

New study suggests that sperm whales travel together, dine alone

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Sperm whale photograph taken during Oregon State University Marine Mammal Institute's April-June 2008 field season tagging sperm whales in the Gulf of California, Mexico. Credit: Craig Hayslip

Sperm whales have long been known to be highly social creatures and a new study confirms that when a group of them travel, they tend to hang pretty close together.

But when it comes to chowing down, it appears they prefer to dine alone.

Researchers from Oregon State University's Marine Mammal Institute and the Autonomous University of Baja California Sur in Mexico tracked a group of sperm whales in the Gulf of California and found that

they spent about 30 percent of their time at the surface resting and socializing. But when they would dive for food, they each went their own way – and what a way it was.

When the whales dove in search of their preferred food – the Humboldt squid – they would sometimes reach depths of 1,500 meters, or nearly a mile below the surface. During one such dive, a whale remained submerged for more than 77 minutes.

The study, which used sophisticated "Advanced Dive Behavior," or ADB tags, allowed the researchers to gather unprecedented amounts of data on sperm whale movement, socialization and feeding and diving behavior that previously had been difficult, if not impossible, to obtain.

Results of the study have just been published in the journal *Ecology and Evolution*.



Sperm whale photo from February 2009 field season in the Gulf of California, Mexico to resight tagged animals. Credit: Craig Hayslip

"We are now learning things about sperm whales that we just didn't have access to before," said Ladd Irvine, a researcher with OSU's Marine Mammal Institute and lead author on the study. "Unlike many other terrestrial and marine mammals that form social groups, sperm whales seem to prefer foraging as individuals. They would stagger both the starting time and the depths of their dives."

The study is important, researchers say, because sperm whales have been notoriously hard to study – in part, because they spend a lot of time underwater and dive to great depths. Technological limitations had precluded researchers from gathering continuous behavior data on them for more than 24 hours at a time until the ADB tags were developed by OSU and Wildlife Computers. The tags can record high-resolution diving depth data as well as GPS locations.

"The ADB tag is pretty revolutionary," said Bruce Mate, director of OSU's Marine Mammal Institute and co-author on the study. "The technology has made whales our partners in acquiring data to better understand ocean conditions and climate change. It shows us what the whales do underwater; when, where and how they feed; what water temperatures they prefer; and how they might be affected by passing ships or other noises."

With the ADB tags, the researchers were able to track individual sperm whales for as long as 35 days. They discovered whales make six different types of dives – two shallow dive types and four deep [dive](#) types. About three out of every four dives were deep dives, they say, likely related to foraging.

"This information is extremely valuable as it reveals how sperm whales allocate their energy resources to different activities such as feeding, resting and socializing over time," Irvine said. "This simply wasn't possible before. Now biologists can compare this information across

years, or regions, to infer how [sperm](#) whale populations respond to external forces such as food availability or predation risk."



Researchers monitoring a whale. Credit: Craig Hayslip

Irvine said the researchers also tracked [sperm whales](#) diving to the ocean bottom and "in some cases they appeared to be following the seafloor."

The number of dives to the ocean bottom that the [researchers](#) documented suggests this might be more common than previously

thought, they pointed out. The dives likely are related to searching for prey.

"One of the things we'd like to explore is whether they were following the seafloor in search of Humboldt squid, or they were searching for other prey," said Daniel Palacios, a principal investigator with the Marine Mammal Institute and co-author on the study. "Sperm whales in other parts of the world will sometimes eat large, bottom-dwelling fish like black cod – even to the point of taking them off fishermen's longline gear.

"So it's possible that these deep, bottom-associated dives represent the [whales](#) looking for alternative prey."

More information: Ladd Irvine et al. Sperm whale dive behavior characteristics derived from intermediate-duration archival tag data, *Ecology and Evolution* (2017). [DOI: 10.1002/ece3.3322](https://doi.org/10.1002/ece3.3322)

Provided by Oregon State University

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