Rijkswaterstaat
Ministry of Infrastructure and Water Management

First Meeting of the Joint HELCOM / OSPAR Task Group on Ballast Water Management Convention (BWMC) and Biofouling

2-3 December 2021
Online

Update on pilot study as input to the development of a protocol for the general assessment of biofouling on commercial vessels in the European Regional Seas

Dr. Saa Kabuta (RWS-Min.I&W)

Dr. Arjan Gittenberger (GiMaRIS)
Drs. Sander Smolders (DVM-Min ANF)

Road map

- Background
- Proposed time line for baseline protocol development
- Pilot project activities
- Pilot project environments
- Pilot research object(s)/Common vessel types/Niche areas
- Summary outcome of the project in 2021

Background

1.JTG HELCOM/OSPAR WORKSHOP (Rotterdam 2019)

- a common regional approach to evaluate IMO biofouling guidelines
- a common management strategy to support the IMO guidelines and guidance
- a common (HELCOM/OSPAR) biofouling research and training to collect and share relevant data and information to support management strategies and new approaches to biofouling issues.

a) issues described in the revised (2019) Baltic Sea Action Plan (BSAP)

b) the need to develop an evidence base to support the adoption of coordinated NIS management approaches under the forthcoming (2021) OSPAR North East Atlantic Environment Strategy (NEAES).

2. TG BALLAST 11-2020 (Discussions)

A proposal by the Netherlands for a pilot study serving as input for the development of a baseline research protocol for the general assessment of biofouling on commercial vessels in the European regional seas

(Ref.: Doc.7-1, Presentation 6, and Outcome of TG BALLAS 11-2020, paragraphs 7.2-7.7)

Proposed time line for Baseline protocol development

2023

An optimised interregional protocol to assess biofouling and NIS introductions through commercial ships

2022

National level Pilot studies to test the design and the applicability of the proposed methodology for baseline Study-leading to the assesment of the levels of biofouling and the introduction of non-indigenous species

2021

Pilot study focused on Rotterdam Port to fully develop and test the value and applicability of the proposed methodologies for inclusion in the baseline study design

2020

Planning and doing an inventory of the tools and knowledge available to aid the development of a research methodology for a baseline assesment of biofouling related NIS introductions

Description of Pilot project activities

-Initial focus of the pilot study in 2021

(inventory of relevant categories to distinguish the structure and function of the proposed protocol for biofouling assessment on commercial vessels)

Category A: Technical Issues

1. Prioritization of ships-parameters
2. Identification of niche areas
3. Establishing ratios: (niche area/vessel area) as the scale for biofouling
4. Monitoring methodologies (frequency and reporting times)

Category B: Technically related administrative issues

5. Frequency for conducting base line surveys
6. Identification of Collaborators for the protocol development process

Category C: Administrative issues

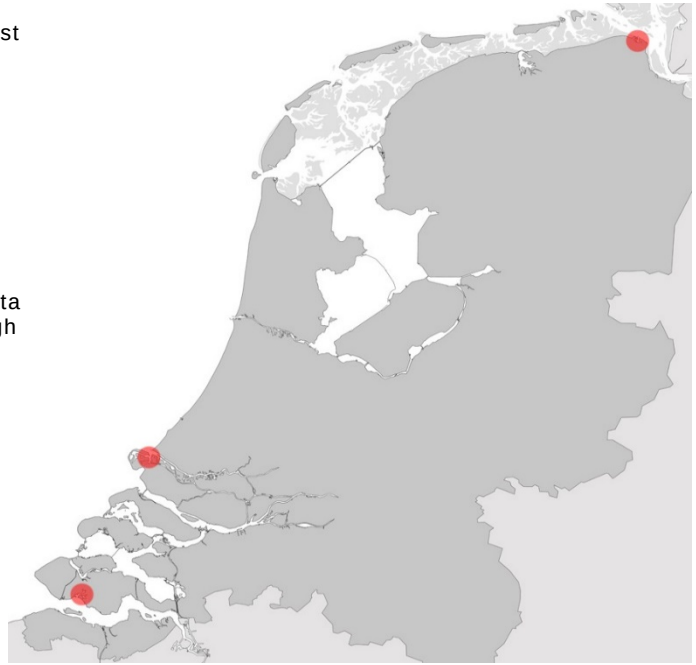
7. Identification of responsible government authorities
8. Inspection procedures and reporting

Planned project Environments

1. Largest capacity in Europe, can host several Ships types and varying capacities with different levels of biofouling issues.

2. Diverse number of Stakeholders, port authorities, ship-owners and shipyard managers needed for the study design and structure

3. Port of Rotterdam has existing data on non-indigenous species through the use of the OSPAR-HELCOM sampling protocol.



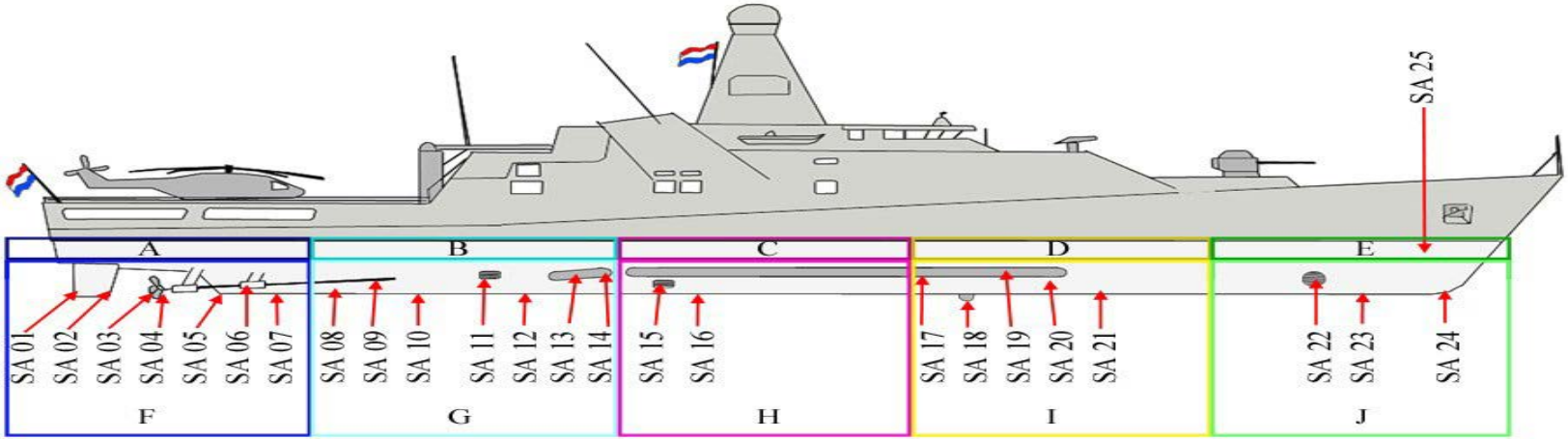
Groningen
Sea port

Port of
Rotterdam

Zeeland
Sea port

Pilot project Object (s)

Schematisch drawing showing vessel huls and niche areas
(approach to be applied to several different vessel types)



Gittenberger et al. (2018) :Assessing hull-fouling on naval ships of the Netherlands,
Zoning is important for sampling because they show:
(1) Different biofouling communities, (2) Species diversity is different, (3) Risk of NIS presence varies.

Common vessel types

Bulker

Tanker

Container ship

General Cargo

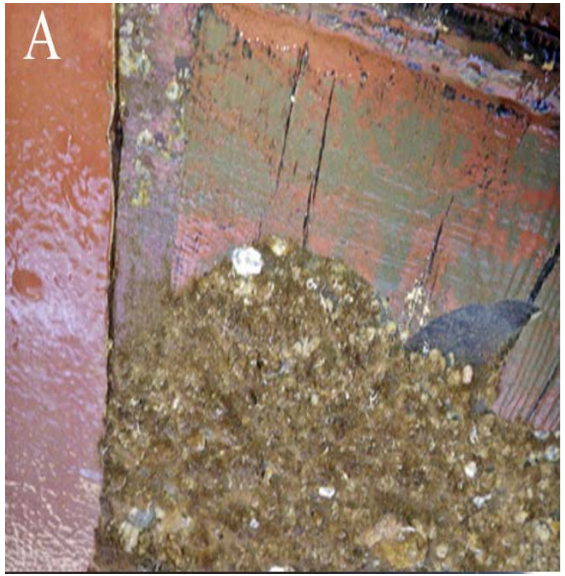
Tug/supply vessel

Fishing vessel

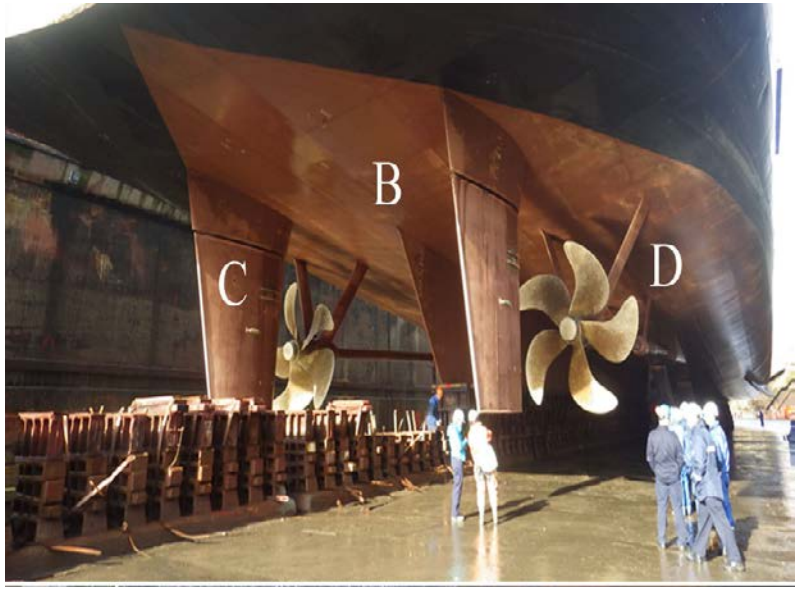
Passenger vessel

Floating platform

Common Niche areas

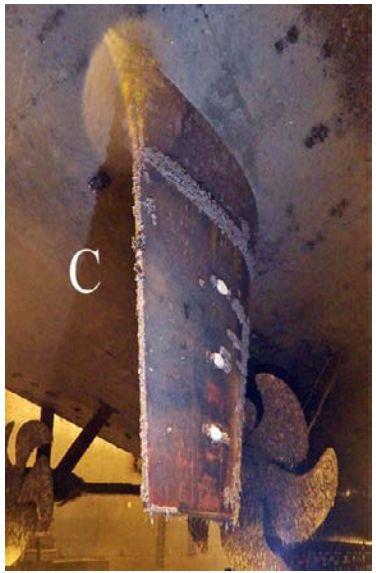


Dry Dock strips



B: Keel;

D: Propellers;



Rudder;

Typical Niche areas

Thrusters

Grates

Summary outcome of the findings in 2021

2021
Describing relevant categories (A,B and C) and understanding the nature of activities defined Under Category A.

Category A: Technical issues

1. Prioritization of ships-parameters
2. Identification of niche areas
3. Establishing ratios: (niche area/vessel area) as the scale for biofouling
4. Monitoring methodologies (frequency and reporting times)

2022/2023

Category B: Technically inclined administrative issues
Category C: Administrative issues

Category A
Activities: (1) Prioritization of ships-parameters, and (2) Identification of Niche areas on commercial vessels

Vessel type impact assessment
Wetted Surface Area (WSA) and Niche Area (NA) per ship type
Automatic Identification system (AIS) or similar tracking data system for NIS introduction/distribution

- In cooperation with port authorities, data of vessels from outside of Europe to the port of Rotterdam can be retrieved, in many cases up to 10 ports in retrospect.
- Getting access to this data was more difficult than expected because of various reasons.
- The data could be granted under contract, whereby one has to consider privacy related laws and regulations
- The data analyses will commence soon and will be completed in the early part of 2022.

Vessel selection steps
Based on shipping behaviour, manner in which they travel/sail over the sea

- Assessment of vessel risk of biofouling could not be done yet as this depends on the analyses of data on vessels entering the port of Rotterdam. Data analysis is expected to start at the beginning of 2022.
- Dry dock inspection of container ships and oil-tankers in Europe is generally difficult due to dry-dock maintenance outside of Europe, e.g. in Asia.
- For the researcher, Corona risk mitigating regulations in dry-docks appear to have made it more difficult to grant access to dry-docks for doing surveys and selecting specific vessel types for dry-dock inspection

Category A

Activity (3) Establishing scales and monitoring methods for biofouling on vessels

Monitoring/sampling is limited to hull areas and niche areas where most fouling occurs

- Dry dock inspection does not seem to be specifically possible in the Netherlands or in Europe for all ship types, survey methods for biofouling assessments on vessels, were focused more on “in-water” possibilities.
- Biofouling assessment can be done through specialized underwater inspection services (using scuba-divers) are offered in ports
- Several inspection videos from the port of Rotterdam were received for analysis to assess their value for NIS risk analysis and detection of fouling classes in various niche areas. Analysis is ongoing and the potential use of the videos for fouling species risk analysis will be reported in due course
- Currently, there is a tool under development and it is being tested with the specific aim of making high resolution videos and taking samples from fouling communities on ship hulls and especially in and around niche areas. The tool may be used to assess fouling communities down to about 12 meters under the water surface without the need of scuba-divers. The same tool may also be used to access niche areas (e.g. grates / propellers) that are up to about 12 meter high from the ground during dry dock inspections

Category A

Activity (4) Monitoring methods for biofouling assessment in sea ports

Generally, three main methods could be investigated depending on the fouling situation. These include:

1. biofouling intensity: not linked to fouling species diversity and the presence of NIS biofouling species
2. diversity of morph-species/types: separation of organisms that look different in morphology
3. diversity of species: Hard to identify at first glance, use of reference database makes the work easier

Collaboration with new and existing biofouling projects in the Rotterdam port using methods including:

- Fouling plates
- Dock scrapings
- Bottom sediment grabs
- navigational buoys
- Species Identification methods (Traditional and Contemporary including DNA-barcoding).

Thank you