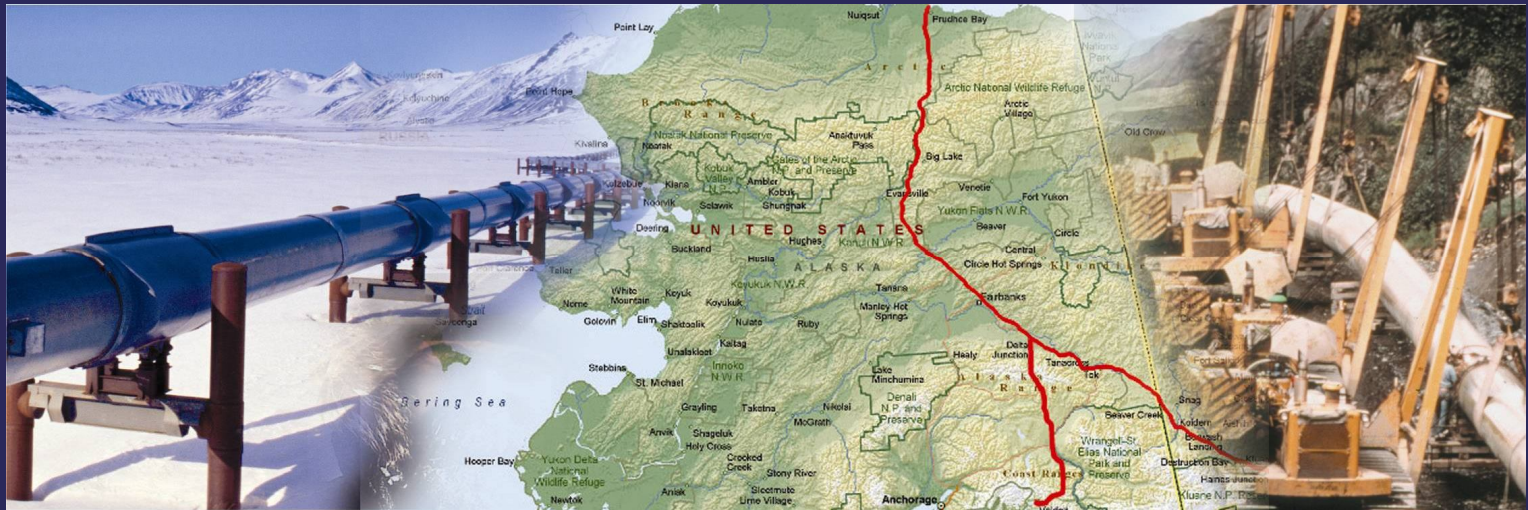


# Arctic Oil and Gas in Today's North American Energy Equation



Drue Pearce  
Federal Coordinator  
Office of the Federal Coordinator for  
Alaska Natural Gas Transportation Projects  
The Canada Institute and the Global Energy Initiative  
of Woodrow Wilson International Center for Scholars  
June 24, 2009

# ANGTA

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# ANGPA



# North Slope to Alberta and Beyond Pipeline Proposals

## Denali

- ❖ Pre-filed with FERC
- ❖ Begun engagement with federal agencies
- ❖ Planning open houses in 2009/2010
- ❖ Planned Open Season in 2010



## TransCanada Alaska

- ❖ AGIA licensee
- ❖ Pre-filed with FERC
- ❖ Begun engagement with federal agencies
- ❖ Planned Open Season in Spring 2010





# President Obama

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## ❖ Pre-Election

"Over the next five years, we should also lease more of the National Petroleum Reserve in Alaska for oil and gas production. And we should also tap more of our substantial natural gas reserves and work with the Canadian government to finally build the Alaska Natural Gas Pipeline, delivering clean natural gas and creating good jobs in the process."

Obama Campaign, Lansing, MI, August 4, 2008

## ❖ Post Election

"Prioritize the Construction of the Alaska Natural Gas Pipeline"  
White House Agenda – Energy and the Environment

# What is the Role of the OFC?

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- ❖ Coordination
- ❖ Compliance and Oversight
- ❖ Information Dissemination

# U.S. Federal Agencies

- **Office of Federal Coordinator**
- **Council on Environmental Quality**
- **Federal Energy Regulatory Commission**
- **Department of Interior**
  - Bureau of Land Management
  - Bureau of Indian Affairs
  - U.S. Fish and Wildlife Service
  - Minerals Management Service
  - National Park Service
  - U.S. Geological Service
- **Department of Energy**
- **Department of Transportation**
  - FHWA
  - PHMSA
  - FAA
- **Department of Treasury**
- **Department of State**
- **Department of Defense**
  - U.S. Army Corps of Engineers
- **Department of Commerce**
  - NOAA
  - NMFS
- **Department of Homeland Security**
  - CBP
  - TSA
  - U.S. Coast Guard
- **Department of Labor**
- **Environmental Protection Agency**
- **Department of Agriculture**
- **Advisory Council on Historic Preservation**
- **Department of Justice**
- **Federal Communications Commission**

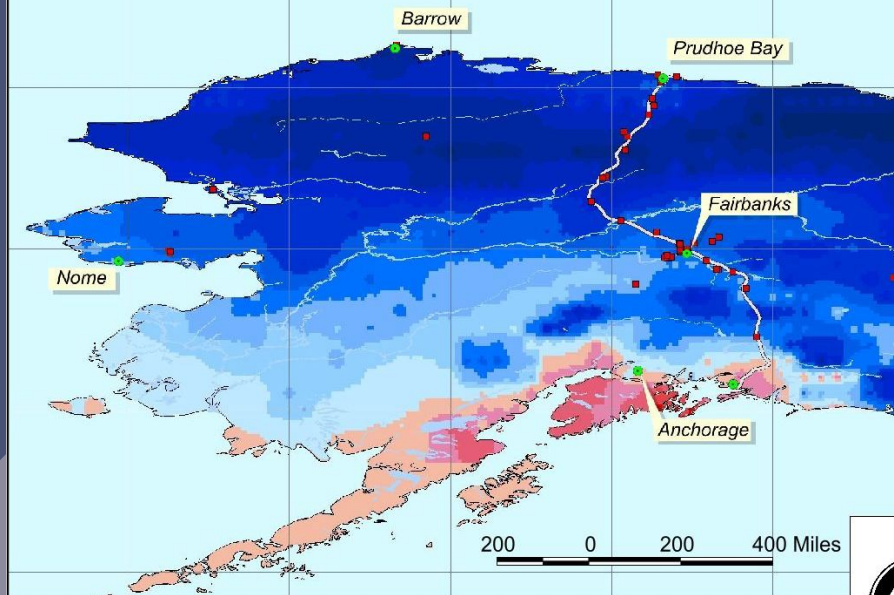
# Recent Developments

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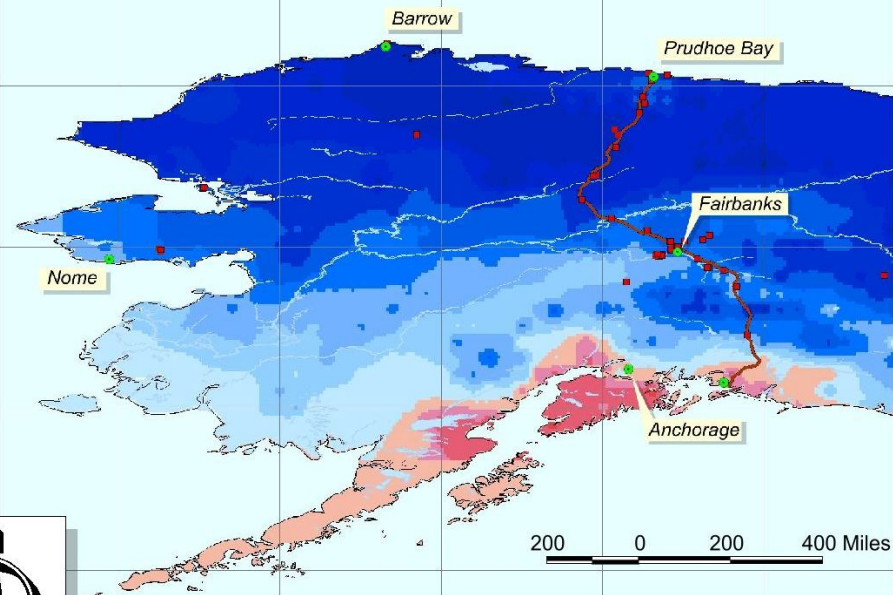
- ❖ Consolidated Implementation Plans
  - ❖ <http://www.arcticgas.gov/routes.htm>
- ❖ TransCanada ExxonMobil Partnership
- ❖ Clarity of Canadian Regulatory Regime



Mean Annual Temperature at 2 m Depth

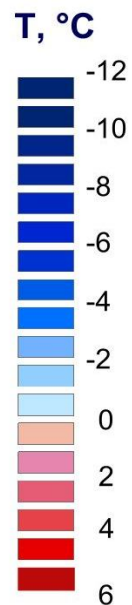


Mean Annual Temperature at 5 m Depth

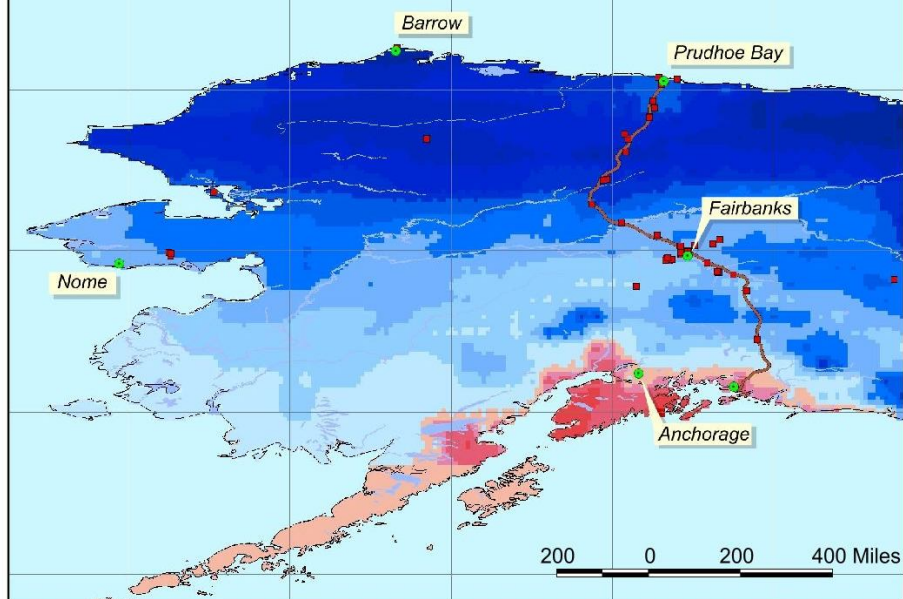


1950

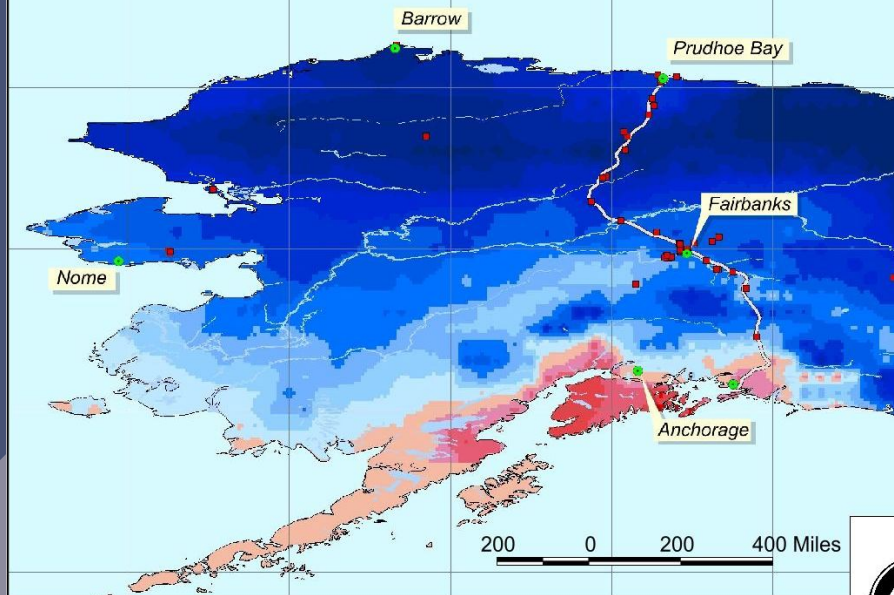
## Spatially Distributed Model of Permafrost Dynamics in Alaska



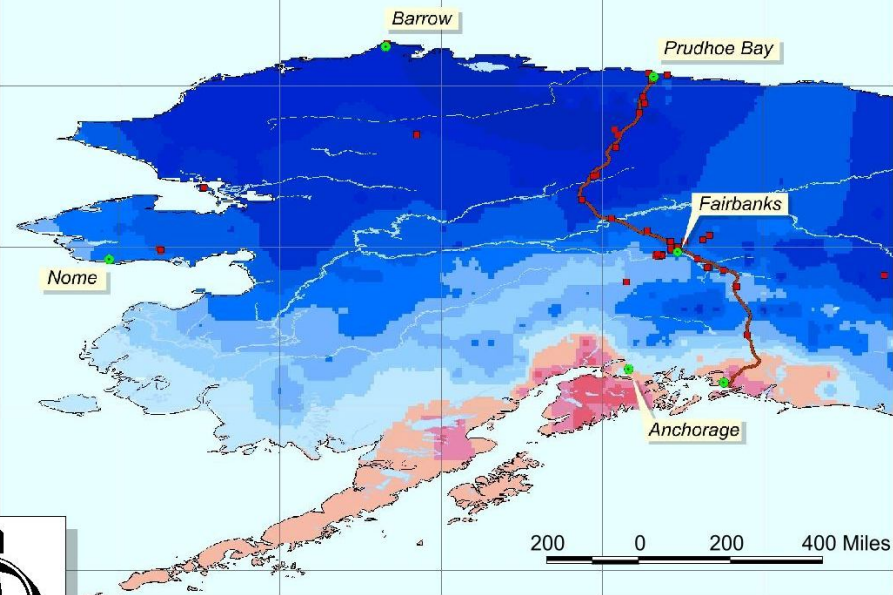
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

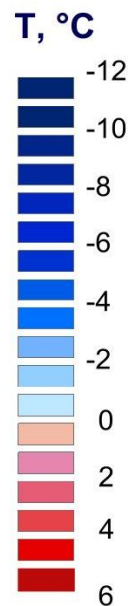


Mean Annual Temperature at 5 m Depth

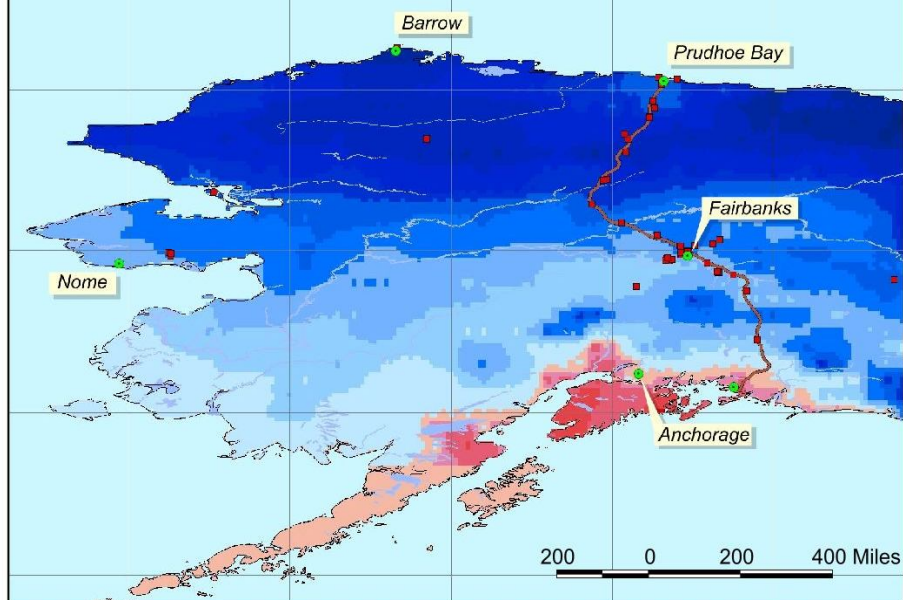


1960

## Spatially Distributed Model of Permafrost Dynamics in Alaska

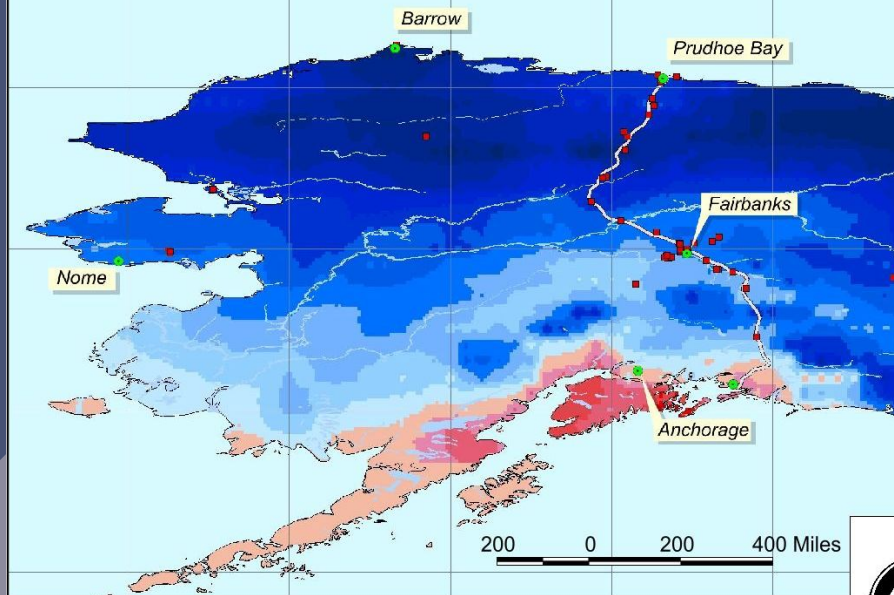


Mean Annual Temperature at 20 m Depth

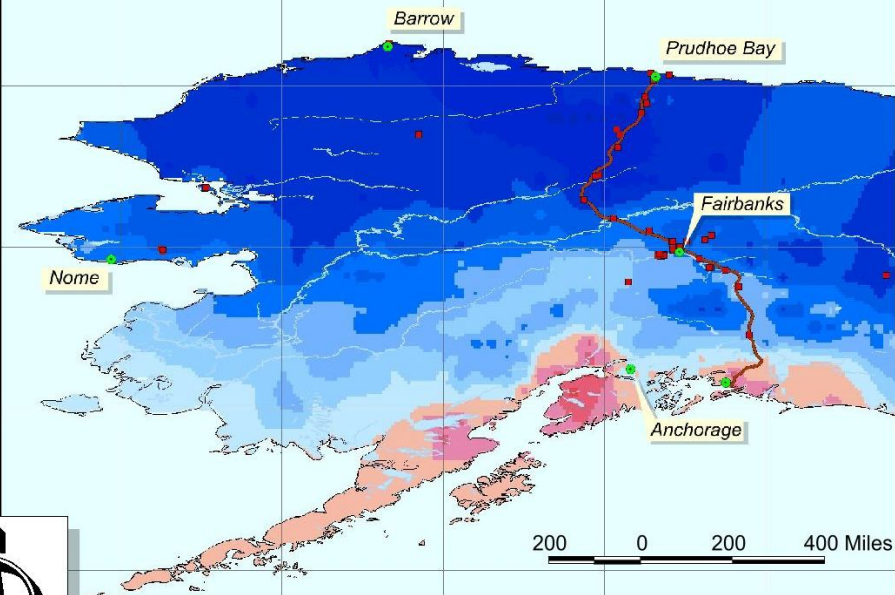




Mean Annual Temperature at 2 m Depth

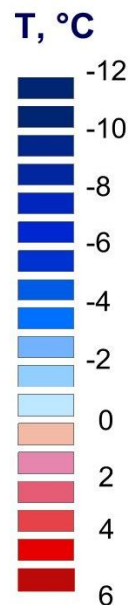


Mean Annual Temperature at 5 m Depth

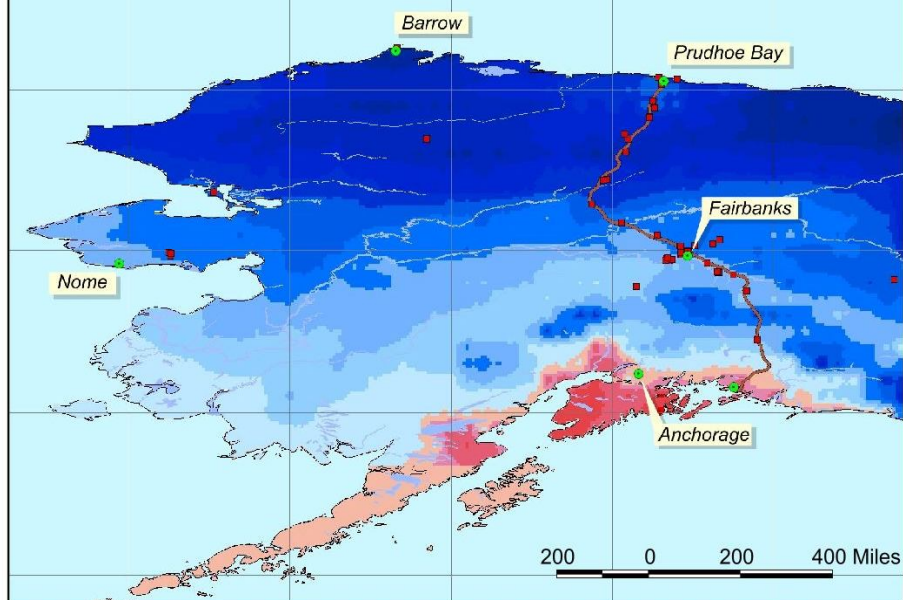


1970

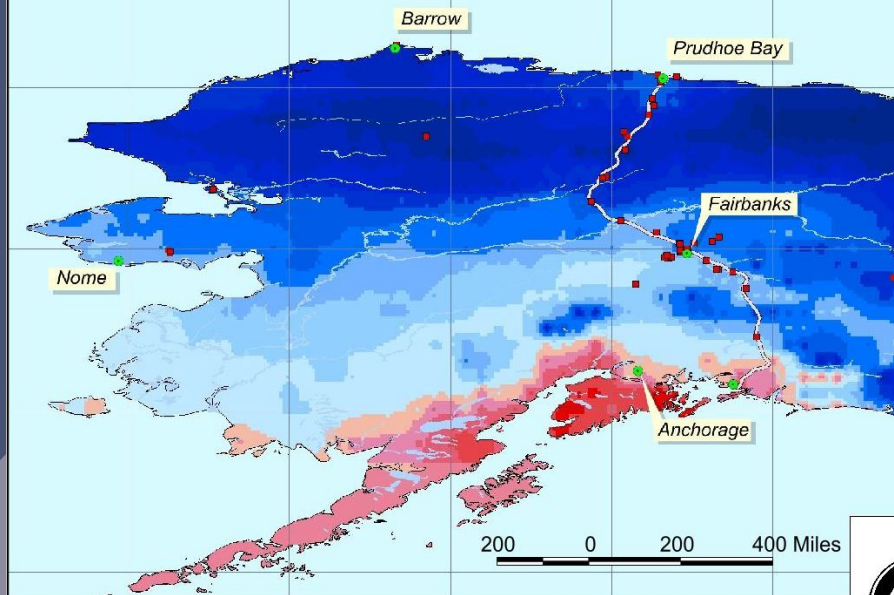
## Spatially Distributed Model of Permafrost Dynamics in Alaska



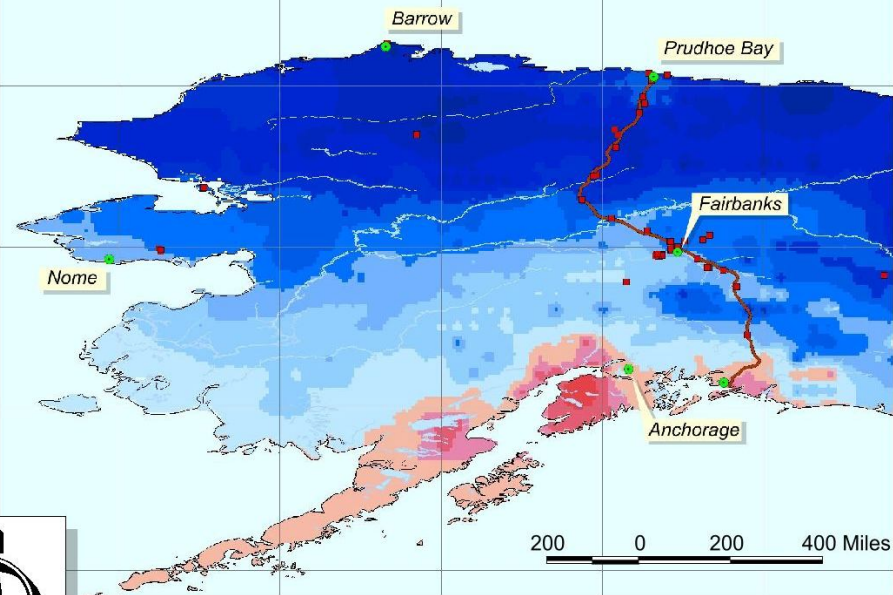
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

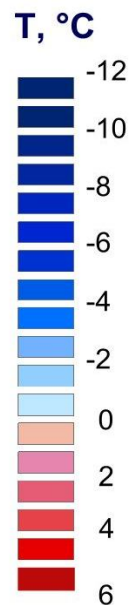


Mean Annual Temperature at 5 m Depth

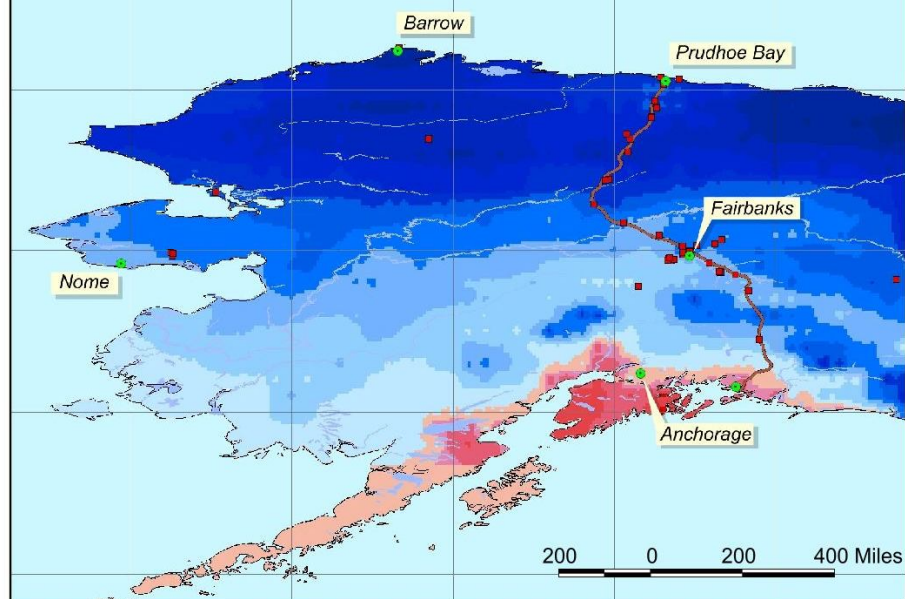


1980

## Spatially Distributed Model of Permafrost Dynamics in Alaska

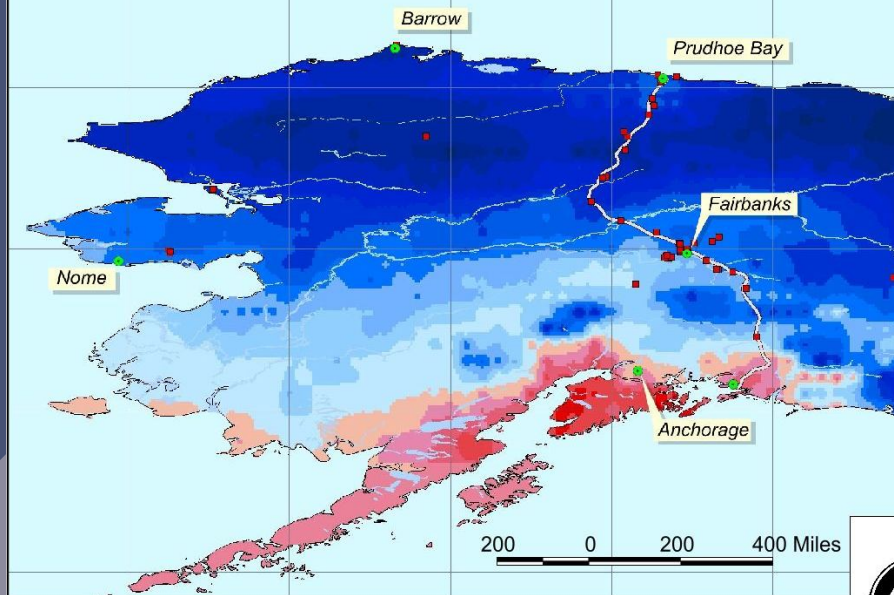


Mean Annual Temperature at 20 m Depth

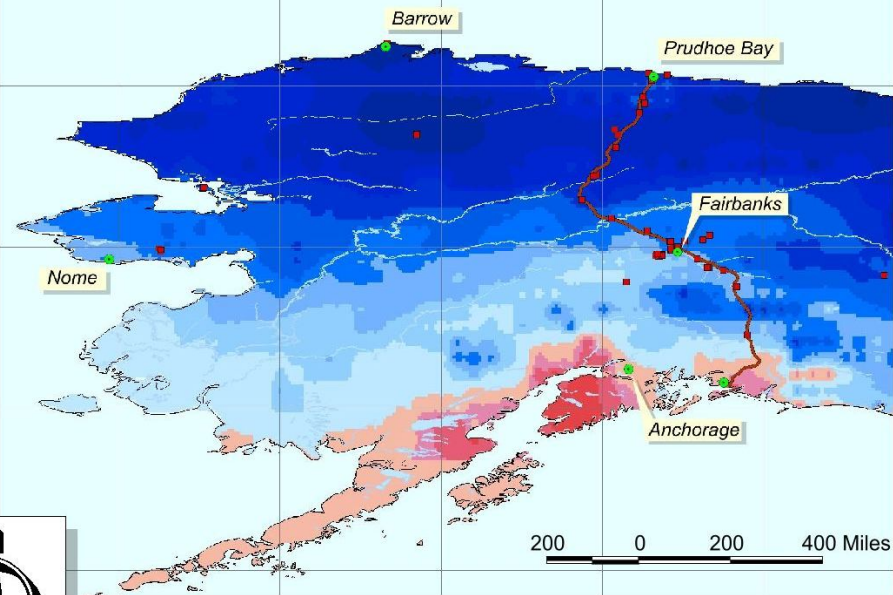




Mean Annual Temperature at 2 m Depth

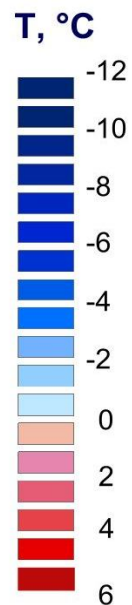


Mean Annual Temperature at 5 m Depth

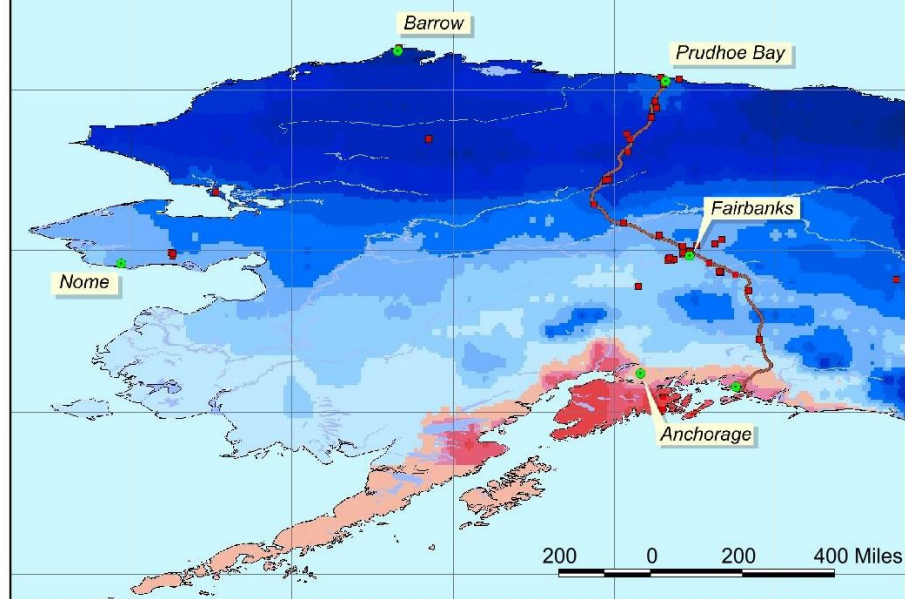


1990

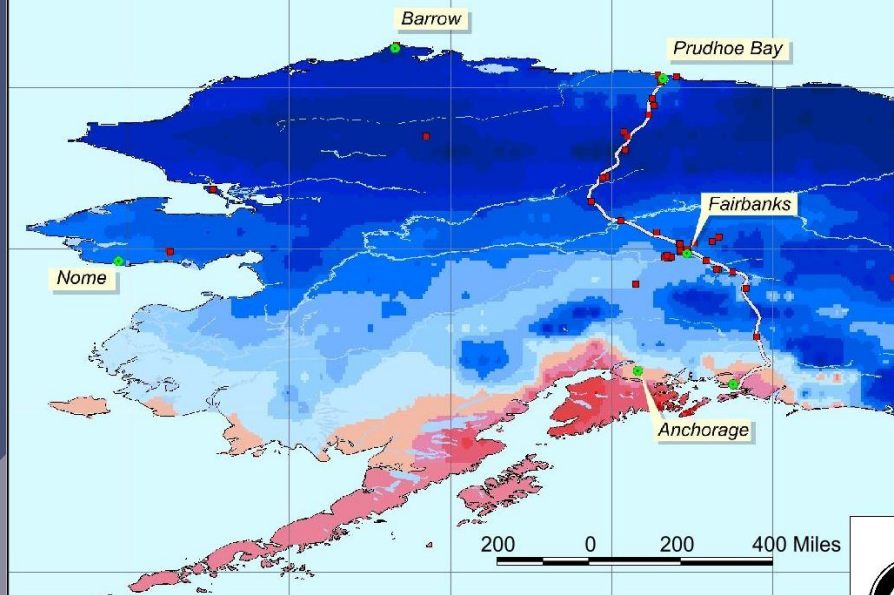
## Spatially Distributed Model of Permafrost Dynamics in Alaska



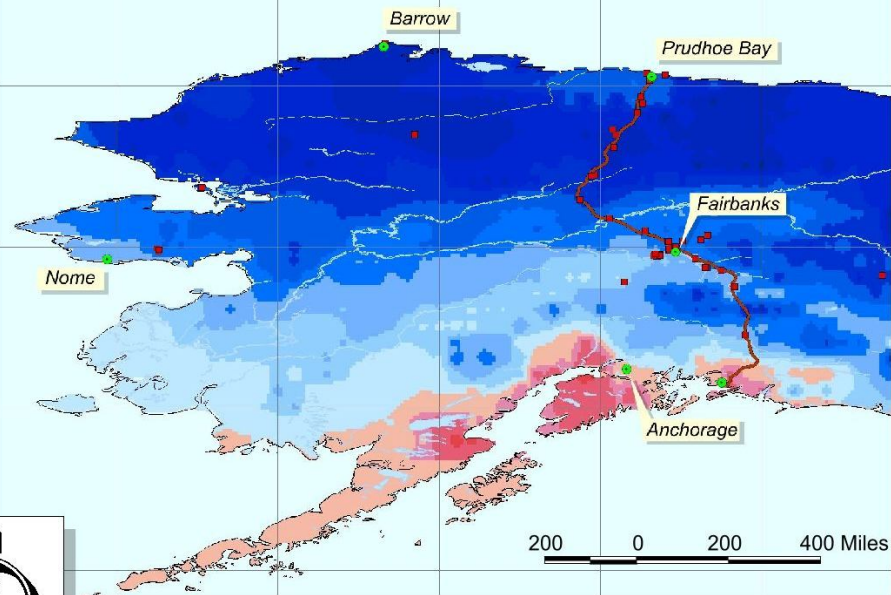
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

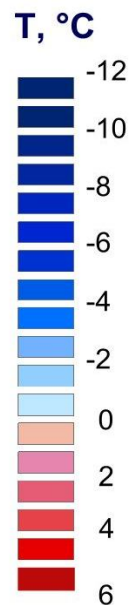


Mean Annual Temperature at 5 m Depth

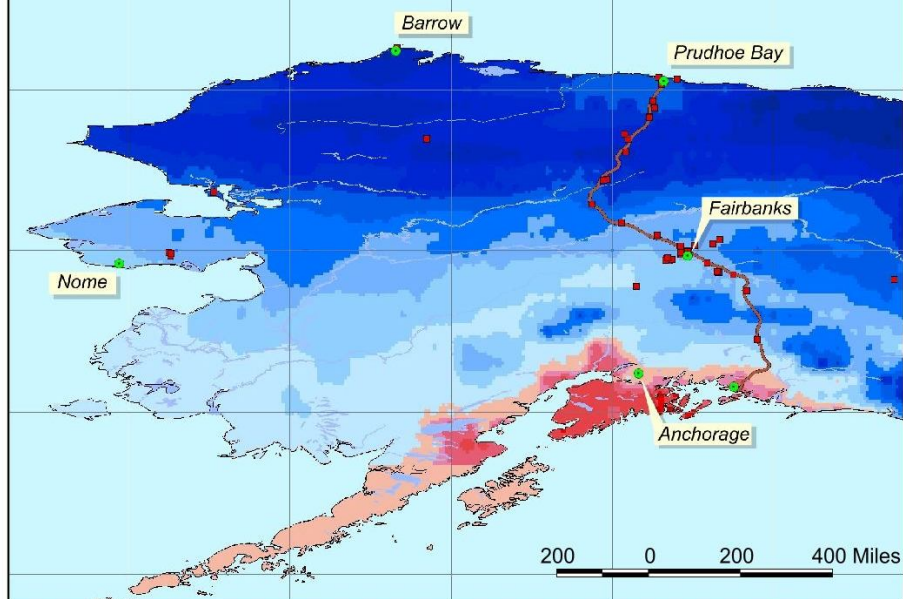


2000

## Spatially Distributed Model of Permafrost Dynamics in Alaska

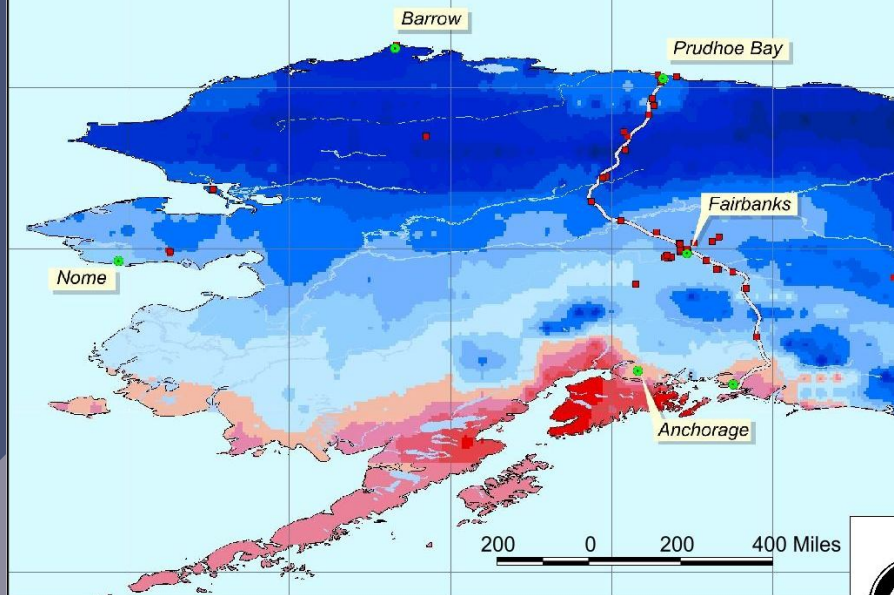


Mean Annual Temperature at 20 m Depth

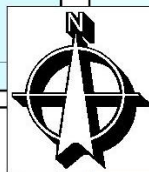
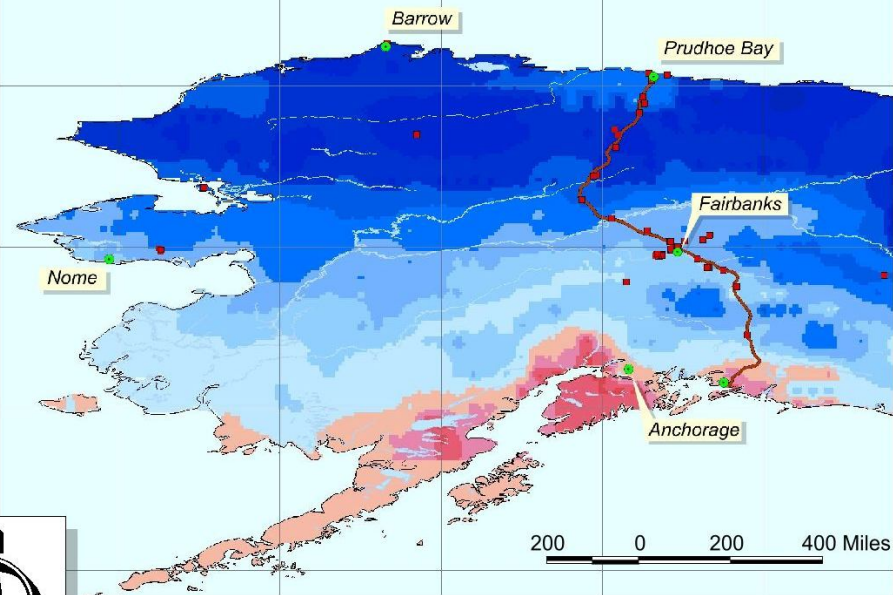




Mean Annual Temperature at 2 m Depth

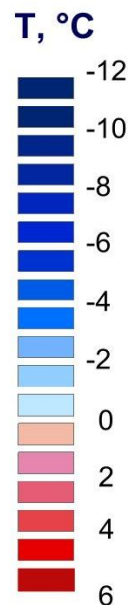


Mean Annual Temperature at 5 m Depth

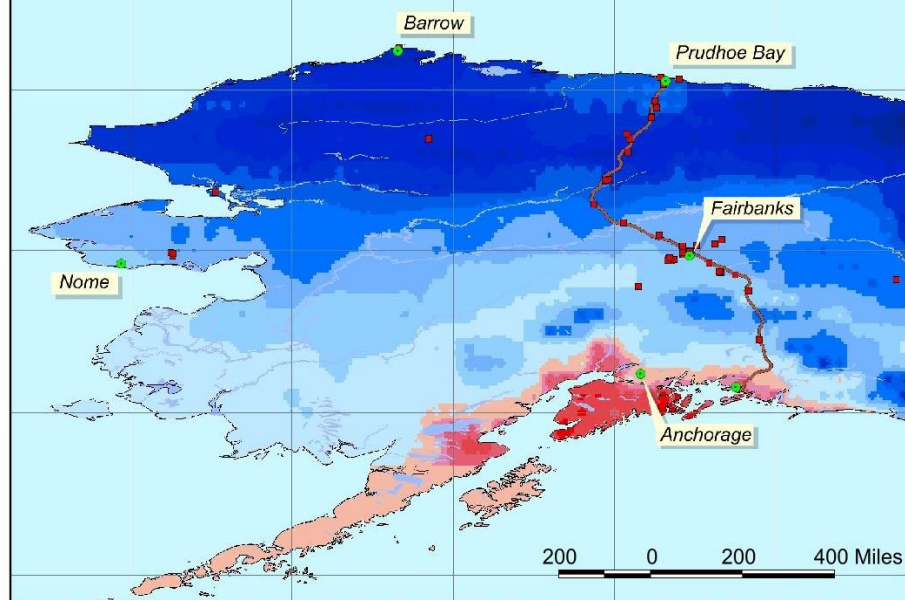


2010

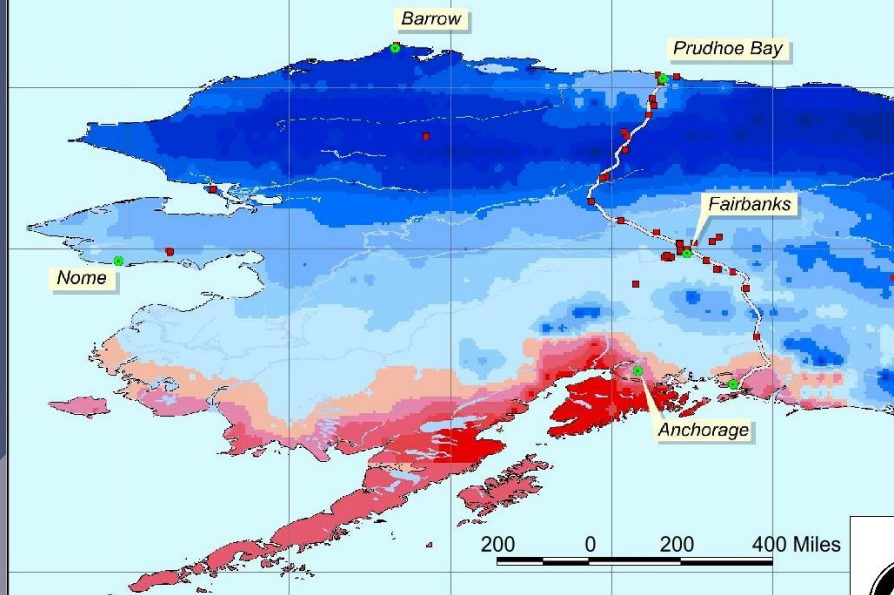
## Spatially Distributed Model of Permafrost Dynamics in Alaska



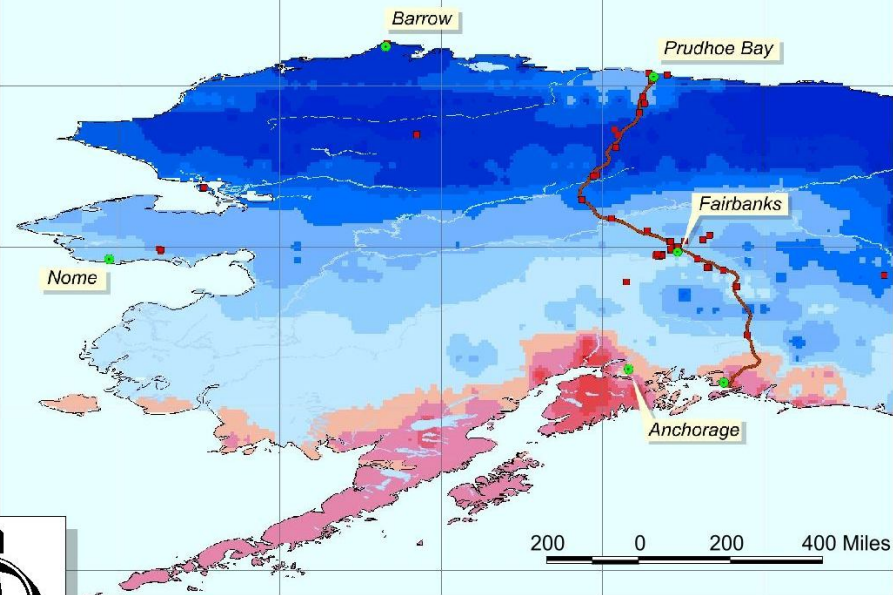
Mean Annual Temperature at 20 m Depth



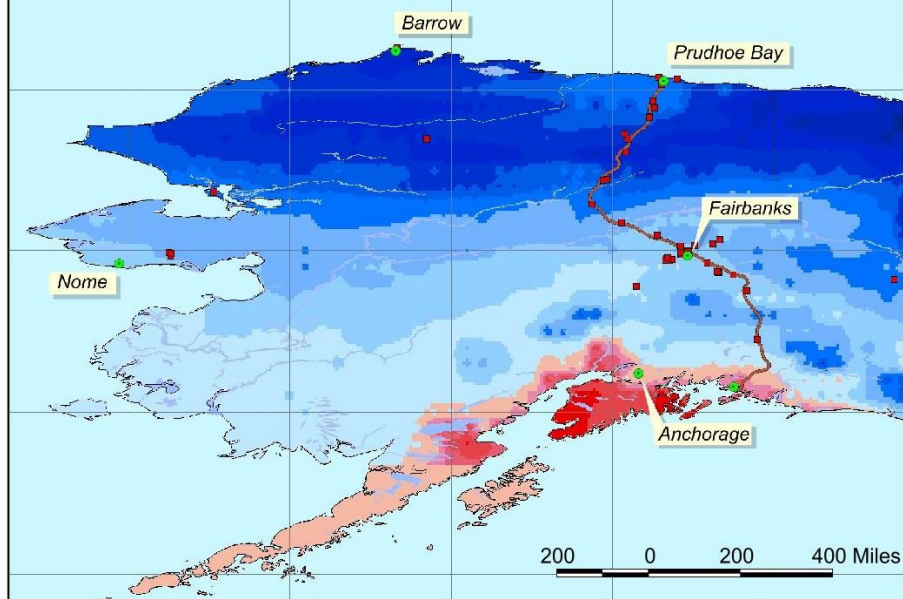
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

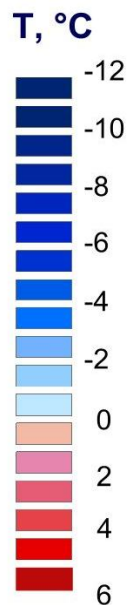


Mean Annual Temperature at 20 m Depth



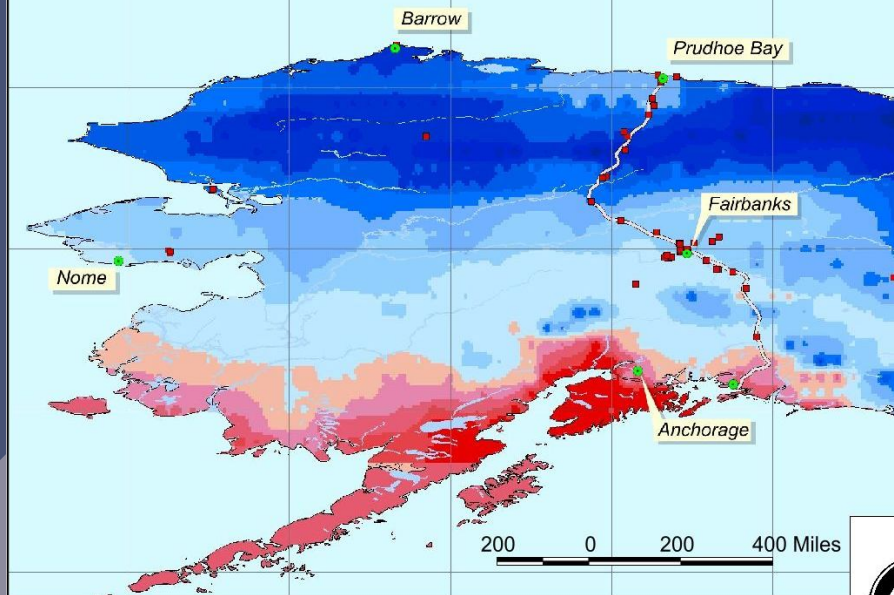
2020

## Spatially Distributed Model of Permafrost Dynamics in Alaska

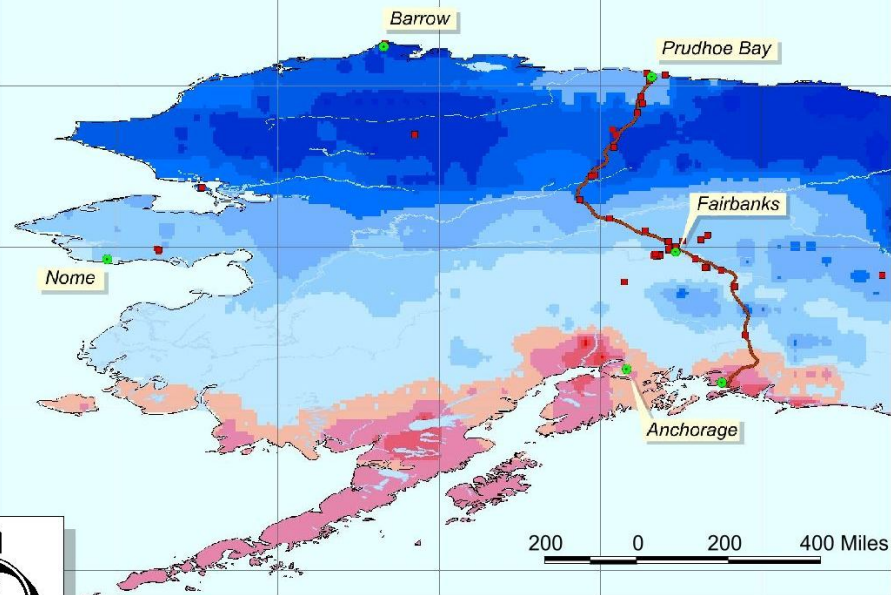




Mean Annual Temperature at 2 m Depth

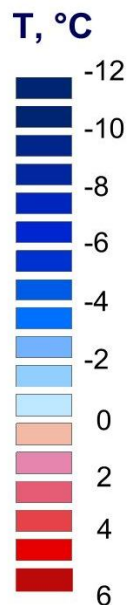


Mean Annual Temperature at 5 m Depth

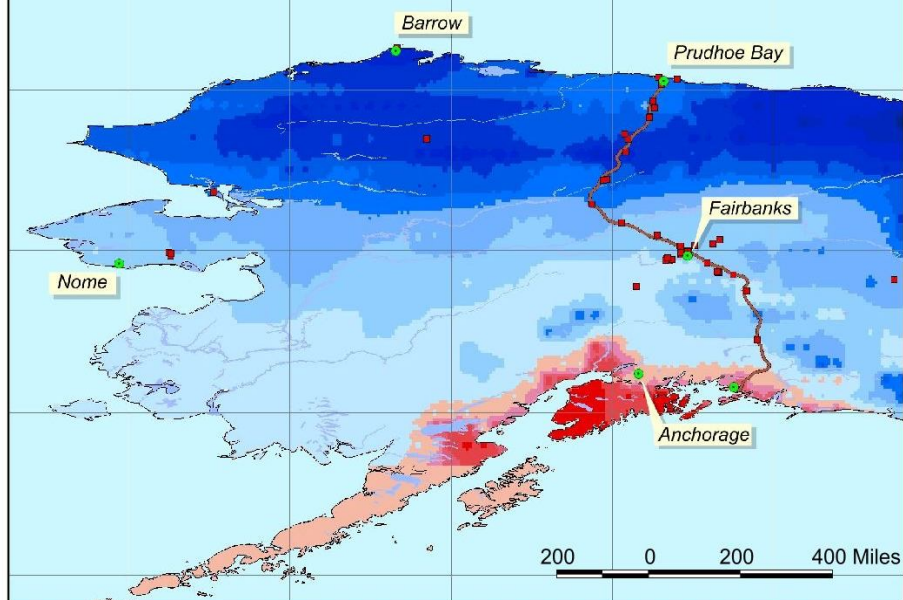


2030

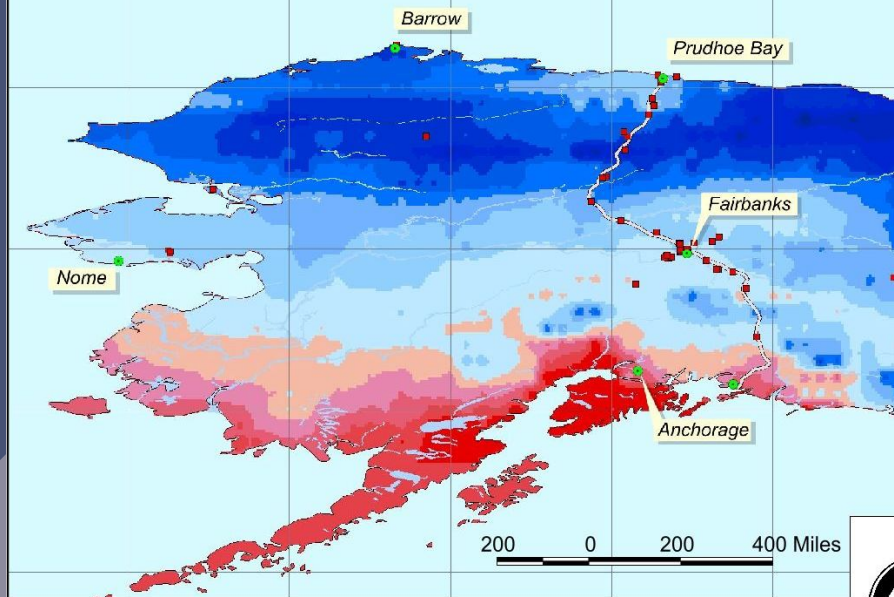
## Spatially Distributed Model of Permafrost Dynamics in Alaska



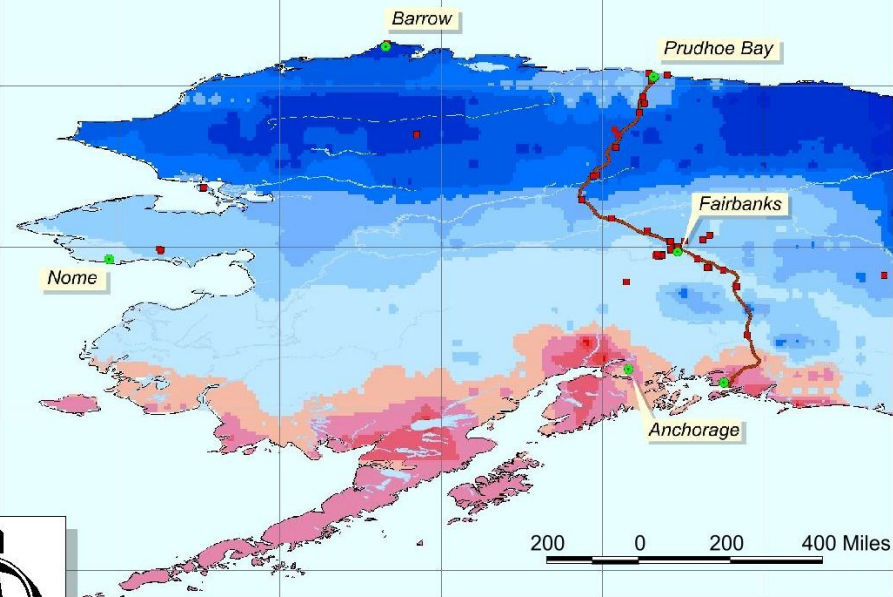
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

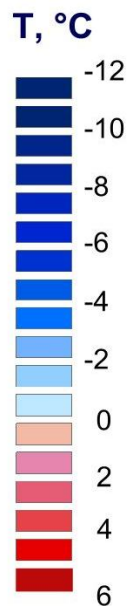


Mean Annual Temperature at 5 m Depth

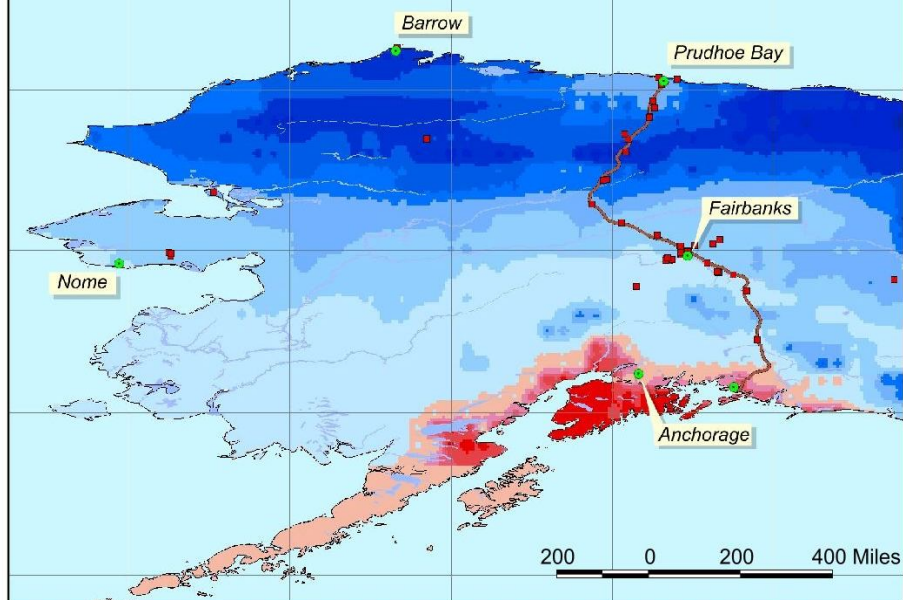


2040

## Spatially Distributed Model of Permafrost Dynamics in Alaska

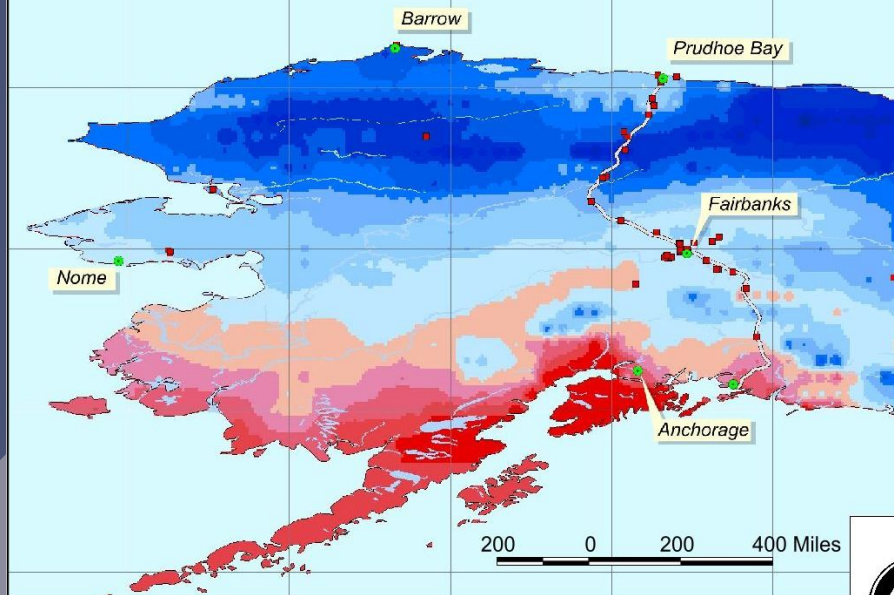


Mean Annual Temperature at 20 m Depth

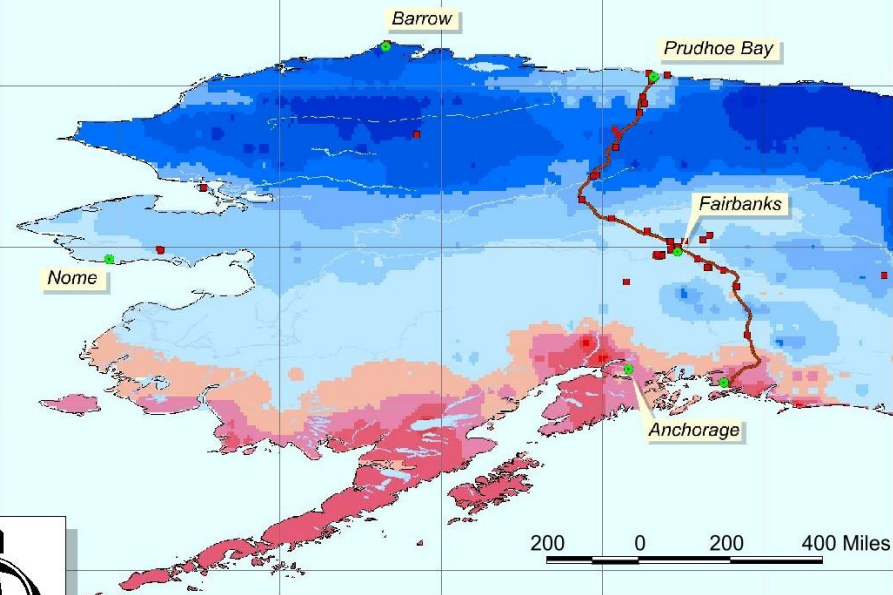




Mean Annual Temperature at 2 m Depth

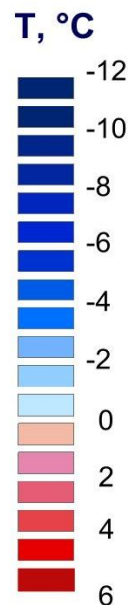


Mean Annual Temperature at 5 m Depth

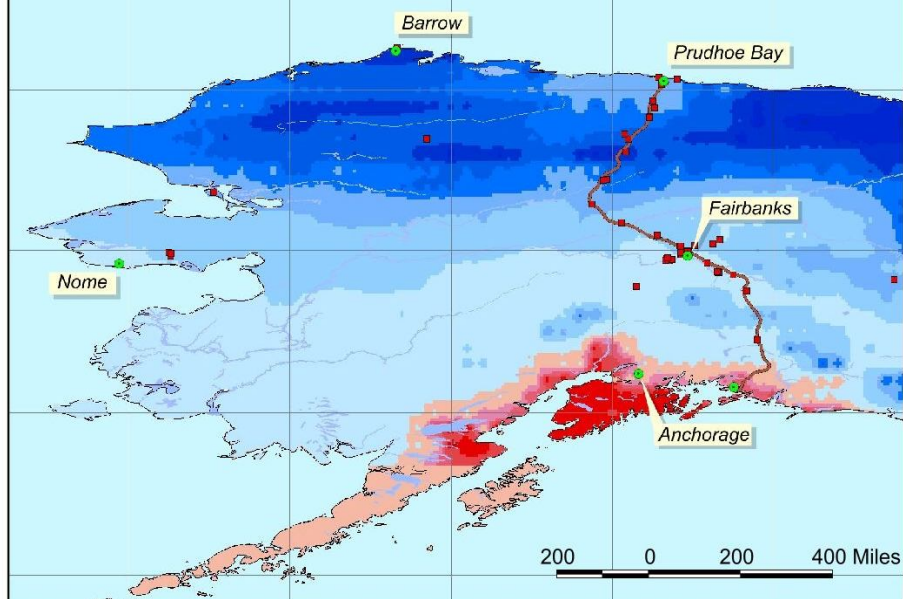


2050

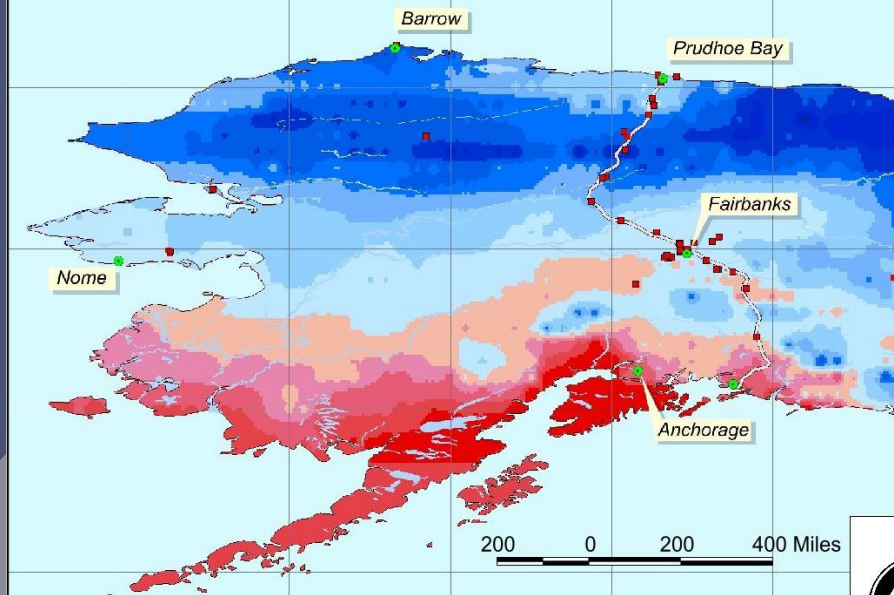
## Spatially Distributed Model of Permafrost Dynamics in Alaska



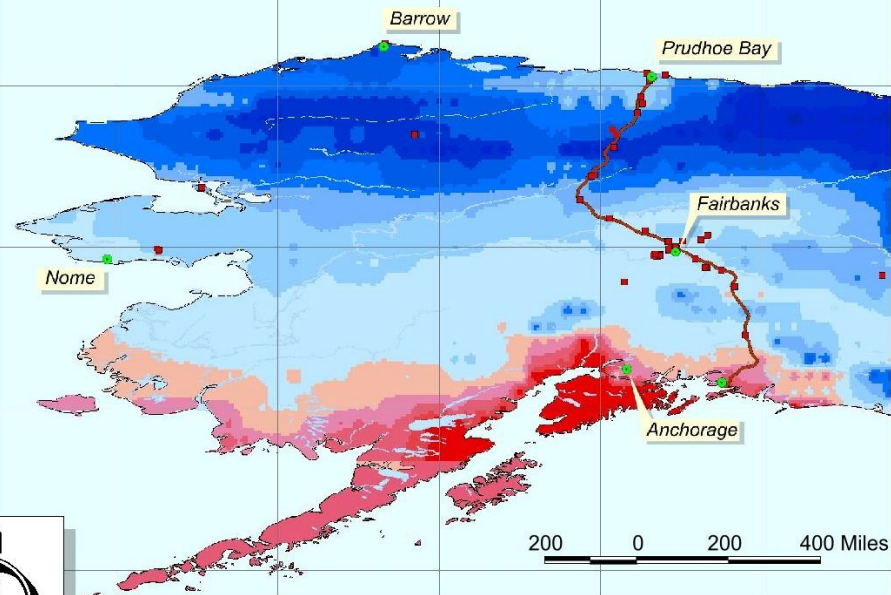
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

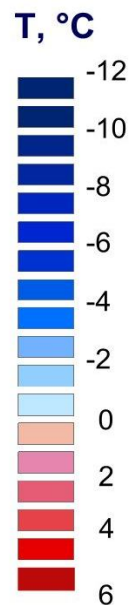


Mean Annual Temperature at 5 m Depth

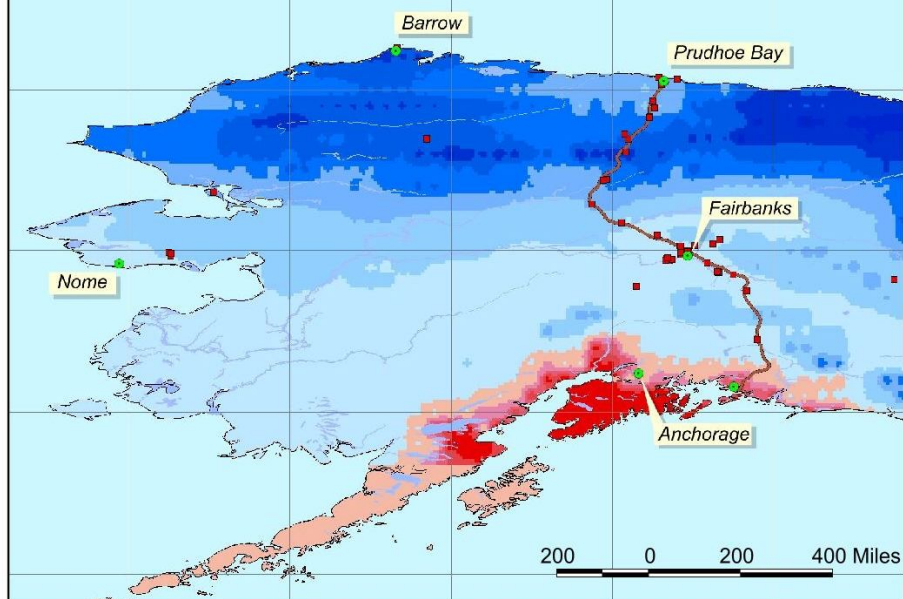


2060

## Spatially Distributed Model of Permafrost Dynamics in Alaska

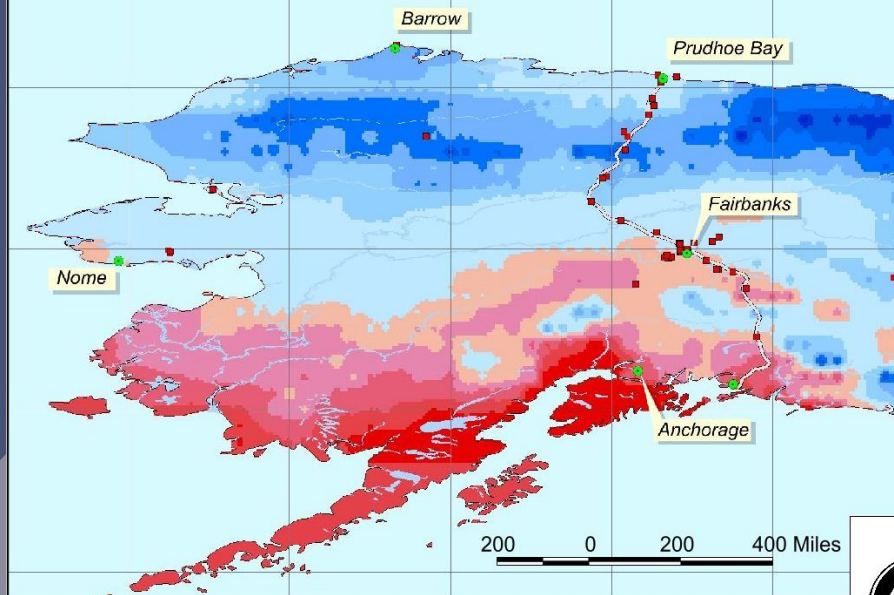


Mean Annual Temperature at 20 m Depth

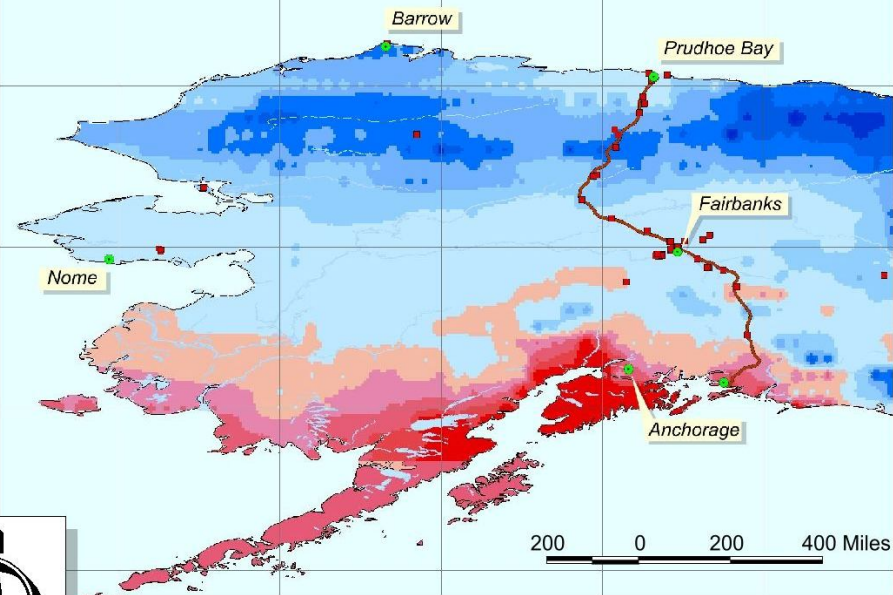




Mean Annual Temperature at 2 m Depth

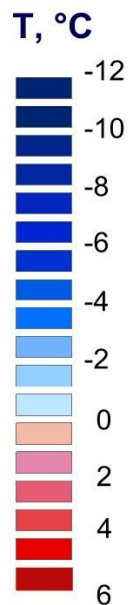


Mean Annual Temperature at 5 m Depth

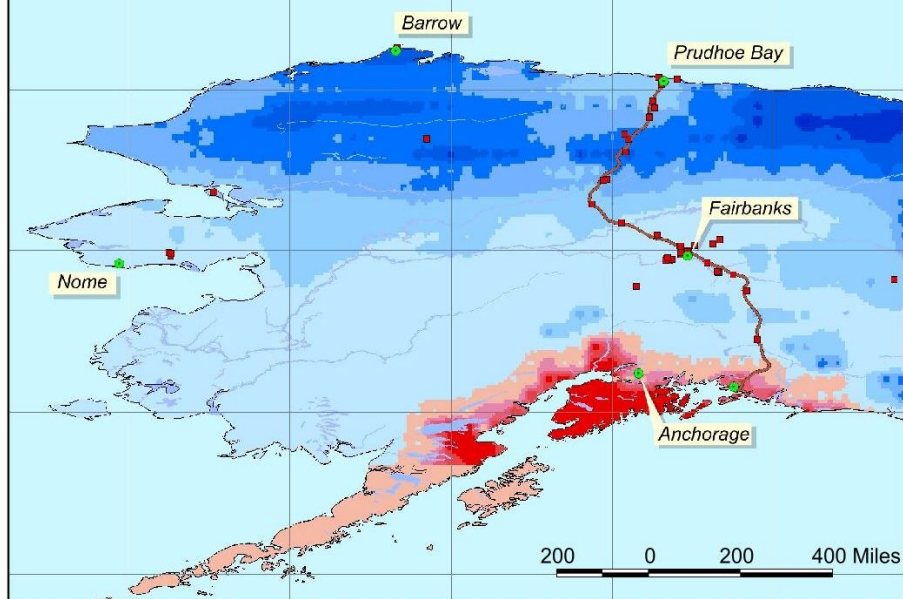


2070

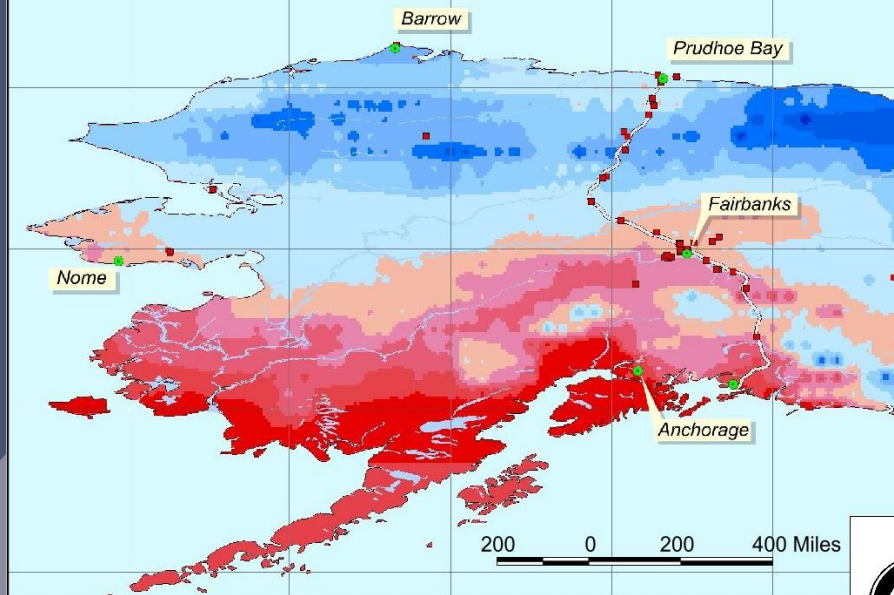
## Spatially Distributed Model of Permafrost Dynamics in Alaska



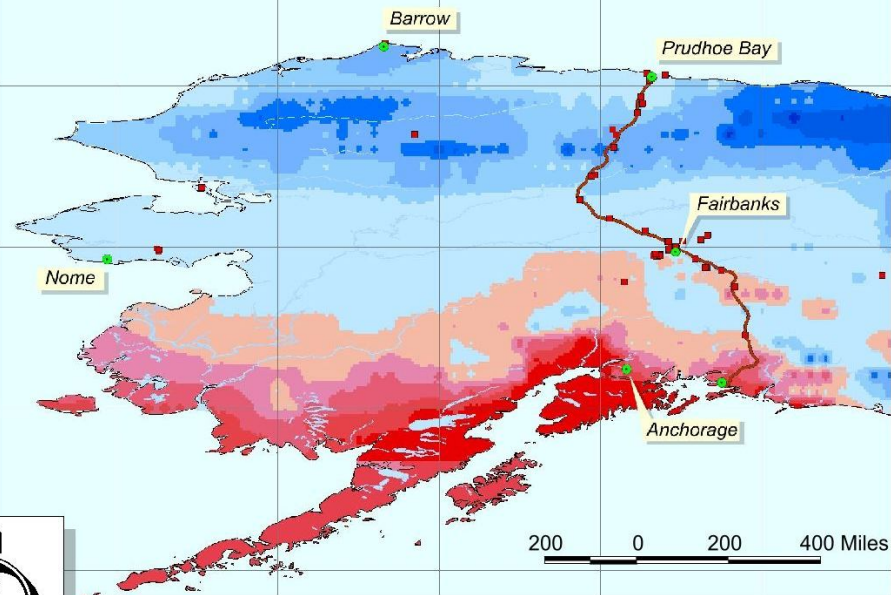
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

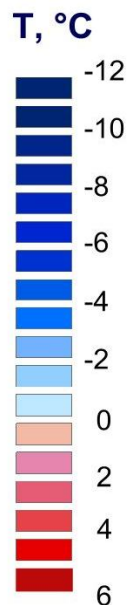


Mean Annual Temperature at 5 m Depth

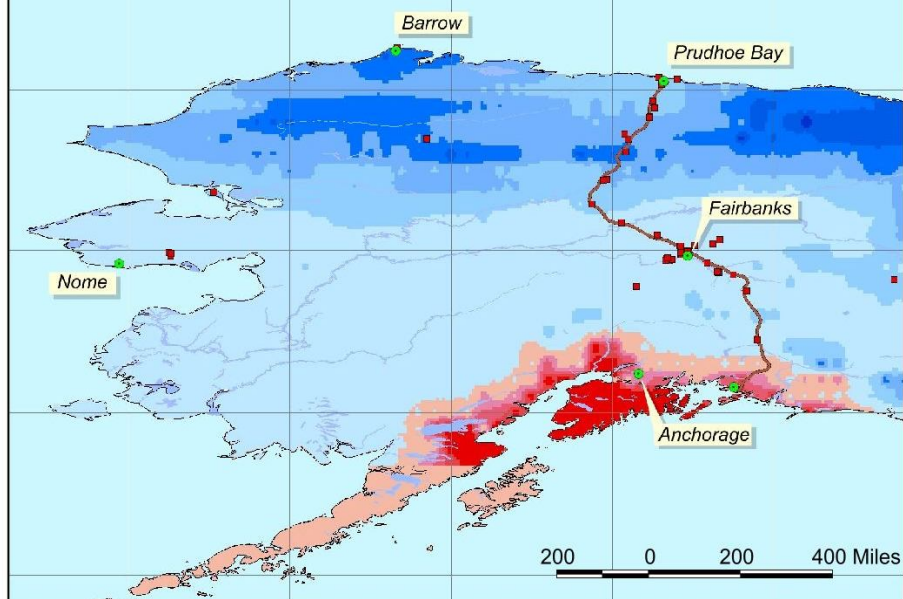


2080

## Spatially Distributed Model of Permafrost Dynamics in Alaska

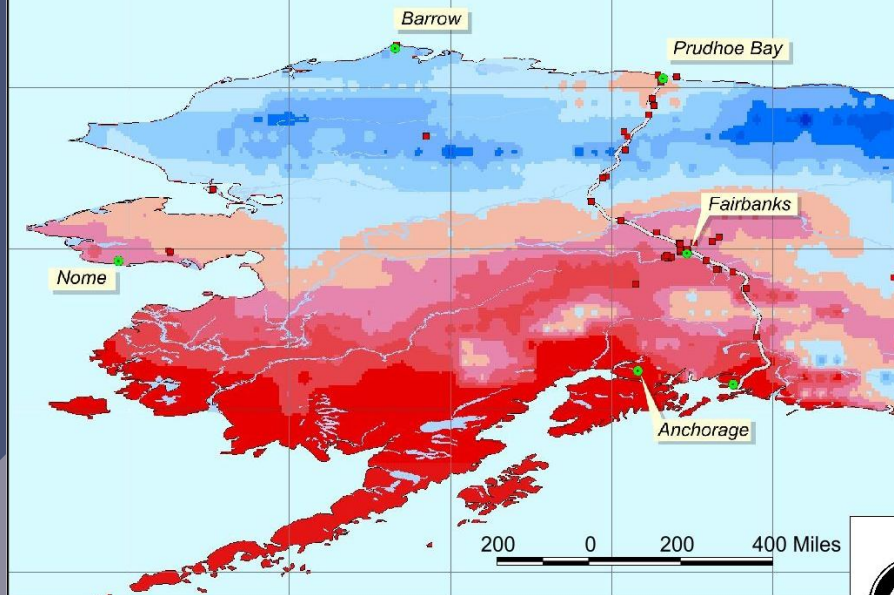


Mean Annual Temperature at 20 m Depth

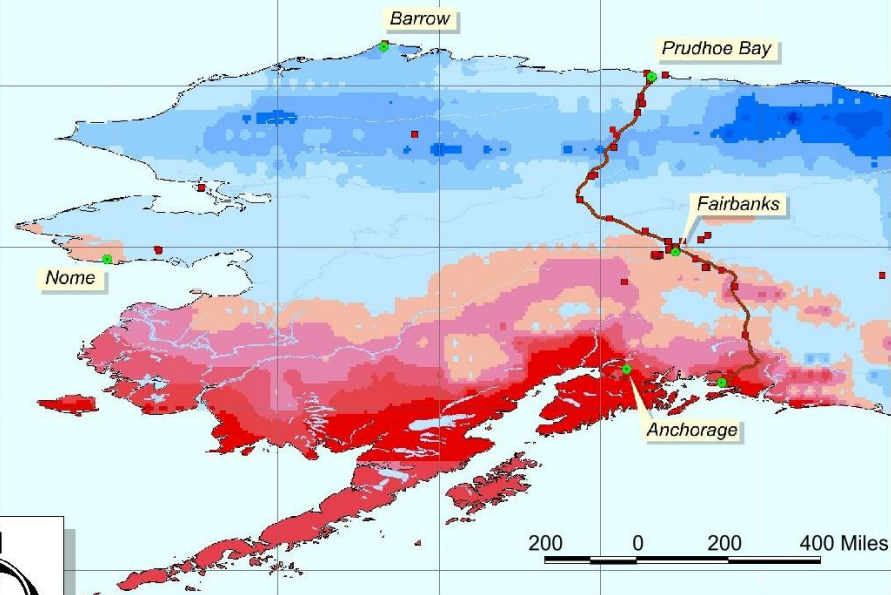




Mean Annual Temperature at 2 m Depth

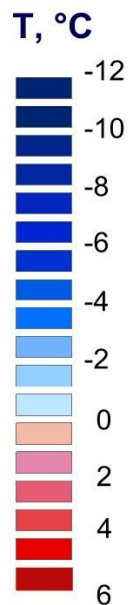


Mean Annual Temperature at 5 m Depth

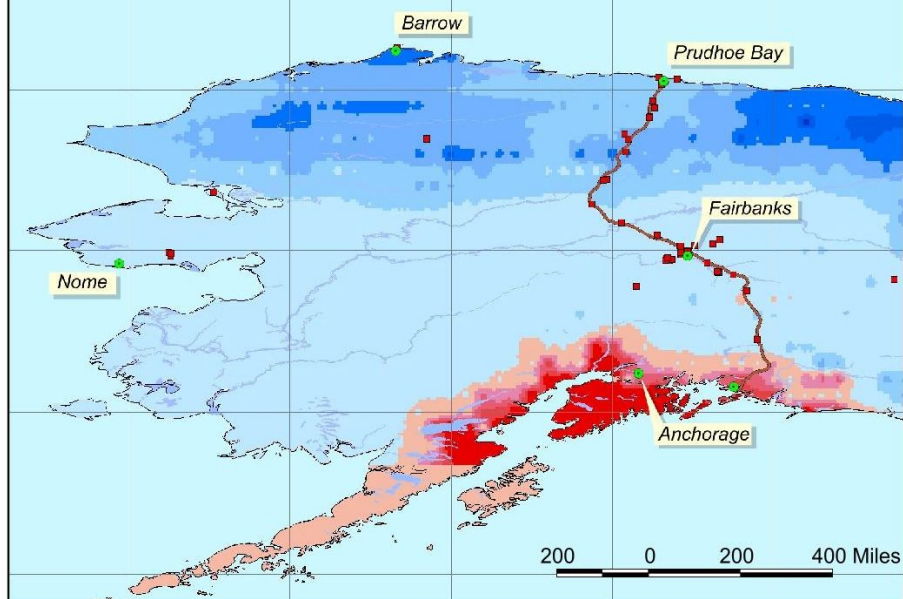


2090

## Spatially Distributed Model of Permafrost Dynamics in Alaska

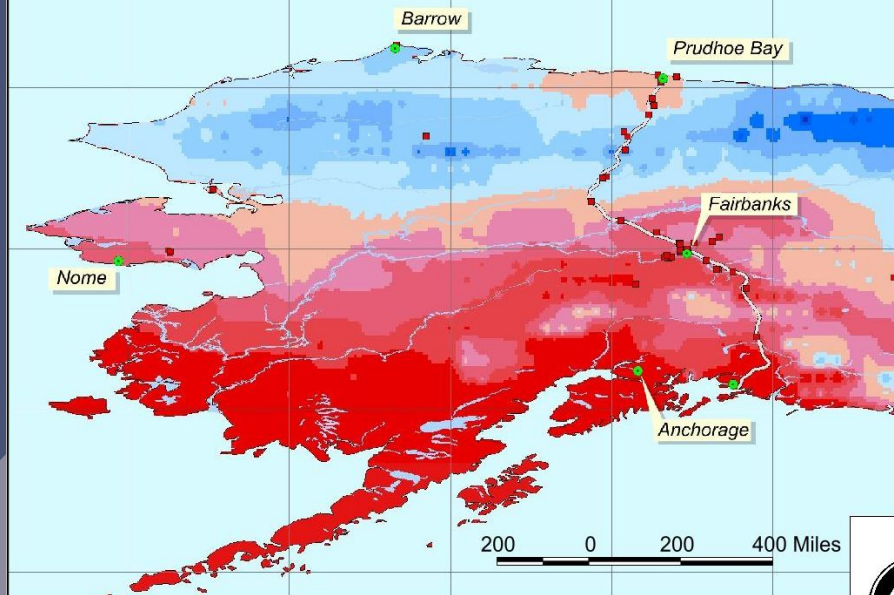


Mean Annual Temperature at 20 m Depth

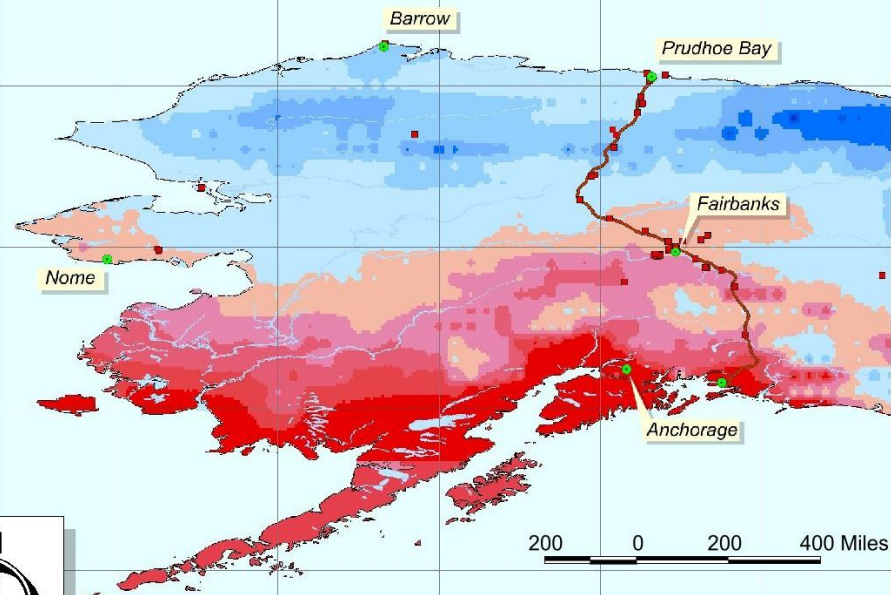




Mean Annual Temperature at 2 m Depth

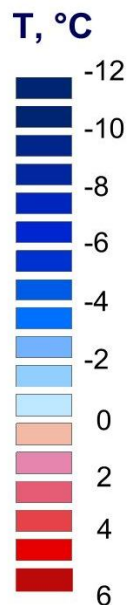


Mean Annual Temperature at 5 m Depth

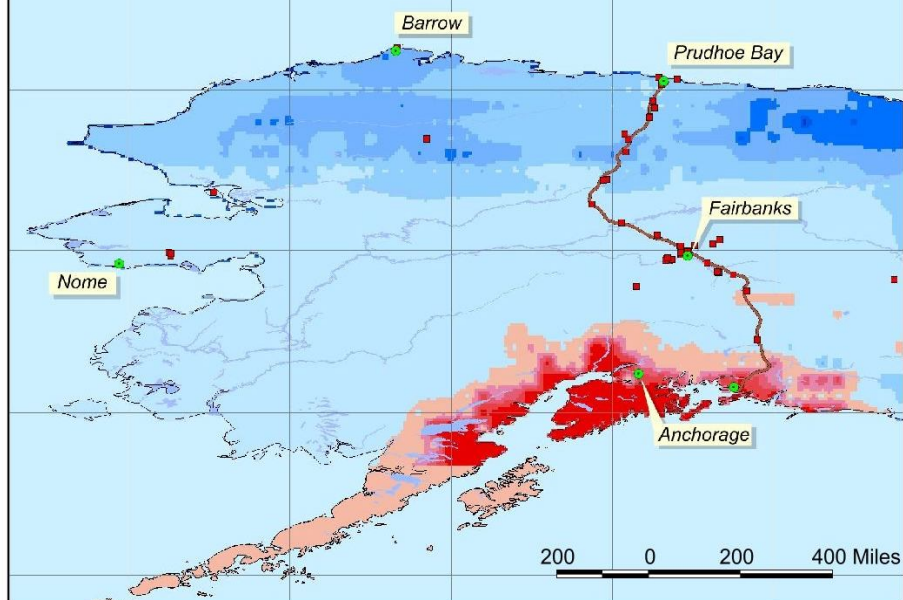


2100

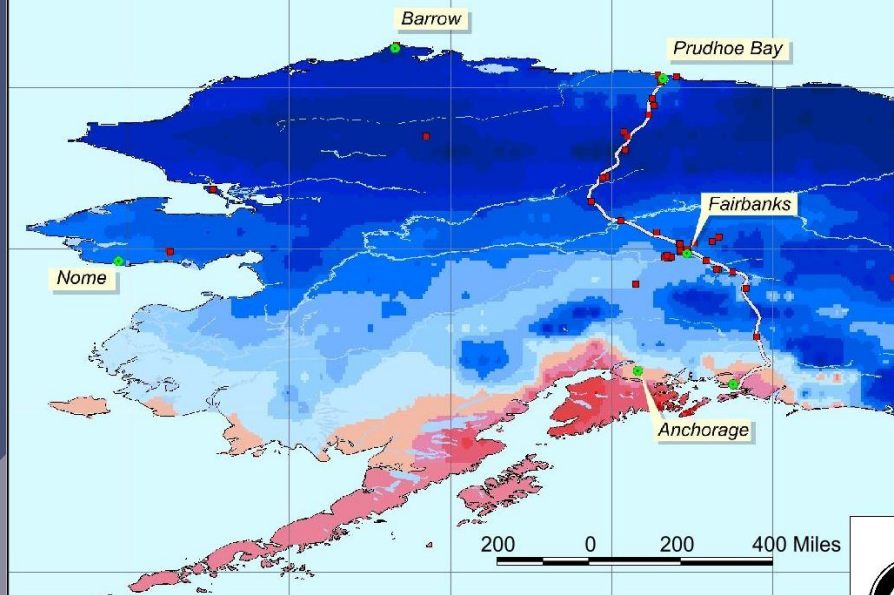
## Spatially Distributed Model of Permafrost Dynamics in Alaska



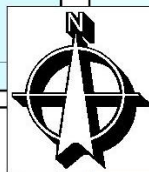
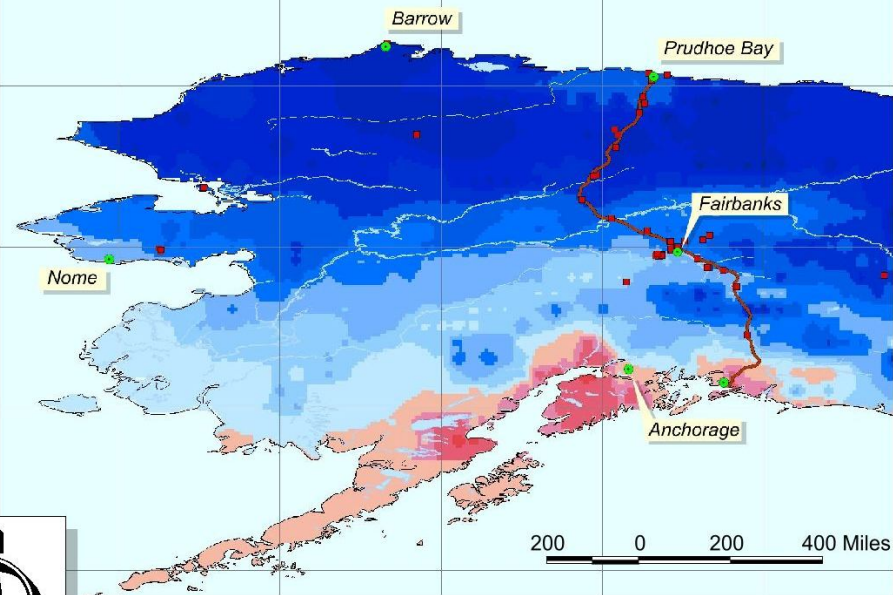
Mean Annual Temperature at 20 m Depth



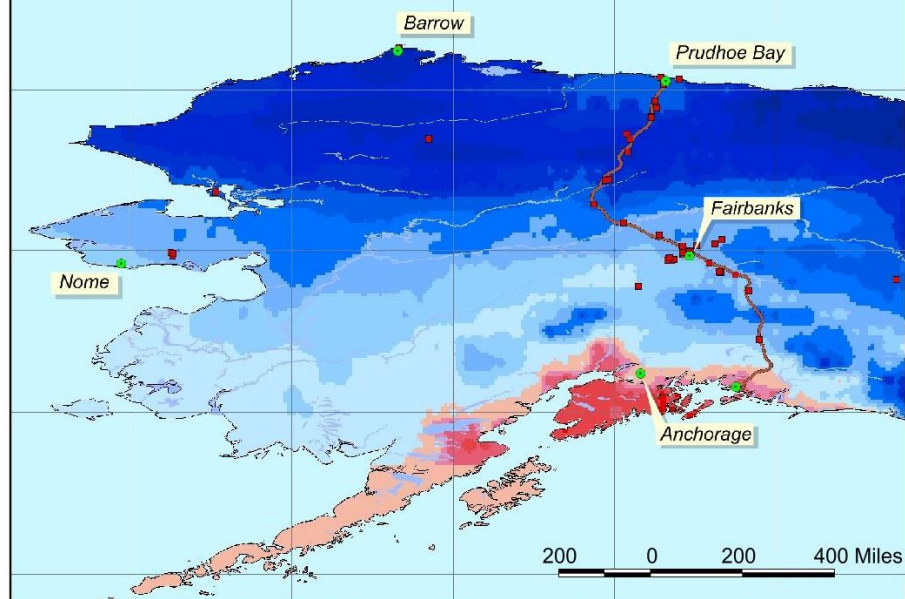
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

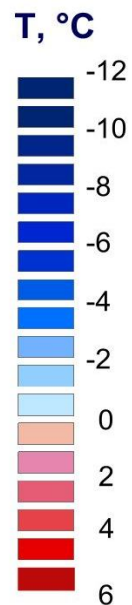


Mean Annual Temperature at 20 m Depth



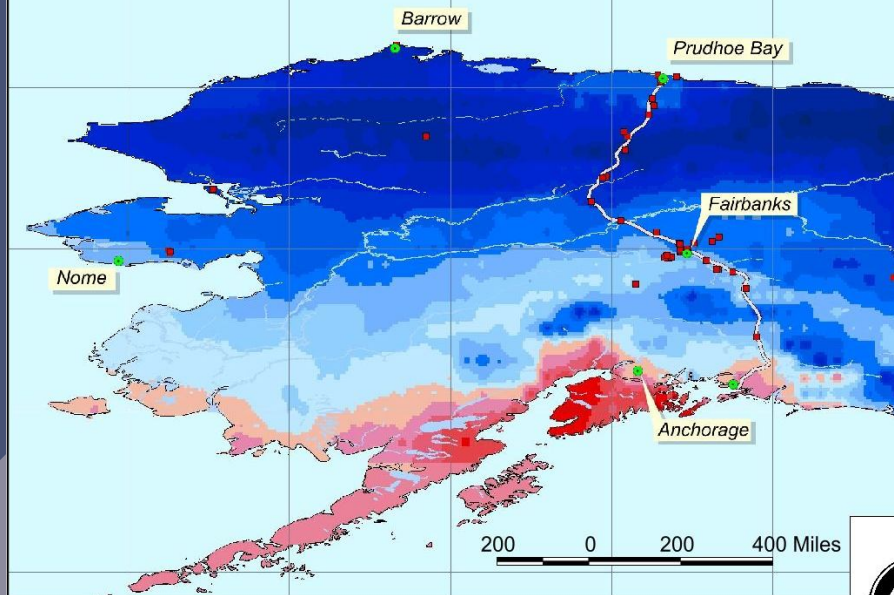
2000

## Spatially Distributed Model of Permafrost Dynamics in Alaska

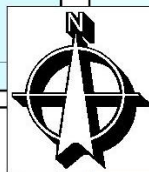
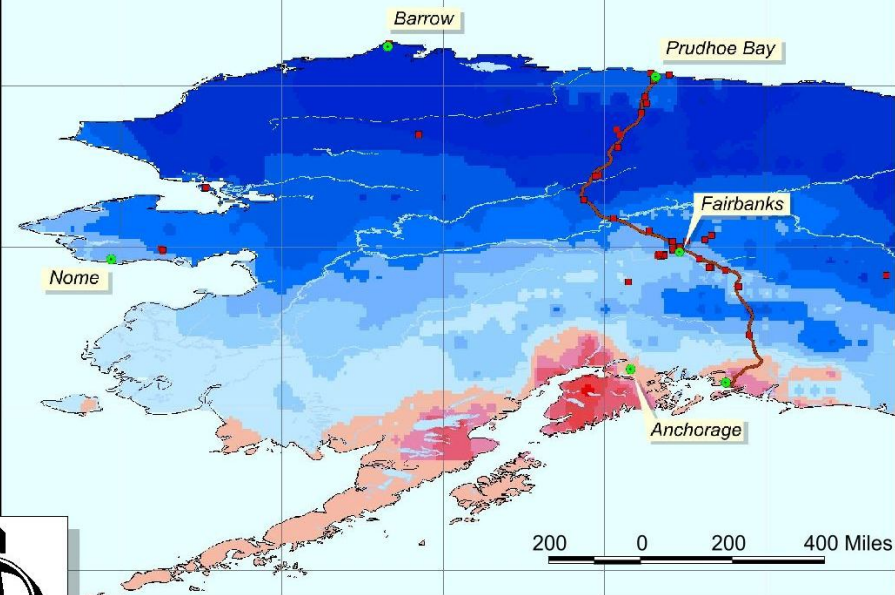




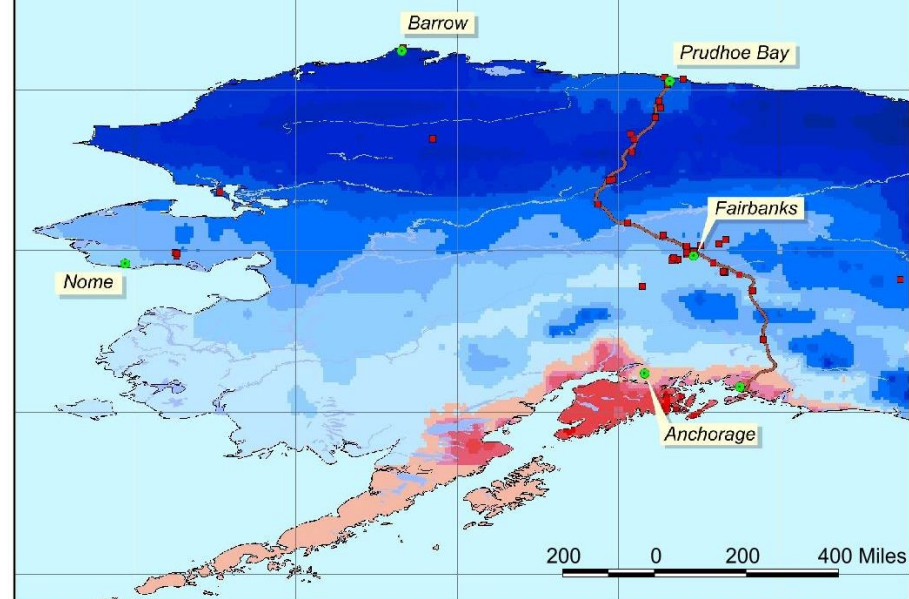
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

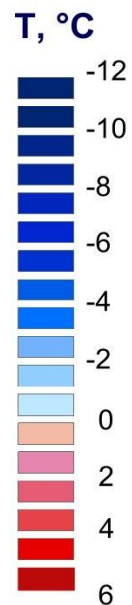


Mean Annual Temperature at 20 m Depth



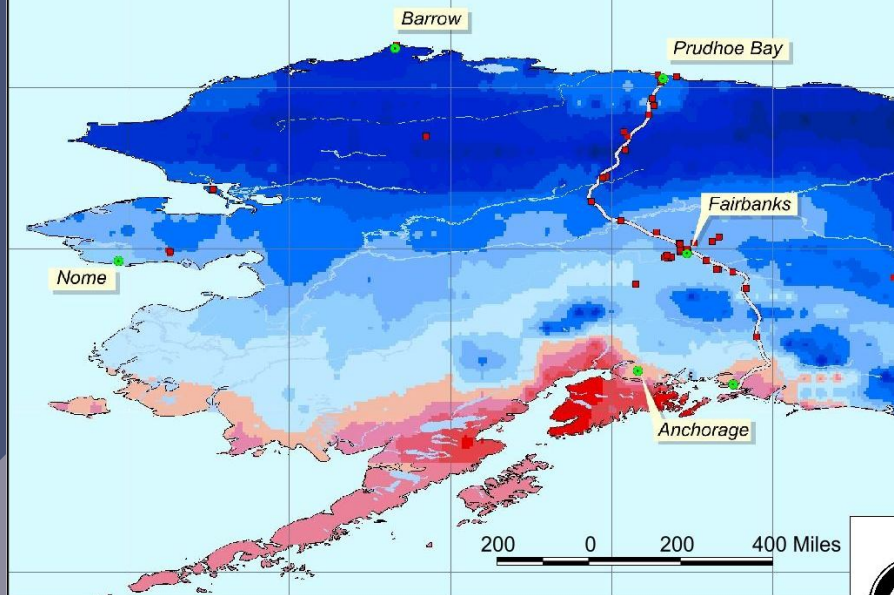
2005

## Spatially Distributed Model of Permafrost Dynamics in Alaska

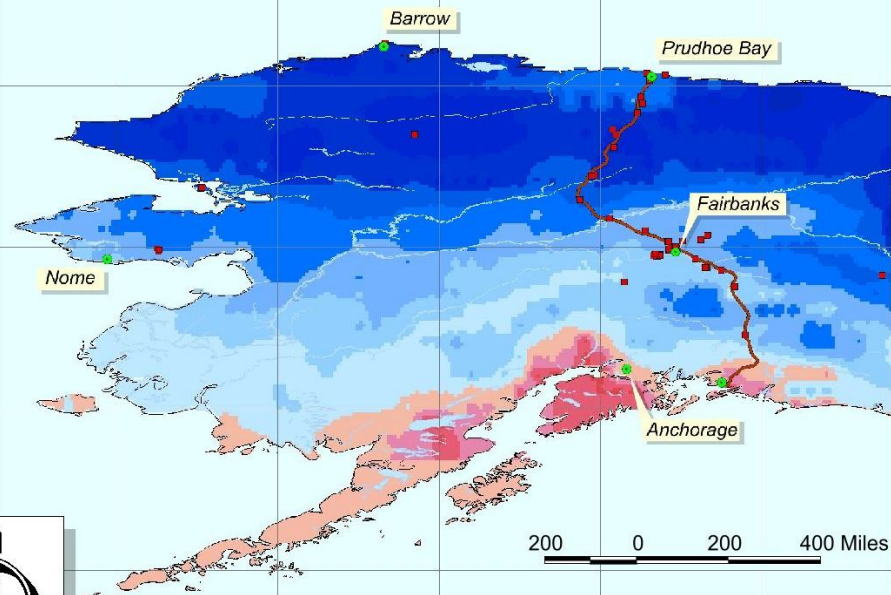




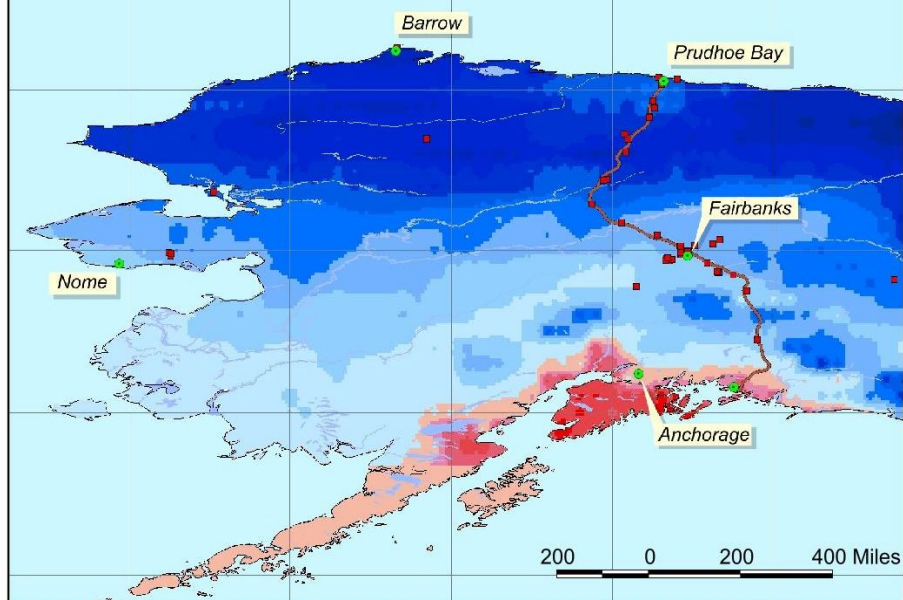
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

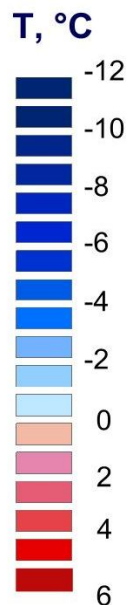


Mean Annual Temperature at 20 m Depth

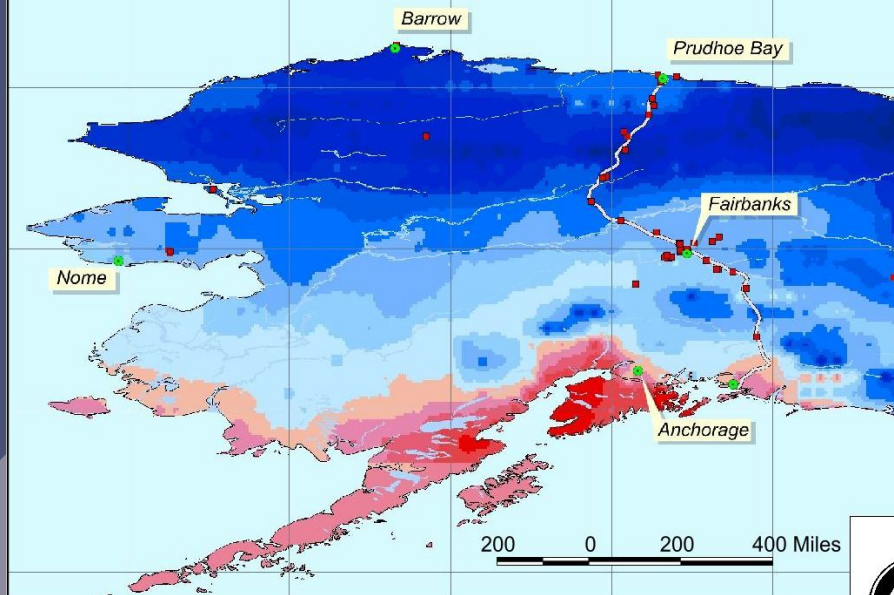


2010

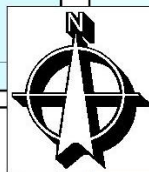
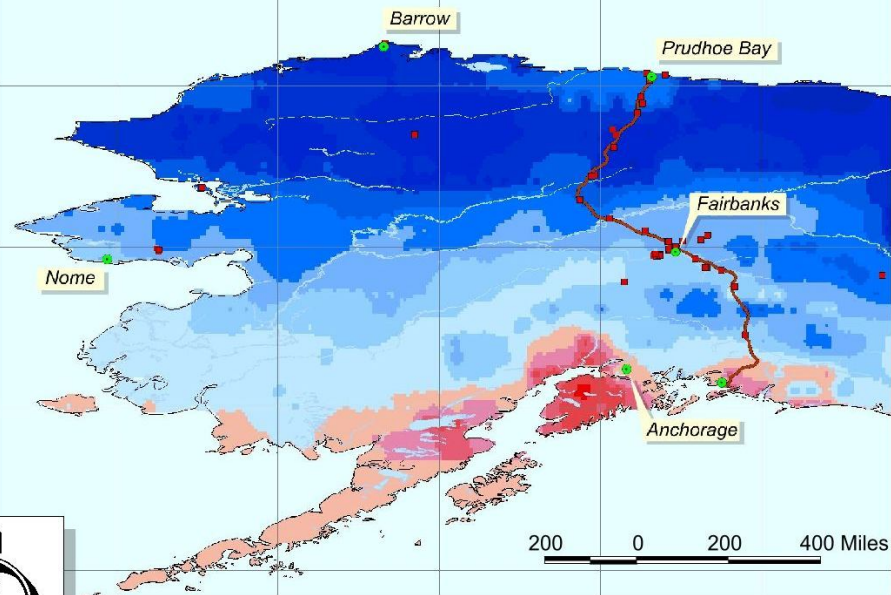
## Spatially Distributed Model of Permafrost Dynamics in Alaska



Mean Annual Temperature at 2 m Depth

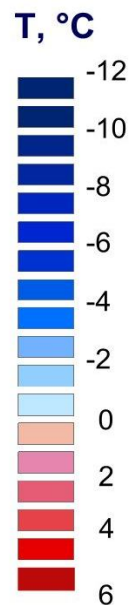


Mean Annual Temperature at 5 m Depth

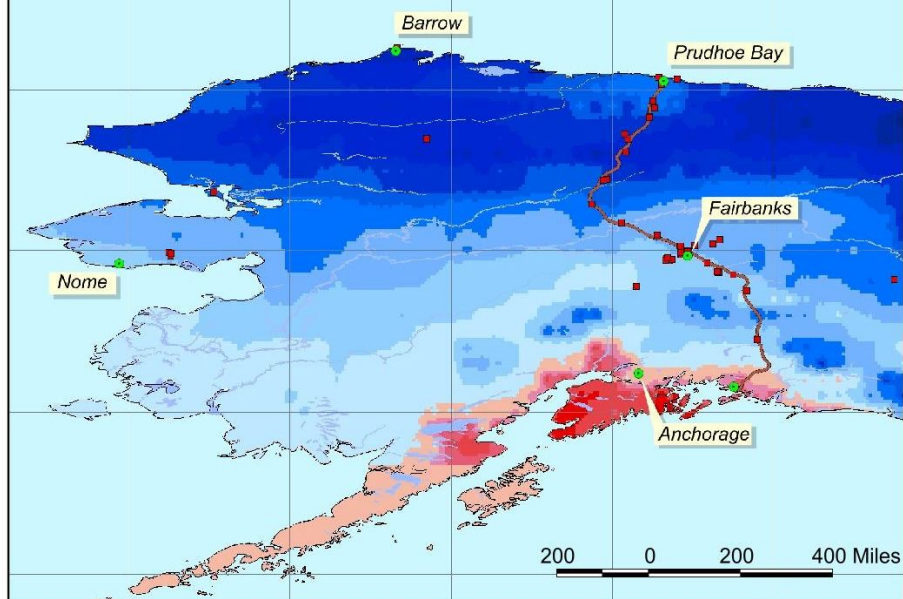


2015

## Spatially Distributed Model of Permafrost Dynamics in Alaska

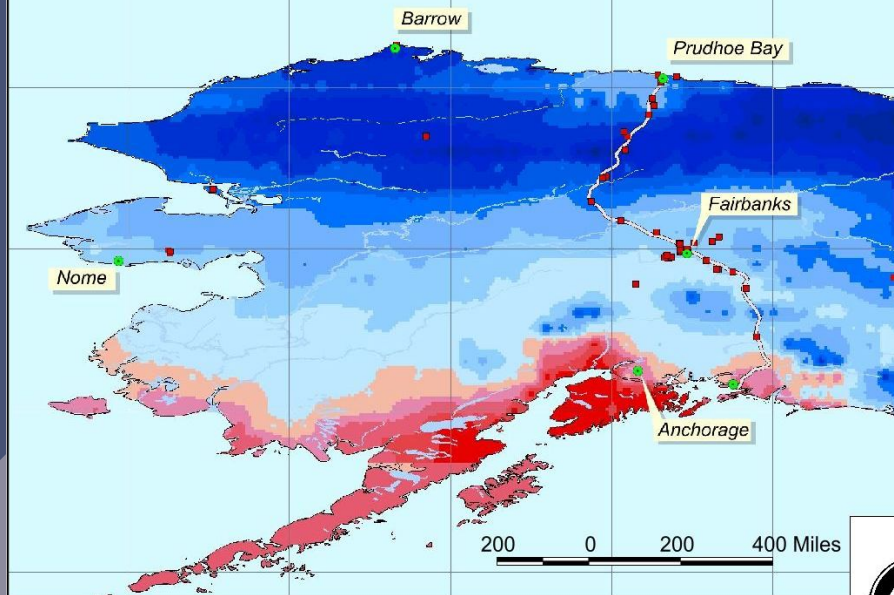


Mean Annual Temperature at 20 m Depth

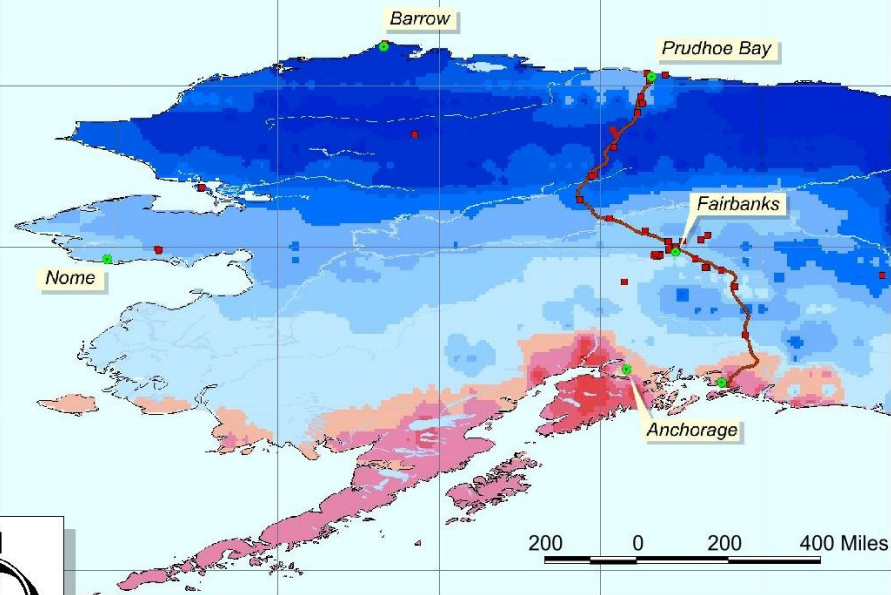




Mean Annual Temperature at 2 m Depth

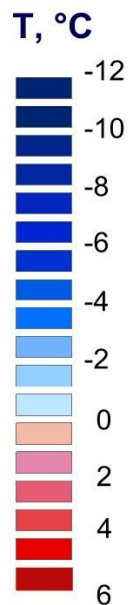


Mean Annual Temperature at 5 m Depth

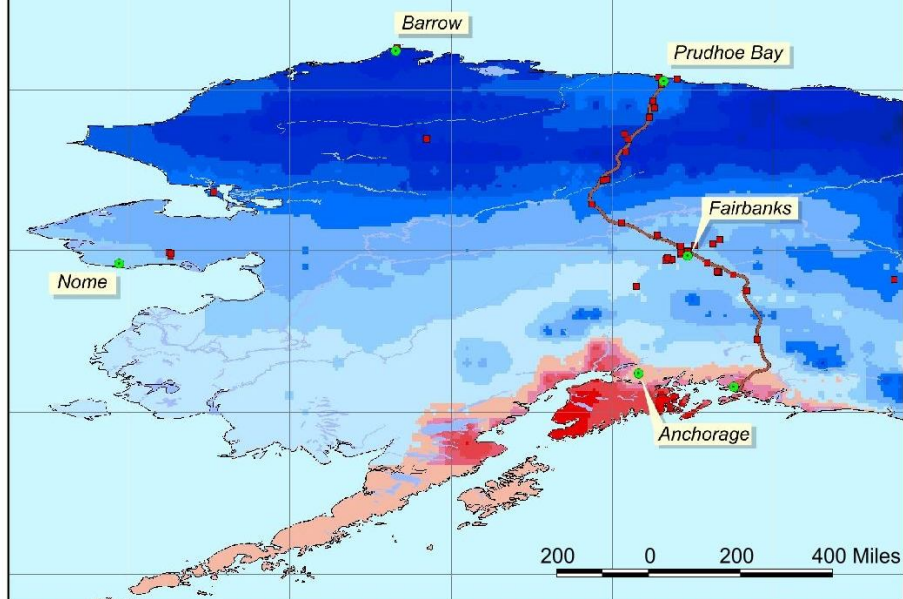


2020

## Spatially Distributed Model of Permafrost Dynamics in Alaska

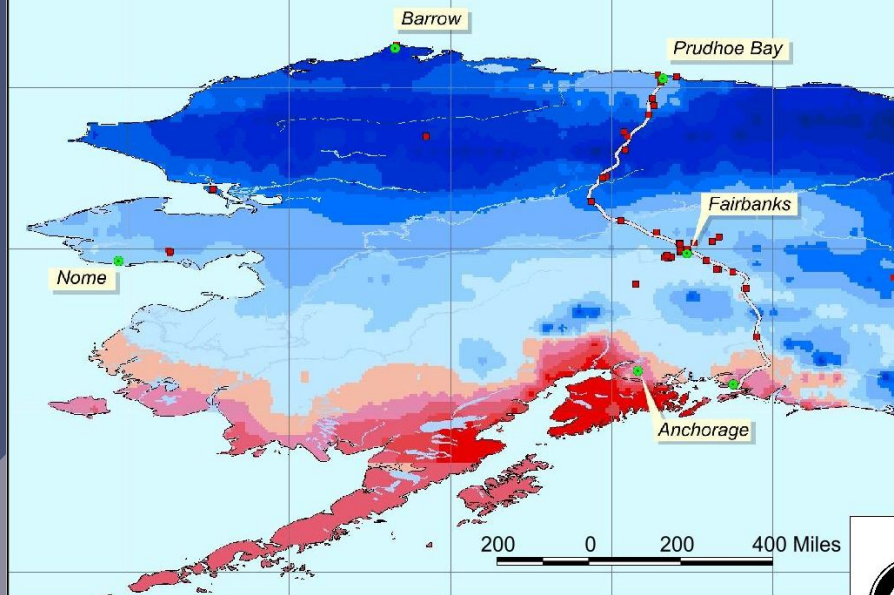


Mean Annual Temperature at 20 m Depth

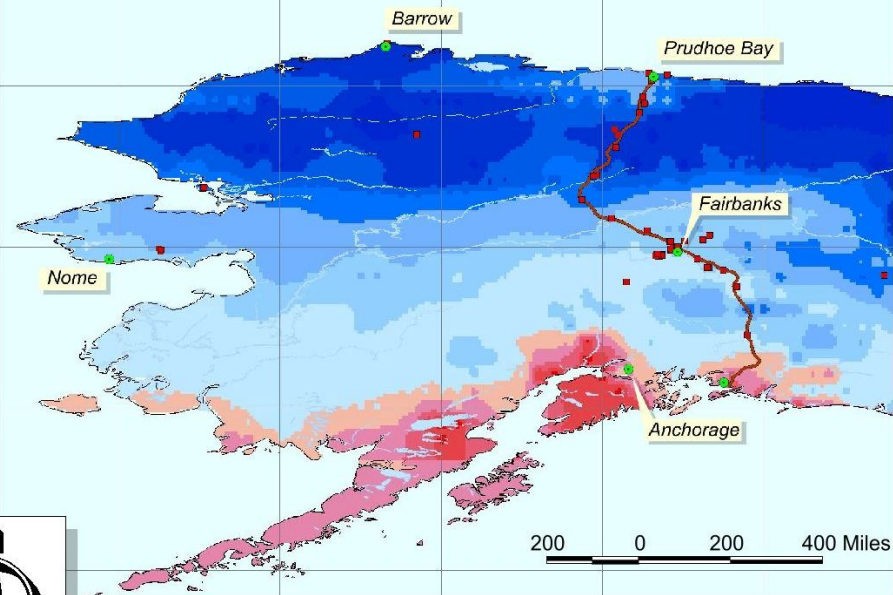




Mean Annual Temperature at 2 m Depth

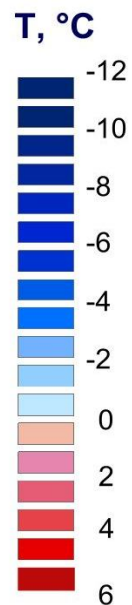


Mean Annual Temperature at 5 m Depth

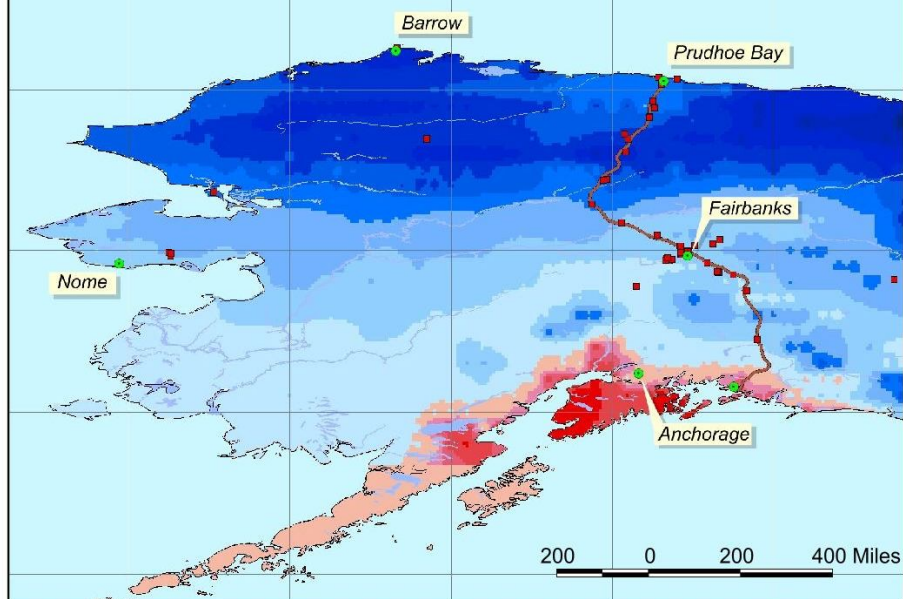


2025

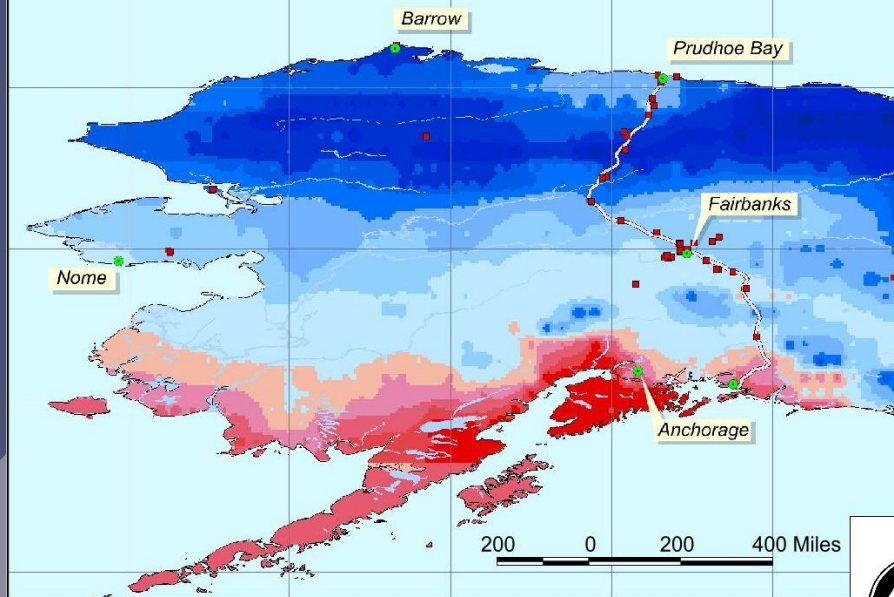
## Spatially Distributed Model of Permafrost Dynamics in Alaska



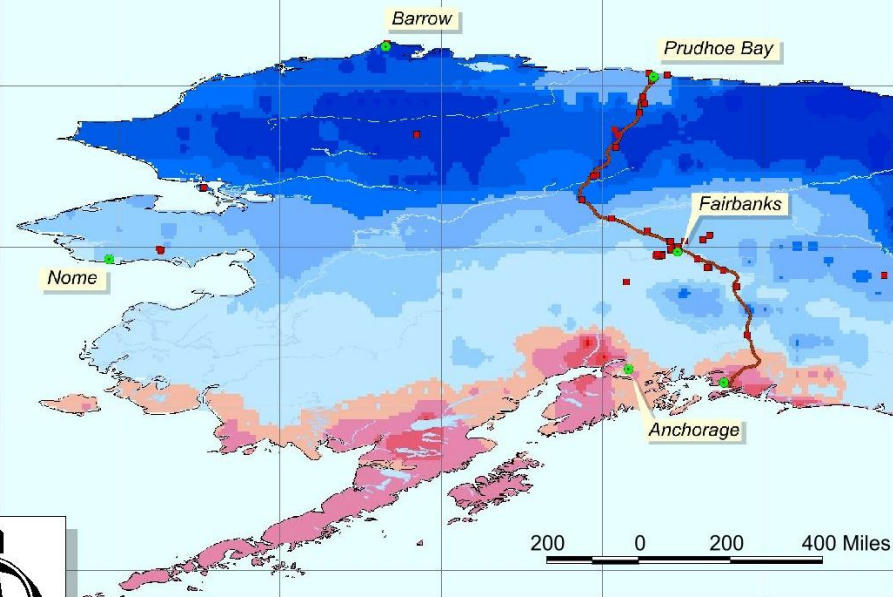
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

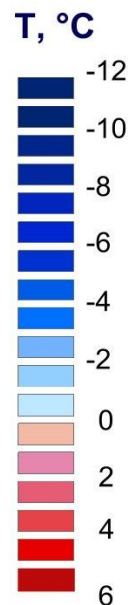


Mean Annual Temperature at 5 m Depth

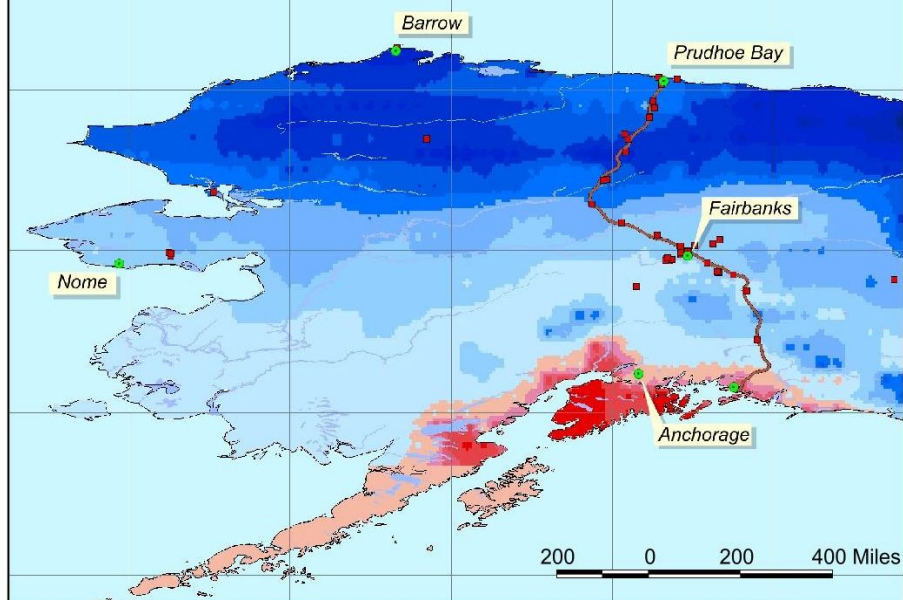


2030

## Spatially Distributed Model of Permafrost Dynamics in Alaska

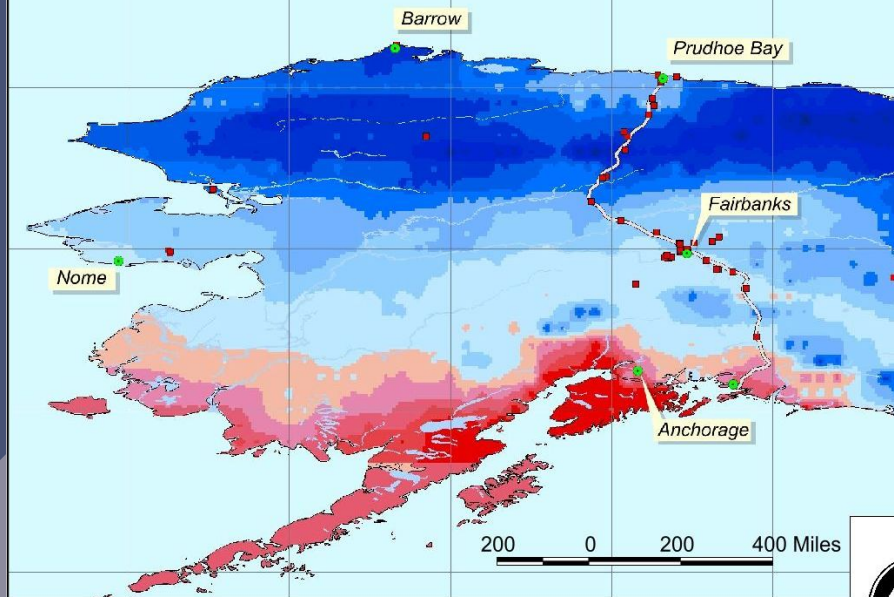


Mean Annual Temperature at 20 m Depth

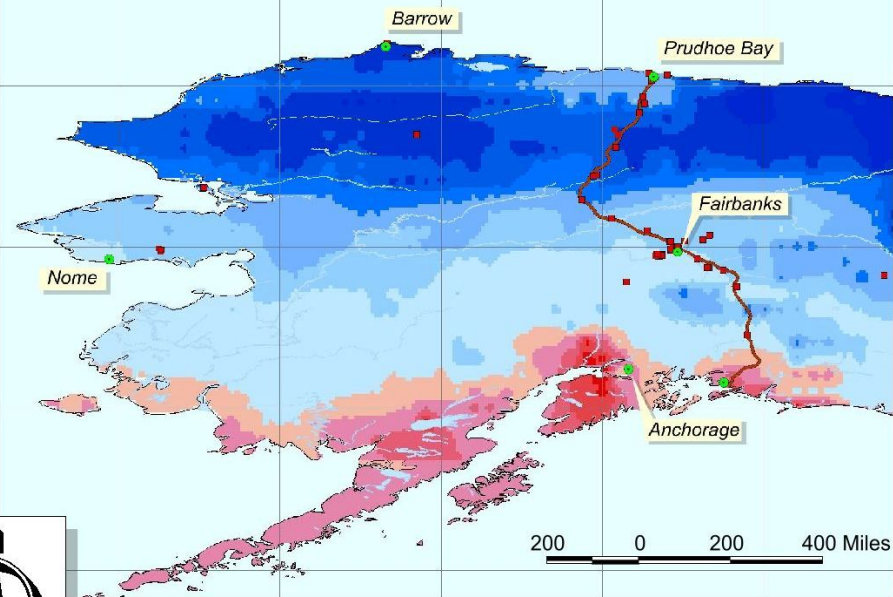




Mean Annual Temperature at 2 m Depth

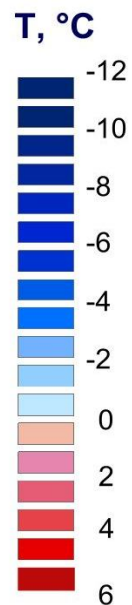


Mean Annual Temperature at 5 m Depth

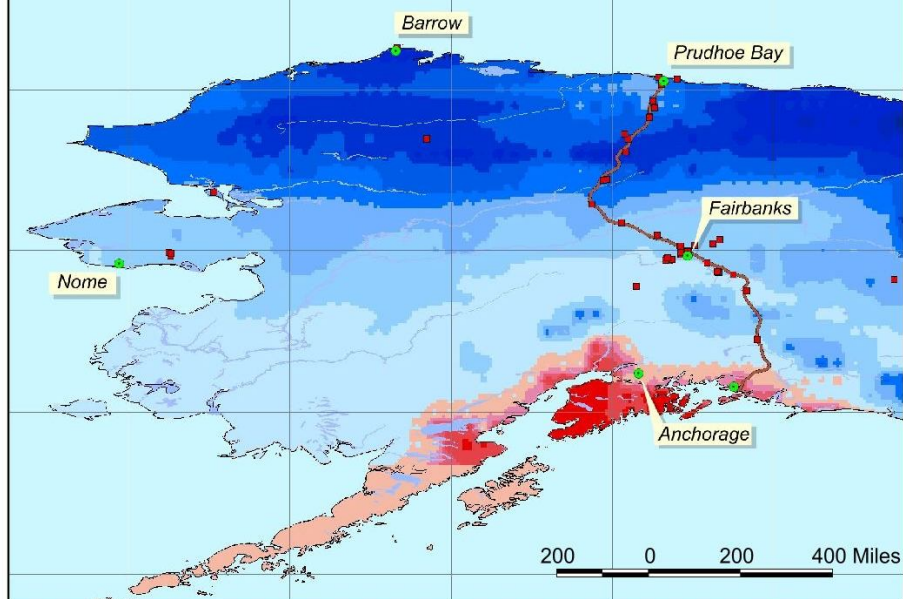


2035

## Spatially Distributed Model of Permafrost Dynamics in Alaska

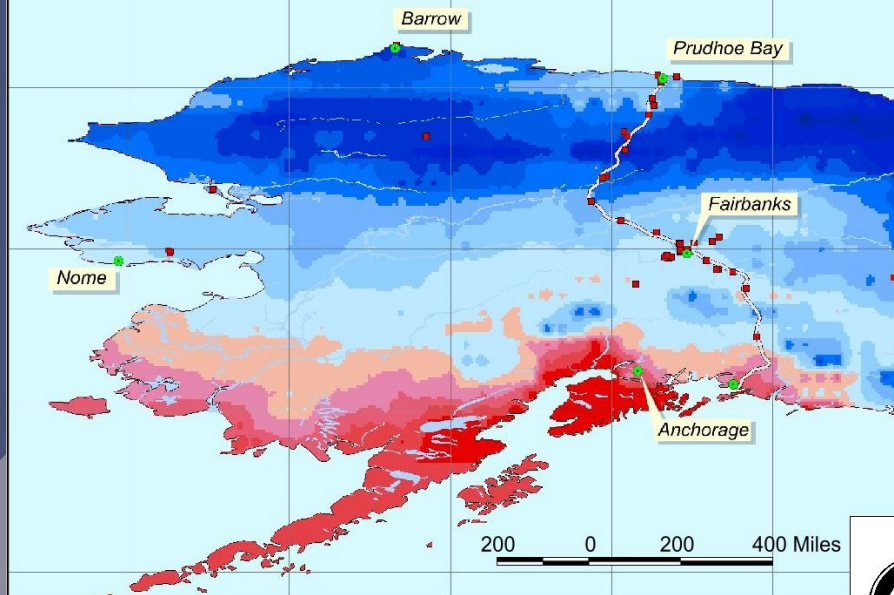


Mean Annual Temperature at 20 m Depth

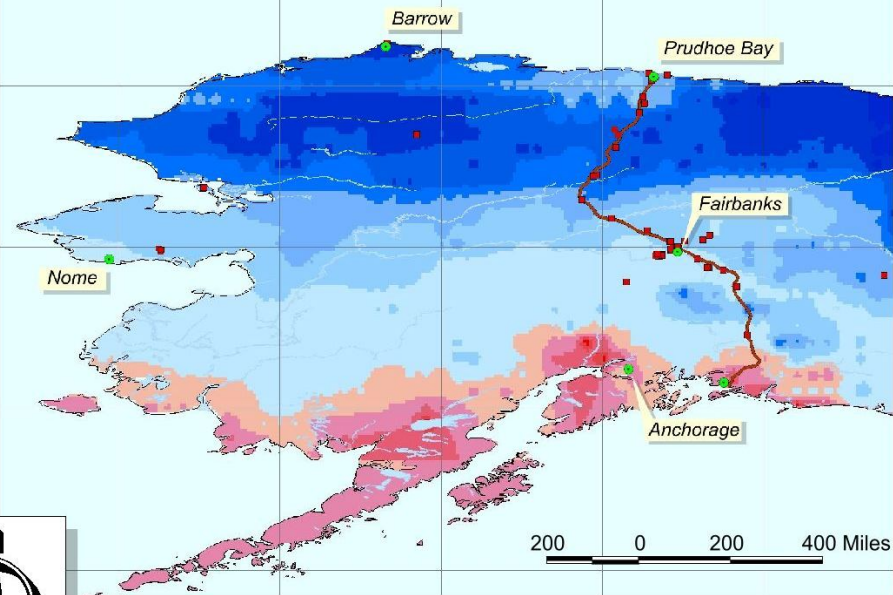




Mean Annual Temperature at 2 m Depth

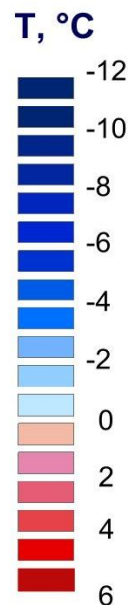


Mean Annual Temperature at 5 m Depth

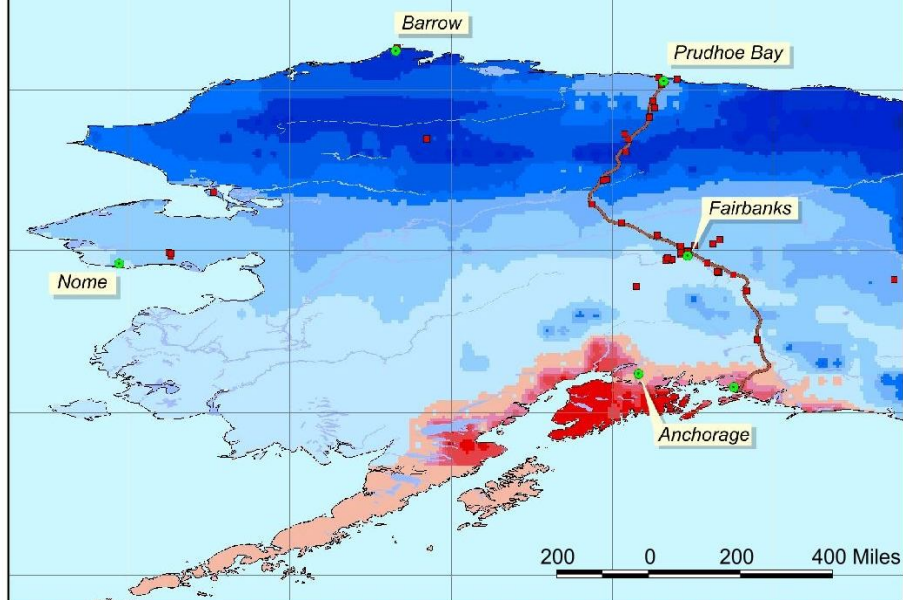


2040

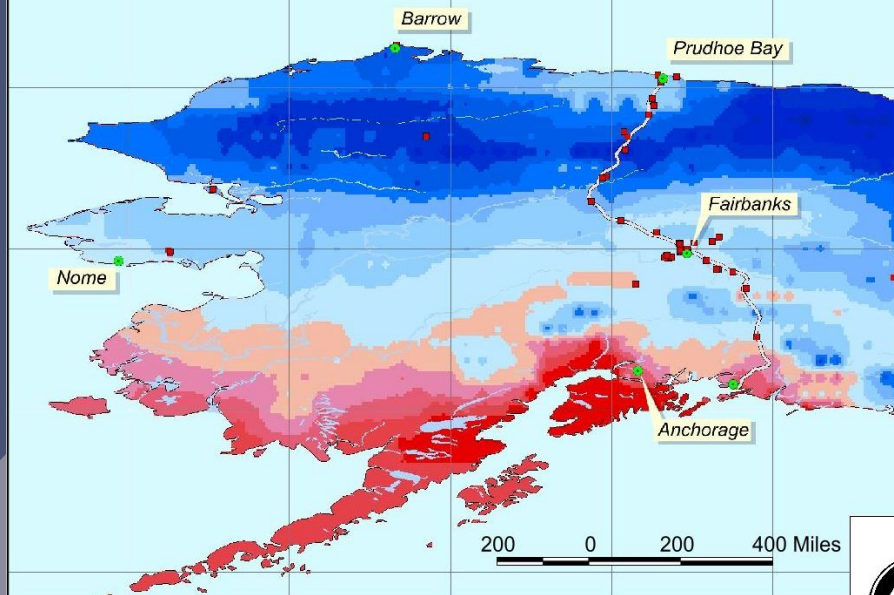
## Spatially Distributed Model of Permafrost Dynamics in Alaska



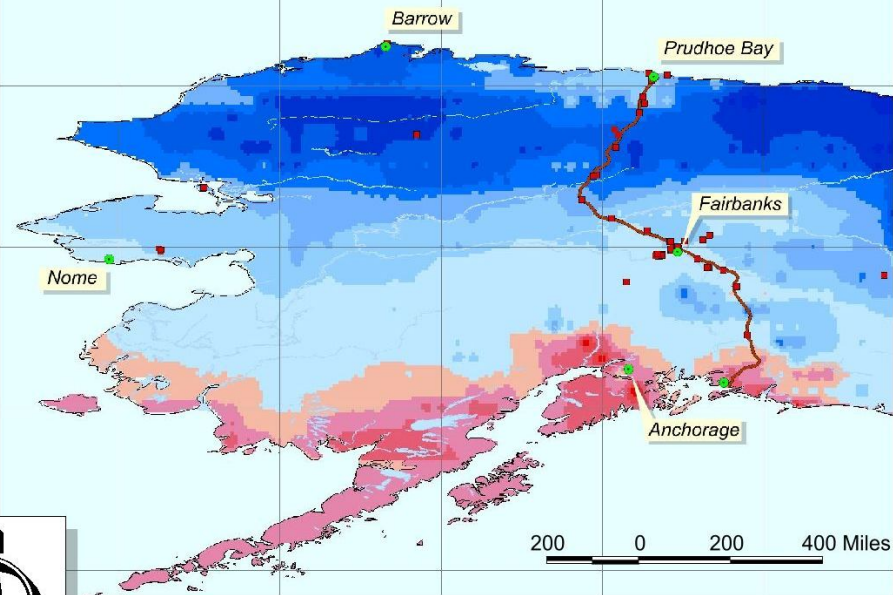
Mean Annual Temperature at 20 m Depth



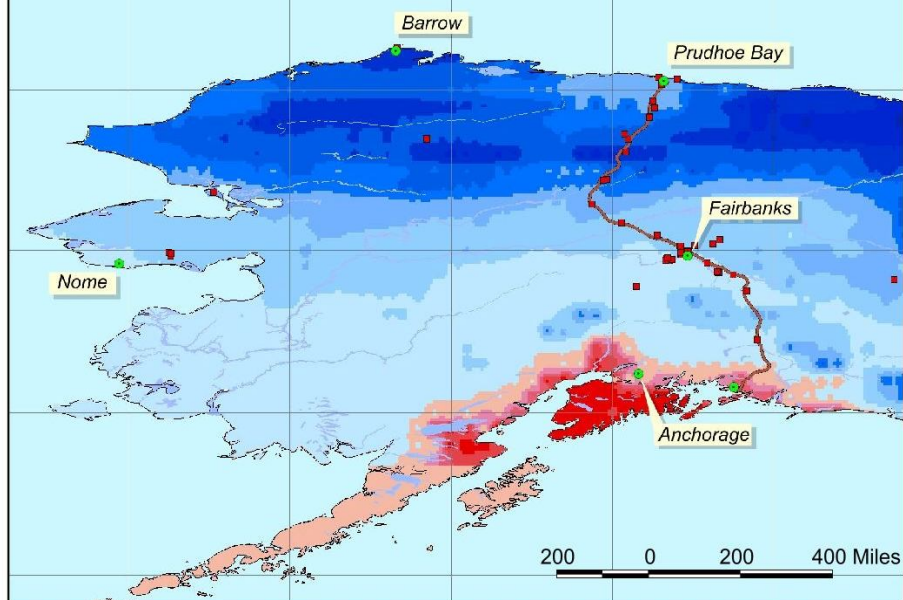
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

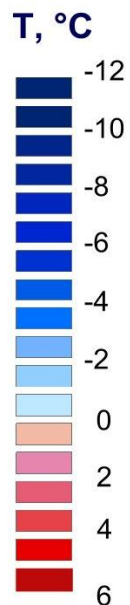


Mean Annual Temperature at 20 m Depth



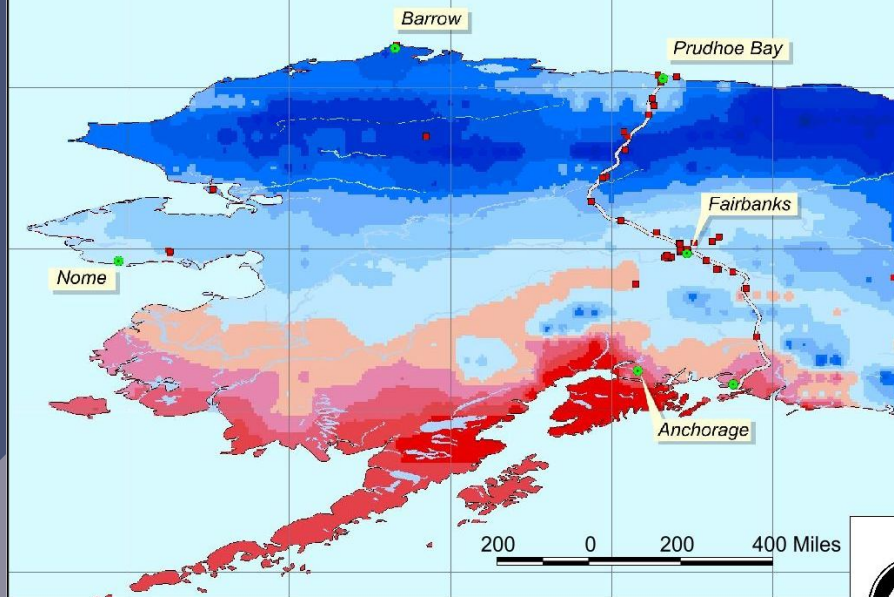
2045

## Spatially Distributed Model of Permafrost Dynamics in Alaska

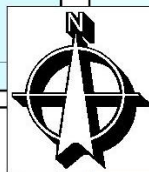
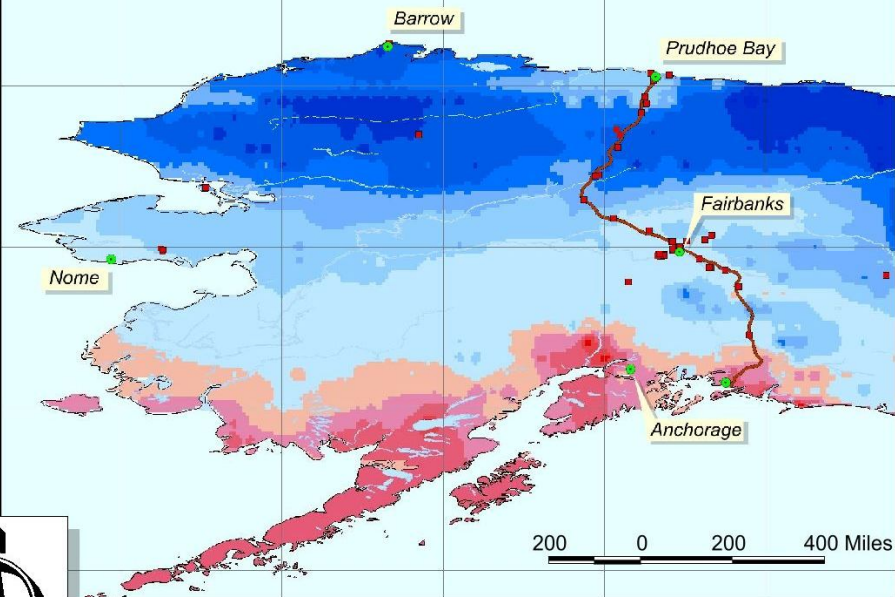




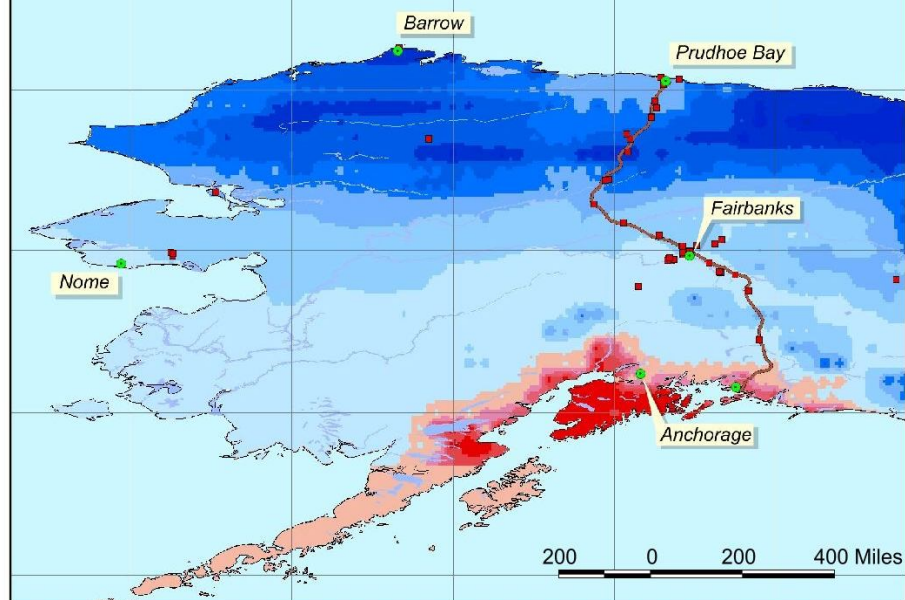
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

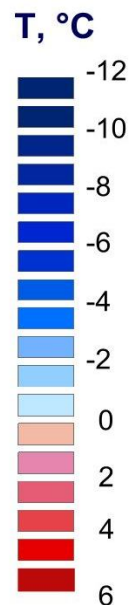


Mean Annual Temperature at 20 m Depth



2050

## Spatially Distributed Model of Permafrost Dynamics in Alaska



# Economics

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- ❖ Financing a \$26+ Billion Enterprise
- ❖ Infrastructure
- ❖ Steel
- ❖ Training/Retaining Qualified Labor
- ❖ Natural Gas Prices



# Infrastructure

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- ❖ Approximately \$2 Billion in Alaska Projects to improve safety and drivability and maintainability
  - ❖ 52 Highway Projects
  - ❖ 6 Airports
  - ❖ 14 Bridges
  - ❖ 15 Facilities
- ❖ Canada?
  - ❖ No firm estimates are available

# Steel

- ❖ Estimated 1.1 million tons in U.S.
- ❖ Estimated 1.4 million tons in Canada

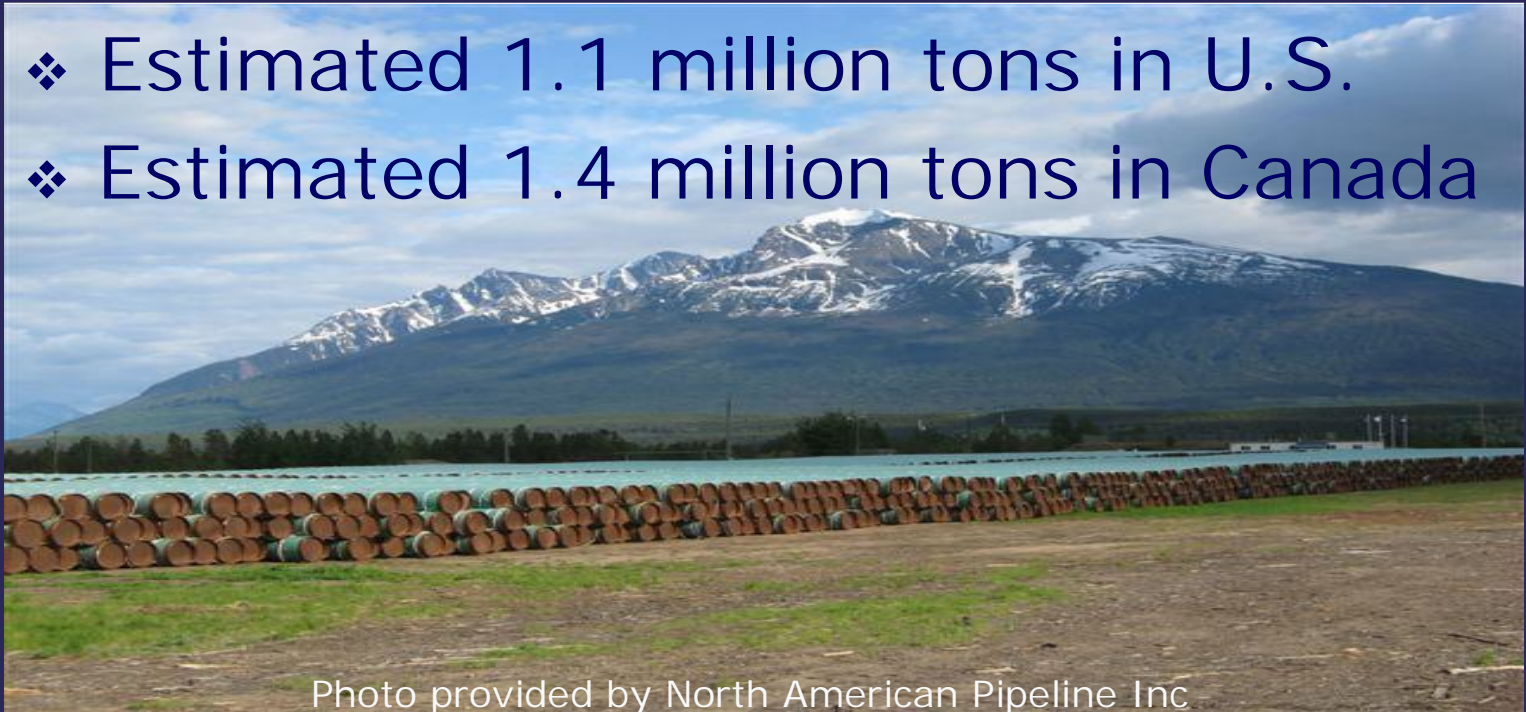


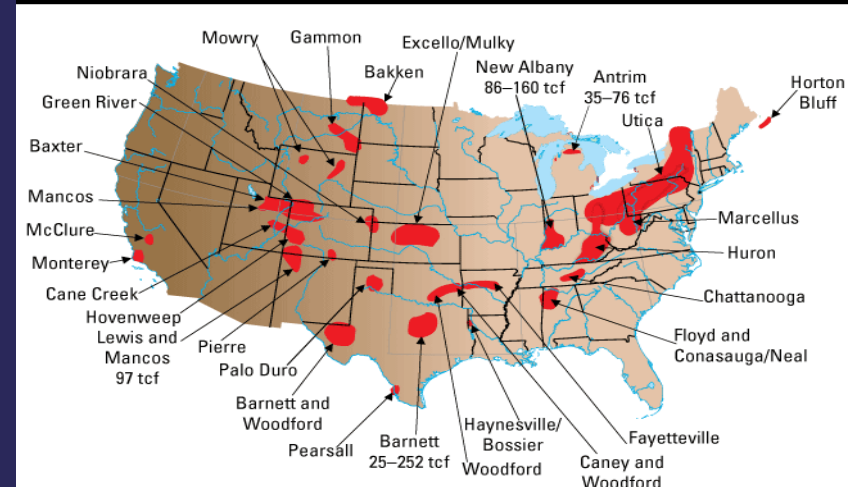
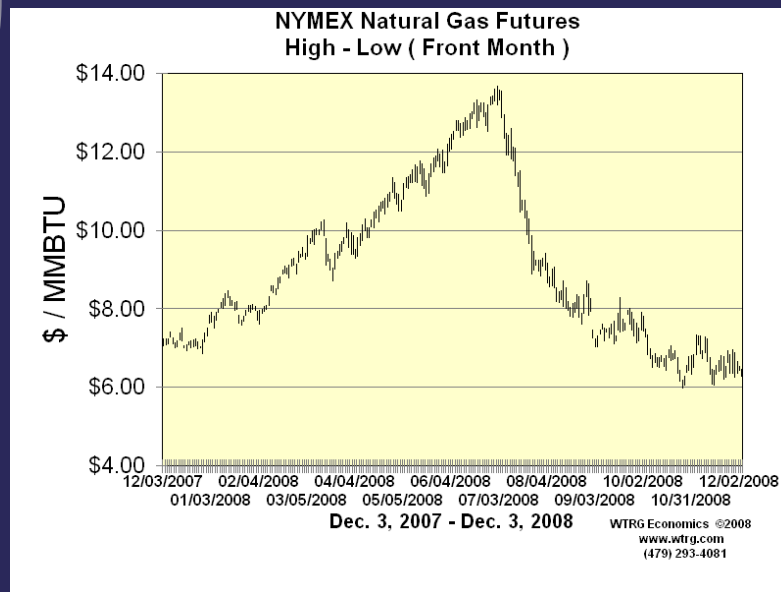
Photo provided by North American Pipeline Inc



# Training/Retaining Qualified Labor



# Natural Gas Prices and Supply







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**Office of the Federal Coordinator  
Alaska Natural Gas Transportation Projects**

**Washington, DC Location:  
1101 Pennsylvania Avenue, NW, 7th Floor  
Washington, D.C. 20004  
(202) 756-4955**

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**Anchorage, AK Location:  
411 W 4<sup>th</sup> Ave. 2<sup>nd</sup> Floor  
Anchorage, Alaska 99501  
(907) 257-1364**

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[info@arcticgas.gov](mailto:info@arcticgas.gov)**