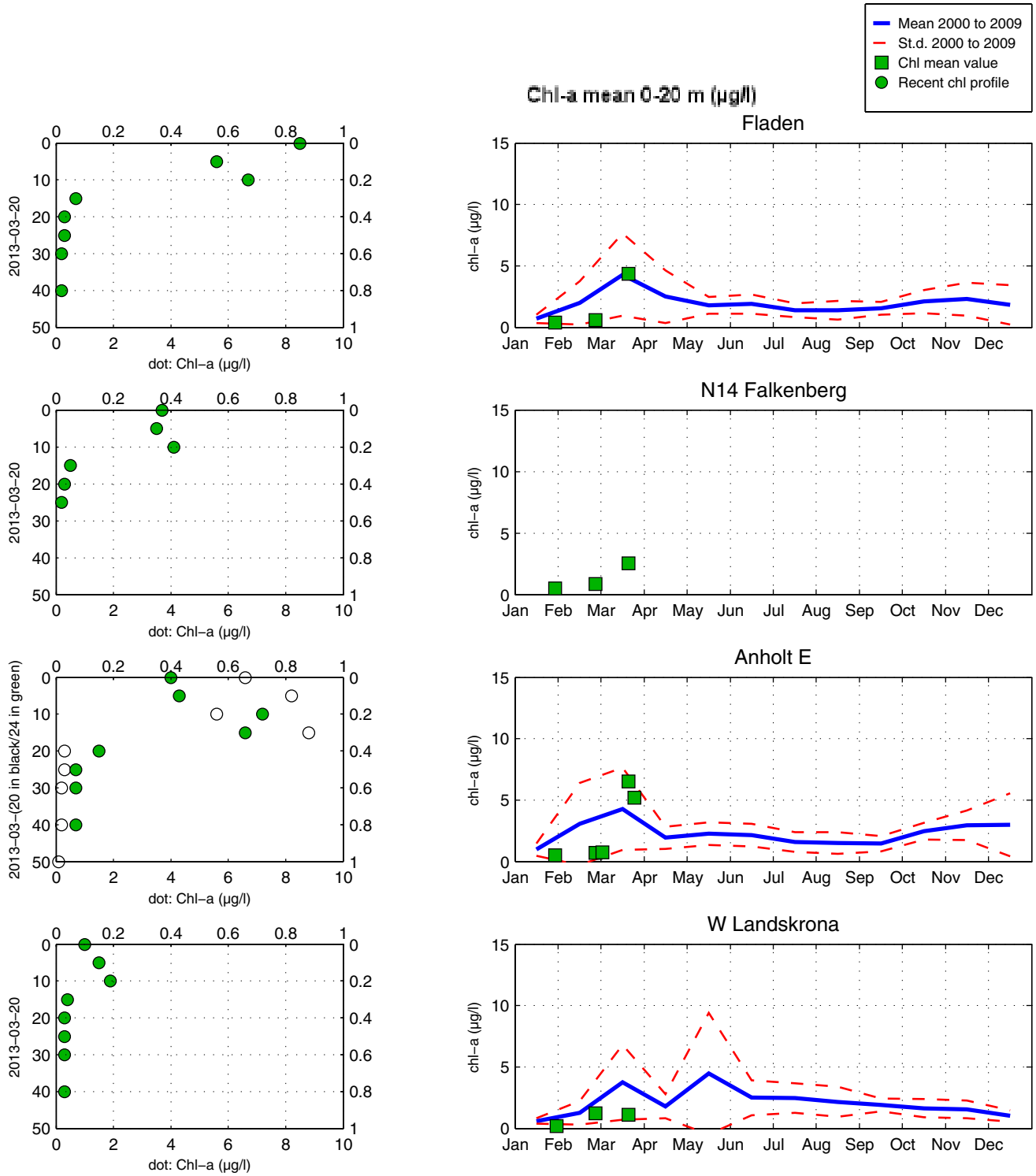
Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	25/3	25/3	20/3	20/3	24/3
	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Navicula</i> spp	present		present	present	present
<i>Thalassionema nitzschioides</i>	present	common	common	common	present
<i>Coscinodiscus concinnus</i>			present		
<i>Detonula confervacea</i>	common	common	2 000 000	800 000	1 000 000
<i>Porosira glacialis</i>			present		present
<i>Rhizosolenia setigera</i>	present	present	present	present	present
<i>Skeletonema marinoi</i>	very common	common	3 500 000	2 200 000	1 700 000
<i>Thalassiosira</i> spp			present		common
<i>Thalassiosira anguste-lineata</i>		present			
<i>Thalassiosira minima</i>	very common		1 300 000	very common	common
<i>Thalassiosira nordenskiöldii</i>	present		common	common	present
<i>Chaetoceros</i> spp	common	present	common	common	common
<i>Chaetoceros brevis</i>				present	
<i>Chaetoceros danicus</i>			present		present
<i>Chaetoceros debilis</i>	common	common	very common	very common	very common
<i>Chaetoceros decipiens</i>			present	present	
<i>Chaetoceros socialis</i>	common		common	common	
<i>Chaetoceros subtilis</i> v. <i>subtilis</i>		present	present		
<i>Chaetoceros tenuissimus</i>	present				
<i>Chaetoceros wighamii</i>			present		
<i>Rhizosolenia hebetata</i> f. <i>semispina</i>	common	common	common	present	present
<i>Navicula transitans</i> v. <i>transitans</i>			present		
<i>Ceratium fusus</i>			present		
<i>Ceratium longipes</i>				present	
<i>Ceratium tripos</i>		present	present		present
<i>Dinophysis acuminata</i>		present			
<i>Dinophysis norvegica</i>		present			
<i>Gymnodiniales</i> spp	common	present			present
<i>Gyrodinium spirale</i>	present	present			
<i>Heterocapsa rotundata</i>		present	common	common	common
<i>Katodinium glaucum</i>		present	present		
<i>Peridinales</i> spp		present			
<i>Protoperidinium</i> spp		present			
<i>Protoperidinium pallidum</i>		present			
<i>Protoperidinium pellucidum</i>	present	present			
<i>Prymnesiales</i> spp		present			
<i>Ebria tripartita</i>		present	present	present	present
<i>Cryptomonadales</i> spp			present		
<i>Plagioselmis</i> spp			present	present	
<i>Plagioselmis prolunga</i>	present		present		
<i>Teleaulax</i> spp	present	common	common	common	present
<i>Apedinella radians</i>					present
<i>Dictyocha speculum</i>					present
Craspedophyceae	common	present	common	common	common
<i>Katablepharis remigera</i>	present			present	present
<i>Mesodinium rubrum</i>		present	present		
<i>Ciliophora</i> spp	present	present	present	present	present

Selection of observed species	BY2	BY5	BCS III-10	BY15	BY38	REF M1-V1
Red=potentially toxic species	21/3	21/3	22/3	22/3	23/3	23/3
	cells/l	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Achnanthes</i> spp						present
<i>Attheya septentrionalis</i>		present				
Bacillariophyceae	present					
<i>Chaetoceros</i> spp	present	present				common
<i>Chaetoceros subtilis</i>	present					present
<i>Chaetoceros wighamii</i>	present					common
<i>Coscinodiscus radiatus</i>			present			
<i>Detonula confervacea</i>	present					
<i>Melosira arctica</i>						present
<i>Skeletonema marinoi</i>	common	present	present	present		common
<i>Thalassiosira</i> spp	present					present
<i>Thalassiosira</i> cf. <i>eccentrica</i>						common
<i>Thalassiosira</i> cf. <i>minima</i>	present					present
<i>Dinophysis acuminata</i>			present			
<i>Dinophysis norvegica</i>		present				
<i>Peridiniella catenata</i>						present
<i>Protoperidinium</i> spp	present	present				
<i>Pterosperma</i> spp						present
<i>Pyramimonas</i> spp					present	present
<i>Aphanizomenon flos-aquae</i>					present	
<i>Woronichinia elorantae</i>			present			
Cryptomonadales	present	present	present	present	present	present
<i>Plagioselmis</i> spp	present	present	present	present	present	present
<i>Teleaulax</i> spp	present	present	present	common	present	present
Flagellates	present	present	present	present	present	present
Unicell	present	present	present	present		present
Ciliophora	present	present	present	present		present
<i>Mesodinium rubrum</i>	present	present	present		present	present

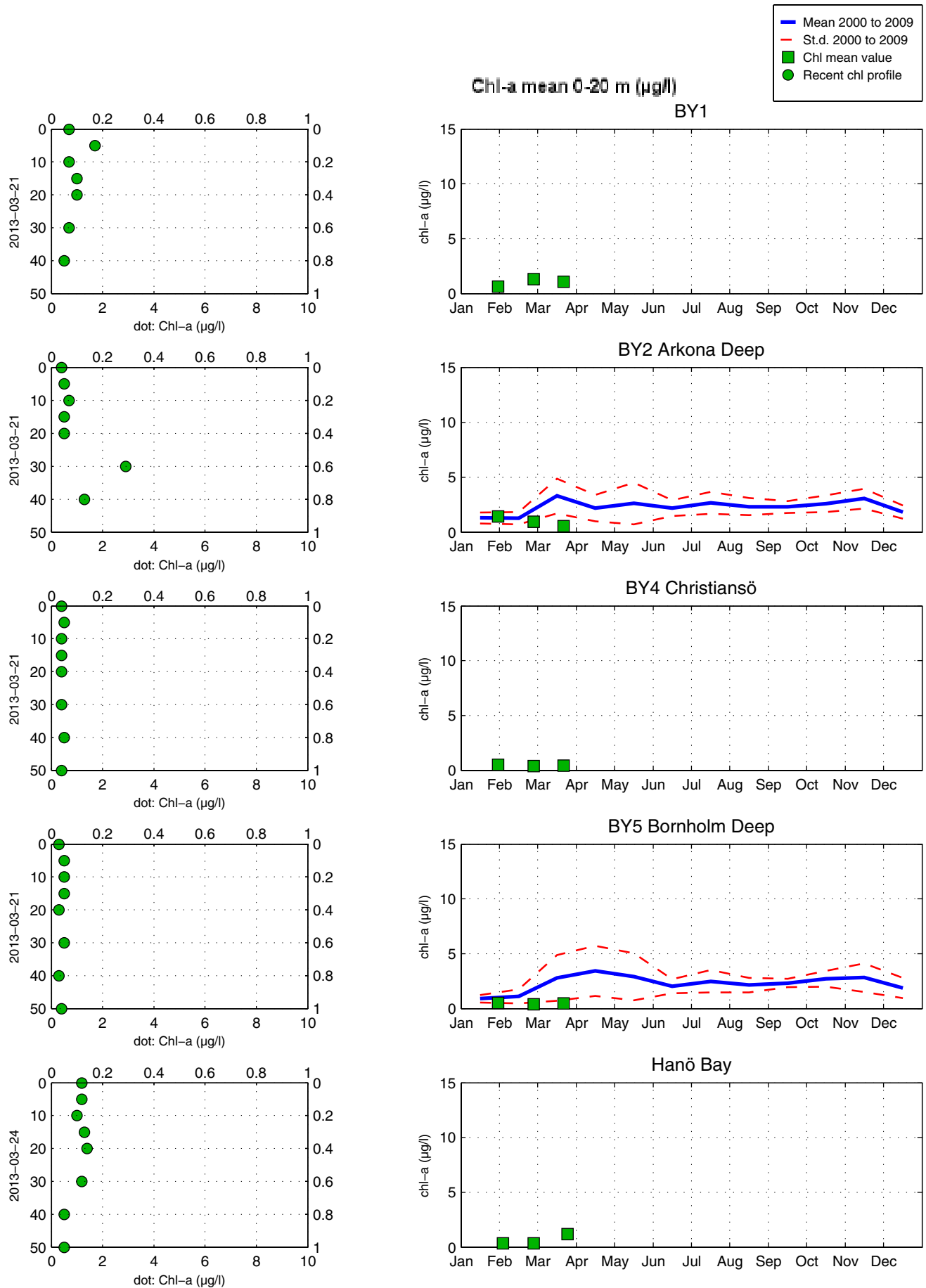
The Skagerrak



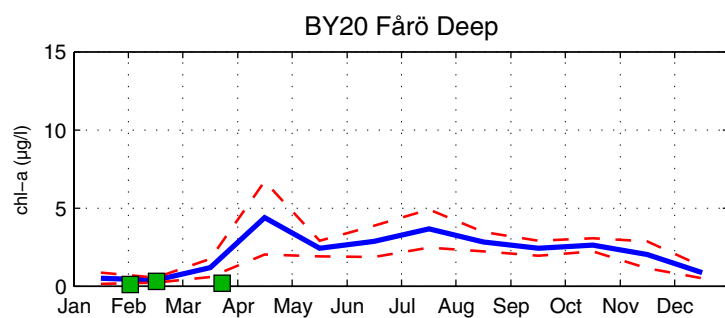
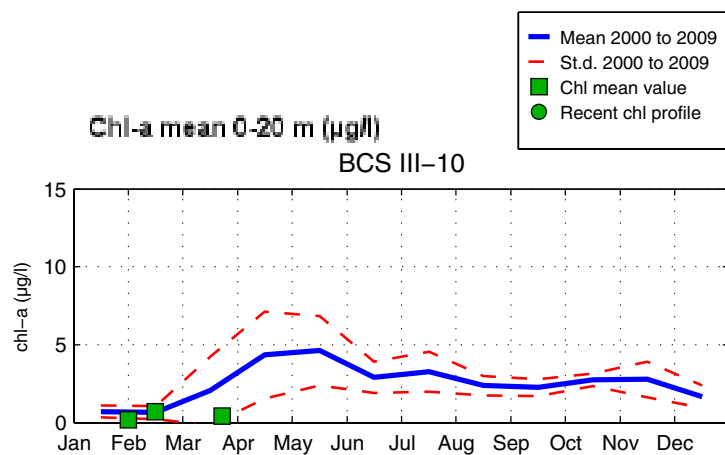
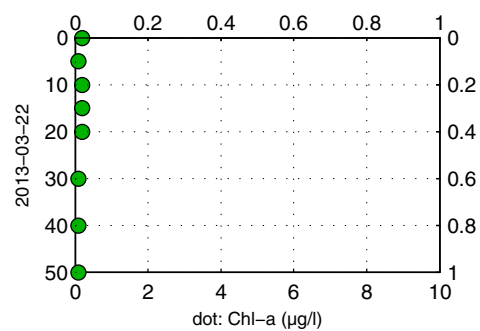
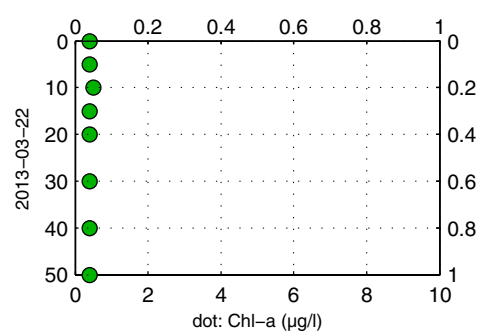
The Kattegat and the Sound



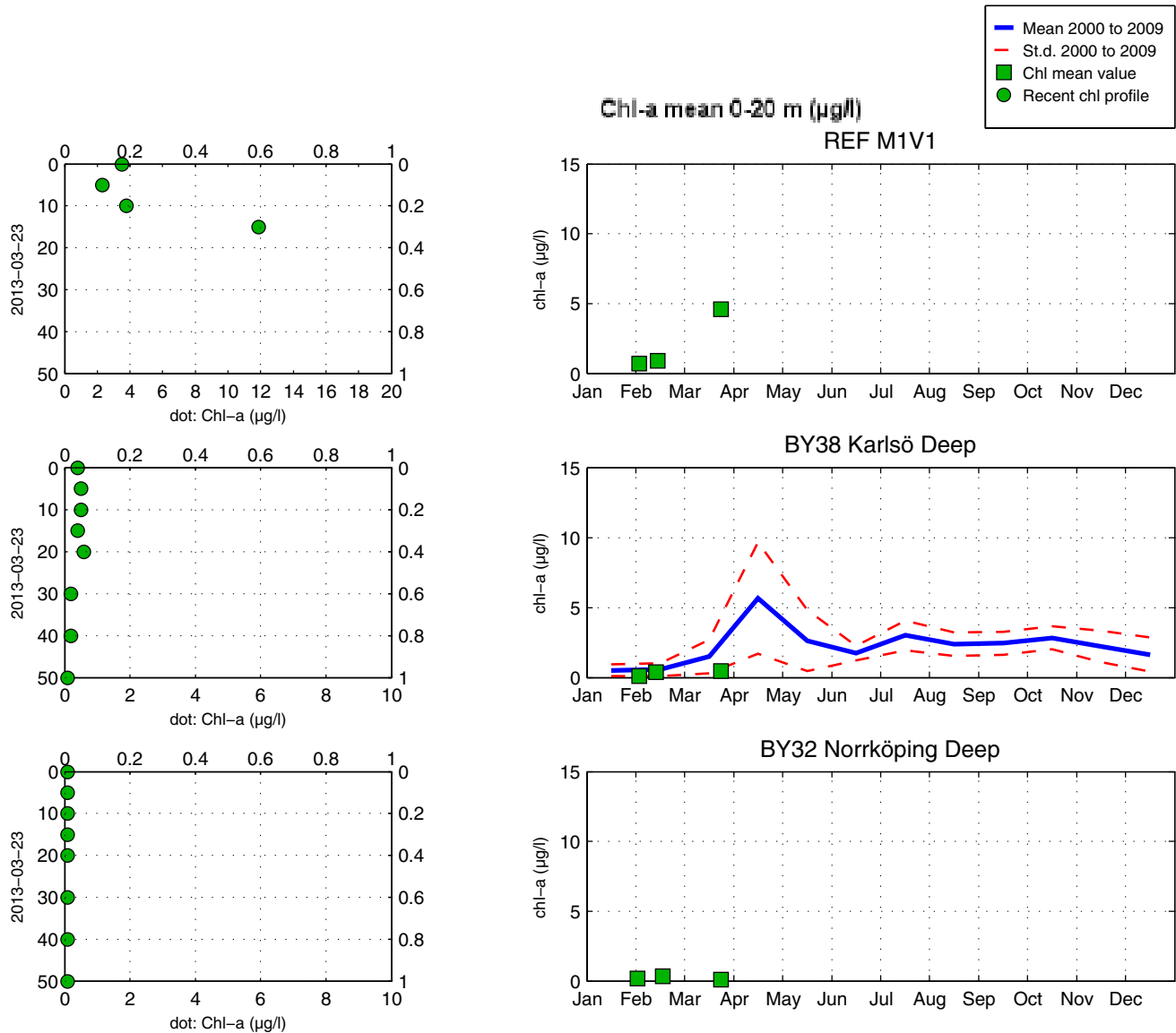
The Southern Baltic



The Eastern Baltic



The Western Baltic



Om klorofylldiagrammen

Klorofyll *a* är ett mått på mängden växtplankton. Prover tas från ett antal djup. 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 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 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

The 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 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>Pseudo-nitzschia</i> spp.	Amnesic shellfish poisoning (ASP)	Milda symptom: Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramp 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.
<i>Chaetoceros concavicornis</i> / <i>C. convolutus</i>	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.
<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.

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.

