

Tracking the deep sea paths of tiger sharks

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This shows the underwater release of one of the tiger sharks with two of the authors. Credit: Thomas Vignaud

Shark research scientist, Dr Jonathan Werry, has undertaken a four year study tracking the migratory patterns of tiger sharks (*Galeocerdo cuvier*) across the Southwest Pacific.

The research, in collaboration with the French government, followed the movement of 33 tiger sharks (1.54 to 3.9 m total length) across the Coral Sea between New Caledonia and the Great Barrier Reef.

The animals were tagged with satellite and acoustic transmitters and their localised movements monitored by receivers in New Caledonia, the Chesterfield and Lord Howe Islands in the Coral Sea and the east coast of Queensland, Australia.

Dr Werry said the findings, to be published in the open access journal *PLOS ONE*, reveal that coastal marine parks provide only brief protection for these important marine predators while oceanic reefs, vital to their ecology, are overlooked.

"In this study we looked at migratory movements and fidelity to specific reefs for tiger sharks tagged in New Caledonia, the east coast of Australia (the Great Barrier Reef) and oceanic reefs in the centre of the Coral Sea," Dr Werry said.

"We found the monitored sharks utilised three dimensional activity spaces of between 503 and 2360 km³ but the range of movement varied consistently with the age and sex of the animal," he said.

One 3.7 m female tiger shark was recorded to a previously unknown depth of 1136m.

"When it comes to traveling long distances adult females are the primary custodians for the 'across Coral Sea' migrations, and this is probably driven by triennial reproductive cycles," Dr Werry said.

"Pre-reproductive females and mature male tiger sharks on the other hand, were observed to demonstrate extraordinary year round residency in the oceanic Chesterfields reef, so this area appears to be a very important habitat for them."

On coastal reefs, all of the monitored tiger sharks were found to be transient.

Dr Werry said understanding the habitat-use and migration patterns of large sharks is extremely important for assessing the effectiveness of Marine Protected Areas, as well as the vulnerability of these predators to fisheries and environmental influences and management of shark-human interactions.

"Management strategies need to consider the wide-ranging movements of large (sub-adult and adult) male and female [tiger sharks](#) at the individual level, in particular when fidelity to specific coastal reefs may be consistent across groups of individuals," he said.

The importance of oceanic Coral Sea reefs should be a priority for future research."

More information: [DOI: 10.1371/journal.pone.0083249](https://doi.org/10.1371/journal.pone.0083249)

Provided by Griffith University

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