SAYA DE MALHA DAILY

A Newsletter by Dominique and François

N°12, THE WEEKENDER, 12-13th November 202

Where are we ?

South of Saya de Malha, Box 3 and 4, 11.62° South 62.13° East
Sunny, choppy seas, Wind 19.63 knots, Air temperature 27°0 Water temperature 27°17

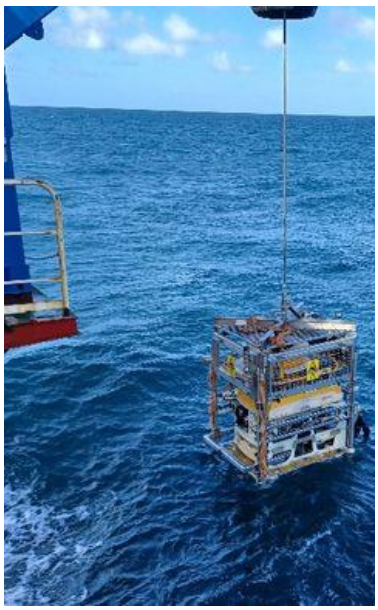
Remotely Operated Vehicle

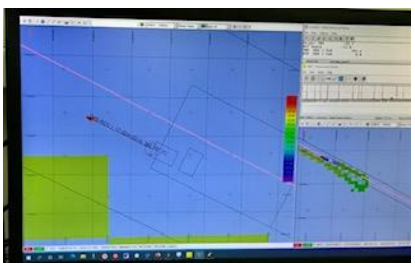
What is a ROV?

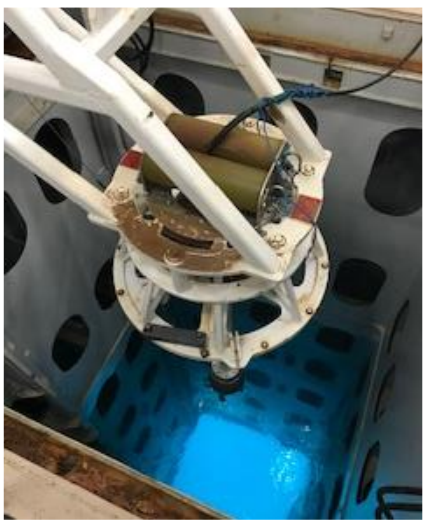
A ROV is a Remotely Operated Vehicle (ROV) similar in concept to an underwater drone. The expedition ROV is a Light work Class SAAB SEAEYE (Cougar XT). It is equipped with a multibeam sonar which provides topographic information, 3 cameras and 2 remotely operated arms for sampling. It can travel at up to 2 knots and at depth from 10 to 1500m for up to 12 hours.

How does it work?

From the control room on board the ship, the ROV team, housed in a fitted container, pilots the ROV using a box equipped with a joystick similar to an old fashion play station which gives a first-person view of what the ROV “sees”. During operation, the ROV, housed in a cage, is lowered into the ocean and then released, becoming autonomous but still connected to the ship-based control room. The position of the ROV under water is essential to know where it is at all times in relation to the seabed and the ship, to design of visual surveys. Positioning is based on the ship Ultra Short Baseline (USBL) system, linked to a GPS coordinates, and lowered in the moon pool during each ROV dive and then plotted on the computer to generate survey profiles.







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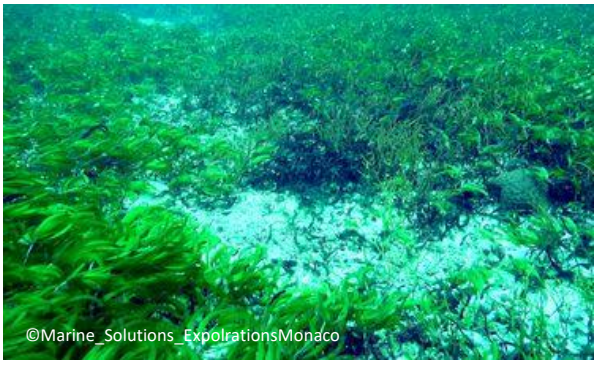
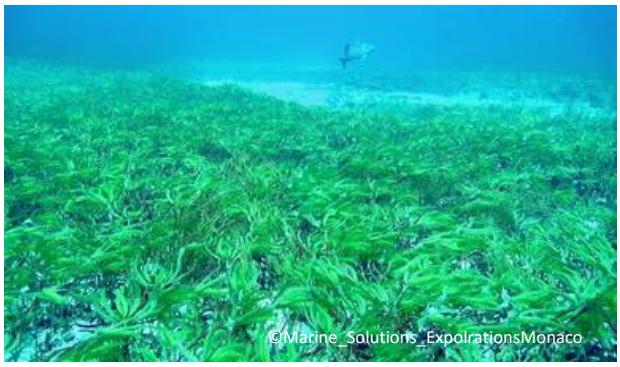
What's the value adding?

The ROV as a tool for science is still in its infancy. This expedition is exposing scientists to alternatives to study the underwater world, data collection and analysis, such as the use of machine learning and AI, which can complement traditional scientific methodologies. The ROV also offers a way to explore the seascape and conduct sampling for longer periods and at great depth. Combining scientific expertise with the exploratory and sampling capabilities of the ROV would expand the breadth of knowledge and understanding of the ocean.

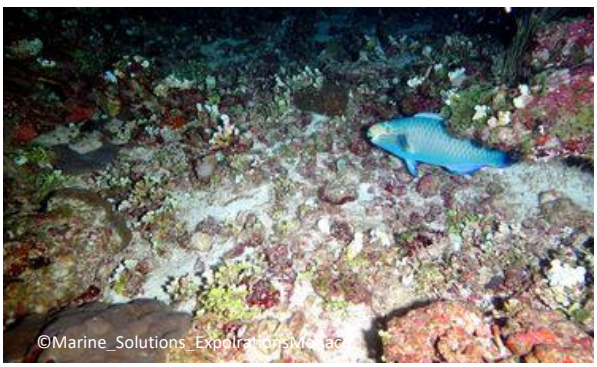
Visual survey of the seagrass bed (30 m) – Saya de Malha North





Visual survey of deep-sea habitats (250m) – Saya de Malha East

Visual survey of coral reef habitat (25-30m) – Saya de Malha East



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The ROV Team

The ROV 4-person team from Marine Solutions is based in Cape town South Africa. There are 2 pilots and a supervisor and for this expedition a 4th person is in charge of survey design, who monitors the ROV position, speed and depth, relative to the ship and the seabed. Whilst the ROV can be bought off the shelf, much of the customization is the work of the team who are mechanical and electrical engineers.

Egon and Robert Laaser, ROV pilots, Marine Solutions

Born in Windhoek, Namibia in 1985 and 1989 respectively. They studied electrical and mechanical engineering in Cape town. Engineering is in the family. 'Subsea engineering was an exciting field to move into" says Robert. As ROV pilots, the brothers worked well as a team. Contracted mainly by oil and gas and mining companies, a scientific expedition is a first. "It is a very different pace and we enjoy working with educated and passionate people ". "There is a lot to explore to make better use of this technology for science. The ROV is a versatile tool that can easily be customized once we understand the scientists needs, to make the most of this expensive type of equipment". "It would have been great to have an opportunity to explore further the areas we surveyed to better understand what we see."

Andrew Matthew, Senior project surveyor, Underwater Surveys

Born in Port Elisabeth, South Africa in 1981. A wrong phone call led him to his current job. Unsuccessful in his applications to fly planes, he was by chance connected to the head of Navy recruitment. Within 2 days he was offered a position of naval officer and worked for 7 years for the navy on hydrographic surveys. Marine Solutions and Underwater Surveys have complementary skills and collaborate often on projects which brought him to this expedition. "Each project is different with unique requirements challenges and expectations". "This expedition is very ambitious, there is a lot to achieve on very tight schedule with different scientific interests over a very large area. Accommodating everyone is challenging. In the end we get the best possible outcome with what we have."

Jeandre Karreman, ROV pilot, Marine Solutions

Jeandre was born in Cape Town in 1993. He trained as a mechanical design technician. It is his first scientific expedition." It is the first time with a bigger ROV, a new experience. It is very exciting. Aldabra was out of this world. There is so much to see and enjoy with this expedition, the ocean is so spectacular and relaxing".

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Using ROV Data

The ROV generates data that can be analysed for various research objectives. For example, Sheena Talma collaborates with the ROV Team to advance her own research on deep-sea biodiversity. The expedition gives her the opportunity to get data that would be difficult and costly to obtain otherwise.

Sheena Talma, Independent consultant, Nekton, Save Our Seas

Sheena was born in Seychelles in 1990. She studied biological sciences in South Africa and is specialized in fish biology and genetics. She joined the Nekton expedition in 2019. "I fell in love with the deep sea". Since through grants and small consultancies she has taken any opportunity to study deep sea fish populations. Her passion is to make knowledge accessible and contribute to building deep sea research capacity in the region. She took advantage of the expedition ROV to test her low-cost deep-sea camera and hopes that Seychelles and Mauritius collaborate on the analysis of ROV data.". "The expedition brings regional scientists together and new collaborations. More research leadership from our region is needed".

The Events of the Day

At long last a large pod of dolphins (Tursiops sp.) played by our ship today

A 12 m Sri Lankan fishing boat, the *Imula*, approached our ship. At sea for months, they asked for water and cigarettes. We swap for fish. They gillnet fish for tuna, skipjack and swordfish.