Dnr: S/Gbg-2016-35

SMHI
Oceanographic Unit
No 3, March 2016

AlgAware
ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

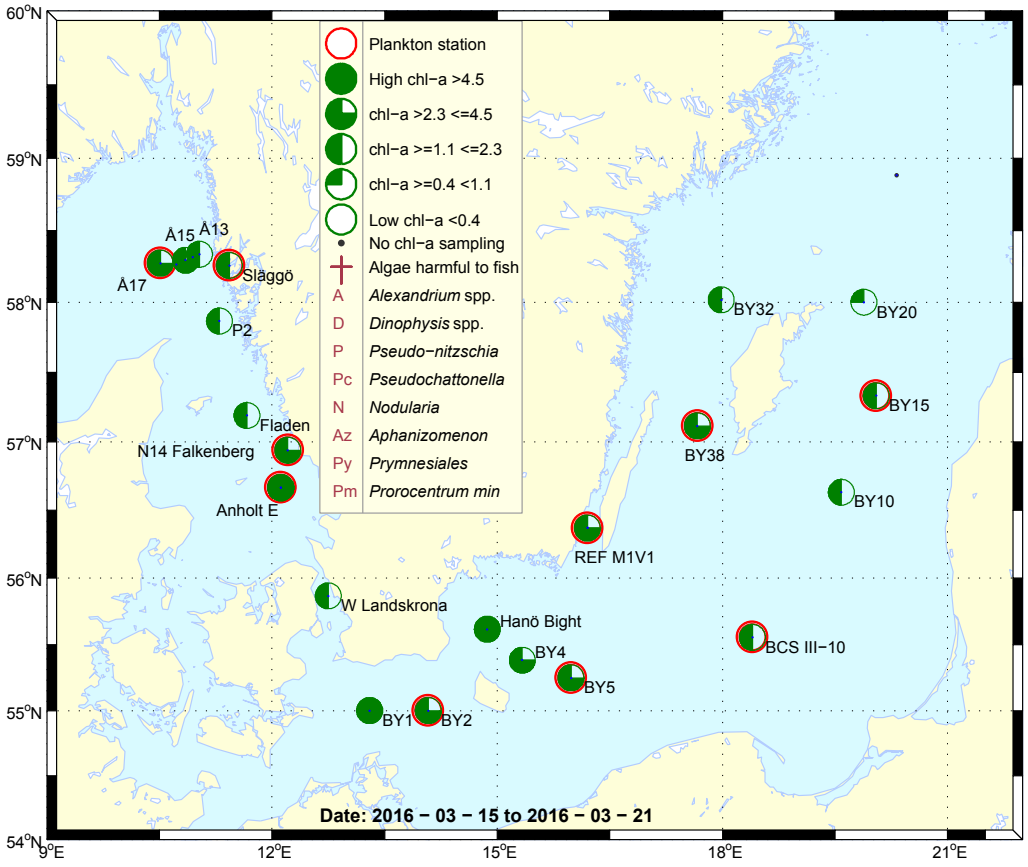
Sammanfattning

Vårblomningen gick mot sitt slut i Kattegatt och Skagerrak. Klorofyllhalterna var generellt höga och de typiska kiselalgerna var närvarande, men närsalterna var helt eller nästan helt slut, varför det förutspås att detta var slutfas av blomningen. Klorofyllfluorescensmaxima dominerades av kiselalger och de integrerade (0-20 m) klorofyllvärdena var normala för denna månad.

I södra Östersjön pågick vårblomning med dominans av kiselalgen *Skeletonema marinoi*. Det var förhöjd aktivitet bland växtplankton i ytan vid övriga Östersjöstationer också, vilket förmodligen var precis en början på vårblomning.

De integrerade klorofyllvärdena (0-20 m) låg över det normala för denna månad vid BY4, REF M1V1 och BY38, i övrigt var det normala värden.

För mer detaljerad information om närsalter mm, se den senaste expeditionsrapporten: http://www.smhi.se/publikationer/2.887/expeditionsrapport-fran-r-v-aranda-vecka-11-12-2016-1.102596



Abstract

The spring bloom was in its final phase in the Kattegat-Skagerrak areas. The chlorophyll concentrations were high and typical spring bloom diatoms were present, but the nutrients were completely or almost completely exhausted, which is why the bloom was predicted to end soon. Chlorophyll fluorescence maxima were dominated by diatoms and the integrated (0-20 m) chlorophyll concentrations were normal for this month.

The spring bloom was ongoing in the southern Baltic with dominance by the diatom *Skeletonema marinoi*. There was enhanced activity amongst phytoplankton in the surface waters at the other Baltic stations as well, which probably meant that the spring bloom was just starting.

The integrated (0-20 m) chlorophyll *a* concentrations were above what is normal for this month at stations BY4, REF M1V1 and BY38 and normal at the rest of the Baltic stations.

For more information about nutrients etc, see the latest cruise report: http://www.smhi.se/en/publications/cruise-reports-from-the-marine-monitoring/cruise-report-from-r-v-aranda-week-11-12-2016-1.102598

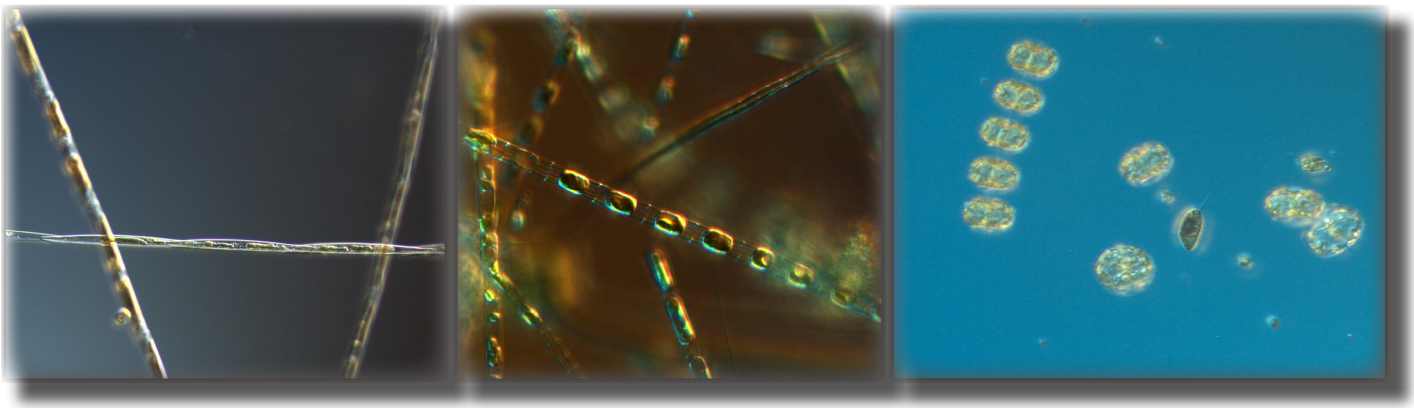
More detailed information on species composition and abundance

The Skagerrak

Å17 (open Skagerrak) 19th of March
The phytoplankton diversity was low, although dominated by diatoms. A chlorophyll fluorescence maximum at 15 m revealed the sinking spring bloom and was mainly caused by the diatoms *Skeletonema marinoi*, *Thalassiosira nordenskioeldii* and *Pseudo-nitzschia* spp.*

Släggö (Skagerrak coast) 19th of March
The species diversity was higher than at Å17, but the cell numbers were quite low. The diatom *Pseudo-nitzschia* spp.* was the most common genus.

Nutrients were very low or completely gone in the surface water in the Skagerrak area, the integrated (0-20 m) chlorophyll *a* concentrations were normal for this month.



The diatoms *Pseudo-nitzschia* spp (left), *Skeletonema marinoi* (middle) and *Thalassiosira nordenskioeldii* (right), were numerous at the phytoplankton stations in the Kattegat and Skagerrak areas.

The Kattegat

Anholt E 18th and 19th of March
The phytoplankton community was dominated by diatoms, of which *Pseudo-nitzschia* spp.* was the most common genus. Chlorophyll fluorescence maxima at 12 and 15 meters were mainly caused by the diatoms *Thalassiosira nordenskioeldii, Skeletonema marinoi* and *Pseudo-nitzschia* spp.*

N14 Falkenberg 19th of March
The amount of phytoplankton was lower than at Anholt E, and consequently the chlorophyll *a* concentrations were also lower.

Inorganic nitrogen was completely exhausted down to 10 meters depth in the Kattegat area, the integrated (0-20 m) chlorophyll *a* concentrations were normal for this month.

The Baltic Sea

BY2 Arkona Basin and BY5 Bornholm Basin 17th of March

Spring bloom was ongoing in the Southern Baltic and inorganic nitrogen was almost completely exhausted down to ten meters depth. Several diatom species were present, and dominated by *Skeletonema marinoi*. Dinoflagellates were also common. A chlorophyll fluorescence maximum between 8 and 9 meters was caused mainly by *S. marinoi*.

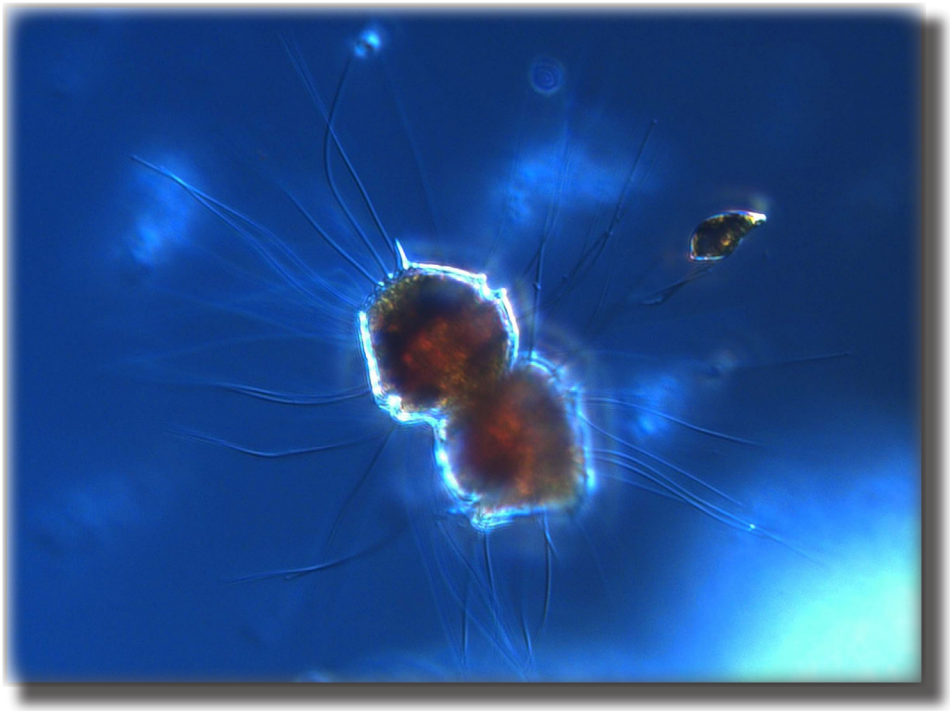
BY15 16th of March and BCS III-10 17th of March

A few diatom species were present, but spring bloom had not yet started. Nutrients were available and chlorophyll concentrations were moderate. A few filaments of the cyanobacterium *Aphanizomenon flos-aquae* were observed at BY15 and colony forming pico-cyanobacteria were abundant.

REF M1V1 Kalmar Sound 20th of March

Spring bloom was ongoing and dominated by the diatom *Skeletonema marinoi*. A few more diatom species were present in low cell numbers. Dinoflagellates were common and represented by e.g. *Peridiniella catenata*. A few filaments of the cyanobacterium *Aphanizomenon flos-aquae* were observed and colony forming pico-cyanobacteria were abundant. Inorganic nitrogen was almost completely exhausted from the surface to the bottom.

The integrated (0-20 m) chlorophyll *a* concentrations were above what is normal for this month at stations BY4, REF M1V1 and BY38 and normal at the rest of the Baltic stations.



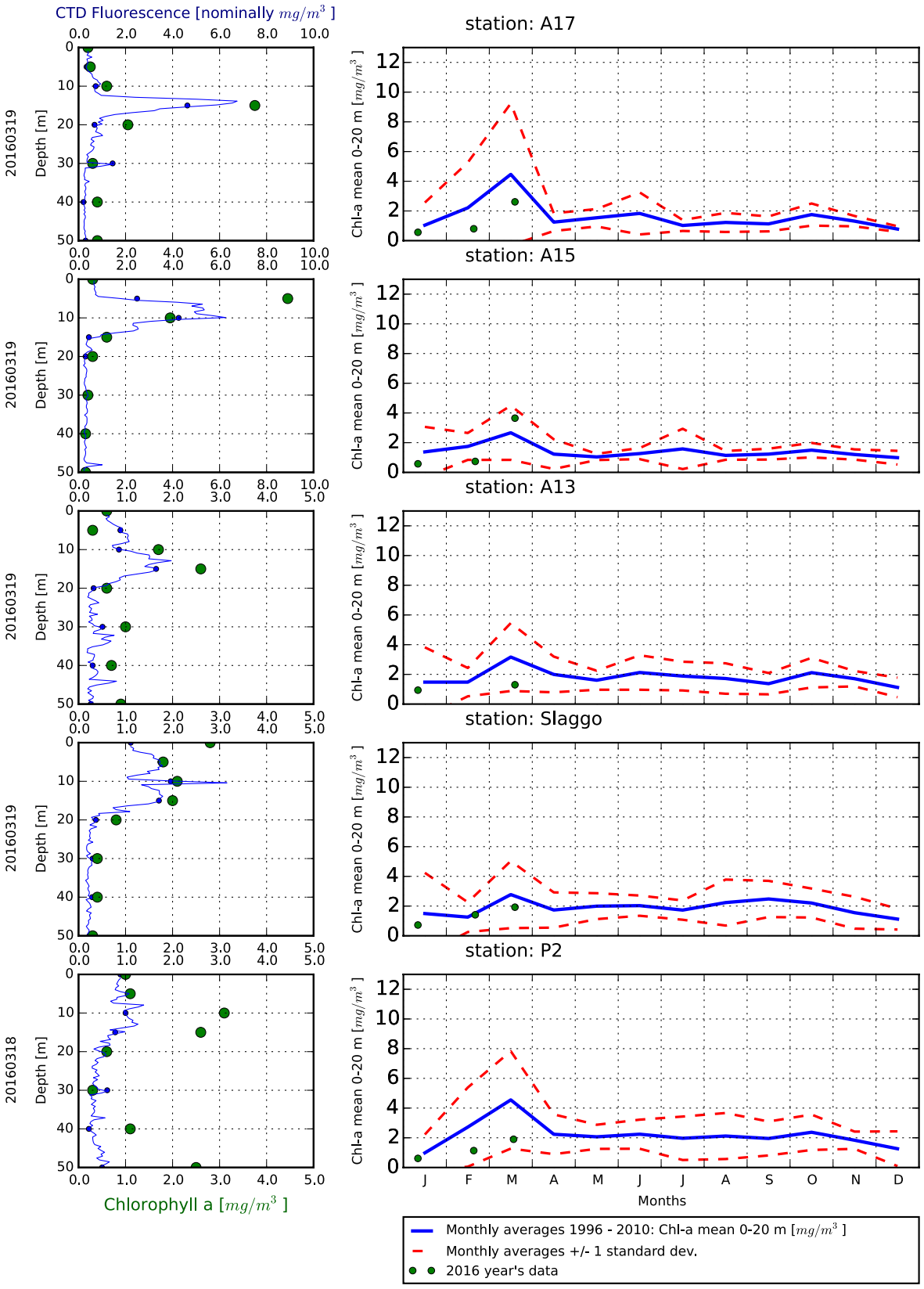
Peridiniella catenata is one of the dinoflagellates that were found at most of the Baltic phytoplankton stations.

Phytoplankton analysis and text by:
Ann-Turi Skjevik

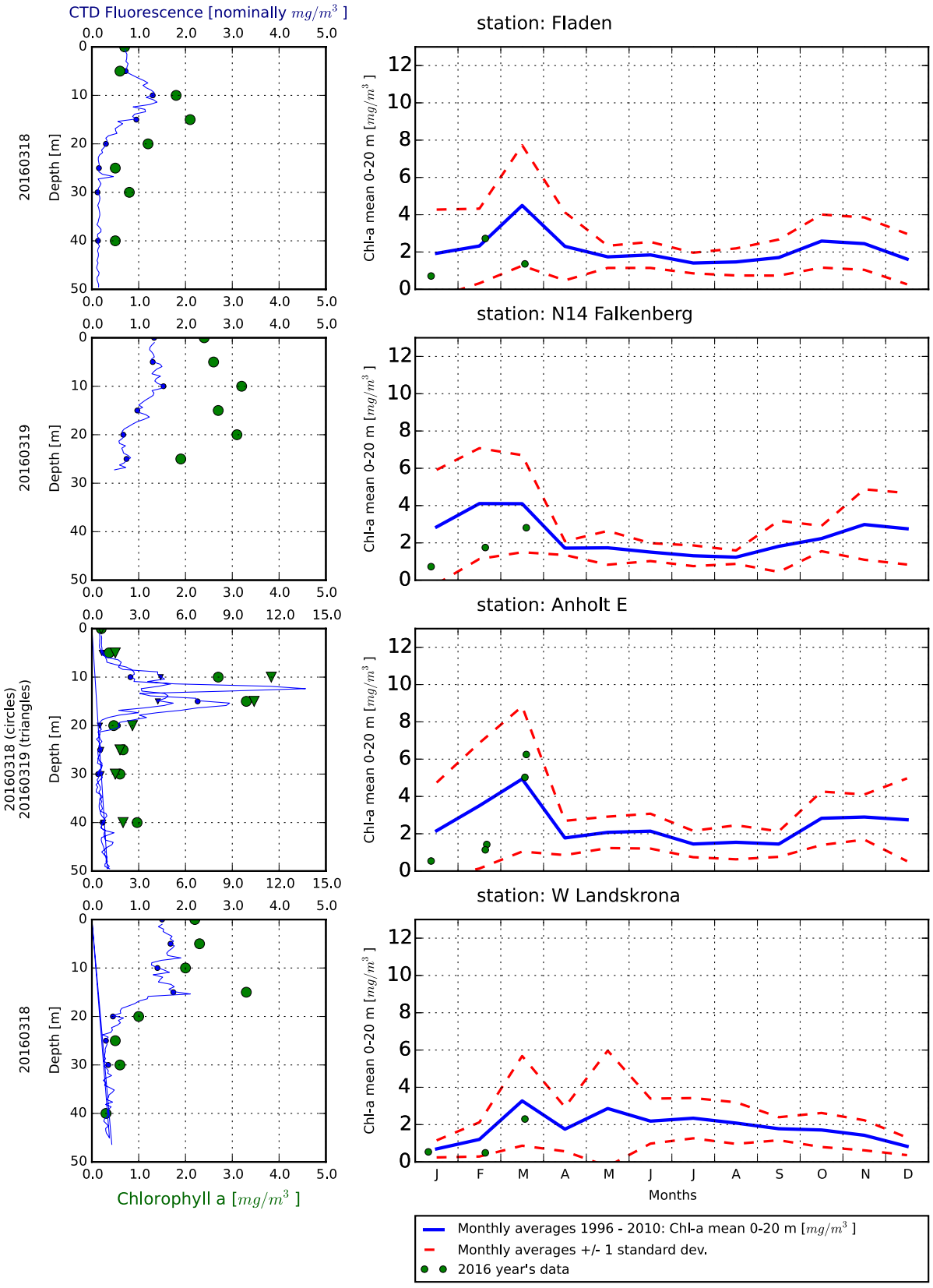
Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	19/3	19/3	19/3	18/3	19/3
Hose 0-10 m	presence	presence	presence	presence	presence
Attheya septentrionalis		present			
Chaetoceros affinis		present		present	
Chaetoceros danicus		present	present	present	present
Chaetoceros debilis	present				present
Chaetoceros decipiens	present	present	present		present
Chaetoceros socialis	present		present		
Coscinodiscus spp		present		present	
Coscinodiscus concinnus			present		present
Cylindrotheca closterium	present				
Detonula confervacea			present		
Guinardia delicatula	present		present	present	present
Leptocylindrus minimus					present
Navicula transitans var. derasa	present				
Proboscia alata		present	present		
Pseudo-nitzschia	present	common	common	very common	very common
Rhizosolenia hebetata f. semispina					present
Skeletonema marinoi	common	present	present	present	present
Thalassionema nitzschioides		present			
Thalassiosira anguste-lineata	present	present		present	
Thalassiosira nordenskioeldii	common	present	present	common	common
Ceratium fusus	present				
Dinophysis acuminata			present	present	present
Gymnodiniales	present	present	present	present	common
Gymnodinium spp				present	
Gyrodinium spirale	present		present		present
Heterocapsa spp		present	present		present
Heterocapsa rotundata		present	present		present
Karlodinium veneficum		present		present	
Peridiniales		present	present		
Peridiniella danica		present	present		
Protoperidinium spp		present			present
Protoperidinium bipes		present		present	
Protoperidinium pellucidum		present	present		present
Dinobryon balticum		present	present		present
Dictyocha speculum	present				
Pseudopedinella spp		present	present		
Pseudopedinella pyriformis		present	present		present
Cryptomonadales	present	common	common	present	present
Woronichinia spp				present	
Eutreptiella spp		present			
Emiliania huxleyi	present				
Heterosigma spp				present	
Cymbomonas tetramitiformis		present			
Calliacantha longicaudata		present			
Craspedophyceae		present			
Leucocryptos marina		present		present	
Telonema subtile				present	present
Ciliophora	common	present	present	present	present
Laboea strobila				present	present
Mesodinium rubrum					present
Stenosemella		present	present		
Strombidium	present				present
Tintinnopsis		present	present		present

Selection of observed species	BY2	BY5	BCS III-10	BY15	REF M1V1
Red=potentially toxic species	17/3	17/3	17/3	16/3	20/3
Hose 0-10 m	presence	presence	presence	presence	presence
Attheya septentrionalis	present	present			present
Chaetoceros danicus	present	present		present	present
Chaetoceros impressus	present	present		present	present
Chaetoceros similis	present	present			present
Chaetoceros socialis					present
Chaetoceros subtilis var. subtilis	common	present		present	present
Cyclotella choctawhatcheeana		present			
Skeletonema marinoi	very common	very common	present	present	very common
Thalassiosira spp	present	present	present		present
Amphidinium sphenoides		present	present		
Amylax triacantha		present			
Gymnodiniales	present	common		common	common
Gymnodinium spp			common		
Gyrodinium flagellare		present		present	
Gyrodinium spirale					present
Heterocapsa spp	present	present			present
Heterocapsa rotundata	present	present			present
Heterocapsa triquetra		present			
Karlodinium micrum				present	
Peridiniales		very common			very common
Peridiniella catenata	present	present	present	present	present
Protoperidinium spp					present
Protoperidinium pellucidum			present		
Cryptomonadales	common	present	common	present	common
Prymnesiales					present
Aphanizomenon flos-aquae				present	present
Aphanocapsa spp		present		present	present
Aphanothece spp		present		present	
Aphanothece paralleliformis		present			
Lemmermanniella spp	present	present	present		
Pseudanabaena		present			
Snowella spp	present	present	present	common	present
Woronichinia spp					present
Pterosperma spp	present		present	present	
Eutreptiella spp		present		present	present
Oocystis spp	present				
Pediastrum cf. boryanum				present	
Planctonema lauterbornii			present		
Calliacantha natans					present
Craspedophyceae					present
Ebria tripartita	present	present		present	present
Ciliophora	common	common	common	present	common
Mesodinium rubrum	present	present	present	present	present
Strombidium spp	present		present		
Tintinnopsis spp					present

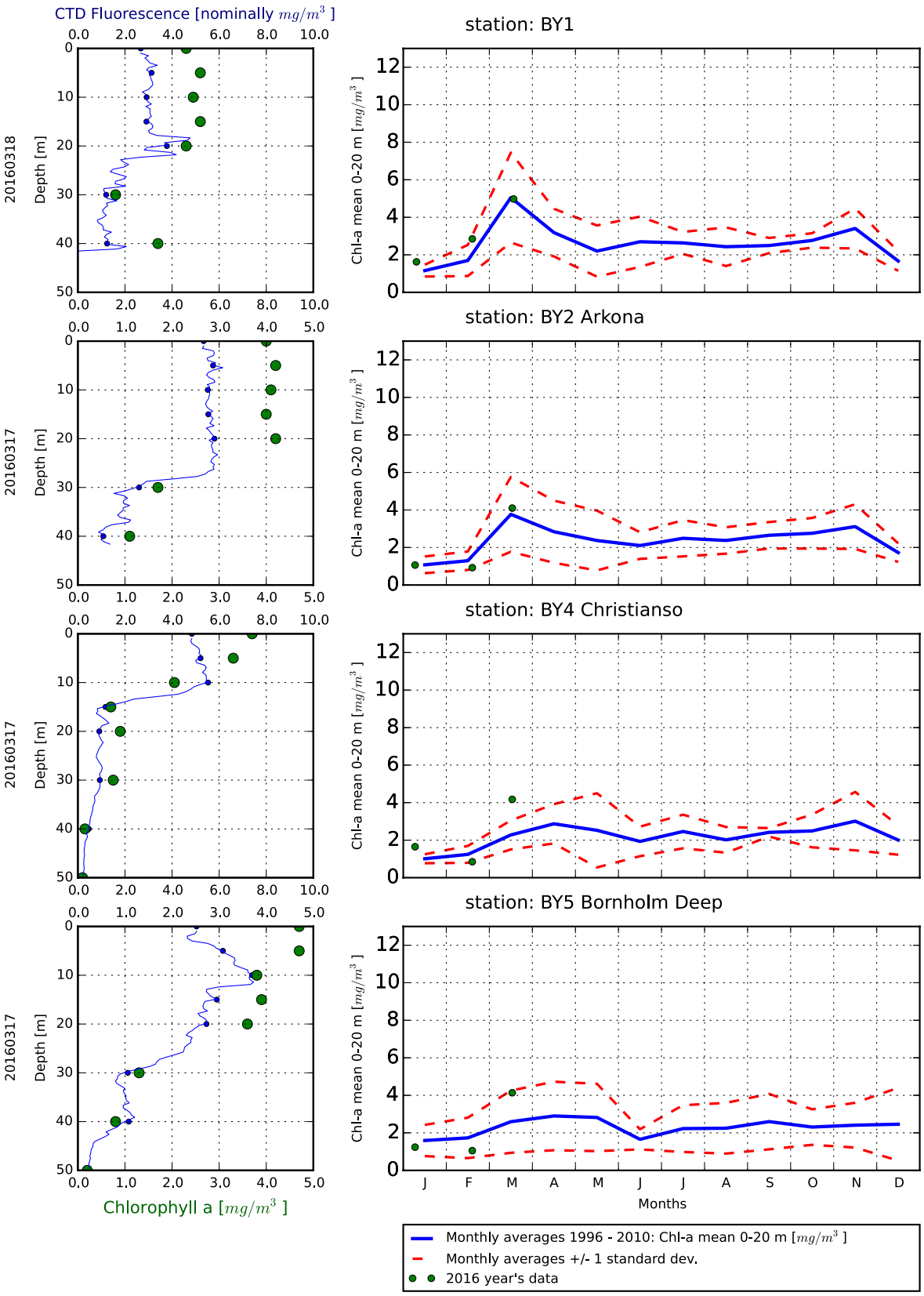
The Skagerrak



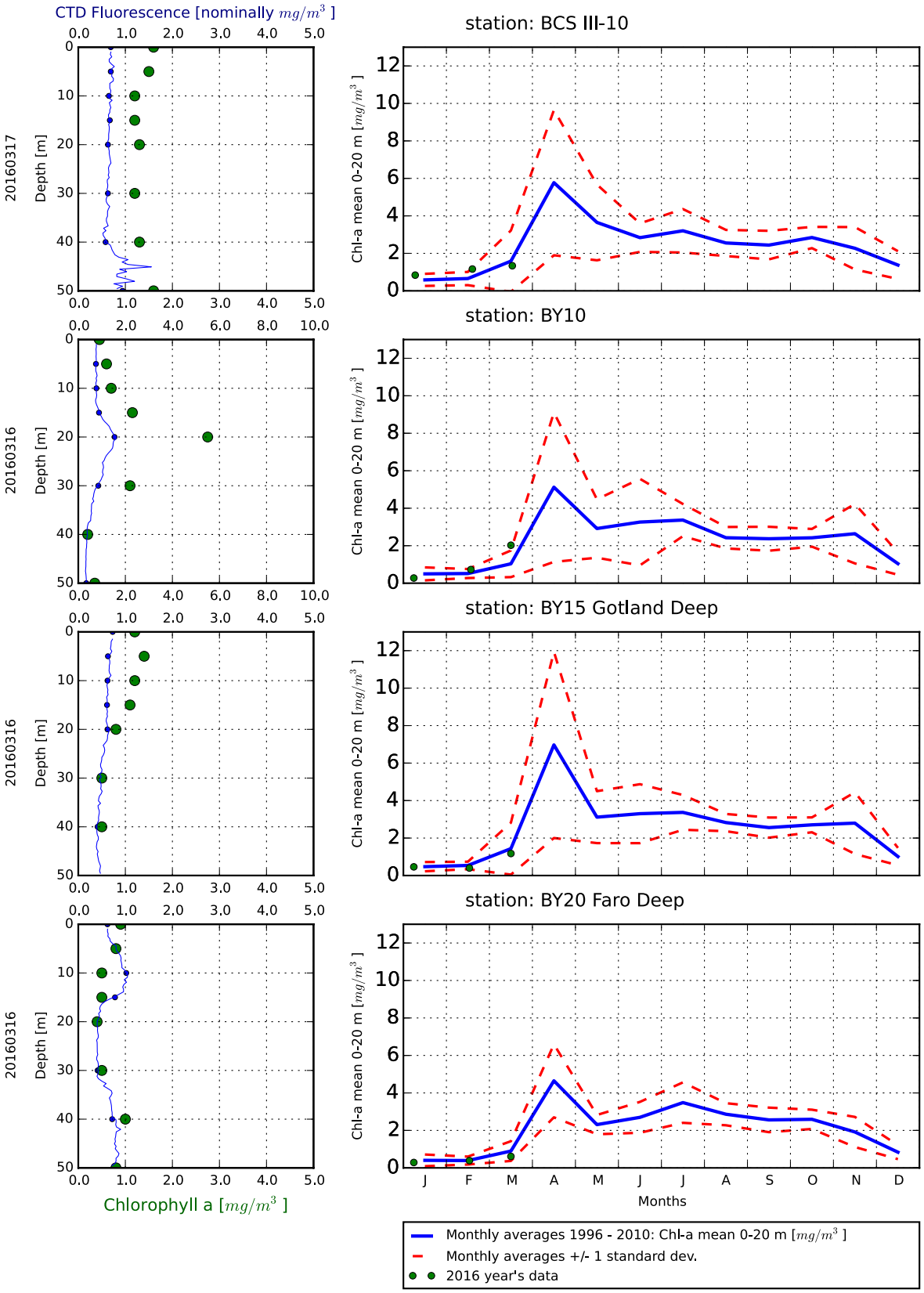
The Kattegat and The Sound

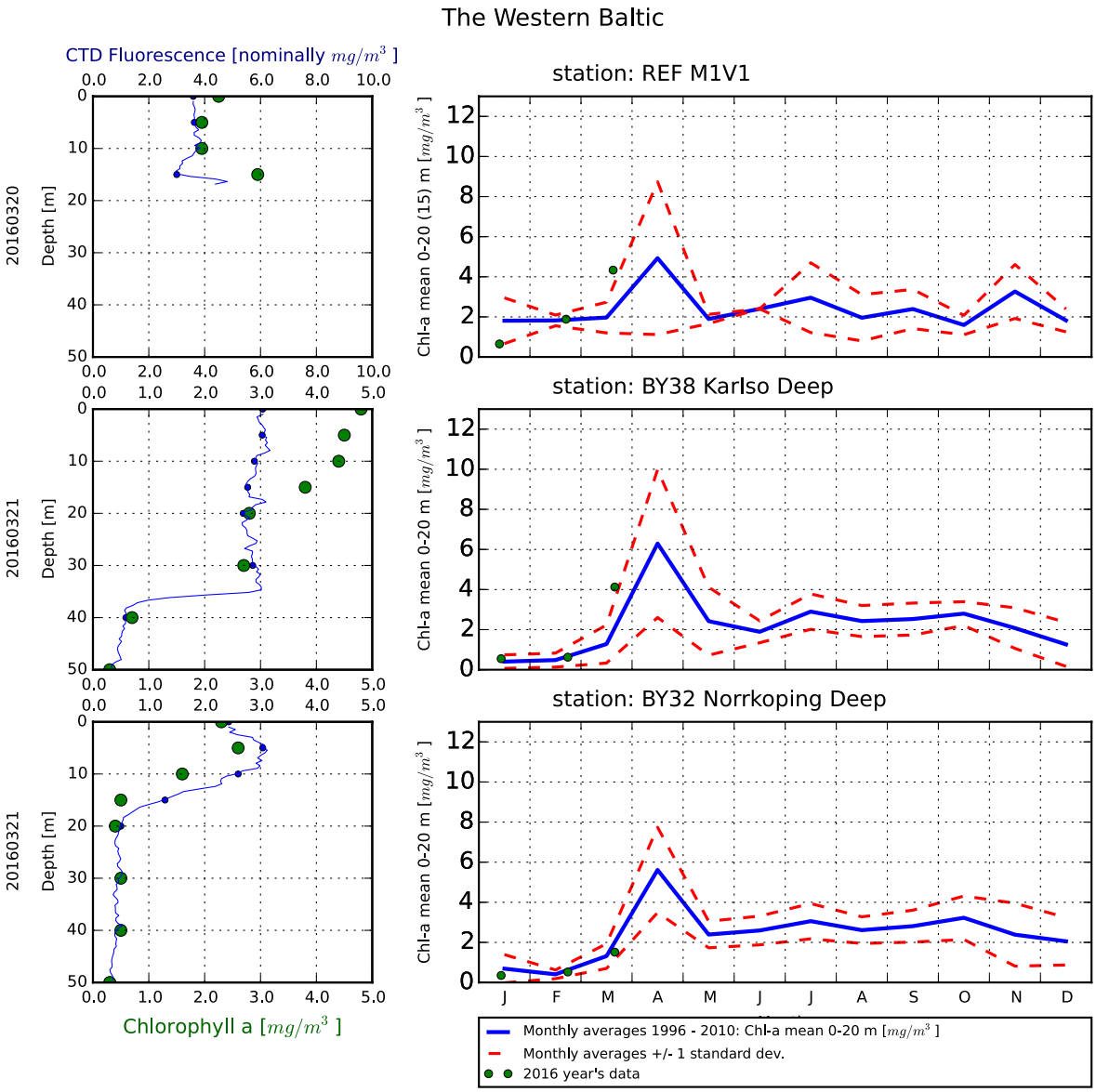


The Southern Baltic



The Eastern Baltic





Om klorofylldiagrammen

Klorofyll *a* är ett mått på mängden växtplankton. Prover tas från ett antal djup. 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. Data are 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 occuring below the surface.

Om AlgAware

SMHI genomför månatliga expeditioner i Östersjön och Västerhavet. Resultat baserade på semikvantitativ mikroskopanalys av planktonprover samt klorofyllmätningar presenteras kortfattat i denna rapport. Information från SMHIs satellitövervakning av algblomningar finns under perioden juni-augusti på www.smhi.se.

About AlgAware

SMHI carries out monthly cruises 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 SMHIs satellite monitoring of algal blooms is found on www.smhi.se during the period June-August.

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, 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.
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.

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.