

# Arctic Landscape Conservation Cooperative

## Alaska Climate-Biome Shift Model

### The Big Picture

Understanding how climate change will affect species distribution and access to traditional subsistence resources in the future is a challenge facing land, resource, and conservation agencies in Alaska. To develop this understanding, we need spatially explicit projections that allow managers to visualize future landscape scenarios under different climate change, as they may be altered by changing climate.

**Project ID:** ARCT2010-01  
**Year Funded** – 2010  
**Start** – April 2010  
**End** – September 2011  
**Budget** – \$192,000

#### Research Partners:

University of Alaska Fairbanks'  
Scenarios Network for Alaska &  
Arctic Planning  
Ecological Wildlife Habitat Data  
Analysis for the Land and  
Seascape Laboratory  
US Fish and Wildlife Service

### *Forecasting temperature and precipitation patterns under future climate scenarios*

#### Project Description

Researchers from the University of Alaska (UAF), The Nature Conservancy, and U.S. Fish and Wildlife Service will use 'climate envelope' models (i.e., models that infer a species' environmental requirements from locations where they are currently found) to explore how patterns in temperature, precipitation, and landcover (i.e., climate-biomes) may shift as a result of changing climate.

#### Why We Are Interested

The project will give managers and other stakeholders a new tool to visualize how temperature and precipitation patterns may shift as a result of climate change. This information will be useful in considering potential impacts of climate change within a given landscape, and also in designing conservation strategies.



Shallow wetland in interior Alaska. Habitats such as this are sensitive to changes in both air temperature and summer precipitation. Photo by USFWS.



## What Will Be Done

This project will use historical climate records for Alaska and Western Canada to identify climate-biomes seen across this region today. These climate-biome models will be coupled with future climate projections in an effort to identify areas within Alaska expected to undergo extreme change, and areas of "refugia" where temperature and precipitation patterns are expected to remain similar to what they are now.

## Expected Outcomes

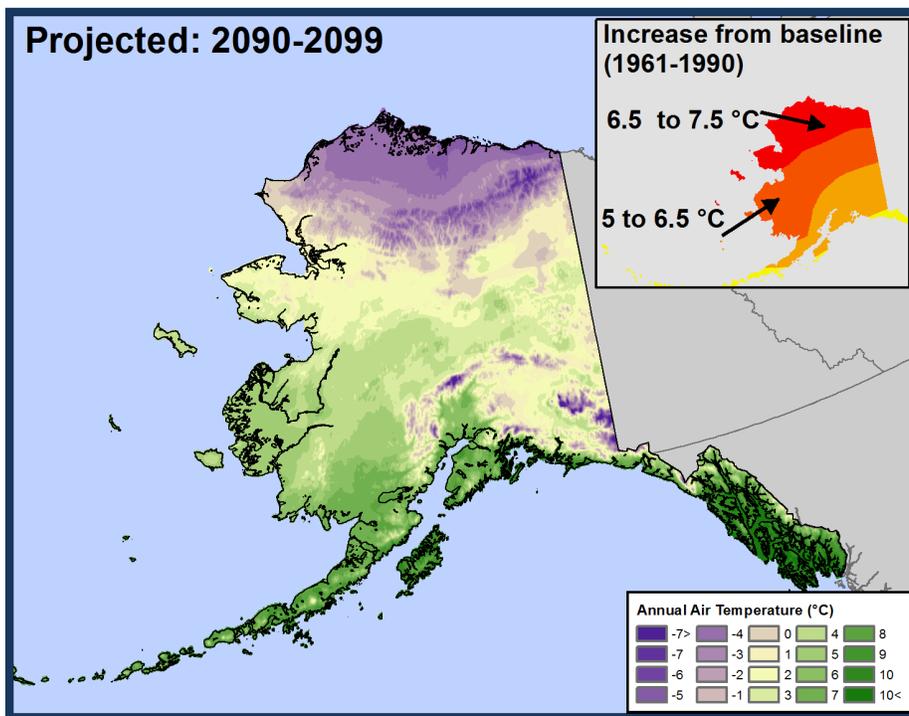
This modeling effort will use climate projections to produce spatially explicate models identifying areas of relative stability and areas of extreme change over the next 100 years. This information has direct applicability to conservation planning and development of vulnerability assessments species of management concern.



The mission of the Arctic LCC is to identify and provide information needed to conserve natural and cultural resources in the face of landscape scale stressors, focusing on climate change, through a multidisciplinary program that supports coordinated actions among management agencies, conservation organizations, communities, and other stakeholders.

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Climate change will eventually shift the species composition and ultimately the biomes of Alaska and Western Canada.



Projected average annual air temperature for the decade spanning 2090-2099. Temperatures are projected to increase by 6.5 to 7.5 °C (~11 to 13.5°F). Changes of this magnitude will likely result in the species composition and ultimately the biomes of Alaska and surrounding areas.

## Timeline

April 2010 – April 2011: Model development.

September 2011: Final report and complete set of GIS models that represent potential climate-biomes from three different time periods.

June 2011

To learn more about this project and other Arctic LCC projects visit: [arcticlcc.org](http://arcticlcc.org)  
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