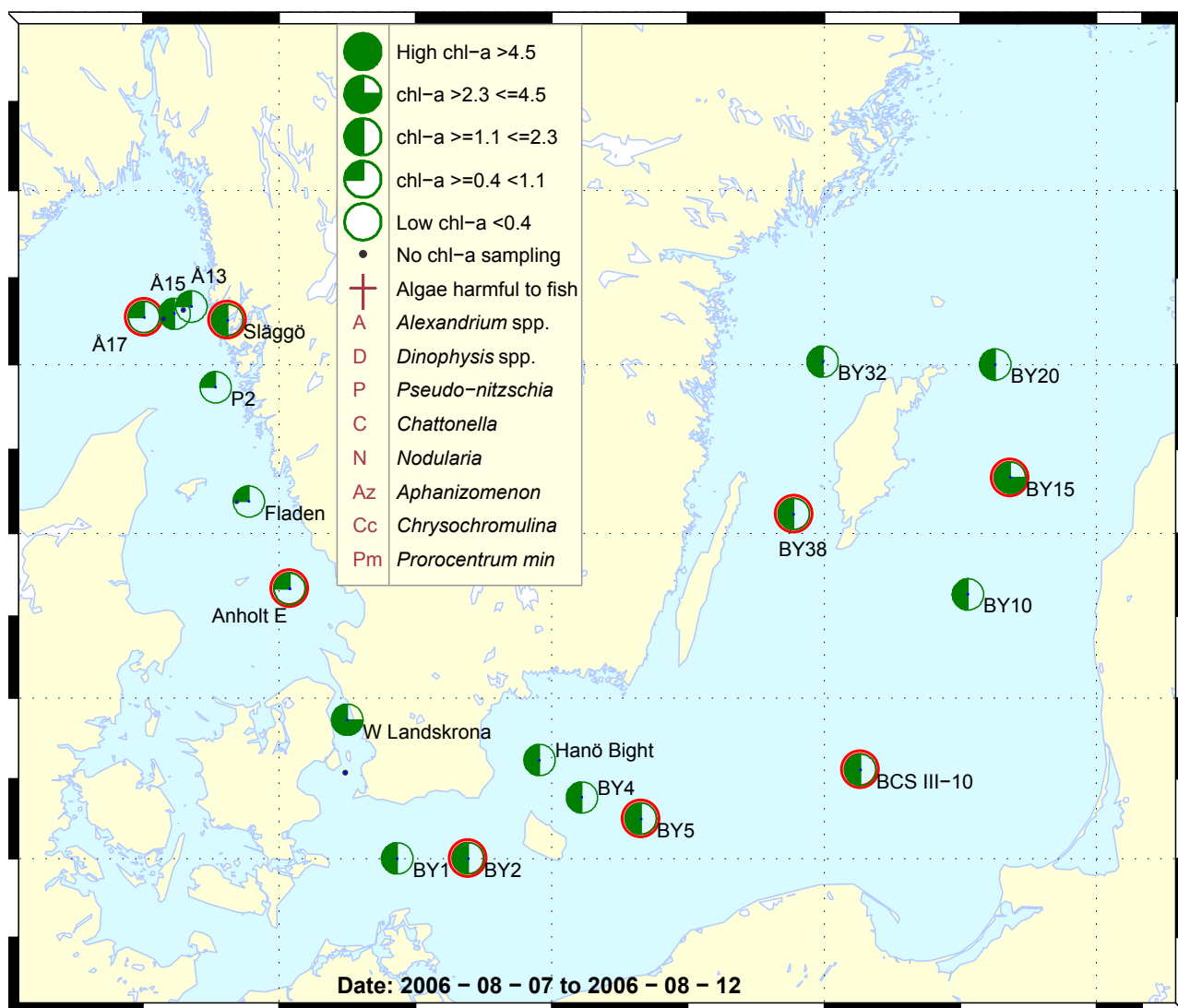


## Sammanfattning

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

I södra Kattegatt och Öresund observerades omfattande ytansamlingar av cyanobakterier som identifierades till den giftiga cyanobakterien *Nodularia spumigena*\*.

I Östersjön var det inga synliga ansamlingar förutom vid Fårödjupet nordost om Gotland. I alla analyserade prover från Östersjön var algfloran mycket fattig och cellantalen var låga. *Nodularia spumigena*\* fanns enbart vid BY15 och då bara med ett fåtal filament (trådar).



## Abstract

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, large surface accumulations of cyanobacteria were observed and identified as *N. spumigena*\*. In the Baltic Sea, visible accumulations were reported only from Fårö deep, northeast of Gotland. All Baltic Sea plankton stations had a very poor plankton flora and the cell numbers were low. A few filaments (threads) of *N. spumigena*\* was observed at BY15.

## Om AlgAware

SMHI genomför ca en gång per månad expeditioner med U/F Argos i Östersjön och Västerhavet. Resultat baserade på mikroskopianalys av planktonprover samt klorofyllmätningar presenteras kortfattat i denna rapport. Information från SMHI:s satellitövervakning av algbloomningar finns på [www.smhi.se](http://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](http://www.smhi.se).

| Art / Species                | Gift / Toxin                         | Eventuella symptom                                                                                                                                                                                                                                                                                                                                                                                                                                    | Clinical symptoms                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Alexandrium</i> spp.      | Paralytic shellfish poisoning (PSP)  | <b>Milda symptom:</b><br>Inom 30 min.:<br>Stickningar eller en känsla av bedövning runt läpparna, som sprids gradvis till ansiktet och nacken; stickningar i fingertoppar och tår;<br>Huvudvärk; yrsel, illamående, kräkningar, diarré<br><b>Extrema symptom:</b><br>Muskelförlamning; andningssvårigheter; känsla av att kvävas;<br>Man kan vara död inom 2-24 timmar efter att ha fått i sig giftet, på grund av att andningsmuskulaturen förlamas. | <b>Mild case:</b><br>Within 30 min:<br>tingling sensation ro numbness around lips, gradually spreading to face and neck; prickly sensation in fingertips and toes; headache, dizziness, nausea, vomiting, diarrhoea.<br><b>Extreme case</b><br>Muscular paralysis; pronounced respiratory difficulty; choking sensation; death trough respiratory paralysis may occur within 2-24 hours after ingestion. |
| <i>Dinophysis</i> spp.       | Diarrhetic shellfish poisoning (DSP) | <b>Milda symptom:</b><br>Efter cirka 30 minuter till några timmar:<br>yrsel, illamående, kräkningar, diarré, magont<br><b>Extrema symptom:</b><br>Upprepad exponering kan orsaka cancer                                                                                                                                                                                                                                                               | <b>Mild case:</b><br>Within 30 min-a few hours:<br>dizziness, nausea, vomiting, diarrhoea, abdominal pain. <b>Extreme case:</b><br>Repeated exposure may cause cancer.                                                                                                                                                                                                                                   |
| <i>Chattonella</i> spp.      | Fish toxin                           | <b>Låg celltäthet:</b><br>Ingen påverkan.<br><b>Hög celltäthet:</b><br>Fiskens gälar skadas, fisken dör.                                                                                                                                                                                                                                                                                                                                              | <b>Low cell numbers:</b><br>No effect on fish.<br><b>High cell numbers:</b><br>Fish death due to gill damage.                                                                                                                                                                                                                                                                                            |
| <i>Pseudo-nitzschia</i> spp. | Amnesic shellfish poisoning (ASP)    | <b>Milda symptom:</b><br>Efter 3-5 timmar:<br>yrsel, illamående, kräkningar, diarré, magkramper<br><b>Extrema symptom:</b><br>Yrsel, hallucinationer, förvirring, förlust av korttidsminnet, kramper                                                                                                                                                                                                                                                  | <b>Mild case:</b><br>Within 3-5 hours: dizziness, nausea, vomiting, diarrhoea, abdominal cramps.<br><b>Extreme case:</b><br>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 Publising.

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.

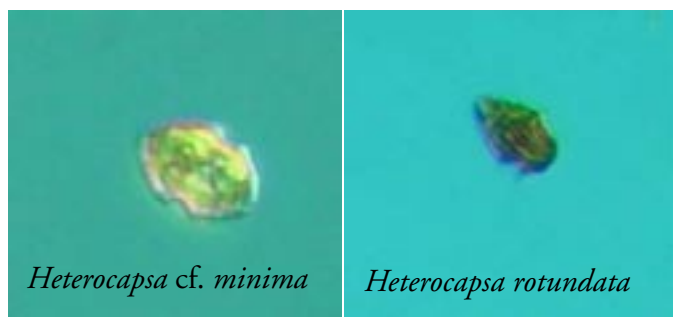
The map on the front page shows weighted mean of chlorophyll *a*, µg/l (0-20 m) at sampling stations. Presence of

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

## The Skagerrak

### Å17 7<sup>th</sup> of August

Very few species of micro algae, mostly dinoflagellates, at low abundances were observed. One diatom species, *Proboscia alata*, was quantified to 230 cells per liter.



### Släggö 7<sup>th</sup> of August

Some more species at higher cell numbers were found at Släggö compared to Å17. The small dinoflagellates *Heterocapsa cf. minima* and *H. rotundata*, were the most abundant species with cell amounts of 35000 and 45000 per liter respectively. A few threads of the filamentous cyanobacteria *Nodularia spumigena*\* was observed.

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

## The Kattegat

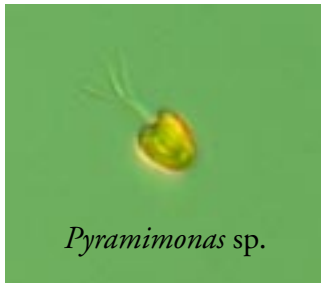
### Anholt E 8<sup>th</sup> and 12<sup>th</sup> of August

Similar species compositions and equally low chlorophyll concentrations were found at the two sampling occasions. The plankton flora was very poor and consisted of a few dinoflagellate species.

| Selection of observed species<br>Red = potentially toxic species | Å17<br>06-08-07<br>cells/L | Släggö<br>06-08-07<br>cells/L | Anholt E<br>06-08-08<br>cells/L | Anholt E<br>06-08-12<br>cells/L |
|------------------------------------------------------------------|----------------------------|-------------------------------|---------------------------------|---------------------------------|
| <i>Cerataulina pelagica</i>                                      |                            | 4800                          |                                 |                                 |
| <i>Leptocylindrus danicus</i>                                    |                            | 7000                          |                                 |                                 |
| <i>Proboscia alata</i>                                           | present                    | present                       |                                 |                                 |
| <i>Pseudo-nitzschia</i> spp                                      |                            | present                       |                                 |                                 |
| <i>Ceratium fusus</i>                                            | present                    |                               |                                 |                                 |
| <i>Heterocapsa cf. minima</i>                                    | 5300                       | 35000                         | 9000                            |                                 |
| <i>Heterocapsa rotundata</i>                                     | 3500                       | 45000                         |                                 | 3500                            |
| <i>Prorocentrum micans</i>                                       |                            | 1700                          | present                         | present                         |
| <i>Phalacroma rotundatum</i>                                     |                            |                               | present                         |                                 |
| <i>Protoceratium reticularum</i>                                 |                            |                               | present                         | present                         |
| <i>Karenia mikimotoi</i>                                         |                            |                               | present                         |                                 |
| <i>Nodularia spumigena</i>                                       |                            | present                       |                                 |                                 |
| <i>Emiliania huxleyi</i>                                         | 8900                       | 31000                         |                                 | 16000                           |

# The Baltic Sea

## Arkona Basin BY2 8<sup>th</sup> of August



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*. In the net sample (0-20 m) a few filaments of the cyanobacteria *Aphanizomenon* sp. was found. The chlorophyll *a* concentration was below average.

## Bornholm Basin BY5 9<sup>th</sup> of August

The plankton flora was as poor as at BY2, but no dinoflagellate species were found. Three species of diatoms at low numbers were observed, of which *C. impressus* was one. No cyanobacteria were found, neither in the net sample (0-20 m). The chlorophyll *a* concentration was below average.

## The South East Baltic BCS III-10 9<sup>th</sup> of August

A few more species were present as compared to BY2 and BY5. The dinoflagellate *Akashiwo sanguinea* was found at an amount of 7500 cells/l, and the diatom *C. impressus* with 1400 cells/l. The small flagellate *Pyramimonas* sp. was the most abundant algae with 150 000 cells/l. *Aphanizomenon* sp was quite common in the net sample (0-20m). The chlorophyll *a* concentration was below average.

## Eastern Gotland Basin BY15 9<sup>th</sup> of August

This is the only station at which *N. spumigena*\* was found at low abundance, and only a few filaments were observed. *Aphanizomenon* sp. was quite common in the samples, and *Anabanea* sp.\* was present at low abundances. *C. impressus* was present in low numbers, as were the dinoflagellates *Dinophysis acuminata*\* and *Phalacroma rotundatum*\*. The chlorophyll *a* concentration was above average.



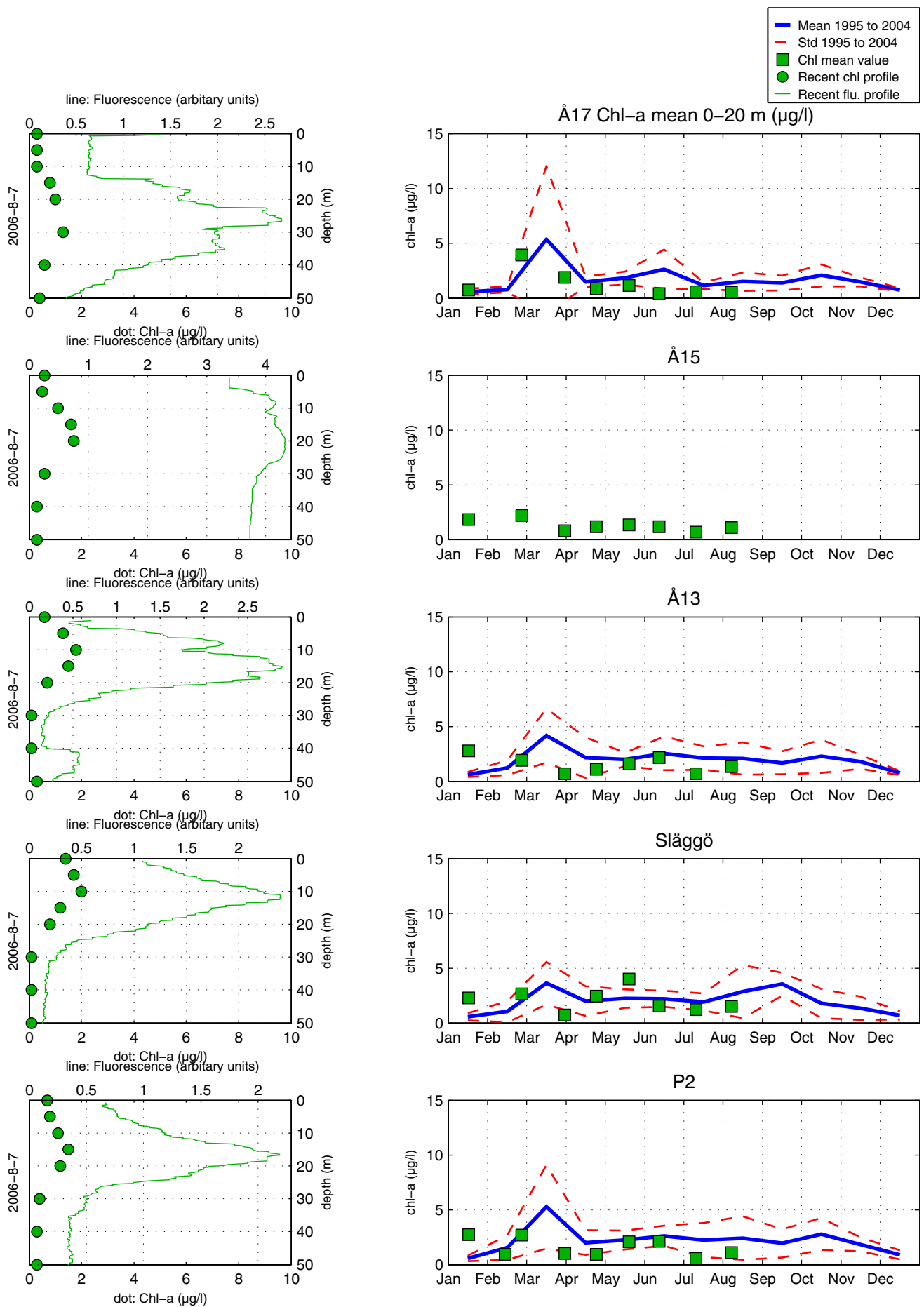
## Western Gotland Basin BY38 10<sup>th</sup> of August

A similar situation was found as at BY2 and BY5, with very few species at low cell numbers. *C. impressus* was found again, as were a few chains of the diatom *Skeletonema costatum*. Some filaments of *Aphanizomenon* sp. were observed in the net sample (0-20m), and the chlorophyll *a* concentration was below average.

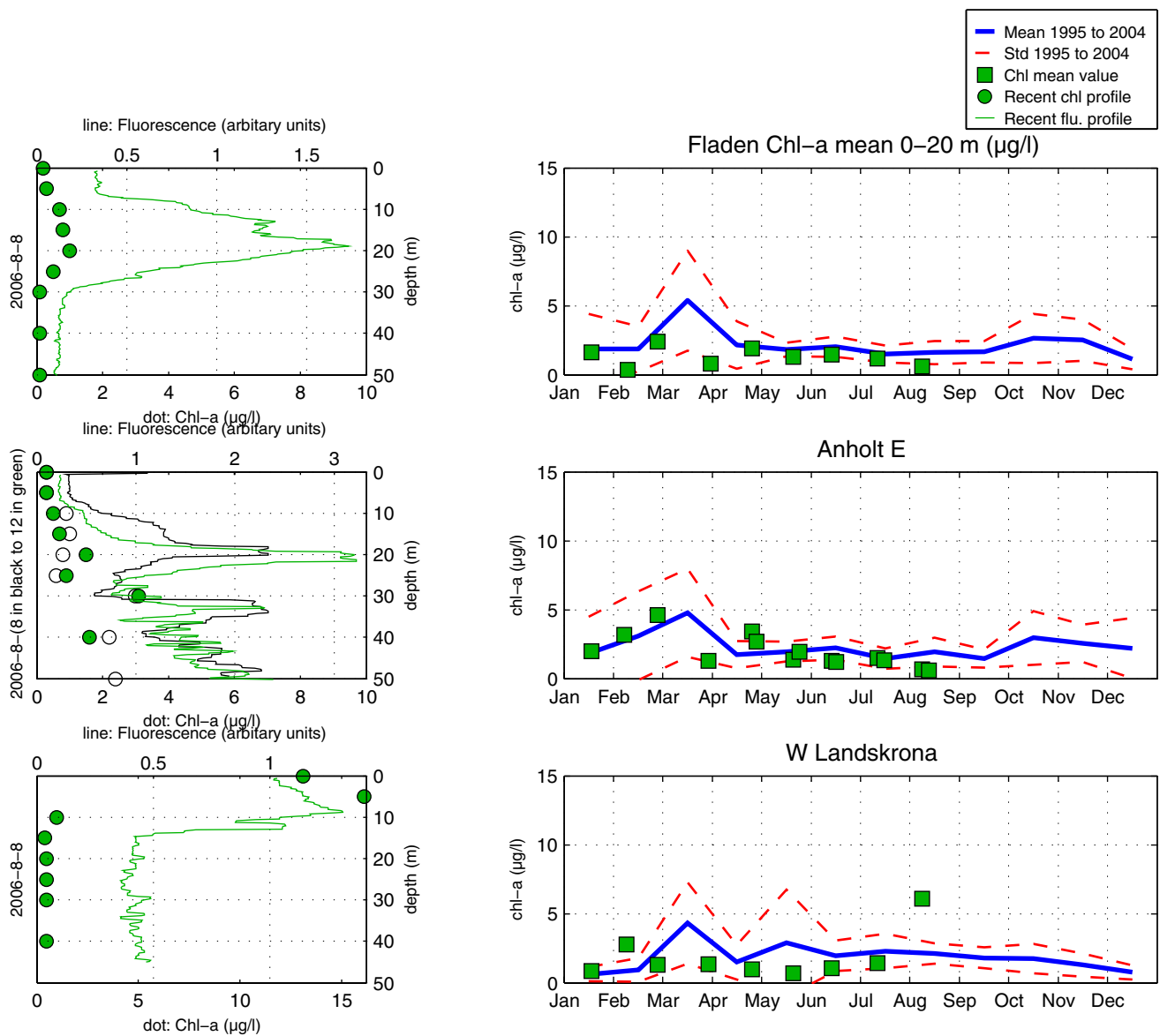
*Ann-Turi Skjevik*

| Selection of observed species<br>Red = potentially toxic species | BY2<br>06-08-08<br>cells/L | BY5<br>06-08-09<br>cells/L | BCS III 10<br>06-08-09<br>cells/L | BY15<br>06-08-10<br>cells/L | BY38<br>06-08-10<br>cells/L |
|------------------------------------------------------------------|----------------------------|----------------------------|-----------------------------------|-----------------------------|-----------------------------|
| <i>Chaetoceros impressus</i>                                     | 1400                       | present                    | 1300                              | present                     | 1808                        |
| <i>Skeletonema costatum</i>                                      |                            | present                    |                                   |                             | present                     |
| <i>Akashiwo sanguinea</i>                                        |                            |                            | 7500                              |                             |                             |
| <i>Amylax triacantha</i>                                         |                            |                            | present                           |                             |                             |
| <i>Heterocapsa cf. minima</i>                                    | 1800                       |                            |                                   |                             |                             |
| <i>Heterocapsa rotundata</i>                                     |                            |                            | present                           |                             |                             |
| <i>Dinophysis acuminata</i>                                      |                            |                            |                                   | 100                         |                             |
| <i>Phalacroma rotundatum</i>                                     |                            |                            |                                   | 150                         |                             |
| <i>Pyramimonas</i> spp                                           | 35000                      | 35000                      | 153000                            | 23000                       | 83000                       |
| Cryptophyceae spp                                                | 87000                      | 88000                      | 440000                            | 18000                       | 35000                       |
| <i>Anabaena</i> sp                                               |                            |                            |                                   | present                     |                             |
| <i>Aphanizomenon</i> spp                                         |                            |                            |                                   | present                     |                             |
| <i>Nodularia spumigena</i>                                       |                            |                            |                                   | present                     |                             |

# The Skagerrak



# The Kattegat and the Sound



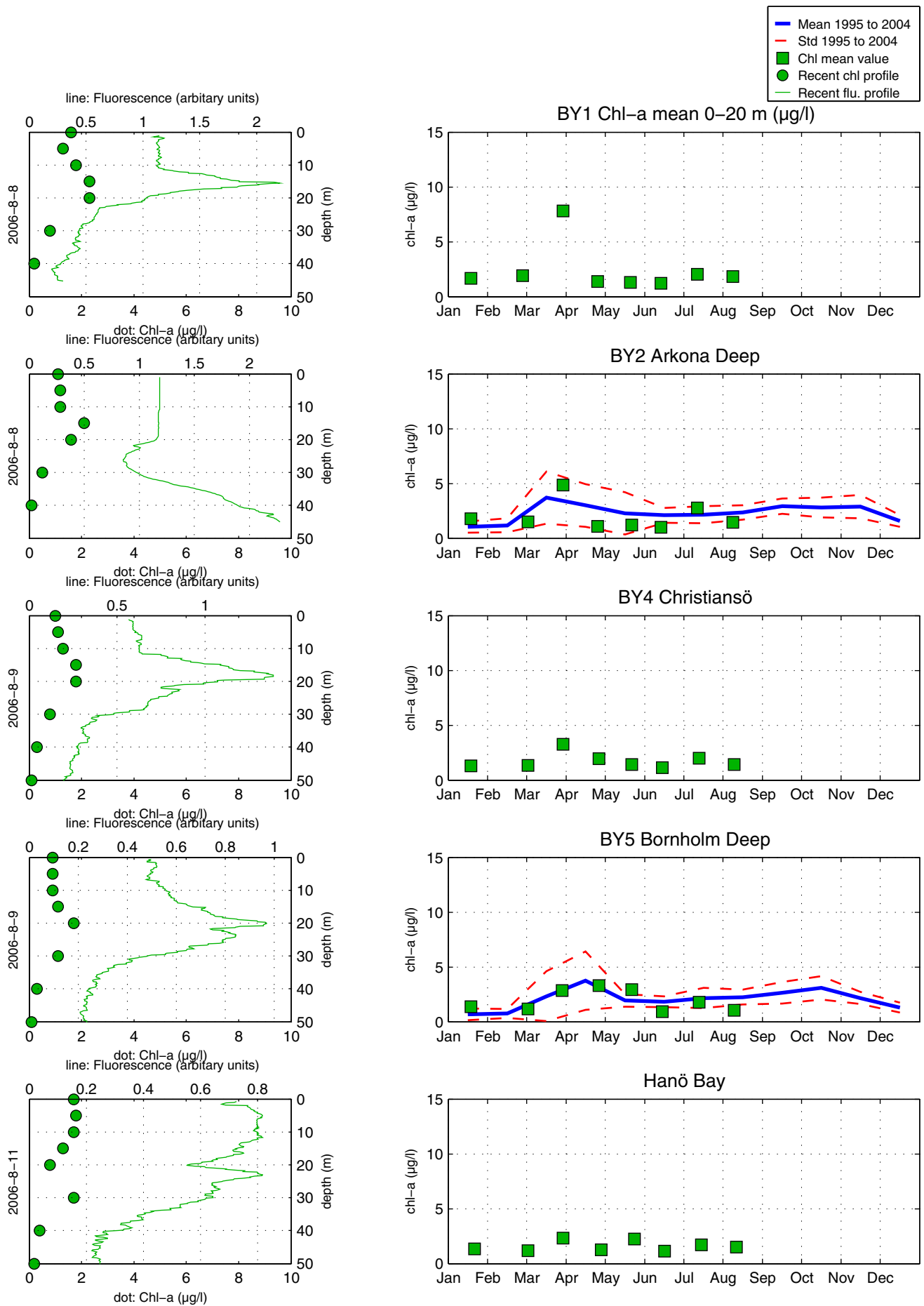
## Om klorofylldiagrammen

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.

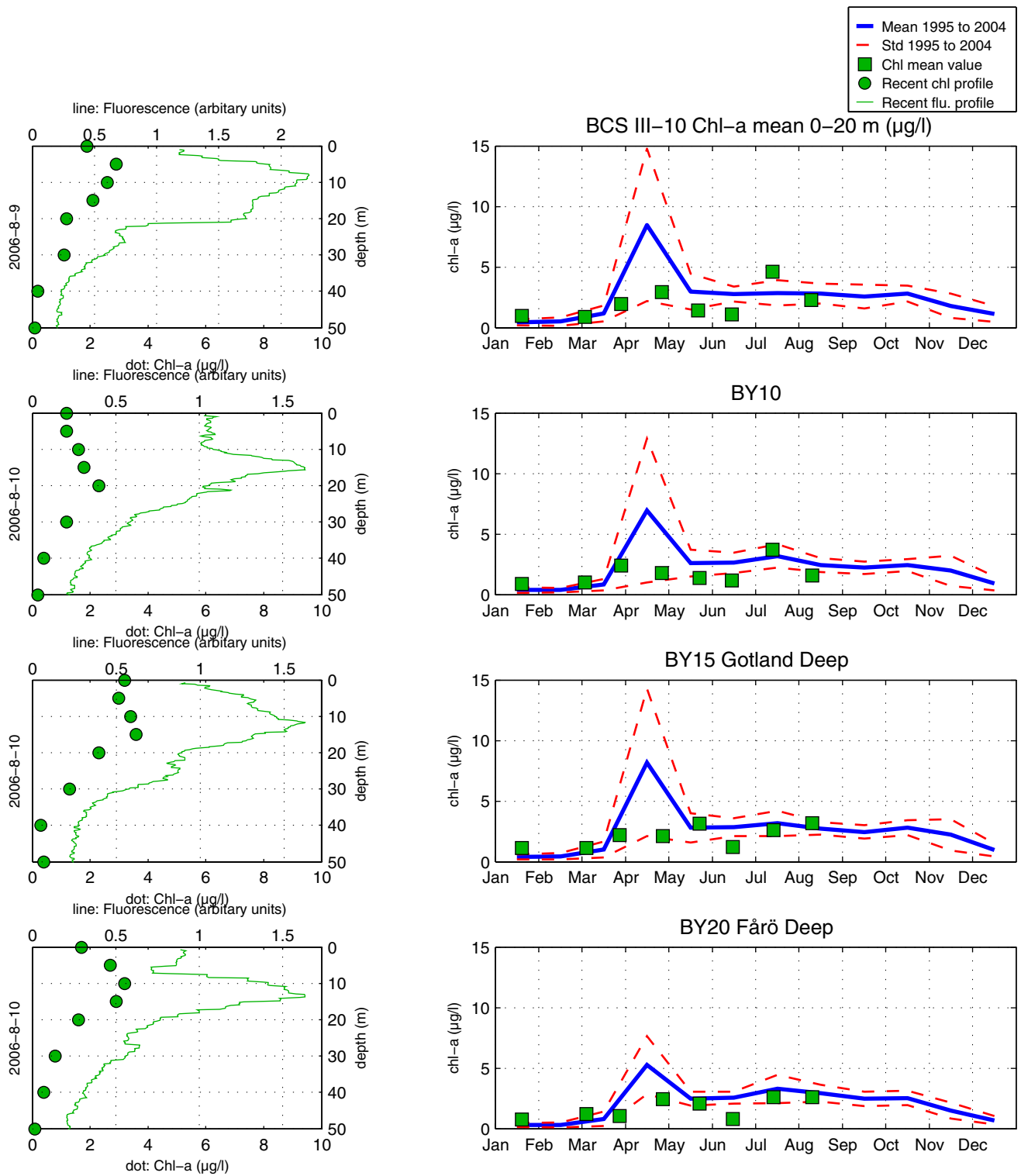
## About the chlorophyll graphs

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 layers of phytoplankton occurring below the surface.

# The Southern Baltic



# The Eastern Baltic



# The Western Baltic

