



University of Alaska Fairbanks - ABoVE Synergies

*Research Capabilities at the University of Alaska
Fairbanks Pertinent to the ABoVE effort*

Cathy Cahill

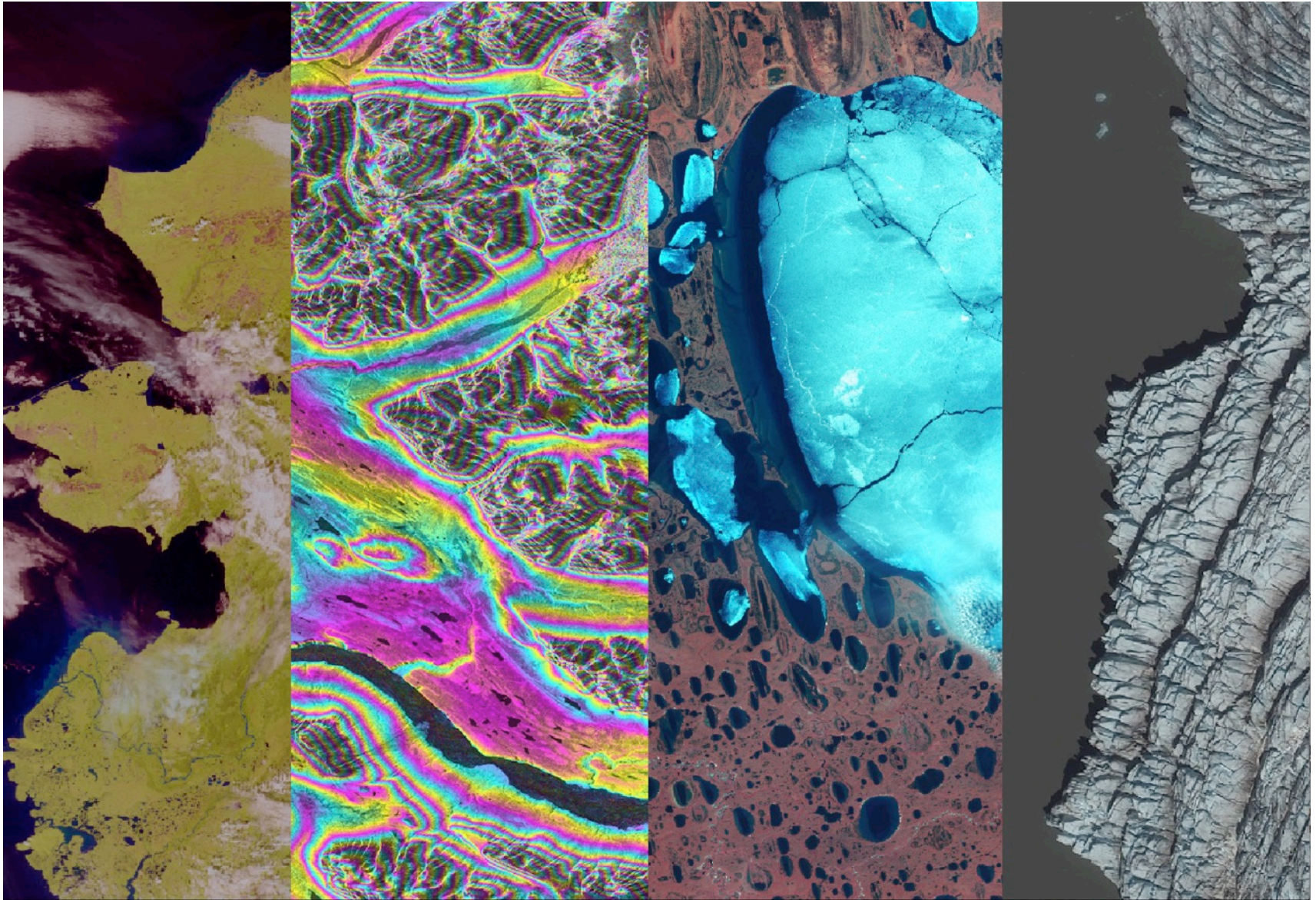
Research is an Integrated Core Function of the University



Summary of UAF's Capabilities

- Alaska Satellite Facility (ASF)
- High Frequency Active Auroral Research Program (HAARP)
- HyLab
- Rocket Launch Facilities
- Lidar
- Alaska Satellite Facility
- UASs
- Manned Aircraft
- Aerosol Sampling
- Volcanic Ash Dispersion Models
- Infrasound
- Sikuliaq
- AUVs
- High Frequency Radars
- Long-Term Ecological Research Stations
- Seismic Monitoring Stations
- Volcano Monitoring
- Tsunami Monitoring
- Research Computing Systems
- Decision Theater North
- Geobotany Lab
- International Arctic Research Center Data Archive (a Member Node for the Data Observation Network for Earth (DataONE))
- Alaska Center for Energy and Power
- Social and Economic Research
- Arctic Policy Research
- Polar Security Research
- Experienced Researchers
- And Much, Much, More!

Satellite Remote Sensing



Operational Support Available to the ABoVE Team at UAF - ASF

- The Alaska Satellite Facility (ASF) downlinks, processes, archives, and distributes remote-sensing data to scientific users.
- ASF is a NASA Distributed Active Archive Center that focuses on synthetic aperture radar data.

Operational Support Available to the ABoVE Team at UAF - GINA

- The Geographic Information Network of Alaska (GINA) receives numerous geospatial data sets, including Suomi-NPP, AVHRR, MODIS, and many in real time.
- GINA rapidly processes the information and makes it available for use by scientific researchers, state and federal agencies, and the general public.

Operational Support Available to the ABoVE Team at UAF - HyLab

- HyLab can provide complete operational support from hyperspectral data acquisition to final product delivery in both field-based and airborne modes.
- UAF's airborne support can provide repeat coverage over target areas where NASA deploys its airborne capabilities but obtains limited data due to logistical constraints.

The Alaska Center for Unmanned Aircraft Systems Integration (ACUASI)

- ACUASI is the University of Alaska's unmanned aircraft system (UAS) research program
- ACUASI is a key partner in the Federal Aviation Administration's Center of Excellence for UAS and leads the Pan-Pacific UAS Test Range Complex

The Test Range



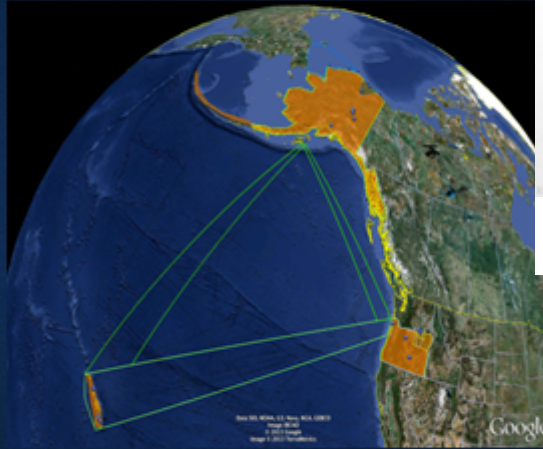
Alaska



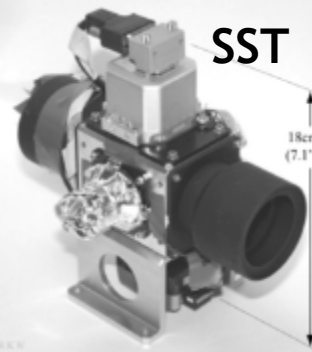
Oregon



Hawaii



Pan Pacific UAS Test Range Complex (PPUTRC)



SST

Radiometer

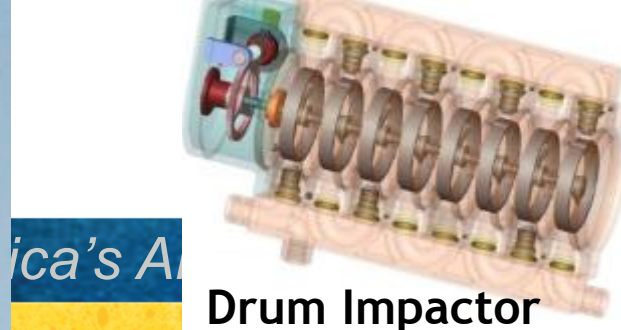


HSI

Aeryon Scout



SAR



Drum Impactor

LIDAR



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917

UAF's Unmanned Aircraft History

- 2001 - Partnership with New Mexico State University
 - Developed applications for the Technical Analysis & Applications Center (TAAC)
- 2003/2004 - Funded to work with USAF and USCG
 - Maritime domain awareness
 - Wildfires in the Interior of Alaska
- 2006 - Acquired first ScanEagle
- 2007 to present - Multiple missions for science, emergency response, humanitarian needs, and engineering and policy development
- 2012 - Alaska legislature funded \$5M to grow program & pursue FAA Site
- 2013 - Selected as one of six FAA test sites
- 2015 - Core member of FAA COE
 - Part of NASA's UTM project



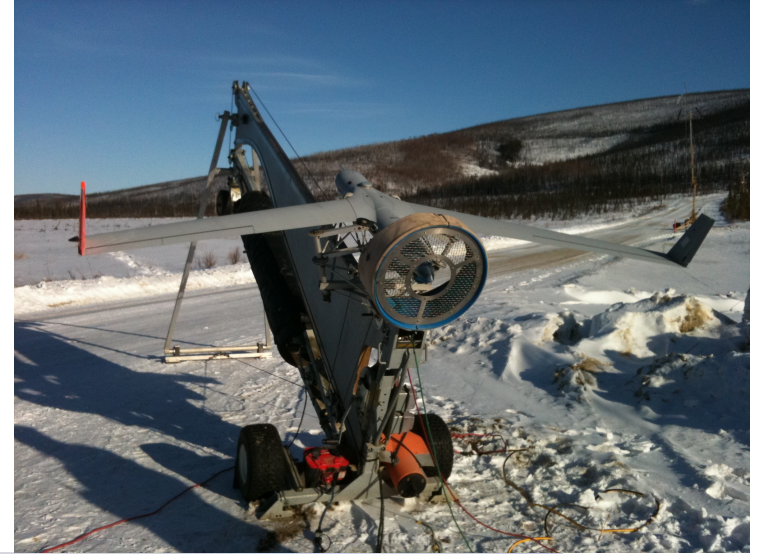
June 2007

First UAF Launch

Altair "Mariner" Alaska July 2004



ACUASI's UAS Fleet





SeaHunter

- Delivery this spring
- 250-300 lb MTOW
- Up to 120 lb payload
- Runway launch/recovery
- Heated pitot tube, enhanced engine for ACUASI version

- Planned for long distance off-shore operations—150-200 miles
- 250 knots speed, 250 miles range
- 16,000 ft AGL
- Gas powered, SATCOM Comms
- Likely test bird for new deicing technology, subsystem certification tests

ScanEagle at the Crazy Mountain Fire Complex

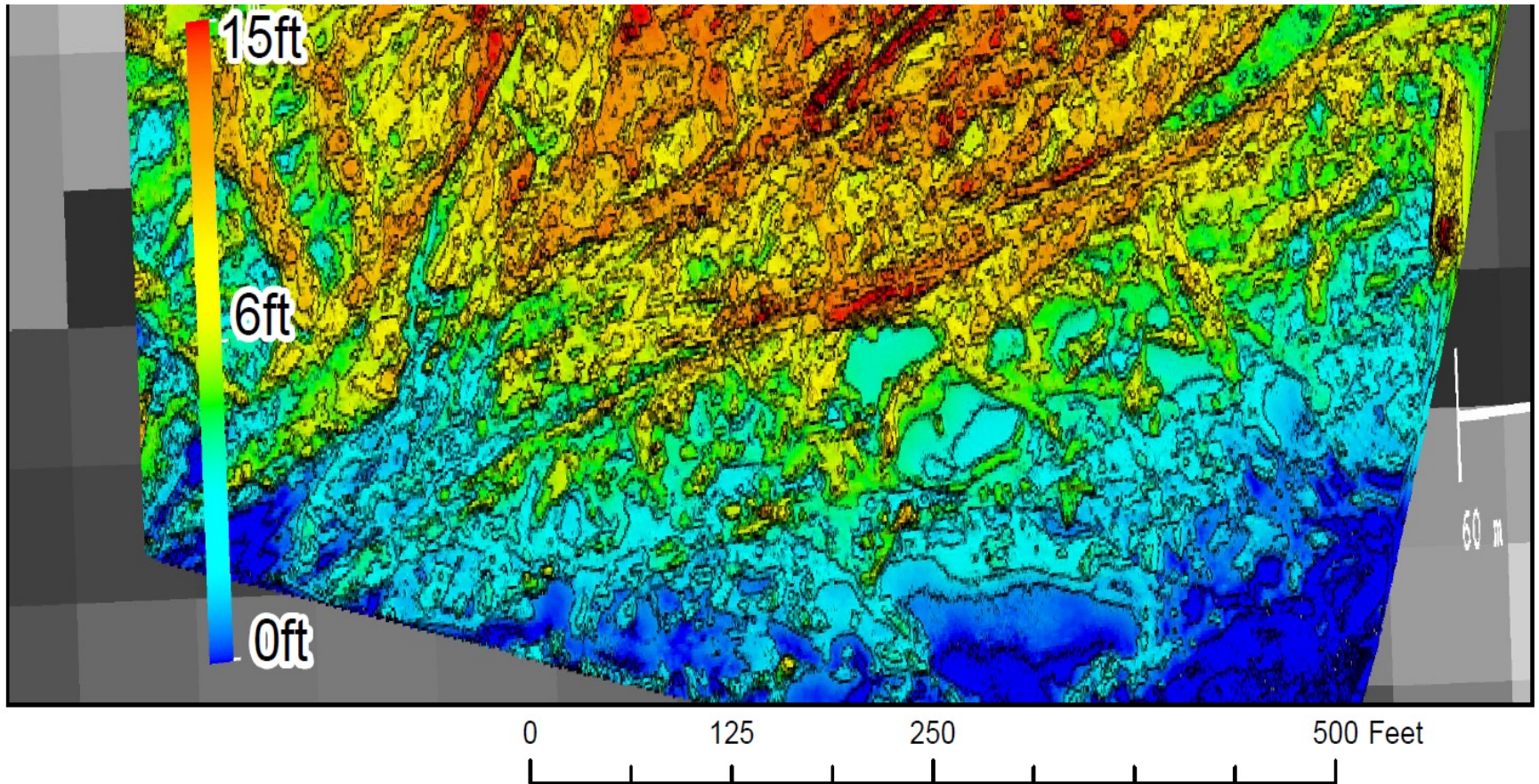


Funny River Wildfire Support

The fire covered more than 221,000 acres and required over 750 firefighters at its peak. Over 75 hot spots were identified with UAS allowing firefighters to target those areas.



Sea Ice Survey - Barrow



Data from the Sea Ice Survey was shared with the community. Mapped ice ridges define the area for ease of determining the best route for an ice trail for whale hunting.

ACUASI/NASA Joint UAS Research

- PPUTRC members are working with NASA and the FAA to develop a system for UAS Traffic Management (UTM)
- By establishing a cloud-based system of airspace reservation that includes:
 - automated provision of traffic avoidance information via location-based warnings, triggered by following a flight plan
 - easy intuitive access to the system for all UAS operators

NASA with FAA concurrence hopes to provide structure and self-managed safety to the under 400 foot operator.



Thank you for your attention!

Questions?

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