Document title	HELCOM work on climate change
Code	5-4
Category	CMNT
Agenda Item	5 - Ecosystem-based approach in MSP
Submission date	26.10.2018
Submitted by	HELCOM Secretariat
Reference	

Background

Two major thematic climate change assessments have been released by HELCOM, the first in 2007 followed by another in 2013. Both reports have been prepared in close collaboration with BALTEX and its successor programme, Baltic Earth.

The HELCOM 2013 Ministerial Meeting in Copenhagen agreed to make the assessment of regional climate change and its implications on the Baltic Sea ecosystem a regular activity. According to the Roadmap of HELCOM activities on the ecosystem-approach (cf. HELCOM 38-2017, document 3-1), as well as the State and Conservation work plan the next climate change assessment is scheduled to start in 2018.

The STATE&CONSERVATION 8-2018 meeting welcomed the plan for climate change work (cf. HELCOM STATE&CONSERVATION 8-2018, document 8J-2), supported the suggested approach, and emphasized the need to link the climate change work to the Baltic Sea Action Plan and other HELCOM targets and measures. The meeting also emphasized that, as climate change is a cross-cutting issue, the proposed EN CLIME would need to have an inclusive working structure and prioritize close cooperation with both internal (e.g. Expert Networks) and external partners (e.g. Baltic Earth initiating work on BACC 3). The meeting agreed on the climate change report card as the aim of the HELCOM climate change assessment work.

HOD 54-2018 considered the proposed HELCOM work on climate change (cf. HELCOM HOD 54-2018, document 4-20) and emphasized the importance of the practical nature of the work and linking the work to that on indicators and measures, and especially updating of the BSAP. The meeting supported the proposed direction of the work and agreed that the dedicated work on climate change will begin in 2018.

Previous HELCOM climate change assessments have been conducted in close cooperation with Baltic Earth (formerly known as BALTEX). Characterisation of different pressures on the natural and human-shaped environment of the region, such as climate change, and synthesis of the state of scientific knowledge about their causes and impacts, has been a core goal of BALTEX in their climate change assessments (BACC I and II). Through the Chair of the Baltic Earth Science Steering Group (BESSG), has taken note of the HELCOM plan and proposed structure of the work and expressed interest in keeping up the fruitful cooperation with HELCOM on any planned climate-change related work.

At the HELCOM 2018 Brussels Ministerial Meeting the importance of linking HELCOM's work more strongly to climate change and especially the need to account for climate change in the process of updating the BSAP was highlighted.

This document provides a general description of the planned HELCOM work on climate change.

Action requested

The Meeting is invited to:

- reflect on the direction of the dedicated work on climate change, to begin in 2018, the proposed working structure and possible links to the work of HELCOM-VASAB Maritime Spatial Planning Working Group;
- identify priority areas under the group's mandate effected by changing of climate parameters and availability of scientific knowledge required for adaptation of relevant regional policies and recommendations;
- consider available expertise in the Group to support the work under the respective priority areas.

Dedicated HELCOM work on climate change

The ultimate aim of HELCOM work on climate change has been identified as increasing the resilience of the system with regards to climate change impacts. From a HELCOM perspective the following have been identified as possible ways to support the process towards reaching this aim:

1) ensuring HELCOM as a platform for a policy-science dialogue on climate change;
2) provisioning of robust, policy relevant, research-based knowledge on the impacts and vulnerabilities to climate change;
3) reviewing policies in the light of climate adaptation.

The inital step to achieving these aims is to provide a coordinating framework, and a consequent platform (aim one), to centralize and synthesize the latest knowledge on the effects of climate change for the Baltic Sea region (aim 2). The products and expertise supplied by the platform are intended to further facilitate the development of appropriate advisory approaches to support the update and implementation of the BSAP which in turn supports aim three (fig 1).

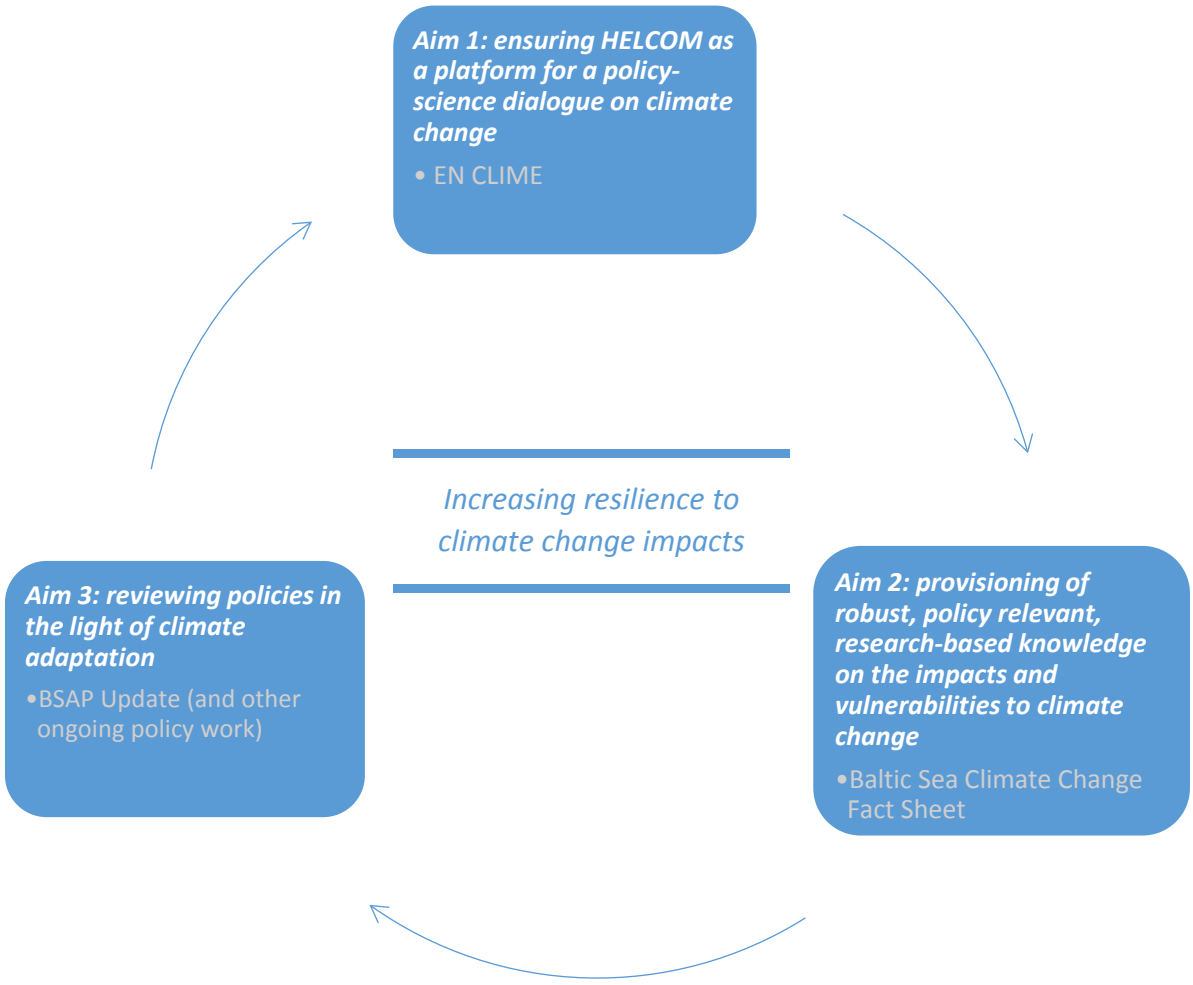

Figure 1. Linking the aims, tools and process of the dedicated HELCOM work on climate change, including example actions and deliverables.

Aim 1: ensuring HELCOM as a platform for a policy-science dialogue on climate change

The challenges presented by marine climate change impacts are by their nature a regional concern and the topic is a cross-cutting issue covering every aspect from science to high level policy requiring a regional and inclusive working structure to tackle in an economic and effective manner.

To achieve the identified objectives, and in support of aim one, there is a need to set up a coordinating framework to utilize the expertise of leading scientists on both direct and indirect effects of climate change on the Baltic Sea environment, and to make this expertise available to, and open up for closer dialogue with, policy makers.

Expert Network on Climate Change (EN-CLIME)

This coordinating framework is suggested to take the form of a HELCOM Expert Network on Climate Change (EN CLIME), to be housed under and guided by the State and Conservation group, in accordance with the working groups ToRs.

As climate change is a cross-cutting issue the proposed EN CLIME would need to have an inclusive working structure and prioritize close cooperation with both internal (e.g. Working Groups and Expert Networks) and external partners (e.g. Baltic Earth). This translates into a need for EN CLIME to be a wider, more inclusive, platform compared to most HELCOM EN's, to which various organizations and experts may be invited in addition to the national representatives.

The intention is for the work of EN CLIME to reduce the lag time for transferring quality assured science to end users with clear guidance on the level of confidence in the science. The work could also support the assessment of knowledge gaps and identification of future research priorities and ensure that new scientific findings on climate change and its impacts on oceans and seas should be visible in HELCOM, as well as find their way into HELCOM decision-making and the day to day work.

Aim 2: Provisioning of robust, policy relevant, research-based knowledge on the impacts and vulnerabilities to climate change

The HELCOM 2018 Brussels Ministerial Declaration stated the following:

WE EMPHASIZE *the need to further strengthen the scientific understanding of the impacts of climate change together with multiple other stressors on the Baltic Sea marine environment, and* ***AGREE*** *that HELCOM should take action to bridge this knowledge to policy and practice."*

HELCOM is a proven route for addressing issues of regional concern and for delivering high quality products with a regional policy level impact. Baltic Earth in turn acts as a focal point for technical marine climate change information in the region. Close cooperation between the two actors provides the opportunity for in depth understanding of the complexity of marine climate change impacts and collective consideration of appropriate adaptation responses. The Expert Network, comprising of experts from both organizations, would oversee the operational delivery of the main scientific products, as well as, any other tasks assigned to them.

Baltic Sea Climate Change Fact Sheet

One of the products of EN CLIME's work is intended to be a Baltic Sea climate change fact sheet, containing a consensus view by the regions climate experts on the topics identified as of interest and value to the policy process. The intention is for the fact sheet to rely on, and synthesise, already existing scientific knowledge.

The fact sheet is to be concise and easily accessible, intended to assist decision-makers in their understanding of what changes have already taken place, and what may occur in the future, thus providing a clear pathway from science to regulators and policymakers. This is directly in line with the identified aim two.

Supporting material

It is however important to take into account that scientific advisors to political processes evaluate and digest scientific information, and for this purpose it is crucial to have high-quality science, such as presented in the fact sheet, supported by complete background information and transparent presentation. This is why more in depth material will be available to support the statements presented in the fact sheet.

The fact sheet will be supported by a thematic assessment, produced in cooperation with Baltic Earth, identifying and elaborating recent scientific findings and research results which have become available since the publication of the BACC II report. The fact sheets will further be supported by e.g. the work of Baltic Earth under their Grand Challenges as well as IPCC reports (e.g. the Special Report on Oceans and Cryosphere in a Changing Climate (SROCC) expected for September 2019).

In addition, to support the provisioning of an estimate for the confidence of the research results presented in the report cards, descriptions will be supported by showing climate change results predominantly based on commonly agreed modelling, where possible, and in line with descriptions used in IPCC.

Priority areas for fact sheet

Priority areas for synthesising policy relevant scientific knowledge are likely to link to issues already addressed by HELCOM, e.g. interactions between eutrophication and climate effects, hazardous substances, biodiversity, maritime activities, and fit under the current BSAP goals. There is also a need to work towards an overall better understanding of the role of the Baltic Sea in the global carbon cycle.

Within each topic it should be described how the individual parameters/indicators are affected by climate change, where ever possible including considerations for management of the relevant pressures and how climate change influences those.

Questions of importance to support management measures include, but are not limited to:

1. What is happening?
2. Why is it happening?
3. What are the direct consequences?
4. What is expected to happen in the future?
5. What can be done about it? Especially focusing on avoidance, alleviation, adjustment and adaptation.
6. What is already being done about it?
7. Where are the gaps?
8. How does it affect the policy landscape?

State and Conservation discussed and supported a number of possible topics, which could be explored in the fact sheet, possibly clustered under the appropriate BSAP goals. These topics have been identified based on relevance for policy processes and availability of information and expertise.

Ecosystem aspects

Environment (abiotic)	*Biotic*
Temperature (air)	Plankton
Temperature (sea)	Benthos
Air-sea flux of heat and water	Fish
Atlantic Heat Conveyor (AHC)	Seabirds
Sea ice	Marine mammals
Salinity	Pelagic biotopes
Stratification	Benthic biotopes
Air-sea exchange of CO2	Coastal biotopes
Acidification	NIS
Sea level	
Seabed	
Weather	
Storms and waves	
Erosion	
Large scale marine processes (spring bloom, spring/fall circulation, biological carbon pump etc)	
Oxygen	

Antropogenic Aspects

Safety	*Economic and social*
Nutrient enrichment	Shipping
Harmful algal blooms (HABs)	Tourism
Pollution	Built structures
Flooding	Fisheries
Human health	Aquaculture
Patogens	
Virus like particles (VLPs)	
Ecosystem services	

Aim 3: Reviewing policies in the light of climate adaptation

In 2007 and 2010, HELCOM Ministerial Meetings noted that climate change will have impacts and this should ultimately be reflected in HELCOM policies. The HELCOM Ministerial Meeting in 2013 subsequently agreed to make the assessment of regional climate change and its implications on the Baltic Sea ecosystem a regular activity, collaborating with Baltic Earth in this respect, with the aim to eventually make it an indicator-based assessment.

The 2013 HELCOM thematic climate change assessment was followed by a HELCOM Workshop on Baltic Sea region climate change and its implications, aiming to specify more stringent actions and supplementary measures, as called for by the HELCOM Ministerial Meetings in 2007 and 2010. The Workshop recommendations was that, following the adaptive management approach, any changes in knowledge related to the effects and impacts of climate change should be communicated to the decision makers to enable possible changes to relevant policies.

The Helsinki Commission has also repeatedly stressed the importance of taking concrete steps to, e.g. make the issue of climate change more prominent overall in HELCOM work, especially as it affects regional targets, and the need to use research and innovative approaches to develop new solutions and techniques to address climate change related issues and translate them into policies.

Climate change and the update of the Baltic Sea Action Plan

The Baltic Sea Action Plan (BSAP) is to be updated by 2021 based on the mandate given by the 2018 HELCOM Brussels Ministerial Meeting, with the aim being to set out a robust action plan for the achievement of the comprehensive HELCOM vision – a healthy Baltic Sea environment. It provides a concrete basis for HELCOM work and incorporates the latest scientific knowledge and innovative management approaches into strategic policy implementation, stimulating goal-oriented multilateral cooperation around the Baltic Sea region.

The Contracting Parties decided that the updated BSAP will, in addition to existing commitments, address new issues based on the commitments made in the 2018 Ministerial Declaration and further deliberations during the BSAP update process. The importance of addressing climate change in the update process of the BSAP was highlighted in the 2018 Ministerial Declaration:

WE STRESS *the need for research and adaptive management to strengthen the resilience of the Baltic Sea in the face of climate change impacts.* ***WE AGREE*** *to increase HELCOM's preparedness to respond to climate change impacts, by taking foreseen climate change impacts into account when updating the BSAP and by exploring the needs and possibilities to further adapt HELCOM's policies and recommendations 1) in line with existing objectives of protection of the marine environment and sustainable use of marine resources, also under the changing climate, and 2) to maximise the capacity of the Baltic Sea ecosystem to contribute to mitigation of climate change through blue carbon storage;*

as well as by several Contracting Parties at the HELCOM 2018 Brussels Ministerial Meeting (see Annex 1 for further excerpts).

To support the work to update the BSAP there is a need to estimate whether current actions are sufficient to reach good status. This will involve substantial work and will be organized topic by topic under the BSAP update work. In addition to identifying tentative gaps in measures the work on sufficiency will also identify knowledge and data needs for effective implementation of measures. This work is to be based on newest scientific findings and knowledge, including related to climate change.

This linkage of the update process of the BSAP and the work on climate change could take the form of joint workshops, and appropriate forward planning of the climate change work to provide for the needs of the BSAP update process, e.g. through producing interim products and/or allowing for access to expert review and information exchange with EN CLIME, all of which in turn support aim three (Reviewing policies in the light of climate adaptation).

By implementing the BSAP objectives the HELCOM Contracting Parties support increasing the resilience of the Baltic Sea to climate change. A clearer understanding of the impacts of climate change would support adjusting the measures to protect the Baltic Sea marine environment so as to allow for increased resilience, supporting the vision of a healthy Baltic Sea even in a changing climate.

Annex 1 HELCOM 2018 Brussels Ministerial Meeting and climate change

The 2018 HELCOM ministerial declaration states:

*"**NOTING** with great concern the impacts of climate change and future ocean acidification on the marine environment of the Baltic Sea, including decreasing ice cover extent and duration, rising water temperature and lowered salinity, as well as the low level of oxygen near the seabed; **NOTING** that these impacts compound existing pressures on marine ecosystems and thus make the need to reduce these pressures even more important, also so as not to further impair the ability of the seas and oceans to act as climate regulator;*

***ACKNOWLEDGING** in this regard that the United Nations Framework Convention on Climate Change and Paris Agreement sets out a global framework for action to put the world on track to avoid adverse effects of climate change by limiting global warming, and **WELCOMING** the increasing recognition of the link between oceans and climate;*

***WE COMMIT** to increasing the protection and restoration of biodiversity, to intensifying regional, subregional and cross-sectoral cooperation, and to preserving and promoting the ecological balance of the Baltic Sea area with strengthened resilience, also as streamlined response to adaptation needs stemming from human-induced climate change;*

***WE STRESS** the need for research and adaptive management to strengthen the resilience of the Baltic Sea in the face of climate change impacts. **WE AGREE** to increase HELCOM's preparedness to respond to climate change impacts, by taking foreseen climate change impacts into account when updating the BSAP and by exploring the needs and possibilities to further adapt HELCOM's policies and recommendations 1) in line with existing objectives of protection of the marine environment and sustainable use of marine resources, also under the changing climate, and 2) to maximise the capacity of the Baltic Sea ecosystem to contribute to mitigation of climate change through blue carbon storage;*

***WE EMPHASIZE** the need to further strengthen the scientific understanding of the impacts of climate change together with multiple other stressors on the Baltic Sea marine environment, and **AGREE** that HELCOM should take action to bridge this knowledge to policy and practice."*

At the 2018 HELCOM Brussels Ministerial Meeting several of the contracting parties and stakeholder also raised the importance of prioritizing climate change in upcoming HELCOM work, specifically under the update of the Baltic Sea Action Plan. The Ministerial debate was utilized by several of the ministers and high level officials for this purpose, for example, Finland drew attention to the importance of the agreement on Maximum Allowable Inputs, and noted that the work to reduce nutrient loads to the Baltic Sea will become more difficult in the future due to the effects of climate change. Latvia expressed their support for including climate change aspects in the BSAP update process and in forthcoming assessments to take necessary actions to adapt policies. Sweden stressed that accounting for pressures from climate change will be important when implementing the SDGs and need to be considered when updating the BSAP.

The CBSS, as a stakeholder and as coordinator of the Horizontal Action Climate of EUSBSR, emphasized in the HELCOM Ministerial Meeting the importance of addressing climate risks and how climate change can be undermining the efforts taken so far to combat eutrophication and human pressures, as well as the need to mitigate climate impacts on biodiversity in the Baltic Sea area. OSPAR in turn stressed the need for adaptation in regard to climate change and ocean acidification and that regional collaboration and sharing of expertise between OSPAR and HELCOM will play a substantive role in the future.

Finland will take over the Chairmanship of the Helsinki Commission on 1 July 2018. One of the draft identified priorities of the Finnish Chairmanship is the 'Baltic Sea and climate change'. Finland presented their draft priorities at the HELCOM 39-2018 meeting (HELCOM 39-2018 document 5-4) and provided the following statement:

"Climate change causes multiple impacts on the Baltic Sea and its marine flora and fauna. Change is fast and, as a response, our decisions may need adjustment. The Baltic Sea is part of the carbon cycle but our understanding of its role in the carbon cycle, e.g. its carbon storage services is still meager. HELCOM can play a role in climate change mitigation by working to maximize storage of carbon in the Baltic Sea. During their Chairmanship Finland wants to ensure that consequences of climate change, such as warming, sea ice decline, anoxia and shifting species ranges will be taken into account when the BSAP will be updated. We also aim to work towards a better understanding of the role of the Baltic Sea in the global carbon cycle."