



KL GeoHydro 2019

**“EMPOWERING MARINE KNOWLEDGE
THROUGH HYDROGRAPHY”**

PROGRAMME & ABSTRACT BOOK

18 - 19 NOVEMBER 2019

Hotel Istana

Kuala Lumpur City Centre

73 Jalan Raja Chulan

50200 KUALA LUMPUR

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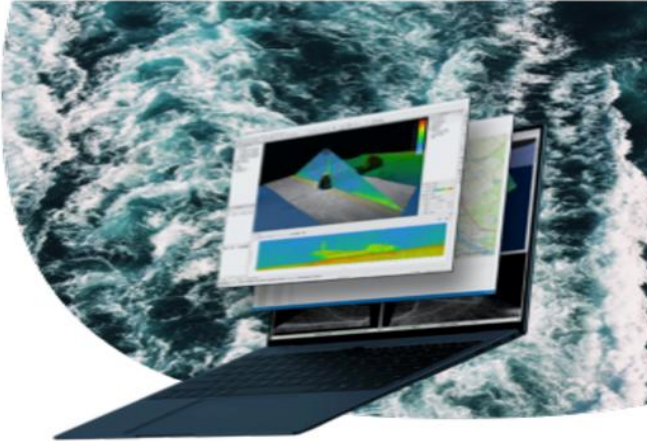
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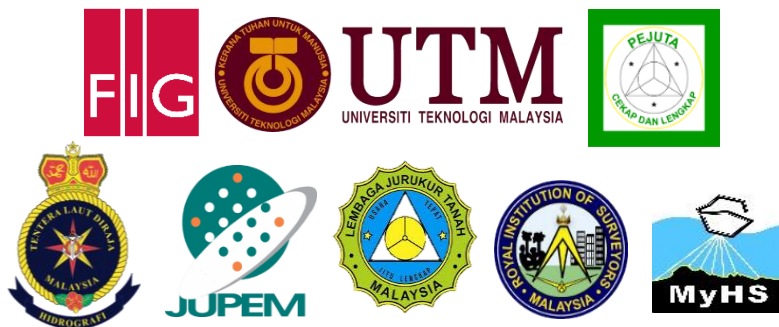
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VISION

Surveying is a modern profession acting worldwide for a better infrastructure for our society and planet earth. The International Federation of Surveyors (FIG) wants to keep, and even improve, its role as the premier non-governmental organisation that represents the interests of surveyors worldwide.



MISSION OF FIG COMMISSION 4 - HYDROGRAPHY

- Promote the aims and objectives of FIG to hydrographers through the active involvement of national delegates from member associations and other interested parties in the activities of the commission.
- Foster closer links with all sister organisations currently active within the global hydrographic community.
- Develop guidelines and standards that will assist hydrographers in the provision of their services.
- Disseminate information relevant to the profession through participation in international meetings, conferences and committees.

UPCOMING EVENT



OBJECTIVE OF THE KL GeoHydro 2019

- To review current trends in hydrographic education, practice, research and development.
- To provide an exposure to the practicing hydrographers and land surveyors into the current research, tools and practices in industry.
- To provide the research community a forum for exposing them to the problems of the practical applications of maritime industry.
- To encourage the exchange of practical hydrographic technologies and experience.
- To provide a forum for the discussion of innovative applications of offshore industry.

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I wish to convey my gratitude to the organising committee for allowing me to express a few words in conjunction with the Kuala Lumpur GeoHydro 2019 (KL GeoHydro 2019). I hope the theme of this international conference “Empowering Marine Knowledge through Hydrography” will serve as a platform for the hydrographic community to work together and synergise efforts in generating more exciting research ideas and novel approaches in the field of hydrography for the benefit of marine community.



I am pleased to welcome speakers, participants and exhibitors to this event. It is my hope that the presence of many experts in the field of hydrography and other related areas in this conference will generate new ideas and create solutions in revitalising hydrographic information for empowering marine knowledge through hydrography. Common and global issues such as marine geodetic modernisation, maritime boundaries, marine cadastre, sea-level rise, satellite-derived bathymetry and other issues that have become a common challenge can also be addressed. As such, the utilisation of hydrographic information in empowering marine knowledge for research development will be the way forward for marine community and in line with achieving United Nations Sustainable Development Goal 14.

I have no doubt that the participants will benefit immensely from the discussion and the exchange of views on this subject to enhance the understanding of the issues and problems related. I, therefore, consider KL GeoHydro 2019 as the most timely and extremely significant. I hope this event will not only achieve its objective but also contribute to the formation of networking amongst the participants and the experts. I am sure that with the knowledge and the friendship established will continue to prosper in the years to come.

Finally, may I wish all speakers and participants a fruitful discussion ahead and hope the event will end with resounding success. To foreign speakers and participants, please accept my humble greetings of “Selamat Datang” and have a pleasant stay in Malaysia.

YANG BERTHORMAT DATO' DR. XAVIER JAYAKUMAR

Minister of Water, Land and Natural Resources, Malaysia

Bismillahirrahmanirrahim
Assalamualaikum warahmatullahi wabarakatuh

Greetings!

On behalf of the Geomatics and Land Surveying community in Malaysia, I take great pride in welcoming all the attendees, locally and internationally, to the first and significant event of Kuala Lumpur GeoHydro 2019 (KL GeoHydro 2019). I would like to also convey our special gratitude to the honourable, Yang Berhormat Dato' Dr. Xavier Jayakumar, Minister of Water, Land and Natural Resources, Malaysia for officiating this memorable occasion.



KL GeoHydro 2019 conference focusses on the marine and hydrographic environment, specifically hydrographic survey; another domain and discipline of the geomatics and land surveying professionals in Malaysia. As the Director General of Survey and Mapping Malaysia and the Chairman of the Land Surveyors Board of Malaysia (LJT), I am delighted to witness the collaboration of various agencies and bodies in regards to the surveying and hydrography such as JUPEM, PHN, LJT, PEJUTA, UTM, RISM, MyHS and YSN Malaysia to co-organised KL GeoHydro 2019, the first of its kind event.

"Empowering Marine Knowledge through Hydrography", is the theme of the conference. By empowering marine knowledge through hydrography, the surveyors' role of providing and managing spatial data can be incorporated in administering the nation's marine geospatial information for the benefit of all levels. Ultimately, the role of surveyors will become more relevant and remain significant, provided surveyors are in tandem with the current hydrography trends and demands, as well as growth in mind-set.

KL GeoHydro 2019 has indeed provided an opportune time to bring together local and international experts from the marine and hydrographic scene for discussions of the latest advances and ideas and to stimulate interdisciplinary interactions. A significant number of invited speakers of prominent surveying and hydrography background will be presenting pertinent issues in this conference. Therefore, a need of further deliberation among the participants in order to enhance the level of professionalism among surveyors and other disciplinary related to the marine environment while being prepared for the challenges that lie in the near future. Thus, I am optimistic that all participants will take away crucial insights and information from the conference.

Last but not least, I would like to thank the organising team for their steadfast dedication to the success of this event. To foreign speakers and participants, I wish you a pleasant and memorable stay in Malaysia.

Thank you.

YBHG. DATO' Sr DR. AZHARI MOHAMED
Director General of Survey and Mapping Malaysia
& Chairman of the Land Surveyors Board of Malaysia

As a maritime nation, the importance of hydrographic data to Malaysia's marine community is undeniable. The usage of hydrographic data is essential, especially for the development of our maritime industries, efficiency of maritime transport control, environment protection, marine science, national spatial data infrastructure, maritime boundary delimitation, maritime defence and marine tourism.

However, reliable hydrographic data only can be delivered by the ethical conduct of hydrographic survey activities. For most of the national hydrographic organisation, the activities conducted not only cover various aspects of processes from the data collection to chart production but also encompass the training of personnel in meeting the demanding quality. The dynamic evolution of international standards for hydrographic surveys significantly affects the uniformity of the activities of hydrographic surveys conducted. These standards equalise the level of accuracy of data collection that will be in a suitable form present on the deliverable products.



Having a strong international character, hydrographic products are used for different purposes in the maritime industry, which is international in its very nature. In order to empower marine knowledge in our maritime community, dynamic collaboration among public and private institutions is paramount. The partnership capable of enhancing the expertise among the surveyors and practitioners in term capacity building, particularly contribution towards the shared national database of hydrographic information.

It is indeed a great honour for National Hydrographic Centre (PHN) to have such an excellent opportunity together with Universiti Teknologi Malaysia (UTM), Department of Survey and Mapping Malaysia (JUPEM) and the Association of Authorised Land Surveyors Malaysia (PEJUTA) in co-organising this pilot project of KL GeoHydro 2019 in Malaysia. I am confident that KL GeoHydro 2019 will surely be the conference to attend and learn more about the knowledge of marine and hydrographic with a world of opportunities, not only for those hydrographic experts and maritime community, but also for any groups and individuals that keen to learn more about the modern hydrography, significant developments in such technologies, the merging influx of hydrographic with the geospatial information field.

The successful organisation of KL GeoHydro 2019 has required the talents, dedication and time of many volunteers and strong support from sponsors. I would like to extend my heartiest congratulations to the entire team from the event organizing committee, delegates and exhibitors for making this conference materialised. Special gratitude and appreciation to invited speakers for their sharing and thought. We hope that all delegates and participants will find the conference both enjoyable and valuable, and also enjoy the architectural, cultural and beauty of Kuala Lumpur, and Malaysia.

Thank you.

YBHG. REAR ADMIRAL HANAFIAH HASSAN

Director General of Hydrography,
National Hydrographic Centre, Malaysia

I am grateful to ALLAH S.W.T for giving me the opportunity to put together my energy and thoughts to organise this conference/exhibition.

On behalf of the Association of Authorised Land Surveyors Malaysia (PEJUTA), it is my great pleasure to welcome all participants to the KL GeoHydro 2019 (Conference and Exhibition).



Thank you for the initiative and willingness of UTM, PHN and JUPEM to co-organised this event as a pilot project. It is a branding event in the South East Asia region and is an event that attracts, draws attention and promotes technological advances in the field of hydrography and marine industry. It is hoped that this event will serve as a forum for PEJUTA members as industry players get the opportunity to cooperate in the development of the National Development sector related to maritime, marina and any other area involving water.

Thank you.

Sr SHAHARUDDIN MUSA

President of the Association of Authorised Land Surveyors Malaysia (PEJUTA)



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On behalf of the organising committee, I would like to welcome everyone to this occasion of "KL GeoHydro 2019 (Conference & Exhibition)".

KL GeoHydro 2019 is jointly organised by the International Federation of Surveyors (FIG), through its Commission 4 together with Universiti Teknologi Malaysia (UTM), Department of Survey and Mapping Malaysia (JUPEM), National Hydrographic Centre (PHN), Association of Authorised Land Surveyors Malaysia (PEJUTA), Land Surveyors Board, Malaysia (LJT), Royal Institution of Surveyors Malaysia (RISM) and Malaysian Hydrographic Society (MyHS). The theme of the conference is "Empowering Marine Knowledge through Hydrography" and has been chosen to reflect on the global trend and challenges in hydrography. The primary objective of KL GeoHydro 2019 is to review the current trends in hydrographic education, practice, research and development.

I am very grateful with the cooperation and support provided by the foregoing international organisation, government agencies and institutions to this event. I would like to stress on the importance of strong cooperation between the government, institutions, people and professionals to ensure the successful implementation of this event. This forum is one of many steps that we can take to learn from each other and work together to address problems and challenges faced by the hydrographic community in Malaysia.

The organising committee has tried to reach out to many marine communities and it is hoped that the participation in this event reflects the different sectors of community. Among them are hydrographic surveyors, offshore surveyors, land surveyors, mariners and academicians.

I wish to express my profound appreciation to the distinguished speakers, sponsors, exhibitors and participants for their support and involvement in ensuring a successful organisation of this event.

Last but not least, I would like to thank all members of the organising committee for their countless and tireless effort to ensure the success of KL GeoHydro 2019.

Thank you.

PROF. Sr DR. MOHD RAZALI MAHMUD
Chairman of KL GeoHydro 2019

Programme

KL GeoHydro 2019

Day 1: 18 November 2019 (Monday)

Welcoming Session

0800 - 0900	Registration
0900 - 0905	Doa Recitation
0905 - 0925	Welcoming Speech by the Chairman of Organising Committee Prof. Sr Dr. Mohd Razali Mahmud
0925 - 1000	Opening of the Exhibition by the Director General of Survey and Mapping Malaysia Department of Survey and Mapping Malaysia YBhg. Dato' Sr Dr. Azhari Mohamed
1000 - 1030	Tea and Coffee Break

Session 1

Chairperson: Mr. Gordon Johnston (FIG)

1030 - 1105	K1	Keynote Address YBhg. Dato' Sr Dr. Azhari Mohamed (Malaysia) Director General of Survey and Mapping Malaysia Department of Survey and Mapping Malaysia <i>Marine Geodetic Modernisation in Malaysian Waters: Current Development and Future Directions.</i>
1110 - 1145	K2	Keynote Address Rear Admiral Hanafiah Hassan (Malaysia) Director General of Hydrography National Hydrographic Centre Royal Malaysian Navy <i>Revitalising Hydrographic Information for Empowering Marine Knowledge.</i>
1150 - 1225	K3	Keynote Address Prof. Sr Dr. Mohd Razali Mahmud (Malaysia) Chair of FIG Commission 4 (Hydrography) Faculty of Built Environment and Surveying Universiti Teknologi Malaysia <i>Empowering Marine Knowledge through Hydrographic Professional Programmes at Universiti Teknologi Malaysia.</i>
1230 - 1400		Lunch Break

Session 2

Chairperson: Sr Saiful Nizam Mustafa (PETRONAS)

- | | | |
|-------------|----|--|
| 1400 – 1425 | 2A | <p>Mr. Johan Stam (Netherlands)
 Managing Director of Skilltrade BV</p> <p><i>Education and Training: Knowledge Leads to Connections.</i></p> |
| 1430 -1455 | 2B | <p>Mr. Mick Hawkins (Australia)
 Business Development Manager for Fugro Australia Marine Pty Ltd</p> <p><i>Unlocking Data Insights in Asia and the South Pacific to Mitigate Impacts of Climate Change and Sea Level Rise.</i></p> |
| 1500 – 1525 | 2C | <p>Sr Dr. Mohd Yunus Mohd Yusoff (Malaysia)
 Director of Survey, Geodetic Survey Division,
 Department of Survey and Mapping Malaysia</p> <p><i>Enhancement of Tidal Stations in Malaysia: Progress and Prospect</i></p> |
| 1530 – 1555 | 2D | <p>Mr. Abhineet Jain (Singapore)
 Global Industry Business Development</p> <p><i>Evolution of Remote Sensing: What's Next?</i></p> |
| 1600 – 1615 | | Tea and Coffee Break |

Session 3

Chairperson: Sr Shaharuddin Musa (PEJUTA)

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|-------------|----|---|
| 1615 – 1640 | 3A | <p>Ms. Poh Lem Choo (Malaysia)
 Senior Programme Officer, World Wild Fund for Nature – Malaysia Marine Programme</p> <p><i>Threats to Semporna's Reefs: A Comparative Study of Underwater Survey Results versus Community Perception.</i></p> |
| 1645 -1710 | 3B | <p>Sr Zulkifli Sidek (Malaysia)
 Deputy Director of Survey, Boundary Affairs Division,
 Department of Survey and Mapping Malaysia</p> <p><i>40 Years of Peta Baru Malaysia 1979.</i></p> |

- 1715 - 1740 3C Dr. Isa Adekunle Hamid-Mosaku (Nigeria)
University of Lagos, Nigeria
Utilisation of Hydrographic Information in Empowering Marine Knowledge for Research Development: Challenges and Prospects.
- 1930 – 2300 KL GeoHydro 2019 Gala Dinner:
 - Opening Ceremony of KL GeoHydro 2019
 - Graduation Ceremony of UTM HYDRO III Programme (FIG/IHO/ICA Category A)
 - Alumni Launching of UTM Hydrography Programmes (FIG/IHO/ICA Category A & Category B)

Sub-Programme: FIG Commission 4 Annual Meeting

- 1400 - 1600 FIG Commission 4 Annual Meeting (by invitation only)
1600 – 1615 Tea and Coffee Break

Sub-Programme: Meet & Greet UTM Alumni Session

- 1800 – 1900 Meet & Greet Session for UTM Alumni (FIG/IHO/ICA Category A & Category B)

Day 2: 19 November 2019 (Tuesday)

Session 4

Chairperson: Sr Razali Ahmad (MyHS)

- | | | |
|-------------|----|--|
| 0900 – 0925 | 4A | <p>Mr. Neil Hewitt (Australia)</p> <p>Chair of FIG Working Group 4.1 – Standards and Guidelines for Hydrography</p> <p><i>Hydrographic Surveyors Certification.</i></p> |
| 0930 – 0955 | 4B | <p>Mr. Gordon Johnston (United Kingdom)</p> <p>Chair of FIG Working Group 4.2 – Blue Growth & UN Sustainable Development Goal 14</p> <p><i>Blue Growth, Developing the Blue Economy and the Surveyors' Contribution.</i></p> |
| 1000 – 1025 | 4C | <p>Mr. Lester Simon Ironside (New Zealand)</p> <p>Chair of FIG Working Group 4.3 – Mapping the Plastic</p> <p><i>Mapping the Plastic – A Surveyor's Response.</i></p> |
| 1030 – 1100 | | Tea and Coffee Break |

Session 5

Chairperson: Sr Dr. Mohd Yunus Mohd Yusoff (JUPEM)

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|-------------|----|---|
| 1100 – 1125 | 5A | <p>Sr Dr. Abdullah Hisam Omar (Malaysia)</p> <p>Chair of FIG Working Group 4.4 – Marine Development and Administration</p> <p>Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia</p> <p><i>Roles of Marine Cadastre for Nation Development: Potential, Requirement and Challenges.</i></p> |
| 1130 - 1155 | 5B | <p>First Admiral Dr. Najhan Md Said (Malaysia)</p> <p>Senior Director of Hydrography, National Hydrographic Centre, Royal Malaysian Navy</p> <p><i>The Naming of Undersea Features in Malaysia: Rational and Challenges.</i></p> |
| 1200 – 1225 | 5C | <p>Sr Dr. Ami Hassan Md Din (Malaysia)</p> <p>Geomatics Innovation Research Group, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia</p> <p><i>Advances in Satellite Altimetry for the Ocean Exploration.</i></p> |
| 1230 – 1400 | | Lunch Break |

Session 6

Chairperson: Sr Mohamad Azmi Mohd Zin (RISM)

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|-------------|----|--|
| 1400 - 1425 | 6A | <p>Mr. Matt Holland (Canada)
Sales Manager Asia / Pacific, Teledyne CARIS</p> <p><i>Trends in Hydrography Empowering Marine Knowledge: Automation for Marine Survey, Products and Possibilities through S-100.</i></p> |
| 1430 – 1455 | 6B | <p>Sr Shaharuddin Musa (Malaysia)
President of the Association of Authorised Land Surveyors Malaysia (PEJUTA)</p> <p><i>Current and Future Challenges for Hydrographic Surveyors in Malaysia.</i></p> |
| 1500 – 1525 | 6C | <p>Assoc. Prof. Dr. Mohd Fadzil Mohd Akhir (Malaysia)
Director of Institute of Oceanography and Environment (INOS), Universiti Malaysia Terengganu</p> <p><i>What Can You Do with 100 Years of Ocean Data?: Experience from World Ocean Database for South China Sea Research.</i></p> |
| 1530 – 1545 | | Tea and Coffee Break |

Session 7

Chairperson: Prof. Sr Dr. Mohd Razali Mahmud (UTM)

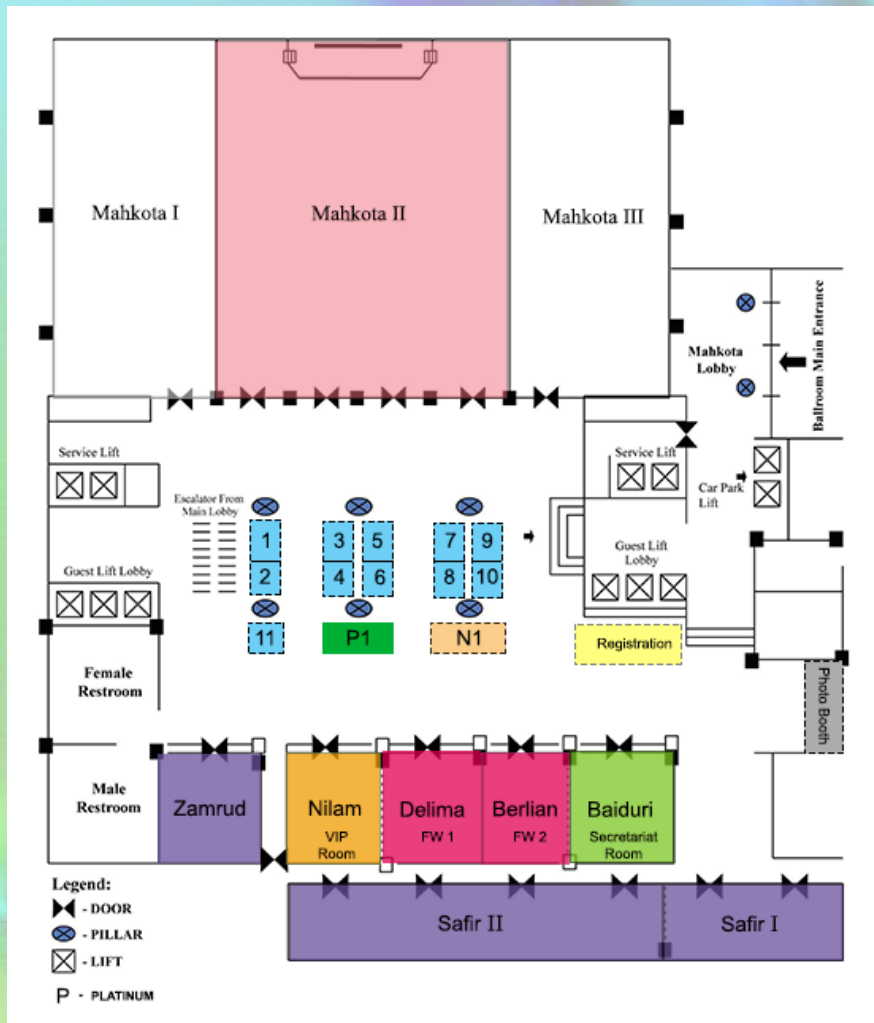
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| 1545 – 1610 | 7A | <p>Mr. Ahmad Hadi Mohamed Rashidi (Malaysia)
Research Officer, Research Centre for Coastal and Oceanography, National Hydraulic Research Institute of Malaysia (NAHRIM), Ministry of Water, Land and Natural Resources</p> <p><i>Impact of Climate Change to Sea Level Rise in Malaysia.</i></p> |
| 1615 – 1640 | 7B | <p>Sr Noorzalinee Ghazali (Malaysia)
Senior Lecturer, Universiti Teknologi MARA</p> <p><i>Mangroves Bioshield vs Mean Sea Level Rise: How We Wreck Our Last Defence!</i></p> |
| 1645 - 1715 | | Award Giving and Closing Ceremony |

Sub-Programme: FIG Young Surveyors Network

Day 2: 19th November 2019 (Tuesday)

- 1400 - 1500 **3MT Competition – What Young Surveyors Can Do?**
 Co-Chair: Sr Nor Fadzillah Haron & Sr Amir Hamzah Othman, YSN Malaysia
 Rapporteur: PEMETA, UTM
- “3 minutes stand up with a scientific twist” – Showcase your innovative idea how it contributes to support the SDGs which focus on marine environment!
- 1500 – 1600 **Youth Talk! Sharp lighting talks by Young Professionals**
 Chair: Sr Kelvin Tang Kang Wee, YSN Malaysia
 Rapporteur: PEMETA, UTM
- This interactive session will be a balance between Young Surveyors and experienced Young Professionals sharing their experiences. This session will inspire and encourage participants to be a part of the surveying profession, seize opportunities and at the same time give back to society.
- Global Young Academy (GYA)
Dr. Kamarrul Azhari Razak
 - Association of Authorised Land Surveyors Malaysia (PEJUTA)
Sr Nik Ikhwan Haqim Hanafi
 - Royal Institution of Surveyors Malaysia (RISM)
Sr Nur Zurairah Abdul Halim
 - Malaysian Hydrographic Society (MyHS)
Sr Lenny Sharinee Sakai
- 1600 – 1630 **Speed Dating – Building blocks for the future!**
 Chair: Amy Ellyza Ghani, YSN Malaysia
 Rapporteur: PEMETA, UTM
- Young Surveyors will build upon connections made during the conference and learn how to positively influence the future of our network in a changing world.

LIST OF EXHIBITORS



Exhibitors

THSG, QPS, SKILL TRADE & GEOMATIC SOLUTIONS GROUP	P1
DEPARTMENT OF SURVEY AND MAPPING MALAYSIA (JUPEM)	N1
MARINE SCIENCE TECHNOLOGY SDN BHD	1
HEMISPHERE GNSS	2
UNIVERSITI TEKNOLOGI MALAYSIA	3
HYDRONAV SERVICES (S) PTE LTD	4
INFINITY SUCCESS SOLUTIONS SDN BHD / GLOBAL-TRAK SYSTEMS SDN BHD	5
TEMASEK HIDROTEKNIK SDN BHD	6
MAP INFORMATION SOLUTIONS SDN BHD	7
OKENOS SDN BHD AND TELEDYNE CARIS	8
RM GEOMETRA SDN BHD	9
SEA AND LAND TECHNOLOGIES PTE LTD	10
NATIONAL HYDROGRAPHIC CENTRE (PHN)	11

KL GeoHydro 2019

Organising Committee

Chairman

Prof. Sr Dr. Mohd Razali Mahmud (UTM)

Co-chairman

Sr Shaharuddin Musa (PEJUTA)

Committee Members

Dato' Sr Dr. Hj Md Said @ Mohd Zaid Abdullah (PEJUTA)

Rear Admiral Hanafiah Hassan (PHN)

First Admiral Dr. Najhan Md Said (PHN)

Sr Dr. Muhammad Asyran Che Amat (JUPEM/ RISM)

Sr Dr. Abdullah Hisam Omar (UTM)

Sr Dr. Khairulnizam M. Idris (UTM)

Sr Dr. Muhammad Imzan Hassan (UTM)

Sr Dr. Abd Wahid Rasib (UTM)

Sr Dr. Rozaimi Che Hasan (UTM)

Sr Dr. Ami Hassan Md Din (UTM)

Lt Cdr Lim Siong Hui RMN (PHN)

Sr Mat Yunus Jaafar (PEJUTA)

Sr Md Rodi Ismail (PEJUTA)

Mrs. Raja Bismayazan Raja Abd Aziz (PEJUTA)

Sr Mohd Nazam Sulaiman (JUPEM)

Sr Mohd Hilmi Abdullah (JUPEM)

Sr Nur Zurairah Abdul Halim (JUPEM/ RISM)

Sr Saiful Nizam Mustafa (PETRONAS)

Sr Noor Safaruddin Kamaruddin (MyHS)

Sr Kelvin Tang Kang Wee (YSN)

KEYNOTE SPEAKER (K1)



YBhg. Dato' Sr Dr. Azhari Mohamed (Malaysia)

Marine Geodetic Modernisation in Malaysian Waters: Current Development and Future Direction

**Director General of Survey and Mapping Malaysia,
Department of Survey and Mapping Malaysia**

e-mail: azhari@jupem.gov.my

Malaysia is a maritime country with its land and marine areas of approximately 332,000 and 613,000 square kilometres respectively. The country claims an estimated of 4,700 km long coastal zone and a sum of 1,370 islands including its offshore geographical entities. The highest priority is given on a task to survey and position of all the islands due to the national sovereignty over the entities of the marine area. The realisation of this task is through the implementation of Marine Geodetic Infrastructures in Malaysian Waters (MyMarineGI) by the Department of Survey and Mapping Malaysia (DSMM). The aim of MyMarineGI project is to create and maintain a modern marine geodetic infrastructure for Malaysian waters with the primary objective is to preserve the national sovereignty over marine areas under its jurisdiction. The scope of works of MyMarineGI project are to extend the Malaysian Geocentric Datum (GDM2000) through marine geodetic network (MGN) covering the selected islands and to establish the Permanent Stations for Marine Global Navigation Satellite System (GNSS) with continuous GNSS tracking capability to strengthen GDM2000 in marine areas. Furthermore, the scope of the project is also to develop seamless land-to-sea topographic database and to establish Marine Geodetic Vertical Datum (MGVD) that will enable the integration of spatial data across the land and sea interface. Next, the development of Marine Geodetic Database (MGDB) at DSMM will facilitate the development of comprehensive Marine Spatial Data Infrastructure for Malaysia. In addition, future plan for Malaysian waters are actively being promoted and planned in order to enhance the objectives of the project. In conclusion, the MyMarineGI project provides significant and direct outcomes and impacts for the purpose of promoting national sovereignty, exclusive economic zone as well as avoids trespassing into country's waters. Thus, the MyMarineGI data will serve as the first building block towards the realisation of Marine Geospatial Data Infrastructures to support the Integrated Coastal Zone Management activities in Malaysia.

Keywords: Marine Geodetic Infrastructures, National Sovereignty, Marine Geodetic Vertical Datum, Integrated Coastal Zone Management, Seamless Land-To-Sea.

KEYNOTE SPEAKER (K2)**YBhg. Rear Amiral Hanafiah Hassan (Malaysia)**

Revitalising Hydrographic Information for Empowering Marine Knowledge

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As a maritime nation, Malaysia's dependence on the ocean can never be understated. Besides surrounded by seas and its maritime space is virtually two times bigger than our land area, the dependency extends to almost all sectors, particularly in food, trade, energy, transportation, tourism and security. To date, the hydrographic information is not only essential but critical especially for the development of a sustainable blue economy, the protection of the marine environment, and the prevention or mitigation of consequences of marine disasters or climate change. A wide range of related hydrographic data is now crucial in supporting essential decisions. These data and associated skills are very similar to those used for supporting the safety of navigation. The customer base for hydrographic products and the use thereof are changing rapidly, either through the evolution of the requirements of navigation or through the extension of other needs for marine data. Therefore, this paper will enlighten the initiatives made by the National Hydrographic Centre (PHN) to revitalise hydrographic information for empowering marine knowledge domestically. Future ocean mapping will condense all marine knowledge in customised data products to meet the needs of the science capability of analysis and predictability. The basis for such comprehensive mapping will be formed by the embedded information about the physical nature as provided by hydrographic data. In line with that PHN has come out with SEABED 2050 initiative to survey Malaysian water with Multibeam Coverage. Furthermore, a dedicated hydrographic act needs to be promulgated in ensuring PHN remains as the national focal point in any hydrographic matters. In pursuing empowering marine knowledge through hydrography, concerted efforts and high commitments from the domestic maritime hydrographic community are encouraged to mitigate identified challenges.

Keywords: Hydrographic Information, Marine Knowledge, Hydrographic Product.

KEYNOTE SPEAKER (K3)



Prof. Sr Dr. Mohd Razali Mahmud (Malaysia)

Empowering Marine Knowledge through Hydrographic Professional Programmes at Universiti Teknologi Malaysia.

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Being a maritime country, hydrography has become a very crucial field in developing the inland waters, offshore activities and industries in Malaysia. Over the years, there has been a remarkable increment in the demand of offshore activities such as fishing and shipping industries, and the most important of all is the economic development of the oil and gas industry which needed a continuous support from an established organisation that is capable in providing various types of hydrographic surveying output. Among the factors that influenced the productivity of hydrographic surveying output such as the hydrographic chart and seabed profile map, are (a) the skilled and qualified personnel in the surveying profession, (b) utilisation of modern and up-to-date survey equipment and techniques, and (c) the availability of established training institution offering professional programmes in hydrographic surveying. The Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia (UTM) is the only academic institution in Malaysia currently focusing its effort towards the development of hydrographic surveying. One of the initiatives of the faculty is to provide education and training in hydrographic surveying to cater for the increasing needs of the country. The paper presents an overview of the establishment of four (4) internationally recognised and accredited hydrographic programmes of Category A and Category B levels at Universiti Teknologi Malaysia over the last 30 years, namely UTM HYDRO I, UTM HYDRO II UTM, HYDRO III and Marine Geospatial and Cartography. The cooperation and collaboration with the National Hydrographic Centre of the Royal Malaysian Navy, Department of Survey and Mapping Malaysia, the Association of Authorised Land Surveyors Malaysia, Land Surveyors Board, Malaysia and the Royal Institution of Surveyors Malaysia have benefited the marine community and clearly demonstrate the benefit of working together in fulfilling the objectives of the country by empowering marine knowledge to the marine community through hydrography.

Keywords: Hydrographic Surveying, Hydrographic Surveyors, Hydrographic Professional Programmes.



SESSION 2

2A

Education and Training: Knowledge Leads to Connections

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E-learning is a growing requirement in various markets. Only in the USA the e-learning market has a turnover of over 5 billion USD which means that the younger generation expect to have easier access to the Basics of Hydrography. E-learning supports the learner's development, courses can be accessed anytime, anywhere, and learners can focus on elements of a programme they need to learn and can skip what they already know. But E-learning also supports the organization's goals; it's flexible students can do their e-learning during down times, it also decreases time traveling and time away from the workplace. One more advantage is that the student can immediately apply the new knowledge on the job, he will be able to make connections and learn more effectively.

In 2008 our hydrographic training programme first received Cat B recognition by the FIG-IHO-ICA International Board on Standards of Competence for Hydrographic Surveyors. The IHO requires that a Cat B course lasts at least 26 weeks. We aimed to keep the time away from home/work for students as short as possible, therefore we added e-learning. With the addition of the 13 weeks e-learning programme we have minimalized this this down to only 13 weeks in class room including a week of safety training. We received continued recognition for 6 years for our updated curriculum, including the e-learning, in April 2016.

We have developed five modules as part of our Cat B curriculum. These modules are supported by our Handbooks of Offshore Surveying. Our e-learning platform is not a one-way road, we add interaction and make it personal. The student can connect with the experts and fellow students from all over the world. The student has the option to e-mail questions and the student will also receive feedback on the assignments. We welcome them every two weeks at the scheduled tele-conferencing sessions.

Upon acquiring acceptable results, a student will be issued a Skilltrade certificate. After completion of the full e-learning programme the students is welcome to participate in the 13-week training of the Hydrographic Survey Category B Course in The Netherlands.

Keywords: Education and Training, e-learning, Hydrographic Survey Category B.



SESSION 2

2B

Unlocking Data Insights in Asia and the South Pacific to Mitigate Impacts of Climate Change and Sea Level Rise

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Climate change events are impacting Asia Pacific communities. Rising sea levels, salt water inundation and increased storm activity are impacting coastal communities at an increasing frequency. To ensure a liveable future for these communities, development decisions that are both sustainable and inclusive of disaster risk mitigation measures are needed.

Key steps in this process is identification of risks to coastal populations and infrastructure. Airborne LiDAR Bathymetry can be used to compile accurate, comprehensive baseline datasets across the coastline to better understand this dynamic environment. Comprehensive accurate datasets can leverage sophisticated analysis techniques to provide tools for improved decision making for communities and the environment in coastal zones.

The Asian and South Pacific nations require modern and integrated coastal management. Fugro have been awarded multiple coastal zone mapping projects in the region, covering both topography and bathymetry of the coastal states.

Survey objectives were to provide fundamental data to support the implementation of the coastal management reforms to deliver high resolution sea bed datasets to the governments of these nations, enabling better decision workflows for planning and management of coastal infrastructure and natural environments.

This presentation will review the technology and processes used to map reef to shore regions around the South Pacific Communities. It will identify best practice examples and provide guidelines for communities and policy makers to be able to invest in the information necessary to help ensure a safe and liveable world.

Keywords: Climate Change, Sea Level Rise, Coastal Management.



SESSION 2

2C

Enhancement of Tidal Stations in Malaysia: Progress and Prospect

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JUPEM continuously collect and disseminate tidal data from tide-gauges located nationwide. Among the major products of the tidal network are the Annual Tide Prediction Tables and the Annual Tide Observation Record which are mainly used for geodetic activities, mapping, development planning, navigation, disaster management and scientific research. Currently, there are ten (10) Tide gauge stations in Peninsular Malaysia, five (5) in Sabah, two (2) in Sarawak and one (1) station in the Federal Territory of Labuan. The observation data collected from these stations are transmitted telemetrically to the Control and Processing Centre at the Geodetic Survey Division in Kuala Lumpur for data processing and analysis purposes. This Control and Processing Centre, comprises of server, network, software and storage capable of receiving and processing data to produce various tide-related outputs for the production of tidal products described earlier. In addition, the existing system allows online access for tidal forecasting. The tidal telemetry system is part of the overall Geodetic Database System Project (SPDG) of JUPEM. JUPEM is currently enhancing the existing system to provide better delivery system to the public. The existing Tidal Data Control and Processing Center needs to be streamlined and improved further to enable JUPEM to provide such services more efficiently and continuously to drive the national development. This paper discusses the progress of the tidal network and system and its prospect for the future.

Keywords: Tide Gauge, Tidal Network, Tidal Telemetry System.



SESSION 2

2D

Evolution of Remote Sensing: What's Next?

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DigitalGlobe, now Maxar has been leading the evolution in Remote Sensing for the past couple of decades. It has set the standards for the industry with the best view of the world through its cutting edge series of satellite constellation, with IKONOS (1999) being the first commercial satellite providing sub meter resolution imagery and World-view-3 (2014) providing 30 cm resolution and 16 multispectral bands in Visible, Near Infrared and Shortwave Infrared part of the spectrum. Space based earth observation continued its evolution with the availability of the first online global color balanced ortho-rectified mosaic of the world at 50 cm resolution. The ability to access and exploit very high resolution images via cloud platform (EarthWatch), not only changed the way the industry used the space based information in the traditional mapping and other remote sensing application but also opened doors for new and non-traditional applications like (mapping poverty and child slavery, precision agriculture, commodity monitoring etc.). We are now at the cusp of transformation in the space industry with the technology changing at a break neck pace, the cost of building satellites and its launch coming down, cloud/internet and location practically becoming part of our everyday life. What can we expect next from the leaders of the space industry in revolutionizing the way the information is collected from space and used in creating valuable insights for informative decision-making process. The session will discuss the next generation constellation to be launched by MAXAR (2021) and set the expectation for the industry yet again.

Keywords: Remote Sensing, Maxar, High Resolution Image, Space Industry.



SESSION 3

3A

Threats to Semporna's Reefs: A Comparative Study of Underwater Survey Results versus Community Perception

Ms. Poh Leem Choo, Ms. Rojaniah Jawalani, Seng Kong Cheo, Ms. Herminatalia Tabar (Malaysia)

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Sabah harbours approximately 90% of reefs in Malaysia, and it is the only state which is within the Scientific boundary of the Coral Triangle, the centre of marine biodiversity. The district of Semporna has the highest concentration of reef coverage. The reefs provide food and a source of livelihood to the local communities and it is a main attraction for divers all over the world. However, these reefs are under threat from fish bombing, marine debris, overfishing and unsustainable tourism practices. Underwater monitoring surveys have been conducted in 2009 and through 2014 to 2017, using an adapted Reef Check methodology to identify human impacts to live coral cover. Blast detectors have been deployed underwater to record fish bombing incidents and it has been verified with manual data records. In order to gather community perception on the threats to reefs, one-on-one interview surveys were conducted. The interviews found that the communities are willing to support reef conservation efforts. The results from the underwater and community surveys confirm that the main threat to the reefs in Semporna is fish bombing; where 86% of Semporna's reefs are threatened as a result. As an NGO, WWF-Malaysia promotes marine resource management as a form of conservation intervention. These initiatives include Semporna Marine Spatial Planning (SMSP), an Anti-Fish Bombing Symposium, community patrolling, Locally Managed Marine Areas (LMMAs), as well as educational and awareness activities. WWF-Malaysia is also an active player in the State and District-level Anti-Fish Bombing Taskforce. However, fish bombing continues to threaten our marine environment and community livelihood. In conclusion, all stakeholders must urgently work together to address this issue as reefs are important as a source of food and income to our tourism industry.

Keywords: Semporna's Reef, Marine Biodiversity, Fish Bombing, Reef Conservation.



SESSION 3

3B

40 Years of Peta Baru Malaysia 1979

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Malaysia shares common maritime boundaries with six (6) neighbouring countries, namely Brunei, Indonesia, the Philippines, Singapore, Thailand and Vietnam with an approximate contiguous marine area of 556,285 km² measured along the coast. Some of these maritime boundaries have been delimited through agreements with neighbouring countries while other boundaries are still being negotiated.

During the late 1960s and early 1970s, neighbouring countries had taken steps to claim their maritime territories which overlapped with Malaysian waters. Also, due to the oil and gas exploration activities that had intensified in the region specifically in the South China Sea, Malaysia faced overlapping maritime boundaries with its neighbouring countries. Thus, in order to protect the sovereignty and interest of the country, the Government of Malaysia had made decision to publish a map depicting Malaysian maritime boundaries.

After years of studies and research, the Malaysian Government published and enacted a map, officially entitled Peta Baru Pelantar Benua Malaysia (The New Map of the Continental Shelf of Malaysia) through Government Gazette No. 5745 on 21 December 1979, and it is widely known as Peta Baru Malaysia 1979 (PBM 1979). PBM 1979 consisted of two sheets, namely Sheet 1 (Peninsular Malaysia) and Sheet 2 (Sabah and Sarawak) showing the boundaries of the territorial waters and the continental shelf of Malaysia.

Besides Geneva Convention 1958, agreements, treaties and MoUs signed with neighbouring countries, related state laws and relevant technical aspects, the drawing of PBM 1979 also shows Malaysia's unilateral maritime boundary claims. Since 1979 to present, Malaysia had resolved maritime boundaries dispute in certain areas with Singapore and Brunei. Perhaps is it necessary to revise PBM 1979?

Keywords: Peta Baru Malaysia 1979, Maritime Boundary, Territorial Water, Continental Shelf.



SESSION 3

3C

Utilisation of Hydrographic Information in Empowering Marine Knowledge for Research Development: Challenges and Prospects

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Tremendous hydrographic information is normally generated by different stakeholders for resource exploitations and explorations that span throughout their entire delineation zones. In this way, marine knowledge about the entire maritime activities is obtained which could subsequently aid better information acquisition, and utilization. However, there exist inadequate trends in research capabilities in these areas, particularly, with respect to national and regional developments due to some driving forces that are yet to be fully integrated in the contexts of the water bodies of developing countries like Nigerian. This paper therefore addresses these gaps and their various implications with respect to marine knowledge that ought to spur the Nigerian maritime domain into a resource-based utilization that is supported by cutting-edge and bestowed researches. The methodology involves the assessments of structured hydrographic information systems based on advancement in ICT capabilities and tools in monitoring researches, developments, and innovations. It is envisaged that hydrographic information and better awareness of marine knowledge would automatically spur better empowerment in research and development thereby enhancing adequate understanding of the maritime domain for informed decisions. This requires commitments and engagements from every marine domain stakeholders, fully supported by government policies and institutionally nurtured by individuals, private and international collaborators.

Keywords: IHO, Hydrographic Information System, Marine knowledge, Research, Development & Commercialization, Maritime Activities.



SESSION 4

4A

Hydrographic Surveyors Certification

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Professional certification recognises an individual's level of education and experience in their chosen field. Whilst hydrographic surveying is an age-old profession, there has been and still is very little in the way of certification in this field.

Land and cadastral surveyors have to get certified to enable them to approve plans for submission for land titles yet is no mandatory level of certification for a hydrographic surveyor to conduct survey operations and industry has relied upon reputation and experience when selecting hydrographic surveyors. Australia has led the way with hydrographic surveyors' certification since the early nineties and up until this year, the AHSCP scheme has been the only scheme recognized by the IBSC.

Certification is important to individuals, employers, hydrographic authorities and industries that rely on hydrographic data that enables them to operate safely and efficiently in the marine environment. Certification of an individual provides assurance that the survey has been conducted using best practice and to international and local standards.

This presentation will outline the history of the Australian Certification scheme, the different levels and the process by which certification is awarded.

Keywords: Professional Certification, Hydrographic Surveyor, Australian Certification Scheme.



SESSION 4

4B

Blue Growth, Developing the Blue Economy and the Surveyors' Contribution

Mr. Gordon Johnston (United Kingdom)

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Development Goal 14

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The Blue Economy and the associated Blue Growth sectors are potentially very broad and general topics. This presentation aims to present the importance of the Blue Economy and Blue Growth in relation to the UN Sustainable Development Goals and to provide, within the context of these concepts, some relationship and ultimately challenges for the surveyor and hydrographic community. How the surveying community gets active and recognized in supporting, promoting and contributing to the Blue Economy and Blue Growth objectives needs to be addressed. It will be the actions of organization such as FIG that may ensure a future with a sustainable ocean environment.

Keywords: Blue Economy, Blue Economy, sustainable development.



SESSION 4

4C

Mapping the Plastic – A Surveyor’s Response

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The effects of plastic pollution on the Earth’s oceans are well documented, potentially catastrophic and increasing exponentially year on year. The UN Environment Programme has calculated that each year more than 8 million tonnes of plastic ends up in the oceans. Eighty per cent of all litter in our oceans is made of plastic. This is an intolerable problem that needs immediate and far-reaching action to remedy. Eric Solheim, Head of UN Environment, speaking at the launch of the #CleanSeas campaign argued that it was past time to tackle the plastic problem that blights our oceans. ‘We’ve stood by too long as the problem has gotten worse’ he said, ‘it must stop’.

The surveying profession agrees. The International Federation of Surveyors (FIG) represents the interests of surveyors in over 120 countries including members of Persatuan Juruukur Tanah Bertauliah Malaysia (PEJUTA) in Malaysia. Its technical work is led by ten Commissions, covering the broad spectrum of the surveying profession. FIG has formed Working Group 4.3 - Mapping the Plastic - a combined initiative of its Young Surveyors Network and Commission 4 (Hydrographic Surveying), committed to finding solutions to this deeply concerning global environmental problem.

Keywords: Plastic Pollution, Mapping the Plastic, Environmental Problem.



SESSION 5

5A

Roles of Marine Cadastre for Nation Development: Potential, Requirement and Challenges

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The rapid development of coastal areas worldwide for economic generation activities and public interests has triggered the need for a new system of marine administration. The introduction of Marine Cadastre has brought a new body of knowledge to geomatics profession worldwide. There are few terminologies or perceptions on marine cadastre definition. With the growth of development in marine area, many issues concerning with marine boundaries and tenure must have a full consideration especially in administration, jurisdiction, management level for rights, restrictions and responsibilities within those areas. Since surveying, administrating and managing in coastal or marine area are not suitable to apply with the same guidelines used in Land Cadastre System, the different guideline regarding with all aspects in dynamic surface of marine area need to be established. The roles of marine cadastre towards nation development will be highlighted. The potential of marine cadastre or marine administration will cover the governance, social and economic. The implementation of marine cadastre involves the development of technical and institutional components. The proper legal framework requires to ensure the smooth implementation of the marine cadastre. Technical and legislation framework are vitally needed for a new system of marine administration.

Keywords: Marine Administration, Marine Cadastre, Governance.



SESSION 5

5B

The Naming of Undersea Features in Malaysia: Rationale and Challenges

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Seamount is technically defined as a distinct generally equidimensional elevation greater than 1,000 meters (3,281 ft) above the surrounding relief as measured from the deepest isobath that surrounds most of the feature. Besides seamount, there are many more undersea features lay on the beneath of the sea. The existence of hundreds of thousands if not over a million undersea features are taken for granted. In recent years, considerable concern has been expressed at the indiscriminate and unregulated naming of undersea features which often get into print in articles submitted to scientific publications, or on maps and charts, without any close scrutiny being made concerning their suitability, or even whether the feature has already been discovered and named. In order to remedy this situation and to bring the geographical names of undersea features to a better standardisation, the International Hydrographic Organization (IHO) and Intergovernmental Oceanographic Commission (IOC), has established the Sub Committee of Undersea Feature Name (SCUFN). In Malaysia, the National Hydrographic Centre (PHN) is responsible for leading the national level Working Group on Island and Marine Geographical Entity Names. The role of this working group is to coordinate and advise on determining the names of islands and offshore geographical entities for the country. Under the scope of offshore geographical entities, PHN is also entrusted for coordinating and proposing undersea feature names located beyond the Territorial Sea (12 nautical miles) to SCUFN through meetings held annually. The initiative in naming the undersea features discovered from bathymetry data collected such as seamount, hills, alley, canyon and others was started by PHN since 2013. To date, there are six submissions of undersea feature names to SCUFN has been accepted in global seabed map and certainly more to come in future. Besides the great achievement, this paper will enlighten the rationale and challenges as the national authority for naming of undersea features in Malaysia.

Keywords: Undersea Feature Name, Offshore Geographical Entity, Seabed Map.



SESSION 5

5C

Advances in Satellite Altimetry for the Ocean Exploration

Sr Dr. Ami Hassan Md Din, Mrs. Amalina Izzati Abdul Hamid, Mr. Mohammad Hanif Hamden, Ms. Nur Surayatul Atikah Alihan and Ms. Nur Adilla Zulkifli
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Technological and scientific advances have gone a long way towards meeting the rigorous measurement requirement, with satellite altimetry has also benefitted from a series of missions, leading to an improved measurement accuracy, from tens of meters to few centimeters. The advent of satellite altimetry has been demonstrated to be a unique tool for mapping the global ocean topography while also making measurements for other ocean parameters, which has resulted to a diverse of applications for hydrography, oceanography, geodesy and geophysics. The basic concept of satellite altimetry is deceptively straightforward. The principle objective is to measure the range R from satellite to the sea surface using radar altimetry. The most stringent application of satellite altimetry is in measuring the absolute sea level, nevertheless, the application of satellite altimetry has expanded to various ocean studies in recent times. At Universiti Teknologi Malaysia, we have been exploiting the satellite altimetry for contemporary applications of sea-level rise study, coastal inundation, current circulation, sea floor mapping, marine geoid, maritime boundary, tidal modelling, ellipsoidal reference survey derived bathymetry as well as ocean renewable energy. Consequently, satellite altimetry opens up new possibilities in the providing much more than surface observations. Although past missions have been flown largely for research purposes, satellite altimetry is rapidly moving into operational domain and eventually will become a routine component of international satellite systems during the twenty-first century.

Keywords: Satellite Altimetry, Ocean Exploration, Altimetry Applications.



SESSION 6

6A

Trends in Hydrography Empowering Marine Knowledge; Automation for Marine Survey, Products and Possibilities Through S-100

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Multiple platforms for fleet surveys, autonomous vehicles, and airborne mapping systems are all being utilized by organizations to increase capacity for hydrographic surveying and ocean mapping. This increased number of vehicles equipped with modern mapping sensors is leading to a dramatic increase of high-resolution data. There is also demand to improve quality control during surveys to ensure that data is properly acquired, and for costly errors to be reduced.

Through process automation, Artificial Intelligence (AI), and remote quality control techniques, organizations can fully benefit from the increased capacity of autonomous, multi-platform, and airborne surveys. This includes improving data quality, reducing redeployment times, minimizing processing backlogs, and extracting various information products with reduced effort, such as products defined under the IHO S-100 data model.

The S-101 ENC, the new ENC specification, and other S-100 products have progressed to the stage where agencies can create them with currently available marine geospatial solutions. This includes capabilities for agencies to efficiently produce and maintain S-101 ENCs through a database driven approach with other navigational and geospatial products. Utilizing existing workflows for creating S-57 and other value-added products, users can create S-101 ENCs and export to exchange sets and other formats for safe navigation and other applications.

With the IHO S-100 data model more emphasis is also being placed on the data than the traditional navigational chart. Data services have the potential to dramatically shorten the period that it takes for new surveys and data to be used for decision support by providing the latest information to subscribers as soon as it is available. This will become an enabling factor for e-Navigation and autonomous shipping. By navigating on the latest bathymetric survey combined with dynamic water level and current information, it should be possible to maintain safety, improve efficiency, and reduce costs. In addition to improving navigation, S-100 data services and products will lead to more possibilities for effective and sustainable use of the marine environment.

Keywords: Automation, Marine Survey, S-101 ENC, Marine Geospatial, IHO S-100.



SESSION 6

6B

Current and Future Challenges for Hydrographic Surveyors in Malaysia

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Malaysia is one of the maritime countries with the total land area is about 332,000 square kilometres. The coastline totals approximately 4,700 km with three neighbouring countries namely Indonesia, Thailand and Brunei Darussalam. The inshore water and the Exclusive Economic Zone extends another 613,000 square kilometres. Specific legislations are applicable in the management and administration of maritime areas of Malaysia such as the EEZ Act 1984 (or Act 311), the Baseline of Maritime Zones Act 2006 (or Act 660) and the Territorial Sea Act 2012 (or Act 75). Hydrographic survey is one of the major branches of geomatics especially in mapping activities as well as determining the boundaries of national waters. The challenges in mapping the country's watersheds are fully addressed by the National Hydrographic Centre (PHN) and the Department of Survey and Mapping Malaysia (JUPEM). Other challenges in maritime areas in Malaysia include sailing safety, protection against navigational aids, submarine pipelines and cables, natural resources protection and conservation, as well as maritime scientific studies under several aviation agencies such as the Malaysian Maritime Enforcement Agency, Marine Department, and Department of Irrigation and Drainage. Higher learning institutions such as universities and polytechnics offer both undergraduate and postgraduate programmes related to hydrography, particularly geomatics focused on hydrographic survey. For example, Universiti Teknologi Malaysia (UTM) in collaboration with several agencies such as the National Hydrographic Centre (PHN), the Department of Survey and Mapping Malaysia (JUPEM), Land Surveyors Board, Malaysia (LJT) and the Association of Authorised Land Surveyors Malaysia (PEJUTA) has conducted an academic qualification programme for Licensed Land Surveyors in hydrographic survey namely UTM HYDRO III (FIG/IHO/ICA Category A) accredited by the International Federation of Surveyors (FIG), International Hydrographic Organisation (IHO) and International Cartographic Association (ICA). This is in addition to empowering the Licensed Land Surveyors community with exposure to hydrographic technologies such as LiDAR bathymetry, Unmanned Surface Vehicle (USV) and satellite bathymetry. The challenges to the Licensed Land Surveyors community in the field of hydrographic survey are directly related to the development of the education system, industry, authorities and radicals.

Keywords: Hydrographic Survey, Hydrographic Surveyors, Licensed Land Surveyors.



SESSION 6

6C

What Can You Do with 100 Years of Ocean Data?: Experience from World Ocean Database for South China Sea Research

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World Ocean Database (WOD) provides over 100 years of oceanographic data especially for physical parameter throughout the world and this includes the region of South China Sea. This availability of data has provided valuable information for oceanographic studies. For the past few years, researchers from Institute of Oceanography and Environment (INOS) has explored a very interesting feature and new information that was not previously understood. The focus is on the impact of changing climate on the ocean environment. Through this attempt we manage to reveal some characteristics of the El-Nino Southern Oscillation (ENSO) impact on SSCS and many other features that are important in the region, which previously are not well understood.

Keywords: Ocean Data, World Ocean Database, South China Sea.



SESSION 7

7A

Impact of Climate Change to Sea Level Rise in Malaysia

Mr. Ahmad Hadi Mohamed Rashidi, Ir Mohd Radzi Abd Hamid, Mr. Amri Mohd Shah and Ms. Nor Aslinda Awang (Malaysia)

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Rapid changes in the climate condition attributed by natural and anthropogenic activities in the recent decades are threatening water resources sustainability and leading to sea level rise phenomena. Water-related risk events such as water stress, coastal and inland floods are increasing, and are projected to magnify in the future. Assessment and identification of potential hydro-meteorological extreme events and sea level rise impacts throughout future climate scenarios are very essential as to provide scientific insights, support resources especially in water and coastal engineering, planning and risk management, and thus reinforce sustainable development measures and climate change actions. The National Hydraulic Research Institute of Malaysia (NAHRIM) has continuously carried out studies and assessments on the vulnerability, impacts and adaptation measures to projected hydroclimate changes and sea level rise. Utilization of analytics technology to process and analyse huge volumes of climate change data can generate accurate insights and foresights of future climate conditions, and subsequently would open up promising disaster resilience and risk reduction approaches and development. Coastal vulnerability index and series of risk maps to evaluate the degree of shoreline severity towards natural hydraulic processes are also developed, and set as a benchmark to select the most vulnerable shoreline for further assessment in sea level rise impacts based on Physical Variables, Physical Vulnerability Index and Population Vulnerability. This paper aims to highlight the researches which have been conducted by Research Centre for Coastal and Oceanography, PKPO NAHRIM focusing on sea level rise study, impact assessment and adaptation measures at selected sites along the coast of Malaysia.

Keywords: climate change, sea level rise, vulnerability, resilience.



SESSION 7

7B

Mangroves Bioshield vs Mean Sea Level Rise: How We Wreck Our Last Defence!

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It has been a long standing debate if mangroves are capable of protecting coastal area from extreme nature force like mean sea level rise and tsunami. However, it is a collective consensus that top to bottom mangroves density is the key to study mangroves mechanism in defending coastal areas. To identify impact of mean sea level (MSL) rise to mangroves density, we quantified mangroves deforestation to mirror mangroves density near the tide gauge across Malaysia water using data obtained from Permanent Service for Mean Sea Level (PSMSL) website (year 2000 to 2017). Malaysia mangroves boundaries, extracted from global mangroves dataset (year 2000), were used to synthesize global tree cover dataset to isolate mangroves areas from other trees, before spatially intersect with tree loss dataset for years 2001 until 2017 to identify deforested mangroves areas. Intact and deforested mangroves were tagged to the nearest tide gauge to identify MSL pattern before being overlaid against land use land cover (LULCC) dataset. All tide gauge has shown a rise in MSL, however it has insignificance impact towards mangroves density reduction, not as much as emergence LULCC pattern did. In 2000, Malaysia had 5594km² mangrove areas with at least 4973km² full with 5-meter-tall matured mangrove trees. After 17 years, 493km² is gone with 43% of it were deforested during the last 4 years. It has been converted into aquaculture, agriculture, urban and empty-land. Empty-land and agriculture have covered almost 50% from the total deforested area while urban area, large scale agriculture, water body and others shared about 10%. It is important to highlight the evidence of mangrove regeneration filling back almost 40% of the deforested area. Revelation of anthropogenic instead of MSL behind 8% mangrove deforestation means Malaysia has lost 493km² coastal defends by our hands.

Keywords: Mangroves Bioshield, Mean Sea Level Rise, Coastal Area, LULCC.



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PEJUTA is a registered association of Licensed Land Surveyors (LLS) since 1979 which brings together practitioners in survey industries around Peninsular Malaysia. The membership of PEJUTA consists of Ordinary, Graduate, Corporate and Associates. It is also a platform for efforts towards bringing about enhancement of the knowledge and skill of its members and promotes awareness of surveying issues. It puts forward views of the members to the authorities and makes representation on strategic issues. In essence, PEJUTA is committed towards promoting sustainable management of the surveying services. Internationally, PEJUTA maintains linkages with related organisations abroad to establish networking in order to realise the industry's common universal goals.

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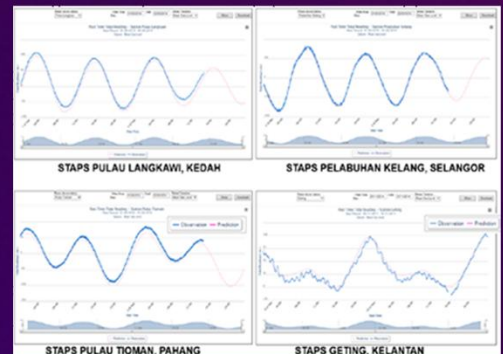
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Stesen Tolok Air Pasang Surut (STAPS)



LOCATION OF TIDE GAUGE STATIONS IN MALAYSIA



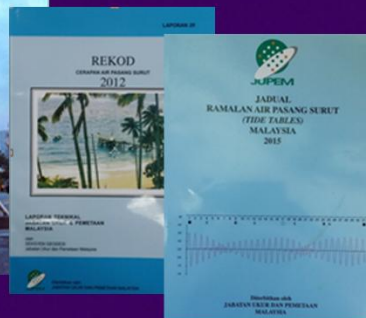
TIDAL RECORD

ROLES OF JUPEM IN RELATION TO TIDAL OBSERVATION IN MALAYSIA

JUPEM has established 21 tide gauge stations (STAPS) along the coastal areas of Malaysia. These tidal stations observe tidal data continuously in order to determine the Mean Sea Level (MSL) for the Peninsular Malaysia Geodetic Vertical Datum (PMGVD).



PENINSULAR MALAYSIA GEODETIC VERTICAL DATUM (PMGVD)



TIDAL OBSERVATION RECORD AND TIDAL PREDICTION BOOK



TIDE GAUGE STATION IN MIRI, SARAWAK

Continuous tidal observation for 18.6 years tidal cycle will enable accurate determination of the Mean Sea Level that will be beneficial for:

1. Determination of the Standard Datum for Precise Leveling Network (PLN).
2. Determination of the Zero Datum for Topographic Survey.
3. Record of Sea Level Rise
4. Prediction of Tidal, Flood and others Coastal / Sea Phenomenon.

STAPS OBJECTIVES

The main objectives of the STAPS to establishment are provide Sea Level Data, Mean Sea Level Data and to publish Tidal Observation Record and Tidal Prediction Book. These tidal information are useful for various parties such as:

1. Economy Sector (Fisheries, Aquamarine, and Recreation)
2. Development (Engineering, Hydrography, Precise Leveling Network)
3. Navigation, Port and Coastal (Safety and Navigation)
4. Climate Change and Natural Disaster (Tsunami, Flood, and Extreme Phenomenon)
5. Scientific Study (Monitoring of Sea Level Rise, Research and Education)





NATIONAL HYDROGRAPHIC CENTRE



National Hydrographic Centre (formerly known as Hydrographic Department, Royal Malaysian Navy) was established in 1972 and responsible for all hydrographic matters in Malaysia. The Office also represents Malaysia in the International Hydrographic Organization (IHO) and as a focal point for matters with regards to Intergovernmental Oceanographic Commission (IOC).



VISION

To become a quality and credible hydrographic services provider.

MISSION

To facilitate the provision of adequate hydrographic information for marine navigation, national defence and development and other purposes.

PRESENT PLATFORMS

The current survey platform consists of KD Perantau and MV Dayang Sari. KD PERANTAU is the only hydrographic survey ship based in Lumut, Perak and MV Dayang Sari is a leasing ship under 2016-2019 Leasing Ship Contract. NHC also having two Survey Boats to conduct hydrographic tasks located in Sandakan, Sabah and Port Klang (NHC). All platforms are installed with digital data acquisition and processing system complete with the differential satellites positioning system.



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Malaysian Chart series (MAL) are published in conformation to IHO Standard and Specification. To date, 99 MAL Charts of various scales have been published and available for sale. They are produced in three different scales:

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ENCs are published in conformation to the S-57 IHO Standard. To date, 109 ENCs covering Malaysian waters have published and available for sale through our appointed distributors. We are constantly keep our ENCs up-to-date with the latest notices to mariners.



PUBLICATIONS

Malaysia Tide Tables is one of the NHC nautical publication. The other publications are:

- Malaysia Tide Tables (Restricted Edition)
- Symbol and Abbreviations (MAL 1)
- Malaysia Chart Catalogue (MAL 2)
- Notices to Mariners





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- To promote the welfare and professional development of members;
- To provide quality, value-added and comprehensive services to members; and
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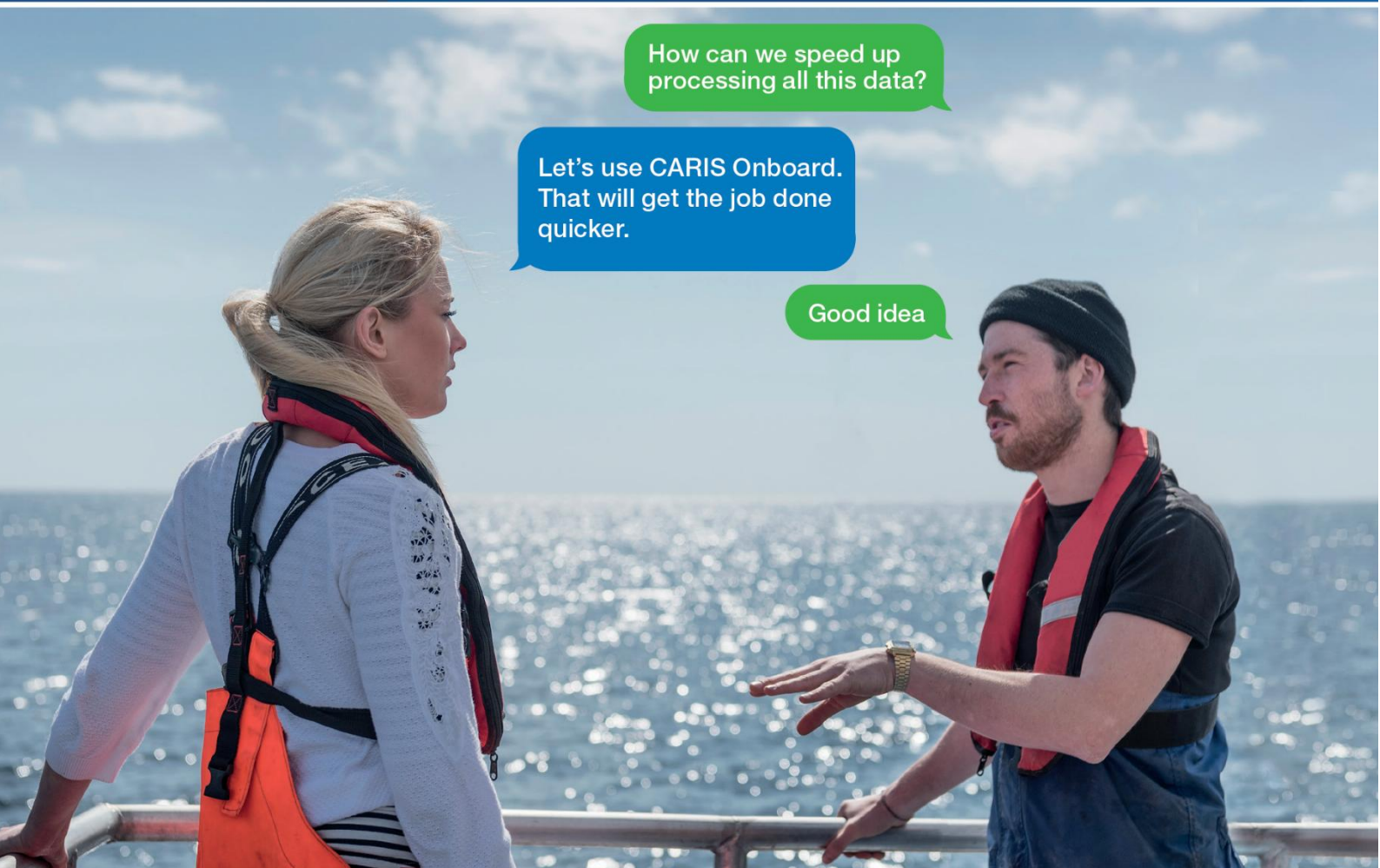
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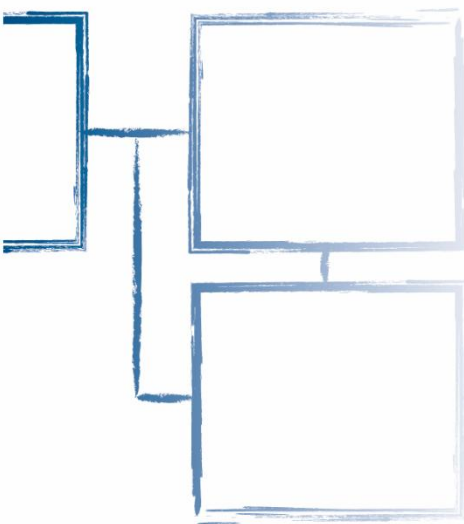
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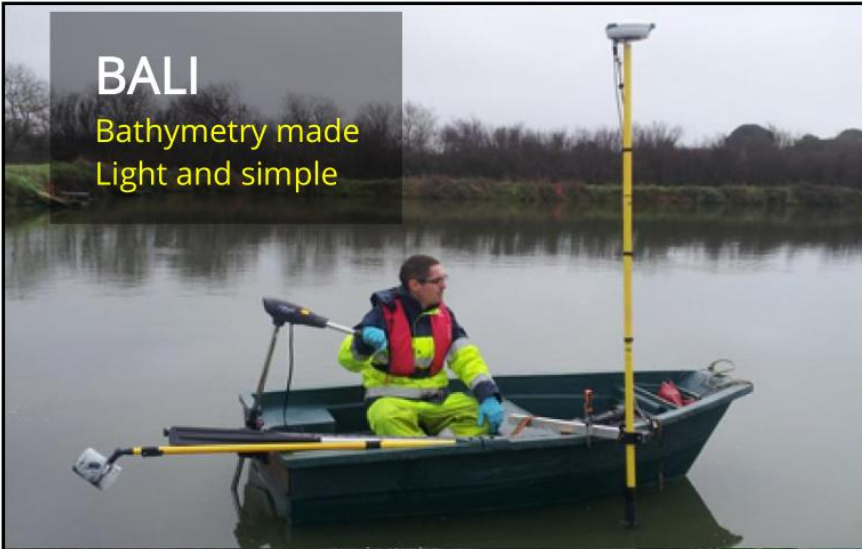


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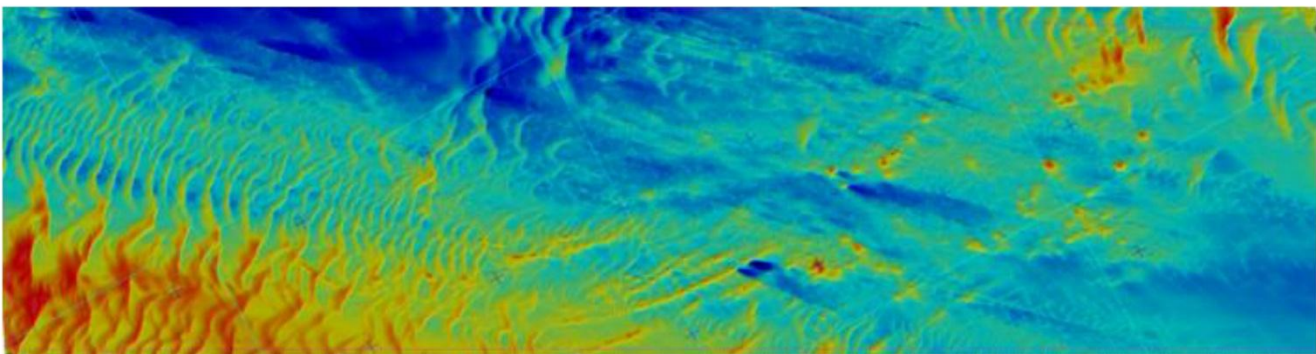
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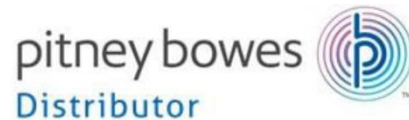


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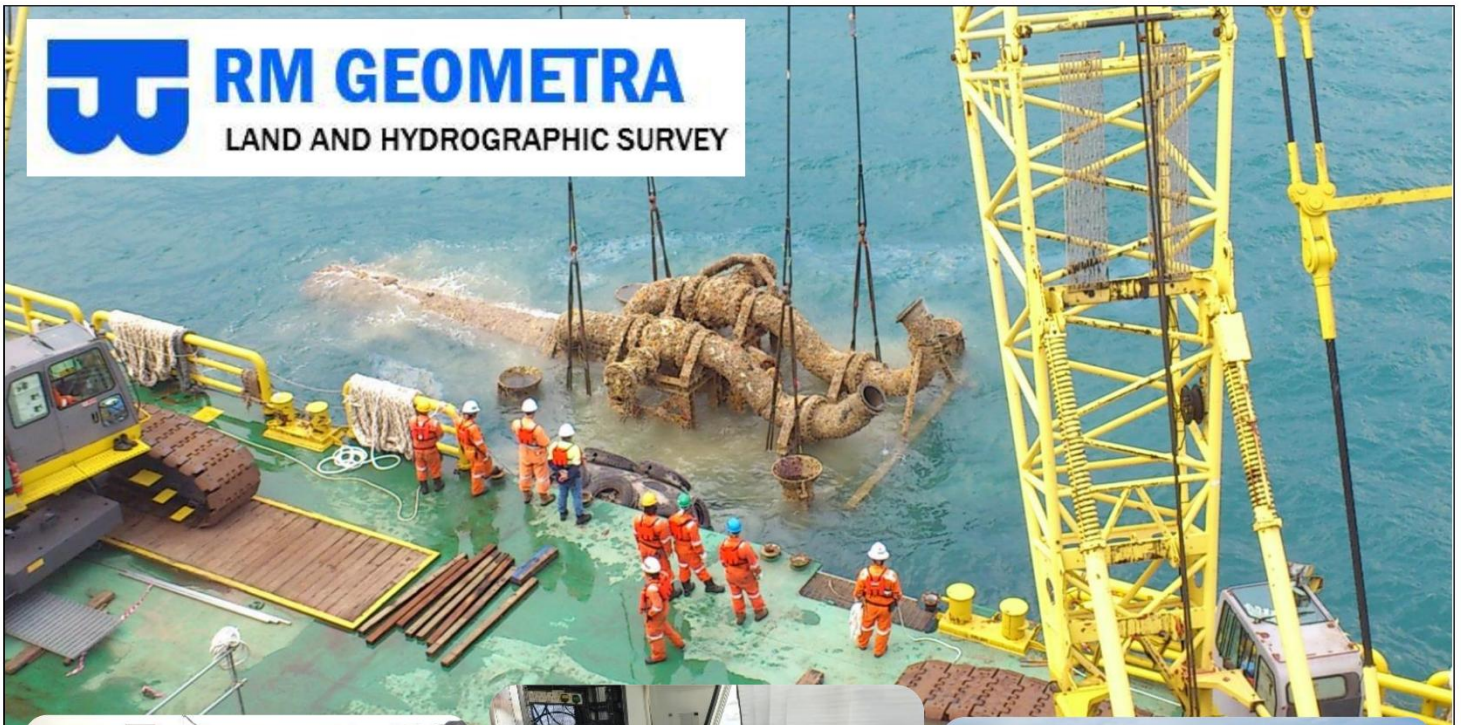
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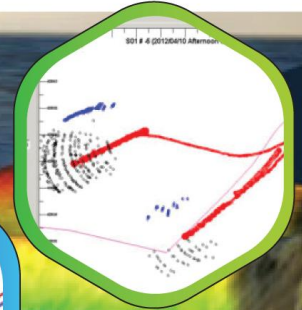
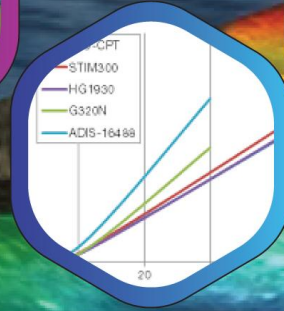
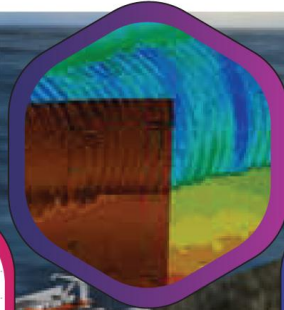
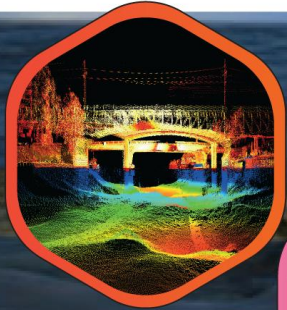
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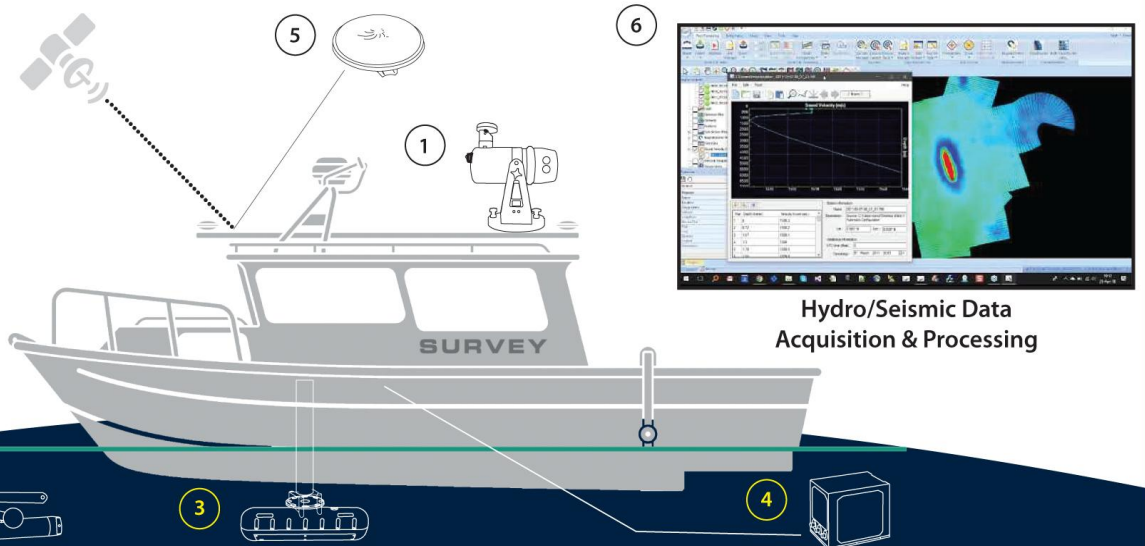
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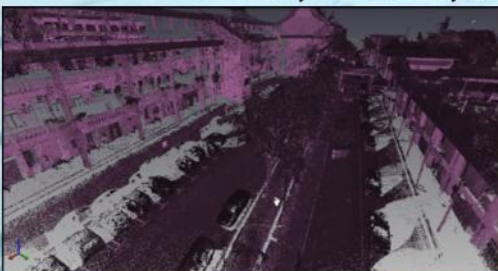
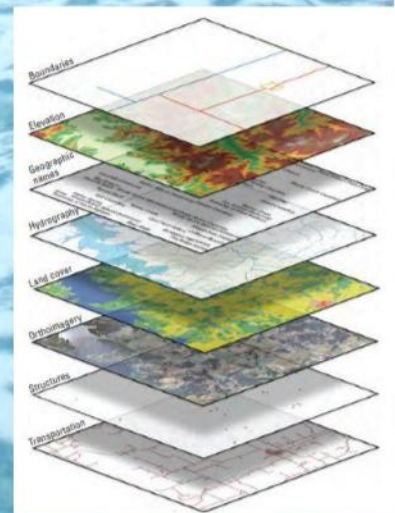


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