Dolphin genetic study provides revelations

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This is a mom and calf in Indian River Lagoon. Credit: Stephen D. McCulloch, Florida Atlantic University

The old saying goes: "Don't judge a book by its cover." Well, the same could be said about bottlenose dolphins.

Bottlenose dolphins are the most common and well-known of their kind – famous in TV and movies. And while one bottlenose dolphin might look similar to another, when you take a closer look at them (really close, as in genetically,) there are differences. In fact, a recently

published study in the *Journal of Heredity* (Vol. 104, pp 765-778) focused on groups of these animals that live in specific areas along the eastern seaboard of the United States, comparing them to other bottlenose dolphins that live offshore, in the northwest Atlantic Ocean, Gulf of Mexico and the Caribbean.

Specifically, the study looked at bottlenose dolphins that lived within the Indian River Lagoon (IRL) on Florida's east coast. The IRL runs from the Jupiter Inlet at the south to the Ponce de Leon Inlet to the north. Those animals were studied from a habitat and behavioral perspective as well as genetically, with some surprising results.

"It certainly took a while for the research to be conducted, data compiled and the findings to be confirmed and published, but it was worth the wait," said Jose Lopez, Ph.D., a professor at Nova Southeastern University's Oceanographic Center who was with FAU when the study began. "This was truly a collaborative effort, with experts from across the globe participating – and what we found was really fascinating."

The nearly decade-long study was a team effort that involved Nova Southeastern University, Florida Atlantic University's Harbor Branch Oceanographic Institute (HBOI,) the National Oceanic and Atmospheric Administration (NOAA); Cornell University; National Institutes of Health; and the University of Durham in England.

These are mom and calf wave riders in Indian River Lagoon. Credit: Stephen D. McCulloch, Florida Atlantic University

"Overall, this highly collaborative study now establishes a genetic baseline for the IRL dolphin population," explained Steve McCulloch, HBOI MMRC program manager. "It can be used as a foundation for future genetic studies and to assist environmental and stock management of the iconic species."

This first-of-its-kind study revealed that within the IRL, there are two different, distinct populations of bottlenose dolphins living in the waters. After the data were analyzed, researchers were able to determine that these two, genetically different groups were divided along a north-south geographic area of the IRL. Along with identifying genetic differences in the animals within the IRL, when compared to bottlenose dolphins that live in other areas, including the open oceanic waters, additional differences were found.

"This study shows evidence that while it may appear that the bottlenose dolphins within the IRL look the same, from a genetic – and geographic standpoint – there are differences," Lopez said. "It's akin to the Hatfields and McCoys or Capulet/Montague stories, that is, different families that are unmistakably of the same species, but for whatever reason living apart. As we work to protect the IRL, this study provides baseline data moving forward as we continue to monitor and study the wildlife that call the area home."

While there were many findings identified, this study also provides important management implications since it's clear the role of the habitat, and subsequent modifications, can directly shape bottlenose dolphin structure.

Provided by Nova Southeastern University