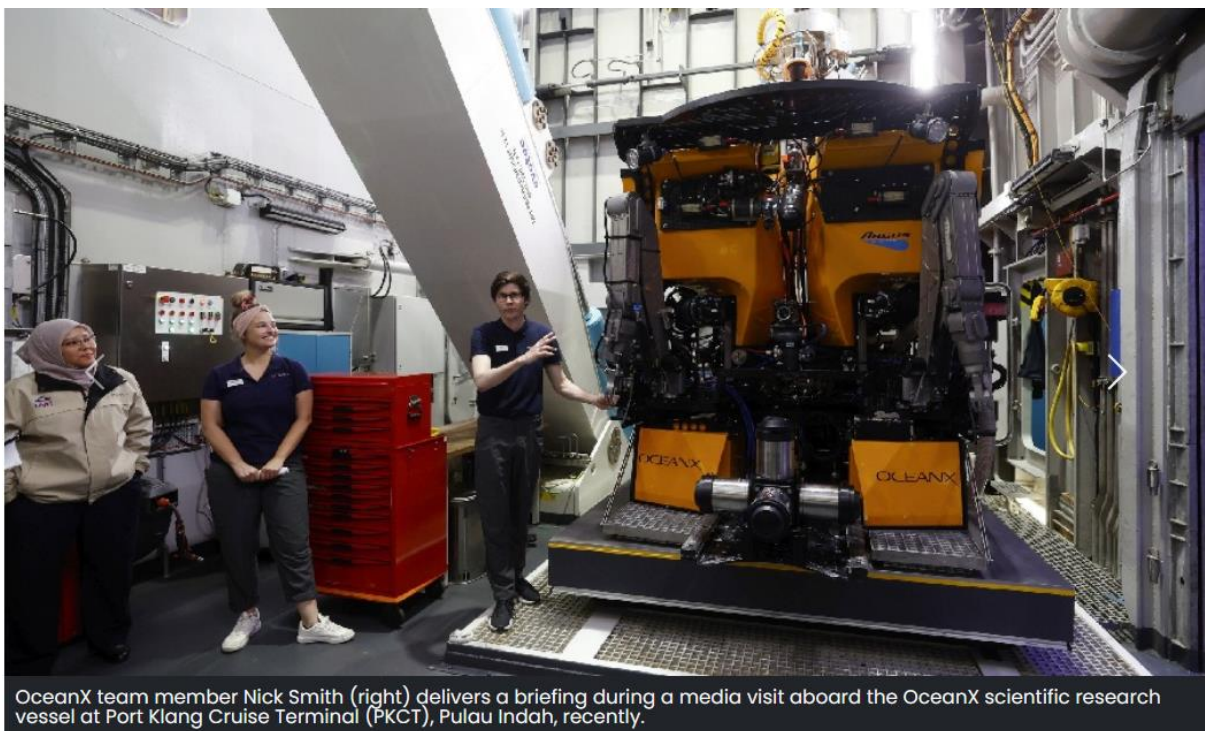




FEATURES

OceanX In Malaysia Evaluating Marine Ecology Amid Growing Degradation

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OceanX team member Nick Smith (right) delivers a briefing during a media visit aboard the OceanX scientific research vessel at Port Klang Cruise Terminal (PKCT), Pulau Indah, recently.

Malaysia's marine habitats are facing increasing threats from climate change and human activities. This first of a two-part article takes a look at OceanX Malaysia Mission 2024, conducted by OceanX in partnership with the Pahang state government, New York University Abu Dhabi and Malaysian scientists to evaluate the health of marine life ecosystems in the waters off Pahang.

Malaysia's stunning tropical waters teem with an array of marine life but its underwater ecosystems are being exposed to degradation due to human activities and climate change.

Malaysia lies within the Coral Triangle, a region recognised as the global epicentre of marine biodiversity. However, its marine habitats face increasing threats from a surge in seaborne trade, port expansions driven by the rapidly growing logistics sector and, not to forget, the rising impact of water-based tourism.

But efforts are underway to evaluate the nation's marine ecology, one of them being the 16-day mission by global ocean exploration non-profit, OceanX, conducted about three months ago in the waters off Pahang and around Tioman Island, and the South China Sea.

(OceanX, an operating programme of the United States-based Dalio Philanthropies, uses next-gen technology to support scientists to explore the ocean and build a global community that is deeply engaged with understanding, enjoying and protecting the world's oceans.)

The OceanX Malaysia Mission 2024 was carried out in partnership with the Pahang state government, New York University Abu Dhabi and 23 Malaysian scientists from Universiti Malaysia Terengganu (UMT) and International Islamic University Malaysia, led by Associate Prof Dr Maizah Mohd Abdullah of UMT.

Stationed aboard OceanXplorer – one of the world's most advanced exploration, scientific research and media production vessels – the team undertook comprehensive oceanography studies off Pahang waters as well as surveys of coral reefs in the area.

In March this year, OceanX had announced a multiyear mission to explore the waters of Southeast Asia to "further understand one of the most biodiverse and threatened oceanic regions in the world".

Speaking during a media briefing on the recent exploration and a tour of OceanXplorer in October when the vessel was docked in Port Klang, Selangor, Maizah said among their "discoveries" was a pod of 120 dolphins swimming with their calves on the waters off Pahang.

Stressing the importance of scientific knowledge in making informed policy decisions, she said, "We can't protect what we don't know."

She said the exploration was important for understanding the condition of marine life in the study area.

"It's very exciting because that's how we learn (more) about the ecosystem, whether there's a new animal or a new behaviour or a new underwater environment out there," she added.

THREE PHASES

She said OceanX Malaysia Mission 2024 was conducted in three phases, with the various efforts focused on achieving the mission's eight objectives.

In Phase One, they explored over 350 square kilometres of the ocean off Pahang while the second phase saw the Malaysian scientists mapping nearshore reefs at high resolution with multibeam sonar and a remotely-operated vehicle (ROV). They also conducted several SCUBA dives to survey habitat composition of various reef areas. These nearshore reefs have rich marine biodiversity and are critical nursery grounds for marine life.



OceanX Science Program Director Mattie Rodrigue (left) and UMT Chief Researcher and Expedition Leader Prof Dr Maizah Mohd Abdullah stand in front of the Triton Submarines deep-sea research vessel.

Phase Three sent the researchers to the front lines of a recent massive coral bleaching event at Tioman Island Marine Park, where SCUBA visual survey methods were used to determine the current coral health status.

“(From our surveys) we also realised that coral reefs in certain areas are far more resilient to climate change,” Maizah told the media, adding the finding showed there is hope for the conservation of those specific types of coral reefs.

She also said OceanX Malaysia Mission 2024 has led to the establishment of 16 stations for a long-term monitoring programme involving future ocean research, including studies on ocean acidification and isoscapes in Malaysia.

Maizah also explained the UMT scientists would analyse the data from the OceanX Malaysia Mission as well as report and publish the data together with OceanX, and maintain an ongoing relationship with OceanX.

According to her, the data collected will enable the researchers to understand marine life better.

“Once we understand why it (specific marine life) is there and the context of its environment, then we know how the future of that system or that animal might change with human impact and climate change,” she added.

ARTIFICIAL INTELLIGENCE

Elaborating on their exploration, Maizah noted that the pioneering effort will play a key role in helping researchers track long-term changes to the reefs and their surrounding ecosystems.

“(During the third phase) we went to 11 sites around Tioman Island, applying the ReefCloud AI (artificial intelligence) programme to monitor the (health and biodiversity of) coral reefs.



OceanX team member Nick Smith (right) delivers a briefing during a media visit aboard the OceanX scientific research vessel at Port Klang Cruise Terminal (PKCT), Pulau Indah, recently.

“The programme allows researchers to track changes in coral cover, species composition and signs of degradation, providing critical data for timely conservation intervention and adaptive management strategies, especially in the face of climate change and human impact,” she said, adding the use of AI speeds up the analysis process.

“We’ve been doing things manually (in the past), and (now) we are facing a very rapidly changing environment with global warming. So, we wanted to use AI to actually speed up the (analysis) process.”

She said previously, researchers had to go diving, take lots of photos and videos, and then come back to the lab to analyse the species and data.

During Phase Three of OceanX Malaysia Mission 2024, the ROV was also deployed to explore mesophotic habitats that are more than 30 metres deep around Tioman Island.

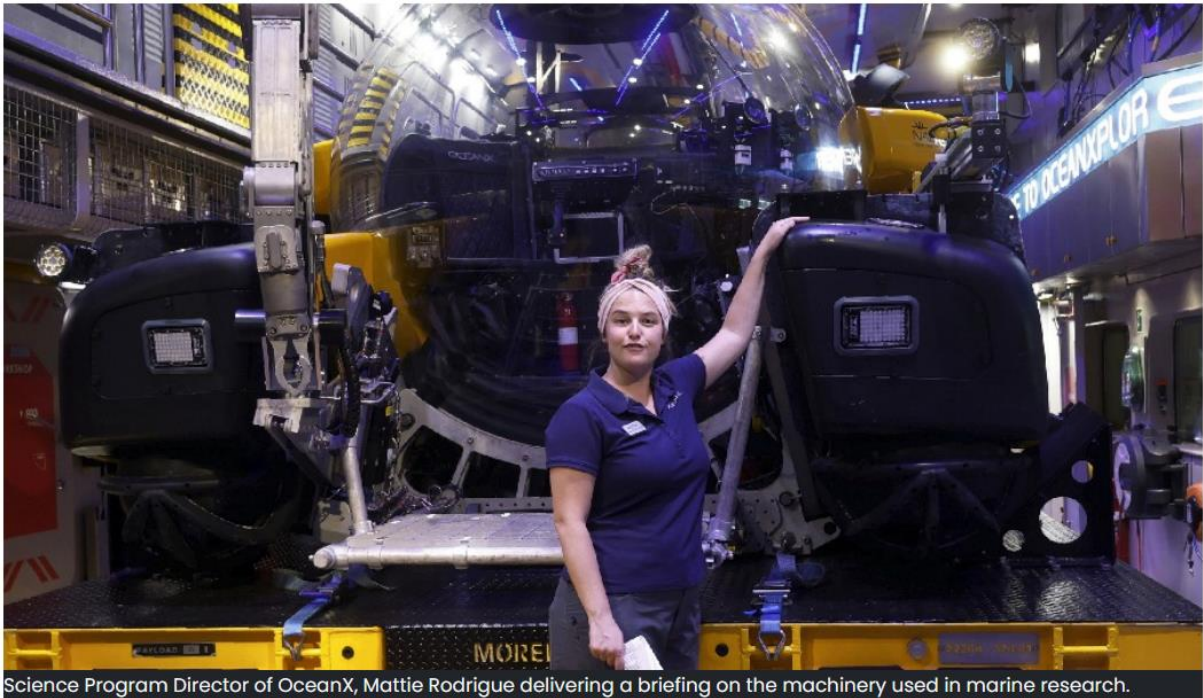
For the first time, Malaysian researchers managed to do a detailed mesophotic biodiversity assessment in Pahang waters with the help of the cutting-edge technology available on OceanXplorer.

Mesophotic coral ecosystems are found in tropical and subtropical regions at depths ranging from almost 100 feet to over 490 feet below the ocean’s surface.

OCEANX TECHNOLOGY

The OceanXplorer, meanwhile, is fully equipped with cutting-edge technology to survey diverse marine environments, including deep-sea, shallow and coastal habitats.

The vessel features two 1,000-metre-long manned submersibles, a remotely operated vehicle (ROV), three dry laboratories and one wet lab, all of which have state-of-the-art research facilities and are equipped with next-gen DNA sequencing capabilities.



Science Program Director of OceanX, Mattie Rodrigue delivering a briefing on the machinery used in marine research.

The technology on board OceanXplorer allows scientists to conduct analyses on specimens. It also has a special pipe system to provide seawater to the lab while releasing uncontaminated specimens back into the sea.

OceanX science programme director Mattie Rodrigue said it is important to understand the biodiversity of marine life, particularly as the ocean receives little attention.

“We have mapped the entire topography of the moon which is far away, but compared to the moon, only about 24.9 percent of our ocean floor has been mapped.

“Mapping the seafloor is the first step in exploring the unknown depths of our global ocean,” she said.

Among the explorations undertaken by OceanX are Red Sea 2020, Red Sea Decade Expedition 2022, Jordan 2022, Norway 2023 and Azores 2023.

Rodrigue said Southeast Asia is well-known as one of the world’s largest marine biodiversity hotspots and much of it remains undiscovered and unexplored.

“That said, Southeast Asia is also home to several island nations including Indonesia, the world’s largest archipelago. In fact, nine out of 10 ASEAN countries touch the sea,” she said.

She said OceanX is committed to joining Southeast Asia in the battle against climate change by exploring the depths of its waters and bringing back critical data, so that a better understanding of how to protect and preserve the ocean can be developed.

OceanX founder and co-chief executive officer Mark Dalio, meanwhile, said the organisation hosted several education tours aboard OceanXplorer while it was docked in Port Klang, reaching more than 200 students and educators.

The tours aimed to provide students with an opportunity to visit the vessel and experience the capabilities of OceanXplorer up close, and better understand potential ocean-related career paths.

“We engage in capacity building through providing students a behind-the-scenes look at OceanXplorer’s cutting-edge capabilities, life on the research vessel, and our advanced media and engineering capabilities in hopes of inspiring youths and further honing their interest in marine conservation,” Dalio added.