

INSTITUTE OF OCEANOGRAPHY & ENVIRONMENT

UPWELLING IN SOUTH CHINA SEA

Workshop co-organized with IOC-WESTPAC which address very interesting topics and findings in the region

SCIENCE-POLICY

Developing excellence in transdisciplinary research and networking through Science-Policy Nexus

OCEAN LITERACY

Interesting ways of teaching kids with cartoon books and website which makes learning meaningful.

MARINE WORMS

visits to 3 island in the east of e Peninsula to study the marine invertebrates community

TURTLE RESEARCH

Casual networking event gathered all researchers working on the various disciplines related to sea turtle conservation

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"We head into 2021 with great expectation and hope for a healthier and more prospective future. This new year we embark on a huge mission, 'UN Decades of Ocean science'. We remain on a mission and on purpose to serve national importance and global needs through this international initiatives. We strategically position yourself with various partners to envision our marine future, for the benefits of science and providing positive impact towards the society"

DIRECTOR'S NOTE



Contents:

IOC-WESTPAC Workshop on Upwelling Science-Policy Interface #oceanprotectors Movement UMT Turtle Research Community	01	
	05	
	08	
	10	

INOS hosted regional IOC-WESTPAC workshop on Upwelling

by INOS



On the 26th January 2021, the Institute of Oceanography and Environment (INOS), Universiti Malaysia Terengganu, had successfully organised the 2nd WESTPAC Workshop on upwelling and its dynamics in the South China Sea and adjacent areas. This fully virtual workshop was officiated by the Representative from the Ministry of Environment and Water, Mr. Jamalulail bin Abu Bakar.

The workshop attracted over a hundred marine researchers and resource managers from the Western Pacific region, who had not only the opportunity to listen to presentations on the latest research on upwelling but also exchange ideas regarding upwelling studies and how it can contribute to the sustainable development of marine and coastal resources in the region. Given the limited scientific knowledge on upwelling systems in the region and their importance to ocean productivity, in 2015, the IOC Sub-Commission for the Western Pacific (WESTPAC) established a regional project, entitled "Upwelling Studies through Ocean Data Integration towards Sustaining Ocean Health and Productivity," aiming to explore new upwelling sites and increase the understanding on upwelling dynamics in the South China Sea (SCS) and adjacent seas, through comparative studies and data integration.



The group now consist of members from more than 10 countries and lead by INOS Director, Assoc. Prof Dr. Mohd Fadzil Mohd Akhir from Malaysia was appointed as Principal Investigator for this project.

During the workshop, the group also took the opportunity to launch their website, which will become the hub for information sharing on upwelling study in the region.

RISING TO THE SURFACE : NEED TO ACCELERATE 'UPWELLING' STUDIES

by WESTPAC



Despite their close link to high ocean productivity, upwelling systems remain poorly investigated in the South China Sea and adjacent seas. Ongoing and future actions to rectify this were at the center of the recently concluded WESTPAC (IOC Sub-Commission for the Western Pacific) international workshop held January 26 to 27, 2021 virtually, the second workshop on the topic, and held at the dawn of the new Decade of Ocean Science for Sustainable Development. The workshop, hosted by the Universiti Malaysia Terengganu, attracted over a hundred marine researchers and resource managers from the Western Pacific region, who not only had the opportunity to listen to presentations on the latest research on upwelling but as well to exchange ideas about how upwelling studies could contribute to the sustainable development of marine and coastal resources in the region.

Occurring in the open ocean and along coastlines, upwelling is a process in which deep, cold ocean water rises toward the surface to replace the water that was pushed away by winds blowing across the ocean surface. Water that rises to the surface is typically rich in nutrients, which results in 'fertilized' surface waters that often have high biological productivity. Nutrient-rich waters encourage the blooms of the phytoplankton, which are at the base of the marine food pyramid: phytoplankton provide food for zooplankton such as copepods, fish larvae and jellyfish, which in turn are food for the larger animals such as fish, shellfish, squid, whales and bird.

In view of the limited scientific knowledge on upwelling systems in the region and their significance to ocean productivity, the IOC Sub-Commission for the Western Pacific (WESTPAC) established a regional project on Upwelling Studies. As such, a research group of marine scientists from various institutions around the region was formed in 2018 to investigate the dynamics of upwellings.

"Upwelling is not well investigated in many small-scale sites in the South China Sea and adjacent seas," Mohd Fadzil Akhir from the Universiti Malaysia Terengganu and Principal Investigator of the IOC-WESTPAC Upwelling Programme, remarked

"And to advance regional research cooperation and to facilitate knowledge and technology exchange, in order for the very unique and different characteristics of these small-scale upwelling sites to be studied and be known, is really the initial focus of the Upwelling group."

Formed in 2018, the WESTPAC Upwelling research group investigates upwelling dynamics in the region. At the 2021 workshop, marine scientists investigating upwelling from various institutions around the region presented studies of upwelling dynamics, including seasonal and interannual variations of surface chlorophyll-a in the Karimata Strait; chlorophyll variability in the tropical South China Sea; the effects of monsoon variability and ENSO (El Niño-Southern Oscillation) in upwelling dynamics; and the upwelling dynamics in Southern China Sea, Northern South China Sea, Northwestern Japan Sea, and in the Philippines. Field observations, as well as remote sensing and modelling technologies, have contributed to these investigations.

To the project's initial eight focus sites – Northern South China Sea, Vietnam Coast, Peninsular Malaysia Eastern Coast, Java-Sumatra Coast, Banda Sea, Sabah Northwest Coast, Zamboanga Peninsula, and the Gulf of Thailand and the Andaman Sea – workshop participants added five new sites, bringing the total number of upwelling study sites to 13.

"Upwelling studies in this region are important to inform not only fisheries management but also marine biodiversity conservation," remarked Vo Si Tuan, WESTPAC Chairperson, from the Vietnam Institute of Oceanography.

"The South Vietnam Upwelling, for example, is one major ocean process in the South China Sea."

How to ensure that upwelling studies could truly support sustainable development goals in the region, especially in light of the 2021 to 2030 Decade of Ocean Science for Sustainable Development, had been another major point of discussion at the workshop. In addition to developing a web-based information portal on upwelling sites in the region, plans are underway for Upwelling research group members to elaborate on how to sustain and further develop this regional project – including through innovative partnerships and synergies with other WESTPAC's research efforts –to serve the goals of the Ocean Decade.

Drawing on marine researchers' expertise studying almost all aspects – physical, biological, chemical, productivity – of the ocean, studies on upwelling tend to engage a wide range of scientific interest. The Sub-Commission strongly encourages resource managers and marine scientists, particularly early career ocean professionals, to join the Upwelling project. If so interested, please reach out to iocwestpac@unesco.org

STRENGTHENING OUR SCIENCE-POLICY INTERFACE

by Farahdilah Ghazali

Centre for Ocean Governance (COG) was formally launched as a sub-set to INOS on 1 October 2020, sprouting from the Ocean Governance Research Programme established as a HICoE programme in 2013. With the main aim of developing excellence in transdisciplinary research and networking through Science-Policy Nexus for innovative and integrated Ocean Governance, COG's common goal is to investigate, produce and share knowledge to understand the adoption of sustainable ocean management better. COG strives to reach the goal through three strategic objectives:

Developing and strengthening partnerships with government agencies & NGOs in promoting integrated Ocean Governance.

Promoting the ecosystem-based approach in marine resource management through sustainable ocean economy (Blue Economy).

Building capacity via Research & Training, Education & Awareness, and Knowledge Transfer on the ocean's sustainable use and resources

COG conducts interdisciplinary research through Science-Policy Interface at the national, regional and international level. With increasing environmental issues, oceans are currently under threat and at risk of irreversible damage through unsustainable development in coastal areas, overfishing, marine biodiversity loss, pollution and the impacts of climate change

With its cross-cutting researchers from a multidisciplinary team, COG main research focus is in Marine Spatial Planning, Natural Resources Law and Valuations, Sustainable Coastal and Island Community Sustainable Livelihood. Fisherv Resources Management, Sustainable Island and Coastal Tourism, Sustainable Shipping and Seaport, Maritime Geo-Politics, and Ocean Literacy.

BIODIVERSITY OF MARINE WORMS LIVING IN CORAL REEFS IN TERENGGANU ISLANDS

by Isabel C. Molina-Acevedo

All my scientific career, I should say, has been related to the sea and its biodiversity. Considering that many marine researchers are more attracted to studying charismatic species, such as turtles, fishes, dolphins and whales, I decided to go for one of the most misunderstood and barely-studied groups of marine invertebrates, the bristle worms, also known as polychaetes. Luckily, this seems to be a wise decision since it has allowed me to study the worm's diversity from different worldwide regions, including the Mediterranean Sea, the Caribbean Sea, and the Mexican Pacific, but now on the most outstanding part of the South China Sea.

My experience in Malaysia has been incredible, even though the Covid-19 pandemic has not allowed me to explore the majestic seas as I really wish. I have had the opportunity to visit three Islands (Bidong, Redang and Perhentian) in the east of the Peninsula to study the marine invertebrates' community, but particularly polychaetes, associated with the coral rubble. When this scientific adventure started, I did not imagine finding such a breathtaking place! The water is so clear and with different blue shades that it immediately incites to dive in and discover its depths. The vast composition of colours and shapes stood out first! But, of course, the best moments for a marine biologist starts when looking at the magnificent coral reefs and their hidden but extremely rich biodiversity. During the sorting, it is common to observe plenty of macroinvertebrates, such as polychaetes (in the first place), crustaceans, molluscs, echinoderms, sea squirts, bryozoans and sponges as part of the coral rubble composition. Many of the species were uncommon for me, or even some forms were rare, such as the long, worm-like sea cucumbers living among the corals or the puffy cushion star. A smile on my face was always drawn at each dive and after it while examining the material.

All the collecting expeditions were successful, and the Polychaeta team of INOS obtained valuable samples. We have found a vast diversity to the extent that several families are recorded for the first time in Malaysia. Many were identified as undescribed species that remain named, or even interesting ecological interactions between polychaetes and sea cucumber were detected. The above has led us to wonder what else is unknown regarding the polychaete fauna in this seemingly underexplored region. This is a fact that must be addressed soon in the looming and aptly-named sixth mass extinction of the species. We are doing our part to shed light on Malaysia's extraordinary marine world, but still, hard work remains to be undertaken.

BE PART OF #oceanprotectors MOVEMENT

by Azza Jauhar Ahmad Tajuddin, English learning Centre (ELC, PPAL)

In 2018, I started to be actively involved in community-based learning activities. Living by the beach of Batu Rakit, Terengganu, I encouraged the undergraduates to share their knowledge with the younger learners in the primary schools around the campus.

Creating meaningful activities to increase the younger learners' ocean literacy were the main aim of the university social responsibility (USR) visits to schools.

What was discovered during the longitudinal study, the misconceptions about the ocean by the little ones from the coastal community were worrying.

The issue created an opportunity for us to ensure that young learners learn, unlearn and relearn facts about the ocean.

How? Illustrated storybooks.

From the 21 USR sessions, we discovered that the kids love story time, even the big kids. Then we discovered that we do not have kids storybooks about our ocean and its creatures in Malaysia.

What did I do? I teamed up with a bio-marine pal, Fara, and we started drafting our first and second book (over coffee).

Late last year, Penerbit UMT agreed to publish the first-ever children's book under its wings, and being the ocean fanatics, we were elated.

Staggy the Coral' and 'Loligo the Squid' try to correct misconceptions and address serious local problems, such as plastic pollution and overfishing, in a simple way.

Though the book was written in English, vivid illustrations help overcome language barriers, and colourful pages could reduce young learners' anxiety.

The ocean literacy series integrate Quranic values, science, arts and language. By doing so, learners begin to see relationships and connections across the disciplines, which makes learning meaningful.

Please visit our website: https://youolls.com/

MEET AND GREET : UMT TURTLE RESEARCH COMMUNITY

by Uzair Rosli

A casual networking event for sea turtles' advocators from UMT has been conducted on 22 December 2020 at INOS Seminar Room. The most significant number of researchers Sea Turtle Research Unit (SEATRU) gathered all internal researchers working on the various disciplines related to sea turtle conservation.

This event intended to get to know each other and understand how each ongoing research within our own circle supports conservation benefits. More than 30 researchers from different faculties and institutes had introduced their works. They also exchanged their research direction for this 2021 sea turtle nesting season. The Director of INOS, Assoc. Prof. Dr Mohd Fadzil Mohd Akhir, mentioned in his welcoming remarks on the importance of integrating all different academic disciplines to boost our conservation effort's benefits. He further encouraged researchers to get involved in bridging science and society programs run by the SEATRU such as Marine Awareness Program, Public Viewing Lab, Kem Si Penyu, an Educational day trip and workshops with the local community. Talented researchers should actively engage the public and share the knowledge of conserving sea turtles effectively with exposure to first-hand conservation fieldwork.

Since the establishment in 1984, SEATRU has developed into a multi-disciplinary programme over three generations of legacies, which aimed at studying all aspects of sea turtle biology and ecology, threats to their survival, information technology on a cloud database and photo ID, and how conservation management initiatives can be established to restore the threatened species to a stable population level.

The vital information resulting from these studies have formed the basis for many essential recommendations made by SEATRU to relevant government agencies for the conservation of sea turtles, especially within the state of Terengganu. By means, SEATRU also offers its field stations the availability to initiate strategic collaborations upon research both locally and internationally to become a leading global reference centre for sea turtle research and conservation in South East Asia.