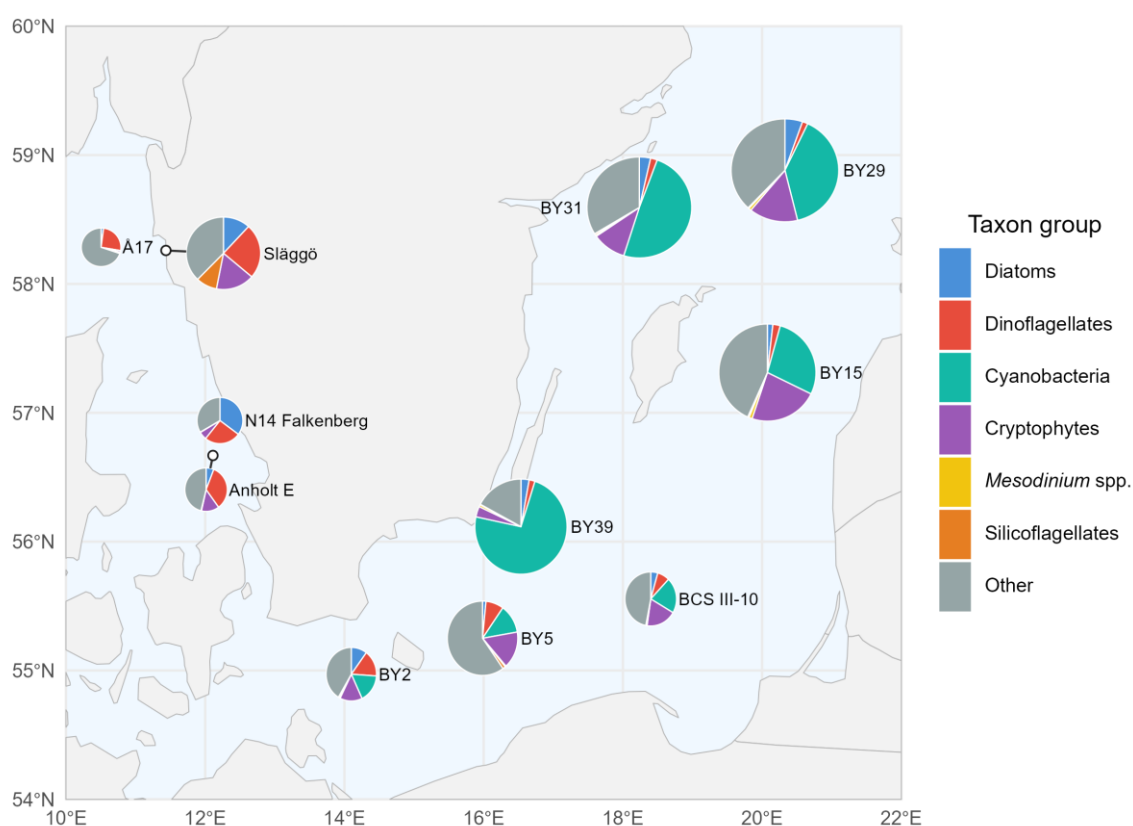


ALGAL SITUATION IN MARINE WATERS SURROUNDING SWEDEN

Report No 9, September 2026
RV Svea cruise, 2026-09-08 to 2026-09-13
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 Anders Torstensson, SMHI. Report text was drafted with the assistance of a large language model. Taxa marked with * are potentially toxic or harmful.

Sammanfattning

Längs Skagerrak och Kattegatt var växtplanktondiversiteten generellt måttlig till hög, med lägst totala cellantal och biovolym vid Å17 och högst vid Släggö. Kiselalger och dinoflagellater dominerade de flesta samhällen, där *Pseudosolenia calcar-avis* och andra stora centriskakiselalger bidrog avsevärt vid Släggö, Anholt E och N14 Falkenberg. Dinoflagellater såsom *Heterocapsa rotundata* var vanliga, och mindre celler representerades främst av kryptomonader och andra små flagellater. Flera potentiellt skadliga taxa observerades i låga till måttliga nivåer, inklusive *Pseudo-nitzschia* spp.*, *Pseudochattonella* spp.*, *Prorocentrum cordatum**, *Dinophysis acuta**, *Dinophysis acuminata** och *Phalacroma rotundatum**. Klorofyllkoncentrationen var normal för säsongen och i linje med den biovolym som registrerades av IFCB.

I Östersjön var artantalet måttligt och de totala cellantalerna var relativt höga vid de flesta stationer, med högst biovolym vid BY29, BY31 och BY39. Samhällena dominerades av trådformiga och kolonibildande cyanobakterier, kryptomonader och andra små flagellater, medan kiselalger bidrog starkare vid BY2, BY29 och BY31. Potentiellt skadliga cyanobakterierna *Aphanizomenon flos-aquae** och *Nodularia spumigena** förekom vid alla Östersjöstations, och *Dolichospermum* spp. och *Aphanothece parallelliformis* var viktiga vid BY39. Den potentiellt skadliga dinoflagellaten *P. cordatum** förekom i låga till måttliga nivåer i hela Östersjön. Klorofyllkoncentrationen var högst i norra Egentliga Östersjön, i överensstämmelse med den förhöjda biovolymen av cyanobakterier och små flagellater, medan BY39 uppvisade lägre koncentration trots hög cyanobakteriebiovolym, vilket kan bero på att samhället dominerat av kolonibildande former (*A. parallelliformis* och Cyanophyceae) som får en högt uppskattad biovolym från bildanalys.

Summary

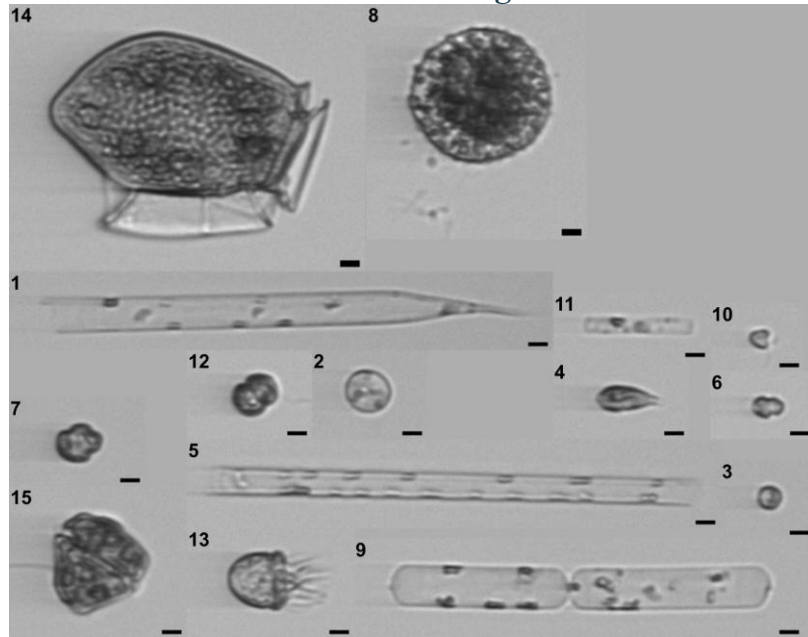
Along the Skagerrak and Kattegat, phytoplankton diversity was generally moderate to high, with total cell numbers and biovolume lowest at Å17 and highest at Släggö. Diatoms and dinoflagellates dominated most communities, with *Pseudosolenia calcar-avis* and other large centric diatoms contributing substantially at Släggö, Anholt E and N14 Falkenberg. Dinoflagellates such as *Heterocapsa rotundata* were common, and smaller cells were represented mainly by cryptophytes and other small flagellates. Several potentially harmful taxa were observed at low to moderate levels, including *Pseudo-nitzschia* spp.*, *Pseudochattonella* spp.*, *Prorocentrum cordatum**, *Dinophysis acuta**, *Dinophysis acuminata** and *Phalacroma rotundatum**. Chlorophyll concentration was normal for the season and in good agreement with the biovolume recorded by the IFCB.

In the Baltic Sea, species richness was moderate and total cell numbers were relatively high at most stations, with the highest biovolume at BY29, BY31 and BY39. The communities were dominated by filamentous and colonial cyanobacteria, cryptophytes and other small flagellates, with diatoms contributing more strongly at BY2, BY29 and BY31. Potentially harmful cyanobacteria *Aphanizomenon flos-aquae** and *Nodularia spumigena** occurred at all Baltic stations, and *Dolichospermum* spp. and *Aphanothece parallelliformis* were important at BY39. The potentially harmful dinoflagellate *P. cordatum** was present at low to moderate levels throughout the Baltic. Chlorophyll concentration was highest in the northern Baltic Proper, matching the elevated cyanobacteria and small-flagellate biovolume, while BY39 showed lower chl concentration despite high cyanobacteria biovolume, indicating a community dominated by colonial forms (*A. parallelliformis* och Cyanophyceae), which yield high biovolume estimates when assessed using imaging.

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

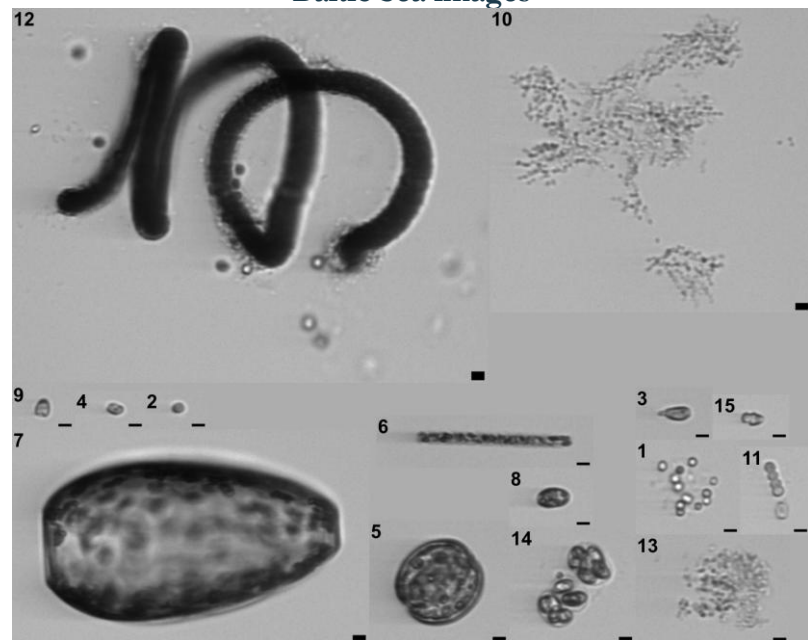
Parameter	Value
Total samples collected (cruise)	268
Samples from AlgAware stations	37
Biological images analysed	78,444
Classification model (PyTorch)	SMHI-NIVA-SYKE-SAMS-SZN-ResNet50-V6.1
LLM model (text generation)	gpt-5.1

West Coast images



The most common taxa by biovolume concentration in the West Coast images were: 1. *Pseudosolenia calcar-avis*, 2. Unclassified, 3. Unicells, 4. Cryptophyta, 5. Rhizosoleniaceae, 6. *Heterocapsa rotundata*, 7. Gymnodiniales, 8. Dictyochales, 9. *Dactyliosolen fragilissimus*, 10. *Pyramimonas* spp., 11. *Leptocylindrus* spp., 12. Dinophyceae, 13. Ciliophora, 14. *Dinophysis acuta*, 15. Peridinales. Black bars represent 5 μm.

Baltic Sea images



The most common taxa by biovolume concentration in the Baltic Sea images were: 1. Cyanophyceae, 2. Unicells, 3. Cryptophyta, 4. Unclassified, 5. Centrales, 6. *Aphanizomenon flos-aquae*, 7. *Coscinodiscus granii*, 8. *Eutreptiella* sp., 9. *Pyramimonas* spp., 10. *Aphanotthece parallelliformis*, 11. *Dolichospermum* spp., 12. *Nodularia spumigena*, 13. Chroococcales, 14. *Oocystis* spp., 15. *Heterocapsa rotundata*. Black bars represent 5 μm.

Spatial biomass distribution

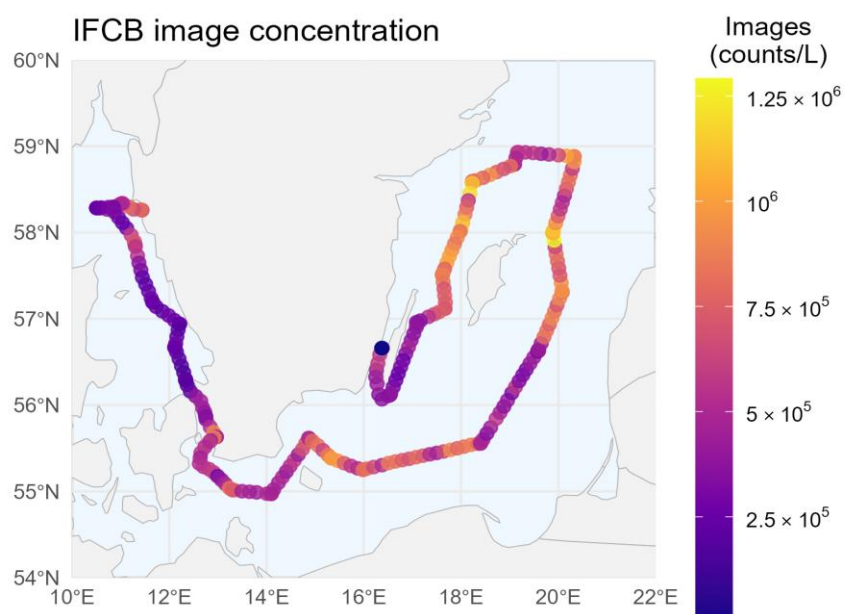


Figure 1. IFCB image concentration along the cruise track. Total images collected: 619,560.

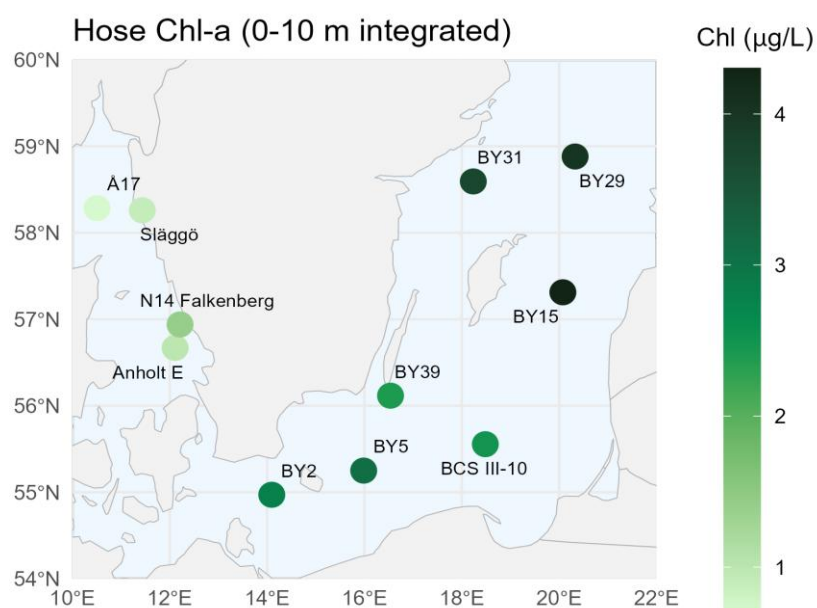
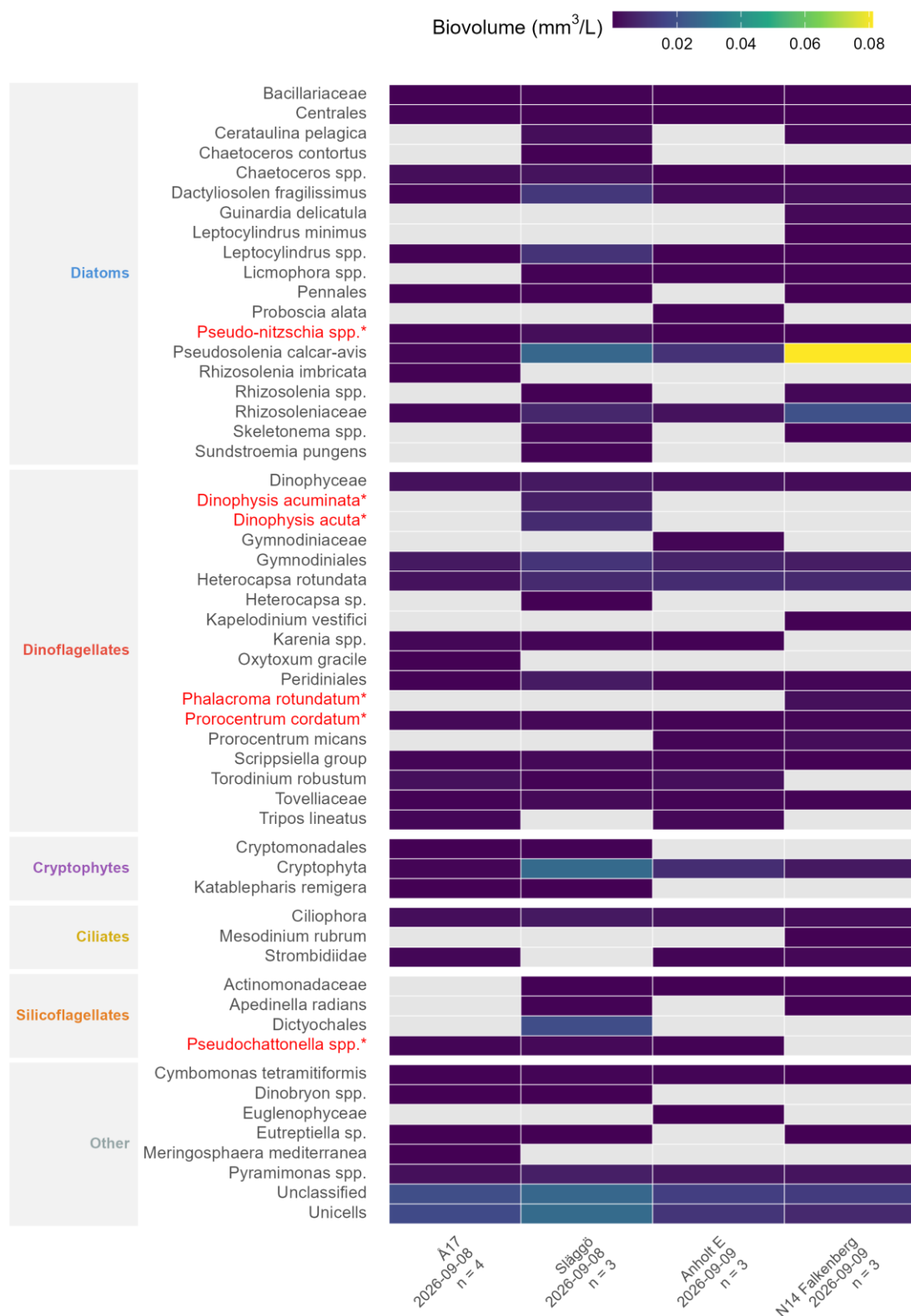


Figure 2. Hose chlorophyll-a (0-10 m integrated) at AlgAware stations during the September 2026 cruise.

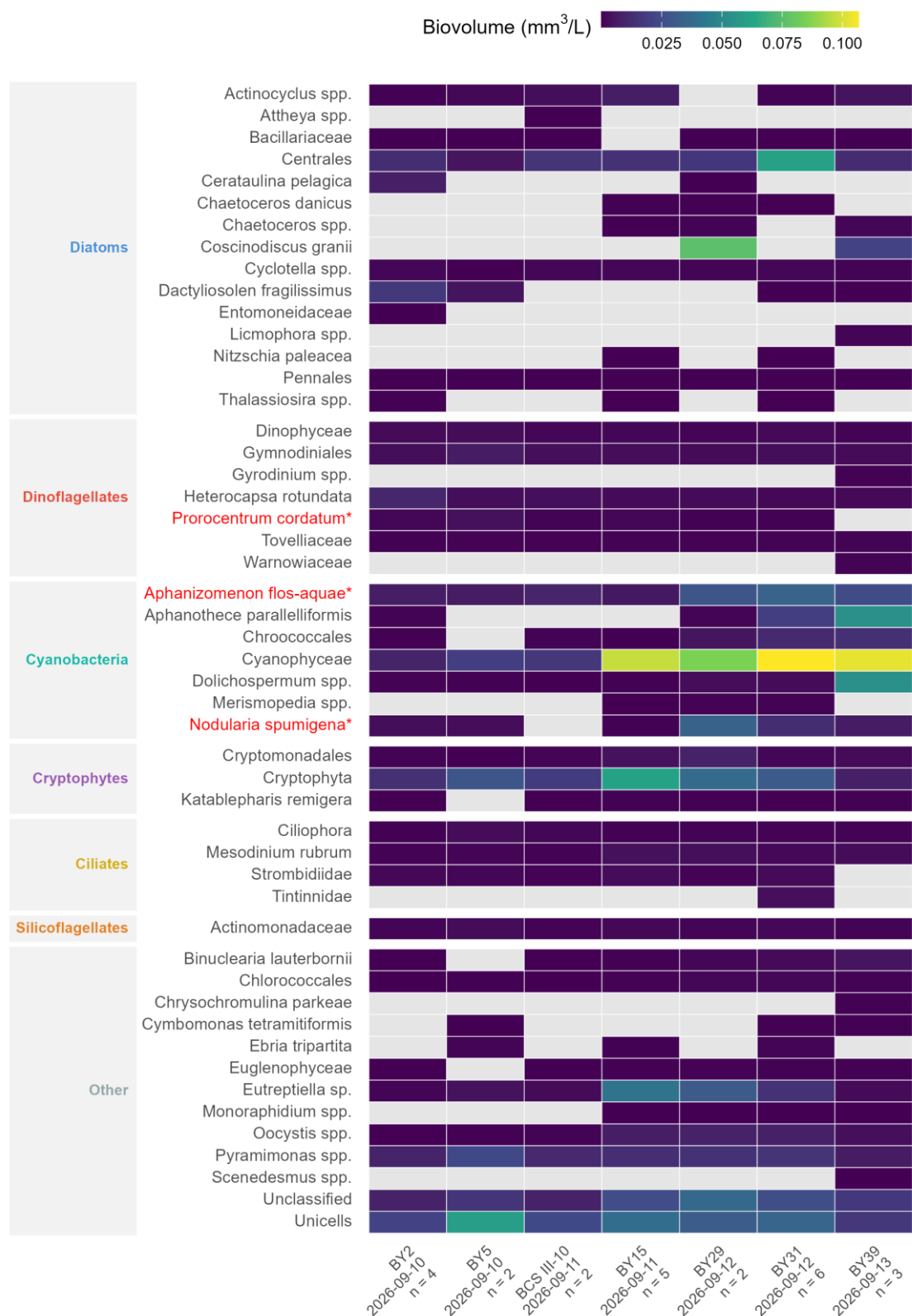
West Coast - Biovolume heatmap



* 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

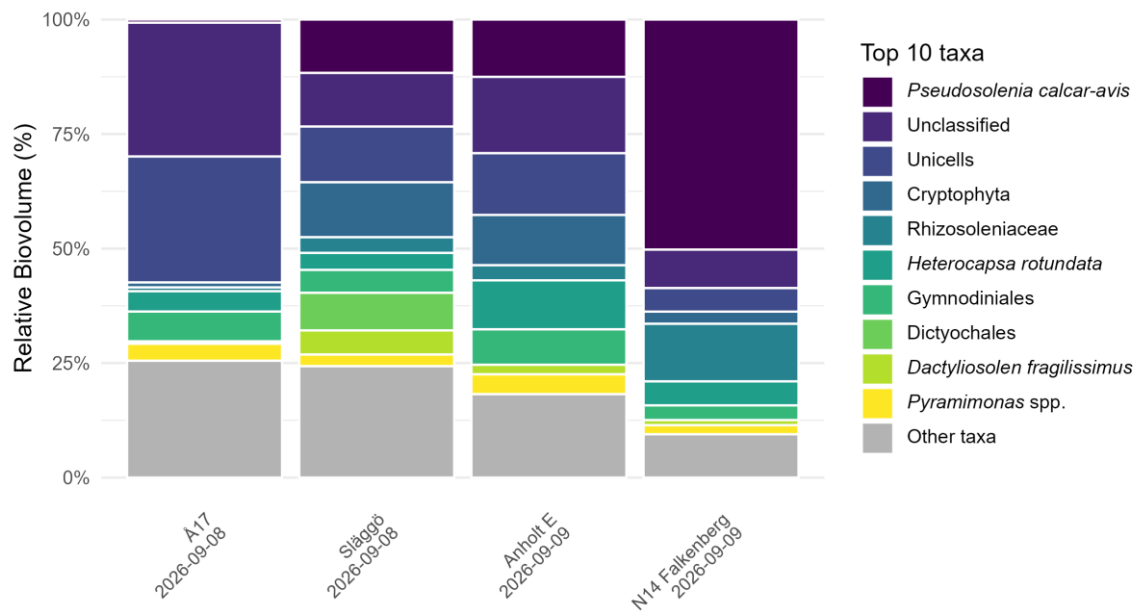
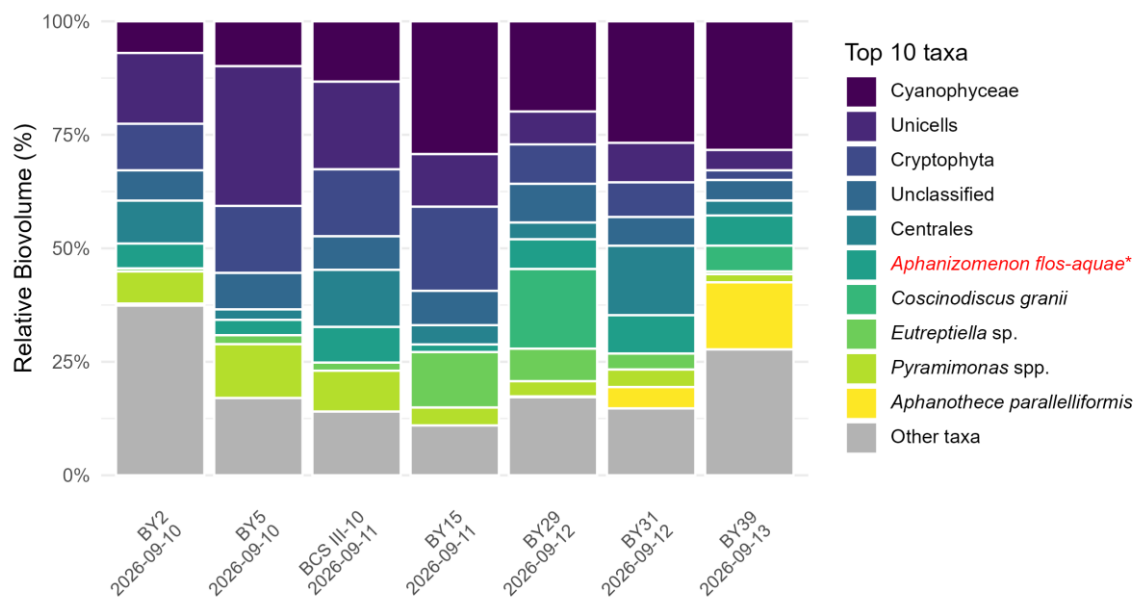


Figure 5. Relative biovolume of top 10 taxa at West Coast stations.



* Potentially harmful taxon

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

Station reports

West Coast

Å17 - 2026-09-08

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, with unicells contributing most of the biovolume, together with the green flagellate *Pyramimonas* spp. and the flagellate *Cymbomonas tetramitiformis*. Among the dinoflagellates, cells from the order Gymnodiniales were most important, followed by *Heterocapsa rotundata* and other Dinophyceae, with additional contributions from *Torodinium robustum*, *Prorocentrum cordatum** and *Karenia* spp. Diatoms were of minor importance and mainly represented by *Chaetoceros* spp., Centrales and members of the *Rhizosoleniaceae* (fragmented cells). Ciliates and cryptophytes occurred in low biovolume, and the silicoflagellate *Pseudochattonella* spp.* was present in small amounts. The potentially harmful taxa *P. cordatum**, *Pseudochattonella* spp.* and *Pseudo-nitzschia* spp.* were all detected, but in low abundances. Chlorophyll concentration (0–10 m) was among the lowest measured during the cruise, in agreement with the relatively low biovolume observed by the IFCB at this station.

Släggö - 2026-09-08

Phytoplankton diversity was high and total cell numbers were also relatively high compared to the other stations on this cruise. Diatoms dominated the community by biovolume, with *Pseudosolenia calcar-avis* as the most important species, followed by *Dactyliosolen fragilissimus* and *Leptocylindrus* spp. Dinoflagellates contributed substantially, where Gymnodiniales and *H. rotundata* were most common and the potentially harmful taxon *Dinophysis acuta** was also among the dominant dinoflagellates. Within the group classified as other, unicells were most abundant, together with *Pyramimonas* spp. and *C. tetramitiformis*. Cryptophytes, silicoflagellates and ciliates occurred in lower biovolumes, represented mainly by Cryptophyta, Dictyochales and Ciliophora. Besides *D. acuta**, the potentially harmful taxa *Dinophysis acuminata**, *Pseudo-nitzschia* spp.*, *Pseudochattonella* spp.* and *P. cordatum** were observed in low to moderate abundances. Chlorophyll concentration (0–10 m) was moderate and in good agreement with the relatively elevated biovolume measured by the IFCB at this station.

Anholt E - 2026-09-09

Phytoplankton diversity was moderate and total cell numbers were relatively high compared to the other West Coast stations, while total biovolume was also somewhat elevated. Dinoflagellates dominated the community, with *H. rotundata* as the most abundant taxon, followed by cells assigned to Gymnodiniales and Dinophyceae. Among the diatoms, *P. calcar-avis* was the most important species, with additional contribution from fragmented *Rhizosoleniaceae* and the species *D. fragilissimus*. Within the other group, numerous small unicells were recorded together with *Pyramimonas* spp. and *C. tetramitiformis*. Cryptophytes, ciliates and silicoflagellates were present in lower biovolumes. The potentially harmful taxa *P. cordatum**, *Pseudochattonella* spp.* and *Pseudo-nitzschia* spp.* were observed in low abundances. Chlorophyll concentration (0–10 m) was moderate and in good agreement with the biovolume measured by the IFCB at this station.

N14 Falkenberg - 2026-09-09

Phytoplankton diversity was relatively high and total cell numbers were moderate compared to the other stations on this cruise, while the total biovolume was among the higher values observed. Diatoms clearly dominated the community, with *P. calcar-avis* as the most important taxon, followed by unidentified (fragmented) *Rhizosoleniaceae* and lower numbers of *D. fragilissimus*. Among the dinoflagellates, *H. rotundata* was most abundant, together with cells from the order Gymnodiniales and the potentially harmful taxon *Phalacroma rotundatum**. The remaining larger cells were mainly represented by unicells and the green flagellate *Pyramimonas* spp., with some *C. tetramitiformis*. Cryptophytes, ciliates, *Mesodinium* spp. and silicoflagellates occurred in low amounts. Besides *P. rotundatum**, the potentially harmful taxa *P. cordatum** and *Pseudo-nitzschia* spp.* were also present in low cell numbers. Chlorophyll concentration (0–10 m) was moderate and in good agreement with the relatively high biovolume detected by the IFCB at this station.

Baltic Sea

BY2 - 2026-09-10

Phytoplankton diversity was moderate and total cell numbers were also moderate compared to the other Baltic Sea stations on this cruise. Diatoms dominated the larger cells, with *D. fragilissimus* as the most important species, followed by Centrales and *Cerataulina pelagica*. Among the other groups, unicells contributed substantially to the biovolume together with the green flagellates *Pyramimonas* spp. and some *Eutreptiella* sp.. Cyanobacteria were also important, with Cyanophyceae and the filamentous taxa *Aphanizomenon flos-aquae** and *Nodularia spumigena** contributing clearly to the community. Dinoflagellates, cryptophytes, ciliates, silicoflagellates and *Mesodinium* spp. occurred in lower biovolumes, with *H. rotundata* as the most common dinoflagellate. The potentially harmful taxa *A. flos-aquae**, *N. spumigena** and *P. cordatum** were all present, but in relatively modest abundances. Chlorophyll concentration (0–10 m) was in the mid-range for the Baltic Sea stations, not in agreement with the lower biovolume observed by the IFCB.

BY5 - 2026-09-10

Phytoplankton diversity was relatively low compared to the other Baltic Sea stations, while total cell numbers were high. The community was dominated by small cells in the group other, with numerous unicells and relatively high abundances of the flagellates *Pyramimonas* spp. and *Eutreptiella* sp.. Cryptophytes were also important, represented mainly by Cryptophyta and cells from the order Cryptomonadales. Among the cyanobacteria, Cyanophyceae were common together with the filamentous taxa *A. flos-aquae** and *N. spumigena**. Dinoflagellates, diatoms, ciliates, silicoflagellates and *Mesodinium* spp. occurred in lower biovolumes. The presence of the potentially harmful cyanobacteria *A. flos-aquae** and *N. spumigena** was notable, although their abundances were moderate. Chlorophyll concentration (0–10 m) was in the mid-range of the Baltic Sea stations, but high for the season (Figure 9), in reasonable agreement with the intermediate biovolume observed by the IFCB.

BCS III-10 - 2026-09-11

Phytoplankton diversity was moderate and total cell numbers were relatively high compared to the other stations on this cruise, while the total biovolume was in the lower mid-range of the Baltic stations. The community was dominated by taxa in the group other, where unicells contributed most of the biovolume together with the green flagellate *Pyramimonas* spp. and the euglenophyte *Eutreptiella* sp.. Cyanobacteria were also important, with Cyanophyceae and Chroococcales present and the filamentous *A. flos-aquae** forming a substantial part of the biomass. Among the diatoms, Centrales dominated, with additional contributions from *Actinocyclus* spp. and *Cyclotella* spp. Cryptophytes, dinoflagellates, ciliates, *Mesodinium* spp. and silicoflagellates occurred in lower amounts, including the dinoflagellate *H. rotundata*. The potentially harmful taxa *A. flos-aquae** and *P. cordatum** were both observed, but not in particularly high abundances. Chlorophyll concentration (0–10 m) was in the lower range for the Baltic Sea stations and in agreement with the biovolume measured by the IFCB.

BY15 - 2026-09-11

Phytoplankton diversity was high and total cell numbers were among the highest recorded during the cruise, with a relatively high total biovolume. Cyanobacteria dominated the community by biovolume, with unidentified Cyanophyceae as the main component, followed by the filamentous taxa *A. flos-aquae** and *Dolichospermum* spp.. The group classified as other was also important, where *Eutreptiella* sp. and various unicells contributed most of the biovolume, together with numerous *Pyramimonas* spp. Cryptophytes were likewise abundant, dominated by Cryptophyta and Cryptomonadales, with some *Katablepharis remigera* present. Diatoms, dinoflagellates, *Mesodinium* spp., ciliates and silicoflagellates occurred only in low biovolumes. The potentially harmful cyanobacteria *A. flos-aquae** and *Dolichospermum* spp. were present, as well as the dinoflagellate *P. cordatum** and the cyanobacterium *N. spumigena**, but all in relatively low abundances. Chlorophyll concentration (0–10 m) was high, both for the season and for the cruise, and in good agreement with the elevated biovolume observed by the IFCB at this station.

BY29 - 2026-09-12

Phytoplankton diversity was high and total cell numbers were also high compared to the other stations on this cruise. Cyanobacteria dominated the community by biovolume, with unidentified Cyanophyceae as the largest component, followed by the filamentous taxa *N. spumigena** and *A. flos-aquae**. Diatoms contributed substantially, mainly through large cells of *Coscinodiscus granii* and some additional Centrales and *Cyclotella* spp. Among the other groups, larger unicells and the euglenophyte *Eutreptiella* sp. were important, together with numerous small flagellates of *Pyramimonas* spp. The smaller cells were further represented by cryptophytes such as Cryptophyta and Cryptomonadales, while dinoflagellates, *Mesodinium* spp., ciliates and silicoflagellates occurred only in low amounts. The potentially harmful cyanobacteria *N. spumigena** and *A. flos-aquae**, as well as the dinoflagellate *P. cordatum**, were all present but not particularly abundant. Chlorophyll concentration (0–10 m) was high and in good agreement with the relatively high biovolume measured by the IFCB at this station.

BY31 - 2026-09-12

Phytoplankton diversity was high and total cell numbers were also high compared to the other Baltic Sea stations, while the total biovolume was among the higher values of the cruise. Cyanobacteria dominated the community, with Cyanophyceae and the filamentous *A. flos-aquae** as the most important taxa, and smaller contributions from *Aphanotheca parallelliformis* and other chroococcalean forms. Among the diatoms, Centrales were most important, with additional contributions from *Cyclotella* spp. and *Actinocyclus* spp. The group classified as unicells contributed substantially to the biovolume within the diverse “other” fraction, together with the green flagellates *Pyramimonas* spp. and the euglenophyte *Eutreptiella* sp. Cryptophytes, dinoflagellates, ciliates, *Mesodinium* spp. and silicoflagellates occurred in lower amounts. The potentially harmful cyanobacteria *A. flos-aquae** and *N. spumigena** were both present, and the potentially harmful dinoflagellate *P. cordatum** was observed in low numbers. Chlorophyll concentration (0–10 m) was high and in good agreement with the relatively high biovolume detected by the IFCB at this station.

BY39 - 2026-09-13

Phytoplankton diversity was relatively high while total cell numbers were moderate compared to the other Baltic stations on this cruise. The community was clearly dominated by cyanobacteria, with additional contributions from diatoms and various small flagellates. Among the cyanobacteria, Cyanophyceae and *A. parallelliformis* were important components, together with *Dolichospermum* spp. The potentially harmful filamentous cyanobacteria *A. flos-aquae** and *N. spumigena** were also present, with *A. flos-aquae** contributing noticeably to the cyanobacterial biovolume. Among the diatoms, *C. granii* dominated, followed by other Centrales and *Actinocyclus* spp. The smaller cells were mainly represented by unicells, including *Pyramimonas* spp. and *Binuclearia lauterbornii*. Cryptophytes, dinoflagellates, *Mesodinium* spp., silicoflagellates and other ciliates occurred in low amounts. Chlorophyll concentration (0–10 m) was low and not in good agreement with the relatively high biovolume observed by the IFCB at this station, probably by the large contribution of the colonial cyanobacteria whose biovolumes are likely overestimated by imaging methods.

The Skagerrak

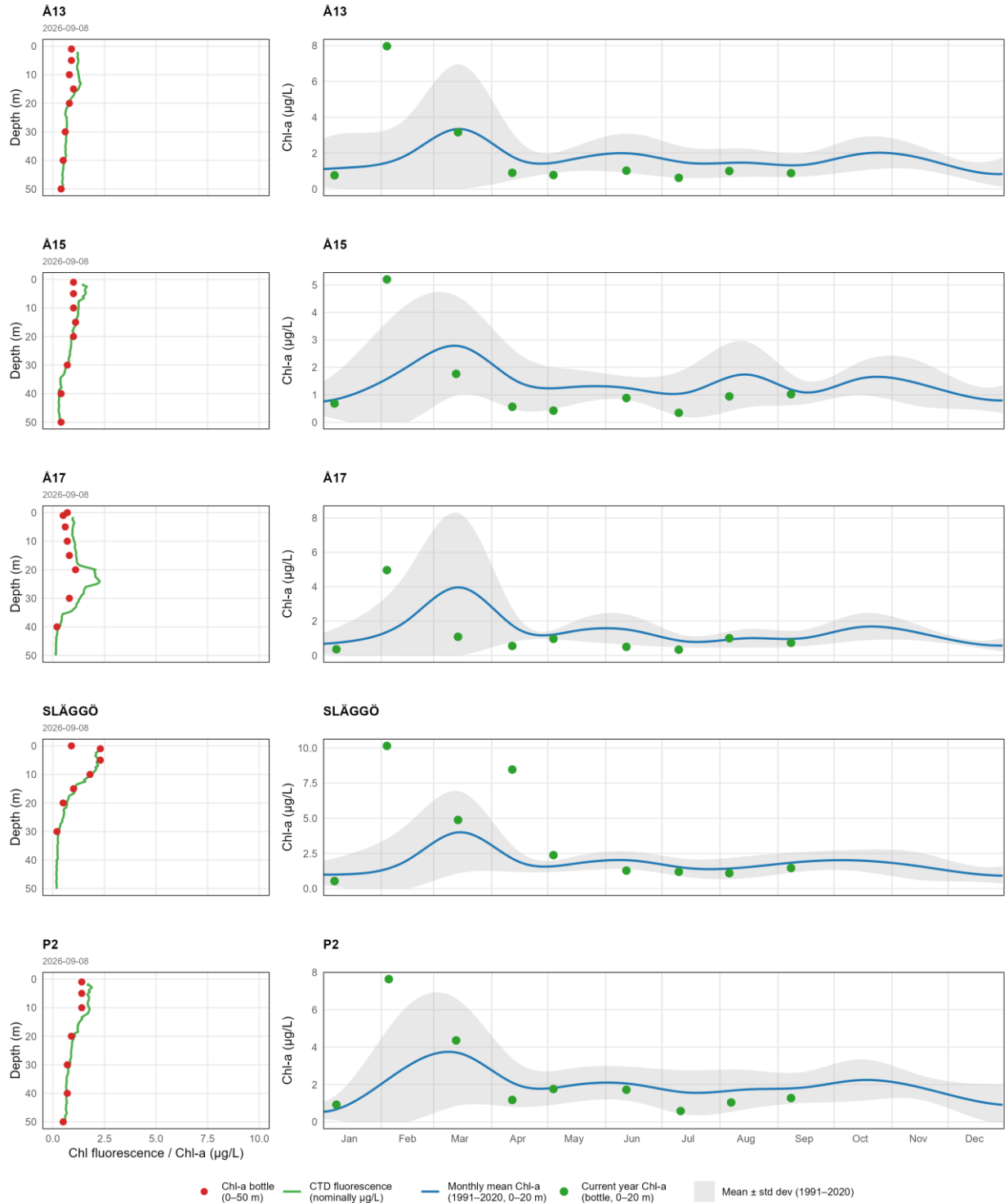


Figure 7. CTD fluorescence profiles and Chl-a time series (with 1991-2020 monthly statistics) for The Skagerrak stations.

The Kattegat and The Sound

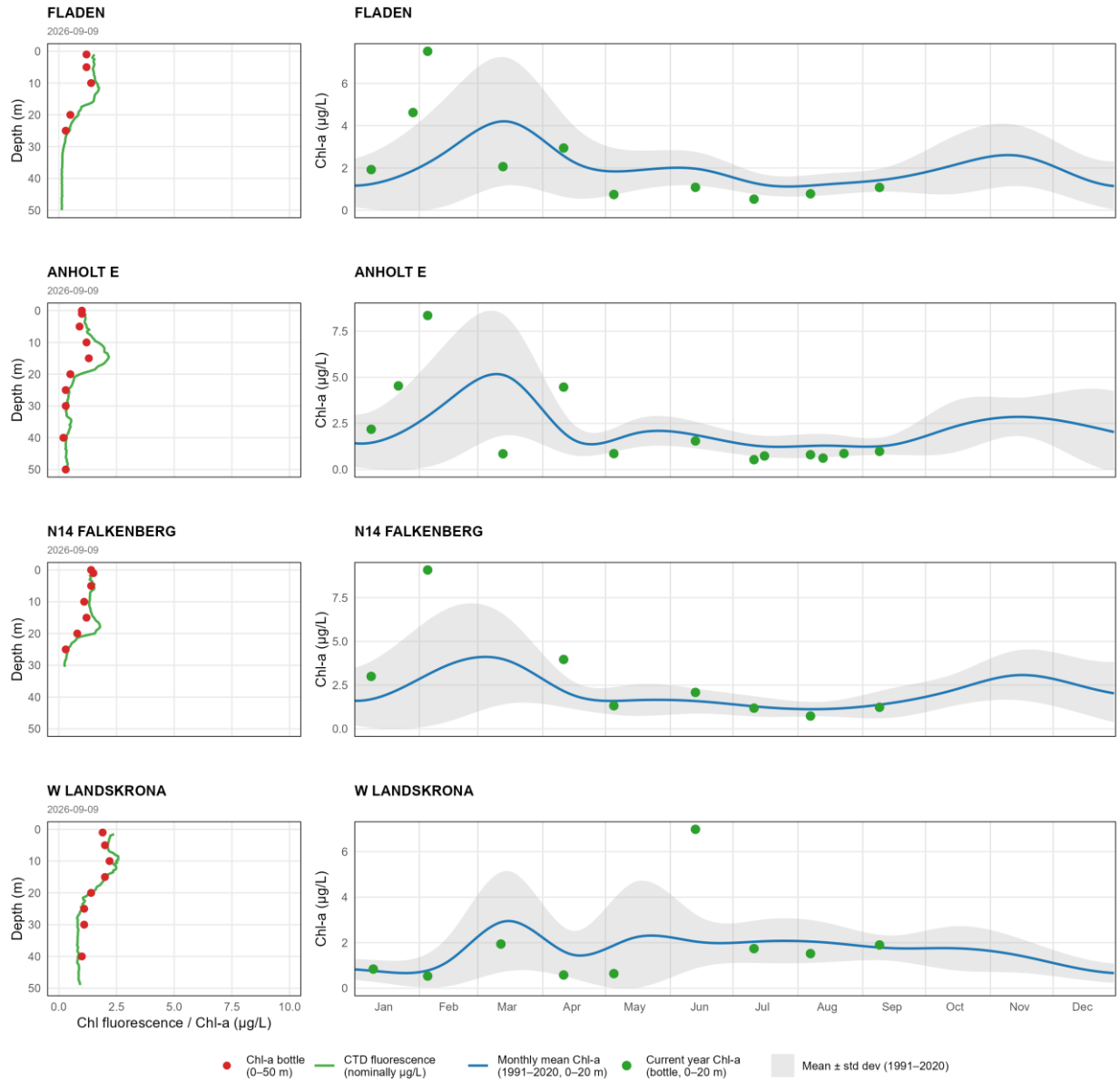


Figure 8. CTD fluorescence profiles and Chl-a time series (with 1991–2020 monthly statistics) for The Kattegat and The Sound stations.

The Southern Baltic

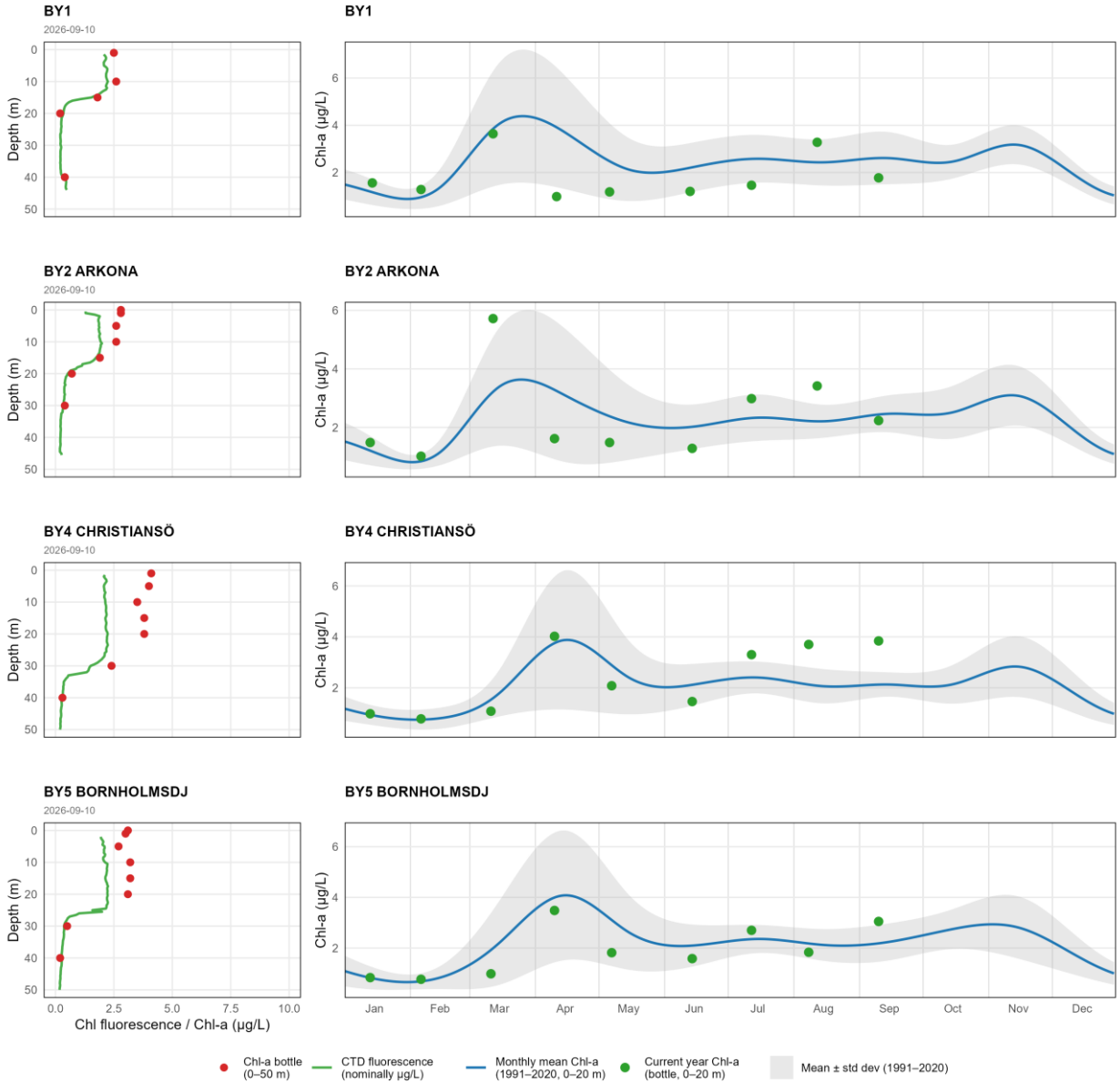


Figure 9. CTD fluorescence profiles and Chl-a time series (with 1991-2020 monthly statistics) for The Southern Baltic stations.

The Western Baltic

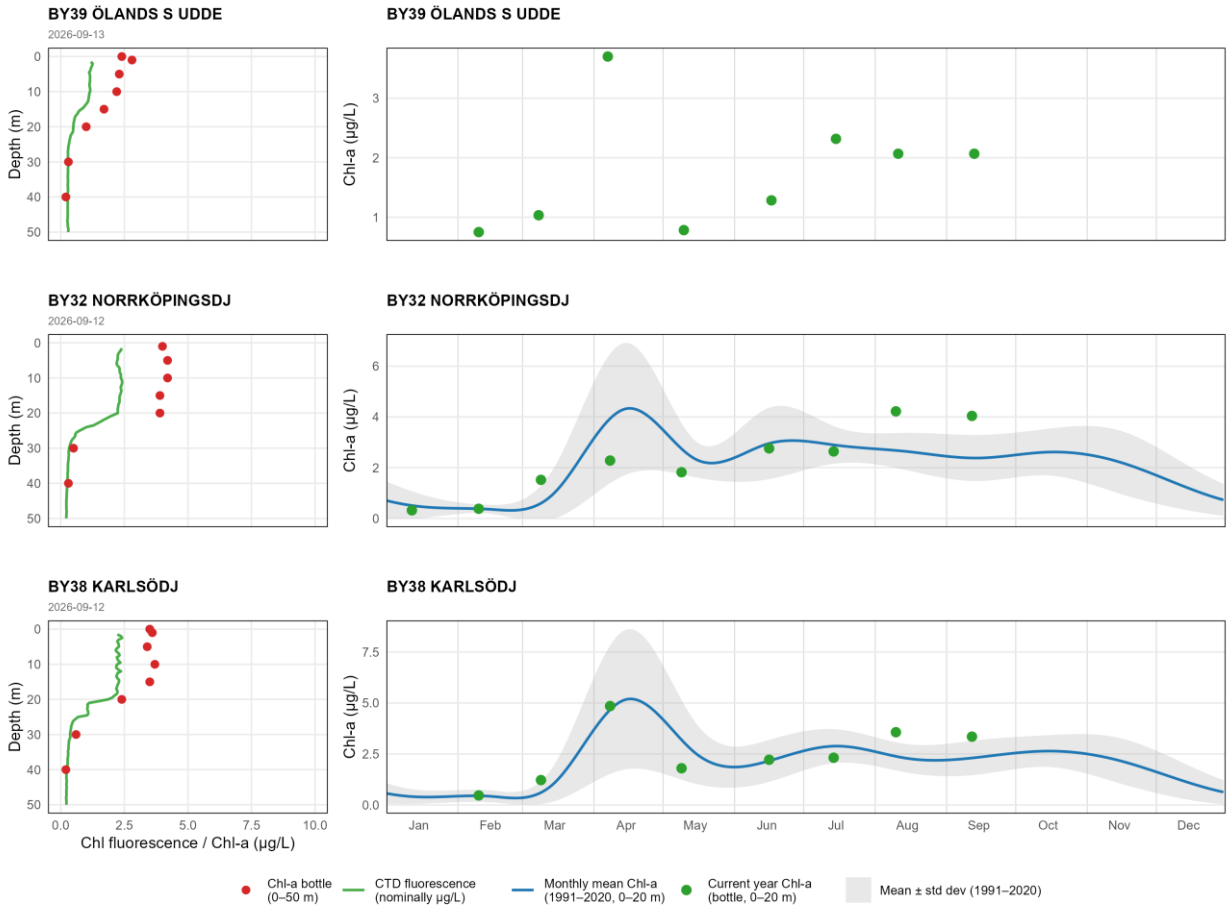


Figure 10. CTD fluorescence profiles and Chl-a time series (with 1991–2020 monthly statistics) for The Western Baltic stations.

The Eastern Baltic

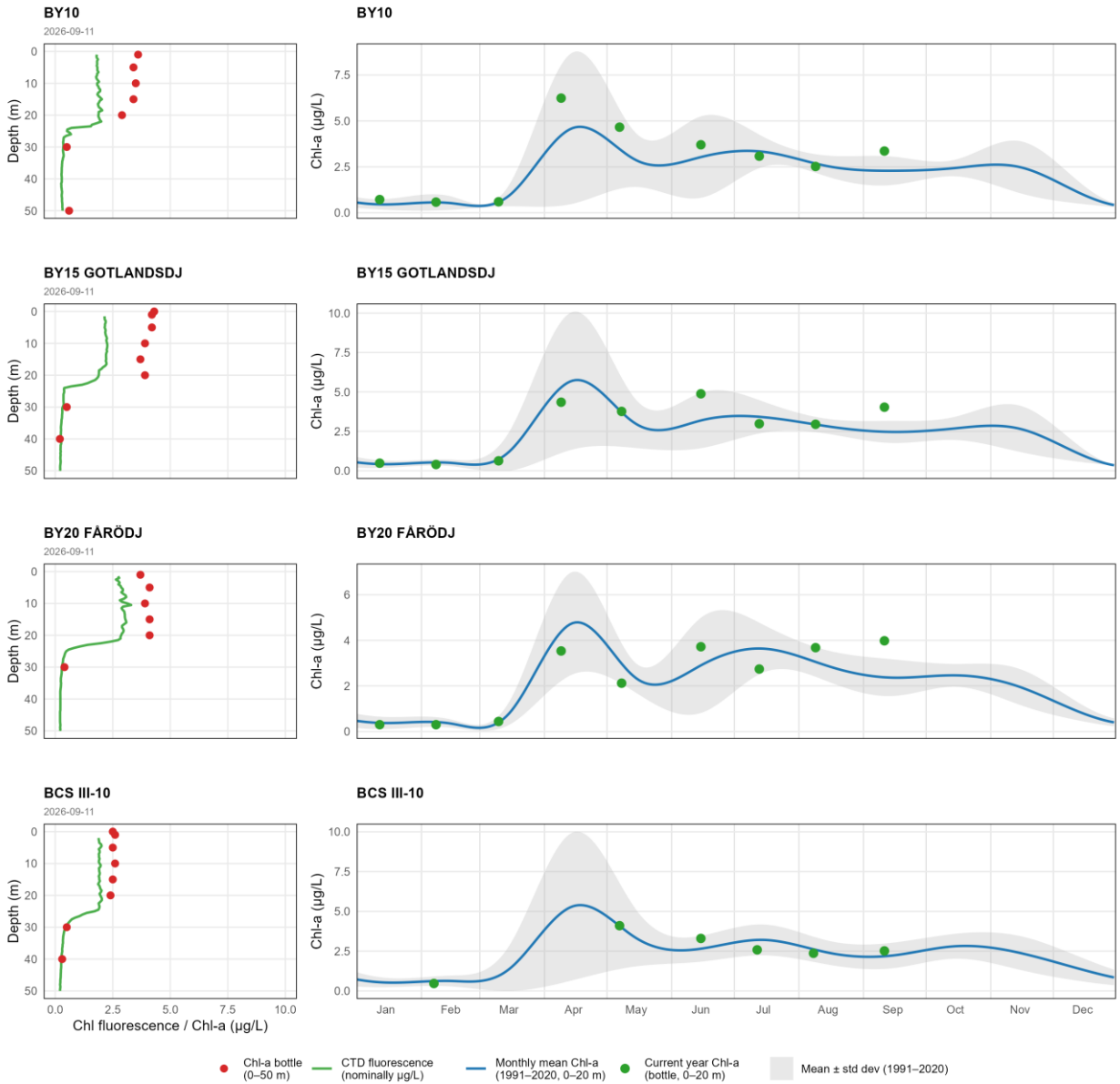


Figure 11. CTD fluorescence profiles and Chl-a time series (with 1991-2020 monthly statistics) for The Eastern Baltic stations.



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