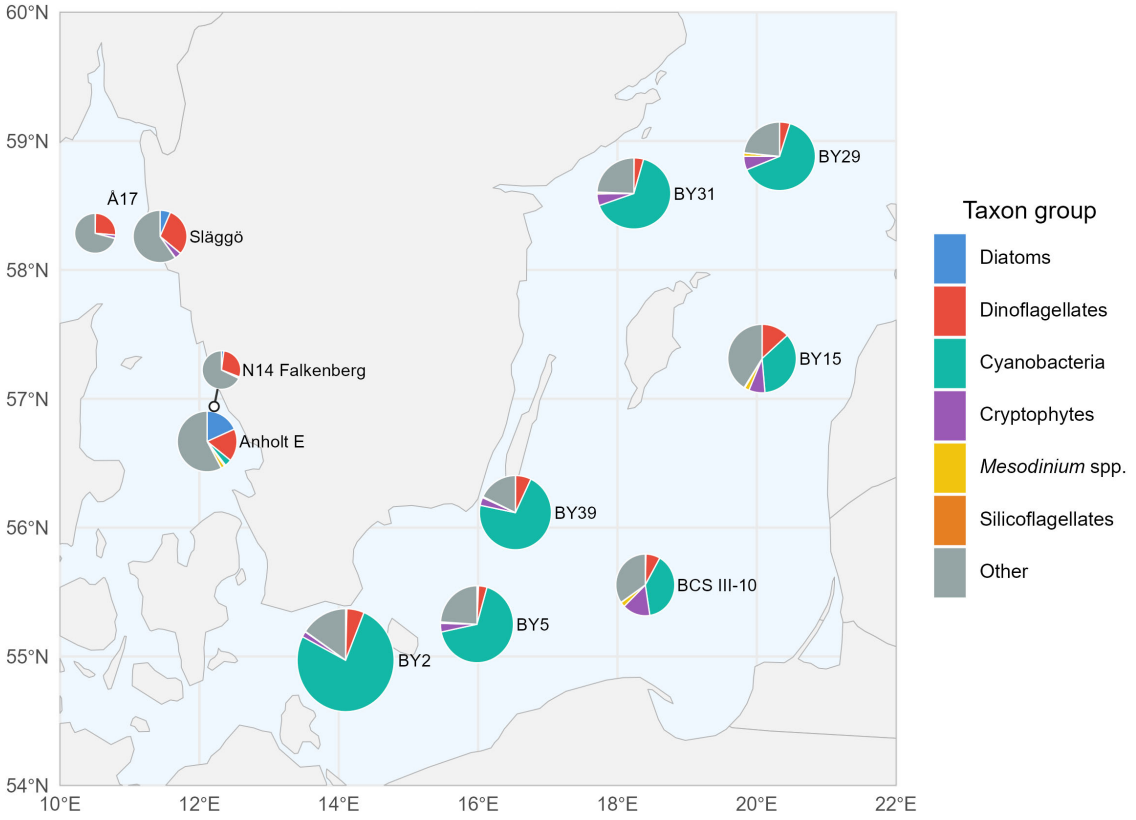
ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

Report No 7, July 2026

RV Svea cruise, 2026-07-10 to 2026-07-16

Dnr: 2026/18/3.1.3



Phytoplankton group composition at AlgAware stations based on carbon concentration. Pie slices show relative group composition; pie size shows relative total carbon concentration among stations.

IFCB report overview

This report is based on images collected by an Imaging FlowCytobot (IFCB) onboard R/V Svea. Samples are collected continuously approximately every 25 minutes from surface water at the ship's water intake for the FerryBox system. The water passes through a 150 µm mesh filter before reaching the IFCB, which generally excludes larger organisms. The instrument triggers image capture on chlorophyll fluorescence, which means that heterotrophic organisms and other non-chlorophyll-containing cells may be underrepresented. In this report we summarize the findings from selected monitoring stations. Phytoplankton identification is based on automated image classification by an AI model, validated by Ann-Turi Skjevik, SMHI. Report text was drafted with the assistance of a large language model. Taxa marked with * are potentially toxic or harmful.

Sammanfattning

I Skagerrak och Kattegatt var växtplanktondiversiteten måttlig till hög men det totala cellantalet och biovolymen var låg. Vid Anholt E under båda besöken dominerades samhällena av kiselalger och andra flagellater, inklusive *Guinardia* spp. och *Chaetoceros* spp., medan dinoflagellater bidrog mindre till den totala biovolymen. Vid N14 Falkenberg dominerade flagellater och Gymnodiniales, med endast små bidrag från kiselalger och cyanobakterier. Den potentiellt skadliga dinoflagellaten *Prorocentrum cordatum** påträffades både vid N14 Falkenberg och Anholt E, men endast i låga cellantal. Klorofyllfluorescensen var generellt låg vid alla stationer på västkusten, i överensstämmelse med den låga IFCB-biovolymen. Det fanns dock några toppar som dominerades av dinoflagellater i Skagerrak. Vid Anholt E i Kattegatt observerades två fluorescenstoppar; vid 25 meter dominerade dinoflagellater medans en sjunkande blomning av kiselalger fanns nära botten.

I Östersjön dominerades växtplanktonsamhällena tydligt av trådformiga cyanobakterier, särskilt *Dolichospermum* spp. *, *Nodularia spumigena** och *Aphanizomenon flos-aquae*. Detta var tydligt vid BY2 och BY5, där cyanobakterier stod för merparten av biovolymen och det totala cellantalet var högt. Vid de mer utsjöbelägna stationerna (BCS III-10, BY15, BY29, BY31 och BY39) dominerade cyanobakterier, men cryptomonader och andra små flagellater bidrog också till hög grad till samhällena. Flera potentiellt skadliga taxa förekom vid stationerna i Östersjön, inklusive *N. spumigena**, *Dolichospermum* spp. *, *Dinophysis acuminata**, *D. norvegica** och *P. cordatum**, men inga noterades på tydligt exceptionella nivåer i IFCB-data. Klorofyllfluorescensen var högst vid BY15 och BY2, i överensstämmelse med den förhöjda cyanobakteriebiovolymen där, medan något lägre fluorescens vid de övriga stationerna i Östersjön återspeglande deras något lägre biovolym.

Summary

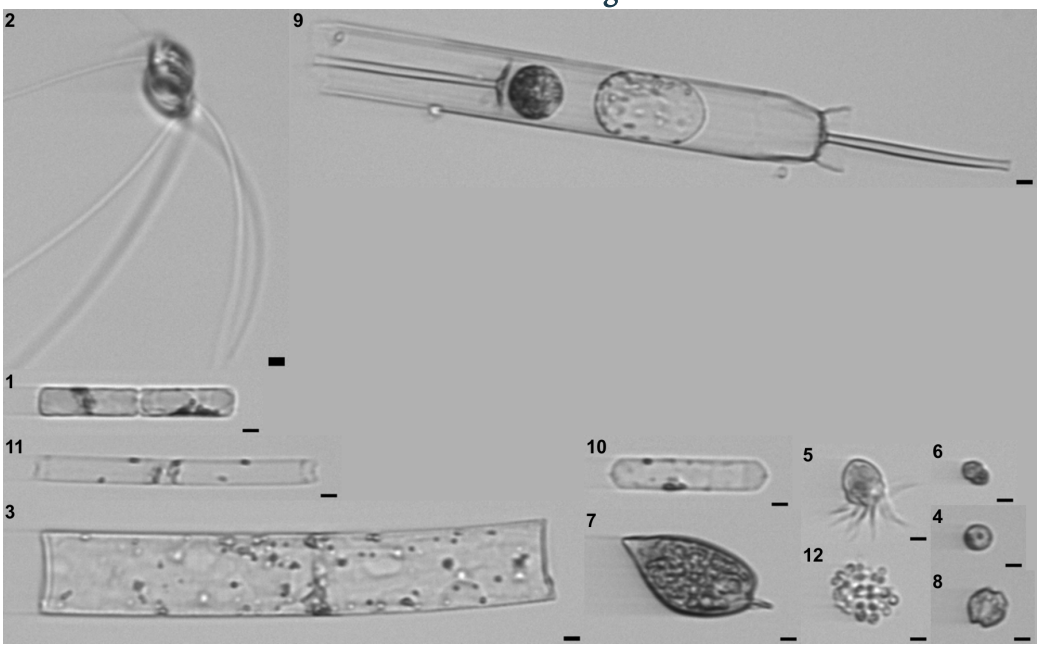
In the Skagerrak and Kattegat areas, phytoplankton diversity was moderate to high but total cell numbers and biovolume were low. At Anholt E on both visits, the community was dominated by diatoms and other flagellates, including *Guinardia* spp. and *Chaetoceros* spp., with dinoflagellates contributing less to the total biovolume. At N14 Falkenberg, flagellates and Gymnodiniales dominated, with only minor contributions from diatoms and cyanobacteria. The potentially harmful taxon *Prorocentrum cordatum** was detected at both N14 Falkenberg and Anholt E, but only in low abundances. Chlorophyll fluorescence was similar and relatively low at all West Coast stations, in agreement with the low IFCB biovolume. There was however some fluorescence peaks dominated by dinoflagellates in the Skagerrak. At Anholt E in the Kattegat, two peaks were observed; at 25 meters dinoflagellates dominated and close to the bottom a sinking bloom of diatoms was found.

In the Baltic Sea, phytoplankton communities were clearly dominated by filamentous cyanobacteria, particularly *Dolichospermum* spp.*, *Nodularia spumigena** and *Aphanizomenon flos-aquae*. This was most pronounced at BY2 and BY5, where cyanobacteria accounted for the majority of the biovolume and total cell numbers were high. At the more offshore stations (BCS III-10, BY15, BY29, BY31 and BY39), cyanobacteria still dominated but cryptophytes and other small flagellates also contributed notably to the community. Several potentially harmful taxa were present across the Baltic stations, including *N. spumigena**, *Dolichospermum* spp.*, *Dinophysis acuminata**, *D. norvegica** and *P. cordatum**, but none were very abundant in the IFCB data. Chlorophyll fluorescence was highest at BY15 and BY2, consistent with the elevated cyanobacterial biovolume there, while somewhat lower fluorescence at the remaining Baltic stations reflected their slightly lower biovolume.

Table 1. Summary of data used to generate the report for the July 2026 cruise.

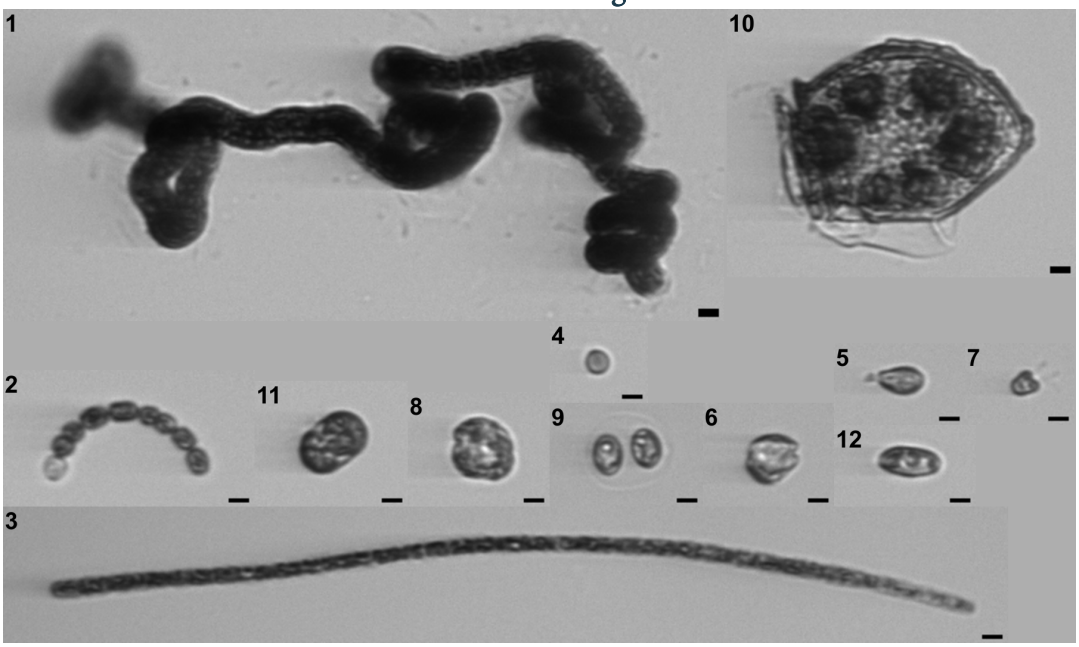
Parameter	Value
Total samples collected (cruise)	285
Samples from AlgAware stations	37
Biological images analysed	52,141
Classification model (PyTorch)	SMHI-NIVA-SYKE-SAMS-SZN-ResNet50-V6
LLM model (text generation)	gpt-5.1

West Coast images



The most common taxa by biovolume concentration in the West Coast images were: 1. *Guinardia delicatula*, 2. *Chaetoceros* spp., 3. *Guinardia flaccida*, 4. Unicells, 5. Ciliophora, 6. Gymnodiniales, 7. *Prorocentrum micans*, 8. Dinophyceae, 9. *Ditylum brightwellii*, 10. *Dactyliosolen fragilissimus*, 11. *Cerataulina pelagica*, 12. Cyanophyceae. Black bars represent 5 µm.

Baltic Sea images



The most common taxa by biovolume concentration in the Baltic Sea images were: 1. *Nodularia spumigena*, 2. *Dolichospermum* spp., 3. *Aphanizomenon flos-aquae*, 4. Unicells, 5. Cryptophyta, 6. Gymnodiniales, 7. *Pyramimonas* spp., 8. Dinophyceae, 9. *Oocystis* spp., 10. *Dinophysis norvegica*, 11. *Mesodinium rubrum*, 12. *Eutreptiella* sp.. Black bars represent 5 µm.

Spatial biomass distribution

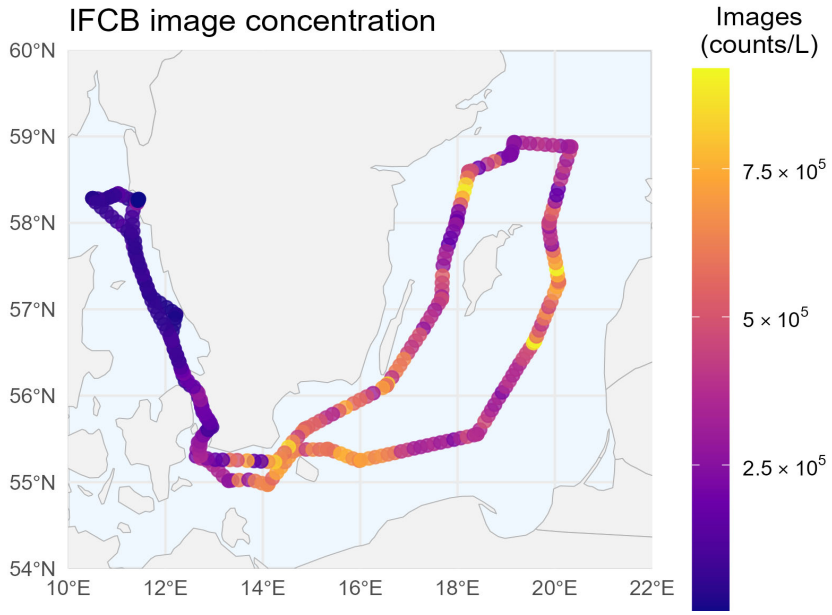


Figure 1. IFCB image concentration along the cruise track. Total images collected: 477,598.

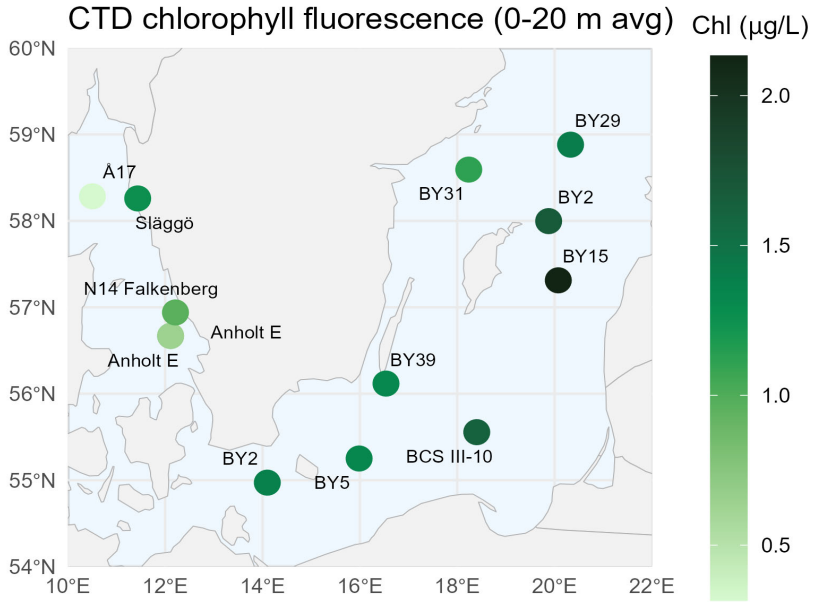


Figure 2. CTD chlorophyll fluorescence (0-20 m average) at AlgAware stations during the July 2026 cruise.

West Coast - Biovolume heatmap

Figure 3. Biovolume heatmap for West Coast stations.

Baltic Sea - Biovolume heatmap

Figure 4. Biovolume heatmap for Baltic Sea stations.

Relative biovolume

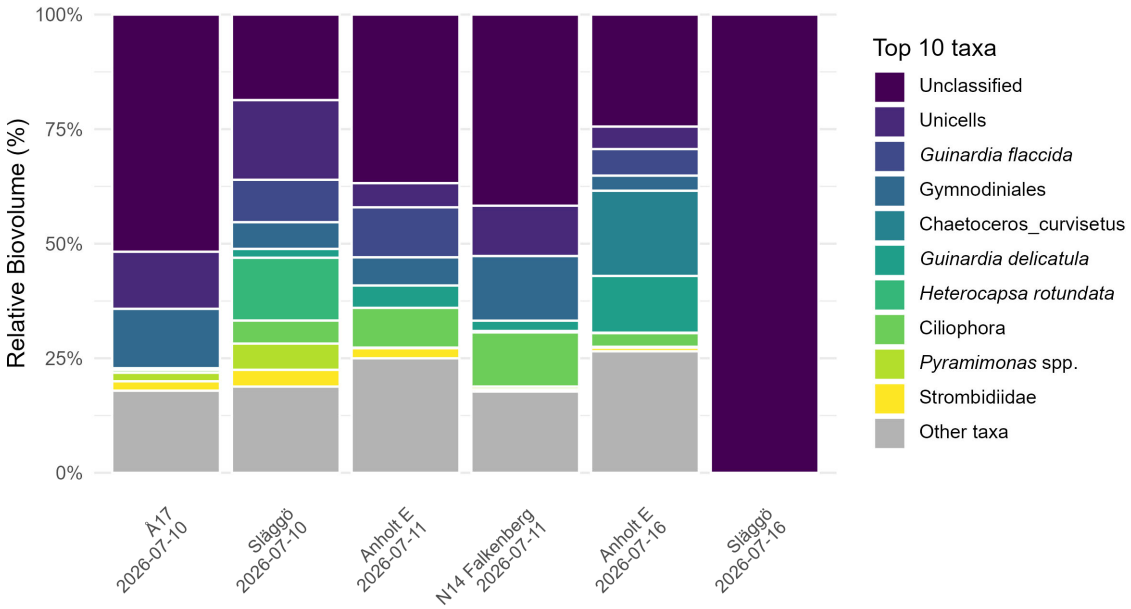


Figure 5. Relative biovolume of top 10 taxa at West Coast stations.

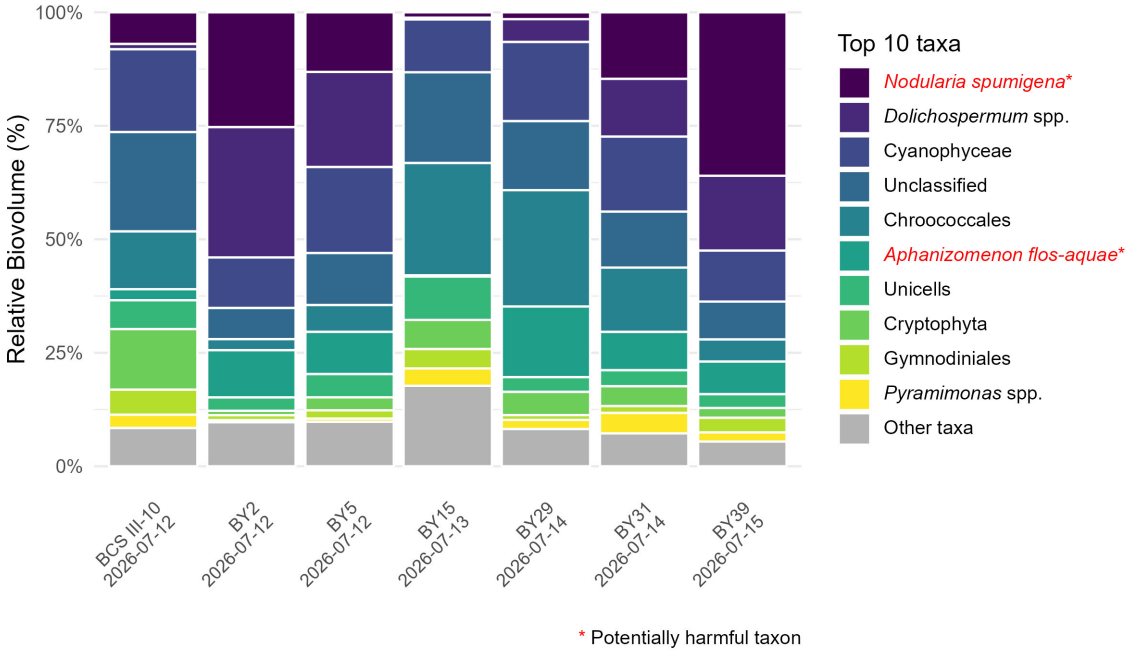


Figure 6. Relative biovolume of top 10 taxa at Baltic Sea stations.

Station reports

The Skagerrak

Å17 - 2026-07-10

Phytoplankton diversity was low and total cell numbers and biovolume were also low compared to most other stations on this cruise. Unidentified flagellates and unicells contributed most of the biovolume, with some additional contribution from ciliates. Dinoflagellates formed the second most important group, mainly represented by the gymnodiniales order, and *Prorocentrum micans* in low cell numbers. Cryptomonadales, diatoms and silicoflagellates occurred in low numbers. The potentially harmful dinoflagellate *Prorocentrum cordatum** was present. Chlorophyll fluorescence was low and in agreement with the relatively low biovolume measured by the IFCB.

Fluorescence maxima at around 30 meters were mainly caused by several species from the dinoflagellate genus *Tripos*. The potentially toxic dinoflagellate *Dinophysis acuta** was present in low numbers.

Släggö - 2026-07-10

Phytoplankton diversity was moderate and total cell numbers were relatively high compared to the other West Coast stations. Unidentified flagellates and unicells contributed most of the biovolume, together with the green flagellate *Pyramimonas* spp. Among the dinoflagellates, *Heterocapsa rotundata* was clearly the most abundant taxon, followed by cells from the order gymnodiniales. Diatoms were also important, with *Guinardia flaccida* dominating this group, together with *Leptocylindrus danicus* and *G. delicatula*. Cryptophytes, silicoflagellates and cyanobacteria occurred in low numbers. The potentially harmful diatom *Pseudo-nitzschia* spp.* was present in low cell numbers. Chlorophyll fluorescence was moderate and in good agreement with the intermediate biovolume observed by the IFCB at this station.

The Kattegat

Anholt E - 2026-07-11

Phytoplankton diversity was relatively high, while total cell numbers and biovolume were moderate compared to the other stations on this cruise. Unclassified cells, ciliates (Ciliophora) and various unicells contributed to most of the biovolume. Dinoflagellates were also important, with *P. micans* and *Tripos lineatus* as the main large-celled taxa, and additional contributions from smaller cells in the order Gymnodiniales. Among the diatoms, *G. flaccida* was most abundant, followed by *G. delicatula* and some *Dactyliosolen fragilissimus*. Cyanobacteria, cryptophytes and silicoflagellates occurred only in low amounts. Chlorophyll fluorescence was moderate and in good agreement with the intermediate biovolume observed by the IFCB.

N14 Falkenberg - 2026-07-11

Phytoplankton diversity and total cell numbers were both low at this station compared to the other stations sampled during the cruise. Unclassified cells and unicells made up most of the biovolume together with various species in the group Ciliophora. Among the dinoflagellates, cells from the order Gymnodiniales and other Dinophyceae were most common, with *P. micans* also contributing to the biovolume. Diatoms were present only in low amounts, represented mainly by *G. delicatula*, *Licmophora* spp. and *D. fragilissimus*. Cyanobacteria and cryptophytes occurred in low numbers. The potentially harmful taxon *P. cordatum** was observed in low abundances. Chlorophyll fluorescence was low and in agreement with the low biovolume measured by the IFCB.

W Landskrona 2026-07-11
A chlorophyll fluorescence peak at 22 meters was mainly caused by diatoms of which *Proboscia alata* was the most numerous species.

Anholt E - 2026-07-16
Phytoplankton diversity and total cell numbers were both relatively high at this station compared to the other West Coast stations, with biovolume in the mid-range of all stations on the cruise. Diatoms dominated the community, with *Chaetoceros curvisetus* as the most numerous species, followed by *G. delicatula*; a few cells of *G. flaccida* and *Ditylum brightwellii* were also present. The second most important component was formed by various small unidentified flagellates and unicells, together with some Ciliophora. Among the cyanobacteria, cells assigned to Cyanophyceae and Chroococcales, including *Chroococcus* spp., contributed a smaller but noticeable share of the biovolume. Dinoflagellates, *Mesodinium rubrum*, cryptophytes and silicoflagellates occurred only in low amounts. The filamentous cyanobacteria *N. spumigena** and *A. flos-aquae* and the potentially harmful taxa *P. cordatum** and *Pseudo-nitzschia* spp.* were all detected, but only in low abundances. Chlorophyll fluorescence was moderate and in good agreement with the diatom-dominated biovolume observed by the IFCB. A chlorophyll fluorescence peak at 25 meters was mainly caused by the dinoflagellate genus *Tripos*, mostly *T. lineatus* and *D. norvegica**. A peak at 62 meters, close to the bottom was dominated by diatom chains, mainly *G. flaccida* and *Detonula pumila*.

Baltic Sea

BCS III-10 - 2026-07-12
Phytoplankton diversity was moderate and total cell numbers were relatively high compared to the other Baltic stations, while the total biovolume was in the lower mid-range. Cyanobacteria dominated the community, with unidentified Cyanophyceae and Chroococcales as the main components, and the filamentous cyanobacterium *N. spumigena** contributing notably to the biomass. The next most important fraction was dominated of unidentified flagellates and unicells, accompanied by the green flagellate *Pyramimonas* spp. Cryptophytes were also abundant. The cyanobacteria *N. spumigena** and *A. flos-aquae* were both present in moderate cell numbers, as were *Dolichospermum* spp.*. Dinoflagellates, *Mesodinium rubrum*, diatoms and silicoflagellates occurred only in low amounts. Chlorophyll fluorescence was moderate and in good agreement with the biovolume observed by the IFCB.

BY1 - 2026-07-12
A chlorophyll fluorescence peak at 22 meters was mainly caused by the green algae *Binuclearia lauterbornii*.

BY2 - 2026-07-12
Phytoplankton diversity and total cell numbers were both high at this station, with the highest biovolume of all stations sampled during the cruise. The community was strongly dominated by cyanobacteria, where *Dolichospermum* spp.* formed the largest share of the biovolume together with the filamentous taxa *N. spumigena** and *A. flos-aquae*, and additional contributions from other cyanobacteria. unidentified flagellates and unicells were abundant. Among the dinoflagellates, *P. cordatum** was the most important species, accompanied by cells from the gymnodiniales group. Diatoms, cryptophytes, *Mesodinium rubrum* and silicoflagellates occurred in low amounts. The potentially harmful taxa *N. spumigena**, *A. flos-aquae** and *P. cordatum** were all relatively common. Chlorophyll fluorescence was clearly elevated compared to most other Baltic Sea stations, in good agreement with the high biovolume measured by the IFCB.

BY5 - 2026-07-12

Phytoplankton diversity was moderate and total cell numbers were relatively high compared to the other Baltic Sea stations on this cruise. The community was clearly dominated by cyanobacteria, with *Dolichospermum* spp. and other Cyanophyceae as the most important components, together with the potentially harmful taxa *N. spumigena** and *A. flos-aquae**. The group classified as other contributed substantially to the biovolume, mainly represented by unclassified cells, unicells and *Oocystis* spp. Dinoflagellates were present in lower biovolume, dominated by Gymnodiniales and other Dinophyceae, with scattered cells of the potentially harmful *P. cordatum**. Cryptophytes, diatoms, *Mesodinium* spp. and Silicoflagellates occurred in low amounts. The smaller cells were mainly represented by unicells, cryptophytes and small flagellates such as *Pyramimonas* spp. Chlorophyll fluorescence was among the higher values recorded during the cruise and in good agreement with the elevated biovolume observed by the IFCB at this station.

BY15 - 2026-07-13

Phytoplankton diversity was moderate and total cell numbers were relatively high compared to the other Baltic Sea stations, while the total biovolume was in the mid-range. Cyanobacteria and unidentified taxa contributed similar and dominant shares of the biovolume. Among the cyanobacteria, Chroococcales and Cyanophyceae dominated, with a smaller contribution from the filamentous *N. spumigena** and *A. flos-aquae*. Unidentified flgellates and unicells were most important, together with numerous cells of *Pyramimonas* spp. Dinoflagellates contributed a smaller but notable fraction of the community, dominated by gymnodiniales and with *Dinophysis norvegica** as the most important identified species. Cryptomonadales and *Mesodinium rubrum* were abundant and only very low numbers of diatoms and silicoflagellates were observed. In addition to *N. spumigena** and *D. norvegica**, the potentially harmful taxa *Dinophysis acuminata** and *P. cordatum** were also present in low numbers. Chlorophyll fluorescence was moderate and in good agreement with the intermediate biovolume recorded by the IFCB at this station.

BY20 - 2026-07-14

A chlorophyll fluorescence peak at 17 meters was partially caused by the potentially toxic dinoflagellate *D. norvegica**.

BY29 - 2026-07-14

Phytoplankton diversity was low, while total cell numbers and biovolume were moderate compared to the other Baltic Sea stations. Cyanobacteria dominated the community, with Chroococcales and Cyanophyceae as the main groups and the filamentous cyanobacterium *A. flos-aquae* contributing substantially to the biovolume. Unidentified flagellates and unicells were abundant, together with the green flagellate *Pyramimonas* spp. and cryptomonadales. The ciliate *M. rubrum* and a few dinoflagellates, including *D. norvegica**, were present in low amounts, and only traces of silicoflagellates and diatoms were detected. The potentially harmful taxa *D. norvegica** and *N. spumigena** were observed in low cell numbers. Chlorophyll fluorescence was moderate and in good agreement with the biovolume measured by the IFCB.

BY31 - 2026-07-14

Phytoplankton diversity was moderate and total cell numbers were also moderate compared to the other Baltic stations on this cruise. The community was dominated by cyanobacteria, with Cyanophyceae and Chroococcales most abundant, together with the filamentous taxa *Dolichospermum* spp.*, *A. flos-aquae* and *N. spumigena**. Unidentified flagellates and unicells, *Pyramimonas* spp. and cryptomonadales were abundant. Dinoflagellates, diatoms, *M. rubrum* and silicoflagellates occurred in low abundances. Besides the dominant filamentous cyanobacteria, the potentially harmful dinoflagellates *D. acuminata** and *P.*

*cordatum** were detected in low numbers. Chlorophyll fluorescence was in the lower range of the Baltic stations, but consistent with the moderate biovolume observed by the IFCB.

BY39 - 2026-07-15

Phytoplankton diversity was moderate and total cell numbers were relatively high compared to the other Baltic stations, with a correspondingly elevated biovolume. Cyanobacteria dominated the community, with *N. spumigena** contributing the largest share of the biovolume, followed by *Dolichospermum* spp.* and *A. flos-aquae*. Unidentified flagellates and unicells and *Pyramimonas* spp. were abundant. Among the dinoflagellates, cells from the order gymnodiniales were the most numerous, followed by other Dinophyceae. Cryptomonadales, *M. rubrum*, diatoms and silicoflagellates occurred in low amounts. Chlorophyll fluorescence was in the mid-range of the Baltic stations and in good agreement with the moderate to high biovolume detected by the IFCB.

Observations of surface accumulations and surface samples

Surface water was analyzed from W Landskrona throughout all of the Baltic stations. The results are presented in the table below.

Surface accumulations were observed the 15th of July when we arrived to BY39 South of Öland and southwards passing the Hanö Bight. When entering the Sound, no accumulations were seen.

Earlier during the cruise, the wind and waves had turned the cyanobacteria down in the water which is why no accumulations were seen prior to the 15th. Cyanobacteria were very much present in the whole area though, thriving in the water, ready to float up to the surface whenever the weather gets calm enough.

Surface samples, bucket	**The following filamentous cyanobacteria were observed:**		
Station:	***Aphanizomenon flosaquae***	***Nodularia spumigena** ***	***Dolichospermum* spp. ***
W Landskrona 11/7		present	present
BY1 12/7	present	present	present
BY2 Arkona 12/7	present	common	very common
BY5 Bornholm 12/7	present	common	very common
BCS III-10 12/7	common	very common	present
BY10 17/7	common	common	present
BY15 Gotlandsdjupet 13/7	present	common	present
BY20 Fårödjupet 13/7	present	common	present
BY29 14/7	very common	very common	common
BY31 Landsortdjupet 14/7	very common	very common	common
BY30 14/7	very common	common	common
BY32 Norrköpingsdjupet 14/7	common	present	present
BY38 Karlsödjupet 14/7	common	present	present
BY 39 Öland södra 15/7	very common	very common	very common
Hanö Bight 15/7	very common	very common	very common

Figure 7. Presence of filamentous cyanobacteria in the surface.

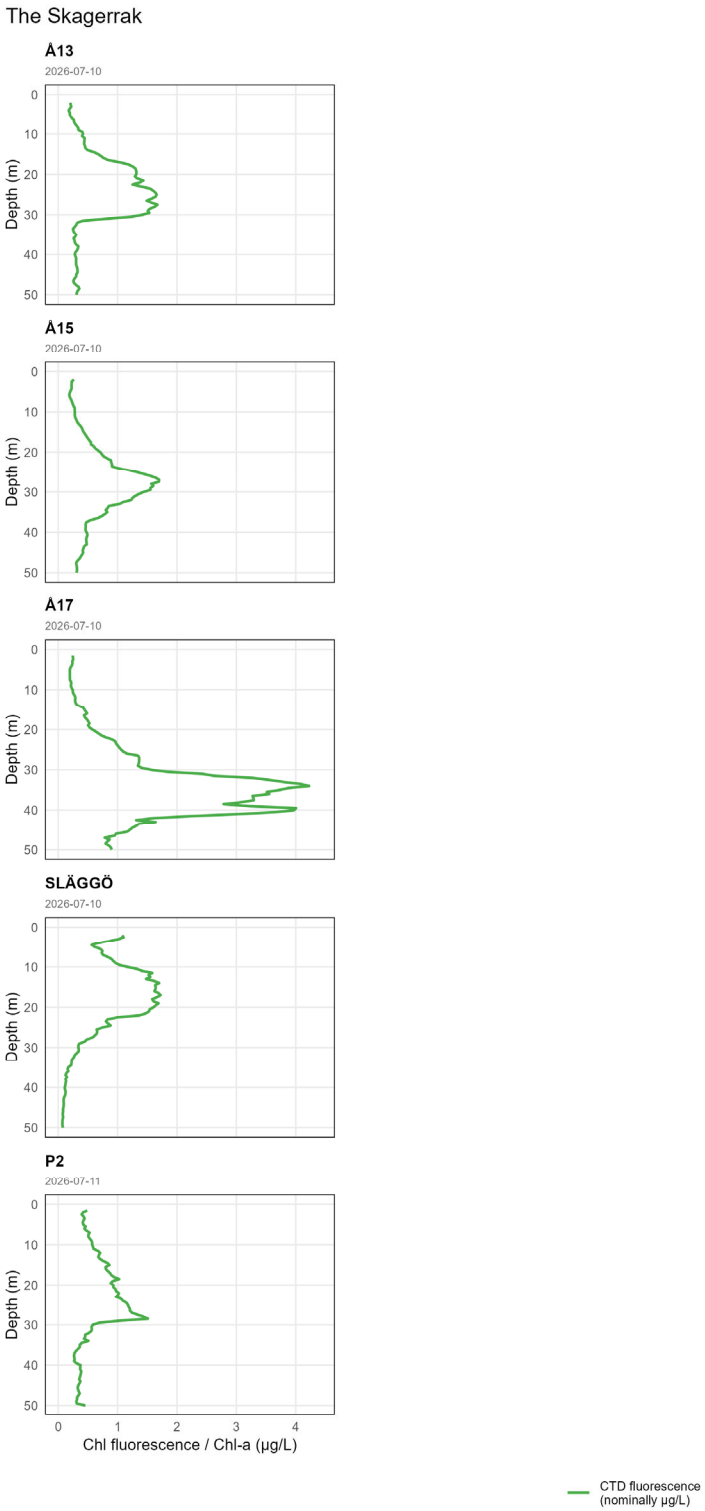


Figure 8. CTD fluorescence profiles for The Skagerrak stations.

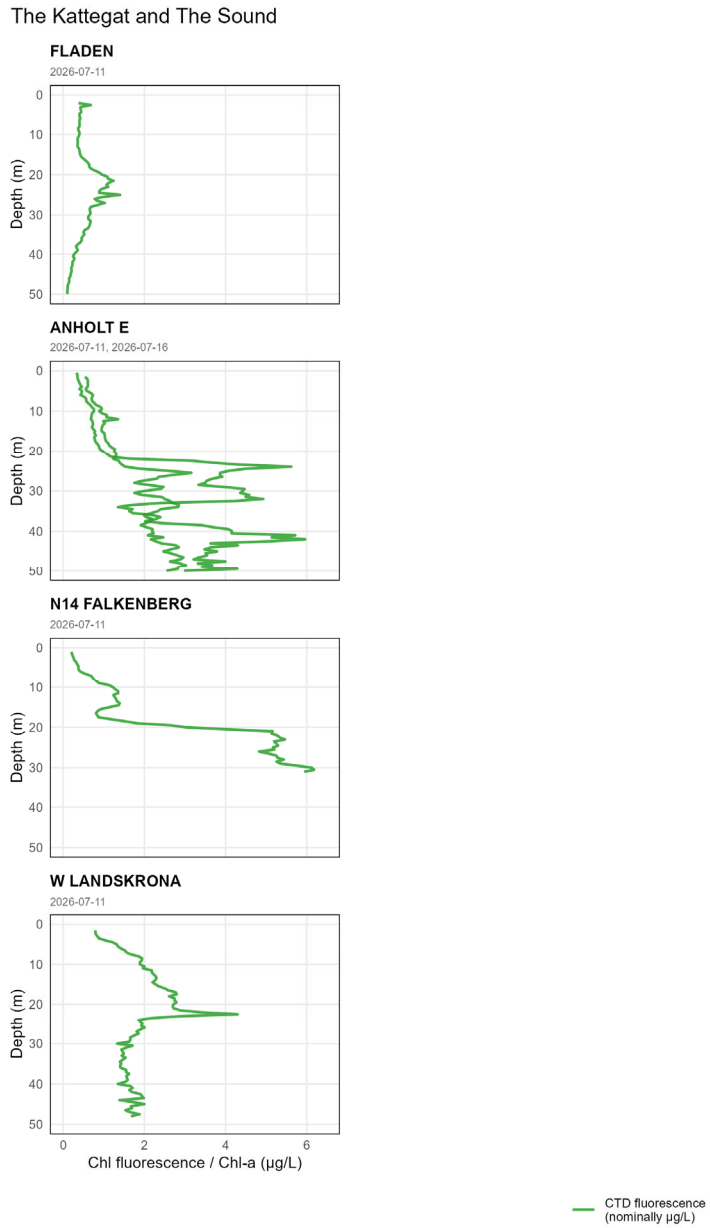


Figure 9. CTD fluorescence profiles for The Kattegat and The Sound stations.

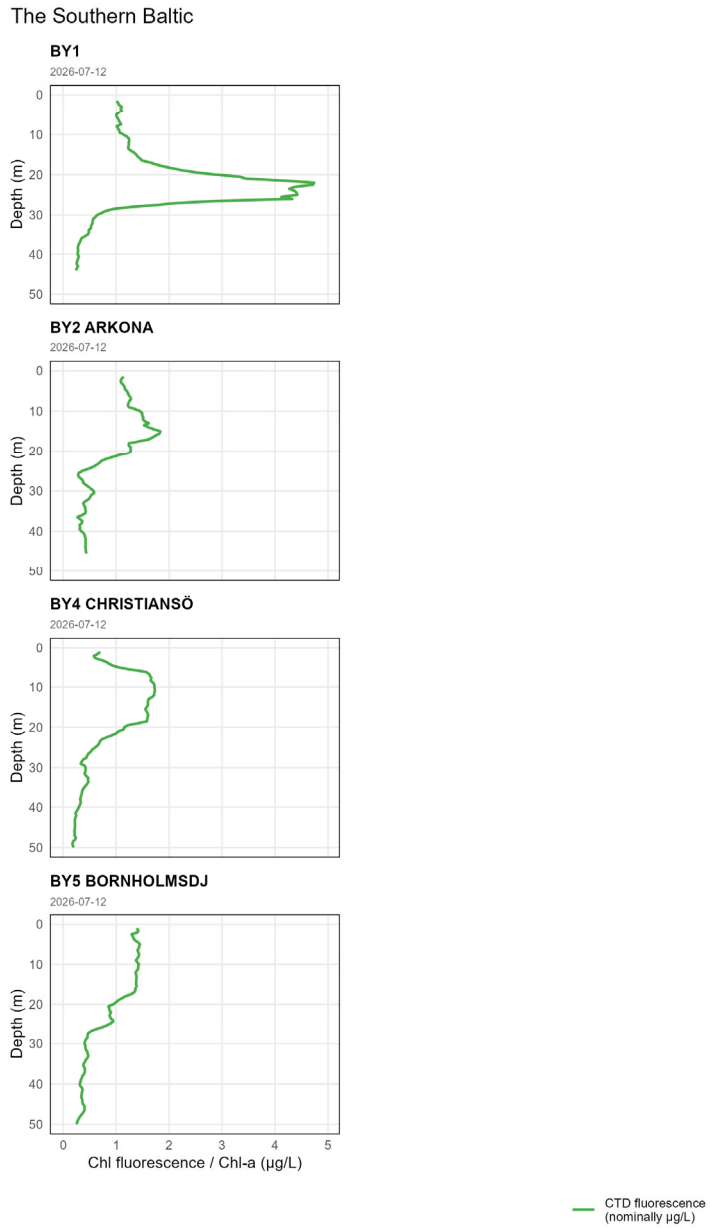


Figure 10. CTD fluorescence profiles for The Southern Baltic stations.

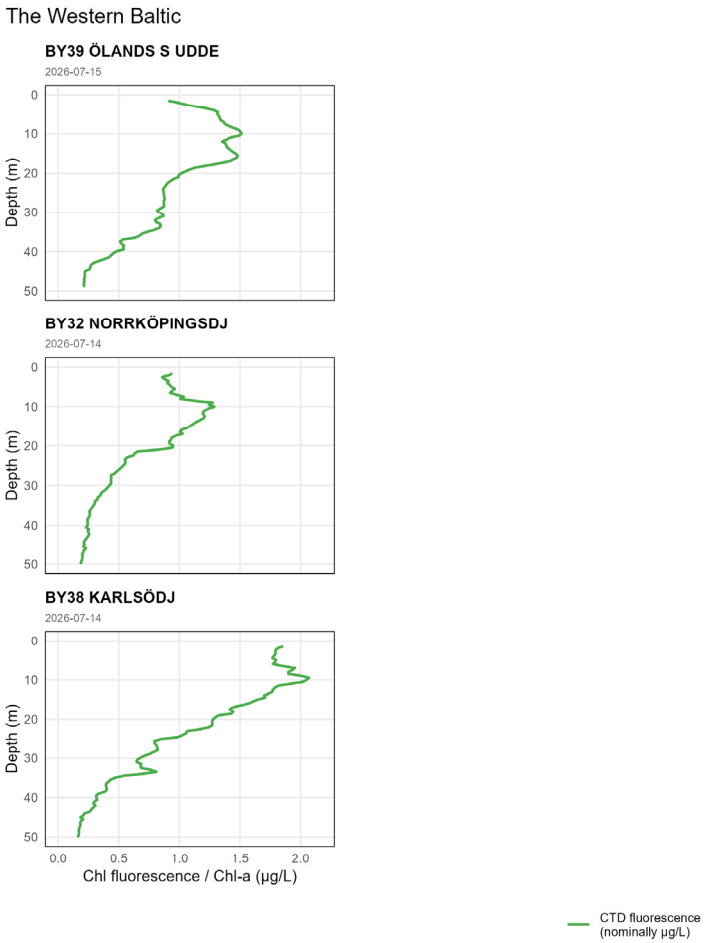


Figure 11. CTD fluorescence profiles for The Western Baltic stations.

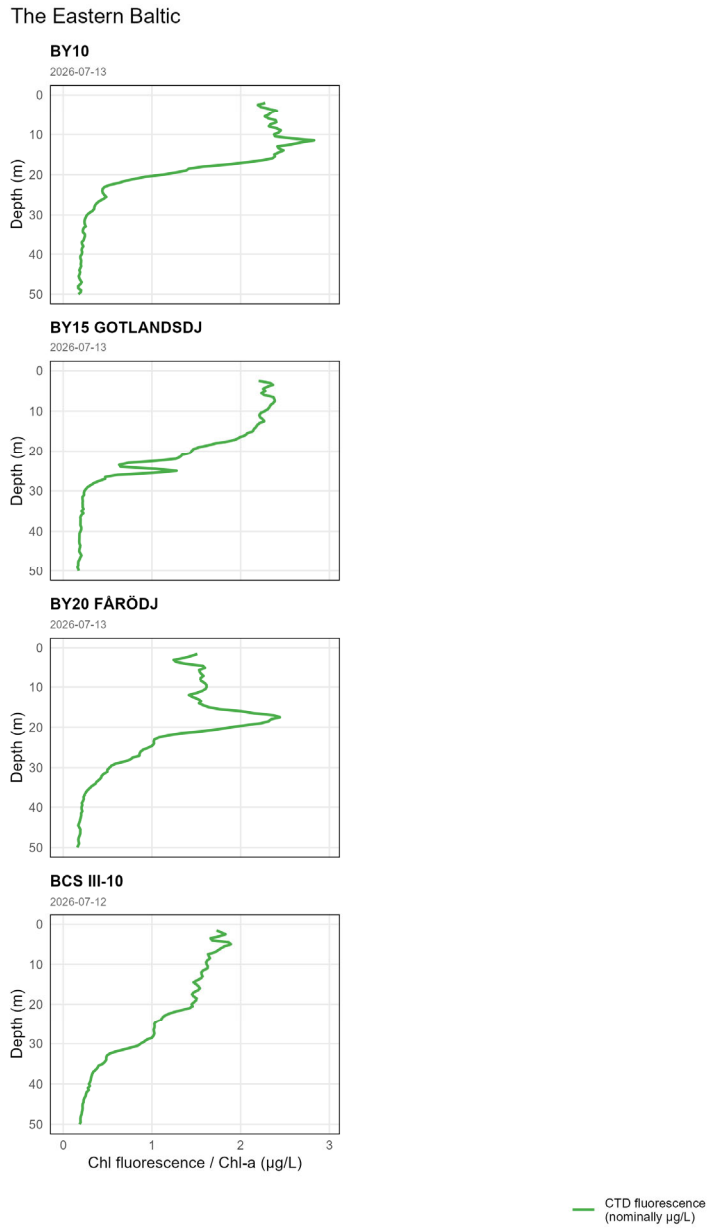


Figure 12. CTD fluorescence profiles for The Eastern Baltic stations.

SMHI
Swedish Agency
for Marine and
Water Management