Flying to the Future:
Building the Drone Industry in Alaska
February 9, 2023

Photo courtesy of Brian Doben (www.atworkproject.com)

ACUASI

- ACUASI is the University of Alaska's drone Center of Excellence
- Our missions include:
  - Assisting the FAA in the safe integration of drones into the National Airspace System
  - Supporting Alaskan drone users and industry
  - Conducting scientific research

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

SeaHunter in Inuvik, Canada

Who Are We?

We are a combination of:

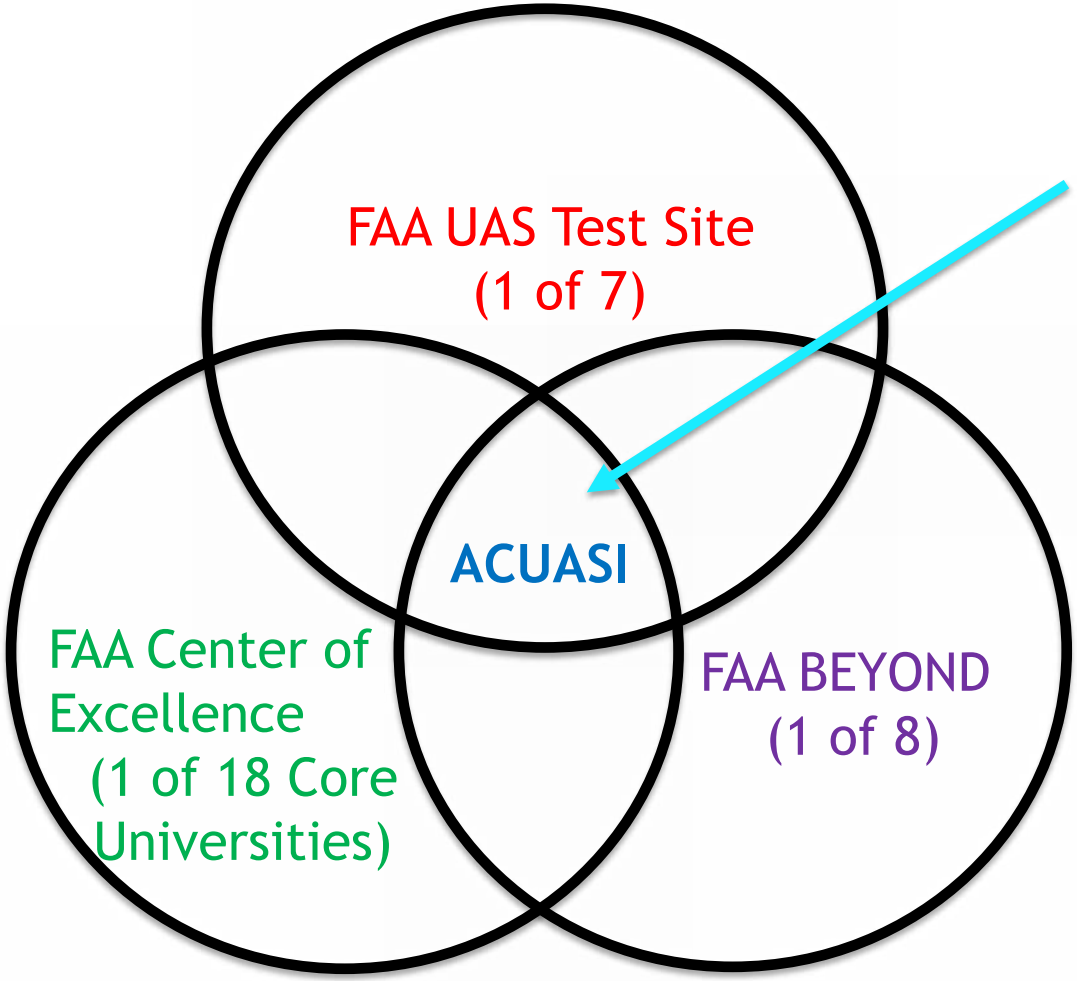
- Veterans and former defense contractors
- Science and engineering faculty, staff, and students
- Pilots (all pilots are manned aircraft pilots)
- Airframe and Powerplant mechanic (IA)
- Retired FAA Air Traffic Control Flight Service Specialist
- Business developer
- Embedded contractors

Alaska UAS/AAM Development

$35.4 Million Programmed for CY 2023 for UAS Research and Development

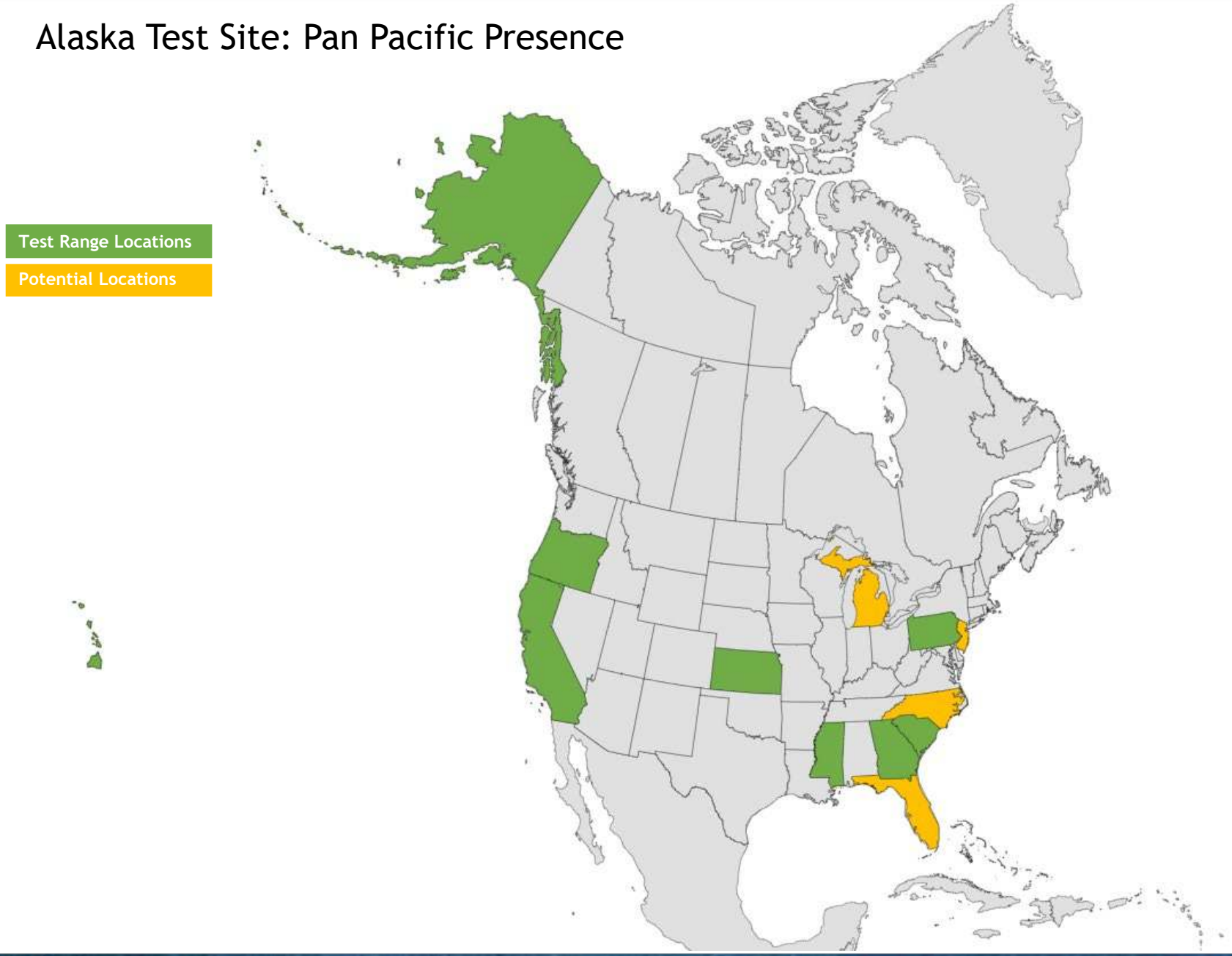
- Funding Sources
  - U.S. DOT & FAA
  - State of Alaska
  - Private Investments
- Partnerships
  - ACUASI
  - SOA Agencies
  - Federal
  - Private Industry

FAA Recognition of ACUASI's Expertise



ACUASI is the only organization in the country with all three programs

Alaska Test Site: Pan Pacific Presence



BVLOS Aviation Rulemaking Committee

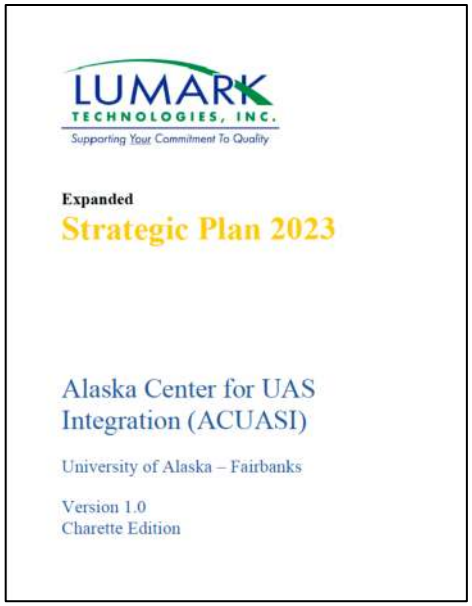
- We fought to protect Alaska's unique airspace environment for both drones and traditional aircraft
  - There are a lot of planes flying under 500' across Alaska
  - Natural GPS-degraded and no cell phone coverage areas so services are hard/impossible to get
  - Gained friends in AOPA, Alaskan Airman's Association, and other pilot organizations

Partners

- Alyeska Pipeline Service Company
- Anduril
- Cherokee Nation
- Doyon Limited
- DRONERESPONDERS
- Echodyne
- Fairbanks International Airport
- Fairbanks North Star Borough
- Furie
- Griffon Aerospace
- Insitu
- Iris Automation
- Merck
- Merlin Labs
- North Slope Borough
- Parallel Flight Technologies
- Phenix Solutions
- Pierce Aerospace
- Raytheon (Intelligence & Space)
- Reliable Robotics
- Skyfront
- State of Alaska Department of Transportation and Public Facilities
- Tanana Chiefs Conference
- Turnagain Arm Heavy Lift
- Unmanned Systems Alaska
- Vanilla
- Vigilant Aerospace Systems
- Xwing

ACUASI Strategic Planning

- Stakeholder Charrette
- August 16-17, 2022 at UAA
- 16 stakeholders plus members of ACUASI's Strategic Planning Advisory Board



- Document maps out ACUASI's future efforts to support the safe integration of drones into the airspace and the creation of a drone economy in Alaska

What Really Makes Us Different

- Real-world use cases
  - Diapers and milk to the villages
- Agnostic about what technology we use
  - We just want something that works
- Beyond Visual Line Of Sight (BVLOS) is a requirement for most of our use cases
- We don’t fly a box

Alaska UAS Growth for 2022-2023

FAA | UAS Drone Popularity

Reporting data as of 1/10/2023 3:56:10 AM ET

Ratio of Population to Drone Registrations

Rank of Popularity	Name	Population	Registrations	Ratio 1 to Population
1	Alaska	738,432	9,091	81
2	Hawaii	1,431,603	15,628	92
3	Utah	2,995,919	30,821	97
4	Idaho	1,654,930	17,003	97
5	Colorado	5,456,574	55,587	98
6	Washington	7,170,351	68,218	105

Unmanned Aviation (AK)

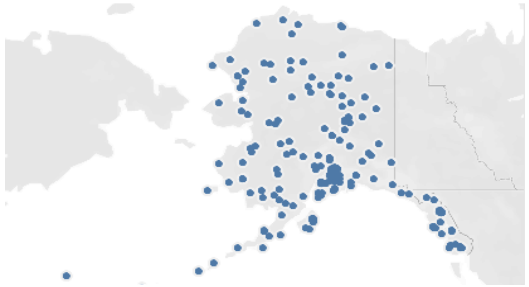
Remote Pilots = **3,241** ↑ 19% from 2022

Registered Unmanned Aircraft = **9,095** ↑ 12% from 2022

Manned Aviation (AK)

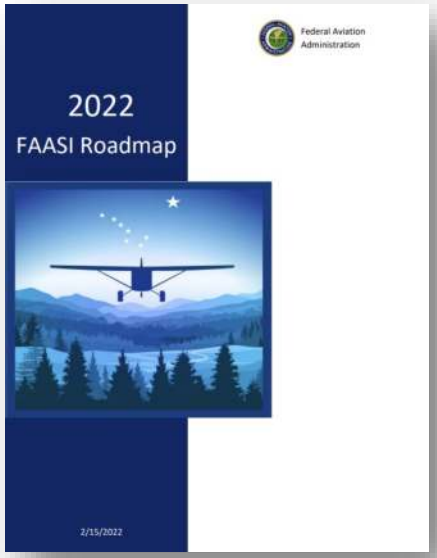
Manned Pilots = **9,428** ↑ 3% from 2022

Registered Manned Aircraft = **8,668** ↑ 4% from 2022



2023

FAA Alaska Aviation Safety Initiative (FAASI)



Safety Outreach

Continue and develop new safety outreach collaborations to address concerns...

Aeronautical Charting

Improve navigation charting by verifying and adding mountain pass information...

Weather Reporting Enhancements

Install weather observing systems at airports and continue testing new weather...

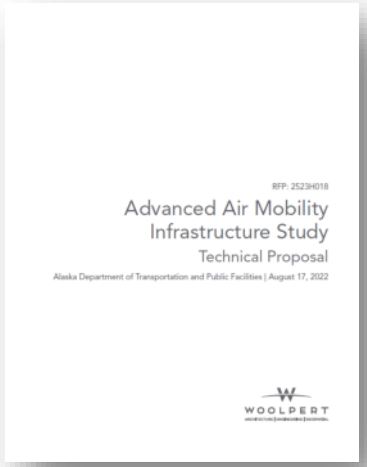
Navigation Strategy Development

Develop an airspace navigation strategy with lower-altitude flight routes and...

Surveillance

Expand ADS-B service coverage to areas that don't have it

AAM Development and Planning Roadmap



Full Airspace Integration

Autonomous

Low weather/night autonomous

Advanced Navigation

GPS Augmentation

Full Weather Radar

Electronically Visible Cooperative Airspace

Surveillance Technologies

Weather Observations

System Status Transparency

Legacy Navigation

Safety Language

Fairbanks International Airport
AeroNexus®

UAF University of Alaska Fairbanks

ACUASI

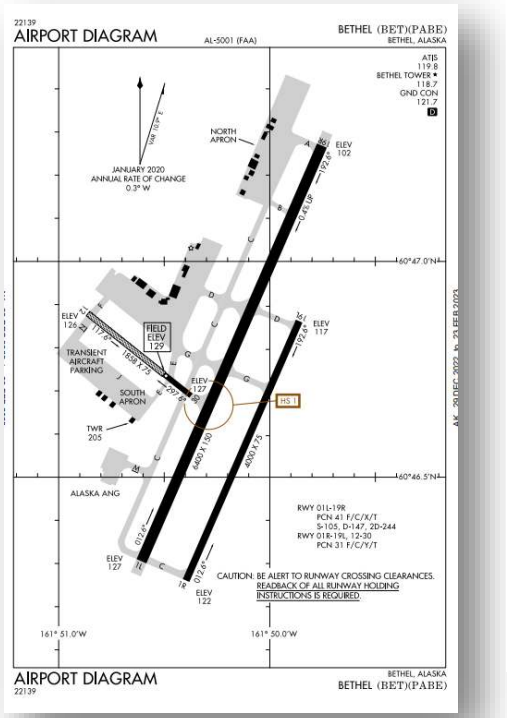
ASSURE
Alliance for System Safety of UAS through Research Excellence

BEYOND

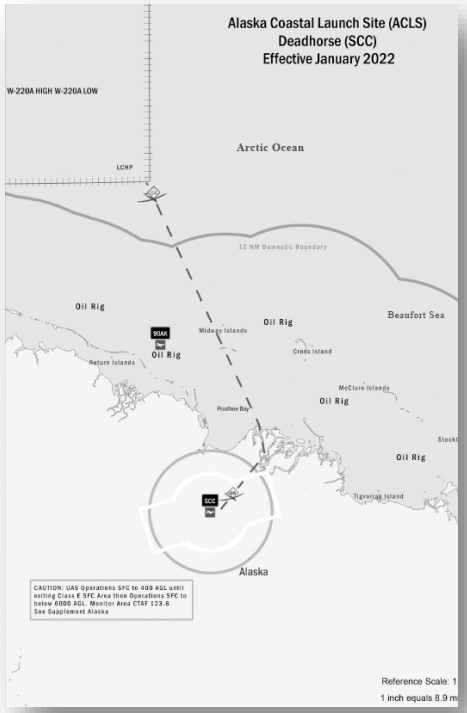
Alaska Airmen Association

AACA
Alaska Air Carriers Association

AAM Technology Deployment



Remote Tower



Advanced Air Mobility

- ACUASI is participating in several Advanced Air Mobility (Large UAS Cargo and Urban Air Mobility) efforts
- Flights and project safety oversight in:
  - Alaska – FAA Test Site and Center of Excellence funding - Merlin Labs (autonomous Cessna Grand Caravan), UAF's SeaHunter, + …
  - California – FAA NextGen funding – 2 projects Xwing (remotely piloted Cessna Grand Caravan), Reliable Robotics (remotely piloted Cessna Grand Caravan), Aurora Flight Sciences (optionally-piloted Centaur), UAF's SeaHunter

Cargo Delivery

- Goal – To deliver cargo including medical supplies more frequently to remote communities via large drone
- Alaska's last 'hundreds of miles' problem
- Can fly when traditional aircraft cannot
- Partnership with local air carriers
- Requires a Part 135 certification
- Extended careers for pilots

Unmanned Cessna 208 Grand Caravan
https://evertsair.com/about/our-fleet/cessna-208-grand-caravan

Fairbanks International Airport

- ACUASI now has a hangar at Fairbanks International Airport (FAI) and will be conducting flights from FAI GA runways

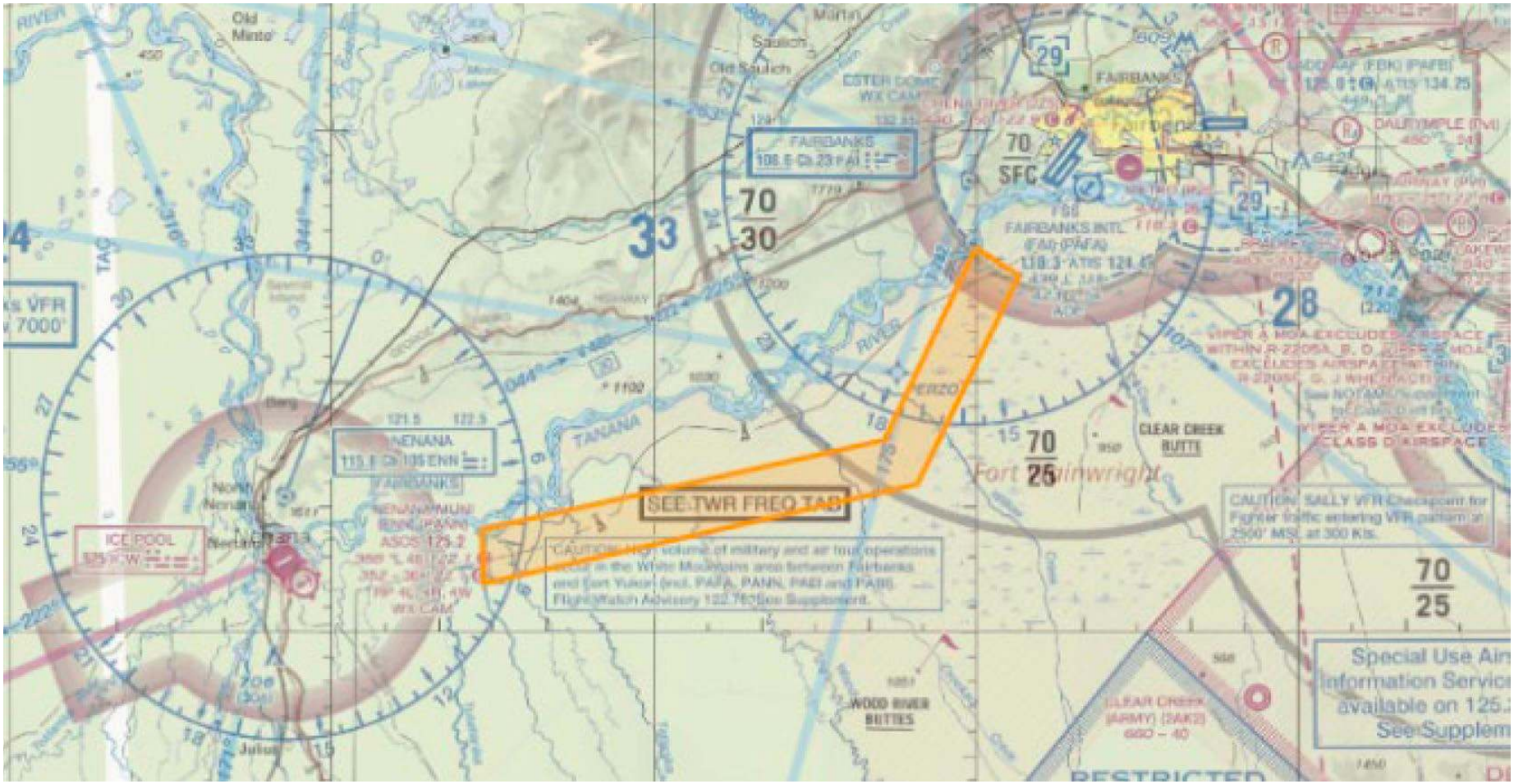
Large Drone (DRS Sentry) at Fairbanks International Airport

- May 22, 2022, 08:21-08:53






Next Step:
Fairbanks to Nenana



Emerging Technology Test Ranges

- ACUASI has started setting up three Emerging Technology Test Ranges:
  - Nenana Municipal Airport (ENN)
  - Palmer Municipal Airport (PAQ)
  - Valdez Airport (VDZ)

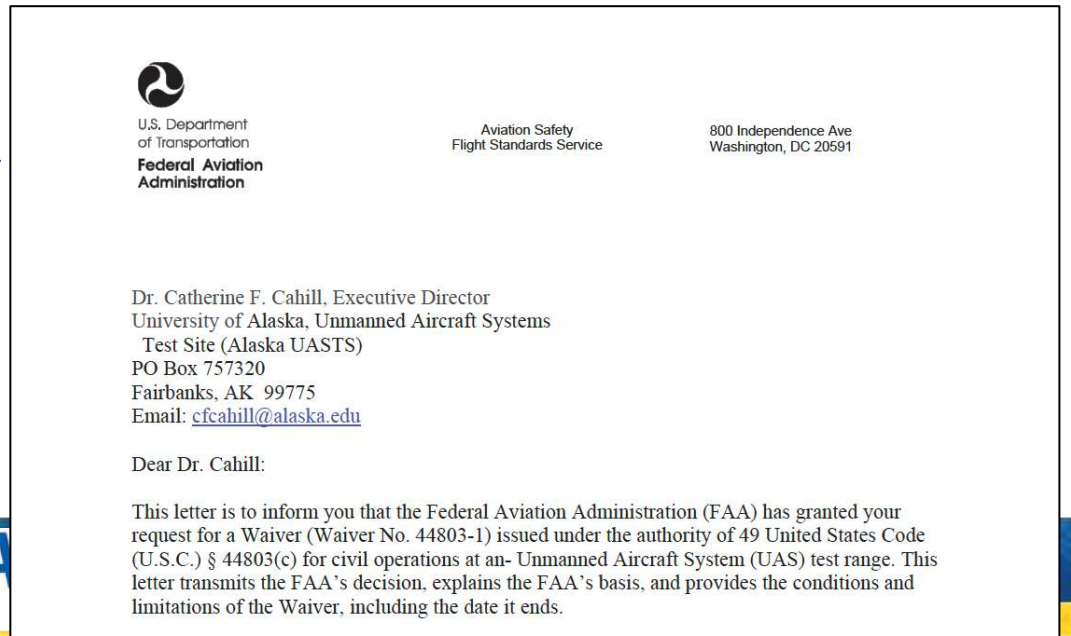
- Purpose – To assist companies with testing prototype systems and payloads under Alaskan conditions
- Each range will include an on-site range manager, hangar space, and test and evaluation equipment

Nenana Municipal Airport

- University of Alaska just signed a 50-year lease with Nenana Municipal Airport (ENN)
- The design for a hangar with office space at ENN is being approved before going out to bid
- ACUASI partnership with Raytheon Intelligence & Space Division is resulting in the addition of a research radar for meteorology information and BVLOS testing being set up at ENN

Hot off the Press!

- On Monday (February 6th) ACUASI received a waiver from the FAA that greatly expanded our ability to help drone manufacturers get their aircraft approved for use in the National Airspace System
- This is the first such waiver ever granted by the FAA



U.S. Department of Transportation
Federal Aviation Administration

Aviation Safety
Flight Standards Service

800 Independence Ave
Washington, DC 20591

Dr. Catherine F. Cahill, Executive Director
University of Alaska, Unmanned Aircraft Systems
Test Site (Alaska UASTS)
PO Box 757320
Fairbanks, AK 99775
Email: cfcahill@alaska.edu

Dear Dr. Cahill:

This letter is to inform you that the Federal Aviation Administration (FAA) has granted your request for a Waiver (Waiver No. 44803-1) issued under the authority of 49 United States Code (U.S.C.) § 44803(c) for civil operations at an- Unmanned Aircraft System (UAS) test range. This letter transmits the FAA's decision, explains the FAA's basis, and provides the conditions and limitations of the Waiver, including the date it ends.

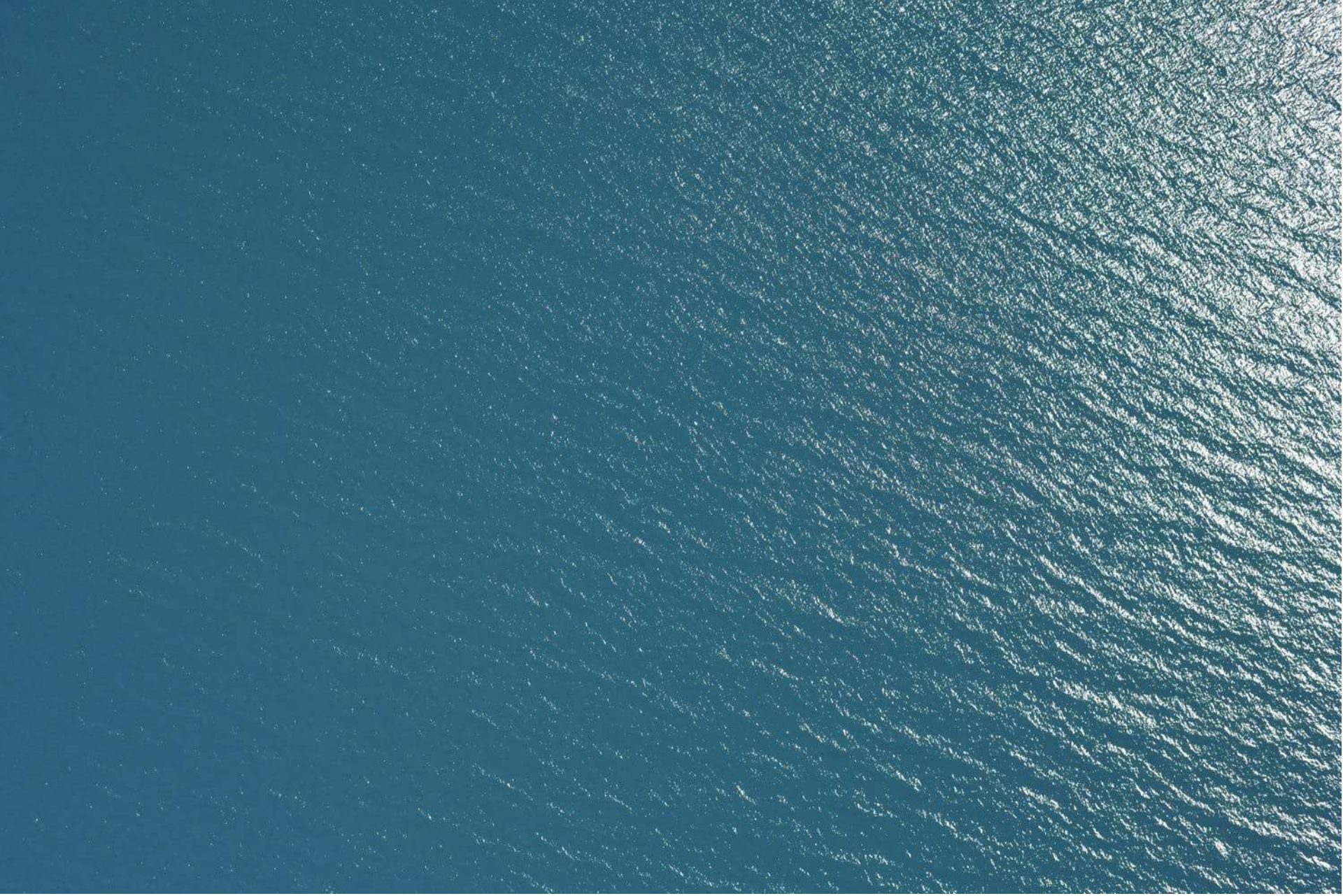
Pipeline Monitoring

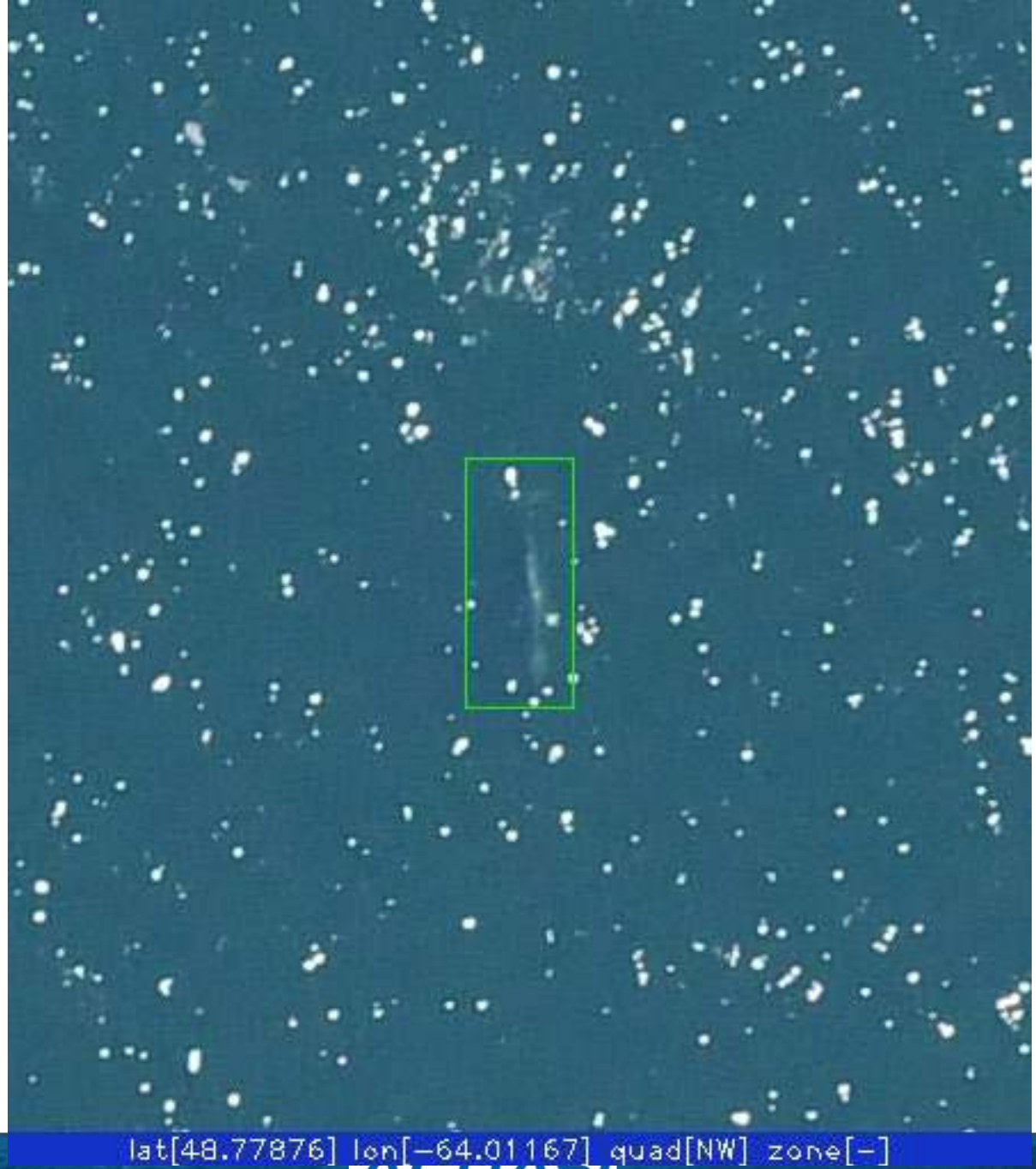
- FAA granted ACUASI a Part 107 waiver for operations along a 20-mile stretch of TAPS for conducting BVLOS pipeline monitoring testing

- We will be using this area to test DAA and larger Vertical Takeoff and Landing (VTOL) aircraft for surveillance

Experience Flying Large Drones BVLOS - Transport Canada Operations

- >30,000 nautical miles of BVLOS flights
- North Atlantic right whales, Gaspé, Canada
- Infrastructure monitoring




lat[48.77876] lon[-64.01167] quad[NW] zone[-]

Disaster Response

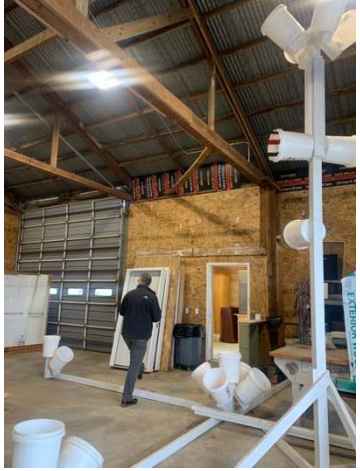
- ACUASI is part of an FAA project that aims to develop a concept of operations for how different federal, state, and local governments, civil operators, and others can deploy drones cooperatively after disasters, such as earthquakes, volcanoes, ice jams, river flooding and oil spills
- ACUASI and the Alaska Department of Transportation and Public Facilities (DOT&PF) are using drones to identify areas with high avalanche potential

Counter-drone (FAA, DOJ, DHS, …)

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

- FAA - ASSURE – Effect of detection and mitigation systems on first responder communications, navigational aids, and other systems critical to the safety of the NAS (the flight campaigns are DHS campaigns)
- DOJ – The use of passive radiofrequency drone detection systems to support local law enforcement agencies
- Army – The development of a mobile prototype system for detection of drones near a column of troops under motion

Education



- UAA, UAF, and UAS are all developing drone courses
  - UAA: Remote Pilot w/operations over people
  - UAF: Certificate in UAS operations and additional degrees in aerospace engineering
  - UAS: Drones in environmental studies
- ACUASI conducts STEM outreach events

What's Next?

In the six months we will:

- Assist partners in flying the first converted Cessna Grand Caravans in Alaska (with safety pilots on board)
- Fly our first drone mission between Fairbanks and Nenana
- Fly numerous drone missions between Fairbanks and Nenana for DAA testing

What's Next...continued

- Conduct several counter-drone flight campaigns in Alaska and other locations
- Develop metrics for evaluating the success of ACUASI's efforts to spur economic development in the drone industry
- Continue our work with the State of Alaska DOT&PF
- Conduct STEM outreach across Alaska

Update on FY 23 Funding

We received $10 M in the State of Alaska FY 23 budget. We have used/will use it to:

- Hire faculty and instructors to support drone/aerospace curricula delivery across UA
- Engage UAA's Institute of Social and Economic Research to evaluate the economics of drones in Alaska
- Identify locations for and begin establishing the three emerging technology test ranges
  - Nenana Municipal Airport received the bulk of the infrastructure money this year

Update on FY 23 Funding

- Accelerate the DAA testing and pioneering flights needed to prove the safety of BVLOS operations in Alaska through the FAA's BEYOND program
- Purchase a large Vertical Takeoff and Landing drone for testing drone deliveries that do not require runways
- Conduct the **Global Autonomous Systems Conference** in Anchorage August 9-11th – Theme: *Trailblazing Autonomous Paths for a New World Economy*

FY 24 Funding Request

The Governor put $10 M in the FY 24 budget for ACUASI. If the funding survives the budget process, we will use it to:

- Hire faculty, a certified flight instructor, and curriculum developers to create a workforce-focused drone certification program for delivery across Alaska
- Initiate drone-focused, dual enrollment programs for high school students
- Conduct the 2nd Annual Global Autonomous Systems Conference

ACUASI's Future Impact on Alaska's Drone Economy

ACUASI will continue to lead the way to the safe integration of drones into the NAS in Alaska

- 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 transferring commercial operations it pioneered to Alaskan companies
- The University of Alaska will create workforce development opportunities across Alaska

Register NOW!

Global Autonomous Systems Conference

August 9 - 11

Dena'ina Center
Anchorage, Alaska

Hosted by the University of Alaska & the State of Alaska

Visit www.AutonomousAlaska.com for more information!


The University of Alaska and its partners will lead the way to routine UAS operations in Alaska!

Register NOW!

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