SEAMOUNTS, CANYONS, AND REEFS

OF THE CORAL SEA

#VisioningCoralSea

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Cairns, Australia
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Expedition Objectives

Mapping Seafloor

High resolution maps of the seabed revealed new detail about the geomorphic processes operating within canyons and around the edges of reefs and seamounts.

Characterize Seabed & Affiliated Communities

By acquiring biological data and samples and comparing them with seabed geomorphology and geology, jellyfish communities and oceanographic data, we can reveal the features and processes driving biodiversity patterns in deep-water settings around the Queensland Plateau.

Epibenthic & Plankton Communities Survey

Surveying reef margins along the Queensland Plateau will indicate their potential to provide refuges for communities impacted by a rapidly warming marine environment, and reveal the influence of past lower sea levels on reef morphology and the present-day spatial patterns of biodiversity.

The overarching goal of this research was to identify the influence of long-term environmental processes on the present-day characteristics and distribution of seafloor biological communities in an important but poorly known region of Australia's marine area- - the northern Great Barrier Reef (GBR) and adjacent Queensland Plateau. We vastly improved our knowledge of seafloor environments in this unexplored region, by identifying seafloor morphology – biological community relationships for predictive modeling of communities, and helping to develop an integrated understanding of Australia's Coral Sea ecosystem through highly interdisciplinary research.

The combination of high-resolution seabed mapping, ROV observations and samples provides us with robust data sets from which we can build models of habitat distributions for the Coral Sea Marine Park and canyons in the Great Barrier Reef Marine Park. Importantly, models can be built to represent patterns across depths and across geomorphic features like reefs, canyons, seamounts, which will aid in our understanding of these deep sea habitats. These new maps, samples and images, give us a new understanding of the geological diversity and biological wealth contained in different zones of the Coral Sea Marine Park. This information can support implementation of management plans for the

At least 3 new coral species were discovered.

30 *days at sea*

21 *ROV dives*

114 *ROV dive hours*

226 *samples collected*

14,572 *km² mapped*

At least **3** *new coral species*

AN UNBLEACHED REEF

Imagery was captured of a huge extent of mesophotic (deep) coral reef in the Coral Sea Marine Park, with no evidence of bleaching from recent events that impacted the Great Barrier Reef in 2020.

BETTER UNDERSTANDING OF LAND/SEA CONNECTIONS

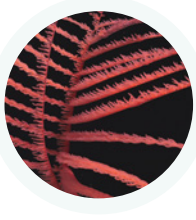
Improved understanding of the link between the Great Barrier Reef lagoon and outer reefs, with data collected that maps the pathways of sediment transport from reefs to submarine canyons and the deep sea.

ANCIENT REEFS REVEALED

Multibeam mapping reveals ancient reef platforms submerged in hundreds of meters of water. A sample of 40-50 million-year-old mudstone was collected, which is what the GBR sits on top. This is the first collection of its kind.

FIRST EVER PHOTOGRAPHY

First ever photography and samples of deep water seabed habitats in the Great Barrier Reef Marine Park, with cameras taken down to 1800 m in the Ribbon Reef submarine canyons.



NEW SPECIES OF CORAL AND JELLIES

Several undescribed species of jellyfish and corals were collected for taxonomic and genetic analysis.

RARE FISH SPOTTED

First recorded observation for Australia of an extremely *rare fish*, Rhinopias agroliba – located in the deeper waters of the Tregrosse Reefs (Coral Sea). The extent of its range was thought to end in Hawaii.