

# THE NORTH SEA BALLAST WATER OPPORTUNITY PROJECT NEWSLETTER

2012/3



NORTH SEA BALLAST WATER

## Introduction

This period saw a specialist workshop on BWM science, a progressively built NORSAS web site, accompanied by press reports (press message included in this newsletter) and further involvement of the sector in our activities in view of dissemination. The project as a whole has been presented at yet another maritime fair conference.



## In this newsletter

- ◆ Workshop in Duluth
- ◆ Fresh water tests at NIOZ
- ◆ Organism detection technologies
- ◆ 180 species in NorSAS database
- ◆ Transparency and Trust

## WP1: Co-ordination

The main issue in this quarter was the drafting of the report for the 7th period of the project by partners and sub-partners. Some sub-partners also had to report on their activities in P6 if they hadn't done so before. Jan Boon worked on a draft annex on transparency for the upcoming meeting of GloBal TestNet, the global group of test facilities for land-based and shipboard testing of ballast water treatment systems. A travel

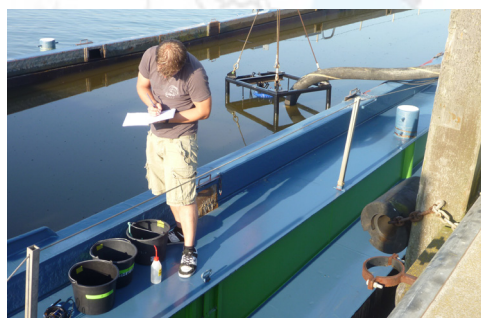
allowance outside the eligible area was given to Louis Peperzak, Stephan Gollasch, Klaas Kaag as organisers and participants in a workshop at the Northeast-Midwest Institute (NEMWI) in Duluth, Minnesota, USA, on the importance of different groups of organisms all smaller than 10 µm (algae, bacteria, Archaea, viruses), and the corresponding counting methods. This workshop was jointly organised by Dr Allegra Cangelosi, president of the NEMWI, and NSBWO

partners Dr Louis Peperzak and Dr Stephan Gollasch. NEMWI also has a large and well-established land-based test facility for freshwater on the border of Lake Superior, and therefore it has been a great opportunity for the NSBWO partner facilities to get more acquainted with its design and possibilities. Finally, the minutes of the Steering Group meeting of the project at the annual meeting in May were finalised and put on the NSBWO website.

## WP 3: Science - Testing

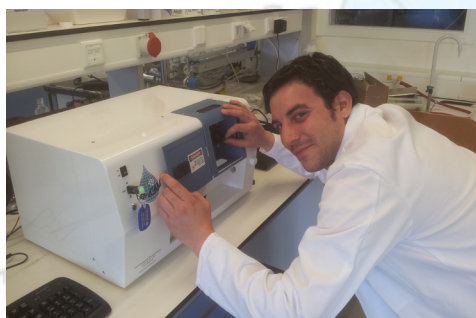
In July the feasibility of an important extension to the NIOZ facility, the testing of freshwater in addition to brackish and salt water, was examined. The test water, was shipped from Den Helder (future IMARES test site) to the NIOZ harbour. Using a special pump and flexible hoses the test water was pumped into the NIOZ piping system (Figure 1). Both IMARES and NIOZ took samples during the whole process to study survival of aquatic organisms. The test proved successful, meaning that ballast water treatment systems can be tested at NIOZ in fresh water as well.

While FDA and ATP techniques for Compliance Monitoring and



Enforcement are being developed at NIOZ, a relatively new technique was examined by Spanish Ph. D. student Leonardo Martinez Romero (Figure 2). The FlowCAM is a combination of flow cytometry and microscopy. Together with Cees van Slooten and Astrid Hoogstraten the applicability of the FlowCAM for counting viable phytoplankton of 10-50 µm was tested on a lab-scale using UV and chlorine. A specific FlowCam, the BallastCam, was also tested. Preliminary results indicate that a specific set of data-filters is needed to correctly identify and enumerate the required organisms. Further testing of both instruments is in progress.

With Dr Judith van Bleijswijk (NIOZ



Molecular Biology Laboratory) ballast water test samples will be examined by 454 Roche Titanium FLX genome sequencing in order to find out which organisms, that cannot be identified easily by existing methods, survive specific ballast water treatments. As a first step, a DNA isolation technique has been optimised.

In reporting for G8 type approval a novel multivariate statistical technique, non-metric multidimensional scaling with a non-metric ANOVA, has been introduced to test the null-hypothesis that there is no difference in species abundances between treated and control samples on the day of discharge.

**Figure 1: Dennis Mosk sampling fresh water on shipboard. The special pump and hose are to the right.**

**Figure 2: Student Leonardo Martinez Romero at work with the FlowCam.**

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### WP4: Science-Detection

Work in WP4 remains focused on organism detection technologies. BWO sub-partner Ovizio was visited for an on-site demonstration of their laser operated digital holographic microscopy system which works with much greater performance and precision compared to traditional light microscopes. In on-board experiment on a container vessel the flow camera of FluidImaging was tested. The instrument takes photographs of objects in water. Both instruments allow a precise size measurement of the objects identified which is needed

to proof compliance with the IMO D-2 Ballast Water Performance Standard. However, both systems cannot identify the viability of organisms which is essential for compliance testing and for G8 type approval testing. Another activity was to organize a BWO workshop to address organisms below 10 micron in minimum dimension. This was jointly arranged by BWO with the Northeast Midwest Institute and the Great Ships Initiative in USA. The workshop was held in September 2012 in Duluth. The workshop attendees concluded that many of the potentially harmful species fall into the size

category below 10 micron in minimum dimension, but they are currently not addressed by the IMO D-2 standard. Prior to a possible renegotiation of this standard it is recommended to undertake comprehensive tests of technologies so that organism detection in this size class is enabled, which is essential for compliance checks. It was further noted during the workshop that, although the D-2 standard may be met by ballast water treatment systems, there may still be living organisms below 10 micron in minimum dimension in the ballast water.

### WP 5: Strategies

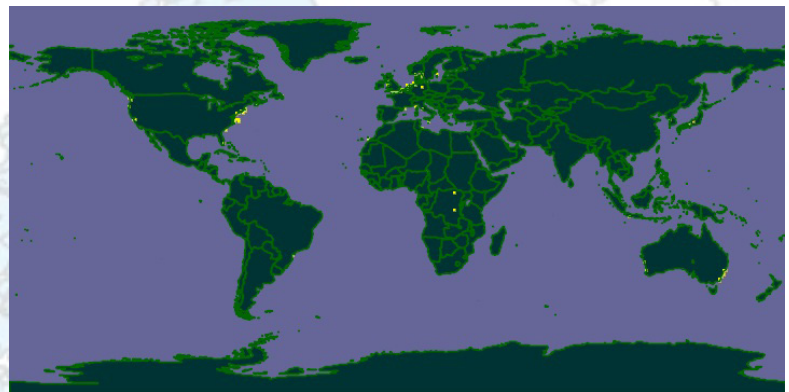
The North Sea Alien Species database, NorSAS ([www.norsas.eu](http://www.norsas.eu)) has now been updated with additional species entries. At present the database contains about 180 species. Among them, the species descriptions are available for about 100 species. The remaining species have got information about their taxonomy along with a GBIF (Global Biodiversity Information Facility) world distribution map. The detailed descriptions of these species will be added in the coming months.

The connectivity probability maps for the North Sea region have now been completed. The detailed report on this is being prepared by DHI-Denmark, which will soon be distributed to partners for comments.

Lectures on Ballast Water Management

issues and problems related to Invasive species are delivered in the Masters program at WMU. A Professional Development Course on Ballast Water Management was also conducted which involved about 20 participants from 11 countries.

We have also been involved in the development of a new project on Ballast Water Management in the Mediterranean region titled "Harmonization of the Ship's Ballast Water management: Aliens species



**GBIF world distribution map for species**

control and marine LIFE protection in the Mediterranean Sea (ALIFE)." The proposal is about to be submitted. This can be seen as an example of a project on regional cohesion that may learn and draw from the NSBWO project.

### WP 6: Dissemination

As this year is marked by a focus on promoting transparency – on all aspects of ballast water management – from the project context, we stepped up our efforts to drawing attention to the relationship between transparency and trust in ballast water management. The issue was highlighted in in a document to IMO-MEPC, submitted, in joint preparation, by sub partner IUCN. The dissemination team continued to meet to further develop and fine-tune strategies and activities, while also focusing on project dynamics and dissemination challenges within the project. ProSea continuously builds

on to the target group inventory. We also set out to initiate a network on transparency with the sector, with an exchange of ideas on transparency between several shipping umbrella's and IUCN in light of MEOC submissions as a first action.

We also focused on preparatory talks on the NSBWO Europort 2013 Conference and on possible ways to transfer the concept of NWBSO-Europort 2011 to other maritime events, notably Europort 2013-Istanbul. Although the latter initially received support from both the Turkish government and form

GloBallast (Turkey is a GloBallast lead-country), it proved not possible to materialise.

In September we presented the project at the ballast-water session of the Clean-Shipping Conference held in conjunction with the SMM maritime fair (Hamburg, 5&6 September).

Shipping-marine environment student Ruurd van der Meer published two wider audience articles on his BW risk approaches a cross-section study between the needs of shipping and the potential of science in this matter.