CREPSUM Annual Report 2023

CREPSUM（Collaborative Research and Education Project in Southeast Asia for Sustainable Use of Marine Ecosystems)

Hiroaki SAITO

1. Ongoing activities, in line with the IMBeR Grand and Innovation Challenges

(Among other uses, information will be used to update the IMBeR Annual Report to SCOR)

1.a. Grand Challenge I

Understanding and quantifying the state and variability of marine ecosystems - with focus on Research Objectives 1 to 3:

***Research Objective 1**. Evaluate and predict the cumulative effect of multiple stressors*
***Research Objective 2**. Integration of climate change and climate variability*
***Research Objective 3**. Impacts on society – preparation for a changed future*

Status and anthropogenic influence of biological diversity in the Southeast Asia:

Fine-scale phylogeography of coastal fishes in the South China Sea: Possible roles of biological traits and geography。 https://doi.org/10.1111/jbi.14239

Factors Influencing the Seagrass-Sea Cucumber Association in Tropical Seagrass Meadows. https://doi.org/10.3389/fmars.2021.696134

Genetic diversities of commercially-harvested jellyfish *Rhopilema hispidum* and *Lobonemoides robustus* in Southeast Asia. https://www.jstage.jst.go.jp/article/pbr/16/4/16_P160408/_article/-char/en

Impacts of multiple stressors on SEA marine ecosystems:

Eutrophication and hypoxia in the upper Gulf of Thailand *https://doi.org/10.1007/s10872-021-00609-2*

The harmful raphidophyte Chattonella (Raphidophyceae) in Western Pacific: Its red tides and associated fisheries damage over the past 50 years (1969–2019). https://doi.org/10.1016/j.hal.2021.102070

Establishment of cytochrome P450 1a gene-knockout Javanese medaka, *Oryzias javanicus*, which distinguishes toxicity modes of the polycyclic aromatic hydrocarbons, pyrene and phenanthrene https://doi.org/10.1016/j.marpolbul.2022.113578

1.b. Grand Challenge II

Improving scenarios, predictions and projections of future ocean-human systems at multiple scales - with focus on Research Objectives 4 to 6:

***Research Objective 4**. Development of integrated data systems and approaches for predictions and projections*
***Research Objective 5**. Development of predictive models and projections for use at regional scales*
***Research Objective 6**. Development of alternative scenarios to bridge the gap between physical climate sciences and humanities*

A Global Survey Project on "the Ocean We Want" for International Collaboration of Ocean Science based on the Value-Belief-Norm framework with the assumption of that personal value system influence environmental behavior via environmental beliefs and personal norms. The questionnaire survey is on going in Australian France, Japan, USA, planning in Indonesia and SEA countries (target 10-15 countries).

1.c. Innovation Challenge 4

To advance and improve the use of social science data for ocean management, decision making and policy development

Indonesia policies and researches toward 70% reduction of marine plastic pollution by 2025. Arifin, Falahudin, Saito et al. (in review).

Marine plastic litter has become an emerging pollution issue in Indonesia. Examining 1) various policies related to plastic litter and their impact on reducing plastic litter in Indonesian seas, and 2) analyzed the current research progress and synthesized further gaps to improve research output. Our results showed that Indonesian policy on reducing of marine plastic litter was largely focused on landbased sources, lack of sea-based leakage, and limited community behavior change in plastic use. Most research was done in the central region where a hotspot of marine plastic pollution occurred, lacking in Indonesia's western and eastern regions. The development of bioplastics technology was mostly in the experimental phase. The goal of the Government of Indonesia to reduce 70% marine plastic litter in Indonesian seas by 2025 needs an extension period through active participation of local governments, implementation of solid waste management information system, and establishment national research agenda on marine based-bioplastic.

1.d. Innovation Challenge 5

Interventions to change the course of climate impacts

Coral biodiversity and restoration in SEA, including coral cultivation and transplantation, zooxanthella and microbial association. https://www.youtube.com/watch?v=ImDaALHxjqA

2. Selected highlights

See web site: https://www.crepsum.com/blog

2.a. Events, Meetings, and Workshops

List all international and national events, meetings and workshops. Describe the level of participation: e.g. chairing session/workshop, organising meeting. Include Endorsed Projects committee meetings and workshops.

CREPSUM Joint Seminar, 8-9 March 2023, Atmosphere and Ocean Research Institute, the University of Tokyo, Kashiwa, Japan (hybrid attendance available). On-site attendee (63, Indonesia, Japan, Malaysia, Thailand, Philippines, Vietnam) , On-line attendee:~20.

Report past 3-years activities from National Coordinators from member countries. Sharing progress in science and successes/impediments of dissemination of knowledge from 6 research groups and 17 member scientists. Discuss on the future collaboration including the development of human network, fund raising, in the scope of sustainable use of marine ecosystem services in SEA.

https://www.crepsum.com/events

3. International collaboration and links

CREPSUM activities are based on international collaboration of member countries (Indonesia, Japan, Malaysia, Philippines, Thailand, Vietnam).

https://www.crepsum.com/

4. Education, outreach and Capacity Development

ICGEB-USM-CREPSUM Course Application of Advanced Genomic Tools for Conservation of Marine Biodiversity. 6-10 June, 2022

https://www.crepsum.com/post/icgeb-usm-crepsum-course-application-of-advanced-genomic-tools-for-conservation-of-marine-biodiv

Jellyfish Identification Workshop (hybrid) 17-18 March 2022.

https://www.crepsum.com/post/jellyfish-identification-workshop

Book: General Management Guide for Harmful Jellyfish Stings in the Western Pacific and Adjacent Areas, Eds. Aileen Tan Shau Hwai et al. ISBN: 978-629-97500-0-0

Jellyfish blooms have been a threat to mankind over the decades. Jellyfish poses risks to human health and socioeconomic activities including severe stings, death, and the collapse of fisheries industries and aquatic systems. Jellyfish has provoked chaos in the Western Pacific and its adjacent areas (Bangladesh, Indonesia, Malaysia, Philippines, Singapore, Sri Lanka, Thailand, and Vietnam) due to their notoriously painful and possibly fatal stings although the status of jellyfish invasion is still not a serious threat yet. The scientists and medical teams are aware of the seriousness of the stings by jellyfish especially from venomous box jellyfish (cubozoans), yet not many people understand the exact first aid method to deal with jellyfish stings. Wrong diagnosis and treatment may cause complications and lead to casualties or deaths due to jellyfish venom. Therefore, prompt, and proper first aid will greatly increase the chances of survival. Thus, professional knowledge and

experiences from experts and emergency departments in various countries compiled into this guide book, which aims to disseminate the precise but simple first aid that can be applied by readers themselves during critical moments; also provide related beneficial information to the public.

The book is available on line from the CREPSUM website: https://www.crepsum.com/post/new-book-general-management-guide-for-harmful-jellyfish-stings

Book: Identification Guide to Pufferfishes (Tetraodontidae, Tetraodontiformes) of the South China Sea. Matsuura and Motomura 2022. The Kagoshima University Museum, Kagoshima, 40 pp., 70 figs. ISBN 978-4-905464-20-4

The taxonomy of pufferfishes in the South China Sea is important not only for the understanding of fish diversity of the region but also for the welfare and food management for humans. The number of poisoning from eating pufferfishes reached 737 rom 1999-2003, due to the lack of knowledge on species identification of pufferfishes and their toxicity. Some species are toxic only limited period/year, which misled people to sell and eat the fishes. The main purpose of this identification guide is to provide distinguishing characters of pufferfishes of the South China Sea and help for food security officers/scientists to identify toxic pufferfishes and prevent food poisoning.

5. Images / Figures

CREPSUM Joint Seminar 8-9 March 2023

Also see the website of CREPSUM: https://www.crepsum.com/blog