

# IOES Bulletin

Institute of Ocean and Earth Sciences,  
University of Malaya



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## Directors' corner: Welcome on board the inaugural issue of IOES bulletin



Assalamualaikum w.b.t and warm greetings.

Welcome to the inaugural edition of IOES bulletin. Through the bulletin, we would like to share the latest research activities and achievements carried out by IOES.

First of all, I would like to walk you through the memory lane of the establishment of IOES. In 2003, University of Malaya charted the Maritime Research Centre (UMMReC) in response to the national call for more concerted research in marine sciences. Within less than five years, UMMReC expanded and was upgraded as Institute of Ocean and Earth Science (IOES) in 2008. As a result of its stellar performance in high quality research and publication, IOES was awarded the Higher Institution Centre of Excellence (HICoE) status in its niche research area of Air-Ocean-Land Interactions by the Ministry of Higher Education Malaysia in 2014, the highest recognition for a research centre/institute in any higher education institutions in Malaysia.

The mission of IOES is to seek scientific understanding and to promote best management practices in the utilisation of marine environment, ocean law and maritime affairs through multidisciplinary research, education and training.

The first issue in this bulletin will start with the overview of IOES and the past activities undertaken by IOES main office in Kuala Lumpur as well as our Bachok Marine Research Station located in Kelantan, east coast of Peninsular Malaysia. Lastly, I would like to take this opportunity to welcome all friends and prospective collaborators to embark on a interesting scientific journey with IOES.

Happy sailing/reading!

Professor Dr. Sumiani Yusoff

Director



## Overview of IOES

### History

The Institute of Ocean and Earth Sciences (IOES) University of Malaya has its roots as the University of Malaya Maritime Research Centre (UMMReC) established in 2003 in response to the national call for more concerted research in the marine sciences.

Since 2003, UMMReC has made itself known nationally and regionally by being the first university research centre to conduct a scientific expedition on board Reef Challenger to the lesser known islands of Pulau Perak and Pulau Jarak in the Strait of Malacca. UMMReC is also the first university research centre to sign a MoU with the Department of Marine Parks of Malaysia and to jointly manage a Marine Research Station in Pulau Tioman.



Bachok Marine Research Station in Bachok, Kelantan

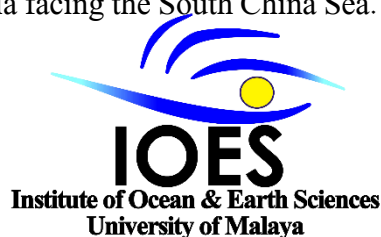


Institute of Ocean and Earth Sciences's main office is situated within the Institute for Advanced Studies Building, University of Malaya's main campus.

### Expansion

As results of its rapid development, University of Malaya Management approved to upgrade UMMReC to a research institute called Institute of Ocean and Earth Sciences (IOES) on 23 October 2007, which was officially launched on 17 January 2008.

In 2012, Bachok Marine Research Station (BMRS) was constructed in Bachok, Kelantan located on the east coast of Peninsular Malaysia facing the South China Sea.



The Logo of IOES

### IOES at a Glance

- Established as UMMReC in 2003
- Upgraded to IOES in 2008
- BMRS
- Four research units
- Awarded the HICoE status in 2014 and 2019
- Regional Global Atmospheric Watch (GAW) centre awarded by the World Meteorological Organization

### Recognition

As a result of its stellar performance, IOES was awarded the prestigious Higher Institution Centre of Excellence (HICoE) status by the Ministry of Higher Education Malaysia in 2014. In 2019, IOES was again awarded the HICoE status for the second time.

### Research Units

- Air-Ocean-Land Interaction & Climate Change
- Marine Biodiversity & Coastal Studies
- Marine Biotechnology, and Maritime Community, Law, Policy & Governance.

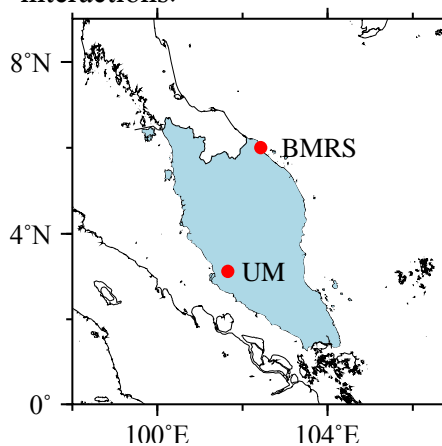


## Bachok Marine Research Station (BMRS)

IOES is home to the Bachok Marine Research Station (BMRS) located in Bachok, Kelantan on the east coast of Peninsular Malaysia, which started operation on 27 June 2012. The station is strategically located within the 100 m of waters' edge of the South China Sea providing unique access for research in air-ocean-land interactions.



Aerial photograph showing the overview of BMRS.



Location of BMRS.



Some of the facilities at BMRS.

## GAW Regional Station

On 14 June 2016, BMRS has been awarded as a **Global Atmospheric Watch (GAW) Regional Station** by the **World Meteorological Organization (WMO)**. The GAW Station receives funds from the National Environmental Research Centre (NERC), UK, through our collaboration with Cambridge University and the University of East Anglia and the Malaysian Meteorological Department. The observation tower of the station is equipped with various of sensors including  $O_3$ ,  $SO_2$ ,  $NO$ ,  $NO_2$ ,  $N_2O$ ,  $CO_2$ ,  $CH_4$ ,  $H_2O$ ,  $CO$  sensors and a micro-Dirac sensors, etc.



(Left to right) GAW observation tower; optical particle counter;  $O_3$ ,  $SO_2$ ,  $NO$ ,  $NO_2$  sensors; central logger,  $N_2O$ ,  $CO_2$ ,  $CH_4$ ,  $H_2O$  sensors;  $CO$  sensor; micro-Dirac sensor; sonic anemometer.



(Left) Deployment of METOcean buoy. (Right) METOcean buoy mooring in the South China Sea.

## FIO-UM Joint Centre

BMRS is currently hosting the First Institute of Oceanography (China) - UM Joint Centre of Marine Science and Technology since Jan 2017. One of the key project is the deployment of a METOcean buoy in the South China Sea.

## Core Research Units



### Air-Ocean-Land Interaction & Climate Change

This unit focuses on research on extreme weather and flood forecasting, measurement of globally important gases in the atmosphere of the tropical Maritime Continent, long-term monitoring program for atmospheric chemistry, carbon circulation and meteorological measurements at Bachok and the role of the Asian monsoon in the variation of the marine environment in the southern South China Sea.

### Marine Biodiversity & Coastal Studies

This unit specialises in the research on biodiversity, distribution and ecology of marine species of different ecosystems such as coral reefs, mangrove, seagrass, etc., as well as in marine geology, coastal gemology, coastal and ocean hydrological processes, sea floor imaginary, sediment biogeochemistry, geomorphological and sediment distribution mapping.



### Marine Biotechnology

This unit conducts research on the utilisation of various marine biological resources for the betterment of mankind and the environment via modern cutting-edge biotechnological techniques. The aim of this unit is to optimize the use of marine resources e.g. microbes, seaweeds, and invertebrates for development of new products or discovery of new bioactive compounds for medical or other industrial purposes.

### Maritime Community, Law, Policy & Governance

This unit is dedicated to a study Southeast Asian maritime culture, ritual and performing arts of maritime community e.g. Bajau and Sama Dilaut of Sabah and Southern Philippines. The other focus is on the law of the sea which covers principles of contemporary international law and policy. It promotes the rule of law in the uses of the oceans. In addition, it also focuses on the ASEAN region and examines the national laws of States. It is involved in teaching and offers consultancy in law, policy and governance matters.



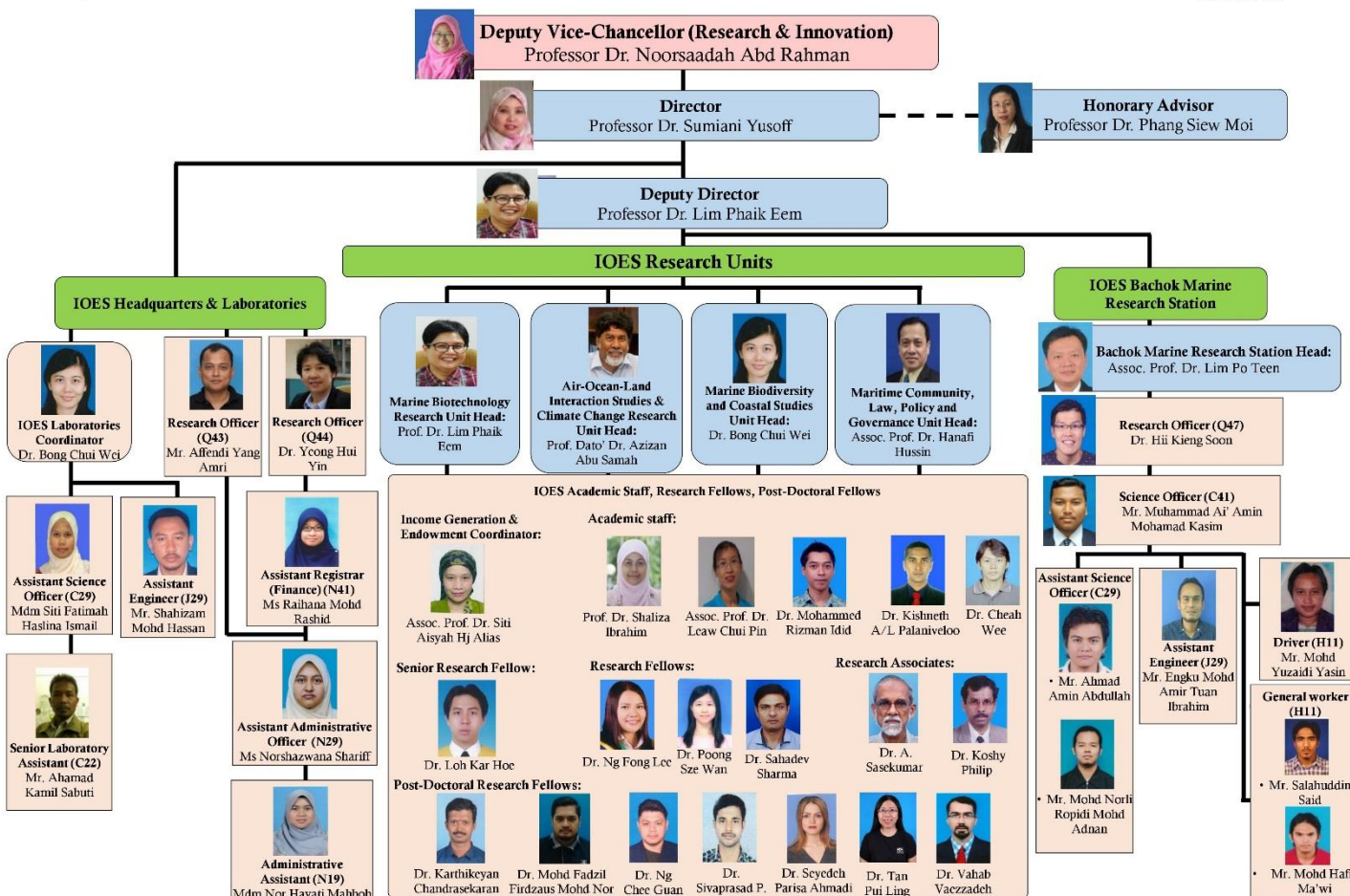


## Organisation Structure

- ❖ 12 Academic Staffs
- ❖ 2 Senior Research Fellows
- ❖ 3 Research Fellows
- ❖ 7 Postdoctoral Research Fellows
- ❖ 3 Research Officers
- ❖ 1 Science Officers
- ❖ 1 Assistant Registrar
- ❖ 11 Support Staffs



### Institute of Ocean and Earth Sciences (IOES) Organization Structure



- ❖ IOES has been awarded status of Higher Institution Centre of Excellence (HICoE) by Ministry of Higher Education on 1 Oct 2014 in Air-Ocean-Land Interaction niche. On 11 September 2015, MOHE awarded full-fledged HICoE status to the IOES which has provided a boost to IOES with increased publications, postgraduate students and collaborations.



IOES researchers during the awarding of HICoE status at Putrajaya

Throughout 2018, IOES researchers successfully published 121 publications with IOES affiliation (97 ISI journal, 9 Scopus Cited & 5 refereed journal, 5 books & 5 book chapters). IOES researchers also received various awards and endowments from national and international agency. IOES also successfully organized workshop, seminar series, outreach program and training course which benefits researchers, staff, postgraduate students and public. IOES also actively engaged with many prestigious institutes around the world through MoA and MoU. IOES also obtained world recognition as BMRS is awarded as a Global Atmospheric Watch (GAW) Centre by the World Meteorological Organisation on 13 Jun 2016.



Met-Ocean Observation Tower



## Visit and Research Collaboration Discussion of Fujian Provincial Department of Science and Technology, China (3 Jan 2019)

1

Lawanjoioδλ' Cpius (3 Jan 2019)

Venue : Anggerik Room, Institute of Advanced Studies Building,  
University of Malaya

Delegates from Fujian Provincial Department of Science and Technology, China make an official visit to IOES on 3 Jan 2019. The main objective of their visit are to **promote academic exchange and discuss cooperation in technology and innovation**. Member of the delegates are Mr Lin Bode (Deputy Director-General, Fujian Provincial Department of Science and Technology), Mr Huang Tiezhuang (Chief, Policy and Regulations Division, Fujian Provincial Department of Science and Technology), Mr. Zhang Hua (Director, Fujian Hi-Tech Innovation Center), Mr. Ren Yiwen (Director, Fuzhou Municipal Science and Technology Bureau) and Mr. Guo Xiheng (Deputy Director, Longyan Municipal Science and Technology Bureau).



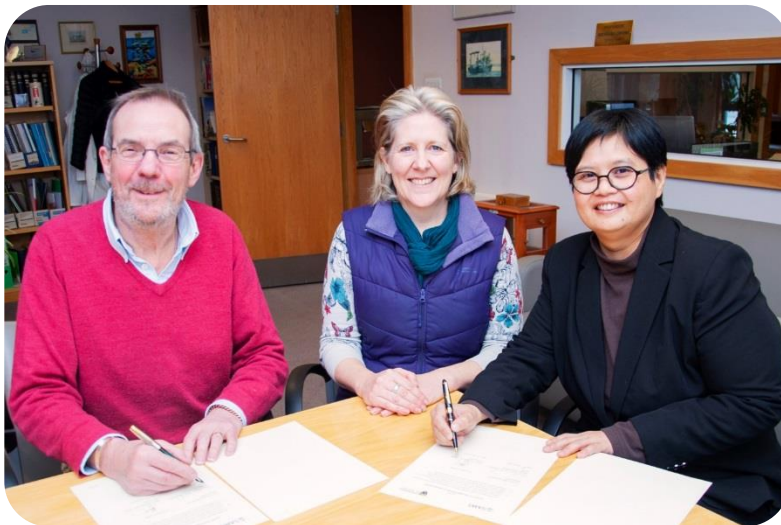


## MoU Signing with The Scottish Association for Marine Science (SAMS), 7-10 Jan 2019

2

Venue : The Scottish Association for Marine Science, United Kingdom

The Scottish Association for Marine Science (SAMS), as lead partner in the GlobalSeaweed STAR programme recently signed a Memorandum of Understanding with a delegation from University of Malaya headed by Professor Lim Phaik Eem as the Partner Leader for Malaysia. The GlobalSeaweed STAR programme is a multi-disciplinary, 4-year, challenge-led, strategic programme in collaboration, primarily with the Philippines, Malaysia and Tanzania. This programme which is funded by UK Research and Innovation (UKRI) through a Global Challenges Research Fund (GCRF) aims to improve the sustainability of seaweed cultivation throughout the world, sharing knowledge on biosecurity, genetic diversity and farming techniques between nations.



Professor Nicholas Owens (left) signing the MOU on behalf of SAMS, witnessed by Professor Elizabeth Cottier-Cook as the PI of the Global SeaweedSTAR programme (center) and Professor Lim Phaik Eem (right) as the Partner Leader for Malaysia.

Group photo of members of the Global Seaweed STAR programme from UK, Malaysia, the Philippines, and Tanzania



## Bioinformatic Programme Collaboration Meeting with Institute of Marine Biotechnology, Universiti Malaysia Terengganu (24 Jan 2019)

3

Venue : Bachok Marine Research Station (BMRS), Kelantan



The delegates from Institute of Marine Biotechnology, Universiti Malaysia Terengganu was led by the Director, Assoc. Prof. Dr. Yeong Yik Sung and accompanied by 2 research officers. Many aspects were discussed with Assoc Prof Dr Lim Po Teen and Assoc Prof Dr Leaw Chui Pin during the meeting such as future collaborations plans in exchanging academics, internship programme opportunities and sharing facilities in both institutes. As a result from the discussion, Assoc Prof Dr Lim Po Teen has been invited as presenter in IMB international conference and Assoc Prof Dr Mohd Danish Daniel from IMB was doing short attachment in BMRS.



## Visit by Department of Survey and Mapping (JUPEM), Kelantan (27 Jan 2019)

4

Venue : Bachok Marine Research Station (BMRS), Kelantan

30 staff from Department of Survey and Mapping (JUPEM), Kelantan, led by their Director, Sr Wan Zainuddin bin Wan Yusoff have visited Bachok Marine Research Station (BMRS), IOES, University of Malaya, Bachok, Kelantan on 27 Jan 2019.

During the tour trip, the staff have given opportunities to expose with all the scientific oceanography sampling instruments (e.g: plankton net, van-dorn water samples, core sampler, Ekman grab, hydralab multi-parameter, scuba diving equipment and etc) and oceanography analysis instruments (e.g: PCR, flow-cytometer, microscope, CHN Elementar Analyzer, Real-Time PCR System, TOC-TN analyzer, CO Analyzer, Optical Particle Counter, Ozone(O<sub>3</sub>) Analyzer and etc). Besides that, the staff also visited all the laboratories in BMRS (e.g. biological oceanography lab, physical oceanography lab, molecular lab, cultures room, hatchery and nursery) and exposed to different research activity in BMRS (e.g: Harmful algae blooms (HABs) research, atmospheric research, seaweed research and prawn breeding research).



## Leaders in Innovation Accelerator (LIA) Programme Pitch, (30 Jan 2019)

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### Leaders in Innovation Accelerator (LIA) Programme Pitch, (30 Jan 2019)

Venue : Malaysian Industry-Government Group for High Technology (MIGHT), Cyberjaya

In promoting technology UASFF System for Biohydrogen Production from Palm Oil Mill Effluent, Prof Dr Shaliza Ibrahim was selected Top 15 in the Leaders in Innovation Accelerator (LIA) programme. LIA is sponsored by the Newton Ungku Omar Fund (NUOF) and facilitated by Oxentia, UK and the Royal Academy of Engineering, UK in collaboration with MIGHT. The selection for Top 15 was made after a 2-day Bootcamp on 14-16 August 2018 that culminated with a pitch. Between then and 30th January 2019, the Top 15 were given mentorship from a UK coach who guided on doing a business pitch. Real investors from Malaysia and the UK were present at the pitch day on 30 January 2019, and the session was also live streamed all over the world. In preparation for this final pitch, Prof Shaliza had to engage with industries related to the technology, hence the meetings and discussions with Muhibbah Engineering, Green Ocean, Sher Engineering, Creoe Sdn Bhd and MPOB. The accelerator effort continues with the team making visits to palm mills to look for collaboration opportunities.





## Impact Study of Implementations of HICoEs by Malaysia Productivity Corporations (31 Jan 2019)

6

(31 JAN 2019)  
Venue : Anggerik Room, Institute of Advanced Studies Building,  
University of Malaya

Total of 6 delegates led by Prof Dr Ku Nor Izah Ku Ismail from MPC visited IOES to carry out an impact study of implementation of HICoE. Malaysia Productivity Corporation (MPC), an agency of the Ministry of International Trade and Industry (MITI), has been mandated to carry out the Impact Study on HICoE by the Ministry of Education (MOE). IOES was awarded Higher Institutions Centre of Excellence (HICoE) on October 2014 in niche Air-Ocean-Land Interaction. The findings of the study will be incorporated into the policy of the update national education blueprint.



## UM Kor SUKSIS - Marine Debris Assessment Programme (14 Feb 2019)

7

Assessment Programme (14 Feb 2019)

Venue : Pantai Melawi, Bachok, Kelantan



Police Undergraduate Voluntary Corps (Kor SUKSIS), University of Malaya have organized “Kursus Modul Etika dan Pengurusan Integriti PDRM” to the junior cadets on 11-17 Feb 2019 at BMRS, IOES UM. The course was conducted based on syllabus that have been approved by Training Department, Royal Malaysian Police Bukit Aman.

One of the activities conducted in BMRS was NOAA Marine Debris Assessment. From the assessment, the awareness on the importance of protecting the environment can be improved. The junior cadets do beach clean-up at Pantai Melawi assisted by IOES staff. Assoc Prof Dr Leaw Chui Pin gave short briefing on Marine Debris Assessment's evaluation method before start the beach clean-up. The waste collected is segregated by category before sent to recycling centre.





## Interview by ASM with Stakeholders (IOES) at University Level (18 Feb 2019)

8

UNIVERSITY LEVEL (18 FEB 2019)

Venue : Anggerik Room, Institute of Advanced Studies Building,  
University of Malaya

Prof Dr Pervaiz K Ahmed and Assoc Prof Dr Santha Vaithilingam from Monash University Malaysia together with Dr Shahkila Mohd Arif and Ms Nurhani Mat Razali from Academy of Sciences Malaysia visited IOES for their study and interview regarding obtaining opinions from stakeholders at university level on Research University implementation.



## Quantifying Mangrove Blue Carbon Stocks (18 – 23 Feb 2019)

9

(18 – 23 Feb 2019)

Mangrove forests provide many ecosystem services to humans globally. They are important for mitigating atmospheric CO<sub>2</sub> levels as they store 3-5 times more carbon (C) in above and belowground pools than other temperate or tropical forested ecosystems. The ability to remove and store large amounts of CO<sub>2</sub> from the atmosphere has elevated the importance of mangroves in national greenhouse gas reduction strategies and incentive-based climate change mitigation programs (e.g., REDD+).

Students from IOES and ISB, UM; LESTARI, UKM and UTM Mara joined the field work to measure and quantify mangrove blue carbon stocks in Merlimau, Malacca. Part of this research program is to train future generation students in field and class to understand mangrove ecology. The function of the IOES is three-pronged: Research, Academic Training and Technology Development.

Students from any University and Institutes are welcome to join field work with us in future. Please contact **Dr. Sahadev Sharma** for further information ([ssharma@um.edu.my](mailto:ssharma@um.edu.my)).





# ASEAN Workshop on the Conservation of Migratory Marine Mammals and Other Endangered Marine Organisms (22-24 Feb 2019)

10

Venue : Marriott Hotel, Putrajaya

This workshop was co-organized by the Institute of Ocean and Earth Sciences (IOES), University of Malaya and The MareCet Research Organization, Malaysia in collaboration with the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) supported by the ASEAN Science Technology and Innovation Fund (ASTIF). The Secretary General of MESTECC Datuk Seri Dr Mohd Azhar bin Haji Yahaya officiated the workshop.

This inaugural workshop gathered government officials, marine scientists and marine conservation managers of the ASEAN Member States to identify drivers behind various conservation issues impacting marine mammals and other marine endangered species in the region. In summary, the workshop main agendas were:

- i) Introduction of the DPSIR Framework and the Important Marine Mammal Areas (IMMAs) and their application as a standard tool for conservation in ASEAN countries;
- ii) A forum for transboundary management of habitats for conservation of marine endangered species; and
- iii) Discussed on the establishment of an ASEAN Marine Mammal and Marine Endangered Species (SEAN MMES) Technical Committee to be formed under the Sub Committee on Marine Science and Technology (SCMSAT).



## Visit from Institute of Hydrobiology, Chinese Academy of Science (IHCAS), Wuhan, China to Bachok Marine Research Station (25 March 2019)

11

Venue : Bachok Marine Research Station, Kelantan

A total of 8 delegates from Institute of Hydrobiology, Chinese Academy of Science (IHCAS), Wuhan, China lead by Prof Zhou Yiyong had visited Bachok Marine Research Station, IOES on 25 March 2019. Member of the delegates (IHCAS) are Prof. Dr. Zhou YiYong, Prof. Dr. Song Lirong, Assoc. Prof. Dr. Song Chunlei, Assoc. Prof. Dr. Cao Xiuyun, Assist. Prof. Dr. Zhang Zhimin, Yang Liu, Deng Qinghui and Chai Xiaojie.

The main objective of their visit is to discuss the progress of Harmful Algal Blooms (HABs) program funded by the Ministry of Science and Technology (MOST), China. The visit was started with BMRS laboratory tour visit, followed with research discussion on HABs research progress in Johor Strait. Prof Zhou was so impressed with all the facilities that have in BMRS and will have more research collaboration with IOES.





# Seminar on Energizing Sustainable Development Goals (SESDG2019) (25 April 2019)

12

(52 7bluJ 5019)

Venue : The Cube, Academy of Islamic Studies, University of Malaya

### SESDG2019 HIGHLIGHTS

**OPENING ADDRESS:**  
YB DATUK SERI SAIFUDDIN NASUTION ISMAIL  
MINISTER,  
MINISTRY OF DOMESTIC TRADE & CONSUMER AFFAIRS  
(KPDNHEP)

**WELCOMING ADDRESS:**  
YBHG. DATUK IR. (DR.) ABDUL RAHIM HASHIM  
VICE-CHANCELLOR,  
UNIVERSITY OF MALAYA

**KEYNOTE ADDRESS:**  
PROFESSOR DR. PHANG SIEW MOI  
HONORARY ADVISOR, INSTITUTE OF OCEAN & EARTH SCIENCES (IOES),  
UNIVERSITY OF MALAYA

**SESDG2019 FORUM**  
PROFESSOR DR. SUMLENI YUSOFF (UM Eco-Campus Secretariat & IOES)  
MR. ALIZEN MEHEDI (SEI Malaysia)  
MADAM NORHATATI ISMAIL (Food Aid Foundation)  
MADAM ISMI AZURA ISTYAR KHAN (Alam Flora)  
MR. ATTENDIYANG ANEHI (Malaysian Society of Marine Sciences)

**OFFICIAL LAUNCH OF  
UM ECO-CAMPUS COLLECTIVE INITIATIVES:**  
1. ECO-SURAU @ UM 2019  
2. UM LIVING LAB SYSTEM  
3. UM LIVING LAB GUIDELINES  
4. IR ON WHEELS

Organized by:  
**UNIVERSITY OF MALAYA**

## Seminar on Energizing SUSTAINABLE DEVELOPMENT GOALS (SDGs) 2019

**25 April 2019 (Thursday) 8AM - 1PM**  
**The Cube, Academy of Islamic Studies (APIUM)**  
**UNIVERSITY OF MALAYA**

Supported by:

**#SESDG2019** | **IN CONJUNCTION WITH:**  
**'For People, Ecosystem and Planet'** | **Celebration of World Earth Day**  
**Theme: 'Protecting Our Species'**

World Earth Day was first celebrated in 1970 on 22 April. A day which transcends all national boundaries yet promotes all geographical integrities, brings people all over the world into one resonating accord, devoted to the preservation of the harmony in nature and yet draws upon the triumphs of technology, the measurement of time, and instantaneous communication through space.

The **SESDG2019** aims at:

- Promoting awareness and education to respective community and audience on the importance of Sustainable Development Goals (SDGs) and its impact on people, ecosystem, and planet;
- Sharing best practices on several topics relevant to SDGs and University of Malaya Eco-Campus Blueprint (UMECB) aspiration;
- Providing platform and opportunities for networking and potential partnership among participants; and
- Supporting local and international commitment to Sustainable Development Goals (SDGs) especially on SDG11 Sustainable Cities and Communities, SDG12 Responsible Consumption and Production, SDG13 Climate Action, and SDG17 Partnership for the Goals.

