Listening for bearded seals (*maklak*/*ugruk)* near Togiak and Utqiaġvik, Alaska

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-in collaboration with-

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Take Home Message: Hydrophones have been deployed and recovered in Utqiaġvik, AK (September 2023- May 2023) and were deployed in Bristol Bay, AK near Togiak in September 2024 to listen for bearded seals.

Overview: Bearded seals are a critical component of Alaskan Native subsistence culture along the Bering, Chukchi, and Beaufort seas[1,9]. The role of declining sea ice and shifting habitat characteristics on ice seals during the breeding season have been widely identified as a subsistence priority [2,17]. Over the past three years, during annual meeting of the ISC, representatives from indigenous communities from Togiak Island in Bristol Bay and from Utqiaġvik in the North Slope Borough (NSB), expressed interest in using acoustics to study residency, timing, and breeding behavior of ice seals, and specifically of bearded seals.

As recently as the 1970's both regions were known to host breeding populations of bearded seals. The contemporary experience of bearded seals in these two regions, however, is contrasting between the North Slope and Bristol Bay. In Bristol Bay, the more southern of the two locations, sea ice that was previously common in spring is no longer present. According to local people from Togiak, bearded seals began to decline between 1970 and 1990 and have become rare. Currently, the arrival and departure of bearded seals appears to have de-coupled from traditional ecological knowledge, resulting in communities that are unsure if bearded seals are present and undetected, or if they have abandoned the area as a breeding ground. In Utqiaġvik, contemporary bearded seal populations are robust, but initial analysis of long-term data indicates that breeding phenology is growing unpredictable in response to changing ice conditions.

We are using historic and contemporary acoustic datasets alongside remotely sensed ice cover data to investigate if and how ice seals alter their breeding timing and duration, and reproductive performance (calling behavior) in response to sea ice loss and anthropogenic noise, and to determine if bearded seals have been abandoned Bristol Bay as a breeding region. This project was developed in collaboration with the Bristol Bay Native Association (BBNA) and the North Slope Borough (NSB) based on feedback expressed during ISC meetings.

Data Collection Update: In September of 2023, a five-element hydrophone array was deployed in Utqiaġvik to monitor bearded seals as part of a NPR-A grant (Figure 1). This array recorded until March 2024 (start of the breeding season). Dr. Fournet and MS Student Rachel Lewis joined Andy Von Duyke in Utqiaġvik in July 2024 to recover the array. Working with Sam and a local hunter, two additional hydrophones were deployed in Bristol Bay in September of 2024 to listen for bearded seals, as well as any other relevant marine mammal species in the region (potentially walrus and/or whales, Figure 2). These will begin recording in November and will continue until summer 2025.

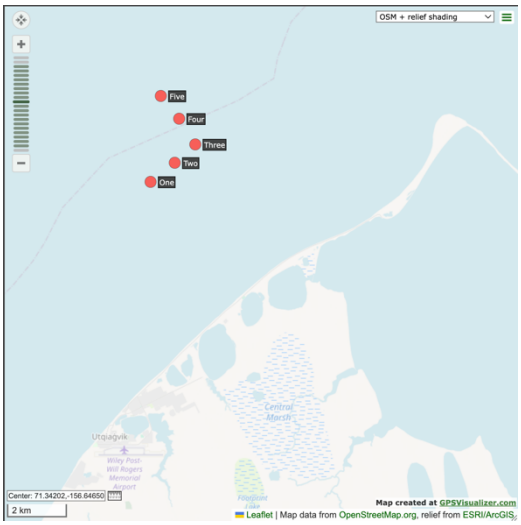

Figure 2- Hydrophone locations winter/spring 2023-2024, Utqiaġvik, AK

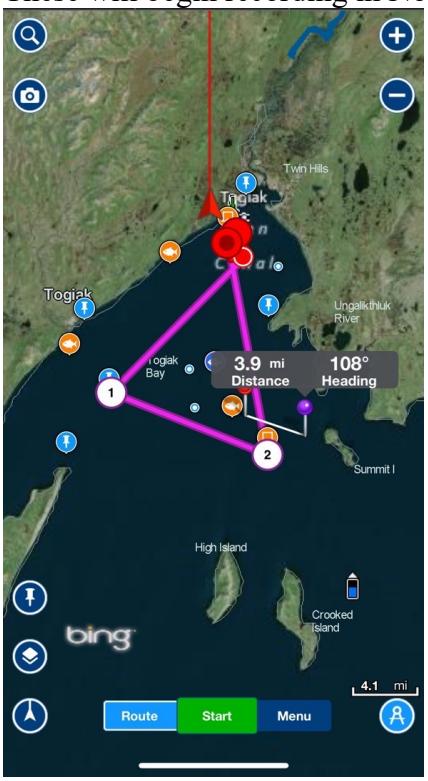

Figure 1- Hydrophone locations in white. Will record in Bristol Bay from November 2023 until ~June, 2024

Students from Togiak School interacted with researchers (from the University of New Hampshire) and had the opportunity to listen to bearded seal recordings and learn about the ecology of bearded seals and bioacoustics as a research field. Additionally, MS student Rachel Lewis acted as a substitute science teacher at the Togiak School. She also led instruction on line splicing in support of Sam's subsistence courses at the school.

Work, funded by the University of New Hampshire, will also include monitoring for vessel presence, and temporal overlap between anthropogenic activities and subsistence species in both Togiak and Utqiaġvik.