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Report on the Activities of NOWPAP Special Monitoring and Coastal Environmental Assessment Regional Activity Centre (CEARAC) in 2018 and 2019

Regional Seas

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List of Acronyms

AP-CREAMS	Advisory Panel for a CREAMS (Circulation Research in East Asian Marginal Seas)/PICES Program in East Asian Marginal Seas
BIO MTS	Medium-Term Strategy on Marine Biodiversity Conservation
CEARAC	Special Monitoring and Coastal Environmental Assessment Regional Activity Centre
DINRAC	Data and Information Network Regional Activity Center
eDNA	Environmental DNA
EcoQOs	Ecological Quality Objectives
FP	Focal Point
FPM	Focal Points Meeting
GEE	Google Earth Engine
GEF	Global Environmental Facility
HAB(s)	Harmful Algal Bloom(s)
IGM	Intergovernmental Meeting
IOC	Intergovernmental Oceanographic Commission of UNESCO
WESTPAC	IOC Sub-Commission for the West Pacific
MERRAC	Marine Environmental Emergency Preparedness and Response Regional Activity Center
ML	Marine Litter
MoE	Ministry of the Environment of Japan
MoU	Memorandum of Understanding
MTS	Medium-Term Strategy
NEAT	NOWPAP Eutrophication Assessment Tool
NEPC	Northwest Pacific Region Environmental Cooperation Center
NOWPAP	Northwest Pacific Action Plan
ORSP	Ocean Remote Sensing Program of IOC/WESTPAC
POMRAC	Pollution Monitoring Regional Activity Center
RAC(s)	Regional Activity Center(s)
RAP BIO	Regional Action Plan for Marine and Coastal Biodiversity Conservation
RAP MALI	Regional Action Plan on Marine Litter
RCU	Regional Coordination Unit
RESTEC	Remote Sensing Technology Center of Japan
SDG	Sustainable Development Goal
S-HAB	Section on Ecology of Harmful Algal Blooms in the North Pacific
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WG42	Working Group on Indicators of Marine Plastic Pollution
YSLME	UNDP/GEF Yellow Sea Large Marine Ecosystem Project

1. Background

1. The Special Monitoring and Coastal Environmental Assessment Regional Activity Center (CEARAC) is one of the four Regional Activity Centers (RACs) of the Northwest Pacific Action Plan (NOWPAP) of the UNEP's Regional Seas Programmes. The Center was established in July 2002 within the Northwest Pacific Region Environmental Cooperation Center (NEPC) in Toyama, Japan, based on the decision of the 4th NOWPAP Intergovernmental Meeting (April 1999) and the Memorandum of Understanding (MoU) signed in July 2002 between UNEP and NPEC.

2. CEARAC has been designated to carry out various activities related to the assessment of the state of the marine, coastal and associated freshwater environments, including the assessment of pollutants input for the verification of monitoring results. In particular, CEARAC has been working on monitoring and assessment of Harmful Algal Blooms (HABs), including the red tides (under Working Group 3), and the application of remote sensing techniques for studying of the marine and coastal environment (Working Group 4).

3. However, after 2008, when CEARAC initiated a specific activity on eutrophication as a joint work of WG3 and WG4, its focus shifted to eutrophication, marine biodiversity, and seagrass mapping under the NOWPAP Medium-Term Strategy 2012-2017 (MTS).

4. Regarding the current 2018-2019 biennium, CEARAC implemented a number of routine activities, such as the organization of Focal Points Meeting (FPM) and maintenance of its websites, three specific intersectional projects on marine biodiversity, seagrass mapping and marine litter. All these activities are the priority areas of the NOWPAP MTS 2018-2023 approved at the 22nd NOWPAP Intergovernmental Meeting (IGM) held in December 2017 in Toyama, Japan.

5. CEARAC activities are mainly funded by the NOWPAP Trust Fund supplemented by an in-kind contribution from NPEC originated from the support of the Ministry of the Environment of Japan (MoE) and Toyama Prefectural Government (USD 532,365). The Toyama Prefectural Government provides funding for the operation of the Secretariat of CEARAC, including personnel salaries and running costs.

2. Staff

6. CEARAC staff members are as follows:

Mr. Michitaka Yokoi	Director (yokoi@npec.or.jp)
Dr. Takafumi Yoshida	Senior Researcher (yoshida@npec.or.jp)
Dr. Genki Terauchi	Senior Researcher (terauchi@npec.or.jp)
Dr. Elígio de Raús Maúre	Researcher (maure@npec.or.jp)
Dr. Ryota Shibano	Researcher (shibano@npec.or.jp)
Ms. Mihoko Nagamori	Staff Member (nagamori@npec.or.jp)

3. Implementation of CEARAC activities for the 2018-2019 biennium after the 23rd NOWPAP IGM (as of 13 December 2019)

7. CEARAC implemented its activities relevant to the monitoring and assessment of the marine and coastal environment during the 2018-2019 biennium approved at the 22nd NOWPAP IGM. By the end of the current biennium, some activities have already been completed, while there are still some tasks left to complete in other activities (Table 1). Major outputs/outcomes of the planned activities are presented in detail in Annex 1.

Table 1 Implementation status of CEARAC activities in 2019 (as of 20 Dec. 2019)[1]

Activities	Status
<Specific Intersessional Projects>	
• Development of the CEARAC Medium-Term Strategy (BIO MTS) on Marine Biodiversity Conservation	On-going (to be extended until February 2020)
• Development of a Tool for Mapping Seagrass Distribution in the NOWPAP Region	On-going (to be completed by the end of 2019)
• Development of the Roadmap for Regional Action Plan for Marine and Coastal Biodiversity Conservation (RAP BIO)	On-going (to be extended until October 2020)
<Marine Litter Activities (RAP MALI)>	
• Development of a Regional Overview of National Efforts to Address Microplastics	On-going (to be completed by the end of 2019)
• Translation of contents of the Northwest Pacific Regional Node into Japanese	On-going (to be completed by the end of 2019)
• Compilation/harmonization of marine litter monitoring data on beaches in the member states and submission of the collected data to DINRAC (in-kind)	On-going (to be completed by the end of 2019)
<Other Routine Work>	
• Strengthening regional capacity for monitoring and environmental assessment through knowledge/information sharing and capacity building	On-going (to be completed by the end of 2019)
• Maintenance of CEARAC websites	On-going (to be completed by the end of 2019)

3.1 Specific Inter-Sessional Projects

3.1.1. Development of the CEARAC Medium-Term Strategy on Marine Biodiversity (BIO MTS) Conservation

8. For CEARAC BIO MTS, six potential topics for future activities of CEARAC beyond 2020 were selected through the discussion at the 16th CEARAC FPM (May 2018). The selected potential topics were 1) Assessment of marine biodiversity, 2) Harmful invasive species, 3)

[1] Details are included in Annex 1 at the end of this report.

Specific migratory species, 4) Conservation of coastal habitats, 5) Plankton species related to aquaculture and fisheries, and 6) Environmental DNA (eDNA). Also, the nominated experts from the Member States assessed the feasibility of these topics.

9. Due to the delayed submission of a feasibility assessment report from the Member States, the development of CEARAC BIO MTS was also delayed. The Secretariat of CEARAC prepared the first draft of CEARAC BIO MTS and presented it at the 17th CEARAC FPM (9-10 September 2019). In the draft, three areas were selected as high priority topics for the future CEARAC biodiversity activities, namely:

- the conservation of biological habitats, including tidal flats, salt marshes, and seagrass and seaweed beds
- plankton species related to aquaculture and fisheries, and
- eDNA.

10. CEARAC FPs approved the draft CEARAC BIO MTS in principle. CEARAC FPs also requested the Secretariat to organize a workshop to finalize the CEARAC BIO MTS and to discuss the workplan for the selected high priority topics to be implemented in the 2020-2021 biennium and after.

11. The Secretariat of CEARAC updated the CEARAC BIO MTS after some refinement work and circulated the revised version to the CEARAC FPs for their review.

12. On 29 November 2019, CEARAC organized a workshop on CEARAC BIO MTS in Chiba, Japan (Figure 1). Nominated experts of the Member States reviewed the CEARAC BIO MTS and agreed on it. Also, during the workshop, a draft workplan for 2020-2021 biennium, which had been prepared by the Secretariat of CEARAC, was reviewed and accepted.

13. The CEARAC BIO MTS is expected to be submitted to the 24th NOWPAP IGM for approval by the NOWPAP Member States.

Figure 1 Workshop (28-29 Nov. 2019, Chiba, Japan)

3.1.2. Development of a Tool for Mapping Seagrass Distribution in the NOWPAP Region

14. A Feasibility study towards the assessment of seagrass distribution in the NOWPAP region (2016-2017) revealed the burden of workload in the process of seagrass mapping with the satellite data analysis. Therefore, CEARAC aims at developing of a new tool for mapping seagrass distribution by taking advantage of emerging cloud-based computing technology based on the agreement at the 16th CEARAC FPM.

15. Then, following the decision of the 17th CEARAC FPM, CEARAC concluded a Memorandum of Understanding (MoU) for the development of a Google Earth Engine (GEE) based tool for mapping seagrass distribution in the NOWPAP region with Remote Sensing Technology Center (RESTEC) of Japan. The tool is under development by RESTEC and to be completed by the end of 2019.

3.1.3 Development of the roadmap for Regional Action Plan for Marine and Coastal Biodiversity Conservation (RAP BIO)

16. By the summer of 2019, Dr. Jingfeng FAN from the National Marine Environmental Monitoring Center (China), Dr. Yong Rock AN from the National Marine Biodiversity Institute (Republic of Korea), and Dr. Tatiana ORLOVA from the A.V. Zhirmunskii Institute of Marine Biology (Russia) were nominated as national experts by NOWPAP FPs to support this work. The Secretariat of CEARAC leads this project on behalf of Japanese biodiversity experts until an appropriate expert is nominated. An international consultant, Dr. David COATES, was hired to guide this project by NOWPAP RCU.

17. Then, Dr. COATES prepared a discussion paper on the development of the Roadmap for the NOWPAP RAP BIO for further review by the nominated experts.

18. The workshop on NOWPAP RAP BIO was held on 28 November 2019 back-to-back with a workshop on CEARAC BIO MTS in Chiba, Japan. The nominated experts participated in the workshop and reviewed the discussion paper put together by the international consultant. The discussion paper was revised based on the comments from the experts. Besides, the experts agreed to provide additional information to refine the discussion paper further.

19. Due to objective reasons, the international consultant did not participate in the meeting in person, as did the representatives of other RACs. Therefore, the attending experts and NOWPAP Regional Coordination Unit (RCU) and CEARAC agreed to extend this project until October 2020 and to use the remaining budget of this project. The participants agreed to hold another workshop in summer 2020 to prepare the first draft of NOWPAP RAP BIO with NOWPAP RCU, all RACs, the national experts and the international consultant. It was also agreed that new global targets and post-2020 targets to be referred to in the process of developing NOWPAP RAP BIO.

20. The first draft of RAP BIO will be submitted to the 25th NOWPAP IGM to be held in late 2020 and reviewed by the Member States in 2021 for its finalization.

3.2 Marine Litter Activities (RAP MALI)

21. Microplastics have been receiving more global attention in recent years; however, information on countermeasures by each NOWPAP member state is not known. To share the best practices and strengthen cooperation between the Member States to address this transboundary threat, CEARAC worked on collecting information on national actions against marine microplastics.

22. At first, the Secretariat of CEARAC collected information on the national actions from available presentations at NOWPAP events and developed a draft summary table. Then, the Secretariat asked the experts of China, Korea, and Russia, who had been nominated by ML FPs, to revise the table. After submission of the revisions from the experts, the Secretariat has refined the contents and developed a regional overview, including a revised summary table. The draft regional overview has been circulated among ML FPs for review in December 2019 for its finalization.

23. In addition to the development of the regional overview of countries' actions against microplastics, CEARAC has translated the current contents of the Northwest Pacific Regional Node into the Japanese language and plans to share it with DINRAC in December 2019 to raise public awareness on marine litter in the NOWPAP region.

24. As for continued regular work, CEARAC has harmonized/summarized marine litter monitoring data submitted from the NOWPAP Member States and provided the data to DINRAC for uploading on its website. By the end of November 2019, as the latest monitoring data have not been submitted from any member state this year, CEARAC continues asking ML FPs to provide input.

3.3 Other Routine Work

3.3.1 Strengthening Regional Cooperation and Coordination by information/ knowledge exchange/sharing

Seventeenth NOWPAP CEARAC FPM

25. The Seventeenth NOWPAP CEARAC FPM was held on 9-10 September 2019 in Toyama, Japan, with 25 participants (CEARAC FPs and alternatives, representatives of NOWPAP RACs and RCU, and NOWPAP partners) (See Figure 2).

26. The Secretariat of CEARAC reported the progress of activities implemented during the 2018-2019 biennium at this meeting. As reported, several activities were delayed due to the late submission of reports and the nomination of experts. CEARAC FPs requested the Secretariat to communicate with CEARAC FPs and RCU more closely and try to improve the situations to finish all the planned work on time.

27. Further, the Secretariat proposed a workplan for the 2020-2021 biennium, which included six inter-sessional activities and some routine work. CEARAC FPs and alternates examined the appropriateness and feasibility of proposed activities and agreed to submit it to the 24th NOWPAP IGM after revising. A draft workplan of CEARAC activities for 2020-2021 is presented in Section 4 in this report.

Figure 2. 17th CEARAC FPM (9-10 Sep. 2019, Toyama, Japan)

The Second CEARAC Expert Meeting on Eutrophication Assessment in the NOWPAP Region

28. The second CEARAC Expert Meeting on Eutrophication Assessment in the NOWPAP Region was held on 22 March 2019 in Vladivostok, Russia (See Figure 3). 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 the assessment of eutrophication in the NOWPAP region. Secretariat of CEARAC introduced a new assessment tool at the meeting: NOWPAP Eutrophication Assessment Tool (NEAT), which uses concentration levels and trends detected by satellite-based chlorophyll-a concertation to detect potential eutrophic zones in the NOWPAP region (https://cloudgis.nowpap3.go.jp/news-title1/). The meeting participants encouraged CEARAC to further develop the NEAT with new ocean color sensors by inter-calibration of sensors and cross-validation with in-situ Chl-a measurements. NEAT was also introduced on a news page of the UNEP website. (https://www.unenvironment.org/nowpap/news/press-release/neat%E2%80%94-satellite-based-technique-keep-eye-growing-eutrophication-threat-oceans)

Figure 3. Second CEARAC Expert Meeting on Eutrophication Assessment in the NOWPAP Region (22 March 2019, Vladivostok, Russia)

Participation in meetings and workshops of other RACs and NOWPAP Partners

29. NOWPAP POMRAC organized a regional workshop: "Development of regional targets of NOWPAP Ecological Quality Objectives (EcoQOs)" on 20-21 March 2019 in Vladivostok, Russia. As one of the selected NOWPAP EcoQOs is the level of eutrophication, and CEARAC has worked on eutrophication for several biennia, the staff of the Center joined the workshop and made a presentation on current activities. CEARAC then held an expert meeting on eutrophication assessment on the following day in Vladivostok, and one of POMRAC FPs joined the meeting and also delivered a presentation. These events helped all of the meeting participants to understand better the current activities of two NOWPAP RACs.

30. In addition to the meetings and workshops held by CEARAC, staff members of the Secretariat of CEARAC participated in the following meetings and events in 2019. In some cases, the participating staff delivered presentations to introduce NOWPAP and CEARAC activities:

- **IOC/WESTPAC ORSP Seagrass bed Mapping Workshop (25-27 February, Beijing, China)**

  CEARAC participated in the workshop to exchange information on current seagrass mapping activities in Asia

- **POMRAC EcoQOs Workshop (20-21 March, Vladivostok, Russia)**

  CEARAC participated in the workshop to increase understanding of current activities of POMRAC, which is closely related to CEARAC activities.

- **NOWPAP RAC-RCU Meeting (1-2 April, Busan, Korea)**

  CEARAC participated in the meeting and shared ideas on activities for the 2020-2021 biennium.

- **First International Operational Satellite Oceanography Symposium (17-19 June, Washington, USA)**

  CEARAC gave an invited talk on the application of remote sensing data for the assessment of eutrophication on a global scale based on the NEAT method.

- **YSLME 3rd Scientific Conference (15-16 July, Qingdao, China)**

  Accepting an invitation from YSLME, CEARAC participated in the conference and gave a presentation on NOWPAP biodiversity activities. YSLME has a long history of conservation of coastal habitat, including MPA networks. For CEARAC's new biodiversity projects, collaboration with the YSLME project is essential, and CEARAC tries to strengthen cooperation with this project.

- **17th DINRAC FPM (22-23 August, Dalian, China)**

  CEARAC participated in the 17th DINRAC FPM and shared the progress of the current CEARAC's activities with DINRAC FPs. DINRAC's activities, especially projects on endangered species and sea reclamation, are closely linked with CEARAC BIO MTS and future projects. Thus, CEARAC asked to promote information sharing and collaboration with DINRAC.

- **22nd MERRAC FPM (27-30 August, Seoul, Korea)**

  CEARAC participated in the 22nd MERRAC FPM to understand the activities of MERRAC for 2018-2019 and 2020-2021 and to explore collaborative opportunities.

- **Google Geo for Good 2019 (16-19 September, Sunnyvale, USA)**

  CEARAC staff joined the workshop to design specification requirements for a cloud-based tool of seagrass mapping, which CEARAC has worked on in the 2018-2019 biennium.

- **NASA Seagrasses & Neural Networks Workshop (24-25 September, Mountainview, USA)**

  CEARAC staff joined the workshop to design specification requirements for a cloud-based tool of seagrass mapping, which CEARAC has worked on in the 2018-2019 biennium.

- **NOWPAP International Coastal Cleanup Campaign (ICC) and NOWPAP Trilateral Environmental Ministers Meeting (TEMM) Joint Workshop (24-27 September, Dalian, China)**

  At the RAP MALI FPM, CEARAC reported the progress of our activities for this biennium and asked ML FPs to nominate experts who can support CEARAC's project: collecting information on national actions against marine microplastics.

- **PICES 2019 Annual Meeting (17- 25 October, Victoria, Canada)**

  PICES is one of the important partners for NOWPAP, and CEARAC collaborated with PICES's working groups, sections and committees in the past decade. At the Annual Meeting, CEARAC participated in the business meetings of AP-CREAMS, S-HAB, WG42 (Microplastics) and MEQ, and shared information on NOWPAP and discussed the future collaboration.

- **16th POMRAC FPM (30 October- 1 November, Beijing, China)**

  CEARAC participated in the 16th POMRAC FPM to share information on current activities and planned ones for 2020-2021 to explore some collaborative chances with POMRAC.

- **WESTPAC Workshop 2019 on Remote Sensing for Coastal Habitat Conservation "Integrating edge-cutting technologies into Coastal Habitat Mapping the Western Pacific" (9-11 December, Nha Trang, Vietnam)**

  CEARAC participated in the workshop to share a case study result of mapping seagrass beds in Nanao Bay, Japan, using a mapping tool powered by GEE. CEARAC staff also conducted a hands-on training on the use of the newly developing GEE based mapping tool with the participants of the ORSP projects.

- **The 7th Asian/16th Korea-Japan Workshop on Ocean Color (11-13 December, Bangkok, Thailand)**

  CEARAC staff participated in the workshop to introduce a newly-developed NOWPAP NEAT and a seagrass mapping tool powered by GEE.

3.3.2 Maintenance of CEARAC Websites

31. CEARAC has been moving the existing system to the Cloud Computing system for more smooth operation and acceptance of a larger volume of data/information in the future.

32. Meanwhile, CEARAC has continued periodical updates of data and information on its webpages. CEARAC's annual newsletter is one primary tool to disseminate updated information of CEARAC to a wide range of readers. It is published in English and Japanese, so even local visitors of CEARAC websites, who are not good at commanding English, can familiarize themselves with the on-going activities of CEARAC. The latest issues are planned for its publication at the end of December 2019.

4. Budget and Expenditure of CEARAC Activities for the 2018-2019 biennium

33. Based on the decision of the 22nd NOWPAP IGM held in December 2017, a budget of 194,250 US Dollars (185,000 US dollars for its activities and 9,250 US dollars for marine litter activities) was assigned to CEARAC for the 2018-2019 biennium. The current rate of expenditures is shown in Table 2. While considering the progress of each activity, CEARAC revised its workplan and budget in 2019, which were agreed by CEARAC FPs by correspondence prior to the 17th CEARAC FPM. However, the total budget of each activity is the same as the one shown in the 16th CEARAC FPM in 2018.

Table 2 Budget and Expenditure for CEARAC Activities for the 2018-2019 biennium, US$

Activity/Tasks	Budget (2018-2019)	Expenditure[2]	Balance
Activity 1: Development of CEARAC MTS on Marine Biodiversity			
- Feasibility assessment	9,000	9,000	0
- Organizing Workshop and preparing meeting report	18,000	18,000	0
- Finalization of CEARAC MTS on BD (2019)	3,000	0	3,000
Sub-total	***30,000***	***27,000***	***3,000***
Activity 2: Development of a Tool for Mapping Seagrass Distribution in the NOWPAP region			
- Updating field data of seagrass (by NPEC)	In-kind	N/A	N/A
- Constructing web-based service (2019)	40,000	40,000	0
Sub-total	***40,000***	***40,000***	***0***
Activity 3: Development of a roadmap for Regional Action Plan for Marine and Coastal Biodiversity Conservation (RAP BIO)			
- Reviewing past NOWPAP activities on marine biodiversity	10,000 + RCU fund	0	10,000
- Organizing a workshop and preparing a report (2019)	20,000	3,000	17,000
Sub-total	***30,000***	***3,000***	***27,000***

[2] In “Expenditure,” the numbers include some amount which has not finished the exact payment, but to be spent by the end of 2019

Activity/Tasks	Budget (2018-2019)	Expenditure	Balance
Activity 4: Development of a Regional Overview of National Efforts to Address Microplastics and Collection of Relevant Marine Litter Data to Support RAP MALI			
- Developing a regional overview of national actions on microplastics	6,000	6,000	0
- Translating contents of Northwest Pacific Regional Node into Japanese	3,250	3,250	0
- Compiling/harmonizing monitoring data of member states and submitting the data to DINRAC	In-kind	N/A	N/A
Sub-total	***9,250***	***9,250***	***0***
Activity 5: Strengthening Regional capacity for Monitoring and Coastal Environmental Assessment through knowledge/information sharing and capacity building			
- Organizing meetings (2 FPMs and 1 Expert Meeting) for info/ knowledge sharing, and preparing meeting reports	54,000	54,000	0
Cooperation and coordination with other RACs and NOWPAP Partners	4,000	4,000	0
Sub-total	***58,000***	***58,000***	***0***
Activity 6: Maintenance of CEARAC Websites			
- Web maintenance and contents update	12,000	12,000	0
- Introducing Cloud Computing technology	15,000	15,000	0
Sub-total	***27,000***	***27,000***	***0***
Grand Total	**194,250**	**164,250**	**30,000**

5. Draft Workplan of CEARAC Activities for the 2020-2021 biennium

34. Based on the discussion and suggestions provided from CEARAC FPs at the 17th CEARAC FPM (September 2019), the Secretariat of CEARAC prepared a draft workplan for CEARAC activities for the 2020-2021 biennium to submit to the 24th NOWPAP IGM for its adoption (see Table 3 below).

5.1. Planned activities to be implemented in the 2020-2021 biennium

5.1.1 Assessment of Distribution of Tidal Flats and Salt Marshes in the NOWPAP region

35. Habitat conservation is selected as a high priority topic for marine biodiversity conservation in the NOWPAP region. While CEARAC has worked on seagrass mapping during the past biennia, tidal flats and salt marshes are also recognized as critical habitats for marine species. Therefore, CEARAC plans to assess the distribution and the historical change of tidal flats and salt marshes in the NOWPAP region with remote sensing techniques and evaluate anthropogenic pressures on these habitats.

Table 3. List of CEARAC Activities for the 2020-2021 Biennium

- Assessment of Distribution of Tidal Flats and Salt Marshes in the NOWPAP region
- Organization of a Training Course on Environmental DNA analysis
- Update of HAB Database and HAB Reference Database
- Case Studies of Estimating Seagrass Blue Carbon in Selected Sea Areas in the NOWPAP region
- Improvement of the NOWPAP NEAT for Assessment and Monitoring of Eutrophication Using Satellite Chlorophyll-a
- Organization of the 5th NOWPAP Training Course on Remote Sensing Data Analysis
- Strengthening Regional Capacity for Monitoring and Coastal Environmental Assessment through Knowledge/Information Sharing and Capacity Building
- Maintenance of Websites

5.1.2 Organization of a Training Course on Environmental DNA Analysis

36. Environmental DNA (eDNA) is a new molecular biological technique. It has a high potential to provide reliable information on biodiversity. However, it is quite new, and the analytical methods have not been standardized yet, and there may be challenges to use this technique in the NOWPAP Member States. As the first step for using eDNA for NOWPAP biodiversity activities, CEARAC plans to organize a training course on eDNA analysis for scientists of the NOWPAP Member States to understand and share its methodology.

5.1.3 Update of HAB Database and HAB Reference Database

37. Monitoring and assessment of HAB is a part of the CEARAC's main work since its inception. In recent years, new issues, such as change in the distribution of HAB causative species due to global warming, as well as massive algal blooms, like green tides and golden tides, were reported in the NOWPAP Member States. Such phenomena have a negative impact on the ecosystems and biodiversity in the NOWPAP region. Therefore, CEARAC plans to update both the HAB database and the HAB reference database in 2020-2021.

5.1.4 Case Studies of Estimating Seagrass Blue Carbon in Selected Sea Areas in the NOWPAP Region

38. CEARAC will estimate the amount of blue carbon in selected areas in the NOWPAP Member States. The results of these case studies will be reported in an expert meeting in 2020, which is to be held back-to-back with an international workshop to raise public awareness on the importance of seagrass beds.

5.1.5 Improvement of the NOWPAP NEAT for assessment and monitoring of eutrophication using satellite chlorophyll-a

39. CEARAC will improve the NOWPAP NEAT, which has been developed based on the Screening Procedure of the NOWPAP Common Procedure for evaluation of potential eutrophic zones in the NOWPAP region. In the improvement, new ocean color sensors will be evaluated and incorporated into the assessment of eutrophication in the coastal and closed bays of the NOWPAP region.

5.1.6 Organization of the 5th NOWPAP Training Course on Remote Sensing Data Analysis

40. CEARAC will organize a one-week training course on remote sensing data analysis for graduate students, young scientists, professionals, and NGO staff. The venue will be chosen in one of the NOWPAP Member States, similarly to the past four trainings. At the training course, lectures and hands-on training on eutrophication assessment and mapping seagrass will be given by prominent lecturers to help improve the knowledge and skills of trainees. An Organization Committee will be established to screen applications, as well as to design the contents of the training course.

5.1.7 Strengthening Regional Capacity for Monitoring and Coastal Environmental Assessment through Knowledge/Information Sharing and Capacity Building

Organization of meetings (18th and 19th FPMs and Expert Meeting on Eutrophication Assessment)

41. The 18th and 19th CEARAC Focal Points Meetings (FPM) will be held in Toyama, Japan, in 2020 and 2021, respectively. Each FPM will review the progress of on-going activities and give suggestions. Besides, in the 19th FPM, CEARAC FPs will discuss a draft workplan and budget of CEARAC activities for the 2022-2023 biennium.

42. The 3rd expert meeting on eutrophication assessment will be held in 2021, and national experts to be nominated by the Member States will report the status of eutrophication in the selected areas of the region. The Secretariat of CEARAC will explain the progress of the improvement work of the NOWPAP NEAT during the meeting.

Strengthening Regional Capacity through Collaborative Actions

43. The Secretariat of CEARAC will strengthen partnership with other NOWPAP Partner organizations to explore collaborative actions for (i) synergy effects of CEARAC activities in wider NOWPAP and neighboring regions; (ii) avoiding unnecessary overlap of activities; and (iii) exploring opportunities of financial mobilization. For example, CEARAC has kept contacting PICES, IOC Sub-Commission for the West Pacific (IOC/WESTPAC), and UNDP/GEF Yellow Sea Large Marine Ecosystem (YSLME) for co-organizing training events (e.g., on eDNA and remote sensing data analysis) in the 2020-2021 biennium.

5.1.8 Maintenance of Websites

44. CEARAC will continue updating the contents (data and information) of its websites regularly by uploading the latest information such as data of the marine environment in the NOWPAP region, outputs of current CEARAC activities, and newsletters. This activity is linked to the update of the HAB database and the HAB reference database.

5.2 Planned Budget for CEARAC Activities for the 2020-2021 Biennium

45. Draft workplan and planned budget for CEARAC activities for the 2020-2021 biennium are shown in Table 4. The Secretariat of CEARAC estimates the total budget for CEARAC activities for 2020-2021 to be $185,000, the same as the one for the 2018-2019 biennium.

Table 4. Draft Workplan and Planned Budget for CEARAC Activities for the 2020-2021 biennium (US$ 185,000)

Activity	Planned Budget (US$)		
	2020	2021	Total
Assessment of Distribution of Tidal Flats and Salt Marshes in the NOWPAP region			
- Development of a tidal flat/salt marsh map in the NOWPAP region	8,000		20,000
- Review of the tidal flats and salt marsh map		9,000 (3,000/ea)	
- Developing a report		3,000	
Organizing a training course on eDNA analysis		25,000	25,000
Updating HAB Database and HAB Reference Database		9,000	9,000
Case Studies of Estimating Seagrass Blue Carbon in Selected Sea Areas in the NOWPAP region			
- Implementation of case studies of estimating seagrass blue carbon	12,000 (3,000/ea)		27,000
- Organization of the Expert Meeting and the 2nd Int'l Workshop		15,000	
- Publication of a booklet for seagrass conservation in the NOWPAP region		T.B.D	
Improvement of the NOWPAP NEAT and Monitoring of Eutrophication Using Satellite Chlorophyll-a			
- Development of an online match-up tool	4,000		20,000
- Evaluation and development of satellite CHL product for use in the operational NEAT		12,000 (4,000/ea)	
- Operational eutrophication monitoring web-map (NEAT)		4,000	
Organization of the 5th Training Course on Remote Sensing Data Analysis		20,000	20,000
Strengthening Regional Capacity for Monitoring and Coastal Environmental Assessment through Knowledge/Information Sharing and Capacity Building			
- Organization of FPM 18 (2020) and preparation of the report	20,000		59,000
- Organization of FPM 19 (2021) and preparation of the report		20,000	
- Organization of Expert MT on Eutrophication Assessment and preparation of meeting report		14,000	
- Strengthening regional cooperation/coordination	2,500	2,500	
Maintenance of Websites (thr.2020-2021)	2,500	2,500	5,000
TOTAL	**49,000**	**136,000**	**185,000**

Annex 1. Major Outputs/Outcomes of CEARAC Activities for 2018-2019

The following table shows the outputs/outcomes delivered by CEARAC activities in the 2018-2019 biennium. Actions and outputs/outcomes are focused on the main tasks in 2019 and after.

Activity on Specific Projects	**Action (major tasks)**	**Outputs/Outcomes**
Development of CEARAC Medium-term Strategy on Marine Biodiversity (BIO MTS)	- Conducting feasibility assessment on the six topics by nominated national experts (1st half of 2019) - Developing a draft BIO MTS (~ August 2019) - Discussion on workplan on marine biodiversity conservation at 17th CEARAC FPM (9-10 Sep 2019) - Organizing a Workshop on CEARAC BIO MTS for marine biodiversity conservation (29 November 2019) - Proposal of CEARAC BIO MTS to the NOWPAP IGM24 (February 2020)	- Reports on the feasibility of potential topics, including the availability of information/data and the needs of member states. - The first draft of CEARAC MTS - Approval of the draft CEARAC BIO MTS in principle - Finalization of the draft CEARAC BIO MTS - Draft workplan for the 2020-2021 biennium [Expected] - Approval of CEARAC BIO MTS - Publication of CEARAC BIO MTS
Development of a Tool for Mapping Seagrass Distribution in the NOWPAP region	- Updating field data of seagrass by NPEC (In-kind) (~ Q3, 2019) - Contracting a consultant and constructing a web-based service of mapping seagrass distribution (~ Q4, 2019)	- Updated field data - Web-based service of mapping seagrass distribution
Development of the roadmap for Regional Action Plan for Marine and Coastal Biodiversity Conservation (RAP BIO)	- Nomination of experts (~ summer 2019) - Preparing the discussion paper on the roadmap for developing the NOWPAP RAP BIO (before Workshop) - Organizing a workshop on NOWPAP RAP BIO (28 November 2019)	- Establishment of a consultant/expert group for the development of RAP BIO - Discussion paper - Revised discussion paper - Revised workplan
	- Preparing a roadmap (discussion paper) (December 2019) - Organizing a workshop for developing the draft RAP BIO (summer 2020)	- Documents for the roadmap for the 24th NOWPAP IGM [Expected] - The first draft of RAP BIO for review by the NOWPAP member states (October 2020)

Activity on Marine Litter (RAP MALI)	**Action (major tasks)**	**Outputs/Outcomes**
Development of a Regional Overview of National Efforts to Address Microplastics and Collection of Relevant Marine Litter Data to Support RAP MALI	- Preparing a draft summary table which shows the relationship among legislations, strategies and actions/programs against microplastics, which are implemented in each member states (~Q3, 2019) - Collecting information on national legislation, strategy, action, etc. by nominated experts (Q4, 2019) - Developing a regional overview of national actions against microplastics based on collected information(Q4, 2019) - Reviewing the draft regional overview by MLFPs (Dec.2019) - Translating contents of Northwest Pacific Regional Node into Japanese (~Q4, 2019) - Compiling/harmonizing marine litter monitoring data submitted by Member states and sending it to DINRAC (In-kind) (throughout 2019)	- Draft summary table - Revised summary table - Draft regional overview - Regional overview of national efforts against microplastics - Japanese pages on Northwest Pacific Regional Node - Latest data on ML monitoring on beaches in the NOWPAP member states
Routine work	**Action (major tasks)**	**Outputs/Outcomes**
	- Organizing 17th FPM (9-10 September 2019)	- Successful organization of the meeting - Approval of reports in implementation of 2018-2019 activities and agreement on submission of a draft workplan for 2020-2021 - Meeting report (FPM17)
	- Organizing Expert Meeting on Eutrophication Assessment (22 March 2019)	- Successful organization of the meeting - Meeting proceeding
	- Participating in relevant events held by other RACs (e.g., FPMs, expert meetings) and/or NOWPAP partners and relevant organizations (throughout 2019)	- Sharing information on current activities among RACs - Strengthening partnership with relevant organizations - Increasing understanding of the marine and coastal environment in the NOWPAP region as well as necessary techniques such as application of remote sensing

Strengthening Regional Capacity for Monitoring and Coastal Environmental Assessment through knowledge and Information Sharing and Capacity Building	- Regularly updated information available on Marine Environmental Watch System as NEAR-GOOS database, including eutrophication data (throughout 2019) - Posting CEARAC newsletter (English and Japanese) (Dec. 2019)	- Updated info/data available on Marine Environmental Watch System - The latest issue of CEARAC Newsletter
Maintenance of CEARAC Websites	- Moving existing websites to cloud-based services (~end of 2019)	- Improved web system