

Sharks revealed as the great protectors of seagrass

July 26 2017, by Joann C. Adkins



Credit: Florida International University

Sharks, marine scientists say, are often misunderstood, described as ravenous man-eaters. In reality, sharks are critically important to the health of the world's oceans, yet a quarter of all shark species are threatened with extinction.

For more than two decades, Florida International University marine scientist Mike Heithaus has been immersed in the world of sharks and other predators that help the sea maintain a delicately balanced food web. Heithaus' work is focused on predators in the waters of South Florida and across the globe in Shark Bay, Australia.

In 2011, some 15 years into a long-term study of the ecological importance of [tiger sharks](#) in Shark Bay, a heat wave struck the region. Warm ocean waters caused the widespread loss of [seagrasses](#), a main food source for dugongs (sea cows) and other species that are the sharks' prey. Now Shark Bay's seagrasses are struggling to bounce back. They have some unexpected help. Sharks have become one of the seagrasses' greatest allies in the fight to survive.

When factors such as heat waves destroy seagrasses, sharks become critical for ecosystem health. Where sharks rove seagrass beds, dugongs and other shark prey steer clear. That keeps seagrasses—which these grazing prey like to eat—from being completely eaten away.

"It's all about how predators and prey interact," said Heithaus, who also serves as dean of FIU's College of Arts, Sciences & Education. "Just the fear of sharks can be enough, in many cases, to keep a marine ecosystem healthy and able to respond to stresses."

This research points out the importance of comprehensive studies of ecosystems, according to David Garrison, a program director in the National Science Foundation's (NSF) Division of Ocean Sciences, which funded the study.

"Without such work, we might not realize the important role sharks play in the recovery and health of seagrasses," he said.

Heithaus and FIU seagrass expert James Fourqurean are conducting

research to assess how climate disturbances and the reduction of shark populations change the oceans.

Losing seagrasses disrupts marine ecosystems and removes critical stores of "blue carbon," which help mitigate climate change. Blue carbon is the carbon captured by the world's ocean and coastal ecosystems.

Although seagrass meadows occupy less than 0.2 percent of the world's oceans, they are responsible for more than 10 percent of all carbon buried annually in the sea. Per unit area, [seagrass meadows](#) can store up to twice as much carbon as the world's temperate and tropical forests, according to Fourqurean. Coastal [seagrass beds](#) hold up to 83,000 metric tons of carbon per square kilometer, mostly in the soils beneath them.

As a comparison, a typical terrestrial forest stores about 30,000 metric tons per square kilometer, mostly in the form of wood.

"Scientists and policymakers are just beginning to understand the global importance of coastal seagrass habitats to climate policy," Fourqurean said.

The same could be said of the sharks, Heithaus said, that in effect guard those seagrasses. He and a team of international researchers have recently embarked on the world's largest survey of reef sharks—[Global FinPrint](#)— to determine if predators are as important to reefs as they are to seagrass ecosystems. As their research continues, many questions remain. But one thing is certain—without [sharks](#), the world would be forever changed.

Provided by Florida International University

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