

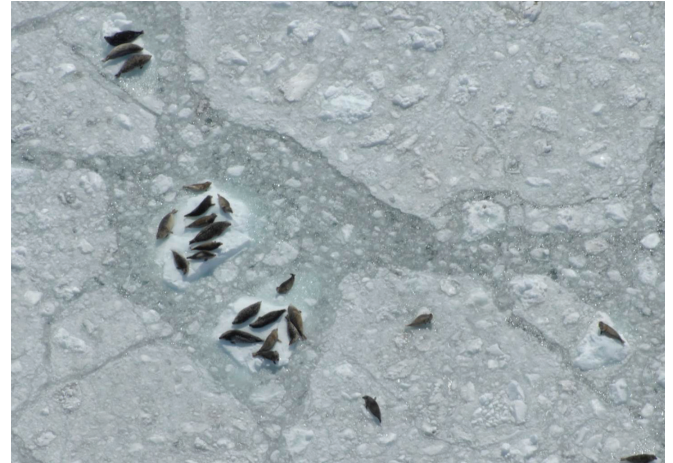


## Harbor Seals and Glacier Ice Habitat

### Background

Tidewater glaciers calve icebergs into the marine environment, which then serve as pupping and molting habitat for some of the largest seasonal aggregations of harbor seals in Alaska. Although tidewater glaciers are naturally dynamic, advancing and retreating in response to local climatic and fjord conditions, most of the ice sheets that feed tidewater glaciers in Alaska are thinning and, as a result, many of the tidewater glaciers are retreating. Climate change models predict rapid loss of glacier ice with unknown impacts to seals that rely on tidewater glacial habitat.

Glacier Bay National Park & the National Park Service Coastal Cluster Program, in partnership with the University of Alaska Fairbanks–Geophysical Institute and the National Marine Mammal Laboratory–Polar Ecosystem Program, are currently conducting research that uses aerial digital imagery, remote sensing technology, and geospatial models to assess seasonal and annual changes in the availability and characteristics of glacier ice as habitat for seals in Johns Hopkins Inlet, a tidewater glacier fjord in Glacier Bay National Park.



Aerial image of harbor seals resting on ice in Johns Hopkins Inlet. NPS photo/J. Womble

### Methods

Systematic aerial photographic surveys are conducted of seals and ice during the pupping (June) and molting (August) seasons. Surveys are flown along a grid of 12 transects and high-resolution digital photos are taken directly under the plane using a vertically aimed camera. Seals are mapped in GIS and spatial statistical models are used to create an intensity surface from mapped seal densities. Object-based image analysis is used to quantify the amount and fine-scale characteristics of ice in the fjord.

Harbor seals exhibit high seasonal fidelity to tidewater glacial fjords during the pupping and molting seasons. Understanding relationships between glacier ice and harbor seal distribution and abundance will be critical for understanding how future changes in tidewater glaciers may impact harbor seals.

#### For more information:

Contact Jamie Womble, [jamie\\_womble@nps.gov](mailto:jamie_womble@nps.gov)  
<http://www.nps.gov/glba/learn/nature/glacial-ice-and-seals-study.htm>

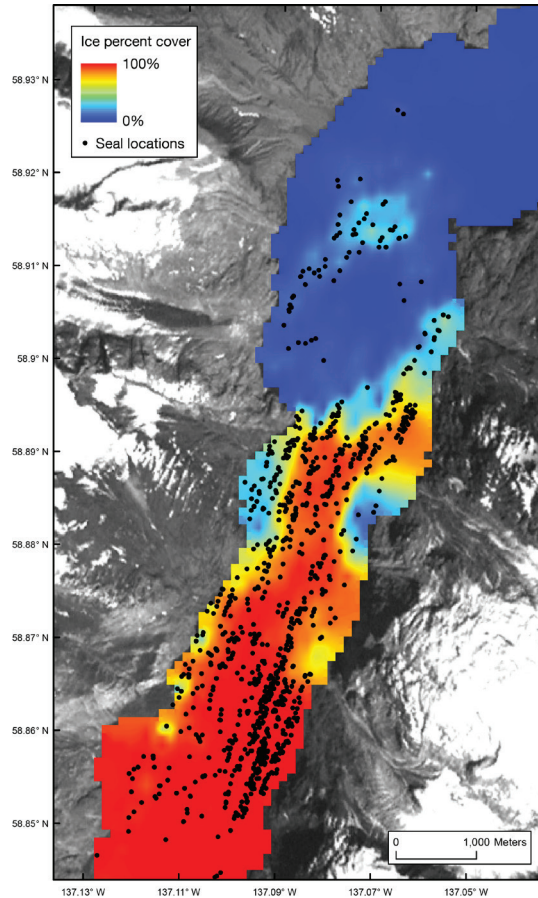


Image of percent ice cover (shown in the color gradients) and seal locations (depicted by black dots) in Johns Hopkins Inlet, Glacier Bay National Park.

Brief designed by: Erin Kunisch  
[www.nps.gov/rlc/oceanalaska/index.htm](http://www.nps.gov/rlc/oceanalaska/index.htm)