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Monterey Bay Aquarium shares a treasure trove of data about young white sharks



In 2001, the Monterey Bay Aquarium wanted to better understand young white sharks so they could help them feel at home at the aquarium. Researchers had studied adult white sharks in the ocean, but they knew very little about what younger sharks were up to in their natural habitat. (Monterey Herald file)

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PUBLISHED: April 25, 2022 at 2:16 p.m. | UPDATED: April 25, 2022 at 3:46 p.m.



You're gonna need a bigger USB drive.

The Monterey Bay Aquarium and its collaborators have released a cache of data about great white sharks they've been collecting for over 20 years.

Earlier this month, an international team of scientists and aquarists led by John O'Sullivan, the director of collections at the Monterey Bay Aquarium and Chris Lowe of CSU Long Beach published a dataset (<https://bit.ly/3MvQlwU>) containing decades' worth of information about juvenile white sharks. Researchers all over the world can now use the data to help them understand where white sharks go during their seasonal migrations, what ocean conditions they prefer and how they interact with other fish. They also published a scientific paper (<https://go.nature.com/3xSAX9y>) that describes how the data was collected and organized.

"This effort really speaks to the Aquarium's mission to inspire conservation of the ocean to promote public education and awareness," said Megan McKinzie, the data coordinator at the U.S. Animal Telemetry Network, whose data center organizes and maintains data about marine animals.



Researchers had studied adult white sharks in the ocean, but they knew very little about what younger sharks were up to in their natural habitats. (Brian Phan — Herald Correspondent)

In 2001, the Monterey Bay Aquarium wanted to better understand young white sharks so they could help them feel at home at the aquarium. Researchers had studied adult white sharks in the ocean, but they knew very little about what younger sharks were up to in their natural habitats and how their seasonal migrations looked.



The team began attaching “biologgers” to young white sharks — devices that record the sharks’ movements along the coast. They also measure the depth and temperature of the water. Over the years, they’ve attached 79 devices to 63 white sharks, many of which had been accidentally caught in commercial fishing nets.

“The project started to support our exhibit program,” O’Sullivan said. “And it blossomed into a wonderful relationship with commercial fishermen, fisheries managers and research colleagues.”

The Monterey Bay Aquarium teamed up with groups who were studying young white sharks in Southern California and Baja California, Mexico. “We found that many of our sharks would head south across this invisible border,” O’Sullivan explained. “And many of their sharks headed north.” Each group had different pieces of a puzzle, and combining their datasets allowed them to put together a more complete picture of shark behavior.

After 20 years of tracking white sharks, the team realized they were sitting on a treasure chest of shark knowledge. The aquarium had answered questions about survival rates and migration patterns in young white sharks, but they knew other scientists might have different questions that could be answered with the same data. This data release allows those researchers to jump right in rather than spending huge amounts of time and money to track sharks themselves. “Scientists can take advantage of the effort we put in and find their own direction,” O’Sullivan said

To get their data out into the world, they began working with McKinzie and the U.S. Animal Telemetry Network to start organizing their data and providing information that would make it easy for other researchers to sift through.

Because this project wasn’t federally funded, the aquarium wasn’t required to share the data they collected. But O’Sullivan said that it’s important to be as open with data as possible for the good of science. “It’s the right thing to do,” he said. “Even if somebody uses our data and comes to different conclusions. That’s how science works.”

O’Sullivan said he believes the data will be helpful in the coming years, as warming oceans shift shark habitats and change the way they interact with people and other sea creatures. White sharks are listed as a vulnerable species, but they eat other protected species like sea otters. “And when that overlaps with public safety, it becomes very challenging for managers, politicians and managers,” O’Sullivan said. Now, if those groups have questions about juvenile white shark behavior, they won’t have to start from scratch.



As the aquarium tags more juvenile white sharks, they'll be able to add that data to the database. And while this is the first biologging dataset the Monterey Bay Aquarium has released, McKinzie said that she's starting to work with them on sharing more datasets. "We're hoping to get some of the other data from other species that they've tagged and tracked over time accessible for folks to use," she said.

O'Sullivan said that he's excited about the information that future biologging datasets might provide about white sharks and ocean species in general. "There are some fundamental areas that we have not even begun to understand."

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