SMHI
Oceanographic Services
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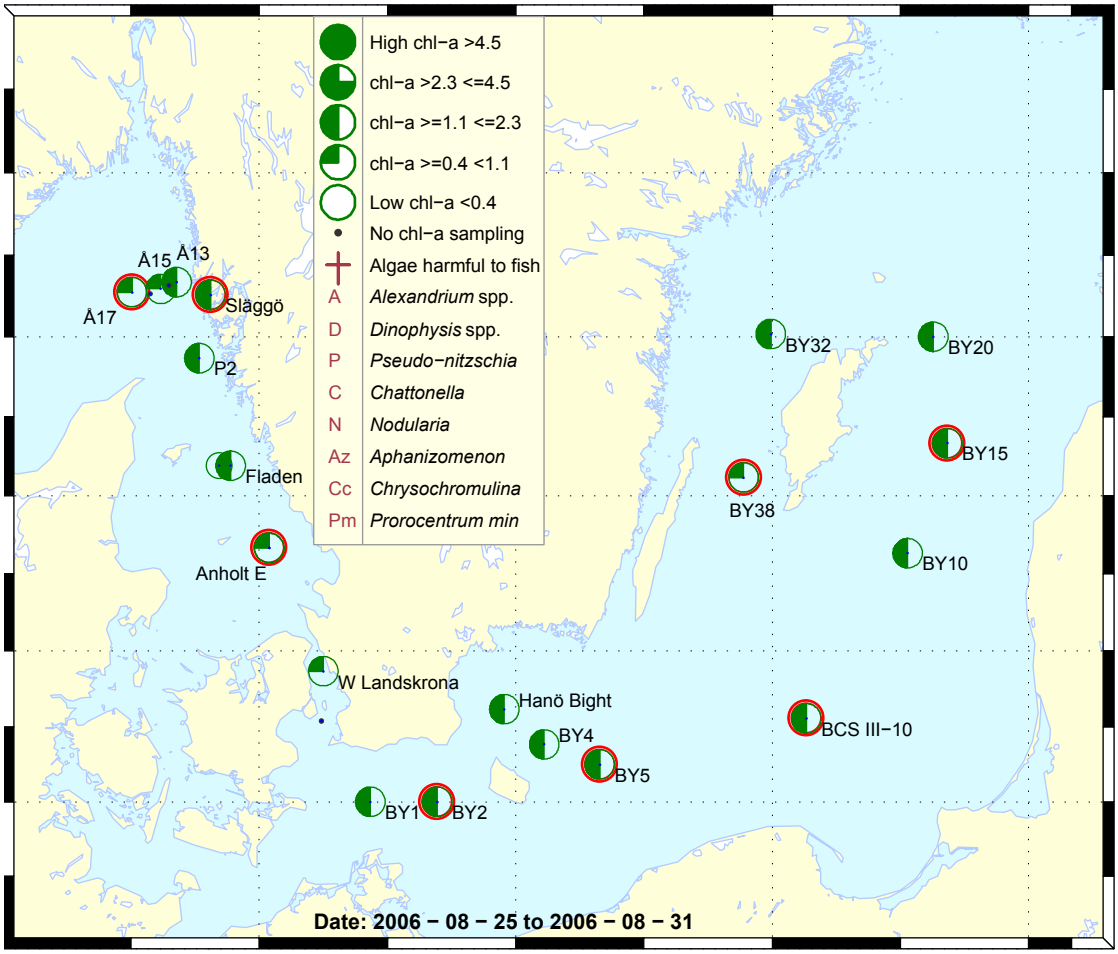
AlgAware
ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

Planktonsituationen i Skagerrak, Kattegatt och i Östersjön var mycket lik densamma från expeditionen tre veckor tidigare.

Klorofyllvärden under medel och låga cellantal av mikroalger präglade planktonsituationen i Skagerrak och Kattegatt.

I södra Kattegatt och Öresund observerades fläckvisa ytansamlingar av cyanobakterier som identifierades till den giftiga cyanobakterien Nodularia spumigena*. *I Östersjön var det inga synliga ansamlingar. I alla analyserade prover från Östersjön var algfloran fattig och cellantalen var låga förutom av små flagellerade arter som var relativt talrika.* N. spumigena* *fanns i låga mängder vid BY2 och BY38.*



Abstract

The plankton situation was very much the same as it was during the last expedition three weeks earlier in the Kattegat, the Skagerrak and the Baltic.

The chlorophyll values were below average and plankton samples from the Skagerrak and the Kattegat areas contained few species in low cell numbers.

In the southern Kattegat and the Sound, patches of surface accumulations of cyanobacteria were observed and identified as N. spumigena*. *All Baltic Sea plankton stations had a poor plankton flora and the cell numbers were relatively high for small flagellated species only.* N. spumigena* *was observed in low amounts at BY2 and BY38.*

Om AlgAware

SMHI genomför ca en gång per månad expeditioner med U/F Argos i Östersjön och Västerhavet. Resultat baserade på 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 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.
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- 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.

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.

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.

More detailed information on species composition and abundance. * = potentially toxic.

The Skagerrak

Å17 31st of August

Quite few species with an overweight of dinoflagellates were observed, the most abundant being *Heterocapsa rotundata*.

Släggö 31st of August

Specieswise, the number of dinoflagellates and diatoms were about the same. Diatom species were more abundant though, above all *Asterionellopsis glacialis* and *Leptocylindrus minimus* with 176 000 and 163 000 cells/L respectively. The diatoms *Skeletonema costatum* and *Chaetoeceros* spp. were common.

Leptocylindrus danicus

The Chlorophyll *a* concentrations were below average in the whole Skagerrak area.

Selection of observed species Red=potentially toxic species [1] quantified in m/L	**Å17** **2006-08-31** **cells/L**	**Släggö** **2006-08-31** **cells/L**	**Anholt E** **2006-08-25** **cells/L**	**Anholt E** **2006-08-31** **cells/L**
Asterionellopsis glacialis		176 000		
Cylindrotheca closterium		15 600	40 000	81 000
Cerataulina pelagica		present		present
Chaetoceros curvisetus		2 300		present
Chaetoceros spp.		12 000	10 600	214 000
Dactyliosolen fragilissimum	present	4 000		
Leptocylindrus danicus	present	present		
Leptocylindrus minimus		163 000		
cf. *Phaeodactylum tricornutum*			10 000	10 000
Pseudo-nitzschia delicatissima-group		9 700	present	present
Pseudo-nitzschia seriata-group		4 000		
Skeletonema costatum	2 700	42 000		
Rhizosolenia cf. *pungens*		1 100		
Ceratium furca		1800		
Ceratium fusus		present		
Ceratium tripos		present		
Dinophysis acuminata			220	220
Phalacroma rotundatum		450	220	
Heterocapsa cf. *minima*	7000	12000	1700	1700
Heterocapsa rotundata	21000	14000	1700	5100
Prorocentrum micans		7700	2800	4100
Prorocentrum minimum	230			
Protoceratium reticulatum		present		
Protoperidinium brevipes	present			
Pyramimonas sp.		3500		
Cryptomonadales spp	present	28000	7000	3400
Nodularia spumigena[1]			0.2	0.01

The Kattegat

Anholt E 25th and 31st of August


Cylindrotheca closterium

Similar species compositions were found at the two sampling occasions but with somewhat more diatoms at the second visit. The cyanobacteria *Nodularia spumigena** was common at the first occasion, and the diatoms *Chaetoceros* spp. and *Cylindrotheca closterium* were found in low amounts. The situation was the other way around at the second occasion, with very few filaments of *N. spumigena** and high numbers of the two diatoms mentioned above.

At Fladen, the chlorophyll *a* content was normal, whereas the contents were below average in the rest of the area.

The Baltic Sea

Arkona Basin BY2 30th of August

The situation was almost identical as the last expedition, an extremely poor plankton flora consisting of small flagellated species as *Pyramimonas* sp., the dinoflagellate *Heterocapsa* cf. *minima* and the chain building diatom *Chaetoceros impressus.* A few filaments of the cyanobacteria *Nodularia spumigena** was found. The chlorophyll *a* concentration was normal.

Bornholm Basin BY5 28th of August

The plankton flora was as poor as at BY2, but no dinoflagellate species were found. One diatom specie, *C. impressus*, at low abundance was observed. The cyanobacteria *Aphanizomenon* sp. was common. Small flagellated cryptomonads and *Pyramimonas* sp. were abundant. The chlorophyll *a* concentration was below average.

The South East Baltic BCS III-10 28th of August

As at BY5, small flagellated species were the most common. Very few diatoms and dinoflagellates were observed in very low numbers and the chlorophyll *a* concentration was below average.

Eastern Gotland Basin BY15 29th of August


Aphanizomenon sp. (left) and *N. spumigena*

Some more species were observed, of which the cyanobacterium *Aphanizomenon* sp. was common and *Anabaena* sp.* was present. The dinoflagellates *Prorocentrum miminum** and *Dinophysis acuminata** were present at very low numbers, as was the diatom *C. impressus. Pyramimonas* sp. was the most abundant specie with 235 000 cells/L. The chlorophyll *a* concentration was below average.

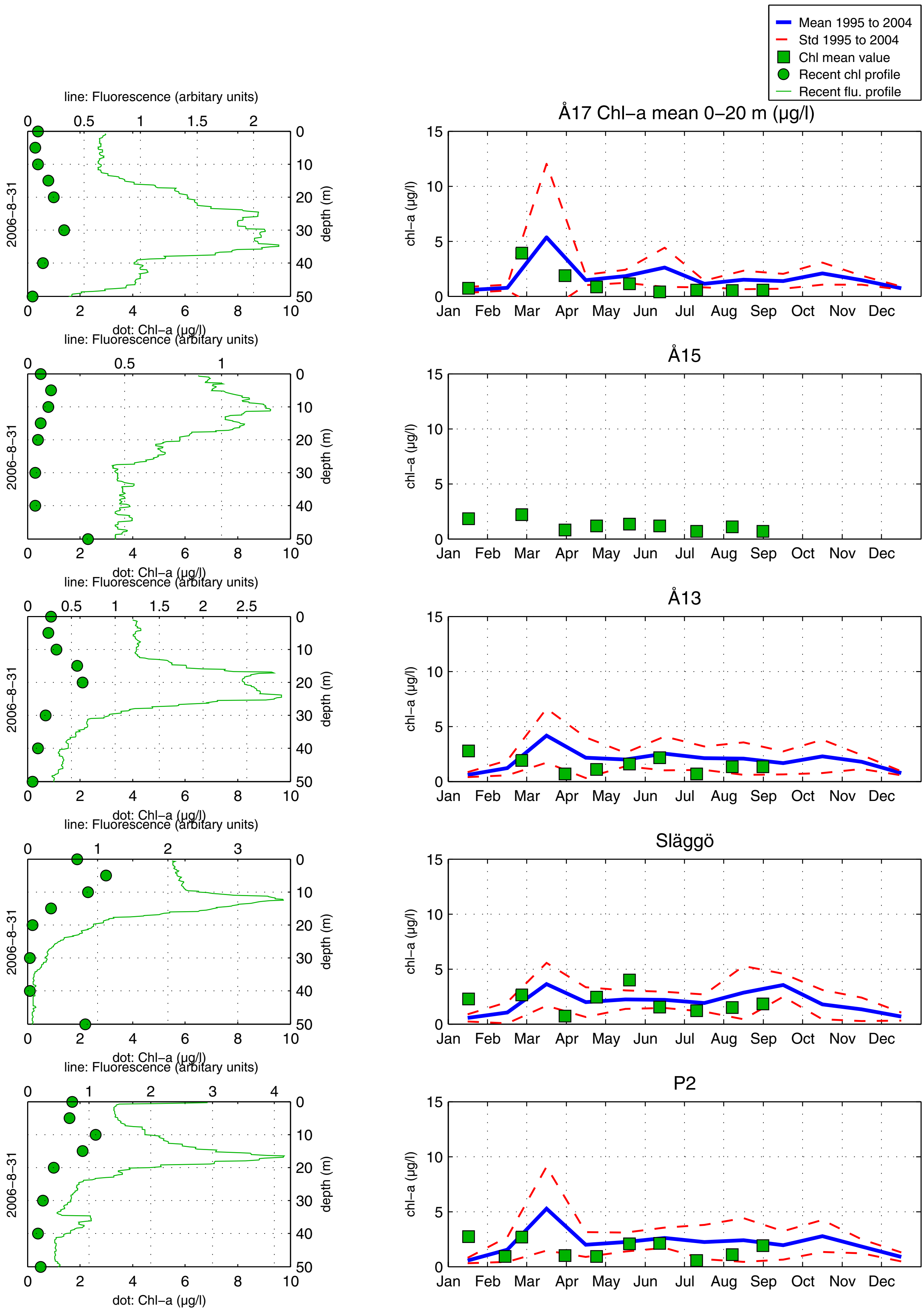
Western Gotland Basin BY38 29th of August

Some filaments of *N. spumigena** was found and *Aphanizomenon* sp. was quite common with about 6 m/L. *C. impressus* was present in low cell numbers, as was *Pyramimonas* sp.. The chlorophyll *a* concentration was below average.

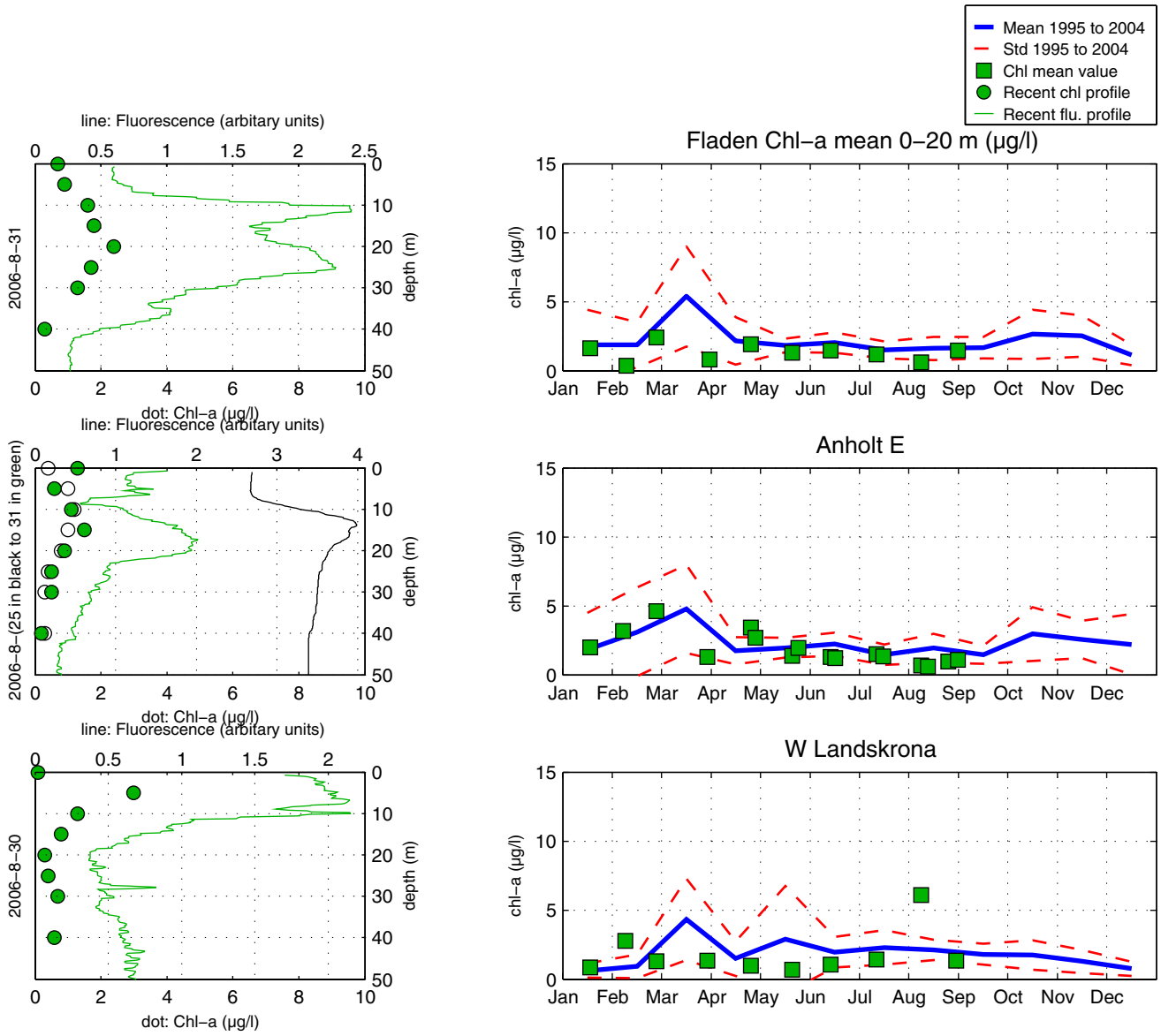
Ann-Turi Skjevik

Selection of observed species Red=potentially toxic species [1] quantified in m/L	**BY2** **2006-08-30** **cells/L**	**BY5** **2006-08-28** **cells/L**	**BCS III 10** **2006-08-28** **cells/L**	**BY15** **2006-08-28** **cells/L**	**BY38** **2006-08-29** **cells/L**
Chaetoceros impressus	900	present	2 700	6 600	7 900
Skeletonema costatum	2 200		1 800		
Cylindrotheca closterium	2 000				
Dinophysis acuminata				present	
Prorocentrum minimum				present	
Katodinium glaucum			present		
Chrysochromulina spp			3500	6900	3500
Cryptomonadales spp		100000	380000	135000	150000
Pyramimonas spp	496000	176000	53000	235000	
Anabaena sp.				present	
Aphanizomenon sp.[1]		3	present	0.7	6
Nodularia spumigena[1]	present				common
Mesodinium rubrum		present	2500	present	

The Skagerrak



The Kattegat and the Sound



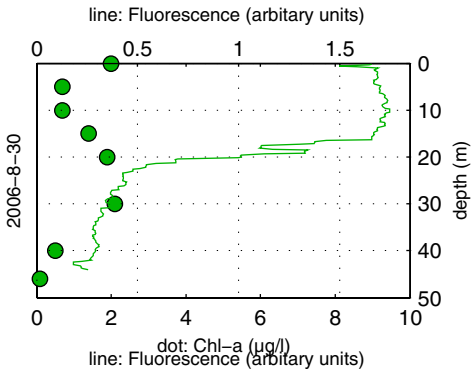
Om klorofylldiagrammen

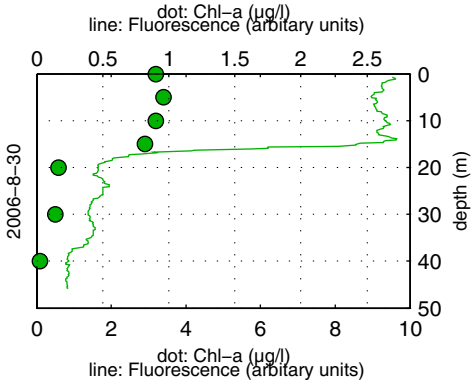
Klorofyll *a* är ett mått på mängden växtplankton. Prover tas från ett antal djup från U/F Argos. Data presenteras både från de fasta djupen och som medelvärden 0-20 m. Utöver resultaten från laboratorieanalyserna av vattenprover mäts klorofyll *a* som fluorescens från ett automatiskt instrument som sänks ned från fartyget. På så sätt kan djupt liggande, ibland, tunna alger av växtplankton observeras.

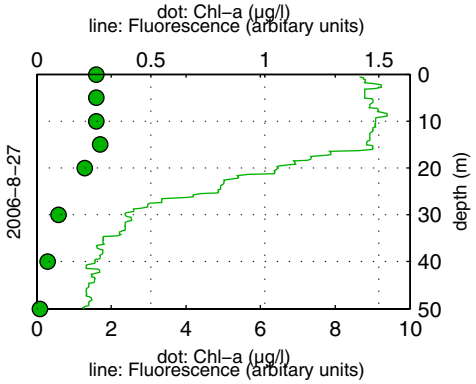
About the chlorophyll graphs

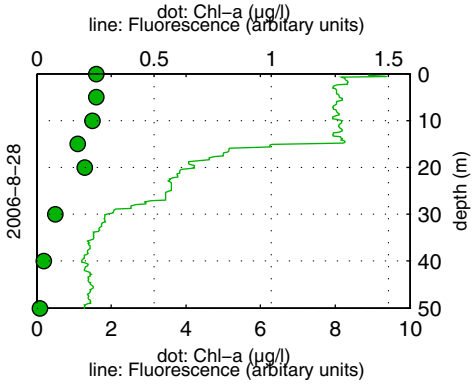
Chlorophyll *a* is sampled from several depths from the R/V Argos. Data is presented both from the discrete depths and as an average 0-20 m. In addition to the laboratory analysis from the water samples chlorophyll fluorescence is measured in continuous depth profiles from the ship. This is a way to observe thin layes of phytoplankton occuring below the surface.

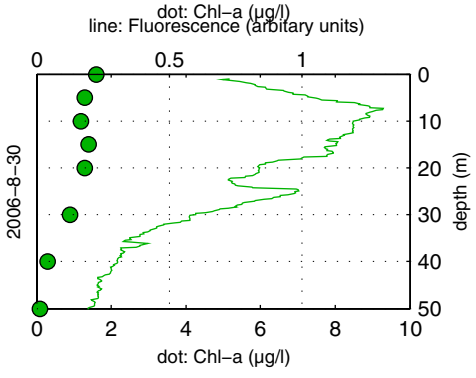
The Southern Baltic

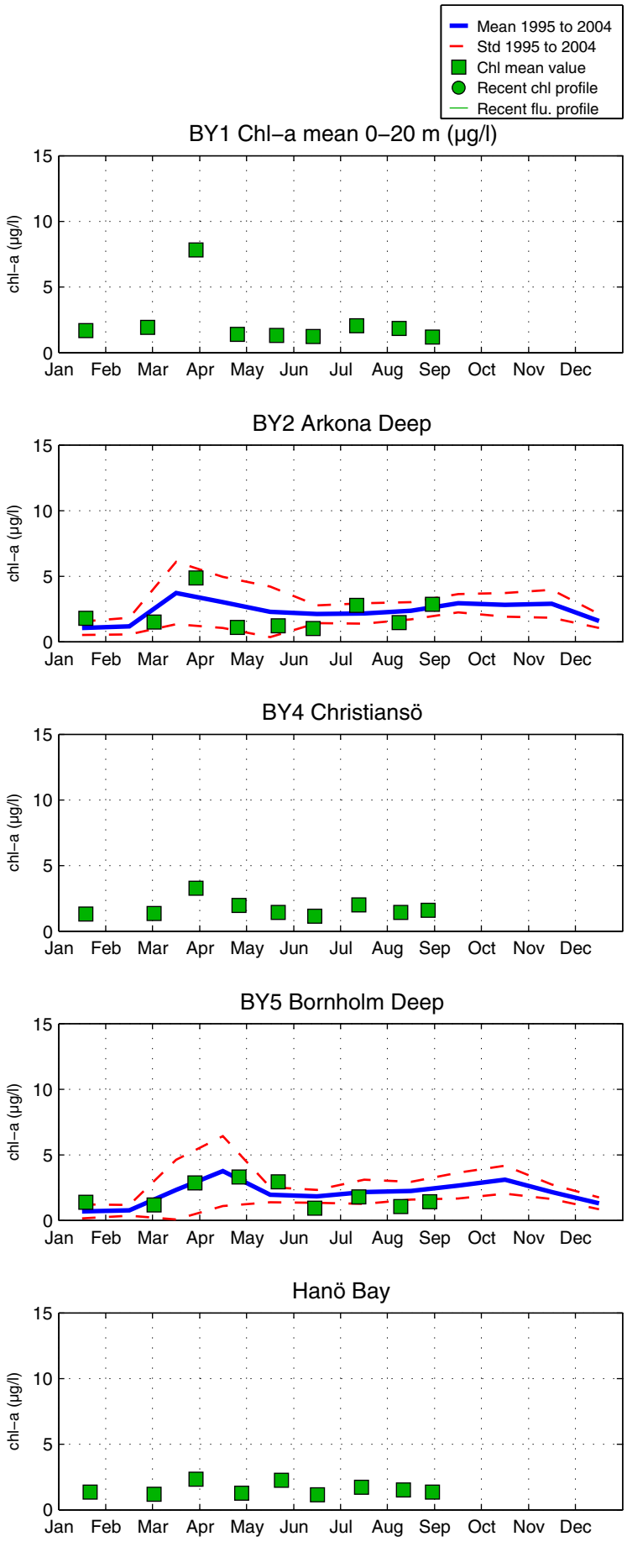




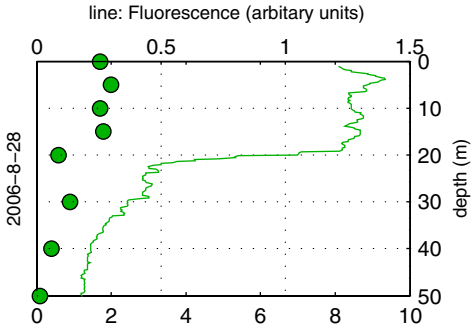


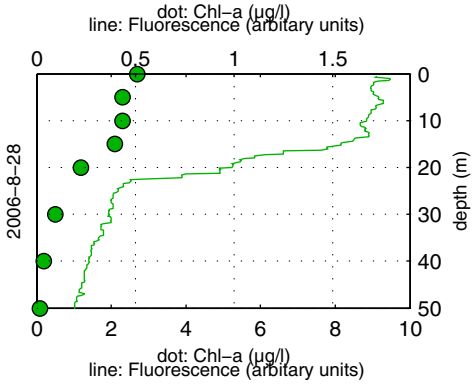


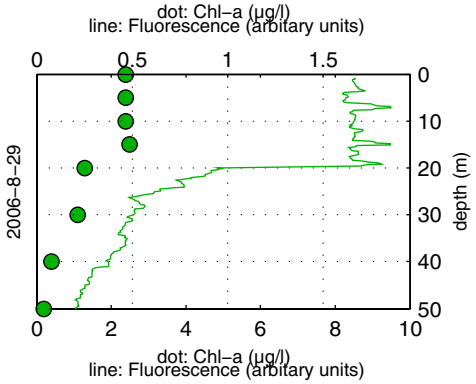


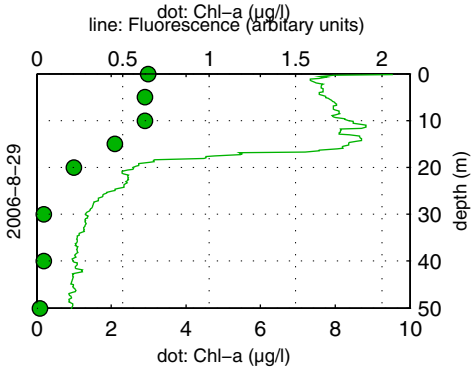


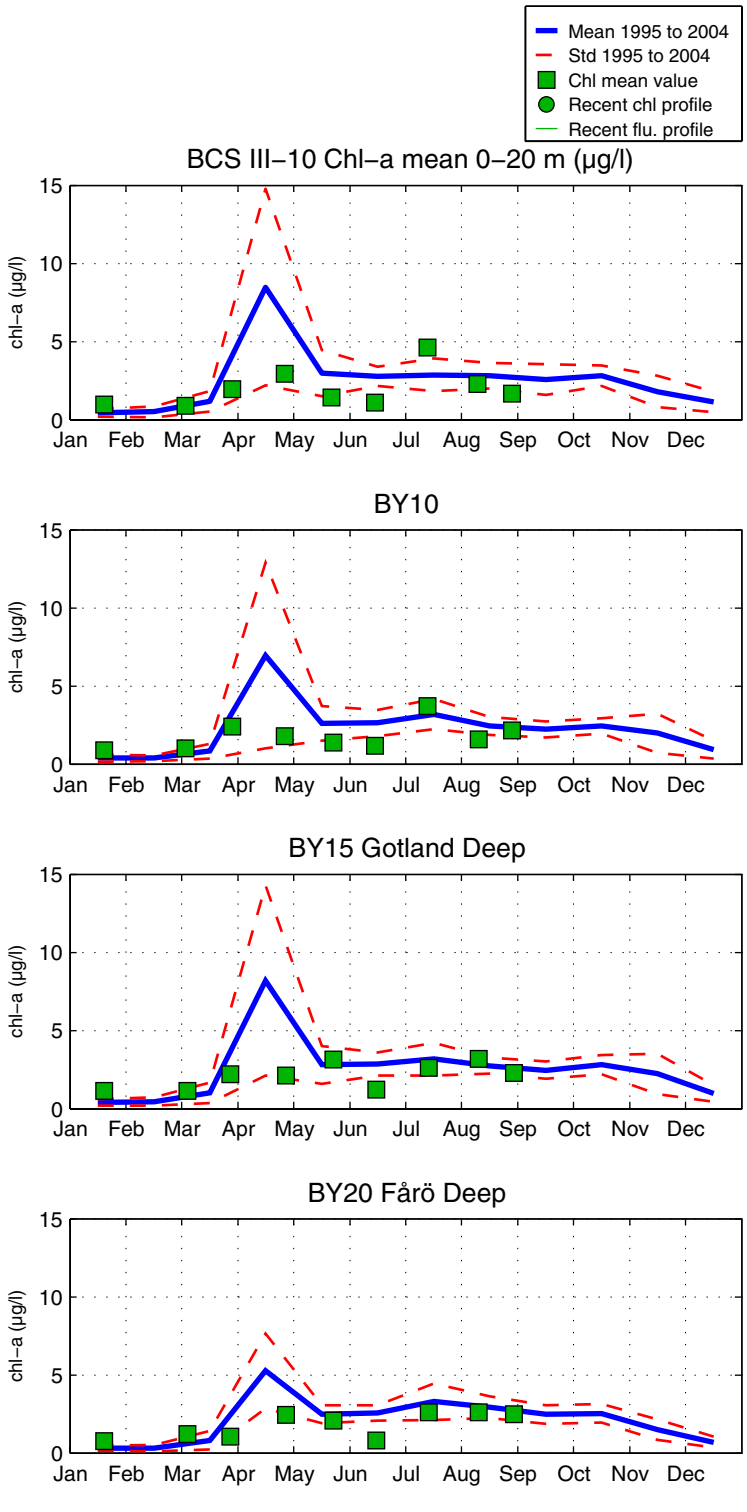
The Eastern Baltic

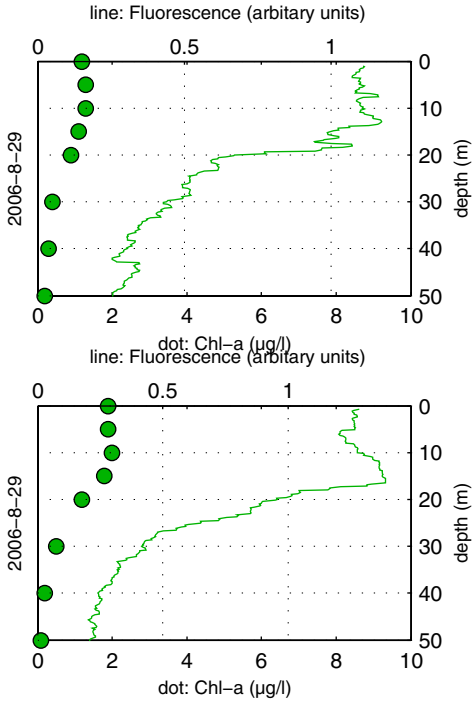


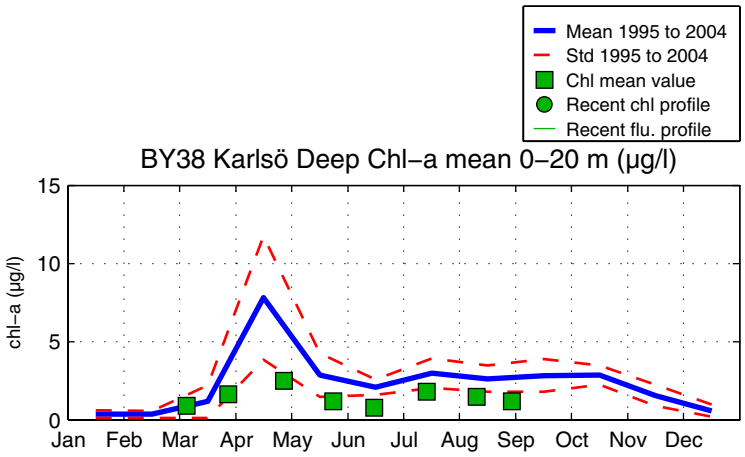


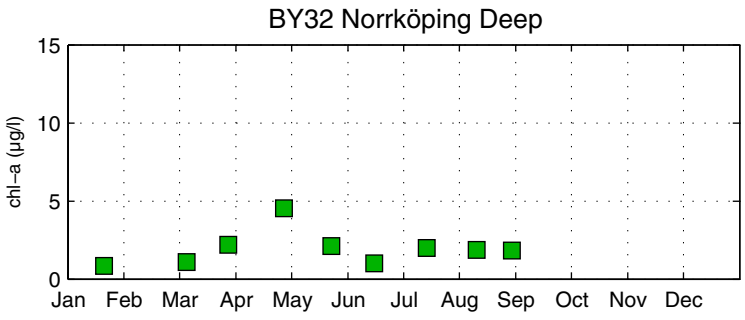







line: Fluorescence (arbitary units)
2006−8−29
depth (m)
dot: Chl−a (µg/l)
line: Fluorescence (arbitary units)
2006−8−29
depth (m)
dot: Chl−a (µg/l)


Mean 1995 to 2004
Std 1995 to 2004
Chl mean value
Recent chl profile
Recent flu. profile
BY38 Karlsö Deep Chl−a mean 0−20 m (µg/l)
chl−a (µg/l)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec


BY32 Norrköping Deep
chl−a (µg/l)
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec