Newsletter from
NOWPAP CEARAC

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

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Contents

Greetings from the Director of CEARAC

It is my great pleasure to publish the 10th issue of CEARAC annual newsletter.

Since its establishment in 2002, the Special Monitoring & Coastal Environmental Assessment Regional Activity Centre (CEARAC) of NOWPAP has been expanding its working areas from the monitoring and assessment of Harmful Algal Blooms (HABs) and development of new assessment tools using remotes sensing techniques to marine litter, eutrophication and marine biodiversity conservation.

In the 2012-2013 biennium, CEARAC has made several notable accomplishments, which include the development of two important regional reports to be made available in early 2014. One of which is a regional report on marine biodiversity entitled “Monitoring and management of Marine Protected Areas in the NOWPAP Region”; and the other is a regional report on eutrophication assessment entitled “Application of the refined NOWPAP Common Procedure for eutrophication assessment in selected sea areas in the NOWPAP region.” CEARAC also held the NOWPAP-PICES Joint Training Course on Remote Sensing Data Analysis in October 2013 in Qingdao, China to facilitate capacity building of young researchers in the NOWPAP member states and beyond. CEARAC also made serious efforts to disseminate data and information to various audience including local communities. One good example was the publication of a brochure entitled “Best practices for prevention of marine litter input from land-based sources in the NOWPAP region” in English and 4 languages of the NOWPAP members (Chinese, Japanese, Korean and Russian) in order to raise awareness of general citizens about marine litter problems and mitigation activities.

Building on such accomplishments in the 2012-2013 biennium, CEARAC plans to move to the next stage of marine biodiversity conservation and eutrophication assessment activities, and initiate a new activity on seagrass and seaweed mapping using remote sensing techniques. Through these activities, CEARAC is looking at future development of comprehensive marine environmental assessment tools.

I would sincerely like to seek your continued understanding of and support for the activities of CEARAC in 2014.

Hiroshi ONO, Director of CEARAC

TATEYAMA Mountain Range and Toyama City

Meetings

The Expert Meeting on Marine Biodiversity and Eutrophication in the Northwest Pacific Region

The Expert Meeting on Marine Biodiversity and Eutrophication in the Northwest Pacific Region was held on August 5-6 in Toyama, Japan. Experts on marine biodiversity, eutrophication and seagrass/seaweed mapping from the NOWPAP region as well as representatives of NOWPAP RCU and the North Pacific Marine Science Organization (PICES) participated in the meeting.

The meeting reviewed the progress of on-going CEARAC activities for the 2012-2013 biennium on marine biodiversity and eutrophication. Also, relevant activities on seagrass and seaweed mapping were introduced by experts. CEARAC presented draft proposals of activities on marine biodiversity, eutrophication and seagrass and seaweed mapping for the 2014-2015 biennium and the meeting provided various suggestions for their improvement. Taking into account the suggestions from the meeting, CEARAC elaborated the draft proposals and presented them to the 11th CEARAC FPM.

The Eleventh CEARAC Focal Points Meeting

The 11th CEARAC FPM was held on September 11-12 2013 in Toyama, Japan with the participation of CEARAC Focal Points, representatives of NOWPAP RCU, other RACs, and PICES.

The meeting reviewed and adopted the report on the implementation of CEARAC activities and related expenditure in the 2012-2013 biennium including the development of two reports on marine protected areas and eutrophication.

The meeting also reviewed and agreed on the draft workplan and budget of CEARAC activities for the 2014-2015 biennium to be submitted to the 18th NOWPAP IGM (December 4-6, 2013, Toyama) after applying some modifications based on the suggestions from the meeting. The workplan includes three new specific projects: (1) pilot assessment of the impacts of major threats to marine biodiversity in selected sea areas in the NOWPAP region; (2) trial application of the screening procedure of the NOWPAP Common Procedure for eutrophication assessment; and (3) case studies of seagrass and seaweed mapping in selected sea areas in the NOWPAP region.

Report and Documents of CEARAC FPM11: http://cearac.nowpap.org/fpm/fpm11.html

Specific Projects

1. Marine Biodiversity (development of a report on marine protected areas)

CEARAC collected information on marine protected areas (MPAs) in the NOWPAP region making use of a database compiled by DINRAC. Then, CEARAC held a Joint Workshop on Marine Biodiversity Conservation and Marine Protected Areas in the Northwest Pacific on March 13-14 in Toyama, in collaboration with the North-East Asian Subregional Programme for Environmental Cooperation (NEASPEC) to exchange information of MPAs in each member state.

The collected information and study results were utilized to develop a regional report: Monitoring and management of Marine Protected Areas in the NOWPAP Region.

The report will be published in early 2014.

NOWPAP/NEASPEC Joint Workshop

2. Eutrophication (refinement of the NOWPAP Common Procedure)

Based on the assessment results of eutrophication status in selected case study areas and suggestions from contracted experts, CEARAC revised the NOWPAP Common Procedure developed in 2009. Then, in the 2012-2013 biennium, the same experts who involved in the previous assessment applied the refined procedure to case study areas (Jiaozhou Bay in China, Northwest Kyushu sea area and Toyama Bay in Japan, Jinhae Bay in Korea, and the Peter the Great Bay in Russia) in order to verify the applicability of the refined NOWPAP Common Procedure.

CEARAC reported on the progress of the work and the table of contents of the regional overview report: Application of the refined NOWPAP Common Procedure for eutrophication assessment in selected sea areas in the NOWPAP Region.

The report will be published in early 2014.

3. Remote Sensing (organization of a training course)

In collaboration with Chinese FPs of CEARAC and Chinese National Environmental Monitoring Center (CNEMC), CEARAC organized NOWPAP-PICES Joint Training Course on Remote Sensing Data Analysis on October 21-25 at Ocean University of China in Qingdao. Among 73 applicants, an organizing committee selected 23 trainees including 7 trainees funded by CNEMC, PICES and the International Ocean Color Coordinating Group and 16 self-funded trainees. Lecturers from the NOWPAP member states, Germany and the US gave lectures on remote sensing techniques for monitoring and assessment of marine

Lecture

Hands on practice

environment including Introduction to ocean color remote sensing, validation, time series analysis of ocean color data and preliminary eutrophication assessment by remote sensing.

Please visit the following website: http://cearac.nowpap.org/monitoring/4thRST/

Participants of the training course

Completion ceremony

4. Marine litter

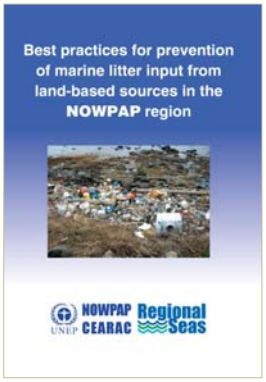
4-1. Publication of reports

As its regular work, CEARAC collected marine litter monitoring data on beaches and submitted them to DINRAC for compilation in order to share the information on current status of marine litter in the NOWPAP region among the member states.

Then, CEARAC compiled information on government measures and best practices for prevention of marine litter input from land sources in the NOWPAP member states, including cooperation among national and local governments, NGOs/NPOs, citizen groups, and developed a regional report in English.
(See http://www.cearac-project.org/RAP_MALI/Regional_report_on_best_practice.pdf)

With the support of small-scale funding from Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), CEARAC published a brochure entitled “Best practices for prevention of marine litter input from land-based sources in the NOWPAP region” in English and 4 languages of the NOWPAP members (Chinese, Japanese, Korean and Russian) based on the above report for public awareness raising.

The reports are downloadable here: http://cearac.nowpap.org/publications/index.html



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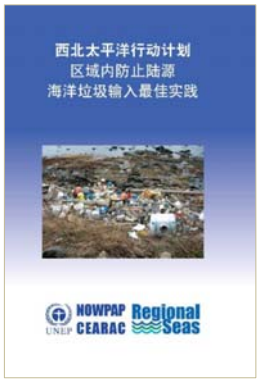

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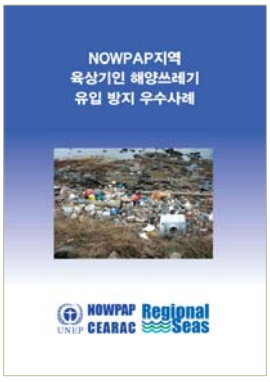

Korean

Russian

4-2. 2013 NOWPAP International Coastal Cleanup and Workshop on Marine Litter Management in Okinawa, Japan

2013 NOWPAP International Coastal Cleanup (NOWPAP ICC) and Workshop on Marine Litter Management was held on October 24-26 in Okinawa, Japan. Since its inception in Yamagata, Japan in 2008, NOWPAP ICC has been held annually in one of the NOWPAP member states.

Along with governmental officials, researchers and NGOs in the NOWPAP member states, representatives of relevant organizations and NGOs from the U.S.A, Canada, Hong Kong and southeastern countries participated in the workshop which was held in Okinawa Institute of Science and Technology Graduate University. On the 1st day of the workshop, there were presentations on activities by NGOs and central and local governments against marine litter with latest information. CEARAC introduced a beach survey and marine art production and exhibition, both of which are conducted by the Northwest Pacific Region Environmental Cooperation Center (NPEC), host organization of CEARAC. CEARAC also presented a newly developed report in 2013, “Best practices for prevention of marine litter input from land-based sources in the NOWPAP region.”

On the 2nd day, there were more presentations given on contaminants in resin pellets and their impacts on marine organisms, marine litter monitoring in coastal areas using sailing boat, and beach cleanup activities in Hong Kong and Alaska. On the 3rd day, participants conducted beach cleanup at Kuraha Beach in Onna Village. Since a typhoon hit the area last few days, a large volume of marine litter was washed ashore. Fishing gear (e.g. buoys) was one of the major items, and the amount of litter related to leisure activity was also big as the beach is in a resort area. One thing we might need to pay attention from now on was that a large number of resin pellets were included in marine litter on the beach.

The next NOWPAP ICC will be held in Korea in 2014.

Cooperation with NOWPAP partners

1. Attending PICES Annual Meeting in 2013

PICES 2013 Annual Meeting was held on October 11-20 in Nanaimo, BC, Canada. On behalf of NOWPAP, one CEARAC researcher (Dr. Takafumi Yoshida) has been an ex-officio member of Section on Ecology of Harmful Algal Blooms in the North Pacific（S-HAB） and attended the annual meeting. North Pacific Marine Science Organization (PICES) has been supported CEARAC activities to co-organize the training course on remote sensing data analysis and to support developing marine and coastal environment assessment tools, so this organization is one of the important partners for CEARAC and NOWPAP as well.

During the 2013 meeting, there was a workshop titled “Economic Impacts of harmful algal blooms on fisheries and aquaculture” and Dr. Yoshida presented HAB occurrences and countermeasures against the problem in the NOWPAP region. In the NOWPAP region, HAB is a serious problem; serious damage in Yatsushiro Sea, Japan in 2009

and 2010 by Chattonella antique and HAB impact in Korea in 2013 have been reported. To reduce negative impacts of HAB, the NOWPAP members have worked on establishing a monitoring system and information networking, and development of early detection tools.

After the workshop, S-HAB meeting was held and the participants exchanged their opinions on future S-HAB activities including the future scope of S-HAB. Also, it was proposed that PICES publish a report on economic impacts of harmful algal blooms on fisheries and aquaculture in cooperation with NOWPAP, which was approved later at the PICES Governing Council. CEARAC and PICES will discuss the contents of the report and other matters with PICES from now on.

In addition, activities of PICES Working Group G28, a group for development of ecosystem indicators to characterize ecosystem response to multiple stressors established in 2011, can be very helpful for current CEARAC projects, so Dr. Yoshida also attended its meeting. After developing an assessment procedure of the eutrophication status in the NOWPAP region in 2009, CEARAC has initiated a new activity for another assessment tool to conserve marine biodiversity in the region. In selecting appropriate indicators, information which WG28 has collected will be a good reference. WG28 plans to develop a report in 2014 to introduce outcomes of its past and current works, and the meeting discussed the contents. The contents will be review of studies on ecosystem indicators and multiple stressors, introduction of some case studies in the North Pacific, and recommendations to PICES and its member states. Sharing the same interests with WG28, CEARAC would like to closely communicate with PICES and promote more cooperation and collaboration.

On October 13 and 16, Dr. Yoshida joined the MEQ (Marine Environmental Quality Committee) meeting and made a brief presentation on CEARAC activities. MEQ is the host body of S-HAB and WG28. At the meeting, it was confirmed that PICES strengthen the collaboration with NOWPAP.

PICES 2014 Annual Meeting will be held in Yeosu, Korea with workshops on marine litter and others. Since marine litter is one big issue NOWPAP has made efforts to address, it is expected to strengthen the partnership between NOWPAP/CEARAC and PICES in various working areas.

2. Attending PICES Summer School on Ocean Observing Systems and Ecosystem Monitoring

Mr. Genki Terauchi, a senior researcher of CEARAC, participated in the PICES 2013 Summer School on Ocean Observing System and Ecosystem Monitoring was which conducted at Hatfield Marine Science Center (HMSC), Newport, OR, USA on August 19-23. HMSC, affiliated organization of Oregon State University (OSU), also functions as a research institution for US Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA) and Oregon Department of Fish and Wildlife (ODFW). The summer school participants were able to use facilities of HMSC.

On the 1st day, an orientation was followed by lectures on observation of marine and river basins, physical oceanography, chemistry, biology, and fisheries science, taking examples from marine environmental issues on the west coast of the U.S. Hypoxic water masses have been observed since 2002 with damage to fisheries by mass mortality of crab, starfish and sea cucumber.

Coastal upwelling in this region is induced by strong northern wind, and sea water of low dissolved oxygen in the deep sea (150-200 m) are getting pulled up the shallow water. Then, when phytoplankton, which takes land-based nutrients and grows, sinks at the sea bottom and consumes oxygen in the process of decomposition. These two phenomena occur at the same time and seem to lead hypoxic water masses in this region. However, since Oregon State faces the Pacific Ocean, hypoxia may be mainly caused by changes of currents and winds led by climate change rather than by eutrophication driven hypoxia in the Gulf of Mexico.

From the 2nd day on, the students were divided into 4 groups, and Mr. Terauchi as a member of the Group 3 took lectures and demonstrations on chemistry in the morning and physical oceanography in the afternoon. In the chemistry class, the group estimated ocean's ability to absorb carbon dioxide (CO_2) by measuring partial pressure of CO_2 (pCO_2), using a measuring device developed by OSU. In the afternoon, the group learned the physical structure of water mass by plotting and analyzing data of water temperature and salinity, which were obtained by Group 1 in the morning at several points from the river mouth of the Yaquina to the upstream areas. Also, characteristic of the autonomous underwater glider "Jane" developed by OSU and how to analyze the obtained data were introduced.

On the morning of the 3rd day, the Group 3 collected water in a bottle at fixed points (4-5 spots) between the river mouth of the Yaquina and its upstream (several kilometers) for (Conductivity Temperature Depth (CTD) measurement and nutrient analysis. In the afternoon, the students learned a formula to estimate ecosystem metabolism, using hourly CTD data that were collected at designated points on the river mouth of the Yaquina, coastal, and offshore areas for about two weeks period. Then, the students compared the obtained estimation with the windstress data, and understood the mechanism of metabolism increase by coastal upwelling after a strong north wind blows.

On the 4th day, Dr. Howard Freedland gave a lecture on Argo floats. “Argo” is a system used in an international project started in 2000 for real-time observation of global oceanographic changes. In the lecture, Dr. Freedland explained the progress of the project including free access to the observed data based by the Argo system and the latest model of the floats. Then, a review session for the 1st and 2nd days was held and a group presentation for the last day was explained. Each group was to be assigned different projects by lot, and Group 3 (Mr. Terauchi’s group) was asked to identify special variation of physical structure on the Yaquina basin using the obtained data in the demonstration session in the course. After dinner, each group spent time together in preparing group presentation on the final day.

On the morning of the final day, each group made a presentation. Group 3 explained the influence of the open ocean on special variation of physical structure on the Yaquina basin, using the various data: CTD and Acoustic Doppler Current Profiler (ADCP) data obtained by two observations conducted by other groups (low tide in the afternoon on Aug 21 and high tide in the morning on Aug 22); benthos samples caught by set net in the afternoon on Aug 21; data of the open ocean surface current by HF radar and undersea glider data by OSU; and chlorophyll-a concentration data from NASA ocean color website. Mr. Terauchi explained what’s happening offshore using observation data, and pointed out that three phenomenon which manifest typical coastal upwelling in this area: (1) north to southwest surface current movement observed by HF radar data on Aug 21-22, (2) high chlorophyll-a concentration, low water temperature, high salinity, and low dissolved oxygen observed by the glider Jane at offshore of Newport on Aug 17- 20 and (3) high chlorophyll-a concentration in coastal area near Newport observed by NASA ocean color satellite. Group 3 then concluded that the Yaquina basin is strongly influenced by the open ocean, in particular, at high tide time.

This summer school was very helpful for CEARAC activity. In particular, hypoxia is often caused by eutrophication in which CEARAC has been actively involved in its assessment in the past several years. Although, there are no specific activities on hypoxia being implemented in NOWPAP yet; it is obviously one of the major threats to marine environment in the NOWPAP region and more attention should be paid to it.

A group photo taken on the last day of the PICES Summer School

Workplan for 2014-2015 biennium

The following is the list of major activities which CEARAC proposes to implement in the 2014-2015 biennium.

Major Activity	Description
Organization of Meetings	12th and 13th FPMs and Expert Meeting
Maintenance of Websites	Regular update of information and publication of newsletter
< Specific projects> ◆ Marine Biodiversity ◆ Eutrophication ◆ Seagrass mapping	- Pilot assessment of the impacts of major threats to marine biodiversity in selected areas in the NOWPAP region - Trial application of the screening procedure of the NOWPAP Common Procedure for eutrophication assessment - Case studies of seagrass and seaweed mapping in selected sea areas in the NOWPAP region
Marine litter (RAP MALI)	- Collection and harmonization of monitoring data - Report of case studies on basin-wide collaborative actions for prevention of marine litter input from land-based sources in Japan

CEARAC Focal Points

Country	Name	Organization
China	Ms. Guihua DONG	China National Environmental Monitoring Center
	Dr. Junlong LI	China National Environmental Monitoring Center
Japan	Ms. Sawako TADA	Ministry of the Environment Japan
	Dr. Yasuwo FUKUYO	The University of Tokyo
	Dr. Joji ISHIZAKA	Nagoya University
Korea	Dr. Changkyu LEE	National Fisheries Research and Development Institute
	Dr. Yoon LEE	National Fisheries Research and Development Institute
	Dr. Yong-Woo LEE	Marine Environment Research & Training Institute
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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Northwest Pacific Region Environmental Cooperation Center (NPEC)
5-5 Ushijimashin-machi, Toyama City, Toyama, 930-0856, JAPAN
Tel: +81-76-445-1571 / Fax: +81-76-445-1581
Website: http://cearac.nowpap.org/ Email: webmaster@cearac.nowpap.org