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Welcome

The multidisciplinary Unmanned Aerial Systems Research Group, Florida Cooperative Fish and Wildlife Research Unit's multidisciplinary UAS research program with the UF Department of Aerospace and Mechanical Engineering's Micro Air Vehicles Laboratory, the UF School of Forest Resources and Conservation's Geomatics Program, and the U.S. Army Corps of Engineers is actively working towards the development of a small unmanned aircraft system (UAS) that is both affordable and user-friendly for natural resource assessments and monitoring. The systems offer rapid deployment, simplified transportation to remote locations that lack runways, and reduced logistical burdens. Using a custom-designed composite airframe with a customized commercial autopilot/GPS avionics suite and image-collection systems, georeferenced imagery from small UAVs provides the ability to rapidly locate and assess ground targets in a variety of remote locations.

What We Do

Unmanned systems offer a new platform for observing, monitoring, and measuring the landscape. They fill the gap between satellite and manned aircraft imagery and ground-based observations. Aerial platforms efficiently cover large areas of land, particularly when ground operations are difficult or dangerous, such as in the Everglades. Unmanned aircraft provide a method of obtaining aerial imagery without the added risk of putting a human life in the air. An interdisciplinary team of researchers at the University of Florida, with funding from the U.S. Army Corps of Engineers, have developed the Mako small Unmanned Aircraft System (sUAS) designed specifically as a low-cost, autonomous, aerial imaging tool for ecological research and monitoring.

Benefits

- Rapid Deployment
- Amphibious Operation in Rugged Terrain
- High Accuracy, High Resolution Imagery
- Completely Autonomous Flight Operation

History

The Unmanned Aerial Systems Research Group has worked for over 12 years to pioneer the development of UAS technology as a tool for aerial imagery collection for natural resource applications.

The initial motivation to explore UAV applications for natural resource applications was to save lives. Due to the challenging terrain and low altitudes characteristic of aerial surveys, light aircraft crashes are the leading cause of workplace mortality among wildife biologists. Despite this fact, thousands of flights are performed annually to perform these critical surveys as no suitable alternative previously existed.

Once the initial concept of utilizing UAVs to replace manned flights was proven feasible through preliminary pilot application projects, subsequent development resulted in 5 generations of unmanned systems. Building on experiences gained and subsequent lessons learned, the program enhanced its interdisciplinary scope with the inclusion of researchers from the UF Department of Mechanical and Aerospace Engineering. This partnership brought advancements in vehicle capabilities, improving flight performance and navigational accuracy while increasing durability for operations in challenging locales. As a suitable sensor platform became available, additional expertise was contributed by researchers from the UF School of Forest Resources and Conservation's Geomatics Program, who then focused the program's efforts on the development of improved imaging payloads for aerial mapping.

The latest generation Mako sUAS is the result of intensive cooperative development between biologists who specify the imagery data products and operational constraints they require, geomaticists who then develop a suitable payload to meet those needs, and aerospace engineers who finally design and build the vehicle to optimally exploit the payload in the specified environment. As the latest system is currently producing valuable aerial imagery products, there is an ongoing development push toward optimizing the methodology of data acquisition and improving the processing and analysis required to turn "pretty pictures" into valuable scientific data to assist biologists and project leads in making better informed assessments and management decisions.

News:

April 2011 **- UAS Research Group receives first-ever FAA COA for Nature Coast environmental monitoring projects**

March 2011 **- UF and USACE designate proposed project area in the Everglades Water Conservation Area 3**

January 2011 **- UAS Research Group hosts Department of the Interior representatives for UAS seminar**

October 2010 **- UAS Research Group in UF Research News Article, Video, Photos**

September 2010 **- UF and USACE close 2010 operations with a successful mission at Fish Eating Bay, Lake Okeechobee, FL**

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