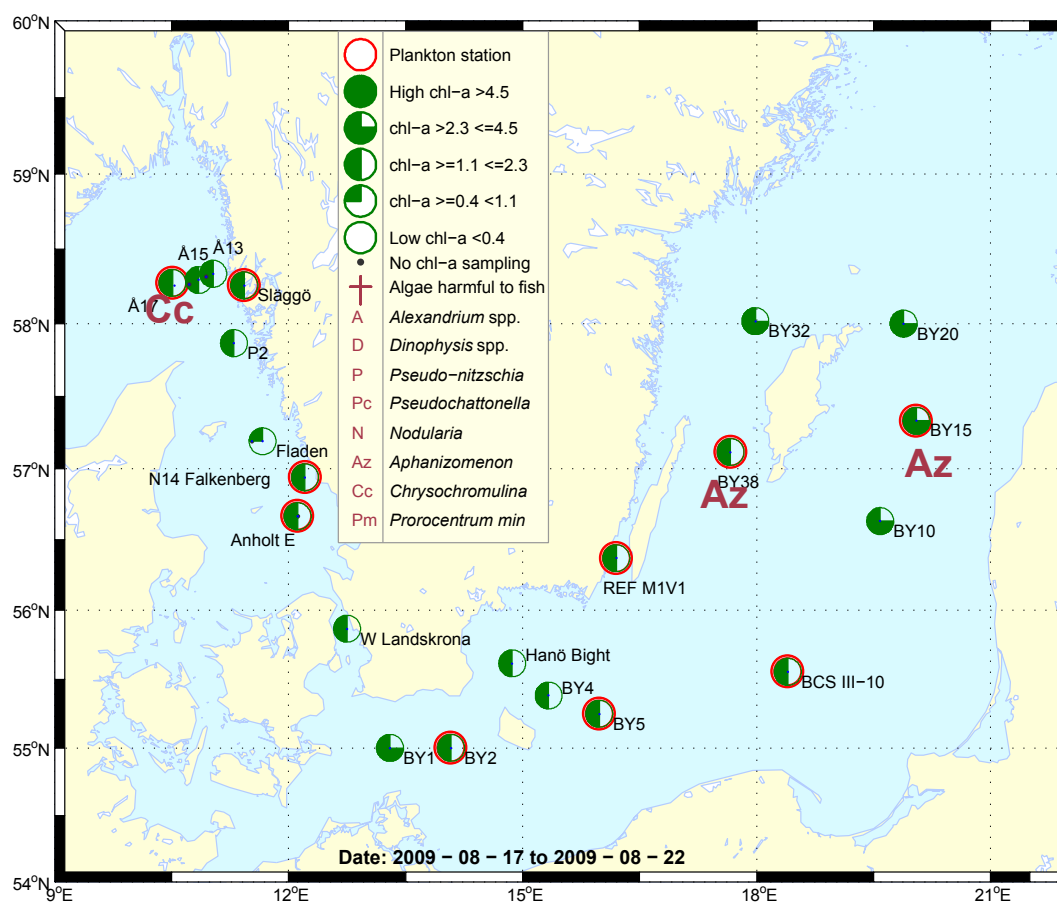


## Sammanfattning

Det var kiselalgsblomning vid Skagerrak-kusten (Släggö) vid tidpunkten för den senaste provtagningen, den 22 augusti. Det var framför allt kiselalgen *Skeletonema costatum* som fanns i höga cellantal, och det var generellt artrikt vid stationen. Klorofyllvärdet i ytan vid Släggö var något förhöjt, men det integrerade värdet (0-20 m) låg inom medel vid Släggö, som det också gjorde vid samtliga Skagerrak- och Kattegattstationer vid provtagningstillfället.

Låga klorofyllvärden, dock inom medel för denna tid på året, präglade samtliga stationer i Östersjön. Artdiversiteten var generellt låg, men relativt stora mängder av filamentösa cyanobakterier återfanns vid BY15, BY38 och i Kalmarsund. Små kolonibildande cyanobakterier fanns i stora antal vid alla Östersjö-stationer.



## Abstract

A diatom bloom was observed at the Skagerrak coast (Släggö) at the time of the latest sampling, 22<sup>nd</sup> of August. The diatom *Skeletonema costatum* was found with high cell numbers and the species diversity was high. The chlorophyll *a* concentration in the surface was enhanced, although the integrated chlorophyll value (0-20 m) was within average at Släggö, as well as at all of the Skagerrak and Kattegat stations.

Low chlorophyll values, within average for this time of the year, were found at all of the Baltic stations. The species diversity was low, but relatively large amounts of filamentous cyanobacteria were present at BY15, BY38 and in the Kalmar Sound. Colonies of small cyanobacteria were abundant at all of the Baltic stations.

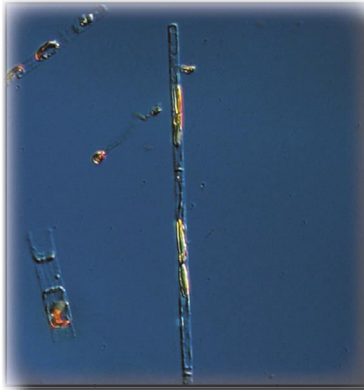
More detailed information on species composition and abundance

## The Skagerrak

### Å17 22<sup>nd</sup> of August (open Skagerrak)

The phytoplankton diversity was rather low. The prymnesiophyte *Chrysochromulina* spp.\* was common as well as the diatom *Cylindrotheca closterium* and the dinoflagellate *Heterocapsa rotundata*.

### Släggö 22<sup>nd</sup> of August (Skagerrak coast)



*Leptocylindrus minimus*

A diatom bloom was observed and *Skeletonema costatum* was found to have the highest cell numbers. Other abundant diatom species were *Chaetoceros* spp. and *Leptocylindrus minimus*. The dinoflagellate *Lingulodinium polyedrum*\* was common.

Although the surface sample concentration of chlorophyll *a* at Släggö was somewhat high, the integrated chlorophyll *a* were within average for this month at the Skagerrak sampling sites.

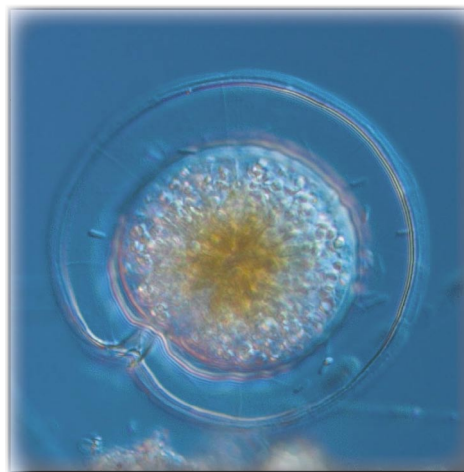
## The Kattegat

### N14 Falkenberg 17<sup>th</sup> of August

The diatom *Skeletonema costatum* was the most numerous species, and *Leptocylindrus minimus* and *Pseudo-nitzschia* spp.\* were common. The number of diatom versus dinoflagellate species were about 50/50 although diatoms dominated the cell counts. The prymnesiophyte *Chrysochromulina* spp.\* was common.

### Anholt E 17<sup>th</sup> and 21<sup>st</sup> of August

The plankton samples were very similar on both occasions, diatoms dominated, but no specific species. Several species were common though, e.g. *Leptocylindrus minimus* and *Pseudo-nitzschia* spp.\*.



*Pyrophacus horologicum*

| Selection of observed species                | Å17        | Släggö      | N14        | Anholt E   | Anholt E   |
|----------------------------------------------|------------|-------------|------------|------------|------------|
| Red=potentially toxic species                | 2009-08-22 | 2009-08-22  | 2009-08-17 | 2009-08-17 | 2009-08-21 |
|                                              | cells/l    | cells/l     | cells/l    | cells/l    | cells/l    |
| <i>Chaetoceros decipiens</i>                 |            | present     |            |            |            |
| <i>Chaetoceros impressus</i>                 |            |             |            | present    | present    |
| <i>Chaetoceros laciniosus</i>                |            | present     | present    |            | present    |
| <i>Chaetoceros socialis</i>                  |            | present     |            |            |            |
| <i>Chaetoceros tenuissimus</i>               |            | present     |            |            | present    |
| <i>Coscinodiscus</i> spp.                    |            |             |            | common     |            |
| <i>Cylindrotheca closterium</i>              | common     | common      | present    | common     | common     |
| <i>Dactyliosolen fragilissimus</i>           | present    | present     |            |            | present    |
| <i>Guinardia delicatula</i>                  | present    | present     |            | common     |            |
| <i>Guinardia flaccida</i>                    |            | present     |            | present    | present    |
| <i>Lennoxia faveolata</i>                    | present    |             |            |            |            |
| <i>Leptocylindrus danicus</i>                | present    | common      | present    | present    | present    |
| <i>Leptocylindrus minimus</i>                |            | common      | common     | common     | common     |
| cf. <i>Nitzschia longissima</i>              |            | common      | present    | common     | common     |
| <i>Proboscia alata</i>                       |            |             | present    | present    | present    |
| <i>Pseudo-nitzschia delicatissima</i> -group |            | present     | present    | present    | common     |
| <i>Pseudo-nitzschia seriata</i> -group       |            | present     | present    | present    | common     |
| <i>Rhizosolenia pungens</i>                  |            |             | present    |            | present    |
| <i>Rhizosolenia setigera</i>                 |            |             |            | present    | present    |
| <i>Skeletonema costatum</i> complex          | present    | 1.5 million | 125 000    | common     |            |
| <i>Thalassionema nitzschioides</i>           |            |             |            | common     |            |
| <i>Amylax triacantha</i>                     |            | present     |            |            |            |
| <i>Ceratium furca</i>                        |            | present     |            | present    |            |
| <i>Ceratium fusus</i>                        | present    | present     | present    | present    | present    |
| <i>Ceratium lineatum</i>                     |            |             | present    |            | present    |
| <i>Ceratium tripos</i>                       |            |             | present    |            |            |
| <i>Dinophysis acuminata</i>                  |            | present     |            | present    |            |
| <i>Dinophysis acuta</i>                      |            |             |            | present    |            |
| <i>Dinophysis norvegica</i>                  |            |             |            | present    | present    |
| <i>Heterocapsa</i> cf. <i>minima</i>         | present    |             |            | present    | present    |
| <i>Heterocapsa rotundata</i>                 | common     | common      | common     | common     | common     |
| <i>Heterocapsa triquetra</i>                 |            | present     | present    | present    |            |
| <i>Katodinium glaucum</i>                    | present    | present     |            |            |            |
| <i>Lingulodinium polyedrum</i>               |            | common      |            | present    |            |
| <i>Noctiluca scintillans</i>                 |            | present     |            |            |            |
| <i>Oxytoxum gracile</i>                      | present    | present     | present    |            |            |
| <i>Prorocentrum balticum</i>                 | present    |             |            |            |            |
| <i>Prorocentrum micans</i>                   |            | present     |            |            |            |
| <i>Prorocentrum redfieldii</i>               |            | present     |            |            |            |
| <i>Protoperidinium divergens</i>             |            |             |            | present    | present    |
| <i>Protoperidinium oblongum</i>              |            | present     |            |            | present    |
| <i>Pyrophacus horologicum</i>                |            |             |            | present    |            |
| <i>Chrysochromulina</i> spp.                 | 70 000     | present     | common     | common     | common     |
| Cryptomonadales spp.                         | 60 000     | 50 000      | present    | present    | common     |
| <i>Pyramimonas</i> spp.                      | common     | common      | common     | present    | present    |
| <i>Apedinella radians</i>                    |            | present     |            |            |            |
| <i>Dinobryon balticum</i>                    |            | present     | present    | present    | present    |
| <i>Dinobryon faculiferum</i>                 |            | present     | present    |            |            |
| <i>Pseudochattonella farcimen</i>            |            |             | present    |            |            |
| <i>Anabaena</i> spp.                         |            | present     |            | present    | common     |
| <i>Leucocryptos marina</i>                   | present    | present     | present    |            |            |
| <i>Mesodinium rubrum</i>                     | present    | present     |            |            |            |

## The Baltic Sea

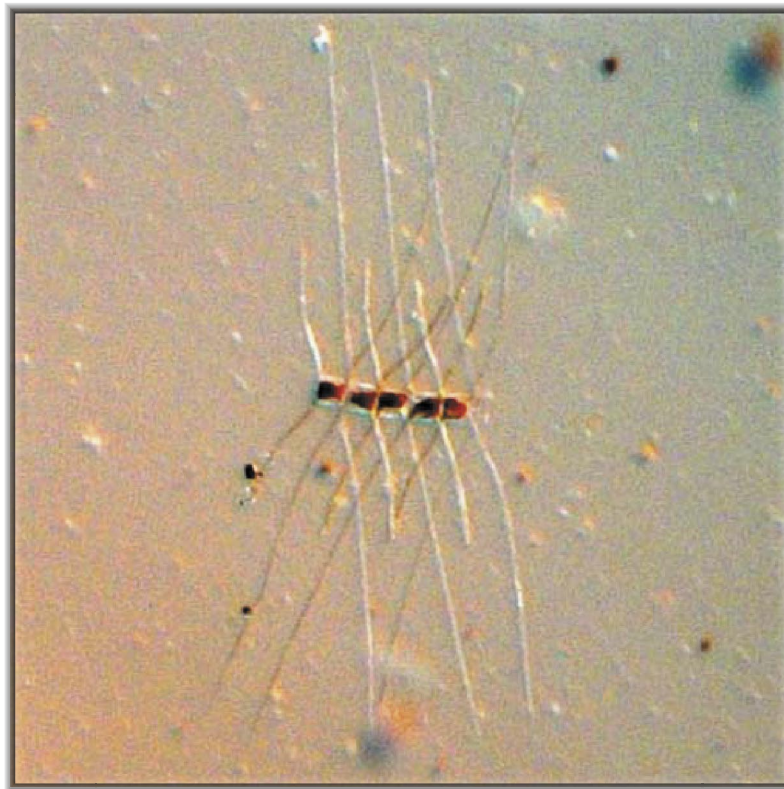
### Arkona Basin BY2, Bornholm Basin BY5 and South East Baltic BCS III-10 18<sup>th</sup>-19<sup>th</sup> of August

The phytoplankton diversity was very low. Traces of the prymnesiophyte *Chrysochromulina polylepis*\* were found at BY2 and BCSIII-10. Cyanobacteria colonies were abundant.

### Eastern Gotland Basin BY15, Western Gotland Basin BY38 and Kalmar Sound Ref. M1-V1 19<sup>th</sup>-20<sup>th</sup> of August

The phytoplankton diversity was very low, but filamentous cyanobacteria and cyanobacteria colonies were common. Traces of the prymnesiophyte *Chrysochromulina polylepis*\* were found at BY38 and in the Kalmar Sound. Other species of *Chrysochromulina* were common at all of the three phytoplankton stations.

The integrated chlorophyll *a* values were within average for this month at the Baltic stations.

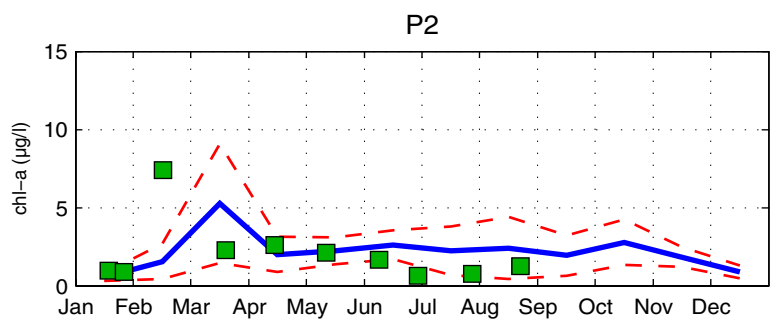
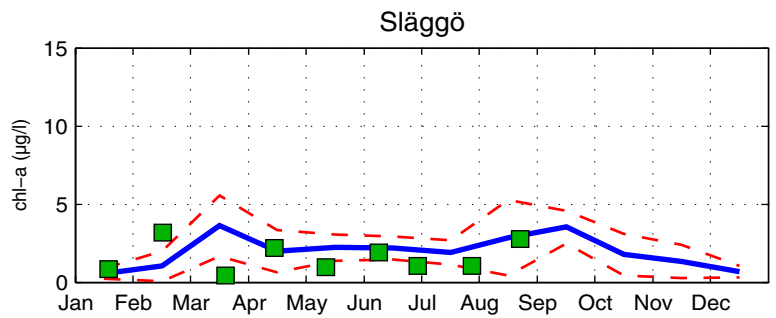
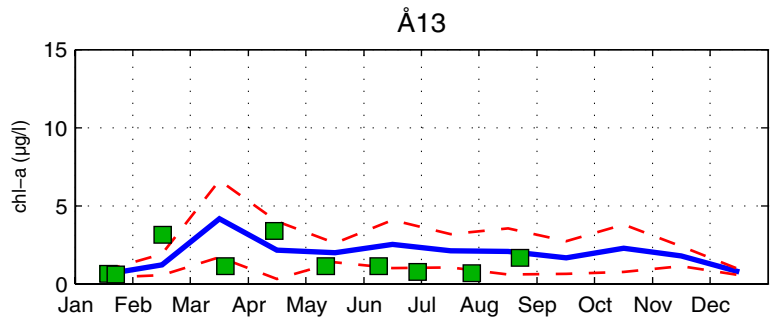
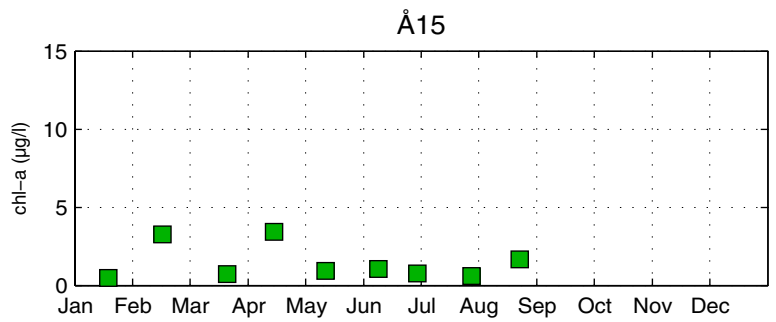
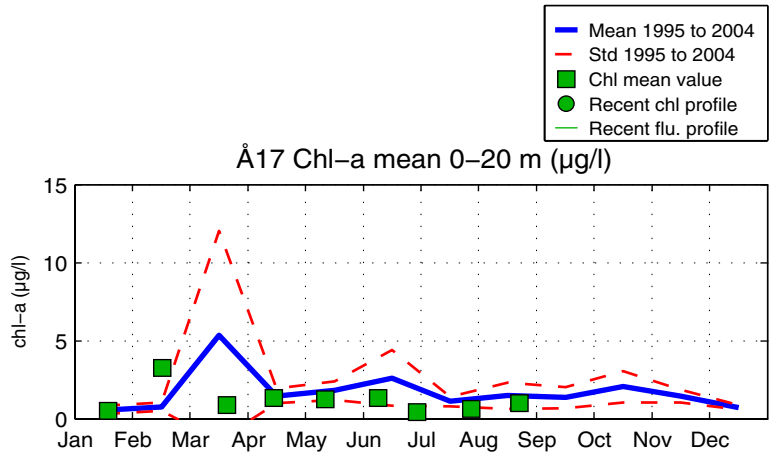
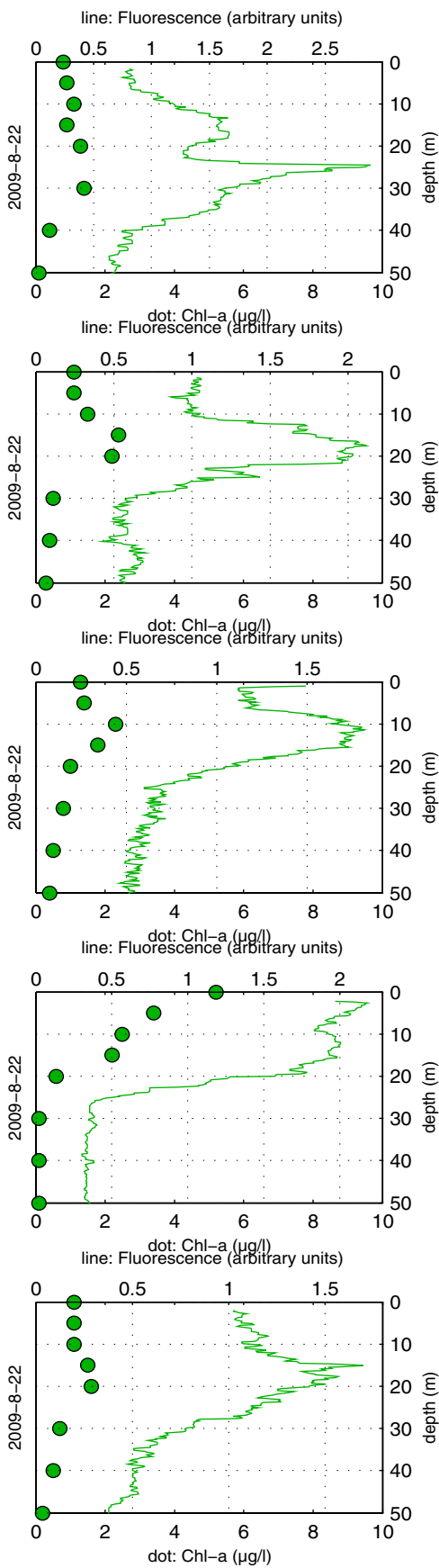


*Chaetoceros impressus*

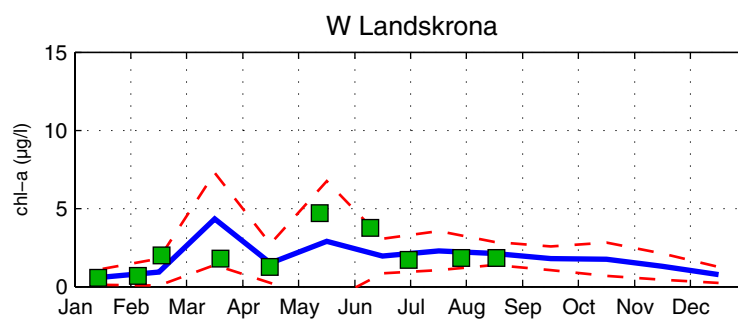
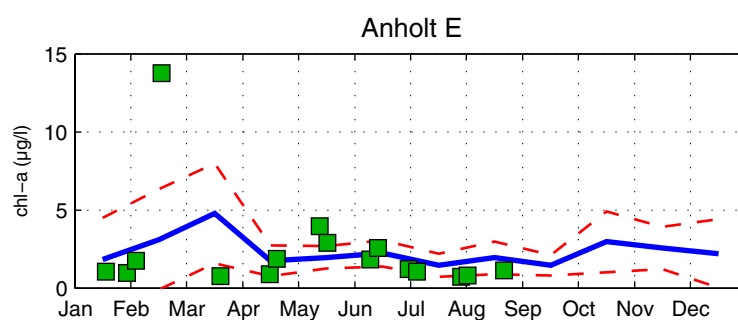
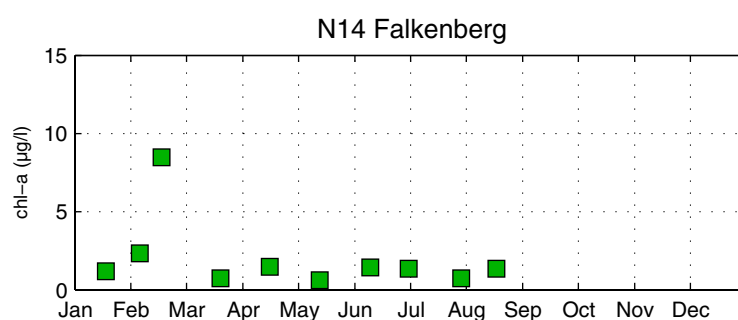
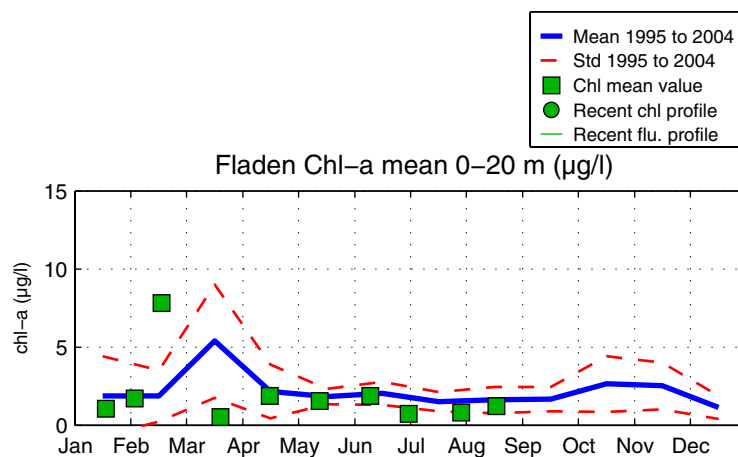
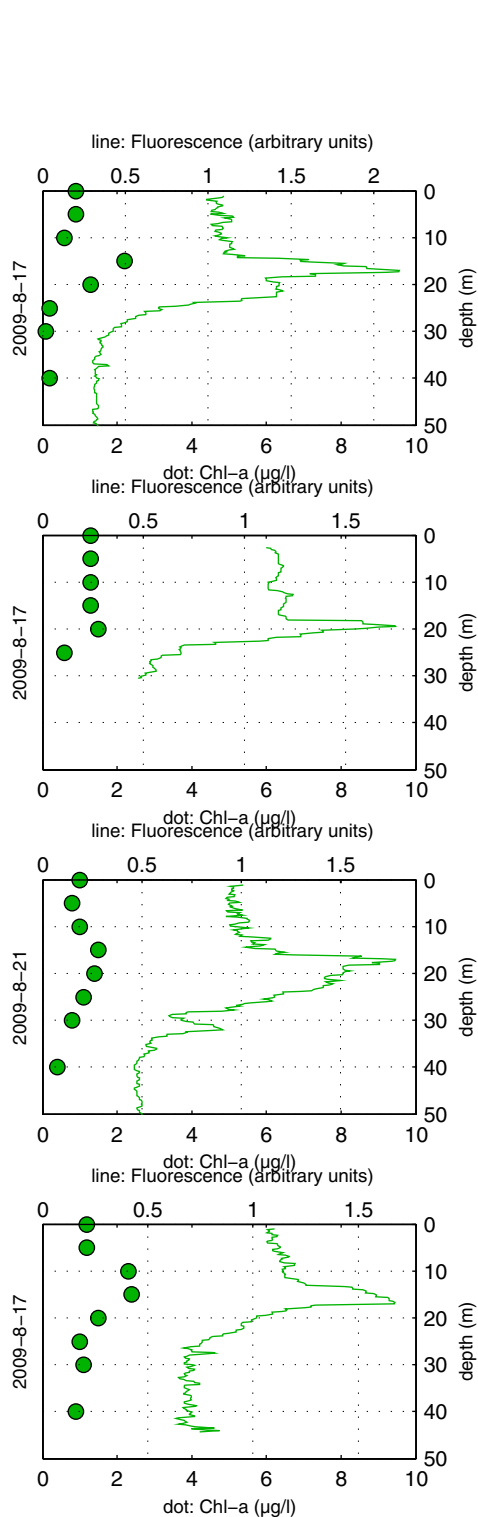
Phytoplankton analysis, text and photos by:  
Ann-Turi Skjevik

| Selection of observed species               | BY2        | BY5        | BCS III-10 | BY15        | BY38        | Ref. M1-V1  |
|---------------------------------------------|------------|------------|------------|-------------|-------------|-------------|
| Red=potentially toxic species               | 2009-08-18 | 2009-08-18 | 2009-08-19 | 2009-08-19  | 2009-08-20  | 2009-08-20  |
| <sup>1</sup> quantified in m/l              | cells/l    | cells/l    | cells/l    | cells/l     | cells/l     | cells/l     |
| <i>Attheya septentrionalis</i>              |            | present    | present    |             |             |             |
| <i>Chaetoceros impressus</i>                |            | common     | present    | common      | present     | present     |
| <i>Chaetoceros thronsenii</i>               |            |            |            |             | present     | present     |
| <i>Cyclotella choctawhatcheana</i>          |            |            |            |             | common      | common      |
| <i>Cylindrotheca closterium</i>             | present    |            |            |             |             | present     |
| <i>Leptocylindrus danicus</i>               | present    |            |            |             |             |             |
| <i>Ceratium fusus</i>                       | present    |            |            |             |             |             |
| <i>Dinophysis norvegica</i>                 |            |            |            |             |             | present     |
| <i>Dinophysis rotundata</i>                 |            |            |            |             | present     |             |
| <i>Heterocapsa triquetra</i>                |            |            |            |             | present     |             |
| <i>Chrysochromulina polylepis</i>           | present    |            | present    |             | present     | present     |
| <i>Chrysochromulina</i> spp.                | present    |            | present    | common      | common      | common      |
| Cryptomonadales spp.                        | common     | present    | common     | present     | common      | common      |
| <i>Dinobryon faculiferum</i>                |            |            |            |             |             | present     |
| <i>Planctonema lauterbornii</i>             |            |            |            | present     | present     |             |
| <i>Pyramimonas</i> spp.                     | common     | common     | common     | present     | common      | common      |
| <i>Pseudopedinella</i> cf. <i>pyriforme</i> | present    | present    |            |             |             | present     |
| <i>Anabaena</i> spp.                        | present    |            |            | present     | common      | very common |
| <i>Aphanizomenon</i> spp.                   | present    |            | common     | very common | very common | common      |
| <i>Nodularia spumigena</i>                  |            |            |            | common      | common      | common      |
| <i>Ebria tripartita</i>                     | present    | present    |            |             |             | present     |
| <i>Leucocryptos marina</i>                  | present    |            | present    | common      | common      | common      |
| <i>Mesodinium rubrum</i>                    | common     | present    | present    | present     | present     | common      |

## The Skagerrak

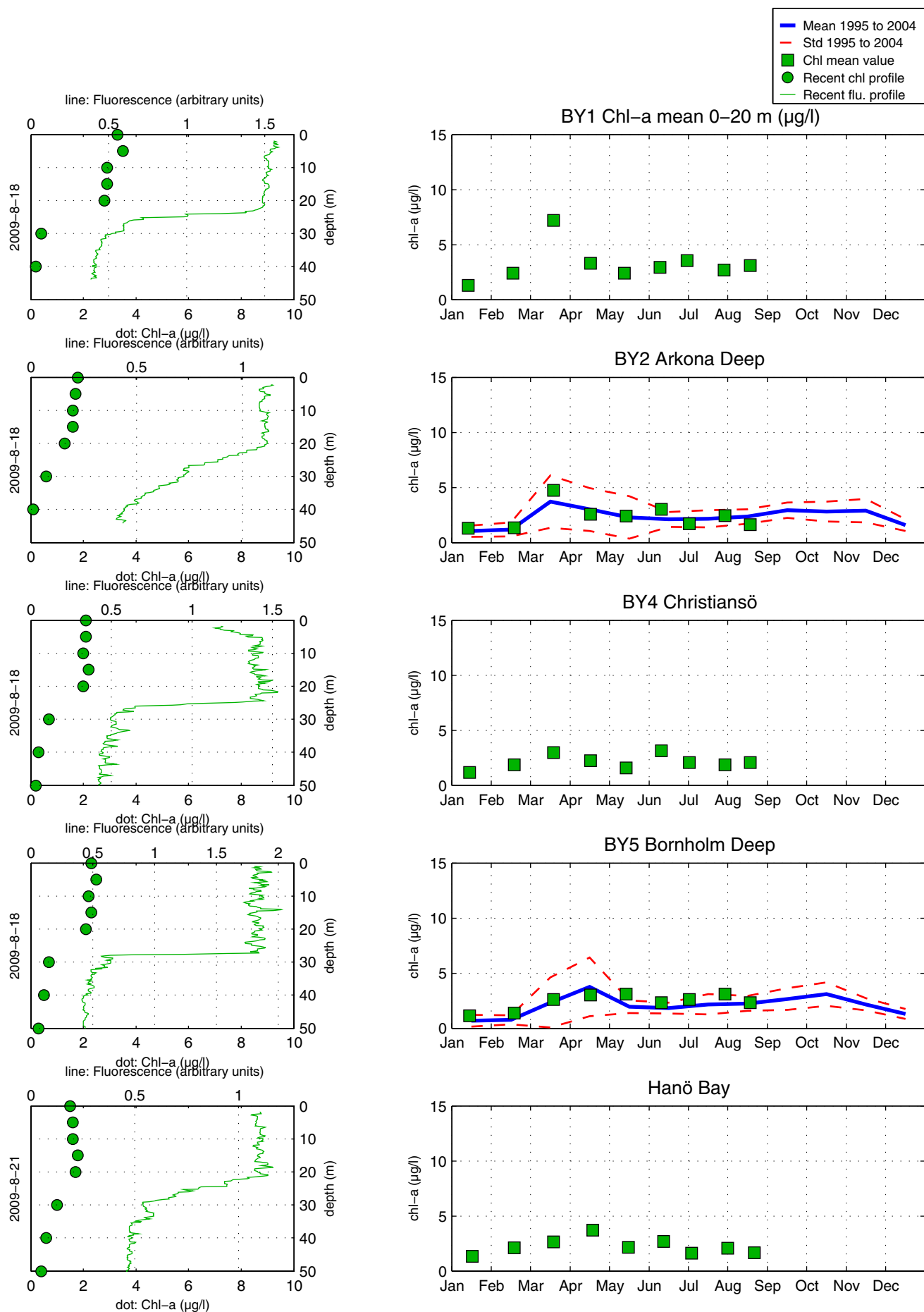


# The Kattegat and the Sound



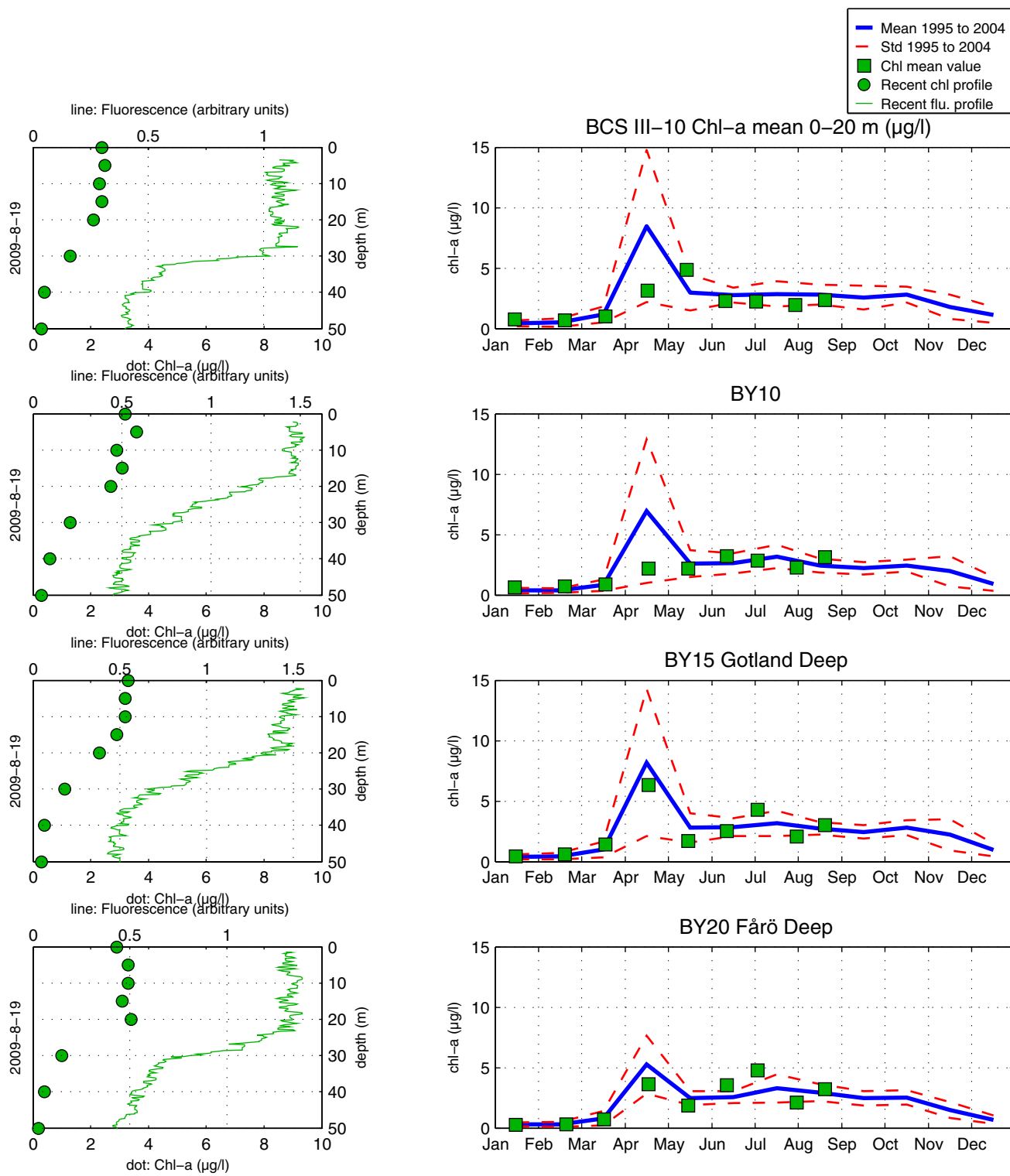


# The Southern Baltic

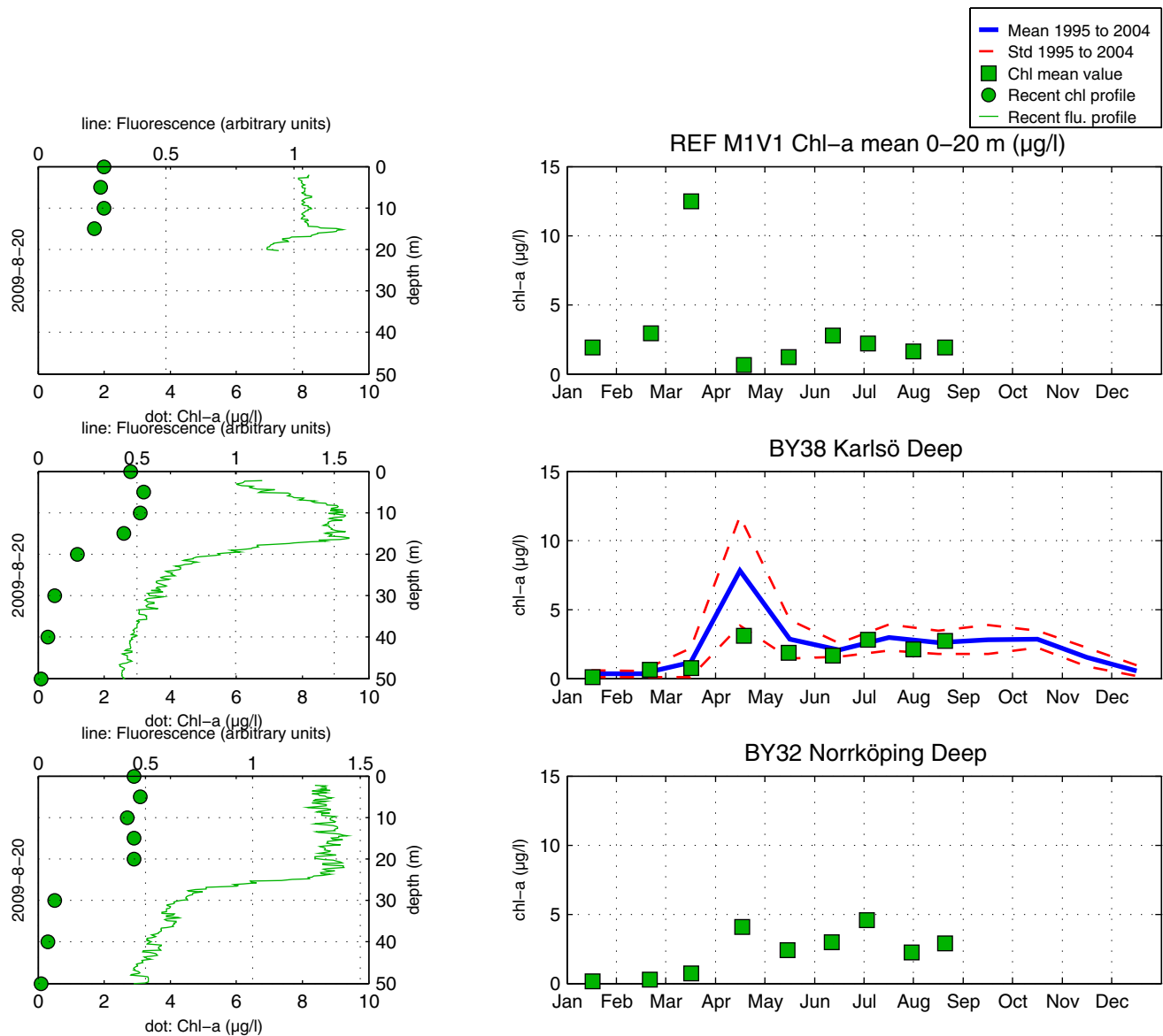




## The Eastern Baltic



# 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.

## 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.

## 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 algbloomingar 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 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](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 or 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 through 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>Pseudochattonella</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 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.

