NLCD Analysis of Wetland and Tree Canopy Dynamics in Eastern North Carolina

Duke UNIVERSITY | BASS CONNECTIONS

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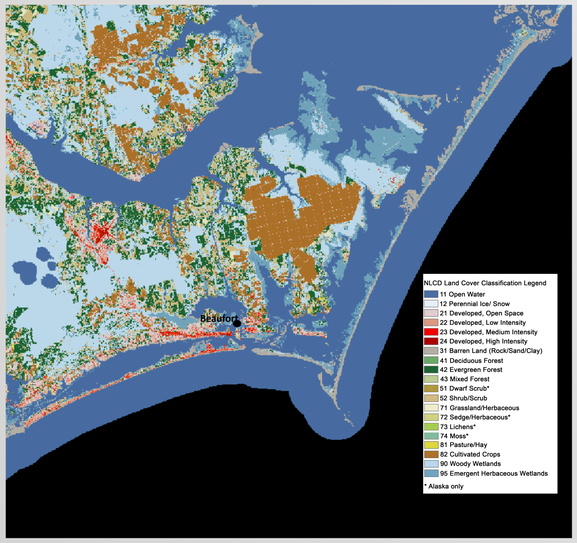
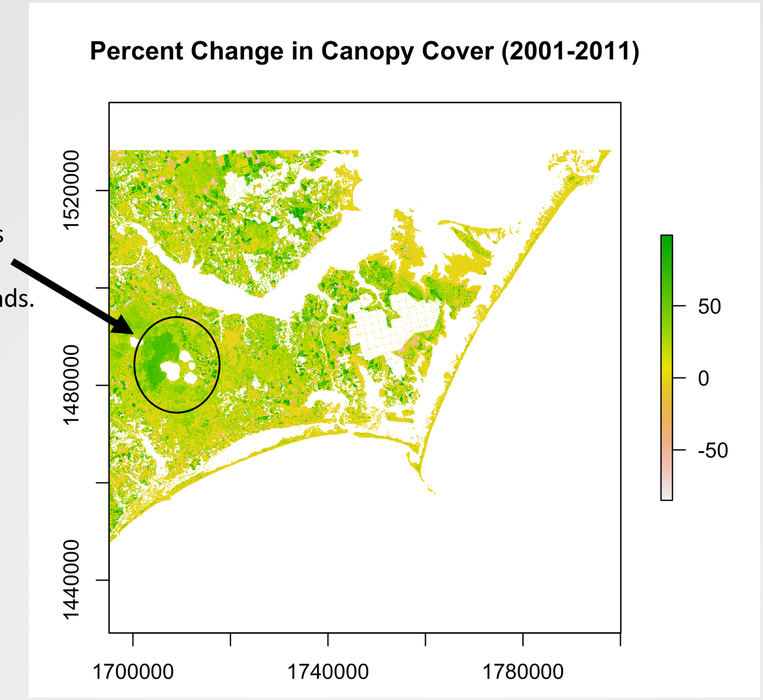
Bass Connections in Energy & Environment

National Land Cover Dataset: Background

- Utilizing decadal **Landsat** satellite imagery, The National Land Cover Dataset (NLCD) is created by the **Multi-Resolution Land Characteristics Consortium (MLRC)**.
- Including the Sierra Club, USGS, NOAA, and other federal agencies, the MRLC generates land cover information for environmental applications.
- **This project applies the NLCD to explore wetland and tree canopy cover fluctuations in the Eastern coast of North Carolina.**



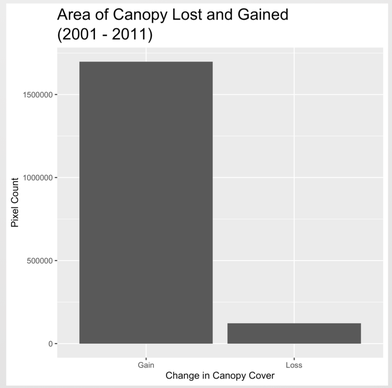


Agriculture was masked from this difference in canopy cover plot to remove potential misclassification of agricultural land cover as canopy. Masked areas appear white.

Tree Canopy Coverage

- Tree canopy coverage is an important indicator of ecosystem change.
- From 2001-2011, more canopy was gained than lost in our study area.

Canopy Gain and Loss



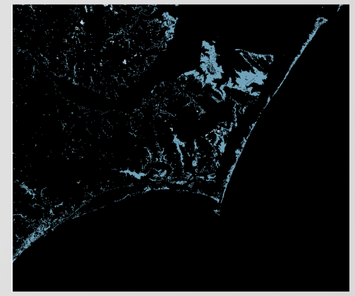
Efficient Data Access: we used the **FedData** package for **data analysis in R**.

Analysis of Wetland Dynamics

Why are Wetlands Important?

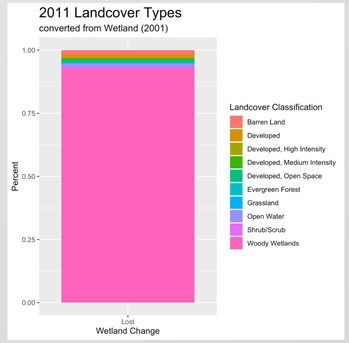
- Wetlands provide critical habitats for wild flora and fauna, improve water quality, and control the distribution of sediment and nutrients (1).
- "Coastal wetlands are among the ecosystems most vulnerable to the effects of climate changes, including SLR, and land-use change" (2).

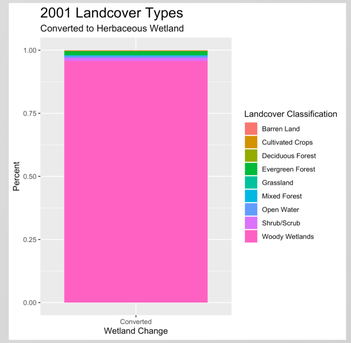
This map displays all land cover classified as emergent wetland in our study area.



How are Wetlands Changing?

- Most change observed between emergent and woody wetlands.
- Wetlands lost most frequently converted to woody wetlands or developed land.
- Wetlands gained most frequently replaced woody wetlands and forest.





References: 1) Monthly Analysis of Wetlands Dynamics Using Remote Sensing Data,, DOI: 10.3390/ijgi7100411, 2) Landscape-Level Consequences of Rising Sea-Level on Coastal Wetlands: Saltwater Intrusion Drives Displacement and Mortality in the Twenty-First Century, DOI: 10.1007/s13157-019-01138-x