

Scientists harness the sun to help sharks

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Researchers are looking to the sun to give hunted and overfished sharks a new ray of hope.

Using a special solar-powered tag, [marine scientists](#) now can study a shark's movements for up to two years by way of data beamed to satellites. Previously, researchers relied on tags that ran on batteries and sometimes died before all the information could be transmitted.

The new tags are like "a smartphone for [marine animals](#)," said Marco Flagg, CEO of Desert Star, a Marina, Calif., company that offers the solar devices. "Just like smartphones, the tags have many sensors and communication capability."

The Guy Harvey Research Institute, based in Dania Beach, Fla., is looking to use the solar tags to track certain species of the fierce fish, including tigers, makos, hammerheads, oceanic white tip and sand sharks. The goal is to better understand their migratory patterns and ultimately keep their population healthy.

Sharks are critical to the overall balance of ocean ecosystems, but commercial fishermen catch them by the millions for their fins, cartilage and meat.

"We've learned a lot from tagging sharks, not least of which is that they are highly migratory," said Antonio Fins, executive director of the Guy Harvey Ocean Foundation, which supports the institute. "They are not American sharks or Bahamian sharks or Mexican sharks. They don't

know borders or nationalities."

About 40 research agencies already use solar tags, which were put on the market two years ago. For instance, the University of Miami's Rosenstiel School of Marine & Atmospheric Sciences studies a variety of sharks, while others use them to track turtles and marine mammals that spend time in the sun.

The overall success of solar tags has yet to be proven because of their relatively limited use. But so far marine researchers have encountered no serious problems, and a growing number of agencies plan to purchase them, manufactures said.

By drawing on [solar energy](#), the tags ensure power is available to beam to a satellite a range of data, including how deep the fish go and the water temperatures they encounter. That information is then transmitted to researchers.

Because most sharks don't linger near the surface - in direct sunlight - the solar-powered tags are programmed to collect data for about six months while running on conventional batteries. Then the tags detach and float to the surface, said Mahmood Shivji, director of the Guy Harvey Research Institute, part of Nova Southeastern University.

"Now it's exposed to sunlight," Shivji said, "and it's been archiving data for six months."

Technically called "pop-up archival satellite tags," the devices can gather an enormous amount of information, so much that batteries alone would die before all the data is transmitted, Shivji said.

"If you have a solar panel, in theory, that tag should be able to transmit 100 percent of its data," he said.

Solar powered or not, tags already have provided researchers with detailed information on the [migratory patterns](#) and daily habits of different fish.

From tracking several [sharks](#) around the world, "we've discovered remarkable data on the behavior of these animals in terms of their movement horizontally as well as vertically," Shivji said.

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