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Project

BALMAS newsletter



Foreword

Dear reader,

we welcome you to have a look at the 3rd BALMAS project Newsletter! BALMAS project partnership is reaching last part of BALMAS project duration. During 5th BALMAS project meeting in Venice at beginning of November 2015 partners will present important outputs and results which will serve to meet BALMAS project objectives. During 5th BALMAS project meeting BALMAS project partners will have 2nd meeting with members of BALMAS Reference Users and Advisory Group (RUAG). RUAG consist with external experts from wider European and overseas area, representing the stakeholders, users and agencies to provide advice and guidance on project orientation till end of BALMAS project. BALMAS partners are glad to discuss with RUAG members!

In this BALMAS Newsletter you may find some important information about achievements of BALMAS project: ballast water sam-

pling on ships, port baseline surveys, Meiofauna Network, how people from local communities can help to detect the introduction of exotic species, legal and policy aspects of ballast water management in the Adriatic Sea, meetings with stakeholders in Croatia, Albania and Montenegro.

Some outputs and results of BALMAS project are already available on the BALMAS project website (www.balmas.eu) on the Knowledge Centre. Thus, readers are welcome to visit the BALMAS project website to follow our achievements and future work.

Wish you a pleasant reading of the 3rd BALMAS Newsletter!

Leon Gosar

BALMAS project Coordinator for the Lead Partner, the Institute for water of the Republic of Slovenia



Port of Koper Container terminal.

Photo: V. Bernetič

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Port of Koper Container terminal.

Photo: V. Bernetič

Ballast Waters Sampling in Italian ports

“two sampling methods were adopted: the in-tank sampling (D-1 standard and D-2 indicative and detailed sampling) and the in-line sampling (D-2 detailed in-line sampling)”

The problem of ballast water represents a prominent vector for the transfer of Harmful Aquatic Organisms and Pathogens (HAOP) across natural barriers. For this purpose OGS (National Institute of Oceanography and Experimental Geophysics) team of researchers has conducted the practical 'ballast water sampling and analysis' in the framework of the Strategic Project BALMAS. From April to June 2015, the sampling activity was performed in the port of Trieste on 10 ships (among Ro-Ro, Cargo and Oil-Tankers) coming from the Mediterranean Sea and the Black Sea. The first ballast water sampling (BWS), performed as a 'test sampling and analysis', was conducted the 23rd of April on the oil-tanker Gemini Sun, a Russian flag ship coming from the Black Sea (more on balmas.eu). The Italian partners of ISPRA (Italian National Institute for Environmental Protection and Research) with Erika Magaletti, Andrea Tornambè and Stefano Di Muccio, the

CNR-ISMAR (Institute of Marine Science) from Ancona with Elisa Baldrighi and the CNR-ISMAR from Venice with Mauro Bastianini and Francesca Garaventa together with the Italian Coast Guard Headquarters represented by Saverio Macchia, took place to the practical demonstration in order to test the equipment as indicated by Matej David present aboard. During all samplings held in Trieste, two sampling methods were adopted: the in-tank sampling (D-1 standard and D-2 indicative and detailed sampling) and the in-line sampling (D-2 detailed in-line sampling). The analyses were immediately carried out in the laboratory of the OGS Institute in Trieste. The OGS team of researcher and technicians have carried on doing the BWS (Ballast Waters Sampling) from 26th of May to 30th June on the following ships: U.N. RO Isletmeleria S., Ulusoy-15 and Ulusoy-14, Turkish flag ships coming from the Mediterranean. According to the protocol, the in-tank sampling consisted of temperature and salinity measurements conducted by means of conductivity meters, whereas the indicative analysis also performed in-tank, was conducted using a fluorometer.

Samples were collected via manhole using plankton nets; different amounts of seawater were sampled for the detailed analyses of the zooplankton, pathogens and phytoplankton. In the home laboratory, microalgae in the size range between 10 and 50 μm were first stained with FDA (Fluorescein diacetate) in order to detect cells viability and then counted in the Sedgewick-Rafter chamber under the epifluorescence microscope and using the blue light. Zooplankton was counted under the stereomicroscope (magnification 25-32x) whereas analyses of pathogens were performed for *Escherichia coli*, Enterococci and *Vibrio cholera*. OGS team is involved in BWS in all the four selected Italian ports. Now BWS is going on both in the port of Venice in collaboration with CNR-ISMAR and in the port of Bari in collaboration with ISPRA. In September the OGS team will proceed the BWS in the port of Ancona.



OGS and CNR-ISMAR team in the port of Venice.

Photo: Mauro Bastianini

Marina Cabrini, Bruno Cataletto and Elena Di Poi

National Institute of Oceanography and Experimental Geophysics (OGS), Italy

'Meiofauna Network' in the project BALMAS: giving a voice to small critters

What is the meiofauna? The term 'meiobenthos' (i.e. meiofauna) was originally used to describe benthic metazoans that can be distinguished from macrobenthos by their small size. The size boundaries of meiofauna are arbitrarily defined, based on the standardised mesh width of sieves with 500 µm (or 1000 µm) as upper and 32 µm as widely applied lower limit. Meiobenthic organisms are mostly found in and on soft sediments, but also on and among epilithic plants and other hard substrates (e.g., animal tubes). In the benthic domain, meiofaunal organisms represent the most abundant and diverse metazoans' component (Fig. 1).

What is the ecological role of meiofauna? Meiofauna represent the link between organic detritus and higher trophic levels. Most organisms are, in fact, deposit feeders, but numerous are also diatom grazer or bacterivores. On the other hand, this community represents an important food source for macrobenthos. Due to their high sensitivity to environmental perturbations, to the great number of individuals, to the lack of larval dispersion and to their short biological cycles, meiofauna provide rapid responses to environmental changes. For its peculiarities this community has proved to be an extremely useful tool for investigating the environmental effects of anthropogenic disturbance and, consequently, for the assessment of the marine ecological status in a given area. Among meiofaunal groups, nematodes are by far the most informative taxon because they often represent the dominant fraction of meiofauna. As a consequence, one of the main umbrella regulations for water systems – the Water Framework Directive (WFD, 2000/60/ EC)- allocates this group among the suitable indicators for the assessment of the ecological quality of marine ecosystems. Recently, nematode communities have been suggested to have an impact on *Vibrio* occurrence in the sediment compartment most probably linked to their grazing activity. The magnitude of this impact depends on the proportion of actively feeding bacterivores within the community.

The PBS and the meiofauna. One of the objectives of the BALMAS project is the realisation of port baseline surveys (PBS) in the 12 biggest ports along the Adriatic Sea coasts: Bari, Ancona, Venice, and Trieste (Italy); Koper (Slovenia); Pula, Rijeka, Šibenik, Split and



Fig. 1: Meiofauna comprise many different taxa: Nematoda, Copepoda with their nauplii, Polychaeta, Oligochaeta, Mollusca, Gastropoda, Tardigrada, Loricifera, Turbellaria, Gastrotricha, Ostracoda, Kinorhyncha, Cumacea, Amphipoda, Isopoda, Tanaisiacea and Acarina.
Picture by O. Giere, 2009

Ploče (Croatia); Bar (Montenegro); and Durrës (Albania). PBSs consist of the sampling of hard substrate organisms, soft bottom benthos, plankton and mobile epifauna to develop an overview of both native and non-indigenous species inhabiting the mentioned-above ports. The assessment of meiofauna population is part of the baseline port monitoring as an 'optional' parameter, since at present it is not possible to define which are 'alien meiobenthic species'.

Small but strong! Even if meiobenthic animals lack a pelagic larval stage in their life cycle, some researchers have reported that ballast tanks can be a 'home' for an assemblage of viable and reproducing meiobenthic organisms. They apparently use cisterns as a regular habitat, which, at the same time, serves as a depository of individuals/species physiologically and ontogenetically ready to colonise suitable sedimentary environments. Nematodes proved to be the most constant and numerous component of such assemblages. Survival of meiofauna in the

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"this community has proved to be an extremely useful tool for investigating the environmental effects of anthropogenic disturbance and, consequently, for the assessment of the marine ecological status"

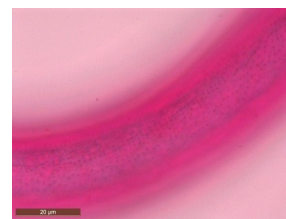


Fig. 3: Cuticle detail of Parachromadorita from Trieste port.

... 'Meiofauna Network' in the project BALMAS: giving a voice to small critters

(Continued from page 3)

ballast-tank sediment residues may underlie the successful colonisation of new habitats by potentially invasive meiofaunal species. This has implications for the zoogeography of meiobenthic taxa and for their role as non-indigenous invasive species. However, despite of the detailed knowledge about macrobenthos in numerous localities, no all-taxa inventory of meiofauna has ever been attempted in a given area.

Why a Meiofauna Network in BALMAS? With the above premises, the BALMAS project offers a good occasion to challenge the idea of an active meiofauna (and “meiofaunologists”!) network, to encourage the meiofauna sampling from different Adriatic ports and to put efforts on meiobenthic analyses and target taxa identification (e.g. nematodes).

Thanks to the collaboration of some colleagues from the different Institutes involved, we collected meiofauna samples from 10 (Trieste, Venezia, Ancona, Bari, Koper, Split, Durres, Bar, Pula and Rijeka) of the 12 ports selected in the project.

Between June 15th and 18th, Dr. Elisa Baldrighi had the pleasure to spend some time at the OGS in Trieste to work hard with Dr. Annalisa Franzo on the identification of nematodes sampled in the Trieste port (Fig. 2). The most practical method to describe nematode genera and species is based on the use of the light microscope and pictorial keys proposed by Platt and Warwick (1983, 1988) and Warwick et al. (1998), and recent literature on the description of new genera and species. In order to identify nematodes to the genus and species level, some aspects should be considered: type of cuticle (Fig.3), shape of the buccal cavity (Fig.4, 5), tail (Fig. 6) and amphid shape, number and position of cephalic sensilla on the head. All these body features can give important functional information such as their feeding habits and ways of living, leading to a better evaluation of the environmental status of the surrounding environment.

This first and very productive experience of knowledge exchange at OGS would be the first attempt to realize an efficient network of young and expert “meiobenthologists” across the Adriatic Sea.



Fig. 2

Fig. 2: Dr. Elisa Baldrighi and Dr. Annalisa Franzo during the knowledge exchange at OGS.

Photo: Simona D'Antoni

Ambitiously, the OBJECTIVES of the network will be:

- 1) to assess the meiofauna populations (i.e. distribution and diversity) from different ports and environmental conditions;
- 2) to up-date the genera/species list(s) of target functional groups (e.g. Nematoda) inhabiting coastal impacted areas of the Adriatic Sea;
- 3) to use the meiofauna, and in particular nematodes, as potential tool for the Environmental Quality Assessment (e.g. changes in the structural and functional diversity of meiobenthic and nematodes population compared to previous data).

Elisa Baldrighi, CNR-ISMAR Ancona, Italy, Annalisa Franzo, OGS Trieste, Italy



Fig. 4: Mouth structure of the predator *Sphaerolaimus*.



Fig. 5: Mouth structure of the epistrate feeders *Parachromadorita*.



Fig. 6: Body and tail shape of *Metacomesoma sp1*. The pink colour of nematodes is due to the use of a colorant, named *Rose Bengal*, to better identify the organism and the morphological structures.

Figs. 3-6: Photos by A. Franzo

Local Ecological Knowledge (LEK): people from local communities can help to detect the introduction of exotic species

“LEK has emerged as an alternative information source on species presence or qualitative and quantitative indices of species abundance”

Empirical evidences indicate that conspicuous pest species are rarely first detected by scientists, but more often by fisherman, marine farmers, dive clubs and local communities for sea recreational activities. The BALMAS project is now involving local com-

given by Azzurro et al. (2011) and Boughedir et al. (2015) and around the chief question: “have you seen a new species never seen before”?

Interviews can be performed to fishermen at the ports but information will concern also surrounding areas. It is important to involve local people in monitoring programmes because they are everywhere and all the time and they can provide the earliest detection. Results will allow to gather information that otherwise cannot be obtained and this is expected to generate synergies with aware-



Photo 1



Photo 2

Photos 1-2 : Pictures of the Bari (Molfetta) meeting organized by Dr. Ernesto Azzurro with sportive fishermen under the collaboration of Lega Navale Italiana Sezione di Molfetta.

Photo: Michele de Gioia



Photo 3: Renato Del Castello (left), the President of FIPSAS (Federazione Italiana Pesca Sportiva ed Attività Subacquea) – Sezione Provinciale of Trieste, gives to dr. Fabio Grati (CNR-ISMAR, Ancona) a crest as a souvenir of the meeting in Trieste.

Photo: Camilla Croci

munities, especially professional and sportive fishermen in the process of data collection. This participatory approach, often indicated as ‘Local Ecological Knowledge’ (LEK), is being used to both: track the potential introduction of exotic species and to generate awareness among the stakeholders. In the last decades, LEK has emerged as an alternative information source on species presence or qualitative and quantitative indices of species abundance. It can be defined as the information that a group of people have about local ecosystems. We usually rely on knowledge gained by individuals over their lifetimes, and not what information has been handed down through the generations. Based on previous experiences made at the transnational Mediterranean level by the “Mediterranean Science Commission” (CIESM), researchers of ISPRA and CNR are performing interviews with local communities, here represented mostly by fishermen but also divers and other ‘sea users’. Semi-structured questionnaire have been conceived according to the approach

ness initiatives and with the structure of early warning system.

In the framework of the project BALMAS, in June-July 2015 interviews were made with fishermen at the ports of Bari (16 interviews and 13 questionnaires), Ancona (7



Photo 4

interviews), Chioggia (12 interviews), Trieste (20 questionnaires) and surrounding
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... Local Ecological Knowledge (LEK): people from local communities can help to detect the introduction of exotic species

“Local Ecological Knowledge’ (LEK), is being used to both: track the potential introduction of exotic species and to generate awareness among the stakeholders”

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areas. Two meetings with sportive fishermen were organized in Bari (Molfetta) (Photos 1-2) and Trieste (Photos 3-5). Preliminary data are being processed and an online questionnaire (link: <http://goo.gl/forms/5V7R1zx6Fm>) has been developed to be widely shared within the network of sportive fishermen.

Next steps will be to translate the questionnaires in eastern Adriatic languages and involve colleagues in this activity.



*Photo 5: Meeting at Trieste.
Photo: Camilla Croci*

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Ernesto Azzurro

Italian National Institute for Environmental Protection and Research (ISPRA), Italy

Focusing on the legal and policy aspects of ballast water management in the Adriatic Sea

The global standards of the 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediments (so-called the "BWM Convention") are an essential element of the background to the BALMAS Project. Pending the entry into force of the Convention, the need to address the harmful consequences - both for environments and economies - of the release into marine waters of species and organisms carried through ships' ballast has led to a number of legal and policy developments. Several maritime States (i.e. US, Australia, etc.) have established ballast water discharge requirements for ships entering their ports or in their territorial sea. As far as European marine regions are concerned, both for the Baltic Sea and for the North Sea States put in place an extensive co-operation on the subject, sharing a common understanding of the problem and developing action plans, guidelines as well as specific practical tools. In the Mediterranean Sea region, States parties to the Barcelona Convention for the protection of its marine and coastal environments have approved a Regional strategy on ballast water management and have agreed harmonized arrangements for conduct-

ing ballast water exchange, that are now recommended to international shipping entering the basin.

Taking into account these developments, the BALMAS Project aims at facilitating the implementation of the Convention global obligations while addressing the peculiarities of the Adriatic Sea, one of the Mediterranean most vulnerable areas combining extremely high volumes of maritime traffic with sensitive environmental resources. Up to now, three bordering Countries already have ratified the Convention (Albania, Croatia and Montenegro) and Italy and Slovenia are in their paths. From a policy perspective, once the Convention will enter into force States will have to address a quite complex range of issues related to its actual effectiveness, including administrative and technical challenges. From a public sector perspective, the new legal regime involves in the front line both maritime and port authorities; at the same time environmental assessments and knowledge are an essential component of the implementation work, including related compliance and enforcement measures. A significant effort in terms of capacity development and training,

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“ three bordering Countries already have ratified the Convention (Albania, Croatia and Montenegro) and Italy and Slovenia are in their paths”

BOX 1 - BALMAS Stakeholders Contact List Entities interested in the BWM system implementation in the Adriatic Sea

Public authorities and bodies



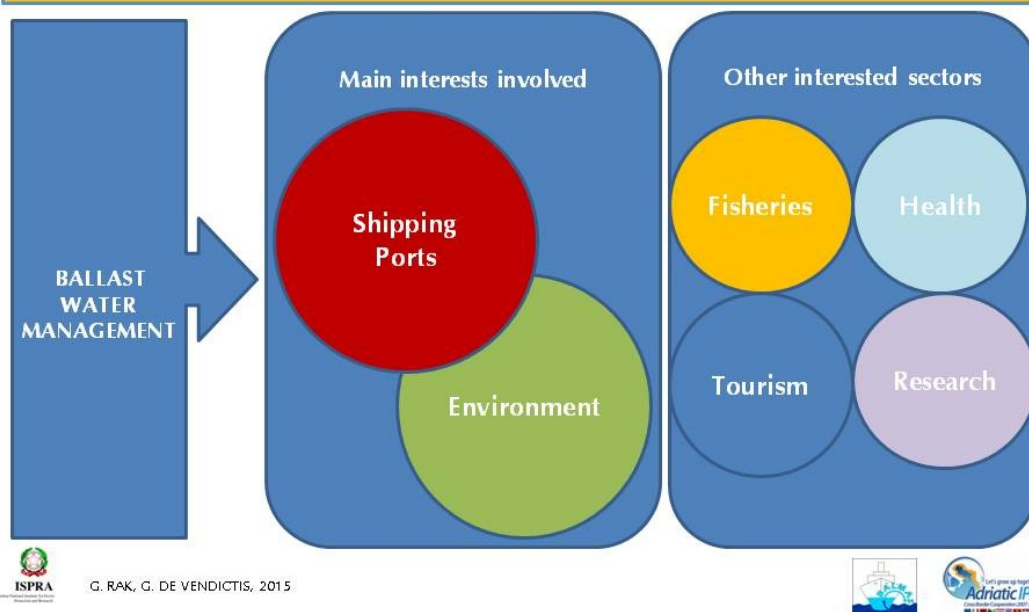
Other stakeholders



... Focusing on the legal and policy aspects of ballast water management in the Adriatic Sea

BOX 2 - Scheme of interests involved in the BWM implementation in the Adriatic Sea

The consideration of possible interactions between the shipping sector and other sectors, both in terms of policies and legal instruments, can support the 2004 BWM Convention implementation, also avoiding unnecessary conflicts between sea uses. Ports functioning, environmental standards and programmes, health procedures, research and technology advancements, fisheries and tourism interests can contribute, where appropriate, to a consistent implementation of the global standards in the Adriatic Sea



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technical skills and equipment, control procedures, monitoring activities and programs, is therefore needed.

Moreover, together with the environment, other public interests may be impaired by organisms and pathogens carried by ships' ballasts (i.e. fishery, aquaculture, health, tourism, etc.), all of them being particularly relevant for Countries bordering the Adriatic. In general terms, the proximity of Adriatic coasts as well as the high volume of intra-basin maritime traffic increases mutual effects of unilateral policy choices and urges Countries to a consistent and balanced implementation of global standards (not only) on ballast water management.

Furthermore, it is worth noting that in the EU the coexistence of many important maritime economies to be sustainably developed and their relations with marine environment protection are currently addressed by different legal instruments (e.g. the maritime spatial planning and the marine strategy framework directives). Indeed, standards for the prevention of shipping derived pollution may benefit from the implementation of other environmental instruments thus avoiding duplication of efforts e.g. environmental monitoring ac-

cording to the EU Marine Strategy Framework Directive could operatively support the implementation of ballast water global obligations.

Along these considerations, the Work Package n. 9 of the BALMAS Project, lead by the Italian National Institute for Environmental Protection and Research (ISPRA), deals with the legal and policy implications of the Ballast Water Management Convention implementation. Work Package n. 9 (WP9) aims at drafting a BWM Strategy for the Adriatic region, including key elements to address the long-term regional implementation of the BWM system developed by the project. To this end, international, European, regional and national legal and policy relevant instruments and stakeholders are reviewed in order to identify opportunities and constrains for a long-term implementation of BWM Plan and related measures and options in the Adriatic area.

Main WP9 outputs will be available starting from the end of 2015. The WP9 work methodology has been shared during project meetings. In December 2014 ISPRA circulated a questionnaire aimed at gathering

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“national legal and policy relevant instruments and stakeholders are reviewed in order to identify opportunities and constrains for a long-term implementation of BWM”

... Focusing on the legal and policy aspects of ballast water management in the Adriatic Sea

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national information on legislative, administrative, institutional and financial sustainability issues. This work featured a general overview of the institutional framework relevant for the BWM in the Adriatic Sea bordering Countries, with a view of facilitating a consistent approach among them. The assessment involved the identification of national stakeholders that could be potentially relevant for the implementation of the BWM International Convention as well as of those authorities and bodies that might be more directly affected by the harmful consequences of ballast water discharges. In this perspective, a list of about 240 authorities and other stakeholders was delivered as a project output (for further details see BOX 1 and 2). The list includes authorities, public bodies

entrusted with institutional functions in the field of ballast water management or marine environmental protection as well as other stakeholders active in sectors potentially relevant for the implementation of ballast water obligations (e.g. environmental protection, research, fishery, tourism, health protection). A further output will be an annotated list of international, EU and national legislation - to be circulated in autumn 2015 - followed by a Final legal and policy report including relevant recommendations.

Giulietta Rak and Giordana De Vendictis

Italian National institute for Environmental Protection and Research (ISPRA), Italy

Meeting with Albanian stakeholders on the World Environment Day

The meeting where BALMAS project was presented to stakeholders was held in Cultural Palace of Durrës, on 5th of June 2015. Albania is included for the first time in a project dealing with ballast water. The project addresses a very important topic for Albania, ballast water management for ships that are anchored and/or moored mainly in the port of Durres and which are consequently polluting the Adriatic Sea. Albania has six coastal ports, where the main port of Albania is Durres port. The port of Durres is exposed to pollution that comes from ballast water originating from different countries of the world. The ballast waters released in the port of Durres are of special interest within the BALMAS project, as Durres is located close to the entrance of the Adriatic Sea. Ballast waters of ships coming from different countries of the world can also contain loads of pollution, invasive fish species etc. By analyzing samples of ballast water taken from ships attending in the port of Durres in the Laboratory of Aquaculture and Fisheries the impact on human health will be assessed. The aim of this project is to analyze ballast waters released in Adriatic Sea (area of the basin of the Port of Durres) and to integrate the results with the previous knowledge about pollution in the Adriatic Sea. The conclusions must be taken in cooperation with port authorities such as the Maritime General Directorate and the Ministry of Environment to minimize this phenomenon and to enforce legal measures

and awareness.

The monitoring in the basin of the port of Durres started in June 2014 and the staff from the Agricultural University of Tirana (Aquaculture & Fishery Laboratory), University of Dubrovnik and Institute of Oceanography in Split was involved. The second sampling was performed in October 2014 in the Port of Durres and also in the Port of Tivat.

Other past activities in the framework of the project BALMAS were presented at the meeting, like publications in newspapers (Tema), meeting with the Vice President of the Municipality of Durres, meeting with the Coordinator

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“The monitoring in the basin of the port of Durres started in June 2014”



BALMAS project was presented to stakeholders was held in Cultural Palace of Durrës.

Photo: Krist Kollitari

... Meeting with Albanian stakeholders on the World Environment Day



BALMAS meeting, Durres 24.03-26.03. 2015, organized by Institute for Water of Republic of Slovenia and hosted by Agricultural University of Tirana.

Photo: Orges Cara



Participants at BALMAS meeting, Durres.

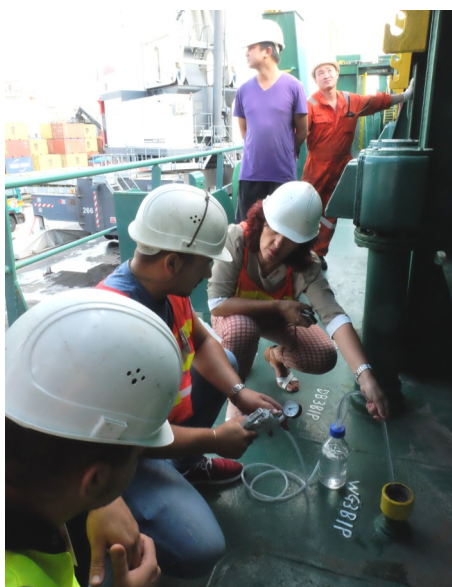
Photo: Orges Cara

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of the IPA Project in the Durres Port Authority, meeting with students of the Agricultural University of Tirana and the Association "Eco-Mobility". A special emphasis was put on the meeting organized in Albania from 22nd to 24th of March 2015. In addition to the participation of 80 members of the staff of BALMAS project, partners from Slovenia, Croatia, Montenegro, Albania and Italy attended the meeting that served as an exchange of experiences and expertise. Results obtained from this project will be presented at scientific conferences and will serve as Msc and Phd topics for students of the Agricultural University of Tirana.

Jerina Kolutari and Magdalena Cara
Agricultural University of Tirana, Albania

“partners from Slovenia, Croatia, Montenegro, Albania and Italy attended the meeting that served as an exchange of experiences and expertise”



The monitoring of ballast water in port of Durres, September 2015.

Photo: Orges Cara

Is Montenegro ready to manage ballast water?

“the intention is to continue the control of water quality and to establish an early warning system”

A unique model of management and control of ballast water, which is being used for safe sailing of ships, will be established in the Adriatic Sea. In Montenegrin ports, this activity is controlled by the Inspection for Safety of Maritime Navigation. That was announced in Bar, on Info Day related to ballast water.

The event was organized by the Ministry of Transport and Maritime Affairs – Maritime Safety Department and the University of

as the part of BALMAS project, Institute of Marine Biology is monitoring the status of flora and fauna in the port of Bar.

She has pointed out that within the BALMAS project the intention is to continue the control of water quality and to establish an early warning system.

Captain Vladan Radonjić, director of Maritime Safety Department, presented the state-of-the-art in ballast water problem in Montenegro. He explained all activities undertaken as



Meeting on Info Day related to ballast water in Bar.

Photo: Maja Lalić

Montenegro - Institute of Marine Biology from Kotor, as the partner of the BALMAS – IPA project.

Dr. Dragana Drakulović, from the Institute of Marine Biology, said that the Info Day was dedicated to informing stakeholders of the problem of ballast water, that we will have more to deal with in the future.

“With ballast water some harmful organisms may be introduced, and reproduced in large number”, Drakulović explained. Currently,

well as practical rules at the level of legislation.

In the frame of the BALMAS project, special equipment for sampling and identification of invasive and harmful species on the spot, has already been purchased.

Maja Lalić

Radio Television of Montenegro



Meeting on Info Day related to ballast water in Bar.

Photo: NN

Croatian Shipowners' Association Mare Nostrum



Ferry boat Port of Mišnjak on Rab Island.

Photo: Courtesy by Mare Nostrum and Rapska plovdba dd

Members of the CSA Mare Nostrum's Technical commission represent the leading Croatian shipping companies who manage 141 vessels with 1.7 million gross tons and are important decision makers for the implementation of BWM (Ballast Water Management) options for vessels. Continuous communication and meetings with the Technical commission contributed the implementation of the activities on Ballast Water as the Vector of Introduction of HAOP (Harmful Aquatic Organisms and Pathogens) in the Adriatic Sea.

We have collected and analyzed the possibilities for instalment of BWTS (Ballast Water Treatment Systems) on bulk carriers, tankers, AHTS (Anchor Handling Tug Supply) vessels of the Croatian fleet. The Shareholding Company Atlantska plovdba who is also a CSA Mare Nostrum member has successfully installed a PanAsia Gloen Patrol Ballast Water system on two new

build vessels named Dubrava and Revelin. Final outputs on BW as the Vector of Introduction of HAOP in the Adriatic Sea and BWM options of the Project have been discussed with the Ministry of Maritime Affairs, Transport and Infrastructure and were presented at the fourth Regular BALMAS meeting held in Durres, Albania in March 2015.

Ballast Water discharges data collected through BW Reporting in Croatian ports of Rijeka, Ploče, Šibenik, Pula and Split were analyzed and with other BALMAS activities presented to the stakeholders in Split within the premises of the Croatian Register of Shipping.

Sandro Vidas

Croatian Shipowners' Association - Mare Nostrum

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Tugboats, Rijeka. Property of CSA Mare Nostrum.

Photo: Courtesy by Mare Nostrum

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More about:

<http://www.balmas.eu/>

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GOVERNMENT OFFICE FOR DEVELOPMENT
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