

EG PHYTO

Quality Assurance of Phytoplankton Monitoring in the Baltic Sea (EG Phyto QA)

(2025-2027)

Objectives

The main target is to ensure and maintain high quality standard of the international Baltic Sea regional phytoplankton monitoring within the HELCOM COMBINE Programme. This is achieved by:

- Maintaining annual training courses
- Maintaining and improvement the phytoplankton biovolume list (i.e. the HELCOM PEG Biovolume file, PEG_BVOLXXXX)
- Participation in intercalibrations, discussions around intercalibration results and taking over new findings in methodological improvements in routine phytoplankton monitoring
- Maintaining and improvement the HELCOM Guidelines on monitoring of phytoplankton species composition, abundance and biomass
- Providing a forum for discussion of phytoplankton indicators and their applicability in the HELCOM area and for assessing the results of the indicator evaluation of future HELCOM holistic assessments.

Background

Quality assurance of data is an important component of the HELCOM monitoring programme, and measures were early taken to evaluate and improve the recommended methods through intercalibrations between the different partners. In 1992 HELCOM PEG (Phytoplankton Expert Group) was established, with the main aim to unify methods of collection, counting and identification of phytoplankton species. In 2022 the group was renamed to HELCOM EG Phyto (Expert Group on Phytoplankton). Since accurate biomass estimates are important in phytoplankton monitoring, the group has also made considerable efforts to standardise size-classes and biovolumes of phytoplankton species found in the Baltic Sea. The use of a standardised species list with fixed size-classes and biovolumes is a decisive measure to improve the quality of the phytoplankton counting method and the comparability of results.

Activities

The main activities will be carried out in two sessions per year. In spring a 2-day online session will be held with the main purpose of updating the HELCOM PEG Biovolume file (PEG_BVOLXXXX). In autumn a 4–5-day physical session will be held, facilitating a taxonomic training course with one or several invited teachers. The venue of the autumn sessions will be circulated between the Contracting Parties and their marine laboratories. Suggested host countries are Finland (Syke) in 2025, Germany (Leibniz Institute for Baltic Sea Research, Warnemünde) in 2026, and Sweden (Dept. of Ecology, Environment and Plant Sciences, Stockholm University) in 2027. Intersessional activities will be organized if needed. The following activities are planned:

Activity:	Aim:
Species identification skills	<p>To maintain continuity and high quality in phytoplankton identification and quantification, because a new generation of phytoplankton researchers and analysts are continuously joining the EG Phyto.</p> <p>To follow recent changes in the taxonomy of Baltic Sea relevant phytoplankton to keep the HELCOM PEG Phytoplankton Biovolume (PEG_BVOLXXXX) file up to date.</p> <p>The taxonomic <u>training courses</u> are planned to encompass:</p> <ul style="list-style-type: none"> a) Identification of phytoplankton species; b) Maintaining and enhancing the competence of analysts to identify non-indigenous species; c) Enhancing the competence of analysts to distinguish resting stages from vegetative stages in the plankton <p>Presenting representative and validated images of Baltic Sea phytoplankton species, publicly available in the HELCOM EG Phyto image gallery at www.Nordicmicroalgae.org.</p>
Intercalibrations	<p>To keep the high standard of phytoplankton monitoring in the Baltic Sea and to assure the comparability of results. The group is active in selecting suitable intercalibrations in which group members could participate. At the annual sessions, the group allocate time to discuss and find solutions for the possible quality problems and discrepancies revealed by the intercalibrations. In addition, organizers of the intercalibrations are invited to the session to present the intercalibration results. The results will be evaluated and discussed and can lead to future suggestions for intercalibrations as well as updates of the HELCOM Guidelines on monitoring of phytoplankton species composition, abundance and biomass.</p>
Further harmonization of the counting method	<p>To update the HELCOM Guidelines on monitoring of phytoplankton species composition, abundance and biomass when needed.</p>
Updating the HELCOM biovolume file (PEG_BVOLXXXX)	<p>To add new taxa and size classes when necessary; to update the biovolume file according to recent taxonomical changes in co-operation with ICES Data Centre, to correct potential errors. The biovolume file (PEG_BVOLXXXX) is updated yearly.</p>
Harmonization of biovolume calculations between CEN standard EN 16695:2015 and the PEG_BVOLXXXX biovolume file	<p>To continue the harmonization of the biovolume calculations between the PEG_BVOLXXXX biovolume file and the CEN standard EN 16695:2015.</p>

Production of Baltic Sea Environmental Fact Sheets (BSEFS)	To update and develop the BSEFS “Cyanobacteria biomass” to track changes in the Baltic Sea phytoplankton community structure.
Platform for phytoplankton indicators	Within EG Phyto a sub-group will be responsible for preparing a part at the yearly sessions to discuss progress within indicator development (Diatom/Dinoflagellate index, Seasonal succession of dominating phytoplankton groups, Cyanobacterial bloom index) and in a later stage to discuss possible assessment of pelagic habitats within HOLAS IV.

The project period is three years. Ms. Iveta Jurgensone, Latvia, will be the chair and convener during 2025-2027.

Expected outcomes

The outcome of the project will be:

1. Ensuring high-quality and harmonized phytoplankton monitoring data in the Baltic Sea
2. Functioning as a network for early warning of potential non-indigenous phytoplankton taxa
3. Memos from the outcome of the annual sessions to HELCOM WG BioDiv
4. Annually revised species/biovolume list of Baltic Sea phytoplankton species (i.e. HELCOM PEG Biovolume file, PEG_BVOLXXXX)
5. Harmonization of the Baltic Sea phytoplankton biovolumes (i.e. HELCOM PEG Biovolume file) with those in the European standard CEN EN 16695:2015
6. Updated HELCOM Guidelines on monitoring of phytoplankton species composition, abundance and biomass as necessary
7. Discussing the existing and possible new phytoplankton indicators, including proposals for integration and aggregation. The outcome of this will be presented as a part in the annual session memo
8. The outcome of results of intercalibration exercises s will be presented and discussed as a part in the annual session memo
9. Updated HELCOM Baltic Sea Environmental Fact Sheet “Cyanobacteria biomass”
10. Continuation of contribution of quality-checked images to the HELCOM EG Phyto image gallery at www.nordicmicroalgae.org
11. Final report (2025-2027)

Consistency with HELCOM priorities

In this project the HELCOM priorities are met by assuring that the quality of the phytoplankton data is high enough to evaluate effects of eutrophication, changes in biodiversity and long-term trends.

Timetable

The activities will be carried out in 2025-2027 (as a continuation to the HELCOM PEG QA project for 2020-2024).

Regular tasks will be discussed during all sessions, for example:

Spring online session

- updating the PEG biovolume file (PEG_BVOLXXXX), including the harmonization of the Baltic Sea phytoplankton biovolumes with the European Standard CEN EN 16695:2015
- discussion on new taxa and size classes, including non-indigenous species, to be added to the PEG biovolume file (PEG_BVOLXXXX). New taxa will be presented with images showing characteristic features for the taxa and time and location of sampling.

Autumn physical session

- harmonization of species identification by common microscopy of samples from the Baltic Sea, and lectures by invited teacher(s) for specific taxonomical groups
- harmonization of analyzing methods by discussing the methodology and intercalibration results to assess homogeneity in the analyses
- information on recent changes in the taxonomy of phytoplankton
- discussion of the progress of phytoplankton indicators being developed
- discussion of Baltic Sea Environmental Fact Sheets and updating of the existing "Cyanobacteria biomass" BSEFS
- evaluation of new images to be added to the HELCOM EG Phyto phytoplankton image gallery at www.nordicmicroalgae.org
- information on new relevant literature, projects about e.g. the development of phytoplankton indicators, meetings, conferences and courses.

Intersessional activities

In addition to the above-mentioned topics:

- EG Phyto works intersessionally in close co-operation with ICES Data Centre to improve Baltic Sea phytoplankton data
- Reporting of EG Phyto activities.

Specific tasks for the autumn sessions:

Autumn session 2025, to be held in Finland

- a) Phytoplankton identification: lectures by invited teacher (to be decided)
- b) Discussion of the next intercalibration, in which participation of the group members will be recommended.

Autumn session 2026, to be held in Germany

- a) Phytoplankton identification: lectures by invited teacher (topic and teacher to be decided).

- b) Planning the next project (2028-2030).

Autumn session 2027, to be held in Sweden (Stockholm)

- a) Phytoplankton identification: lectures by invited teacher (topic and teacher to be decided)
- b) Presentation of the results from intercalibration (if any suitable organized) and discussion of the outcome.
- c) Discussion of assessment of pelagic habitat to be included in HOLAS 4.

Specific tasks to support the development and evaluation of phytoplankton indicators

As the project period is in the middle of the 6 years cycle of the HOLAS 4 assessment period, focus will be on discussions on revised indicators or new proposed indicators that have been developed after the current assessment period.

Important links to the products of HELCOM EG Phyto

- [Biovolume file \(PEG_BVOLXXXX\)](#) (the latest and valid version of PEG_BVOLXXXX available at ICES website), with biovolumes and fixed size-classes used for the calculation of phytoplankton biomass in routine monitoring of Baltic Sea phytoplankton. For geometrical shapes used, see [Olenina et al 2006](#) and the latest version of [PEG_BVOLXXXX](#). Note that the above Excel-file of biovolumes should be used both for species and biovolume list in routine monitoring of Baltic Sea phytoplankton. (The file is updated yearly).
- Phytoplankton sampling and analysis is carried out according to the [HELCOM Guidelines for monitoring of phytoplankton species composition, abundance and biomass](#) within the [HELCOM COMBINE](#).
- Image gallery of Baltic phytoplankton species validated by the group: [HELCOM EG Phyto image gallery at the Nordic Microalgae web site](#).
- HELCOM Baltic Sea environment fact sheet "[Cyanobacterial biomass](#)". Older versions available under "archive".

View HELCOM phytoplankton sampling stations via HELCOM [interactive data and map service](#).

Older HELCOM Baltic Sea environment fact sheets about phytoplankton, produced by EG Phyto (or PEG), see [archive](#):

- An unusual phytoplankton event five years later: the fate of the atypical range expansion of marine species into the southeastern Baltic (HELCOM Baltic Sea Environment Fact Sheet 2010)
- Unusual phytoplankton event during winter-spring 2007-2008 (Baltic Sea Environment Fact Sheet 2008)

- Impact of invasive phytoplankton species on the Baltic Sea ecosystem 1980-2008 (HELCOM Baltic Sea Environment Fact Sheet 2009)
- Shifts in the Baltic Sea summer phytoplankton communities in 1992-2006 (HELCOM Indicator Fact Sheet 2007)

Other useful links to phytoplankton web sites (not maintained by EG Phyto)

[AlgaeBase](#)

[Checklist of Baltic Sea Phytoplankton Species](#) (Hällfors 2004). Species reported from the Baltic Sea until 2004.

[Diatoms of North America](#)

[Dinoflagellates – Centre of Excellence for Dinophyte Taxonomy](#)

[IOW-photo gallery of phytoplankton](#)

[Kasviplanktonopas \(in Finnish\)](#)

[Plankton net](#)

[WoRMS](#) (World Register of Marine Species)

Contracting Parties and laboratories

Denmark

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Finland

Germany

Latvia

Lithuania

Poland

Sweden

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