



Working Towards Comparable and Accurate Test Results – The Role of Global TestNet at the IMO

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***Ballast Water and Biofouling Management in Invasion Alien Species Prevention and
Control***

28-30 November 2023, Antalya-Türkiye





BACKGROUND ON GLOBAL TESTNET

- **What:** We promote comparable and accurate results on the performance evaluation of technologies and methodologies to control the risk of bio-invasion and harmful species introductions by shipping (e.g., Ballast water; Biofouling, Sewage Treatment Plants)



"To promote comparable and accurate test results on the performance evaluation of technologies and methodologies to control the risk of bio-invasion and harmful species introductions by shipping, through an open exchange of information, transparency in methodologies and advancing the science of testing."

The Global TestNet was initially developed to address the need for standardization and comparability in the testing of ballast water management systems (BWMS).

The first meeting of testing organisations took place in Malmo (Sweden) in 2010 under the umbrella of Global Partnership, and test facilities agreed to enter a Memorandum of Understanding in 2013 during an annual meeting in Busan (Korea). In 2016, the members voted for additional by-laws (e.g. on voting) and voted on September 8 2017 in favour of expanding the network beyond BWMS testing, and into biofouling in order to further support the shipping industry and its numerous stakeholders in managing the risk of bio-invasions and harmful species introductions into aquatic environments.

News

Biofouling Solutions joins Global TestNet

We would like to warmly welcome the most award winning Biofouling Solutions to Global TestNet! The internationally recognised Australian team of biosecurity consultants has been delivering

- **How:** through an open exchange of information, transparency in methodologies and advancing the science of testing

- Annual meetings with minutes in open source
- Inter-comparison methodology charts in open source
- Position statements on issues related to expertise matters
- Participation in knowledge sharing activities (conferences etc.)

- **For all:** Position statements and technical documents available on our website <https://www.globaltestnet.org/home>

History of Global TestNet



2010
 First Activity of Global TestNet:
 Created under the framework of the
 Global Industry Alliance (GIA) of the
 GloBallast Project

2013
 MoU signed between the members of the
 Global TestNet

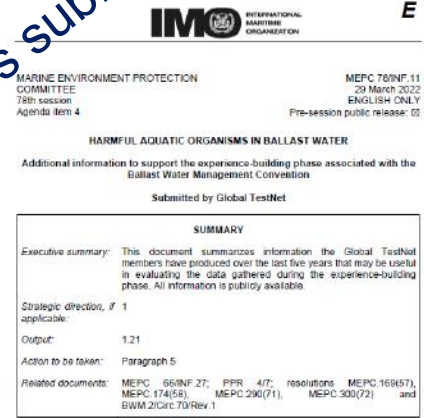
2016
 By-laws are developed to facilitate decision
 making and ensure responsiveness towards
 stakeholders – position statement on website

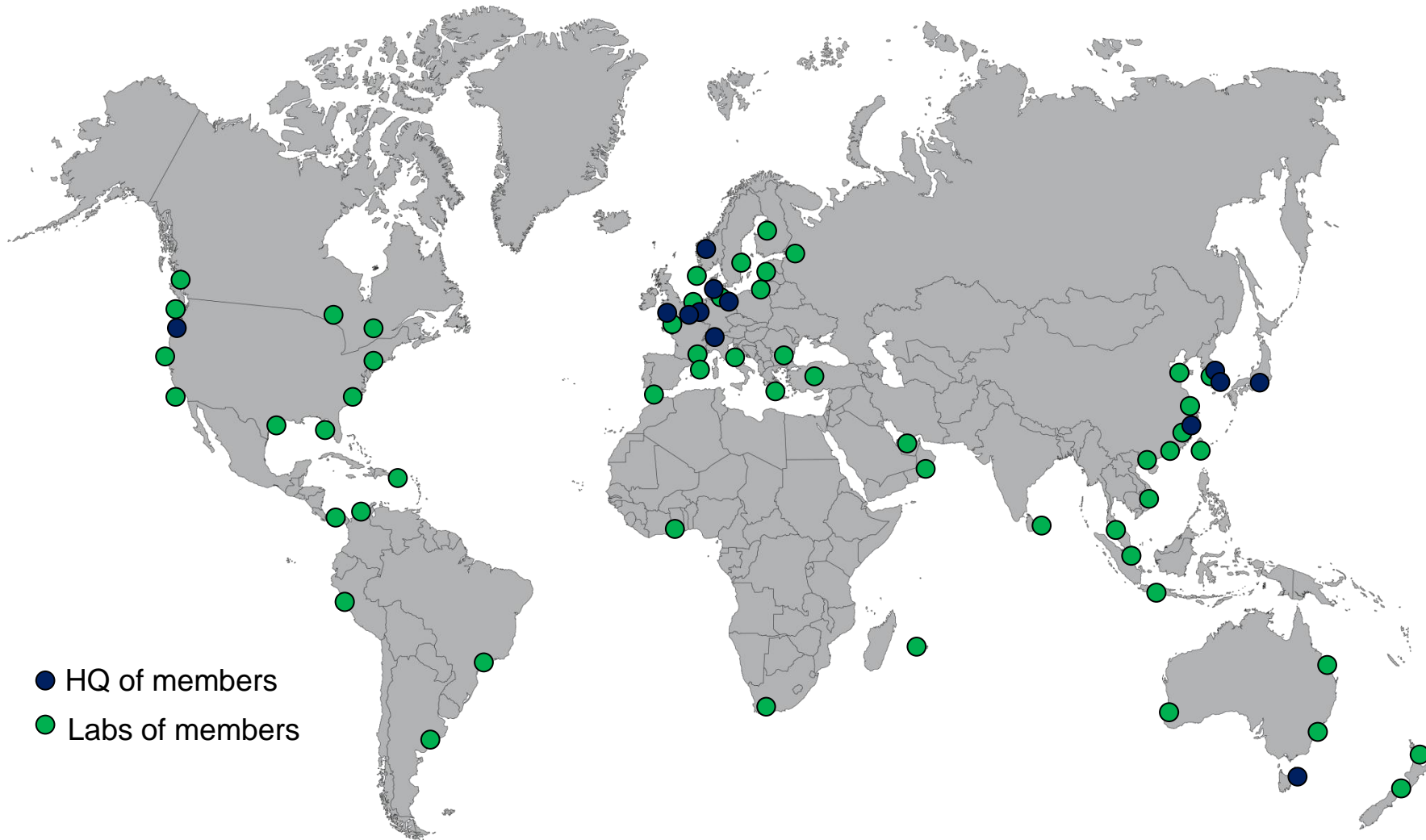
2019
 Strategic Partner of the GloFouling Project

2020
 Incorporated in the UK and accepted as
 Organization with a Consultative Status at the IMO



2010 2013 2016 2019 2020 2022





- HQ of members
- Labs of members

**Truly Global
network of
laboratories and
experts in testing**

**12 active members
(from 1 to 98,000
staff)**

Our Members

- [Ankron Water Services](#)
- [Ballast Water Detecting Laboratory of Shanghai Ocean University](#)
- [Biofouling Solutions Pty Ltd](#)
- [Cal Maritime Golden Bear Facility](#)
- [DHI](#)
- [Korea Institute of Ocean Science and Technology \(KIOST\)](#)
- [Korea Marine Equipment Research Institute \(KOMERI\)](#)
- [Marine Biological Research Institute of Japan, Co., Ltd](#)
- [Norsk Institutt for Vannforskning \(NIVA\), Norway](#)
- [PML Applications Ltd](#)
- [Control Union Water B.V.](#)
- [SGS](#)



OUR MEMBERS' SCOPE OF WORK

Global TestNet Registered Activities

1. Land-based testing (IMO BWM Code / USCG);
2. Shipboard testing (IMO BWM Code / USCG / IMO BWM2/Circ70)
3. Ballast water ecotoxicology testing (WET test – G9 Guidelines);
4. Evaluation of Anti-Fouling Systems or MGPS efficiency and/or toxicity;
5. Evaluation of efficacy of In Water Cleaning / Grooming Systems
6. Inspection of ship hull biofouling and/or Assessment of procedures/Risk management from Biofouling

Individual members also have many other capabilities which are not these related to their membership in Global TestNet

Type Approval Testing of BWMS

- Facilities from our members can be used to test under accreditation against the Ballast Water Code, the USCG regulations
- Most BWMS approved today have received approval following testing at one of our member's facility
- All facilities of Global TestNet are independent from the manufacturer and a conflict-of-interest policy is required prior to joining the membership



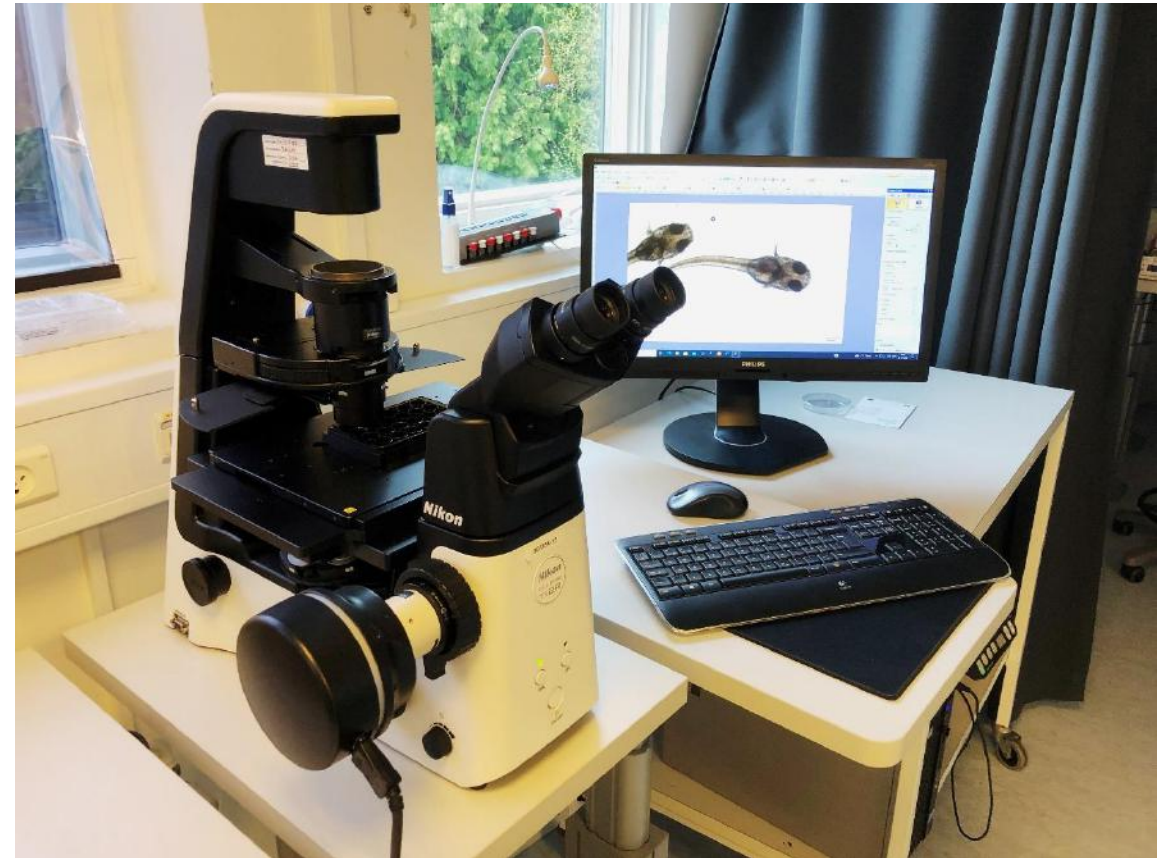
Shipboard, Commissioning and Compliance tests

- Our members have been carrying out >2,000 D-2 tests in >40 countries to verify that installations of BWMS are done properly and that BWMS function once installed onboard.
- Experience from our members was shared with the World Maritime University during the Experience Building Phase of the IMO
- Members continue to share their overall observations and a new submission to IMO may be done later this year or next



Ecotoxicity evaluation of discharge (from Ships or from in-water hull cleaning systems)

- Monitoring
- Fate assessments (i.e., persistence or biodegradability)
- Effects assessments
 - Whole effluent Toxicity (from operations)
 - Toxicity of individual biocides
- Prediction and modelling,
 - Predicted Environmental Concentration
 - Predicted No-Effect Concentrations

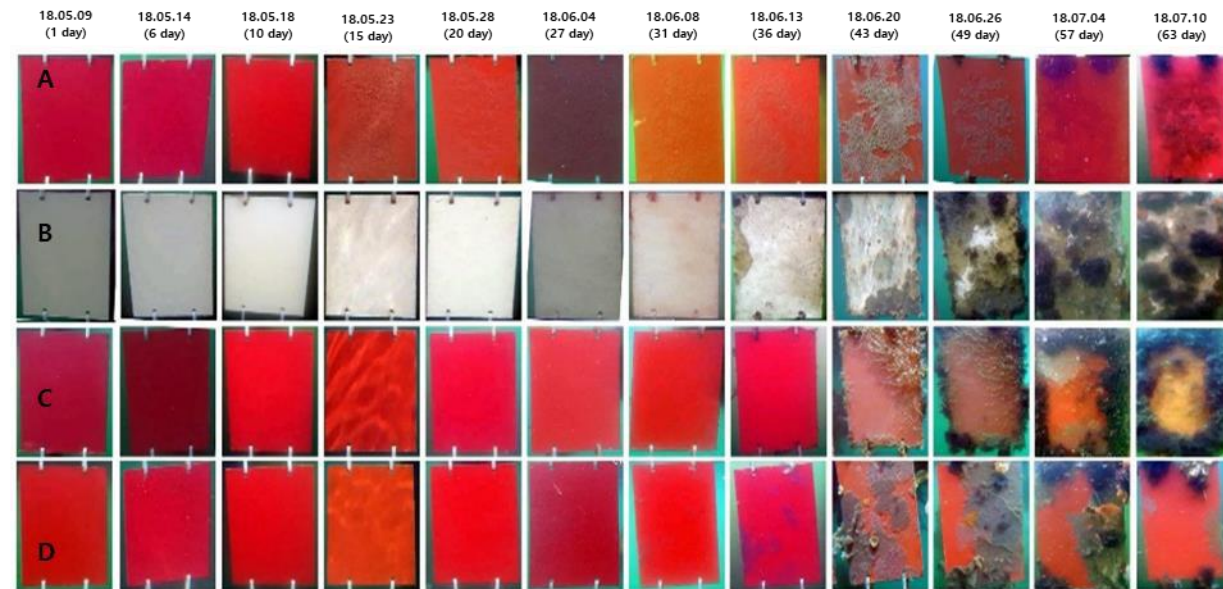


Courtesy: DHI



Testing of antifouling coatings designed for different hull locations and internal structures

- Availability of AAMP certified inspectors (NACE and SSPC merged to Association for Materials Protection and Performance (AAMP))
- Testing of coating according to MSC regulations
 - thermal properties, corrosion, abrasion, heat resistance, toxicity, etc.
- Antifouling coating efficacy evaluation
 - Different testing schemes can be implemented for different coating depending of hull locations targets
 - Development of criteria for evaluations as needed



Courtesy: KIOST

Biofouling Inspection and Verification

- Biofouling inspections during drydocks or in water inspections
 - Following Guidance from Authorities or Classification societies working on their behalf
 - Following optimized procedures based on decades of experience
- Identification/characterization of biofoulings of ships and plates - expertise in HAOP identification
 - Traditional taxonomy
 - Molecular testing (eDNA)



Courtesy: Biofouling Solution

Validation of efficacy and impacts of In-Water Grooming or Cleaning Technologies and Marine Growth Prevention Systems (MGPS)



Courtesy: Biofouling Solution

Limitations in terms of normalization but recent progress

- There is no type approval testing scheme under IMO
- There are no International Standard from standardization organizations (ISO, EPA, AFNOR) against which labs can be accredited
- But a few standards have been developed (including both equipment and operations):
 - Australia: Draft in water cleaning standard
 - Canada: Draft Voluntary Guidance for Relevant Authorities on In-Water Cleaning of Vessels
 - New-Zealand: Procedures for evaluating in-water systems to remove or treat vessel biofouling
 - BIMCO-ICS Industry standard on in-water cleaning with capture...



GLOBAL TESTNET STRATEGY AND ACTIVITIES



Our Strategy – Framework to get it right

- 3 Goals
 - Goal 1: Establish list of activities and improve operations of the organisation
 - Goal 2: Advance technical knowledge through the member's skills
 - Goal 3: Communicate efficiently
- Action plan with 24 tasks !

No	G	AP	Description	Frequency	Responsible
18	2	10	Initiate discussions on the impact of IWC on AFS in (different IWC approaches various ways)	By end of strategic plan	Steering and members
18	3	1	Participate actively in IMO MEPC and PPR meeting through the involvement of the chair and technical advisors as required	All meetings	Chair
20	3	2	Support the sharing of information gathered by members (and position statement) through the submission of INF paper to MEPC and PPR meeting	As needed	Steering committee
21	3	3	Communicate about Global TestNet activities through social media and updated websites – including at minima. Day of Women in Maritime (18 May).	Continuous needed	as Secretary

Global TestNet
 Strategy 2023-2025
 Version 1
 13 February 2023

No	G	AP	Action plan	Deadline	Responsibility
22	3	4	International Day for Biological Diversity (22 May), World Ocean Day (8 June), Day of the Seafarer (25 June), Day of the Maritime (28 September) International Maritime Day (28 September) International Maritime Day (28 September) Support presentation around submission of papers possible when requested by stakeholders	As needed	Chair or identified member as needed
23	3	5	Support the communication around submission of papers from members to peer review journals and other accessible gray reports prepared by members	Continuous needed	as Secretary
24	3	6	Support visibility of Global TestNet through membership's actions such as: - Use of Global TestNet slide during membership's technical presentations - Use of signature logo and text in emails (global TestNet)	Continuous needed	as Membership

Supporting Science-based policy making for IMO

- Data gathering for the experience building phase of the BWM Convention
 - First set of data submitted to World Maritime University to prepare MEPC 78-4-1 (submission available here: [EBP submission from Global TestNet-LAST.pdf](#) (globaltestnet.org))
 - New submission of data in preparation
- Active participation in the revision of the 2011 Biofouling Guidelines into the 2023 Biofouling guidelines
- Active participation in the revision of the BWM Convention (until 2026)
- Active strategic partner and support of the GloFouling Partnership (supporting regional activities when possible)
- Preparation of a verification guidelines for MGPS (2024)



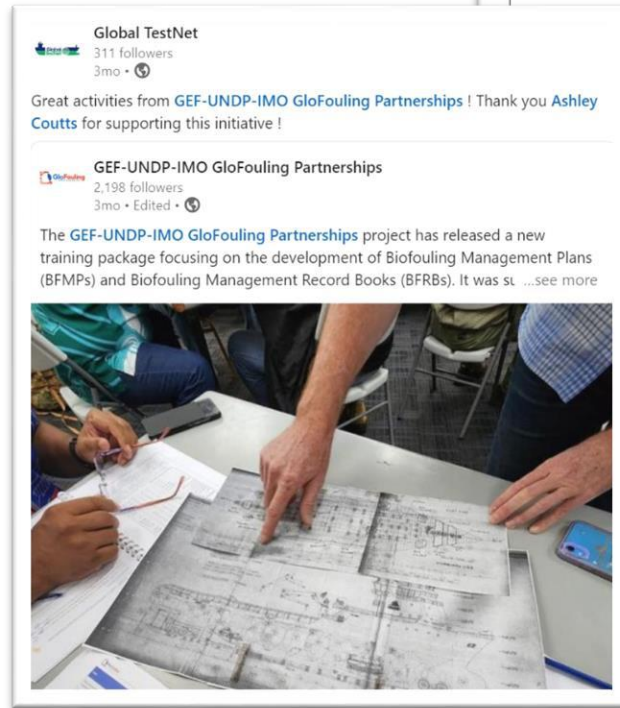
Sharing findings in peer reviewed publications (ensuring scientific robustness)

- **Drake et al 2021:** Design and installation of ballast water sample ports: Current status and implications for assessing compliance with discharge standards. Marine Pollution Bulletin 167:112280
- **Drillet et al 2023:** Improvement in compliance of ships' ballast water discharges during commissioning tests. Marine Pollution Bulletin. 191: 114911
- **Hansen et al 2023:** Inherent lack of CMFDA/FDA staining in certain algae and its implication for ballast water testing. Marine Pollution Bulletin. Volume 194: 115312
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Raising awareness and offering information on best practices

- Intercomparison chart
- Experience based positions
- Social media broadcasting
- Participation in conferences
- ...



Methodology Comparison Charts Jan 2021

5. Sampling procedures (Commissioning tests)

Table 5. Sampling details, commissioning tests for the discharge of treated water, organisms > 50 micron, 10 – 50 micron, and <10 micron

Facility	OET* or Sequences	Sampling approach (open nets or closed sampler)	Flow meter position (before or after sampling)	Duration of Sample Collection	Total Volume Sampled (>50um)	Indicative method used	Detailed method used	Time used between sampling and analyses
OET (if possible)		Open Net	Before sampling	< 1 hour	≥ 3 m ³	ATP	> 50 µm: Microscopy	Immediate
						PAM flourometry	10-50 µm: FDA/CMFDA	
Sequence	Open net	Sample container	Before sampling	< 1 hour	2 x 350-500 L	10-50 µm	>50 µm: Microscopy	<6 hr
							10-50 µm: FDA/CMFDA	<6 hr
							< 10: E.coli, Enterococcus, Cholera	<24 hr
OET	Open net	Before sampling	< 1 hour	≥ 3 m ³		> 50 µm: Microscopy	< 2 hr	
Sequence	Sample container					10-50 µm: FDA/CMFDA	< 2 hr	
Sequence	Sample container					< 10: E.coli, Enterococcus, Cholera	< 24 hr	
OET	Open net	Before sampling	> 30 minutes	≥ 3 m ³		ATP	> 50 µm: Microscopy	< 2 hr
OET	Open net	Before sampling	Whole operation	≥ 3 m ³	PAM flourometry	>50 µm: Microscopy	< 6 hr	
						10-50 µm: FDA/CMFDA	< 6 hr	
						< 10: E.coli, Enterococcus, Cholera	< 6 hr	
Sequence	Sample container					10-50 µm: FDA/CMFDA, Flow Cytometry	< 6 hr	
Sequence	Sample container					< 10: E.coli, Enterococcus, Cholera	< 6 hr	

**Teşekkür ederim. Sorularınız olursa
cevaplamak için buradayım**

