SMHI
Oceanographic Unit
No 8, Augusti 2013

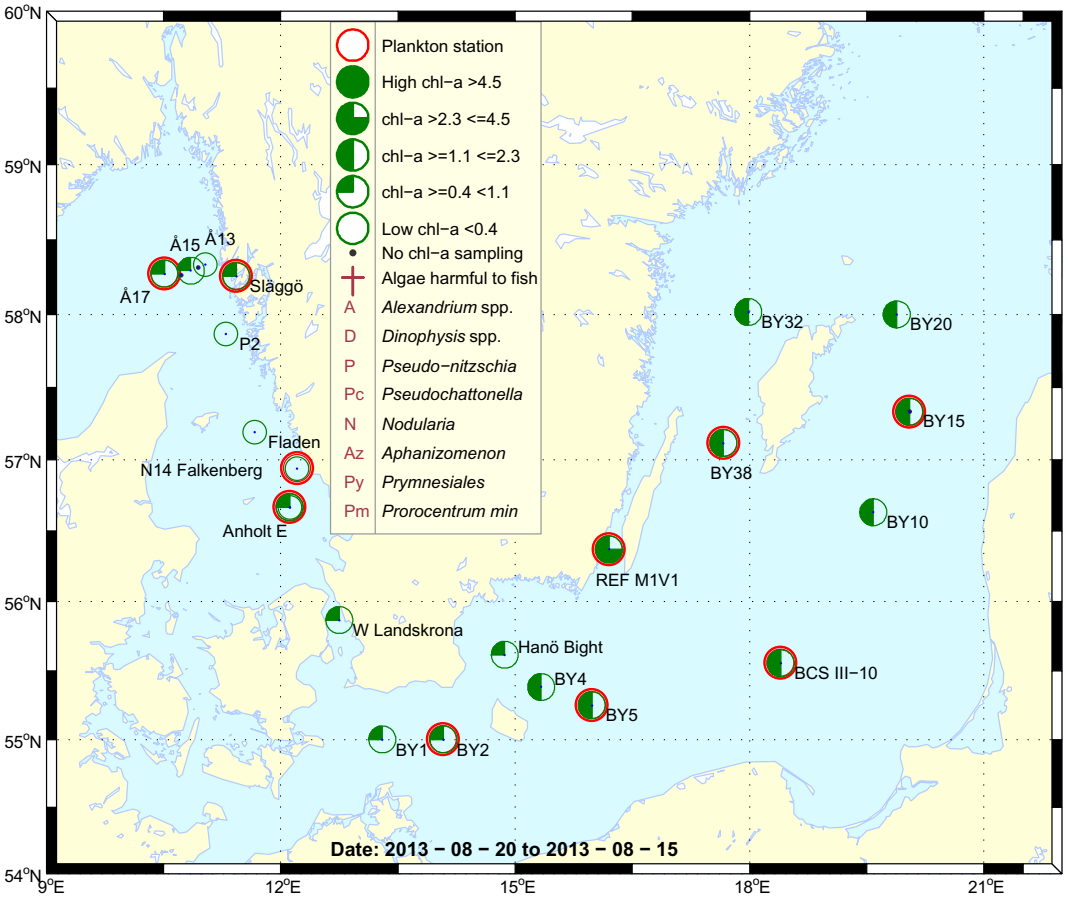
AlgAware
ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

Sammanfattning
Rapporten innehåller resultat från två utsjöresor i augusti.

Växtplanktondiversiteten var låg i Skagerrak och Kattegatt. Bara små arter fanns i höga cellantal, exempelvis kalkflagellaten *Emiliania huxleyi*, som är känd för att färga havet turkost när den blommar. Klorofyllhalterna var låga i områdena, men inom det normala förutom vid N14 där klorofyllvärdena låg under detektionsgränsen.

Små arter dominerade proverna även från Östersjön. Filamentösa cyanobakterier var vanligt förekommande vid BY5, BY15, BY38 och vid RefM1V1. Vid RefM1V1 återfanns högst antal celler och arter, dominerade av kolonier av pikocyanobakterier.

Klorofyll *a*-halterna var inom det normala för denna månad.



Abstract
This report offers results from two August cruises.

The phytoplankton diversity was low in the Skagerrak and the Kattegat areas. Merely small species were found in high cell numbers, i.e. the coccolithophorid *Emiliania huxleyi,* known to colour the ocean turquoise when blooming. The chlorophyll *a* concentrations were within normal in the areas except at N14 where the concentration was below the detection limit.

Small species dominated the Baltic samples. Filamentous cyanobacteria were common at BY5, BY15, BY38 and RefM1V1. The highest numbers of cells and species were found at RefM1V1, where colonies of pico cyanobacteria dominated.

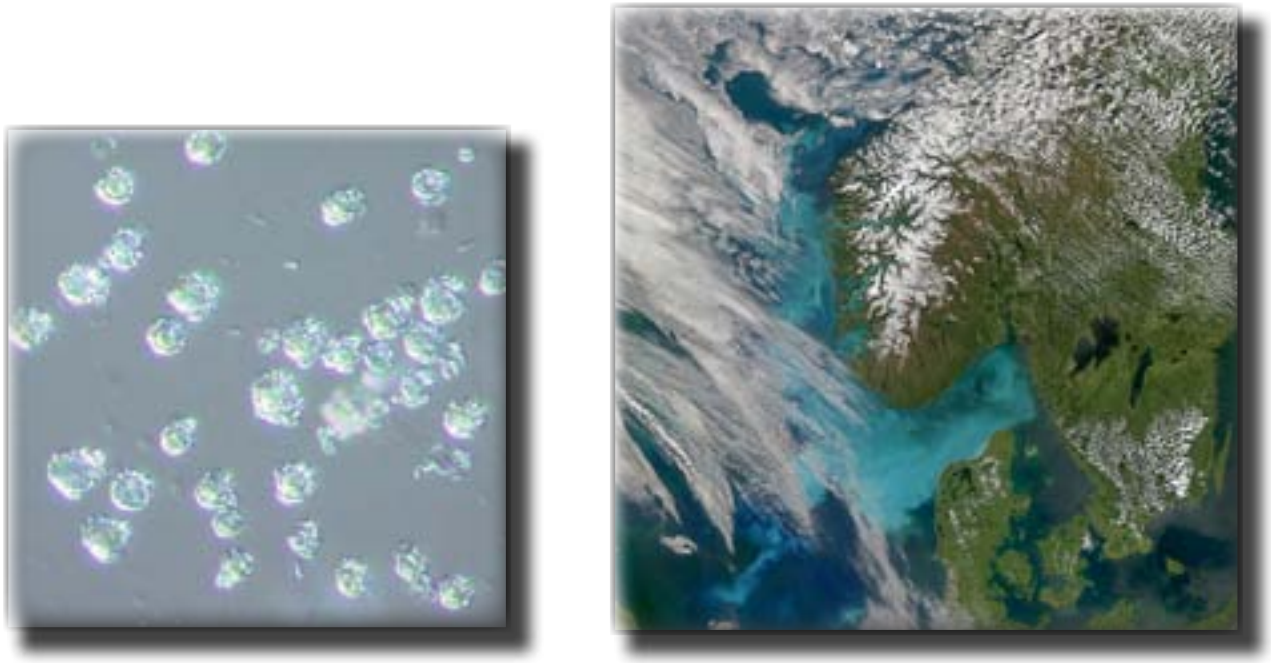
The chlorophyll *a* concentrations were within normal for this month.

More detailed information on species composition and abundance

The Skagerrak

Å17 12th of August
The phytoplankton diversity was very low. Only a few cells were found in the sample. Most common were cells from the order prymnesiales, formerly called *Chrysochromulina*. Quite a few ciliates were found.

Släggö 12th of August
The phytoplankton diversity was a bit higher at this station compared to Å17. Some diatoms such as *Skeletonema marinoi* and *Leptocylindrus danicus* were found in high cell numbers. The most common group was however small flagellates such as different cells belonging to the order prymnesiales. The coccolithophorid *Emiliania huxleyi* was present in low amounts.



The coocolithophorid *Emiliania huxleyi* as seen in the light microscope and from satellite (the turqoise). The pictures are from blooms during spring 2009 and 2010 respectively.

The Kattegat

N14 Falkenberg 12th of August
The phytoplankton diversity was very low. Only a few cells were present in the sample. The coccolithophorid *Emiliania huxleyi* dominated the cell numbers with about 160 000 cells per liter.

Anholt E 13th and 15th of August
The diversity was very low in the phytoplankton samples from both of the visits, small flagellates were common, among which the coccolithophorid *Emiliania huxleyi* was found.

The Baltic Sea

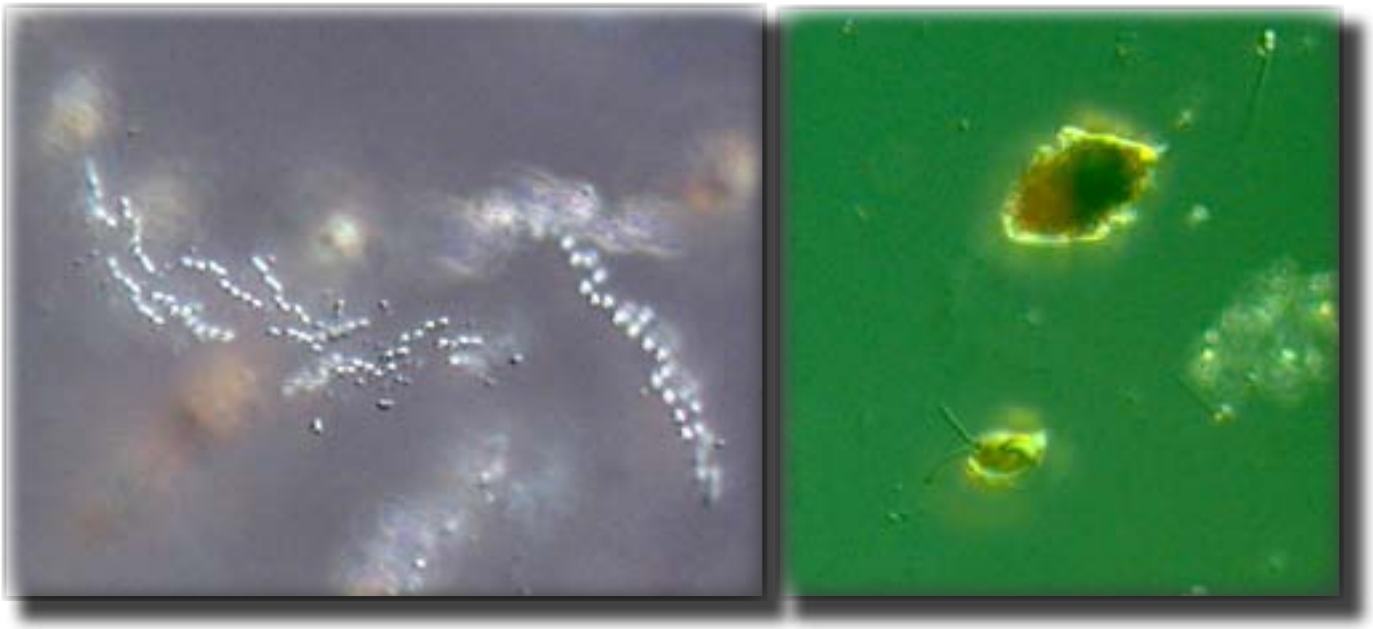
BY2 Arkona 14th of August
Small flagellates were common, *Pyramimonas* spp. amongst others. The diatoms *Chaetoceros impressus* and *C. wighamii* were present.

BY5 Bornholms Deep 14th of August
The filamentous cyanobacterium *Aphanizomenon flos-aquae* was common. Small flagellates were abundant of which *Pyramimonas* spp. was numerous. The diatom *Chaetoceros impressus* was common.

BCSIII-10 and BY15 22nd of August
The phytoplankton sample was dominated by small flagellates among which Cryptomonads and *Pyramimonas* spp. were abundant. The diatom *Chaetoceros impressus* was present. Prymnesiales cells were common. The cyanobacterium *Aphanizomenon flos-aquae* was common at BY15.

BY38 21st of August
The filamentous cyanobacterium *Aphanizomenon flos-aquae* and colonies of pico cyanobacteria were common. Small flagellates of various kinds were abundant

Ref M1V1 Kalmar Sound 21st of August
Dense colonies of different kinds of pico cyanobacteria dominated the phytoplankton sample. Equal, rather high, amounts of the filamentous cyanobacteria *Anabaena* spp., *Aphanizomenon flos-aquae* and *Nodularia spumigena** were present. *Cyclotella choctawhatcheana* and *Chaetoceros impressus* were the most common diatoms. Dinoflagellates were scarce, but *Dinophysis norvegica* and *Heterocapsa triquetra* were found in low numbers. Cryptomonads, Prymnesiales, *Pyramimonas* spp. and other small flagellates were numerous.



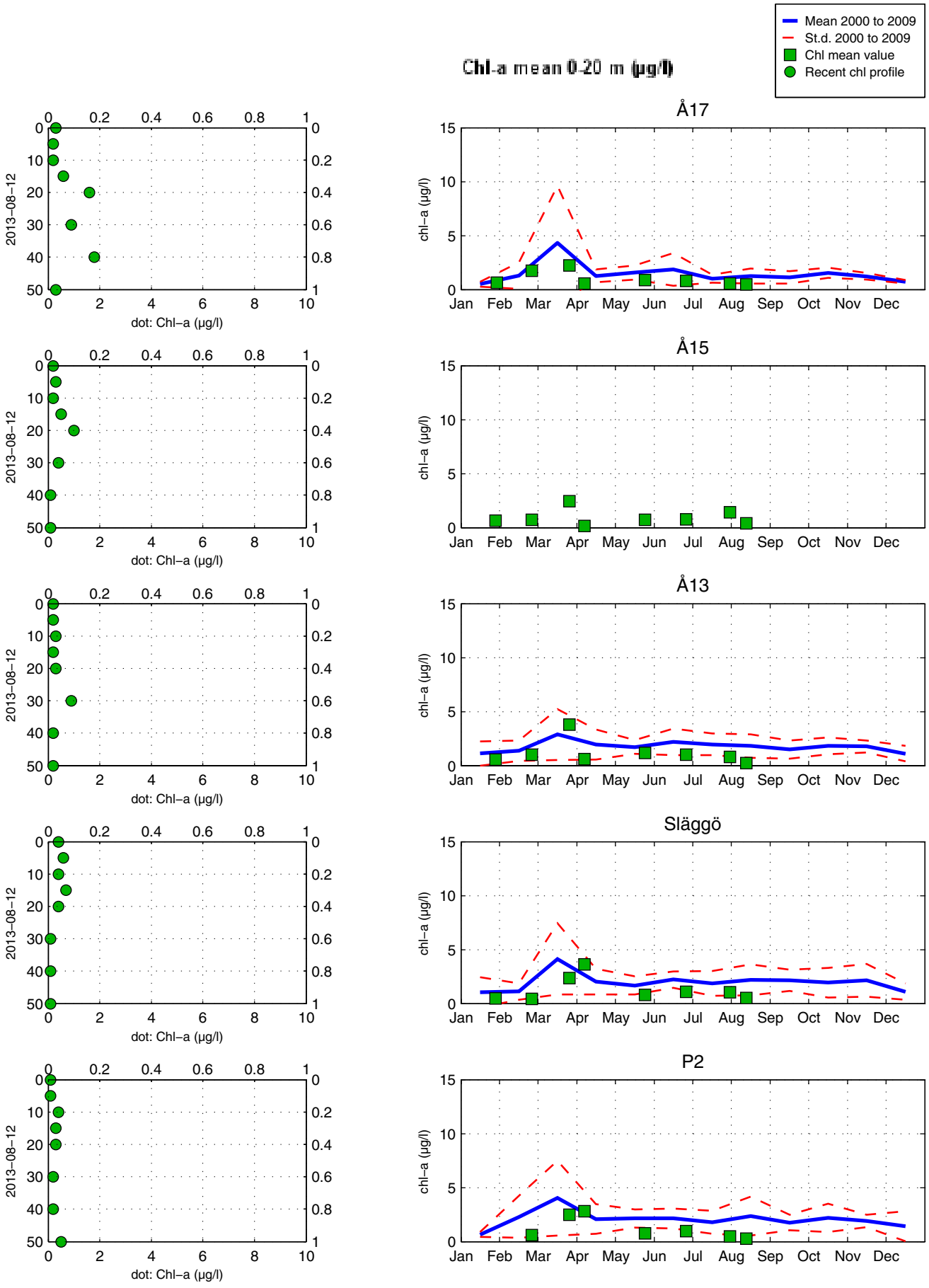
The pico cyanobacterium *Aphanothece parallelliformis* in the picture to the left. The dinoflagellate *Heterocapsa triquetra* (the larger cell) and a crypomonad in the right hand picture. Both shots are from the Ref M1V1 sample.

Phytoplankton analysis and text by:
Ann-Turi Skjevik and Marie Johansen

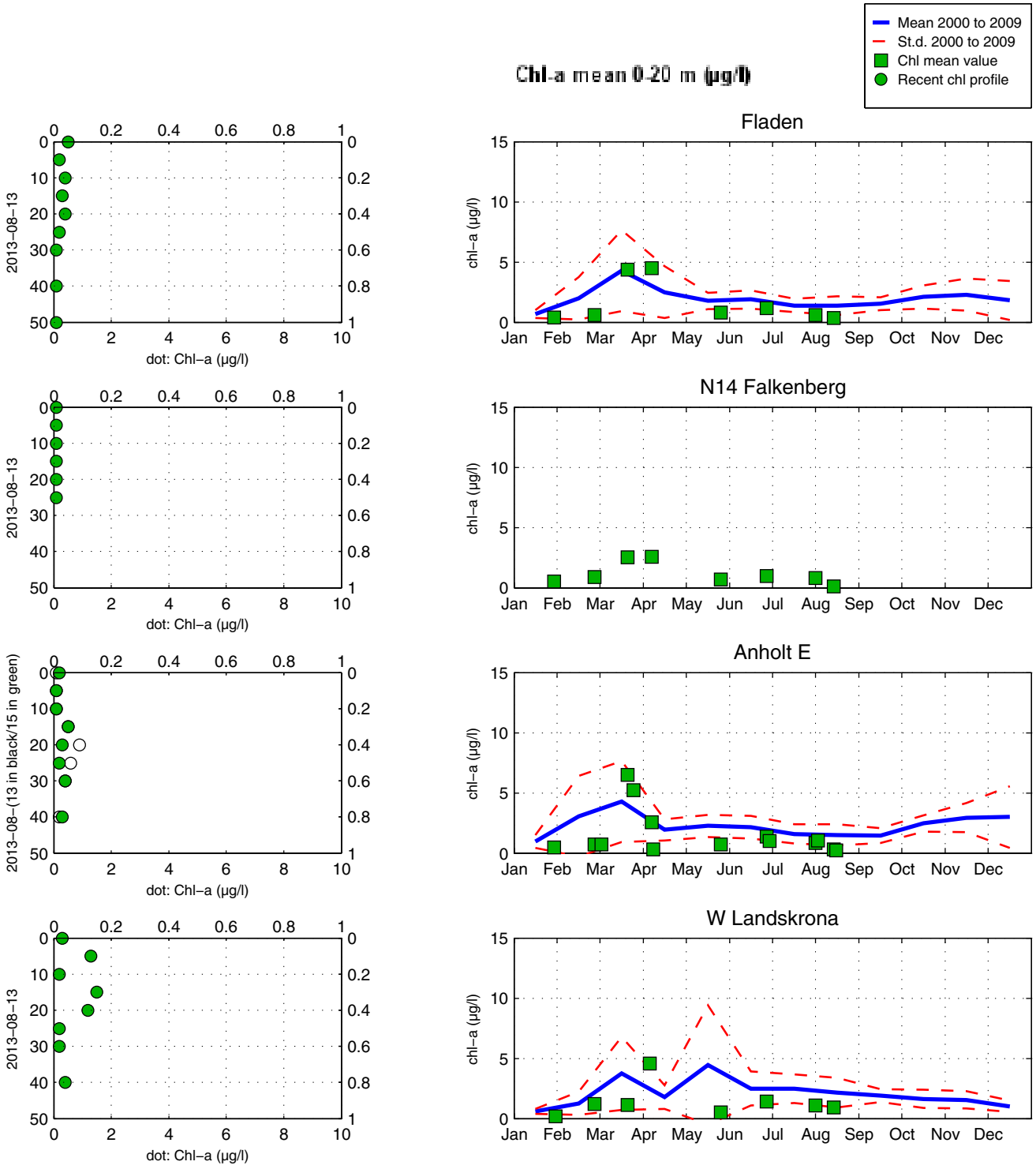
Selection of observed species	**Å17**	**Släggö**	**N14**	**Anholt E**	**Anholt E**
Red=potentially toxic species	**12/8**	**12/8**	**13/8**	**13/8**	**15/8**
Hose 0-10 m	**cells/l**	**cells/l**	**cells/l**	**cells/l**	**cells/l**
Cerataulina pelagica		present			
Cylindrotheca closterium					present
Dactyliosolen fragilissimus		present		present	present
Leptocylindrus minimus		present			
Nitzschia longissima		present			
Proboscia alata				present	present
Skeletonema marinoi		common			
Azadinium spp	present				
Ceratium fusus	present				
Ceratium tripos			present		present
Dinophysis acuta			present		
Gonyaulax spp					present
Gymnodiniales spp	present		present	present	present
Gymnodinium simplex				present	
Heterocapsa spp		present		present	
Katodinium glaucum					
Peridiniales spp	present	present	present	present	present
Pronoctiluca pelagica					present
Prorocentrum micans		present			present
Protoperidinium spp	present			present	
Emiliania huxleyi		present	common	very common	very common
Prymnesiales spp	common	common	present	very common	very common
Pyramimonas spp		present		present	present
Cryptomonadales spp	present	present	present	common	common
Katablepharis remigera				present	
Leucocryptos marina				present	
Ebria tripartita					present
Telonema subtile		present		present	
Mesodinium rubrum				present	present
Strombidium spp				present	
Ciliophora spp	common	common	present	common	present

Selection of observed species	**BY2**	**BY5**	**REF M1-V1**	**BY15**	**BCS III-10**	**BY38**
Red=potentially toxic species	**14/8**	**14/8**	**21/8**	**22/8**	**22/8**	**21/8**
	cells/l	**cells/l**	**cells/l**	**cells/l**	**cells/l**	**cells/l**
Attheya septentrionalis		present				
Chaetoceros danicus		present	present	present	present	present
Chaetoceros impressus	present	common	common	present	common	present
Chaetoceros subtilis			present	present		
Chaetoceros throndsenii			present	common		
Chaetoceros wighamii	present					
Cyclotella choctawhatcheana			very common			
Cylindrotheca closterium			present			
Dinophysis norvegica			present			
Gymnodiniales	present	present				present
Gymnodinium verruculosum					present	
Heterocapsa rotundata	present	present		present	present	
Heterocapsa triquetra			present			
Heterocapsa spp	present	present				
Peridiniales	present	present		present		
Prorocentrum micans		present				
Eutreptiella spp				present		
Pterosperma spp	present				present	present
Pyramimonas virginica			present	present	very common	common
Pyramimonas spp	very common	very common	common	very common	very common	common
Anabaena spp			common	present		
Aphanizomenon flos-aquae		very common	common	common		common
Chroococcales spp						
Aphanothece parallelliformis			dominating	present	common	
Nodularia spumigena			common			
Snowella spp		present				present
Cryptomonadales	very common	very common	very common	very common	very common	very common
Dinobryon faculiferum			common			
Pseudopedinella pyriforme		present				
Ebria tripartita			present			
Katablepharis remigera		present				
Leucocryptos marina	present	present		present		present
Prymnesiales	common	common	common	common	common	common
Flagellates	very common	very common	very common	very common	very common	very common
Helicostomella subulata				present	present	present
Mesodinium rubrum	common	present	present	present	present	
Ciliophora	common	common	common	common	common	common

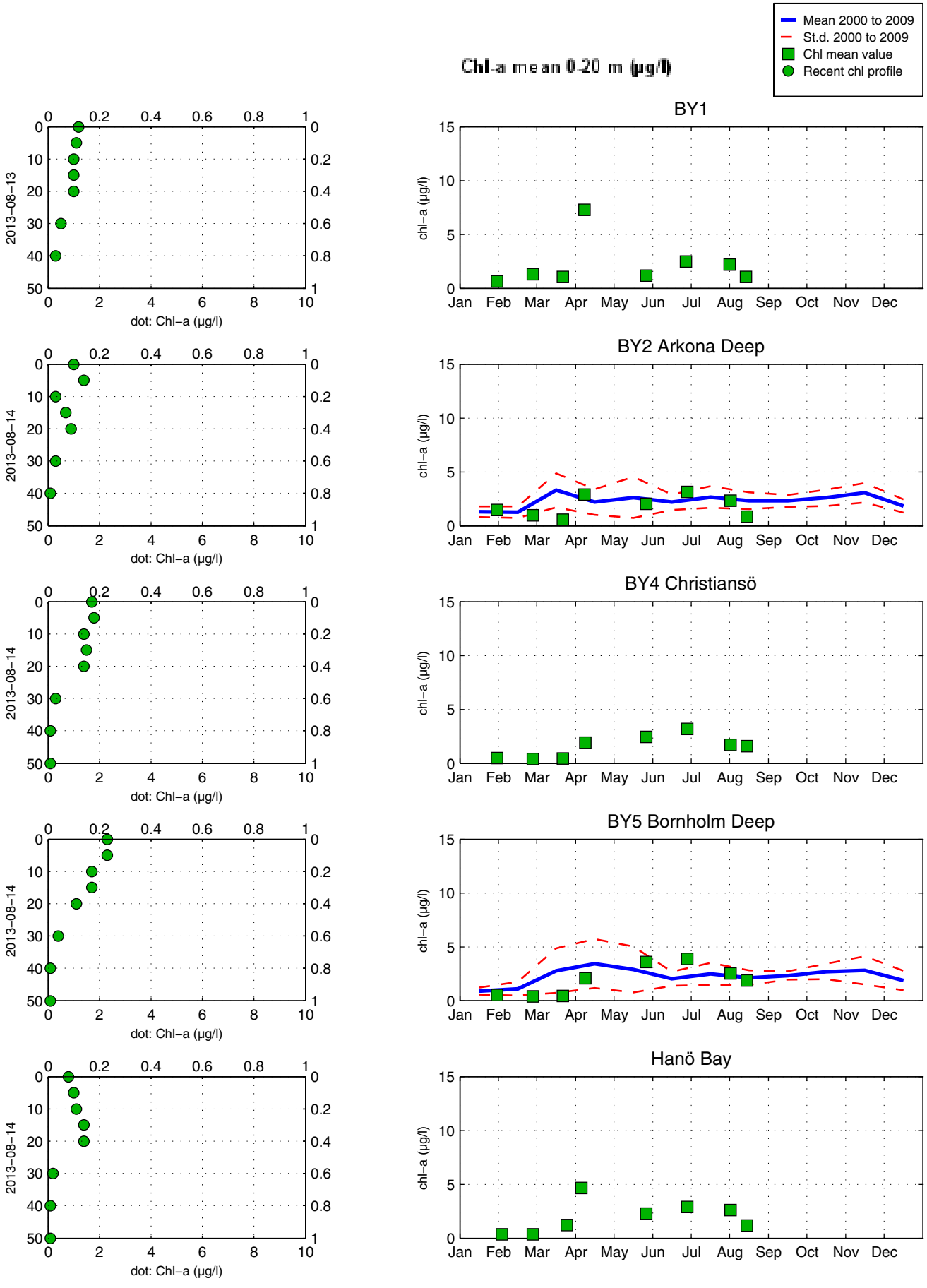
The Skagerrak



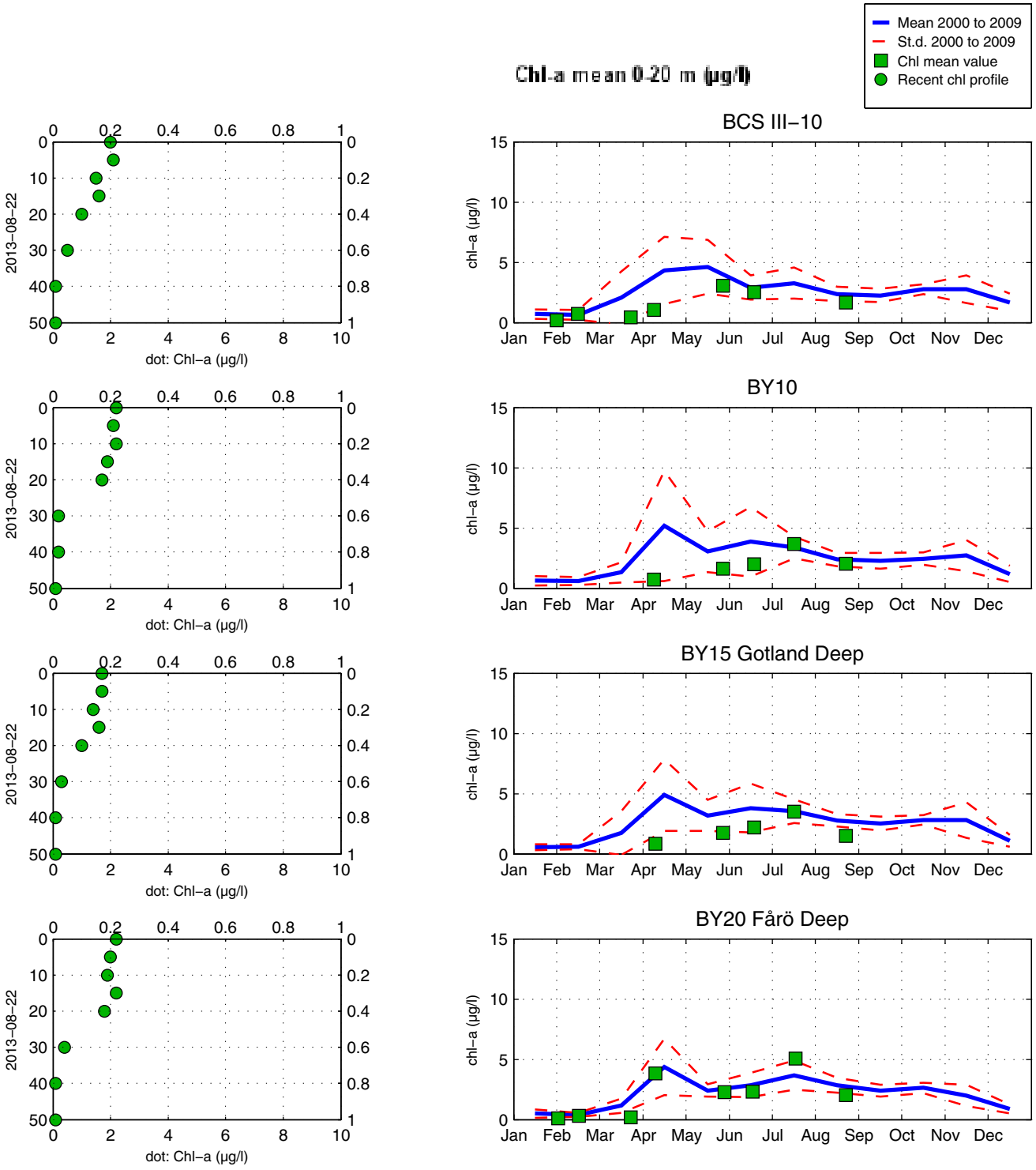
The Kattegat and the Sound

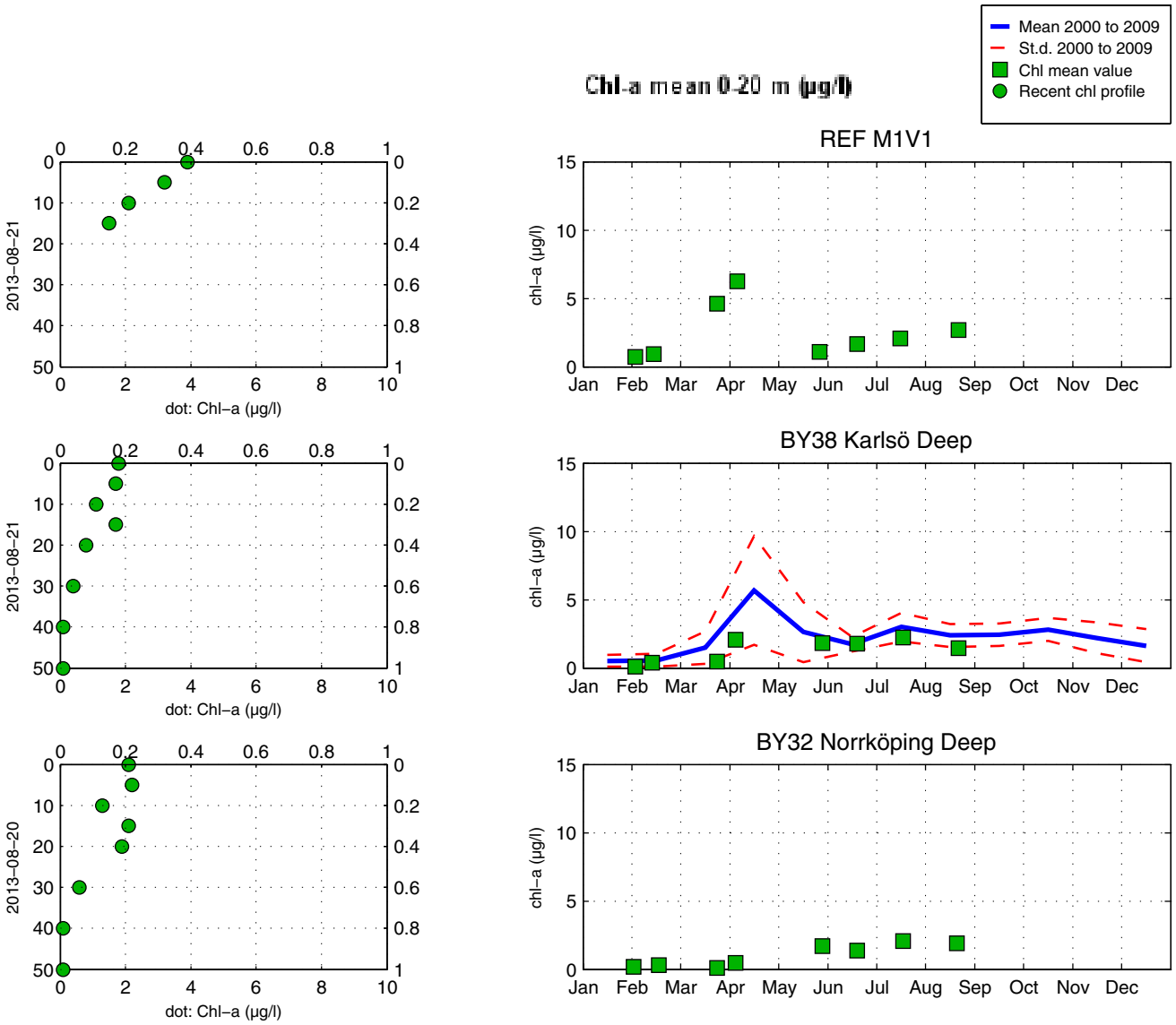


The Southern Baltic



The Eastern Baltic





Om klorofylldiagrammen

Klorofyll *a* är ett mått på mängden växtplankton. Prover tas från ett antal djup. 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. 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.

Om AlgAware

SMHI genomför ca en gång per månad expeditioner 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

The SMHI carries out monthly cruises 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 or 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.
Pseudo- niztschia 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.
Chaetoceros concavicornis/ C.convolutus	Mechanical damage through hooks on setae	**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.
Pseudochattonella 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.

Översikt över några 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.