



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

**Thirteenth Intergovernmental Session of the IOC Sub-Commission
for the Western Pacific (WESTPAC-XIII)**

27–29 April 2021, Online Session

EXECUTIVE SUMMARY

In accordance with Rule of Procedure 48.3, WESTPAC, as a primary Subsidiary Body of IOC, is required to report to a Governing Body on its sessions.

The IOC Assembly at its Thirty-first session will be invited to consider this Executive Summary. For more detailed information on this session, please refer to the Summary Report of the Thirteenth Intergovernmental Session of WESTPAC at <https://ioc-westpac.org>

- 1 The Thirteenth Intergovernmental Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-XIII) was held virtually from 27 to 29 April 2021 with the Agenda given in **Annex I**. The session was hosted by the Government of the People's Republic of Bangladesh, and attended by more than 120 delegates from 13 Member States in the Western Pacific and its adjacent areas. The Foreign Minister of Bangladesh, IOC Executive Secretary and Assistant Director General of UNESCO, and Chairperson of the Sub-Commission addressed the opening.
- 2 The Sub-Commission convened this session in the wake of a prolonged global COVID-19 pandemic and also in the first year of the UN Decade of Ocean Science for Sustainable Development (2021-2030) (*hereinafter referred to as "Ocean Decade"*). Thus, this session aimed to review the Sub-Commission's programme delivery and efficiency despite the pandemic, deliberate on the engagement in and contribution to the development of the IOC draft Medium-Term Strategy (2022-2029) and the UN Ocean Decade. The Sub-Commission finally elected its new officers for the next intersessional period.
- 3 Throughout the session, Member States expressed their overwhelming support for the continued efforts of the Sub-Commission in assisting member states to address their development challenges, and a leading role that the Sub-Commission has been taking in promoting and mobilizing actions in the region for the Ocean Decade. The achievements of the Sub-Commission would not have been possible without the tireless efforts of the WESTPAC office. While appreciating their high-quality performance and efficient operation, **the Sub-Commission expressed its deepest concern** over the understaffed and overstretched situation in the WESTPAC Office, and **strongly encouraged** all Member States to explore any possibility of loaning their experts to the WESTPAC office, in order to maintain the present momentum of the Sub-Commission.
- 4 **The Sub-Commission expressed** its highest appreciation to the Government of Bangladesh, for its heartfelt offer to host this session physically in Bangladesh although it couldn't be possible, and its tremendous support and thoughtful arrangement which ensured the session

a success. **The Sub-Commission took note of** the request of the host country to enhance its research capacity for sustainable development, and **reiterated its commitment** to assisting scientists and institutions of Bangladesh in all possible ways.

WESTPAC Programme Implementation over the Last Intersessional Period (May 2019 to April 2021)

5 Since the last session (WESTPAC-XII, 2-5 April 2019, Manila, the Philippines), a number of workshops, trainings, field surveys, and demonstration activities had been carried out in the field until the pandemic broke out in early 2020. To cope with the unprecedented situation, the Sub-Commission took immediate actions to remedy the negative impacts, with more than 100 virtual consultations/meetings organized since early 2020.

6 Notwithstanding the restrictions imposed by the Covid-19 pandemic, the Sub-Commission continued to position IOC as the lead for marine science development and cooperation in the region, and to concert joint actions of research and policy communities to address critical challenges for sustainable development. In addition to implementing its core programme activities, the Sub-Commission also took a lead in the preparations and promotion of the Decade in the region.

7 It has been evidenced that the Sub-Commission has been co-designing, and co-implementing its various programmes and activities, with Member States to address the IOC High Level Objectives and common ocean priorities of the region, namely: **ocean and climate; marine biodiversity, seafood safety and security; and ocean ecosystem health**. Some of its programmes have been forming concrete regional components of IOC and related global programmes and efforts, such as GOOS, IP-HAB, GOA-ON, GO2NE, as well as the IOC Capacity Development Strategy (2015-2021).

8 The main thrust of the Sub-Commission includes two regional GOOS (NEAR-GOOS and SEAGOOS); one regional network of training and research centers on marine science (RTRCs); and sixteen programmes/working groups, respectively focusing on monsoon onset, air-sea interactions in the Kuroshio extension, Asian marginal seas, ocean acidification, ocean deoxygenation, feasibility study on the 2nd Cooperative Study of the Kuroshio and Adjacent Regions (CSK-2), coastal upwelling studies, fluvial sediment to the South China Sea, coral reef restoration and conservation, harmful algal blooms, endangered megafauna, remote sensing for coastal habitat mapping, marine toxins and seafood safety, marine microplastics, harmful jellyfish, and ocean forecasting system development and application. **The major accomplishments over the last intersessional period were reflected in:**

- Delivering knowledge and services to serve the needs of Member States to address ocean sustainability challenges

9 The Sub-Commission attaches great importance to the development and delivery of needed knowledge and services for Member States to serve their needs. Great progress over the last intersessional period could be demonstrated by: (a) the development of operational ocean forecasting services to support coral reef conservation, with a trial version of the Thai Coral Bleaching Alert System developed in early 2020 at its initial phase; (b) the monitoring of ocean acidification and research on its impact, with increased number of monitoring stations and capacity of Member States for fulfilling their commitment to SDG 14; (c) the establishment of an Ocean Oxygen Research and Monitoring Network in Nov 2019, to spearhead the studies of various aspects of hypoxia and help inform policymakers on the declining oxygen in their coastal and open waters; (d) increased Member States' research capacity for combating marine plastic pollution, as illustrated by the first scientific finding published on microplastic in the Bay of Bengal in late 2019 and second one in Oct 2020; (e) the transfer and application of remote sensing techniques for marine protected area management, with technical assistance having provided in producing seagrass maps for three selected MPA sites: Li-bong and Pha-ngan Islands in Thailand

and Con Dao in Vietnam; and (f) the delivery of knowledge and outreach services on harmful jellyfish for public health, with a Field Guide to the Jellyfish of Western Pacific published in early 2021, and a number of outreach and awareness activities conducted locally on harmful jellyfish and emergency response for hoteliers, coastal government authorities and school students.

- Mobilizing actions for the UN Decade of Ocean Science for Sustainable Development (2021-2030)

10 The Sub-Commission has been sparing no effort in promoting, engaging in and contributing to the preparation and development of the Ocean Decade. Tremendous effort over the last intersessional period includes: (a) leading the organization of the Decade Regional Planning Workshop (31 July-02 August 2019, Japan) together with the North Pacific Marine Science Organization (PICES), with a catalog of knowledge gaps identified and a list of concrete recommendations to inform the preparation phase of the Decade; (b) motivating stakeholders in the region into the development process of the Decade Implementation Plan; (c) developing and organizing the Decade Regional Dialogue on Co-designing the Ocean Science We Need for the Ocean We Want (10 November 2020, virtual), with a wide range of ocean stakeholders engaged to explore the region's opportunities and challenges and discuss good practices to deliver co-designed, solution-oriented research for sustainable development in the region; (d) developing potential proposals for Decade Actions while capitalizing on existing programmes and networks, with a non-exhaustive list of pipeline proposals developed and presented at the current session for further inputs, engagement and commitment; (e) providing strategic and technical support to Member States in the region for their decade related activities at both regional and national level; and (f) catalyzing partnerships and initiating co-design of transformative solutions amongst diverse stakeholder groups in the region by planning for and organizing a Decade Regional Kickoff Conference (24-25 August 2021, Virtual) and the Decade Regional Conference Series which will run throughout the decade in conjunction with the Sub-Commission's triennial International Marine Science Conferences in 2022, 2025, 2028, and 2031; and

- Bolstering institutional and human capacity for sustainable development of ocean, marine and coastal resources

11 The Sub-Commission recognizes capacity development as one of key means of implementation that helps Member States to achieve their growth and development goals. It has been deploying integrated capacity development tools developed to suit national and regional needs.

12 The Sub-Commission has been implementing the IOC Capacity Development Strategy (2015-2021), and fulfilling its voluntary commitment to the UN Ocean Conference - "*Develop research capacity and transfer of marine technology through the UNESCO/IOC Regional Network of Training and Research Centers (RTRCs) on Marine Science*", which include: (a) The Regional Training and Research Centre on Ocean Dynamics and Climate (RTRC-ODC) and Regional Training and Research Centre on Marine Biodiversity and Ecosystem Health (RTRC-MarBEST) have been operating smoothly with annual trainings organized in 2019 and 2020 in a hybrid mode, based on the pressing needs of early career ocean scientists; (b) three new RTRCs, respectively on Reef Management and Restoration (the University of the Philippines), Marine Toxin and Food Safety (Institute of Oceanography, Vietnam), and Marine Plastic Debris and Microplastics (East China Normal University of China) are well prepared to receive young scientists from within and outside region as soon as the pandemic ends; (c) In late 2019 the Sub-Commission kicked off the third phase of a UNESCO/Korean Funds-in-Trust project "Enhance the Capacity for Species Identification and Genetic Analysis on Marine Organisms in the Coral Reef Ecosystems in the Western Pacific"; (d) In addition, WESTPAC started in June 2019 the implementation of another UNESCO/Japanese Funds-in-Trust project aiming to accelerate the transfer of marine technology for marine biodiversity conservation and seafood safety, particularly on coastal habitat conservation, marine toxins and seafood safety, and other hotspot biodiversity related issues; and (e) Sub-Commission demonstrated its unique value for IOC in addressing its Member States'

specific needs directly. For instance, WESTPAC has been assisting Vietnam to enhance its research capacity for ocean acidification and molecular techniques with a national training workshop conducted on 22–23 October 2019, Nha Trang, Vietnam; and Thailand with a national training course organized on 25-27 November 2020, Phuket, Thailand.

13 **The Sub-Commission expressed** its appreciation, in particular to:

- The Government of Thailand, through its Department of Marine and Coastal Resources, for the provision of office space and facilities for the WESTPAC Office; and its National Commission for UNESCO for the financial support to WESTPAC effort in developing ocean forecasting service for coral reef conservation;
- The Government of China for hosting the Regional Training and Research Center on Ocean Dynamics and Climate (Ministry of Natural Resources and its First Institute of Oceanography) with its annual trainings having been provided since 2011, and the Regional Training and Research Center on Marine Plastic Debris and Microplastics (East China Normal University);
- The Government of Indonesia, through its Indonesian Institute of Sciences, for hosting the Regional Training and Research Center on Marine Biodiversity and Ecosystem Health with annual trainings having been provided since 2016;
- The Governments of the Philippines and Vietnam for hosting the Regional Training and Research Center on Reef Management and Restoration (University of the Philippines), and Marine Toxin and Seafood Safety (Institute of Oceanography), respectively;
- Member States for their in-cash support, such as China via its voluntary contribution to the IOC Special Account, Japan via the UNESCO/Japanese Funds-in-Trust, and the Republic of Korea via the UNESCO/Korean Funds-in-Trust. A significant in-kind support was also provided by China, Indonesia, Japan, Malaysia, the Philippines, Russia, Thailand and Vietnam for various WESTPAC programmes and activities.

14 **The Sub-Commission** has been demonstrating its strategically important value for IOC in achieving its global objectives. The Sub-Commission noted with pleasure that the draft IOC Medium Term Strategy (2022-2029) highlighted the importance of “working closer to the field”, and thus suggested that close communications be established with the members of the IOC Intersessional Financial Advisory Group (IFAG) to ensure that the Sub-Commission could contribute its inputs to the draft MTS until it will be adopted by the IOC Assembly at its 31st session in June 2021.

15 While **stressing** the importance of the Sub-Commission’s programmes and activities to assist Member States addressing their sustainability challenges, **the Sub-Commission appreciated** the continued efforts in “making ocean science more relevant” over the last intersessional period, and **further emphasized** the need to keep improving communications with Member States, by all means, about programme activities and outputs to enhance programme delivery and efficiency, and to ensure solid ownership of programmes by Member States.

16 **The Sub-Commission recognized** the importance of, and has been facilitating, the exchange of ocean data, information, products and services among Member States in compliance with the IOC Oceanographic Data Exchange Policy. **The Sub-Commission welcomed** the IODE’s decision at its 26th Session (20-23 April 2021, Virtual) “to link its ODINs more closely to IOC Regional Subsidiary Bodies”, and thus **decided to** establish a task force consisting of WESTPAC Officers, Head of the office and invited experts in the region who have a good knowledge about both the Sub-Commission and ODINWESTPAC, with a mandate to explore the most appropriate arrangement on data and information management at the regional level.

17 **The Sub-Commission further expressed** its deep concern over the incompatibility of the current size of the WESTPAC Office and a broader spectrum of the WESTPAC activities, let alone the new responsibility and associated workload arising from the UN Ocean Decade. The incompatibility of the current size of the secretariat compared to the unprecedented demands are the main risk for positioning IOC in the region as the lead agency for ocean research and the coordination agency for the UN Ocean Decade.

WESTPAC Programme Development over the next Intersessional Period (May 2021- April 2023) and beyond

I. WESTPAC new programmes and working groups

18 The Sub-Commission has been continuously developing itself to better respond to the needs of its Member States. In response to the ever-increasing demands for ocean science solutions to sustainable development, **the Sub-Commission decided** to establish the following new programmes and working groups:

- 2nd Cooperative Study of the Kuroshio and its Adjacent Regions (CSK-2), based on the feasibility study of the Intersessional Working Group of the Sub-Commission established in 2017, to enable ocean research community and other relevant ocean stakeholders to co-design and co-implement the Kuroshio related research, in order to improve forecast of regional weather and climate, and enhance science informed fisheries and aquaculture management.
- Changing Asian Marginal Seas and their Response to Climate Change, evolved from the WESTPAC Working Group on Asian Marginal Seas (2017-2021), to (a) undertake quantitative evaluation of mixing processes of regional circulation and nutrient cycles, with three case studies, respectively on: stratification and nutrient supply for primary production in the central and outer shelves (East China Sea); eutrophication, red tide and hypoxia in the upper Gulf of Thailand; and nutrient supply and oxygen-minimum zones in the Sea of Okhotsk; and (b) predict the long-term variations of processes underlying hydrological and biogeochemical cycles in the marginal seas responding to global warming, with a case study on the Marginal Sea surrounded by Japan, Korea and Russia (MSJKR);
- Working Group on Gas Hydrates and Methane Fluxes in the Indo-Pacific, in view of limited studies and lack of international cooperation on the nature, evolution and environmental impacts of gas hydrate system and its associated Methane fluxes;
- Working Group on Rapid Detection Technology for Harmful Algal Blooms, given the need of member states to effectively manage harmful algal blooms and mitigate their impacts, to explore, promote, adapt and apply rapid detection technology for HABs by means of not only traditional microscopy methods, but also molecular probes and quantitative PCR assays, high-throughput sequencing and remote sensing technique etc.; and
- Working Group on Integrated Investigation in the Indo-Pacific Convergent Center: Marine Ecosystem and Biodiversity, aiming to further identify, building on existing WESTPAC efforts, research priorities related to the evolution of marine ecosystem and biodiversity in the convergent area.

19 With due consideration of a need for the integration of natural and social sciences in addressing ocean sustainability, **the Sub-Commission took note of** the demand of Member States at the session for a joint initiative on Marine Spatial Planning (MSP), and **decided to** further explore the possibility of developing a new programme or working group on MSP over the next intersessional period.

20 **The Sub-Commission emphasized** the ownership of Member States over all programmes and working groups, and **further urged** Member States to identify their suitable experts and institutions to engage in and lend their support to the development and implementation of these programmes or working groups.

II. WESTPAC's role in and contribution to the UN Ocean Decade

21 **The Sub-Commission noted with great pleasure** a high level of support of Member States for the leading role that the Sub-Commission has been taking since 2018 in the development and implementation of the UN Ocean Decade in the region. Given the increasing interest of Member States and stakeholders in the Decade, **Member States strongly suggested** a certain level of authority, for instance the endorsement of Decade activities which are to be conducted in the region, be delegated to the Sub-Commission to ensure the timely conduct of Decade activities and the ownership of Member States over the Decade, The Sub-Commission **further requested** IOC Executive Secretary to consider supporting the role of the Sub-Commission in the Decade.

22 **The Sub-Commission highly appreciated** the WESTPAC Office, and Advisory Group for their tremendous efforts, despite the pandemic, in mobilizing actions for the UN Decade of Ocean Science for Sustainable Development (2021-2030), which culminated in a non-exhaustive list of pipeline proposals for UN Ocean Decade Actions at the initial stage. Adhering to the “co-designed, solution-oriented” approach, and capitalizing on the existing networks and resources, these proposals initially include, but not limited to,

- 2nd Cooperative Study of the Kuroshio and its Adjacent Regions;
- Development and Application of Seamless Ocean Forecasting System: from Ocean to Climate, via stakeholder engagement, development and provision of tailored application tools and services;
- Investigation of the Riverine Flux of Plastic to the Ocean to combat marine plastic pollution;
- Ocean Solutions, a demonstration programme about ocean sustainability for coastal developing countries in the region, through the deployment of multi-disciplinary monitoring and integrated research on eutrophication-hypoxia-ocean acidification in selected demonstration coastal areas for science informed decisions, management and economic development;
- Save Our Corals, a partnership programme to enhance coral resilience, by reaching out to and working together coral reef related international initiatives and national programmes, and providing needed knowledge and science services;
- Capacity Development and Transfer of Marine Technology through the co-designed and co-developed IOC Regional Network of Training and Research Centers on Marine Science; and
- Development of an Ocean Decade Regional Conference Series in conjunction with the WESTPAC triennial International Marine Science Conferences in 2022, 2025, 2028, and 2031, respectively.

23 **The Sub-Commission further encouraged** interested Member States, their experts, institutions and relevant stakeholders to provide further inputs, actively engage in and leverage support to the further development and implementation of these proposals.

24 **The Sub-Commission emphasized** the importance of capacity development and transfer of marine technology as integral part of its Decade Actions, **and further reaffirmed** its commitment to stepping up its efforts in this regard. In consideration of the regional characteristics and common interests of the Member States, **the Sub-Commission decided** to continuously

employ adaptive and integrated approaches to capacity development, with guiding principles to suit national, regional even global needs, to co-design and co-develop with Member States, to integrate capacity development into Decade Actions or research programmes addressing ocean sustainability challenges, and to foster North-South and South-South cooperation.

25 **The Sub-Commission welcomed** the kind offer of the Government of Thailand to host a Decade Coordination Office, as an extension of the current WESTPAC Office, with a mandate to develop, coordinate and implement Decade Actions in the region. **The Sub-Commission further encouraged** all Member States to provide financial and/or human resources in support of the operation of the Office.

26 **The Sub-Commission accepted**, with great appreciation, the offer of Thailand to host the Decade Regional Kickoff Conference (24-25 August 2021, virtual), and 1st Decade Regional Conference in conjunction with the 11th WESTPAC International Marine Science Conference which was scheduled for August 2022.

27 The **Sub-Commission noted** with great appreciation the kind offer of the Government of Indonesia to host the next Intergovernmental Session of the Sub-Commission in early 2023.

III. WESTPAC Programme and Budget (May 2021 - April 2023)

28 The Sub-Commission has been taking “co-design, co-development” approach to its programme development and implementation, with most of its activities conducted via the extra budgetary support of its Member States in the region, either in kind or in cash. The draft Programme and Budget for May 2021 to April 2023 was prepared based on the preliminarily planned activities by the WESTPAC Office, programmes/projects, working groups and Regional Training and Research Centers. The budget estimate was presented in three forms: (a) regular budget allotted from IOC; (b) in cash extra budget to be raised from Member States; and (c) in kind contribution from Member States in support of WESTPAC programmes and activities.

29 Given the limited amount of regular budget from IOC and tremendous efforts to be made in raising extrabudgetary resource, the WESTPAC Programme and Budget has been serving in practice as guidance on the activities that Member States would like to jointly promote and seek funding from various sources in support of their implementation. It was informed that only USD80K to 115K will probably be secured from the IOC Regular Budget for 2022 to 2023 for the Sub-Commission. Despite the Ocean Decade, there is no prospect for the Sub-Commission to receive an increased regular budget from IOC and UNESCO. Therefore, same as before, most of the activities of the Sub-Commission over May 2021 to April 2023 will have to be carried out via extrabudgetary support from Member States, either in cash or in kind.

30 **The Sub-Commission highly appreciated** the continued efforts of the WESTPAC Office in resource mobilization and programme development, and further requested all Member States to provide and elevate their support in all possible ways, either for programme delivery or operation of the WESTPAC Office.

31 **The Sub-Commission adopted** the WESTPAC Programme and Budget for May 2021 to April 2023, which was attached as **Annex II**, with a good understanding that the workplan will likely be subject to appropriate adjustments due to the ever-changing situation brought about by the pandemic.

Election of WESTPAC Officers

32 **The Sub-Commission elected**, by acclamation, Fangli Qiao from China and Kentaro Ando from Japan as Co-Chairpersons; and Aileen Tan Shau Hwai from Malaysia as Vice-Chairperson of the Sub-Commission for the next intersessional period.

ANNEX I

AGENDA

- 1. OPENING**
- 2. ORGANIZATION OF THE SESSION**
 - 2.1 ADOPTION OF THE AGENDA
 - 2.2 DESIGNATION OF RAPPORTEUR
 - 2.3 CONDUCT OF THE SESSION
- 3. STATUTORY REPORTS**
 - 3.1 STATEMENT OF THE CHAIRPERSON
 - 3.2 REPORT BY THE HEAD OF WESTPAC OFFICE ON INTERSESSIONAL ACTIVITIES AND PROGRAMME DEVELOPMENT AND IMPLEMENTATION
 - 3.3 RECENT DEVELOPMENTS WITHIN UNESCO, ITS IOC, AND THEIR RELEVANCE TO WESTPAC
 - 3.3.1 UN Decade of Ocean Science for Sustainable Development (2021-2030)**
 - 3.3.2 IOC Draft Medium Term Strategy (2022-2029), and IOC Programme and Budget**
- 4. REVIEW AND EVALUATION OF REGIONAL PROGRAMMES, PROJECTS AND WORKING GROUPS FOR MAY 2019 - APRIL 2021**
 - 4.1 OCEAN AND CLIMATE CHANGE
 - 4.2 MARINE BIODIVERSITY, SEAFOOD SAFETY AND SECURITY
 - 4.3 OCEAN ECOSYSTEM HEALTH
 - 4.4 CAPACITY DEVELOPMENT
- 5. ESTABLISHMENT OF NEW PROGRAMME/PROJECT AND/OR NEW WESTPAC WORKING GROUPS**
- 6. CONTRIBUTION TO THE UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT (2021-2030)**
 - 6.1 OUTCOMES OF THE UN DECADE REGIONAL PLANNING WORKSHOP, REGIONAL DIALOGUE AND PARTNERSHIP BUILDING
 - 6.2 WESTPAC APPROACH TO CAPACITY DEVELOPMENT FOR THE OCEAN DECADE
 - 6.3 WESTPAC PROPOSAL(S) FOR OCEAN DECADE ACTIONS
 - 6.4 PREPARATIONS FOR THE OCEAN DECADE REGIONAL KICKOFF CONFERENCE (VIRTUAL, 24-25 AUGUST 2021), AND THE FIRST DECADE REGIONAL CONFERENCE IN CONJUNCTION WITH THE ELEVENTH WESTPAC INTERNATIONAL MARINE SCIENCE CONFERENCE (SCHEDULED FOR AUGUST 2022, THAILAND)
- 7. WESTPAC PROGRAMME AND BUDGET FOR THE PERIOD MAY 2021 - APRIL 2023**
- 8. ELECTIONS OF THE OFFICERS OF THE SUB-COMMISSION**
- 9. DATE AND PLACE OF THE NEXT SESSION**
- 10. OTHER MATTERS**
- 11. ADOPTION OF DECISIONS AND RECOMMENDATIONS**
- 12. CLOSURE**

ANNEX II

WESTPAC PROGRAMME AND BUDGET FOR MAY 2021 - April 2023¹

Project/Programme	Activities	Objectives	Expected outputs	Date and Place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
POLICY, STRATEGIC, TECHNICAL AND SECRETARIAT SUPPORT							
WESTPAC Advisory Group Meeting	WESTPAC Advisory Group Meeting	Review and provide guidance	All activities developed with high quality, effectiveness	Late 2021, 2022, 2023	/	10K	20K
Ocean Decade Planning and consultation	Ocean Decade Kick-off Event	To communicate the Decade objectives, and engage stakeholders in Decade preparations	Awareness raised, partnerships established, and stakeholders engaged in the co design process	24-25 August 2021	6K	/	/
	Ocean Decade 1 st Regional Conference & 11 th WESTPAC IMSC			August 2022	10K	/	10K
	Ocean Decade national advocacy and engagement workshop	To advocate Ocean Decade in ocean stakeholder in Member States	Engagement enhanced	May 2021-May 2023	10K	/	30K
11th WESTPAC International Marine Science Conference	Keynotes, sessions, workshops and side events	Gather marine scientists to develop multi-disciplinary collaboration	Conference Programme	August 2022	20K	40K	600K
14th Intergovernmental Session	Statutory science-policy interface	Regional consensus reached on its programmes, new officers elected	Summary report and cooperative programmes established	Early 2023	5K	/	120K
Coordination, including the office operation	Development, coordination and implementation, and resources mobilization of WESTPAC activities	Ensure the full operation of the Sub-Commission and implementation of workplan	New activities developed, workplan implemented and quality service provided	May 2021-April 2023	40K	50K	100K
OCEAN PROCESSES AND CLIMATE IN THE INDO-PACIFIC							
North East Asian Regional-GOOS (NEAR-GOOS)	1. 21st Session of Coordinating Committee for NEAR-GOOS	Review progress and status of NEAR-GOOS, and discuss future plan for development of NEAR-GOOS	Action plans and recommendations	Late 2021, Japan	/	/	/
	2. 22nd Session of Coordinating Committee for NEAR-GOOS	Review progress and status of NEAR-GOOS, and discuss future plan for development of NEAR-GOOS	Action plans and recommendations	Late 2022	/	/	20K
	3. the WG workshop/technical meeting on NEAR-GOOS OFS	To improve ocean forecasting capacity in the NEAR-GOOS region	Release and improvement of NEAR-GOOS OFS forecasting products	During the intersectional period	/	/	10K countries/agencies
	4. GOOS Regional Alliances Forum 10	Enhance cooperation and information sharing among NEAR-GOOS, other GOOS Regional Alliances and the GOOS Office	Further development of NEAR-GOOS through Integration into the Global GOOS	Late 2021	/	/	/
	5. A symposium to engage in the Ocean Decade	improve data and product services, and engage more stakeholders and fund to support the development of NEAR-GOOS	improvement of NEAR-GOOS data and services and increasing visibility of NEAR-GOOS	August 2022, Thailand	/	/	20K
	6. PICES Annual Meeting 2021	Strengthen collaboration with stakeholders	Enhanced awareness on NEAR-GOOS	Late 2021	/	/	/
	7. PICES Annual Meeting 2022	Strengthen collaboration with stakeholders	Enhanced awareness on NEAR-GOOS	Late 2022	/	/	5K
Ocean Forecasting System (OFS)							
South East Asian Regional-GOOS (SEAGOOS)	1. Development of OFS as an Ocean Decade Action	Contribute high quality forecasting products for participating countries	OFS daily products; science and technology on OFS	May 2021-May 2023	/	/	TBD

¹ the WESTPAC Programme and Budget mainly serves as guidance for joint activities that the Sub-Commission would like to promote and seek funding from various sources in support of their implementation. The amount of Regular Budget is based on the IOC Draft Programme and Budget for 2022-2023. The EXB will have to be sought from funding agencies.

Project/Programme	Activities	Objectives	Expected outputs	Date and Place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
	2. Development of subdomain operational high-resolution OFS	To develop subdomain high-resolution OFS for Malaysia, Thailand and other participating countries	Subdomain high-resolution OFS developed for Malaysia, Thailand and other participating countries;	FIO, China PMBC, Thailand UMT, Malaysia	/	/	300K
	3. Development of Coral Bleaching Alert System and Ocean Search and Rescue System	<ul style="list-style-type: none"> To improve Coral Bleaching Alert System To develop the Ocean search and rescue System 	Coral Bleaching Alert System Ocean search and rescue System	FIO, China PMBC, Thailand	/	20K	400K
	4. Joint cruises and buoy deployments	<ul style="list-style-type: none"> To obtain oceanographic data to validate the OFS product To enhance understanding of oceanographic processes in the region 	Observed data such as temperature, salinity, current, and meteorological parameters obtained	PMBC, Thailand UMT, Malaysia	/	/	1.0 Million
	5. Workshop and Training Course	<ul style="list-style-type: none"> To foster the regional cooperation through the transfer of technology among participating countries. To develop regional capability and capacity of early career ocean professionals on numerical modeling and survey technology 	Workshop (s) and training course (s) organized	FIO, China PMBC, Thailand WESTPAC	/	10K	30K
Monsoon Onset Monitoring and its Social and Ecosystem Impacts (MOMSEI)							
	1. MOMSEI Summer School–VII	Capacity building and knowledge sharing on monsoon-ocean interaction, physical-biological interaction, extreme oceanic heatwave and massive coral bleaching.	1. Early career scientist capacity building, 2. Science-informed policy.	Nov. 2022, Phuket	/	5K	35K
	2. Joint Cruise in Andaman Sea	Routine service the ocean observing systems	Data	Every November in 2021, 2022 and 2023, Phuket and Andaman Sea	/	/	350K
	3. Mesoscale and sub-mesoscale modeling study	Comparative study on the mesoscale and sub-mesoscale processes in the South China Sea, Gulf of Thailand and Andaman Sea	1. Model system setup, 2. Joint MOMSEI Summer School-VII	Nov. 2022, Phuket	/	/	20K
	4. New MOMSEI Science Plan and Implementation Strategy (SPIS) Review Workshop	Discuss the draft MOMSEI SPIS and focus on the priorities	Revised MOMSEI SPIS	Nov., 2022, Phuket	/	5K	20K
Ocean Acidification and its Impacts on Marine Ecosystems (OA)							
	1. International Calibration on pH and TA analysis by spectrophotometer and Auto-titrator	To assess the quality of pH and TA measurement system within the WESTPAC-OA members	1. To make better understand the quality and performance of lab analysis within member of WESTPAC-OA. 2. To identify any technical problem that facing by members and what assistance need to solve the problems by the WESTPAC or WESTPAC-OA project	mid of 2021, coordinate by the WESTPAC	/	8K	8k
	2. Training/Workshop on ocean acidification monitoring and indicator methodology for SDG 14.3.1	Strengthen the WESTPAC OA monitoring and research network with updating information and knowledge and assisting member states to build up capacity on monitoring a carbonate chemistry of seawater to serve the target need of SDG 14.3 and 14.a	1. Products of data and information are generated to support countries to fulfill the commitment to SDG14.3 and 2. Support technological transfer for ocean acidification monitoring and research to the member states in the region and maintain coordinate ocean	mid to late of 2022, place will be determined	/	15K	/

Project/Programme	Activities	Objectives	Expected outputs	Date and Place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
			acidification network to support the Global Ocean Acidification Observing Network (GOA-ON).				
	3. Establish task teams to assess status of OA and synthesis review publication related to impacts of OA at national and regional level using generated data and information from regional OA network and available publication respectively.	To be better understand the ocean acidification status and its impacts on marine ecosystem and socio-economic at national and regional level that will be beneficial to the policy maker and marine resources management manager.	Report or publication on results of the OA monitoring and situation of OA in the region	late of 2021 and early of 2022 (2-virtual meetings) and one physical meeting, if it is possible, in late of 2022	/	15K	5K
Upwelling Studies through Ocean Data Integration towards Sustaining Ocean Health and Productivity (Upwelling studies)	1. 3rd Upwelling workshop	Conduct a workshop to discuss the progress of development work of the upwelling program	New and updated scientific progress, come up with a strategic plan to enhance the outcome of this project through different outlets	March 2022	/	10K	10K
	2. Young Scientist Training: Integrated data analysis for upwelling study	Conduct training for young scientist on upwelling dynamics and integrated data analysis	Prepare researcher a systematic technique in accessing available ocean data from different sources and integrated the information to study specific study area	Dec 2021	/	/	15K
	3. Book publishing meeting	Discuss the content, progress and finalizing the upwelling book organized by the group members	Provide realistic framework and timeline for the book publication	1 June 2021 and 1 Nov 2021	/	/	8K
South China Sea Fluvial Sediments and Environmental Change (FluSed)	1. Research cruise	Deep-sea sediment transport mooring (sink)	Maintaining the deep-sea mooring observation system in the southern South China Sea	May 2021, South China Sea	/	/	100K
	2. 14th FluSed workshop	Exchange of scientific results	Strengthen collaboration: joint writing manuscripts, data comparison, further cooperation discussion.	December 2021, Singapore (tentative)	/	20K	20K
	3. Fieldtrip sampling	Source to sink process	River sediment sampling along middle-lower reaches of Mekong and Brahmaputra.	May 2021	/	/	60K
	4. Research cruise	Deep-sea sediment transport mooring (sink)	Maintaining the deep-sea mooring observation system in the southern South China Sea	May 2022, South China Sea	/	/	100K
	5. Research cruise	River discharge observation (source)	Deploying a river observation system in the Mekong estuary	January 2022, Vietnam	/	/	60K
	6. 15th FluSed workshop	Exchange of scientific results	Strengthen collaboration: joint writing manuscripts, data comparison, further cooperation discussion.	December 2022, Shanghai (tentative)	/	20K	20K
Indo-Pacific Ocean Environmental Variations and Air-Sea Interactions (IPOVAI): Typhoon Forecast and Climate Prediction	1. Validate the climate prediction system	To quantitatively evaluate the prediction ability of FIO-ESM v2.0	One publication	May 2021-Dec 2021	/	/	100K
	2. Operationally run the climate prediction system	To provide high-quality climate prediction results	13 months prediction started from each month. Quasi-operational prediction may start in 2021	Officially start from Jan 2022 for long	/	/	3M

Project/Programme	Activities	Objectives	Expected outputs	Date and Place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
				term, computer in China			
	3. Develop and validate the new generation Typhoon forecasting system	To dramatically reduce the forecasting error of Typhoon intensity	Typhoon and ocean forecasting system, 1-2 publications	May 2021-April 2023	/	/	2M
	4. Joint cruises and observations	<ul style="list-style-type: none"> To obtain oceanographic data to validate the climate prediction and Typhoon forecasting To enhance understanding of air-sea interaction processes in the region 	Observed data	PMBC, Thailand UMT, Malaysia etc	/	/	1 M
	5. Workshops	To organize 1-2 workshops on climate prediction and Typhoon forecasting	Workshops organized	One in 2022, and the other in 2023 considering the situation of COVID-19	/	15K	30K
The 2nd Cooperative Study of the Kuroshio and Adjacent Regions (CSK-2)	1. ISC meetings	Coordination etc.	Report	Not determined yet	/	/	10K
	2. Stakeholders meeting	Develop Partnership	Partnership in official and/or off line	Not determined yet	/	/	10K
	3. See Chapter 5.2 for each activities	Research	Papers	Continuous	/	/	Too huge to quantify
WG007: Working Group on Gas hydrates and Methane Fluxes in the Indo-Pacific Region	1. WG annual meetings		proposals	2022,2023	8K	/	10K
MARINE BIODIVERSITY, SEAFOOD SECURITY AND SAFETY							
Coral Reef Conservation and Restoration	1. Webinars: updating activities of project coral reef conservation and restoration in the WESTPAC region	<ul style="list-style-type: none"> To update and plan activities related to project coral reef conservation and restoration To summarize all coral restoration and conservation techniques available within the Western Pacific region and outside the regions To promote those techniques among WESTPAC member countries 	Report/scientific paper	May 2021-April 2022	/	3.5K	3.5K
	2. VDO series: technology transfer of coral reef restoration in the WESTPAC region	To promote those techniques among WESTPAC member countries	VDO	May - December 2021	/	30K	/
	3. Workshop: updating activities of project coral reef conservation and restoration in the WESTPAC region	<ul style="list-style-type: none"> To disseminate the synthesis data on coral restoration techniques through scientific communities To have a guideline on reef rehabilitation for reef managers in Southeast Asia region 	Book	December 2022	/	/	From a book publisher

Project/Programme	Activities	Objectives	Expected outputs	Date and Place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
Coral Reef Resilience to Climate Change and Human Impacts	1. Summer School on “Impact of Anthropogenic Forcing on Coral Reefs and Consequence at Ecosystem Level”	<ul style="list-style-type: none"> To gain knowledge on consequence of impacts of climate change and human activities on the coral reef health and interventions to reduce reef stressors, To use a book of the Coral Reefs in the Western Pacific for the trainees, To promote capacity building related to research and managing coral reefs in the WESTPAC. 	<ol style="list-style-type: none"> Report on capacity building of the project A book of the Coral Reefs in the Western Pacific 	December 2021, Penang, Malaysia	/	/	10K This activity was postponed from December 2019 because of the COVID-19 pandemic
	2. Regional training course on molecular techniques for genetic connectivity and resilience research	<ul style="list-style-type: none"> To understand techniques of molecular genetics for reef connectivity and ecological resilience studies, To enhance network for research on coral reefs and coordination with other projects in the region, To promote capacity building related to research and managing coral reefs in the WESTPAC 	Trained scientists and students under the network for coral reef research in the WESTPAC	August 2021, Bangkok, Thailand	/	/	5K A preliminary training for Thai students was carried out in July 2019 at Hat Yai, Thailand, in collaboration with Prince of Songkla University and Thailand's National Science and Technology Development Agency
	3. Regional young scientists' workshop on coral bleaching in collaboration with Ocean Forecasting System (OFS) project	<ul style="list-style-type: none"> To review coral bleaching and relevant data for improving the regional early warning systems to support coral reef resilience To enhance network for research on coral reefs and coordination with other projects in the region To promote capacity building related to young scientist research on coral reefs in the WESTPAC 	Trained scientists and students under the Young Scientists Network for coral reef research in the WESTPAC	August 2021, Bangkok, Thailand	/	/	5K <ul style="list-style-type: none"> In collaboration with the Marine Science Association of Thailand Onsite and Virtual workshop
	4. Workshop on Coral Reef Resilience to Climate Change and Human Impacts	<ul style="list-style-type: none"> To brainstorming and discussion on prioritization of research on coral reef resilience and management in the WESTPAC To promote capacity building related to research and managing coral reefs in the WESTPAC 	Recommendations for enhancing coral reef resilience, management and conservation in the WESTPAC	October 2021, Bangkok, Thailand	/	/	5K <ul style="list-style-type: none"> In collaboration with the Marine Science Association of Thailand Onsite and Virtual workshop
	5. Workshop on Regional young scientists to support the UN Decade of Ocean Science	<ul style="list-style-type: none"> To review coral reef studies in the WESTPAC for determining research collaboration to support the UN Decade of Ocean Science 	A collaborative research to support the UN Decade of Ocean Science	August 2022, Bangkok, Thailand	/	/	10K In collaboration with the 7th National Marine Science

Project/Programme	Activities	Objectives	Expected outputs	Date and Place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
		<ul style="list-style-type: none"> To enhance network for research on coral reefs and coordination with other projects in the region To promote capacity building related to young scientist research on coral reefs in the WESTPAC 					Conference of Thailand, Bangkok, Thailand
	6. Workshop on Coral Reef Resilience to Climate Change and Human Impacts	<ul style="list-style-type: none"> To brainstorming and discussion on research collaboration for coral reef resilience and management in the WESTPAC To promote capacity building related to research and managing coral reefs in the WESTPAC To support the UN Decade of Ocean Science 	Research collaboration for coral reef resilience and management in the WESTPAC	August 2022, Bangkok, Thailand	/	/	10K In collaboration with the 7th National Marine Science Conference of Thailand, Bangkok, Thailand
	7. Workshop on Coral Reef Resilience-based Management	<ul style="list-style-type: none"> To review case studies on coral reef resilience-based management for applying in the WESTPAC To promote capacity building related to research and managing coral reefs in the WESTPAC To support the UN Decade of Ocean Science 	Good case studies on coral reef resilience-based management in the WESTPAC	March 2023 Bangkok, Thailand	/	/	10K
DNA Taxonomy and Recruitment Monitoring of the Coral Reef Marine Organisms	1. Recruitment monitoring workshop			March 2022	/	10K	5K
	2. Expansion of the WESTPAC biodiversity portal	Increase the number of data in the portal	No less than 100 species	December 2021			Republic of Korea
	3. Publication of a WESTPAC marine biodiversity book	Publication	WESTPAC marine biodiversity book	December 2021			Republic of Korea
	4. Project wrap-up			June 2022	/	10K	5K
Ocean Remote Sensing for Coastal Habitat Mapping	<p>1. Demonstration of remote sensing technology on seagrass mapping in selected pilot sites in cooperation with local authorities</p> <ul style="list-style-type: none"> Technical meeting at three sites Generate seagrass habitat maps at three sites Transfer mapping technics to researchers/local authorities at three sites 	<ul style="list-style-type: none"> To demonstrate remote sensing technics to researchers/local authorities concerning seagrass monitoring that they don't use the technics To inform on the methods to monitor seagrass meadows distributed in broader areas that ground surveys can't cover To transfer remote sensing techniques to local researchers and authorities responding to their need 	<ol style="list-style-type: none"> coastal habitat maps generated by local researchers/authorities Implementing remote sensing technics for generating seagrass maps from satellite images to researchers/local authorities of seagrass monitoring Recommendation to marine policy 	<p>Ko Talibon Island and/or Ko Phangan Island, Thailand Khánh Hoà Province and/or Con Dao Islands, Vietnam</p> <ol style="list-style-type: none"> Technical meeting by September 2021. Generate seagrass habitat maps by September 2021 Transfer mapping 	/	20K	10K

Project/Programme	Activities	Objectives	Expected outputs	Date and Place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
				technics by May 2022.			
	2. Scaling up workshop on seagrass mapping with remote sensing for reviewing the results of three sites	<ul style="list-style-type: none"> To summarize the demonstration activities To share direction of use of coastal habitat mapping To expand demonstration sites 	<ol style="list-style-type: none"> Increase in authorities using the remote sensing technics Increase in reliable coastal habitat maps in WESTPAC region by remote sensing technics Through publication, increase in sites to use habitat maps created by remote sensing technics for integrated coastal management in WESTPAC region 	<ol style="list-style-type: none"> Scaling up workshop on seagrass mapping by June 2022 Dialogue with local researchers and authorities by April 2023 Publication by June 2022 	/	20K	10K the University of Tokyo, Kitasato University etc.
	3. Book Publication concerning temporal changes in seagrass distributions in WESTPAC region	<ul style="list-style-type: none"> To inform importance and usefulness of seagrass mapping through remote sensing technics to researchers/local authorities in WESTPAC region 	Through publication, increase in sites to use habitat maps created by remote sensing technics for integrated coastal management in WESTPAC region	Publication by December 2022	/	10K	5 k the University of Tokyo, Kitasato University etc.
Marine Toxin and Seafood Safety	1. Field research on CTXs	Understanding on the mechanism of CTX occurrence and accumulation in marine ecology system	Sample collection for toxin analysis	May-June 2021 Phu Quy Island, Binh Thuan Province, Vietnam	/	25K	50K
	2. Scientific workshop on addressing emerge issues in the region in term of seafood safety	To identify emerge issues in the region in term of seafood safety and actions needs	<ol style="list-style-type: none"> Evaluation of achievement of TMSS until 2021. Action plan for 2022-2025 incl. list of response from member states, identified PI/each member states 	Sept. 2022, IO, Vietnam	/	15K	10K
	3. Expert sending	Establish PSP toxin analyser in Vietnam	5-10 Vietnamese can analyse PSP toxin using equipment in Regional keylab in IO	May 2023, IO, Vietnam	/	15K	15K
Regional Study on Marine Endangered Species (Mammals and Sea Turtles) in the Tropical Asia for Effective Conservation	1. MES Session at the 11th WESTPAC IMSC	Exchange information and results on development of technology and knowledge	Dissemination of updated technology and knowledge	2021, Thailand	/	2K	10K
	2. Regional symposium on MES	Exchange information and results on development of technology and knowledge	Dissemination of updated technology and knowledge	2022, Thailand	/	1K	25K
	3. Regional training course on MES	Training on both traditional and modern method/technology of observation and study	Dissemination of integrated methods of MES observation and study	2022, Thailand	/	3K	20K
	4. Local MES sessions / workshops	Exchange information and results on development of technology and knowledge	Dissemination of updated technology and knowledge	2021, 2022, 2023 Thailand, Malaysia, Indonesia, China	/	/	30K
WG009: Working Group on Integrated Investigation in Indo-Pacific Convergent Center -Marine Ecosystem and Biodiversity	1. Workshops, seminars, and meetings	identify the priority issues about the Marine Biodiversity Research in the IPCC area and integrate the shared interests of countries for further collaboration	<ol style="list-style-type: none"> Communication Reports Science Action Plan for the I3PCC-MEB Program 	2021- 2023	8K	10K	20K

Project/Programme	Activities	Objectives	Expected outputs	Date and Place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
	2. Training courses	<ul style="list-style-type: none"> Deep sea ecosystem Ocean observation 	30~40 participants	2021- 2023	/	/	50K
Healthy Ocean Ecosystem							
Distribution, source, fate and impacts of marine microplastics in the Asia Pacific region	1. Organize two international meetings to discuss the progress of the project as well as the collaborative study on river fluxes of plastic and microplastics;	Discuss the progress and outcomes of this projects	Meeting reports and research plan for next year.	Late 2021- early 2022	/	10K	50K
	2. Conduct field surveys based on the established harmonized methodology.	Obtain the riverine fluxes of plastics and microplastics	Obtain the riverine fluxes of plastics and microplastics	2022-2023 Yangtze River	/	/	300K
	3. Publish the data of microplastics in beaches which were conducted in 2018;	Share the previous research data with the public and colleagues	Share the previous research data with the public and colleagues	2021-2022	/	/	10K
Harmful Algal Blooms	1. Strategic meeting	Update the status of HAB information in the region and identify emerging HABs issue to address	Regional networking, identified national/ regional HAB training courses, identified emerging HAB issues	2021 (online), 2022 (place to be determined)	/	/	10K
	2. Strengthening collaboration with other HAB related networks (EASTHAB, GlobalHAB, IOC-IPHAB, PICES S-HAB, etc.)	Facilitation of information exchange and dissemination	Global networking, and enhanced dissemination of information and collaborations	2021-2023	/	/	/
	3. Capacity building	Plan and organize regional /national training workshops on identified emerging HAB issues in the region	Trained researchers and technicians	2021-2023	/	20K	10K
	4. Gathering HAB species information in the region	Preparation for the publication (training material for future capacity development)	Identified HAB species and photos	2021-2023	/	/	/
Enhancement of Sustainable Harmful Jellyfish Research & Networking in WESTPAC region	1. Workshop on Toxicology - online workshop for Treatment & Recovery to healthcare providers	Provide knowledge & information on health systems (surveillance & reporting) and Training & Education	Audience or participants will be more informed on how to handle jellyfish sting cases	Aug 2021 (virtually)	/	/	5K
	2. Workshop on Forecasting - "Utilization of environmental DNA techniques in jellyfish monitoring / survey"	Using environmental DNA approaches on monitoring and forecasting	Enabling participants to initiate their forecasting program in their countries	Aug/Sep 2022, USM, Penang, Malaysia	/	12K	10K
	3. Workshop on socioeconomic status and ecological importance of jellyfish	Provide information on the impacts and benefits of jellyfish in our ecosystems and contribution to our socioeconomic status	Enabling participants to understand the impacts and management of jellyfish in their countries	Thailand/Philippines (to be confirmed) or virtually, Year 2022	/	12K	5K
	4. Outreach & Awareness – Continue conducting public talks and outreach programs involving local government, tourism, hospitality industries, schools etc.	Provide knowledge & information jellyfish, treatment and actions to be taken by all	Audience or participants will be more informed the jellyfish in our environment	Throughout the whole project duration	/	/	8K
	5. Symposium - co-organize/ cohort the 7th International Jellyfish Bloom Symposium in India	Involve WESTPAC in international partnership with other organisation/s	Establishing and strengthening networking among scientists working on jellyfish research	2022, India	/	15K	/
Healthy, Productive and Sustainable Asian Marginal Seas: Understanding changes in the marine	1. <i>1st stage workshop once a year</i>	Determine what kinds of knowledge we could share and what is important to establish common understanding. Survey and invite	Clarify issues for common understanding on the marine environment in the marginal seas and recommend possible	2021 – 2024 Toyama, Japan; Seoul, Korea; VladivostokRussia;	/	15K	Possible but not fixed

Project/Programme	Activities	Objectives	Expected outputs	Date and Place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
environment in responses to global climate change		early-career scientists who can build international cooperative communities	cooperative research groups as well as early career groups.	Fukuoka, Japan			
WG005: Working Group on Ocean Oxygen Network (O ₂ NE)	1. Identification of additional members of the technical working group	Increase roster of scientists from the WESTPAC members states working on deoxygenation	A more extensive network of researchers working on deoxygenation in WESTPAC	Virtual 2021 to 2022	/	/	/
	2. Workshop (side event during the 2022 WESTPAC ISC)	To develop a project proposal on deoxygenation for the WESTPAC region	A greater engagement and linkages of researchers in WESTPAC working on hypoxia and deoxygenation	2022 WESTPAC Scientific Conference Thailand	/	5K	10K
	3. Scientific session on deoxygenation at WESTPAC Scientific Conference	Elicit and exchange information on studies focusing on eutrophication, hypoxia, and deoxygenation in the WESTPAC region	Improved networking and information exchange among scientists in the region	2022 WESTPAC Scientific Conference Thailand	/	/	/
	4. Review paper for publication in a peer-reviewed journal	To assess the state of deoxygenation in the WESTPAC region	Additional information on and engagement of researchers in the region	3Q 2022	/	/	/
	5. Website	Greater visibility of the issue and generating awareness and interest by many more stakeholders on deoxygenation	Greater awareness and engagement	Starting 3Q 2021 Philippines	/	5K	2K
	6. WESTPAC O ₂ NE Training Workshop	Connect young researchers with leading scientists from the academic and SME world in the WESTPAC region working on oxygen to go through practical sessions on laboratory and field experiments, and modeling.	Several young scientists in the WESTPAC region trained and made part of a global network of researchers working on deoxygenation	2022 Xiamen, China	/	5k	20k
WG008: Working Group on Rapid Detection Technologies for Harmful Algal Blooms	1. Workshops	Rapid Detection Technology for Harmful Algal Blooms	Establish the Working Group of Rapid Detection Technology for Harmful Algal Blooms; Communication and Exchange the Current Research Status of Rapid Detection Technology for Harmful Algal Blooms; Discuss and design the rapid detection technology for HABs towards the early warning and effective management of HABs in the region	October 2021 Beihai/Online; 2022	8K	/	10K
	2. Training Workshop	Study Rapid Detection Technology for Harmful Algal Blooms	Sharing the Study Method and Rapid Detection Technology for Harmful Algal Blooms	2022	/	5K	10K
	3. Business Meetings	Discuss and summarize the progress of RDT-HAB-IOC-WESTPAC	Business discussion and decision	2023	/	5K	5K
CAPACITY DEVELOPMENT FOR MARINE SCIENCE, OBSERVATIONS AND SERVICES							
Regional Training and Research Center on Ocean Dynamics and Climate (RTRC-ODC)							
UNESCO/IOC Regional Network of Training and Research Centers on Marine Science	1. 10th ODC training course on “Regional Application of Coupled Climate Models”	To enhance the regional research capacity and capability in couple model applications	Understanding the coupling processes of atmosphere, ocean circulation, and application of coupled climate models in WESTPAC regions	2021, Qingdao (onsite and online)	/	/	150K

Project/Programme	Activities	Objectives	Expected outputs	Date and Place	Funding Required, US\$		
					IOC (in-cash)		Other in-kind sources (national or internat'l)
					Regular	Extra budget	
	2. 11th ODC training course on “Application of Ocean Forecast System”	To enhance the regional research capacity and capability in the understanding and applications of OFS	Understanding and application Ocean Forecast System through lectures and hands-on practice	2022, Qingdao (onsite and online)	/	10K	150K
	3. 12th ODC training course on “Climate Predication and Projection”	To enhance the regional research capacity and capability in climate model and prediction	Deep understanding of the climate variability and change, diagnosis of the earth system models	2023, Qingdao (onsite and online)	/	10K	150K
	4. Three to four times forums form Early Career Professional Network each year	To enhance the understanding and applications of OFS at different regions, and to enhance the knowledge of OFS	OFS applications	Virtual meetings	/	/	50K
Regional Training and Research Center on Marine Biodiversity and Ecosystem Health (RTRC-MarBEST)							
	1. Training course on fish taxonomy and ecology	Increasing knowledge and skill of fish taxonomist in the region	To enhance regional research capacity on fish taxonomy and ecology	2021, Bintan (on site or on-line)	/	25K	125K
	2. Training course on ocean health index	Understanding the ocean health index, and its application in the region	To enhance regional research capacity on the use ocean health index	2022, Jakarta & Pari Island (on site or on-line)	/	25K	125K
	3. Training course on CITES Non-Detriments Findings	Understanding the CITES Non-Detriments Findings, and their use for the region	To enhance regional research capacity on CITES Non-Detriment Findings	2023, Jakarta & Lombok (on site or on-line)	/	25K	125K
	4. Forum for young marine and early career scientists	Strengthening the networking among scientists on marine biodiversity and ecology, and enhancing the regional and international cooperative studies on those issues	To sharing knowledge and resources for better research on marine biodiversity and ecology.	2023, Jakarta & Pari Island (on site or virtual meeting)	/	/	75K
Regional Training and Research Center on Marine Plastic Debris and Microplastics							
	1. Organize a training seminar or class to train your students and scientists on microplastics research.	Training young scientists and students in this region on plastic and microplastic research	20 young students and scientists will got trained	2022	/	/	30K
Regional Training and Research Centers on Marine Toxins and Seafood Safety							
	1. E-training on scientific sampling, isolation and identification of potential benthic CTX producers	To transfer proper guidance for scientific sampling, isolation and identification in case study in Vietnam	5-10 Vietnamese can conduct research following the guidance	May 2022, IO, Vietnam	/	3K	5K
Sub-total					115	644.5	11,429.5
Total					12,289		