

**REPORT**  
**OF HELCOM WORKSHOP**  
**AND TRAINING COURSE ON PHYTOPLANKTON**

Hosts: Swedish Meteorological and Hydrological Institute, Sven Källfeltsgata 15, 42671 Västra Frölunda, Sweden.

Venue at Gothenburg University, Marine Institute, Carl Skottsbergs gata 22b, Gothenburg, Sweden.

9-13 April 2018

HELCOM Phytoplankton Expert Group (PEG)

**Message to HELCOM:**

- The main focus of the HELCOM PEG is, and should also be in the future, to improve the quality of phytoplankton monitoring in the Baltic Sea area and to harmonize sampling, analytical methods and analytical skills. Good quality phytoplankton data is crucial for any evaluation of phytoplankton trends in the Baltic Sea and is our main contribution to Baltic phytoplankton indicator development.
- HELCOM PEG has made some minor revisions of the guideline for monitoring of phytoplankton. The group finds it unclear if the phytoplankton guideline is still a part of the HELCOM Combine manual. This needs to be clarified at the HELCOM website. It has also to be clearly described how to refer to this and other guidelines at the webpage and the guideline document should contain last update date (i.e. when the updated version was uploaded at the HELCOM website).
- New images were presented and agreed to be added to the PEG image gallery on the Nordic Microalgae website.
- PEG updated and will yearly continue to update the Baltic Sea Environment Fact Sheet "Cyanobacteria biomass".
- PEG continues to provide data to the indicator "Cyanobacterial Bloom Index (CyaBI)" if asked and would like to have more information about this indicator. The PEG group can also continue to provide data for other indicators.
- Indicators still in development will be discussed in the future if presented at the meeting.
- HELCOM PEG discussed the presentation of results from the 2016 phytoplankton ring test arranged by the Quality Assurance Panel of the German Marine Monitoring Program (GMMP) of the North Sea and Baltic Sea at the Federal Environment Agency. All participants from the PEG had passed this ring test. The results of the SYKE phytoplankton proficiency test of 2017 were also presented and discussed. All participants from PEG were also successful in this test. PEG recommends that money support from HELCOM can be allocated for costs for participation in tests like the SYKE phytoplankton proficiency test since it will be more cost efficient to take part in provided test than organizing own PEG tests. PEG also wishes that some of the funding can be used for presentations of ring test results at the PEG meetings and for additional statistics from test results. PEG finds it valuable to be in dialog with test providers beforehand to organize tests that can follow-up on certain problematic parts of the method or certain taxa.
- The PEG biovolume file was updated during the meeting.
- PEG will start the work for comparison and harmonization of biovolume calculations between CEN standard EN-16695:2015 and the PEG biovolume list, starting with taxa that show major differences.
- PEG will present a new project proposal for the period 2020-2022 at the HELCOM autumn 2018 State and Conservation meeting.

### **Opening of the workshop**

The chair of the HELCOM Phytoplankton Expert Group (PEG), Ms. Iveta Jurgensone from the Latvian Institute of Aquatic Ecology, opened the meeting. The host Ms. Marie Johansen from the Swedish Meteorological and Hydrological Institute gave a short presentation with some practical information. All participants introduced themselves with name, affiliation and main focus of interest related to phytoplankton. The list of participants is attached as Annex 1.

All documents and presentations from the meeting will be available at the “PEG phytoplankton” workspace at HELCOM meeting Portal after the meeting.

### **Adopting the agenda and election of the rapporteur and future chair**

The agenda for the meeting was adopted by the participants without substantial changes (but was later on changed a bit since the update of the biovolume file took more than one day). Ms. Marie Johansen from Swedish Meteorological and Hydrological Institute (Sweden) was elected as rapporteur. Ms. Iveta Jurgensone was re-elected as chair for the next project period (May 2020-April 2022); all participants agreed and welcomed this. The agenda is added as Annex 2.

### **Information about last year's activities**

Ms. Iveta Jurgensone gave information about activities between the meetings 2017 and 2018. An extract of her presentation is given in Annex 3.

### **Planning of the new project 2020-2022**

The proposal for the new project period 2020-2022 was discussed and it will be presented at the HELCOM State and Conservation meeting in autumn 2018 by the chair Ms. Iveta Jurgensone.

### **Updating the HELCOM Guideline for Phytoplankton**

Ms. Heidi Hällfors from SYKE (Finland) chaired the discussion of the updating of the HELCOM COMBINE Manual for phytoplankton.

Minor changes was proposed to the guideline:

- Change the title to: “Guidelines for monitoring of phytoplankton species composition, abundance and biomass” to make it more consistent with other former HELCOM COMBINE guidelines.
- Change the reference to the CEN standard EN-16695:2015 in the text.
- Add “chains” into image 3 description and the corresponding text.
- Add a date to the document (when the updated version was uploaded at HELCOM WEB site). This last addition needs to be done by HELCOM.

The group finds it unclear if the phytoplankton guideline is still a part of the HELCOM COMBINE manual or not. This needs to be clarified at the HELCOM website. It has also to be clearly described how to refer to this, and other guidelines, at the HELCOM webpage (i.e. what is the correct reference). For this it is also important that the date of upload/updating of the document is included in the document.

The PEG group decided for now not to add a detailed table about what counting strategies are used in every PEG member laboratory.

### **Presentation of the German 2016 Phytoplankton ring test**

The report from the 2016 phytoplankton ring test, organized by the Quality Assurance Panel of the German Marine Monitoring Program of the North Sea and Baltic Sea located at the Federal Environment Agency, was presented at the meeting by Ms. Jessica Saule. Jessica Saule acknowledged the comments mentioned about the results of the ring test being tedious and time-consuming to report for the participants. The procedure was to count all species and give biomass in three different sub samples and to report the data in special excel sheets in different way than the PEG members are used to. The results presented by Jessica Saule showed a wide range of number of species reported by different taxonomists. It also indicated that biovolume calculations are made differently (it is however not possible to see the results of just the PEG-members). The results presented invited to a good discussion among the members attending the meeting.

### **Harmonization between the HELCOM PEG biovolume file and the CEN standard EN-16695:2015**

Ms. Jeanette Göbel from State Agency of Agriculture, Environment and Rural Areas (Germany) presented the work progress with the CEN standard EN 16695:2015 (Water quality - Guidance on the estimation of phytoplankton biovolume) and a comparison between standard and the PEG-biovolume file.

The group acknowledged that Ms. Ann-Turi Skjevik, Ms. Siv Huseby and Mr. Lars Edler as a group will start to check the species that has the largest discrepancy in biovolume between the two files. A thorough examination of differences in geometric shape between the two biovolume files will be discussed at the next PEG meeting in 2019 and these species will be addressed separately with comments and suggestions for the geometrical shape which should be used. A separate working file (Excel) will be sent to all PEG-members. The PEG group will provide photos of species where geometrical shape differs for discussion purposes.

### **Information about new literature, conferences etc.**

Ms. Heidi Hällfors (Finland) mentioned that a new book on dinoflagellates are about to be published. The name of the book is Süßwasserflora von Mitteleuropa, Bd. 6 - Freshwater Flora of Central Europe, Vol. 6: Dinophyceae. It will be available for sale in summer 2018.

Ms. Helene Munk Sørensen (Denmark) informed about the upcoming HAB conference in Nantes (France) in autumn 2018.

Ms. Janina Kownacka (Poland) informed about a new publication: Yang Li et al 2017. Diversity in the Globally Distributed Diatom Genus *Chaetoceros* (Bacillariophyceae): Three New Species from Warm-Temperate Waters. Plos One, 13 January 2017.

### **SYKE Phytoplankton proficiency test Prof Test 12/2017: Baltic Sea and freshwater species identification**

In autumn 2017 SYKE, Finland, provided a proficiency test of phytoplankton Prof Test 17/2017 and PEG members could, with the kind help with finance from HELCOM, participate in this test.

Ms. Heidi Hällfors, SYKE Finland, presented the identification part of the SYKE Phytoplankton proficiency test Prof Test 12/2017. Images used for the Baltic Sea and the freshwater identification part of the test (20 + 20 taxa) were shown and characteristics of the different taxa were carefully pointed out by Ms. Heidi Hällfors.

Ms. Sirpa Lehtinen (SYKE, Finland) presented the measuring and counting part of the proficiency test 12/2017. In the measuring part the size of *Aphanizomenon* sp. heterocysts, and the cells of *Rhodomonas marina* and *Scrippsiella hangoei* had been measured by the participants. All 39 participants had passed the test. Wrong size measurements can be due to faulty calibration of the ocular and objectives and/or a use of an insufficient magnification.

In the counting part of the test the species *Heterocapsa triquetra*, *Skeletonema marinoi* and *Woronichinia naegliana* had been counted on 30 video-clips by the participants. The species *Heterocapsa* and *Skeletonema* were easier to count but the most troublesome taxon was the colony-forming *Woronichinia*. Half of the participants had apparently counted exactly what was seen on the images, the other half assumed a sphere with cells on the surface. Some of the video clips were shown and the results and how to count the different species was discussed in the group. Following decisions were made:

- *Woronichinia naegliana* is a spherical cyanobacteria colony with the cells on the surface and should be counted as about the double of the cells seen on the video-clips. By teaching and examination of samples together at the PEG-meetings we can help each other to remind us how the number of cells in different colony-forming cyanobacteria should be estimated.
- Concerning diatoms, all cells with any plasma inside the cell should be counted (which is also consistent with our phytoplankton counting guideline). In a species as *Skeletonema marinoi*, with spiny connections between the cells, some had counted a cell if the actual cell (plasma) was inside the grid even if the spiny connections were crossing a side of the grid. Others included the connections in the unit "cell" and did not count the cell if the connections were crossing the side of the grid. Both ways is possible but you should always be consistent how you do it. This difference could explain some of the higher variance in the *Skeletonema* results.

SYKE will, most likely, arrange a phytoplankton ring test in autumn 2020 (October-November). The SYKE ring test will most likely continue as an ongoing program with a three year interval. The PEG members discussed and agreed on the possibility to use the SYKE ring test for the group in the future. It was agreed that using an implemented system would be beneficial as the test is then produced by an accredited laboratory for development of ring tests. This would also be cost efficient and money could be used to reduce costs for members attending the intercalibration. SYKE also welcomes input on how to make the test suitable for the PEG group's need which promotes the work and development of the group. Ms. Heidi Hällfors and Sirpa Lehtinen, both from SYKE Finland, will address these questions to the organizers.

### Training course

This year no expert had been invited as a teacher for the phytoplankton course. This year's practical part was dedicated to learn from each other, and thereby use the competence within the PEG group. The participants used half a day to look at samples collected in the Baltic Sea area. A big screen was used to show the samples to all members for common discussion on important details for identification. A lot of pictures of difficult taxa, taken by participants during the past year/years, were also presented and discussed.

### Updating the PEG Biovolume file

Ms. Iveta Jurgensone led the work with the updating of the biovolume file. (Since this took more than one long day, Wednesday, the updating was continued both on some hours on Thursday and Friday).

Ms. Iveta Jurgensone presented issues which had been discussed in correspondence with Mr. Michael Guiry, the person responsible for updating the taxonomical databases AlgaeBase and WoRMS. These issues were discussed within the group and it was agreed that Ms. Iveta Jurgensone together with Ms. Heidi Hällfors continues correspondence with Mr. Michael Guiry to resolve problematic taxonomical issues.

ICES can today not update old data in the phytoplankton database with the latest PEG biovolume file. Instead each country has to resend old data updated with the latest biovolume file, together with the new data. HELCOM PEG would like to send only new data to ICES through the different national database centers and thinks that ICES should be responsible for updating old data in the ICES database. It should be possible to see both what the valid name of a species is (according to the latest PEG Biovolume file) and what name was originally reported.

Before the meeting SMHI (Sweden) and Ms. Iveta Jurgensone had prepared a table with differences between WoRMS and Algaebase.

This year the major focus was on the 2/3 part of the list. The work was based on the last version of the file PEG\_BVOL2018\_working\_file.xls that was sent to the participants on 2018-04-03. This version included changes of size range for diatoms, updated synonyms and higher taxonomy for Chrysophyceae and Prymnesiophytes as well as new species and size classes (proposed by PEG members before the meeting) and other corrections and questions that needed to be addressed during the meeting.

The work at the meeting followed the holding points as agreed upon by earlier PEG meetings. Work on the different sheets were carried out simultaneously: Ms. Iveta Jurgensone had made changes to the sheet "Biovolume file", and the "Non-accepted" sheet and went through the changes. Ms. Siv Huseby from Umeå Marine Science Center (Umeå University, Sweden) handled changes in "Change log".

In the genus *Ceratium*, old synonyms will still be kept valid until the revision of all species belonging to this genus is completed in the Algaebase and WoRMS databases. For now there is for example two names, *Ceratium tripos* and *Tripos muelleri*, accepted in WoRMS for the same taxa.

Following new taxa were added to the biovolume file after presentation by Ms. Heidi Hällfors from SYKE (Finland) (see Annex 4): *Chrysococcus*, *Dinobryon borgeri*, *Dinobryon suecicum*, *Dinobryon suecicum* var. *longispinum*, *Eunotia zasuminensis*, *Nitzschia holsatica* and *Lepocinclis tripteris*.

Ms. Susanne Busch presented problems with hidden dimensions of *Attheya decora* and some *Chaetoceros* species where the hidden dimension of the size classes differs significantly. It was decided that one should use the relations of hidden dimensions of other size classes or similar species when adding new size classes.

The group decided that it will, in the future, try to reduce the number of size classes of species if there are too many size classes.

What is presented as size range was discussed, especially concerning centric diatoms where in several species only the diameter is shown in the size range column. Depending on the species both diameter and height are used in size range. No consensus was reached at the meeting and the question will be addressed again.

The HELCOM PEG still wants to keep the groups Pennales, Centrales, Unicell and Flagellates as well as the complexes *Diplopsalis* CPX, *Scrippsiella* CPX, and *Oblea rotunda* CPX. Ms. Marie Johansen will send a letter to ICES and WoRMS and stress the importance of these taxa to have a valid AphiaID.

Before the PEG\_BVOL2018 file is finalized and sent to ICES:

- class, order, genus and species names should be set in alphabetic order within a division and size classes in numeric order,
- all lines in "Species" column should be checked so there are no extra empty space after the name.

For next year's updating of the PEG\_BVOL2019 the file will be checked against WoRMS at the SMHI in early January 2019. The results of the comparison will be distributed to the PEG group. Corrections and additions of new species, size classes etc. to the PEG\_BVOL2018 file should be sent to Ms. Iveta no later than three weeks before the meeting 2019 to enable the distribution of the list in good time before the meeting.

For the revision of the PEG\_BVOL2019 file:

- 1) Check the last third part of the biovolume file (EUGLENOPHYTA, CHLOROPHYTA, BIGYRA, CERCOZOA, CHOANOZOA, INCERTAE SEDIS, CILIOPHORA and OTHERS) for synonym changes, update higher taxonomy and correct size ranges. Chlorophyceae will be updated by: Ms. Ann-Turi Skjevik and Ms. Janina Kownacka and the rest by Ms. Iveta Jurgensone. These changes should be sent to Ms. Iveta Jurgensone at the latest at end of February 2019. Additionally the use of Cryptophyceae instead of Cryptomonadales should be included.
- 2) Start the harmonization of the calculations between the BVOL file and the standard EN-16695:2015.
- 3) All new proposed species should be presented at the meeting with pictures, sizes etc.
- 4) New size classes to be added should be different in size ranges and volumes than the already existing. (At least 30% difference in biovolume compared with existing size classes and size ranges measured should be in accordance with that found in literature).
- 5) The use of the *Scrippsiella* CPX has to be discussed further. It was decided that for size class 1-3 to add a comment that it is *sensu lato* Hoppenrath et al. 2009 (Hoppenrath, M., M. Elbrächter and G. Drebes 2009. Marine Phytoplankton. Kleine Senckenberg-Reihe 49, Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, 264 pp.) (looks like *Scrippsiella* cf. *trochoidea*) and for size class 4-11 that it is the *Scrippsiella hangoei/Biecheleria baltica/Gymnodinium corollarium* complex. However, since this is not clear from the PEG\_BVOL files (past and present) at least Finland has used size classes 1-3 also for the *Scrippsiella hangoei/Biecheleria baltica/Gymnodinium corollarium* complex. Ms. Heidi Hällfors and Ms. Marie Johansen, responsible for updating the dinoflagellates, will make a proposal how to deal with this when the dinoflagellates are next updated as a group.

### **Updating the HELCOM PEG image gallery at NordicMicroalgae.org**

Ms. Janina Kownacka (National Marine Fisheries Research Institute, Poland) gave a presentation containing pictures of species not having any pictures in the HELCOM PEG gallery at NordicMicroalgae. The group looked through the pictures and agreed on new pictures to be added to the webpage. All together we decided to upload 26 images, made by Ms. Regina Hansen, Ms. Susanne Busch, Ms. Heidi Hällfors, Ms. Joanna Siemiak, Ms. Janina Kownacka and Ms. Helena Högländer.

All images to be included in the image gallery should:

- preferably be presented by the person proposing it, and information should be given about special characteristics for that species. This is an opportunity for the participants to learn about species that maybe not all encounter in their own samples.
- be of good quality and they should be cropped so they only contain cells of one species.

Before every meeting a document will be sent out with a list of species where there are no images in the HELCOM PEG image gallery.

### **Latest information about the HELCOM phytoplankton indicator work**

Mr. Norbert Wasmund (Leibniz-Institute for Baltic Sea Research Warnemünde, Germany) gave a presentation with an overview of the HELCOM HOLAS assessment. As the assessment is nearly finalized there was less time spent on this issue this year. Only three presentations of updated indicators followed by a short discussion within the group of how to best serve HELCOM in the indicator work.

Mr. Norbert Wasmund presented an update on the *Diatom-dinoflagellate index*.

Mr. Andres Jaanus (Estonian Marine Institute) presented an update on the *Seasonal succession of dominating phytoplankton groups* which now is in the state as a test indicator in the HOLAS II.

Ms. Heidi Hällfors presented a short overview on the *Cyanobacterial bloom index (CyaBI)* which is a pre-core indicator.

An overall discussion on possible ways to support the process by the PEG group developed after the presentations. Several of the PEG-members are already active in the work of the presented indicators and other indicators. The time assigned on the meeting is only sufficient for presentations and short discussions. One possibility for the future is to give comments on the functions of proposed indicators. It was proposed that one indicator will be in focus each year to enable extended discussions on its use and possibilities.

### **Updating the Baltic Sea Environment Fact Sheet “Cyanobacteria biomass”**

Mr. Norbert Wasmund from the Leibniz-Institute for Baltic Sea Research Warnemünde (Germany) presented the work about the HELCOM Baltic Sea Environment Fact Sheet. PEG agreed to continue updating the fact sheet “Cyanobacteria biomass”. Mr. Norbert Wasmund will continue to lead the work. Data from 2017 should be sent to him by end of June 2018 (or the latest in end of July).

Requested data from the “Cyanobacteria biomass” fact sheet have also been sent by Mr. Norbert Wasmund to Ms. Vivi Fleming-Lehtinen (from Finland) for inclusion in their “Cyanobacterial Bloom Index (CyaBI)”, a proposed HELCOM core indicator, combining satellite data with biomass data from samples.

### **Excursion and conference dinner**

On Thursday evening (12 April) the group enjoyed a lovely conference dinner at the restaurant “Brännö Vårdshus” situated on the Island Brännö. The short boat trip to the Island and the dinner provided excellent opportunities for net-working and discussions among the members of the group.

### **Planning of next meeting in 2019**

Next meeting in 2019 will be arranged in Riga, Latvia, with the Latvian Institute of Aquatic Ecology as host. Suggested dates are 8-12 April 2019.

During the meeting, at least one day is needed for the updating of the biovolume file.

- In 2019 the last third of the biovolume file will be revised for taxonomy, as decided on earlier meetings, according to our three years project. In 2019 following groups will be revised for higher taxonomy and synonyms: EUGLENOPHYTA, CHLOROPHYTA, BIGYRA, CERCOZOA, CHOANOZOA, INCERTAE SEDIS, CILIOPHORA and OTHERS.
- The taxa with largest differences between the CEN standard EN-16695:2015 and the PEG biovolume file will be checked by Ms. Siv Huseby, Mr. Lars Edler and Ms. Ann-Turi Skjevik. During the workshop the PEG group will agree upon compiled suggestions for geometrical shapes of selected species from HELCOM PEG biovolume file and CEN standard.
- Proposals for new size classes and taxa should be sent to Iveta at the latest three weeks before the meeting.
- The Swedish Meteorological and Hydrological Institute will check the PEG\_BVOL2018 file against WoRMS and AlgaeBase in the beginning of 2019 and this will be used to update the biovolume file with new synonyms.

The training course should focus on features you can see in a light microscope. The topic of the year should be diatoms, if a suitable teacher can be found. Dr. D. Sarno or Dr. A. Zingone were suggested as possible teachers. Furthermore PEG plans to:

- Discuss and continue the updating of the phytoplankton monitoring guidelines
- Discuss and continue the updating of the Environment Fact Sheet “Cyanobacteria biomass”.
- Inform about recent literature, conferences etc.
- Continue the updating of the HELCOM PEG image gallery at [NordicMicroalgae.org](http://NordicMicroalgae.org).
- Presentations of interesting project connecting to Baltic Sea phytoplankton are welcomed.

The first draft of the agenda for 2019 meeting will be sent out to the PEG group in early 2019.

**Additional presentations during the meeting****Presentation of the software Plankton Tool Box (Thursday)**

Ms. Ann-Turi Skjevik and Ms. Marie Johansen gave a hands-on introduction to the open access counting program Plankton tool box (PTBX). (The program is available at <http://nordicmicroalgae.org/tools>).

**Extra topic – blood red ice along the Baltic Sea coast winter 2018 (Thursday)**

Ms. Heidi Hällfors (SYKE, Finland) presented a phenomenon that occurred along the Finnish coast during winter and spring 2018, blood-red ice. Ms. Kaire Kaljurand (EMI, Estonia) observed the same phenomenon. The consensus among scientists is that the blood-red color was caused by pigments leaking from disintegrating bladder wrack (*Fucus vesiculosus*).

**The distribution of cyanobacteria in the Baltic Proper observed using novel methods in summer 2017 (Friday)**

Mr. Bengt Karlson (Swedish Meteorological and Hydrological Institute) presented a synthesis of phytoplankton data obtained through testing of various instruments in the Baltic Sea during the JERICO-NEXT Project.

**Experiences from analyzing multi-country phytoplankton data downloaded from [www.ices.dk](http://www.ices.dk) (Friday)**

Mr. Bengt Karlson (SMHI, Sweden) presented the analysis of HELCOM PEG data that he had downloaded from the ICES database. He explained that it is a bit complicated to download and that some data is missing and many errors in the data were found.

**Ending of the meeting**

Ms. Iveta Jurgensone thanked the organizers and the meeting participants and closed the meeting.

## Annex 1

**HELCOM PEG WORKSHOP AND TRAINING COURSE 09-13 APRIL 2018 IN GOTHENBURG, SWEDEN****LIST OF PARTICIPANTS (alphabetic order)**

<b>Name</b>	<b>Address</b>	<b>Telephone</b>	<b>E-mail</b>
Susanne Busch	Leibniz Institute for Baltic Sea Research; Seestr. 15, D-18119 Rostock GERMANY	+49 3815197440	<a href="mailto:susanne.busch@io-warnemuende.de">susanne.busch@io-warnemuende.de</a>
Lars Edler	WEAQ AB, Doktorsgatan 9D, SE-26252 Ängelholm, SWEDEN	+46 431 80854	<a href="mailto:lars.edler@telia.com">lars.edler@telia.com</a>
Annely Enke	Estonian Marine Institute University of Tartu Mäealuse 14 EE-12618 Tallinn ESTONIA	+372 56647252	<a href="mailto:annely.enke@ut.ee">annely.enke@ut.ee</a>
Marzena Fordon	Wojewódzki Inspektorat Ochrony Środowiska w Olsztynie Delegatura w Elblągu; ul. Powstańców Warszawskich 10, 82-300 Elbląg POLAND	+48 552327800	<a href="mailto:m.fordon@wios.olsztyn.pl">m.fordon@wios.olsztyn.pl</a> <a href="mailto:biologia.elblag@wios.olsztyn.pl">biologia.elblag@wios.olsztyn.pl</a>
Jeanette Göbel	State Agency for Agriculture, Environment and Rural Areas (LLUR), Hamburger Chaussee 25, D-24220 Flintbek, GERMANY	+49 434704444	<a href="mailto:jeanette.goebel@llur.landsh.de">jeanette.goebel@llur.landsh.de</a>
Regina Hansen	Leibniz Institute for Baltic Sea Research; Seestr. 15, D-18119 Rostock GERMANY	+49 3815197240	<a href="mailto:regina.hansen@io-warnemuende.de">regina.hansen@io-warnemuende.de</a>
Siv Huseby	Umeå Marine Sciences Center, Umeå University Norrbyn, SE-90571 Hörnefors SWEDEN	+46 90 786 7967	<a href="mailto:siv.huseby@umu.se">siv.huseby@umu.se</a>
Heidi Hällfors	Finnish Environment Institute (SYKE) Marine Ecological Research Laboratory Agnes Sjöbergin katu 2, FI-00790 Helsinki FINLAND	+358295 251 114	<a href="mailto:heidi.hallfors@ymparisto.fi">heidi.hallfors@ymparisto.fi</a>
Helena Högländer	Dept. of Ecology, Environment and Plant Sciences Stockholm University Svante Arrhenius väg 20 A SE – 10691 Stockholm SWEDEN	+46 8 6747551	<a href="mailto:helena.hoglander@su.se">helena.hoglander@su.se</a>
Andres Jaanus	Estonian Marine Institute University of Tartu Mäealuse 14 12618 Tallinn ESTONIA	+372 5097792	<a href="mailto:andres@sea.ee">andres@sea.ee</a>

Hans Henrik Jakobsen	Aarhus University, Faculty of Science and Technology, Department of Bioscience, Danish Centre for Environment and Energy (DCE), Frederiksborgvej 399, PO Box 358, DK-4000 Roskilde DENMARK	+45 22574058	<a href="mailto:hhja@bios.au.dk">hhja@bios.au.dk</a>
Marie Johansen	Swedish Meteorological and Hydrological Institute (SMHI) Oceanographic Unit Sven Källfeltsgata 15 SE-426 71 Västra Frölunda SWEDEN	+46 31 7518972	<a href="mailto:marie.johansen@smhi.se">marie.johansen@smhi.se</a>
Marléne Johansson	Umeå Marine Sciences Center, Umeå University Norrbyn, SE-90571 Hörnefors SWEDEN	+46 90 786 55 64	<a href="mailto:marlene.a.johansson@umu.se">marlene.a.johansson@umu.se</a>
Iveta Jurgensone Chair	Daugavpils University Agency Latvian Institute of Aquatic Ecology, Department of Marine Monitoring Voleŗuieŗa 4 Riga, LV-1007, LATVIA	+371 26446019	<a href="mailto:iveta.jurgensone@lhei.lv">iveta.jurgensone@lhei.lv</a>
Kaire Kaljurand	Estonian Marine Institute University of Tartu Mäeŗaluse 14 12618 Tallinn ESTONIA	+372 6718974	<a href="mailto:kaire.kaljurand@ut.ee">kaire.kaljurand@ut.ee</a>
Maria Karlberg	Swedish Meteorological and Hydrological Institute (SMHI) Oceanographic Unit Sven Källfeltsgata 15 SE-426 71 Västra Frölunda SWEDEN	+46 31 7518939	<a href="mailto:maria.karlberg@smhi.se">maria.karlberg@smhi.se</a>
Bengt Karlson	Swedish Meteorological and Hydrological Institute (SMHI) Oceanographic Unit Sven Källfeltsgata 15 SE-426 71 Västra Frölunda SWEDEN	+46 31 7518958	<a href="mailto:bengt.karlson@smhi.se">bengt.karlson@smhi.se</a>
Chatarina Karlsson	Pelagia Nature and Environment AB Industrivägen 14 SE- 901 30 Umeå SWEDEN	+46 90702179	<a href="mailto:chatarina.karlsson@pelagia.se">chatarina.karlsson@pelagia.se</a>
Beata Kowalkowska	Wojewódzki Inspektorat Ochrony Środowiska w Gdańsku, Delegatura w Słupsku, ul.Kniażewicza 30 76-200 Słupsk POLAND	+48 59 7141903	<a href="mailto:b.kowalkowska@gdansk.wios.gov.pl">b.kowalkowska@gdansk.wios.gov.pl</a>
Janina Kownacka	National Marine Fisheries Research Institute, Department of Fisheries Oceanography and Marine Ecology, ul. Koŗłataja 1, Gdynia 81-332 POLAND	+48 58 7356288	<a href="mailto:janina.kownacka@mir.gdynia.pl">janina.kownacka@mir.gdynia.pl</a>

Sirpa Lehtinen	Finnish Environment Institute (SYKE) Marine Ecological Research Laboratory Agnes Sjöbergin katu 2, FI-00790 Helsinki FINLAND	+358 295 251 353	<a href="mailto:sirpa.lehtinen@ymparisto.fi">sirpa.lehtinen@ymparisto.fi</a>
Malin Mohlin	Medins Havs och Vattenkonsulter AB Företagsvägen 2, SE-435 33 Mölnlycke SWEDEN	+46 31 3614086	<a href="mailto:malin.mohlin@medinsab.se">malin.mohlin@medinsab.se</a>
Mats Nebaeus	Pelagia Nature & Environment AB Industrivägen 14, 2 tr SE-901 30 Umeå SWEDEN		<a href="mailto:mats.nebaeus@gmail.com">mats.nebaeus@gmail.com</a>
Irina Olenina	Department of Marine Research of Environmental Protection Agency, Lithuania Taikos 26 LT-91141 Klaipeda LITHUANIA	+370 61205120	<a href="mailto:i.olenina@aaa.am.lt">i.olenina@aaa.am.lt</a>
Jessica Saule	Umweltbundesamt Qualitätssicherungsstelle des BLMP (FG II 2.5 - Labor für Wasseranalytik) Bismarckplatz 1, 14193 Berlin GERMANY		<a href="mailto:jessica.saule@uba.de">jessica.saule@uba.de</a>
Joanna Siemiak-Zielonka	Wojewódzkiego Inspektoratu Ochrony Środowiska w Gdańsku; Traktów. Wojciecha 293 80-001 Gdańsk POLAND	+48 583094911	<a href="mailto:j.siemiak@gdansk.wios.gov.pl">j.siemiak@gdansk.wios.gov.pl</a>
Ann-Turi Skjevik	Swedish Meteorological and Hydrological Institute (SMHI) Oceanographic Unit Sven Källfeltsgata 15 SE-426 71 Västra Frölunda SWEDEN	+46 31 751 89 79	<a href="mailto:Ann-Turi.Skjevik@smhi.se">Ann-Turi.Skjevik@smhi.se</a>
Helene Sørensen	Ministry of Environment and Food of Denmark, Environmental Agency, Vasevej 7 8920 Randers NV DENMARK	+45 91 32 95 61	<a href="mailto:hemso@mst.dk">hemso@mst.dk</a>
Norbert Wasmund	Leibniz Institute for Baltic Sea Research; Seestr. 15, D-18119 Rostock GERMANY	+49 381 5197212	<a href="mailto:norbert.wasmund@io-warnemuende.de">norbert.wasmund@io-warnemuende.de</a>

## Annex 2

**WORKSHOP AND TRAINING COURSE of the HELCOM Phytoplankton Expert Group (PEG)  
9-13 APRIL 2018 IN GOTHENBURG, SWEDEN**

Venue: Gothenburg University, Marine Institute, Carl Skottsbergs gata 22b, Gothenburg, Sweden

**AGENDA**

**Monday April 9<sup>th</sup> 2018**

**Room: The big lecture hall**

- |             |   |
|-------------|---|
| 9:00–9:10   | Opening of the Workshop<br><i>Chair Iveta Jurgensone, Marie Johansen, Ann-Turi Skjevik</i>  |
| 9:10–9:20   | Election of the rapporteur, adoption of agenda<br><i>Iveta Jurgensone</i>   |
| 9:20–9:55   | Information on last year's activities<br><i>Iveta Jurgensone</i>  |
| 9:55–10:30  | Planning of the new project, elections of new Chair<br><i>Iveta Jurgensone + all</i>  |
| 10:30–11:00 | Coffee  |
| 11:00–11:50 | Cont. Planning of the new project, elections of new Chair<br><i>Iveta Jurgensone + all</i>  |
| 11:50–12:30 | Updating the HELCOM COMBINE manual<br><i>Heidi Hällfors + all</i>   |
| 12:30–14:00 | Lunch   |
| 14:00–15:00 | Results of the Phytoplankton Ring test 2016<br><i>Jessica Saule</i>   |
| 15:00–15:20 | Coffee  |
| 15:20–16:30 | Harmonization between the HELCOM PEG biovolume file and the CEN stand<br>Geometric shapes, Formula correction factors<br><i>Iveta Jurgensone, Jeanette Goebel + all</i> |
| 16:30–17:00 | Information about new literature, conferences etc.<br><i>Iveta Jurgensone + all</i>   |

**Tuesday April 10<sup>th</sup> 2018**

**Room: Sal 1**

- |             |   |
|-------------|---|
| 9:00–10:30  | SYKE Phytoplankton proficiency test ProfTest 12/2017: Baltic Sea and freshwater species identification<br><i>Heidi Hällfors</i> |
| 10:30–11:00 | Coffee  |
| 11:00–12:30 | Overview of the SYKE Phytoplankton Proficiency test 12/2017 results: Measuring and counting<br><i>Sirpa Lehtinen</i>            |
| 12:30–14:00 | Lunch   |
| 14:00–15:30 | Training course and analysis of own samples   |
| 15:30–16:00 | Coffee  |
| 16:00–18:00 | Training course and analysis of own samples   |

**Wednesday April 11<sup>th</sup> 2018**

**Room: Sal 1**

- |           |  |
|-----------|--|
| 9:00–9:30 | Information about the correspondence with WoRMS and AlgaeBase of the PEG |
|-----------|--|

- problematic species list  
*Iveta Jurgensone*
- 9:30–10:30 Updating the HELCOM PEG taxa and biovolume file  
*Iveta Jurgensone + all*
- 10:30–11:00 Coffee
- 11:00–12:00 Updating the HELCOM PEG taxa and biovolume file  
*Iveta Jurgensone + all*
- 12:00–13:30 Lunch
- 13:30–15:00 Updating the HELCOM PEG taxa and biovolume file  
*Iveta Jurgensone + all*
- 15:00–15:30 Coffee
- 15:30–20:00 Updating the HELCOM PEG taxa and biovolume file  
*Iveta Jurgensone + all*

**Thursday April 12<sup>th</sup> 2018****Room: Sal 6**

- 9:00–10:10 Image gallery: all phytoplankton groups with focus to fill gaps where images are missing  
*Janina Kownacka + all*
- 10:10–10:30 Coffee
- 10:30–11:40 Discussions of the first results of the HOLAS assessment and the proceeding of the phytoplankton indicator work  
*Norbert Wasmund, Andres Jaanus, Heidi Hällfors + all*
- 11:40–12:00 Updating the “Cyanobacteria biomass” Baltic Sea Environmental Fact Sheet  
*Norbert Wasmund*
- 12:00–13:30 Lunch

**Room: Sal 10**

- 13:30–14:30 Presentation of the free counting and data handling program  
*Ann-Turi Skjevik, Marie Johansen*
- 14:30–16:10 Cont. Updating the HELCOM PEG taxa and biovolume file  
*Iveta Jurgensone + all*
- 16:10 Excursion and Conference dinner

**Friday April 13<sup>th</sup> 2018****Room: The big lecture hall**

- 9:00–9:30 The distribution of cyanobacteria in the Baltic Proper observed using novel methods in summer 2017  
*Bengt Karlson (Felipe Artigas, Johannes Johansson, Malin Johansson, Sirpa Lehtinen, Arnaud Louchart, Jukka Seppälä and Lars Stemann)*
- 9:30–10:00 Experiences from analyzing multi-country phytoplankton data downloaded from [www.ices.dk](http://www.ices.dk)  
*Bengt Karlson*
- 10:00–10:10 Coffee
- 10:10–10:40 Cont. Updating the HELCOM PEG taxa and biovolume file  
*Iveta Jurgensone + all*
- 10:40–11:50 Tasks for the next meeting and discussions about PEG report 2018  
*Iveta Jurgensone + all*
- 11:50–12:00 Summing up and closing of the meeting  
*Chair Iveta Jurgensone, Marie Johansen*

## Annex 3

**Last year's activities (April 2017–April 2018)****1) Information from HELCOM STATE & CONSERVATION GROUP**

STATE & CONSERVATION 6-2017 meeting in 15-19 May, 2017 Uppsala, Sweden

**HELCOM indicators and assessment**

- 4J.53 The Meeting took note of the current Status of development of pre-core and candidate indicators (document 4J-7). The Meeting identified the following indicators to be of high priority for the upcoming year: -Diatom-dinoflagellate indicator, Germany

**Reporting from experts groups, networks and projects**

- 4J.61 The Meeting took note of the report from the 2017 annual meeting of Phytoplankton Expert Group, PEG QA (document 4J-8).

**Phytoplankton monitoring guidelines**

- 5J.1 The Meeting considered the monitoring guidelines concerning phytoplankton species composition, abundance and biomass (document 5J-1) and endorsed their publication in the HELCOM Monitoring Manual.

*Comments from Germany:*

Reference "CEN 2015" should be corrected to: "EN 16695 water quality – guidance on the estimation of phytoplankton volume" amended by a foot note "For undated references, the latest edition of the referenced document (including any amendments) applies."

In comparison to the other guidelines this document is very comprehensive. Possibly it could be shortened if references to the following standards are included (amended by the foot note see above): EN 15204: Water quality - Guidance standard on the enumeration of phytoplankton using inverted microscopy (Utermöhl technique); EN 15972: Water quality - Guidance on quantitative and qualitative investigations of marine phytoplankton«

13.04.2018 STATE & CONSERVATION 7-2017 meeting in 23-27 October, 2017 Sopot, Poland

**HELCOM indicators and assessment**

- 3J.1 The Meeting took note of the information that the first version of the 'State of the Baltic Sea' report prepared by the HOLAS II project was published in June 2017 and is available via <http://stateofthebalticsea.helcom.fi/>
- Updating of existing HELCOM core indicator reports

**Phytoplankton monitoring guidelines**

- 4J.1 The Meeting took note of the publication on the HELCOM website of monitoring guidelines for reproductive status of seals, extended Rapid Assessment Survey for non-

indigenous species, phytoplankton species composition, abundance and biomass as well as mesozooplankton.

Next STATE & CONSERVATION 8-2018 meeting in 14 –18 May 2018, Klaipeda, Lithuania

- Document submission 23 April 2018

## 2) Update of biovolume file

- After the meeting all agreed biovolume file PEG\_BVOL2017 changes were added and sent to ICES and in 19 June, 2017 the file version 2017-06-20 was accepted by ICES.
- *Ceratoneis closterium* was changed back to *Cylindrotheca closterium* and ICES accepted the file version 2017-06-27.
- In October 2017 *Pseudo-nitzschia seriata* SIZCL 1 was found twice in PEG\_BVOL, both as accepted and as non-accepted. This was corrected and ICES accepted the corrected file version 2017-10-11.
- In September 28 the list of problematic species 2017 was sent to Petra Schilling.
- In December 21 the list of problematic species 2017 was sent to WoRMS and AlgaeBase. Professor Michael Guiry answered in December 22.
- The PEG\_BVOL2018 file was checked against WoRMS at the SMHI and the file «HELCOM\_PEG\_2018\_WoRMS.xlsx» was sent to the group in 29 January 2018.
- The corrections sent by Susanne Bush, Irina Olenina, Helena Högländer and Heidi Hällfors for the dinoflagellates and second third of the biovolume file (diatoms) were sent by the end of February.
- New species and size classes were sent by the end of March.
- The new updated «PEG\_BVOL2018\_version\_03\_04» was sent to the PEG group in 3 April 2018.

## 3) Baltic Sea Environment Fact Sheet – Cyanobacteria biomass indicator

- Group agreed to continue the work and sent total biomass data of genera *Nodularia*, *Aphanizomenon* and *Dolichospermum* to Mr. Norbert Wasmund before end of June 2017.
- Updated Fact sheet was published 28 August 2017 at the HELCOM website.

#### **4) Upload of images to image gallery**

The agreed photos (11 images of different taxa) of the PEG were uploaded to [www.NordicMicroalgae.org](http://www.NordicMicroalgae.org) by the originators.