

United Nations Environment Programme

**NOWPAP**



Northwest  
Pacific  
Action Plan

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the Northwest Pacific Action Plan  
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11-13 February 2020

**Report of the Communications Effort by NOWPAP Regional  
Coordination Unit and Regional Activity Centers**

For reasons of economy, this document is printed in a limited number. Delegates are kindly requested to bring their copies to meetings and not to seek additional copies.

**Regional  
Seas**

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**List of Acronyms**

DINRAC	Data and Information Networking Regional Activity Centre
EcoQO(s)	Ecological Quality Objective(s)
FP(s)	Focal Point(s)
GEF	Global Environment Facility
IGM	Intergovernmental Meeting
IMO	International Maritime Organization
LME	Large Marine Ecosystem
NGO(s)	Non-Governmental Organization(s)
MTS	Medium-Term Strategy
NOWPAP	Northwest Pacific Action Plan
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
RAC(s)	Regional Activity Center(s)
RCU	Regional Coordinating Unit
SDG(s)	Sustainable Development Goal(s)
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNEP	United Nations Environment Programme

## Report on Communication Efforts by NOWPAP RCU and RACs

1. As recommended by the 23rd Intergovernmental Meeting (IGM) in Moscow, Russia<sup>1</sup>, the Regional Coordination Unit (RCU) and Regional Activity Centers (RACs) have strengthened its communication efforts in 2019 to follow the NOWPAP Public Awareness Strategy strictly. NOWPAP RCU and RACs took several specific actions to follow closely:

### A New NOWPAP web-site

2. News and information have been posted on the NOWPAP homepage since 2006 at the old NOWPAP site. However, a new NOWPAP website, being a child of the UNEP website, was launched in December 2018. The homepages of RACs were also updated.

3. The link to the new NOWPAP website is <https://www.unenvironment.org/nowpap>.

4. The new websites follow all UNEP corporate communication policies and templates.

### Popular Version of NOWPAP Mid-Term Strategy 2018-2023

5. A popular version of the NOWPAP Mid-Term Strategy (MTS) (2018-2023) has been finalized for publishing. An international consultant, a designer, was recruited by RCU to develop a modern design of this publication. An electronic version of the Popular version of MTS 2018-2023 has been completed and included as an Information Document in the 24th IGM package (UNEP/NOWPAP IG.24/INF/14).

### NOWPAP Quarterly Newsletter

6. An electronic Newsletter (Northwest Pacific Action Plan Quarterly) was distributed regularly by the NOWPAP RCU to member states and partners. The Newsletter summarizes in a concise form the critical highlights of NOWPAP, which happened within quarters of the year and, also, presents essential activities to be organized in the next quarter.

7. The Newsletter is distributed to the following stakeholders:

- i) i) Member States (Focal Points and other government agencies in the countries)
- ii) ii) Structural units of NOWPAP (RCU, RACs, FPs, etc.)
- iii) iii) UNEP Headquarters
- iv) iv) UNEP Regional Seas Programme, including both UNEP HQs and individual Regional Seas Conventions and Action Plans, including those not administered by UNEP
- v) v) Partner UN agencies involved in NOWPAP activities (UNESCAP, IMO, UNDP, etc.)
- vi) vi) Other intergovernmental bodies (e.g., PEMSEA)
- vii) vii) GEF funded LME Projects (e.g., UNDP GEF Yellow Sea Large Marine Ecosystem Project)
- viii) viii) Academia

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<sup>1</sup> 23<sup>rd</sup> NOWPAP IGM, Resolution 1, item 6 (see document UNEP/NOWPAP IG.24/3, page 29 for details).

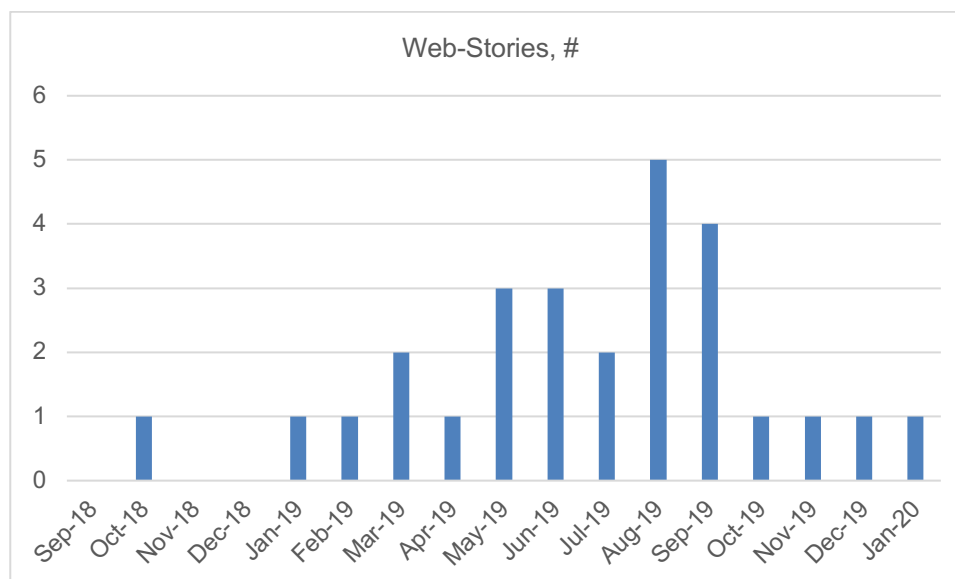
- ix) ix) Local governments in the NOWPAP region
- x) x) NGOs and relevant community-based organizations.
8. All four 2019 Newsletters (Q1, Q2, Q3, and Q4) are provided in Annex B. Links to Newsletters are provided below:
- i) Quarter 1, 2019: <https://spark.adobe.com/page/qPSKv2gJ7WLa/>.
  - ii) Quarter 2, 2019: <https://spark.adobe.com/page/MHgKxrlDBPB9i/>.
  - iii) Quarter 3, 2019: <https://spark.adobe.com/page/62FFLzjIHxeg7/>.
  - iv) Quarter 4, 2019: <https://spark.adobe.com/page/uvBHHkm25DrsZ/>.

### NOWPAP Web-Stories

9. Web-stories play a significant role in keeping NOWPAP stakeholders regularly updated on key events and activities organized by RCU and RACs. Web-stories also follow the participation of NOWPAP representatives in significant meetings and Conferences.

10. Altogether, after the 23rd IGM, twenty-seven web-stories have been prepared and posted by RCU on NOWPAP's site. Figure 1 below presents the distribution of published NOWPAP web-stories between 23<sup>rd</sup> and 24<sup>th</sup> IGMs.

**Figure 1. Number of Web-Stories Published during Aug 2018-Feb 2020.**



11. All web-stories are included in 17. Links to each individual web-story on NOWPAP's web-site are also provided in 17.

### NOWPAP Promotional Videos

12. A set of popular educational videos has been completed as visual material for the promotion of NOWPAP. The set of five videos includes:

- Marine Litter video (3'55")

- Eutrophication video (5'40")
- Video on Marine Biodiversity (8'32")
- Video on oil and HNS spills (6'10")
- NOWPAP and Sustainable Development Goals (SDGs) (9'45")

13. The videos include a detailed description of critical environmental challenges of the NOWPAP region, the capacity available in the Member States, within NOWPAP and its structural units (RACs, RCU).

14. The videos also showcase and promote a variety of scientific and technical expertise available in the region. Successful practices and experiences have also been showcased.

15. All videos are available in five languages: English (audio and subtitles) and also subtitles in four languages of NOWPAP. The videos present NOWPAP in its multidisciplinary, using infographics and a common, easy to understand, language.

16. Since the videos have not been cleared for wide distribution by the NOWPAP Member States, links have been provided directly to the Member States NOWPAP Focal Points for acquaintance. All videos will be launched at the 24<sup>th</sup> IGM.

### **Other Relevant Activities**

17. NOWPAP maintains an online presence on Facebook ([facebook.com/nowpap.unep](https://facebook.com/nowpap.unep)).

18. Information about NOWPAP is regularly provided to UNEP Headquarters and UNEP Regional Office for Asia and the Pacific.

19. The staff of the NOWPAP RCU and RACs provided inputs and articles to newsletters and delivered lectures/presentations at the local level. For example, RCU delivered a lecture on marine litter at a student beach cleanup campaign held in Busan in August 2019. RCU continues taking part in events and strengthening practical cooperation with the NOWPAP hosting cities: Toyama and Busan.

20. While attending a number global and regional meetings such as the Regional Consultative and Planning Workshop towards the UN Decade of Ocean Science for Sustainable Development (31 July- 2 August 2019, Tokyo), the SEA of Solutions 2019 Partnership week for marine plastic pollution prevention (11-14 November 2019, Bangkok), staff members of RCU and RACs promoted NOWPAP and ensured its visibility, as well as public attention, to the marine environment conservation through open discussions and dialogue.



## Annex A. NOWPAP Web Stories

### 1. Marine Environmental Emergency Preparedness and Response Regional Activity Centre 2019 Expert Meeting

January 14, 2020

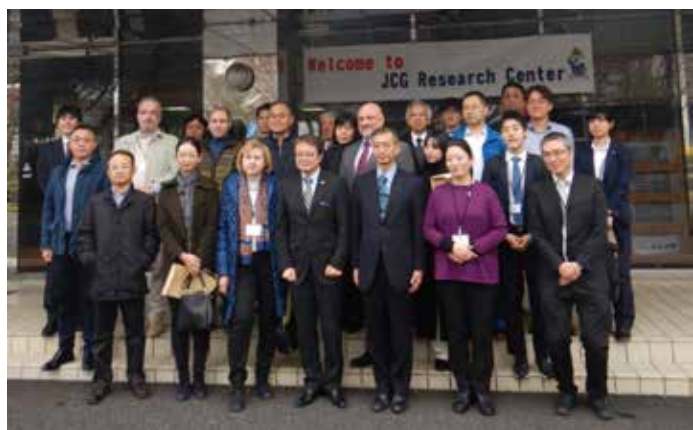
The 2019 Expert Meeting of the Northwest Pacific Action Plan's the Marine Environmental Emergency Preparedness and Response Regional Activity Centre took place in December 2019, in Tokyo, Japan. The Japan Coast Guard hosted the meeting.



The meeting provided an effective platform for discussions on strengthening the engagement of the private sector in combatting spills of oil, oil products and hazardous noxious substances. Experts from the four Northwest Pacific Action Plan Member States (China, Japan, The Republic of Korea and the Russian Federation) and representatives of a number of private sector stakeholders shared information about current practices and

technologies used for identification and joint actions for prevention and recovery operations during accidents. They also highlighted possible entry points for future engagement at the bilateral and regional levels, involving all Northwest Pacific Action Plan Member States.

Proceedings of the meeting are of the vital importance for the Northwest Pacific region, one of the heaviest vessel traffic regions of the world. The Northwest Pacific Action Plan Member States must form a practical intergovernmental cooperative framework by exchanging information and experiences on oil spill response, including the use of state-of-the-art technologies and systems. With this in mind, this meeting was a significant milestone in moving the agenda of engagement with the private sector forward in the Northwest Pacific region.



Numerous presentations and discussions at the meeting have set a friendly and collaborative environment. Presenters updated the participants on the recent developments in each of the countries as well as in the neighbouring regions.

Key recommendations of the meeting included:

- For the preparation of possible oil spill accidents in future, it is beneficial to develop close links between public and private sector stakeholders further and to establish required platforms, such as joint groups for public and private sector players. These platforms need to be designed to enable individual stakeholders to exchange information on oil spill accidents effectively, to conduct joint oil spill response exercises, and hold regular meetings and workshops for exchange of knowledge and experience.



- Successful experience from the Northwest Pacific region on response to oil spills, for instance, actions following the Sanchi accident in 2018, is worth showcasing internationally. To do so, further strengthening of the cooperation with the International Maritime Organization is critical, as well as presenting such successful experience in international meetings.

- China announced that an international meeting under the framework of the "Global Initiative China" project<sup>2</sup> will be held in 2022 and invited the Northwest Pacific Action Plan Member States and the Secretariat of the Marine Environmental Emergency Preparedness and Response Regional Activity Centre to the meeting to share and exchange information on oil spill accidents.

- The Northwest Pacific Action Plan expert meeting also invited the Centre to consider the possibility of establishing a public-private sector platform for dealing with oil spill accidents under the Marine Environmental Emergency Preparedness and Response Regional Activity Centre framework.

(Writer: Yegor Volovik, Editor: Anna Manikowska D.G., Reviewer: Yegor Volovik)

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<sup>2</sup> <http://www.imo.org/en/OurWork/Environment/MajorProjects/Pages/GIProjects.aspx>

## 2. High priority activities identified for future marine biodiversity conservation

December 10, 2019

Link to the story: [High priority activities identified for future marine biodiversity conservation](#)



Marine scientists from China, Japan, the Republic of Korea, and the Russian Federation identified conservation of biological habitats, plankton species, and environmental DNA as one of the highest priorities for the Northwest Pacific region, as well as the deciding way to protect marine biodiversity. These priorities

were thoroughly discussed at a meeting held in Chiba, Japan, in November 2019.

The Northwest Pacific region is famous by its numerous biodiverse areas. At the same time, the dense population and large-scale industry in the Northwest Pacific Action Plan countries pose severe anthropogenic pressures on marine biodiversity.

In 2017, the Special Monitoring and Coastal Environmental Assessment Regional Activity Centre of the Northwest Pacific Action Plan proposed to develop a Medium-Term Strategy for marine biodiversity conservation. After two years of consultations and active discussions with relevant partners, Northwest Pacific Action Plan countries' experts have agreed on priority directions and concrete actions to be included in the strategy.

Tidal flats and salt marshes are habitats that provide essential ecosystem services to many species. For instance, these areas are critical for migratory birds for feeding, resting and wintering. This fact explains why scientists of the region agreed to map tidal flats and salt marshes separately from seagrass and seaweed meadows, as they have been doing for the past few years. They will develop a separate distribution map of these habitats for the entire region. The map will help to assess more precisely the anthropogenic causes of the deterioration of the coastal habitats and will contribute to the conservation efforts on endangered migratory birds.

Another adverse impact is regular harmful algal blooms causing massive damage to fisheries and aquaculture in the Northwest Pacific region. Recent reports show that non-indigenous species, including red tide causative algae, invaded the region with ship ballast waters. Moreover, extensive blooms, such as green and golden tides, are becoming common phenomena in the region. Scientists of the Northwest Pacific region have, therefore, developed a database on harmful algal blooms. The

database will allow the countries to assess changes in species distribution and impacts on natural ecosystems and services they provide.

Environmental DNA is a new molecular biological technology that can be used to monitor marine diversity and specific species. The countries in the Northwest Pacific region will standardize the utilization of the environmental DNA techniques, develop a standardized manual, as well as establish a network of experts from the Member States.



Overall, countries of the region will further continue to develop modern coastal habitat monitoring tools, applying new techniques, such as remote sensing and environmental DNA, for strengthening marine biodiversity conservation and assessing the scales of anthropogenic impacts on the marine environment and ecosystems. The work will help the countries to fulfill their commitments, such as [Aichi Biodiversity Targets](#) and several [Sustainable Development Goals](#) included in the 2030 Agenda for Sustainable Development.

(Writer: Ning Liu, Editor: Anna Manikowska D.G., Reviewer: Yegor Volovik, Takafumi Yoshida)

### 3. Designing a roadmap to develop the Regional Action Plan on Marine and Coastal Marine Biodiversity Conservation

November 28, 2019

Link to the story: [Designing a roadmap to develop the Regional Action Plan on Marine and Coastal Marine Biodiversity Conservation](#)



In November 2019, in the City of Chiba, Japan, a group of marine scientists from the Northwest Pacific region agreed on a roadmap to develop the Regional Action Plan on Marine and Coastal Marine Biodiversity.

At the Chiba meeting, the experts reviewed previous work on marine and coastal biodiversity and identified gaps in

the current knowledge, particularly, in the following areas:

- status, trends and future potential of the marine and coastal ecosystem services
- geographical scope and health of major marine and coastal habitats
- effectiveness of current conservation measures

The meeting also reviewed relevant existing regional strategies, action plans, major policy frameworks, as well as interventions addressing marine and coastal biodiversity. The meeting participants exchanged opinions on how to scale up and synergize the current actions taken by the countries. The experts have introduced national strategies on biological diversity in their countries. All four Member States of the Northwest Pacific Action Plan, namely: China, Japan, the Republic of Korea, and the Russian Federation, prioritize biodiversity conservation and have adopted national strategies and action plans to streamline the implementation of the Convention on Biological Diversity. The proposed Regional Action Plan on Marine and Coastal Marine Biodiversity is sought to support the Member States in their conservation work, such as strengthening international cooperation, addressing the transboundary nature of the marine biodiversity and demonstrating positive outcomes of the actions taken.

According to the agreement reached, the design and development of the Regional Action Plan on Marine and Coastal Marine Biodiversity will have a robust participatory nature, with the engagement of multiple stakeholders. Only this way, the Plan will support the environmentally friendly socio-economic development of the Northwest Pacific region. The meeting recommended presenting a revised roadmap for the development of the Regional Action Plan on Marine and Coastal Marine Biodiversity for approval to the 24<sup>th</sup> Intergovernmental Meeting of the Northwest Pacific Action Plan in early 2020. The second expert meeting on the Regional Action Plan on Marine and Coastal Marine Biodiversity will be held in September 2020 to finalize the Plan and ensure adoption by the Member States by the end of 2021, in line with resolutions of the Northwest Pacific Action Plan and Convention of Biological Diversity.

*Writer: Ning Liu; Editor: Anna Manikowska D.G. Reviewer: Yegor Volovik*

#### 4. Highlighting regional cooperation to address marine litter in a regional training

October 1, 2019

##### [Highlighting regional cooperation to address marine litter in a regional training](#)



As a part of a capacity-building programme, representatives from government authorities, research institutions and non-governmental organizations from Brunei Darussalam, Cambodia, China, Indonesia, Lao People's Democratic Republic, Malaysia, Peru, the Philippines, Russia, Timor-Leste, Singapore, and the Republic of

Korea participated in a training workshop on marine debris in Busan, Republic of Korea in October 2019.

This workshop was organized by Asia-Pacific Economic Cooperation's Marine Environmental Training and Education Center of the Korea Institute of Ocean Science and Technology, Our Sea of East Asia Network and the Korea Marine Environment Management Corporation with support from the Ministry of Ocean and Fisheries of the Republic of Korea and the Partnerships in Environmental Management for the Seas of East Asia.

The workshop participants were trained in various methods to monitor and assess marine debris, and also took part in field work within a marine debris shoreline survey. The training programme included a number of other aspects, e.g. recycling of aquaculture Styrofoam buoys, collection technology of marine debris, marine microplastic pollution, transport of marine debris in the oceans, hazardous chemicals associated with marine debris. The workshop presented a unique opportunity for the participants to share their experience of addressing these issues in their countries.



As marine litter is one of key focus areas of the Northwest Pacific Action Plan, the key achievements and lessons learned in the past decade in the fight against marine litter were presented during this workshop. It was emphasized that regional cooperation, sharing of knowledge, experience, and best practices, as well as science-informed policy recommendations are critically important to address marine litter at a regional or global scale.

*Writer: Ning Liu, Editor: Anna Manikowska D.G., Reviewer: Yegor Volovik, Nancy Groves*

## 5. Harmonizing methods to monitor microplastic pollution

September 27, 2019

### [Harmonizing methods to monitor microplastic pollution](#)



The global production of plastics has increased between 1950 and 2017 at an average of 9 per cent per year, reaching about [350 million tons in 2017](#). Natural weathering processes convert larger plastic products into much smaller pieces of plastics, micro- and nano-plastics. In addition, microfibers from clothing, microbeads and

plastic pellets used in cosmetics, as well as in cleaning products - currently extensively used - also enter the environment.

In recent years, negative impacts of microplastic pollution have drawn the great attention of scientists as a global issue. In the Northwest Pacific region, a group of scientists from China, Japan, the Republic of Korea and Russia gathered together in Dalian, China, in September 2019 to discuss ways harmonize monitoring methods of microplastics pollution in the region.

Daoji Li, Director of the Plastic Marine Debris Research Center from the East China Normal University, introduced a monitoring network of 48 survey stations along the coastline of China established by his team. In July 2019, the team conducted a comprehensive microplastic study in the Yangtze Estuary for the full tide and whole depth of the water. Following this exercise, in August 2019, the research was extended to additional 15 main estuaries in China.



Sang Hee Hong from the Korea Institute of Ocean Science and Technology highlighted the importance of adequate quality assurance and quality control practices for this kind of research. Such practices need to include a number of measures to avoid contamination of samples during storing and analysis, use of special materials for sample handling and processing, application of special step-by-step procedures and availability of certified laboratories and equipment.

Atsuhiko Isobe, Professor at the Research Institute of Applied Mechanics of the Kyushu University in Japan presented a "Numerical particle tracking model for predicting microplastic abundance in the Pacific after 50 years". According to his forecasts: "The high concentrations (of marine plastics) in the upper ocean are remarkable in boreal summer in the Northern Hemisphere, owing to the relatively calm oceanic conditions, and owing to the concentration denser than the Southern Hemisphere." In boreal summer, a heavy precipitation belt slowly moves from the equatorial Indian Ocean to south

Asian monsoon regions on a two- to six-week time scale, which [affects extreme weather events over Asia](#).

Nikolai Kozlovskii, from the Pollution Monitoring Regional Activity Centre of the Northwest Pacific Action Plan, emphasized that some institutions in Russia had undertaken initial assessment of microplastic contamination in the Baltic Sea coastal area and in the Far East. Sampling in the rivers was carried out in spring, summer and autumn months from 2016 to 2018.

During discussions at the meeting, the scientists from China, Japan, the Republic of Korea and Russia agreed to continue working on a project proposal to harmonize the monitoring methodologies for microplastics in the marine environment in the Northwest Pacific region. To do this, pollution criteria of microplastics in the marine environment will be studied, such as the contents of microplastics in the water column, sediments, aquatic organisms, as well as the detection ratio in the various media and biota.

*Writer: Ning Liu, Editor: Anna Manikowska D.G., Reviewer: Yegor Volovik, Nancy Groves*



## 6. Chinese volunteers team up to clean up beach in Dalian

September 25, 2019

### [Chinese volunteers team up to clean up beach in Dalian](#)



Representatives of government agencies and research institutes from China, Japan, the Republic of Korea, the Russian Federation, as well as participants from the UN Environment Programme (UNEP), the Trilateral Cooperation Secretariat, and non-governmental organizations teamed up with volunteers from

China to clean up the Bangchui Beach in Dalian, China, on 25 September 2019.

The campaign was organized by the Northwest Pacific Action Plan and the Trilateral Environmental Ministers Meeting among China, Japan, and Korea, in cooperation with the Ministry of Ecology and Environment of China, the Dalian Ecology and Environment Bureau, and the Dalian Volunteers Association on Environmental Protection.



More than 150 people joined this event and collected 76 kilograms of litter, which included 220 plastics items (weighing a total of 16.6 kilograms), 93 rubber items (26.6 kilograms), 17 metal items (8.5 kilograms) and 4 glass items (0.4 kilograms).



Implementation of such joint activities has clear public awareness impacts both short- and long-term. For instance, one of the volunteers from the Dalian Customs House said: "Before the campaign, I saw the beach was very clean already, but I was surprised that we still could collect so many kinds of litter." Two tourists, also present at the site, were encouraged by the cleanup activity and enrolled in the Dalian Volunteers Association on Environmental Protection. The Volunteers Association guided the participants on how to collect buried trash.

The Northwest Pacific Action Plan is proactively involved in a number of activities to address marine litter since 2006, and organizes annual coastal cleanup campaigns among China, Japan, the Republic of Korea and the Russian Federation on a rotating basis.

Haibing Zhang, Deputy Secretary General of Dalian Metropolitan Government, expressed his appreciation to the Northwest Pacific Action Plan for selecting Dalian to host the campaign this year. He emphasized that “the Dalian Metropolitan Government has launched a five-month operation to clean litter on the beach. We have assembled 45,000 people to clean 2,700 tonnes of litter at the beach this year. We look forward to continuing our cooperation with the Northwest Pacific Action to protect the ocean.”



*Photo Credit: Dalian Environmental Protection Volunteers Association*

*Photographer: Fengxiang ZHANG*

## 7. Exploring ways to improve waste management to reduce marine litter to the oceans

September 24, 2019

### [Exploring ways to improve waste management to reduce marine litter to the oceans](#)



Policymakers and experts from the Northwest Pacific region gathered in Dalian, China, in September 2019 to discuss how to improve waste management to address marine litter at source.

The Northwest Pacific Action Plan, the Trilateral Environmental Ministers Meeting with China, Japan and the Republic of Korea, and the Ministry of Ecology and Environment of China jointly organized the marine litter management workshop in Dalian in September 2019. The theme of the meeting was “Improvement of waste management to reduce marine litter into the oceans.”

Qingjia Meng, from the Chinese Research Academy of Environmental Sciences, announced that China issued technical specification for waste plastics recycling in 2019; technical specification for plastics waste recycling and sorting in 2016; and ship pollutants emission standard in 2018. In April 2012, the State Council issued the “12th Five-Year Plan for the Construction of Harmless Treatment Facilities for Urban Domestic Wastes”. On 21 January 2019, the State Council issued the workplan on the Zero-Waste City Pilot Program in China which promotes the reduction, recycling and the environmentally sound disposal of waste. By the end of 2020, 46 major cities must complete their waste sorting and processing system. Before 2025, prefectural-level cities are expected to complete the domestic waste classification and treatment system.



Tatsuya Abe from the Ministry of Environment of Japan announced that the Cabinet of Japan approved the 4th Fundamental Plan for Establishing a Sound Material-Cycle Society on 19 June 2018. It sets a medium- to long-term strategy for the establishment of a sound material-cycle society in Japan and indicates measures to be implemented. The pillars of the plan include: regional circular and ecological sphere, proper waste management and environmental restoration, international resource circulation, resource circulation throughout the entire lifecycle and disaster waste treatment systems.

Sora Yi from the Korea Environment Institute indicated that the Comprehensive Plan for Marine Plastics Reduction in Korea was adopted on 29 May 2019. It includes the measures to manage the entire lifecycle of marine plastics from their generation to collection and treatment, aiming to reduce marine plastics by 30 percent by 2022 and 50 percent by 2030 compared to 2018. The plan

envisages to reduce marine debris generation, increase the volume of marine debris collection, recycle marine plastics, enact marine waste management laws, and significantly expand public participation.

Daria ZADOYA from the Maritime State University, named After Admiral G.I. Nevelskoy of the Russian Federation, introduced the waste management system reform in the far east area. A regional operator is responsible for waste management from landfill to recycling. Tax on waste management has been increased. It is planned to increase the proportion of material reuse and recycle to 60 percent. Cleanup campaigns have been organized in the Russian Federation regularly.

The meeting was used by the participants as a good opportunity to share their experience and best practices, as well as measures to counter challenges. The International Environmental Technology Center of UNEP, its Regional Office for Asia and Pacific, the Coordinating Body on the Seas of East Asia and the Trilateral Cooperation Secretariat have also actively participated in these knowledge exchange sessions.



*Photo Credit: Dalian Environmental Protection Volunteers Association*

*Photographer: Fengxiang ZHANG*

## 8. Developing regional action on marine biodiversity conservation in the Northwest Pacific

September 10, 2019

### [Developing regional action on marine biodiversity conservation in the Northwest Pacific](#)



The Northwest Pacific region features a high diversity of marine and coastal species ranging from boreal to subtropical. However, the highly dense population in the region is putting enormous pressure on marine and coastal

biodiversity.

In the past decade, the four regional activity centres of the Northwest Pacific Action Plan have conducted studies and assessments including seagrass mapping, assessing threats to marine biodiversity, abundance and distribution of invasive species, collection of information on endangered species, monitoring and management of marine protected areas, and evaluating the state of the marine environment of the Northwest Pacific region. Nevertheless, without a clear direction on marine biodiversity conservation, each centre implements their activity as directed by their focal points.

Policymakers from China, Japan, the Republic of Korea and the Russian Federation agreed in 2018 to develop a Regional Action Plan on Marine and Coastal Biodiversity Conservation (RAP-BIO). The plan envisages to come to a common understanding of the future direction of the Northwest Pacific Action Plan, coordinate the activities of each of the four Northwest Pacific Action Plan's regional activity centres and contribute to more effectively conserve marine biodiversity. Finally, the plan is expected to significantly contribute to achieving the Aichi Biodiversity Targets and Sustainable Development Goals in the region.



In September 2019, experts and policymakers from China, Japan and the Russian Federation met in Toyama, Japan at the 17<sup>th</sup> Focal Points Meeting of the Special Monitoring and Coastal Environmental Assessment Regional Activity Centre of the Northwest Pacific Action Plan to discuss and agree how to move forward with the development of the Regional Action Plan on Marine and Coastal Biodiversity Conservation. Since Korean experts could not participate in the meeting in person, they sent their inputs and comments by email. The meeting agreed that a separate dedicated workshop would be organized in November 2019 to discuss a roadmap, which had been prepared by a group of consultants. This meeting will be held back-to-back with another meeting. The latter will focus on working areas of marine and coastal biodiversity in the region and the role of each of the regional activity centres.

It is expected that the plan will be ready by 2022 and will be considered for adoption by Member States by 2023.

## 9. Northwest Pacific region experts exchange views with Chinese volunteers on marine environmental protection

August 30, 2019

[Northwest Pacific region experts exchange views with Chinese volunteers on marine environmental protection](#)



Chinese environmental protection volunteers, from elementary students to senior citizens, exchanged views on marine environmental protection and biodiversity conservation with experts at the 17<sup>th</sup> Focal Points Meeting of Data and Information Networking Regional Activity Center of the Northwest Pacific Action Plan which was held in Dalian, China in

August 2019.

A representative from the Dalian Environmental Protection Volunteer Association spoke about their beach clean-up activities in the past decade. Several students from the Dalian University Students Volunteer Association introduced their activities on conserving oyster reefs. A volunteer from the finance sector spoke of his passion to protect marine environment. Experts from China, Japan, the Republic of Korea, and the Russian Federation presented their respective research, and appreciated the encouraging work done by the volunteers.

The meetings was organized by the Secretariat of the Data and Information Networking Regional Activity Centre of the Northwest Pacific Action Plan and the Rendu Shanghai, a non-governmental ocean conservation organization.



## 10. Exploring strategic directions on regional cooperation for addressing maritime disasters

August 27, 2019

### [Exploring strategic directions on regional cooperation for addressing maritime disasters](#)



Maritime experts and policymakers gathered in Seoul, the Republic of Korea in August 2019 to brainstorm on future directions of regional cooperation to address oil, hazardous noxious substance and marine pollution.

Due to fast economic growth and the consequential increase of maritime traffic in the region, a number of oil spill and hazardous noxious substance spills occurred in the Northwest Pacific region. Responding to this, China, Japan, the Republic of Korea and the Russian Federation set up the Marine Environmental Emergency Preparedness and Response Regional Activity Centre under the Northwest Pacific Action Plan in 2000. In the past two decades, four Member States have cooperated closely to respond to maritime disasters through information exchange, joint exercise, development of cooperative mechanisms, platform, guidelines etc.

The Regional Oil Spill Contingency Plan adopted by the four Member States in 2003 has further laid a solid foundation for the regional cooperation in addressing oil spill incidents. The plan was revised to add hazardous and noxious substances issues in 2009. In the Sanchi incident, where a 136,000-tonnes oil tanker sank near Shanghai in January 2018, four Members States cooperated closely and timely exchanged more than 250 reports under the framework of the Regional Contingency Plan. This has demonstrated the effectiveness of the regional mechanism.



In the August meeting in Seoul, participants commended the achievements of the regional mechanism including various communication channels and practical response capacities. They also highlighted that the Regional Centre should brace opportunities like newly emerging global issues, further strengthening relationship with the International Maritime Organization. The weak link with UN Sustainable Development Goals and the limited operational budget of the Regional Activity Centre were also recognized.

Participants also discussed potential projects like early assessment of the status and fate of oil spills, application of new technologies to spill prevention preparedness and response, health and safety issue for responders, volunteers and residents, and long-term environmental monitoring after spill incidents. It was suggested to develop a mid- or long-term strategy for the Regional Activity Centre to address marine disasters and pollution.

## 11. Advancing research on endangered species in the Northwest Pacific region

August 24, 2019

### [Advancing research on endangered species in the Northwest Pacific region](#)



Marine scientists and government officers agreed to further survey the species filed as endangered in the Northwest Pacific region in the 17th Focal Points Meeting of Data and Information Networking Regional Activity Centre of the Northwest

Pacific Action Plan which was held in Dalian, China on 22–23 August 2019.

In 2014 and 2015, scientists confirmed that 69 species on the International Union for Conservation of Nature red list are present in the Northwest Pacific region. They expanded the research to 143 species in 2016 and 2017. The study finds that most of the surveyed endangered species in the region are animals, and only two are plants. Among animal species, 61 chordata (animals with a backbone), and six invertebrates were listed as endangered species. Among them, two species were ranked as critically endangered by the International Union for Conservation of Nature, namely the spoon-billed sandpiper and the sea-run Taimen. Among the remaining 67 species, 44 were ranked as vulnerable and 23 as endangered.

In 2018 and 2019, a total of 1,196 species listed on the Japanese red list were evaluated by national experts from China, the Republic of Korea and the Russian Federation. In order to better understand the situation of endangered species, promote information sharing, and contribute to biodiversity conservation in the region, participants in the Dalian meeting agreed to advance the study in the upcoming eight years. However, a knowledge gap existed in the development of the Marine Species Red List, and the information is inconsistent between member countries, which may constitute a challenge for the advance of this project. In 2020–2021, China will lead the project. The China Species Red List, issued by the Ministry of Ecology and Environment and the Chinese Academy of Sciences, and the List of National Key Protected Wildlife, issued by the Ministry of Agriculture and Rural Affairs, will contribute to building a list of endangered species recognized in China.

“We hope the study will help to verify whether a species endangered in one country is endangered in other countries as well. Some years ago, China presented a few crested ibis, a kind of endangered bird, to Japan. Japan has successfully cultivated more than a hundred of crested ibis and released them into the wild. We hope that Member States can exchange endangered marine species for conservation in the future,” said Yoshihisa Shirayama, lead expert of the project from Japan.



“This study will promote our work on the red list of marine species in China, for we do not have this kind of list yet, with the need of including more information on species,” said Hongjun Li, a Chinese expert from the National Marine Environmental Monitoring Centre.



## 12. Regional brainstorming on the UN Decade of Ocean Science

August 20, 2019

### [Regional brainstorming on the UN Decade of Ocean Science](#)



Some 150 representatives from academia, governmental agencies, international organizations, industry and non-governmental organizations met in Tokyo, Japan in August 2019 to brainstorm approaches for achieving the objectives of the UN Decade of Ocean Science for Sustainable Development.

The UN Decade proclaimed by the United Nations General Assembly in December 2017 endeavors to provide countries full support to achieve the 2030 Agenda Sustainable Development Goals through ocean science. The Tokyo meeting, organized by the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization's Sub-Commission for the Western Pacific, was to raise awareness about the Decade, identify knowledge gaps and science questions, develop an understanding of existing and potential scientific initiatives, programmes, partnerships and resources, and elaborate issues on capacity-building, information sharing and communications.

Six working groups were tasked to discuss the following themes: clean ocean, healthy and resilient ocean, predicted ocean, safe ocean, sustainably harvested and productive ocean, and transparent and accessible ocean.

Recommendations emerging from the discussions included to conduct additional research to better understand source, transport and fate functions of nutrients, and to provide high-quality data on a variety of chemical pollutants. The design of a comprehensive initiative to reduce plastic pollution was also suggested.



The participants highlighted that there is a need for two-way communications between scientists, public, and policymakers. For ocean prediction, it is critical to develop high-resolution oceanic coupled models for seamless forecasting from weather to climate, physical-biogeochemical coupled models, forecast systems and marine ecosystem models. Meeting participants suggested enhancing partnerships with regional and transnational organizations including the Northwest Pacific Action Plan in the application of models and capacity-building.

Improving the application of science research and data will encourage investments into the technologies that provide valuable safety information to communities, noted participants. For a sustainably harvested and productive ocean, it was suggested to improve identification of ecosystem

thresholds, stock assessments and monitoring of fishery removals, and develop indicators of sustainability. For new programmes and initiatives, it was suggested that these apply both to natural and social sciences. New initiatives should be community-based, bottom-up, and locally focused.

It was also suggested to accelerate efforts to bring the complete spectrum of biological data into the data system and aggregate data from biodiversity beyond national jurisdiction areas.

The Northwest Pacific Action Plan highlighted in the meeting that it is critical to convert scientific research results into policy recommendations, as research should help countries to achieve the targets set by the United Nations. The Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization requested the Northwest Pacific Action Plan to continue supporting the activities related to the UN Decade of Ocean Sciences.

### 13. Partnering with Korean University Students in Clean up Marine Litter Camp

August 7, 2019

#### [Partnering with Korean University Students in Clean up Marine Litter Camp](#)



In August 2019, the Korea Association for UN Environment initiated the two-day 2019 Beat Plastic Pollution: Save the Sea—Clean-up Marine Litter Camp. The intention of the camp was to give 30 university students the opportunity to participate in marine litter cleanup activities and learn about marine litter. The students came from 17

different Korean universities: Pusan National University, Pukyuong National University, the Catholic University of Korea, Korea Maritime & Ocean University and Yonsei University.

Ning Liu, Programme Officer at the Northwest Pacific Action Plan, was invited to speak to the participants. He introduced the current situation, the sources and adverse effects of marine litter in the Northwest Pacific region. He focused on the three key elements to tackle marine litter issue, namely the prevention of marine litter input, the monitoring of marine litter quantity and distribution, and the removal of existing marine litter.

During the presentation, Ning Liu highlighted that the marine litter issue is fundamentally an environmental governance issue that involves policymakers, researchers, manufacturers, consumers, media and civil society. Improving policies, legislation as well as waste management are key elements in the fight against marine litter. He encouraged the student to explore better technology solutions and better policy options to address this issue. The Korea Association for UN Environment regularly organizes events for university student and works closely with the Northwest Pacific Action Plan to raise awareness on marine litter.



*(photo credit: Shuyue Yan)*

## 14. Achievements of Northwest Pacific Action Plan highlighted in Yellow Sea Science Conference

July 19, 2019

### [Achievements of Northwest Pacific Action Plan highlighted in Yellow Sea Science Conference](#)



The Yellow Sea is a large shallow productive sea between mainland China and the Korean Peninsula. It covers an area of 400,000 km<sup>2</sup> with 600 million people living in its coastal areas. The Yellow Sea is one of the

most heavily exploited marine ecosystems in the world. Pollution and contaminants resulting from human activities, eutrophication, toxic blooms of harmful marine organisms, jellyfish blooms, overfishing, unsustainable mariculture, habitat loss and degradation have all imposed pressures on the Yellow Sea.

Scientists, policymakers, representatives from international organizations and non-governmental organizations gathered in a [Science Conference](#) organized by the Yellow Sea Large Marine Ecosystems Project in Qingdao, China in July 2019 to explore ways to address marine environmental protection and sustainable development of the Yellow Sea. The Conference hosted four events on fisheries, biodiversity, marine litter and microplastics, and nutrients.



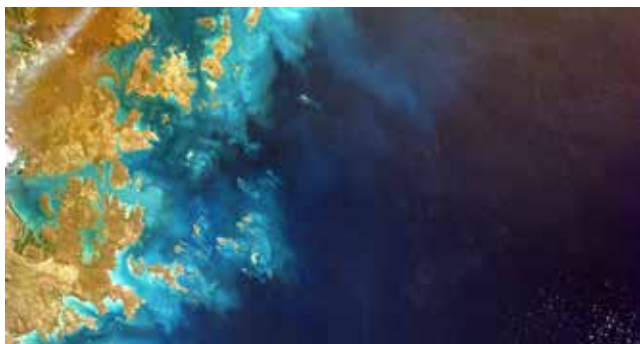
The Northwest Pacific Action Plan was invited to the Science Conference. In the marine litter session, Ning Liu, Programme Officer of the Northwest Pacific Action Plan introduced [the progress and lessons learned of the Northwest Pacific Regional Action Plan on Marine Litter](#). He highlighted that sharing of best practices among Member States helped the region address litter originating from member nations. Although many reports have been published, and a series of meetings have been organized, there are still challenges in addressing marine litter, including the lack of engagement of the private sector.

In the session on nutrients, Liu introduced the effectiveness of the Northwest Pacific Eutrophication Assessment Tool. In the biodiversity session, Takafumi Yoshida from the Special Monitoring and Coastal Environmental Assessment Regional Activity Centre introduced [the achievements of the Northwest Pacific Action Plan in conserving biodiversity](#), and informed the participants that a Regional Action Plan on Marine Biodiversity Conservation is under development.

## 15. Identifying policy gaps to address marine litter in cooperation with non-governmental organization

July 5, 2019

### [Identifying policy gaps to address marine litter in cooperation with non-governmental organization](#)



The Northwest Pacific Action Plan exchanged views with Our Sea of East Asia Network, a Korea based non-governmental organization, on analyzing policies and identifying gaps to address marine litter in the Northwest Pacific region in July 2019 in Tongyeong, Republic of Korea.

The Northwest Pacific Regional Action Plan on Marine Litter was adopted in 2008 which has facilitated information exchange and regional cooperation in fighting against marine litter in the region. After a decade, there is a need to revise the Action Plan to respond to current calls and initiatives to manage marine litter. The Northwest Pacific Action Plan cooperated closely with Our Sea of East Asia Network to develop the Third Overview of Marine Litter in the Northwest Pacific Region.

Ning Liu, Programme Officer of the Northwest Pacific Action Plan highlighted in the meeting in Tongyeong that the Third Overview of Marine Litter would provide recommendations for countries in the region on how to revise the Action Plan. It is critical to follow up on the resolutions on marine litter made by the United Nations Environmental Assembly in the last few years and refer to the gaps identified by the UN Environment Programme at the global level.

Our Sea of East Asia Network introduced their analysis about the status and trends in distribution and impacts of marine litter, and the analysis of recommendations and resolutions on marine litter made from international forums, including the G7 and G20. Both sides agreed to further discuss the development of the Overview. The Overview is expected to be reviewed at the Focal Points Meeting of Marine Litter of the Northwest Pacific Action Plan in September 2019 in Dalian China and will be published by the end of 2019.

Our Sea of East Asia Network is a non-profit organization established in 2009 dedicated to research, education, policy development and international cooperation to protect the marine environment from marine litter. The Northwest Pacific Action Plan and Our Sea of East Asia Network have co-organized a regional marine litter workshop and a non-governmental forum in June 2018 in Busan, in cooperation with the Ministry of Oceans and Fisheries of the Republic of Korea.



## 16. Applying the Northwest Pacific Action Plan Eutrophication Assessment Tool on a global scale

June 22, 2019

### [Applying the Northwest Pacific Action Plan Eutrophication Assessment Tool on a global scale](#)



The Northwest Pacific Action Plan was invited to [the First Operational Satellite Oceanography Symposium](#) held in June 2019 in Maryland, United States to introduce the [Northwest Pacific Action Plan Eutrophication Assessment Tool](#) (NEAT) and its applicability on a global scale.

The Symposium was organized by the National Oceanic and Atmospheric Administration Center for Weather and Climate Prediction. Some 150 experts on satellite oceanographic data, products and applications attended the meeting. The Symposium discussed what made an operational application successful, and where and how satellite service could be improved.

Genki Terauchi, Senior Researcher at the Special Monitoring and Coastal Environmental Assessment Regional Activity Centre of Northwest Pacific Action Plan presented the eutrophication assessment tool in the meeting. The tool enables detection of potential eutrophication zones from millions of pixel-based information retrieved by time series of ocean colour sensors.

Transforming big amounts of data into simple but robust indexes whose meaning stakeholders will understand instantly is of paramount importance, Trauchi said. He further explained that this method can help develop indicators for the index of coastal eutrophication under the sustainable development goal 14.1.1—Index of coastal eutrophication -by using both concentration levels and trends of remotely sensed Chlorophyll a.

Application of the eutrophication assessment tool method on a global scale is in progress and almost ready for operational use. Use of higher-resolution ocean colour sensors is planned to better detect eutrophication in estuaries and enclosed bays.

The participants agreed that inter-validation of data from different sensors is necessary among agencies and companies which provide relevant data. Provision of reliable and validated data is more important than fast-paced provision of data and relevant agencies and companies should invest their time in education and human resource development to keep up with the continuous evolution of computer technology and data processing.



The Special Monitoring and Coastal Environmental Assessment Regional Activity Centre will continue develop the eutrophication assessment tool by using new satellite sensor data to better map eutrophication status in higher spatial resolution.

## 17. Sharing experience with East Asian countries in institutional strengthening to address marine pollution

June 20, 2019

[Sharing experience with East Asian countries in institutional strengthening to address marine pollution](#)



The Northwest Pacific Action Plan was invited to the 24<sup>th</sup> Intergovernmental Meeting of the Coordinating Body on the Seas of East Asia to share its experiences on addressing marine environmental protection through institutional strengthening. The meeting took place in June 2019 in Nusa Dua, Bali, Indonesia.

Participants discussed the establishment and operation of the Coordinating Body on the Seas of East Asia's regional activity centres to enhance its abilities to protect the marine environment. Indonesia established a Regional Capacity Centre for Clean Seas to respond to its presidential decree and Bali Declaration which called for mainstreaming of the protection of coastal and marine ecosystems including from marine litter and microplastics, and to foster linkages with the Regional Seas Programmes.

Indonesia suggested exploring the opportunity of making the Regional Capacity Centre for Clean Seas into a regional activity centre of the Coordinating Body on the Seas of East Asia. Its aim is to assist countries to improve their national capacities towards implementation of the Coordinating Body's action plan and strategic direction. The Government of Indonesia allocated US\$500,000 as initial funding from its national budget, with additional finance of US\$500,000 envisaged annually.

Ning Liu, Programme Officer from the Northwest Pacific Action Plan, introduced the history and operation modalities of their regional activity centres. He explained that the Special Monitoring and Coastal Environmental Assessment Regional Activity Centre was set up by the Ministry of Environment of Japan in 1999, with the Government of Japan providing financial and human resources. The Centre has conducted research and assessments of the state of the marine, coastal and associated freshwater environments, promoted and coordinated regional cooperation through national focal points and nominated experts related to special monitoring and assessment of the marine and coastal environment.



Similarly, the Republic of Korea hosted the Marine Environmental Emergency Preparedness and Response Regional Activity Centre to address oil spills and hazardous and noxious substances spills. In the Sanchi incident, where a ship which contained more than 130,000 tonnes of oil sank near

Shanghai in early 2018, Member States have exchanged information effectively and timely through the mechanism set up by the Centre.

The Data and Information Regional Activity Centre hosted by China has facilitated marine environmental information exchange in the region, while the Pollution Monitoring Regional Activity Centre hosted by the Russian Federation has conducted various research project on pollution monitoring and environmental assessment.

Ning Liu highlighted that the Centres have enhanced the ownership of Member States and increased the Northwest Pacific Action Plan's abilities to address marine and coastal environmental protection. The Centres have also played an important role in leveraging financial resources.

The meeting appreciated Indonesia's efforts in reducing and mitigating land-based sources of marine pollution through institutional development focusing on capacity building, knowledge management and awareness raising. Participants also encouraged Indonesia to further develop the Regional Capacity Centre for Clean Seas, to transform it into a Coordinating Body on the Seas of East Asia Regional Activity Centre for consideration at the 25th intergovernmental meeting.



## 18. Sharing experiences in addressing marine litter in the Yellow Sea

June 5, 2019

### [Sharing experiences in addressing marine litter in the Yellow Sea](#)



Experts from the People's Republic of China, the Republic of Korea and international organizations gathered in Busan, Republic of Korea on 4-5 June 2019 to explore ways to address marine pollution in the Yellow Sea. They compared the baseline survey research on marine litter, reviewed related legislation and regulation, and discussed measures to address

marine litter in the Yellow Sea.

Their findings were largely positive. As China's National Marine Environmental Monitoring Center pointed out, "From 2010 to 2018, the average density of beach litter of monitored beaches of the Yellow Sea was reduced from 72,825 to 35,502 items per square kilometre." And according to Our Sea of East Asia Network (a Korea-based non-governmental organization), "Long-term monitoring by the Korea's Ministry of Oceans and Fisheries shows the decreasing accumulation rates around the Korean peninsula and along the western coasts. However, abandoned fishing and aquaculture items and sport fishing gears have still seriously affected endangered birds and their habitats, and navigation safety of naval ships and other vessels."



The meeting also addressed the source of marine litter. China's Shandong Marine Resource and Environment Research Institute briefed participants on the status and regulatory measures of marine litter management in Weihai City of China, stating that the city will implement total pollutant control measure in the estuary area and further improve its marine litter monitoring and evaluation system.

The official from Taean, Chongnam Do, Republic of Korea highlighted the importance to establish integrated improvement measures to minimize marine litter through prevention and systematic management.

The Secretariat of the Yellow Sea Large Marine Ecosystem Phase II Project updated the meeting on the status of the establishment of the Clean Beach City Alliance—a platform to promote and facilitate the cooperation and exchanges among business, academia, schools and communities at local level in different countries and catalyse result-oriented actions in addressing marine litter. The alliance tackles the issue through a holistic approach at local levels. It will promote technological cooperation to track the source of marine litter and remove the debris from receiving waters, through an exhibit in a venue yet to be determined. Candidate cities include Qingdao and Weihai in China, and Chungnam Do in the Republic of Korea.

Ning Liu, Programme Officer of Northwest Pacific Action Plan highlighted the importance of controlling marine litter from its sources. He commented on and compared the waste management systems in China and the Republic of Korea. He also introduced the annual Northwest Pacific marine litter management workshop to be held on 24-27 September 2019 in Dalian, China, and invited the delegates to join the workshop to further enhance regional cooperation in addressing marine litter.

## 19. Identify best practices and gaps to achieve voluntary commitments to the UN Ocean Conference

May 31, 2019

### [Identify best practices and gaps to achieve voluntary commitments to the UN Ocean Conference](#)



International and regional environmental organizations, governments and academia gathered in May 2019 to identify the best practices and experiences, gaps and obstacles in the delivery the voluntary commitments to the 2017 United Nations Ocean Conference.

The Meeting of the Communities of Ocean Action “From Commitments to Action: Implementing SDG14” was organized by the UN Department of Economic and Social Affairs in Incheon, Republic of Korea.

In the opening session, Liu Zhenmin, Under-Secretary-General for Economic and Social Affairs, said, “The next few years must be one of action and accelerated implementation of the 2030 Agenda... The ocean and its resources are essential to the achievement of the 2030 Agenda and SDGs [Sustainable Development Goals] as a whole.”

Yangsoo Kim, Vice Minister, Ministry of Oceans and Fisheries of the Republic of Korea, stated: “The issue of marine debris, one of the globally intractable problems, will completely be addressed by the measures improving prevention and buy-back schemes targeting up to 30 per cent reduction by 2022 and 50 per cent by 2030 [in Korea].”

More than 1,400 voluntary commitments to advance the implementation of Sustainable Development Goal 14 and related targets were registered in the 2017 Ocean Conference. Participants in Incheon shared the progress of their voluntary commitments. The Nature Conservancy and the Convention of Biodiversity pointed out that 866 voluntary commitments regarding marine and coastal ecosystems management were registered, there was disproportionate representation of some regions, the private sector and science community were under-represented, and one third of volunteer commitments did not indicate links to other Sustainable Development Goals.



The UN Environment Programme reported that 136 volunteer commitments related to coral reefs were registered, but only 26 per cent were updates. It was suggested to consider certificates for reporting and completion, or awards ceremony at the United Nations Ocean Conference.

India's Suganthi Devadason Marine Research Institute introduced the removal of marine debris from reef areas in the Gulf of Mannar, Tamil Nadu, India to reduce the stress to the bleached corals and

to support the recovery process. The Institute highlighted that removal of debris was a continuous process and that removal, enforcement and awareness-building among fishers should be in place.

The International Union for Conservation of Nature introduced their “Support to the Government on Marine and Coastal Resource Management and Sustainable Livelihoods in Northern Sri Lanka” and pointed out that resources and political commitment at the local level are less than optimal to meet the complex socio-economic, climate and technology challenges.

The Northwest Pacific Action Plan exchanged views with the participants in the conference on how to further collect data on marine litter, build databases on ocean resources, and engage civil society to achieve the voluntary commitments.

## 20. Promoting cross-border environmental cooperation in the Korean Peninsula

May 17, 2019

### [Promoting cross-border environmental cooperation in the Korean Peninsula](#)



International and regional environmental organizations and experts gathered in Seoul in May 2019 to explore ways to promote cross-border conservation in the Korean Peninsula, building on green initiatives launched after the historic 2018 Korean leaders' summit.

The Northwest Pacific Action Plan of the UN Environment Regional Seas Programme participated in the regional briefing on environment conservation and cooperation on the Korean Peninsula. The meeting was organized by the East Asian-Australasian Flyway Partnership, the Hanns Seidel Foundation Korea and the Ramsar Convention Regional Center.

Following the 2018 Summit between the Republic of Korea and the Democratic People's Republic of Korea, many environmental organizations have stepped up activities in the Democratic People's Republic of Korea. Meanwhile, the country joined the East Asian-Australasian Flyway Partnership and became a Party to the UN Ramsar Convention on Wetlands. The National Wetland Inventory of the Democratic People's Republic of Korea was published in October 2018. Contacts have been established between the country's Ministry of Land and Environment Protection and more than 20 international environmental conservation organizations.

Hanns Seidel Foundation Korea, (a non-profit political organization based in Seoul), the East Asian-Australasian Flyway Partnership (a network aims to protect migratory waterbirds, their habitat and the livelihoods of people dependent upon them), the Ramsar Convention Regional Center, Birds Korea, a Republic of Korea-based non-governmental organization and the Beijing Office of the United Nations Educational, Scientific and Cultural Organization (UNESCO) have launched conservation activities in the Democratic People's Republic of Korea.

Hanns Seidel Foundation has organized five conservation workshops in Pyongyang which were attended by about 260 participants. Another 750 participants were trained in training workshops organized by the group around the country.



At the Seoul meeting, Birds Korea shared findings of its surveys for a wetland project in the Democratic People's Republic of Korea. The northeast coast of the Korean Peninsula is an important habitat for waterbirds and seabirds and a potential eco- and avian-tourism destination.

According to the New Zealand-based Pukorokoro Miranda Naturalists' Trust, with continuing habitat loss around much of the Yellow Sea, tidal flats in the Democratic People's Republic of Korea offer a safety net habitat for the East Asian-Australasian Flyway. However, tideland reclamation is accelerating.

At the Seoul meeting, the East Asian-Australasian Flyway Partnership highlighted the case of the Mundok Migratory Bird Reserve located along the Chongchon River estuary in the Democratic People's Republic of Korea. The country's Ministry of Land and Environment Protection plans to promote the Mundok Migratory Bird Reserve as a model for wetland conservation in the country.

Northwest Pacific Action Plan Programme Officer Ning Liu said that participation in the Seoul meeting was a valuable opportunity to explore how the UN Environment Regional Seas Programme can use its regional cooperation-based approach to promote marine environmental conservation on the Korean Peninsula.

## 21. NEAT—a satellite-based technique to keep an eye on growing eutrophication threat to oceans (2019)

May 6, 2019

[NEAT—a satellite-based technique to keep an eye on growing eutrophication threat to oceans \(2019\)](#)



A carpet of algae, floating dead fish for as far as the eye can see, a stench so powerful it irritates the lungs and stings the eyes... these are some of the effects of algal blooms, caused by ocean eutrophication, a deadly phenomenon for aquatic ecosystems.

Eutrophication happens when excessive nutrients from agricultural, industrial and urban wastes enter the seas, leading to serious disruption of marine ecosystems, damage to vital sea habitats and the spread of harmful algal blooms, commonly known as red tides. Nearly half of the world's population lives within 100 km of a coast—an estimated 41 per cent of the global ocean is strongly affected by land-based human activities.

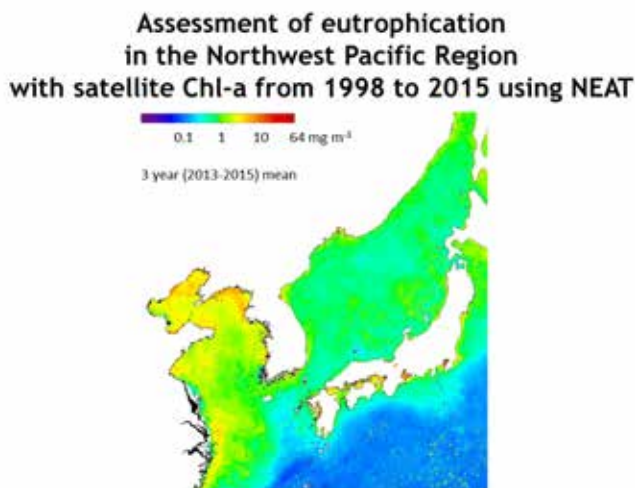
In 2008, massive green macroalgae blooms caused by eutrophication spread over 2,400 km<sup>2</sup> in the Yellow Sea and East China Sea and 1 million tons had to be removed and treated at a cost of more than US\$100 million.

Satellite imagery, a tool for early detection (Credit: Genki Terauchi, NOWPAP CEARAC)

A satellite imagery technique for timely detection of potential dead zones in the sea, developed by the UN Environment Northwest Pacific Regional Seas Programme is now ready for use to protect oceans from the serious threat of eutrophication.

Marine scientists from China, Japan, Republic of Korea and the Russian Federation meeting in Vladivostok, Russia in March 2019, endorsed the effectiveness of the Northwest Pacific Action Plan Eutrophication Assessment Tool (NEAT) in protecting the region from eutrophication that threatens marine and human health and can severely harm fisheries and tourism.

The Regional Seas Programme's Northwest Pacific Action Plan intends to collaborate with global online search giant Google and the Japan Aerospace Exploration Agency to test NEAT to monitor eutrophication in oceans around the world, using cloud computing.



## 22. Mitigation of HABs in eutrophic waters of the Bohai sea using modified clay technology, Photo by Zaixing Wu, Institute of Oceanology, Chinese Academy of Sciences

“Eutrophication assessment with rapidly increasing amount of satellite data requires a simple but robust methodology like NEAT,” says Genki Terauchi of the Northwest Pacific Action Plan’s Special Monitoring and Coastal Environmental Assessment Regional Activity Centre who led development of the technique.

NEAT uses satellite-derived chlorophyll-a concentration levels and trends to detect potential eutrophic zones. Eutrophication results in high levels of phytoplankton growth and organic matter supply to marine ecosystems and chlorophyll-a concentrations are a reliable indicator of eutrophication.

Satellite monitoring data for chlorophyll-a concentration levels in Northwest Pacific seas was used for



a Northwest Pacific Action Plan study led by Terauchi to devise the NEAT methodology. It overcomes difficulties with remote sensing such as estimating chlorophyll-a concentration in coastal waters due to turbidity caused by entry of water from land.

The Northwest Pacific Action Plan’s Special Monitoring Centre has been studying eutrophication since 2008 and has developed methodologies to assess eutrophication levels in the region. The NEAT methodology was reviewed at the eutrophication assessment meeting of marine scientists organized by the Northwest Pacific Action Plan’s Special Monitoring Centre in Vladivostok.

The Special Monitoring Centre has also developed [an online portal on harmful algal blooms, countermeasures against harmful algal blooms and eutrophication monitoring guidelines](#) for local government officials in coastal regions.

A significant reduction in marine pollution by 2025, in particular from land-based activities, is part of the commitment made by world leaders in the 2030 Agenda for Sustainable Development. “Use of the NOWPAP Eutrophication Assessment Tool will help countries in the region to report their progress to achieve Sustainable Development Goals,” said Ning Liu, Programme Officer of the Northwest Pacific Action Plan.

Further resources: [potential eutrophic zones in the NOWPAP region](#).



### 23. Marine scientists from the Northwest Pacific region review targets for assessing ocean health

March 21, 2019

[Marine scientists from the Northwest Pacific region review targets for assessing ocean health](#)



Marine scientists from China, Japan, the Republic of Korea and the Russian Federation met in Vladivostok, Russian Federation in March 2019 to discuss ways of assessing the health of the seas shared by the four countries in order to support regional progress towards ocean-related Sustainable Development Goals.

The meeting, organized by the Pollution Monitoring Regional Activity Centre (POMRAC) of the Northwest Pacific Action Plan of the four-decades-old UN Environment Regional Seas Programme, discussed six most applicable indicators related to monitoring marine ecological quality in the region and agreed on the targets for the four of them, aligned with environmental Sustainable Development Goals.

They also suggested Jiaozhou Bay in China, Toyama Bay and/or Hakata Bay in Japan, Masan Bay in Republic of Korea and Russia's Amursky Bay as designated areas for testing of the targets related to nutrient, chlorophyll 'a' and contaminant concentration levels in water and sediments, and marine litter.

Anatoly Kachur, Director of Pollution Monitoring Regional Activity Center said that the testing will make it easier for the countries to monitor the state of the marine and coastal environment.



The Vladivostok expert meeting, held at the Far Eastern Branch, Russian Academy of Science, followed up on the five ecological quality objectives (EcoQOs) for the Northwest Pacific region agreed on by the four countries in 2014, namely ensuring that:

- Biological and habitat diversity are not changed significantly due to anthropogenic pressure
- Alien species are at levels that do not adversely alter ecosystems
- Adverse effects of eutrophication are absent
- Contaminants cause no significant impact on coastal and marine ecosystems and human health
- Marine litter does not adversely affect coastal and marine environments

In December 2018, Northwest Pacific Action Plan member countries tasked the Pollution Monitoring Regional Activity Centre with developing targets for measuring progress towards these regional ecological quality objectives in line with the global Sustainable Development Goals indicators. The



Pollution Monitoring Regional Activity Centre analysed national targets related to the regional ecological quality objectives for identifying targets aligned with the indicators for ocean-related Sustainable Development Goals.

The Vladivostok meeting agreed on the following targets for monitoring the quality of the marine and coastal environment:

- Nutrient concentrations in the water column within the designated area do not exceed baseline values or national standards
- Chlorophyll 'a' concentrations do not exceed baseline values
- Contaminant concentrations in water and surface sediments do not exceed existing national standards over a five-year period
- A decreasing trend in the amount of marine litter washed ashore over a five-year period

Marine scientists from the four countries will test these targets by observing actual monitoring data in designated areas in 2020–2021.

## 24. Northwest Pacific Regional Seas Programme to support 'Clean Beach City Alliance' against marine litter

March 14, 2019

[Northwest Pacific Regional Seas Programme to support 'Clean Beach City Alliance' against marine litter](#)



Qingdao City in Shandong province of the People's Republic of China, and Taean County in South Chungcheong Do province of the Republic of Korea are popular coastal resorts about 600 km apart, on opposite ends of the Yellow Sea, and known for their clean beaches and clear seas.

Shandong and South Chungcheong Do provinces are partners in an environmental initiative that brings together local authorities, businesses and civil society to keep their beaches free of marine litter—a threat to the seas and coasts of East Asia.

Acknowledging the primary role of local governments in protecting the coastal and marine environment, a meeting of a United Nations project to protect the Yellow Sea marine ecosystem held in Qingdao in March 2019 has now agreed to set up a 'Clean Beach City Alliance' linking coastal cities in China, Japan and the Republic of Korea with support from the UN Environment Northwest Pacific Action Plan. The 3rd Meetings of the Management, Science and Technical Panel and Interim Commission Council of the United Nations Development Programme / Global Environment Facility Yellow Sea Large Marine Ecosystem project has sought the cooperation of the Northwest Pacific Action Plan, which is promoting regional cooperation against marine litter in Northwest Pacific seas since 2008.

"Local governments are and should be the primary players in reducing marine litter through legislation and establishment of comprehensive policy framework. These enabling conditions will provide a conducive platform to engage business, academia, non-governmental organizations, youth and other stakeholders to take joint actions within their respective areas of expertise," says a background paper on the 'Clean Beach City Alliance' presented at the meeting.

The Yellow Sea Large Marine Ecosystem meeting agreed to identify one city in Shandong, Taean County as well as a city in Japan to join the Alliance. Participating cities will host annual forums on the prevention and control of marine debris pollution and work together to tackle marine litter by involving local governments, business, youth and non-governmental organizations.

Northwest Pacific Action Plan Programme Officer Ning Liu told the Qingdao meeting that the Alliance would benefit from marine litter guidelines for the region developed by the UN Environment Regional Seas Programme and adopted by the Yellow Sea Large Marine Ecosystem project.

The Northwest Pacific Regional Action Plan on Marine Litter promotes cooperation among China, Japan, Republic of Korea and the Russian Federation to prevent, reduce and remove marine litter from Northwest Pacific coastal areas and waters.

The Yellow Sea Large Marine Ecosystem is one of 66 large marine ecosystems in the world. The project was launched in 2005 to address environmental threats to the Yellow Sea, which covers 400,000 km<sup>2</sup> between China and the Korean peninsula.

An estimated 4.8–12.7 million tonnes of plastic waste enter the world's oceans annually. The seas surrounding East Asia are one of the global hotspots of marine litter pollution and are assessed to have 27 times more microplastics (plastic particles less than 5 mm) per square kilometre than other world seas.



Further resources: [Northwest Pacific Action Plan marine litter and microplastics](#)

## 25. Good ocean data science is crucial for protecting and nurturing the world's oceans

February 19, 2019

[Good ocean data science is crucial for protecting and nurturing the world's oceans](#)



Good ocean data science is vital for reversing the rapid decline in the health of our seas that threatens humanity and the planet, the UN Environment Northwest Pacific Regional Seas Programme told an international scientific forum in Tokyo, Japan, in February 2019, in preparation for the first UN Decade of Ocean Science.

The 18–19 February 2019 *International Oceanographic Data and Information Exchange (IODE) XXV Scientific Conference*, organized by the International Oceanographic Data and Information Exchange programme of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and hosted by the Government of Japan, reviewed scientific preparedness and needs for the UN Decade of Ocean Science for Sustainable Development (2021-2030). The Decade aims to strengthen scientific knowledge for the sustainable use of the largest planetary ecosystem.

“The UN Decade of Ocean Science is a once in a lifetime opportunity for the global expert community to define the concept of sustainability for the marine environment and communicate to policymakers and the public the importance of oceans for humanity,” Lev Neretin, Coordinator of the UN Environment Northwest Pacific Action Plan, told the conference.

“New knowledge, new forms of public-private partnerships and new forms of communication are needed to realize the mission of the Decade,” he added.

In a presentation to the expert gathering, Mr Neretin highlighted the contribution of the over four-decade-old UN Environment Regional Seas Programme to the sustainable management of the marine and coastal environment, a key goal of the 2030 Agenda.

An estimated 99 per cent of habitable marine areas lack basic biodiversity knowledge for their management and up to 1 million marine species could still be unknown to science. Ocean science has a less than 4 per cent share in global research and development investment.



The UN Environment and its Regional Seas Programme are developing indicators and reporting mechanisms for monitoring implementation of Sustainable Development Goal 14: Life Below Water.

Besides generating quality data from its monitoring of the regional marine and coastal environment and communicating this to policymakers and the public, the Northwest Pacific Action Plan coordinates regional implementation of the ocean-related Sustainable Development Goals (SDGs).

### **UN Decade of Ocean Science for Sustainable Development (2021-2030)**

The United Nations has proclaimed a [Decade of Ocean Science for Sustainable Development \(2021-2030\)](#) to support efforts to reverse the cycle of decline in ocean health and gather ocean stakeholders worldwide behind a common framework that will ensure ocean science can fully support countries in creating improved conditions for sustainable development of the ocean.

The [Intergovernmental Oceanographic Commission](#) (IOC) of UNESCO has been tasked by the UN General Assembly to coordinate the Decade's preparatory process working with the global ocean community to plan for the next ten years in ocean science and technology to deliver, together, the ocean we need for the future we want!

### **International Oceanographic Data and Information Exchange (IODE) Programme**

The International Oceanographic Data and Information Exchange (IODE) programme was established in 1961 to enhance marine research, exploitation and development, by facilitating exchange of oceanographic data and information among countries and generating data and information. There are over 80 oceanographic data centres in as many countries collecting and ensuring ocean data quality, and making these available to countries.

## 26. NOWPAP marks 20 years of partnership with Japan's marine conservation center

January 25, 2019

[NOWPAP marks 20 years of partnership with Japan's marine conservation center](#)



### The UN Environment's Northwest Pacific Action Plan marks 20 years of partnership with Japan's marine conservation centre

At an event to mark the 20th anniversary of Japan's Northwest Pacific Region Environmental Cooperation Center (NPEC), the UN Environment's Northwest Pacific Action Plan (NOWPAP) voiced its commitment to strengthen its 20-year partnership with

the Center to help steer regional implementation of ocean-related Sustainable Development Goals (SDGs) and the Northwest Pacific Action Plan's Medium-term Strategy 2018-2023.

Addressing the 'Northwest Pacific Region Environmental Cooperation Center 20th Anniversary Symposium' held in January in the Center's home city of Toyama and attended by 120 members of the public, the UN Environment's Northwest Pacific Action Plan's Coordinator Lev Neretin highlighted how both entities have used the best available scientific knowledge to address pressing threats to the region's marine and coastal environment over the last two decades.

These include pioneering efforts to deal with the now globally recognized problem of marine litter and a methodology for eutrophication assessment with the identification of more than 20 potential areas in the region affected by excessive nutrient pollution.



"The results of this work are being used by our regional and global partners to measure the progress of countries in achieving the Sustainable Development Goals. The increasing focus of the Northwest Pacific Action Plan on the achievement of the Sustainable Development Goals through strong regional cooperation should bring us even closer together in using the best available knowledge, and building capacities to address old and new threats to the marine environment," Neretin said.

"Environmental issues are closely connected with the daily lives of citizens, and they need to be tackled by national and regional actions," said Governor of Toyama Takakazu Ishii in his opening remarks to the event. "Therefore, international cooperation is critical. Toyama Prefecture has been working successfully with the Northwest Pacific Region Environmental Cooperation Center and

Northwest Pacific Action Plan on marine litter issues. We introduced a plastic bag ban in commercial stores in Toyama back in 2008, the first Prefecture to ban plastic bags in Japan.” A keynote presentation on plastic pollution in the marine environment was made by Professor Haruyuki Kanehiro of Tokyo University of Marine Science and Technology, Chairman of Japan’s Ministry of Environment’s Experts’ Group on Marine Litter.

Presentations were also made by two high schools in Toyama and by the Toyama Prefecture authorities, as well as by the Northwest Pacific Region Environmental Cooperation Center.

Set up in 1999 by the Ministry of Environment, Japan, the Center has been hosting the Northwest Pacific Action Plan’s Special Monitoring and Coastal Environment Assessment Regional Activity Centre (CEARAC) for the last 20 years. The Activity Centre coordinates regional assessments of the state of the marine, coastal and associated freshwater environments, including marine biodiversity and land-based sources of pollution. It is developing new monitoring tools for seagrass distribution and building regional remote sensing capacities.



## 27. Japan's prestigious Keio university takes the leap into a plastic-free future

October 25, 2018

[Japan's prestigious Keio university takes the leap into a plastic-free future](#)



At this year's Fujisawa Campus annual festival at Japan's prestigious Keio University, a large number of the over 10,000 mostly young visitors were drawn to a peculiar display booth.

The attraction was understandable—visitors to the booth, mostly students from Keio and other universities as well as pre-university students and members of the public, were encouraged to

change their lifestyles and reduce dependence on plastics. Reusable bags, drinking straws and bottles were displayed at the booth along with material about the UN Environment Regional Seas Programme.

"I didn't know that it takes only such simple action in our daily lives to protect our environment," said a surprised university graduate student after studying the displays at the booth.

"It is good for us to start to learn to change our behaviour while still at university," said a young woman. "This will give us a stronger sense of commitment and shared values later in life to protect our environment."



'Beat Plastic Pollution' banners and environment-friendly substitutes for plastics were displayed. The booth was set up by the civil society group UMINARI to launch the Beat Plastic Pollution campaign during



the 13 October University festival held in Fujisawa—a city on Japan's mid-western Pacific Ocean coast. UMINARI, coordinator of the network, had teamed with the UN Environment Northwest Pacific Action Plan (NOWPAP), a Regional Seas Programme headquartered in Toyama, Japan, for its anti-plastic campaign designed for campuses.

The campaign was launched on behalf of Onewave network, a nationwide platform that brings together

non-profit, civil society and private sector groups in Japan to promote public awareness of working together to protect the shared global environment.

Young and old, everyone was encouraged to act. "I am glad to see the young learning to take care of the environment and ready to give up some conveniences," said a woman visitor in her late sixties. Many students visiting the booth made a formal pledge to switch to using sustainable alternatives to plastics on campus.

“We are very encouraged by the enthusiasm shown by students and their readiness to stop using plastics. Our goal was to get students involved, change their minds and act. We can now continue the Plastic-Free Campus campaign both online and offline for lasting and widespread impact,” said Takanobu Date, Chief Executive Officer of UMINARI and Coordinator of Onewave network.



“According to estimates by UMINARI, every second, about 1,000 single-use plastic bags are used in Japan. While the country is well known for its modern and efficient waste management practices, the significance of reducing single-use plastics is no less important here than in other parts of the world,” said Lev Neretin, Coordinator of the Northwest Pacific Action Plan of UN Environment. “We are delighted to support the first public initiative of this very promising youth movement,” he added.

The campaign also resulted in some businesses and research organizations agreeing to provide support to Onewave network in making Japanese campuses plastic-free.

## Annex B. NOWPAP Quarterly Newsletter

### NOWPAP Quarterly 1 - 2019



#### 1. NOWPAP marks 20 years of partnership with Japan's marine conservation center

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and land-based sources of pollution. It is developing new monitoring tools for seagrass distribution, and building regional remote sensing capacities.

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### **3. Northwest Pacific Regional Seas Programme to support 'Clean Beach City Alliance' against marine litter**

Qingdao City in Shandong province of the People's Republic of China, and Taean County in South Chungcheong Do province of the Republic of Korea are popular coastal resorts about 600 km apart, on opposite ends of the Yellow Sea, and known for their clean beaches and clear seas.

Shandong and South Chungcheong Do provinces are partners in an environmental initiative that brings together local authorities, businesses and civil society to keep their beaches free of marine litter—a threat to the seas and coasts of East Asia.

Acknowledging the primary role of local governments in protecting the coastal and marine environment, a meeting of a United Nations project to protect the Yellow Sea marine ecosystem held in Qingdao in March 2019 has now agreed to set up a 'Clean Beach City Alliance' linking coastal cities in China, Japan and the Republic of Korea with support from the UN Environment Northwest Pacific Action Plan. The 3rd Meetings of the Management, Science and Technical Panel and Interim Commission Council of the United Nations Development Programme / Global Environment Facility Yellow Sea Large Marine Ecosystem project has sought the cooperation of the Northwest Pacific Action Plan, which is promoting regional cooperation against marine litter in Northwest Pacific seas since 2008.

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have 27 times more microplastics (plastic particles less than 5 mm) per square kilometre than other world seas.

[Northwest Pacific Action Plan marine litter and microplastics](#)

#### **4. Marine scientists from the Northwest Pacific region review targets for assessing ocean health**

Marine scientists from China, Japan, the Republic of Korea and the Russian Federation met in Vladivostok, Russian Federation in March 2019 to discuss ways of assessing the health of the seas shared by the four countries in order to support regional progress towards ocean-related Sustainable Development Goals.

The meeting, organized by the Pollution Monitoring Regional Activity Centre (POMRAC) of the Northwest Pacific Action Plan of the four-decades-old UN Environment Regional Seas Programme, discussed six most applicable indicators related to monitoring marine ecological quality in the region and agreed on the targets for the four of them, aligned with environmental Sustainable Development Goals.

They also suggested Jiaozhou Bay in China, Toyama Bay and/or Hakata Bay in Japan, Masan Bay in Republic of Korea and Russia's Amursky Bay as designated areas for testing of the targets related to nutrient, chlorophyll 'a' and contaminant concentration levels in water and sediments, and marine litter.

Anatoly Kachur, Director of Pollution Monitoring Regional Activity Center said that the testing will make it easier for the countries to monitor the state of the marine and coastal environment.

The Vladivostok expert meeting, held at the Far Eastern Branch, Russian Academy of Science, followed up on the five ecological quality objectives (EcoQOs) for the Northwest Pacific region agreed on by the four countries in 2014, namely ensuring that:

- Biological and habitat diversity are not changed significantly due to anthropogenic pressure
- Alien species are at levels that do not adversely alter ecosystems
- Adverse effects of eutrophication are absent
- Contaminants cause no significant impact on coastal and marine ecosystems and human health
- Marine litter does not adversely affect coastal and marine environments

In December 2018, Northwest Pacific Action Plan member countries tasked the Pollution Monitoring Regional Activity Centre with developing targets for measuring progress towards these regional ecological quality objectives in line with the global Sustainable Development Goals indicators. The Pollution Monitoring Regional Activity Centre analysed national targets related to the regional ecological quality objectives for identifying targets aligned with the indicators for ocean-related Sustainable Development Goals.

The Vladivostok meeting agreed on the following targets for monitoring the quality of the marine and coastal environment:

- Nutrient concentrations in the water column within the designated area do not exceed baseline values or national standards

- Chlorophyll 'a' concentrations do not exceed baseline values
- Contaminant concentrations in water and surface sediments do not exceed existing national standards over a five-year period
- A decreasing trend in the amount of marine litter washed ashore over a five-year period

Marine scientists from the four countries will test these targets by observing actual monitoring data in designated areas in 2020–2021.

### **5. NOWPAP launches a video on marine litter and microplastics in seas of the Northwest Pacific**

We have entered an 'Age of Plastic' where plastics may outweigh fish in the oceans by 2050. One of the most densely populated regions of the world, the Northwest Pacific, is the global hotspot of marine litter and microplastics pollution. Northwest Pacific Action Plan (or NOWPAP), one of the eighteen Regional Seas Programmes of the UN Environment, has been responding to the threat of marine litter in the region since 2005. Through a regional framework of cooperation - the NOWPAP Regional Action Plan on Marine Litter - China, Japan, Republic of Korea and Russia are working on the monitoring, reduction and removal of marine litter and microplastics along the coasts and in seas of the NW Pacific.

### **6. MERRAC participation in IMO Sub-Committee on Pollution Prevention and Response 6th Session**

The IMO Sub-Committee on Pollution Prevention and Response (PPR) held its sixth session from 18 to 22 February 2019 at the London headquarters, chaired by Mr. Sveinung Oftedal (Norway). The session was attended by delegations from Member Governments and an Associated Member of IMO, specialized agencies and by observers from international and non-governmental organizations.

MERRAC was invited to brief the IMO PPR Sub-Committee on the practical use of its online pollution reporting system (POLREP) for real-time exchange of information between competent national authorities during the Sanchi spill incident in early 2018 and was represented at the meeting by its consultant Ms. Siyeon Lee.

The Sub-Committee on PPR deals with all matters relating to pollution prevention and response within IMO remit, ranging from all annexes of the MARPOL Convention to the control and management of harmful aquatic organisms in ship ballast water and sediments as well as biofouling, anti-fouling systems, pollution preparedness, response and cooperation for oil and hazardous and noxious substances, and safe and environmentally sound recycling of ships.

In a document submitted through the IMO secretariat, MERRAC briefed the IMO Sub-Committee on the NOWPAP Regional Oil and HNS Spill Contingency Plan (RCP), NOWPAP joint communications and oil and HNS spill response exercises (DELTA and BRAVO) as well as RAP MALI, during a discussion on IMO cooperation with the UN Environment Regional Seas Programme in implementing the OPRC convention and the OPRC-HNS protocol. MERRAC was selected as one of the best examples of regional cooperation in marine pollution preparedness and response along with REMPEC and RAC/REMPEITC-Caribe.

MERRAC also participated in the Drafting Group on OPRC Guidelines which is developing the 'Guide on the Implementation of the OPRC Convention and the OPRC-HNS Protocol'. The Drafting Group meeting was attended by delegations of 18 governments, 2 United Nations specialized agencies, 6 observers from intergovernmental organization.

The participation of MERRAC in the PPR 6th session and sharing of information on its work was a big opportunity to showcase to a global audience, NOWPAP achievements in promoting regional cooperation in protecting the ocean.

### 7. Towards "Blue Economy" transformation in the NOWPAP Region

The "blue economy" is relatively new concept that has emerged since the UN Conference on Sustainable Development in 2012 [2]. Although there is no globally shared definition, the term "blue economy" refers to the environmentally sustainable development of the ocean-related economic activities [3]. "A sustainable ocean economy emerges when economic activity is in balance with the long-term capacity of ocean ecosystems to support this activity and remain resilient and healthy" [4].

The concept of blue economy has emerged because the expansion of "traditional" ocean business resulted in excessive use, over-exploitation and loss of natural ocean assets, including marine biodiversity. In response to those negative impacts, society at large needs a new approach supporting responsible businesses that could maximize economic and social benefits while protecting and rebuilding environmental assets. Although global transformation towards blue economy would require enormous amount of effort in investments, new technologies, and innovative ideas, taking into account the scale of ocean economy, potential and long-term benefits for its growth and new employment could surpass these initial investments over time.

Which commercial activities are associated with the blue economy? The commonly cited sectors are renewable ocean energy, fisheries and aquaculture, marine tourism, and commercial activities associated with shipping and ports development. For three NOWPAP countries alone, the ocean economy value added is estimated conservatively at few percentages of each country's GDP (Table 1 below).

**Table 1. Scale of Blue Economy Sectors in NOWPAP Countries**

Scale of Blue Economy Sector in NOWPAP countries: China, RO Korea, and Japan			
	CHINA	RO KOREA	JAPAN
<b>Ocean economy (Gross value added or GVA, in constant prices)</b>	<b>US\$1,041.9 billion (in 2015)</b>	<b>US\$43.53 billion or 3.3% of GDP (as of 2013)</b>	<b>1.48% of GDP in 2000</b>
<b>Employment in ocean economy</b>	<b>35.9 million people (in 2015)</b>	<b>656,303 (as of 2013)</b>	<b>1million (in 2000)</b>
<b>Estimated value of coastal and marine ecosystems</b>	<b>US\$150 billion</b>	<b>US\$42.4 billion – 44.5 billion</b>	<b>n.a.</b>

Source : State of Oceans and Coasts

The ocean-based renewable energy is being developed to meet with the global goals of climate change [5]. Since the non-renewable energy sources like fossil fuels result in CO<sub>2</sub> and other greenhouse gases emissions, the global action is required to scale up the use of renewable energy to mitigate global warming. Some countries moved by adding marine renewable energy into their national energy mix. In the NOWPAP countries, new energy facilities and R&D center were established to research non-renewable energy.

China made a lot of investments in R&D and built a Chinese Marine Energy Center (CMEC) as well as installing a great number of offshore wind farms to serve for their national demands of energy [6]. RO Korea has developed tidal barrage in Sihwa Lake, which is the largest tidal energy plant in the world [7]. Japan and Korea developed renewable ocean energy plant like Goseong OTEC/SWAC plants [8] (Figure 1 below).



**Figure 2. Goseong OTEC/SWAC plants**



Since Asian continent is the largest consumer of seafood from fisheries and aquaculture, the latter is an important blue economy sector in the NOWPAP region (ref: Fish consumption in Asia has doubled during the last three decades [9]). Especially, the growth rate of capture fisheries in China is increasing with an average annual rate of 9% from 1990-2012 (Table 2).

**Table 2. Fisheries capture data in the NOWPAP countries (excl. Russia)**

<b>Fisheries Data in NOWPAP countries: China, RO Korea, and Japan</b>			
	<b>China</b>	<b>Japan</b>	<b>RO Korea</b>
<b>Total fisheries</b>	70,368	4,817	3,187
<b>Capture fisheries growth (avg. annual %, 1990-2012)</b>	9.1	-4.3	-1.8
<b>Aquaculture growth (avg. annual %, 1990-2012)</b>	1.3	-1.1	3

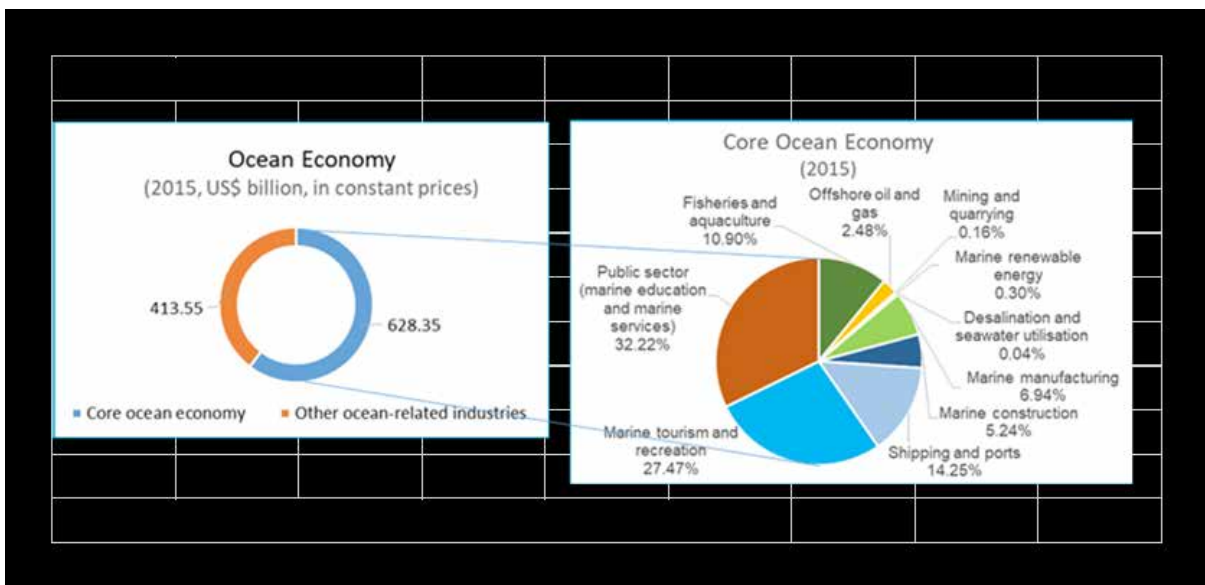
Source : Economic Assessment of Oceans for Sustainable Blue Economy Development. PEMSEA. March 22, 2017

Market demand became a driver for over-fishing as well as resulted in the increased discards of fisheries products due to unsustainable fishing practices. To improve and maintain fish stocks and ensure food security, Asian countries increased aquaculture production, which now accounts for 80% of the global aquaculture production [10]. While aquaculture replaced collapsed fish stocks and improved food security, the sector is not without negative environmental impacts, including increased nutrient and litter pollution, introduction of invasive species and others [11]. To mitigate environmental

impacts, countries explored new innovative practices such as multi-trophic aquaculture [12]. Integrated multi-trophic aquaculture (IMTA) is the new aquaculture practice using natural ecosystem, which co-culture complementing species like seaweed with shrimp so that one species can process the wastes from another [13]. In another aspect, sustainable fisheries rely on the increasing transparency of surveillance and reporting of the fish. These regulatory issues were improved by applying sophisticated technologies to comply with national, regional and global legal frameworks, including addressing illegal, unreported and unregulated fishing. Diet changes and consumption at the market could also become a driver transforming fisheries and aquaculture sectors towards sustainability.

The dramatic expansion of the tourism sector in the region transformed both national and local economies. However, tourism and recreational activities also could bring negative environmental impacts such as pollution, waste, and water shortages. In addition, marine ecosystems and habitats are at the risk of degradation because of the over-development of hard infrastructures such as airports, marinas, resorts, and hotels [14]. International tourism could generate positive impacts to local coastal communities by bringing employment opportunities and revenues. For example, coastal tourism in China had a value of US\$172.63 billion. Marine tourism and recreation in China constitute about 1/3 of their core ocean economy added value. The employment in coastal tourism has reached to 1,306,000, which is 3.7% of marine-related industries in China [15] (Figure 2).

**Figure 3. Ocean Economy in China**



To make tourism sector sustainable, it is important to manage the development of tourism infrastructures and recreational facilities in such a way that they have minimum environmental costs while providing economic benefits for local economies.

Shipping and ports sector are noticeable in Asia where 7 out of 9 world's biggest seaports are located, including Shanghai, Shenzhen, and Hong Kong [16]. With the growing globalized economy, shipments between countries are expected to triple in the next 25 years [17]. NOWPAP countries have the world biggest seaports; one of them is in Busan, RO Korea. In Korea, the ship-building sector accounts for 42% of the national ocean economy. Besides, marine transportation is used for almost all (99%) of Korean cargo in importing raw materials and exporting finished goods (Table 3).

Table 3. Ocean economy in RO Korea

<b>Total Gross Output and Gross Value Added of the Ocean Economy in RO Korea, 2010.</b>					
<b>Sector</b>	<b>Total gross output</b>		<b>Value added</b>		
	<b>million USD</b>	<b>(%)</b>	<b>million USD</b>	<b>(%)</b>	
<b>Entire Industry</b>	<b>3,124,037.40</b>	<b>100</b>	<b>1,152,580.80</b>	<b>100</b>	
<b>Ocean Industry</b>	<b>133,846.80</b>	<b>4.3</b>	<b>37,822.60</b>	<b>3.3</b>	
<b>Ocean-based Sectors</b>	Fisheries and aquaculture	7,515.30	5.6	3,226.40	8.5
	Marine chemical and salt	563.7	0.4	363.1	1
	Marine electric power				
	Marine construction	2,835.00	2.1	1,272.30	3.4
	Shipping	34,555.50	25.8	3,287.80	8.7
<b>Ocean-related Sectors</b>	Machine equipment	10,120.10	7.6	2,641.70	7
	Ship building	53,008.40	39.6	15,919.20	42.1
	Marine services (mapping, surveying, consulting)	1,448.60	1.1	935.6	2.5
	Research and development (R&D)	601.9	0.4	404.7	1.1
	Government, education	4,294.60	3.2	2,805.70	7.4
	Seafood processing and retails	8,926.40	6.7	2,312.20	6.1
	Pharmaceuticals, Biotechnology, etc.	7	-	3.1	0
Port		3,522.60	2.6	1,747.00	4.6
	Marine tourism	6,447.80	4.8	2,903.70	7.7

Source : Economic Assessment of Oceans for Sustainable Blue Economy Development, PEMSEA, March 22, 2017

Shipping and ports development could have negative impacts on the coastal areas, including chemical and noise pollution from the construction of port facilities, shipping operations, and accidental oil spills. In addition, discharge of ballast waters could transfer invasive species and compromise the health of coastal ecosystems. Shipping sector also contributes to emissions of greenhouse gases which escalates global warming [18]. Since shipping and ports operation involve a variety of stakeholders and businesses, partnerships and networking are the important enabling factors in transitioning this sector towards blue economy. Technology development is another key factor to minimize environmental damages caused by shipping without affecting the performance of businesses.

To harness the blue economy, it is imperative to have multi-level cooperation and partnerships among public and private sector, academia and civil society. International cooperation can contribute to a large-scale global reform towards building sustainable blue economy. It should foster the development of integrated strategic action plans and effective ocean management frameworks using a holistic approach [19]. The networking and collaboration between technology developers and users could accelerate the sharing of knowledge and solutions that can be particularly useful in the field of research and development and technology transfer<sup>20</sup>.

Large scale investment is urgently needed in “greening” ocean economy sectors. Supporting transformation towards blue economy would require unprecedented level of international cooperation and collaboration at multiple levels and with various sectors connected directly and indirectly to the

ocean. For NOWPAP countries whose economies are closely connected to coasts and the ocean, transforming towards sustainable blue economy will be critical for making their societies, economies and shared environment sustainable and resilient.

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### **1. NEAT—a satellite-based technique to keep an eye on growing eutrophication threat to oceans (2019)**

A carpet of algae, floating dead fish for as far as the eye can see, a stench so powerful it irritates the lungs and stings the eyes... these are some of the effects of algal blooms, caused by ocean

eutrophication, a deadly phenomenon for aquatic ecosystems.

Eutrophication happens when excessive nutrients from agricultural, industrial and urban wastes enter the seas, leading to serious disruption of marine ecosystems, damage to vital sea habitats and the spread of harmful algal blooms, commonly known as red tides. Nearly half of the world's population lives within 100 km of a coast—an estimated 41 per cent of the global ocean is strongly affected by land-based human activities.

In 2008, massive green macroalgae blooms caused by eutrophication spread over 2,400 km<sup>2</sup> in the Yellow Sea and East China Sea and 1 million tons had to be removed and treated at a cost of more than US\$100 million.

A satellite imagery technique for timely detection of potential dead zones in the sea, developed by the UN Environment Northwest Pacific Regional Seas Programme is now ready for use to protect oceans from the serious threat of eutrophication.

Marine scientists from China, Japan, Republic of Korea and the Russian Federation meeting in Vladivostok, Russia in March 2019, endorsed the effectiveness of the Northwest Pacific Action Plan Eutrophication Assessment Tool (NEAT) in protecting the region from eutrophication that threatens marine and human health and can severely harm fisheries and tourism.

The Regional Seas Programme's Northwest Pacific Action Plan intends to collaborate with global online search giant Google and the Japan Aerospace Exploration Agency to test NEAT to monitor eutrophication in oceans around the world, using cloud computing.

"Eutrophication assessment with rapidly increasing amount of satellite data requires a simple but robust methodology like NEAT," says Genki Terauchi of the Northwest Pacific Action Plan's Special Monitoring and Coastal Environmental Assessment Regional Activity Centre who led development of the technique.

NEAT uses satellite-derived chlorophyll-a concentration levels and trends to detect potential eutrophic zones. Eutrophication results in high levels of phytoplankton growth and organic matter supply to marine ecosystems and chlorophyll-a concentrations are a reliable indicator of eutrophication.

Satellite monitoring data for chlorophyll-a concentration levels in Northwest Pacific seas was used for a Northwest Pacific Action Plan study led by Terauchi to devise the NEAT methodology. It overcomes difficulties with remote sensing such as estimating chlorophyll-a concentration in coastal waters due to turbidity caused by entry of water from land.

The Northwest Pacific Action Plan's Special Monitoring Centre has been studying eutrophication since 2008 and has developed methodologies to assess eutrophication levels in the region. The

NEAT methodology was reviewed at the eutrophication assessment meeting of marine scientists organized by the Northwest Pacific Action Plan's Special Monitoring Centre in Vladivostok.

The Special Monitoring Centre has also developed [an online portal on harmful algal blooms, countermeasures against harmful algal blooms and eutrophication monitoring guidelines](#) for local government officials in coastal regions.

A significant reduction in marine pollution by 2025, in particular from land-based activities, is part of the commitment made by world leaders in the 2030 Agenda for Sustainable Development. "Use of the NOWPAP Eutrophication Assessment Tool will help countries in the region to report their progress to achieve Sustainable Development Goals," said Ning Liu, Programme Officer of the Northwest Pacific Action Plan.

Further resources: [potential eutrophic zones in the NOWPAP region](#).

## **2. Promoting cross-border environmental cooperation in the Korean Peninsula**

International and regional environmental organizations and experts gathered in Seoul in May 2019 to explore ways to promote cross-border conservation in the Korean Peninsula, building on green initiatives launched after the historic 2018 Korean leaders' summit.

The Northwest Pacific Action Plan of the UN Environment Regional Seas Programme participated in the regional briefing on environment conservation and cooperation on the Korean Peninsula. The meeting was organized by the East Asian-Australasian Flyway Partnership, the Hanns Seidel Foundation Korea and the Ramsar Convention Regional Center.

Following the 2018 Summit between the Republic of Korea and the Democratic People's Republic of Korea, many environmental organizations have stepped up activities in the Democratic People's Republic of Korea. Meanwhile, the country joined the East Asian-Australasian Flyway Partnership and became a Party to the UN Ramsar Convention on Wetlands. The National Wetland Inventory of the Democratic People's Republic of Korea was published in October 2018. Contacts have been established between the country's Ministry of Land and Environment Protection and more than 20 international environmental conservation organizations.

Hanns Seidel Foundation Korea, (a non-profit political organization based in Seoul), the East Asian-Australasian Flyway Partnership (a network aims to protect migratory waterbirds, their habitat and the livelihoods of people dependent upon them), the Ramsar Convention Regional Center, Birds Korea, a Republic of Korea-based non-governmental organization and the Beijing Office of the United Nations Educational, Scientific and Cultural Organization (UNESCO) have launched conservation activities in the Democratic People's Republic of Korea.

Hanns Seidel Foundation has organized five conservation workshops in Pyongyang which were attended by about 260 participants. Another 750 participants were trained in training workshops organized by the group around the country.

At the Seoul meeting, Birds Korea shared findings of its surveys for a wetland project in the Democratic People's Republic of Korea. The northeast coast of the Korean Peninsula is an important habitat for waterbirds and seabirds and a potential eco- and avian-tourism destination.

According to the New Zealand-based Pukorokoro Miranda Naturalists' Trust, with continuing habitat loss around much of the Yellow Sea, tidal flats in the Democratic People's Republic of Korea offer a safety net habitat for the East Asian-Australasian Flyway. However, tideland reclamation is accelerating.

At the Seoul meeting, the East Asian-Australasian Flyway Partnership highlighted the case of the Mundok Migratory Bird Reserve located along the Chongchon River estuary in the Democratic People's Republic of Korea. The country's Ministry of Land and Environment Protection plans to promote the Mundok Migratory Bird Reserve as a model for wetland conservation in the country.

Northwest Pacific Action Plan Programme Officer Ning Liu said that participation in the Seoul meeting was a valuable opportunity to explore how the UN Environment Regional Seas Programme can use its regional cooperation-based approach to promote marine environmental conservation on the Korean Peninsula.

### **3. Identify best practices and gaps to achieve voluntary commitments to the UN Ocean Conference**

International and regional environmental organizations, governments and academia gathered in May 2019 to identify the best practices and experiences, gaps and obstacles in the delivery the voluntary commitments to the 2017 United Nations Ocean Conference.

The Meeting of the Communities of Ocean Action "From Commitments to Action: Implementing SDG14" was organized by the UN Department of Economic and Social Affairs in Incheon, Republic of Korea.

In the opening session, Liu Zhenmin, Under-Secretary-General for Economic and Social Affairs, said, "The next few years must be one of action and accelerated implementation of the 2030 Agenda... The ocean and its resources are essential to the achievement of the 2030 Agenda and SDGs [Sustainable Development Goals] as a whole."

Yangsoo Kim, Vice Minister, Ministry of Oceans and Fisheries of the Republic of Korea, stated: "The issue of marine debris, one of the globally intractable problems, will completely be addressed by the measures improving prevention and buy-back schemes targeting up to 30 per cent reduction by 2022 and 50 per cent by 2030 [in Korea]."

More than 1,400 voluntary commitments to advance the implementation of Sustainable Development Goal 14 and related targets were registered in the 2017 Ocean Conference. Participants in Incheon shared the progress of their voluntary commitments. The Nature Conservancy and the Convention of Biodiversity pointed out that 866 voluntary commitments regarding marine and coastal ecosystems management were registered, there was disproportionate representation of some regions, the private sector and science community were under-represented, and one third of volunteer commitments did not indicate links to other Sustainable Development Goals.

The UN Environment Programme reported that 136 volunteer commitments related to coral reefs were registered, but only 26 per cent were updates. It was suggested to consider certificates for reporting and completion, or awards ceremony at the United Nations Ocean Conference.

India's Suganthi Devadason Marine Research Institute introduced the removal of marine debris from reef areas in the Gulf of Mannar, Tamil Nadu, India to reduce the stress to the bleached corals and to support the recovery process. The Institute highlighted that removal of debris was a continuous process and that removal, enforcement and awareness-building among fishers should be in place.

The International Union for Conservation of Nature introduced their "Support to the Government on Marine and Coastal Resource Management and Sustainable Livelihoods in Northern Sri Lanka" and pointed out that resources and political commitment at the local level are less than optimal to meet the complex socio-economic, climate and technology challenges.

The Northwest Pacific Action Plan exchanged views with the participants in the conference on how to further collect data on marine litter, build databases on ocean resources, and engage civil society to achieve the voluntary commitments.

#### **4. Sharing experiences in addressing marine litter in the Yellow Sea**

Experts from the People's Republic of China, the Republic of Korea and international organizations gathered in Busan, Republic of Korea on 4-5 June 2019 to explore ways to address marine pollution in the Yellow Sea. They compared the baseline survey research on marine litter, reviewed related legislation and regulation, and discussed measures to address marine litter in the Yellow Sea.

Their findings were largely positive. As China's National Marine Environmental Monitoring Center pointed out, "From 2010 to 2018, the average density of beach litter of monitored beaches of the Yellow Sea was reduced from 72,825 to 35,502 items per square kilometre." And according to Our Sea of East Asia Network (a Korea-based non-governmental organization), "Long-term monitoring by the Korea's Ministry of Oceans and Fisheries shows the decreasing accumulation rates around the Korean peninsula and along the western coasts. However, abandoned fishing and aquaculture items and sport fishing gears have still seriously affected endangered birds and their habitats, and navigation safety of naval ships and other vessels."

The meeting also addressed the source of marine litter. China's Shandong Marine Resource and Environment Research Institute briefed participants on the status and regulatory measures of marine litter management in Weihai City of China, stating that the city will implement total pollutant control measure in the estuary area and further improve its marine litter monitoring and evaluation system.

The official from Taean, Chongnam Do, Republic of Korea highlighted the importance to establish integrated improvement measures to minimize marine litter through prevention and systematic management.

The Secretariat of the Yellow Sea Large Marine Ecosystem Phase II Project updated the meeting on the status of the establishment of the Clean Beach City Alliance—a platform to promote and facilitate the cooperation and exchanges among business, academia, schools and communities at local level in different countries and catalyse result-oriented actions in addressing marine litter. The alliance tackles the issue through a holistic approach at local levels. It will promote technological cooperation to track the source of marine litter and remove the debris from receiving waters, through an exhibit in a venue yet to be determined. Candidate cities include Qingdao and Weihai in China, and Chungnam Do in the Republic of Korea.

Ning Liu, Programme Officer of Northwest Pacific Action Plan highlighted the importance of controlling marine litter from its sources. He commented on and compared the waste management systems in China and the Republic of Korea. He also introduced the annual Northwest Pacific marine litter management workshop to be held on 24-27 September 2019 in Dalian, China, and invited the delegates to join the workshop to further enhance regional cooperation in addressing marine litter.

#### **5. Sharing experience with East Asian countries in institutional strengthening to address marine pollution**

The Northwest Pacific Action Plan was invited to the 24th Intergovernmental Meeting of the Coordinating Body on the Seas of East Asia to share its experiences on addressing marine environmental protection through institutional strengthening. The meeting took place in Nusa Dua, Bali, Indonesia.



Participants discussed the establishment and operation of the Coordinating Body on the Seas of East Asia's regional activity centres to enhance its abilities to protect the marine environment. Indonesia established a Regional Capacity Centre for Clean Seas to respond to its presidential decree and Bali Declaration which called for mainstreaming of the protection of coastal and marine ecosystems including from marine litter and microplastics, and to foster linkages with the Regional Seas Programmes.

Indonesia suggested exploring the opportunity of making the Regional Capacity Centre for Clean Seas into a regional activity centre of the Coordinating Body on the Seas of East Asia. Its aim is to assist countries to improve their national capacities towards implementation of the Coordinating Body's action plan and strategic direction. The Government of Indonesia allocated US\$500,000 as initial funding from its national budget, with additional finance of US\$500,000 envisaged annually.

Ning Liu, Programme Officer from the Northwest Pacific Action Plan, introduced the history and operation modalities of their regional activity centres. He explained that the Special Monitoring and Coastal Environmental Assessment Regional Activity Centre was set up by the Ministry of Environment of Japan in 1999, with the Government of Japan providing financial and human resources. The Centre has conducted research and assessments of the state of the marine, coastal and associated freshwater environments, promoted and coordinated regional cooperation through national focal points and nominated experts related to special monitoring and assessment of the marine and coastal environment.

Similarly, the Republic of Korea hosted the Marine Environmental Emergency Preparedness and Response Regional Activity Centre to address oil spills and hazardous and noxious substances spills. In the Sanchi incident, where a ship which contained more than 130,000 tonnes of oil sank near Shanghai in early 2018, Member States have exchanged information effectively and timely through the mechanism set up by the Centre.

The Data and Information Regional Activity Centre hosted by China has facilitated marine environmental information exchange in the region, while the Pollution Monitoring Regional Activity Centre hosted by the Russian Federation has conducted various research project on pollution monitoring and environmental assessment.

Ning Liu highlighted that the Centres have enhanced the ownership of Member States and increased the Northwest Pacific Action Plan's abilities to address marine and coastal environmental protection. The Centres have also played an important role in leveraging financial resources.

The meeting appreciated Indonesia's efforts in reducing and mitigating land-based sources of marine pollution through institutional development focusing on capacity building, knowledge management and awareness raising. Participants also encouraged Indonesia to further develop the Regional Capacity Centre for Clean Seas, to transform it into a Coordinating Body on the Seas of East Asia Regional Activity Centre for consideration at the 25th intergovernmental meeting.

## **6. Applying the Northwest Pacific Action Plan Eutrophication Assessment Tool on a global scale**

The Northwest Pacific Action Plan was invited to the First Operational Satellite Oceanography Symposium held in June 2019 in Maryland, United States to introduce the Northwest Pacific Action Plan Eutrophication Assessment Tool (NEAT) and its applicability on a global scale.

The Symposium was organized by the National Oceanic and Atmospheric Administration Center for Weather and Climate Prediction. Some 150 experts on satellite oceanographic data, products and

applications attended the meeting. The Symposium discussed what made an operational application successful, and where and how satellite service could be improved.

Genki Terauchi, Senior Researcher at the Special Monitoring and Coastal Environmental Assessment Regional Activity Centre of Northwest Pacific Action Plan presented the eutrophication assessment tool in the meeting. The tool enables detection of potential eutrophication zones from millions of pixel-based information retrieved by time series of ocean colour sensors.

Transforming big amounts of data into simple but robust indexes whose meaning stakeholders will understand instantly is of paramount importance, Trauchi said. He further explained that this method can help develop indicators for the index of coastal eutrophication under the sustainable development goal 14.1.1—Index of coastal eutrophication —by using both concentration levels and trends of remotely sensed Chlorophyll a.

Application of the eutrophication assessment tool method on a global scale is in progress and almost ready for operational use. Use of higher-resolution ocean colour sensors is planned to better detect eutrophication in estuaries and enclosed bays.

The participants agreed that inter-validation of data from different sensors is necessary among agencies and companies which provide relevant data. Provision of reliable and validated data is more important than fast-paced provision of data and relevant agencies and companies should invest their time in education and human resource development to keep up with the continuous evolution of computer technology and data processing.

The Special Monitoring and Coastal Environmental Assessment Regional Activity Centre will continue develop the eutrophication assessment tool by using new satellite sensor data to better map eutrophication status in higher spatial resolution.

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### **1. Identifying policy gaps to address marine litter in cooperation with non-governmental organizations**

The Northwest Pacific Action Plan engaged with Our Sea of East Asia Network, a Korea based non-governmental organization, in analyzing policies and identifying gaps

to address marine litter in the Northwest Pacific region in July 2019 in Tongyeong, Republic of Korea.

The Northwest Pacific Action Plan member states adopted a Regional Action Plan on Marine Litter in 2008. The plan, until now, has successfully facilitated information exchange and regional cooperation on fighting marine litter in the region. After over a decade from then, there is an urgent need to revise the Action Plan to respond to the current calls and initiatives of various stakeholders to manage marine litter in an integrated manner. The Northwest Pacific Action Plan cooperated closely with Our Sea of East Asia Network to develop the Third Overview of Marine Litter in the Northwest Pacific Region.

In the meeting in Tongyeong in July 2019, Dr. Ning Liu, Programme Officer of the Northwest Pacific Action Plan, highlighted that the Third Overview of Marine Litter would provide recommendations for the countries on how to revise the Action Plan. He also stressed that it was critical to follow up on the resolutions on the marine litter adopted by the United Nations Environmental Assembly in the last few years and to bridge identified gaps promptly and effectively at the global level.

Our Sea of East Asia Network introduced their analysis of the status and trends in the distribution and impacts of marine litter and presented an analysis of relevant recommendations and resolutions of major international forums, including the G7 and G20 meetings. Both parties agreed to further cooperate on strengthening the Overview. Further, the Overview will be reviewed by the Meeting of the Focal Points on Marine Litter of the Northwest Pacific Action Plan in September 2019 in Dalian China to be published by the end of 2019.

Our Sea of East Asia Network is a non-profit organization established in 2009 dedicated to research, education, policy development, and international cooperation to protect the marine environment from marine litter. In June 2018, The Northwest Pacific Action Plan and Our Sea of East Asia Network co-organized a regional marine litter workshop and a non-governmental forum in Busan, in cooperation with the Ministry of Oceans and Fisheries of the Republic of Korea.

### **2. Achievements of Northwest Pacific Action Plan highlighted in Yellow Sea Science Conference**

The Yellow Sea is a vast, shallow, and highly productive sea between mainland China and the Korean Peninsula. It covers an area of 400,000 km<sup>2</sup> populated by 600 million people predominantly living in its coastal areas. The Yellow Sea is one of the most heavily exploited marine ecosystems in the world. A number of the following factors, like pollution from human activities, eutrophication, toxic blooms of harmful algae, jellyfish blooms, overfishing, unsustainable mariculture, degradation of habitats, have all imposed pressures on the Yellow Sea ecosystem.

Scientists, policymakers, representatives from international organizations, and non-governmental organizations met at a Science Conference organized by the Yellow Sea Large Marine Ecosystems Project in Qingdao, China in July 2019 to further explore ways to streamline marine environmental protection of the Yellow Sea and sustainable development of societies and economies of the countries. The Conference hosted events with a thematic focus on fisheries, biodiversity, marine litter and microplastics, and nutrients.

During the marine litter session, Dr. Ning Liu, a Programme Officer of the Northwest Pacific Action Plan, introduced the progress and lessons learned during activities on the marine litter of the Northwest Pacific Regional Action Plan. He highlighted that sharing of best practices among Member States helped the region address litter originating from member nations. There are still harsh challenges in addressing marine litter, despite publishing numerous reports and holding consultations and meeting. Participants emphasized that the lack of engagement with the private sector

significantly slows down the process. At the session on nutrients, Dr. Liu introduced the effectiveness of the Northwest Pacific Eutrophication Assessment Tool developed by the experts from the region. During the biodiversity session, Dr. Takafumi Yoshida, representing the Special Monitoring and Coastal Environmental Assessment Regional Activity Centre, introduced the achievements of the Northwest Pacific Action Plan in the field of biodiversity conservation and informed the participants on the progress in the development of a Regional Action Plan on Marine Biodiversity Conservation.

### **3. Partnering with Korean University Students in a campaign "Clean up Marine Litter Camp."**

In August 2019, the Korea Association for UN Environment initiated a two-day 2019 Beat Plastic Pollution: Save the Sea—Clean-up Marine Litter Camp. The Camp involved 30 university students and gave a rare opportunity to participate in marine litter clean-up activities and acquire specific knowledge about marine litter. The students came from 17 different Korean universities, among them: the Pusan National University, the Pukyong National University, the Catholic University of Korea, the Korea Maritime & Ocean University, and the Yonsei University.

Dr. Ning Liu, the Programme Officer at the Northwest Pacific Action Plan, informed the students on recent developments in the region related to the combat on marine litter. He introduced the current situation, the sources of pollution, as well as the adverse effects of marine litter on the environment. He focused on the three key elements to tackle marine litter issues, namely the prevention of marine litter input, the monitoring of marine litter quantity and distribution, and existing practices of the removal of existing marine litter.

During the presentation, Dr. Ning Liu highlighted the fundamental importance of the marine litter governance that involves policymakers, researchers, manufacturers, consumers, media, and civil society in a modern circular economy approach. Improving policies, legislation as well as waste management are the vital elements in the fight against marine litter. He encouraged the student to explore better technology solutions and policy options to drastically improve the current situation. The Korea Association for UN Environment regularly organizes events for university students and works very closely with the Northwest Pacific Action Plan to raise awareness on marine litter issues.

### **4. Regional brainstorming on the UN Decade of Ocean Science**

Over 150 representatives from academia, governmental agencies, international organizations, industry, and non-governmental organizations met in Tokyo, Japan, in August 2019 to brainstorm on how to achieve the objectives of the UN Decade of Ocean Science for Sustainable Development.

The UN Decade declared by the United Nations General Assembly in December 2017 endeavors to provide countries full support to achieve the 2030 Agenda Sustainable Development Goals through the ocean science. The Tokyo meeting, organized by the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization's Sub-Commission for the Western Pacific, provided additional details of the decade, highlighted the knowledge gaps and questions to be answered by science, informed of the existing and potential scientific initiatives and interventions, as well as partnerships and resources. Currently, effective capacity-building and information exchange and sharing become critical, so do the modern ways of sustainable communications.

Six working groups worked on the following themes: clean ocean, healthy and resilient ocean, predicted ocean, safe ocean, sustainably harvested and productive ocean, and transparent and accessible ocean. Recommendations developed the need for additional research to better understand sources, transport routes, and the fate functions of nutrients. High-quality data on a variety of chemical pollutants will further inform the design of a comprehensive initiative to reduce plastic pollution.

The participants highlighted that there is a need for two-way communications between scientists, the public, and policymakers. For ocean forecasts, application of modern high-resolution ocean coupled models, for instance, weather-to-climate, physical-biogeochemical coupled models, forecast systems, as well as integrated marine ecosystem models. Meeting participants suggested enhancing partnerships with regional and transnational organizations, including the Northwest Pacific Action Plan, in the utilizing modeling results, also for capacity-building.

Improving the research and data will inspire investments into the technologies that provide valuable safety information to communities, noted participants. For a sustainably harvested and productive ocean, experts suggested to improve the identification of ecosystem thresholds, stock assessments and monitoring of fishery removals, and develop indicators of sustainability. For new initiatives, it is essential to use tools from both natural and social sciences. New initiatives should be community-based, bottom-up, and locally focused.

The meeting called to accelerate the current efforts to bring the complete spectrum of biological data into the data system and aggregate data from biodiversity beyond national jurisdiction areas.

The Northwest Pacific Action Plan highlighted the importance of converting results of scientific research into policy recommendations and, this way, to help the countries to achieve the targets set by the United Nations. The Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific, and Cultural Organization requested the Northwest Pacific Action Plan will continue supporting the activities related to the UN Decade of Ocean Sciences.

## **5. Advancing research on endangered species in the Northwest Pacific region**

In the 17<sup>th</sup> Focal Points Meeting of Data and Information Networking Regional Activity Centre of the Northwest Pacific Action Plan held in Dalian, China, on 22–23 August 2019, marine scientists and government administrators agreed to survey the species assigned to the category of endangered in the Northwest Pacific region.

In 2014 and 2015, scientists confirmed that 69 species on the International Union for Conservation of Nature red list are present in the Northwest Pacific region. They expanded the research to 143 species in 2016 and 2017. The study finds that most of the surveyed endangered species in the region are animals, and only two are plants. Among animal species, 61 Chordata (animals with a

backbone), and six invertebrates are in the endangered species category. Among them, two species were listed as critically endangered by the International Union for Conservation of Nature, namely the spoon-billed sandpiper and the sea-run Taimen. Among the remaining 67 species, 44 were ranked as vulnerable and 23 as endangered.

In 2018 and 2019, national experts from China, Korea, and Russia studied a total of 1,196 species listed on the Red List of Japan. Scientists and government representatives met in Dalian, China, on 22–23 August 2019 at the 17th Focal Points Meeting of the Data and Information Networking Regional Activity Centre and agreed to survey further the endangered species of the NOWPAP region. To understand the situation with endangered species better, to promote more extensive information sharing, and to directly contribute to the strengthening of the biodiversity conservation efforts in the region, participants of the Dalian meeting agreed to advance the study on endangered species in the next eight years. Meeting participants emphasized that the existing knowledge gaps and inconsistency of information available in the countries could hamper the development of the Marine Species Red List. In 2020–2021, as agreed by at the meeting, China will lead the project. The Species Red List of China, published by the Ministry of Ecology and Environment and the Chinese Academy of Sciences, and the List of National Key Protected Wildlife in China, published by the Ministry of Agriculture and Rural Affairs, will also contribute to the Marine Species Red List.

"We hope the study will help to verify whether a species endangered in one country is endangered in other countries as well. Some years ago, China presented a few crested ibis species, an endangered bird species, to Japan. Japan has successfully cultivated more than a hundred of crested ibises and released them into the wild. We hope that member states can exchange endangered marine species for conservation in the future," said Mr. Yoshihisa Shirayama, the lead expert of the project from Japan.

"This study will promote our work on the Red List of marine species in China, as we do not have this kind of list yet, with the need to include more information on species," said Mr. Hongjun Li, a Chinese expert from the National Marine Environmental Monitoring Centre.

## **6. Exploring strategic directions on regional cooperation for addressing maritime disasters**

Maritime experts and policymakers gathered in Seoul, the Republic of Korea, in August 2019 to brainstorm on future directions of regional cooperation to address oil, hazardous noxious substance, and marine pollution.

Due to the fast economic growth and the corresponding increase of maritime traffic in the region, several oil and hazardous noxious substance spill incidents occurred in the Northwest Pacific region. Responding to this, China, Japan, the Republic of Korea and the Russian Federation set up the Marine Environmental Emergency Preparedness and Response Regional Activity Centre under the Northwest Pacific Action Plan in 2000. In the past two decades, four member states have cooperated closely to respond to maritime accidents through multi-layer information exchange, joint exercises, the establishment of cooperative mechanisms, platforms, guidelines.

The Regional Oil Spill Contingency Plan adopted by the four Member States in 2003 has further laid a solid foundation for regional cooperation in addressing oil spill incidents. In 2009, the plan was revised to include an additional category: Hazardous and Noxious Substances. In the Sanchi incident, when a 136,000-tonnes oil tanker sank near Shanghai in January 2018, the member states cooperated very closely to timely exchange more than 250 reports under the framework of the Regional Contingency Plan. Such a level of collaboration demonstrated the effectiveness of the regional mechanism.

In the August meeting in Seoul, participants commended the achievements of the regional mechanism, including various communication channels and practical response capacities. They also highlighted that the Regional Centre should be using the currently available windows of opportunities like the global environmental agenda, strengthening the relationship with the International Maritime Organization. The weak link with UN Sustainable Development Goals and the limited operational budget of the Regional Activity Centre were also recognized.

Participants also discussed potential projects like an early assessment of the status and fate of oil spills, the application of new technologies to spill prevention preparedness and response, health safety and security for responders, volunteers and residents, and long-term environmental monitoring after spill incidents. The development of a mid- or long-term strategy for the Regional Activity Centre to address marine disasters and pollution now becomes vital.

### **7. Northwest Pacific region experts exchange views with Chinese volunteers on marine environmental protection**

In August 2019 in Dalian, China, Chinese environmental protection volunteers, from elementary students to senior citizens, exchanged views on marine environmental protection and biodiversity conservation with experts at the 17th Focal Points Meeting of Data and Information Networking Regional Activity Center of the Northwest Pacific Action Plan.

A representative from the Dalian Environmental Protection Volunteer Association introduced beach clean-up activities in the past decade. Also, several students from the Dalian University Students Volunteer Association acquainted the audience with their activities on the conservation of the oyster reefs. A volunteer from the finance sector spoke of his passion for protecting the marine environment. Experts from China, Japan, the Republic of Korea, and the Russian Federation presented their research and expressed appreciation for the encouraging work done by the volunteers.

### **8. Developing regional action on marine biodiversity conservation in the Northwest Pacific**

The Northwest Pacific region features a high diversity of marine and coastal species ranging from boreal to subtropical. However, the highly-dense population in the region is putting enormous pressure on marine and coastal biodiversity.

In the past decade, the four regional activity centers of the Northwest Pacific Action Plan have conducted studies and assessments including seagrass mapping, assessing threats to marine biodiversity, abundance and distribution of invasive species, collection of information on endangered species, monitoring and management of marine protected areas, and evaluating the state of the marine environment of the Northwest Pacific region. Nevertheless, without a clear direction on marine biodiversity conservation, each center implements its activity as directed by their focal points.

Policymakers from China, Japan, the Republic of Korea and the Russian Federation agreed in 2018 to develop a Regional Action Plan on Marine and Coastal Biodiversity Conservation (RAP-BIO). The plan envisages to come to a common understanding of the future direction of the Northwest Pacific Action Plan, coordinate the activities of each of the four Northwest Pacific Action Plan's regional activity centers and contribute to more effectively conserve marine biodiversity. Finally, the plan significantly contributes to achieving the Aichi Biodiversity Targets and Sustainable Development Goals in the region.

In September 2019, experts and policymakers from China, Japan, and the Russian Federation met in Toyama, Japan at the 17th Focal Points Meeting of the Special Monitoring and Coastal Environmental Assessment Regional Activity Centre of the Northwest Pacific Action Plan to discuss

and agree how to move forward with the development of the Regional Action Plan on Marine and Coastal Biodiversity Conservation. Since Korean experts could not participate in the meeting in person, they sent their inputs and comments by email. The meeting agreed that a separate dedicated workshop would be organized in November 2019 to discuss a roadmap, which had been prepared by a group of consultants. This meeting will be held back-to-back with another meeting. The latter will focus on working areas of marine and coastal biodiversity in the region and the role of each of the regional activity centers.

The plan will be ready by 2022 and will be considered for adoption by member states by 2023.

### **9. Chinese volunteers team up to clean up beach in Dalian**

Representatives of the government agencies and research institutes from China, Japan, the Republic of Korea, the Russian Federation, as well as participants from the UN Environment Programme (UNEP), the Trilateral Cooperation Secretariat, and non-governmental organizations teamed up with volunteers from China to clean up the Bangchui Beach in Dalian, China, on 25 September 2019.

The campaign organized by the Northwest Pacific Action Plan and the Trilateral Environmental Ministers Meeting among China, Japan, and Korea, in cooperation with the Ministry of Ecology and Environment of China, the Dalian Ecology and Environment Bureau, and the Dalian Volunteers Association on Environmental Protection, demonstrated the willingness of governments and civil society to stand up against marine litter.

More than 150 people joined this event and collected 76 kilograms of litter, which included 220 plastics items (weighing a total of 16.6 kilograms), 93 rubber items (26.6 kilograms), 17 metal items (8.5 kilograms) and four glass items (0.4 kilograms).

Implementation of such joint activities resulted in clear public awareness impacts, both short- and long-term. For instance, one of the volunteers from the Dalian Customs House said: "Before the campaign, I noticed the beach seemed to be clean already, but I was surprised that we still could collect so many kinds of litter." Two tourists, also present at the site, were encouraged by the clean-up activity and joined the Dalian Volunteers Association on Environmental Protection. The Volunteers Association guided the participants on how to collect buried litter.

The Northwest Pacific Action Plan is proactively involved in several activities to address marine litter since 2006 and organizes annual coastal clean-up campaigns among China, Japan, the Republic of Korea and the Russian Federation on a rotating basis.

Haibing Zhang, Deputy Secretary-General of Dalian Metropolitan Government, expressed his appreciation to the Northwest Pacific Action Plan for selecting Dalian to host the campaign this year. He emphasized that "the Dalian Metropolitan Government has launched a five-month operation to clean litter on the beach. We have assembled 45,000 people to clean 2,700 tonnes of litter at the beach this year. We look forward to continuing our cooperation with the Northwest Pacific Action to protect the ocean."

### **10. Exploring ways to improve waste management to reduce marine litter to the oceans**

Policymakers and experts from the Northwest Pacific region gathered in Dalian, China, in September 2019 to discuss how to improve waste management to address marine litter at source.

The Northwest Pacific Action Plan, the Trilateral Environmental Ministers Meeting with China, Japan, and the Republic of Korea, joined by the Ministry of Ecology and Environment of China, jointly



organized the marine litter management workshop in Dalian in September 2019. The theme of the meeting was "Improvement of waste management to reduce marine litter into the oceans."

Qingjia Meng, from the Chinese Research Academy of Environmental Sciences, announced that China issued a technical specification for waste plastics recycling in 2019; technical specification for plastics waste recycling and sorting in 2016; and ship pollutants emission standard in 2018. In April 2012, the State Council issued the "12th Five-Year Plan for the Construction of Harmless Treatment Facilities for Urban Domestic Wastes". On 21 January 2019, the State Council issued a workplan on the Zero-Waste City Pilot Program in China, which promotes the reduction, recycling, and environmentally sound disposal of waste. By the end of 2020, 46 major cities must complete their waste sorting and processing system. Before 2025, prefectural-level cities are targeting to complete the domestic waste classification and treatment system.

Tatsuya Abe from the Ministry of Environment of Japan announced that the Cabinet of Japan approved the 4th Fundamental Plan for Establishing a Sound Material-Cycle Society on 19 June 2018. It sets a medium- to long-term strategy for the establishment of a sound material-cycle society in Japan and indicates measures to be implemented. The pillars of the plan include the local circular and ecological sphere, proper waste management and environmental restoration, international resource circulation, resource circulation throughout the entire lifecycle, and disaster waste treatment systems.

Sora Yi from the Korea Environment Institute highlighted the Comprehensive Plan for Marine Plastics Reduction in Korea adopted on 29 May 2019. It includes the measures to manage the entire lifecycle of marine plastics from their generation to collection and treatment, aiming to reduce marine plastics by 30 percent by 2022 and 50 percent by 2030 compared to 2018. The plan envisages to reduce marine debris generation, increase the volume of marine debris collection, recycle marine plastics, enact marine waste management laws, and significantly expand public participation.

Daria ZADOYA, from the Maritime State University named after Admiral Nevelskoy of the Russian Federation, introduced the waste management system reform in the Far East area. A regional operator is responsible for waste management from landfill to recycling. Tax on waste management has been increased. It is planned to increase the proportion of material reuse and recycle to 60 percent. Clean-up campaigns have been organized in the Russian Federation regularly.

The participants used a good opportunity given by the meeting to share their experience and best practices, as well as measures to counter challenges. The International Environmental Technology Center of UNEP, its Regional Office for Asia and Pacific, the Coordinating Body on the Seas of East Asia, and the Trilateral Cooperation Secretariat have also actively participated in these knowledge exchange sessions.

## **11. Harmonizing methods to monitor microplastic pollution**

The global production of plastics has increased between 1950 and 2017 at an average of 9 percent per year, reaching about [350 million tons in 2017](#). Natural weathering processes convert larger plastic products into much smaller pieces of plastics, micro- and nanoplastics. Besides, microfibers from clothing, microbeads, and plastic pellets used in cosmetics, as well as in cleaning products—currently extensively used—also enter the environment.

In recent years, the negative impacts of microplastic pollution have drawn the great attention of scientists as a global issue. In the Northwest Pacific region, a group of scientists from China, Japan,

the Republic of Korea, and Russia gathered together in Dalian, China, in September 2019 to discuss ways harmonize monitoring methods of microplastics pollution in the region.

Daoji Li, Director of the Plastic Marine Debris Research Center from the East China Normal University, introduced a monitoring network of 48 survey stations along the coastline of China established by his team. In July 2019, the team conducted a comprehensive microplastic study in the Yangtze Estuary for the full tide and whole depth of the water. Following this exercise, in August 2019, the research was extended to additional 15 main estuaries in China.

Sang Hee Hong from the Korea Institute of Ocean Science and Technology highlighted the importance of adequate quality assurance and quality control practices for this kind of research. Such practices need to include some measures to avoid contamination of samples during storing and analysis, use of unique materials for sample handling and processing, application of special step-by-step procedures, and availability of certified laboratories and equipment.

Atsuhiko Isobe, Professor at the Research Institute of Applied Mechanics of the Kyushu University in Japan, presented a "Numerical particle tracking model for predicting microplastic abundance in the Pacific after 50 years". According to his forecasts: "The high concentrations (of marine plastics) in the upper ocean are remarkable in boreal summer in the Northern Hemisphere, owing to the relatively calm oceanic conditions, and owing to the concentration denser than the Southern Hemisphere." In boreal summer, a heavy precipitation belt slowly moves from the equatorial Indian Ocean to south Asian monsoon regions on a time scale of two or to six weeks, which [affects extreme weather events over Asia](#).

Nikolai Kozlovskii, from the Pollution Monitoring Regional Activity Centre of the Northwest Pacific Action Plan, emphasized that some institutions in Russia had undertaken an initial assessment of microplastic contamination in the Baltic Sea coastal area and the Far East. Sampling in the rivers was carried out in spring, summer, and autumn months from 2016 to 2018.

During discussions at the meeting, the scientists from China, Japan, the Republic of Korea, and Russia agreed to continue working on a project proposal to harmonize the monitoring methodologies for microplastics in the marine environment in the Northwest Pacific region. In order to succeed, pollution criteria of microplastics in the marine environment will be studied, such as the contents of microplastics in the water column, sediments, aquatic organisms, as well as the detection ratio in the various media and biota.

**NOWPAP Quarterly 4 - 2019****I. NOWPAP PROGRESS****1. Highlighting regional cooperation to address marine litter in a regional training**

As a part of a capacity-building programme, representatives from government authorities, research institutions and non-governmental organizations from Brunei Darussalam,

Cambodia, China, Indonesia, Lao People's Democratic Republic, Malaysia, Peru, the Philippines, the Russian Federation, Timor-Leste, Singapore, and the Republic of Korea participated in a training workshop on marine debris in Busan, Korea, in October 2019.

This workshop was organized by the Asia-Pacific Economic Cooperation's Marine Environmental Training and Education Center of the Korea Institute of Ocean Science and Technology, Our Sea of East Asia Network and the Korea Marine Environment Management Corporation with support from the Ministry of Ocean and Fisheries of Korea and the Partnerships in Environmental Management for the Seas of East Asia.

The workshop participants were trained in various methods of monitoring and assessment of marine debris, and also took part in fieldwork within a marine debris shoreline survey. The training programme included several other aspects, e.g., recycling of aquaculture Styrofoam buoys, marine debris collection technology, marine microplastic pollution, transport of marine debris in the oceans, hazardous chemicals associated with marine debris. The workshop presented a unique opportunity for the participants to share their experience of addressing these issues in their countries.

As marine litter is one of the key focus areas of the Northwest Pacific Action Plan, the key achievements and lessons learned in the past decade in the fight against marine litter were presented during this workshop. It was emphasized that regional cooperation, sharing of knowledge, experience, and best practices, as well as science-informed policy recommendations, are critically important to address marine litter at a regional or global scale.

**2. Shanghai forum brainstorms combating marine plastic waste**

As the country with the biggest population and the second-largest world economy, China plays a significant role in addressing marine litter. Academia, policymakers, industry leaders, activists from civil society organizations, in partnership with international and UN organizations, explore various approaches to combat plastic waste pollution.

The East China Normal University and the United Nations Educational, Scientific and Cultural Organization (UNESCO), acting in partnership, brought together vital stakeholders to a forum titled "Combating Marine Plastic Waste" in November 2019 in Shanghai, China. The conference gave a unique opportunity to experts from Europe and Asia to review the trends of plastic production, approaches to monitor marine debris effectively, and to actualize waste management practices, as well as to brainstorm on ways to drastically reduce plastic pollution and, while doing so, to minimize adverse impacts on the environment.

Daoji Li, Professor at the State Key Laboratory of Estuarine and Coastal Research and the Plastic Marine Debris Research Center of the East China Normal University, presented results of his research of plastic waste. According to his findings, in 2001, in China, the load of plastic pollution in

the sea ranged between a half and three-quarters of a million tonnes. Practitioners in China anticipated reducing by more than 100,000 tonnes the plastic waste entering the ocean every year, due to the improved regulations and measures. The total amount of plastic pollution to be decreased is expected to reach about 200,000 tonnes a year by 2020.

Juying Wang, Professor at China's National Marine Environmental Monitoring Center, stated that a total of nearly 23 million tonnes of waste plastics were recycled in 2017 in China, accounting for over 30 percent of plastic production of the entire country. Currently, China aims to increase the portion of degradable packaging material by 50 percent by 2020.

Peter John Kershaw, Chair of the Joint Group of Experts on Scientific Aspects of Marine Protection, highlighted the importance of a risk assessment framework to identify the characteristics of microplastics, assess the risks, and develop mitigation measures.

Wenyue Yang, Director of the Policy and Regulation Division of the Shanghai Municipal Greening and City Appearance Administration, presented concrete actions taken in Shanghai to improve waste separation practices in 2019. After regulations were issued, the waste recycling rate increased in Shanghai by 41.7 percent, compared with 2017.

Guanglian Pang, Deputy Secretary-General of the China Petroleum and Chemical Industry Association, pointed out that the petrochemical industry can solve the plastic waste problem from the perspective of molecular structure by establishing a green plastic supply chain with the engagement of society as a whole.

Nanqing Jiang, Secretary-General of the China Plastics Reuse and Recycling Association, highlighted the difficulty in introducing the circularity of the plastics. Focusing on recycling alone will not be enough to address the sheer amount of plastic waste. Production and consumption must be tackled as well.

The Northwest Pacific Action Plan was represented at the forum to exchange views with the participants on possible intergovernmental mechanisms to regulate plastic production and consumption. Notably, the Basel Convention Regional Center in Beijing was requested to assess the effects of banning the import of solid waste to China since 2017.

Several industry representatives presented their approaches to sustainable packaging and production. The meeting recommended formulating various measures to reduce plastic waste entering the sea, especially to strengthen the management of waste generated from coastal fishing, aquaculture, and household waste.

(Writer: Ning Liu, Editor: Anna Manikowska D.G., Reviewer: Yegor Volovik, Nancy Groves)

### **3. Designing a roadmap to develop the Regional Action Plan on Marine and Coastal Marine Biodiversity Conservation**

In November 2019, in the City of Chiba, Japan, a group of marine scientists from the Northwest Pacific region agreed on a roadmap to develop the Regional Action Plan on Marine and Coastal Marine Biodiversity.

At the Chiba meeting, the experts reviewed previous work on marine and coastal biodiversity and identified gaps in the current knowledge, particularly, in the following areas:

- status, trends and future potential of the marine and coastal ecosystem services
- geographical scope and health of major marine and coastal habitats
- effectiveness of current conservation measures.

The meeting also reviewed relevant existing regional strategies, action plans, major policy frameworks, as well as interventions addressing marine and coastal biodiversity. The meeting participants exchanged opinions on how to scale up and synergize the current actions taken by the countries.

The experts have introduced national strategies on biological diversity in their countries. All four Member States of the Northwest Pacific Action Plan, namely: China, Japan, the Republic of Korea, and the Russian Federation, prioritize biodiversity conservation and have adopted national strategies and action plans to streamline the implementation of the Convention on Biological Diversity. The proposed Regional Action Plan on Marine and Coastal Marine Biodiversity is sought to support the Member States in their conservation work, such as strengthening international cooperation, addressing the transboundary nature of the marine biodiversity and demonstrating positive outcomes of the actions taken.

According to the agreement reached, the design and development of the Regional Action Plan on Marine and Coastal Marine Biodiversity will have a robust participatory nature, with the engagement of multiple stakeholders. Only this way, the Plan will support the environmentally friendly socio-economic development of the Northwest Pacific region.

The meeting recommended presenting a revised roadmap for the development of the Regional Action Plan on Marine and Coastal Marine Biodiversity for approval to the 24th Intergovernmental Meeting of the Northwest Pacific Action Plan in early 2020. The second expert meeting on the Regional Action Plan on Marine and Coastal Marine Biodiversity will be held in September 2020 to finalize the Plan and ensure adoption by the Member States by the end of 2021, in line with resolutions of the Northwest Pacific Action Plan and Convention of Biological Diversity.

(Writer: Ning Liu; Editor: Anna Manikowska D.G. Reviewer: Yegor Volovik)

#### **4. High priority activities identified for future marine biodiversity conservation**

Marine scientists from China, Japan, Korea and Russia identified conservation of biological habitats, plankton species, and environmental DNA as one of the highest priorities for the Northwest Pacific region, as well as the deciding way to protect marine biodiversity. These priorities were thoroughly discussed at a meeting held in Chiba, Japan, in November 2019.

The Northwest Pacific region is famous for its numerous biodiverse areas. At the same time, the dense population and large-scale industry in the Northwest Pacific Action Plan countries pose severe anthropogenic pressures on marine biodiversity.

In 2017, the Special Monitoring and Coastal Environmental Assessment Regional Activity Centre of the Northwest Pacific Action Plan proposed to develop a Medium-Term Strategy for marine biodiversity conservation. After two years of consultations and active discussions with relevant partners, Northwest Pacific Action Plan countries' experts have agreed on priority directions and concrete actions to be included in the strategy.

Tidal flats and salt marshes are habitats that provide essential ecosystem services to many species. For instance, these areas are critical for migratory birds for feeding, resting and wintering. This fact explains why scientists of the region agreed to map tidal flats and salt marshes separately from seagrass and seaweed meadows, as they have been doing for the past few years. They will develop a separate distribution map of these habitats for the entire region. The map will help to assess more precisely the anthropogenic causes of the deterioration of the coastal habitats and will contribute to the conservation efforts on endangered migratory birds.

Another adverse impact is regular harmful algal blooms causing massive damage to fisheries and aquaculture in the Northwest Pacific region. Recent reports show that non-indigenous species, including red tide causative algae, invaded the region with ship ballast waters. Moreover, extensive blooms, such as green and golden tides, are becoming common phenomena in the NOWPAP region. Scientists of the Northwest Pacific region have, therefore, developed a database on harmful algal blooms. The database will allow the countries to assess changes in species distribution and impacts on natural ecosystems and services they provide.

Environmental DNA is a new molecular biological technology that can be used to monitor marine diversity and specific species. The countries in the Northwest Pacific region will standardize the utilization of the environmental DNA techniques, develop a standardized manual, as well as establish a network of experts from the Member States.

Overall, countries of the region will further continue to develop modern coastal habitat monitoring tools, applying new techniques, such as remote sensing and environmental DNA, for strengthening marine biodiversity conservation and assessing the scales of anthropogenic impacts on the marine environment and ecosystems. The work will help the countries to fulfill their commitments, such as [Aichi Biodiversity Targets](#) and several [Sustainable Development Goals](#) included in the 2030 Agenda for Sustainable Development.

(Writer: Ning Liu, Editor: Anna Manikowska D.G., Reviewer: Yegor Volovik, Takafumi Yoshida)

## **II. Upcoming Events**

### **1. The 24th Intergovernmental Meeting of the Northwest Pacific Action Plan, Beijing, People's Republic of China, 11 - 13 February 2020.**

Delegates from the four member states, the Russian Federation, the Republic of Korea, Japan, the People's Republic of China, and key international observers will converge in Beijing to discuss NOWPAP's future direction for the 2020 - 2021 biennium.

### **2. The international workshop on Key Indicator Species and Habitats for Marine Biodiversity Change in East Asia, Jeju, Republic of Korea, March 2020**

The workshop will be held to enhance capabilities to participate in research on global change and sustainability and to support science-based decision-making in the region and beyond to understand what key indicator species are, ecosystem types and major pathways resulting in marine biodiversity changes in the Northwest Pacific.

**III. Marine Environmental Digest (10 links)**

<https://www.eastasiaforum.org/2019/10/26/sea-change-japanese-leads-on-marine-plastic-litter/>

<https://www.japantimes.co.jp/news/2019/12/29/national/science-health/team-including-japanese-researchers-use-sea-turtles-predict-ocean-temperature-change/#.XhPt00czaUk>

<https://www.japantimes.co.jp/news/2019/10/02/national/science-health/japan-u-s-eu-jointly-measure-plastic-waste-inflows-oceans/#.XhP6VUczaUk>

<https://www.themoscowtimes.com/2019/10/18/russia-moves-phase-out-plastic-bags-new-draft-law-a67791>

<https://www.azocleantech.com/article.aspx?ArticleID=988>

<https://www.straitstimes.com/asia/east-asia/china-vows-to-tackle-marine-pollution-in-bohai-sea>

<https://www.reuters.com/article/us-china-environment-plastic/china-drafts-new-rules-to-control-rural-plastic-pollution-idUSKBN1YA06T>

<https://bioplasticsnews.com/2019/10/16/korean-researcher-invents-plastic-bag-using-pulp-and-crab-shell/>

<https://www.chinadaily.com.cn/a/201911/25/WS5ddb2cb2a310cf3e355799f3.html>

<https://en.yna.co.kr/view/AEN20191024006700320>

**Annex C. CEARAC Newsletters (Dec 2018, Dec 2019)**



# Newsletter from **NOWPAP CEARAC**

Northwest Pacific Action Plan  
Special Monitoring & Coastal Environmental Assessment  
Regional Activity Centre

**No. 15**  
Dec. 2018

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## Greetings from CEARAC

### Michitaka YOKOI, CEARAC Director

One of the major works in United Nations Environment Programme (UNEP) is Regional Seas Programme. Of 18 programmes around the world, Northwest Pacific Action Plan (NOWPAP) was adopted in 1994 by four member states, namely China, Japan, Korea and Russia, to protect, manage and develop marine and coastal environment of the region. Each member hosts one regional activity centre (RAC), and Special Monitoring and Coastal Environmental Assessment Regional Activity Centre (CEARAC) was established in the Northwest Pacific Region Environmental Cooperation Center (NPEC) in Toyama City in Japan in 2002 by finalization of Memorandum of Understanding (MoU) between UNEP and NPEC. As its name states, CEARAC has worked on monitoring and assessment of marine and coastal environment and development of special monitoring and assessment tools using remote sensing technique.



In recent years, CEARAC implemented activities on marine litter, eutrophication and marine biodiversity, and in 2018 CEARAC has mainly worked on development of CEARAC Medium-term Strategy (MTS) on marine biodiversity, development of the roadmap for Regional Action Plan for Marine and Coastal BIODIVERSITY Conservation (RAP BIO), and development of a tool for mapping seagrass distribution in the NOWPAP region.



Actually, 2018 is the 20<sup>th</sup> anniversary year of NPEC, and CEARAC has reaffirmed its commitment to protect the marine environment in the NOWPAP region through its current and future activities.

I strongly expect that this CEARAC newsletter helps its readers understand CEARAC and get interested in conservation of marine and coastal environment both in Toyama Bay and the wider NOWPAP region.

## Workplan for 2018-2019 biennium

In the 2018-2019 biennium, CEARAC has been conducting the following activities.

Activity		Task
Organization of Meetings		<ul style="list-style-type: none"> <li>- Focal Points Meeting (FPM) in 2018 and 2019</li> <li>- Expert Meeting</li> </ul>
Maintenance of Website		<ul style="list-style-type: none"> <li>- Periodical update of web contents</li> <li>- Upgrade of Marine Environmental Watch System</li> <li>- Reconstruction of CEARAC websites using cloud computing technology</li> </ul>
<b>Specific Projects</b>	1 Development of the CEARAC Medium-term Strategy (MTS) on marine biodiversity in the NOWPAP region	<ol style="list-style-type: none"> <li>(1) Feasibility assessment on potential topics of future CEARAC activities</li> <li>(2) Organization of marine biodiversity workshop and meeting for development of CEARAC MTS on marine biodiversity</li> <li>(3) Development of the CEARAC Medium-term Strategy on marine biodiversity</li> </ol>
	2 Development of a roadmap for Regional Action Plan for Marine and Coastal Biodiversity Conservation (RAP BIO)	<ol style="list-style-type: none"> <li>(1) Review of past marine biodiversity activities of NOWPAP</li> <li>(2) Development of a roadmap for RAP BIO</li> <li>(3) Organization of NOWPAP Marine and Coastal Biodiversity Workshop</li> </ol>
	3 Development of a tool for mapping seagrass distribution in the NOWPAP region	<ol style="list-style-type: none"> <li>(1) Detection of potential seagrass habitat</li> <li>(2) Development of a tool for mapping seagrass distribution</li> <li>(3) Construction of web-based service for mapping seagrass distribution</li> </ol>
Marine litter (RAP MALI)		<ul style="list-style-type: none"> <li>- Harmonization/Summarization of monitoring data submitted by the members</li> <li>- Regional overview of national efforts to address microplastics</li> <li>- Translation of contents in the Northwest Pacific Regional Node into Japanese</li> </ul>

## Activities in 2018

### 1. Organization of Meeting

#### The 16th CEARAC Focal Points Meeting

The 16th NOWPAP CEARAC FPM was held on 10-11 May 2018 in Toyama, Japan with the participation of CEARAC Focal Points and alternates from the four NOWPAP member states, representatives of NOWPAP RCU, other Regional Activity Centres (RACs) of NOWPAP, the IOC Sub-Commission for the Western Pacific (IOC/WESTPAC), North-East Asian Sub-regional Programme for Environmental Cooperation (NEASPEC), North Pacific Marine Science Organization (PICES), Yellow Sea Large Marine Ecosystem (YSLME) Phase II. One representative of China National environmental Monitoring Center and one FP of DINRAC also joined the meeting.



CEARAC Focal Points Meeting is a NOWPAP arrangement consisting of representatives of the NOWPAP members in order to promote smooth and effective implementation of special monitoring and assessment of the marine and coastal environment.

The meeting reviewed the results, outcomes of CEARAC activities for the 2016-2017 biennium and also discussed the new activities for the 2018-2019 biennium. The draft workplan and budget of CEARAC activities for the 2018-2019 biennium was agreed at the 22nd NOWPAP IGM which was held on 19-21 December 2017 in Toyama.

The workplan for the 2018-2019 biennium includes three specific projects:

- (1) Development of a CEARAC Medium-term Strategy on marine biodiversity
- (2) Development of a roadmap for Regional Action Plan for Marine and Coastal Biodiversity Conservation
- (3) Development of tool for mapping seagrass distribution in the NOWPAP region

Report and Documents of CEARAC FPM16:

<http://cearac.nowpap.org/meeting-report/the-sixteenth-nowpap-cearac-focal-points-meeting/>



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## 2. Reports of main projects for the 2018

### **Development of the CEARAC Medium-term Strategy on Marine Biodiversity**

CEARAC started activities on marine biodiversity in 2010, and through various activities, we have found gaps of data availability and the situation among the four NOWPAP member states. In order to match CEARAC biodiversity projects with the member states' needs, it was suggested to show the future vision for marine biodiversity conservation in the NOWPAP region.

In the 2018-2019 biennium, CEARAC implements an activity: Development of the CEARAC Medium-term Strategy on Marine Biodiversity, which aims to show the basic policy and vision on future CEARAC biodiversity activities.

At the 16th CEARAC FPM held in May 2018, potential topics and foci for future CEARAC activities on marine biodiversity were discussed and selected;

- Assessment of Marine Biodiversity
- Harmful Invasive Species
- Specific Migratory Species
- Conservation of biological habitats
- Plankton species related to aquaculture and fisheries
- Environmental DNA

The nominated experts from the member states are now implementing 'feasibility assessment' of potential topics based on data availability and national policies of respective member states. The result of the feasibility assessment will be reported at the workshop to be held in Q2 2019, and prioritization of potential topics will be discussed there.

The draft CEARAC Medium-term Strategy on Marine Biodiversity will be prepared by the 17th CEARAC FPM and submitted for approval at the meeting and the following 24th NOWPAP Intergovernmental Meeting.

### **Development of a roadmap for Regional Action Plan for Marine and Coastal Biodiversity Conservation**

In the last NOWPAP Medium-term Strategy (MTS) 2012-2017, development of the Regional Action Plan on Marine and Coastal Biodiversity Conservation (RAP BIO) was proposed. However, it was not realized during the 2012-2017 period and its development included as one of the major objectives in the new MTS 2018-2023. RAP BIO provides a regional framework for coordination of policies and management decisions of the NOWPAP member states and identifies the role of NOWPAP in conservation and sustainable use of marine and coastal biodiversity. Because of lack of RAP BIO, each RAC had to explore relevant activities on their own and implemented them in the past biennia. In prospect of clarifying roles of each RAC and increasing cooperation among them, early development of RAP BIO is strongly desired.

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At the all RACs FPM held in 2018, construction of a roadmap toward development of RAP BIO was discussed and several suggestions were provided. All RACs agreed to take the same process when Regional Action Plan on Marine Litter (RAP MALI) was developed in 2008 and to develop a roadmap which shows future roles of the member states, RCU and RACs as well as necessary components to be incorporated in RAP BIO.

For development of the roadmap for RAP BIO, following activities will be done during this biennium;

1) Development of Marine Biodiversity Activity

One international consultant and 4 national consultants/experts of the member states will review and assess the past NOWPAP activities on marine biodiversity and identify clusters of issues of regional and national importance for marine biodiversity conservation and its sustainable use.

2) Organization of NOWPAP Marine and Coastal Biodiversity Workshop

A workshop will be held in 2019 in order to exchange/share information/opinions on working areas of marine and coastal biodiversity in the NOWPAP region as well as roles of each RAC.

## **Development for a tool for mapping seagrass distribution in the NOWPAP region**

In the 2016-2017 biennium, CEARAC completed activity of feasibility study towards assessment of seagrass distribution in the NOWPAP region, in which CEARAC envisions estimating seagrass distribution in the entire coastal seas of the NOWPAP region in the future by using satellite images. In the feasibility study report published in 2018 concluded use of cloud computing is necessary to estimate seagrass distribution in the NOWPAP region.

By now, CEARAC with national experts has collected information of seagrass observation records obtained in the field and developed a prototype of [Cloud GIS](#) to map their locations. These collected field data of seagrass records will be screened out to train and validate in classification of satellite images into different sea floor substrates types including seagrass distribution. More information about this activity can be found at a web story of [Cloud computing to speed up stocktaking of Northwest Pacific blue carbon sinks](#) in UNEP website.

### 3. Cooperation with NOWPAP Partners and Organizations

#### **The 23rd Intergovernmental Meeting of the Northwest Pacific Action Plan**

The Intergovernmental Meeting (IGM) is the high-level body of NOWPAP that provides policy guidance and decisions for the entire activities of NOWPAP. It is organized annually on an each member states. Representatives of the four RACs and RCU Also participate in the IGM.

The 23rd NOWPAP IGM was held on 9-11 October 2018 in Moscow, Russian Federation. The meeting approved the reports of four regional activity centres on-going activities and the workplans for the 2018-2019 biennium. They also discussed the NOWPAP medium-term strategy for the 2018-2023.

The next IGM will be held in China in 2019.



#### **2018 PICES Annual Meeting**

North Pacific Marine Science Organization (PICES) is an important partner for NOWPAP. 2018 PICES Annual Meeting was held in Yokohama, Japan (25 Oct. – 4 Nov.), and Dr. Takafumi Yoshida, staff of CEARAC Secretariat participated in sessions, workshops and business meetings which are related to CEARAC/NOWPAP activities.

The business meeting of Study Group on Marine Microplastic (SG-MMP) was held on 26 Oct. SG-MMP aims to identify major microplastic issues in the North Pacific and to establish a list of priority research needs for the PICES member states as well as for the world by avoiding unnecessary duplication of other international and regional working groups and programs on microplastics. Members of SG-MMP reviewed research papers on microplastics around the world and showed some characteristics of microplastics in seawater, sea surface, sediment and biota in the North Pacific region. The review also showed the North Pacific region as the most polluted sea area in the world. During the meeting, potential topics which PICES should focus on such as impacts of microplastics and their associated chemicals on marine environment and biota, source and input of microplastics, and methodology of microplastics monitoring were discussed. SG-MMP proposed to establish a new working group on marine microplastics which aims to develop the list of indicator species on marine microplastics and to develop the guidelines on risk assessment of microplastics including chemical pollution. SG-MMP also proposed organizing a topic session on microplastics in the next PICES Annual Meeting to be held in 2019 in Victoria, Canada. NOWPAP is expected to be a partner of the new working group. NOWPAP started establishing a new project on microplastics, therefore it is necessary to develop strong collaboration between NOWPAP and PICES in the future.

The business meeting of Advisory Panel of Marine Non-indigenous Species (AP-NIS) was held on 27 Oct. PICES had one working group on non-indigenous aquatic species in 2005-2013, but this WG was disbanded. AP-NIS aims to continue sharing information on NIS and develop a better understanding of

changing distribution of NIS and invasion pathways and vectors. During the meeting, past PICES activities were reviewed and maintenance and update of NIS database were suggested. ToR of AP-NIS require exchanging information on updated regulations/policy, best practices for monitoring, early detection, rapid response, and control/containment options. Now, CEARAC is implementing the feasibility assessment on potential topics for CEARAC MTS on marine biodiversity, and NIS can be one of them. Experts of the NOWPAP member states are collecting information on national measures on NIS. Therefore, at the next AP-NIS business meeting, CEARAC expects to share collected information through our feasibility assessment. If NIS is selected as a high priority issue for future CEARAC activities, CEARAC will collaborate with PICES more strongly.

The business meeting of Section on Ecology of Harmful Algal Blooms in the North Pacific (S-HAB) was held on 30 Oct. In the past years, CEARAC organized a joint workshop in PICES Annual Meeting and published one PICES scientific report together, so S-HAB is an important partner for CEARAC. During the meeting, the latest situation on HAB occurrence in the PICES member countries was reported. It was reported that bloom of *Cochlodinium* occurred after all these years in Korea, and a huge green tide occurred every year in China. S-HAB proposed to organize a topic session on the impact of HAB in the next annual meeting and expected CEARAC to co-chair the session. As achieving Sustainable Development Goals (SDGs) is significant for NOWPAP, and sustainable development of ocean and marine resources is a prioritized issue, impact of HAB on marine environment and marine species is an interesting topic for NOWPAP/CEARAC.

The business meeting of Marine Environmental Quality Committee (MEQ) was held on 28 and 31 Oct. MEQ is a parent committee of SG-MMP, AP-NIS and S-HAB, and CEARAC has invited MEQ members to the past CEARAC meetings. At the meeting this year, CEARAC introduced the current NOWPAP activities related to MEQ's. MEQ members reaffirmed that close collaboration between PICES and NOWPAP is necessary in the future, same as in past years. For the next PICES Annual Meeting, several joint topic sessions and workshops with NOWPAP are proposed, and continuous support from NOWPAP to MEQ activities were also expected.

Regarding internal changes in MEQ, both Chair, Dr. Chuanlin Huo and Vice-Chair, Dr. Thomas Therriault stepped aside, and Dr. Guangshui Na was elected as new Chair together with Dr. Andrew RS Ross, as new Vice-Chair. CEARAC appreciates generous cooperation of PICES under the great leadership of Dr. Huo and Dr. Therriault, and look forward to continued partnership with the new chair and vice-chair and all other members in the future.

## **PICES-2018 Annual Meeting:**

**Toward integrated understanding of ecosystem  
variability in the North Pacific**

**Oct 25 – Nov 4, 2018  
Yokohama, Japan**



## ● Participation in an expert workshop on marine pollution indicators under Sustainable Development Goal target 14.1 in Paris

The United Nations (UN) General Assembly in September 2015 agreed on 17 Sustainable Development Goals (SDGs) and 169 targets as the framework for the 2030 Agenda for Sustainable Development. The SDG 14 is related to ocean, and there are several targets to conserve and sustainably use the oceans, seas and marine resources for sustainable development.

An expert workshop on marine pollution indicators of the SDG 14.1 was held at the UNESCO Headquarters in Paris on September 12 to 13, to discuss methodologies on eutrophication and plastic debris assessment under the SDG 14.1.1. One of the main outcomes of the meeting was to approach monitoring of the SDG 14.1.1 with 2 levels of data: (1) global level dataset sources from earth observations and (2) in-situ data at national and regional scales. The meeting also acknowledged the usefulness of remotely sensed chlorophyll-a concentration for assessment of eutrophication.

Hence, NOWPAP CEARAC has long been working for eutrophication issues in the NOWPAP region, Dr. Genki Terauchi, a member of CEARAC Secretariat, participated in this workshop representing NOWPAP and presented CEARAC activities related to eutrophication assessment using the NOWPAP Common Procedure. He introduced a joint work effort within the NOWPAP framework, focusing on a recently published conference paper titled "[Assessment of eutrophication using remotely sensed chlorophyll-a in the Northwest Pacific region](#)".

UNEP continues to refine and develop statistical methodologies for measuring the SDG 14.1.1 and efforts of Regional Seas Programmes including NOWPAP is expected.



Scientific experts in regional seas programmes and earth observation specialists working on the science of marine pollution indicators, data capture and dissemination.

Dr. Terauchi is the 2nd person from the left in the 2nd row.



## New Member

Elígio de Raús Maúre joined the Northwest Pacific Region Environmental Cooperation Center (NPEC) in July 2018. At NPEC he oversees the processing and analysis of marine environment remote sensing data for the evaluation of coastal eutrophication in the scope region of the Northwest Pacific Action Plan and global ocean. So, his current work focus on the application of remote sensing techniques to monitoring of coastal eutrophication, a major problem of global concern.



### **Elígio de Raús Maúre,**

Department of Study and Research  
Northwest Pacific Region  
Environmental Cooperation Center  
PhD in Environmental Studies  
(Oceanography), Nagoya  
University, Japan

Before moving to NPEC, he spent 6 years at the Nagoya University where he earned his PhD in Environmental Studies. There, his research work focused on physical-biological interactions in the ocean, particularly, on the impacts of mesoscale eddies on biological activity in the ocean. The work combined remote sensing data (chlorophyll-a concentration from ocean colour and sea level anomaly data from altimeters) with *in situ* data (temperature and salinity) to investigate the roles of physical processes (in this case mesoscale eddies, circular currents in the ocean) in regulating phytoplankton seasonality. Two papers were published out of this work.

The first was in Geophysical Research Letters and was featured editor's highlight (Geophysical Research Letters, 44(21), (2017) <https://doi.org/10.1002/2017GL074359>) with a press release in Japan. The second was published in the Journal of Geophysical Research: Oceans, 123, 6841–6860. (2018) <https://doi.org/10.1029/2018JC014089> and can be freely accessed through an online shared read-only link (<https://rdcu.be/7Mgx>). Besides the work on the physical-biological interactions at the oceanic mesoscales, he has been involved in the measurements of vertical light field in the ocean and algorithm development in addition to improving the measurement techniques of light field in optically complex coastal waters. This work was collaboration between scientists from USA (NASA and Biospherical, Inc.) and Japan (Nagoya University, Hokkaido University, etc.).

As a native of Maputo, Mozambique, before coming to Japan as a research student in April 2012, he served as a metrologist at the National Institute of Standardization and Quality from July 2009 to March 2012 after obtaining a bachelor's degree in physical oceanography at Eduardo Mondlane University in Maputo in 2008. During his study career in Japan, he became very enthusiastic about applying his remote sensing skills and knowledge to contribute to improving the overall understanding of the role played by the oceanic environment in relation to the biosphere in the world under the climate change.

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Northwest Pacific Action Plan (NOWPAP)**

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# Newsletter from NOWPAP CEARAC

Northwest Pacific Action Plan  
Special Monitoring & Coastal Environmental Assessment  
Regional Activity Centre

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## Greetings from CEARAC

### Michitaka YOKOI, CEARAC Director

Special Monitoring and Coastal Environmental Assessment Regional Activity Centre (CEARAC) is one of the four Regional Activity Centres (RACs) established in the four member states (China, Japan, Korea and Russia) of the Northwest Pacific Action Plan (NOWPAP) which was adopted in 1994 as part of the Regional Sea Programme of the United Nations Environment Programme (UNEP). Since its inception in 2002, CEARAC has mainly worked on monitoring and assessment of the marine and coastal environment by using remote sensing (RS) technique in cooperation with the Northwest Pacific Region Environmental Cooperation Center (NPEC), host organization of CEARAC.



In a conventional way for monitoring and/or assessment of the environment, we need to go to target areas to directly collect target species or measure values of the environment. However, with RS technique, we can obtain data away from targets. CEARAC uses high resolution images taken by sensors on satellites which go around the earth. The obtained images are processed to understand the state and/or the trend of the marine and coastal environment in the NOWPAP region. Covering a much wider area by one shot is definitely a big advantage of satellite images. With RS technique, CEARAC has developed the Common Procedure for Eutrophication Assessment and NOWPAP Eutrophication Assessment Tool (NEAT) which was introduced in the UNEP website in May 2019.

Another, but not last outputs of CEARAC in the 2018-2019 biennium is a new tool for mapping seagrass distribution in the NOWPAP region. In recent years, seagrasses was recognized as one of the important habitats, and CEARAC developed a tool to spot seagrass beds using GIS. We expect that the general public will get involved in spotting seagrass beds to increase info./data of them.

Through our activities, CEARAC hopes to contribute to the marine and coastal environment conservation in the NOWPAP region as well as achievement of relevant global processes such as Sustainable Development Goals (SDGs). Actually, CEARAC and its activities have been highly-evaluated and introduced in some important regional and global meetings and other events.

CEARAC Newsletter Vol.16 introduces our activities implemented in the 2018-2019 biennium, focusing on the ones in 2019. We hope this newsletter helps its readers get more interested in the marine and coastal environment in Toyama Bay and the wider northwest Pacific region, and step forward toward conservation of the precious marine and coastal environment as well.



## Activities in 2019

### 1. Organization of Meeting

#### ➤ **Second CEARAC Expert Meeting on Eutrophication Assessment in the NOWPAP Region**

The second CEARAC Expert Meeting on Eutrophication Assessment in the NOWPAP Region was held on 22 March 2019 in Vladivostok, Russia. As “Index of coastal eutrophication” became one of the sub-indicators of the Sustainable Development Goal (SDG) 14.1, the meeting participants recognized the importance of continuing eutrophication assessment in the NOWPAP region. CEARAC has been processing a regionally tuned remotely sensed chlorophyll-a concentration (satellite Chl-a) data in the Northwest Pacific region and regularly provide such data on the Marine Environment Watch System website. Using level and trend of these regionally tuned time series data, CEARAC developed NOWPAP Eutrophication Assessment Tool (NEAT) to identify potential eutrophic zones in the NOWPAP Region. The NEAT was introduced at the meeting and the meeting participants endorsed its effectiveness and encouraged CEARAC its further development with new ocean color satellite sensor data by inter calibration of sensors and cross validation with in situ chlorophyll-a concentration data. Successfully story of the NEAT was also introduced in [a webstory of the UNEP website](#).



## ➤ The 17th CEARAC Focal Points Meeting

The 17th NOWPAP CEARAC Focal Points Meeting (FPM) was held on 9-10 September 2019 in Toyama, Japan with the participation of CEARAC Focal Points and alternates from the four NOWPAP member states, representatives of Regional Coordinating Unit (RCU) and other Regional Activity Centres (RACs) of NOWPAP, the IOC Sub-Commission for the Western Pacific (IOC/WESTPAC), and one Japanese researcher.

CEARAC FPM is a NOWPAP arrangement consisting of representatives of the NOWPAP member states in order to promote smooth and effective implementation of special monitoring and assessment of the marine and coastal environment in the NOWPAP region.

The meeting reviewed current CEARAC activities for the 2018-2019 biennium and discussed planned activities for the 2020-2021 biennium. After discussion, the draft workplan of CEARAC for the 2020-2021 biennium including six projects: assessment of distribution of tidal flats and salt marshes in the NOWPAP region; organization of a training course on environmental DNA (eDNA) analysis; update of HAB database and HAB reference database; implementation of case studies on estimating seagrass blue carbon in selected sea areas in the NOWPAP region; improvement of the NOWPAP Eutrophication Assessment Tool (NEAT) and monitoring of eutrophication using satellite chlorophyll-a; and organization of the 5<sup>th</sup> NOWPAP training course on remote sensing data analysis was adopted and agreed to be submitted to the 24<sup>th</sup> NOWPAP IGM to be held in Beijing, China in February 2020.



Report and Documents of CEARAC FPM17 can be found on the following website.

<http://cearac.nowpap.org/meeting-report/the-seventeenth-nowpap-cearac-focal-points-meeting/>

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➤ **Workshop on NOWPAP Regional Action Plan on Marine and Coastal Biodiversity Conservation (RAP BIO) and Workshop on CEARAC Medium-term Strategy for Marine Biodiversity Conservation (BIO MTS)**

CEARAC organized two workshops jointly on 28-29 November in Chiba, Japan. Nominated experts for RAP BIO and nominated experts for CEARAC coastal habitat and environmental DNA (eDNA) projects participated in the workshops.

On the first day, 28 November, the workshop on RAP BIO was held. Unfortunately, the international consultant for RAP BIO, Dr. David Coates couldn't participate in the workshop, and Dr. Ning Liu, scientific officer of NOWPAP RCU moderated the workshop instead. After Dr. Liu explained the objective of the workshop and the discussion paper prepared by Dr. Coates, the nominated experts of the NOWPAP member states introduced national actions for marine biodiversity conservation in their respective states. Then, while reviewing the discussion paper, they were asked to provide additional information, if necessary, based on the national biodiversity strategies of each member state. So all participants carefully reviewed the paper and provided their comments. Some major comments from them are as follows:

- NOWPAP RAP BIO should be along with national biodiversity strategies of the member states. At the beginning of implementing RAP BIO, existing national strategies should be reviewed and RAP BIO should show the common objectives among the member states;
- Strategic Plan for Biodiversity 2011-2020, including Aichi Biodiversity Targets will be revised to Post 2020 Targets at the COP15 held in China in 2020. When NOWPAP develops RAP BIO, we should refer to the new global targets;
- Assessment of ecosystem services is an important element for marine biodiversity conservation. However, NOWPAP has not assessed ecosystem services in cooperation with support from economist and/or social scientists, so it is difficult to assess the historical trend of ecosystem services.
- In the past biodiversity activities, we faced the limitation of available data on marine biodiversity, Therefore, it may be difficult to assess the trend on several biodiversity topics in the NOWPAP region.



After a long discussion, the participants of the workshop agreed to revise the CEARAC workplan (development of the roadmap for RAP BIO) including the schedule of the activity. Based on the comments provided from the RAP BIO experts, the discussion paper will also be revised and submitted to the 24<sup>th</sup> NOWPAP IGM to be held in February 2020. CEARAC has spent only 15,000 USD for this project and still has 15,000 USD. With the leftover money, an additional workshop will be held in summer 2020 with representatives of NOWPAP RCU and RACs, the international consultant and the experts of the member states in order to prepare a draft RAP BIO. The draft RAP BIO will be submitted to the member states by the end of 2020 to be reviewed in 2021 and expected to be approved by the end of 2021.

On 29 November, another workshop on CEARAC BIO MTS was held. After introduction of the workshop, the participants reviewed the final draft of CEARAC BIO MTS. They agreed to submit the BIO MTS to CEARAC FPs for their approval for submission to the 24<sup>th</sup> IGM.

In the morning session, the participants discussed a new project for the 2020-2021 biennium: assessment of distribution of tidal flats and salt marshes in the NOWPAP region. As a keynote speaker, CEARAC Secretariat invited Dr. Nicholas Murray, James Cook University, Australia. Dr. Murray developed a tidal flat distribution mapping tool and the manager of the Global Intertidal Change. So, support from Dr. Murray is highly expected in order to map the distribution of tidal flats and salt marshes in the NOWPAP region with satellite images. Dr. Murray introduced the history of development of the global tidal flats mapping tool and provided ideas of how to collaborate with CEARAC project. The workshop participants recognized Dr. Murray's mapping tool is very useful for the NOWPAP region and asked for his support to the CEARAC project.



Then, the experts on tidal flats and salt marshes of the NOWPAP member states shared information on the distribution of these habitats in each member state. In the NOWPAP region, wide tidal flat areas are distributed in the Chinese and Korean coastal areas of the Yellow Sea. In Japan, most tidal flats are located in the Seto Inland Sea and the Ariake Sea. In Russia, tides are very weak and the distribution of tidal flats in the Russian coastal area is very limited. Only in the northern part of the NOWPAP region, Strait of Tartary, intertidal areas, there are some tidal flats detected. After the presentations, it was recognized that each member state has available data and information on the distribution of tidal flats and salt marshes. The participants discussed the CEARAC's workplan for assessment of distribution of tidal flats and salt marshes in the 2020-2021 biennium, and agreed as follows:

- In 2020, CEARAC Secretariat with support by Dr. Murray will develop a draft tidal flats and salt marshes distribution map using satellite images. National experts will review the draft map and revise it based on available data and information in each member state.

- In 2021, CEARAC Secretariat will prepare a historical distribution map from 1980s. Using some information, such as reports on reclamation in the NOWPAP region which has been developed by DINRAC in 2018-2019, anthropogenic impacts on tidal flats and salt marshes will be assessed.

The expected outputs of this project will be a distribution map of tidal flats and salt marshes in the NOWPAP region and a regional report on the distribution assessment of tidal flats and salt marshes in the NOWPAP region.

In the afternoon, a session for another new project on environmental DNA (eDNA) was held. The experts of the member states reported the status on application of eDNA technique in their respective states. Japan is a pioneering country and has a long history on studies using eDNA. A Japanese expert group developed a database of fish metabarcoding (MiFish) and assessed the distribution of fishes along all Japanese coasts. In China, eDNA is used for conservation of Chinese egrets. By using eDNA, the number of Chinese egrets and their sex are monitored. In Korea, distribution of phyto- and zoo-plankton is monitored using eDNA. Korean experts have tried to assess the relationship between fish distribution and plankton distribution using eDNA. In Russia, application of eDNA has just been started in monitoring of phytoplankton species using eDNA and development of a database of fish metabarcoding. It was understood that in all NOWPAP member states, eDNA technique has been applied in some researches, but the degree of its application is different among the member states. The experts agreed to organize a training course to share the methodology of eDNA analysis among the member states and develop a common manual on eDNA analysis. The first training course will be held in spring 2021 in Kobe University, Japan.

The experts reviewed two draft workplans of CEARAC activities for 2020-2021: assessment of distribution of tidal flats and salt marshes in the NOWPAP region, and a training course of eDNA analysis during the workshop and they agreed on both of them. More detailed workplans will be prepared by CEARAC Secretariat and the activities will be proposed at the next CEARAC FPM (18<sup>th</sup> FPM) to be held in early summer in 2020.

The meeting also discussed the future CEARAC activities after 2022, and agreed to continue discussion in the next biennium.



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## 2. Reports of main projects for 2018-2019

### ➤ **CEARAC activities for marine biodiversity conservation in the 2018-2019 biennium**

In the 2018-2019 biennium, CEARAC has been implementing two activities for marine biodiversity conservation. The first is “Development of a CEARAC Medium-term Strategy for Marine Biodiversity Conservation (CEARAC BIO MTS)”.

In the past 10 years, CEARAC implemented activities on marine biodiversity conservation through publication of a report on monitoring and management in marine protected areas (MPAs) in the NOWPAP region, assessment of major pressures on marine biodiversity in the NOWPAP region, and so on. However, CEARAC FPs requested CEARAC Secretariat to show a clear future vision of CEARAC’s activities for marine biodiversity conservation in the NOWPAP region. Based on the request from them, CEARAC Secretariat proposed to develop a CEARAC Medium-term Strategy for Marine Biodiversity Conservation (CEARAC BIO MTS) in the current biennium.

At first, CEARAC FPs selected six potential topics for marine biodiversity conservation for future CEARAC activities as 1) Assessment of marine biodiversity, 2) Harmful invasive species, 3) Specific migratory species, 4) Conservation of biological habitats, 5) Plankton species related to aquaculture and fisheries and 6) environmental DNA (eDNA). The nominated experts by CEARAC FPs assessed the data availability and feasibility of the potential topics in each member state. Then, three topics were selected as high priorities based on their assessments, namely, conservation of biological habitat, plankton species and eDNA.

In addition to the future priority topics, CEARAC developed the basic policies of CEARAC BIO MTS. Our basic policies for marine biodiversity conservation are:

- A) CEARAC focuses on activities which are related to coastal environmental assessment and development of assessment tools for special monitoring programmes, as shown in the Memorandum of Understandings (MoU) with United Nations Environment Programme (UNEP);
- B) CEARAC contributes to the development of NOWPAP Regional Action Plan on Marine and Coastal Biodiversity Conservation (RAP BIO), and implements our tasks shown in RAP BIO and conserves marine biodiversity in the NOWPAP region after RAP BIO is approved; and
- C) Through the monitoring and assessment programmes of marine biodiversity, CEARAC contributes to NOWPAP Ecological Quality Objectives (EcoQOs) and their achievements.

Based on these basic policies and priority topics, in CEARAC BIO MTS,

- CEARAC tries to develop coastal habitat monitoring tools for marine biodiversity conservation and to assess the current situation and anthropogenic impacts on important habitats in the NOWPAP region;
- CEARAC tries to develop monitoring tools using new techniques such as remote sensing and eDNA, and assesses the current status of marine biodiversity including non-indigenous species in the NOWPAP region; and
- CEARAC tries to promote the developed monitoring and assessment tools in the NOWPAP member states and to enhance capacity building including human resource development and expert network development.



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The first draft of CEARAC BIO MTS was proposed at the 17<sup>th</sup> CEARAC FPM (9-10 September 2019). CEARAC FPs approved the draft in principle with inputs from all NOWPAP member states. Based on the request from CEARAC FPs, CEARAC organized a workshop in order to finalize the BIO MTS on 29 November 2019 in Chiba, Japan. Details of the workshop are introduced in another article, “the organization of workshop” in this newsletter. The participants of the workshop agreed to submit the final version of CEARAC BIO MTS prepared by the Secretariat to the CEARAC FPs and the NOWPAP IGM for its final approval.

The second activity is “development of a roadmap for NOWPAP Regional Action Plan on Marine and Coastal Biodiversity Conservation (RAP BIO)”. RAP BIO is future visions and goals for marine and coastal biodiversity conservation in the NOWPAP region. It is closely related to CEARAC BIO MTS: therefore, CEARAC has been implementing this activity in the 2018-2019 biennium. As for national experts of this project, Dr. Jing-feng Fan is nominated from China, with Dr. Yong-Rock An from Korea and Dr. Tatiana Orlova from Russia. An international consultant, Dr. David Coates was also hired by NOWPAP RCU for this project.

The discussion paper was prepared by Dr. Coates and circulated among the nominated experts. In order to review and improve the discussion paper, a workshop on RAP BIO was held on 28 November back-to-back with the workshop for CEARAC BIO MTS. Unfortunately, Dr. Coates was absent from the workshop, but three nominated experts and representatives of NOWPAP RCU, CEARAC, DINRAC and POMRAC joined and reviewed the discussion paper.

During the workshop, the experts introduced actions on marine biodiversity conservation implemented in their states. It was agreed that the experts will provide additional information to the discussion paper based on the information included in their presentations. Representatives of RACs also shared past and current activities of theirs which are related to marine biodiversity conservation.

After a long discussion, the participants agreed to revise the discussion paper with inputs from the experts. The participants also discussed and agreed the future workplan of CEARAC for development of a roadmap for RAP BIO. This project will be extended to the end of October 2020 and an additional workshop will be held in summer 2020 in order to prepare the draft RAP BIO. Expected participants for the next workshop are representatives of NOWPAP RCU and all RACs, nominated experts and the international consultant. It was also suggested that when NOWPAP RAP BIO is developed, global processes such as National Biodiversity Strategy and Global Biodiversity Strategy, Aichi Biodiversity Targets and Post 2020 Strategy should be reviewed to make RAP BIO to conform with them.

The discussion paper will be submitted to the coming 24<sup>th</sup> NOWPAP IGM to be held in February 2020.

### ➤ **Development for a tool for mapping seagrass distribution in the NOWPAP region**

Feasibility study towards assessment of seagrass distribution in the NOWPAP region carried out 2016-2017 biennium suggested use of cloud computing technologies to analyze freely available multispectral satellite images with a standardized analysis procedure.

Based on the decision at the 17th FPM, CEARAC started development of a mapping tool using Google Earth Engine, a planetary-scale platform for Earth science data & analysis. The tool is under development and to be completed by the end of 2019.

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### 3. Cooperation with NOWPAP Partners and Organizations

#### ➤ 2019 PICES Annual Meeting

2019 PICES Annual Meeting was held on 16-27 October in Victoria, Canada, and several thematic meetings or workshops which closely related to the NOWPAP's and CEARAC's activities were organized. Dr. Takafumi Yoshida in CEARAC Secretariat participated in the several meetings and shared information with PICES experts.

Section on Ecology of Harmful Algal Blooms in the North Pacific (S-HAB) organized a workshop "Global HAB: Evaluating, Reducing and Mitigating the Cost of Harmful Algal Blooms: a Compendium of Case Studies". NOWPAP was one of co-sponsor of the workshop, so Dr. Yoshida participated in it.

As a new attempt, not only experts on HAB but also experts on economic and society joined the workshop, and participants shared good practices and discussed the collaboration between nature science and economical/social science. Three sea areas were selected as study sites: North America (west coast of USA), South America (Chile) and East Asia (Korea), and best practices on evaluating, reducing and mitigating the cost of HAB were reported. From the NOWPAP region, Dr. Weol-Ae Lim, National Institute of Fisheries Science of Korea, reported the new system for forecasting the HAB occurrence along the Korean coast.

Sustainable Development Goals (SDGs), global targets, were adopted in 2015, and SDG 14 aims sustainable use of fishery resources. NOWPAP region is one of the sea areas where fishery and aquaculture are very active. For sustainable fisheries and aquaculture in our region, this PICES workshop provided useful information. The workshop plans to publish a scientific report, and it is expected that NOWPAP will use it for the future assessment in the NOWPAP region.

Advisory Panel for CREAMS/PICES Program in East Asian Marginal Seas (AP-CREAMS) organized a workshop, "Circulation, biogeochemistry, ecosystem, and fisheries of the western North Pacific marginal seas: Past and future of CREAMS (Circulation Research of East Asian Marginal Seas)". Target sea area of AP-CREAMS and NOWPAP is same, and AP-CREAMS expects collaboration with NOWPAP in the future. So, Dr. Yoshida also participated in the workshop and shared information on NOWPAP's activities with other participants. AP-CREAMS is interested in climate change issues and interaction between marginal seas. Such topics are also important issues for NOWPAP. It is expected AP-CREAMS and NOWPAP develop strong collaboration in the future.

PICES established a new Working Group (WG42) on Indicators of Marine Plastic Pollution. WG42 focuses on marine plastic pollution including microplastics. The first business meeting was held and Terms of Reference of the Working Group was discussed. Members of WG42 discussed potential indicator species to assess marine plastic pollution and goals of the group. Then, WG42 organized a topic session, "Environmental indicators of plastic pollution in the North Pacific". Since NOWPAP was a co-sponsor of the topic session, Dr. Yoshida joined the session. Many interesting studies on marine plastic pollution were introduced from scientists, and in the presentations, especially researches on microplastic in air and source of micro fibers provided useful information for prevention of microplastic input from new sources. NOWPAP plans to establish a new project on marine microplastics, so it is expected to collaborate with PICES on this topic.

Marine Environmental Quality Committee (MEQ) is one of the most important partners for NOWPAP. MEQ is a parent committee of S-HAB, WG42 and Advisory Panel on Marine Non-indigenous Species (AP-NIS). NOWPAP was invited to the business meeting of MEQ and introduced NOWPAP activities and future collaboration. AP-NIS plans to organize a workshop on Environment DNA (eDNA) for monitoring of Non Indigenous Species (NIS) in the next PICES Annual Meeting. CEARAC Medium-term Strategy for Marine Biodiversity Conservation (CEARAC BIO MTS) selected eDNA as a future high priority topic in the NOWPAP region. Because of the mutual interest on eDNA, AP-NIS and MEQ may be a co-organizer of CEARAC's eDNA training course to be planned in 2021. S-HAB and WG42 also plan to hold a workshop and a topic session which related to NOWPAP activities. PICES Annual Meeting 2020 will be held in Qingdao, China, and it is expected that many NOWPAP experts will participate in the meeting. CEARAC would like to join the meeting and continue collaboration with relevant committee, section, advisory panel and working group of PICES in the future.

### ➤ **Participation in Integrating edge-cutting technologies into Coastal Habitat Mapping in the Western Pacific**

Coastal habitats have important social, economic and ecological value. The Ocean Remote Sensing Project (ORSP) of the UNESCO IOC Sub-Commission for the Western Pacific (IOC/WESTPAC), is trying to help conserve coastal habitats by use of remote sensing through mapping the spatiotemporal distribution of coastal habitats, with an initial focus on seagrass beds. An international workshop, integrating edge-cutting technologies into Coastal Habitat Mapping in the Western Pacific was organized from Dec 9 to 11, 2019 at Oceanography Institute Nha Trang, Vietnam. NOWPAP has been a partner of the IOC/WESTPAC for long time, Genki Terauchi, a senior researcher of NOWPAP CEARAC has attended the workshop to share a case study result of mapping seagrass beds in Nanao Bay using a mapping tool powered by Google Earth Engine (GEE). He also conducted a hand on training on the use of the newly developing GEE based mapping tool with the participants of the ORSP projects. CEARAC is promoting of use of the mapping tool to enhance mapping seagrass in the NOWPAP region and southeast Asia. CEARAC is planning to launch this tool as part of Marine Environmental Watch Project by March 2020.



## New Member

### Dr. Ryota SHIBANO, Researcher

I joined the Northwest Pacific Region Environmental Cooperation Center (NPEC) in April 2019. At NPEC, I am in charge of the activities on marine litter-related activities of NOWPAP CEARAC. In the 2018-2019 biennium, CEARAC has been developing the regional overview on actions and programs against marine microplastics implemented in the NOWPAP member states. Microplastics were indicated as a serious problem around the world at the G20 Osaka Summit 2019, and my work is to share and disseminate relevant information and to raise public awareness on microplastics among the NOWPAP member states. Besides, I have been studying the estimation of biogeochemical dynamics in the Toyama Bay, as part of NPEC's work, by using a bay scale model which couples ocean circulation with low trophic ecosystem.



Before joining NPEC, I worked as a postdoctoral researcher for three years in the Center for Marine Environmental Studies (CMES) in Ehime University, Japan. The research theme was “Construction of a model to predict environmental changes in the Japan Sea” in one of Environment Research and Technology Development Fund S-13 projects by the Ministry of the Environment, Japan. The research team developed a marginal-sea scale model which couples ocean circulation with low trophic ecosystem and estimated the biogeochemical dynamics in the Yellow Sea, the East China Sea and the Japan Sea. For managing sustainable coastal regions in the Japan Sea, it is needed to estimate the biogeochemical cycles in the entire Japan Sea including the coastal regions. Under cooperation with NPEC and Kyushu University, the research team studied and developed the estimation model. The result in the research is published in *Estuarine, Coastal and Shelf Science* (Shibano *et al.*, 2019: <https://doi.org/10.1016/j.ecss.2019.106386>).

As other works, I studied impacts of global warming on the fishery resources using the outputs of earth system model (Coupled Model Intercomparison Project 5; CMIP5).

I am from Miyazu City in Kyoto Prefecture located on the west coast along *Honshu*, mainland of Japan, same as Toyama City. I studied physical oceanography and remote sensing by Prof. Masahisa Kubota in Tokai University (currently Guest Prof. in the Institute of Oceanic Research and Development, Tokai University). Under Prof. Yasuhiro Yamanaka in Hokkaido University, I obtained a doctoral degree in environmental science, specializing in marine biogeochemical dynamics and ecosystem model researches. I hope my knowledge from the previous studies and current work in NPEC help to realize/maintain the sustainable marine environment which has been received a big impact by climate change.



## CEARAC Focal Points

Country	Name	Organization
China	Dr. Liu XIHUI	China National Environmental Monitoring Center
	Dr. Peng WANG	National Marine Environmental Monitoring Center
Japan	Mr. Katsunori YANO (as of Sep. 2019)	Ministry of the Environment, Japan
	Dr. Joji ISHIZAKA	Nagoya University
	Dr. Nobuyuki YAGI	Tokyo University
Korea	Dr. Young Nam KIM	Korea Marine Environment Management Corporation
	Dr. Yong-Rock AN	National Marine Biodiversity Institute of Korea
	Dr. Eun Chan YANG	Korea Institute of Ocean Science & Technology
Russia	Dr. Vladimir SHULKIN	Far Eastern Branch of the Russian Academy of Sciences
	Dr. Tatiana ORLOVA	Far Eastern Branch of the Russian Academy of Sciences



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**Special Monitoring & Coastal Environmental Assessment Regional Activity Centre (CEARAC) of  
Northwest Pacific Action Plan (NOWPAP)**

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**Annex D. DINRAC Newsletters on Marine Litter (Q2 2018, Q3 2018)**



**NOWPAP**

Northwest Pacific Regional Node of the Global  
Partnership on Marine Litter

ISSUE 2, 2018



### *About Regional Node of GPML*

The Global Partnership on Marine Litter Honolulu Strategy (GPML) serves as a coordination forum aiming to harness the collective knowledge and resources of governments, practitioners, donors and other international organizations in strengthening and scaling up the implementation of the – a global framework for prevention and management of marine debris, which was adopted in 2012. The GPML is the foremost international effort for cooperation between authorities, industry and civil society to address the issue of marine litter on a global scale. It should serve as a critical source of information to guide action at the global, regional, national and sub-national level to help prevent and reduce the amount of marine litter in the global ocean. The involvement of the private and public sectors and civil society is vital for the GPML to meet its ambition. The 22d NOWPAP 22nd IGM (21-23 December 2018) has decided to transfer the hosting of the Regional Node from NPEC to DINRAC.

The GPML aims at achieving six major goals through strategic engagement and action:

1. Provide a global multi-stakeholder support mechanism for reducing the input and impacts of macro-plastics and microplastics in the ocean.

2. Advance three main pillars for marine litter reduction dealing with: A - sea-based sources and inputs; B - land-based sources and inputs and, C - accumulation of litter on shorelines, seabed and water column.

3. Help coordinate litter reduction initiatives at local, national, regional, inter-governmental and global scales, within and across relevant social and economic sectors.

4. Strengthen partnerships with Regional Seas Programmes and other regional bodies, both formal and informal.

5. Act as a focal point for the exchange of information and guidance, by means of the Marine Litter Network.

6. Support the work of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) with respect to marine litter, under the 2012 Manila Declaration.

*DINRAC was invited to attend Beach Litter Brand Audit Annual Report Release Conference*

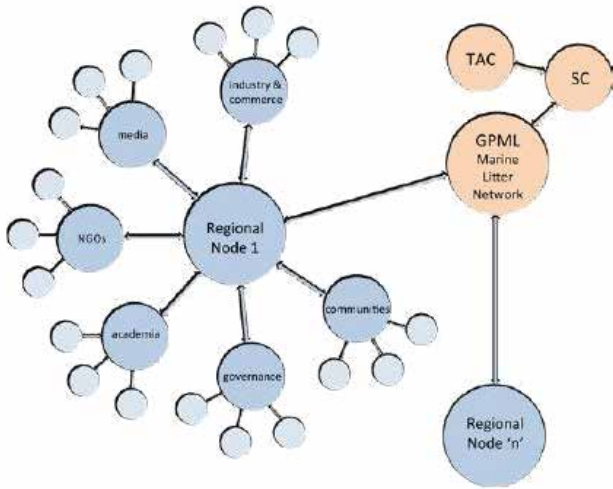


Figure 1. Schematic of relationships within a Regional Node and links to the rest of the GPML, via the Marine Litter Network.

On 17 March 2018, DINRAC representative was invited to attend the Release Conference for Beach Litter Brand Audit Annual Report organized by Ford Motor Company, Ford CEGC, and Shanghai Rendu Ocean NPO Development Center.

At the conference, as the NOWPAP Randiness partner in the management of marine litter, Shanghai Rendu NPO Development Center has issued the “Beach Litter Brand Audit Annual Report”. As a Non-Profit Organization that focuses on Marine Litter in China, Rendu creates the dimension of Commercial brand in the international marine litter monitoring methods. Through the discussion, the organizers hope that the consumers, producers and sellers, the public and commercial brands could pay more attention to the problem of marine litter and participate in the action of marine litter disposal.

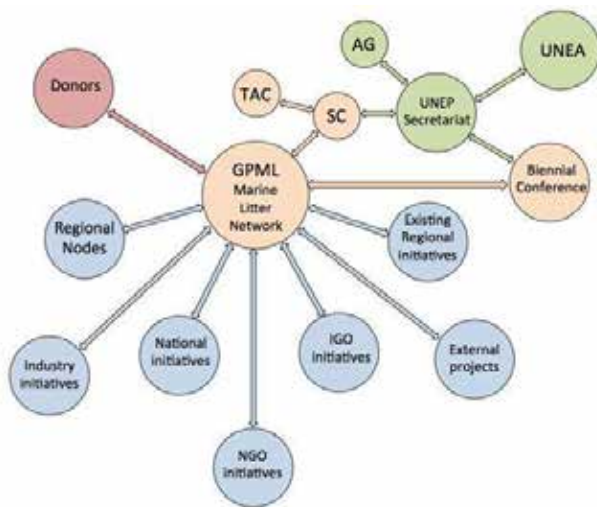


Figure 2. Schematic of relationship between the regional nodes embedded within the GPML and a range of other organizations and initiatives with common interests and potential partners in the GPML, via the Marine Litter Network: TAC - Technical Advisory Committee; SC – Steering Committee; UNEA – United Nations Environment Assembly; AG - Advisory Group for reporting to the UNEA; Biennial Conference – Biennial Conference of the GPML Partners.





*DINRAC attended the NOWPAP-TEMM Joint Workshop on Marine Litter Management- NOWPAP Regional Action Plan on Marine Litter Focal Points Meeting*

The Symposium and a series of meetings were hosted by the RCU of NOWPAP, supported by the Ministry of Ocean and Fisheries of Korea and held in Busan, South Korea, in from June 3rd to 6<sup>th</sup>, 2018.

In June 3rd, RCU organized a consultative meeting on micro plastic. Methods of monitoring and analysis of regional micro plastics, the progress in related toxicology and the related work carried out by member countries were discussed.

In June 4th, the Northwest Pacific Action Plan and the conference of the three countries' environmental ministers on marine Litter management were held. The conference mainly exchanged experiences on the marine litter management in the countries NOWPAP, and discussed the handling and disposal of fishing gear in aquaculture.



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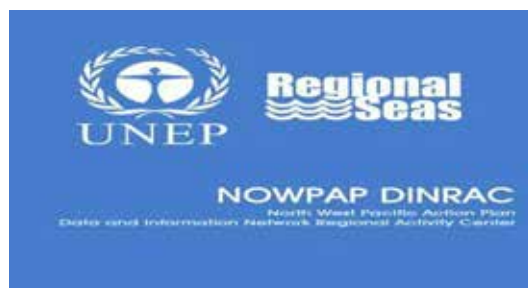
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**NOWPAP**

Northwest Pacific Regional Node of the Global Partnership on Marine Litter

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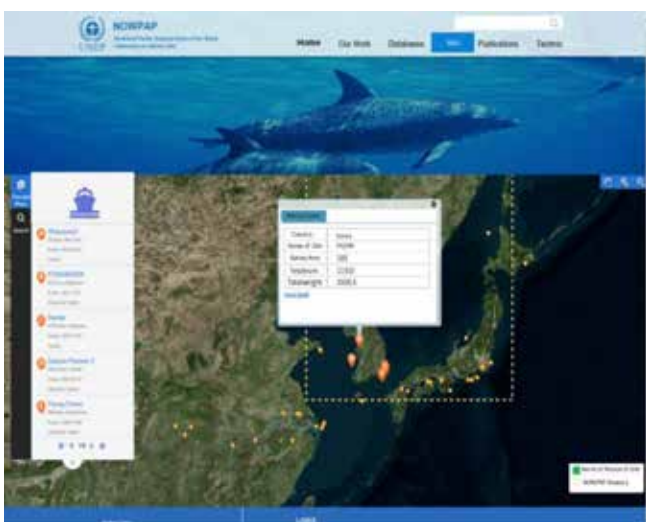
### The further development of GPML NOWPAP Regional Node

The Regional Node aims to enhance awareness of marine litter prevention actions at the national, local and grass-root levels, 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) in support of the NOWPAP Action Plan on Marine Litter. Marine litter data has been received from CEARAC. The new website for the Regional Node has been developed and the WebGIS system has been completed.

National Laboratory of Marine Science and Technology (Qingdao) from 3 to 5 July 2018 in Qingdao, China.

With the theme of "Strengthening cooperation in ocean observation and prediction": ocean observation and prediction, deep-sea and polar research, sustainable development of the progress of the latest frontier of marine institutions and the ocean, major challenges of marine science and technology, equipment of marine scientific research were widely discussed by the participants of 101 marine institutions, universities and 5 international organizations from 24 countries.

At the meeting, it was adopted the recommendations of 2018 Global Ocean Summit. The representatives agreed that the collaborative innovation of marine science and technology should be strengthened, and a new partnership for cooperation in ocean observation and research should be set up to meet the challenges of economic and social development to



### DINRAC was invited to attend the 2018 Global Ocean Summit

DINRAC representative was invited to participate in the 2018 Global Ocean Summit organized by Pilot



marine science and technology and the sustainable development of the ocean.

**NOWPAP DINRAC was invited to attend APEC Workshop on Innovative Marine Debris Solutions**

DINRAC representative was invited to participate in the 2018 APEC Workshop on Innovative Marine Debris Solutions at July 26, 2018 in Beijing. The themes of the conference are Innovative Initiatives of APEC Economies on Marine Debris Prevention, New Research Advances on Marine Debris and Micro-plastics, Innovative Thoughts or Ideas of Enterprises on Marine Debris Prevention.

At the meeting, official from Indonesia, USA, Chile, Thailand, Vietnam introduced the prevention action plan of each country. Several scientists on marine litter introduced the research advances of marine litter and microplastic. It is agreed to enhance the marine litter management and continue to do specific scientific research on marine litter and microplastic to meet the sustainable development of the ocean.



**NOWPAP DINRAC was invited to attend GIS Software Technology Conference 2018 in Beijing**

NOWPAP DINRAC was invited to attend GIS

Software Technology Conference 2018 in 29-31 August, in Beijing. The theme of the conference is “Geo-intelligence Enabled by Ascending

Dimension”. The conference is organized jointly by China Association for Geographic Information Society, Chinese Society for Surveying, Mapping, and Geoinformation, China Software Industry Association, The Geographical Society of China, Institute Of Geographic Sciences and Natural Resources Research of CAS, and SuperMap. It consists of Thematic Conference, Symposiums, GIS Developer Forum, and the GIS solution and industries’ Exhibition.

NOWPAP DINRAC has introduced with related partners about the working progress of DINRAC databases, WebGIS application modules, and development of GPML Regional Node Portal etc. Particularly, DINRAC has discussed several potential cooperative fields with SuperMap based on its Network Information System and Platform.



**DINRAC participated the national scientific monitoring of marine litter in Shanghai**

On August 3th, 2018, the fourth national scientific monitoring was conducted by cooperating with

Rendu in monitoring points of JiudianSha Pudong Base, Shanghai. Volunteers from Apple Inc completed the beach litter cleaning up.



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