

## **Report on CEARAC Activities for the 2020-2021 biennium**

### **1. Background**

In recent years, CEARAC has implemented activities in accordance with the prioritized working areas shown in the NOWPAP Medium-Term Strategy (MTS) 2018-2023 as well as pursuing mandates of CEARAC: monitoring and assessment of the marine and coastal environments with innovative and efficient tools such as remote sensing.

At the 17<sup>th</sup> CEARAC Focal Points Meeting (FPM) held on 19-20 September 2019, the CEARAC Secretariat proposed a workplan of CEARAC activities for the 2020-2021 biennium with six specific projects on monitoring and assessment of marine biodiversity, seagrass distribution and occurrences of eutrophication by using remote sensing techniques, and organization of two training course for regional capacity building. After discussion, the meeting agreed the proposed workplan to submit to the 24<sup>th</sup> NOWPAP Intergovernmental Meeting (IGM) to be held in later 2019.

However, COVID-19 pandemic prevented the NOWPAP member states from traveling overseas and it resulted in postponement of the organization of the IGM. In June 2020, the member states finally adopted the Programme of Work (PoW) of NOWPAP for the 2020-2021 biennium by e-mail correspondence, which includes the CEARAC workplan for 2020-2021.

Following this, CEARAC concluded Small-Scale Funding Agreement (SSFA) with UNEP in June 2020, and the planned CEARAC activities for the current biennium were officially started. Because of the late conclusion of the contract, the funding and activity term for 2020-2021 CEARAC activities were set between 15 June 2020 and 30 June 2022.

Due to the late start of planned activities and less direct contact with CEARAC FPs and experts because of the pandemic, the CEARAC Secretariat prepared implementation plans and circulated the paper among CEARAC FPs in August 2020, which was adopted by e-mail correspondence in September.

As of July 2021, while some of CEARAC activities for the 2020-2021 biennium are in the final stage of their implementation, others have been behind schedule and/or changed due to the prolonged influence of COVID-19.

## 2. CEARAC activities for the 2020-2021 biennium

CEARAC activities for the 2020-2021 biennium are shown in Table 1 below.

**Table 1. Planned activities of CEARAC for the 2020-2021 biennium**

Planned activity
<p><b>Routine Work</b></p> <p><b>Organization of meetings and cooperation/coordination with other RACs and NOWPAP partners</b></p> <ul style="list-style-type: none"> <li>- Organizing the 18<sup>th</sup> FPM (2020) and 19<sup>th</sup> FPM (2021)</li> <li>- Organizing the 3rd Expert Meeting on eutrophication assessment (2021)</li> <li>- Information exchange/sharing through participation of events (e.g. FPMs of other RACs)</li> <li>- Joint organization of events, if applicable</li> </ul>
<p><b>Maintenance of websites</b></p> <ul style="list-style-type: none"> <li>- Updating contents of CEARAC websites and the Marine Environmental Watch System</li> <li>- Uploading CEARAC newsletters (2020 and 2021)</li> </ul>
<p><b>Specific projects</b></p> <p><b>Assessment of the distribution of tidal flats and salt marshes in the NOWPAP region</b></p> <ul style="list-style-type: none"> <li>- Mapping tidal flats/salt marshes in each member state by using Global Intertidal Change (GIC)</li> </ul>
<p><b>Organization of a training course on eDNA analysis</b></p> <ul style="list-style-type: none"> <li>- Preparing an English manual</li> <li>- Organizing the 1<sup>st</sup> eDNA training course (Spring 2022)</li> </ul>
<p><b>Updating HAB database and HAB reference database</b></p> <ul style="list-style-type: none"> <li>- Updating HAB (reference) databases with latest information</li> </ul>
<p><b>Case studies of estimating seagrass blue carbon in selected sea areas in the NOWPAP region</b></p> <ul style="list-style-type: none"> <li>- Conducting case studies in selected sea areas in each member state</li> <li>- Organizing the 2<sup>nd</sup> International workshop and an expert meeting</li> <li>- Preparing a booklet</li> </ul>
<p><b>Improvement of the NOWPAP Eutrophication Assessment Tool (NEAT) for assessment and monitoring of eutrophication using satellite chlorophyll-a</b></p> <ul style="list-style-type: none"> <li>- Improving NEAT</li> </ul>
<p><b>Organization of the 5<sup>th</sup> NOWPAP training course on remote sensing data analysis</b></p> <ul style="list-style-type: none"> <li>- Organizing the 5<sup>th</sup> training course</li> </ul>

## 3. Major outputs/outcomes of CEARAC activities for the 2020-2021 biennium (as of July 2021)

### <Routine Work>

#### 3.1 Organization of meetings and cooperation/coordination with other RACs and NOWPAP partners

Because of the outbreak of coronavirus, the 18<sup>th</sup> Focal Points Meeting (FPM), which

was originally planned to be held in 2020, was postponed until 24 -25 August 2021. In addition, it has been difficult to hold the face-to-face FPM; therefore, the FPs agreed to organize an online meeting. The main agendas for FPM18 are review of the progress of the on-going CEARAC activities and consideration of potential activities for the next 2022-2023 biennium.

In addition to FPMs, CEARAC regularly holds expert meetings in every biennium. In 2020-2021, an expert meeting on seagrass blue carbon and the 3<sup>rd</sup> expert meeting on eutrophication assessment will be held virtually in the second half of 2021.

CEARAC has shared and exchanged information/data and experiences of its past and on-going activities with other RACs and/or NOWPAP partner organizations through participation of their meetings and other occasions as well as e-mail correspondences. In 2021, CEARAC has participated in DINRAC FPM in January and MERRAC FPM in July, both of which were held virtually.

Then, upon request from POMRAC, CEARAC has provided some input on marine biodiversity to POMRAC to help development of the third version of the State of the Marine Environment Report (SOMER-3), which will be published in the next biennium (2022-2023). Besides, because of some difficulty in money transfer to Russia and accumulated unspent budget in each RAC for organization of online meetings without travel expenses, NOWPAP RCU requested three RACs (CEARAC, DINRAC and MERRAC) to support POMRAC's activities by using their unspent budget. In case of CEARAC, part of its unspent budget was decided to be allocated for this POMRAC's SOMER-3 development activity, and the Memorandum on this matter was exchanged between NOWPAP RCU and CEARAC.

### **3.2 Maintenance of websites**

CEARAC periodically updates the contents of its website (<http://cearac.nowpap.org/>), including CEARAC annual newsletters in English and Japanese, which introduce highlights of CEARAC activities (<http://cearac.nowpap.org/newsletter/>).

### **<Specific Projects>**

#### **3.3 Assessment of the distribution of tidal flats and salt marshes in the NOWPAP region**

This assessment activity is planned to use a tool for mapping tidal flats and salt marshes, –Global Intertidal Changed (GIC) developed by Dr. Nicholas Murray of James Cook University. In 2020, the system of the tool was revised specifically to suit to the NOWPAP region based on national input provided by the nominated experts in each member state. Then, the first draft distribution map of tidal flats in the NOWPAP region was developed in June 2021. However, there are still some fault detection occurred. Thus, Dr. Murray developed an online tool to remove such fault detection from the map, and the CEARAC Secretariat asked the nominated experts to review and correct the

draft map using the online tool. After review and correction work, the distribution map will be finalized by the end of October.

To explain the methodology for mapping tidal flats using GIC as well as to explain the limitation and accuracy of the tool, CEARAC will publish a report on assessment of the distribution of tidal flats and salt marshes in the NOWPAP region by June 2022.

### **3.4 Organization of a training course on eDNA analysis**

An English manual for the planned environmental DNA (eDNA) analysis training course was prepared in 2020 based on the Japanese manual of the eDNA Society in Japan, and it was distributed to relevant researchers and organizations in the member states for reference. The training course with practical hands-on experiences was planned in spring 2022 in Japan; however, it is still not certain because of the coronavirus situation. CEARAC Secretariat has been observing the current pandemic situation including the number of patients, vaccination, and/or restrictions for international travelers to Japan as well as the preparation of the venue, Kobe University. The final decision of the timing of the training course will be decided at the 18<sup>th</sup> CEARAC FPM.

### **3.5 Updating of HAB database and HAB reference database**

CEARAC Secretariat constructed an integrated website on harmful algal blooms (HABs) more than 10 years ago, and since then, there haven't enough update work done to their contents. By the end of the first half of 2021, the CEARAC Secretariat has collected recent information on HABs and/or red tide occurrences in the NOWPAP member states and scientific paper in each member state. CEARAC Secretariat, then, will ask the FPs at the 18<sup>th</sup> CEARAC FPM to nominate experts who will review the developed draft lists of new information for updating the HAB Integrated Website. The experts will add more information to the lists, if possible. This activity is planned to be completed at the end of 2021.

### **3.6 Case studies of estimating seagrass blue carbon in selected sea areas in the NOWPAP region**

CEARAC has constructed a Mapseagrass project website to help scientists, researchers, conservationist and policy maker map the distribution of seagrass using satellite images. CEARAC then started trial operation of cloud-based seagrass mapping tools; Seagrass Mapper built using Google Earth Engine for mapping and Seagrass Trainer to manage field-based seagrass information to prepare training data to work with the Seagrass Mapper. These tools will be utilized for mapping seagrass in selected sea areas in the NOWPAP member states then for estimating blue carbon in seagrass ecosystem.

By now, national experts were nominated by CEARAC FPs to carry out case studies of estimating seagrass blue carbon in selected sea areas in each NOWPAP member

state. Case study results will be discussed at an online expert meeting planned at the end of 2021. CEARAC will then develop a booklet with a summary of the case studies and recommendations for conservation of seagrass beds.

### **3.7 Improvement of the NOWPAP Eutrophication Assessment Tool (NEAT) for assessment and monitoring of eutrophication using chlorophyll-a**

Since the development of the NOWPAP common procedure of eutrophication assessment in 2009, CEARAC has refined the first step (Screening Procedure) of the procedure and developed the NOWPAP Eutrophication Assessment Tool (NEAT) to enable detection of potential eutrophic zones by using satellite derived chlorophyll-a (CHL) data.

NEAT was introduced as one of the innovative actions in Regional Seas Programmes of UNEP in the final draft of “Global Manual on Ocean Statistics Towards a definition of indicator methodologies” (2018) and also selected as one of the 32 winning projects to address some of the biggest global challenges using open Earth Data by Group on Earth Observation (GEO) and Google Earth Engine (GEE) in 2020.

Currently, CEARAC has worked on global application of NEAT under cooperation with Nagoya University, Japan Aerospace Exploration Agency (JAXA), Google and the Northwest Pacific Region Environmental Cooperation Center (NPEC), the host organization of CEARAC.

For continuous use of NEAT in monitoring and assessment of the marine environment, preparation of long-term consistent CHL data is necessary by adopting new satellite sensors. For this purpose, CEARAC has developed an online match-up tool to evaluate satellite derived data against in-situ data collected by national experts in NOWPAP member states. In-situ data will be collected by the end of October and newly evaluated long-term consistent CHL data will be prepared by CEARAC for continuous assessment of eutrophication in the NOWPAP region.

### **3.8 Organization of the 5<sup>th</sup> training course of remote sensing data analysis**

CEARAC organized four training courses for remote sensing data analysis in 2007-2013. Since the last training course (2013), CEARAC has developed new monitoring and assessment tools for coastal environment by using remote sensing techniques, such as the NEAT and the cloud-based seagrass mapping tools.

CEARAC will organize the 5<sup>th</sup> training course in aiming to help capacity building and promote the use of these newly developed tools in the NOWPAP and neighboring regions. Because of COVID-19 pandemic, the planned training course will be switched to as a webinar style from a conventional style with participants gathering in person. The webinar will be organized in December 2021.

## **4. Other work**

### **4.1 Development of Regional Action Plan for Marine and Coastal Biodiversity**

### **Conservation (RAP BIO)**

Development of Regional Action Plan for Marine and Coastal Biodiversity Conservation (RAP BIO) has been a continued work since the 2018-2019 biennium. In the last biennium, CEARAC developed a roadmap of RAP BIO in cooperation with NOWPAP RCU, other RACs, nominated national experts and a hired international consultant, and it was planned to be submitted to the 24<sup>th</sup> NOWPAP IGM. However, because of the postponement of the IGM, the member states approved the roadmap through e-mail communication, and it was decided to develop the RAP BIO using the unspent budget from 2018-2019.

After a draft RAP BIO was developed by the international consultant and circulated among the nominated experts and the RACs for comments, NOWPA RCU organised a virtual meeting in March 2021 with the experts and RAC representatives. Following the comments and suggestions, the draft document was further revised and sent to the NOWPAP Focal Points for national consultations in April 2021. It is expected that the member states will approve the RAP BIO at the 24<sup>th</sup> NOWAPAP IGM to be held in 2021 virtually.

### **5. Budget and expenditure for CEARAC activities for the 2020-2021 biennium**

Based on the adoption of the NOWPAP Program of Work (PoW) for the 2020-2021 biennium by the NOWPAP member states in May 2020 by e-mail correspondence, CEARAC has been allocated 185,000 US dollars for its activities. Because of COVID-19 pandemic, organization of planned meetings and training courses have been suspended or postponed, and some amount of budget has been unspent as of July 2021. Table 2 shows the budget and the current status of expenditures of CEARAC activities for the 2020-2021 biennium.

**Table 2 Budget and Expenditures of for CEARAC Activities for the 2020-2021 biennium (as of July 2021)**

Activity	Budget (USD)		Expenditure (USD) (as of July 2021)		Unspent amount (USD) (as of July 2021)	
	breakdown	total	spent	balance	to be spent by June 2022	Final Balance (projected)**
<b>Meetings and cooperation/coordination</b> - 2 FPMs (18+19) Expert MT - Cooperation/coordination	59,000	59,000	5,000	54,000	6,000	48,000
<b>Website maintenance</b>	5,000	5,000	100	4,900	4,900	0
<b>Assessment of tidal flat/salt marsh distribution</b> - Collecting info./reviewing a draft map - Accuracy assessment - Revision of GIC	9,000 3,000 8,000	20,000	0 0 0	20,000	20,000	0
<b>eDNA Training Course</b>	25,000	25,000	0	25,000	(25,000) (TBD at FPM18)	(25,000)
<b>HAB database update</b> - Information review by experts - Updating the website	6,000 3,000	9,000	0 0	9,000	9,000	0
<b>Seagrass blue carbon estimation*</b> - Case study by experts - Developing a booklet	24,000 3,000	27,000	0 0	27,000	27,000	0
<b>NEAT improvement</b> - Developing match-up tool - Evaluation by experts - Interactive NEAT monitoring web-map	4,000 12,000 4,000	20,000	4,000 0 0	16,000	16,000	0
<b>5<sup>th</sup> remote sensing training course</b>	20,000	20,000	0	20,000	20,000	0
<b>Total</b>		<b>185,000</b>	<b>9,100</b>	<b>175,900</b>	<b>102,900+25,000</b>	<b>48,000+25,000</b>

\* The budget was revised and adopted by CEARAC FPs by e-mail correspondence in June 2021.

\*\* When some allocated fund is left unspent at the end of the contracted term (June 2022), the money is to be returned to UNEP.