

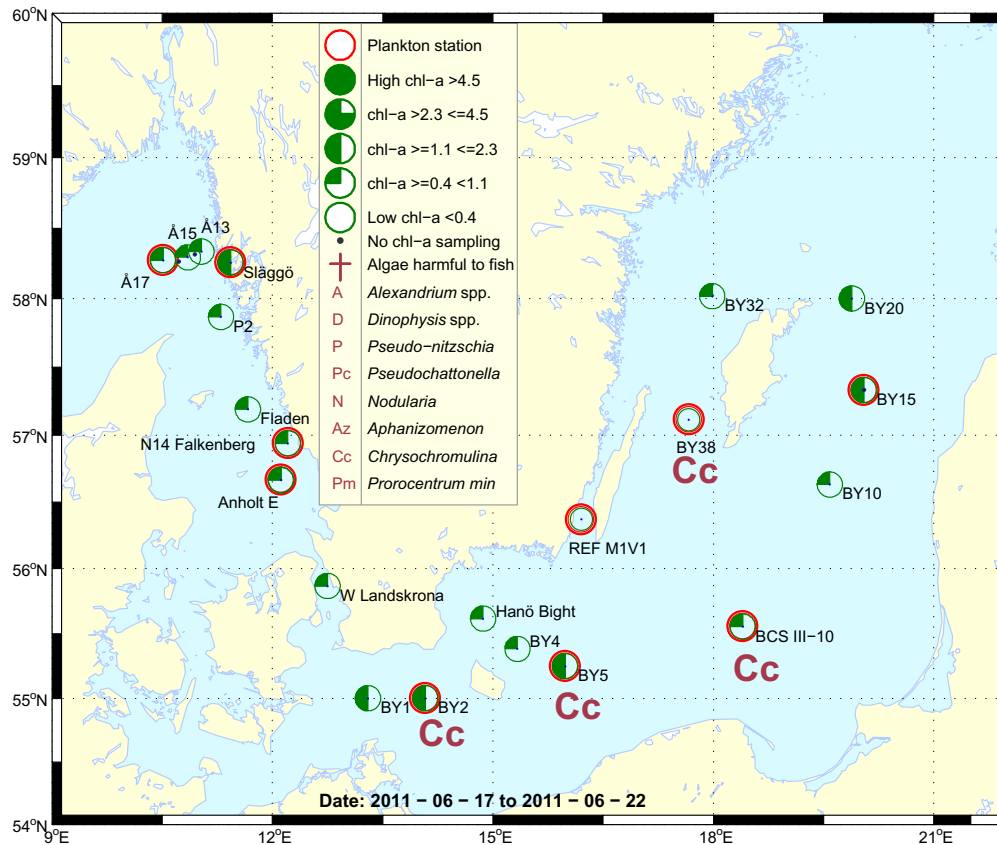
Sammanfattning

Växtplanktonsamhället i Skagerrak och Kattegatt innehöll framförallt små flagellater och i Skagerrak dominerade coccolithophoriden *Emiliana huxleyi* vid Å17, den mest nordliga stationen. Släggö hade en artrik planktonflora som dominerades av kiselalgen *Dactyliosolen fragilissimus*. I Kattegatt dominerade släktet *Chrysochromulina* vid båda stationerna och *D. fragilissimus* fanns i relativt höga tätheter.

De integrerade klorofyll *a* koncentrationerna var inom det normala för stationerna i Skagerrak för årstiden. I Kattegatt återfanns lägre klorofyllvärden än normalt för årstiden vid Fladen och Anholt E.

I Östersjön dominerades växtplanktonsamhället av små flagellater vid samtliga stationer och då fram för allt av släktet *Chrysochromulina*. Filamentösa cyanobakterier hittades i relativt höga tätheter vid de sydliga stationerna men inte i blomningsmängder. Få stora arter återfanns men kiselalgen *Chaetoceros impressus* var relativt vanlig vid de sydvästliga och västliga stationerna.

De integrerade klorofyll *a* koncentrationerna var i den södra delen av Östersjön låga men inom det normala. Vid de östra samt västra stationerna var klorofyllvärdena lite under det normalt låga för årstiden.



Abstract

The phytoplankton community in both Skagerrak and Kattegat areas comprised mainly of small flagellates. The only exception was Släggö, the inner site in the Skagerrak where the diatom *Dactyliosolen fragilissimus* was found in highest abundance. The coccolithophorid *Emiliana huxleyi* was dominating at Å17 whereas the genus *Chrysochromulina* dominated at both stations in the Kattegat. *D. fragilissimus* was recorded with quite high cell numbers in the Kattegat.

The integrated chlorophyll *a* concentrations were within normal in the Skagerrak area. The chlorophyll *a* concentrations were lower than normal at two stations in the Kattegat.

In the Baltic Sea the phytoplankton community was dominated by small flagellates and especially by the genus *Chrysochromulina*. Filamentous cyanobacteria were found in moderate abundances at the stations in the southern part but not in bloom forming quantities. Only a few large species were recorded but the diatom *Chaetoceros impressus* was quite abundant in the southwestern and western stations.

The integrated chlorophyll *a* concentrations were within normal in the southern part of the Baltic and below normal in the eastern and western parts.

More detailed information on species composition and abundance

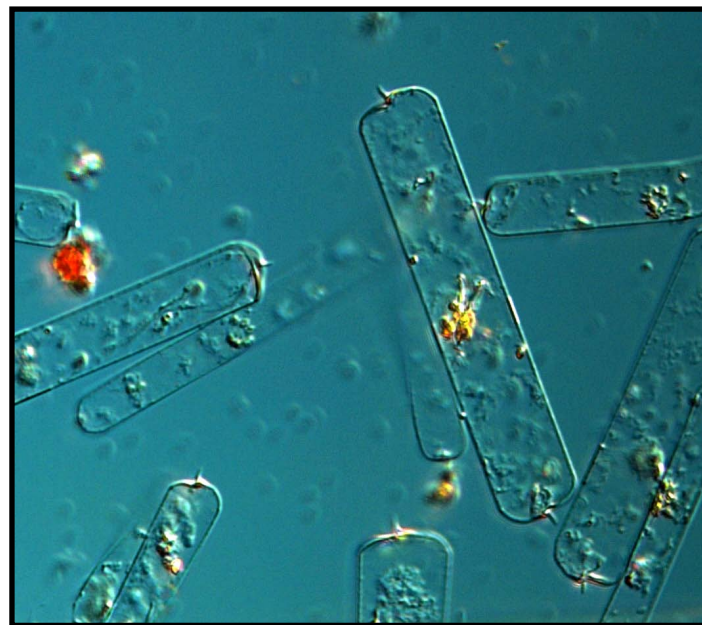
The Skagerrak

Å17 17th of June (open Skagerrak)

The species diversity was quite low and was dominated by small flagellates and predominantly the coccolithophorid *Emiliana huxleyi* appeared in over 1 million cells per liter. The genus *Chrysochromulina* was also quite abundant.

Släggö 17th of June (Skagerrak coast)

A quite diverse community was found and the diatom *Dactyliosolen fragilissimus* dominated at this site but other diatoms were also present. The same small flagellates were found as at Å17 but the genus *Chrysochromulina* was more abundant than *Emiliana huxleyi* this time.



The diatom *Dactyliosolen fragilissimus*

The Kattegat

N14 Falkenberg 18th of June

The phytoplankton community was quite scarce and consisted mainly of small flagellates and especially the genus *Chrysochromulina* together with different cryptomonads such as *Plagioselmis prolonga*. The diatom *Dactyliosolen fragilissimus* was most common among the diatoms. A few filaments of the cyanobacteria genus *Anabaena* were found.

Anholt E 18th and 22nd of June

The phytoplankton community was, on the first occasion, quite comparable with what was found at N14 and mostly consisting of small flagellates. No cyanobacteria were however recorded but quite a few cells of *Leucocryptos marina* were found.

The community structure had however changed a bit upon the second sampling occasion and the plankton community diversity had increased now comprising of several species of dinoflagellates and diatoms in low numbers. The small flagellates had increase in number of species and several cryptomonads were found in quite high numbers such as the genus *Teleaulax*. The coccolithophorid *Emiliana huxleyi* was also more abundant on the second sampling occasion. The chlorophyll *a* concentrations were below the calculated mean for the last 10 years period.

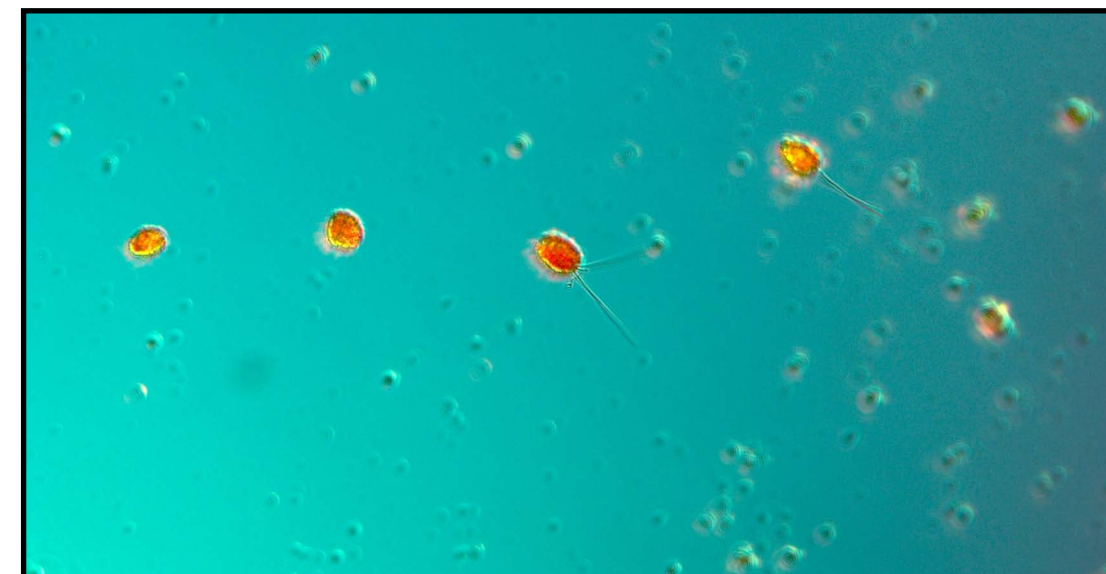
The Baltic Sea

Arkona Basin BY2 19th of June

The filamentous cyanobacterium *Aphanizomenon* was found in relatively high numbers together with a few filaments of the genus *Nodularia*. The phytoplankton community was although dominated by several small flagellates and predominantly the genus *Chrysochromulina* but also different cryptomonads. The green algae *Planctonema lauterbornii* was common.

Bornholm Basin BY5 19th of June

A quite equal community was found at this site and the same proportion of filamentous cyanobacteria was recorded as at BY2. The diatom *Chaetoceros impressus* was however recorded in relatively high numbers.



The flagellate *Chrysochromulina polylepis* (from a previous bloom in the Baltic)

South East Baltic BCS III-10 19th of June

Only a few filaments of the cyanobacterium genus *Aphanizomenon* was recorded. Small flagellates dominated and the genus *Chrysochromulina* above all but also several cryptomonads. The diatom *Chaetoceros impressus* was common. The chlorophyll *a* values were below the ten years average.

Eastern Gotland Basin BY15 20th of June

The community was dominated by different small flagellates and *Chrysochromulina* appeared in highest cell numbers. The golden algae *Dinobryon faculiferum* was found in relatively high numbers together with quite a few ciliates.

Western Gotland Basin BY 38 21th of June

Small flagellates were clearly dominating the community and the genus *Chrysochromulina* was found in highest numbers. The only other algae found in relatively high numbers was the green algae *planctonema lauterbornii*. The chlorophyll *a* values were very low and below the calculated average concentration for the last ten years.

Kalmar Sound Ref. M1-V1 21th of June

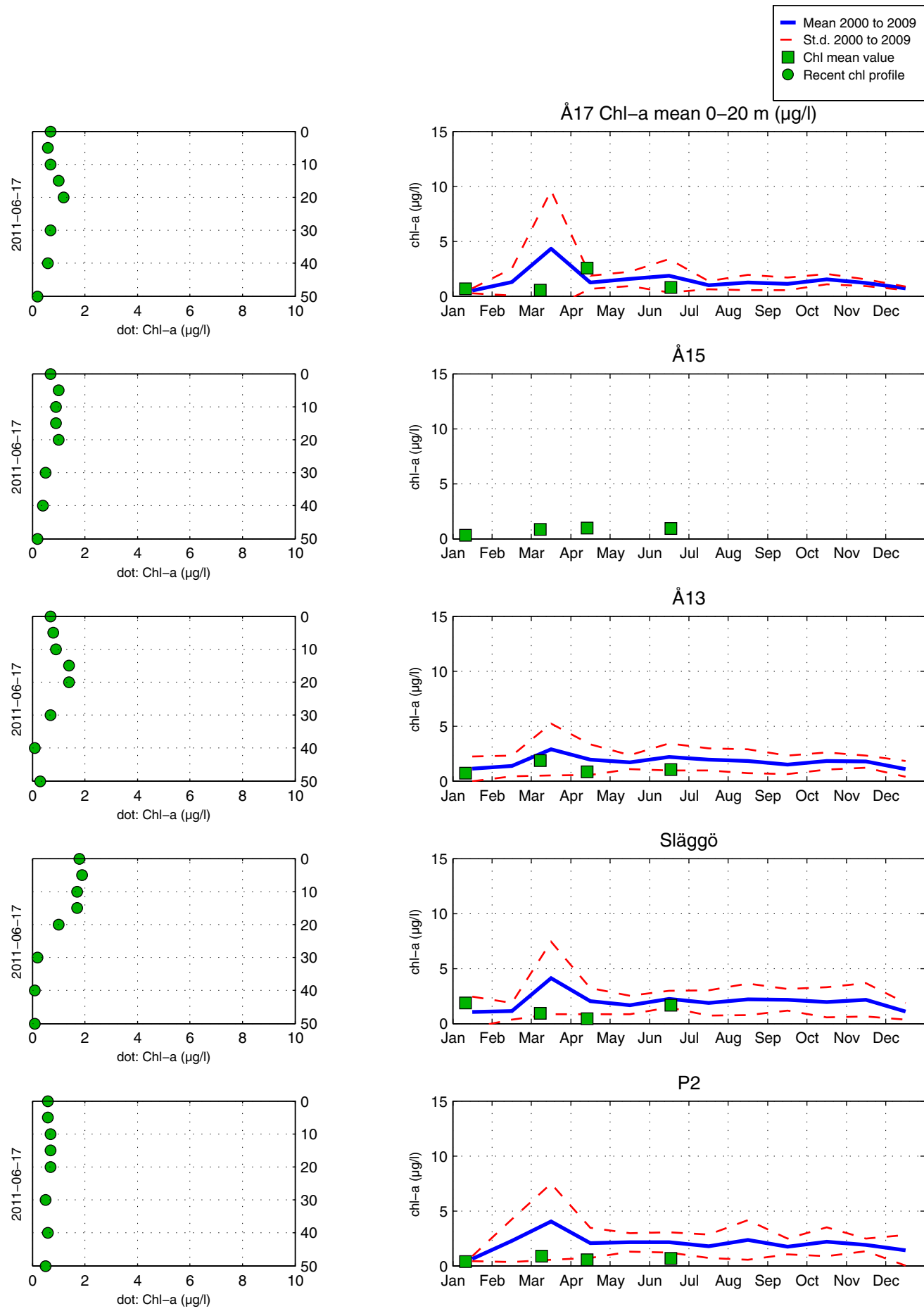
Only a few larger cells was recorded and a couple of filamentous cyanobacteria was found. The dominance of *Chrysochromulina* was apparent but the genus *Dinobryon* was also recorded in quite high cell numbers.

Phytoplankton analysis and text by:
Marie Johansen

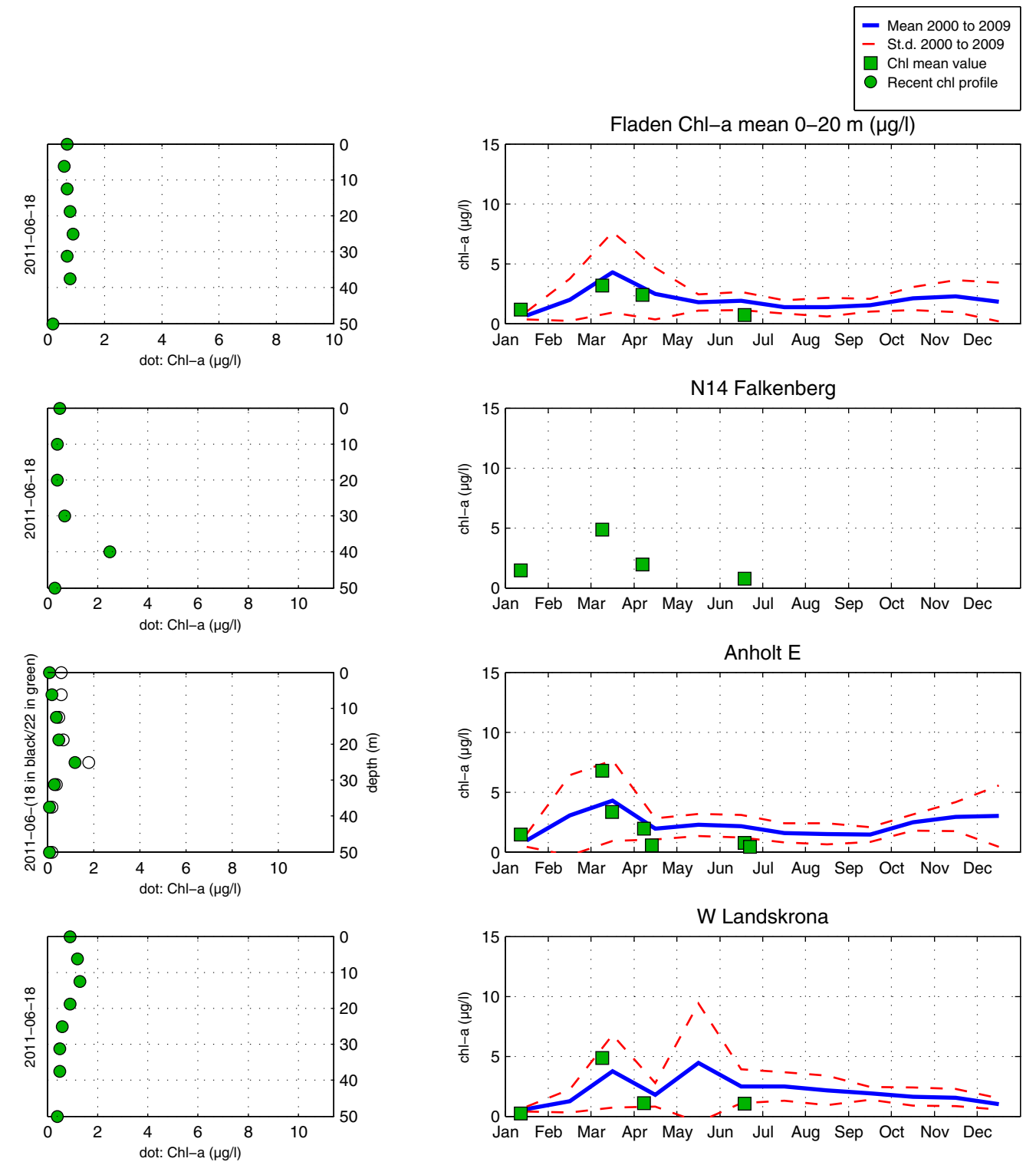
Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	17/6	17/6	18/6	18/6	22/6
	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Chaetoceros decipiens</i>			present	present	present
<i>Chaetoceros lacinosus</i>					present
<i>Chaetoceros</i> spp.		present		present	present
<i>Dactyliosolen fragilissimus</i>	present	dominating	common	common	common
<i>Guinardia flaccida</i>	present	present			
<i>Licmophora</i> spp.		present			
<i>Proboscia alata</i>	present	present		present	present
<i>Pseudo-nitzschia seirata</i> -group		present			
<i>Rhizosolenia hebetata</i>	present	present			
<i>Rhizosolenia</i> spp.		present			
<i>Skeletonema marinoi</i>		present			
<i>Thalassionema nitzschioides</i>				present	
<i>Ceratium fusus</i>		present			present
<i>Ceratium tripos</i>		present	present		present
<i>Dinophysis acuminata</i>	present	present			
<i>Dinophysis norvegica</i>	present	present	present		present
Gymnodiniales spp.	present			present	
<i>Karlodinium veneficum</i>		present			present
<i>Peridiniella danica</i>		present			present
<i>Protoceratium reticulatum</i>		present			
<i>Protoperidinium depressum</i>		present			
<i>Protoperidinium</i> spp.		present			
<i>Chrysochromulina</i> spp.	common	common	dominating	dominating	dominating
Cryptomonadales spp.	present	present	common		common
<i>Hemiselmis virescens</i>				present	
<i>Katablepharis remigera</i>					present
<i>Teleaulax</i> spp.	present				common
<i>Plagioselmis prolunga</i>		present	common	common	common
<i>Pyramimonas</i> spp.	common	present		present	
<i>Dinobryon</i> spp.			present		
<i>Anabaena</i> spp.			present		present
<i>Leucocryptos marina</i>	present	present		common	common
<i>Emiliana huxleyi</i>	dominating	common	present	present	common
Ciliophora spp.	present	present	present	present	present
<i>Helicostomella</i> spp.		present	present		present
<i>Laboea strobila</i>		present			
<i>Mesodinium rubrum</i>		present	present		
Choanoflagellidea			present	present	common

Selection of observed species	BY2	BY5	BCS III-10	BY15	BY38	Ref. M1-V1
Red=potentially toxic species	19/6	19/6	19/6	20/6	21/6	21/6
	cells/l	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Chaetoceros danicus</i>	present			present	present	
<i>Chaetoceros impressus</i>	present	common	common	common	present	
<i>Chaetoceros similis</i>						
<i>Chaetoceros wighamii</i>				present		
<i>Dinophysis acuminata</i>		present		present	present	
<i>Dinophysis norvegica</i>		present	present	present		
<i>Gymnodinium</i> spp.	present	present	present			present
<i>Heterocapsa rotundata</i>		present				present
<i>Katodinium glaucum</i>				present		
<i>Peridiniella danica</i>			present		present	present
<i>Protoperidinium bipes</i>						present
<i>Chrysochromulina</i> spp.	dominating	dominating	dominating	dominating	dominating	dominating
Cryptomonadales spp.	common	common	common	present		present
<i>Hemiselmis virescens</i>				present		
<i>Plagioselmis prolunga</i>	common	common	common	present	common	present
<i>Teleaulax</i> spp.	present				present	present
<i>Pyramimonas</i> spp.	common	common	common	common	common	common
<i>Dinobryon faculiferum</i>				common	common	present
<i>Dinobryon</i> spp.						common
Chlorodendrales spp			present			present
<i>Oocystis</i> spp.	present	present		present		
<i>Planctonema lauterbornii</i>	common	common	common	common	common	
<i>Anabaena</i> spp.					present	present
<i>Aphanizomenon</i> spp.	common	common	present	present	present	present
<i>Cyanobacteria</i> colony spp.	present	present	present	present	present	present
<i>Nodularia spumigena</i>	present	present			present	
<i>Leucocryptos marina</i>	present	present				present
Choanoflagellidae			common	common		common
Ciliophora spp.	present	present	present	common	present	present
<i>Mesodinium rubrum</i>		present	present	common	present	present

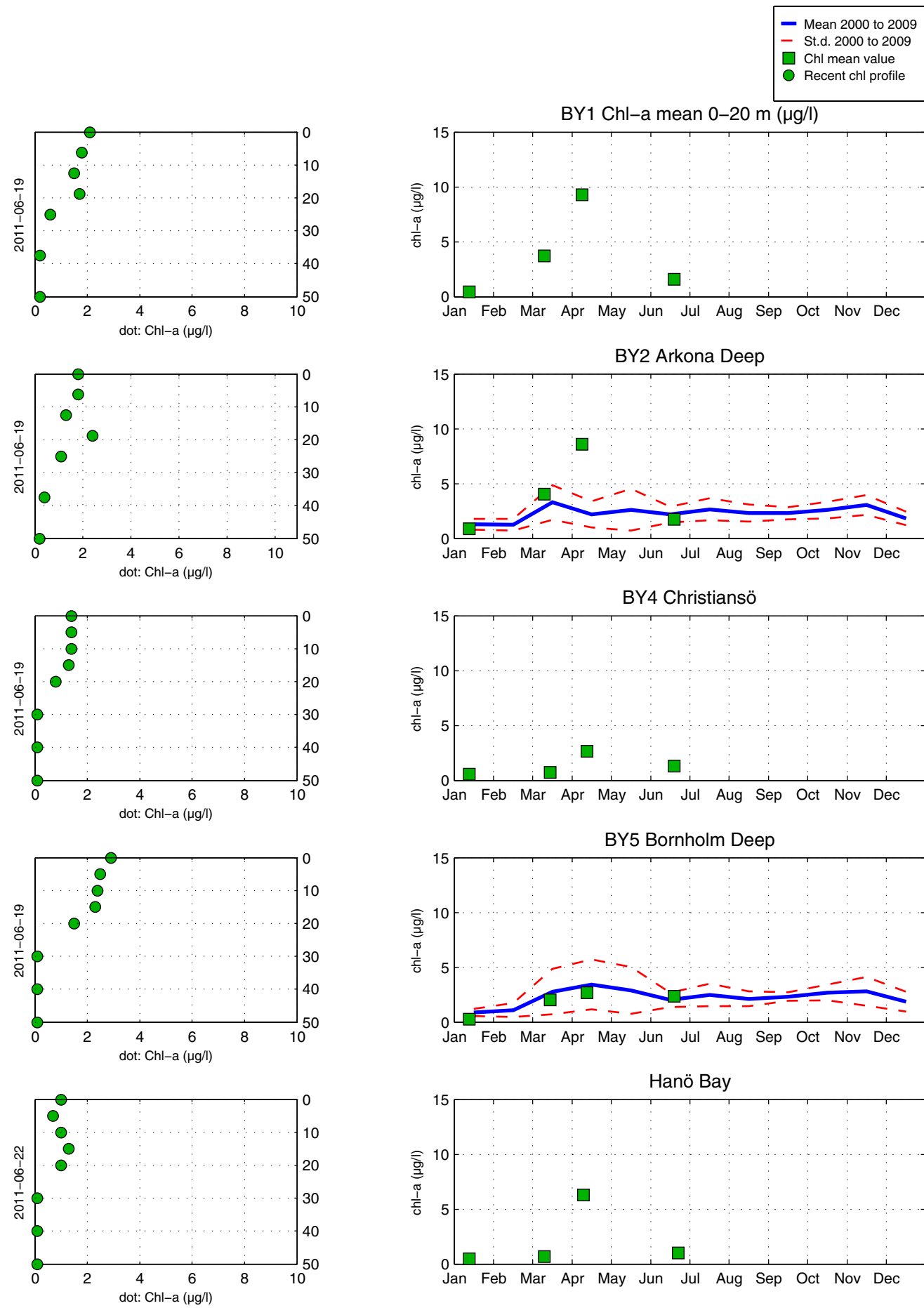
The Skagerrak



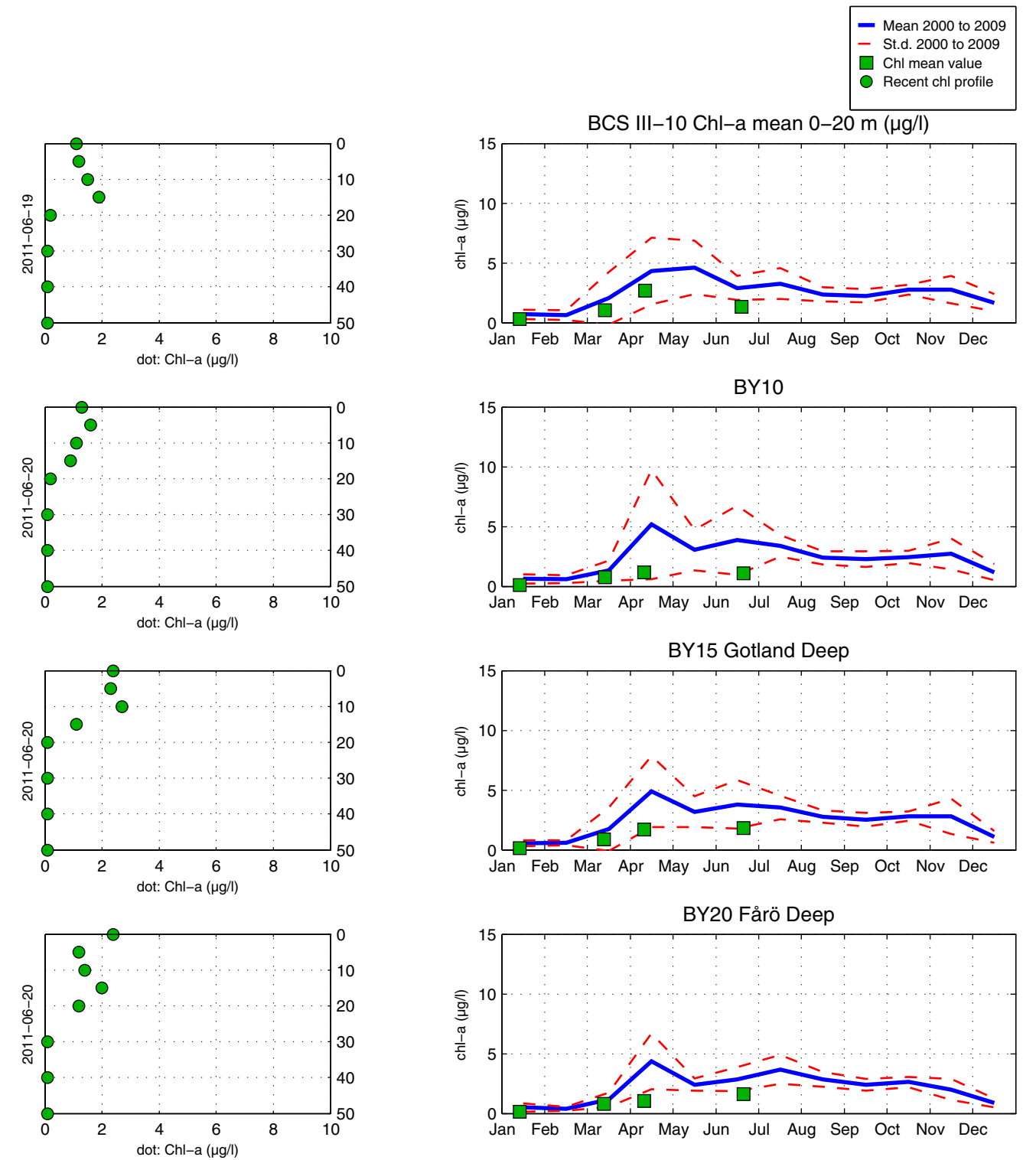
The Kattegat and the Sound



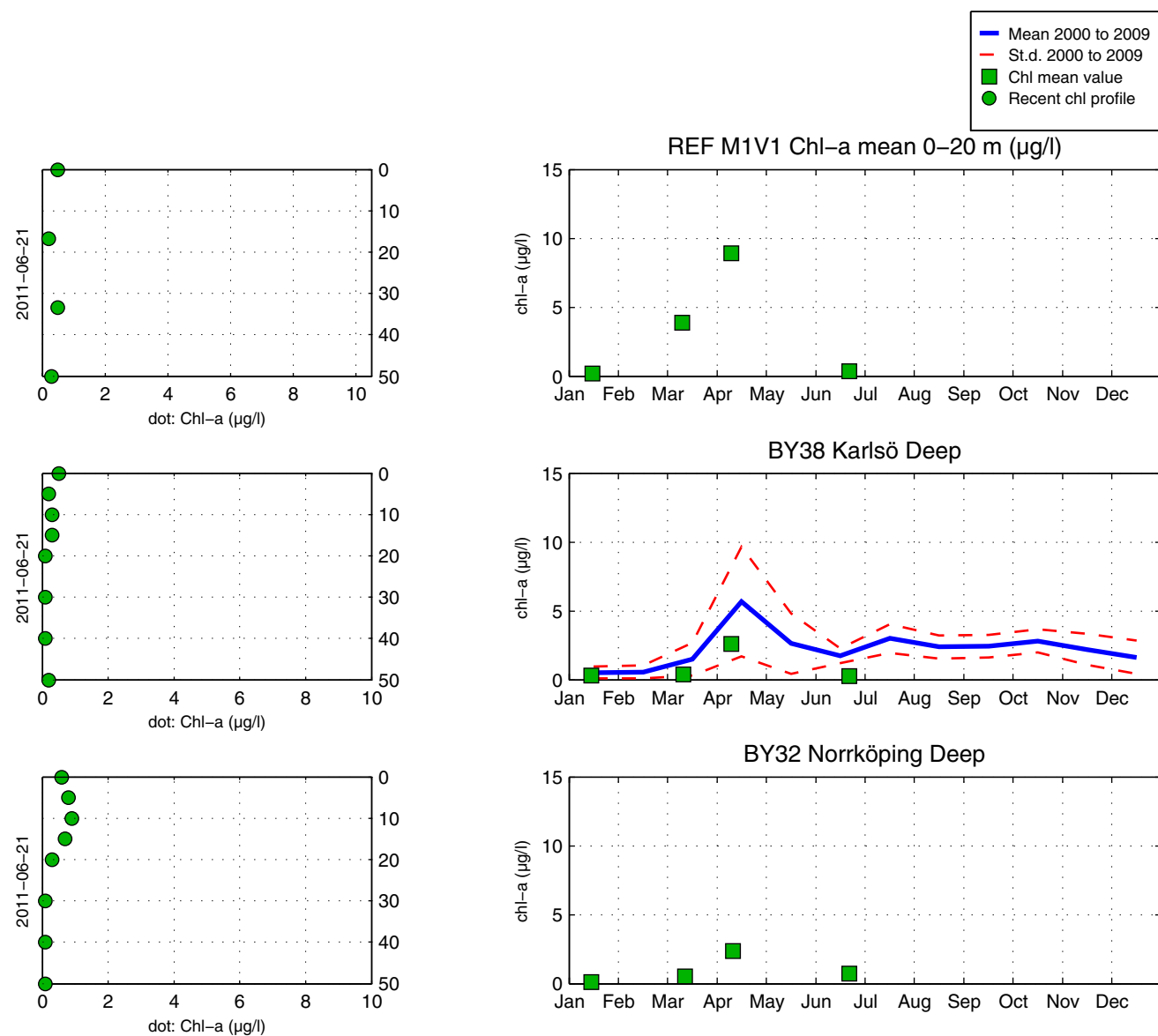
The Southern Baltic



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. Tekniska problem ombord satte stopp för månadens fluorescens-mätningar.

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. Chlorophyll fluorescence was not measured this month due to technical problems on board.

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 algbloomningar 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>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.
<i>Chaetoceros concavicornis</i> / <i>C. convolutus</i>	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.
<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.

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. 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.

