

## From the Editor

Welcome to the first issue of Ballast Water News, the quarterly newsletter of the Global Ballast Water Management Programme, a new initiative to address the severe environmental, economic and health threats posed by harmful organisms carried in ships' ballast water.

As the first newsletter, this issue provides an introductory overview of the programme. Future issues will provide updates on the programme's progress as well as articles on latest developments in science, engineering, shipping, law and other responses to the problem of introduced marine species.

It is hoped that the newsletter will assist the dissemination and exchange of information and views. Professionals from all disciplines involved in ballast water or introduced marine species are invited to submit articles and letters to the Editor, for consideration for publication in Ballast Water News.

Under the programme, an Information and Communications Network is being established at IMO in London. This will provide a central reference point, clearing-house and communication facility for all Global information on invasive marine species in general and ballast water in particular.

The network will be largely electronic and internet based, including links with web-sites and databases maintained by other organizations. It is hoped that this will enhance communication between parties working on introduced marine species around the world, and thereby reduce the possibility of duplication. It will also include a hard copy collection of publications, housed in the IMO library.

I am most pleased to be a member of the Programme Coordination Unit at IMO and I look forward to serving as Technical Adviser to the programme and Contributing Editor for Ballast Water News over the next three years. Happy reading!



**Steve Raaymakers**  
Contributing Editor

## From the Programme

The initiation of this Global programme heralds a new era in the activities of IMO, representing a concerted effort to provide technical assistance to member countries to implement IMO guidelines and conventions.

An extremely important consideration during the development of programme will be to ensure coordination between each demonstration site and consistency with the international regime. As shipping is probably the most international industry, the only effective way to address shipping related issues is through a standardised international system. This has been one of the hallmarks of the success of IMO in its more than 50 year history. The avoidance of unilateral responses by individual states is critical to the success of the programme.

A key feature of the Global Ballast Water Management Programme is the level of cooperation between different agencies, countries, industry and other parties that it embraces. The programme sees the resources of the Global Environment Facility (GEF) being deployed through the United Nations Development Program (UNDP) to allow IMO to assist the governments of Brazil, China, India, Iran, South Africa and Ukraine, to protect their coastal and marine resources from the major threat of alien species introduced through ballast water.

As the programme develops, this cooperation will be extended to include additional governments in each region represented by the initial demonstration sites. After the completion of the programme IMO is committed to sustain the necessary mechanism to assist all member states as they strive to meet their obligations under the expected mandatory instrument.

Our role here at the Programme Coordination Unit is a challenging one, and we look forward to serving all programme partners to deliver successful and fruitful outcomes together.



**Dandu Pughiuc**  
Chief Technical Adviser



## The Problem

The introduction of invasive marine species into new environments by ships' ballast water, attached to ships' hulls and via other vectors has been identified by the GEF as one of the four greatest threats to the world's oceans. The other three are land-based sources of marine pollution, over exploitation of living marine resources and physical alteration/destruction of marine habitat.

Shipping moves over 80% of the world's commodities and transfers around 10 billion tonnes of ballast water across the globe each year.

Ballast water is absolutely essential

to the safe and efficient operation of modern shipping, providing balance and stability to un-laden ships. However, it may also pose a serious ecological, economic and health threat.

What is ballast water? Ballast is any material used to weight and/or balance an object. One example is the sandbags carried on conventional hot-air balloons, which can be discarded to lighten the balloon's load, allowing it to ascend.

Ships have carried solid ballast, in the form of rocks, sand or metal, for thousands of years. In modern times, ships use water as ballast. It is much less difficult to load on and off a ship, and is therefore more efficient and economical than solid ballast. When a ship is empty of cargo, it

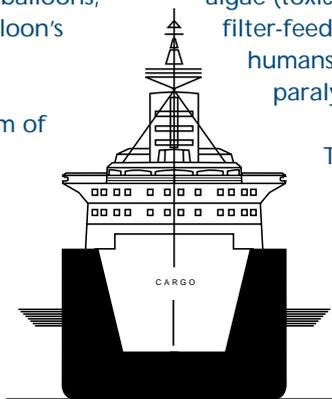
fills with ballast water to maintain its stability, balance and structural integrity. When it loads cargo, the ballast water is discharged

The problem of concern to this programme arises when this ballast water contains marine life. There are literally thousands of marine species that may be carried in ships' ballast water; basically anything that is small enough to pass through a ships' ballast water intake ports and pumps. This includes bacteria and other microbes, small invertebrates and the eggs, cysts and larvae of various species. In one case, healthy, live fish have been found swimming in a ship's ballast tank.

The development of larger, faster ships completing their voyages in ever shorter times, combined with rapidly increasing world trade, means that the natural barriers to the dispersal of species across the oceans are being reduced.

As a result, whole ecosystems are being changed. In the USA, the European Zebra Mussel *Dreissena polymorpha* has infested over 40% of internal waterways and has required over US\$1 billion in expenditure on control measures since 1989. In southern Australia, the northern Asian kelp *Undaria pinnatifida* is invading new areas rapidly, displacing the native seabed communities. In several countries, introduced, microscopic, 'red-tide' algae (toxic dinoflagellates) have been absorbed by filter-feeding shellfish, such as oysters. When eaten by humans, these contaminated shellfish can cause paralysis and even death.

The list goes on, hundreds of examples of major ecological, economic and human health impacts across the globe. It is even feared that diseases such as cholera might be able to be transported in ballast water.



Bulk carrier cross section

Shaded area = ballast tanks fitted for stability.  
Filled with seawater when ship empty of cargo.



### Case Study

- Species *Mnemiopsis leidyi*
- Common name Comb jelly
- Origin North America
- Introduced to Black Sea
- Via Ships' ballast water
- First recorded 1982
- Status Populations fluctuate, may exceed 1kg/m<sup>2</sup> in biomass throughout the entire Black Sea at times.

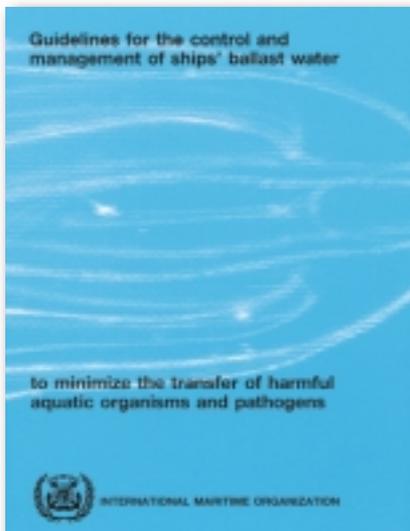
- Main impacts Massive decline in commercial fisheries due to reduction in plankton, which the Comb jelly feeds on. Losses estimated at US\$500M per year! Compounds other human impacts such as pollution.
- Management Options Increased regional cooperation. Prevent translocation of the Comb jelly from Black Sea. Research biological controls.

## The Global Response



In response to this threat, the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992, in its Agenda 21 called on the International Maritime Organisation (IMO) to take action to address the transfer of harmful organisms by ships.

As a specialised agency of the United Nations responsible for the international regulation of ship safety and the prevention of marine pollution, IMO is the most appropriate body through which to address this issue. By 1992 it had already been active in ballast water issues for over ten years.



The member countries of IMO have developed voluntary guidelines for the control and management of ships' ballast water, to minimise the transfer of harmful aquatic organisms and pathogens. These guidelines were adopted by the IMO Assembly in 1997, by resolution A.868(20). They replace earlier, less comprehensive voluntary guidelines adopted in 1993. Management and control measures recommended by the guidelines include:

- Minimising the uptake of organisms during ballasting, by avoiding areas in ports where populations of harmful organisms are known to occur, in shallow water and in darkness, when bottom-dwelling organisms may rise in the water column.
- Cleaning ballast tanks and removing muds and sediments that accumulate in these tanks on a regular basis, which may harbour harmful organisms.

- Avoiding unnecessary discharge of ballast.
- Undertaking ballast water management procedures, including:
  - Exchanging ballast water at sea, replacing it with 'clean' open ocean water. Any marine species taken on at the source port are less likely to survive in the open ocean, where environmental conditions are different from coastal and port waters.
  - Non-release or minimal release of ballast water.
  - Discharge to onshore reception and treatment facilities.



The shipping industry has also been very active in helping to address invasive marine species and participates actively in the IMO Marine Environment Protection Committee (MEPC) Ballast Water Working Group. In particular, the International Chamber of Shipping (ICS) and the International Association of Independent Tanker Owners (INTERTANKO) have published an excellent Model Ballast Water Management Plan. This gives practical guidance for the implementation of the IMO voluntary guidelines on board ships.

All of the approaches recommended under the IMO guidelines are subject to limitations. Reballasting at sea currently provides the best-available risk minimisation measure, but is subject to serious ship-safety limits. Even when it is able to be fully implemented, this technique is less than 100% effective in removing organisms from ballast water.

## The Global Response continued

Significant research and development efforts are therefore underway by a number of scientific and engineering research establishments around the world, aimed at developing a more complete solution to this problem. Options being considered include:

- Physical treatment methods such as filtration, separation and sterilisation using ozone, ultra-violet light, electric currents and heat treatment.
- Chemical treatment methods such adding biocides to ballast water to kill organisms.
- Biological treatment methods such as adding a predatory or parasitic organism to ballast water to kill any other organisms it might contain.

All of these possibilities currently require significant further research effort. Any control measure that is developed must meet a number of criteria, including:

- It must be safe.
- It must be environmentally acceptable.
- It must be cost-effective.
- It must work.



In recognition of the limitations of the current IMO voluntary guidelines, the current lack of a totally effective solution and the serious threats still posed by invasive marine species, IMO member countries have agreed to develop a mandatory international legal regime to regulate and control ballast water.

The IMO's MEPC and its Ballast Water Working Group, are well advanced with developing this regime and it is hoped that it will be agreed by member countries in 2002. It may take the form of a new Annex to the International Convention for the Prevention of Pollution from Ships (MARPOL), or a new international convention or other legal instrument in its own right.

## The GEF IW Project



In addition to the initiatives described above, IMO has joined forces with the GEF International Waters (IW) portfolio, the United Nations Development Programme (UNDP), member governments and the shipping industry to assist less-industrialised countries to tackle the ballast water problem.

The full title of this new project is *Removal of Barriers to the Effective Implementation of Ballast Water Control and Management Measures in Developing Countries*. It is more simply referred to as the *Global Ballast Water Management Programme*.

This programme will assist developing countries to implement effective measures to control the introduction of foreign marine species, initially through six demonstration sites. These are intended to represent the six main developing regions of the world, being (Refer Map):

- |                                 |                     |
|---------------------------------|---------------------|
| ● <b>Dalian/China</b>           | East Asia,          |
| ● <b>Mumbai/India</b>           | South Asia,         |
| ● <b>Kharg Island/Iran</b>      | Middle East,        |
| ● <b>Cape Town/South Africa</b> | Africa,             |
| ● <b>Odessa/Ukraine</b>         | Eastern Europe, and |
| ● <b>Sepitiba/Brazil</b>        | South America.      |

It is planned that as these sites progress, they will be replicated throughout each region in the future. Lessons learned from the initial demonstration sites will be valuable in improving ballast water management and reducing the translocation of harmful marine species in each region.

The programme will provide a mechanism for the ongoing provision of technical assistance to less industrialised countries to implement the new IMO ballast water regime when it comes into force, through the continuation of an in-house ballast water unit at IMO after the three years of the GEF IW project. This will build on the groundwork conducted by the initial Programme Coordination Unit.

## Development Objectives

The broad development objectives of the programme are:

- Assist developing countries to reduce the transfer of harmful organisms from ships' ballast water.
- Increase adherence by these countries to the current IMO voluntary guidelines on ballast water management.
- Assist these countries to prepare for the implementation of the IMO mandatory regime when it comes into force.

## Immediate Objectives

In order to achieve the broad development objectives, the programme has a number of Immediate Objectives, which are linked to specific Outputs and Activities. These are:

- Programme coordination and management.
- Communication, education and awareness.
- Risk Assessment.
- Ballast water management measures.
- Compliance, enforcement and monitoring.
- Regional cooperation and replication.
- Resources and financing.

An extremely important consideration will be to ensure coordination between each site and consistency with the international regime. As shipping is an international industry, the only effective way to address shipping related issues is through a standardised international system. This has been one of the hallmarks of the success of IMO in its 50 year history. The avoidance of unilateral responses by individual states is critical to the success of the programme.

## Timeline and Funding

This is a three-year programme (2000-2003).

The total budget is US\$10.2 million, comprising:

- US\$7.39 million from GEF
- US\$2.8 million in co-funding from the six participating countries.

## Programme Management

The programme is being implemented by UNDP and executed by IMO, under the GEF International Waters portfolio.

A three person PCU has been established within the Marine Environment Division (MED) at IMO headquarters in London.

The PCU has the benefit of the support, facilities and services of IMO. High priority is being given to coordinating the activities of the programme with the broader activities of IMO, especially the development of the international ballast water regulatory regime by MEPC.

Country Focal Points (CFPs) and CFP Assistants have been established in each of the six participating countries.

Overall, the programme will be advised by a Global Project Task Force (GPTF). This will comprise representatives of GEF, UNDP, IMO and the six participating countries, the shipping industry and possible other parties that are able to contribute to the programme in a meaningful way.

## Have your say!

Please feel free to submit articles or letters to the editor for consideration for publication in **Ballast Water News**  
[mbaker@imo.org](mailto:mbaker@imo.org)

## Would You like to receive Ballast Water News in the future?

Please fax or e-mail your name and postal address to the Programme Coordination Unit

Fax +44 20 7587 3261 ■ E-mail [mbaker@imo.org](mailto:mbaker@imo.org)  
 Ballast Water News will also be posted on [www.imo.org](http://www.imo.org)



## Programme Summary



- Development Objectives**
- Assist developing countries to reduce the transfer of harmful aquatic organisms in ships' ballast water.
  - Assist developing countries to implement the IMO voluntary guidelines (A.868(20)) and prepare for the IMO mandatory regulatory regime.

**Timeline**

- Three years – May 2000 to May 2003.

- Initial funding**
- US\$7.6 million from Global Environment Facility (GEF). US\$2.8 million support-in-kind from participating countries.

**Implementation**

- United Nations Development Program (UNDP).

**Execution**

- International Maritime Organization (IMO), through Programme Coordination Unit (PCU).

**Recipients/beneficiaries**

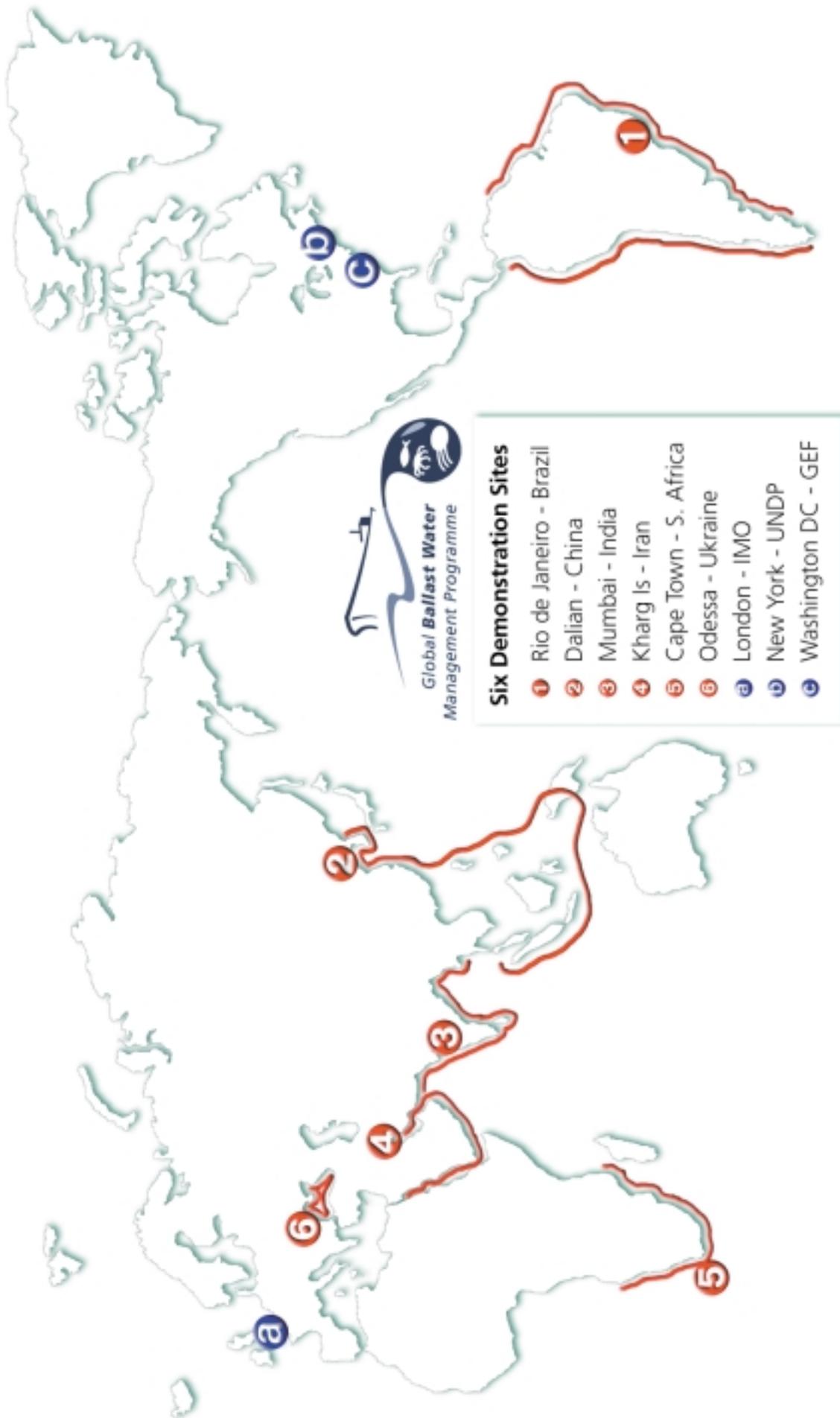
- Initially, six pilot countries/demonstration sites, to be replicated throughout regions.

**Partners**

- Shipping and port industries, international environmental non-government organisations, other parties as programme develops.

**Activities to be undertaken**

- Establish Programme Coordination Unit at IMO, comprising Chief Technical Adviser, Technical Adviser, Programme Assistant and support.
- Establish Info/Comms Network – including web-site, databases/directories, library collection, newsletter and Global communications system.
- Establish and support Lead Agency, Country Focal Point (CFP), Country Project Task Force (CPTF) and CFP Assistant in each pilot country.
- Establish Global coordination arrangements – Global Project Task Force (GPTF).
- Develop and implement communication, education and awareness raising programmes, including:
  - Generic materials – posters, pamphlets, brochures, videos etc to raise awareness of the issue in the pilot countries and elsewhere.
  - Case Studies of the economic, ecological and human health impacts of ballast water introductions to raise awareness.
  - Country Communication Workshops and National Communication Workplans in each country.
- Undertake Ballast Water Risk Assessments to assess risk of introductions of marine species at each demonstration site.
- Undertake Port Baseline Surveys of native biota and introduced marine species at each demonstration site.
- Develop Training Packages to train Lead Agency port and shipping personnel in ballast water management measures as contained in IMO guidelines.
- Review legislation relevant to ballast water in each country and advise/assist improvements.
- Develop and implement National ballast water management plans for each pilot country.
- Hold global R&D symposium to review scope for new ballast water management and treatment measures and coordinate R&D agenda.
- Develop Compliance Monitoring and Enforcement (CME) systems for each demonstration site, including ballast water sampling equipment and training.
- Form Regional Task Forces (RTFs), support RTF meetings and study tours to the demonstration sites by personnel from neighbouring countries.
- Identify long term economic instruments that can be used to resource in-country ballast water management arrangements.
- Hold a Global Donor Conference to identify and secure donors for subsequent phases of the programme.





## Progress Report

### Activities Undertaken April – June 2000:

- ✓ PCU established at IMO London.
- ✓ Lead Agencies and CFPs designated in each country.
- ✓ CFP Assistants engaged in most countries.
- ✓ CTF Guidelines produced.
- ✓ CTFs formed and 1st meetings held in each country.
- ✓ PCU inception country visits undertaken.
- ✓ Workplan and budget reviewed.
- ✓ 1st issue of Ballast Water News produced.
- ✓ Arrangements completed for 1st GPTF Meeting.



### Activities Planned July – September 2000:

- Hold 1st GPTF Meeting 5-7 July.
- Establish Info/Comms Network and website.
- Commence development of National Workplans.
- Reprint/distribute IMO Guidelines.
- Hold Country Communication Workshops.
- Commence Case Studies.
- Produce generic education/awareness materials.
- Produce 2nd issue of Ballast Water News.



## More Information?

Check out these web-sites:

- [www.imo.org](http://www.imo.org) – International Maritime Organization.
- [www.ml.csiro.au/~spinks/CRIMP/](http://www.ml.csiro.au/~spinks/CRIMP/) - Australian Centre for Research on Introduced Marine Pests (CRIMP).
- [www.ku.lt/nemo/mainnemo.htm](http://www.ku.lt/nemo/mainnemo.htm) – Baltic Research Network on Invasions and Introductions.
- <http://members.aol.com/sgollasch/sgollasch/index.htm> – European Union Concerted Action Programme.
- [www.zin.ru/projects/invasions/](http://www.zin.ru/projects/invasions/) - Russian Group on Aquatic Alien Species.
- <http://invasions.si.edu/> - USA Smithsonian Environmental Research Centre, includes:
  - <http://invasions.si.edu/ballast.htm> – National Ballast Water Information Clearing House.
  - <http://invasions.si.edu/nis.htm> – National Marine & Estuarine Invasions Database.
  - <http://invasions.si.edu/aird.htm> – Aquatic Invasions Research Directory.
- [www.ichcabulk.org](http://www.ichcabulk.org) – International Cargo Handling Co-ordination Association (ICHCA) Bulk Panel.
- [www.intertanko.com](http://www.intertanko.com) – International Association of Independent Tanker Owners (INTERTANKO).

*More web-sites next issue. To contact the PCU – see details on front page.*

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