

Joint HELCOM/OSPAR Task Group on
Ballast Water Management Convention (BWMC) and Biofouling
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Background

A proposal of a Regionally Harmonized Early Warning System (EWS) on findings of harmful aquatic organisms and pathogens (HAOP) in the Baltic Sea was developed in the frame of the INTERREG Baltic Sea Region Programme project [COMPLETE](#) (Completing management options in the Baltic Sea Region to reduce risk of invasive species introduction by shipping, 2017-2020) and further developed during its extension phase [COMPLETE PLUS](#) (2021). EWS implementation is in line with the recently updated Baltic Sea Action Plan which calls for “Establish by 2024 and subsequently implement the early warning system in case of the introduction of invasive species in ports.” (BSAP, 2021; Action S7, under Theme: Maritime activities/ Topic: Non-indigenous species).

This document presents the progress made in the further development of EWS, taking into account the input provided by TG BALLAST 10-2019 and TG BALLAST 11-2020 ([Outcome TG BALLAST 10-2019](#), para. 3.5-3.9; [Outcome TG BALLAST 11-2020](#), para. 3.2-3.9) and HELCOM MARITIME 21-2021 ([Outcome MARITIME 21-2021](#), para. 3.5-3.11). Following the decision of HELCOM MARITIME 21-2021, Denmark, Finland and Latvia have already agreed to participate in the pilot testing of EWS and have appointed their focal points for the implementation of this system.

HELCOM MARITIME 21-2021 further agreed that experiences of the pilot implementation should be submitted to JTG BALLAST & BIOFOULING for consideration with the view to revising the EWS, as may be needed and invited JTG BALLAST & BIOFOULING 1-2021 to consider the draft EWS and to further plan its pilot implementation.

Action required

The Meeting is invited to consider the draft EWS and to further plan its pilot implementation.

Contracting Parties are invited to nominate national focal points responsible for: 1) sending timely information on findings of HAOP in ports and their vicinities, 2) taking decision as a member of the EWS Expert Group, and 3) receiving a warning signal and further actions.

Proposal of a Regionally Harmonized Early Warning System (EWS) on the detection of harmful aquatic organisms and pathogens (HAOP)

The proposed EWS is embedded in [AquaNIS](#) as a dedicated functional module and has three main blocks or stages: 1) detection and reporting, 2) decision procedure, and 3) warning signal and actions (Fig. 1).

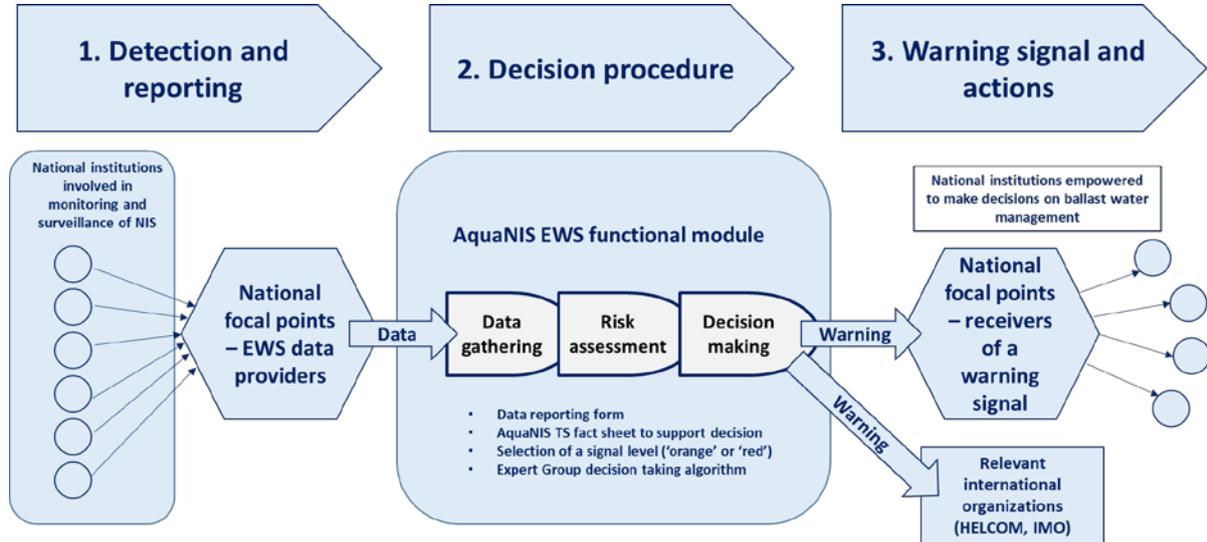


Figure 1. Principal scheme of the Early Warning System on findings of Harmful Aquatic Organisms and Pathogens.

The implementation of the EWS foresees three types of national focal points (Table 1), depending on the actions they are to conduct.

Table 1. The role of national focal points in the Early Warning System

EWS blocks	Members' role	Responsibilities	Actors
1. Detection and reporting	Data providers	Timely submit data on detection of HAOP to the EWS platform.	National focal points responsible for gathering information on findings of IAS and potential HAOP from institutions involved in monitoring and surveillance of non-indigenous species.
2. Decision procedure	Experts on IAS	Promptly make a decision on the need to propagate a warning signal and its level ("yellow" or "red") ¹ .	Specialists in IAS nominated by Member States to the EWS Expert Group (or AquaNIS Editorial Board).
3. Warning signal and actions	Receivers of a warning signal	Receive a signal and disseminate it at the national level.	National focal points entitled to receive a warning signal and take appropriate actions.

¹ Please see Table 3 for further definition of colours associated to warning signal.

1. Detection and reporting

Detection of potential HAOPs is the prerogative of institutions that monitor NIS, conduct targeted NIS and IAS research, or collect citizen science data. These institutions should be advised to report the results of potential HAOPs to the national focal point assigned to provide EWS data.

On receiving data from local sources, the national data provider connects to the AquaNIS EWS module and fills out a special form, indicating the name of the species, country and port from which data are reported, species distribution, whether it is the cause of the outbreak, known impacts and other relevant information (see Fig. 2). If the HAOP is not included in the TS list, the free text option can be used to indicate which IAS is detected and justify why it should be reported as a potential HAOP. A drop-down menu is used as much as possible to facilitate the data entry process and its quality and minimize human errors.

Before sending a warning signal, the national data provider receives the AquaNIS fact sheet, which is automatically generated when the name of a species included in the HELCOM TS list is entered. The fact sheet contains data extracted from AquaNIS on the impact of species on human health, economy or the environment (if known), its distribution throughout the world and in the Baltic Sea, as well as its possible relationship with ballast water (i.e. the presence of pelagic larvae in life cycle). The factsheet will help to decide whether the signal is of orange or red level (Table 2). Then, the data is submitted to the EWS Expert Group.

The figure consists of two side-by-side screenshots of a web-based reporting interface. The left screenshot shows a 'Report Data' form for 'AquaNIS Fact Sheet'. It includes fields for 'Country' and 'Port', both with 'Select:' dropdown menus. Below these are three sections for 'Known human health impact?', 'Known economic impact?', and 'Known measurable environmental impact?', each with 'Yes' and 'No' radio buttons. A 'Suggested level of signal' section contains a table with columns for 'Level', 'Criteria', and 'Criteria definition'. The table lists four options: 'Red' (Outbreak of TS or HAOP), 'Yellow' (TS new for the Baltic Sea), 'Yellow' (TS spreading in the Baltic Sea), and 'Yellow' (A new potential HAOP/TS). An 'Additional Information' section provides a text area for further details. The right screenshot shows the 'AquaNIS Fact Sheet' for the species *Dreissena polymorpha*. It displays 'Species Taxonomy' (Family: Dreissenidae, Order: Veneroida, Class: Bivalvia, Phylum: Mollusca) and 'Species Data' including 'Molecular Information' (Available), 'Association with Vessel Vectors' (Ballast waters, Biofouling), and 'Plankton Life Stage' (Zooplankton (Larvae)). A 'Target Species Management' section lists five criteria with status indicators (green for 'Yes', yellow for 'No'). The bottom section, 'Introduction Events', shows a table of events in the Baltic Sea and in ports.

Level	Criteria	Criteria definition
<input type="radio"/> Red	Outbreak of TS or HAOP	Observation of a TS or a new potential HAOP forming outbreak in a port or port vicinities.
<input type="radio"/> Yellow	TS new for the Baltic Sea	Detection of a NIS belonging to the HELCOM/OSPAR TS, which is new in the Baltic Sea.
<input type="radio"/> Yellow	TS spreading in the Baltic Sea	Detection of a TS previously observed in the Baltic Sea spreading to a new Baltic Sea country.
<input type="radio"/> Yellow	A new potential HAOP/TS	Detection of a non-indigenous species new for the Baltic, which is not on the TS list yet, but which has features attributable to HAOP according to the screening based on TS selection criteria.

Recipient Region	Introduction Year
Belgium / North Sea	1826
Estonia / Baltic Sea	1803 - 1850

Figure 2. Reporting form on finding of potential HAOP (left) and AquaNIS Fact Sheet to support decision making on issuing a warning signal (right).

Data providers, members of the EWS expert group and signal receivers are to be nominated.

2 Decision procedure

The EWS Expert Group supported by AquaNIS Editorial Board consisting of specialists in management of IAS and ballast water, receives data from a national focal point and decides within 48 hours on the need to propagate a warning signal and its level, "yellow" or "red" (Table 2). The decision process is automated as much as possible and includes a voting procedure and the ability to express an opinion (a special form). If necessary, an online discussion is organized.

Table 2. The criteria for the "red" and "yellow" warning signals.

Level	CRITERIA (short name)	CRITERIA (definition)
“Red”	Outbreak of TS or HAOP	Observation of a TS or a new potential HAOP forming outbreak in a port or port vicinities.
“Yellow”	TS new for the Baltic Sea	Detection of a NIS belonging to the HELCOM/OSPAR TS, which is new in the Baltic Sea.
	TS spreading in the Baltic Sea	Detection of a TS previously observed in the Baltic Sea spreading to a new Baltic Sea country.
	A new potential HAOP(TS)	Detection of a non-indigenous species new for the Baltic, which is not on the TS list yet, but which has features attributable to HAOP according to the screening based on TS selection criteria.

When a decision is made, a warning signal is sent to all national representatives registered in the EWS, as well as to relevant organizations.

3 Warning signal and actions

The alert sent to all registered recipients designated by the participating parties as national focal points (e. g. Port State Control authorities, Ministries of Transport or Environment).

On receiving the signal, the focal points decide what recommended action to take: for example, they may recommend mariners not to uptake ballast water in the port under their jurisdiction if a new TS is detected there, or prohibit release of ballast water taken from a port where outbreak of a TS or a new potential HAOP was observed, or propose eradication, containment or other mitigation measures in that port (Table 3). Decisions are made locally depending on the specific situation and based on national legislation. For species belonging to the strongest impact category, contingency plans should previously be developed and be ready for implementation. Response strategies and methods should be anticipated and consensus reached on as many details as possible beforehand.

Table 3. Recommended actions upon receiving a yellow or red warning signal

Action	Yellow level	Red level
A. Alert mariners of areas where vessels should not uptake ballast water.		X
B. Alert environmental and health authorities that an early response and an implementation of remediation measures is needed.		X
C. Alert the authorities responsible for granting exemptions for ballast water treatment of the possible need to revisit the permits.	X	X

Literature

Gollasch, S., David, M., Broeg, K., Heitmüller, S., Karjalainen, M., Lehtiniemi, M., ... & Strake, S. et al. (2020). Target species selection criteria for risk assessment based exemptions of ballast water management requirements. *Ocean & Coastal Management*, 183, 105021.

IMO, M. (2004). International convention for the control and management of ships' ballast water and sediments. In *BWM/CONF./36*.

Olenin, S., Alemany, F., Cardoso, A. C., Gollasch, S., Gouletquer, P., Lehtiniemi, M., et al. (2010). Marine strategy framework directive. *Task Group*, 2.

Glossary

- **AquaNIS** is an information system on the aquatic Non-Indigenous Species (NIS) and cryptogenic species (www.corpi.ku.lt/databases/aquanis), which stores and disseminates information on NIS introduction histories, recipient regions, taxonomy, biological traits, impacts, and other relevant documented data.
- **An Early Warning System (EWS)** on findings of harmful aquatic organisms and pathogens (HAOP) in the Baltic Sea, aimed at reducing the risk of spreading HAOP by minimizing the uptake and discharge of ballast water which could be harmful to the recipient area. EWS is a dedicated functional module of AquaNIS that provides a platform for the timely exchange of information on HAOP and invasive alien species detections in order to generate an alert.
- **Harmful aquatic organisms and pathogens (HAOP)** - aquatic organisms or pathogens which, if introduced into the sea including estuaries, or into fresh water courses, may create hazards to the environment, human health, property or resources, impair biological diversity or interfere with other legitimate uses of such areas (IMO, 2004).
- **Invasive alien species (IAS)** are a subset of established non-indigenous species which have spread, are spreading or have demonstrated their potential to spread elsewhere, and have an adverse effect on biological diversity, ecosystem functioning, socio-economic values and/or human health in invaded regions (Olenin et al., 2010).
- **Non-indigenous species (NIS)** are species introduced outside of their past or present natural range and outside of their natural dispersal potential due to intentional or unintentional introduction resulting from anthropogenic activities. This includes any propagule which might survive, reproduce and subsequently form a population (Olenin et al., 2010).
- **Target Species (TS)** are species identified by a Party that meet specific criteria indicating that they may impair or damage the environment, human health, property or resources and are defined for a specific port, state or biogeographic region (IMO, 2007). The TS list for ballast water exemptions is available at the [HELCOM website](#)
- **TS selection criteria** are based on the assessment of a species ability to spread via ballast water or sediments as the major vector, its current distribution in the Baltic Sea, and impact on human health, economy and environment and its severity (according to Gollasch et al. 2020).
- **Port** is a location on a coast or shore containing one or more harbours where ships can dock and transfer people or cargo to or from land.
- **Port vicinity** is an area near a port where ballast water operations may occur, including areas where vessels may conduct ballast water discharge or uptake operations when approaching a port or leaving it, e.g., port approaches, anchorage areas and designated ballast water discharge and uptake areas. The dimension of a port vicinity is port specific.
- **Outbreak** – a situation in which species populations experience impulsive, short-term (several days to several months) exponential population growth during which they adversely affect one or more of the following: biodiversity, ecosystem functioning, socioeconomic values and human health.
- **Registered recipients** – are national focal points entitled to send and receive a warning signal using the AquaNIS EWS module.