SMHI
Oceanographic Unit
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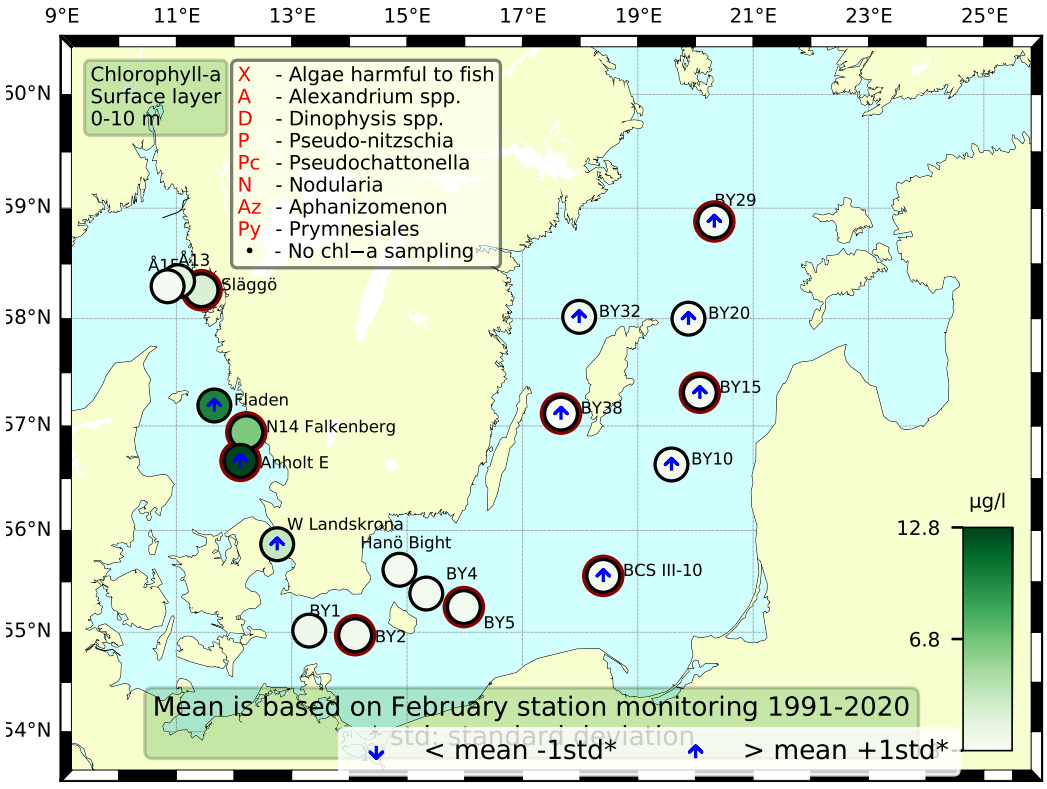
AlgAware
Dnr: S/Gbg-2023-23
ALGAL SITUATION IN
MARINE WATERS SURROUNDING SWEDEN

Sammanfattning

Vårblomningen var främst igång i Kattegatt, med höga cellantal av framför allt kiselalgerna *Skeletonema marinoi* och *Thalassiosira nordenskioeldii*. Även klorofylltopparna vid Fladen och Anholt (Kattegatt) dominerades av *Skeletonema marinoi*. Alla stationer hade liknande artsammansättning, men dominansen av enskilda arter var tydligare i Kattegatt jämfört med Skagerrak (dock kunde enbart Släggö provtas denna månad). De integrerade klorofyllhalterna (0–10 m och 0–20 m) var högre än normalt i Kattegatt, och inom det normala spannet för Släggö.

Diversiteten och cellantalen av växtplankton var låga i Östersjön, med mest små celler såsom Cryptomonadales och mindre Gymnodiniales, samt olika ciliater. Några fåtal kedjor av *Skeletonema marinoi* återfanns på några av stationerna. De integrerade klorofyllhalterna (0–10 m och 0–20 m) var något förhöjda för månaden vid alla stationer förutom de sydvästra stationerna.



Abstract

Spring bloom was primarily ongoing in the Kattegat, with high abundances of the diatoms *Skeletonema marinoi* and *Thalassiosira nordenskioeldii*. The chlorophyll peaks at Fladen and Anholt (Kattegat) were also dominated by *Skeletonema marinoi*. All stations had similar species composition, although the dominance of certain species was more prominent in Kattegat compared to Skagerrak (only station Släggö could be sampled this month). The integrated chlorophyll concentrations (0-10m and 0-20 m) were higher than normal for this month in the Kattegat, and within the normal range at Släggö.

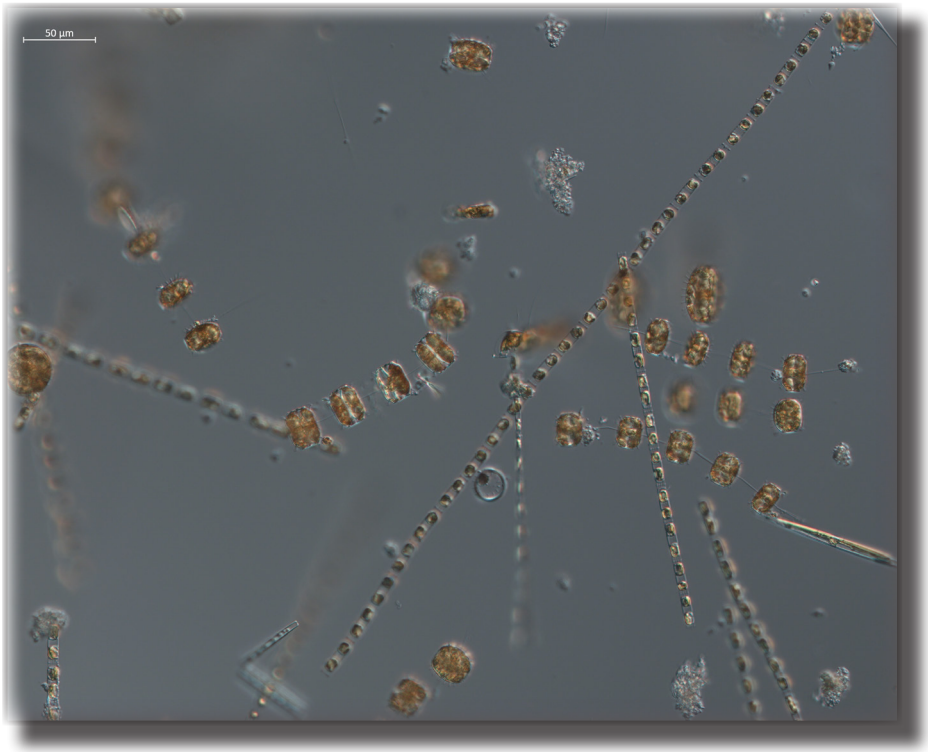
Diversity and cell abundance of phytoplankton were low in the Baltic Sea, with mostly smaller cells such as Cryptomonadales and smaller Gymnodiniales as well as various ciliates. Some chains of *Skeletonema marinoi* were found at several stations. The integrated chlorophyll concentrations (0-10m and 0-20 m) were a bit above normal for the month at all stations except the stations in the southwestern part.

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

The Skagerrak

Å17 (open Skagerrak) 9th of February
Phytoplankton was not sampled due to poor weather conditions.

Släggö (Skagerrak coast) 9th of February
Species diversity, cell numbers and chlorophyll concentrations indicate that the spring bloom is being initiated. The Släggö sample contained a high species diversity, especially of diatoms, and high total cell numbers. The diatom *Skeletonema marinoi* dominated the sample and the diatom *Thalassiosira nordenskioeldii* was also very common. The integrated chlorophyll concentration was within normal for this month.



The diatoms *Skeletonema marinoi* and *Thalassiosira nordenskioeldii* dominated the samples on the west coast. Photo: A. Torstensson.

The Kattegat

Anholt E 10th of February
Spring bloom was ongoing with high species diversity, especially of diatoms, and very high total cell numbers. The diatom *Skeletonema marinoi* dominated the sample and the diatom *Thalassiosira nordenskioeldii* was also very common. The integrated chlorophyll concentration was far above normal for this month.

N14 Falkenberg 10th of February
Spring bloom was ongoing with high abundances of diatoms. The dominance of certain species was more prominent here than at Anholt, yet the sample contained high total cell numbers. The diatom *Skeletonema marinoi* dominated the sample and the diatom *Thalassiosira nordenskioeldii* was also very common. The integrated chlorophyll concentration was above normal for this month. The chlorophyll peak at this station was also dominated by *Skeletonema marinoi*.

Fladen 10th of February
The chlorophyll peak was dominated by the diatom *Skeletonema marinoi*.

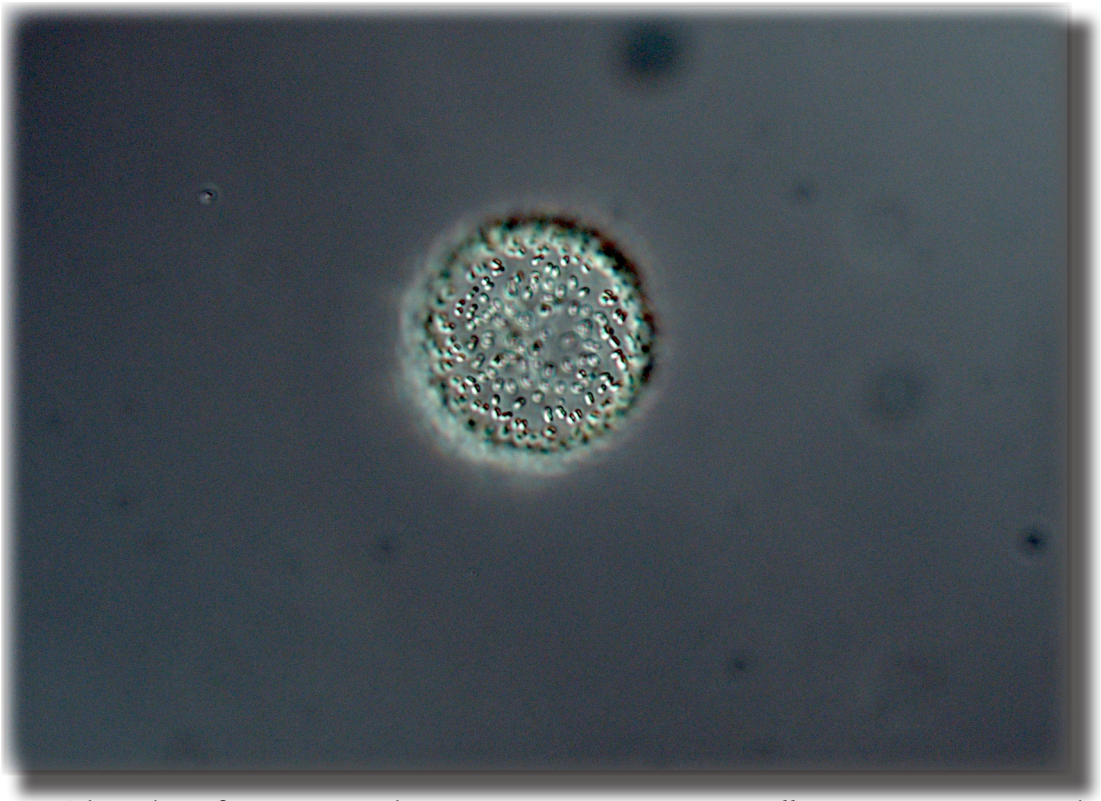
The Baltic

BY2 Arkona 11th of February
The phytoplankton diversity and abundances were very low with mainly small cells such as Cryptomonadales and ciliates. There were also some cells of *Chaetoceros castracanei, Skeletonema marinoi* and Gymnodiniales. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BY5 Bornholm deep 11th of February
The phytoplankton diversity and abundances were very low with mainly small cells such as ciliates and Cryptomonadales. There were some cells of *chaetoceros castracanai*, *Snowella* sp. and *S. marinoi*. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were within the normal range for this month.

BCSIII-10 12th of February
The phytoplankton diversity and abundances were very low with mainly small cells where Cryptomonadales were the most common. There were also some cells of Oocystis sp. and various ciliates. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were above the normal range for this month.

BY15 Gotland deep 13th of February
The phytoplankton diversity and abundances were very low with mainly small cells such as *Snowella* sp. and Cryptomonadales. There were also some cells of different ciliates. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were above the normal range for this month.



The colony forming cyanobacterium genus *Lemmermaniella* was present at a couple of stations in the Baltic. Photo: M. Johansen.

BY29 14th of February
The phytoplankton diversity and abundances were very low with mainly colonyforming cyanobacteria. There were some cells of *Oocystis* sp., *Lemmermaniella* sp., and *Snowella* sp. and *S. marinoi.* The integrated (0-20 m and 0-10 m) chlorophyll concentrations were above normal range for this month.

BY31 Landsort deep 15th of February
The phytoplankton diversity and abundances were low with mainly small cells such as Cryptomonadales, *Snowella* sp.and small naked cells of the order gymnodiniales.

BY38 15th of February
The phytoplankton diversity and abundances were low with mainly small cells of Cryptomonadales. There were also some cells of *Snowella* sp. and *S. marinoi* present. The integrated (0-20 m and 0-10 m) chlorophyll concentrations were above normal range for this month.

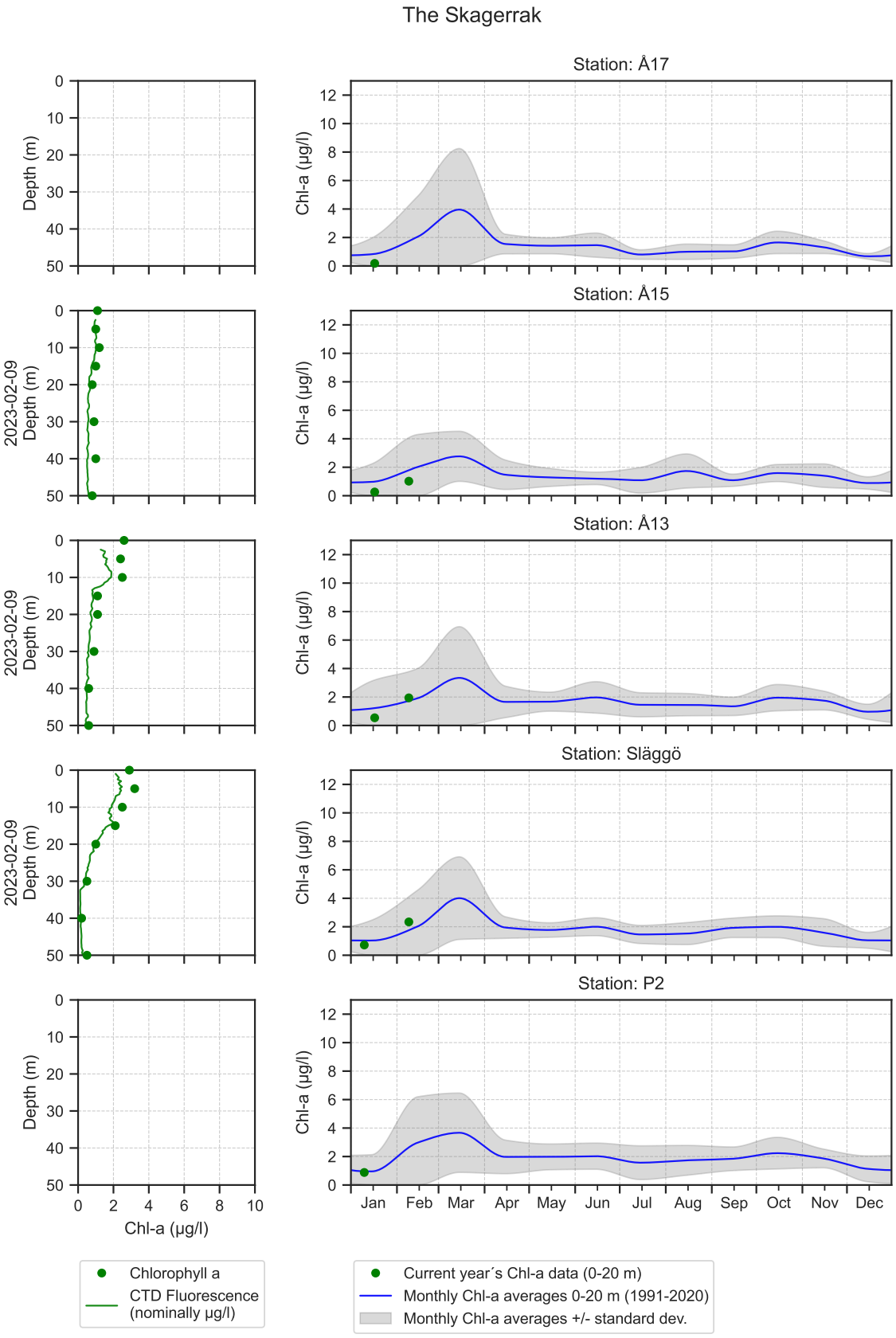
BY39 16th of February
The phytoplankton diversity and abundances were low with mainly small cells of Cryptomonadales. There were also some *Binuclearia lauterbornii* and *S. marinoi* present.

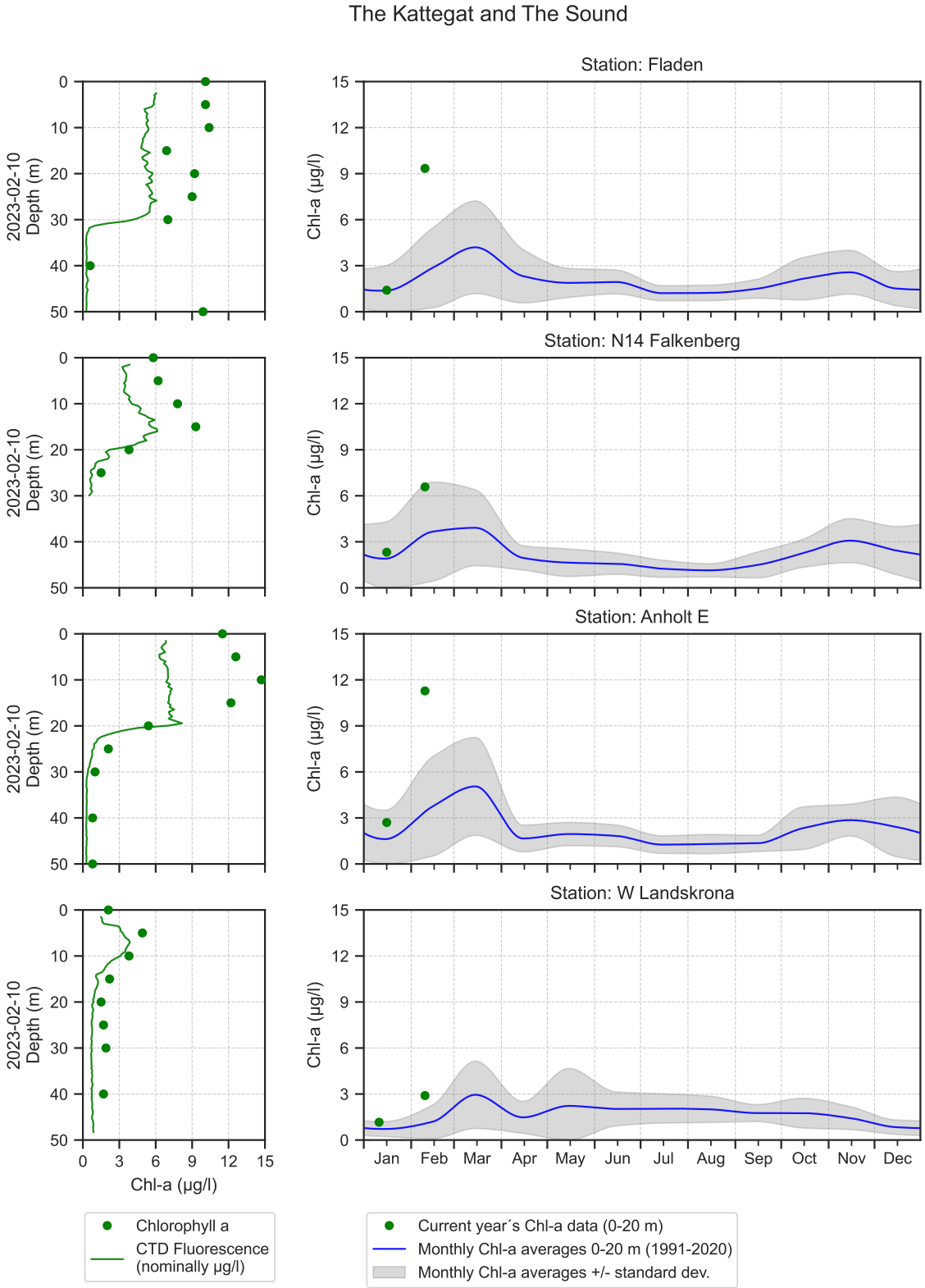
Hanöbukten 11th of February
The phytoplankton diversity and abundances were very low with mainly small cells such as ciliates and Cryptomonadales.

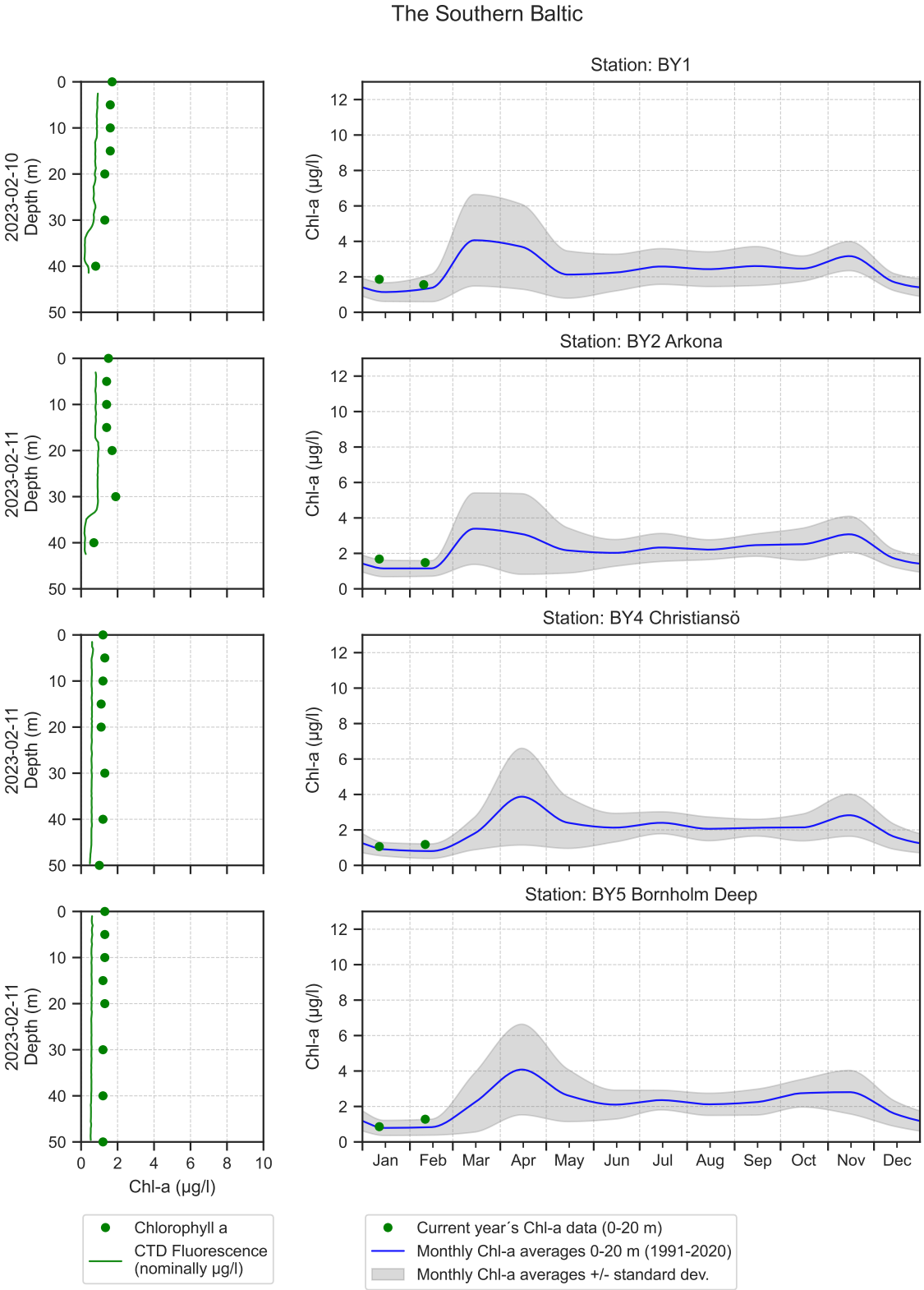
Phytoplankton analysis and text:
Anders Torstensson and Marie Johansen.

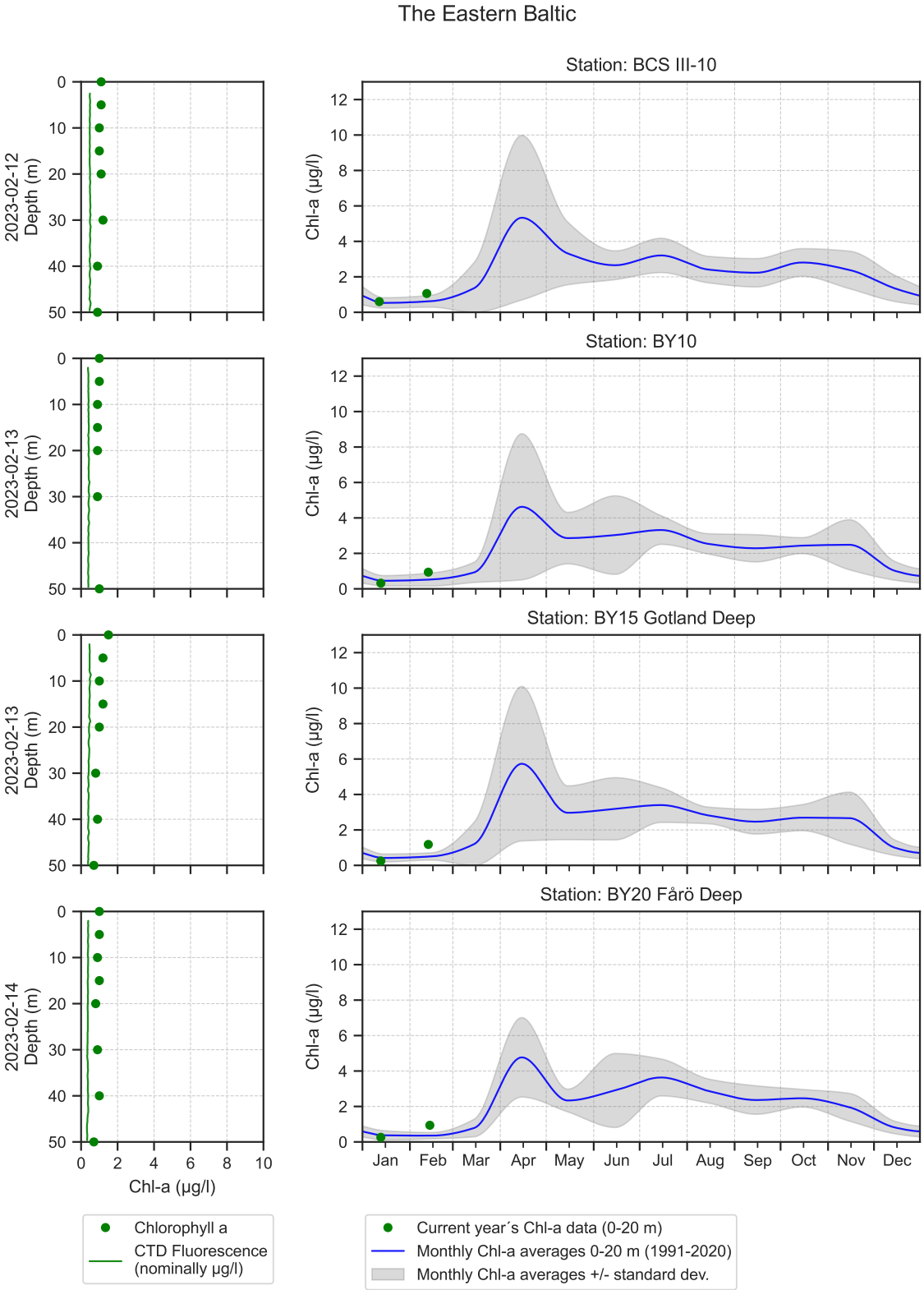
Selection of observed species	Anholt E	N14	Släggö
Red=potentially toxic species	10/2	10/2	9/2
Hose 0-10 m	presence	presence	presence
Attheya		present	
Centrales	present	present	common
Cerataulina pelagica			present
Chaetoceros		present	
Chaetoceros danicus	present	present	
Chaetoceros debilis	present	present	common
Coscinodiscus concinnus	present		
Dactyliosolen fragilissimus	present	present	
Ditylum brightwellii	present		
Guinardia delicatula	present	present	present
Guinardia flaccida	present	present	
Leptocylindrus danicus	present		present
Nitzschia longissima	present	present	present
Pennales			present
Proboscia alata	present	present	present
Pseudo-nitzschia	present	present	present
Rhizosolenia hebetata f. semispina	present	present	present
Rhizosolenia imbricata			present
Skeletonema marinoi	very common	very common	very common
Thalassionema nitzschioides	common	present	present
Thalassiosira angulata	present	present	present
Thalassiosira anguste-lineata	present	present	present
Thalassiosira nordenskioeldii	very common	very common	very common
Thalassiosira punctigera			present
Cryptomonadales		present	present
Pseudanabaena	present		present
Octactis speculum	present	present	present
Dinophysis norvegica		present	
Gymnodiniales	present	present	present
Peridiniales	present		present
Tripos fusus			present
Tripos lineatus	present	present	present
Tripos longipes	present		
Tripos muelleri	present	present	present
Ebria tripartita	present		
Emiliania huxleyi	present	present	present
Ciliophora	present	present	present

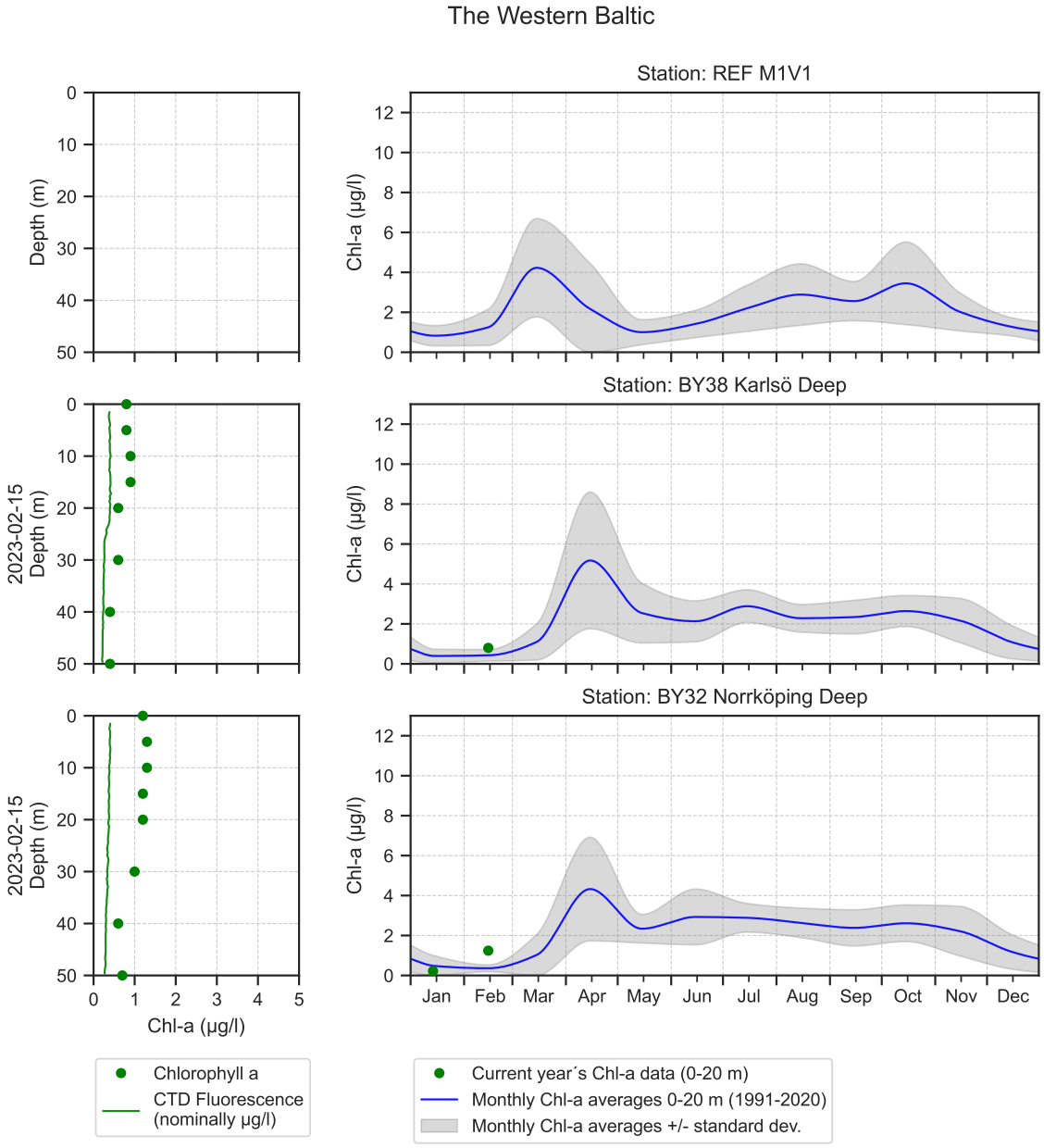
Selection of observed species	BCSIII-10	BY2	BY5	BY15	BY29	BY31	BY38	BY39	Hanöbight
Red=potentially toxic species	12/2	11/2	11/2	13/2	14/2	15/2	15/2	13/2	11/2
Hose 0-10 m	presence	presence	presence	presence	presence	presence	presence	presence	presence
Chaetoceros castracanei		present	present					present	
Skeletonema marinoi		present	present		present	present		present	
Dinophysis acuminata							present		
Gymnodiniales		present	present	present	present	common	common	present	
Peridiniales						present		present	
Prymnesiales				present					
Oocystis	present		present	present	present	present	present		
Binuclearia lauterbornii	present						present		
Cryptomonadales	common	common	common	common	common	common	common	common	common
Telonema subtile									present
Eutreptiella gymnastica	present	present	present	present	present		present		present
Aphanocapsa	present				present				present
Aphanothece							present		
Lemmermanniella					present				
Lemmermanniella parva	present								
Snowella	present			common	present	present	present	present	present
Ciliophora	present	common	present	present	present	present	common	present	present
Mesodinium rubrum	common	common	common	common	present	common	present		present


The Skagerrak
Station: Å17
Station: Å15
Station: Å13
Station: Släggö
Station: P2
Depth (m)
2023-02-09
Depth (m)
Chl-a (µg/l)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Chlorophyll a
CTD Fluorescence
(nominally µg/l)
Current year´s Chl-a data (0-20 m)
Monthly Chl-a averages 0-20 m (1991-2020)
Monthly Chl-a averages +/- standard dev.


The Kattegat and The Sound
Station: Fladen
Station: N14 Falkenberg
Station: Anholt E
Station: W Landskrona
2023-02-10
Depth (m)
Chl-a (µg/l)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Chlorophyll a
CTD Fluorescence (nominally µg/l)
Current year´s Chl-a data (0-20 m)
Monthly Chl-a averages 0-20 m (1991-2020)
Monthly Chl-a averages +/- standard dev.


The Southern Baltic
Station: BY1
Station: BY2 Arkona
Station: BY4 Christiansö
Station: BY5 Bornholm Deep
2023-02-10
2023-02-11
Depth (m)
Chl-a (µg/l)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Chlorophyll a
CTD Fluorescence (nominally µg/l)
Current year´s Chl-a data (0-20 m)
Monthly Chl-a averages 0-20 m (1991-2020)
Monthly Chl-a averages +/- standard dev.


The Eastern Baltic
Station: BCS III-10
Station: BY10
Station: BY15 Gotland Deep
Station: BY20 Fårö Deep
2023-02-12
2023-02-13
2023-02-13
2023-02-14
Depth (m)
Chl-a (µg/l)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Chlorophyll a
CTD Fluorescence (nominally µg/l)
Current year´s Chl-a data (0-20 m)
Monthly Chl-a averages 0-20 m (1991-2020)
Monthly Chl-a averages +/- standard dev.



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. 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
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 (0-10 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.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