

## Outline of the 10th International Kuroshio Science Symposium

### **“Addressing Coastal Resources Conservation and Food Security through Science-Based Solutions and Innovations” (November 24-26, 2016)**

**Paatio De Sa Jose, Mallipot, Albay, Philippines**

Bicol University Tabaco Campus (BUTC), Tabaco City, Philippines hosted the 10<sup>th</sup> International Kuroshio Science Symposium. This international symposium is now in its third cycle, which featured topics on (1) Fisheries and Coastal Resource Management; (2) Ecological Habitats and Coral Sciences; (3) Socio-Economics and Food Security; (4) Biosciences and Oceanography. Another feature was a Cross-Border Education Session which focused on Integrated Management of Coastal Resources by Marine Protected Areas (MPAs).

This conference was conceptualized to better understand the impacts of Kuroshio from ecological, environmental, economic and social perspectives in the countries involved. Moreover, this conference aimed to arrive at meaningful solutions to common problems and further cooperation with focus on the aspects of coastal resources conservation and food security.

It was held last November 24-26, 2016 at Patio de San Jose, Malilipot Albay with the theme “Addressing Coastal Resources Conservation and Food Security through Science-

Based Solutions and Innovations”. This was attended by the following:

- 38 paper presenters and guests:
  - Kochi University, Japan – 9
  - National Sun Yat Sen University, Taiwan – 2
  - Yokohama National University – 1
  - University of the Philippines-Visayas – 1
  - Bicol University, Office of the President – 1
  - Bicol University Tabaco Campus, Philippines – 8
  - Bicol University Graduate School – 1
  - Bicol University College of Science – 2
  - BU Research and Development Center – 1
  - BFAR – Regional Office 2 – 6
  - Catanduanes State University, Virac, Catanduanes – 1
  - Partido State University, Goa, Camarines Sur – 3
  - Local Government Unit of Tabaco City – 2
- 3 media members (radio stations) – 1 from One Radio-Tabaco, 1 from Sky Radio-Tabaco and Ligao and 1 from



**The participants of the 10th International Kuroshio Science Symposium on November 24, 2017**

DWRC-FM

- 56 participants - 40 from Bicol University Tabaco Campus (faculty, non-teaching staff, students), 3 from BU Research and Development Center, 2 from Bicol University Graduate School, 1 from Bicol University Extension Service Center,

one (1) from Department of Environment and Natural Resources V (DENR-RO V), 5 from Bureau of Fisheries and Aquatic Resources V (BFAR RO V), 2 from Partido State University, and 2 exchange students (Japan) representing Bicol University College of Arts and Letters



**The participants of the 10th International Kuroshio Science Symposium on November 25, 2017**

**Field Work of Cross-Border Education in Sagurong, San Miguel Island on November 26., 2017**



**The participants of Field Work of Cross-Border Education in Sagurong, San Miguel Island**



**Interview with the Barangay Captain and the Chairman of Bantay Dagat**



**Interview with stakeholder (fisherman)**

Day one (November 24, 2016) of the conference commenced with keynote addresses by Dr. Teruyuki Shinbo of Kochi University, Japan, Dr. Milagros Morales of Bureau of Fisheries and Aquatic Resources, Region 2; Dr. Arnulfo M. Mascariñas of Bicol University and Dr. Hsu-Sen Chen of National Sun Yat Sen University, Taiwan, followed by the media conference. In the afternoon, the activity focused on the lecture series on the Cross-border education session: Integrated management of Coastal Resources by Marine Protected Areas, which was chaired by Dr. Victor Soliman and Dr. Mina Hori. Nine papers were presented during the said plenary session. Prof. Antonino B. Mendoza, Jr synthesized the said session

Four concurrent sessions were held on the second day (November 25, 2016). A total of 28 papers were presented during the said sessions. Particularly, 10 papers were

presented in Fisheries and Coastal Resources Management session which was chaired by Dr. Plutomeo M. Nieves and Dr. Milagros C. Morales; 8 papers presented in Ecological Habitats and Coral Sciences session chaired by Dr. Takahiro Taguchi and Prof. Ronnel R. Dioneda; 5 papers in the Bioscience and Oceanography session chaired by Dr. Wilfredo L. Campos and Dr. Osamu Miura; and 5 papers in Socio-economic and Food Security session chaired by Dr. Raul G. Bradecina and Dr. Teruyuki Shinbo. Dr. Ninfa R. Pelea delivered the synthesis of the symposium during the closing program.

To benchmark on strategies towards co-existence with the ecosystem conservation/preservation and the development of rural resident's lives, community visit and interview of stakeholders in Brgy Sagurong, San Miguel Island Tabaco City, was conducted on the third and last day of the conference.

# Symposium Program

November 24, 2016

## Opening Ceremony

### Doxology

BUTC Students Performing Artists

### Philippine National Anthem

### Welcome Address

Hon. Krisel L. Luistro City Mayor, Tabaco City

### Presentation of Participants and Symposium Overview

Prof. Maria Asuncion V. Oronan  
Dean, BU Tabaco Campus

### Keynote Addresses

Dr. Arnulfo M. Mascariñas  
SUC President IV, Bicol University, Philippines

Dr. Milagros Morales Regional  
Director, Bureau of Fisheries and Aquatic Resources,  
Region 02, Philippines

Dr. Teruyuki Shinbo,  
Professor, Graduate School of Kuroshio Science, Kochi  
University, Japan

Dr. Hsu-Sen CHEN  
College of Marine Sciences National Sun Yat-Sen  
University Kaohsiung, Taiwan

### Media Conference

### Cross-Border Education Session: Integrated Management of Coastal Resources by Marine Protected Areas

#### Lecture Series

Chair: Dr. V. Soliman and Dr. Mina Hori

#### Philippine MPAs: How Best Can They Be Managed?

Victor S. Soliman<sup>1</sup>, Antonino B. Mendoza, Jr.<sup>2</sup>, Ronnel  
R. Dioneda Sr.<sup>3</sup>

<sup>1</sup> Bicol University Graduate School, Legazpi City,

<sup>2</sup> Bicol University Tabaco Campus, Tabaco City,

<sup>3</sup> Bicol University Research and Development Center,  
Legazpi City

#### Western Danajon Bank: Networking of Ecology and Management

Wilfredo L. Campos<sup>1</sup>, Samuel Gulayan<sup>2</sup>, Liezel C.  
Paraboles<sup>1</sup>, Pacifico D. Beldia<sup>3</sup>

<sup>1</sup> OceanBio Lab, University of the Philippines Visayas,  
Miag-ao, Iloilo, Philippines,

<sup>2</sup> Bohol Island State University, Candijay, Bohol,  
Philippines,

<sup>3</sup> Malampaya Foundation, Inc., Alabang, Metro-Manila,  
Philippines

#### Marine Protected Areas and Integrated Management of Coastal and Ocean Resources

Hiroyuki Matsuda<sup>1,2</sup>, Darien D. Mizuta<sup>2</sup>, Eirini I.  
Vlachopoulou<sup>3</sup>, Mitsutaku Makino<sup>4</sup>

<sup>1</sup> Kochi University, Japan,

<sup>2</sup> Yokohama National University, Japan,

<sup>3</sup> University of the Aegean, Greece,

<sup>4</sup> National Research Institute of Fisheries Sciences, Japan

#### Evaluating the Conservation Effectiveness of Partially Protected Marine Areas for Commercially Important Fishes in Bicol Region, Philippines

Renan U. Bobiles<sup>1,2</sup>, Yohei Nakamura<sup>2</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City,  
Philippines,

<sup>2</sup> Graduate School of Kuroshio Science, Kochi  
University, Japan

#### Ecological Management of MPA from the Perspective of Seaweed and Seagrass Ecology

Antonino B. Mendoza, Jr.<sup>1</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City,  
Philippines

#### Opportunities and Challenges of Community -Based Marine Protected Area (CB-MPA) Programs in Cagayan Province, Philippines

Emma Legaspi Ballad<sup>1,3</sup>, Teruyuki Shinbo<sup>1</sup>, Yoshinori  
Morooka<sup>2</sup>,

<sup>1</sup> Laboratory of Environmental Change and Sustainable,  
Society, Graduate School of Kuroshio Science, Kochi  
University, Japan,

<sup>2</sup> Professor Emeritus, Kochi University, Japan,

<sup>3</sup> Department of Agriculture-Bureau of Fisheries and  
Aquatic Resources Regional Office 02, Tuguegarao  
City, Cagayan, Philippines

#### Balancing Fishery and Tourism, Case Study from Thailand

Mina Hori<sup>1</sup>

<sup>1</sup> Graduate School of Kuroshio Science, Kochi

University, Japan

### **MPA Management and Rural Fisheries along Lagonoy Gulf**

Raul G. Bradecina<sup>1</sup>

<sup>1</sup> Partido State University, Goa, Camarines Sur, Philippines

### **Life and Natural Resource Use in the Communities lying behind the MPA: The San Miguel Island Case**

Plutomeo M. Nieves<sup>1</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines

### **Open forum**

#### **Synthesis of the Lecture Series**

Antonino B. Mendoza, Jr. <sup>1</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines

**November 25, 2016**

### **Concurrent Sessions**

#### **1. Fisheries and Coastal Resources Management**

Session Chairs: Dr. Plutomeo M. Nieves and Dr. Milagros Morales

#### **Evaluation of Lying-in Hatchery Concept as Resource Management Strategy**

Plutomeo M. Nieves<sup>1</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines

#### **Simultaneous Occurrence of Larvae and Juveniles of *Acanthopagrus latus* and *A. Schlegelii* (Sparidae) in the Estuary of Northern Vietnam**

Thanh Trung Tran<sup>1</sup>, Izumi Kinoshita<sup>1</sup>, Hau Duc Tran<sup>2</sup>

<sup>1</sup> Usa Institute of Marine Biology, Kochi University, Japan,

<sup>2</sup> Hanoi National University of Education, Hanoi, Vietnam

#### **Molluscicidal Activity of Poison vine *Derris elliptica* in Non-Target Organism: The Philippine Freshwater Trumpet Snail *Jagora asperata***

Kristian Q. Aldea<sup>1</sup>, Jimmy T. Masagca<sup>2</sup>

<sup>1</sup> Catanduanes State University (Panganiban Campus), Panganiban, Catanduanes, Philippines,

<sup>2</sup> Catanduanes State University (Virac, Campus), Virac, Catanduanes, Philippines

#### **The State of Atulayan Fish Sanctuary and Fishers Behavior on the Protection of Marine Protected Area (MPA) through Social Marketing in Municipality of Saga, Camarines Sur**

Joel B. Balasta<sup>1</sup>

<sup>1</sup> Partido State University, Nato, Sagnay, Camarines Sur, Philippines

#### **Rapid Mobulid Assessment Survey in Camarines Sur, Philippines**

Redentor L. Buetre<sup>1</sup>, Maureen F. Postrado<sup>2</sup>, Primo G. Barja<sup>2</sup>, Almira C. Valencia<sup>2</sup>, Patricia M. Candelaria<sup>1</sup>, Irene C. Consulta<sup>1</sup>

<sup>1</sup> Partido State University-Sagnay Campus, Sagnay, Camarines Sur, Philippines,

<sup>2</sup> Partido State University-Caramoan, Campus, Caramoan, Camarines Sur, Philippines

#### **Diversity and Species Composition of Marine Fish Fauna in Isabela Waters, Philippines**

Angel B. Encarnacion<sup>1</sup>, Milagros C. Morales<sup>1</sup>, Evelyn C. Ame<sup>1</sup>, Melanie C. Villarao<sup>1</sup>

<sup>1</sup> DA-Bureau of Fisheries and Aquatic Resources, Regional Office No. 02, Tuguegarao City, Philippines

#### **Philippine Eel (Anguillidae) Conservation Initiatives Towards Sustainable Resource Management**

Evelyn C. Ame<sup>1</sup>, Milagros A. Morales<sup>1</sup>

<sup>1</sup> DA-Bureau of Fisheries and Aquatic Resources, Regional Office No. 02, Tuguegarao City, Philippines

#### **Reproductive Biology and Population Dynamics of FRigate Tuna (*Auxis thazard*) and Bullet Tuna (*Auxis rochei*) from Babuyan Channel, Philippines**

Melanie C. Villarao<sup>1</sup>, Milagros C. Morales<sup>1</sup>, Evelyn C. Ame<sup>1</sup>, Angel B. Encarnacion<sup>1</sup>, Erickson Gumiran<sup>1</sup>

<sup>1</sup> DA-Bureau of Fisheries and Aquatic Resources, Regional Office No. 02, Tuguegarao City, Philippines

#### **Stock Assessment of Spider Conch (*Lambis lambis*) in Guinayan Island, Rapu-Rapu, Albay**

Skorzeny C. de Jesus<sup>1</sup>, Romeo B. Asejo Jr. <sup>1</sup>, Arian S. Bandola<sup>1</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines

#### **Community Structure and Reproductive Biology of Spider Conch Genus *Lambis***

Anne Retuerma-Dioneda<sup>1</sup>

<sup>1</sup> Bicol University College of Science, Legazpi City, Philippines

## 2. Ecological Habitats and Coral Sciences

Session Chairs: Dr. Takashiro Taguchi and Prof. Ronnel R. Dioneda

### Recent Advance of Molecular Cytogenetic Studies on Scleractinian Corals (Stony Corals)

Takahiro Taguchi<sup>1,2</sup>, Satoshi Kubota<sup>1,2</sup>, Takuma Mezaki<sup>3</sup>, Erika Tagami<sup>2</sup>, Satoko Sekida<sup>4</sup>, Kazuo Okuda<sup>4</sup>, Akira Tominaga<sup>1,2</sup>

<sup>1</sup> Laboratory of Human Health and Medical Science, Graduate School of Kuroshio Science, Kochi University, Japan,

<sup>2</sup> Department of Molecular and Cellular Biology, Kochi Medical School, Kochi University, Japan,

<sup>3</sup> Kuroshio Biological Research Foundation, Hata County, Kochi, Japan,

<sup>4</sup> Laboratory of Cell Structure and Function, Division of Marine Bioresources, Graduate School of Kuroshio Science, Kochi University, Japan

### Breeding and Culture Morphology of Tropical Green Algae

Alvin Monotilla<sup>1</sup>, Masanori Hiraoka<sup>1</sup>

<sup>1</sup> Graduate School of Kuroshio Science, Kochi University, Japan

### Morphology and Life History of Cosmopolitan Green Macroalgae, *Ulva prolifera* (Ulvophyceae, Chlorophyta)

Jianjun Cui<sup>1</sup>, Alvin Monotilla<sup>1</sup>, Masanori Hiraoka<sup>1</sup>

<sup>1</sup> Graduate School of Kuroshio Science, Kochi University, Japan

### Ecological Impact of Tsunami: A Ten-year Field Study of Intertidal Mud Snails Exposed to the 2011 Tohoku Earthquake Tsunami

Osamu Miura<sup>1</sup>, Gen Kanaya<sup>2</sup>, Shizuko Nakai<sup>3</sup>, Hajime Itoh<sup>4</sup>

<sup>1</sup> Graduate School of Kuroshio Science, Kochi University, Japan,

<sup>2</sup> National Institute for Environmental Studies, Onogawa, Tsukuba, Ibaraki, Japan,

<sup>3</sup> Department of Marine Science and Resources, College of Bioresource Sciences Nihon University, Kanagawa, Japan,

<sup>4</sup> Atmosphere and Ocean Research Institute, The University of Tokyo, Chiba, Japan

### The climate effect on the shrimp assemblages in the waters off the Gaoping (Kaoping) River mouth, southwestern Taiwan- An eight-year observation

Chen Hsu-Sen<sup>1,2</sup>, Wen, Ta-Chieh<sup>3</sup>, Chen, Chiee-Young<sup>4</sup>, Chen, Meng-Hsien<sup>1,2</sup>

<sup>1</sup> Department of Oceanography, National Sun Yat-sen University, Kaohsiung, Taiwan,

<sup>2</sup> Asia-Pacific Ocean Research Center, National Sun Yat-sen University, Kaohsiung, Taiwan,

<sup>3</sup> R/V Ocean Research I, National Taiwan University, Taipei, Taiwan,

<sup>4</sup> Department of Marine Environmental Engineering, National Kaohsiung Marine University, Kaohsiung, Taiwan

### Low cost and low tech community based coral reef restoration: A pilot demonstration study in Tabaco City, Albay, Philippines

Antonino B. Mendoza, Jr.<sup>1</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines

### Coral Reef Assessment in Selected Marine Protected Areas in Albay, Philippines

Christian D. Cabiles<sup>1</sup>, Antonino B. Mendoza Jr.<sup>1</sup>, Ronnel R. Dioneda Sr.<sup>2</sup>, Victor S. Soliman<sup>3</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines,

<sup>2</sup> Bicol University Research and Development Center, Legazpi City, Philippines,

<sup>3</sup> Bicol University Graduate School, Legazpi City, Philippines

### Assessment of Seaweeds Species along Uyugan, Batanes, Philippines

Eleandro A. Obar<sup>1</sup>, Quirino G. Pascua<sup>2</sup>, Milagros C. Morales<sup>2</sup>

<sup>1</sup> University of the Philippines in the Visayas, Miag-ao, Iloilo Philippines,

<sup>2</sup> Bureau of Fisheries and Aquatic Resources Region 02, Tuguegarao City, Philippines

## 3. Biosciences and Oceanography Session

Chairs: Dr. Wilfredo L. Campos and Dr. Osamu Miura

### Otolith microstructure and early life of seagrass siganid *Siganus canaliculatus* (Park 1797) with implications to marine reserve management

Victor S. Soliman<sup>1</sup>, Hideaki Yamada<sup>2</sup>, Renan U. Bobiles<sup>1</sup>, Kosaku Yamaoka<sup>3</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines,

<sup>2</sup> Ishigaki Tropical Station, Seikai National Fisheries Research Institute, Fisheries Research Agency, Ishigaki, Okinawa, Japan,

<sup>3</sup> Graduate School of Kuroshio Science, Kochi University,

Kochi, Japan

**The nifH gene abundances of unicellular heterotrophic diazotrophs ( $\alpha$ -,  $\gamma$ -proteobacteria) in the Kuroshio**

Tien-Yi Chen<sup>1</sup>, Yuh-ling Lee Chen<sup>1</sup>

<sup>1</sup> Department of Oceanography, National Sun Yat-sen University, Kaohsiung, Taiwan

**Density Distribution of Blue Crab (*Portunus pelagicus*) Larvae with Implications to the Lying-in Concept of Stock Enhancement**

Aldrin Mel B. Macale<sup>1,2</sup>, Simon G. Alcantara<sup>3</sup>, Plutomeo M. Nieves<sup>2</sup>

<sup>1</sup> Camarines Norte State College, Institute of Fisheries and Marine Sciences, Mercedes, Camarines Norte, Philippines,

<sup>2</sup> Bicol University Tabaco Campus, Tayhi, Tabaco City, Philippines,

<sup>3</sup> Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines

**Morphometric, Sexual Dimorphism and Fecundity of Endemic Freshwater Shrimp *Caridina buhi* (Crustacea: Decapoda: Caridea) from Lake Manapao**

Sandy Rey B. Bradecina<sup>1</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines

**Surfactants in the Environment**

Katrina L. Canon<sup>1</sup>

<sup>1</sup> Bicol University Graduate School, Legazpi City, Philippines

**4. Socio-Economics and Food Security Session**

Chairs: Dr. Raul Bradecina and Dr. Teruyuki Shinbo

**Local Residents' Valuation on Marine Protected Areas (MPAs) in Northern Luzon, Philippines: Application of Willingness to Pay (WTP) and Willingness to Work (WTW) Approach**

Emma Legaspi Ballad<sup>1,3</sup>, Teruyuki Shinbo<sup>1</sup>, Yoshinori Morooka<sup>2</sup>

<sup>1</sup> Laboratory of Environmental Change and Sustainable Society Graduate School of Kuroshio Science, Kochi University, Japan,

<sup>2</sup> Professor Emeritus, Kochi University, Japan,

<sup>3</sup> Department of Agriculture-Bureau of Fisheries and Aquatic Resources Regional Office 02, Tuguegarao City, Philippines

**Physico-chemical properties of dried *Porphyra acanthophora* in the Philippines**

Ritchie A. Rivera<sup>1</sup>, Ye-JooKim<sup>2</sup>, Yang-Bong Lee<sup>2</sup>, Angel B. Encarnacion<sup>1</sup>

<sup>1</sup> Department of Agriculture-Bureau of Fisheries and Aquatic Resources Regional Office No. 02, Regional Government Center, Tuguegarao City, Philippines,

<sup>2</sup> Department of Food Science and Technology, Pukyong National University, Busan, Korea

**The Significance of Indigenous Knowledge System of Fishers in the Management of Peculiar Species: the Case of Siganids in Lagonoy Gulf, Philippines**

Ninfa R. Pelea<sup>1</sup>, Leonila B. Barbacena<sup>1</sup>, Maria Luisa U. Tango<sup>1</sup>, Glenda A. Abejuela<sup>1</sup>, Raffy B. Bilangel<sup>1</sup> and Christian D. Cabiles<sup>1</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines

**Related Issues and Problems to Safety of Dried and Smoked Fish in Bicol Region (Philippines)**

Ninfa R. Pelea<sup>1</sup>, Milard P. Subagan<sup>1</sup>, Herminia Bondad<sup>1</sup>, Jamella Ivy R. Nieves<sup>1</sup>, Maria Josefa Pelea<sup>1</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines

**The Economic Value of the Capture Fisheries and Coastal Habitats in Representative Municipalities West and East Coast of Albay, Philippines**

Erwin E. Torres<sup>1</sup>, Ronnel R. Dioneda<sup>1</sup>, Sr., Joan R. Nace<sup>1</sup>, Mariz B. Bermillo<sup>1</sup>

<sup>1</sup> Bicol University, Legazpi City, Philippines

**Socio-Economic Assessment of the Gleaners of Spider Conch in Prieto Diaz, Sorsogon**

Ma. Teresa Abalon-Mirandilla<sup>1</sup>

<sup>1</sup> Bicol University College of Science, Legazpi City, Philippines

**Posters Sessions**

**Reproductive Biology and Population Dynamics of Flyingfish (*Cheilopogon unicolor*) from Batanes Waters**

Evelyn C. Ame<sup>1</sup>, Jessica Retamal<sup>1</sup>, Milagros C. Morales<sup>1</sup>

<sup>1</sup> Bureau of Fisheries and Aquatic Resources, Regional Office 02 Tuguegarao City, Philippines

**Evaluation of Lying-in Hatchery Concept as Resource Management Strategy**

Plutomeo M. Nieves<sup>1</sup>

<sup>1</sup> Bicol University Tabaco Campus, Tabaco City, Philippines

## Closing Ceremony

### Impressions

#### Synthesis of Symposium Proceedings

Ninfa R. Pelea,  
Professor, Bicol University Tabaco Campus

#### Awarding of Certificates

Maria Asuncion V. Oronan,  
Dean, Bicol University Tabaco Campus

#### Closing Remarks

Ronnel R. Dioneda  
Director, BU Research and Development Center

November 26, 2016

### Cross-Border Education: Fieldwork in Sagurong, San Miguel Island

#### Courtesy Call to Barangay Chairman

Dr. Plutomeo M. Nieves  
Prof. Antonino Mendoza, Jr.  
Mr. Renan Bobiles  
Mr. Christian Cabiles

#### Interview of Stakeholders

#### Discussion in BUTC: *Towards Co-existence with the Ecosystem Conservation: Preservation and the Development of Rural Residents' Lives*

Dr. Plutomeo M. Nieves (BU)

## Cross-Border Education Session :

### Integrated Management of Coastal Resources by Marine Protected Areas

#### Review

##### Plutomeo M. Nieves

Bicol University Tabaco Campus  
Tabaco City, Albay, Philippines

This review covers the lecture series and field work in held on November 24 and 26, 2016 respectively, during the 10<sup>th</sup> International Kuroshio Science Symposium held at Patio De San Jose, Malilipot, Albay, Philippines and San Miguel Island, Tabaco City.

The lecture series highlights nine presentations where marine protected area (MPA) is the central discussion points. The first paper features an unorthodox management scheme referred to as *Hidden MPA*. The word "hidden" implies that it is not within the popular view for MPAs because it is privately managed with armed men on guard. Interestingly, its success is indicated by a good to excellent live coral cover with impressive reef fish diversity and biomass. Given this reality, is it worth adapting? Meanwhile, the MPA management and rural fisheries along Lagonoy Gulf were reported to show successes as well as failures. The sustainability of MPAs however, depends largely if it could promote the material welfare of the fishers.

The case of Western Danajon Bank, presents a new MPA management approach - by networking 21 community-level MPAs. Ecologically, the effort is beneficial in determining the hydrographic and larval distribution of fish eggs and larvae. In aspect of governance, management networking re-establishes

the implementation structure and formalizes management plan in each community-level MPAs.

Dr. Matsuda presented comprehensive views about fisheries management: the input control regulates fishing opportunities while the output control regulates the amount and quality of fish landings, MPA falls under the input control category. The idea of MPA also varies with definition as well as governance: the bottom-up to top down management or co-management in which the government shares power with resource users (common in Asian countries). In Japan, co-management is based on territorial use rights for fisheries (TURF) and special overlap between varieties of fisheries. Japanese local fishers from focal FCAs can regulate their own fishing gears, season and fishing ground in operation, a management action not found in the Philippines. But recently, conflict between other stakeholder groups (eco-tourism, whale-watching and snorkeling); offshore wind farms and restoration movement of sea grass beds as payment for ecosystem services (PES) is evident, thus, the hesitation of the fisheries Agency of Japanese Government to develop an integrated coastal management framework.

A comparative evaluation of MPAs: partially protected MPAs fully protected and open fishing in terms of species richness and abundance of commercially important fishes using visual belt transect survey reveals that fully protected area is still more a effective approach. From the ecological perspectives, suggests the critical significance of seaweed and sea grass ecology in MPA establishment in view of its connectivity to marine ecosystem.