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Background

MARITIME 18-2018 took note of the successful Interreg Baltic Sea Region Project application COMPLETE (Completing management options in the Baltic Sea Region to reduce risk of invasive species introduction by shipping). The project, with HELCOM participation, will be implemented during October 2017-October 2020 ([Outcome of MARITIME 18-2019](#), para 3.10).

This document provides a follow-up on the work conducted within the project since its presentation at MARITIME 18-2018 ([document 3-2](#)).

Action requested

The Meeting is invited to take note of the information on the status of the project “Completing management options in the Baltic Sea Region to reduce risk of invasive species introduction by shipping ([COMPLETE](#)), 2017-2020”.

Status report of the COMPLETE project

Summary

The work towards the project overall objectives, harmonized monitoring of non-indigenous species (NIS), harmonized implementation of Ballast Water Management Convention (BWMC), and regional biofouling management strategy, has continued according to the project plan. The project is starting the final year of its implementation, and all activities are expected to be finalized by September 2020.

Interested parties and stakeholders who are so far not involved in the project are invited to get in contact with the lead partner. Further information is available at www.balticcomplete.com.

Project partnership

Project partners have long-term expertise and know-how in innovative solutions for shipping, risk assessment and management systems, surveillance and monitoring:

- Kotka Maritime Research Association (KMRA, coordinator)
- Klaipėda University (KU, scientific coordinator)
- Baltic Marine Environment Protection Commission – Helsinki Commission (HELCOM)
- Finnish Environment Institute, Marine Research Centre (SYKE)
- University of Gdansk (UG)
- University of Helsinki, Department of Environmental Sciences (UH)
- Chalmers University of Technology (CHALMERS)
- Federal Maritime and Hydrographic Agency (BSH)
- South-Eastern Finland University of Applied Sciences (XAMK)
- University of Tartu (UTARTU)
- Keep the Archipelago Tidy Association (KAT)
- Latvian Institute of Aquatic Ecology (LIAE)

Associated organizations of the project represent shipping companies, port authorities, governmental bodies, environmental NGOs and research institutions from all Baltic Sea countries.

Project activities

The COMPLETE project is aimed at tackling gaps and proposing operational frameworks and tools for a harmonized implementation of the International Convention for the Control and Management of Ship's Ballast Water and Sediments (BWMC 2004), the Guidelines for the Control and Management of Ship's Biofouling to Minimize the Transfer of Invasive Aquatic Species (IMO Biofouling Guidelines, 2011), as well as the EU Marine Strategy Framework Directive (MSFD), and the development of a common Baltic Sea Region biofouling management strategy.

WP2: Guidelines for surveillance and monitoring program of non-indigenous species

The overall aim is to develop a system to monitor the effectiveness of ship's ballast water/sediments and hull biofouling management measures and to evaluate the progress towards the HELCOM BSAP objective "No introductions of alien species from ships".

- **Selecting innovative tools for detection of target harmful aquatic organisms and pathogens.**

The aim is to develop a molecular detection method, which enables rapid and suitable detection of target species based on eDNA analysis. Work has been progressing well towards development of the standardized sampling protocol for the target non-indigenous species and methodological recommendations on species-specific sampling procedures. In addition, continued efforts have been devoted to work on methods to distinguish "living" and "recent" ballast tank biota based on the eDNA. The biological samples for DNA analyses have been collected from Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden.

- **Biofouling assessment protocol for leisure boats**

The biofouling assessment protocol for marinas and small boats developed in the project was tested in summer 2019 in two countries (Latvia and Poland). The assessment was accompanied with a questionnaire to the boat owners. The [questionnaire](#) is available in English, Estonian, Finnish, German, Latvian, Lithuanian, Polish, Russian and Swedish.

- **Assessment of overall biofouling potential and areas of risk**

Data for the risk assessment of biofouling potential of various types of vessels has been collected for calculation of their wetted surface area (WSA) and their ports of departure. The boater questionnaire developed in the project for biofouling assessment protocol will also be utilized to estimate the biofouling potential for leisure boats. The most vulnerable areas for new introductions via biofouling of ships are summarized and analyzed (e.g. information about the geographical location of ports and marinas, and their relative distance from potentially sensitive areas) and presented on the map.

- **Integrated monitoring system of non-indigenous species introductions by shipping and other vectors**

Work has started towards developing a monitoring manual for the Baltic Sea region on non-indigenous species. This will utilise relevant components of the already existing monitoring programs on various marine biota as well as propose new components targeting specifically selected areas, trophic levels or taxa. The deliverable will be ready by the end of the project.

WP3: Ballast water risk assessment and management systems

The overall aim is to develop a fully operational and regionally harmonised structure for ships' ballast water management in the BSR.

- **Target species selection criteria and risk assessments**

The HELCOM/OSPAR Joint Harmonized Procedure (JHP) target species (TS) list serves as basis for the risk assessment analyses to taking decision whether ballast water management exemption (BWMC A-4) can be granted on ship voyages between selected ports. The final version of the TS selection criteria was submitted to HELCOM/OSPAR TG BALLAST and presented in its meeting during the back-to-back meeting with the COMPLETE project in December in Gothenburg, Sweden. It has been acknowledged by TG BALLAST as also reflected in its outcome ([document 3-4](#) and [Outcome of TG BALLAST 9-2018](#), para. 3.8-3.13).

- **Advanced risk assessment tool under the HELCOM-OSPAR Joint Harmonised Procedure**

The aim is to develop an improved online risk assessment (RA) tool under the JHP to allow administrations and ship owners to quickly identify routes that may qualify for exemptions in the HELCOM and OSPAR marine areas linked to the most updated knowledge on harmful aquatic organisms and pathogen introduction by shipping in the Baltic Sea and the North Atlantic. A document was submitted to TG BALLAST 9-2018 describing the work plan designed to accomplish the improvements in the RA tool ([document 5-1](#)) to ensure that the work of the project is aligned with countries' needs.

Work has been done on the design of a new database ([BaltiCheck](#)) which among other, will contain data from port surveys currently available. This new database will have a link with the AquaNIS one to ensure the most updated scientific knowledge. It is envisaged that following discussions within TG BALLAST the algorithm of the RA tool will be amended ([Outcome of TG BALLAST 9-2018](#), para. 3.9). This amendment will be then implemented into the risk assessment tool.

- **Delivering the regionally harmonized fully operational early warning system**

The regionally harmonized early warning system (EWS) will be based on the integrated monitoring program of non-indigenous species (NIS) and harmful aquatic organisms and pathogens (HAOP) introductions, built on existing surveys and approaches, which may provide information on their arrival, establishment and

spread. This activity directly relates to several other activities in the project, since criteria to issue the warning will be based on detailed categorization of NIS (and HAOP) impacts on human health, economy, environment and socio-cultural values, incorporated into the information system on NIS, regularly supplemented by data from national and regional marine monitoring programs and other sources. All COMPLETE partners have given feedback to the questionnaire, where the current HAOP observation practices and early warning systems were mapped in each partner country. This information will be utilized as the basis for developing the EWS for the key stakeholders.

- **Decision support system for the Baltic Sea ballast water management**

A Baltic Sea ballast water management (BWM) decision support system (DSS) contributes to the implementation of common actions, helps sharing information, and thus enable the achievement of more effective BWM measures, lessens the burden on vessels, and lowers the costs of BWM measures in the Baltic Sea Region. For that purpose, the BWM DSS derived from the EU FP7 project VECTORS needs to be adapted to the Baltic Sea regional situation in order to support the implementation of the most effective BWM measures in the region. International developments influencing these decisions are currently followed and reviewed: IMO developments (e.g. Experience Building Phase EBP) and the next stages of EMSA and Paris MoU developments with a focus on the Baltic Sea. To include as many main and recent developments and information as possible, the BWM DSS is going to be conducted in 2020.

- **Training local authorities for the Ballast Water Management Convention**

Participants from the administrations and scientific sector of seven Baltic Sea countries, which are going to perform ballast water sampling and analysis met in a COMPLETE workshop organized in Hamburg in May 2019. Knowledge and practical hands-on exercises for all stages from planning and sampling to analysis were included in one seminar, which was supervised by the internationally recognised scientists Dr. Matej David and Dr. Stephan Gollasch. The materials and report of the workshop will be provided by the COMPLETE project. In addition, a documentary on the practical exercises combined with interviews with the experts will be prepared.

WP4 Evidence-based options for biofouling management in the Baltic Sea Region

Information on national regulations, common and best available technologies and practices concerning all aspects of biofouling, antifouling, and cleaning of commercial ships, and recreational boats are scarce in the Baltic Sea Region. For the development of a regional management strategy on biofouling, this information is essential.

- **National biofouling regulations, cleaning procedures and facilities**

Collecting information on national legislation related to biofouling issues as well as on cleaning and anti-fouling procedures, facilities and waste management has been started, including information on the application of the IMO biofouling guidelines and experiences with it. In addition to the questionnaire on biofouling in the leisure boat sector, a questionnaire on biofouling in the commercial shipping sector was edited and will be published in English also by means of the online tool and sent to relevant stakeholders. For the issue of in-water cleaning, the international workshop "National regulation and approval processes concerning in-water cleaning of boats and ships in the Baltic Sea Region - current procedures and future needs" was organized at the BSH in Hamburg on the 27 and 28 May 2019. The workshop aimed to gather and to compile information on legal aspects and regulation of in-water cleaning that are already in place in the BS countries as well as their practical implementations.

- **Catalogue of best practices for biofouling management from within and outside the Baltic Sea Region**

A literature research has been started in order to collect international biofouling management and antifouling practices. Currently, a rating system is being developed aiming at identifying which practices can be rated as "best practices" concerning environmental, economic and practical aspects. This task is aimed at collecting examples for good practices and best available technologies concerning antifouling, and biofouling

management worldwide, and assessed for their applicability specifically in the Baltic Sea Region. The in-water cleaning workshop described in the previous section combines also the information and knowledge gathering needs for carrying out this activity. The participants of the workshop were invited to give examples of good/best practices and of their experiences (examples of granted approvals, approved cleaning procedures/technologies etc.), to be used as the basis of the catalogue of best practices and ultimately to be taken into account in the biofouling management roadmap proposal.

- **Guidance on antifouling systems cost-efficiency evaluation**

There are several options for antifouling (AF) systems. In addition to the use of AF paints, many ships are performing hull cleaning in between repainting. As AF systems may contain various chemical components, which can be released to the surrounding water after cleaning, the effect of cleaning with water jets/brushes has been studied. In addition, the concentration of copper in the AF systems has been tested. All experimental work has been finalized and the results from these studies, which will be publicly available by the end of the project, will contribute to the development of guidance on AF practices for the BSR.

- **Benefits of biofouling management on ship speed, fuel consumption and emissions**

In summer 2018, passage data was collected on two ROPAX liners of operating between Finland and Germany (M/S Finnmaid and M/S Finnstar). Fuel consumption, draught, trim, speed over ground, propeller pitches and rotation speeds of shafts were recorded during the voyages. Furthermore, gaseous emission measurements of main engines were carried out during two sessions, in May and August 2018. In summer 2019, data collection continued: passage data was collected from Finnlines Star-class ROPAX vessels, but besides that, also from two RORO-ships (M/S Serenade and M/S Gabriella) operating between Helsinki (Finland) and Stockholm (Sweden). Data analyses included calculation model based on hydrodynamics, statistical data-analysis (several methods) and Bayesian network analysis (tree-augmented naive Bayes), and the results will be reported by September 2020.

WP5 Databases and user-friendly information support

The overall aim of WP5 is to develop information products, which will be maintained after the end of the project. These products will be used for collecting, summarizing and assessing data on HAOP, and for decision-making on choosing optimal antifouling system and cleaning options.

- **Information system on non-indigenous species and harmful aquatic organisms and pathogens**

The COMPLETE project continuously advances the AquaNIS information system, which contains the most up-to-date and free-access information/data on NIS introduction events within the Baltic Sea, neighbouring regions (e.g. North Sea) and other regions of the world. The database already contains metadata on molecular markers of HAOP solving several project tasks and selection of likely biofouling organisms based on accumulated world-wide knowledge and record of data from biofouling potential estimation, and selection of target species and early warning system (EWS). Collaboration with HELCOM data coordinators is underway to create a link for information exchange for the RA tool under the HELCOM-OSPAR JHP. Work with the development of the functional module for the Early Warning System in AquaNIS will continue.

- **Decision support tool for selection of optimal antifouling system and cleaning options**

Activities have been continued to develop the first version of a decision support (DS) tool for evaluating the biofouling risk and its cost-effective management. This tool will integrate knowledge related to cost-effectivity of different antifouling strategies. The work with the DS tool has continued by developing the structure of the model. The first version of the areal division to be used in the model has been developed. This is based both on the physical and chemical characteristics of the Baltic Sea basins as well as the NIS data from HELCOM risk assessment tool and AquaNIS database. To promote the joint development of the DS tool, a 3-day knowledge co-production workshop in Helsinki in October 2018 was organized, where the main aims were to advance the development of the DS tool, to improve the joint understanding of the system and question in focus, and to plan future work in order to avoid overlapping work. The tool will be cross-disciplinary, integrating the huge knowledge base of the transnational group of experts and other

stakeholders involved in the project and actively utilizing information and knowledge developed in COMPLETE project, and it will be finalized by September 2020.

- **Interactive user-friendly map on hull cleaning services**

Activities are underway to create an interactive map to reflect one of the main themes in the COMPLETE project - hull cleaning services and applied technologies. The map is targeted to cover the whole BSR, combining technical and visual solutions in a convenient and understandable manner for easy processing of the collected information. The map contains information from stakeholder database provided by all project partners. The map currently contains 66 entries from all countries around the Baltic Sea plus Norway, including the contact details of respective organizations/companies providing hull cleaning services in the BSR. The final map will be available by the end of the project.

WP6 Stakeholder involvement and strategy development processes

WP6 is oriented on active communication and involvement of all project target groups with the aim to develop a proposal of a roadmap for harmonized biofouling management in the Baltic Sea Region. It will include information on what specific actions are needed in order to reach a regional harmonized biofouling management of maritime and leisure traffic, and what stakeholders would have to be involved in developing this common regional management strategy. The roadmap proposal will include tailored recommendations from the project for the BSR, reviewed and supplemented by the target groups.

The [COMPLETE Stakeholder Conference](#) “Towards solutions for sustainable shipping and boating: better biofouling and ballast water management” will be held on December 4-5 2019 in Jurmala, Latvia. The aim of the conference is to discuss potential solutions and sustainable management options to reducing the risk of invasive species introductions caused by shipping and boating in the Baltic Sea Region. The stakeholder conference is aimed at policy makers on international, regional, and national level, (e.g. maritime and environmental administrations) as well as at local administrations, ports/port authorities, chemical safety authorities, shipyards/docks, shipping companies, boating associations, marinas, environmental NGOs, and companies providing hull cleaning services or antifouling systems. The registration for the event will be closed on October 4th, 2019.

Concept for a Regional Baltic Biofouling Management Roadmap has been submitted to HELCOM MARITIME 19-2019 for consideration ([document 4-2](#)). This document provides an overview of the COMPLETE project outputs and deliverables related to biofouling management in the Baltic Sea Region, contributing to the implementation of the IMO Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (resolution MEPC.207(62)) which are currently under review (MEPC.1/Circ.811), and the Guidance for minimizing the transfer of invasive aquatic species as biofouling (hull fouling) for recreational craft (MEPC.1/Circ.792) in the Baltic Sea Region.