

## Sammanfattning

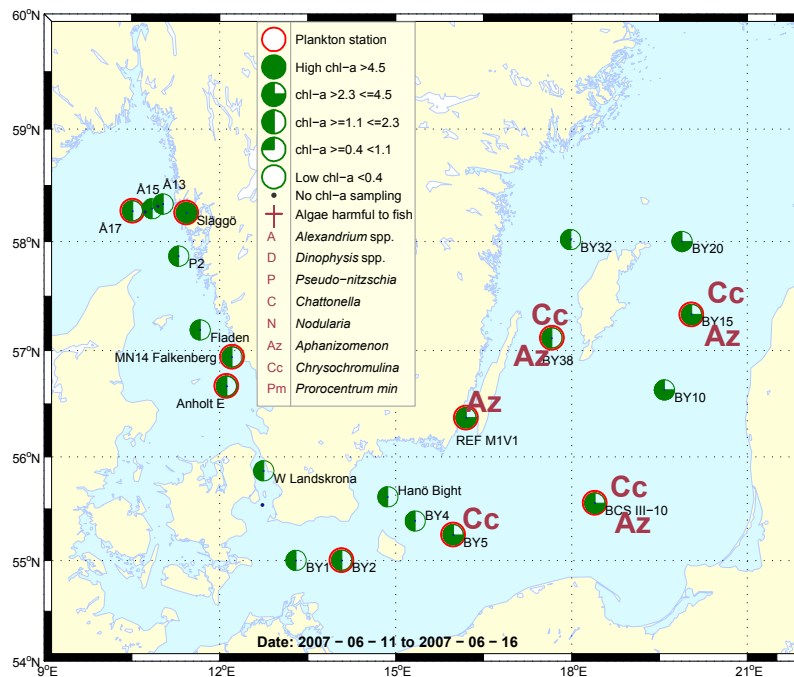
I yttre Skagerrak dominerade kiselalger och den potentiellt giftiga *Pseudo-nitzschia delicatissima*-gruppen var talrikast. Arten låg dock långt under gränsvärdet. Klorofyll *a*-värdet var något under det normala. I kustnära Skagerrak var det i stället samma antal arter av dinoflagellater som kiselalger. I antal celler dominerade kiselalgen *Dactyliosolen fragilissimus*. Klorofyll *a*-värdet var lågt i ytan, men på 15 m observerades en topp på hela 18,5 µg/l vid Släggö.

I Kattegatt dominerade *D. fragilissimus* antalsmässigt. Dinoflagellaten *Karlodinium micrum* var vanlig. Klorofyll *a*-värdet var normalt lågt.

I samtliga prover från Östersjöns observerades cyanobakterier. Mycket få trådar observerades i södra Östersjön, vid BY2 och BY5, vid BY5 fanns ett fåtal av den giftiga arten *Nodularia spumigena*. Större mängder cyanobakterier återfanns vid övriga stationer, framför allt *Aphanizomenon* sp. Mycket små mängder av *N. spumigena* observerades vid BCS III-10 och i Kalmar sund (M1V1), lite större mängder fanns vid Gotlands östra och västra bassänger (BY15 och BY38).

Relativt höga cellantal av det för fisk giftiga släktet *Chrysochromulina* spp. återfanns vid alla stationer förutom BY2, där det fanns i måttliga mängder. Guldalgen *Dinobryon faculiferum* och prasinophyceén *Pyramimonas* spp. observerades också i höga antal vid de flesta stationerna i Östersjön.

Halten av klorofyll *a* var normal i södra Östersjön, i övrigt låg den över det normala.



## Abstract

In the outer Skagerrak diatoms dominated the plankton, the potentially toxic species *Pseudo-nitzschia delicatissima*-group being the most abundant. The chlorophyll *a* (chl *a*) value was below average. In the coastal Skagerrak diatoms and dinoflagellates were represented by the same amount of species, although the diatom *Dactyliosolen fragilissimus* dominated the cell count. The chl *a* value was low at the surface, but at 15 meters there was a peak of 18,5 µg/l, causing a high integrated value above the average.

In the Kattegatt, *D. fragilissimus* was the most abundant and the dinoflagellate *Karlodinium micrum* was common. The chl *a* value was at average.

Cyanobacteria were observed in all samples from the Baltic stations. A few threads were found in the southern Baltic, at BY2 and BY5, and at BY5 one of the identified species was the toxic species *Nodularia spumigena*. Quite big amounts of cyanobacteria were found at all the other Baltic stations, most of which consisted of *Aphanizomenon* sp. A few filaments of *N. spumigena* were observed at BCS III-10 and M1V1, some more at BY15 and BY38.

The fish toxin producing genus *Chrysochromulina* spp was abundant at all stations except BY2. *Dinobryon faculiferum* and *Pyramimonas* spp. were also abundant at most of the stations.

The chl *a* value was at average in the southern Baltic, in all other areas it was above 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](http://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](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>Chattonella</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.

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

More detailed information on species composition and abundance

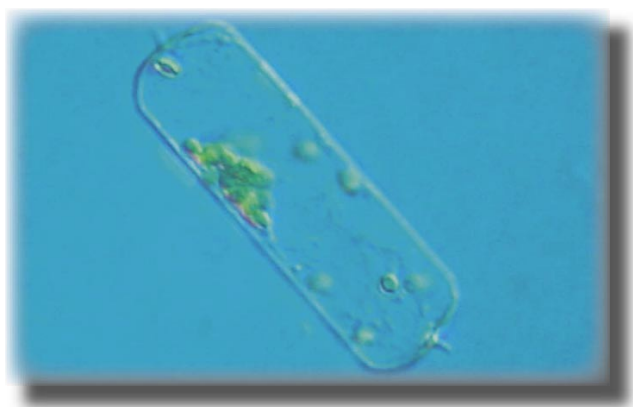
Två stationer har lagts till i det nationella programmet. N14 ligger i kustnära Kattegatt och Ref-M1V1 i Kalmar sund.  
Two stations have been added to the national program. N14 is in the Kattegat and Ref-M1V1 is in the sound of Kalmar.

## The Skagerrak

### Å17 11<sup>th</sup> of June 2007 (outer Skagerrak)

Diatoms dominated the plankton sample with the highest cell number represented by the potentially toxic specie *Pseudo-nitzschia delicatissima*-group. The cell number was far below the critical limit of one million cells per liter though.

### Släggö 11<sup>th</sup> of June 2007 (coastal Skagerrak)



*Dactyliosolen fragilissimus*

Fewer species were observed as compared to Å17, and there were equal amounts of dinoflagellates as of diatoms when it comes to number of species. The diatom *Dactyliosolen fragilissimus* had the highest cell numbers.

The chl *a* values were below average in the the whole area except at Släggö. At Släggö the chl *a* value was low at the surface, but at 15 meters there was a peak of 18,5 µg/l, causing a high integrated value above the average.

## The Kattegat

### N14 Falkenberg 12<sup>th</sup> of June 2007

The plankton situation was similar to the one at Släggö with *D. fragilissimus* having the highest cell number. The small dinoflagellate *Karlodinium micrum* was observed in rather high numbers, as was small flagellated species as for example *Leucocryptos marina*.

### Anholt E 12<sup>th</sup> and 16<sup>th</sup> of June 2007

More or less the same species were found at the two occasions, but the cell numbers had risen at the second visit at Anholt. *D. fragilissimus* had the highest cell numbers at both occasions (except small flagellated species), but the amount had doubled on the 16th. *K. micrum* was common as was *Leucocryptos marina*.

The chl *a* values were at average in the Kattegat.

Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	2007-06-11	2007-06-11	2007-06-12	2007-06-12	2007-06-16
	cells/L	cells/L	cells/L	cells/L	cells/L
<i>Cerataulina pelagica</i>	present				
<i>Chaetoceros curvisetus</i>	present				
<i>Cylindrotheca closterium</i>		present	present		present
<i>Dactyliosolen fragilissimus</i>	25 000	150 000	60 000	70 000	28 000
<i>Guinardia delicatula</i>	present				
<i>Leptocylindrus danicus</i>	30 000				
<i>Leptocylindrus minimus</i>	present				
<i>Navicula</i> sp.		present			
<i>Phaeodactylum tricornutum</i>			12 000	48 000	
<i>Proboscia alata</i>	present	present		present	present
<i>Pseudo-nitzschia delicatissima</i> -group	350 000				
<i>Skeletonema costatum</i>	present				present
<i>Thalassionema nitzschioides</i>	present	present	present	present	present
<i>Amphidinium crassum</i>	present		present		
<i>Ceratium fusus</i>		present			
<i>Ceratium macroceros</i>	present				
<i>Ceratium tripos</i>	present	present	present	present	
<i>Heterocapsa cf. minima</i>		10 000		present	
<i>Heterocapsa rotundata</i>	present				present
<i>Karlodinium micrum</i>	present	20 000	45 000	40 000	45 000
<i>Peridiniella danica</i>		present	present	present	present
<i>Dinobryon faculiferum</i>	present				
Cryptomonadales spp.	50 000	30 000	20 000	30 000	20 000
<i>Chrysochromulina</i> sp.	present			12 000	20 000
<i>Pyramimonas</i> sp.	present		present	present	15 000
<i>Leucocryptos marina</i>	present		99 000	135 000	85 000
<i>Telonema subtile</i>			20 000	7 000	8 000
<i>Mesodinium rubrum</i>	present				
<i>Strombidium</i> spp	present	present		present	

## The Baltic Sea

### Arkona Basin BY2 12th of June 2007

The sample was dominated by small flagellated species, mostly from the group Cryptophyceae. Some chains of *D. fragilissimus* and a few threads of cyanobacteria were found. The ichthyotoxic (toxic to fish) genus *Chrysochromulina* spp. was observed.

### Bornholm basin BY5 13th of June 2007

Quite high cell numbers of *Chrysochromulina* sp. were found and the solitary chrysophycean *Dinobryon faculiferum* was common. The toxic cyanobacterium *Nodularia spumigena* was present with small amounts of threads.

### The South East Baltic BCS III-10 13th June 2007

Even higher cell numbers of *Chrysochromulina* sp. were found as compared to BY5. The prasinophycean *Pyramimonas* spp. was observed with high numbers, as well as *D. faculiferum*. Small dinoflagellates as *Karlodinium micrum* and *Heterocapsa rotundata* were present. The three most common “summer species” of cyanobacteria were found, quite high amounts of *Aphanizomenon* sp. (non toxic) and a few threads of *Anabaena* sp. (non toxic) and *N. spumigena*.



Left: *Aphanizomenon* sp. right: *Nodularia spumigena*

### Eastern Gotland Basin BY15 and Western Gotland Basin BY38 14th of June 2007

The amount of *N. spumigena* was higher than at the other stations, but still low. *Aphanizomenon* sp. was quantified to high numbers though, and so was the ichthyotoxic genus *Chrysochromulina* sp. The chrysophycean *D. faculiferum* was abundant as was a number of other small flagellated species. The potentially toxic dinoflagellate *Dinophysis acuminata* was found in cell numbers just above its critical limit at By 15, and far below the limit at By 38.

### Kalmar Sound Ref. M1-V1 15th of June 2007

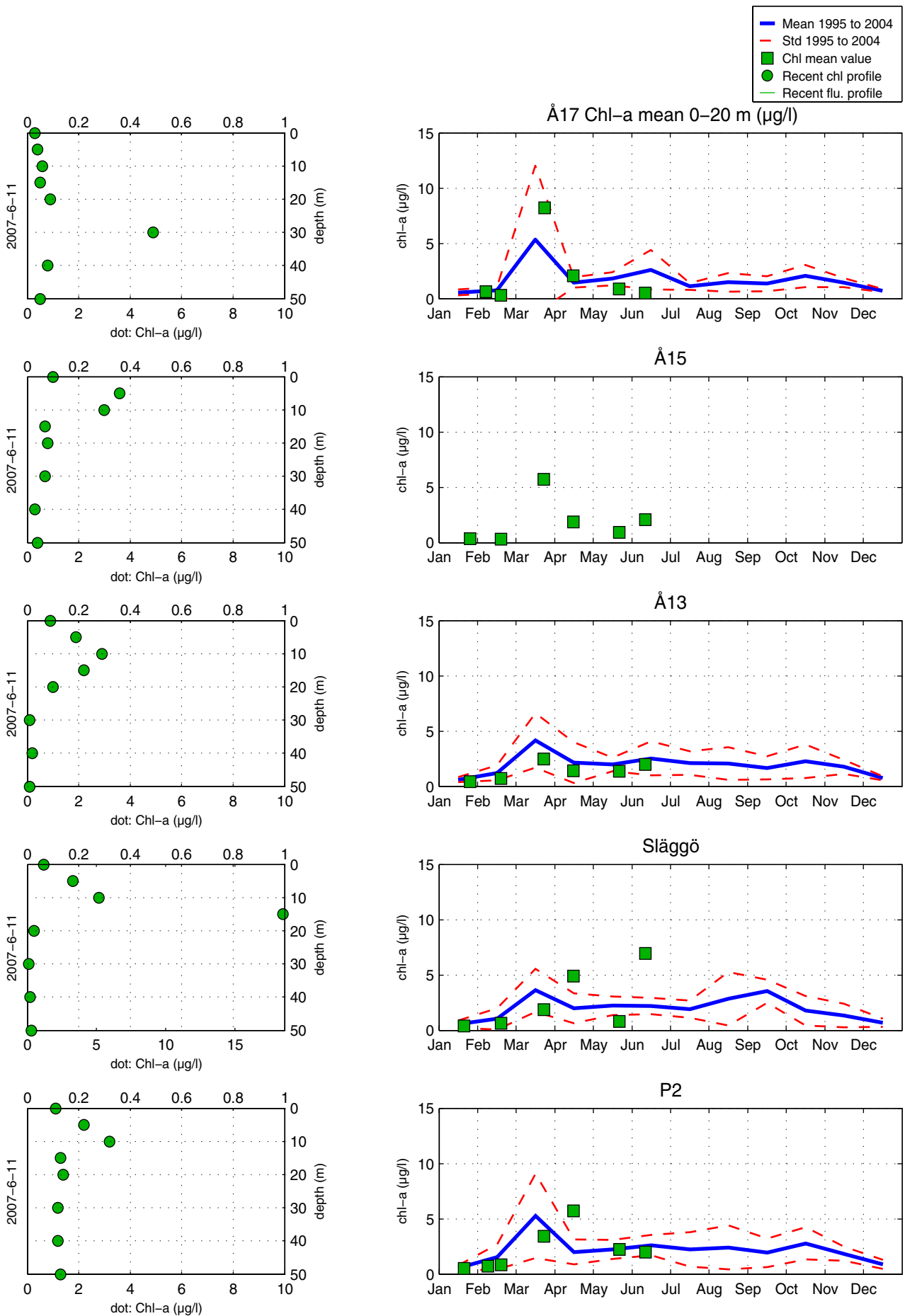
The cyanobacteria situation was similar to the one above with high amounts of *Aphanizomenon* sp. and some filaments of *N. spumigena*. *Chrysochromulina* spp. was less abundant as compared to previous Baltic stations, but still common.

<b>Selection of observed species</b>	<b>BY2</b>	<b>BY5</b>	<b>BCS III 10</b>	<b>BY15</b>	<b>BY38</b>	<b>Ref-M1V1</b>
Red=potentially toxic species <sup>1</sup> quantified in m/L	<b>2007-06-12</b>	<b>2007-06-13</b>	<b>2007-06-13</b>	<b>2007-06-14</b>	<b>2007-06-14</b>	<b>2007-06-15</b>
	<b>cells/L</b>	<b>cells/L</b>	<b>cells/L</b>	<b>cells/L</b>	<b>cells/L</b>	<b>cells/L</b>
<i>Dactyliosolen fragilissimus</i>	present					
<i>Dinophysis acuminata</i>				3 000	present	
<i>Dinophysis norvegica</i>			present			
<i>Heterocapsa rotundata</i>	present	present	17 000	present	present	present
<i>Heterocapsa cf. minima</i>		present				
<i>Karlodinium micrum</i>	17 000		present			
<i>Katodinium glaucum</i>					present	
<i>Chrysochromulina spp</i>	10 000	248 000	997 000	1 000 000	720 000	50 000
Cryptomonadales spp	190 000	25 000	40 000	50 000	150 000	88 000
<i>Apedinella radians</i>						present
<i>Dinobryon faculiferum</i>		35 000	103 000	218 000	140 000	50 000
<i>Pyramimonas spp</i>	34 000	30 000	185 000		50 000	125 000
<i>Anabaena sp.</i> <sup>1</sup>	present		present		present	
<i>Aphanizomenon sp.</i> <sup>1</sup>			common	very common	very common	very common
<i>Nodularia spumigena</i> <sup>1</sup>		present	present	present	present	present
<i>Leucocryptos marina</i>	30 000					
cf. <i>Telonema subtile</i>	25 000		present			
<i>Pterosperma spp.</i>		present	present	common	common	
<i>Calliakantha natans</i>				common		present
<i>Mesodinium rubrum</i>			present	present	present	present
<i>Strombidium spp.</i>		present	present		present	present

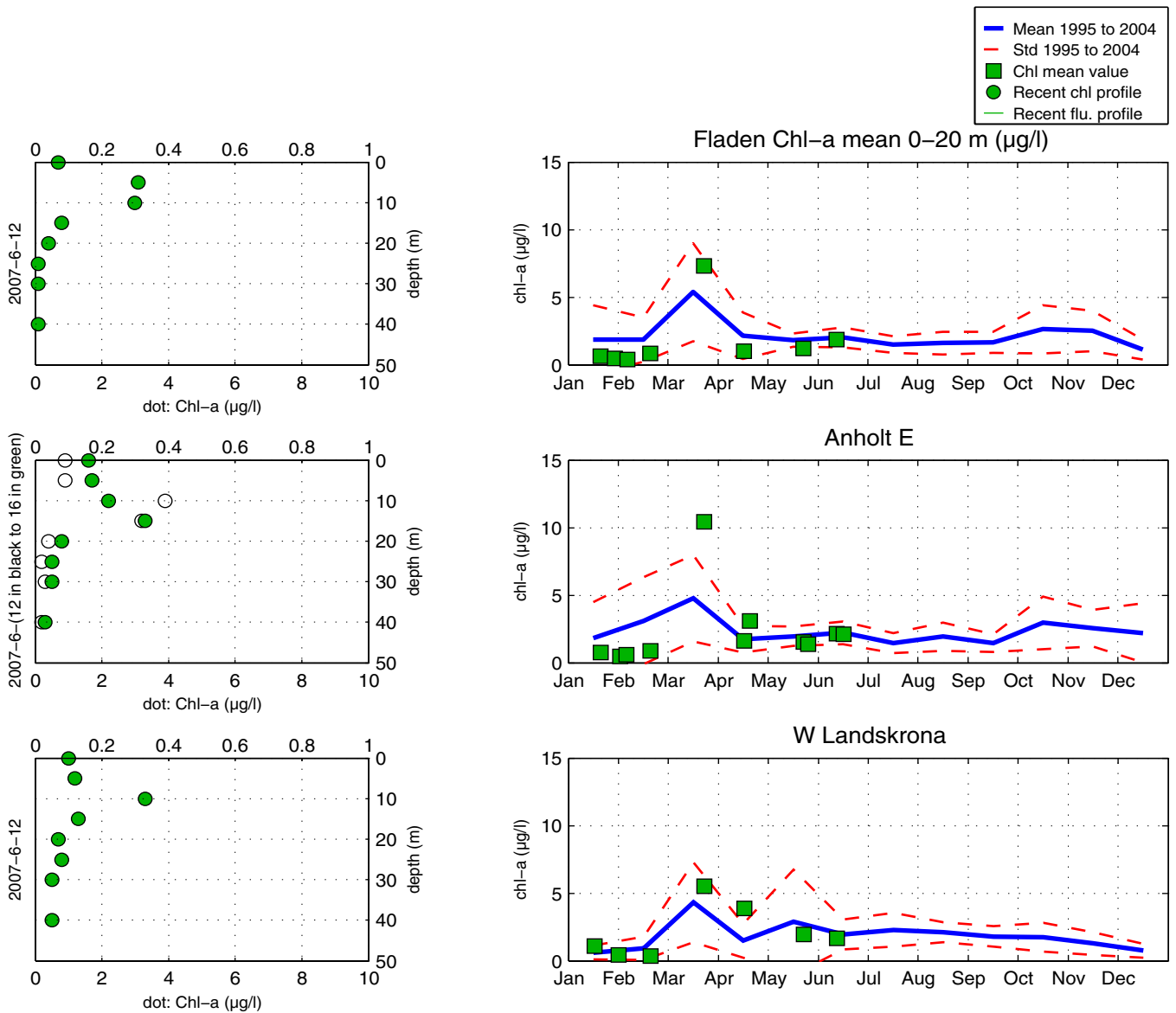
Phytoplankton analysis and text by Ann-Turi Skjevik.

Reviewed by Lars Edler.

# The Skagerrak



# The Kattegat and the Sound



## Om klorofylldiagrammen

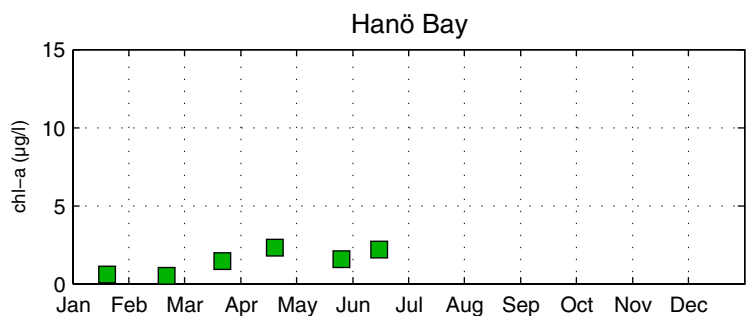
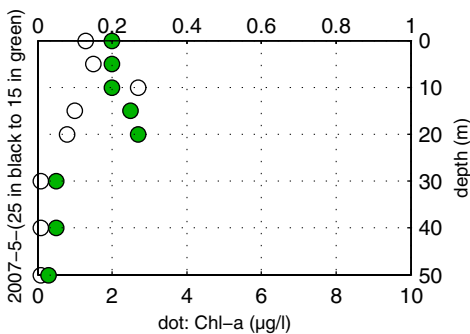
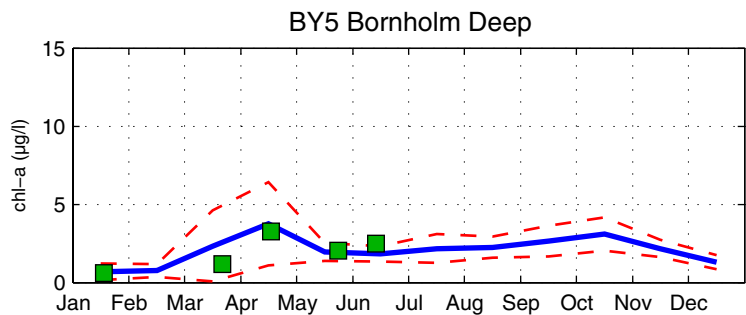
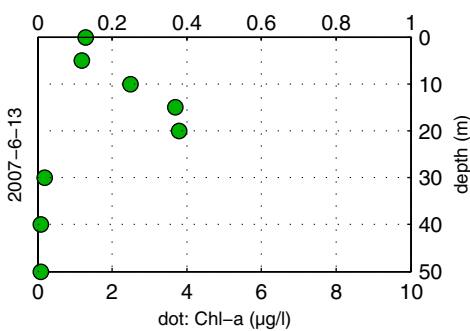
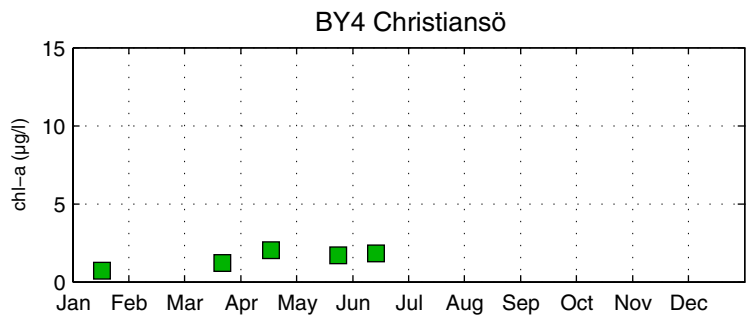
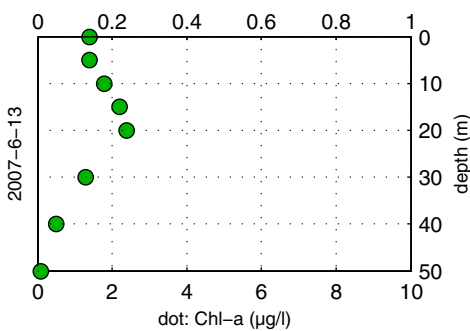
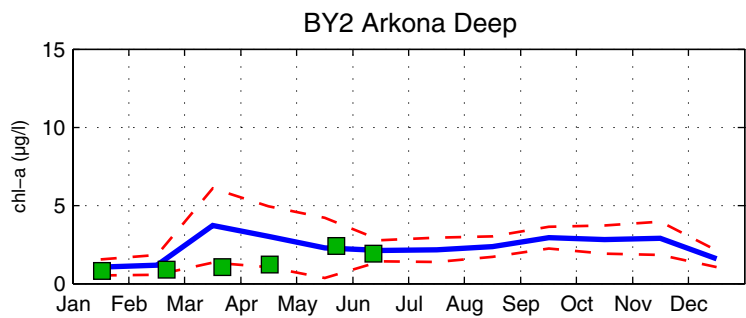
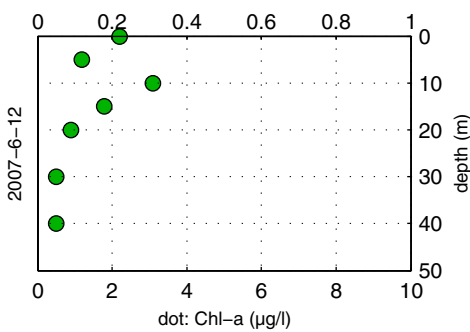
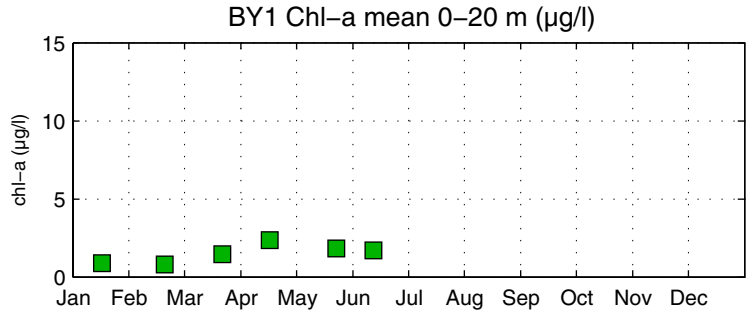
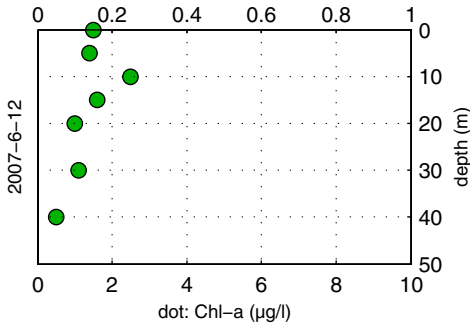
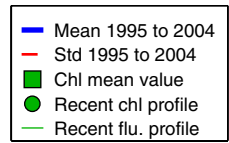
Klorofyll *a* är ett mått på mängden växtplankton. Prover tas från ett antal djup från U/F Argos. Data presenteras både från de fasta djupen och som medelvärden 0-20 m. Utöver resultaten från laboratorieanalyserna av vattenprover mäts klorofyll *a* som fluorescens från ett automatiskt instrument som sänks ned från fartyget. På så sätt kan djupt liggande, ibland, tunna alger av växtplankton observeras.

## About the chlorophyll graphs

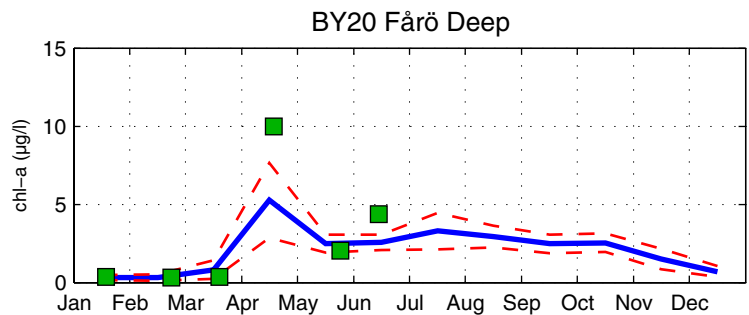
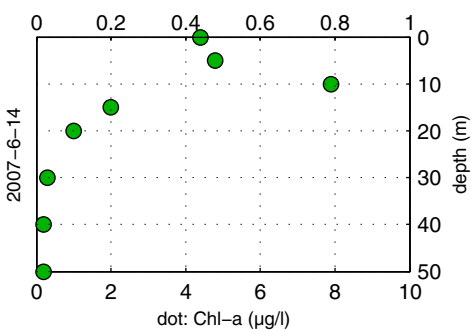
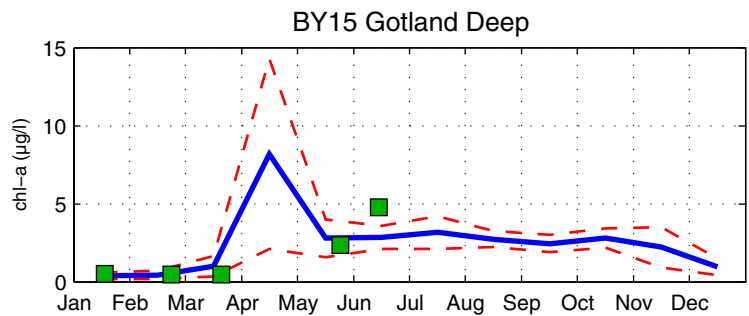
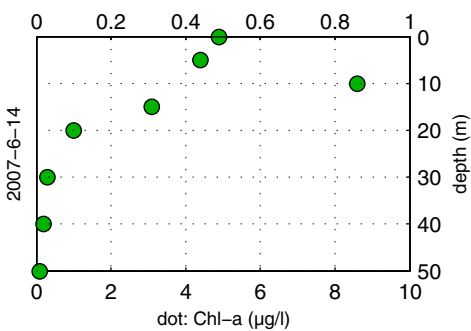
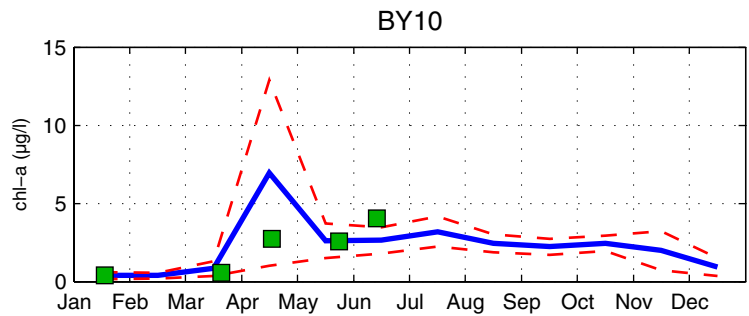
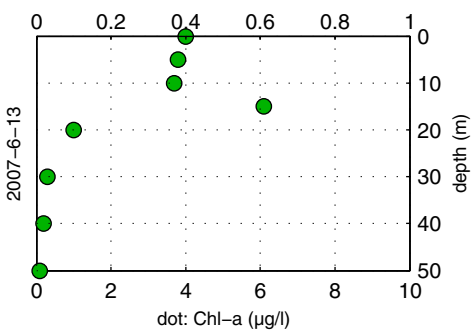
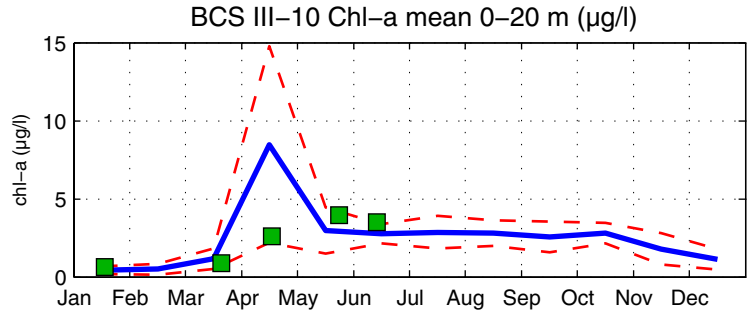
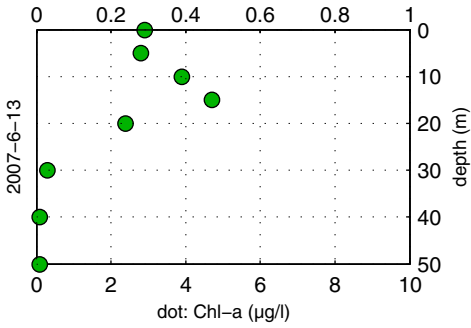
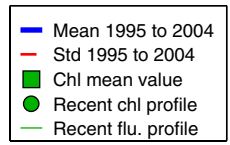
Chlorophyll *a* is sampled from several depths from the R/V Argos. Data is presented both from the discrete depths and as an average 0-20 m. In addition to the laboratory analysis from the water samples chlorophyll fluorescence is measured in continuous depth profiles from the ship. This is a way to observe thin layers of phytoplankton occurring below the surface.



# The Southern Baltic



# The Eastern Baltic



# The Western Baltic

