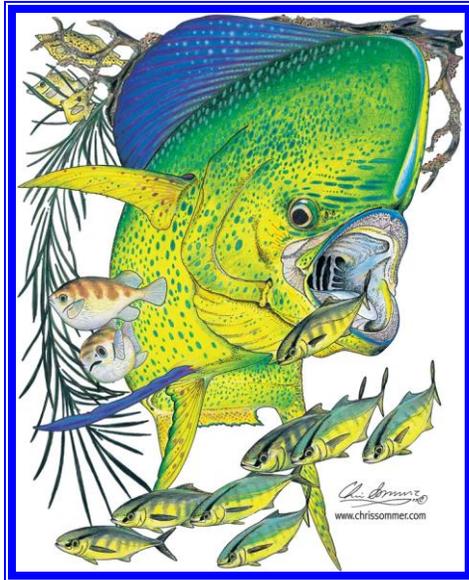


Cooperative Science Services, LLC Dolphinfish Research Program

Made possible by a grant from Costa Del Mar

March 2013



A 43-inch female dolphinfish swims off with a satellite tag in tow that would later show her to use water temperatures from 75.7 to 85.8°F and make dives to depths as deep as 538 feet. Photo by Wess Merten.

San Juan Fish Is a Wealth of Information

On November 10, 2012, Wess Merten, a graduate student at the University of Puerto Rico and assistant on the DRP, joined Capt. Manuel Botello's crew of Irvin Baez and Alexis Alfalla aboard the *Missing Angel* for a fishing trip off San Juan, Puerto Rico, to tag dolphinfish. In addition to deploying conventional streamer tags on dolphin, this trip also had the challenge of catching a fish at least 25 pounds in size that could carry a satellite tag.

As luck would have it, only the satellite tag was deployed this day. At 12:25 local time, a 43-inch female dolphinfish was released carrying the fifteenth pop-off satellite tag to be attached to the species. The tagging process requires the fish to be brought into the boat using a dipnet where the instrument is quickly attached and the fish is lowered back into the water. Once in the water, the fish is slowly led along beside the boat until it regains strength. Only then is it released, exposing it to the ever-present predators that inhabit the deep blue waters.

This fish represents many milestones in the study of this great game fish. It is the first of its species to carry a satellite tag off the northern coasts of the Caribbean Islands. This fish is only the second female dolphinfish to be fitted with the high-tech instrument and is the first cow to carry the tag for the full 30-day monitoring period. Its travel also represents the longest distance moved by a dolphinfish tagged off Puerto Rico.

Having recorded the temperature and depth at roughly five-minute intervals for 30 days, the tag released itself

from the fish and floated to the surface at 7:16 pm on December 11, 2012. It drifted on the surface for seven hours before making first contact with an ARGOS satellite, at which time it was located 45 miles north northeast of the northeastern tip of Cuba. The instrument would spend the next 19 days transmitting its archived data as it drifted on the ocean's surface.

The tag surfaced 520 miles west northwest of its release site, showing the fish had traveled half the distance to the Florida Keys from San Juan during its 30 days of liberty. This movement follows the westerly pattern set by seven recoveries of fish tagged off the north coast of Puerto Rico using convention tags. A similar westerly movement

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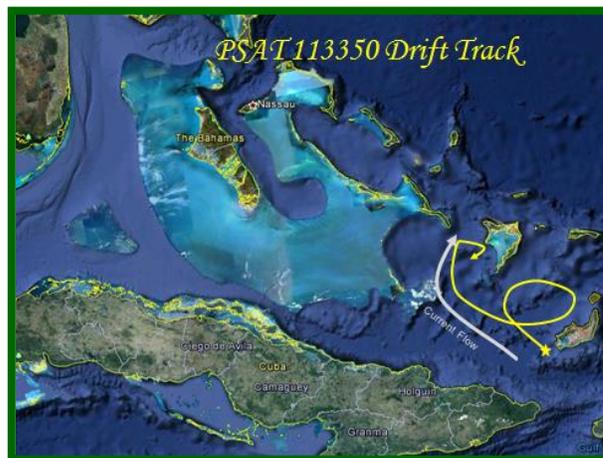


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pattern has been shown by fish on the south coast. These recaptures involved fish that were originally tagged during the months of September, November, December and January, which make up the major portion of the dolphin season off Puerto Rico's north coast. The documented movement by fish from the north coast suggests that dolphin depart Puerto Rican waters in a westerly direction following the deep trench between the Bahamas Bank and the Caribbean Islands ultimately ending in the Florida Straits off the Keys.



Satellite tags offer researchers a bonus in hydrographic data. They provide data on the speed and direction of prevailing surface ocean currents in the area where the instrument surfaces. Each time the unit contacts a satellite to transmit data, a GPS position is recorded for the unit's location. The figure above shows the 19-day, 344-mile drift of the tag after it separated from the San Juan fish.



All tagged fish recoveries have indicated dolphin are traveling west as they pass Puerto Rico. In the figure above red arrows represent satellite tag tracks while green arrows are streamer tags movements.

While all of the documented movements have been in the same direction, the rate at which the fish travel has varied widely. The range in travel speeds observed for dolphin tagged off Puerto Rico has run from 18.1 to 0.9 miles per day. During the same period when the fish with the satellite tag was traveling westward at 17.3 miles per day, a smaller dolphin released off San Juan and out for 30 days traveled westward at less than one mile per day. The difference may be explained by the locations where the fish were released. The fish carrying the satellite tag was released 31 miles offshore, well out into the main current off the island, while the small fish was released seven miles from shore. It is common to find minor currents near land masses that behave differently from the area's dominant offshore current. The smaller fish could have been in such a current that moved at a much slower pace.

This large cow dolphin has provided a wealth of information on the temperatures that it utilized and its varied use of the water column. The instrument transmitted more than 7,600 observations that were recorded during the 30-day period. This mass of data will require many days to filter through before we get a comprehensive understanding of what was going on. We do see immediately that this fish engaged in more deep diving during the first half of the monitoring period than the second half. It made more deep dives at night than during the day, and it utilized depths below 100 feet far more frequently than did the dolphin tracked off the south coast of Puerto Rico in 2011.

The information gathered by this instrument is adding volumes to what we know about the species that could not have been gathered more economically in any other fashion. This data significantly strengthens the case for the Old Bahamas Channel being a major route for dolphin entering U.S. territorial waters in the Florida Straits.

Gathering the Evidence

During the ten years of research, dolphin tagged off the U.S. Atlantic coast have shown up in the Caribbean with regularity. While East Coast dolphin have shown up in the Caribbean as far west as Mexico and southward to Venezuela, most recoveries have come from the northeastern corner of the Caribbean Sea. East Coast fish have also been recovered off the north coasts of the Dominican Republic and Cuba.

The Dolphinfish Research Program needs your financial support. No federal funds support this important research. This program exists because of private donations.

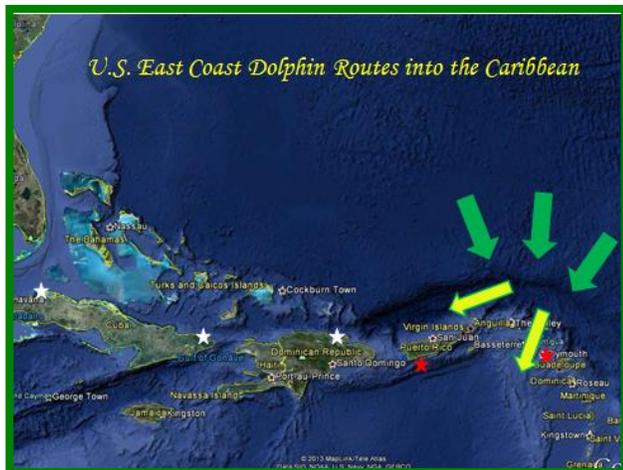
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Collectively, these tag recoveries establish a link between fish in the two areas. While the majority of the recoveries, eight out of eleven, occurred in the three-month period of February through April, others have occurred in December (two) and in May (one). This demonstrates that most Caribbean recoveries occur during the time when dolphin are at their lowest abundance or even absent off the U.S. East Coast.



Recaptures of tagged dolphin (shown as stars), indicates that fish from U.S. waters show up along the northeast corner of the Caribbean Sea (green arrows). At this point, some fish move along the Atlantic shores of the northern islands while others enter the Caribbean Sea (yellow arrows).

Dolphinfish Research Joins Global Network

The DRP can now be found on Facebook and Twitter, thanks to the effort of Wessley Merten, a student at the University of Puerto Rico, who collaborates on dolphinfish research with the DRP. Wess, who is finishing up his PhD degree has been working with the DRP since 2011 and heads up the DRP research effort in the Caribbean. He will be posting information about recent happenings in the program and about upcoming events involving the DRP.

Please join us on Facebook and Twitter to find out the latest news on the program.

 **Fan page: Dolphinfish Research Program**
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Dolphin are known for their strong schooling instincts. However, male dolphin, called bulls, adopt a solitary life style once they reach about 38 inches in fork length. Large bulls commonly escort schools of females, staying at a distance from the school but within visual contact. Photo by Sergio, Brazilian Marine Fisheries.

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