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Agenda Item	3 – Ballast water and biofouling
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Background

MARITIME 17-2017 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 17-2017](#), para. 3.6).

This document provides a follow-up on the work conducted within the project since its presentation at MARITIME 17-2017 ([document 3-3](#) and [presentation 1](#)).

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, harmonized implementation of Ballast Water Management Convention, and regional biofouling management strategy, has been started according to the project plan.

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 will be 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, 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 Ships' Ballast Water and Sediments (BWMC 2004), the Guidelines for the Control and Management of Ships' 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 permanently monitor the effectiveness of ballast water and hull biofouling management measures and to evaluate the progress towards the ecological objective 'No introductions of alien species from ships'.

- **Selecting innovative tools for detection of target harmful aquatic organisms and pathogens (KU)¹**

The aim is to develop a molecular detection method, which enables rapid and sensitive detection of target species based on their DNA in environmental samples. Selection of candidate species (potential HAOP) for the first round of eDNA analysis has been made. The work will continue with development of the molecular (DNA barcode) library for target NIS identified in the Baltic Sea based on HELCOM/OSPAR risk assessment by

¹ Institutions leading the activity are included in brackets.

using existing genetic databases and DNA barcodes identified in partner laboratories for the species not present in database, and production of a manual on application of species/group specific molecular markers.

- **Biofouling assessment protocol for leisure boats (KAT)**

A preliminary biofouling assessment protocol has been tested in Finland during summer 2018, and a sampling campaign covering all Baltic Sea Region will be implemented in summer 2019. The assessment will be accompanied with a questionnaire to the boat owners, and invited volunteer boaters can participate in a follow-up survey where samples of fouling species would be collected from their boats during and after the boating season.

- **Assessment of overall biofouling potential and areas of risk (UG)**

A risk assessment of biofouling potential of various types of vessels has been started by collecting data for calculation of their wetted surface area (WSA) and their ports of departure. The most vulnerable areas for new introductions via biofouling of ships will be collected (e.g. information about the geographical location of ports and marinas, and their relative distance from potentially sensitive areas).

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

A monitoring manual for the Baltic Sea region on non-indigenous species, including both all ongoing monitoring methods and the new methods that will be developed during COMPLETE, will be drafted in the COMPLETE project. The work has started and discussions held in wider expert forums, the ICES working groups on introduction and transfer of marine organisms (WG ITMO) and ICES/IOC/IMO WG on ballast and other ship vectors (WG BOSV), and the structure of the manual will be developed accordingly.

WP3: Ballast water risk assessment and management systems

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

- **Target species selection criteria and risk assessments (BSH)**

The HELCOM/OSPAR Joint Harmonized Procedure (JHP) target species (TS) list serves as basis for the risk assessment performed to taking decision whether ballast water management exemption (BWMC A-4) can be granted on ship voyages between selected ports. The selection criteria for the existing target species list and the risk assessment scheme under the JHP are reviewed and recommendation for improvement provided for the work of the HELCOM/OSPAR TG Ballast in December 2018.

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

The aim is to develop an improved online risk assessment 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. The project has been communicating with TG BALLAST to inform them of the possible contribution from COMPLETE to their work as well as needed input from TG BALLAST to benefit the implementation of the project. Dialogue has been initiated with the KU to further improve the links between AquaNIS and the RA tool under the JHP.

- **Delivering the regionally harmonized fully operational early warning system (KU)**

The regionally harmonized early warning system (EWS) will be prepared based on the integrated monitoring program of non-indigenous species (and harmful aquatic organisms and pathogens) introductions, built on

all types of existing surveys and approaches, which may provide information on their arrival, establishment and spread. Therefore this activity is closely related to WP2 activities. In addition, this activity is related to WP5 activities, because criteria to issue the warning will base on detailed categorization of non-indigenous species (and harmful aquatic organisms and pathogens) impacts on human health, economy, environment and socio-cultural values, incorporated into the information system on non-indigenous species, regularly supplemented by data from national and regional marine monitoring programs and other sources.

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

A Baltic Sea ballast water management (BWM) decision support system (DSS) supports the implementation of common actions, as well as it helps sharing information, and with this achieving 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 project VECTORS will be further adapted to the Baltic Sea regional situation in order to support the implementation of the most effective BWM measures in the BSR.

- **Training local authorities for the Ballast Water Management Convention (BSH)**

Ballast water sampling and analysis are complex processes and it is beneficial to harmonize them to avoid that vessels are compliant in one port, but not in another port just because of different methods applied. Invited for this training event which is organized and held by world's leading experts for sampling and analysis are the port state control authorities of all COMPLETE countries. The training will take place in spring 2019 in Hamburg.

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 (BSH)**

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.

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

A literature research has been started in order to collect international biofouling management and antifouling practices. Currently, a rating system is developed aimed 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 technology concerning antifouling, and biofouling management worldwide, and assessed for their applicability specifically in the Baltic Sea region.

- **Guidance on anti-fouling systems cost-efficiency evaluation (CHALMERS)**

There are several options for anti-fouling (AF) systems. In addition to the use of AF paints, many ships are performing hull cleaning in between repainting. Experimental work has been carried out during summer 2018 for describing the biofouling on different anti-fouling systems and also for documenting hull cleaning effects and efficiency on these systems. As anti-fouling 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. Also, the concentration of copper in the anti-fouling systems has been tested.

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

Literature survey needed for evaluation of experimental validation of biofouling management on ship fuel consumption and emissions has been done, and the first empirical measurements on ships have been made during 2018. Information of staff attitudes and practices towards hull cleaning and tacit knowledge that they might have concerning connections between cleaning and the ship's speed, fuel efficiency and emissions will be collected.

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 harmful aquatic organisms and pathogens (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 (KU)**

The COMPLETE project will further develop AquaNIS information system, which contains the most up-to-date and free-access information/data on non-indigenous species (NIS) introduction events within the Baltic Sea, neighboring regions (e.g. North Sea) and other regions of the world. The database will be used for the storage of 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 (WP2), and selection of target species and early warning system (WP3). AquaNIS will provide the required biological information for granting exemptions with the JHP tool, to be further developed under WP3.

- **Decision support tool for selection of optimal anti-fouling system and cleaning options (UH)**

First version of a decision support tool for evaluating the biofouling risk and its cost-effective management will be developed, by integrating knowledge related to cost-effectivity of different antifouling strategies. The tool is cross-disciplinary, integrating the huge knowledge base of the transnational group of experts and other stakeholders involved in the project and actively utilizing the results from WPs 2 and 4.

- **Interactive user-friendly map on hull cleaning services (LIAE)**

An interactive map will reflect one of the main themes in COMPLETE project - hull cleaning services and applied technologies. The map is targeting to cover the BSR, combining technical and visual solutions in a convenient and understandable manner for easy processing of the collected information.

WP6 Stakeholder involvement and strategy development processes

WP is oriented on active communication and involvement all project target groups with aim to develop a proposal of a roadmap on for harmonized biofouling management for Baltic Sea Region.

- **Establishing network of main stakeholders (LIAE)**
- **Engaging stakeholders into development and use of project products (KMRA)**
- **Roadmap proposal for harmonized biofouling management in the Baltic Sea Region (KMRA)**

The proposal of the roadmap 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 Baltic Sea region, reviewed and supplemented by the target groups. Stakeholder mapping has started.