Remote Uncrewed Aircraft System (UAS) Inspection and Response Team Development in the Bering Strait Region

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Background/Objectives. The Native Village of Unalakleet, Alaska recently completed a feasibility study for using uncrewed aircraft systems (UAS) and on-line data tools to support community adaptation planning in response to climate change and to support emergency response activities. Also in Alaska, the United States Coast Guard (USCG) is responsible for the inspection of 380 bulk fuel storage facilities, 347 of which are only accessible by boat or airplane. Exploring the nexus of needs of these two coastal Alaskan stakeholder groups, this project was designed to train a set of UAS pilots in the remote, coastal, hub community of Unalakleet, Alaska to fly small UAS in support of local decision-making and USCG mission support.

The specific objectives of this project are to: 1) co-produce UAS-based infrastructure inspection and emergency response protocols, using non-Chinese, commercial off the shelf, UAS platforms, with the Alaska Native Village of Unalakleet, 2) create a knowledge product for the USCG providing analysis of flight experiments using electrooptical and infrared sensors to support infrastructure and emergency response monitoring, 3) understand the feasibility of expanding the developed UAS program to communities throughout the Norton Sound region to effectively support facility inspections and emergency response efforts in remote western Alaska, and 4) determine if this project can be used as a roadmap for that expansion.

Approach/Activities. Members of the Bering Strait community of Unalakleet, Alaska applied for participation in the program, received eight weeks of remote training from University of Alaska Fairbanks drone pilots and researchers on the safe and legal use of these remote sensing tools, followed by the successful completion of FAA Part 107 certification exams. Along with UAS flight training, this project included the co-production of infrastructure assessment and emergency response UAS protocols among the pilots, researchers and USCG representatives. Pilots were trained to use both electrooptical and infrared sensors to analyze different targets, and to create 2-D orthomosaics and 3-D models of infrastructure and landscape features. The feasibility of expanding this training program regionally, inclusive of the economic challenges and required capacities, is currently under evaluation while the broad dissemination of process and technological knowledge gained to other remote Arctic communities has begun.

Results/Lessons Learned. Technology-based solutions to problems associated with climate change, food security, environmental stewardship and emergency response can bolster workforce development opportunities in rural communities while also meeting the needs of regulatory and response agencies. This presentation will highlight the leveraging of partnerships, adaptation of methodologies, and milestones achieved to make this a successful multidisciplinary project.