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<b>Document title</b>	Recent developments under the HOLAS II project
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<b>Agenda Item</b>	3- Activities of relevant HELCOM projects or processes
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## Background

The project for the development of the Second Holistic Assessment of Ecosystem Health in the Baltic Sea will give an update of the environmental status of the Baltic Sea and evaluate progress towards reaching the goal of Good Environmental Status of the Baltic Sea.

The HOLAS II project was initiated in December 2014. The current document summarizes the progress of the HOLAS II project with a focus on developments of assessment tools through the HELCOM coordinated EU co-finance projects BalticBOOST and TAPAS. The document also provides an overview of the time-table for the timing of project activities.

## Action required

The Meeting is invited to take note of the information and provide guidance as appropriate.

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## The HOLAS II project in brief

HOLAS II will give an update on the overall state of ecosystem health in the Baltic Sea. The assessment will follow up on the goals of the Baltic Sea Action Plan, and will be developed so that the results will support reporting under the EU Marine Strategy Framework Directive (MSFD) by those Contracting Parties to the Helsinki Convention that are also EU member states.

The main components of the assessment are:

- **Distribution of human activities and pressures** in the Baltic Sea. Cumulative impacts are assessed using the Baltic Sea Pressure and Impact Index.
- **Assessment of good environmental status** using core indicators, and integrated assessments of Biodiversity, Eutrophication, Hazardous substances and an assessment of Maritime Activities.
- **Economic and social analyses** to support regional assessments of the use of marine waters and cost of degradation.
- **Measures** to reach good environmental status.

Based on preliminary discussions at HOLAS II 1-2014 and HOLAS II 2-2015 it was proposed that main results of the assessment are published in a circa 90 pages report available in print and for download as pdf, while more detailed information will be presented as associated products in the form of web based information, downloadable fact sheets and thematic reports. Tentative outputs from HOLAS II project are presented in document 3-3 to this meeting.

A considerable share of the development work required to meet the goals of HOLAS II takes place within the HELCOM coordinated EU co-financed [project BalticBOOST](#), and since January 2016 also within the [TAPAS project](#).

## The assessment of human activities and pressures

The assessment is based on the collation of spatial data set of human activities and pressures that will be used in the implementation of the Baltic Sea Pressures and Impact Index as well as being made available as fact sheets for single activities and pressures. Progress in updating the data sets on human activities and pressures is described in document 4-4 to HOLAS II 5-2016.

### Development of the Baltic Sea Pressure and Impact Index

Theme 1 of the TAPAS project has the objective of further developing the HELCOM Baltic Sea Pressure and Impact Indices (BSPI/BSII) that were initially presented in the initial holistic assessment in 2010 (HOLAS I), and also to align the index with the requirements of the MSFD. The development of the indices is to be guided by two HELCOM workshops with participation of experts from HELCOM Contracting Parties and by the HOLAS II core team. The first BalticBOOST workshop on the pressure and impact index was held 28-29 January 2016 in Helsinki and resulted in numerous recommendations to the project that will be considered in the development ([Outcome of the HELCOM TAPAS Workshop on the HOLAS II Pressure and Impact Index](#)). The further development of the indices will also be addressed at HOLAS II 5-2016 (26-28 April 2016).

The Theme 1 partners are HELCOM, SYKE and NIVA DK. The work plan for TAPAS Theme 1 is included in Annex 1 to this document. The activities are working towards presenting the BSPI/BSII approach for endorsement at HOD in December 2016.

### Background and objectives

The impact index (BSII) is based on georeferenced data layers of anthropogenic pressures, human activities and ecosystem components, and on weight scores which estimate the potential impact of each assessed pressure on specific ecosystem components. The weight scores combine the pressure and ecosystem

component layers and are as such a sensitivity score for each specific combination of ecosystem components and pressure. The pressure index (BSPI) assesses the anthropogenic pressures/human activities in the defined assessment units without including ecosystem components.

The assessment of pressures and human activities in the second HELCOM holistic assessment will build on the further development of the existing BSPI and BSII, in particular.

- **Impact weight scores:** This will be done by developing and carrying out an online survey among experts and combining its results with published impact studies.
- **Temporal and spatial aspects:** The impact of different pressures will be more accurately represented by taking temporal aspects into account in data selection (e.g. if impacts are valid only certain seasons) and weight scores (e.g. if impacts are occasional, periodic, or permanent). Also spatial extent is further considered by including stronger scientific basis for spatial impact.
- **Spatial data sets:** The spatial data sets on pressures, human activities, and ecosystem components, which the assessment will build are updated and improved. The collation take place outside of TAPAS Theme 1.. Update of HELCOM spatial data sets on ecosystem components (benthic species and habitats as well as mobile species) is carried out under theme 2 of TAPAS.

The newly developed improvements to the indices will be tested by the project and reported as a deliverable.

### [Summary of recommendations from the TAPAS Pressure Index workshop 1-2016](#)

#### **Lists of pressure and ecosystem data**

The Workshop proposed to focus the setting of impact scores on a simple pressure/ecosystem component matrix including ca 20-25 ecosystem components, and ca 25 pressure data sets, as this should comply with the MSFD and provide an ecologically relevant resolution at the regional scale addressed here.

The WS recommended that the number of pressure data layers should not be too high (to avoid too complicated impact estimates) and, hence, aggregation of pressure layers will be needed. The pressure layers in the final assessment should follow the main categories of the MSFD Annex III (~18 pressures) but some categories could be further split (e.g. bioaccumulating and non-bioaccumulating contaminants).

The WS recommended to use the EMODNET broad-scale habitat types (EUNIS level 3), hypoxic areas, Natura 2000 habitats (underwater parts), modeled distribution maps of some habitat-forming species (from the BSAP), some fish species and marine mammals as well as some important areas for seabirds. The final list of maps will depend on the success of the HELCOM data call and combining the data into Baltic wide maps (see above).

#### **Describing spatial gradients for pressures and impacts**

The WS recommended that scientific literature should be analyzed to provide evidence for spatial gradients of pressures and impacts but that also the TAPAS online survey should include questions of this aspect. The spatial extent of pressures will be included to the spatial data layers of pressures and be also visible in the pressure fact sheets, which the WS recommended to be published of the pressures.

#### **Including temporal frequency of pressures**

The WS recommended that the pressures and impacts should distinguish between continuous, seasonal and intermittent pressures. How to address this issue is still not solved but it is clear that the frequency of a pressure affects also the intensity of pressure (i.e. a repeated pressure is greater than a single occasion) and therefore the frequency should be included into the spatial pressure data (i.e. the input pressure data).

## Estimation of impacts

The WS recommended that the impacts should be sought from scientific literature for those impacts which are predominant in the Baltic Sea and likely available in literature (eutrophication, hazardous substances, as well as for aspects on physical disturbance on selected ecosystem components).

The WS recommended also that expert-based impact estimates should be acquired through the TAPAS online survey. The WS discussed how to carry out the survey in the CPs and noted that statistical analyses of the replies require several responses. Therefore, if CPs will carry out centralized and pre-summarized surveys, the replies should at least contain confidence intervals (estimated of variation around of the medians/means).

## 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 (under the assessment of MSFD Descriptor 3). The assessment of maritime activities will build on information and data from HELCOM Maritime Assessment, planned to be finalized by the end of the 2016. In addition, marine litter, underwater noise and non-indigenous species are assessed.

The assessment approaches to be used by HOLAS II are to be agreed on within 2016, in order to carry out the first assessments in spring 2017. The assessment tool for biodiversity and hazardous substances are developed under the BalticBOOST project, Work packages 1.1 (Development of a biodiversity assessment tool) and 2.1 (Development of a tool for assessment of hazardous substances).

### Development of a biodiversity assessment tool

The BalticBOOST WP 1.1 has the task to develop a tool for assessing the status of biodiversity in the Baltic Sea. The tool is developed against assessment needs arising from the MSFD, the BSAP and the HELCOM Monitoring and Assessment Strategy. The development is to be guided through two HELCOM workshops with participation of experts from the HELCOM Contracting Parties, the HOLAS II core team and the State and Conservation Working Group.

The first BalticBOOST workshop was held on 11-12 February 2016 in Copenhagen ([Outcome of HELCOM BalticBOOST workshop on the HOLAS II biodiversity assessment tool](#)).

The BalticBOOST WP 1.1 partners are HELCOM, SYKE (Finland), NIVA DK (Denmark) and EMI (Estonia). The work plan for WP 1.1 is included in Annex 2 to this document. The activities are working towards presenting the biodiversity assessment tool for endorsement at HOD in December 2016.

### Background and objectives

As a starting point of BalticBOOST WP 1.1., the applicability of existing assessment tools for MSFD purposes was analysed. The usefulness of different integration methods was also analyzed. It was concluded that in a context where different types of data and variables are included (as is the case in the HOLAS II assessment), the most suitable approach is to use a hierarchical assessment structure, where higher level assessments are given by averaging (possibly weighted), possibly using a one-out-all-out procedure at higher hierarchical levels. The only identified assessment tools utilizing such nested and hierarchical levels were the BEAT, MARMONI and NEAT tools. BEAT was used in the first HOLAS assessment (HELCOM 2010), the MARMONI tool was developed in a Life+ project, whereas NEAT has been developed in the FP7 project DEVOTES.

The BalticBOOST Biodiversity workshop (HELCOM BalticBOOST Biodiv 1-2016) supported that the developing HELCOM biodiversity assessment tool should have the same basic features as the BEAT and NEAT tools

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(Outcome of workshop, para 29). In practice, this would mean modifying the NEAT tool to fit the purposes of the HELCOM biodiversity assessment.

### Summary of recommendations from the BalticBOOST biodiversity workshop 1-2016

#### **Spatial scale and spatial aggregations**

The workshop concluded that the integrated assessment would be most useful at the most detailed spatial resolution. The present HELCOM Core indicators, which will be used in the biodiversity assessment, are assessed at different spatial levels and this will need to be taken into account in the developing tool that enables assessment results at the highest (most detailed) spatial resolution.

The workshop recommended BalticBOOST to test integrated assessments at both lower and higher levels of spatial aggregation and evaluate the results in relation to data availability and presentation of results. As well, BalticBOOST was recommended to explore the possibilities of down-scaling indicator results, including the possibility to weigh indicators (Outcome of workshop, para 40).

#### **Aggregation methods for integrated assessment of biodiversity**

The aggregation methods applied in the integrated assessment need to be defined and presented in a transparent way. The workshop noted that applying OOA in integrated assessment inflates the bias towards failure to reach GES. The review of integrated assessment tools concluded that weighed averaging would be better suited for MSFD context. It was proposed that hierarchical aggregation rules, possibly with OOA in the high-end, give a good account of evidence, allows for estimating confidence of assessment and still supports a precautionary approach.

The workshop recommended BalticBOOST to both test the use of averaging and OOA at lower and higher aggregation levels (Outcome of workshop, para 35).

#### **Indicator related issues**

The workshop discussed a number of issues related to the properties of core indicators and their application in the assessment tools including:

- The tool should be able to use GES concepts for all core indicators (boundary, trend, interval and conditional approaches). At the moment, the NEAT tool only runs on indicators assessed in relation to a GES boundary, so technical solutions need to be developed to include also indicators with other GES concepts.
- The core indicators are based on very different types of data (units and scales) and they thus need to be normalized in order to be included in a common assessment. As well, to estimate the distance of the indicator value to the GES boundary (in addition to defining if the indicator is in GES or not) and to be able to compare this distance among indicators, normalization is needed.
- Weighting of indicators was discussed during the workshop. Regarding ecological relevance, it was noted that it is a very challenging issue to solve in an objective way and that there are also good reasons for treating all indicators in same way. When it comes to downscaling indicators from larger spatial assessment units, down-weighting of indicators which are not relevant at certain smaller subareas could be motivated
- Confidence of the assessment result in the NEAT tool is presented as a probability distribution, based on information on the standard error of the indicator values entered into the tool. The workshop noted that it will not be possible to supply a data-driven standard error for all core indicators and thus, an alternative approach need to be applied

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BalticBOOST will develop solutions together with Lead and co-Lead country representatives for core indicator development. A request from BalticBOOST was issued on 31.3.2016 to Lead and co-Lead country representatives.

### Development of a hazardous substance assessment tool

The BalticBOOST WP 2.1 has the task to develop a tool for assessing the status of hazardous substances in the Baltic Sea. The development will be based on the CHASE 2.0 tool and is to be guided through two HELCOM workshops with participation of experts from the HELCOM Contracting Parties, the HOLAS II core team and the State and Conservation Working Group. The development is specifically aimed at updating the CHASE tool so that it is aligned with current needs of HELCOM and the Marine Strategy Framework Directive and for use in the HOLAS II project.

Plans for developing the existing CHASE 2.0 tool were presented and discussed in the '[HELCOM BalticBOOST workshop on the HOLAS II hazardous substance assessment](#)' held 2-4 February 2016 in Copenhagen, Denmark.

The BalticBOOST WP 2.1 partners are HELCOM and NIVA DK (Denmark). The WP 2.1 activities are working towards presenting the biodiversity assessment tool for endorsement at HOD in December 2016. The schedule for work in 2016 is presented in Annex 3 to this document.

### Background and objectives

In 2010, the CHASE tool was developed and applied in the first- thematic assessment of hazardous substances in the Baltic Sea (BSEP No. 120B). The results were subsequently synthesized and included in the HELCOM Initial Holistic Assessment 'Ecosystem Health of the Baltic Sea' (BSEP No. 122).

The basis for the current work is the CHASE 2.0 developed by the HARMONY project and applied in the North Sea (see Andersen et al. 2016) as supported by the 'HELCOM BalticBOOST workshop on the HOLAS II hazardous substance assessment' (Outcome of workshop, para 50). By basing the update on CHASE 2.0, the tool will still directly link to CHASE 1.0 and enable direct comparisons with previous assessments.

The CHASE methodology is based nesting indicators in four compartments water, sediments, biota and biological effects. For a detailed description of the CHASE tool, please confer with Andersen et al. (2016).

### Summary of recommendations from the BalticBOOST biodiversity workshop 1-2016

In accordance with recommendations from the workshop the update of the CHASE tool itself will primarily focus on:

- The structure of the tool. The current version is based on aggregations of the individual indicators under each of the four compartments. Various suggestions for other aggregation and groups will be considered, e.g. based on advice from experts and the HOLAS II Core Group.
- The number of classes. The current version of CHASE is based on 5 status classes sensu WFD, but 2 and 3 class approaches will be considered and tested according to the approach developed the EUTRO-OPER project to visualize distance to GES (Outcome of workshop para 90).
- The use of the one out – all out principle. Other approaches such as averaging and/or conditional rules (two out – all out) will be considered and tested.
- Secondary assessment of 'confidence' (taking the assessment of 'chemical status' as the primary assessment result).

Some issues will despite not being part of the tool itself influence the tool development and structure. This is due to pre-processing of the data on which the classifications will be based, and will also be considered in the further tool development:

- Assessment units (outside the tool itself). The workshop recommended using HELCOM assessment scale 4 when developing and testing the assessment tools (Outcome of workshop, para 72).
- Aggregation of substances/indicators within assessment units (averaging vs. medians; outside the tool).
- Selection of substances/indicators (Core Set vs. all available information; outside the tool). The workshop recognised that the confidence is affected by data availability and therefore supported to complement the CHASE-based test assessment of core indicators with an assessment based on all available substance data and thresholds, also not agreed in HELCOM.

Based on the discussions on compatibility with the integration result from CHASE and the MSFD reporting requirements, the BalticBOOST recommended that the BalticBOOST WP 2.1 to the hazardous substance assessment tool in the following manner in order to prepare **five approaches** that meet all identified needs in accordance with recommendations received from the workshop (based on Outcome of workshop, para 67).

#### 1. Coastal WFD assessment

- Contracting Parties will be asked to deliver assessment shapefiles and data to the HELCOM Secretariat accompanied by information on the list of substances assessed and if used rules for grouping and/or extrapolation.
- This compilation will enable comparison with use of CHASE in the coastal assessment units, pending that data used in the WFD on hazardous substance is made available by Contracting Parties.

#### 2. Open sea MSFD Art 9 D8 compliance-check (GES/sub-GES)

- To be based on core indicators (incl. radioactive substances) with agreed GES boundaries.
- The compliance check does not require a tool, only conditional rules outlined in an excel format and implemented in the assessment system by the following steps; list of substances with thresholds > evaluate with monitoring data if GES/sub-GES > OAO between substances per assessment unit

#### 3. CHASE integrated status assessment coastal and open sea

- To be based on:
  - core indicators evaluated against agreed GES boundaries
  - as many substances/indicators as available. This will in practise mean that the testing will include additional substances evaluated against alternative thresholds (for example additional substances from directive 2013/39/EU, e.g. DDE (degraded product of DDT), HCH, HCB) and core indicator substance measurements from matrices not compatible with the GES boundary. Alternative standards and matrices to the EQS will be needed especially for those additional substances that are not priority substances according to directive 2013/39/EU, and/or are not monitored in water but the EQS is expressed only for water (HARMONY catalogue as a starting point).
  - bio-effect compartment assessed using pre-core indicators (data harvesting needed as Contracting Parties do not yet report regularly, to be clarified if the ICES simplified reporting format could be used).

#### 4. CHASE core indicator coastal/open sea

- To be based on;
  - core indicators evaluated against agreed GES boundaries.

- To be carried out by ‘switching-off’ all non-core indicator substances from the above approach 3 test.
- This test will enable an evaluation of whether current monitoring of core indicators only can deliver an assessment of adequate confidence and will explore the different outcome of the assessment of core indicators based on the OOA between substances, tentatively required for MSFD reporting, and the CHASE nested assessment.

#### 5. CHASE integrated D9

- To be based on the biota compartment only, and substances selected to be evaluated against food safety thresholds.
- To be carried out by evaluating the environmental monitoring biota data also used in the above mentioned tests (conversion factors needed to convert to values comparable for edible parts of the matrix) and in addition by including data from monitoring carried out by food safety authorities (data harvesting needed by Contracting Parties).

There is a dialogue with ICES regarding the possibility of using the HELCOM EUTRO-OPER concept for CHASE classifications. Pending resources and also possibilities to combine data hosted by ICES with data products ( $C_{\text{THRESHOLD}}$  values and data not currently available within the ICES databases), a CHASE assessment platform equivalent to the platform for eutrophication status assessments could be developed and potentially also applied for HOALS II purposes. This work is taken forward under BalticBOOST WP 2.2 (Improved data labelling and data flow for hazardous substance) by Lead Partner ICES.

## Economic and social analyses

The assessment of economic and social impacts will mainly be taken forward as part of the TAPAS project within 2016. The project is led by SYKE, Finland, with SEI Tallinn, Estonia as a co-lead. In addition, a project researcher is hired at the Secretariat to support the work on part time during 2016. A workshop planned to focus on assessing the use of marine waters is planned for 11-12 May, 2016 in Helsinki, Finland. The developments of the ESA analyses is included in separate document to the meeting, document 3-5.

## Roadmap and timeline

Table 1 gives a general overview, table 2 gives the planned upcoming meetings and workshops, and table 3 gives a more detailed roadmap for the planned activities in HOLAS II.

Table 1. General overview

	2014		2015				2016				2017				2018	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Planning and project initiation																
Outline of the assessment																
Indicator development- Core indicators																
Propose indicators and spatial data to be included																
Data arrangements																
Tool and method development																
Final data submission for inclusion in HOLAS II																
Agree assessment methods to be applied (HOD 51-2016)																
2017 assessments (data for 2011-2015)																
Evaluation of assessment results																



Updates as needed																
<i>Workshops on the pressure index</i>																
HOLAS II Pressure Index WS1, 13 Nov 2015																
TAPAS Pressure Index WS 1-2016, 28-29 Jan																
HELCOM TAPAS Pressure Index WS 2-2016, Tent Sep.																
<b>MARITIME ACTIVITIES</b>	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	
Targeted data request on Maritime activities																
First draft of the Maritime assessment, May																
Intersessional comments from Maritime and other relevant groups																
Endorsement of the assessment, Sept																
Endorsement at HOD, Dec																
Release of the Maritime Assessment																
<b>ASSESSMENT OF ENVIRONMENTAL STATUS (GES)</b>	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	
Core indicator development																
Data arrangements and data collation																
Assessment of status by core indicators																
Updated core indicator fact sheets																
<b>Biodiversity integrated assessment</b>	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	
Concept development																
Data arrangements and data collation																
Method and tool development																
Decide on methods to use																
Assessments																
Publication of first results																
Updates as needed																
<i>Workshops on the biodiversity assessment</i>																
HOLAS II Biodiv 1-2015; 15 Jun 2015																
HELCOM BalticBOOST Biodiv 1-2016, 11-12 Feb 2016																
HELCOM BalticBOOST Biodiv 2-2016. Tent. Sep 2016																
HOLAS II Biodiv 2-2017. Tent. Feb. 2017																
<b>Hazardous substances integrated assessment</b>	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	
Concept development																
Data arrangements and data collation																
Method and tool development																
Decide on methods to use																
Assessments																
Publication of first results																
Updates as needed																
<i>Workshops on the hazardous substances assessment</i>																
HELCOM BalticBOOST Hz WS 1-2016 2-4 Feb 2016																
HOLAS II Hz WS 1-2017 Tent Feb 2017																
<b>Eutrophication integrated assessment</b>	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	
Method and tool development (EUTRO-OPER)																
Data arrangements and data collation																
Decide on methods to use																





## Annex 1: Work plan of the HELCOM TAPAS Theme 1

Theme 1 work plan is built on the seven tasks given in the project application. The tasks, expected deliverables, main responsible partners and additional notes are given in the Table 1.

After the first TAPAS WS, the Theme 1 partners have developed a more concrete work plan, made connections with other similar projects and started working towards the next workshop.

Table 1. HELCOM TAPAS Theme 1 work plan. *Additions after the 1<sup>st</sup> workshop (HELCOM TAPAS Pressure Index WS 1-2016) are indicated in red,*

TAPAS Theme 1 tasks (from the application)	Deliverables	Main responsible + deadlines	Notes
<p>Task 1) Workshop 1 with participation of national experts to:</p> <p>(1.1) Identify and agree on the data sets of pressures, human activities and ecosystem components to be used in the BSPI and BSII assessments based on initial consideration by HOLAS II core team and on the plans and progress of THEME 2 of the project;</p> <p>(1.2) Identify requirements to improve the BSPI and BSPII, including the impact weight scores and spatial and temporal aspects of pressures and impacts.</p>	Workshop #1 outcome + documents.	SYKE The WS was held on 27-28 January 2016 in HELCOM Secretariat.	<a href="#">WS Outcome</a>
<p>Task 2) Produce Baltic Sea impact weight scores for specific ecosystem components, including to</p> <p>(2.1) develop and carry out an online survey addressing experts in all Contracting Parties, <i>include questions about forms of spatial gradients from pressure sources.</i></p> <p>(2.2) to include information from peer-reviewed publications, <i>use the LiACAT tool as necessary,</i> and</p> <p>(2.3) to test the inclusion of uncertainties/probabilities to the weight scores.</p>	<p><b>2.1 Online survey:</b> Document and presentation to WS #1 (plan) and WS #2 (results).</p> <p><b>2.2 Impacts from studies:</b> Document to WS #2.</p> <p><b>2.3 Uncertainties:</b> document to WS #2</p>	<p><b>2.1:</b> NIVA DK [early June]</p> <p><b>2.2:</b> SYKE [May]</p> <p><b>2.3:</b> SYKE [June]</p>	Link to BOOST WP 3.1 (and 3.2). Joint documents/papers are possible. SYKE and IOW contribution from BOOST will be significant.
<p>Task 3) Technical development of the BSPI and BSII indices to include consideration of temporal and spatial aspects of the pressures and impacts.</p> <p><i>The spatial gradients will be tested based on literature survey and the online survey.</i></p> <p><i>Temporal aspects will be tested by taking seasonal effects into account and considering temporary impacts.</i></p>	Document and presentation to WS #2.	SYKE [May-August]	Depends partially on the replies to the online survey (the spatial gradient functions).
<p>Task 4) Carry out a test application of the indices and evaluate the outcome based on the most recent available data sets in HELCOM.</p> <p><i>Tests will be carried out by real data, preferably using the fresh HOLAS II data layers.</i></p>	Document and presentation to WS #2.	SYKE [June-September]	Starting with the HELCOM data and continuing with the national data (from the call).
<p>Task 5) Workshop 2 with participation of national experts to:</p> <p>(5.1) Present the test results at a workshop with representation of experts from Contracting Parties and</p>	Workshop #2 outcome + documents.	SYKE [October]	

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(5.2) Fine-tune the approach based on guidance from the workshop.			
Task 6) A report on how the impact weight scores have been derived and a data base with the results of the surveys (expert survey and literature survey).	Document + presentation to WS #2. A section in the final report.	SYKE [Draft available in November]	Link to the BOOST WP3.1 + 3.2
Task 7) A protocol for application of the BSPI/ BSII together with the test results, including a step-wise guidance how to calculate the indices.	Document to HOD. Final report to HELCOM BSEP.	SYKE [Draft available in November]	

## Annex 2. Workplan of the BalticBOOST WP1.1 (Development of biodiversity tool)

### WP 1.1 objectives and the background

SYKE coordinates the work carried out under the WP. The work will be done by NIVA Denmark, EMI and SYKE. The table (Table 1) indicates the tasks, deliverables, time table and responsible partners of the WP. The concrete product of WP 1.1 is a biodiversity assessment tool for following up progress towards GES and achieving the objectives of the MSFD and BSAP. It will directly contribute to the implementation of the HELCOM HOLAS II project and thereby to the production of a joint roof report for the 2018 MSFD reporting for HELCOM Contracting Parties also being EU Member States.

### WP 1.1 workplan and progress

Table 1 presents the workplan of the WP1.1 towards the delivery in mid-November for the HELCOM HOD meeting. The table also indicates also the early progress, which includes, *inter alia*, preparing documents and presentations and running of the first workshop as well as continuing to develop each of the development tasks after the workshop.

At the second workshop in September, the tool and its evaluation results will be presented. The final report will be presented in the HELCOM HOD meeting in December 2016.

<b>Tasks (as defined in the application)</b>	<b>Milestones and deliverables</b>	<b>Responsibility &amp; deadlines</b>	<b>Notes</b>
<i>Additions from the 1st workshop are given in italics.</i>			
Task 1) Review methods to integrate indicators in the tool and to consider the grouping of indicators: the work will take into account on-going development in MSFD CIS WG-GES, development of the HELCOM core indicators, reports and scientific studies, the BSAP, the EC Decision 477/2010 as well as the review and revision work of the Decision, and Annex III of the MSFD.	Document and presentation at WS1	SYKE (presented at the WS1)	The outcome of the WS is available through HELCOM Meeting Portal
Task 2) Consider technical requirements to include HELCOM core indicators in the tool: the core indicators have utilized various approaches to set GES boundaries which result in technical challenges in the development of the assessment tool (e.g. GES expressed as a boundary, a range or a trend).  <i>The minimum and maximum values and SE of the indicators are to be asked from expert groups or collected from data.</i>  <i>Identify difficult cases &amp; possible solutions.</i>	Document and presentation at WS1	SYKE (document at WS1)  DL: March-May	To be a chapter in the final report
Task 3) Technical solutions that take into consideration transparency of assessment results/user-friendliness and to gain understanding of the method and the results among the experts in HELCOM Contracting Parties.  <i>Discussions between EMI and Secretariat of the contents and the form of the tool workspace.</i>	Presentation at WS1  Workspace development to be presented at the WS2.	EMI (presentation at WS1)   EMI & HELCOM  By: August	

Task 4) Carry out 2 workshops with participation of experts from HELCOM Contracting Parties, under the HOLAS II project, for guidance and knowledge input for the development of the tool.	WS1 in February (documents and outcomes) WS2 in September (documents and outcomes)	SYKE  WS1 was held on 12-13 February 2016 in Copenhagen  WS2 will be in September	WS outcomes available through HELCOM Meeting Portal
Task 5) Develop principles to define and possibly quantify uncertainty which can affect the assessment outcome.  <i>WS1 gave recommendations how the uncertainty should be estimated, Uncertainty considerations should cover aspects of quality in data, indicators, and the assessment.</i>	1) Presentation at WS1 2) Document to WS2	SYKE (document at WS1)  By: August	Chapter in the final report
Task 6) Develop a tool to assess biodiversity status of the Baltic Sea building on the findings of the previous steps.  <i>Test using core indicators, WFD indicators, different spatial assessment units.</i>  <i>Consider and test weighting of indicators and define principles, if necessary.</i>  <i>Develop solutions to include indicators where GES is assessed based on trends or conditional rules</i>	1) First version of the tool ready for testing 2) Presentation of tool at WS2	NIVA (tool development), SYKE (testing of the tool), EMI (coding related to task 3)  (presentation at WS1)  Tool to be tested May-July. Presented at WS2.	To be presented to S&C 5-2016.
Task 7) Validate the tool based on a desk study in case study areas (n = 6) against environmental data; the test results will be compared with scientific studies, other marine assessments of the areas as well as known anthropogenic impacts in the areas.  <i>Case study areas (likely to be): Gulf of Finland, Gulf of Riga, Bothnian Sea, Gotland Basin, Arkona Sea, Danish Straits.</i>	1) Document and presentation at WS2	SYKE  Work to be done between May-August.	Chapter in the final report
Task 8) Prepare a final report that together with the test results and the operational tool (e.g. code in R and a data format) will be delivered as a component of the implementation of the HELCOM HOLAS II project.	Final report (aim at BSEP)	SYKE (November)	

### Annex 3. Schedule for work within BalticBOOST WP 2.1.2016

Time schedule for completing the updated of CHASE is outlined below:

- May 2016: Prototype tool made available as an R-script based on the structure outlined in the first section (4 compartments, 5 steps etc.).
- June 2016: Initial testing of the prototype tool based on data from a number of Baltic Sea offshore cases study areas (n = 9-17).
- September 2016:
  - Synthesis of the test results
  - HELCOM BalticBOOST workshop to evaluation test results
  - Fine-tuning of the CHASE tool and codes based on guidance from the workshop.
- October and November 2016: Writing of a CHASE report (Working title: “Development of an updated tool for integrated assessment of ‘chemical status’ in the Baltic Sea”) including the tool itself, codes, results of the testing, as well as guidance on how to apply the tool.
- Presentation of the updated tool for endorsement by State and Conservation 5-2016 (7-11 November 2016) and approval at HOD 51-2016.