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**IMPLEMENTING THE STRATEGIC ACTION PROGRAMME FOR THE YELLOW SEA LARGE MARINE ECOSYSTEM: RESTORING ECOSYSTEM GOODS AND SERVICES AND CONSOLIDATION OF A LONG-TERM REGIONAL ENVIRONMENTAL GOVERNANCE FRAMEWORK  
(UNDP/GEF YSLME Phase II Project)**

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**Proceedings of the Inception Ceremony of the  
UNDP/GEF YSLME Phase II Project**

Koreana Hotel, Seoul, RO Korea  
13 July 2017

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## Summary of the Inception Ceremony of the UNDP/GEF YSLME Phase II Project

*Koreana Hotel, Seoul, RO Korea*

*13 July 2017*

### Introduction

1. The Inception Ceremony of the UNDP/GEF YSLME Phase II Project was held at the Diamond hall, Koreana Hotel, Seoul, RO Korea from 10:00 – 12:00 on 13 July 2017. Ministry of Oceans and Fisheries of RO Korea hosted the ceremony.
2. The Inception Ceremony was participated by representatives from Ministry of Foreign Affairs and Ministry of Oceans and Fisheries (MOF) of RO Korea, State Oceanic Administration (SOA) and Fisheries Bureau of Ministry of Agriculture of the PR China, Incheon Metropolitan City of RO Korea, provincial governments of Shandong and Jiangsu, UNDP, UNOPS, NOWPAP, PEMSEA, ENEA/UNESCAP, UNDP Seoul Policy Center, and Korea Marine Environment Management Corporation (KOEM).
3. Academic institutions and NGOs from RO Korea and PR China also attended the ceremony, including Korea Institute of Ocean Science and Technology (KIOST), National Marine Environmental Monitoring Center (NMEMC/SOA), First Institute of Oceanography (FIO/SOA), Yellow Sea Fisheries Institute of Chinese Academy of Fishery Sciences (YSFRI/CAFS), Conservation International, HannsSiedel Foundation, BlueRibbon Ocean Conservation Association (BROCA) of PR China.
4. The agenda of the ceremony and the full list of participants can be found in Annex 1 and Annex 2.

### Opening of The Ceremony

5. Mr. Yinfeng GUO, Project manager of the YSLME, served as the master of ceremony. Referring to the event as a much-awaited day of UNDP/GEF Yellow Sea Large Marine Ecosystem Project, he welcomed all participants to the Inception Ceremony of the second phase of the Project. After a highlight of YSLME as one of the more than 20 International Waters projects, he considered it to be showcase to the International Waters community of the Global Environment Facility on ecosystem-based management of large marine ecosystem taking a partnership approach. He introduced the guests to the ceremony and welcomed the international and regional organizations, government authorities, academic institutions, civil society organizations, interns and volunteers in the ceremony.

### Welcome Address

6. On behalf of the Ministry of Oceans and Fisheries, RO Korea, Mr. Yang-soo KIM, Deputy Minister, welcomed the participants and congratulated on launching the 2nd Phase of the

Project and expected to achieve significant success in a number of activities to be implemented in the 2nd Phase. He underscored the importance of all stakeholders continued in taking LME approach to addressing overfishing, marine litter from land-based sources and loss of coastal habitats to development, and the support of all stakeholders to achieve the common goals enshrined in the YSLME SAP. In addition, he mentioned the YSLME Project as the cooperation platform to achieve the ocean blueprint of reshaping the oceans as envisioned by the government of RO Korea.

#### Opening Address

7. On behalf of UNDP, Mr. Jose PADILLA, Regional Technical Advisor, welcomed the participants and congratulated on launching the 2nd Phase of the Project and hoped that it would be carried out within the East Asian Seas Programmatic Approach. Mr. PADILLA expressed the second Phase of the Project just made the first step through inception, he hoped the Project would gain the momentum, accelerate and make up for the lost ground. Also, he mentioned there are several lessons that all stakeholders can draw upon such as:
  - 1) the overriding importance of regional cooperation by all littoral countries;
  - 2) the partnership beyond the government;
  - 3) the supportive governance mechanisms need to be put in place to implement the SAP; and
  - 4) the need for action on the ground through the strong leadership of communities and support by local government.
8. In addition, he assured that the UNDP system will continue to lend its full support to the YSLME project.

#### Congratulatory Addresses

9. On behalf of the government of PR China and in his capacity as the National Coordinator of the YSLME second Phase of the Project, Mr. Fengkui LIANG expressed his gratitude to the participants and congratulated on launching the 2nd Phase of the Project. He introduced the Project as an ecosystem-based management project which requires regional cooperation aiming at enhancing protection of marine ecosystem and sustainable development of marine resources. He highlighted that the Project had obtained remarkable results in the Phase I by completing the TDA, conducting two joint-cruises, holding two regional science conferences, and implementing two batches of small grant programs, and expected success of the Project in its Phase II with remarkable results as well. He thanked the participating countries and the Secretariat for their efforts trying to deliver successful results and accomplishments during the second phase of the Project. Again, he hoped this meeting will produce fruitful results with engagement of participants in discussion. In particular, he expressed his sincere appreciation to the scientists of both countries who have contributed remarkably to the Project.

10. On behalf of the Ministry of Foreign Affairs, RO Korea, Mr. Sei-joog KWON, Deputy Director General, welcomed all participants and thanked UNDP and UNOPS for the continuous support to the Project. He stressed on the fact that the success of the Project comes from common understanding of importance of the YSLME Project. During the Project Phase I, governments of RO Korea and PR China provided strong support for the establishment and approval of SAP, and will enhance more efforts on conservation of the Yellow Sea than ever before. He emphasized on the importance of cooperation in implementing the environmental problems of the Yellow Sea, and hoped that the YSLME project would provide significant foundation for the successful implementation of the Project's activities rather than just talk on the table.
11. On behalf of 3 million people from the Incheon Metropolitan City, RO Korea, Mr. Dong Am CHO, Vice Mayor of Incheon City welcomed all participants and thanked UNDP and UNOPS for the continuous support to the Project. He expressed the Incheon Metropolitan City would work together with GCF, UNESCAP, UNISDR and UNDP to achieve the goals of developing low-carbon and green economy. He expected the second Phase of the YSLME Project to play a pivotal role in facilitating cooperation among YSLME countries through marine environmental collaboration.
12. After the addresses by the guests, Mr. Yang-soo KIM, Mr. Jose PADILLA, Mr. Fengkui LIANG, Mr. Sei-joog KWON, Mr. Dong Am CHO, Mr. Kirk BAYABOS, Mr. Stephen Adrian ROSS, Ms. Juying WANG and Mr. Jae-Ryoung OH proceeded to the stage and cut the ribbon to formally launch the second Phase of the Project.
13. The ribbon-cutting ceremony was followed by a group photo and a 20-minute coffee break.

#### Keynote Addresses

14. The opening ceremony was followed by three keynote presentations.
15. Mr. Jae Ryoung OH, National Coordinator of RO Korea, delivered a keynote entitled Environment Challenges in the Yellow Sea: Environmental Status and the Way Forward. He highlighted marine debris and micro-plastics as emerging issues in this region. Also, he talked about the way forward and gave suggestions including establishing regional monitoring program.
16. Ms. Juying WANG, Deputy Director General of National Marine Environment Monitoring Center of SOA of PR China delivered a keynote entitled Advancing Marine Ecological Civilization to restore ecosystem goods and services of Yellow Sea - Progress in implementation of YSLME Strategic Action Programme in China. She gave an introduction of actions for marine eco-civilization in PR China which provides insights about the new context of promoting National Ecological Progress in PR China according to YSLME SAP.

17. Mr. Adrian Ross, Executive Director of PEMSEA discussed sustaining regional ocean governance in the Seas of East Asia with focus on the experience of PEMSEA in implementation of sustainable development strategy for the Seas of East Asia (SDS-SEA). Mr. ROSS discussed regional sea governance and SDS-SEA which provide insights to YSLME stakeholders about the process, framework, partnership and sustainable development of regional seas governance. He introduced the mission for PEMSEA and SDS-SEA. He emphasized the importance of implementing Integrated Coastal Management in this area. In addition, Mr. ROSS also introduced innovative tools which PEMSEA developed and focused on in recent years such as SEA Knowledge Bank.
18. The slides of the three keynotes are attached as Annexes in this report.
19. Mr. Yinfeng GUO thanked the excellent presentations of the speakers and declared the closure of the Opening Ceremony and keynote session. He then invited participants to enjoy a lunch hosted by UNDP.

## Annex 1: Agenda of Inception Ceremony of the UNDP/GEF YSLME Phase II Project

*Koreana Hotel, Seoul, RO Korea  
10:00-12:00, 13 July 2017*

### **Agenda**

**09:30-10:00            REGISTRATION**

**10:00-10:40            WELCOME ADDRESS**

Mr. Yang-soo KIM, Deputy Minister,  
Ministry of Oceans and Fisheries (MOF), RO Korea

#### **OPENING ADDRESS**

Mr. Jose PADILLA, Regional Technical Adviser, UNDP/GEF

#### **CONGRAGULATORY ADDRESSES**

Mr. Fengkui LIANG, Associate Counsel,  
State Oceanic Administration (SOA), PR China

Mr. Sei-joong KWON, Deputy Director General,  
Ministry of Foreign Affairs(MOFA), RO Korea

Mr. Dong Am CHO, Vice Mayor of Incheon Metropolitan City,  
RO Korea

**10:40-10:50            LAUNCH CEREMONY AND PHOTOS**

**10:50-11:10            COFFEE BREAK**

**11:10-12:00            KEYNOTE ADDRESSES**

- Environmental Challenges in the Yellow Sea: Environmental Status and the Way Forward, Mr. Jae Ryoung OH, National Coordinator, RO Korea
- Advancing Marine Ecological Civilization to restore ecosystem goods and services of Yellow Sea – progress in implementation of YSLME Strategic Action Programme in China. Ms. Juying

WANG, Deputy Director General, National Marine Environmental Monitoring Center, State Oceanic Administration

- Sustaining regional ocean governance in the Seas of East Asia: the experiences of PEMSEA in implementation of SDS-SEA, Mr. Adrian ROSS, Executive Director, PEMSEA

**12:00**

**Closure**



## Annex 2: List of Participants at Inception Ceremony

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Annex 3: Welcome Address of Deputy Minister of Oceans and Fisheries of Republic of Korea Mr. Yang-soon KIM

환 영 사

2017. 7. 13(목)

해양수산부 해양정책실장

김 양 수

안녕하십니까?

만나뵈게 되어 대단히 반갑습니다.

해양수산부 해양정책실장 김양수 입니다.

바쁘신 일정에도 참석해주신

중국 국가해양국 후 송친(Liang Fengkui) 심의관님과

UNDP 호세 파딜라(Jose Padilla) 지역기술자문,

한국 외교부의 권세중 심의관님,

인천광역시 조동암 부시장님께

감사의 말씀을 전합니다.

UNDP, UNOPS(유놉스) 관계자와 YSLME 제 2 기 사업 착수를 기념하기 위해

이 자리에 모이신

국내·외 전문가, NGO 관계자 여러분께도

환영의 말씀을 드립니다.

12 년 전,

YSLME 제 1 기 사업을 시작했던 이 자리에서

다시 제 2 기 사업 착수워크숍을 개최하게 되어

더욱 뜻깊게 생각합니다.

수년 간의 사업중단에도 불구하고

오늘 YSLME 제 2 기 사업을 착수하게 된 것은

한·중 양국의 적극적인 협력 의지,

그리고 여기 계신 전문가 분들의 관심과 열정이

있었기 때문이라고 봅니다.

황해는 역사적으로 한·중 양국을 잇는 해상교역로이자  
풍요로운 수산자원을 제공하는 황금어장으로서  
한국과 중국의 경제발전에 기여한 바가  
결코 작지 않습니다.

그러나, 여러분께서 아시는 바와 같이  
황해에 대한 이용과 개발이 늘어갈수록  
황해생태계는 지속적으로 악화되어 왔습니다.

과도한 어업활동으로 인한 수산자원 남획,  
연안 난개발에 따른 해양생태계 파괴,  
육상기인 해양쓰레기 문제 등  
황해환경을 위협하는 요인들은 계속 증가하고 있습니다.

기후변화로 인한 해수온상승 및 해양산성화 또한  
황해생태계 보전에 어려움을 가중시키고 있습니다.  
황해는, 한 국가의 관할권을 넘는  
월경성 환경문제를 다루기 위해 고안된  
'광역해양생태계(Large Marine Ecosystem)' 사업에  
가장 적합한 모델이라고 생각합니다.

한국과 중국, 각자의 노력만으로  
황해생태계 보전은 불가능합니다.  
황해를 공유하는 한국과 중국의 정책당국,  
전문가, NGO 등 모든 이해당사자들이 힘을 합칠 때  
황해 환경은 개선될 것입니다.  
YSLME 제 1기 사업이 황해의 문제점을 파악하고  
문제해결을 위한 전략계획을 수립하는 단계였다면,  
제 2기 사업은 한·중 양국이 함께 세운 계획들을  
실현하는 데 주력해야 합니다.

이번 2기 사업에서는  
어족자원 공동조사, 지속가능한 양식기술 개발,  
해양보호구역 평가, 해양쓰레기 가이드라인 수립 등  
여러 분야에서 다양한 협력 사업들이 추진될 전망입니다.  
YSLME 제 2기 사업을 통해  
실질적인 황해환경 개선이 이루어지기를 기대합니다.

아울러, 장기적인 관점에서  
황해생태계 공동관리 메커니즘을 만들어갈 것을  
제안드립니다.

‘프로젝트’ 차원의 사업추진을 넘어서  
공동관리 메커니즘이 만들어질 경우  
한·중 양국 간 협력은 더욱 증진될 것입니다.  
내외 귀빈 여러분!

해양수산부는 신정부 출범과 함께 ‘재조해양(再造海洋)’,  
즉 바다의 모든 것을 새롭게 한다는 비전을 세웠습니다.

황해생태계의 지속가능한 이용과 보전을 추구하는 YSLME 사업이야말로  
바다를 새롭게 만들어나가는,  
‘재조해양’의 비전에 부합하는 정책이라고  
생각합니다.

끝으로,  
YSLME 제 2기 사업이 성공적으로 진행될 수 있도록  
한국 정부로서는 모든 지원을 다하겠다는 말씀을 드리며,

오늘 행사 준비를 위해 애써주신 관계자 분들과  
참석하신 모든 분들께 감사와 환영의 인사를  
다시 한 번 드립니다.

함께하신 모든 분들께  
항상 건강과 행운이 함께 하시길 바랍니다.



감사합니다.

2017 년 7 월 13 일

해양수산부 해양정책실장 김 양 수

### **Welcome Address**

**Mr. Yang-soo KIM**  
**Deputy Minister of Ministry of Oceans and Fisheries**  
**Republic of Korea**

It is a great pleasure to meet you all. I am Yang-soo Kim, Deputy Minister of Ministry of Oceans and Fisheries.

I would like to express my heartfelt thanks to Mr. Fengkui Liang, Deputy Director General of State Oceanic Administration, Mr. Jose Padilla, Regional Technical Adviser of UNDP, Mr. Seijoong Kwon, Deputy Director General of Ministry of Foreign Affairs, and Mr. Dong Am Cho, Vice Mayor of Political & Economic Affairs of Incheon Metropolitan City for joining us in the Inception Ceremony.

I would also like to welcome the participants from UNDP and UNOPS as well as domestic and foreign experts and NGO parties who have gathered here to celebrate the launch of YSLME Phase II Project.

I find it even more meaningful that the launching workshop of YSLME Phase II Project is held in this same place where 12 years ago, YSLME Phase I Project was launched.

Despite years of project suspension, I believe that the launch of YSLME Phase II Project is possible today due to the willingness of Korea and China to actively cooperate, and the interest and passion of the experts with us here.

As a maritime trade route connecting Korea and China as well as a rich fishing ground that has provided abundant fishery resources throughout history, the contribution of the Yellow Sea to the economic development of Korea and China is not small.

However, as you may know, the Yellow Sea ecosystem has been continuously deteriorating with the increase in usage and development of the Yellow Sea.

The factors including overfishing of fisheries resources due to excessive fishing activities, destruction of marine ecosystem from coastal development, and marine litter problem, which threaten the Yellow Sea environment, are increasing.

Moreover, the increase of sea-water temperature and oceanic acidification due to climate change are intensifying the difficulties in preserving the Yellow Sea ecosystem.

I believe that the Yellow Sea is the most appropriate model for the 'Large Marine Ecosystem' project designed to deal with the international environmental issues that transgress a single country's jurisdiction.

The preservation of the Yellow Sea ecosystem is not possible with the individual efforts of Korea and China.

The Yellow Sea environment will be improved when the policy making authorities of South Korea and China, related experts, NGOs, and all stakeholders cooperate together.

If the first phase of the YSLME project was to identify the problem of the Yellow Sea and establish a strategic action plan for problem solving, the second phase of the YSLME project must focus on the implementation of the plans established by both Korea and China.

In the second phase of the project, various cooperative projects are expected to be carried out in diverse fields including joint research on fishery resources, development of sustainable aquaculture technology, evaluation of marine protected areas, and establishment of marine litter guidelines.

We expect practical improvements of the Yellow Sea environment through the YSLME Phase II Project.

In addition, from a long-term perspective, the creation of a common management mechanism of the Yellow Sea ecosystem is recommended.

Once a common management mechanism that transgresses the 'project' level promotion is created, the cooperation between Korea and China will be further enhanced.

Distinguished guests!

With the launch of the new government, the Ministry of Oceans and Fisheries has set a vision to renew everything in the sea.

I believe that the YSLME project that pursues sustainable use and preservation of the Yellow Sea ecosystem is the policy that accords with our vision of marine renewal.

In conclusion, I would like to say that the Korean government will give all the support required for the successful progress of the YSLME Phase II.

Once again, I would like to express my utmost gratitude and welcome to those who endeavoured for today's ceremony and all the distinguished guests.

I wish all the welfare and luck to everyone who joined us today.

Thank you!

各位，早上好。非常高兴见到各位。我是海洋水产部海洋政策室室长 Yang-soo KIM。在此向百忙之中来参会的中国国家海洋局梁凤奎副司长和 UNDP 地区技术者 Jose Padilla，韩国外交部 Mr. Sei-joong KWON 副司长，仁川广域市赵东岩副市长表示感谢。

也在此向 UNDP, UNOPS 的相关人员和为了纪念 YSLME 第 2 期项目启动相聚在此的各位国内、外专家，NGO 相关人员表示欢迎。

我个人认为在 12 年前启动 YSLME 第 1 期项目的故地再次举办 YSLME 第 2 期项目的启动工作会议是具有深远意义的。因为韩·中两国的积极的合作意向还有在座的各位专家们的关心和热情使数年间被中断的项目能够在今天重新启动 YSLME 第 2 期项目。

黄海在历史上是韩·中两国的海上贸易通道的同时作为提供丰富水产资源的黄金渔场对韩国和中国的经济发展的贡献也不容小觑。

但是，如大家所知道的那样对黄海的利用和开发越多黄海生态系统也在持续恶化中。伴随过度的渔业活动引起的水产资源滥捕、沿海乱开发产生的海洋生态界破坏，陆地起因海洋垃圾问题等威胁黄海环境的因素也在持续增加中。由气候变化引起的海水温度上升和海洋酸化更是为保护黄海生态系统增加了难度。

我个人认为黄海超越了一个国家的管辖权，对于为了治理越境性环境问题而制定的‘广域海洋生态系统 (Large Marine Ecosystem)’项目而言黄海是最适合的标本。

韩国和中国，只靠自身的努力保持大黄海生态系统是不可能的。当共有黄海的韩国和中国的政策当局、专家、NGO 等所有利害当事者们的力量加在一起的时候黄海环境会有所改善。

如果说 YSLME 第 1 期项目是了解黄海的问题和为了解决问题所制定的战略计划的阶段的话，第 2 期项目是致力于实现韩·中两国一起制定的计划。

在这次的 2 期项目中鱼类资源共同调查，可持续养殖技术的开发，评价海洋保护区域，制定海洋垃圾实施计划等从各个领域的多种合作来推进项目。期待通过 YSLME 第 2 期项目黄海环境能够得到有效的改善。同时，从长远的角度考虑提议建立黄海生态系统共同管理机制。超越项目层面的推进工作如果建立共同管理机制的话将进一步增进韩·中两国间的合作。

各位国内、外贵宾朋友！

海洋水产部在新政府上台的同时设立了‘再造海洋’，即将大海中的所有东西都重新做的蓝图。认为追求黄海生态系统的可持续利用和 YSLME 项目才是符合重新创造大海的‘再造海洋’的蓝图的策略。

最后，作为韩国政府方为了 YSLME 第 2 期项目能够成功地进行将极尽所能给予所有的支援。同时也再次向为了准备本次工作会议的所有相关人员和所有参会人员表示感谢与欢迎。

在此祝愿所有在座的各位身体健康，幸运常伴。

谢谢。

**UNDP Opening Remarks at the Inception Meeting for the  
YSLME Phase II Project**

**Dr. Jose Padilla**

**July 13, 2017, Seoul, ROK**

Mr. Yang-soo KIM, Deputy Minister, Ministry of Oceans and Fisheries (MOF), RO Korea;  
Mr. Liang Fengkui, Deputy Director General, State Oceanic Administration (SOA), PR China;  
Mr. Sei-joong KWON, Deputy Director General, Ministry of Foreign Affairs, RO Korea;  
Mr. Dong am CHO, Vice Mayor of Incheon Metropolitan City, RO Korea;  
Distinguished international and national specialists, partners and colleagues,

Good Morning!

On behalf of UNDP, I convey warm greetings and congratulations to the governments of the People's Republic of China and the Republic of Korea at this momentous Inception Ceremony for the project "*Implementing the Strategic Action Programme for the Yellow Sea Large Marine Ecosystem: Restoring Ecosystem Goods and Services and Consolidation of a Long-term Regional Environmental Governance Framework*".

This project builds upon several years of successful regional cooperation for the sustainable use of YSLME that has been put in place by the two countries through the Yellow Sea Partnership. The first phase of the YSLME project has been recognized globally as a model for regional cooperation in an area that is important for marine biodiversity, ecosystem services, navigation and other uses. The project has provided a forum for constructive dialogue and discussions of shared concerns through the conduct of a Transboundary Diagnostic Assessment. This scientific document guided the formulation, negotiations and the subsequent adoption in November 2009 of the Strategic Action Program to address the Transboundary concerns.

The YSLME Phase II project's objective is to foster a long-term institutional, policy, and financial arrangements for effective ecosystem-based management of the Yellow Sea. To achieve this objective, the project will support the formation of a YSLME Commission that will oversee the implementation of the Strategic Action Program and will support the efforts of the two countries to arrest the degradation of the biological resources, restore depleted fish stocks and preserve the ecosystem services following an Ecosystem Approach.

In line with the GEF International Waters (IW) strategic priorities, the project will assist the countries reach an agreement on ecosystem-based joint action for the sustainable management of the YSLME and to catalyse institutional reforms and support the implementation of policies aimed at reducing the threats to the ecosystem integrity of this important water body.

In many instances, the first step is the most difficult to make. Allow me to make an analogy. As with us humans, we first learn to crawl before we walk, but once we muster the courage to stand on our own feet, we begin to walk, we move faster, increase the pace, we run. Just like in this

second phase project, UNDP has delivered an approved project more than three years ago in 2014 but we are just making the first step just now. We are, however, confident that having made the first step through this Inception, the project will gain the momentum, accelerate and make up for the lost ground. The discussions that transpired during the past two days in this same room – the first meeting of the Management, Science and Technical Panel for the phase two project – are encouraging and an ominous good start. UNDP encourages all project stakeholders to seize and maintain the inertia to ultimately deliver on the objectives of the project.

Into this phase of the YSLME project, UNDP brings a wealth of experience in supporting regional projects in various parts of the world and in particular, the Asia-Pacific region which is my geographic remit. In addition to the YSLME, I oversee several multi-country projects, including the Integrated Coastal Management project implemented by PEMSEA, the oceanic fisheries management project implemented by the Western and Central Pacific Fisheries Commission, the LME projects in the Arafura and Timor Seas, the Sulu-Sulawesi Seas and the Pacific Warm Pool LME. There are several lessons that we can draw upon.

First, is the overriding importance of regional cooperation by all littoral countries. The conduct of and agreement on the TDA and the negotiations on the SAP are crucial in bringing together all countries into the table. We have done this in the first phase with the Yellow Sea Partnership, the completion of the TDA and endorsement of the SAP. The second phase project will strengthen the Partnership through the Yellow Sea Commission.

Second and related to the first is the Partnership beyond the governments – national, provincial, local. Key partners include the private sector, non-government organizations and all citizens who need to rally behind the objectives of the project. The importance of raising public awareness and education cannot be overemphasized in bringing about the necessary transformational change. UNDP encourages the representation of the private sector in future meetings of the project. As mentioned earlier, the Partnership was initiated in the first phase and will be strengthened in the second phase.

Third, supportive governance mechanisms need to be put in place to implement the SAP. Unless the SAP is mainstreamed international and local policies, its sustained implementation cannot be guaranteed. The second phase project will support this.

Fourth, is the need for action on the ground through the strong leadership of communities and support by local governments. It will be the actions on the ground that will bring about real and measurable changes in indicators of ecosystem health. We have done in the first phase through the demo projects which will be intensified in the second phase.

At this juncture, let me mention recent global developments that are of relevance to our project. The Sustainable Development Goals – SDGs – adopted by the global community in September 2015 include a specific Goal for the Oceans. Goal 14 – Life Below Water. If you had the chance to read the objectives of YSLME2 and the targets of SDG 14 summarized in the standees displayed in this room, you would have noticed the very close alignment between the two. It is as if the design of the YSLME2 project has anticipated SDG14. Put another way, the issues besetting the Yellow Sea are typical of the situation globally.

On the week of June 5-9 this year, the first global Ocean Conference was convened in New York in support of the implementation of the SDG 14. There are three key outcomes from that Conference: The Call to Action; the joint Summary of the Chairs; and the List of Voluntary Commitments. Considering the alignment of SDG14 and YSLME2 targets, the PMO registered the

project in the roster. It is one of the close to 1,400 commitments in the Conference Website. The Call-to-Action document specifically section 13, supports the integrated and ecosystem approach being implemented in our project.

UNDP is pleased to have facilitated the first phase project and the follow-up second phase project which we are now launching today. Rest assured that the UNDP system will continue to lend its full support. UNOPS serves as the executing agency and the financial support comes from the Global Environment Facility (GEF). During the bridging phase, RO Korea has provided generous and substantial financial support to keep the momentum going.

Finally, and most importantly, I take this opportunity to express UNDP's gratitude to the RO Korea government for the usual warm hospitality in hosting this event. We also express the same specifically to the project partners, Ministry of Ocean and Fisheries of RO Korea, the State Oceanic Administration of PRC, and many other government agencies who are represented here. We also appreciate the generosity of the Incheon Metropolitan City of RO Korea for hosting the PMO at this prestigious office building in Songdo. We also note the leadership and hard work of the PMO for moving the project at this point.

We sincerely wish the YSLME Project will be successfully implemented with joint support for us all.

Thank you for your kind attention!

**Congratulatory Address at the YSLME Phase II Project Inception Ceremony**  
**by Mr. Fengkui LIANG**

July 13, 2017, Seoul, Republic of Korea

Distinguished Deputy Minister Mr. Kim, guests, ladies and gentlemen,

Good morning!

I am delighted to join the Inception Ceremony of the GEF YSLME phase II project. On behalf of State Oceanic Administration of China, I would like to extend my sincere thanks to all the international organizations, Chinese and Republic of Korea governments, NGOs coming to this ceremony. I also wish to appreciate all participants for joining and paying attention to this project.

As one of the coastal countries of YSLME, Chinese government always pays attention to the conservation and sustainable use of Yellow Sea. In recent years, Chinese government invested heavily in MPA development, marine ecosystem and coastal wetland restoration, marine biological resource restoration with some successful achievements.

There is no doubt that, YSLME's conservation and sustainable use can't be successful without the wide participation of other coastal countries and international organizations. The most successful project among those is the GEF YSLME Phase I Project, conducted from 2005 to 2009, which is the predecessor of our phase II project. The phase I project, based on transboundary diagnosis and analysis, organized Chinese and Republic of Korea's scientists and government departments to co-compile the "Regional Strategic Action Programme" aiming at reducing the stress of YSLME, promoting Yellow Sea ecosystem's sustainable development. Based on those, China and Republic of Korea developed and approved their National SAP respectively.

Based on the great success and wide spread praises of the Phase I, the Governments of China, Republic of Korea and UNDP together applied the Phase II with approval by the GEF. This could promote the widespread international cooperation and practice on conservation and sustainable use of Yellow Sea.

At the moment of inception ceremony of Phase II, I would like to express my sincere thanks to GEF, UNDP, UNOPS, China and Korea governments. During the very long application process, all the organizations provided proper manpower and financial support, and their great enthusiasm and patience.

Two countries' scientists payed great efforts during the application process. Some of them left our project, some of the old scientists who contributed to the project remarkably have even left us forever. I'm here to express my respect to all the scientists from China and Republic of Korea who contributed remarkably to this project.

In addition, people who are familiar with the application process won't forget the efforts that all the aspects of this project has paid for the participation of all the coastal countries to join this project.

Today's inception ceremony marks the official implementation of YSLME phase II. Congratulations to YSLME PMO. Thanks to their positive communication, and hard work. As you all know, during the previous preparation period, due to the PMO's problem in coordination and communication, resulted in severe delay of project implementation. But after Mr. Guo took the office in the end of 2016, as the new Project Manager, he positively coordinated everything and built the reliable working relationships. In the beginning of 2017, he organized experts from the two sides to negotiate on phase II documents and make necessary modifications to the project documents according to the latest developments in the two countries recently. Those efforts make the project to be on the right track. I hope PMO can keep this working efficiency and attitude to promote the successful finish of this project.

To guarantee the smooth implementation of this project, China started inter-ministry coordinating commission, including Ministry of Finance, foreign affairs, agriculture, SOA, and Yellow Sea local governments. At the same time, as the implementation organization, SOA provided finance and policy support for main technical supporting organizations. I believe these technical supporting teams will contribute more based on the phase I work.

After all these years' development and accumulation, China and Republic of Korea have all developed a lot in oceanic technology. I believe if the two sides hold the same attitude of sincere cooperation, proceeding towards the same aim, the YSLME phase II will gain more success. And it can become an outstanding example of management of large marine ecosystem.

At last, I wish the inception ceremony a complete success!

Thanks!

### **黄海项目二期项目 ICC 讲话**

国家海洋局国际合作司副巡视员 梁凤奎

(2017年7月13日 首尔)

尊敬的各位来宾、女士们、先生们：

早上好！

很高兴参加“黄海二期项目”的科学技术管理委员会会议。我以本项目中国国家项目协调员的身份，向前来参会的各位领导和专家表示热烈的欢迎和诚挚的感谢。

黄海大海洋生态系项目是全球环境基金（GEF）资助的比较成功的国际水域项目之一。项目一期在实施过程中为减轻黄海大海洋生态系环境压力做出了很大贡献，同时也获得了丰富的先进经验，在国际上获得了广泛赞誉。因此在一期项目一期结束后，中韩两国和 UNDP 共同努力申报的二期项目于 2013 年获得了全球环境基金批准实施。尽管历经了重重波折与困难，但在中韩双方的共同努力下，今天二期项目将正式启动，这也标志着中韩共同的黄海大海洋生态系二期项目即将步入一个崭新的阶段。



黄海大海洋生态系项目，是典型的区域合作、共同实施基于生态系统的海洋管理项目，以促进海洋生态保护与资源可持续利用。一期项目曾经取得了丰富的成果，是中韩海洋合作的成功典范。在一期项目实施过程中开展了跨边界诊断分析，组织实施了两次中韩联合海上调查，两次科学大会，两批小额示范项目；编制了地区和国家的黄海大海洋生态系战略行动计划，开展了十个与战略行动计划有关的示范项目。这些成绩的取得都与参与项目的各工作组专家大力支持是分不开的，也希望中韩各位专家继续支持二期项目，取得更大的成效。

黄海二期项目是在一期项目编制的《地区战略行动计划》基础上，在黄海区域中韩两国共同实施该行动计划。该行动计划以生态承载力为科学基础，设计了针对供给服务、调节服务、文化服务和支撑服务的行动。通过开展相关各项活动，促进黄海大海洋生态系各项服务和产品的可持续供给。项目的实施将建立区域海洋协调机制，在黄海周边国家实现管理行动的同步与协调，并将生态系统管理的理念引入政府的决策与管理过程，以全面改善黄海的渔业资源、可持续养殖业、加强海洋保护区网络、强化现有的海洋监测和生态系统评估、提升海洋综合管理能力。

黄海一期项目的成功实施，不仅为参与国提供了进行大海洋生态系保护的有效合作平台，也为我们增加了参与和实施该类项目的经验。一期项目已结束多时，双方人员和机构也几经更替，更有一些老科学家永远离开了我们，这都为二期的实施带来了一定困难。但我相信，在黄海项目办的有力协调和积极努力下，中韩双方的政府和科学家都会积极提供各类资源和支持，保障二期项目目标的圆满完成。

自 2009 年一期项目结束，中韩两国在海洋保护与管理上都取得了极大的进步。希望通过今天的会议，参与项目的各位专家能够结合自身实际情况，进行深入的交流，对二期项目进行有益的补充和完善，为项目的正式实施做好准备。也希望大家能够齐心协力、团结一致，做好项目的各项准备工作，为项目的顺利实施做出努力，为黄海地区的可持续发展贡献出自己的力量。

最后，预祝会议圆满成功！谢谢！

Annex 6: Congratulatory Address of Deputy Director General of Ministry of Foreign Affairs of RO Korea Mr. Sei-joong KWON

## 인사말

바쁘신 와중에도 멀리서 참석해주신  
해양수산부 김양수 해양정책실장님  
중국 국가해양국(SOA, State Oceanic Administration)  
휴 송친(Hu Songqin) 심의관님,  
인천시 조동암 부시장님,  
그리고 내외 귀빈 여러분,

오랜 산고의 시간을 거쳐 한국과 중국의 소중한 자산인 황해를 보전하기 위한 황해광역해양생태계 제2기 사업이 출범하게 된 것을 매우 기쁘게 생각합니다.

오늘 착수워크숍을 위해 애써주신  
UNDP, UNOPS(유넵스) 측 전문가 여러분을 비롯한 국내외 전문가  
및 관계자 여러분께도 심심한 감사의 말씀을 드립니다.

특히, 취임하자마자 착수워크숍 개최를 위해 노고를 아끼지 않으신  
신 구오(Yinfeng Guo) YSLME 사무국장께도 진심으로 감사드립니다.

### 황해 현황과 보전 필요성

황해는 풍부한 어족자원으로 6억명 이상의 연안 주민들에게 삶의 기반을 제공해 주고 있는 소중한 자연공간입니다. 또한, 대륙과 한반도를 연결하고 광활한 대양으로 뻗어 나갈 수 있도록 하는 교통, 물류상의 훌륭한 경제적 자산입니다.

그러나, 황해는 60여개 이상의 크고 작은 강들을 통해 유입되는 담수와 부유물, 그리고 바람과 해류의 영향을 적게 받는 지형적 조건으로 인해 외양 해수와의 교류가 어려워 오염물질 유입과 확산이 쉬워 외부 오염에 매우 취약한 상황에 놓여있습니다.

뿐만 아니라 연안 인구증가, 갯벌 간척 등 연안개발, 산업폐기물 투기, 남획 및 과도한 양식 등으로 인해 해양생태계 훼손, 수질저하, 생산력감소 등이 나타나면서 생태계 부양 능력의 저하를 초래하고 있습니다.

이러한 황해의 오염 문제를 해결하기 위해 해양생태계를 보존하고 나아가 연안주민의 삶의 질 향상, 보다 넓게는 동북아 환경보존에 기여하기 위해서도 국제기구와 인접국들 간의 협력이 절실한 상황입니다.

오늘의 YSLME 제2기 착수워크숍은 이러한 맥락에서 매우 시기 적절하다고 생각합니다.

#### YSLME의 성과 및 나아갈 방향

내외 귀빈 여러분,

YSLME 제1기 사업은 사무국, 한-중 전문가, 공무원 분들의 헌신적인 노력을 통해, 황해보전을 위한 지역적 공감대와 협력적 모멘텀이 조성되어 행동지향적인 황해 보전의 기틀이 마련되었습니다.

제1기 사업 완료 이후 사업이 중단되는 어려움도 있었지만 제2기 사업의 착수는 여기계신 한 분 한 분의 노고와 적극적 의지, 관심과 열정 덕분에 가능할 수 있었다고 생각합니다.

이러한 결과로 YSLME 사업은 GEF와 UND로부터 높은평가를 받았으며 전세계 66개의 LME 중 거의 유일하게 제2기 사업이 출범하게 된 매우 모범적인 협력체로 평가받고 있습니다.

이러한 제2기 사업이 성공적으로 진행되어 소기의 성과를 얻기 위해서는 인접국가간의 상호 신뢰에 기반한 탄탄한 협력과 소통이 있어야합니다.

국경 간 이동을 통해 인접국가간 상호 영향을 받는 해양환경 문제 특성상 인접국가들 간의 공동 대응은 매우 중요합니다. 훼손된 황해의 기능을 회복하고 지속가능한 보존 및 발전을 위한 주변국들의 관심과 함께하는 노력이 요구됩니다.

또한 2기 사업의 성과가 일시적이 아닌 영속적으로 추진해 나가야 한다는 기초아래 황해보전을 위한 협력이 금번 2기 사업으로 종료되지 않고 지속될 수 있도록 지속적인 관심을 갖고 추진해 나가야 할 것입니다.

한국의 새로운 정부는 김양수 해양수산부 실장님이 언급하신 것처럼 바다의 모든 것을 새롭게 한다는 재조해양(再造海洋)의 비전을 세우고 정책을 추진중에 있습니다.

외교부는 북서태평양보전실천계획(NOWPAP), 동아시아해양조정기구(COBSEA) 등 다자 협력 기구를 통한 해양보전협력에 적극 동참하여 신정부의 정책에 부합할 수 있도록 적극 협력해 나갈 것입니다.

#### 맺음말

내외 귀빈 여러분,

“화합의 시작은 이해”라는 옛 철학자의 말이 있습니다.

한-중 양국은 제1기 사업을 통해 황해를 둘러싼 오염현황을 과학적으로 진단하고 황해의 실태를 이해할 수 있었으며, 이를 바탕으로 제2기 사업추진의 발판을 마련하였습니다.

제2기 사업을 통해 양국은 UNDP, YSLME 사무국과의 긴밀한 협조아래 지역전략계획을 구체적으로 실현하고 지속가능한 해양자원 이용 및 보호를 위한 실질 협력 사업을 이행해 나가기를 기대합니다.

제2기 사업의 성공은 실제 이행에 달려 있는 만큼 이 자리에 함께하신 여러분들의 의지와 열정에 달려있다고 해도 과언이 아닐 것입니다. 아무쪼록 사업이 성공적으로 이행될 수 있도록 여러분의 적극적인 관심과 노력을 당부드립니다.

끝으로, 오늘 행사를 위해 애써주신 모든 관계자 여러분들의 노고에 다시한번 감사의 말씀을 전하며 제2기 YSLME 사업의 성공을 기원합니다.

감사합니다.

#### **Congratulatory Address**

**Mr Sei-Joong KWON**  
**Deputy Director General, Ministry of Foreign Affairs**

Greetings. I am the Deputy Director General of the Ministry of Foreign Affairs, Sei-joong Kwon.

For all those who have come from afar even in these busy times,  
Mr. Kim Yang-soo, Deputy Minister of Marine Policy Office, Ministry of Oceans & Fisheries,  
Mr. Liang Fengkui, Deputy Director General of China State Ocean Administration (SOA),  
Mr. Cho Dong Am, Vice mayor of Incheon Metropolitan City, and, all the distinguished guests,

I am pleased for the launch of the YSLME Phase II Project that will strive to conserve the valuable asset of Korea and China, the Yellow Sea.

I would also like to express my sincere gratitude to the experts from UNDP, UNOPS, domestic and foreign experts, and concerned parties who have worked hard for the launching workshop today.

In particular, I sincerely thank YSLME Chief Technical Advisor, Mr. Yinfeng Guo, who endeavored for the launch of the workshop from the moment of taking the position.

### **Current status of Yellow Sea and Necessity for Conservation**

The Yellow Sea is a precious natural space that provides the basis of life for more than 600 million coastal people with abundant fish resources. It is also a great economic asset in respect to the transportation and logistics that connects the continent with the Korean Peninsula and allows for the extension out into the vast ocean.

However, the Yellow Sea is in a vulnerable state to external pollution because of the inflow of freshwater and floating matters via over 60 large and small rivers, the geographical conditions that is only slightly affected by wind and currents, and the easy inflow and proliferation of contaminants due to the difficulty of interchange with the outer seawater.

In addition, the increase in coastal population, reclamation of tidal flats and coastal development, disposal of industrial waste, overfishing, and excessive aquaculture have resulted in degradation of marine ecosystem, deterioration of water quality, and decrease of productivity that lead to the deterioration of the Ecosystem Carrying Capacity.

In order to solve the pollution problem of the Yellow Sea, preserve the marine ecosystem, improve the quality of life of coastal inhabitants, and more broadly, to contribute to the environmental preservation in Northeast Asia, cooperation between international organizations and neighboring countries is urgently needed.

In this context, I believe that today's YSLME Phase II launching workshop is timely.

### **Achievements and Direction of YSLME**

Distinguished guests,

Through the dedicated efforts of the Secretariat, Korea-China experts, and government officials, the basis for action-oriented conservation of the Yellow Sea of YSLME Phase I Project was laid out with the creation of regional consensus and cooperative momentum for the conservation of the Yellow Sea.

Although the project faced a hardship of suspension after the completion of the first phase, I believe that the start of the second phase has been made possible thanks to the hard work, active commitment, interest, and enthusiasm of each and every one here in this room.

As a result, the YSLME project has received high assessment from the GEF and UNDP and is regarded as an exemplary partnership, which is the only one of the 66 LMEs in the world to have launched its second phase.

In order for the second phase project to proceed successfully and achieve desired results, there must

be a solid cooperation and communication, based on mutual trust, between the neighboring countries.

Due to the nature of the marine environment problems that is mutually affected by cross-border movements between neighboring countries, joint action among neighboring countries is critical. Efforts and attention of neighboring countries are required for the restoration of the damaged Yellow Sea and for sustainable conservation and development.

In addition, under the stipulation that the result of the second phase should be perpetuated rather than be temporary, the cooperation for the conservation of the Yellow Sea should be continued with interest so that the project will not be terminated.

The new government of Korea is in the process of renewing its policy with the establishment of the vision of the reconstructed ocean, as mentioned by the Deputy Minister of Marine Policy Office, Ministry of Oceans & Fisheries, Mr. Kim Yang-soo.

The Ministry of Foreign Affairs will actively participate in the marine preservation cooperation through multilateral cooperation organizations such as the Northwest Pacific Action Plan (NOWPAP) and the Coordinating Body on the Seas of East Asia (COBSEA), and actively cooperate to comply with the policies of the new government.

## **Conclusion**

Distinguished guests, there is a saying of an old philosopher, "the beginning of harmony is understanding".

Through the first phase of the project, both Korea and China were able to scientifically diagnose the pollution situation surrounding the Yellow Sea and understand the actual situation of the Yellow Sea, through which the foundation for the second phase of the project has been prepared.

Through the second phase of the project, I look forward for the two countries to fulfill a concrete regional strategic plan and implement realistic cooperation projects for sustainable use and protection of marine resources, under a close cooperation with the UNDP and the YSLME Secretariat.

As the success of the second phase depends on the actual implementation, it would not be an exaggeration to say that it depends on the will and enthusiasm of those who have gathered in this place. I would like to entreat you for your active interest and efforts so that the project can be successfully implemented.

Finally, I would like to extend my gratitude to all those involved in the event for their efforts and wish the best of success in the YSLME Phase II Project.

Thank you.

## 贺词

百忙中来参加会议的  
海洋水产部Mr. Yang-soo KIM海洋政策室室长，  
中国国家海洋局梁凤奎副司长，

仁川市赵东岩副市长，  
还有其他各位国内、外贵宾朋友们，

历经长时间的苦痛为了保护韩国和中国的宝贵资产黄海启动了黄海广域海洋生态系统第2期项目感到很高兴。

向为了本次启动工作会议辛苦工作的UNDP, UNOPS方的国内外专家们和相关工作人员们表示真挚的感谢。

特别是向上任伊始就开始为启动工作会议的举办不惜辛苦的郭寅峰项目经理表示真心的感谢。

### 黄海现状与保护的必要性

作为有着丰富的渔产资源的黄海是作为给沿海居民们提供生活依靠的重要自然空间。也是作为连接大陆与韩半岛的广阔的大洋可以延伸出去的交通、物流上极好的经济型资产。

但是，黄海通过60多个以上的大小江河流入淡水和浮游物，而且，具有受风和海流的影响较小的指向性条件与外部海洋交流困难污染物质容易流入和扩散，处于外部污染非常脆弱的情况。

不止如此，由于沿海人口增加，开垦滩涂等海岸开发，工业废弃物排放，滥捕及过度养殖等引起的海洋生态系统破坏，水质下降，生产力减少等现象的同时导致生态系统抚养能力下降。

为了解决这些黄海污染问题保护海洋生态系统而前进，提高沿海居民的生活质量，更广范围的说就算是为了保护东北亚环境做出贡献国际机构和邻国间的合作迫在眉睫。

我认为本次的YSLME第2期项目启动工作会议在这样的情况下时机恰到好处。

### YSLME的成果及未来的方向

国内、外贵宾朋友，

YSLME第1期项目通过项目办公室，韩-中专家，各位公务员们的忘我努力，为了保护黄海形成地区性的共识和合作的势头准备目标性保护黄海的行动框架。

我个人认为第1期项目结束以后虽然历经项目中断的困难第2期项目得以启动与在座的每一位的努力和积极地意向，关心和热情密不可分。

这样的结果使YSLME项目从GEF和UND得到了很高的评价的同时也被评价为全世界66个LME中唯一启动第2期项目的模范合作团体。

为了第2期项目能够成功的进行并取得早期的成果需要以邻国间的相互信任为基础的稳固合作和沟通。

通过国境间的移动受到邻国间的相互影响的海洋环境问题从特性上邻国间的共同对应是非常重要的。为了恢复破坏的黄海机能并可持续保护及发展需要周边国家的一起努力。

2期项目的成果不是暂时的而是在持久地推进的基调下，应该持续关注并促进为了保护黄海的合作不以本次2期项目结束能够持续。

像Mr. Yang-soo KIM海洋水产部室长所说那样韩国新政府正在推进所设立的大海的所有东西都重新做的再造海洋的蓝图。

外交部将通过保护北西太平洋行动计划(NOWPAP),东亚海洋协调机构(COBSEA)等多边合作机构积极参与保护海洋合作，符合新政府的政策将积极合作。

## 结束语

国内、外的各位贵宾，

古代哲学家说“和睦的开始是理解”。

韩-中两国通过第1期项目对围绕黄海的污染现状进行了科学的诊断并了解黄海的实况，以此为基础准备推进第2期项目。

期待第2期项目通过两国 与UNDP, YSLME办公室的紧密合作下具体实行地区战略计划并为了海洋资源的可持续利用及保护实施实质合作项目。

第2期项目的成功取决于实际实施程度, 取决于在座的各位的意向和热情也不是妄言。

最后，再一次向为了准备这次工作会议辛苦工作的所有相关人员表示感谢并预祝YELME第2期项目取得成功。

谢谢。



Annex 7: Congratulatory Address of Vice Mayor of Incheon Metropolitan City Mr. Dong Am CHO

■ 모두말씀

- 안녕하십니까. 인천시 정무경제부시장 조동암입니다.
- 황해광역생태계보전사업 제 2 기 프로젝트 발족식 개최를 300 만 인천시민과 함께 진심으로 축하드리며 YSLME 제 2 기 사업에 우리시도 함께 할 수 있어서 매우 기쁨.
- 뜻깊은 이 자리에 함께하신 해양수산부 김양수 해양정책실장님, UNDP 방콕사무소의 호세 파딜라(Jose Padilla) 기술담당관님, 외교부 권세중 심의관님, 중국 국가해양국의 후송친(Hu songqin) 심의관님을 비롯한 내외 귀빈 여러분께 감사드립니다.

■ 강조점

- 해양은 생명의 근원이자 수산자원의 보고이며, 현재 전 세계의 뜨거운 이슈가 되고 있는 지구 기후변화와 밀접한 관계임을 우리는 잘 알고 있음.
- 그럼에도 인구의 증가, 연안의 무분별한 개발과 수자원의 남획 등으로 무한할 것 같았던 해양자원과 생태계 지원 서비스는 어느새 지속가능한 이용을 우려할 상황에 처해 있는 실정임.
- 한·중·북한 3 국이 공유하고 있는 황해 또한 다르지 않다고 생각 됨. 기존의 국가, 지자체 등 행정구역 단위의 단편적 해양관리에서 오는 한계를 극복하고,
- 경계를 초월하는 월경성 문제를 공동으로 해결하기 위해 LME 사업이 전 지구적으로 전개되었고, YSLME 사업 또한 그 중의 하나로서 UNDP 의 협조와 지원 속에 추진되고 있음을 잘 알고 있음.

이 자리를 빌어 UNDP 와 한·중 정부 관계자분들께 깊이 감사드립니다.

- YSLME 제 2기 프로젝트의 발족을 통해  
해양자원을 둘러싼 국가 간 갈등을 해소하고  
환경이라는 비정치적인 주제로 서해 접경지역의 긴장 완화와  
남북한 그린데탕트의 실현, 그리고 동북아 해양환경 협력의 거점 역할의  
수행을 기대 함.
  
- 우리 인천시는  
168 개의 섬과 전국 갯벌의 28.5%인 709 km<sup>2</sup>의 갯벌을 가진 자연환경과  
인천국제공항과 인천항을 중심으로 동북아 중심도시로서 세계와 교류하고  
있으며,  
특히 GCF, UN ESCAP, UN ISDR 등 기후관련 국제기구와 함께 저탄소  
녹색도시 구현의 선도도시로서 역할을 하고자 노력하고 있음.
  
- 내일 해양보호구역(MPA) 세미나와 갯벌 현장견학이 이루어지는  
강화도는 우리나라에서 4 번째로 큰 섬이며,  
섬 전체에는 유네스코 세계문화유산으로 지정된  
부근리 지석묘(고인돌)를 비롯하여 역사적인 유물들이 곳곳에 분포하는  
지붕없는 박물관으로 불리우는 역사의 현장이자 관광 명소 임.
  
- 역사를 소중히 간직하고, 미래 유산인 해양환경을 보전하기 위해  
MPA 지정을 추진 중에 있으며,  
그간 연도교로 막혀있던 바닷길을 연결하여 해수를 소통시켜  
갯벌생태계를 복원하는 사업도 시행하고 있는 곳으로  
YSLME 관계자 여러분께 의미있는 장소가 될 것이라고 생각 함.

■ 맺음말

- 아무쪼록 YSLME 2기 사무국의 무궁한 발전을 기원하며,  
이번 행사를 위해 애써주신 관계자 여러분 모두에게 다시 한번 감사드립니다.
  
- 또한, 이 자리에 참석하신 모든 분들의 앞날에

건강과 행복이 함께 하시기를 기원 드립니다.

### **Congratulatory Address**

**Mr. Dong Am CHO**  
**Vice Mayor of Incheon Metropolitan City**

Greetings. I am Dong Am Cho, Vice Mayor for Political & Economic Affairs of Incheon Metropolitan City.

I would like to express a sincere congratulation for the launch of the YSLME Phase II Project along with the 3 million Incheon citizens, and it is a great honor to be a part of the project.

I would like to express my heartfelt gratitude to Mr. Yang-soo Kim, Deputy Minister of Ministry of Oceans and Fisheries, Mr. Sei-joong Kwon, Deputy Director General of Ministry of Foreign Affairs, Mr. Fengkui Liang, Deputy Director General of State Oceanic Administration, Mr. Jose Padilla, Regional Technical Adviser of UNDP, and all the distinguished guests who have joined us in this place.

We are well aware that the ocean is a source of life, treasure of fisheries resources, and is closely related to the global climate change, which currently is a hot topic all over the world.

Nevertheless, marine resources and ecosystem support services, which seemed to be infinite, are in a situation of concern for sustainable use due to population increase, indiscriminate development of the coast, and overfishing of marine resources.

The Yellow Sea, which Korea, China, and North Korea share, is not different.

The LME project has been developed globally in order to overcome the limitations of the divisional marine management of the administrative units such as the state and local governments and to jointly solve the border-crossing problems. YSLME project is one of the LME projects and we are well aware that it is being promoted with the cooperation and support of UNDP.

I would like to take this opportunity to express my deep gratitude to the UNDP and the Korean and Chinese government officials.

Through the launch of the YSLME Phase II Project, I expect the conflicts surrounding the marine resources to be resolved, the tensions in the West Sea border region to subside with the non-political theme of the environment, the green detente between North and South Korea be fulfilled, and the project to act as base for Northeast Asia marine environment cooperation.

Incheon Metropolitan City has a natural environment with 168 islands and 709 km<sup>2</sup> of mud-flat which accounts for 28.5% of the national mud-flats, is interacting with the world as a focal city of Northeast Asia with the Incheon International Airport and Incheon Port, and strives to play the role as a leading city in the reformation as a low-carbon green city alongside with GCF, UN ESCAP, UN ISDR, and other climate related international organization.

Ganghwa Island, where the Marine Protected Area (MPA) seminar and the mud-flat field trip are to be held tomorrow, is the 4th largest island in Korea and it is considered as a historical site as well as a tourist attraction as it is called 'the museum without a roof', with dolmens designated as UNESCO world heritages located across the island.

I believe that it will be a meaningful place for YSLME participants as the designation of MPA is in process to cherish the history and to preserve the marine environment for the future. Also, a project to restore the mud-flat ecosystem by connecting a sea route that was blocked by the bridge is in process.

I wish for an unending development of the YSLME Phase II Project Secretariat and once again express my deepest gratitude to all those who endeavoured for today's ceremony.

Furthermore, I wish for the best of welfare and luck to all those who are with us today.

I extend my sincerest congratulation for the launch of YSLME Phase II Project.



# **Environmental Challenges in the Yellow Sea: Environmental Status and the Way Forward (Pollution)**

**Jae R. OH**  
**National Coordinator, ROK**

**Inception Ceremony of  
the UNDP/GEF YSLME Phase II Project  
13 July 2017  
Seoul, Korea**

## **CONTENTS**

- Environmental Status and Problems**
- Monitoring Chemical Pollution**
  - ▶ Overview of International Monitoring Programmes
  - ▶ Emerging Contaminants
  - ▶ YSLME 1<sup>st</sup> phase Co-operative Cruise
- Marine Debris and Microplastics**
- The Way Forward**

## **Environmental Status (YSLME SAP)**

- ▶ 1.6 Billion Tons of Sediment
- ▶ 1,500 Billion Tons of Freshwater
- ▶ 460 Billion Tons of Water from Rainfall

## **Environmental Problems (YSLME SAP)**

### **Major Contaminants**

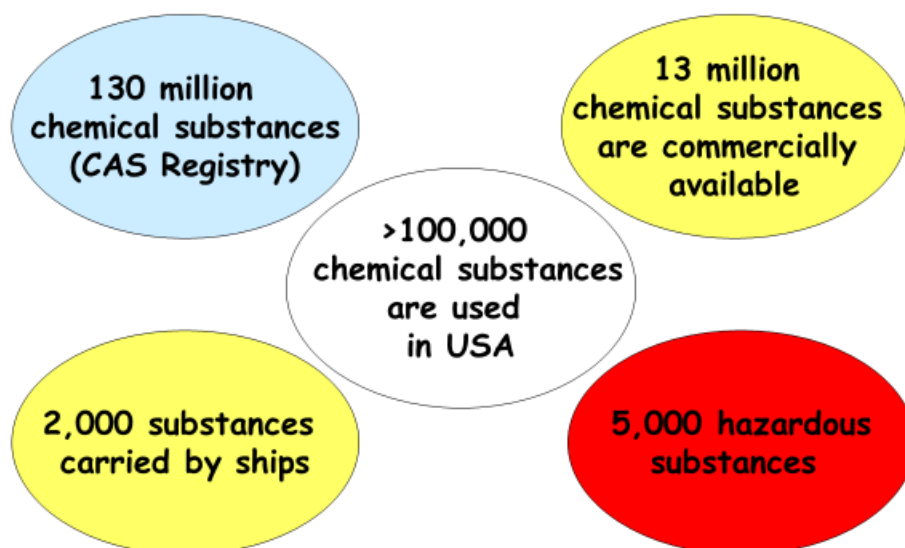
- inorganic nitrogen and phosphate
- faecal substances
- ▶ **heavy metals**
- ▶ **persistent organic pollutants (POPs)**
- ▶ **polycyclic aromatic hydrocarbons (PAHs)**
- ▶ **marine litter**

## **Monitoring Chemical Pollution**

- ▶ Overview of International Monitoring Programmes
- ▶ Emerging Contaminants
- ▶ YSLME 1<sup>st</sup> phase Co-operative Cruise

## **Overview of Int'l Monitoring Programmes**

## The « *chemical universe* »



## Chemicals Usage in USA

- An estimated **US\$700 Billion** worth of chemistry products flow through the US economy each year
- Registered or approved for commercial use: **>100,000** chemicals
  - >84,000 Industrial chemicals
  - 9,000 food additives
  - 3,000 cosmetics ingredients
  - 1,000 pesticide active ingredients
  - 3,000 pharmaceuticals

(Ref: The Pulse of the Bay, 2013, SFED)



**Table. Overview of some major well-established international monitoring programmes and the contaminants and matrices they measure**

(after Roose and Brinkman, 2005).

Organisation or programme	Start of the programme	Parameters	Sample types
AMAP	1978	HM, PCBs, PAHs, OCPs	biota, sediment, water, human tissue
HELCOM	1979	HM, PCBs, PAHs, OCPs, OTINs	biota, sediment, water
NS&T	1986	HM, PCBs, PAHs, OCPs	biota, sediment
IMW	1965 (1991)	HM, PCBs, PAHs, OCPs	biota (bivalves)
OSPAR	1978	HM, PCBs, PAHs, OCPs, OTINs	biota, sediment

b

**Table. Overview of the main selection criteria used for selecting potentially harmful substances as applied by major marine monitoring programmes and frameworks.**

Programme Criterium	WFD	AMAP	BSC	HELCOM	MEDPOL	OSPAR	UN-ECE POP
Persistence	X	X	X	X	X	X	X
Bioaccumulation	X	X	X	X	X	X	X
Toxicity	X	X	X	X	X	X	X
Production volume and use	X			X		X	
Presence in the environment	X	X	X	X			
Modelling	X						
Long-range transport		X			X		X

(Ref: Position Paper 16. Monitoring Chemical Pollution in Europe's Seas. Nov. 2011. European Science Foundation)

## Emerging Contaminants

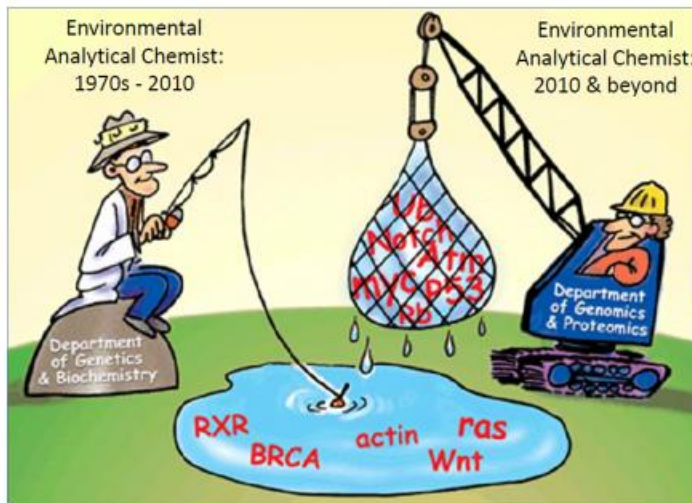
### Emerging Contaminants

- Definition: **Previously unknown or unrecognized pollutants.**  
(Ignored Environmental Contaminants)
- “As any analytical chemist knows, what you see depends on what you look for” (Lynn Roberts, Johns Hopkins Univ.)
- Emerging contaminants are generally not included in the legislation (Non-priority Pollutants)
- Improvements in analytical methods has increased our ability to detect the occurrence of chemicals in very minute quantities.
- Very little is known about the health impact of these chemicals, but they are widespread, persistent in the environment and tend to bioaccumulate
- Effects of a mixture of these chemicals unknown

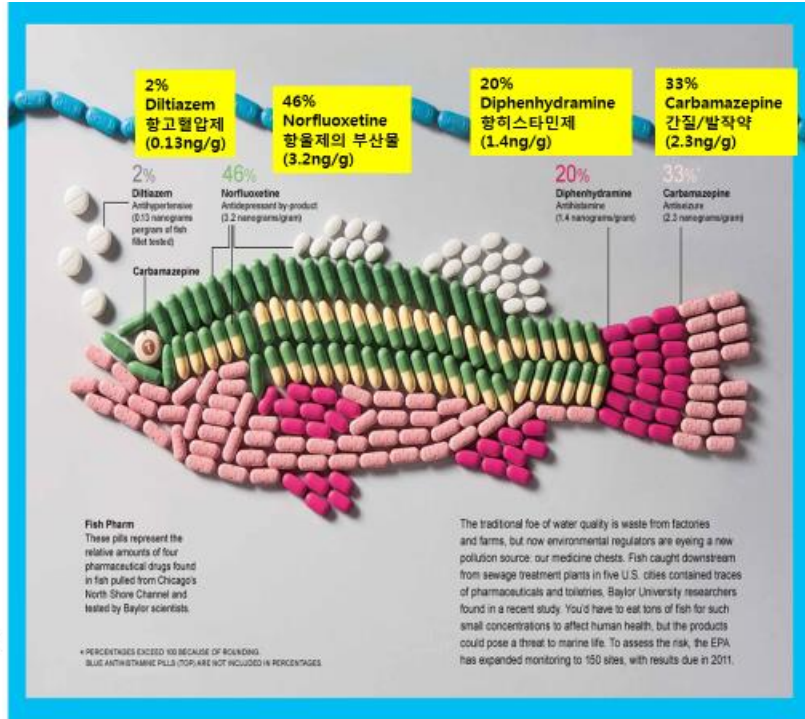
## Emerging Contaminants

- Pesticides including metabolites
- Pharmaceuticals
- Personal care products: cosmetics, detergents, perfumes
- Industrial additives and by-products: Dioxane, Bisphenol A
- Food additives: BHA, BHT
- Flame retardants: PBDE, alkyl phosphates, triazoles
- Surfactants: alkyl ethoxylates, PFOS, and PFOA
- Hormone and sterols: estradiol and cholesterol
- Plasticisers and sweeteners

**What are the next emerging contaminants and how can we find them in the environment?**



**Evidence of bioaccumulation of some (but not all) CECs**



National Geographic  
April 2010

**OSPAR priority chemicals**

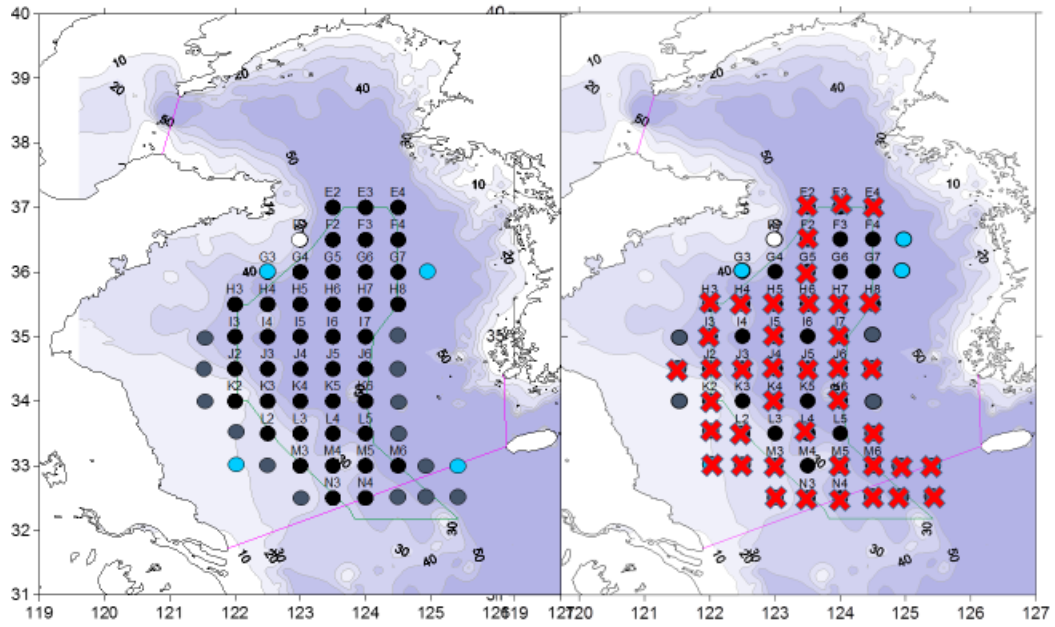
Cadmium	Dicofol
Lead and organic lead compounds	Endosulfan
Mercury and organic mercury compounds	HCH isomers
Organic tin compounds	Methoxychlor
Neodecanoic acid, ethenyl ester	Pentachlorophenol (PCP)
PFOS	Trifluralin
Tetrabromobisphenol-A	Clotrimazole
Trichlorobenzenes	2,4,6-tri-tert-butylphenol
Brominated flame retardants	Nonylphenol-ethoxylates
Polychlorinated biphenyls (PCBs)	Octylphenol
Polychlorinated dibenzodioxins and dibenzofurans (PCDDs, PCDFs)	Phthalates: dibutylphthalate (DBP), diethylhexyl-phthalate (DEHP)
Short chained chlorinated paraffins (SCCPs)	Polycyclic aromatic hydrocarbons (PAHs)
4-(dimethylbutylamino) diphenylamin (6PPD)	Musk xylene

# YSLME 1<sup>st</sup> phase

## Co-operative Cruises

January 2006: 61 stations

January 2008: 20 stations



May 2006: 80 stations

August 2008: 37 stations

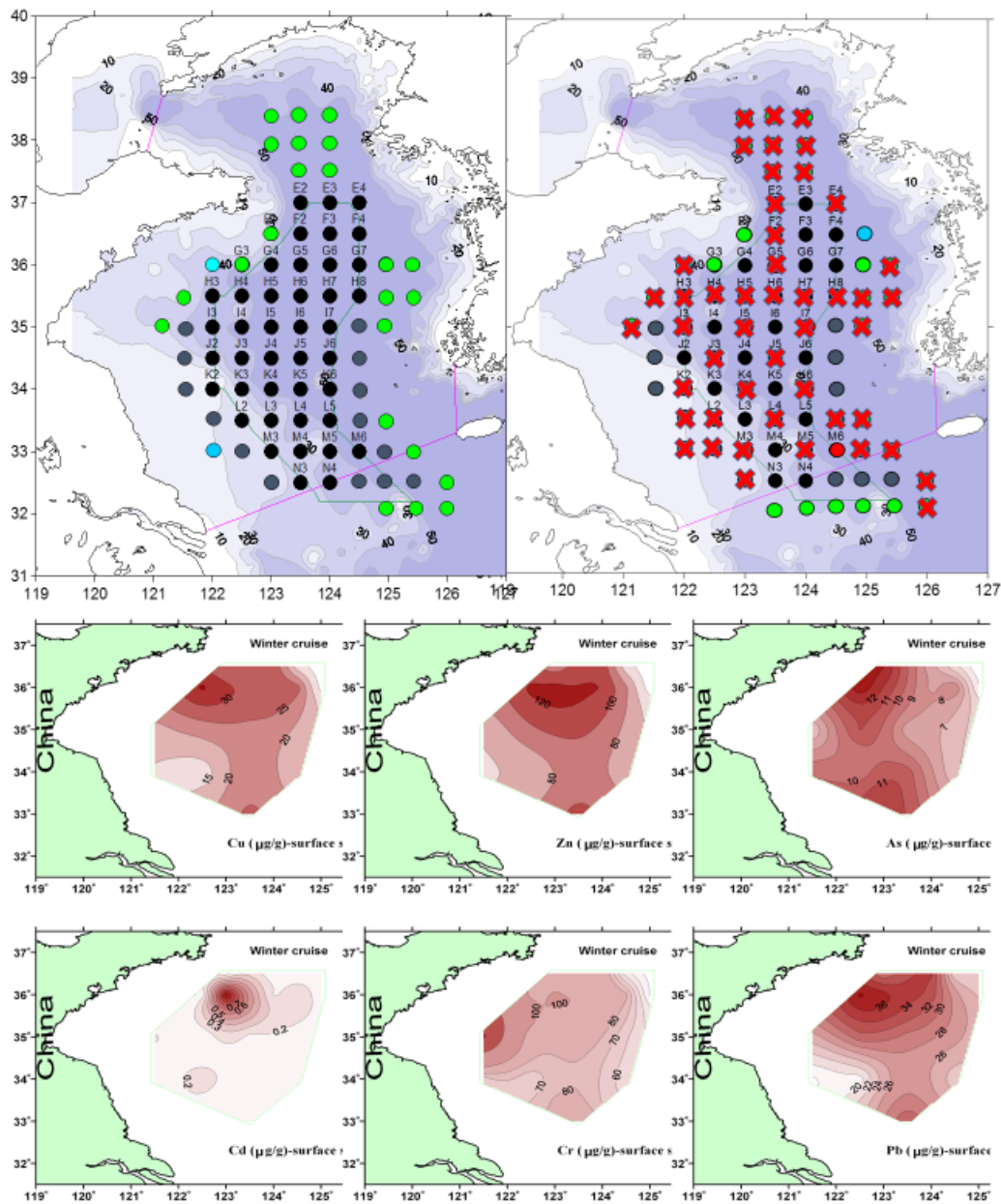
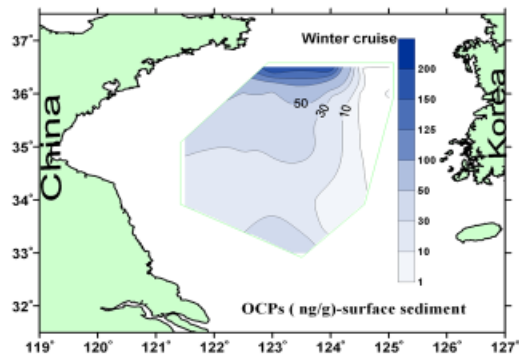
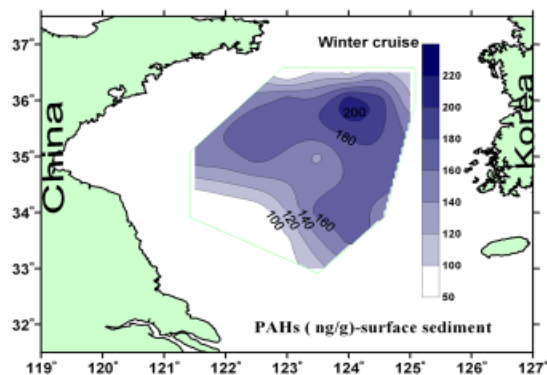


Figure. Cu, Zn, As, Cd, Cr and Pb concentration in the sediment in winter.



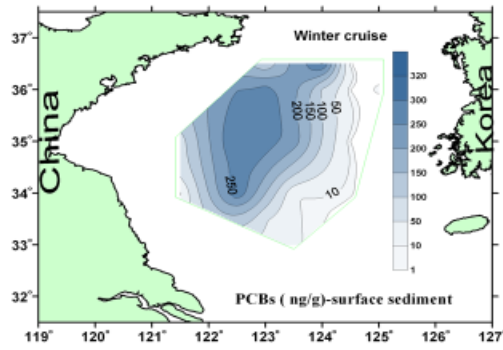
**Target organochlorine pesticides (19 OCPs)**

$\alpha$ -BHC	$\gamma$ -Chlordane	p,p'- DDD
$\beta$ - BHC	$\alpha$ - Chlordane	Endrin Aldehyde
$\gamma$ - BHC	Endosulfan-I	Endosulfan Sulfate
$\delta$ - BHC	p,p'-DDE	p,p'- DDD
Heptachlor	Dieldrin	Methoxychlor
Aldrin	Endrin	
Heptachlor Epoxide	Endosulfan-II	



**Target polycyclic aromatic hydrocarbons (18 PAHs)**

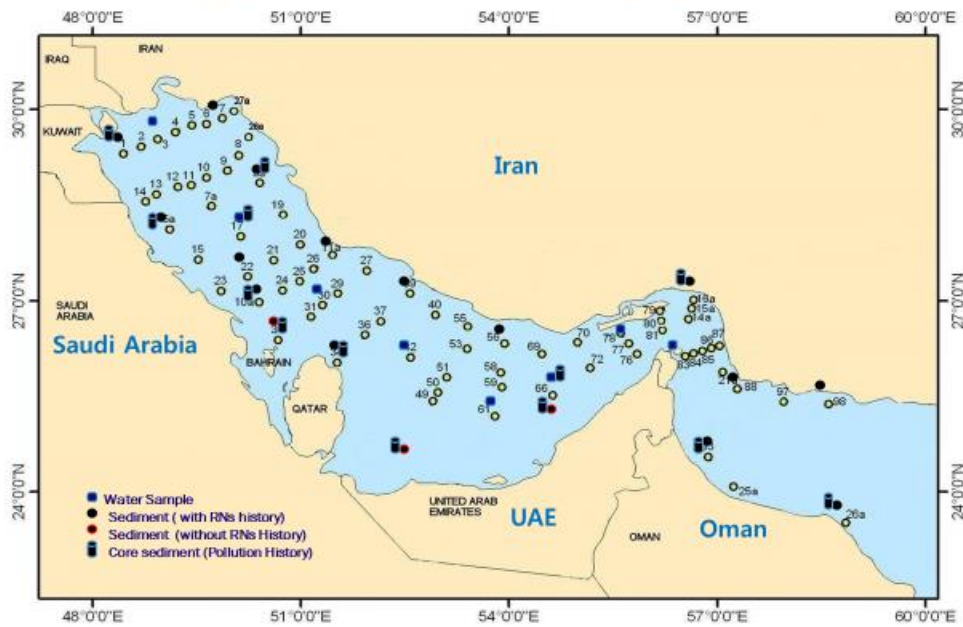
Naphthalene	Anthracene	Benzo[b]fluoranthene
2-Methynaphalene	Phenanthrene	Benzo[k]fluoranthene
1-Methynaphalene	Fluoranthene	Benzo[a]pyrene
Acenaphthylene	Pyrene	Benzo[1,2,3-cd] pyrene
Acenaphthene	Benzo[a]anthracene	Dibenzo[a,h]anthracene
Fluorene	Chrysene	Benzo[ghi]perylene



**Target PCB congeners**

PCB18	PCB101	PCB138
PCB258	PCB105	PCB153/132
PCB52	PCB110	PCB170
PCB66/95	PCB118	PCB180

**ROPME Oceanographic Winter 2006 Cruise Sampling Stations**





**Table. Chemical contaminants analyzed in the sediments from the RSA.**

Low MW PAHs	High MW PAHs	Petroleum Hydrocarbons	Organochlorine Pesticides	PCBs	Major and Trace Elements
Naphthalene	Fluoranthene	PH equiv. Chrysene	HCB	PCB 8	Aluminum (Al)
C1-naphthalenes	Pyrene	PH equiv. ROPME Oil	$\alpha$ HCH	PCB 18	Antimony (Sb)
C2-naphthalenes	C1-pyrenes	Resolved aliphatics	$\beta$ HCH	PCB 28	Arsenic (As)
C3-naphthalenes	Benz (a) anthracene	Unresolved aliphatics	Lindane	PCB 31	Barium (Ba)
C4-naphthalenes	Chrysene	n-C12	$\delta$ HCH	PCB 44	Calcium (Ca)
Biphenyl	C1-chrysenes	n-C13	Total HCHs	PCB 49	Cadmium (Cd)
Acenaphthylene	C2-chrysenes	n-C14	<i>pp'</i> DDE	PCB 52	Chromium (Cr)
Acenaphthene	C3-chrysenes	n-C15	<i>pp'</i> DDD	PCB 66/95	Cobalt (Co)
Fluorene	Benzo (b+j) fluoranthene	n-C16	<i>pp'</i> DDT	PCB 87	Copper (Cu)
C1-fluorenes	Benzo (k) fluoranthene	n-C17	DDMU	PCB 97	Iron (Fe)
C2-fluorenes	Benzo (a) fluoranthene	n-C18	<i>op</i> DDE	PCB 101	Lead (Pb)
C3-fluorenes	Benzo (e) pyrene	n-C19	<i>op</i> DDD	PCB 105	Lithium (Li)
Dibenzothiophene	Benzo (a) pyrene	n-C20	<i>op</i> DDT	PCB 110	Magnesium (Mg)
C1-dibenzothiophenes	Perylene	n-C21	Total DDTs	PCB 118	Manganese (Mn)
C2-dibenzothiophenes	Indeno [1,2,3-c,d] pyrene	n-C22	Heptachlor	PCB 126	Nickel (Ni)
C3-dibenzothiophenes	Benzo [g,h,i] perylene	n-C23	Aldrin	PCB 128	Selenium (Se)
C4-dibenzothiophenes	dibenz [a,h] anthracene	n-C24	Dieldrin	PCB 138	Silver (Ag)
Anthracene		n-C25	Endrin	PCB 149	Strontium (Sr)
Phenanthrene		n-C26	<i>cis</i> Chlordane	PCB 153	Tin (Sn)
C1-phenanthrenes	<b>Auxiliary Analysis</b>	n-C27	<i>trans</i> Chlordane	PCB 156	Uranium (U)
C2-phenanthrenes	Grain size	n-C28	<i>trans</i> Nonachlor	PCB 169	Vanadium (V)
C3-phenanthrenes	Organic carbon	n-C29	Heptachlor epoxide	PCB 170	Zinc (Zn)
C4-phenanthrenes	Lipid contents	n-C30	Methoxychlor	PCB 174	Mercury (Hg)
Retene	Moisture content	n-C31	$\alpha$ Endosulfan	PCB 177	
		n-C32	$\beta$ Endosulfan	PCB 180	
		n-C33	Endosulfan sulfate	PCB 183	
		n-C34		PCB 187	
		n-C35		PCB 189	
		n-C36		PCB 194	
		Pristane		PCB 195	
		Phytane		PCB 199	
		Squalane		PCB 201	
		Resolved aromatics		PCB 206	
		Unresolved aromatics		PCB 209	
				Ar.1254	
				Ar.1260	

Abbreviations: MW, molecular weight; PH, petroleum hydrocarbons; Ar, Aroclor

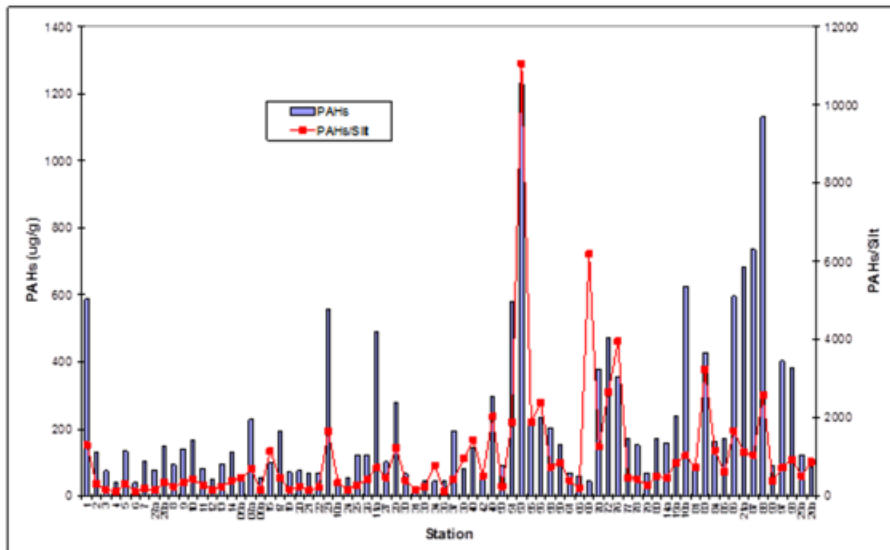


Figure. Comparison of total PAHs to silt normalized PAHs concentrations. Normalized concentrations of PAHs were calculated as total PAHs/silt fraction of the sediment.

## Ecosystem Health of the Baltic Sea HELCOM Initial Holistic Assessment (2003-2007)

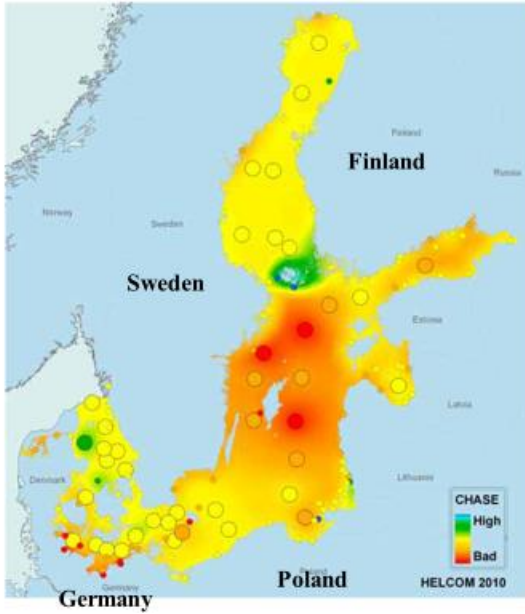


Figure. Integrated classification of the **'status of hazardous substances'** in 144 assessment units. Blue = 'high' status, green = 'good', yellow = 'moderate', orange = 'poor', and red = 'bad' status.

'High' and 'good' status (blue and green) are equivalent to 'areas not disturbed by hazardous substances', while 'moderate', 'poor', and 'bad' status (yellow, orange and red) are equivalent to 'areas disturbed by hazardous substances'.

## Marine Debris and Microplastics



Plastic pollution policies? Or, how to “solve” a wicked problem.



Max Liboiron  
ABD, Media, Culture and Communication  
New York University  
Coordinator, Plastic Pollution Coalition East Coast Chapter

## Ocean plastics



NOAA

## Problems with ocean plastics: entanglements



Left: image by Jim Patterson  
Right: Image by NOAA

## Problems with ocean plastics: ingestion



2  $\mu\text{m}$  microplastic in gut cavity of *M. edulis*

Top: Image from 5 gyres  
Lower corner: from Browne et al "Ingested Microscopic Plastic Translocates to the Circulatory System of the Mussel, *Mytilus edulis* (L.)" 2008.

# Ocean plastics: a soup



Left: image by Max Liboiron  
Right: image from 5 Gyres

## 3. MPs research in China



# MPs on Beach



Baseline  
Occurrence of microplastics in the coastal marine environment: First observation on sediment of China

Qingshan Qiu<sup>a</sup>, Jinqing Peng<sup>a,\*</sup>, Xubiao Yu<sup>a</sup>, Fangchao Chen<sup>a</sup>, Jundong Wang<sup>a</sup>, Fengzhang Dong<sup>a</sup>

**Table 2**  
Incidence of microplastics in sediments of China (number of items per 50 g dry sediment).

Sites	Place	No.	long class	Middle class	Short class	Total
S1	Shapawan	1	45	80	150	275
		2	44	60	112	216
		3	49	58	154	261
		Average	46	66	138.7	260.7
S2	Haikou	1	26	82	153	261
		2	80	212	255	547
		3	61	107	171	339
		Average	56.7	133.7	206.3	396.7
S3	Wanning	1	77	85	148	310
		2	118	134	127	389
		3	105	222	221	608
		Average	120	147	168.7	435.7
S4	Sanya	1	164	175	185	524
		2	39	62	119	220
		3	61	76	150	287
		Average	88	104.3	151.3	343.6
S5	Beibai	1	90	101	138	329
		2	66	56	117	239
		3	93	94	148	335
		Average	83	83.7	134.3	304



Qiu et al., 2015

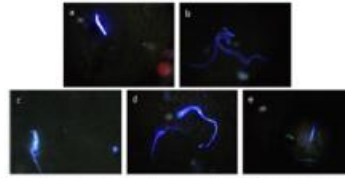
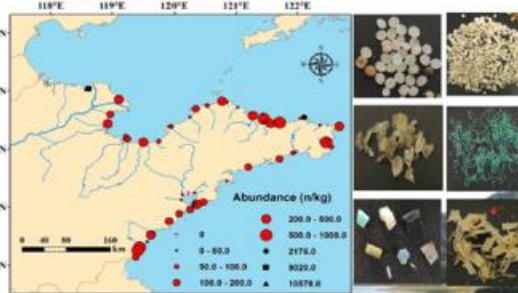


Fig. 4. Images of microplastics by an optical fluorescence microscope from Shapawan (S1), Haikou (S2), Wanning (S3), Sanya (S4), and Beibai (S5).

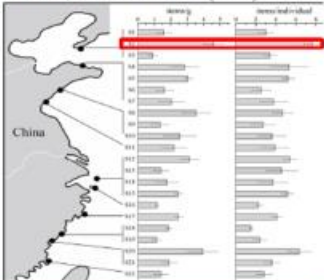
Zhang et al., 2016



(Ref: J. Wang, NMEMC)

# MP in Shellfish

Li et al., Environ. Pollut. (2016)



Variation Range:  
0.9 - 4.6 items/g;  
1.5 - 7.6 items /individual

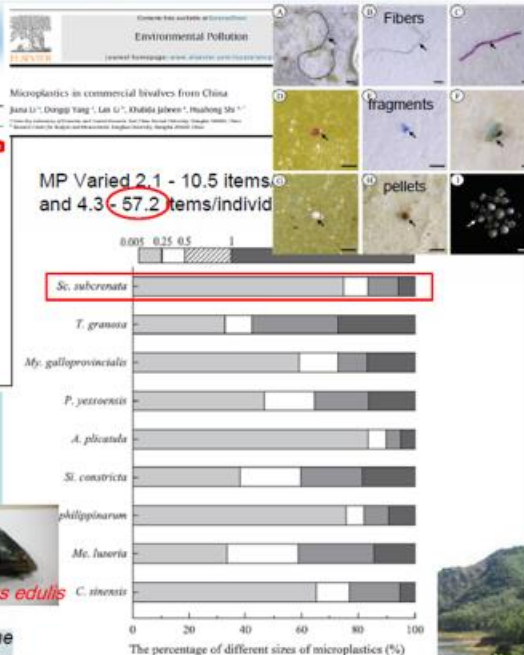
Average Density:  
2.2 items/g;  
4.0 items/individual



Mytilus edulis



National Marine Environment



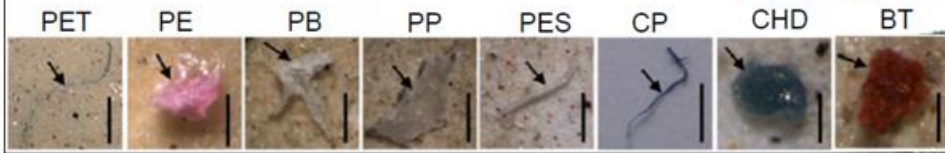
(Ref: J. Wang, NMEMC)

# MPs in Table Salts from China

Yang et al., 2015

- MPs content was 550–681 particles/kg in sea salts;
- fragments and fibers were the prevalent types of particles compared with pellets and sheets.
- MPs measuring less than 200  $\mu\text{m}$  represented the majority of the particles, accounting for 55% of the total MPs
- most common MPs were polyethylene terephthalate, followed by polyethylene and cellophane in sea salts.
- 5  $\mu\text{m}$  pore size, 47 mm cellulose nitrate filter paper using a vacuum system.

(Ref: J. Wang, NMEMC)



## Effects of MPs on Marine Copepod (2013)

### Size-Dependent Effects of Micro Polystyrene Particles in the Marine Copepod *Tigriopus japonicus*

Kyun-Woo Lee,<sup>\*,1,8</sup> Won Joon Shim,<sup>‡</sup> Oh Youn Kwon,<sup>†</sup> and Jung-Hoon Kang<sup>\*,1</sup>

<sup>†</sup>South Sea Environment Research Department, Korea Institute of Ocean Science and Technology, 391 Jangmok-myeon, Geoje-shi, 656-834, South Korea

<sup>‡</sup>Oil and POPs Research Group, Korea Institute of Ocean Science and Technology, 391 Jangmok-myeon, Geoje-shi, 656-834, South Korea

Supporting Information

**ABSTRACT:** We investigated the effects of three sizes of polystyrene (PS) microbeads (0.05, 0.5, and 6- $\mu\text{m}$  diameter) on the survival, development, and fecundity of the copepod *Tigriopus japonicus* using acute and chronic toxicity tests. *T. japonicus* ingested and egested all three sizes of PS beads used and exhibited no selective feeding when phytoplankton were added. The copepods (nauplius and adult females) survived all sizes of PS beads and the various concentrations tested in the acute toxicity test for 96 h. In the two-generation chronic toxicity test, 0.05- $\mu\text{m}$  PS beads at a concentration greater than 12.5  $\mu\text{g}/\text{mL}$  caused the mortality of nauplii and copepodites in the  $F_0$  generation and even triggered mortality at a concentration of 1.25  $\mu\text{g}/\text{mL}$  in the next generation. In the 0.5- $\mu\text{m}$  PS bead treatment, despite there being no significant effect on the  $F_0$  generation, the highest concentration (25  $\mu\text{g}/\text{mL}$ ) induced a significant decrease in survival compared with the control population in the  $F_1$  generation. The 6- $\mu\text{m}$  PS beads did not affect the survival of *T. japonicus* over two generations. The 0.5- and 6- $\mu\text{m}$  PS beads caused a significant decrease in fecundity at all concentrations. These results suggest that microplastics such as micro- or nanosized PS beads may have negative impacts on marine copepods.

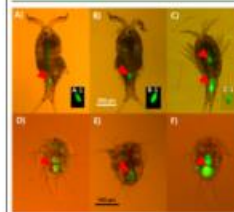
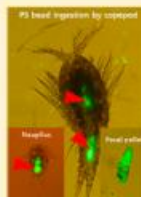


Figure 1. Fluorescently labeled polystyrene beads (inset) of 0.05  $\mu\text{m}$  (A, D), 0.5  $\mu\text{m}$  (B, E), and 6  $\mu\text{m}$  (C, F) diameter ingested by *Tigriopus japonicus* including adults (A, B, C) and nauplii (D, E, F) exposed to several concentrations (A, B, C) and nauplii (D, E, F) exposed to several concentrations (D, E, F) of polystyrene beads. A, B, C: 0.05  $\mu\text{m}$  PS bead; D, E, F: 0.5  $\mu\text{m}$  PS bead; G, H, I: 6  $\mu\text{m}$  PS bead for 24 h. A, B, C: 0.05  $\mu\text{m}$  PS bead; D, E, F: 0.5  $\mu\text{m}$  PS bead; G, H, I: 6  $\mu\text{m}$  PS bead for 96 h. A, B, C: 0.05  $\mu\text{m}$  PS bead; D, E, F: 0.5  $\mu\text{m}$  PS bead; G, H, I: 6  $\mu\text{m}$  PS bead for 96 h. A, B, C: 0.05  $\mu\text{m}$  PS bead; D, E, F: 0.5  $\mu\text{m}$  PS bead; G, H, I: 6  $\mu\text{m}$  PS bead for 96 h.

## ESP Debris as Source of Hazardous Chemicals (2016)

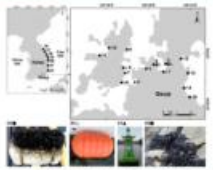



Figure 4. (a) Map showing sampling sites according to substrate type. (b) micrograph of (1) and (2) and (c) and (d) micrograph of marine debris with the substrate along with its chemical analysis.



pubs.acs.org/est

Article

### Styrofoam Debris as a Source of Hazardous Additives for Marine Organisms

Mi Jang,<sup>1,2</sup> Won Joon Shim,<sup>1,2</sup> Gi Myung Han,<sup>1</sup> Manviri Rani,<sup>1</sup> Young Kyoung Song,<sup>1,2</sup> and Sang Hee Hong<sup>1,2</sup>

<sup>1</sup>Oil and POPs Research Laboratory, Korea Institute of Ocean Science and Technology, Jangjuk-myeon 391, Geoje 656-834, Republic of Korea  
<sup>2</sup>Korea University of Science and Technology, Daejeon 305-320, South Korea

Supporting Information

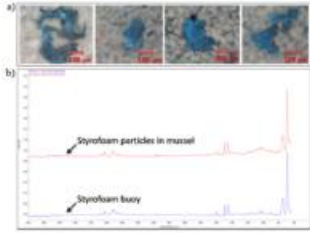
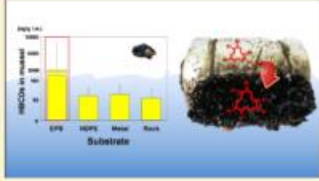



Figure 4. (a) GC-MS chromatograms of styrofoam particles in mussel and (b) GC-MS chromatograms of styrofoam particles from mussel, from styrofoam buoy.

over plastic debris and substances in marine biota to provide field associated chemicals to iodocane (HBCDs), recently detected in debris. We hypothesize the additives in inhabiting such debris are we investigated the by mussels inhabiting inhabiting differentylene (HDPE), metal, BCD levels up to 5160 ng/g lipid weight and the  $\gamma$ -HBCD dominated isomeric profiles in supports the transfer of HBCDs from styrofoam substrate to mussels. Furthermore, notified inside mussels, probably originating from their substrates.



PAHs, and also additives leached out of other plastics such as (PBT/PE) in container. Therefore, plastic can concentrate

## UV Stabilizers & AOs in Plastic MD (2017)



Science of the Total Environment 579 (2017) 745–754

Contents lists available at ScienceDirect

Science of the Total Environment

Journal homepage: [www.elsevier.com/locate/scitotenv](http://www.elsevier.com/locate/scitotenv)

### Benzotriazole-type ultraviolet stabilizers and antioxidants in plastic marine debris and their new products

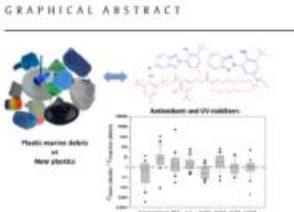
Manviri Rani<sup>a</sup>, Won Joon Shim<sup>a,b</sup>, Gi Myung Han<sup>a</sup>, Mi Jang<sup>a,b</sup>, Young Kyoung Song<sup>a,b</sup>


<sup>a</sup> Oil and POPs Research Laboratory, Korea Institute of Ocean Science and Technology, 41 Jangjuk-1-gil, Geosje 656834, Republic of Korea  
<sup>b</sup> Department of Marine Environmental Sciences, Korea University of Science and Technology, 217 Gakong-ro Daejeon 30532, Republic of Korea

**HIGHLIGHTS**

- Quantitative measurement of antioxidants and UV stabilizers in plastic marine debris
- A comparative study of additive contents between marine debris and new plastics
- Plastic marine debris has the potential to act as vectors and carriers of hazardous chemicals in the marine environment.
- High and irregular use of additive chemicals in short-term use plastics.

**GRAPHICAL ABSTRACT**





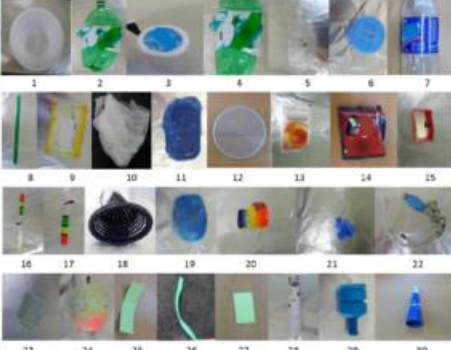


Fig. 1. Photos of marine plastic debris collected from the Korean coast. Sample 10 (1) is a new plastic product purchased from the local market.

56



# Microplastic Fragmentation (2017)

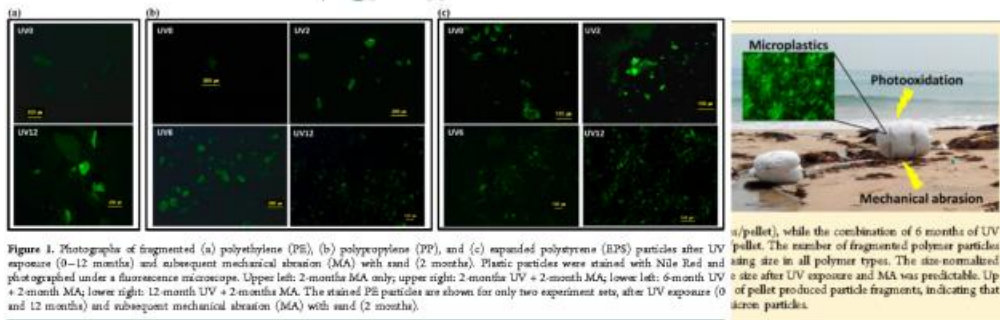
## Combined Effects of UV Exposure Duration and Mechanical Abrasion on Microplastic Fragmentation by Polymer Type

Young Kyoung Song,<sup>1,2</sup> Sang Hee Hong,<sup>1,2</sup> Mi Jang,<sup>1,2</sup> Gi Myang Han,<sup>1</sup> Seung Won Jung,<sup>2,3</sup> and Won Joon Shim<sup>1,2,4</sup>

<sup>1</sup>Oil and POPs Research Group, Korea Institute of Ocean Science and Technology, Geoje 53201, Republic of Korea

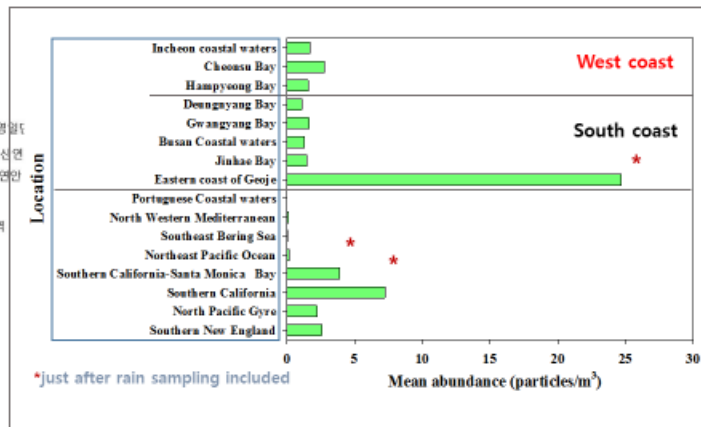
<sup>2</sup>Department of Marine Environmental Science, Korea University of Science and Technology, Daejeon 34113, Republic of Korea

<sup>3</sup>Library of Marine Samples, Korea University of Science and Technology, Geoje 53201, Republic of Korea



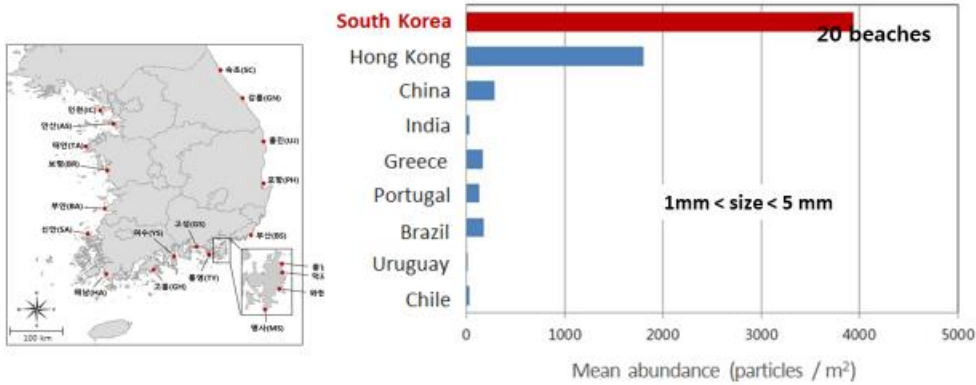
**Figure 1.** Photographs of fragmented (a) polyethylene (PE), (b) polypropylene (PP), and (c) expanded polystyrene (EPS) particles after UV exposure (0–12 months) and subsequent mechanical abrasion (MA) with sand (2 months). Plastic particles were stained with Nile Red and photographed under a fluorescence microscope. Upper left: 2 months MA only; upper right: 2 months UV + 2 months MA; lower left: 6 months UV + 2 months MA; lower right: 12 months UV + 2 months MA. The stained PE particles are shown for only two experiment sets, after UV exposure (0 and 12 months) and subsequent mechanical abrasion (MA) with and (2 months).

## Microplastics in sea surface



Song et al. (2014) *Environ. Sci. Technol.*  
Kang et al. (2015) *Mar. Pollut. Bull.*  
Kang et al. (2015) *Arch. Environ. Contam. Toxicol.*

## Microplastics on beach (1mm < s < 5 mm)



Lee et al. (2013) *Mar. Pollut. Bull.*  
Song et al. (2015) *Mar. Pollut. Bull.*

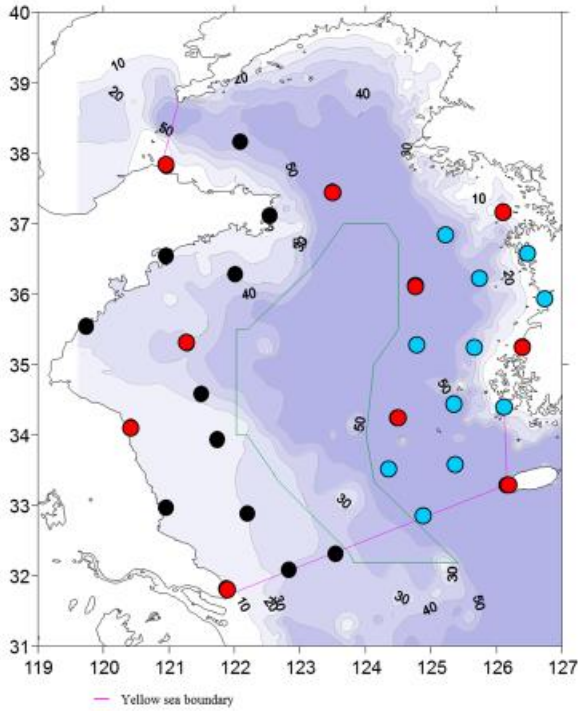
## The Way Forward:

### Tasks of RWG-Pollution

#### ► Establish Regional Monitoring Program

- Harmonize National Monitoring Programs
- Regular YSLME Co-operative Cruise (every 5 years-UNRP)

- Target Pollutants and Matrix
- SOPs for emerging contaminants and MPs
- Regional environmental standards (or criteria)
- Data QA/QC



## Harmonize National Monitoring Programs (China & Korea)

● = China STN

● = Korea STN

● = Ref. STN

- Sampling Season
- Sample Matrix
- Target Pollutants
- SOPs
- Data QA/QC



*Thank you very much  
for your attention!!!*



 国家海洋局

**Advancing Eco-Civilization to restore ecosystem goods and services of Yellow Sea**  
– progress in implementation of YSLME SAP in China

**Juying WANG**  
National Marine Environment Monitoring Center  
State Oceanic Administration, China

**01 Contents of the YSLME SAP**

**YSLME I Strategic Action Programme (2009)**

UNDP/GEF Project entitled  
"Reducing Environmental Stress in  
The Yellow Sea Large Marine Ecosystem"

**STRATEGIC  
ACTION PROGRAMME**  
for The Yellow Sea Large Marine Ecosystem



- SAP identifies **11 regional targets** aimed at maintaining the ecosystem's carrying capacity to provide the provisioning, regulating, cultural and supporting services to the region and beyond.
- SAP also suggests **governance actions** as an implementation mechanism to enhance the environmental effectiveness of legal instruments; promote participation of a wide range of stakeholders.

## 02 Context of Promoting National Ecological Progress

18<sup>th</sup> NC of CP,  
2012



New perspective:  
Clean waters and green hills are  
precious treasures.

Five development ideas:  
Innovation, coordination, green, open  
and sharing

### Overall Plan for the Reform of Eco-civilization System

Published on Sep. 21, 2015 by the central government.  
One of the overarching documents for Eco-Civilization reform

### President Xi's remarks in the 70<sup>th</sup> Session of the United Nations Assembly, Sep. 28, 2015

We should build *an ecosystem that puts Mother Nature and green development first*. Efforts should be made to address the conflicts brought by industrial civilization, and take the *harmonious existence between man and nature* as the goal so as to realize the sustainable development of the world and the comprehensive development of the mankind. The international community should work together on the way towards a global *eco-civilization* and stick to a green, low-carbon, recyclable and sustainable development path.

## 03 Ideas of marine eco-civilization in China

### Philosophical basis for advancing marine eco-civilization

Respect the  
ocean

- with reverence and thanksgiving, rather than above it

Stay in tune with  
ocean nature.

- to exploit and utilize the ocean in compliance with objective laws in scientific and reasonable manner

Protect the  
ocean

- restrict human activities within limits of ocean's carrying capacity, leave restoration time for the seas

### 03 Ideas of marine eco-civilization in China

#### Basic policies for advancing marine eco-civilization

##### Resource-saving priority

- to place *saving* as first priority when developing and utilizing marine resources

##### Protection priority

- to give *marine environment protection and pollution source prevention* first priority

##### Natural resilience as the main way

- to put *natural resilience* at first place when protecting and restoring marine eco-system

### 03 Ideas of marine eco-civilization in China

#### Core Ideas

- ❑ Eco-system based integrated marine management
- ❑ To use “eco plus” thinking in the whole of process of ocean governance

#### Marine Eco-civilization Construction

- ❑ Eco+ marine economy
- ❑ Eco+ marine management
- ❑ Eco+ marine technology
- ❑ ...

## 04 Actions for marine eco-civilization in China

### Legal system

- **Marine Environment Protection Law of the People's Republic of China (2016)**
- **Law of the People's Republic of China on the Administration of Sea Areas (2001)**
- **Island Protection Law of the PRC (2010)**
- **Law of the PRC on the Exploration and Development of Resources in Deep Seabed Areas (2016)**
- .....

### Policy system

- **National Implementation Program for Marine Eco-civilization Construction (2015-2020)**
- **Water Pollution Prevention and Control Action Plan**
- **Coast Pollution Prevention and Control Action Plan**
- **Opinion issued by State Oceanic Administration on full implementation of marine red-line scheme**
- .....

## 04 Actions for marine eco-civilization in China

- **National Major Marine Functional Zoning Plan approved in 2015**
- **National Marine Functional Zoning Plan (2011-2020) approved in 2012**

Reclamation: is strictly controled and managed.  
Natural mainland coastal line: 35%.



## 04 Actions for marine eco-civilization in China



国家级海洋自然/特别保护区(海洋公园)分布图

### Enhance MPAs network

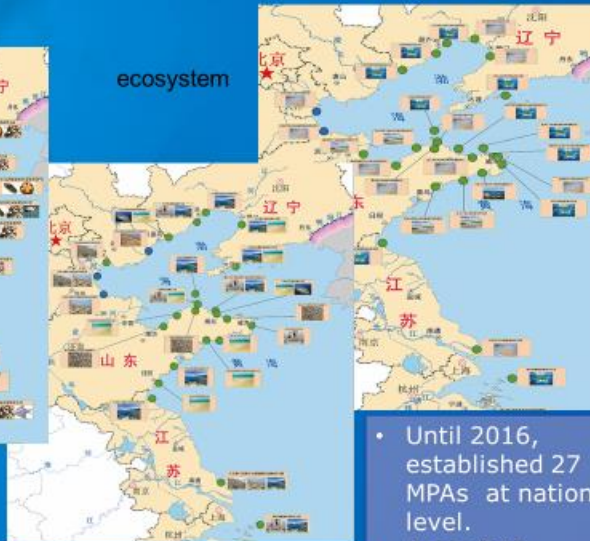
- Until now, more than 250 MPAs have been established at local and national levels;
- Total area - 120 thousand km<sup>2</sup>, appr. 4% of China's jurisdictional sea area
- Target in 2020: 5%



## 04 Actions for marine eco-civilization in China



MPAs at national level in Yellow Sea



natural scenery & historic heritage

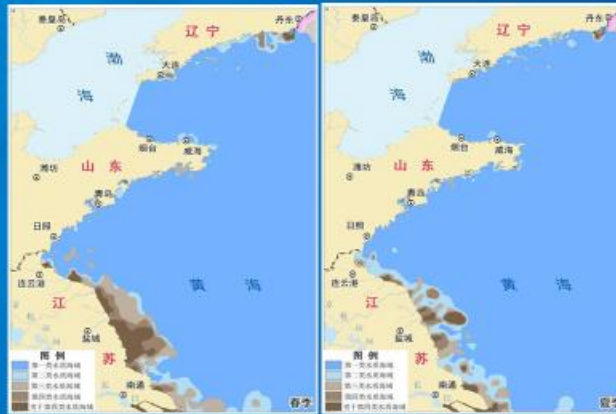
- Until 2016, established 27 MPAs at national level.
- Area: 646 thousand hectares



## 04 Actions for marine eco-civilization in China

- **Advanced marine pollution prevention and management**
- *Total Emission Quantity Control system in key sea areas*
- *Goal: Source emission control, Quality improvement of marine environment*
- *Integrated coastal management and integrated watershed-sea area management*

- In 2020, Sea water quality satisfied I and II category in coastal area:  $\geq 70\%$ ;
- To eliminate worse than V category groundwater discharged into sea
- By the end of 2017, to eliminate illegal and irrational sewage outfalls



## 04 Actions for marine eco-civilization in China

- **Enhanced marine monitoring capacity building**



## 04 Actions for marine eco-civilization in China

### Enhanced marine monitoring capacity building



130  
sewage outfalls

23

## 04 Actions for marine eco-civilization in China

### Enhanced marine monitoring capacity building



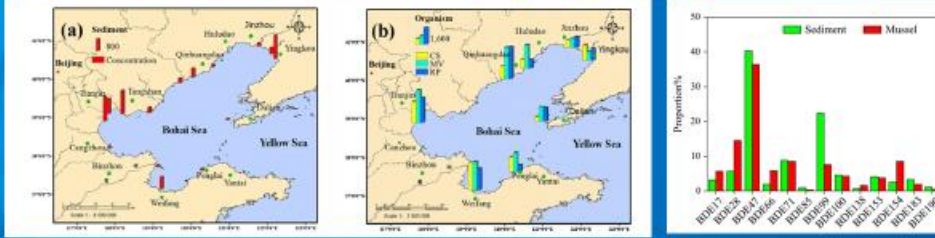
*Macro- debris monitoring*



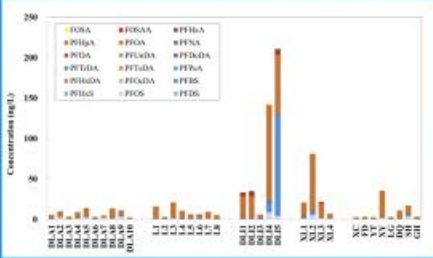
*Micro- debris monitoring*

## 04 Actions for marine eco-civilization in China

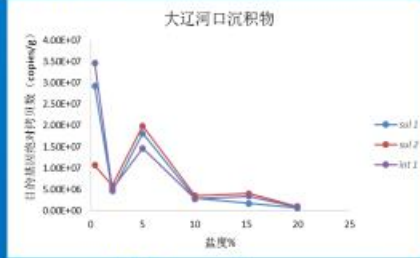
### Enhanced marine monitoring capacity building



SCCPs in sediment and mussels, Ma et al., MPB, 2014. Wang et al., Chemosphere 74 (2009)



PFOAs, Chen et al., EP,



antibiotics resistance gene

## 04 Actions for marine eco-civilization in China

Since 2010, more than 180 key rehabilitation projects implemented in China

- 270 km<sup>2</sup> coastline managed
- 130 ha. beaches rehabilitated
- 5000 ha. coastal wetlands restored
- 160 ha. mangroves, 1100 *Suaeda heteroptera* and 5 million tamarisks grown
- 11 billion yuan invested by Chinese government



## 04 Actions for marine eco-civilization in China



## 05 Prospective vision for marine environment in China





Thank you!



**Inception Ceremony of the  
UNDP/GEF YSLME Phase II Project**

Sustaining Regional Ocean Governance in the Seas of East  
Asia: PEMSEA experiences in the implementation of the  
SDS-SEA

by  
S. Adrian Ross  
Executive Director, PEMSEA

13 July 2017  
Seoul, PO Korea



[www.pemsea.org](http://www.pemsea.org)

## PEMSEA Mission:

To foster and sustain healthy and resilient coasts and oceans, communities and economies across the Seas of East Asia through integrated management solutions and partnerships



www.pemsea.org 2

## Sustainable Development Strategy for the Seas of East Asia

- Regional SAP and declaration of commitment to implement a **shared vision**, adopted by 14 countries
- SDS-SEA 2015 incorporates **new and emerging priorities at the global level** (e.g., SDGs, Aichi Biodiversity Targets, Sendai Framework, UNFCCC Paris Agreement)
- Promotes **sustainable economic development towards a blue economy** in coastal and marine areas through the application of ICM approaches
- Advances the role of **partnerships and innovative finance and economic instruments** (e.g., blue carbon) as a means of achieving sustainable development and blue economy objectives



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## Integrated Coastal Management (ICM)



- ICM as a recognized international approach
  - UN Conferences/Conventions and Action Plans
    - UNCED, WSSD, UNICPOLOS, CBD, IPCC, Agenda 21, GPA
  - International & UN Organizations
    - IIUCN, GEF, UNDP, UNEP, UNIDO, FAO, etc.
- ICM as a management framework
  - Biodiversity conservation and MPA (ECBA)
  - Fisheries management (EAFM)
  - Climate change and hazard management (CCA/DRRM)
  - Pollution reduction
  - River basin and watershed management (IRBM/IWRM)



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### 1993:

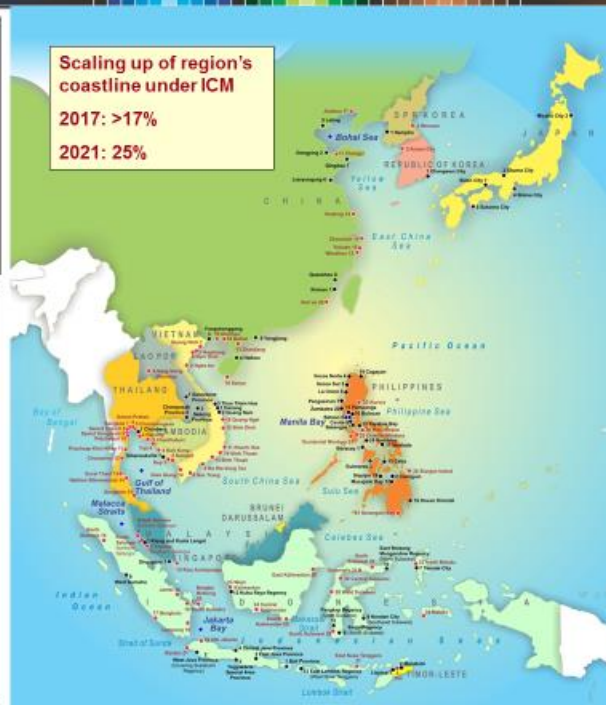
**2 ICM sites** (2 countries)  
**Total coastline:** 286 km  
**Total population:** 2.9 million  
**Watershed area:** 3,026 km<sup>2</sup>  
**Focus:** marine pollution prevention and management

### 2017:

**102 ICM sites** (13 countries)  
**Total coastline:** >40,000 km  
**Total population:** >146.8 million  
**Watershed area:** 331,500 km<sup>2</sup>  
**Focus:** coastal and ocean governance, habitat restoration and management/MPAs, climate change adaptation/disaster risk reduction, sustainable fisheries, alternative livelihoods, integrated river basin and coastal area management

### Scaling up of region's coastline under ICM

**2017: >17%**  
**2021: 25%**





## Challenges, gaps and limitations

- National inter-agency and multi-sectoral coordination mechanism for coastal and ocean governance
- National Ocean Policy/conflicting policies, laws and regulations
- Scientific input to address uncertainties/knowledge gaps (MSP; ecosystem service valuation; hazards and vulnerabilities; nutrient management; hypoxia)
- Socio-economic benefits and impacts of SAPs, management programs and projects
- Financing and investments
- Knowledge and experience sharing



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## Strategies and Actions

- Start up of ICM programs in priority sites in various countries:
  - Conduct of ICM and specialized skills training
  - Capacitating and engaging the PEMSEA Network of Learning Centers (15 ICM LCs and 2 RCOEs)
  - Conducting leadership forums in collaboration with the PEMSEA Network of Local Governments (41 members)
  - Supporting the development and implementation of the PNLG SAP for 2016-2020
- Relication and scaling up to other local governments/sites



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## SEA Knowledge Bank

- e-Library: case studies, best practices, training manuals, etc. focused on protection and management of ecosystem services and blue economy development
- Innovative tools/applications, such as ecosystem valuation, marine spatial planning, State of the Coasts reporting
- Investment-readiness assessments
- Networking: Experts, PNLC, PNLG, COPs, Youth, Women, Indigenous People



## Scaling Private Sector Investment in Blue Economy

**Building on its work in SDS-SEA/ICM implementation, PEMSEA has taken steps to promote financing and investment by the private sector in coasts and oceans including:**

- Assessing the ICM investment landscape in East Asia
- Pilot value-chain analyses/business cases for enterprises at the community level
- Establishing online platform supporting the development of investment projects at ICM sites
- Exploring application of financing mechanisms including green bonds and blue carbon finance
- Developing a concept and initiating partnerships to establish an Ocean Investment Ecosystem



## SDS-SEA Implementation Plan 2017-2022

- Climate Change and DRRM
- Biodiversity Conservation and Management
- Pollution Reduction and Waste Management



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THANK YOU



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