



## CAPACITY DEVELOPMENT (5.4)

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**IOC Sub-Commission for the Western Pacific (WESTPAC)**



Fourteenth Intergovernmental Session of the IOC Sub-Commission for the Western Pacific  
4-7 April 2023, Jakarta, Indonesia



# Presentation outline



- IOC and WESTPAC capacity development strategy
- Why capacity development matters
- WESTPAC's effort in addressing capacity building and its effectiveness
- A summary of key achievements
- Key activities since the last Session (April 2021)
- Problems encountered and recommendations for future development in this thematic area
- Planned activities for May 2023- April 2025

# IOC capacity development strategy:



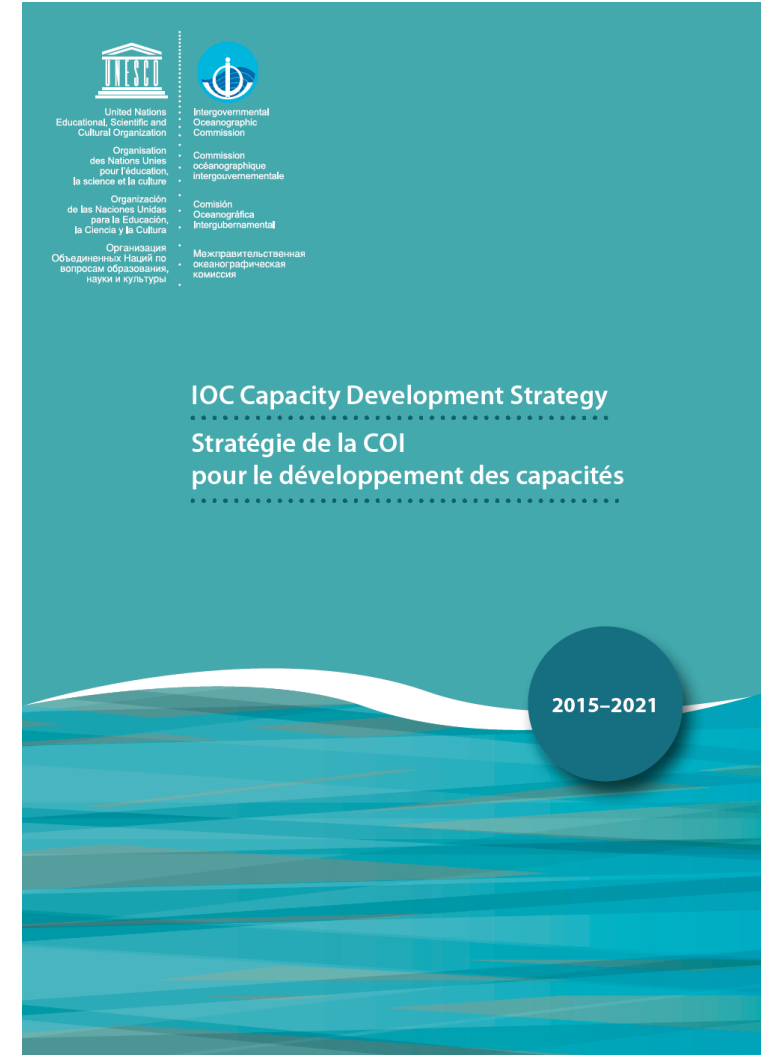
To ensure that all Member States have the capability to build and apply scientific knowledge to achieve the High-Level Objectives (HLOs),



*[IOC Regional Subsidiary Bodies] are the most efficient platforms for co-designing and co-delivering IOC capacity development activities with Member States, leaving no one behind.*



Weddell Sea, Antarctica  
I. Noyan Yilmaz/Shutterstock.com



# WESTPAC's effort in addressing capacity building and its effectiveness :



## IOC Vision and High-Level Objectives (2022-2029)

- Healthy ocean and sustained ocean ecosystem services
- Effective warning systems and preparedness for tsunamis and other ocean-related hazards
- Resilience to climate change and contribution to its mitigation
- **Scientifically-founded services for the sustainable ocean economy**
- Foresight on emerging ocean science issues

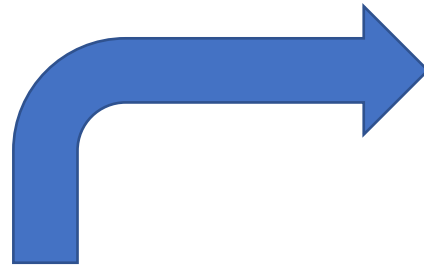
**Note: building science capacity for the UN Ocean Decade (2021-2030)**

## WESTPAC's activities thematic areas

- Ocean processes and Climate in the Indo-Pacific
- Marine biodiversity, seafood security and safety
- Healthy ocean ecosystem

## WESTPAC Capacity Development Objectives

## IOC's Capacity Development Strategy



# Empowering people in marine science: WESTPAC Efforts in Capacity Development



## Bolster institutional capacity for the Future We Want

**Guiding principles:** Empowered, Adaptive, Inclusive, and Integrated

### Approaches:

- ❑ Target early career scientists
- ❑ Suit national and regional needs, while closely following global emerging issues
- ❑ Link training to the attainment of research goals by integrating CD into program development
- ❑ Co-design and co-development with Member States

# Integrated capacity development tools



“Development of “UNESCO/IOC Regional Network of Training and Research Centers (RTRCs) on Marine Science”

Inclusion of capacity building into WESTPAC research programmes and conduct of a series of regional and national tailored training (or training workshop) in Member States on a rotation basis

“Training Through Research” via the engagement of early career scientist into WESTPAC research programmes

Establishment of “WESTPAC Best Young Scientist Award” and “WESTPAC Young Scientist Grant” to nurture young science leaders and facilitate international exposure of young scientists

**WESTPAC has been exploring more feasible tools to develop capacity at different level, including:**

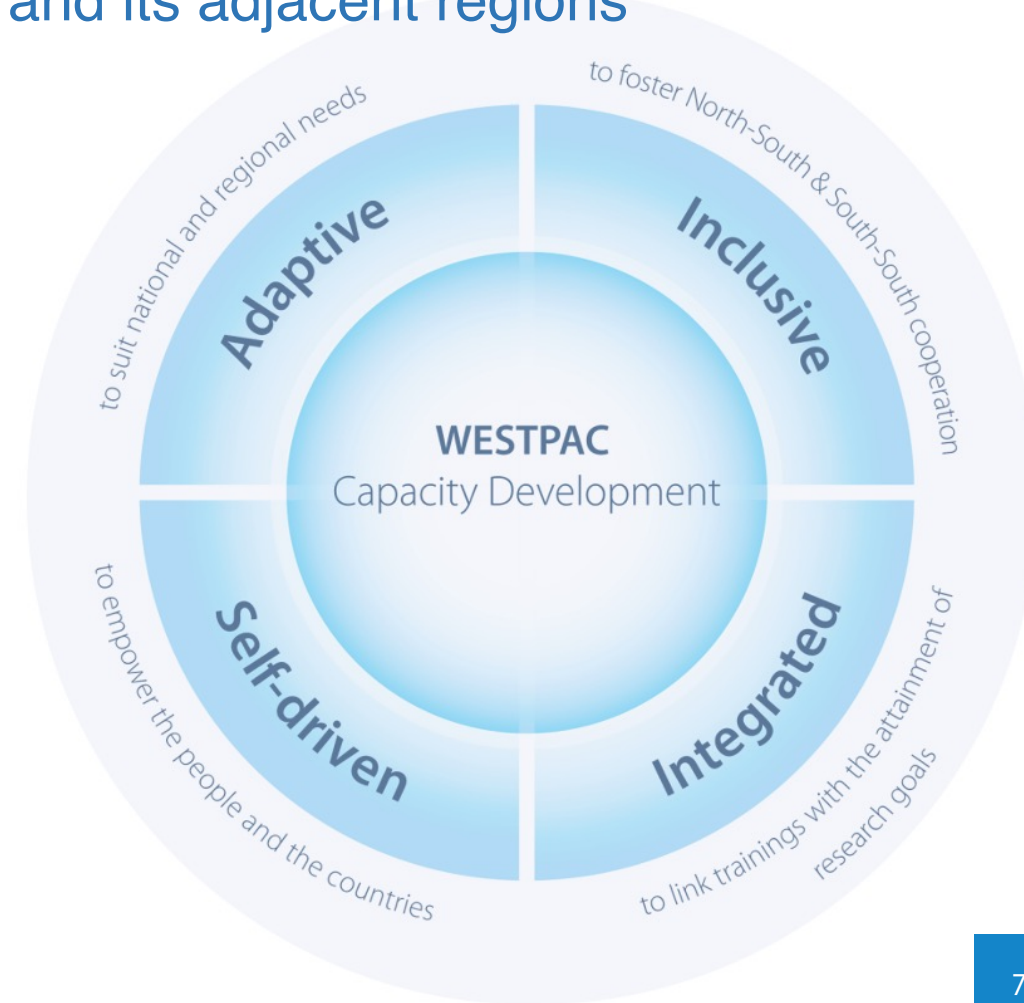
Initiation of “WESTPAC Young Scientist Forum for WESTPAC early career scientist to exchange their perspective on marine science development and cooperation

Conduct of “Bring Marine Science to School” to inspire young generations/school students on ocean and marine science

# Regional Capacity Building: IOC/WESTPAC

## “UNESCO/IOC Regional Network of Training and Research Centers (RTRC) on Marine Science in the Western Pacific and its adjacent regions”

- RTRC was initiated in 2008: it **aims** to improve national and regional capability and capacity for marine science in a sustainable and systematic manner and integrate research with training.
- The RTRCs were established based on the specialized areas of the host institutes in the region.
- It employs a co-design and co-development approach in tailoring capacity development to suit stakeholder needs, building on mutual assistance among countries in the region and providing high-quality training, research opportunities, and sustainable long-term service.



# Regional Capacity Building: IOC/WESTPAC

## “UNESCO/IOC Regional Network of Training and Research Centers (RTRC) on Marine Science in the Western Pacific and its adjacent regions”

1. Reef Management and Restoration, University of the Philippines, Philippines, 2019-
2. Marine Toxins and Seafood Safety, Institute of Oceanography, Vietnam, 2019-
3. Marine Plastic Debris and Microplastics, East China Normal University, China, 2019-
4. Marine Biodiversity and Ecosystem Health, National Research and Innovation Agency (BRIN), Indonesia, 2016 -
5. Ocean Dynamics and Climate, First Institute of Oceanography, China, 2010 -

The RTRC initiative is tailored to national and regional needs, building on mutual assistance among countries in the region and providing high-quality training, research opportunities, and sustainable long-term service.



*Build on the expertise of the host Institutes*



# Regional Capacity Building: IOC/WESTPAC



## “UNESCO/IOC Regional Network of Training and Research Centers (RTRC) on Marine Science in the Western Pacific and its adjacent regions”

RTRCs	Established	Host Institute	Training courses/trainee /countries	Training courses for 2023-25
RTRC-Ocean Dynamic and Climate	2010	First Institute of Oceanography , China	11/670/54	3
RTRC-Marine Biodiversity and Ecosystem Health	2016	National Research and Innovation Agency, Indonesia	7/114/18 (from 2016 to 2020)	3
RTRC-Reef Management and Restoration	2019	University of the Philippines	1/8/4	3
RTRC-Marine Toxins and Seafood Safety	2019	Institute of Oceanography, Vietnam	0/-/-	3
RTRC-Marine Plastic Debris and Microplastics	2019	East China Normal University, China	0/-/-	3

# Capacity development within the WESTPAC's Project/Programmes

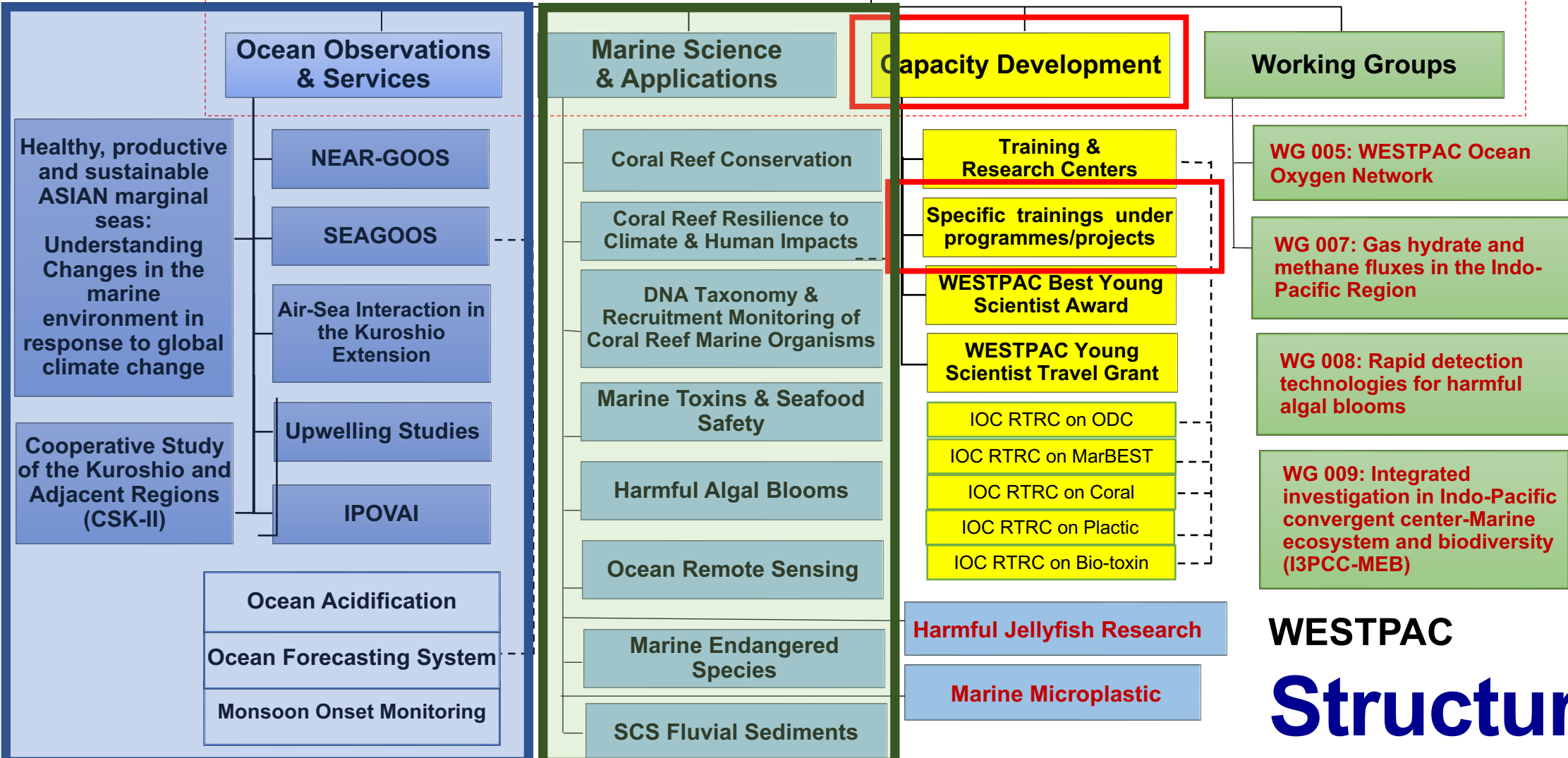


WESTPAC Session

WESTPAC Office, Bangkok

WESTPAC Advisory Group

## WESTPAC International Marine Science Conference



# WESTPAC Structure



# Regional Capacity Building: IOC/WESTPAC

## Challenges:

- 2019-2022: A difficult time for implementation of programmes/projects activities due to Covid-19
- Declining of financial support for ocean science research and monitoring during the pandemic and the post-pandemic, which could affect the implementation of WESTPAC's capacity development and activities of programmes/projects

## Mitigating impacts from the pandemic :

- Established partnerships with ocean-related partners in synergy resources used for capacity development and implementation of programmes/projects.
- Strong willingness of the host Institutes the RTRCs and programmes/projects in supporting activities and capacity development.



# Regional Capacity Building: IOC/WESTPAC

## Forwards:

- **Encouraging** the Member States to join an effort with the WESTPAC to support the establishment of **new RTRCs** in enhancing support of the UN Decade Objectives
- **Encouraging** the Member States to participate actively in capacity development and support the RTRCs activities
- **Encouraging** Member States to support establishing programmes/projects in close collaboration with the WESTPAC and RTRCs could allow young scientists in the countries to improve their knowledge and skills through training and research, which could be a long-term benefit to the nations.
- **Encouraging** Member States to host or organize the training workshop of WESTPAC programmes/projects

# Capacity Development: Advance knowledge for ocean processes, marine biodiversity & ecosystem health



## Intersessional period (2021-2023): WEBINARS

### CALL FOR WEBINAR SPEAKERS FOR CSK-2

**BY 25 JUNE 2020**

We are seeking speakers for a CSK-2 webinar series on scientific topics related to the Kuroshio and its adjacent regions.

#### Objectives

1. to understand scientific interests of countries and their institutions in CSK-2<sup>1</sup>, and the environmental, social-economic importance of Kuroshio and its adjacent regions;
2. to formulate a preliminary outline for the CSK-2 Science Action Plan, which could potentially contribute to the UN Decade of Ocean Science for Sustainable Development (2021-2030).

#### Criteria

Webinar speakers are expected to introduce:

1. ongoing or planned study(ies) related to the Kuroshio and its adjacent regions;
2. how the study(ies) could contribute to addressing environmental, social-economic challenges, such as weather and climate knowledge and services, seafood safety and security, pollution and ecosystem health etc;
3. concrete ideas/plans for conducting the CSK-2 jointly.

#### SUBMISSION OF PROPOSALS

Please submit your abstract of no more than 400 words (one page), together with your CV to [locwestpac@unesco.org](mailto:locwestpac@unesco.org), with a copy to Kentaro Ando ([ando@jamstec.go.jp](mailto:ando@jamstec.go.jp)), Xiaopu Lin ([linxiaopu@ouc.edu.cn](mailto:linxiaopu@ouc.edu.cn)), and Cesar Villanoy ([cesarv@msi.upd.edu.ph](mailto:cesarv@msi.upd.edu.ph)).

<sup>1</sup>The Second Cooperative Study of the Kuroshio and Adjacent Regions (CSK-2)

### WESTPAC Webinar Series on OCEAN ACIDIFICATION

Register for event

5 May 2021 (UTC+7)	12 May 2021 (UTC+7)
<p>13:00-13:30 Underway Measurement of Dissolved Inorganic Carbon (DIC) in Estuarine Waters <i>Dr. Awan Zhan, Third Institute of Oceanography, China</i></p> <p>13:30-14:00 On-going observation of ocean acidification in coastal waters in Thailand <i>Dr. Sawaratt Srirongse, Department of Marine and Coastal Resources, Thailand</i></p> <p>14:00-14:30 Effect of ocean acidification on growth, lipid and carotenoid content of a widely used green microalgae in aquaculture, <i>Codium vulgare</i> Beijerinck (Beijerinck) Seto <i>Dr. Wa'ao, University of Hali Oka Kendari, Indonesia</i></p> <p>14:30-15:00 Q/A</p>	<p>13:00-13:30 Integrative effects of deoxygenation and acidification along the sub-estuaries in the Upper Gulf of Thailand <i>Ms. Khanitha Uthapan, Xiamen University, China</i></p> <p>13:30-14:00 Coastal acidification, the other eutrophication problem in mariculture areas <i>Prof. Maria Lourdes McGlone, University of the Philippines</i></p> <p>14:00-14:30 Effects of Ocean Acidification on Oyster Aquaculture <i>Prof. Alden Tari Shaw-Huei, Universiti Sains Malaysia</i></p> <p>14:30-15:00 Q/A</p>
19 May 2021 (UTC+7)	26 May 2021 (UTC+7)
<p>13:00-13:30 Coral reefs and ocean acidification: impact and adaptive capacity in Thailand and southern Asia <i>Dr. Suchana Chavorn, Chulalongkorn University, Thailand</i></p> <p>13:30-14:00 Coral calcification in the southern part of Vietnam studied with a new method <i>Mr. Vu Tran Tuan Anh, Institute of Oceanography, Vietnam</i></p> <p>14:00-14:30 Influence of acidification and associated changes on coral reef resources in the Philippines <i>Dr. Patrick Cabalan, University of the Philippines</i></p> <p>14:30-15:00 Q/A</p>	<p>13:00-13:30 Hard coral diversity of the tropical shallow reef in the vicinity of an underwater vent exposed to a lowered pH gradient <i>Ms. Nithyasa Narasim, Universiti Sains Malaysia</i></p> <p>13:30-14:00 Porites colonies get smaller in CO<sub>2</sub>-enriched coral communities of SW Luzon, Philippines <i>Ms. Rainie Cabrera, University of the Philippines</i></p> <p>14:00-14:30 An updated model on the future ocean acidification program of IOC-WESTPAC <i>Dr. Patrick Cabalan, University of the Philippines</i></p> <p>14:30-15:00 Q/A</p>

For more information: <https://ioc-westpac.org>

### International Webinars on Advancing Remote Sensing Applications for the Sustainable Development of Ocean, Marine and Coastal Resources

Scheduled for 15 November 2022 - 17 January 2023

#### CALL FOR SPEAKERS

#### Objectives

1. To facilitate an exchange of latest knowledge and development practices about ocean remote sensing applications.
2. To develop opportunities for applying remote sensing to the conservation and sustainable use of marine and coastal resources.

#### Webinar speakers are expected to:

1. Showcase ongoing or planned efforts in applying ocean remote sensing for ocean and climate research, climate change mitigation and adaptation, coastal and marine management, marine biodiversity conservation and ecosystem restoration, and disaster risk reduction.
2. Analyze the progress achieved and explore concrete ideas/plans for future cooperation in ocean remote sensing application.

#### Submission of proposals

**Deadline: 10 October 2022**

Please submit your abstract of less than 400 words, together with your CV to [locwestpac@unesco.org](mailto:locwestpac@unesco.org), with a copy to [penchanla@go.buu.ac.th](mailto:penchanla@go.buu.ac.th) and [tachanata@go.buu.ac.th](mailto:tachanata@go.buu.ac.th)

Each presentation will take about 30 mins, including 5 mins for questions.

The webinar program will be available by 31 October 2022 at <https://ioc-westpac.org>

### HARMFUL JELLYFISH WEBINAR

#### Future Friend or Foe: Handling Our Relationship with Jellyfish in SEA

**15<sup>th</sup> Sept 2020**  
2:00 pm - 4:00 pm (UTC/GMT +08:00)

#### Speakers:

- Dr. Mohammed Rizman Iddi**  
Senior Lecturer, University of Malaya, Malaysia  
Diversity, Distribution and Ecology of Jellyfish: Insights from Coastal Surveys in Malaysia
- Dr. Tri Maharani, Msi, SpEM**  
Head Emergency Dahu Musada Jopohi Kendri East Java donesia & President Indonesia Toxicology, Indonesia  
Jellyfish Cases in Indonesia: Data and Problems
- Dr. Patrick Joseph Tiglao, MD, FPCEM**  
Emergency Medicine Consultant/ Specialist, Corazon Locsin Memorial Hemodialysis Regional Hospital & Eastern Visayas Regional and Medical Center, Philippines  
Jellyfish Impact to Health: The Philippines Experience
- Prof. Dr. Lakkana Thaikruea**  
Professor, Chiang Mai University, Thailand  
"How to Turn the Lethal Jellyfish Controversial Health Threat with Conflicts of Interest into International Solution"

#### Moderator:

- Iffah Iesa**  
Scientific Officer, Curator  
Lee Kong Chian Natural History Museum, Singapore

Scan & Join us

<https://forms.gle/mimnQ0wVqhpP2Rg99a>

**Webinar:** sharing and exchanging knowledge, disseminating knowledge from the WESTPAC's programmes/projects to wider ocean-related stakeholders, and further collaborating to develop regional actions

# Capacity Development: Advance knowledge for ocean processes, marine biodiversity & ecosystem health



## Intersessional period (2021-2023): UN Ocean Decade



### UN Ocean Decade Kickoff Conference for the Western Pacific and its Adjacent Areas

25-26 November 2021

Watch the Opening on November 25 at 1300-1520 Bangkok (UTC+7)



One programme and three projects were registered as UN Ocean Decade actions by WESTPAC

- UN 21: Accelerating MSP in the region
- UN 22: Asia's riverine plastic emission
- UN 23: Transformations in Capacity Development-RTRCs network
- UN24: 2nd Cooperative Study of Kuroshio and Adjacent Regions

### DECADE ACTION INCUBATOR SESSIONS

Combat pollution	Sustainably feed the world's population	Build resilience to climate change	Ensure a sustainable ocean observing system	Ensure comprehensive capacity development
Restore ecosystems and biodiversity	Develop a sustainable blue economy	Enhance multi-hazard early warning services	Develop a digital representation of the ocean	Change humanity's relationship with the ocean

#### Overall time arrangement for Decade Action Incubators

25 Nov 2021 (UTC+7, Bangkok Time)				26 Nov 2021 (UTC+7, Bangkok Time)			
0830 –1030	1030 – 1230	1300 – 1520	1530 - 1730	0830 –1030	1030 – 1230	1300 –1500	1530 - 1730
<a href="#">Incubator 1</a> Ocean Solutions	<a href="#">Incubator 4</a> Marine mammals and sea turtles	Opening and High-Level Segment	<a href="#">Incubator 6</a> Save our corals	<a href="#">Incubator 8</a> Indo-Pacific Convergent Center	<a href="#">Incubator 11</a> Riverine plastic and microplastic	<a href="#">Incubator 14</a> Sciences for blue economy	<a href="#">Incubator 16</a> Ocean data assimilation and CoastPredict
<a href="#">Incubator 2</a> Marine Life 2030	<a href="#">Incubator 5</a> Changes in Asian Marginal Seas		<a href="#">Incubator 7</a> Ocean forecasting	<a href="#">Incubator 9</a> Marine spatial planning	<a href="#">Incubator 12</a> Harmful algal blooms	<a href="#">Incubator 15</a> Coastal inundation and erosion	<a href="#">Incubator 17</a> ECOP (Asia): Science communication
<a href="#">Incubator 3</a> Remote sensing				<a href="#">Incubator 10</a> Marine heatwaves	<a href="#">Incubator 13</a> Kuroshio	Launch of a Decade endorsed project: COASTAL SOS	

# Capacity Development: Advance knowledge for ocean processes, marine biodiversity & ecosystem health



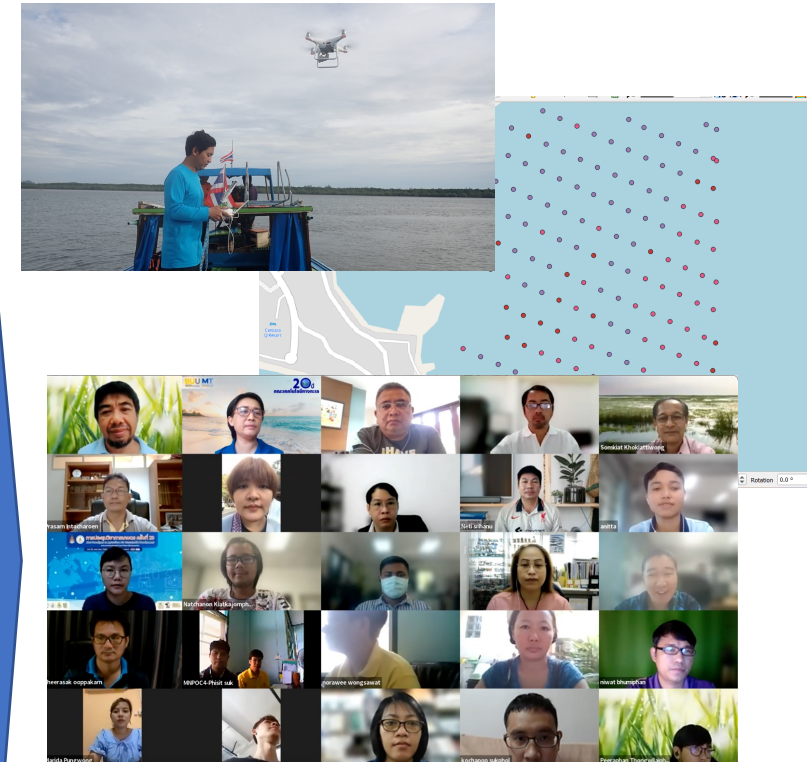
## Intersessional period (2021-2023): Ocean Remote Sensing



**First Training in Thailand (hybrid):** using Google Earth Engine (GEE) for seagrass mapping (16-18 December 2020, by the expert of the WESTPAC ORS project, the participants were from the seagrass mapping team of the Department of Marine and Coastal Resources (DMCR) and a local expert from Burapha University, Thailand.



Series (3) of internal review and practical training and workshop (virtual) of DMCR seagrass mapping team, using GEE in Thailand, 2021.

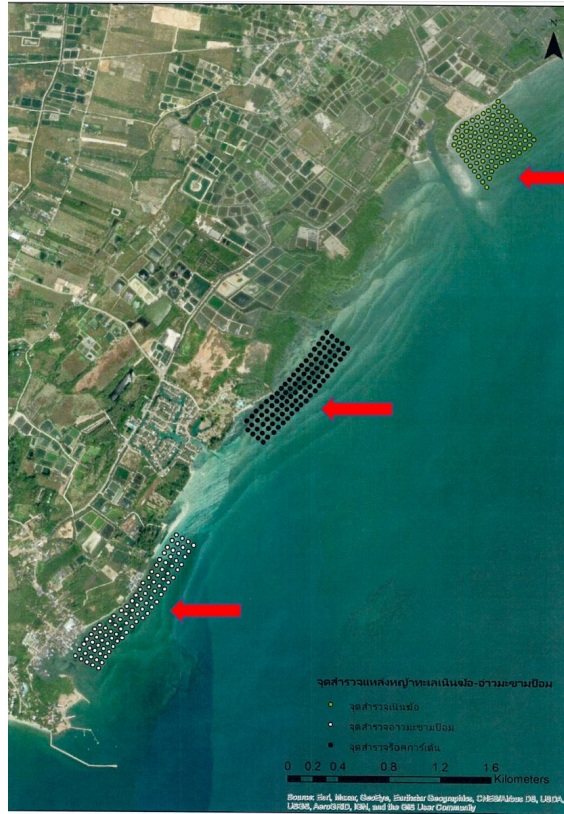


With the technical support of WESTPAC, the drone was introduced into field data collection and integrated into GEE's satellite data processes, this GEE and drone technical was disseminated to the wider RS community in Thailand through the training (virtual), 20-23 December 2021 and 8-11 February 2022

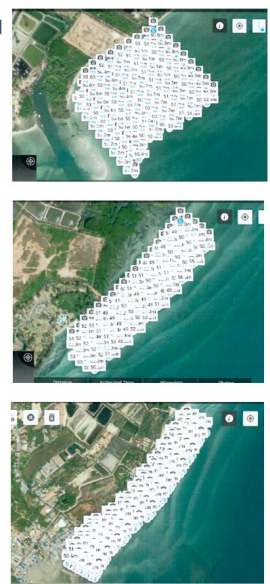
# Capacity Development: Advance knowledge for ocean processes, marine biodiversity & ecosystem health



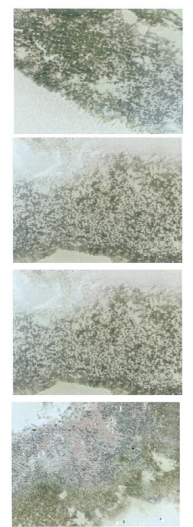
## Intersessional period (2021-2023): Ocean Remote Sensing



At each point on the map are taking photos by drone



Examples of seagrass photos were taken by drone for further processes and input in the GEE processes.



Results from GEE's processes, **green** (high density) and **light green** (low density) are seagrass areas



Ao Ma Kham pom, Rayong Province, Thailand

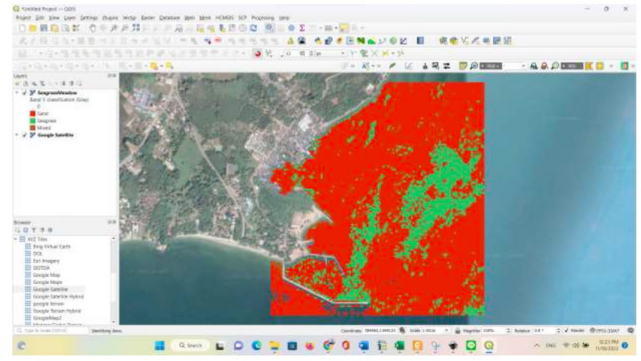


Figure 65 Result in GIS software

This can be done with a beautiful map or will analyze the area further.

### 7. ABUNDANCE MAPPING

It may be possible to apply field data on seagrass integrity, such as the percentage of seagrass cover, and then provide an integrity threshold, and then classify the data like this work, which is consistent with the collection of field data by researchers, but must be applied to seagrass integrity assessments from vertical photographs, which may apply other programs such as ImageJ to assess seagrass cover areas, for example.

The results of the two-year effort of WESTPAC and DMCR in the practical use of **GEE** and **drones** for processing satellite data have succeeded to get good results of seagrass mapping and potentially being used in operation for monitoring seagrass.

The **training manual for seagrass mapping using Google Earth Engine** (in Thai and English) was developed based on the knowledge of two-year practices.



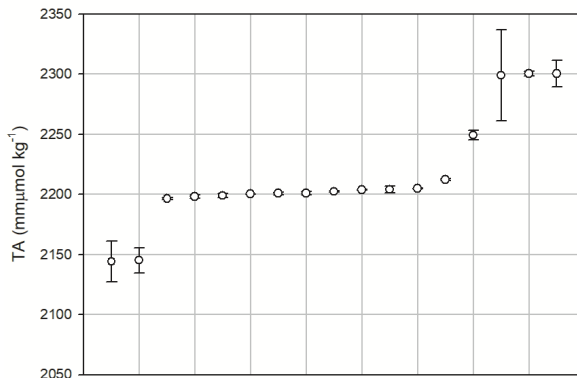
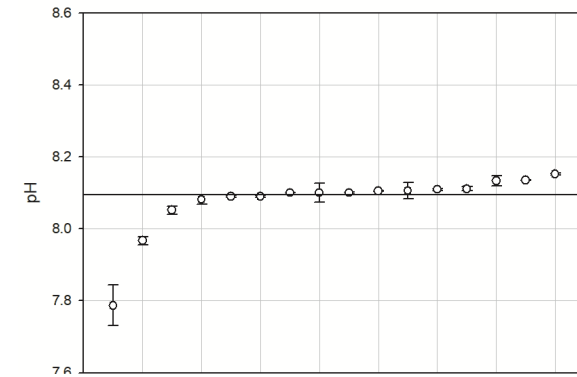
# Capacity Development: Advance knowledge for ocean processes, marine biodiversity & ecosystem health



## Intersessional period (2021-2023): Ocean Acidification

### Intercalibration Exercise on pH and Total Alkalinity Measurement

Building up capacity on the measurement of the acidity of seawater and other carbonate-related parameters to meet the standard requirement of SDG-14.3.1



Lab ID	Countries	Name and postal address for CRMs shipping
1	China	City university of Hong Kong,
2	China	First Institute of Oceanography, Ministry of Natural Resources
3	China	Third Institute of Oceanography, Ministry of Natural Resources
4	China	361105 A2-402 Zhou-Long-Quan Building, Xiamen University
5	Japan	RIGC/ Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
6	Japan	Mutsu Institute for Oceanography (MIO) Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
7	Japan	Meteorological Research Institute
8	Korea	Korea Institute of Ocean Science and Technology
9	Malaysia	Universiti Sains Malaysia
10	Malaysia	Universiti Malaysia Terengganu
11	Philippines	University of the Philippines,
12	Russia	Pacific Oceanological institute
13	Singapore	Asian School of the Environment Nanyang Technological University
14	Thailand	Aquatic Resources Research Institute, Chulalongkorn University
15	Thailand	Phuket Marine Biological Center
16	Thailand	Marine and Coastal Resources Research Center
17	Thailand	Faculty of Science, Ramkhamhaeng University
18	Thailand	Marine Science Department, Chulalongkorn University
19	Vietnam	Institute of Oceanography

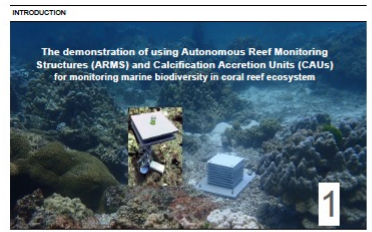


# Capacity Development: Advance knowledge for ocean processes, marine biodiversity & ecosystem health

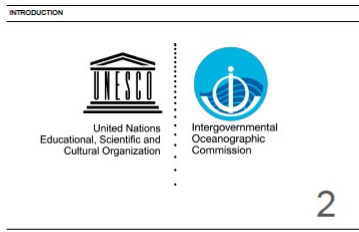


## Intersessional period (2021-2023): Ocean Acidification

### Training material (video) for the operation of the Autonomous Reef Monitoring Structure (ARMS) and calcification accretion Unit (CAU) in monitoring biodiversity in the coral reef area.



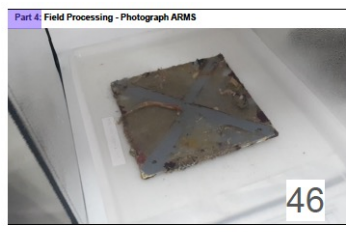
Tide with in situ video of deployed ARMS and CAUs (to show how it looks like)



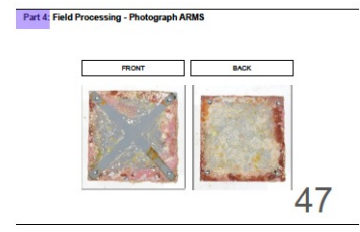
Brought to you by UNESCO and IOCWESTPAC



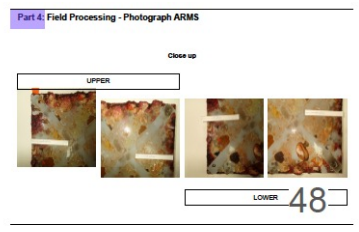
Coral reefs are very biodiverse, complex and productive ecosystems, however they are also one of the most threatened. Coral reefs are extremely susceptible to local and global stressors such as climate change, ocean acidification, sedimentation, eutrophication, exploitation of resources and many more. Fancy coral reef b roll



Place each plate in a photo tray (with 2 cm high stands to support the corners of the plate), add the appropriate label, and photograph from a top down position



Take an initial photo of the plate with the label and then photograph the whole plate several times without the label. Turn the plate over and repeat.



Take a close up image of each quarter of the plate, the center, and of anything of interest. Turn the plate over and repeat.



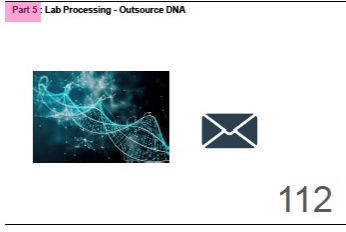
Prepare buckets of seawater with bubblers on the boat to transfer the ARMS to once removed from the water



Carefully bring the ARMS onto the boat and to the holding buckets, flip the ARMS so it is upright in the holding buckets and transfer all water and sediment from the transfer buckets into the holding buckets



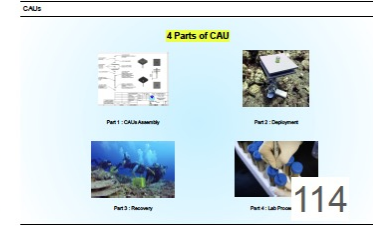
Keep ARMS in the shade and under bubblers through the whole transfer process



Send material for DNA processing



Calcification accretion units (CAUs)



4 Parts of CAU

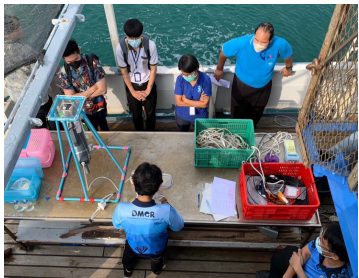
# Capacity Development: Advance knowledge for ocean processes, marine biodiversity & ecosystem health



## Intersessional period (2021-2023):

### National Training Workshop on Ocean acidification and its impacts on marine ecosystems in Malaysia, Thailand, and Vietnam.

Strengthening the cooperation of ocean-related stakeholders on awareness of OA impacts and building capacity on OA research and monitoring in supporting the generation of national OA data and information to achieve their commitment to SDG-14.3 and supporting the development of national policy and management plan for the coast.



**Thailand**  
2-4 November 2022  
Prince of Songkhla Uni. &  
Phuket Marine Biological  
Center



**Malaysia**  
20-22 September 2022  
Centre for Marine and Coastal  
Studies (CEMACS), Universiti  
Sains Malaysia (USM), Penang,  
Malaysia



**Vietnam**  
13-15 October 2022  
Institute of Oceanography





# Thank You

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