SMHI

Oceanographic Unit
No 3, 14 – 19 April 2008

AlgAware

ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

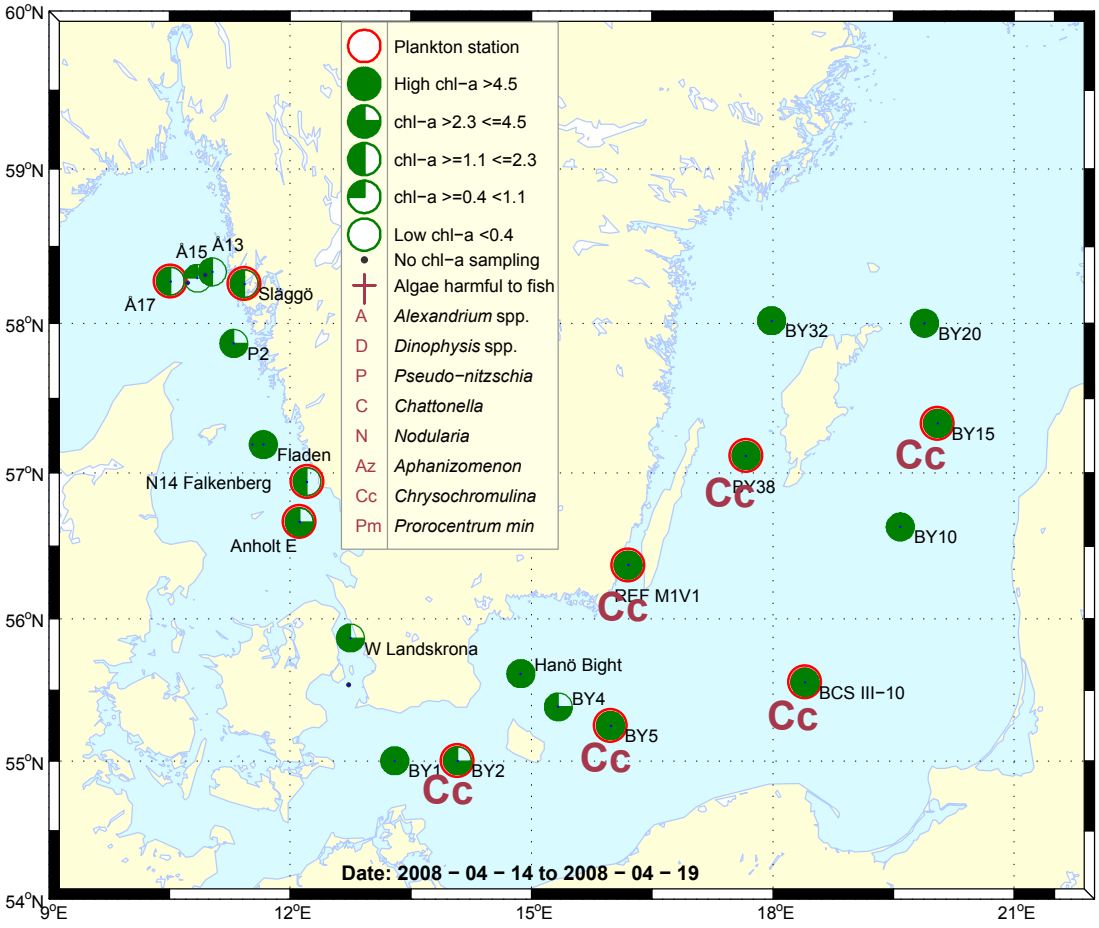
I Skagerrak var diversiteten låg vad det gäller växtplankton. I yttre Skagerrak var det bara små flagellerade arter som var vanliga, vid kusten var även några arter av kiselalger vanliga. Klorofyll a*-halterna låg inom det normala för denna månad.*

I Kattegatt observerades samma situation som vid Skagerrakskusten, med ett undantag. Förhöjda klorofyllvärden och rapporter om kräftor som betett sig onormalt, resulterade i ett extra håvprov vid Fladen. Inget anmärkningsvärt noterades, bara kiselalgsblomning och ett fåtal celler av de potentiellt giftiga dinoflagellaterna Protoceratium reticulatum *och* Prorocentrum minimum.

Vid flera stationer i Skagerrak och Kattegatt observerades tunna skikt av förhöjda klorofyll a*-värden.*

En art av släktet Chrysochromulina*, som funnits i prover från Östersjön under höst och vinter dominerade planktonproven vid samtliga Östersjö-stationer. Små flagellater var vanliga, och vid två stationer observerades rester av vårblomningen.*

Den filamentösa cyanobakterien Aphanizomenon *sp. observerades i södra och östra Östersjön. Klorofyll* a*-halten var över det normala för denna månad vid BY5.*



Abstract

The diversity was low in the phytoplankton samples from the Skagerrak area. In the open Skagerrak, only small flagellated species were common. At the coast, some diatom species were common in addition to the flagellates. The chlorophyll a *concentrations were at average.*

In the Kattegat area, the same situation as at the Skagerrak coast was observed, with one exception. At Fladen, the chlorophyll a *concentrations were enhanced and quite far above average for this month. Due to this fact and to reports about crayfish behaving oddly, extra plankton sampling was made with net 0-20 meters. An ongoing diatom bloom was observed at Fladen, and a few cells of the potentially toxic dinoflagellates* Protoceratium reticulatum *and* Prorocentrum minimum.

At several stations in the Skagerrak and the Kattegat areas, enhanced chlorophyll a *concentrations were observed in thin layers.*

A species of the genus Chrysochromulina *that has been found in the samples from the Baltic throughout autumn and winter dominated at all the Baltic stations. Small flagellates were common and at two of the stations, fragments of the spring bloom were found.*

The filamentous cyanobacterium Aphanizomenon *sp. was observed in the southern and the eastern Baltic. The chlorophyll* a *concentrations were above normal for this month at BY5.*

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 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 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
Alexandrium 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 ro numbness around lips, gradually spreading to face and neck; prickly sensation in fingertips and toes; headake, dizziness, nausea, vomiting, diarrhoea. **Extreme case** Muscular paralysis; pronounced respiratory difficulty; choking sensation; death trough respiratory paralysis may occur within 2-24 hours after ingestion.
Dinophysis spp.	Diarrehetic 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.
Chattonella 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.
Pseudo- nitzschia spp.	Amnesic shellfish poisoning (ASP)	**Milda symptom:** Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramper **Extrema symptom:** Yrsel, hallucinationationer, 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 cirkel indicates that there has been no sampling at that station.

The Skagerrak

Apedinella radians

Å17 14th of April 2008 (open Skagerrak)
The plankton diversity was low in the middle of april. Only small species, like the prasinophyceae *Pyramimonas* spp., and cryptomonads were abundant. The small dinoflagellate *Heterocapsa rotundata* and the golden algae *Apedinella radians* and *Pseudopedinella* spp. were rather common.

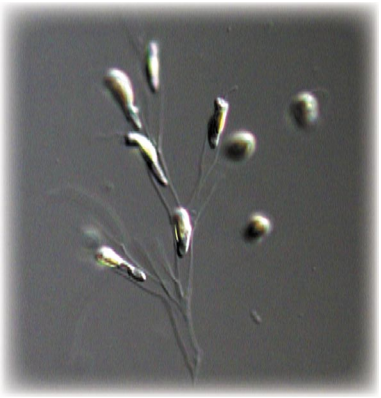
Släggö 14th of April 2008 (Skagerrak coast)
The diversity was somewhat higher as compared to Å17. Still small species were the most abundant. In addition to the species mentioned above, the diatoms *Rhizosolenia hebetata* and *Skeletonema costatum* were common. The potentially toxic dinoflagellate *Dinophysis acuminata* was observed close to its critical value.

The chlorophyll *a* concentrations were at average at all Skagerrak sampling stations.

The Kattegat

N14 Falkenberg 15th of April 2008
Cryptomonads were the most abundant in the plankton sample. *Rhizosolenia hebetata* was the most numerous diatom and *Heterocapsa rotundata* was the most common dinoflagellate. The golden algae *Dinobryon balticum* was common, and the potentially toxic dinoflagellates *Dinophysis acuminata* and *D. norvegica* were observed in low cell numbers.

Anholt E 15th and 19th of April 2008
The plankton situation was similar at the two sampling occasions. The species composition was very much the same, although the cell numbers were generally higher at the second visit. Diatoms dominated the samples, *Rhizosolenia hebetata* being the most abundant.



Dinobryon balticum

The chlorophyll *a*-concentrations were at or close to average in the whole Kattegat area except at Fladen, where chlorophyll *a* was enhanced and quite far above average for this month. Due to this fact and to reports about crayfish behaving oddly, extra plankton sampling was made with net 0-20 meters. An ongoing diatom bloom was observed with *Rhizosolenia hebetata* dominating the sample. Many other diatoms were common, for instance *Guinardia delicatula, Skeletonema costatum* and *Chaetoceros* spp. A few cells of the potentially toxic dinoflagellates *Protoceratium reticulatum* and *Prorocentrum minimum* were present, but no suggestions to why crayfish should be affected can be given on the basis of this plankton sample.

Protoceratium reticulatum

Selection of observed species Red=potentially toxic species	**Å17** **2008-04-14** **cells/l**	**Släggö** **2008-04-14** **cells/l**	**N14** **2008-04-15** **cells/l**	**Anholt E** **2008-04-15** **cells/l**	**Anholt E** **2008-04-19** **cells/l**
Chaetoceros danicus				present	present
Coscinodiscus spp.				present	
Cylindrotheca closterium	present				
Dactyliosolen fragilissimus					present
Guinardia delicatula		present	common	present	common
Lennoxia faveolata	present				
Leptocylindrus danicus		present			
Proboscia alata		present	present	present	present
Pseudo-nitzschia spp.		present	present	present	
Rhizosolenia hebetata		common	common	common	common
Rhizosolenia setigera			present	present	present
Skeletonema costatum complex		common	common	present	common
Thalassionema nitzschioides		common		present	
Alexandrium spp.		present	present	present	
Ceratium tripos				present	
Dinophysis acuminata		common	present		
Dinophysis norvegica		present	present	present	
Gyrodinium spirale			present	present	present
Heterocapsa rotundata	very common	very common	common	present	common
Heterocapsa triquetra		present			
Karlodinium micrum					present
Katodinium glaucum		present	present	present	
Oxytoxum criophilum				present	
Peridiniella danica	present	present	present	present	common
Protoceratium reticulatum		present			
Protoperidinium depressum		present	present	present	
Protoperidinium pellucidum		present			
Scrippsiella-complex		present			
Cryptomonadales spp.	very common	very common	common	common	common
Chrysochromulina spp.	present				
Apedinella radians	common	present	present		
Dinobryon balticum			common		
Dinobryon faculiferum				present	present
Pseudopedinella spp.	common		present	present	
Eutreptiella spp.	present				
Pyramimonas spp.	very common	common	present	present	present
Leucocryptos marina	present	present	present	common	common
Calliacantha longicaudata	present	present	present	present	present
Calliacantha natans			present	present	present
Laboea strobila				present	
Mesodinium rubrum		present		present	present

The Baltic Sea

Arkona Basin BY2 16th of April
A species of the genus *Chrysochromulina* has been very abundant at the Baltic stations since October. This month was no exception, the species dominated all samples when it comes to number of cells. It was interesting to see the variety of sizes in *Chrysochromulina* sp. this month. The cells have been remarkably large for this genus, the biggest being 19 µm in length, but at BY2, most of the cells were quite small this time.

The filamentous cyanobacterium *Aphanizomenon* sp. was common, as were small cryptomonads, the dinoflagellate *Heterocapsa rotundata* and the prasinophyceae *Pyramimonas* spp.

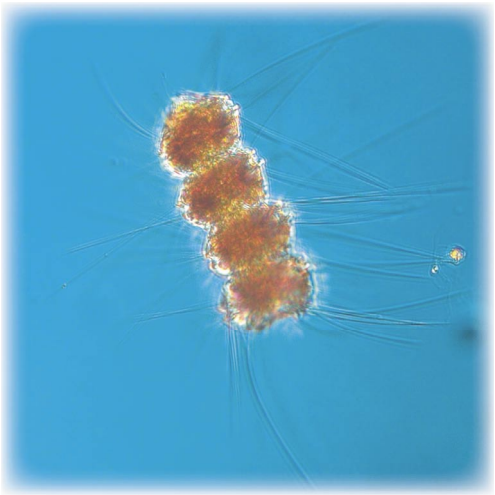
Bornholm Basin BY5 16th of April
Chrysochromulina sp. dominated the plankton sample. Small flagellated species were common, like the golden algae *Dinobryon balticum,* the prasinophyceae *Pyramimonas* spp., and the dinoflagellate *Heterocapsa rotundata.* The filamentous cyanobacteria *Anabaena* sp. and *Aphanizomenon* sp. were observed in very low numbers.

The South East Baltic BCS III-10 16th of April and BY 38 17th of April
Chrysochromulina sp. dominated the sample and the cyanobacterium *Aphanizomenon* sp. and the dinoflagellate *Peridiniella catenata* were common. *H. rotundata* and *Pyramimonas* spp were very numerous.

Eastern Gotland Basin BY15 17th of April Kalmar Sound Ref. M1-V1 18th of April
Fragments of the past spring bloom were obvious due to the presence of diatoms like *Skeletonema costatum, Thalassiosira* spp. and *Chaetoceros* spp. Except for these diatoms, the plankton situation was similar to the ones at BCS III-10 and BY38.

The chlorophyll *a* concentrations were enhanced but within average at BCS III-10 and at BY20. At BY5 the concentration was above average.

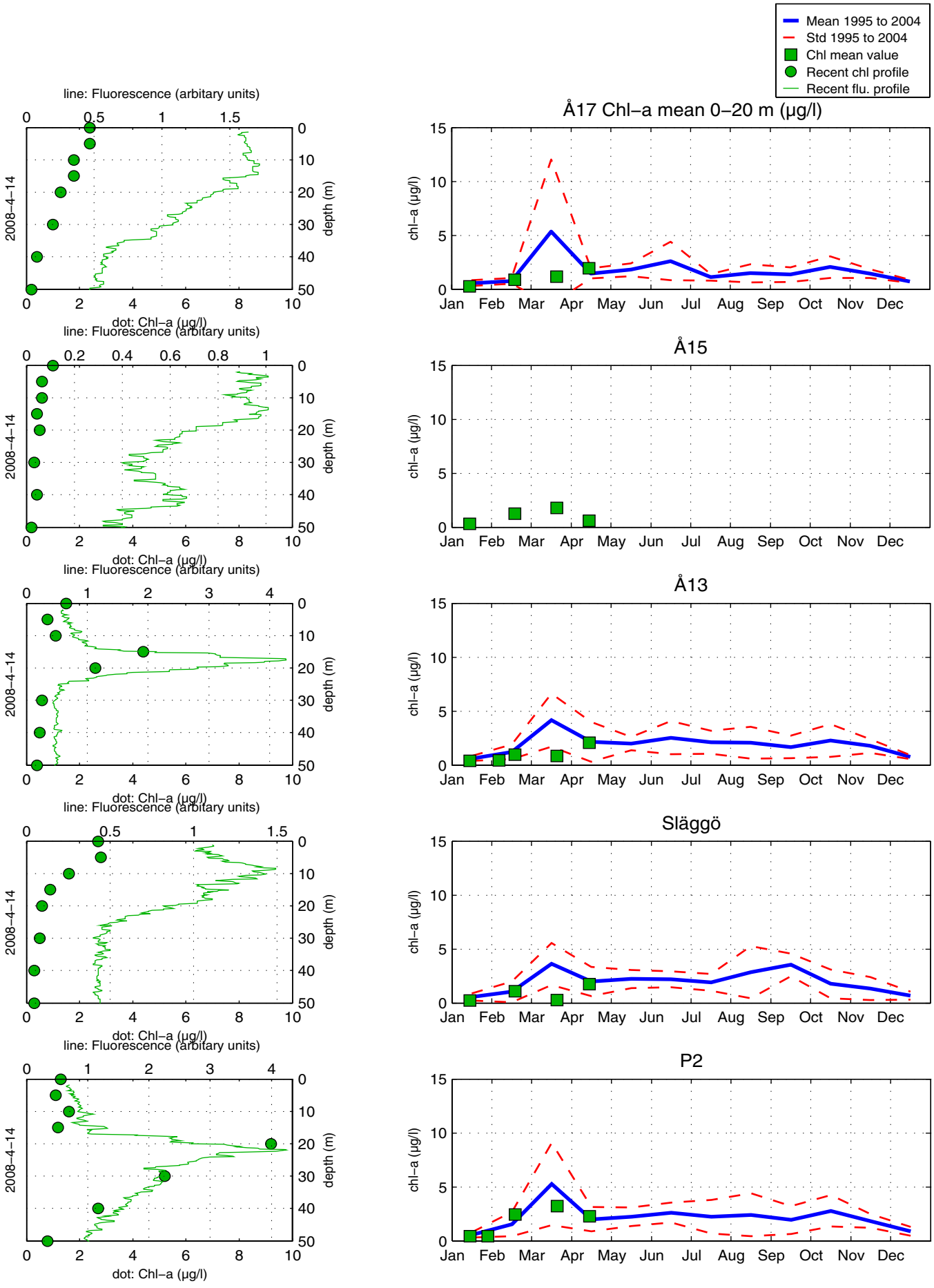
Phytoplankton analysis and text by:
Ann-Turi Skjevik



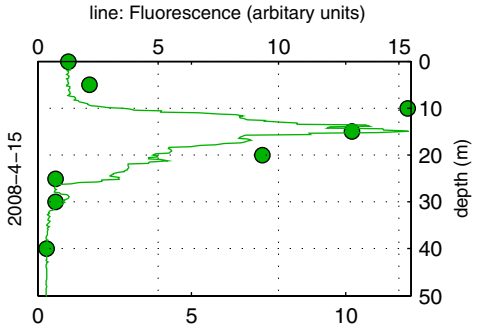
Peridiniella catenata

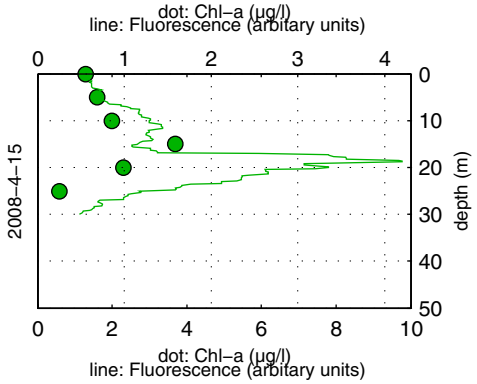
Selection of observed species Red=potentially toxic species [1] quantified in m/l	**BY2** **2008-04-16** **cells/l**	**BY5** **2008-04-16** **cells/l**	**BCS III-10** **2008-04-16** **cells/l**	**BY15** **2008-04-17** **cells/l**	**BY38** **2008-04-17** **cells/l**	**Ref. M1-V1** **2008-04-18** **cells/l**
Attheya spp.	present					
Chaetoceros impressus				present		
Cyclotella choctawhatcheeana				present		
Skeletonema costatum complex	present			common		common
Thalassiosira spp.				present	present	
Amphidinium crassum					present	present
Amphidinium sphenoides		present	present			present
Amylax sp.			present			
Dinophysis acuminata		present	present	present	present	present
Gymnodiniales spp.	common	common	common	present	present	common
Heterocapsa rotundata	common	common	very common	very common	common	common
Heterocapsa triquetra	present					
Karlodinium micrum		present				
Katodinium glaucum	present		present			
Peridiniella catenata	present	present	very common	very common	common	present
Peridiniella danica	present	present	present	present		
Chrysochromulina sp.	dominating	dominating	dominating	dominating	dominating	dominating
Cryptomonadales spp.	very common	common	common	present	common	common
Pyramimonas spp.	common	very common	very common	common	common	very common
Dinobryon balticum		common	present			common
Dinobryon faculiferum	present	present				present
Calliacantha longicaudata		present		present	present	
Calliacantha natans	present	present	present	present	present	
Anabaena spp.		present				
Aphanizomenon sp.	common	present	common	present		
Ebria tripartita		present				
Mesodinium rubrum	present	present	present	present	present	present

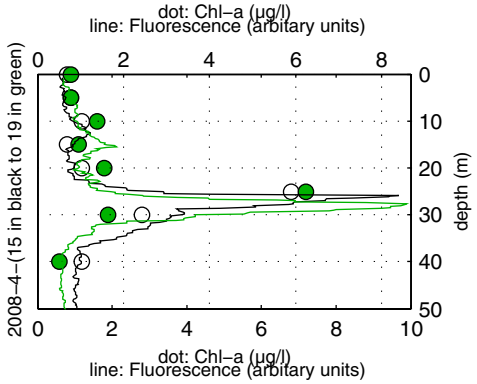
The Skagerrak

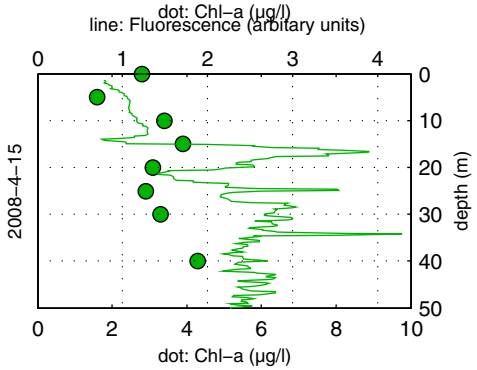


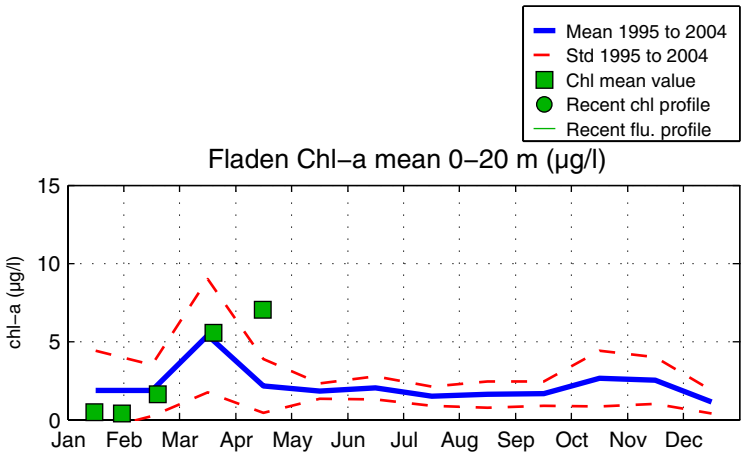
The Kattegat and the Sound

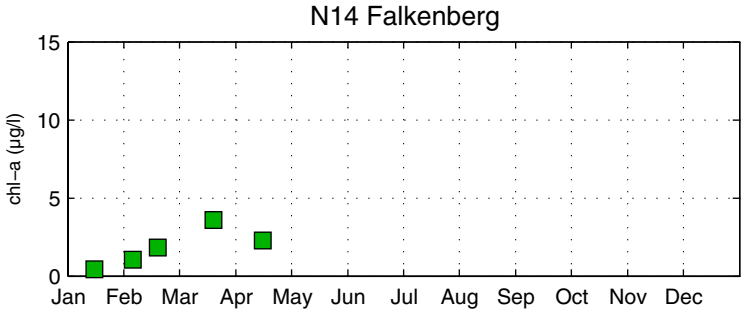


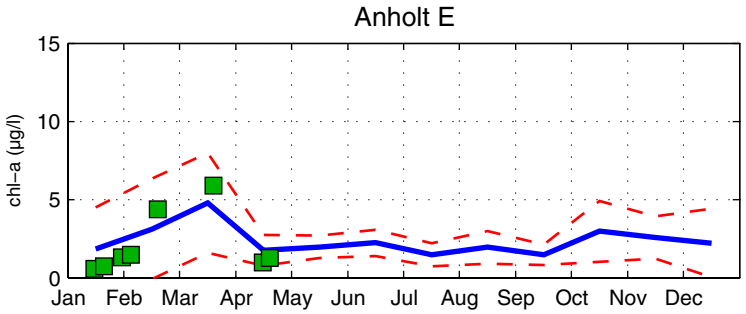


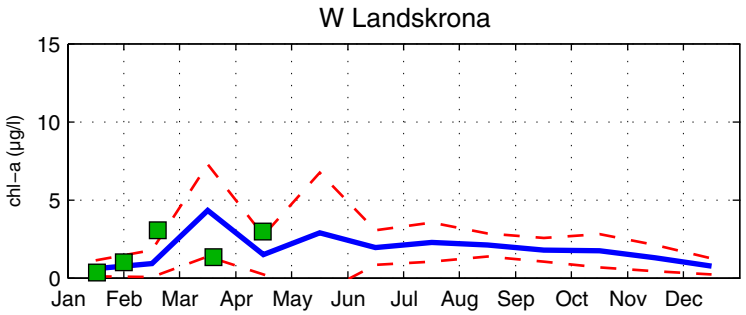




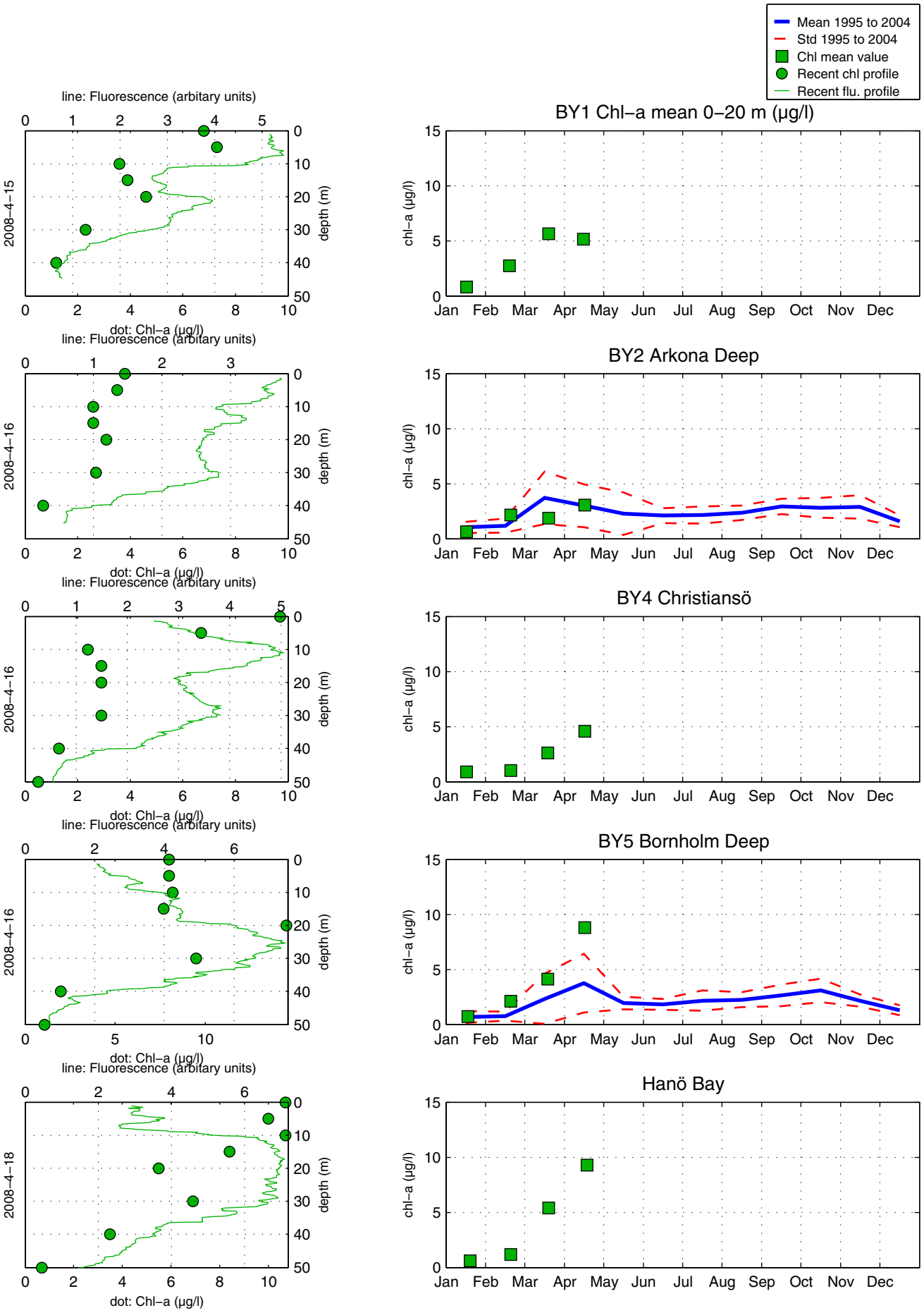




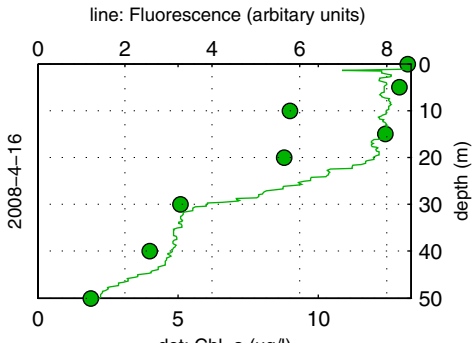


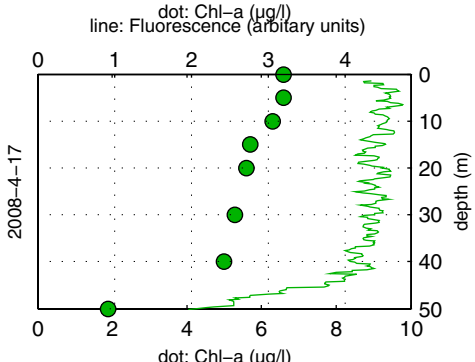


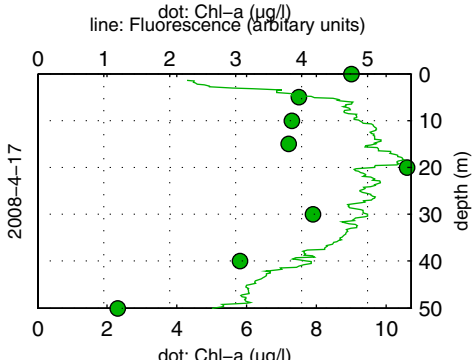
The Southern Baltic

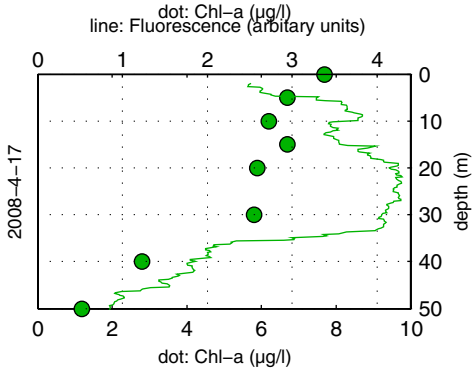


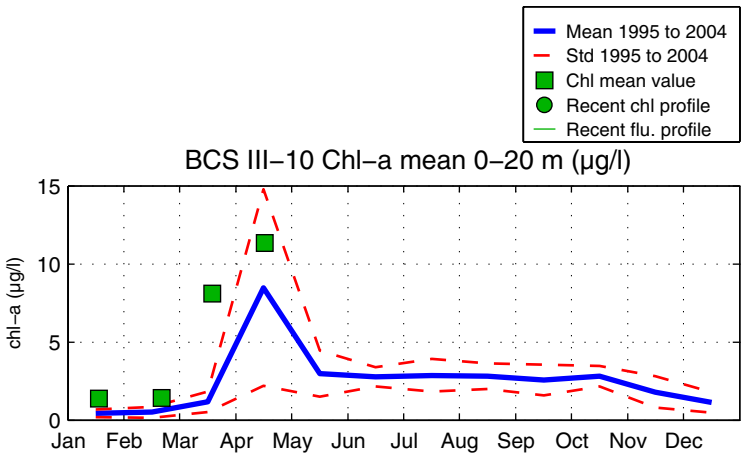
The Eastern Baltic

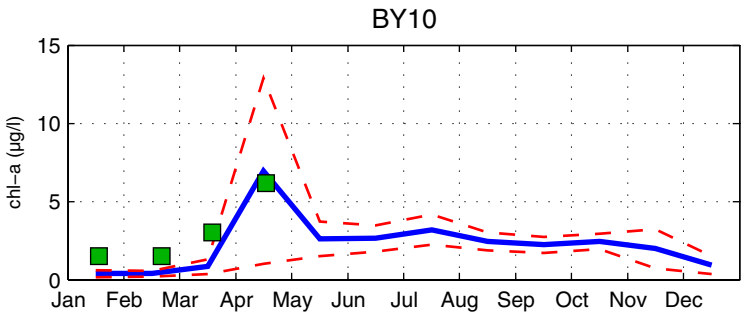


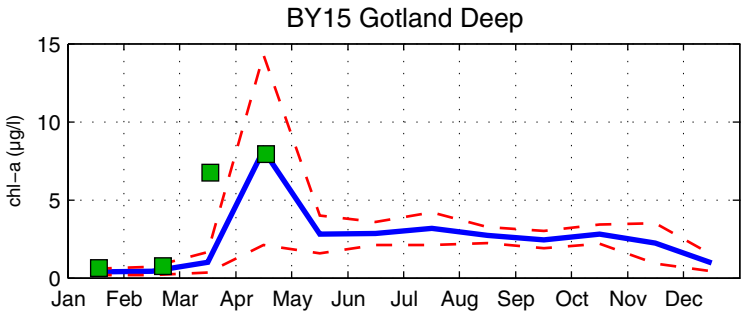


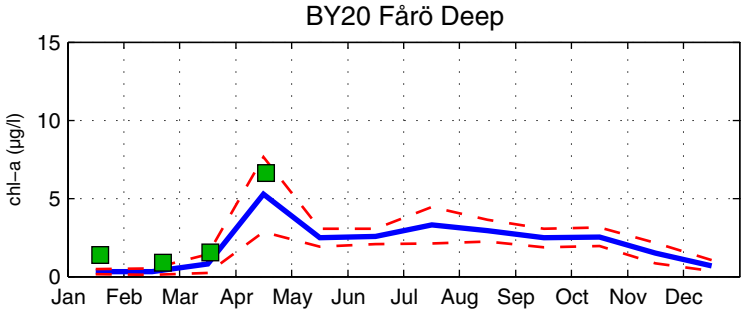




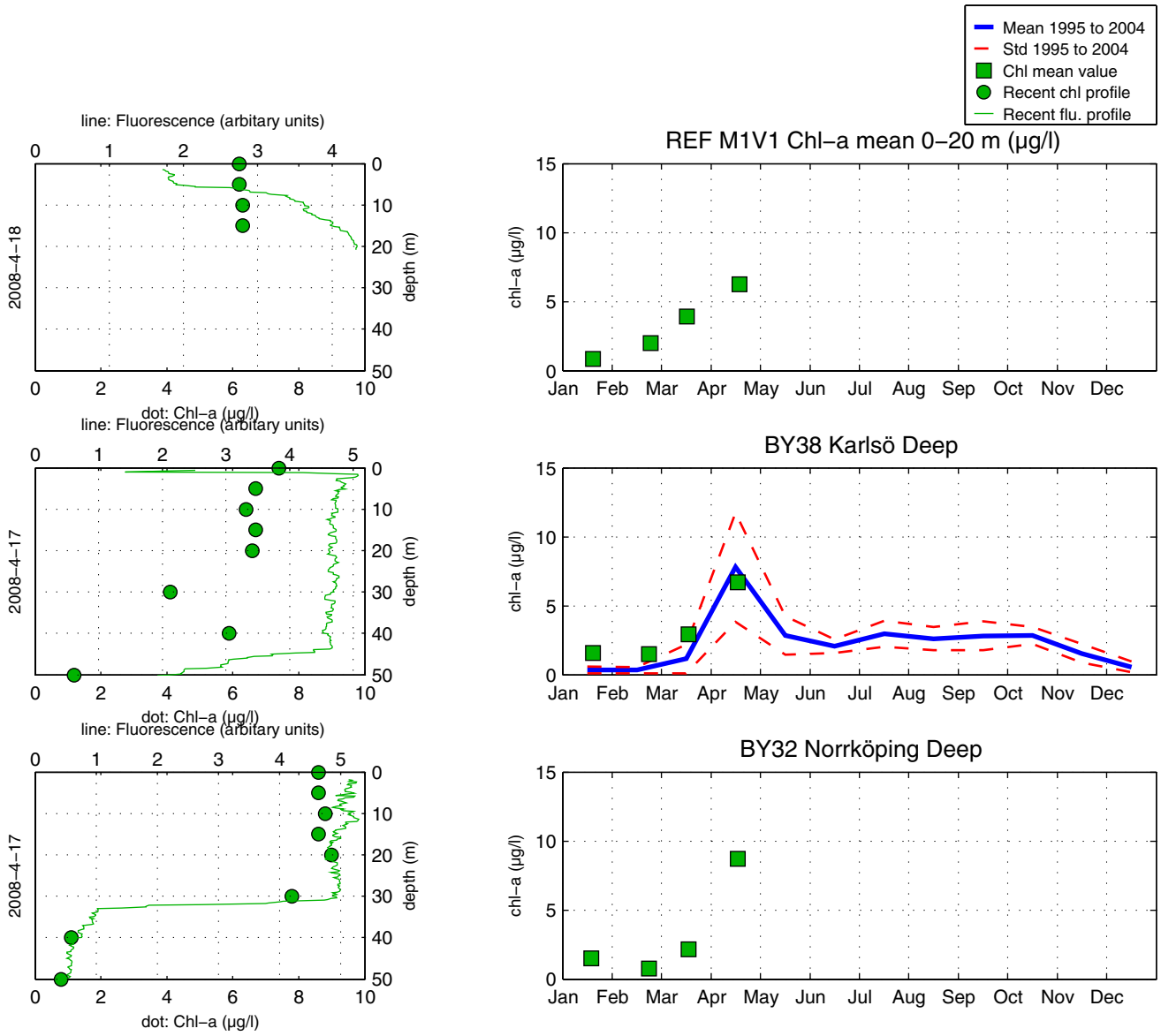








The Western Baltic



Om klorofylldiagrammen

Klorofyll *a* är ett mått på mängden växtplankton. Prover tas från ett antal djup 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 layes of phytoplankton occuring below the surface.