

## CREPSUM Annual Report 2022

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

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### 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*

*Studying the emergence of hypoxic water mass and its transport process in the Gulf of Thailand by means of field observation. Also, examining how flooding affects hypoxic water mass formation using a physical-ecosystem model. It is found that nutrient management is essential to protect the marine environment in the Gulf of Thailand. (Morimoto et al., 2021)*

*Investigating the effects of biological traits on phylogeographic patterns of selected marine fishes in the South China Sea. It was predicted that overall similarity in these traits correlates with similarity in phylogeographic patterns among species, and that genetic diversity and demographic stability are associated with these traits, as well as the local (paleo)environment. (Muto et al., 2021)*

*Red tides and associated fisheries damage caused by the harmful raphidophyte *Chattonella* were reassessed based on the documented local records for 50 years to understand the distribution and economic impacts of the harmful species in the Western Pacific. (Lam et al., 2021)*

*It is concerned biological and environmental impacts of polycyclic aromatic hydrocarbons (PAHs) through microplastic pollution. However, it has not yet established to evaluate the impact. We developed knock-down fish of cytochrome P450 1a (Cyp1a), an important enzyme for metabolism of organic pollutants, using the CRISPR/Cas 9 system, and provided a deeper understanding of fish catabolism of environmental pollutants. (Rusni et al, 2022).*

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### 2. Selected highlights

#### 2.a. Selected scientific highlights since last report (1-5)

*Last report was submitted to SSC meeting, May/June 2021*

*Publication of “Identification Guide to Puffefishes (Tetraodontidae, Tetraodontiformes) of the South China Sea”: This book is useful not only fish biologist but also non scientists who need to*

identify potentially poisonous pufferfishes. Some pufferfishes are usually not poisonous and edible but temporarily, or regionally, poisonous and induce fatal food poisoning incidents.

## 2.b. Publications since last report

Please add all publications since last report to the table below (see notes for details on “Class” and “Activity” fields).

<b>Publication with DOI</b>	<b>Class 1, 2, 3</b>	<b>Activity*</b>
Rusni et al. 2022. Establishment of cytochrome P450 1a gene-knockout Javanese medaka, <i>Oryzias javanicus</i> , which distinguishes toxicity modes of the polycyclic aromatic hydrocarbons, pyrene and phenanthrene, <i>Marine Pollution Bulletin</i> 178 <a href="https://doi.org/10.1016/j.marpolbul.2022.113578">https://doi.org/10.1016/j.marpolbul.2022.113578</a>	Class 2	CREPSUM
Lum et al. 2021. The harmful raphidophyte <i>Chattonella</i> ( <i>Raphidophyceae</i> ) in Western Pacific: Its red tides and associated fisheries damage over the past 50 years (1969–2019). <i>Harmful Algae</i> 107: 102070. <a href="https://doi.org/10.1016/j.hal.2021.102070">https://doi.org/10.1016/j.hal.2021.102070</a>	Class 2	CREPSUM
Benico, W.M. Lum, K. Takahashi, A.T. Yñiguez and M. Iwataki 2021. Thecal tabulation, body scale morphology and phylogeny of <i>Heterocapsa philippinensis</i> sp. nov. ( <i>Peridinales</i> , <i>Dinophyceae</i> ) from the Philippines. <i>European Journal of Protistology</i> 80: 125811. <a href="https://doi.org/10.1016/j.ejop.2021.125811">https://doi.org/10.1016/j.ejop.2021.125811</a>	Class 2	CREPSUM
Inoue et al. 2021. Mussel biology: from the byssus to ecology and physiology, including microplastic ingestion and deep-sea adaptations. <i>Fish Sci</i> 87, 761–771. <a href="https://doi.org/10.1007/s12562-021-01550-5">https://doi.org/10.1007/s12562-021-01550-5</a>	Class 2	CREPSUM
Muto et al. (2021). Fine-scale phylogeography of coastal fishes in the South China Sea: Possible roles of biological traits and geography. <i>Journal of Biogeography</i> , 48, 2785–2800. <a href="https://doi.org/10.1111/jbi.14239">https://doi.org/10.1111/jbi.14239</a>	Class 2	CREPSUM
Morimoto et al. (2021) Hypoxia in the Upper Gulf of Thailand –hydrographic observation and modeling-. <i>J. Oceanography</i> , 77(6), 859-877. <a href="http://dx.doi.org/10.1007/s10872-021-00616-3">http://dx.doi.org/10.1007/s10872-021-00616-3</a>	Class 2	CREPSUM
Iida et al. 2021 Genetic diversities of commercially-harvested jellyfish <i>Rhopilema hispidum</i> and <i>Lobonemoides robustus</i> in Southeast Asia. <i>Plankton and Benthos Research</i> 16, 308-317. <a href="https://doi.org/10.3800/pbr.16.308">https://doi.org/10.3800/pbr.16.308</a>	Class 2	CREPSUM
Floren et al. 2021. A Review of Factors Influencing the Seagrass-Sea Cucumber Association in Tropical Seagrass Meadows. <i>Frontiers in Marine Science</i> 8, 2021 <a href="https://doi.org/10.3389/fmars.2021.696134">https://doi.org/10.3389/fmars.2021.696134</a>	Class 2	CREPSUM
Buranapratheprat et al. 2021. Eutrophication and hypoxia in the upper Gulf of Thailand. <i>Journal of Oceanography</i> 75, <a href="https://doi.org/10.1007/s10872-021-00609-2">https://doi.org/10.1007/s10872-021-00609-2</a>	Class 2	CREPSUM
Muto et al. 2021 Fine-scale phylogeography of coastal fishes in the South China Sea: Possible roles of biological traits and	Class 2	CREPSUM

geography. <i>J. Biogeography</i> , 48, 2785-2800 <a href="https://doi.org/10.1111/jbi.14239">https://doi.org/10.1111/jbi.14239</a>		
Stankovic et al., 2021 Quantification of blue carbon in seagrass ecosystems of Southeast Asia and their potential for climate change mitigation. <i>Science of The Total Environment</i> , 783. <a href="https://doi.org/10.1016/j.scitotenv.2021.146858">https://doi.org/10.1016/j.scitotenv.2021.146858</a>	Class 2	CREPSUM
Sudo et al., 2021 Distribution, Temporal Change, and Conservation Status of Tropical Seagrass Beds in Southeast Asia: 2000–2020. <i>Front. Mar. Sci.</i> <a href="https://doi.org/10.3389/fmars.2021.637722">https://doi.org/10.3389/fmars.2021.637722</a>	Class 2	CREPSUM
Nguyen et al. 2021. Update of seagrass cover and species diversity in Southern Viet Nam using remote sensing data and molecular analyses. <i>Reg. Studies in Mar. Sci.</i> 44. <a href="https://doi.org/10.1016/j.rsma.2021.101803">https://doi.org/10.1016/j.rsma.2021.101803</a>	Class 2	CREPSUM
Nguyen et al. 2022. Microsatellite-based analysis of the genetic diversity and population structure of the seagrass species <i>Thalassia hemprichii</i> from southern Viet Nam. <i>Aquatic Botany</i> 178. <a href="https://doi.org/10.1016/j.aquabot.2022.103497">https://doi.org/10.1016/j.aquabot.2022.103497</a>	Class 2	CREPSUM
Nguyen et al. 2021. Analysis of rDNA reveals a high genetic diversity of <i>Halophila major</i> in the Wallacea region. <i>PLoS ONE</i> 16(10): e0258956. <a href="https://doi.org/10.1371/journal.pone.0258956">https://doi.org/10.1371/journal.pone.0258956</a>	Class 2	CREPSUM
Vinh and Ouillon 2021. The double structure of the Estuarine Turbidity Maximum in the Cam-Nam Trieu mesotidal tropical estuary, Vietnam. <i>Mar. Geol.</i> 442. 106670. <a href="https://doi.org/10.1016/j.margeo.2021.106670">https://doi.org/10.1016/j.margeo.2021.106670</a>	Class 2	CREPSUM
Pham et al. 2021. Landslide susceptibility mapping using state-of-the-art machine learning ensembles. <i>Geocarto Int.</i> <a href="https://doi.org/10.1080/10106049.2021.1914746">https://doi.org/10.1080/10106049.2021.1914746</a>	Class 2	CREPSUM
Lan et al. 2021. Identification and estimation of the marine ecosystem services surrounding selected offshore islands of Vietnam. <i>Environ Dev Sustain</i> 23, 2224–2242 (2021). <a href="https://doi.org/10.1007/s10668-020-00671-8">https://doi.org/10.1007/s10668-020-00671-8</a>	Class 2	CREPSUM
Woo et al., A. 2021. Review on Knowledge and Research of Interstitial Sea Cucumber. <i>Paleontol. J.</i> 55, 1063–1071 <a href="https://doi.org/10.1134/S0031030121090148">https://doi.org/10.1134/S0031030121090148</a>	Class 2	CREPSUM
Pratama et al. 2021. An annotated checklist of crinoids (Echinodermata) collected by the South Java Deep-Sea biodiversity cruise 2018. <i>Raffles Bull. Zool.</i> , supplement 36, 435-450. DOI: 10.26107/RBZ-2021-0046	Class 2	CREPSUM
Okunishi et al. 2021. Redescription of <i>Ophiolipus levis</i> (Echinodermata: Ophiuroidea) collected from deep waters in the Sunda Strait. <i>Raffles Bull. Zool.</i> , supplement 36, 435-450. DOI: 10.26107/RBZ-2021-0045	Class 2	CREPSUM
Thoha et al. 2021. Distribution of phytoplankton in Pangkep Waters, South Sulawesi, Indonesia. <i>IOP Conf. Ser.: Earth and Env. Sci.</i> , 649(1), 012017. <a href="https://doi.org/10.1088/1755-1315/649/1/012017">https://doi.org/10.1088/1755-1315/649/1/012017</a>	Class 2	CREPSUM

*\*If appropriate, please list the IMBeR activity through / by / from / during which the publication arose*

### **2.c. 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 Planning Meeting for 2022*

*24 March 2022. On-line. More than 70 members of IMBeR regional project CREPSUM were attended. Reporting annual activities in 2021-2022 under COVID-19 pandemic, planning funding priority and activities in 2022-23 including joint seminar in Japan in March 2023.*

<https://www.crepsum.com/post/crepsum-planning-meeting>

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## **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/>

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## **4. Input to management, policy and SOCIETY\* over the last year**

*Add anything that is not covered under “1.c. Grand Challenge III”*

*\*As previous reporting forms requested ‘input to management and policy’ only, please add any ‘input to society’ not captured in previous reports*

*One of the research group of CREPSUM is “Social-Ecological System”. Under the COVID-19 pandemic, planned questionnaire survey was postponed.*

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## **5. Education and outreach**

*Jellyfish Identification workshop*

*17-18 March 2022. On-line. This is a training workshop of jellyfish identification as part of CREPSUM educational activity collaborated with IOC/WESTPAC. More than 60 trainees gathered from 9 countries/region (Indonesia, Japan, Malaysia, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, Vietnam) and received lectures. High quality microscopic video images are prepared. Lecturers are not only specialists of jellyfish biology and ecology but also medical doctors and health personnel, who give lectures on the health incidents related to jellyfish.*

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

*Deep Dive Into the Journey of Women in Ocean Science.*

12 Oct., 2021. On-line. Leading women marine scientist from Malaysia, Japan and Indonesia gave talks on the challenges and accomplishments in the realms of marine science, and encouraged young scientists. <https://www.crepsum.com/post/deep-dive-into-the-journey-of-women-in-ocean-science>

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## 6. Planned activities

Joint Seminar. March 2023. Kashiwa (AORI, UTokyo), Kashiwa

Field and fishmarket survey of jellyfish in Thailand. Summer 2022.

Japan-Malaysia joint field survey in Malaysia. Summer 2022.

Field survey for the value of marine ecosystem services related to plastic pollution and tourism (face-to-face and online survey). Pari Island, Indonesia, Autumn 2022.

Several field studies are on planning, with considering travel regulation and COVID-19 pandemic.

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## 7. Images / Figures

*\*\*\*\*It is always good to have some recent photos / figures / infographics to create more exposure for the Regional Programmes, Working Groups, etc. These can range from those suitable for a very scientific audience, to those that would engage the general public. IMBeR would use these, on the website (e.g. <http://www.imber.info/> and <http://www.imber.info/en/news>), in tweets (@imber\_ipo), in presentations, etc. In addition, Future Earth (one of our sponsors) regularly asks us to provide high quality images for their glossy reports. These can highlight the activities of IMBeR and their other Global Research Projects (see pdfs of past Future Earth reports here <https://futureearth.org/publications/annual-reports/>)*

*So, please provide any images that you might think are useful. These can be pasted in this document or emailed as an attachment to [imber@ecnu.edu.cn](mailto:imber@ecnu.edu.cn).\*\*\*\**

*See the website of CREPSUM: <https://www.crepsum.com/blog>*