



Penny Mae



TIGER SHARK EXPEDITION

May 2014

EXPEDITION OVERVIEW

Sharks are a major apex predator in the oceans and play an important role in the food chain, and therefore ecosystem. Understanding shark behavior, especially reproductive behaviors, is vital to maintaining shark species and thus a healthy marine ecosystem. Using satellite and acoustic tags to track shark movements and evaluate behavioral patterns can reveal where sharks are mating, gestating or giving birth. Additional analyses of blood and skin samples can provide information on a shark's health and stress levels. Tiger Beach, Bahamas is a well-known female tiger shark aggregate and is a popular site for tourist shark diving. This location is the only place in the world known to have such an abundance of female tiger sharks, making it an incredible location to study female shark behavior.

The International SeaKeepers Society teamed up with researchers from the R.J. Dunlap Marine Conservation Program at the University of Miami, Florida Biodiversity Institute and *M/Y Penny Mae* to study tiger sharks in the Bahamas. *M/Y Penny Mae* served as a base of operations for the expedition and the crew assisted the shark science team in the field to successfully catch and release 15 female tiger sharks during the one-week expedition at Tiger Beach, Bahamas.

GOALS

- Determine reproductive strategies and mating behaviors of tiger sharks
- Identify mating and pupping locations
- Examine tiger shark health
- Implement shark conservation practices and reserves based on scientific findings

METHODOLOGY

At the beginning of each day, several weighted drum lines are baited and placed throughout the study area. Each line is checked regularly for sharks. If a tiger shark is on the line, it is hand reeled onto a custom-made shark tagging platform, which was designed and built by Florida Biodiversity Institute specifically for this purpose. Each shark is restrained on the shark platform, and remains partially submerged in water with a water pump inserted into the shark's mouth to provide continual, oxygen-rich water flow over the shark's gills. The science team then takes several measurements and samples as well as tags the shark before releasing it back into the ocean.



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1. Tagging

The science team uses both satellite tags and acoustic transmitters to tag sharks. Since satellite tags are so expensive, only a select few sharks receive these tags. All tiger sharks receive acoustic transmitters. These transmitters are surgically placed just under the shark's skin. The acoustic tags send out a signal that can be received by hydrophone receivers that have been installed on the seafloor around Tiger Beach.

2. Morphology

Several morphological measurements are taken, including overall length, dorsal and pectoral fin sizes, etc. These measurements can tell scientists a lot about shark movement as well as growth if a shark is recaptured at a later date. Documenting mating scars is also important.

3. Blood and fin clip samples

Examining blood and muscle samples can inform researchers on everything from the health and stress levels of a shark to the shark's diet.

5. Ultrasound

A portable ultrasound is used to detect the absence or presence of pups. The ultrasound technician can also determine how many pups are in a pregnant female.

CONCLUSION

The research team successfully caught, tagged & released 15 tiger sharks. The researchers took blood samples, morphometric measurements, and conducted ultrasounds on all 15 sharks. Additionally, acoustic tags were implanted in 13 of the sharks, three of which also received satellite transmitters. Of the 15 captured sharks, one was a recapture from a previous shark tagging expedition in October 2013, and had since given birth, providing scientists with exciting data and a way to learn more about where the birth occurred. The yacht and crew of *M/Y Penny Mae* proved to be a huge asset and an invaluable part of the operation.

PRESS AND ADDITIONAL INFORMATION

Press surrounding this expedition was significant in the yachting community, including coverage in MegaYacht News, Charterworld, and Dockwalk as well as social media sites.

Data collected from this expedition will be presented in a number of scientific publications and conferences to share with research colleagues. Satellite tag data is made publicly accessible online.

Websites

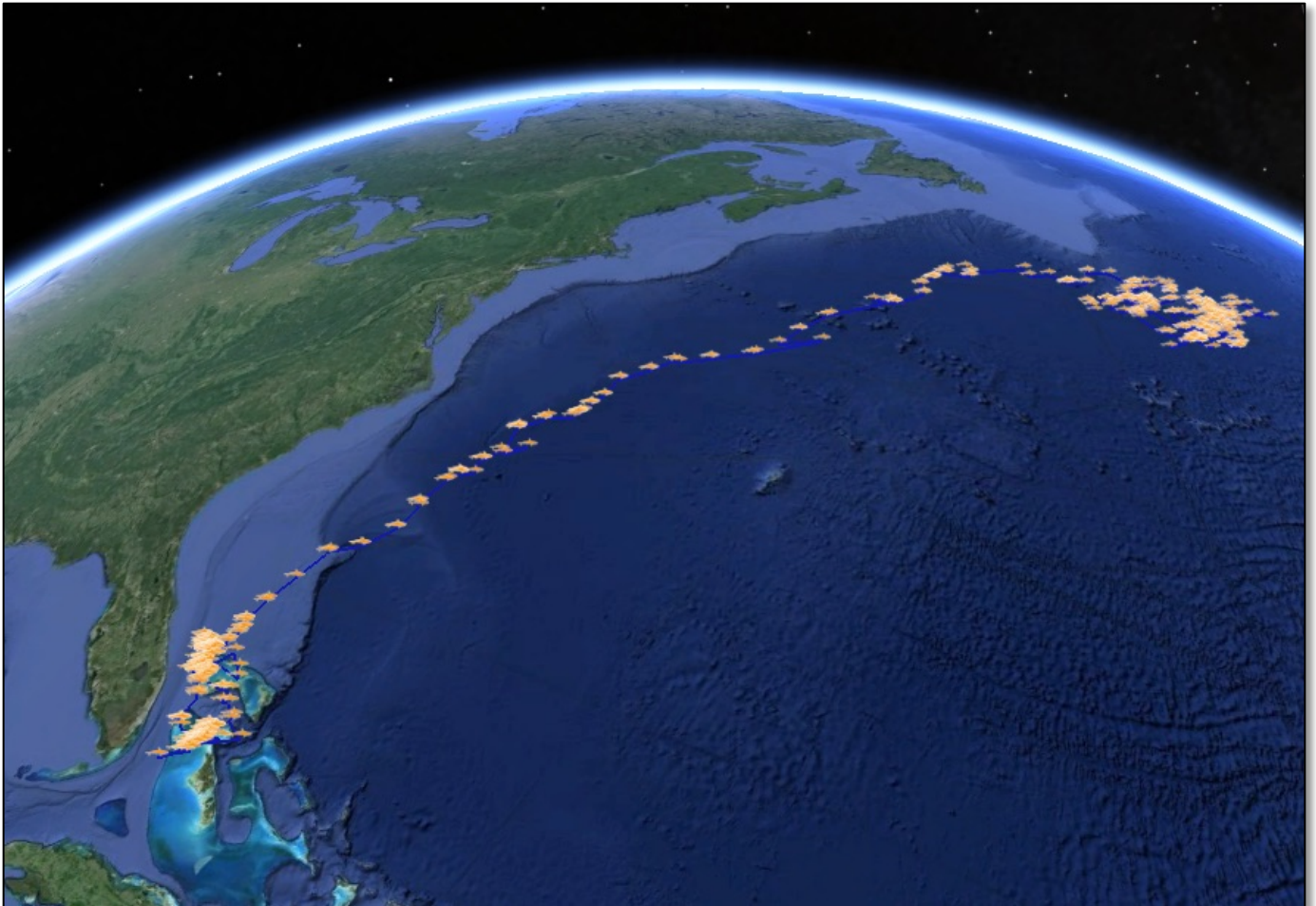
seakeepers.org
rjd.miami.edu
my-pennymae.com
oceanfbi.com

PHOTO GALLERY



SATELLITE TRACKING

Satellite tags from May's expedition have since offered a very unique window into the migration patterns and movements of these sharks. Here is one interesting track of one of the tagged sharks during the May 2014 expedition showing that the shark was initially tagged in the NW Bahamas but has since gone north offshore the United States to the North Atlantic near New Foundland.



Species:	Tiger Shark
Scientific Name:	Galeocerdo cuvier
Date Tagged:	May 12, 2014
Location Tagged:	Tiger Beach, Bahamas
Total Length:	352 cm
Sex:	Female

These tracks can be followed in real time here:

<http://rjd.miami.edu/education/virtual-learning/tracking-sharks/spez>

<http://rjd.miami.edu/education/virtual-learning/tracking-sharks/sebastian-abess>