telemetry is a powerful technique to generate high-quality data on animals' locations and a multitude of diving profile parameters. State-space models have evolved over the years and are effective for the estimation of behavioral states. However, for species like the leatherback turtle (*Dermochelys coriacea*), whose prey can move dynamically with the oceanic currents, the definition of behavioral states is not as clear as for other species. Here, we present an innovative approach that integrates telemetry data (horizontal and vertical movements) to more accurately distinguish behavioral states, especially migration and foraging behaviors. During the 2024 nesting season, seven nesting leatherback turtles were instrumented with SPLASH10-F-295 tags from Wildlife Computers in Comboios Beach, Espirito Santo, Brazil. Haulout events, validated by cross-referencing three data sources (i.e., telemetry csv files DDN/DryDeepNeither, FastGPS and HaulOut) were combined with nesting beach patrolling records to inform nesting events. We further used a state-space model to regularize tracks in 6-hour intervals using the package aniMotum, matching the dive profile summaries. Latent behavioral states were estimated using displacement, step length, distance from the coast, turning angle, maximum dive depth and nesting events with a mixed-membership movement model (M4 package) that segments tracks and clusters segments. The proportion distribution within each cluster was inspected for biological interpretability, and those exhibiting similarities were merged, resulting in the estimated latent behavioral states across track segments. Results from M4 were compared with the behavioral index from the move persistence model (aniMotum) using multiple cutoff thresholds. Results demonstrate clearer spatial and temporal delineations of migration and foraging areas from M4 model compared to fixed move persistence index cutoffs. We were able to clearly identify distinct migrating patterns, one mostly over the continental shelf between southeastern Brazil and the Plata River estuary between Uruguay and Argentina, and another in oceanic waters towards Tristan da Cunha. We also identified distinct foraging behaviors based on maximum dive depths, including shallower (within 50 m) and deeper (between 100-800 m). Three foraging areas were delineated: 1) over the southeastern Brazilian continental shelf, between Rio de Janeiro and Santa Catarina states, 2) over the continental shelf around the Plata River estuary, and 3) west of the Tristan da Cunha Island. This methodological advancement provides a scalable and transferable framework for sea turtle research worldwide. Beyond improving the resolution of behavioral studies, it offers practical implications for management, including more precise identification of habitats for protection, potential overlap with threats (e.g., fishing effort, industrial activities), and enhanced capacity to evaluate the effectiveness of conservation measures over time. By combining movement and dive data in a cluster-based framework, our approach goes beyond the binary output of traditional state-space models, identifies multiple behavioral states, clarifies migration routes and foraging hotspots, and directly supports spatial management of leatherback turtles.

SEA TURTLE SURVEYS AND SATELLITE TRACKING IN PEARL HARBOR, O'AHU, HAWAI'I, USA*

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Pearl Harbor is a geographically protected lagoon located on the Hawaiian island of O'ahu. For approximately the past 120 years, Pearl Harbor has been the site of the largest U.S. Joint Air/Navy base in the Pacific Ocean. Despite substantial environmental degradation, Pearl Harbor continues to be a resource rich habitat of important marine species. These include green (*Chelonia mydas*) and hawksbill (*Eretmochelys imbricata*) sea turtles. The Navy is required to manage and protect sensitive biological resources mandated by the Sikes Act of 1960, and has conducted various visual surveys of sea turtles within Pearl Harbor. Although the previous surveys provide important insights into the distribution of these turtles, due to the limitation of their non-capture approach, detailed information on sea turtle movements, spatial ecology and habitat use remains lacking. To fill these data gaps, NOAA was tasked with conducting fieldwork to better understand sea turtle movement ecology in Pearl Harbor. In this study we outline the methods and preliminary results of this research, which represents the first attempt to satellite track sea turtles in Pearl Harbor. Given both the military relevance of the area and the ESA threatened or endangered status of the sea turtles, this study has important implications to future development and management efforts in the region. Snorkel survey transects were conducted using a small boat along coastal waters within Pearl Harbor. Whenever feasible, turtles were captured while freediving and immediately brought up to the surface and lifted into the boat to be processed following standard protocol. Satellite tags (Wildlife Computers SPOT and SPLASH tags) were applied with fiberglass and two-component epoxy, and covered with anti-fouling paint. During six survey days, 115 turtles were encountered, 85 of which were solely observed, and 30 were captured. One of the encounters was a hawksbill turtle, while all others were green turtles. All 30 captured turtles were green turtles, 22 of which were equipped with satellite tags. The average tag duration was 135.8 days (SD = 80.1 days), with a minimum of 13 days and a maximum of 295 days. Two tracked turtles fully exited Pearl Harbor; one large sub-adult made stops on Maui, Molokaʻi, Kauaʻi, and Niʻihau, and settled on the southern coast of Kauaʻi. The other, an adult female, migrated to Kapou (Lisianski, ~1700km), making this the first Kapou migration tracked using telemetry from the Main Hawaiian Islands. We calculated and analysed the home range of turtles that remained within Pearl Harbor to better understand habitat use in that area. The average core home range for all turtles was 1.1 km2 (sd = 1.4 km2; range = 0.1 – 5.6 km2), while the average overall home range was 5.7 km2 (sd = 7.5 km2; range = 0.3 – 25.2 km2). These estimates suggest that while many turtles remain highly localized, especially around key foraging and resting structures, they still utilize a wider portion of the harbor over time. These results will help in the planning of upcoming military installation expansion projects and conservation efforts.

ASSESSING THE IMPACTS OF LONG-TERM SATELLITE TAGGING ON GROWTH RATES OF IMMATURE HAWKSBILL TURTLES

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Animal-borne devices such as transmitters, data loggers, and identification tags are widely used across taxa to address key biological and ecological questions. However, these devices can sometimes affect animal behaviour and fitness, making it essential to assess their potential impacts across species and life stages. In this study, we evaluated whether long-term satellite tagging influences the growth and/or condition of immature hawksbill turtles (*Eretmochelys imbricata*) at a foraging site in the Indian Ocean. Between 2018 and 2021, we captured hawksbill turtles at Turtle Cove, in the south of Diego Garcia lagoon, Chagos Archipelago, and fitted 25 individuals with Fastloc-GPS satellite tags. Tagged turtles had a mean straight carapace length (SCLn-t) of 55.3 ± 6.9 cm (range = 47.9-69.5 cm; N = 21). We recaptured 12 tagged individuals between 2021 and 2023 and removed 11 tags after 2-3 years of attachment. From capture-mark-recapture, we estimated growth rates of 54 individuals (mean SCLn-t range = 33.3-69.4 cm), of which 10 were tagged and 44 were untagged individuals at liberty for 730-1095 days. Additionally, we conducted a literature search for studies investigating the potential effects of satellite tag attachment on sea turtles. Growth rates declined exponentially with increasing turtle size for tagged and untagged individuals,

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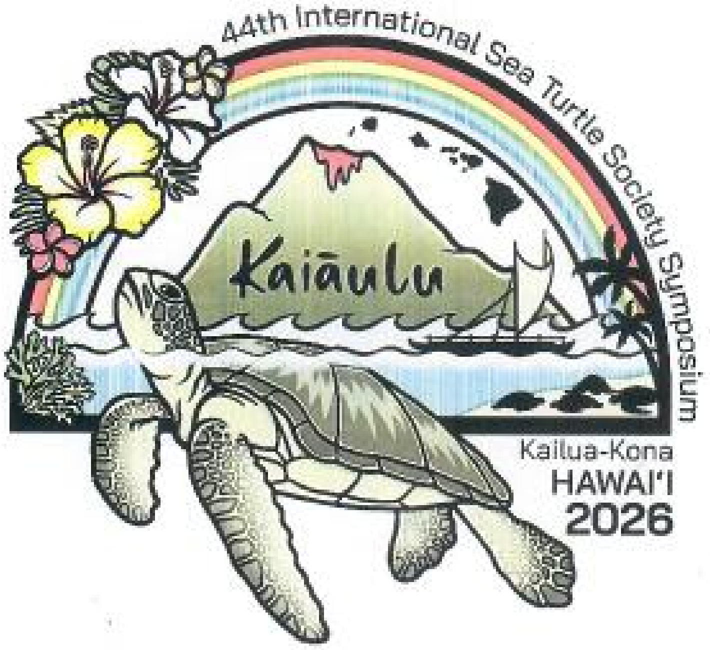

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