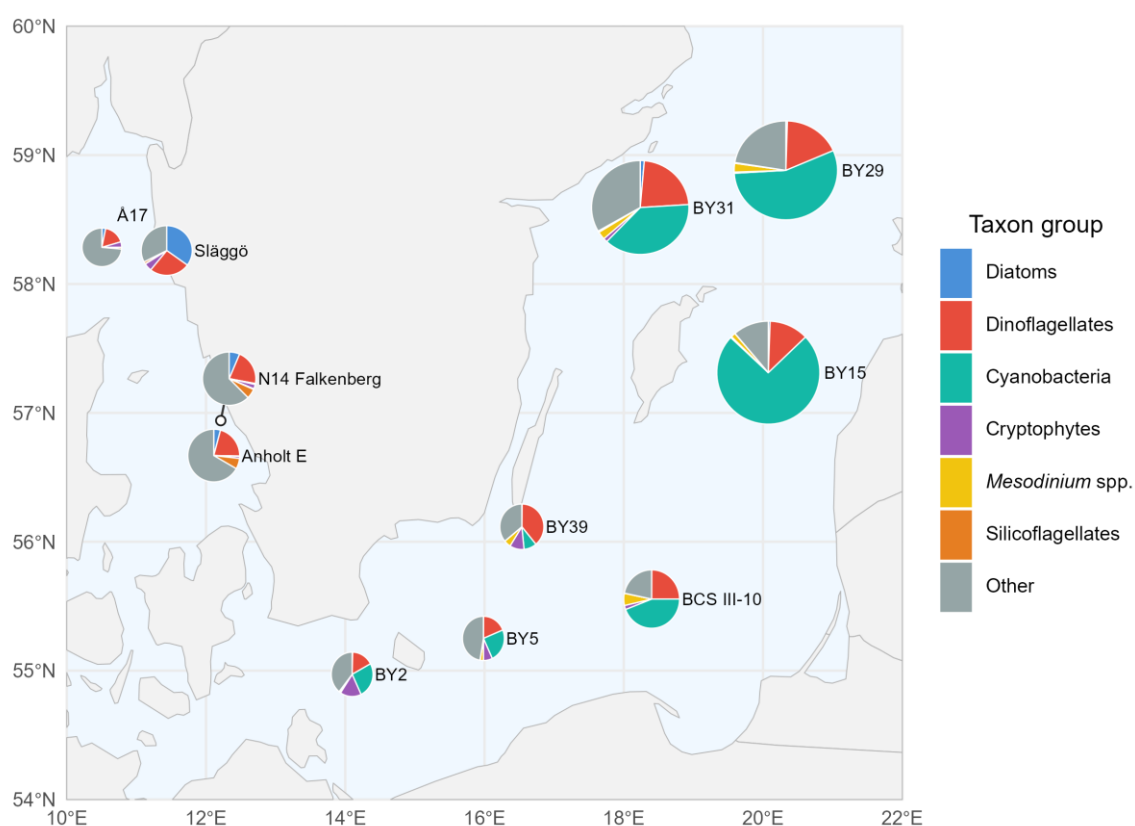


ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

Report No 6, June 2026
RV Svea cruise, 2026-06-12 to 2026-06-17
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 med generellt låga till måttliga totala cellantal. Vid Släggö dominerades samhället av kiselalger såsom *Guinardia flaccida*, *Cerataulina pelagica* och *Dactyliosolen fragilissimus*, med dinoflagellater och olika små flagellater som bidrog till biovolymen; klorofyllkoncentrationen var här måttlig och stämde väl överens med den förhöjda biovolymen av kiselalger. Vid Å17, Anholt E och N14 Falkenberg dominerades samhället istället av små flagellater och andra små celler, med kiselalger och dinoflagellater som bidrog mindre till den totala biovolymen; klorofyllkoncentration vid dessa stationer var liknande eller något högre än vid Släggö och i stort sett i överensstämmelse med IFCB:s biovolymmönster. Flera potentiellt skadliga taxa observerades på låga till måttliga nivåer längs Västkusten, inklusive *Pseudo-nitzschia* spp.*, *Pseudochattonella* spp.*, *Alexandrium pseudogonyaulax** och *Dinophysis acuminata**, men ingen tydlig dominans av dessa taxa kunde påvisas.

I Östersjön observerades en uttalad cyanobakterieblomning vid utsjöstationerna, med cyanobakterier som tydligt dominerade växtplanktonsamhället och med markant förhöjd klorofyllkoncentration. Vid BY15, BY29 och BY31 dominerade cyanobakterier, i synnerhet *Aphanizomenon flos-aquae** tillsammans med *Nodularia spumigena**, biovolymen, åtföljda av dinoflagellater (inklusive Gymnodiniales och andra dinoflagellater) och olika små flagellater; klorofyllkoncentration vid dessa stationer var hög och i överensstämmelse med den mycket höga biovolym som uppmättes av IFCB. Vid BCS III-10 samexisterade cyanobakterier och dinoflagellater som dominerande grupper, återigen med förhöjd klorofyllkoncentration i linje med den ökade biovolymen. De mer sydliga och nordliga Östersjöstations (BY2, BY5 och BY39) uppvisade lägre biovolym och klorofyllkoncentration, med samhällen sammansatta av blandningar av cyanobakterier, dinoflagellater, kryptomonader och andra små flagellater. I hela Östersjön förekom potentiellt skadliga taxa, inklusive *A. flos-aquae**, *N. spumigena**, *D. acuminata**, *Dinophysis norvegica** och *Pseudo-nitzschia* spp.*, men inga överskridanden av varningsnivåer indikerades i de tillgängliga data.

Summary

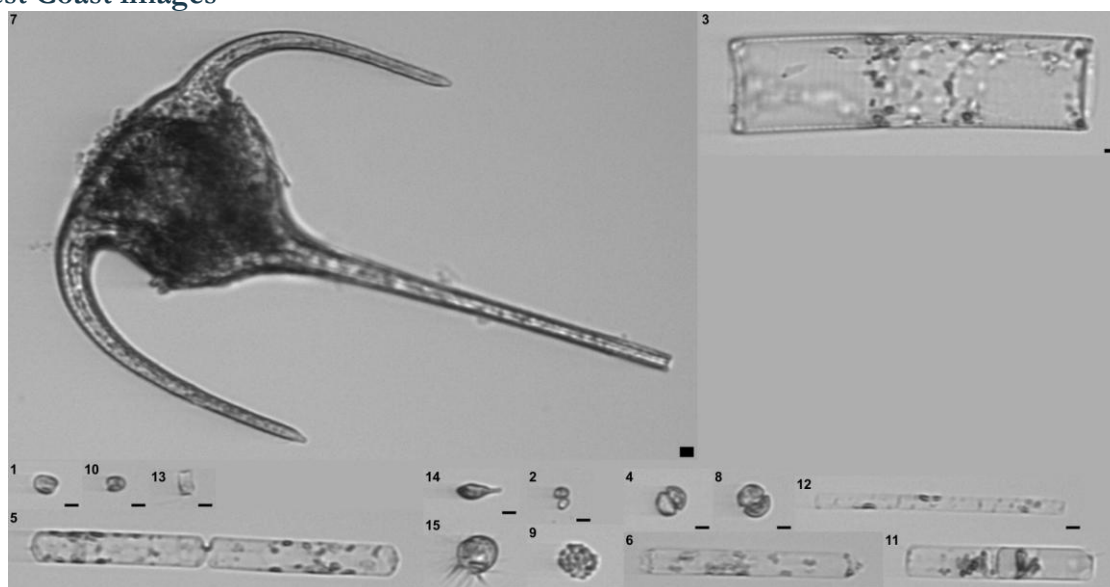
In the Skagerrak and Kattegat, phytoplankton diversity was moderate to high with generally low to moderate total cell numbers. At Släggö, the community was dominated by diatoms such as *Guinardia flaccida*, *Cerataulina pelagica* and *Dactyliosolen fragilissimus*, with dinoflagellates and various small flagellates contributing to the biovolume; chlorophyll concentration here was moderate and in good agreement with the elevated diatom biovolume. At Å17, Anholt E and N14 Falkenberg, the community was instead dominated by small flagellates and other small cells, with diatoms and dinoflagellates contributing less to the total biovolume; chlorophyll concentration at these stations was similar to or slightly higher than at Släggö and broadly consistent with the IFCB biovolume patterns. Several potentially harmful taxa were observed at low to moderate levels along the West Coast, including *Pseudo-nitzschia* spp.*, *Pseudochattonella* spp.*, *Alexandrium pseudogonyaulax** and *Dinophysis acuminata**, but no clear dominance of these taxa was detected.

In the Baltic Sea, a pronounced cyanobacterial bloom was observed at the offshore stations, with cyanobacteria clearly dominating the phytoplankton community and chlorophyll concentration markedly elevated. At BY15, BY29 and BY31, cyanobacteria, in particular *Aphanizomenon flos-aquae** together with *Nodularia spumigena**, dominated the biovolume, accompanied by dinoflagellates (including Gymnodiniales and other dinoflagellates) and various small flagellates; chlorophyll concentration at these stations was high and consistent with the very high biovolume measured by the IFCB. At BCS III-10, cyanobacteria and dinoflagellates co-dominated, again with elevated chlorophyll concentration in line with the increased biovolume. The more southern and northern Baltic stations (BY2, BY5 and BY39) showed lower biovolume and chlorophyll concentration, with communities composed of mixtures of cyanobacteria, dinoflagellates, cryptophytes and other small flagellates. Throughout the Baltic Sea, potentially harmful taxa were present, including *A. flos-aquae**, *N. spumigena**, *D. acuminata**, *Dinophysis norvegica** and *Pseudo-nitzschia* spp.*, but no warning level exceedances were indicated in the available data.

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

Parameter	Value
Total samples collected (cruise)	267
Samples from AlgAware stations	43
Biological images analysed	101,708
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. Unicells, 2. Unclassified, 3. *Guinardia flaccida*, 4. Gymnodiniales, 5. *Dactylosolen fragilissimus*, 6. *Ceratantula pelagica*, 7. *Tripes muelleri*, 8. Dinophyceae, 9. *Pseudocbattonella* spp., 10. *Pyramimonas* spp., 11. *Guinardia delicatula*, 12. *Leptocylindrus* spp., 13. *Chaetoceros* spp., 14. Cryptophyta, 15. Ciliophora. Black bars represent 5 µm.

Baltic Sea images



The most common taxa by biovolume concentration in the Baltic Sea images were: 1. *Aphanizomenon flos-aquae*, 2. Unclassified, 3. Gymnodiniales, 4. Unicells, 5. Cyanophyceae (mainly heterocysts and akinetes), 6. Dinophyceae, 7. *Pyramimonas* spp., 8. *Heterocapsa rotundata*, 9. *Dolichospermum* spp., 10. *Mesodinium rubrum*, 11. *Nodularia spumigena*, 12. *Chaetoceros* spp., 13. *Dinophysis acuminata*, 14. Cryptophyta, 15. Strombidiidae. Black bars represent 5 µm.

Spatial biomass distribution

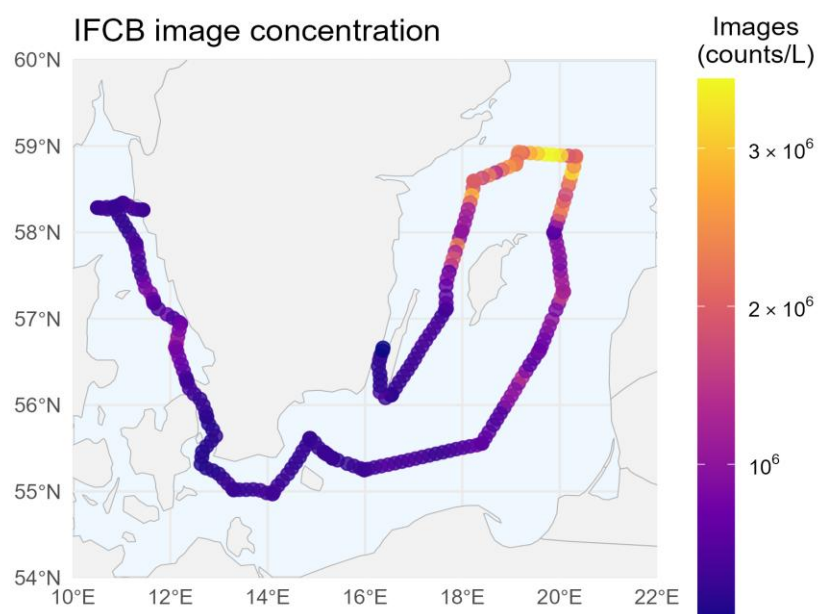


Figure 1. IFCB image concentration along the cruise track. Total images collected: 703,552.

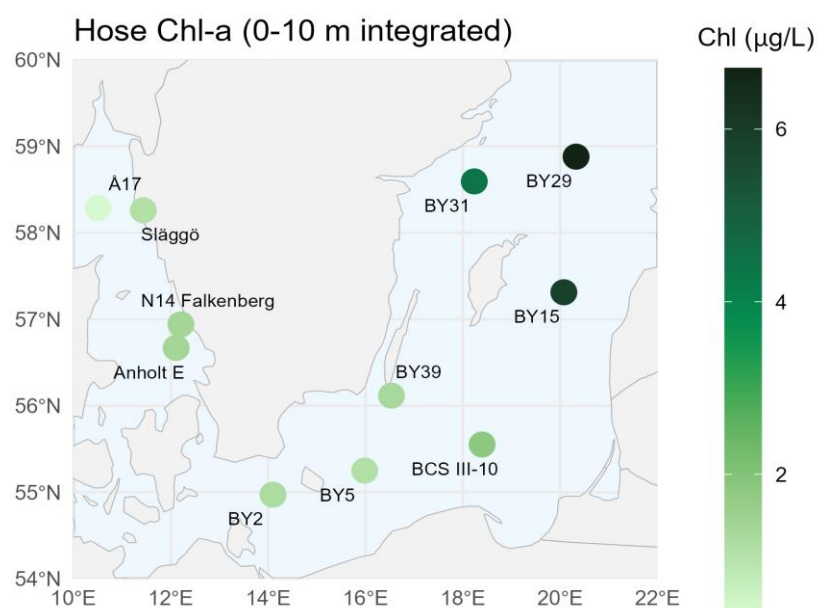


Figure 2. Hose chlorophyll-a (0-10 m integrated) at AlgAware stations during the June 2026 cruise.

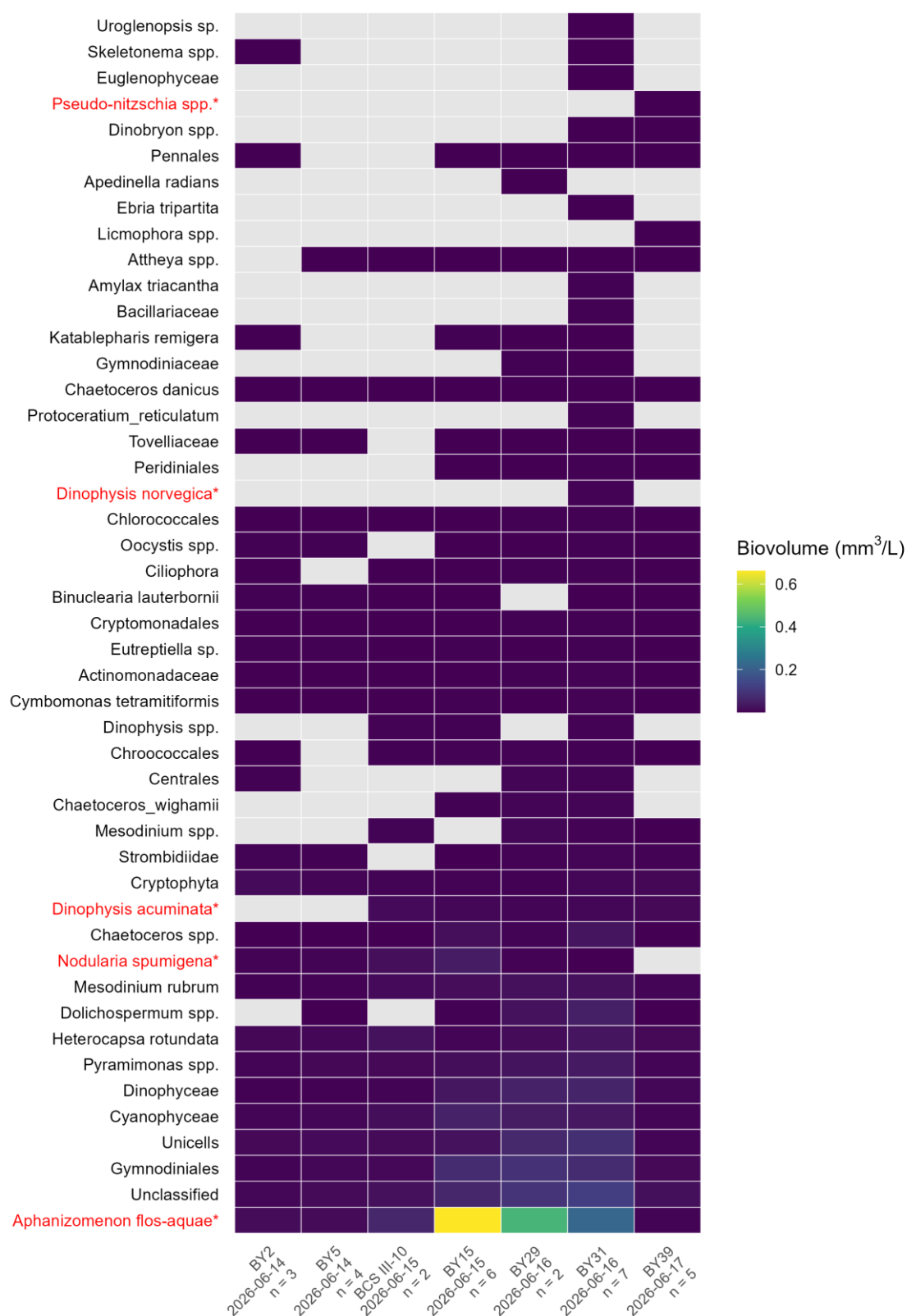
West Coast - Biovolume heatmap



* Potentially harmful taxon

Figure 3. Biovolume heatmap for West Coast stations.

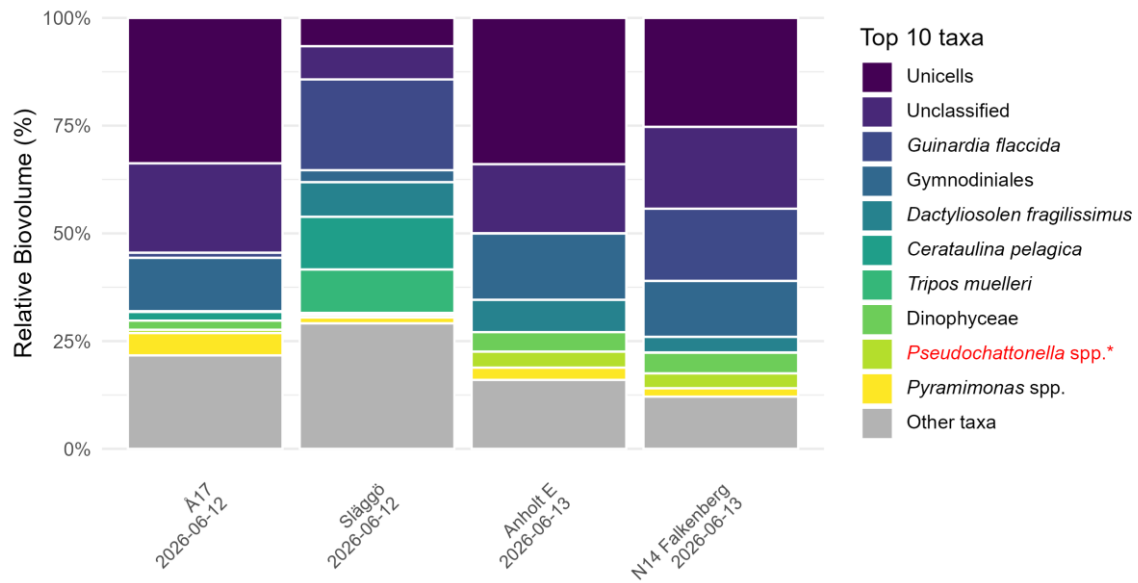
Baltic Sea - Biovolume heatmap



* Potentially harmful taxon

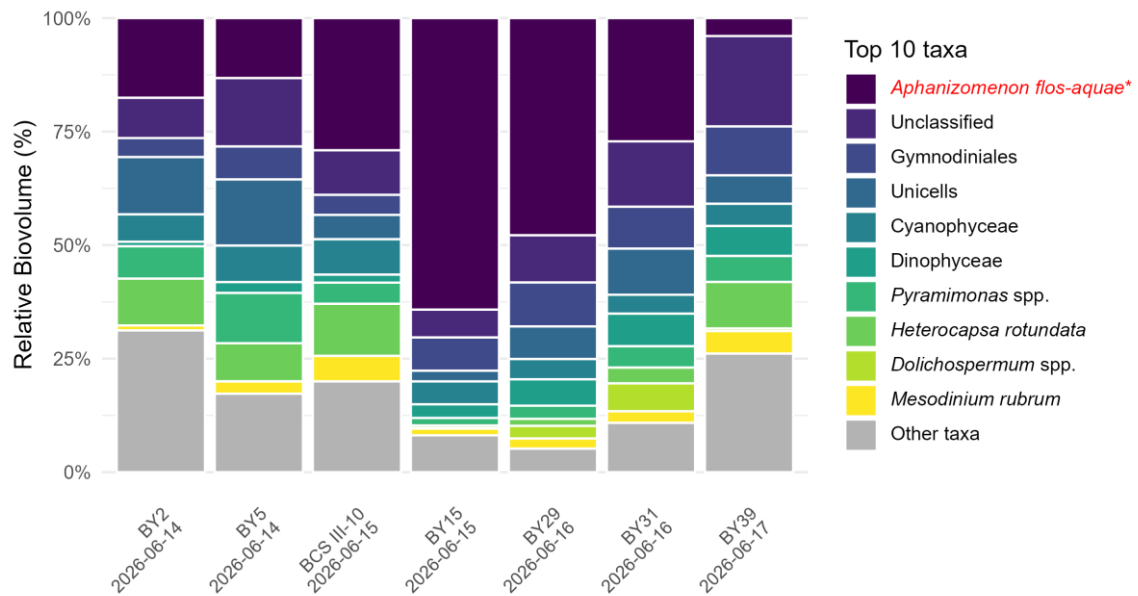
Figure 4. Biovolume heatmap for Baltic Sea stations.

Relative biovolume



* Potentially harmful taxon

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



* Potentially harmful taxon

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

Station reports

West Coast

Å17 - 2026-06-12

Phytoplankton diversity was moderate and total cell numbers were relatively low compared to the other stations on this cruise. The community was dominated by small cells classified as unicells and unclassified forms, together with the green flagellate *Pyramimonas* spp. Among the dinoflagellates, cells from the order Gymnodiniales contributed most to the biovolume, with additional presence of Dinophyceae and the larger species *Torodinium robustum*. Diatoms were less important, represented mainly by *Cerataulina pelagica*, *Guinardia delicatula*, *Lauderia* spp. and *G. flaccida*, with a few cells of *Chaetoceros* spp. Cryptophytes and Silicoflagellates occurred in low biovolume, including Cryptophyta, Cryptomonadales and *Pseudochattonella* spp.*. The potentially harmful taxa *Pseudochattonella* spp.* and *Pseudo-nitzschia* spp.* were both observed, but only in low abundances. Chlorophyll concentration was among the lowest recorded during the cruise, in agreement with the relatively low biovolume measured by the IFCB at this station.

Släggö - 2026-06-12

Phytoplankton diversity was high and total cell numbers were moderate compared to the other stations on this cruise, while total biovolume was among the higher values observed. Diatoms clearly dominated the community, with *Guinardia flaccida* as the most important species, followed by *C. pelagica* and *Dactyliosolen fragilissimus*; *Pseudo-nitzschia* spp.* were also relatively numerous among the diatoms. Dinoflagellates contributed a smaller but notable share of the biovolume, mainly represented by *Tripos muelleri* and cells from the order Gymnodiniales, with additional cells from the *Scrippsiella* group. Among the other phytoplankton, unclassified cells and unicells formed a substantial background, and the green flagellate *Pyramimonas* spp. was also common. Cryptophytes, Silicoflagellates and *Mesodinium* spp. occurred only in low amounts. The potentially harmful taxa *Pseudo-nitzschia* spp.*, *Alexandrium pseudogonyaulax**, *Pseudochattonella* spp.* and *Dinophysis acuminata** were all detected, but in low to moderate abundances. Chlorophyll concentration was moderate and in good agreement with the relatively high biovolume measured by the IFCB at this station.

Anholt E - 2026-06-13

Phytoplankton diversity was moderate and total cell numbers were relatively high compared to the other stations on this cruise, while total biovolume was in the mid-range. The community was dominated by taxa in the group Other, with numerous unicells and unclassified cells, and with *Pyramimonas* spp. also contributing notably. Among the dinoflagellates, cells from the order Gymnodiniales and the class Dinophyceae were most common, with *Heterocapsa rotundata* also present. Diatoms were less important in terms of biovolume and were represented mainly by *D. fragilissimus*, *Chaetoceros* spp. and a few cells of *G. delicatula*. Silicoflagellates were represented by *Pseudochattonella* spp.* and *Octactis speculum* together with cells from the family Actinomonadaceae, and cryptophytes and cyanobacteria occurred only in very low amounts. The potentially harmful silicoflagellate *Pseudochattonella* spp.* was among the dominant silicoflagellates, and low numbers of the potentially harmful diatom *Pseudo-nitzschia* spp.* were also observed. Chlorophyll concentration was moderate and in good agreement with the intermediate biovolume measured by the IFCB at this station.

N14 Falkenberg - 2026-06-13

Phytoplankton diversity was relatively high and total cell numbers were moderate compared to the other stations on this cruise. The community was dominated by taxa in the group Other, where unicells and unclassified cells contributed most of the biovolume, together with the flagellate *Cymbomonas tetramitiformis*. Among the diatoms, *G. flaccida* was most abundant, followed by *D. fragilissimus* and *Chaetoceros* spp. Dinoflagellates were also important, with cells from Gymnodiniales and Dinophyceae dominating, while Tovellaceae occurred in lower numbers. Silicoflagellates, cryptophytes, cyanobacteria such as *Dolichospermum* spp., and *Mesodinium rubrum* were present but contributed only a small fraction of the total biovolume. The potentially harmful silicoflagellate *Pseudochattonella* spp.* was among the dominant taxa by biovolume, and the potentially harmful diatom *Pseudo-nitzschia* spp.* occurred in low numbers. Chlorophyll

concentration was moderate and in good agreement with the intermediate biovolume observed by the IFCB at this station.

Chlorophyll peaks

Several chlorophyll peak samples were analyzed by microscopy from the west coast (Figures 8-9). The peaks were dominated by centric diatoms at most stations. At Å17 (30 m) and Å15 (30 m) on 12 June, the peak consisted of a mixed assemblage of centric diatoms, whereas very few cells were observed at 75 m at Å15. At P2 (30 m) on 12 June, the chlorophyll peak was also dominated by centric diatoms, with *Rhizosolenia imbricata* being the most abundant species. At W Landskrona (12.5 m) on 13 June, the peak was instead dominated primarily by *Chaetoceros curvisetus*.

Baltic Sea

BY2 - 2026-06-14

Phytoplankton diversity was moderate and total cell numbers were relatively low compared to the other Baltic Sea stations on this cruise. The community was dominated by small cells in the group other, with unicells and unclassified forms contributing most of the biovolume, together with the green flagellate *Pyramimonas* spp. Cyanobacteria were also important, with the filamentous *Aphanizomenon flos-aquae** as the dominant taxon, accompanied by other Cyanophyceae and lower numbers of *Nodularia spumigena**. Among the dinoflagellates, *H. rotundata* was most abundant, followed by unidentified Gymnodiniales and other Dinophyceae. Cryptophytes, diatoms, *Mesodinium* spp. and Silicoflagellates occurred only in small amounts. The presence of the potentially harmful cyanobacteria *A. flos-aquae** and *N. spumigena** was noted, but their abundances were relatively low compared to other Baltic stations with more developed blooms. Chlorophyll concentration was low to moderate and in good agreement with the modest phytoplankton biovolume measured by the IFCB at this station.

BY5 - 2026-06-14

Phytoplankton diversity was relatively low and total cell numbers were moderate compared to the other Baltic stations on this cruise. The community was dominated by taxa in the other group, with unclassified cells and unicells contributing most of the biovolume, together with the green flagellate *Pyramimonas* spp. Cyanobacteria formed the second most important group; the filamentous *A. flos-aquae** was dominant, accompanied by other Cyanophyceae and lower numbers of *N. spumigena**. Dinoflagellates were also important, mainly represented by *H. rotundata*, cells from the order Gymnodiniales and other Dinophyceae. Cryptophytes, *Mesodinium* spp., diatoms and Silicoflagellates occurred only in small amounts. The potentially harmful cyanobacteria *A. flos-aquae** and *N. spumigena** were both present but not particularly abundant. Chlorophyll concentration was relatively low and in good agreement with the modest biovolume observed by the IFCB at this station.

BCS III-10 - 2026-06-15

Phytoplankton diversity was moderate and total cell numbers were also moderate compared to the other Baltic Sea stations, while the total biovolume was relatively low. Cyanobacteria dominated the community, with *A. flos-aquae** as the most important taxon, followed by *N. spumigena** and other Cyanophyceae. Among the dinoflagellates, *H. rotundata* was clearly the most abundant species, with *D. acuminata** and cells from the order Gymnodiniales also contributing to the biovolume. Within the other group, unclassified cells and unicells were common, together with *Pyramimonas* spp. The ciliates *M. rubrum* and *Mesodinium* spp., cryptophytes and a few diatoms and silicoflagellates occurred in low amounts. The potentially harmful taxa *A. flos-aquae**, *N. spumigena** and *D. acuminata** were all present, but their abundances did not dominate the total cell numbers. Chlorophyll concentration was relatively low compared to the other Baltic Sea stations, in agreement with the modest biovolume measured by the IFCB.

BY15 - 2026-06-15

Phytoplankton diversity was moderate and total cell numbers were high compared to the other Baltic Sea stations, with one of the highest biovolumes of the cruise. Cyanobacteria clearly dominated the

community, with *A. flos-aquae** as the most abundant taxon, followed by other Cyanophyceae and *N. spumigena**. Among the dinoflagellates, cells from the order Gymnodiniales contributed most to the biovolume, together with other Dinophyceae and the potentially harmful *D. acuminata**. The group classified as unclassified and unicells was common, and the green flagellate *Pyramimonas* spp. was also numerous. Diatoms, *Mesodinium* spp., cryptophytes and silicoflagellates occurred only in low amounts. The presence of the potentially harmful taxa *A. flos-aquae**, *N. spumigena** and *D. acuminata** was notable, although their cell numbers were not particularly high. Chlorophyll concentration was relatively elevated compared to most other stations and was consistent with the high biovolume recorded by the IFCB.

BY29 - 2026-06-16

Phytoplankton diversity and total cell numbers were both high at this station compared to the other Baltic Sea stations. Cyanobacteria dominated the community, with *A. flos-aquae** clearly the most important taxon by biovolume, accompanied by other Cyanophyceae and *Dolichospermum* spp. in lower amounts. Among the other groups, unclassified cells and unicells contributed substantially to the biovolume, while the green flagellate *Pyramimonas* spp. was also rather numerous. Dinoflagellates were represented mainly by cells from the order Gymnodiniales and other Dinophyceae, with *H. rotundata* relatively common. *M. rubrum* and other *Mesodinium* spp. were present, and small numbers of diatoms, cryptophytes and silicoflagellates were also observed. The potentially harmful cyanobacteria *A. flos-aquae** and *N. spumigena** were both recorded. Chlorophyll concentration was relatively high and in good agreement with the elevated biovolume measured by the IFCB.

BY31 - 2026-06-16

Phytoplankton diversity and total cell numbers were both high at this station compared to the other Baltic Sea stations on the cruise. Cyanobacteria dominated the community by biovolume, with *A. flos-aquae** as the most important taxon, followed by *Dolichospermum* spp. and other Cyanophyceae. The group classified as other contributed substantially to the biomass, where unclassified cells and unicells were most numerous, and the green flagellate *Pyramimonas* spp. was also common. Among the dinoflagellates, cells from Gymnodiniales and Dinophyceae dominated, with *H. rotundata* frequent in the smaller size fraction. *Mesodinium* spp., cryptophytes and silicoflagellates occurred in lower biovolumes. The potentially harmful cyanobacteria *A. flos-aquae** and *Dolichospermum* spp. were relatively abundant, while *D. acuminata**, *Dinophysis norvegica** and *N. spumigena** were present in low numbers. Chlorophyll concentration was relatively high and in good agreement with the elevated biovolume recorded by the IFCB.

BY39 - 2026-06-17

Phytoplankton diversity was moderate and total cell numbers were relatively low compared to the other Baltic Sea stations on this cruise. Dinoflagellates dominated the community, with *D. acuminata** contributing substantially to the biovolume together with cells from the order Gymnodiniales and *H. rotundata*. Among the other larger cells, many unclassified cells and unicells were recorded, and the green flagellate *Pyramimonas* spp. was also abundant. Cryptophytes were well represented, mainly by Cryptophyta and cells from the order Cryptomonadales. Cyanobacteria, *Mesodinium* spp., diatoms and silicoflagellates occurred only in low biovolumes; among the cyanobacteria, *A. flos-aquae** and *Dolichospermum* spp. were present. The potentially harmful taxa *D. acuminata**, *A. flos-aquae** and *Pseudo-nitzschia* spp.* were all observed, but in relatively low abundances. Chlorophyll concentration was low compared to the central Baltic stations, in agreement with the modest total biovolume measured by the IFCB at this station.

Chlorophyll peaks

Several chlorophyll peak samples were analyzed by microscopy from the Baltic Sea (Figures 10-12). Prymnesiales blooms mainly caused the peaks in the Baltic Sea (Figure 7). Other small organisms as various cyanobacteria colonies, small dinoflagellates, *Pyramimonas* sp., *Pseudopedinella* spp., *Mesodinium rubrum*, the green algae *Binuclearia lauterbornii* and the diatom *Chaetoceros similis* were abundant.

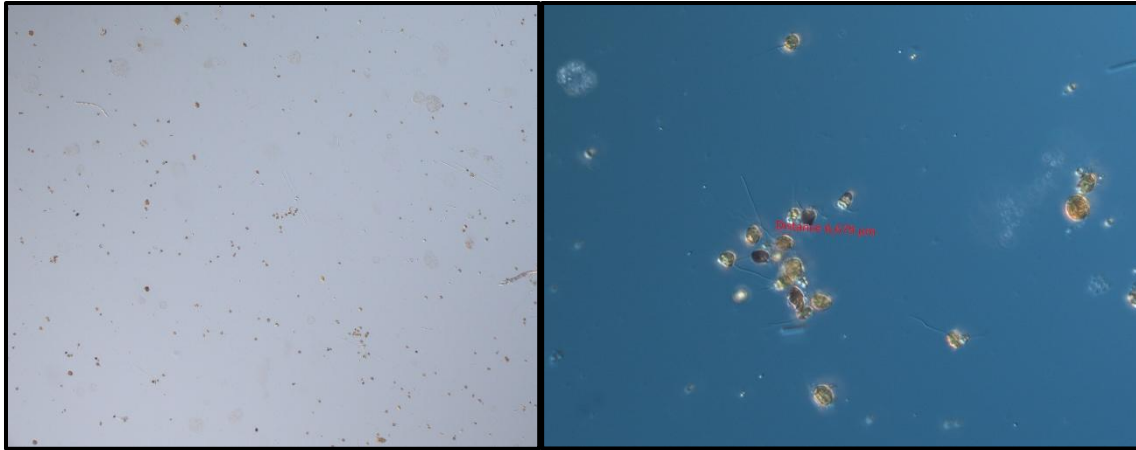


Figure 7. The fluorescence peaks were mainly caused by prymnesiales. The photos show the organisms in two different enhancements, 50x and 400x. The cells are approximately 7 µm long. Photo: A-T. Skjevik.

Surface samples

Samples from the upmost water column was also sampled during the cruise and analyzed by microscopy. In the Northern Baltic Proper, bundles of *A. flos-aquae* were very abundant and *Doliospermum* were numerous, similar to what was analyzed by the IFCB. A few filaments of *N. spumigena** were present. At BY39, south of Öland, only *A. flos-aquae* was observed in low amounts. Pine pollen and the dinoflagellates *D. acuminata* and *D. norvegica* were generally numerous in the surface samples.

Between BY10 and BY15 East of Gotland the weather was very calm and surface accumulations were observed.

The Skagerrak

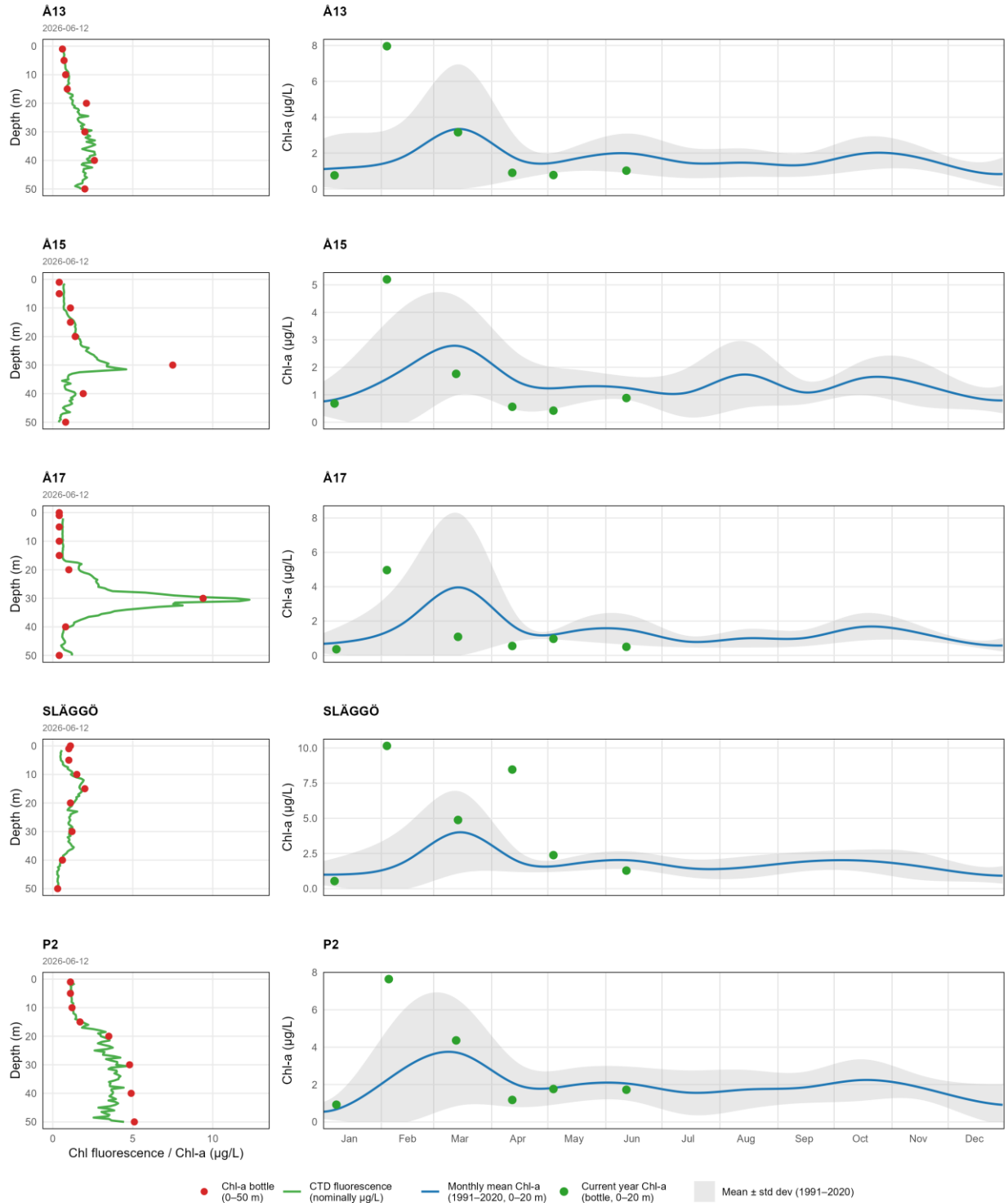


Figure 8. CTD fluorescence profiles and Chl-a time series (with 1991-2020 monthly statistics) for The Skagerrak stations.

The Kattegat and The Sound

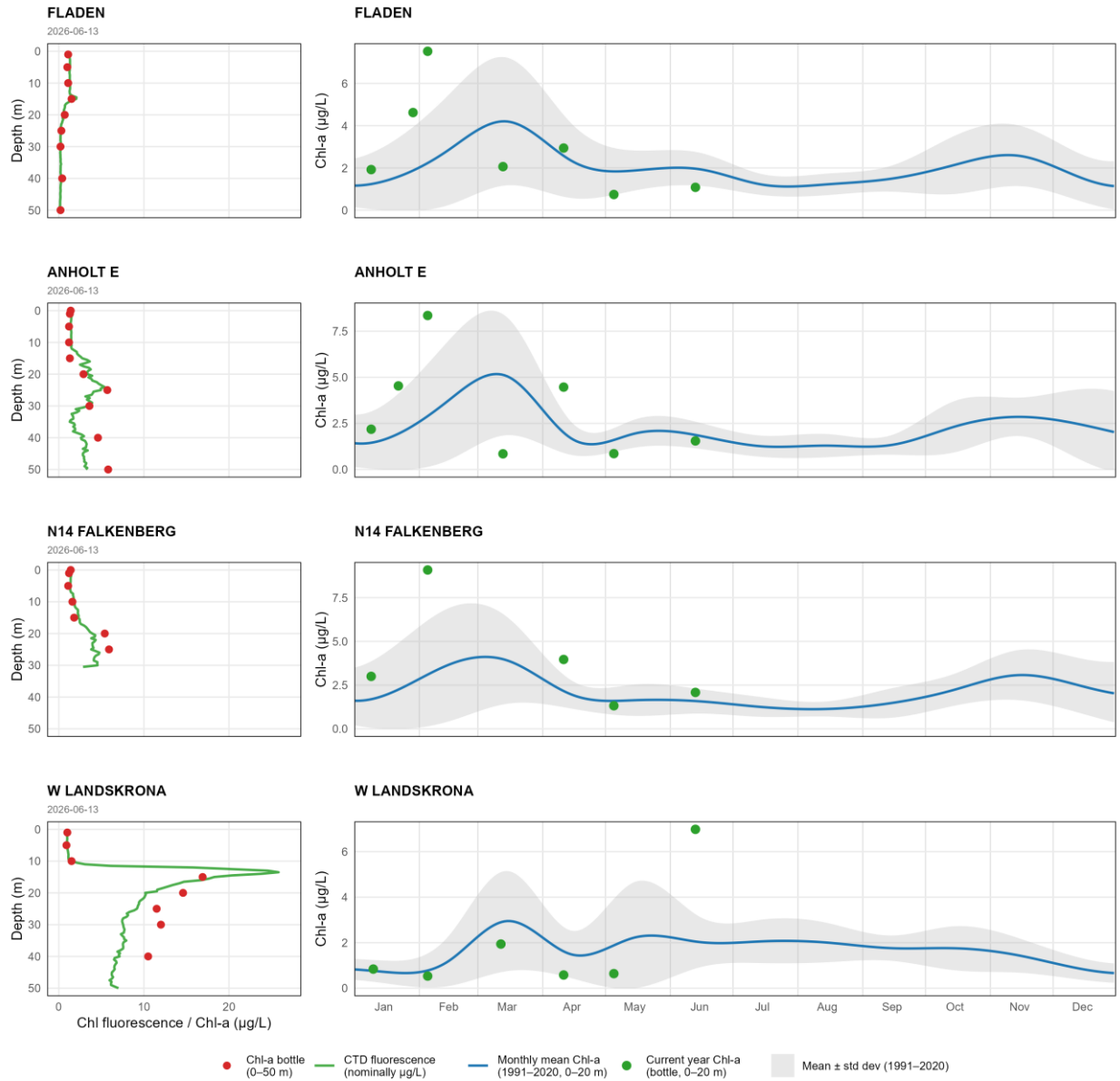


Figure 9. CTD fluorescence profiles and Chl-a time series (with 1991–2020 monthly statistics) for The Kattegat and The Sound stations.

The Southern Baltic

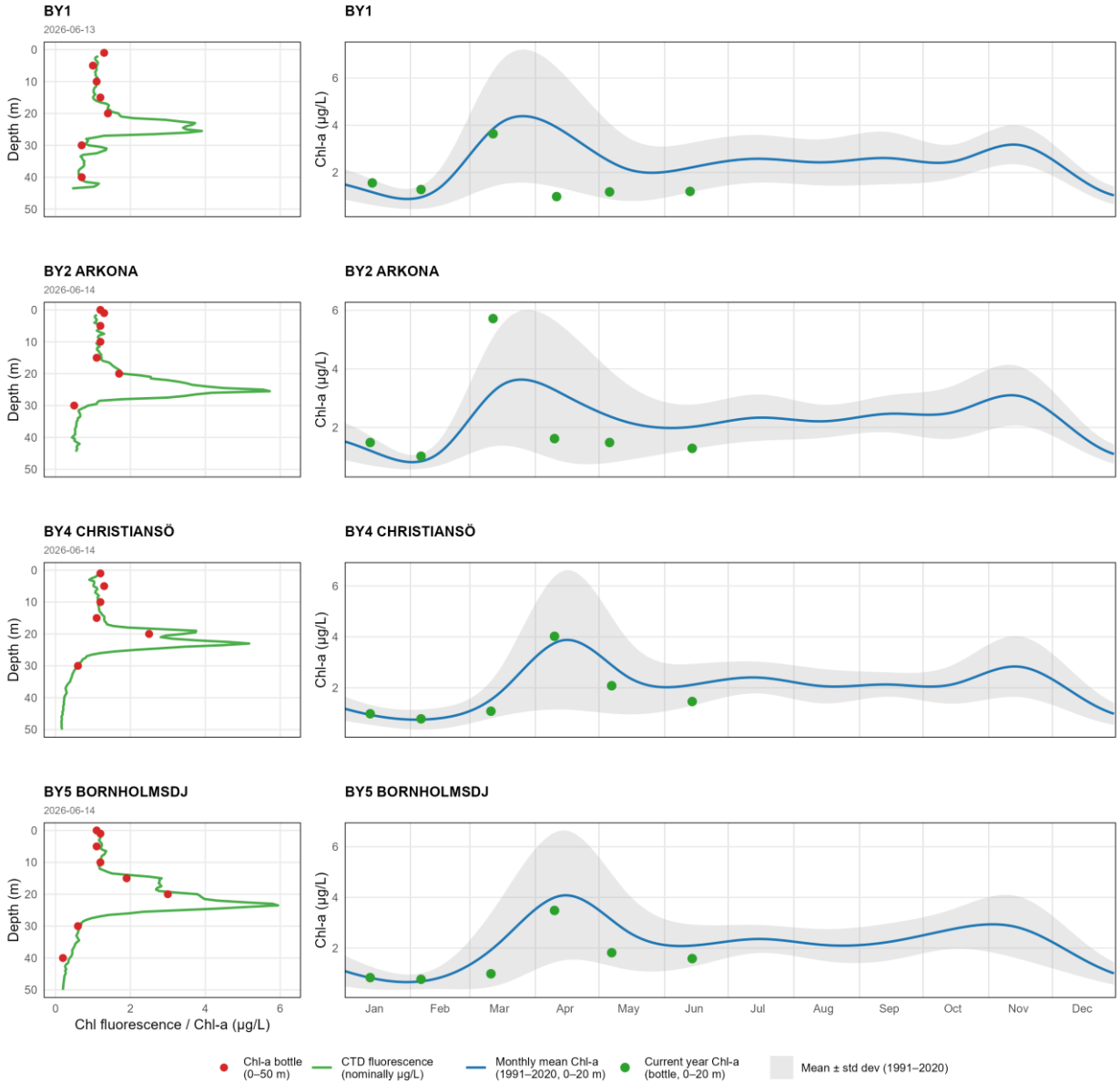


Figure 10. CTD fluorescence profiles and Chl-a time series (with 1991-2020 monthly statistics) for The Southern Baltic stations.

The Western Baltic

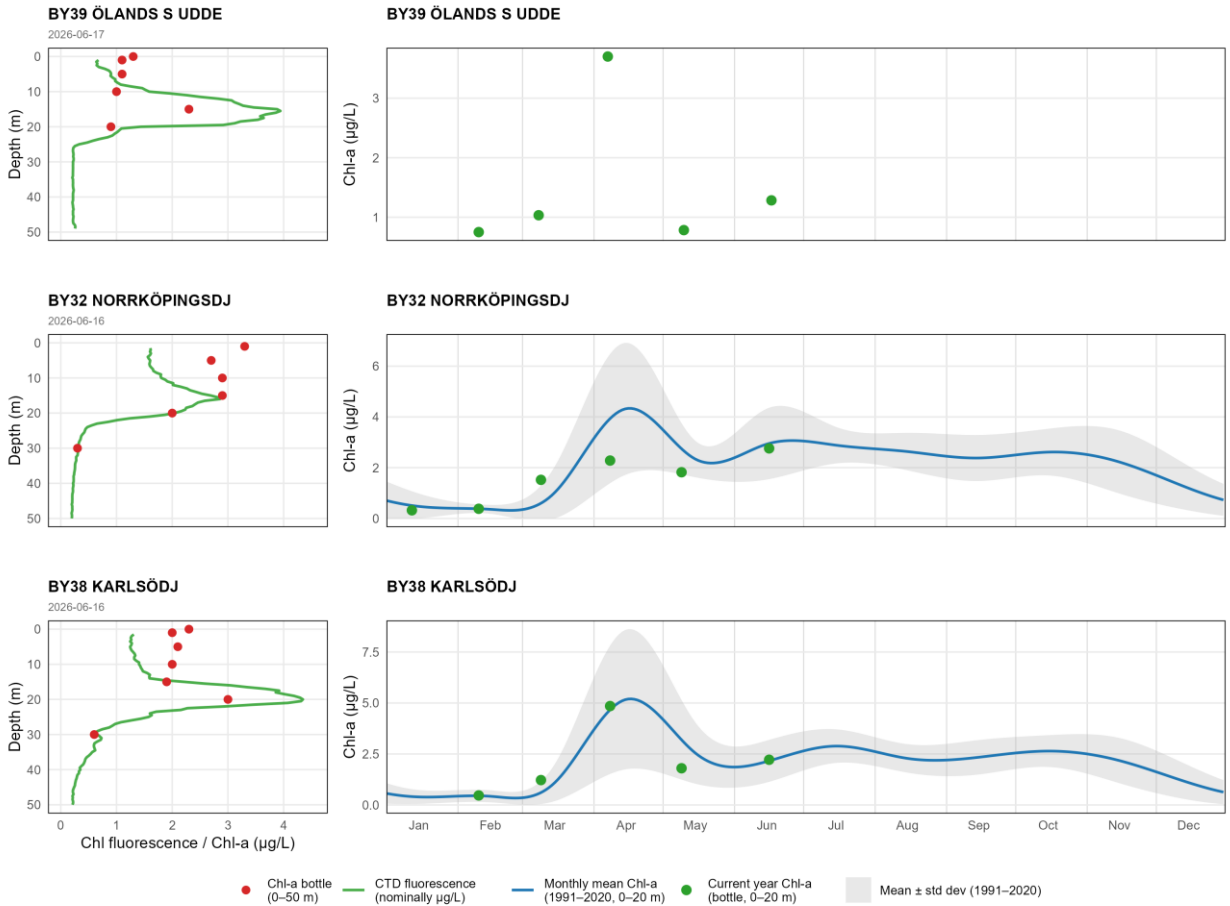


Figure 11. CTD fluorescence profiles and Chl-a time series (with 1991–2020 monthly statistics) for The Western Baltic stations.

The Eastern Baltic

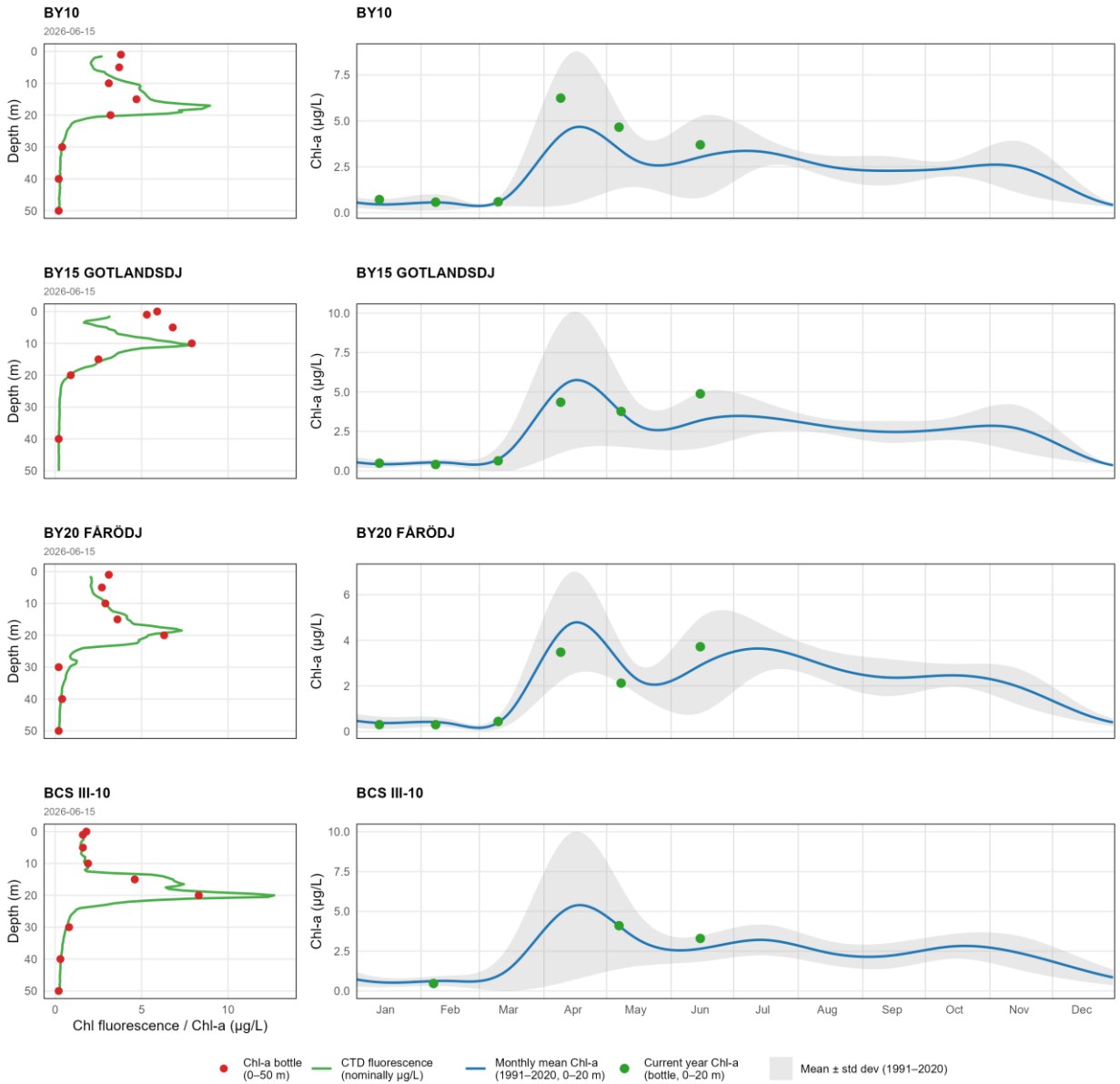


Figure 12. CTD fluorescence profiles and Chl-a time series (with 1991–2020 monthly statistics) for The Eastern Baltic stations.



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