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Volume 3 - 2012/2013

NORTH SEA BALLAST WATER

THE BALLAST WATER TIMES

Note from the management

Before you, lies the third edition of The Ballast Water Times. The first two issues of this newspaper have already shown their value, as many people read them at conferences; they were distributed amongst all the NSBWO project members, and sent out to all who are interested in the developments around IMO's Ballast Water Management Convention. This time we have focused on the NSBWO project. We've been working on a stakeholder analysis, have participated in the MTC project and have had our annual meeting. Also, the spin-off of the project has to be considered. See what the project has been up to on page 8.

The NSBWO project will continue for another 1.5 years, and during that period we intend to publish several new issues of the Times. To find the most recent activities of the NSBWO project, please follow us on Twitter @NSBWO or register on our website www.northseaballast.eu.

Enjoy reading!

Monitoring bacteria in ballast water by mass spectroscopy

Kaveh Emami, Ehsan Mesbahi & Hossein Enshaei, Newcastle University

Shipping moves over 80% of the world's commodities and transfers approximately 3-5 billion tons of ballast water around the world every year. Ships' ballast tanks hold different non-indigenous vertebrates, invertebrates, plants and microorganisms. Thus, marine bio-invasion by ballast water derived organisms may threaten naturally evolved biodiversity, the consequences of which are being increasingly realized in recent years. The microbiology of ballast water is also of increasing environmental importance, since discharged ballast water may contain infectious pathogens and may thus lead to their global dissemination. Currently monitoring and characterization of marine bacteria in large volumes of sea water is time consuming and costly. To make this process faster, cost-efficient and more reliable, we are in the process of constructing comprehensive Matrix Assisted Laser Desorption Ionization Time of Flight (MALDI-TOF) mass-spectral libraries of bacterial species from ballast water. Advances in instrumentation, proteomics, and bioinformatics have contributed to the successful applications of mass spectrometry for detection and characterisation of microorganisms. For that reason, during last two decades, the application of mass spectroscopy in clinical diagnostic microbiology has been rapidly increased and the method is becoming a routine approach in many hospitals worldwide. Characterisation of bacteria by MALDI-TOF has the advantages of speed, sensitivity, specificity and automation.

To evaluate a rapid and cost-effective method for monitoring bacteria in ballast water, so far, we have characterized several marine bacterial isolates by MALDI-TOF MS. Since International Maritime Organization (IMO) regulations are concerned with the unintended transportation of pathogenic bacteria through ballast water, the emphasis of our work has been placed on detecting species of *Vibrio,* enterococci and coliforms. In our recent study, using artificial ballast water, from the North Sea we investigated the presence of potentially harmful species. No pathogenic species were detected except for the opportunistically pathogenic bacterium *Pseudomonas aeruginosa*. Over several species of: *Vibrio, Pseudomonas*, *Enterococcus*, *Pseudoalteromonas*, *Serratia*, *Bacillus*, *Tenacibaculum*, *Proteus*, and *Lactobacillus* were identified. This method is extremely useful when other conventional or molecular approaches such as 16S rRNA gene analysis cannot differentiate bacterial isolates.

www.ncl.ac.uk/marine

Federal Republic of Germany ratifies Ballast Water Management Convention soon

Andreas Zink, PhD student

The success and effectiveness of the Ballast Water Management Convention (BWMC) heavily depends on the ratification of this international treaty by States. As stated in Article 18 (1) BWMC, the Convention enters into force 12 months after the date that at least 30 States, representing not less than 35% of the gross tonnage of the world's merchant fleet, ratify the Convention. After the ratification of the BWMC by Denmark in September 2012, a total of 36 States, amounting to 29.07% of the world tonnage, are Party to the Convention. All neighbouring countries of the North Sea ratified the BWMC except for the United Kingdom, Belgium and Germany. Currently, the ratification of the Convention by Germany is in progress. The draft for a ratification law by the German Government was accepted by the Bundesrat (Upper House of the German Parliament) in October, so only the German Bundestag (Parliament) has to give its approval, which is quite certain, due to the fact that the BWMC will improve the protection of the marine environment in the North Sea and in the Baltic Sea. Subject to this legislative procedure, Germany will submit its accession instrument to the IMO and will thereby finally become Party to the Convention. Following a ratification of the Convention by Germany, representing 1.9% of the world's merchant fleet, it is very likely that the Convention will enter into force in 2014. It is therefore mandatory that the riparian States of the North Sea approve uniform standard rules and criteria for exemptions from the BWMC, i.e., establish Ballast Water Exchange Regions in the North Sea in accordance with the rules of the Convention and the relevant MEPC Guideline G7 (Risk Assessment).

www.uni-trier.de

Project on ballast water sampling and rapid onboard compliance analysis nears completion

Lothar Schillak, marine biologist, senior marine expert

In February this year the Federal German Maritime and Hydrographic Agency – BSH, Hamburg, Germany announced a competition to develop a general sampling and analysis procedure, feasible on board a ship. SGS Institute Fresenius GmbH, Germany, and Prof. Dr. Nick Welschmeyer, Moss Landings Marine Laboratories, California, USA were successful and were asked to undertake the ballast water research and development project: *Effective New Technologies for the Assessment of Compliance with the Ballast Water Management Convention.* The project objectives are twofold: (i) the development of a representative sampling technique and procedures and (ii) the definition of adequate methods for rapid, onboard ballast water analysis. The project is supervised and managed by Dr. Lothar Schillak, marine biologist from SGS.

To achieve representative sampling the project concentrates on a modular, portable cascade filtering system which is connected to the main ballast water pipe system installed onboard. The filtering system allows for large sample volumes to be taken as the ballast water is flushed back to the main ballast water pipe system after having passed the filter cascade. It comprises three filter components according to the IMO size classes >50µm, >10µm<50µm and bacteria (0.2 µm).

For the rapid onboard analysis of ballast water the project concentrates on different methods: Fluorescence-di-acetate (FDA, IMO size class >10<50µm), Pulse-Amplified-Modulation Fluorometry (PAM, IMO size classes >50µm and >10µm<50µm), Adenosin-triphosphate Fluorometry

(ATP, all three IMO size classes) and Fluorescence-in-situ-Hybridisation (FISH, IMO size class bacteria). Except for the PAM method it was necessary to further develop the other methods for the analysis of ballast water in regard of the seawater chemistry and the special conditions under which ballast water analysis has to be executed. One of the main targets in developing these methods was to allow for fast "sample-to-result" times.

Following laboratory testing the prototype of the modular, portable cascade filtering system, together with the analytical methods, will be tested under real discharge conditions on ships in operation in November this year.

The submission of the final project report to the BSH is anticipated in January 2013. It is planned to present the essential facts and findings of the project within the frame of the IMO MEPC Session 65 in May 2013.

www.sgsgroup.com

Using Flow Cytometry for ballast water monitoring

Sandra Schöttner, postdoctoral researcher, project manager & Friederike Hoffmann, project collaborator

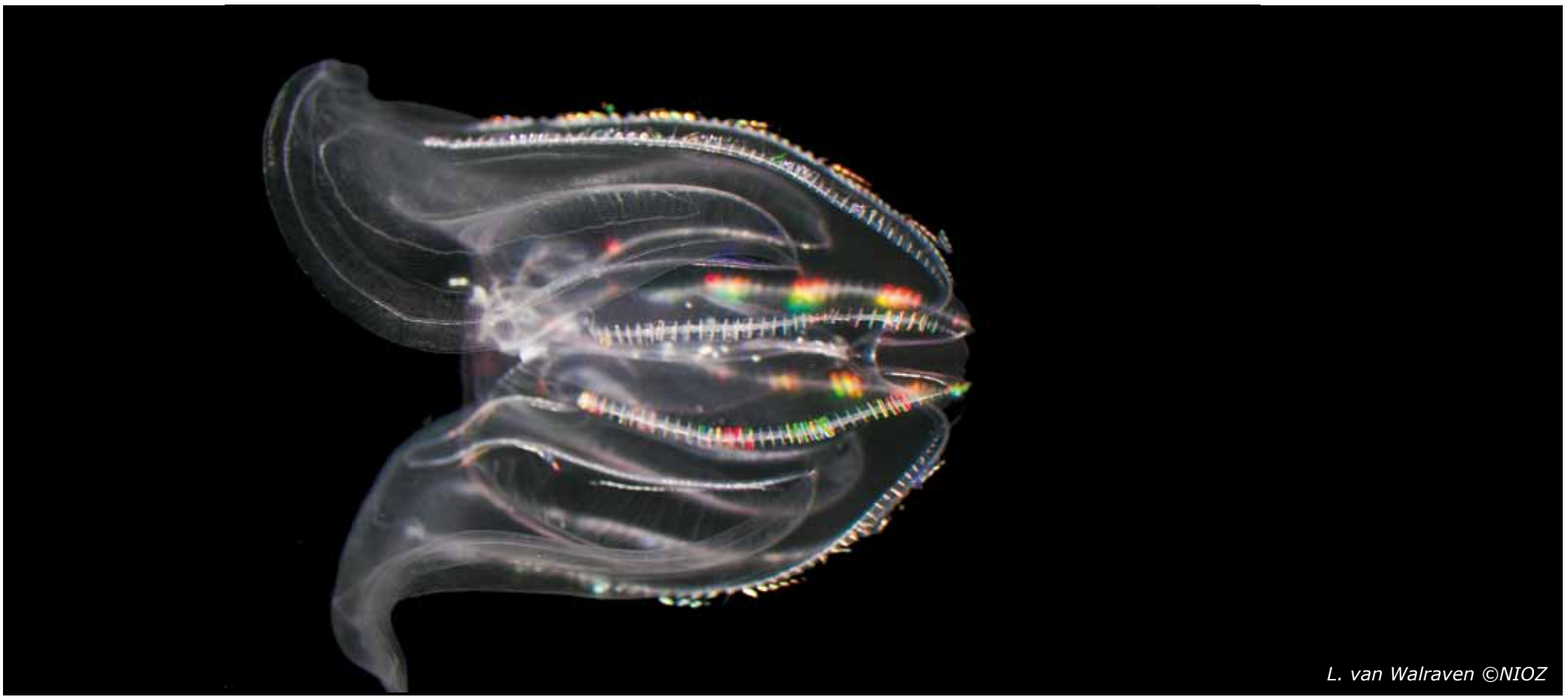
How can flow cytometry, a laser-based biophysical method well-established in clinical application and biological research, be used to monitor the efficiency of ballast water treatments in real-time?

This question is currently being pursued by a team of Norwegian scientists and engineers in a joint effort referred to as BallastFlow, an innovation-targeted research project (2011-2014) funded by the Norwegian Research Council and the company Knutsen OAS Shipping. The BallastFlow consortium comprises the two NSBWO project sub partners UniResearch and NIVA, as well as the project leader Høgskolen Stord-Haugesund and its industrial partner Knutsen OAS Shipping. In addition, the Universities of Bergen (Norway) and Klaipeda (Lithuania) act as direct collaborator and international advisor, respectively.

With a total budget of 9 M NOK (ca. 1.2 M EUR), the project team has set out to develop a flow cytometric approach to ballast water analysis which, based on suitable viability and diversity markers, facilitates the detection, enumeration and -where required- identification of viable vs. non-viable phytoplanktonic and bacterial cells. Research and development operations involve both laboratory studies and pilot tests with KBAL©, a pressure drop- and UV-based ballast water treatment system developed by Knutsen OAS. Achievements so far include the successful distinction between active/viable and damaged/dead micro-algal cells after subjection to different UV as well as KBAL© treatment conditions - and will soon include results on the use of fluorescence in-situ hybridization for targeting UV-treated bacteria.

By exploring and advancing the application of flow cytometry in ballast water research, BallastFlow aims to significantly contribute to the ongoing quest for a standardized high-throughput method that enables effective monitoring of ballast water organisms, both on land and at sea.

www.ballastflow.com



L. van Walraven ©NIOZ

Workshop on organisms <10 µm in ballast water

Louis Peperzak, project leader science (NIOZ) & Stephan Gollasch, independent consultant (GoConsult)

The IMO Ballast Water Management Convention (BWMC) gives discharge standards in its Regulation D-2 on viable organisms larger than 10 µm, larger than 50 µm and on three types of bacteria as human health indicators. How do test facilities measure the indicator bacteria? And more important: a large number of other organisms exists that are smaller than 10 µm. Which species are there, do they pose invasive risks, and how can these species be measured? These questions were discussed at a workshop held in Duluth (USA) in September 2012.

The three human health indicator bacteria were measured by almost all facilities by using the same standard techniques, which consist of plating samples on selective agar media. One common problem is, however, that the concentration of some organisms in the test water is so low that it is difficult or even impossible to test for the efficacy of the treatment systems. One solution could be bench scale testing of treatment systems, e.g. with *E. coli*.

Organisms <10 µm that are not mentioned in the BWMC cover viruses, eukaryotes, archaea and bacteria other than the health indicators. This is an interesting group, as potentially toxic algal species (eukaryotes) are included in this size group. Many bacteria are known that are pathogenic to, for instance, fish and wildlife and such bacteria are therefore relevant both ecologically and economically. Viruses are known to be pathogens to all eukaryotes, such as sea mammals, birds and algae. On the bright side, there are currently no indications that archaea are pathogenic.

Ecological and economically relevant species that are transported in ballast water may become invasive in a new environment after discharge. That is, if they are not already present at the place of discharge. Many small microbes have a global distribution, they are "everywhere", and from this point of view there is no invasiveness. On the other hand, small species are known that do occur within certain geographical boundaries, so these are certainly potentially invasive. A special group consists of symbionts and parasites that live inside a host organism such as a fish. Their ability to survive on their own for a long time is limited. The invasiveness of parasites is therefore much less compared to free-living organisms.

The test facilities and the academic institutions with which they cooperate employ a wide array of techniques to measure viruses, eukaryotes, archaea and bacteria. Abundances may be measured by microscopy, flow cytometry and quantitative PCR. By using vital stains, microscopy and flow cytometry are able to distinguish living (viable) from dead organisms. Species identification on the other hand requires advanced molecular techniques such as "next generation sequencing" of DNA or RNA that allows for rapid and increasingly cheaper sample analyses. In addition, a number of rapid compliance tests were discussed. These test, including the measurement of biological activity by FDA or ATP, are however not species or size class specific.

After the workshop the attendees visited the GSI test facility in Superior. GSI performs freshwater ballast water system testing with rigorous attention to quality control. The full workshop report that is authored by Allegra Cangelosi, Stephan Gollasch and Louis Peperzak will be submitted to the BSH later this year, and combined with all other workshop reports will become part of MEPC 65.

View of the Great Ship Initiative (GSI) test facility in Superior (Wisconsin, USA) that was visited by the contributors of the NSBWO/GSI/Northeast-Midwest Institute Organisms <10 µm workshop.

North Sea Alien Species database

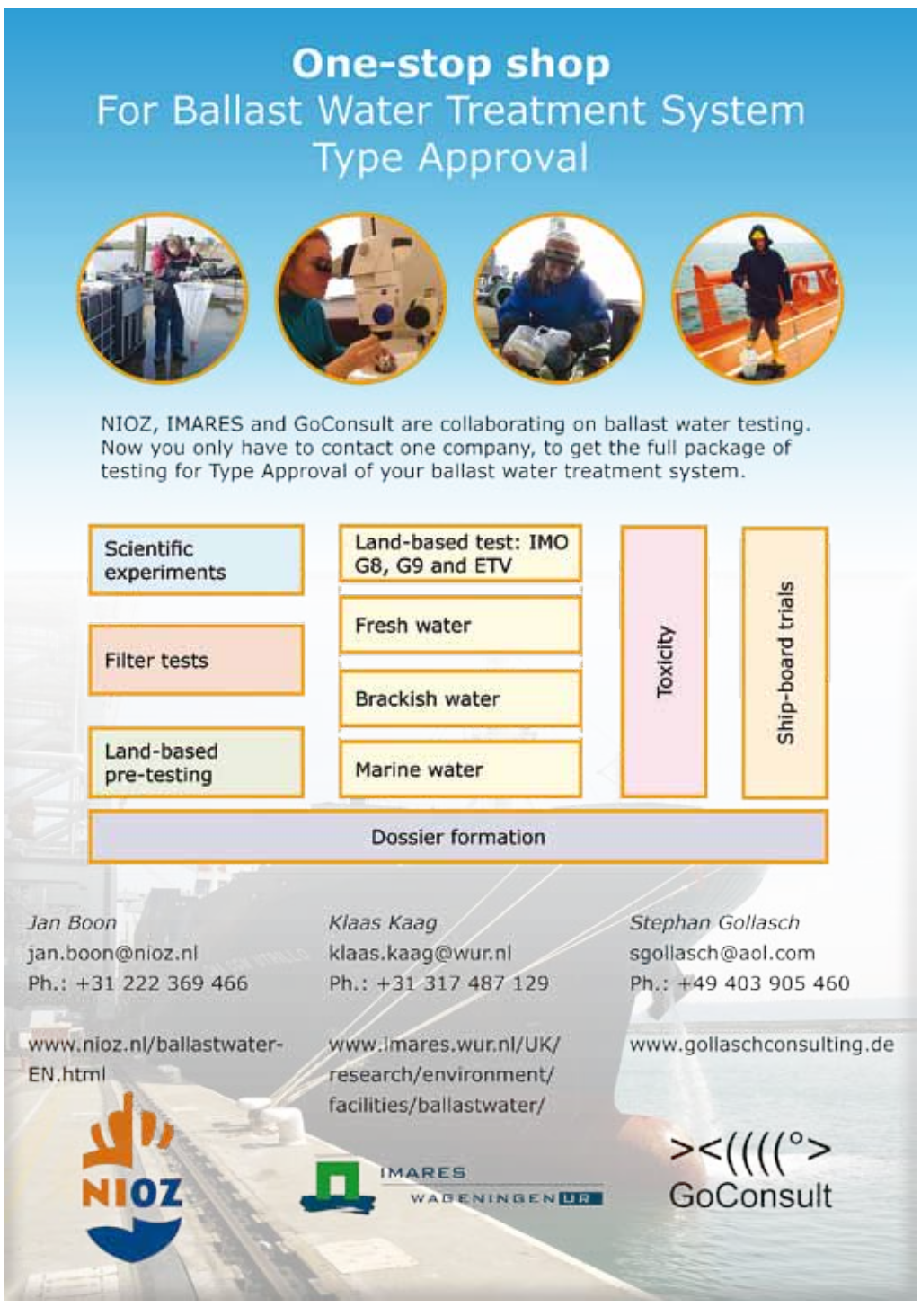
Chetan A. Gaonkar, research associate & Olof Linden, professor

A web based alien species database for the North Sea Region has been developed by World Maritime University, Sweden, which is a partner within the NSBWO project. The first phase of this database is launched at www.norsas.eu portal. The database provides current information about the status of alien species in the North Sea region along with detailed species specific information such as taxonomy, common names, images of the species, morphological description, biology, ecology, any notable impact in the North Sea, population and species status in the North Sea, pathways and vectors of introductions, procedures for management of the species, a GBIF (Global Biodiversity Information Facility) species distribution map (worldwide), a North Sea occurrence map and related bibliographies. Species information is compiled from various sources such as peer reviewed scientific articles, working group reports and web sources.

At present the database contains about 180 species entries. Among them, the species descriptions are available for about 100 species. The remaining species have got information about their taxonomy along with GBIF world distribution map. The database will be updated on a continuous basis with information about new species and updated information about already entered species. The web database will serve as an interactive tool for promoting awareness of marine non-native species to stakeholders such as maritime managers, experts and an interested public. This new database may be used in the detection and identification of alien species in the North Sea Region as well as serve as an early warning system for potential introduction of alien species.

www.wmu.se

NORSAS
North Sea Alien Species Database



The development of detection guidance and guidelines for port state control

Brian Elliott, senior project officer for environmental protection & Eleonora Panella, project officer

As many States cannot ratify the IMO BWMC until they have a method to enforce it, there has been a significant focus on the development of sampling for compliance in the last few years. Sampling methods have been developed through focussed planktonic research and adapted through the testing of systems during type approval. However, applying these further to compliance testing raises a whole series of challenges that need to be overcome. Port State Control (PSC) has to incorporate biological sampling. The samples taken have to be representative of the whole discharge to comply with the Guidelines supporting the BWMC. Pressure for one international testing regime has also materialised, despite the inherent autonomy of States to devise their own testing regime to gather evidence for their own legislature. Additionally, further challenges have arisen after the last BLG 16 (February 2012) that the Type Approval system is not robust enough to ensure that the treatment system passes the compliance test in a port.

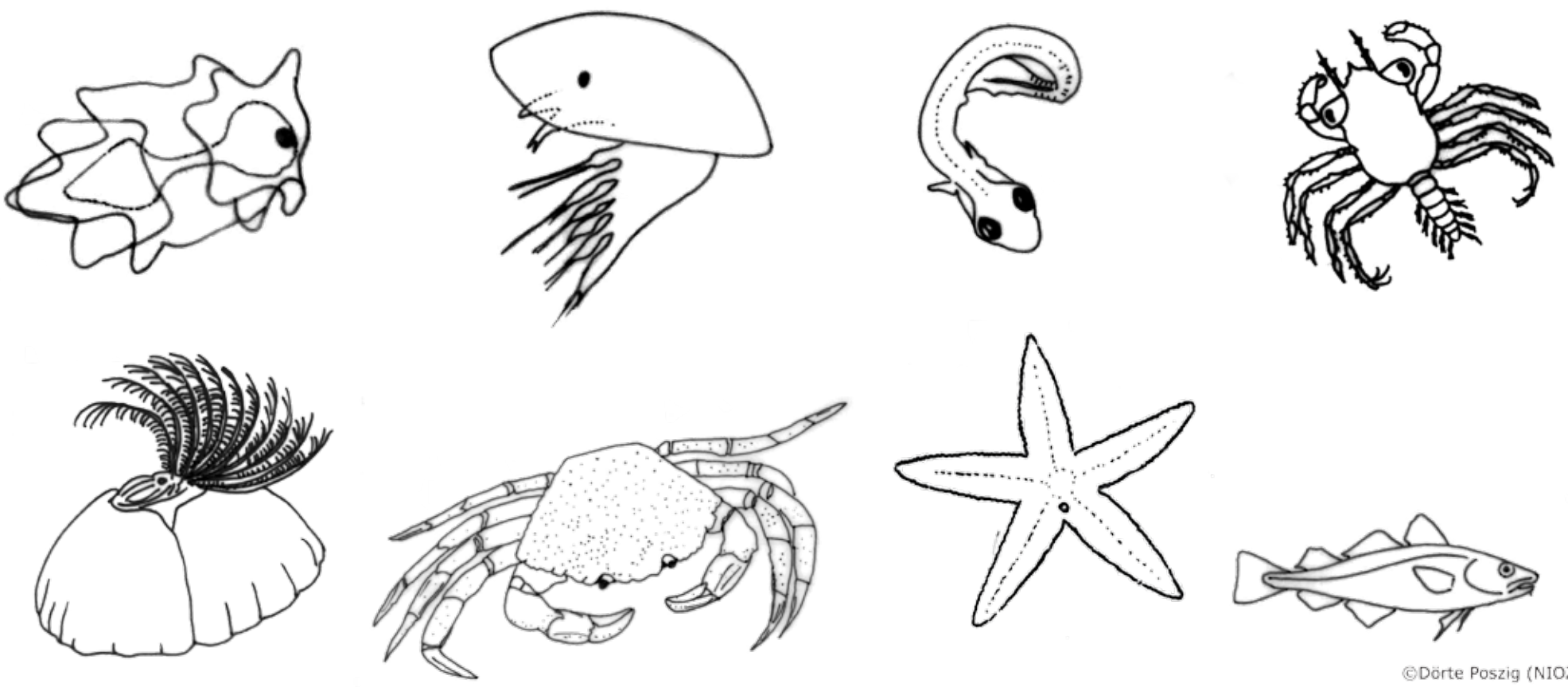
The IMO's Correspondence Group on Ballast Water Sampling, set up during the 16th Sub-Committee on Bulk Liquids and Gases, focused on these issues. Two documents were produced, one highlighting the sampling methods available and their limitations, the other providing guidance on how administrations should prepare for PSC.

The Correspondence Group paper suggests a stepped approach to sampling using indicative methods to show potential non-compliance before detailed analysis. It also introduces the concept of testing for "gross non-compliance" - identifying treatment systems that are not working resulting in ballast water with organism levels well over the D-2 Standard of the BWMC. Both of these go some way to addressing the case where, without knowing the variation of organisms in the ballast water discharge, the number of samples needed to ensure representativeness cannot be calculated. A situation that is exacerbated when treatment systems are used immediately prior to discharge as there is no chance to take samples to calculate this variation. A suite of tests have been suggested in the Correspondence Group paper and these have to be standardised to ensure harmonisation between PSC inspections. Additionally the confidence limits and thresholds used for compliance testing have to be developed and published. The two level sampling regime encompassed in the BWMC also has to be integrated with the tiered operation of PSC, whilst ensuring that the right to sample at any time enshrined in the BWMC is maintained. These issues are now being taken up by the PSC community prior to the BWMC coming into force. The development of these issues may or may not result in changes to the existing guidelines and guidance. However, the challenges raised have been, and are being solved to a level which allows IMO Member States to ratify and bring the BWMC into force in the very near future.

www.emsa.europa.eu/implementation-tasks/environment/ballast-water.html

When I grow up I will become...

Connect the pictures of the larvae with the correct adult animal.



©Dörte Poszig (NIOZ)

Marine and freshwater zooplankton at NIOZ

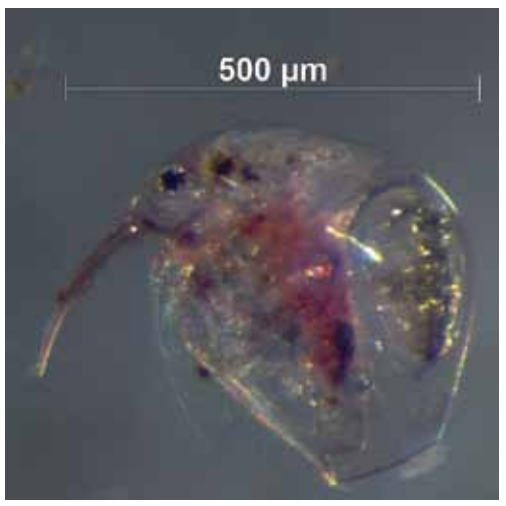
Eva Immler, lab technician

The NIOZ ballast water research group is looking back at a busy and successful testing season 2012. Two companies completed their land-based tests at our test facility. In order to develop methods for ballast water testing even further, the NIOZ ballast water team already has a full schedule of experiments for winter 2012, so that we will be prepared to test according to the ETV protocol in 2012.

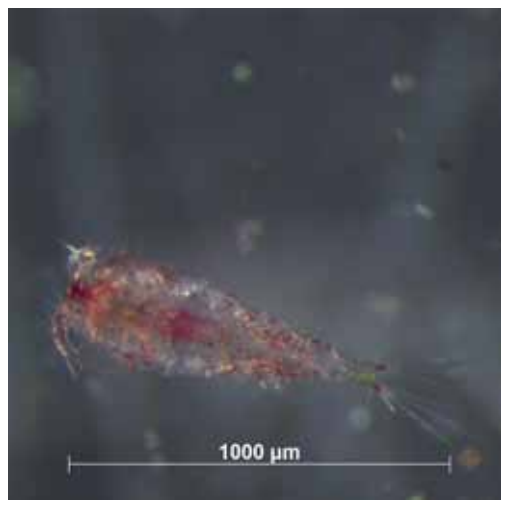
In the past, NIOZ performed G8 and G9 tests according to the IMO standards, using good quality intermediate and high salinity test water pumped from the institute's harbor. In August and September this year, we successfully carried out G8 tests with fresh water, originating from Lake Ijssel, only 10 km away from our test facility. Using a special plankton-friendly pump, the test water was fed into our system. The abundance of plankton above 50 µm in our fresh water was between 100,000 and 300,000 organisms per m^3.

A very difficult and crucial point in the analyses of the zooplankton samples that we take from the test water, is the life or dead determination of organisms. For marine water organisms, beside movement and structure, we use a stain called neutral red as an additional criterion for the life-dead determination. A main difference between marine water and freshwater organisms is their osmoregulation; the process of keeping fluids in balance within the organism relative to the surrounding. The red stain is only taken up by living organisms as long as they are exchanging fluids with their surroundings. Freshwater zooplankton do not take up the stain very well (picture 1/2) compaired to marine organisms (picture 5). Therefore, we are doing some small experiments with alternative live stains for freshwater organisms (picture 3/4). The organisms in blue are stained with a probe that will color the dead organisms without harming the ones that are alive. In the coming winter we will examine the use of different live-dead stains in combination with automated identification and quantification systems, to improve the counting of both marine and freshwater organisms.

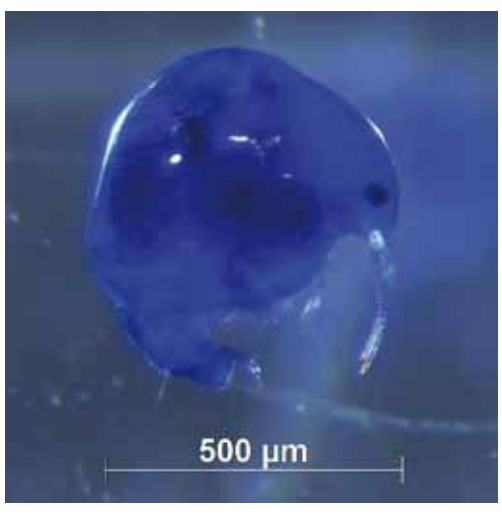
www.nioz.nl/ballastwater-EN.html
Twitter @NIOZBWTestSite



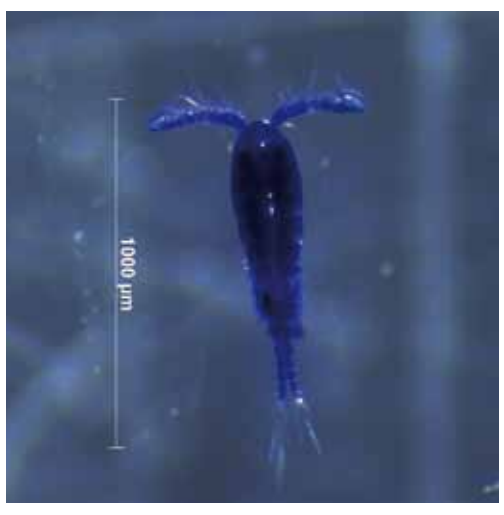
1. Live Bosmina with neutral red.



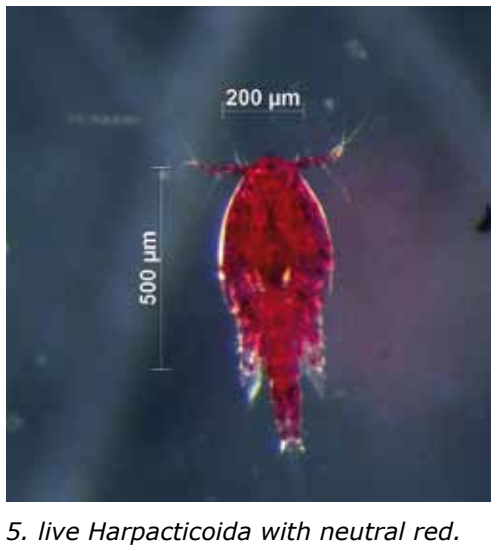
2. Live Cyclopoid with neutral red.



3. Dead Bosmina with aniline blue.



4. Dead Cyclopoid with aniline blue.



5. live Harpacticoida with neutral red.

Marine environmental awareness training

Erik Bogaard, director

Ballast water management is one of the biggest environmental challenges facing the shipping industry today. In order to tackle this problem, regulations are needed (such as the IMO convention on ballast water management), technological innovations are required (for instance to develop suitable ballast water treatment systems), and at the core of this all, seafarers and others working in the shipping industry must be willing to comply with regulations and to fulfill their personal role in preventing the spreading of invasive species. The IMO calls this the 'human element' and it is crucial in tackling environmental issues such as invasive species introduced by ballast water. Now, there is a course that is dedicated to this human element: the IMO model course Marine Environmental Awareness.

This course has been developed by ProSea and was submitted to the IMO by the Dutch government. It tackles the requirements of the revised STCW Code (which entered into force on the 1st of January 2012) in which basic international requirements on training, certification and watch keeping are described for seafarers. In the revised code it is prescribed that maritime officers should gain knowledge and awareness of the prevention of pollution to the marine environment. Ballast water management is an important aspect of this.

The marine environmental awareness course is a two-day course, in which (future) seafarers are interactively involved in the subject of sustainable shipping (sustainability being defined as a balance of People, Planet and Profit - ecology, society, and economy). The course includes 14 informational lectures that help trainees understand the impact of shipping on the environment (including basic marine ecology, invasive species through ballast water, the effects of oil, chemicals, and marine litter on the marine environment, and the effects of air emissions of shipping). In addition, trainees think about and exchange opinions on the subject of sustainable shipping and environmentally sound shipping in four interactive workshops, eventually leading to a focus on their personal responsibility in the prevention of pollution ('what can I do'?).

In order to facilitate teachers and trainers worldwide to provide this training, ProSea has developed a set of educational materials that includes PowerPoint lectures of all course subjects, accompanied by illustrative background articles and short movies. Teachers and trainers that wish to teach the model course as developed by ProSea can order a set of educational materials at ProSea. They can also follow a "train the trainer" course at ProSea.

www.prosea.info

Safeguarding openness of non-confidential information enhances confidence and trust in ballast water management

Cato C. ten Hallers-Tjabbes, FRIN, CaTO Marine Ecosystems, Delegation Leader IUCN at IMO

The slow entry into force of the BWMC is a shared concern. It is clear that the maritime sector doesn't feel confident in its ability to cope with the BWMC requirements.

Tokens of uncertainty and lack of trust in the options, are reflected by questions such as how to know whether a BWM System does what it is supposed to do on-board ship, or what to expect regarding portstate inspection and enforcement. The uncertainty also reflects the unfamiliarity of the shipping community with the world of marine biology, the domain where ballast water problems where first recognised and where many of the solutions have to rely on.

Confidence and trust in the options to meet the BWMC requirements needs transparency of all relevant information. Fully understanding the process of certification and port state control, and the science and technology underlying it, is crucial. Only then can the consequences and new tasks that affect both regulator and industry be faced with confidence and informed choices be made. Although knowledge on BWM is rapidly developing, issues that yet need to be clarified keep emerging. Identifying what is known, and what is as yet unknown, can alleviate uncertainty and help to recognise new challenges. No sincere body is served by mystifications. To choose an adequate BWM System one needs to understand how systems are tested, and with what results as to efficacy and environmental acceptability. One needs to know what is needed to face port state control inspection with confidence. Adequate information on the availability of BWM Systems, and the potential to mount such systems on ships, are equally important.

The regulatory environment has a clear role in creating trust and in safeguarding transparency. True progress in BWM needs commitment of administrations to fully inform the maritime sector and the world at large. They should employ and promote the use of mechanisms, regimes and instruments to safeguard transparency world-wide.

www.northseaballast.eu

Marine Environment Protection Committee IMO – Observer Organisations.

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Challenges to effective implementation of the BWM Convention

Niels van de Minkelis, technical and environmental affairs

The Royal Association of Netherlands Ship owners (KVNR) and its membership is making every effort to achieve further significant improvements to the shipping industry's environmental performance. The BWMC is therefore wholeheartedly supported.

In the first edition of the Ballast Water Times, the KVNR wrote about the 'hurdles in ballast water management' which were identified. Since then, some progress has been made. Notably the Netherlands government played an active role at IMO level. For the semi-submersible ships the concept "ballast water treatment by internal circulation" (MEPC 63/2/13) was submitted to the IMO Marine Environment Protection Committee. This concept was welcomed by other IMO Member States (MEPC 64/2/9) during last MEPC 64 meeting and an Unified Interpretation may follow next year at MEPC 65.

The KVNR appreciates the joint actions of the HELCOM and OSPAR States. A task group met for the first time in October, taking the first steps in developing a proposal for a recommendation for a common framework for the OSPAR and HELCOM regions on the issue of exemptions for ships operating exclusively between specified ports/locations in accordance with Regulation A-4 1.4 of the BWMC.

Nevertheless for some specialist ship types, notably the unmanned seagoing barges, no adequate solution has been found yet.

Furthermore there are a number of challenges remaining:

- the assumed lack of robustness of the testing requirements. The withdrawal from the market of a Type Approved ballast water management system (BWMS), following the discovery during extended testing by the vendors that the system did not perform consistently under conditions normally encountered, substantiating the concerns of ship owners.
- sampling and analysis procedures for port State control purposes.

These challenges have been identified by several stakeholders and are presently being discussed at IMO.

www.kvnr.nl

NSBWO pro

The NSBWO project started in 2009 with the aim to provide regional cohesion, encourage innovation and to develop future strategies in ballast water policies and ballast water management. The project is programmed run to the end of 2013. It may be possible to gets an extension for another half year. Now, with a year and a half left to go, the project has done a lot to accomplish its ambitious goal. We can look back at a lot of workshops, meetings, presentations, MEPC submissions and a successful two-day conference during Europort 2011. We also closely monitor the ratification of the IMO BWMC (2004). But, we are not done yet. There is still a lot to do. At the moment we are developing tools for ship owners, ports and others involved in BWM that can be used after the project is done.

This is our NSBWO calendar:

- February 11- 14, 2013 – Flow Cytometer workshop at NIOZ on Texel, The Netherlands
- November 6 & 7, 2013 – Ballast Water Management: from concept to reality, conference during Europort, Rotterdam, The Netherlands
- Bacteria Workshop for specialists, dates not known yet
- Compliance, Monitoring and Enforcement Workshop for specialists, Hamburg, dates not known yet

Keep an eye on our website and twitter @NSBWO. We will announce the project activities there.

NSBWO Annual Project Meeting 2012

Jan Boon, project leader & Dörte Poszig, management assistant

On May 24th and 25th, 2012 the annual meeting of the NSBWO project was held. With 63 participants, the meeting was a success. Several workshops were organised by different partners, and of course the steering group met to discuss the work plan for the coming year. Mr Rolf von Ostrowski of the German Wasser- und Schifffahrtsverwaltung agreed to act as chair for the year 2012-2013, for which we are very grateful. The annual meeting provided a good opportunity for all project partners, external invitees and people interested in the developments related to the IMO BWMC to meet and discuss the progress within and outside the NSBWO project.

Steering Group Meeting

The main recommendation of the steering group meeting was to explore the options of continuing the project after its present finalization date of December 31st, 2013, in particular taking into consideration future work that enables the established information platform to be maintained, and generating ideas for possible improvements of test procedures on land, on board and for CME. The number of countries which have ratified the Ballast Water Management Convention is now well above the required minimum of 30, but the shipping tonnage is still below the required threshold of 35%. Still, the number of countries which have signed the Convention has been steadily increasing over the last few years and it is generally expected that the required tonnage level will be met in 2013. Since this will automatically mean that the measures described in the Convention will come into force one year after that date, an extension of the project until mid-2014 seems crucial to satisfy the need for information.

Workshops

The workshop topics of this year's AM were chosen by the project partners, as they were seen as hot topics.

From the Modelling Workshop a number of conclusions were drawn. Coupled ecosystem-hydrodynamic models can be used to 'tag' different functional groups of organisms which can be followed over longer time periods, so that their distribution can be studied in detail in the entire North Sea region. An advantage of such models is that they include the reproduction cycle of organisms, whereas in purely hydrodynamic models, a planktonic organism is treated like an inert particle floating with the current. It is essential to have a detailed understanding of the dispersal ranges, mortality, grazing and behavioural aspects of non-native species in the North Sea prior to modelling their distribution and progress has been made here.
During the Ports Workshop it became clear that most ports are still uncertain about their role in ballast water management when the BWMC comes into force. Yet BWM can offer many opportunities for ports and private companies active therein. A good example is Groningen Sea Ports, bordering the Wadden Sea World Heritage, which took up the challenge by, together with a number of partners, starting up a pilot project in which a shore or port based ballast water treatment system shall be built and operated. The Port of Rotterdam also thoroughly investigated BWM issues. It sees a role for private parties active in the harbour to start initiatives for harbour reception facilities for untreated ballast water.

The main conclusions from the Organism Detection Workshop are that progress has been made to modify organism detection technologies, for the purpose of compliance monitoring under the BWMC standards on board upon arrival of a ship in a harbour. However, because of several uncertainties, these methods still have a lower accuracy and precision than the elaborate analytical techniques applied during the land-based and ship board tests for type approval. At the moment, it seems that organism detection technologies can enable assessments of non-compliance with the D-2 Standard by an indication of gross exceedance of the organism numbers, but the methods are not yet sensitive enough to show a small exceedance of the standard.

Developments in the USA

Highlights of this year's AM were the lectures given by our overseas guests Dr. Allegra Cangelosi (Principal Investigator at the Great Ships Initiative (GSI) Test facility for BWTS), Dr. Richard Everett (U.S. Coast Guard) and Mr. Jon Stewart (President of International Maritime Technology Consultants, Inc.). In March 2012, the US Coast Guard issued its 'Standards for Living Organisms in Ships' Ballast Water Discharged in U.S. Waters; Final Rule'. In the USA, ballast water treatment systems are evaluated according to procedures that include the Environmental Technology Verification (ETV) Protocol of the US Environmental Protection Agency (USEPA), as well as additional shipboard and environmental test requirements. Ballast water treatment systems type approved by a foreign administration in accordance with the IMO convention do not automatically get a type approval from the USCG. BWTS manufacturers with BWTS type approved in accordance with the IMO BWMC can make a request for acceptance of their systems as an "alternate management system", or AMS, through the procedures described in the Final Rule. Vessels with AMS installed before the compliance date for meeting the ballast water discharge standard set by the Final Rule can use the AMS in lieu of ballast water exchange prior to the compliance date, and can continue to use the AMS for up to 5 years following the compliance date. Uncertainty about whether systems type approved by foreign administrations will meet the USCG type approval requirements has created nervousness in the ship owner community, which definitely needs to be further addressed in the coming year.

www.northseaballast.eu

Everything you ever wanted to know!

Marieke Vloemans, communications officer (NIOZ) & Ellen Kuipers, project leader shipping safety (Wadden Sea society)

Within the NSBWO people have a lot of knowledge. It is important to disseminate this knowledge. Therefor the NSBWO website has a new feature. From now on you can open and respond to discussions on our own forum. The success of this forum depends on your input. We invite you all to take a look at the forum to start a discussion or ask everything you ever wanted to know about the NSBWO project.

The forum has four main topics, 'The NSBWO project', 'Discussions', 'News' and 'FAQ'. Under the topic 'Discussions' we will open a new discussion every two months. And you could respond to articles from the Ballast Water Times to get more information. We also hope to become a good source for news from the ballast water world.

We would like to see you all online.

www.northseaballast.eu

ject news

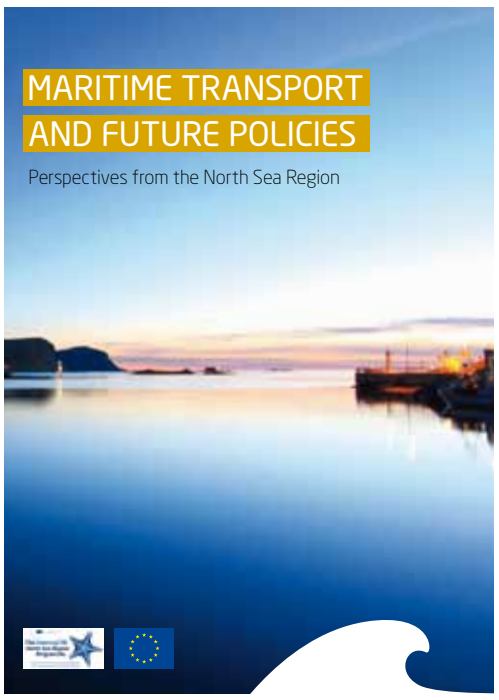
Maritime Transport and Future Policies - perspectives from the North Sea Region

Erik Bogaard, director
ProSea foundation

What are hot topics for maritime transport in the North Sea Region (NSR)? To answer this question, the NSBWO project joined forces with partners from other Interreg projects in the Maritime Transport Cluster (MTC) project. The final product is a policy paper written for the European Parliament, the European Commission and the NSR (EU Member States and Norway) countries that is meant to inspire and contribute to discussions on future EU coordinated maritime transport projects. Green maritime transport, introduction of invasive species, research and knowledge exchange are among those hot topics.

The development of cluster projects is part of the Interreg IV B programme. Clusters of exiting projects can have extra 'strategic' relevance when they work together, to maximize their impact and visibility. The MTC project applies the cluster idea to the maritime transport sector. The MTC has linked the results from ongoing Interreg IV B projects dealing with maritime transport issues and new business trends from the maritime industry as well as with EU transport policy development.
Lead Partner of the MTC project is Port of Hamburg Marketing. NIOZ is representing the NSBWO project in the MTC project. Erik Bogaard from the ProSea foundation participated actively in the project on behalf of NIOZ and the NSBWO project.

The partners in the MTC project carried out an analysis in 2011 and 2012 of all active 14 transport related projects within the North Sea Interreg IV B programme, looked at maritime transport research and consulted the maritime industry in the NSR about business trends. Business trends in maritime transport were identified and linked to the projects and research. This resulted in the MTC Policy Paper "Maritime Transport and Future Policies - Perspectives from the North Sea Region". It was officially launched in Bremerhaven in June 2012. The policy paper offers a holistic perception and combines the opinions of stakeholders of the Interreg IV B North Sea Region Programme on maritime transport, with the challenges, opportunities and experiences of the maritime industry. In this way the paper is intended to inspire and to contribute to discussions on future EU cohesion and transport policy developments.



Ten main themes were identified to bring together a wide range of important perspectives from within the maritime transport sector:

1. A Leading Maritime Region
2. Efficient Transport
3. Smart Solutions
4. Combining the Modes
5. Infrastructure – the Solid Base
6. Planning the North Sea Region
7. Green Maritime Transport
8. Research and Knowledge Management
9. Working in the Transport Sector
10. Maritime Business Perspectives

The NSBWO project had its main input in the subjects 'Green Maritime Transport' (including energy efficiency, reduction of emissions, introduction of invasive species and recycling of ships) and 'Research and Knowledge Management'(including technical research, innovation and knowledge exchange). By participating in the MTC project, the NSBWO project has contributed to the discussion on future EU policy and the content of the new Interreg Programme. Thanks to the MTC project the issues of research and knowledge management and green maritime transport, including the introduction of invasive species, have been included as an important aspect of future EU policies.

After the launch of the policy paper this June, the project activities have focused on the communication of the project results to the transport business community, to the national transport administrations and to the European policy makers. The MTC project will run until December 2012.

www.maritimetransportcluster.eu


J. Snoek ©NIOZ

Ship owners, what do they need?

Marieke Verweij, project manager

With the upcoming ratification of the BWMC, the shipping industry is facing a big challenge. By 2016 all ships must treat their ballast water so that the risk of introducing invasive species is minimized. The NSBWO project may be very valuable to ship owners in their quest of deciding upon appropriate Ballast Water Management for their fleet. However, thus far, the project has had some difficulties in engaging ship owners. In order to find out what type of information ship owners are interested in specifically, we decided to ask them, in several interviews.
Ship owners pointed out that awareness of the problem should be enhanced, for office staff and for seafarers alike. Most of them do not know the exact reasons behind Ballast Water Management. General awareness of the seriousness of the problem of invasive species should be created, as well as awareness of the contribution of shipping to the problem and to the solution (in relation to other vectors, such as aquaculture releases).

Ship owners appeared quite hesitant to decide on which Ballast Water Treatment System (BWTS) to buy. The most important issue for them to consider are the costs, related to two aspects: installation on board and the possible increase in ship fuel consumption. Ship owners said they would be pleased with an independent overview of all BWTS that are currently on the market, which should provide insights in important parameters, such as operational costs, space needed onboard, etc. Ship owners furthermore wonder how they can deal with certain specific ship types in their fleet that can hardly comply with the BWMC, such as very small ships with too little space onboard for elaborate treatment systems or very large ships that have to treat huge amounts of ballast water. Some ship owners are examining the option of using drinking water as ballast water.

One of the main worries of ship owners with respect to upcoming Ballast Water (BW) regulations is whether an IMO type approved BWTS will also be accepted in US waters. US standards for type approval of equipment are far more stringent than the IMO equivalent. Another worry goes out to enforcement and control: how is port state control going to test that the Ballast Water Treatment System onboard has been turned on and works appropriately? And how long will this testing take (extended time in port)? And how can you ensure that this enforcement will be thorough and honest in every country?
Ship owners also wondered about the role and responsibilities of ports. What are the plans of port authorities with respect to BW? Will they provide BW reception or even BW treatment facilities on shore? And when sailing between two harbors that have similar ecosystems (that are part of the same 'ecozone'), will a ship then be exempted from BWT? If so, where will boundaries between ecozones be drawn? What should a risk assessment (needed for exemption) look like and where can you submit such a risk analysis?

The above information is very valuable to the members of Work Package 6 (Dissemination) of the NSBWO project. We will attempt to answer as many of the questions above by using the knowledge of all NSBWO project partners. Currently, we are developing concrete products that can help ship owners on their way towards new BW regulations and BWT. Current ideas for such products include one-day workshops for ports and ship owners together and PowerPoint presentations for in-house use. Keep an eye on us if you're interested in such matters! And if there are any other critical questions or issues that we have not covered yet, please let us know!

www.prosea.info

European projects, how can we continue after 2013

Hans Flipsen, advisor

With various European programs, the EU member states, the European commission and the European parliament wish to enhance the European collaboration. With the wish of the NSBWO project steering group for extension of the NSBWO project and the exploration of future opportunities to continue this collaboration, the NSBWO project has clearly achieved this EU goal.

However, how can we continue this collaboration? What are the opportunities and where can we find funding for these? This is depending on where we wish to go. Do we aim for the next maritime environmental problem? Or do we wish to disseminate our ballast water knowledge to other regions in Europe?

Both options are open, but we have to make our choices now to prepare for subsidy programs that could open as early as 2014. It takes from 6 months up to a year to build a good European project, so it is important to consider the options now.

Aiming for the next maritime environmental problem could be achieved in a smaller consortium, finding funding from Interreg North Sea, North West Europe, Life + or even Horizon 2020.

Alternatively, continued dissemination of our results may be best supported by an Interreg VC application. It will be up to parties among you to take an initiative and lead one of these options. Others have expressed their interest to participate and we can help you set up these initiatives.

www.emconsult.nl

Congratulations Ruud van der Meer!

The NSBWO project congratulates Ruurd van der Meer with his second place for the Rachel Carson Environmental Thesis price 2012, with his theses 'Ballast Water Risk Assessment in the North Sea. Evaluating Ballast Water Management Exemption in the North Sea Region'.

For the tenth time the Rachel Carson Thesis price is awarded to the most outstanding thesis on the topic of environment and sustainable development. The price is an opportunity for students to show their research to a broad range audience of colleague-students and professionals. This year 19 theses entered the competition. A jury chose a top 3 with a very broad range of topics, mostly with an international perspective.

Ruurd's complete report can be downloaded from the Groningen University library website: beta.wewi.eldoc.ub.rug.nl

Project partners

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Project consultants

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Colophon

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Contact information

www.northseaballast.eu
info@ballastwater.eu
Twitter @NSBWO