



# Use of Unmanned Aircraft Systems in the Arctic

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# The Alaska Center for Unmanned Aircraft Systems Integration

- ACUASI is the University of Alaska's unmanned aircraft system (UAS) research program
- ACUASI leads the Pan-Pacific UAS Test Range Complex, one of the six FAA UAS Test Sites, and Marty Rogers runs the FAA Center of Excellence for UAS
- ACUASI has been flying UAS in Alaska and the Arctic for 15 years



# Payloads and Platforms

- Making climate-relevant measurements in requires the correct combination of UAS and payload characteristics:

<u>Payload</u>	<u>Endurance</u>	<u>Launch</u>
Visible camera	Long (10+ hours)	Catapult
IR camera	Medium	Runway
SAR	Short (<1 hour)	Vertical take off
Gas sensor		Hand thrown
Black carbon		

# ACUASI's UAS Fleet

ScanEagle, Nanook, SeaHunter, Responder, Scout, Ptarmigan, and others



Mostly catapult, hand, or vertical launch

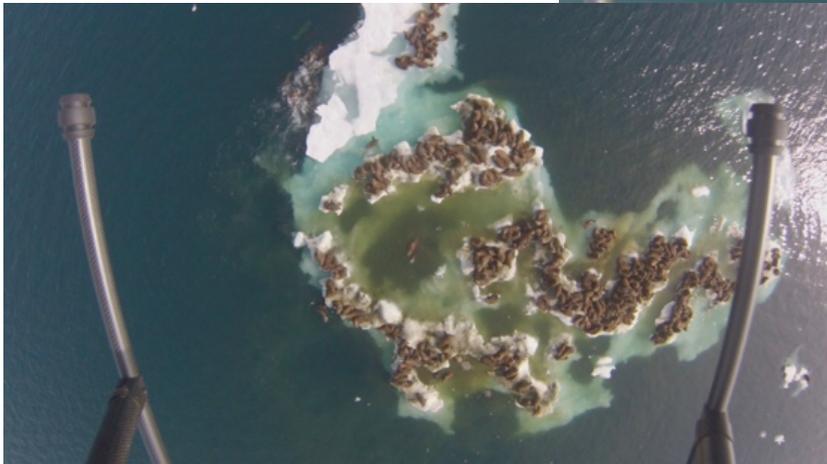
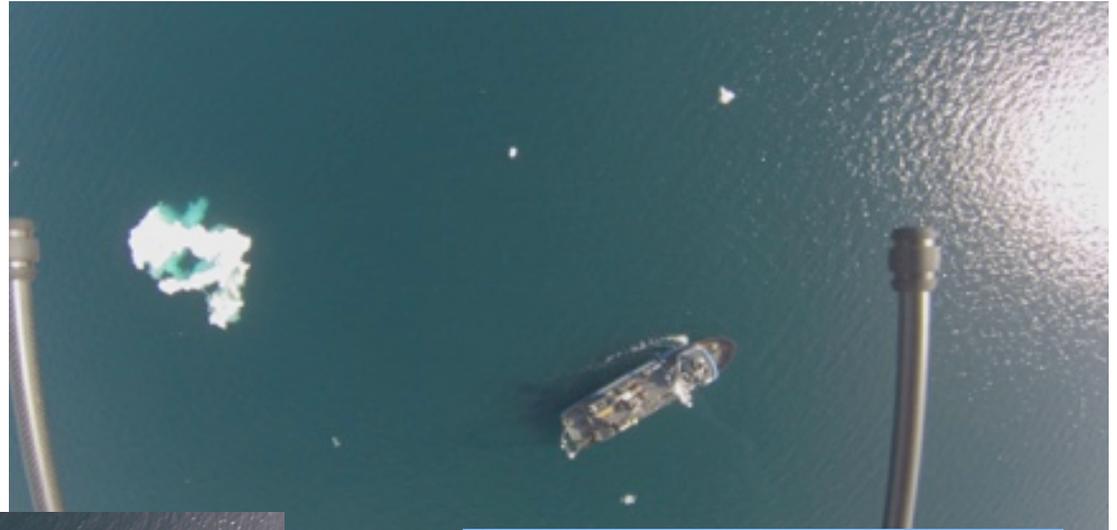


Counter-rotating propellers, heated pitot tubes, fuel injected engines, or battery-powered

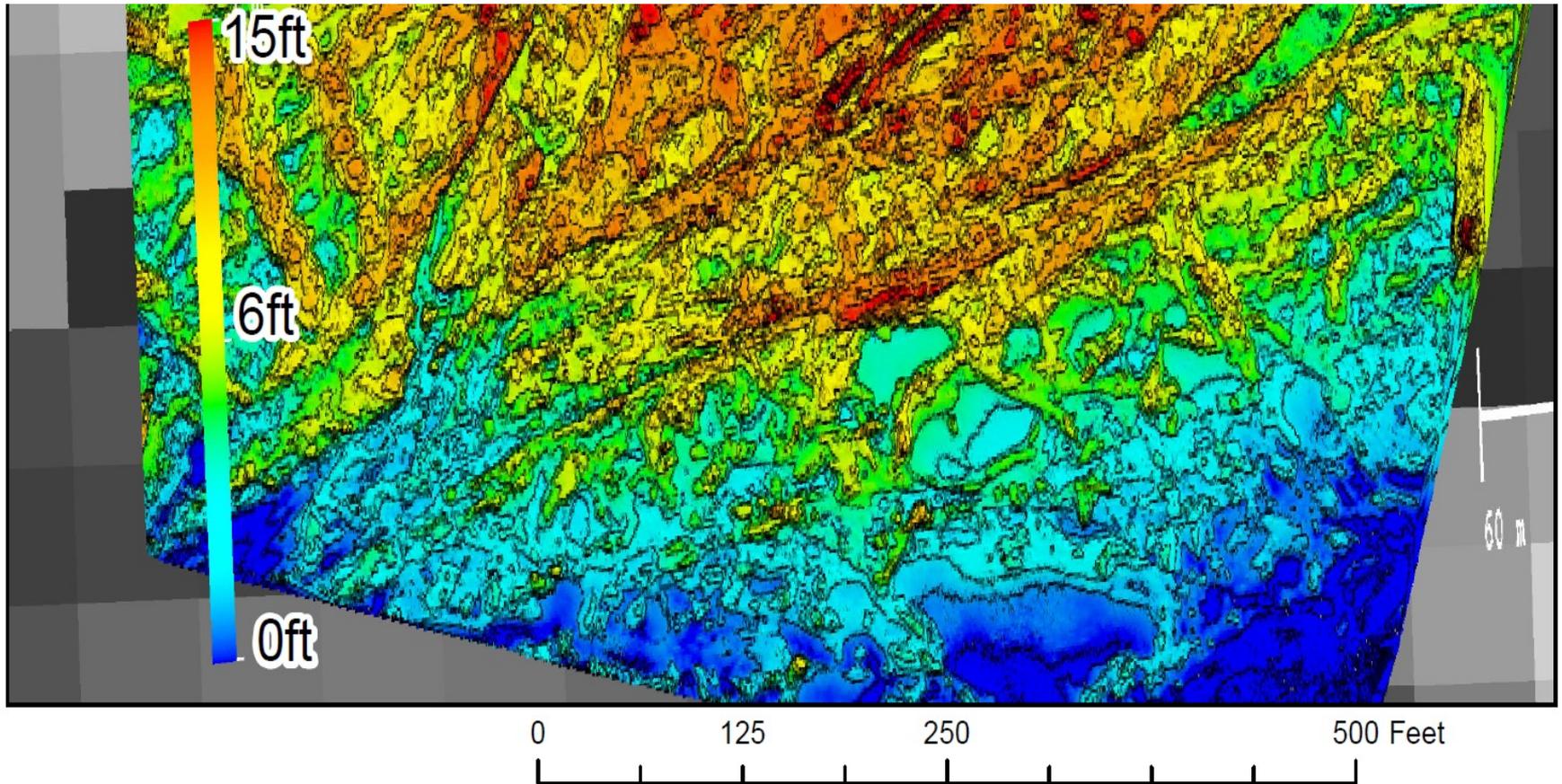


New auto pilot and control station for communication via satellite

# Walrus Studies Ptarmigan, Ship Launch (2015)



# 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.

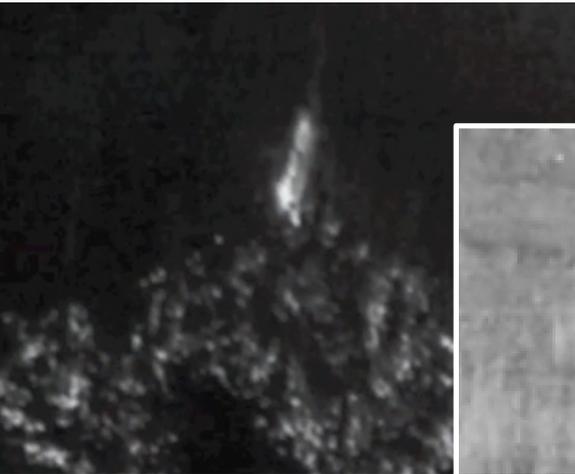
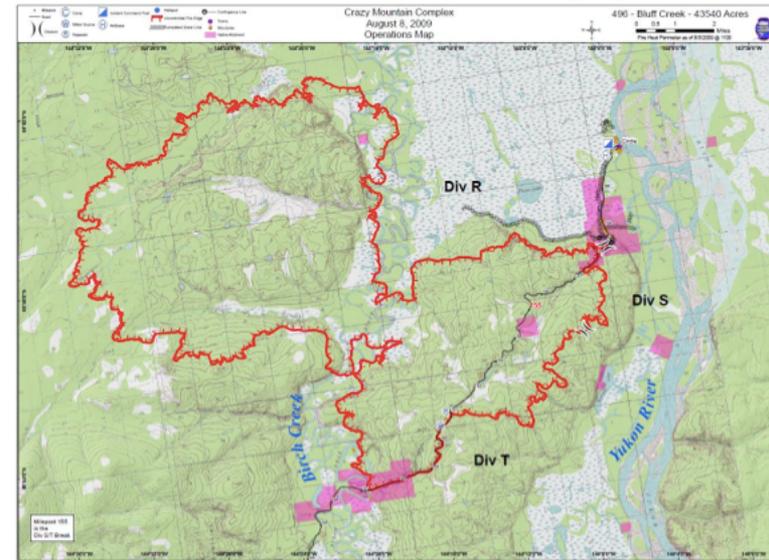
# Oil Spill Research - Poker Flat Research Range (April 2015)



# Crazy Mountain Wildfire

## Alaska Fire Service Incident Command Team Support

- Tasked by Alaska Fire Service Incident Command Team
- Manned aviation not flown for (5) days due to the smoke and limited visibility
- Satellite imagery (MODIS) incapable of showing critical activity



# International Partners

## Testing of SA-03 in Iceland



# Arctic UAS Summary

- UAS ideal for dirty, dull, and dangerous operations
- Capable of *in situ* measurements of numerous climate variables
- Systems need to be hardened for extreme cold and icing conditions
- Partnerships can make deploying UAS in the Arctic more affordable



Thank you!

