

# Study: Lagoons from Arctic's forgotten coast vulnerable to climate change and human development

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WCS technician Thomas House holds a sheefish - Aukulak Lagoon. Credit: Kevin Fraley

A new scientific review article led by WCS captures the unique and dynamic characteristics of coastal lagoon ecosystems in the Arctic Beringia Region, and discusses how climate change effects and human development could alter these habitats.

Lagoons make up 40% of the Chukchi Sea coastline of Alaska, and are integral components of ecological protected areas such as Cape Krusenstern National Monument, Bering Land Bridge National Preserve, and Alaska Maritime National Wildlife Refuge. Additionally, they are important wild food harvesting locations for the Iñupiat People, who rely on subsistence hunting and gathering to maintain their food security.

Fish species commonly encountered in the lagoons include important subsistence harvest species such as sheefish, Dolly Varden char, and saffron cod, commercially important chum salmon, and Beringia-endemic taxa like Bering cisco and Alaska blackfish. Birds that are found nesting and feeding around the lagoons include tundra swans, Caspian terns, Arctic terns, Sandhill cranes, long-tailed jaeger, and glaucous gulls. Mammal species we commonly encounter along or nearby lagoons include musk oxen, grizzly bears, bearded seals, beluga, caribou, and beaver.

The review article was published in the September 2022 issue of *Arctic*, a scientific journal produced by the University of Calgary and the Arctic Institute of North America. Dr. Kevin Fraley, the lead author, is a fisheries ecologist for WCS' Arctic Beringia Program, based in Fairbanks, Alaska.

"This review is a culmination of a decade of fisheries monitoring and research efforts conducted by WCS and partners at these lagoons, and while there are still many aspects of these unique and important ecosystems to study, the article represents the best understanding of Arctic coastal lagoon structure and ecology to date," says Fraley.

To complete the article, the authors synthesized findings from long-term fisheries monitoring and research efforts conducted at multiple lagoons within Bering Land Bridge National Preserve, Cape Krusenstern National Monument, and Alaska Maritime National Wildlife Refuge. In addition, Traditional Ecological Knowledge relating to lagoon ecology and subsistence harvest practices was entrusted to the authors by Iñupiat and other Northwest Alaska residents. Finally, relevant published literature was reviewed and incorporated into the effort.

One of the most important points raised in the article was that physical layout, water chemistry, invertebrate diversity, and fish ecology (abundance, [species diversity](#), diet, behavior, and survival) within lagoons are driven by the presence of seasonal channels connecting lagoons to the Chukchi Sea. Because these channels are narrow and their layout and function are vulnerable to perturbations like storms, coastal erosion, and restructuring of beach gravel by natural and artificial means, climate change and [human development](#) affecting the channels could have disproportionate, negative impacts on [lagoon](#) ecosystems.

Although this review represents a major benchmark in the process of studying the lagoons of the Arctic Beringia region, WCS and partners plan to continue monitoring these habitats to identify any ecological shifts caused by natural and anthropogenic perturbations. Further, WCS will explore additional research avenues to enhance the understanding of these unique ecosystems and champion their conservation.

**More information:** Kevin M. Fraley et al, The Forgotten Coast: A Synthesis of Current Knowledge of Southern Chukchi Sea Lagoon Ecosystems, *ARCTIC* (2022). [DOI: 10.14430/arctic75608](https://doi.org/10.14430/arctic75608)

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