



Alaska Center for Unmanned Aircraft Systems Integration Pan Pacific UAS Test Range Complex (PPUTRC)

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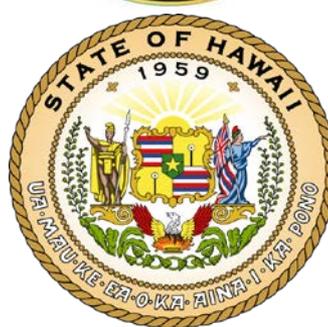
Pan Pacific UAS Test Range Complex (PPUTRC)



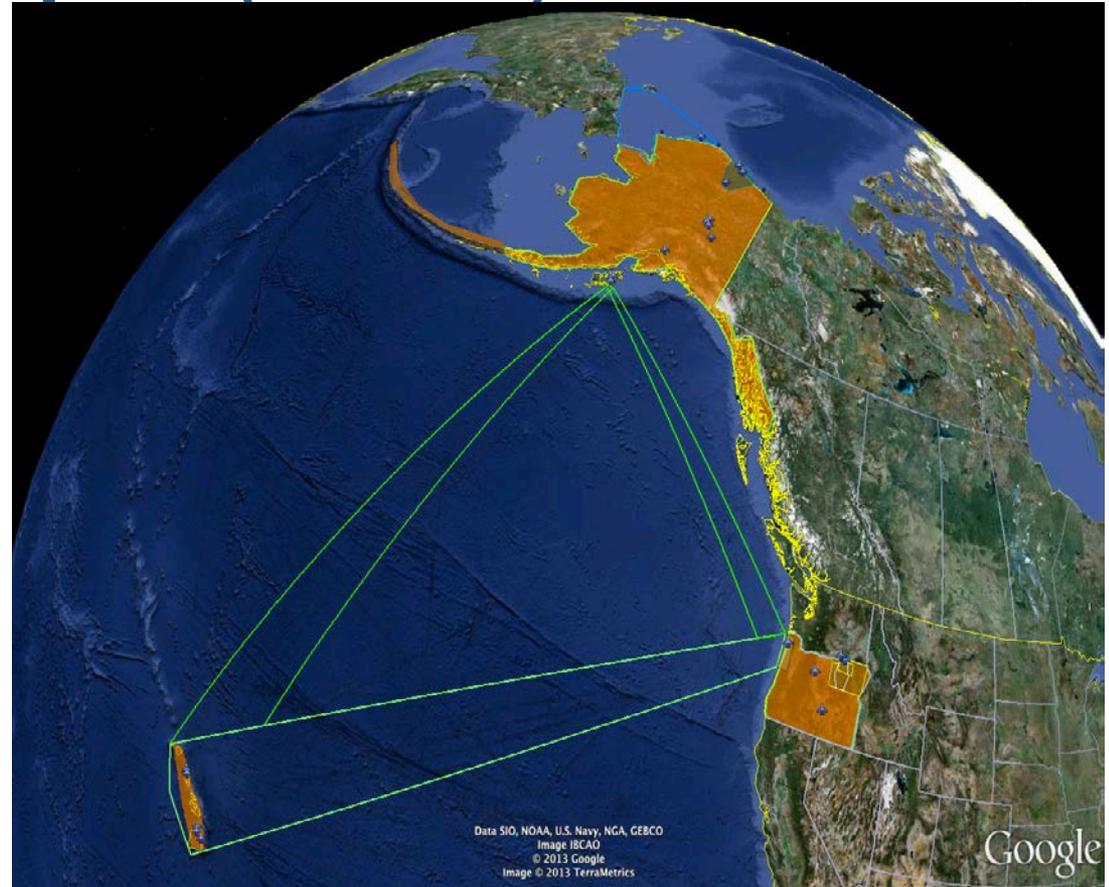
Alaska



Oregon



Hawaii



Overview

- **Background - ACUASI**
- **ACUASI Missions 2013**
- **Anticipated Missions**
- **UAF's R&D Focus**
- **Shaping Future Efforts**

Poker Flat Research Range (PFRR)

University-operated rocket range

- Airspace management since 1969
- Sounding rockets to 1,500 km altitude
- Impact up to 1,800 km downrange
- Up to 35,000 lb multi-stage rockets
- Close relationship with FAA

UAS operations since 2001

- 2001 - Partnership with New Mexico State U
- 2007 to present - Multiple missions for science, emergency response, humanitarian needs, and engineering development
- Current fleet is diverse and growing, 9 different platforms and 100+ UAS
- High ops tempo, 150+ flight days average



Long Term Goals

- **ACUASI Mission**
 - A research center for small, unmanned aircraft systems providing *integration of unique payloads and supporting pathfinder missions* within government and science communities, with a special emphasis on the arctic region.
- **ACUASI Vision**
 - *Develop, test, and ultimately exploit emerging unmanned aircraft technology* and its uses to create a positive economic and social benefit within the State of Alaska.



Pan Pacific UAS Test Range Complex (PPUTRC)

- **UAF led team**
- **Alaska, Oregon, and Hawaii, plus 56 additional team members**
 - Includes state agencies (DOT, DPS, Forestry of DNR, DHS&EM, National Guard)
 - Universities, EDCs, corporations
 - Associations like Medallion, AUVSI
- **Opportunity for development of**
 - Procedures supporting safe UAS integration into NAS
 - Technical subsystems/sensors supporting DAA
 - Means to assess UAS for airworthiness & grant experimental certification

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Recent Missions (2013)

- **MIZOPEX**
- **Idaho Power**
- **Eni Petroleum (multiple)**
- **BP (multiple)**
- **US Coast Guard aboard the Healy**
- **Pilgrim Hot Springs**
- **Ugak Island**
- **NEX7 Payload Evaluation in California**
- **Iceland mapping flights**
- **Bethel Aircraft Crash exercise**
- **Demo for DOT road mapping**
- **FEMA data upload demonstration**

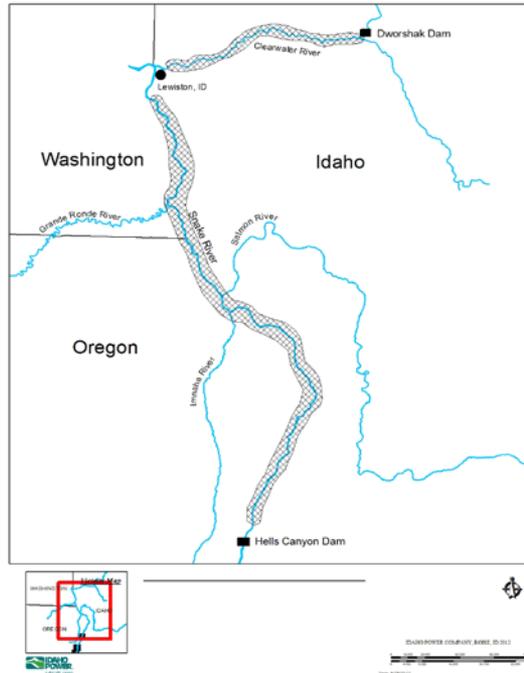
Missions of Interest

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- BP (multiple)
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- **Wildfire & prescribed burn missions**

Idaho Power Salmon Spawning Habitat

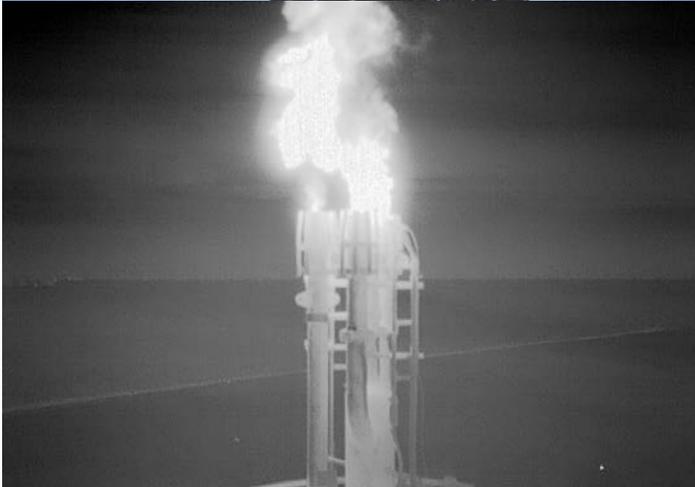
Nov-Dec 2013

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



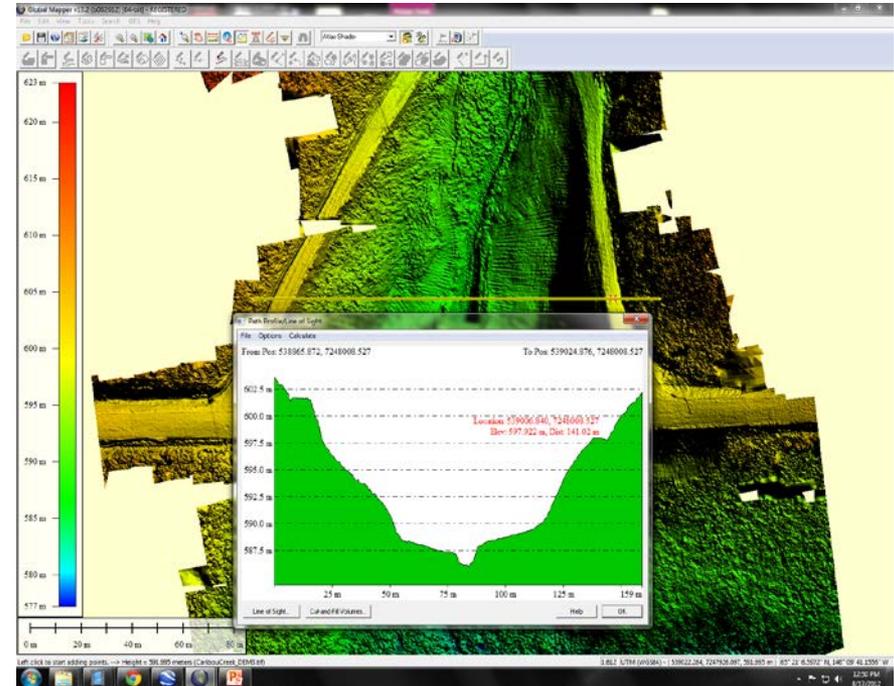
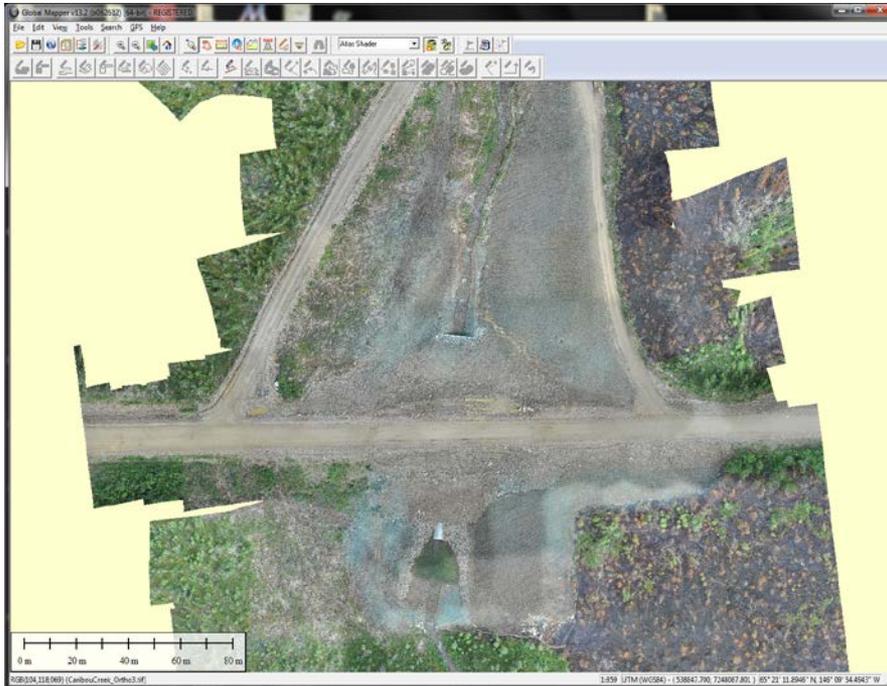
Eni Infrastructure

Nov 2013



Oliktok Point Production Facility

Infrastructure - Ortho Image & Surface Models



Culvert under road with elevation data



Wildfires

Supported the Crazy Mountain Fire Complex
Visibility < 1/4 mile so manned aircraft could not fly



Mass Casualty Exercise

Bear Bite SAREX, Feb 2013

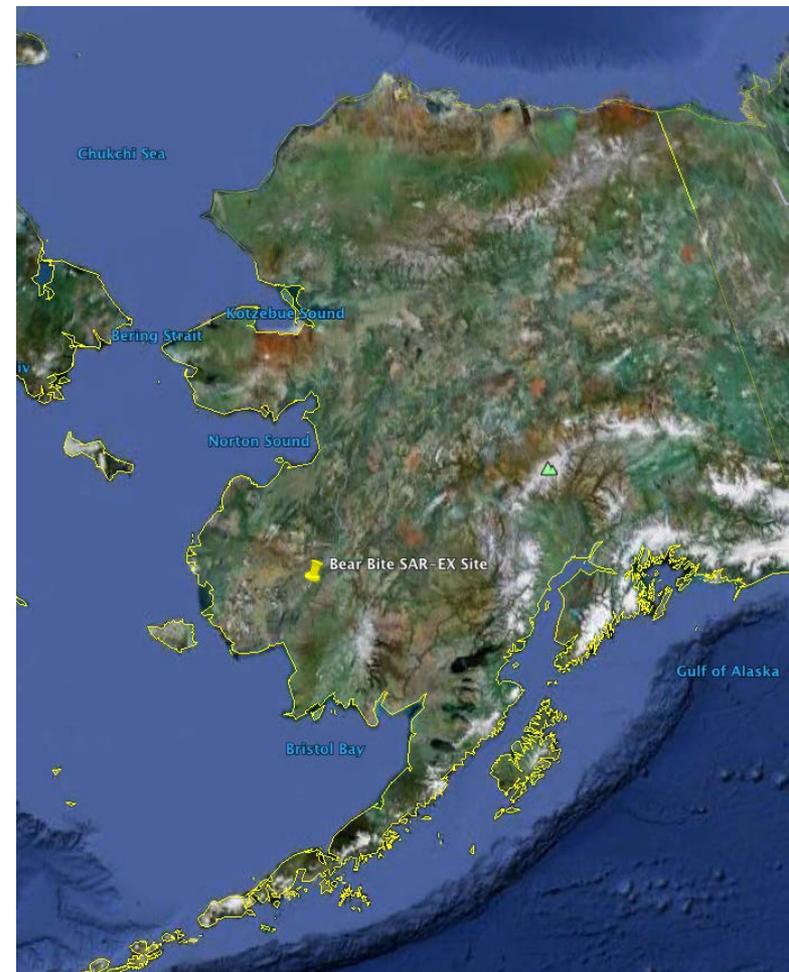
“An aircraft crashed in the tundra roughly 20 miles outside Bethel Alaska many died with some survivors”

Deployed two unmanned aircraft systems with support team

Coordinated with manned aviation on the scene

Mission:

- Map scene for event documentation
- Real-time SAR response

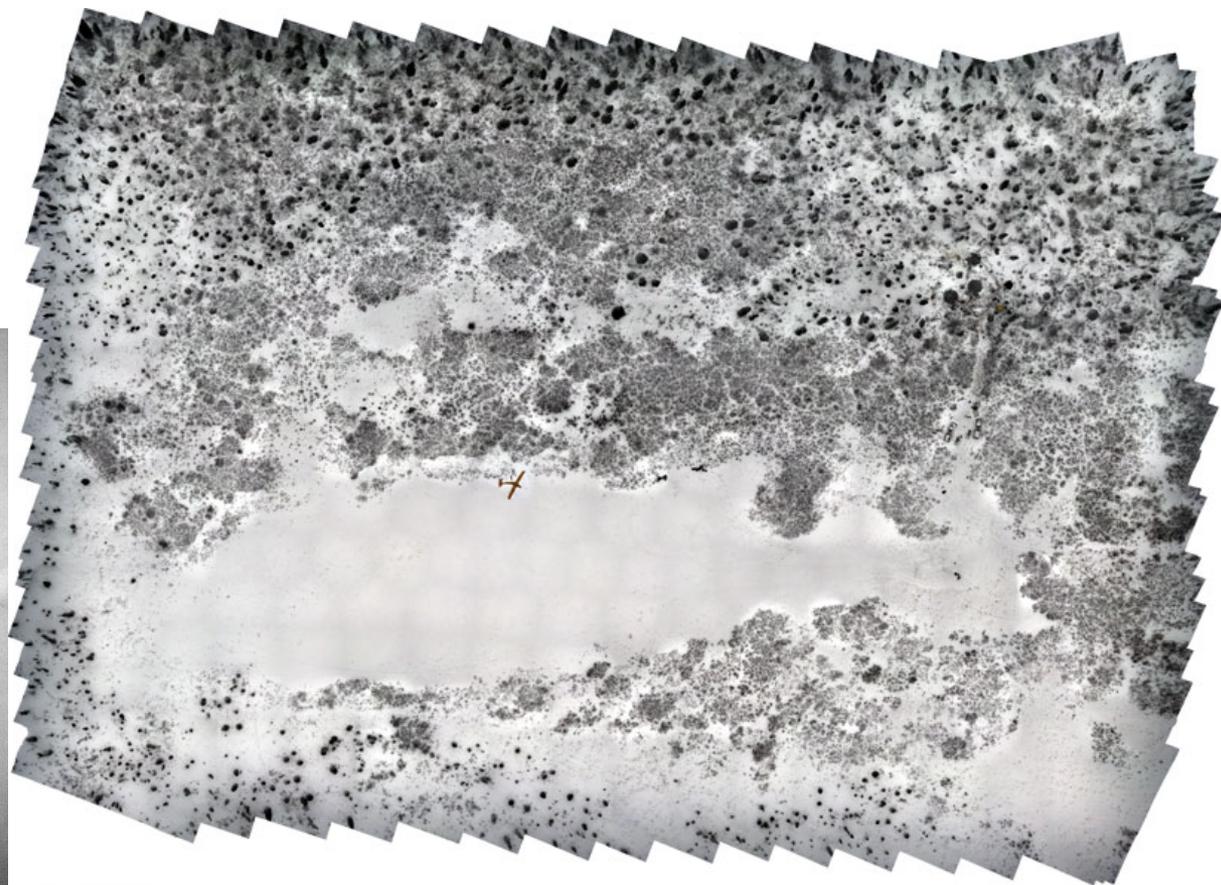




Bear Bite SAREX

Feb 2013

Thermal Infrared & Rapid Mosaics



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Sample of Projected Missions for 2014-15

- **Vigilant Guard/Alaska Shield**
- **Electrical Power Generation support**
- **Oil Companies (BP, Eni, others)**
- **Idaho Power**
- **Iceland**
- **Test missions for PPUTRC**
- **Sikuliaq Ice Trials**
- **Methane Hydrate Research**
- **North Slope**
- **Oklahoma power & energy opportunities**
- **Possibly on retainer for FEMA – response to wildfires, etc**



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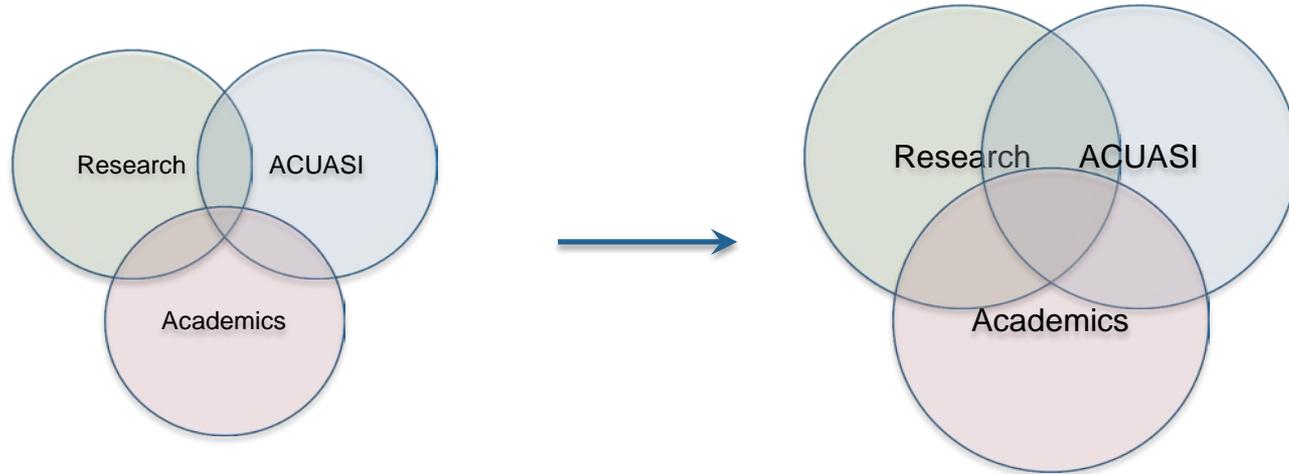
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UAF Focus on Integrated Activities

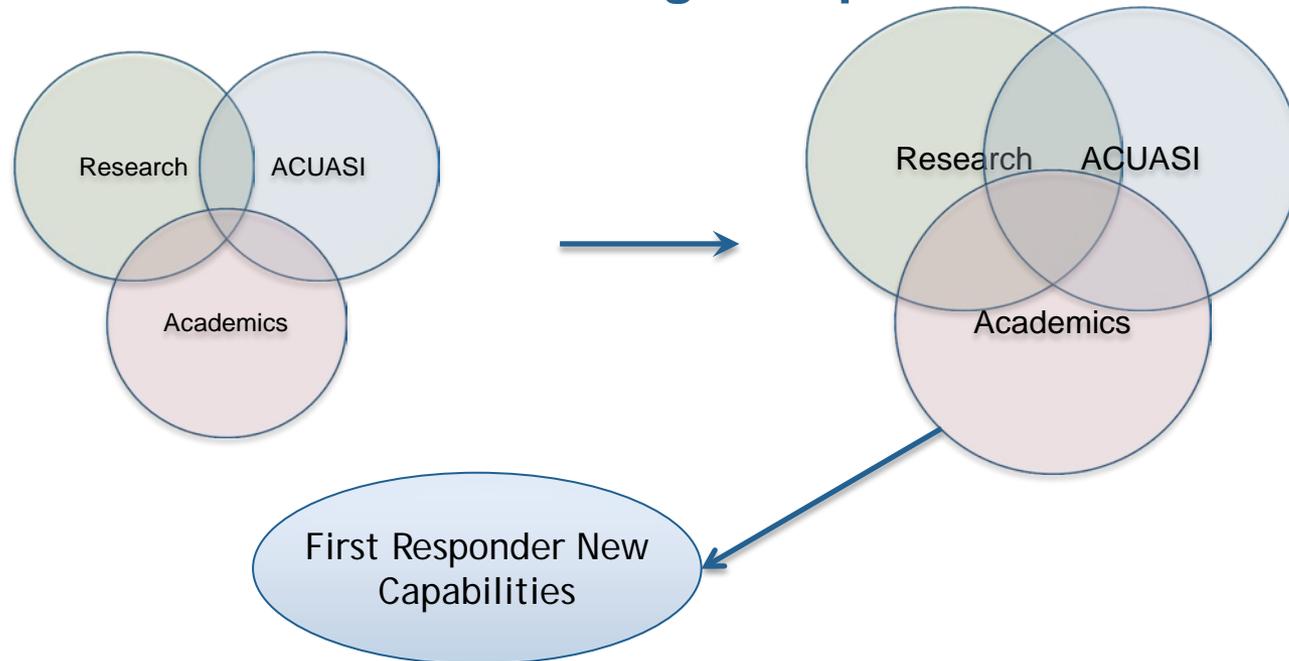
- Increase opportunities to benefit Research, Academics & ACUASI through cooperative efforts



- Facilitate research/ACUASI opportunities
 - Provide academic support to ACUASI...supporting research
 - Introduce students to opportunities in research & ACUASI
 - Increase awareness of all within & outside UAF
- PPUTRC offers expanded opportunities to collaborate on research

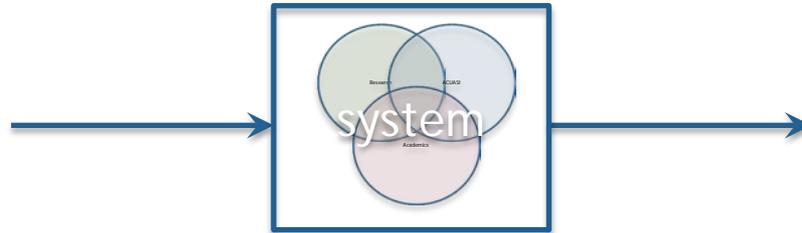
UAF Focus on Integrated Activities

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- Collaboration with agencies offers near term enhancement to current capabilities, access to UAS support

UAF Focus on Integrated Activities



↑ People + ↑ Collaboration + ↑ Awareness = ↑ Success

- **Academic efforts supporting research**
 - Leverage existing design courses to study UAV systems and UAF research missions, where appropriate
 - Investigate opportunities for new curriculum providing support to research and UAS design advancement
- **Test Site efforts qualify UAS systems, evaluate procedures**
- **ACUASI/Test Site assist with airspace access, training**
- **Success could mean new tools, techniques, levels of safety, responsiveness**

PPUTRC Gain from ACUASI Research

- **Academic research enables answers to FAA questions**
 - Each mission involves mission planning, safety risk management, test plans, flight data collection, etc
- **Increasingly, missions challenge new horizons of operation—or could**
 - Larger, more complex COAs raise questions of airports, interaction with GA, multiple ATOs

PPUTRC Ranges Outside Alaska

- Three Oregon ranges approve, fourth to come
 - First COA there will be Tillamook
 - Specializing in high altitude balloons with sensor-filled shuttle
 - Features: new facility, 5000 ft runway, small public uncontrolled airport,
 - Pendleton airport—small public controlled airport
 - Warm Springs—managed by confederated tribes of, interested in precision agriculture, SAR
- Hawaii offers high altitude corridors, still needs to develop new anchors at ends; original denied
 - First COA may be our lava flow project
 - Still sorting funding, management

PPUTRC Missions

- **Potential clients seeking test opportunities**
 - Offers data collection for type certificate categories,
- **Plan to explore UAS category definitions**
- **Plan to craft performance-based criteria**
 - Vs design & manufacturing based inspection
 - Offers shorter, simpler inspection approach
 - Accommodates rapid innovation climate
 - Based on different risk profile given no humans onboard
 - Reduces FAA workload during rapid growth time
- **Plan to assess FAA proposed path from unproven to operational**
 - While following, but collect data to determine where more flight hours add no new information

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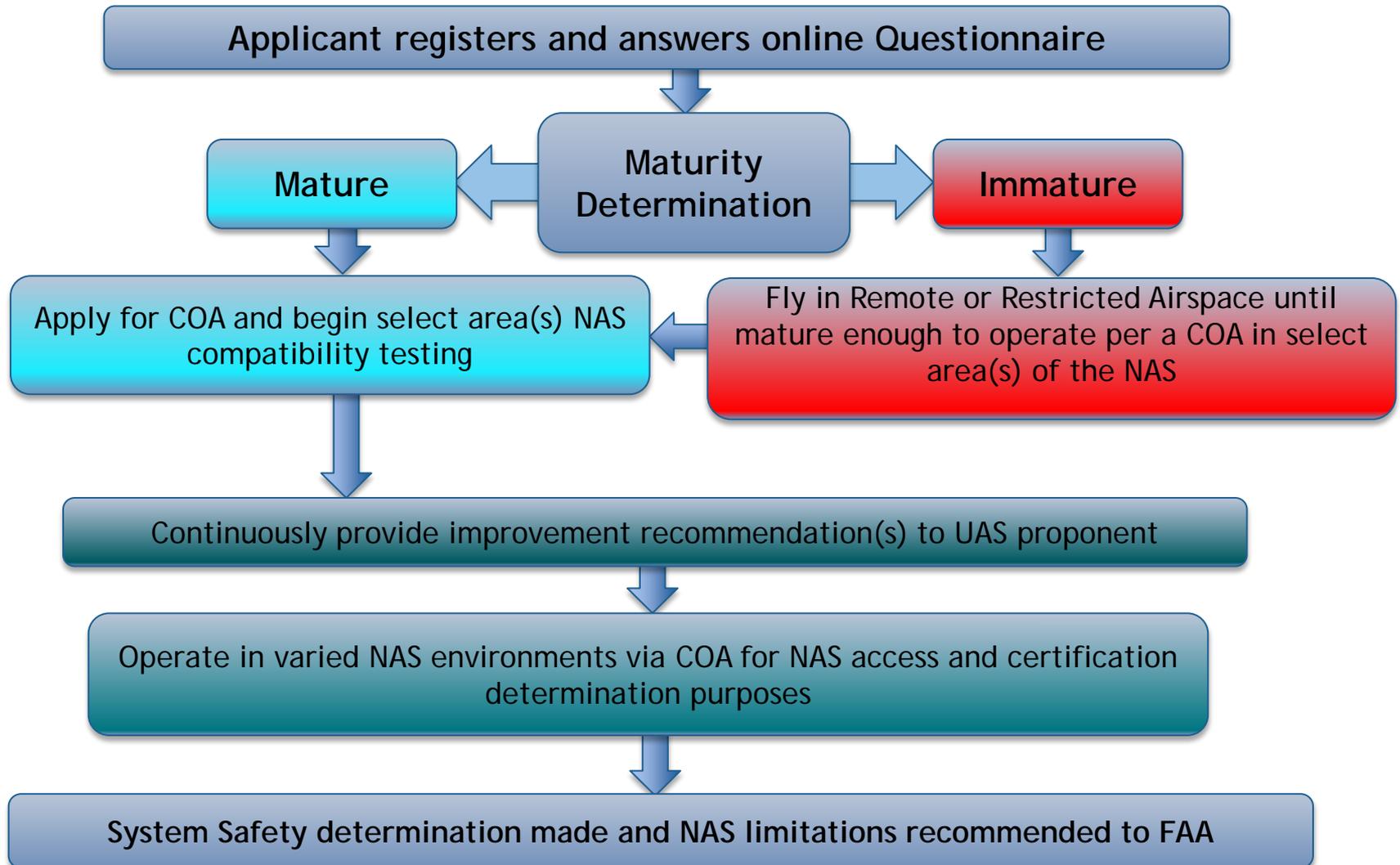


Shaping Future Efforts

- Focus future efforts to maximize positive impact on research, academics, and local community
- Maximize benefit of partnerships, cultivate new relationships, and ensure longterm sustainability
- Prioritize mission support and asset investment strategy
- Articulate strategy in 10-year research plan
 - Align to FAA objectives
 - Coordinate inputs of Oregon, Hawaii and other team members

Risk Management

(Range User Maturity Determination Process)



How Site Access will be Granted

- Online application will provide first level assessment of a client's needs
- Fees based on Developmental and Operational Rqmt's, UAS flight maturity and users operational maturity
- Graduated fee structure that encourages growth of start-up companies and offers full range of services
- No exclusionary practices, procedures or favoritism granted to Federal Government users
- Proprietary data protected via upfront agreements
 - Data for FAA only typical gathered for NAS safety + procedural development

Safety Risk Management

(Aviation/System/Range/Site)

- **Institutional Programmatic Safety Program**
- **Core Safety Requirements, Scope, Framework and Processes**
- **Operational Safety**
- **Aviation Safety**
- **Hazardous Materials Handling, Safety and Disposal**
- **Safety Training and Personnel Certification**
- **Facilities, Construction, Site Activation and Remote Site Considerations**
- **SMS, SRM, SRMD training program that continuously teaches the evolving needs of emerging safety concerns**

Privacy

- **Dedicated to protect privacy of our citizens so beneficial uses can be obtained**
- **Current statutory/case law strongly protects privacy while defining legal airborne activities (manned)**
 - **UAS a new technology, but subject to same restrictions**
 - **FAA directed test sites to develop policies**
 - **PPUTRC-specific policy under development**
 - **AK legislative task force focusing on management & control of data rather than the tool that collected it**
 - **Strict adherence to policies of the National Institute of Justice, the International Association of Chief's of Police, the Airborne Law Enforcement Association and enacted State legislation (all 3 states)**

Summary

- **Selecting Missions**
- **Existing Assets & Long Term Goals**
- **Mission Analysis**
- **Potential Payloads**
- **Future Efforts**

Questions?