

(2nd Edition)

The 1st NOWPAP Workshop on Marine Litter

8-9 June 2006

Song-Do Get-Pearl Tower, Incheon, the Republic of Korea



UNEP



IMO

Organized by

Northwest Pacific Action Plan (NOWPAP)

Marine Environmental Emergency Preparedness and Response Regional Activity Centre (MERRAC)

Sponsored by

 Korean Ministry of Maritime Affairs and Fisheries (MOMAF),  Incheon Metropolitan City, Republic of Korea

Supported by

NOWPAP Regional Coordinating Unit (RCU)

United Nations Environment Programme (UNEP)

International Maritime Organization (IMO)

CONTENTS

Summary of the 1st NOWPAP Workshop on Marine Litter	1
Program	5
Opening Ceremony	7
Keynote Speech	17
□ Marine Litter: A Global Challenge	19
<u>Ellik Adler</u> and <u>Ljubomir Jeftic</u>	
Special Lectures	37
□ Prevention of Marine Litter Pollution under IMO Conventions	39
Miguel Palomares	
□ The Marine Litter Activity in the NOWPAP Region	55
Jeung-Sook Park	
□ Korean Policy on Marine Litter	65
Jeong-Seok Yu	
Session 1 : Current Status of Monitoring and Distribution of Sea-based Marine Litter	73
□ The Marine Litter from Fishery Source in Yellow and Bohai Sea - Status and Measures	75
Weichi Kang	
□ Observation for Floating Plastics in the Seas Adjacent to Japan and the Western North Pacific by Japan Meteorological Agency	85
Mitsuhiko Ida	
□ Marine Debris Monitoring System in Korea	91
Dong-Oh Cho, Sun-Wook Hong and Jong-Myoung Lee	
□ Principals of Arrangements for Litter Monitoring in Harbor Waters	99
Yana Yu. Blinovskaya	

Session 2 : Policy and Management for Sea-based Marine Litter in NOWPAP region	113
□ China's Policy on Management of Marine Litter from Ships Cuiming Xu	115
□ Overview of Marine Litter Problems and Measures in Japan Yuji Adachi	129
□ The Cost-Sharing System for Managing the Marine Litter by Agreement Among the Administrative Organization of around the Capital Area in Korea Young-Gwon Ha, Kyeong-Doo Cho and Sung-Woo Kim	141
□ Activity of the Primorye Government for Sea-Based Marine Litter in Vladivostok Sergey Moninets	155
Session 3 : Current Status of the Treatment and Recycling Technology Development of Sea-based Marine Litter and Others	165
□ Legal Instruments and Institutional Arrangements Related to Marine Litter in China - Summary and Analysis Linlin Hu, Binghui Zheng and Xianfeng Wu	167
□ Case Study of the Treatment and Recycling Technology Development of Marine Litter Related to Fishery in Japan Yasutsugu Yokohama	179
□ The Result of “The Project of Purchasing Marine Wastes Pulled up During Fishing” in Korea Nam-Keun Jung, Seung-Taek Hwang and Seong-Oh Im	193
□ Basic Factors of Khabarovskij Kray Southern Seashore Pollution Alexey N. Makhinov	205
List of Participants to the 1st NOWPAP Workshop on Marine Litter	207

The FIRST NOWPAP WORKSHOP ON MARINE LITTER

(Incheon, Republic of Korea, 8-9 June 2006)

SUMMARY OF THE WORKSHOP

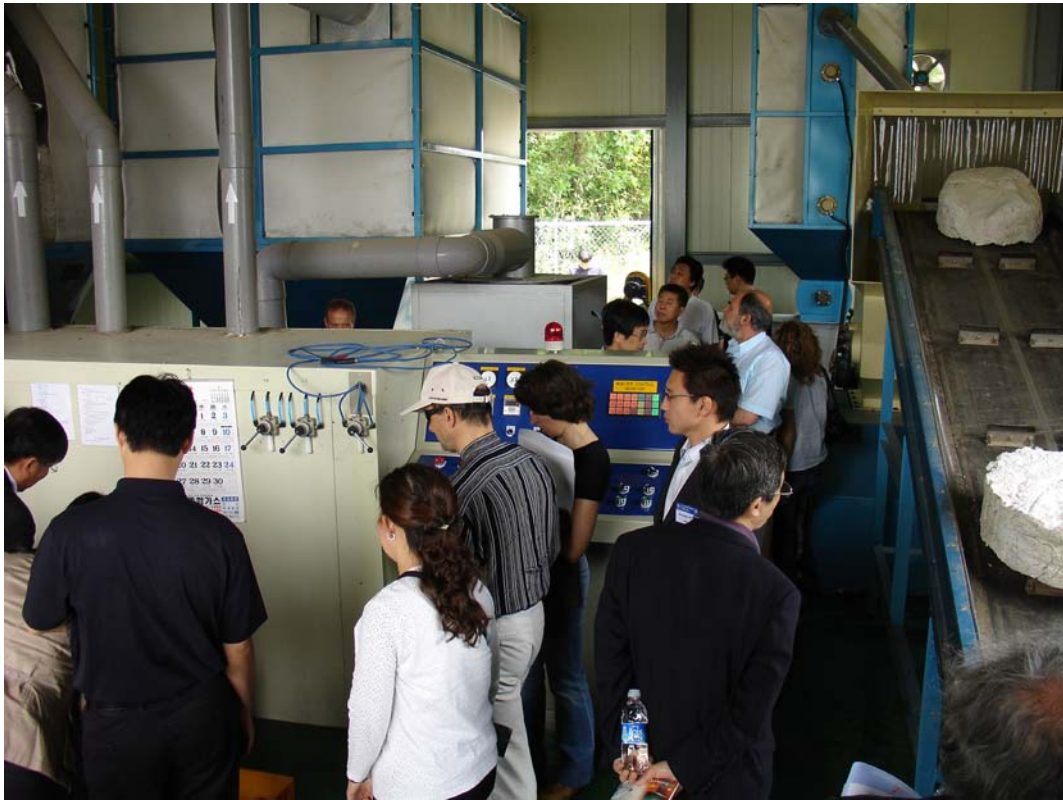
- The 1st NOWPAP Workshop on Marine Litter was held from 8 to 9 June 2006 with the participation from the NOWPAP Members (People's Republic of China, Japan, Republic of Korea and Russian Federation), United Nations Environment Programme (UNEP), International Maritime Organization (IMO) and Non-Governmental Organizations.
- A total of 15 presentations were made at the workshop by representatives of UNEP, IMO, NOWPAP Regional Coordinating Unit (RCU) and member states with respect to marine litter monitoring, distribution, policies and management, treatment and recycling technologies. Additionally, a side event was organized in order to learn about the Korean Buyback Programme of marine litter from fishermen and technological approaches to collect marine litter. Also, a visit to a recycling facility for treating discarded polystyrene was arranged. The workshop and field trip were financially sponsored by the Ministry of Maritime Affairs and Fisheries and Incheon Metropolitan City, the Republic of Korea.
- The participants of the workshop discussed and made comments on existing data and information related to the marine litter, especially the ones from the sea-based sources in the region, and exchanged their relevant experience and expertise. Recognizing the severity of the problems imposed by the marine litter on the marine and coastal environment of the NOWPAP region and the transboundary nature of the problem, the workshop participants re-affirmed the need for co-operation among the NOWPAP members and also between the NOWPAP and the neighboring Regional Seas such as COBSEA in order to better cope with the marine litter problem.
- The participants noted that marine litter monitoring, related regulations and policies as well as treatment technologies already exist in this region. Nevertheless, the participants came to an understanding that further efforts are continuously needed to co-ordinate these regional activities, raise awareness of marine litter problem, increase participation of all concerned stakeholders, and exchange information, experience, expertise and lessons learned. Also, they agreed that there is a need for the countries in the Region to manage the sea-based marine litter issue through the full implementation of existing global regulations such as those contained in the London Convention concerning dumping at sea and MARPOL Annex V with respect to ship-generated garbage, and also to manage the issue based upon the NOWPAP Marine Litter Activity (MALITA) project approved by the 10th NOWPAP Intergovernmental Meeting.
- The participants reached a consensus that the workshop should be continuously organized and that the topics of the next workshop should include regional- and/or sub-regional specific issues.



< Participants to the 1st NOWPAP Workshop on Marine Litter >



< Technical Trip related to Marine Litter Facilities and Equipment >



< Recycling Facility for Treating Formed Styrene >



< Buyback Programme of Marine Litter from Fishermen >



< Collecting Deposited Marine Litter >



< Collecting Drifted Marine Litter >

PROGRAM

1st Day : 8 June 2006 (Thursday)

09:00~09:30	Registration
09:30~10:00	Opening Ceremony (Session Chair: Dr. Seong-Gil Kang, NOWPAP MERRAC) <ul style="list-style-type: none">- Opening Address: Dr. Chang-Gu Kang, Director, NOWPAP MERRAC- Welcoming Addresses:<ul style="list-style-type: none">• Mr. Pyeoung-Sik Shin, Director-General, Ministry of Maritime Affairs and Fisheries, Republic of Korea• Mr. Myung-Soo Cheon, Deputy Mayor, Incheon Metropolitan City, Korea- Congratulatory Address: Dr. Alexander Tkalin, NOWPAP Coordinator
10:00~10:20	Photo Session & Coffee Break
10:20~10:50	Keynote Speech: <ul style="list-style-type: none">- Marine Litter: A Global Challenge (Dr. Ellik Adler, UNEP)
10:50~12:00	Special Lectures: <ul style="list-style-type: none">- Prevention of Marine Litter Pollution under IMO Conventions (Mr. Miguel Palomares, IMO)- The Marine Litter Activity in the NOWPAP Region (Dr. Jeung-Sook Park, NOWPAP RCU)- Korean Policy on Marine Litter (Dr. Jeong-Seok Yu, Ministry of Maritime Affairs and Fisheries, Korea)
12:00~13:30	Lunch
13:30~14:50	Session 1 : Current Status of Monitoring and Distribution of Sea-based Marine Litter (Session Chair: Mr. Yudong Zhu, People's Republic of China) <ul style="list-style-type: none">- The Marine Litter from Fishery Source in Yellow and Bohai Sea - Status and Measures (Ms. Weichi Kang, Ministry of Agriculture of China)- Observation for Floating Plastics in the Seas Adjacent to Japan and the Western North Pacific by Japan Meteorological Agency (Mr. Mitsuhiro Ida, Ministry of Land, Infrastructure and Transport of Japan)- Marine Debris Monitoring System in Korea (Dr. Dong-oh Cho, Korea Maritime Institute)- Principles of Arrangements for Litter Monitoring in Harbor Waters (Dr. Yana Yu. Blinovskaya, Maritime State University, Russia)

14:50~15:10	Coffee Break
15:10~16:30	<p>Session 2 : Policy and Management for Sea-based Marine Litter in NOWPAP region(Session Chair: Dr. Takashi Kusui, Japan)</p> <ul style="list-style-type: none"> - China's Policy on Management of Marine Litter from Ships (Ms. Cuiming Xu, China Maritime Safety Administration) - Overview of Marine Litter Problems and Measures in Japan (Mr. Yuji Adachi, Ministry of the Environment of Japan) - The Cost-Sharing System for Managing the Marine Litter by Agreement Among the Administrative Organization of Around the Capital Area in Korea (Mr. Kyeong-doo Cho, Incheon Metropolitan City, Korea) - Activity of the Primorye Government for Sea-based Marine Litter in Vladivostok (Mr. Sergey Moninets, Ministry of Transport of Russia)
16:30~17:50	<p>Session 3 : Current Status of the Treatment and Recycling Technology Development of Sea-based Marine Litter and Others(Session Chair: Mr. Vladimir Shulkin, Russian Federation)</p> <ul style="list-style-type: none"> - Legal Instruments and Institutional Arrangements Related to Marine Litter in China - Summary and Analysis (Mr. Linlin Hu, Chinese Research Academy of Environmental Sciences) - Case Study of the Treatment and Recycling Technology Development of Marine Litter related to Fishery in Japan (Dr. Yasutsugu Yokohama, Organization to Promote Conservation of Sea and Seashore (Marine Blue 21), Japan) - The Result of "The Project of Purchasing Marine Wastes Pulled up During Fishing" in Korea (Mr. Seong-Oh Im, Korea Marine Pollution Response Corp.) - Basic Factors of Khabarovskij Kray Southern Seashore Pollution (Dr. Alexey N. Makhinov, Russian Academy of Sciences)
17:50~18:30	Discussion and Summary
18:30	Dinner

2nd Day : 9 June 2006 (Friday)

09:00~18:00	Technical Trip (related to marine litter facilities and equipments)
-------------	--

Opening Ceremony

OPENING ADDRESS

by

Dr. Chang-Gu Kang, Director, NOWPAP MERRAC

His Excellency Mr. Pyeoung-Sik Shin, Director-General of Marine Policy Bureau of Ministry of Maritime Affairs and Fisheries,
Mr. Myung-Soo Cheon, Deputy Mayor for Administrative Affairs of Incheon Metropolitan City,
Dr. Ellik Adler, United National Environment Programme,
Mr. Miguel Palomares, International Maritime Organization,
Dr. Alexander Tkalin, NOWPAP Regional Co-ordinating Unit
Distinguished Delegates from 4 NOWPAP Members, People's Republic of China, Japan, Republic of Korea and Russian Federation,
Distinguished Workshop Presenters and Participants,
Ladies and Gentlemen!

It is my great honor to announce the official opening of the First NOWPAP Workshop on Marine Litter. First of all, I welcome warmly all of you to the 1st NOWPAP Workshop on Marine Litter. Also, I would like to express sincere gratitude to the Government of the Republic of Korea and the Incheon Metropolitan City, and United Nations Environment Programme (UNEP), International Maritime Organization (IMO) for their support and contributions in organizing this workshop.

Ladies and Gentlemen,

As you are already fully aware, the marine litter became a major part of marine pollution which destroys the ecological, economic, cultural, recreational and aesthetic values of the marine ecosystem and its components. In acknowledging the serious problem imposed by the marine litter in the Northwest Pacific region, 4 NOWPAP members – People's Republic of China, Japan, Republic of Korea, and Russian Federation approved the Marine Litter Activity (which is MALITA) at the 10th Intergovernmental Meeting on Northwest Pacific Action Plan (NOWPAP) November 2005.

Under the framework of this MALITA project, NOWPAP members and NOWPAP institutions will carry out various activities to respond the marine litter problem in this region. We, MERRAC, as one of NOWPAP regional activity center, will do our best to implement the given missions successfully.

As one of important activities for MALITA, this 1st NOWPAP Workshop on Marine Litter was organized with participation of the competent authorities from NOWPAP members and relevant global organizations, through which we wish to develop efficient countermeasures to control the marine litter problems in this region.

1 Day workshop and 1 day facility tour are now planned. I am fully sure that this workshop will be a good opportunity for NOWPAP members to exchange their experience and expertise related to marine

litter and to design the future detailed common activities against marine litter. Also, in tomorrow facility tour you will have a chance to visit a polystyrene-volume-reduction facility, which is a kind of recycling system, the site of purchasing marine litter for fisherman, etc.

Once again, on behalf of NOWPAP MERRAC I would like to extend my sincere appreciations to all of you for your contributions and supports to this workshop.

Thank you very much.

WELCOMING ADDRESS

by

*Mr. Pyeoung-Sik Shin, Director-General, Marine Policy Bureau,
Ministry of Maritime Affairs and Fisheries, Republic of Korea*

Distinguished Delegates from 4 NOWPAP Members, People's Republic of China, Japan, Republic of Korea and Russian Federation,

Dr. Ellik Adler, Chief of the Regional Seas Branch of UNEP,

Dr. Alexander Tkalin, Coordinator of NOWPAP,

Mr. Miguel Palomares, Senior Deputy Director of Marine Environment Division of IMO,

Mr. Myung-Soo Cheon, Deputy Mayor for Administrative Affairs of Incheon Metropolitan City,

I feel very much honored to make this welcoming address in the First NOWPAP Workshop on Marine Litter on behalf of the Ministry of Maritime Affairs and Fisheries.

As you know, the First International Workshop on Marine Litter in the Northwest Pacific Region was held last November in Toyama, Japan. And the Toyama workshop gave us a chance to raise the awareness on marine litter issues and to extend our efforts to resolve those issues.

I believe that today's workshop is a process to reach our goal with our attention and efforts on marine litters as well as a beginning step for the further take-off in marine environment field. In that sense, this venue is obviously significant and precious.

Ladies and gentlemen, distinguished guests!

Under the infinite competition between countries and in the rapid and dramatic economic development and industrialization, our world in the 21'st century has been faced with issues of polluted environment in all sectors including water, air, earth, and underground water as well as ocean, thereby imposing a severe threat to our living conditions and environments.

In particular, ocean and marine have provided us with aesthetically wonderful view of nature and abundant natural resources, but unfortunately ocean and marine pollution issues have been relatively excluded and marginalized at the pollution discussion table, compared with land pollution issues.

And, as a result of it, our ocean has been so much contaminated by various pollutants including oil and litters as well as land-based sources of pollution that it now seems almost to lose its self-purification capability.

Particularly in recent days, floating litters in ocean have been introduced into foreign countries, raising an issue of marine litter migration. So, NOWPAP is well aware of the severity of this issue and planning to put this issue on the priority agenda and to act for the resolution of the issue.

In Korea as well, the marine litter has damaged our costal and marine community by reducing the fishery resources and degrading coastal sceneries and views. So, we, the Ministry of Maritime Affairs and Fisheries, are taking the lead in coming up with action plans for marine litter issues.

First, we have made continuous efforts to reduce marine litters by cutting the amount of fishery gears used in ocean and by preventing dumping of litters and waste into ocean through legal actions.

Also, in order to collect marine litters introduced into our coast and ocean, since 1999, we have annually poured more than 30 billion won out of central and local governments' budget into the marine litter reception activities

Besides, residents at the local communities, civil society members and local governments are working together in coast clean-up activities.

With all those efforts, we now see somewhat improvement, but I still believe more fundamental way to solve the issue is to prevent the pollution sources from the beginning stage.

Like that, it should be the first step for each country to thoroughly manage its own nation-generated litters, and in terms of unavoidably travelling litters, we have to fully discuss the issues in workshops like this one so that the outcome of discussion can be reflected in the intergovernmental meetings.

Ladies and gentlemen, and honorable guests from home and abroad!

I sincerely hope that this workshop held in Incheon, the international marine city, will be a venue for all of you experts and delegates from each country and international bodies to have a successful discussion session.

And at the same time, I am looking forward further opportunities for discussion on marine pollution issues at the international level thereby contributing to solving the marine environmental issues of the Northwest Pacific Region.

Thank you very much.

WELCOMING ADDRESS

by

Mr. Myung-Soo Chun, Deputy Mayor, Incheon Metropolitan City, Republic of Korea

Good morning, I am pleased to be here with you today.

Distinguished guests from United Nations Environment Program (UNEP), International Maritime Organization (IMO), Northwest Pacific Action Plan (NOWPAP) member states and Ministry of Maritime Affairs and Fisheries, and ladies and gentlemen!

It's my pleasure to welcome all of you to this international port city of Incheon.

Many countries in the world are working on maritime issues, and Incheon is also focusing on becoming a competitive hub city of Northeast Asia by enhancing quality of life of its people based on Incheon International Airport (IIA) and seaport.

I think this workshop is very significant in that Pacific countries have gathered together to discuss matters of common interest. And it is my great honor to join you today.

The ocean has been a central factor in Incheon City's historical and economic development, and will continue to play a major role as this city transforms into an international business center.

Incheon is a dynamic city, building Korea's new economic growth engine, based on our state-of-the-art international airport and the Incheon Free Economic Zone comprised of the Songdo, Yeongjong and Cheongna Areas.

In addition, the Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT), the first United Nations agency in Korea, will be inaugurated in Songdo International City later this month. The bid to host the 2014 Asian Games, as well as the scheduled relocation to Songdo of major Korean and foreign educational institutions, will be a major boost to the image of Incheon as an international city.

In the past, there was a lack of awareness in the local marine environment, which has had a negative impact on the ecosystem, decreased the fishing resources and led to economic difficulties for the local fishing industry.

Now, I'm proud to say, Incheon is transforming into an eco-friendly maritime city, protecting our sea and tidal flats, and our beautiful 155 islands, as we build a world-class infrastructure and develop our tremendous potential.

In order to prevent contamination of the sea, due to waste flowing from the mainland, Incheon joined, in 2002, with neighboring Seoul, and the Gyeonggi Provincial government, to commit 28.5 billion won on improving the water quality off the city's coast.

Moreover, Incheon is Korea's first local government to operate an advanced ocean cleaning vessel, encourage fishermen to collect marine garbage, and has installed litter-blocking filters in the sewer system.

The marine environment will be increasingly more important in the 21st century, and we should work together to protect our precious common ocean resources.

I hope this NOWPAP workshop will help countries to solve the issue of ocean litter, and establish mechanisms for international cooperation.

Also, I ask that the distinguished guests support our efforts to keep Incheon's ocean waters clean.

Once again, I'd like to thank all the distinguished guests for taking the time to attend this workshop, and I wish you a memorable and pleasant stay in Incheon.

CONGRATULATORY ADDRESS

by

Dr. Alexander Tkalin, NOWPAP Coordinator

Mr. Pyeong-Sik Shin, Director-General, Ministry of Maritime Affairs and Fisheries,
Mr. Myung-Soo Cheon, Deputy Mayor, Incheon Metropolitan City,
Dr. Elik Adler, UNEP, and Mr. Miguel Palomares, IMO,
Dr. Chang-Gu Kang, Director of NOWPAP MERRAC,

Ladies and Gentlemen, colleagues and friends including Dr. Srisuda Jarayabhand from COBSEA and Ms. Connie Chiang from the YSLME project,

It is my great pleasure to make a congratulatory address at the First NOWPAP Workshop on Marine Litter. At the beginning of my speech, I must thank the organizers first for their hard work to prepare this meeting. My sincere appreciation further extends to the Ministry of Maritime Affairs and Fisheries and the Incheon Metropolitan City for their generous support and warm hospitality. I am also glad to see here representatives from all NOWPAP member states, participants from research institutions, NGOs and the general public.

Marine litter is certainly the global problem that threatens the marine environment, living organisms, and even human health and safety. Unfortunately, in spite of existing international legal instruments addressing marine litter, the problem is getting worse. There are several reasons:

The first reason comes from our attitude: someone may leave garbage after enjoying a day at the beach; a significant proportion of marine litter is also garbage that is thrown overboard or lost from ships. So, unless we change our behavior and habits to minimize the generation of garbage, the overall marine litter situation will not improve.

Another reason is lack of land-based infrastructure to receive marine litter properly.

Last, but not least, is lack of awareness of the severity and impact of marine litter on the marine and coastal environment among stakeholders, NGOs and the general public including school kids as well as people involved in different sectors of industry such as shipping, fisheries, plastic manufacturing etc.

In fact, we can not resolve the marine litter problem overnight. It will take time to improve the marine litter problem. In this regard, I would like to stress that the best solution to cope with the marine litter problem is to work together: government officials, researchers, those who work in private sector, NGOs, and the general public – only together we can achieve positive results from our efforts to combat the marine litter.

I wish this workshop to be very successful.

Thank you very much.

Keynote Speech

MARINE LITTER: A GLOBAL CHALLENGE

Ellik Adler and Ljubomir Jeftic***

**Senior Programme Officer, Chief of the Regional Seas Branch
Division of Environmental Conventions, United Nations Environment Programme*

P.O.Box 20552 Nairobi, Kenya, Ellik.Adler@unep.org

***UNEP Consultant, Zagreb, Croatia*

INTRODUCTION

Marine litter is found in all sea areas of the world – not only in densely populated regions, but also in remote places far away from any obvious sources. The problem of marine litter is cultural and multi-sectoral. The root causes are generally poor management of human activities or inadequate understanding on the part of the public and workers of the potential consequences of their behaviour. The barriers to change are largely resistance to change, deficiencies in public information and a lack of comprehension of the dangers associated with current practices among the public and workers.

A number of countries have taken some initial steps to address the marine litter issue through legislation, enforcement of international agreements, providing reception facilities for ship-generated wastes, improving their waste management practices and supporting extensive beach cleanup activities, as well as through the initiation of information, education and public awareness programmes. Thus, many activities have already been started but, clearly, not enough has yet been done.

In this paper particular emphasis will be given to the problem of abandoned, lost, and derelict fishing gear (ALFG). During the 1950s, most of the world's fishing industries largely replaced nets and gear made of natural fibres such as cotton, jute and hemp with those made of synthetic materials, such as nylon, polyethylene and polypropylene. The problem with these materials is that unlike natural fibre gear that degrades over time, synthetic fishing gear is functionally resistant to degradation in the water. Hence, once discarded or lost, this gear remains in the marine environment, with negative economic and environmental impacts. As an example of the problem the UNEP's 'Marine Litter – An Analytical Overview' reports that in 2002, the National Oceanic and Atmospheric Administration (NOAA) collected 107 tonnes of nets and lines and other fishing gear on the Pearl and Hermes Atoll (northern Hawaiian Islands) alone. In 2003, another 90 tonnes were found near the Pearl and Hermes, and Midway Islands.

THE REGIONAL SEAS PROGRAMME

UNEP's Regional Seas Programme, initiated in 1974, provides a legal, administrative, substantive and financial framework for the implementation of Agenda 21, (in particular chapter 17 on oceans), for the Plan of Implementation of the World Summit on Sustainable Development (WSSD, Johannesburg 9/2002) and more recently, for the Bali Strategic Plan. The Programme restates that

sustainable development of the oceans requires effective coordination and co-operation, at the global and regional levels, and between relevant bodies. The UNEP's Regional Seas Programme is based on regional Action Plans, related to the environmental conservation and management of a common body of water. These plans are usually adopted by high-level intergovernmental meetings and implemented, in most cases, in the framework of a legally binding Regional Seas Convention and its specific protocols, under the authority of the respective Contracting Parties or Intergovernmental Meetings.

Currently, seventeen regions are covered by adopted Action Plans: Thirteen regional Action Plans have been established under the auspices of UNEP: The Wider Caribbean (Cartagena Convention), East Africa (Nairobi Convention), East Asia (COBSEA), Mediterranean (Barcelona Convention), North-West Pacific (NOWPAP), West and Central Africa (Abidjan Convention), are directly administered by UNEP and the Black Sea (Bucharest Convention), the ROPME Sea Area (Kuwait Convention region), North-East Pacific (Antigua Convention), Red Sea and Gulf of Aden (Jeddah Convention), South Asia (SAS – SACEP), South-East Pacific (CPPS, Lima Convention) and South Pacific (SPREP Noumea Convention), which are independently administered by their regional secretariats. Similar independent regional programmes and agreements are in place in the Antarctic (CCMLAR), the Arctic (PAME), the Baltic Sea (Helsinki Convention, HELCOM), the Caspian (Teheran Convention) and North-East Atlantic (Oslo Paris Convention, OSPAR). Plans for a new programme in the South-West Atlantic are under consideration.

Altogether, more than 140 countries participate in at least one Regional Seas Action Plan and/or conventions aiming for sustainable use and management of the ocean and coastal areas.

Each of the RSP's Action Plans is based on the respective region's particular environmental concerns and challenges, as well as its socio-economic and political situation. Most RS Programmes evolved around a common axis and their identified **shared priorities include:**

- Land-based sources of marine and coastal pollution
- Ship-generated marine pollution (oil, chemicals, litter, invasive species)
- Increased urbanization and coastal development causing destruction of ecosystems and habitats
- Conservation and management of marine and coastal ecosystems
- Integrated Coastal Area Management (ICAM) and Integrated Coastal Area and River Basin Management (ICARM)
- Over-exploitation and depletion of living marine resources, including fisheries
- Monitoring, reporting and assessment of the marine environment

A decision of the 22nd UNEP Governing Council (Nairobi, February, 2003) set out the elements of a new global strategy for the Regional Seas Programmes. The strategy is based on the central idea that the Regional Seas Conventions and Action Plans serve two major objectives:

1. As a principal **platform for regional implementation of global conventions, MEAs** (Multilateral Environmental Agreements) **and global programmes** or initiatives – that is, to provide the UN agencies or global programmes an existing regional mechanism through which they could implement their activities on a regional scale; and
2. As a **regional platform** for co-ordination of activities that **will contribute to sustainable development** of the shared marine and coastal environment.

This set the base for developing the new Strategic Directions for 2004-2007 by the 5th and 6th Global Meetings of the Regional Seas, Nairobi, November 2003 and Istanbul, December 2004.

The new global strategic directions identify actions to be implemented during 2004-2007 to enhance the RSP at the global level, while continuing the implementation of the action programmes of the individual RSPs as agreed upon by their governing bodies. **The following are the new strategic elements or directions:**

1. **Increase the Regional Seas Programme's contribution to sustainable development** through the development of partnerships with relevant social, economic and environmental stakeholders.
2. **Enhance sustainability and effectiveness** of the Regional Seas Programmes through increasing country ownership, national legislation, compliance and enforcement, and through involving civil society and the private sector, building capacities, ensuring viable financial arrangements.
3. **Enhance the Regional Seas Programme's visibility and political impact** in global and regional policy setting, through the establishment of a strengthened 'RS Alliance', addressing emerging and priority issues, and ensuring participation of Regional Seas in the relevant regional and global *fora*.
4. **Support knowledge-based policy-making**, improve knowledge on the state of the marine environment through scientific monitoring and assessment and **enhance public awareness**.
5. **Increase the use of the Regional Seas Programme as a platform** for promoting synergies and coordinated regional implementation of relevant MEAs, global and regional initiatives and responsibilities of United Nations Agencies, such as IMO, IAEA, IOC of UNESCO and FAO and other international relevant actors as.
6. Promote the development of a universal vision and integrated management, based on the **ecosystem approach**.

Putting prominent emphasis on the effort to address the issue of Marine Litter in general and of Abandoned and Lost Fishing Gear in particular, UNEP's Regional Seas Programme can act as a platform for developing common regional strategies, promoting synergies and coordinated regional implementation. Although several initiatives are being undertaken worldwide, mostly at the national level, to prevent, reduce and/or remove ALFG, regional and international co-operation are of vital significance for the development of a common jurisdiction for the prevention, as well as the eradication of the problem, because of its transboundary nature.

UN ASSEMBLY RESOLUTION A/60/L.22 ON MARINE LITTER

Recently, international attention is focusing more and more on the problem of marine litter and this is becoming an issue of local, national, regional and global concern. Even the General Assembly of UN did address the problem of marine litter in its November 2005 session and relevant paragraph of the corresponding resolution are reproduced below.

The UN General Assembly addressed the issue of marine litter/debris in Nov. 2005 and the UN General Assembly Resolution A/60/L.22 - Oceans and the Law of the Sea - of 29 November 2005 states:

"...The General Assembly,

65. *Notes the lack of information and data on marine debris and encourages relevant national and international organizations to undertake further studies on the extent and nature of the*

- problem, also encourages States to develop partnerships with industry and civil society to raise awareness of the extent of the impact of marine debris on the health and productivity of the marine environment and consequent economic loss;*
66. *Urges States to integrate the issue of marine debris within national strategies dealing with waste management in the coastal zone, ports and maritime industries, including recycling, reuse, reduction and disposal, and to encourage the development of appropriate economic incentives to address this issue, including the development of cost recovery systems that provide an incentive to use port reception facilities and discourage ships from discharging marine debris at sea, and encourages States to cooperate regionally and subregionally to develop and implement joint prevention and recovery programmes for marine debris;*
67. *Invites the International Maritime Organization, in consultation with relevant organizations and bodies, to review annex V to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, and to assess its effectiveness in addressing sea-based sources of marine debris;*
68. *Welcomes the continued work of the International Maritime Organization relating to port waste reception facilities, and notes the work done to identify problem areas and develop an action plan addressing the inadequacy of such facilities;*
69. *Calls upon States to take all appropriate measures to control, reduce and minimize, to the fullest extent possible, marine pollution from land-based sources as part of their national sustainable development strategies and programmes, in an integrated and inclusive manner, and to advance the implementation of the Global programme of Action for the Protection of the Marine Environment from Land-based Activities and the Montreal Declaration on the Protection of the Marine Environment from Land-based activities; [and]*
70. *Welcomes the convening of the Second Intergovernmental Review Meeting of the Global Programme of Action in Beijing from 16 to 20 October 2006 as an opportunity to discuss marine debris in relation to the source categories of the Global Programme of Action, and urges broad high-level participation.”*

It is hoped that this resolution of the UN General Assembly will bring the issue of marine litter to the centre of global attention and concern and will serve as legal and programmatic platform for the developing of relevant national, regional and global initiatives to challenge the problem of marine litter.

SOURCES OF MARINE LITTER

Main sources of the marine litter could be either sea-based or land-based.

Sea-based sources

- Merchant shipping, ferries and cruise liners.
- Fishing vessels and fish farming.
- Naval vessels, research ships and pleasure crafts.
- Offshore oil and gas platforms.

Land-based sources

- Waste from municipal landfills located on the coast.

- The wider context of waste management.
- Discharge of untreated municipal sewerage and storm water.
- Industrial facilities.
- River transport.
- Tourism and beach-going leftovers.

PROBLEMS AND BOTTLENECKS

There are many problems associated with marine litter and some of them are presented below. These problems range from global levels to very local levels, sometimes emphasized dramatically by local geographic, hydrographic and environmental conditions:

- Marine Litter poses a severe threat to marine life, protected areas and species and marine habitats and ecosystems.
- It has significant environmental and economic impact on commercial fisheries resources.
- It has the potential to act as a vector for the introduction of marine invasive species.
- It has serious aesthetic impact on beaches and affects tourism.
- It poses threat to human health and safety.
- It is a serious navigational hazard and poses losses to cooling systems of vessels, from small fishing boats and yachts to large military vessels.
- It plugs intakes of sea water such as desalination plants and cooling water for power stations.
- It damages fishing vessels and gear.
- It is a transboundary issue causing political conflicts and tension.
- It affects all the regions of the world - from Antarctica to Greenland from the long coastline of continents to the smallest and most remote islands of the Pacific.
- Despite international, regional and national efforts, there are indications that marine litter is increasing.
- While many of the negative impacts of marine litter are experienced at the local level and require local action, marine debris is a global issue.
- It has a wide variety of sources and can move great distances from where it originally enters the marine environment.
- Domestic efforts to prevent the incidence of marine and coastal litter (especially marine-sourced) are ineffective without regional and international collaboration to address the sources of the problem.
- While Marine Litter is part of the physical marine environment and is therefore directly influenced by the interactions of wind, sand and sea, there is little information available on how debris is transported and broken down within this dynamic system.
- Better information on the influence of ocean circulation and wind patterns on the movements of marine debris and its persistence in the marine and coastal environment, would enable a better understanding of areas of convergence and accumulation of debris, including regions of potential navigational hazard.
- This information would also help identify areas for targeting removal of debris at sea to minimize its threat to vessels, wildlife or sensitive coastal environments.
- The lack of international legal instruments (except for IMO/MARPOL Annex V which deals only with garbage from ships) or Global Programmes – makes it difficult to tackle the problem

of marine litter.

- Deficiencies in the implementation and enforcement of existing international, regional and national regulations/standards are increasing.
- Lack of awareness among main stakeholders and the general public, is a major reason why ML appears to increase worldwide.
- Lack of regional or sub-regional agreements and programmes hinders regional coordinated approach.
- Marine litter data that is currently collected tends to be ad hoc, inconsistent, poorly collated, and difficult to access. This, in turn prevents establishing 'status and trend' comparisons across regions and inhibits the assessment of effectiveness of preventative measures over time.

ABANDONED, LOST, AND DERELICT FISHING GEAR (ALFG) PROBLEM

Abandoned, lost, and derelict fishing gear is a significant and very persistent form of marine litter. It poses a threat to the marine environment, as well as human life and activities. The Regional Seas Programme of UNEP recognises the immediate and direct interconnection between marine litter and lost/abandoned fishing gear and related debris. It also puts significant emphasis on the development of solutions on the basis of international co-operation within the framework of a broader marine litter initiative. Some of the characteristics of the problem are presented below.

- Though evidence of the manufacturing origin of derelict nets can be recorded, it remains unclear which fishing fleets use the gear types found, and therefore who is responsible for their loss and/or disposal.
- There is insufficient information available on the technical, social, cultural and economic factors influencing the loss or disposal of fishing gear at sea.
- There is a diverse range of fishing fleets operating throughout the Asia Pacific region, from large factory trawlers to small subsistence or artisanal fisheries, and fishing debris may occur as a result of deliberate disposal or unintentional loss from any or all of these fleets.
- Measures required to address the technical and socio-economic influences on polluting behaviours within each fisheries sector are potentially very different.
- In order to target effective preventative measures, good information on fishing operations, including the gear types used by each sector, and the reasons for gear loss and/or disposal is critical.
- In many areas of Asia Pacific derelict fishing gear represents the greatest proportion of litter and it tends to be the debris type of greatest concern to coastal communities.
- In many parts of the Asia Pacific, abandoned fishing nets have caused loss of life through damage to vessels at sea.
- Recent ship reports from the Asia Pacific region show an increase of large derelict fishing nets, floating at sea and posing navigational hazard and a significant threat to marine wildlife.
- There is a need to introduce cost effective and efficient procedures for at-sea retrieval of derelict fishing gear, and for responding to community reports of hazardous floating debris.
- Despite a range of measures to control and reduce marine litter currently developed or partially in place in Asia Pacific, marine litter continues to accumulate in many areas of the seas and coastline - indicating the need for enhanced responses and activities on a local, national, regional and international scale.

- There is a need for domestic, bilateral and multilateral measures and multi-sectoral activities to prevent the problem at its source.

POSSIBLE STRATEGIES AND POLICIES TO APPROACH THE PROBLEM OF MARINE LITTER

The problem of marine litter has to be approached simultaneously at national, regional and global levels in order to be effective. In this section of the paper proposals for activities to be carried out at the (a) national and domestic; (b) bilateral and regional; and (c) multilateral, international and global levels are presented.

National and Domestic Activities

- Address gaps in the responsibilities of Government agencies for recovering of large and threatening floating nets or shipping containers.
- Develop economic instruments to address the financial value of abandoning fishing gear at sea.
- Promote and spread of codes of responsible conduct in fisheries, and consider the development of codes for other users of the marine environment.
- Increase the implementation and enforcement of MARPOL Annex V through the development of reception facilities.
- Promote and develop better waste management.
- Allocate legal responsibilities and financial resources to local authorities for regular and mandatory beach clean up operations.
- Encourage and facilitate adequate funding for control of solid pollutants, including litter, in river inputs to the oceans.
- Establish consistent and sustained national approach to litter abatement education.
- Continue support for community and NGO based coastal clean up activity.
- Provide funds and infrastructure for national and regional consistent and sustained monitoring.
- Improve funding for targeted research on the sources, impacts and of marine litter.

Bilateral and Regional Activities

- Improve the information available on the sources of ALFG and other types of marine litter (e.g. document net and gear types used by fleets).
- Identify the socio-economic and technical factors influencing the loss and disposal of waste (especially fishing gear and nets) within fisheries through direct engagement with fishing industry participants and coastal communities.
- Investigate possible links between IUU fishing in the region and ghost nets.
- Determine the capacity of ports throughout the region to handle vessel sourced waste, (particularly derelict fishing gear), and investigate the barriers and incentives relevant to the effective use of existing port waste reception facilities.
- Analyze ocean circulation, wind and drift patterns in the region and focus on identifying accumulation areas for marine debris.
- Transfer information and technologies already developed for prevention and cleanup of AFLG at sea or on the bottom.
- Improve information on the impacts of marine debris on wildlife and people.
- Document economic costs of debris to shipping and fishing industries.

- Encourage and assist countries which have not done so to sign, ratify and enforce Annex V of the MARPOL73/78.

Multilateral, International and Global Activities

General

- Initiate Regional Activities as a basis for a Global Approach.
- Build ownerships and partnerships (e.g - the coming GPA IGR 2).
- Develop information and outreach to change human behaviour and attitude.
- Establish science based harmonized monitoring and assessment.
- Develop sectoral activities.
- Raise funds for global and multilateral initiatives.

Specific

- Address and act according to the decisions of the 60th UN General Assembly Resolution (A/60/L.22 - Oceans and the Law of the Sea - of 29 November 2005).
- Review existing structures, processes and tools relevant to the control of marine litter, especially from the perspective of the fishing industry and with special emphasis on the effectiveness of MARPOL Annex V with respect to fishing industries and the management of waste on board fishing vessels (e.g - UNEP-FAO study).
- Identify the socio-economic and technical factors influencing the loss and disposal of waste from vessels, especially fishing vessels.
- Establish a global network of permanent marine litter monitoring sites to promote consistent monitoring and information gathering and exchange, to enable understanding of long-term trends, and to inform adaptive and effective management responses.
- Introduce, through Regional Fisheries Management Organizations, FAO, IMO, Regional Seas and other relevant bodies, guidelines or regulations and incentive measures to prevent the disposal of fishing gear, including compulsory reporting of lost fishing gear.
- Increase engagement of countries with the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) in order to better address land based sourced of litter.
- Provide funding for research and development that will contribute to solutions, such as on making fishing gear less harmful to marine species and on enabling precise location and identification of the source of derelict nets.
- Improve data collection activities and consolidate existing data on marine debris.
- Develop and establish long term scientific monitoring systems and methodologies.

UNEP'S ACTIVITIES ON THE MANAGEMENT OF MARINE LITTER

UNEP and its Regional Seas Programme (UNEP/RSP) and the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) have been developing and implementing a number of activities on the management of marine litter, amongst others:

- Document "Marine Litter: and analytical overview" was published in 2005 (available on line

http://www.unep.org/regionalseas/Publications/Marine_Litter.pdf).

- Leaflet on marine litter “Tightening the noose” was published in 2005.
- The problem of the management of marine litter was reported as a part of the UNEP's contribution to the Secretary General's report on "Oceans and law of the sea" to the sixty-first session of the General Assembly (Nov. 2005).
- An MoU was developed between UNEP and the Food and Agriculture Organization (FAO) for the review of available relevant information and the preparation of a document on “Marine Litter and Abandoned/Lost Fishing Gear”.
- Problem of the management of marine litter was presented in number of international meetings, including UNICPOLOS (June 2005).
- GEF Medium Sized Project “Development of a Global Framework for Marine Litter Reduction” is being prepared (see below).
- Series of regional actions on marine litter in several Regional Seas Conventions and Action Plans are being developed (see below).

Most of these activities have been developed by UNEP/RSP in consultation and, if appropriate, in co-operation with UN Agencies, including IMO, IOC of UNESCO, FAO and the Basel Convention. Internal consultations and plans for co-operation were held also with the GPA and the Division of Technology Industry and Economics (DTIE) of UNEP.

GEF MEDIUM SIZED PROJECT “DEVELOPMENT OF A GLOBAL FRAMEWORK FOR MARINE LITTER REDUCTION”

UNEP/RSP has been developing a ‘*global initiative on marine litter management*’. Although marine litter is found in all sea areas of the world, this proposed initiative would concentrate on pilot regions that are particularly affected. It would also provide a global platform for co-operation and co-ordination of activities for the control and management of marine litter.

A first step in this direction is a proposal for a GEF Medium Sized Project “Development of a Global Framework for Marine Litter Reduction” that is being developed by UNEP/RSP. This project would establish the necessary regional foundations and regional/national capacities to address the problem of management of marine litter. The results of this project, through activities in pilot regions (Northwest Pacific, Wider Caribbean and Baltic) will allow further development of a global initiative.

This project is being designed to accelerate international action to reduce the entry of litter into the ocean on a global scale. The project is predicated on the need to formulate an efficient template for regional actions that, when applied systematically and in a harmonized manner, will result in substantial reductions in marine litter. Accordingly, the project has been designed both to develop a generic approach to the control of litter susceptible to contaminating the marine environment and to implement this approach to specific pilot regions as large-scale demonstrations of its effectiveness and benefits as a pilot for subsequent widespread application on a global basis.

The general objective of the project is to provide in selected pilot regions a demonstrated basis for a global platform for the coordination of activities for the control and management of litter to reduce, and ultimately eliminate, the inadvertent entry of litter into the marine environment. The resultant framework will cover all land-based and maritime activities as well as tourism and recreation pursuits that contribute to marine litter in varying degrees throughout the globe.

The specific objectives of this project are:

- To develop assessment and review mechanisms relating to marine litter mitigation and prevention applicable at regional level.
- Apply these mechanisms in selected pilot regions as a basis for formulating regional action plans for addressing the problem of marine litter.
- To review and evaluate the pilot regional applications of the procedures as a means of preparing a globally-applicable framework for the implementation of measures to reduce marine litter from all sources at regional levels that include indicators of success.

The outcome of the project will be a platform for immediate application in marine and coastal regions by coordinated action by individual countries under regional marine agreements (such as the Regional Seas Conventions and Action Plans) for the systematic reduction of global contamination of the marine environment by litter.

Each of the selected pilot regions has already demonstrated a commitment to initiating action aimed at improving the management of litter to reduce the entry of such material into the marine environments of these regions. There are clearly benefits in the collaborative development of action on this topic that will ensure that any approach adopted is both efficient and harmonized at a global level. Parties to the regional agreements in all three regions comprise both developing and developed states.

UNEP'S ACTIVITIES IN REGIONAL SEAS

Regional actions on marine litter are being developed in following Regional Seas Conventions and Action Plans areas: Black Sea; Caspian Sea; East Asian Seas (COBSEA); Mediterranean; Nairobi Convention and East Africa; Northwest Pacific (NOWPAP); Red Sea and Gulf of Aden (PERSGA); South Asia Seas (SACEP); South East Pacific (CPPS); and Wider Caribbean. Additional regions that may start this activity soon are the Pacific (PREP).

The regional activities are arranged through the agreement (MoU or other agreement) concluded between the Regional Organisation and UNEP/RSP on the management of marine litter in the region. The activities and collection of information are carried out through the regional and national consultants. Each of the regions has a tailor made programme and a work plan based on the same concept and activities described below.

Objective of the Agreement

The objective of the MoU (or similar agreement) is to assist in the environmental protection and sustainable development in the relevant region through the development of a “Regional Programme of Action of the Sustainable Management of Marine Litter in the Region (RPA/ML)”.

Activities and Outputs

The main activities and outputs of a standard agreement with the relevant regional organisation are:

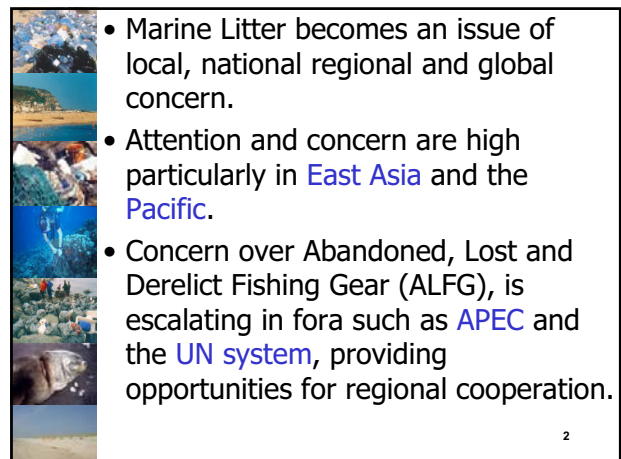
- (a) Preparation of the Review Document on Marine Litter in the region.

A Review Document on Marine Litter in the region, to be prepared by a regional consultant, should include, among others, collection and review of existing institutional arrangements; capacities and funding resources; data and information on marine litter in the marine and coastal environment; legal and administrative instruments; programmes and initiatives; identification of gaps and needs in coverage of marine litter management; and proposals for changes and

- recommendations. Such Review document should be based on national reports (compiled by national experts/consultants and preferably based on standard questionnaires) and other available documents and information, such as relevant scientific papers and other sources and literature.
- (b) Preparation of proposals for national and regional monitoring and evaluation programmes.
Proposal(s) for national and regional monitoring and assessment programmes should include the development of appropriate methodologies for the assessment of volumes, compositions, distribution patterns and trends of marine litter in the region. The methodologies suggested should preferably be based on successful experiences gained in other regions.
 - (c) Organization of a regional meeting of national authorities and experts on Marine Litter.
A Report of the Regional Meeting will provide an assessment of the regional situation and will discuss the products of activities (a) and (b).
 - (d) Mobilization of the countries in the region to participate in a Regional Cleanup Day, within the framework of the International Coastal Cleanup Campaign.
 - (e) A Report on the participation of countries of the region in the Regional Beach Cleanup Day, in which the countries will participate, within the framework of the International Coastal Cleanup Campaign to promote awareness and education campaigns.
 - (f) Based on the products of activities (a) to (d) preparation of a "Regional Plan of Action on the Sustainable Management of Marine Litter in the Region".

REFERENCES

- Adler E., 2005: UNEP Challenges the Global Problem of Marine Litter, Paper for the NOWPAP workshop on management of Marine Litter, UNEP, Regional Seas, Nairobi, Kenya
- Kiessling I., 2005: Proposed strategy for finding solutions to marine debris, Discussion paper, 28 October 2005. Marine Division, National Oceans Office Branch, Department of the Environment and Heritage, Australia
- UNEP, 2005: UNEP Regional Seas Programme, Marine Litter And Abandoned Fishing Gear, Report to the Division of Ocean Affairs and the Law of the Sea, Office of Legal Affairs, UNHQ, Regional Seas Coordinating Office, UNEP, Nairobi; April 2005.
- UNEP, 2005a: Marine Litter, and analytical overview.
- UNEP, 2006: UNEP Challenges the Global Problem of Marine Litter.



- US Academy of Sciences - estimates the total input of ML into oceans worldwide is **6.4 Million tonnes per year** resulting in 13,000 plastic objects per square km of oceans surface.
 - Despite local and sometimes national activities, on many coastlines around the world and reports from mid-oceans show that **levels of Marine Litter are increasing**.
- 3

This can be understood when the characteristics of ML are noted

- **Persistency:** long-lived and active for decades; mostly non-degradable variety of plastics, metals and glass (90-95%)
 - **Mobility:** travels huge distances around the world with ocean currents and winds
- 4

What is the issue of Marine Litter in Asia Pacific and around the world?

- Marine Litter poses a severe threat to marine life, protected species and marine habitats;
 - it has significant environmental and economic impact on commercial fisheries resources;
 - It has the potential to act as a vector for the introduction of marine invasive species;
 - It has serious aesthetic impact on beaches and affects tourism;
- 5

- It poses threat to **human health** and safety;
 - it is a serious **navigational hazard** and poses losses to cooling systems of vessels, from small fishing boats and yachts to large military vessels;
 - It plugs intakes of sea water such as desalination plants and cooling water for power stations;
 - **Damage to fishing vessels and gear** - in the Shetlands a loss of \$12,000-60,000 per year / per vessel;
- 6

- In many parts of the **Asia Pacific**, abandoned fishing nets have caused loss of life through damage to vessels at sea;
- It is a **transboundary** issue causing political conflicts and tension;
- Litter that is likely to have originated from urban sources in **Asia** is also washing ashore in huge quantities in remote and unpopulated coastal areas of northern Australia, Papua New Guinea and the South Pacific islands;

7

- In many areas of **Asia Pacific** **derelict fishing gear** represents the greatest proportion of litter and it tends to be the debris type of greatest concern to coastal communities;
- It affects **all the regions of the world** - from Antarctica to Greenland from the long coastline of continents to the smallest and most remote islands of the Pacific;

8



9

Hurdles and bottlenecks in the management of ML

- Despite international, regional and national efforts, there are indications that **ML is increasing**;
- While many of the negative impacts of Marine Litter are experienced at the local level and require **local** action, marine debris is a **global** issue;
- It has a wide variety of sources and can move great distances from where it originally enters the marine environment;

10

- Domestic efforts to prevent marine and coastal litter (especially marine-sourced) are therefore ineffective without **regional and international collaboration** to address the **sources** of the problem.

11

Challenging the Abandoned Fishing Gear problem

- Though evidence of the manufacturing origin of derelict nets can be recorded, it remains unclear which fishing fleets use the gear types found, and therefore who is responsible for their loss and/or disposal;
- There is insufficient information available on the technical, social, cultural and economic factors influencing the loss or disposal of fishing gear at sea;

12

- There is a **diverse range of fishing fleets** operating throughout the **Asia Pacific** region, from large factory trawlers to small subsistence or artisanal fisheries, and fishing debris may occur as a result of deliberate disposal or unintentional loss from all of these fleets;
- Measures required to address the technical and socio-economic influences on **polluting behaviours** within each fisheries sector are potentially very different;

13

- Therefore, in order to target effective preventative measures, **good information** on fishing operations, including the gear types used by each sector, and the reasons for gear loss and/or disposal is critical.

14



Behaviour and fate of Lost Fishing Gear

- While Marine Litter is 'part' of the physical marine environment and is therefore directly influenced by the interactions of wind, sand and sea, there is **little information** available on how debris is transported and broken down within this dynamic system;
- Better information on the influence of **ocean circulation** and wind patterns on the movements of marine debris and its persistence in the marine and coastal environment, would enable a better understanding of areas of convergence and accumulation of debris, including regions of potential navigational hazard;

16

- This information would also help identify areas for targeting **removal of debris at sea** to minimize its threat to vessels, wildlife or sensitive coastal environments;
- Recent ship reports from the **Asia Pacific** region show an **increase of large derelict fishing nets**, floating at sea and posing **navigational hazard** and a significant threat to marine wildlife;

17

- There is a need to introduce **cost effective and efficient procedures for at-sea retrieval** of derelict fishing gear, and for responding to community reports of hazardous floating debris.
- There is a need to understand **socio-economic factors** of abandoning fishing gear at sea and to develop **economic instruments** to address these factors;
- There is a need to **improve data collection** activities and to consolidate existing data on marine debris;

18

- Data on Marine Litter that is currently collected tends to be ad hoc, inconsistent, poorly collated, and difficult to access. This, in turn prevents establishing 'status and trend' comparisons across regions and inhibits the assessment of effectiveness of preventative measures over time;
- Long term and harmonized scientific monitoring systems and methodologies must be developed and established.

19

- Marine debris originates from a variety of sources and has impacts on many sectors; **However**, in many countries, agency responsibility and capacity to respond to these reports is mostly unclear.

- Currently, in many cases, it falls outside the jurisdictional responsibility of any one government, local management agency or industry.

20

- In order to address this complex issue it is therefore important to clearly identify inefficiencies and gaps in current policy and governance arrangements, and to develop an integrated approach to addressing Marine Litter concerns.

THIS IS TRUE FOR BOTH THE NATIONAL and REGIONAL LEVELS.

21

And finally, hurdles on the global level

- The lack of international legal instruments (except for IMO/MARPOL Annex V which deals only with garbage from ships) or Global Programmes – makes it difficult to tackle.
- Deficiencies in the implementation and enforcement of existing international, regional and national regulations/standards are increasing.
- Lack of awareness among main stakeholders is a major reason why ML appears to increase worldwide.

22



Possible strategies and Policies –

- Despite a range of measures partially in place in Asia Pacific, marine litter continues to accumulate in many areas - indicating the need for enhanced responses on a local, national, regional and international scale.
- Countries more concerned are the countries down-wind or downstream which receive marine litter, mainly ALFG.
- There is a need for domestic, bilateral and multilateral measures and multi-sectoral activities to prevent the problem at its source.

24

National and Domestic activities (1)

- Address **gaps in the responsibilities of Government agencies** which, currently result in no agency having responsibility for recovering of large and threatening floating nets;
- Develop **economic instruments** to address the financial value of abandoning fishing gear;
- Promote and spread of **codes of responsible conduct in fisheries**, and consider the development of codes for other sectors;
- Increase the implementation and enforcement of MARPOL **Annex V** through the development of **reception facilities**;
- Promote and develop better **waste management**;

25

National and Domestic activities (2)

- Allocate **legal responsibilities and financial resources** to local authorities for **regular and mandatory beach clean up operations**;
- Encourage and facilitate adequate funding for control of litter in **rivers** inputs to the oceans;
- Establish consistent and sustained **litter education**;
- Support **community and NGO** coastal clean up activity;
- Provide funds and infrastructure for national and regional consistent and **sustained monitoring**;
- Improve funding for **targeted research** on the sources, impacts and of marine litter;

26

Bilateral and Regional Activities

- **Improve the information** jointly available on the sources of ALFG (e.g. document net and gear types used by fleets);
- Identify the **socio-economic** and technical factors influencing the loss and disposal of waste (especially fishing gear and nets) within fisheries through direct engagement with fishing industry participants and coastal communities;
- Investigate possible links between **IUU fishing** in the region and ghost nets;
- Determine the capacity of ports throughout the region to handle vessel sourced waste, (particularly derelict fishing gear), **and** investigate the barriers and incentives relevant to the **effective use of existing port waste reception facilities**.

27

- Study **ocean circulation, wind and drift patterns** in the and focus on identifying accumulation areas for marine debris.
- **Transfer of information and technologies** already developed for prevention and cleanup of AFLG **at sea or on the bottom**;
- Improve our information on the impacts of marine debris on wildlife and people (for example document numbers of turtles and other wildlife found entangled in nets);
- **Document economic costs** of debris on shipping and fishing industries.
- Encourage and assist countries to sign, **ratify and enforce Annex V** of the MARPOL73/78.

28

Required Multilateral, International and Global Activities

1. Initiation of the **Regional Activities** as a basis for a Global Approach;
2. Building **ownerships and partnerships** (e.g - the coming **GPA IGR 2**);
3. Develop **information and outreach** to change **human behaviour** and attitude;
4. Develop **sectoral activities**;
5. Fundraising for global and multilateral initiatives;
6. **DO NOT** develop an new Global Convention (for the time being...)

29

Multilateral, International and Global Activities – more specific

- Address and act according to the **decisions of the 60th United Nations General Assembly** (of Nov. 2005; Resolution on Oceans and the Law of the Sea);
- Review existing structures and tools relevant to the control of marine litter with special emphasis **on the effectiveness of MARPOL Annex V with respect to fishing industries** and the management of waste on board fishing vessels (e.g - UNEP-FAO study);

30

Multilateral and Global Activities – more specific (2)

- Introduce, through FAO and RFMOs, IMO, Regional Seas and other relevant bodies, guidelines, regulations or incentive measures to prevent the disposal of fishing gear, including compulsory reporting of lost fishing gear;
- Increase **engagement of countries** with the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) in order to better address land based sourced of litter;

31



Partners

- **UNEP (Regional Seas, GPA, DTIE, Basel Convention)**
- **IMO and London Convention**
- **UNESCO/IOC**
- **FAO (and RFBs)**
- **Regional organisations (EU)**
- **Countries / Governments**
- **Civil Society – Industry and the Private sector, NGOs)**

32

Regional Seas Activities developed by UNEP

- Publications
- U.N GA decisions
- DEVELOPMENT of 11 REGIONAL ACTIVITIES
- Development of a GEF MS Project
- Network of NGOs
- Work with the Civil Society

33

Regional Activities developed and sponsored under Regional Seas

- NOWPAP (North West Pacific)
- East Asian Seas (COBSEA)
- East Africa (Nairobi Convention)
- SACEP (South Asian Seas)
- Mediterranean
- Caspian
- Black Sea
- Caribbean
- PERSGA (Red Sea and the Gulf of Aden)
- CPPS
- HELCOM and OSPAR as partner programmes
- In 2006 – (S)PREP

34

**There is so much to do -
we have do it together!**



Thank you

Special Lectures

PREVENTION OF MARINE LITTER POLLUTION UNDER IMO CONVENTIONS

Miguel Palomares

*Senior Deputy Director, Marine Environment Division, International Maritime Organization
4 Albert Embankment, London SE1 7SR United Kingdom,
mpalomar@imo.org*

INTRODUCTION

The prevention of marine pollution from ships in all its manifestations is one of the main concerns of the International Maritime Organization. As such, it occupies a prominent place among the Organization's priorities and has been, and continues being, the subject of permanent attention by IMO Members, mainly through the work of the Marine Environment Protection Committee and its subsidiary bodies, and also of the Meetings of the Contracting Parties to the London Convention and Protocol. In addition to the regulatory work performed by these bodies, the IMO Secretariat endeavours to provide technical assistance to developing countries, through the Integrated Technical Co-operation Programme (ITCP) of the Organization and other externally-funded projects, with the objective of developing or increasing their ability and capacity to implement the international regulatory regime embodied in the relevant Conventions and Protocols to which they are Party.

The aim of this paper is to provide an overview of the IMO regulatory framework dealing, in particular, with the prevention of marine pollution caused by garbage discharged or dumped from ships. Consequently, it will mainly address MARPOL Annex V and, to a lesser extent, the London Convention and Protocol.

THE MARPOL CONVENTION

The International Convention for the Prevention of Pollution from Ships, as modified by the Protocols of 1978 and 1997 relating thereto (hereinafter referred to as the "MARPOL Convention"), constitutes one of the most important global treaties aimed at protecting the marine environment from all sort of ship-generated contaminants. The Convention contains regulations covering several types of pollutants in six Annexes:

- Annex I Regulations for the Prevention of Pollution by Oil (October 1983)
- Annex II Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (April 1987)
- Annex III Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (July 1992)

- Annex IV Prevention of Pollution by Sewage from Ships (September 2003)
- Annex V Prevention of Pollution by Garbage from Ships (December 1998)
- Annex VI Prevention of Air Pollution from Ships (May 2005)

As with other international instruments, Parties to MARPOL have obligations and rights. On the one hand, they accept the obligation to ensure that ships flying their flag do not discharge wastes into the sea and, in return, they enjoy the right of not being polluted by ships from other Parties, to the extent that they can prosecute the offenders if the pollution occurs within their territorial waters. Non-Parties cannot invoke such right, but they may still be subject to prosecution under the “not more favourable treatment” principle. Annexes I and II are compulsory, in the sense that they have to be ratified at the same time as the Convention, whereas the other four Annexes are optional.

MARPOL ANNEX V ON PREVENTION OF POLLUTION BY GARBAGE FROM SHIPS

Annex V entered into force on 31 December 1998 and has subsequently been amended several times to include the designation of certain special areas; to introduce provisions relating to port State control on operational requirements; and to include amendments to several regulations. It contains regulations for the control of pollution by garbage from all ships. In other words, Annex V regulates the discharge of “all kind of victual, domestic and operational waste including fresh fish and parts thereof, generated during the normal operation of the ship and liable to be disposed” (regulation 1) from “vessels of any type whatsoever operating in the marine environment, including hydrofoil boats, air cushion vehicles, submersibles, floating craft and fixed or floating platforms” (Article 2 (4) of the Convention), which also means pleasure craft and fishing vessels. So, this Annex applies virtually to anything that floats which is liable to produce almost any kind of refuse.

In implementing Annex V regulations, the Administration needs to take into account which of them apply to the ship (flag State) and which to shore installations (port or coastal State), as well as:

- the type of garbage;
- the discharge location (distance from land); and
- the existence of special areas.

Special Areas

Due to specific oceanographic, ecological or shipping characteristics of some sea areas, the Convention has established “special areas”. The discharge of oil or oily mixtures (Annex I), noxious liquid substances carried in bulk (Annex II), garbage (Annex V) and gas emissions (Annex VI) is subject to more stringent control in special areas. Currently there are eight special areas designated under MARPOL Annex V, as shown in the table below, where the adoption of special mandatory methods for the prevention of sea pollution by garbage is required.

Only the Baltic Sea, the North Sea and the Antarctic Sea special areas are currently effective. The others, although properly designated under Annex V regulation 5, are not yet in effect because of insufficient port reception facilities in, or lack of ratification of the Convention by, some of the countries constituting the special area in question.

Except for very few exceptions in cases of emergency (regulation 6), the disposal of the following into the seas anywhere within special areas is prohibited (regulation 5):

Adoption, entry into force & date of taking effect of Special Areas			
Special Areas	Adopted	Date of Entry into Force	In Effect From
Annex V: Garbage			
Mediterranean Sea	2 Nov 1973	31 Dec 1988	*
Baltic Sea	2 Nov 1973	31 Dec 1988	1 Oct 1989
Black Sea	2 Nov 1973	31 Dec 1988	*
Red Sea	2 Nov 1973	31 Dec 1988	*
"Gulfs" area	2 Nov 1973	31 Dec 1988	*
North Sea	17 Oct 1989	18 Feb 1991	18 Feb 1991
Antarctic area (south of latitude 60 degrees south)	16 Nov 1990	17 Mar 1992	17 Mar 1992
Wider Caribbean region including the Gulf of Mexico and the Caribbean Sea	4 July 1991	4 April 1993	*

1. all plastic, including but not limited to synthetic ropes and fishing nets, plastic bags and incinerator ashes from plastic products;
2. all other garbage, including paper products, rags, glass, metal, bottles, crockery, dunnage, lining and packing materials;
3. food wastes less than 12 miles from land, except in the case of the Wider Caribbean Region, where comminuted or ground food wastes capable of passing through a 25mm screen may be discharged not less than three nautical miles from land; and
4. mixtures of garbage and other discharges having different disposal or discharge requirements.

Coastal States bordering a special area undertake to provide adequate reception facilities in all their ports, taking into account the special needs of ships operating in the area concerned, and also to notify the Organization the measures taken in that respect. A designated special area will only be effective after the Organization has received a sufficient number of notifications and has established a date from which the above requirements will take effect. After that date has been communicated by the Organization to the Parties, ships will have to comply with the requirements, even in the case where adequate reception facilities are not provided.

In the case of the Antarctic Sea, where no reception facilities are likely to be found, special provisions apply, whereby the flag State has to ensure that its ships, if intending to enter that special area, have sufficient capacity to retain on board all the garbage likely to be produced during the voyage, and the coastal States where the ship is likely to touch port during the voyage, especially the final destination, have to ensure that adequate reception facilities to receive the generated waste are in place.

Disposal outside special areas

Although the requirements applying outside special areas (regulation 3) are somewhat less stringent, the disposal of all plastics, including ropes, fishing nets, bags and incinerator ashes, is still prohibited anywhere at sea. Dunnage, lining and packing materials that float shall not be discharged within 25

miles from land, whereas the disposal of food waste and all other garbage is prohibited less than 12 miles from the nearest land, unless it is comminuted or ground, in which case the minimum distance from land for disposal is 3 miles. Mixtures of garbage and other discharges having different disposal or discharge requirements are subject to the most stringent provisions.

In the case of floating or fixed offshore platforms engaged in the exploration or exploitation of seabed mineral resources, the disposal of any garbage is prohibited, except for food wastes that have been passed through a comminuter or grinder, provided the platform in question is located more than 12 miles from land. These requirements also apply to ships within 500 metres of the above-mentioned platforms.

The following table provides a tabulated summary of the requirements regulating the disposal of garbage at sea.

Garbage type	All ships		Offshore platforms and ships within 500 m of them (regulation 4)
	Outside special areas* (regulation 3)	In special areas* (regulation 5)	
Plastics (includes synthetic ropes and fishing nets and plastic garbage bags)	Disposal prohibited	Disposal prohibited	Disposal prohibited
Floating dunnage, lining and packing materials	25 nautical miles offshore or more	Disposal prohibited	Disposal prohibited
Paper, rags, glass, metal, bottles, crockery and similar refuse	12 nautical miles offshore or more	Disposal prohibited	Disposal prohibited
All other garbage (including paper, rags, glass, etc.), comminuted or ground	3 nautical miles offshore or more	Disposal prohibited	Disposal prohibited
Food waste not comminuted or ground	12 nautical miles offshore or more	12 nautical miles offshore or more	Disposal prohibited
Food waste comminuted or ground	3 nautical miles offshore or more	12 nautical miles offshore or more	12 nautical miles offshore or more
Mixed refuse types	The more stringent requirements (regulation 3(2))		
* Special areas: Mediterranean Sea, Baltic Sea, Black Sea, Gulf area, North Sea, Antarctic, Wider Caribbean Region, and Red Sea (regulation 5(1))			

Notwithstanding the above dispensations where the discharge of certain wastes is allowed beyond specified distances from the nearest land, the underlying principle is that, in as far as is possible and practicable, such wastes should be retained on board for disposal at adequate reception facilities ashore and that, when this is not feasible, the disposal into the sea of the garbage in question is to be made as far as practicable from the nearest land and in no case at a distance below the stipulated range in each case.

Shipboard garbage management (owner/operator and flag State responsibility)

In contrast with other MARPOL Annexes, the provisions of Annex V address discharges from ships and do not stipulate equipment requirements. For instance, regulation 9(2) requires every ship of 400 gross tonnage and above and every ship certified to carry 15 persons or more, to have in place a garbage management plan for the crew to follow, developed in accordance with the IMO *Guidelines for the development of garbage management plans* (MEPC/Circ.317) and written in the working language of the crew. The plan must designate the person in charge of its execution and contain written procedures for collecting, storing, processing and disposing of garbage and for the use of the equipment on board.

Each discharge operation or activity in respect of garbage on board must be duly recorded. To this end, every ship that is required to have a garbage management plan must be provided with a Garbage Record Book (regulation 9(3)), which is to be maintained in accordance with the relevant provisions of that regulation and be in the form specified in the appendix to Annex V. In addition, every ship of 12 metres or more in overall length is required to display placards to notify the crew and passengers of the ship's disposal provisions. The Administration may waive the requirement for a Garbage Record Book for ships certified to carry 15 persons or more but that are engaged on voyages of one hour or less in duration, and for fixed or floating platforms while engaged in exploration and exploitation of the sea-bed.

The above requirements are addressed to the ship owner/operator and, as the ultimate responsible, to the maritime Administration in its capacity as flag State. As such, the Administration should:

1. provide advice and information to the ships flying its flag;
2. examine onboard arrangements during inspections;
3. investigate infringements; and
4. prosecute offenders.

Port reception facilities (coastal/port State responsibility)

Regulation 7 of MARPOL Annex V states that the Government of each Party to the Convention undertakes to ensure the provision of adequate reception facilities for garbage from ships using its ports and terminals. This is, therefore, a necessary condition to enable the implementation of the Annex and, indeed, for designated special areas to take effect. As such, it is the responsibility of the maritime Administration in its capacity as port/coastal State, although it does not mean that the Administration must necessarily provide the facility; it means, in practice, that the Administration can require a port authority or a terminal operator to provide the facilities, the same way it requires the owner of a ship flying its flag to have on board a Garbage Record Book.

The obligation to provide adequate port reception facilities covers all ports, terminals, harbours and marinas visited by commercial shipping and other types of vessel. In order that ports can ensure that such facilities are commensurate with the quantities and variety of wastes likely to be delivered ashore, they need to develop a port waste management procedure or plan to enable them to accurately assess

their needs. In turn, the Administration will need to consider how it can best promote the adoption of sound port waste management procedures, either by imposing a statutory obligation in their ports, harbours and marinas; through voluntary industry initiatives; or by a combination of the two possibilities (e.g. public/private initiatives). In any event, there is a need for a consultative process, whereby all interested parties, including port authorities, ship operators, agents, waste service providers and, of course, the various Government agencies, have the opportunity of expressing their views and state their interests before a plan of action is agreed by all.

The appendix to this paper provides some useful references to relevant IMO publications and documents that will enable the reader to obtain extensive guidance on implementation of the provisions of Annex V and all matters related to port reception facilities. In particular, the *Comprehensive manual on Port Reception Facilities* provides detailed advice on all aspects related to the issue, such as the key steps towards the creation of effective facilities, which may include:

- developing a waste strategy;
- national implementation;
- planning reception facilities;
- choice of location;
- type and quantities of ship generated wastes;
- equipment alternatives to collect, store and treat ship-generated wastes;
- recycling ship-generated wastes;
- options for final disposal;
- establishment and operation of reception facilities (i.e. funding mechanism);
- co-ordination and ship requirements; and
- options for enforcement and control.

Port State control

Under MARPOL Annex V, a ship when in port of another Party is subject to inspection by officers duly authorized by such Party (port State control officers) concerning operational requirements under the Annex, where there are clear grounds for believing that the master or the crew are not familiar with essential shipboard procedures relating to the prevention of pollution by garbage. In these circumstances, the Party shall take the necessary steps to ensure that the ship does not sail until the situation has been rectified in accordance with the relevant requirements.

The role of IMO

The International Maritime Organization is a specialized agency of the United Nations and, therefore, cannot act as an enforcement agency in response to allegations of inadequacy of port reception facilities. Nevertheless, the obligation for Parties to report alleged inadequacies to IMO remains valid. The Organization, on the other hand, is in a unique position to raise matters of concern with national Administrations and may, on occasions, act as honest broker in trying to avoid resorting to more formal arbitration procedures.

In the field of technical co-operation, IMO provides educational, training and technical assistance both to existing Parties and also to States wishing to become Parties to MARPOL. Under its Integrated Technical Co-operation Programme, the Organization, recognizing the transboundary nature of marine pollution by garbage, fosters regional agreements which may bring about significant environmental improvements and provide the participating States with a basis for co-operation on enforcement and exchange of technical information.

Latest developments

The UN General Assembly, through resolution A/RES/60/30 of 29 November 2005, invited IMO to review MARPOL Annex V, in consultation with relevant organizations and bodies, and to assess its effectiveness in addressing sea-based sources of marine debris, while welcoming the continued work of IMO related to port waste reception facilities and noting the work done to identify problem areas and develop an Action Plan addressing the inadequacy of such facilities, a draft of which had already been prepared. In addition, the General Assembly, through resolution A/RES/60/31, called upon States, FAO, IMO, UNEP and all relevant organizations and stakeholders to take action to address the issue of lost or abandoned fishing gear and related marine debris, including through the collection of data on gear loss, economic costs to fisheries and other sectors and, of course, the impact on marine ecosystems.

Having noted the above decisions of the General Assembly, as well as other actions regarding the launch of an “assessment of assessments” in preparation for the regular process for global reporting and assessment of the state of the marine environment, including socio-economic aspects, the IMO’s Marine Environment Protection Committee (MEPC), at its 64th session in March 2006:

1. noted the invitation of the UN General Assembly and agreed to initiate the review of MARPOL Annex V, and to assess its effectiveness in addressing sea-based sources of marine debris;
2. invited delegations to submit proposals under the Committee’s relevant agenda items to review MARPOL Annex V for this purpose;
3. noted that the Secretariat was co-operating with FAO, UNEP and the GPA, regarding marine debris and, as requested in resolution A/RES/60/31, agreed to co-operate with FAO on discarded fishing gear – in particular through the Joint IMO/FAO Working Group on IUU Fishing; and
4. noted the establishment of and arrangements for launching the “assessment of assessments”, as a start-up phase for the “regular process”.

THE LONDON CONVENTION AND PROTOCOL

The *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972* (the London Convention) is one of the oldest global conventions to protect the marine environment from human activities and has been in force since 1975. Its objective is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter. Currently, 81 States are Parties to this Convention. The term “dumping” is defined in the Convention as any deliberate disposal at sea of wastes and other matter from vessels, aircraft, platforms or other man-made structures at sea, including the vessels and other structures themselves. Dumping does not include the disposal at sea of wastes or other matter incidental to, or derived from, the normal operations of vessels, aircraft, etc.

The Convention fully prohibits the dumping of “persistent plastics and other persistent synthetic materials, for example, netting and ropes, which may float or may remain in suspension in the sea in such a manner as to interfere materially with fishing, navigation or other legitimate uses of the sea.” The disposal of vessels and platforms or other man-made structures at sea is, in principle, allowed under the Convention, if certain conditions are met, and “provided that material capable of creating floating debris or otherwise contributing to pollution of the marine environment has been removed to the maximum extent.”

The 1996 Protocol to the London Convention 1972, which entered into force on 24 March 2006

(with currently 27 Contracting Parties), and which will eventually replace the London Convention, operates on the basis of a full ban on dumping, except for specific wastes listed in its Annex 1. Dumping at sea of marine litter in any form or shape is prohibited.

In view of their broad objective to promote the effective control of all sources of marine pollution, both the London Convention and Protocol oblige Contracting parties to co-operate with all international agreements and programmes to prevent and control the dumping of marine litter from whatever source.

CONCLUDING REMARKS

It can be safely concluded that there exists an adequate international regulatory framework in place to prevent and control pollution of the sea by garbage/litter from ships, embodied in the MARPOL Convention with its associated manuals and guidelines, and in the London Convention and Protocol.

At the same time we have to admit that the seas continue being fouled by debris, although it is difficult to quantify the proportion of garbage that is contributed by ships and other floating craft, in comparison to that produced by land sources, be it deliberately or as a consequence of natural disasters, such as floods, tidal waves, etc. Regardless of how small or big the proportion attributed to ships is we stand a good chance of drastically reducing the ship-originated input by ensuring that the above-mentioned instruments are ratified and fully implemented by all flag and coastal States.

We have to recognize also that developing countries may find it difficult to implement what represents a rather complex body of international legislation, such as MARPOL, and that the only practicable way of addressing these difficulties is through technical co-operation. IMO, with its very scarce resources, has to juggle the many needs identified under the more than 40 Conventions and Protocols under its aegis against the inappropriate funds available, with the conclusion that more resources are needed to continue building on past achievements, in particular relating to port reception facilities, on which IMO has been working for a long time in collaboration with many coastal developing countries. This, being a global problem, requires global solutions and, as such, there is a need for a serious funding commitment from the international community, in particular those countries and industry organizations able to contribute funds and expertise.

It is, therefore, imperative that any action in that regard is taken in a way that efforts are not duplicated or resources are wasted, and this can only be achieved when all stakeholders consult with each other and agree to collaborate. IMO stands ready and willing, as corroborated by its Marine Environment Protection Committee, to co-operate with sister UN Organizations such as UNEP and FAO, with regional centres such as NOWPAP- MERRAC, with individual countries and also with the shipping industry where appropriate, in order to rid the seas of ship-generated garbage/litter/debris, as part of the overarching goal of preventing litter from all sources from entering the marine environment.

APPENDIX**List of IMO publications and documents relating to the Prevention of Marine Pollution by Garbage from Ships**

- **MARPOL** - The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997), as amended. Consolidated edition 2002 - ISBN 92-801-5125-8. Amendments published separately.
- **London Convention and Protocol** (The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 and the 1996 Protocol relating thereto) - ISBN 92-801-4155-4
- MARPOL - How to do it - ISBN 92-801-4152-X
- Guidelines for the Implementation of Annex V of MARPOL 73/78 - ISBN 92-801-1438-7, as amended by resolution MEPC.92(45)
- Comprehensive Manual on Port Reception Facilities – ISBN 92-801-6094-X
- Guidelines for Ensuring the Adequacy of Port Waste Reception Facilities - ISBN 92-801-5101-0
- Guidelines for the development of garbage management plans (MEPC/Circ.317).

**PREVENTION OF MARINE LITTER POLLUTION
UNDER IMO CONVENTIONS**

1st NOWPAP Workshop on Marine Litter
Incheon, Republic of Korea
8 – 9 June 2006

Miguel Palomares
Senior Deputy Director
Marine Environment Division
International Maritime Organization (IMO)

Marine litter is addressed under:

**MARPOL Annex V; and
London Convention & Protocol**

MARPOL

**THE INTERNATIONAL CONVENTION FOR
THE PREVENTION OF POLLUTION FROM
SHIPS, 1973, AS MODIFIED BY THE
PROTOCOLS OF 1978 AND 1997
RELATING THERETO**

In short:

the MARPOL Convention

ANNEXES to MARPOL

- Annex I: Regulations for the Prevention of Pollution by Oil (October 1983).
- Annex II: Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (April 1987).
- Annex III: Regulations for the Prevention of Pollution by Harmful Substances Carried at Sea in Packaged Form (July 1992)

ANNEXES to MARPOL (Cont'd)

- Annex IV: Regulations for the Prevention of Pollution by Sewage from Ships (September 2003).
- Annex V: Regulations for the Control of Pollution by Garbage from Ships (December 1998).
- Annex VI: Regulations for the Prevention of Air Pollution from Ships (May 2005)

MARPOL General Obligations and Rights

General obligations:

Parties to ensure that ships flying their flag do not discharge wastes into the sea
Provision of port reception facilities

General rights:

Not being polluted by ships from other Parties and can prosecute
Principle of “not more favourable treatment”

MARPOL ANNEX V
Regulations for the control of pollution by garbage from ships

Two important definitions:

Garbage:
 "all kinds of victual, domestic and operational waste including fresh fish and parts thereof, generated during the normal operation of the ship and liable to be disposed of" which are not covered by other Annexes.

Ship:
 "vessel of any type whatsoever operating in the marine environment, including hydrofoil boats, air cushion vehicles, submersibles, floating craft and fixed or floating platforms". So, it also means fishing vessels and pleasure craft.

MARPOL Annex V

Roles of the maritime Administration:

As FLAG State:
 - implement regulations applying to the ship

As COASTAL State:
 -implement regulations applying to shore installations

As PORT State:
 -make sure ships of other Parties comply

Annex V
Prevention of Pollution by Garbage from ships

Time taken for objects to dissolve at sea	
Paper bus ticket	2-4 weeks
Cotton cloth	1-5 months
Rope	3-14 months
Woolen cloth	1 year
Painted wood	13 years
Tin can	100 years
Aluminium can	200-500 years
Plastic bottle	450 years

Source: Hellenic Marine Environment Protection Association (HELMPEPA)

Special Areas under MARPOL Annex V
 (regulation 1(3))

Special Area means a sea area where for recognized technical reasons in relation to its oceanographic and ecological condition and to the particular character of its traffic the adoption of special mandatory methods for the prevention of sea pollution by garbage is required.

Special Areas under MARPOL

Annex I (oil)	Annex II (bulk chemicals)	Annex V (garbage)	Annex VI (air pollution)
Mediterranean Sea	Baltic Sea	Mediterranean Sea	Baltic Sea (19.05.2006)
Black Sea	Black Sea	Black Sea	North Sea (22.11.2007)
Baltic Sea	Antarctic Area	Baltic Sea	
Red Sea		Red Sea	
Gulfs Area		Gulfs Area	
Gulf of Aden		North Sea	
Antarctic Area		Wider Caribbean Region	
North West European Waters		Antarctic Area	

Control of disposal in Special Areas

Obligations for ships (flag State)

Disposal PROHIBITED EVERYWHERE:

- All plastics, including ropes, fishing nets, bags, incinerator ashes, etc.
- All other garbage, including paper, rags, glass metal, bottles, crockery, dunnage, lining and packing materials
- Mixtures of garbage and other wastes with different discharge requirements.

Disposal PROHIBITED WITHIN 12 MILES FROM LAND:

- Food wastes (in the Wider Caribbean, 3 miles if food wastes are ground to 25mm)

Control of disposal in Special Areas (cont'd)

Obligations for coastal States

- Provision of adequate reception facilities in all their ports
- Notify IMO of such provision (necessary for Special Area to become effective)

Special obligations in Antarctica

- Flag State: Sufficient capacity on board
- Coastal State: Adequate reception facilities in specific ports

Control of disposal outside Special Areas

Obligations for ships (flag State)

Disposal PROHIBITED EVERYWHERE:

- All plastics, including ropes, fishing nets, bags, incinerator ashes, etc.
- Mixtures of garbage and other wastes with different disposal or discharge requirements.

Disposal PROHIBITED WITHIN 25 MILES FROM LAND:

- Floating dunnage, lining and packing materials.

Disposal PROHIBITED WITHIN 12 MILES FROM LAND:

- Food wastes and other garbage, including paper, rags, glass metal, bottles, crockery, etc. Permitted outside 3 miles from land if ground to 25mm.

Control of disposal outside Special Areas (cont'd)

Obligations for offshore platforms and ships within 500 metres (flag State)

- Disposal of EVERYTHING is PROHIBITED except:
- food wastes if ground to 25mm, where the platform is located more than 12 miles from land.

Control of disposal outside Special Areas

Obligations for coastal States:

- 1 Provision of adequate reception facilities in all their ports
- 2 Notify IMO of such provision

Control of disposals anywhere UNDERLYING PRINCIPLE

In as far as is possible and practicable, all garbage and other wastes should be retained on board for disposal at adequate shore reception facilities. If this is not possible, the disposal into the sea should be made as far as practicable from the nearest land and, in no case, at a distance below the range stipulated by the Convention.

MARPOL Annex V Conditions for garbage disposal (regulations 3, 4, 5)

Garbage type	All ships		Offshore platforms and ships within 500 m of them (regulation 4)
	Outside special areas* (regulation 3)	In special areas* (regulation 5)	
Plastics (includes synthetic ropes and fishing nets and plastic garbage bags)	Disposal prohibited	Disposal prohibited	Disposal prohibited
Floating dunnage, lining and packing materials	25 nautical miles offshore or more	Disposal prohibited	Disposal prohibited
Paper, rags, glass, metal, bottles, crockery and similar refuse	12 nautical miles offshore or more	Disposal prohibited	Disposal prohibited
All other garbage (including paper, rags, glass, etc.), comminuted or ground	3 nautical miles offshore or more	Disposal prohibited	Disposal prohibited
Food waste not comminuted or ground	12 nautical miles offshore or more	12 nautical miles offshore or more	Disposal prohibited
Food waste comminuted or ground	3 nautical miles offshore or more	12 nautical miles offshore or more	12 nautical miles offshore or more
Mixed refuse types	The more stringent requirements (regulation 3(2))		

* Special areas: Mediterranean Sea, Baltic Sea, Black Sea, Gulf area, North Sea, Antarctic, Wider Caribbean Region (regulation 5(1)). ** K-44, 5(2), 5.

Shipboard Garbage Management

All ships of 400 gross tonnage and above and every ship certified to carry 15 persons or more will have to carry a Garbage Management Plan, to include written procedures for collecting, storing, processing and disposing of garbage, including the use of any relevant equipment fitted onboard (incinerators, compactors, comminuters).

The Garbage Management Plan should designate the person responsible for carrying out the plan and should be in the working language of the crew.

(regulation 9(2))

Garbage Record Book and Placards

-Except for a few exceptions, all ships and fixed or floating platforms required to have a Garbage Management Plan must provide a *Garbage Record Book* to record all disposal and incineration operations.

(regulation 9 (3))

-Every ship of 12 metres or more in length must also display *placards* notifying passengers and crew of the relevant disposal requirements.

(regulation 9(1))

Port reception facilities – Annex V

(regulation 7)

- 1 “The Government of each Party to the Convention undertakes to ensure the provision of facilities at ports and terminals for the reception of garbage, without causing undue delay to ships, and according to the needs of the ships using them.”
- 2 “The Government of each Party shall notify the Organization for transmission to the Parties concerned of all cases where the facilities provided under this regulation are alleged to be inadequate.”

Port reception facilities (cont'd)

- 3 Cover all ports, terminals, harbours and marinas, which need port waste management procedures
- 4 The Administration can:
 - > impose statutory obligation;
 - > allow voluntary industry initiatives; or
 - > accept a combination thereof.
- 5 Consultative process: Government agencies; port authorities; ship operators; agents; waste service providers, etc.



Port reception facility database (PRFD)

A web-based inventory on port reception facilities data available through the IMO website

The objectives of the database are:

- the dissemination of current information on port reception facilities to the maritime community on a global basis through the internet;
- the institution of an automated method for the regular up-dating of the information; and
- the facilitation of user-friendly searches.

Port Reception Facilities: IMO support

- Comprehensive manual on port reception facilities
- Guidelines for ensuring the adequacy of port waste reception facilities
- Guidelines for the implementation of MARPOL Annex V
- MARPOL – How to do it

Port State Control
(regulation 8)

- Ships, when in foreign ports, are subject to control by the port State
- Port State control officers may inspect ship if there are clear grounds that master or crew are not familiar with essential procedures, including Garbage Record Book
- Ship may be detained until situation is rectified

THE LONDON CONVENTION

- The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (the London Convention) is one of the oldest global conventions to protect the marine environment from human activities and has been in force since 1975
- Its objective is to promote the effective control of ALL SOURCES of marine pollution and take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter (Articles I and II)
- 81 States are Party to the London Convention

WHAT IS DUMPING?

DUMPING IS THE DELIBERATE DISPOSAL AT SEA OF WASTES AND OTHER MATTER FROM VESSELS, AIRCRAFT AND OTHER STRUCTURES, INCLUDING THE VESSELS THEMSELVES.

THE LONDON CONVENTION FULLY PROHIBITS THE DUMPING OF WASTES such as persistent plastics and other persistent synthetic materials such as netting and ropes which may float or remain in suspension in the sea.

DUMPING IS NOT:

- Pipeline discharges from land
- Operational discharges from vessels or offshore installations

**LONDON PROTOCOL
BASIC RULES**

The 1996 Protocol to the London Convention (London Protocol) is developed to modernize and eventually replace the Convention.

The Protocol is in force since 24 March 2006 and has currently 27 Parties

Its objective is to “...protect and preserve the marine environment from ALL SOURCES of pollution and take effective measures to prevent, reduce and where practicable eliminate pollution caused by dumping or incineration at sea of wastes and other matter.”



THE ROLE OF IMO

- Cannot act as enforcement agency (prerogative of the Parties)
- Receives and disseminates reports on alleged inadequacies of port reception facilities
- Provides technical assistance to developing countries
- Fosters regional agreements as basis for co-operation on enforcement

LATEST DEVELOPMENTS

Following requests by UN General Assembly (A/RES/60/30 & A/RES/60/31):

- IMO's MEPC has initiated a review of MARPOL Annex V; Members to submit review proposals;
- IMO Secretariat is co-operating with FAO, UNEP, GPA re. marine debris;
- IMO is co-operating with FAO on discarded fishing gear (Joint IMO/FAO Working Group on IUU fishing)

SO, UNDER INTERNATIONAL LAW...

- Discharge/disposal anywhere at sea of plastic-derived garbage is prohibited under the MARPOL Convention
- Dumping of plastic or synthetic materials anywhere at sea is prohibited under the London Convention/Protocol
- Therefore....

CONCLUDING REMARKS

- There exist adequate international regulations to prevent/control the disposal and dumping into the sea of garbage/litter from ships
- Difficult to quantify the proportion of marine litter contributed by ships, but need to reduce/eliminate through full implementation of MARPOL and London Convention & Protocol

CONCLUDING REMARKS (cont'd)

- Need to assist developing countries through technical co-operation, in particular with port reception facilities issues, but resources are scarce
- Global problem that requires global solutions: need funding from donor countries and organizations, including shipping industry

CONCLUDING REMARKS (cont'd)

- Avoid duplication of efforts and waste of resources
- IMO ready to co-operate with UNEP, FAO, regional centres such as MERRAC, individual countries and shipping industry, if necessary, to reduce and, eventually, eliminate ship-generated garbage worldwide



THE MARINE LITTER ACTIVITY IN THE NOWPAP REGION

Jeung-Sook Park

*Scientific Affairs Officer, NOWPAP Regional Coordinating Unit Busan Office
408-1 Shirang-Ri, Gijang-Eup, Gijang-Gun, Busan 619-902, Republic of Korea,
Jeungsook.park@nowpap.org*

MARINE LITTER PROBLEM

Any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment can be defined as marine litter. A continuous input of large quantities of all kinds of man-made materials including plastics results in a gradual build-up and posing a growing threat to the marine and coastal environment.

Marine Litter can be found near the source of input but could also be transported over long distances with ocean currents and winds. As a result, marine litter is found in all seas areas of the world - not only in densely populated regions but also in remote places far away from any obvious sources (*e.g.* on remote islands in the middle of oceans and in the polar regions).

Marine litter is an environmental, economic, health and aesthetic problem. It can cause death to wildlife and threaten marine and coastal biodiversity. Pieces of litter can transport invasive species between seas. Medical and sanitary waste constitutes a health hazard and can seriously injure people. The presence of marine litter cause damage that entails great economic costs and losses to people, property and livelihood, as well as poses risks to health and even lives. Marine litter also spoils, fouls and destroys the beauty of the sea and the coastal zone.

GLOBAL CONCERN ON MARINE LITTER

Recognizing the severity of marine litter problem, the UN organizations and other international programmes have dedicated themselves to prevent the marine and coastal environment from marine litter for over last 10 years. A wide range of marine litter-related activities has already been developed, mainly on the regional and national scale. There are also global conventions and agreements related to marine litter such as the UN Convention on the Law of the Sea, the Agenda 21 and the Johnsonburg Plan of Implementation, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention 1972) and the 1996 Protocol, the International Convention for the Prevention of Pollution from Ships (MARPOL Convention 73/78), the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Convention on Migratory Species, Global Programme of Actions for the Protection of the Marine Environment from Land-based Activities, the FAO Code of Conduct for Responsible Fisheries, and the Convention on Biodiversity.

Despite efforts already made at the global, regional and national level, the marine litter problem is

continuously getting worse. There are several reasons that the problem appears to increase worldwide. Deficiencies in the implementation and enforcement of existing international and regional environment related agreements, as well as national regulations and standards are contributing to the problem. Littering practices from the shipping and fisheries sectors, as well as lack of land-based infrastructure to receive litter, combined with a lack of awareness among main stakeholders and the general public, are other major reasons.

DISTRIBUTION OF MARINE LITTER

There are no recent and certain figures on the amounts of marine litter worldwide. Nor are there any such global figures on the annual inputs of marine litter to the marine and coastal environment. In 1997, the US Academy of Science estimated the total input of marine litter into the oceans, worldwide, at approximately 6.4 millions tonnes per year. According to other calculations, some 8 million items of marine litter has been estimated to enter oceans and seas every day, about 5 million of which are thrown overboard or lost from ships. Furthermore, it has been estimated that over 13,000 pieces of plastic litter are floating on every square kilometer of ocean surface.

In the year 2004 International Coastal Cleanup, organized by the Ocean Conservancy, over 305,000 volunteers from 88 participating countries removed over 7.7 million pounds of marine litter from more than 11,000 miles of shoreline. More than 6,600 divers participated in underwater cleanups, gathering more than 155,000 pounds of debris from 382 miles of riverbed and seafloor. Over 60 percent of all marine litter found during the 2004 Cleanup originated from land-based shoreline and recreational activities such as picnics, festivals, sports and day at the beach.

MARINE LITTER ACTIVITY IN THE NOWPAP REGION

The geographical scope of the Northwest Pacific Action Plan (NOWPAP) is a semi-enclosed sea area surrounded by the People's Republic of China, Japan, the Republic of Korea and the Russian Federation. These coastal countries are the four member states of NOWPAP that was adopted in 1994 as a part of the UNEP Regional Seas Programme with the goal of the wise use, development and management of the marine and coastal environment.

Since marine litter became an issue of concern in the region, the NOWPAP member states have discussed and adopted Resolution 1B of the Ninth Intergovernmental Meeting (Busan, Republic of Korea, 2004), Recommendation 2 of the NOWPAP Intersessional Workshop (Seoul, Republic of Korea, 2005) and Resolution 4 of the Tenth Intergovernmental Meeting (Toyama, Japan, 2005) to initiate marine litter activity in the region. According to these resolutions and recommendation, a new project on Marine Litter Activity (MALITA) in the NOWPAP region was developed and is being implemented since November 2005.

The initial steps of the MALITA implementation are to collect and review existing data and information relevant to marine litter in each of the NOWPAP members. As a result, database on marine litter related data and information will be established. Another activity is to collect information on relevant legal instruments and programmes on marine litter in each of the NOWPAP members in order to identify gaps and needs in the coverage of marine litter between the member states. On the basis of these initial activities, the following activities will be implemented accordingly:

- Development of regional and national strategies on integrated management of marine litter;
- Development and implementation of long-term regional and national monitoring programme;
- Development of sectoral guidelines for management of marine litter;
- Development and improvement of port reception facilities and services;
- Development of public education and awareness raising campaigns; and
- Development of Regional Action Plan on marine litter

The NOWPAP project will raise the awareness of the general public about marine litter as one of the key risk factors in the marine and coastal environment degradation in the region. This project will be implemented in close collaboration with the member states, existing four Regional Activity Centres and newly nominated marine litter national Focal Points, and will support the development of the integrated waste management policies and systems at the national and regional level. The NOWPAP Regional Action Plan on marine litter to be developed at the end of the project will contribute to prevent and reduce marine litter in the Northwest Pacific region in line with the global theme of the sustainable development.




Marine Litter Activity (MALITA) Sustainable Management of Marine Litter



Presented by Dr Jeung Sook PARK
NOWPAP Regional Coordinating Unit

Marine Litter (Debris)

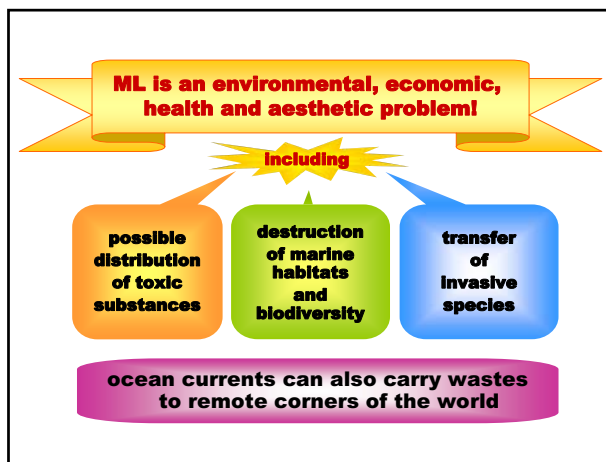

**Any persistent,
manufactured and processed
solid material
discarded, disposed of and abandoned
in the marine and costal environment**



lying on beaches and shores

floating on the water surface

**mixed in the water column
and sank even to the seabed**

Work Plan of NOWPAP MALITA

Initiation (1-4)

Implementation (5-10)


Building Ownerships and Partnerships (11)

Information and Outreach (12-15)

Sectoral Activities (16-19)

Fundraising (20-21)

Regional Action Plan (22-23)



Marine Litter in NOWPAP region

RCU


I Draft MALITA Documents

Meetings
Workshops

Public Awareness
and campaigns

Civil Society and
Stakeholders

NFPs RACs



- Legal Instruments and Programmes
- Existing Data and Information
- Regional and National Strategies on Integrated Management
- Long-term Monitoring Programme
- Waste Management Polices/Systems
- Port Reception Facilities
- Sectoral Guidelines

III Draft Regional Action Plan

Conventions and Agreements related to Marine Litter Activity

- UN Convention on the Law of the Sea
- Agenda 21 and Johannesburg Plan of Implementation
- London Convention 1972 and the 1996 Protocol
- MARPOL Convention 73/78 Annex V
- Basel Convention
- Convention on Migratory Species
- GPA for the Protection of the Marine Environment from Land-based Activities
- FAO Code of Conduct for Responsible Fisheries
- CBD, with the Jakarta Mandate

UN Department of Economic and Social Affairs
Division for Sustainable Development

Agenda 21

A comprehensive plan for global, national and local action by the organizations of UN system, governments and major groups in every area in which human activity impacts in the environment

Section 1. Preamble
Section 2. Conservation and Management of Resources
Section 3. Strengthening the Role of Major Groups
Chapter 17. Protection of the Oceans, All Kinds of Seas, including Enclosed and Semi-enclosed Seas, and Coastal Areas and the Protection, Rational Use and Development of their Living Resources
Chapter 21. Environmentally Sound Management of Solid Wastes and Sewage related Issues
Section 4. Means of Implementation

JOHANNESBURG SUMMIT 2002
24 August - 4 September 2002

Plan of Implementation

- I. Introduction
- II. Poverty Eradication
- III. Changing Unsustainable Patterns of Consumption and Production
 - Para. 22. Renew the Commitment, as advanced in Agenda 21, to Sound Management of Chemicals throughout their Life Cycle and of Hazardous wastes for Sustainable Development and for the Protection of Human Health and the environment
- IV. Protection and Managing the Natural Resource Base of Economic and Social Development
 - Para. 33. Enhance Maritime Safety and Protection of the Marine Environment from Pollution by actions at all levels to:
 - Para. 34. Improve the Scientific Understanding and Assessment of Marine and Coastal Ecosystems as a fundamental basis for sound decision-making, through actions at all levels to:
- V. Sustainable Development in Globalizing World
- VI. Health and Sustainable Development
- VII. Sustainable Development of Small Island Developing States
- VIII. Sustainable Development for Africa
- IX. Means of Implementation
- X. Institutional Framework for Sustainable Development

London Convention (Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter, 1972) and 1996 Protocol Thereto

Solutions for Land-based Sources of Marine Pollution and Proper Waste Management in General

A few crucial amendments

Annex 1. Wastes or other matters that may be considered...

Annex 2. Assessment of wastes or other matters that may be,

Annex 3. Arbitral Procedure

1. dredged sludge
2. sewage sludge
3. fish waste, or material resulting from industrial fish processing operations
4. vessels and platforms or other man-made structure at sea
5. inert, inorganic geological material
6. organic material of natural origin
7. bulk items primarily comprising iron, steel, concrete and similarly unarmful materials for which the concern is physical impact, and limited to those circumstances when such wastes are generated at locations, such as small islands with isolated communities, having no practicable access to disposal options other than dumping

International Convention for the Prevention of Pollution from Ships 1973 and 1978 Protocol

Global treaty for the prevention of pollution of the marine environment by ships from operational and accidental causes

- Governs the design and equipment of ships
- Establishes systems of certificates and inspections
- Requires states to provide reception facilities for the disposal of oily waste and chemicals

Annex I. Regulations for the Preventions of Pollution by Oil (1983)

Annex II. Regulations for the Control of Pollution by Noxious Liquid Substance In Bulk (1987)

Annex III. Regulations for the prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (1992)

Annex IV. Prevention of Pollution by Sewage from Ships (2003)

Annex V. Prevention of Pollution by Garbage from Ships (1988)

Annex VI. Regulations for the Preventions of Air Pollution from Ships and NOx Technical Code (2005)

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal


Problems and challenges posed by the transboundary movements and the environmentally sound management of hazardous wastes and other wastes (89/02)

- Annex I. Categories of Wastes to be Controlled**
- 45 Waste Streams of Hazardous Wastes
- Annex II. Categories of Wastes Requiring Special Considerations**
(households and residues arising from their incineration)
- Annex III. List of hazardous Characteristics**
- Annex IV. Disposal Operations**
- Annex V A. Information to be Provided on Notification**
- Annex V B. Information to be Provided on the Movement Document**
- Annex VI. Arbitration**
- Annex VII. Not yet entered into force**
- Annex VIII. List A**
- Annex IX. List B (solid plastic wastes)**



UNEP Milestones

- 1972: UNEP established after UN Conference on the Human Environment
- 1973: Conventions on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- 1975: Mediterranean Action Plan (first of 13 regional action plans under the UNEP RBP)
- 1979: Bonn Conventions on Migratory Species
- 1985: Vienna Conventions for the Protection of the Ozone Layer
- 1987: Montreal Protocol on Substances that Deplete the Ozone Layer
- 1988: Intergovernmental Panel on Climate Change (IPCC) established to assess information related to human-included climate change
- 1989: Basel Convention on the Transboundary Movement of Hazardous and Other Wasters
- 1992: Convention on Biological Diversity
- 1995: Global Programme of Action (GPA) launched to protect marine environment
- 1998: Rotterdam Convention on Prior Information Consent
- 2000: Maimú Declaration (a call for action by the first Global Ministerial Environment Forum)
- 2000: Millennium Declaration (environmental sustainability listed as one of eight MDG)
- 2001: Stockholm Convention on Persistent Organic Pollutants (POPs)
- 2002: World Summit on Sustainable Development reaffirms UNEP's central role in international effort to achieve sustainable development
- 2005: Bali Strategic Plan for Technology Support and Capacity Building adopted by UNEP Governing Council mandating national level support to developing countries
- 2009: World Summit emphasizes key role of environment in sustainable development



UNEP addressing issues related to impacts on the marine environment from land-based activities

- Identification of the nature and severity of problems
 - Food security and poverty alleviation
 - Public health
 - Coastal and marine resources and ecosystem health
 - Economic and social benefits and uses
- Contaminants (not listed in order of priority)
 - Sewage
 - Radioactive substance
 - Nutrients
 - Litter
 - Persistent Organic Pollutants
 - Oils (hydrocarbons)
 - Sediment mobilization

Major reasons that marine litter problem is continuously getting worse worldwide

1. deficiencies in the implementation and enforcement of existing international and regional environmental related agreements, as well as national regulations and standards
2. littering practice from the shipping sector
3. lack of land-based infrastructure to receive litter
4. lack of awareness among main stakeholders and the general public



2004 World Environment Day "Wanted! Seas and Oceans: Dead or Alive?"

The marine environment is facing challenges that, if not addressed immediately and effectively, will have profound implications for sustainable development.

"Nitrogen overload from fertilizers is creating a growing number of oxygen-starved "dead zones" in coastal waters across the globes."

"Marine litter is killing up to a million seabirds and 100,000 sea mammals and turtles each year."

"Moreover, despite the growing reach and intensity of commercial fishing operations, total global fish catch is declining. Nearly three quarters of world fish stocks are being harvested faster than they then reproduce." - **Overfishing**

Quantities of Marine Litter

1997 US Academy of Science and other Estimations and Surveys



The total input of marine litter into the oceans, worldwide, was estimated at approximately **6.4 million tonnes/year**

Some **8 million items** have been estimated to enter oceans and seas every day, about 5 millions of which are thrown overboard or lost from ships



Over 13,000 pieces of plastic litter are floating on every square kilometer of ocean surface

89% of marine litter observed floating on ocean surface are plastics in the North Pacific (1998)



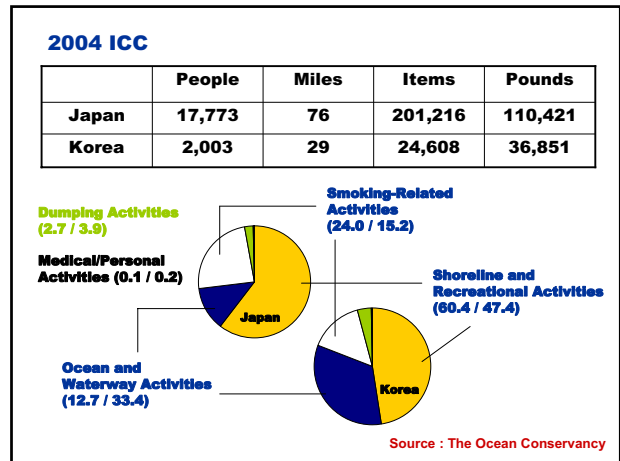
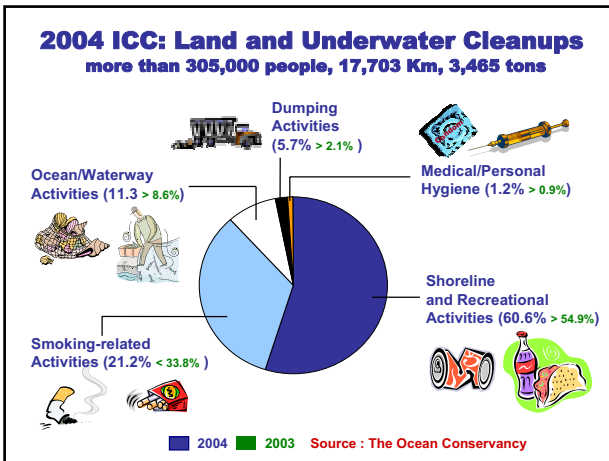
21st International Coastal Cleanup Campaign



The Ocean Conservancy would like to thank our major sponsors for making the International Coastal Cleanup possible.

The Ocean Conservancy
Advocates for wild, healthy oceans

U.S. Environmental Protection Agency



Top Ten Items of 2004 ICC

Worldwide	Japan	Korea
Cigarettes/Cigarette Filters (18.2)	Cigarettes/Cigarette Filters (19.9)	Cigarettes/Cigarette Filters (11.9)
Food Wrappers/Containers (10.8)	Caps/Lids (11.9)	Buoys/Floats (11.7)
Caps/Lids (8.6)	Beverage Bottles (Plastic) (11.8)	Beverage Bottles (Glass) (8.4)
Bags (7.5)	Food Wrappers/Containers (9.8)	Beverage Bottles (Plastic) (8.0)
Beverage Bottles (Plastic) (7.0)	Beverage Cans (8.6)	Caps/Lids (7.1)
Cups/Plates/Forks/Spoons (6.7)	Bags (5.7)	Food Wrappers/Containers (4.9)
Beverage Bottles (Glass) (4.5)	Rope (5.2)	Strapping Bands (4.9)
Beverage Cans (4.4)	Beverage Bottles (Glass) (4.7)	Beverage Cans (4.6)
Straws/Stirrers (4.0)	Clothing/Shoes (2.3)	Bags (4.4)
Fishing Nets (2.5)	Buoys/Floats (2.3)	Plastic Sheeting/Tarps (4.0)
Totals	74.1	82.2
		69.9

Source : The Ocean Conservancy

Main land-based sources

- municipal landfills (waste dumps) located on the coast
- riverine transport of waste from landfills or other sources along rivers and other inland waterways
- discharge of untreated municipal sewage, including storm water and occasional overflows
- industrial facilities: solid waste from landfills and untreated waste water
- tourism (recreational visitors to the coast; beach-goers)

Main sea-based sources

- merchant shipping, ferries and cruise liners
- fishing vessels
- military fleets and research vessels
- pleasure craft
- offshore oil and gas platforms
- aquaculture installations
- waterway recreational activities (diving and marinas)

NOWPAP effort made since 2005/6

Meetings and Workshops

Environment Education

Cooperation

Coastal Cleanup Campaign

NOWPAP efforts to reduce or prevent marine litter will benefit all those using the Northwest Pacific and its beaches



KOREAN POLICY ON MARINE LITTER

Jeong-Seok Yu

*Director, Marine Conservation Division
Ministry of Maritime Affairs & Fisheries
140-2, Gye-dong Jongro-gu Seoul 110-793, Republic of Korea
jsyu@momaf.go.kr*

OVERVIEW

The bottom of the sea may act as the important ecological space that is connected not only with benthic ecosystem but also the whole marine ecosystem. However, due to recent various causes such as large fishing activities in costal areas, continuous economic development, and leisure activities with improved incomes, the bottom of the sea is in a serious situation with various deposited wastes, disposed shells, and discharged contaminant deposits exceeding self-cleansing power.

The government recognized the significance of ocean wastes as new marine contaminants and prepared diverse management programs; National Science & Technology Council also designated the large six kinds of domestic marine contaminants and suggested technological approach methods; ocean wastes are designated as the most serious marine contaminants as well as marine/sediment contamination, red tide, beach damage, marine ecosystem disturbance, and marine accidents, and 'Ocean Waste Management Strategy' has been executed in full scale since 1999.

THE STATUS AND PROBLEMS OF OCEAN WASTES

Ocean wastes may be classified into fishery-caused wastes and land-caused wastes by the origin of production. Fishery-caused wastes mostly consist of fishing implements lost during fishery activities but they are also produced by disposing of damaged fishing implements when they replace the fishing implements; the fishing implements such as weirs and gill nets were significantly increased with developed catching fishery since 1970's; more than 400 thousand tons of wastes are expected to be deposited in the ocean and, in case of major fishing banks and the sea areas with high density of wastes are found to have 115 thousand tons of wastes through survey.

Meanwhile, large quantity of land-caused wastes, which consist of grasses/trees, beverage containers, packing papers, and other leisure supplies, flow into seas at a time through rivers and streams during heavy rains and, at the time of attack by Rusa in 2002, 170 thousand tons of flood wastes flew in the ocean and contaminated the whole seaside of the country as well as islands. According the data of survey on the cities and provinces which was carried out in 2005, most of them consist of plastics that were considered to be originated from the land.

Table 1. Yearly quantities of ocean wastes produced

	Total	Fishery implements	Styrofoam	Plastics
Production (ton)	98,730	14,300	5,054	79,376
Shares (%)	100	14.5	5.1	80.4

Although the official survey on the damage with such ocean wastes is domestically poor, it was found that wastes destroys the places for inhabitation and spawning of fish resources and disposed fishery implements form the graves of fishes resulting in reduction of fish resources (see Fig. 1). Also, disposed fish nets are wound on the screws of sailing vessels resulting in vessel accidents and the various wastes disposed on every place of the seaside significantly affect the costal scenery (see Fig. 2).

The damage on marine resources is expressed as the apparent reducing trend of costal fishes but there is no detailed report due to the difficulty in distinguishing this damage from the causes such as deterioration of stream water or temperature elevation. In terms of the damage on marine ecosystem, damage on sea birds is partially presented but, as there are few inhabitations of marine mammals in domestic coasts, the damage on them is rarely reported.



Fig. 1. Giant spider crabs and blue crabs dead in the disposed fish nets in the sea
(Left : Wooljin giant spider crab bank in July '03 / right : Yeonpyeongdo blue crab bank in August '04)



Fig. 2. The status of wastes disposed at the seaside (Yuldo, Haenam-gun, Jeonnam, June '04)

As shown above, ocean wastes destroying marine ecosystem are to be controlled by city or provincial governments in case of costal areas within 12 miles to inner direction from territorial waters but positive measures are poor due to the main entities for collection and management of disposed fishery instruments and insufficient budgets.

Also, as the processing of waste fishery instruments produced during fishery activities requires app. 300 thousand won of cost per ton, they are frequently disposed on the seaside or in the sea without permission.

EXECUTION OF OCEAN WASTE COLLECTION

Since the first execution of ocean waste collection project was executed in 1999, 47 thousand tons of deposited wastes were collected form 117 harbors or fishing ports of the country until 2003. From 2004, ocean waste collection project was executed focused on the fishing ports in the major sea areas of costs in the country and, in 2005, the wastes disposed in islands, damp (beach) protection zones, and the seaside were also concurrently collected.

Table 2. Performance of collection/processing of ocean wastes

(Unit : million won, ton)

Item	Total		'99~'02		'03		'04		'05	
	Expenses	Collection	Expenses	Collection	Expenses	Collection	Expenses	Collection	Expenses	Collection
Total	51,889	61,310	25,085	34,892	8,399	11,916	8,599	6,072	9,806	8,430
Collection project	47,611	55,203	25,085	34,892	7,668	11,338	6,893	3,619	7,965	5,354
Purchase project	4,278	6,107	-	-	731	578	1,706	2,453	1,841	3,076

※ Purchase projects consist of national expenditure only.

Meanwhile, ocean waste purchase project has been executed by letting fishers carry disposed fishery implements to fishing ports which are pulled in during operation rather than disposing in the sea, at low expenses with the result that ocean waste are collected and the recognition on the damage with wastes are converted.

This system was accepted by the institutions when government-level measures are asked with emphasizing the examples that disposed wastes pulled in during operation are disposed in the sea again because fishers could not process them although they carried them to the fishing ports at the start of this government.

This project was executed in 2003 with the fishing boats of adjoining seas as models with 100% support by national expenditures and, since 2004, it has been being executed as a supportive project (80% of national expenditures and 20% of local autonomous entities' expenses) with joint sharing of project expenses with local autonomous entities is produces the effect that additional incomes are produced to fishers and government expenditures are saved as well as collection of wastes because the damage with ocean wastes was recognized and joint participation was achieved.

FUTURE OCEAN WASTE COLLECTION STRATEGY

Basic direction

With application of EEZ in the near sea areas of Han Peninsula, the values of costal fishing banks and marine spaces have been elevated compared to the past but ocean wastes have been continuously increased with industrialization and urbanization of costal areas and huge scale of damages are given to the marine ecosystem.

In such situation, an approach with a new paradigm to meet the marine environment for recovery of the marine ecosystem is required and, as well as preparation of systemic management measures against ocean wastes, preventive and reductive points should also be considered for the passed suppression of production of ocean wastes as well as collection of them. Also, the waste processing method, which had been executed depending upon reclamation, incineration, and ocean dispose in past, should also be converted into the direction for maximization of reuse and environment friendly processing.

Ocean waste strategies executed

Continuous execution of ocean waste collection project

The project for collection of wasted deposited in the harbors and fishing ports was completed in 2003 and the project was expanded to costal/adjoining seas from 2004 but the collected quantity did not reach the produced quantity and not-collected wastes were accumulated; the project will continuously be executed with annually increased budget.

For this, development of strategies for preparation of marine environment improvement shares is needed as well as general budget and sincere participation, such as sharing of a certain portion of expenses by local autonomous entities in case of the expenses for costal areas, is also required.

Organization and operation of conferences by autonomous entities to manage the origins of waste contamination

Ocean wastes are continuously produced and the collection project, which was initiated in 1999, should be executed for a fairly long time in future but the most important strategy is the strategy to reduce production by blocking the origins of production. As the efforts to manage such land and marine caused origins by the central government have limitation, conferences should be organized by neighboring autonomous entities with joint sharing of expenses to minimize the production of wastes and strategies should be established for rapid processing of produced wastes.

To manage the disposed wastes on Han River basins, Seoul City, Incheon City, and Gyeonggi-do organized a conference and agreed in sharing yearly 28.5 billion won of expenses from 2002 to 2006; the agreement is being executed and other autonomous entities also need to make such effort. For national expansion and execution of such model case, there is a plan to support the autonomous entities, which organize conferences with priority execution of supportive projects of autonomous entities as well as positive financial supports.

Extended execution of ocean waste purchase project

To prevent the inefficient examples that fishers dispose the wastes, which are pulled-in during operation or produced during fishery activities, in the sea and the government collects them with large amount of budget, purchase system was executed since 2003 and this system will be extended every year. However, as purchase project does not meet the principle of causer and as it is not executed to support the lives of fishers, fishers should carry the wastes pulled in during operation to fish ports and

a measure for joint sharing of expenses by autonomous entities and National Federation of Fisheries Cooperatives etc. should be considered in the respect of the burden of processing expenses.

Continuous execution of R&D of ocean waste integrated-processing system

Since 1999, a practical collection/processing system was established with graft with marine scientific technology; waste fishery Styrofoam reducer, ocean waste pre-processing and resource system, multipurpose ocean waste collection boat, ocean waste incinerator, equipment to survey deposited fishing nets in 1,000m depth in NOWPAP Sea, and portable on-board integrated-processing system technology were developed.

It is planned to execute the strategy focused on practical use in the field for application of the outputs obtained for efficient collection/processing of ocean wastes.



Fig. 3. Multipurpose ocean waste collection boat



Fig. 4. Ocean waste incinerator



Fig. 5. Equipment to survey deposited fishing nets in 1,000m depth in NOWPAP Sea



Fig. 6. Waste fishery Styrofoam reducer

Execution of the strategy for cultivation of ocean waste reuse enterprises

Through continuous studies and investment in relation to ocean wastes, the technologies for collection and processing to resources through reuse of them were developed through private and government studies and are at the stage of practical use. Especially, the method to process the ocean wastes is rapidly turning its direction from previous incineration, reclamation, or ocean dispose to processing to resources. Synthetic resins and solid fuels are produced with use of the waste Styrofoam produced in breeding ground and the waste fishing nets deposited in coastal/adjoining seas with

continuous demand of them and, therefore, the ocean waste strategies, which were focused on collection and processing (incineration and reclamation), should also be focused on cultivation of waste reuse enterprises.

CONCLUSION

The discharge of various contaminants such as marine floating wastes and the wastes deposited on the bottom of sea is in a serious situation exceeding self-cleansing power by marine itself due to recent large scale fishery activities in coastal seas, overall extension of industrial fields with economical development, and elevated life levels.


Although land and air contaminations arouse public opinions and improvement measures are taken because they are directly detected by us and give damages to us, however, the damage on the vast marine environment is located at blind spots with no interest by the people and the significance of it is practically overlooked.

A task should be implemented to suppress the production of ocean wastes such as waste fishery implements as well as continuous execution of collection project in future. Also, with organization of conferences by autonomous entities, joint measures should be taken and education & PR should be strengthened to cultivate the ocean waste reuse enterprises and to convert the recognition by fishers.

Also, development of environment-friendly fishery implements such as bio-decomposition weirs, materials, and nets will be the task to be performed and systemic infrastructures should be constructed to prevent the examples of secondary marine contamination with re-dispose of collected wastes through extended installation of waste fishery implementation collection places in fishing ports and islands.

Korean Policy on Marine Litter

The 1st NOWPAP Workshop on Marine Litter
2006. 6.8 ~ 6.9



해양수산부
MINISTRY OF MARITIME AFFAIRS & FISHERIES

①

Overview

- Crisis of the sea-bed
 - ✓ Destruction of marine ecological space
 - ✓ The contamination of the coastal area accelerated by the over-fishing activity, rapid economic development, marine leisure boom
 - ✓ Insufficiency of environmental facilities, faint consciousness of marine environment
- The background of the policy
 - ✓ Marine litter designated as one of the 6 marine contaminants (water quality, red-tide, damage of the sandbank, etc)
 - ✓ Embarking on management policy of marine litter in 1999

②


Status and problems(1)

- Discrimination by the source
 - ✓ Ocean-based : fishing nets washed out in the typhoon or dumped at times of fishing activity and wastes from the vessel etc.
 - ✓ Land-based : massive waste flowed into the river in the heavy rain
 - ※ The majority of land-based source is tree and plants, plastics, etc.
- Damage by the marine litter
 - ✓ Ghost-fishing, destruction of spawning ground
 - ✓ Damage of coastal view caused by derelict marine litter
 - ✓ Cause of marine vessel accidents

③

Status and problems(2)

- Obstacle to securing management system
 - ✓ Inactive measure of municipal city (lack of budget, etc)
 - ✓ Frequent illegal activity such as leaving rubbish, can, bottle, etc. on the beach and shore



④

Execution of marine litter collection

- Completion of marine litter recovery for 117 harbors and fishing ports from 1999 to 2003
- Embarking on major fishing grounds in 2004
- Investing budget 51,900 million won in marine litter recovery project from 1995 to 2005
- Started marine litter purchase program in 2003

⑤

Future Strategy

- Basic Direction
 - ✓ Development of new paradigms of policy adjusted to change of the marine environment
 - ✓ Conversion of ocean dumping, reclamation etc.
 - To preventive and reductive measures through managing contaminant sources
 - To maximization of reuse and recycling
- Driving Marine Policy
 - ✓ Accomplishment of marine litter recovery project
 - Increase of budget, number of application areas
 - Improvement of budget stability through the special account by marine environment improvement shares

⑥

Future Strategy

- ✓ Promotion of local governments associations to manage the sources of contamination on a regional basis
 - Joint sharing of expenses and responsible wastes management by related parties
 - Providing incentives for organizing the cooperative committee for marine waste management
 - ※ operation model : Seoul, Incheon, Gyeonggi
 - : Budget : 28,500 million from 2002 to 2006
- ✓ Extension of purchase program
 - Raising fishermen's consciousness and saving the cost of wastes recovery and treatment
 - Considering the application of PPP (Polluters Pay Principle) in near future
 - Financial supports for treatment costs only

7

Future Strategy

- Technology practice of collecting marine litter
 - ✓ Distributing equipments resulted from R & D continuously
- Maximizing the recycling of marine litter
 - ✓ Supporting recycling enterprises
 - ✓ Development environment-friendly technology and equipments



8

Conclusion

- Ocean is confronted with the serious crisis with the self-cleansing power lost,
- Though the national interest on marine litter has been focused on the restoration of our marine environments,
- More concrete policy will be realized for further reduction of marine litter.

9

Session 1

Current Status of Monitoring and Distribution of Sea-based Marine Litter

The 1st NOWPAP Workshop on Marine Litter
8-9 June 2006

THE MARINE LITTER FROM FISHERY SOURCE IN YELLOW AND BOHAI SEA - STATUS AND MEASURES

Weichi Kang

Vice-Director

*Bureau of fisheries management & fishing port superintendence of
Yellow Sea and Bohai Sea areas, Ministry of Agriculture*

kwc828@163.com

Yellow Sea Status of Pollution By Fishery Litter and the Counter measures

- 1、About the yellow sea
- 2、Current pollution status by fishery litter
- 3、Control Measures to be taken
- 4、Countermeasures and suggestions

ABOUT THE YELLOW SEA

- The Yellow Sea is a marginal sea to China mainland. It has a sea area of 436,000 square kilometers. The average depth of the Yellow Sea is 44 meters and the maximum depth is 140 meters. The offshore yellow sea is heavily influenced by Yellow Sea warm current and coastal current. The Yellow Sea warm current weakens step by step as they flows northwards. As they reaches the south end of Liaotung Peninsula, they enter into the Bohai Gulf. The Yellow Sea coastal current strengthens by coastwise rivers.

- The current covers nearly most surface layer of the west part of sea area of Yellow Sea. Once the water area environment of the Yellow Sea is polluted, China will be the most suffer. So China should cooperate with the neighbor countries to strengthen the measures for the prevention and disposal of the pollution in the Yellow Sea.

Current pollution status by fishery litter

- Fishery litter is produced mainly by sunken vessels, fishing net and attachments, aquatic-breeding net and accessories and discard from human daily life.

a. sunken vessels

- The weather of Yellow Sea is mainly influenced by westerlies weather system. And in summer it is also effected by the tropic and the subtropics weather system. The weather here is complicated and variable. Tropical storm, storm tide, rainstorm, hailstone, marine fog, cold wave, frost and such natural calamity occur on occasion.

- Additionally, the fishery vessels in China are comparatively built simply. So boatsinking often occurs with the influence of calamity. More than 100 fish boatsinking happens in this sea area every year. As a common case, fisherman would salvage the sunken boat and draw it back to the port by themselves. But sometimes the seabed and the surrounding are too complex or the cost is too high, they have to give up salvaging.

- . The presence of sunken boat in the water can be harmful to fishing condition and navigation. But it is not so harmful to marine environment and halobios. Along with the development of shipbuilding technology and the improvement of accuracy in disaster weather forecast, the higher level of communicative facilities and the forced disuse of old vessels, the accident of fish boat sinking are reduced year after year.

b. fishing net and attachments

- The main inshore fishing net in the Yellow Sea is fixed net, trawl net, gill net, purse net, tackles and so on. The main offshore fishing net is drag net, gill net, purse net and long-line fishing. The fishing case, cordage, floater, buoy, fishing case and bamboo and wood poles are easily lost.

- To most Chinese fishers, the abandonment of net and attachments is completely passive. It is caused by the unforeseen accidental factors such as bad weather, stormy wave, seabed barrier, or entanglement with other ships, but not on purpose.

- As China now has already established a rather complete waste reclaim and disposal system, the fishers in this area will search and salvage the lost if they lose or find floating net or accessory. The discarded fishing net, cordage, floater, buoy, and fishing case will be delivered to the appointed department to be dealt with. After being reprocessed they can be used again, so that we can set up the recycling economy system.

C. aquatic-breeding net and attachments

- In China the inshore aquatic-breeding mainly uses net case, floating raft. In common case, the nets and ropes can not be lost unless in the stormy or such a bad weather. After a period of usage, the net will usually get some adhesion which will influence the permeability of water. Fishers would periodically have it cleaned up or change the net. The discarded net and attachments will be treated by appointed department and be reused.

D. waste of daily life

- The undecomposable or slowly - decomposable daily life waste can be generally divided into two kinds. One is those which can be taken back to the port to be recycled, such as bottles and cans. The other kind can be easily thrown away and it can cause pollution, such as food and packing materials.

Scrap floater



Scrap floater



Scrap floater



scrap webbig & cordage



Scrap webbig



Scrap webbig & cordage



Dealing with attachments on the scallop dish



Dealt with attachments



Reprocessed new floater and scrap floater



Scrap floater



Reprocessed new floater



Reclaimed scrap fish net&cordage



Selecting scrap fish net&cordage



Processing scrap fish net&cordage



Process scrap fish net&cordage to plastic grain



Control Measures to be taken

- The government and the public of China pay more and more attention to the environmental protection of marine fishery. Since 1982, with the publication of "marine environment protection law" and "law of fishery" and some other related laws, China has adopted a series of measures to protect marine environment.

- In recent years, China has been carrying out the scientific development policy in the development of economy. An important task is to realize the harmonious coexistence of the human and the nature. As for the ocean, that is to protect marine environment from the pollution caused by the marine litter.

- Firstly, China is to perform more on the propaganda and education of marine ecological environmental protection and take them as a main course in fishery law's training program. The awareness of fisher on environmental protection is to be improved continually.

- Secondly, China is to improve the technology of shipbuilding and the accuracy of disaster weather forecast and to improve the level of communication facilities. China has adopted strict fishing ship inspection program and promoted the safety production to reduce ship sinking and the missing of fishing nets and lines.

- Thirdly, China is to go on in carrying out “the scrap of fish boat and transfer fisher to other careers” program. Since 2002, altogether 18,000 fish boats have been scraped, almost 100,000 fishers have been transfer fisher to other careers all over the country. In doing this, the marine natural resource is protected and the marine environment is less impacted.


Countermeasures and suggestions


- The prevention and integrative treatment of marine fishery litter is a long and hard work. We suggest the following:

- 1、Master and emphasize the key-point. For the nowadays, the fishery production in China mainly depends on individual fishing ships. Those ships production are independent and scattered. To enhance the capabilities of those fishers, more propaganda and education to the individual ships are needed.

- 2、Rely on the basis of a system, make the monitor more perfect. Make full use of the current monitoring system of fishery water and environment. Enforce the monitor and management of fishery litter and promote the prevention system gradually.

- 3、Promote the mechanism. Enforce the laws strictly. Strengthen the control and management to fishery ships. Under strict administration, take more effective measures to reduce marine waste.

- 
-
- 4、Lay emphasis on basic job. Depend on the concerned party active collaboration and provide the support funds. Enhance the construction of fishery environment prevention. Extend low-charge special reclaim facilities. Equip the fishing ships with living waste reclaim facilities and prepare special trucks on the port to reclaim the waste from fish ships to bring down the pollution of drifts on the sea.



5、Set up international cooperation and assistance system. Work hard in the scientific research into fishery ecological protection. Promote the international communication and technical cooperation. Learn from the Russian Federation, Japan and Republic of Korea the excellent experience. Take scientific and advanced technology to the protection and control of sea pollution. Promote jointly the well development of the marine system.



Thank you very much

OBSERVATION FOR FLOATING PLASTICS IN THE SEAS ADJACENT TO JAPAN AND THE WESTERN NORTH PACIFIC BY JAPAN METEOROLOGICAL AGENCY

Mitsuhiko Ida

*Deputy Director, Ocean Office, Policy Bureau, Ministry of Land, Infrastructure and Transport
2-1-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8918, Japan
ida-m2ih@mlit.go.jp*

INTRODUCTION

Japan Meteorological Agency (JMA) is an affiliate agency of the Ministry of Land, Infrastructure and Transport. The goals of JMA are mitigation and prevention of natural disasters, safety of transportation, development and prosperity of industry, and Improvement of the public welfare. To meet these goals, JMA has been focusing its efforts on monitoring earth environment and on forecasting natural phenomena in the atmosphere, the ocean and the earth, as well as on conducting researches and technical developments in the relevant fields. JMA observes marine pollution in the seas adjacent to Japan. Marine pollution monitored by JMA consists of oil pollution and heavy metal. Floating plastics is observed as one form of the oil pollution.

OBSERVATION OF FLOATING PLASTICS

JMA observes floating plastics in the seas adjacent to Japan and the western North Pacific. The basic method of monitoring floating plastics is the following.

Monitoring Method

- Several observational lines are determined (Figure 1).
- Research ships go along with the lines.
- Observers watch the sea surface from the bridge during the daytime.
- When observers find floating pollutants they record locations and types of the pollutants.

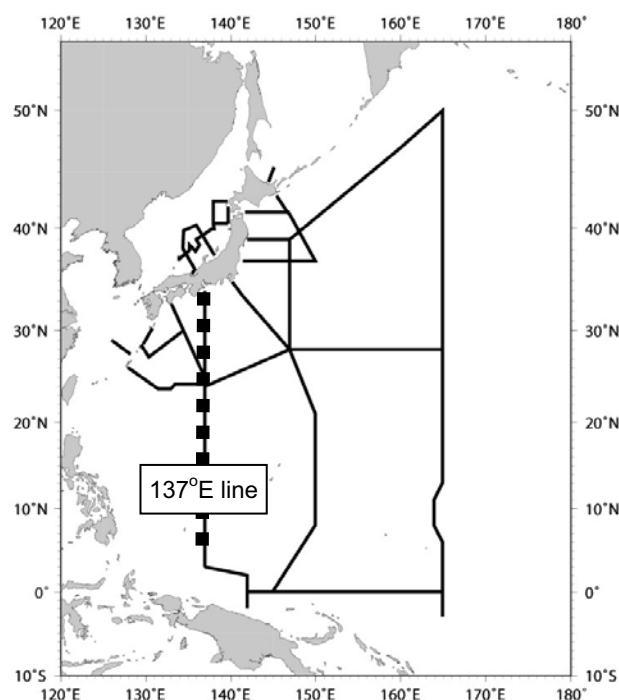


Figure 1. Observation lines of JMA research vessels (2005)

The observation line on 137 east longitude line was established in 1977, and since then JMA has observed floating pollutants on this line.

DISTRIBUTION OF FLOATING PLASTICS IN 2005

Because the monitoring is conducted in such a way as indicated above, the observation results are described as the number of pieces of floating plastics per 100km. The Figure 2(a), Figure 2(b), Figure 2(c) and Figure 2(d) show the observation results in winter, spring, summer and autumn, respectively. The size of circles in the figures indicates the number of floating plastics per 100km. The mark “+” means that no plastics are found all the daytime.

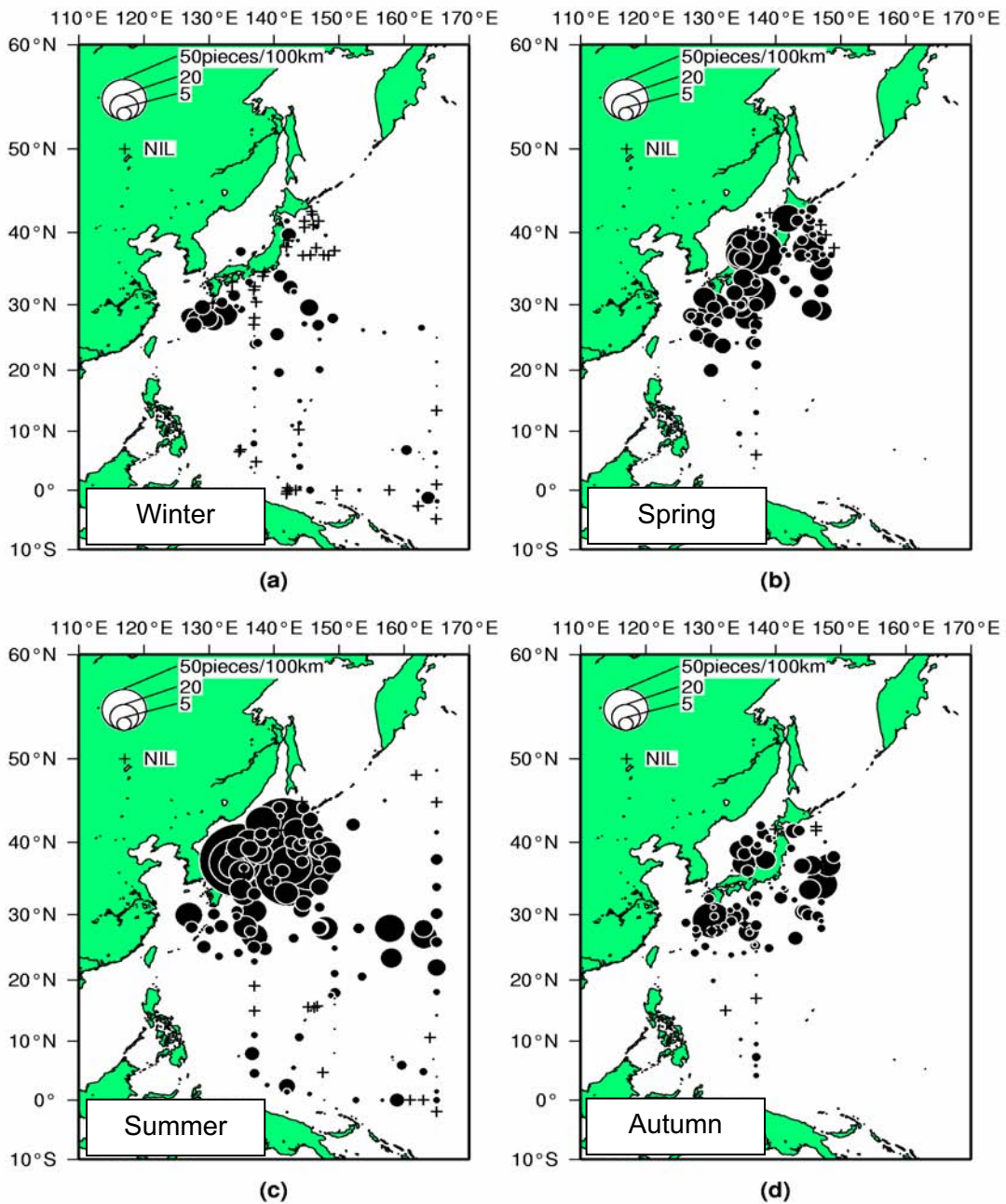


Figure 2. Distribution of floating plastics in 2005

As the Figures show that from spring to autumn, more than 20 pieces of floating plastics per 100km are found in the seas adjacent to Japan. Relatively many floating plastics are found around 30 north latitude line, south of the Kuroshio and the Kuroshio Extension. The seasonal tendency has not changed for the past several years.

NUMBER AND COMPOSITION OF FLOATING PLASTICS

According to the types of floating plastics, they are categorized into the four types: polystyrene form, fishing gear, plastic film, and other plastics. Figure 3 is the overview of the observation results in 2005, which indicates what types of floating plastics were found in which sea areas. In general, large proportion of floating plastics was occupied by Polystyrene form. This is not the tendency in 2005 but the overall tendency in the recent years. In East China Sea and NOWPAP Sea, the average number of floating plastics is large twice than in other seas. In particular, plastics in the form of fishing gear account for as much as 50 percents.

* In this monitoring by JMA, plastics are categorized by the following criteria.

- Polystyrene form
- Fishing gear, including signs attached to nets
- Plastic film, including plastic bags and sheets
- Other plastics, including containers of detergent and plastic bottles

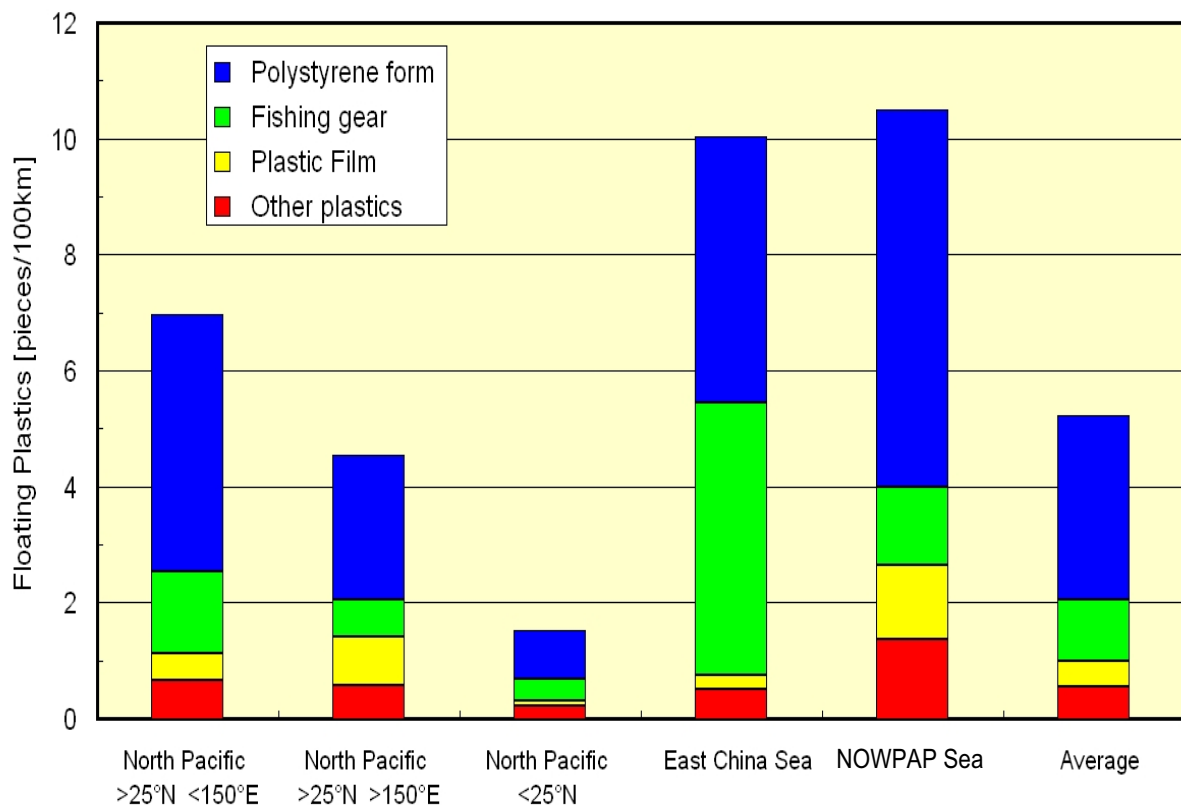


Figure 3. Number and composition of floating plastics by sea areas

AVERAGE DISTRIBUTION OF FLOATING PLASTICS BETWEEN 1981 AND 2000

The Figure 4 shows the average distribution of floating plastics between 1981 and 2000. The average distribution indicates that how many pieces of floating plastics were found annually from 1981 to 2000 in the areas divided by 5 degree longitude and latitude. In general, the number of floating plastics becomes smaller as the distance from the Asia Continent becomes larger. Also, the number of floating plastics in the sea adjacent to Japan is larger than that in the south of 20 north longitude and the sub-arctic region. Relatively many floating plastics are found around 30 north longitude, south of the Kuroshio and the Kuroshio Extension.

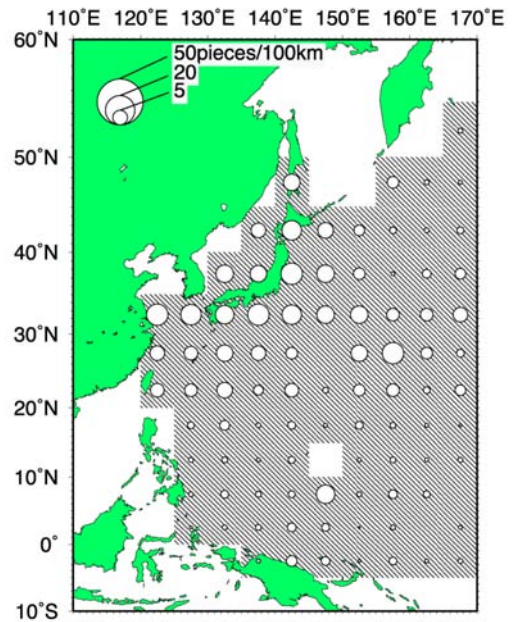


Figure 4. Average distribution of floating plastics between 1981 and 2000

TIME SERIES OF NUMBER OF FLOATING PLASTICS

The Figure 5 shows the time series of the number of floating plastics. As the figure indicates, the number of floating plastics in the seas adjacent to Japan has been decreasing from its peak around 1989.

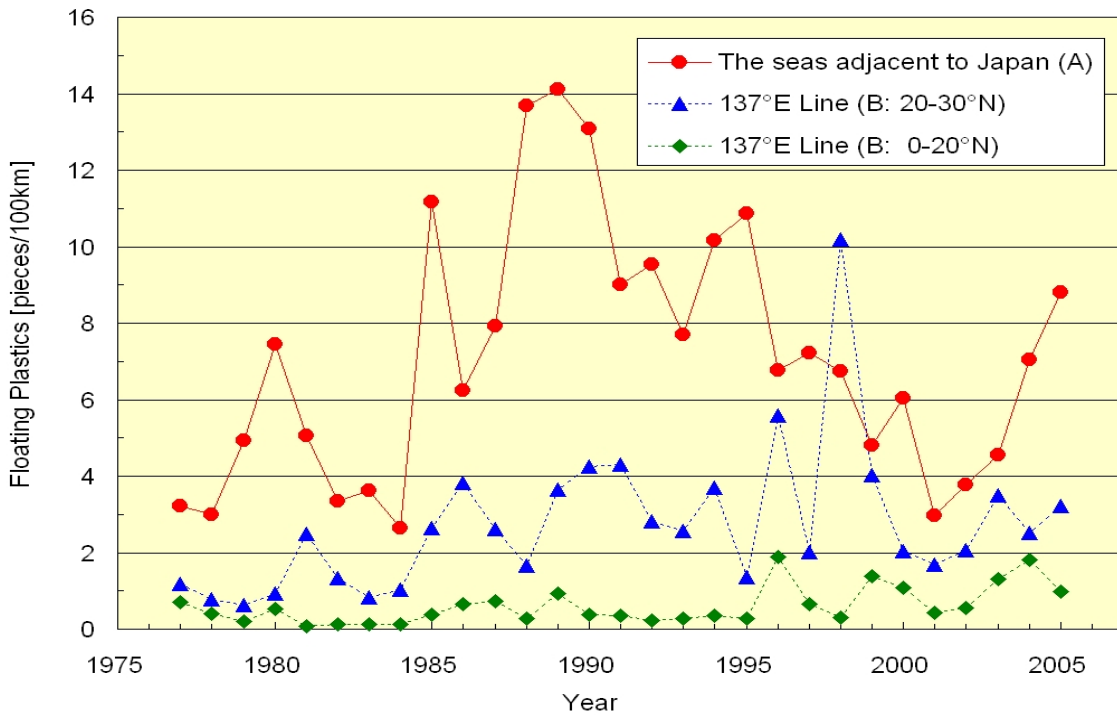


Figure 5. Number of floating plastics by time

Observation of Floating Plastics in the Sea adjacent to Japan by Japan Meteorological Agency

Mitsuhiko Ida

Deputy Director of Ocean Office
Ministry of Land, Infrastructure and Transport

1st NOWPAP Workshop on Marine Litter
June 8th, 2006
Incheon, Republic of Korea

Observation for Monitoring Marine Pollution performed by JMA

Marine pollution

Oil Pollution
• Petroleum hydrocarbons
• Floating tar balls
• Oil slicks
Floating pollutants (Plastics)

Heavy Metals
• Cadmium (Cd)
• Mercury (Hg)

Greenhouse gases in seawater and air

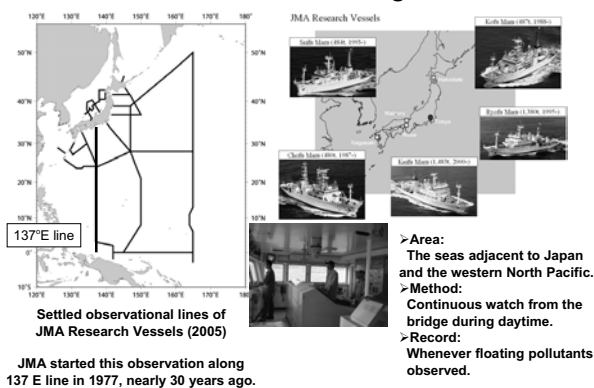
Carbon dioxide (CO₂)

Methane (CH₄)

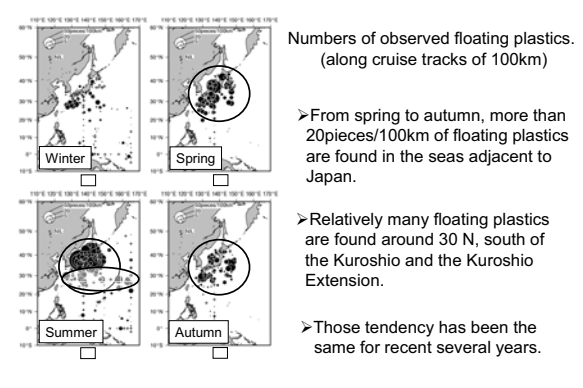
Nitrous Oxide (N₂O)

Chlorofluorocarbons (CFC-11, CFC12)

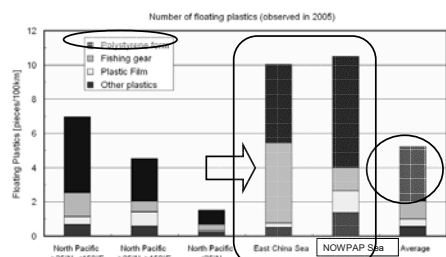
Observation of Floating Plastics



Distribution of floating plastics (2005)

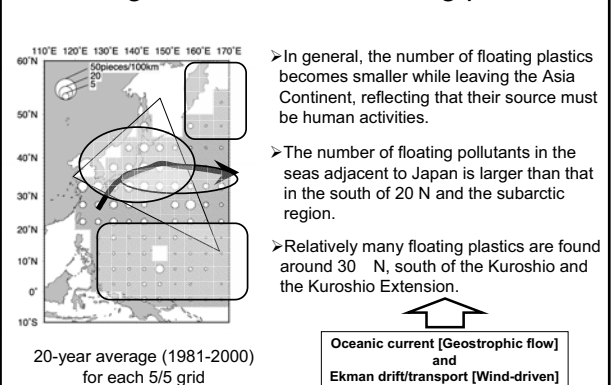


Number and composition of floating plastics

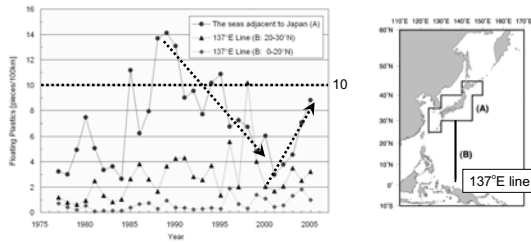


- In general, large proportion of floating plastics was occupied by "Polystyrene form" (more than 60%).
- About twice of average of floating plastics were found in East China Sea and NOWPAP Sea.
- "Fishing gear" accounted for about 50% in East China Sea.

Average distribution of floating plastics



Time series of floating plastics



- Recent several years, observed floating plastics are less than 10 pieces/100km all over the western North Pacific.
- As for the seas adjacent Japan, floating plastics have been decreased after the peak of 1988-1990.
- The tendency of increasing, however, can be found after 2000.

JMA webpage – Marine Diagnosis Report-



Information on the marine pollution in the western North Pacific is open to the public

JMA Top:

<http://www.jma.go.jp/jma/index.html>

Marine pollution in the western North Pacific:

<http://www.data.kishou.go.jp/kaiyou/shindan/>

(only in Japanese)

Thank You!!

MARINE DEBRIS MONITORING SYSTEM IN KOREA

*Dong-Oh Cho**, *Sun-Wook Hong*** and *Jong-Myoung Lee***

**Research Fellow, Korea Maritime Institute, 1027-4, Bangbae3-dong, Seocho-gu
Seoul 137-851, Republic of Korea, oceancho@kmi.re.kr*

***Sajig Indoor Swimming Pool 2F, 930 Sajig 2-Dong, Dongrae-Gu, Busan, 607-820, Korea
Korea Marine Rescue Center, oceanook@kornet.net, sachfem@kornet.net*

Marine debris is by-products of human activity that have ended up in the oceans. As population increases and industrialization continues, huge quantities of marine debris are generated from the land and the aquaculture and fishing industries, which are densely active in the coastal areas.

Most of the land-based marine debris flows into the sea through rivers during times of flooding, so it is difficult to monitor their origin and source of generation. Some land-based marine debris is generated through recreation at the beach and along the coast. Most marine debris harms the marine environment and communities through maritime accidents, habitat degradation, loss of fisheries products, and loss of tourism.

Korea government has initiated marine debris management, such as removal and disposal of deposited marine debris in the coastal waters and fishing grounds and investment for R&D of collection, disposal, recycling of marine debris. However, once marine debris is at sea, it is hard and costly to remove and dispose on land. So the public tries to prevent marine debris generation through public outreach programs, such as monitoring, workshops and participating in the International Coastal Cleanup (ICC).

Compared to other coastal countries in the world, monitoring marine debris in Korea has only started recently. More than twenty three local NGOs have participated in monitoring twenty coastal sites regularly since 2000.

The weight and number of marine debris are identified and measured according to the guidelines from the Ocean Conservancy (O/C). Land-based marine debris is the largest, but compared to other countries, sea-based marine debris (ocean/water) is also large because of dense activity in aquaculture in the coastal waters of Korea.

Most monitoring members are students of the local junior high schools and high schools, teachers of the local elementary schools and junior high schools, and housewives, so the effect of public outreach program seems to be large. Korea has tried underwater monitoring through diving since 2002 because much marine debris is deposited in the coastal waters. Underwater monitoring is so difficult and dangerous that all of the monitoring members are experts in diving. For monitoring in underwater, a manual was developed in 2003.

Korea has participated in the International Coastal Cleanup since 2001. Participation in ICC is a participatory program to raise public awareness in cooperation with NGOs, the national government and research institutes. But NGOs monitoring of marine debris play a key role in carrying out the event.

Monitoring NGOs have held training workshops regularly since 2001. Participants of training

workshops are NGOs from various fields as well as monitoring NGOs, volunteers, government officials, and researchers. The purposes of the training workshops are to learn lessons and experiences through case studies of monitoring marine debris in the field. In the workshop, all the participants including the central and local government officials are talking and discussing the status, problems and alternative policies on marine debris and thereby many government policies have been adopted.

Social scientists have developed various kinds of education and public relation materials for public outreach programs. Social scientists develop a draft of all the materials, and then they are tested, evaluated and finalized by NGO leaders and school teachers. Until now social scientists have developed materials for public outreach programs for leaders of NGOs and school teachers. Social scientists have not only developed materials for public outreach programs but also have participated in the monitoring at coastal sites, the ICC, the training workshops and classroom teaching and exchanged opinions and feedback for the development of materials.

Monitoring Program in Korea

Dong-Oh Cho (KMI)
Sun-Wook Hong· Jong-Myoung Lee
(KMRC)

Contents

- I. Background of Monitoring Program
- II. Characteristics of Monitoring Program
- III. Major Activities
- IV. Summary of Monitoring
- V. Problem to Be Solved

Background of Monitoring Program

- **Characteristics of Marine Debris**
 - **Wet, Heavy, Lengthy and Bulky but also Salty**
 - High cost of removal
 - Reclamation > Incineration
 - **Floating and Transfer from Original Generation**
 - Conflicts between polluter and damaged
 - International cooperation

Background of Monitoring Program

- **Characteristics of Marine Debris (cont'd)**
 - **Long Life**
 - Persistent impact to marine environment
 - Loss of fisheries production
 - Cause of maritime accidents
 - Aesthetic loss of beach and coast
 - **Non-Point Sources of Pollution**
 - Generating from anywhere human beings are living
 - Various kinds as industrialization
 - Difficult enforcement of legislation

Background of Monitoring Program

- **Background of Monitoring**
 - **Limits of Government Policy**
 - Limits of Resources
 - Disposal-Oriented
 - **Marine environment management is too wide for government alone**
 - **More Prevention than Disposal**

Characteristics of Monitoring Program

- **Partnership : MANGO**
 - **Government (MOMAF)**
 - Financial & administrative support
 - **Research Institute (KMI)**
 - Technical support
 - Policy recommendation
 - **NGOs (> 40s)**
 - Monitoring in fields

MANGO : Marine Alliance among
Nongovernmental Organizations,
Governments and Research Organizations

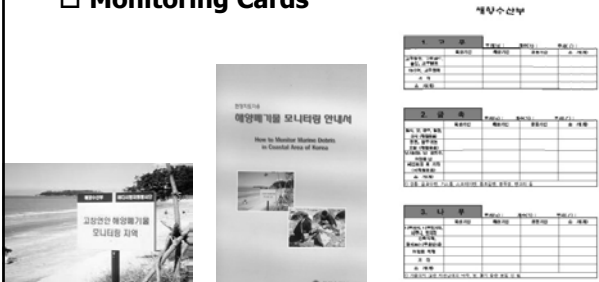


Major Activities

- Beach Monitoring
- Local coastal NGOs leading
 - Volunteers, students, etc.
- More than 24 sites
 - Along east, west, south coasts
- Monitoring Card
 - Developed monitoring card and manual for Korea coasts and beaches

Major Activities

- Beach Monitoring (cont'd)
- Monitoring Cards



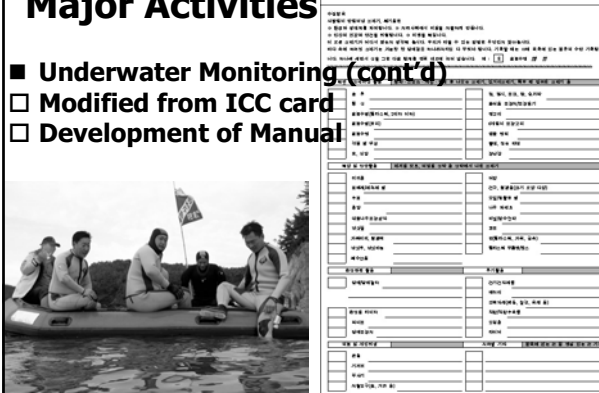
The image shows a manual cover titled '해양해결을 모니터링할 연내제' (How to Monitor Marine Debris in Coastal Area of Korea) and three monitoring cards. The cards are labeled '해당수신부' (Receiving Department) and have columns for '구분' (Category), '현황' (Status), '비고' (Remarks), and '일' (Date). The cards are for '해양쓰레기' (Marine Debris), '해양생물' (Marine Life), and '조수' (Tide).

Major Activities

- Underwater Monitoring
- Much marine debris is deposited in the coastal waters
- Diver experts: KMRC
 - Dangerous and difficult
- Developed underwater monitoring manual (not published)

Major Activities

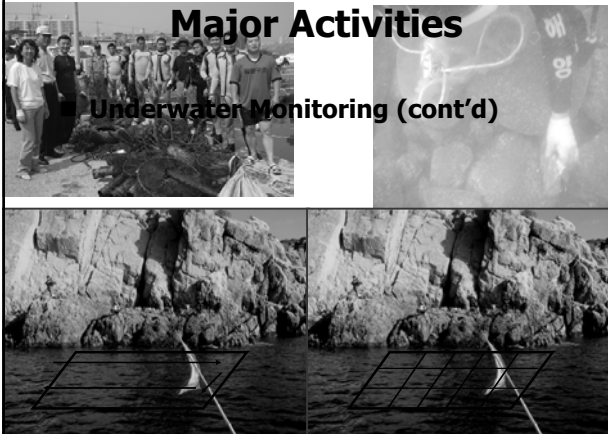
- Underwater Monitoring (cont'd)
- Modified from ICC card
- Development of Manual



The image shows a manual for underwater monitoring with a detailed table of contents and a photo of divers in a boat. The table of contents includes sections for '수집물' (Collected Items), '수집물 목록' (List of Collected Items), '수집물 사진' (Photographs of Collected Items), '수집물 기록' (Records of Collected Items), '수집물 보관' (Storage of Collected Items), '수집물 운반' (Transportation of Collected Items), '수집물 처리' (Disposal of Collected Items), '수집물 회수' (Recovery of Collected Items), '수집물 폐기' (Disposal of Collected Items), and '수집물 재활용' (Recycling of Collected Items).

Major Activities


Underwater Monitoring (cont'd)



The image shows a group of people on a beach, a diver underwater, and a diver on a boat. The diver on the boat is holding a large net or frame in the water.

Major Activities

- Participation in ICC & Coastal Cleanup
- Largest volunteer effort designed by The Ocean Conservancy (USA)
- Joined in 2001
- National Events
 - Increasing public awareness




The image shows a poster for 'Coastal Cleanup Korea 2001' and two photos of volunteers participating in the cleanup. One photo shows a banner that says '해양쓰레기 줄이기 위해 함께 노력합시다' (Let's work together to reduce marine debris).

Coastal Cleanup Korea

Year	Beach/UW (Site)	People	Items (ea.)	Pound (kg)	Length (km)	Main Event (Minister's Participation)
2001	22 / 1	1,750	11,187	7,831	23.1	Inchon Jebu Island
2002	22 / 0	1,600	8,589	3,879	17	Boryoung Moochangpo Beach
2003	15 / 11	1,200	14,677	7,150	14.7	Only local voluntary events
2004	23/5	1,916	22,004	13,163.4	21.64	Only local voluntary events
2005	31/13	7,112	77,722	310tons	40	Only local voluntary events

Major Activities

Workshop and Training
 10 workshops since 2001



Year	Month	Location	Topics
2001	Apr. July Oct.	Seoul Ansan Geoje	Theoretical background of the third type management / Preliminary result of marine debris monitoring / Preview of web-based D/B system / Governmental policy / Public education and relations strategies / The first ICC result / Marine pollution issues
2002	Jan. June Nov.	Seoul Yeosu Busan	Questionnaire on NGOs' marine-related activities / Underwater monitoring method / Development of educators' book / Marine debris statistic system / Local marine environmental issues

Major Activities

Workshop and Training
 10 workshops since 2001



Year	Month	Location	Topics
2003	June Nov.	Taeon Cheonan	Drifted marine debris / Education and public relations materials' application / Output and outcome of MANGO / Japanese case (from JEAN)
2004	July	Ulsan	Management for island debris / Treatment technology Underwater ecology / Scuba monitoring
2005	July	Tong-yeong	Local model cases of ICC / Current pattern around Korean peninsula / Strategies for drifted debris issue NGOs' international cooperation in Northeastern Asia / National marine debris monitoring program

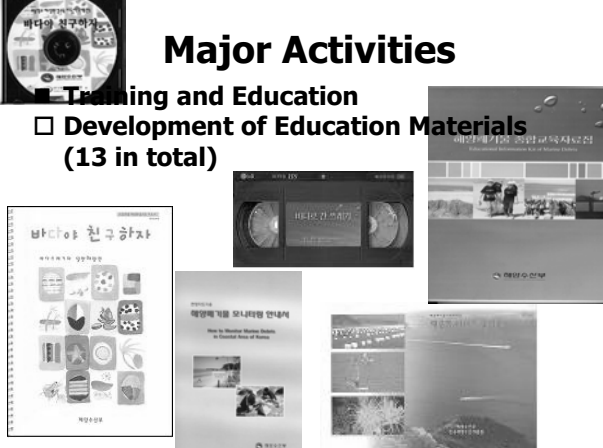
Major Activities

Training and Education
 Development of Education Materials (13 in total)

Year	Type	Target	Content
2001	Posters(4) / Leaflets(2) Booklet Video / VCD	Adults / Children The public	Basic knowledge about marine debris
2002	Monitoring manual Information kit	NGOs activists /The public	Guide book for organizers of beach monitoring
2003	Text book (2 paperbacks & CD)	NGOs activists and teachers	Activities for classroom (K3~6)
2004	Leaflet	The public	Result of efforts for five years

Major Activities

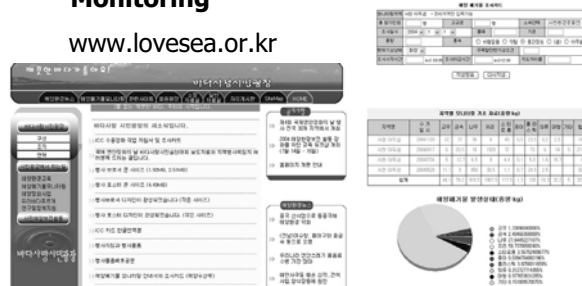
Training and Education
 Development of Education Materials (13 in total)

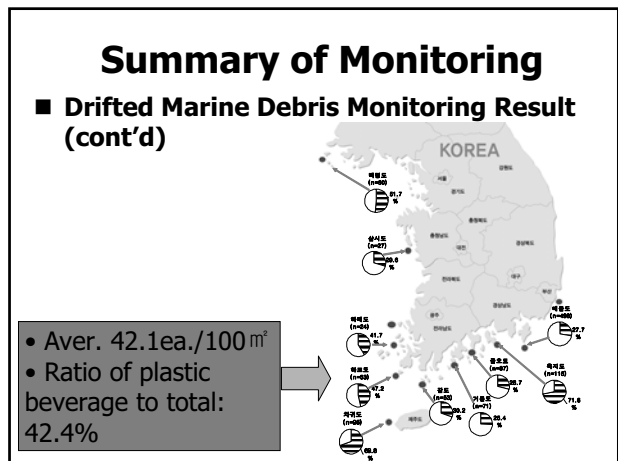
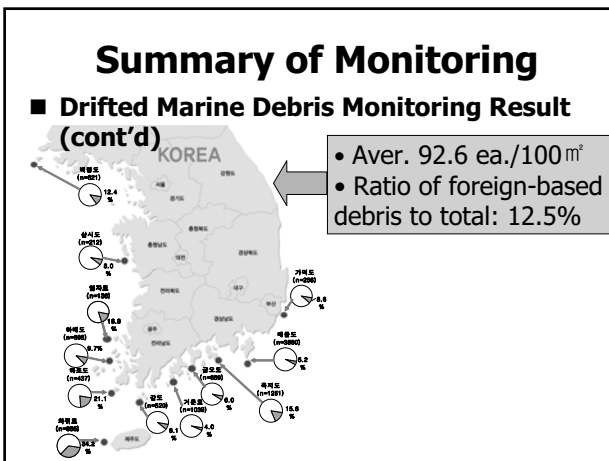
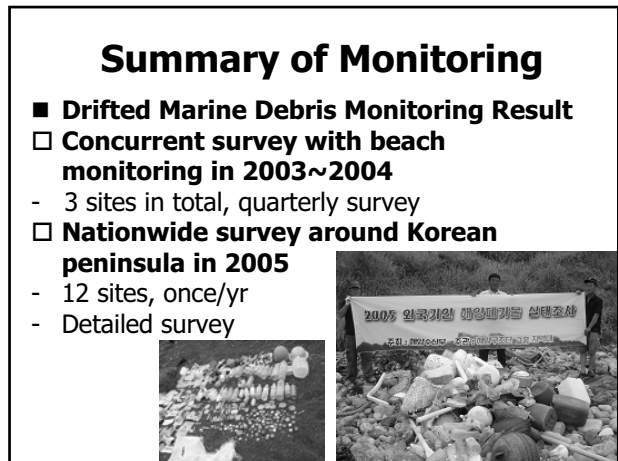
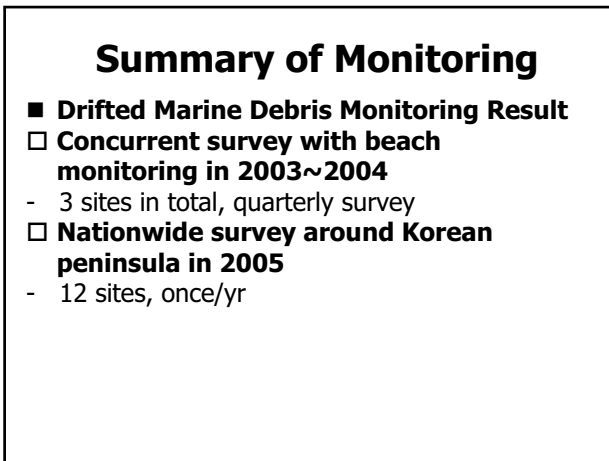
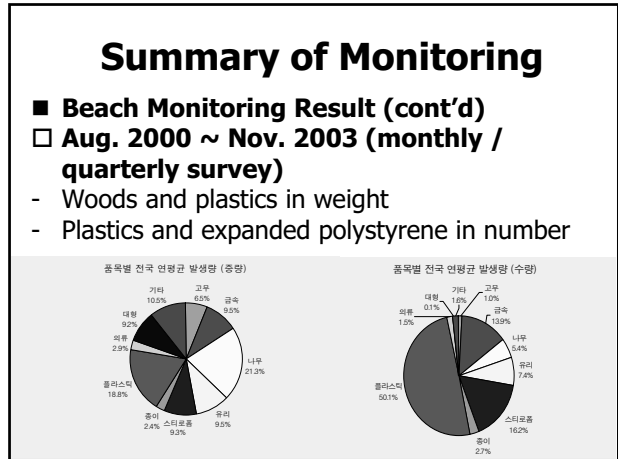
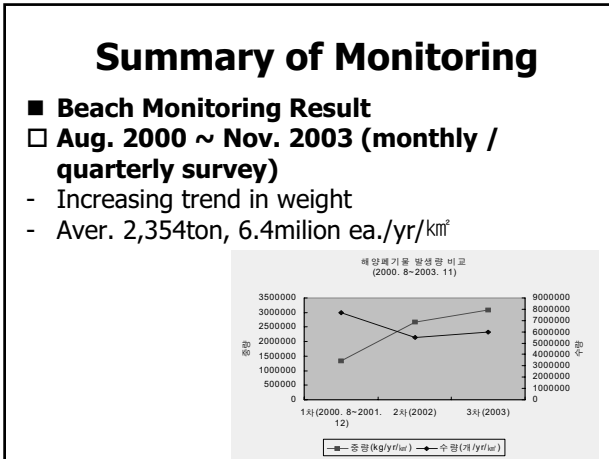


Major Activities

Data Base on Marine Debris Monitoring

www.lovesea.or.kr





PRINCIPALS OF ARRANGEMENTS FOR LITTER MONITORING IN HARBOR WATERS

Yana Yu. Blinovskaya

*Researcher, Maritime State University named after Admiral G.I. Nevelskoy
50A Verkhneportovaya St., Vladivostok 690059, Russian Federation
blinovskaya@msun.ru*

According to statistical data approximately 80 per cent of the Earth's population inhabits coastal zones (either directly on the coast or within a 100km band along it). Most of world's biggest cities (of more than 1,000,000 residents) are located there. The same pattern is observed in leading industries distribution as well. All the said gives rise to a number of conflicts in the "man – environment" system, marine environment pollution with litter among them. This problem is one of the most serious ones in APR countries' coastal zones. Various public and research organizations of the region are engaged in the study of coastal marine zone pollution and litter composition, actual and potential pollution sources are being revealed. However, there is no commonly accepted policy for coastal pollution evaluation yet, which causes wide-spread doubts as to the reliability of the data collected. This is of especial importance for marine litter monitoring principals in offshore zones.

Litter on the sea surface may be caused both by the shore-based (carryover from beaches) and by the sea-based sources (trans-border carryover, transport industry). About 6.5mln tons of litter are introduced into marine environment annually, a considerable portion being stable synthetic materials. As a consequence zones of high litter concentration suffer from environmental stresses.

Recent years have witnessed regular large-scale operations in cleaning sea coasts from litter. For instance, 1993 international action (taken in 33 countries worldwide) resulted in cleaning 8,000km of shoreline. Almost 5.5mln articles dumped by men into the sea and then brought by the sea onto the shore were gathered. Of all the waste collected plastic articles accounted for 58.8 per cent, butts from cigarettes with filter (about 900,00pcs) accounted for 16.8 per cent, bottles and jars used for drinks, as well as their corks and lids accounted for 12.7 per cent. The fewest number (1 per cent) was accounted for by fishing gear and its components (fishing line, spoon-baits, net snatches, floats), which nevertheless present the highest danger to marine biota, as sea animals perish very soon once fouled by gear or lines.

Litter management is governed by the regulatory and legal framework of the present day. Thus, the Rules for Preventing Pollution by litter from Ships completely ban dumping of any type of plastics into the sea, including synthetic materials, but still considerable amounts of plastics show up in the marine environment. The Primorsky Krai coastal zone is no exception.

With due regard to all the above the Sea Protection Institute, Maritime State University named after Admiral G.I. Nevelskoy conducts assessment of coastal zone pollution in the Peter the Great Gulf and development of marine litter monitoring techniques. At the First International Marine Litter Workshop there was a presentation of techniques based on the assessment of qualitative and quantitative

composition of litter in various geomorphologic sections of the beach, and of the results obtained from the coastal pollution study. The Workshop has demonstrated that despite the shared severity of the problem throughout NOWPAP region, the sources of pollutant introduction into the marine coastal environment of Japan, Korea, China, and Russia are quite different. In the south-western part of Primorsky Krai the “land originated” litter is prevailing. It is mainly coming from the enterprises and companies doing their business on the coast, as well as tourism, represented as a rule by unmanaged tourist camps. Litter of the sea origin is predominant in the southern part of the Khasan seashore. There wide sandy beaches are mostly polluted in the zones of max and medium setup, while litter is basically composed of the matter of overseas origin (e.g., consumer plastics). Thus one can make conclusions as to the litter origin and ways of coming. These may be, for instance, currents bringing litter from the open sea, or the Tumannaya River stream and its further spread by the currents over the sea water area. The analysis of the data obtained through the 1999-2005 research made it possible to arrive at the following conclusions:

1. it's the beach supralittoral zone which is the most heavily polluted part of the coastal zone;
2. the coast is the more polluted the closer it is to the developed lands;
3. near-estuary areas are subject to extensive pollution;
4. smalls predominate in the litter structure.

As to the arrangements for marine litter monitoring in offshore zones, the first ever overall attempt to conduct it will be undertaken in the Peter the Great Gulf waters during summer, 2006 with the support of the Floating Lab (Sea Protection Institute) aboard motor sailing yacht “Rif”. The research in the course of the expedition is scheduled to be carried out by the Institute staff and students. Monitoring is based on the method of offshore zone pollution assessment tested in 2005. The method concept is as follows.

Regular-shaped grid has been selected as an operational area unit of mapping (Fig. 1), the cell frequency of which depends on the area of the zone under research. For instance, within the Amursky Bay waters it is practicable to use trigonometric grid with a cell's side of 1km. The yacht design provides for a fine-meshed trawl net of 5m in breadth and 10m in length. The trawl net is thrown from the fore of the boat. Further course is shaped according to the predetermined grid supported by GPS fixes. Litter qualitative and quantitative characteristics are evaluated for every separate cell of the grid. Moreover, the quantity of litter of different size is calculated and the litter qualitative characteristics are recorded. Following the shoreline pollution evaluation policy the litter is graded as to its size. At that it is divided into three categories:

1. small-sized litter (articles up to 5cm);
2. medium-sized litter (sized from 5cm to 10cm);
3. large-sized litter (over 50cm).

Articles exceeding 1m are considered beyond the categories.

The data is inserted into the table, a fragment of which is presented below (Table 1).

Simultaneously photographic work and video filming take place making it possible to grasp a whole picture when conducting office operations. The expedition results achieved through monitoring are then recorded into the database. Results analysis and pollution sources identification will facilitate the development of recommendations to the administrating authorities and top the organizations carrying out their activities within the coastal zone.

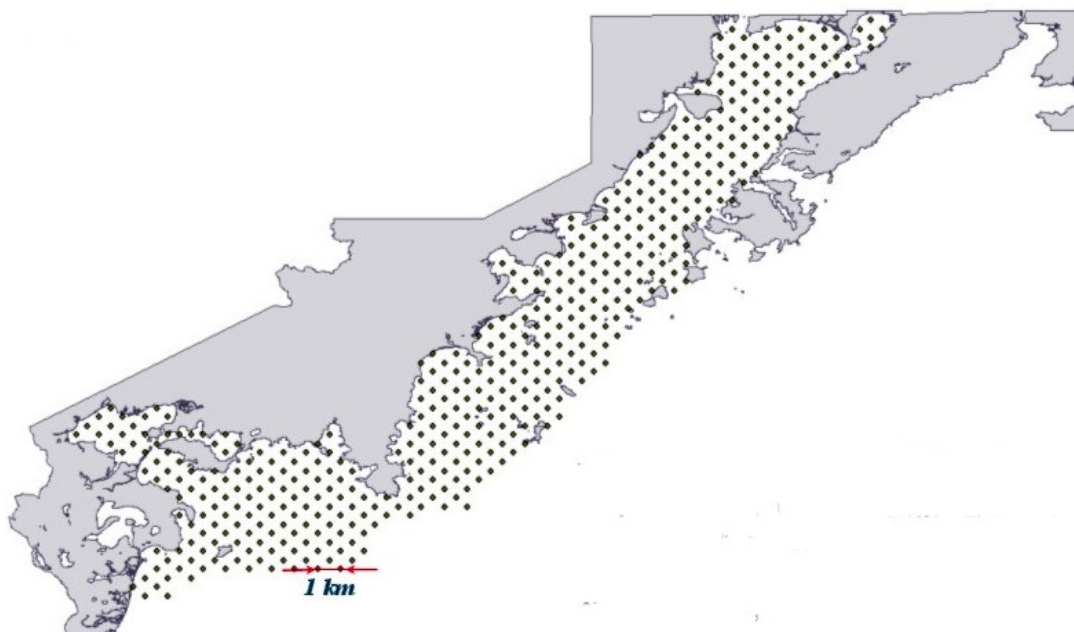


Fig. 1. Litter Mapping Territorial System for south-western part of Primorsky Krai

Table 1. A Fragment of Litter Monitoring in Offshore Zone Table

cell No.	travel time (hrs)	how propelled		Litter qualitative and quantitative characteristics (pcs)		
		motor-driven	wind-driven			
				<i>consumer waste</i>	<i>small</i>	
					<i>medium</i>	
					<i>large</i>	
				<i>wood</i>	<i>small</i>	
					<i>medium</i>	
					<i>large</i>	
				<i>plastics</i>	<i>small</i>	
					<i>medium</i>	
					<i>large</i>	
				<i>fishing gear</i>	<i>small</i>	
					<i>medium</i>	
					<i>large</i>	

Monitoring frequency is dependent of the extent of the waters littering. Thus, within the zones featuring intensive economic activities it seems expedient to carry out monitoring on a quarterly basis. Seasonal activities, for example recreational activities, imply that monitoring should be carried out twice: prior to the season commencement and upon its termination. These measures would contribute into the development of the best litter management strategy.

In order to obtain a more or less adequate picture of waters littering the measurements are conducted taking hydrodynamic parameters into account. For instance, surface currents allow predicting the major litter migration routes. Viewing the Peter the Great Gulf current chart (Fig. 2) one can assume that the litter will tend to travel from the south-western part of the Primorsky Krai shores along the coast of the Khasan District towards the Amursky Bay. The current setting from the head of the Amursky bay is no less considerable and may serve as a litter migration route as well. Therefore, the highest litter concentration in the offshore zones will be observed in the central part of the Amursky Bay where currents meet.

Wind amplitude characteristics allow determining the litter concentration zones. Accounting for these characteristics in the course of the first trial sailings facilitated the disclosure of 300-500m wide litter plumes out from the Razdolnaya River. At that in windless regions litter tends to be accumulated for a long period of time, gradually shifting towards the near-shore waters, such as Peschanaya Bight and Melkovodnaya Bight.

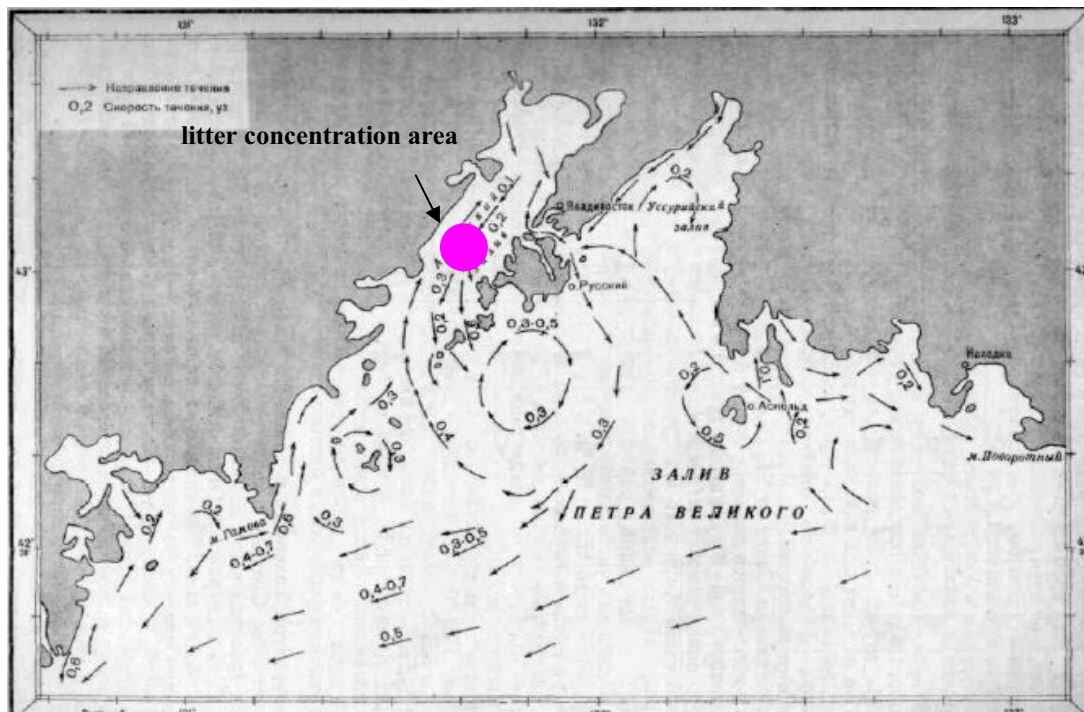


Fig. 2. Surface Currents in Peter the Great Gulf

At a varying distance offshore litter's qualitative and quantitative characteristics will vary. They are governed by the currents' strength and rate, pollution sources distribution, and some other factors.

For the purpose of identifying areas of increased litter concentration it is necessary to make use of the remote sensing data. For instance, litter may be introduced with river runoffs, which plumes are clearly seen on the space images. Therefore, when planning monitoring activities a stage of reconnaissance operations on the basis of modeling is essential. Modeling is based on the deployment of geoinformation systems. GIS databases, containing cartographic and semantic information, provide for a general idea of litter distribution locations. Monitoring carried out on a regular basis will make it possible to identify qualitative and quantitative characteristics. Application of these methods will also allow identifying pollution sources, litter travel routes and areas of litter concentration.

The use of the Floating Lab, featuring a high degree of independence and performance while being comparatively inexpensive, seems to be the best way for monitoring not only in inner waters but in the

offshore zones as well. Harbor services may be incorporated into the monitoring process in the inner waters. In particular, data collected from garbage disposal vessels, will provide for an opportunity of marine litter management within the Maritime Administration of Sea Ports' responsibility zones. Ports and sea-going vessels, being one of the sources of littering, can thus be involved into the unified monitoring system.

All of the NOWPAP participating nations are involved into finding a solution to this problem to a varying degree, but all of them share the same idea: it is necessary not only to keep a check on litter within their own territories and waters, but to unite efforts with the neighbors in domains of management, technologies, and monitoring, which is of special significance with regard to trans-border litter carryover. Thus, the solution to the problem rests not only on its perception and some theoretical and practical studies, but also on administrating authorities contribution expressed in terms of certain legislative, legal, and financial support. This will serve as a basis for monitoring on a regular basis. Interaction of research, production and administrative agencies will allow implementing the centralized marine litter management program.

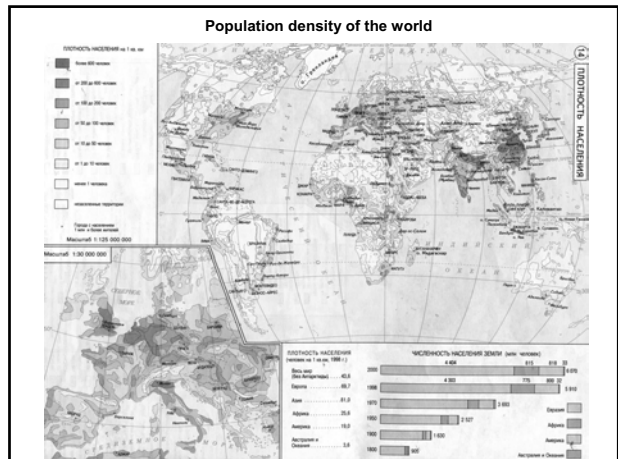
Thus, the marine pollution analysis conducted in accordance with the uniform monitoring policy will make it possible to grasp an adequate picture of the examined area state and to give recommendations for waters cleanup operations and for the pollution prevention measures, whether pollution is caused by land-based sources or sea-based ones. Our belief is that the proposed monitoring concept holds much promise not only for the RF part of the NOWPAP region, but for the other parts. It will facilitate identification of marine litter travel routes, as well as pollution sources.

REFERENCES

1. Blinovskaya Ya. Yu., Sergeyev V.V. Beach area sanitary and engineering condition evaluation // Problems of Geography at the Turn of XXI-th Century. Proceedings of All-Russia Scientific Conference, February 24 – 26, 2000. Tomsk: University of Tomsk, 2000. Pp. 21 – 22.
2. Marine Litter. An Analytical Overview. UNEP. 2005. 48 p.
3. First International Workshop on Marine Litter in the Northwest Pacific Region 14 – 15 November 2005. Ministry of the Environment of Japan. 2005. 166 p.

PRINCIPALS OF ARRANGEMENTS FOR LITTER MONITORING IN HARBOR WATERS

Yana Yu. Blinovskaya
candidate of science (geography)
Sea Protection Institute
Maritime State University named after admiral G.I. Nevelskoy
Vladivostok



The same pattern is observed in leading industries distribution as well. All the said gives rise to a number of conflicts in the "man – environment" system, marine environment pollution with litter among them.

3

This problem is one of the most serious ones in APR countries' coastal zones

Marine Litter in Japan
(Mr. TANAKA presentation)

Marine Litter in Korea
(Mr. Jung presentation)

Marine Litter in China
(Dr. HU presentation)

Marine Litter in Russia

4

Various public and research organizations of the region are engaged in the study of coastal marine zone pollution and litter composition, actual and potential pollution sources are being revealed.

5

However, there is no commonly accepted policy for coastal pollution evaluation yet, which causes wide-spread doubts as to the reliability of the data collected

6

Litter on the sea surface may be caused both by the shore-based (carryover from beaches) and by the sea-based sources (trans-border carryover, transport industry)

7

About 6.5 mln tons of litter are introduced into marine environment annually, a considerable portion being stable synthetic materials.

8

Recent years have witnessed regular large-scale operations in cleaning sea coasts from litter

9

Litter management is governed by the regulatory and legal framework of the present day

10

the Rules for Preventing Pollution by litter from Ships completely ban dumping of any type of plastics into the sea, including synthetic materials, but still considerable amounts of plastics show up in the marine environment

11

The Primorsky Krai coastal zone is no exception

12

With due regard to all the above the Sea Protection Institute, Maritime State University named after Admiral G.I. Nevelskoy conducts assessment of coastal zone pollution in the Peter the Great Gulf and development of marine litter monitoring techniques

13

No. of the point	Litter Monitoring Table (in fragments)				
	zone 1.1	zone 1.2	zone 1.3	zone 2	zone 3
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

At the First International Marine Litter Workshop there was a presentation of techniques based on the assessment of qualitative and quantitative composition of litter in various geomorphologic sections of the beach

14

...and of the results obtained from the coastal pollution study

15

The Workshop has demonstrated that despite the shared severity of the problem throughout NOWPAP region, the sources of pollutant introduction into the marine coastal environment of Japan, Korea, China, and Russia are quite different

Marine litter in Japan
(Mr. Ohkura presentation)

Marine litter in Korea
(Mr. Hong Gun Sung presentation)

16

In the south-western part of Primorsky Krai the "land originated" litter is prevailing

17

It is mainly coming from the enterprises and companies doing their business on the coast, as well as tourism, represented as a rule by unmanaged tourist camps

18

Litter of the sea origin is predominant in the southern part of the Khasan seashore. There wide sandy beaches are mostly polluted in the zones of max and medium setup, while litter is basically composed of the matter of overseas origin (e.g., consumer plastics)

19

Thus one can make conclusions as to the litter origin and ways of coming. These may be, for instance, currents bringing litter from the open sea, or the Tumannaya River stream and its further spread by the currents over the sea water area

Stream general scheme 20

The analysis of the data obtained through the 1999 – 2005 research made it possible to arrive at the following conclusions:

21

1. it's the beach supralittoral zone which is the most heavily polluted part of the coastal zone

22

2. the coast is the more polluted the closer it is to the developed lands

Developed beaches in the Khasan area


Unreclaimed beaches in the Khasan area

23

3. near-estuary areas are subject to extensive pollution

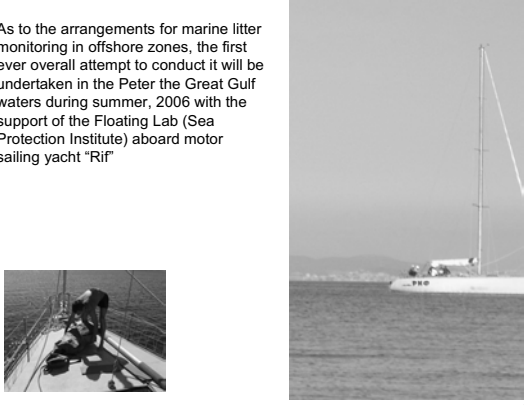
24

4. smalls predominate in the litter structure



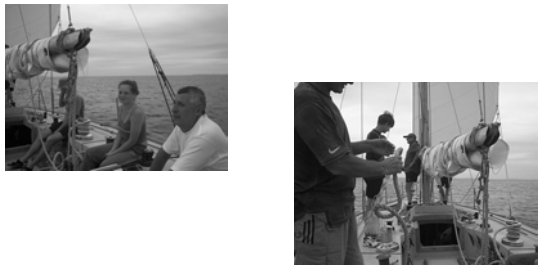
25

As to the arrangements for marine litter monitoring in offshore zones, the first ever overall attempt to conduct it will be undertaken in the Peter the Great Gulf waters during summer, 2006 with the support of the Floating Lab (Sea Protection Institute) aboard motor sailing yacht "Rif"




26

The research in the course of the expedition is scheduled to be carried out by the Institute staff and students



27

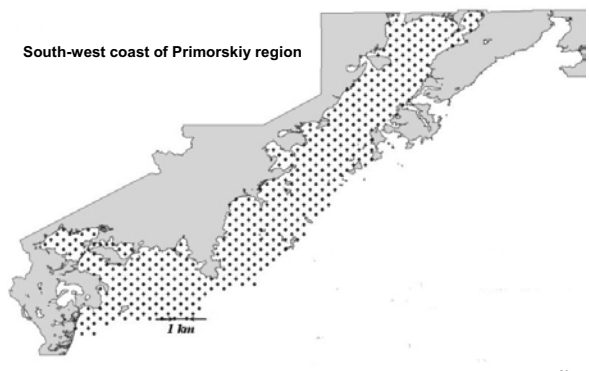
Monitoring is based on the method of offshore zone pollution assessment tested in 2005



28

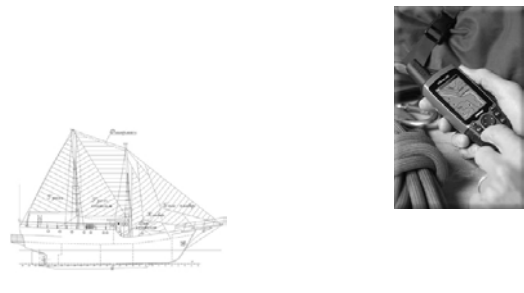
Regular-shaped grid has been selected as an operational area unit of mapping, the cell frequency of which depends on the area of the zone under research.

South-west coast of Primorskiy region



29

The yacht design provides for a fine-meshed trawl net of 5m in breadth and 10m in length. The trawl net is thrown from the fore of the boat. Further course is shaped according to the predetermined grid supported by GPS fixes.



30

The quantity of litter of different size is calculated and the litter qualitative characteristics are recorded.

organic substance	garbage	
	wood	
non-organic substance	plastics	
	rubber	

31

As to the size there are three categories

small litter	objects up to 5cm in size	
middle litter	objects from 5cm to 50cm	
large litter	over 50cm	
Objects of more than 1m are beyond categories.		

32

The data is inserted into the table

A Fragment of Litter Monitoring in Offshore Zone Table

cell No.	travel time (hrs)	how propelled		Litter qualitative and quantitative characteristics (pcs)	
		motor-driven	wind-driven		
				consumer waste	small
				medium	
				large	
				wood	small
				medium	
				large	
				plastics	small
				medium	
				large	
				fishing gear	small
				medium	
				large	

33

Simultaneously photographic work and video filming take place making it possible to grasp a whole picture when conducting office operations. The expedition results achieved through monitoring are then recorded into the database.

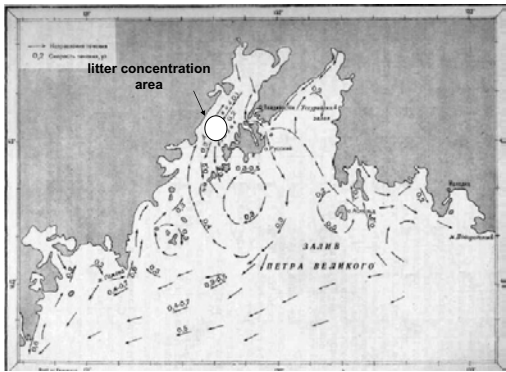






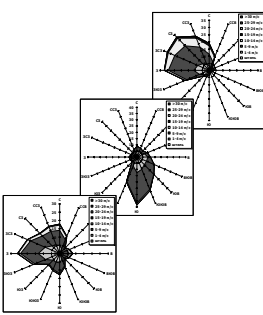
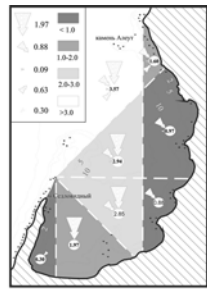
34

In order to obtain a more or less adequate picture of waters littering the measurements are conducted taking hydrodynamic parameters into account.

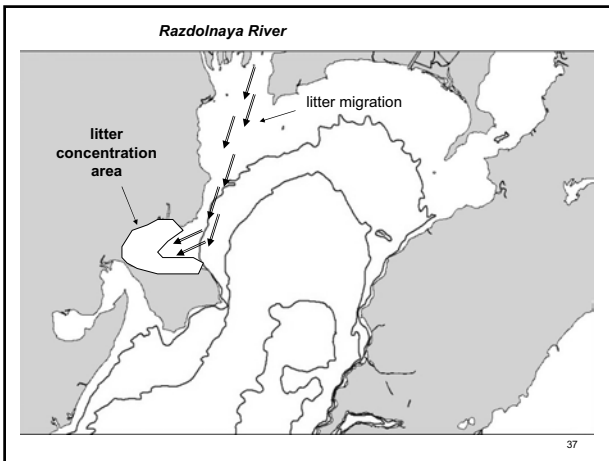


35

Wind amplitude characteristics allow determining the litter concentration zones

36



At a varying distance offshore litter's qualitative and quantitative characteristics will vary.

38

For the purpose of identifying areas of increased litter concentration it is necessary to make use of the remote sensing data.

39

Therefore, when planning monitoring activities a stage of reconnaissance operations on the basis of modeling is essential. Modeling is based on the deployment of geoinformation systems.

40

The use of the Floating Lab, featuring a high degree of independence and performance while being comparatively inexpensive, seems to be the best way for monitoring not only in inner waters but in the offshore zones as well. Harbor services may be incorporated into the monitoring process in the inner waters.

41

All of the NOWPAP participating nations are involved into finding a solution to this problem to a varying degree, but all of them share the same idea: it is necessary not only to keep a check on litter within their own territories and waters, but to unite efforts with the neighbors in domains of management, technologies, and monitoring.

42



Session 2

Policy and Management for Sea-based Marine Litter in NOWPAP region

CHINA'S POLICY ON MANAGEMENT OF MARINE LITTER FROM SHIPS

Cuiming Xu

*Consultant, Department of Ship Safety and Pollution Prevention
China Maritime Safety Administration, 11 Jianguomennei Avenue, Beijing 100736, P.R. China
xucuiming@msa.gov.cn*

ABSTRACT

This paper briefly introduces the general situation about damage caused by pollution from marine litter (garbage), and describes China's management process for prevention of pollution by garbage from ships and the counter measures adopted by the Chinese Government, such as: basic requirements, remediation of "White Pollution"; availability of adequate reception facilities for garbage from ships, enforcement of **State** control and prevention of illegal discharge from ships, promotion of environment protection and enhancement of awareness in environment protection. In order to reduce or eliminate pollutant discharge, it identifies some problems and makes some suggestions as follows: (i) further enhancement of the awareness of the society and seafarers in environment protection; (ii) improvement of means of control; (iii) protection of particularly sensitive sea areas; (iv) strengthening regional cooperation; and (v) implementation of a mandatory levy system for discharge of pollutants from ships.

GENERAL

Damage Caused by Pollution from Marine Garbage

Damage caused by pollution of marine environment means harmful effects from direct or indirect introduction into the seas of substances which damages marine living resources and human health, produces negative impact on fishery and other legal activities, and leads to lower quality of marine water utilization and marine environment. As one of the physical forms of pollution damage to the marine environment, pollution from marine garbage dates back the early days of maritime history, although the pollution in ancient times was insignificant. However, things have changed dramatically in modern shipping, as great increase in number of ships and intensity of traffic have caused more and more serious pollution to the marine environment. Particularly, since the opening and reform policy and with a rapid growth of the economy of China, ships entering China's sea areas are increasing day by day and the pollution from marine garbage is becoming ever more serious. In the sea areas of Bohai and Jiaozhou Bay of Qingdao, marine pollution caused by garbage is becoming even severe. The marine environment, fishing resources and navigational safety in these sea areas have been affected to different degrees, as various types of garbage stay in the seas, with some floating on the surface and some settling into the seabed, due to the geographical features of the region and poor exchangeability

of the sea waters.

Organization and Personnel

Along the coastline and Yangtze River, Pearl River and Heilongjiang River, China MSA has established 20 Regional MSAs under which 113 local branches have been established. China MSA boasts of a working team consisted of about 28,000 qualified officials and other working staff and a patrol force of about 1,300 vessels and crafts of various types. One division set up within each Regional MSA mentioned above, which deals with the prevention of pollution from ships, main functions such as: organizing, coordinating the responses to oil spills; preventing pollution from ships; checking the pollution prevention equipment and the availability and validity of relevant documents, and investigating and dealing with pollution accidents etc..

China's Management Process for Prevention of Pollution by Garbage from Ships

China pays great attention to marine environment protection, and therefore has gradually established its marine environment protection institutions and corresponding legal systems. Both the public awareness for marine environment protection and management of law have been enhanced. The cause of marine environment protection has been progressing continuously. Thanks to the improvement in marine environment protection, the trend of worsening pollution has abated, the environment quality in some of the sea areas has improved, and the water quality in the larger sea area has remained fairly good, even though the total quantity of polluting substances has increased as a result of rapid growth of the economy in the coastal region.

In as early as 1974, China enacted the first environment protection law – namely, (the Interim Regulations on Pollution Prevention in Coastal Waters of the People's Republic of China) which regulates the treatment of garbage from ships. In 1982, the Law on Marine Environment Protection was established, which constitutes the basic law for protecting the Chinese marine environment and specifies the provisions on prevention of marine pollution by garbage from ships. Thereafter, several sets of relevant administrative rules, regulations and standards have been promulgated, such as: the Administrative Rules for Prevention of Marine Pollution from Ships of the People's Republic of China, the Administrative Regulations for Prevention of Inland Water Pollution from Ships of the People's Republic of China, the Administrative Regulations for Environment Protection in the Transportation Sector, the Standards on Discharge of Pollutants from Ships, and the General Technical Requirements on Degradable Tableware used on Board Ships. Meanwhile, China has also formulated some regional regulations for application in the heavily polluted areas, e.g., the Administrative Regulations for Prevention of Pollution of the Yangtze River by Garbage from Ships and by Solid Wastes along the Riversides, which was adopted in 1997, thus establishing specific rules and regulations for preventing pollution by garbage from ships and by solid wastes along the riversides, and for providing and managing waste reception facilities. Starting from the 1 October 2001, China has been implementing the Bohai Blue Sea Action Plan which aims at marine pollution prevention from ships and protection of the biological environment in the Bohai sea area. Through the combination of all those programmes, the legal systems and policy framework have basically taken their shapes to the benefit of prevention of pollution by garbage from ships in the shipping industry of China.

As a Contracting Party to the 73/78 MARPOL Convention, China acceded to Annex V to the Convention on 21 November 1988. In order to fully implement the 1995 Amendment to Annex V to the 73/78 MARPOL Convention, prevent garbage pollution from ships and protect the marine environment, and according to relevant rules and regulations, new and existing ships engaged in international voyages (and voyages to and from Hong Kong and Macao) began complying with this

amendment on the 1st July 1997 and the 1st July 1998 respectively. More over, ships engaged in domestic voyages began complying with the amendment on the 1 October 2005.

COUNTER MEASURES ADOPTED BY THE CHINESE GOVERNMENT

Basic Requirements

To control and reduce garbage volume introduced into the sea is the major means to prevent marine environment pollution. China, through its national legislation and in accordance with the regulations of Annex V to the 73/78 MARPOL Convention, gives effect to her management by 4 different steps, which are the collection, treatment, storage and discharge of garbage from ship. Ships are required to install pollution prevention equipment and instruments in order to have adequate waste treatment capability. China has developed the following provisions on the management of garbage from ships:

- **On treatment and discharge of garbage from ships in accordance with international conventions and national regulations.**

The standards on discharge of garbage from ships applied in China are as follows:

Standards on Discharge of Garbage from Ships

Substance to be Discharged	Inland Waterways	Coastal Areas
Plastics	Prohibited from dumping into water	Prohibited from dumping into water
Floating objects	Prohibited from dumping into water	Prohibited from dumping into water within 25 nautical miles from the nearest land
Food waste and other garbage	Prohibited from dumping into water	Uncomminuted food wastes are prohibited from dumping into the water within 12 nautical miles from the nearest land. Comminuted waste with a particle size of less 25mm is allowed to be dumped into the sea outside 3 nautical miles from the nearest land.

- **On compliance with requirements contained in the ship garbage management plan and Garbage Record Book**

All ships of 400 gross tons or above and all ships which are certified to carry 15 passengers or more should carry a garbage management plan to be observed by seafarers and carry a Garbage Record Book. On board all ships of less than 400 gross tons and all ships carrying fewer than 15 passengers, the garbage treatment information should be accurately recorded in the Ship's Log. The garbage management plan is developed on the basis of the relevant IMO Guidelines, and should be implemented by designated personnel on board ships. The plan should include the written procedures for garbage collection, storage, disposal and treatment, and equipment operation procedures on board ships.

All the ships which are required to carry a garbage management plan should carry a Garbage Record Book. Each discharge operation or action in relation to garbage on board ships should be properly recorded in the Garbage Record Book.

– **On compliance with garbage disposal placard**

All ships of 12 meters or above in length should put up garbage disposal placard and promulgate discharge requirements to seafarers and passengers.

– **On compliance with provisions relating to garbage pollution accidents**

Pollution accidents caused or identified by ships should be reported to the Administration, which has the right to investigate into and deal with ships causing pollution accidents.

Remediation of “White Pollution”

Plastic package material is causing a very serious “white pollution” due to a large amount of disposal along the Chinese railways, into three gorges of the Yangtze River as well as in cities and towns. In 1996, the Chinese government decided to comprehensively remediate the “white pollution”. The Chinese Government decided that the “white pollution” problem along the Yangtze River, in the Taihu Lake and along railways should be solved within one year, by terminating the use of one-off foam tableware. Thereafter, the Chinese Ministry of Communications enforced the regulations on total prohibition of non-degradable polystyrene foam tableware (foam plastics) on passenger ships and cruise ships which sail along the Yangtze River and the coast. In addition, all one-off tableware must be made of degradable materials. In such a way, the problem of “white pollution” to the marine environment has been effectively solved.

Availability of Adequate Reception Facilities for Garbage from Ships

In order to ensure adequate reception facilities in ports, China has required ports to build in ship garbage reception facilities at the early stage of the construction. Ports handling ship garbage reception must have adequate and appropriate reception facilities. Over the last 30 years, construction of large and medium-sized ports in China has been effectively implementing a system to assess impact of the projects on the environment and another system of “three simultaneities” to protect the environment around engineering projects. At present, every port has installed garbage treatment facilities which are equipped with garbage reception vehicles and ships. According to statistics, in 2005, ports under the jurisdiction of Shandong Maritime Safety Administration alone received more than 10,000 tons of garbage from ships.

Enforcement of State Control and Prevention of Illegal Discharge from Ships

As an authority responsible for implementation of the 73/78 MARPOL Convention in China and for enforcement of the Law on Marine Environment Protection and the Law on Water Pollution Prevention, China Maritime Safety Administration and its subsidiaries have set up specialised administrative units for prevention of pollution from ships, which are carrying out surveillance and inspection on ship garbage management strictly in accordance with relevant international and national rules and regulations. According to the statistics, China MSAs carry out up to 20,000 inspections on pollution prevention certificates and pollution prevention equipment on board ships each year, detect and deal with violations of more than 1000 cases each year. Currently China is one of a few countries that have the best performance in such enforcement.

Promotion of Environment Protection and Enhancement of Awareness in Environment Protection

Environment protection is a cause of the entire nation which needs the involvement of the whole society. Therefore, the Chinese government takes every opportunity, such as the "Fifth of June" World Environment Day, to promote environment protection by way of different activities. Thanks to such efforts, the public has gradually realised the importance of marine pollution prevention, has greater understanding about laws and regulations concerning garbage pollution prevention, and more importantly has truly recognised the significance of garbage pollution prevention.

ISSUES AND SUGGESTIONS***Further Enhancement of the Awareness of the Society and Seafarers in Environment Protection***

To achieve this goal, the government, social groups, enterprises and individuals need to be mobilised, starting from themselves, to reduce the volume of garbage and to refrain from littering, thus preventing marine pollution by garbage. Particularly, seafarers' awareness in environment protection needs to be further enhanced through promotion activities and heavier administrative penalties, in order to reduce garbage pollution from ships at sea.

Improvement of Means of Control

Unlike the case with surveillance of oil waste discharge from ships, currently there is a lack of effective surveillance and monitoring means for garbage discharge from ships. This is a regional and global issue. Therefore, we suggest that further study should be carried out in this area by NOWPAP members, Contracting Parties to the MARPOL Convention, IMO and other international organisations, to further improve means for surveillance and monitoring of illegal discharge of garbage from ships.

Protection of Particularly Sensitive Sea Areas


In the heavily polluted Bohai sea area, any discharge of garbage from ships should be prohibited under national legislation, such as Regulations for Bohai Environment Protection or by application for PSSA status through IMO, so as to designate the Bohai Sea Area as a PSSA.

Strengthening Regional Cooperation

Regarding the issue of marine garbage pollution in the North West Pacific, we propose that all the member states should avail the opportunity of this conference to further strengthen regional cooperation in technical research, management practices and joint efforts on pollution prevention.


Implementation of a Mandatory Levy System for Discharge of Pollutants from Ships

At present, China has no mandatory systems in place to levy charges on pollutant discharge from ships. This type of levy system is to charge certain amount of fees from polluters in accordance with relevant national regulations, taking into account the categories, quantities and concentrations of discharged pollutants. The feature of this type of fees is to apply the law of value to put financial pressure on polluters in order to reduce or eliminate pollutant discharge. Mandatory requirement on ships to pay fees for pollutant discharge will help to strengthen the ability at national ports to receive and treat pollutants and to protect the environment around ports and at sea. It is a necessary measure to benefit our posterity. It is proposed that concrete and feasible methods be properly worked out, so as to establish a levy system to be imposed upon discharge of pollutants from ships which is commensurate to the circumstances of our country.




**1st NOWPAP Workshop
on Marine litter**

8-9 June 2006
Incheon, the Republic of Korea



**China's Policy on Management of Marine
Litter from Ships**

XU CUIMING
China MSA




Contents

- 1 General
- 2 Organization and Personnel
- 3 Counter Measures Adopted by the Chinese Government
- 4 Issues and Suggestions



1 General


- Damage Caused by Marine Litter (Garbage) Pollution from Ships
- China's Management Process for Prevention of Garbage Pollution from Ships



General

(1) Damage Caused by Marine Garbage Pollution from Ships

- As one of the physical forms of pollution damage to the marine environment, a great increase in number of ships and intensity of traffic have caused more and more serious pollution to the marine environment.




General

(1) Damage Caused by Pollution from Marine Garbage


- Particularly, since the opening and reform policy and with a rapid growth of the economy of China, ships entering China's sea areas are increasing day by day and the pollution from marine garbage is becoming more serious. In the sea areas of Bohai and Jiaozhou Bay of Qingdao City, marine pollution caused by garbage is becoming even severe.

General



(2) China's Management Process for Prevention of Pollution by Garbage from Ships

- To pay great attention to marine environment protection;
- To have gradually established its marine environment protection institutions and corresponding legal systems.



National Legislation System and Policy Framework for Prevention of Marine Pollution from by Ships

National

- Law on Marine Environment Protection
- Rules for Prevention of Marine Pollution from Ships of the P.R.C.
- Administrative Regulations for Prevention of Inland Water Pollution from Ships of the P.R.C., And Administrative Regulations for Environment Protection in the Transportation Sector
- Standards on Discharge of Pollutants from Ships, and the General Technical Requirements on Degradable Tableware used on Board Ships.

Regional


- Administrative Regulations for Prevention of pollution of the Yangze River by Garbage from Ships and by Solid Wastes along the Riversides
- Bohai Blue Sea Action Plan

《1978防污公约》缔约国



2 Organization and Personnel


- Along the coastline and Yangtze River, Pearl River and Heilongjiang River, China Maritime Safety Administration (China MSA) has established 20 Regional MSAs, under which 113 local branches have been established. China MSA boasts of a working team consisted of 28,000 qualified officials and other working staff and a patrol force of 1,300 vessels and crafts of various types.



2 Organization and Personnel

One division set up within each Regional MSA mentioned above, dealing with prevention of pollution from ships, main functions, such as:

- Organizing, coordinating the responses to oil spills;
- Preventing pollution from ships;
- Checking the pollution prevention equipment and the availability and validity of relevant documents, and
- Investigating and dealing with pollution accidents.



Organization and Personnel

ORGANIZATION CHART OF CHINA MSA


SHANG HAI MSA	TIANJIN MSA
LIAONING MSA	HEBEI MSA
SHANDONGMSA	JIANGSU MSA
ZHEJIANG MSA	FUJIAN MSA
GUANGDONG MSA	GUANGXI MSA
HAINAN MSA	CHANGJIANG MSA
HEILONGJIANG MSA	SHENZHEN MSA
YINGKOU MSA	YANTAI MSA
LIANYUNGANG MSA	XIAMEN MSA
SHANTOU MSA	ZHANJIANG MSA



Organization and Personnel


China MSAs






3 Counter Measures Adopted by the Chinese Government

- 1) Basic Requirements
- 2) Bohai Blue Sea Action Plan
- 3) Remediation of “ White Pollution”



3 Counter Measures Adopted by the Chinese Government

- 4) Availability of Adequate Reception Facilities for Garbage from Ships
- 5) Enforcement of State Control and Prevention of Illegal Discharge from Ships
- 6) Promotion of Environment Protection and Enhancement of Awareness in Environment Protection




Counter Measures Adopted by the Chinese Government

1) Basic Requirements

Through its national legislation and in accordance with the regulations of Annex V to the MARPOL 73/78 Convention,


- To control and reduce garbage volume introduced into the sea is the major means to prevent marine environment pollution
- To give effect to her management by 4 different steps, which are the collection, treatment, storage and discharge of garbage from ship



Counter Measures Adopted by the Chinese Government


1) Basic Requirements

- To require ships to install pollution prevention equipment and instruments in order to have adequate waste treatment capability

Basic Requirements

1) Basic Requirements




Basic Requirements

Ship delivering Garbage



Basic Requirements

Standards on Discharge of Garbage from Ships

Substance to be Discharged	Inland Waterways	Coastal Areas
Plastics	Prohibited from dumping into water	Prohibited from dumping into water
Floating objects	Prohibited from dumping into water	Prohibited from dumping into water within 25 nautical miles from the nearest land
Food waste and other garbage	Prohibited from dumping into water	Uncomminuted food wastes are prohibited from dumping into the water within 12 nautical miles from the nearest land. Comminuted waste with a particle size of less than 25mm is allowed to be dumped into the sea outside 3 nautical miles from the nearest land.

Basic Requirements

Ship Garbage Management Plan



Basic Requirements

On compliance with requirements contained in the Ship Garbage Management Plan and Garbage Record Book

- All ships of 400 gross tons or above and all ships which are certified to carry 15 passengers or more should carry a Garbage Management Plan to be observed by seafarers and carry a Garbage Record Book.
- On board all ships of less than 400 gross tons and all ships carrying fewer than 15 passengers, the garbage treatment information should be accurately recorded in the Ship's Log.

Basic Requirements

Ship's Garbage Record Book



Basic Requirements

Garbage Record Book

垃圾排放记录

RECORD OF GARBAGE DISCHARGES

船名: _____ 船舶编号或呼号: _____ 海事证书编号: _____

Ship's name: _____ Distinctive No. or letters: _____ IMO No.: _____

垃圾种类:

Garbage categories:

- 塑料
- 漂浮的垃圾物料、衬网或包装材料
- 被磨碎的纸制品、破布、玻璃、金属、瓶子、陶器等
- 纸类纸制品、破布、玻璃、金属、瓶子、陶器等
- 食物垃圾、纸制品、破布、玻璃、金属、瓶子、陶器等
- 食品废弃物
- 焚烧炉残渣 (可能含有有毒或重金属残余物的塑料产品的焚烧除外)

备注: 在特殊区域禁止排放除食品废弃物以外的任何垃圾。只有特准入海的垃圾必须分类, 排入接收设施的容量; 其他垃圾只限列明数量的估计量, 排入接收设施的容量和禁止排放的总量。

NOTE: THE DISCHARGE OF ANY GARBAGE OTHER THAN FOOD WASTE IS PROHIBITED IN SPECIAL AREAS. ONLY GARBAGE DISCHARGED INTO THE SEA MUST BE CATEGORIZED. GARBAGE OTHER THAN CATEGORY 1 DISCHARGED TO RECEPTION FACILITIES NEED ONLY BE LISTED AS A TOTAL ESTIMATED AMOUNT. DISCHARGES OF CARGO RESIDUES REQUIRES START AND STOP POSITIONS TO BE RECORDED.

Basic Requirements

On Compliance with Garbage Disposal Placard

- All ships of 12 meters or above in length should put up Garbage Disposal Placard and promulgate discharge requirements to crew and passengers.


Basic Requirements



Ship's Garbage Disposal Plan



Basic Requirements




Garbage Disposal Placard

垃圾公告牌
GARBAGE DISPOSAL PLACARD

(1) 一切塑料制品, 包括但不限于合成缆绳、合成渔网、塑料垃圾袋以及可能含有毒或重金属残余物的塑料制品的焚烧炉灰渣, 均不得处理入海;
 (2) 渔船物料、材料和包装材料在距最近陆地25海里内不得处理入海;
 (3) 食品废弃物和一切其它的垃圾, 包括货物残余物、纸制品、破布、玻璃、金属、瓶子、陶器及类似的废物, 在距最近陆地12海里内不得处理入海;
 (4) 上述垃圾不得在下列区域处理入海: 地中海、波罗地海、黑海、红海、海湾水域、北海、南极和泛加和北海区域;

(A) The disposal into the sea of all plastics INCLUDE BUT NOT LIMITED TO SYNTHETIC ROPES, SYNTHETIC FISHING NETS AND PLASTIC GARBAGE BAGS AND INCINERATOR ASHES FROM PLASTIC PRODUCTS WHICH MAY CONTAIN TOXIC OR HEAVY METAL RESIDUES, is prohibited.
 (B) The disposal into the sea of damage, lining and packing materials is prohibited if the distance from the nearest land is less than 25 nautical miles.
 (C) The disposal into the sea of food wastes and all other garbage including CARGO RESIDUES, paper products, rags, glass, metal, bottles, crockery, and similar refuse is prohibited if the distance from the nearest land is less than 12 nautical miles.
 (D) The disposal of garbage mentioned above is prohibited in the following areas: the Mediterranean sea, the Baltic sea, the Black sea, the Red sea, the Gulf area, the North sea, the Antarctic area and the wider Caribbean region.


Basic Requirements



On Compliance with Provisions Relating to Garbage Pollution Accidents

- Pollution accidents caused or identified by ships should be reported to the Administration, which has the right to investigate into and deals with ships causing pollution accidents.

Basic Requirements




2) Bohai Blue Sea Action Plan

One of Main Chapters in Action Plan- Measures for Prevention of Marine Litter Pollution from Ships

- For the domestic voyage, all ships of 150 gross tons or above and all ships which are certified to carry 15 passengers or more, sailing within the Bohai Blue Sea area, should carry a Garbage Management Plan to be observed by crew, and strictly treat the garbage according to the plan.
- All ships of 12 meters or above in length should put up Garbage Disposal Placard and promulgate discharge requirements to crew and passengers.
- The disposal of all kinds of garbage is prohibited from dumping into the sea.

Basic Requirements



2) Bohai Blue Sea Action Plan (cont.)

In order to have adequate waste treatment capability :

- To require ports and harbours to install pollution prevention equipment and instruments for garbage from ships
- To purchase and build up some boats for reception of garbage from ships
- To collect and transfer garbage to the city garbage reception facilities for treatment

Basic Requirements



Shandong MSA's





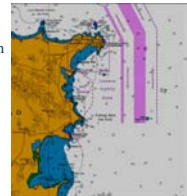
3) Remediation of “White Pollution”

- In 1996, the Chinese government decided to comprehensively remediate the “white pollution”.
- To decided that the “white pollution” problem along the Yangtze River, in the Taihu Lake and along railways should be solved within one year, by terminating the use of one-off foam tableware. Thereafter, the Chinese Ministry of Communications enforced the regulations on total prohibition of non-degradable polystyrene foam tableware (foam plastics) on passenger ships and cruise ships which sail along the Yangtze River and the coast. In addition, all one-off tableware must be made of degradable materials.



4) Availability of Adequate Reception Facilities for Garbage from Ships

- To build up ship garbage reception facilities at the early stage of the construction
- To have adequate and appropriate reception facilities in ports handling ship garbage reception
- To effectively implement a system to assess impact of the projects on the environment and another system of “three simultaneities” to protect the environment around engineering projects
- To receive more than 10,000 tons of garbage from ships in 2005, in the ports under the jurisdiction of Shandong MSA alone



5) Enforcement of State Control and Prevention of Illegal Discharge from Ships

- China MSA and its subsidiaries have set up specialised administrative units for prevention of pollution from ships, which are carrying out surveillance and inspection on ship garbage management strictly in accordance with relevant international and national rules and regulations.



5) Enforcement of State Control and Prevention of Illegal Discharge from Ships (cont.)

According to the statistics:

- China MSAs carry out up to 20,000 inspections on pollution prevention certificates and pollution prevention equipment on board ships each year,
- To detect and deal with violations of more than 1000 cases each year. Currently China is one of a few countries that have the best performance in such enforcement.

(6) Promotion of Environment Protection and Enhancement of Awareness in Environment Protection

- Chinese Government has taken every opportunity, such as the “Fifth of June” World Environment Day, and to promote environment protection by way of different activities.
- To gradually realize the importance of marine pollution prevention,
- To have greater understanding about laws and regulations concerning garbage pollution prevention,
- To have truly recognised the significance of garbage pollution prevention..

4 Issues and Suggestions

- (1) Further Enhancement of the Awareness of the Society and Crew in Environment Protection
- (2) Improvement of Means of Control
- (3) Protection of Particularly Sensitive Sea Area
- (4) Strengthening Regional Cooperation
- (5) Implementation of a Mandatory levy System for Discharge of Pollutants from Ships

(1) Further Enhancement of the Awareness of the Society and Crew in Environment Protection

- To achieve this goal, the government, social groups, enterprises and individuals need to be mobilised, starting from themselves, to reduce the volume of garbage and to refrain from littering, thus preventing marine pollution by garbage.
- Particularly, to further enhance crew's awareness in environment protection through promotion activities and heavier administrative penalties, in order to reduce garbage pollution from ships at sea.

(2) Improvement of Means of Control

Unlike the case with surveillance of oil waste discharge from ships, currently there is a lack of effective surveillance and monitoring means from garbage discharge from ships.

(2) Improvement of Means of Control (cont.)

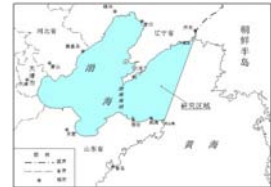
This is a regional and global issue. Therefore,

- To suggest that further study should be carried out in this area by Contracting Parties to the MARPOL Convention, IMO and other international organizations, especially NOWPAP members
- To further improve means for surveillance and monitoring of illegal discharge of garbage from ships



(3) Protection of Particularly Sensitive Sea Area

In the heavily pollution Bohai Sea Area, any discharge of garbage from ships should be prohibited under national legislation, such as: Regulations for Bohai Environment Protection or by application for PSSA status through IMO in the future, so as to designate the Bohai Sea Area as an PSSA.



Issues and Suggestions

(4) Strengthening Regional Cooperation

- Regarding the issue of marine litter pollution in the North West Pacific, we propose that all the NOWPAP members should avail the opportunity of this Workshop to further strengthen regional cooperation in technical research, management practices and joint efforts on MARINE LITTER.



Issues and Suggestions

(5) Implementation of a Mandatory Levy System for Discharge of Pollutants from Ships


- At present, China has no mandatory systems in place to levy charges on pollutant discharge from ships.
- This type of levy system is to charge certain amount of fees from polluters in accordance with relevant national regulations, taking into account the categories, quantities and concentrations of discharged pollutants.
- The feature of this type of fees is to apply the law of value to put financial pressure on polluters in order to reduce or eliminate pollutant discharge.



Issues and Suggestions

(5) Implementation of a Mandatory Levy System for Discharge of Pollutants from Ships (cont.)

- Mandatory requirement on ships to pay fees for pollutant discharge will help to strengthen the ability at national ports to receive and treat pollutants and to protect the environment around ports and at sea.



Issues and Suggestions

(5) Implementation of a Mandatory Levy System for Discharge of Pollutants from Ships (cont.)

- It is a necessary measure to benefit our posterity.
- It is proposed that concrete and feasible methods be properly worked out, so as to establish a levy system to be imposed upon discharge of pollutants from ships which is commensurate to the circumstances of our country.

Thanks for your attention !



OVERVIEW OF MARINE LITTER PROBLEMS AND MEASURES IN JAPAN

Yuji Adachi

*Section Chief, Global Environmental Issues Division, Global Environmental Bureau
Ministry of the Environment, 1-2-2 Kasumigaseki, Chiyoda-ku, Tokyo 100-8975, Japan
YUJI_ADACHI@env.go.jp*

INTRODUCTION

Recently concern about washed-up driftage on the coastal zone in Japan has been growing among national and local governments, local residents and media.

Based on the concern, Northwest Pacific Region Environmental Cooperation Center (NPEC) has conducted a series of survey to grasp the actual situation of washed-up driftage along the coasts of the region



The aim of the survey is to provide related countries with a reference material for designing measures to protect for the marine environment and fishing grounds and waste disposal measures. The survey also aims at raising awareness of residents in the region on the importance to protect the marine environment from washed-up driftage.

In April this year National government has established a Meeting of Director Generals of related ministries which are in charge of washed-up driftage in order to develop measures based on a result of

local governments which are suffering the serious situation of marine litter and driftage.

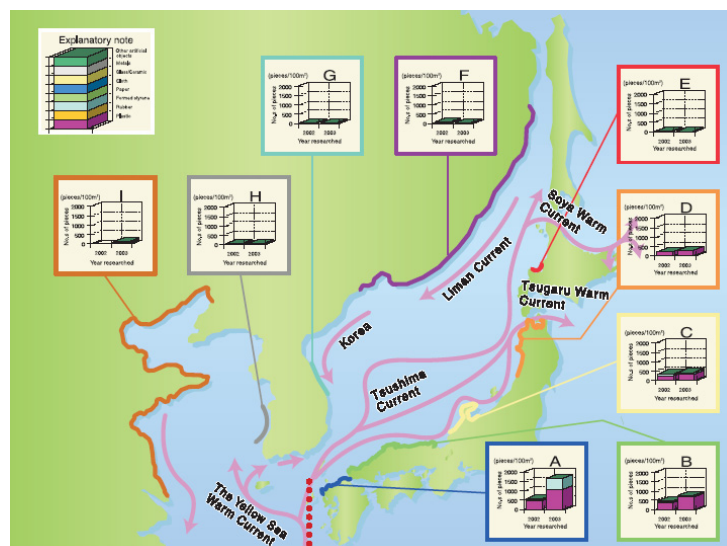
Today, I would like to introduce these current policies and measures to struggle washed-up driftage on coastal zone in Japan.

OVERVIEW OF WASHED-UP LITTER

Japan has long coastline comparing with its area. The total length of it is about 35,000km. Also, Japan is located downstream of strong tides such as Kuroshio, Oyashio, and Tsushima Current. Therefore, washed-up and driftage would be flown by the tides and piled up on the sea shore of Japan.

Although the amount of washed-up litter on the coastal line in Japan is not reconnoitered thoroughly, a robust calculation suggests the amount up to about 100,000t per year in Japan.

There is a result of survey conducted by Northwest Pacific Region Environmental Cooperation Center (NPEC) on Japan, China, South Korea, Russia, and the 48 coastline in FY 2003.



The average number of collected objects per 100m² was 427 pieces in FY 2003 research. The collected objects consisted of the following materials.

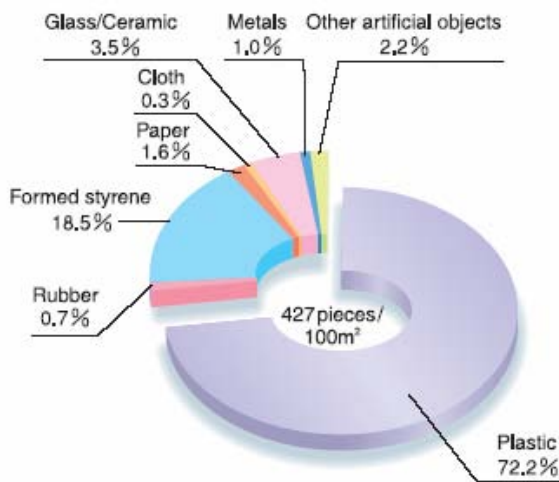
- “Plastic and vinyl”– 308 pieces / 100 m² (Accounts for 72.2% of total pieces .)
- “Formed styrene”–79 pieces / 100 m²(18.5%)
- “Glass and ceramics”–15 pieces / 100 m²(3.5%)
- “Other artificial object”–9 pieces / 100 m²(2.2%)

Materials such as plastic and formed styrene accounted for a significantly high proportion to the whole amount of washed-up litter.

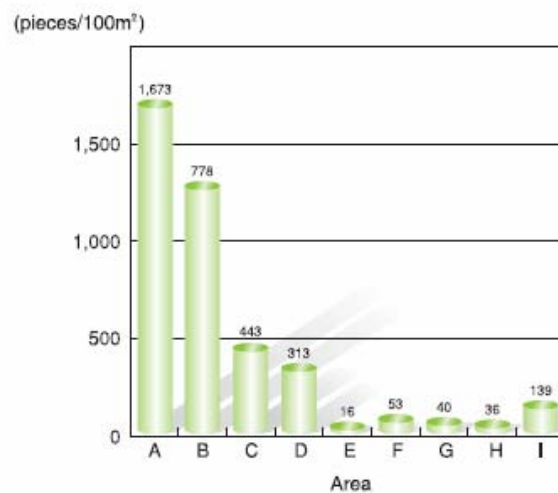
The average numbers of pieces in each area are as follows.

- “Area A ”- 1,673 pieces / 100 m²
- “Area B ” – 778 pieces / 100 m²
- “Area C ” – 443 pieces / 100 m²
- “Area D” – 313 pieces / 100 m²

Less objects were collected in “Area E” through “Area I”



Ratio of constituent classifications



Average number of the collected driftage per 100 m² by area

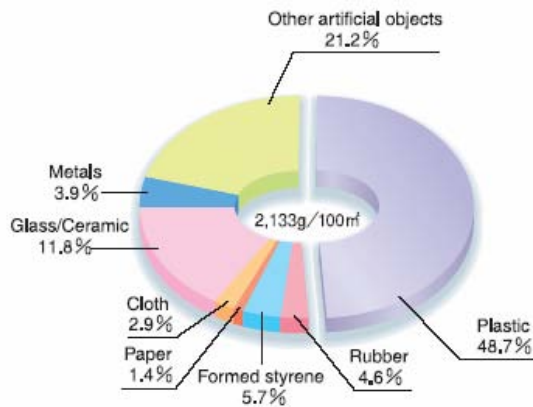
The average weight of collected objects per 100m² was 2,133g in FY 2003 reserch. The collected objects consisted of the following materials.

- “Plastics” – 1,038g/100m²(Accounts for 48.7% of total weight)
- “Other artificial objects” –452g/100m²(21.2%)
- “Glass and ceramics” –252g/100m²(11.8%)
- “Formed styrene” –121 g/100m²(5.7%)
- “Rubber” –97 g/100m²(4.6%)

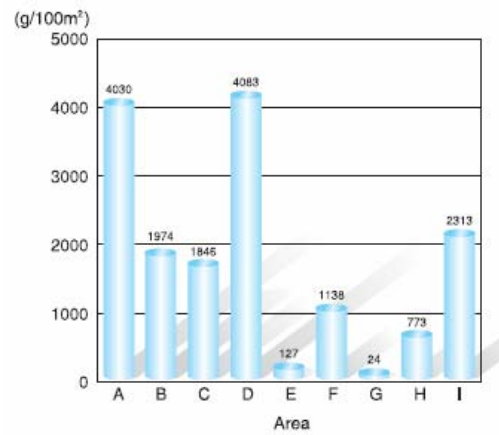
The weight of plastics (1,038g/100m²) accounts for a significantly large proportion (48.7 %) as it

also showed high proportion in its number.

The average weight of washed-up litter in "Area D" is the heaviest with 4,083g/100m²; "Area A" with 4,030g/100m² in the second place followed by "Area I" with 2,313g/100m². Only small amounts are collected in "Area E, F, G and H"



Ratio of constituent classifications by average weight



Average weight of the collected driftage per 100 m² by area

The result of overall research found that the amount of washed-up litter is less in northern shore than southern shore both in number and weight in Japan.

The amount of washed-up litter has geographical uneven distribution, that total amount of them in the northwest Kyusyu was considerably bigger than in the other regions. Also, the amount of litter in islands facing to the open sea is large. The ratio of litter origin has regional specific distribution site by site as well, and it is pointed out that in Southwest Islands, Western coasts in Kyushu, and Northwestern coasts in Mainland have high ratio of foreign litter.

Some marine litter is sea-based, while others are land-based. There are also areas on which rope, float, fishing net, etc used by vessel is washed-up in large quantities. For example, as to PET bottle etc., it could be possible in concept to identify the manufactured country by its bar code, but it is not realistic to identify the country discharging it because big amount of products are imported and exported in all over the world. Moreover, fishery gears, such as fishing net, float made from styrene etc, are found as drifted waste on shore, but in most cases, they don't have indication of its origin. Therefore, it would be difficult to determine the source of discharge.

WASHED-UP PLASTIC CONTAINERS

In every winter, especially in mid January, many plastic containers(20L square tank) are drifted ashore on Japan coast. The Ministry of the Environment of Japan reported the number of plastic containers based on the data from various related organisations.

In 2006, 8,368 pieces were counted on the coastal zone in the whole country in January. On many of found containers, Korean alphabets were embossed. Since newly drifted and ashore waste come by April, more containers have been drifted ashore even in April. Some plastic containers are filled with dangerous liquid which may cause health problem. Therefore, related authorities make warning to raise public awareness of the drifting-ashore situation and to prevent accidents by mis-handling.

It would be important to have a cooperation programme for exchanging information on the situation

of these containers and for developing effective policy and measures to reduce the out flowing containers in the source areas.



REGULATION OF MARINE LITTER

As for washed-up litter of our country, most of them are plastic and vinyl.

The origins of the marine litters are surmised as follows: flown from rivers, drifted ashore from foreign country, released while fishing, illegal dumping from vessel. So many related ministries are making efforts on survey and regulation.

Otherwise, an organization related to fishery conveys technological study of recycling of fishery wastes to prevent those wastes from being flown out to the sea.

Dumping of wastes from vessel is regulated by the Marine Pollution Prevention Law except for specific municipal wastes listed in a government order. The Law is one of the national laws to implement the international commitments of London Convention and Marpol 73/78 Convention ANNEX V. Violators are fined up to 10 million yen.

The nearly amended law requires persons who plan to dump land-based waste to ocean to be licensed by the Minister of the Environment based on the requirements in the 1996 Protocol for the London Convention. The regulation on sea-based wastes will be maintained as it is.

COLLECTION, TRANSPORT, AND DISPOSAL OF MARINE LITTER

In Japan, prefectural governments implement “management” of coastline areas. In 2002, special arrangement on local allocation tax, “Coast Management Expense” was established for prefectural governments and this expense could be spent on management of washed-up litter. Besides, Waste Management Law requires any person or groups which supervise swimming beaches, rivers, ports, and other public places to make efforts to keep them clean.

Actual places where the clean-up activities are held are swimming beaches, sightseeing spots, harbors and fishing areas. Various entities such as local governments, port managers, local associations, volunteers, and so on. carry out clean-up activities. In some cases, national/local governments support the activities financially.

In most cases, collected marine litter is transported to disposal factory by local governments, or commissioned companies.

In case huge amount of drift woods washed-up by disasters like typhoons, special financial support is applied to prefectural governments.

GOVERNMENTAL EFFORTS

Issues on marine problems are taken care of by several ministries; for example, the Minister of the Environment takes charge of marine environmental conservation, the Ministry of Land Infrastructure and Transport takes charge of coast management, Japan Coast Guard takes charge of crackdown on maritime crimes, the Ministry of Agriculture, Forestry and Fisheries takes charge at fisheries industry. These related ministries are making efforts on financial support, technical development, education and enlightenment on this problem.

Drifted and washed-up marine litter, some of which is originated in foreign countries, has resulted in degradation of coastal functions, deterioration of the environment, especially ecosystem, and sea landscapes, and adverse impacts to maintenance of safe navigation of ships and to fisheries. These incidents have been significant in recent years. Therefore, Japanese Government organized an inter-governmental meeting on drifted marine litter in 2000, the Ministry of the environment has lead its activities for information exchange.

However, there have not been any measures to be regarded as quick-acting medicine, because it is difficult to address release sources as some are located in foreign lands and of coordinating many different governmental agencies which work on different tasks.

Hence, the Government decided to establish the framework in order to discuss more effective measures against marine litter. The outline of the framework is:

1. Meeting of relevant ministries at Director-Generals level has been established since April 2006.
2. The Ministry of the Environment is in charge of management of the meeting in cooperation with the Ministry of Land, Infrastructure and Transport and the Fishery Agency. The Cabinet Secretariat also attends the meeting and provides necessary advices.
3. Main tasks of the Meeting are as follows.

The meeting will review and discuss ①current status, ②measures being taken, ③measures including international measures, which address pollutant sources, and ④measures in areas where damages are significant. The meeting is scheduled to compile the measures to be taken in March, 2007.

ACTION HEREAFTER

Recently, the amount of marine litter driftage to the Japanese coast lines has increased, and much social attention has been drawn to this matter. Following the adoption of the project on marine litter at the 10th NOWPAP Meeting held in Toyama last November, NOWPAP will hold the International Coastal Cleanup (ICC) in Tsushima-city, Nagasaki-Prefecture this September, which the Japanese government, municipalities and related NGOs will participate in. This activity will be beneficial for the NOWPAP Member governments and NGOs develop their cooperating strategies Tsushima islands are regarded as the most seriously affected area by marine litter problem.

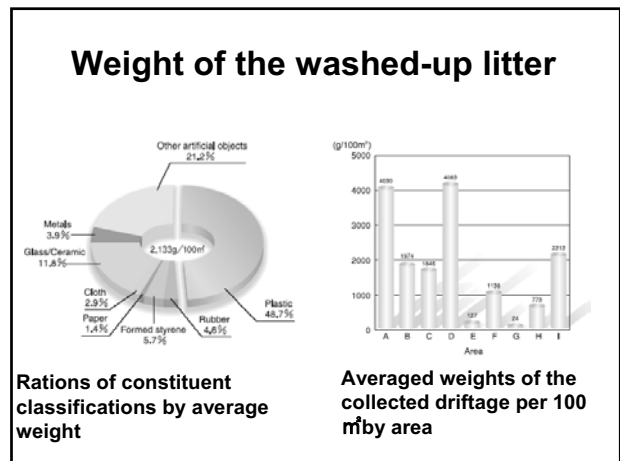
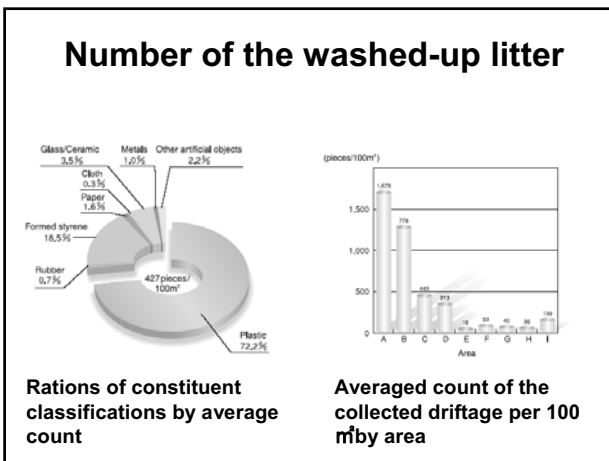
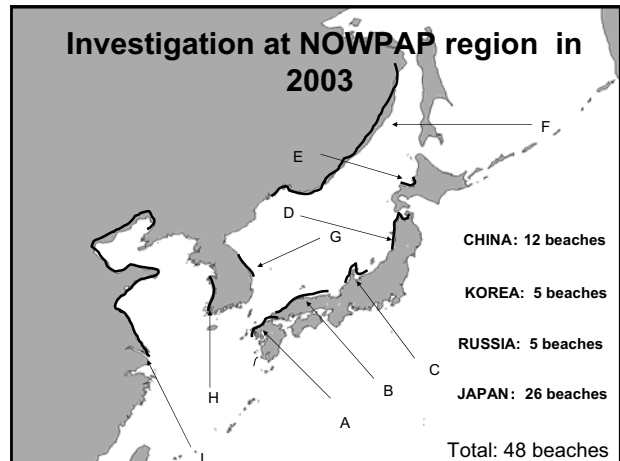
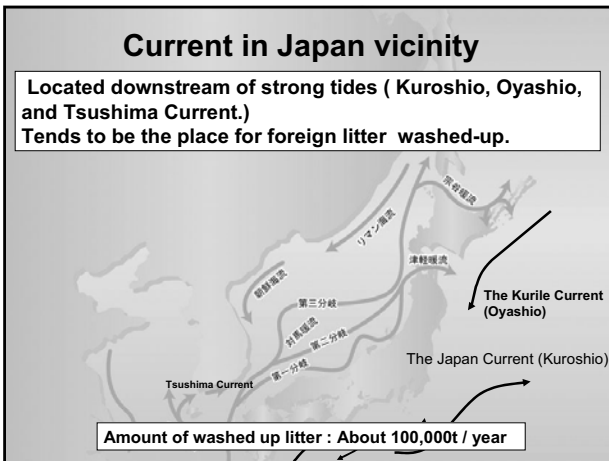
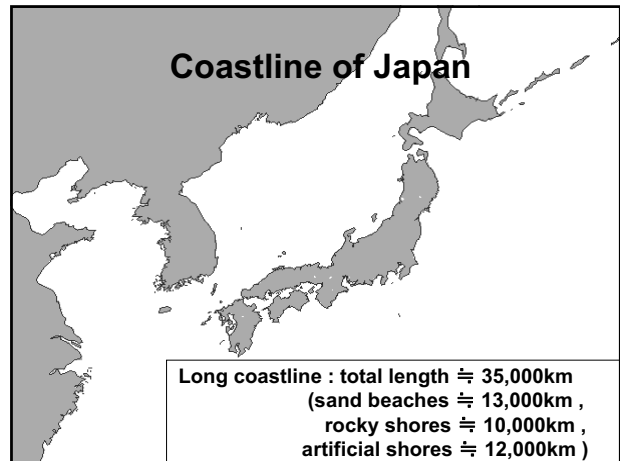
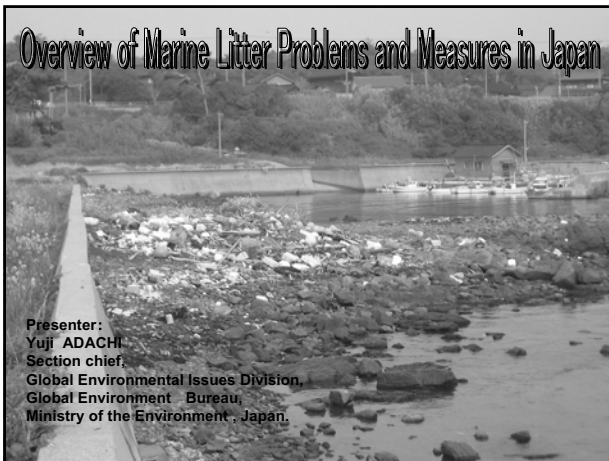
The four NOWPAP Members discharge marine litter, while the driftage annoys them. In this

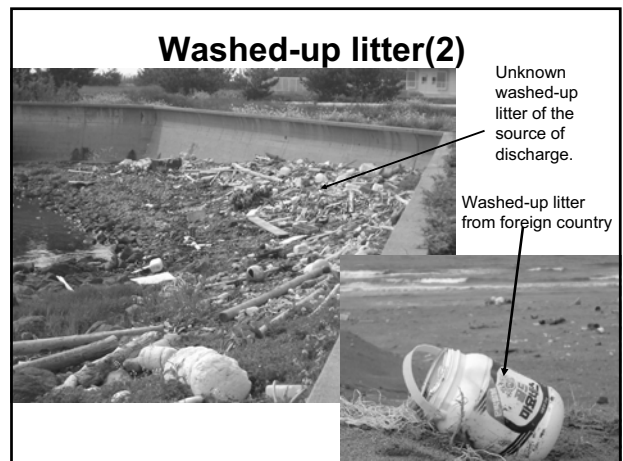
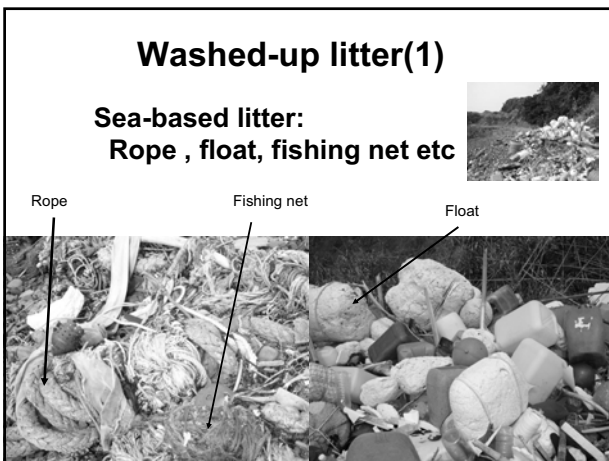
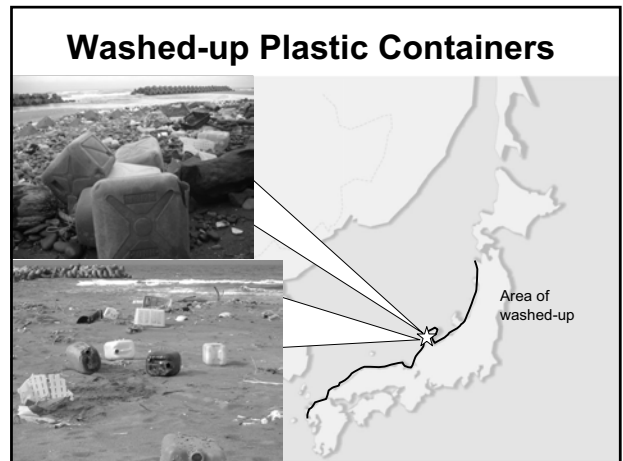
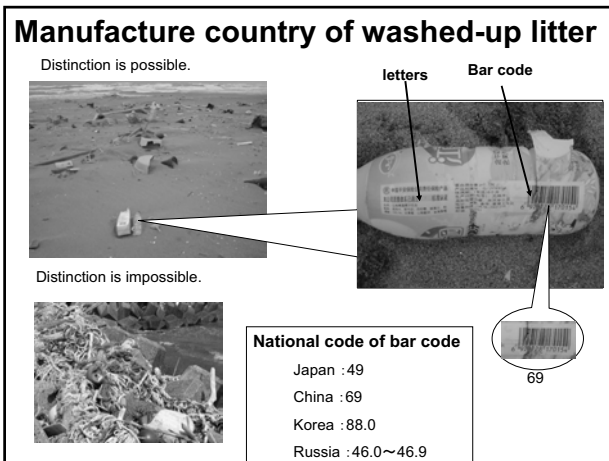
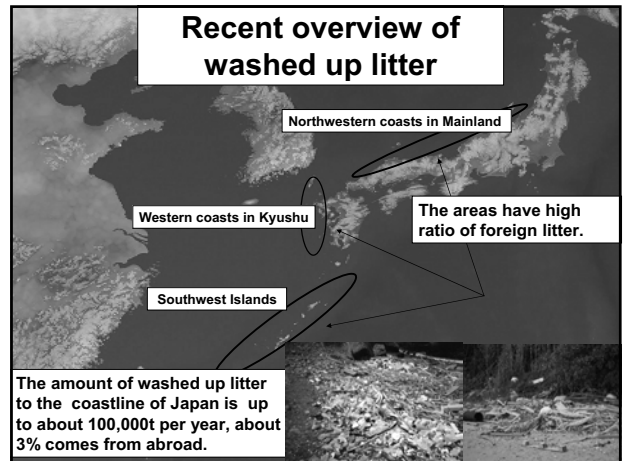
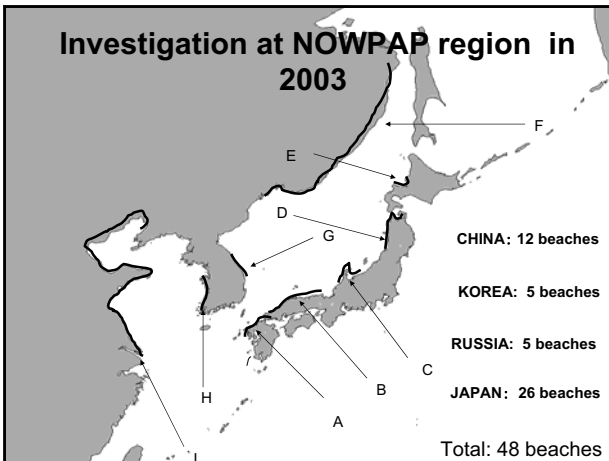
context, the four countries are generators and victims at the same time. Therefore, it is essential to address the pollutant sources in every country for the ultimate solution. Japan cooperate with the other Members and make its utmost efforts to address this international problem.

COLUMN: CASE OF INTERNATIONAL COOPERATION

Students of the Foreign Language College of Busan, Republic of Korea got to know the serious problem in Tsushima is lands by marine litter which are largely generated in Korea. The students have been visiting Tsushima city since 2002 every year, and performing cleaning activities in collaboration with local residents. The event was held in May 21st this year as shown in the photograph.







Inhibition of marine litter

Many related ministries are making efforts on survey and regulation .



R & D

An organization related to fishery conveys technological study of recycling of fishery wastes to prevent those wastes from being flown out to the sea.

Disposal of wastes from vessels

Disposal of wastes from boats and vessels are regulated by domestic law corresponding to LONDON Convention and MARPOL 73/78 Convention, Annex V.



Clean-up of coastline

Management of coastline areas


Prefectural governments responsible for "management"

"Any person or groups which supervise swimming beaches, rivers, ports, and other public places shall make efforts to keep them clean". (Waste management Law)

•Various entities such as local governments, port managers, local associations, volunteers, and so on. carry out clean-up activities.

In most cases, collected marine litter is transported to disposal facilities by local governments, or commissioned companies.


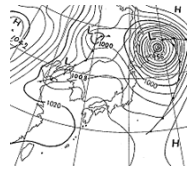
In 2002, special arrangement on local allocation tax, "Coast Management Expense" was established for prefectural governments and this expense could be spent on management of washed-up litter.



Measures in case of disasters (typhoons)

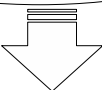
•In case of the large amount of drift woods washed-up by disasters like typhoons, special financial supporting regimes are applied.


Ex)
Financial support for disposal of driftwood in case of disasters (prefectural governments responsible for "management" of coastline areas)

Governmental efforts

Drifted and washed-up marine litter, some of which is originated in foreign countries, has resulted in degradation of coastal functions, deterioration of the environment etc. These incidents have been significant in recent years





1. Meeting of relevant ministries at Director-Generals level has been established since April 2006.
2. The Ministry of the Environment is in charge of management of the meeting in cooperation with the Ministry of Land, Infrastructure and Transport and the Fishery Agency. The Cabinet Secretariat also attends the meeting and provides necessary advices.
3. The meeting reviews and discusses
 - ① current status, ② measures being taken, ③ measures including international measures, which address pollutant sources, and ④ measures in areas where damages are significant.

The meeting is scheduled to compile the measures to be taken in March, 2007.

Government Meeting

Clean-up activities by volunteer etc.

Coast line after clean-up

Action hereafter

The four NOWPAP Members discharge marine litter, while the driftage annoys them. In this context, the four countries are generators and victims at the same time. Therefore, it is essential to address the pollutant sources in every country for the ultimate solution. Japan cooperate with the other Members and make its utmost efforts to address this international problem.

City of Tsushima , Nagasaki Prefecture

Students of the Foreign Language College of Busan, Republic of Korea got to know the serious problem in Tsushima is lands by marine litter which are largely generated in Korea. The students have been visiting Tsushima city since 2002 every year, and performing cleaning activities in collaboration with local residents. The event was held in May 21st this year as shown in the photograph.

Thank you for your attention

THE COST-SHARING SYSTEM FOR MANAGING THE MARINE LITTER BY AGREEMENT AMONG THE ADMINISTRATIVE ORGANIZATION OF AROUND THE CAPITAL AREA IN KOREA

Young-Gwon Ha, Kyeong-Doo Cho** and Sung-Woo Kim****

**Water Management Division, Incheon Metropolitan City
1138 Guwol-dong Namdong-gu, Incheon 405-750, Republic of Korea
hyg0913@hanmail.net*

***Head, Dept. of Research Planning & Coordination, Incheon Metropolitan City
1138 Guwol-dong Namdong-gu, Incheon 405-750, Republic of Korea
kdcho@idi.re.kr*

****Research Fellow, Dept. of Environment & Ecology, Incheon Metropolitan City
1138 Guwol-dong Namdong-gu, Incheon 405-750, Republic of Korea
watershed@idi.re.kr*

INTRODUCTION OF INCHEON COASTAL REGION

General Description

The Incheon Coastal Region is developing into a marine hub of East Asia with Incheon International Airport, Songdo New City, and International Harbor. The Yellow Sea where Incheon Coastal Region is located has a wide spreaded tideland and relatively great tidal range known as one of the most important tidelands in the world.

However, the tidelands around Incheon Coastal Region was reclaimed for Incheon International Airport and lots of area have been reclaimed for the purpose of landfills, agricultural area, industrial complex, and New town. For this, earlier rias coast is getting shorter and simpler, smaller tideland as well.

Development of Environmental Change

Because Incheon Coastal Region is located along a side of capital area(the industry and the business are concentrated in capital city, Seoul), near-shore industrial complex was constructed in this region and it discharges tons of industrial waste water into Incheon Coastal Region. Furthermore, seawater quality in Incheon Coastal Region is affected with pollutants from capital area through Han River and Siwha Reservoir.

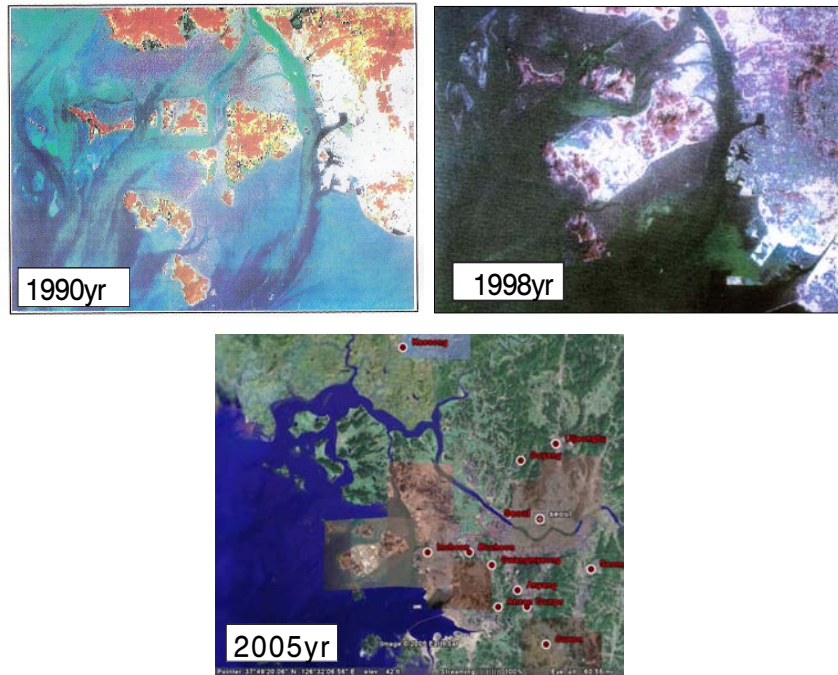


Figure 1. Topographical Changes of Incheon Coastal Region

CONTRIBUTION OF DISCHARGE LOAD BY INFLUENT SOURCES

Contribution of discharge load by influent route

Influent sources can be presented in three ways : direct influent from land, influent through Han River and influent from Siwha Reservoir.

BOD load from the influent sources of Han River and from Siwha Reservoir are 153,055kg/day and 59,769kg/day respectively. It accounts for 65% and 25% of all.

Hence, it is important to manage source area (such as Seoul, Incheon and Gyung-gi) which discharge the load into Han River. And continuous management to Siwha Reservoir and its basin is needed.

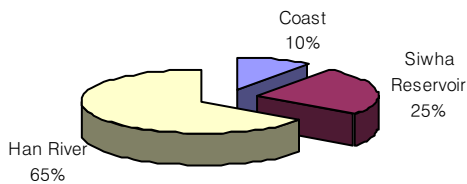


Figure 2. BOD discharge load rate by influent sources

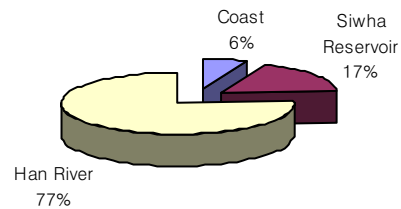


Figure 3. T-N discharge load rate by influent sources

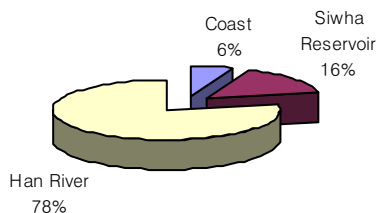


Figure 4. T-P discharge load rate by influent sources

Contribution of discharge load by administrative district

BOD discharge load from Gyung-gi, Seoul, and Siwha Reservoir are 44%, 25%, and 20% of all, respectively. When T-N is considered, the rate are 54% for Gyung-gi, 23% for Seoul, and 20% for Siwha Reservoir. BOD discharge load for Incheon is 4,603.23kg/day (2% of all).

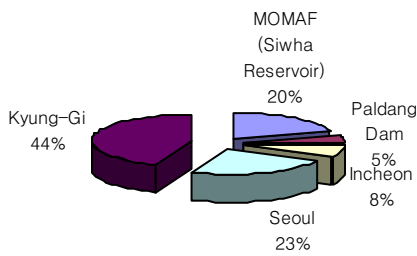


Figure 5. Share rate of BOD load

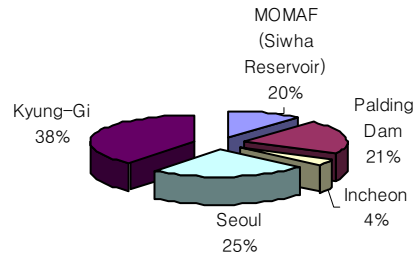


Figure 6. Share rate of T-N load

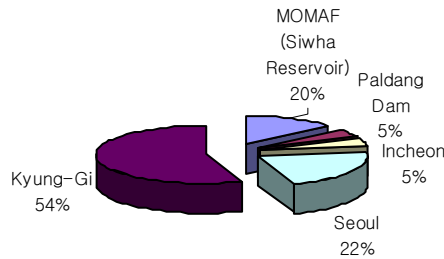


Figure 7. Share rate of T-P load

STATE OF MARINE LITTER AND ESTIMATION

Estimation of float and deposition litter

Through the amount of collected litter from Incheon Coastal Region in every year, volume of the floating litter can be estimated at 191,271 cubic meters and amount of submerging litter throughout Incheon Coastal Region (about 500,000 ha) can be estimated at 97,000 tons (194,000 cubic meters). For this, we assumed density of litter is homogenous over all area.

Especially, Youngjong, Chochi, Dukjuk, Jinly, Jango, and Wooldo area have the largest amount of submerging litter.

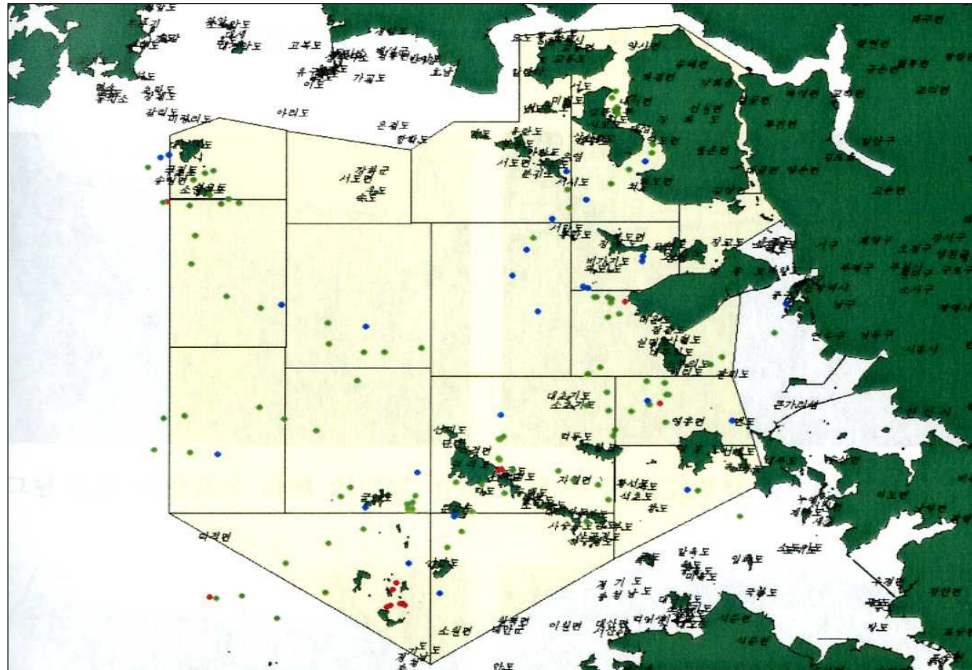


Figure 8. Distribution of submerging litter

Note) Green area : where amount of submerging litter per unit area range
 $0.0\text{kg/m}^2 \sim 0.1\text{kg/m}^2$

Red area : where amount of submerging litter per unit area is over 0.1kg/m^2

Analysis of marine litter

Floating litter flowing into Incheon Coastal Region consist of 46,508 m³(63.6%) of vinyl and plastics, 10,050m³(13.7%) of wood-pieces, 5,848m³(8.0%) of styrofoam, 4,674m³(6.4%) of waste-rubber, and 3,739m³(5.1%) of fishing nets during ordinary season. In contrast to this, the composition of floating litter are 42,372 m³(76.2%) of wood-piecesm, 5,068m³(9.1%) of vinyl and plastics, 3,308m³(5.9%) of fishing nets during rainy season, respectively.

Table 1. Seasonal and compositional estimation of floating litter

Composition	Ordinary Season		Rainy Season		Flood Season		Total	
	Influent (m ³)	Rate (%)	Influent (m ³)	Rate (%)	Influent (m ³)	Rate (%)	Influent (m ³)	Rate (%)
Vinyl/Plastics	46,508	63.6	5,068	9.1	483	0.8	52,059	27.2
Fishing nets	3,739	5.1	3,308	5.9	-	-	7,047	3.7
Bottles	2,337	3.2	1,038	1.9	-	-	3,375	1.8
Waste-rubber	4,674	6.4	1,669	3.0	290	0.5	6,633	3.5
Styrofoam	5,843	8.0	2,158	3.9	-	-	8,001	4.2
Wood-pieces	10,050	13.7	42,372	76.2	53,637	85.8	106,059	55.4
ETC	-	-	-	-	8,099	13.0	8,099	4.2
Total	73,151	100.0	55,613	100.0	62,509	100.0	191,273	100.0

COST-SHARE FACTORS FOR SEAWATER QUALITY IMPROVEMENT IN INCHEON COASTAL REGION

Decision of the 1st factor for cost-share

PPP (Polluter Pays Principle) is applied to the 1st factor for cost-share according as polluters should be responsible for the environmental problems and pay for the cost of restoration. This principle is said to be applied to seawater quality problem in Incheon Coastal Region by a commonsense that pollutants in Incheon Coastal Region continuously come from Han River Watershed.

Weight by share factor

PPP is a basic principle on considering β the weight value for improving seawater quality in Incheon Coastal Region, and β may be assumed to be 0.7 for long-termal management.

Table 2. Example of cost-share for improvement in Incheon Coastal Region

C_1		Polluter share	
		Direct Benefit (Incheon City share)	Indirect Benefit (Joint share)
Central Government share	Incheon City share	Joint share(C_2)	

Table 3. Weight values by the principles of cost-share for the improvement in Incheon Coastal Region

	convenience benefiter (α)	polluter (β)
Weight	0.3	0.7

Estimation of cost-share rate

Method 1 is to consider Seoul and Gyung-gi as non-benefiter of convenience. Hence, 50% of population in the watershed is considered between BOD discharge load and Marine loads.

Method 2 is to suggest distributing cost-share rate among local governments by considering 50% of watershed area between BOD discharge load and Marine loads. As a result, Incheon takes over the most share as most convenience benefiter.

Seoul is responsible for 35 % of total expenses considering population and Gyung-gi which has the largest area takes over 39 % of expenses considering watershed area.

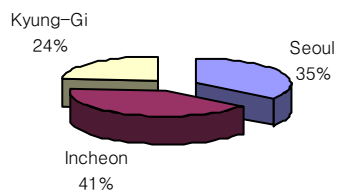


Figure 9. Method 1-Joint share rate

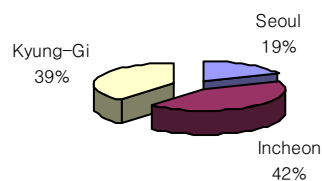


Figure 10. Method 2- Joint share rate

AGREEMENT AND FULFILLMENTS

Agreement

- **Subject**

Coast-share agreement for litter disposal in Incheon Coastal Region and Han Watershed

- **History and Background**

This agreement was established for cost-share of the expenditure of litter disposal in Incheon Coastal Region and Han Watershed in April, 2001.

- **Subject of the Project**

Litter disposal project is based on a joint research with five cities and provincial governments, named, <cost-share research for water quality management in Han Watershed> and it covers investigation of marine litter distribution, removal, disposal, and management of refuse ship.

- **Project period**

2002 ~ 2006

- **Project Expenses**

Total expenditure for litter disposal project in Incheon Coastal Region is 25 billion won (about 25 million US dollars) from 2002 to 2006 (during 5years)

- **Cost-share rate**

Based on the result of research, cost-share rate for litter disposal project was agreed to 22.8% for Seoul, 50.2% for Incheon, and 27.0% for Gyung-gi, respectively at the convention of 12th Administrative Commission.

Disposal result of marine litter

As a result of the agreement, 28.5 million dollars of subsidy was granted and , 7,816m² of submerging litter, 7,237m² of suspending litter, and 5,183m² of floating litter were removed from 2002. Because, however just only 1.3% of over all marine litter(191,273m²) in Incheon Coastal Region is being removed , incoming litter increases in every year.

Table 4 shows removed and or treated amount of marine litter by year.


Table 4. Disposal result of marine litter

Year	Total(m ³)	Rainy Season Screen	Purchase	Dredging	Coastline
Total	60,888	5,183	7,237	7,816	40,652
2002	7,980	1,290	380	3,647	2,663
2003	15,662	1,112	1,170	2,075	11,305
2004	17,330	2,089	1,206	721	13,314
2005	19,916	692	4,481	1,373	13,370

Dominant factors of seawater quality in Incheon Coastal Region and re-estimation of cost-share rate

As Cost-share Agreement for Improvement in Incheon Coastal Region established in 2001 by local Governments (Seoul, Incheon and Gyung-gi) expires in this year, a research for distribution of more reasonable cost-share rate is undergoing.

This research is expected to find what dominant factors cause seawater contamination in Incheon Coastal Region by investigations of pollutant sources flowing into Incheon Coastal Region and estimation of the loads as well as give an basis of re-estimating cost-share rate for improvement of seawater quality in Incheon Coastal Region.




The cost-sharing system for managing the marine litter by agreement among the administrative organizations around the capital area in Korea


Jun. 8, 2006

Kyeong Doo Cho, Ph.D
Senior research fellow, Incheon Development Institute

Contents



- I Introduction of Incheon Coastal Region (ICR)
- II Contribution of discharge load by influent sources
- III State of marine litter and estimation
- IV Cost-share factors for seawater quality improvement in ICR
- V Agreement and fulfillments



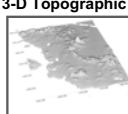
I. Introduction of ICR

Location




General description


3-D Topographic




Population



River basin-1



River basin-2




Earlier rias coast is getting short and simple due to frequent landfill and reclamation project

Incheon Coastal Region

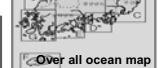
Characteristics

- Well-developed tideland and high productive coastal region by relatively great tidal range
- Seawater quality effects from coastal industrial complex and land influent
- Contamination increase in coastal region caused by ongoing development around the Capital Area


Middle of the Yellow Sea- I




Over all ocean map

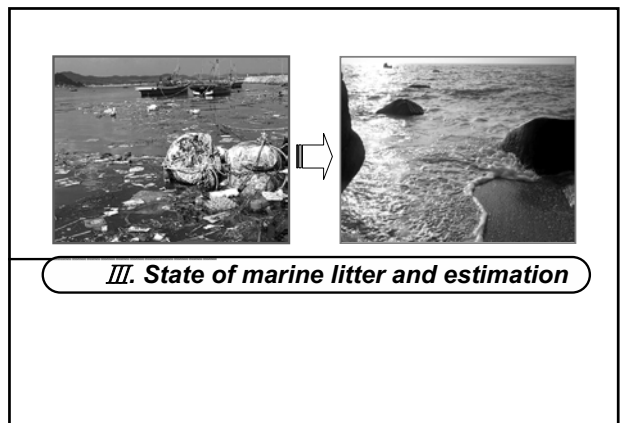
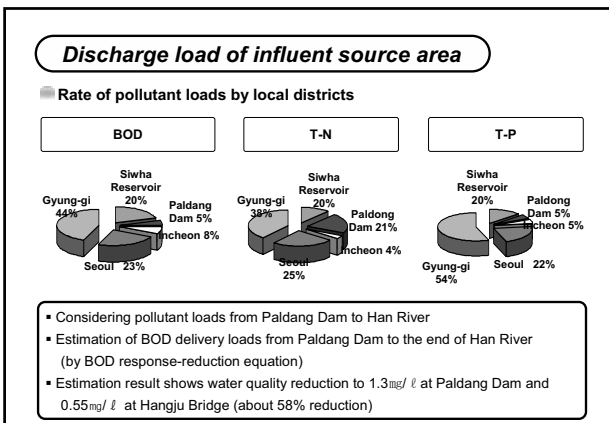
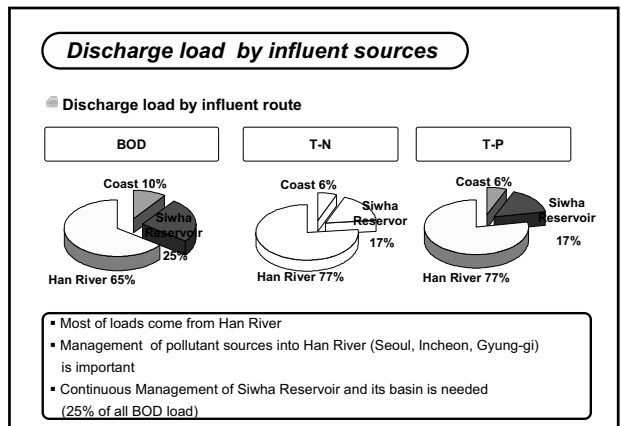
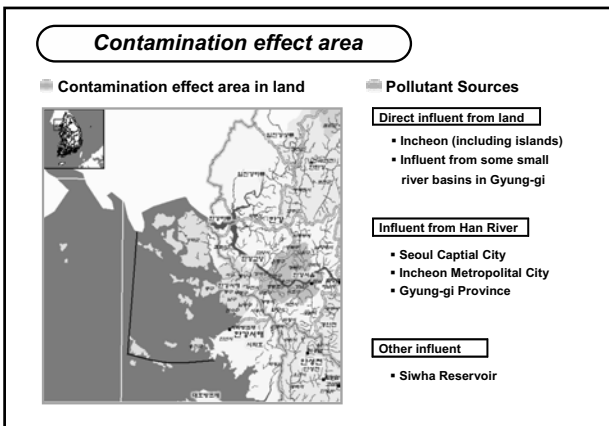
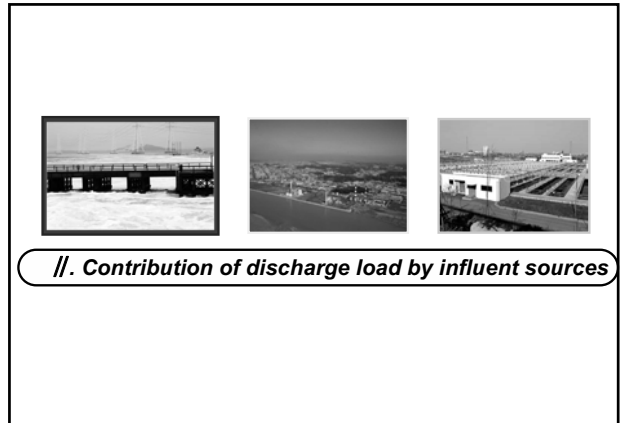
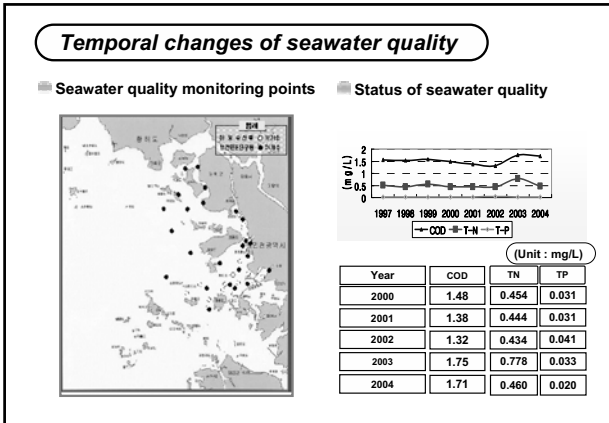


Tidelands



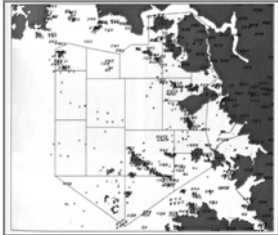
Ocean conservancy area





Estimation Result

- Distribution of submerging litter
- Estimation



Floating litter

- Through the amount of collected litter, Floating litter is estimated at 191,271 m³

Submerging litter

- Submerging litter effected from Han River is estimated at 194,000 m³ in Incheon Coastal Region

- Green area : where amount of submerging litter per unit area is less than 0.1Kg/m²
- Red area : where amount of submerging litter per unit area is over 0.1Kg/m²

Analysis of marine litter

- Amount of incoming litter in a year (floating litter)

Composition	Total	Vinyl and Plastics	Waste-nets	Bottles	Waste-rubber	Styrofoam	Wood-pieces	ETC
Influent(m ³)	191,273	52,059	7,047	3,375	6,633	8,001	106,059	8,099
Rate(%)	100.0	27.2	3.7	1.8	3.5	4.2	55.4	4.2

- Compositions of floating litter
 - Vinyl & plastics are the most in ordinary season and wood-pieces are the most in rainy season.
 - In average, wood pieces are the most (55.4%) and vinyl & plastics are the 2nd (27.2%).

IV. Cost-share factors for seawater quality improvement in ICR

Weight by share factor

- Principles of cost-sharing
 - Polluter Pays Principle : PPP
 - Beneficiary Pays Principle : BPP
 - Ability-to-Pay Principle : APP
- According to Commonsense that pollutants in ICR continuously come from Han River Watershed, PPP was accepted as 1st principle.

Weight value by share factor

- Weight value by share factor

C ₁		Polluter share	
		Direct Benefit (Incheon City share)	Indirect Benefit (Joint share)
Central government share	Incheon city share	Joint share(C ₂)	

- Weight value by the principles of cost-share

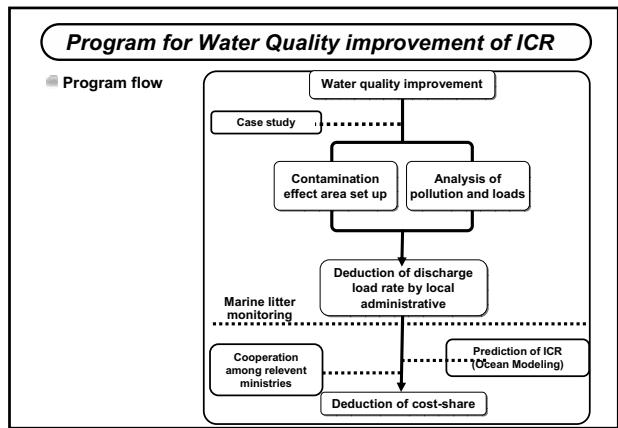
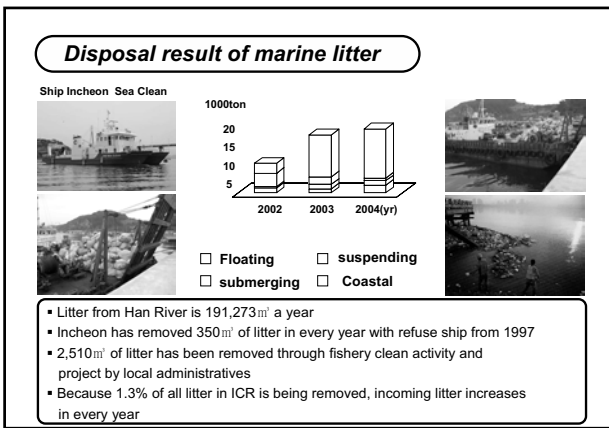
	Convenience benefiter (α)	Polluter (β)	Ability (γ)
Weight	0.3	0.7	No regards

Estimation of cost-share rate

- Estimation from research result
 - Seoul and Gyung-gi is considered as non-convenience benefiter. And Incheon pays the most expenses.
 - Method 1 : 50% of population in the watershed is considered between BOD discharge and Marine loads.
 - Method 2 : 50% of watershed area is considered between discharge and marine loads.
 - When the litter appears in portion of population, share rate for Seoul increases up to 35% due to high density of population.
 - When the litter appears in portion of watershed area, share rate for Gyung-gi increases up to 39% due to relatively large watershed area.

V. Agreement and fulfillments

Agreement	
Subject title	•Cost-share agreement for litter disposal in ICR and Han Watershed
History and Background	•Established for cost-share of the expenditure of litter disposal in ICR and Han Watershed in April, 2001
Subject of the Project	•Investigation of marine litter distribution, removal, disposal, and management of refuse ship
Project Period	•2002~2006
Project Expenses	•5billion won(\$5,000,000) a year Total expenditure is granted 25billion won (\$25,000,000)
Cost-share rate	•22.8% for Seoul, 50.2% for Incheon, and 27.0% for Gyeong-gi



Program for Water Quality improvement of ICR

Area

Temporal Area

- Period
 - Sep. 2005 ~ July 2006
- Basic Period : 2003yr, Final Period : 2011yr

Spatial Area

- Land : Contamination effect area of ICR
- Ocean : Incheon Coastal Region

Purpose

- To find dominant factors of seawater quality in ICR
- To suggest a basis of re-estimation cost-share rate for improvement of seawater quality in Incheon Coastal Area

Program for Water Quality improvement of ICR

Main concept of this Program

1. To establish new plan of various projects to abate and manage the issues related to the coastal and marine environment of ICP including marine litter,
2. To make central and local governments cooperate with granting funds, such as ocean pollution charge or water use charge.



ACTIVITY OF THE PRIMORYE GOVERNMENT FOR SEA-BASED MARINE LITTER IN VLADIVOSTOK

Sergey Moninets

*Director, Sea Protection Institute, Vladivostok, Russian Federation Ministry of Transport
50a, Ul. Verkhneportovaya, Vladivostok 690059, Russian Federation
moninets@msun.ru*

Most of Primorsky Krai residents (total number being approximately 2mln people) live in the port cities and town (the biggest ones being Vladivostok and Nakhodka). During summer period lots of tourists (estimates vary from 500 to 800 thousand people) rush to the southern coasts of Primorsky Krai.)

Fishery and sea transport are among the leading industries in the economy of Primorsky Krai. The biggest Russian Far East ports are situated on the Krai territory: Vladivostok, Nakhodka, Vostochny. Besides, there are some miniports such as Posyet, Zarubino, Olga, Plastun. As a rule, these ports also accommodate fishery ports serving as bases for fishery companies engaged in fishing both in coastal zones and in open water areas of Far Eastern seas.

The ecological situation in the sea waters adjacent to Primorsky Krai cities and larger settlements is anything but satisfactory.

PETER THE GREAT GULF WATERS: EXTENT OF POLLUTION

Near-shore sea water areas of the Peter the Great are zones of most heavy anthropogenic impact, especially in semi-landlocked inner bays. They have been subject to anthropogenic stress for many decades both from the part of industrial enterprises, the Navy, the merchant and fishery fleet, and from the part of housing and municipal engineering, and extremely polluted urban areas. The state of coastal waters environment remains unsatisfactory.

Hydrocarbons comprising oil are amongst the main factors of sea water pollution. Pollution of water areas with oil products lasting for several decades has resulted in turning the bottom of the Golden Horn Bay into a thick layer of bituminous aggregate. **Visual observations** tell that oily slicks on the bay waters surface attain intensity 5, while the percentage of the surface area covered with them lies within a range of 40-100 per cent. Apart from oily slicks all the water areas of the Peter the Great Gulf are noted for tremendous amounts of litter, while in the Amursky Bay there are brown foam covered areas.

Research into the shore litter undertaken on the shoreline of the Peter the Great Gulf in 1999 and in 2005 gave the grounds to conclude that the bulk of the litter found in the near-shore waters is of local origin. And the most polluted water areas are those of the port of Vladivostok. There are days when visual observations would indicate that litter concentration attains 2kg – 3kg per 1,000sq.m..

What are the sources of the port of Vladivostok waters pollution by litter?

SOURCES OF SEA POLLUTION BY LITTER

Among the sea sources one may distinguish transport ships, fishing boats, naval ships, as well as small-sized boats and yachts used for sports fishing and recreation.

Nowadays there is a series of regulatory documents to govern the procedure for the management of waste generated on board ships while at sea. All of these documents are developed on the basis of MARPOL 73/78 International Convention requirements. The nature protection organizations and port authorities supervise sea-going vessels' compliance with these requirements.

Refuse and bilge waters collection from calling merchant and fishing vessels has been arranged in all ports of Primorsky Krai. Larger shipping and fishing companies aspiring to keep their reputation issue internal circular letters on the sea pollution prevention (SPP) and see to the observance by their crews. It is understood that in smaller companies where maintaining SPP services is a too heavy burden, there are instances when litter (including plastics) is discharged into the sea. It is rather difficult for the nature protection agencies to keep a track on these violations at the present stage.

Various estimates agree that most part of the litter is introduced into the port of Vladivostok waters with the effluent of smaller rivers, flowing through the urban areas. Unavailability of a good system of litter collection and utilization gives rise to unauthorized dumpsites along the banks of these rivers. With rain or thaw the water level in these rivers rises and all the litter is brought into the port water area.

It is small wonder that under such circumstances many ships and many crews commit environmental offense. Instead of transfer of litter onto specialized ships they dump litter overboard at night.

The pollution source control system is extremely ineffective today. Identification of the sources of pollution or of separate cases of litter dumping is difficult of accomplishment.

AVAILABLE PORT WATERS CLEANING SYSTEM

The existing practice of cleaning the water areas in ports is that each water-user is obliged to keep the assigned water area of the port clean, that is not to pollute it, to remove litter and oil slicks. This requirement perfectly well fits the situation with a single water user in the port. But currently in the port of Vladivostok there are about hundred small-sized companies leasing or operating the port berths. They are obliged to conclude contracts with specialized companies engaged in water area cleaning. But these companies lack resources. The port water area is continuously served by only 2 or 3 specialized litter skimmers built in the 80-s last century. In winter when there is an appearance of ice in the port water area the port waters cleaning operations are suspended. It is understood that available facilities can't cope with continuously incoming masses of litter.

At the end of 2005 an interdepartmental commission on the Peter the Great Gulf cleaning-up was established under the aegis of the Primorsky Krai Governor. The Commission united the representatives of the federal and Krai nature protection agencies, major water users, state administrations of sea ports, and the Navy. The Commission's top priority is organization of actions in cleaning the port of Vladivostok waters from oil, and from production and consumption wastes.

Taking into account the higher level of agencies represented at the Commission it succeeds in

solving separate problems of the port of Vladivostok waters cleaning.

Primorsky Krai Government sets rather serious goals for itself and achieving these goals will fundamentally improve the ecological situation in the port of Vladivostok. The following top priorities are scheduled:

- construction of the city sewage treatment and rain-storm run-off treatment plants;
- prevention of water areas siltage and pollution with sediments originating from rain-storm run-off and man-caused solids run-off from rivers;
- actions in water areas cleaning;
- cleaning the Gulf waters from wrecked and abandoned craft followed by their further utilization;
- formation of new artificial land areas for recreation and other purposes in place of ash disposal areas and urban ore landfills;
- starting litter processing plants;
- monitoring of the water bodies' state;
- involvement of non-governmental organizations to solving environmental problems.

These activities' financial backing amount and procedure are being considered and in near future the actions program will be submitted to the Primorsky Krai Legislative Assembly for examination.

Steps taken by the Primorsky Krai Government prove that the state system of port water areas cleaning from pollution is being restored. It is the Krai Government that has every authority to get the port of Vladivostok waters cleaning system under its total control.

1. Port of Vladivostok Water User Register has been compiled. In accordance with RF legislation using of any zone of sea water areas is subject to obtaining a state-granted license. Moreover, a contract of the right to use this zone of water area is to be concluded with the government. This contract stipulates the procedure for keeping the water area clean.
2. An overall inventory of licenses issued has revealed that only 60 per cent of water uses do hold the licenses. An obligation to enter into water use agreements was laid on the other players in this sector of economy.
3. Starting a project of fitting sewage water outlets and mouths of rivers flowing into the sea with fine filter grating has been initiated.
4. All the river beds have been inspected. Sites of unauthorized dumping have been identified. Measure are being taken to remove these.
5. On the basis of the inspection dozens of directions were issued on correcting the violations of the nature protection law. The amounts of penalties reached several thousand US dollars. At that the justification for the penalty sanctions is not always sound. Water area pollution is spread under the influence of the wind and currents. It is understood that neither the wind nor the current recognize the limits of different zones. As a result some water users in the lee side of the bays have to bear the major burden of responsibility for general pollution of the port waters. This will not facilitate mutual understanding between the water users and the administration.

Apart from the above, the following actions have been scheduled within the framework of the "Waste" Krai Programme for the years of 2005-2011.

- water supply and sewage facilities reconstruction and development in the city of Vladivostok (sewage facilities);

- construction of rain-storm run-off treatment plants in the city of Vladivostok
- construction of municipal solid waste landfill in the city of Vladivostok;
- rehabilitation of the municipal solid waste landfill (in the area of Gornostai bay, Vladivostok);
- sunken ships recovery;
- utilization of ships removed from service.

Presently the Commission is working out the program of actions for the nearest years, featuring the following priorities:

- organizing port waters pollution monitoring on a regular basis;
- identifying the major sources of port waters pollution;
- determining the basic principals of cleaning activity organization and financial backup;
- establishing a stricter control on the water user compliance with the requirements of the Compulsory Regulations on sea ports and other regulatory documents.

With the activities of Primorsky Krai Government being on the rise, there are still quite many issues lacking unambiguous answers until present time. Among these open questions there are the following ones:

1. **Financial support sources and procedures** for main water areas cleaning programmes. That's the most essential and controversial matter. The Primorsky Krai budget can't provide required financing for all the programmes. The federal budget can't be relied upon either. Many of the water user are willing to contribute to the cause but they need to be presented the reasonable substantiating of their share in the common fund. Meanwhile unanimity has not been reached yet as to the final amount of the annual budget for the port of Vladivostok water area cleaning system. Estimates vary in the range of from USD800,000 to USD2,000,000.
2. **Introduction of modern technologies** of water areas cleaning from litter and oil. That's the second by the order of importance unsolved issue. Present-day skimmers of garbage are known to be quite expensive. Personnel needs to be trained in new techniques. Vladivostok in this respect is a unique site. Here the whole complex is to be started from the very beginning. Let me remind you that garbage collecting vessels currently available at the port of Vladivostok were built 15-20 years ago, they are few in number and their efficiency is extremely low.
3. **Organization of the system of continuous monitoring** port waters. Implementation of this project would help reduce the amounts of litter ingress into water areas. To the best of my knowledge, some ports of the region possess such systems which have proved their effectiveness. In terms of priority of putting into practice the establishment of operative pollution sources monitoring system is, no doubt, at the top of the list. But its implementation is to a great extent dependent on financing. For the time being monitoring is confined to episodic control agencies' raids.

There is no commonly shared approach to solving the above issues amidst the interdepartmental commission. And that is a hindrance to the adoption of the activities' programme.

CONCLUSION

It is obvious that many ports of NOWPAP region encountered in the past and / or are still encountering the similar problems. Therefore the meetings like the 1st ML Workshop are the best venues for discussion of this sort of problems. Many ports of NOWPAP region, as far as I know, possess up-to-date systems for port waters cleaning. Say, I remember perfectly well what the Inner Sea of Japan port waters were like at the end of 1970-s and how they changed just ten years later.


Within the framework of activities 17 and 18 there is some space for starting a discussion of problems and exchange of experience on port waters cleaning issues. This exchange can be realized through a number of ways:

- publication of special symposium;
- conducting a workshop for experts and local authorities;
- holding a conference and an exhibition devoted to modern port waters cleaning technologies and techniques.

Experience exchange in the field will eventually promote the establishment of effective system of port water areas protection from pollution.

Maritime State University
Sea Protection Institute

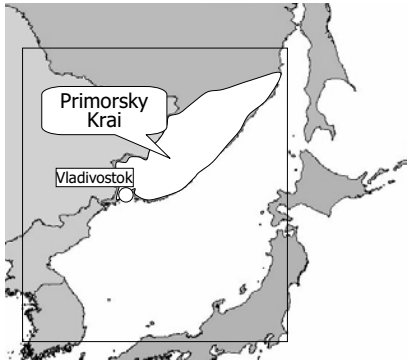
Activity of the Primorye Government for
Sea-based Marine Litter in Vladivostok



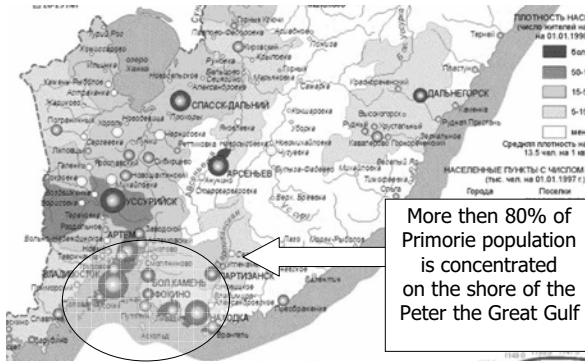
Presented by
SERGEY MONINETS

June 8, Incheon, Korea

Primorsky Krai and NOWPAP Region



Distribution of Primorsky Krai population



General sources of ML

- **Sea-based sources of ML**
 - Merchant shipping, ferries and cruise liners
 - Fishing vessels and fish farming

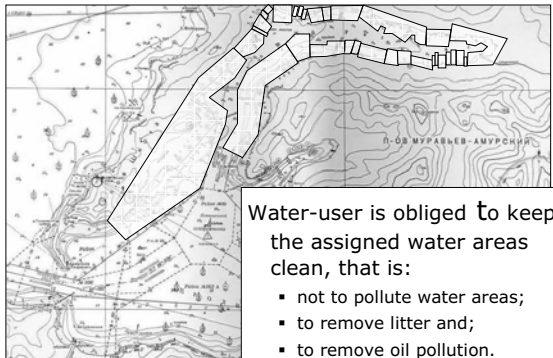
Refuse and bilge waters collection from calling merchant and fishing vessels has been arranged in all big ports of Primorsky Krai. But there are instances when litter (including plastics) is discharged into the sea

General sources of ML

- **Land-based sources of ML**
 - Waste from municipal landfills located on the coast or by river transport
 - Discharge of untreated municipal sewerage and storm water

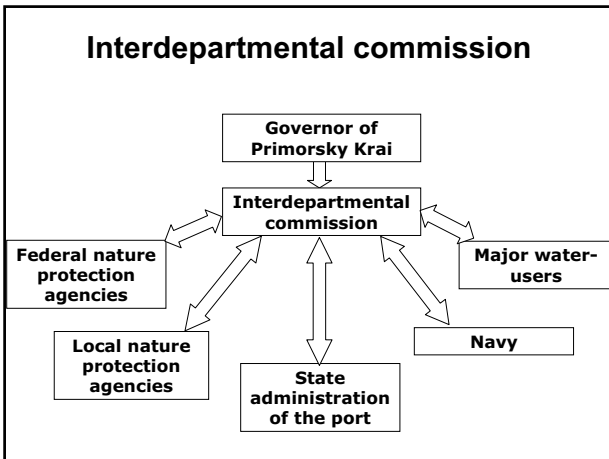
The most part of the litter is introduced into the port of Vladivostok waters with the effluent of smaller rivers, flowing through the urban areas

Water-users in the port of Vladivostok



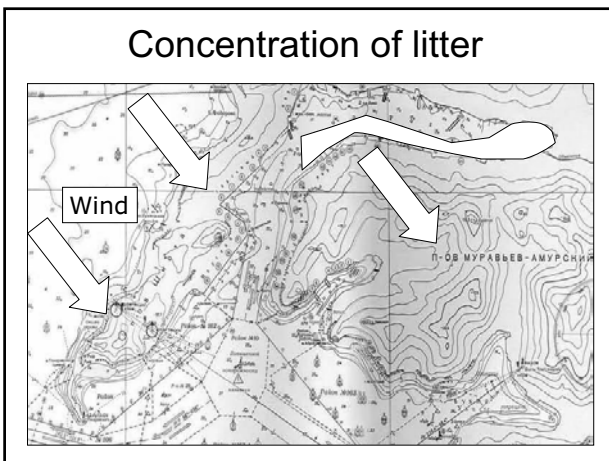
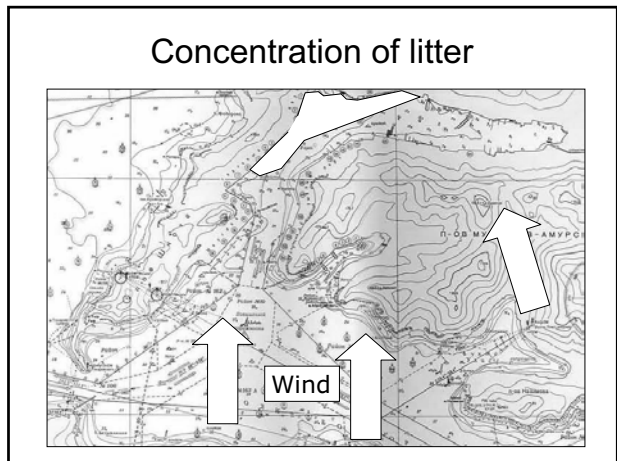
Water-user is obliged to keep the assigned water areas clean, that is:

- not to pollute water areas;
- to remove litter and;
- to remove oil pollution.



- ### The top priorities of the Government activity
- construction of the city sewage treatment and rain-storm run-off treatment plants;
 - prevention of water areas siltage and pollution with sediments originating from rain-storm run-off and man-caused solids run-off from rivers;
 - actions in water areas cleaning;
 - cleaning the Gulf waters from wrecked and abandoned craft followed by their further utilization;
 - starting litter processing plants;
 - monitoring of the water bodies' state;
 - involvement of non-governmental organizations to solving environmental problems

- ### Steps taken by the Government
- Port of Vladivostok Water User Register has been compiled.
 - An overall inventory of licenses issued has revealed that only 60 per cent of water uses do hold the licenses. An obligation to enter into water use agreements was laid on the other players in this sector of economy.
 - Starting a project of fitting sewage water outlets and mouths of rivers flowing into the sea with fine filter grating has been initiated.
 - All the river beds have been inspected. Sites of unauthorized dumping have been identified. Measure are being taken to remove these.
 - On the basis of the inspection dozens of directions were issued on correcting the violations o the nature protection law.



- ### Framework of the "Waste" Krai Programme
- water supply and sewage facilities reconstruction and development in the city of Vladivostok (sewage facilities);
 - construction of rain-storm run-off treatment plants in the city of Vladivostok
 - construction of municipal solid waste landfill in the city of Vladivostok;
 - rehabilitation of the municipal solid waste landfill (in the area of Gornostai bay, Vladivostok);
 - sunken ships recovery;
 - utilization of ships removed from service.

Action for the nearest future

- organizing port waters pollution monitoring on a regular basis;
- identifying the major sources of port waters pollution;
- determining the basic principals of cleaning activity organization and financial backup;
- establishing a stricter control on the water user compliance with the requirements of the Compulsory Regulations on sea ports and other regulatory documents.

The open questions: Financial Sources

- Financial support sources and procedures are the most essential and controversial matter
- The federal budget can't be relied upon either
- Water user need to be presented the reasonable substantiating of their share in the common fund
- The final amount of the annual budget for the port of Vladivostok water area cleaning system estimates vary in the range of from USD800,000 to USD2,000,000

The open questions: modern technologies

- In Vladivostok the whole complex is to be started from the very beginning.

The open questions: continuous monitoring

- Some ports of the NOWPAP region possess the systems of continuous monitoring which have proved their effectiveness
- In terms of priority of putting into practice the establishment of operative pollution sources monitoring system is at the top of the list.
- But its implementation is to a great extent dependent on financing.

Conclusions

- There is no commonly shared approach to solving the port waters cleaning problems
- The ML Workshops are the best venues for discussion of port waters cleaning problems.
- Within the framework of activities #17 and #18 there is some space for starting a discussion of problems and exchange of experience on port waters cleaning issues.
- This exchange can be realized through a number of ways:
 - publication of special symposium;
 - conducting a workshop for experts and local authorities;
 - holding a conference and an exhibition devoted to modern port waters cleaning technologies and techniques.

Thank you



Session 3

Current Status of the Treatment and Recycling Technology Development of Sea-based Marine Litter and Others

LEGAL INSTRUMENTS AND INSTITUTIONAL ARRANGEMENTS RELATED TO MARINE LITTER IN CHINA - SUMMARY AND ANALYSIS

*Linlin Hu**, *Binghui Zheng** and *Xianfeng Wu***

**Marine Litter Focal Point of China
Environmental Standards Research Institute, SEPA
No.8 Dayangfang, Anwai, Beijing 100012, P.R.China
hull@craes.org.cn*

***Vice Director, Marine Environment Protection Division
State Environmental Protection Administration
No. 115 Xizhimennei Nanxiaojie, Beijing 100035, P.R.China
wu.xianfeng@sepa.gov.cn*

ABSTRACT

Through collecting and summarizing the data and information on constitutional provisions, framework laws, institutional legislation/cross-cutting legislation related to marine litter in China, a national summary on marine litter related national legal instruments and institutional arrangements is introduced. The comments on these instruments and arrangements from the view of marine litter and the analysis of gaps and needs in the coverage of the marine litter issue by national instruments are subsequently made.

1. LIST OF NATIONAL LAWS, REGULATIONS, AND INSTITUTIONAL LEGISLATION RELATED TO THE MARINE LITTER

The laws, regulations, and institutional legislation obviously related to the marine litter in China include:

- Constitution of the people's republic of China, Amended for the fourth time on March 14, 2004,
- Environmental Protection Law of the people's republic of China, December 26, 1989
- Marine Environmental Protection Law, Revised on December 25, 1999
- Regulations on the Prevention of Pollution Damage to the Marine Environment by Land-based Pollutants, Effective on August 1, 1990
- Regulations on the Administration of Environmental Protection in the Exploration and Development of Offshore Petroleum, December 29, 1983
- Regulations on the prevention of Vessel-induced Sea Pollution, December 29, 1983
- Regulations on Control over Dumping of Wastes in the Ocean, March 6, 1985
- and Proposals on Strengthening the Management of the Plastic Package Wastes along Main Roads,

in River Basins and at Tourist Attractions, Approved by the State Council on September 22, 1998.

In the Law on Prevention of Environmental Pollution Caused by Solid Waste and Law on Prevention and control of Water pollution, there are clear descriptions both in Article 2 that “This Law is not applicable to the prevention and control of marine pollution, which is provided for by a separate law” and “It does not apply to the prevention of marine environmental pollution caused by solid waste...”, then the two laws are not treated as “obviously related” ones.

2. DETAILED ARTICLES RELATED TO THE MARINE LITTER

2.1 Constitution Provisions

In the Constitution of the people’s republic of China, there wrote:

in Article9The state ensures the rational use of natural resources and protects rare animals and plants. Appropriation or damaging natural resources by any organization or individual by whatever means is prohibited,

in Article26 The state protects and improves the living environment of the people and the ecological environment. It prevents and controls pollution and other public hazards.

2.2 Framework laws

In the Environmental Protection Law of the people’s republic of China, there wrote:

in Article7, The competent department of environmental protection administration under the State Council shall conduct unified supervision and management of the environmental protection work throughout the country.

The competent department of environmental protection administration of the local people’s governments at or above the county level shall conduct unified supervision and management of the environmental protection work within areas under their jurisdiction.

The state administrative department of marine affairs, the harbor superintendency administration, the fisheries administration and fishing harbor superintendency agencies, the environmental protection department of the armed forces and the administrative departments of public security, transportation, railways and civil aviation at various levels shall, in accordance with the provisions of relevant laws, conduct supervision and management of the protection of natural resources.

in Article 21 The state Council and the people’s governments at various levels in coastal areas shall provide better protection for the marine environment. The discharge of pollutants and dumping of wastes into the seas, the construction of coastal projects, and the exploration and exploitation of offshore oil must be conducted in compliance with legal provisions so as to guard against the pollution and damage of the marine environment.

in Article 46 If a international treaty regarding environmental protection concluded or acceded to by the People’s Republic of China contains provisions differing from those contained in the laws of the People’s Republic of China, the provisions of the international treaty shall apply, unless the provisions are ones on which the People’s Republic of China has announced reservations.

In the Marine Environmental Protection Law, there wrote:

in Article 2 This law shall apply to the internal waters, territorial seas and the contiguous zones, exclusive economic zones and continental shelves of the People’s Republic of China and all other sea areas under the jurisdiction of the People’s Republic of China....

This law shall also apply to areas beyond the sea areas under the jurisdiction of the People’s

Republic of China that cause pollution to the sea areas under the jurisdiction of the People's Republic of China.

in Article 5 The competent administrative department in charge of environment protection under the State Council, as a department to exercise unified supervision and administration over nation-wide marine environment protection work, shall render guidance, co-ordination and supervision and be responsible for nation-wide environment protection work to prevent and control marine pollution damages caused by land-based pollutants and coastal construction projects. The competent State Oceanic administrative department in charge of marine affairs shall be responsible for the supervision and administration of the marine environment, organize survey, surveillance, supervision, assessment and scientific research of the marine environment and be responsible for nation-wide environment protection work to prevent and control marine pollution damages caused by marine construction projects and dumping of wastes in the sea. The competent State administrative department in charge of maritime affairs shall be responsible for the supervision and administration of marine environment pollution caused by non-military vessels inside the port waters and non-fishery vessels and non-military vessels outside the port waters under their jurisdiction, and be responsible for the investigation and handling of the pollution accidents. In the event of a pollution caused by a foreign vessel navigating, berthing and anchoring and operating in the sea area under the jurisdiction of the People's Republic of China, officers in charge shall board the vessel in question to examine and handle the case. Should a pollution accident caused by vessels result in fishery damages, the competent administrative department in charge of fisheries shall be invited to take part in the investigation and handling of the accident. The competent State administrative department in charge of fisheries shall be responsible for the supervision and administration of marine environment pollution used by non-military vessels inside the fishing port waters and the fishing vessels outside the fishing port waters, and be responsible for the protection of ecological environment in the fishing zones and examine and handle fishery pollution cases beyond the pollution accidents mentioned in the previous clause. The environmental protection department of the Armed Forces shall be responsible for the supervision and administration of marine pollution caused by military vessels and for the investigation and handling of the pollution cases. The functions and responsibilities of the departments invested by the law with power to conduct marine environment supervision and administration of the coastal local People's Governments above the county level shall be determined by the People's Governments of the Provinces, Autonomous Regions and Municipalities directly under the Central Government in accordance with this law and relevant regulations of the State Council.

in Article 11 ...Those dumping wastes in the sea shall, in accordance with the State regulations, pay dumping fees.

in Article 14 The competent State administrative department in charge of marine affairs shall, in accordance with State environmental monitoring and supervisory norms and standards, administer the investigation, monitoring and supervision of nation-wide marine environment, work out specific measures of implementation, organize nation-wide marine environment monitoring and supervision network in conjunction with relevant departments, handle assessment of marine environment quality at regular intervals and release sea cruise supervision dispatches....

Other relevant department shall, in accordance with the division of work of nation-wide marine environment monitoring network, be respectively responsible for the mouths of rivers that empty into the sea and main pollutant discharge outlets.

in Article 28 ...Mariculture shall determine breeding density in a scientific way, rationally feeding and apply manure ...and accurately use medicines, so as to prevent pollution to the marine environment.

in Article 38 The abandoning, piling up and disposal of mining tailing, waste ores, cinders, garbage

and other solid wastes along shore and beach shall be conducted in accordance with relevant provisions of the “Law of the People’s Republic of China on the Prevention and Control of Environment Pollution Caused by Solid Wastes”.

in Article 55 No units is permitted, without approval of the competent State administrative department in charge of marine affairs, to dump any wastes into the sea areas under the jurisdiction of the People’s Republic of China.

Units that need to dump wastes in the sea must submit a written application to the competent State administrative department in charge of marine affairs for its examination and approval and shall not proceed the dumping before a permit is granted by the said department.

Wastes from outside the boundaries of the People’s Republic of China are prohibited to dump into the sea areas under the jurisdiction of People’s Republic of China.

in Article 73 Whoever, in violation of the provisions of this law, commits any of the following acts, shall be ordered to remedy within a certain period of time and be fined by the competent department invested by law with power to conduct marine environment supervision and administration with the provisions of this law:...

(3) dumping wastes in the sea without obtaining certificate of permit for dumping;

...Whoever commits any of the following acts mentioned in previous clause ...and (3), shall be fined not less than 30,000 yuan but no more than 200,000 yuan; ...

in Article 62 No vessels and their related operations shall, in the sea areas under the jurisdiction of the People’s Republic of China, discharge pollutants, wastes, ballast water, vessel garbage and other harmful substances into the sea in violation of the provisions of this law.

Those engaged in the business of collection of the pollutants. Wastes and garbage from vessels and the operation of vessel cabin cleaning and washing must possess corresponding capabilities of pollutant collection and treatment.

in Article 69 Ports, docks, loading and unloading spots and shipyards must, in accordance with relevant regulations, be equipped with proper facilities to accommodate and deal with vessel-induced pollutants and wastes, and shall keep these facilities in good conditions.

Ports, docks, loading and unloading spots and shipyards must draw up contingency plans to deal with oil spill pollution and shall be equipped with corresponding contingency equipment and devices to deal with oil spill.

in Article 88 Whoever, in violation of the provisions of this law, commits any of the following acts, shall be warned or fined by the department invested with power to conduct marine environment supervision and administration in accordance with the provisions of this law:

- (1) ports, docks, loading and unloading spots and vessels which are not equipped with pollution prevention facilities and devices;
- (2) vessels no in possession of pollution prevention certificate and pollution prevention document, or do not take records of pollutant discharge in accordance with relevant provisions.
- (3) Engaged in surface and port water area ship dismantling, old vessel refitting, salvaging and other surface and underwater operations which cause pollution damage to the marine environment;....

Whoever commits any of the following acts mentioned in previous clause(1)..., shall be fined not less than 20,000 yuan and not more than 100,000 yuan; act mentioned in previous clause (2) shall be fined no more than 20,000 yuan; and act mentioned in previous clause (3) shall be fined not less than 50,000 yuan and not more than 200,000 yuan.

in Article 95 For the purpose of this law, the definitions of the following terms are:

- (1) “pollution damage to the marine environment” means any direct or indirect introduction of substances or energy into the marine environment which results in deleterious effects such as harm to marine living resources, hazards to human health, hindrance to fishing and other legitimate operations at sea, impairment of the useful quality of sea water and degradation of environment quality.....

2.3 Regulations and institutional legislation

2.3.1 Regulations on the Prevention of Pollution Damage to the Marine Environment by Land-based Pollutants

Article 11 It is prohibited to pile up, discard, or dispose of solid wastes along seashores and beaches without approval. If it is really necessary to pile up or dispose of solid wastes for the time being, a written application shall be submitted according to the examining and approving procedures stipulated by the environmental protection departments of the coastal provinces, autonomous regions, and municipalities directly under the central government. The application shall mainly include the following contents: the name and address of the applicant;...

Article 12 Any organization or individual who has been approved to set up waste yards and treatment facilities shall build dikes and facilities against raising dust and leakage of wastes. Prior to their use, the dikes and facilities shall pass the inspection by the environmental protection department that approved the establishment of the waste yards and treatment facilities.

2.3.2 Regulations on the Administration of Environmental Protection in the Exploration and Development of Offshore Petroleum

Article 12 Requirements of control for other waste materials:

- (1) ..
- (2) the dumping of industrial garbage in large quantities is to be managed in accordance with the stipulations of marine dumping of waste materials; fragmentary industrial garbage may not be discarded into the fishery waters and sea-lanes;
- (3) domestic garbage that need to be discharged within 12 nautical miles from the nearest land shall undergo pulverization treatment with the granules less than 25 millimeters in diameter.

2.3.3 Regulations on the prevention of Vessel-induced Sea Pollution

Article 27 Garbage from vessels shall not be dumped at will into harbor waters. Vessels carrying toxic or dusty bulk goods may not wash the decks and cabins at will in the harbors, or discharge the residue materials in the harbors in any other ways. If washing is really necessary, applications must be submitted to the harbor superintendencies in advance for approval.

Article 28 Any vessel in the harbor that needs to dump garbage shall raise on board signals as designated by the harbor, and hire garbage boats/trucks to dispose of it. At the same time the following requirement must be met:

- (1) the containers for storing and collecting domestic garbage of the vessel must have covers and may not leak, and dumping must be done at regular intervals;
- (2) cabin paddings, materials used for sweeping the cabin and various types of solid garbage shall be dumped by the shipping service departments; the vessel shall apply to these departments in advance and provide the information about the types and amounts of the materials to be dumped;...

Article 30 Vessels disposing of garbage at sea shall conform to the following stipulations:

- (1) plastic products may not be cast off into the sea;
- (2) granulated domestic garbage and kitchen wastes of less than 25mm in diameter may, after pulverization treatment, be cast off beyond 3 nautical miles from the nearest land; those which have not been thus treated shall be cast off beyond 12 nautical miles from the nearest land.

Article 31 Any unit that needs to use vessels to dump waste materials shall submit the document of approval by the State Oceanography Bureau or by its agency to the harbor superintendency of the harbor where shipment starts, and may go through the visa procedures for the vessels to make their entry and exit only after verification. If the actual cargoes are found to be not in conformity with the contents approved, the visa application shall be rejected.

Article 36 In surface ship scrapping, the scraps may not be cast off into the sea....

Article 47 The maximum amount of a fine on a shipowner is 100,000 yuan...

2.3.4 Regulations on Control over Dumping of Wastes in the Ocean

Article 4 The competent departments responsible for matters concerning the dumping of wastes are the National Oceanographic Bureau and its agencies.

Article 11 Waste matters fall into three categories in the light of their toxicity, content of harmful elements and the impact upon the marine environment. The criteria used for categorization shall be worked out as annex by the competent department and subject to amendment in the light of changes in ecological environment, the development in science and technology and the need in protecting the marine environment.

1. The dumping of wastes and other substances as listed in Annex I is prohibited. In times of emergency, when wastes cannot be disposed of on land because of its impact upon human health, emergency permits shall be issued with the approval of the National Oceanographic Bureau to dump wastes in prescribed ways and designated areas.
2. The dumping of wastes as listed in Annex II shall require special permits in advance.
3. The dumping of wastes of low or no toxicity other than those listed in Annex I and Annex II shall require ordinary permits in advance.

Annex I ...4. Fishing net, ropes, plastic products and other artificial synthesis which can float on the surface or suspend in the water, and thus seriously interfere with navigation, fishing and other activities, or endanger the ocean life.

Annex II 3. Containers, waste metals and other heavy waste materials that will easily sink to the bottom of the sea and might seriously hinder fishing or navigation.

2.3.5 Proposals on Strengthening the Management of the Plastic Package Wastes along Main Roads, in River Basins and at Tourist Attractions

...

2. It is prohibited to use non-degradable one-off vesicant plastic tableware at railway stations, abroad passenger trains, and abroad passenger ships and excursion ships sailing in inland waters such as the Yangtzi River, the Thai Lake, etc.

3. It is prohibited to litter or deposit plastic package wastes or other solid wastes into rivers, lakes and or on their banks. In the Yangtzi River, the Thai Lake, the major tourist attractions and other inland waters, the local people's governments shall, within three months, organize the cleaning of the plastic

package wastes floating in the water or deposited on the banks.

5. The departments of communications at different levels shall strengthen the management of ship rubbish. All ships shall be equipped with the Ship Rubbish Register, the Ship Rubbish Management Plan, the bulletin boards and enough containers to store rubbish as required by relevant laws and regulations....

3. ANALYSIS AND COMMENTS

3.1 Advantages

3.1.1 Main marine litter sources are well covered through the regulations

The four regulations on Land-based Pollutants, Exploration and Development of Offshore Petroleum, Vessel-induced Sea Pollution, and Dumping of Wastes, respectively, cover the main sources for marine litter to a high extent including both the land-based source and sea-based source. Though no individual regulation is available covering waste fishing facilities as an important source for marine litter, it is clearly regulated in the Regulations on Control over Dumping of Wastes in the Ocean in its Article 11 and Annex I.

3.1.2 Each corresponding administrative department has a distinct authority and responsibility on marine environmental protection

In the Marine Environmental Protection Law's Article 5, the roles in protecting marine environment for the competent administrative department in charge of environmental protection, marine affairs, maritime affairs, and fisheries are clearly settled. Concerning the marine litter, it can be said that competent administrative department in charge of environmental protection cares for the land-based marine litter, maritime affairs and fisheries authority together care for ship-based marine litter sharing a respective part, and marine affairs authority for other sea-based marine litter except the ship-based one.

3.1.3 Marine litter is included, even not by a direct manner, in the law

In the Article 95 of the Marine Environmental Protection Law, the definition of "pollution damage to the marine environment" is given as "means any direct or indirect introduction of substances or energy into the marine environment which results in deleterious effects such as harm to marine living resources, hazards to human health, hindrance to fishing and other legitimate operations at sea, impairment of the useful quality of sea water and degradation of environment quality....". In my opinion, marine litter has accordance with the descriptions like "substances", "harm to marine living resources", "hindrance to fishing" and "degradation of environment quality".

3.1.4 Existing several clauses highly related to marine litter

There are some rules that have high relationship with marine litter indeed. For example, Regulations on the Administration of Environmental Protection in the Exploration and Development of Offshore Petroleum's Article 12 require control for dumping of industrial garbage, and require that domestic garbage within 12 nautical miles from the nearest land shall undergo pulverization treatment with less than 25 millimeters. In the Regulations on the prevention of Vessel-induced Sea Pollution's Article 30, plastic products are forbidden to be cast off into the sea, and domestic garbage less than 25mm may, after pulverization treatment, be cast off beyond 3 nautical miles from the nearest land; those not been treated shall beyond 12 nautical miles. In Article 11 of the Regulations on Control over Dumping of

Wastes in the Ocean, wastes fall into three categories and that listed in Annex I is prohibited to dump, and fishing net, ropes, plastic products and other artificial synthesis which can float on the surface or suspend in the water are listed in Annex I.

3.1.5 Management of the Plastic Package Wastes are emphasized by the State Council

The Proposals on Strengthening the Management of the Plastic Package Wastes along Main Roads, in River Basins and at Tourist Attractions were approved by the State council specially dealing with the plastic package pollution. In its second, third and fifth proposal, non-degradable one-off vesicant plastic is restricted, plastic package wastes are prohibited to litter or deposit into rivers, lakes and or on their banks(which may be an important source for marine litter) and ship rubbish management is strengthened.

3.2 Disadvantages

3.2.1 Long revision period

Though the Marine Environmental Protection Law was revised in 1999, the four regulations were not ever revised since 1990, and three of them all have a history over twenty years. As the situation of marine environmental protection has changed a lot, some requirements gradually lose its time characteristic. For example, the punishments involved in the four regulations are not enough from nowadays' point of view, which limit the fine to 100,000 yuan (about 12, 500\$).

3.2.2 The word “Litter” never appears

Though as the 3.1.4 part above mentioned, there are some requirements set by laws and regulations that have high relationship with marine litter, the word “marine litter” or “litter” is not included in any article of corresponding laws and regulations. Wastes with no obvious toxic effect but only sensuous or physical effect, like marine litter, may still not be the most important care and not be weightily regulated.

The 1st NOWPAP Workshop on Marine Litter

Legal instruments related to Marine Litter in China
— Summary and Analysis

Hu Linlin
Chinese Research Academy of Environmental Sciences

8 June, 2006
Incheon, Republic of Korea



Contents

- List of national laws, regulations, and institutional legislation
- Detailed articles related to the marine litter
- Analysis and comments

List of laws, regulations, institutional legislation

National legal system in China

Approved by

Law	National People's Congress
Regulation	the State Council
Institutional legislation	state administrative department

List of laws, regulations, institutional legislation

List (1)

- **Constitution** of the people's republic of China, Amended for the fourth time on March 14, 2004
- **Environmental Protection Law** of the people's republic of China, December 26, 1989
- **Marine Environmental Protection Law**, Revised on December 25, 1999



List of laws, regulations, institutional legislation

List (2)

- **Regulations on the Prevention of Pollution Damage to the Marine Environment by Land-based Pollutants**, Effective on August 1, 1990
- **Regulations on the Administration of Environmental Protection in the Exploration and Development of Offshore Petroleum**, December 29, 1983
- **Regulations on the prevention of Vessel-induced Sea Pollution**, December 29, 1983
- **Regulations on Control over Dumping of Wastes in the Ocean**, March 6, 1985

List of laws, regulations, institutional legislation

List (3)

- **Proposals on Strengthening the Management of the Plastic Package Wastes along Main Roads, in River Basins and at Tourist Attractions, Approved by the State Council on September 22, 1998.**
- **the Law on Prevention of Environmental Pollution Caused by Solid Waste and Law on Prevention and control of Water pollution**

clear descriptions - are not applicable to the prevention and control of marine pollution

Detailed articles related to the marine litter

General status

- **Total amount of the related articles**
Over 30 articles/annex
- **Direct/indirect**

Detailed articles related to the marine litter

Examples – department roles

Environmental Protection Law, Article 7 & Marine Environmental Protection Law, Article 5

Roles of different departments in marine protection: the competent State administrative departments in charge of environment protection, marine affairs, maritime affairs, fisheries, Armed Forces



their roles in the Marine Litter

Detailed articles related to the marine litter

Examples – definition of marine pollution

Marine Environmental Protection Law, Article 95

“pollution damage to the marine environment” means any direct or indirect introduction of substances or energy into the marine environment which results in deleterious effects such as harm to marine living resources, hazards to human health, hindrance to fishing and other legitimate operations at sea, impairment of the useful quality of sea water and degradation of environment quality.....

Detailed articles related to the marine litter

Examples - offshore petroleum

Exploration and Development of Offshore Petroleum Regulations, Article 12

- dumping of industrial garbage in large quantities is to be managed...
- domestic garbage that need to be discharged within 12 nautical miles from the nearest land shall undergo pulverization treatment with the granules less than 25 millimeters in diameter

Detailed articles related to the marine litter

Examples – facilities for vessel-induced pollutants

Marine Environmental Protection Law, Article 69

Ports, docks, loading and unloading spots and shipyards must be equipped with proper facilities to accommodate and deal with vessel-induced pollutants and wastes, and shall keep these facilities in good conditions.

Detailed articles related to the marine litter

Examples - vessel-induced pollution

Regulations on the prevention of Vessel-induced Sea Pollution , Article 27,28,30,31,36

- Garbage from vessels shall not be dumped at will into harbor waters
- Any vessel in the harbor that needs to dump garbage shall raise on board signals
- plastic products may not be cast off into the sea; domestic garbage, less than 25mm may be cast off ..
- In surface ship scrapping, the scraps may not be cast off into the sea
- ...

Detailed articles related to the marine litter

Examples - dumping of wastes

Regulations on Control over Dumping of Wastes in the Ocean , Article 11, Annex I,II

- Wastes and other substances as listed in Annex I is prohibited; the dumping of wastes as listed in Annex II shall require special permits in advance; the dumping of wastes of low or no toxicity other than those listed in Annex I and Annex II shall require ordinary permits.
- Annex I ...4. Fishing net, ropes, plastic products and other artificial synthesis which can float on the surface or suspend in the water, ...
- Annex II... 3. Containers, waste metals and other heavy waste materials that will easily sink to the bottom of the sea ...

in compliance with the London Convention

Detailed articles related to the marine litter

Examples – facilities for vessel-induced pollutants

Marine Environmental Protection Law, Article 69

Ports, docks, loading and unloading spots and shipyards must be equipped with **proper facilities to accommodate and deal with vessel-induced pollutants and wastes**, and shall keep these facilities in good conditions.

Detailed articles related to the marine litter

Examples – plastic package wastes

Proposals on Strengthening the Management of the Plastic Package Wastes along Main Roads, in River Basins and at Tourist Attractions

- 3.It is prohibited to litter or deposit plastic package wastes or other solid wastes into rivers, lakes and or on their banks ...
- 5.The departments of communications at different levels shall strengthen the management of ship rubbish. All ships shall be equipped with the Ship Rubbish Register, the Ship Rubbish Management Plan, the bulletin boards and enough containers to store rubbish as required by relevant laws and regulations...

Analysis and comments

Advantages (1)

Main marine litter sources are well covered through the regulations

The four regulations on Land-based Pollutants, Exploration and Development of Offshore Petroleum, Vessel-induced Sea Pollution, and Dumping of Wastes cover the main sources for marine litter including both the land-based source and sea-based source.

Analysis and comments

Advantages (2)

Each corresponding administrative department has a distinct authority and responsibility on marine environmental protection

Concerning the marine litter, it can be said that competent administrative department in charge of environmental protection cares for the land-based marine litter, maritime affairs and fisheries authority together care for ship-based marine litter, and marine affairs authority for other sea-based marine litter except the ship-based one

Analysis and comments

Advantages (3)

Marine litter is included, even not by a direct manner, in the law
Article 95 of the Marine Environmental Protection Law

There are several clauses highly related to marine litter

Management of the Plastic Package Wastes is emphasized by the State Council

Analysis and comments

Disadvantages

The word(s) “marine litter” or “Litter” never appears

Long revision period
For example, the fine involved in the four regulations are all limited to 100,000 RMB yuan (about 12,500\$)

Compliance and enforcement



CASE STUDY OF THE TREATMENT AND RECYCLING TECHNOLOGY DEVELOPMENT OF MARINE LITTER RELATED TO FISHERY IN JAPAN

Yasutsugu Yokohama

*Director, Shizugawa Nature Center,
Organization to Promote Conservation of Sea and Seashore (Marine Blue 21),
Tokura-Sakamoto 40, Minami-Sanriku-cho, Motoyoshi-gun, Miyagi prefecture, Japan, zip 986-0781,
yokohama@nature.shizugawa.miyagi.jp*

The Organization to Promote Conservation of Sea and Seashore was established in 1992 for the purpose to conserve the environment of sea and seashore supporting marine resources and pleasure of people.

In order to attain our purpose we support the voluntary activities cleaning up the beach, and make the map of marine litter distribution in Japan under the support of the Fisheries Agency. Recently, as the accumulation of useless floats made of foam styrene on the beach become serious in areas where the raising of oyster etc. is active, we try to develop the technology to treat and recycle them.

We also make effort to raise public awareness of the importance of sea and seashore by means of lectures on making pressed algae which makes every one notice the existence of various seaweeds beautiful in color and shape which grow on the bottom of the sea and play important functions in the marine ecosystem.

BEACH CLEANING

We investigate cleaning activities on seashores and riversides in Japan under the support of Fisheries Agency every year from 1994. Results obtained for 11 years from 1994 to 2004 are shown in Table 1. The last results obtained in 2005 shows that 16,810 activities were held on seashores and riverside in Japan. The total number of participants in the activities was about 1,320,000, within which about 740,000 was those in the activities on seashores. The amount of marine litter collected on seashores was 377,000m³. This value is equivalent to about 123,000 t.

The amount of marine litter collected on seashores in each of last three years in Japan was around 400,000m³, which was two to three times as large as that in each of four years from 1994 to 1997.

The yearly mean of marine litter collected on seashores for last 12 years from 1994 to 2005 was about 100,000 t. The total amount of marine litter stranded on seashores whole over Japan is estimated to be about four times as large as that actually collected. The yearly mean for last 12 years is estimated to be about 400,000t.

TREATMENT OF USELESS FLOAT MADE OF FOAM STYRENE

Our organization developed an instrument to crush the float to small pieces and compress them. Its test working was made in 2004 under cooperation of local fishery guilds. The test showed us that the instrument could treat about 25 floats (60 cm in diameter and 105 cm in length for each) per hour and decrease the volume to about 5 to 7 %. On the other hand, however, several problems were found. The most serious one of them was the wear of the screw which was essential to crush the float to small pieces and compress them. The wear of the screw was due to contamination of sand, mud and many kinds of organisms from the surface of the float. Another problem was too much load on the motor driving the screw. The cause of this problem was also contamination of sand, mud and organisms.

In order to solve the problems the instrument was improved, and the wear of the screw and the load to the motor were decreased.

Fig. 1 shows the appearance of the improved instrument, and Fig. 2 shows its structure. Photo. 1 shows the process of the treatment of floats. Photo. 1-1 shows the instrument and floats to be treated. Each of those floats is loaded in the crush room of the instrument as shown in Photo. 1-2 and Photo. 1-3. Photo. 1-4 shows the bottom of the crush room, where the screw crushes the float and force crushed material toward the pipe. As the pipe is made taper, crushed material is compressed, and decreased in volume to 5~7 %. The compressed material is excreted from the pipe as shown in Photo. 1-5, and lifted up with a belt conveyer just above a bag as shown in Photo. 1-6. Each of bags, shown in Photo. 1-7, contains material from 30 floats, the weight of which is about 150 kg.

Compressed pieces of foam styrene produced in this system can be used as fuel substitute for petroleum.

The subject to be solved is the further improvement of the system to reduce the effects of impurities since most of floats are attached with various foreign substances as shown in Photo. 1-8.

LECTURE ON MAKING PRESSED ALGAE

As the issue of artificial marine litter is mainly due to the indifference of people to the environment of the sea, raising public awareness is an effective way of reducing marine litter. Activity to make pressed algae using beautiful seaweeds is effective in raising awareness of the importance of the sea as well as the beach cleaning activity.

Although all the land plants have green leaves, seaweeds are colorful than plants. The color variation among seaweeds is the result of the adaptation and acclimation of each species to the light condition at each depth it grows. The colorfulness of seaweeds suggests us that sunlight is essential for seaweeds to live. Pollution of the seawater diminishes the intensity of light penetrating into seawater.

After the experience of making or looking at pressed algae beautiful in color and shape, most of people from children to the aged become aware of the important light breeding seaweeds, and grow to prevent pollution of the sea.

They become also aware of important roles of seaweeds in the marine ecosystem. Communities of seaweeds clean seawater as well as offer spawning grounds, nurseries and foods to various marine organisms. These functions are very large in marine forests, as shown in Photos. 5 and 6, constituted with brown algae of large size. Unfortunately, however, destruction of such marine forests, due to diminishment of light, frequently occurs in Japan.

Pressed algae made in the lecture are different from scientific specimens. Although scientific specimens are not necessary to be beautiful, pressed algae made in the lecture must be beautiful

because they must attract people. In the lecture they draw pictures using colorful seaweeds as shown in Photo. 4.

The lecture on making pressed algae also has the effect to attract people to beach cleaning activity. The beach cleaning activity can be well combined with the lecture on making pressed algae because among marine litter on seashores we can find out many kinds of colorful seaweeds drifted from different depths and stranded on shore.

Table 1. Amount of marine litter collected in Japan for 11 years from 1994 to 2004.

Year	On the beach		On the sea surface	
	m ³	t	m ³	t
2004	376,980	122,519	7,097	3,321
2003	503,415	154,999	11,965	5,000
2002	115,302	35,501	9,409	4,403
2001	141,221	45,897	3,332	1,559
2000	97,652	35,704	4,711	2,297
1999	415,386	156,775	9,727	5,173
1998	366,749	158,925	98,952	64,319
1997	104,490	39,437	4,842	4,047
1996	148,591	62,090	1,556	1,821
1995	158,536	66,245	1,006	94,162
1994	193,318	80,779	620	518
Average	238,331	87,170	13,929	16,965



Photo 1. The process of the treatment of floats.



Photo 2. A lecture on making pressed algae held at an elementary school sponsored by our organization.



Photo 3. A beach cleaning by schoolchildren after the lecture.



Photo 4. Works of pressed algae made by schoolchildren.



Photo 5. A community of *Ecklonia cava* at a depth of 5m in Shimoda Bay.



Photo 6. A community of *Sargassum horneri* at a depth of 3m in Shimoda Bay.

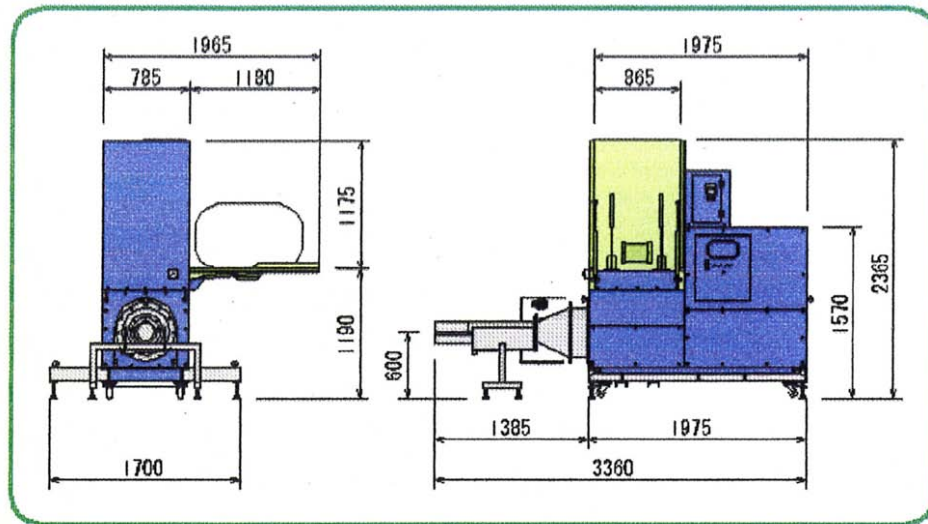


Fig. 1. The appearance of the instrument.

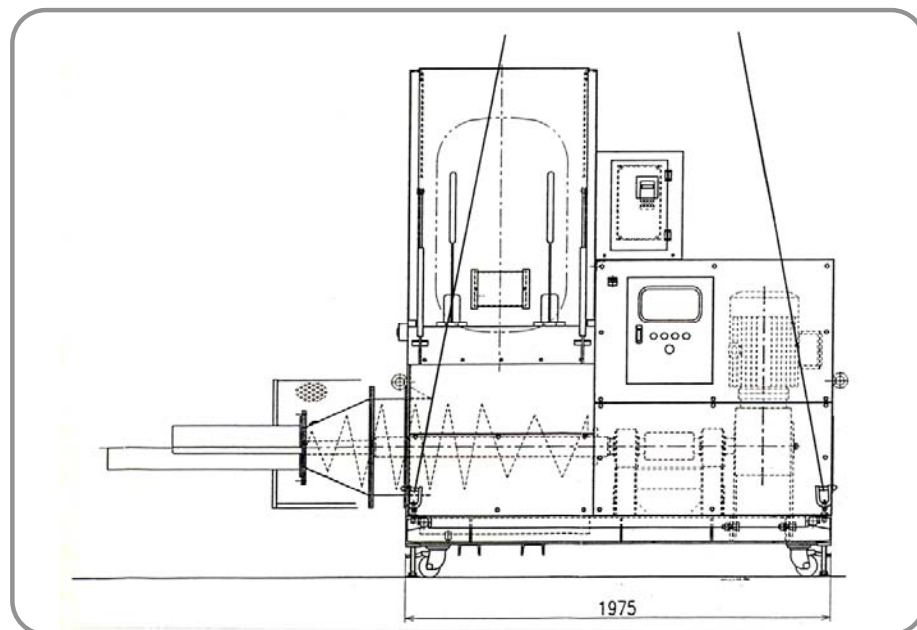


Fig. 2. The structure of the instrument.

Case Study of Treatment and Recycling
Technology Development of Marine Litter
Related to Fishery in Japan

Yasutsugu Yokohama

Shizugawa Nature Center
Organization to Promote Conservation of Sea and Seashore
(Marine Blue 21)

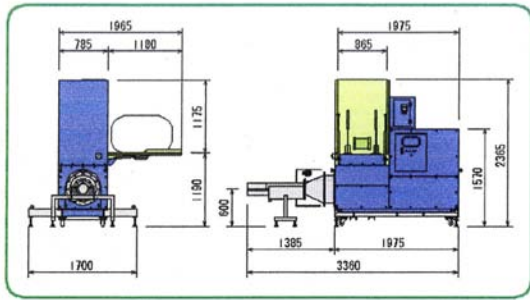


Amount of marine litter collected in Japan for 11 years from 1994 to 2004.

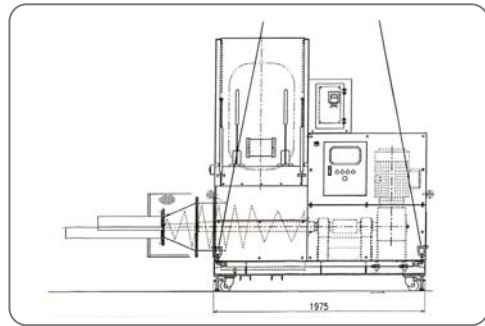
Year	On the beach		On the sea surface	
	m ²	t	m ²	t
2004	376,980	122,519	7,097	3,321
2003	503,415	154,999	11,965	5,000
2002	115,302	35,501	9,409	4,403
2001	141,221	45,897	3,332	1,559
2000	97,652	35,704	4,711	2,297
1999	415,386	156,775	9,727	5,173
1998	366,749	158,925	98,952	64,319
1997	104,490	39,437	4,842	4,047
1996	148,591	62,090	1,556	1,821
1995	158,536	66,245	1,006	94,162
1994	193,318	80,779	620	518
Average	238,331	87,170	13,929	16,965



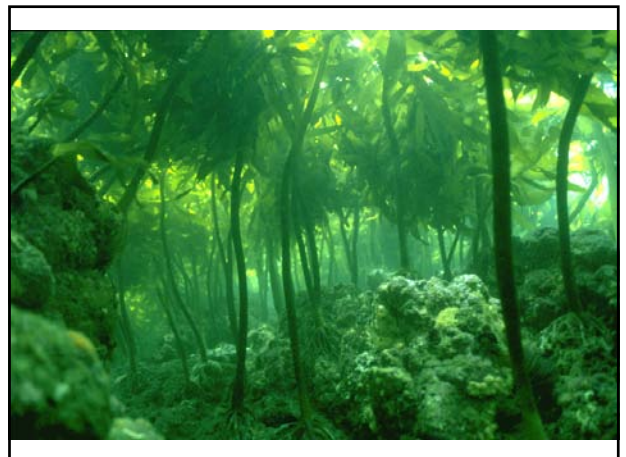
The appearance of the instrument.

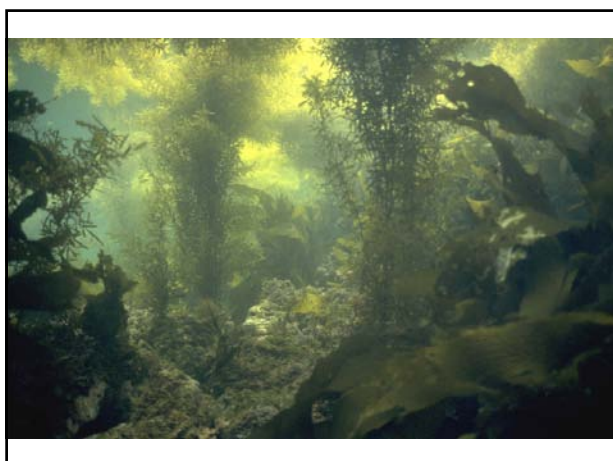


The structure of the instrument.



Works of pressed algae





THE RESULT OF “THE PROJECT OF PURCHASING MARINE WASTES PULLED UP DURING FISHING” IN KOREA

*Nam-Keun Jung**, *Seung-Taek Hwang*** and *Seong-Oh Im****

**General Manager, Korea Marine Pollution Response Corporation(KMPRC)
Haegong Bldg. 71, Samsung-dong Kangnam-gu, Seoul 135-870, Republic of Korea*

***Director, Marine Environment Division,*

Korea Fisheries Infrastructure Promotion Association

****Consultant, Korea Marine Pollution Response Corporation(KMPRC)
Haegong Bldg. 71, Samsung-dong Kangnam-gu, Seoul 135-870, Republic of Korea*

san94@kmprc.or.kr

INTRODUCTION

Korea is surrounded by the sea on 3 sides and its area is wider than land 4.5times, So that we can have huge resources. It gives us cheerful surroundings, food resources like fish and shellfish, and industrial resources. Also, it's very important as a main sea route of imports and exports for our national economy.

However, in addition to economic prosperity, rapid industrialization has also brought unprecedented environmental destruction to the sea. In general, 80% of marine pollution is attributable to waste materials thrown in from inland areas. Once waste materials are disposed to the sea, they cause severe destruction of spawning grounds and habitats of marine creatures, as well as threaten the safety of vessel operation(Fig. 1).



Fig. 1. Damages caused by deposited worthless fishing implements underwater.

For reason of that, Ministry Of Maritime Affairs & Fisheries(MOMAF) understood the seriousness of marine pollution due to marine wastes, and has carried out the project of collecting marine wastes in earnest from 1999(Table 1).

Table 1. The result of collecting marine wastes promoted by MOMAF in Korea from 1999 to 2005.
(unit : billion won, ton)

Total		'99~'01		2002		2003		2004		2005	
budget	result	budget	result	budget	result	budget	result	budget	result	budget	result
647	61,151	285	24,623	90	10,112	87	11,916	87	6,071	98	8,429

In this presentation, I'd like to show Korea's activities for improving marine environment by introducing "The project of purchasing marine wastes pulled up during fishing" promoted by MOMAF,

At the same time, showing advantages of this project, I'd like to introduce another way for marine environment improvement.

WHAT IS "THE PROJECT OF PURCHASING MARINE WASTES PULLED UP DURING FISHING"?

The purpose of "The project of purchasing marine wastes" is improving the marine environment and recovering the fish resources by making fishermen bring back marine wastes pulled up like worthless fishing implements, rope and vinyl during fishing to harbour.

And by carrying out this project, we are going to make fishermen raise the recognition of the marine environmental importance and elevate the effect of marine environmental improvement efficiently with low cost.

If we look back on the background of this project, fishermen often pulled up many kind of marine wastes which were not expected with fishing net or fish hook during fishing operation. However, they were again thrown away into the sea. Even though fishermen brought them to a harbour, there were no places to dispose of them. So fishermen couldn't avoid throwing them away into the sea again.

As the result, marine wastes like worthless fishing implements were continually being deposited in coastal areas which is spawning grounds and habitats of marine creatures. Marine wastes also were threatening the safety of vessel operation and having a bad influence upon fisheries due to the reduction of the fish resources.

For this reason, MOMAF established this project that they purchase the marine wastes pulled up during fishing from fishermen on land and dispose of them. Now, fishermen get to have the recognition about marine environment as well as don't throw away them into the sea again.

THE PROCESS OF THE PROJECT OF PURCHASING MARINE WASTES..

For carrying out this project, MOMAF, local municipals, the fisheries cooperative union, Korea Marine Pollution Response Corporation(KMPRC), Korea Fisheries Infrastructure Promotion Association(KFPA) and fishermen have participated in this project(Table 2).

Let's look at the role of each organs. MOMAF take the project application from local municipals, make a decision of the project areas, make an allocation of the national fund estimate, and make a project guide.

Local municipals also invest for this project and supervise it with MOMAF.

The fisheries cooperative union plays a role in purchasing marine wastes from fishermen directly on the spot.

KMPRC and KFPA plays a role in disposal of them, making sacks to collect wastes and supplying the national funds to the fisheries cooperative union.

On the spot, The fisheries cooperative union distributes sacks to fishermen before going to fishing.

Fishermen put them into sacks with the vessel name, fishing type, fisherman's name and phone number on it. When they get back to harbour, they give sacks which contain them to the fisheries cooperative union.

Table 2. The role of each organs

Organ name	role
MOMAF	<ul style="list-style-type: none"> - Selecting the project areas - Allocating the national fund estimate - Making a project guide - Supervising the project
Local municipals	<ul style="list-style-type: none"> - Making a locality estimate - Supervising the project
The fisheries cooperative union	<ul style="list-style-type: none"> - Purchasing marine wastes from fishermen - Requesting the national funds - Distributing sacks to fishermen - Paying for purchasing price to fishermen
KMPRC & KFPA	<ul style="list-style-type: none"> - Disposal of marine wastes - Making sacks and distributing it to the fisheries cooperative union - Supplying the national funds

Sacks are classified into 3 types, 40ℓ, 100ℓ, 200ℓ. and we pay for 4,000won, 10,000won, 20,000won to fishermen respectively. In case of the large size wastes which can't be packed into sacks, they should attach a tag on it. and we pay them 260won per kg(Fig 2). We also purchase shell, crab and eel traps.




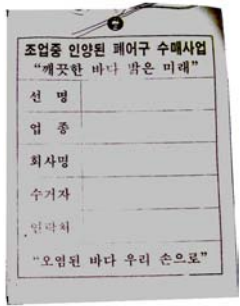
Size	40ℓ	100ℓ	200ℓ	Tag
Picture				
Purchasing Price	4,000 won	10,000 won	20,000 won	260 won/kg

Fig. 2. The pictures of sacks and a tag

THE RESULT OF THIS PROJECT.

The first project was established in 2003. We inputted 100% national funds for it, and carried out at 3 local municipals by way of showing an example. We spent 731 million won of national funds and purchased total 578 tons of marine wastes from fishermen.

In 2004, we increased the number of local municipals from 3 to 11. And local municipals also inputted 20% of total funds. We spent total 1,707 million won and purchased total 2,453 tons of marine wastes.

In 2005, we spent total 1,842 million won at 31 local municipals and purchased total 3,076 tons of marine wastes(Table 3 & Fig. 3).

Table 3 . The result of the project of purchasing marine wastes from 2003 to 2005.

(unit : thousand won, ton)

	2003	2004	2005
no. of places	3	11	31
budget	731,072	1,706,641	1,841,513
Result of purchasing	578	2,453	3,076
Cost per ton	1,265	696	599

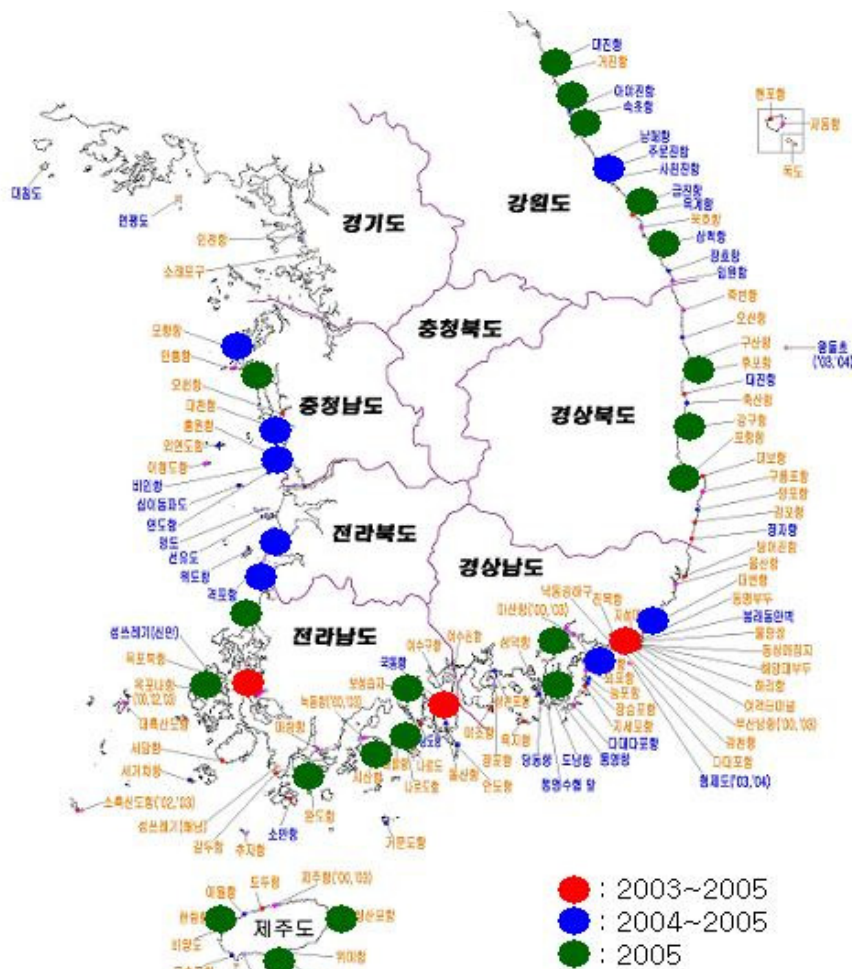


Fig. 3. The places of the project of purchasing marine wastes from 2003 to 2005.

THE ANALYSIS OF THIS RESULT

The analysis of this result shows us that we decreased the removal cost of marine wastes substantially. For examples, let's compare this project with the project of collecting waste materials deposited underwater in coastal areas. Through the project of collecting waste materials deposited underwater, we spent total 6,893 million won and collected total 3,619 tons in 2004. In the same manner, In 2005 we spent total 7,965 million won and collected total 5,352 tons(Table 4).

Table 4. The result of the project of collecting waste materials deposited underwater from 2004 to 2005. (unit : thousand won, ton)

	2004	2005
budget	6,893,070	7,964,946
Result of collecting	3,619	5,352
Cost per ton	1,905	1,488

As we compare the cost per 1 ton of marine waste in 2004, this project cost 696 thousand won per ton. On the other hand, the collecting project cost 1,905 thousand won per ton.

Likewise, in 2005, this project cost 599 thousand won per ton. On the other hand, the collecting project cost 1,488 thousand won per ton.

It showed that this project substantially decreased the cost of removal compared with the collecting project in 2004 and 2005 and the cost decreased 37%, 40% respectively(Fig 4).

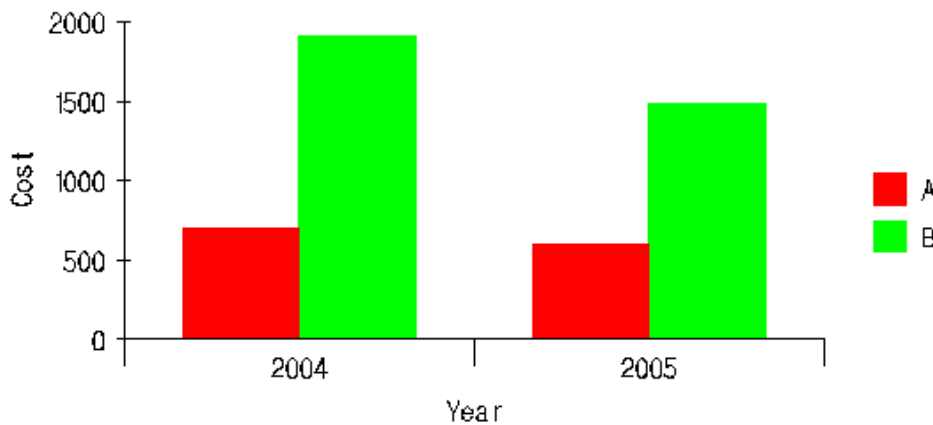


Fig. 4. The comparison of the removal cost per 1 ton of marine waste between the project of purchasing marine wastes(A) and the project of collecting waste materials deposited underwater(B). (unit : thousand won)

This result is because the collecting project needed a fleet of vessels consisted of a waste collecting boat, a towing boat and a crane barge. Also, we had to pay much cost to use a fleet of vessels due to high cost of vessels operation and oil cost. At this reasons, The cost of the collecting project was much relatively.

On the other hand, this project didn't need a fleet of vessels like the collecting project. So, we just paid purchasing cost for fishermen, disposal cost of wastes, cost of labor and production cost of sacks. That's why this project was able to reduce costs.

CONCLUSION

As mentioned above, the project of purchasing marine wastes is effective system to reduce the budget comparing with other system like the collecting project.

It could be applied to the present Korea's policy of low cost but high efficiency. Also, it made the local fishermen improve the recognition of the importance of marine environment. By carrying out this project, I think a vicious circle that fishermen's throwing away marine wastes pulled up during fishing into the sea will not be repeated again. And we could elevate the participation rate of fishermen because they could make the sea clearer and get the extra money by participating in this project.

By Making full use of this project and sharing with you some of the good ideas, I hope that we improve this project more efficiently and contribute to make the sea clearer.

※ Accompanying photo :

The process of the project of purchasing marine wastes



■ Building a depository of marine wastes before the project is started.



⇓ Distributing sacks to fishermen before going to fishing.



⇓ Fishing boats loaded up with sacks



↓ Writing the vessel name and addresses on sacks clearly with a permanent pen.



↓ Giving sacks containing marine wastes to the member of the fisheries cooperative union.



↓ Sacks and large size wastes are stacked in the depository.



↓ Sending marine wastes to disposal facilities and recovering usable things from them



Activities of KMPRC

- Marine pollution control and response
- Operation of waste oil storage facilities
- Training on oil pollution response
- Harbor tug service & Marine floating crane operation
- Special project on marine environment preservation

Introduction

- The importance of the sea
 - Providing nice environment variety of sea food & industrial resources and main route for import & export
- Marine pollution
 - 80% is originated from the land
 - Threatening spawning grounds & fish habitats and ship's safety

The project of collecting marine wastes promoted by the Ministry Of Maritime Affairs & Fisheries(MOMAF)

Nationwide ports

Coastal areas

Shorelines

Wet lands

Islands

Table. The result of collecting marine wastes from 1999~2005. (unit : billion won,

Total		99-'01		2002		2003		2004		2005	
budget	result	budget	result	budget	result	budget	result	budget	result	budget	result
647	61,151	285	24,623	90	10,112	87	11,916	87	6,071	98	8,429

Purpose of presentation

- Introducing the project of purchasing marine wastes(P.Project)
- Showing advantages of P.Project with analyzing the result for 3 year

Outline

- I. What is P.Project?
- II. The process
- III. The result
- IV. The analysis
- V. Conclusion

1. What is P.Project ?

- The purpose
 - Making fishermen bring back marine wastes pulled up during fishing

Background of P.Project

- Improving the marine environment
- Recovering the fish resources
- Raising the recognition
- Elevating the effect with low cost

2. Process of P.Project

Fig. The role of each organs

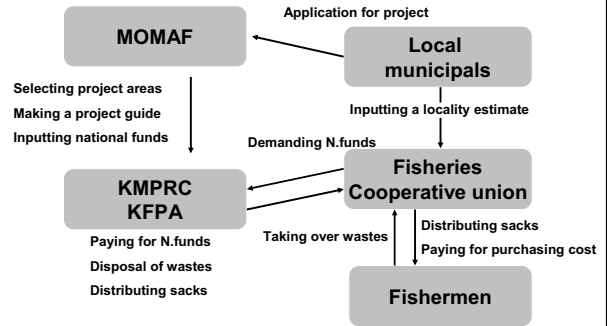



Fig. The pictures of sacks and a tag

Size	40ℓ	100ℓ	200ℓ	Tag
Picture				
Purchasing Price	4,000 won	10,000 won	20,000 won	260 won/kg

The picture of depositaries of marine wastes



Distributing sacks to fishermen before going to fishing



The picture of fishing boats loaded up with sacks



The picture of personal details on sack



The picture of taking over sacks



The picture of Stacked marine wastes



The picture of disposal of marine wastes



3. The result of P.Project

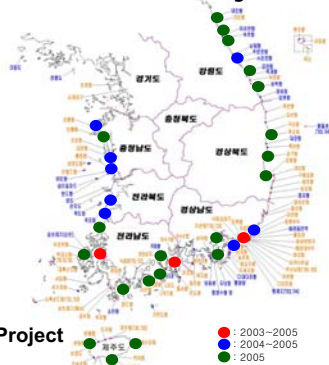


Fig. The places of P.Project

The result of P.Project from '03 to '05

Table. The result of P.Project from '03 to '05
(unit : thousand won, ton)

	2003	2004	2005
No. of places	3	11	31
Budget	731,072	1,706,641	1,841,513
Result of purchasing	578	2,453	3,076
Cost per ton	1,265	696	599

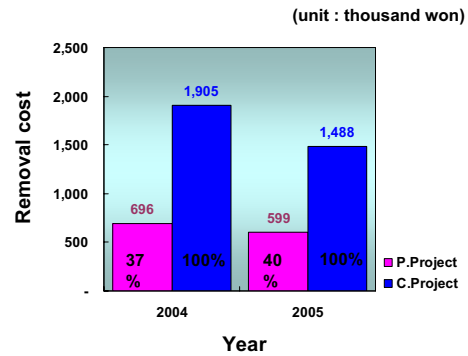
4. The analysis

Decreasing the removal cost substantially

Table. The result of the project of collecting waste materials deposited underwater (C.Project) from '04 to '05 (unit : thousand won, ton)

	2004	2005
Budget	6,893,070	7,964,946
Result of collecting	3,619	5,352
Cost per ton	1,905	1,488

Fig. The comparison of the removal cost per 1 ton of marine waste between P.Project and C.Project (unit : thousand won)



The difference of the removal cost



- C.Project
 - High cost of vessel operations
 - High cost of Oil



Increasing the cost



- P.Project
 - Paying for minimum purchasing cost
 - Don't need a fleet of vessels



Decreasing the cost

5. Conclusion

- P.Project
 - Effective system to reduce the budget
 - Decreasing the removal cost substantially
 - Improving the recognition
 - Don't throw away marine wastes into the sea again
 - Elevating the participation rate of fishermen
 - Making the sea clearer & Getting the extra money



BASIC FACTORS OF KHABAROVSKIJ KRAY SOUTHERN SEASHORE POLLUTION

Alexey N. Makhinov

*Deputy Director of Institute of Water and Ecology Problems,
Far East Branch, Russian Academy of Sciences
65 Kim Yu Chen Street Khabarovsk 680000, Russian Federation
mahinova@ivep.as.khb.ru*

A coastal line along the Okhotsk and Japan Seas within Khabarovsky Krai exceeds 3 500 km. Still economic activities are little developed there, especially in its northern part (the Okhotsk Sea). The Tatar Strait shores are characterized with more active industrial activities. There are several ports there, like Vanino port, the biggest in Russia and several others of regional importance (De-Kastri, Lazarev, Sovetskaya Gavan). In river basins of the Sikhote-Alin mountain range timber harvesting is quite intensive and has a significant impact on hydrological regime of rivers, running into the Okhotsk and Japan Seas.

Substantial pollution comes from the sewage discharge into rivers and seas. Most sewage waters are not fully treated. For examples, according to the Far East Natural Resource Department in Vaninsky and Sovetskaya Gavan Districts in 2001 49 million cu m of sewage waters were discharged, including 6.09 million cu m of non-treated and 4.4 million cu m half-treated waters.

The Tatar Strait is a very specific area of the Japan Sea. It is the longest strain in the Northern Hemisphere and has rather complicated peculiarities of river run-off chemical composition, including that of the Amur River.

Two factors influence water pollution in this area. The first is the Amur River run-off. It is well known that in winter 40% of the Amur run-off (Yakunin, 1975) is discharged into the Japan Sea. In summer it is reduced to 30%. Recently registered intensive pollution of the Amur River in winter impact vulnerable coastal ecosystems. The second factor is the increasing anthropogenic pressure, caused by the De-Kastri port development. Planned construction of the oil pipeline “Lasarev – De-Kastri” and oil terminal in the port, as well as the expansion of timber export from Sisiman Bay will create addition sources of pollution in the Tatar Strait.

Timber harvesting in the basins of the rivers Tumnin, Chistovodnaya, Tutto and others, numerous forest fires, placer gold mining increased the discharge into seawaters of terrigenous and dissolved materials like sulfur, phosphorus and nitrogen compounds. Besides, several big towns of Khabarovsky krai are situated on the Japan Sea coast. Household sewage and industrial wastewater, not being fully treated, are discharged into the sea. In spite of a rather well developed environmental service of the Vanino port, still the pollution of the port area with phosphorus and nitrogen oil products is revealed.

Pollution of coastal waters with different litter and industrial wastes is not evenly spread in Khabarovsky krai. Most intensive it is in the vicinity of cities and towns, sea ports like Lazarev, De-Kastri, Vanino and Sovetskaya Gavan. Wood materials, metal items, plastics and glass are most

common.

World experience proves the necessity of study and inspection of coastal waters conditions as well as their ecological monitoring.

The problem of extensive study of sea shores remains urgent as contaminated fish and dead birds are found there due to oil spills and other anthropogenic disasters. Only a well planned and scientifically proved complex of measures, including different methods of wastewater treatment, can help to reduce the level of coastal pollution.

Marine litter studies in the Far Eastern region have been undertaken by NGOs, within the international project in Vanino, for example. The studies revealed that the issues of coastal line pollution with litter become urgent for Russia and need further attentive studies and measures to clean the shores and reduce the amount of anthropogenic matter flow into the sea.

There are certain coastal zone litter pollution specifics in the territory. Pollution of the sea shores close to the Amur mouth is mainly caused by the river, which discharges litter in great amounts. A significant portion of it originates from China. Observation of the Amur River near Khabarovsk and Komsomolsk-on-Amur indicated that 80% of plastic litter is of Chinese origin. Amur floods cause a “volley” discharge of litter into the sea, which further pollutes the seashores.

Assessment of the Amur River litter discharge into the sea seems quite important and urgent, as well as it is important to other major rivers of the NOW PAP zone.

In Khabarovsky Krai public awareness of the seashores pollution with household and industrial wastes and ecological education of population become very important. Local authorities in coastal communities should play the key role in the litter prevention activities and together with scientific and public organizations should develop and adopt legislative acts to reduce pollution of the coastal and marine areas. Law enforcement should be also made effective. In Khabarovsky Krai issues of collecting and recycling wastes that accumulated in recent years around the settlements need to be also effectively addressed.

List of Participants to the 1st NOWPAP Workshop on Marine Litter

(Incheon, 8-9 June 2006)

People's Republic of China

Mr. Xianfeng WU

Vice Director

Marine Environment Protection Division

State Environmental Protection Administration

No. 115 Xizhimennei Nanxiaojie, Beijing 100035, P.R.China

Tel: +86-10-66556-275

Fax: +86-10-6655-6272

E-mail: wu.xianfeng@sepa.gov.cn

Ms. Cuiming XU (presenter)

Consultant

Department of Ship Safety and Pollution Prevention

China Maritime Safety Administration

11 Jianguomennei Avenue, Beijing 100736, P.R.China

Tel: +86-10-6529-2877

Fax: +86-10-6529-2875

E-mail: xucuiming@msa.gov.cn

Ms. Weichi KANG (presenter)

Vice-Director

Bureau of fisheries management & fishing port superintendence of
Yellow Sea and Bohai Sea areas, Ministry of Agriculture

Tel: +86-535-6606856

Fax: +86-535-6614533

E-mail: kwc828@163.com

Mr. Linlin HU (presenter)

Researcher, ML Focal Point

Chinese Research Academy of Environmental Sciences

Environmental Standards Research Institute, SEPA

No.8 Dayangfang, Anwai, Beijing, 100012 P.R.China

Tel: +86-10-8491-9396

Fax: +86-10-8491-9396

E-mail: hull@craes.org.cn

Mr. Yudong ZHU

Professor

Data and Information Network Regional Activity Centre (DINRAC)

Environmental Information Center,

State Environmental Protection Administration (SEPA)

No. 1 Yuhui Nanlu, Chaoyang District, Beijing 100029, People's Republic of China

Tel: +86-10-8464-0869

Fax: +86-10-8463-0849

E-mail: zhu@zhb.gov.cn

Mr. Jijun LI

Director

Marine Pollution and Dangerous Goods Control Division

Shandong Maritime Safety Administration

21, Wuxia Road, Qingdao, P.R.China

Tel: +86-532-8667-1129

Fax: +86-532-8667-1125

E-mail: wfc@sdmsa.gov.cn

Mr. Shoukui SONG

Section Chief

Yantai Oil Spill Response Technical Center, China MSA

No.8 Huanhai Road, Yantai 264000, P.R.China

Tel: +86-013953597829

Fax: +86-535-6683651

E-mail: sksong788@sohu.com

Mr. Lei FENG

Officer

Marine Pollution and Dangerous Goods Control Division

Building 3, 1 Wenanli, Guizhou Road, Guangzhoudao

Tanggu District, Tianjin 300451, P.R.China

Tel: +86-22-6631-0291

Fax: +86-22-6631-0237

E-mail: fenglei_msa@sina.com.cn

Japan

Prof. Dr. Takashi KUSUI

TOYAMA PREFECTURAL UNIVERSITY
5180 Kurokawa Imizu-shi, Toyama, Japan, Zip 939-0398
Tel: +81-766-56-7500 ex 707
Fax: +81-766-56-0396
E-mail: kusui@pu-toyama.ac.jp

Dr. Yasutsugu YOKOHAMA (presenter)

Director
Organization to Promote Conservation of Sea and Seashore(Marine Blue 21)
Tokura-Sakamoto 40, Minami-Sanriku-cho, Motoyoshi-gun, Miyagi prefecture, Japan
Zip 986-0781
Tel: +81-226-46-9109
Fax: +81-226-46-9115
E-mail: yokohama@nature.shizugawa.miyagi.jp

Mr. Mitsuhiko IDA (presenter)

Deputy Director
Ocean Office, Policy Bureau, MLIT
2-1-3 Kasumigaseki Chiyoda-ku, Tokyo 100-8918, Japan
Tel: +81-(0)3-5253-8267(direct)
Fax: +81-(0)3-5253-1549
E-mail: ida-m2ih@mlit.go.jp

Mr. Yuji ADACHI (presenter)

Ministry of the Environment
Global Environment Issues Division, Global Environment Bureau
1-2-2 Kasumigaseki, Chiyoda-ku, Tokyo, Japan, Zip 100-8975
Tel: +81-3-5521-8246
Fax: +81-3-3581-3348
E-mail: YUJI_ADACHI@env.go.jp

Mr. Shusaku HIRAI

Ministry of the Environment
Global Environment Issues Division, Global Environment Bureau
1-2-2 Kasumigaseki, Chiyoda-ku, Tokyo, Japan, Zip 100-8975
Tel: +81-3-5521-8245
Fax: +81-3-3581-3348
E-mail: SHUSAKU_HIRAI@env.go.jp

Mr. Masanobu MIYAZAKI

Director of CEARAC
Northwest Pacific Action Plan
Special Monitoring & Coastal Environmental Assessment Regional Activity Centre
Established at NPEC
Northwest Pacific Region Environmental Cooperation Centre
5-5 Ushijimashin-machi, Toyama city, Japan, Zip 930-085
Tex: +81-76-445-1571
Fax: +81-76-445-1581
E-mail: miyazaki@npec.or.jp

Mr. Takashi SHIOIRI

Assistant Director
Marine Environment Protection & Disaster Prevention Division,
Guard & Rescue Department, Japan Coast Guard
2-1-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8918, Japan
Tel: +81-(0)3-3591-9819 (direct)
Fax: +81-(0)3-3591-5085
E-mail: takashi-shioiri@kaiho.mlit.go.jp

Republic of Korea

Mr. Sang-Soo AHN

Mayor
Incheon Metropolitan City
1138, Guwal-dong, Namdong-gu, Incheon, Republic of Korea
Tel: +82-32-440-2001
Fax: +82-32-427-8311

Mr. Myung-Soo CHEON

Deputy Mayor for Administrative Affairs
Incheon Metropolitan City
1138, Guwal-dong, Namdong-gu, Incheon, Republic of Korea
Tel: +82-32-440-2020
Fax: +82-32-422-0010

Mr. Pyeoung-Sik SHIN

Director-General
Marine Policy Bureau

Ministry of Maritime Affairs & Fisheries
140-2, Gye-dong Jongro-gu Seoul, 110-793, Republic of Korea
Tel: +82-2-3674-6500
Fax: +82-2-3674-6516

Mr. Kong-Kyun OH

Director General
Incheon Regional Maritime Affairs & Fisheries Officer
Seohaero 193, Jung-gu, Incheon, Republic of Korea
Tel: +82-32-885-0010
Fax: +82-32-880-6114

Mr. Jae-Heung CHUN (presenter)

Deputy Director
Marine Conservation Division
Ministry of Maritime Affairs & Fisheries
140-2, Gye-dong Jongro-gu Seoul, 110-793, Republic of Korea
Tel: +82-2-3674-6564
Fax: +82-2-3674-6565
E-mail: cjh54@momaf.go.kr

Mr. Jong-Hwa BANG

Assistant Director
Marine Conservation Division
Ministry of Maritime Affairs & Fisheries
140-2, Gye-dong Jongro-gu Seoul, 110-793, Republic of Korea
Tel: +82-2-3674-6564
Fax: +82-2-3674-6565
E-mail: bjh125@momaf.go.kr

Mr. Dong-Oh CHO (presenter)

Research Fellow
Korea Maritime Institute
1027-4, Bangbae3-dong Seocho-gu Seoul, 137-851, Republic of Korea
Tel: +82-2-2105-2762
Fax: +82-2-2105-2779
E-mail: oceancho@kmi.re.kr

Mr. Kyeong-Doo CHO (presenter)

Head, Dept. of Research Planning & Coordination
Incheon Metropolitan City

1138 Guwol-dong Namdong-gu Incheon, 405-750, Republic of Korea
Tel: +82-32-260-2621
Fax: +82-32-260-2629
E-mail: kdcho64@msn.com

Mr. Seong-Oh IM (presenter)

Consultant
Korea Marine Pollution Response Corporation (KMPRC)
Haegong Bldg. 71, Samsung-dong, Kangnam-gu, Seoul, Republic of Korea
Tel: +82-2-3498-8699
Fax: +82-2-3498-8695
E-mail: san94@kmprc.or.kr

Mr. Young-Gwon HA

Water Management Division
Incheon Metropolitan City
1138 Guwol-dong Namdong-gu Incheon, 405-750, Republic of Korea
Tel: +82-32-440-3642
Fax: +82-32-440-3619
E-mail: hyg0913@hanmail.net

Mr. Sung-Woo KIM

Research Fellow, Dept. of Environment & Ecology
Incheon Metropolitan City
1138 Guwol-dong Namdong-gu Incheon, 405-750, Republic of Korea
Tel: +82-32-260-2662
Fax: +82-32-260-2669
E-mail: watershed@idi.re.kr

Mr. Nam-Keun JUNG

General Manager
Korea Marine Pollution Response Corporation (KMPRC)
Haegong Bldg. 71, Samsung-dong, Kangnam-gu, Seoul, Republic of Korea
Tel: +82-2-3498-8690
Fax: +82-2-3498-8695
E-mail: nkjung@kmprc.or.kr

Mr. Seung-Taek HWANG

Director
Marine Environment Division
Korea Fisheries Infrastructure Promotion Association

28-9 Ineui-dong Jongro-gu Seoul, Republic of Korea
Tel: +82-2-3673-2853
Fax: +82-2-3673-2856
E-mail: hst@fipa.or.kr

Mr. Sang-Eun LEE

Director
Marine Pollution Surveillance Division
Korea Coast Guard
3-8, Songdo-Dong, Yeonsu-Gu, Incheon, Republic of Korea
Tel: +82-32-835-3021
Fax: +82-32-835-3705
E-mail: selsell@kcg.go.kr

Mr. Du-Ho KIM

Director
Marine Pollution Response Division
Korea Coast Guard
3-8, Songdo-Dong, Yeonsu-Gu, Incheon, Republic of Korea
Tel: +82-32-835-3023
Fax: +82-32-835-3705
E-mail: kim5050@kcg.go.kr

Mr. Hong-Gi CHAI

Deputy Director
Marine Pollution Surveillance Division
Korea Coast Guard
3-8, Songdo-Dong, Yeonsu-Gu, Incheon, Republic of Korea
Tel: +82-32-835-3126
Fax: +82-32-835-3621
E-mail: csa1255@hanmail.net

Mr. Seung-Hwan LEE

Deputy Director
Marine Pollution Response Division
Korea Coast Guard
3-8, Songdo-Dong, Yeonsu-Gu, Incheon, Republic of Korea
Tel: +82-32-835-3129
Fax: +82-32-835-3705
E-mail: leesh@kcg.go.kr

Mr. Sang-Jin LEE

Manager
Pollutant Analysis Team, Research&Development Center
Korea Coast Guard
3-8, Songdo-Dong, Yeonsu-Gu, Incheon, Republic of Korea
Tel: +82-32-835-3133
Fax: +82-32-835-3907
E-mail: sangjinlee1@hotmail.com

Mr. Jeong-Mog SEO

Assistant Director
Maritime Pollution Response Division
Korea Coast Guard
3-8, Songdo-Dong, Yeonsu-Gu, Incheon, Republic of Korea
Tel: +82-32-835-3229
Fax: +82-32-835-3705
E-mail: green@kcg.go.kr

Mr. Jeong-Gyu SEO

Director General
Environment Greenery Bureau
Incheon Metropolitan City
1138, Guwal-dong, Namdong-gu, Incheon, Republic of Korea
Tel: +82-32-440-2701
Fax: +82-32-440-2909
E-mail: sjg222@yahoo.co.kr

Mr. Youn-Joong CHUNG

Director
Water Management Division
Incheon Metropolitan City
1138, Guwal-dong, Namdong-gu, Incheon, Republic of Korea
Tel: +82-32-440-2704
Fax: +82-32-440-3619
E-mail: chungyj@incheon.go.kr

Mr. Myung Kun CHOI

Chief
Water Management Division
Incheon Metropolitan City
1138, Guwal-dong, Namdong-gu, Incheon, Republic of Korea

Tel: +82-32-440-3645
Fax: +82-32-440-3619
E-mail: cmk0500@hanmail.net

Mr. Seo Gu JEONG

Consultant
Water Quality Conservation Division
Incheon Metropolitan City
1138, Guwal-dong, Namdong-gu, Incheon, Republic of Korea
Tel: +82-32-440-3645
Fax: +82-32-440-3619
E-mail: seoguda@naver.com

Russian Federation

Mr. Sergey MONINETS (presenter)

Director
Sea Protection Institute, Vladivostok
Russian Federation Ministry of Transport
50a, Ul. Verkhneportovaya, Vladivostok, 690059,
Russian Federation
Tel./Fax: +7-4232-51-52-70
E-mail: moninets@msun.ru

Dr. Vladimir SHULKIN

Head,
Laboratory of Geochemistry
Pacific Geographical Institute, Far Eastern Branch, Russian Academy of Sciences
7 Radio Street, Vladivostok 690041, Russian Federation
Tel: +7-4232-320652
Fax: +7-4232-312833
E-mail: shulkin@tig.dvo.ru

Ms. Yana Yu. BLINOVSKAYA (presenter)

Researcher of Sea Protection Institute Maritime State University
After named Admiral G.I.Nevelskoy
50A Verkhneportovaya, Russian Federation
Tel/Fax: +7-4232-51-52-70
E-mail: blinovskaya@msun.ru

Ms. Larisa KABALIK

The assistant to the editor-in-chief
of the Center of protection of the wild nature 'Zov Taygi'
690041 Radio Str. 7 Vladivostok, Russian Federation
Tel: +7-4232-32-06-66
Fax: +7-4232-31-21-59

Dr. Natalia KUTAEVA

Deputy Director / Head of Marine Environment Protection Division
State Marine Pollution Control, Salvage & Rescue Administration (MPCSA)
Ministry of Transport of the Russian Federation
3/6, Petrovka St., Moscow 125993, Russian Federation
Tel: +7-495-959-46-93 / 95
Fax: +7-495-959-46-94
E-mail: kutaevang@mintrans.ru

Dr. Gennady SEMANOV

Head of Laboratory Environmental Safety of Maritime Transport
Central Marine Research & Design Institute (CNIIMF)
6, Kavalergardskaya Str., St.Petersburg 193015, Russian Federation
Tel: +7-812-271-10-15
Fax: +7-812-274-38-64
E-mail: Semanov@cniimf.ru

MERRAC

Dr. Chang-Gu KANG

Director
Marine Environmental Emergency Preparedness and Response
Regional Activity Centre (MERRAC)
P.O. Box 23, Yuseong, Daejeon 305-600, Republic of Korea
Tel: +82-42-868-7260
Fax: +82-42-868-7738
E-mail: cgkang@moeri.re.kr

Dr. Seong-Gil KANG

Senior Consultant
Marine Environmental Emergency Preparedness and Response
Regional Activity Centre (MERRAC)

P.O. Box 23, Yuseong, Daejeon 305-600, Republic of Korea
Tel: +82-42-868-7281
Fax: +82-42-868-7738
E-mail: kangsg@moeri.re.kr

Dr. Jeong-Hwan OH

Senior Consultant
Marine Environmental Emergency Preparedness and Response
Regional Activity Centre (MERRAC)
P.O. Box 23, Yuseong, Daejeon 305-600, Republic of Korea
Tel: +82-42-868-7205
Fax: +82-42-868-7738
E-mail: jhoh@moeri.re.kr

Ms. Yeo-Kyoung YUN

Secretariat
Marine Environmental Emergency Preparedness and Response
Regional Activity Centre (MERRAC)
P.O. Box 23, Yuseong, Daejeon, 305-600, Republic of Korea
Tel: +82-42-868-7214
Fax: +82-42-868-7738
E-mail: nowpap@moeri.re.kr

NOWPAP Regional Coordinating Unit (RCU)

Dr. Alexander TKALIN

NOWPAP Coordinator
NOWPAP Regional Coordinating Unit Toyama Office
5-5 Ushijimashin-machi, Toyama city 930-0856, Japan
Tel: +81-76-444-1611
Fax: +81-76-444-2780
E-mail: Alexander.Tkalin@nowpap.org

Dr. Jeung-Sook PARK (presenter)

Scientific Affairs Officer
NOWPAP Regional Coordinating Unit Busan Office
408-1 Shirang-Ri, Gijang-Eup, Gijang-Gun, Busan 619-902, Republic of Korea
Tel: +82-51-720-3002
Fax: +82-51-720-3009
E-mail: Jeungsook.park@nowpap.org

United Nations Environment Programme (UNEP)

Dr. Elik ADLER (presenter)

Senior Programme Officer
Chief of the Regional Seas Branch
Division of Environmental Conventions
United Nations Environment Programme
P.O.Box 20552 Nairobi, Kenya
Tel: +254-02-624-544/033
Fax: +254-20-624-618/300
E-mail: Elik.Adler@unep.org

IMO

Mr. Miguel PALOMARES (presenter)

Senior Deputy Director
Marine Environment Division
International Maritime Organization
4 Albert Embankment, London SE1 7SR, United Kingdom
Tel: +44-20-7735-7611
Fax: +44-20-7587-3210
E-mail: mpalomar@imo.org

CEARAC

Dr. Takafumi YOSHIDA

Northwest Pacific Action Plan
Special Monitoring & Coastal Environmental Assessment Regional Activity Centre
Established at NPEC
5-5 Ushijimashin-machi, Toyama city, Japan
Tel: +81-76-445-1571
Fax: +81-76-445-1581

COBSEA

Dr. Srisuda JARAYABHAND

Director

Coordinating Body of the Seas of East Asia (COBSEA)

United Nations Building, 2nd Floor, Block B

Rajadamnern-Nok Avenue

Bangkok 10200, Thailand

Tel: (662) 288-1905

Fax: (662) 281-2428

E-mail: jarayabhand@un.org