Miami-Dade Ecological Forecasting II

Utilizing NASA Imagery and GIS Modeling for the Design and Implementation of the Miami-Dade Western Greenway

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- Team Members: Mohamed Amin (University of Wisconsin-Madison), Lauren Anderson (University of Georgia), Erick Braun (Georgia State University), Tunan Hu (University of Georgia), Linli Zhu (University of Georgia)

Background

- Miami-Dade County:
  - Estimated population will reach 2,959,308 by 2030 (Miami for Visitors)
  - Urban development threatening attempts to maintain and restore Everglades habitats
- The Everglades:
  - Largest subtropical ecosystem in the United States
  - National park established in 1947
  - International treasure, biosphere reserve, world heritage site

Community Concerns

- **Urban development** is threatening the attempts to maintain and restore Everglades habitats

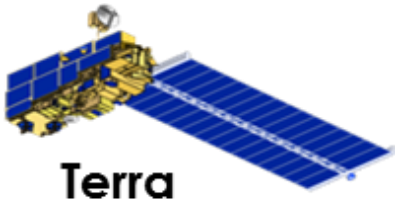
- Importance of the **Everglades:**
  - Growing Southern Florida population depends on the many **ecosystem services** provided by the Everglades, such as **water recharge resources**
  - Located along avian migratory routes and home to many **endemic species**
  - **Ecotourism**

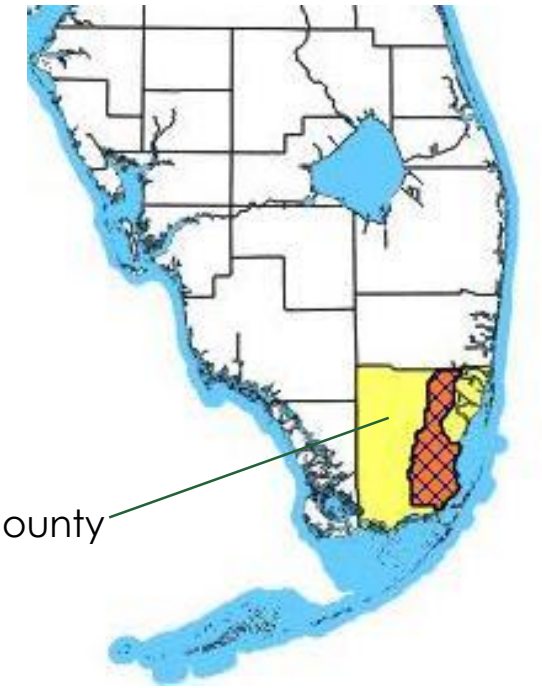
Project Purpose

- **The Miami-Dade Parks, Recreation and Open Spaces Department and Trust for Public Land have embarked on an ambitious project to develop the Western Greenway.**
  - System of trails and recreational destinations along the county's western edge.
  - Provide a transition between urban developed areas and the Everglades.
  - **3 goals: Conservation, Agritourism, Recreation**

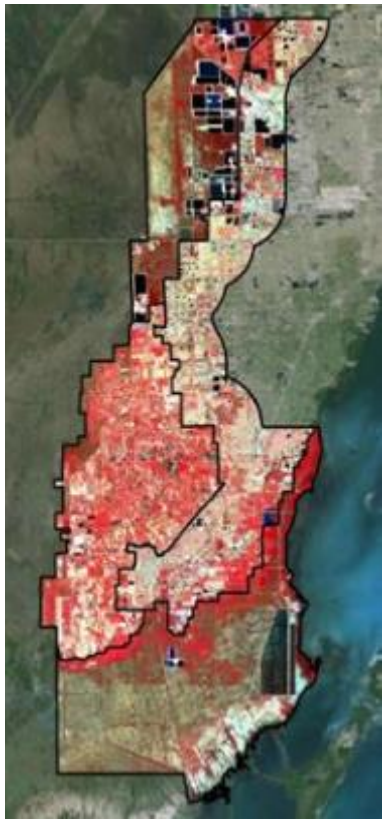
Study Area and NASA Earth Observations

- Study Area
  - The southern tip of Florida: the entirety of the proposed Western Greenway (urban-wetland fringe to the western edge of Miami-Dade county).
- Terra – ASTER
  - March 7th, 2011





Data source: University of Florida GeoPlan Center



Study Area

Methodology

IMAGE PROCESSING

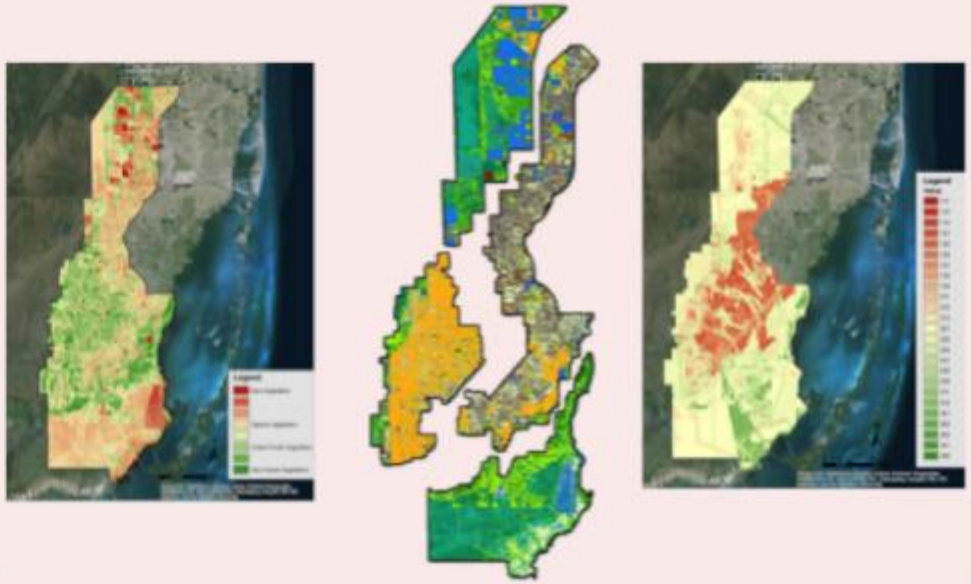
- Atmospheric Correction ENVI 5.0 QUick Atmospheric Correction (QUAC)
- A composite image was created from bands 3, 2,1 and NDVI
- Land use information was integrated with ASTER imagery

ANALYSIS

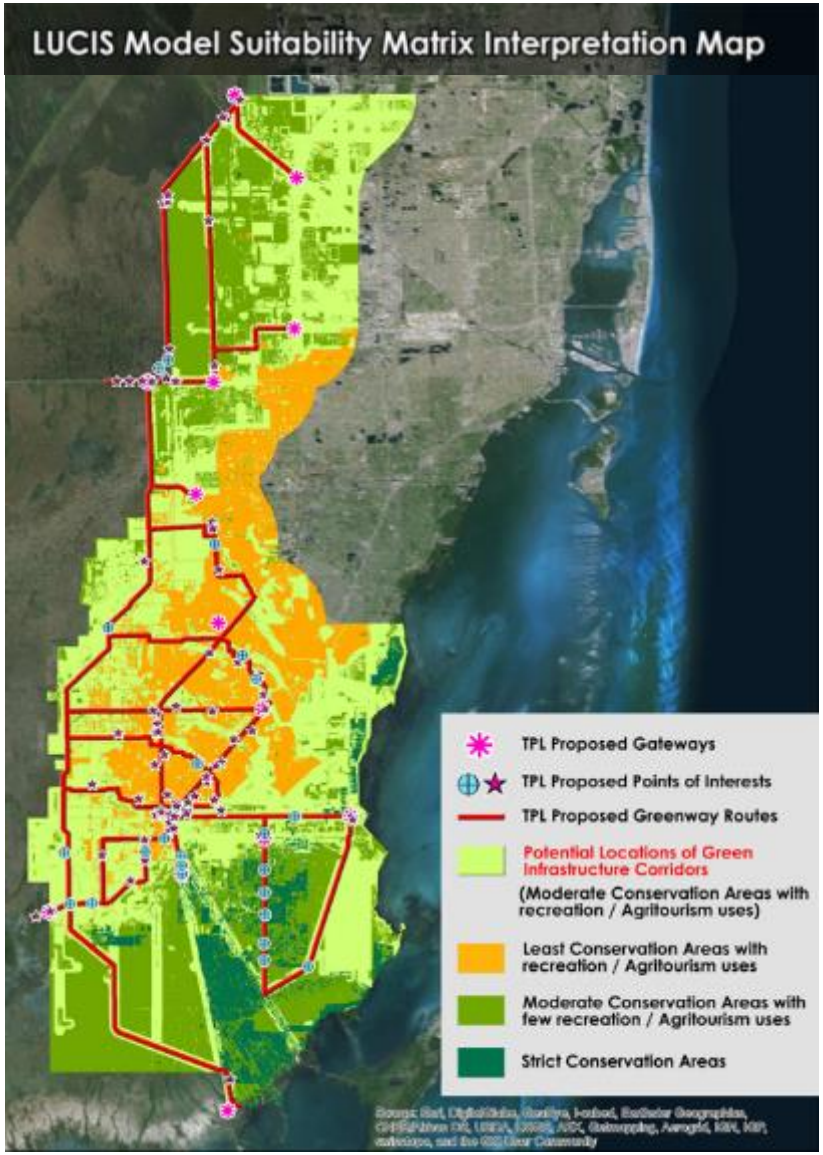
- NDVI Classification
- LUCIS Model analysis
- A Land Cover Classification Map was created from the Composite ASTER Bands
- Conservation, Agritourism, and Recreation

END PRODUCTS

Classification Image based off of the NDVI Analysis	Supervised classification results from four characteristic zones	LUCIS Model Suitability Matrix Map



Results

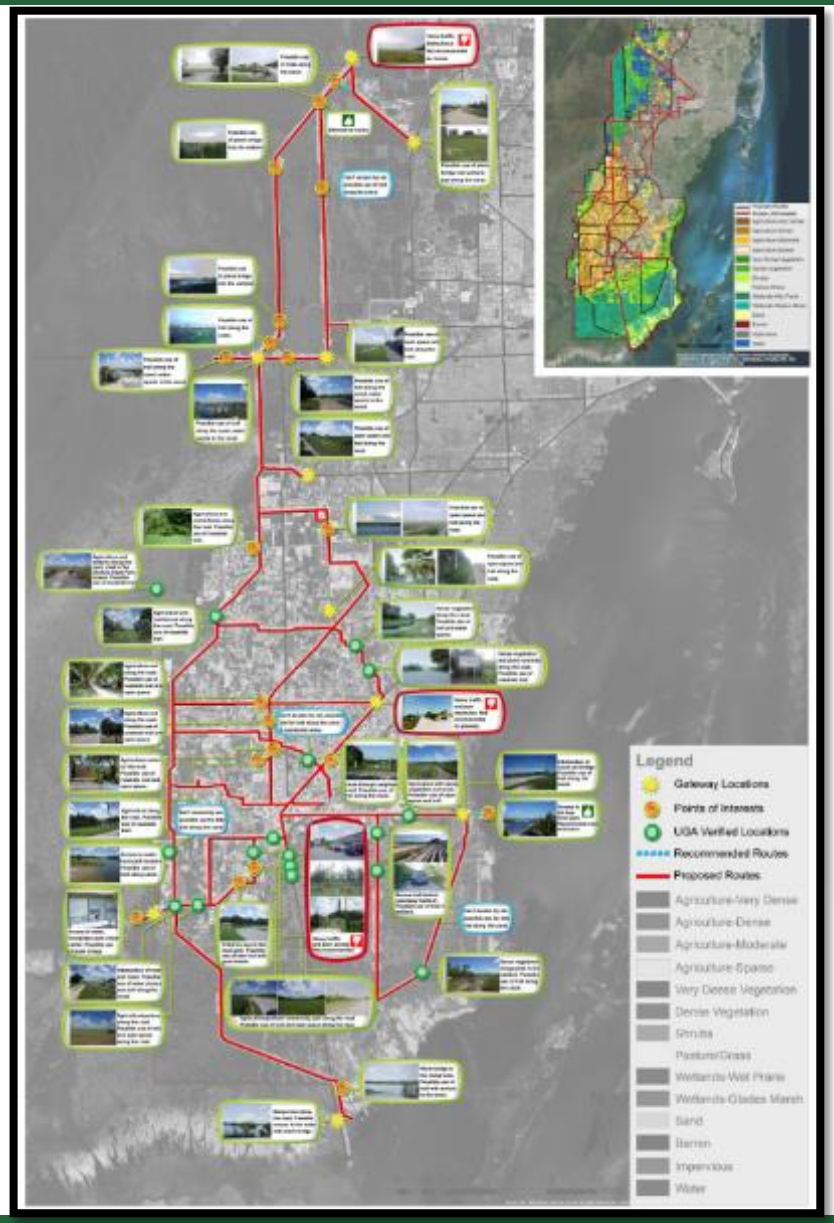


Vision 1:
Trail along the canal

Vision 2:
Trail near the gateway

Vision 3:
Trail into the wetlands

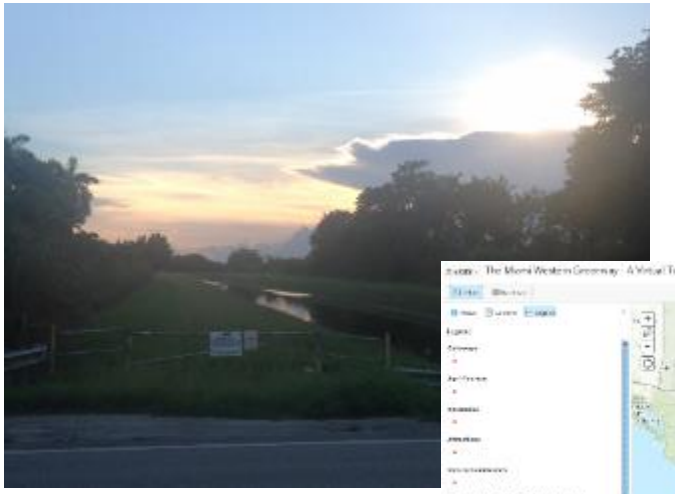
Trip to Study Area

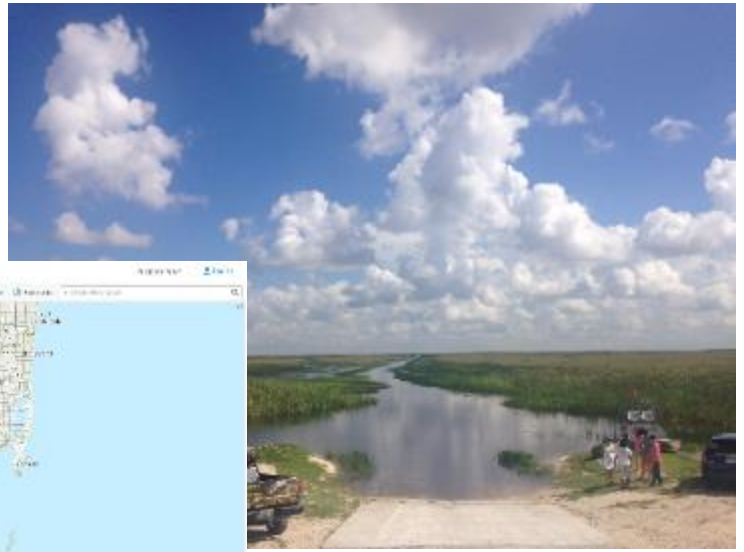


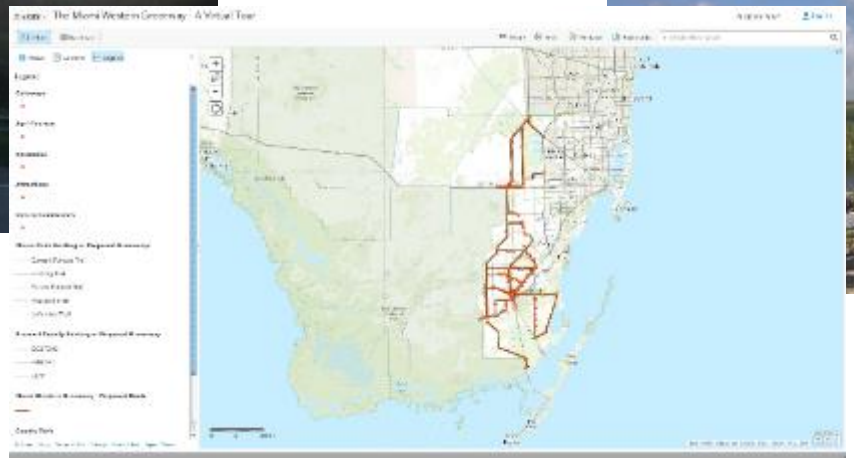
- Met with project partners to discuss specific goals and criteria for the Western greenway
- Traveled to proposed greenway routes, destinations, and gateways to document specific opportunities for greenway development

Conclusions/Benefits to the End-User

- Updated, higher resolution NDVI and land cover classification maps have played a vital role in the planning and design of the Western Greenway
- The LUCIS model helped specifically assess the greenway's three goals of conservation, agritourism, and recreation, producing a spatial representation of probable patterns of future land use
- Contributions of the project to an online story map help to bring awareness of the greenway project to the general public







Team Members and Project Partners

Left to right: Dr. Rosanna Rivero, Erick Braun, Mohamed Amin, Lauren Anderson, Ning Chen, Linli Zhu, Tunan Hu

Miami-Dade County Park, Recreation and Open Spaces Department

The Trust for Public Land

Thanks Again!

Dr. Rosanna Rivera, University of Georgia

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