



Outcome of the intersessional meeting of HELCOM – Baltic Earth Expert Network on Climate Change (EN CLIME 6C-2020)

Introduction

0.1 The Intersessional Meeting of the joint HELCOM/Baltic Earth Expert Network on Climate Change (EN CLIME 6C-2020), was held as an online meeting on 30 November 2020.

0.2 The Meeting was attended by most of the EN CLIME Lead Authors and main contributors. The List of participants is contained in **Annex 1**.

0.3 The Meeting was chaired by Mr. Jonas Pålsson, Co-Chair of the Expert Network. Ms. Petra Kääriä, HELCOM, acted as secretary of the Meeting.

0.4 The aim of the Meeting was to consider the peer review comments and process as well as specific matters related to the Climate Change Fact Sheet final report.

Agenda Item 1 Adoption of the Agenda

1.1 The Meeting adopted the Agenda.

Agenda Item 2 Structure and layout of the final report

2.1 The Meeting considered the Sankey diagram depicting the connections between the parameters (document 4), as presented by the Secretariat.

2.2 The Meeting agreed to delete text in brackets from the parameter titles.

2.3 The Meeting further agreed to delete 'heat waves' and 'extremes' from the parameter titles, however noted that information on extremes might be important and of interest for readers and decided to add text in the *Introduction* section describing which parameters include information on extreme events.

2.4 The Meeting welcomed the revised icons prepared by the Secretariat and provided the following comments:

- Large Scale Atmospheric Circulation: front should be drawn a different way and the picture could be less round not to resemble an ear. Details will be communicated between the co-Chair and Secretariat.
- Sea ice: suggestion to add an outline of an iceberg
- Sea level: left part of the wave could be removed
- Waves will be revised (not to resemble shark fins)
- Fish will be separated into two icons and the details will be communicated between the co-Chair and Secretariat.
- Ecosystem function: the current logo was considered good as it catches the complexity of the topic. Also, a symbol with three different sized fish eating each other + a sun and cloud symbols was

suggested as an alternative. The Lead of Water Cycle parameters and Secretariat will communicate about the details.

- Coastal protection and offshore structures: suggestions to turn the windmill (not to look like a rocket) and draw a circle around it. The Meeting agreed to come back to discussing this icon at a later stage
- Ecosystem services: add human hand under the fish, as well as something describing other ecosystem services, e.g. small yacht (tourism) and sun – add human dimension

2.5 The Meeting considered the parameter 'Runoff' and agreed to change the name to 'River run-off' throughout the report.

2.6 The Meeting considered the parameter 'Changes in carbonate chemistry', noted the suggestion to rename it as 'Ocean acidification', however as the topic is broader also including organic matter production and respiration agreed to rename it as 'Carbonate chemistry'. The Meeting noted that acidification is also addressed in the parameter key messages (as the parameter 'Acidification' was combined with 'Changes in carbonate chemistry').

2.7 The Meeting considered the parameter 'Oxygen concentration and hypoxia' and noted that it should be more consistent with the other titles and the parameter 'Carbonate chemistry'. The Meeting thus agreed to rename it as 'Oxygen'.

2.8 The Meeting considered the map view of eight previously selected parameters, as presented by the Secretariat and noted that the word limit for the map text is 50 words per assessment unit. The Meeting noted that combined subbasin borders will be added to the picture.

2.9 The Meeting agreed that a short description and a link to further clarification of RCP4.5 and other RCPs will be added on the map view page and invited the Secretariat to provide this text.

2.10 The Meeting suggested to change the map view title from 'RCP4.5' to 'Future of Baltic Sea' or 'Projections of the Baltic Sea' with a subheading indicating that the information depicted in the map is according to IPCC RCP4.5.

2.11 The Meeting agreed that text for the map view for the agreed parameters (Sea temperature, Sea ice, Sea level, Precipitation, Oxygen, Nutrient concentrations and eutrophication as well as Benthic habitats and Shipping) will be submitted to the Secretariat (petra.kaaria@helcom.fi) by **15 December 2020**.

Agenda Item 3 Peer review process

3.1 The Meeting agreed that comments on the second draft text on Introduction ([document 2-Rev.2](#)) will be provided to the Secretariat (petra.kaaria@helcom.fi) by **15 December 2020**.

3.2 The Meeting agreed that text on the summary for each parameter (document 1) will be submitted to the Secretariat (petra.kaaria@helcom.fi) by **15 December 2020**.

3.3 The Meeting welcomed the following status of work on the revised key messages, as presented by the Lead/Co-Lead Authors and emphasized that additional comments have been provided by the peer reviewers on the specific parameters and the comments are available on the [workspace](#) (please note that comments by peer reviewer 6 are provided as a separate [file](#)). The Meeting invited the Lead Authors to consider both the comments provided by the peer reviewers and by this meeting in their revised key messages.

Direct parameters (previously called primary parameters)

- **Changes in carbonate chemistry:** Most suggested changes are already incorporated, and good rephrasing was suggested by the peer reviewers.
- **Oxygen and hypoxia:** not that many critical comments, overlap can be easily sorted out.
- **Large Scale Atmospheric Circulation** has been restructured and comments included.
- **River run-off:** the text has been revised and is considered OK, a few aspects regarding synchronizing with precipitation are still to be addressed. Comments provided the Co-Chair will also be addressed.

- **Riverine nutrient loads and atmospheric deposition:** repetition between ‘River runoff’ and ‘Riverine nutrient loads and atmospheric deposition’ is unavoidable. The word bioavailability will be explained with half a sentence and comments raised by the meeting will be incorporated.
- **Salinity, Stratification, Precipitation, Sediment transportation:** still being commented by the authors. It needs to be checked whether there are clear trends in the records for changes in precipitation in the southern Baltic Sea during summer.
- **Sea ice:** most comments will be considered in the revision and more focus will be given to the Baltic Sea level. Sea ice effect on gas exchange is not considered as important from sea ice perspective. There are not that many other parameters influenced by sea ice.
- **Sea level:** it was noted that this parameter text contains more references than the other key messages and noted that this is OK due to the long monitoring history and suggested to focus on original references (instead of BACC II)
- **Sediment transportation:** two peer reviewers had suggested synchronizing the parameters ‘Sediment transportation’ and ‘Coastal protection and offshore structures’ (to communicate the same facts and not have too much overlap). It was decided not to merge these two and to provide more specific information on the ‘Coastal protection and offshore structures’ parameter.
- **Solar radiation and cloudiness:** some reviewers wished to add Baltic streams however this is not considered as relevant. Policy relevance was changed a bit.

Indirect parameters (previously called secondary parameters)

- **Benthic habitats:** suggested changes by peer reviewers have been taken into, however effect from diving birds was not considered as relevant. It was considered as difficult to incorporate all changes and still keep the text within 100 words.
- **Blue carbon storage capacity**
The Meeting appreciated the work done on the parameter and was of the opinion that this is an important topic to consider in relation to climate change. However, currently the focus of the text is not on the Baltic Sea level and the Meeting suggested that unless the text can be revised to be more focused on the Baltic Sea level, this parameter would be skipped from the Baltic Sea Climate Change Fact Sheet.
- **Coastal and marine ecosystem services:** as the topic is so complex and difficult, the text should be formulated very carefully. Not much scientific literature is available on the topic from the Baltic Sea scope. It was noted that each sentence should have a reference. It was also suggested to describe positive and negative impacts without judging anything about the responding trends.
This text was considered as problematic as many statements are not supported by literature.
- **Coastal and migratory and Demersal and pelagic fish**
Some peer review comments were considered as helpful, some on the other hand not very easy to understand. Keeping the 100-word limit after incorporating changes suggested by the reviewers is considered problematic. Preliminary studies mentioned will be cited under knowledge gaps.
- **Ecosystem function:** a lot of comments were received, and the text will be revised accordingly. It was advised not to draw overall conclusions and to line with the key messages of ‘Solar radiation’.
- **Coastal protection and offshore structures:** critique was raised by the peer reviewers that the text is mostly about coastal protection and more text is needed on climate change impacts on offshore structures. However, scientific literature on climate change effects on offshore structures is lacking, but issues such as impact of offshore windfarms to local ecosystems are known.
It was discussed whether complex interactions with conflicting interests should be more highlighted in the text (e.g. building windmills leaves less space for fisheries). It was also pointed out that the title would possibly need rephrasing. Two experts from Denmark and

Germany were suggested to be contacted for further working on the parameter. Communication between the Lead Author and Co-Chair Markus Meier will be carried out.

- **Fisheries:** All peer review comments have been incorporated and those from the Co-Chair will also be considered by the deadline of 7 December. Two major things were raised in the comments: 1) better synchronization between fish and fisheries parameters and 2) more emphasis on recreational fisheries.

The Meeting noted that the authors for fish and fisheries parameters are mostly the same people and the aim has been to avoid repetition between these parameters. The Meeting agreed not to merge the parameters on fish and fisheries and noted that recreational fisheries have been addressed in a more general level in the key messages.

- **Microbial community and processes**
This text was considered to be nicely written however complicated for a layman to understand.
- **Non-indigenous species:** editorial changes have been incorporated, comments on species migration were not considered as relevant as NIS are transferred by human activities. Notes on calcium carbonate changes were addressed. It was agreed that a sentence on the impacts of acidification on shell formation of NIS species (non-native species might have different response to pH changes, e.g. species from lake environments) will be added.
- **Nutrient concentrations and eutrophication:** Many comments were received from the peer reviewers. More quantitative information required by one reviewer not possible to add due to lack of scientific literature. The statement that changing deep water oxygen levels mask load reduction needs further consideration. Further discussion on the peer review comments will continue via e-mail exchange between the group.
- **Marine mammals:** The authors are happy with the current text. Reviewer comments did not cause major changes.
- **MPAs:** Most of the suggested changes have been incorporated. One major change was that acidification aspects were removed from the MPA key messages, as they are not relevant on MPA level. Answers to the reviewer comments are included in the document. **Shipping:** Other drivers section considered difficult, new text is fine.

3.4 The Meeting considered cross-referencing between different parameter key messages, noted that for example the parameter 'Sea temperature' includes more links than other key messages and was of the opinion that as water temperature is key among the key messages, it is OK for it to have more links than for example shipping.

3.5 The Meeting agreed that links to skipped parameters can also be provided if relevant (i.e. HABs, Pelagic habitats, Harmful algal blooms, Pollution and hazardous substances, Ecotoxicology, Human health, Pathogens).

3.6 The Meeting agreed that the Lead Authors will scrutinize the linked parameters and make changes if needed and the Co-Chairs and Secretariat will check for consistency (e.g. that links are provided both ways between parameters).

3.7 The Meeting questioned whether the 100-word limit can be exceeded in cases where more text would be crucial for the message to be understood and welcomed the clarification by the Secretariat that the word limit can be extended up to 120 word under headings not including confidence assessment however is strictly maximum 100 words under headings with confidence assessment.

3.8 The Meeting recommended that a reference be added after each statement.

3.9 The Meeting noted that in case good arguments can be provided not to follow the peer review comments, they can be ignored.

3.10 The Meeting invited the Lead Authors to prepare response to the peer reviewers in case of major issues, e.g. significant overlap and contradicting key messages between different parameters.

3.11 The Meeting emphasized the need to focus on climate change impacts on each parameter.

3.12 The Meeting welcomed that Co-Chair Jonas Pålsson will make suggestions for changes under the *Policy relevance* section and contact the lead authors directly.

3.13 The Meeting agreed that the key messages will be revised based on the peer review comments and the revised texts submitted to the Secretariat (petra.kaaria@helcom.fi) as soon as possible and at latest **by 7 December 2020**.

Agenda Item 4 Future work

4.1 The Meeting recalled the decision by EN CLIME 6B-2020 that the intention is to avoid the need for a second peer review round and rather contact additional colleagues in order to improve some key messages, if needed.

4.2 The Meeting agreed that the co-Chairs and the Secretariat will carry out the second peer review round and provide comments on the revised key messages **by 31 December 2020**. The Meeting noted that the review can start as soon as the comments from the first peer review round have been incorporated in the key messages. The Lead Authors are invited to further revise the key messages based on the comments by the second peer review round **by 15 January**.

4.3 The Meeting stated that in case problems arise with meeting the deadlines, the Secretariat and Co-Chairs should be contacted in order to find a solution.

4.4 The Meeting revised the following time schedule for the upcoming work:

Task	Deadline/period	Responsible
Key messages		
Revised text based on 1st peer review round comments submitted to the Secretariat	7 December	Lead Authors
Second review round	31 December	Co-Chairs and Secretariat
Revised text based on second review round	15 January	Lead Authors
Submission of ready peer reviewed key messages and report for HELCOM State & Conservation WG approval	22 January	Lead Authors
Possible revision of key messages and report based on comments by S&C	15 Feb-23 Feb	Lead Authors
Submission of final key messages for adoption by HELCOM 42-2021	23 February	Lead Authors
Other texts/graphs for the Climate Change Fact Sheet Report		
Comments on second draft text for <i>Introduction</i>	15 December	All EN CLIME members
Text for overview/summary for each parameter	15 December	Lead Authors
Text on map view parameters	15 December	Lead Authors
Final draft text for <i>Introduction</i>	11 January	Secretariat and Co-Chairs
First draft text for <i>Summary and conclusions</i>	11 January	Secretariat and Co-Chairs
<i>EN CLIME 7-2021</i>	18 January	All EN CLIME members
Final text for <i>Summary and conclusions</i>	22 January	All EN CLIME members

4.5 The Meeting recalled the upcoming meeting of the Network (EN CLIME 7-2021) on 18 January 2021, at 10-17 EET.

Agenda Item 5 Any other business

5.1 The Meeting recalled that EN CLIME 6B-2020 noted that the term 'solar radiation' is not entirely correct, however as it is commonly used in meteorology it could be use as such in the Fact Sheet. The Meeting noted that within the Secretariat the term 'solar radiation' was supported.

Agenda Item 6 Outcome of the Meeting

6.1 The Outcome of EN CLIME 6C-2020 was approved via correspondence and is available at the [EN CLIME 6C-2020 Meeting Site](#), together with documents considered by the Meeting.

Annex 1 List of participants

Representing	Name	Organization	E-mail
Co-Chairs			
Co-Chair	Jonas Pålsson	Swedish Agency for Marine and Water Management	jonas.palsson@havochvatten.se
Co-Chair	Markus Meier	Baltic Earth	markus.meier@io-warnemuende.de
Baltic Earth			
Baltic Earth	Karol Kuliński lead Carbon & Nutrient Cycles	Institute of Oceanology of the Polish Academy of Sciences	kroll@iopan.pl
Baltic Earth	Anna Rutgersson lead Energy cycle parameters; Shipping	Uppsala University	anna.rutgersson@met.uu.se
Baltic Earth	Christian Dieterich lead Sea Level and Wind Extremes parameters	Swedish Meteorological and Hydrological Institute	christian.dieterich@smhi.se
Baltic Earth	Kari Hyytiäinen co-author tourism	University of Helsinki	kari.hyytiainen@helsinki.fi
Baltic Earth	Marcus Reckermann	Helmholtz-Zentrum Geesthacht	marcus.reckermann@hzg.de
Baltic Earth	Gregor Rehder	IOW	gregor.rehder@io-warnemuende.de
Baltic Earth	Jürgen Holfort	Federal Maritime and Hydrographic Agency (BSH)	juergen.holfort@bsh.de
Baltic Earth	Jukka Käyhkö lead Water Cycle parameters; Coastal protection and offshore structures	University of Turku	jukka.kayhko@utu.fi
HELCOM Contracting Parties			
Germany	Jan H. Reißmann	Federal Maritime and Hydrographic Agency (BSH)	jan.reissmann@bsh.de
Germany	Miriam Sollich	BfN	Miriam.Sollich@BfN.de
Finland	Ari Laine lead NIS; MPAs	Parks and Wildlife Finland	ari.laine@metsa.fi
Finland	Markku Viitasalo lead MPAs	SYKE	Markku.viitasalo@syke.fi
Finland	Meri Kallasvuo co-lead Fisheries	Natural Resources Institute	Meri.Kallasvuo@luke.fi
Finland	Markus Ahola	Swedish Museum of Natural History	markus.ahola@nrm.se
Lithuania	Arturas Razinkovas-Baziukas Lead ecosystem services	Klaipėda University, Marine Research Institute	arturas.razinkovas-baziukas@ku.lt

Sweden	Bärbel Muller-Karulis lead Nutrient concentrations and eutrophication		barbel.muller.karulis@su.se
Sweden	Antonia Sandman lead Benthic habitats	AquaBiota Water Research	antonia.sandman@aquabiota.se
Sweden	Jens Olsson co-lead fish	Swedish University of Agricultural Sciences	Jens.olsson@slu.se
Sweden	Örjan Östman co-lead Fish, lead Ecosystem function	Swedish University of Agricultural Sciences	orjan.ostman@slu.se
Sweden	Oleg Savchuk	Baltic Nest Institute	oleg.savchuk@su.se
HELCOM Secretariat			
Secretariat	Petra Kääriä	HELCOM	petra.kaaria@helcom.fi
Secretariat	Dominik Littfass	HELCOM	dominik.littfass@helcom.fi