SMHI
Oceanographic Unit
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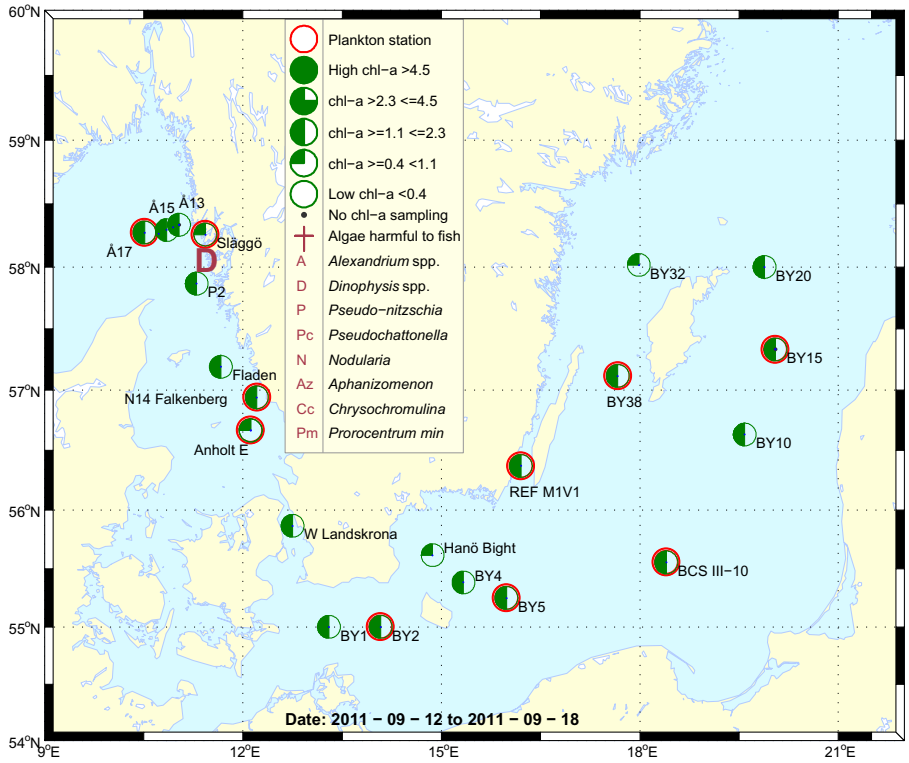
AlgAware
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

De integrerade klorofyll *a* värdena (0-20m) i Skagerrak och Kattegatt var på de flesta stationer normala för säsongen. Släggö är dock ett intressant undantag där värdena låg under det normala men samtidigt uppvisade fytoplanktonprovet från Släggö en väldigt hög celltäthet.

Fytoplanktonsamhället i Skagerrak varierade mellan stationerna. I motsatts till Å17 uppvisade Släggö en imponerande artrikedom och en hög celltäthet. Stora giftiga och icke giftiga dinoflagellater dominerade provet från Släggö medan små nakna dinoflagellater och cryptomonader dominerade Å17 provet. Stationerna i Kattegatt hade en genomgående låg celltäthet och ingen särskilt imponerande artrikedom. Samhället dominerades av cryptomonader och små flagellater. Det för fisk potentiellt giftiga släktet *Chrysochromulina* fanns kvar i vattnet men var inte lika dominerande som i augusti. En och annan giftig art från dinoflagellatsläktet *Dinophysis* fanns i de aktuella septemberproverna.

I Östersjön var de integrerade klorofyll *a* värdena (0-20m) normala för säsongen på alla stationer. Cryptomonader dominerade tillsammans med släktet *Pyramimonas* vid alla stationerna. Kolonibildande och filamentösa cyanobakterier hade minskat i antal sedan augusti expeditionen. Även celltätheten hos släktet *Chrysochromulina* hade minskat men var fortfarande vanligt förekommande vid alla stationer.



Abstract

The integrated (0-20 meters) chlorophyll *a* concentrations were within normal for the season at most of the Skagerrak and Kattegat sampling sites. One interesting exception was Släggö with lower concentrations than normal but with a very high cell density in the phytoplankton sample that was analysed.

The phytoplankton community was variable in the Skagerrak, with a high diversity and high cell density at Släggö while the opposite situation was found at Å17. Large and toxic/non-toxic dinoflagellates dominated at Släggö but mostly small naked dinoflagellates (10-20 µm) together with cryptomonads dominated at Å17. The stations in Kattegatt had a very low cell density and species diversity. The community was dominated by cryptomonadales and small flagellates. The genus *Chrysochromulina* was common and some large and toxic species from the genus *Dinophysis* were present.

The integrated (0-20 meters) chlorophyll *a* concentrations from the Baltic Sea were within normal for the season at all stations. Cryptomonads together with the genus *Pyramimonas* were dominating the samples at all stations. Both colony forming and filamentous cyanobacteria had diminished since the last expedition, but the fish toxic genus *Chrysochromulina* was still common if not dominating.

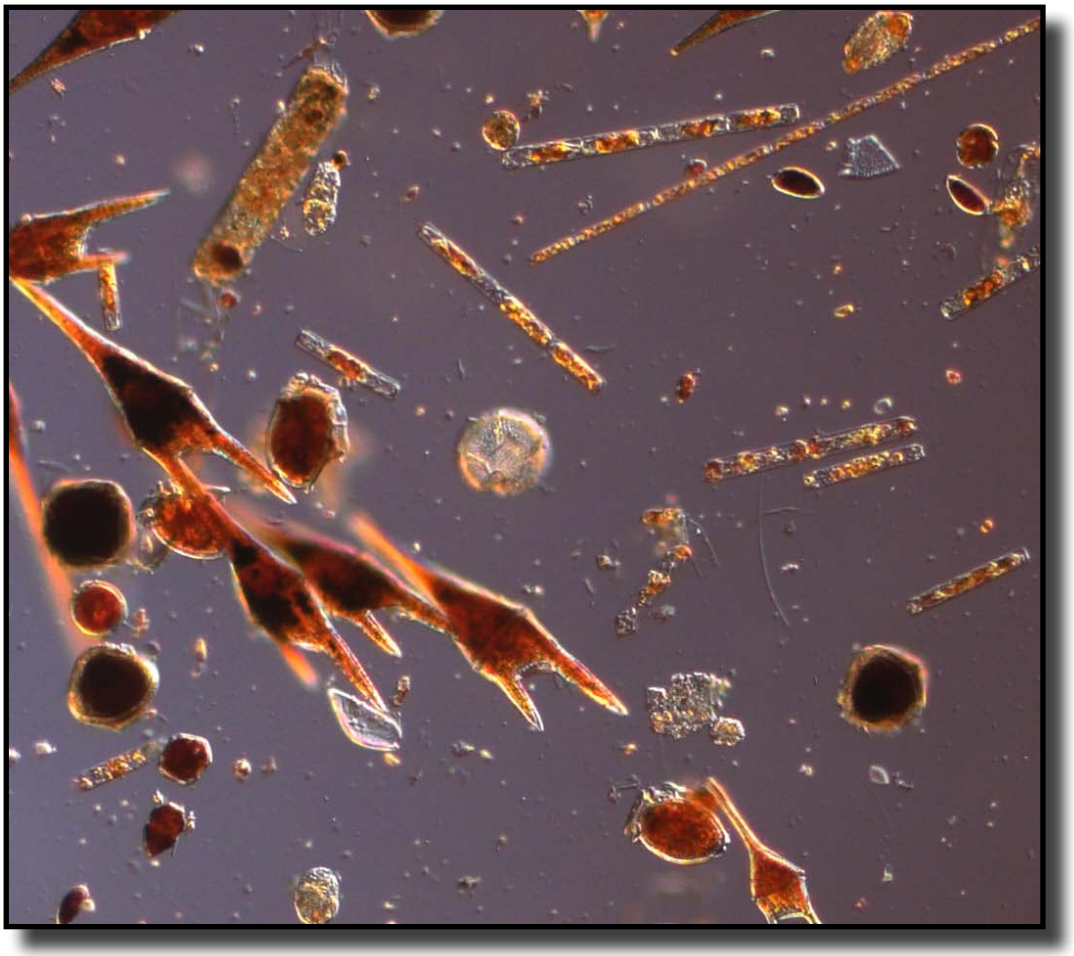
More detailed information on species composition and abundance

The Skagerrak

Å17 18th of September (open Skagerrak)
The phytoplankton species diversity and cell density was low. Together with small naked dinoflagellates (10-20 µm), cryptomonads were most abundant. The genus *Chrysochromulina* was common in the sample.

Släggö 12th of September (Skagerrak coast)
The species diversity and cell density was striking and much higher at this station compared to Å17. Large toxic and non-toxic dinoflagellates dominated the sample; the potentially toxic dinoflagellate *Lingulodinium polyedrum* together with *Ceratium furca* were the most dominating species at this station. Furthermore, *Dinophysis acuminata* and *Dinophysis acuta* were common. Despite a clear dominance of dinoflagellates the diversity of diatoms was impressive and the genus *Pseudo-nitzschia* was together with *Guinardia delicatula* and *Ceratulina pelagica* the most common diatoms at this station.

The integrated (0-20 meters) chlorophyll *a* concentrations from Skagerrak were normal for the season at Å17 but lower than normal at Släggö. The chlorophyll *a* values corresponded to the cell density observed at Å17. The integrated (0-20 meters) chlorophyll *a* concentrations did not correspond to the cell density observed at Släggö. The values were expected to be higher because of the very high cell density in this sample.



The phytoplankton community at Släggö was beautiful and divers.

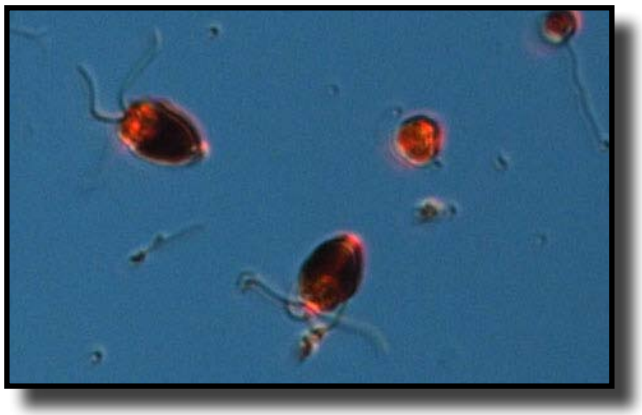
The Kattegat

N14 Falkenberg 13th of September
The density and species diversity was low. The sample was dominated by cryptomonads and small flagellates. The fishtoxic genus *Chrysochromulina*, especially *C.* cf *polylepis*, small (10-20 µm) Peridiniales and Gymnodiales were common. The potentially toxic D*inophysis acuta* and cells from the genus *Heterosigma* were present in the sample. The cryptomonads were most abundant and only a few diatom species were present at this station.

Anholt E 13th and 17th of September
This station had a similar density and species composition as the station N14 Falkenberg. There was, however, a difference between the two sampling dates with increased amount of large dinoflagellates and presence of the potentially toxic dinoflagellate *Dinophysis norvegica* at the second visit.

The integrated (0-20 meters) chlorophyll *a* concentrations from Kattegatt were normal for the season at all stations.

Chrysochromulina cf. *polylepis*



Pyramimonas spp. was common in the Baltic Sea

The Baltic Sea

The high abundance of colonyforming cyanobacteria had diminished at all stations since the last expedition. Furthermore, high abundances of single filaments of the genus *Aphanizomenon* observed at BY 38 had diminished since the last expedition; fewer filaments were present this time. Species from the genus *Pseudanabaena* was found at most stations.

Despite the overall lower abundance of the genus *Chrysochromulina* since last expedition, this genus was still found in high cell numbers at all stations.

Cryptomonads together with the genus *Pyramimonas* were otherwise dominating the samples at all stations. Furthermore, dinoflagellates were overall more common and showed a more diverse species composition compared to diatoms. At some stations toxic species from the genus *Dinophysis* was present. *Dinophysis rotundata* and *Dinophysis acuminata* were present at BY38 and *Dinophysis acuminata* was common at Ref.M1-V1.

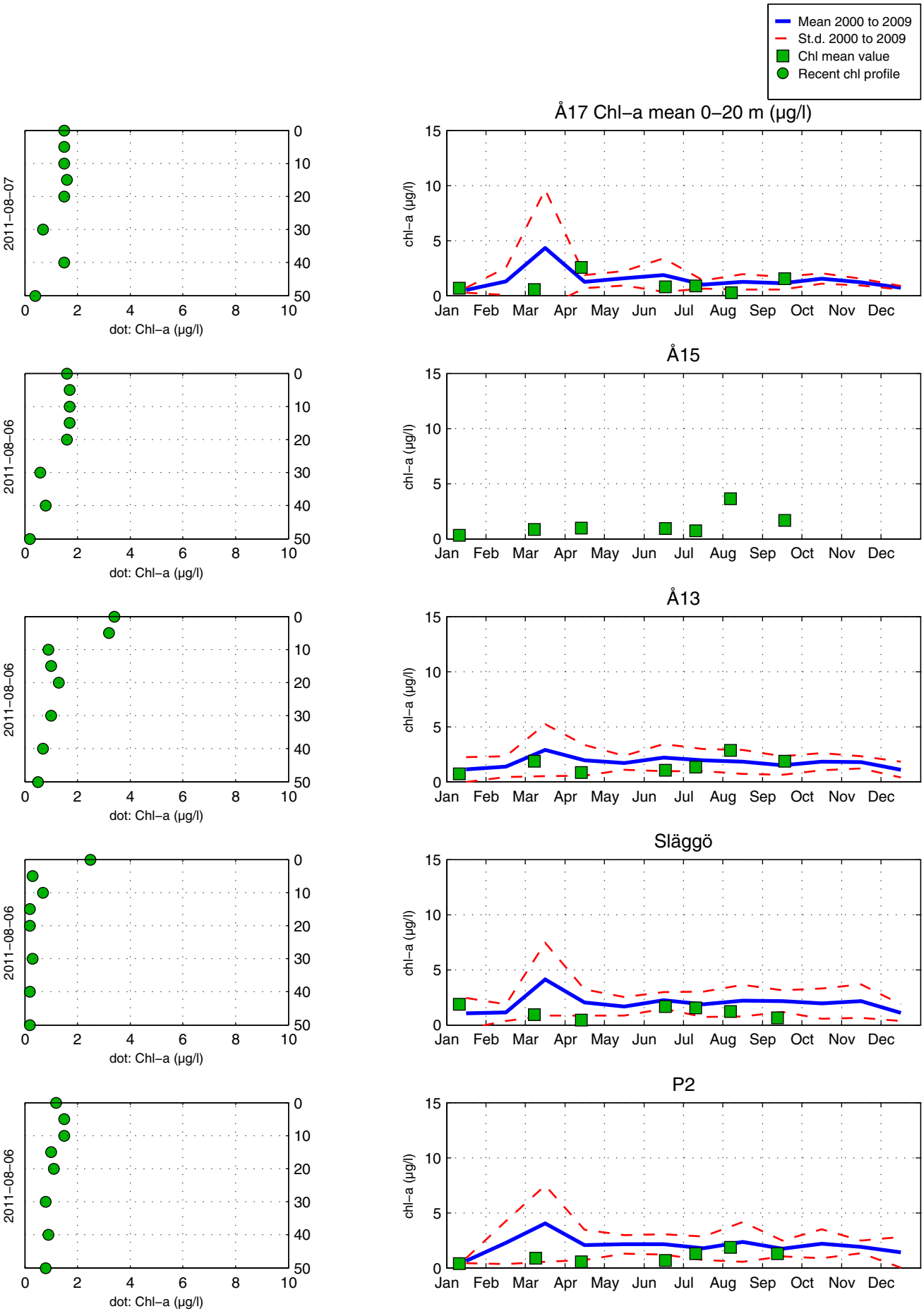
The integrated (0-20 meters) chlorophyll *a* concentrations from the Baltic Sea were normal for the season at all stations.

Phytoplankton analysis and text by:
Malin Mohlin

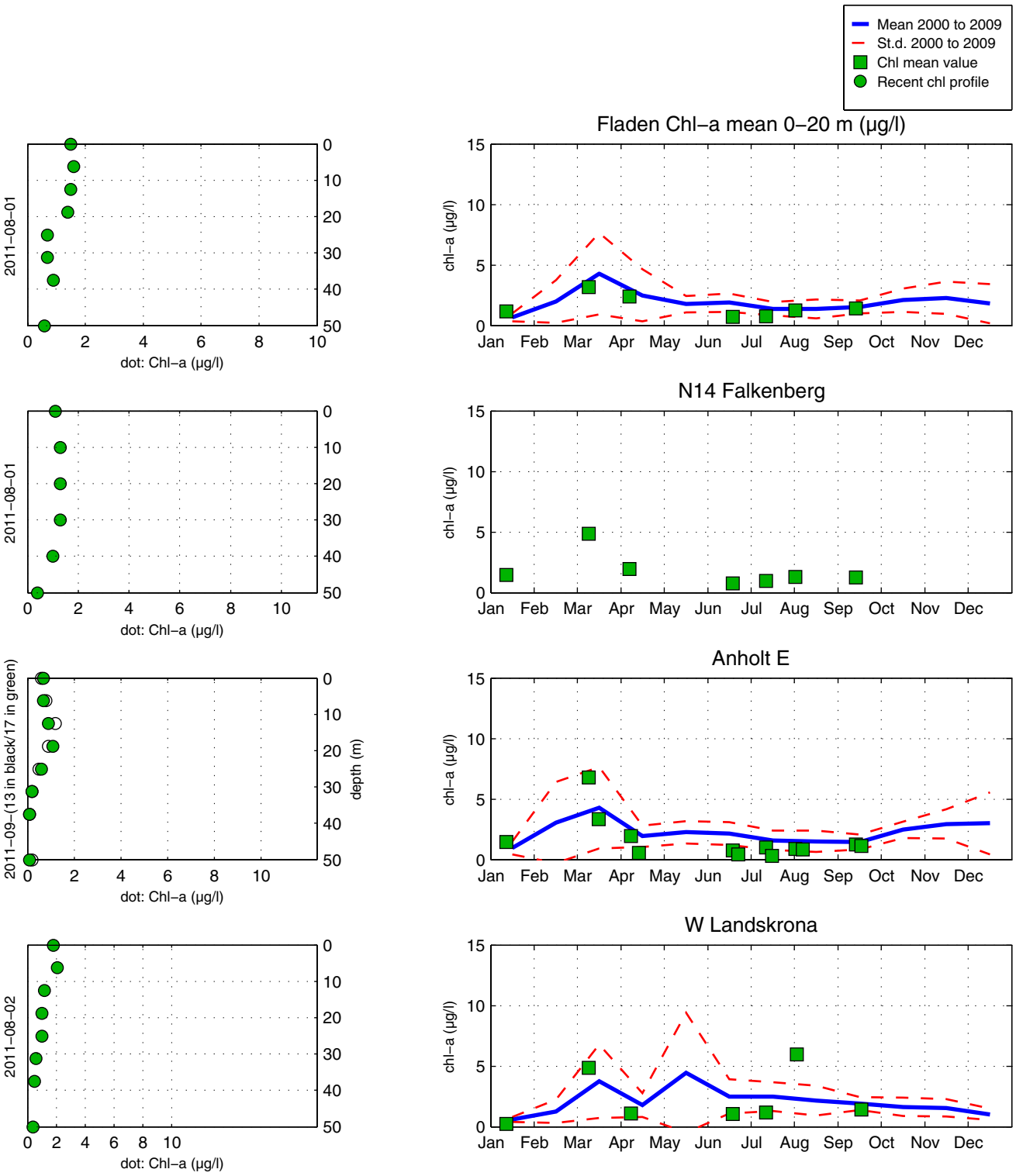
Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	18/9	12/9	13/9	13/9	17/9
	cells/l	cells/l	cells/l	cells/l	cells/l
Ceratulina pelagica		common			
Coscinodiscus spp.			present	present	
Dactyliosolen fragilissimus		present			
Ditylum brightwellii		present			
Guinardia delicatula		common			
Guinardia flaccida		present	present		
Nitzschia longissima		present			
Proboscia alata					present
Pseudo-nizschia spp.	present	common			
Pseudosolenia calcar-avis		present	present		
Rhizosolenia spp.					present
Rhizosolenia hebetata				present	
Amphidinium spp.	present				
Ceratium furca		very common	present	present	present
Ceratium fusus		common	present	present	present
Ceratium lineatum		present	present	present	present
Ceratium longipes					present
Ceratium tripos		present	present	present	present
Dinophysis acuminata		common			
Dinophysis acuta		common	present		
Dinophysis norvegica					present
Dinophysis rotundata		present			
*Gonyaulax*spp.		present			
Gymnodiniales	common		present	common	common
Gyrodinium flagellare	common	common	present	present	
Heterocapsa cf. *minima*	present				
Heterocapsa rotundata				present	
Heterocapsa triquetra					
Karenia mikimotoi	present	present	present	present	
Katodinium glaucum		present			present
Lingulodinium polyedrum		very common			
Peridiniales	present	present	common	common	common
Pronoctiluca pelagica	present		present		
Prorocentrum micans	present	common		present	present
Prorocentrum minimum		present			
Prorocentrum redfieldii		common			
Protoceratium reticulatum		present			
Protoperidinium spp.		present			
Heterosigma spp.			present		
Chrysochromulina cf. *polylepis*			present	present	
Chrysochromulina spp.	common	present	common	present	common
Pleurochrysis spp.		present		present	
Apedinella radians		present			
Dichtyocha fibula		present			
Dichtyocha speculum		present			
Cryptomonadales spp.	very common	common	very common	very common	very common
Plagioselmis prolonga	common				
Teleaulax spp.	common	common			
Pyramimonas spp.	common	present	present	common	common
Calliacantha longicaudata				present	
Ebria tripartita		present			
Leucocryptos marina	common		present	present	present
Ciliophora	present	present	present	present	present

Selection of observed species	**BY2**	**BY5**	**BCS III-10**	**BY15**	**BY38**	**Ref. M1-V1**
Red=potentially toxic species	**14/9**	**14/9**	**15/9**	**15/9**	**16/9**	**16/9**
	cells/l	**cells/l**	**cells/l**	**cells/l**	**cells/l**	**cells/l**
Attheya septentrionalis				present		
Centrales	present	present			present	present
Chaetoceros impressus					present	
Coscinodiscus spp.			present	present	present	
Cylindrotheca closterium						present
Cladopyxis claytonii		present		present		
Dinophysis acuminata					present	common
Dinophysis rotundata					present	
Gymnodiniales	present	common	common	common	common	present
Gyrodinium spp.	present		present	present	present	present
Gyrodinium flagellare		common	present			
Heterocapsa spp.			common			
Heterocapsa rotundata	common					
Karenia mikimotoi			present			
Katodinium glaucum	present	present		present		present
Peridiniales	present	present		present	present	present
Cryptomonadales spp.	very common	very common	very common	very common	very common	very common
Apedinella radians				present		present
Chrysochromulina spp	common	common	present	common	common	common
Chrysochromulina cf. *polylepis*	common	common	common	present	common	
Pyramimonas spp.	very common	very common	very common	very common	very common	very common
Cyanobacteria colony forming				common		common
Anabaena spp						present
Aphanizomenon flos-aqua					common	
Oocystis spp.					present	
Pseudanabaena spp.			present	common	common	common
Woronichinia spp.					present	
Pterosperma spp.			present		present	
Eutreptiella spp.	present		present	common		
Mallomonas acaroides	present					
Choanoflagellidea	present					present
Ebria tripartita					present	
Leucocryptus marina	present	present	present	present	present	present
Ciliophora	present	present	present	present	present	common
Helicostomella sp.				present	present	
Mesodinium rubrum	common	common	common	present		common

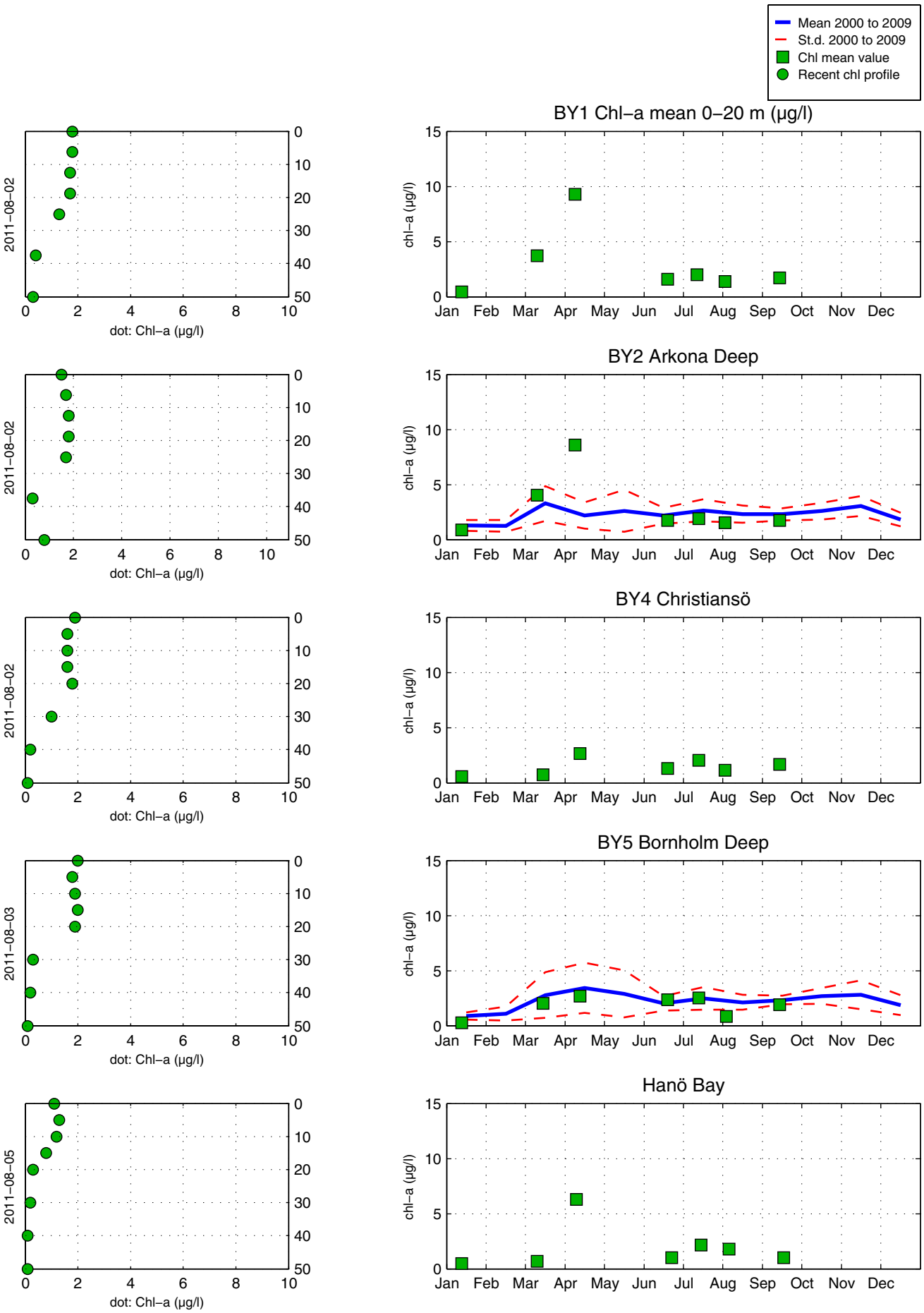
The Skagerrak



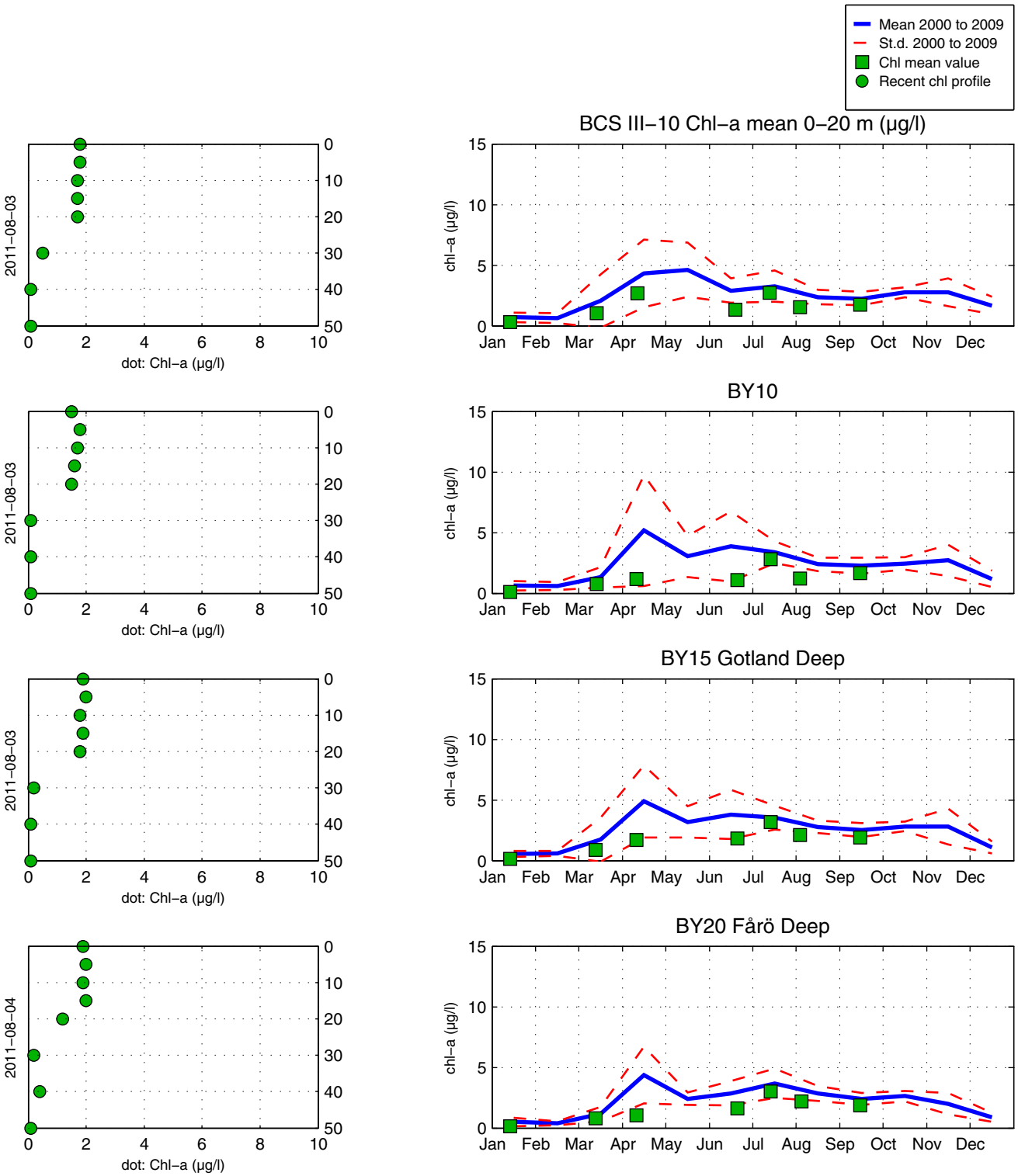
The Kattegat and the Sound



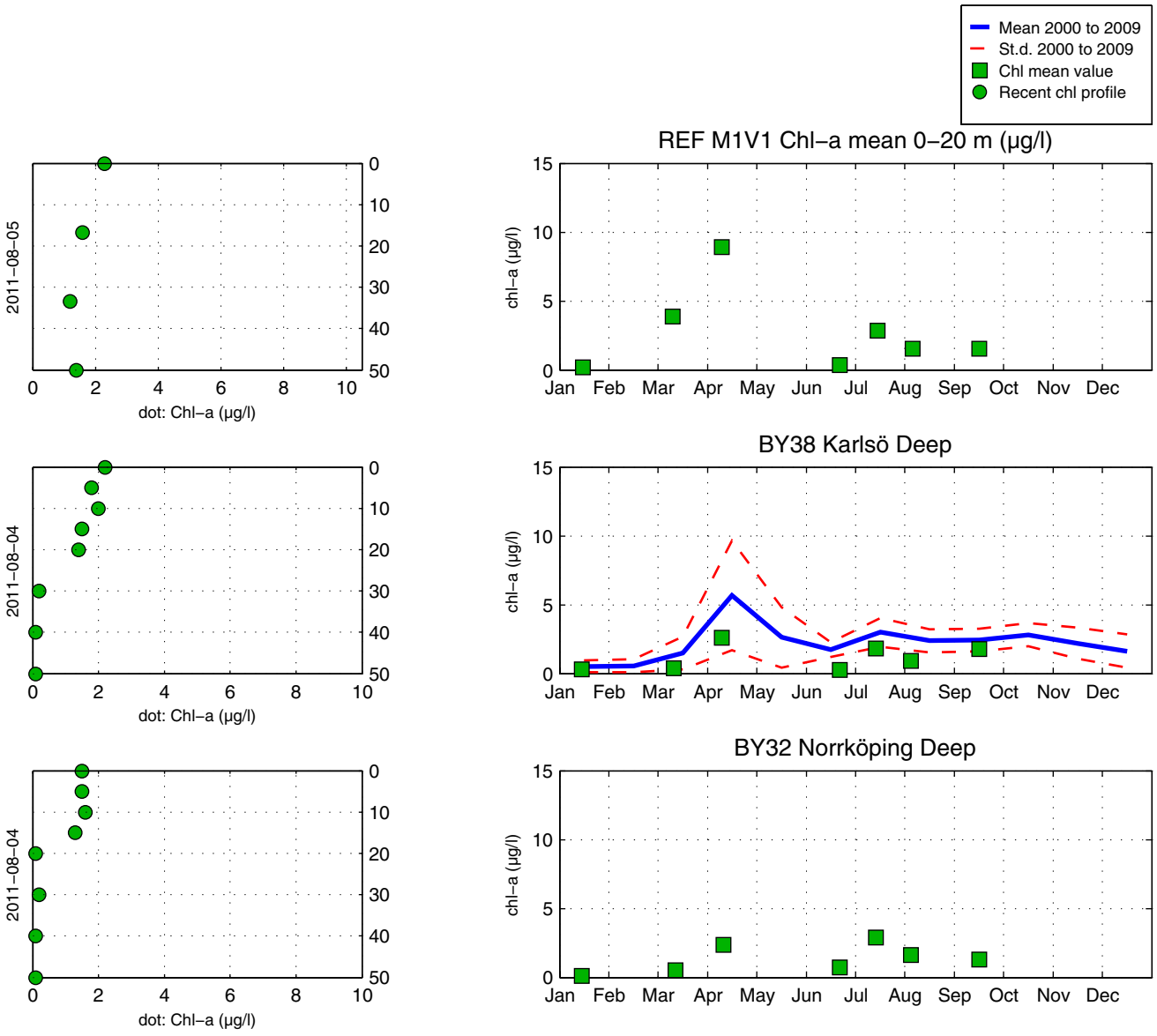
The Southern Baltic



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 layes of phytoplankton occuring below the surface. Chlorphyll 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 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 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. 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.