

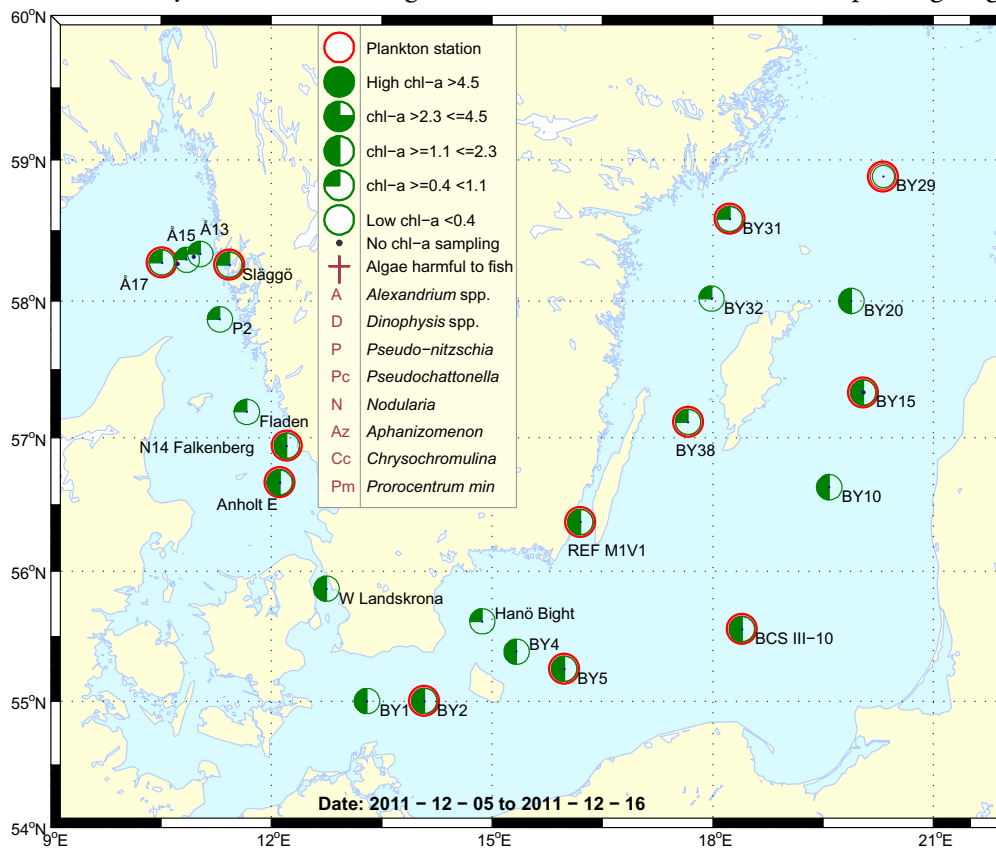
Sammanfattning

Växtplanktondiversiteten var relativt låg vid båda Skagerrakstationerna. Släktet *Ceratium* som förekommit i höga cellantal under hela hösten återfanns även nu i relativt höga celltätheter.

Artdiversiteten var lite högre i Kattegatt jämfört med Skagerrak förutom vid den sista provtagningen vid Anholt E. Bland de större arterna så var det framför allt dinoflagellater som förekom. Släktet *Ceratium* som har återfunnits i höga celltätheter under hela hösten återfanns i relativt höga cellantal.

Östersjön dominerades av cryptomonader, framförallt från släktet *Teleaulax*. Släktet *Chrysochromulina* fanns vid det flesta stationerna. Det förekom även filamentösa cyanobakterier på de flesta stationer. Vid enstaka stationer fanns celler från släktet *Dinophysis*.

De integrerade (0-20 m) klorofyll *a* värdena var låga, men normala för månaden i alla provtagningsområden.



Abstract

Overall the phytoplankton diversity was low at the Skagerrak sampling sites. The genus *Ceratium* that has been found in high amounts during autumn was observed with moderate cell numbers.

The species diversity was a bit higher at the Kattegat sampling sites compared to the Skagerrak area, except on the second sampling occasion at Anholt E. Dinoflagellates were the most common among the larger species and the genus *Ceratium* was found with relatively high cell numbers.

The Baltic phytoplankton stations were dominated by small cells such as cryptomonads, mainly from the genus *Teleaulax*. The genus *Chrysochromulina* was present at all stations. Filamentous cyanobacteria were present at most stations and the genus *Dinophysis* at some.

The integrated (0-20 m) chlorophyll *a* concentrations were low, but within normal for this month in all sampling areas.

More detailed information on species composition and abundance

The Skagerrak

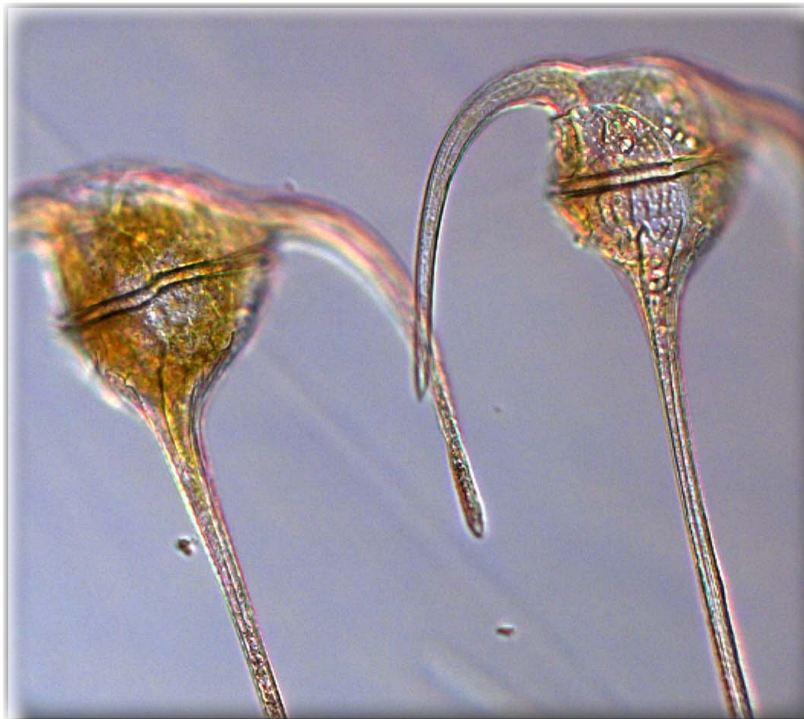
Å17 5th of December (open Skagerrak)

The phytoplankton diversity was quite low. Diatoms were more abundant than dinoflagellates and consisted mostly of *Skeletonema marinoi* whereas *Ceratium lineatum* was most common among the dinoflagellates. Small flagellates such as cryptomonads were quite common.

Släggö 5th of December (Skagerrak coast)

The diversity was low. Dinoflagellates were more common than diatoms and the genus *Ceratium* was most abundant. *Ceratium lineatum* and *C. tripos* were found with relatively high cell numbers. *Skeletonema marinoi* dominated among the diatoms.

The integrated (0-20 m) chlorophyll *a* concentrations were low, but within normal for this month in the Skagerrak.



The dinoflagellate *Ceratium tripos* was common in the Skagerrak and Kattegat areas.

The Kattegat

N14 Falkenberg 6th of December

The species richness was a bit higher than at the Skagerrak stations. The dinoflagellate genus *Ceratium* was present with several species but predominantly *C. lineatum* and *C. tripos* were found. Small flagellates belonging to the group cryptomonads were also found. Several species of the potentially toxic diatom genus *Pseudo-nitzschia* was present in low amounts.

Anholt E 6th and 16th of December

A little more diverse community was found on the first occasion than the last. Dinoflagellates were most common among the large species on both occasions and the genus *Ceratium* was the most common. The diatom *Skeletonema marinoi* was relatively common on the first stop but not on the second visit.

The integrated (0-20 meters) chlorophyll *a* concentrations were within normal for the season in the Kattegat.

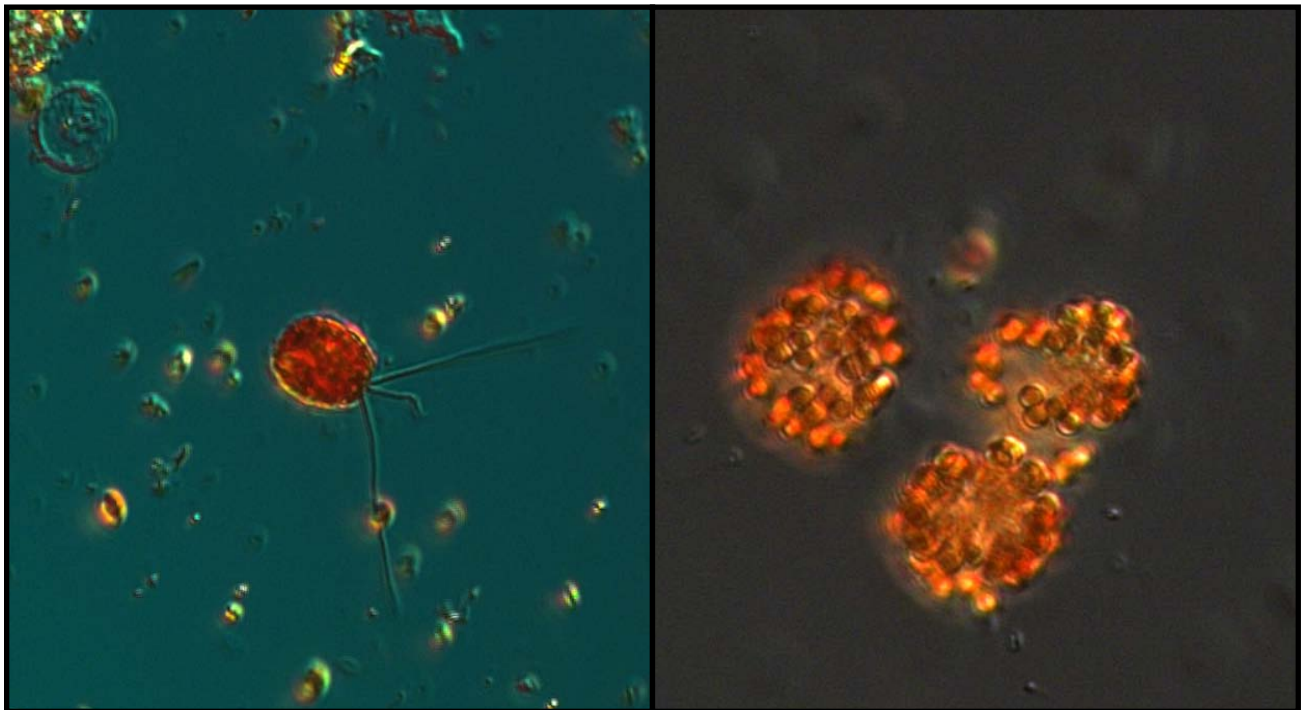
The Baltic Sea

The phytoplankton species composition was very similar to the situation in November. The cell density was low and dominated by small cells such as cryptomonads, mainly from the genus *Teleaulax*. There were also large cells belonging to the genus *Coscinodiscus* at most stations. Furthermore, cells from the genus *Dinophysis* were present at some stations.

The genus *Chrysochromulina* was common or at least present at most stations. *Aphanizomenon flos-aqua* and unidentified filamentous cyanobacteria were also present at most stations and even common at some stations. Colony forming cyanobacteria from the genus *Woronichinia* spp., were present at almost all stations.

The cell density was very low at the station Ref. M1V1 in the Kalmar sound. The depth at the Kalmar sound sampling site (21 m) and the stormy weather during the expedition this month resulted in a phytoplankton sample dominated by detritus.

The integrated (0-20 meters) chlorophyll *a* concentrations were low but normal for the season at all stations. Despite a low cell density, the highest chlorophyll *a* concentrations were found at Ref. M1V1.

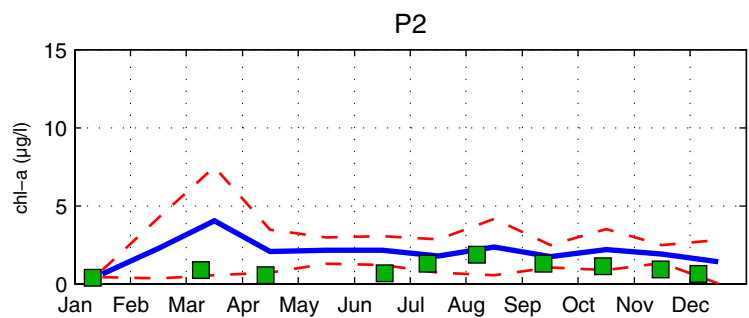
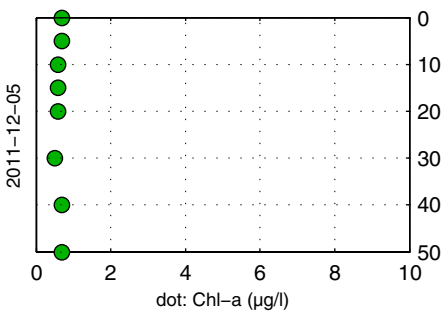
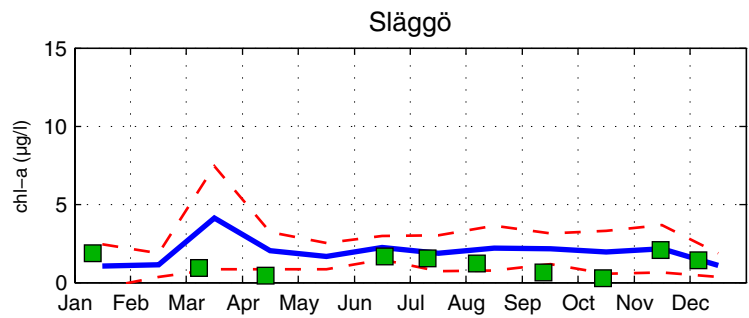
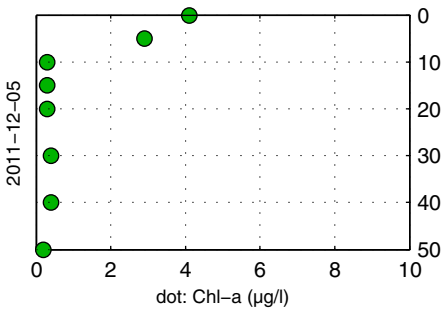
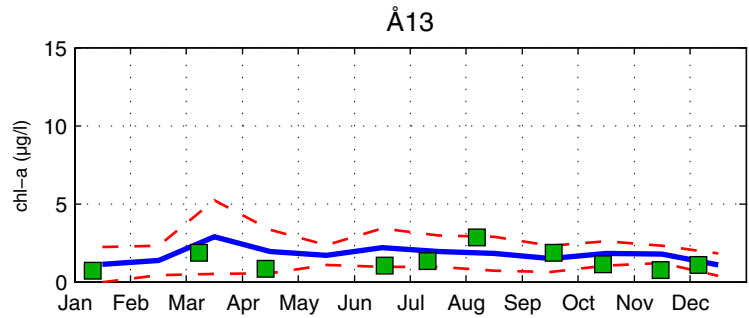
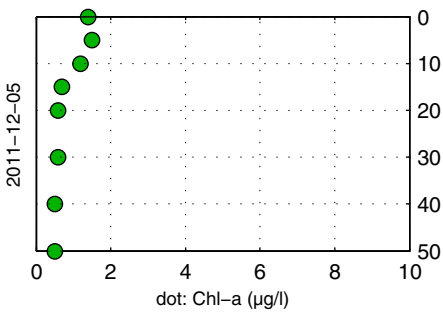
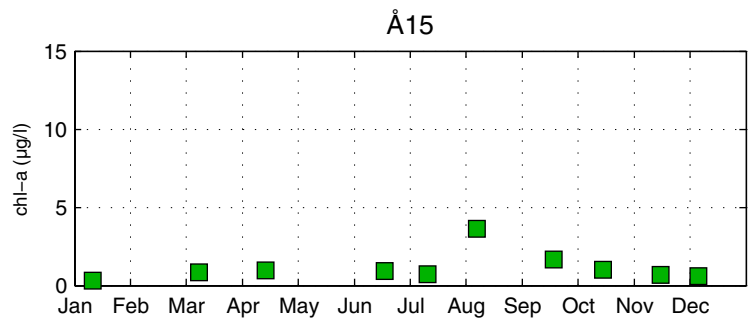
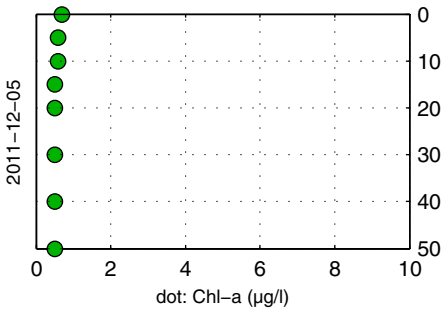
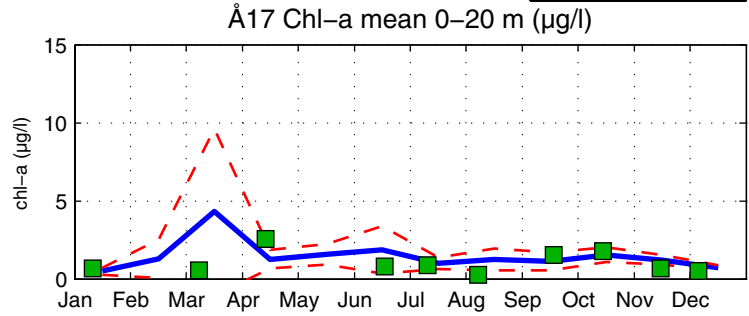
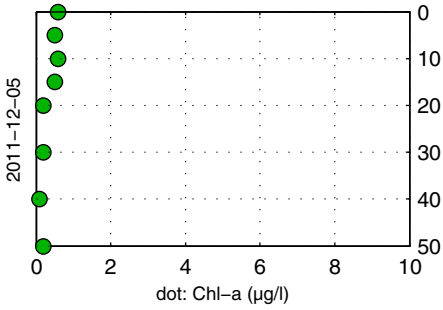
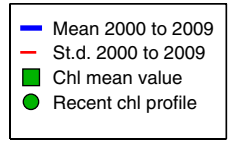


The genus *Chrysochromulina* (left) and the colonyforming cyanobacterium *Woronichinia* sp. was common or present at most stations in the Baltic Sea.

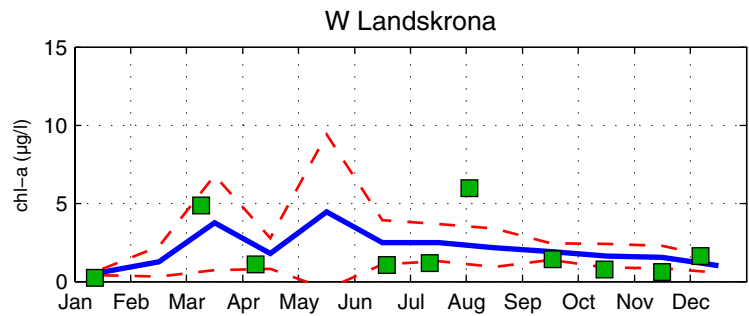
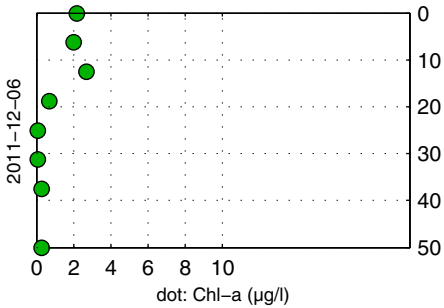
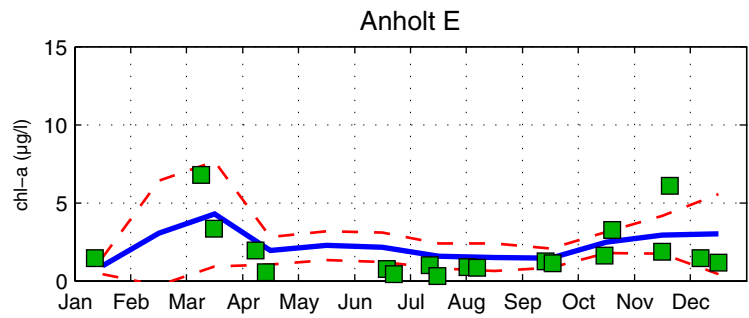
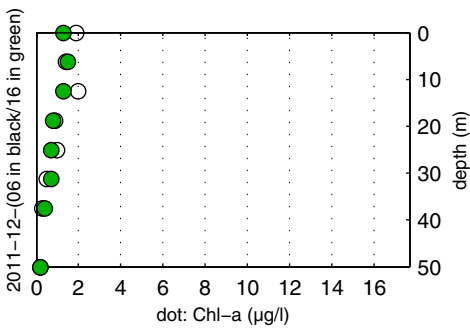
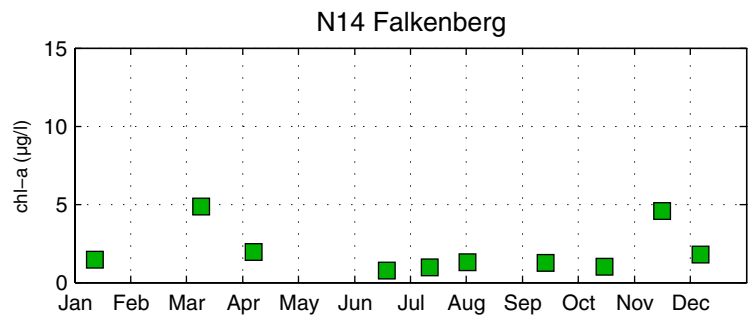
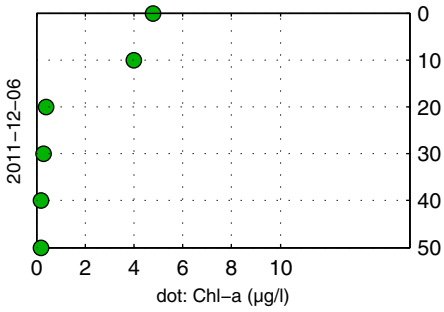
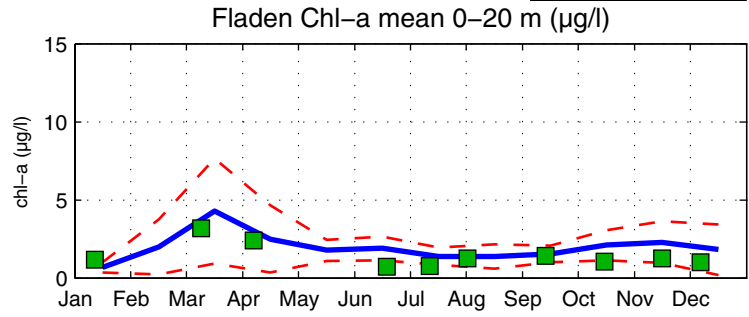
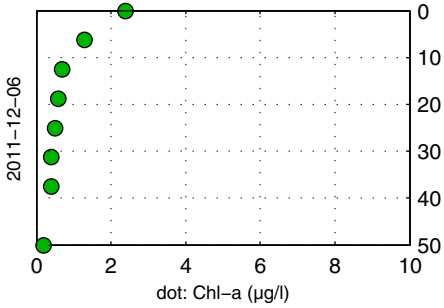
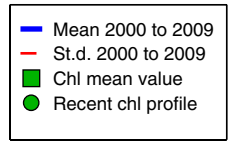
Selection of observed species	Å17	Släggö	N14	Anholt E	Anholt E
Red=potentially toxic species	5/12	5/12	6/12	6/12	16/12
	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Ceratulina pelagica</i>	present				
<i>Chaetoceros danicus</i>	present				
<i>Chaetoceros subtilis</i>					present
<i>Chaetoceros cf. tenuissimus</i>	present				present
<i>Cylindrotheca closterium</i>				present	present
<i>Leptocylindrus minimus</i>	present				
<i>Porosira glacialis</i>			present	present	present
<i>Pseudo-nitzschia spp.</i>	present		common		
<i>Rhizosolenia hebetata</i>					present
<i>Rhizosolenia imbricata</i>		present			
<i>Skeletonema marinoi</i>	common	common		common	
<i>Thalassionema nitzschioides</i>		present		present	
<i>Thalassiosira angulata</i>	common		present	present	
<i>Thalassiosira punctigera</i>				present	
<i>Thalassiosira rotula</i>					present
<i>Akashiwo sanguinea</i>	present	present		present	
<i>Amphidinium sphenoides</i>	present				
<i>cf. Azadinium sp.</i>	present			present	present
<i>Ceratium furca</i>			present	present	present
<i>Ceratium fusus</i>			present	present	present
<i>Ceratium lineatum</i>	common	common	common	common	common
<i>Ceratium longipes</i>					present
<i>Ceratium macroceros</i>				present	
<i>Ceratium tripos</i>	present	common	common	common	common
<i>Dinophysis acuta</i>				present	
<i>Dinophysis norvegica</i>				present	present
<i>Dinophysis rotundata</i>			present		
Gymnodiniales	present	present	present	common	present
<i>Gyrodinium spirale</i>			present		
<i>Karenia mikimotoi</i>		present		present	
<i>Katodinium glaucum</i>					present
Peridinales			present		
<i>Prorocentrum micans</i>			present	present	present
<i>Protoperidinium cf. crassipes</i>			present		
<i>Protoperidinium divergens</i>				present	
<i>Protoperidinium steinii</i>			present		
<i>Dichtyocha speculum</i>		present	common	present	present
<i>Chrysochromulina spp.</i>		present	present	present	present
<i>Heterosigma akashiwo</i>	present				
Cryptomonadales spp.		common	present	present	present
<i>Hemiselmis virescens</i>			present		
<i>Plagioselmis prolunga</i>	common		common	present	present
<i>Teleaulax spp.</i>	common		present	common	common
<i>Pyramimonas spp.</i>				present	
Cyanobacteria colony	present				
<i>Pleurochrysis spp.</i>	present				
<i>Leucocryptos marina</i>	present	present	present		
Choanoflagellidea	present	present	common		
Ciliophora	present	present	present	present	present
<i>Mesodinium rubrum</i>			present	present	

Selection of observed species	BY2	BY5	BCS III-10	BY15	BY29	BY38	BY31	Ref. M1-V1
Red=potentially toxic species	7/12	7/12	7/12	8/12	8/12	14/12	14/12	15/12
	cells/l	cells/l	cells/l	cells/l	cells/l	cells/l	cells/l	cells/l
<i>Actinocyclus</i> spp.		present			present			
<i>Chaetoceros</i> spp.								present
<i>Chaetoceros impressus</i>	present	present		present	present	present	present	present
<i>Coscinodiscus granii</i>		common	present	present	present		present	
<i>Cyclotella choctawhatcgeeana</i>	present							
<i>Ceratium tripos</i>	present							
<i>Dinophysis acuminata</i>				present	present			present
<i>Dinophysis norvegica</i>					present	present	present	
Gymnodiniales	present	present	present	present	present	present	common	present
Gyrodinium spirale	present	present					present	
<i>Heterocapsa</i> spp.	present	present			present	present		present
<i>Katodinium glaucum</i>		present	present	present			present	
Peridinales					present	present	present	present
<i>Protoperdinium</i> spp.						present	present	present
Cryptomonadales spp.	very common	very common	common	common	present	present	common	common
<i>Teleaulax</i> spp.	very common	common	present	common	common	common	common	common
<i>Dictyochoa speculum</i>	present							
<i>Chrysochromulina</i> spp.	common	present	present	present		present		
<i>Pterosperma</i> spp.	present			present		present		present
Cyanobacteria spp. filament					present	common	present	
Cyanobacteria colony forming	common	present	present	present		present	present	
<i>Aphanizomenon flos-aquae</i>				present	common	present	common	
<i>Nodularia spumigena</i>		present						
<i>Pseudanabaena</i> spp.								
<i>Woronichinia</i> spp.	common	present	present	present	present	present	present	
<i>Planctonema lauterbornii</i>	present				present		common	
<i>Pyramimonas</i> spp.	common	common	common	present	present	present	present	present
<i>Oocystis</i> spp.		present		present		present		present
<i>Pediastrum</i> spp.				present				
Choanoflagellidea	common	common	common		present	present	common	
<i>Leucocryptus marina</i>	present							
Ciliophora	present	present	present	present	present	present	present	present
<i>Mesodinium rubrum</i>	present	present	present	present	present	present	present	present

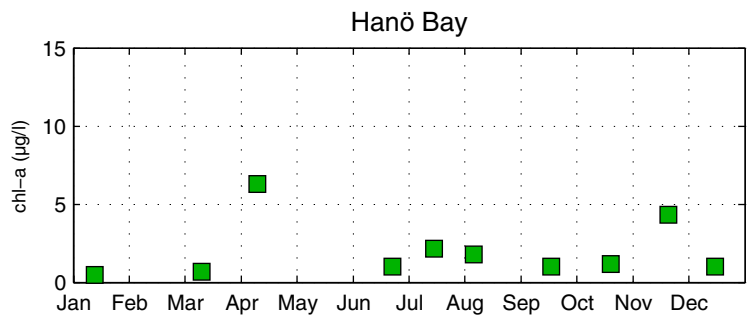
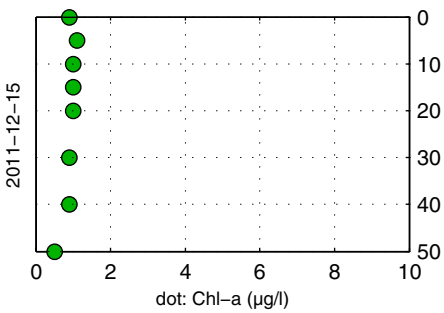
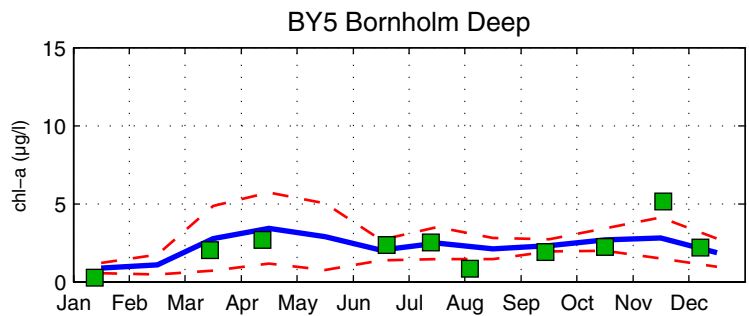
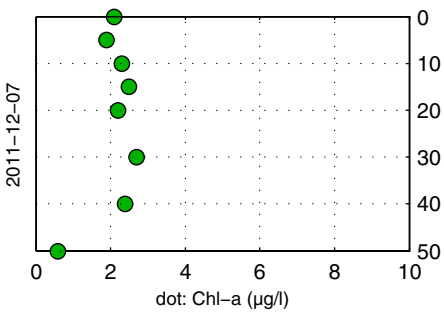
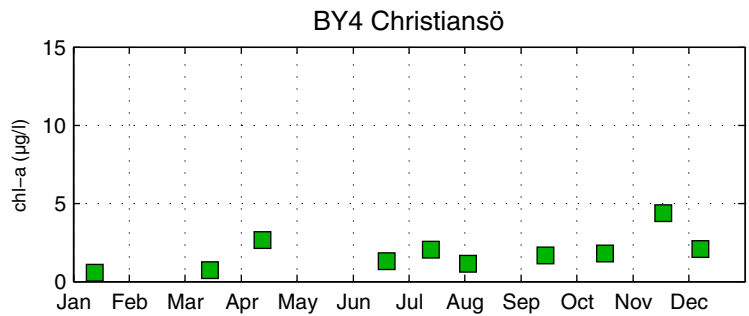
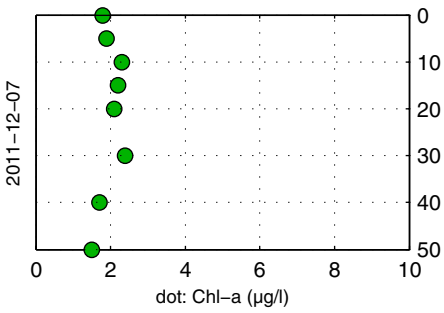
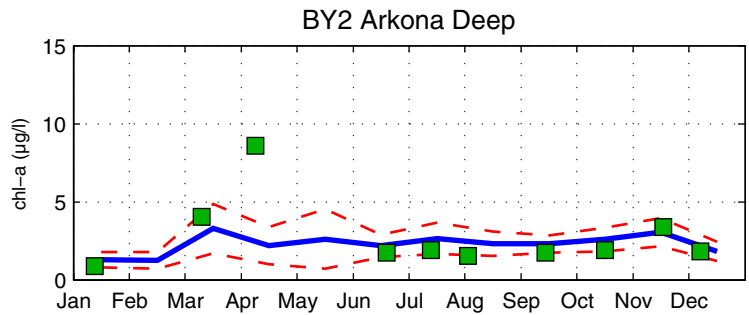
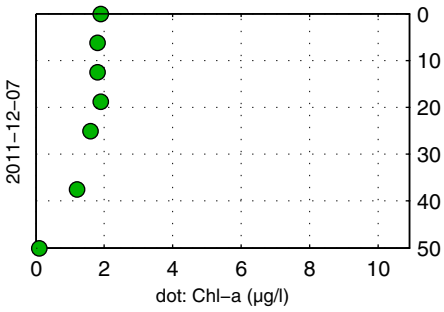
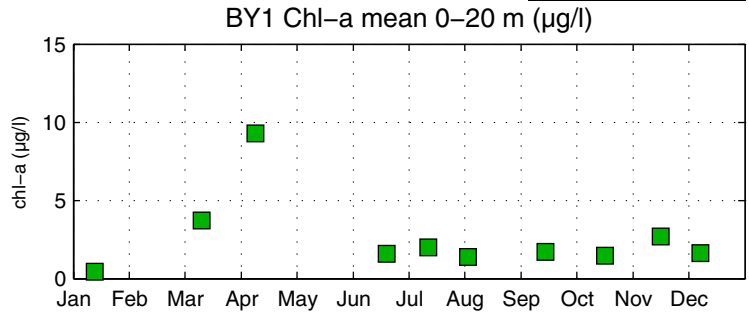
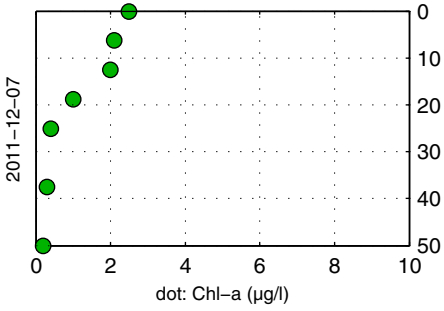
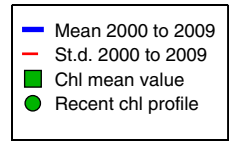
The Skagerrak



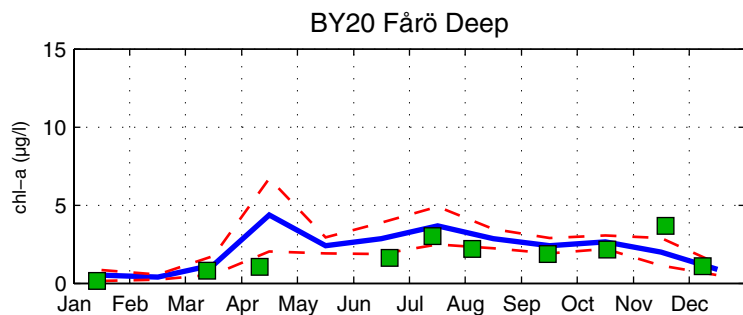
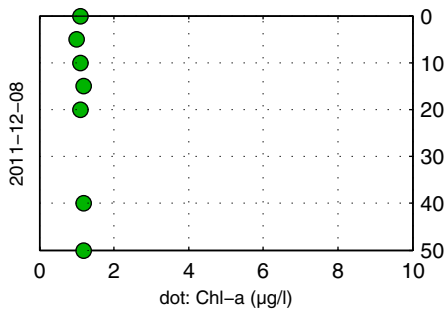
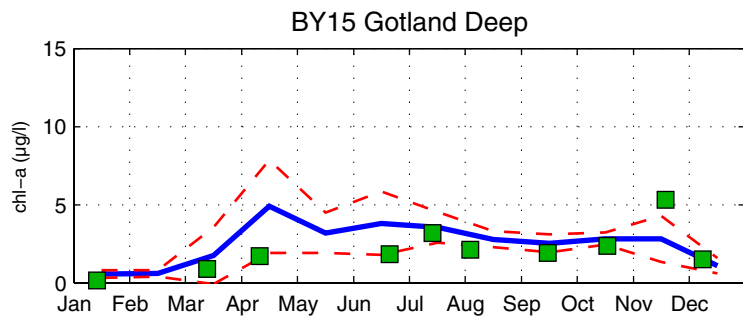
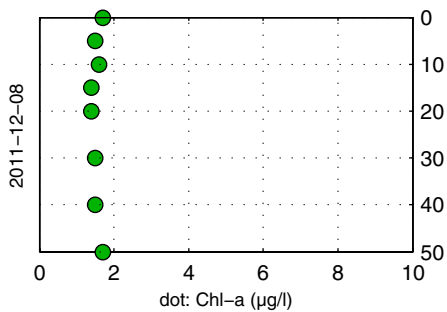
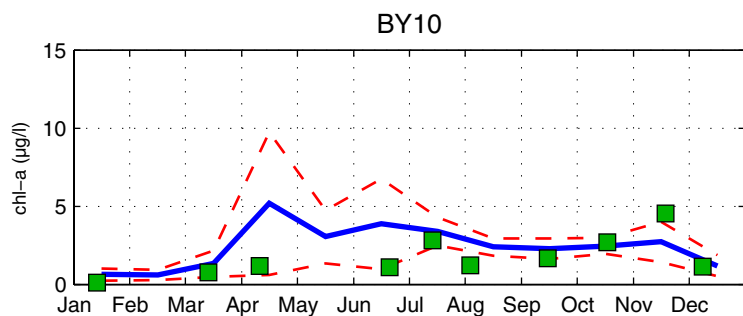
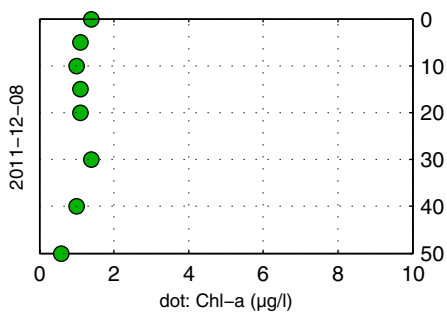
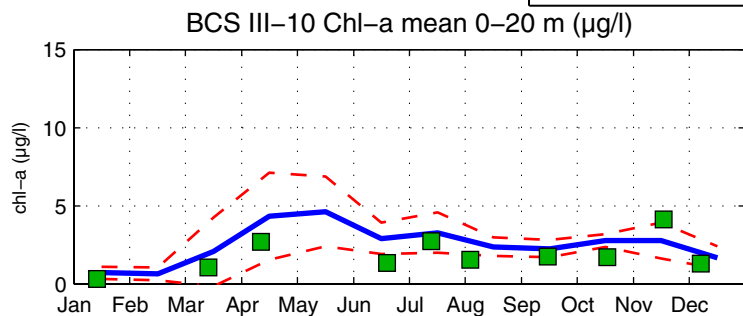
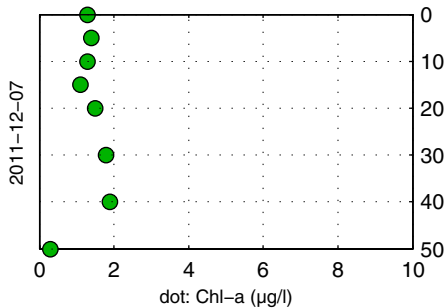
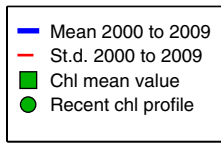
The Kattegat and the Sound



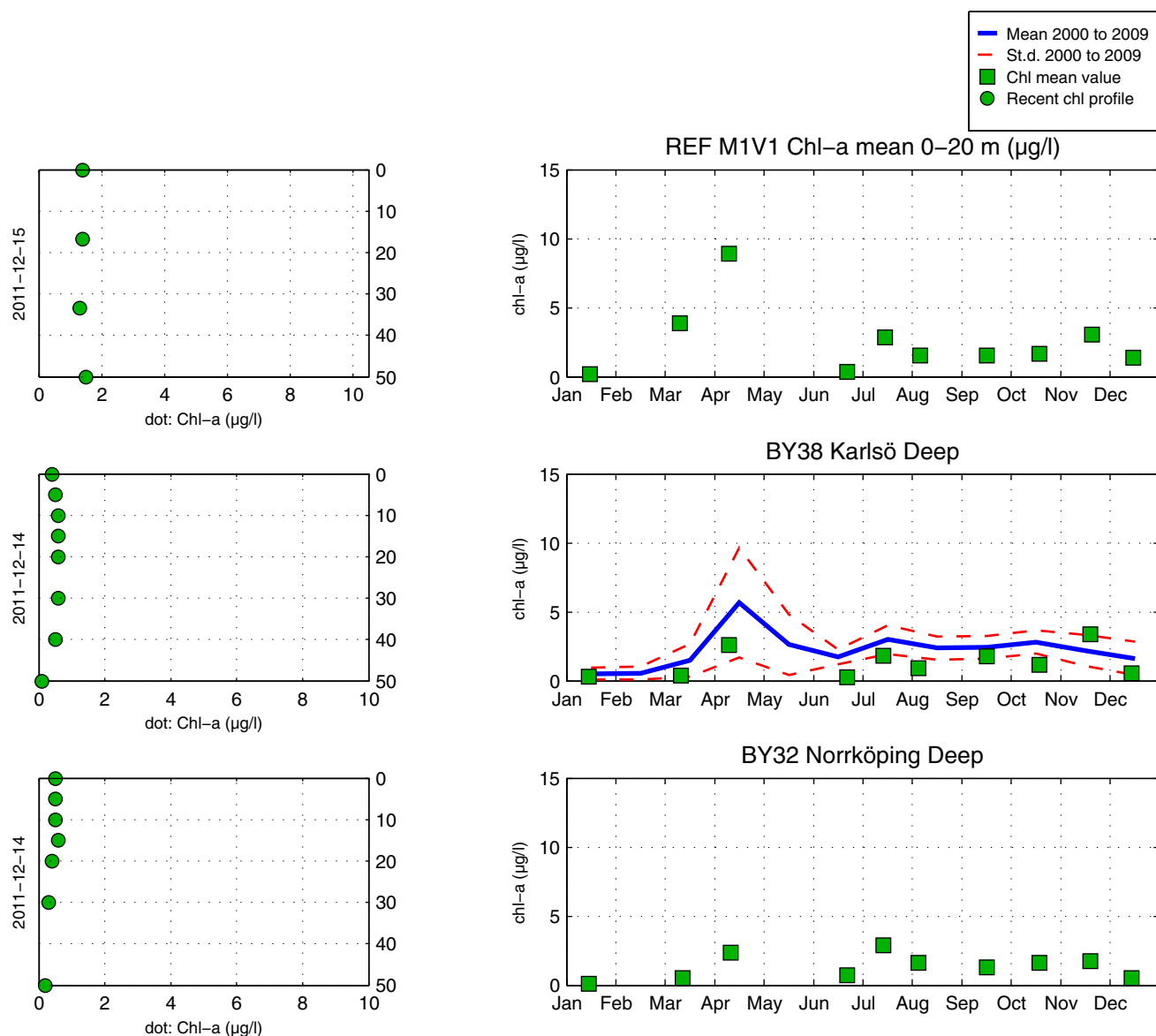
The Southern Baltic



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. Tekniska problem ombord satte stopp för månadens fluorescens-mätningar.

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. Chlorophyll fluorescence was not measured this month due to technical problems on board.

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.

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.

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.

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. 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.

