



All the GIS

A cross-section of GIS technologies –
from historical aerials to LiDAR to mobile data collection
– help tell the story of Pockoy Island’s archaeological treasures.

Pockoy Island



Pockoy Island

- Barrier Island
- SCDNR Property – Botany Bay Plantation
- Natural undeveloped beach (boneyard beach)



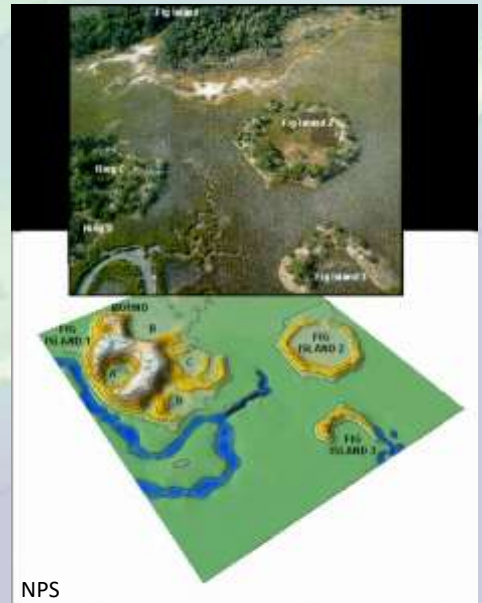
The Discovery

- An archaeologist looks at a Digital Elevation Model...



Shell Rings

- Approximately 4,000 years old (Late Archaic period)
- Approximately 50 sites across SE United States
- Little is known about people who constructed them



The Realization



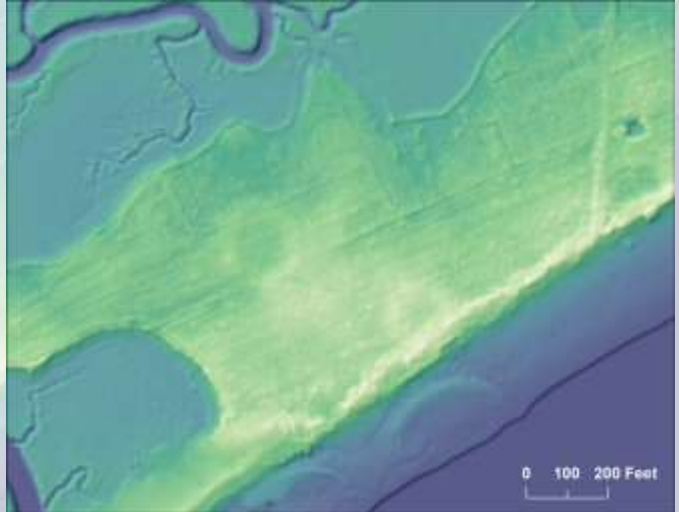
Changing Shorelines, Heritage at Risk

- South Carolina Geological Survey calculated rates of erosion.
- Scanned aerial photos and historical maps
- Analysis of Moving Boundaries Using R (AMBUR)



Changing Shorelines, Heritage at Risk

- Between 1949 and 2016, retreat of **24.5 ft / year**
- Storms in 2015 – 2017 resulted in **51 ft / year**



Field work began in 2017

- Archaeologists verify the shell rings
- Begin excavations on seaward ring



2019 Field Season

- Need to systematically survey all Pockoy Island (Shovel Test Pits)
 - Do it quickly
 - Efficient collection of data
 - Ensure data quality by volunteers
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- Collector
 - Survey123
 - Bluetooth GNSS

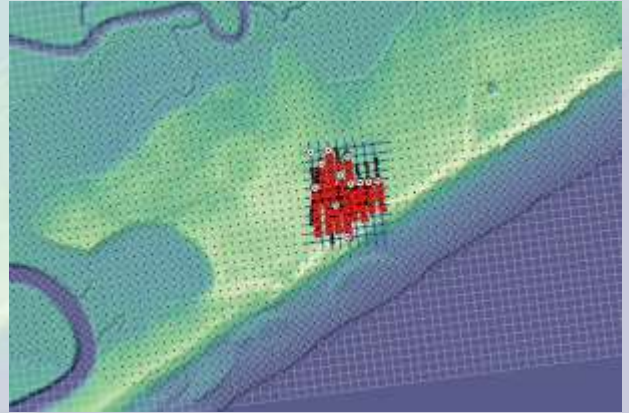
Challenges

- Dense vegetation
- Many field staff
- Maintaining a regular grid spacing
- Ensure data quality



Grid Set Up

- Developed a 10-meter grid across island
- Aligned with survey grid from excavations
- Assigned local coordinate system (Context)



Flagging STP Locations

- Grid was only digital
- GNSS Receiver (Arrow 100) and Collector to navigate to grid points
- Place flag on ground with local coordinate
 - Actual STP location may be offset from grid due to ground conditions
- Record actual flag location with GNSS by editing point in Collector



Shovel Tests

- Survey123 Form developed for Shovel Test data
- Form made public - could be accessed by volunteer field staff (university students)
- Walk to flag, dig shovel test, record data.



Key Survey123 Form Features

- Dropdown list of all Context values
 - Used to join Survey123 data back to GNSS locations
- Conditional fields
- Calculated the value of one field based on another
 - Bottom of one interval is top of next
 - Auto calculate total artifact count

The Dashboard

- Dashboard developed to show progress in real-time
- Join as a Hosted Feature Layer View
 - Survey123 data joined in real-time to GNSS locations
- Locations of Artifacts
- Artifact Counts
- Positive and Negative Shovel Tests

The Dashboard



After field work

- Data immediately verified by archaeologists in ArcGIS
- Data exported to CSV and submitted to national database
- Developing the methodology further for use at other SCDNR properties (tens of thousands of shovel tests)
- Linking Collector and Survey123 with Context attribute

Thanks

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