# SATELLITE TRACKING CONFIRMS THE USE OF STABLE ISOTOPES TO INFER FORAGING GROUNDS OF LOGGERHEAD TURTLES (*CARETTA CARETTA*) NESTING ON FLORIDA'S EAST COAST*

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Loggerhead nest numbers in Florida, home to 90% of loggerhead nesting in the southeastern U.S., have been declining since 1998 for unknown reasons. One hypothesis proposed for this decline is a change in foraging that could lead ultimately to a change in reproductive parameters. We explored the link between foraging ecology and reproduction to gain more information on adult foraging behavior and locations of key foraging grounds, which is essential for the development of appropriate management strategies. We also investigated the effectiveness of stable isotopes to trace foraging ecology and migratory routes. Loggerheads (n=13) nesting at the Archie Carr National Wildlife Refuge were fitted with satellite tags, and tissue samples were collected for carbon and nitrogen stable isotope analysis. Telemetry identified three major migratory pathways and associated foraging grounds: (1) a seasonal shelf-constrained North-South migratory pattern between Virginia and North Carolina, (2) a year-round residency in southern foraging grounds and (3) a residency in the waters adjacent to the breeding area. Half of the individuals we tracked moved north, demonstrating for the first time that the mid-Atlantic coast of the United States represents an extremely important foraging ground for the Peninsular Florida Recovery Unit. Both δ13C and δ15N signatures differed among groups associated with foraging areas. Post-hoc analysis revealed that each migratory group differed in δ13C, while δ15N differed only in loggerheads of southern foraging grounds. No tracked females left the continental shelf, suggesting that isotopic differences among females may not be attributed to a neritic/oceanic strategy. On the contrary, we found a North-South latitudinal gradient in δ13C isotopic values, with northern individuals being the most 13C depleted and southern samples the most 13C enriched. This suggests that a latitudinal gradient may play a relevant role in explaining differences in isotopic signatures among females nesting at the Carr Refuge. We also investigated the relationship between fitness parameters and foraging strategies. Females using northern and southern foraging grounds were larger than individuals residing in proximity to the breeding ground, but northern and southern groups did not differ from one another. We found no differences in clutch size among groups after correction for body length. For seven of the 13 females with tagging history, no differences in remigration interval were found among migratory groups. Stable isotopes hold great promise when used as intrinsic markers to trace foraging habits and migratory connections, but several assumptions still need to be tested to interpret isotopic patterns found in the marine realm. Our results suggest that stable isotope analysis can be used to infer foraging strategies and residence areas for loggerheads nesting on Florida's east coast in lieu of more expensive satellite telemetry. We suggest using stable isotopes to assign turtles to foraging regions, allowing population-level estimates of reproductive parameters among foraging areas.