



Alaska Center for Unmanned Aircraft System Integration: Future Innovation in Alaska

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Photo Courtesy of Peter Houlihan

Background/Refresher

- The Alaska Center for Unmanned Aircraft Systems Integration (ACUASI) is UA's drone Center of Excellence
- Geophysical Institute staff started working with drones in 2001
- The UA Board of Regents created ACUASI in 2012 to compete for an FAA drone Test Site



Goal – Complete, Safe Integration of Drones with Traditional Aircraft in the National Airspace System



SeaHunter in Inuvik, Canada

Who Are We?

We are an 18-person combination of:

- Veterans and former defense contractors
- Many UAF engineering graduates
- Science and engineering faculty, staff, and students
- Pilots (all pilots are manned aircraft pilots)
- Airframe and Powerplant mechanic (IA)
- Retired FAA Air Traffic Control Flight Service Specialist
- Business developer
- Embedded contractors



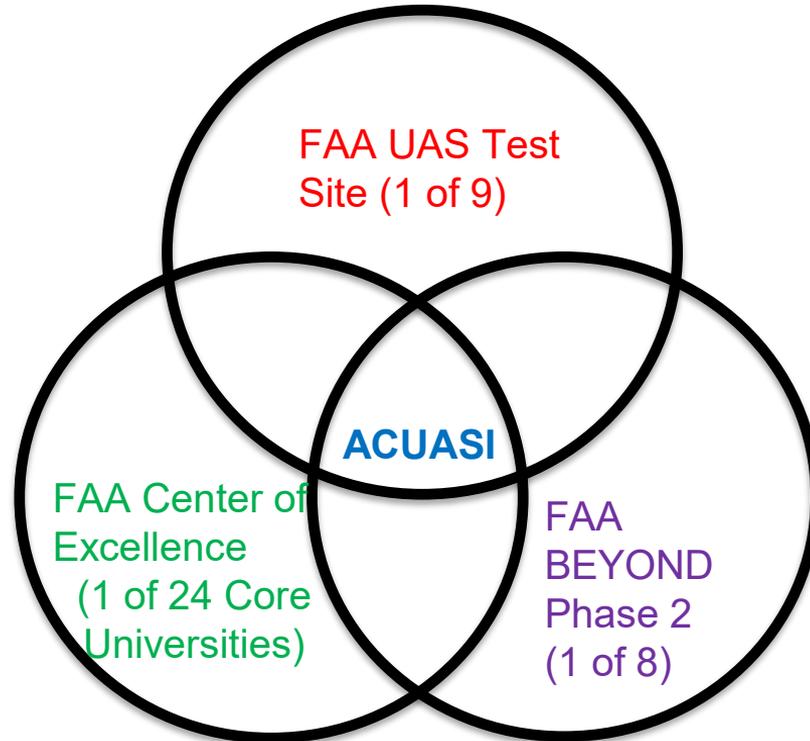
What Makes Us Different

- Real-world use cases
- Agnostic about what technology we use
- Flying Beyond Visual Line Of Sight (BVLOS) of the Pilot in Command is a requirement for most of our use cases
- We do not fly a highly-instrumented box
- Reach across the U.S.
 - Special permission to fly small in all Class G airspace 5 miles outside of an airport across the entire U.S. and its territories, including coastal waters.
 - 80 special permissions at locations across the U.S. for more advanced operations.

FAA Recognition of ACUASI's Expertise

ACUASI participated in the Beyond Visual Line Of Sight (BVLOS) Aviation Rulemaking Committee

Cahill was on the Advanced Aviation Advisory Committee



ACUASI is conducting multiple research projects for the FAA with a variety of commercial partners.

Working with the FAA – Alaska Influence on BEYOND Phase 2

BEYOND Phase 2 Scope



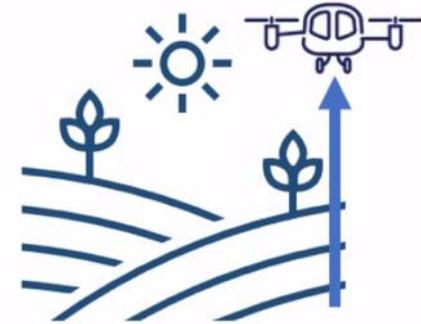
Goal: Develop a performance-based framework for state, local, tribal, and territorial governments to enable more complex, scalable drone operations



Bigger



Farther



Higher

Expected Outcome: Create a ubiquitous NAS environment that enables true integration and establish criteria for future policy development and rulemaking.



Pipeline Monitoring - Progress

Challenges associated with monitoring the Trans-Alaska Pipeline System (TAPS):

- Long distances
- Poor communications
- Steep climbs
- Permitting
- Cost

Solution: a relatively inexpensive, small fixed-wing, drone that can fly close to the pipeline (“shielded”) for long distances, climb quickly, and satellite command and control and data streaming links.

Griffon Aerospace RedWing (a.k.a. the MQM-186)



- Made in the U.S.A.
- Wingspan: 10.1 ft
- Maximum Take-off Weight: 54 lbs
- Useful payload: 12 lbs
- Maximum airspeed: 75 knots max airspeed
- Maximum endurance: 6+ hours
- Engine: 35 cc, gas powered
- Command and control and data streaming: satellite communications
- Camera: visible and thermal infrared

<https://www.griffonaerospace.com/products/redwing/>

Griffon Aerospace Redwing (a.k.a. the MQM-186)

- ACUASI worked with Griffon Aerospace in Madison, Alabama, to increase the power and duration of this American-made aircraft.
 - The U.S. Navy actually received the first aircraft produced with ACUASI's updates
- ACUASI will be receiving their RedWing aircraft in April.
- The goal is to fly TAPS looking at thermosiphon health in Fall 2026.



Furie Mission

- BVLOS Flights between a natural gas rig in Cook Inlet and the shore
- Distance - ~15 miles
- Aircraft – Hybrid Project Supervolo
- Payload – Water samples for environmental compliance
- Detect and Avoid:
 - Ground-based Detect and Avoid – Raytheon Skylar Radar
 - Visual observers on both ends
 - Streaming video to avoid ships



Detect and Avoid - Progress

- We acquired two Windracers ULTRA Mark 1 UAS
- 900 lbs maximum take-off weight, 200 lbs payload, 3 bay doors, ~5-hour endurance
- Equipping with full radar-based Detect and Avoid



Detect and Avoid - Progress

- We are testing the Fortem radar's ability to meet industry standards for Detect and Avoid.
- If the system is able to meet the standards, the FAA should allow the aircraft to operate BVLOS in the Alaskan airspace because it will have a system capable of spotting other aircraft near them and avoiding them.
- It will be a key step towards implementing safe, real-world medical supply and cargo delivery operations

Medical Supply Delivery Demonstration

Jan 23, 2026

<https://www.instagram.com/reel/DU2s5J9ifrU/>

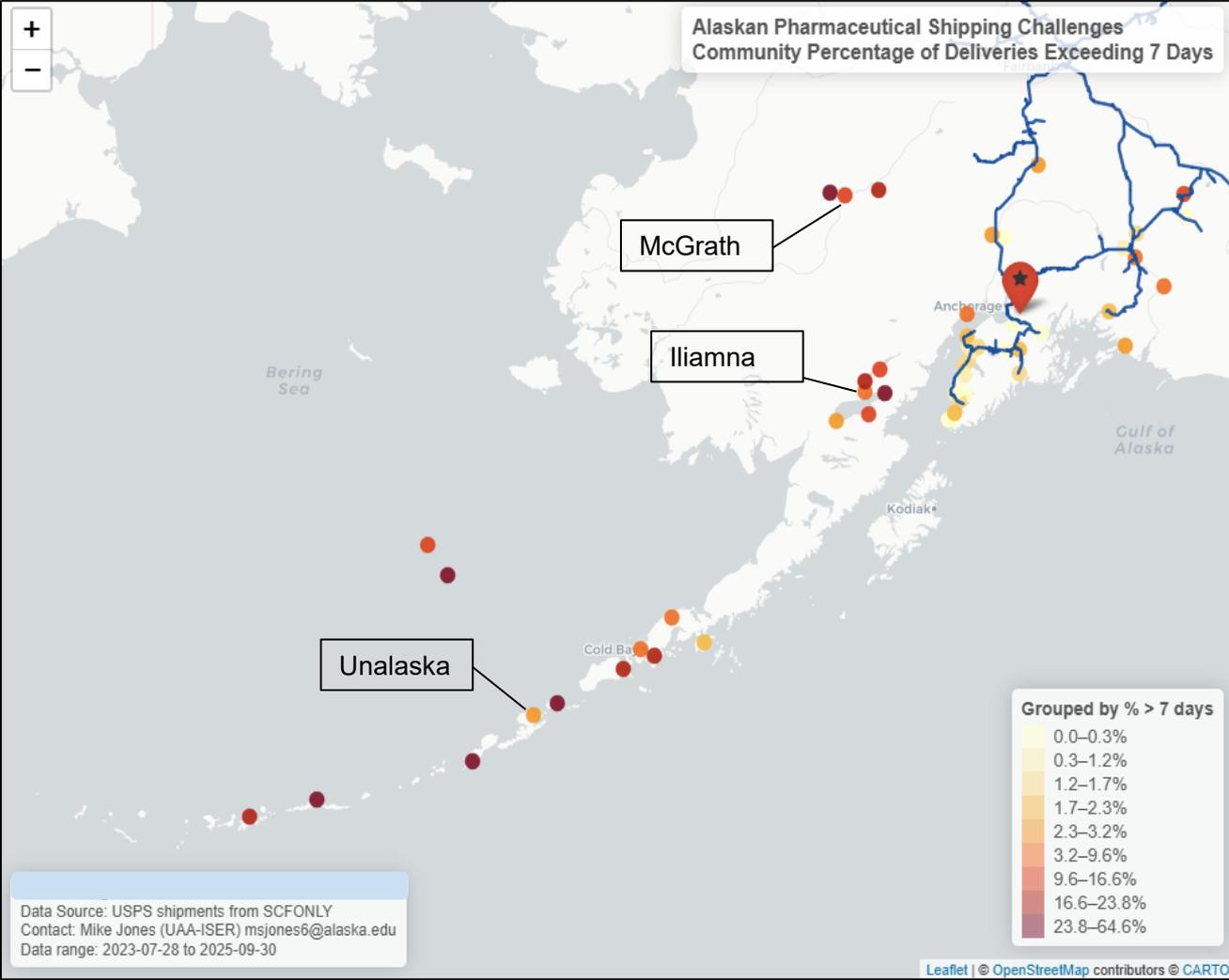


ACUASI and the Institute for Social and Economic Research (ISER) at the University of Alaska Anchorage are working with multiple regional health providers to get funding to conduct pilot medical supply deliveries at locations across Alaska.



With THO partners, UAA-ISER is quantifying delays in pharmaceutical air shipments for data-driven supply chain solutions.

Three THOs participating (SCF data shown). Building large statistical models that proxy for delays across aviation networks, show opportunities for UAS enhancement.

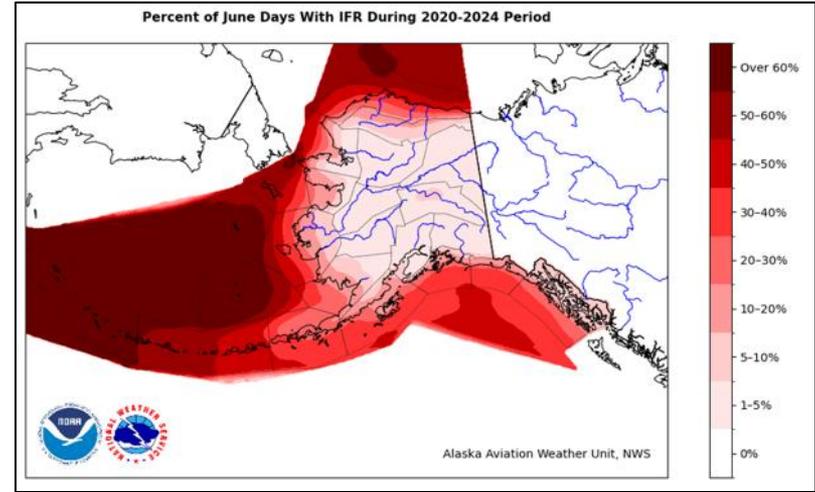
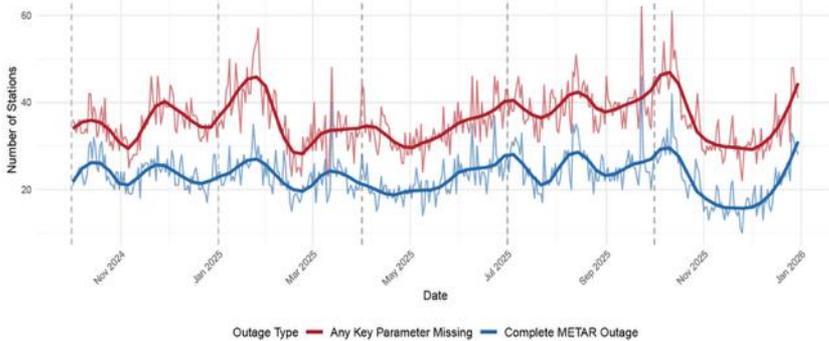


With FAA, NOAA, ADOT, and industry partners, UAA-ISER is modeling aviation infrastructure outages, weather challenges, and flight traffic

AWOS and ASOS (Aviation Weather Station) Outages

Daily Count of Stations with 2n+ Outages

Thin lines = daily count; Thick lines = smoothed trend; Dashed lines = quarter boundaries



Skydio X10 Drone Docks -



- Collaboration with the State of Alaska Department of Transportation and Public Facilities, Caltrans, Skydio, and others.
- Skydio X10 drone docks are drone-containing housings that open to allow a drone to launch in case of an emergency or some other need.



Skydio X10 Drone Docks -

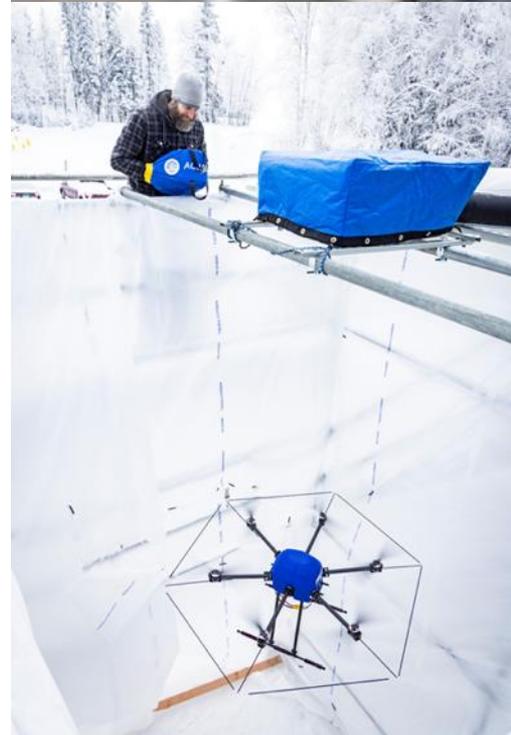


- The drones are remotely piloted from Anchorage or some other emergency response location to collect the imagery needed to assess the situation.
- ACUASI's part of the project is to test a Skydio X10 drone dock's ability to survive and operate year-round in the Fairbanks environment.



Supercool Water Experimental Arctic Tower (SWEAT)

- ACUASI scientists, in conjunction with Canadian partners, the Supercool Water Experimental Arctic Tower (SWEAT).
- SWEAT allows the ACUASI team to create supercooled water droplets of known size and cause icing on drone surfaces.
- SWEAT allows the team to test anti-icing and deicing technologies.



Arctic Trafficability

- BVLOS operations, supported by ground-based radars, to fly Synthetic Aperture Radar (SAR), LiDAR, and Ground-penetrating radar to identify best route for traversing of snow-covered and melting permafrost environments.



XPRIZE End Destructive Wildfire Competition

- ACUASI is supporting the XPRIZE End Destructive Wildfire Competition.
- Goal of the competition – Autonomously detect and suppress a high-risk wildfire in 10 minutes in a 1000 square kilometer area.
- The five finalist teams will be coming to Alaska to participate in the final testing this summer.

<https://www.xprize.org/news/meet-the-future-of-autonomous-wildfire-response-xprize-wildfire-announces-finalist-teams-advancing-in-11m-competition>

Counter-drone (FAA, DOJ, DOW, ...)

The ACUASI team has entered the realm of counter-drone (C-UAS):

- FAA - ASSURE - Effect of drone detection systems on first responder communications, navigational aids, and other systems critical to the safety of the National Airspace System.
- DOJ - The use of passive radiofrequency drone detection systems to support local law enforcement agencies, including airport police.
- DOW - Supporting Alaska military installations by testing their drone defenses to identify any gaps and provide recommendations on how to fill them.
- U.S. Congress - Providing subject matter expertise on C-UAS.

C-UAS Highlights

- The Test Site team flew several Red Force style campaigns against Counter-UAS and UAS Detection, Tracking, and Identification (DTI) Systems during the last six months.
- ACUASI deployed a DTI system in support of the Alaska Department of Transportation's glacial outburst flood monitoring efforts in Juneau. A UAS violated the TFR and missed a DOT UAS by ~30m. Local law enforcement used the end of the track and a door-to-door search to find the operator.
- ACUASI deployed a DTI system in support the University of Alaska Anchorage Police Department for President Trump's visit.

ACUASI's Future Impact on Alaska's Drone Economy

- ACUASI will be flying large drones from Alaskan airports to test and evaluate drone capabilities and evaluate business cases.
- ACUASI and its partners will be developing the technology and processes for monitoring essential infrastructure and other BVLOS missions.
- ACUASI will be pioneering medical supply delivery operations with Tribal Health Consortiums.
- ACUASI will be transferring commercial operations pioneers to Alaskan companies.



**ACUASI is flying North to the
Future!**

Questions?

