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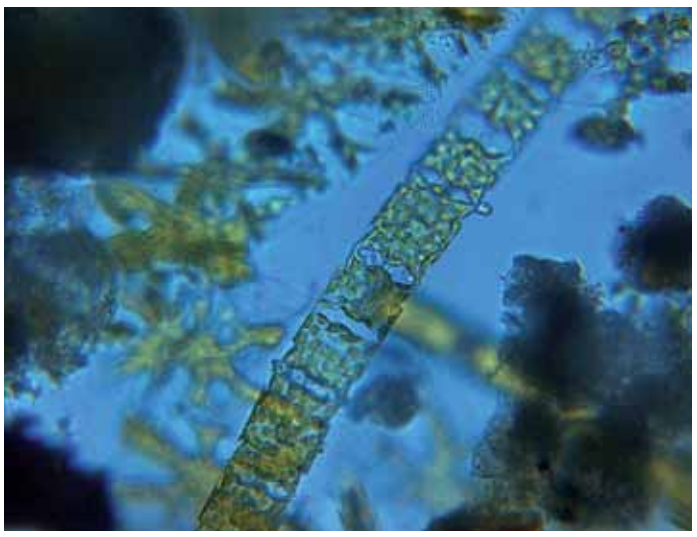
NORTH SEA BALLAST WATER

THE BALLAST WATER TIMES

THIS IS THE FIRST ISSUE OF THE BALLAST WATER TIMES



The North Sea Ballast Water Opportunity (NSBWO) project is a cooperation between more than forty partners and sub-partners. They are located in the United Kingdom, Belgium, the Netherlands, Germany, Denmark, Norway and Sweden. The NSBWO project aims to reach regional cohesion, innovation and develop future strategies in ballast water policies and ballast water management. The project is co-funded by the INTERREG IVB North SeaRegion Programme of the European Regional Development Fund and is coordinated by NIOZ-Royal Netherlands Institute for Sea Research. In this newsletter you can read about the partners and sub-partners of this project and their recent developments. We hope you will enjoy this newsletter and that it´s helpful for future developments within and outside the NSBWO project.

For contact and more information regarding the project please check our website:

North Sea Ballast Water Opportunity project

Etienne Brutel de la Rivière (NIOZ)

Although the need for the Ballast Water Management Convention (BWMC) was obvious, a group of experts realized that a lot of work had to be done to get the BWMC adopted. Treatment techniques were not available and detection technologies were only partly available for application in well-conditioned laboratories. In addition, a lot of question marks were raised by ship owners, port state control officers, industry and policy makers.

The North Sea Ballast Water Opportunity (NSBWO) project started in 2009 to find scientific and mainly practical answers on all sorts of questions in relation to the ballast water and the governing convention. To stimulate the work in the project and useful outcomes, a set of very specific deliverables was identified at the beginning of the project.

This involves:

- Strengthening of regional cohesion and harmonization amongst North Sea countries in respect of certification and compliance enforcement;
- To boost research, innovation and knowledge exchange in respect of ballast water treatment systems;
- To develop practical methodologies and instruments for monitoring and compliance control;
- To get open access of information on marine / aquatic bio-invasive species and to develop models on their behavior;
- To develop future strategies on the knowledge gained and recommendations for the future accordingly; and
- To raise awareness in respect of the above.

The project lasts till the end of 2013 and comprises of over 40 partners and sub-partners within the North Sea Region, including policy makers, authorities, industry and research institutes. Although the initial focus was on the North Sea area, nowadays this project also has close cooperations in the international community, such as the IMO, GloBallast and the US Coast Guard, due to the high level of expertise and knowledge gained over the past years.

The Interreg IVB North Sea Region Programme

Investing in the future by working together for a sustainable and competitive region

Review of the ballast water issue

Ruurd van der Meer (student RUG/NIOZ)

Shipping is an important vector of non-indigenous species introduction. Such species pose risks to the receiving ecosystem. Organisms are transferred along the globe by ship's ballast water and find their way along the global shipping network. Shipping routes, densities and climate simularity can predict and record patterns of new species introductions. An introduction of non-indigenous species in the aquatic environment can lead to adverse impacts on ecology, as well as human health and economy. The members of the International Maritime Organization (IMO) adopted the BWMC in 2004 in order to reduce the transfer of non-indigenous species by ship's ballast water. The BWMC requires ships to use ballast water management to ensure that ships only discharge a minor amount of species in the recipient area, according to the BWMC D-2 standard. Ships that cannot comply with the requirements for their type of ship or due to the operating area might be exempted of performing ballast water management, but only after performing ballast water risk assessment for which the ships have to comply with specific requirements. Risks from the ballast water are the risks of introducing an invasive species and establishing a population of the species in a recipient area (outside the species' native range).

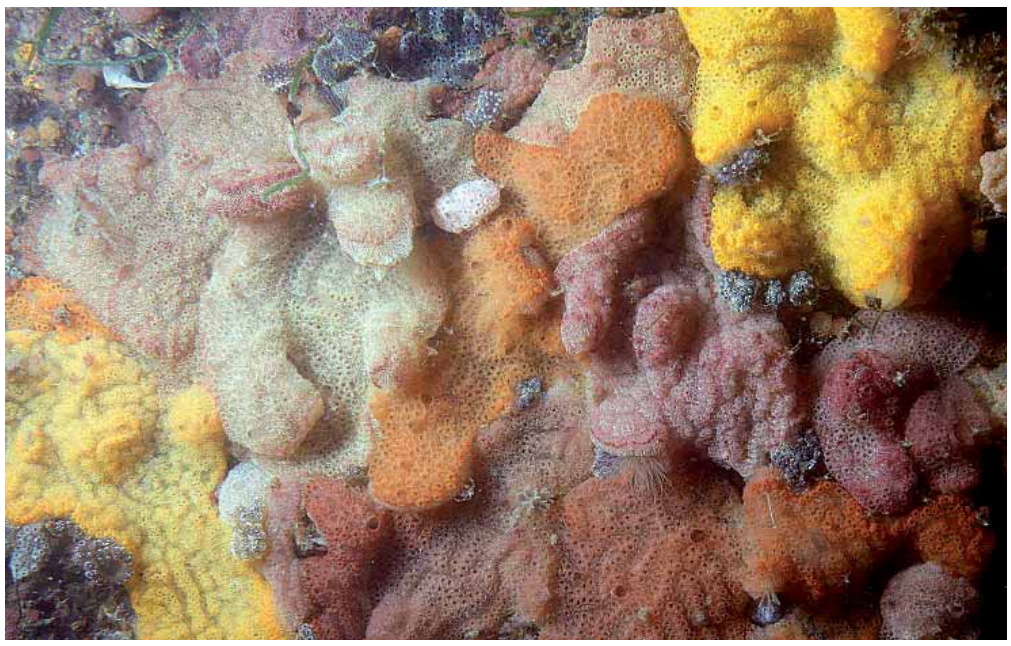
Alien alert! Dutch marina's are hotspots for invasive alien species

Tom van der Have

Ever heard of wakame, Japanese club tunicate, slipper limpet or Pacific oyster? As their names suggest these marine organisms come from far, often the other end of the world, like the Pacific, but turn up with increasing frequency in our part of the world. Recent surveys of marina's in the Dutch Wadden Sea, an UNESCO World Heritage Site, showed that these areas are rich in alien marine species (www.gimaris.com). Alien or non-native species are plants and animals which are transported actively or passively by man often far outside their original distribution range. These organisms are often transported between marinas by attaching to hulls of small recreational vessels after arriving in our region with ballast water or with shellfish imports. Alien species thrive in these small harbours because they are quiet, secluded areas, rich in food and far from the natural enemies in their home range. The risks associated with these species are that some of them expand rapidly and can then develop into nuisance species. They can smother mussel cultures (sea squirts) causing production losses, can foul pontoons and hulls, which are therefore more difficult and costly to clean (Pacific oyster), and can compete with our native species. For this reason the IMO recently agreed on voluntary guidelines to reduce the chance of the introduction of alien species with hull fouling. Our government hopes that successful implementation of these voluntary guidelines will result in a lower number of aliens entering our coastal waters and consequently a reduced negative impact on the economy and biodiversity.

www.vwa.nl/invasieve-exoten
Invasieve-exoten@minlnv.nl

Colonial sea squirt, an invasive alien species (© Arjan Gittenberger)



Transparency in evaluating ballast water management systems

Cato ten Hallers-Tjabbes (CaTO Marine Ecosystems)

The IMO values public access to information on certification of ballast water management (treatment) systems (BWM systems). Both IMO Guidelines on certification of BWM systems have a provision for access to information. Guideline G9 on evaluating environmental acceptability of BWM systems that make use of active substances for disinfection explicitly prescribes the environmental information items that should be non-confidential. For transparency on Guideline G8, on approval of BWM systems, IMO adopted Resolution MEPC.175(58) that recommends to disclose test results when notifying IMO a BWM system has been certified and to make the test reports available in the public domain.

Most countries adhere to the Recommendation. Many countries have regimes to regulate public access to information on the environment. The USA have their Public Information Act and all European countries are party to the Aarhus Convention. The Aarhus Convention requires governments to safeguard public access to information on the environment. It has a Compliance Committee in support of the provisions. When environment information is not being disclosed, the public can appeal to the Committee. The Committee's arbiters judge the complaint; governments have to comply with the ruling. The European Union countries that have certified BWM systems in notifying IMO all adhere to Resolution MEPC.175(58).

WMU invasive species website

Chetan Gaonkar

We here at World Maritime University (WMU), Malmo, Sweden as a partner organization within the NSBWO project are working on launching an invasive species website particularly for the North Sea region. The website will serve as an interactive tool for promoting awareness of marine non-native species to stakeholders such as maritime managers, academic researchers and an interested public. The initial phase of the North Sea Alien Species (NorSAS) website will contain information on the status of introduced species in the North Sea, their biological and ecological background, pathways of introduction, their consequences on the environment and the economy and their management aspects. This new database addition may be used to augment a global network of the occurrences and distribution of alien species in the near future. We are aiming to launch this website at the latest by the beginning of 2012 at http://www.norsas.eu portal.

The WMU operates under the auspices of IMO, a specialized agency of the United Nations and is truly an organization by and for the international maritime community that aims at providing high-level maritime education and research. Established by an IMO Assembly Resolution in July 1983, its basic aim is to further enhance the objectives and goals of IMO and IMO member states around the world. WMU's mission is to serve the global maritime community in furtherance of IMO's aims and objectives. As a Centre of Excellence for maritime education and research, the University promotes the highest practicable standards in maritime transportation, policy and administration, management, safety, security and environment protection, and provides a mechanism for the international exchange and transfer of knowledge and its applications.

www.wmu.se

The approval and certification of BWT systems

Tjitse Lupgens

Technologies for BW management are subject to approval and certification through specific IMO processes and testing guidelines designed to ensure such technologies: 1) meet the relevant IMO standards, 2) are suitable for use in the specific shipboard environment.

In general the Flag State will probably choose to use a recognised organisation - such as Lloyd's Register (LR) - to verify and quality assure the tests and resulting data for certification.

As LR we recently were involved in 4 BWT Systems which are tested by the Dutch test Facility NIOZ at Texel and therefore have our share in the NSBWO project. In advance test plans and testing procedures are reviewed by LR and Flag State before testing will be started. With the test facility ideally situated, LR can justify to travel 3 hours for the test and have discussions with the experts at NIOZ.

For certification it is from great importance to build-up proper records to prove confirmation today and in the future the test has been carried out in accordance with the procedures and G8 Guidelines. Witnessing 5 test runs is required minimum for certification. Further special audits are carried out at the NIOZ test laboratory to assure the level of quality of testing is according to the test standards.

The sea-based test alone requires six months of testing based on a triplicated trial, with biological analysis to be completed within six hours of sampling.

For shipboard tests LR is attending too at least 3 test runs during the 6 months of testing. The system LR witnessed this year onboard the COSCO GUANGZHOU finalised in August successfully the last test run.

For LR taking part in the NSBWO project is not a matter of only verifying and quality assuring the test but it is a learning process too and a chance in gaining on the spot practical knowledge and input in BWM.

As LR we focus constantly on good control of assuring quality of the Certification process and communication between manufacturer and Flag State.

www.lr.org

Testing at the NIOZ harbour

Isabel van der Star

The Ballast Water testing team of NIOZ-Royal Netherlands Institute of Sea Research finished testing season 2011 at the beginning of October. The ballast water testing facility is located on the island of Texel. The area is highly eutrophicated and waters contain high sediment loads from the Wadden Sea and rivers discharging close to the area. One advantage of the location is a natural salinity difference between high and low tide which is large enough to test two salinities of at least 10 psu difference. This is one of the requirements for land based tests of ballast water systems. Testing is done by filling tanks with water that went through a treatment system. The systems are the responsibility of the manufacturers and stay a 'black box' for the testing team. Additionally, a control tank is filled with untreated water. The water is discharged after 5 days. Samples are taken at the first and the fifth day and analyzed in the laboratory for any living organisms. Analysis of organisms is done by inverted and dissection microscopes, as well as a flow cytometer. This is done ten times to investigate whether the ballast water treatment system works as required by IMO.

This season was quite successful although the phytoplankton season was not long due to weather circumstances. Due to a dry and sunny spring, there was a reduced amount of nutrients which normally are discharged by rivers and lake IJssel into the Wadden Sea. This resulted in lower phytoplankton and zooplankton numbers. However, there were still enough organisms to test three different systems for certification, and do lots of pretests including different filter tests. Although it's hard work we never get tired of it and we always love it when it is spring again!

www.nioz.nl

Aerial view of the NIOZ harbour (© Pieter de Vries)

Sustainable shipping

Geert Jan Reinders

Groningen Seaports is an "Eco Ports" certified port. By participating in this specific environmental management standard for ports Groningen Seaports wants to show its awareness of the environment. The urge to operate in a sustainable way is firmly anchored in the mission statement of the organisation:

"Groningen Seaports exists to stimulate economic activities - and, thus, employment - in the ports, and at the industrial sites and other logistic centres under its direct management or control, and do this in a responsible and sustainable manner".

The location of the ports (being Delfzijl and Eemhaven), adjacent to the vulnerable Wadden Sea, gives a constant consideration of the developments in the ports. By participating in programs like "Clean North Sea Shipping" and the "nsbwo project" Groningen Seaports hopes to be at the front end of the development of sustainable shipping. In practice Groningen Seaports hopes to participate in a pilot for an onshore ballast water treatment system. Furthermore preparations are made to introduce an incentive system for clean shipping.

www.groningen-seaports.com

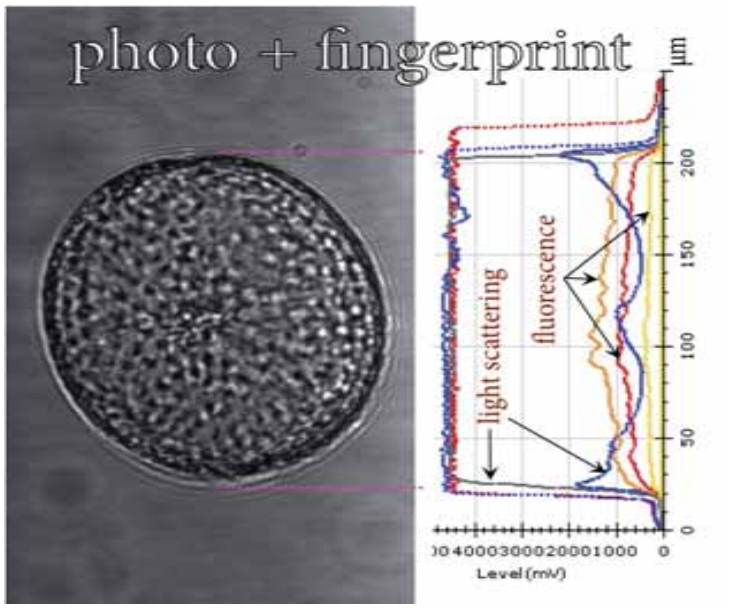
Aerial view of Eemshaven

Highspeed-biometry in BWT and invasive species control

George Dubelaar

We don't try to kill organisms as one might expect of an industrial participant of the NSBWO project; we build instruments to detect and analyze the microscopical particles in the water. There are many different types of particles out there: inorganic and organic nonliving particles of all sizes, bacteria, small phytoplankton cells, bigger phytoplankton cells and colony formers, ciliates, zoöplankton, fish eggs etc. and aggregates of all that. Therefore: to probe the composition of the microbial particle assemblage you need to see them all, one by one! And that is exactly what our CytoSense flow cytometer does: it measures an optical fingerprint from each particle at rates of thousands per second, and shoots photo's of 'interesting' particles in realtime based on these fingerprints. Great for marine biologists who take a CytoSense on their cruises, even submerged as CytoSub or let it monitor a fixed point on a mooring with the CytoBuoy. To check the performance of ballast water treatment processes on board of ships similar analyses are required. However, peripherals, circumstances, protocols and data analysis targets are specific. In this project therefore we have redesigned various CytoSense hard– and software components to build a compact CytoGraph for BWT system testing and trials by our partners.

www.cytobuoy.com

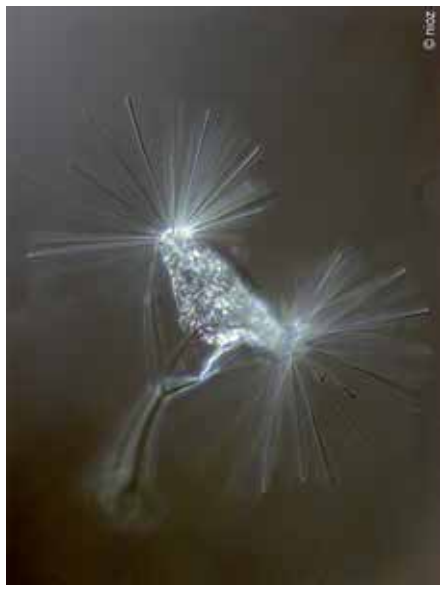


Neutralization Step for Ballast Water Treatment with PERACLEAN® Ocean

Jürgen Meier

Evonik Industries AG is one of the world leaders in speciality chemicals. For the treatment of ballast water, Evonik produces and markets PERACLEAN® Ocean, for which Evonik has been granted the basic approval in 2006. PERACLEAN® Ocean is a recognized highly effective biocide against a broad spectrum of organisms based on peracetic acid. Evonik has decades of experience in the production, distribution and application of this type of biocide in various industries around the globe. While being highly effective, PERACLEAN® Ocean has the advantage of degrading into the environmentally harmless substances acetic acid, water and oxygen. More recently, the company focused its developments in the area of ballast water treatment on the control of residual active substances. As a result, Evonik has developed an automatic neutralization system, which eliminates any residual concentrations of peracetic acid and hydrogen peroxide. Evonik is committed to contribute with its expertise and capacity in environmentally safe and sustainable chemical solutions for the problem of invasive species being transported with ballast water. In this role, Evonik is a partner in the Ballast Water Opportunity Project of the Interreg IVB-North Sea Region Programme.

http://corporate.evonik.com



Marchien de Ruiter, Stichting De Noordzee

Ballastwater & Ports: Miscible?

Maurits Prinssen

With 35,000 calls of seagoing vessels every year the Port of Rotterdam handles 430 million ton cargo. These vessels also exchange ballast water in large quantities in the port. A study in 2008 showed an intake of 77 million ton and discharge of 35 million ton ballast water.

With the coming BWMC, the treatment of the ballast water may have a small effect for port operations. But malfunctions of treatment systems shall influence turn around time severely. Another issue is the disposal of the sediments in ports and supply of chemicals for some treatment systems. Ports should be prepared for this.

Clear guidelines/legislation on quick sampling and speedy analysis (of the samples) should be in place before the convention will be enforced.

For ships without an adequate treatment system a mobile system may be prudent in ports. With such a system which can be easily placed on a barge, pontoon or truck, ships will have the least demurrage in a port.

Ships should not encounter any undue delay because of unclear implementation of legislation.

www.portofrotterdam.com

Marine environmental awareness training and the ProSea Foundation

Erik Bogaard

On the 27th of January 2011, the International Maritime Organization (IMO) accepted the 'marine environmental awareness' model course that was submitted by the Dutch government and was developed by the ProSea Foundation. As a result, knowledge of the effects of shipping on the marine environment, and awareness of the personal role of seafarers in the prevention of pollution will become a structural and recognizable aspect of worldwide maritime officers training.

By June 2010, IMO finished the revision of the STCW Code, in which basic international requirements on training, certification and watchkeeping 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.

The ProSea Foundation is a non-profit organization that specializes in educating maritime professionals. ProSea has broad experience providing marine awareness courses for the Dutch fishing sector, maritime academies in the Netherlands, Sweden and Denmark, and shipping companies in the UK, Greece and Kuwait. ProSea developed a two-day course, in which future seafarers are interactively involved in the subject of sustainable shipping.

The model course 'marine environmental awareness' forms a concrete basis for knowledge and awareness of the marine environment in the prevention of pollution as prescribed in the STCW Code.

One of the impacts of shipping on the marine environment is the introduction of invasive species by ballast water. The acceptance of the model course is an excellent opportunity to create awareness of the problem of invasive species, the upcoming acceptance of the ballast water convention and the availability of solutions. As a subpartner in the Ballast Water Opportunity project, ProSea will contribute to raise this awareness.

www.prosea.info

BSH Competition Compliance Control

Effective new technologies for the assessment of compliance with the Ballast Water Management Convention

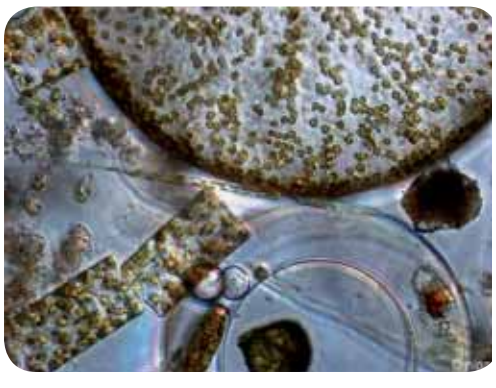
Deadline: November 25th, 2011

www.bsh.de/bwcompliance

Start date: 2011/09/08

End Date: 2011/11/25

Location: BSH, Germany



Real-time 3D microscopy platform for ballast water monitoring

Philip Mathuis

Ovizio, spin-off of the "Université Libre de Bruxelles" (ULB), is one of the partners that joined the Ballast water project last year with the objective to contribute to the detection for monitoring and compliance control work package.

Ovizio, in collaboration with the Laboratory for Analytical and Environmental Chemistry of the "Vrije Universiteit Brussel" VUB, has been working on the adaption of its Digital Holographic Microscopy based monitoring technology for the analyses of ballast water samples. The Ovizio oLine platform has been positively identified as an instrument supporting the identification and live-dead determination of organisms in the 50-800 µm range.

The project started with a review of literature on the use of Holography in the aquatic sciences and has realized the first tests of the technology on a range of marine planktonic organisms.

The Digital holographic microscopy based technology can analyze fluids in a flow cell in 3D in real time with the ability to refocus post recording. The platform captures quantitative data into an expert system allowing the system to distinguish and count microscopic objects and to detect viability based on label free methods.

www.ovizio.com

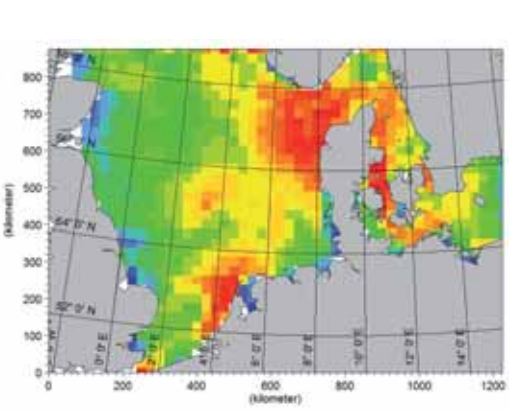
Ballast water vulnerability mapping

Flemming Thorbjørn Hansen (DHI)
Thomas Uhrenholdt (DHI)
Jesper Harbo Andersen (University of Aarhus)

Invasive species introduced to marine areas through the release of ballast water may exhibit a considerable threat to local ecosystems. This risk varies significantly between localities due to a number of factors affecting the probability of survival of individual invasive organisms and subsequently successfully establishing of a sustainable population. One important factor is the interconnectivity of marine areas, i.e. the likelihood that an organism once released from ballast water in one area ends up in another area. For small organisms (e.g. planktonic species, pelagic larvae of benthic invertebrates or juvenile fish) this interconnectivity is primarily determined by the sea currents and secondarily by species specific life histories such as survival and motional behavior.

DHI has developed a methodology for mapping the interconnectivity of marine areas of the North Sea region and the western Baltic Sea based on numerical modeling integrating classical 3D hydro-dynamical modeling and Agent Based modeling. Dividing the North Sea region into areas of 25x25 kilometers in size a connectivity index of each area has been calculated to produce a series of ballast water vulnerability maps indicating areas where introduced organisms are more likely than others to spread to other areas.

www.dhigroup.com



What UBA is doing at the NSBWO

Anja Kehrer & Stefanie Wieck

The German Federal Environment Agency (Umweltbundesamt, UBA) is responsible for the protection of the environment against adverse environmental factors, e.g. the potential risks caused by chemicals. Therefore the environmental risk assessment (ERA) of biocidal active substances as they are used in ballast water management systems (BWMS) is one of the duties of the agency. For a consistent level of protection for the environment as well as for the equal treatment of applicants it is necessary that the ERA of such substances is done according to the same basis of evaluation among the countries approving BWMS.

This common basis was still lacking for exposure assessment. To make sure that the results of the ERAs for different BWMS from different countries are comparable, UBA developed a guidance document for an emission scenario document (ESD) which was published as an INF-paper at MEPC 62 (MEPC 62/INF.19) and presented at the 6th Ballast Water Management Conference in London as well as the annual meeting of the NSBWO, 2011 at Newcastle University.

To make sure that all interested countries are able to comment on the conducted ERAs by other states it is furthermore crucial that all required data is available in the non-confidential part of the submissions to IMO. Therefore UBA prepares a submission regarding this topic together with the other German authorities for MEPC 63.

www.uba.de

Barnacles on Norderney

Counting moving organisms on board – quite a challenge!

Viola Liebich (NIOZ)

Viola Liebich tells about her experiences doing research on invasive species. For my PhD thesis, I studied invasive plankton species and their response to different ballast water treatment systems. The main task is to count and measure marine organisms according to IMO requirements. For that challenge I could join an on board test of a ballast water treatment system. The journey between Zeebrugge and Malmö took place in 2010 on board of the MV Toronto; a car and truck carrier, owned by Wilhelm Wilhelmsen and operated by Wallenius Wilhelmsen Lines. The ship's crew was overwhelmingly nice, they supported us whenever they could. The team started their system and the biologists took samples of the water, which was pumped inside, got treated, and discharged after a few hours. To compare the results additional control samples of untreated water were taken. I counted under a microscope the organisms which were still alive. To notice a species' movement when everything is moving around you is quite a challenge. Luckily, the vessel voyage I joined provided the data for a very successful test. It was my pleasure to join the following party at the highest deck with an amazing BBQ (and 360 Degrees ocean view!).

Thanks to T. Rajeevan (Technical Manager-BWT Wilhemsen Ships Equipment), B. Jacobs (Resource Ballast Technologies ltd (Cape Town), M. Slotwinski (Wilhelmsen Ships Equipment), the vessel crew and especially the Captain and Chief Engineer.

Assessment, approval and application

Anneke Rippen

IMARES -Institute for Marine Resources and Ecosystem Studies- is bridging the fields of environmental ecology, ecotoxicology and marine governance. It plays an important scientific role in counteracting the unwanted introduction of (invasive) species through ballast water discharge.

The institute is working with ballast water since 2006 and is experienced in application dossiers -guidance, risk assessments, modelling-, ecotoxicity testing (G9), technology development, pilot scale testing, culturing organisms -necessary for studies reaching inlet criteria-, and advanced ecosystem testing using mesocosms. IMARES is ISO 9001 certified, can work under full confidentiality and consists of an expert team of scientists, analysts and technicians.

A new land-based test facility, meeting IMO and ETV requirements, is under development and expected to be ready for a first run early 2012. The facility enables land-based testing (G8) of brackish to fresh water and consists of a 500 m^3 feed tank, a 250 m^3 test tank and a 250 m^3 control tank.

www.imares.wur.nl

The IMarEST Ballast Water Expert Group

Thomas Mackey

IMarEST hosts the Ballast Water Expert Group (BWEG). These expert, or special interest, groups (SIGs) are formed by IMarEST members sharing a common interest with the remit of sharing knowledge among group members and disseminating it to the larger IMarEST membership and the wider marine community, including via a dedicated webpage on the IMarEST website. The BWEG will have its 5th meeting immediately prior to an IMarEST BW Conference, organised by the BWEG to be held in London on February 23 and 24, 2012. Although SIGs are essentially comprised of IMarEST members, on topics such as BWM, they encourage participation by representatives from other relevant constituencies.

The NSBWO project is one of the organisations that work closely with the BWEG. Others include Lloyd's Register, ICS, EMSA, various national Administrations associated with the Ballast Water Management Convention (BWMC), and others. One of the BWEG's objectives is to disseminate information specifically about the NSBWO and to assist where possible especially in awareness-raising.

Through the expert group and its activities IMarEST has, in addition, established a strategic partnership with GloBallast, an IMO organization supporting the BWMC. IMarEST's particular focus is on enhancing awareness of the BWMC through its extensive international network.

www.imarest.org
technical@imarest.org

IMO Type Approved BWM System 2500 m3/hr capacity installed in a tanker pump room. Photo compliments of Hyde Marine

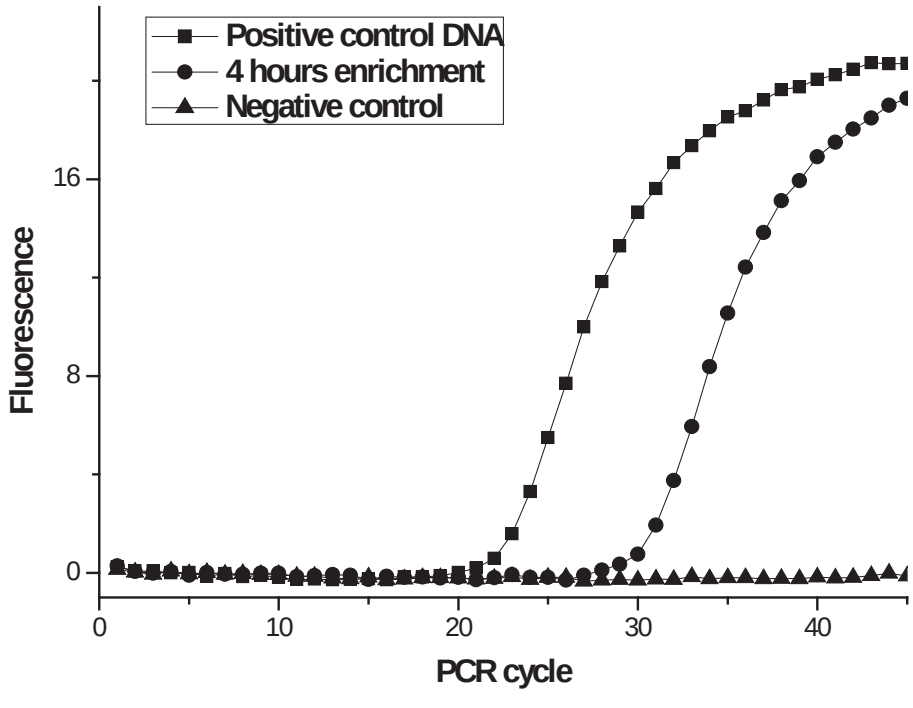
Real-time PCR detection of Vibrio cholerae in ballast water

Else-Marie Fykse

The D-2 guidelines of the BWMC state that ships are to discharge < 1 colony forming unit (CFU) per 100 ml ballast water containing toxigenic *Vibrio cholerae* (i.e. O1 and O139). Norway has acceded to the convention, which requires tools for disinfection, monitoring and testing of the ballast water for pathogenic indicator bacteria, including *V. cholerae*.

The objective of this work was to develop highly specific and sensitive molecular methods based on real-time PCR for rapid monitoring and identification of *V. cholerae* in ballast water. Ballast water, produced at the BallastTech-NIVA AS land-based test centre at Solbergstrand at the eastern coast of Norway (N 59365722, E 10391024), was spiked with *V. cholerae* cells at different concentrations per 100 ml test water and the detection level of *V. cholerae* in conjunction with high levels of heterotrophic bacteria/Vibrio spp. were examined. We show that the IMO requirements can be obtained by using the presence-absence method based on enrichment in alkaline peptone water, filtration of the enrichment broth and isolation of DNA from the filter followed by real-time PCR that specifically detect 1 CFU/100 ml toxigenic *V. cholerae* within 7 h including 4 h enrichment.

www.ffi.no



D-2 Standard

Ballast water at discharge should contain:

Less than 10 viable organisms/m^3 ≥ 50 µm and;

Less than 10 viable organisms/ml ≤ 50µm and ≥ 10 µm and;

Indicator microbes ≤ following concentrations:
- *Vibrio cholerae* <1 cfu/100 ml
- *Escherichia Coli* <250 cfu/100 ml
- *Intestinal Enterococci* <100 cfu/100 ml

Ballast water treatment - are there emerging public health concerns?

Barbara Werschkun

The German Federal Institute for Risk Assessment (BfR) evaluates risks for consumers from chemicals, articles and food. In ballast water, potential dangers may not only be lurking in the form of pathogenic microbes or toxin-producing algae, but, in the form of hazardous chemicals, may also be newly generated.

Chlorine, ozone, hydrogen peroxide are only some of the highly corrosive oxidants that are used in ballast water management systems (BWMS). Their supply, handling and storage must follow carefully designed procedures in order to protect workers from injuries through accidental exposure. Chloroform, bromoform, and other halogenated organic chemicals are unwanted by-products of chlorination or other oxidative water treatment. In drinking water, these substances are strictly limited on account of their carcinogenic and mutagenic potential. Whether their release into the environment in treated ballast water might lead to relevant human exposure, e.g. via seafood, seaside activities, or, again, ship-related workplaces, remains to be found out.

Thus BfR scientists critically observe the ongoing BWMS approvals. Desk studies have been prepared on disinfection by-products, pathways of human exposure, and the resulting overall risks. Laboratory studies were recently initiated, and the conduct of field studies is envisaged.

www.bfr.bund.de

Exemptions - the regional dimension

Jonathan Simpson

As the convention approaches entry into force many of the questions the UK administration are receiving relate to exemptions. Conversations with other administrations suggest this area is becoming increasingly important across Europe as shipowners consider how best to comply with the convention.

With the dense network of short sea routes found throughout Europe there are significant challenges for regulators in considering the suitability of individual routes for exemptions. Additionally the current economic conditions make it all the more likely that owners will seek such exemptions as they must take the decision on fitting treatment systems in a difficult investment climate. This is particularly the case for newbuildings as while few owners are committing to new tonnage at the moment many are considering the need to invest in new tonnage in the longer term.

In order to provide the clarity owners need it is vital that Europe's administrations work together to establish the criteria for exemption that protect the marine environment from the transfer of non-indigenous species but also facilitate the operation of vital short sea routes. The UK is currently working on such assessments and we look forward to sharing the results with our industry and administration partners.

www.dft.gov.uk/mca

Wadden Sea protection against unwanted guests

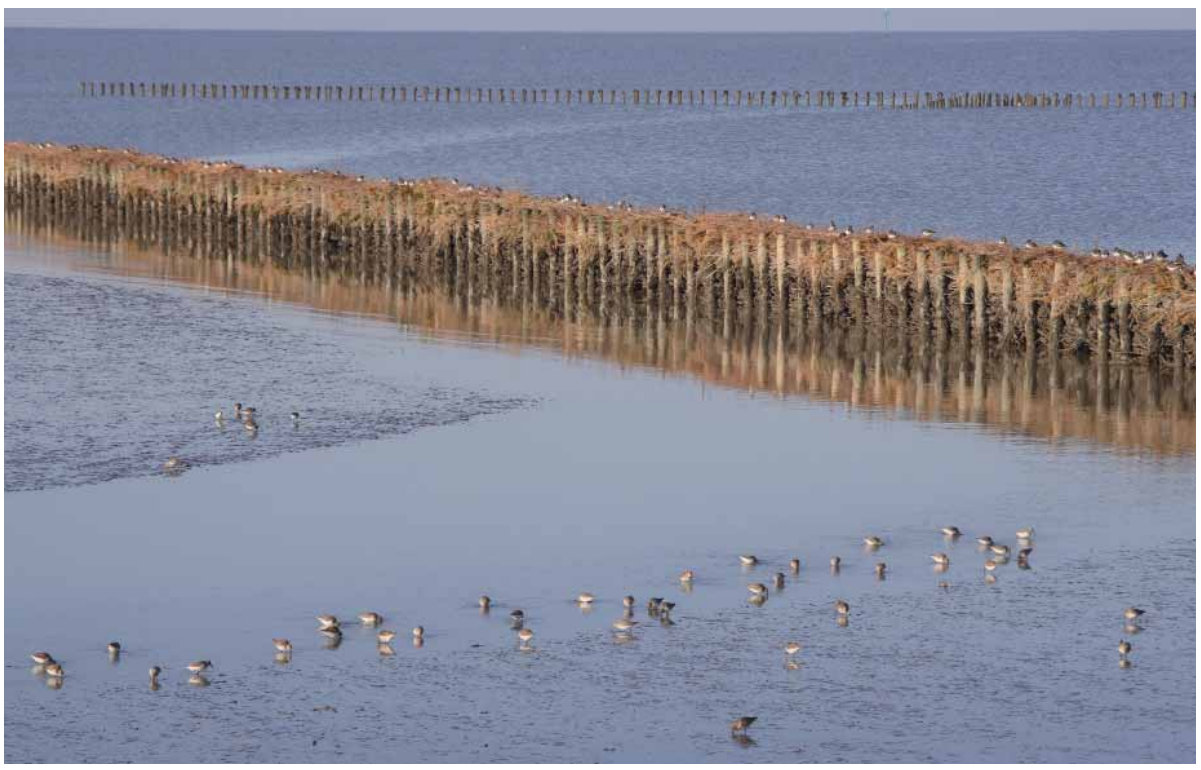
Ellen Kuipers

The Wadden Sea is one of the last major tidal areas in the world. The Wadden Sea is unique in its kind and for this reason UNESCO gave out the World Heritage status in 2009. One of the recommendations of the World Heritage Committee is to develop a monitoring program for alien species which threaten the Wadden Sea. The arrival of exotic species in the Wadden Sea may lead to a reduction of biodiversity, with negative environmental and economic consequences.

The Waddenvereniging has been working for over 45 years to the preservation, restoration and proper management of this unique area. We appreciate to work on our goals with other organizations.

For the Waddenvereniging the NSBWO project is a great platform to work with scientists, policymakers, port authorities, shipping companies and industry on a coherent, innovative and feasible policy for treating the ballast water of ships. This reduces the risk of introduction of unwanted species in the Wadden Sea. The Waddenvereniging wishes that her knowledge and network in this project contributes to a sustainable future for the Wadden Sea where nature and economy go hand in hand.

www.waddenvereniging.nl



Hurdles in Ballast Water Management

Niels van de Minkelis

The Royal Association of Netherlands Shipowners (KVNR) and its membership are making every effort to achieve further significant improvements to the shipping industry's environmental performance. The Ballast Water Management Convention is therefore wholeheartedly supported.

However, meeting the requirements of the BWMC isn't a straight forward job for each Dutch shipowner.

In this respect the KVNR is assisting its members in several ways.

For specific types of ships there are technical and operational concerns regarding the availability of suitable ballast water management systems.

For example the semi-submersible ships take in and discharge large capacities of ballast water in a relatively short period of time.

None of the ballast water management systems currently available can handle these high flow rates and large capacities.

Another example are the seagoing barges which are unmanned during the voyage and which do not have machinery spaces which are suitable for the installation of a ballast water management system. These concerns have also recently been addressed to the IMO in order to gain awareness and support. Meanwhile new concepts are jointly being explored by the shipowners and KVNR.

On the other hand are some shipowners and the KVNR currently exploring the possibilities for exemptions for ships operating exclusively between specified ports in the North Sea. The OSPAR states in the North Sea bio-region are currently formalizing the procedure for the issuance of exemptions. As per guideline G7 of the convention it should however be ensured that the risks involved are acceptable by conducting scientifically robust risk assessments. The shipowners and KVNR are therefore in close contact with the OSPAR states in order to have a clear view on what is expected from each stakeholder.

All in all there are several different hurdles to be taken in order to be ready for the date of enforcement of the convention.

www.kvnr.nl

Risk Index Model for Ballast Water Exchange

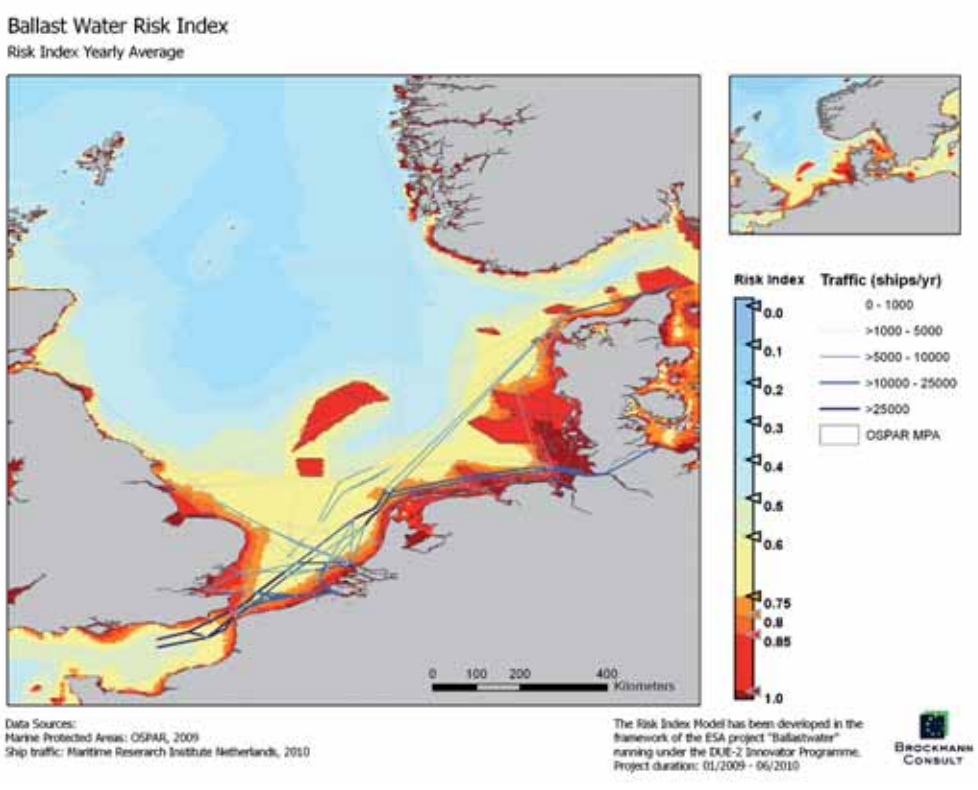
Kerstin Stelzer

Alternative for BW treatment is BW exchange. A Risk Index for ballast water exchange has been developed within the ESA Innovator II Project "BallastWater" and further adjusted during the Interreg NSBWO project. Risk means the risk that an invasive species, which is released by ballast water exchange at a certain location, survives and potentially causes damage to the ecosystem. The model for the risk index follows the recommendations expressed in the BWMC for ballast water exchange and combines a number of different input information including satellite earth observation data. For certain situations high or low risk is assumed, e.g.:

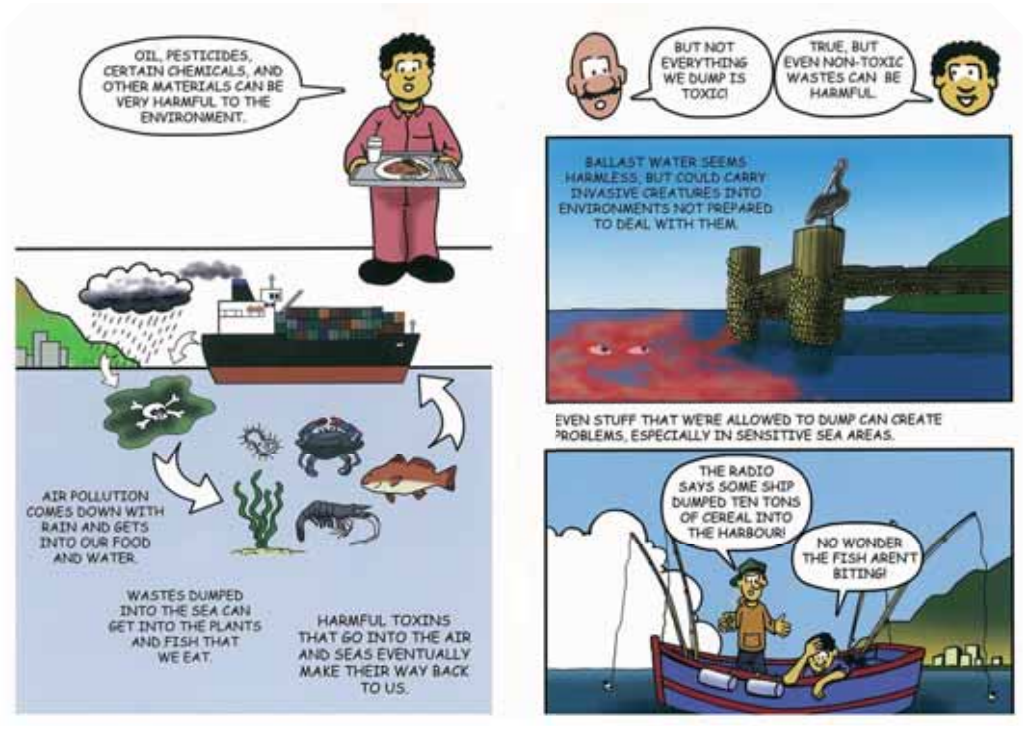
- high risk is assumed for high chlorophyll concentration,
- low risk is assumed for clear water (high transparency values),
- high risk is assumed near the coast and at low water depths,
- high risk is assumed for currents that potentially transport the ballast water to the coast or towards protected areas and
- high risk is assumed if the temperature and salinity at the source of the ballast water is similar to the situation where the ballast water shall be exchanged.

On this basis, averaged yearly and seasonal risk indices were calculated indicating regions with constant high or low risk and regions where the risk is rather variable.

www.brockmann-consult.de



Average Risk Index on a basis of yearly risk index maps; Risk Index = 1 is indicating high potential risk for invasive species. The blue lines are showing the main shipping routes



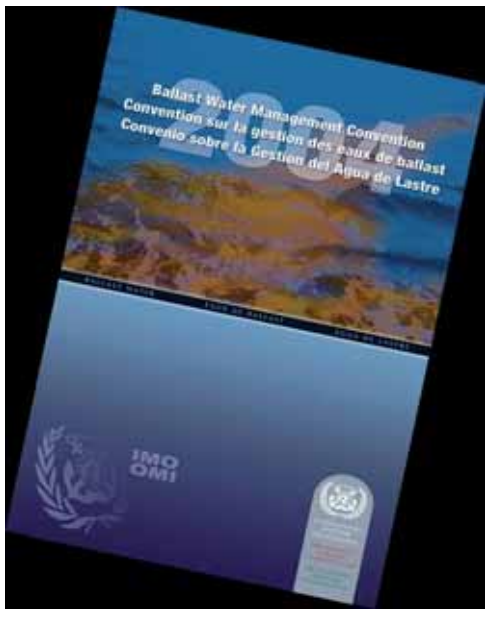
American Steamship Owners Mutual Protection & Idemnity Association, INC.

Shipowners, be prepared!

Dick Brus

The Netherlands has ratified the Ballast Water Management Convention in April 2010. The IMO Secretariat expects that enough ratifications will come in soon, and that the Convention will enter into force in 2012 or 2013. Regulations will enter into force retroactive. For example, regulations for ships constructed in 2011 or 2012 will retroactive become mandatory once the Convention enters into force in 2013! So be prepared, and begin to plan your ballast water management and control requirements in time!

www.rijksoverheid.nl/ministeries/ienm



North Sea Ballast Water Opportunity project partners

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CATO
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NFV
Newcastle University
NIOZ
OVIZIO Imaging Systems
WMU World Maritime University
zebra bioscience

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