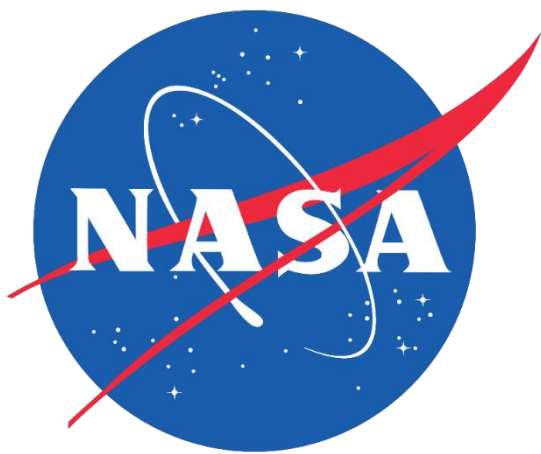


Cape Hatteras Ecological Conservation



Delineating Shoreline and Mapping Change along the Cape Hatteras National Seashore for Coastline Management and Transportation Corridor Adaptation Strategies

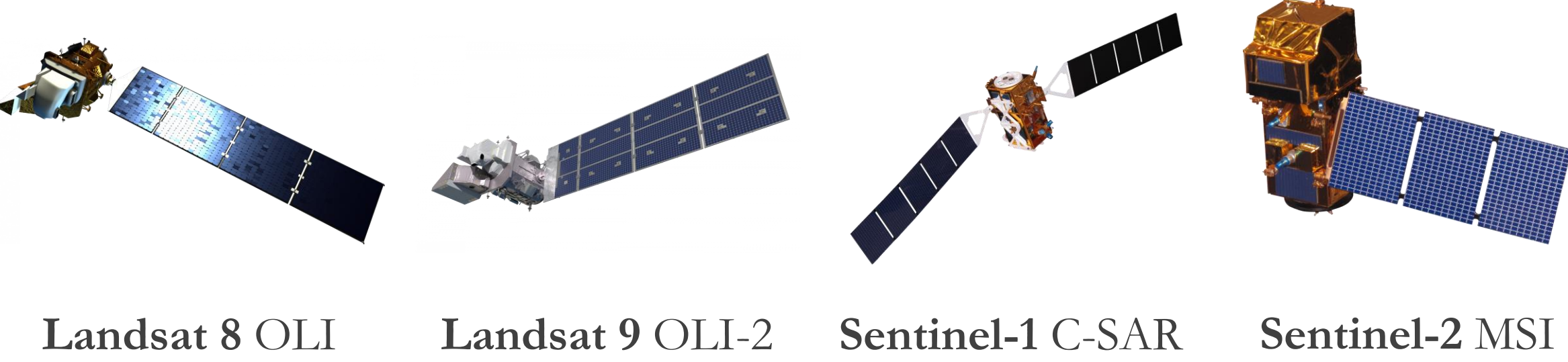
Project Synopsis

This project partnered with the National Park Service at Cape Hatteras National Seashore in North Carolina to explore the use of optical data to delineate shorelines and map coastline change over the past ~10 years. Using Earth observing data from multiple NASA sources, this project will support decision making relating to prioritization of investments in mitigation and strategic planning for transportation corridor adaptations including potential relocation of infrastructure and placement of beach nourishment efforts.

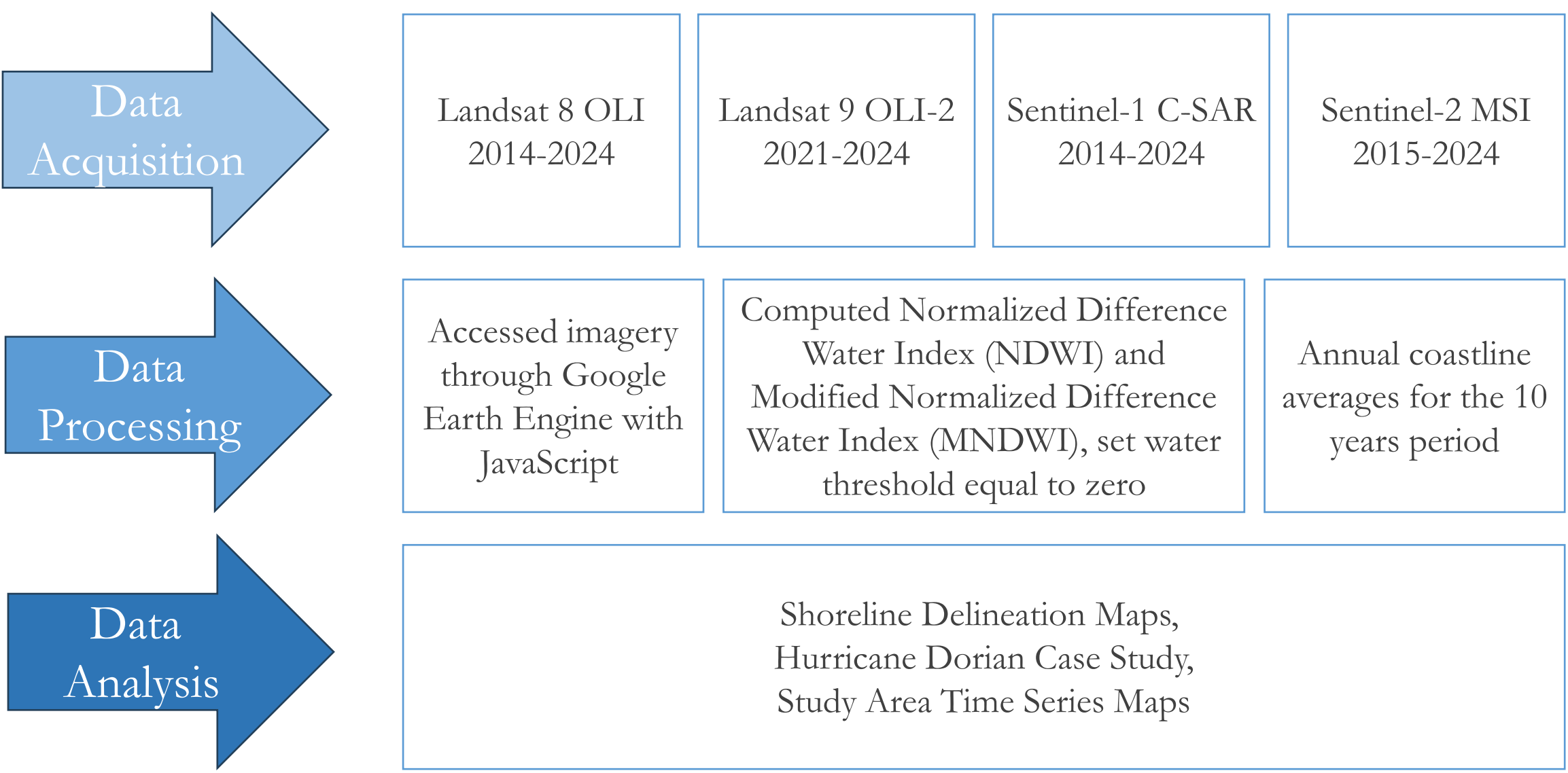
Objectives

- **Develop** an efficient method for analyzing shoreline change within the study area
- **Identify** the regions and infrastructure vulnerable to coastal erosion
- **Aid** the National Park Service shoreline conservation efforts through the creation of shoreline change and infrastructure maps

Earth Observations



Methodology



Study Area

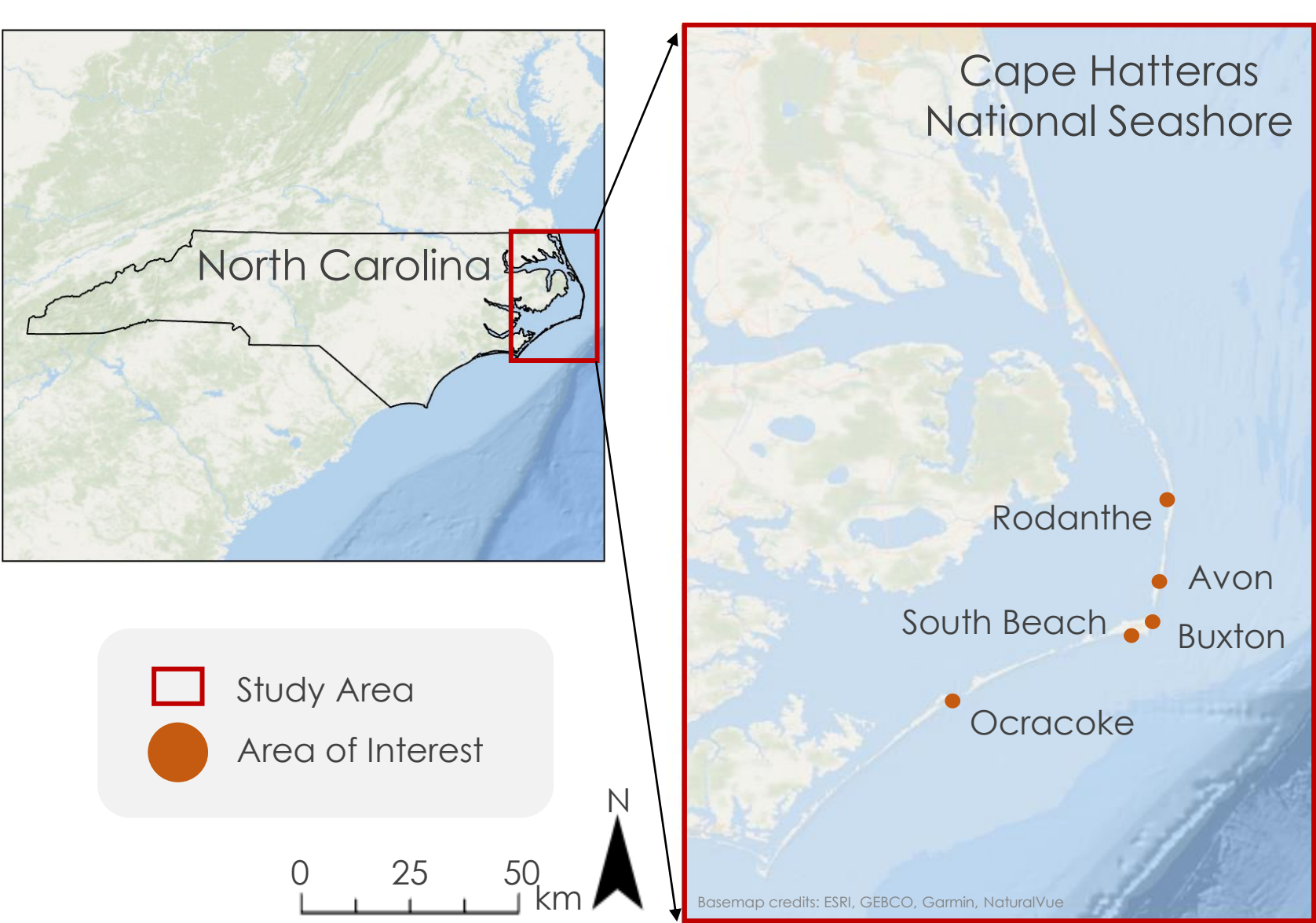


Figure 1. Cape Hatteras National Seashore, shown in relation to the seashore's location in North Carolina and marked with significant locations addressed in this study.

Team Members



Ella Haugen
Project Lead



Alyson Bergamini



Julian Alcantara

Results

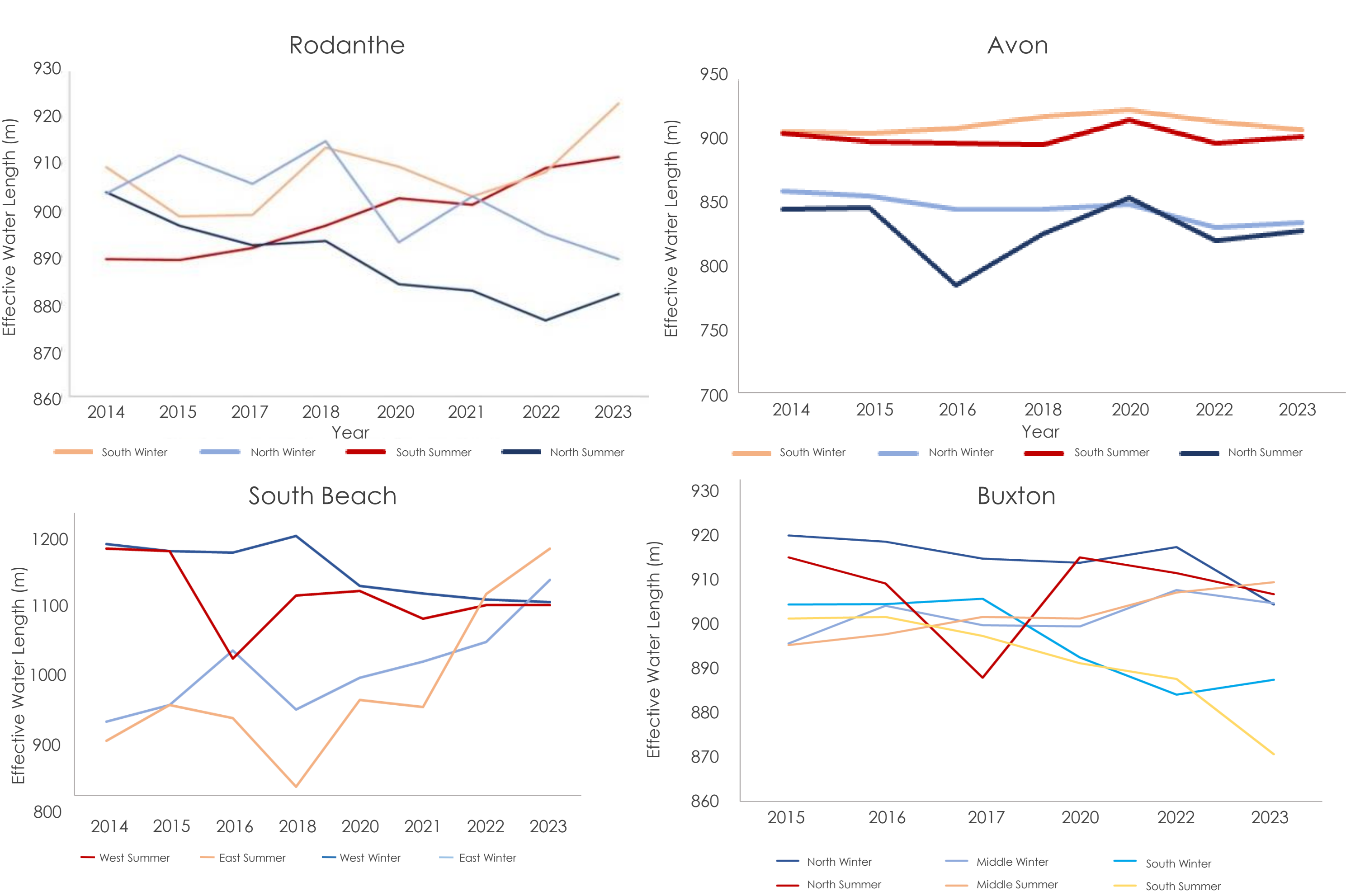


Figure 2. Effective water length by year in each of the study areas. Increasing water length values indicate that the shoreline is receding.

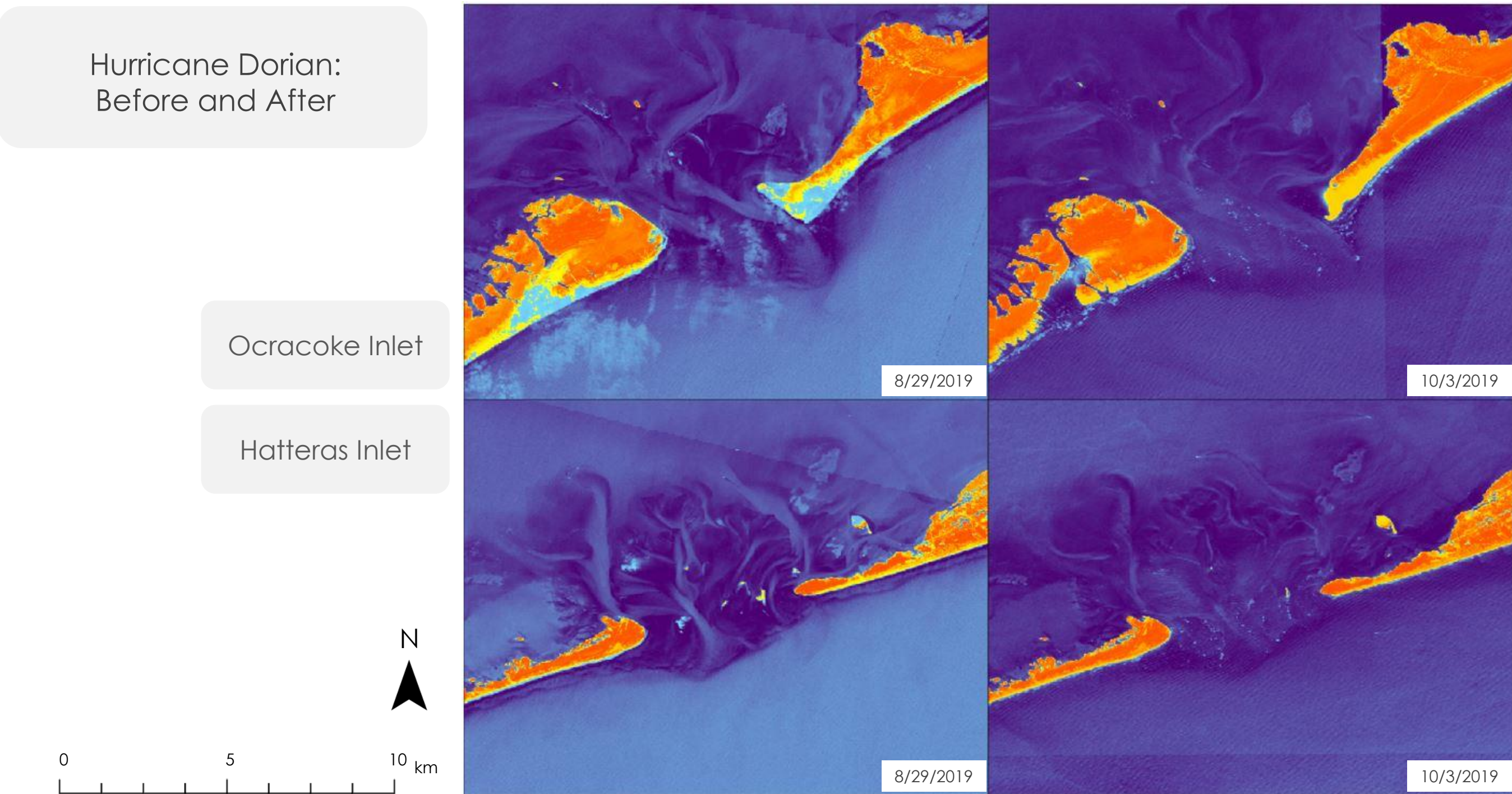


Figure 3. Images of Ocracoke and Hatteras Inlets, processed through a modified normalized difference water index to illustrate damage caused by Hurricane Dorian.

Conclusions

- The creation of shoreline change maps allowed for the identification of parts of North Carolina Highway 12 (NC-12) that are vulnerable to coastal erosion.
 - Land loss in Southern Rodanthe highlighted the importance of the construction of the Rodanthe bridge.
 - Avon and Buxton saw little shoreline change that affected NC-12.
- This method of analyzing shoreline change will allow the NPS to continue analyzing seasonal oscillation and the impact of storm events on infrastructure and the shoreline.

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Olivia Landry | NASA DEVELOP Lead, Virginia - Langley

Dr. Kenton Ross | NASA DEVELOP Program Manager

Dr. Xia Cai | NASA DEVELOP Lead Science Advisor

Project Partner



Cape Hatteras National Seashore



Virginia – Langley | Spring 2024



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