



2015 NOWPAP
International Coastal Cleanup and
joint TEMM-NOWPAP
Workshop on Marine Litter Management



Yantai, China
24-25 September 2015



NOWPAP

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2015 NOWPAP International Coastal Cleanup and Joint TEMM-NOWPAP Workshop on Marine Litter Management Yantai, China, 24-25 September 2015

Organizers:

- NOWPAP Regional Coordinating Unit (RCU)
- Ministry of Environmental Protection (MEP), China
- Chinese Research Academy of Environmental Sciences (CRAES)
- Yantai Environmental Protection Bureau (EPB)

Supporters:

- Shandong Provincial Government
- Yantai Municipal Government

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Programme of Workshop and ICC Beach Cleanup

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Summary of the 2015 NOWPAP International Coastal Cleanup (ICC) and Joint TEMM-NOWPAP Workshop on Marine Litter Management

2015 NOWPAP ICC was organized on 24-25 September 2015 in Yantai, China. Comprised of a workshop and a beach cleanup, this ICC campaign was organized with the following objectives:

- To build capacity for effective management of marine litter in the NOWPAP region.
- To promote the Global Partnership on Marine Litter (GPML) in the region.
- To promote the International Coastal Cleanup campaigns in the region and to share relevant experience of NOWPAP member states and partners.
- To strengthen cooperation in the region on dealing with marine litter, including central and local governments, NGOs, academia and industry
- To increase public awareness of marine litter issues.
- To promote the implementation of NOWPAP Regional Action Plan on Marine Litter (RAP MALI).

The workshop was organized as a joint event of NOWPAP and TEMM (Tripartite Environment Ministers Meeting among China, Japan and Korea) which considers marine litter a priority issue among others and welcomes NOWPAP efforts in promoting public awareness and regional cooperation to solve the issue.

The workshop was held with 4 sessions focused on the efforts of central and local governments, NGOs activities and international cooperation, sea-based marine litter monitoring, and cooperation between NOWPAP and TEMM. NOWPAP marine litter focal points, representatives of national and local governments (China, Korea, Japan and Russia), NOWPAP partners (Ocean Conservancy, COBSEA), ICC coordinators, universities, research institutes, NOWPAP Regional Activity Centres and environmental NGOs participated in the meeting and beach cleanup.

A RAP MALI working meeting was organized to review the progress in the implementation of the RAP MALI projects in 2014-2015 and to discuss plans for 2016-2017. A TEMM working meeting was also held to discuss how to strengthen the cooperation between TEMM and NOWPAP in the near future.

Programme

24 September, Thursday

09:00—17:00: Joint TEMM-NOWPAP workshop on marine litter management

25 September, Friday

08:00—10:00: TEMM focal points meeting on marine litter

10:00—12:00: RAP MALI working meeting (attended by NOWPAP marine litter focal points, representatives of NOWPAP RACs and RCU)

Beach cleanup

13:50— Departure for ICC campaign/beach cleanup (bus ride about 10 minutes)

17:00— Back to the hotel

**Joint TEMM-NOWPAP Workshop on Marine Litter Management
Yantai, People's Republic of China, 24 September 2015**

| | |
|-------------|--|
| 08:40-09:00 | Registration |
| 09:00-09:20 | Opening (Chaired by Mr. Hao CHEN, NOWPAP Marine Litter Focal Point of China) (Speeches by MEP, provincial/municipal government, NOWPAP RCU) |
| | Session 1: Central and local governments' efforts to deal with marine litter (Chaired by Mr. Hao CHEN, NOWPAP Marine Litter Focal Point of China) |
| 09:20-09:40 | Hao CHEN: China's government efforts in dealing with marine litter issues |
| 09:40-10:00 | Jun SAEGUSA: Efforts to combat marine litter by the Government of Japan |
| 10:00-10:20 | Kensuke TAKENOUCI: Actions to clean up Ise Bay - all together and beyond boundaries |
| 10:20-10:50 | Coffee break, group photo |
| 10:50-11:10 | Sang Hee HONG: Addressing the issue of microplastics in the Republic of Korea |
| 11:10-11:30 | Q&A, Discussion |
| | Session 2: NGOs activities and international cooperation (Co-Chaired by Mr. Jun SAEGUSA, TEMM/NOWPAP Marine Litter Focal Point of Japan and Ms. Hanako YOKOTA, representative of JEAN) |
| 11:30-11:50 | Allison SCHUTES: Ocean plastics: looking back at 30 years of data and forward towards solutions |
| 11:50-12:10 | Yonglong LIU: The efforts of environmental protection NGOs in China in fighting against marine litter pollution |
| 12:10-13:30 | Lunch |
| 13:30-13:50 | Hanako YOKOTA: JEAN efforts and activities related to 2011 tsunami debris |
| 13:50-14:10 | Takafumi YOSHIDA: Presentation on the NW Pacific regional node of GPML |
| 14:10-14:30 | Yana BLINOVSKAYA: Results of ICC campaigns in the Russian Far East and preparation for the 2016 NOWPAP ICC |
| 14:30-14:50 | Reynaldo MOLINA: Coordinating Body on the Seas of East Asia (COBSEA) - updates and initiatives |
| 14:50-15:10 | Young Nam KIM: Education and public awareness to reduce marine litter in the Republic of Korea |
| 15:10-15:20 | Q&A, Discussion |
| 15:20-15:40 | Coffee break |

Session 3: Sea-based marine litter: monitoring and management

(Chaired by Xiaodong ZHONG, NOWPAP Deputy Coordinator)

- 15:40-16:00 Jong Myoung LEE: Results and outcomes of Korea National marine debris monitoring programme
- 16:00-16:20 Sergey MONINETS: Development of marine litter monitoring system in Peter the Great Gulf
- 16:20-16:30 Q&A, Discussion

Session 4: Cooperation within the framework of TEMM

(Chaired by Xiaodong ZHONG, NOWPAP Deputy Coordinator)

- 16:30-16:40 Mr. Yi LI: Marine litter action plan under TEMM
- 16:40-17:00 Jun SAEGUSA: A proposal for marine litter data sharing under TEMM action plan
- 17:00-17:10 Q&A, discussion
- 17:10-17:20 Closing

List of Participants of 2015 NOWPAP ICC

24-25 September 2015, Yantai, China

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Presentation handouts

中华人民共和国环境保护部
 中国环境科学研究院
 CHINESE RESEARCH ACADEMY OF ENVIRONMENTAL SCIENCE

China's government efforts in dealing with marine litter issues

Hao Chen
 Yantai, 24 September 2015

Outline

- 1 Overview of China's ML status
- 2 Efforts inside China to deal with ML
- 3 International cooperation to deal with ML

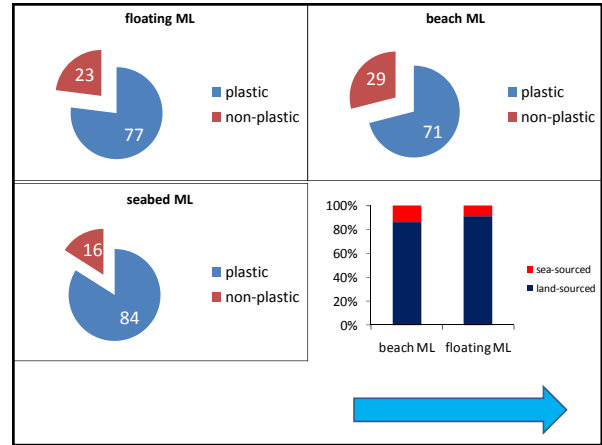
Distribution of ML (number/ km²) in coastal and nearshore regions of China in 2014

data source: Bulletin of China's Marine Environmental Status of China for the year of 2014

- ◆ Guideline for monitoring of Marine Litter was drafted by State Oceanic Administration (SOA) of China
- ◆ 50 survey locations were set along coastal areas
- ◆ Types, amount and distribution of marine litter, and identifying source

图例

- Big floating ML on seawater surface
- Small ML on seawater surface
- Beach ML
- Seabed



- Control of plastic pollution...
- Control of land-based generation of solid waste...

➔

The use of plastic bags is becoming more restrictive ...

- ◆ Super-thin (<0.025 mm) plastic bags are forbidden for production and use, effective of June 1, 2008;
- ◆ No free use of plastic shopping bags, effective of June 1, 2008

↓

Non-degradable plastic bags are forbidden for production and use in Jilin Province, effective of January 1, 2015



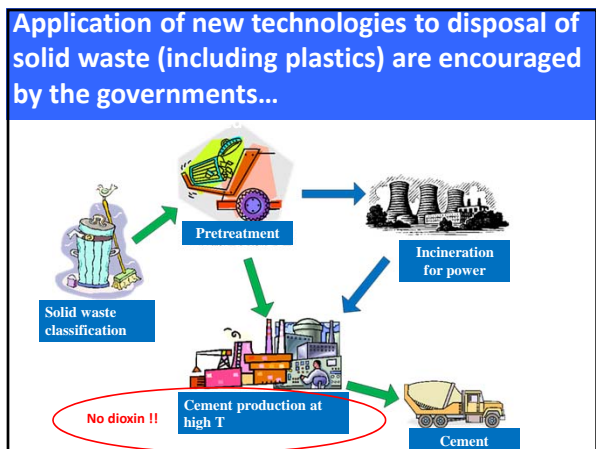
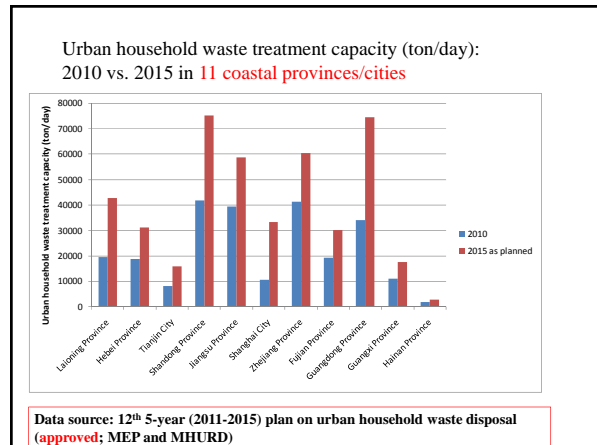
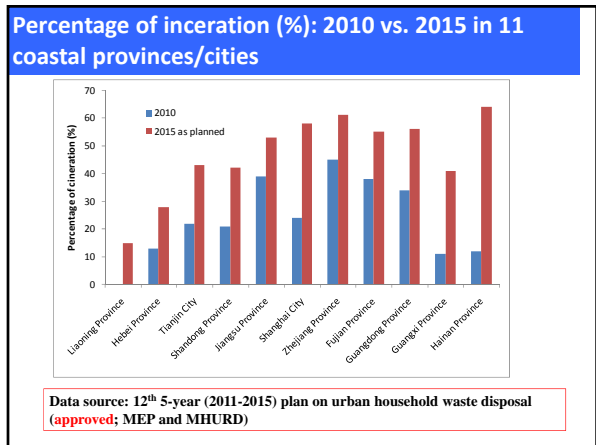
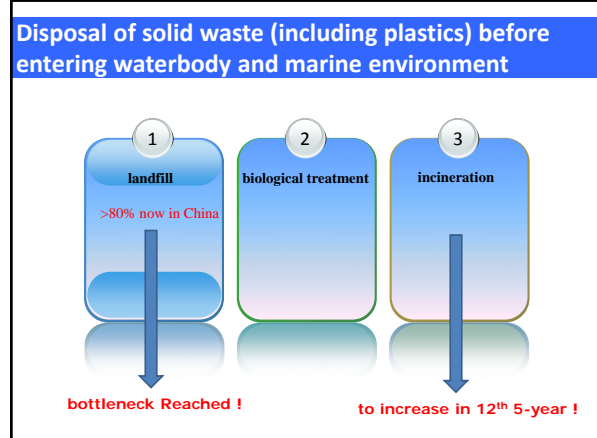

Replaced by paper bags or degradable plastic bags...

The use of non-degradable plastics is still allowed in some provinces...

BUT

It will be fined if the vendor provide the plastics free of charge to the customers in the markets...

Fine of up to RMB 5,000 !



中华人民共和国工业和信息化部
Ministry of Industry and Information Technology of the People's Republic of China

六部委关于开展水泥窑协同处置生活垃圾试点工作的通知

Six Departments of China Governments release a joint agreement in 2015, on the pilot study of disposal of household solid waste by a Cement Rotary Kiln Co-processing

Besides urban areas, the rural areas are a new focus in the years to come...



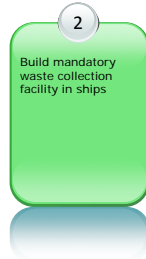
Ministry of Housing and Urban-Rural Development (MHURD) Starts "The 5-year (2015-2019) Major Project on Household Waste Disposal & Treatment in Rural Areas"

Target: **90% by 2019**

Besides land sources, sea-based sources also generate marine litter...



Shipping-based marine litter is another important come...



12th 5-year (2011-2015) plan on transportation (Ministry of Transportation; MOT)

More waste reception facilities in ports...



Inspection of categorization and disposal of ship garbage



Ship garbage reception operation

More restrictive on-board waste disposal rules by MOT.....

- International Convention for the Prevention of Pollution From Ships (MARPOL) in 1973, 1978 (MARPOL 73/78) had annex 5
- Appendices to annex 5 were approved in 2011 by IMO and became effective as of January 1, 2013

None of plastics is allowed to enter the sea!

Other Authorities' Efforts – Fishery Bureau



- Fishery Bureau of Ministry of Agriculture
- Keep fishery port clean
- Recycle of waste fishery facilities



Coastal cleanup organized by the local governments...


Examples – Yantai

- Organizer: Yantai Maritime Safety Administration (MSA), youth league committee
- More than 90 volunteers collected garbage on the First Bathing Beach (3.2km total length)
- More than 20 volunteers collected nearshore drifting ML through 2 maritime inspection ships
- 730 pieces of marine litter, including plastic bags and mineral water bottles were collected



Information provided by Yantai MSA & from http://kab.yantai.gov.cn/content/news/index_dis.jsp?id=123957

International cooperation...



NOWPAP MALITA and ICC events

MEP has organized ML related Departments, NOWPAP related provinces, and NGOs to participate the NOWPAP ML workshops and activities for several times.



Introduction of ICC Survey Card



- Marine Litter classification
- Using of OC's data card
- To find the source

Tripartite Environment Ministers Meeting (TEMM) among China, Japan and Korea




Tripartite Joint Action Plan on Environmental Cooperation

2015-2019

China-U.S. Strategic and Economic Dialogue



Cooperation between State Oceanic Administration (SOA) of China and NOAA of U.S. to cope with marine debris



The Honolulu Strategy
A Global Framework for Prevention and Management of Marine Debris

IOEPA UNEP

Discussed and reviewed in The Fifth International Marine Debris Conference...



Efforts to combat Marine Litter in Japan (Legal framework and International Cooperation)

Office of Marine Environment
Ministry of the Environment, Government of Japan



Contents

1. Overview of Marine Litter in Japan
2. Legal framework for establishing a SMC (Sound Material Cycle) society
3. Cooperation under Marine litter law in Japan
4. International Cooperation

1

1. Overview of Marine Litter in Japan

Nagasaki Pref. (Tsushima-city)



Yamagata Pref. (Tobishima)



[Damage caused by marine debris]
Bad effects on ...

Marine Environment
Beautiful Beach...Tourism

Ecosystems
Fishery Operation
Ship Navigation etc.



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2. Legal framework for establishing a SMC (Sound Material Cycle) society

Basic Environment Law
Completely enforced in August 1994

Basic Environment Plan
Completely amended and announced in April 2006

Basic Act for Establishing a SMC Society (Basic Framework Act)
Completely enforced in January 2001

Ensuring material cycle in society
Reducing consumption of natural resources
Lowering environmental load

Fundamental Plan for Establishing a SMC Society
Officially announced in March 2003
The fundamentals for other plans designed by the State
Amended in March 2008

< Proper treatment of waste >

Waste Management and Public Cleansing Law
Partially amended in May 2010

- ① Reduction of waste generation
- ② Proper treatment of waste (including recycling)
- ③ Regulation for establishment of waste treatment facilities
- ④ Regulation for waste treatment operators
- ⑤ Establishment of waste treatment standards, etc.

Defining the roles and responsibilities of local governments

< Promotion of recycling >

Law for the Promotion of Effective Utilization of Resources
Completely amended and enforced in April 2001







- ① Recycling of recycled resources
- ② Ingenuity and innovation to create structures and use materials to facilitate recycling
- ③ Labeling for sorted collection
- ④ Promotion of effective utilization of by-products

recycle → reuse
recycle

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2. Legal framework for establishing a SMC (Sound Material Cycle) society

Regulations according to characteristics of individual articles

| | | |
|--|---|--|
| <p>Law for the Promotion of Sorted Collection and Recycling of Containers and Packaging</p> <p style="font-size: small;">Completely enforced in April 2000 Partially amended in June 2006</p>  <p style="font-size: x-small;">Bottles, PET bottles, paper or plastic containers and packages</p> | <p>Law for the Recycling of Specified Kinds of Home Appliances</p> <p style="font-size: small;">Completely enforced in April 2001</p>  <p style="font-size: x-small;">Air-conditioners, refrigerators, freezers, TVs, washing machines, drying machines</p> | <p>Law for the promotion of the Utilization of Recyclable Food Resources</p> <p style="font-size: small;">Completely enforced in May 2001 Partially amended in June 2007</p>  <p style="font-size: x-small;">[Food residues]</p> |
| <p>Construction Material Recycling Law</p> <p style="font-size: small;">Completely enforced in May 2002</p>  <p style="font-size: x-small;">Timber, concrete, asphalt</p> | <p>Law for the Recycling of End-of-Life Vehicles</p> <p style="font-size: small;">Completely enforced in January 2005</p>  <p style="font-size: x-small;">[Vehicles]</p> | <p>Small Home Appliance Recycling Law</p> <p style="font-size: small;">Enforced in April 2013</p>  <p style="font-size: x-small;">[WEEE]</p> |

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3. Cooperation under Marine litter law in Japan

Marine litter law (enforced in 2009)

* Purpose

- * To conserve good landscape and environment, by promoting **smooth removal action** and **effective reduction** of marine litter generation.
- * to achieve the comprehensive and effective promotion of activities

→ Clarify the respective responsibility of relevant organizations
(National government, and local government, the Coast Administrator ,etc.)

Government of Japan

Basic Policy for marine Litter cabinet decision in 2009

Local government (prefectural government)

Regional Plan for marine litter (based on Basic Policy)

Take Action!

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3.Cooperation under Marine litter law in Japan

* **Marine litter law** (The Act on Promotion of Disposal of Articles Washed Ashore for Good Coastal Views and Environment for Conserving Beautiful Rich Nature)

Contents

- * Chapter 1 General Provisions (Article 1 to Article 12)
- * Chapter 2 Fundamental Policies (Article 13)
- * Chapter 3 Regional Plans, etc. (Article 14 to Article 16)
- * Chapter 4 Promotion for Countermeasures against Washed-Ashore Articles (Article 16 to Article 31)
 - ✓ Section I **Smooth Disposal** of Washed-Ashore Articles, etc.
 - ✓ Section II **Reduction in Generation** of Washed-Ashore Articles, etc.
 - ✓ Section III **Other Policies and Measures Concerning the Promotion for Disposal of Other Washed-Ashore Articles**, etc.

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3.Cooperation under Marine litter law in Japan

Marine Litter Law (Article 30)

- ① The government shall establish **the Council for Promoting Countermeasures against Marine Litter** which is composed of officials from relevant national organizations and **conduct the coordination to achieve the comprehensive and effective promotion.**
- ② The government shall establish **Expert Council** for Countermeasures against Marine Litter, which is composed of those who have expertise in the Council for Promoting .
- ③ **Expert Conference shall give advice and make proposals** about matters concerning promotion of Countermeasures against Marine Litter to the Council.

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3.Cooperation under Marine litter law in Japan

Marine Litter Law

The Government
The Promotion Council of marine litter policy is set up within the government

Cooperation under The Promotion Council of marine litter policy

Ministry of the Environment.

- The Secretariat of the Promotion Council in order to manage the affairs of the council.
- **Responsibility for Management of Marine litter (excluding matters related to other ministries).**
- **Responsibility for waste management (the Waste Management and Public Cleaning Act etc.) and establishment of a sound material-cycle society (including promotion of Recycling system etc.).**

Ministry of Economy, Trade and Industry. → Industrial activities.

Ministry of Agriculture, Forestry and Fisheries → Fishery based litters, Trees from mountains.

Ministry of Land, Infrastructure, Transport and Tourism → River side litter, debris in Port and Sea Route area.

Japan Meteorological Agency → Research for plastic debris

Japan Coast Guard → Control of illegal dumping in the sea area

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3.Cooperation under Marine litter law in Japan

Subsidy Project to Local government Based on article 29
Article 29 "Government has a responsibility to prepare budget for promote activities to combat marine litter"

National Budget 2009-2014 About **16 billion JPY**
2015 About **3 billion JPY**

Subsidy budget can be used for

- Cleaning up coast
- Reducing generation

From 2015, removing **floating litter and sediment on the seabed** are added to the menu of subsidy.

Flow of Subsidy: Government of Japan (Plan, Subsidy, Report) → Local Government → Removal action etc.

Result of Subsidy Project by Government of Japan

| Fiscal year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------------------------------|--------|--------|--------|-------|--------|--------|
| Budget (Million JPY) | | | 6,000 | | 10,000 | |
| Amount of removed litters (t) | 11,760 | 17,584 | 43,058 | 6,617 | 34,610 | 43,259 |

Amount of removed litters (t) bar chart (2009-2014)

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4. International Cooperation

Close Collaboration on 3R and Waste Management Policies with Asian Countries

Marine litter law article 8
"...actions against marine litter problem must be promoted regarding with International cooperation."

China
- Japan-China Waste Recycling Policy Dialogue conducted since 2008.
- Circular Economy Promotion Law enforced in January 2009.
- Memorandum of Cooperation for Establishing Environmentally Sound City in Shenyang and Kawasaki signed between the Environment Ministers of Japan and China in June 2009.

Laos
- Assistance for national 3R strategy development provided since 2006.
- National strategy established in December 2010.

Thailand
- Assistance for national 3R strategy development provided since 2005.

Cambodia
- Assistance for national 3R strategy development provided since 2006.

Singapore
- Bilateral policy dialogue conducted since July 2006.
- Letter of Intent signed between Japan's Parliamentary Secretary of the Environment and the CEO of National Environment Agency of Singapore in June 2010.
- New Letter of Intent signed between Japan's Vice-Minister for Global Environmental Affairs and the CEO of National Environment Agency of Singapore on Mar 3, 2014.

Malaysia
- Assistance for Development of Strategic Plan for Organic Food Waste Management provided since 2010.

Indonesia
- Assistance for national 3R strategy development provided since 2005.
- Final draft of the national 3R strategy is in the process of obtaining government approval.
- Waste Management Law enacted in May 2008.
- On Oct 24, 2010, Memorandum of Cooperation in the Areas of Solid Waste, Hazardous and Toxic Waste Management signed between the Environment Ministers of both countries.

On Dec 5, 2012, Memorandum of Cooperation signed between the Environment Ministers of Japan and Indonesia.

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4. International Cooperation

<Leaders' Declaration G7 Summit>

- G7 countries recognize the marine litter in particular plastic litter, poses a global challenge.(Leaders' Declaration G7 Summit 7-8 June 2015)
- The G7 countries commits to priority actions and solutions to combat marine litter as below.
 - ① Removal actions
 - ② Actions to Address Land-Based Sources
 - ③ Actions to Address Sea-based Sources
 - ④ Action on Education, Research and Outreach

<Tripartite Environment Ministers Meeting> [Japan, ROK, China]

- The Ministers from China, Japan, ROK adopted the Tripartite Joint Action Plan on Environmental Cooperation in TEMM17 on April 2015. The Ministers agreed to hold workshops on marine litter, share data on marine litter, and exchange information on each country's policies and experiences in the plan.

11



伊勢湾再生 ISE BAY REGENERATION

**Actions to Clean Up Ise-Bay
- All Together & Beyond Boundaries -**

2015.09.24 Joint TEMM-NOWPAP Workshop
on Marine Litter Management
Kensuke TAKENOUCI (Mie Prefecture in Japan)

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伊勢湾再生 ISE BAY REGENERATION

Contents

- Introduction of Mie Prefecture
- Ocean Litter in Isewan (=Ise-Bay)
- Action over Local Administrative Districts
- Campaign across Forest, River and Sea
- Isewan Network

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1. Introduction of Mie Pref. 伊勢湾再生 ISE BAY REGENERATION

Mie Prefecture

- Population: 1,811,990 (2015.7.1)
- Area: 5,774km² (2014.10.1)
- Number of municipality: 29 cities

3

1. Introduction of Mie Pref. 伊勢湾再生 ISE BAY REGENERATION

Ise Bay

*Some Pictures Ref: Kanko Mie

4

2. Ocean Litter in Isewan 伊勢湾再生 ISE BAY REGENERATION

Isewan water area

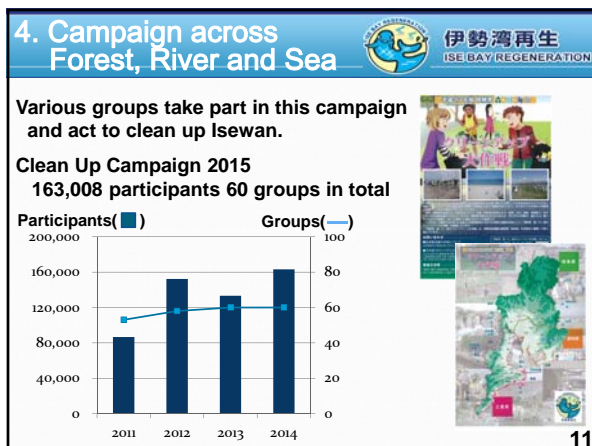
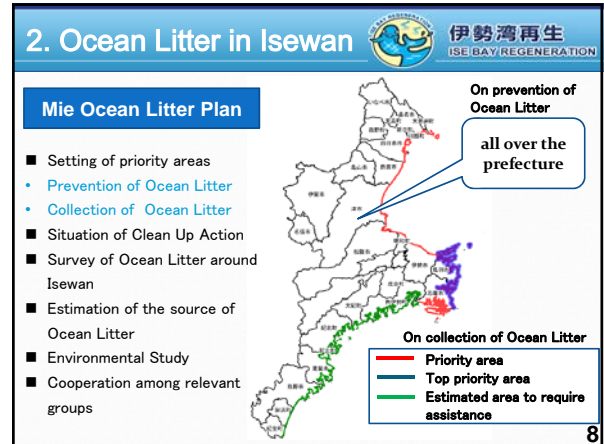
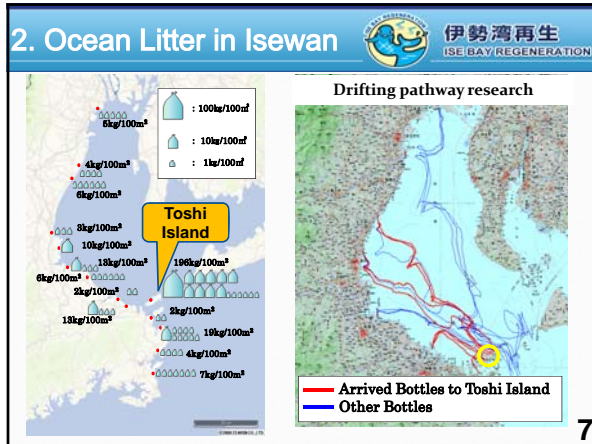
- Water Area: 2,342km²
- Population: over 10 million
- The shape is like a shallow dish and the average depth is lower than Tokyo-bay and Osaka-bay; the area(<10m depth) is large.
- The entrance into the bay is about just 20km across, so the circulation between inner and outer of the bay is non-active.
- The amount of pouring from rivers is about 200 billion m³/year.

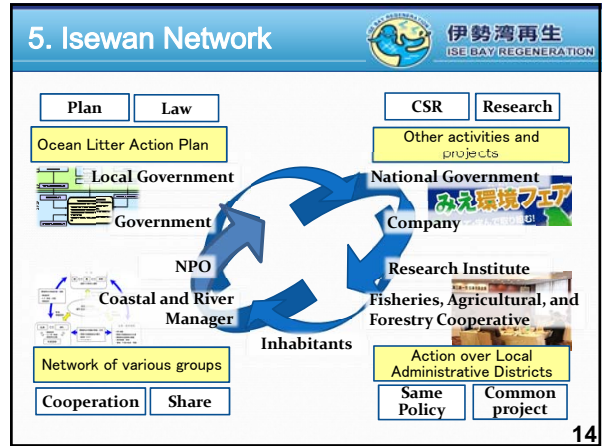
5

2. Ocean Litter in Isewan 伊勢湾再生 ISE BAY REGENERATION

Toshi Island (Nasa Beach)

6





伊勢湾再生
ISE BAY REGENERATION

Thank you for your attention

Toward regeneration of Isewan

2015.09.24 Joint TEMM-NOWPAP Workshop
on Marine Litter Management
Kensuke TAKENOUCI (Mie Prefecture in Japan) 15

Joint TEMM-NOWPAP Workshop on Marine Litter Management
2015.9.24 Yantai, China

Microplastic Issue and Government policy in South Korea

Sang Hee Hong

Korea Institute of Ocean Science and Technology




What are Microplastics?

- Synthetic polymers less than 5 mm in diameter.

- Primary microplastics**
 - Resin pellets [Geopu, Korea/ KIOST]
 - PE microbead in cosmetics
 - PE microbead [Pondil and Sewell, 2009]
- Secondary microplastics**
 - Fragment [Jojojo/ KIOST]
 - Seaweed shreds [Zubers & Richards, 2005]
 - Microfiber in lobster [Murray and Cowie, 2011]

Why MP? Change of Paradigm in Marine Debris Issue: Fate and Effect

Mega (Hippo) → **Macro** (Dog) → **Meso** (3 mm) → **Micro** (100 μm) → **Nano** (5 μm) → **Virus**

Increasing ... (from Mega to Nano):

- Numbers
- Bioavailability
- Target organisms
- Toxicity
- Detection difficulty
- Clean up difficulty

Decreasing ... (from Mega to Nano):

- Volume
- Entanglement
- Settling velocity

Why MP? Change of Paradigm in Marine Debris Issue: Fate and Effect

(cm - m): Mammal: Entanglement, Bird: Ingestion, Fish: Ingestion

(μm - cm): Bird: Ingestion, Fish: Ingestion

(nm - μm): Crustacean: Ingestion, Bivalve: Ingestion (exposure exp.)

Increasing ... (from cm-m to nm-μm):

- Numbers
- Bioavailability
- Target organisms
- Toxicity
- Detection difficulty
- Clean up difficulty

Decreasing ... (from cm-m to nm-μm):

- Volume
- Entanglement
- Settling velocity

Why MP? Change of Paradigm in Marine Debris Issue: Toxic chemicals

1. Adsorbed chemicals

- Hydrophobic nature of polymers
- High adsorption capacity ($10^4 \sim 10^6$)
- Persistent Organic Pollutants (POPs)
- Facilitated desorption in gut fluids?

2. Additives

- Various inorganic and organic materials: Plasticizer, heat stabilizer, anti-oxidant, flame retardants, UV absorber, catalysts, dye, etc
- High contents (~50% of polymer weight)
- Leaching (enhanced by weathering?)

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Why microplastics?

- From coast to open ocean (Browne et al., 2011; Hidalgo-Ruz et al., 2012)
- Increasing trend (Thompson et al., 2004; Classens et al., 2011)
- Ingestion and bioaccumulation (?) (Boerger et al., 2010; Davison and Asch, 2011)
- Adverse biological effects (Browne et al., 2008; Lee et al., 2013)
- Carrier of toxicants (Tueten et al., 2009)

Microplastics as a Global Marine Environmental Issues

Intergovernmental Oceanographic Commission (2010)

| | | | |
|------------------------|--------------------|---|--|
| High level Objective 2 | CLIMATE CHANGE | • Ocean carbon coordination project • Ocean Acidification | UN Regular Process Scientific and Technical Group |
| High level Objective 3 | OCEAN HEALTH | • Microplastics • Invasive marine microalgae • Invasive Alien Species | |
| High level Objective 4 | COASTAL MANAGEMENT | • ICAM projects • Coastal Inundation • Marine Spatial Planning | |

United Nations Environment Assembly (UNEA)

1/6. Marine plastic debris and microplastics **Change of Term** Marine Debris
The United Nations Environment Assembly.

14/20. Requests the Executive Director, to undertake a study on marine plastic debris and marine microplastics, building on existing work and taking into account the most up-to-date studies and data, focusing on:

- Identification of the key sources
- Identification of possible measures and best available techniques and environmental practices
- Specification of areas especially in need of more research

Need to Fill the Knowledge Gap

Input source and pathway?
Chemicals?
Weathering and Fragmentation?
Toxicity?
Distribution?

Is microplastics a 'serious problem' or a 'red herring'?

To conduct scientific research and monitoring to answer the question

Microplastic issue in South Korea & Government policy

I. Abundance of Microplastics

Top 10 Macro-Marine Debris (ICC, >25mm)

➢ Plastic items are dominant type of marine debris
➢ Styrofoam buoy and rope represent a large portion of beached marine debris in Korea

| Rank | World(2014) | South Korea(2001-2010) | |
|------|---------------------------|---------------------------|------|
| 1 | Cigarettes/filters | Cigarettes/filters | 1.8% |
| 2 | Food wrappers | Grocery bags (plastic) | 8.6% |
| 3 | Beverage bottle (plastic) | Beverage bottle (plastic) | 8.6% |
| 4 | Caps, Lids (plastic) | Buoy | 7.0% |
| 5 | Straws, Stirrers | Caps, Lids (plastic) | 6.9% |
| 6 | Grocery bags (plastic) | Beverage bottles (glass) | 6.1% |
| 7 | Beverage bottles (glass) | Beverage cans | 4.9% |
| 8 | Other plastic bags | Food wrappers/containers | 4.5% |
| 9 | Pager bags | Rope | 3.9% |
| 10 | Beverage cans | Strip | 3.8% |

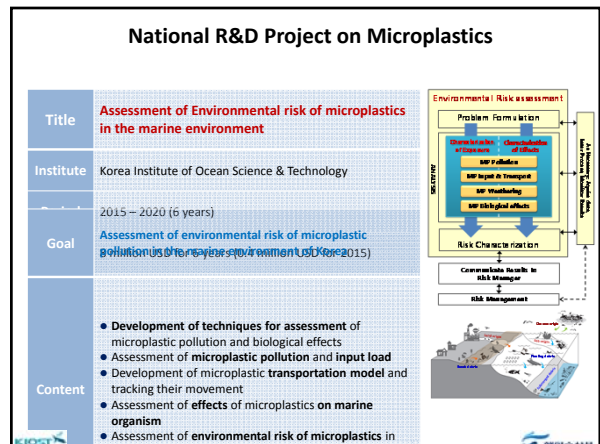
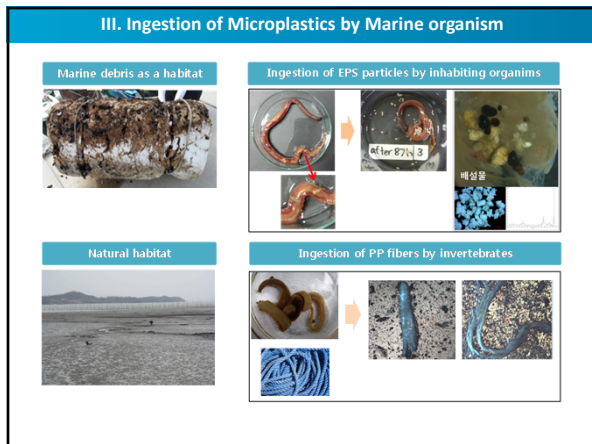
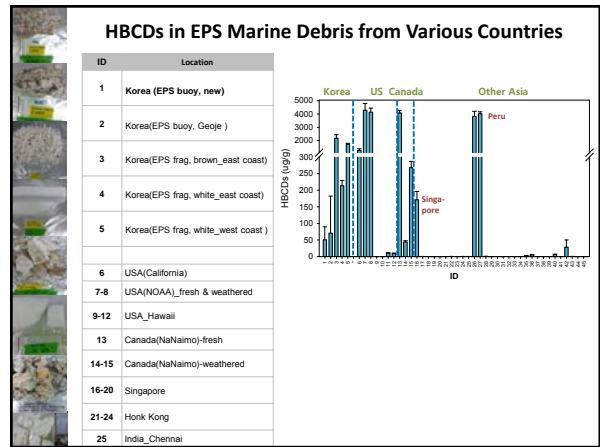
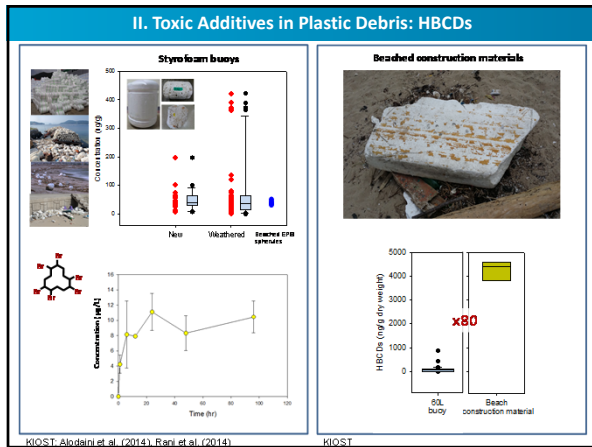
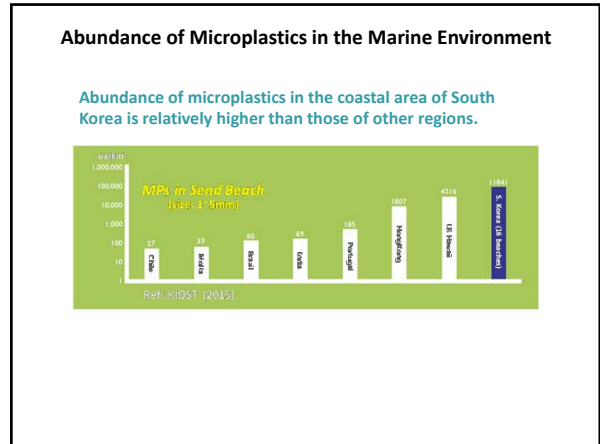
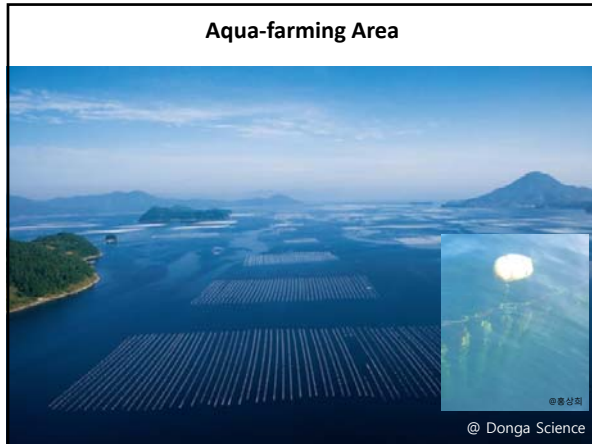
*Size > 25cm

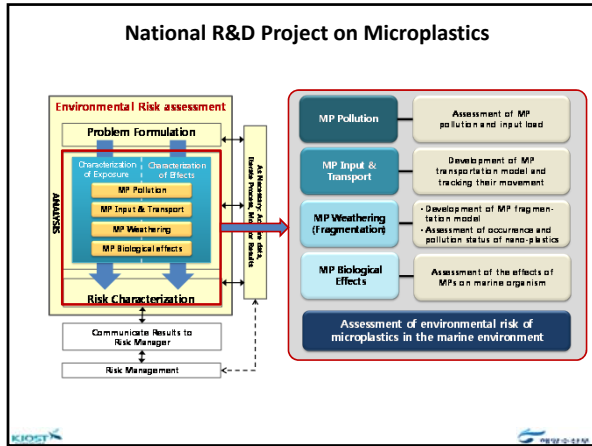
Microplastics on Sand Beach (1 mm < s < 5 mm)

Expanded polystyrene (EPS) fragment is the predominant item of microplastics in the Korean beaches

EPS (spherules or fragments) ~ 95%
Hard plastic 5%
Resin pellet 1%
Intact items 1%

*EPS: expanded polystyrene
Ref.: Mar Pollut Bull [2013]





Marine Debris Prevention Activities in Rep. of Korea : Replacement of EPS Buoy with Eco-Friendly Buoy

- Establish **certification standard for Eco-Friendly Buoy**
*Eco-Friendly Buoy: High-density buoy (> 0.2 g/cm³) coated or covered with polymers (or polymer films)
- **Government program for eco-friendly buoy supply**
 - ▶ Budget: 0.36 million USD (2015), 3.5 million USD(2016)
 - ▶ If, distribution rate > 50% : Amendment of Fishing Ground Management Act

Type of Eco-Friendly Buoy

| Encased type | Expanded type | Extruded type |
|-------------------------------|------------------------------------|--------------------------------|
| | | |
| 폴리우레아 코팅부표 (polyurea coating) | PE 필름 집착 부표 (PE thin-film coating) | 하이브리드 코팅 부표 (Hybrid coating) |
| | EPP 부표 (Polypropylene buoy) | 사출형 PVC 부표 (Extruded PVC buoy) |

Marine Debris Prevention Activities in Rep. of Korea : Integrated Management system for marine plastic debris

- Establish **Management System for Used Styrofoam Buoy (2015~)**
 - ▶ **Information management system** for used Styrofoam buoys
 - ▶ **Recovery system** for used Styrofoam buoys
 - ▶ Increase **compulsory recycle rate** of used Styrofoam buoy: 28%(‘15) → 80%(‘19)
 - ▶ Improvement of Styrofoam debris management system

- Establish **Integrated Fishing Gear Management Plan** (under planning)
 - ▶ Apply Life cycle assessment concept

Thank you for your attention!

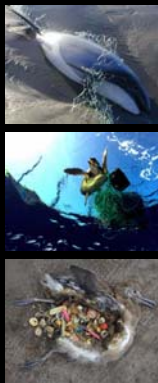
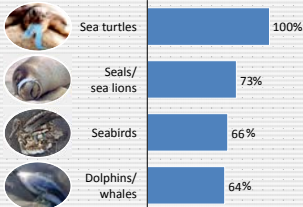
MARINE DEBRIS RESEARCH PROGRAM

OCEAN PLASTICS: LOOKING BACK AT 30 YEARS OF DATA AND FORWARD TOWARDS SOLUTIONS



MORE THAN 600 SPECIES IMPACTED

Percent of taxa impacted by marine debris

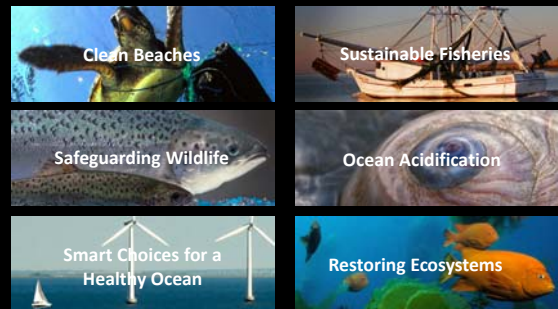


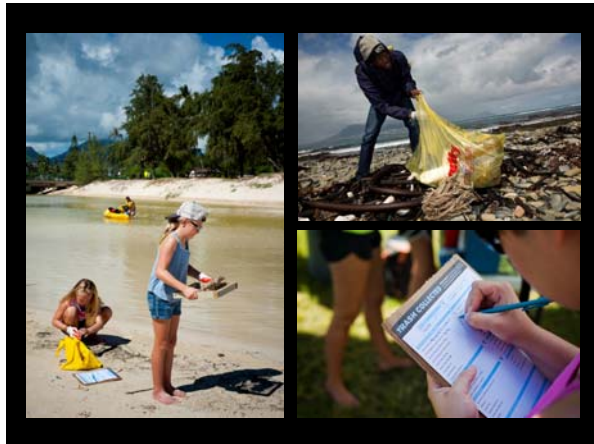
SOURCE: CBD, 2012; Rochman et al., 2013; Davison and Ash, 2011; Jacobsen et al., 2011; Raum-Suryan et al., 2009; Hanel and Pyle, 2000; NOAA

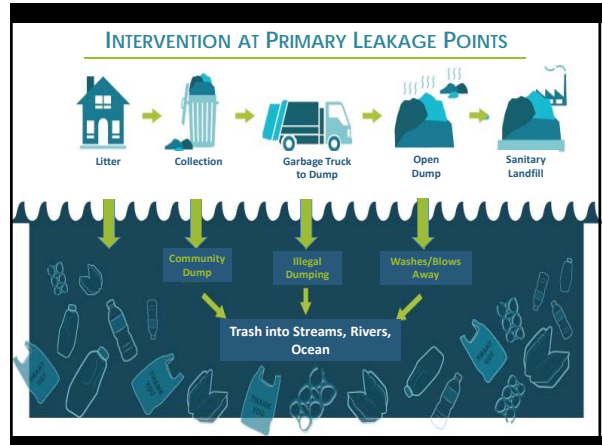


OCEAN CONSERVANCY

NEW SOLUTIONS FOR A CHANGING OCEAN







HOLISTIC APPROACH: TRASH FREE SEAS

Integrated Approach:

1. International Coastal Cleanup
2. Education & Outreach
3. Catalyze Science
4. Trash Free Seas Alliance

DISCHARGE OF GARBAGE INTO THE SEA IS PROHIBITED

The discharge of all garbage is prohibited into the navigable waters of the United States and into all other waters except as specifically allowed.

Discharge Permitted:

- Ground food waste not less than 300m from nearest land
- Other food waste not less than 100m from nearest land
- Cargo residues, classified as not harmful to the marine environment and less than 100m from nearest land
- Cleaning agents and residues in cargo hold and external wash water classified as not harmful to the environment
- All discharge, except for cleaning agents in wash water, must be in tanks and as far as practicable from nearest land.

Inside Special Areas Designated Under MARPOL Annex V:

- More stringent discharge requirements apply for discharges of food wastes and cargo residues
- Certain Annex V and international garbage management plan

The discharge of all forms of plastic into all waters is prohibited. The discharge of all garbage into the Great Lakes or their connecting or tributary waters is prohibited, except for cleaning agents or residues in their original sealed water receptacles as not harmful to the marine environment. State, local, and tribal regulations also may apply. Discharge of any type of garbage must be entered in the Garbage Record Book.

Violators are subject to civil and/or criminal penalties. www.oceanconservancy.org/goodmate



Rendu Ocean NPO Development

LiuYongLong:
ICC coordinator of China
Director Rendu Ocean

September 24, 2015



The story between China E-NPO & MD

Shanghai Rendu Ocean NPO Development Center

LiuYongLong:
ICC coordinator of China
Director Rendu Ocean
September 24, 2015


Contents

- Brief introduction of Rendu Ocean
- Our knowledge of marine debris
- Marine debris management of China Ocean NPO



Contents

- *Brief introduction of Rendu Ocean*
- *Our knowledge of marine debris*
- *Marine debris management of China Ocean NPO*



Brief introduction of Rendu Ocean

Rendu Ocean was founded in 2007, which promotes the protection of ocean environment.

In 2013, Rendu Ocean registered as a NPO and non-commercial enterprise.



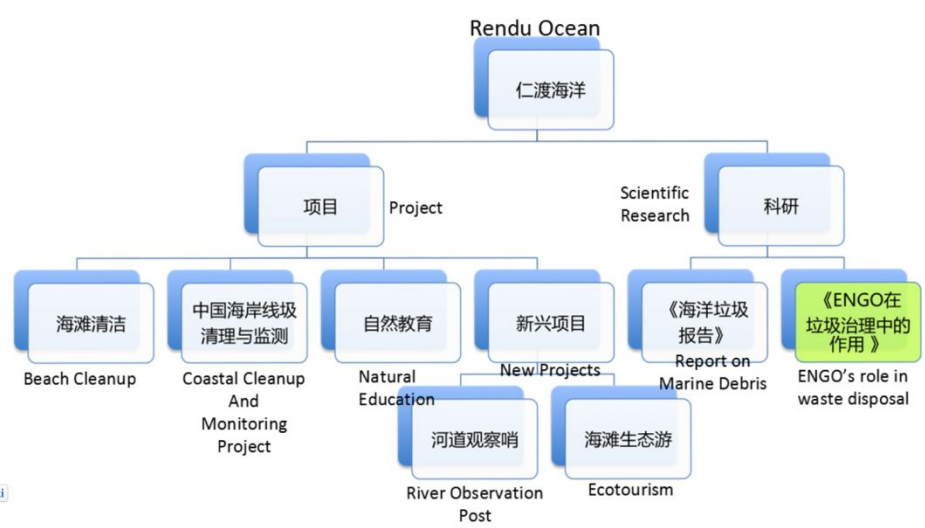
- 我们是: We are member of this Alliances -**
- 国际海滩清洁活动中国区协调人 / Chinese Coordinator of ICC (the International Coastal Cleanup)
 - Global Partnership on Marine waste (GPML)
 - CLEAN UP WORLD (CUW) 中国第一家会员单位 / the First member of CUW in China Mainland
 - 零碳正式成员 / China 0 waste Alliance
 - 全国青少年生态环保知识竞赛组委会 China Youth Roundtable environmental protection organization/Round table meeting of Chinese youth ecological environmental protection organization
 - 中国环保先锋行动网络 / Environmental Advocacy Network in China (EAC-CN)
 - 社会组织自律规范正式成员 / the Union of Self-Disciplinary Organizations (USDO)

In 2013, Rendu Ocean registered as a NPO and non-commercial enterprise.



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Business Framework

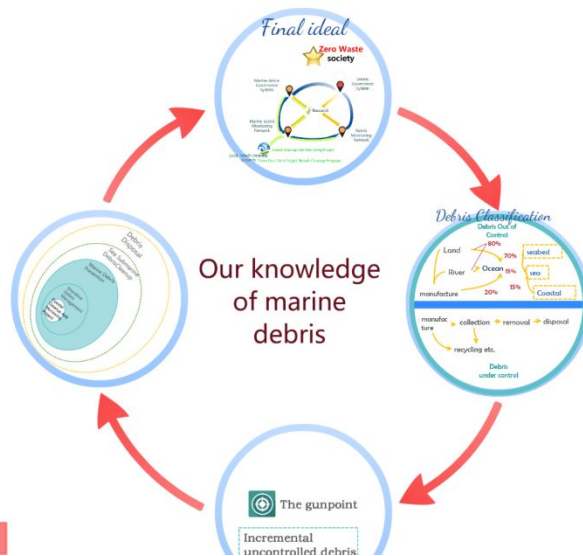




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- ❖ 社会组织自律吧正式成员 / the Union of Self-Disciplinary Organizations (USDO)

Our knowledge of marine debris



Final ideal

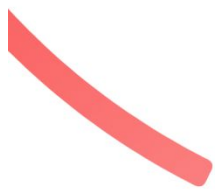


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Debris Classification



8

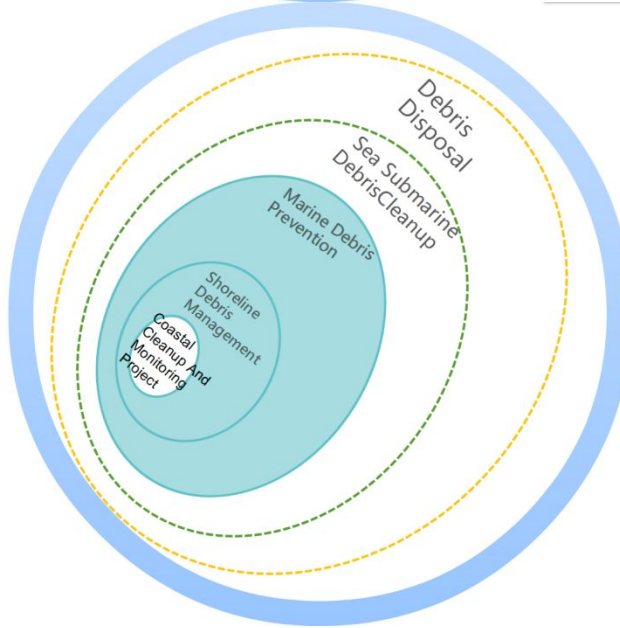


The gunpoint

Incremental uncontrolled debris

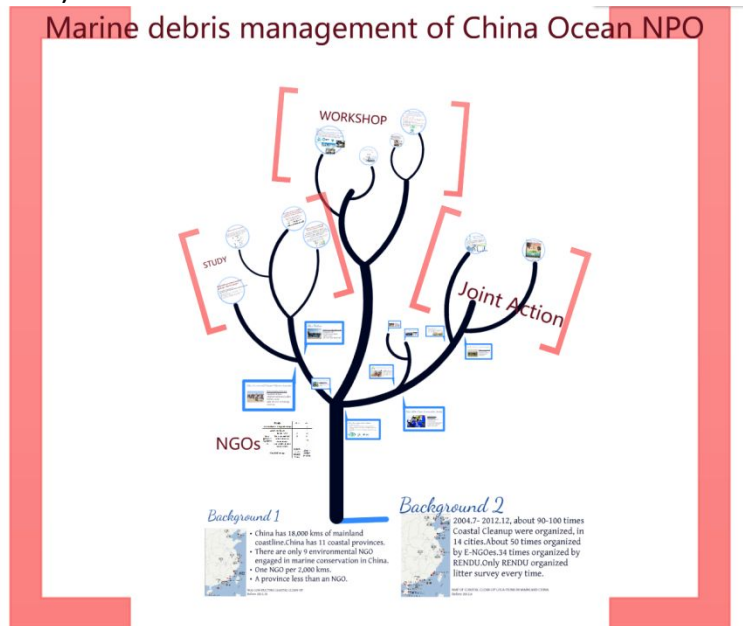


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Our k
of





Background 1



- China has 18,000 kms of mainland coastline. China has 11 coastal provinces.
- There are only 9 environmental NGO engaged in marine conservation in China.
- One NGO per 2,000 kms.
- A province less than an NGO.

NGO CON-DUCTING COASTAL CLEAN-UP Before 2012.10

Background 2



2004.7- 2012.12, about 90-100 times Coastal Cleanup were organized, in 14 cities. About 50 times organized by E-NGOs. 34 times organized by RENDU. Only RENDU organized litter survey every time.

MAP OF COASTAL CLEAN-UP LOCA-TIONS IN MAINLAND CHINA Before 2012.6



Joint Action



Coastal Cleanup And Monitoring Project


守护海岸线
Coastal Cleanup And Monitoring Project
中国海岸线垃圾清理与监测项目

- The project was co-founded by Mangrove Conservation Foundation(MCF) and Rendu Ocean in November 1, 2014.
- The project is to become the platform of cooperation in coastline waste issue.
- The project includes a resource integration platform and two activities (Beach Cleanup and Research and Monitoring).





920 Coastal Cleanup Locations in Mainland China



Total of 31 NGOs involved in the initiation Joint initiated by the MCF, Rendu Ocean, Shenzhen Blue Ocean



WORKSHOP



A first step toward a unified platform for communication and collaboration...

The 1st workshop on China's environmental NGOs role in marine litter issues, Shanghai(China), August 24.

Organized by CRAE financially supported by UNEP under a SSFA for a project "National Report of China's Environmental NGOs in Marine Litter Issues" and technically supported by Shanghai Rendu



"LET'S PROTECT OCEAN" R4WO SCIENTIFIC ROUNDTABLE

Time: 9:30-12:00 am August 10th
Venue: swissnex China conference room
(Room 2210, swissnex, Blog A, Xianxia Road 319)

held by swissnex China and the R4WO team

technically supported by Shanghai Rendu



2015 Cross-Straits Clean Ocean Movement

The first time strait engaged in marine protected NGOs gathered and discuss marine debris control.
30 mainland institutions, 16 Taiwanese organizations

Organized by The Society Of Wilderness and MCF financially supported by SEE technically supported by National Museum Of Marine Science&Technology and Shanghai Rendu



Human Ocean Sustainability—China Ocean Philanthropy Summit 2015

Think Globally, Act Locally – Strategy and Action for China Ocean Philanthropy

Venue: Haikou

Time : 3-4th december, 2015

Topic: marine pollution, marine ecological restoration and sustainable fisheries, comprehensive thoughts of marine environmental protection

Organized by Shanghai Rendu and China Blue financially supported by The David and Lucile Packard Foundation MCF Hainan Arilines technically supported by Hainan Selfish and Coral Conservation Association, Blue Ocean Protection Association, Hainan Biological Protection Association



STUDY

Report on MD in China 2015
The reaction report shows all kinds of information on the governance of marine waste by 2015. We try to provide a more complete collection of information for the public to focus on marine waste issues.

The Study of POPs in Seawater Based on the Monitoring of Plastic Resin Pellets on the Beach
This study is based on the monitoring of plastic resin pellets on the beach to study the distribution and migration of POPs in seawater.

Marine Environmental NGO Directory (version of 2014)
Integrate and publish information of current marine environmental nonprofits, as a guide to help the public understand and contact the organizations.

Intertidal zone miniature plastic garbage collection project
Time: August, 2014-January 2015
Sampling Location: Shanghai Nanhui Mouth Beach, Dalian
Organized by SOW
Financially supported by The National Geographic and Waku International Fund
Co-funder supported by Shanghai Kimba and SOW's Dalian Environmental Protection Volunteers Association



Intertidal zone miniature plastic garbage collection project

Time August 2014 January 2015

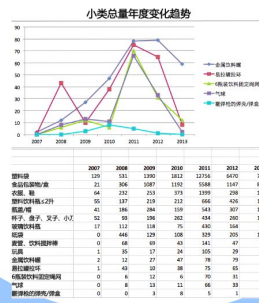
Sampling Location: Shanghai Nanhui Mouth Beach, Dalian

Organized by CRAES
 financially supported by The National Geographic Air and Water Conservation Fund
 Volunteer supported by Shanghai Rendu and DEPVA (Dalian Environmental Protection Volunteers Association)



Report on MD in China 2015

The reaction report China all kinds of information on the governance of marine waste by 2015. We try to provide a more complete compilation of information to the public to focus on marine waste issues.



The Study of POPs in Seawater-Based on the Monitoring of Plastic Resin Pellets on the Beach

Three times, 2014 March, June, September
 Sampling Location: Shanghai Nanhui Mouth Beach

financially supported by Global Village of Beijing
 technically supported by Hideshige Takada, Ph.D

Table 1. Analytical result of plastic resin pellets from Shanghai Rendu

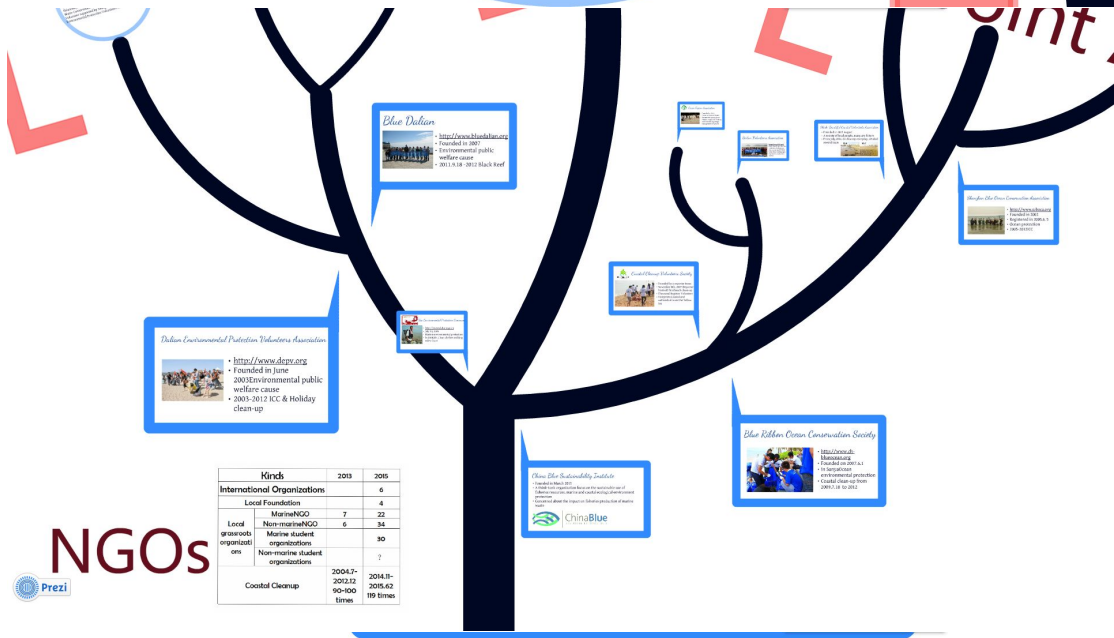
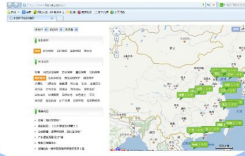
| Sample ID | POPs concentration (ng/g-pellet) | | | | | | | | | |
|-------------------|----------------------------------|-------|------|------|-------|------|------|------|------|-------|
| | Σ13 PCBs ^a | DDTs | | | | HCHs | | | | |
| | | DDT | DDD | DDE | Total | α | β | γ | δ | Total |
| 14042800 | 6.2 | 15.39 | 5.89 | 8.54 | 29.8 | 0.06 | 0.00 | 0.00 | 0.00 | 0.06 |
| Global Background | 10 | | | | 4 | | | | | 2 |



Marine Environmental NGO Directory (version of 2014)

Integrate and publish information of current marine environmental nonprofits. as a guide to help the public understand and contact the organizations.

financially supported by Global Greengrants Fund (GGF) technically supported by China Development Brief and He Yi Institute



NGOs

| Kinds | 2013 | 2015 |
|--------------------------------|----------------------------------|---------------------------|
| International Organizations | | 6 |
| Local Foundation | | 4 |
| Local grassroots organizations | MarineNGO | 7 |
| | Non-marineNGO | 6 |
| | Marine student organizations | |
| | Non-marine student organizations | |
| Coastal Cleanup | 2004.7-2012.12 90-100 times | 2014.11-2015.62 119 times |



NGOs

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Dalian Environmental Protection Volunteers Association



- <http://www.depv.org>
- Founded in June 2003 Environmental public welfare cause
- 2003-2012 ICC & Holiday clean-up



Blue Dalian



- <http://www.bluedalian.org>
- Founded in 2007
- Environmental public welfare cause
- 2011.9.18 -2012 Black Reef



Coastal Cleanup Volunteers Society



- Founded by a reporter team
- November 8th, 2007 (Reporter Festival) first beach clean-up
- Thousand Register Volunteer
- Footprints Coastal and wetlands all over the Yellow Sea



Beilun Volunteers Association



- <http://www.bl35.org/>
- Early March 2012 the first clean Beach (Chunxiao blue ocean sand Elf Hill)
- More than 35,000 people registered volunteersA GONGO



Green Fujian Association



- Founded in 2014
- Focus on Marine Waste
- ResourceMinjiang River estuary rough sea floating reed islands of garbage Management Practices

Shishi Beautiful Coastal Volunteets Association

- Founded in 2015 August
- A society of local people, many are fishers
- From July,2014, do cleanup everyday, divided several team



Shenzhen Blue Ocean Conservation Association



- <http://www.szboca.org>
- Founded in 2002
- Registered in 2005.6. 5
- Ocean protection
- 2005-2012ICC



Blue Ribbon Ocean Conservation Society



- <http://www.ch-blueocean.org>
- Founded on 2007.6.1
- in Sanya Ocean environmental protection
- Coastal clean-up from 2009.7.18 to 2012



China Blue Sustainability Institute

- Founded in March 2015
- A think-tank organization focus on the sustainable use of fisheries resources, marine and coastal ecological environment protection
- Concerned about the impact on fisheries production of marine waste



ChinaBlue
SUSTAINABILITYINSTITUTE





Sea Environmental Protection Community



- <http://www.dahai.ngo.cn>
- July 11, 2005
- Marine environmental protection
- In 2000, Mr. Clean clothes walking miles Coast



联系我们 Contact Us

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网址: www.jingtan.org Website: www.jingtan.org

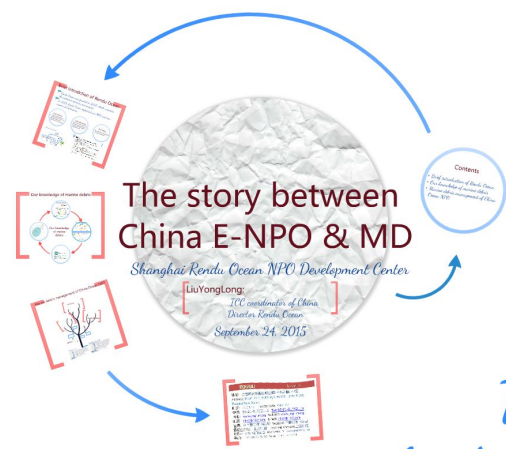
邮箱: rd-sh@163.com E-mail: rd-sh@163.com

官微: @上海仁渡 (新浪) Weibo: @上海仁渡 (Sina)

微信公共号: 上海仁渡 WeChat Account: 上海仁渡

联系人: 茹懿 (助理主任) LINKMAN: Ru Yi (Assistant Director)

手机: 159 0076 4240 Mobile: 159 0076 4240



Thanks for listening!




**EFFORTS AND ACTIVITIES RELATED
TO 2011 TSUNAMI DEBRIS**

NOWPAP ICC-WS
2015/09/23-24

JEAN
Hanako Yokota

Details of Presentation

- Correspondence
- Projects done in Canada by JLP and IVUSA
- Results from exchanging information in between NGO
- Role of ICC



Tohoku Japan Disaster Site



1. Correspondence (1)

- 2011 March 11 Great East Japan earthquake triggered a massive Tsunami
- In May 2011 with request from JEAN, the Liberal Democratic Party hosted a special committee for problems of driftage items due to Tsunami.
- From spring of 2012, with the support of the Ministry of Environment of Japan, we started the research with cooperation of NGO/NPO both in Canada and United States.

Goal for the research and communication;

- 1) To understand the driftage situation of Canada and United States, and by using the information to assist with Japans correspondence.
- 2) To further develop and strengthen the network in between NGO.
- 3) To share the information with general public.

1. Correspondence(2)

- August 2012 Portland, Oregon. U.S.A.
Information exchange, beach survey
- January- March 2013 Hawaii, Oregon. U.S.A.
Information exchange, beach survey
Forum in Sendai (Disaster Struck area)



1. Correspondence (3)

- June 2013 Alaska. U.S.A.
Information exchange with NGO from Alaska.
Beach Survey
- September 2013 British Columbia Canada, Washington. U.S.A
Information exchange with NGO from BC and Washington.
Beach Survey



Canada Great Canadian Shoreline Clean Up

1. Correspondence (4)

- October 2014 Vancouver, Canada
Information exchange with NGO/NPO from Canada and USA
Hosted a forum at Vancouver Aquarium
- November 2014 Tokyo, Natori, Miyagi Prefecture, Japan
Information exchange with NGO/NPO
Forum in Natori city

2. Clean Up Projects done by JLP and IVUSA in Canada

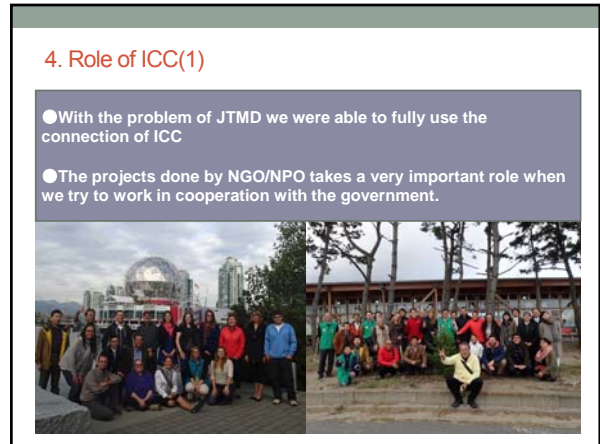
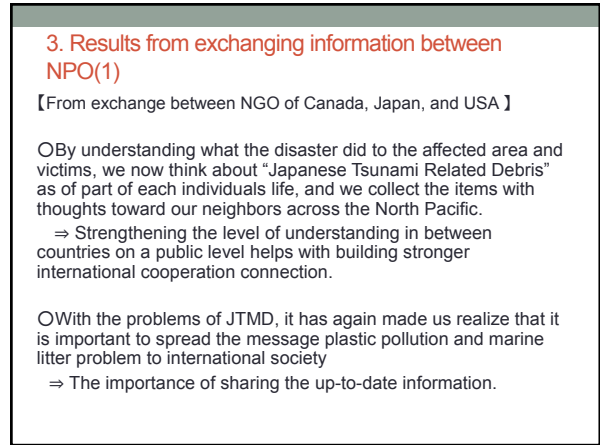
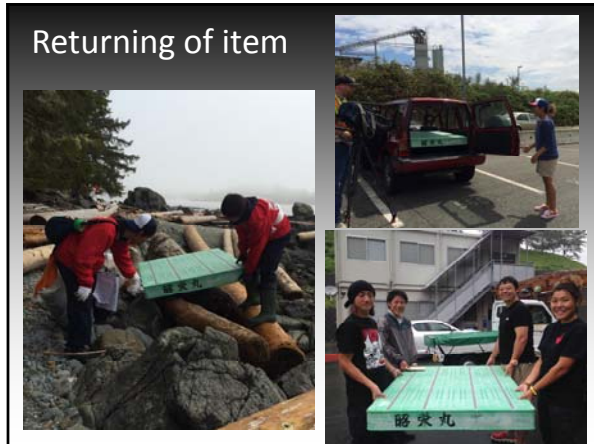
- JLP : Japan Love Project
- 2 Clean ups in March and May of 2013
- Objective: to show appreciation to the help offered during disaster
- Team members: Japanese students, working holiday from Japan

JLP Project 2013

2. Clean Up Projects done by JLP and IVUSA in Canada

- IVUSA :
- International Volunteer University Student Association
- 5 day clean up in March 2014
- 70 students from Japan
- 6 ton of debris

IVUSA clean up March 2014



4. Roles of ICC(2)

- We need International Cooperation to correspond to the problem of marine litter.

- We realized the importance of ICC network if we wanted to strengthen the International Cooperation, clean up projects, education of prevention and environment.



Northwest Pacific Regional Node of GPML

Takafumi YOSHIDA
NOWPAP CEARAC
24 September 2015, Yantai, China
Joint TEMM-NOWPAP Workshop on Marine Litter Management

Northwest Pacific Regional Node of Global Partnership on Marine Litter




(http://www.npec.or.jp/NWPacific_node)

*GPML is one of three global multi-stakeholder partnerships of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA)

Objectives of NW Pacific Regional Node

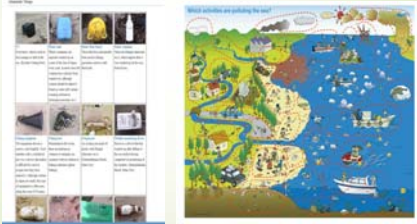
- To enhance awareness of marine litter prevention actions at the national, local and grass-root levels
- To strengthen exchange information on best practices and measures for prevention of marine litter input among the NOWPAP member states and beyond through Global Partnership on Marine Litter (GPML*)
- To enhance knowledge of GPML among local governments, NGOs/NPOs and local people in NOWPAP countries

NW Pacific Regional Node in 4 languages



Contents of NW Pacific Regional Node:

- Basic information on marine litter
 - What is marine litter?
 - Marine litter found on beaches
 - Sources of marine litter input



Video clips on marine litter

Situation of marine litter on sea bed of coastal area of Toyama



Contents of NW Pacific Regional Node

- Survey data on marine litter on beaches in the NOWPAP member states

Characteristic of marine litter in the NOWPAP member states

China Japan Korea Russia

Survey sites in 2012

Survey method

Manual for survey

Data sheet

Contents of NW Pacific Regional Node

- Public awareness

New contents: Microplastic

Microplastic is plastic particles with an upper size limit of 5mm

Impacts of microplastics

- Absorption of toxic pollutant
- Bioaccumulation

UNEP Year Book 2014

Partnership with International Pellet Watch

(URL: <http://www.pelletwatch.org/>)

Partnership with project "Effects of marine debris caused by the great tsunami of 2011"

(URL: <http://nilim-camera.eco.coocan.jp>)



Information on actions by central government, local governments and other entities

- Updating of information on various kind of activities against marine litter conducted by central government, local governments and other entities in Japan
- Translation of report published by Ministry of Environment Japan into English

In the 2016-2017 biennium, information of China, Korea and Russia will be added to the NW Pacific Regional Node

**RESULTS OF ICC
CAMPAIGNS IN THE
RUSSIAN FAR EAST AND
PREPARATION FOR THE
2016 NOWPAP ICC**

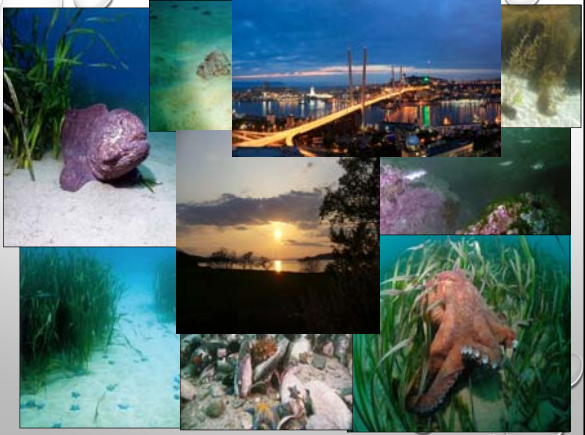
BLINOVSKAYA YANA
MARITIME STATE UNIVERSITY NAMED AFTER ADMIRAL G. I. NEVSKOY,
VLADIVOSTOK, RUSSIA

YANTAI, 2015

**PRESERVATION OF THE ENVIRONMENT IS
BECOMING AN OVERRIDING PRIORITY
FOR MANY AREAS AND NATIONS**



**ONCE YOU GOT IN THE MORNING,
WASHED AND TIDIED YOURSELF UP –
SWEEP UP A MESS ON YOUR PLANET**



MARINE LITTER PROBLEM



**SOCIAL PROGRAMMES AND PROJECTS
FACILITATING ENVIRONMENTAL EDUCATION
AND RAISING PUBLIC AWARENESS**



PILOT ICC CAMPAIGN IN RUSSIA, OCTOBER, 2007

Морская экология - 2007
3 - 8 октября
Владивосток, Россия

СВИДЕТЕЛЬСТВО
This is to certify that
Steve Raaymakers
took part in International Coastal Cleanup carried out on the 2nd of October, 2007 in All-Russian Children center "Ocean"

International Coast Cleanup
2 October 2007

INTERNATIONAL COASTAL CLEANUP DATA CARD

NOWPAP ICC IN VLADIVOSTOK, SEPTEMBER, 2008

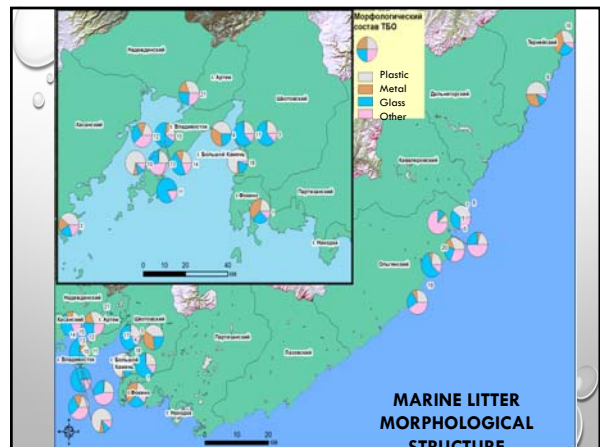
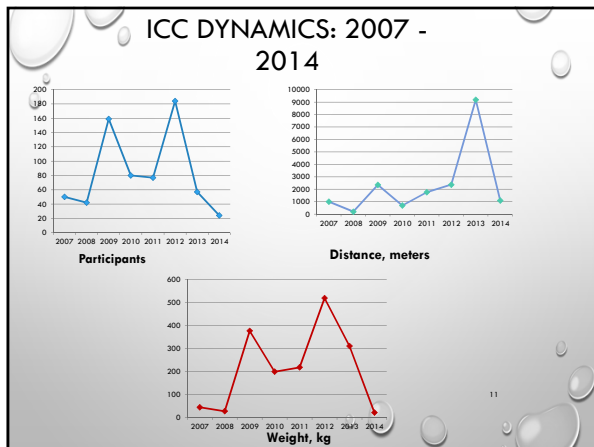
- 42 PARTICIPANTS;
- 27,7 KG MARINE LITTER;
- 200 M COASTAL CLEANUP.

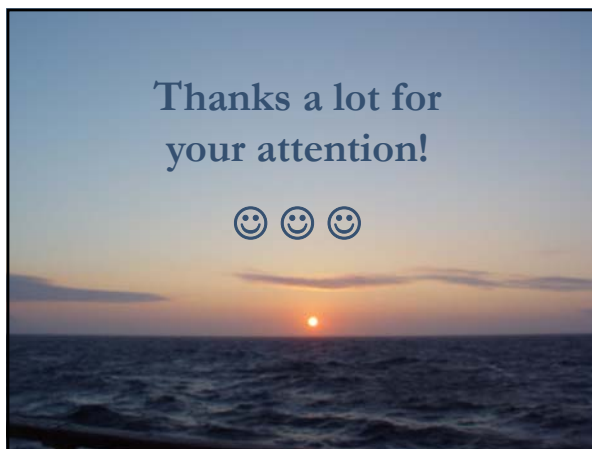
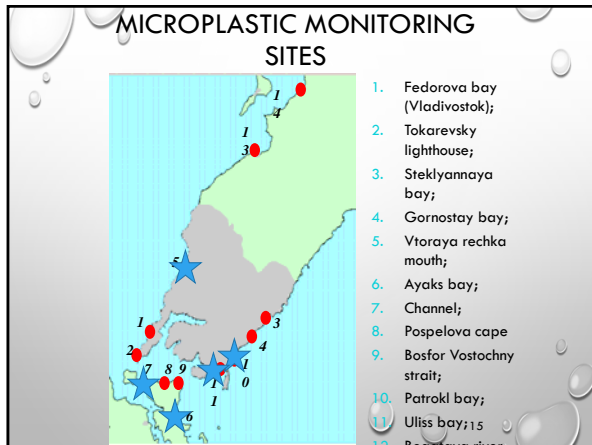
NOWPAP ICC IN VLADIVOSTOK, JULY, 2012

- 51 PARTICIPANTS;
- 26,6 KG MARINE LITTER;
- 1000 M COASTAL CLEANUP.

ICC SITES IN PRIMORYE

1. Fedorova bay (Vladivostok);
2. Peschany peninsula;
3. Baklan bay;
4. Slavyanka bay;
5. Olga bay;
6. Ugolny gulf;
7. Amursky gulf (Tavrichanka);
8. Plastun bay;
9. Vladimir gulf;
10. Lidovka (Dalnegorsk);
11. Traitsu bay;
12. Tabunaya bay;
13. Expedition bay;
14. Popov island;
15. Rusky island;
16. Navgorodskaya bay (Posiet);
17. Boisman bay;
18. Nakhodka gulf;
19. Kraskino






Coordinating Body on the Seas of East Asia (COBSEA)

Updates and Initiatives

NOWPAP International Coastal Cleanup and Workshop
24-25 September 2015, Yantai, China


COBSEA
 Coordinating Body for the Seas of East Asia
 www.cobsea.org

Coordinating Body on the Seas of East Asia (COBSEA)

- One of 17 UNEP Regional Seas Programmes (RSPs) for the East Asian Seas Region 140 Countries
- RSPs include 14 Conventions and 3 Action Plans covering 140 countries










COBSEA
 Coordinating Body for the Seas of East Asia
 www.cobsea.org

Coordinating Body on the Seas of East Asia (COBSEA)

- UN lead agency for marine environmental matters in East Asia, responsible for coordinating the activities of governments, NGOs, UN and donor agencies, and individuals on marine environment
- COBSEA Mandate: To coordinate activities implementing the East Asian Seas Action Plan
- Secretariat (EAS/RCU) based in Bangkok


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COBSEA Updates

22nd Intergovernmental Meeting (IGM)
April 2015, Bangkok


- Trust Fund contributions – Increased 😊
- Secretariat hosting - Thailand




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COBSEA Updates

- Recruitment of COBSEA Coordinator – early 2016
- Recruitment of COBSEA consultant to develop strategic direction, financial scenarios, resource mobilization strategy – ongoing
- Development of GEF South China Sea SAP Implementation Project – PPG ongoing
- 2nd Extraordinary IGM in March/April 2016


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COBSEA Regional Initiatives

- Sida Spatial Planning in the Coastal Zone – Disaster Prevention and Sustainable Development
- Yeosu Addressing the Challenge of Sea-Level Rise and Coastal Erosion in the East Asian Seas – Initial Implementation of COBSEA Regional Strategy
- MFF Protecting Marine Ecosystems in MFF Countries Using the Green Fins Approach
- MFF Strengthening the Resilience of Coastal Communities, Ecosystems and Economies to Sea-Level Rise and Coastal Erosion
- MFF Mapping and Enhancing Natural Resource Governance in Small Island Communities


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Sida Coastal Spatial Planning Project

- Focused on spatial planning in the coastal zone - integration of new concepts to existing systems
- **Goal** - To prevent or reduce impacts from natural disasters, climate change and sea-level rise
- Implemented in 3 phases from 2010 to 2013 with budget of 1.29 M USD
- Participating countries: Cambodia, China, Indonesia, Philippines, Thailand and Vietnam



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Sida Coastal Spatial Planning Project

Phase 1 – Develop Regional Resource document – *Spatial Planning in the Coastal Zone of the EAS Region: Integrating Emerging Issues and Modern Management Approaches* and the “Training/ Capacity Building Menu” (Oct. 2011)

Phase 2 – National consultation meetings on capacity-building needs (November-December, 2011)

Phase 3 – Implementation of capacity building and adaptation activities



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Yeosu Coastal Erosion Project

- **Goal** – To build capacity in COBSEA developing countries in order to strengthen the sustainability, resilience and wise management of threatened coastal resources and associated ecosystems
- Focused on the initial implementation of the COBSEA Regional Programme on Coastal Erosion
- Implemented in 3 phases from 2012 to 2013 with budget of 400,000 USD
- Participating countries: Cambodia, Indonesia, Malaysia, Philippines, Thailand and Vietnam



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Yeosu Coastal Erosion Project

Phase 1: producing an assessment of national and sub national settings related to coastal erosion (situation analysis, mapping and assessment of current & planned interventions, assessment of gaps & needs)

Phase 2: National consultations, identification and prioritization of possible interventions

Phase 3: Producing a 'national roadmap' for addressing coastal erosion



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MFF Green Fins Project

- Implemented from 2013 to 2014 with budget of 250,000 USD including co-financing
- Regional Partner: Reef-World Foundation
- Participating countries: Maldives and Vietnam
- **Goal** – To strengthen the conservation, sustainability and wise management of coral reefs and associated coastal ecosystems by encouraging environmentally responsible diving tourism through implementation of the Green Fins approach.
- **Green Fins Approach** – promotes private sector compliance with a code of conduct and assessment system, raise awareness among regulators, diving companies and customers, and develops and strengthen regulatory framework implementation.









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Project Activities and Outputs

- ‘Situation analysis’ of the diving industry and its impacts on coral reefs and local communities and assessment survey of environmental policies or standards for the diving and snorkelling industry including identifying gaps and needs and potential Green Fins National Teams
- National level multi-stakeholder consultations to introduce and implement the Green Fins approach including establishment and capacity development of Green Fins National Teams



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Project Activities and Outputs

- Implementation of activities using the Green Fins approach including integration of the Green Fins approach in existing processes and approaches to national marine environmental laws and regulations governing tourism industries.








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MFF Coastal Erosion Project

- Two-year project – January 2013-December 2014
- Total budget – USD 440,000 including co-financing
- Participating countries: Pakistan and Thailand
- Partners: Ministry of Climate Change (Pakistan), Department of Marine and Coastal Resources (Thailand), MFF NCB Pakistan and Thailand, other relevant national and sub-national authorities
- Goal - To strengthen through needs-based interventions, the resilience of coastal communities, economies and ecosystems to the adverse impacts of sea-level rise and coastal erosion in Pakistan and Thailand

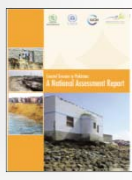






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Project Activities and Outputs

- Analysis and assessment on coastal ecosystem vulnerabilities to coastal erosion and sea-level rise including review of policies and legislations and structures and work on coastal erosion and priority gaps and needs for addressing coastal erosion
- Conduct national consultation meetings to discuss and agree on assessment reports and menu of pilot interventions

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Project Activities and Outputs

- Design and implement pilot interventions for addressing coastal erosion, and distill, document and disseminate lessons learned and best practices from the project






Results/Outcomes

- Knowledge and capacity on vulnerability and resilience of coastal ecosystems and communities to sea-level rise and coastal erosion are enhanced and strengthened



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MFF Natural Resources Governance Project


- Two-year project – January 2013-December 2014
- Total budget – USD 278,000 including co-financing
- Participating countries: Maldives, Seychelles, Thailand and Sri Lanka
- Partners: United Nations Development Programme (UNDP) Maldives, the Seychelles National Parks, IUCN Sri Lanka, and IUCN Thailand, other relevant national and sub-national authorities
- **Goal** - To enable and support natural resource governance on small islands that integrates and builds on the respective strengths of local and community-based management as well as national policy and legal frameworks at different levels.


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Project Activities and Outputs

- Conduct national review and stakeholder consultation on natural resource governance frameworks including opportunities for specific natural resource governance reform, and capacity needs assessment focusing on communities and local government.
- Develop resource toolkit for community involvement in natural resource governance in small islands.





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Project Activities and Outputs

- Organize capacity building and pilot-scale demonstration interventions for small island natural resource governance reform.
- Produce communication materials that synthesize project lessons and outputs.

Results/Outcomes


- Enhanced knowledge and understanding on national/sub-national frameworks for natural resources governance
- Increased community participation in natural resources governance

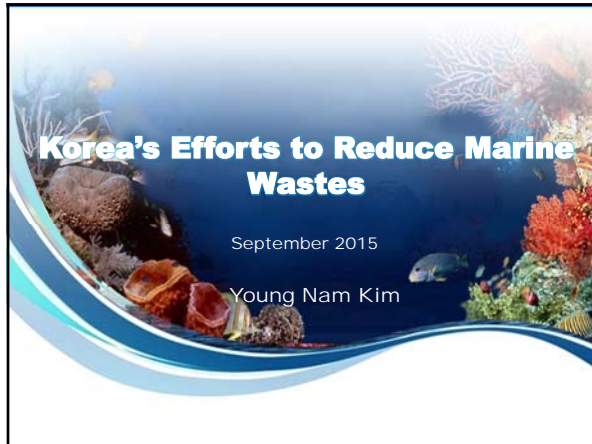



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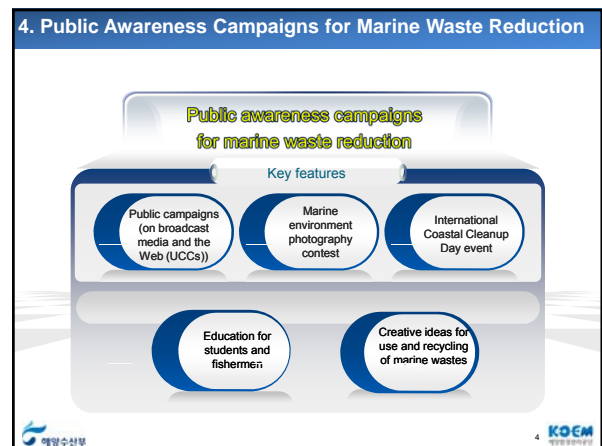
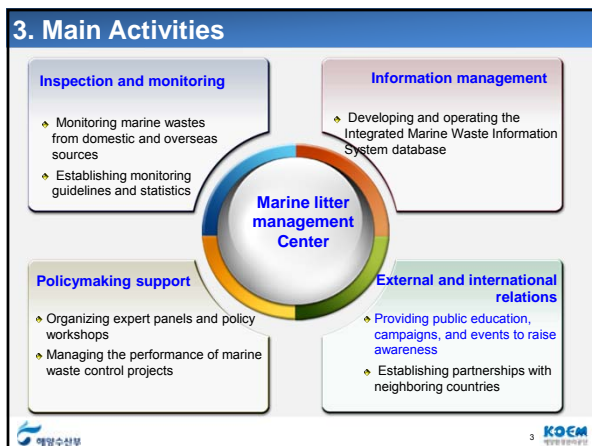
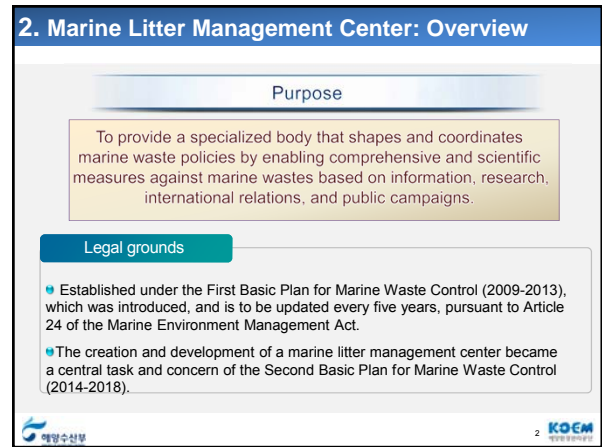
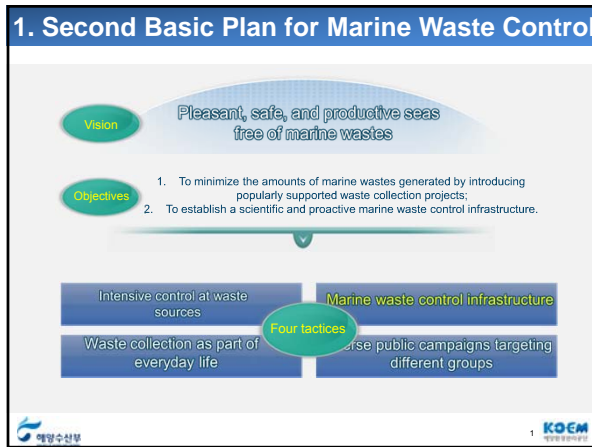
THANK YOU


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Contents

- 1 Second Basic Plan for Marine Waste Control
- 2 Marine Waste Control Center: Overview
- 3 Main Activities
- 4 Public Awareness Campaigns for Marine Waste Reduction
- 5 Progress



5. Progress

1 Nationwide public campaigns (on broadcast media and the Web (UCCs))

- To raise public awareness of marine waste reduction efforts through mass media.
- Period/chosen medium: every July and August, KBS

※ Public campaigns will be held on the KTX and subways as well.

| | |
|-----------------------|---|
| Public campaign image | UCC against marine disposal of plastics |
| | |

5 KOEM

5. Progress

2 Marine Environment Photography Contests

- Topics: photographs showing pollution caused by marine wastes, abundance of marine resources, and themes promoting environmental awareness.
- Eligible participants: elementary, middle, and high school students and adults
- Number of entries: 3,825 in 2015, 1,406 in 2014, 798 in 2013, and 1,610 in 2012.
- Exhibitions: at five train stations, including Seoul Station, coastal passenger terminals, and the Korea National Maritime Museum

| | | |
|---------------------|---------------------|------------|
| Award-winning entry | Award-winning entry | Exhibition |
| | | |

6 KOEM

5. Progress

3 Marine waste reduction education for students and fishermen

- Practical education and training, targeting students and fishermen, on marine pollution reduction
 - ⇒ Raising awareness of marine pollution and minimizing marine wastes.
- Targets: students and fishermen
- Features
 - Developing learning materials catering to different groups of students and fishermen.
 - Organizing workshops for school teachers and NGO activists.
 - Providing lectures on marine waste control and organizing excursions and field trips for cleaning up marine wastes.

| | | |
|-------------------|---------|------------|
| Learning material | Lecture | Field trip |
| | | |

7 KOEM

5. Progress

4 Support for marine environment preservation activities of NGOs

- Active support for NGOs engaging in activities for the preservation of marine environments on International Coastal Cleanup Day and the Day of Seas
- Targets/budget: voluntary groups that monitor and clean up marine wastes / up to KRW 10 million per group per year.
- Activities
 - Monitoring marine wastes at 40 locations nationwide.
 - Cleanup of marine environments by voluntary groups on International Coastal Cleanup Day and the Day of Seas.

| | |
|------------------------------------|-----------------------------------|
| Monitor and Clean up Marine Wastes | International Coastal Cleanup Day |
| | |

8 KOEM

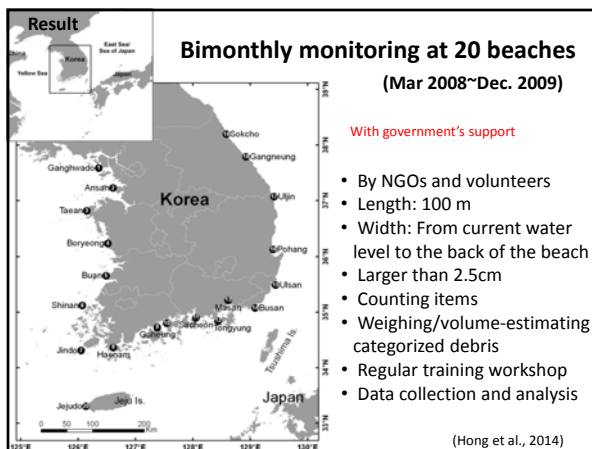
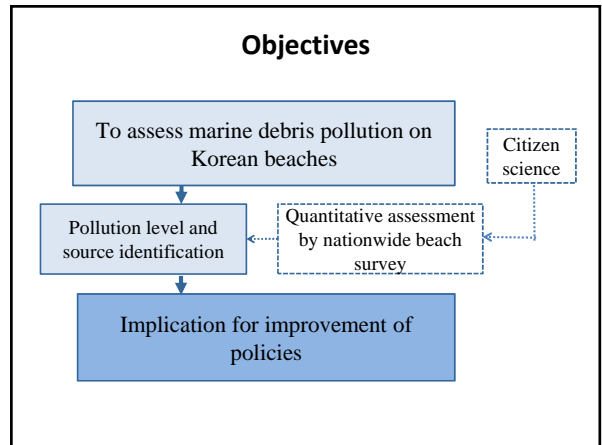
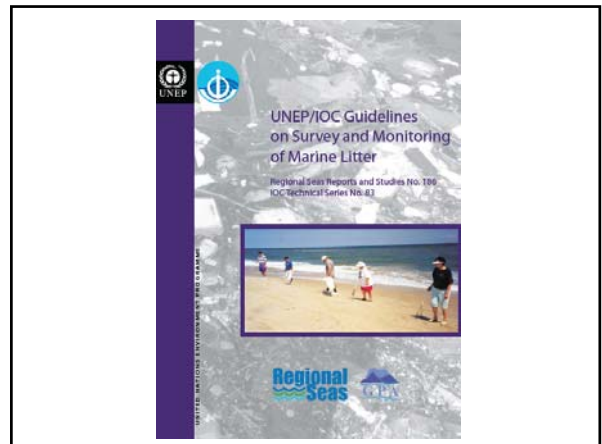
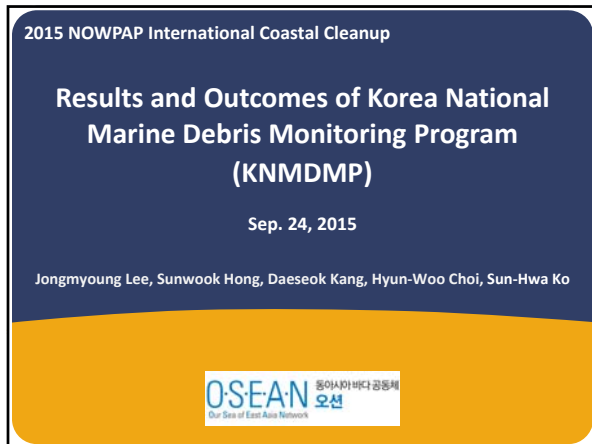
5. Progress

5 Marine Waste Upcycling Festival

- Raising public awareness of marine wastes through various performances and exhibitions of artworks based on marine wastes.
 - Upcycling: Creative recycling of waste materials by turning them into new materials or products based on creative ideas and designs.
- Date and location: July 31 to August 2, 2015, at Yeosu World Expo 2012 Foundation
- Features
 - Exhibition and sale of diverse artworks based on marine waste-related themes
 - Exhibitions and events related to products of businesses that produce goods using marine wastes
 - Concerts and fashion shows featuring musical instruments and garments made with marine wastes

| | |
|----------------------|--------------------------|
| Upcycling Exhibition | Concert and fashion show |
| | |

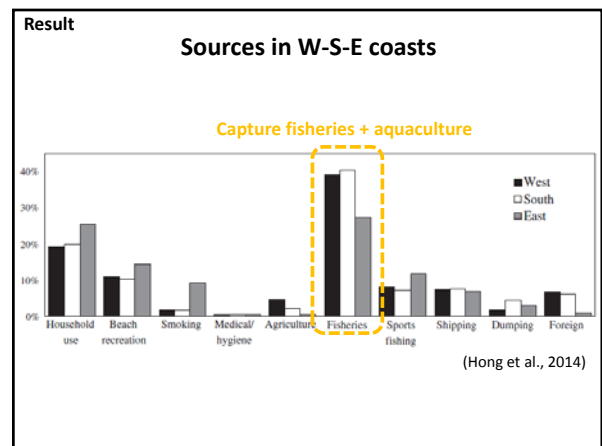
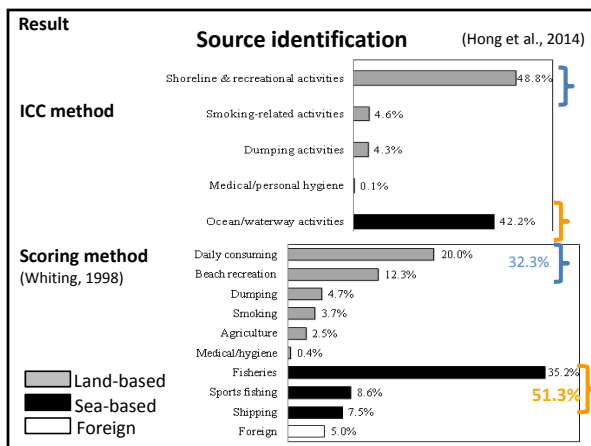
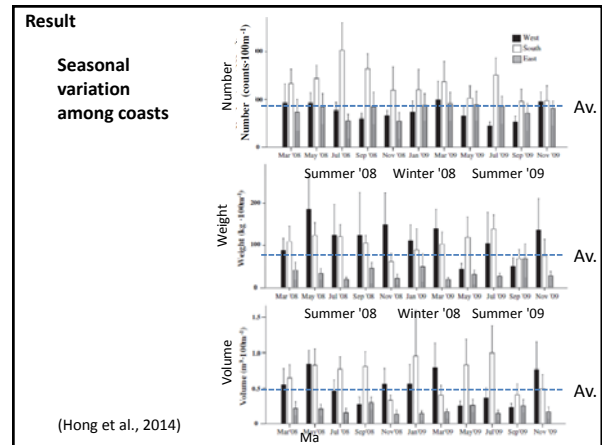
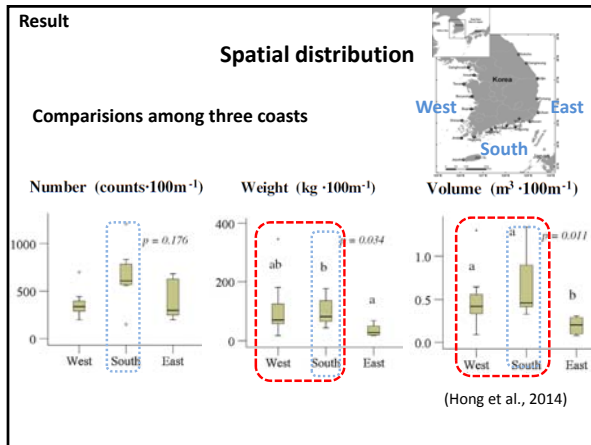
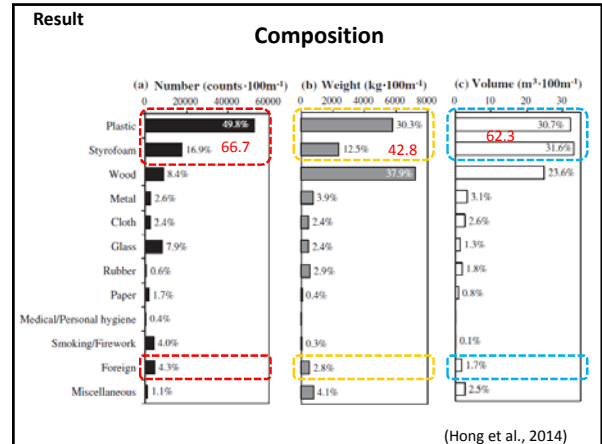
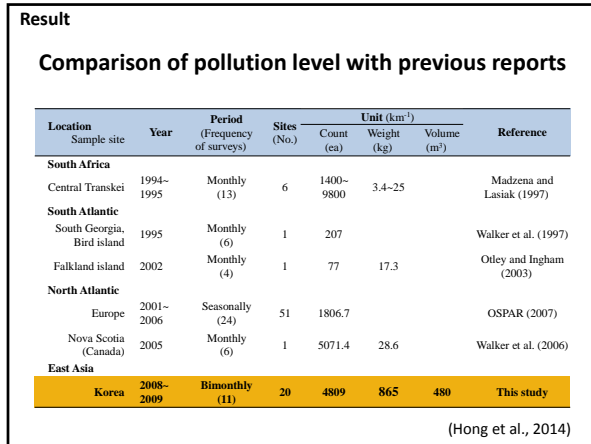
9 KOEM



Result

| Site No. | Coast | Land use type | Average quantity Unit/100m/2month | | | | | |
|-----------|-------|---------------|-----------------------------------|-------------|-------------|------------|-------------|-------------|
| | | | Av | SE | Av. | SE | Av. | SE |
| 1 | | Rural | 700.2 | 146.1 | 58.8 | 13.3 | 0.42 | 0.13 |
| 2 | | Rural | 337.4 | 48.9 | 17.9 | 4.2 | 0.09 | 0.02 |
| 3 | | Tourist | 307.9 | 68.5 | 58.5 | 27.3 | 0.27 | 0.11 |
| 4 | West | Island | 269.5 | 35.9 | 71.3 | 15.3 | 0.40 | 0.08 |
| 5 | | Tourist | 443.1 | 94.4 | 180.5 | 60.2 | 1.30 | 0.31 |
| 6 | | Island | 198.1 | 36.6 | 71.0 | 17.0 | 0.47 | 0.09 |
| 7 | | Island | 345.1 | 59.0 | 345.8 | 71.0 | 0.64 | 0.11 |
| 8 | | Rural | 150.0 | 19.4 | 44.1 | 9.3 | 0.33 | 0.11 |
| 9 | | Rural | 557.9 | 83.7 | 159.5 | 30.6 | 0.61 | 0.14 |
| 10 | South | Rural | 607.8 | 111.9 | 176.4 | 29.9 | 1.18 | 0.21 |
| 11 | | Island | 579.5 | 153.3 | 82.7 | 13.2 | 0.43 | 0.10 |
| 12 | | Urban | 832.1 | 99.7 | 56.6 | 7.7 | 0.40 | 0.06 |
| 13 | | Urban | 1206.8 | 136.7 | 76.1 | 14.9 | 0.46 | 0.09 |
| 14 | | Urban | 299.7 | 55.3 | 18.3 | 5.3 | 0.10 | 0.02 |
| 15 | | Urban | 248.3 | 36.8 | 24.5 | 7.2 | 0.17 | 0.05 |
| 16 | East | Tourist | 625.9 | 67.6 | 50.6 | 8.6 | 0.31 | 0.06 |
| 17 | | Tourist | 198.3 | 48.5 | 19.9 | 6.1 | 0.08 | 0.02 |
| 18 | | Tourist | 294.3 | 37.6 | 32.0 | 6.7 | 0.24 | 0.05 |
| 19 | | Urban | 682.3 | 84.7 | 69.0 | 23.1 | 0.29 | 0.03 |
| 20 | South | Island | 433.8 | 102.0 | 145.6 | 35.4 | 1.34 | 0.44 |
| Av | | | 480.9 | 19.4 | 86.5 | 4.5 | 0.48 | 0.03 |

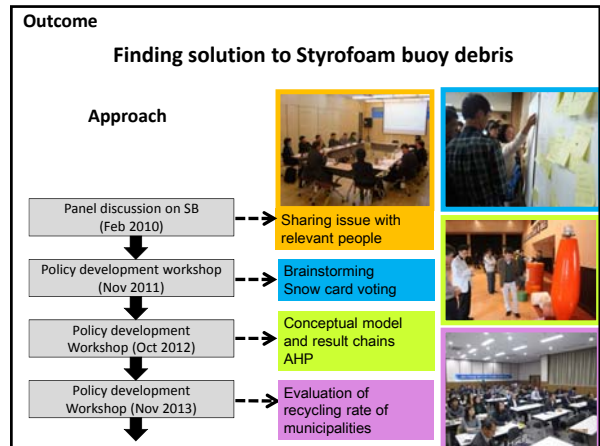
(Hong et al., 2014)



Result

Top 10 items in number (Hong et al., 2014)

| Rank | Items | Count | % |
|-----------------|--|----------------|--------------|
| 1 | Aquaculture + Styrofoam buoys | 13,588 | 12.8 |
| 2 | capture fisheries Fishing ropes | 8,703 | 8.2 |
| 3 | Beverage bottles (glass) | 7,326 | 6.9 |
| 4 | Plastic bags | 6,974 | 6.6 |
| 5 | Plastic food wrappers | 6,819 | 6.4 |
| 6 | Plastic caps, lids | 5,176 | 4.9 |
| 7 | Beverage bottles (plastic) | 5,065 | 4.8 |
| 8 | Plastic strapping bands | 4,737 | 4.5 |
| 9 | Miscellaneous plastic items | 4,223 | 4.0 |
| 10 | Timber (for ships, aquaculture facilities) | 3,676 | 3.5 |
| Subtotal | | 66,287 | 62.7 |
| Total | | 105,797 | 100.0 |

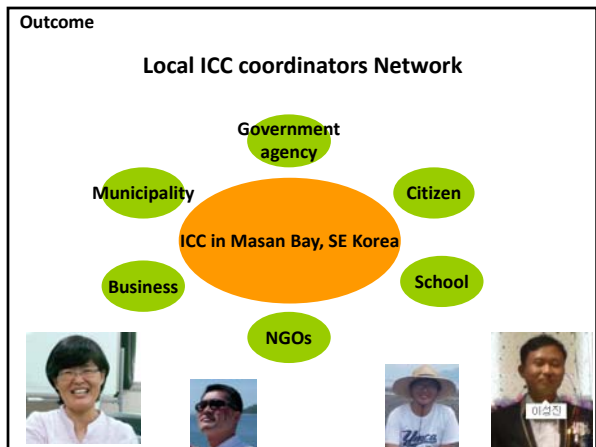
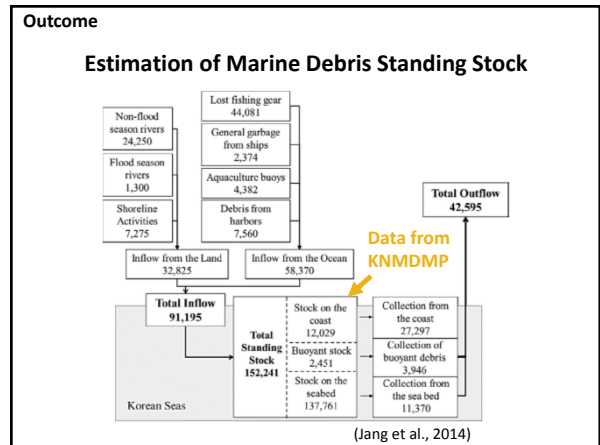


Outcome

Strategies and potential actions on Styrofoam buoys issue

| Cause | Strategy | Potential action |
|-------------------------------------|---|---|
| Unintended loss of buoys in use | Reducing overuse of buoys in aquaculture | Developing alternative techniques for sustainable aquaculture using less an buoys Regulating illegal uses outside the permitted culture areas Gear marking of buoys in use |
| | Exchanging into durable buoys | Developing new buoys in alternative materials Continuing the government funding program on the use of 09s Economic incentive (i.e. subsidy) for exchange into new durable buoys |
| | Improvement of buoys maintenance | Developing onboard technology not to lose in poor weather conditions |
| Intended discard of buoys after use | Preventing gear conflicts | MOU among fishing communities Avoiding gear conflict with fishing license systems Educating fishermen to avoid gear conflicts |
| | Education and outreach | Research on Styrofoam buoys pollution and its impacts Incentives for encouraging user's retrieval |
| Difficulties to collect and recycle | Research on Styrofoam buoys pollution and its impacts | |
| | Incentives for encouraging user's retrieval | |
| Difficulties to collect and recycle | Development of efficient cleanup technologies | |
| | Support for cleanups | |
| Difficulties to collect and recycle | Incentives for recycling of buoys | |
| | | |

References: Jang et al. (2013), Hong et al. (2014), Lee et al. (2013), Lee et al. (2015)



www.osean.net

Conclusion


- ❖ First result on pollution level and sources of marine debris on the beaches at national level, providing quantitative baseline of pollution level by marine debris in number, weight, and volume
- ❖ Management policies should focus on marine debris from ocean/waterway activities, especially aquaculture (buoys, ropes etc).
- ❖ Possibility of use as an indicator to monitor effectiveness of policies through long-term monitoring

20

Conclusion

- ❖ KNMDMP has promoted local NGOs involvement in marine debris issues.
- ❖ KNMDMP site captains are functioning as local coordinators of ICC Korea.
- ❖ NGO leaders organizing public awareness programs in their region.
 - Local marine debris monitoring programs
 - Outreach to fishermen and students

UNEP recognizes "Citizen Science" as an emerging issues

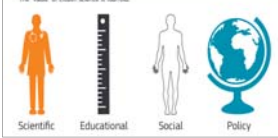


UNEP Year Book 2014 emerging issues update
Realizing the Potential of Citizen Science

European Commission emphasizes the value of "Citizen Science".

What is the value of citizen science?

The "value" of citizen science is fourfold:



Scientific Educational Social Policy

KNMDMP is a model case of Citizen Science to contribute to the Marine Debris Solution!

We greatly appreciate all the volunteers of KNMDMP!



Thank you very much for listening!

 Maritime State University named after Admiral G. Nevelskoy 
Institute of Sea Protection and Shelf Development



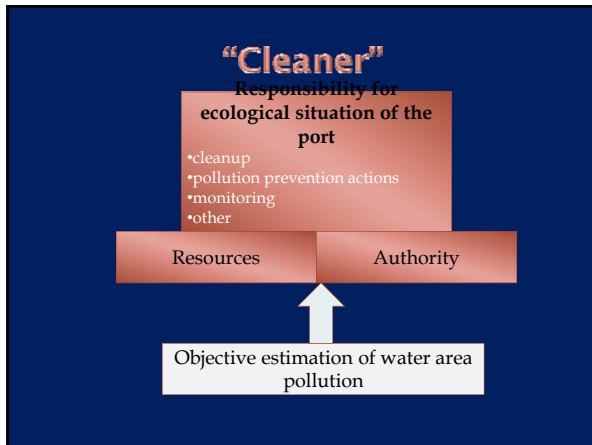
Development of marine litter monitoring system

Sergey Moninets
Yantai 2015 moninets@msun.ru

Port Vladivostok water Area

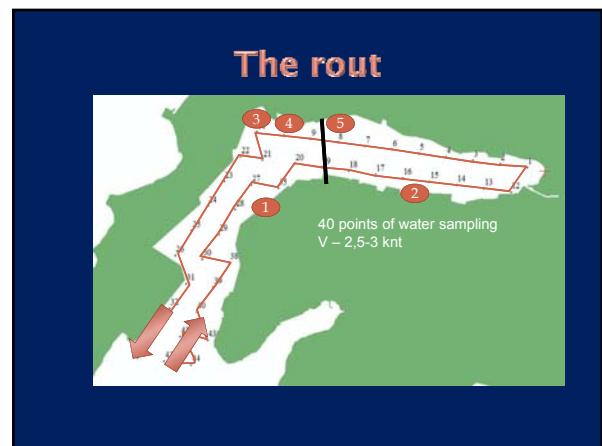
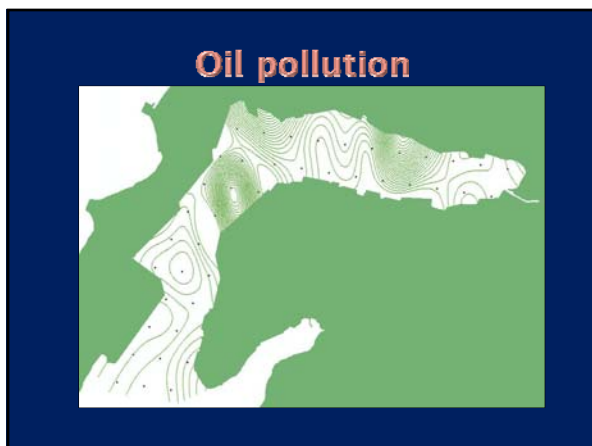
The main causes of inefficient cleaning system:

- Concentration of industry and population
- Lack of sewage treatment facilities
- A lot of water users on the port water area
- Inadequate legislation



The tasks of methodology for ecological situation estimation

- Estimate the common value of floating marine litter on the port water area
- Determine the qualitative composition of the litter
- Estimate the oil pollution
- Approximately determine pollution sources.



Equipment



Sony Cyber-shot DSC-H20
10.10 MP, 10x zoom
Carl Zeiss Vario-Tessar



Sony DCR-SX60E
4MP, 60x zoom
Carl Zeiss Vario-Tessar




ASUS MyPal A639
Swivel GPS Patch Antenna





7


Floating ML




Area 3. Uncertain detection of litter

Area 2. The possibility of concentration and composition estimating is limited

Area 1. the image quality is high and allows to identify the most part of pollution fragments





Area 3




Area 2


Area 1

Photo and Video

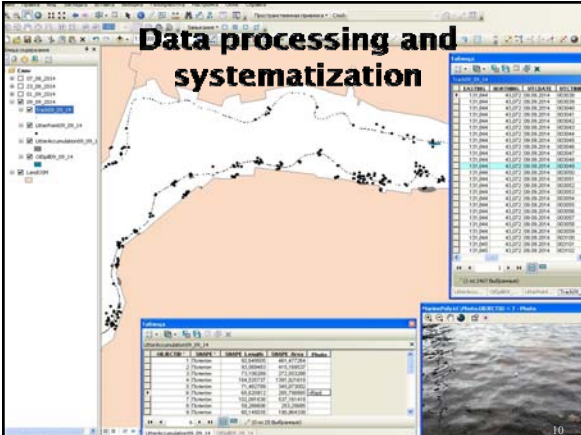





Camera



Data processing and systematization



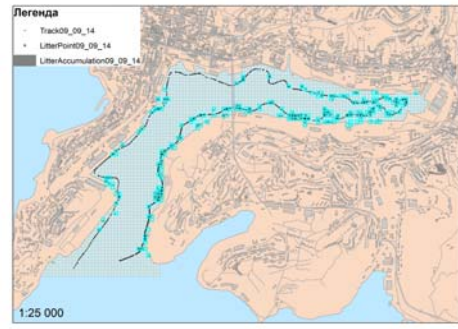
| Time | Lat | Long | Photo |
|----------|---------|---------|---------------|
| 12:00:00 | 41.0000 | 41.0000 | 120000_01.jpg |
| 12:00:10 | 41.0000 | 41.0000 | 120000_02.jpg |
| 12:00:20 | 41.0000 | 41.0000 | 120000_03.jpg |
| 12:00:30 | 41.0000 | 41.0000 | 120000_04.jpg |
| 12:00:40 | 41.0000 | 41.0000 | 120000_05.jpg |
| 12:00:50 | 41.0000 | 41.0000 | 120000_06.jpg |
| 12:01:00 | 41.0000 | 41.0000 | 120000_07.jpg |
| 12:01:10 | 41.0000 | 41.0000 | 120000_08.jpg |
| 12:01:20 | 41.0000 | 41.0000 | 120000_09.jpg |
| 12:01:30 | 41.0000 | 41.0000 | 120000_10.jpg |
| 12:01:40 | 41.0000 | 41.0000 | 120000_11.jpg |
| 12:01:50 | 41.0000 | 41.0000 | 120000_12.jpg |
| 12:02:00 | 41.0000 | 41.0000 | 120000_13.jpg |
| 12:02:10 | 41.0000 | 41.0000 | 120000_14.jpg |
| 12:02:20 | 41.0000 | 41.0000 | 120000_15.jpg |
| 12:02:30 | 41.0000 | 41.0000 | 120000_16.jpg |
| 12:02:40 | 41.0000 | 41.0000 | 120000_17.jpg |
| 12:02:50 | 41.0000 | 41.0000 | 120000_18.jpg |
| 12:03:00 | 41.0000 | 41.0000 | 120000_19.jpg |
| 12:03:10 | 41.0000 | 41.0000 | 120000_20.jpg |
| 12:03:20 | 41.0000 | 41.0000 | 120000_21.jpg |
| 12:03:30 | 41.0000 | 41.0000 | 120000_22.jpg |
| 12:03:40 | 41.0000 | 41.0000 | 120000_23.jpg |
| 12:03:50 | 41.0000 | 41.0000 | 120000_24.jpg |
| 12:04:00 | 41.0000 | 41.0000 | 120000_25.jpg |
| 12:04:10 | 41.0000 | 41.0000 | 120000_26.jpg |
| 12:04:20 | 41.0000 | 41.0000 | 120000_27.jpg |
| 12:04:30 | 41.0000 | 41.0000 | 120000_28.jpg |
| 12:04:40 | 41.0000 | 41.0000 | 120000_29.jpg |
| 12:04:50 | 41.0000 | 41.0000 | 120000_30.jpg |

10

Data processing and systematization

Легенда

- Trаск09_09_14
- LiterPoint09_09_14
- LiterAccumulation09_09_14



1:25 000

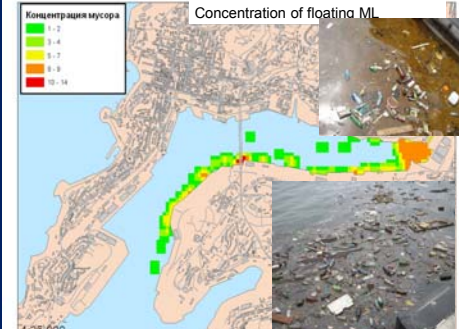
11

Data processing and systematization

Концентрация мусора

- 1-2
- 3-4
- 5-7
- 8-9
- 10-16

Concentration of floating ML



1:25 000

12

Frequency of observations

- one time two week at least
- to avoid observation in the winds changing period
- to carry on observation after the rainfall

We believe that the implementation of this methodology all interested parties will have an objective picture of the waters pollution situation and it dynamic.



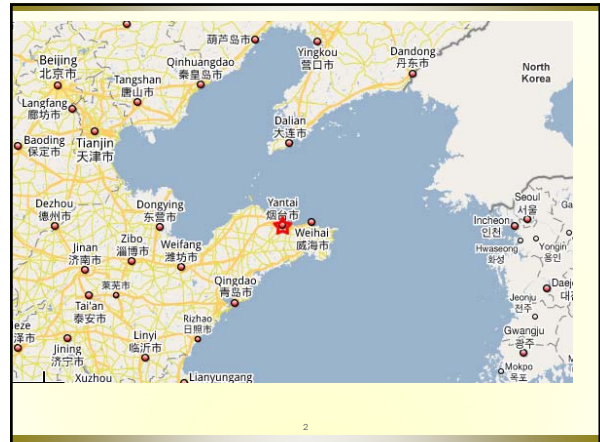
Thank you!

TEMM

Marine Litter Action Plan Under TEMM

Yi LI
Marine Litter Focal Point of China Under TEMM
September 24, 2015

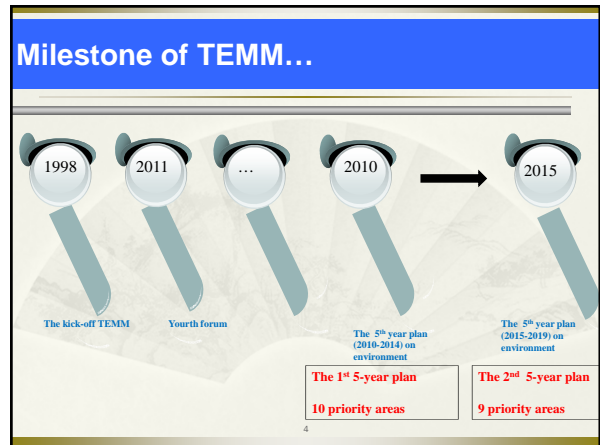
1



What is TEMM...

Three Environment Ministers Meeting (TEMM)

3



Tripartite Joint Action Plan (TJAP) on environment cooperation in ten priority areas at TEMM 12 (the 1st action plan of TEMM)...

5. Pollution Control

(Objectives)

27. The three countries will prevent atmospheric and other environmental pollution in the region, and will protect the aquatic and marine environments.

(Activities)

28. The three countries will cooperate closely, involving the remaining country, to enhance activities of Regional Action Plan on Marine Litter (RAP MALI) under the Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP), inter alia, to strengthen joint-workshops and activities to raise awareness and promote research cooperation for sharing the scientific knowledge, including that which would improve the understanding of all countries in the region regarding the marine litter generation mechanism, with a view to managing the generation of marine litter.

5

The importance of ML issues is being recognized...


Joint Communiqué
The 16th Tripartite Environment Ministers Meeting
Among Korea, China and Japan
28-29 April 2014, Daegu, Korea

11. **Marine Litter:** The Ministers appreciated the joint efforts made by the three countries within the framework of Northwest Pacific Action Plan (NOWPAP) including the progress of Regional Action Plan on Marine Litter (RAP MALI) containing the coastal clean-up activities. They confirmed the importance of continued promotion of the joint activities in the area including NOWPAP RAPMALI to protect the marine and coastal environment in the region from marine litter. They also agreed to cooperate to hold joint-workshops and promote activities to understand the situation and subjects of marine litter on surrounding sea area in each country and construct a database within the framework of NOWPAP. They also noted the importance of promoting the implementation of NOWPAP.

The importance of ML issues is being recognized...

**Joint Communiqué
The 17th Tripartite Environment Ministers Meeting
Among China, Japan and Korea
29-30 April 2015, Shanghai, China**

12. The Ministers recognized the importance of cooperation among the three countries in conserving water environment and marine environment. They appreciated the progress of cooperation on marine litter including Regional Action Plan on Marine Litter (RAP MALI) activities under Northwest Pacific Action Plan (NOWPAP) and recognized the importance of further joint efforts made by the three countries. They decided to cooperate to hold joint workshops and promote activities to understand the situation and subjects of marine litter on surrounding sea area in each country.


Tripartite Joint Action Plan on Environmental Cooperation

2015-2019

Tripartite Joint Action Plan (TJAP) on environment cooperation in ten priority areas at TEMM 12 (the 1st action plan of TEMM)...

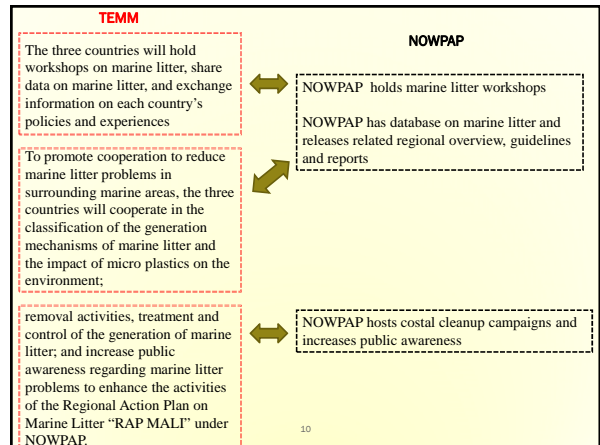
3.6 Conservation of Water and Marine Environment

A. Water Environment

- ❖ Tripartite Joint Research on Integrated Water Environment Management
- ❖ Underground (Drinking) Water Technology Cooperation

B. Marine Environment

- ❖ Tripartite Workshop on Marine Litter
- ❖ Cooperation under the Framework of NOWPAP



A proposal for marine litter data sharing under TEMM Joint Action Plan

Contents

1. A proposal for marine litter data sharing under TEMM Joint Action Plan
2. Research activities by Government of Japan

1

Tripartite Joint Action Plan on Environmental Cooperation (TEMM Joint Action Plan)

1. **Tripartite Workshops on Marine Litter**
 - * The three countries will hold workshops on marine litter, **share data on marine litter**, and exchange information on each country's policies and experiences.
2. **Cooperation under the Framework of NOWPAP**
 - * To promote cooperation to reduce marine litter problems in surrounding marine areas, the three countries will cooperate in the **clarification of the generation mechanism of marine litter and the impact of microplastics on the environment**.

2

The project addressing marine litter issue on the framework of TEMM Joint Action Plan

Marine litter drift in the surrounding ocean area, sink on the sea bottom, and are washed ashore. These litter cause adverse effect on the marine environment, disturb navigation, and spoil beautiful ocean!

It's the time that we, three countries cooperate to solve the problem, and get back our beautiful ocean!

Japan main policies in 2015

- Survey on marine litter (to grasp geographical and temporal change)
- Survey on drifting litter & micro-plastic
- Survey on marine litter on the coast & sea bottom
- Collection & disposal of the marine litter on the coast
- Reduction of generation of marine litter

1. To promote sharing information about marine litter from respective countries!
2. Harmonized monitoring method is need to realize Joint research project.

3

Research activities by Government of Japan

4

Overview of research activities by Government of Japan

Government of Japan has conducted seamless marine litter research from coast to Offshore and Antarctic Ocean to understand behavior and environmental risk of microplastics drifting in coastal waters and open oceans

Monitoring activity on the coast
Amount, density, items, language! Where comes from) of the marine litter found on the several collecting the data of cleaning activities in Japan.
Coast line : 50m (each point)

Monitoring activity on offshore
Observation of the floating debris, sampling microplastics and litters on the sea(from 2014).

Monitoring activity across from the Pacific Ocean to Antarctic Ocean
Observation of the floating debris, sampling microplastics. (from 2015 - 2018)

5

