Team 6: Remote Sensing Coastal Change at Alligator River National Wildlife Refuge (ARNWR)

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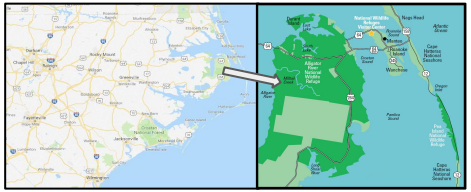
Introduction

- ARNWR: 152,000 acres, created in 1984, biological hotspot, frontier for sea level rise
- Refuge health declining leading to scenes of ghost forest
- We attempted to implement big data strategies to gather and present information that can be used in management decision making for environmental conservation.

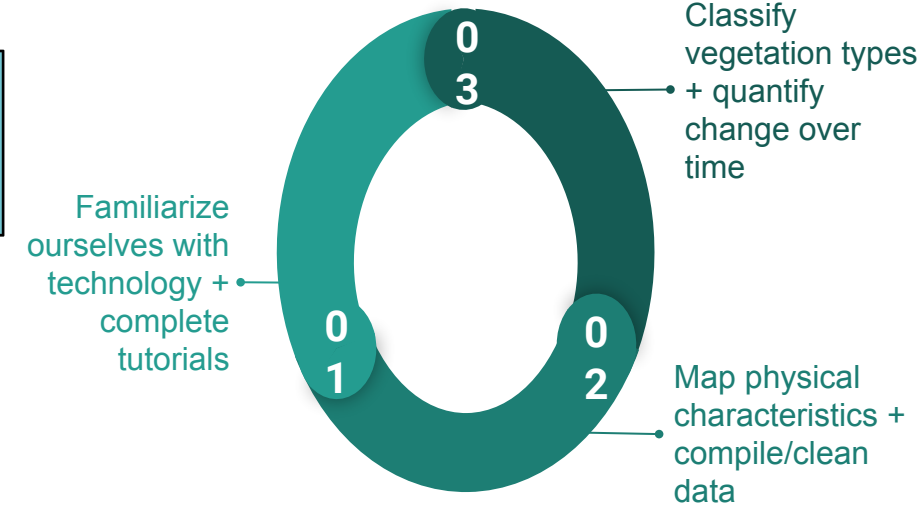
Objectives

1. Visualize geospatial and remote sensing data
2. Quantify vegetation and change through classification
3. Make data accessible to refuge managers

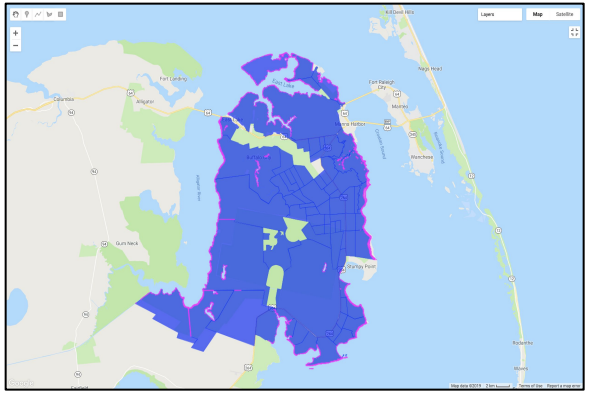


Google Earth Engine

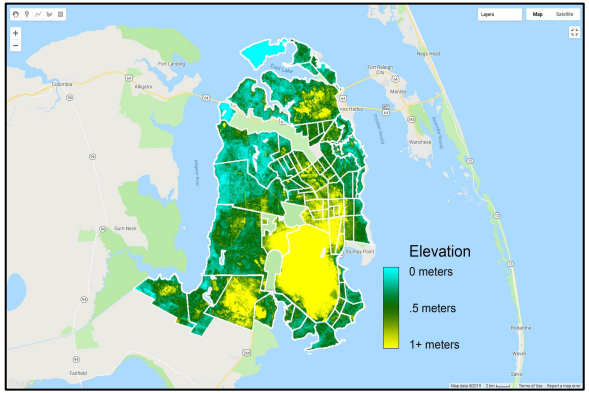
Workflow



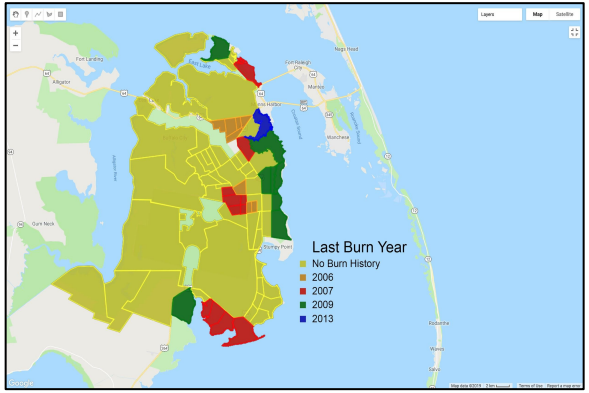
Maps of Physical Characteristics and Relevant Management Units



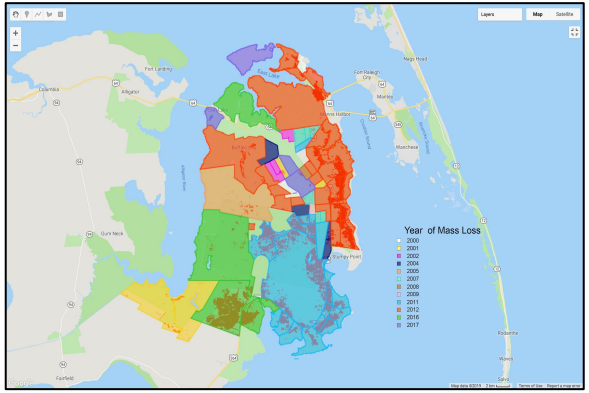
1,120 football fields of land lost since 1984



Enitre refuge less than 1.5 meters above sea level



Fire not the leading cause of forest decline

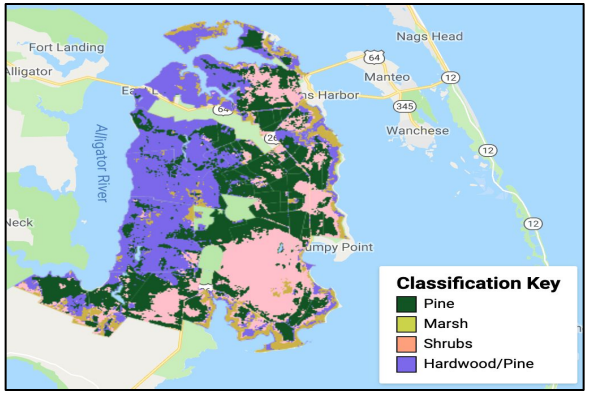


Most significant years of forest decline

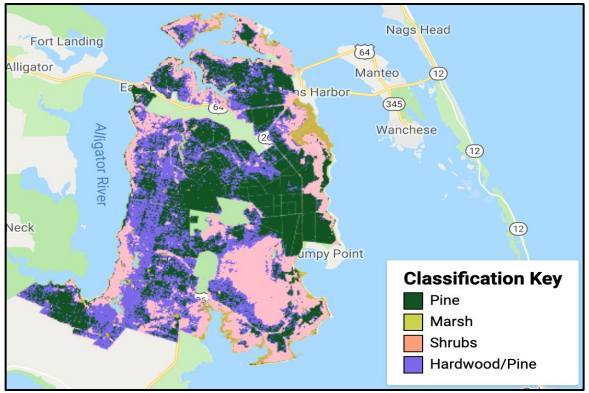
Takeaways

- Most significant forest loss occurred 2011-2012, which coincided with centennial drought (orange and light blue)
- 2016 was also a major year of forest decline, this may have been an effect of Hurricane Matthew

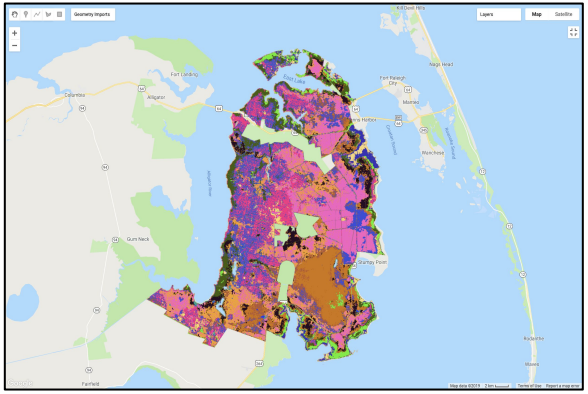
Classification of Vegetation from Landsat and Visualization of Change

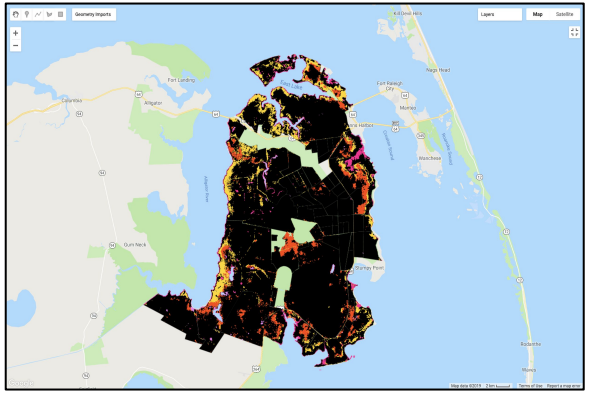


Vegetation Cover in 1987



Vegetation Cover in 2017


Vegetation Class Transitions


Notable Vegetation Changes

Takeaways

- The refuge is constantly changing
- The most notable and alarming changes are those of transition from forest to non-forest as shown in the figure on the bottom right