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Tagged Loggerhead Sea Turtles Follow Pattern, Except For George

Researchers, including staff from NOAA's Northeast Fisheries Science Center, tagged 15 juvenile and adult loggerhead sea turtles May 16-21 in Mid-Atlantic waters, including one in the Gulf Stream. Eight turtles were also filmed by a remotely operated vehicle, or ROV. The work is part of an on-going effort begun in 2009 to learn more about loggerhead turtle movements and behavior.

The team included Heather Haas, Henry Milliken, Eric Matzen, Joshua Hatch and Annamaria Izzi from the Northeast Fisheries Science Center (NEFSC)'s Woods Hole Laboratory, as well as Ron Smolowitz, Samir Patel and Shea Miller from the Coonamessett Farm Foundation (CFF) in East Falmouth, Mass. The research team worked with the captains and crews from two commercial sea scallop vessels, the 91-foot F/V *Kathy Ann* and the 85-foot *Ms Manya*, both based in Barnegat Light, New Jersey.

"We went out about two weeks earlier in the season this year, and still found many turtles, despite the cold 13 degree Celsius (13°C, or 55.4°F) waters. Our field work is usually timed to match the beginning of the turtles' migration into waters north of North Carolina," Haas said. "When we tag early in the migration, we can sample from a single location but still capture turtles that are destined for many different foraging areas."

After capturing 14 turtles on the Mid-Atlantic shelf, the researchers headed further offshore into the edge of the Gulf Stream. They captured and tagged one loggerhead there and named him (or her, since the sex is unknown) George, for Georges Bank. Unlike the other tagged turtles that stayed on the shelf, George traveled along the Gulf Stream and hopped off into an offshore warm core ring, now south of Martha's Vineyard. Researchers are not sure why George's migration was different from the rest, but have an idea. He could be a "teenage" turtle.

The researchers also deployed an ocean surface drifter made by Falmouth High School students. The drifter data, collected by NEFSC oceanographer James Manning, will add to information that helps ground truth ocean surface circulation models.

Eight loggerhead turtles were also filmed with a remotely operated vehicle, including one from the surface to the ocean bottom. Typical waters depths were 50-60 meters (roughly 160-200 feet deep).

The earlier time frame for this year's tagging and sampling trip was evident. "All the turtles were very cold, with body temperatures around 13 degrees C (55 degrees F)," Haas said. Turtles can become cold stunned (unable to move) due to cold temperatures but the subsequent tracks of these tagged turtles shows that they survived the cool waters of their early spring migrations.

Aboard the F/V *Kathy Ann*, the 15 loggerheads were individually weighed, measured, and had biological samples taken. Each was outfitted with a satellite-linked data logger, or satellite tag, and with more conventional flipper and PIT (passive integrated transponder) tags, and then released back into the ocean. Most of the turtles were out of the water for less than an hour.

Sampling included a cloacal lavage with a saline solution to collect specimens for a number of studies. One of those studies is looking for the presence of nematodes, a type of worm found in some scallop meats. Loggerhead diets include scallops, other bottom-dwelling animals, and gelatinous zooplankton.

Veterinarian Roxanna Smolowitz of Roger Williams University has positively identified eggs from the *Sulcascaris sulcate* nematode from the lavage samples. Researcher Mike James at Canada's Department of Fisheries and Oceans and Amanda Southward-Willard of the University of North Carolina, Wilmington are collaborating with NEFSC researchers to conduct health assessments by comparing healthy turtles with those caught as bycatch in fishing gear.

The biological samples collected from the turtles for genetic and health assessment studies will also be analyzed to assess sex and foraging behavior. Some of the results will be available within weeks, while other findings will require months to produce. The tags, however, work from the time they are submersed in salt water. Since large juvenile and adult turtles grow slowly, the tags could remain on these animals for many months, and possibly a few years.

A portion of the tagging project is funded from an award to CFF through the sea scallop industry's research set-aside program and provides an opportunity for the research organizations to collaborate on research of long-term interest. The multi-agency Atlantic Marine Assessment Program for Protected Species (AMAPPS) initiative provides supporting funds.

Over the past eight years, the collaborative project has satellite tagged approximately 150 loggerhead turtles in the mid-Atlantic. Many of the tagged turtles can be tracked on the NEFSC's turtle tagging web site at: <http://www.nefsc.noaa.gov/psb/turtles/turtleTracks.html>

The satellite tags provide detailed information about turtle behavior at sea, especially in commercial fishing areas where juvenile loggerheads are the most common incidentally-caught sea turtle in fishing gear. The information gathered from the data loggers can be used to define areas where turtles are most at risk of encountering fishing gear. Loggerheads, like all sea turtles found in U.S. waters, are protected under the Endangered Species Act.

In 2015, the research team from NEFSC and CFF tagged 10 loggerhead turtles during three research trips. Two of those trips took place aboard the F/V *Kathy Ann*, departing for one trip from Barnegat Light and once from Woods Hole, and one trip aboard the 209-foot NOAA Ship *Henry B. Bigelow*. During the June 23-July 2, 2015 trip aboard the *Bigelow* the researchers focused their work on Georges Bank, deploying two satellite transmitters on loggerheads.

Although loggerheads have been sighted in the area before, no turtles have been tracked with high quality satellite tags that far north and offshore during the summer months.

Researchers think George and other loggerheads they hope to find later this summer on a trip in the Georges Bank area may be younger and smaller than those they find further south. Being able to tag and obtain samples from some of these turtles who are much further north and in offshore waters would provide additional information on migration habits and behaviors.

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Related links:

Sea Turtle research at the NEFSC: <http://www.nefsc.noaa.gov/psb/turtles/>

Loggerhead Turtles: <http://www.nmfs.noaa.gov/pr/species/turtles/loggerhead.html>

2015 Satellite Tagging of Loggerhead Turtles: <http://coonamessettfarmfoundation.org/2015-satellite-tagging-of-loggerhead-sea-turtles/>

Scientists Tag 19 loggerhead Turtles off Mid-Atlantic Coast (2014):
http://www.nefsc.noaa.gov/press_release/pr2014/scispot/ss1407/

Coonamessett Farm Foundation – Research Projects:
<http://coonamessettfarmfoundation.org/research-projects/>

2016 Drifter Tracks: <http://www.nefsc.noaa.gov/drifter/>