

What will Diamond-backed Terrapin (*Malaclemys terrapin*) Nesting Habitat Look Like by 2100?

The Effects of Predicted Sea Level Rise on Diamond-backed Terrapin (*Malaclemys terrapin*)

Nesting Habitat in Three National Parks

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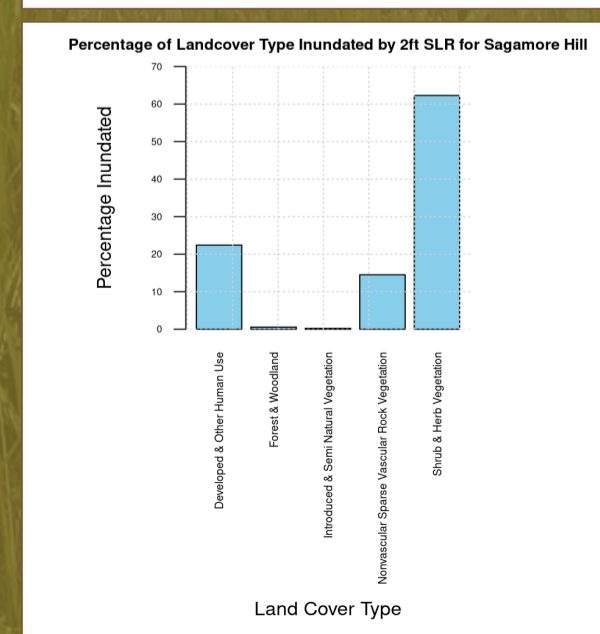
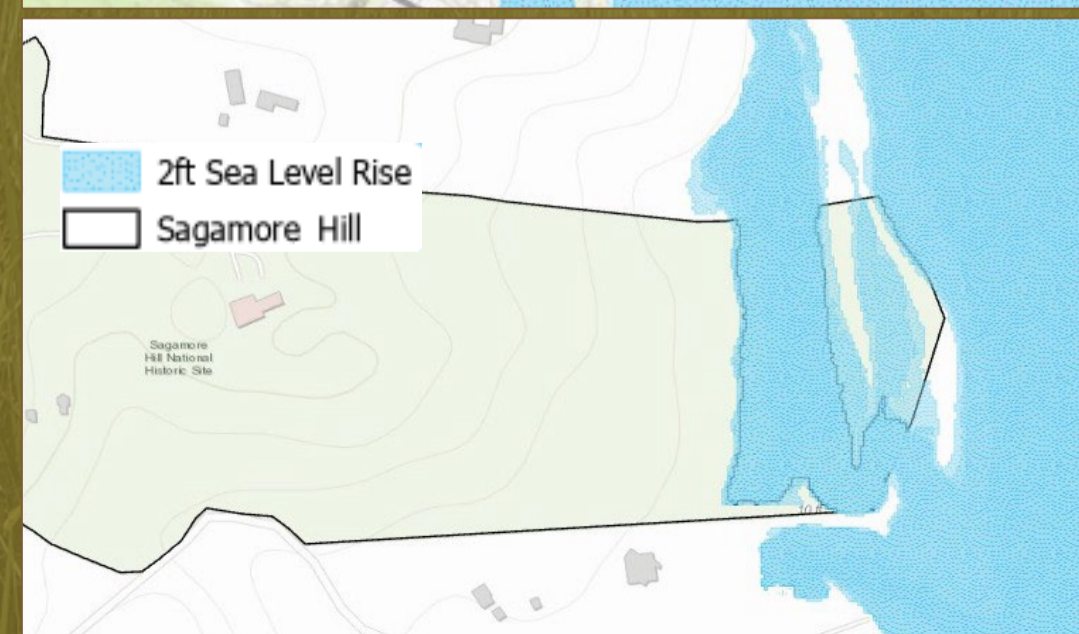
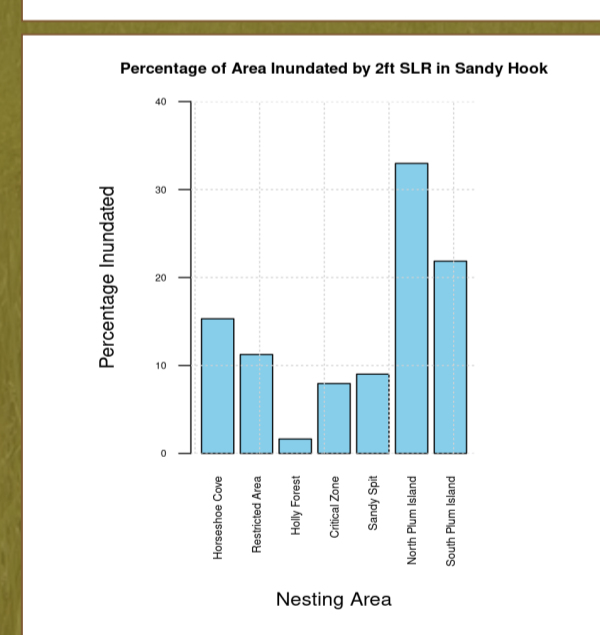
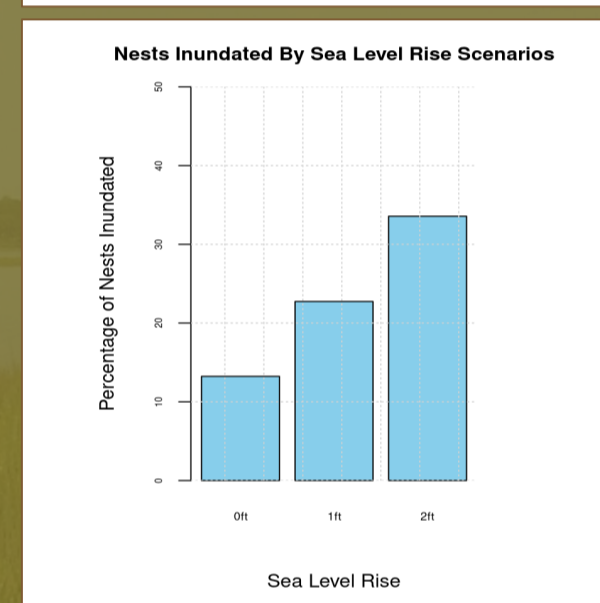
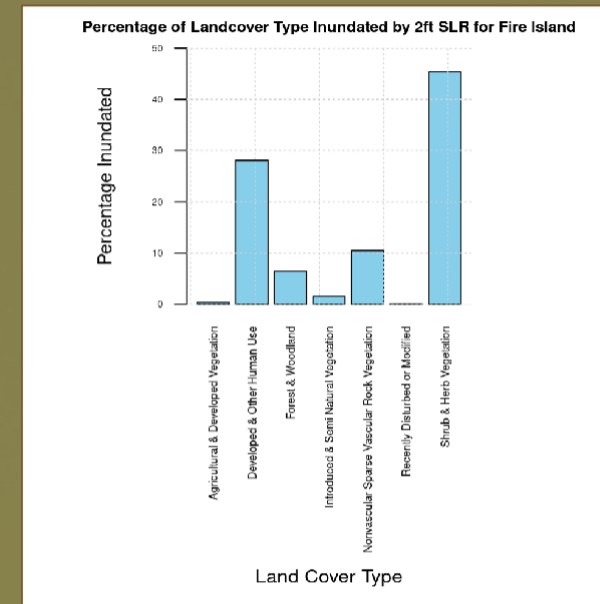
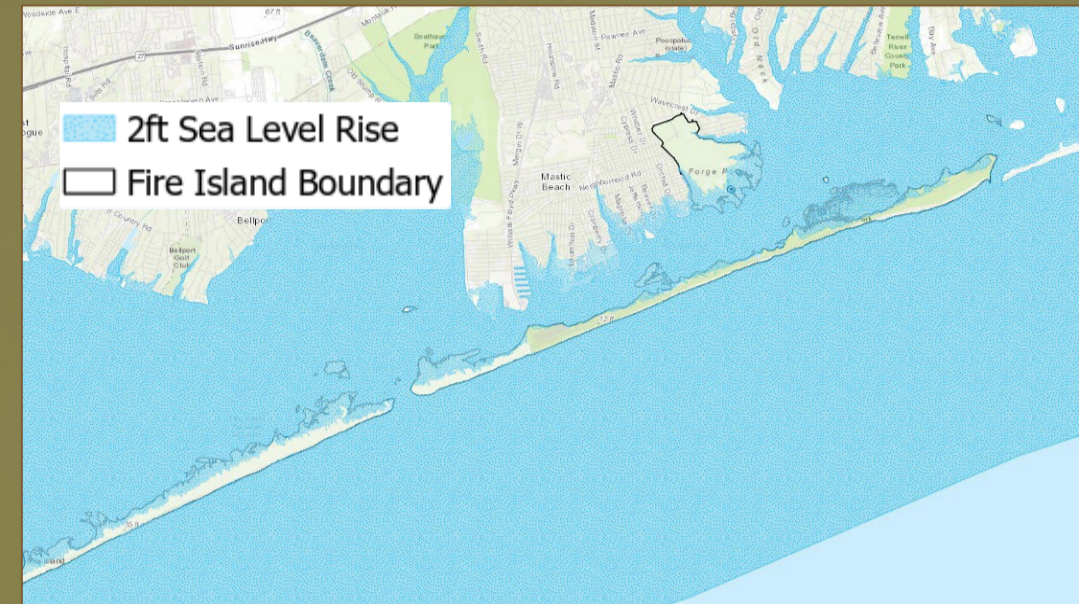
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Introduction

- According to NOAA's 2022 sea level rise predictions, it is expected that at least 2 feet of sea level rise will be observed by 2100.
- Diamond-backed terrapins (*Malaclemys terrapin*) are native to salt marshes and estuaries along the Atlantic coast but recently, managers have noted concerns for population declines due to a range of anthropogenic threats.
- The purpose of this project was to use ArcGIS Pro software to map Diamond-backed Terrapin nesting habitat in Sandy Hook, Sagamore Hill, and Fire Island National Parks with increasing sea level rise (SLR), as well as determine land cover types and critical nesting habitat that will be affected by SLR in the future.

Methods

- ArcGIS Pro software was used to map nesting habitat and sea level rise data
- The boundaries data of the sites were sourced from the National Parks Service
- Sea level rise feature layers were sourced from NOAA
- Data from nest surveys collected in 2023 from Sandy Hook was also used.
- National land cover data (NCLD) was used to determine which land cover types will be affected most by the rising sea level
- Graphs were created in R Studio



Results

- 'Shrub and Herb Vegetation' was the land cover type most likely to be affected by SLR in both Sagamore Hill and Fire Island.
- Currently, the Critical Zone of Sandy Hook is affected most by the highest water line. However, in the 1ft and 2ft SLR scenarios, North Plum Island is expected to be affected the most.
- From past student research, there have been 277 total depredated nests found on Sandy Hook. In this study it was found that 30 nests will be inundated with current mean high-water line, 63 nests will be inundated with 1 ft sea level rise, 93 nests will be inundated with 2ft sea level rise.



Discussion

- The land cover type 'Shrub & Herb Vegetation' is the most common nesting habitat for Diamond-backed terrapins.
- By 2100, almost half of the nests found on Sandy Hook will be inundated by the mean highest water line.
- In the future, depredated nests will be located on Fire Island and Sagamore Hill. The nesting zones will be determined, like that on Sandy Hook. The methods applied can be used to determine the risk of inundation for nests in these parks as well.
- Understanding the vulnerabilities to predicted SLR may provide managers with the ability to manage habitat to allow population persistence.