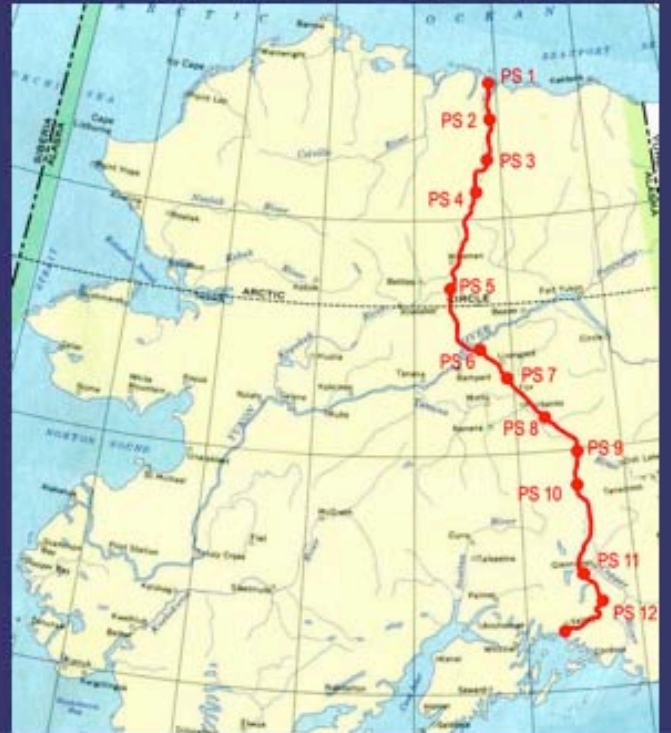


# Alaska's Natural Gas Pipeline: Closer to Reality?



Drue Pearce  
Federal Coordinator  
Office of the Federal Coordinator for  
Alaska Natural Gas Transportation Projects  
Resource Development Council Breakfast  
March 19, 2009

# TAPS



# ANGTA

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# ANGPA



# Planned Pipeline Projects

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- ❖ TransCanada Alaska
  - ❖ AGIA licensee
  - ❖ Begun engagement with federal agencies
- ❖ Denali
  - ❖ Pre-filed with FERC
  - ❖ Planning open houses in 2009
- ❖ ANGDA
  - ❖ Army Corps of Engineers (ACE) is EIS lead
  - ❖ Finished scoping meeting
- ❖ Enstar
  - ❖ ACE is EIS lead
  - ❖ Working with DOI regarding access in Denali NP

# Administration Transition

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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

# What are the Challenges?

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Technical  
Economic  
Political  
Process



# Technical

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- ❖ Construction in Permafrost
- ❖ Arctic Construction
- ❖ High Pressure/Large Diameter Pipelines
- ❖ Pipeline Design
- ❖ Climate Change
- ❖ Seismic

# Technical: Construction in Permafrost



# Technical: Arctic Construction



# Technical: High Pressure/Large Diameter 48inch, X80, 2500/2600PSIG



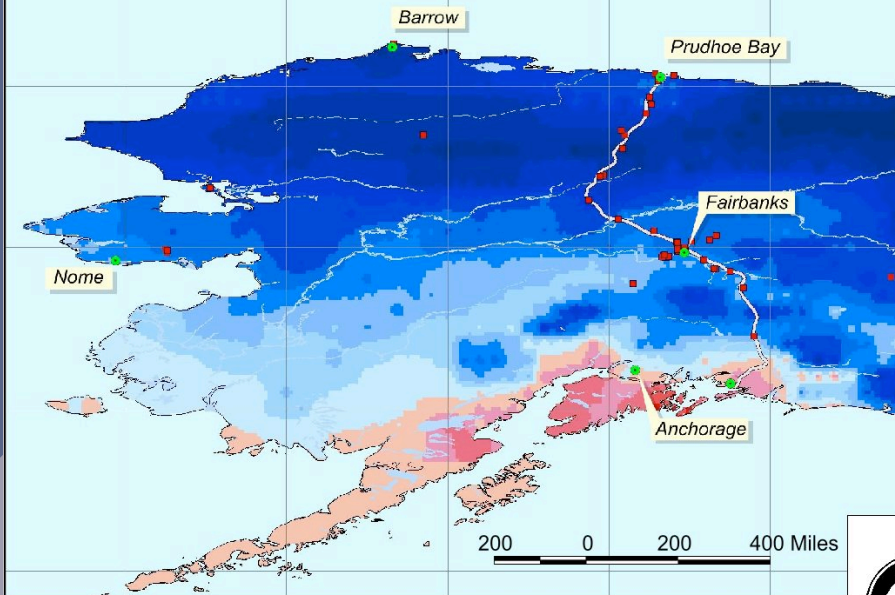
Photos provided by North American Pipeline Inc

# Technical: Pipeline Design

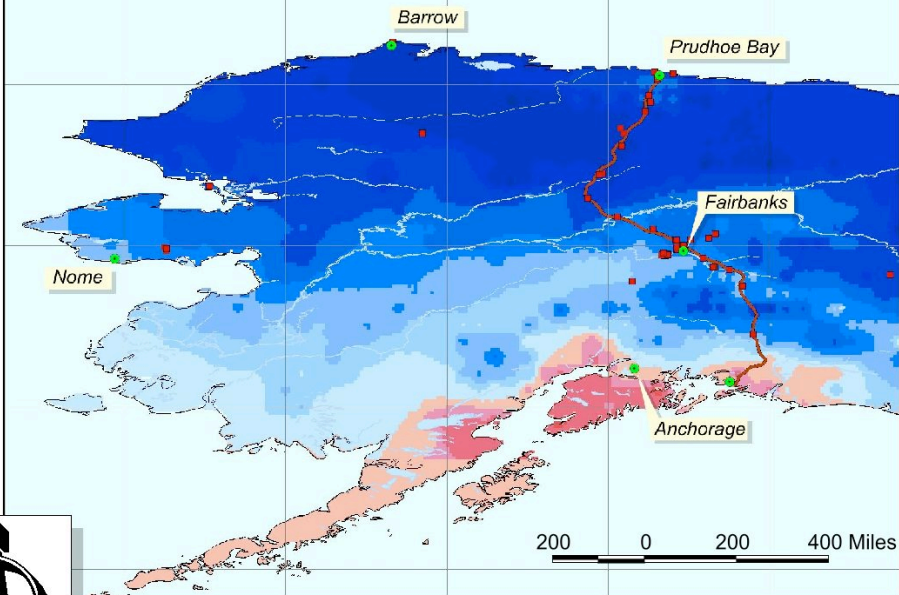
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- ❖ Design Analysis
  - ❖ The stress based upon operating pressures
  - ❖ The stress due to overburden loading from the permafrost and soil
  - ❖ The operating temperatures of the pipeline
  - ❖ Any possible freeze and thaw stresses caused by frost jacking or thaw settlement
  - ❖ Buoyancy control stresses in areas where wetlands thaw
- ❖ Pipeline Coating and Cathodic Protection Design Review
  - ❖ Effectiveness
  - ❖ Continuous or periodic monitoring

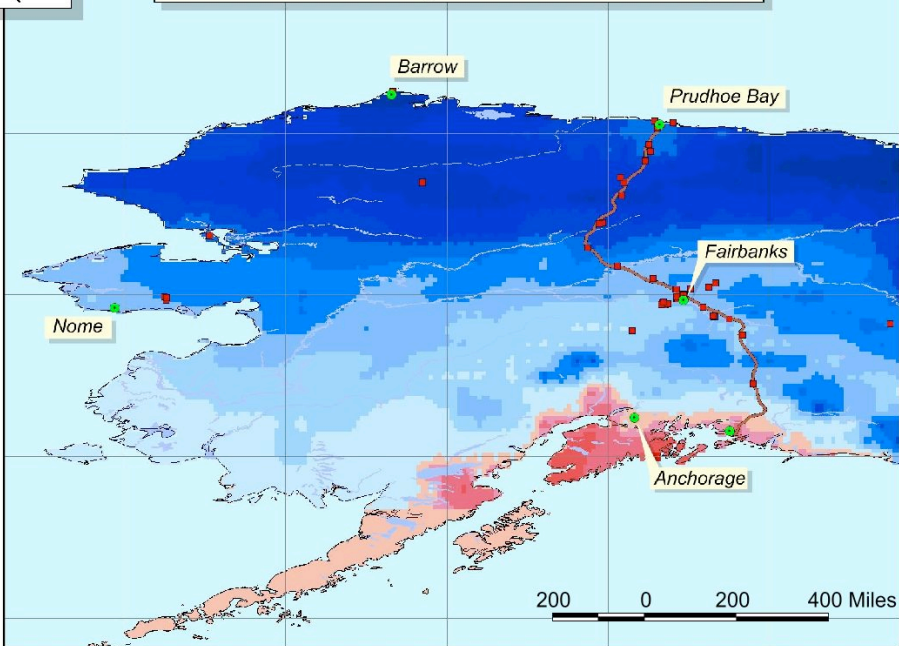
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

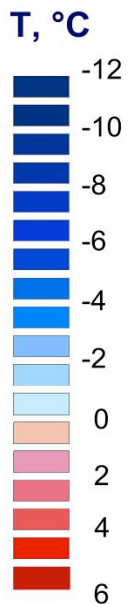


Mean Annual Temperature at 20 m Depth

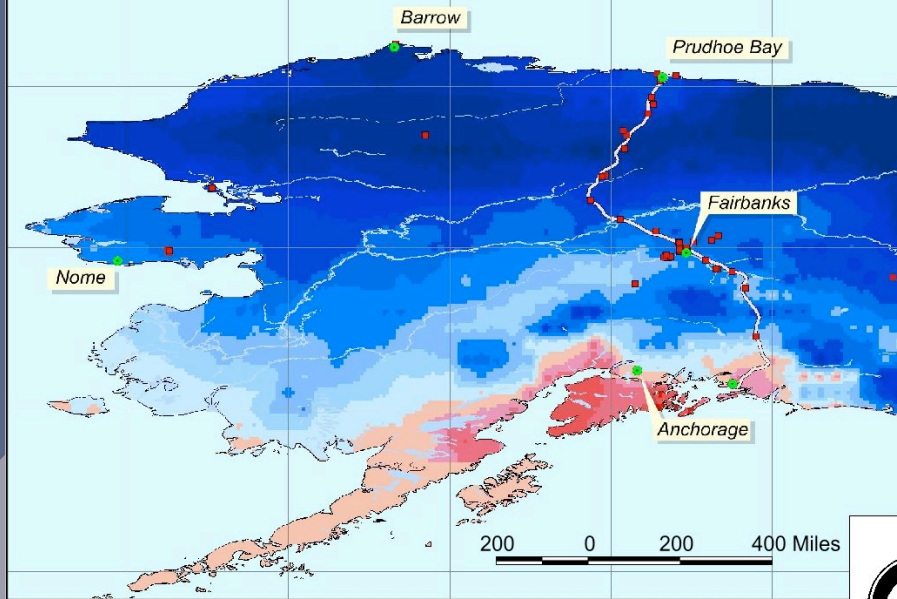


1950

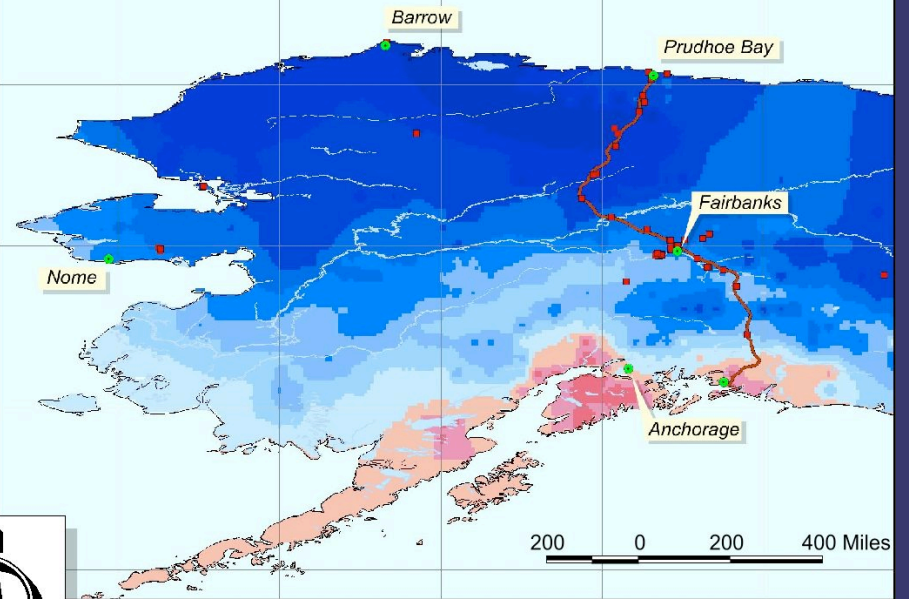
# Spatially Distributed Model of Permafrost Dynamics in Alaska



Mean Annual Temperature at 2 m Depth

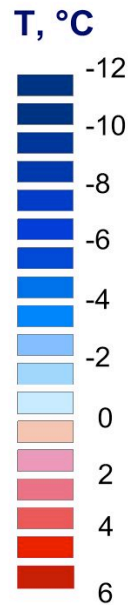


Mean Annual Temperature at 5 m Depth

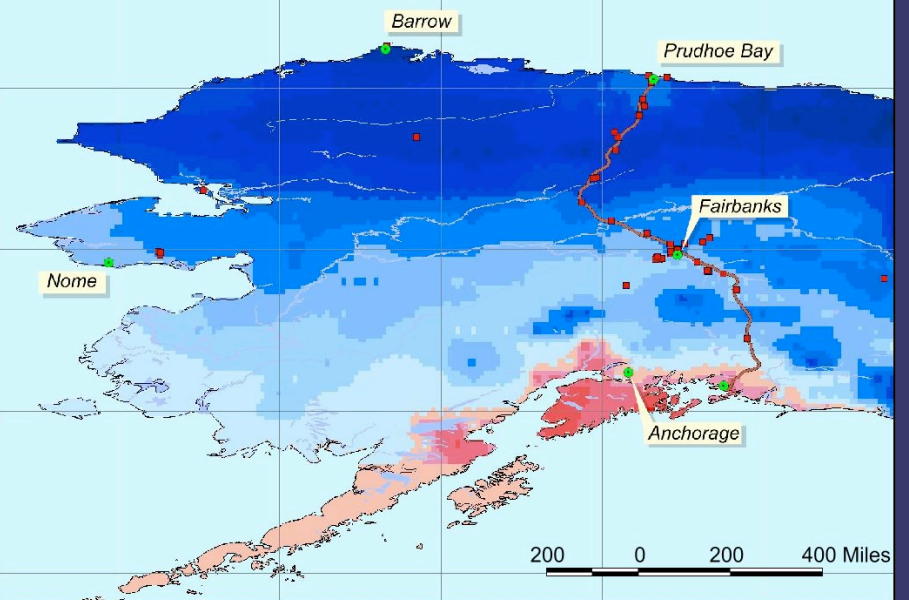


1960

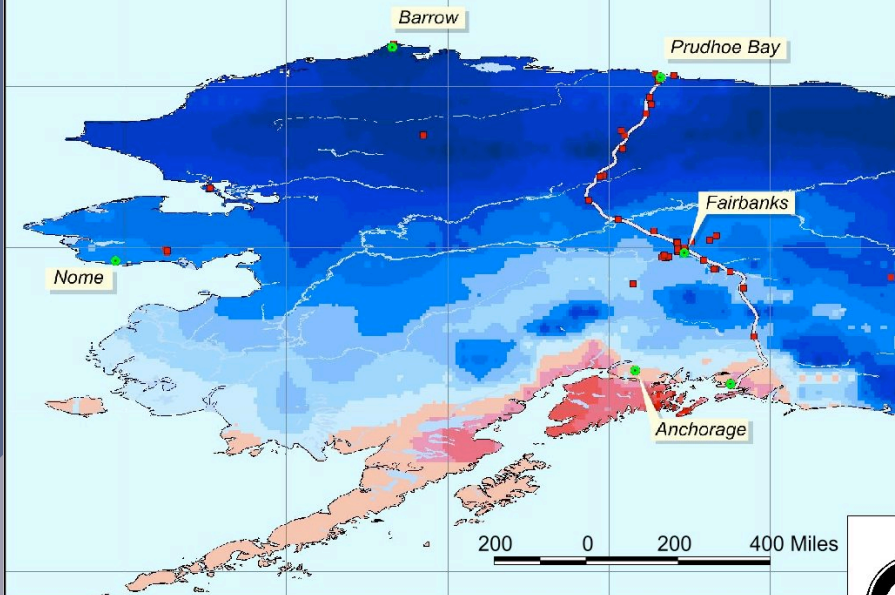
## Spatially Distributed Model of Permafrost Dynamics in Alaska



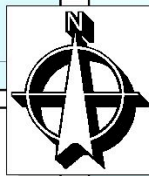
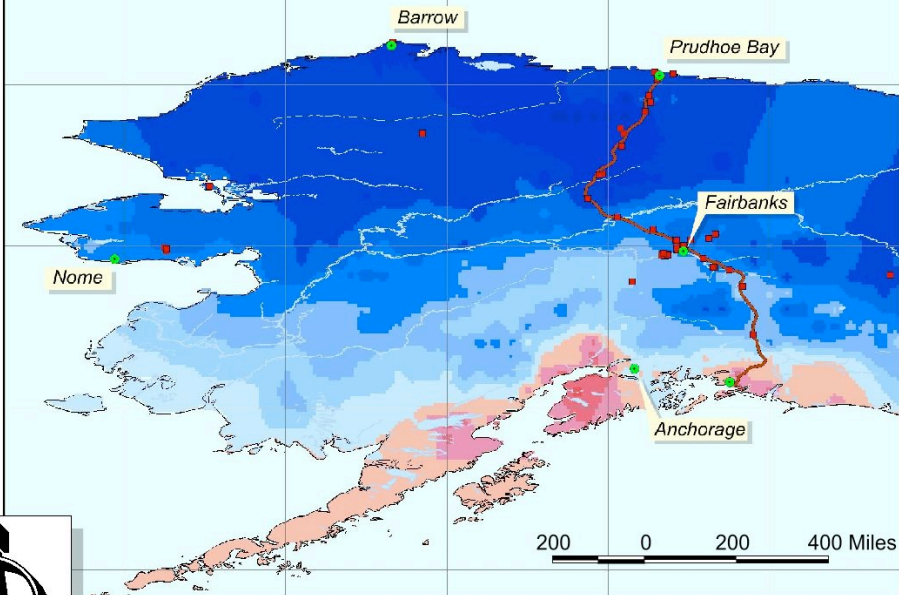
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

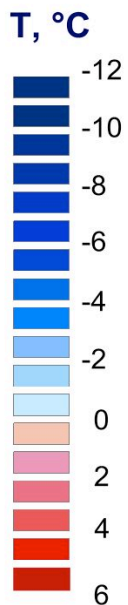


Mean Annual Temperature at 5 m Depth

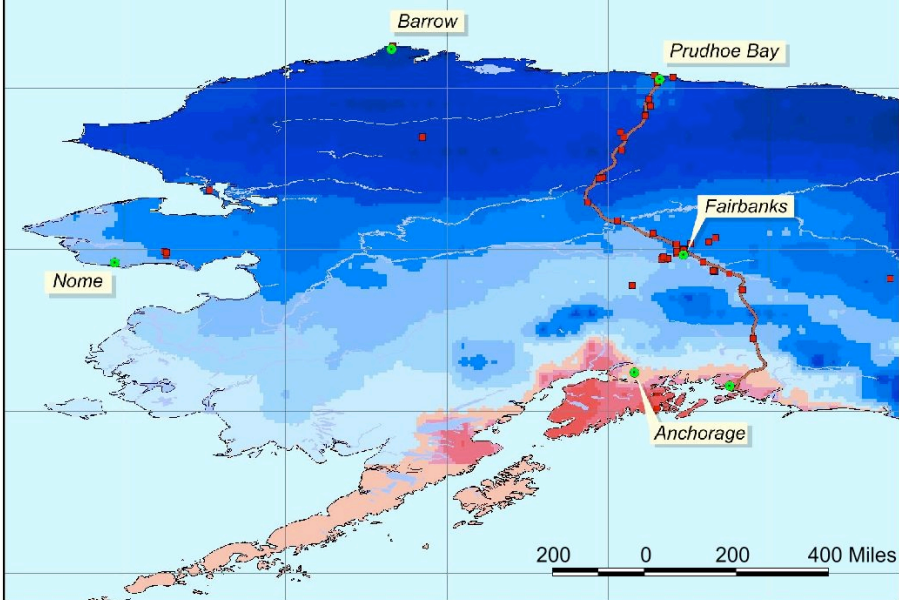


1970

# Spatially Distributed Model of Permafrost Dynamics in Alaska

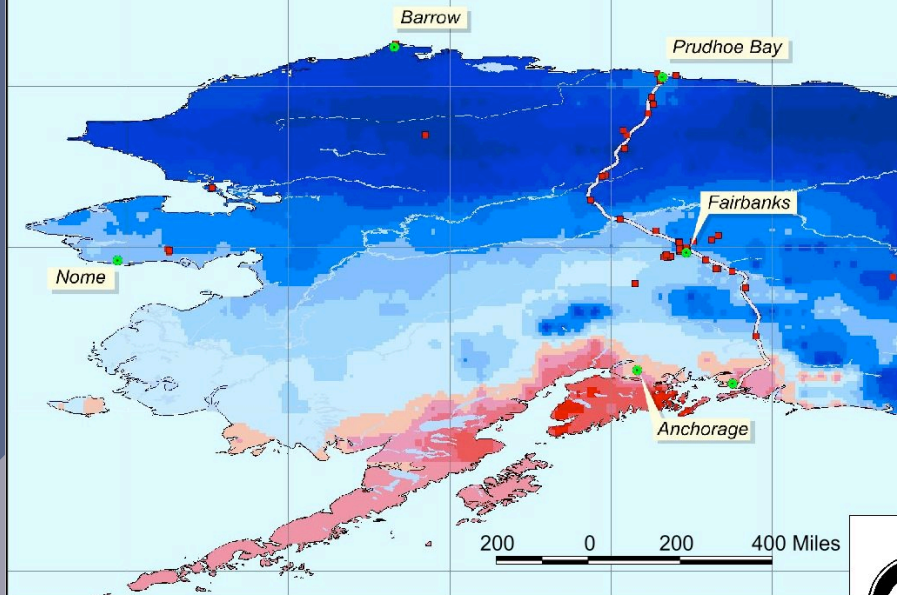


Mean Annual Temperature at 20 m Depth

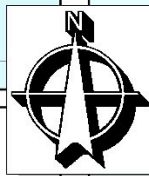
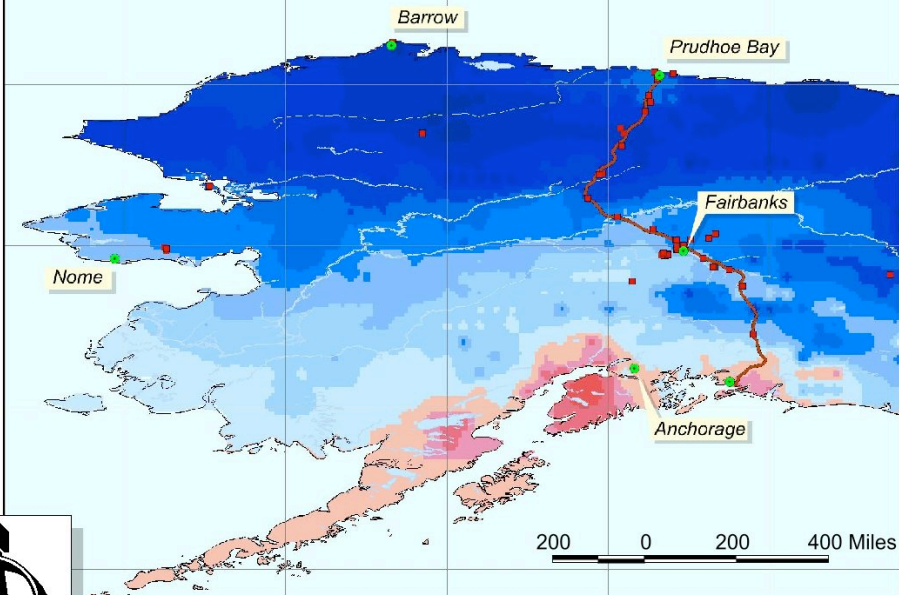




Mean Annual Temperature at 2 m Depth

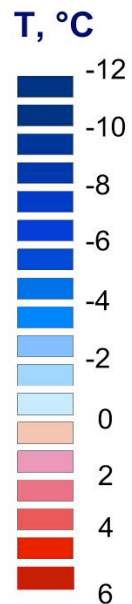


Mean Annual Temperature at 5 m Depth

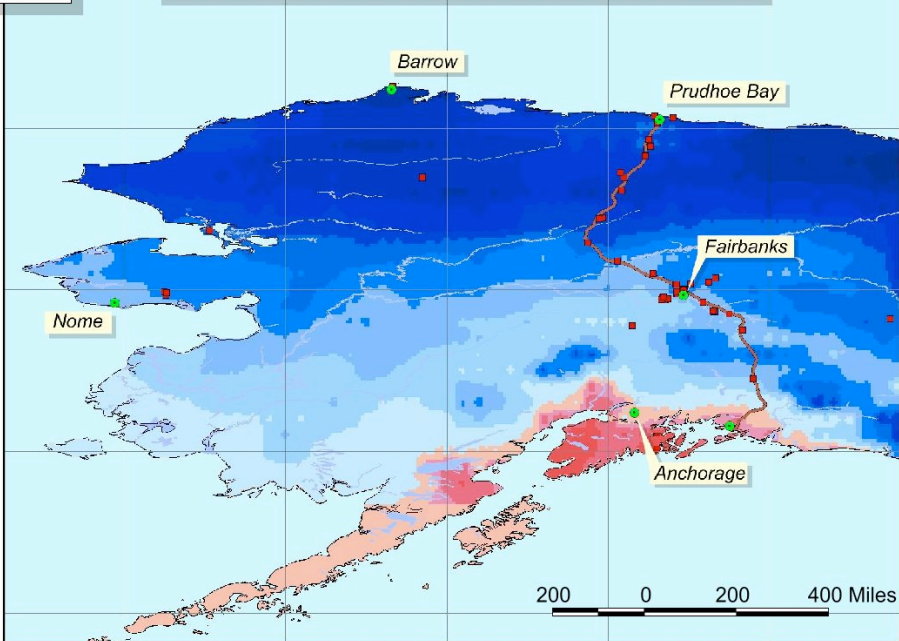


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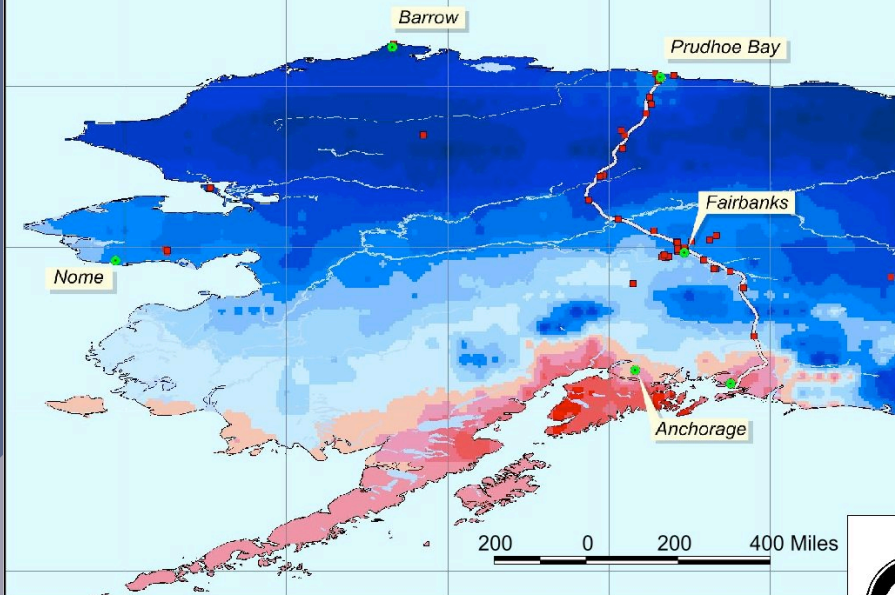
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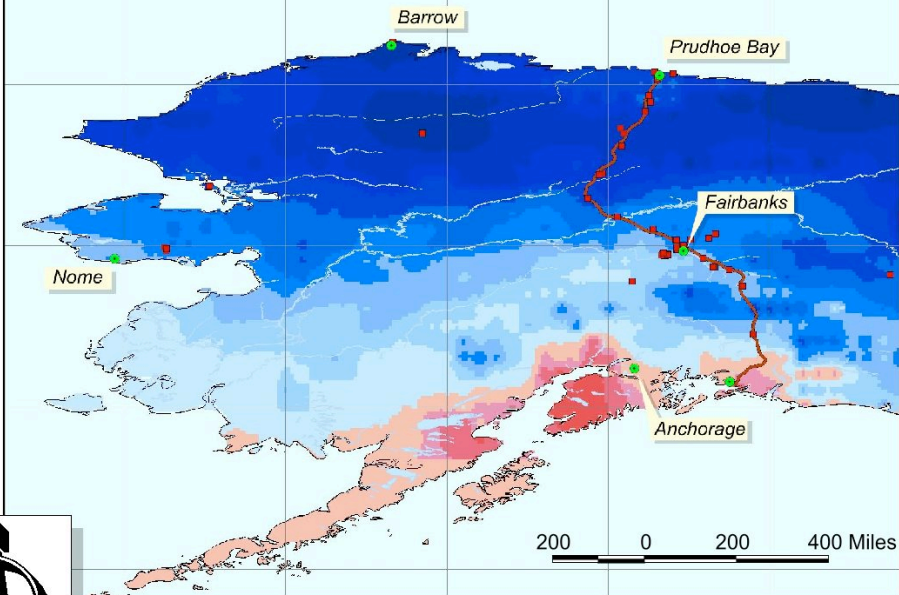
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

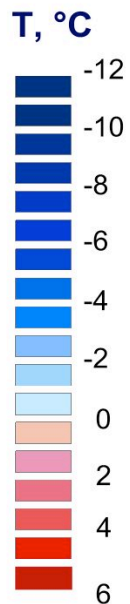


Mean Annual Temperature at 5 m Depth

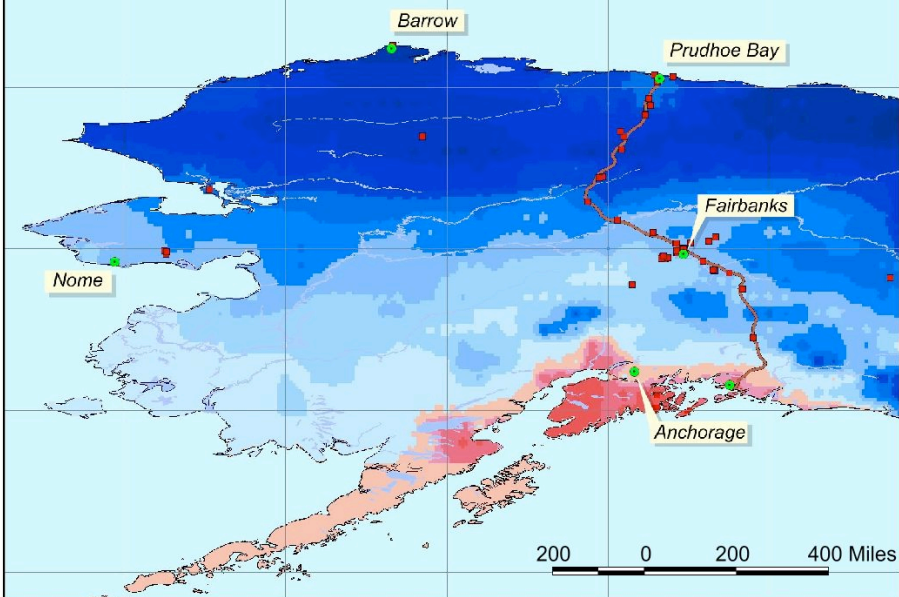


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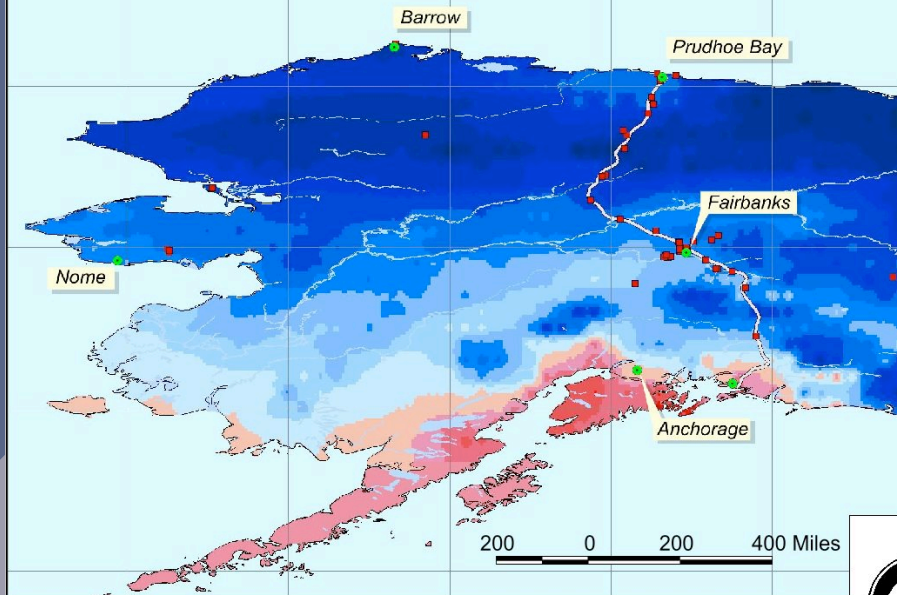
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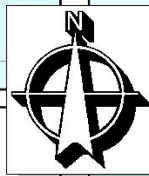
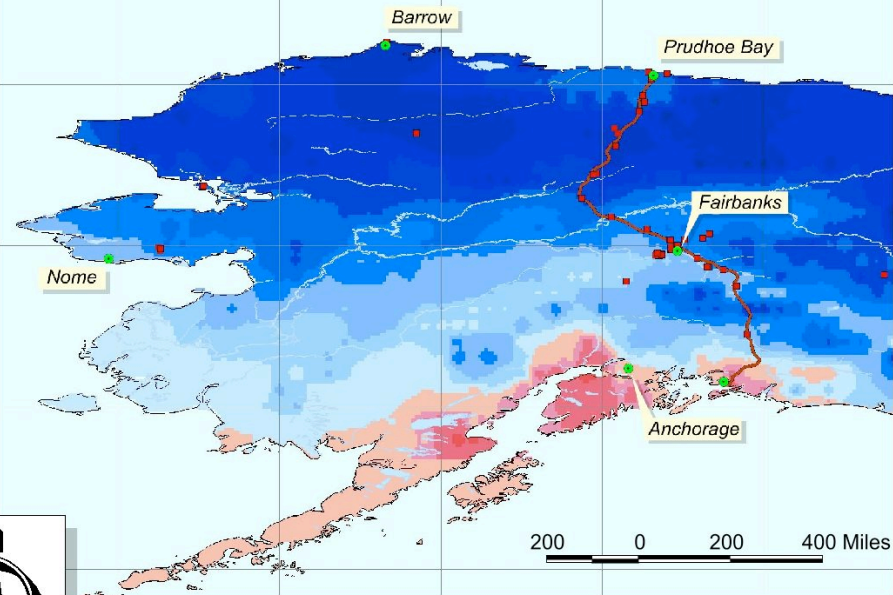
Mean Annual Temperature at 20 m Depth



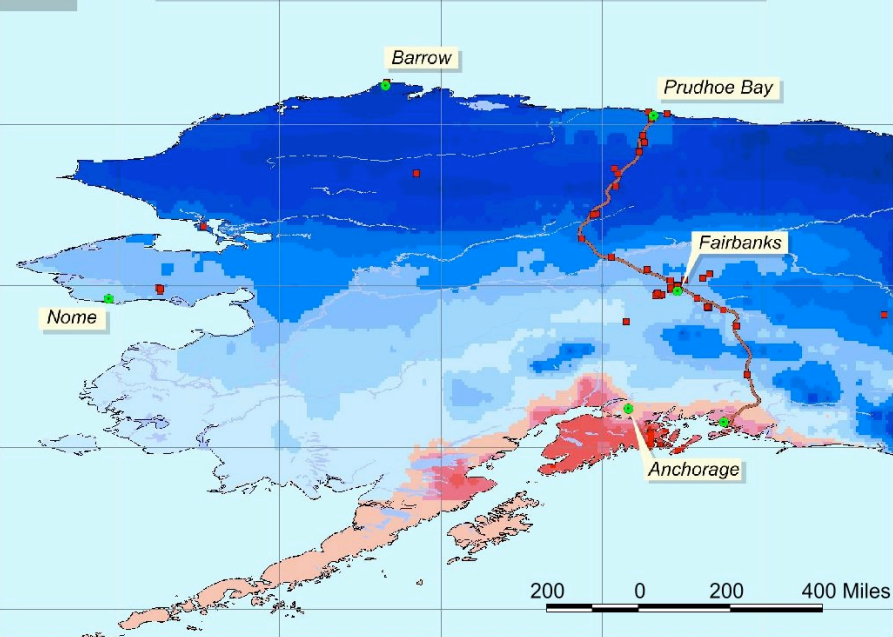
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

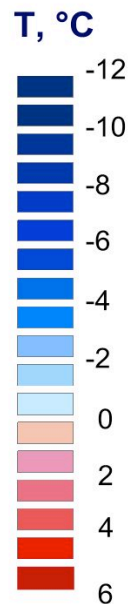


Mean Annual Temperature at 20 m Depth

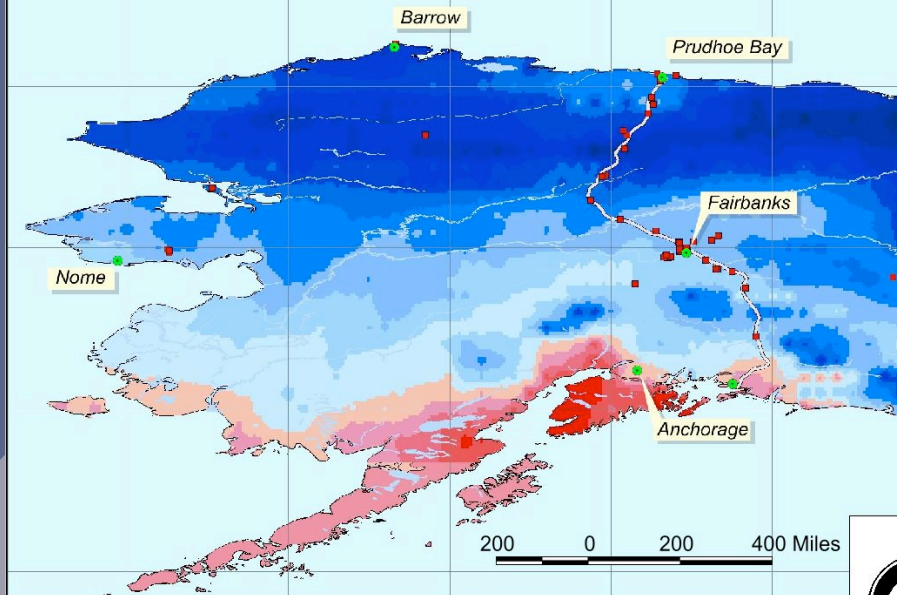


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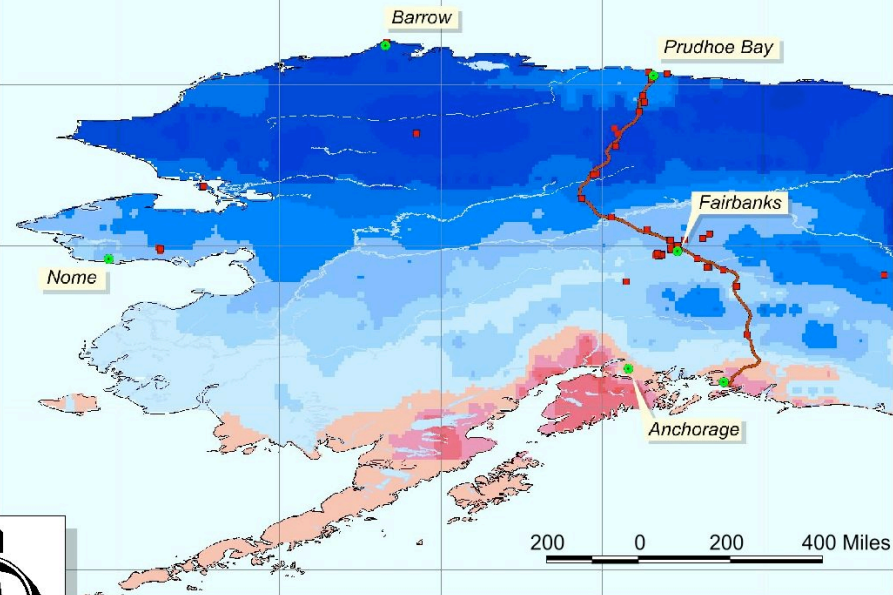
# Spatially Distributed Model of Permafrost Dynamics in Alaska



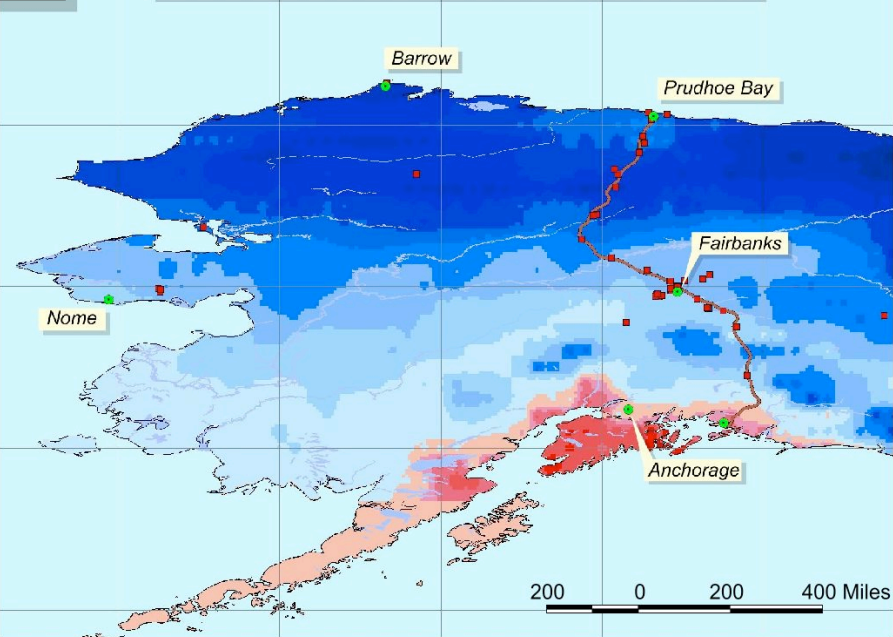
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

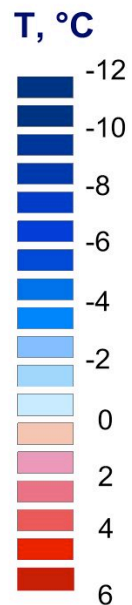


Mean Annual Temperature at 20 m Depth

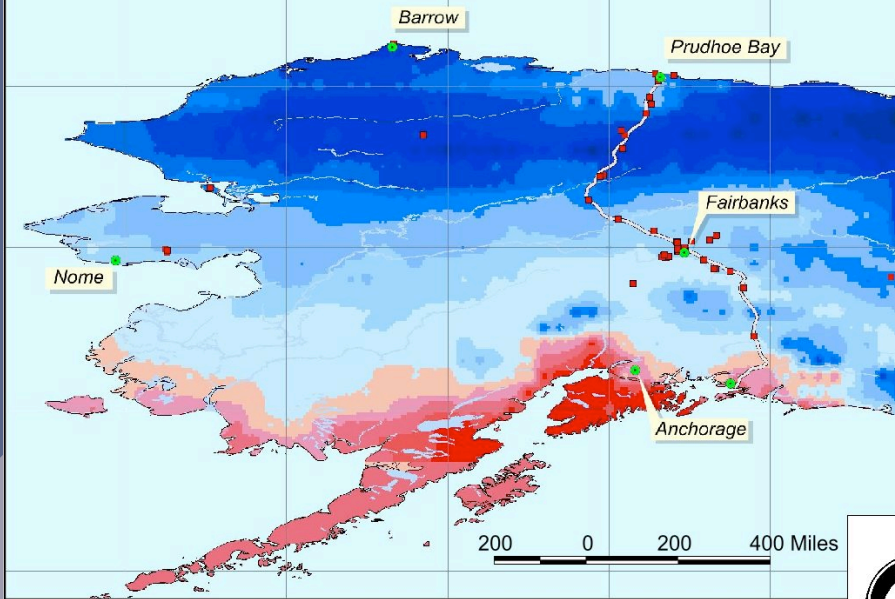


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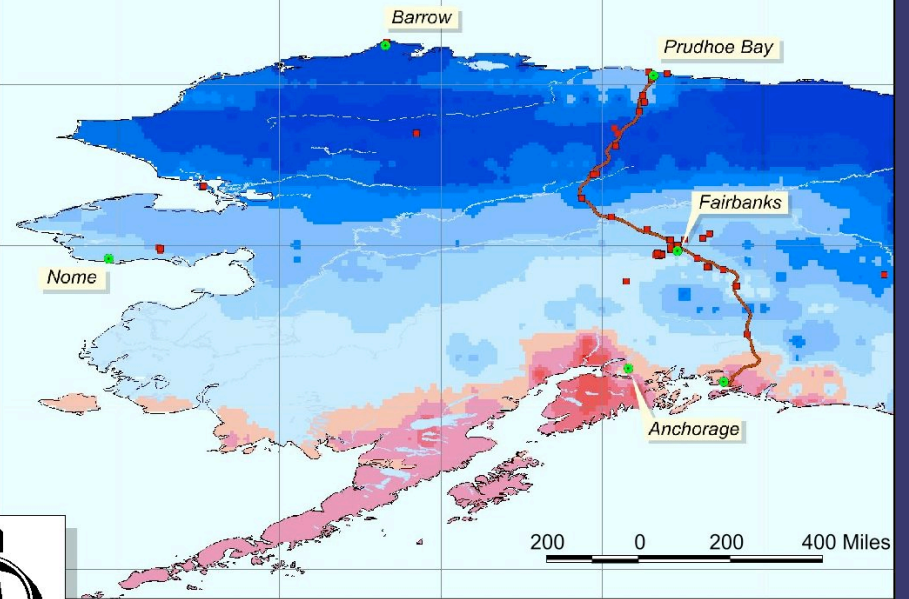
# Spatially Distributed Model of Permafrost Dynamics in Alaska



Mean Annual Temperature at 2 m Depth

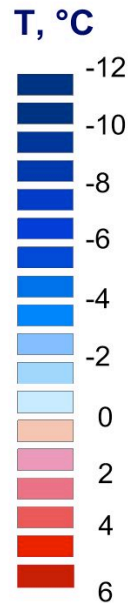


Mean Annual Temperature at 5 m Depth

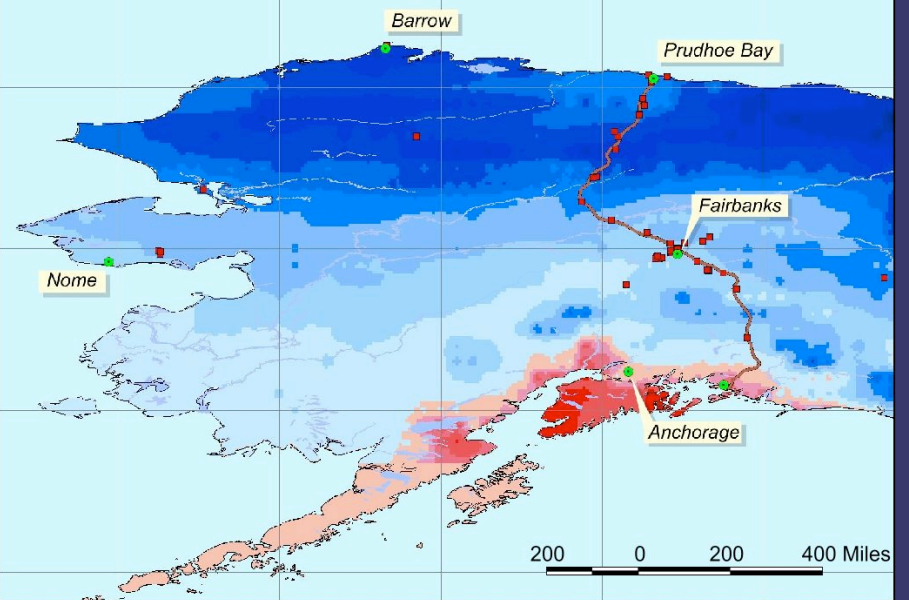


2020

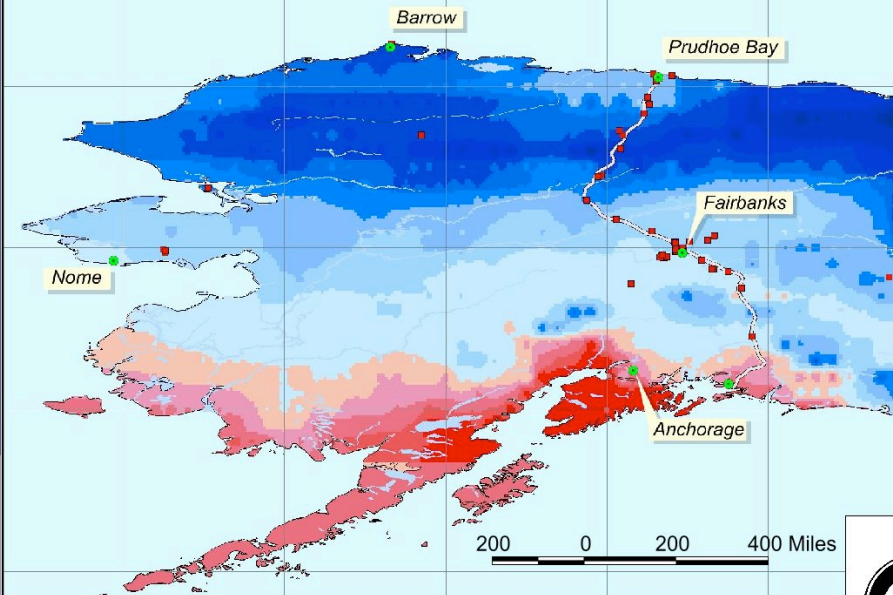
# Spatially Distributed Model of Permafrost Dynamics in Alaska



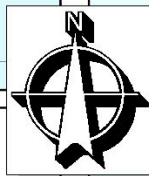
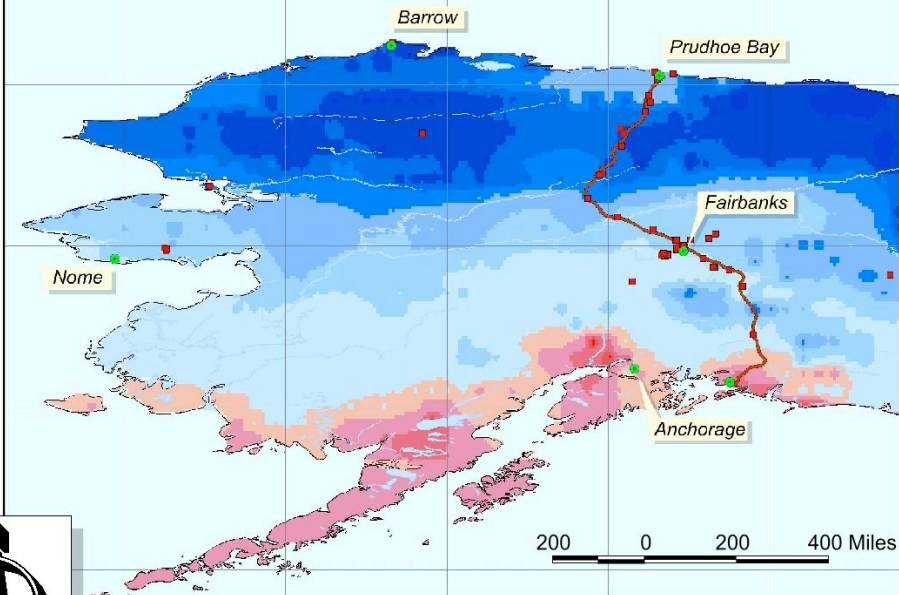
Mean Annual Temperature at 20 m Depth



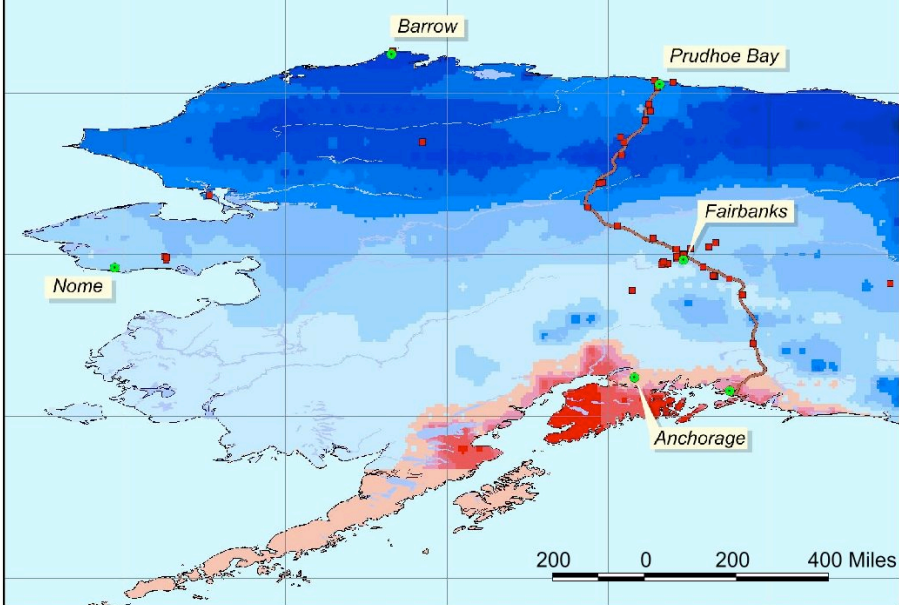
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

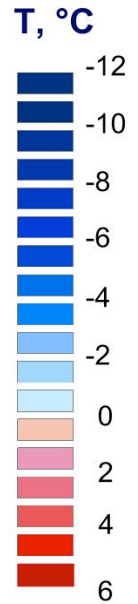


Mean Annual Temperature at 20 m Depth

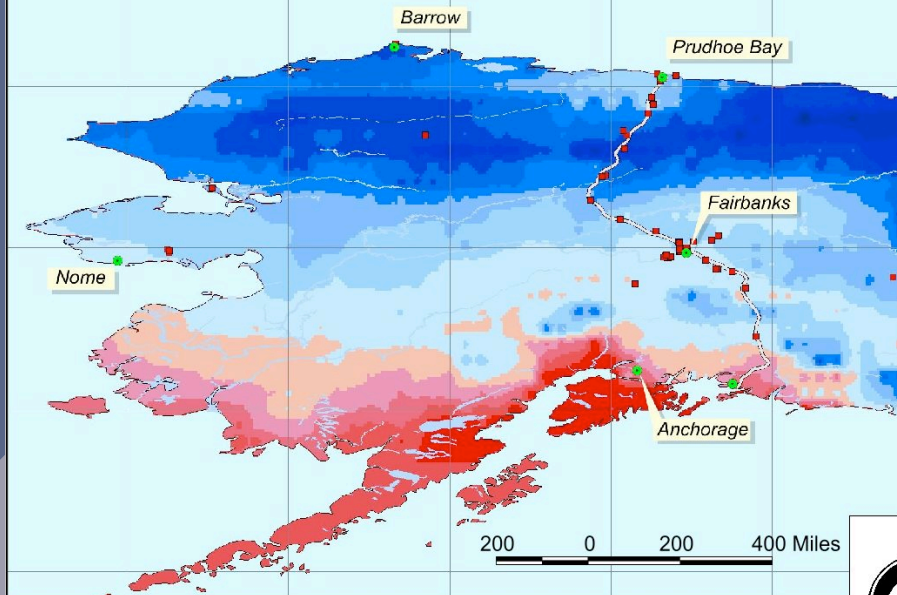


2030

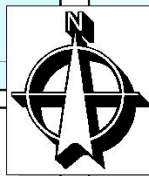
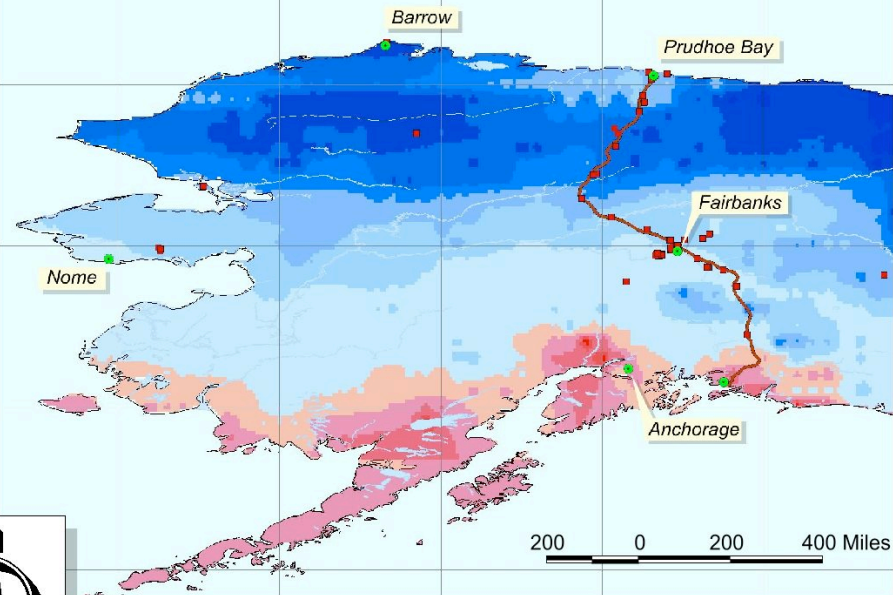
# Spatially Distributed Model of Permafrost Dynamics in Alaska



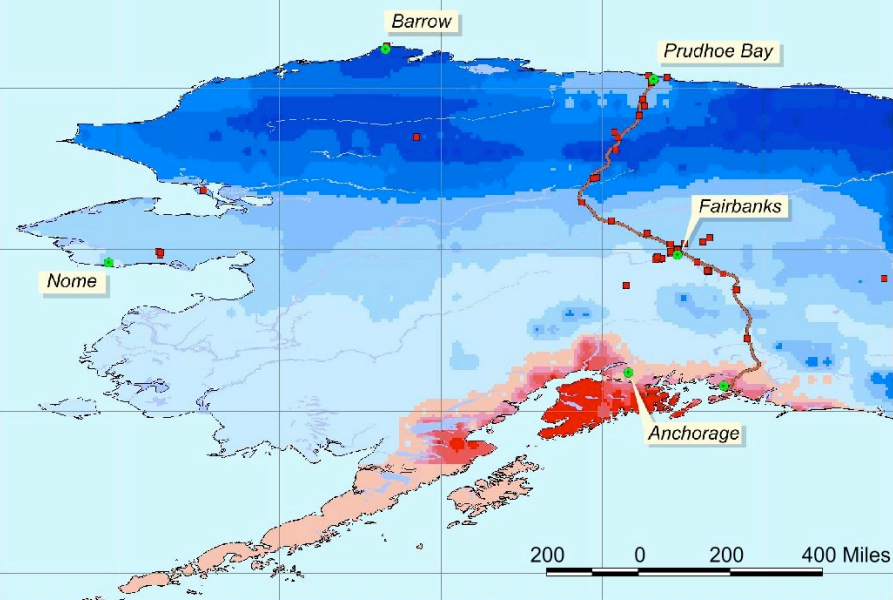
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

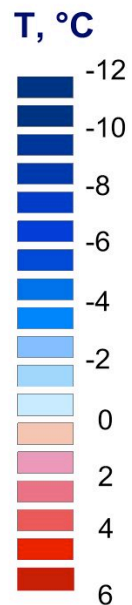


Mean Annual Temperature at 20 m Depth

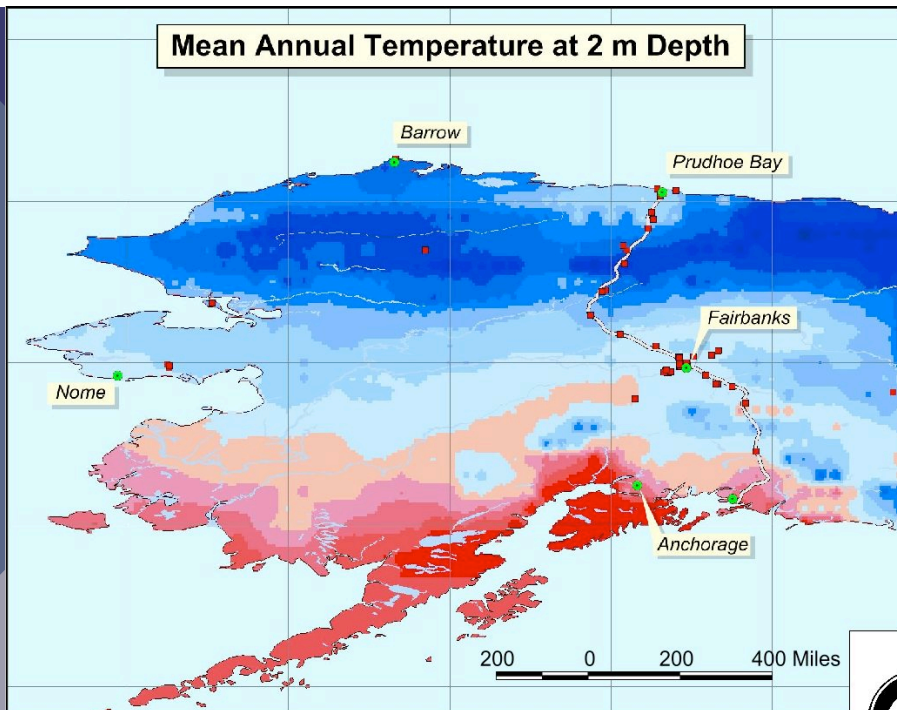


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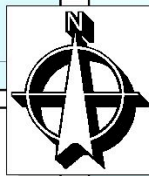
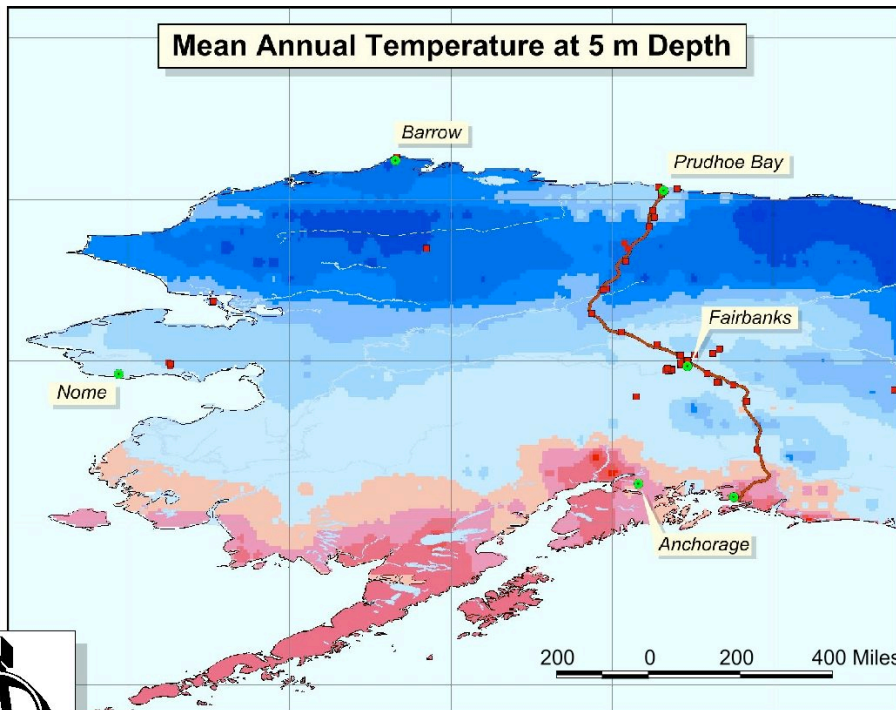
# Spatially Distributed Model of Permafrost Dynamics in Alaska



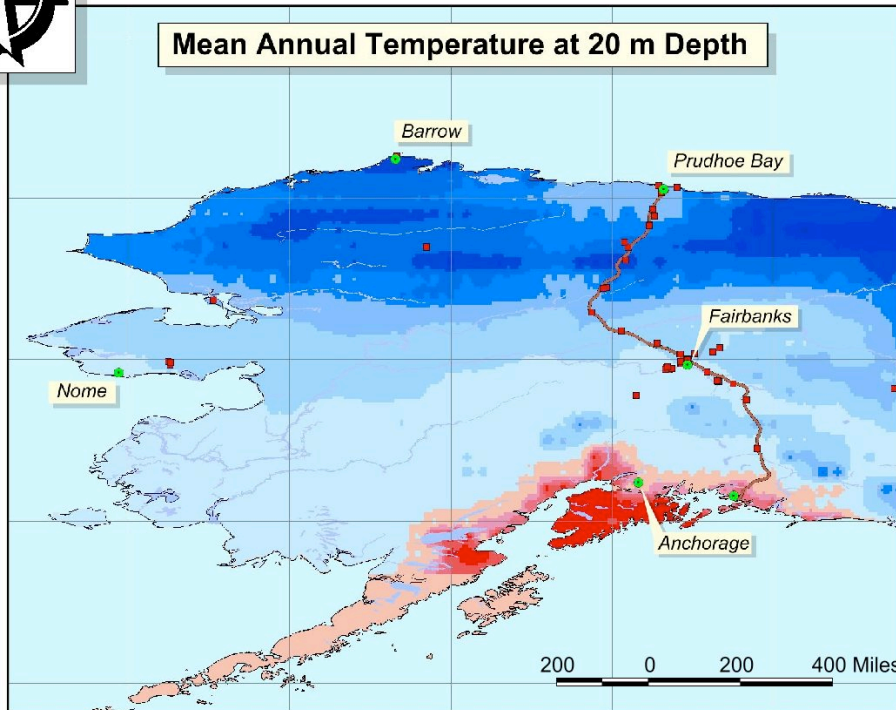
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

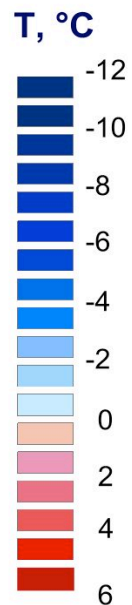


Mean Annual Temperature at 20 m Depth



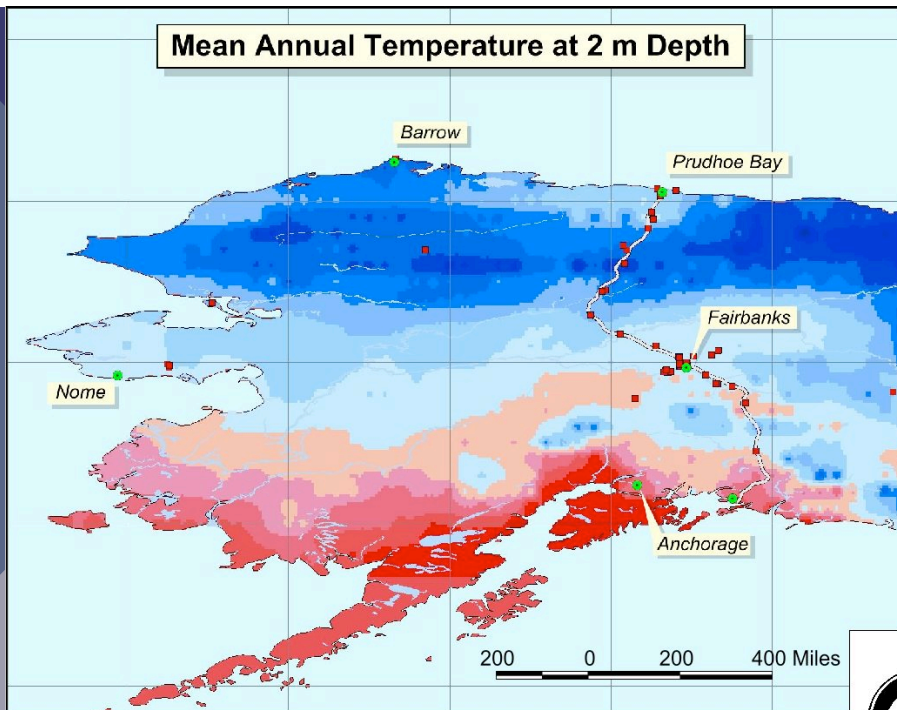
2050

# Spatially Distributed Model of Permafrost Dynamics in Alaska

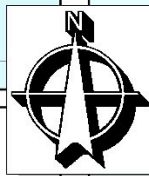
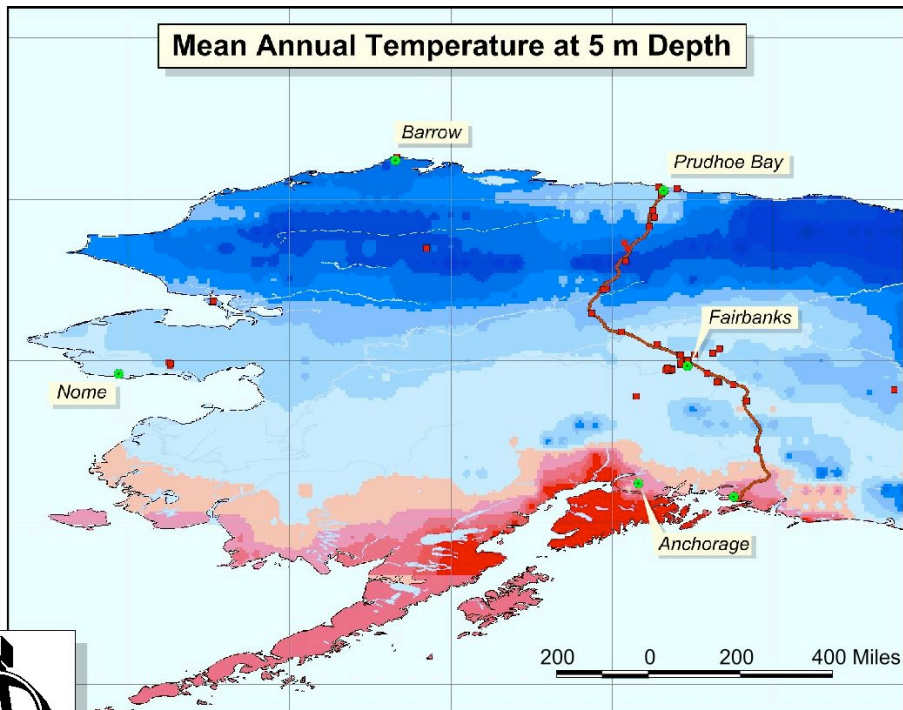




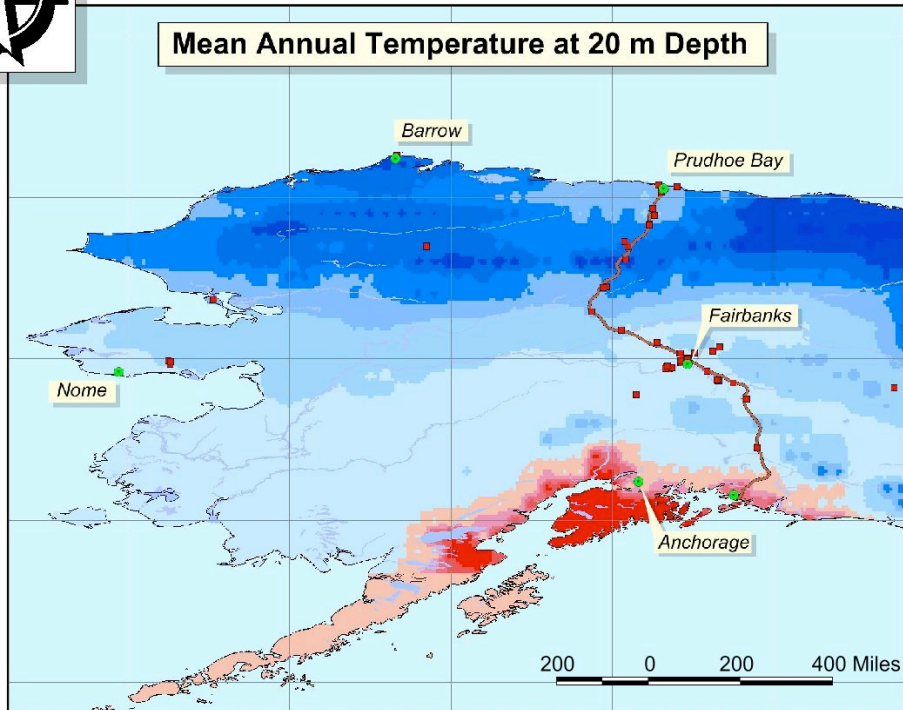
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

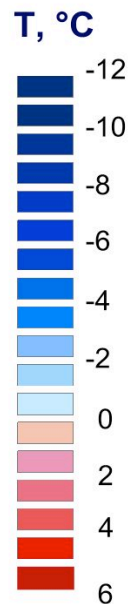


Mean Annual Temperature at 20 m Depth

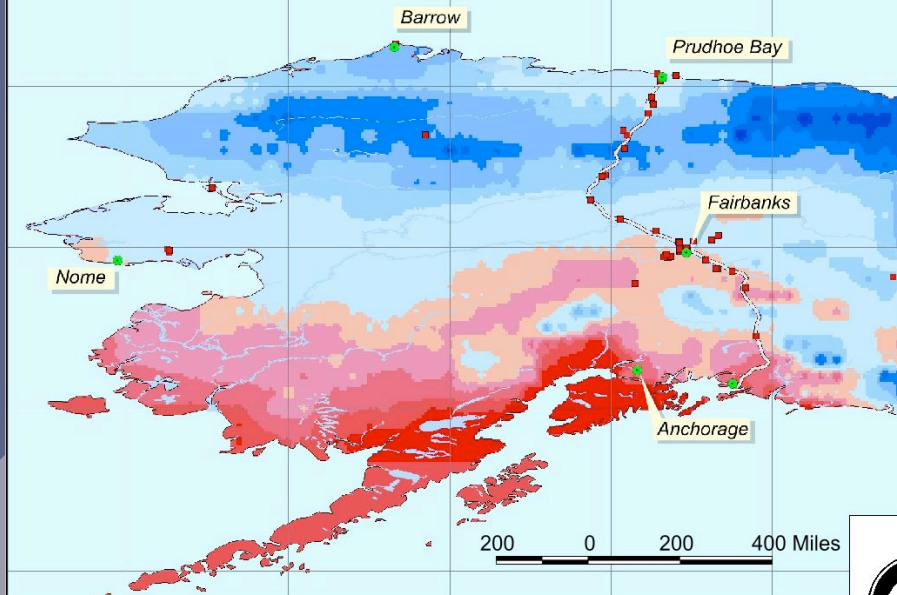


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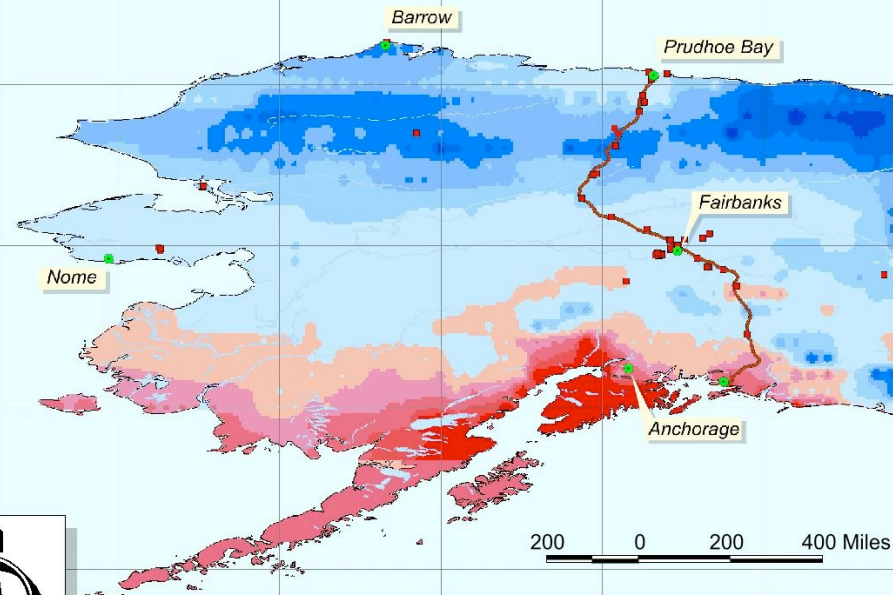
# Spatially Distributed Model of Permafrost Dynamics in Alaska



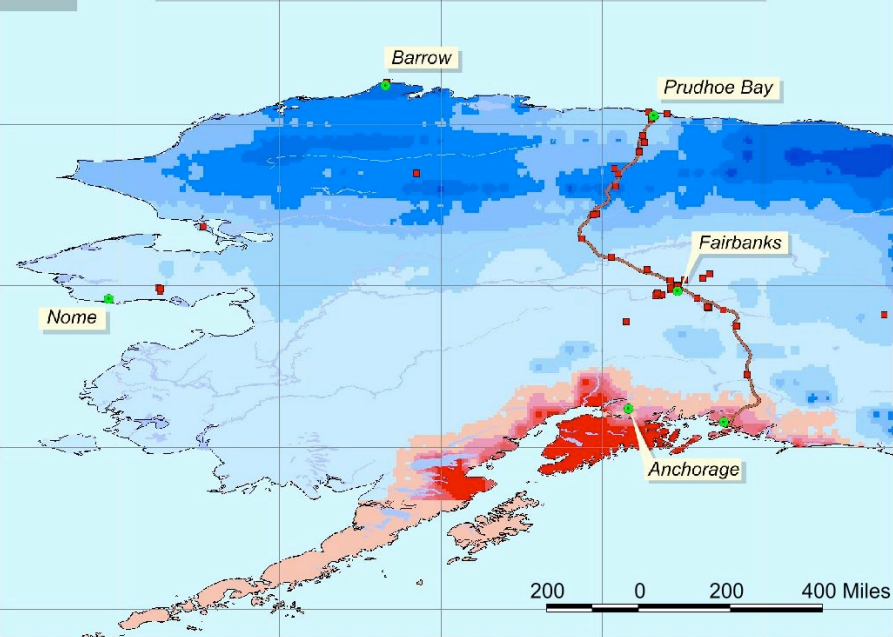
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

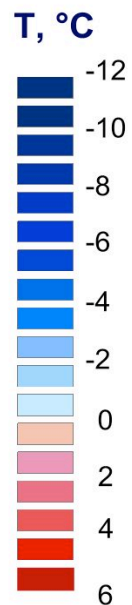


Mean Annual Temperature at 20 m Depth

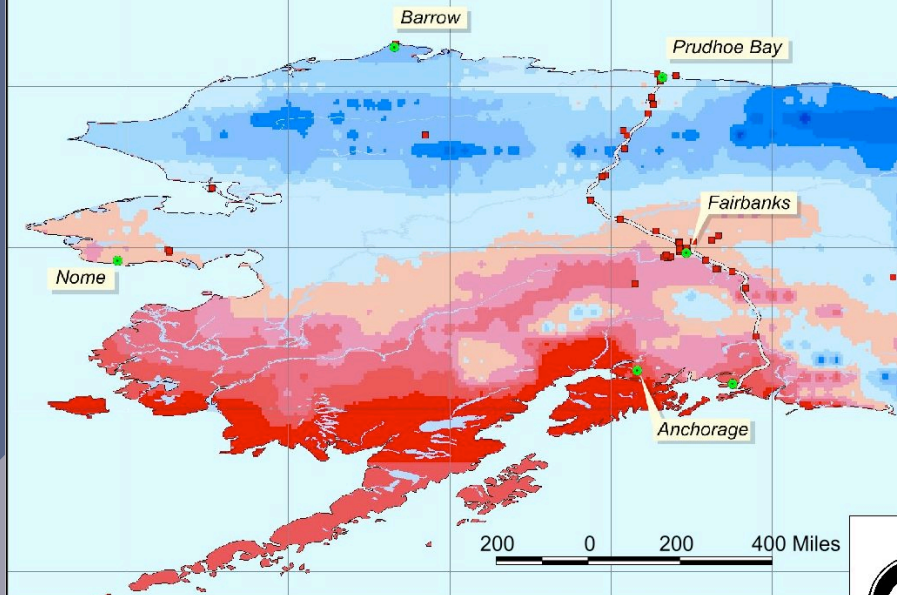


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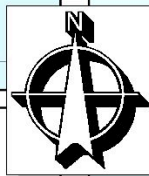
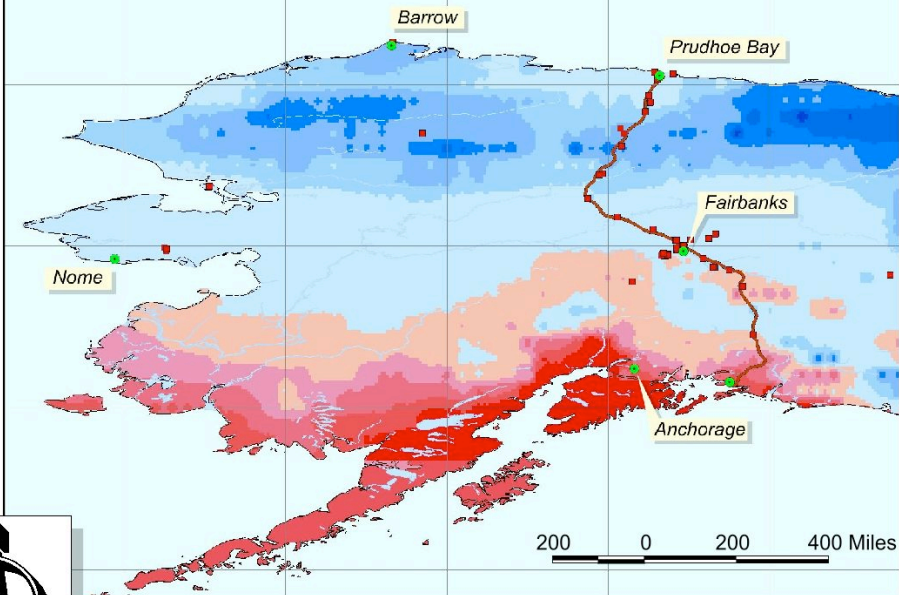
# Spatially Distributed Model of Permafrost Dynamics in Alaska



Mean Annual Temperature at 2 m Depth

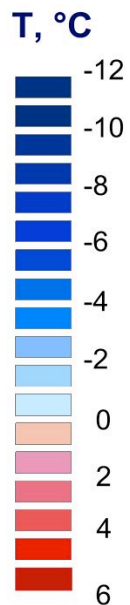


Mean Annual Temperature at 5 m Depth

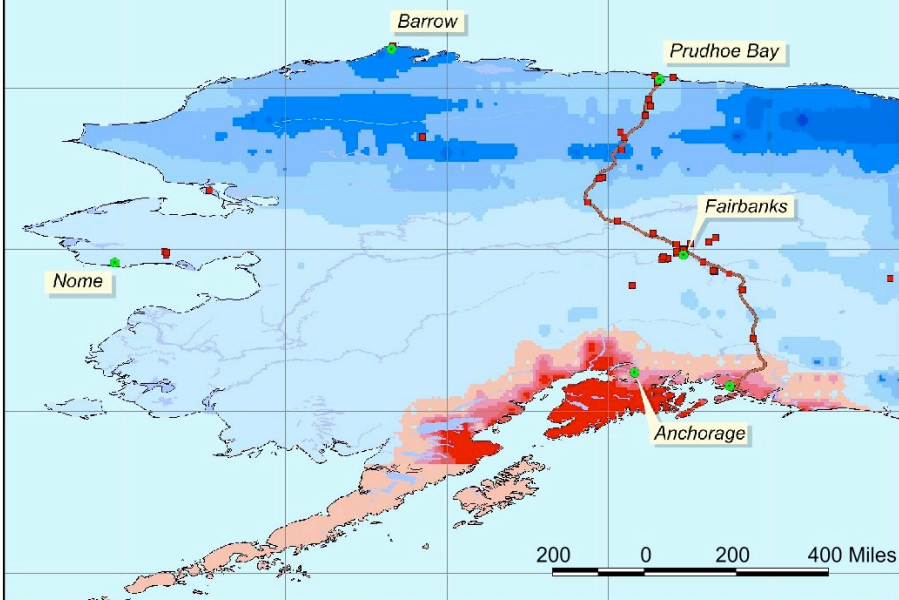


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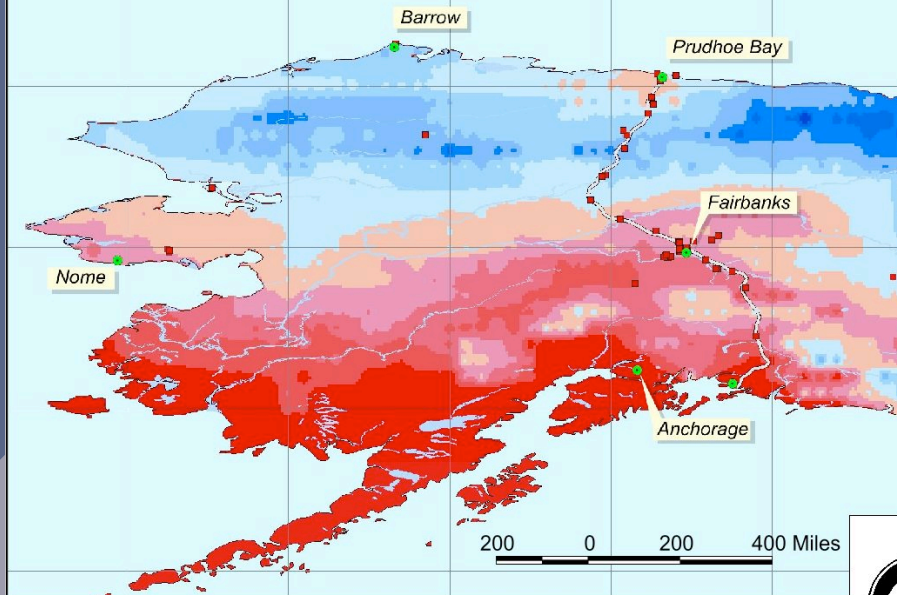
# Spatially Distributed Model of Permafrost Dynamics in Alaska



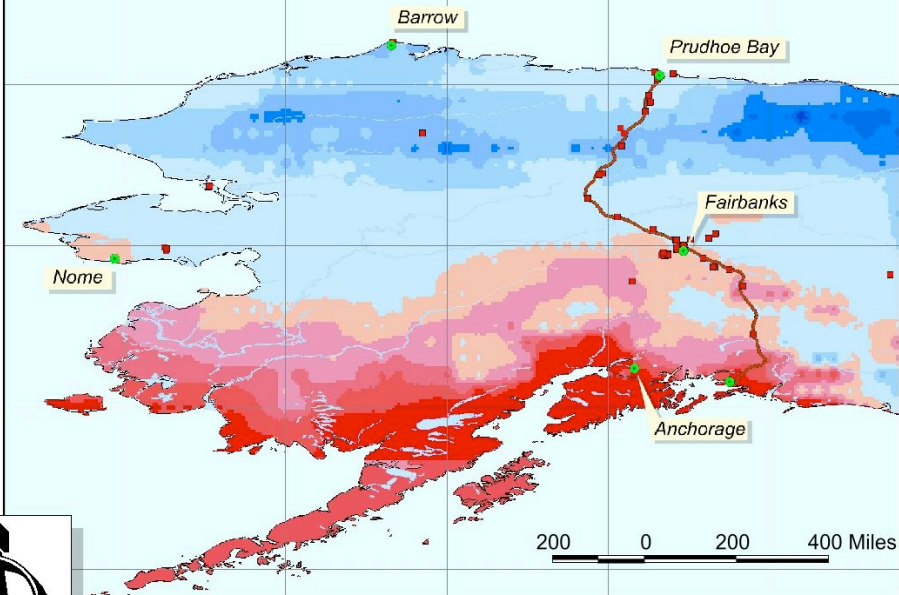
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

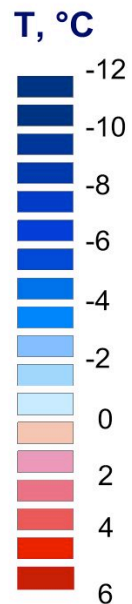


Mean Annual Temperature at 5 m Depth

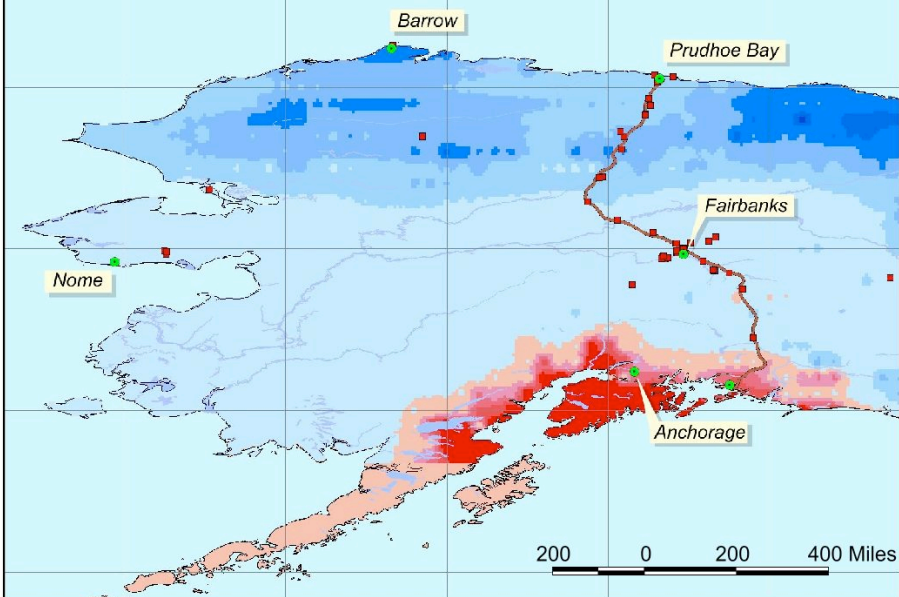


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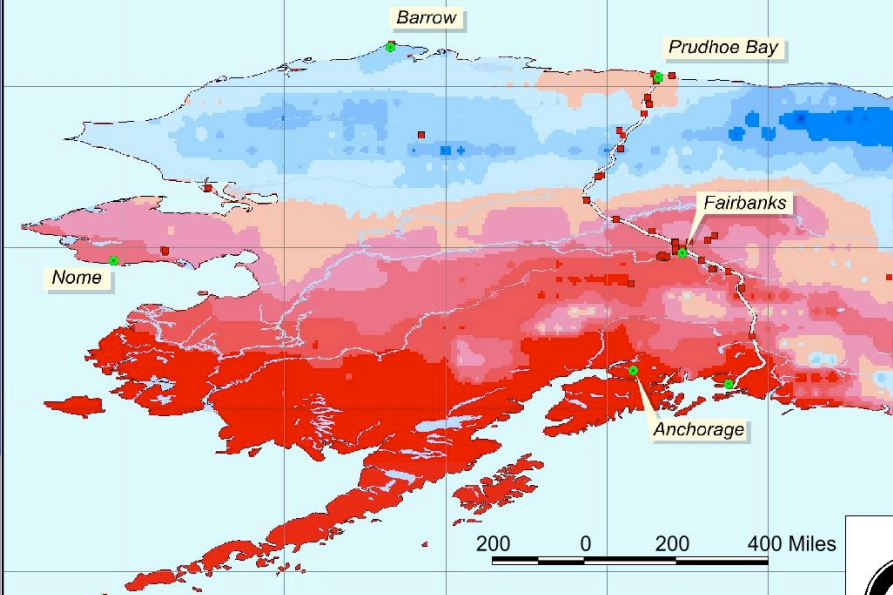
# Spatially Distributed Model of Permafrost Dynamics in Alaska



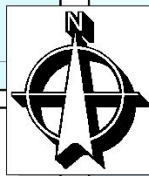
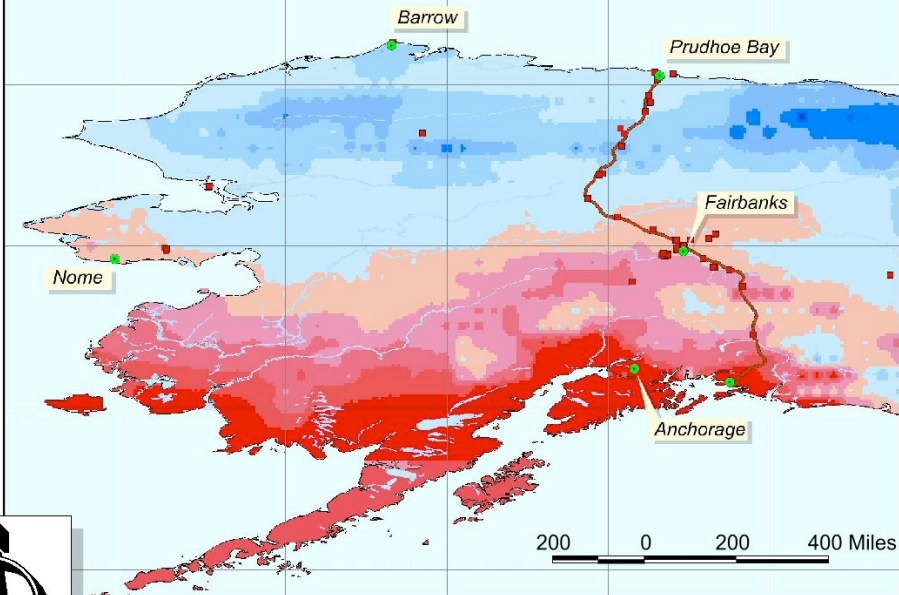
Mean Annual Temperature at 20 m Depth



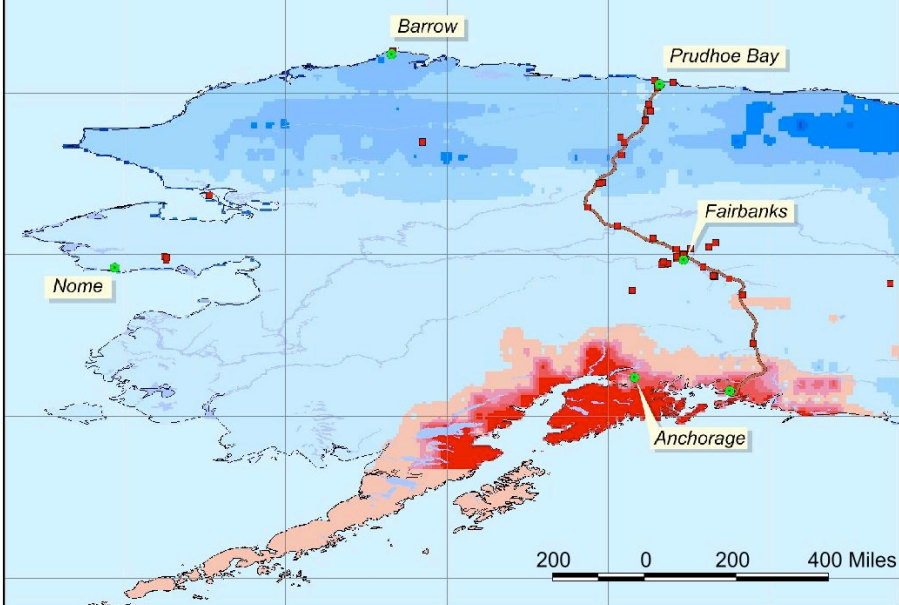
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

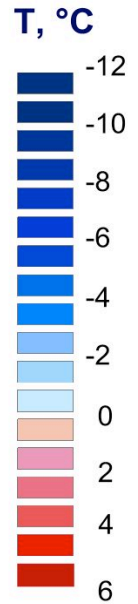


Mean Annual Temperature at 20 m Depth

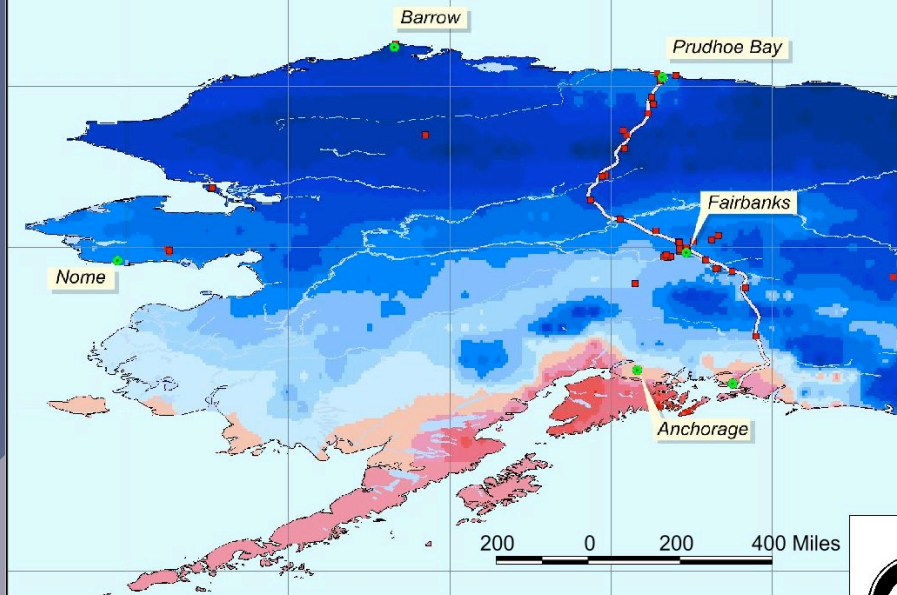


2100

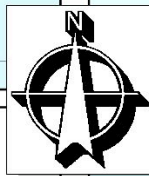
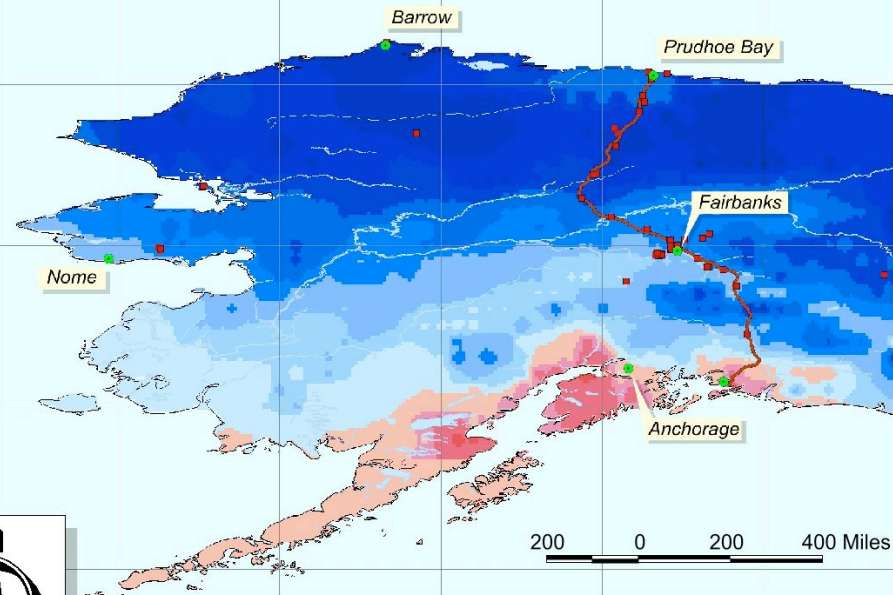
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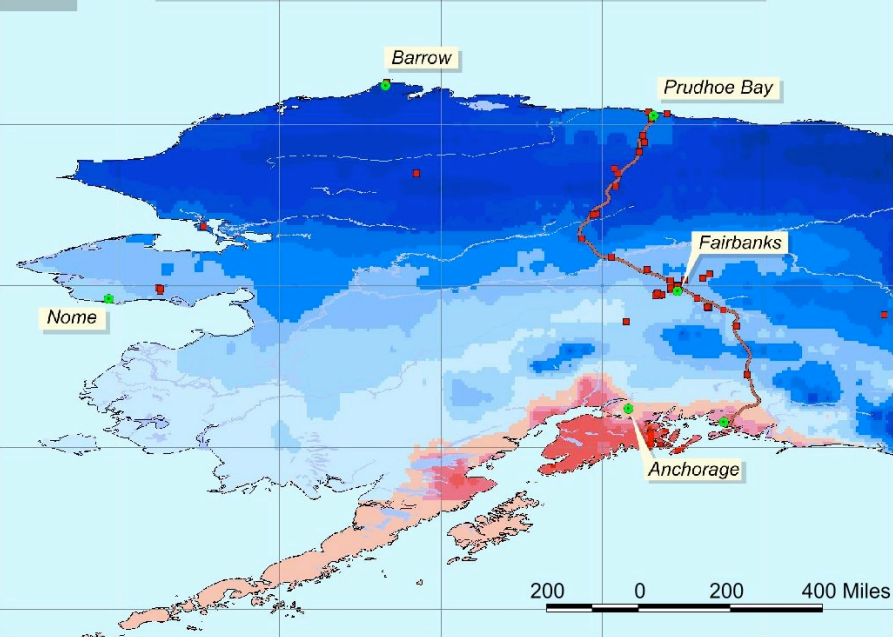
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

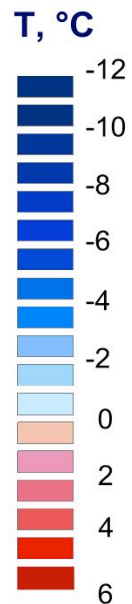


Mean Annual Temperature at 20 m Depth

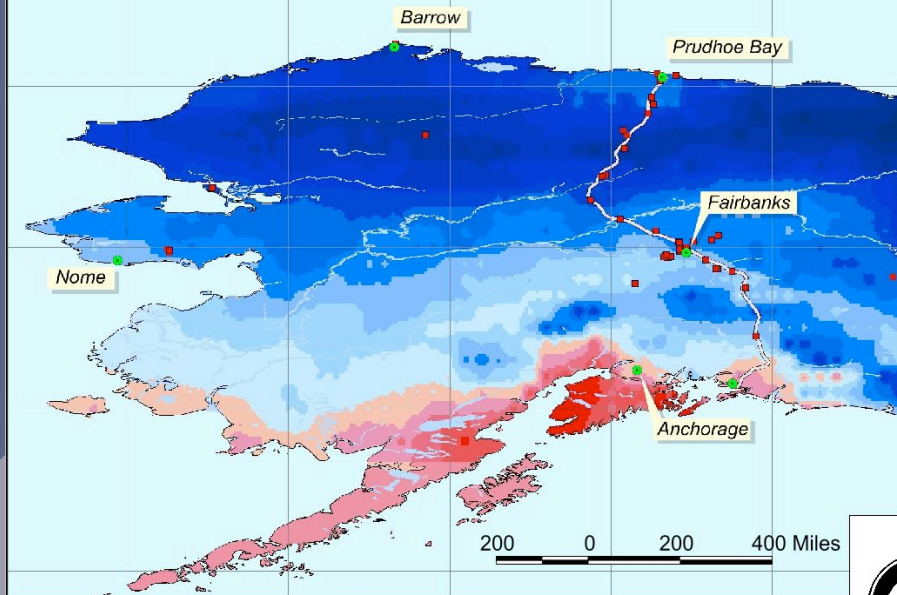


2000

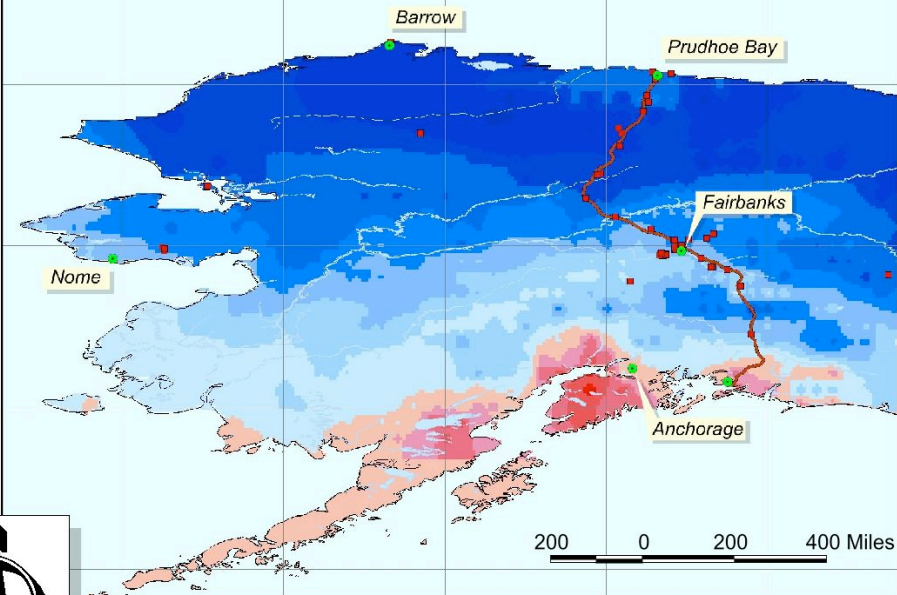
# Spatially Distributed Model of Permafrost Dynamics in Alaska



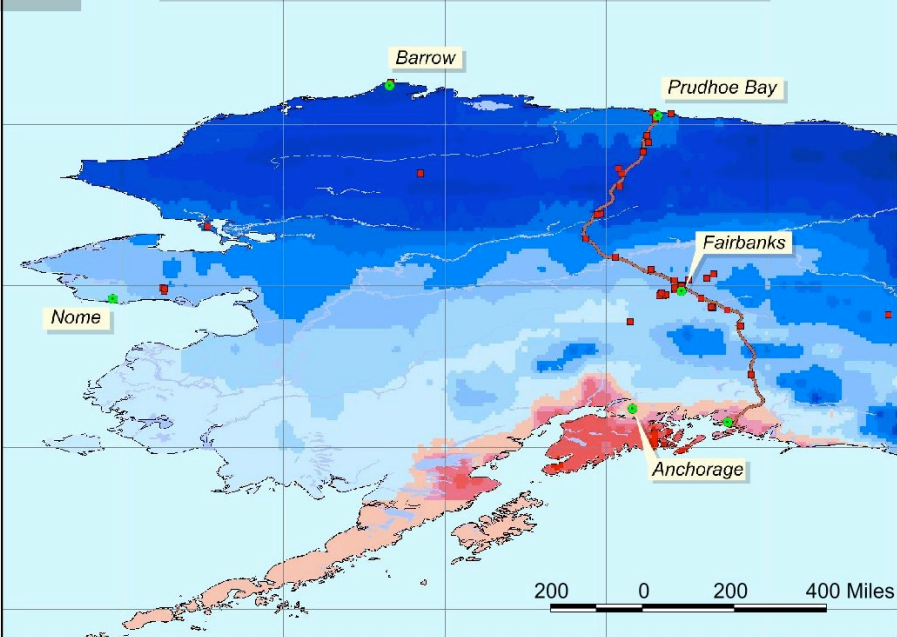
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

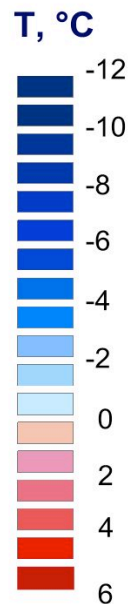


Mean Annual Temperature at 20 m Depth

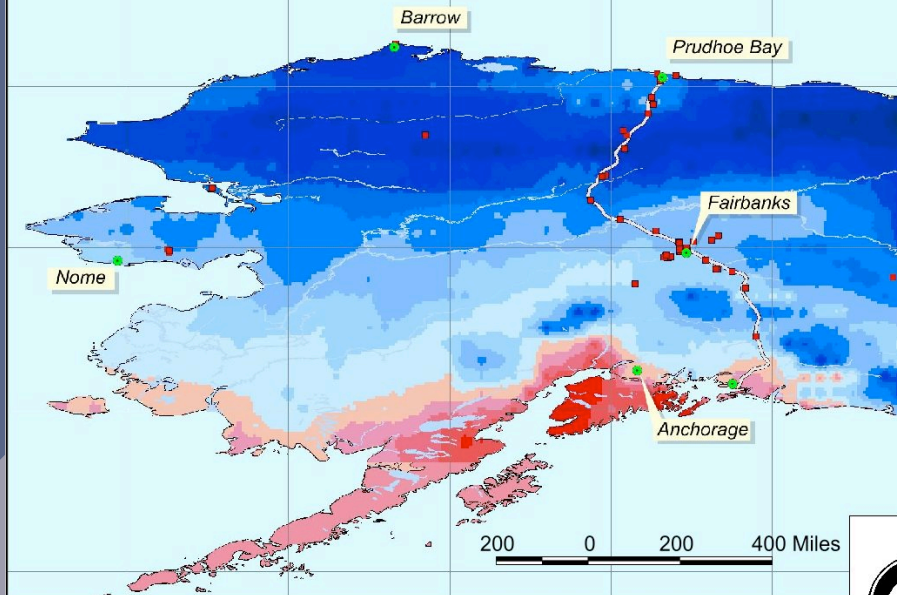


2005

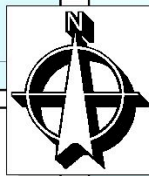
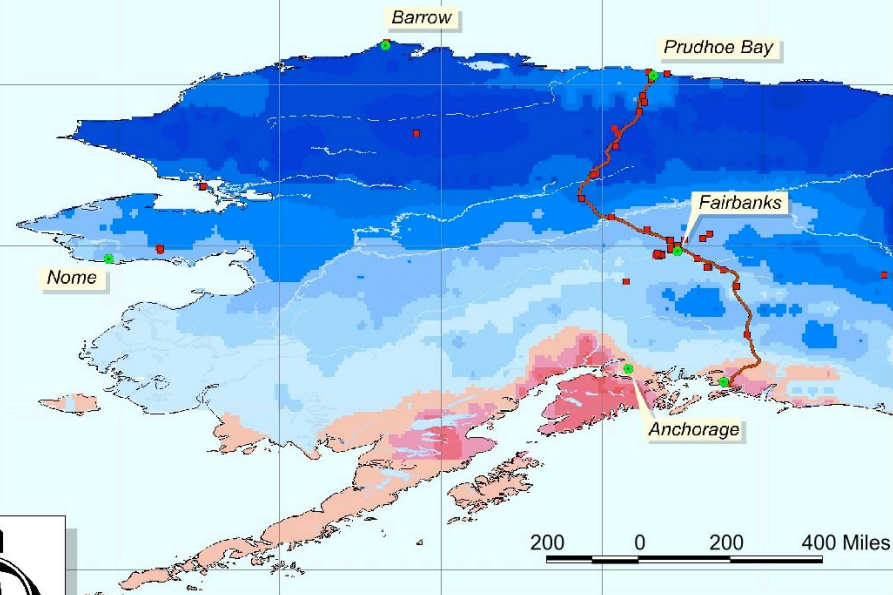
# Spatially Distributed Model of Permafrost Dynamics in Alaska



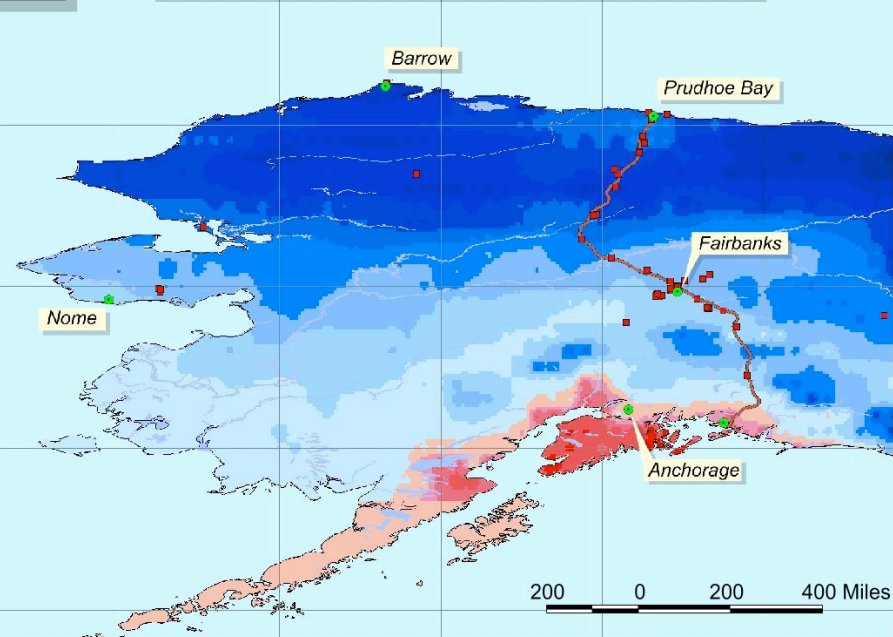
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

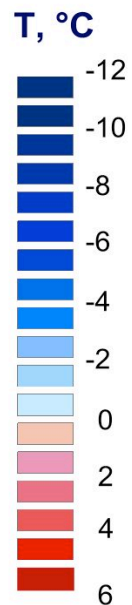


Mean Annual Temperature at 20 m Depth



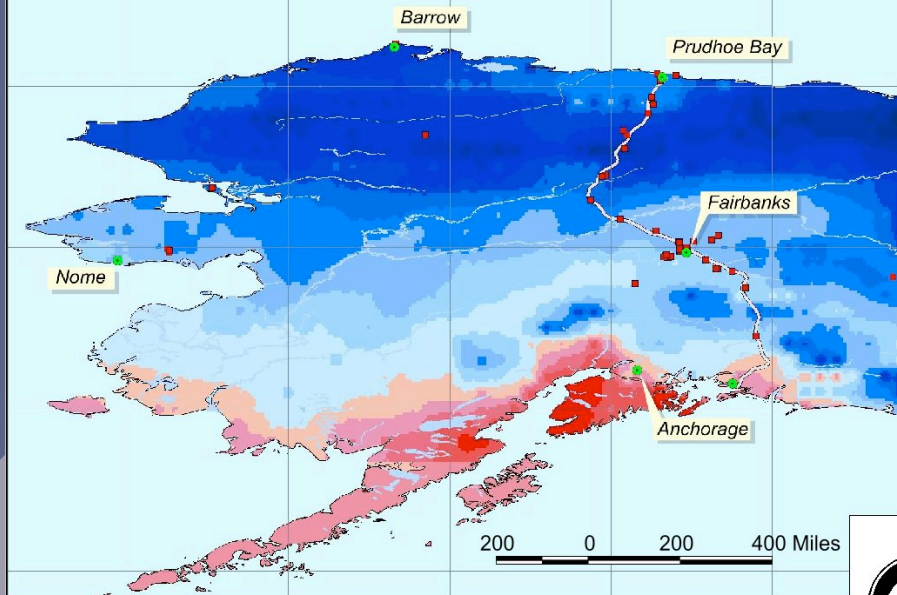
2010

# Spatially Distributed Model of Permafrost Dynamics in Alaska

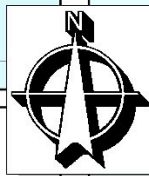
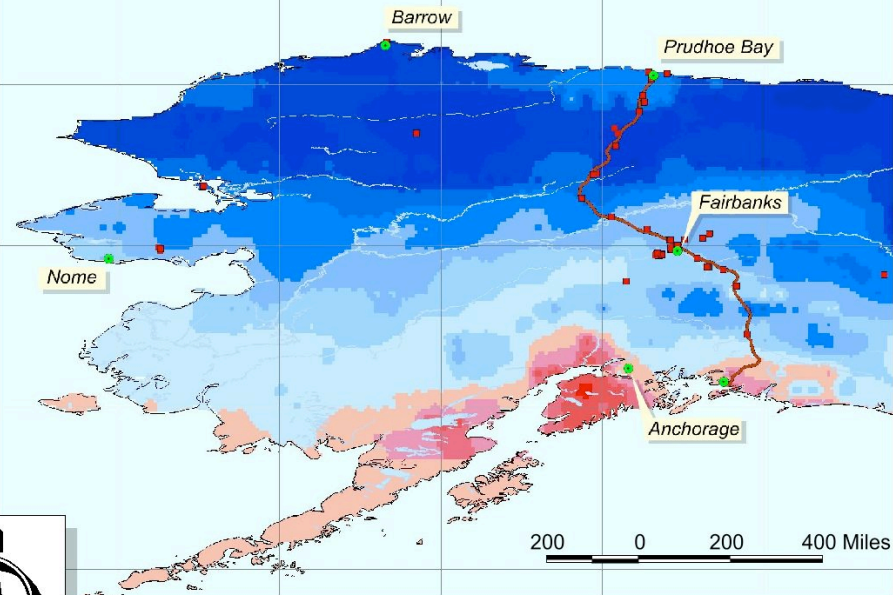




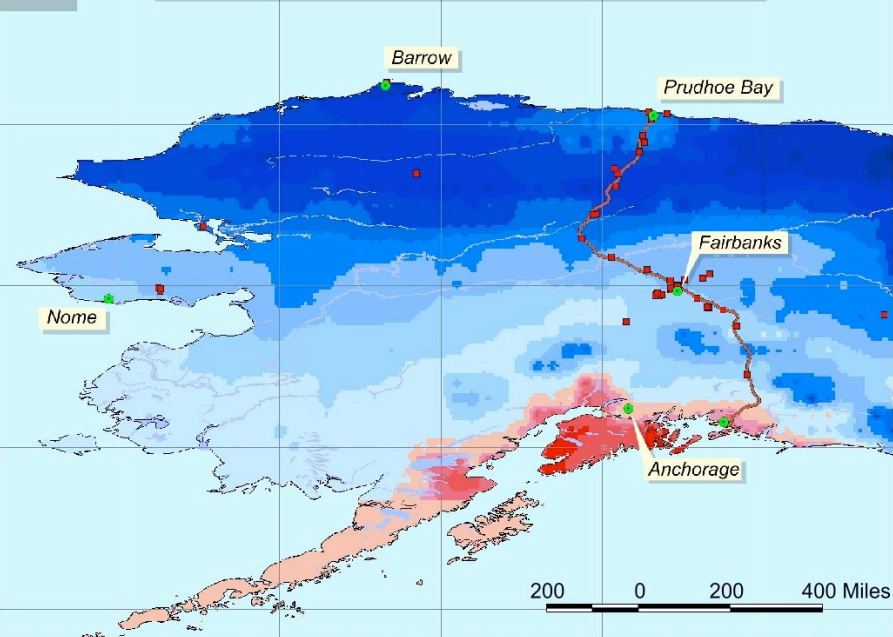
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

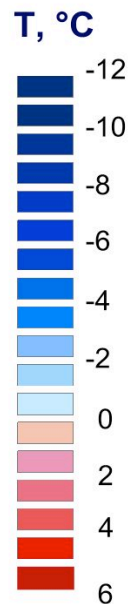


Mean Annual Temperature at 20 m Depth

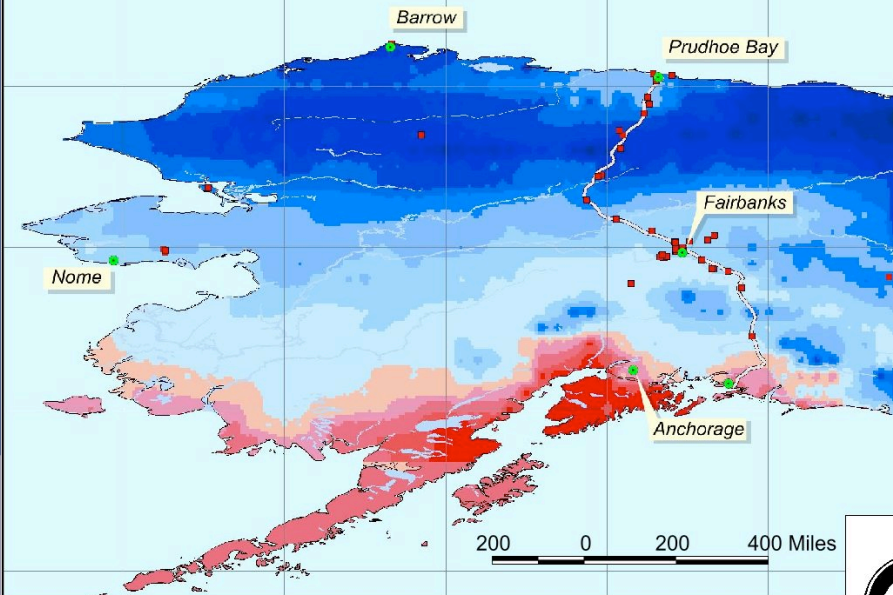


2015

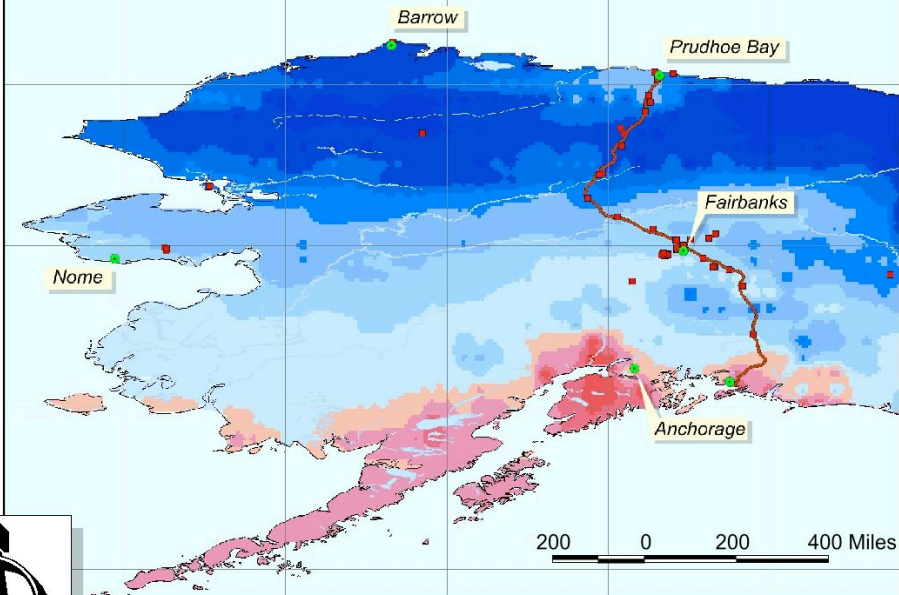
# Spatially Distributed Model of Permafrost Dynamics in Alaska



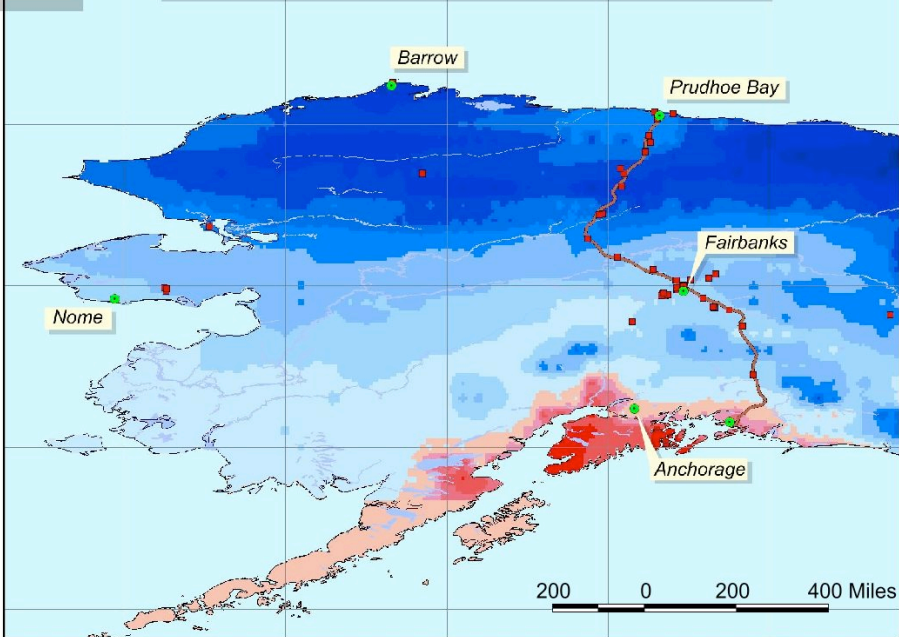
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

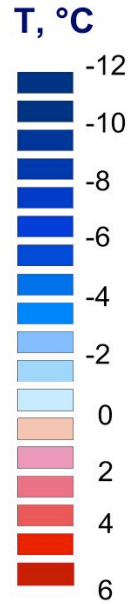


Mean Annual Temperature at 20 m Depth

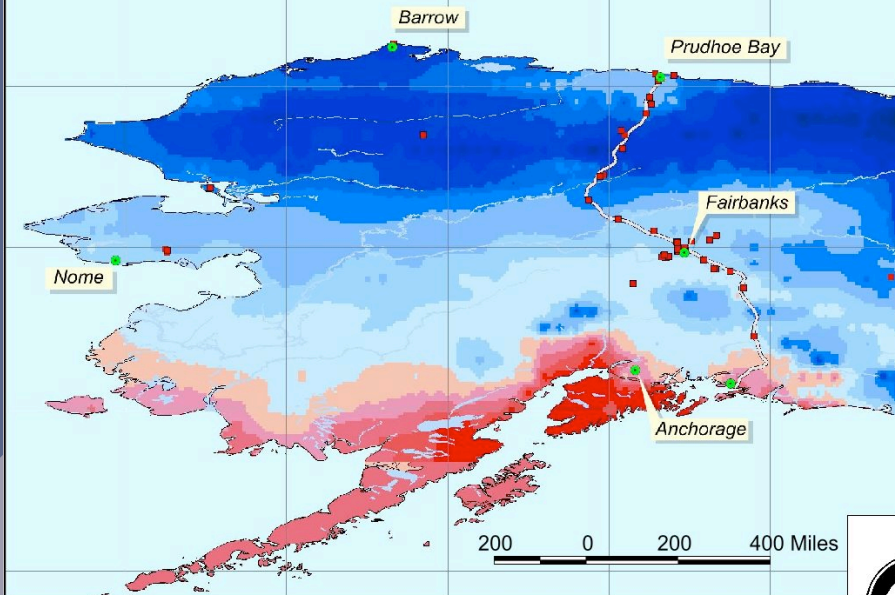


2020

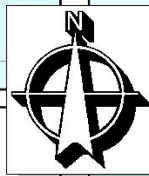
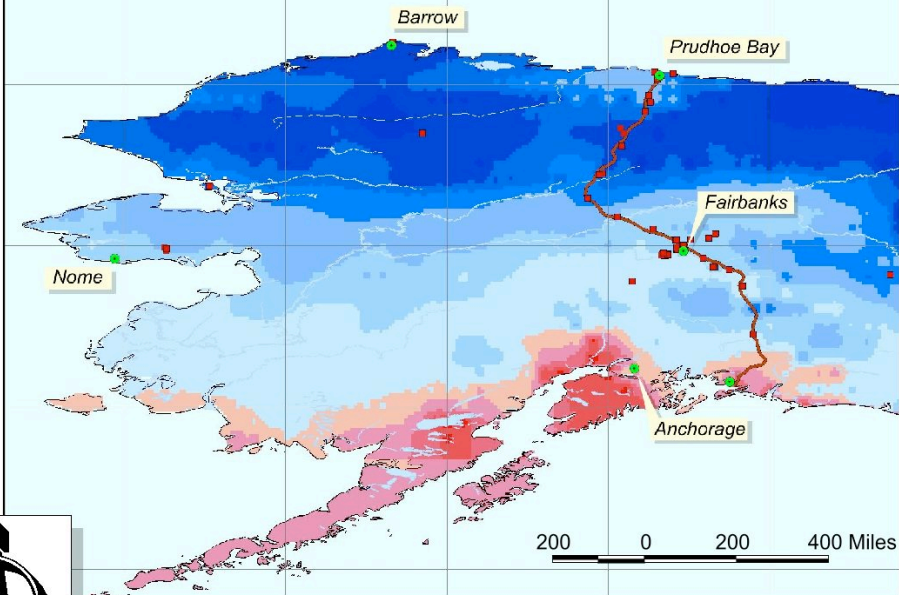
# Spatially Distributed Model of Permafrost Dynamics in Alaska



Mean Annual Temperature at 2 m Depth

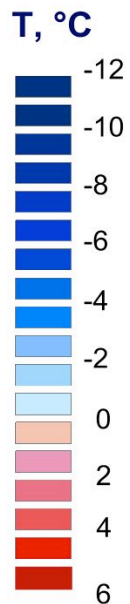


Mean Annual Temperature at 5 m Depth

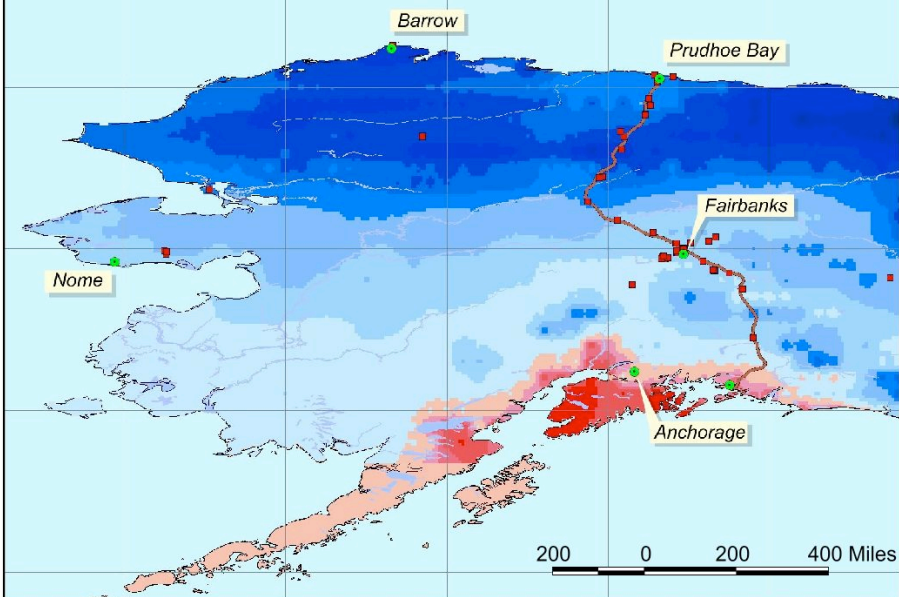


2025

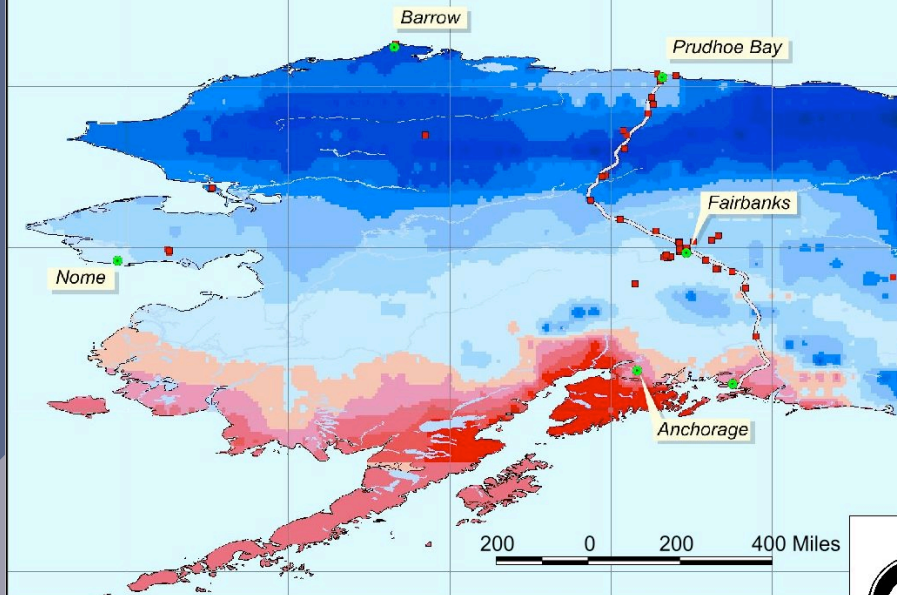
# Spatially Distributed Model of Permafrost Dynamics in Alaska



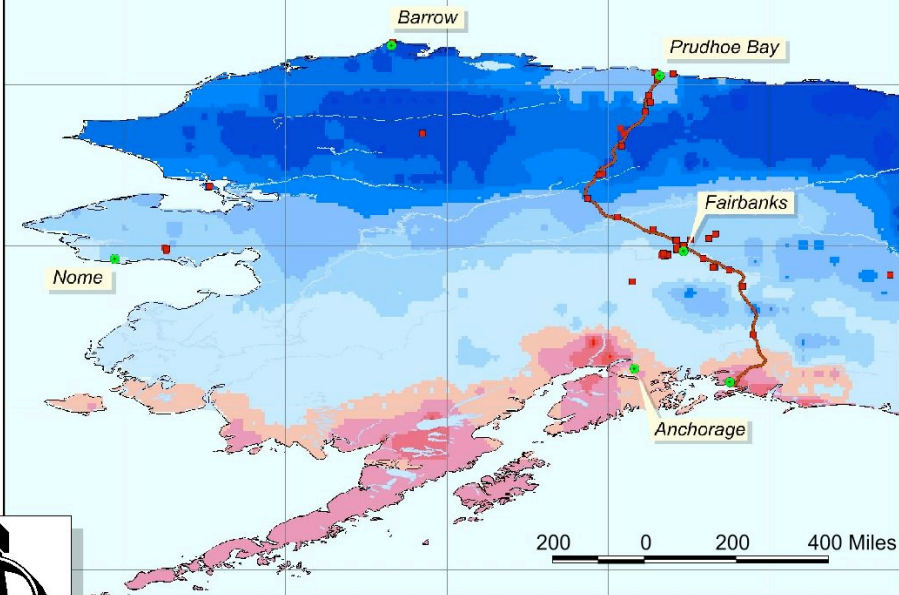
Mean Annual Temperature at 20 m Depth



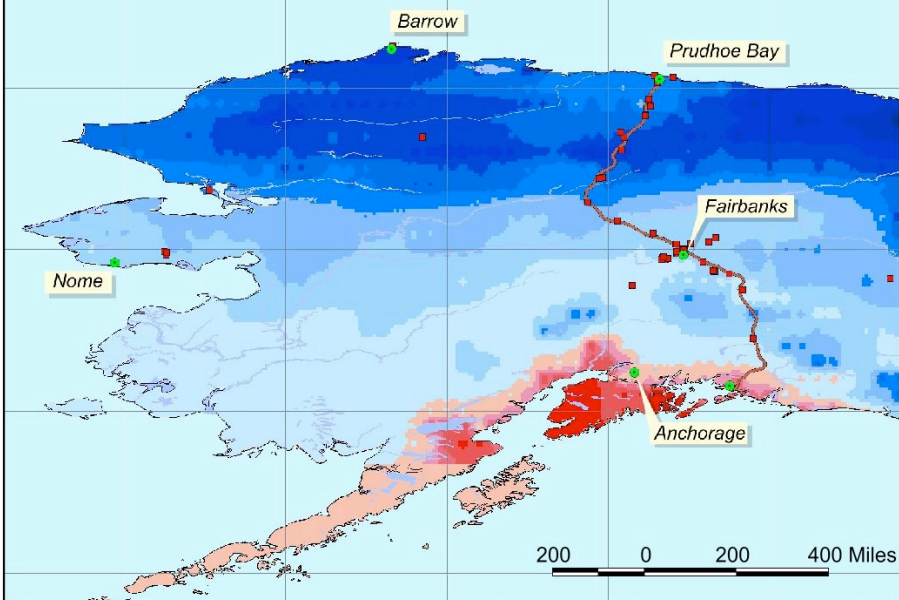
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

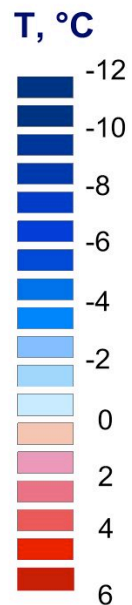


Mean Annual Temperature at 20 m Depth

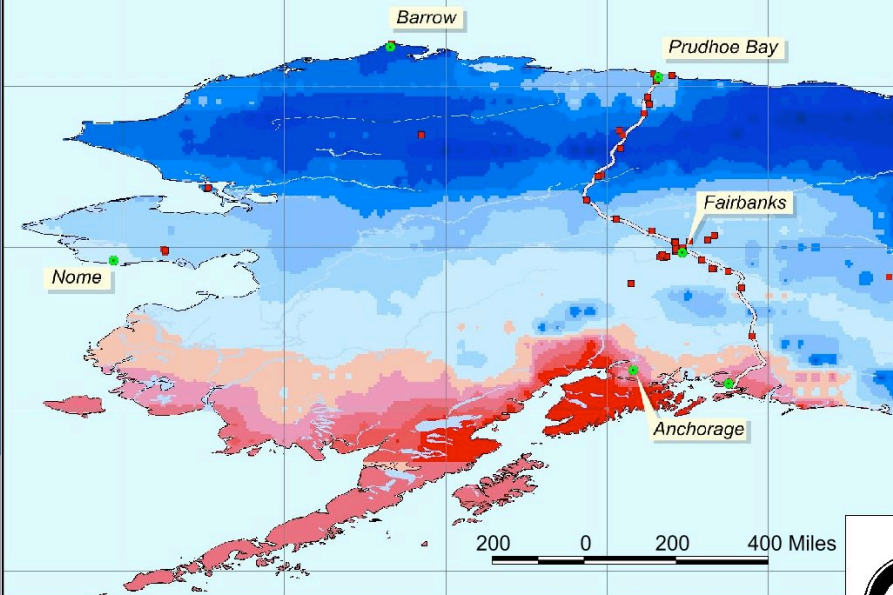


2030

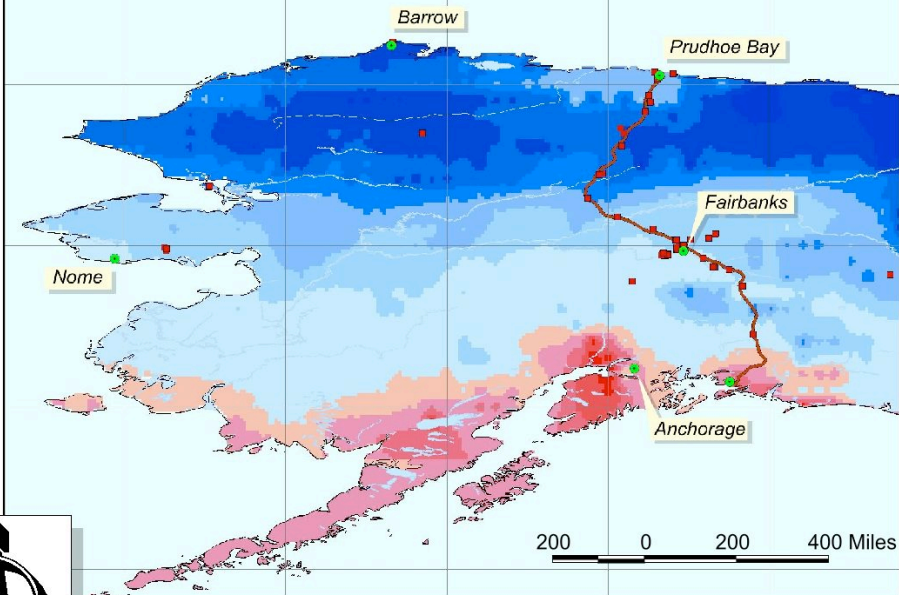
# Spatially Distributed Model of Permafrost Dynamics in Alaska



Mean Annual Temperature at 2 m Depth

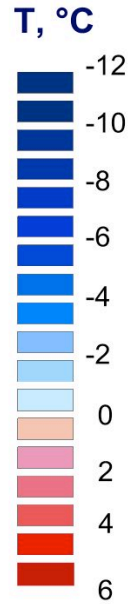


Mean Annual Temperature at 5 m Depth

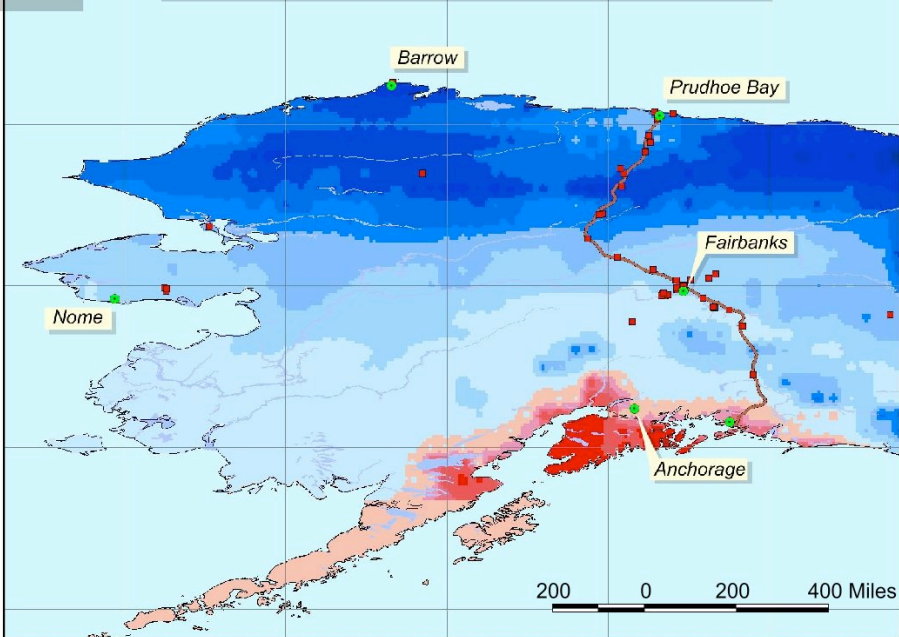


2035

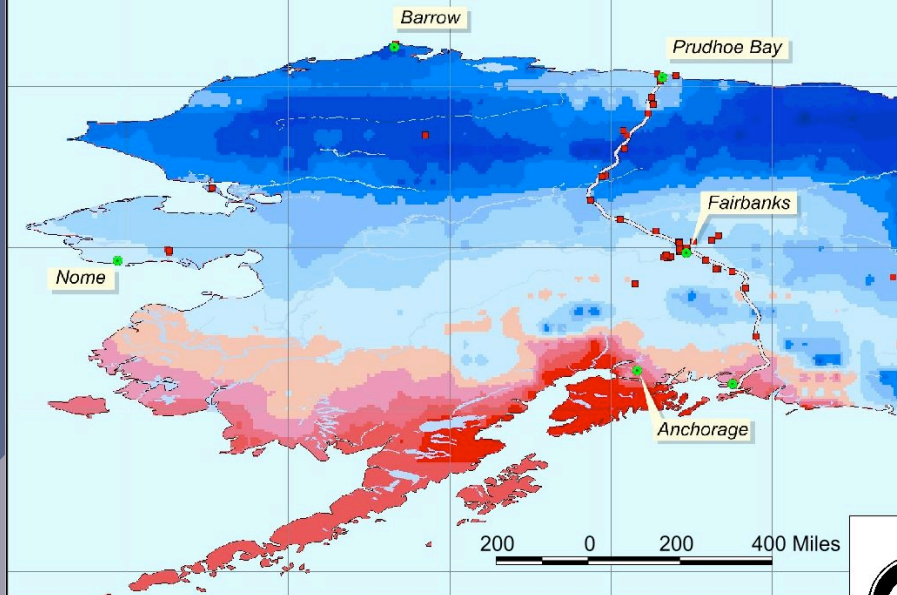
# Spatially Distributed Model of Permafrost Dynamics in Alaska



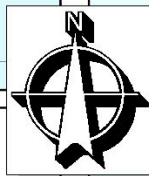
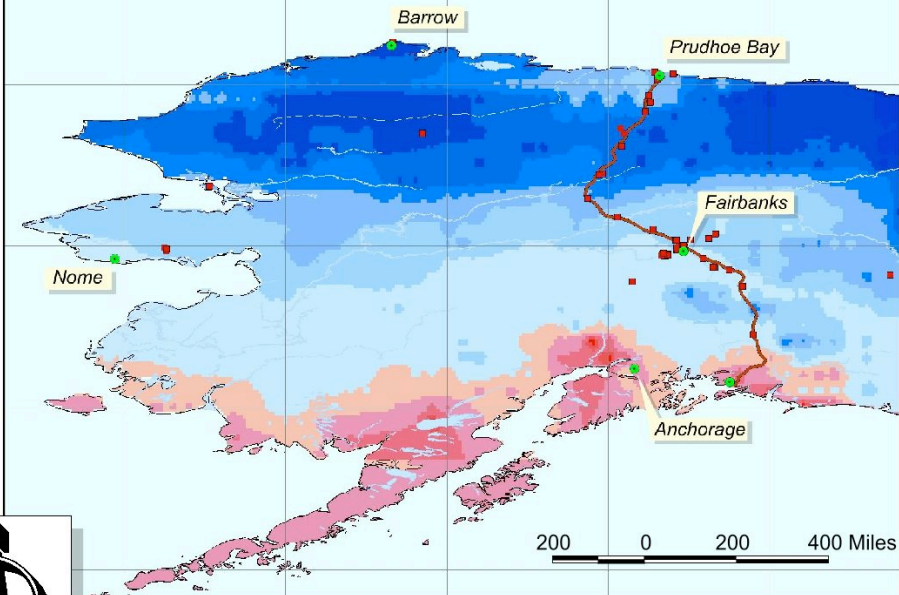
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

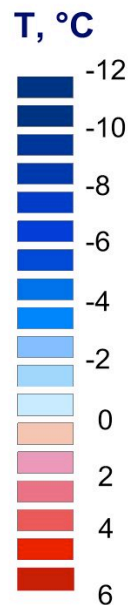


Mean Annual Temperature at 5 m Depth

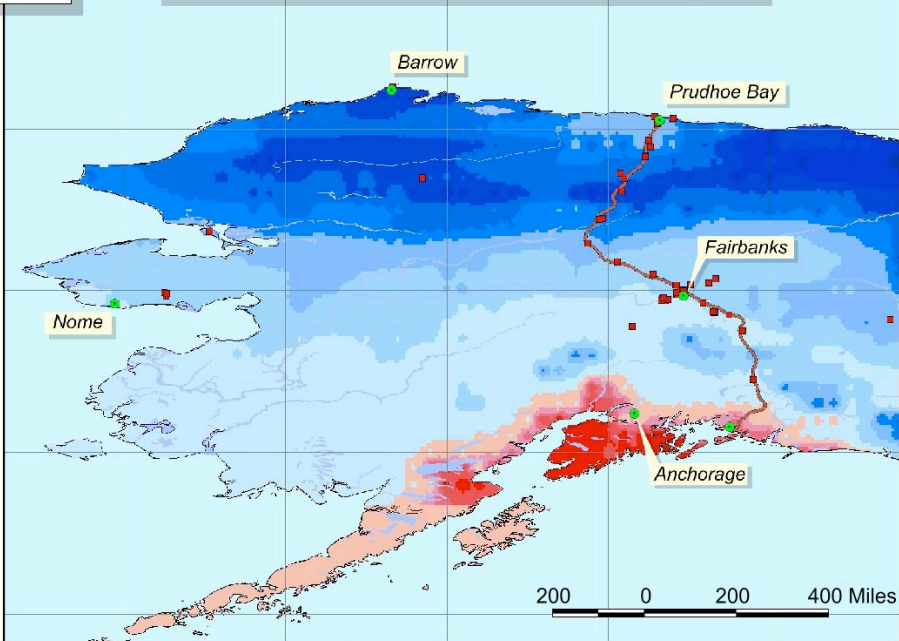


2040

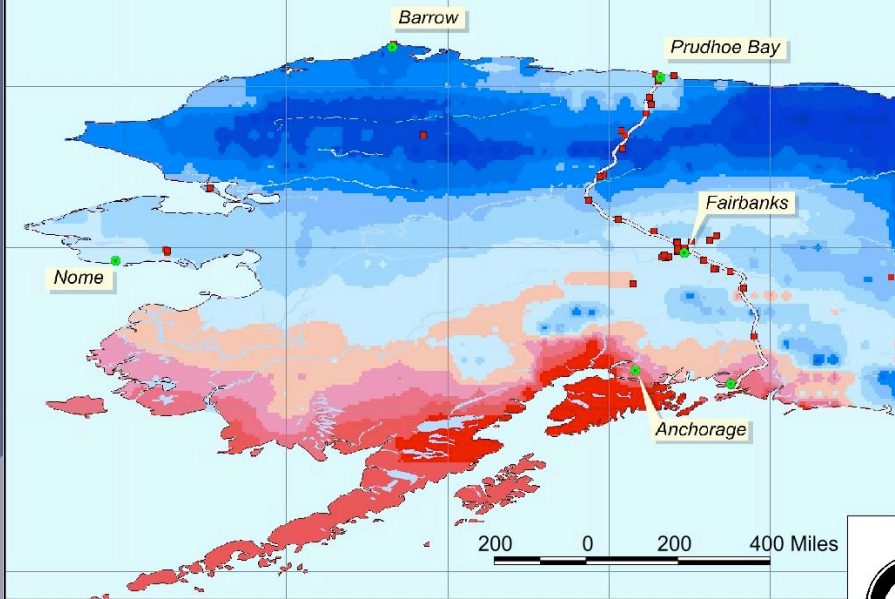
# Spatially Distributed Model of Permafrost Dynamics in Alaska



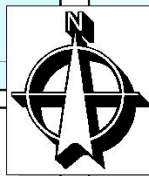
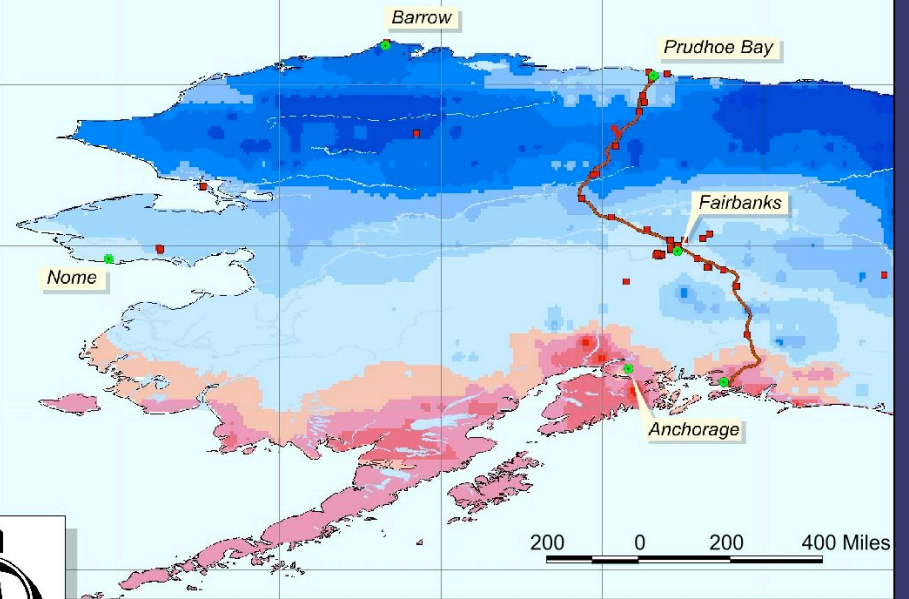
Mean Annual Temperature at 20 m Depth



Mean Annual Temperature at 2 m Depth

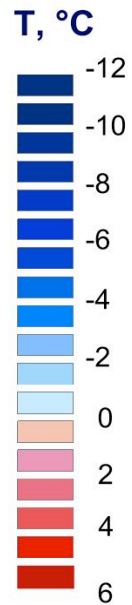


Mean Annual Temperature at 5 m Depth

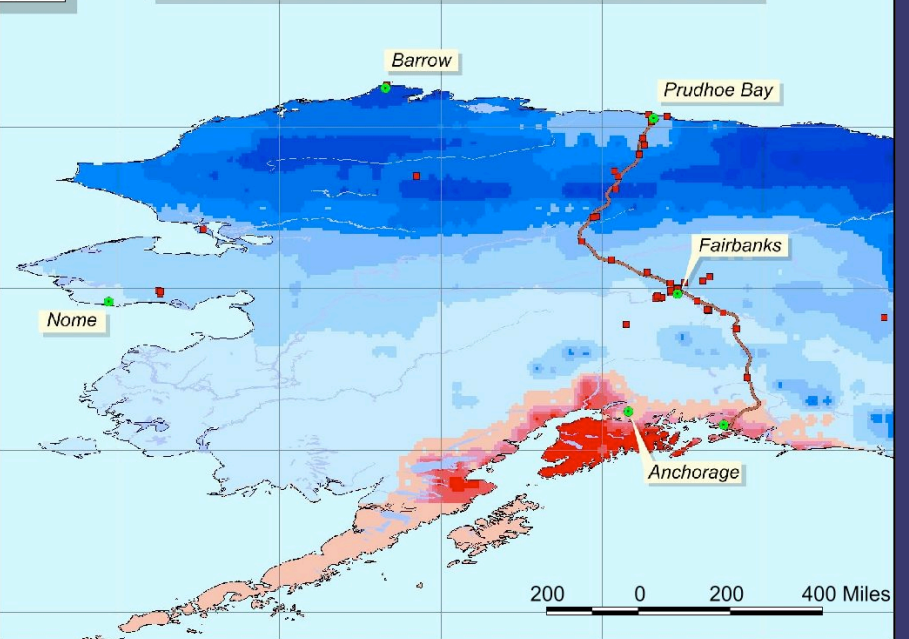


2045

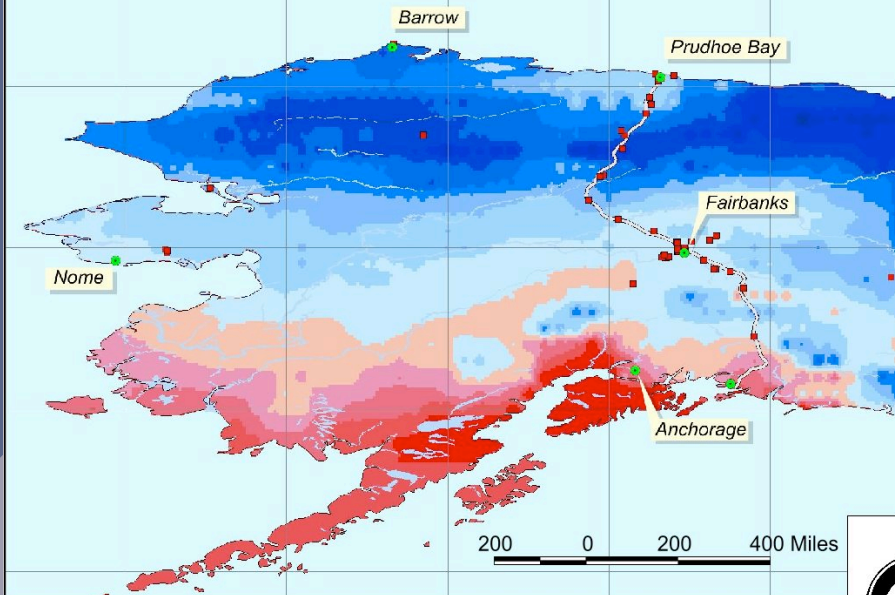
# Spatially Distributed Model of Permafrost Dynamics in Alaska



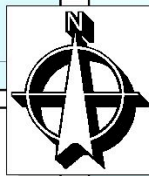
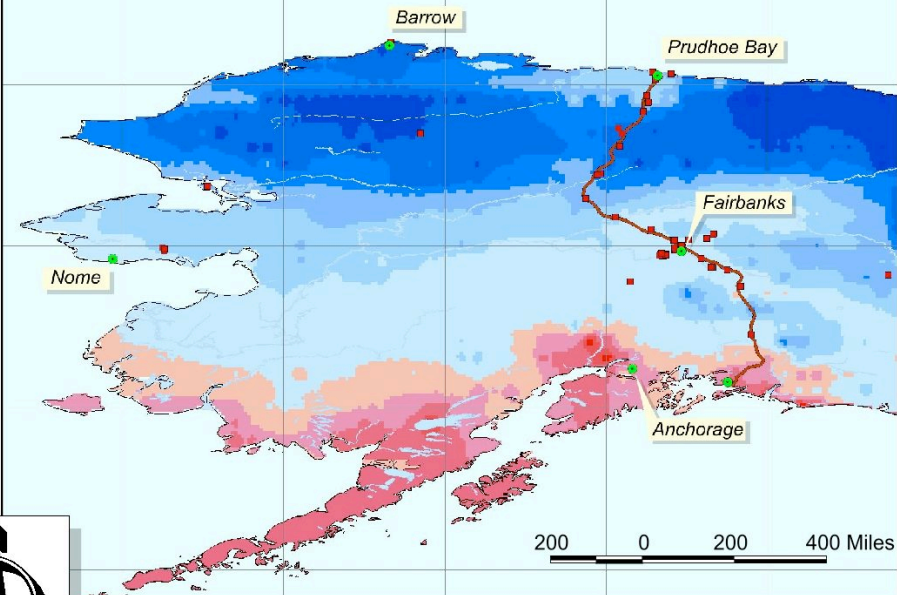
Mean Annual Temperature at 20 m Depth



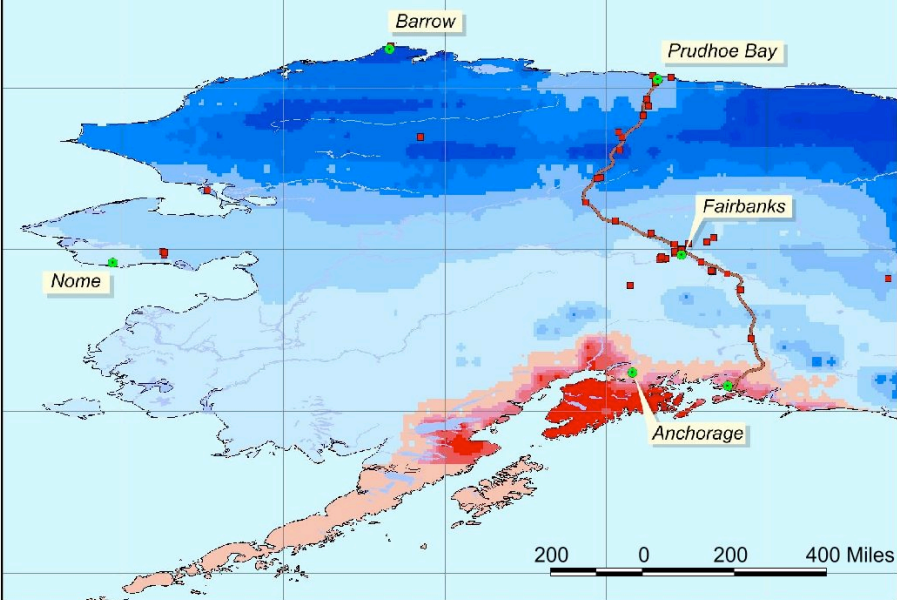
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

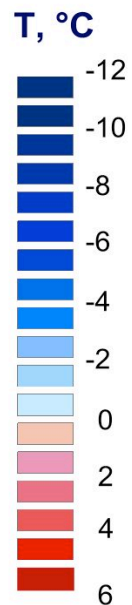


Mean Annual Temperature at 20 m Depth



2050

# Spatially Distributed Model of Permafrost Dynamics in Alaska





# Technical: Seismic

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**This rupture of the Tok Cutoff Highway in Alaska resulted from a magnitude 7.9 earthquake along the Denali Fault in 2002.**



**Peter Haeussler, USGS, prepares to measure the offset of a crevasse on the Canwell Glacier.**

# Economic

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

# Economic: Financing a \$26+ Billion Enterprise

## ❖ Federal Loan Guarantees

- ❖ Public Law 108-324, Section 116
- ❖ \$18 Billion in 2004 U.S. dollars



# Economic: Infrastructure

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- ❖ Approximately \$1 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

## Economic: Steel

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

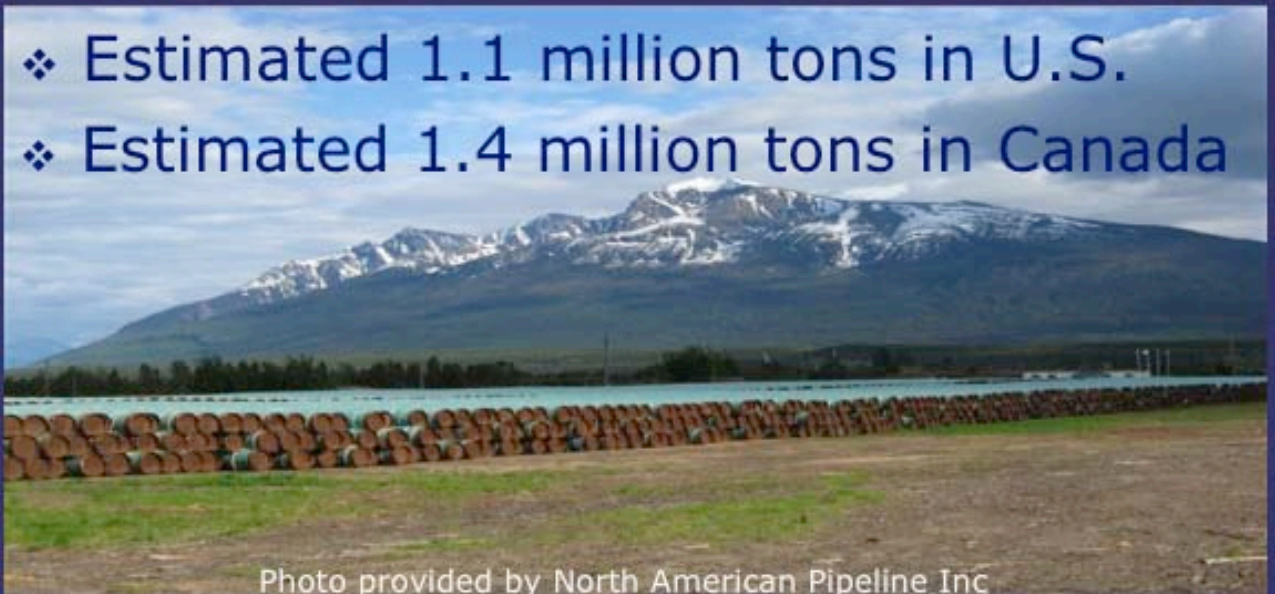
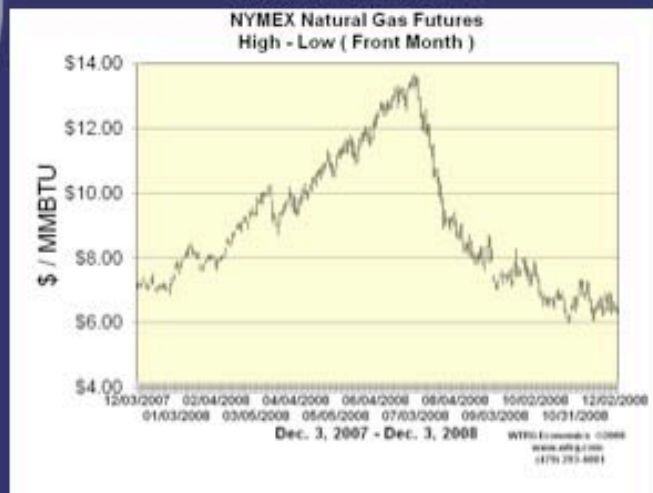


Photo provided by North American Pipeline Inc

# Economic: Training/Retaining Qualified Labor



# Economic: Natural Gas Prices



Major US shale basins.



# POLITICS!



# The Competitors



# Key Players

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- ❖ Federal Governments
- ❖ State, Provincial and Territorial Governments
- ❖ Municipal Governments
- ❖ Stakeholders

# Process Related Issues

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- ❖ Permitting
- ❖ Environmental Review
- ❖ Consultations

# Process: U.S. Federal Agencies

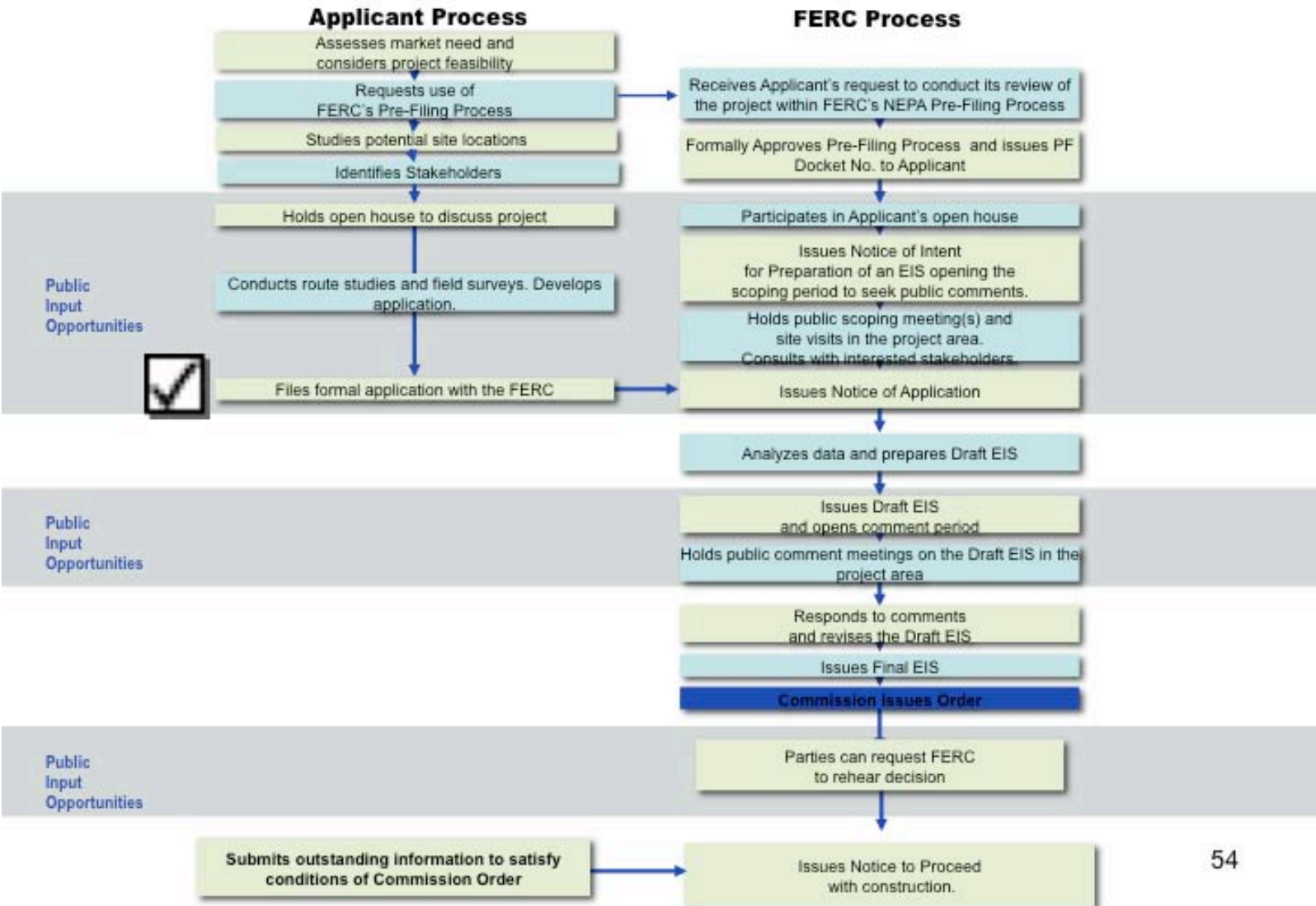
- **Office of Federal Coordinator**
- **Council on Environmental Quality**
- **Federal Energy Regulatory Commission**
- **Department of Interior**
  - Bureau of Land Management
  - Bureau of Indian Affairs
  - U.S. Fish and Wildlife Service
  - Minerals Management Service
  - National Park Service
  - 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**

## Process: Environmental Review

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- ❖ Canadian, NPA or NEB
- ❖ State of Alaska
- ❖ U.S. Federal, including NEPA

# FERC Pre-Filing Environmental Review Process



# Process: FERC Resource Reports

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- 1) General Project Description
- 2) Water Use and Quality
- 3) Fish, Wildlife and Vegetation
- 4) Cultural Resources
- 5) Socioeconomics
- 6) Geological Resources
- 8) Soils
- 9) Land Use, Recreation and Aesthetics
- 10) Air and Noise Quality
- 11) Alternatives
- 12) Reliability and Safety

For more information on each report, you can find the FERC regulations at [http://edocket.access.gpo.gov/cfr\\_2005/aprqttr/pdf/18cfr380.12.pdf](http://edocket.access.gpo.gov/cfr_2005/aprqttr/pdf/18cfr380.12.pdf)

# Process: Government-To-Government

## Consultations with Directly and Indirectly Affected Alaska Natives





# Process: Consultations

- ❖ Cultural and Historic Sites

- ❖ National Historic Preservation Act, Section 106





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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**

**<http://www.arcticgas.gov>  
[info@arcticgas.gov](mailto:info@arcticgas.gov)**