

State Marine Biologists Track White Sharks from Commonwealth to the Georgia Coast and Gulf of Mexico

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BOSTON - June 07, 2011 - State marine experts from the Department of Fish and Game's (DFG) Division of Marine Fisheries (DMF) have tracked four white sharks that were tagged off the coast of Cape Cod last year, documenting the migration of one to waters off the coast of Georgia and another to the Gulf of Mexico.

"The ability to track these animals over a great distance will help biologists learn more about the habits and patterns of white sharks that visit our waters," said Energy and Environmental Affairs Secretary Richard K. Sullivan Jr. "I applaud the efforts of this research program, which brings us a greater understanding of these captivating creatures of the deep."

Under the direction of Greg Skomal, DMF project leader and fisheries biologist, six white sharks - ranging from 10- to 18-feet in length - were tagged off the coast of Monomoy Island from late July through mid-September of 2010.

Five of these sharks were tagged with Pop-up Satellite Archival Transmitting (PSAT) tags programmed to transmit data during the winter months.

The remaining shark was tagged in August with an acoustic transmitter, which allowed project members to track fine-scale movements in the waters around Monomoy and Chatham. The acoustic transmitter emits a ping that is detected by receivers, which log the date and time of the detection. Data is then uploaded from the receiver. This technology makes it possible to examine the extent to which white sharks utilize an area relative to tide, time of day, and other factors such as water temperature. DMF has been using this technology to track the movements of other species, including striped bass, codfish, sand tiger sharks, and horseshoe crabs for several years. There are several acoustic receiver arrays situated throughout state waters and along the eastern seaboard. For this study, four additional receivers were placed from the southern tip of Monomoy to Nauset Beach.

Although most of the detections of the white shark were during daylight hours, the movements of the shark tagged with the acoustic transmitter did not appear to coincide with any particular tidal stage. Remaining in the area for approximately three months, this shark intermittently travelled from Monomoy to the Chatham Inlet until November 7.

"The Division of Marine Fisheries' shark research program is a great example of cutting-edge science improving our understanding of sharks and other wildlife," said DFG Commissioner Mary Griffin.

Of the five PSAT tags, one tag did not report, two tags jettisoned prematurely (one off the coast of Monomoy in September; one off Hatteras, N.C. in October), and two tags reported as programmed. Of those, one shark had made its way to the Gulf of Mexico in January, and the other shark was tracked to an area 200 miles off the coast of Georgia in April. The white shark that migrated to the Gulf of Mexico spent the first two weeks of December in the waters off northern Florida before moving through the Straits of Florida to the Gulf. The tag that popped up off the coast of Georgia was affixed to an 18-foot mature female. This shark's movements did not follow the contour of the Continental Shelf, and tag data indicated the shark dove to depths as great as 2,700 feet every day - in sharp contrast to the behavior of other tagged sharks. Skomal believes this deep diving more closely mimics the behavior exhibited by white sharks off the west coast of North America when they leave coastal feeding grounds.

The advent of new satellite-based tagging technology has allowed the research team to examine the movements,

habitat use, and behavior of white sharks. In contrast to standard satellite tags, these tags do not transmit real-time positions, but instead collect and store temperature, depth, and light level data. At a time programmed by the researcher, the tag pops off the shark, floats to the surface and transmits archived data to satellites. Data are then relayed back to researchers. The three-dimensional movements, including migration paths, depths, and temperature preferences of sharks can be recreated based on those data.

"The Division of Marine Fisheries has received a number of generous donations from various foundations and private citizens interested in supporting our shark research activities," said Paul Diodati, DMF director. "These contributions are much appreciated and will be used to improve our understanding of white sharks."

This year, \$68,900 was donated to the program by the Sacco Foundation, Save Our Seas Foundation, Discovery Communications LLC, Coastal Conservation Association, Cape Cod Salties Sportfishing Club, John Whalen and David Eldredge.

In 2004, DMF attempted to place a PSAT tag on a great white shark that was stuck in a shallow estuary at Naushon Island off Cape Cod. While DMF's Skomal and his team were able to place a tag on that shark, the device malfunctioned and detached prematurely from the animal shortly afterward without acquiring any data. In 2009, the team tagged five sharks in waters off of Chatham - tracking three to the coast of North Florida.

Since 1987, the DMF shark research project has been compiling data on white sharks sighted off the New England coast. From the data collected - in particular the tagging results from 2009 and 2010--and other historical sightings, it appears that white sharks are most abundant on the continental shelf between Massachusetts and New Jersey during the summer and off Florida's east coast during the winter.

Despite its well-established presence in the North Atlantic, the white shark is considered an elusive species and efforts to study its life history and ecology have been hampered by the inability of researchers to predictably encounter these sharks. Much of what is known of this species comes from the analysis of distribution records, rare behavioral observations and the examination of dead specimens. According to Skomal, white sharks are known to feed on seals and sea lions and researchers speculate that they may be attracted to Massachusetts coastal waters to hunt the growing population of gray seals that migrate here annually.

State officials stress that beachgoers should use common sense and be aware of their surroundings. DMF advises swimmers to avoid swimming at dawn or dusk, stay close to the shore and avoid areas where seals congregate. DMF also points out, however, that shark attacks on humans are rare. The last one off the coast of Massachusetts occurred in 1936.

Given the recent increase in shark sightings, the DMF shark research project plans to continue its ongoing research, enhancing its ability to advise local authorities, study the life history and ecology of this species, and improve state and federal shark management. Such studies will continue to focus on the collection of shark sighting data as well as the deployment of electronic tags.

White sharks are predators that may play an important role in controlling the populations of important prey species. As juveniles they consume primarily bony fishes, but shift to larger prey when they grow in excess of 10 feet. Their prey includes other sharks, seals, sea lions, dolphins, porpoises, and blubber scavenged from whale carcasses. White sharks are thought to grow to lengths in excess of 22 feet, but the largest reliably measured was 21 feet. Females mature between 14 to 17 feet and males between 12 to 14 feet. The maximum accurately recorded weight is close to three tons. Their estimated lifespan can be over 30 years.

Funded by several federal grants, DMF's shark research program is one of ten marine fisheries research programs funded through DMF's Recreational Marine Fisheries program. [Click here for more information about the DMF's shark research program.](#)

The Department of Fish and Game (DFG) is responsible for promoting the enjoyment and conservation of the Commonwealth's natural resources. DFG carries out this mission through land preservation and wildlife habitat

management, management of inland and marine fish and game species, and enforcement of the Massachusetts Endangered Species Act. DFG promotes enjoyment of the Massachusetts environment through outdoor skills workshops, fishing festivals and other educational programs, and by enhancing access to the Commonwealth's lakes and ponds.

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