

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

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.

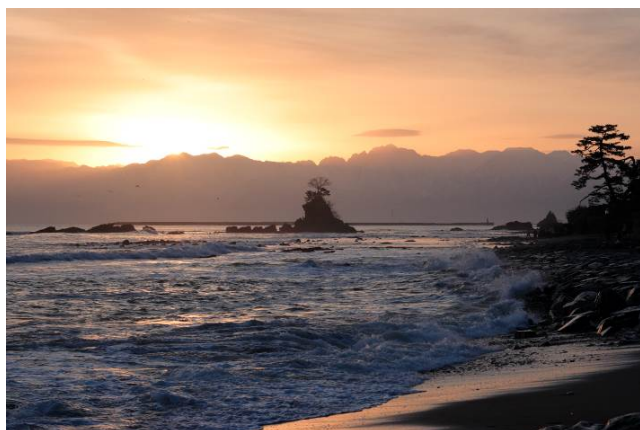


In recent years, CEARAC implemented activities on marine litter, eutrophication and marine biodiversity, and in 2018 CEARAC has mainly worked on development of CEARAC Medium-term Strategy (MTS) on marine biodiversity, development of the roadmap for Regional Action Plan for Marine and Coastal BIODIVERSITY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

distribution in the NOWPAP region.

Actually, 2018 is the 20th 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"> - Focal Points Meeting (FPM) in 2018 and 2019 - Expert Meeting
Maintenance of Website		<ul style="list-style-type: none"> - Periodical update of web contents - Upgrade of Marine Environmental Watch System - Reconstruction of CEARAC websites using cloud computing technology
Specific Projects	1 Development of the CEARAC Medium-term Strategy (MTS) on marine biodiversity in the NOWPAP region	<ol style="list-style-type: none"> (1) Feasibility assessment on potential topics of future CEARAC activities (2) Organization of marine biodiversity workshop and meeting for development of CEARAC MTS on marine biodiversity (3) Development of the CEARAC Medium-term Strategy on marine biodiversity
	2 Development of a roadmap for Regional Action Plan for Marine and Coastal Biodiversity Conservation (RAP BIO)	<ol style="list-style-type: none"> (1) Review of past marine biodiversity activities of NOWPAP (2) Development of a roadmap for RAP BIO (3) Organization of NOWPAP Marine and Coastal Biodiversity Workshop
	3 Development of a tool for mapping seagrass distribution in the NOWPAP region	<ol style="list-style-type: none"> (1) Detection of potential seagrass habitat (2) Development of a tool for mapping seagrass distribution (3) Construction of web-based service for mapping seagrass distribution
Marine litter (RAP MALI)		<ul style="list-style-type: none"> - Harmonization/Summarization of monitoring data submitted by the members - Regional overview of national efforts to address microplastics - Translation of contents in the Northwest Pacific Regional Node into Japanese

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/>



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.

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,

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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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