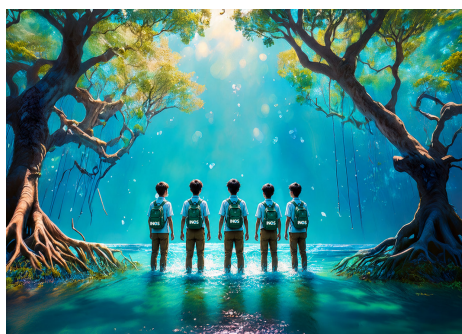


INOS

INOS Silver Jubilee: From Humble Beginnings to Oceanographic Excellence



Mini Expedition to Setiu Wetlands 2025

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Deployment of Unjam – Pengkalan Jie Fisheries Community Program

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INOS and NAHRIM Unite to Address Sea Level Rise and Coastal Morphological Dynamics

Held at the INOS Research Gallery, the event successfully bridged scientific data with actionable policy.

From the Editor's Desk

INOS Newsletter Editorial Team



Welcome to the first issue of the INOS E-Newsletter 2026, highlighting our continued journey in advancing ocean science, research, conservation and community engagement. This issue reflects INOS's Silver Jubilee, celebrating 25 years of growth from humble beginnings to oceanographic excellence.

We also showcase our Mini Expedition to Setiu Wetlands 2025, the UNJAM deployment supporting the Pengkalan Jie Fisheries Community Programme, and INOS-COG's field efforts for the IOPC Fund Assessment. Strategic initiatives are further highlighted through the FGD on Coastal Disaster Management and Coastal Erosion Index Data Coordination, as well as INOS and NAHRIM's collaboration on sea-level rise and coastal morphological dynamics.

Rounding off this issue is the ASEAN Archaeological Meet Up 2025, featuring the Bidong Shipwreck Excavation and its contribution to advancing maritime heritage research. Together, these activities demonstrate INOS's commitment to impactful science, strategic partnerships and sustainable management of our marine and coastal environments.



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INOS Silver Jubilee:

From Humble Beginnings to Oceanographic Excellence



Written by: **Faizah Aplop (INOS)**

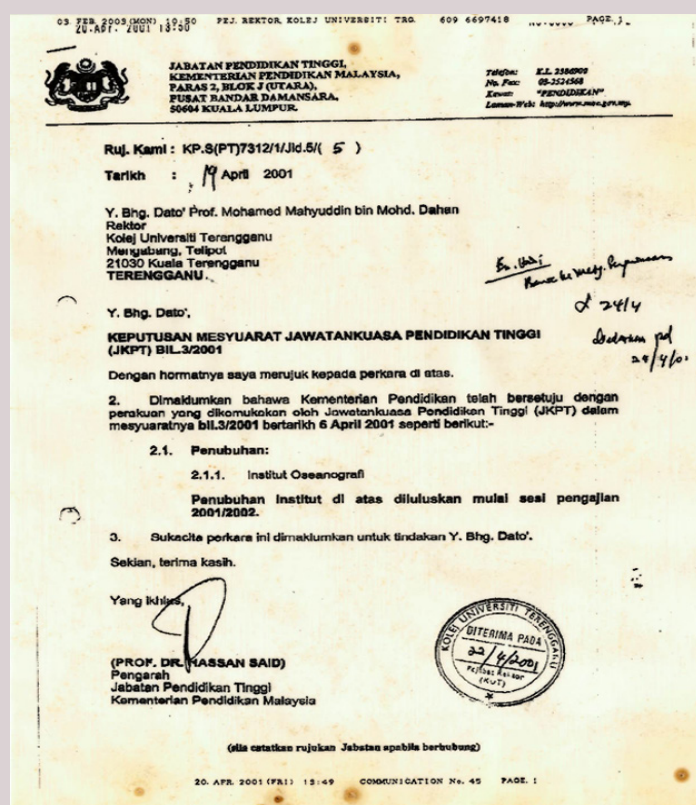
The establishment of the Institute of Oceanography and Environment (INOS), Universiti Malaysia Terengganu (UMT), was closely linked to the vision and recommendations of the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) to strengthen national oceanographic capacity in member countries. Following this recommendation, INOS was established in April 2001 as the principal research institute of Kolej Universiti Terengganu (KUT), which was granted autonomous university college status in the same month. On 1 July 2001, Kolej Universiti Terengganu was officially renamed Kolej Universiti Sains dan Teknologi Malaysia (KUSTEM), reflecting its expanded mandate and strategic emphasis on science and technology.

At its inception, INOS's management comprised 4 units: Management and Administration, Research Publication and Promotion, Research and Laboratory, and Research Secretariat. Under the leadership of a director, supported by an officer and a financial clerk, INOS served as the KUSTEM's research secretariat, playing a central role in coordinating and strengthening the institution's research capacity. Its core responsibilities included supporting and monitoring research projects, organising specialised training programmes and short courses, and promoting KUSTEM's research outputs to the academic community and other key stakeholders. INOS continued to serve as KUSTEM's flagship research institute, coordinating research funding, postgraduate programmes, and multidisciplinary research in oceanography and marine sciences. Following an institutional restructuring in 2006, the institute was renamed the Institute of Oceanography (INOS). When KUSTEM was upgraded to a full-fledged public university and renamed Universiti Malaysia Terengganu (UMT) on 1 February 2007, INOS maintained its pivotal role in advancing marine research and expanding its research portfolio. In subsequent years, the institute resumed its original name, the Institute of Oceanography and Environment (INOS).

Since its establishment, INOS has aligned its operations, research programmes, and postgraduate training with the advancement of oceanography and marine sciences. Its research is organised around 4 strategic focus areas: Marine and Ocean Technology, Oceanographic Science and Management, Sustainable Science and Management, and Marine Informatics. Collectively, these focus areas encompass 13 specialised research groups that drive multidisciplinary research and innovation at KUSTEM. To support its research agenda, INOS manages 5 specialised laboratories: Marine Pollution and Geoscience, Biotechnology, Informatics, Electronics and Instrumentation, and Biodiversity museum. These laboratories provide state-of-the-art facilities, specialised equipment, and technical support to researchers and postgraduate students, enabling advanced research activities in oceanography, marine science, and environmental studies. In addition to supporting internal research activities, the laboratories offer analytical services such as sample analysis, specialised equipment access, and technical expertise to external stakeholders and collaborators. The facilities also serve as platforms for conducting specialised training programmes, workshops, and capacity building activities for researchers, postgraduate students, and other scientific communities. Over the years, these specialised laboratories have remained operational. However, they have recently been rebranded under new names to reflect organizational changes and align with current scientific and technological developments. The laboratories are now known as: (1) Biodiversity and Biological Oceanography (OBB), (2) Marine Pollution and Chemical Oceanography (OKP), (3) Hydrography and Physical Oceanography (OFH), (4) Natural Resources and Geological Oceanography (OGSA), and (5) Marine Informatics and Satellite Oceanography (OSIM). In addition, INOS also oversees living laboratories and a gallery (MAG) and has established 4 research centers, which are Center for Ocean Governance (COG), UMT Repository and Reference Center (formerly known as Biodiversity Museum), Center for Marine Conservation (CMC), and the newly created Technology Empowerment and Linkages for Innovation, Proof of Technology and Sustainability (TELIPOTS).

In its early years, as the central administrative and technical unit responsible for managing research funds and coordinating institution-wide activities, INOS also oversaw the allocation and administration of major grants. The research budget allocations awarded to KUSTEM by the Ministry of Science, Technology and Innovation (MOSTI) under the Intensification of Research in Priority Areas (IRPA) Experimental Applied Grant were RM1,948,650.00, RM994,500.00, and RM1,300,100.00 in 2001, 2002, and 2003, respectively. During these three years, KUSTEM secured a total of approximately RM9.6 million in research funding. This grand total includes research funding from MOSTI, such as RM488,231.00 from IRPA (top-down), as well as contributions from other agencies, including RM408,000.00 from the National Oceanography Directorate (NOD), and RM4.5 million from Fundamental Research Grants.

In recent years, INOS has received RM4.64 million in funding over three years from 2024 to 2026. These funds were secured from university sources (25.6%), the private sector (24.1%), national grants (46.3%), and international grants (4.0%). The total funding received for 2024, 2025, and 2026 was RM1,478,784.87, RM2,518,891.63, and RM647,301.11, respectively, reflecting INOS's growing success in obtaining support from diverse funding sources.

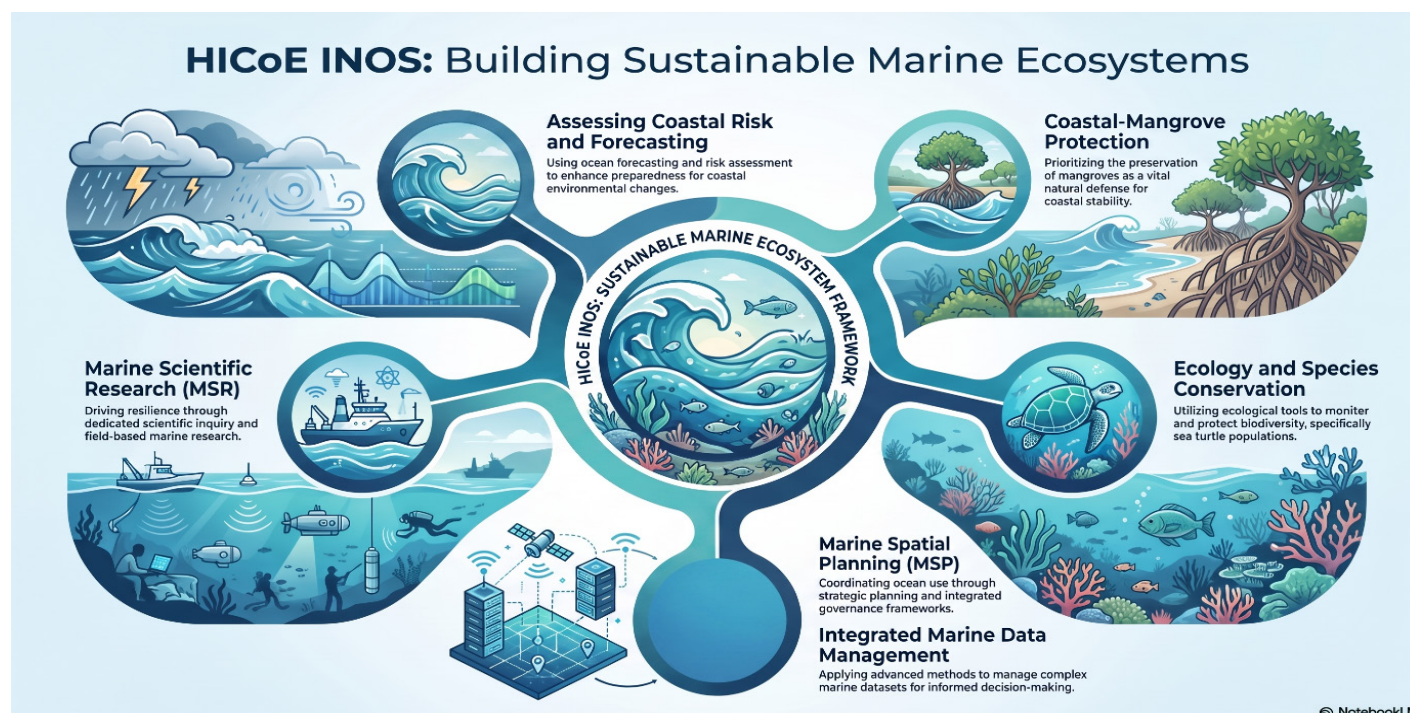


Within 25 years of operations, INOS has been led by six dedicated directors. Each director played a distinct role in the institute's development. They refined governance and financial management systems, secured and administered major research grants, established strategic partnerships with national and international agencies, expanded laboratory and fieldwork capacity, and enhanced postgraduate curricula and training programmes. Collectively, their leadership strengthened INOS's research profile, increased publication output, and positioned the institute as a national reference centre in oceanography and marine science.

In 2001, apart from the director, the institute employed only 4 staff members: 2 academic staff, 1 fisheries officer, and 1 financial clerk. By 2026, INOS's workforce had grown to 47 core staff members, comprising 9 administrative personnel, 22 officers including science officers, assistant science officers, research officers, as well as a curator supporting the laboratories, and 16 academic staff. This core team is further complemented by 30 associate research fellows, bringing additional expertise and project capacity. Together, these personnel strengthen INOS's research capabilities, administrative operations, and community and stakeholder outreach, enabling the centre to undertake larger, multidisciplinary projects and increase its contribution to marine science and policy.

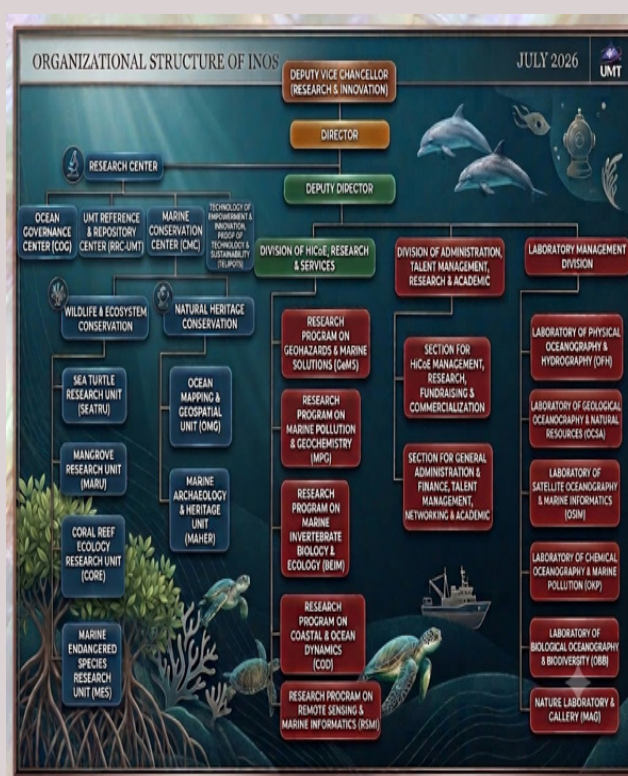
Transformation into a Higher Institution Centre of Excellence (HICoE) in Marine Science

A major milestone in the institute's history was achieved in 2012, when the Malaysian Ministry of Higher Education recognised INOS as a Higher Institution Centre of Excellence (HICoE) in Marine Science research. The HICoE focused on the niche area of Ocean and Coastal Resilience for Sustainable Marine Ecosystem Services in the South China Sea, reflecting INOS's leadership in multidisciplinary marine research. The initiative was spearheaded by a ten-member research team comprising five core INOS researchers and five associate researchers. The HICoE research framework was organised into three flagship programmes: Marine Environmental Processes (Programme 1), Marine Endangered Species (Programme 2), and Legal and Policy Governance (Programme 3). Funding and performance evaluation were implemented in three phases. Phase I (July 2012–June 2015) provided an initial allocation of RM5 million to establish and develop the research programmes. Phase II (July 2015–December 2019) allocated an additional RM2 million to strengthen research activities and outputs. The HICoE Accreditation Phase (1 August 2023 – 31 July 2025) was supported by RM800,000, enabling INOS to sustain its research excellence and reinforce its position as Malaysia's leading centre for ocean and coastal resilience research.



Connecting Community and the sea: UMT's World Oceans Week Carnival

Another significant achievement of INOS has been its leadership in the annual World Oceans Week (WOW) carnival at Universiti Malaysia Terengganu (UMT). Since 2015, INOS has spearheaded and actively supported this flagship event, held every June, to raise public awareness and educate communities about the importance of marine conservation for the long-term sustainability of marine ecosystems and future generations. Activities are organised across the UMT campus and its research stations, with a different theme adopted each year to address emerging ocean-related issues. Over the years, the WOW carnival has evolved from a series of modest campus-based outreach activities into a flagship programme that bridges cutting-edge ocean science with public engagement. Early editions focused primarily on marine awareness through specimen exhibitions, poster displays, sea turtle conservation activities, and beach clean-up programmes. More recent editions have expanded considerably to include research showcases, interactive science exhibitions, indoor sporting events, the Run with Penyu programme, edutourism activities, marine entrepreneurship exhibitions, integrated beach clean-up and community health screening programmes, as well as literary, creative, and innovation competitions. The carnival also features citizen science initiatives such as water quality monitoring and biodiversity surveys. It also offers school-based educational programmes that inspire students to explore careers in marine and ocean sciences. The annual theme shapes the selection of public lectures, workshops, exhibitions, and community engagement activities, ensuring that the carnival remains relevant to contemporary challenges, including marine plastic pollution, climate change impacts on coastal ecosystems, sustainable fisheries, and the management of marine protected areas.



By bringing together researchers, students, government agencies, industry partners, schools, and local communities, the UMT World Oceans Week carnival has become an important platform for strengthening ocean literacy, fostering environmental stewardship, and promoting sustainable management of coastal and marine resources. It also demonstrates how UMT's expertise in oceanography and marine science can be translated into meaningful societal benefits. Over the past decade, the carnival has evolved into not only a celebration of INOS's scientific achievements but also a collaborative platform for co-creating innovative solutions to marine and coastal challenges with the wider Terengganu community. Challenges, including marine plastic pollution, climate change impacts on coastal ecosystems, sustainable fisheries, and the management of marine protected areas.

Institutional Milestones and Global Recognition

Over 25 years of operation, the institute has received numerous national and international awards and recognitions. In addition to being named a Higher Education Centre of Excellence (HICoE), INOS has held international roles in oceanographic data and training since 2015, serving as a data contributor to the IOC-UNESCO oceanographic data and information management framework and as a Regional Training Centre (RTC) for the Ocean Teacher Global Academy (OTGA), a regional capacity-building hub for ocean data management, marine science training, and ocean literacy in the Asia-Pacific. Since 2016 INOS has also been a consortium member of the TROPIMUNDO Erasmus Mundus Joint Master's Degree Programme, contributing expertise in marine biodiversity and ecosystem management to an international postgraduate curriculum.

Among its institutional initiatives, INOS established the INOS Research Gallery to promote marine science education, research dissemination, and public engagement. The gallery preserves, interprets, and showcases scientific collections, research outputs, and educational materials on oceanography, marine biodiversity, and environmental sustainability. Its origins lie in the Biodiversity Museum (established 2004), which was renamed the South China Sea Natural History Museum in 2011 and later became the South China Sea Repository and Reference Centre (RRC) on 1 April 2012. The Research Gallery was subsequently developed as an exhibition space to communicate INOS's multidisciplinary research achievements through permanent and thematic displays of specimens, instruments, and findings that underscore the institute's roles in ocean exploration, biodiversity conservation, and sustainable marine management. Collectively, these activities have enabled INOS to contribute to high-impact publications, provide leadership in marine ecosystem research,

INOS 2026 and Beyond: Strengthening Marine Science, Innovation, Community Service and Global Partnerships

In May 2026, INOS celebrated its Silver Jubilee alongside UMT, commemorating 25 years since the institute's formal recognition and the granting of autonomous university college status to KUT, which was subsequently renamed to KUSTEM on 1 July 2001. INOS continues to look forward to strengthening research in marine science and oceanography and creating innovative solutions and global partnerships. To achieve this, INOS has introduced a 10-year (2026 – 2035) strategic plan that focuses on seven cores: 1) research excellence centred on marine and aquatic resources; 2) commercialisation, innovation, data, and digitalisation; 3) empowering community social impact through living laboratories; 4) internationalisation of research and strategic networking; 5) academic excellence and alumni empowerment; 6) strengthening institutional image and visibility; and 7) institutional sustainability through the strengthening of governance and talent. This roadmap will guide investments in laboratories and field stations, the development of interdisciplinary research clusters, the expansion of postgraduate programmes, and the deepening of partnerships with government, industry, community and international research networks.

To implement this strategic plan, INOS has restructured its organization into a more focused and integrated framework that strengthens research, administration, and laboratory management, as shown in the new organizational structure (figure 8). With the support of UMT higher management, research associates, communities, industry, national collaborators, and international partners, INOS is mobilising its staff and expertise to their fullest potential in pursuit of its strategic goals.



From its humble beginnings, INOS has grown steadily alongside the advancement of marine and ocean sciences. In response to emerging global challenges, including climate change and the increasing need for sustainable resource management, the institute continues to strengthen its research capacity through innovation and strategic collaborations with local communities, government agencies, industry, and international partners. INOS embraces an interdisciplinary approach that integrates field research, laboratory analyses, advanced technologies, and policy engagement to translate scientific knowledge into effective conservation, management, and evidence-based decision-making. As digital technologies continue to evolve, particularly in the field of artificial intelligence (AI), INOS is committed to incorporating AI-driven solutions for data acquisition, real-time environmental monitoring, predictive modelling, and intelligent decision support. These emerging capabilities will enhance the accuracy, efficiency, and timeliness of marine and coastal assessments, enabling the institute to better anticipate ecosystem changes, support climate resilience, and contribute to the sustainable management of marine resources for the benefit of biodiversity, coastal communities, and future generations.

As INOS enters its next chapter, the institute is positioned to serve as a regional hub for ocean science, a catalyst for sustainable coastal development, and a model for how research can directly support national priorities and the global Sustainable Development Goals.

Mini Expedition to Setiu Wetlands 2025

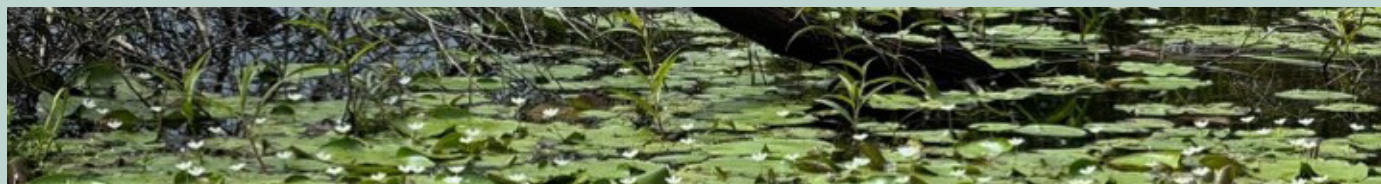
Written by: **Effi Helmy Ariffin & Mahamad Nasir Abdullah (INOS)**

Strengthening Integrated Wetland Research for Sustainable Ecosystem Management

The Institute of Oceanography and Environment (INOS), in collaboration with the Institute of Tropical Aquaculture and Fisheries (AKUATROP), the Institute of Climate Adaptation and Marine Biotechnology (ICAMB), and the Institute of Tropical Biodiversity and Sustainable Development (IBTPL), Universiti Malaysia Terengganu (UMT), successfully organised the Mini Expedition to Setiu Wetlands 2025 from 8–11 September 2025.

This multidisciplinary initiative reflects UMT's commitment to advancing integrated marine and environmental research through collaboration across its research institutes. The expedition aims to strengthen scientific understanding of the ecological status of Setiu Wetlands while supporting biodiversity conservation and the sustainable management of one of Malaysia's most significant wetland ecosystems.

The programme is further strengthened through a strategic partnership with the Majlis Pengurusan Taman Negeri Terengganu (MPTNT), whose collaboration will facilitate field research activities and promote the translation of scientific findings into effective conservation and protected area management practices.



Project Leadership

The Mini Expedition is led by an experienced multidisciplinary team comprising:

Project Leader: Assoc. Prof. Dr. Effi Helmy Ariffin (INOS)
Project Vice Leader: Assoc. Prof. Dr. Ts. Dr. Nor Azman Kasan (AKUATROP)
Assoc. Prof. Dr. Liew Hon Jung (AKUATROP)
Assoc. Prof. Dr. Tan Min Pau (ICAMB)
Assoc. Prof. Dr. Jamilah binti Mohd Salim @ Halim (IBTPL)

Together, these project leaders bring complementary expertise in oceanography, aquaculture, marine biotechnology, biodiversity, and environmental sciences, providing a strong foundation for interdisciplinary research and long-term ecological monitoring of Setiu Wetlands.

Integrated Research for Sustainable Wetland Management

The Mini Expedition to Setiu Wetlands 2025 integrates the multidisciplinary expertise of INOS, AKUATROP, ICAMB, and IBTPL through a comprehensive research framework encompassing hydro-spatial surveillance, aquatic biodiversity assessment, molecular biodiversity profiling using DNA and eDNA technologies, and GIS-based habitat mapping. By leveraging advanced technologies such as UAVs, Geographic Information Systems (GIS), environmental DNA (eDNA), and integrated environmental databases, the expedition aims to establish a robust long-term ecological monitoring programme for Setiu Wetlands.

The programme is expected to generate a comprehensive environmental database, high-resolution habitat and species distribution maps, DNA-based biodiversity inventories, scientific publications, technical reports, and policy recommendations that will strengthen evidence-based conservation and sustainable wetland management. The integrated monitoring framework developed through this initiative is also envisioned as a model that can be replicated in other wetland ecosystems across Malaysia.

Bringing together 40 researchers, science officers, technical personnel, and postgraduate students, with strategic support from the Research and Field Services Centre (PPPL), University Health Centre (PKU), Office of Corporate Communications (PKK), UMT Press, Security Division, and the Majlis Pengurusan Taman Negeri Terengganu (MPTNT),



Deployment of *Unjam* – Pengkalan Jie Fisheries Community Program

Written by: **Joseph anak Bidai (INOS)**

Date: 8 – 9 August 2025

Location: Pengkalan Jie, Terengganu, Malaysia

Introduction

Along the coast of Terengganu, the lives of fishermen have always been closely tied to the rhythm of the sea, the ebb and flow of the tides, changing seasons, and the unpredictable presence of fish. For the fishing community of Pengkalan Jie, one traditional practice that remains relevant to this day is the use of *unjam*, an artificial fish aggregating device (FAD) deployed on the seabed to attract fish. More than just a fishing technique, it represents a heritage of traditional knowledge passed down from one generation to another, adapted over time while retaining its fundamental principle: the sustainable use of natural resources to support livelihoods

On 8 and 9 August 2025, the Pengkalan Jie Fishing Community, in collaboration with Universiti Malaysia Terengganu (UMT), carried out an *unjam* deployment activity in the waters off Kuala Nerus. The deployment sites were identified using a Global Positioning System (GPS). The activity also received support from Pusat Sekolah Memandu Academy (M) Bhd, which contributed coconut fronds as the primary material for the construction of the *unjam*. The programme was led by Mr. Zulfauzi (Jie) and Mr. Fadhli (Man), who serve as the Penghulu and association secretary, respectively. A similar activity was previously organised in collaboration with UMT in 2023.

Day 1 – Collecting and Preparing Coconut Fronds

The objective of the first day was clear: to collect enough coconut fronds for the construction of *unjam*.

A total of 10 members were involved in the activity, each bringing equipment such as machetes, saws, and ropes. Some climbed the coconut trees while others remained on the ground to collect the cut fronds. Each fallen frond was promptly gathered, cleaned of old or damaged leaves, and neatly arranged. After working for four hours, the collected fronds were loaded into a four-wheel-drive vehicle and transported back to the base.



Night Work – Tying Coconut Fronds to the Main Rope

The work on the first day did not end when the sun went down. At 9:00 PM, the team began tying coconut fronds onto the main ropes. The base area was illuminated by floodlights, while the shadows of the coconut fronds swayed gently in the night breeze.

Each *unjam*, required a 10-fathom main rope, with seven coconut fronds attached at specific intervals. This process required proper tying techniques to ensure that the knots would not come loose once deployed on the seabed and that the fronds would remain securely positioned despite strong ocean currents. The ropes used were high-quality natural coir ropes that would eventually decompose into environmentally friendly materials.

The atmosphere during the night shift was relaxed yet focused. Some participants tied the fronds, others trimmed excess leaves, while the rest organised the completed sections. Occasional laughter broke the silence of the night, creating a sense of camaraderie among the team. By midnight, all the sets scheduled for that day had been neatly arranged and were ready for the next stage of attaching the weights.



Day Two – Preparing the Weights and Final Arrangements

The morning of 9 August began with a different but equally important task: preparing the weights for the *unjam*. The weights were made from sacks filled with sand, with every two sacks combined into a single unit. This method was chosen because it could withstand ocean currents and keep the unjam in position for approximately six to ten months before the sacks naturally decomposed.

Once the weights were ready, the ends of the ropes that had been prepared the previous night were securely tied to the sandbag units. This connection was a critical component of the entire structure, as any failure at this point could cause the unjam to drift away with the currents.

Deploying the *unjam* at Sea

With all preparations completed, seven *unjam* units were loaded onto a fishing boat. The boat then headed toward a predetermined location marked using GPS coordinates. The site selection was not random; it was based on the fishermen's experience and knowledge of ocean currents, water depth, and fish migration routes.

The deployment process was carried out one unjam at a time. Upon reaching the designated coordinates, the weighted sandbags were carefully lowered into the sea, followed by the coconut fronds that gradually descended through the water column. This operation required precision, as the unjam needed to be deployed relatively close to one another to maximise their effectiveness in attracting fish.

Throughout the deployment process, team members maintained constant communication and recorded the coordinates of each unjam for future reference. Within a few weeks, the area was expected to attract various species such as scads, mackerel, and squid, as the unjam would provide shelter and feeding opportunities for smaller marine organisms.





Function and Importance of *unjam*

Unjam functions as an artificial structure designed to attract and concentrate fish within a specific area of the sea. The coconut fronds serve as a natural shelter, particularly for small fish seeking protection from predators. Over time, the fronds become a substrate for the growth of algae, marine biofilms, and plankton communities, which in turn attract small fish looking for food.

As small fish gather around the structure, larger predatory species are drawn to the area to feed, creating a complete ecological food chain. For fishermen, this makes the *unjam* an efficient fishing location, reducing both fuel consumption and the time spent searching for fish.

From a sustainability perspective, strategically placed *unjam* can help reduce fishing pressure on natural coral reef ecosystems, allowing these habitats more time to recover and regenerate. In the long term, they contribute to maintaining stable fish populations and ensuring that marine resources remain productive for future generations.

Conclusion

The *unjam* deployment activities conducted on 8–9 August 2025 demonstrate that traditional fishing techniques remain highly relevant in the modern era when supported by proper management, technology, and strong community collaboration. Every coconut frond tied, every sandbag lowered into the sea, and every GPS coordinate recorded represents a step toward ensuring that the ocean continues to provide sustainable livelihoods for fishing communities.

Through the deployment of these *unjam*, local fishermen hope to see increased fish catches in the coming months while ensuring that future generations can continue to benefit from the same valuable resource—a healthy, productive, and sustainable marine environment filled with life.



Spill to Support: INOS-COG on the Ground for IOPC Fund Assessment



Written by: **Muhammad Danial Noor Iskandar & Mohd Fikri Mohamad (INOS)**

Following the Marine Honour – Vox Maxima oil spill, the INOS-COG team from Universiti Malaysia Terengganu (UMT) was mobilised as enumerators and assessors under the International Oil Pollution Compensation (IOPC) Funds to support compensation efforts for Malaysian fishers affected by the incident. The spill, which released approximately 817 m³ of oil after a tanker collision in June 2024, did not remain confined to Singapore waters; it eventually reached parts of the Johor Strait and disrupted key fishing areas around Pengerang. From 7–10 December 2025, field verification took place at the Arts and Culture Hall, Kampung Dato Abdul Ghani Othman, Pengerang, Johor, where 138 fishers came forward to have their claims assessed. The process went beyond reviewing forms—it involved direct conversations, careful cross-checking of documents, and a close look at each fisher's fishing records and reported losses. In many cases, formal documentation such as receipts was limited or unavailable, reflecting the realities of small-scale fisheries. To address this, the team relied on a triangulation approach, combining site visits to landing points, restaurants, and wholesalers with market price comparisons, consultations with local fishermen associations (PNK), and verification with fishing gear suppliers. Informal engagements with fish dealers and middlemen—those who handle daily fish transactions—added another layer of insight, helping to anchor the assessment in real, day-to-day practices. Through these interactions, a clearer picture of the community emerged. Most claimants were full-time fishers operating in nearshore waters, dependent on traditional methods such as drift nets, and many belonged to lower-income groups. For them, fishing is not just a job—it is the backbone of their daily livelihood. The team assessed claims across economic loss, fishing gear damage, and vessel-related impacts, applying a consistent framework that linked catch data, fishing frequency, and market prices to estimate actual losses. Interestingly, it became evident that many fishers had understated their losses, with assessed values often exceeding what was originally claimed. At the same time, challenges arose from informal practices—gear purchased without receipts, repairs done incrementally, and transactions carried out through middlemen. Rather than treating these as limitations, the team worked around them, using local price references and supplier data to ensure that each assessment remained fair, grounded, and reflective of real conditions on the ground.

Strategic Focus Group Discussion (FGD): Coastal Disaster Management and Coastal Erosion Index Data Coordination



Written by: **Effi Helmy Ariffin (INOS)**

The Strategic Focus Group Discussion (FGD) on Coastal Disaster Management and Harmonisation of Coastal Erosion Index Data was successfully held from 24 to 26 July 2025 in the Seminar Room at Swiss-Belhotel, Kuantan. This programme aimed to bring experts from various fields across universities, government and industry to exchange knowledge and ideas to improve management and disaster preparedness for coastal erosion in Malaysia.

The main focus of the discussion was a review of two important references used in coastal planning, namely the National Coastal Erosion Study (NCES) 2015 and the National Coastal Zone Physical Plan 2 (RFZPPN-2). The discussion aimed to understand the differences between both approaches and identify areas where the two references can be improved and used together to support better coastal management.

The discussion was moderated by Associate Professor Dr. Effi Helmy Ariffin. There were participants present from different organisations such as Universiti Malaysia Terengganu (UMT), Universiti Malaya (UM), Universiti Tun Hussein Onn Malaysia (UTHM), International Islamic University Malaysia (IIUM), National Hydraulic Research Institute of Malaysia (NAHRIM), Department of Irrigation and Drainage (JPS), Politeknik Nilai and RYE Engineering Sdn. Bhd. To make the discussion more intensive, the participants were divided into three groups, from the northern, southern and eastern coasts of Peninsular Malaysia.

Throughout the three days of discussions, the participants shared their experiences and opinions on various coastal erosion problems, such as the causes of shoreline changes, the effects of coastal development, problems faced by coastal people, possible mitigation measures, and the possibilities of nature-based solutions for mitigating the problem.

One of the key issues discussed was the distinction between NCES 2015 and the RFZPPN-2. It became clear that NCES concentrates predominantly on the physical processes related to the coastline, whereas RFZPPN-2 takes into account additional factors such as the environment, infrastructure, socio-economic characteristics and others. In turn, both methods were considered strong and could serve as complements to one another.



Coastal erosion is a complex phenomenon affected by many different factors such as natural and man-made actions. The waves, currents, monsoon seasons and the changes in sea level remain constant in the process of influencing the coast. In contrast, coastal development, land reclamation, urbanisation and changes in land use may also contribute to the problem.

There were also discussions about the need for choosing appropriate methods of coastal protection. Although engineering measures such as seawall construction and rock revetments are important in protecting critical sections, nature-based methods could be considered in coastal management processes. Both approaches could be integrated into the management process in order to balance protection and conservation of the environment.

Among other recommendations, it is recommended to harmonise the assessment process of NCES 2015 and RFZPPN-2, to have consistent coastal erosion indicators, and improve the flow of information among the concerned parties. It was agreed that there is a need to develop an effective approach to the assess the risk of coastal erosion.

Overall, the FGD successfully brought together experts from different sectors to exchange knowledge and discuss future improvements in coastal erosion assessment and management. The recommendations from the discussion will serve as important input towards enhancing coastal planning and decision-making in Malaysia.



INOS and NAHRIM Unite to Address Sea Level Rise and Coastal Morphological Dynamics

Written by: **Effi Helmy Ariffin (INOS)**

KUALA NERUS — In a proactive effort to confront climate change and escalating coastal erosion, the Institute of Oceanography and Environment (INOS), Universiti Malaysia Terengganu (UMT), and the National Water Research Institute of Malaysia (NAHRIM) organised the strategic outreach seminar “Kenaikan Aras Laut dan Dinamik Geomorfologi Pantai Malaysia: Daripada Penyelidikan ke Tindakan Adaptasi”. Held at the INOS Research Gallery, the event successfully bridged scientific data with actionable policy. Opening addresses by Prof. Dr Zainudin bin Bachok and Ts. Saiful Bahri bin Hamzah emphasised that managing sea level rise requires robust evidence and close inter-agency cooperation. The core programme featured eight distinct technical briefings on coastal resilience and community adaptation:

- Prof. Dr Zainudin bin Bachok (INOS UMT) analysed the performance of artificial reefs since the 1970s, noting a pivotal shift in 2006 toward robust reinforced concrete or steel structures and PETRONAS’s “Rigs-to-Reefs” initiatives to attenuate wave energy.
- Ir. Pn. Wan Norshuhada binti Wan Khairuddin (JPS Terengganu) detailed national trends, noting that 1,347.6 km of Malaysia’s coastline is actively eroding, and mapped JPS classification zones for critical Terengganu hotspots.
- Prof. Madya Dr Effi Helmy bin Ariffin (INOS UMT) developed shoreline projections using modelling tools, namely MIKE-21 and DualSPHysics, advocating for low-profile hybrid innovations such as E-Fence and M-Net over traditional revetments.
- Prof. Madya Gs. Ts. Dr Aliashim bin Albani (CEFORE UMT) evaluated Marine Renewable Energy (MRE) frameworks, using Extreme Value Analysis (EVA) to ensure structural reliability while supporting the delivery of green power to isolated communities.
- Puan Norasniza binti Hamzah (PLANMalaysia) shared insights into the execution of the Kampung Angkat MADANI project in Kampung Tanjung Gelam, where local knowledge successfully guided RM1.2 million in funding across 12 infrastructure projects.
- Prof. Madya Dr Behara Satyanarayana (INOS UMT) demonstrated through 10-metre-deep soil coring at the Matang Reserve that mangroves store up to five times more carbon than standard 1-metre assessments indicate.
- Prof. Madya Dr Hazman bin Samsudin (BEACON UMT) outlined the acceleration of global sea level rise (4.5 mm/year), citing a Tioman Island case study projecting RM23 billion in economic losses by 2050 to justify blue financing models.
- Prof. Dr Wan Izatul Asma binti Wan Talaat (INOS UMT) advocated for mainstreaming Ecosystem-based Adaptation (EbA) into local policy and the upcoming National Adaptation Plan (MyNAP) to secure sustained institutional funding.



The true success of this outreach program lies in the shared hope and commitment forged between researchers, policymakers, and the local community. By uniting a diverse range of approaches, from advanced engineering innovations like M-Net and applied geospatial technology to multi-layered disciplinary concepts; this seminar successfully synthesised scientific innovation with the deep, generational knowledge of coastal residents, proving that protecting Malaysia's shores is a collective responsibility. Moving forward, this collaborative spirit provides a powerful foundation for the upcoming National Adaptation Plan (MyNAP), ensuring that future generations will inherit a resilient, thriving, and securely preserved coastal heritage.



ASEAN Archaeological Meet Up 2025: Advancing Maritime Heritage Through the Bidong Shipwreck

Written by: **Hasrizal Shaari (FSSM – INOS)**

Pulau Bidong, renowned for its rich maritime history, once again became the centre of international attention with the successful organisation of the ASEAN Underwater Archaeological Meet Up 2025 and the Fifth Phase of the Bidong Shipwreck Excavation, held from 18 to 22 September 2025. The programme brought together underwater archaeologists, researchers, and heritage practitioners from across the ASEAN region, reinforcing Pulau Bidong's growing reputation as a significant maritime archaeological research site.

The primary objective of the fifth excavation phase was to investigate the structural remains of the Bidong Shipwreck and collect exposed timber samples for scientific analysis. These samples will help determine the vessel's construction techniques, timber species, provenance, and state of preservation. In addition, the excavation focused on recovering unique artefacts that are vulnerable to deterioration, ensuring their preservation and documentation for future research.

A major highlight of the programme was the participation of Yang Amat Mulia Tengku Puteri Utama Raja, daughter of His Royal Highness the Sultan of Terengganu, in her role as Conservation Ambassador of Universiti Malaysia Terengganu (UMT). Known for her passion for scuba diving and underwater photography, Tengku Puteri Utama Raja actively participated in the excavation activities rather than merely observing them.

Her involvement attracted considerable attention among participants and researchers. She joined the archaeological team during the underwater excavation and observed the excavation and recording of significant wooden ship components, including floor timbers, keel elements, and wooden pegs uncovered at the site. Her participation reflected a strong commitment to promoting awareness and appreciation of Malaysia's underwater cultural heritage.

The programme also served as an important platform for regional collaboration. Representatives from Indonesia, Singapore, and Thailand participated in the excavation and related activities, strengthening professional networks and fostering future cooperation in maritime archaeology and heritage management across Southeast Asia.



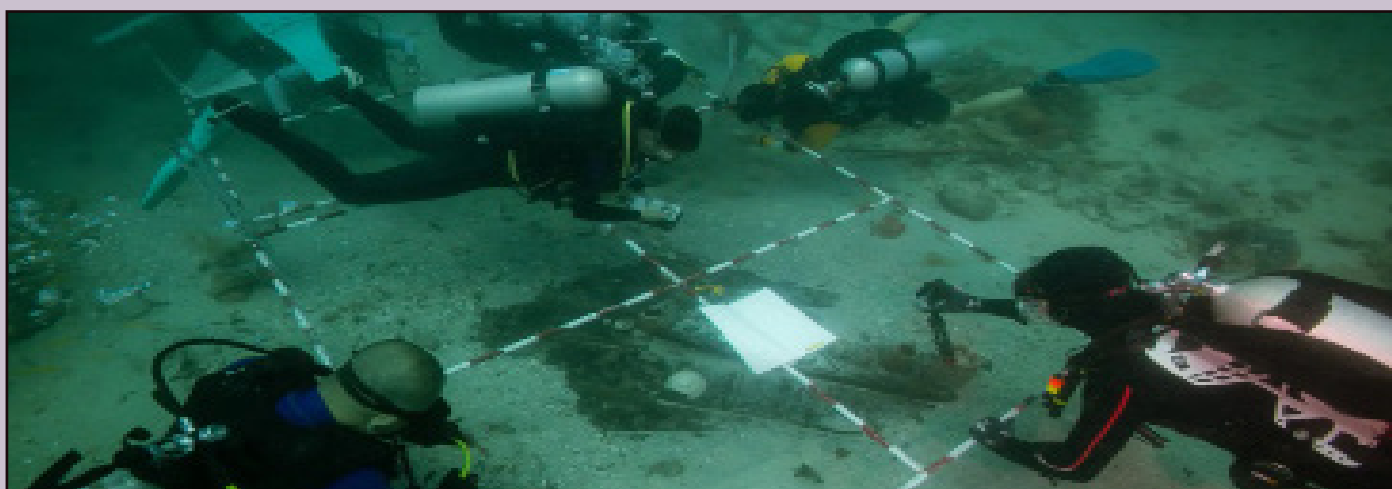
Further enhancing the programme's international standing was the presence of two distinguished experts from Flinders University, Australia. Professor Wendy van Duivenvoorde, a leading maritime archaeologist, and Mr. Hiro Yoshida, a specialist in scientific archaeological diving, contributed their expertise to the excavation and training activities conducted throughout the programme.

Following recovery, all artefacts underwent preliminary desalination treatment to prevent deterioration from salt accumulation after centuries of submersion in the marine environment. This essential conservation process will ensure the long-term preservation of these valuable cultural materials for future study and exhibition.

According to Mr. Baharim Mustapa, UMT's Technical Director of Archaeological Diving and Scientific Diving Instructor, the participation of Tengku Puteri Utama Raja provided tremendous encouragement to the research team. Her active involvement demonstrated strong support for efforts to preserve and promote Malaysia's maritime heritage.

Beyond its scientific achievements, the excavation further strengthened Pulau Bidong's position as one of Malaysia's leading maritime archaeological research sites. The programme also highlighted the commitment of researchers, government agencies, and international partners to safeguarding underwater cultural heritage at both national and regional levels.

The success of ASEAN Underwater Archaeological Meet Up 2025 is expected to elevate the profiles of UMT and the Department of National Heritage (JWN) as leaders in underwater archaeology and maritime heritage research. Looking ahead, UMT has approved the establishment of Marine Heritage (MAHER) under the Centre for Marine Conservation, Institute of Oceanography and Environment (INOS), marking a significant step towards advancing research, conservation, training, and public engagement in maritime and underwater cultural heritage (UCH).





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