Nest-site fidelity of northern diamondback terrapins (*Malaclemys terrapin terrapin*) at The Wetlands Institute

Joey Brace, Florida Gulf Coast University

The northern diamondback terrapin, *Malaclemys terrapin terrapin,* is a subspecies of diamondback terrapin native to the northeastern United States. The subspecies plays a vital role in their coastal marsh ecosystems due to their predation of marsh periwinkle snails (*Littoraria irrorata*), which tend to overgraze on saltmarsh cord grass (*Spartina alterniflora*). Their nesting season, from May through July, is increasingly threatened due to anthropogenic activity such as road mortality and overdevelopment in nesting areas. In order to assist with future habitat management efforts, understanding the nesting behavior of the species is key to optimize the use of the available nesting habitat. My research examines the nest-site fidelity of diamondback terrapins based on nest location and dominant substrate by individual. From 2020-2025, data has been collected on all observed nesting events on the TWI property. I analyzed the proximity of the nesting sites of terrapins (N = 32) who have nested on the property on three or more occasions, as well as the trends in desired environmental traits. My results indicate that terrapins within the study site at TWI return to nest within approximately 24 meters (2.05-231.2) of their previous nesting sites and that there was no significant difference in distance between exclosures based on location (X^2=3.2, P=0.2). These results inform terrapin nesting hotspots on the property, approximate ranges for the fidelity of diamondback terrapins, as well as preferred substrate type of the terrapins that nest there.

American oystercatcher (*Haematopus palliatus*) foraging opportunity and disturbance on the Delaware Bay and Atlantic coastal marsh

Mary Castellani, Rutgers University

The American oystercatcher (*Haematopus palliatus*) is an iconic coastal breeding shorebird and a species of special concern in New Jersey. It uses shoreline habitats to forage for bivalves, marine worms, and other invertebrates. Historically, the Delaware Bay oystercatcher population received less research attention than its Atlantic coast counterpart. The Delaware Bay American Oystercatcher Project was started in 2022 to study oystercatcher productivity and habitat use during the breeding season. Feeding is a key component to survival for these birds, especially during a time as energetically expensive as the breeding season. In contribution to this project, I conducted foraging surveys within three hours of low tide on two Delaware Bay sites and one Atlantic coast marsh site to investigate differences between oystercatcher foraging presence, success, and disturbances among habitats. I recorded data on anthropogenic disturbances and probes into substrate to determine foraging success. Foraging success varied by site (X_2^2=8.47, p=0.01), but only the two 2025 Delaware Bay sites presented significant differences (Z=-2.39, p=0.02, with the less disturbed site having higher success ratios but a smaller sample size of foraging bouts (n=3) than the site with commercially-seeded oyster beds (n=6). Time of day (X^2=0.09, p=0.77) and low tide stage (X^2=1.06, p=0.30) did not affect presence of foraging oystercatchers. Oystercatchers typically continued foraging and remained at the sites despite potential disturbances, suggesting a tolerance or acclimation to anthropogenic activity. Results of this study can be used to inform habitat restoration projects and anthropogenic disturbance limitations in oystercatcher foraging habitats.

Trends in diamondback terrapin (*Malaclemys terrapin*) nest site characteristics at The Wetlands Institute

Sarah Davidson, Widener University

The diamondback terrapin (*Malaclemys terrapin*), a turtle native to U.S. coastal salt marshes, plays a crucial role in maintaining marsh ecosystems by controlling invertebrate populations. Due to coastal development, road mortality, and rising sea levels, they are listed as a species of special concern in New Jersey. The Wetlands Institute (TWI) property, a large, elevated area situated on a salt marsh, has become a prominent nesting ground for the local terrapin population, with hundreds of nesting events recorded annually. I aimed to identify environmental factors influencing diamondback terrapin nest site selection on the TWI property to better understand and guide the restoration and preservation of optimal nesting habitats. When nesting events were observed, several environmental variables were recorded, including substrate type, light levels, surface temperature, and elevation. The mean surface temperature was 76.5 ±32.2°F and there was no significant difference between substrate types and surface temperature. The range recorded for illumination of the nesting sites ranged from 503 to 8977 foot-candles. Amongst the 137 nesting events recorded, I found that sand was the most abundant substrate (36.5%), followed closely by grass (33.6%). Elevation varied by substrate type (χ^2_4=13.2, $p \leq 0.01$); shell sites were significantly higher than grass and sand sites, and grass was significantly higher than sand (all $p \leq 0.01$). Nest elevations ranged from 3.8 to 6.7 feet; and the probability of finding a terrapin nest significantly increases above 4 feet ($p < 0.01$). These results will help inform terrapin nesting habitat restoration projects, allowing preferred nest site characteristics to be promoted and ensuring restored habitats can support healthy terrapin populations in the future.

The range and habitat usage of eastern box turtles on suburban properties in Cape May County

Kristen Kallok, Barnard College

The eastern box turtle (*Terrapene carolina carolina*) is a largely terrestrial subspecies of common box turtle found throughout the eastern United States. Eastern box turtle populations are important for healthy ecosystems due to their effective seed dispersal especially in low-density areas. These turtles are listed on the IUCN Red List as vulnerable due to declining populations as a result of anthropogenic activity. This study investigates the habitat usage and home range of Eastern box turtles on a small suburban habitat fragment in Cape May County (Site A), using data collected 2017-2025. One individual was tracked on Site A daily in June and July using VHF radio telemetry. I analyzed location and habitat data using ArcGIS, R, and JMP. These results were compared to those of box turtles from a larger suburban habitat fragment in the area (Site B). My results indicate turtles at Site A prefer areas of lower temperatures (Z=1.87, p=0.06) and abundant ground cover (Z=-0.13, p=0.89). Individuals at Site A utilized garden spaces that provided optimal ground cover, environmental conditions, and limited disturbance. The home ranges at Site A averaged 72% smaller than those at Site B (Z=-1.96, p=0.05) but exceeded the ranges of three individuals. In comparison with Site B, habitat at Site A is heterogeneous in terms of vegetative cover, and the limited area of suitable cover may constrain turtle movements. These results suggest that small habitat fragments could be beneficial for the conservation of the

species by allowing the survival of populations in areas where significant habitat disturbance has occurred.

Tracking succession of vegetation following strategic placement of dredged material on a saltmarsh island

Katelyn Seay, Stockton University

Sea level rise contributes to salt marsh degradation by increasing the frequency and duration of tidal flooding, which drowns vegetation and disrupts natural sediment accumulation. To counteract this, the strategic placement of dredged material is a vital restoration technique that can help rebuild elevation and support the long-term resilience of these ecosystems. Ring Island includes a placement area known as the Elevated-Nesting-Habitat (ENH) which, over time, has provided nesting ground for vulnerable coastal wildlife species. My study aims to assess the long-term vegetation succession and zonation patterns of six focal species (*Spartina patens, Iva frutescens, Juncus gerardii, Phragmites australis, Baccharis halimifolia, and Distichlis spicata*) on the ENH, in order to inform adaptive marsh restoration strategies. I surveyed vegetation in systematically and randomly placed 1m² plots in July 2025. Then I analyzed vegetation surveys from 2020–2025 to assess species composition, percent cover, and elevation to monitor long-term restoration outcomes. Overall, there has been a change over time in species presence across elevation at the ENH. For example, the overall presence of *Iva frutescens* has remained relatively stable over time ($x^2 = 4.4$, $p = 0.2$), but its distribution across elevation bins has shifted ($x^2 = 14.4$, $p < 0.01$) from 4-5ft. to 3-4ft. This study helps us understand the evolution of strategically placed dredged materials into beneficial wetland habitats and the results can be used to enhance marsh restoration projects in the future, giving insights on optimal elevation for focal vegetation species used by wildlife for nesting.