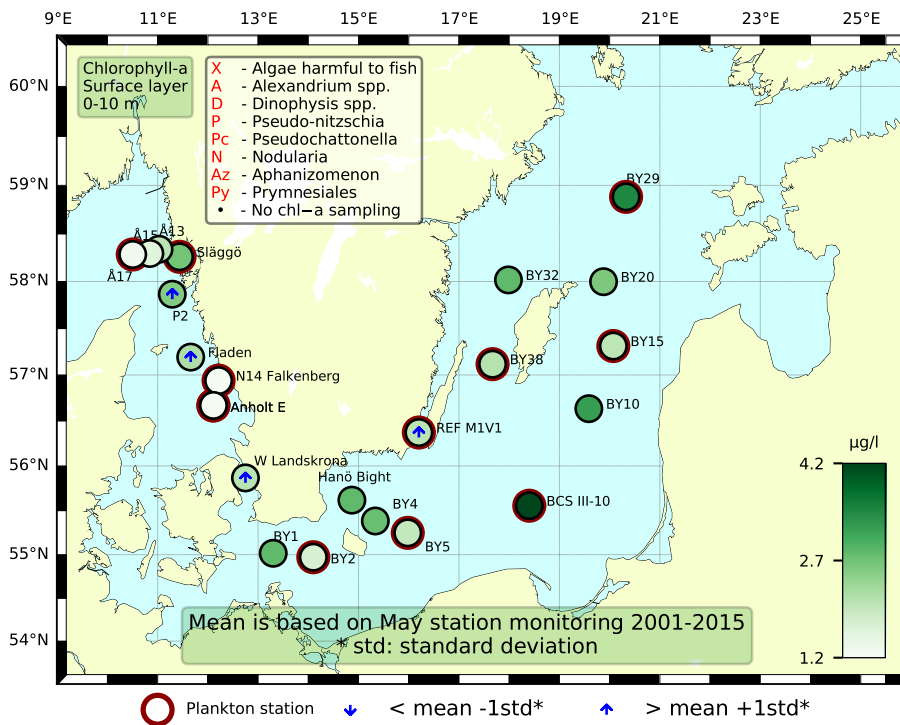


Sammanfattning

Både artdiversitet och totala cellantal var relativt höga vid båda stationerna i Skagerrak vid denna provtagning. Kiselalger dominerade med en kombination av arter. Ett antal fluorescencstoppar återfanns på olika djup. Provtagna från dessa visade att kiselalger dominerade klart i dessa skikt. Kiselalgen *Guinardia flaccida* återfanns i höga tätheter i samtliga toppar och var helt dominerande i proverna från norra Skagerrak. De två stationerna i Kattegatt innehöll få celler och hade låg artdiversitet. De större cellerna dominerades av dinoflagellater. Generellt sett var dinoflagellatsläktet *Tripos* (tidigare *Ceratium*) vanligt vid dessa stationer. De integrerade klorofyllhalterna var låga men inom det normala för månaden vid samtliga stationer på Västkusten.

Artdiversiteten var generellt sett hög i Östersjön, men de totala cellantalen var rätt låga förutom vid de stationer som dominerades av kolonibildande cyanobakterier. Vid stationerna i södra delarna av Östersjön var koncentrationen av kolonibildande cyanobakterier högst. Den filamentösa cyanobakterien *Aphanizomenon flosaquae* återfanns vid de flesta stationer, men var talrikast vid de nordligare stationerna. De integrerade klorofyllhalterna var normala vid de flesta stationer ända undantaget var Ref M1V1 (kustnära) där de var över vad som är normalt för månaden.



Abstract

Both the species diversity and total cell numbers were moderate at both stations in the Skagerrak at the time of sampling. Diatoms dominated with a combination of species. Several fluorescence peaks were recorded at different depths. Samples from these depths contained almost exclusively diatoms. The diatom *Guinardia flaccida* was found in high concentrations at all peaks with a clear domination at the northern stations. The two stations in the Kattegatt had low total cell concentrations and low species diversity. The larger cells in the samples were dominated by dinoflagellates. The genus *Tripos* (previously *Ceratium*) was most common at these stations. The integrated chlorophyll concentrations were low but within normal for the month at all stations along the west coast.

The species diversity was generally high in the Baltic Sea, but the total cell numbers were low except for the stations dominated by colony forming cyanobacteria. The stations in the southern part of the Baltic Sea had the highest concentrations of colony forming cyanobacteria. The filamentous cyanobacteria *Aphanizomenon flosaquae* was found at most stations and even in moderate concentrations in the northern part. The integrated chlorophyll concentrations were within normal at all stations except at RefM1V1 (close to the coast) where it was above what is normal for the month.

Below follows a more detailed information on species composition and abundance. Species marked with * are potentially toxic or harmful.

The Skagerrak

Å17 (open Skagerrak) 12th of May

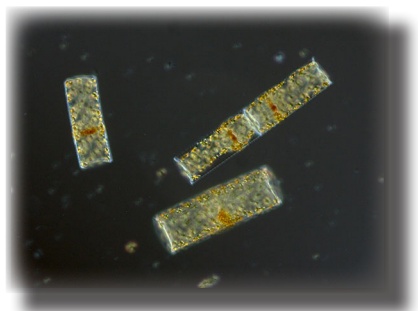
Both the phytoplankton diversity and the total cell concentrations were moderate. The phytoplankton community was dominated by diatoms. The species *Dactyliosolen fragilissimus* was found in highest cell numbers. Other common diatoms were *Skeletonema marinoi*, *Cerataulina pelagica*, *Guinardia delicatula* and *G. flaccida*. The dinoflagellates were few and mainly represented by the genus *Tripes*. The smaller cells were also quite few and were dominated by the order Cryptomonadales. The coccolithophore *Emiliania huxleyi* was found in moderate cell numbers. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were within normal for this month.

Släggö (Skagerrak coast) 12th of May

Both the phytoplankton diversity and the total cell concentration were relatively high. The plankton community was dominated by diatoms. The species *Skeletonema marinoi* and *Dactyliosolen fragilissimus* were most common but *Cerataulina pelagica* and *Guinardia delicatula* were also present in high cell numbers. The dinoflagellates were few and mainly represented by the genus *Tripes*. Few small cells were found and among these the order cryptomonadales and the coccolithophore *Emiliania huxleyi* was found in higher cell numbers. The integrated chlorophyll concentration (0-10 m) was within normal for the month. The integrated chlorophyll concentration (0-20 m) was in the higher range of what is normal for the month.

Fluorescence peaks

A few fluorescence peaks were found on the CTD recording. At Å16, and At Å13 a bit closer to the coast a fluorescence peak was found at around 20 m which was totally dominated by the diatom *Guinardia flaccida*. A small fluorescence peak was also noted Å17 at 10 m but was not captured from the water bottles. At P2, close to the border of Kattegat, a fluorescence peak was found at 40 m. The sample taken from this depth was dominated by different diatoms, such as *Guinardia flaccida*, *G. delicatula*, *G. striata* and *Rhizosolenia imbricata*.



The diatom *Guinardia flaccida* dominated in the fluorescence peaks found in the Skagerrak.



The diatom *Dactyliosolen fragilissimus* was found in moderate concentrations along the Swedish west coast.

The Kattegat

Anholt E 11th and 13th of May

Both the phytoplankton diversity and the total cell concentrations were low at both sampling occasions. The larger cells were dominated by the genus *Tripes*. On the second sampling occasion different small cells dominated in numbers where the potentially toxic order prymnesiales were abundant together with the order cryptomonadales. The diatom *Dactyliosolen fragilissimus* was also abundant on the second occasion. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were low but within normal for this month on both occasions.

N14 Falkenberg 12th of May

Both the phytoplankton diversity and the total cell concentrations were low. The dinoflagellate genus *Tripes* dominated among the larger cells. The diatom *Skeletonema marinoi* dominated in numbers. Quite a lot of medium sized ciliates were found. The smaller cells were dominated by different cryptomonades. The integrated chlorophyll concentrations (0-10 m and 0-20 m) were low but within normal for this month.

The Baltic

BY2 11th of May

The phytoplankton diversity was low but the total cell concentration was high. The sample was clearly dominated by different colony forming cyanobacteria. The most abundant genus was *Lemmermanniella* spp. but colonies of the genus *Aphanocapsa* and *Aphanothece* was also abundant. A fluorescence maximum was noted at 20 m and the sample taken contained mainly colony forming cyanobacteria. The integrated chlorophyll concentration (0-10 m and 0-20 m) were within normal for this month.

BY5 10th of May

The phytoplankton diversity and the total cell concentrations were moderate. The plankton community was a mixture of dinoflagellates, diatoms and colony forming cyanobacteria. The species found in the highest number was the diatom *Chaetoceros similis*. Among the dinoflagellates the potentially toxic genus *Dinophysis* was common together with the genus *Heterocapsa*. Different sorts of colony forming cyanobacteria were abundant. The filamentous cyanobacteria *Aphanizomenon flosaquae* was found in moderate numbers of filaments.

BCSIII-10 10th of May

The group Gymnodiniales was most numerous at this station. There were also several genus represented of colony forming cyanobacteria, as well as the filamentous *Aphanizomenon flosaquae*, in quite high numbers. The chlorophyll concentration was within normal for this month.

BY15 9th of May

BY15 was very similar in both diversity and cell numbers as BCSIII, the only difference was the few chains of the diatom *Skeletonema marinoi* present at BY15. The chlorophyll concentration was low but within normal for this month.

BY29 8th of May

The phytoplankton diversity and the total cell concentrations were moderate. The diatom *Thalassiosira baltica* was most common. The filamentous cyanobacteria *Aphanizomenon flosaquae* was found in moderate numbers of filaments. The potentially toxic genus *Dinophysis* was common. The integrated chlorophyll concentration (0-10 m) was within normal for this month.

BY38 14th of May

The phytoplankton diversity and the total cell concentrations were quite low. The diatom *Thalassiosira baltica* was most common. The filamentous cyanobacteria *Aphanizomenon flosaquae* was found in moderate numbers of filaments. The dinoflagellate *Heterocapsa rotundata* was most common among the small cells. Only a few colony forming cyanobacteria was found. The integrated chlorophyll concentration (0-10 m) was within normal for this month.

BY31 8th of May

The phytoplankton diversity and the total cell concentrations were both low. The sample was dominated by different dinoflagellates. The potentially toxic *Dinophysis acuminata** was abundant together with *Peridiniella catenata* and *Heterocapsa rotundata*. Different species of ciliates were abundant. No integrated chlorophyll was available at the time of writing.

REFM1V1 14th of May

The phytoplankton diversity was high at this station, but cells were in low numbers. There were no *Aphanizomenon flosaquae* at this station. The integrated 0-20 m chlorophyll concentration was within normal for this month, while 0-10 m was higher than normal.

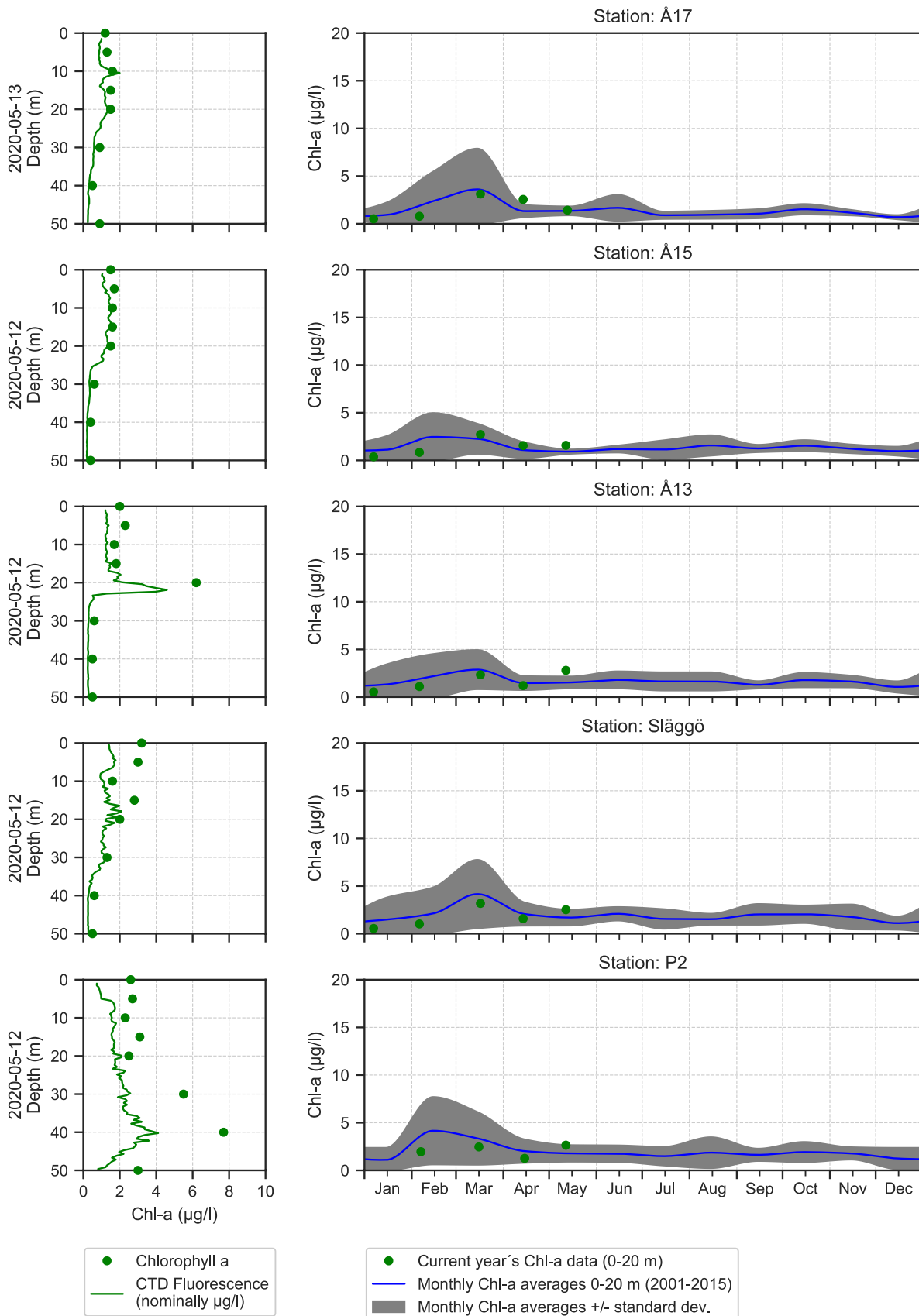
Phytoplankton analysis and text:

Marie Johansen and Maria Karlberg

Selection of observed species	Anholt E	Anholt E	N14	Släggö	Å17
Red=potentially toxic species	11/5	13/5	12/5	12/5	12/5
Hose 0-10 m	presence	presence	presence	presence	presence
Cerataulina pelagica		present		common	common
Chaetoceros subtilis				present	
Dactyliosolen fragilissimus	present	very common	present	very common	very common
Guinardia delicatula	present			common	common
Guinardia flaccida	present			common	common
Paralia sulcata			present		
Proboscia alata		present			
Rhizosolenia hebetata f. semispina				present	
Skeletonema marinoi			very common	very common	common
Thalassionema nitzschioides	present	present		present	
Tripes furca				present	
Tripes fusus	present	present	present		
Tripes longipes	common	present	common	present	present
Tripes macroceros				present	common
Tripes muelleri	common	present	common	present	present
Dinophysis norvegica	present		present	present	
Gymnodiniales		present	present	present	present
Gymnodinium cf. litoralis		present			
Heterocapsa rotundata	present				
Katodinium glaucum				present	
Protoperidinium depressum				present	
Protoperidinium pellucidum				present	
Dinobryon balticum			present		
Dinobryon faculiferum		present		present	
Cryptomonadales	common	common	common	present	common
Emiliana huxleyi	present	present	present	present	common
Prymnesiales	present	common	present		
Oocystis	present		present		
Pyramimonas		present		present	present
Leucocryptos marina	present	present			
Telonema subtile	present	present	present		present
Dictyocha speculum		present			
Pseudochattonella				present	
Choanoflagellatea	present	present	present	present	
Ebria tripartita	present	present	present		present
Ciliophora	common	common	common	present	common
Mesodinium rubrum	present				
Helicostomella subulata				present	

Selection of observed species	BCSIII-10	BY2	BY5	BY15	BY29	BY31	BY38	REFM1V1
Red=potentially toxic species	10/5	11/5	10/5	9/5	11/5	8/5	14/5	14/5
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence
Centrales	present			present				present
Chaetoceros similis	common	present	very common	common			present	present
Chaetoceros subtilis								present
Coscinodiscus radiatus	present							present
Dactyliosolen fragilissimus			common					
Pennales	present							
Skeletonema marinoi			present	present		present		present
Thalassiosira		present			present	present	present	
Thalassiosira baltica					common	present	very common	
Amphidinium crassum								present
Amylax triacantha	present			present	present	present		present
Dinophysis acuminata	common	present	common	common	common	common	present	common
Dinophysis norvegica	present		present	present	present		present	present
Gymnodiniales	very common		present	common	present	common	present	common
Gymnodinium verruculosum	present							present
Gyrodinium						present		
Gyrodinium fusiforme								present
Gyrodinium spirale					present			
Heterocapsa rotundata			present	common		common	common	
Heterocapsa triquetra	present		common	present				common
Karlodinium veneficum				present				
Peridinales		common				present		
Peridiniella catenata	present			common	present	common		
Peridiniella danica	present			present				
Phalacroma rotundatum						present		
Protoperidinium					present	present		
Protoperidinium bipes								present
Protoperidinium brevipes	present				present			
Protoperidinium pellucidum								present
Scrippsiella cpx								present
Dinobryon							present	
Dinobryon divergens	common			common				common
Dinobryon faculiferum								present
Oocystis	present	present	present	present				
Binuclearia lauterbornii	present	common	present	common	common		present	present
Pyramimonas				common				present
Cryptomonadales	common		present	present	present		present	present
Leucocryptos marina	present							
Pseudochattonella				common				
Eutreptiella				present				present
Aphanizomenon			common		common	present	common	
Aphanizomenon flosaquae	common			common				
Aphanocapsa		common	common		present		present	
Aphanocapsa cf. holsatica	common			present				present
Aphanothece		common	present		present		present	
Cyanodictyon								common
Lemmermanniella		very common	common				present	
Lemmermanniella cf. pallida	common			present				present
Lemmermanniella cf. parva	common			present				present
Snowella		common	present		present			
Snowella litoralis	common			present				present
Calliakantha natans								present
Choanoflagellata				present				
Ebria tripartita	present		present					
Ciliophora		common	common		common	common	present	
Mesodinium rubrum	present			present	present	present	present	present
Flagellates	common			common				common

The Skagerrak



Om AlgAware

SMHI genomför månatliga expeditioner i Östersjön och Västerhavet. Resultat baserade på semikvantitativ mikroskopisk analys av planktonprover samt klorofyllmätningar presenteras kortfattat i denna rapport. Information från SMHIs satellitövervakning av algbloomingar finns under perioden juni-augusti på www.smhi.se. Resultat från provtagningarna kan hämtas från SMHI:s databas på sharkweb.smhi.se. Hydrografidata läggs ut varje månad, växtplanktondata läggs ut en gång per år.

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. Results from the expeditions are found in the SMHI database, sharkweb.smhi.se. Data are published monthly, phytoplankton data however, are published once a year.

Art / Species	Gift / Toxin	Eventuella symptom	Clinical symptoms
<i>Alexandrium</i> 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; headache, dizziness, nausea, vomiting, diarrhoea. Extreme case 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)	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.
<i>Pseudo-nitzschia</i> spp.	Amnesic shellfish poisoning (ASP)	Milda symptom: Efter 3-5 timmar: yrsel, illamående, kräkningar, diarré, magkramp 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.
<i>Chaetoceros concavicornis</i> / <i>C. convolutus</i>	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.
<i>Pseudochattonella</i> 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.

Oversikt 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 (0-10 m) vid de olika stationerna. Pil upp eller ned indikerar om resultatet är över eller under en standardavvikelse från medel. Medel är beräknat utifrån aktuell månad under perioden 2001-2015. 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 (0-10 m) at sampling stations. The arrow up or down indicate whether the result is above or below one standard deviation from mean. The mean value is calculated using results from the actual month during the period 2001-2015. Presence of harmful algae at stations where species analysis is performed is shown with a symbol.

