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## Future Activities of CEARAC

### *Greetings from the Director of CEARAC, Norihiko TANAKA*



We have the pleasure of announcing the release of CEARAC annual newsletter in 2011. I hope that this newsletter will show its readers the hints on the issues to be focused from a viewpoint to

conserve the marine environment in the NOWPAP region.

In 2011, CEARAC held the Expert Meeting on Marine Biodiversity and Eutrophication in the Northwest Pacific Region (4-5 August, Toyama, Japan) and the 9th NOWPAP CEARAC Focal Points Meeting (6-7 September, Toyama, Japan) and reviewed the activities implemented for the 2010-2011 biennium and discussed possible activities to initiate for the next biennium, 2012-2013.

The followings are the brief introduction of CEARAC activities for 2012-2013 adopted in the meetings above.

(1) Eutrophication: case studies for assessing the eutrophication status in the selected sea areas in the NOWPAP region were conducted, using 'Procedures for the assessment of eutrophication status including evaluation of land based sources of nutrients for the NOWPAP region (NOWPAP Common Procedure) developed in 2009. Then CEARAC analyzed the results of all case studies comprehensively. Along with showing the current eutrophication status in the selected sea areas, the results identified some problems in comparability among the results. Therefore the NOWPAP Common Procedure needs some improvement for obtaining more accurate assessment results. Consequently, CEARAC will conduct the **'refinement work of the NOWPAP Common Procedure for eutrophication assessment towards assessment of the whole NOWPAP region.'** Besides improvement and enhancement

of the NOWPAP Common Procedure, articles review (reviewing published papers and reports on eutrophication and ecological modeling) will be implemented so as to move on to the next step towards assessment and management of eutrophication.

(2) Marine biodiversity: The tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD COP 10) was held in Nagoya, Japan in 2010 and the Aichi Targets were adopted, which included Target 11 stating "By 2020, at least ..... and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes." Thus, it is expected that littoral states will design, plan, develop and implement various activities and programmes to achieve the target, and CEARAC will also implement one related activity, **'preparing the regional report for the conservation and sustainable use of marine biodiversity in the NOWPAP region'** to contribute to establishment of national marine protected areas (MPAs).

This activity includes collection of basic information on the existing MPAs in the NOWPAP region, based on the database on MPAs by NOWPAP DINRAC and analysis in the current status of them. A research for the status of monitoring and management in some MPAs will also be conducted. In addition, considering a new approach for conservation of the marine biodiversity such as designing ecologically and biologically significant areas (EBSAs), CEARAC will develop a comprehensive report on possible measures, including MPAs, to be taken for conservation of the marine biodiversity in the NOWPAP Region. The outcomes of this

activity will be effectively used in the future assessment of the environmental status in the NOWPAP sea area, which will be facilitated based on the 2010-2011 activities.

(3) Remote Sensing : three training courses on remote sensing data analysis have been held in Japan, Korea and Russia by now, and the experiences through these events helped CEARAC develop closer cooperation with other regional/international organizations such as IOC/WESTPAC, PICES and IOCCG. This activity has also contributed to capacity building in terms of satellite data

application in the NOWPAP region and the adjacent areas. CEARAC together with potential partners expects to continue the 'training course on remote sensing data analysis' and the next one is planned to be held in China.

CEARAC is one of the four regional activity centres of NOWPAP and responsible for assessment and monitoring of the coastal and marine environment, including development of tools for environmental planning and management. To pursue the goal of NOWPAP, CEARAC will make more efforts on cooperation and coordination of activities

with other national/regional/international organizations and institutes as well as implementation of activities focusing on eutrophication and conservation of the marine biodiversity.

From next year on, CEARAC will provide information only through the electronic format for faster and wider circulation of the news. Thank you very much for reading the past issues of the newsletter, and CEARAC hopes that a new version of our newsletter will continuously help its readers deepen their knowledge on the coastal and marine environment and become more interested in the environmental issues.

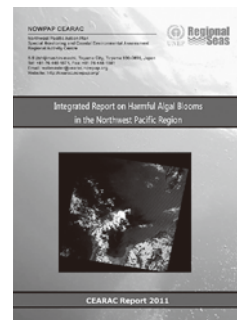
## Activities of Working Group 3 (Harmful Algal Blooms) in the 2010-2011 biennium

### Integrated Report on Harmful Algal Blooms for the NOWPAP Region

Six years have passed since the first publication of the Integrated Report on Harmful Algal Blooms (HABs) for the NOWPAP Region in 2005. Since then, CEARAC has implemented HAB Case Study for establishing the most effective and laborsaving way for sharing information among the member states and developed a common sheet for data sharing. Using this common sheet, each member state has provided the recent information on HAB occurrences in the sea area where HABs occur frequently, and HAB monitoring is conducted regularly. In the 2010-2011 biennium, CEARAC updated the HAB Integrated Report by adding provided latest information from the member states. This updated report introduces not only

HAB occurrences in the NOWPAP region but also new topics in this region. In recent years, the causative species which induce serious fishery damages have been changing. *Cochlodinium polykrikoides* was the main causative species in the past; however, the number of bloom of *C. polykrikoides* decreased and other species, *Chattonella antiqua*, made a huge bloom and caused serious fishery damages. In Yatsushiro Sea and Ariake Sea in Japan, economic loss by *C. antiqua* bloom reached several billion Japanese Yen. In addition, massive blooms of green macroalgae *Ulva prolifera* has become of concern. Although this bloom doesn't cause fishery damages, much money was spent for removing a great amount of green macroalgae. To prevent

such damages by HABs, appropriate countermeasures are necessary in a timely manner. In the updated integrated report, several challenging studies using remote sensing and techniques of molecular genetics are introduced. This integrated report will be downloadable soon from CEARAC website (<http://cearac.nowpap.org/>).



### Workshop on remote sensing techniques for HAB detection and monitoring at the PICES 2011 Annual Meeting

CEARAC organized a one-day workshop at the PICES 2011 annual meeting in October in collaboration with PICES HAB Section back-to-back with the NOWPAP/PICES/WESTPAC joint training course on remote sensing data analysis held in Vladivostok. Remote sensing techniques have some

problems on resolution and data correction while there are advantages such as they can observe wider areas for longer periods of time. Continuous monitoring is quite useful for HAB detection and monitoring, so remote sensing is one of the potential tools for more comprehensive monitoring.

At the workshop, several case studies on monitoring and countermeasures of HABs were introduced. In the afternoon session, two invited speakers, Dr. Joji Ishizaka and Dr. Raphael Kudela, gave lectures on available satellite data and analysis software and demonstrations using them.

## Cochlodinium Homepage in Chinese, Korean and Russian version.

CEARAC established *Cochlodinium* Homepage several years ago and has provided useful information for understanding this species. To promote utilization of this homepage by more local stakeholders, CEARAC has prepared Chinese, Korean and Russian versions in the following site (<http://www.cearac-project.org/wg3/cochlo-entrance/>).



## Activities of Working Group 4 (Remote Sensing of the Marine Environment) in the 2010-2011 biennium

### Integrated Report on Ocean Remote Sensing for the NOWPAP region: towards assessment of marine and coastal environment (2011)

In 2005, CEARAC requested WG4 experts in the NOWPAP members (China, Japan, Korea and Russia) to prepare national reports on the status of ocean remote sensing (the status of its application to the marine environment), and then published the Integrated Report on Ocean Remote Sensing for the NOWPAP Region based on these national reports. The integrated report included recommendations on capacity building by training courses and an improved information network and on closer cooperation among other relevant

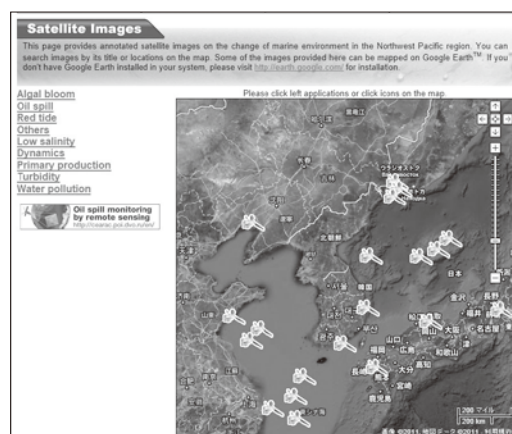
regional and international organizations and/or programmes in order to facilitate further utilization of ocean remote sensing in the marine environment. Meanwhile, new satellites and sensors have been deployed and more frequent and more detailed observation data has been being obtained in recent years. Re-assessment of past observation data also helps improvement of database for identifying long-term trends on phenomena such as climate change. As further studies and researches have been done, there has been progress in applying

remote sensing for conservation of the marine environment.

As six years have passed since the last publication of the Integrated Report, CEARAC has prepared a new Integrated Report on Ocean Remote Sensing for the NOWPAP region: towards assessment for marine and coastal environment (2011) by updating information with recent progress as mentioned above. This Integrated report will soon be available on CEARAC website (<http://cearac.nowpap.org/>).

## NOWPAP Ocean Remote Sensing Portal

Website of NOWPAP Ocean Remote Sensing Portal was constructed by combining existing two websites; Portal Site on Ocean remote sensing, and Education materials for utilization of remote sensing. More materials on ocean remote sensing in the NOWPAP region are available at (<http://www.cearac-project.org/wg4/portalsite/>).



# Report on the NOWPAP/PICES/WESTPAC Joint Training Course on Remote Sensing Data Analysis

The NOWPAP/PICES/WESTPAC joint training course on remote sensing data analysis was organized by the NOWPAP Special Monitoring & Coastal Environmental Assessment Regional Activity Centre (CEARAC), the North Pacific Marine Science Organization (PICES) and IOC Sub-Commission for the Western Pacific (WESTPAC) at the Far Eastern Federal University (FEFU) in Vladivostok, Russia on 8-12 October 2011. The course was co-sponsored by NOWPAP, PICES, WESTPAC and IOCCG. The training course was conducted for 22 selected trainees, from China, Japan, Korea, Russia, India, Indonesia and the Philippines, who are postgraduate students, professional researchers and local government officers working in the field of marine sciences.

Ten lecturers, from the NOWPAP member countries (China, Japan, Korea and Russia) and Germany and USA, delivered lectures on remote sensing applications for monitoring and assessment of the marine and coastal environment in the Northwest Pacific Region. The students obtained useful skills and knowledge to utilize remote sensing data for monitoring and assessing coastal and open ocean environments. The full report

of the training course is available on the NOWPAP CEARAC website at: (<http://cearac.nowpap.org/monitoring/3rdRST/index.html>).



A group photo taken on the last day

## Voices from participants

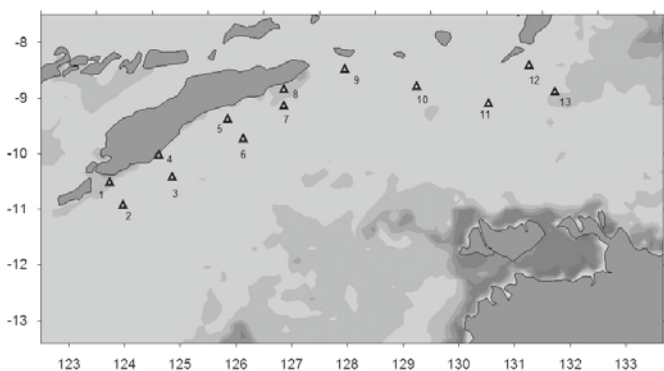


**Muhammad Ramdhan**  
 Researcher  
 Research and Development Center for Marine and Coastal Resources  
 Ministry for Marine Affairs and Fisheries (Indonesia)

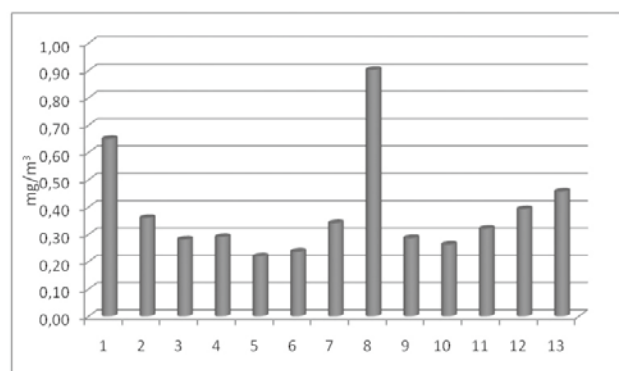
This is a short article of my impression on the training course that held by NOWPAP/PICES/WESTPAC. The training was conducted in Vladivostok, Russia on 8 to 12 October 2011. I'm very grateful that I have jointed this training. Through the 5

day training, right now I can more explore the Chlorophyll-a distribution around the Indonesia territorial sea, for example, the chlorophyll-a distribution in Timor Sea in July 2010 like the picture shown below :  
 From the MODIS data monthly Level 3, I generated the area of interest in Timor Sea. It is a very interesting place because in Timor Sea lots of petroleum companies build a well for oil production. And in August 2009, there was a big oil spill in that area. I try to find a correlation about the oil spill impact on the chlorophyll-a concentration in the Timor Sea area.  
 There are so much new knowledge that I got from this course, such as Uncertainties

in ocean colour remote sensing and Atmospheric Correction by Dr. Roland Doerffer, Global Ocean Observing System by Dr. Vyacheslav B. Lobanov, Detection of HAB by Dr. Raphael Kudela, Satellite ocean color; changes and software WIM/WAM by Dr. Mati Kahru, BEAM software introduction, Assessment of Eutrophication with remote sensing by Dr. Joji Ishizaka, Validation of ocean colour and GOCI satellite by Dr Yu-Hwan Ahn, Radiometric calibration of satellite solar reflective band by Dr. Sung Ling, Introduction of ScanMagic Software by Dr. Nataiya Evtushenko, Mapping habitat by Dr. Teruhisa Komatsu, Oil spill detection



Left: Monthly composite image of Chlorophyll-a concentration on July 2010, black triangle represent ATSEA cruise station in Timor Sea. Right: The Chlorophyll-a concentration in station 1-13 generated from the left image.



by using SAR data by Dr. Leonid Mitnik. Overall the lecturers are experts of their fields and the introduced software are very advanced.

I could see the unique culture and hospitality of Russian people. They are very warm and nice people. Dr. Leonid Mitnik, the Russian senior scientist said that the



**Joeeun Yoon**

Student

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I am in the second year of master degree in UST (University of Science & Technology). I am interested in the research about changes of primary production by climate change. My research data are remote sensing data and in situ data. But I have had some difficulties to handle satellite data. First of all, I needed to understand satellite data that is used for calculating primary



**MiHye Seo**

1<sup>st</sup> year PhD student

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This Training Course was held in early October of this year in Vladivostok, Russia. Before attending the course, I was anxious for not having any knowledge or background in remote sensing analysis. However, soon after the first two days had past, I found this course was highly helpful for people to understand how to generate several different kinds of environmental data maps from some decades of satellite data even without background knowledge of remote sensing. The good things about this training program were that all the lectures and exercises were taught by experienced professionals and the materials used in the lectures were provided as Power Point slides, so I could go back to the lecture slides anytime. When I had a difficulty to understand the lecture

young scientists/researchers must have a global networking. Because we live on the same earth, we must try to better understand what is happening around this world.

Last but not the least, I want to say thank you to Dr. Komatsu who has selected me as the funded participant by WESTPAC for this training, and to Mr. Norihiko Tanaka

productivity and know what satellite data is. I thought that the training course could provide more information and knowledge to me. I also anticipated getting together and having education and sharing research fields with many young scientists of the world.

NOWPAP/PICES/WESTPAC Joint Training Course on Remote Sensing Data Analysis was held in Russia on October 8 to 12, 2011. It was my first time to visit Russia. But I didn't have any difficulty of staying in Vladivostok because the staff members arranged accommodations and transportation and sight-seeing.

Training course was held at Far Eastern Federal University. The lectures consisted of several topics. Most of lectures were

materials, the lecturers helped me solve the problems. Thanks to those helpful materials and lecturers, I made a big progress in both understanding the remote sensing materials and utilizing its satellite data in preferable formats. Although I hadn't thought of using remote sensing data for my study, this training course gave me a chance to know and understand the remote sensing techniques, and I started thinking how to improve my own study with actual remote sensing data as environmental factors.

In addition to the educational side, there were several other advantages in this training course. Among all, the biggest advantage was a friendship established among the participants. The participants were from various countries including Russia, Korea, Japan, China, Malaysia, the Philippines, Indonesia and India. Some of them knew the materials very well, and some of them were not so familiar with remote sensing. Therefore, during the hands-on exercises, we helped one another to learn how to use the program to analyze satellite data. This was one occasion for us to know other participants. In addition,

and CEARAC team who had worked so hard to organize this international training course. My friends who I met in Vladivostok; Mr. Genki Terauchi, Mr. Hayashi, Ms. Cordero-Bailey, Mr. Krishna, Mr. Kachur, Mr. Shimizu, Ms. Shambarova, Mr. Elemenko, and all the participants. Thanks for the great experience.

very instructive. Primary production lecture by Dr. Joji Ishizaka was especially useful because I am studying primary production. Introduction into satellite data software by Dr. Roland Doerffer and Dr. Mati Kahru was also very useful and interesting. I thought that satellite data software would increase my ability to handle satellite data.

I met many young scientists of the world. Their research fields varied considerably. I had a good time in the training course with them and talked about many things. I keep in touch with them.

This training course is an unforgettable experience. I'd like to thank the staff members and all lecturers for all of their hard work. I hope to be given an opportunity to re-engage in the program.

the participants stayed in the same hotel, and the five-day training course was long enough to make friends with them. Sometimes we talked about personal things including our families, native tongues, our own cultures, countries, or anything other than lecture materials. I got very close to some participants. It is not so easy to make a connection to a person in a different country, but this training course provided a rare and very good chance of building a friendship with other scientists and students from different countries. I hope to keep in touch with them for a long time, so I can have an easy access to the researchers and scientists in remote sensing analysis in the future.

In short, this was a very good training course. It was so hard to follow the lectures that I had to review the materials by myself every night. But I could improve knowledge about remote sensing analysis and could make very nice friends in other countries through this training course. I would like to thank all the coordinators and lecturers for giving me this great opportunity.

## Initiating a new project on sea grass bed mapping in Tohoku region, Japan

An earthquake with a magnitude of 8.9 hit the north-east (Tohoku) area of Japan on March 11 and has brought devastating damages to the area. Numerous roads and towns have been inundated and destroyed by *tsunami* triggered by the earthquake, and thousands of people lost their lives. Many satellite images, before-and-after the *tsunami*, were obtained and analyzed by space agencies to investigate the damages. The results of these rapid investigations are available on the Internet such as on the website of the International Charter "Space and major disasters" (<http://www.disasterscharter.org/>), and they delivered

useful information to help or mitigate the negative effects of the disasters. However, most of these images are limited on land and not much has been studied to assess the damages under water in the coastal area with satellite images.

Northwest Pacific Region Environmental Cooperation Center (NPEC), the hosting body of CEARAC, has initiated a research project to assess impacts of the *tsunami* on sea grass beds by remote sensing techniques, with a research grant provided by the Mitsui Environmental Foundation from July, 2011. This project aims at assessing damages of sea grass beds by the

*tsunami* and the earthquake and providing useful information towards its recovery. The first ship observation was conducted with one under-water camera and side scan sonar on October 18 to 20, 2011 at the Shizugawa Bay in Miyagi Prefecture (Fig. 1.) Subsequently, aerial photos over the Shizugawa Bay were taken on November 1. The obtained information will be analyzed together with satellite images observed before the *tsunami* and the earthquake to estimate potential damages of sea grass beds in this area. The project will be continued until March 2014.

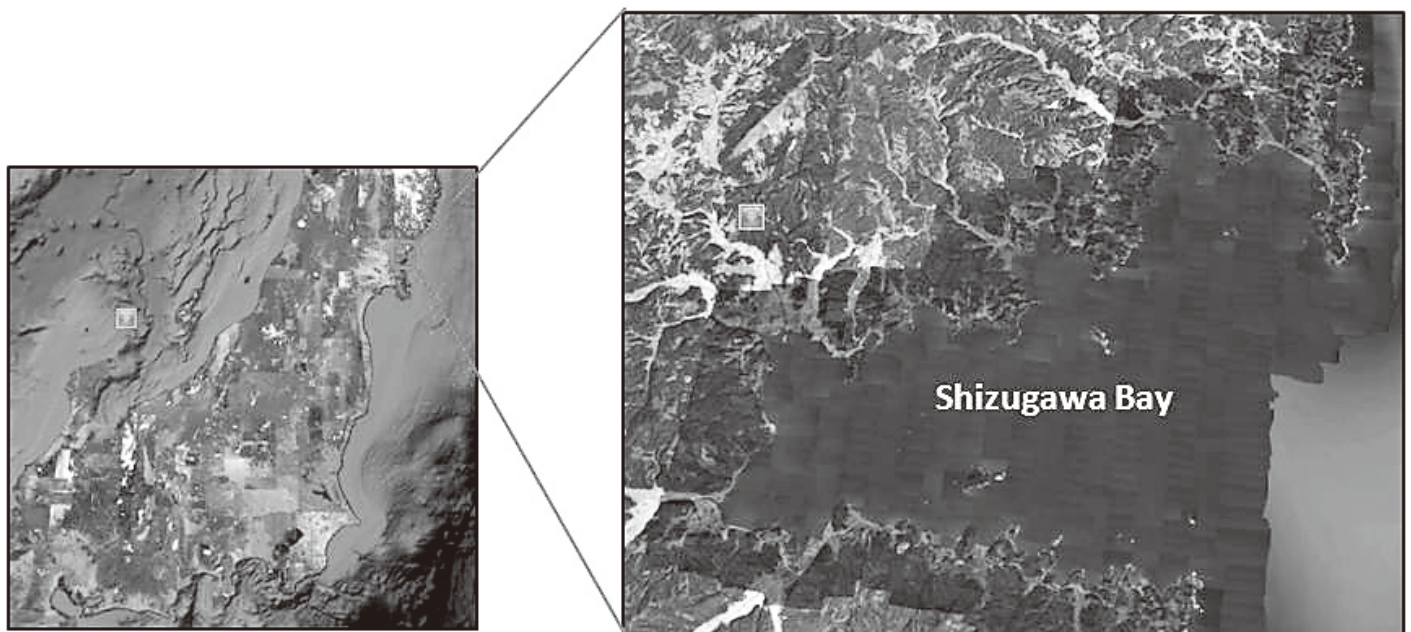


Figure 1. Aerial photos over the Shizugawa Bay taken on November 1, 2011.

### Announcement

The CEARAC Newsletter is distributed free of charge. For additional copies, or if you would like to be placed on our mailing list, please contact CEARAC at the following address: [webmaster@cearac.nowpap.org](mailto:webmaster@cearac.nowpap.org)

All the information about this newsletter and more can be downloaded from CEARAC Website.

This is the last time to distribute the newsletter in the paper format. From the next, it will be distributed in the electronic format. You can read the past issues at CEARAC Website.

#### NOWPAP CEARAC

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