UAVs, Archeology & Agriculture

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Outline

• Study Area:
  – Everglades Agricultural Area (EAA)

• Case Study 1: Wedgworth Site

• Case Study 2: Hutchinson Site

• Case Study 3: Belle Glade Mound and Midden

• Conclusions
Everglades Agricultural Area (EAA)
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Case Study 1: Wedgworth Site

Research Question:

- Can the drone derived photogrammetric elevation data reveal any anomalies or patterns of the underlying archeological site?

Wedgworth

- Start of Drone Research in EAA
- 2015 Site Discovery
- Currently Limited Site Excavation and Knowledge
  - Collaboration of:
    - Palm Beach County Archeologist/Preservation Officer
    - Florida Gulf Coast University Anthropology Professor
    - Florida Atlantic University
    - And more.
  - Florida Gulf Coast University Field Camp location: Summer 2015
Wedgworth Site Perspective

South
3D ArcScene Perspective
Case Study 2: Hutchinson Site

- **ResearchQuestion:** What value can UAVs bring to active archaeological sites?

- **Hutchinson**
  - Most Documented Site
  - December 2016 Discovery
  - Start to finish of Excavation
    - Time lapse dig locations and environmental conditions
    - Data Representation
Hutchinson Site
Hutchinson Site

Hutchinson
March 31, 2017

0  125  25  50 Meters
Hutchinson Site

Large Excavation Pit Image Record: Drone Solution

May 5, 2017
Hutchinson Site

- Build Database
  - Fast Review
  - Easy Editing
- Site closed May 2017
  - Crop changed to rice
  - Fields flooded
Case Study 3: Belle Glade Mound and Midden

- Research Question:
  - Can past and present multi-sourced remote sensing data be combined to produce new information from past excavations?

- Residential Property today within EAA
- Initial and only Excavated in 1933 (Gene M. Stirling)
- Rediscovering and exploring the site
  - Combined and compared:
    - Satellite and Aerials
    - Historic Aerials
    - Archeological notes
    - Archeological Images
    - Lidar
    - Drone photogrammetric elevation
Belle Glade Mound and Midden

- Rebuilding Site through combining notes and Remote sensing
  - The Democrat River

  - Stirling stated, “The site was located between the forks of the Democrat River, a stream that has now been largely obliterated as a result of drainage operations (Smithsonian Institution, 1935).”
Belle Glade Midden

- Stirling’s report to the Board of Regents of The Smithsonian gave a record of physical dimension and stated that the refuse or midden mound was approximately **100 yards** (91.44 m) by **150 yards** (137.16 m) (Smithsonian Institution, 1935).
  - Digitized Approximate size and overlaid on Lidar
Belle Glade Midden

- The Belle Glade Midden
  
  - Stirling’s records indicated that he removed a section of the midden 70 feet (64 m) by 20 feet (18.28 m) in the North West section (Smithsonian Institution, 1935). Digitized Approximate size overlaid on historical aerial from 1940, 1949 and 1952.
Belle Glade Mound

- The Belle Glade Mound Lidar

2007 Lidar Elevation

High: 12.51 m
Low: 1.31 m

~ 110 m Diameter

Belle Glade Burial Mound
Democrat River
Belle Glade Mound

- The Belle Glade Mound Photogrammetric Elevation
  - Improved precision in elevation data
Belle Glade Mound

- Examining excavation information
  - No scale
  - No accurate representation in shape
Belle Glade Mound

- Applying excavation information
Belle Glade Mound

- Applying excavation information
  - Mystery House
    - Obscure later reference to the house of Sidney (Fritzie) Dryden and Gladys Belasario.
    - Reference mentions midden but possible mistake
Belle Glade Mound

- Applying excavation information
  - Inductive Theory
Belle Glade Mound and Midden
Belle Glade Mound and Midden

- Future Work
  - 3D Reconstructions
Thank You

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