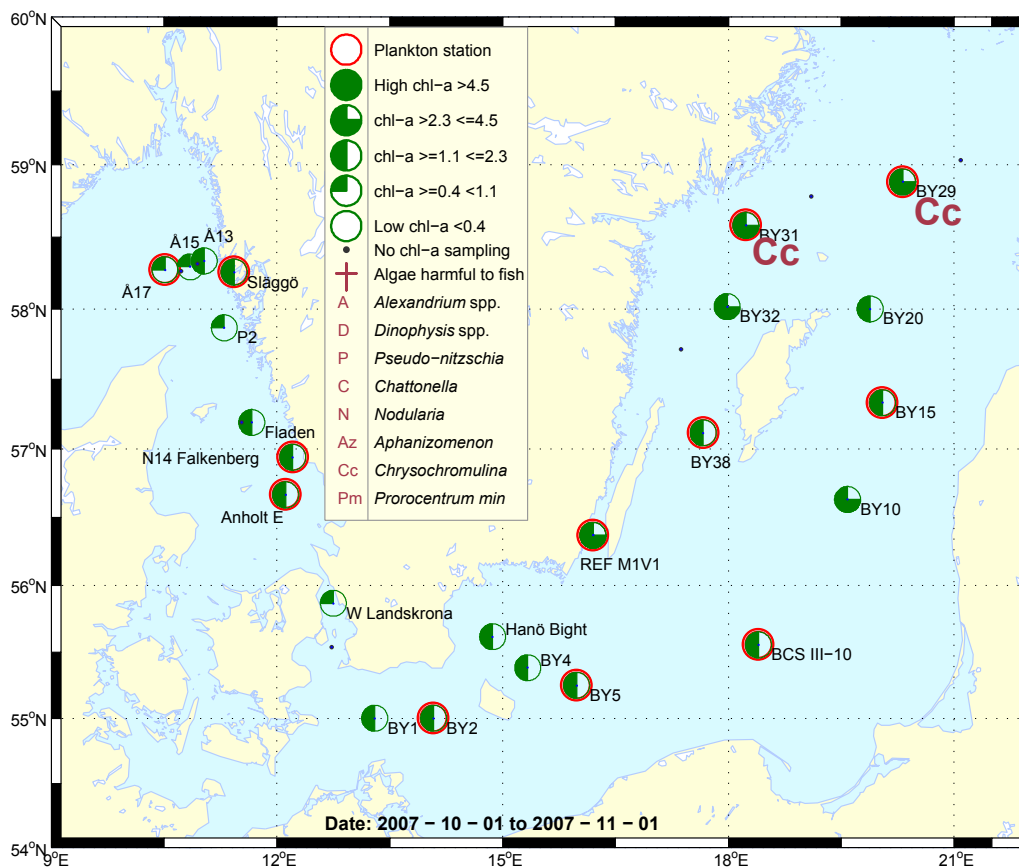


Sammanfattning

Kiselalger dominerade planktonprover tagna i Skagerrak och Kattegatt. *Leptocylindrus danicus* var talrikast i Skagerrak och *Skeletonema costatum* complex i Kattegatt. Kiselalgen *Chaetoceros concavicornis* observerades i Kattegatt. Den är känd för att orsaka fiskdöd i Kanadensiska fiskodlingar, genom att den fastnar i fiskens gälar. Den potentiellt giftiga kiselalgen *Pseudo-nitzschia* spp. var vanlig i båda områden.

I Östersjön var små arter som cryptomonader och prasinophyceän *Pyramimonas* spp. talrikast. Cyanobakterier förekom i Bornholmsbassängen, Kalmar Sund och i norra egentliga Östersjön. I det sistnämnda området pågick en mindre blomning av den potentiellt giftiga haptofyten *Chrysochromulina* sp.

Klorofyll *a*-halterna var normala.



Abstract

In the Skagerrak and the Kattegat areas diatoms dominated. *Leptocylindrus danicus* was the most numerous in the Skagerrak, and *Skeletonema costatum* complex in the Kattegat area. The diatom *Chaetoceros concavicornis* was observed in the Kattegat area. The species is known to be lethal to salmon in Canadian aquaculture by becoming trapped between the fish gill filaments. The potentially toxic diatom *Pseudo-nitzschia* spp. was common in both areas.

In the Baltic small species as cryptomonads and the prasinophyceae *Pyramimonas* spp. dominated the samples. Cyanobacteria were present in the Bornholm Basin (BY5), in Kalmar Sound (Ref.M1-V1) and in the northern Baltic proper (BY29 and BY31). At BY29 and BY31 an ongoing bloom of the potentially toxic haptophyte *Chrysochromulina* sp. was observed.

The chlorophyll *a* concentrations were at average.

Om AlgAware

SMHI genomför ca en gång per månad expeditioner med U/F Argos i Östersjön och Västerhavet. Resultat baserade på mikroskopanalys av planktonprover samt klorofyllmätningar presenteras kortfattat i denna rapport. Information från SMHI:s satellitövervakning av algblomningar 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 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>Chattonella</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.

More detailed information on species composition and abundance

The Skagerrak

Å17 31st of October 2007 (open Skagerrak)



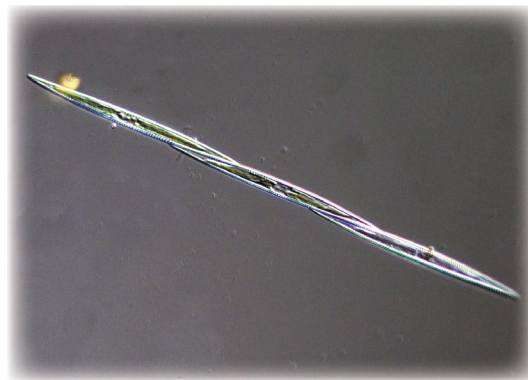
Leptocylindrus danicus

Generally, the plankton sample was low in diversity. Diatoms dominated and the most abundant species was *Leptocylindrus danicus*. The diatoms *Cerataulina pelagica* and *Skeletonema costatum* were rather common.

Släggö 31st of October 2007 (Skagerrak coast)

Diatoms dominated, the most common species being *Leptocylindrus danicus*, the same as at Å17. The diversity was higher though, i.e. both the number of species and the cell numbers were higher. The diatoms *Dactyliosolen fragilissimus* and the potentially toxic *Pseudo-nitzschia* spp. were common.

The chlorophyll *a* concentrations were at average for the season in the Skagerrak areas.



Pseudo-nitzschia sp.

The Kattegat

N14 Falkenberg 31st of October 2007

Diatoms dominated the plankton, with *Skeletonema costatum* complex being the most abundant. The diatom *Chaetoceros concavicornis* was still present, but much less abundant this month. The species is known to be lethal to salmon in Canadian aquaculture by becoming trapped between the fish gill filaments. The potentially toxic genus *Pseudo-nitzschia* spp. was quite common.

Anholt E 31st of October 2007

The same species composition was found at Anholt E as at N14, although the cell numbers were lower.

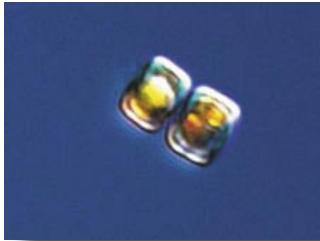
The chlorophyll *a* concentrations were at average in the Kattegat area.

Selection of observed species	Å17	Släggö	N14	Anholt E
Red=potentially toxic species	2007-10-31	2007-10-31	2007-10-31	2007-10-31
	cells/l	cells/l	cells/l	cells/l
<i>Cerataulina pelagica</i>	10 000	8 000	15 000	7 000
<i>Chaetoceros concavicornis</i>		present	7 000	5 000
<i>Chaetoceros danicus</i>		present	present	present
<i>Chaetoceros similis</i>		present	present	present
<i>Cylindrotheca closterium</i>	present	20 000	23 000	present
<i>Dactyliosolen fragilissimus</i>	present	67 000	11 000	22 000
<i>Ditylum brightwellii</i>		present	present	present
<i>Guinardia delicatula</i>		present	present	present
<i>Guinardia flaccida</i>		present	5 000	
<i>Leptocylindrus danicus</i>	15 000	240 000	37 000	30 000
<i>Leptocylindrus minimus</i>	present	14 000	present	present
<i>Proboscia alata</i>		present	present	present
<i>Pseudo-nitzschia delicatissima</i> -group	present	85 000	16 000	8 900
<i>Pseudo-nitzschia seriata</i> -group		20 000	35 000	20 000
<i>Rhizosolenia pungens</i>		present	20 000	12 000
<i>Rhizosolenia setigera</i>	present	present	4 500	2 000
<i>Skeletonema costatum</i>	8 000	25 000	515 000	54 000
<i>Thalassiosira nordenskiöldii</i>	present			
<i>Ceratium tripos</i>				present
<i>Dinophysis acuminata</i>				present
<i>Dinophysis norvegica</i>	present		present	
<i>Gymnodinium verruculosum</i>	present	present		
<i>Heterocapsa cf. minima</i>			present	
<i>Heterocapsa rotundata</i>	present		present	
<i>Katodinium glaucum</i>	present		present	
<i>Lessardia elongata</i>	present	5 000		
<i>Noctiluca scintillans</i>			present	present
<i>Prorocentrum micans</i>	present		present	
Cryptomonadales spp.	35 000	40 000	55 000	36 000
<i>Chrysochromulina</i> spp.	5 000			5 000
<i>Dictyocha fibula</i>	present	present	present	present
<i>Dictyocha speculum</i>	present	5 300	present	present
<i>Apedinella radians</i>	present	7 000	present	present
<i>Pyramimonas</i> spp.	present		present	5 000
<i>Leucocryptos marina</i>	present	present	present	
<i>Laboea strobila</i>			present	
<i>Mesodinium rubrum</i>			present	present
<i>Strombidium</i> spp	present		present	present

The Baltic Sea

Arkona Basin BY2 30th of October 2007

The plankton situation was very much like the one from the previous expedition with a dominance of small species as cryptomonads, e.g. *Plagioselmis prolonga*. The most abundant genus was the prasinophycé *Pyramimonas*. The dinoflagellate *Heterocapsa rotundata* and the diatoms *Dactyliosolen fragilissimus* and *Cyclotella choctawhatcheana* were present. The chlorophyll *a* concentration was a bit low but within average.



Cyclotella choctawhatcheana

Bornholm Basin BY5 29th of October 2007

In addition to the species mentioned at BY2, the cyanobacterium *Aphanizomenon* sp. was present. The chlorophyll *a* concentration was at average.

The South East Baltic BCS III-10 29th of October 2007 and the Eastern Gotland Basin BY15 18th of October 2007

The diversity was low, and only small species were found. The most abundant was *Pyramimonas* spp. followed by cryptomonads. The dinoflagellates *Gymnodinium verruculosum* and *Heterocapsa rotundata* were present, and the chlorophyll *a* concentrations were at average.

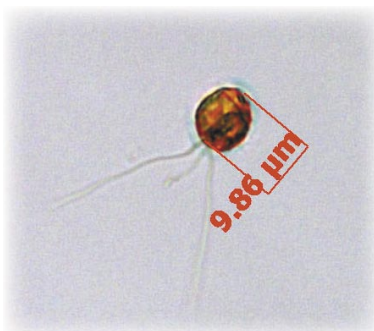
Kalmar Sound Ref. M1-V1 24th and 29th of October 2007

The number of species was somewhat higher than at the other Baltic stations. The cyanobacteria *Aphanizomenon* sp., *Nodularia spumigena* as well as unidentified filaments were present. The potentially toxic dinoflagellate *Dinophysis acuminata* was present at the first visit, the diatom *Skeletonema costatum* complex was abundant at both visits whereas the dinoflagellate *Heterocapsa rotundata* was abundant only at the second sampling occasion.



Northern Baltic proper BY29 11th and BY31 16th of October 2007

A small bloom of the potentially toxic *Chrysochromulina* sp. was observed both sites with cell numbers around 300 000/l. The cyanobacteria *Aphanizomenon* sp. and *Nodularia spumigena* were present and small flagellated species were numerous.



Chrysochromulina sp.

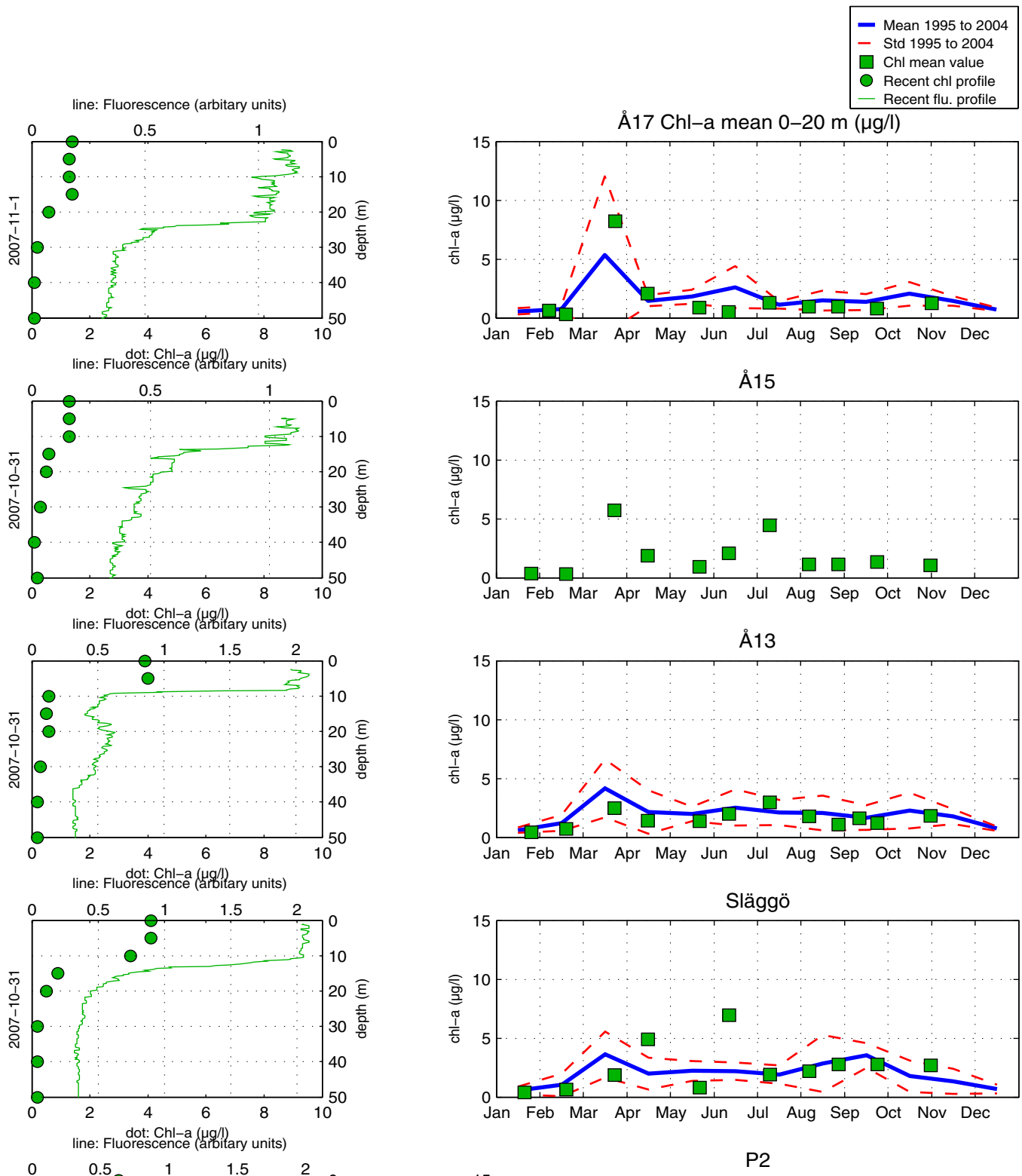
Dinophysis acuminata at

Selection of observed species	BY2 2007-10-30 cells/l	BY5 2007-10-29 cells/l	BCS III 10 2007-10-29 cells/l	BY15 2007-10-18 cells/l	Ref. M1-V1 2007-10-24 cells/l	Ref. M1-V1 2007-10-29 cells/l	BY29 2007-10-11 cells/l	BY31 2007-10-16 cells/l
Red=potentially toxic species 1 quantified in m/l								
<i>Chaetoceros danicus</i>			present	present	present	present	present	present
<i>Chaetoceros impressus</i>			present					
<i>Cyclotella choctawhatcheana</i>	6 500						present	3 600
<i>Dactyliosolen fragilissimus</i>	20 000							
<i>Pseudo-nitzschia</i> spp.	present							
<i>Skeletonema costatum</i> complex					44 200	46 000		
<i>Cladopyxis claytonii</i>						present		
<i>Dinophysis acuminata</i>					present			
<i>Gymnodinium verruculosum</i>		3 500	present	present				
<i>Heterocapsa rotundata</i>	3 000	present	12 000	present	29 000	present	present	
<i>Heterocapsa triquetra</i>					present			
<i>Katodinium glaucum</i>						present		
<i>Eutreptiella</i> spp.		present						
<i>Chrysochromulina</i> spp.							293 000	340 000
<i>Cryptomonadales</i> spp.	83 000	37 000	85 000	30 000	55 000	20 000	76 000	66 000
<i>Plagioselmis prolonga</i>	32 000	21 000	53 000	44 000	43 000	21 000	23 000	23 000
<i>Dictyocha fibula</i>	present							
<i>Apedinella radians</i>					present	present		
<i>Pyramimonas</i> spp.	55 900	12 000	24 000	19 000	75 900		49 000	54 000
<i>Choanoflagellidea</i> spp.	16 000	present				33 000		
<i>Ebria tripartita</i>	present							
<i>Leucocryptos marina</i>		5 000	10 000	10 000	6 900	3 500	5 300	3 500
<i>Aphanizomenon</i> sp. ¹		common			present	common	present	present
<i>Cyanobacteria</i> filaments					common	common		
<i>Nodularia spumigena</i>					present		present	present
<i>Mesodinium rubrum</i>	present	3 000	3 700	3 000	present	3 500	present	present
<i>Strombidium</i> spp.	present	present	3 200	present	present	present	present	present

Phytoplankton analysis and text
by:
Ann-Turi Skjevik

Reviewed by Lars Edler

The Skagerrak



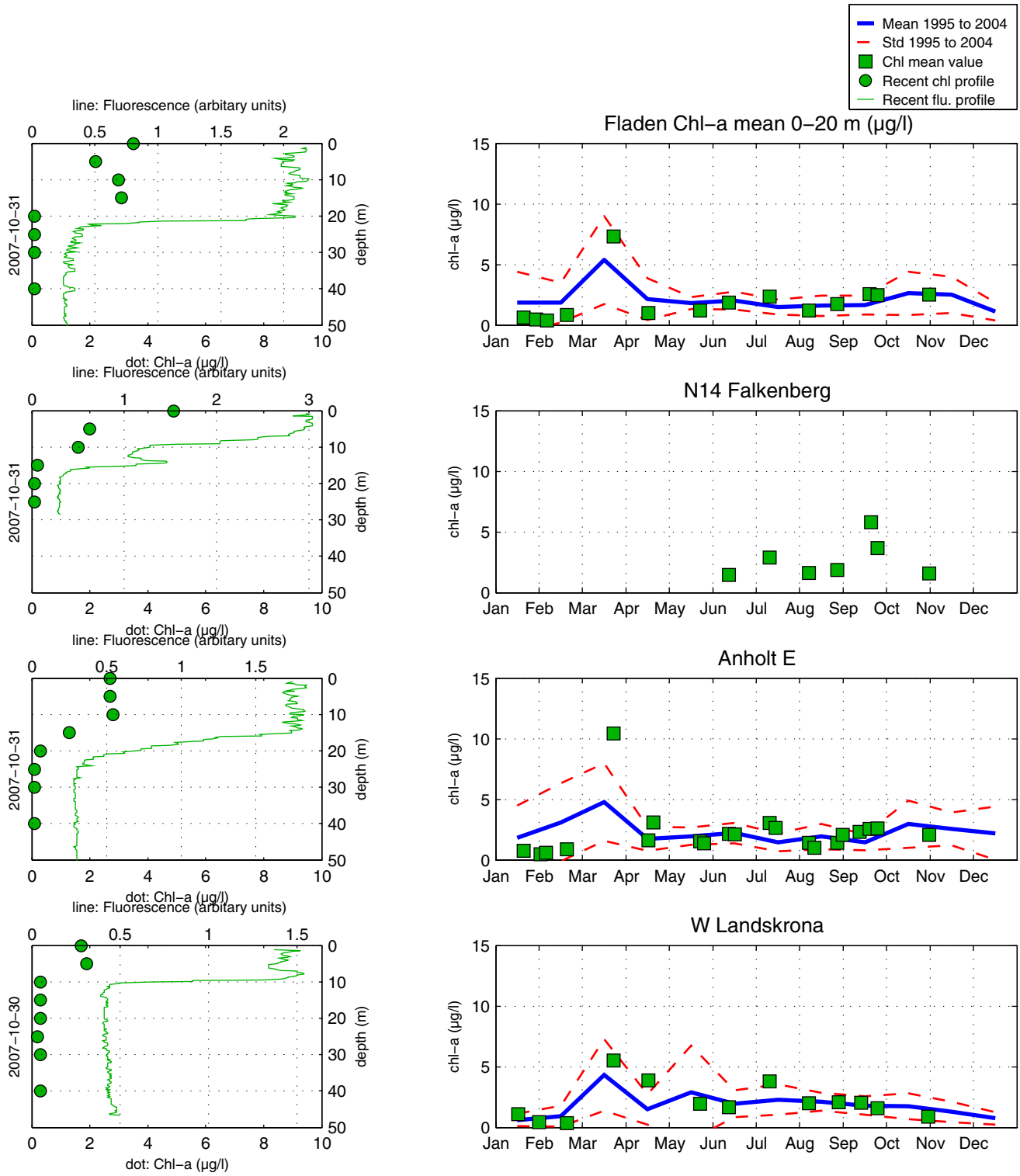
Om klorofylldiagrammen

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 alger av växtplankton observeras.

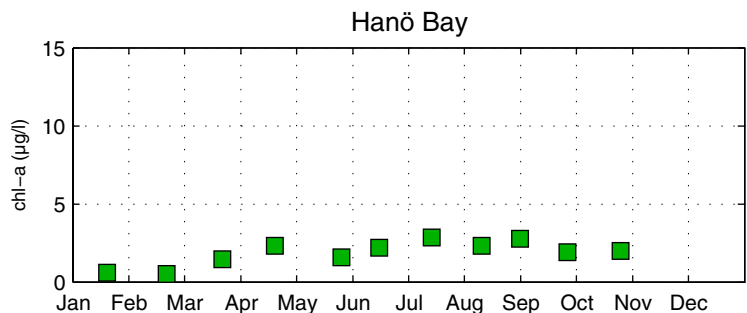
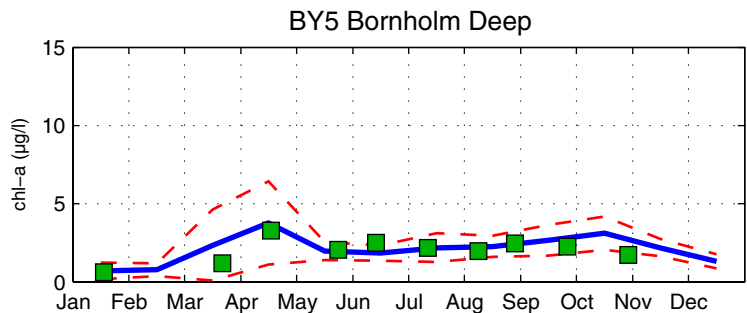
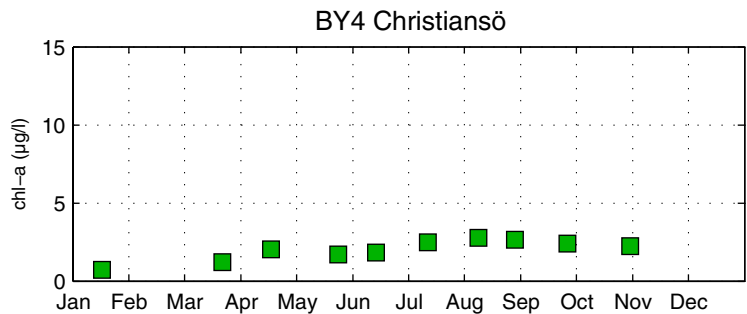
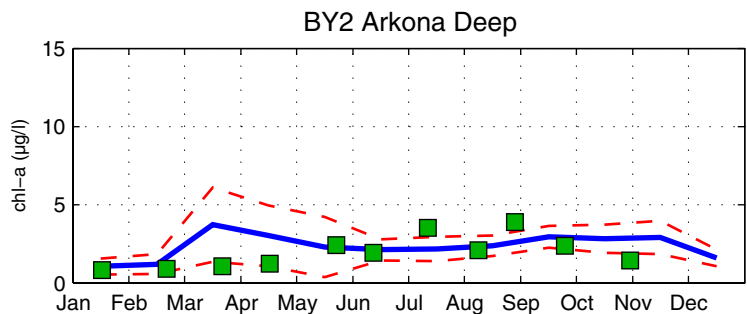
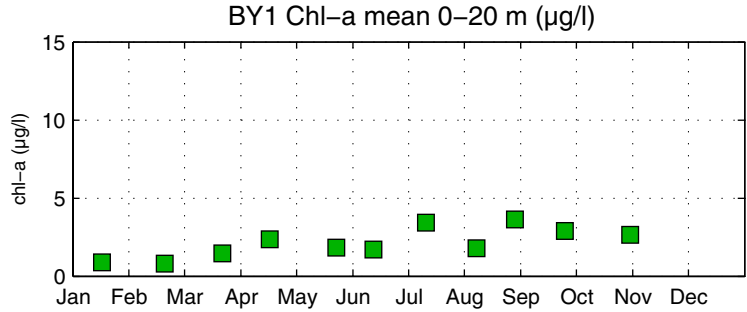
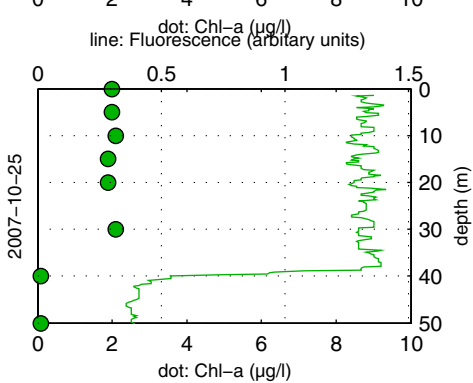
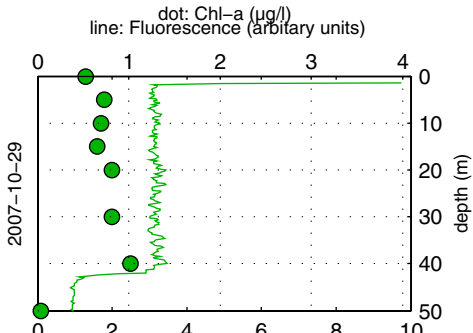
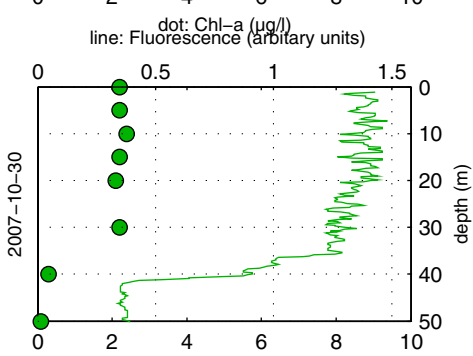
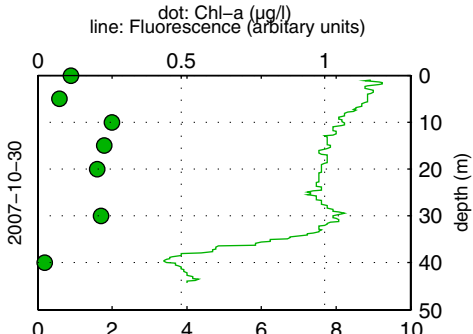
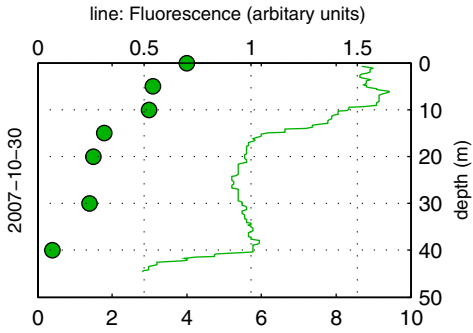
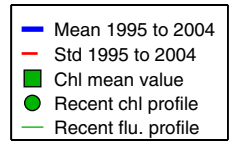
About the chlorophyll graphs

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.

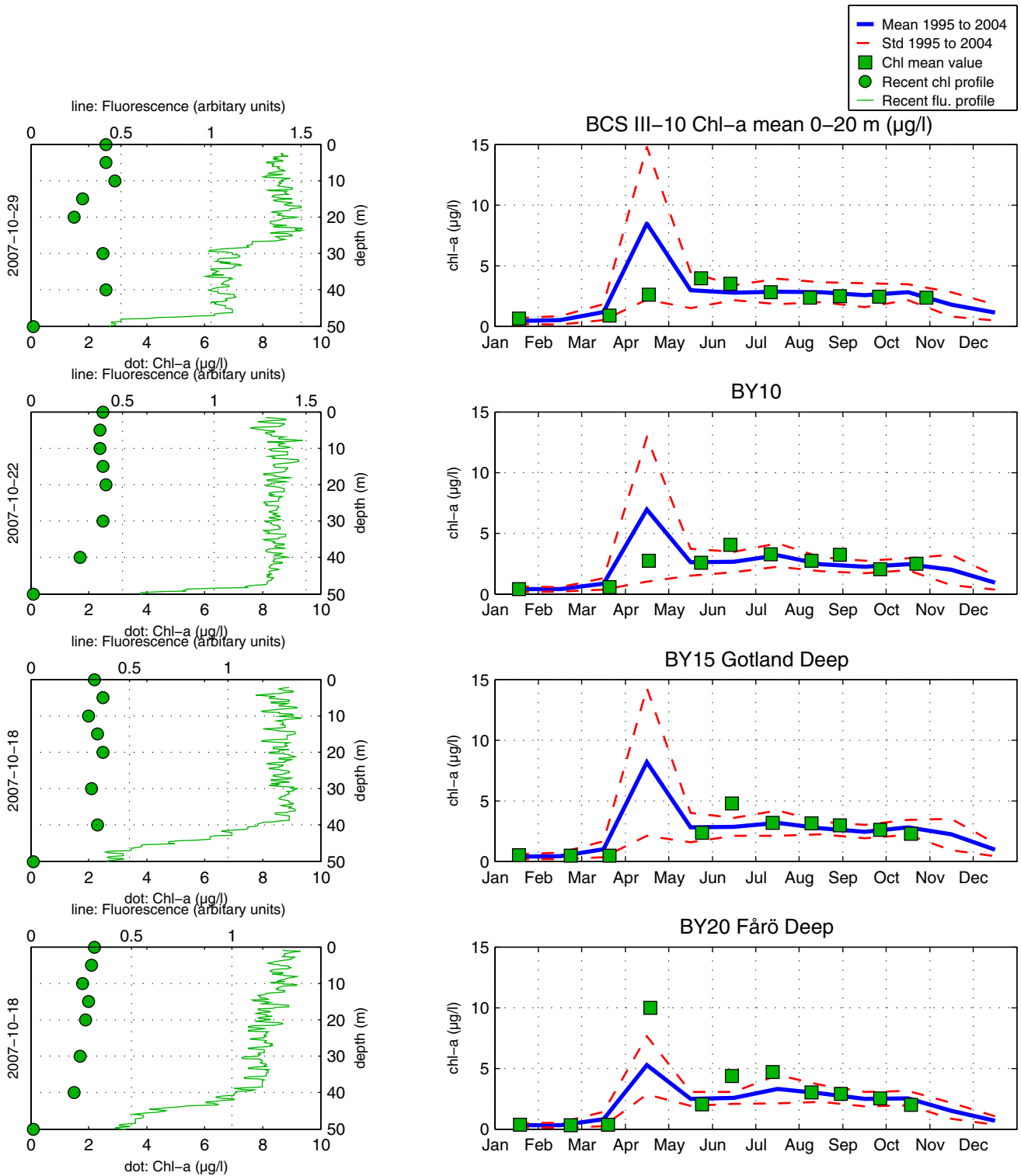
The Kattegat and the Sound



The Southern Baltic



The Eastern Baltic



The Western Baltic

