# Ballast Water News

Global **Ballast Water** Management Programme

ISSUE 16 JANUARY – MARCH 2004


## From the Editor

After fourteen years of complex and sometimes sensitive negotiations, IMO member States adopted the *International Convention for the Control and Management of Ships' Ballast Water and Sediments* on 13 February this year. Considering the enormous scientific and technological challenges, and the highly complex and multi-disciplinary nature of the problem; encompassing biology, chemistry, engineering, law, economics and ecology, not to mention ship design, construction and operation, achieving consensus on the Convention must be seen as a major achievement.

Understandably, this issue of Ballast Water News focuses on the new Convention, including the column on this page by Dandu Pughiuc, the new Head of the recently established IMO Office for Ballast Water Management; the Guest Speaker article by Mr Jean-Claude Sainlos, the new Director of the IMO Marine Environment Division; and a more in-depth exploration of the provisions of the Convention on pages 3 to 5. We also assess the implications of the Convention for IMO Assembly Resolution A.868(20), which in 1997 adopted the IMO *Guidelines for the control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens*.

Although adoption of the Convention provides a uniform global regulatory regime, some jurisdictions are proceeding with unilateral regulatory arrangements. On page 6 we consider one such approach, by Washington State in the USA.

The need for rapid entry-into-force and effective implementation of the new Convention is brought into sharp focus on page 7, with articles highlighting new biological invasions in Scotland and Antarctica. The Southern Ocean around Antarctica has long been treasured as one of the last remaining pristine areas of the world, relatively free of human disturbance. Now it seems that without urgent implementation of prevention and control measures, including the Ballast Water Management Convention, no corner of our planet is safe from invasive species.

In this issue, our partners at IUCN – The World Conservation Union, provide some perspectives on issues to be considered in relation to the possible use of chemical biocides in ballast water treatment.

We wrap-up with news of some of the main GloBallast activities this last quarter, including the Global Task Force meeting, ongoing regional activities in the Black and Baltic Seas and plans for the Wider Caribbean, as well as some book and conference announcements. Happy reading!

**Steve Raaymakers**
Contributing Editor

## From the Secretariat

In response to the growing concern related to invasive aquatic species in ships' ballast water, IMO member States have been working together since 1988 to develop an international legal regime to regulate and control this major marine environmental problem. A new international law, the *International Convention for the Control and Management of Ships' Ballast Water and Sediments*, was adopted by IMO member States at a diplomatic conference held from 9 to 13 February 2004 at IMO in London.

The Preamble of the Convention firmly connects the issue to IMO's mandate regarding ship safety, cleaner seas and internationally agreed standards. It also clearly links the Convention with the integrated coastal management concept advocated by the United Nations Conference on Environment and Development and with the sustainable development concept promoted by the World Summit on Sustainable Development. At the global level, the Convention reflects the increasing need for cooperation among the various UN agencies. The text follows the same structure and regulatory strategy as MARPOL 73/78, with general obligations and rights in the Articles and Regulations on specific technical matters encapsulated in the Annex.

Ships will be required to implement Ballast Water Management Plans, maintain reliable records of ballast water operations and carry out ballast water management procedures to given standards. Parties to the Convention are given the option to take additional measures, consistent with international law and in observance of guidelines yet to be developed by IMO. Parties are also required to promote and facilitate scientific research on ballast water management and monitor the effects of new technologies. Parties are further requested to provide support for States which request technical assistance and to share the available relevant technologies, equipment and facilities.

IMO Secretary-General, Mr. Efthimios E. Mitropoulos, congratulated member Governments on the successful outcome of the Conference and emphasized the importance of early, wide and effective implementation of the new Convention.

The introduction of harmful aquatic organisms and pathogens to new environments is a major threat. Oceans cover 70% of our planet and nearly 60% of the world population live in coastal areas. Protection of the marine environment is beyond the scope of one country and has global benefits. The new instrument is, undoubtedly beneficial for all involved; industry will benefit from a uniform global regime while impacts on the marine environment will be reduced.

**Dandu Pughiuc**
IMO Office for Ballast Water Management


Ballast Water News is the quarterly newsletter of the Global Ballast Water Management Programme (GloBallast), and is produced with the support of the World Conservation Union (IUCN). GloBallast is a cooperative initiative of GEF, UNDP, IMO and other partners to assist developing countries to reduce the transfer of harmful organisms in ships' ballast water, through the implementation of IMO guidelines.



***For further information please contact:***

The Editor, Ballast Water News, Global Ballast Water Management Programme
Fax +44 (0)20 7587 3261 Email sraaymak@imo.org Web http://globallast.imo.org

Marine Programme Officer, IUCN Global Marine Programme
Email imene.meliane@iucn.org Web http://www.iucn.org/themes/marine/

# Guest Speaker

***Mr Jean-Claude Sainlos***
***Director, Marine Environment Division***
***International Maritime Organization***

*Mr. Jean-Claude Sainlos of France is an Environmental Lawyer who held the post of "Charge de Mission a la Mission Interministerielle de la Mer", at the Office of the Prime Minister, Paris, from October 1978 to June 1986. He entered the UN system in June 1986 as Programme Officer at the Regional Seas Programme of UNEP, in Nairobi, Kenya.*

*He first joined IMO in December 1988 as Director of the IMO/UNEP Regional Marine Pollution Emergency Response Centre (REMPEC) for the Mediterranean Sea, based in Malta. In June 1998 Mr. Sainlos left Malta to take up duties at IMO Headquarters in London, as Senior Deputy Director of the Sub-Division for Pollution Response and Technical Co-operation Co-ordination, in the Marine Environment Division (MED). On 1 January 2004 he was promoted to Director of MED.*

Upon assuming duties as Director of MED on 1 January 2004, one of the first major tasks before me was to oversee arrangements for the diplomatic conference scheduled for 9 to 13 February 2004, to consider the adoption of the draft *International Convention for the Control and Management of Ships' Ballast Water and Sediments*.

Over the last 14 years, my predecessors as Directors of MED, Mr. Koji Sekimizu and Mr. Oleg Khalimonov, had successfully supported the sensitive and complex negotiations within the IMO Marine Environment Protection Committee (MEPC) and its Ballast Water Working Group; which had culminated in finalization of the draft text of the Convention and the decision by the IMO Council to approve convening of the diplomatic conference. To do justice to these major achievements, and the challenge to ensure a successful conference and adoption of the new Convention, was extremely significant so soon in my new Directorship.

The Conference was opened by Mr. E.E. Mitropoulos, Secretary-General of IMO. Mr. Daniel T. Joseph (India) was elected President of the Conference, along with Admiral Sergio Chagasteles (Brazil), Ms. Khibi Mabuse Manana (South Africa) and H.E. Mr. Ihor O. Mitiukov (Ukraine) as Vice Presidents. The fact that these posts were held by Pilot Countries under the GEF/UNDP/IMO Global Ballast Water Management Programme (GloBallast), is a direct indication of the success of GloBallast in catalysing high-level engagement by developing countries in the IMO Convention process.

As Director of MED my role in the Conference was as Executive Secretary, supporting the Secretary-General in ensuring that all Secretariat functions were carried out properly, in turn with the support of two Deputy Executive Secretaries; Mr. Du Dachang and Mr. R. Coenen and the full staff of MED.

The Conference established a Committee of the Whole with the mandate to consider the draft Convention and Conference resolutions, chaired by Mr. Mike Hunter (UK), who had skilfully chaired the MEPC Ballast Water Working Group during critical negotiations over the last four years, to develop the Convention text. The Conference also established a Drafting Committee, chaired by Captain Frederick Kenney (US) and a Credentials Committee to examine credentials of representatives, Chaired by Captain Benito Pulido (Venezuela).

Under the wise leadership of the President and Vice-Presidents and expert steerage of the Committee Chairmen, combined with solid support from the IMO Secretariat, the Conference successfully navigated several challenging issues and, in the spirit of compromise and consensus that is the hallmark of the success of IMO, culminated in the adoption of the new *International Convention for the Control and Management of Ships' Ballast Water and Sediments* on Friday 13 February 2004.

This act, providing a uniform and effective international law to regulate ballast transfers, is perhaps one of the most significant global environmental achievements in the early part of this Century. It is a major credit to the vision and efforts of delegates from IMO member States and the staff of the Secretariat, including those mentioned here and many others, who have been involved since 1988.

Much work remains to be done however, to ensure that the Ballast Water Management Convention enters-into-force as soon as possible, and that parties to the Convention implement it effectively through appropriate national legislation. There is also much work still to be done to develop technical guidelines under the Convention, including among others, guidelines for approval of ballast water management systems and prototype treatment technologies.

My staff and I remain committed to facilitating global and uniform implementation of this highly important Convention, both through the newly formed Office for Ballast Water Management, which is headed by Mr. Dandu Pughiuc and acts as Secretariat to the Convention, and through the GloBallast Programme headed by Mr. Steve Raaymakers, providing capacity-building, institutional strengthening and technical cooperation to member States.

*Jean-Claude Sainlos*

## FORTHCOMING CONFERENCES

27-29 August 2004

***International Conference on Assessment and Control of Biological Invasion Risks***
Yokohama, Japan
*isp@vege1.kan.ynu.ac.jp*

8-10 September 2004

***Ballast Water and Waste Water Treatment Aboard Ships and in Ports***
Bremen, Germany
*Lonicer@t-online.de*

19-23 September 2004

***13th International Conference on Aquatic Invasive Species***
Ennis, County Clare, Ireland
*www.aquatic-invasive-species-conference.org*

# Convention Adopted by Consensus

*After 14 years of complex negotiations between IMO member States, the International Convention for the Control and Management of Ships' Ballast Water & Sediments was adopted by consensus at a Diplomatic Conference at IMO in London on Friday 13 February 2004.*

The Conference was attended by representatives of 74 member States, one Associate Member; and observers from two inter-governmental organizations and 18 non-governmental international organizations.

The Ballast Water Management Convention is divided into 22 Articles and an Annex of Regulations, which includes technical standards and requirements. The main features of the Convention are as follows:

## Entry into Force

The Convention will enter into force 12 months after ratification by 30 States, representing 35 per cent of world merchant shipping tonnage (Article 18 *Entry into Force*).

## General Obligations

Under Article 2 *General Obligations* Parties undertake to give full and complete effect to the provisions of the Convention and the Annex in order to prevent, minimize and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through ships' ballast water and sediments.

Parties are given the right to take, individually or jointly with other Parties, more stringent measures with respect to the prevention, reduction or elimination of the transfer of harmful aquatic organisms and pathogens through ships' ballast water and sediments, consistent with international law. Parties should ensure that ballast water management practices do not cause greater harm than they prevent to their environment, human health, property or resources, or those of other States.

## Reception Facilities

Under Article 5 *Sediment Reception Facilities* Parties undertake to ensure that ports and terminals where cleaning or repair of ballast tanks occurs, have adequate reception facilities for sediments.

## Research and Monitoring

Article 6 *Scientific and Technical Research and Monitoring* calls for Parties individually or jointly to promote and facilitate scientific and technical research on ballast water management; and monitor the effects of ballast water management in waters under their jurisdiction.

## Survey, Certification and Inspection

Ships are required to be surveyed and certified (Article 7 *Survey and Certification*) and may be inspected by port State control officers (Article 9 *Inspection of Ships*) who can verify that the ship has a valid certificate; inspect the Ballast Water Record Book; and/or sample the ballast water. If there are concerns, then a detailed inspection may be carried out and "the Party carrying out the inspection shall take such steps as will ensure that the ship shall not discharge Ballast Water until it can do so without presenting a threat of harm to the environment, human health, property or resources."

All possible efforts shall be made to avoid a ship being unduly detained or delayed (Article 12 *Undue Delay to Ships).*

## Technical Assistance & Regional Cooperation

Under Article 13 *Technical Assistance, Co-operation and Regional Co-operation*, Parties undertake, directly or through the Organization and other international bodies, as appropriate, in respect of the control and management of ships' ballast water and sediments, to provide support for those Parties which request technical assistance to train personnel; to ensure the availability of relevant technology, equipment and facilities; to initiate joint research and development programmes; and to undertake other action aimed at the effective implementation of the Convention.

## Annex – Section A General Provisions

This includes definitions, application and exemptions. Under Regulation A-2 *General Applicability:* "Except where expressly provided otherwise, the discharge of Ballast Water shall only be conducted through Ballast Water Management, in accordance with the provisions of this Annex."

## Annex – Section B Management and Control Requirements for Ships

Ships are required to have on board and implement a Ballast Water Management Plan approved by the Administration (Regulation B-1). The Ballast Water Management Plan is specific to each ship and includes a detailed description of the actions to be taken to implement the Ballast Water Management requirements and practices.

Ships must have a Ballast Water Record Book (Regulation B-2) to record when ballast water is taken on board; circulated or treated for ballast water management purposes; and discharged into the sea. It should also record when ballast water is discharged to a reception facility and accidental or other exceptional discharges of ballast water.

The specific requirements for ballast water management are contained in Regulation B-3 *Ballast Water Management for Ships:*

Ships constructed before 2009 with a ballast water capacity of between 1500 and 5000 cubic metres must conduct ballast water management that at least meets the ballast water exchange standards or the ballast water performance standards until 2014, after which time it shall at least meet the ballast water performance standard.

Ships constructed before 2009 with a ballast water capacity of less than 1500 or greater than 5000 cubic metres must conduct ballast water management that at least meets the ballast water exchange standards or the ballast water performance standards until 2016, after which time it shall at least meet the ballast water performance standard.

Ships constructed in or after 2009 with a ballast water capacity of less than 5000 cubic metres must conduct ballast water management that at least meets the ballast water performance standard.

Ships constructed in or after 2009 but before 2012, with a ballast water capacity of 5000 cubic metres or more shall conduct ballast water management that at least meets the ballast water exchange standards or the ballast water performance standards until 2016, after which time it shall at least meet the ballast water performance standard.

Ships constructed in or after 2012, with a ballast water capacity of 5000 cubic metres or more shall conduct ballast water management that at least meets the ballast water performance standard.

Under Regulation B-4 *Ballast Water Exchange*, all ships using ballast water exchange should, whenever possible, conduct ballast water exchange at least 200 nautical miles from the nearest land and in water at least 200 metres in depth, taking into account Guidelines developed by IMO. In cases where the ship is unable to conduct ballast water exchange as above, this should be as far from the nearest land as possible, and in all cases at least 50 nautical miles from the nearest land and in water at least 200 metres in depth.

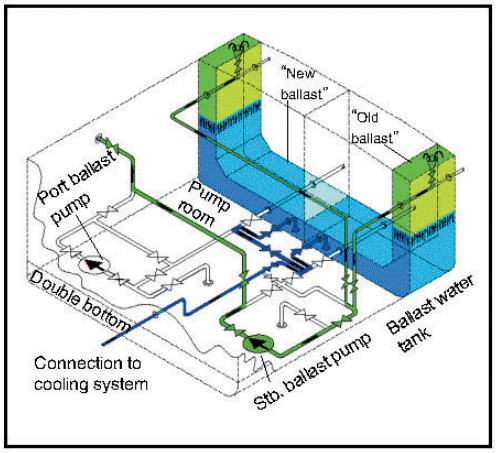
When these requirements cannot be met, areas may be designated where ships can conduct ballast water exchange. All ships shall remove and dispose of sediments from spaces designated to carry ballast water in accordance with the provisions of the ships' Ballast Water Management Plan (Regulation B-4).

## Annex – Section C Additional Measures

A Party, individually or jointly with other Parties, may impose on ships additional measures to prevent, reduce, or eliminate the transfer of Harmful Aquatic Organisms and Pathogens through ships' Ballast Water and Sediments.

In these cases, the Party or Parties should consult with adjoining or nearby States that may be affected and should communicate their intention to establish additional measure(s) to the Organization at least 6 months prior, except in emergency or epidemic situations. When appropriate, Parties will have to obtain the approval of IMO.

## Annex – Section D Standards for Ballast Water Management




*The Convention sets standards providing clear performance targets for ballast water treatment technologies* (Image: Navion)

There is a ballast water exchange standard and a ballast water performance standard. Ballast water exchange could be used to meet the performance standard.

### Regulation D-1 Ballast Water Exchange Standard

Ships performing ballast water exchange shall do so with an efficiency of 95 per cent volumetric exchange of ballast water. For ships exchanging ballast water by the pumping-through method, pumping through three times the volume of each ballast water tank shall be considered to meet the standard described. Pumping through less than three times the volume may be accepted provided the ship can demonstrate that at least 95 percent volumetric exchange is met.

### Regulation D-2 Performance Standard

Ships conducting ballast water management shall discharge less than 10 viable organisms per cubic metre greater than or equal to 50 micrometres in minimum dimension and less than 10 viable organisms per milliliter less than 50 micrometres in minimum dimension and greater than or equal to 10 micrometres in minimum dimension; and discharge of the indicator microbes shall not exceed the specified concentrations.

The indicator microbes, as a human health standard, include, but are not be limited to:Toxicogenic *Vibrio cholerae* (O1 and O139) with less than 1 colony forming unit (cfu) per 100 milliliters or less than 1 cfu per 1 gram (wet weight) zooplankton samples; *Escherichia coli* less than 250 cfu per 100 milliliters; Intestinal Enterococci less than 100 cfu per 100 milliliters.

Ballast Water Management Systems must be approved by the Administration in accordance with IMO Guidelines (Regulation D-3 *Approval Requirements for Ballast Water Management Systems*). These include systems which make use of chemicals or biocides; make use of organisms or biological mechanisms; or which alter the chemical or physical characteristics of the ballast water.

### Prototype Technologies

Regulation D-4 covers *Prototype Ballast Water Treatment Technologies.* It allows for ships participating in a programme approved by the Administration to test and evaluate promising Ballast Water Treatment Technologies to have a leeway of five years before having to comply with the requirements.

### Review of Standards

Under Regulation D-5 *Review of Standards by the Organization*, IMO is required to review the Ballast Water Performance Standard, taking into account a number of criteria including safety considerations; environmental acceptability; practicability; cost effectiveness and biological effectiveness.

### Annex – Section E Survey and Certification Requirements for Ballast Water Management

Gives requirements for initial, annual, intermediate and renewal surveys and certification requirements. Appendices give Form of Ballast Water Management Certificate and Form of Ballast Water Record Book.

### Conference Resolutions:

The Conference also adopted four resolutions:

- *Resolution 1* pertaining to future work by the Organization, particularly on the development of various guidelines under the Convention
- *Resolution 2* pertaining to the use of decision-making tools when reviewing the standards pursuant to Regulation D-5
- *Resolution 3* pertaining to the promotion of technical co-operation and assistance
- *Resolution 4* pertaining to the future review of the Annex to the Convention

To obtain the full text of the Convention email *cgregory@imo.org* (available in Arabic, Chinese, English, French, Russian and Spanish).

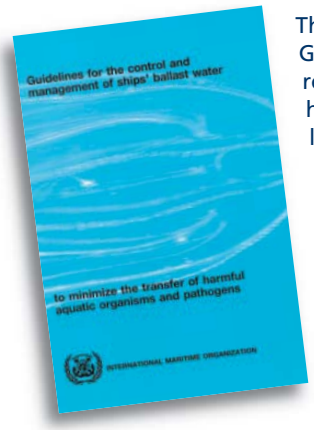
*Schedule for ballast water management under Section B of the new Convention (BWES = BW Exchange Standard, BWPS = BW Performance Standard)*

| Ship construction | Ballast capacity (cubic metres) | Control required |
|---|---|---|
| Before 2009 | 1500 – 5000 | at least meet BWES or BWPS up to 2014 then BWPS |
| Before 2009 | <1500 or >5000 | at least meet BWES or BWPS up to 2016 then BWPS |
| In or after 2009 | <5000 | at least meet BWPS |
| In or after 2009 but before 2012 | 5000 or more | at least meet BWES or BWPS up to 2016 then BWPS |
| in or after 2012 | 5000 or more | at least meet BWPS |

*Adapted from IMO External Relations*

# What about the '97 Guidelines?

*Now that the International Convention for the Control and Management of Ships' Ballast Water and Sediments has been adopted, what is the status of IMO Assembly Resolution A.868(20) – which in 1997 adopted the IMO "Guidelines for the control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens"?*




The A.868(20) Resolution and Guidelines have often been referred to as *voluntary*, however they do have certain legal status under international law, having been adopted by consensus as a Resolution of the Assembly of IMO, the UN Organization with a global mandate for the regulation of shipping. Section 11 of the Guidelines provides for countries to implement and enforce their provisions through National legislation. According to the UN Convention on the Law of the Sea, coastal States can enact laws to protect the marine environment based upon generally accepted international standards. Without any doubt A.868(20) meets this requirement.

The A.868(20) Guidelines provide a comprehensive set of practical measures that, if implemented fully, will do much to minimize the transfer of harmful aquatic organisms and pathogens in ships' ballast water. They provide a very sound, standardised, internationally endorsed and formally adopted basis for countries to implement ballast water control and management measures.

From a legal point of view, the status of Resolution A.868(20) is not affected by the adoption of the Convention. The 1997 Resolution and Guidelines still hold international legal status as described above, and countries can continue to apply them. There is nothing in the new Convention that explicitly states that the Convention supersedes Resolution A.868(20). Once the Convention comes into force countries can apply both, as long as they do not contradict each other. If such contradiction exists, then legally the Convention provisions would apply.

Given that the new Convention is based largely on A.868(20) (in terms of practical measures), anything done to implement the Resolution and Guidelines will not pre-empt the Convention, but better prepare coastal States for it. However, IMO advises that maritime administrations should ideally now move towards implementing the new Convention and its Regulations, even if it has not come into force.

*SR*

# Washington Lays Down the Law

*Although adoption of the International Convention for the Control and Management of Ships' Ballast Water & Sediments provides a uniform and harmonized global regulatory regime for this issue, some jurisdictions are proceeding with unilateral regulatory arrangements, including amongst others, the State of Washington on the west coast of the USA. The Washington regime is based on ballast water reporting by ships and the practice of ballast water exchange at sea, and also sets discharge standards for ballast water treatment. Despite some important inconsistencies with the Convention, the Washington laws place the State in good stead for rapid implementation of the Convention should it choose to do so in the near future. The main provisions are as follows:*

## Reporting Requirements

All vessels of **300 gross tons** and greater, except military vessels, **must** file a Ballast Water Reporting Form **24 hours prior** to entering Washington State waters. U.S. Coast Guard and IMO Ballast Water Reporting Forms will be accepted. The U.S. Coast Guard form is preferred.

Ballast Water Reporting Forms shall be filed with the **Marine Exchange** for vessels entering Puget Sound or Washington State coastal ports.

Ballast Water Reporting Forms shall be filed with the **Merchants Exchange** for vessels entering the Columbia River ports.

Vessels that do not discharge ballast water must either file a Ballast Water Reporting Form with **"Not Discharging Ballast Water"** written in the ballast water history section or submit a notification letter.

## Notification Letter Option

Vessel operators who do not regularly discharge ballast water while in Washington State ports, and do not file ballast water reports, shall notify the department in writing. The notice must contain the Vessel Name, IMO No., Lloyds No. or USCG No., Owner, Agent, Vessel Type and a statement that the vessel will not discharge ballast water while in Washington State ports.

## Exchange Requirements

All vessels intending to discharge ballast water within Washington State waters are required to conduct an open ocean exchange. Vessels making an ocean crossing are required to exchange their ballast water at least 200 NM offshore. Vessels making a coastal voyage are required to exchange their ballast water at least 50 NM offshore.

## Exchange Exemptions

- When it is not safe to conduct an open ocean ballast water exchange, or if a vessel has design limitations or equipment malfunctions that preclude exchange. In such cases the master must declare a safety exemption on the Ballast Water Reporting Form.
- When a ships' ballast is water common to the state and has not been mixed with waters or sediments from outside the Columbia River north to the Strait of Juan de Fuca, inland waters of Puget Sound, the Strait of Juan de Fuca and the Strait of Georgia south of latitude 50°N.
- When an approved ballast water treatment system is used that meets the Washington State ballast water discharge standards.

## Future Treatment Requirements

From 1 July 2007, the discharge of improperly exchanged or treated ballast water into Washington State waters is prohibited. This means current safety exemptions for exchange will no longer be valid. Vessel operators must begin now to plan for implementing treatment alternatives to exchange.

By 1 July 2006, ship operators must submit a report to the Washington Department of Fish and Wildlife (WDFW) describing how they will meet the 1 July 2007 requirements.

## WDFW Inspections

A WDFW Vessel Inspector will examine ballast water management records, take ballast water and sediment samples and will make other inquiries to assess compliance with Washington State ballast water management laws.

## Penalties for Violations

A vessel that fails to file a Ballast Water Reporting Form may be subject to a civil penalty of up to $500.

Any owner or operator who knowingly and intentionally falsifies a Ballast Water Reporting Form is liable for a civil penalty of up to $5,000. Additionally, the owner or operator is subject to criminal penalties of up to five years imprisonment or a fine of $5,000 or both.

A vessel that discharges improperly exchanged or treated ballast without a valid exemption is liable for a civil penalty of up to $5,000.

**Contacts**
*Department of Fish and Wildlife*
*600 Capitol Way North*
*Olympia, WA 98501-1091 USA*
*Phone: +1 360-902-2741*
*Fax: +1 360-902-2845*
*Email: ballastwater@dfw.wa.gov*

# New Invasions

## Suspect Species in Scottish Seas

*Scotland's coastline is experiencing biological invasions that threaten to wipe out native species. The Scottish Association for Marine Science (SAMS) has published a target list of seven foreign sea creatures, which they claim could devastate native marine eco-systems.*

Four of the seven species are already thriving in Scottish waters: the skeleton shrimp (*Caprella mutica*), the leathery sea squirt (*Styela clava*) and two varieties of Asian seaweed; green fingers (*Codium fragile*) and japweed (*Sargassum muticum*). The remaining three, the Chinese mitten crab (*Eriocheir sinensis*), Japanese kelp (wakame) (*Undaria pinnatifida*) and another sea squirt (*Perophora japonica*), are listed as they are already established in English waters and are spreading northwards.

The predominance of northeast Asian species amongst the invaders most probably relates to similar environmental conditions between northeast Asian and Scottish waters, allowing the invaders to thrive in their new habitats.

Invading seaweeds such as Japanese kelp can shade-out native species, depriving them of light, oxygen and nutrients. Introduced marine animals such as shrimp and sea squirts could out-compete their native counterparts. Mitten crabs dig into shorelines to create burrows and could damage the bank habitats of Scottish sea lochs.

During the next three years, SAMS will head a research programme involving marine stations around the UK to map the full distribution of these invasive species, prevent their expansion and take steps to stop other foreign invaders reaching Scotland's coastline. The project is called ALIENS – Conserving native biodiversity by raising awareness of invasive species – and is funded by the Esmée Fairbairn Foundation.

Photo: L. Cook

*Two introduced skeleton shrimps found in Scottish waters*

While the main problem is believed to be ships' ballast water, foreign species may also be introduced by the aquaculture industry. For example, oyster spats used to be packed in seaweed, which may contain the larvae of exotic species.

Shipping traffic could increase dramatically in coming years if global warming melts ice in the Northwest Passage, opening a new route to the Atlantic for commercial vessels. This could lead to further alien species arriving in Scottish, UK and European waters.

*Further information: www.sams.ac.uk*

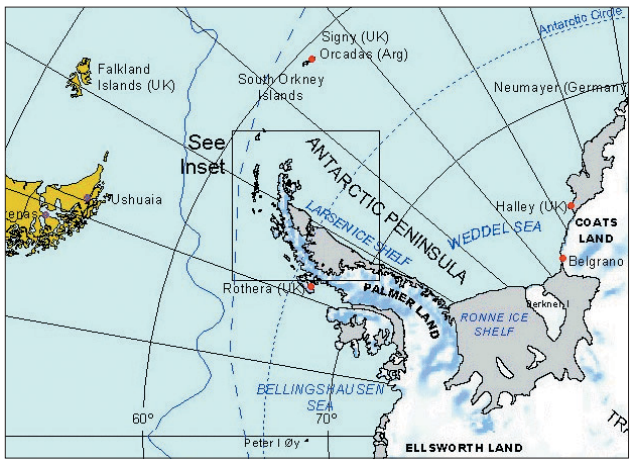
## Antarctic Waters No Longer Safe

*Until recently, it was believed that the Southern Ocean around Antarctica was one of the few remaining oceans to be free of introduced species. However, in 2004 two Brazilian marine scientists, Marcos Tavares and Gustavo De Melo, published a paper claiming that the Antarctic marine ecosystem is no longer free from biological invasions (Tavares & Melo 2004. Antarctic Science 16 (2) 129-131).*

*Spider crab* Hyas araneus *from Norway* (Image © C. d'Udekem)

Tavares & Melo analysed benthic samples from an Antarctic Peninsula research cruise, and found a male and a female of the majid spider crab *Hyas araneus.*

The species has previously been reported only from the North Atlantic and the Arctic Oceans, north of 41°N. This is the first record of a non-indigenous marine species in Antarctic seas. Truly bipolar species are extremely rare and restricted to a few pelagic species. The spider crab may have arrived in Antarctica via ships' sea-chests or ballast water.




*The Antarctic Peninsula (adapted from AAD)*

For at least 25 million years the pristine Antarctic ecosystems and highly endemic marine fauna have been protected by isolation and a major lack of human activity. However, in recent years ship traffic has boomed in Antarctica, mainly as a result of increased tourism, fishing and scientific research.

When increased shipping is combined with polar warming, the potential for increased biological invasions with unpredictable consequences for Antarctic marine ecology, is a cause for major concern. Timely and effective implementation of prevention and control measures, including the new IMO Ballast Water Management Convention, is urgently required.

*Further information: mdst@usp.br*

# Ballast Water Management – some Eco-Perspectives

*The principle of ecological sustainability requires adoption of the ecosystem approach and scientific and societal perspectives in the development of global environmental regulatory regimes, including the recently adopted International Convention for the Control and Management of Ships' Ballast Water and Sediments.*

## Ecosystem approach

Ecosystems may be particularly vulnerable to alien invasion due to specific conditions, whether or not caused by human use. Understanding what can influence or compound the susceptibility of coastal ecosystems to biological invasions can assist in risk assessment and recognising a need for specific care or measures that may be required. Stressed ecosystems are likely to be more vulnerable, while other factors may also play a role. Asking scientists of long-standing expertise and experience in field investigations for their 'hidden' wisdom and judgement can help to create better understanding and more optimal regional protective policies. Such understanding can then be used in raising awareness and education.

*The ecosystem approach requires humans to consider the impacts of their activities, including management responses and regulatory regimes, on entire ecosystems rather than individual species or values.*

## Evaluation of ballast water management

At present the development of a formal, international evaluation framework for ballast water management and treatment is lagging behind the state of initiatives in treatment technology, as illustrated at the ballast water treatment R&D symposiums convened by IMO-GloBallast in recent years. It is crucial to evaluate treatment systems in a way that is representative for what might happen in a natural system.

## Scientific understanding and development of standards for ballast water management

Standards for ballast water to be discharged are a crucial tool in proper ballast water management. The state of scientific knowledge in relation to the development of standards for phytoplankton and zooplankton above a certain size limit is relatively robust. However, for microbes (bacteria and viruses), in particular those that are not human pathogens, the understanding appears to be not up to meeting the requirements for setting such standards scientifically. An inventory of what is known at present and what more would be needed for developing standards for microbes, as well as how to generate such knowledge and feed it into the process of developing these standards, appears to be required. Awareness of the place microbes have in marine ecosystems also needs to be stimulated.

## Societal perspective – innovation in support of environmental policies

During the process of developing policies for harmful anti-fouling paints for ships, in response to the political will to decide on progressive environmental policies, innovative industries rapidly responded by developing environmentally less harmful anti-fouling systems. The innovative actions created a context for effective implementation of a ban on organotins, and as such supported the development of the policy process to phase out organotins from anti-fouling systems for ships.

Similar signals can be seen emerging in ballast water treatment. Several industries have taken up the challenge to develop ballast water treatment methods, thereby responding to developments in marine environmental policies, as set out within IMO, and many more innovative initiatives are to be expected in the future. By acting innovatively, the relevant industries show potential to support an environmentally safer route towards ballast water management. Stimulating awareness of such development can support building linkages, coalitions and networks in ballast water management based on mutual benefit, in particular for coastal and port States.

*Cato ten Hallers-Tjabbes*
*Cato Marine Ecosystems*
*cato@nioz.nl*

# Chemical Biocides – a Case for Caution

*One of the options that have been proposed for the treatment of ballast water is the use of chemical biocides. Given the amounts of ballast water discharged globally each year (estimates range from 3 to 12 billion tonnes), the specific conditions of ballast water tanks, and the predominance of discharge of ballast water in coastal systems, an informed debate on this unresolved issue appears appropriate. Such debate may well stimulate awareness, in a similar manner as earlier awareness has been stimulated on the environmental consequences of toxic anti-fouling paints (ten Hallers-Tjabbes, 2003 a & b).*

## Scale of discharged ballast water

The volumes of ballast water taken-up, transferred and discharged into world oceans each year far exceed the volumes of any other ship-sourced discharge regulated by IMO, such as Liquid Noxious Substances under Annex II of MARPOL, even if the lowest estimates for ballast water of around 3 billion tonnes per year are accepted (billion = $10^9$).

Should treatment of ballast water with chemical biocides (to prevent the transfer of harmful aquatic organisms) be widely applied, the potential discharge of these chemicals into the sea could be at levels well in excess of what is released by current anti-fouling paints (estimated for TBT at 1900 tonnes/year, for copper at 27000 tonnes/year (Ranke, 2001)).

In order to be effective, the concentration of chemical used needs to be maintained at a toxic level, which would mean that yearly an amount of 5 to 10 x $10^{12}$ litres of water of a toxic concentration would be discharged.

## Limitations of traditional toxicity testing

Conventional toxicity testing routines have only limited potential for the purpose of assessing ecotoxicity of ballast water, if they serve that purpose at all. The conventional approach to ecotoxicity, comparing a local concentration to an 'acceptable' level, neglects the complexity of marine ecosystems and their major consequences for the behaviour, fate and residence time of toxins. The few studies that investigated the spatio-temporal fate of biocides in a marine environment, indicate a much lower degradation potential than predicted, due to uncertainty regarding the influence of temperature, metabolic activity, redox potential, presence of other toxic compounds, and toxicity of transformation products (Ranke, 2002; Ranke & Jastorff, 2000).

Few of the conditions that are employed in traditional toxicity assessment suites are directly relevant for ballast water tanks. Both absence of light and lack of oxygen greatly hamper the degradation of contaminants (*cf* TBT as an example).

*Many toxic chemicals are carried as cargo by specialised tankers. These purpose-built ships are subject to a rigorous and specific safety regime. If other ship types were to carry large quantities of chemicals for the purpose of ballast water treatment, they might well be classed as chemical tankers themselves, creating major design, operational, safety and environmental implications.*

Organisms, in particular bacteria, are the major actors in environmental degradation processes. Yet such organisms are also likely to be rendered non-viable by the treatment, so one would miss their degradation potential.

## Natural alternatives

Humans have synthesised many chemicals based on elements that have never successfully been integrated into construction and life support processes of living matter. Only a few elements could be successfully integrated into living systems throughout evolution.

Many 'naturally' synthesised compounds function as natural toxins or deterrents and are excreted for that purpose, such as sesquiterpenoids (Sun & Fenical, 1979). Organochlorines are predominantly (or exclusively) functioning as chemical protection and defence (Gribble, 1994); organobromines appear to serve a similar chemical protection function (Gribble, 1999). They do not serve the maintenance or construction of living matter and they act as toxins in the marine environment.

The amount of ballast water discharged necessitates a reconsideration of employment of chemicals in ballast water treatment. A precautionary approach would be served by restricting secondary ballast-water treatment systems to compounds that have proven viable in sustaining living systems.

*Cato ten Hallers-Tjabbes*
*Royal Netherlands Institute for Sea Research*
*IUCN Representative to IMO*
*cato@nioz.nl*

**References for this article are listed on page 11**

# Global Task Force Meets in London

*From 2 to 6 February this year the GloBallast Programme's Global Task Force held its 5th meeting at IMO Headquarters in London. The Task Force convened immediately prior to the Diplomatic Conference which considered adoption of the new Ballast Water Management Convention, thereby allowing delegates from the GloBallast Pilot Countries to stay on and attend the Conference, effecting cost-efficiencies.*

The Global Task Force meets annually and comprises representatives from GEF, UNDP, IMO, the PCU and the six Pilot Countries, as well as industry and environmental NGO's. Its main function is to review progress for the previous year and consider and approve the PCU and Pilot Country workplans and budget for the forthcoming year. It acts as an overall steering and advisory committee for the Programme.

Reports presented by the six Pilot Countries and the PCU showed that significant progress continues to be made in implementing Programme activities. A major outcome of the meeting was a decision to extend the timeframe for finalization of Programme activities by 10 months to 31 December 2004, within the existing available budget.

# Regional Task Force Meets in Romania

*Black Sea port survey replication team in Istanbul*

*From 28 to 30 January 2004 the GloBallast Regional Task Force for the Black Sea convened the 2nd Black Sea Conference on Ballast Water Control and Management, in Constanta, Romania.*

The meeting was attended by Black Sea littoral States Bulgaria, Georgia, Turkey, Romania, Russian Federation and Ukraine as well as the Istanbul Commission/Black Sea Environment Programme.

The meeting adopted Terms of Reference for the Regional Task Force and agreed a series of short-term actions under the Regional Strategic Action Plan for ballast water control and management, that had been adopted by Black Sea States at the first regional conference held in Odessa, Ukraine in October 2001.

Within the GloBallast Programme the Black Sea region is now one of most informed and advanced in terms of regional cooperation. The actions to be carried out during the remainder of 2004 include:

- Establishing National Task Forces in each country.
- Developing a Regional Aquatic Invasive Species Information System (RAISIS).
- Sharing the Odessa experience with port biological surveys by holding seminars and field demonstrations in each country.
- Delivering training in each country using the GloBallast modular training package.

*Roman Bashtannyy*
*rabotn@te.net.ua*

# GloBallast Helps HELCOM

*On 3rd and 4th of March this year the Baltic Marine Environment Protection Commission (HELCOM) held its 25th meeting in Helsinki, Finland.*

Photo: M Rosenberg

*The Baltic Sea, being largely enclosed and with low native biodiversity, is particularly vulnerable to aquatic bio-invasions, and is already suffering from the impacts of several invasive species.*

*One example is the Cladoceran water flea* Cercopagis pengoi, *pictured here, which has been introduced to the Baltic from the Caspian Sea. It reproduces rapidly to form very large, densely-packed populations that dominate the zooplankton and clog fishing nets and trawls, causing economic impacts to the fishing industry.*

The issue of invasive aquatic species and ballast water management was placed firmly on the HELCOM agenda at this meeting, with GloBallast making a presentation and joining discussions on the issue. The Commission made several key decisions relating to ballast water and invasive aquatic species:

- stressing the seriousness of the problem in the Baltic Sea and recommending the nine Baltic countries to ratify, as soon as possible, the IMO Ballast Water Management Convention,
- encouraging the HELCOM maritime committee, led by Finland, Germany and Sweden, in cooperation with IMO-GloBallast, to develop a regional action plan on this matter,
- asking the HELCOM Secretariat to further cooperate with IMO in the preparation of the future GloBallast *Partnerships* project.

*SR*

# GloBallast Goes Tropical

From 23 to 26 March 2004 GloBallast attended the "White Water to Blue Water" partnerships conference in Miami, Florida. The objectives were to raise awareness of the invasive aquatic species and ballast water issue amongst countries of the Wider Caribbean, and explore opportunities to develop partnerships for the development of a Regional Strategic Action Plan for ballast water control and management, under the proposed future GloBallast *Partnerships* project.

As a result of the conference, GloBallast is now working more closely with government and shipping groups in the USA and Wider Caribbean, to identify co-funding for future regional capacity-building and technical cooperation activities.

*Cruise ship tourism is a major part of the economy in the Wider Caribbean. The many positive environmental initiatives of the cruise industry, including in the area of ballast water management, featured at the White Water to Blue Water conference in Miami.*

# New Bio-Invasion Books


Island Press has recently released *Invasive Species – Vectors and Management Strategies*. Edited by two of the world's leaders in the science of aquatic bio-invasions, Drs Greg Ruiz and James Carlton, the book also covers terrestrial bio-invasions, with a total of 40 authors contributing to18 chapters.

ISBN 1-55963-902-4

Another recent release by Island Press is *Invasive Alien Species – A New Synthesis*.

ISBN 1-55963-362-X

*www.islandpress.org/books*

# Risk Reports Released

The full set of final reports for the Ballast Water Risk Assessments for the GloBallast demonstration ports of Khark Island (Iran), Odessa (Ukraine), Mumbai and Jawaharlal Nehru (India), Dalian (China), Sepetiba (Brazil) and Saldanha Bay (South Africa) have now been published under the GloBallast Monograph Series.

*http://globallast.imo.org/publications*

## References for page 9

Collins,T.J., 2001. Towards Sustainable Chemistry. Science, 291: 48.

Gribble, G.W., 1994. The natural production of chlorinated compounds. Environmental Science & Technology, 28: 310-319.

Gribble, G.W., 1999. The diversity of naturally occurring organobromine compounds. Chem. Soc. Rev., 28: 335-346.

Oberdörster,E.,& McClellan-Green,P. (2000).The neuropeptide APGW amide induces imposex in the mud snail, *Ilyanassa obsolete*. Peptides, 21: 1323-1330.

Ranke, J., 2001. Ecotoxicological risk profiles of chemicals. Ph D Thesis, University of Bremen (GE), 164 pp.

Ranke, J., 2002. Persistence of antifouling agents in the marine biosphere. Environmental Science & Technology 36: 1539-1545.

Ranke, J. & B. Jastorff, 2000. Multidimensional risk analysis of antifouling biocides. ESPR – Environmental Science & Pollution Research, 7 (2): 105-114.

Sun, H.H. & Fenical, W. 1979. Rhipocephalin and rhipocephenal; toxic feeding deterrrents from the tropical marine alga *Rhipocephalus phoenix*. Tetrehedron Lett., 5: 685-688.

Ten Hallers-Tjabbes, C.C., J.-W. Wegener, A.G.M. Van Hattum, J.F. Kemp, E. Ten Hallers, T.J. Reitsema & J. P. Boon. 2003a.. Imposex and organotin concentrations in *Buccinum undatum* and *Neptunea antiqua* from the North Sea: relationship to shipping density and hydrographical conditions. Marine Environmental Research, Vol. 55: 203-233.

Ten Hallers-Tjabbes, C.C., J. P. Boon, J. L. Gomez Ariza & J. F. Kemp, 2003b. Communicating the Harmful Impact of TBT: What can scientists contribute to EU environmental policy planning in a global context? Ocean yearbook Vol. 17: 417-448.

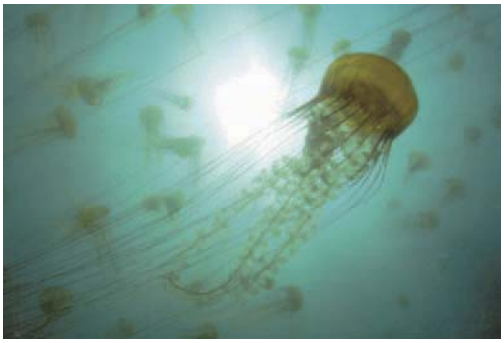
# Progress Report

## Activities Undertaken Jan – March 2004

- ✓ Briefed HELCOM Maritime Committee on new BW Convention, Stockholm, 22 Jan.
- ✓ Convened 2nd Regional Task Force meeting for Black Sea, Constanta, Romania 28-30 Jan (Ukraine lead).
- ✓ Convened 5th Global Task Force meeting, IMO London, 2-6 Feb 2004.
- ✓ Attended/supported Diplomatic Conference to adopt BW Convention, IMO London, 9-13 Feb.
- ✓ Effected PCU re-structure, with establishment of IMO Office for Ballast Water Management on 1 March.
- ✓ Assisted 25th meeting of HELCOM to develop response to ballast water issue, Helsinki 3-4 March.
- ✓ Delivered modular ballast water management training course in Cape Town, South Africa, 5-11 March (South Africa lead).
- ✓ Participated in White Water to Blue Water planning/funding conference, Miami, 24-26 March.
- ✓ Attended/supported MEPC 51, IMO London, 30 March – 2 April.
- ✓ Hosted GEF Consultant undertaking in-depth case study of GloBallast as part of Third Study of GEF's Overall Performance, 30 March – 2 April.
- ✓ Edited proceedings of 2nd International Ballast Water Treatment R&D Symposium.
- ✓ Completed all final reports on Risk Assessments for each Demonstration Site and progressed same for Port Biological Baseline Surveys and other activities.
- ✓ Prepared16th issue of Ballast Water News.

## Activities Planned April – June 2004

- Attend Global Invasive Species Network (GISIN) workshop, Baltimore 6-8 April (Brazil lead).
- Hold GloBallast *Partnerships* meeting with UNDP and GEF, New York 14-15 April.
- Convene 1st Regional Task Force meeting for South America (MERCOSUR Region), Brasilia, 26-28 April (Brazil lead).
- Attend APEC Introduced Marine Pests workshop, Puerto Varas, Chile 3-5 May.
- Convene 1st Regional Task Force meeting for South Asia, Goa, India, 13-14 May (India lead).
- Attend/present at 2nd International Ballast Water Management Conference and Exhibition, Singapore 19-21 May (PCU and all Pilot Countries).
- Complete first phase of web-based Country Profiles database.
- Deliver modular ballast water management training course in Dalian, China 7-11 June (China lead).
- Present at Maritime Institute of Malaysia Conference on Ballast Water, Kuala Lumpur 10 – 11 June.
- Finalise planning for Africa port survey replication in Mombasa, Kenya (South Africa lead).
- Publish proceedings of 2nd International Ballast Water Treatment R&D Symposium.
- Renew/extend agreement with IUCN for co-production of Ballast Water News.
- Produce 17th issue of Ballast Water News.
- PCU staff annual leave.



# More Information?

**Programme Coordination Unit**
**Global Ballast Water Management Programme**
**International Maritime Organization**
**4 Albert Embankment**
**London SE1 7SR United Kingdom**

**Telephone : +44 (0)20 7587 3251 or 3279**
**Fax : +44 (0)20 7587 3261**
**Email : sraaymak@imo.org *or* jmatheic@imo.org**
**Web : http://globallast.imo.org**

Produced by Scanplus Print Group, London. Tel +44 (0)20 7787 1100 • Printed on recycled paper