SMHI
Oceanographic Unit
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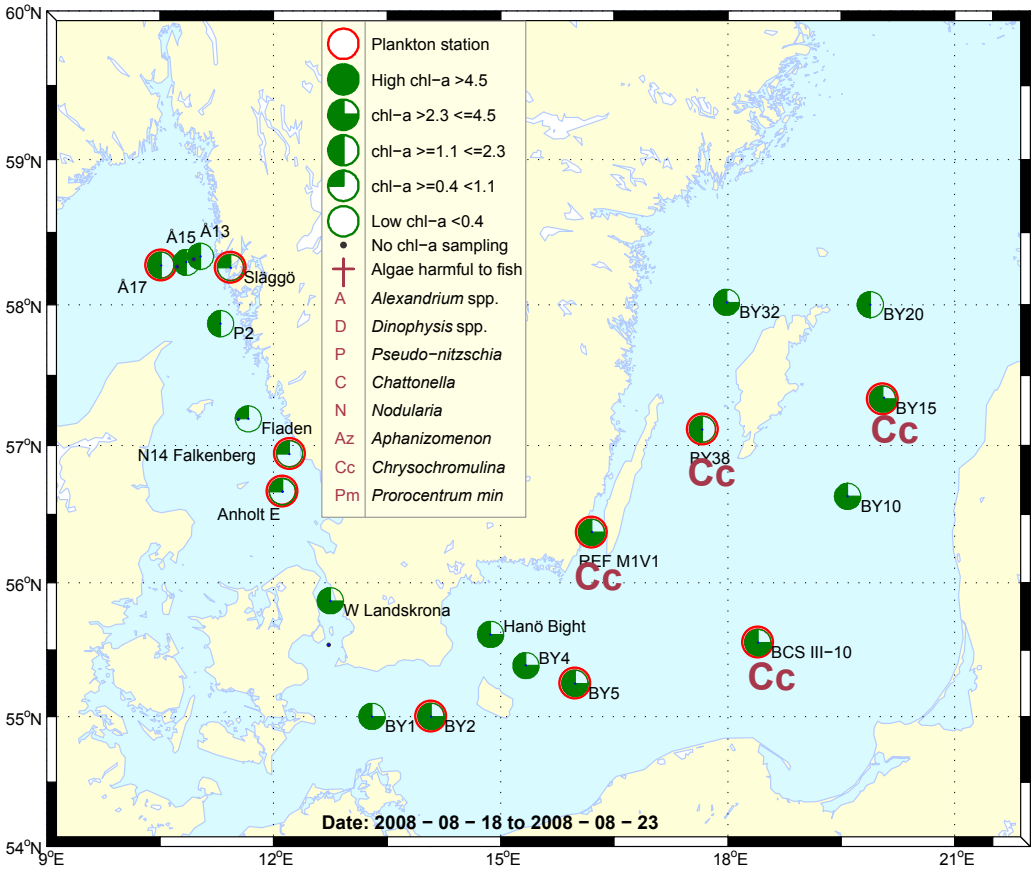
AlgAware
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

I Skagerrak innehöll växtplanktonproverna få arter med låga cellantal. I Kattegatt var diversiteten låg, dock högre vid Anholt än vid N14. De integrerade (0-10 meter) klorofyll *a*-halterna var inom eller nära det normala för denna månad vid alla stationer i Skagerrak och Kattegatt, men det var några intressanta klorofyll-maxima på omkring 20 meters djup vid flera stationer.

Det var generellt låg diversitet i växtplanktonproverna från Östersjön. Cyanobakterier fanns i små mängder vid de flesta stationer, och var vanliga enbart vid BY2 och i Kalmar sund. De integrerade (0-10 meter) klorofyll *a*-halterna var inom det normala för denna månad vid alla Östersjöstationer.



Abstract

The phytoplankton samples were poor when it comes to number of species and cell numbers in the Skagerrak area. In the Kattegat, the diversity was higher at Anholt than at N14, but still quite low. The integrated (0-10 meters) chlorophyll a concentrations were at average or close to average at all stations in the Skagerrak and Kattegat areas, but there were some interesting chlorophyll peaks at around 20 meters at some stations.

Diversity was low at the phytoplankton stations in the Baltic Sea. Cyanobacteria were found in low amounts at most stations, and were common at BY2 and in the Kalmar Sound only. The integrated (0-10 meters) chlorophyll a concentrations were at average at all of the Baltic stations.
concentrations were above average in the Eastern Baltic.

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

Å17 18th of August (open Skagerrak)
The phytoplankton diversity was low. A few species were found in low numbers and the most numerous genus was the prasinophyte *Pyramimonas* spp.

Släggö 18th of August (Skagerrak coast)

Skeletonema costatum

The phytoplankton diversity was higher in comparison to Å17 although cell numbers were moderate. The most numerous diatom was *Skeletonema costatum* and the most numerous dinoflagellate was *Heterocapsa* cf. *minima*.

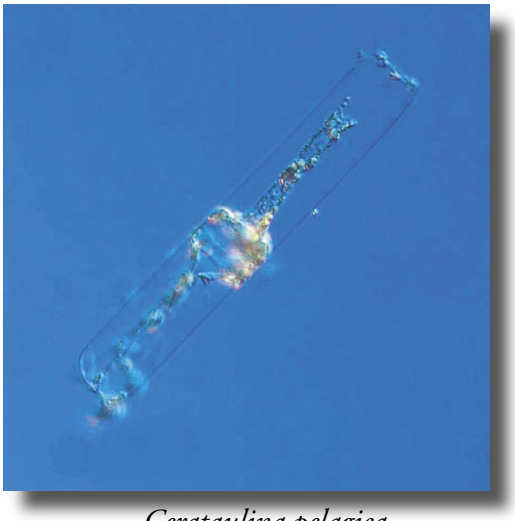
The chlorophyll *a* concentrations were at average in the Skagerrak area.

The Kattegat

N14 Falkenberg 19th of August
Cell numbers were very low, and the most numerous species was the dinoflagellate *Heterocapsa rotundata*.

Anholt E 19th and 23rd August
Heterocapsa rotundata was the most numerous dinoflagellate and the diatoms *Cerataulina pelagica, Guinardia delicatula* and *Pseudo-Nitzschia* spp.* were common at both occasions. At the first visit, the prasinophyte *Pyramimonas* spp. was common and the prymnesiophyte *Chrysochromulina* spp.* at the second stop.

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



Cerataulina pelagica

Selection of observed species Red=potentially toxic species	**Å17** **2008-08-18** **cells/l**	**Släggö** **2008-08-18** **cells/l**	**N14** **2008-08-19** **cells/l**	**Anholt E** **2008-0819** **cells/l**	**Anholt E** **2008-08-23** **cells/l**
Cerataulina pelagica	present		present	present	
Chaetoceros contortus				present	
Chaetoceros danicus			present		
Chaetoceros decipiens		present			
Chaetoceros laciniosus		present		present	
Chaetoceros similis			present		
Chaetoceros subtilis			present		
Chaetoceros spp.		present	present	common	
Cylindrotheca closterium	present	60 000		present	common
Dactyliosolen fragilissimus	present		present	common	common
Guinardia delicatula	present	present	present	common	common
Guinardia flaccida			present	present	present
Leptocylindrus danicus		present	common	present	common
Leptocylindrus minimus		present	present		present
Phaeodactylum tricornutum					
Proboscia alata		present	present		present
Pseudo-nitzschia spp.		30 000	common	common	common
Rhizosolenia hebetata		present			
Rhizosolenia pungens			present	present	present
Skeletonema costatum complex		230 000	present	present	present
Ceratium furca	present	present	present	present	present
Ceratium fusus			present	present	present
Ceratium lineatum	present	present		present	present
Ceratium longipes		present			
Ceratium macroceros		present			
Ceratium tripos			present	present	present
Dinophysis acuminata	present				
Dinophysis norvegica			present		
Heterocapsa cf. *minimum*	present	present			
Heterocapsa rotundata	present	present	common	30 000	38 000
Heterocapsa triquetra		present			
Karlodinium micrum	present		present		
Lingulodinium polyedrum		present			
Oxytoxum gracile		present			
Peridiniella danica	present		present		
Prorocentrum micans		10 000	present	present	present
Scrippsiella-complex				present	
Torodinium robustum	present				
Cryptomonadales spp.	19 000	97 000	present	87 000	20 000
Chrysochromulina spp.	present	present	present	10 000	28 000
Dictyocha fibula		present			
Dictyocha speculum		present			
Dinobryon balticum			common	common	common
Dinobryon faculiferum			present		
Pyramimonas spp.	45 000	present	present	20 000	present
Leucocryptos marina				present	
Mesodinium rubrum		present		present	
Strombidium spp.	present	present	present	present	present

The Baltic Sea

Arkona Basin BY2 20th of August

Small cryptomonads and the prasinophyte *Pyramimonas* spp. were the most numerous. *Heterocapsa rotundata* was the most common dinoflagellate, and the cyanobacterium *Aphanizomenon* spp. was also common.

Bornholm Basin BY5, 20th of August

The phytoplankton situation was very similar to the one at BY2, except that the dinoflagellate *Prorocentrum minimum** was very common, and the cell number of *H. rotundata* was higher than at BY2.

South East Baltic BCS III-10 21st of August

Cryptomonads, *Pyramimonas* spp. and the prymnesiophyte *Chrysochromulina* spp.* were very numerous. The dinoflagellate *Heterocapsa rotundata* was common and *P. minimum** was present. The diatom *Chaetoceros impressus* was very numerous. Low amounts of the cyanobacterium *Aphanizomenon* spp. were observed.

Eastern Gotland Basin BY15 21st and Western Gotland Basin BY 38 22nd of August

Cryptomonads, *Pyramimonas* spp. and the prymnesiophyte *Chrysochromulina* spp.* were the most common. The dinoflagellate *Heterocapsa rotundata* and the diatom *Chaetoceros impressus* were present.

Kalmar Sound Ref. M1-V1 22nd of August

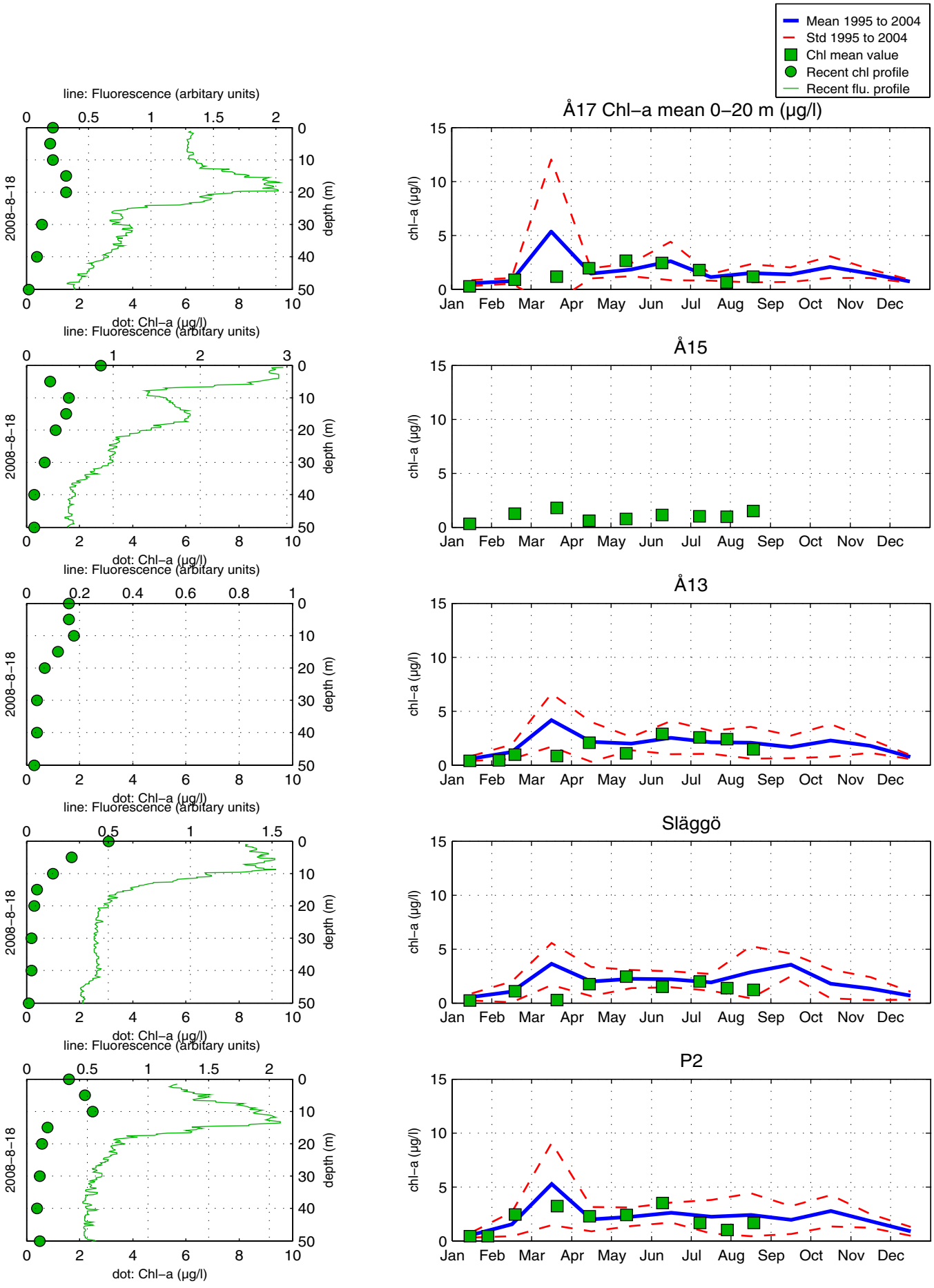
The cyanobacteria *Anabaena* spp., *Aphanizomenon* spp. and *Nodularia spumigena* were found and were quite common. Several species of dinoflagellates and diatoms were observed. Of the former, *Heterocapsa rotundata*, *H. triquetra* and *Prorocentrum minimum** were the most common. The diatom with the highest cell numbers was *Cyclotella choctawhatcheana* and the prymnesiophyte *Chrysochromulina* spp.* was common.

Prorocentrum minimum

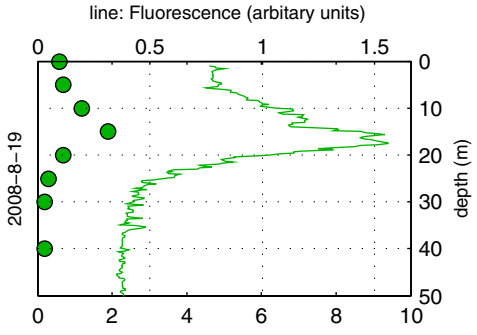
Phytoplankton analysis and text by: Ann-Turi Skjevik

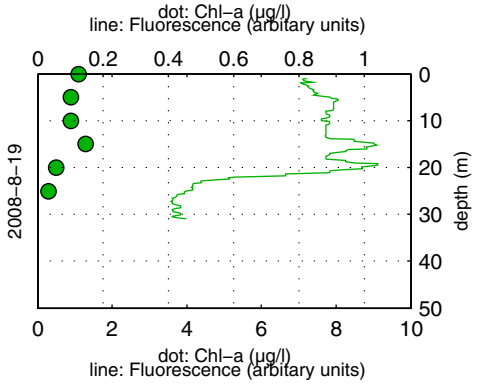
Selection of observed species Red=potentially toxic species [1] quantified in m/l	**BY2** **2008-08-20** **cells/l**	**BY5** **2008-08-20** **cells/l**	**BCS III-10** **2008-08-20** **cells/l**	**BY15** **2008-08-21** **cells/l**	**BY38** **2008-08-22** **cells/l**	**Ref. M1-V1** **2008-08-22** **cells/l**
Chaetoceros danicus					present	
Chaetoceros impressus			36 000	common	12 000	
Cyclotella choctawhatcheana	present					18 000
Cylindrotheca closterium	present					present
Pseudo-nitzschia spp.	present					
Rhizosolenia pungens	present					
Skeletonema costatum complex						present
Thalassiosira spp.						present
Ceratium fusus	present					
Ceratium tripos	present					
Cladopyxis claytonii	present					present
Dinophysis norvegica						present
Dinophysis rotundata				present		present
Gonyaulax cf. *digitale*		present				
Heterocapsa rotundata	common	76 000	present	present	common	present
Heterocapsa triquetra	present					common
Karlodinium micrum		present				
Katodinium glaucum						
Prorocentrum minimum	present	85 000	present			common
Chrysochromulina spp.	present	present	280 000	114 000	very common	very common
Cryptomonadales spp.	330 000	332 000	1 080 000	510 000	very common	very common
Pyramimonas spp.	230 000	405 000	575 000	52 000	very common	very common
Anabaena spp.	present					common
Aphanizomenon spp.	common	present	present	present	common	common
Nodularia spumigena						common
Ebria tripartita	present			present		
Leucocryptos marina	present	present				
Mesodinium rubrum		present	present	10 000	present	present
Strombidium spp.	present	present	present	present	present	present

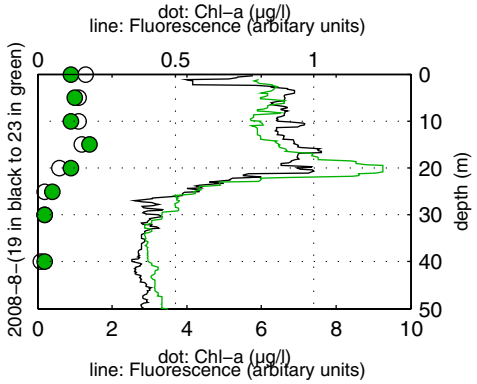
The Skagerrak

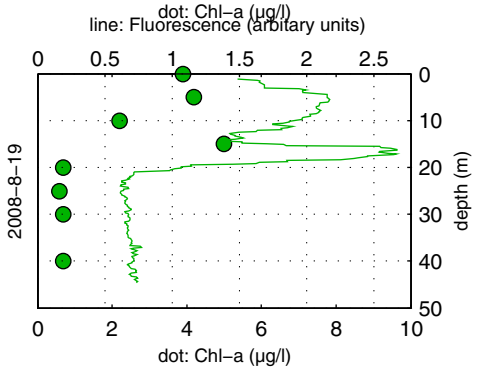


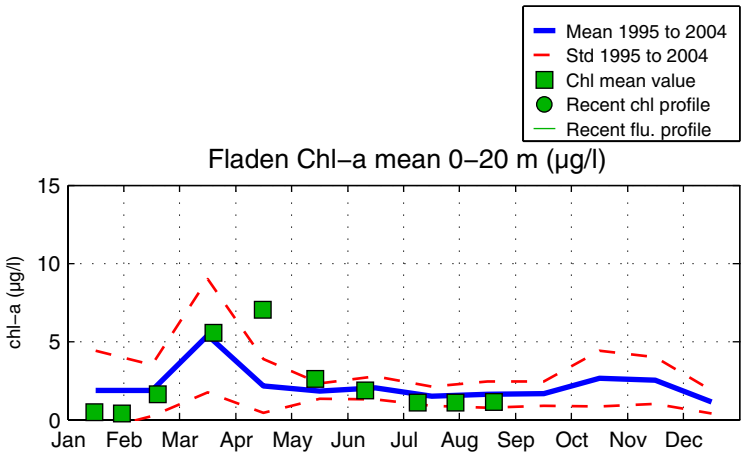
The Kattegat and the Sound

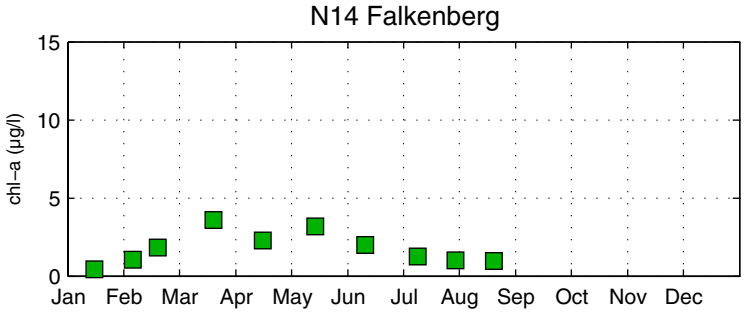


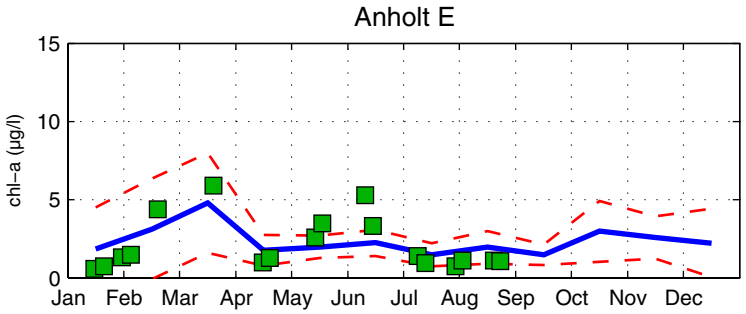


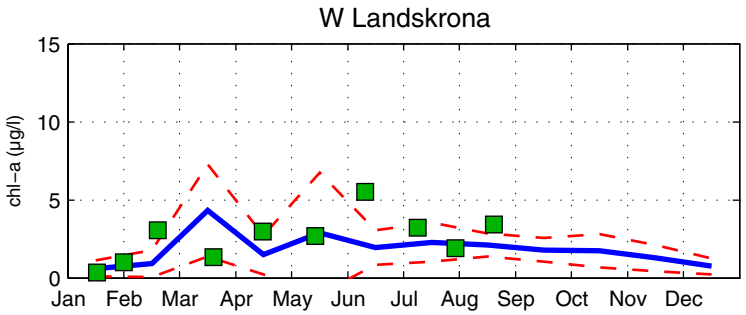




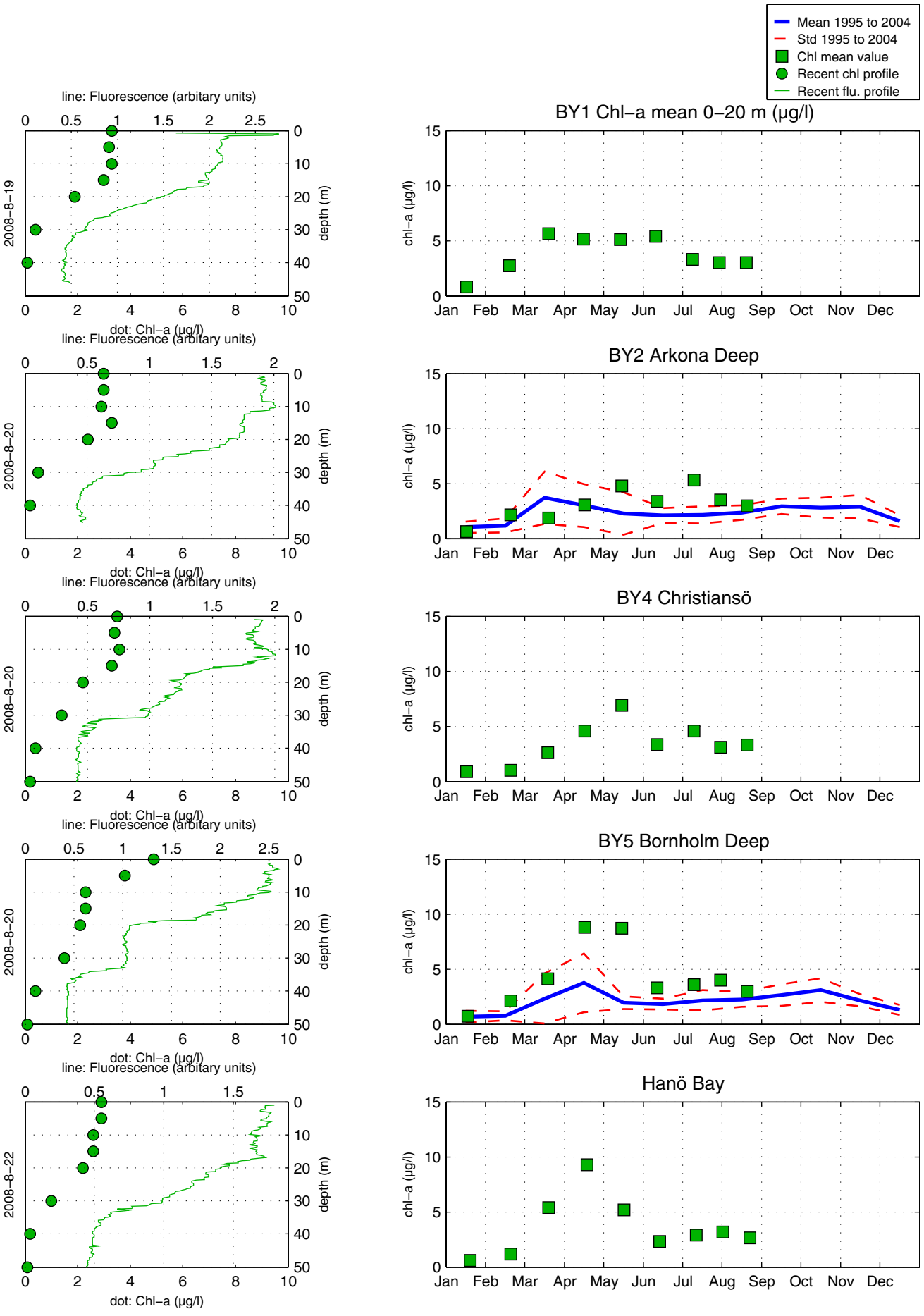




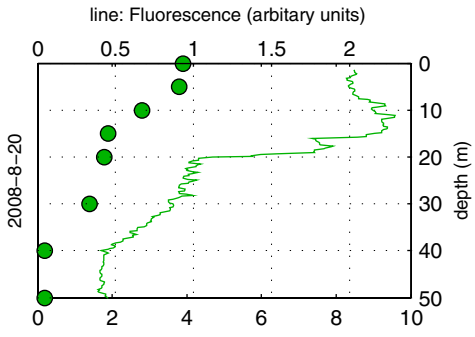


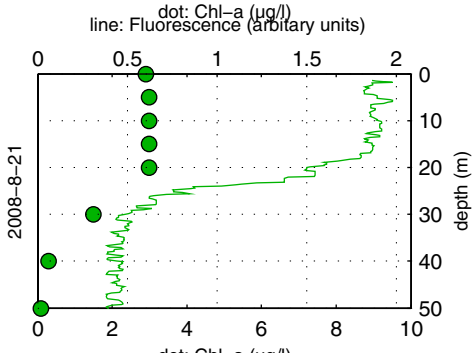


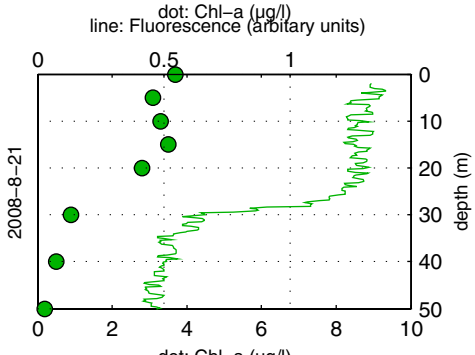
The Southern Baltic

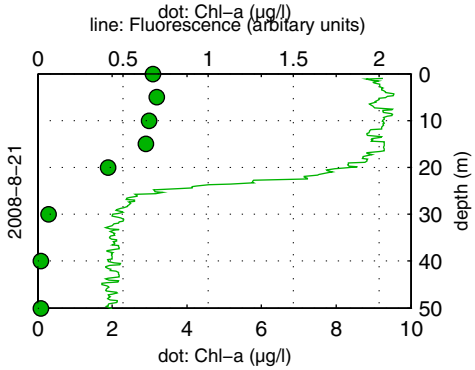


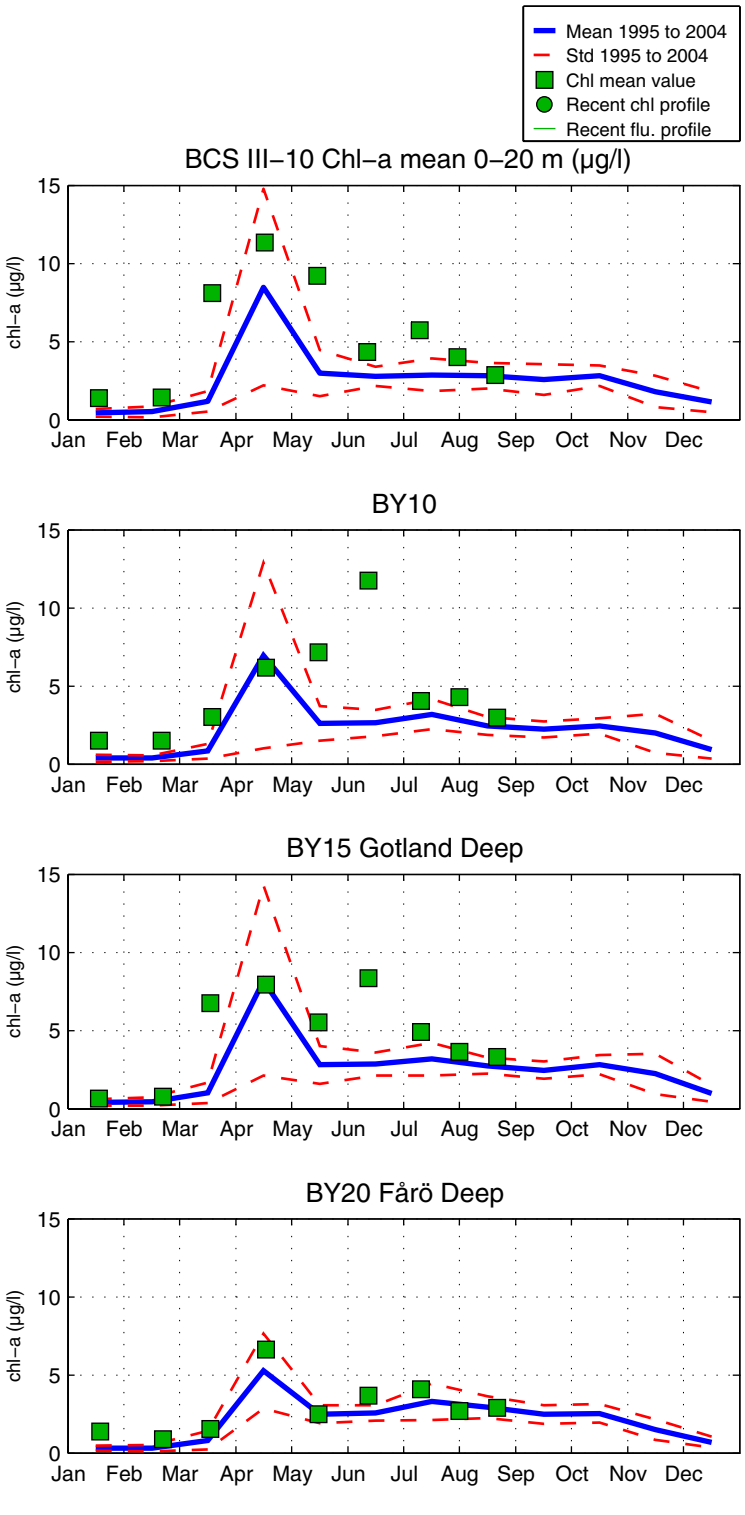
The Eastern Baltic



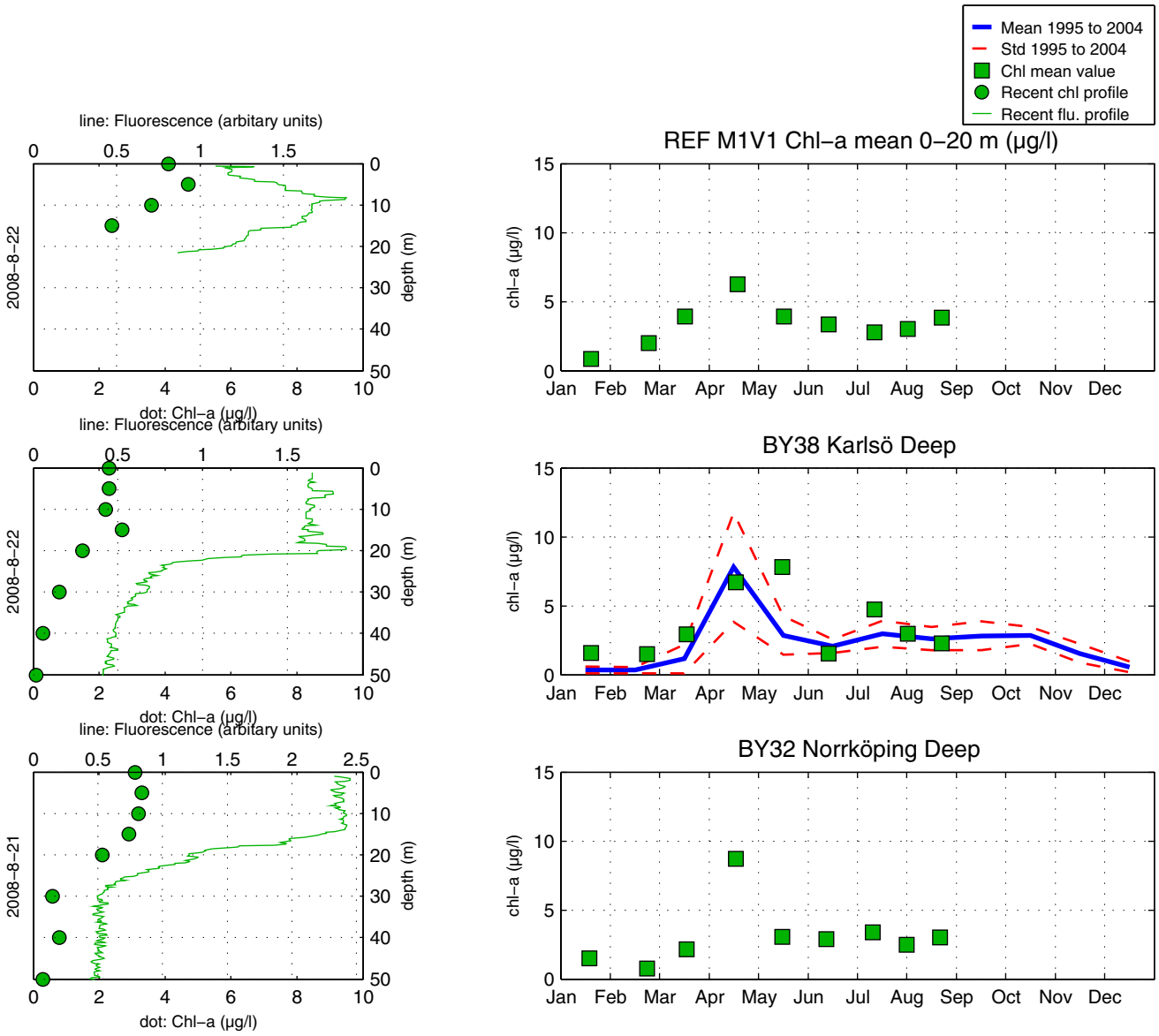








The Western Baltic



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.