



# THE ASIAN NETWORK FOR USING ALGAE AS A CO<sub>2</sub> SINK THE ASIAN PACIFIC PHYCOLOGICAL ASSOCIATION



## Newsletter

Issue No. 9 September 1, 2014



This Newsletter was supported by the Project "Study on the Mitigation and Adaptation Measures Using Seaweeds : Korea-ASEAN Network," National Research Foundation of Korea, and Marine Research Institute, Pusan National University.

### *Message from the President of The Asian Pacific Phycological Association*



Dr. Wendy A. Nelson

The Asian Network for Using Algae as a CO<sub>2</sub> Sink, a working group set up under the auspices of APPA, was initiated during the 4th Asian Pacific Phycological Forum (APPF) in Bangkok, Thailand in 2005.

The objective of the network has been to collaborate on research addressing the use of algae to remove CO<sub>2</sub>, thereby addressing problems associated with global warming. Korea initiated this Network, and has led this working group, which comprises 16 members from 12 countries from the Asia-Pacific region.

This initiative has led to the development and enhancement of collaborative relationships and research networks, the enhancement of member parties' national programmes, and has established an international profile and increased awareness of the key role of algae through participation in international meetings.

The Asian Network for Using Algae as a CO<sub>2</sub> Sink is a flagship working group for the APPA as it addresses some of the key objectives of the APPA, namely "to serve as a venue for the exchange of information related to phycology, and to promote international cooperation among phycologists and phycological societies in the Asian Pacific region." The APPA is very pleased by the role that the Asian Network for Using Algae as a CO<sub>2</sub> Sink has played in contributing to these objectives. Our colleagues in Korea are to be congratulated for their vision and their continued energy in developing and maintaining the network, and in communicating the issues widely in international meetings and through technical visits between member parties.

The 7th APPF in Wuhan provides us with our next opportunity to gather and to consider developments across the region and the focus for further work.

Wendy A. Nelson  
President – APPA



## *Study on the Mitigation and Adaptation Measures Using Seaweeds: Korea-ASEAN Network*


The research project on “Study on the Mitigation and Adaptation Measures Using Seaweeds: Korea-ASEAN Network,” funded by National Research Foundation (NRF), Korea was initiated July 1, 2013 for 2 years. Total five institutes of ASEAN countries are mainly involved in the project with Professor Ik Kyo Chung as the principal investigator; Institute of Ocean and Earth Sciences, University of Malaya, Malaysia, Institute of Biotechnology, Vietnamese Academy of Science and Technology, Vietnam, Faculty of Fisheries and Marine Science, University Sam Ratulangi, Indonesia, University of San Carlos, the Philippines and Marine Research Institute, Pusan National University, Korea. The members of 12 countries of the working group, the Asian Network for Using Algae as a CO<sub>2</sub> Sink, APPA will serve as the advisory committee group.

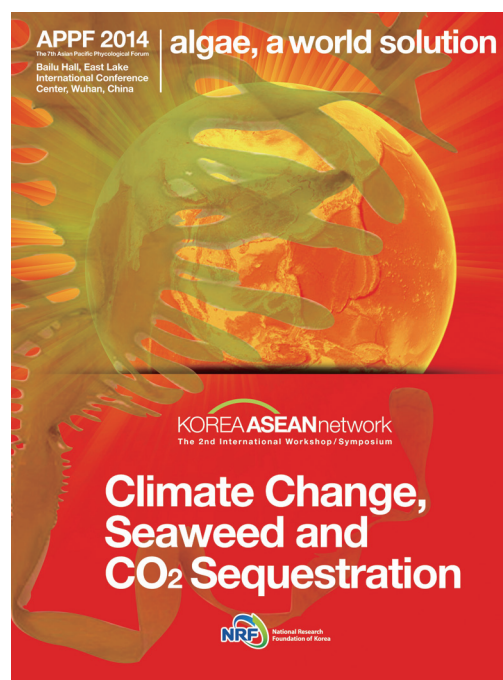
The objectives of the Network project are:

1. To synthesize the current status of scientific knowledge of the role that algae and seaweed beds play in climate change mitigation, and to identify how this knowledge can support management strategies and policy decisions.
2. To identify the major gaps in knowledge concerning coastal Blue Carbon that still need to be addressed.
3. To analyze the major threats to algae and seaweed beds and how different damaging anthropogenic practices as well as climate change are responsible for causing greenhouse gas emissions from these ecosystems, as well as eroding the various ecosystem services provided.
4. To provide algae and seaweed beds science-based policy recommendations for the management of coastal carbon sinks.
5. To raise awareness of successful algae and seaweed beds case studies around the world.

6. To explore possibilities for algae and seaweed beds policy, science and pilot projects in the region of ASEAN countries and set out a plan of action for algae and seaweed beds in the region of East Asia.


The outcomes of the network are expected to be:

1. A white paper/workshop report and newsletter, providing a synthesis of current status of scientific knowledge on algae and seaweed beds, identification of major gaps in knowledge, successful algae and seaweed beds case studies, and management strategies that protect and enhance these carbon stocks, including an analysis of threats and damaging activities to coastal Blue Carbon and how they are responsible for greenhouse gas emissions.
2. A plan of action for algae and seaweed beds as Blue Carbon in the region of East Asia, outlining research needs, policy gaps and possible pilot projects. 



***The 1st Korea-ASEAN International Workshop  
“Climate changes, Seaweed and CO<sub>2</sub> Sequestration”***

The first workshop of Korea-ASEAN International Workshop on “Climate changes, Seaweed and CO<sub>2</sub> Sequestration” was held at Sangnam International House, Pusan National University, Busan, Korea, November 27-29, 2013. The workshop program included three sessions, convened by Professor Jin

Ae Lee, Secretary of the Asian Network for Using Algae as a CO<sub>2</sub> Sink, the Asian Pacific Phycological Association, and Professor Ik Kyo Chung, the principal investigator of the research project, “Study on the Mitigation and Adaptation Measures Using Seaweeds: Korea-ASEAN Network.” 

**SESSION 1** Overview of the current status of seaweed solution in Korea-ASEAN Network

Moderator : Prof. Jin Ae Lee, Inje Univ. (Korea)

- 09:30 Overall Korea-ASEAN Network Objectives  
Prof. Ik Kyo Chung, PNU (Korea)
- 09:40 Overview of Korean seaweed solutions  
Prof. Ik Kyo Chung, PNU (Korea)
- 10:00 National reports of ASEAN countries  
Malaysia (Yeong Hui Yin, on behalf of Phang Siew Moi)  
Indonesia (Grevo S. Gerung)  
Vietnam (Dang Diem Hong)  
The Philippines (Ik Kyo Chung, on behalf of Danilo B. Largo)
- 11:10 Discussion
- 12:00 Planning for next meeting and other activities  
September 20, 2014 at Institute of Hydrobiology, Wuhan, China  
(The 7th Asian Pacific Phycological Forum)

**SESSION 2** Overview of seaweed beds and kelp forests in Blue Carbon

Moderator: Prof. Ik Kyo Chung, PNU (Korea)

- 14:00 Overview of Blue Carbon  
Prof. Jin Ae Lee, Inje Univ. (Korea)
- 14:30 Round table discussion on seaweed as Blue Carbon
  - Gap between other Blue Carbon and seaweeds
  - Gaps and challenges in seaweed knowledge and management
  - Coastal carbon distribution mapping
  - Local, regional, and global-scale distribution and carbon budget
  - Mapping carbon stock in seaweed beds/kelp forests aquaculture
  - Modelling challenges and priorities
  - Overview of Blue Carbon research activities

**SESSION 3** Overview of seaweed aquaculture beds ecosystem services and payment

Moderator: Prof. Ik Kyo Chung, PNU (Korea)

- 16:30 Overview of coastal and marine ecosystems (CMEs) services and payment  
Prof. Ik Kyo Chung, PNU (Korea)
- 16:45 Introduction of the evaluation of seaweed aquaculture beds ecosystem services in Korea  
Mr. Calvyn Sondak, PNU (Korea)
- 17:00 Round table discussion  
Gaps and challenges in seaweed knowledge and management
- 19:30 Close



1-2. The 1st Korea-ASEAN International Workshop on “Climate changes, Seaweed and CO<sub>2</sub> Sequestration” was held at Sangnam International House, Pusan National University, Busan, Korea, November 27-29, 2013.

## *International Blue Carbon Symposium 2014*

### *Manado, North Sulawesi, Indonesia*

(Reported by Calvyn F. A Sondak, Pusan National University, [calvynson@yahoo.com](mailto:calvynson@yahoo.com))

The Agency for Marine Affairs and Fisheries Research and Development (AMAFRAD), Ministry of Marine Affairs and Fisheries Republic of Indonesia in collaboration with the Government of North Sulawesi Province held the International Blue Carbon Symposium (IBCS) with a theme of “Discovering the value of Blue Carbon in Coral Triangle Region” within the series of World Coral Reef Conference (WCRC) 2014.

The objectives of the symposium were:

1. To initiate Blue Carbon stakeholders in Indonesia to support science and policy implementation.
2. To identify current climate, coastal and ocean science-policy issues and opportunities to sustainable use and conservation of Blue Carbon ecosystems.
3. To disseminate Blue Carbon research in Coral Triangle Region.

The symposium was held on 15 May 2014 in Manado, North Sulawesi, Indonesia. In this symposium, the Minister of Marine Affairs and Fisheries, Governor Province of North Sulawesi and Chairman of R & D Agency for Marine and Fisheries had the opportunities to give their remarks on Blue Carbon. The meeting was attended by over 500 participants. IBCS is one of a series of events Coral Reefs World Conference (WCRC) 2014. IBCS 2014 is a mean of communication and sharing of marine and coastal experts from various countries such as Indonesia, Australia, Japan, South Korea, China, Thailand, Vietnam, Malaysia, Nigeria, Pakistan, UK, Mauritius, Germany and USA. In addition, representatives of international organizations were also present such as United Nations Environment Programme (UNEP) and Conservation International (CI).

The keynote speakers at the symposium included Dr. Jerker Tamelander of UNEP and Dr. Sri Tantri of the Ministry of Environment. Other speakers were Dr. Daniel M. Alongi (AIMS), Dr. Emily Pidgeon (CI), Dr. Andreas A. Hutahaeen (Marine and Coastal Resources Research and Development, Research and KP), Prof. Dr. Grevo Gerung (University Sam Ratulangi), Dr. Niken Sakuntaladewi (Ministry of Forestry), Dr. Agus Supangat (NCCC), Prof. Kazuo Nadaoka (Tokyo Institute of Technology - Japan), Prof. Luzhen Chen (University of Xiamen - China), Prof. Ik Kyo Chung (Pusan National University - Korea), Prof. Mineo Okamoto (Tokyo University of Marine Science & Technology - Japan), Prof. Dr. Dang Diem Hong (Vietnam Academy of Science and Technology), Prof. Put O Ang, Jr. (The Chinese University of Hong Kong), Dr. Henry Kiswara (P2O LIPI), Dr. Xuele Zhang (FIO-SOA), Terry L. Kepel, M.Sc (Marine and Coastal Resources Research and Development, Research and KP), and Dr. Janny D. Kusen, Dr. Billy T. Wagey, Prof. Daisy M. Makapedua, Prof. Charles R. Kepel, Dr. Pankie Pangemanan, Calvyn F. A Sondak and Mark Lasut of University Sam Ratulangi.

The main topics discussed during the meeting were Blue Carbon for blue growth: Coastal ecosystem management in Coral Triangle Region; Blue Carbon in Coral Triangle Region and its current status; Managing coastal ecosystem and its services; Natural coastal and marine resources: An overview and coastal resources and its benefits.

Professor Ik Kyo Chung presented topic “Seaweed solution”, Prof. Grevo Gerung presented “Seaweed and its prospectus to Blue Carbon in Indonesia”, Prof. Put O. Ang Jr. presented “Seaweed farms and *Sargassum* beds as potential carbon sink along the Chinese coasts” and Prof. Dang Diem Hong “Contribution of algal mass cultivation to climate change and sea level rise scenarios in Vietnam.” 





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3-10. International Blue Carbon Symposium on "Discovering the value of Blue Carbon in Coral Triangle Region" within the series of World Coral Reef Conference 2014 was held in Manado, North Sulawesi, Indonesia on May 15, 2014.


***International Blue Carbon Scientific Working Group***  
***October 29-30, 2013***  
***IOC- UNESCO HQ, Paris, France***

The Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO) hosted the latest International Blue Carbon Initiative Scientific Working Group meeting October 29-30, 2013 in their offices in Paris, France. This two-day meeting brought together the research community to assess the state of remote sensing science internationally and to identify knowledge gaps and opportunities for collaborations that will accelerate research in the future.

The workshop program included five sessions:

1. Mapping tidal marshes.
2. Recent Blue Carbon developments.
3. Mapping seagrasses.
4. Policy impacts.
5. Ongoing developments of the Working Group.

The meeting offered an opportunity for the scientific community to help shape the path forward in addressing remote sensing and mapping issues related to seagrasses, marshes, and mangroves. Meeting attendees took an active role in considering the current state of the science and planning future opportunities for the research community as a whole.

Prof. Ik Kyo Chung, Pusan National University educated the group on the many uses of seaweed and kelp (including wall paper and biofuels). Aside from the products for human use that can be manufactured from seaweed, it also provides ecosystem services such as CO<sub>2</sub> removal. Seaweed and kelp should be considered in blue carbon efforts because it can be produced beyond shallow areas in the deep ocean (providing income without habitat destruction) and healthy seaweed beds are estimated to absorb 15 tons of CO<sub>2</sub>/year/ha. 

For more details

<http://thebluecarboninitiative.org/wp-content/uploads/Report-Paris-Meeting-FINAL2.pdf>



11. The International Blue Carbon Initiative Scientific Working Group meeting, hosted by the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO), was held at IOC, UNESCO in Paris, France, October 29-30, 2013.



## UPCOMING EVENTS

- 1) **The 7<sup>th</sup> Asian Pacific Phycological Forum**, September 20-24, 2014  
Institute of Hydrobiology, Wuhan, China <http://appf2014.org>



- 2) **The 2<sup>nd</sup> Korea-ASEAN International Workshop “Climate Changes, Seaweed and CO<sub>2</sub> Sequestration”**, September 20, 2014, Bailu Hall, East Lake International Conference Center, Wuhan, China  
Session 1 Current status of seaweeds as in the Korea-ASEAN and APPA countries  
Session 2 Seaweed Blue Carbon and adaptation measures in the Korea-ASEAN and APPA countries

*The publication and the Asian Network for Using Algae as a CO<sub>2</sub> Sink,  
Asian Pacific Phycological Association*

# ICES Journal of Marine Science



**ICES**  
**CIEM**

International Council for  
the Exploration of the Sea  
 Conseil International pour  
l'Exploration de la Mer

ICES Journal of Marine Science (2013), 70(5), 1038–1044. doi:10.1093/icesjms/fsz206

## Installing kelp forests/seaweed beds for mitigation and adaptation against global warming: Korean Project Overview

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Chung, I. K., Oak, J. H., Lee, J. A., Shin, J. A., Kim, J. G., and Park, K.-S. 2013. Installing kelp forests/seaweed beds for mitigation and adaptation against global warming: Korean Project Overview. – ICES Journal of Marine Science, 70: 1038–1044.

Received 28 August 2012; accepted 20 December 2012; advance access publication 11 January 2013.

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