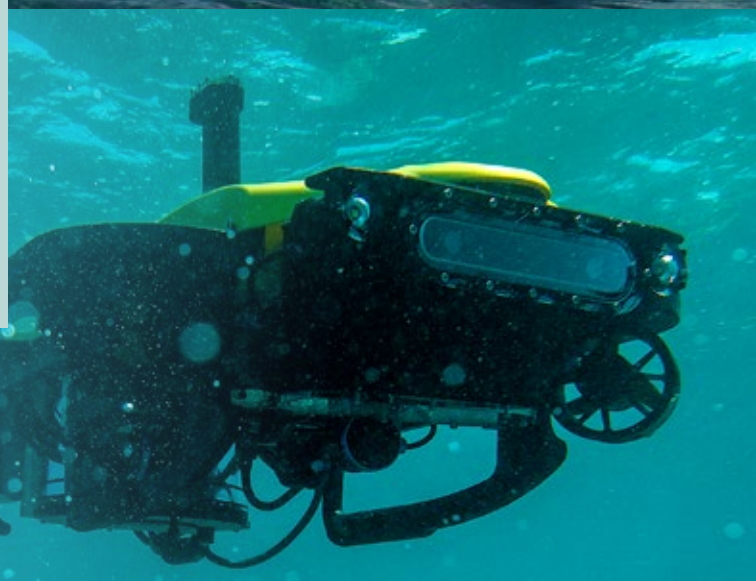
Australian Government

Australian Institute of Marine Science

REEFWORKS

AUSTRALIA'S TROPICAL MARINE TECHNOLOGY TEST RANGE

On the doorstep of the Great Barrier Reef, ReefWorks offers a national capability to safely test marine technologies, unmanned systems and new sensors in a tropical marine environment.



Top: AIMS-QUT Reef Survey trials of a WAM-V Autonomous Surface Vessel (ASV). Photo: Geoff Page, AIMS. Right: Coral Autonomous Underwater Vehicle (AUV) undergoing trials, Photo: Geoff Page, AIMS.

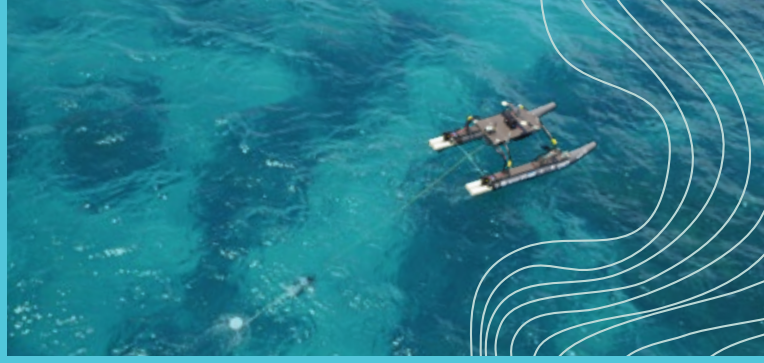
THE WORLD'S FIRST TROPICAL MARINE TECHNOLOGY TESTING FACILITY

The Australian Institute of Marine Science (AIMS) is extending its unique marine technology testing infrastructure and capability to a new national facility available to industry, government, and academic innovators.

ReefWorks is the world's first tropical marine technology test range. It offers development, design and testing services for marine technologies across all technology readiness levels (from concept to mature commercial systems) for both civilian and defence purposes.

Reefworks caters for unmanned and autonomous aerial, surface, and underwater systems as well as other innovations or sensors that require testing and evaluation in the marine environment.

Available facilities – including laboratories, workshops, wharf facilities, three sea test ranges with differing conditions and autonomous corridors – provide a cost-effective, safe, repeatable test environment in a secure facility, in a remote tropical location.



WAM-V ASV towing an imaging platform for reef flat surveys. Drone image, AIMS, Photo: Joe Gioffre.

A UNIQUE PROPOSITION

Autonomous systems have stringent compliance requirements for managing risks to personnel, equipment, vessels, and the environment.

The harsh tropical marine environment of northern Australia is a challenging operating environment for marine technologies.

ReefWorks is a tropical-water national test and evaluation facility for marine technology. With its remote location, marine infrastructure and the inhouse expertise of AIMS, it enables a streamlined pathway to transition marine technology innovation from development through to operation.

Serving the needs of both industry, government and academics, ReefWorks is well positioned to catalyse innovation in marine robotic autonomous systems and artificial intelligence (RAS-AI).

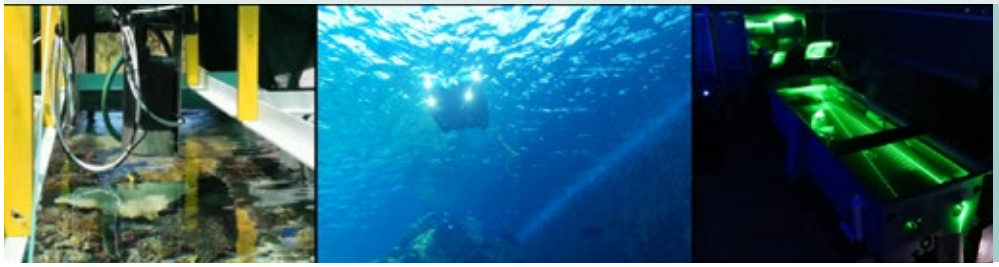
It expands capability to tackle the grand challenges facing Australia's marine ecosystems.

Joe Gioffre(r) (AIMS Chief Pilot) and Dr. Jon Kok (l) with the AIMS Hyper-spectral drone system Photo: Scott Bainbridge.

REEFWORKS SERVICES AND FACILITIES

1. MARINE PLATFORM AND SENSOR TEST FACILITY

RAS-AI sensors and platforms need a tightly-controlled environment to gather data for determining performance. ReefWorks offers a sensor test tank facility within the National Sea Simulator (SeaSim) as a controlled test environment to evaluate next-generation marine sensor performance as well as a platform test tank facility for vehicle/vessel testing in a controlled environment.



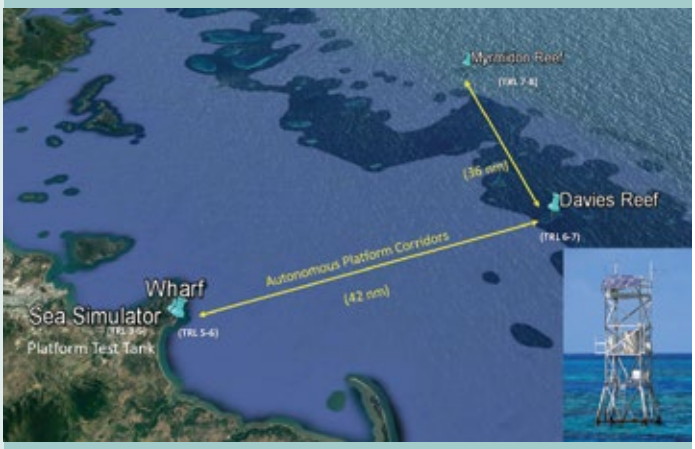
Sensor payload and platform test tanks collaborative trials, from left: AIMS-QUT Photo: Scott Bainbridge. AIMS-ReefHQ Photo: Melanie Olsen. AIMS-DST Group Photo: Jon Kok.

2. TROPICAL MARINE TEST RANGES

ReefWorks offers three marine test ranges to test longer-range vessel performance:

- With directly adjacent waters in a controlled scientific zone, the marine operations test range caters for shallow, controlled testing in the turbid waters off AIMS Cape Cleveland across to Cape Bowling Green.
- Davies Reef is a clear-water coral reef range with a sensorised research tower connected to AIMS Cape Cleveland.
- Further offshore, Myrmidon Reef, with another connected research tower, offers remoteness as a test factor.

ReefWorks also includes drone corridors between the testing areas, to routinely verify performance of unmanned (including autonomous) underwater, surface, and aerial platforms.



The ReefWorks marine test ranges.

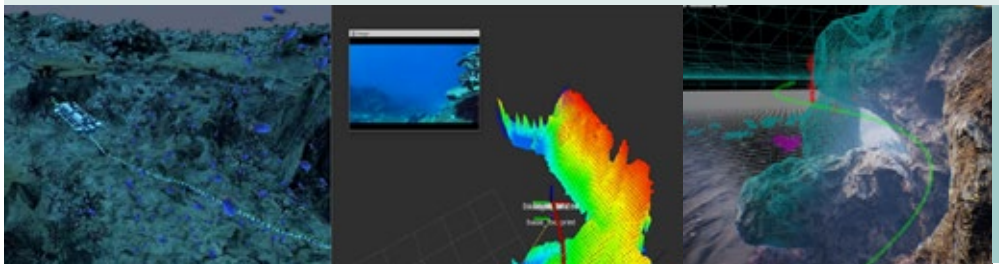
3. TROPICAL RANGE DIGITAL TWIN

Most testing and evaluation of RAS-AI systems occurs in a digital environment for practical reasons and cost-effectiveness.

Digital environment testing is offered by ReefWorks through real-time collected data and a partnership with the NQ SPARK concept.

NQ SPARK is the North Queensland Simulation Park, an advanced environmental training facility drawing on expertise of Cubic Defence in collaboration with government, academia and industry.

Our digital twin test range supports the entire development cycle from simulation validation, bench testing, tank tests through to nearshore and offshore field testing.



Test range digital twin examples: AIMS-QUT digital modelling and simulation environments for autonomous underwater platforms.

LOCATION

ReefWorks is based at AIMS headquarters, a secure government facility in an isolated shore-based location, 50km south of Townsville, Queensland. AIMS is the nation's tropical marine research agency. In existence for almost half a century, it plays a pivotal role in providing large-scale, long-term, and world-class research that helps governments, industry and the wider community to make informed decisions about the management of Australia's marine estate. It contains on-site accommodation, data centre, facilities, and engineering and operations support to assist collaborators in efficiently conducting their activities.

CONTACT US

AIMS is seeking partners to invest in the development of this unique facility as well as innovators interested in using the facility to test their autonomous systems.

For further information please contact:

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Top: The Cape Cleveland base of Australian Institute of Marine Science, North Queensland. Photo: AIMS / Joe Gioffre.
Below: The National Sea Simulator, Australian Institute of Marine Science, Cape Cleveland, North Queensland. Photo: Roslyn Budd.