

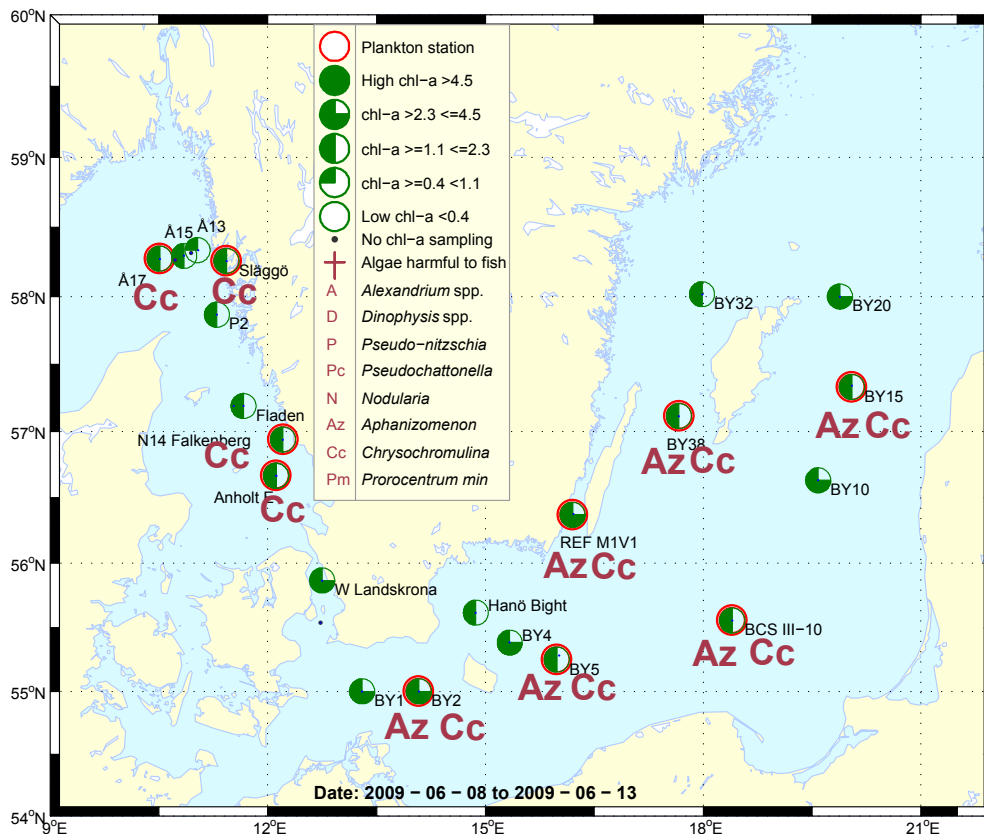
Sammanfattning

Prymnesiophyten *Chrysochromulina* spp.* blommade i Skagerrak och i Kattegatt. I övrigt var kiselalgen *Pseudo-nitzschia* spp.* vanlig i Skagerrak. Kalkflagellaten *Emiliania huxleyi*, som är känd för att orsaka vackert turkosfärgat vatten men i övrigt är ofarlig, blommade vid P2 i Skagerraks kustområde. Turkost vatten uppmärksammades vid flera stationer, men bara ett fåtal celler av *E. huxleyi* fanns i proverna så blomningen kan ha befunnit sig under 10 meters djup.

I Kattegatt var kiselalgerna *Pseudo-nitzschia* spp.* och *Phaeodactylum tricornutum* vanliga utöver *Chrysochromulina**-blomningen.

Intressanta fluorescens maxima mättes upp i Skagerrak och Kattegatt mellan 15-20 meter, men alla integrerade (0-20 m) värden låg inom medel för denna månaden.

I Östersjön hade mängden av cyanobakterien *Aphanizomenon* spp. ökat rejält jämfört med den förra provtagningen. De senaste dagarna har man dessutom kunnat se ytansamlingar med hjälp av satellitbilder, <http://www.smhi.se/cmp/jsp/polopoly.jsp?d=7826&l=sv>



Abstract

The prymnesiophyte *Chrysochromulina* spp.* was blooming in the Skagerrak and Kattegat areas. The diatom genus *Pseudo-nitzschia** was common in the Skagerrak. The calcium flagellate *Emiliania huxleyi*, non toxic but known to colour the water beautifully turquoise, bloomed at P2 at the Skagerrak coast. The turquoise water was observed at more stations, but the bloom may have been below 10 meters because only a few cells of *E. huxleyi* were found in the samples.

Apart from the *Chrysochromulina** bloom in the Kattegat, the diatoms *Pseudo-nitzschia* spp.* and *Phaeodactylum tricornutum* were common in this area.

Interesting fluorescence maxima were found between 15-20 meters throughout the Skagerrak and Kattegat areas, although the integrated (0-20 m) values were within average for this month.

In the Baltic Sea the amount of the cyanobacterium *Aphanizomenon* spp. had increased a lot since the last sampling took place. These last days surface accumulations have been visible on satellite images, <http://www.smhi.se/cmp/jsp/polopoly.jsp?d=7826&l=en>

More detailed information on species composition and abundance

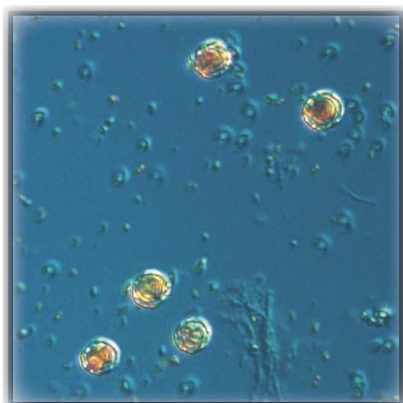
The Skagerrak

Å17 8th of June (open Skagerrak)

A few species were present and the prymnesiophyte *Chrysochromulina* spp.* was the most numerous genus. Small flagellates like the heterotrophic species *Leucocryptos marina* were common.

Släggö 8th of June (Skagerrak coast)

Chrysochromulina spp.* was found with the highest cell numbers, and both *Pseudo-nitzschia delicatissima*-group* and *Pseudo-nitzschia seriata*-group* (diatoms) were very common. Diatom and dinoflagellate species were many and several potentially toxic species were present in low amounts.



Emiliana huxleyi cells and small coccoliths from their cell walls lying around.

There were interesting fluorescence peaks between 15-20 meters depth throughout the Skagerrak area. Maybe partly caused by the coccolithophorid *Emiliana huxleyi* that was found in a state of bloom at the station P2. Plankton was sampled at P2 because of the turquoise water usually caused by *E. huxleyi*. *E. huxleyi* is however non toxic.

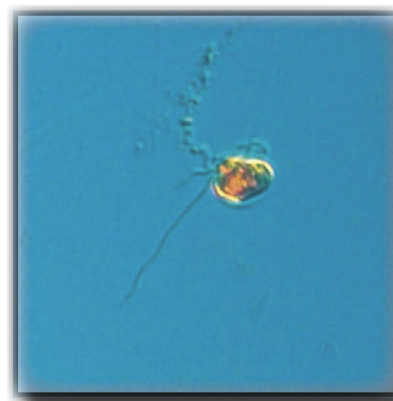
The Kattegat

N14 Falkenberg 9th of June

The prymnesiophyte *Chrysochromulina* spp.* was the most common genus and the diatom *Skeletonema costatum* was very numerous. The diatoms *Phaeodactylum tricornutum* and *Pseudo-nitzschia delicatissima*-group* and the flagellate *Leucocryptos marina* were common.

Anholt E 9th and 13th of May

Chrysochromulina spp.* was very common at both visits, but apart from that the species composition differed a lot between the two sampling occasions. The number of species and the total cell numbers were a lot higher at the second visit. The chlorophyll *a* values were also higher at the second stop, at the surface it was nearly three times as high compared to the first occasion. The integrated (0-20 meter) chlorophyll *a* value was higher as well the second time.



Chrysochromulina sp.

Selection of observed species	Å17	Släggö	P2	N14	Anholt E	Anholt E
Red=potentially toxic species	2009-06-08	2009-06-08	2009-06-08	2009-06-09	2009-06-09	2009-06-13
	cells/l	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Cerataulina pelagica</i>		present		present		
<i>Chaetoceros decipiens</i>				present		
<i>Cylindrotheca closterium</i>		present			present	present
<i>Dactylosolen fragilissimus</i>		present		present	present	present
<i>Guinardia delicatula</i>				present		
<i>Guinardia flaccida</i>					present	
<i>Leptocylindrus danicus</i>		present		present		present
<i>Leptocylindrus minimus</i>		present				
cf. <i>Nitzschia longissima</i>		present			present	
<i>Phaeodactylum tricornutum</i>				common	common	common
<i>Proboscia alata</i>		present		present		common
<i>Pseudo-nitzschia delicatissima</i> -group	present	70 000		common	present	present
<i>Pseudo-nitzschia seriata</i> -group		70 000		present		
<i>Rhizosolenia imbricata</i>	present	present		present		present
<i>Rhizosolenia setigera</i>		present		present		present
<i>Skeletonema costatum</i> complex		present		158 000		common
<i>Thalassionema nitzschioides</i>		present		present	present	present
cf. <i>Azadinium spinosum</i>				present	present	present
<i>Ceratium fusus</i>	present	common			present	present
<i>Ceratium lineatum</i>		present				present
<i>Ceratium longipes</i>		present				
<i>Ceratium macroceros</i>		present			present	
<i>Ceratium tripos</i>	present	present		present	present	present
<i>Cladopyxis claytonii</i>	present					
<i>Dinophysis acuminata</i>		present				
<i>Dinophysis norvegica</i>		present				present
<i>Dinophysis rotundata</i>		present				
<i>Gyrodinium flagellare</i>				present		present
<i>Heterocapsa rotundata</i>	present	present		present		present
<i>Heterocapsa</i> spp.	present					present
<i>Heterocapsa triquetra</i>		present		present	present	present
<i>Karlodinium micrum</i>		present			present	present
<i>Lingulodinium polyedrum</i>						present
<i>Peridiniella danica</i>				present		
<i>Protoperidinium conicum</i>		present				
<i>Protoperidinium steinii</i>		present			present	
<i>Scrippsiella</i> complex				present		
<i>Chrysochromulina</i> spp.	828 000	209 000		385 000	70 000	85 000
<i>Emiliana huxleyi</i>		present	2 350 000		present	
Cryptomonadales spp.	65 000	common		common	common	178 000
<i>Eutreptiella</i> spp.		present		present		
<i>Pyramimonas</i> spp.	present	present		present		present
<i>Apedinella radians</i>				present		
<i>Dinobryon faculiferum</i>	present	present		present	present	common
<i>Quadricoccus euryhalinicus</i>						present
<i>Anabaena</i> spp.					present	common
<i>Nodularia spumigena</i>						present
<i>Calliakantha longicaudata</i>		present		present	present	common
<i>Calliakantha natans</i>		present		present	present	present
<i>Ebria tripartita</i>		present		present	present	present
<i>Leucocryptos marina</i>	55 000	present		87 000	common	154 000
<i>Telonema subtilis</i>	present			present	common	present
<i>Mesodinium rubrum</i>		present				present
<i>Strombidium</i> spp.		present		present		present

The Baltic Sea

Weak surface accumulations of cyanobacteria were visible in the Hanö bight and around Gotland on the 21st and 22nd of June, interpreting satellite images using BAWS, (Baltic Algal Watch System) <http://www.smhi.se/cmp/jsp/polopoly.jsp?d=7826&l=en>.

Arkona Basin BY2 and Bornholm Basin BY5 10th of June

The prymnesiophyte *Chrysochromulina polylepis*^{*}, the prasinophyte *Pyramimonas* spp. and chryptophytes dominated the phytoplankton samples. The amount of the filamentous cyanobacterium *Aphanizomenon* spp. had increased a lot compared to the previous sampling and traces of the filamentous cyanobacteria *Anabaena* spp. and *Nodularia spumigena*^{*} were observed. The integrated chlorophyll *a* concentrations were within average for this month.



The cyanobacterium *Aphanizomenon* sp.

South East Baltic BCS III-10 10th of June

The phytoplankton situation was very similar to the one at the stations above apart from the fact that *C. polylepis*^{*} was less abundant and the dinoflagellate *Dinophysis norvegica*^{*} was common. The integrated chlorophyll *a* concentration was within average.

Eastern Gotland Basin BY15 11th of June and Western Gotland Basin BY 38 12th of June

These were the stations where the cyanobacterium *Aphanizomenon* spp. was the most abundant this month. The prymnesiophyte *Chrysochromulina polylepis*^{*}, the chrysophyte *Dinobryon faculiferum* and the prasinophyte *Pyramimonas* spp. were very numerous and the dinoflagellates *Dinophysis acuminata* and *D. norvegica*^{*} were common. The cyanobacterium *Nodularia spumigena*^{*} was present at BY38. The integrated chlorophyll *a* concentrations were within average for this month.

Kalmar Sound Ref. M1-V1 12th of June

The amount of the cyanobacterium *Aphanizomenon* spp. was high and the prymnesiophyte *Chrysochromulina polylepis*^{*} and the prasinophyte *Pyramimonas* spp. were found with high cell numbers. Cryptophytes were very common and *Heterocapsa triquetra* was the most common dinoflagellate. The dinoflagellates *Dinophysis acuminata*^{*}, *D. norvegica*^{*} and *D. rotundata*^{*} were present.

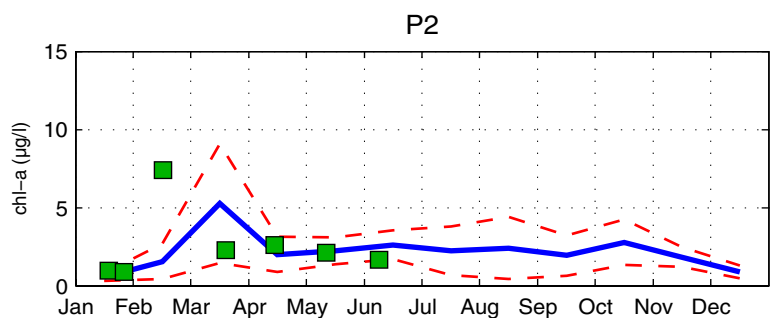
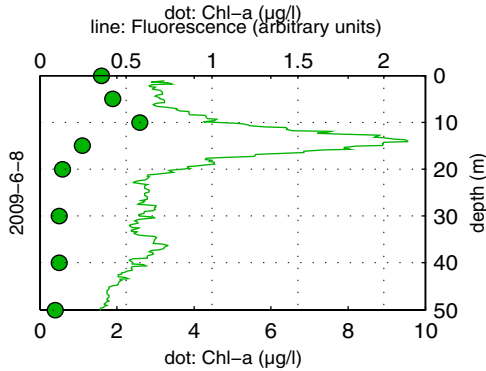
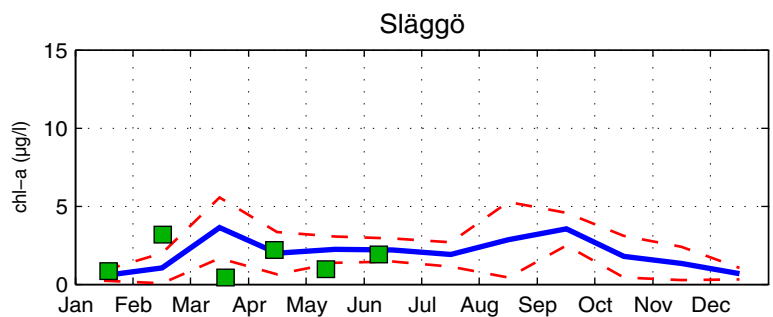
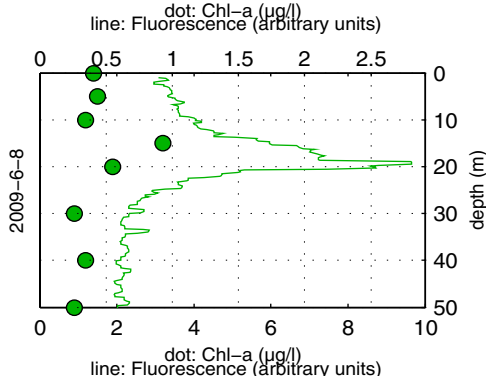
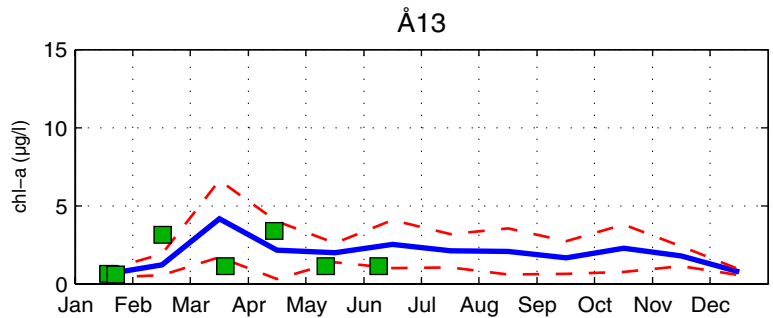
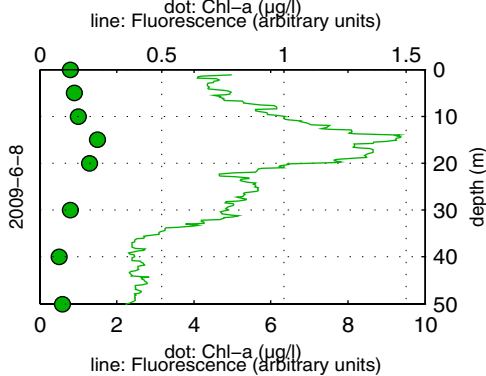
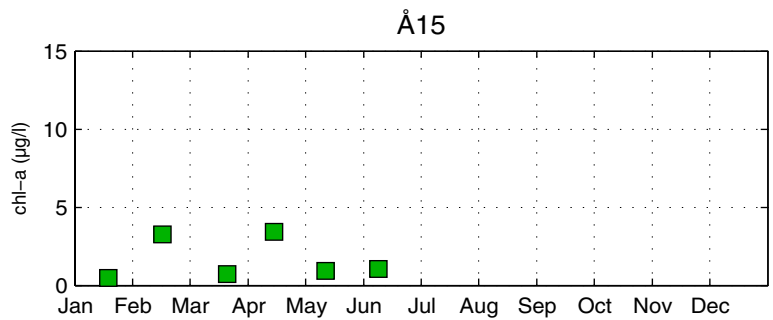
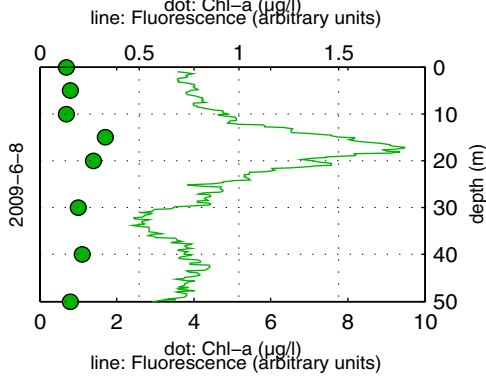
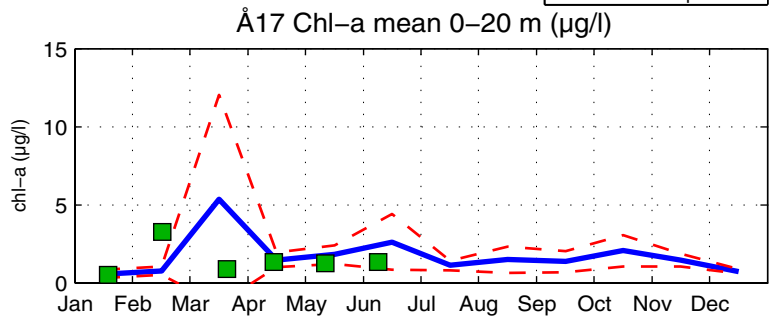
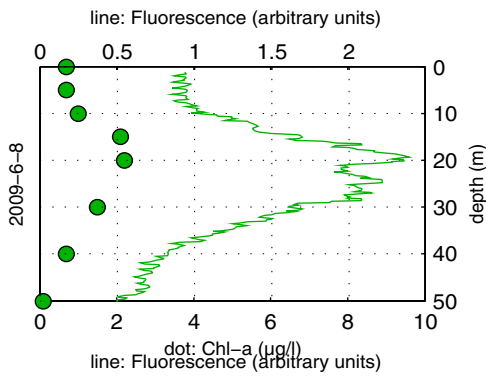
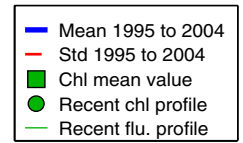


Dinophysis rotundata

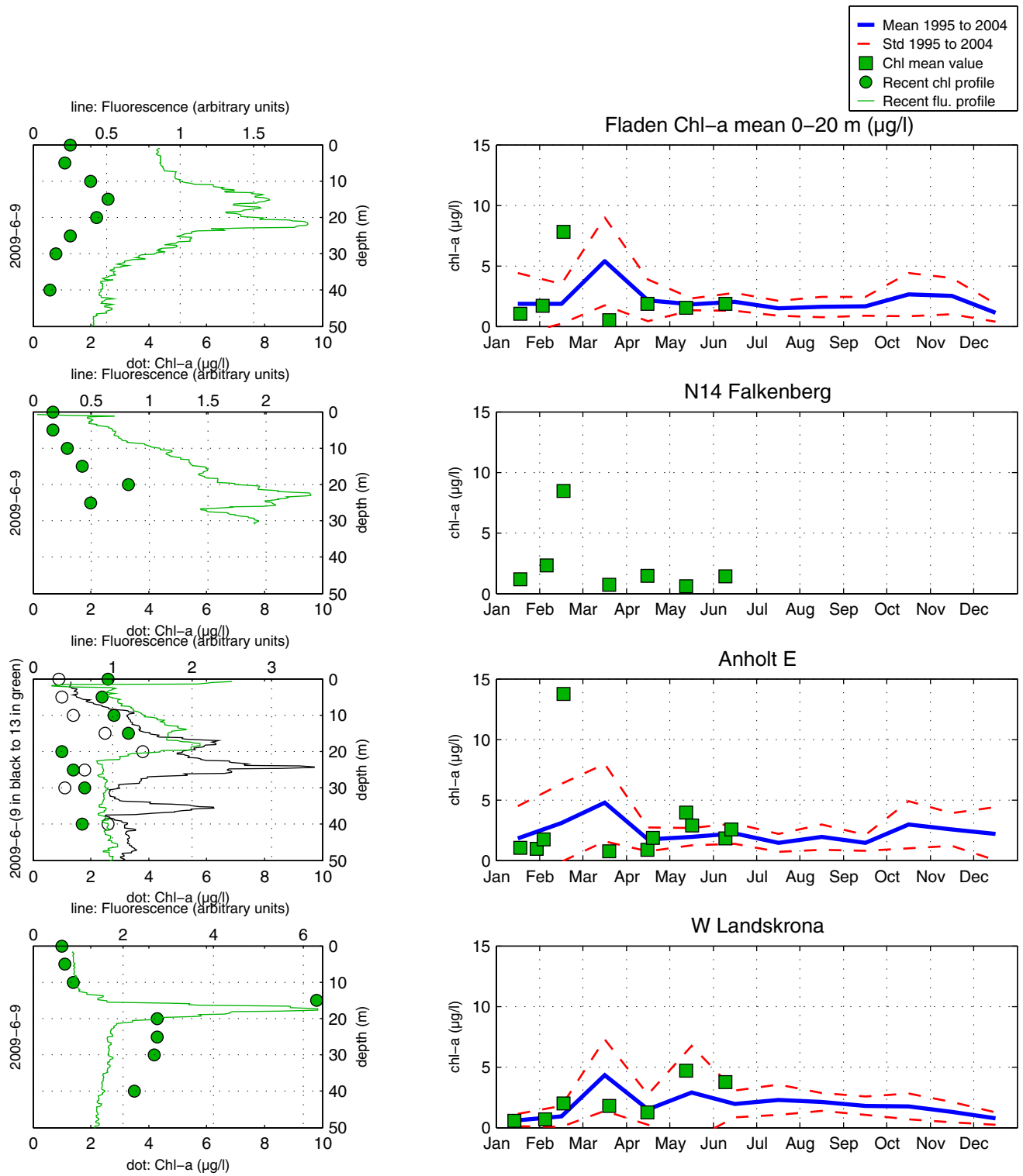
Phytoplankton analysis and text by:
Ann-Turi Skjevik

Selection of observed species	BY2	BY5	BCS III-10	BY15	BY38	Ref. M1-V1
Red=potentially toxic species	2009-06-10	2009-06-10	2009-06-10	2009-06-11	2009-06-12	2009-06-12
¹ quantified in m/l	cells/l	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Chaetoceros danicus</i>			present	present		
<i>Chaetoceros impressus</i>	present	present		present		
<i>Chaetoceros thronsenii</i>	present					
<i>Dinophysis acuminata</i>				common	present	present
<i>Dinophysis norvegica</i>	present	present	present	common	present	present
<i>Dinophysis rotundata</i>						present
<i>Gyrodinium flagellare</i>	present					
<i>Heterocapsa rotundata</i>	present	common	common	common	present	present
<i>Heterocapsa</i> spp.	present	77 000	common	common	common	present
<i>Heterocapsa triquetra</i>						common
<i>Karlodinium micrum</i>						present
<i>Katodinium glaucum</i>				present		
<i>Lingulodinium polyedrum</i>						present
<i>Peridiniella danica</i>	present		present	present	present	present
<i>Chrysochromulina</i> spp.	966 000	1 560 000	215 000	224 000	355 000	510 000
Cryptomonadales spp.	96 000	150 000	common	common	99 000	76 000
<i>Dinobryon faculiferum</i>	present	common	present	common	140 000	present
<i>Pyramimonas</i> spp.	160 000	420 000	57 000	57 000	170 000	233 000
<i>Anabaena</i> spp.		present				present
<i>Aphanizomenon</i> spp.	3.5	2	3	11	12	8
<i>Nodularia spumigena</i>	present				present	
<i>Calliakantha longicaudata</i>				present	present	
<i>Calliakantha natans</i>	present			common	present	present
<i>Ebria tripartita</i>				present	present	
<i>Leucocryptos marina</i>				present	present	present
<i>Mesodinium rubrum</i>		present	present	common	present	present

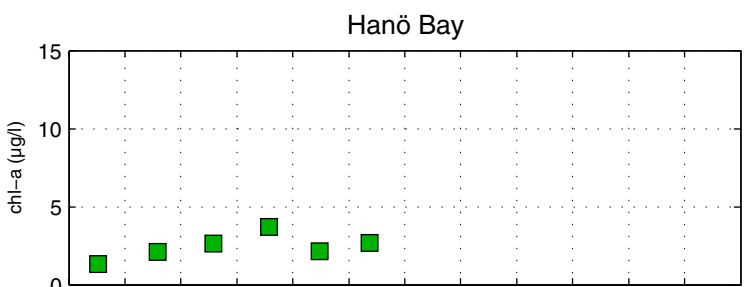
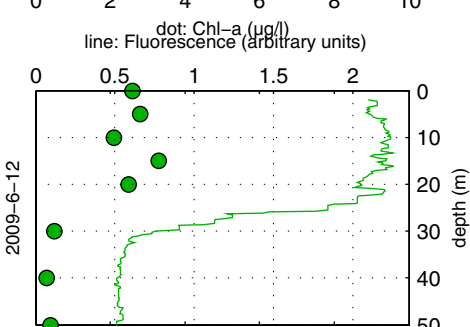
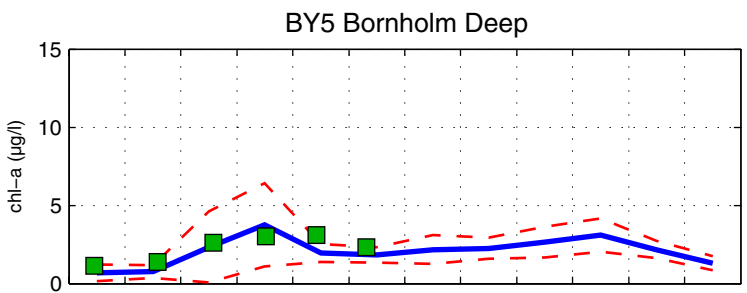
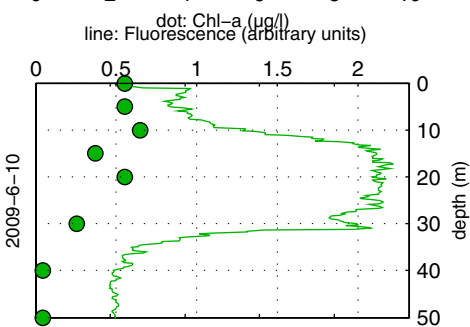
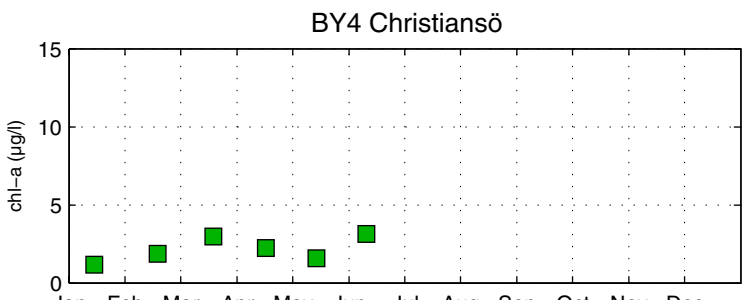
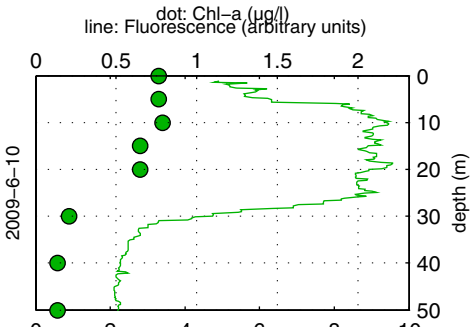
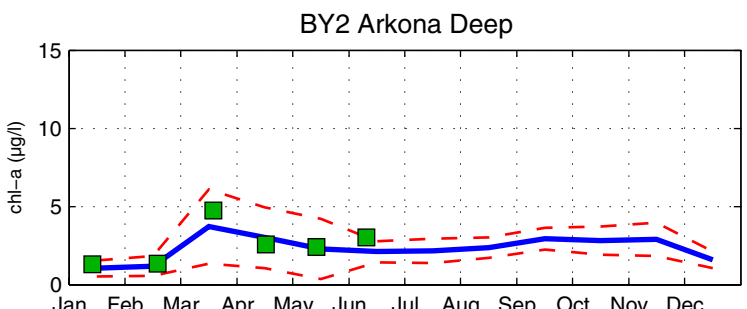
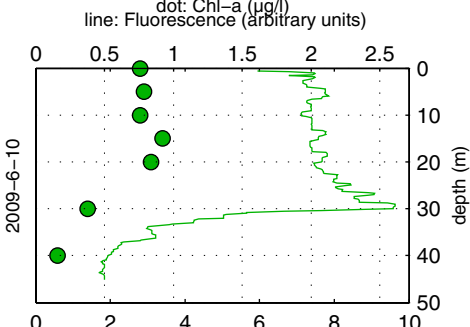
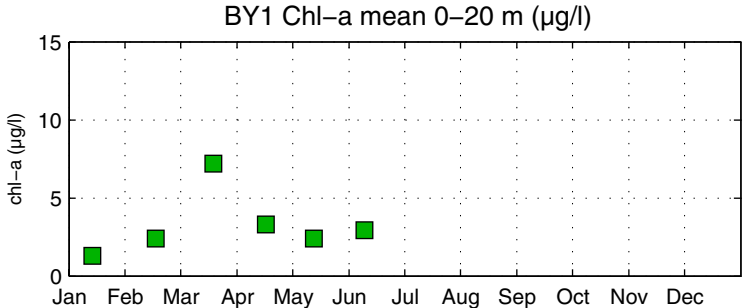
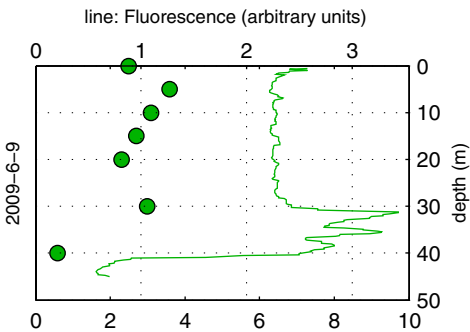
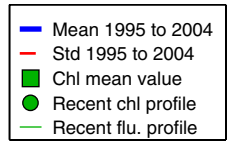
The Skagerrak



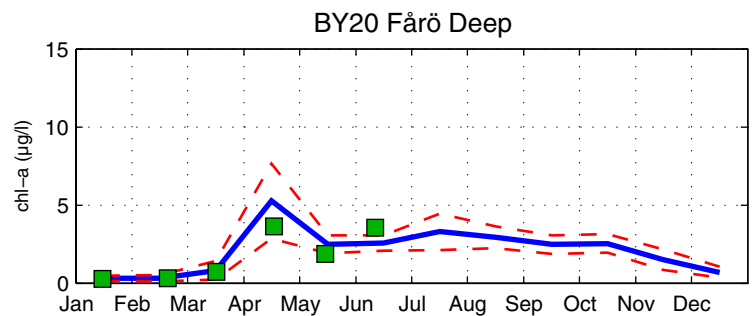
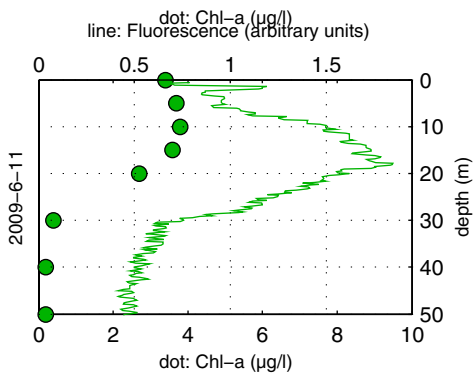
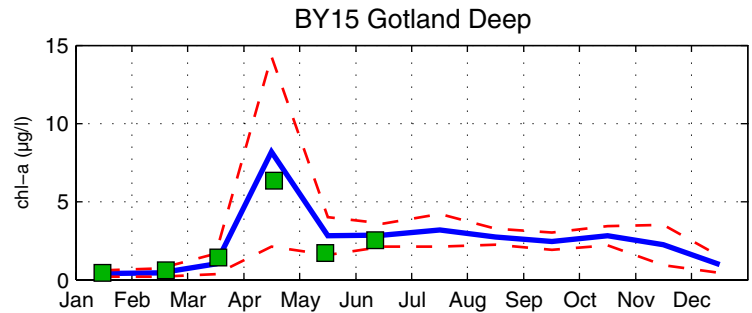
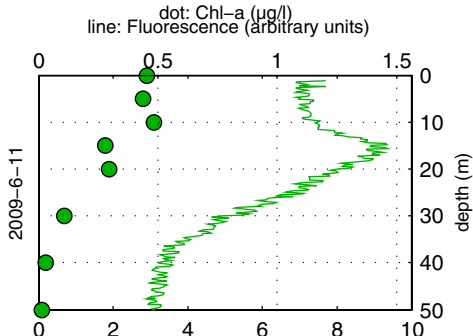
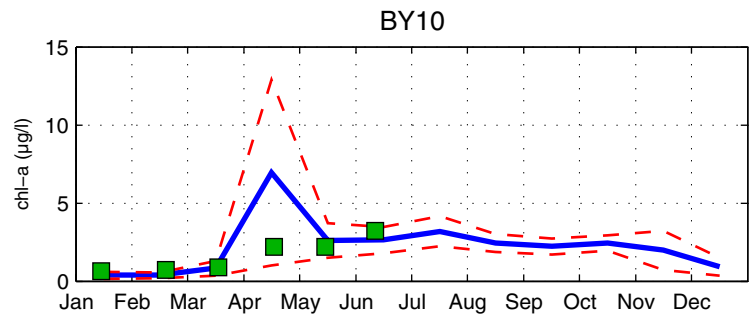
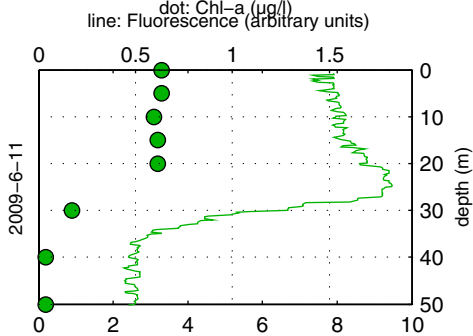
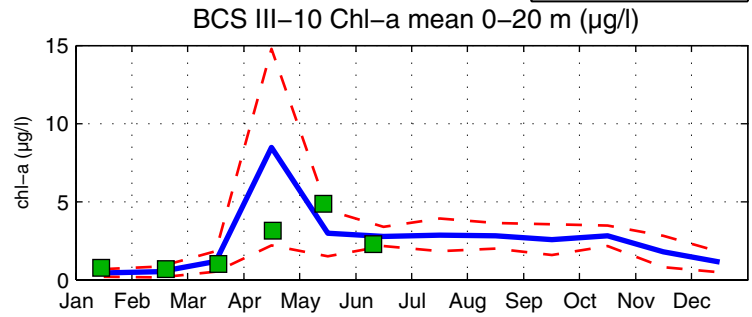
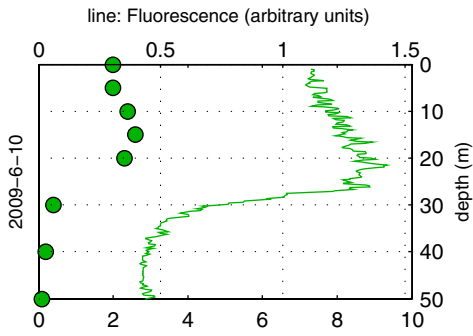
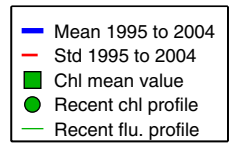
The Kattegat and the Sound



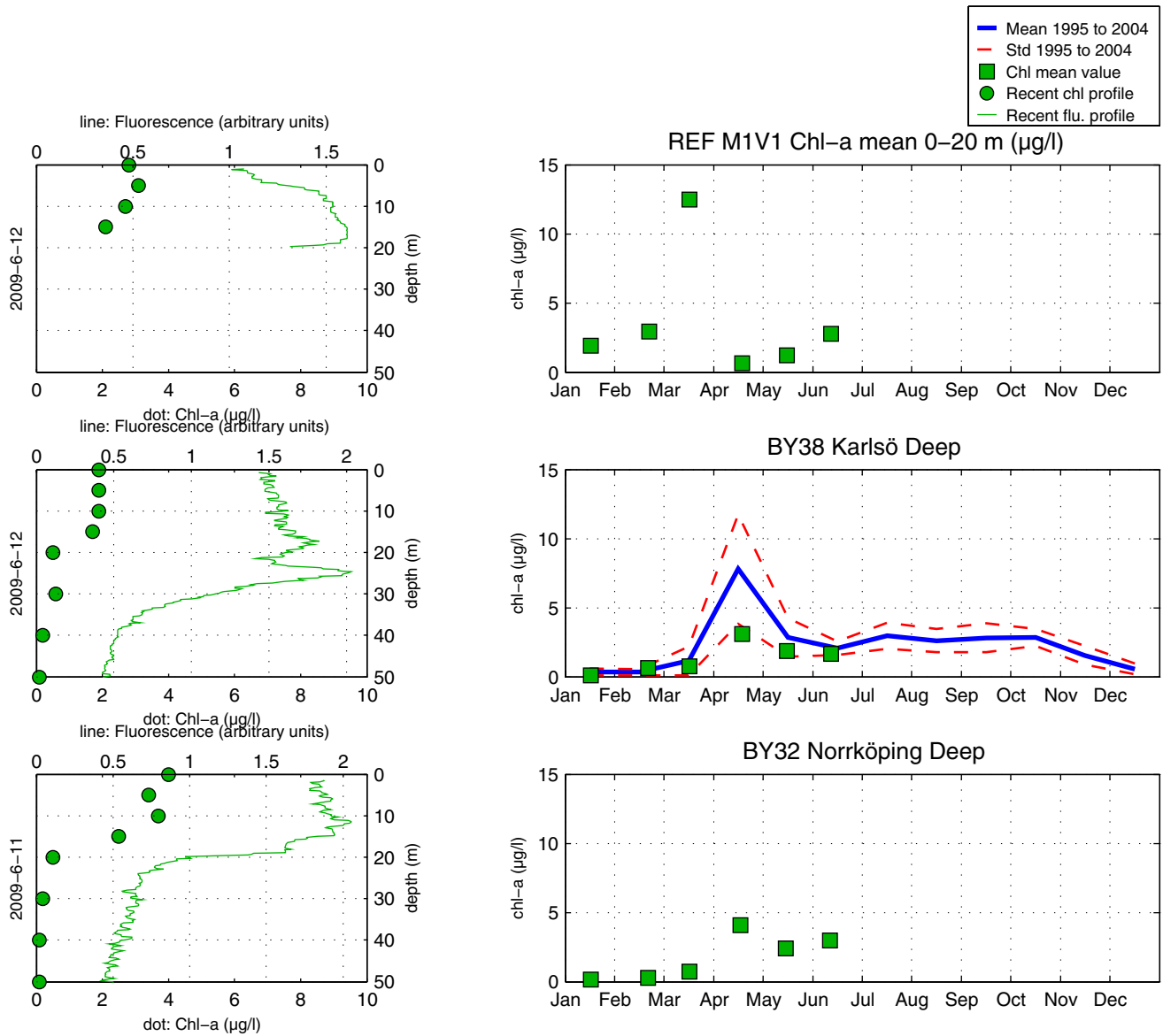
The Southern Baltic



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 algbloomingar 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.

