Research and UAS & UAS Research

Marty Rogers
Executive Director
FAA UAS COE
The Small Unmanned Aircraft System (sUAS)

Less than 20 kg (55 lbs)
- Fixed Wing or Rotary Wing
- Battery or Gas Affects Endurance
- Multiple Launch & Recovery Options

On-Board Sensing Possibilities and Capabilities
- Visible and/or Thermal Imagery
- Video and/or Still Photography
- LASER and LIDAR detection and ranging
- Synthetic Aperture Radar
- Aerosols and Gasses; detection, characterization and classification
- Dropsondes
Sensitive Inland and Coastal Research Applications
Yukon River Breakup in Circle, Alaska – NOAA Funded
Yukon River Breakup in Circle, Alaska – NOAA Funded
Idaho Power Salmon Spawning Habitat

Mapping Fall Salmon Nests along a 162 km of the Snake and Clearwater River in Idaho, Washington, and Oregon “THREATENED” under the Endangered Species Act
Unique and Difficult Operating Conditions

Previous Manned Aviation Project - Accidents
Idaho Power Salmon Spawning Habitat

Raw Image
Idaho Power Salmon Spawning Habitat
After Analysis
• **Habitat Study**
  - Precision Hawk
  - CIR-modified Nikon J3
  - 165’ altitude
  - 0.5” pixels

• **Disaster Response Exercise**
  - DJI Phantom 2
  - Vision Plus
  - Various altitudes
  - Various pixel sizes

• **Wildfire**
  - Altavian Nova
  - CIR-modified Canon EOS Rebel SL1
  - 800’ altitude
  - 2.0” pixels

• **Wildfire**
  - Altavian Nova
  - Micasense RedEdge
  - 400’ altitude
  - 3.2” pixels
“Informing UAS Policy Through Research”

Introduction to ASSURE
What is ASSURE?

The Alliance for System Safety of UAS Through Research Excellence - The Federal Aviation Administration’s Center of Excellence for Unmanned Aerial Systems

Still young: 18 months old

22 Schools, 110+ companies – big team for a big job!
What is a FAA Center of Excellence?

COEs are “entities with substantive ties to universities which advance the state of transportation knowledge within a particular aviation area.”

FAA William J. Hughes Tech Center manages COEs

COE’s get two funding vehicles

- Grants (mandatory 1-to-1 cost share)
- IDIQ Contracts (cost share negotiable)

Congress added $5 million to the UAS COE in FY15 & FY16; expect similar amounts on yearly basis
ASSURE
Alliance for System Safety of UAS through Research Excellence

CORE TEAM
Alabama
UNIVERSITY OF ALABAMA IN HUNTERSVILLE
Alaska
UNIVERSITY OF ALASKA IN FAIRBANKS
Arizona
EMBRY AERONAUTICAL UNIVERSITY-PREScott
California
UNIVERSITY OF CALIFORNIA DAVIS
Florida
EMBRY RIDDLE AERONAUTICAL UNIVERSITY
Kansas
KANSAS STATE UNIVERSITY
KANSAS UNIVERSITY OF KANSAS
WICHITA STATE UNIVERSITY
Montana
MONTANA STATE UNIVERSITY
New Mexico
NEW MEXICO STATE UNIVERSITY
North Carolina
NORTH CAROLINA STATE UNIVERSITY
North Dakota
UNIVERSITY OF NORTH DAKOTA
Oregon
OREGON STATE UNIVERSITY
Ohio
THE OHIO STATE UNIVERSITY
Pennsylvania
DREXEL UNIVERSITY

AFFILIATE TEAM
Alabama
AUBURN UNIVERSITY
TUSKEGEE UNIVERSITY
Indiana
INDIANA STATE UNIVERSITY
Louisiana
LA TECH UNIVERSITY
Ohio
SINCLAIR COMMUNITY COLLEGE
Canada
CONCORDIA UNIVERSITY
United Kingdom
UNIVERSITY OF SOUTHAMPTON

MISSISSIPPI STATE UNIVERSITY
History education Research community Tradition pride
FAA Funded ASSURE Research

- Validate small UAS (sUAS) ASTM standards – Kansas State University
- Develop detect and avoid (DAA) to enable sUAS beyond visual line of sight (BVLOS) operations under specific operational limitations – University of North Dakota
- Air to air collision – Wichita State University
- Air to ground collision – University of Alabama Huntsville
- UAS Maintenance Standards – Kansas State University
- Human Factors – Drexel and Embry Riddle Aeronautical University
- UAS Noise – Mississippi State University
- Economic Impact of UAS – Embry Riddle Aeronautical University
- UAS Operations over Populations – University of Alabama Huntsville
Pan Pacific UAS Test Range Complex
Test and Operational Locations

- Iceland
  - RU & UI
- Bering Sea
  - Available Oceanic Areas
- Alaskan
  - UAF
- Hawaii
  - UH
- Oregon
  - OSU
- Mississippi
  - MSU

Image: Landsat
Data: SIO, NOAA, U.S. Navy, NGA, GEBCO
Image: IBCAO
Image: U.S. Geological Survey
Thank You