# [***Magic mangroves a ‘blue carbon' buffer for Great Barrier Reef***](https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:64GM-SS61-DY19-C4FY-00000-00&context=1516831)

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**Byline:** Liam Phelan

**Highlight:** ***Mangrove*** forests on some remote islands of the northern Great Barrier Reef are expanding by up to six metres a year, new research indicates.

**Body**

A scientific field trip to a small group of deserted islands on the Great Barrier Reef has its roots in a 1928 expedition and has implications for the future of the reef.

A team of researchers from the University of Wollongong led by Associate Professor Sarah Hamylton visited the Howick islands, about 130 kilometres north-east of Cooktown, in far northern Queensland, last year and found the ***mangroves*** were expanding.

"What's particularly interesting for a lot of the islands in the Howick group that we are mapping and investigating is that they are growing," Associate Professor Hamylton says.

"Most of the islands we have looked at are predominantly made up of broken up corals, which waves then sweep and deposit on the island. This coral sediment is responsible for building up the islands. Add in ***mangrove*** forests and you can see that these islands are actually growing. Some ***mangrove*** forests are marching forwards by up to five to six metres per year," she explains.

Associate Professor Hamylton says the group was able to compare aerial images taken by a drone with hand-drawn maps created in 1928 and photographs from 1974.

"This research was started back in 1928 with an expedition known as the Great Barrier Reef Low Isles Expedition."

In July 1928, British and Australian scientists undertook a journey to investigate the biggest coral reef in the world. They spent 13 months wandering reefs and islands, looking at ocean conditions and growth rate of corals.

"Two members of the Great Barrier Reef Low Isles Expedition were particularly interested in how old the reef islands around here are and how were they formed," says Associate Professor Hamylton.

"The researchers observed ocean waves and tidal currents transporting loose coral sediments derived from the underlying reef platform and depositing these to form the islands. Sometimes these cays or islands may remain unconsolidated and move around with the seasons. But over time, the larger cays built up to be above the sea level and become covered in vegetation, which stabilises them into more permanent features."

Forty-five years later, in 1973-74, another group of researchers, the Royal Society and Universities of Queensland Expedition, decided to partially retrace the footsteps of the researchers from the 1928 expedition. They concentrated on remapping the Howick group, as well as other islands further north, in more detail. By remapping the islands and collecting more data on ***mangrove*** forest vegetation, the researchers believed they could inspire subsequent studies.

The information caught the eye of Associate Professor Hamylton who has a keen interest in geomorphology, which examines how landscapes such as the islands on the Great Barrier Reef form and are shaped over time.

"When I looked over the maps from 1928, then some aerial photos from 1974, I then compared these maps and images with recent satellite imagery from the internet and could plainly see that the islands had increased in size. Especially since 1974."

The UOW field trip in June 2021, with funding from the Australian Academy of Science, involves collecting thousands of aerial drone images, ground referencing photographs and ***mangrove*** forest surveys of 10 different islands among the Howick group. This data will be used to monitor ***mangrove*** expansion and other changes to reef flat environments from island to island.

According to Dr Jeff Kelleway, research fellow in the School of Earth, Atmospheric and Life Sciences at UOW, ***mangroves*** are magical entities.

"***Mangrove*** forests on these islands are so important. The dense underground root system helps bind soils and build elevation, while the above-ground roots provide shelter for marine life and slows down water flows and encourages sediment deposits that reduce erosion."

While scientists have long known these trees and their ecosystem play a huge role in nurturing fish populations and buffer island shores from storms and ocean surges, it's only recently scientists have realised how important these forests are when it comes to climate change.

Rhizophora stylosa, with their tall roots and dense mud beneath, are an efficient tool to remove and store carbon that humans have put in the atmosphere in a process known as "***blue carbon***".

"***Mangrove*** trees capture carbon dioxide from the atmosphere, and then trap and store it in their carbon rich soils for hundreds or thousands of years," Dr Kelleway says. "The term ***blue carbon*** came about because the buried carbon is stored underwater in coastal ecosystems."

He says it's only now — in the age of climate change and after a series of reef bleachings — that scientists are beginning to understand how ***mangrove*** forests are truly extraordinary in their ability to store carbon, virtually unmatched by any other ecosystem on Earth.

While the early results of their field trip showing the expanding ***mangroves*** on this one island group are intriguing, the scientists say more work needs to be done to understand broader more destructive changes are happening further north.

"At this early stage of data analysis, it's still too early to have a clear indication as to why. It could be the deforestation of ***mangrove*** forests or it could have to do with the health of reef around the islands," Dr Kelleway says.

According to the research team, the maps from the previous century transformed the way they can respond to historic and contemporary coral reef problems.

Associate Professor Hamylton explains the hand-drawn maps were produced using a plane table as a drawing board. The paper was then clamped by heavy screws fitted with large wings. Then along with sighting instruments, a wooden ruler, an ivory scale rule and a trough compass the 1928 team would record distances and transfer their measurements onto paper. The whole kit would then be bundled up into two large stiff canvas bags and transported to the next location.

"Our new mapping with our UAV [drone] not only shows how modern technologies are employed to produce them, but that mapping has been and continues to remain a fundamental activity that underpins the understanding of coral reef environments and helps to shape policies in resource management and conservation."

On the 27-hour boat trip back to Cairns, the research team sit around a small dinner table and discuss their adventures and discoveries.

A PhD student in philosophy Oxana Repina says the research is now more important than ever.

"The fate of the Great Barrier Reef depends on how quickly we address human-made pressures like climate change and try to reduce greenhouse gas emissions. This place is among the most diverse and iconic ecosystems on Earth. Sure, the media headlines have portrayed the reef as dying or dead, but that's an oversimplification, it's a bit more complicated than that. Let's not write the reef off just yet."

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