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Timeline: Two years; data collection anticipated in summer 2020 and 2021

Funding: [Coastal Marine Institute](#) and the [Bureau of Ocean Energy Management](#).
The project also relies on substantial funding from existing projects: the [Alaska Arctic Observatory and Knowledge Hub](#) (AAOKH) at the University of Alaska Fairbanks and the [Ice Seal Research Program](#) at the North Slope Borough Department of Wildlife Management (NSB-DWM).

Permitting:

- National Marine Fisheries Service General Authorization No. 23546
- Bureau of Land Management Land Use Permit FF097621
- University of Alaska Fairbanks IACUC Protocol 1610672-2

Summary: Spotted seals (*Phoca largha*) and bearded seals (*Erignathus barbatus*) are seasonally abundant throughout coastal regions of the Beaufort Sea during the summer and fall, frequently hauling out on coastal sandbars, spits, and islands. Yet, the influence of environmental factors and potentially increasing human disturbance on distribution, numbers, and behavior is unclear. The frequency, duration, and timing of haulout use can vary with local conditions (e.g., wind, water level, fish movements, seasonality, and human presence).

The goal of this pilot study is to evaluate the potential for new and emerging technologies, specifically time-lapse cameras (e.g. commonly known as ‘game cameras’) and small quad-copter style Unmanned Aircraft Systems (sUAS, or commonly known as ‘drones’), to assess the seasonal presence, behavior, and numbers of ice seals at several summer-fall Alaskan coastal haulout sites near Utqiagvik, AK (Fig. 1). Based on experience in the region and local consultation, we expect to encounter spotted seals during this research. An additional component is to measure responses (if any) by ice seals to the presence of sUAS.

In August 2020 (year 1), cameras and weather stations were deployed at haulout sites in Dease Inlet and Smith Bay (Figure 2). Due to agency restrictions and COVID-19 precautions, no small drone research was conducted in 2020. We are currently evaluating the ability to conduct small drone research plans for summer-fall 2021.

Local involvement and outreach are fundamental components of the project. Project updates and results will be shared with the Ice Seal Committee and updates in ‘[AAOKH News](#)’ and NSB-DWM newsletters.

Objectives:

1. Test and refine remote camera and sUAS survey methods to assess relative numbers, presence/absence, and behavior of spotted seals at known haulout sites.
2. Quantify the effects of environmental conditions on spotted seal summer-fall haulout behavior
3. Assess combined effects of environmental conditions and human activity on numbers and behavioral responses of hauled out spotted seals.
4. Quantify disturbance effects of sUAS on hauled out spotted seals.
5. Assess feasibility of using sUAS to survey spotted seal abundance at coastal haulouts.

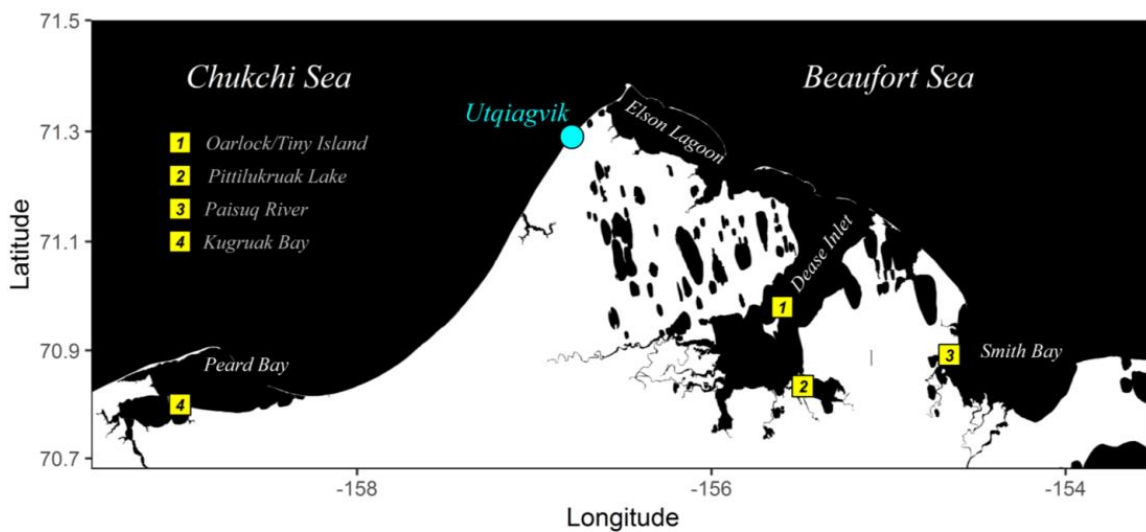


Figure 1. Spotted seal haulout locations proposed for sUAS and time-lapse camera surveys (yellow boxes) in the vicinity of Utqiagvik (blue circle).



Figure 2. (Left) Drs. Andrew Von Duyke and Craig George deployed time-lapse cameras (blue circle) and acoustic recorders (purple circle) were placed on a T-post at the spotted seal haulout area on Oarlock Island in Dease Inlet in August 2020. **(Bottom)** Dr. Andrew Von Duyke stands next to the weather station deployed at Oarlock Island. The T-post with camera and acoustic recorder can be seen in the red circle in the background. Photos courtesy A. Von Duyke and K. Scheimreif, NSB-DWM.

