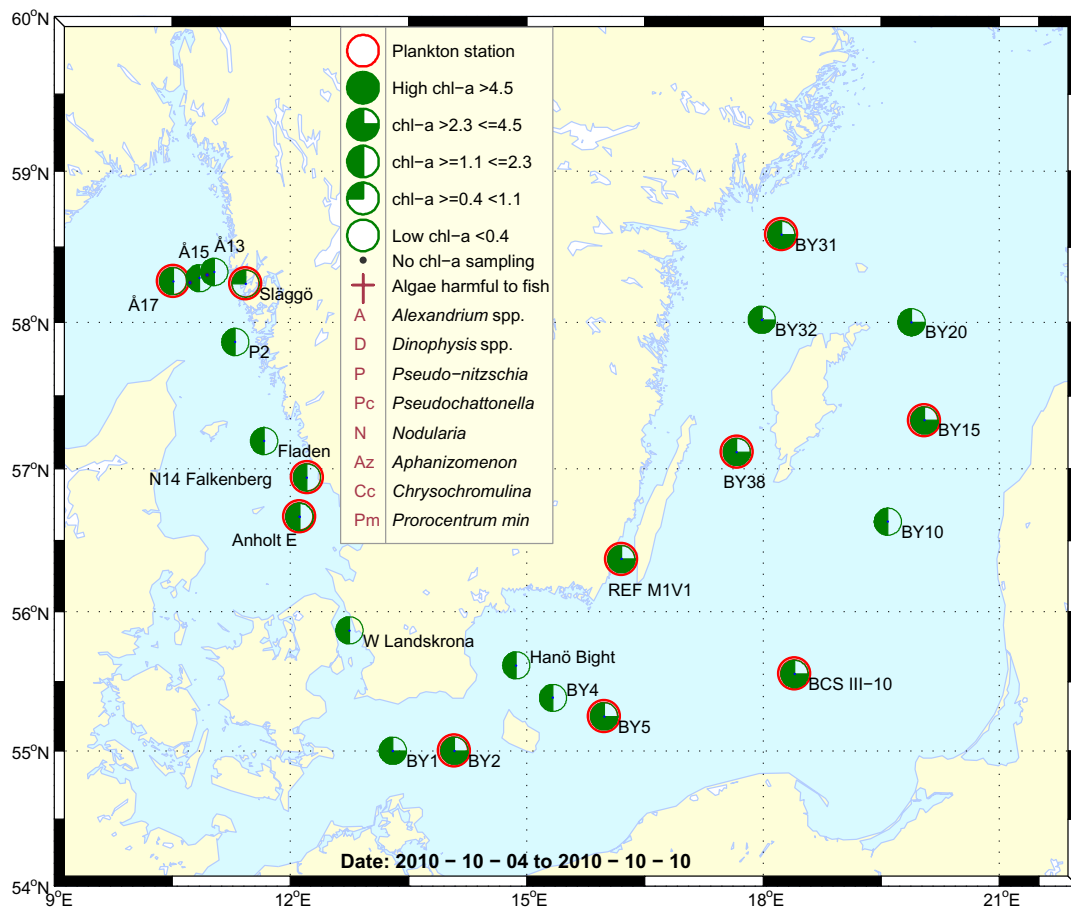


## Sammanfattning

Artdiversiteten bland växtplankton var ganska hög både i Skagerrak och i Kattegatt, men cellantalen var högre i Kattegatt-analyserna. Kiselalger dominerade i proverna och klorofyll *a* halterna låg inom medel vid samtliga stationer, fast de var lite förhöjda inom gränserna vid Å13 i Skagerrak och Fladen i Kattegatt.

Små arter med flageller dominerade vid stationerna i Östersjön. Flagellaten *Chrysochromulina polylepis*\* fanns vid de flesta stationer och var rätt riklig i antal celler vid BY38.

Den integrerade (0-20m) klorofyll *a*-halten var precis över medel vid BCSIII-10, vid övriga Östersjöstationer låg halterna inom medel.



## Abstract

The phytoplankton species diversity was rather high in the Skagerrak and Kattegat areas although the number of cells was higher in the latter. Diatoms dominated the samples and chlorophyll *a* concentrations were at average at all stations but somewhat enhanced, within the limits, at Å13 in the Skagerrak and at Fladen in the Kattegat area.

Small flagellated species dominated at the Baltic stations. The flagellate *Chrysochromulina polylepis*\* was present at most of the stations and was quite numerous at BY38.

The integrated (0-20 m) chlorophyll *a* concentration was just above average at BCSIII-10 and within average at all other stations in the Baltic.

More detailed information on species composition and abundance

## The Skagerrak

### Å17 7<sup>th</sup> of October (open Skagerrak)

The species diversity was relatively high, but the total cell number was quite low leading to integrated (0-20 m) chlorophyll *a* concentrations at average for this month. The number of dinoflagellate and diatom species was approximately the same, although the diatoms *Pseudosolenia calcar-avis* and *Leptocylindrus minimus* and small flagellates (cryptomonads) were found to have the highest cell numbers.

### Släggö 7<sup>th</sup> of October (Skagerrak coast)

The species diversity was higher compared to Å17, but the cell numbers were lower. Small flagellates were the most numerous and the integrated (0-20 m) chlorophyll *a* concentration was at average for this month.



To the left, the spear shaped cell of the diatom *Pseudosolenia calcar-avis*, to the right, a dividing cell. *P. calcar-avis* showed up at the Swedish West coast phytoplankton stations last autumn. This year the diatom has been observed in both spring and autumn samples.

## The Kattegat

### N14 Falkenberg 7<sup>th</sup> of October

The diatom *Skeletonema marinoi* was in autumn bloom and several other diatoms were common.

### Anholt E 6<sup>th</sup> and 8<sup>th</sup> of October

Diatoms were dominating although the species specificity and cell numbers differed between the two visits. Considering the short period of time between the visits the difference may be strange, but one reason is the diurnal rhythm i.e. the plankton moving up and down in the water during day and night. Another reason is of course the analysis being rather superficial.

## The Baltic Sea

### Arkona Basin BY2 6<sup>th</sup> of October

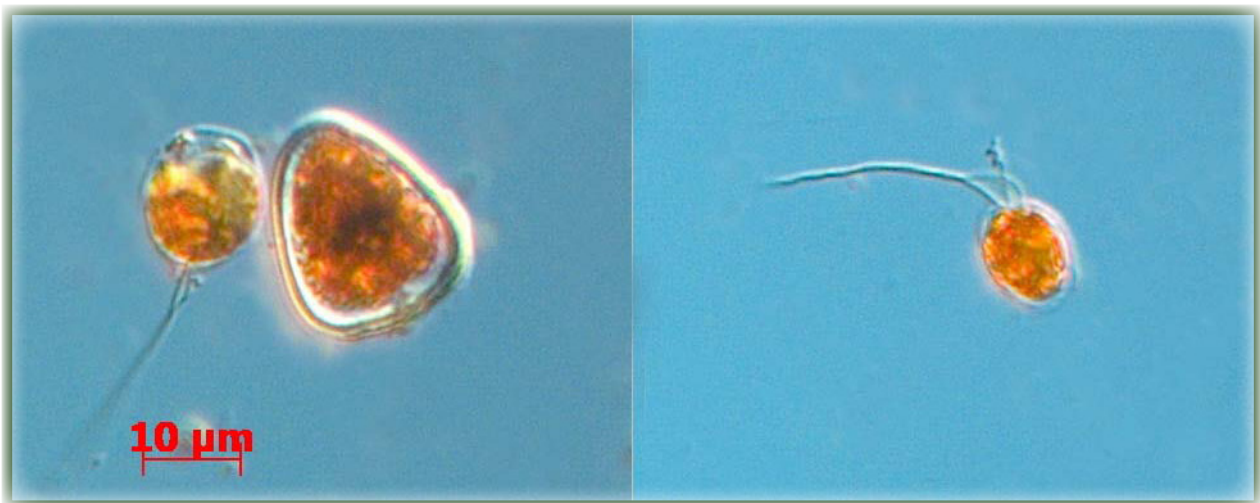
Small flagellates like cryptomonads, *Pyramimonas* spp. and the dinoflagellate *Heterocapsa* spp. dominated the phytoplankton sample.

### Bornholm Basin BY5 5<sup>th</sup> of October

In addition to small flagellates being very common, the filamentous cyanobacterium *Aphanizomenon* sp. was numerous.

### South East Baltic BCS III-10 5<sup>th</sup> of October

Small flagellates dominated and a few diatom species were present in low cell numbers.



The flagellate *Chrysochromulina polylepis* and the dinoflagellate *Prorocentrum minimum* to the left, another shot of *C. polylepis* to the right.

### Eastern Gotland Basin BY15 4<sup>th</sup> of October

The phytoplankton situation was the same as at BY5.

### Western Gotland Basin BY38 10<sup>th</sup> of October

The flagellate *Chrysochromulina polylepis*\* and the dinoflagellate *Prorocentrum minimum*\* were found with relatively high cell numbers. Other small flagellates and the filamentous cyanobacterium *Aphanizomenon* sp. were numerous.

### Kalmar Sound Ref. M1-V1 9<sup>th</sup> of October

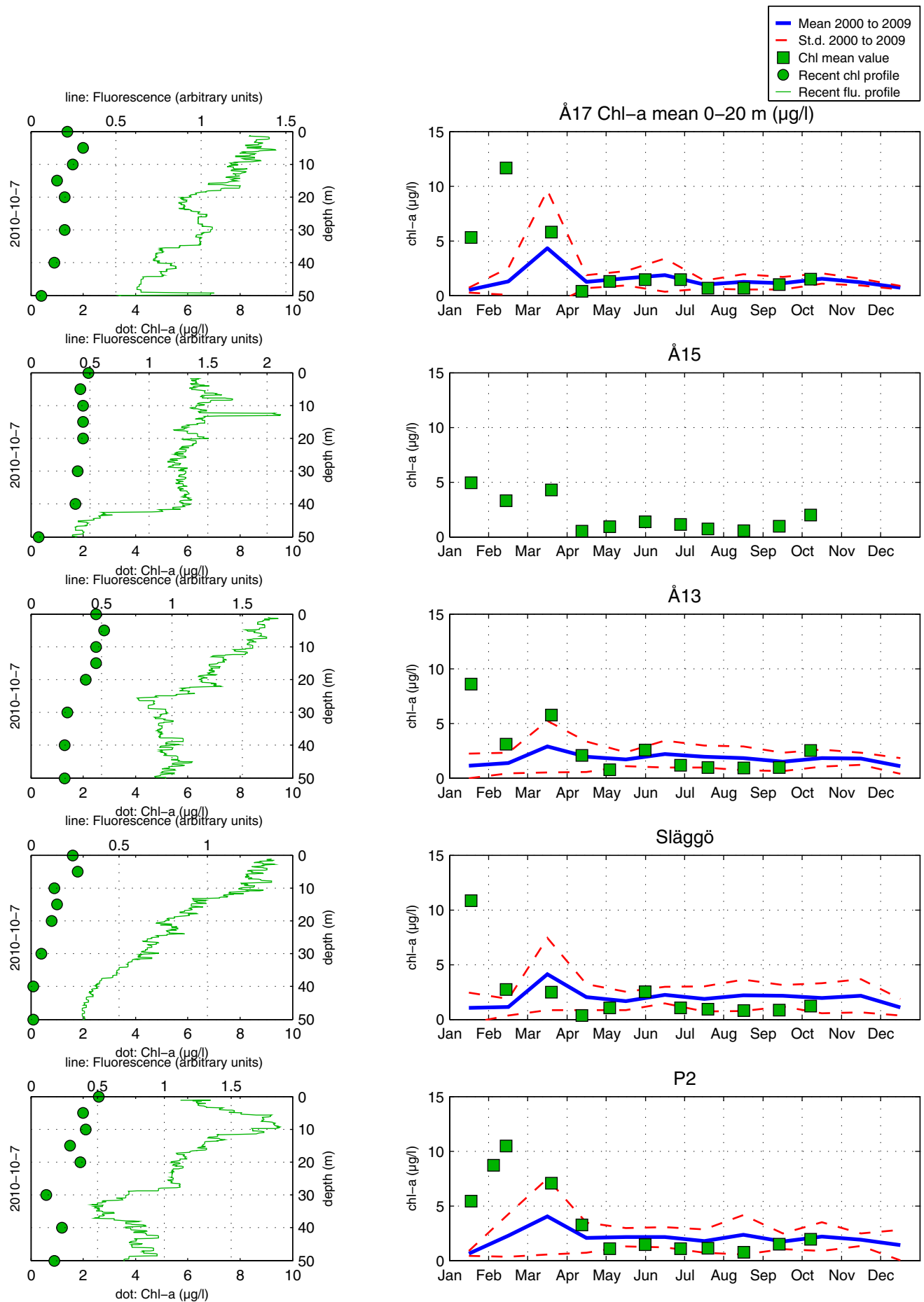
The flagellate *Chrysochromulina polylepis*\* and the dinoflagellate *Prorocentrum minimum*\* were present with low cell numbers. Small flagellates and the filamentous cyanobacterium *Aphanizomenon* sp. were numerous.

Phytoplankton analysis and text by:  
Ann-Turi Skjevik

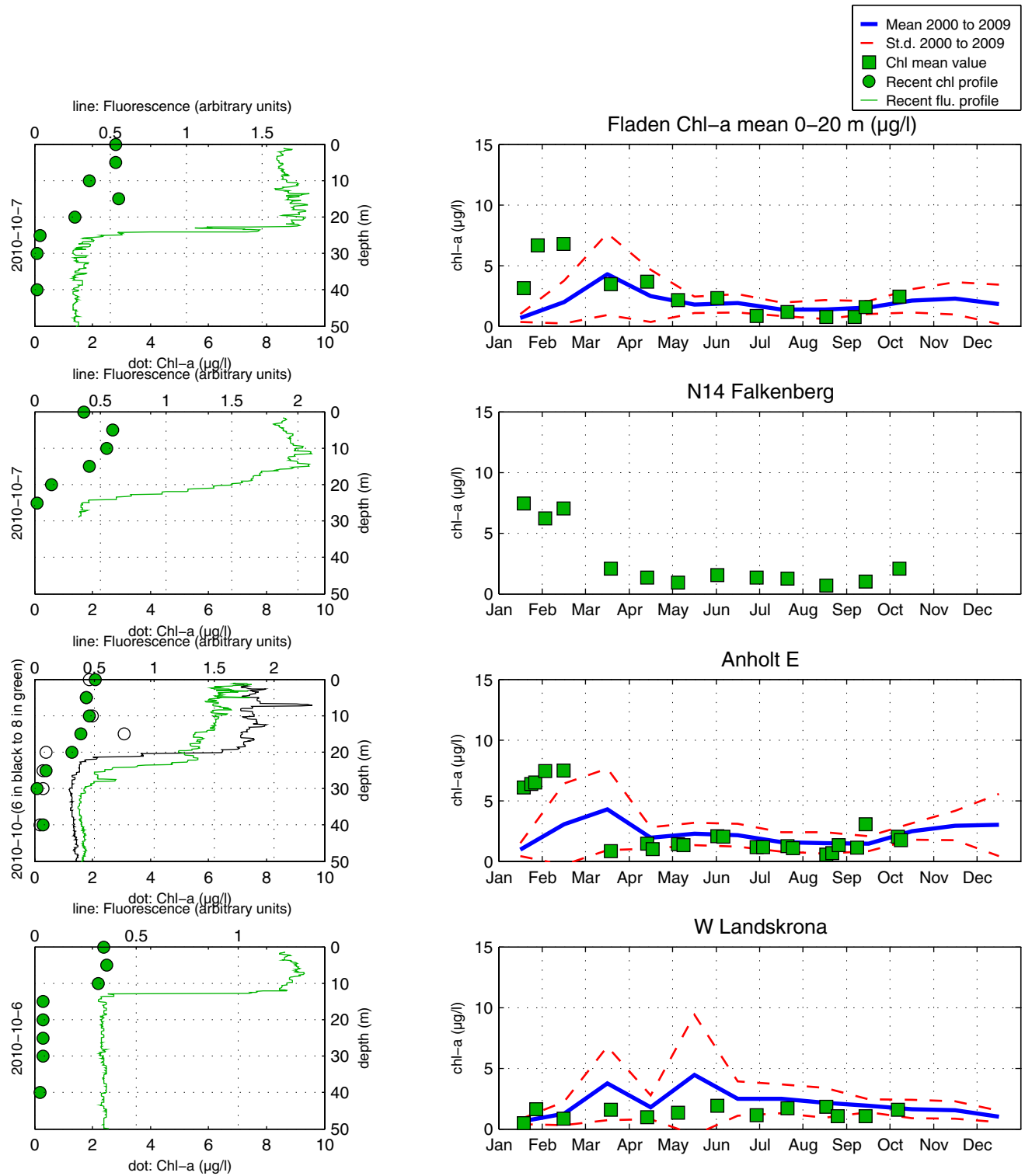
Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	7/10	7/10	7/10	6/10	9/10
	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Cerataulina pelagica</i>	present	present	very common	common	common
<i>Chaetoceros contortus</i>				common	
<i>Chaetoceros convolutus</i>					present
<i>Chaetoceros curvisetus</i>			present	common	present
<i>Chaetoceros lacinosus</i>		present	present	present	
<i>Chaetoceros simplex</i>			present	present	
<i>Chaetoceros socialis</i>			common	very common	very common
<i>Cylindrotheca closterium</i>	present	present	present	present	present
<i>Dactyliosolen fragilissimus</i>			present		present
<i>Ditylum brightwellii</i>	present		present	present	present
<i>Guinardia delicatula</i>	present	present	present	present	present
<i>Guinardia flaccida</i>		present	present	present	present
<i>Leptocylindrus danicus</i>	present	present	present	present	present
<i>Leptocylindrus minimus</i>	common	present	common	common	present
<i>Nitzschia longissima</i>	present	present	common	present	present
<i>Proboscia alata</i>	present		present	present	present
<i>Pseudo-nitzschia delicatissima</i> -group	present		present	present	present
<i>Pseudo-nitzschia seriata</i> -group	common	present	common	common	common
<i>Pseudosolenia calcar-avis</i>	common	present	common	very common	very common
<i>Rhizosolenia pungens</i>			present	present	present
<i>Skeletonema marinoi</i>	present	present	1 500 000	very common	present
<i>Ceratium fusus</i>	present			present	present
<i>Ceratium lineatum</i>	present	present	present	present	present
<i>Ceratium macroceros</i>	present	present			
<i>Ceratium tripos</i>		present			present
<i>Gymnodinium verruculosum</i>	present	present			
<i>Gyrodinium flagellare</i>	present	present			present
<i>Heterocapsa</i> spp.		present			present
<i>Karlodinium micrum</i>			present		present
<i>Polykrikos schwartzii</i>		present			present
<i>Prorocentrum micans</i>	present	present			present
<i>Prorocentrum redfeldii</i>	present	present			
<i>Protoceratium reticulatum</i>	present			present	
<i>Protoperidinium</i> spp.	present	present		present	present
<i>Chrysochromulina</i> spp.	present	present	common	common	common
Cryptomonadales spp.	common	very common	common	common	common
<i>Heterosigma akashiwo</i>			present	present	present
<i>Pyramimonas</i> spp.		present	present	present	present
<i>Apedinella radians</i>	present	present	present		present
<i>Dinobryon balticum</i>	present		present	present	
<i>Dinobryon faculiferum</i>		present	present		
<i>Pseudopedinella pyriforme</i>		present		present	present
<i>Dictyocha fibula</i>		present		present	
<i>Dictyocha speculum</i>	present	present	present	present	present
<i>Nodularia spumigena</i>			present		
<i>Calliakantha natans</i>		present	present	present	present
<i>Katablepharis remigera</i>		present			present
<i>Leucocryptos marina</i>	present	present	present	present	present
<i>Telonema subtile</i>		present		present	
<i>Laboea strobila</i>	present	present	present	present	present

Selection of observed species	BY2	BY5	BCS III-10	BY15	BY38	Ref. M1-V1
Red=potentially toxic species	6/10	5/10	5/10	4/10	10/10	9/10
	cells/l	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Cerataulina pelagica</i>	present					
<i>Chaetoceros danicus</i>	present		present			
<i>Chaetoceros impressus</i>	present	present	present		present	present
<i>Chaetoceros thronsdensei</i>					present	
<i>Coscinodiscus</i> spp.	present	present	present	present		
<i>Cyclotella choctawhatcheana</i>	present			present	present	present
<i>Skeletonema marinoi</i>	present		present			present
<i>Gladopyxis claytonii</i>		present	present			
<i>Dinophysis acuminata</i>	present			present		
<i>Dinophysis norvegica</i>					present	present
<i>Gymnodinium verruculosum</i>	present	present	present			
<i>Gyrodinium flagellare</i>			present			
<i>Heterocapsa rotundata</i>	common	common	common	present	present	present
<i>Heterocapsa</i> spp.	present	present	common	present	present	common
<i>Prorocentrum minimum</i>	present			present	130 000	present
<i>Protoperdinium bipes</i>						
<i>Chrysochromulina polylepsis</i>	present		present	present	60 000	common
<i>Chrysochromulina</i> spp.	present	present	present	present	very common	present
Cryptomonadales spp.	very common	very common	very common	very common	very common	very common
<i>Pyramimonas virginica</i>	present		present	present		present
<i>Pyramimonas</i> spp.	very common	very common	very common	very common	very common	very common
<i>Apedinella radians</i>	present					
<i>Pseudopedinella pyriforme</i>	present					
<i>Aphanizomenon</i> spp.		common	present	very common	very common	very common
<i>Nodularia spumigena</i>					present	present
<i>Planctonema lauterbornii</i>					present	
<i>Eutreptiella</i> spp.	present	present	present	present		
<i>Calliakantha longicaudata</i>						
<i>Calliakantha natans</i>	present	present	present	present		
<i>Ebria tripartita</i>	present	present			present	
<i>Katablepharis remigera</i>	present					
<i>Leucocryptos marina</i>	present	present	present	present		present
<i>Mesodinium rubrum</i>	present	present	present	common	present	common

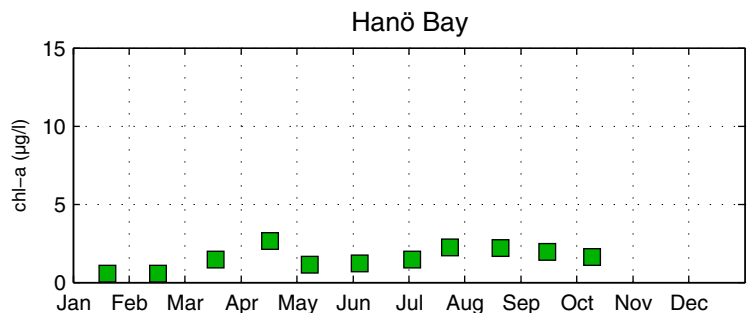
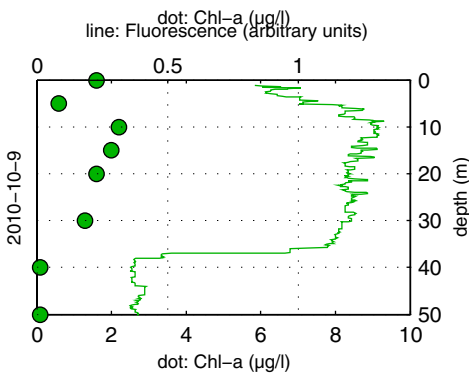
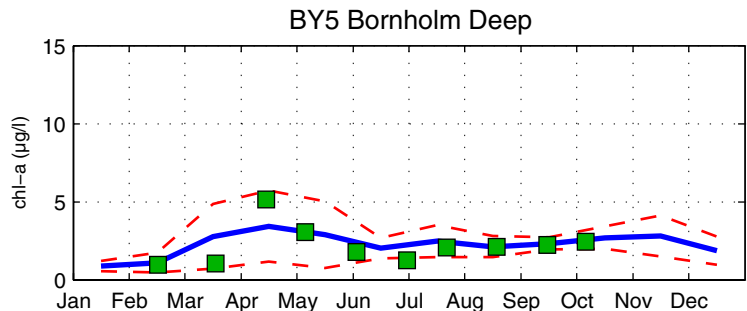
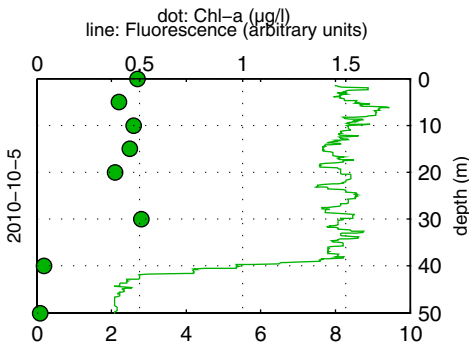
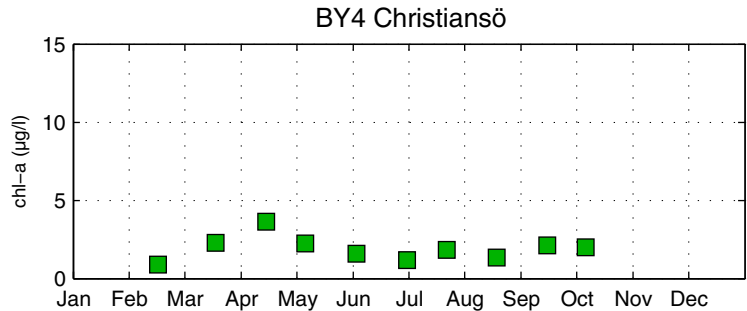
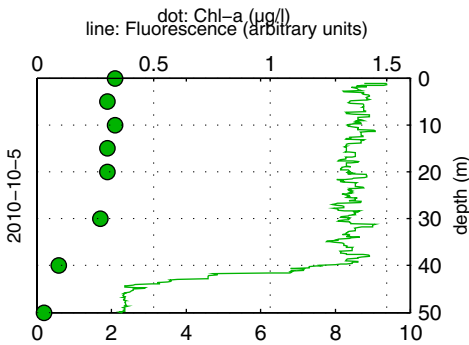
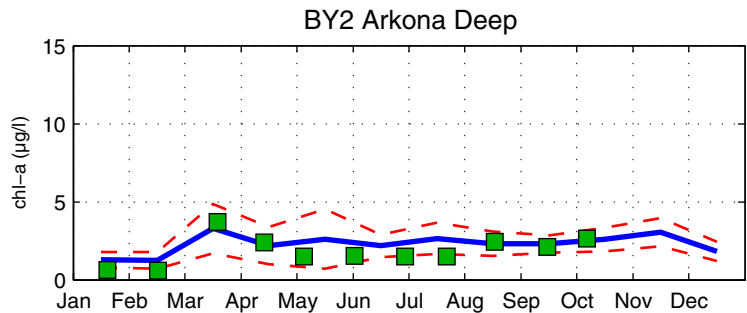
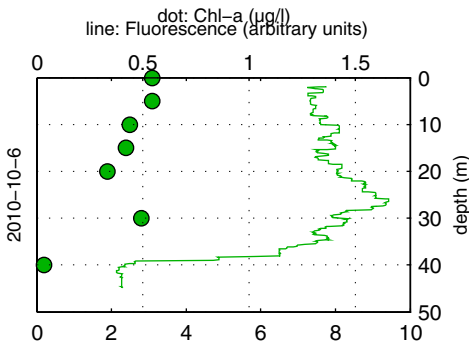
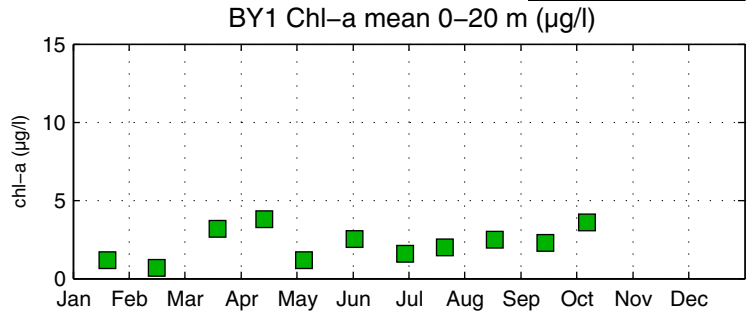
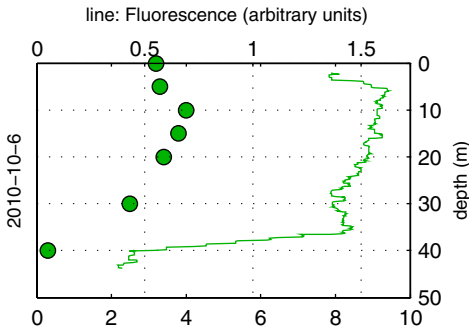
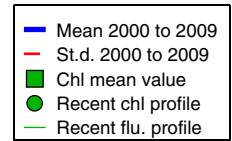
# The Skagerrak



# The Kattegat and the Sound

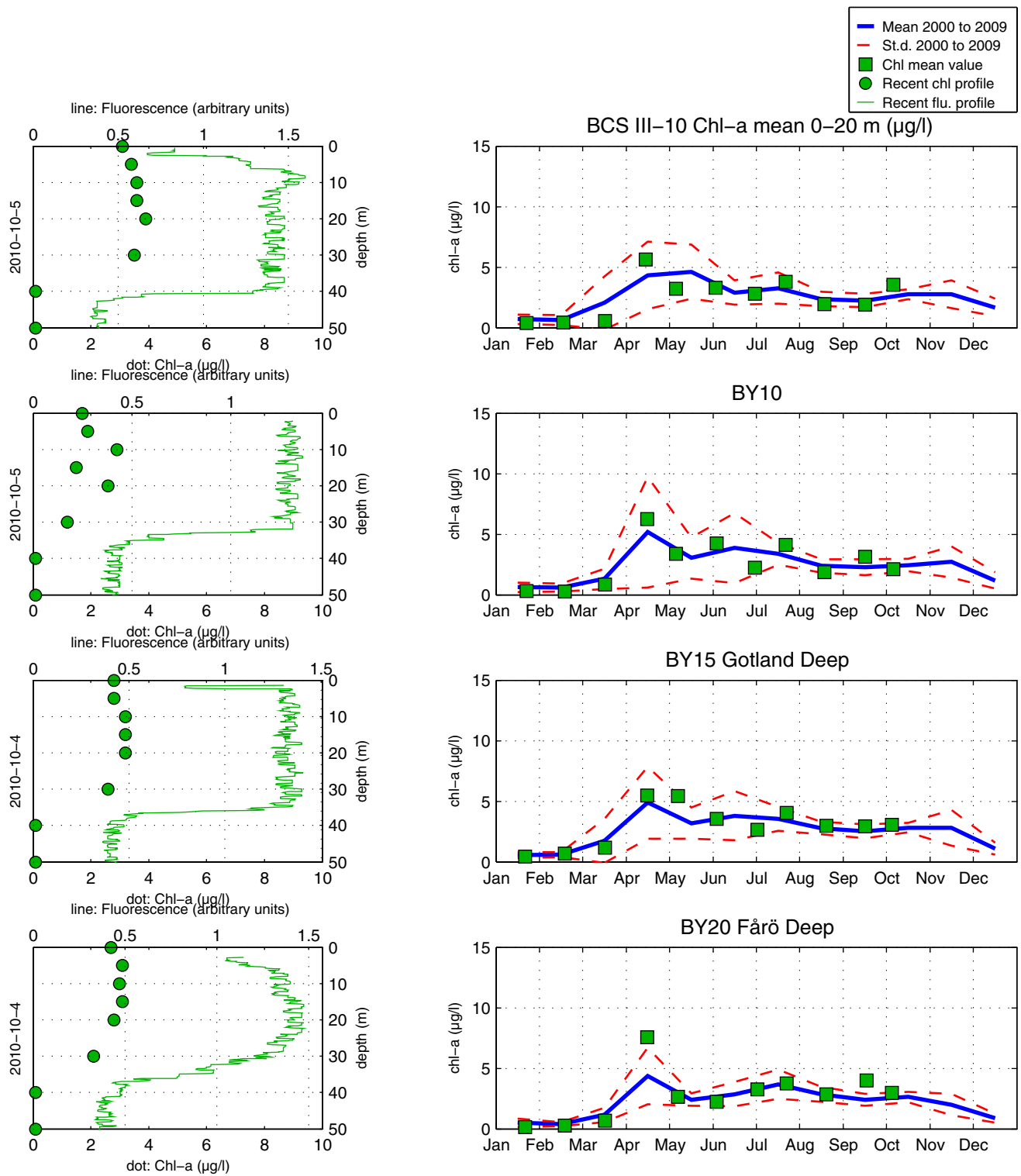


# The Southern Baltic

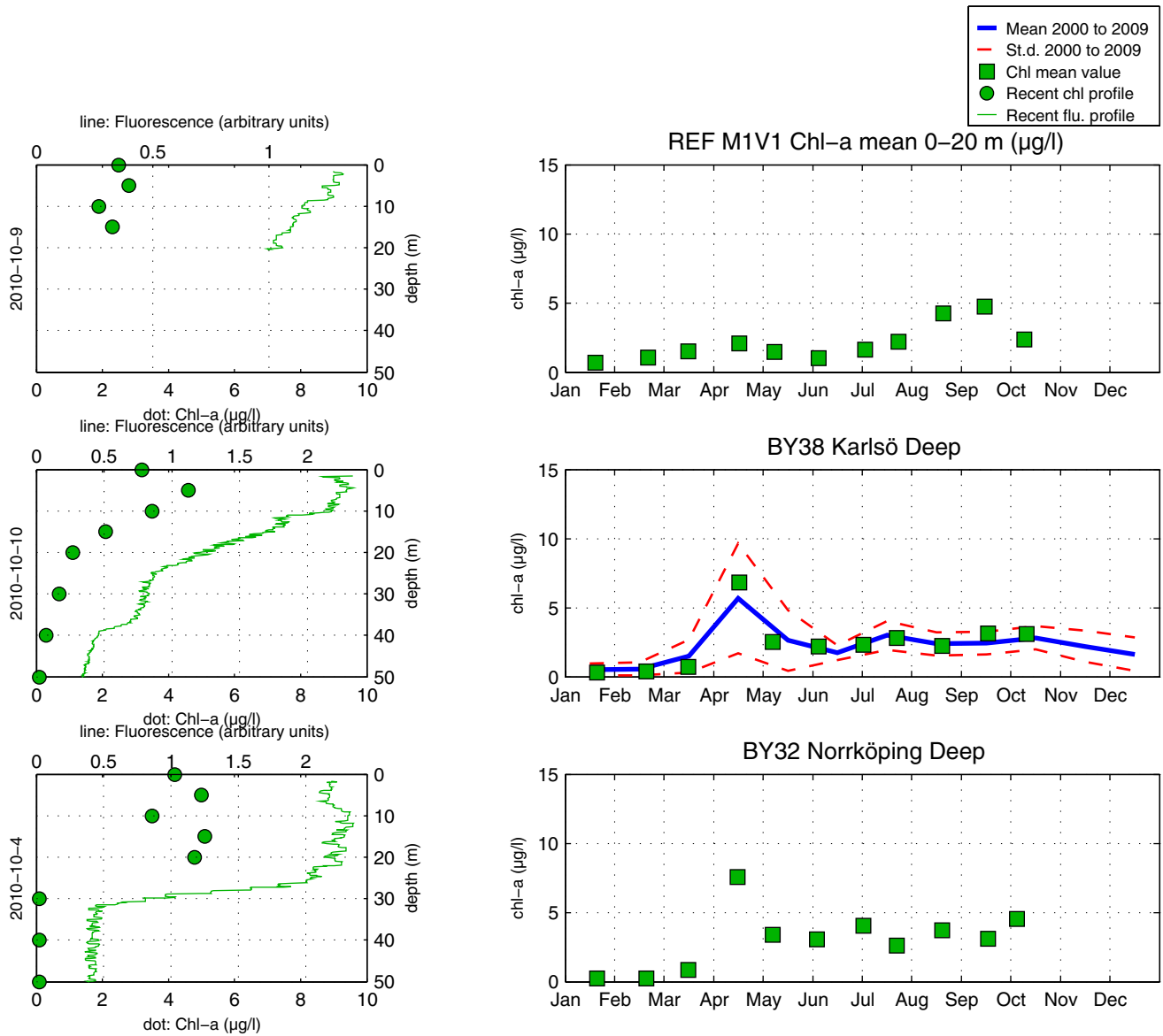




# The Eastern Baltic



# 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 medelvärdet 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 algbloomingar finns på [www.smhi.se](http://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](http://www.smhi.se).

Art / Species	Gift / Toxin	Eventuella symptom	Clinical symptoms
<i>Alexandrium</i> spp.	Paralytic shellfish poisoning (PSP)	<b>Milda symptom:</b> 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 <b>Extrema symptom:</b> 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.	<b>Mild case:</b> 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. <b>Extreme case</b> 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)	<b>Milda symptom:</b> Efter cirka 30 minuter till några timmar: yrsel, illamående, kräkningar, diarré, magont <b>Extrema symptom:</b> Upprepad exponering kan orsaka cancer	<b>Mild case:</b> Within 30 min-a few hours: dizziness, nausea, vomiting, diarrhoea, abdominal pain. <b>Extreme case:</b> Repeated exposure may cause cancer.
<i>Pseudochattonella</i> spp.	Fish toxin	<b>Låg celltäthet:</b> Ingen påverkan. <b>Hög celltäthet:</b> Fiskens gälar skadas, fisken dör.	<b>Low cell numbers:</b> No effect on fish. <b>High cell numbers:</b> Fish death due to gill damage.
<i>Pseudo-nitzschia</i> spp.	Amnesic shellfish poisoning (ASP)	<b>Milda symptom:</b> Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramper <b>Extrema symptom:</b> Yrsel, hallucinationer, förvirring, förlust av korttidsminnet, kramper	<b>Mild case:</b> Within 3-5 hours: dizziness, nausea, vomiting, diarrhoea, abdominal cramps. <b>Extreme case:</b> 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.

