



MARCH 2016

The unmanned aircraft system (UAS) uses an unmanned aerial vehicle (UAV) to capture and record accurate, high-quality data for a variety of uses. The UAS was developed in collaboration with the University of Florida's Department of Aerospace Engineering and the U.S. Geological Survey's Florida Cooperative Fish and Wildlife Unit, for the purpose of having an easy-to-deploy, low-cost method of aerial reconnaissance and data collection.

With this technology, the Jacksonville District UAS section is able to provide the resources to make more informed decisions using cutting-edge technology. Additionally, the Jacksonville District UAS section is able to obtain expedited access to the airspace via a Memorandum of Agreement with the Federal Aviation Administration, allowing quick response on most projects.

## PROGRAM BENEFITS

The UAS program is capable of providing timely and accurate geospatial data for a variety of mission requirements, essential for scientists, engineers and first responders. Program benefits include:

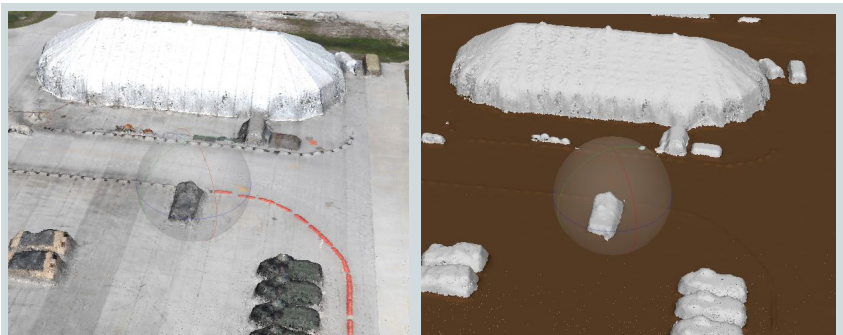
- Reliable data collection tools
- Accurate, high resolution imagery
- On demand/rapid turnaround
- Rapid, accurate dissemination of information critical for decision making

The program can also serve to augment infrastructure inspections and monitoring efforts to ensure that various districts, emergency responders, field investigators, etc., are provided with the most comprehensive geospatial information.



## UAV ADVANTAGES & FEATURES

- Compact, portable and reliable
- No site preparation
- Quality boots-on-the-ground data with aerial efficiency
- Rapid deployment options available in remote and difficult to access areas
- Crew of two to three persons
- Limited ground control requirements
- Geospatial measurement from UAS telemetry
- Visible spectrum mosaics down to 1 centimeter resolution
- Color infrared and near infrared mosaics down to 1 centimeter resolution
- RGB point clouds and video feeds
- Digital Surface Models (DSM)
- Digital Elevation Models (DEM)



RGB point clouds with bare earth filtering to extract digital elevation models.

## POTENTIAL APPLICATIONS

### EMERGENCY OPERATIONS RESPONSE

- Provide comprehensive data for rapid decision making
- Structure and damage assessments
- Debris volume estimates

### ECOSYSTEM RESTORATION

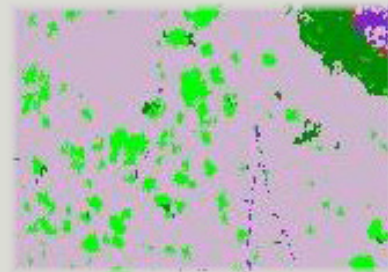
- Monitor environmental change over time
  - Dry to wet conditions
  - Plant mix changes (invasive and native)
- Endangered species monitoring
- Document mitigation success/failure
- Document baseline pre-mitigation conditions
- Automated vegetation mapping
- 3D printed custom payloads for biocontrol releases, ideal for invasive species management

### OPERATIONS

- Dredge spoil area monitoring/ DEM for volume estimates
- Beach renourishment monitoring
- Turbidity sampling

### CONSTRUCTION PROJECT MONITORING

- Compare pre- and post-construction conditions
- Document potential claim situations



Thematic mapping of invasive species. The bright green denotes cogon grass.

## UAV MODELS



### Nova Fixed Wing (F6500)

- Hand-launched aircraft that can land in the water and on the ground
- State of the art DSLR camera
- Most efficient tool for obtaining high fidelity geospatial data



### Nova Multi-Rotor (R8400)

- Aircraft that has vertical take-off, landing and hovering capabilities
- Interchangeable payloads with Nova Fixed Wing for data consistency
- Able to access mission sites with difficult landing approaches



### DJI Phantom Vision

- Video and still frame capability that provides rapid deployment and mapping option
- Two-person teams with minimal logistical footprint; Ideal for emergency management missions
- Custom built payloads for mission needs, such as fully-integrated Thermal Infrared Video system



### Sensefly eBee

- Two-person teams with minimal logistical footprint; Ideal for emergency management missions
- Ideal tool for smaller projects with limited landing approaches
- Low kinetic energy and foam construction allows safe operation, such as in urban areas for an emergency management mission

## FOR MORE INFORMATION



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