

Exploration: Journey to Mer

Aerial view of Mer Photo: Ray Berkelmans

AIMS scientist, Dr Hugh Sweatman, speaks about fascinating scientific journeys to some little-known reefs.

Over the past three years, AIMS scientists have been working with the Torres Strait Regional Authority to track the condition of reefs in Torres Strait.

On their most recent trip, Dr Sweatman's team surveyed fishes and corals on the reefs of Mer, Poruma, Aureed, Masig and Erub. The team is set to publish their findings in December 2014. He speaks about Torres Strait's rich, little studied, ecosystems, the importance of these seas for marine research and how these islands were the quest for many early seafarers. Funding was provided through the Australian Government's National Environmental Research Program.

What was your team hoping to discover in the seas around Mer?

Mer is in the Eastern Torres Strait, on the edge of the Coral Sea, and lies along an extension of the Great Barrier Reef (GBR). Its northern location means that it is close to the Coral Triangle, the global centre of coral diversity in the waters of Indonesia, Malaysia and the Philippines. We expected to find more coral species around Mer than on reefs in other parts of the GBR, partly because of Mer's remoteness. This means that its reefs are not affected by human activities on land. We expected to find diverse and healthy reefs, and that was generally the case.

The volcanic crater formation of Dawar Photo: R. Berkelmans

How important historically are these islands to scientists?

Despite its remoteness, one of the earliest scientific expeditions to study coral reefs went to Mer about 100 years ago. A group of distinguished scientists from the Carnegie Institute in Washington DC spent five weeks on Mer in September-October 1913 collecting reef organisms and studying their ecology. The expedition made collections of corals that Thomas Vaughan of the US National Museum described and compared with those from other sites in the Pacific. Hubert Lyman Clark of Harvard University collected echinoderms (such as sea urchins, sea cucumbers and starfish) and, even though he was only wading, Clark collected three crown-of-thorns starfish (COTS) on the reef flat, implying that they were present in quite large numbers. The AIMS team found outbreak densities of COTS on the local reefs in 2013 and 2014. This means that outbreaks may not be a new phenomenon.

What else did you learn from early scientific expeditions to the islands?

The expedition leader, Alfred Goldsborough Meyer, in the early part of the 20th Century, was interested in why different species of corals lived in different zones of the reef. He did experiments in tanks on the beach to see what temperature ranges the different species could tolerate. He described the corals that he found along a

line across the reef flat between the reef edge and the shore and recorded the location on a map. The AIMS team used Mayer's map to survey of the same area of reef and found some interesting differences; notably in 1913 there was a broad zone of the reef flat occupied by *Seriatopora hystrix* in colonies so large that they formed micro-atolls. In 2013, only a few small colonies could be found. There could be many reasons for this, but *S. hystrix* is one of the common coral species that is most sensitive to unusually high water temperatures.

The island of Waier in the foreground and Mer in the background Photo: R. Berkelmans

Your team also surveyed coral reef fishes on several reefs in the central and Eastern Torres Strait. What did you learn?

More is known about the reef fish of Torres Strait than about the corals, but even so we recorded several species of damselfish and wrasses that are more common on reefs in the southern GBR than in the north, and yet there they were further north on reefs in the central Torres Strait. We planned to collect some specimens on our second visit to look at the genetic relatedness of populations in Torres Strait and in the south, but we were frustrated by bad weather.

The lack of cyclones in the low latitude of the Torres Strait has helped to protect the reefs in the region from significant damage. What do you think is the biggest threat to the biodiversity and health of the environment in the region?

This project followed on from concern caused by the first records of coral bleaching in Torres Strait in 2010, and climate change is the greatest threat to coral reefs in many regions in the medium term. The Torres Strait remains a very busy seaway and the many reefs and shallow depths mean that shipping accidents and oil spills are a potential hazard.

What is your team planning for the next expedition?

AIMS hopes to continue and to expand the reef monitoring program and biodiversity surveys.