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Background

The project for the development of the Second Holistic Assessment of Ecosystem Health in the Baltic Sea (HOLAS II) will give an update of the environmental status of the Baltic Sea and evaluate progress towards reaching the goals of the Baltic Sea Action Plan. It will be developed so that it can be used in the 2018 reporting under the EU Marine Strategy Framework Directive for the Contracting Parties that are also EU member states. A first version of the assessment report for national consultation is planned to be ready by June 2017.

HOLAS II started in December 2014 and will continue until June 2018. Since June 2015, the project has moved into an active phase focusing on tool development and outlining in more detail the assessments to be carried out and the data to be included. The project has convened two workshops (biodiversity assessment, economic and social analysis) and two further workshops are planned for the upcoming 6 months (pressures, biodiversity assessment).

In addition to HELCOM budget, the project is financed with special contribution by Sweden and co-financed by the EU through the BalticBOOST project supporting development of tools. Additionally, a proposed EU project to support HOLAS II is pending a decision on financing.

This document summarizes the main aims of the project and outlines current activities and processes to develop the assessment approaches to be applied.

Action required

The Meeting is invited to:

- take note of the progress in preparation of the second holistic assessment of the ecosystem health of the Baltic Sea; and
- discuss the proposed timing and necessary time required for national consultation of the holistic assessment.

Aims and assessment structure of HOLAS II

The overall aim of HOLAS II is to evaluate progress in relation to the goals of the Baltic Sea Action Plan (BSAP) and any improvement in the status of the marine environment since the initial holistic assessment of HELCOM (2010). It is also to serve as a regional roof report for reporting of Article 8 of the Marine Strategy Framework Directive (MSFD) for the Contracting Parties being EU member states. The project is composed of several building blocks, including an assessment of i) the distribution of human activities and pressures, ii) the status of the environment based on core indicators, and iii) social and economic impacts (See Annex 1 for a draft outline). In addition, measures to reach good environmental status will be addressed. The project runs from December 2014 to June 2018. A first version of the report is planned to be ready for national consultation in June 2017 (See Annex 2 for a roadmap).

Outline and status of the planned assessments

Human activities and pressures

The assessment will show the spatial distribution of main pressures on the Baltic Sea, including key areas for cumulative impacts. The format for presentation will build on the Baltic Sea pressure and impact index (BSPI and BSII), as used within the initial HELCOM holistic assessment¹. The indices will be evaluated and modified as needed in order to account for any recent methodological developments and reporting needs. The proposed revisions to Annex III of the MSFD are being taken into account when selecting the layers to be included in the analyses, including information on human activities and pressures.

The BSPI and BSII build on the concepts described by Halpern et al. (2008), and the method description is given in BSEP 125² and Korpinen et al. (2012)³. The concepts were subsequently developed further for the eastern parts of the North Sea by the HARMONY project, which has developed a HARMONY Pressure & Impact Mapper software⁴.

- The impact index (BSII) is based on georeferenced data sets of anthropogenic pressures, human activities and ecosystem components, and on weight scores that combine the pressure and ecosystem component layers. The weight scores estimate the potential impact of each assessed pressure on specific ecosystem components. In the HELCOM initial holistic assessment, the weight scores were produced by expert judgement by a set of experts from the Contracting Parties. In HARMONY, the scores were based on more developed and detailed questionnaires directed to a larger group of experts.
- The pressure index (BSPI) assesses the anthropogenic pressures/human activities in the defined assessment units without including ecosystem components. It however includes a weighting component in order to grade the effect of the pressures on the ecosystem in a generalized perspective.

¹ www.helcom.fi/Lists/Publications/BSEP122.pdf

² <http://www.helcom.fi/Lists/Publications/BSEP125.pdf>

³ Korpinen, S., Meski, L., Andersen JH., Laamanen, M. 2010. Human pressures and their potential impact on the Baltic Sea ecosystem, *Ecological Indicators* 15(1):105-114.

⁴ Andersen, J.H. & Stock, A. (eds.), 2013. Human uses, pressures and impacts in the eastern North Sea. Aarhus University, DCE –Danish Centre for Environment and Energy. 136pp. Technical Report from DCE –Danish Centre for Environment and Energy No.18 <http://www.dmu.dk/Pub/TR18.pdf>

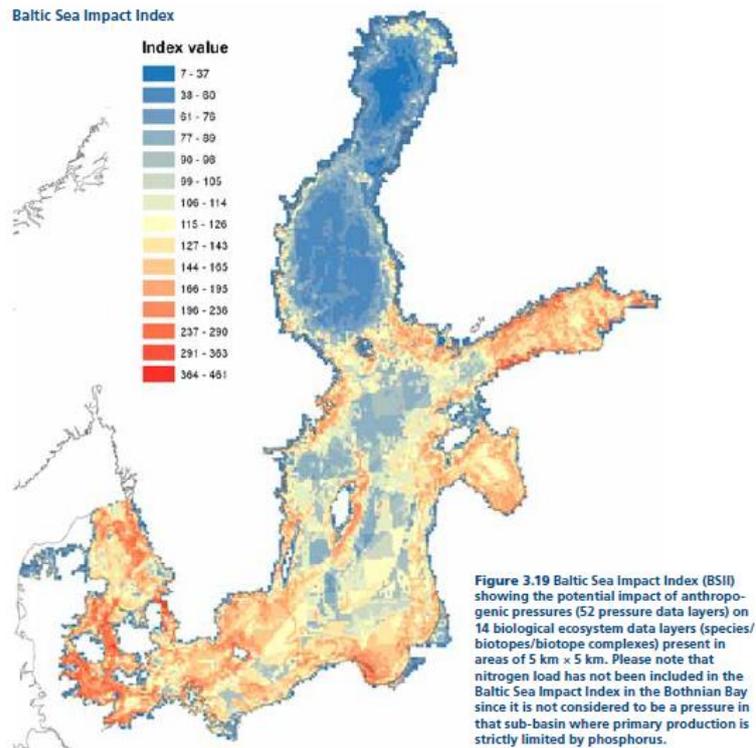


Figure 1. Key areas of impacts on the Baltic Sea according to the Baltic Sea Impact Index of 2010 (*Ecosystem Health of the Baltic Sea - HELCOM Initial Holistic Assessment. Baltic Sea Environment Proceedings No. 122*). The index will be developed further and an updated assessment will be produced within HOLAS II.

A process is ongoing to identify the spatial data sets on human activities and pressures that would be used in the assessment. The proposed revised MSFD Annex III has been taken as a starting point and is being verified and complemented as needed in order to establish a regional list of pressures and human activities and uses relevant for the Baltic Sea as well as a matrix of human activities and their pressures in the Baltic Sea. Simultaneously, an investigation is ongoing to determine for which layers it will be possible to obtain data in time for use in HOLAS II. These activities are coordinated by the Secretariat to formulate proposals for consideration within HOLAS II. The Pressure Working Group and HELCOM-VASAB Maritime Spatial Planning Working Group are also involved to provide feedback, and other relevant working groups could also be approached time permitting.

Information (metadata) on the spatial data sets that will be used in the indices is required by the end of 2015 as background information for developing further the assessment approach. The data to be used in the assessment needs to be in place by October 2016 in order to be included in the national consultation. In addition to data on the spatial distribution of human activities and pressures, the assessment requires data on the spatial distribution of key ecosystem components (e.g. mammals, birds, fish, benthic habitats). The development of ecosystem data sets for birds and benthic biotopes is currently considered by the State and Conservation Working Group with anticipated data request from Contracting Parties by end of 2015. The updated and improved information will be available in [HELCOM Data and Map services](#) and serve the assessments within HOLAS II as well as other HELCOM activities.

HOLAS II 3-2015 agreed that the HELCOM (2010) indices for assessing cumulative pressures and impacts from multiple human activities (BSPI and BSII) should be used in HOLAS II, and that these should be developed

further in order to make use of new knowledge. HELCOM has applied for a direct grant from EU (See agenda item 2), which would co-fund the development of the index, if granted funding.

The most important development steps identified are to 1) better incorporate information on the temporal and spatial extent of the pressures that are assessed, 2) to update and improve the impact weight scores that the BSII builds on, and 3) to include uncertainty estimates in the assessments.

A workshop will take place on 13 November 2015 in Helsinki, Finland in order to support and provide guidance to the development work (HELCOM Pressure Index WS). More specifically, the workshop will:

- consider and propose spatial data sets to be included in the analyses, concerning pressures and human activities as well as ecosystem components,
- plan the way forward on how to develop the impact weight scoring,
- discuss how to improve the spatial and temporal aspects of the assessment.

The assessment of good environmental status

The status assessments will build on the HELCOM core indicators, as developed within HELCOM and by ICES for commercial fish. The current view of HELCOM core indicators potentially available to be included in the assessment is indicated in Figure 2. Taking note of the study reservations from Denmark and Germany, HOD 48-2015 agreed on the indicators and GES boundaries, including their use in HOLAS II assessment according to the recommendation by the Gear Group, and the publication of agreed core indicator reports at the HELCOM website as they become ready for publishing. The possibility to include additional, e.g. national, indicators has been discussed by the HOLAS II core team and in general discouraged but in case of further consideration a number of criteria to be considered has been agreed ([Outcome of HOLAS II 3-2015, para 3-13](#)). Some indicators are to be developed further during 2016 in order to ensure that quantitative definitions of GES are available.

The assessment will cover all descriptors of the MSFD. Thematic assessment within the key segments of biodiversity, hazardous substances and eutrophication will be produced. In addition, marine litter, underwater noise and non-indigenous species are assessed. The assessments will primarily be based on data from the period 2011-2016. The state assessment will be complemented with assessment of trends, using as long data series as possible for selected parameters. Information and data from HELCOM Maritime Assessment, planned to be finalized by the end of the 2016, will also be used.

D2 Non Indigenous Species (C-GES 1)	Birds (C-GES 2)	Mammals (C-GES 4)	Fish (C-GES 4+2)	D8 Contaminants (C-GES 6)
NIS ARRIVAL (C-GES)	BIRDS ABUND BREED (C-GES) BIRDS ABUND WINTER (C-GES)	SEALS DISTR (C-GES) SEALS POP (C-GES) MAMMALS NUTRITION (C-GES) MAMMALS REPR (C-GES)	FISH COAST FUNCT (C-GES) FISH COAST KEY SP (C-GES) FISH SALMON REPR (C-GES) FISH SEATROUT REPR (C-GES) FISH LFI (C) FISH ML (PC) COMM FISH 3.2 (ICES-GES) COMM FISH 3.3 (ICES-GES)	HAZ HBCDD (C-GES) HAZ METALS (C-GES) HAZ PBDE (C-GES) HAZ PFOS (C-GES) HAZ RAD (C-GES) HAZ EAGLE REPR (C-GES) HAZ PCB (C) HAZ PAH (C) HAZ TBT IMPO (C) HAZ ACI (PC) HAZ DICLO (PC) HAZ ESTRO (PC) HAZ LMS (PC) HAZ REPR (PC)
D3 Commercial fishing (C-GES 1)				
COMM FISH 3.1 (ICES-GES)				
D6 Seafloor integrity (C-GES 0)	Benthic habitats (C-GES 0)	Pelagic habitats (C-GES 1)	Food webs (C-GES 0)	
SEAFLOOR CUM IMPACT (PC)	BENTHOS POP STRUCTURE (C) BENTHOS BQI (C) BENTHIC DISTR BIOTOPES (PC) VEGETATION DEPTH (PC)	PELA ZOOPLANKTON (C-GES) PELA DIATOM DINOS (PC) PELA SEASON SUCC (PC) EUTRO PRIM CSA (PC) EUTRO SPRING BLOOM (PC)	-	
D5 Eutrophication (C-GES 5)				
EUTRO DIN (C-GES) EUTRO DIP (C-GES) EUTRO CHLA (C-GES) EUTRO CLARITY (C-GES) EUTRO OX DEBT (C-GES) EUTRO NTOT (PC) EUTRO PTOT (PC)				
	D10 Marine litter (C-GES 0)	D11 Energy and noise (C-GES 0)		Annex III
	LITTER BEACH (PC)	NOISE CONTINUOUS (PC)		EUTRO MAI (C-GES) INCIDENTAL CATCH (C) OIL SPILLS (PC)

Figure 2. Indicators potentially available for the assessment of good environmental status within HOLAS II, including the first set of HELCOM core indicators. Indicators marked "C-GES" have a quantitative definition of GES and could be applied directly provided data is available. Indicators marked "C" still need a quantitative definition of GES. Indicators marked "PC" are pre-core indicators and would need further development within 2016 in order to be included in HOLAS II.

Biodiversity assessment

The thematic assessment of biodiversity will build on the HELCOM core indicators related to descriptor 1, 4 and parts of descriptors 3 and 6, in line with the proposed revised MSFD guidelines⁵.

HELCOM has received support through the EU co-financed BalticBOOST project to develop the biodiversity assessment tool. The project was started in September 2015, and will finish in December 2016. Finalization of the tool development is however aimed at by mid-November 2016 to cater for endorsement according to HELCOM procedures.

Initial guidance for the tool development was provided by the HELCOM workshop to support the development of a biodiversity assessment tool within HOLAS II (HELCOM Biodiv WS 1-2015), which was held on 15 June 2015. The guidance is being developed further and will be considered by HOLAS II 4-2015 in November 24-25, 2015. A HELCOM Workshop to provide further guidance to the development of the tool is tentatively planned to take place in March 2016 as part of the BalticBOOST project.

Hazardous substances assessment

The hazardous substances assessment is planned to build on the HELCOM core indicators related to descriptor 8. The assessment will be carried out using the CHASE tool, which was also used in the initial HOLAS assessment in 2010 and which will be developed further as needed based on input from the Contracting Parties. The development work will take part as part of the BalticBOOST project, with a similar timeline as the Biodiversity tool development work. Initial guidance for the tool development has been provided by the Contracting Parties and will be developed further by HOLAS II 4-2015 (Nov 24-25, 2015).

⁵ Marine Strategy Framework Directive (MSFD) Common Implementation Strategy. 14th meeting of the Working Group on Good Environmental Status (WG GES) 5 October 2015, Brussels

Eutrophication assessment

The thematic assessment of eutrophication will be carried out with the approach used in the 'Eutrophication status assessment 2007-2011'⁶ including improvements developed by the HELCOM project EUTRO-OPER.

Economic and social analyses

The assessment of economic and social impacts will focus on developing a framework to support a regional harmonization of approaches to assess cost of degradation and the probability of different management measures to improve environmental status.

In contrast to the assessment of status and pressures, economic and social analyses have so far had a limited role in HELCOM regional collaborations. However, its further development has been highlighted in existing agreements such as the 2013 HELCOM Ministerial Declaration⁷. The evaluation of the MSFD Article 8 reporting in 2012 revealed a corresponding need, and a lack of coherence in the assessment approaches used by EU Member States in the Baltic Sea region.

As a first step to advance the process, the Contracting Parties were invited to nominate experts to form a platform with the task to take this part of HOLAS II forward. Estonia, Finland, Germany, Poland and Sweden are represented in the group and the remaining Contracting Parties are encouraged to join. Finland offered to lead the ESA components in HOLAS II.

Further, a HELCOM workshop to develop a framework for economic and social analyses was held on September 30-October 1, 2015 chaired by the Lead country Finland (HOLAS II ESA). The workshop drafted a framework for regional economic and social analyses in the Baltic Sea, and proposed a way forward for its further development. The framework identifies connection points between the economic analyses and the assessment of status and pressures, gives examples on how these could be linked by quantitative analyses, and identifies prioritized action points for further development. The framework entails the ecosystem services as well as the marine waters accounting approach. Nominations of experts on the marine water account approach are particularly invited, to join the continued work in order to ensure that this part is adequately represented.

The report from the HOLAS II ESA Workshop will be finalized by October 24, 2015. A follow-up workshop is tentatively planned for May 2016.

⁶ HELCOM, 2014. Eutrophication status of the Baltic Sea 2007-2011 - A concise thematic assessment. Baltic Sea Environment Proceedings No. 143

⁷ <https://portal.helcom.fi/meetings/HOLAS%20II%203-2015-258/MeetingDocuments/Outcome%20of%20HOLAS%20II%203-2015.pdf> (Future strategic approach for HELCOM, para IV)

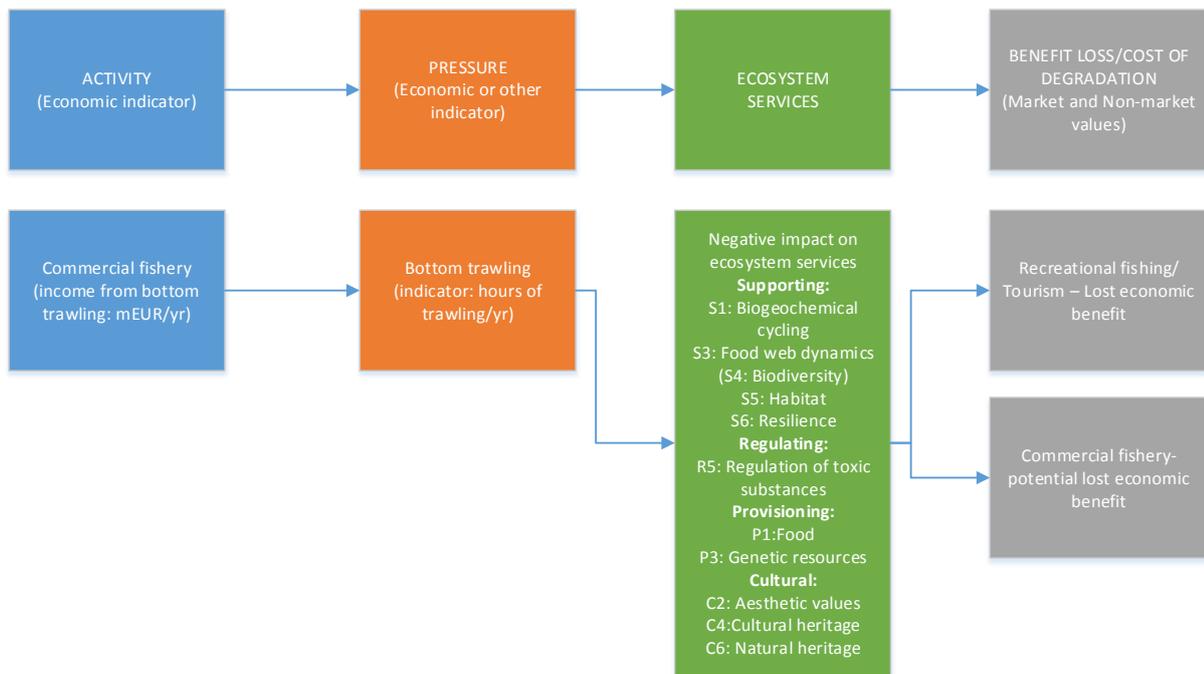


Figure 3. Proposed framework for how to link economic and social analyses to the assessment of status and pressures within HOLAS II, as presented to the HELCOM HOLAS II ESA WS. The framework was further developed by the Workshop. The Workshop report will be ready by late October.

Annex 1. Preliminary draft outline of the 2nd Holistic Assessment of Baltic Sea ecosystem health (Outcome of HOLAS II 2-2015, Annex 2)

0. Executive Summary

1. Introduction

- Policy background and international cooperation
- include summary of characteristics of the Baltic Sea
- Previous assessments
- Reading instructions!

2. Methods section

- include conceptual outline showing the structure of the assessments in the report
- new developments of tools
- Methodology [short version in printed report, longer version in the web-version]

3. Assessment of the status of ecosystem health

- biodiversity assessed including status based GES descriptors (“pizza), showing for Descriptor 1 also separately the assessment of elements, differentiated as in monitoring programmes under Article 11
- assessment of pressure based descriptors (“satellites”) intact
- Selection of trends in key parameters
- Supporting parameters to interpret result of the assessment tools (e.g. change in climatic factors between assessment periods).

4. Input and human activities acting on the environment

- Spatial distribution and trends of main human activities and pressures, e.g. with pressure core indicators (shown individually) including maritime activities
- Cumulative assessment of pressures using the BSPI/BSII, including new pressure data layers, should be possible to assess changes in relation to the previous assessment
- Climate change – summary based on thematic assessment and new info, e.g. EMEP

5. Social and economic aspects [consider title – more communicative]

- Cost-of degradation of the environment, benefits of mitigating environmental problems

6. Measures towards reaching GES (To be developed further)

- Regionally agreed targets
- Existing and planned measures (inform on ongoing work focus on HELCOM work)
 - could include real examples/successful cases
 - could address sufficiency of measures to reach GES (“If GES has not been reached, why has it not been reached”, potentially including societal drivers)

7. Conclusions and future outlook

Annex 2 Revised roadmap of HOLAS II (Outcome of HOLAS II 3-2015, Annex 3)

Grey = main activity, Green = workshop, Yellow = Assessment. Numbers refer to HOLAS II core team meeting number.

The roadmap will be revised by HOLAS II 4-2015 (24-25 November). Already known changes are indicated with red.

Activities	2014- Q4	2015- Q1	2015- Q2	2015- Q3	2015- Q4	2016- Q1	2016- Q2	2016- Q3	2016- Q4	2017- Q1	2017- Q2	2017- Q3	2017- Q4	2018- Q1	2018- Q2
Planning phase for project implementation	DONE														
1. Assessment of pressures and human activities															
<u>a) Spatial distribution and trends of human activities and pressures</u>															
_ Identify human activities and pressures			3												
_ Identify appropriate scale			3												
_ data arrangements and data flows					4										
_ Improving pressure data layers					4										
<u>b) Assessment of cumulative impact of pressures</u>															
_ Develop and test HELCOM pressure indices															
Workshop 1; Initial, conceptual discussion, guidance			3	WS											
Tool development															
Workshop 2; Testing of new tool							ws?								
Possible adjustments of tool															
_ Carrying out assessment cumulative impact of pressures															
<u>c) Climate change (incl hydrological supporting parameters)</u>															
_ data needs and data flows					4										
_ Carrying out assessment															
2. Assessment of the state and distance to GES															
<u>a) Core indicator-based assessment, using tools for integration</u>															
Biodiversity (D1, D3, D4, D6 According to pizza)															
_ Develop and test state assessment tools biodiversity		2													
_ indicators to be included		2	3												
_ Identification of data needs and data flows			3												
Workshop 1; (tool evaluation and development needs)			WS		ws		WS								
Tool development															
Review of work at STATE 3-2015 (9/13 nov)					x										
Data flows					4										
Workshop 2; Testing of new tool								WS							
_ Trends of biodiversity elements															
Possible adjustments of tool															
_ Carrying out assessment biodiversity															

Hazardous substances (D8, D9)																			
_ Update and test state assessment tools hazardous substances																			
_ Identification of data needs and data flows			3																
Data flows					4														
Identification of tool development needs					4														
Tool development																			
Review of work at STATE 3-2015					x														
Workshop to test the tool?								ws?											
Possible adjustments of tools																			
_ Carrying out assessment hazardous substances																			
_ Trends of hazardous substances																			
Eutrophication (D5)																			
_ Carrying out assessment eutrophication																			
Non-indigenous species (D2)			3		4														
Commercial fish and shellfish (D3) (pressure related)			3		4														
Hydrographical changes (D7)			3		4														
Marine litter (D10)			3		4														
Noise (D11)			3		4														
Integrated status assessment of the ecosystem health																			
_ Develop and test state assessment tool for ecosystem health								5											
_ Carrying out assessment of ecosystem health																			
3. Social and economic aspects																			
Method and concept development for economic and social impact studies (A3)			3	WS															
_ Assessment of cost-of degradation of the environment, benefits of mitigating environmental problems												pot.							
4. Sufficiency of measures to reach GES (A5)																			
_ Environmental targets																			
_ Map existing and planned measures (A4), including MPAs		Under GEAR /IG POM																	
_ Gap analysis of measures																			
_ Developing proposals on new measures.																			

