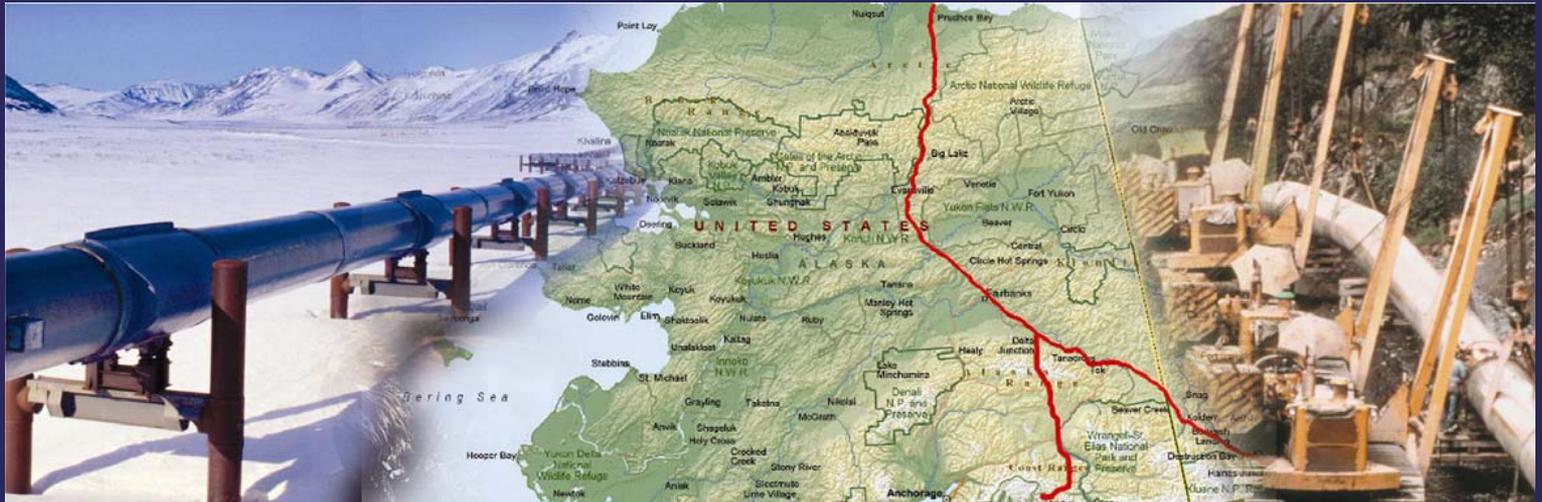


Alaska's Natural Gas Pipeline: Closer to Reality?

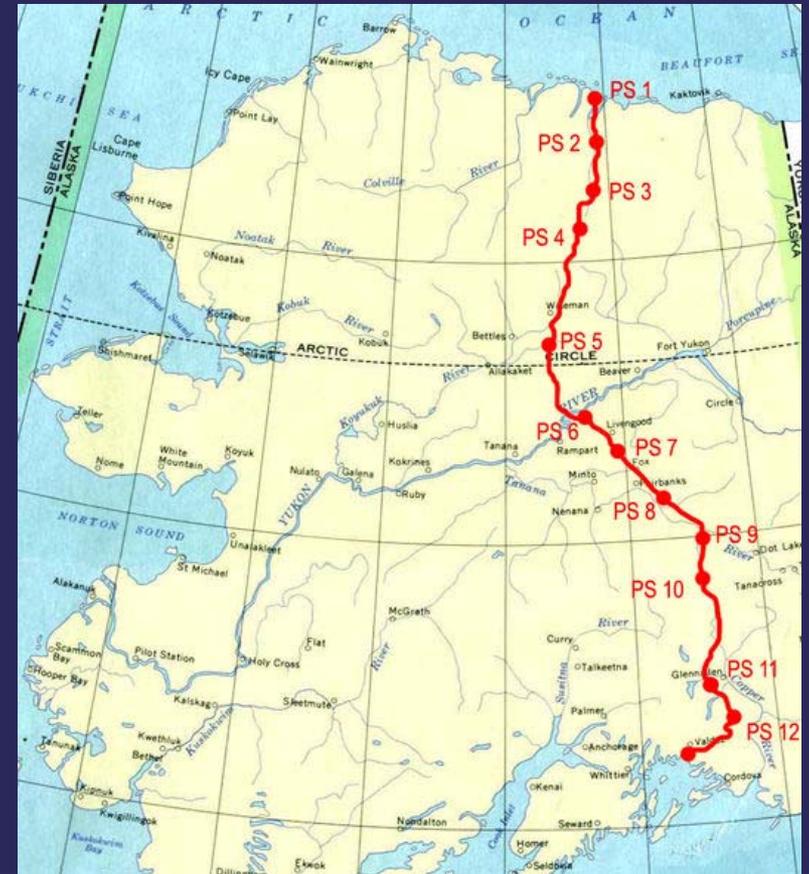


Drue Pearce
Federal Coordinator
Office of the Federal Coordinator for
Alaska Natural Gas Transportation Projects
5th Annual Pipeline Opportunities Conference
March 11, 2009

Pipeline Projects

- ❖ Past
 - ❖ TAPS
 - ❖ ANGTA
- ❖ Present
 - ❖ ANGPA

TAPS



ANGPA



Planned Pipeline Projects

- ❖ 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

❖ 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?

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

What are the Challenges?

Technical
Economic
Political
Process

Technical

- ❖ 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

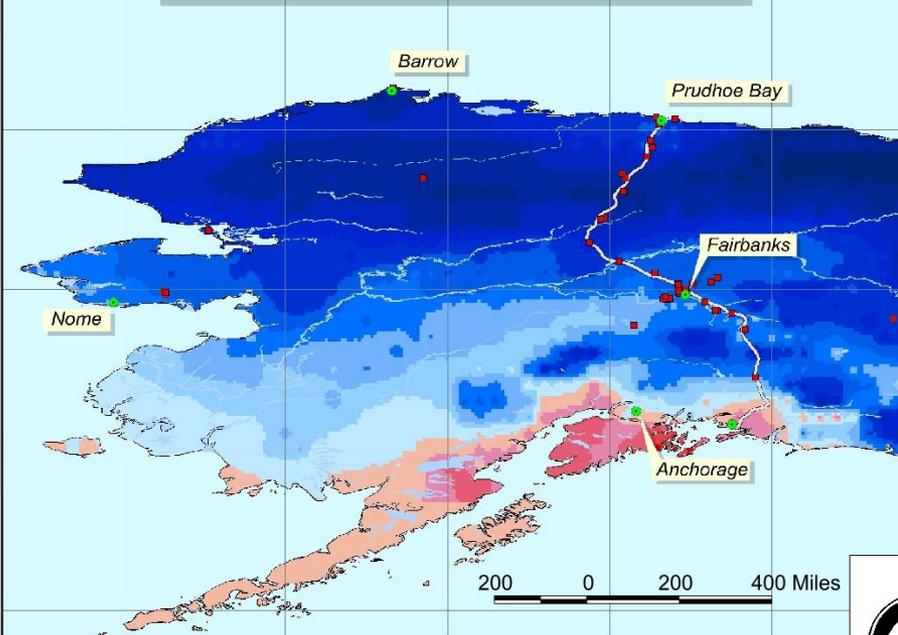


Photos provided by North American Pipeline Inc

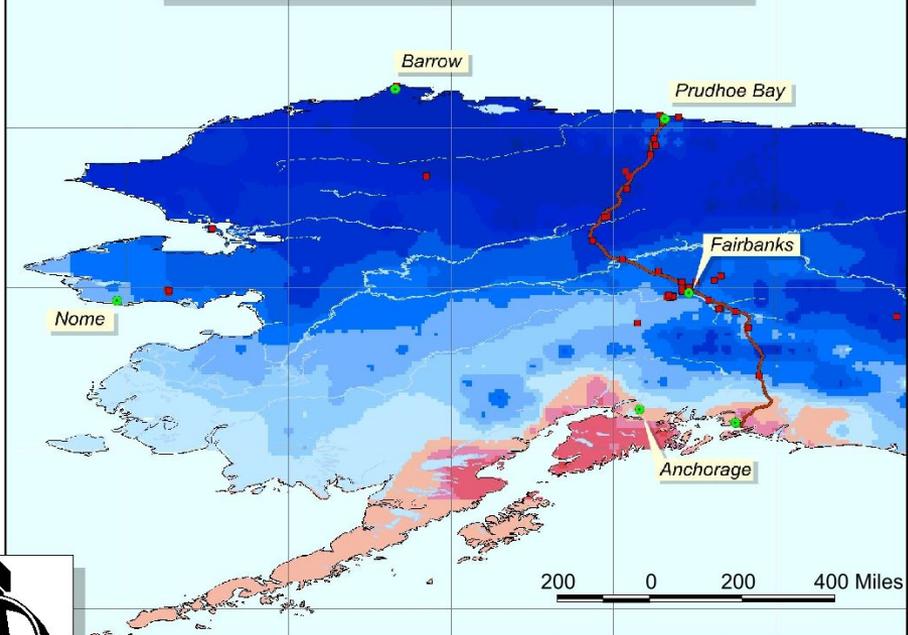
Technical: Pipeline Design

- ❖ 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

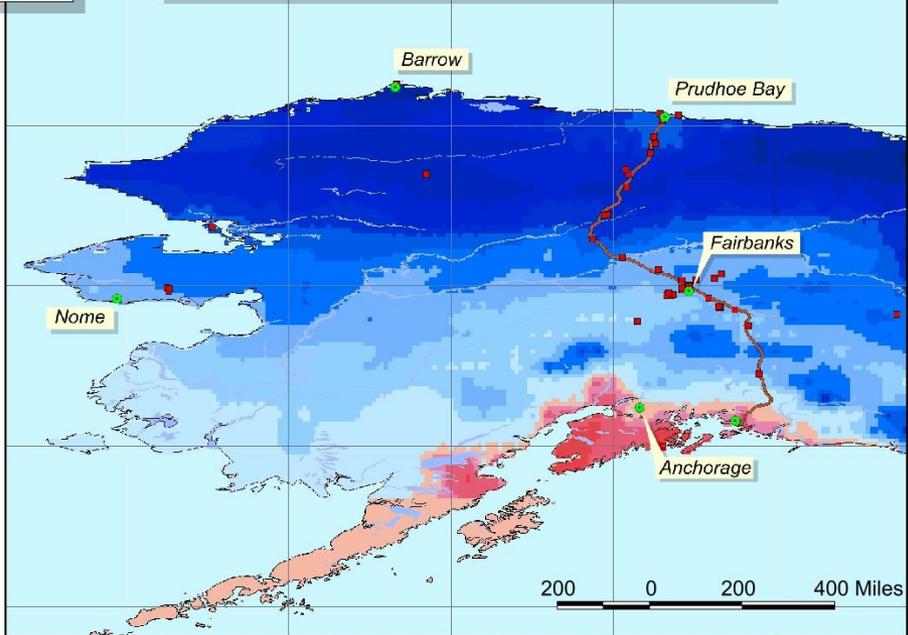
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

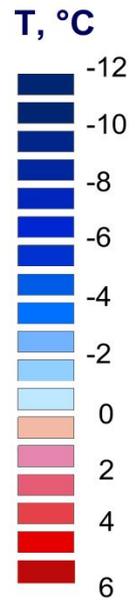


Mean Annual Temperature at 20 m Depth

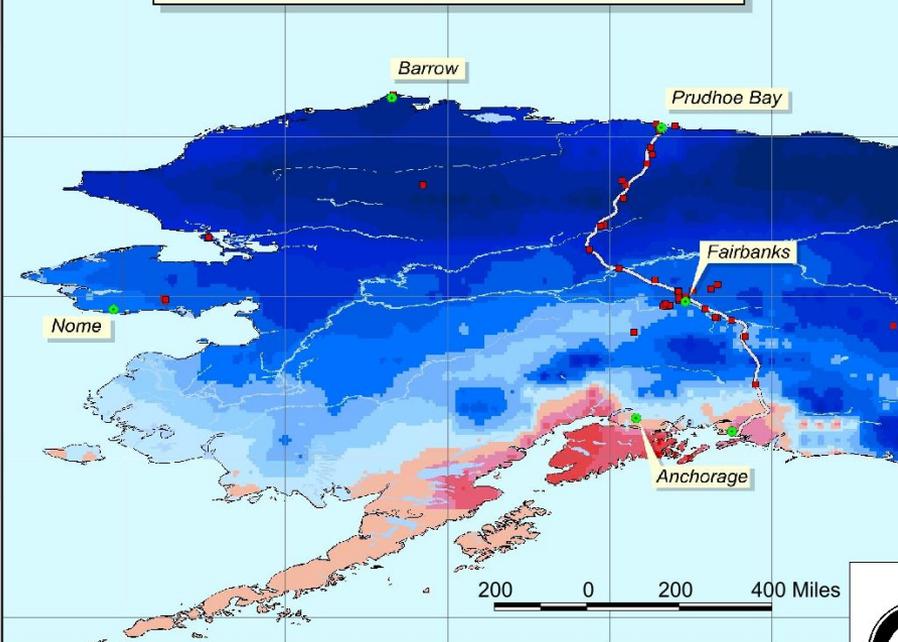


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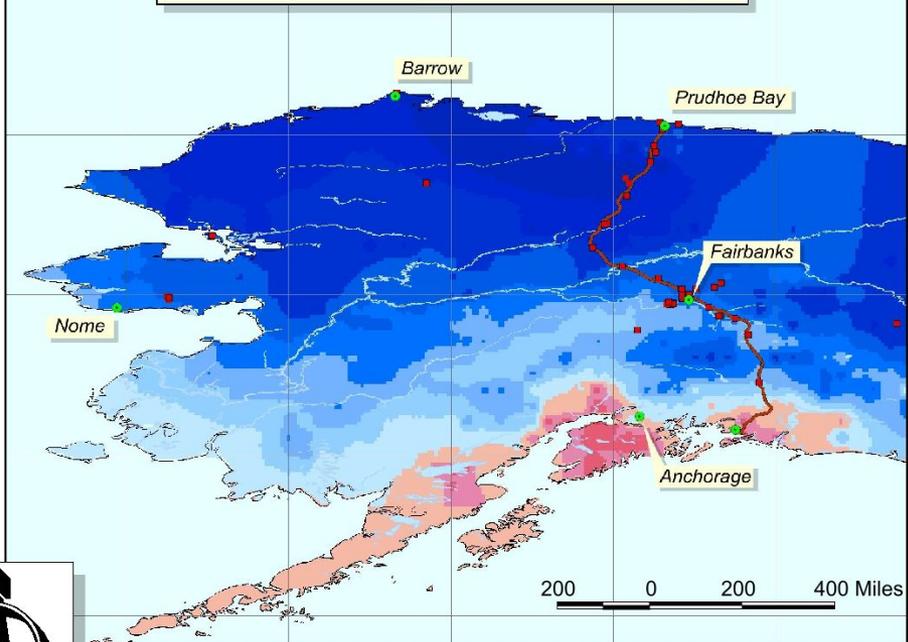
Spatially Distributed Model of Permafrost Dynamics in Alaska



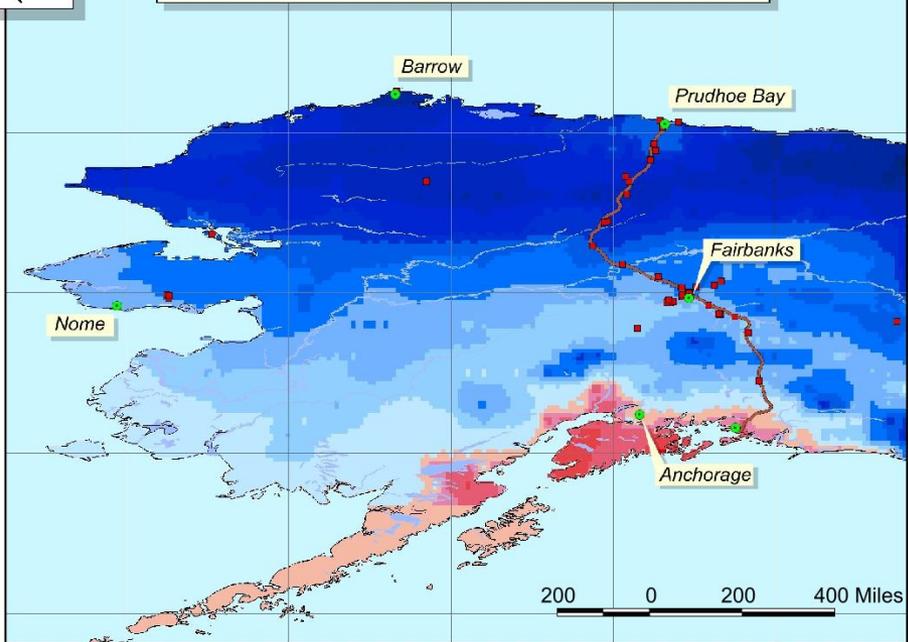
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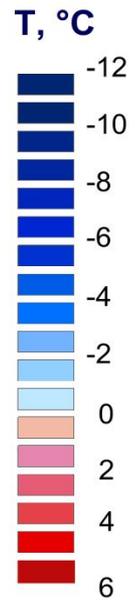


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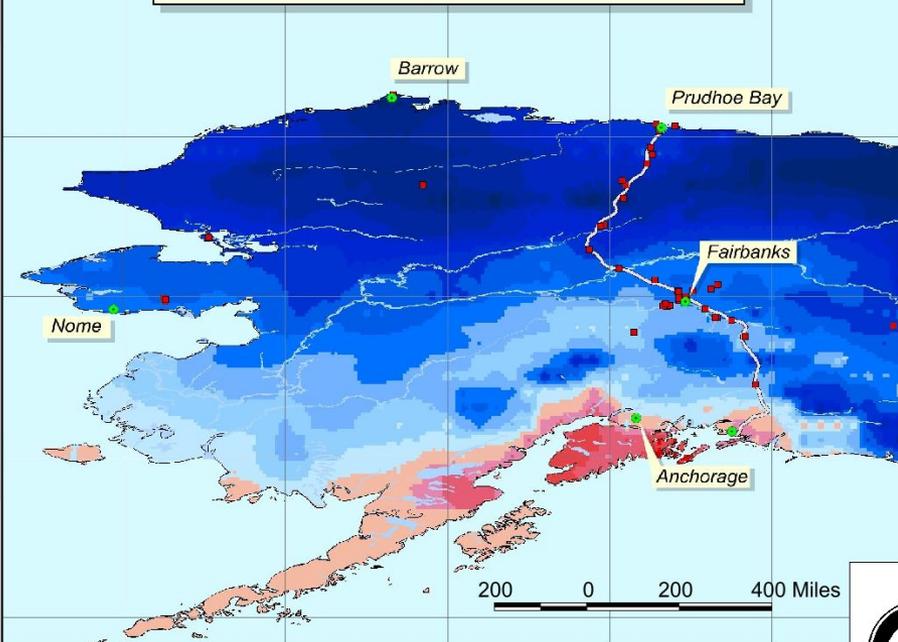


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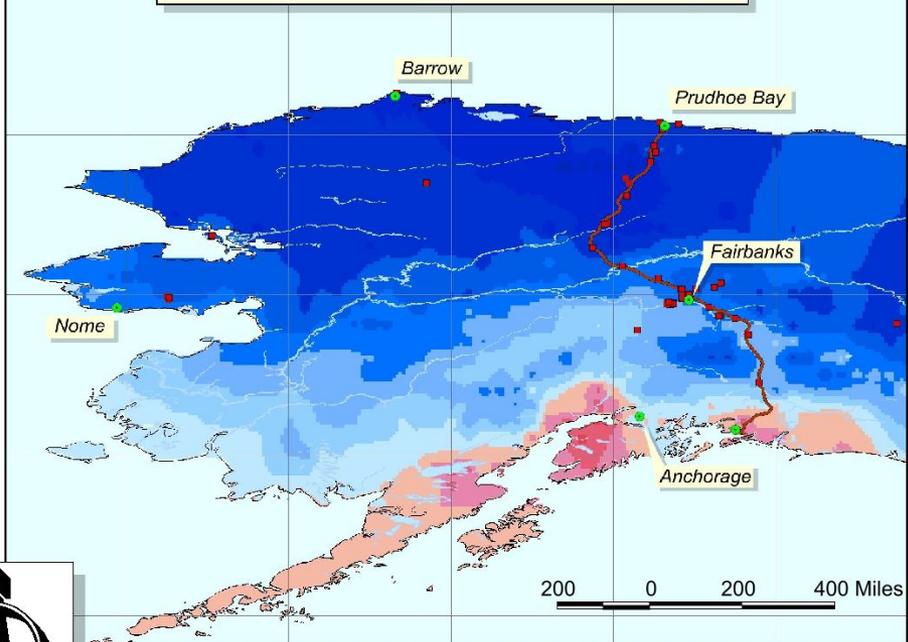
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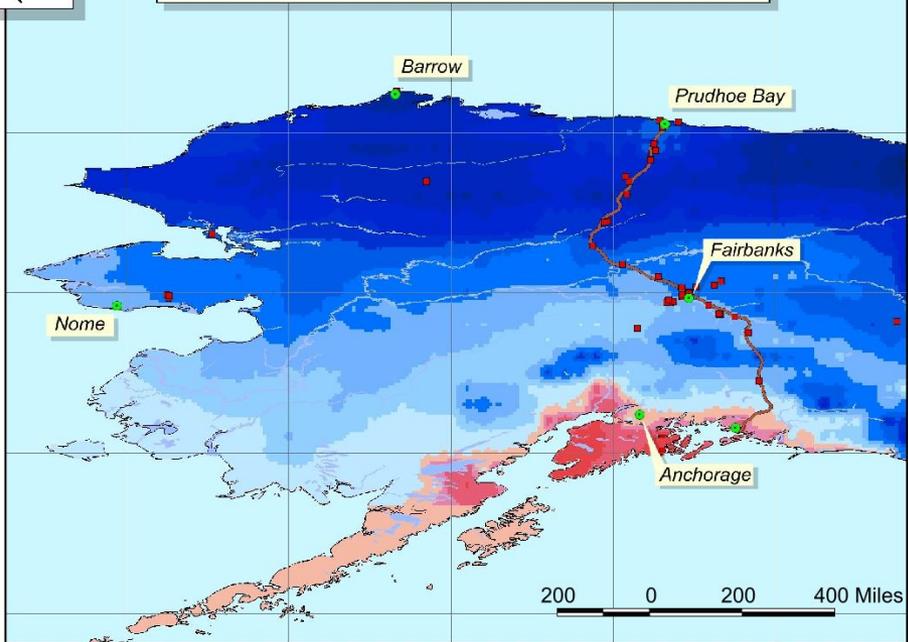
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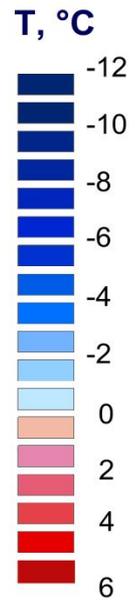


Mean Annual Temperature at 20 m Depth

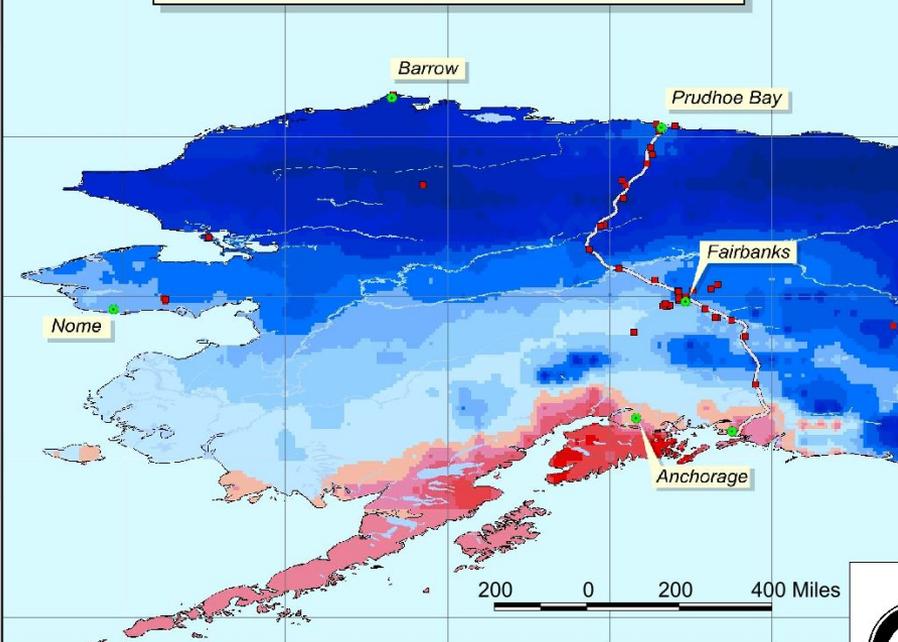


1970

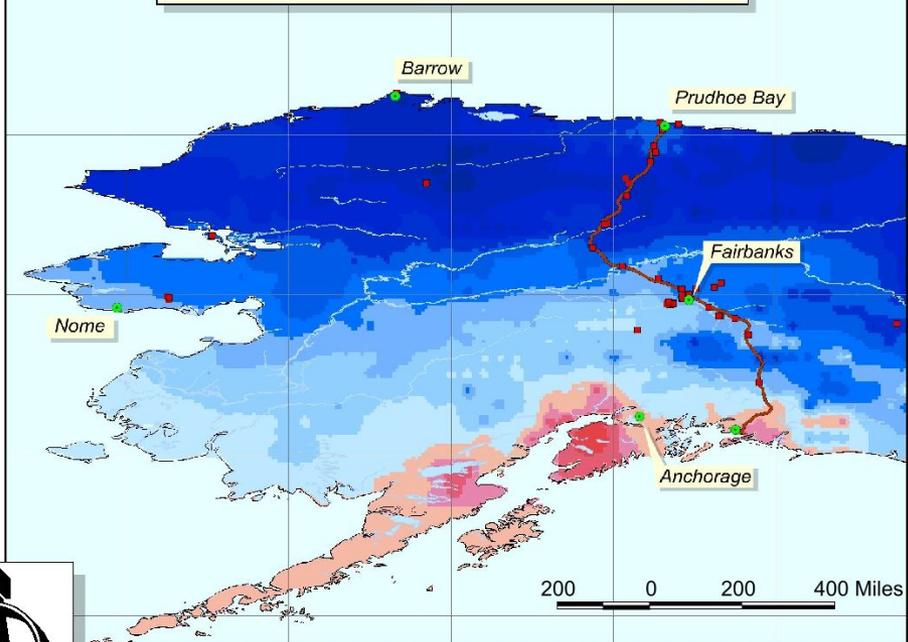
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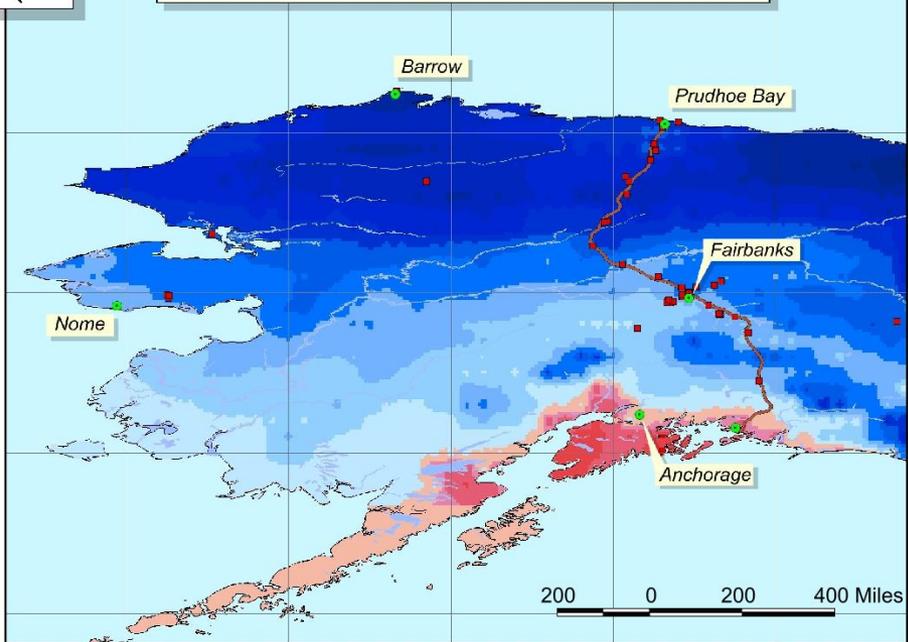
Mean Annual Temperature at 2 m Depth



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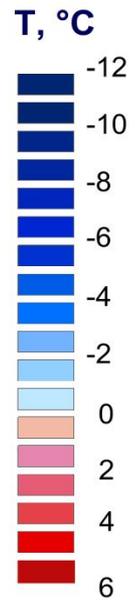


Mean Annual Temperature at 20 m Depth

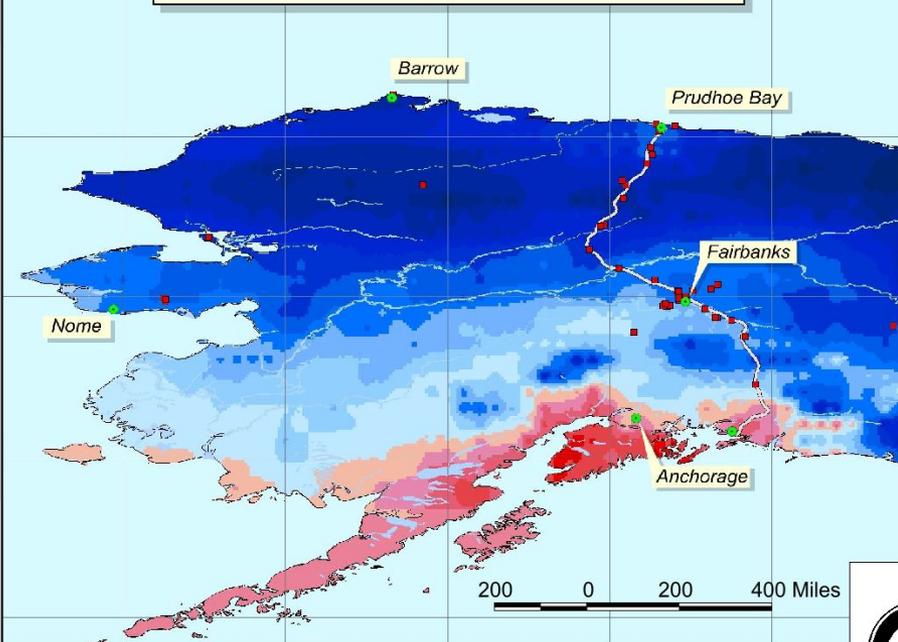


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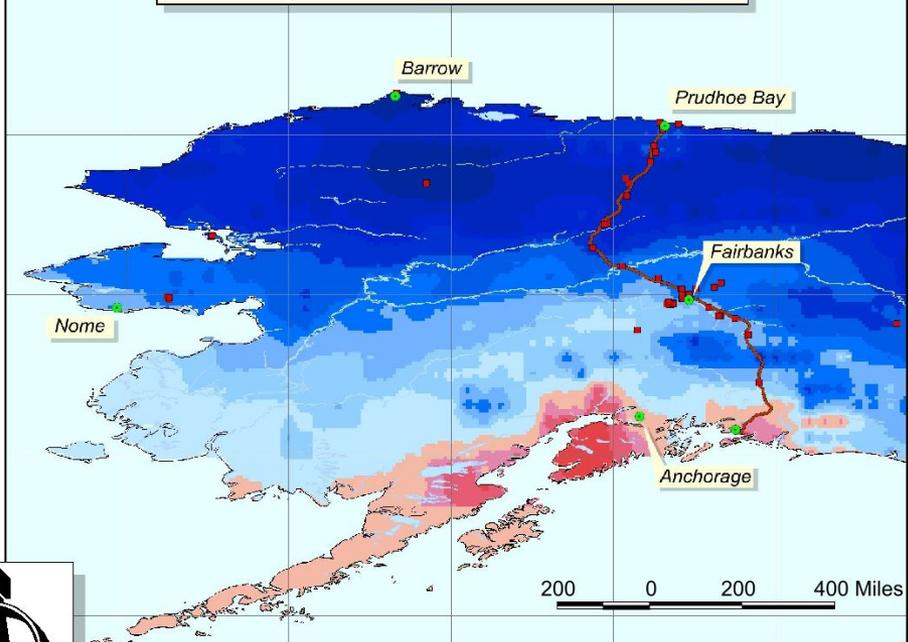
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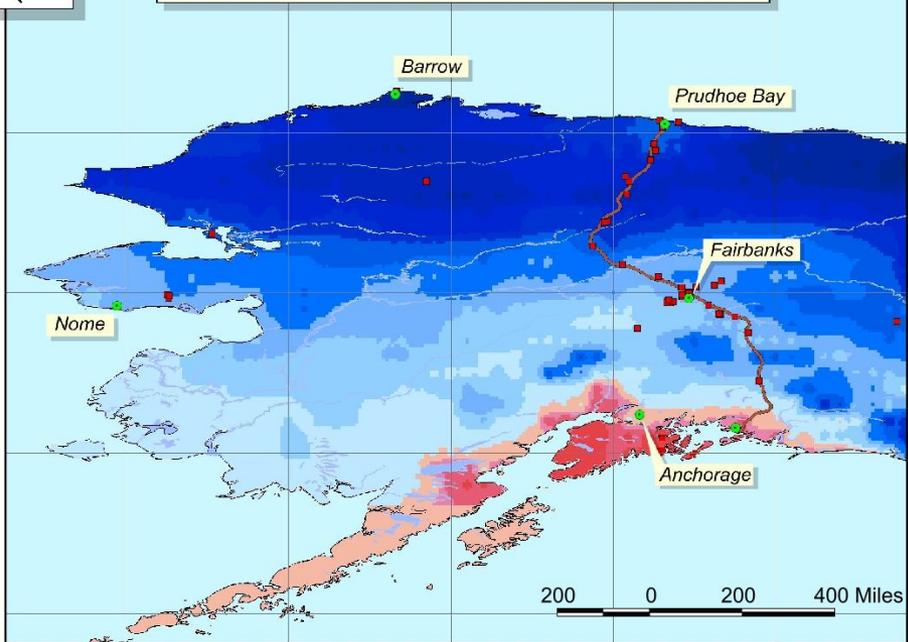
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

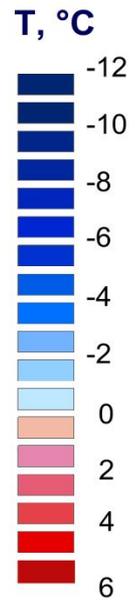


Mean Annual Temperature at 20 m Depth

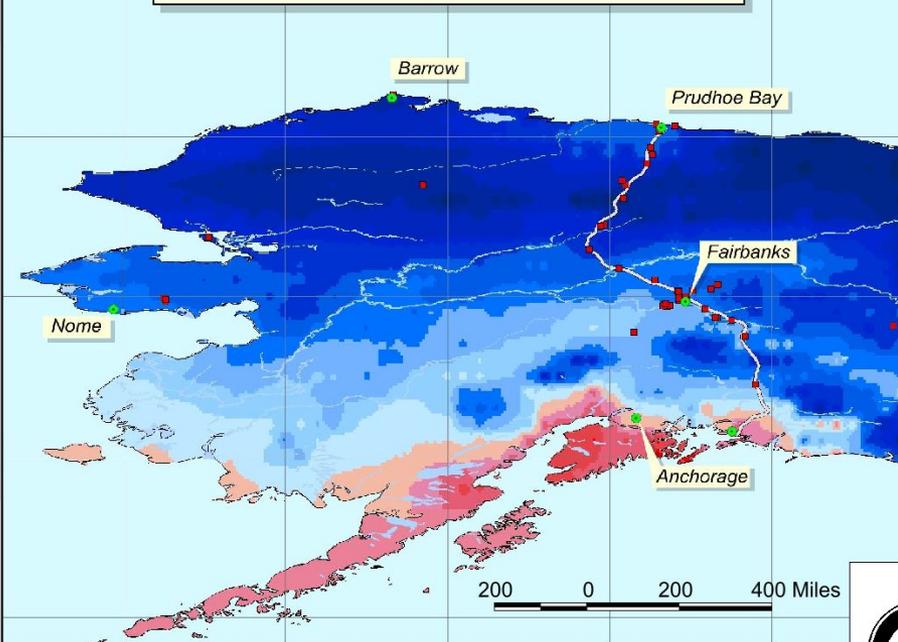


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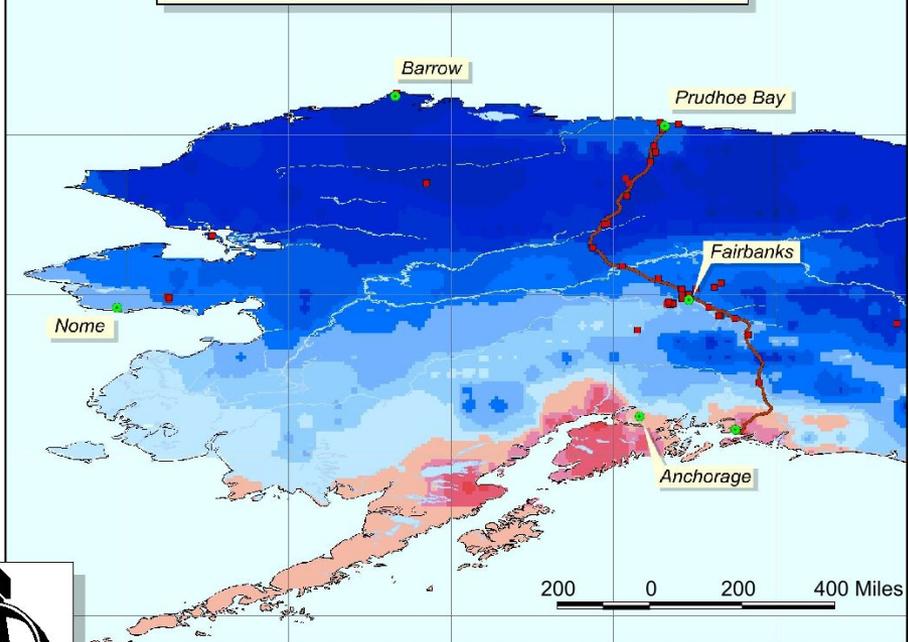
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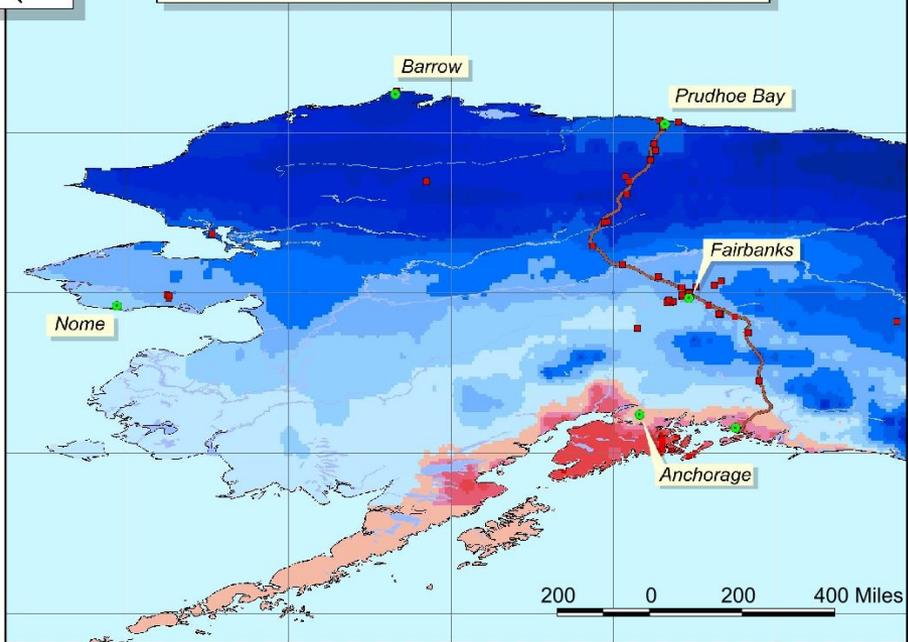
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

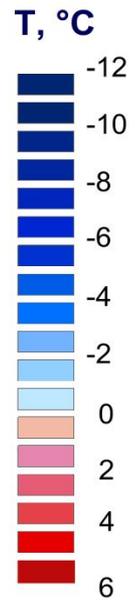


Mean Annual Temperature at 20 m Depth

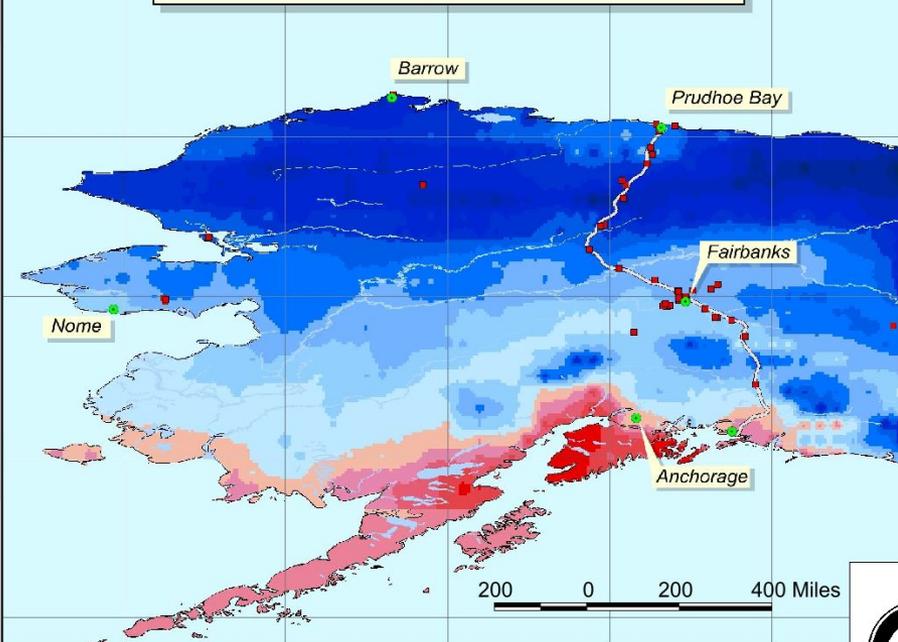


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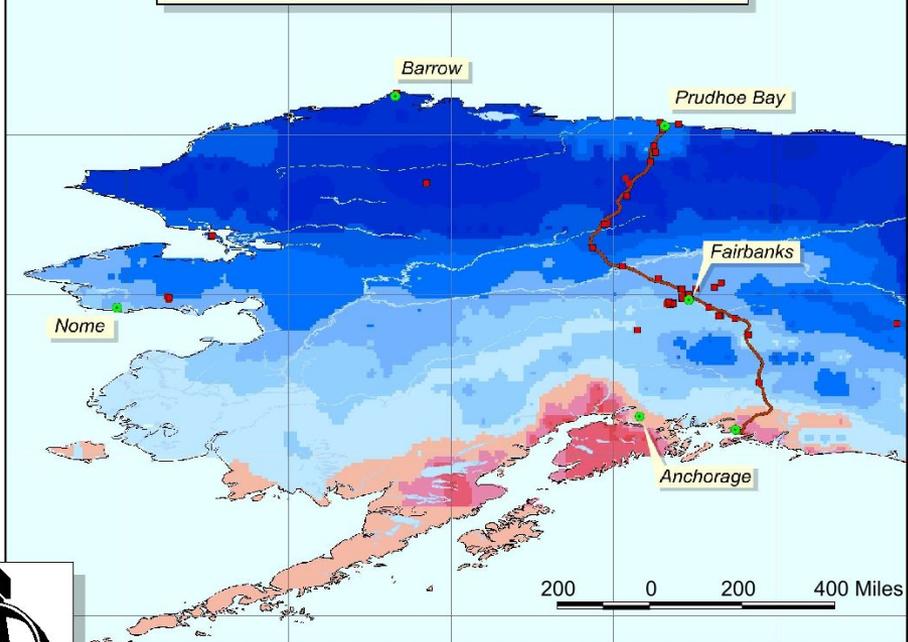
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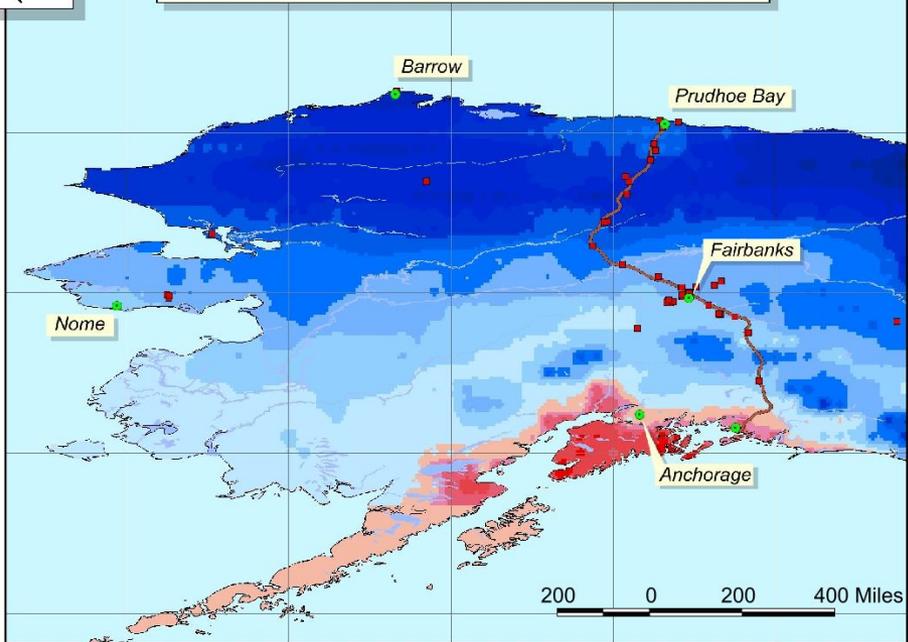
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

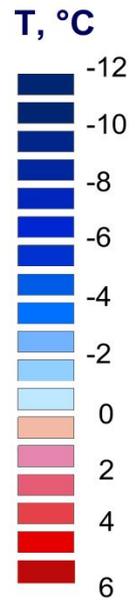


Mean Annual Temperature at 20 m Depth

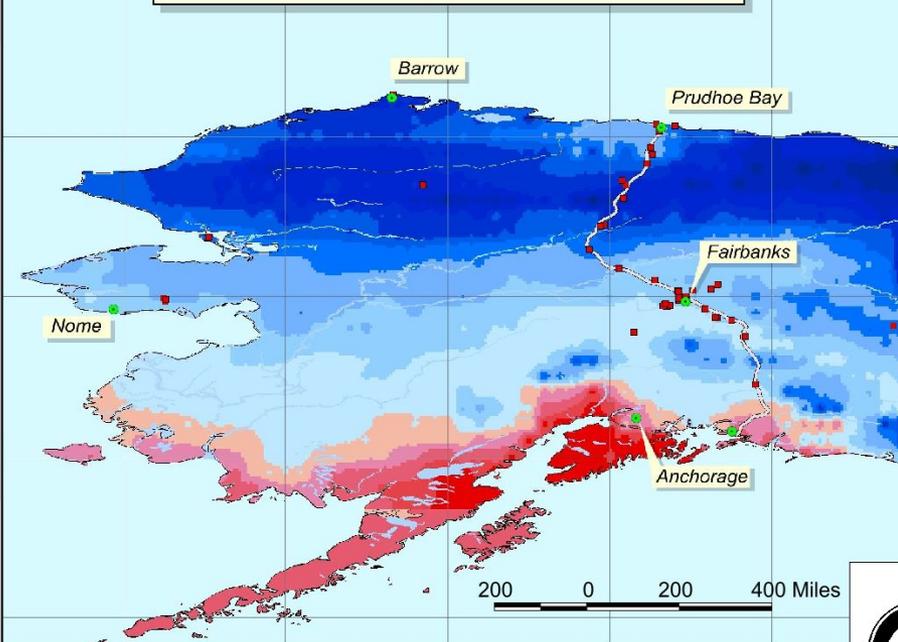


2010

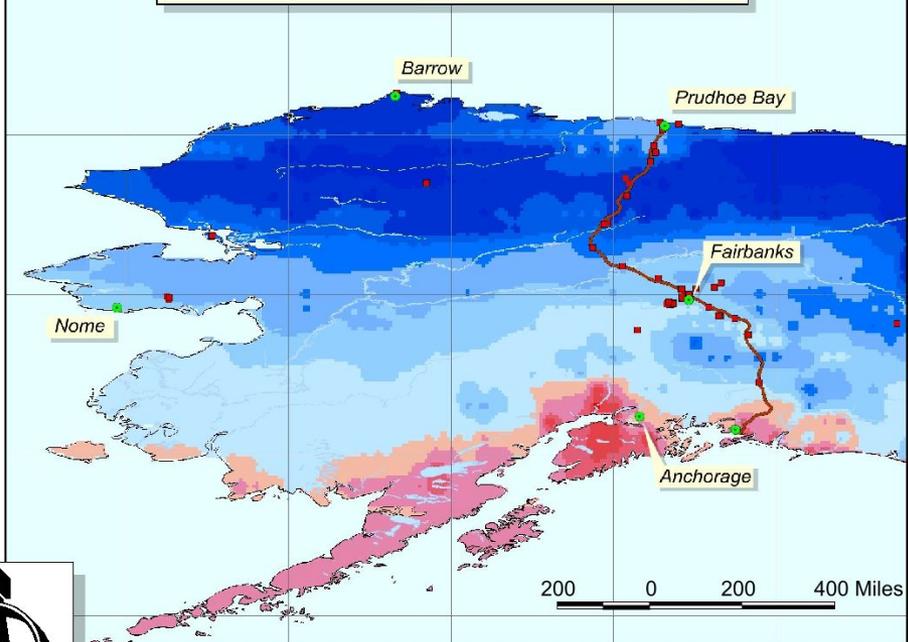
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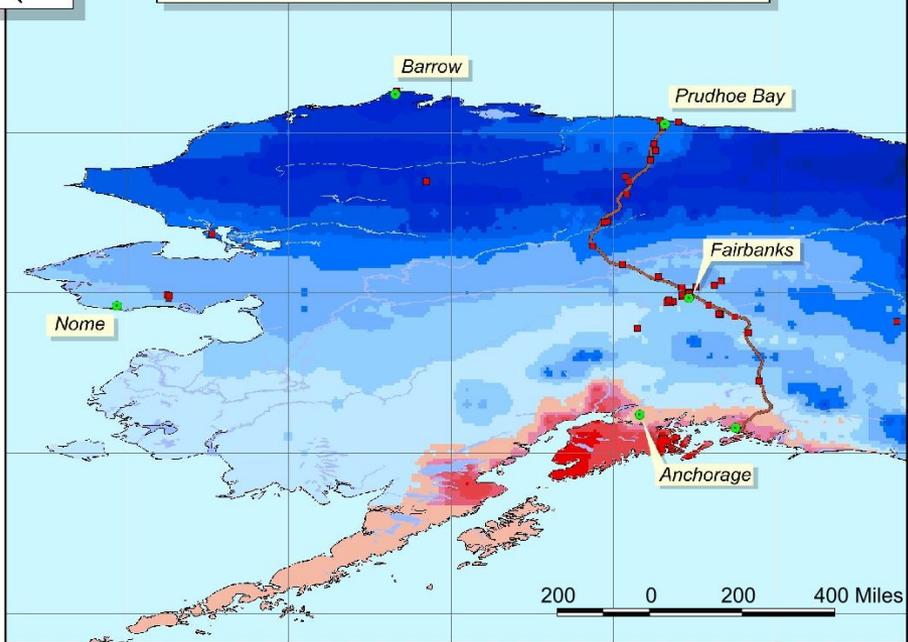
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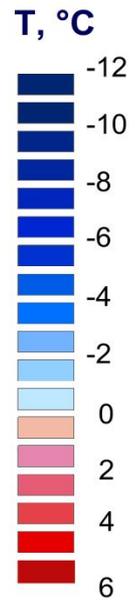


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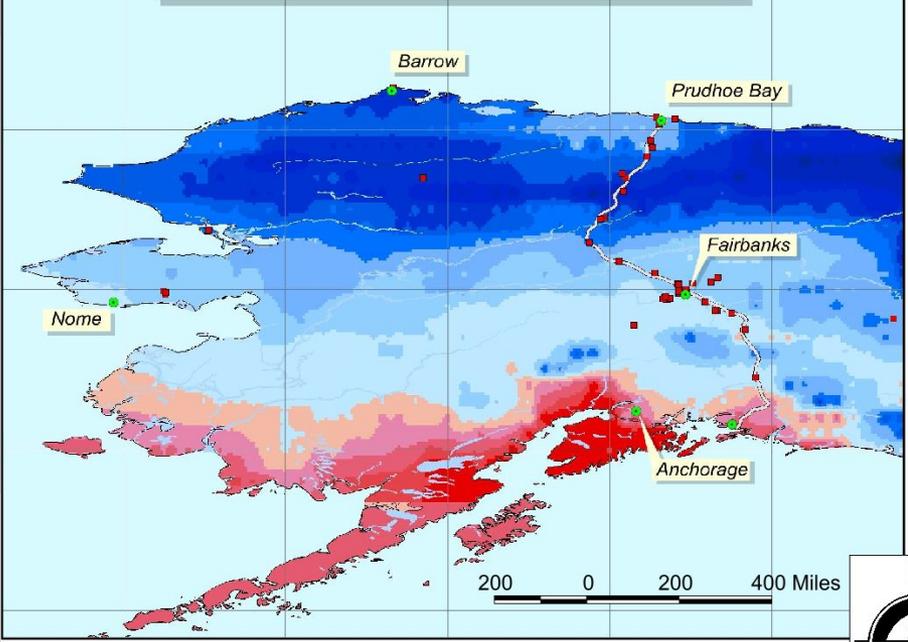


2020

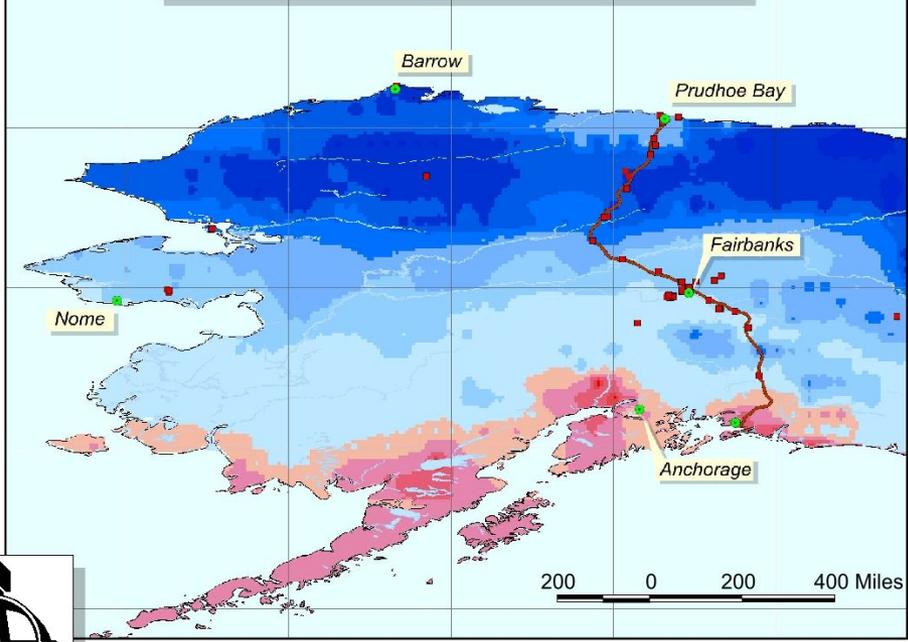
Spatially Distributed Model of Permafrost Dynamics in Alaska



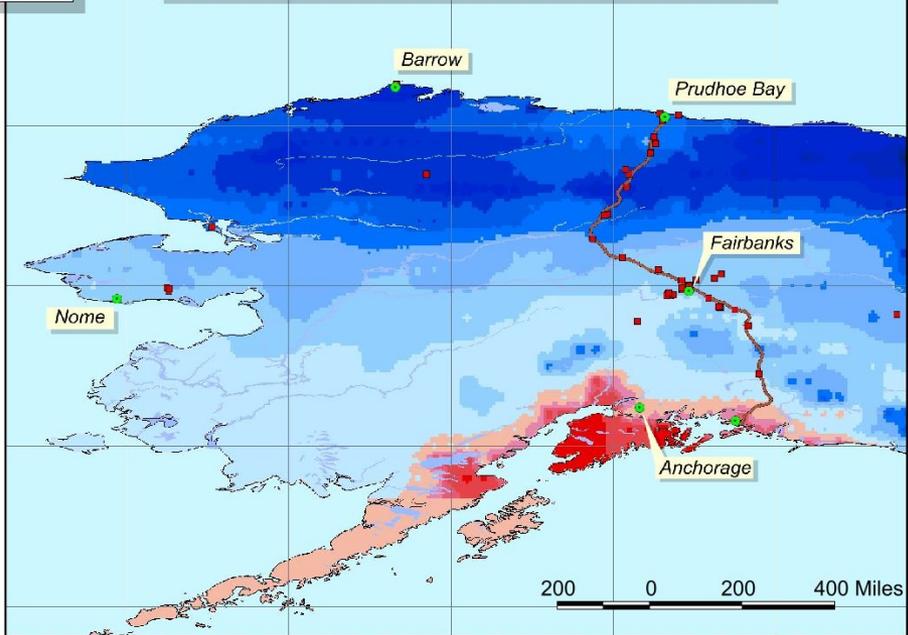
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

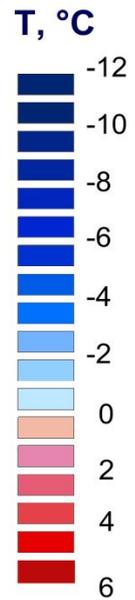


Mean Annual Temperature at 20 m Depth

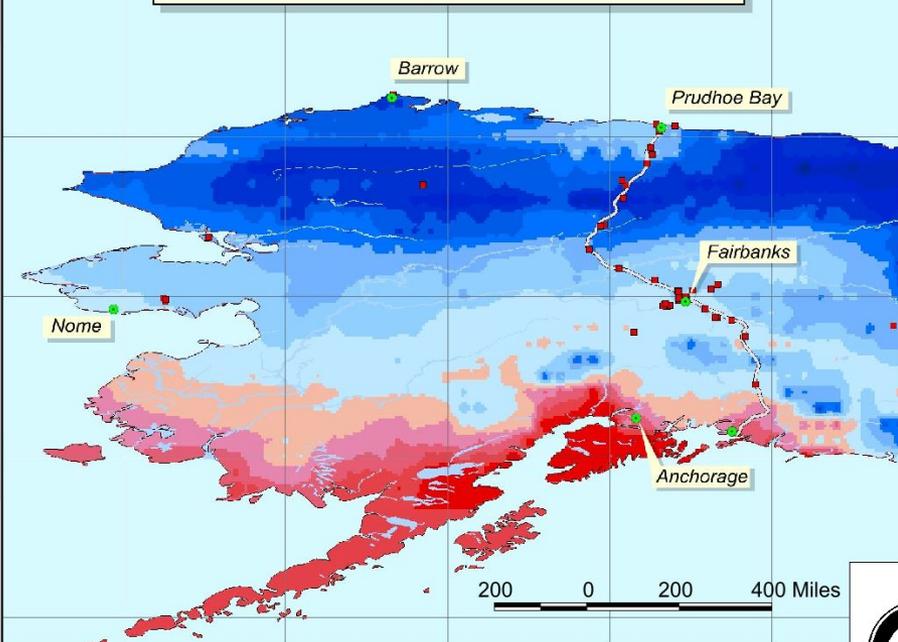


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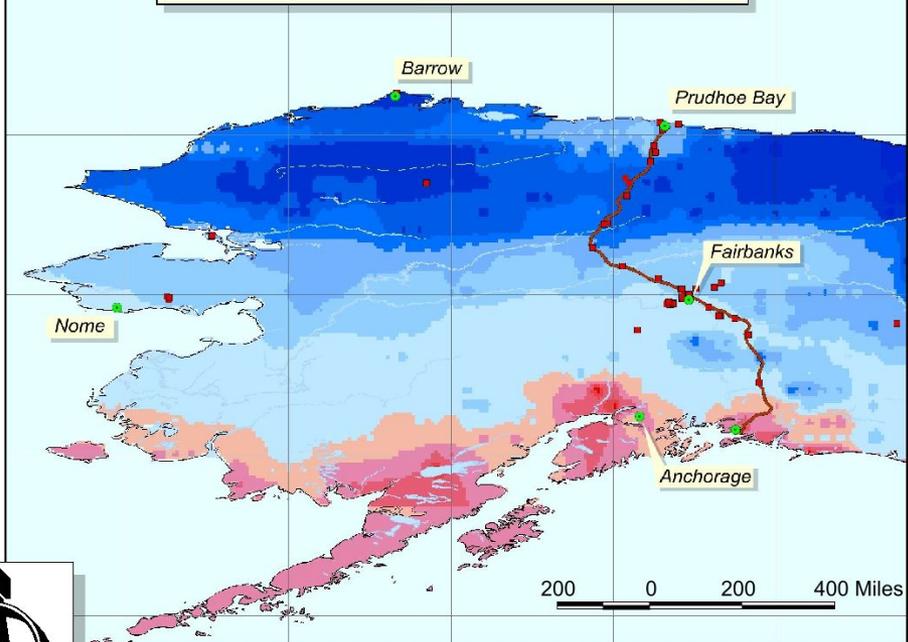
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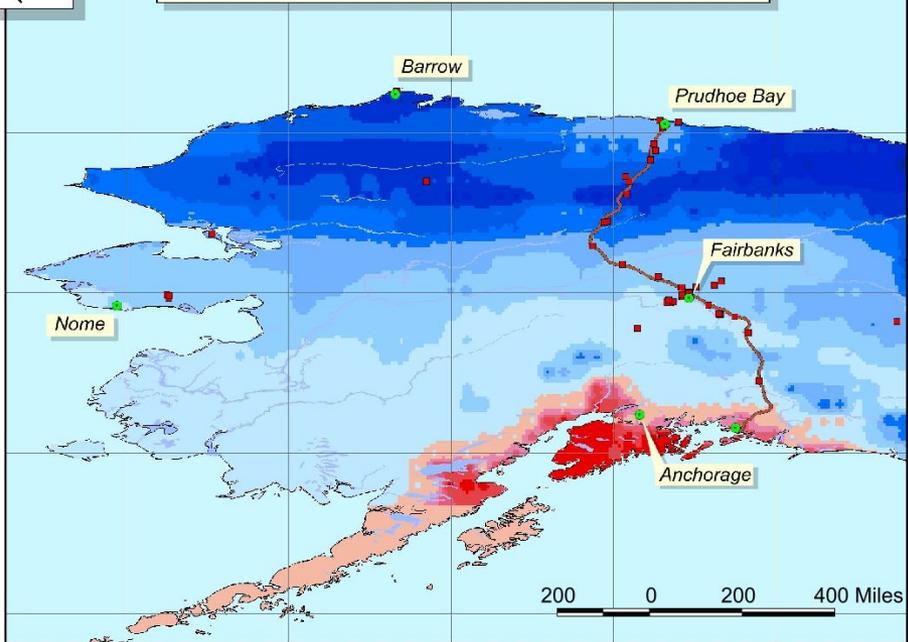
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

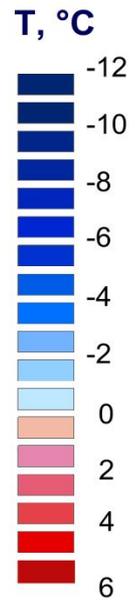


Mean Annual Temperature at 20 m Depth

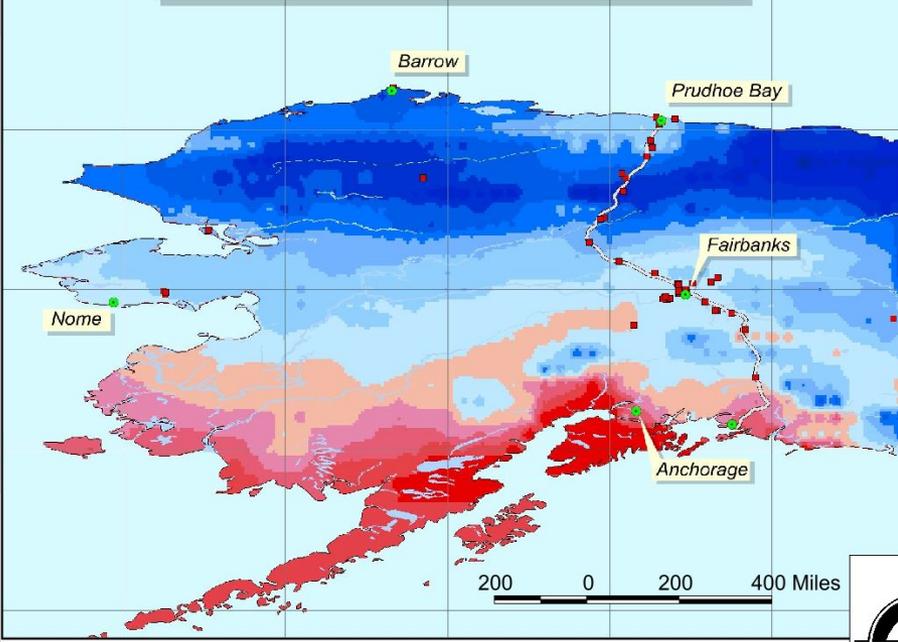


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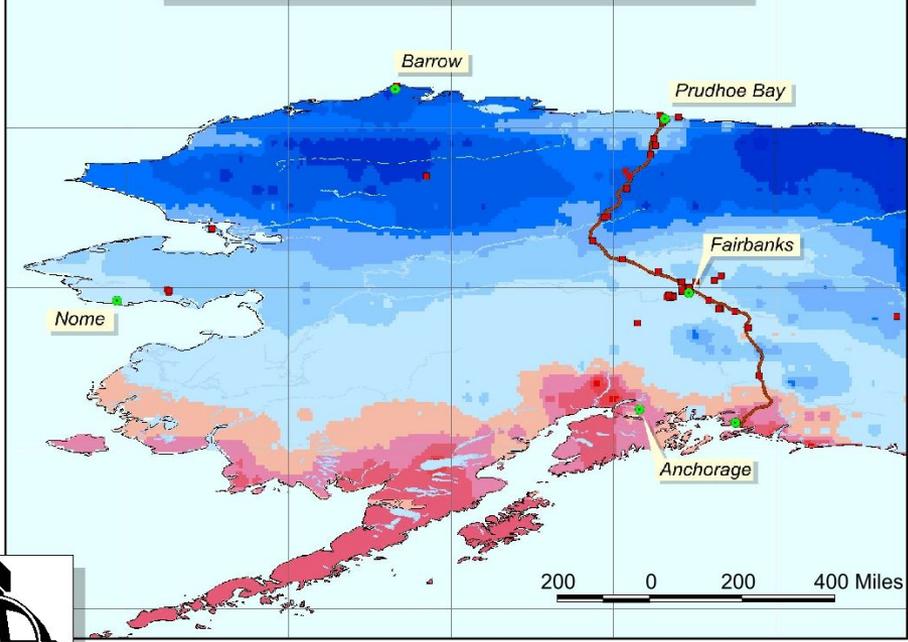
Spatially Distributed Model of Permafrost Dynamics in Alaska



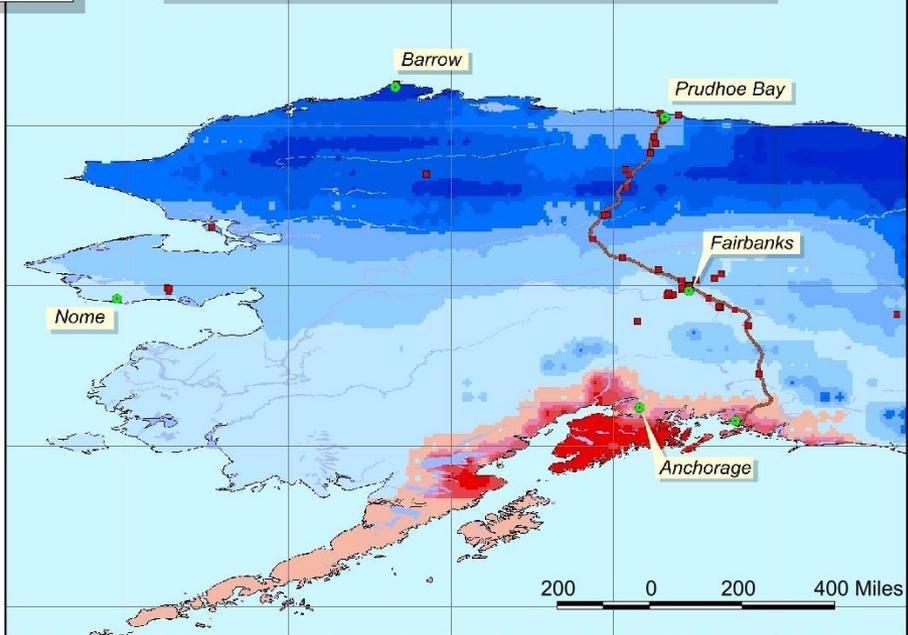
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

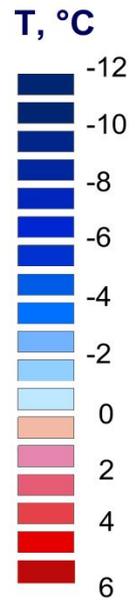


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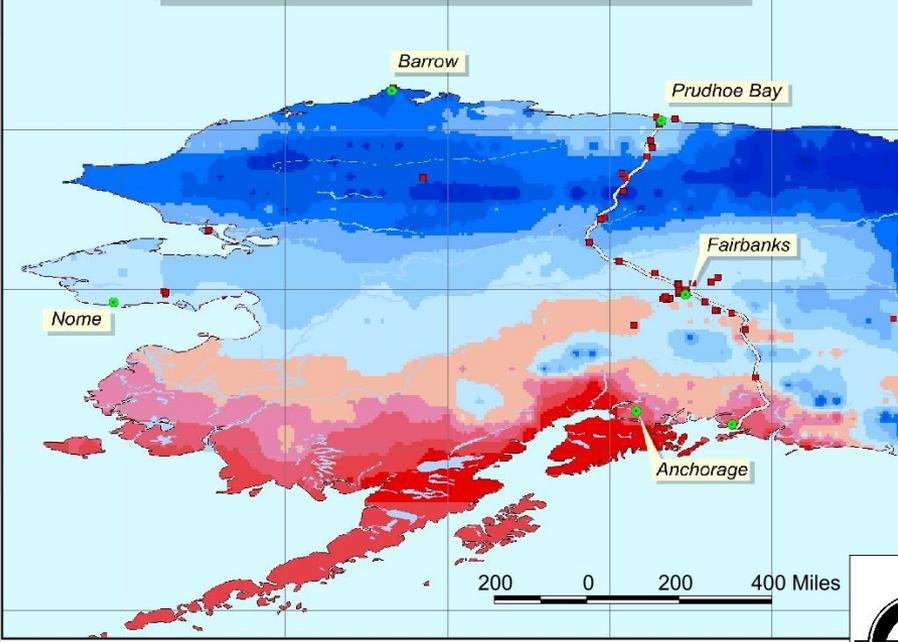


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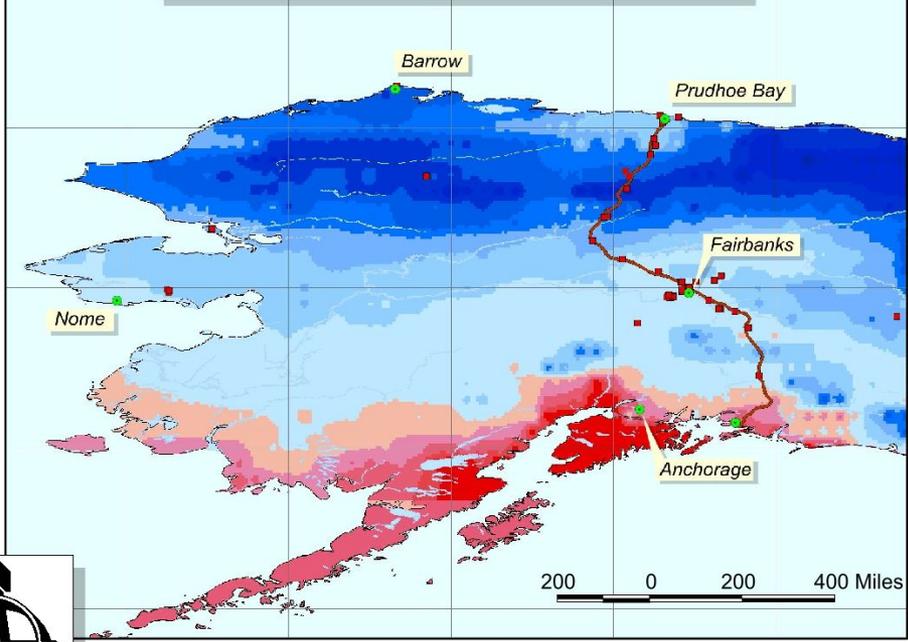
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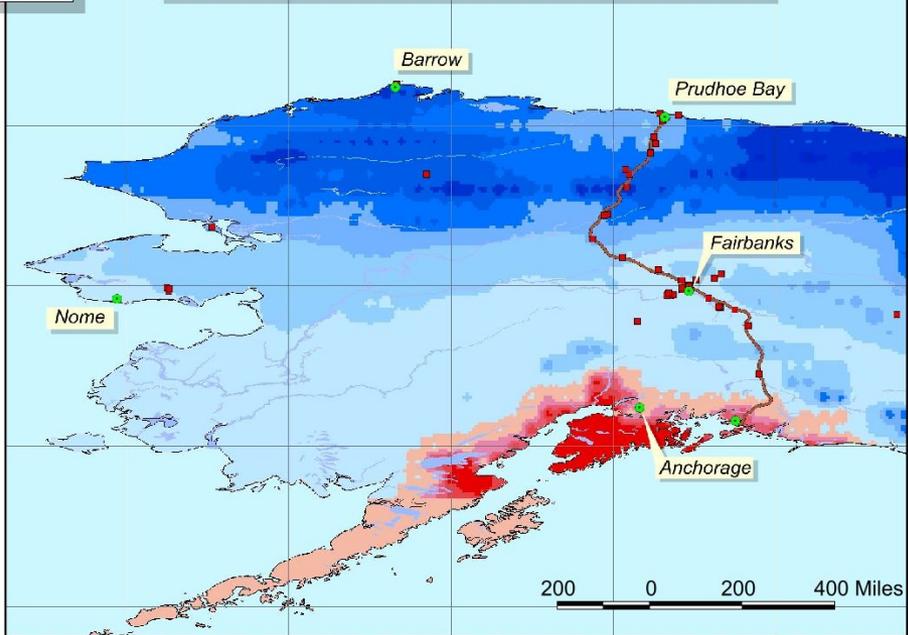
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

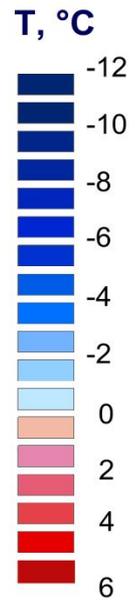


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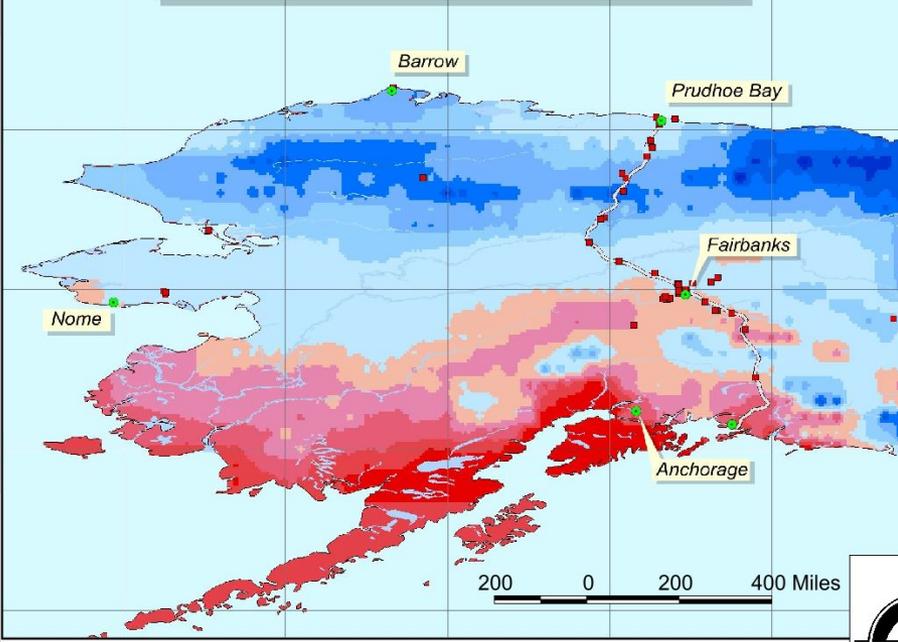


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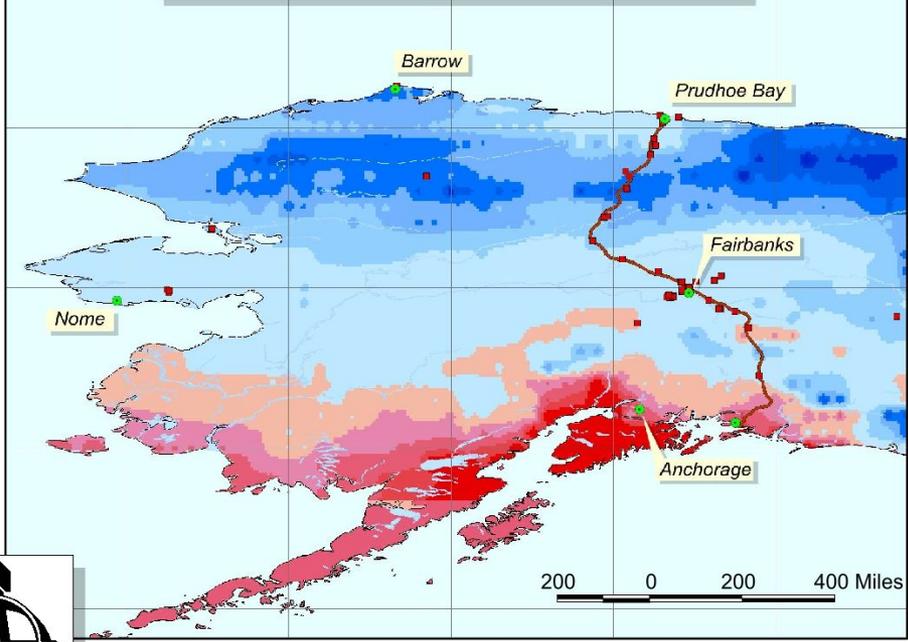
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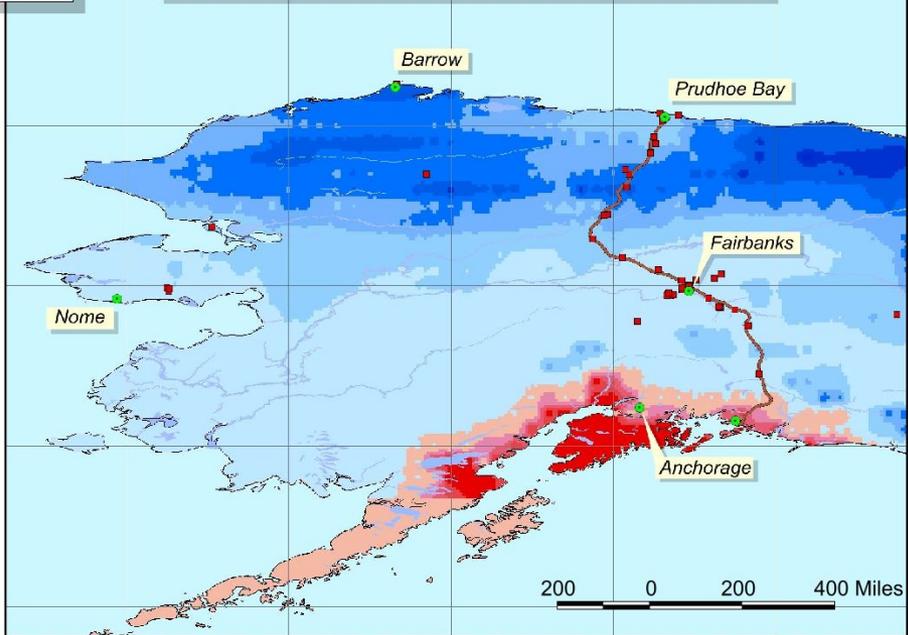
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

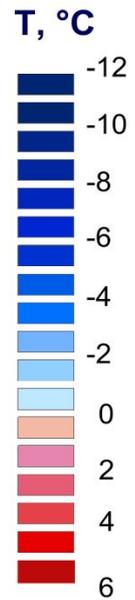


Mean Annual Temperature at 20 m Depth

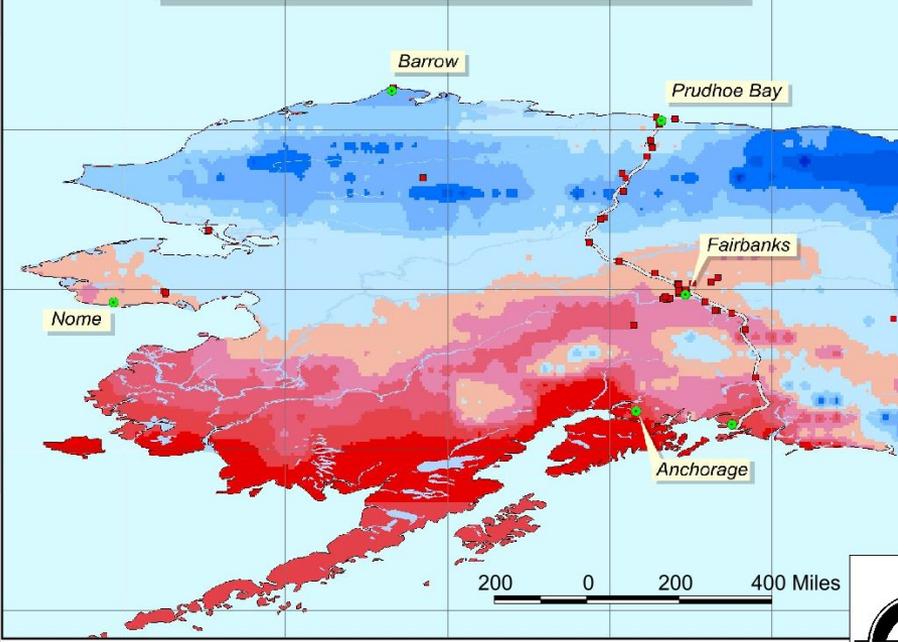


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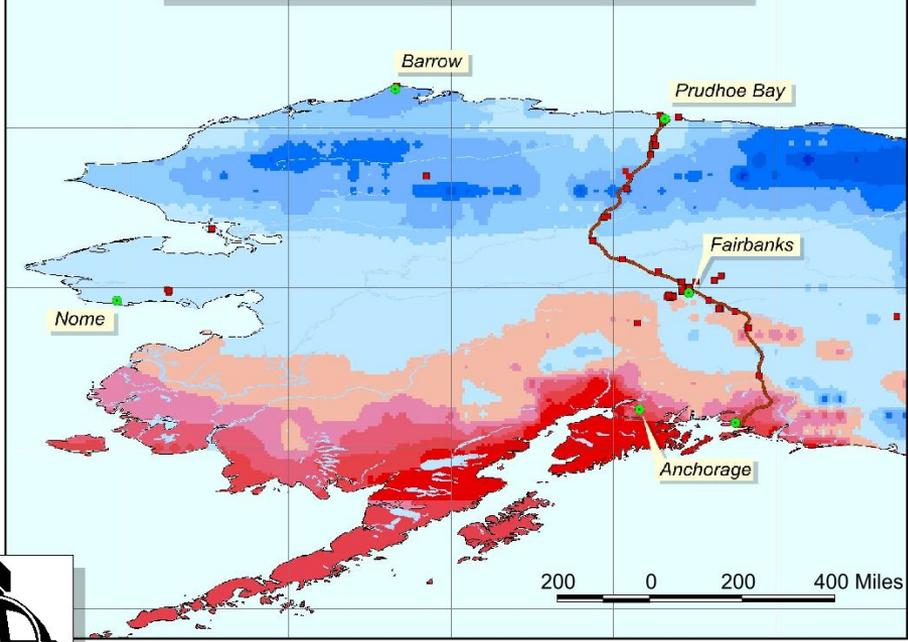
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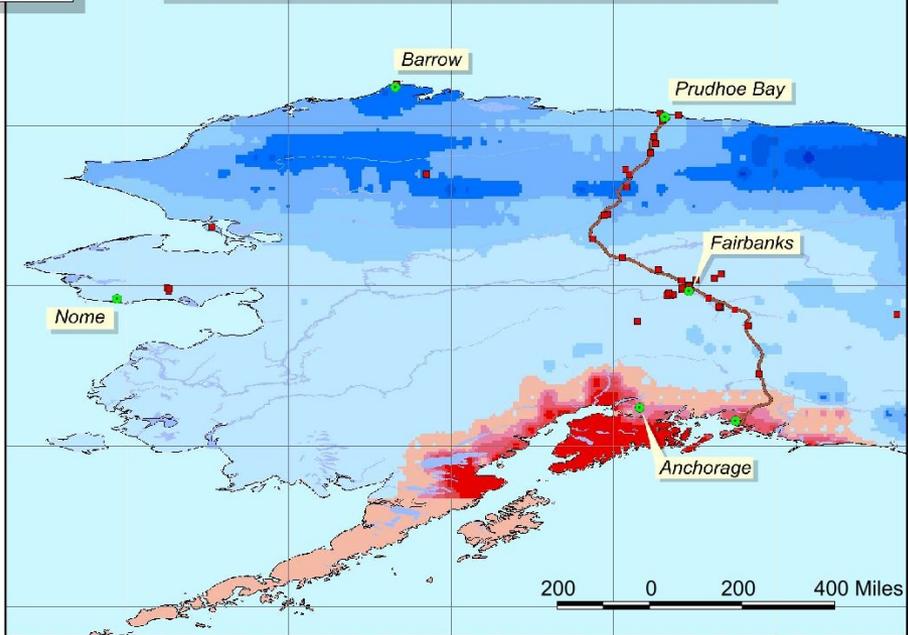
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Mean Annual Temperature at 5 m Depth

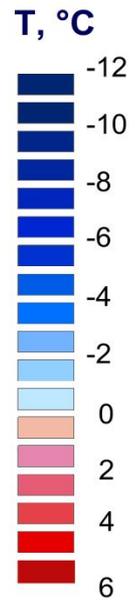


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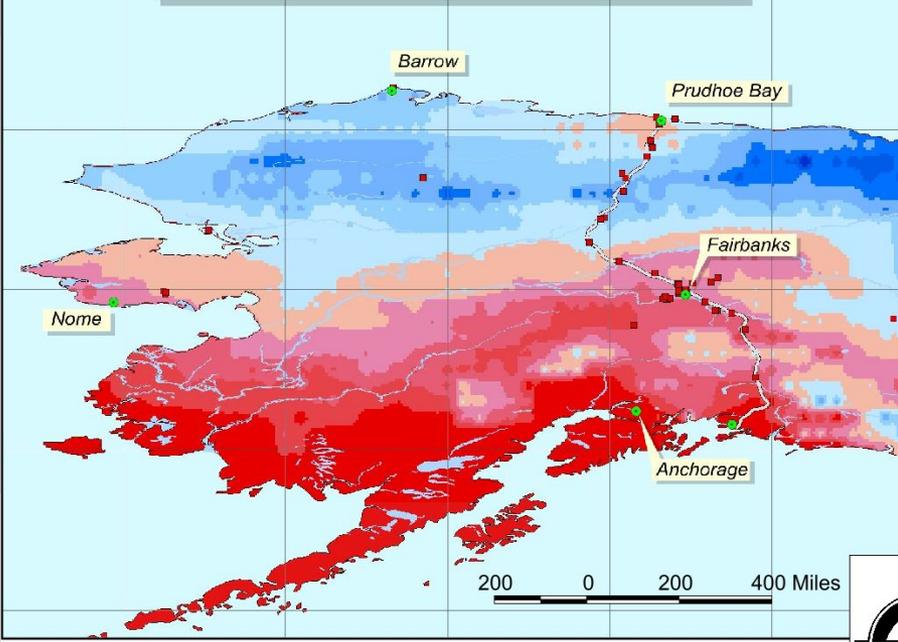


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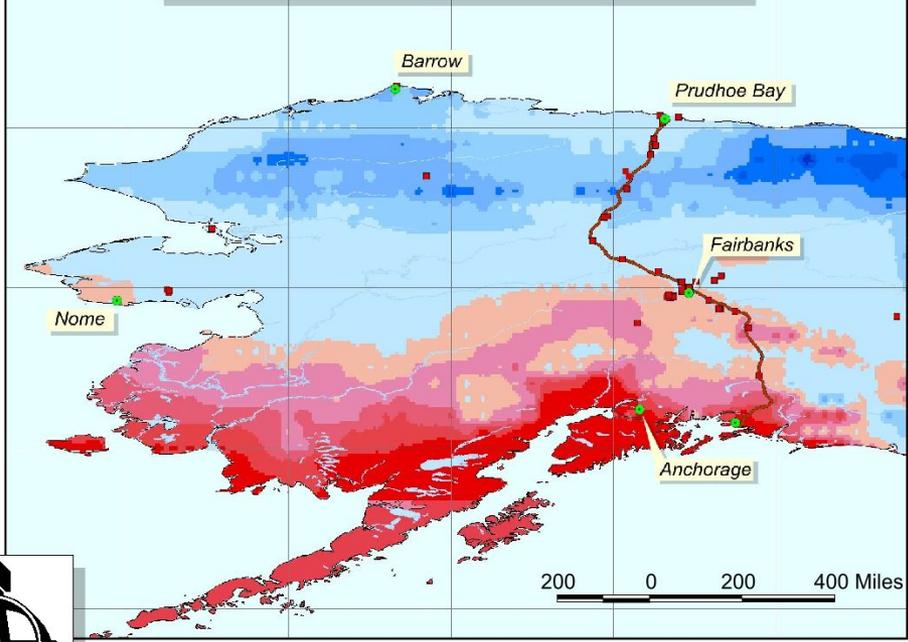
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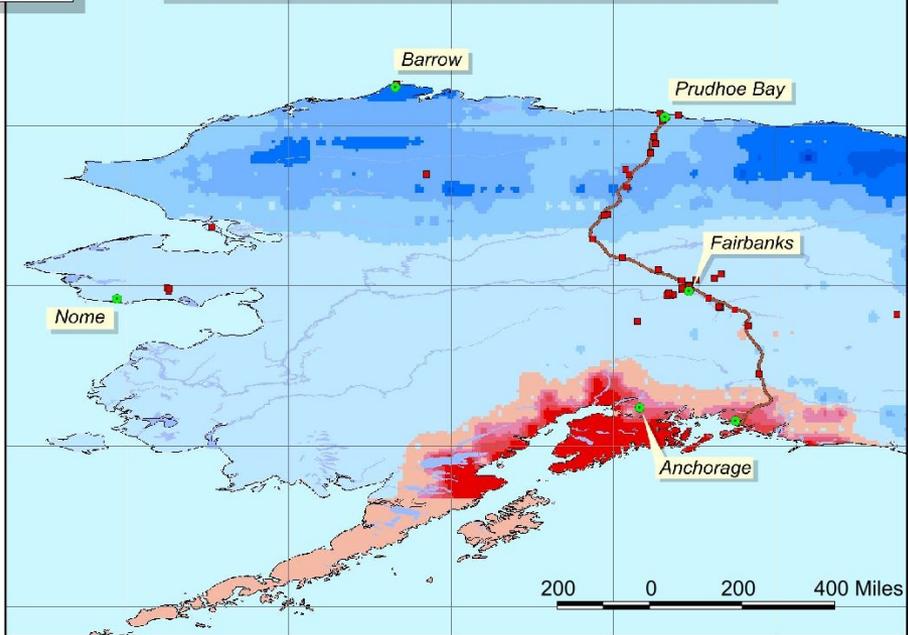
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Mean Annual Temperature at 5 m Depth

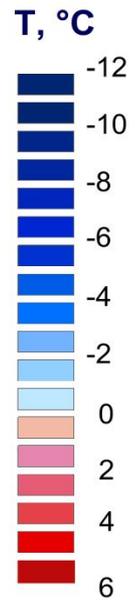


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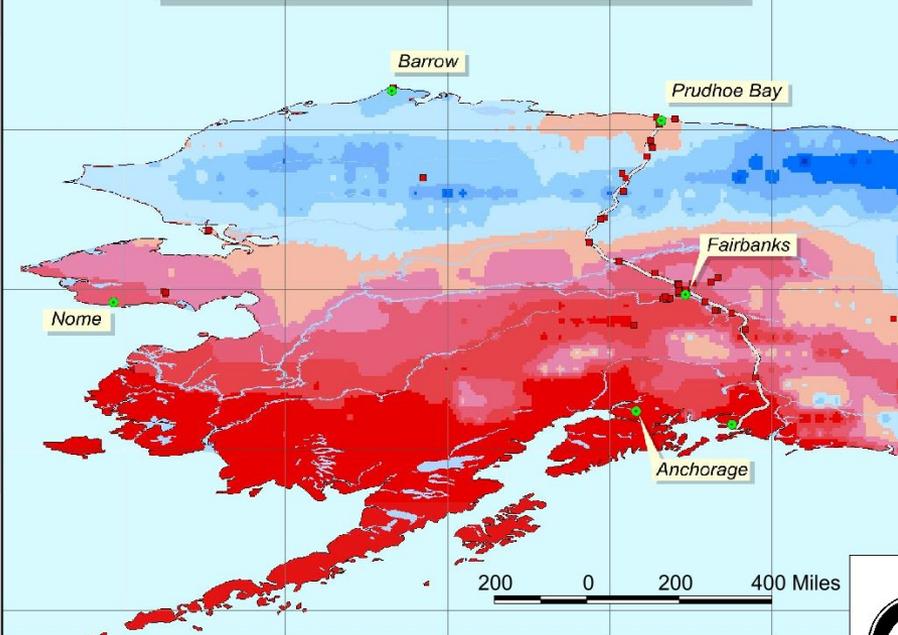


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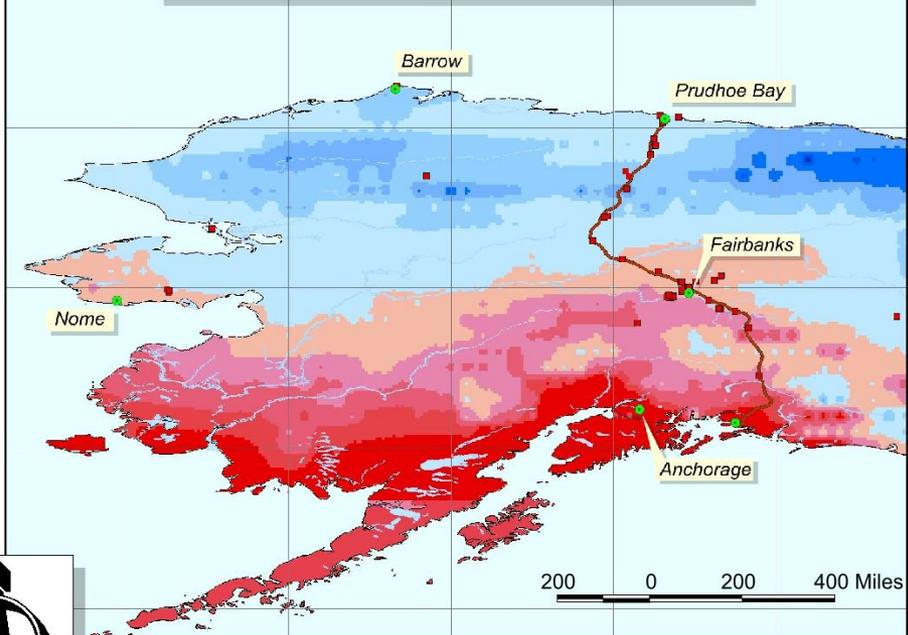
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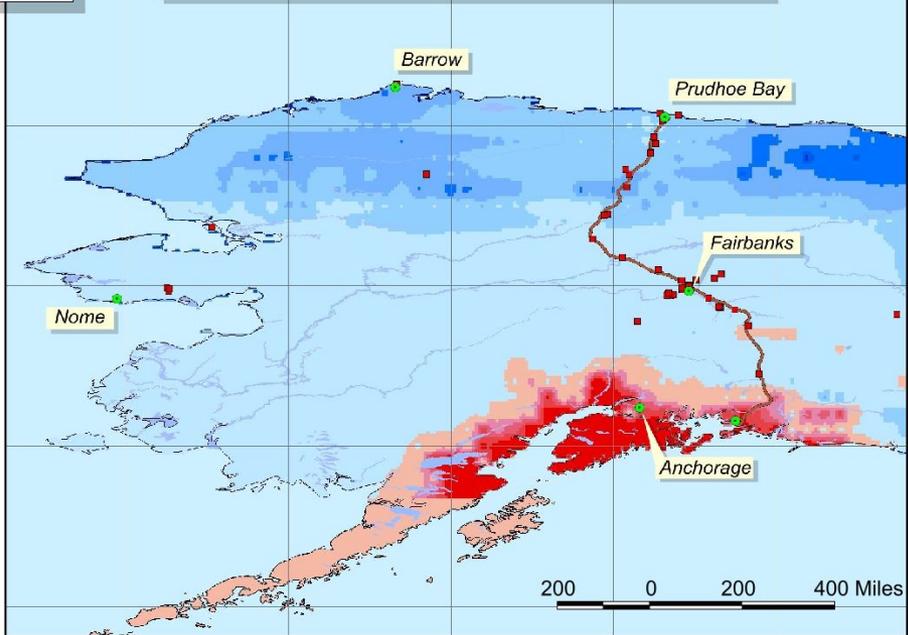
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Mean Annual Temperature at 5 m Depth

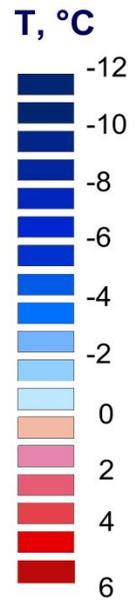


Mean Annual Temperature at 20 m Depth

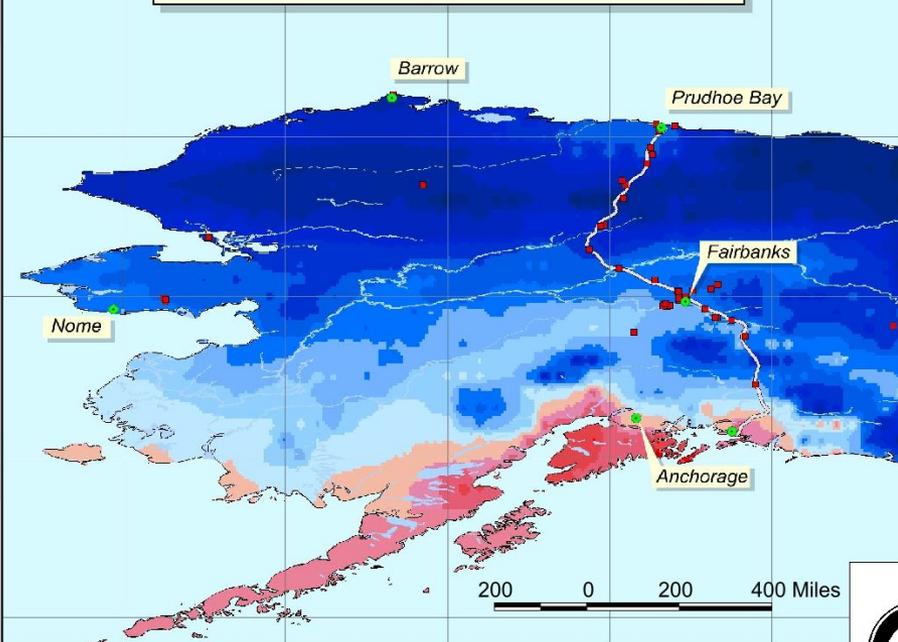


2100

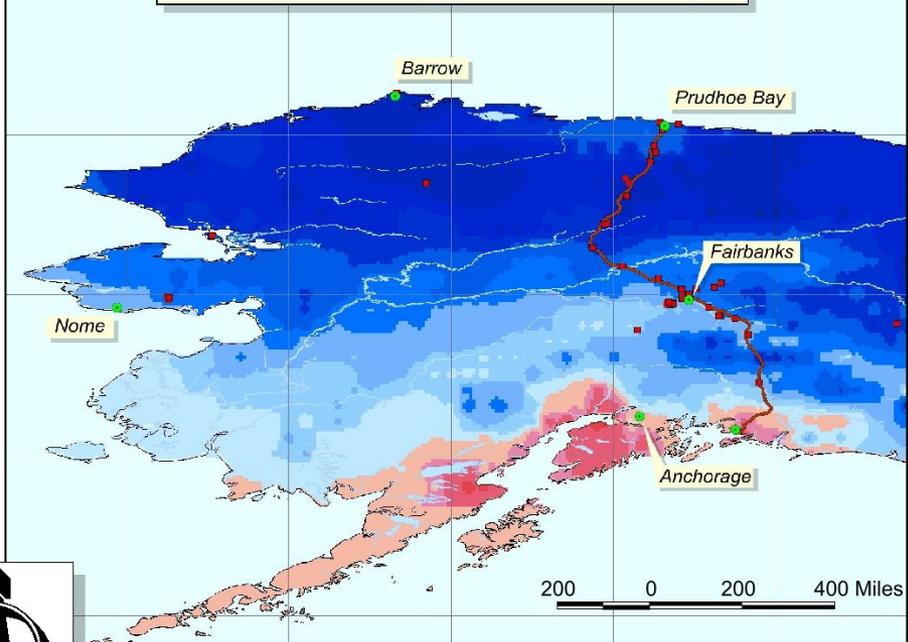
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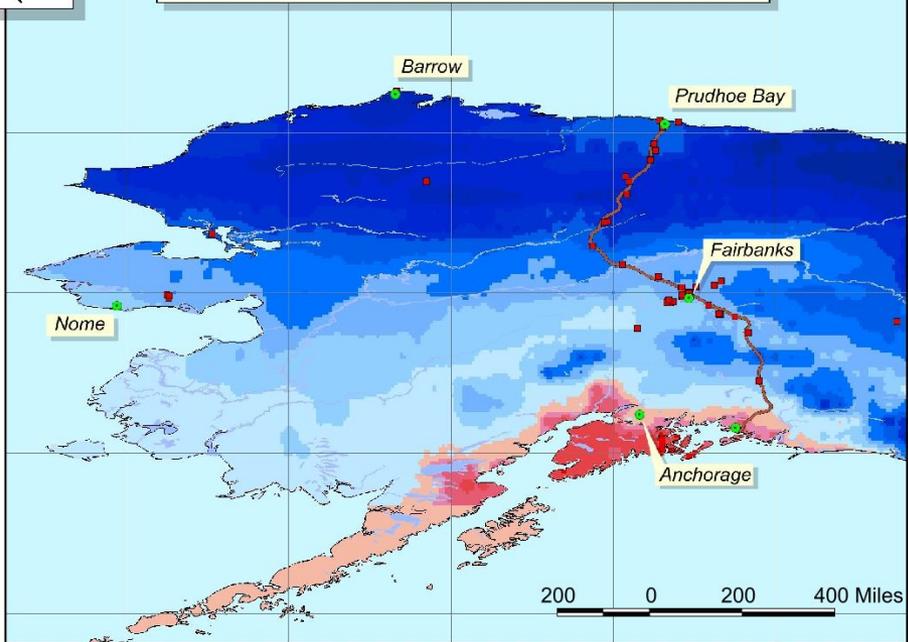
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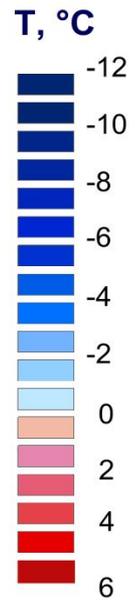


Mean Annual Temperature at 20 m Depth

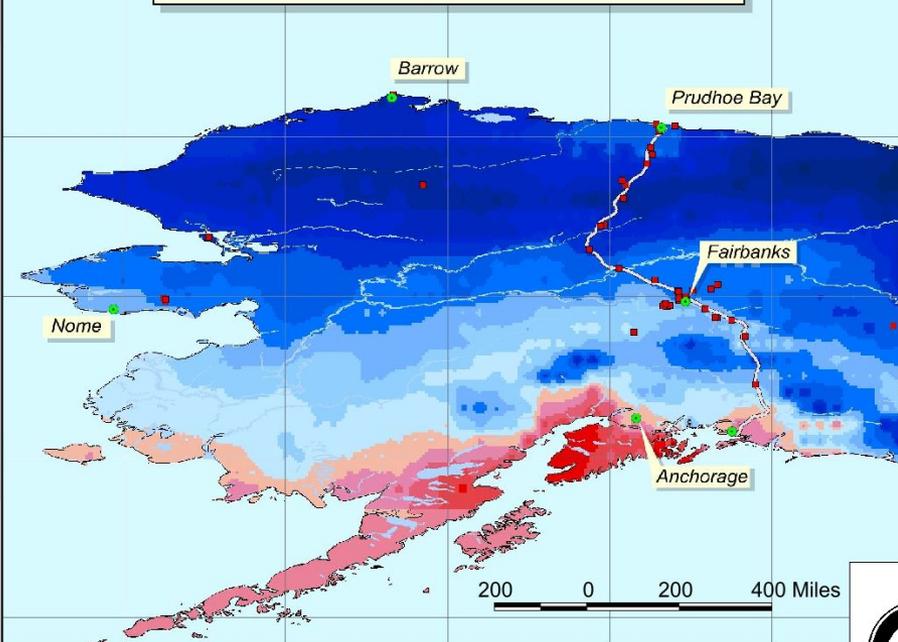


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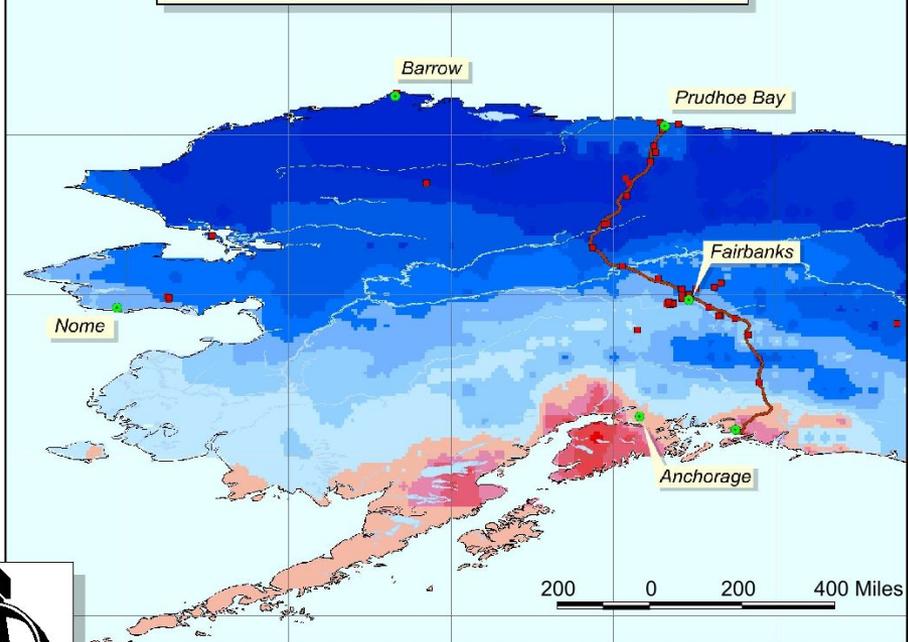
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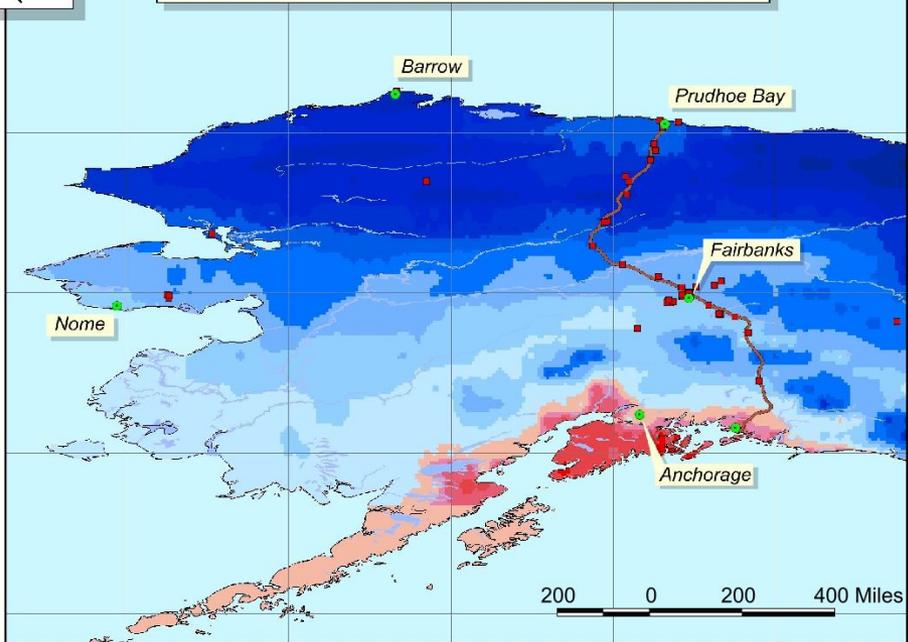
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Mean Annual Temperature at 5 m Depth

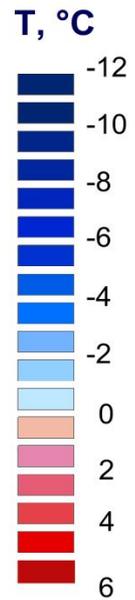


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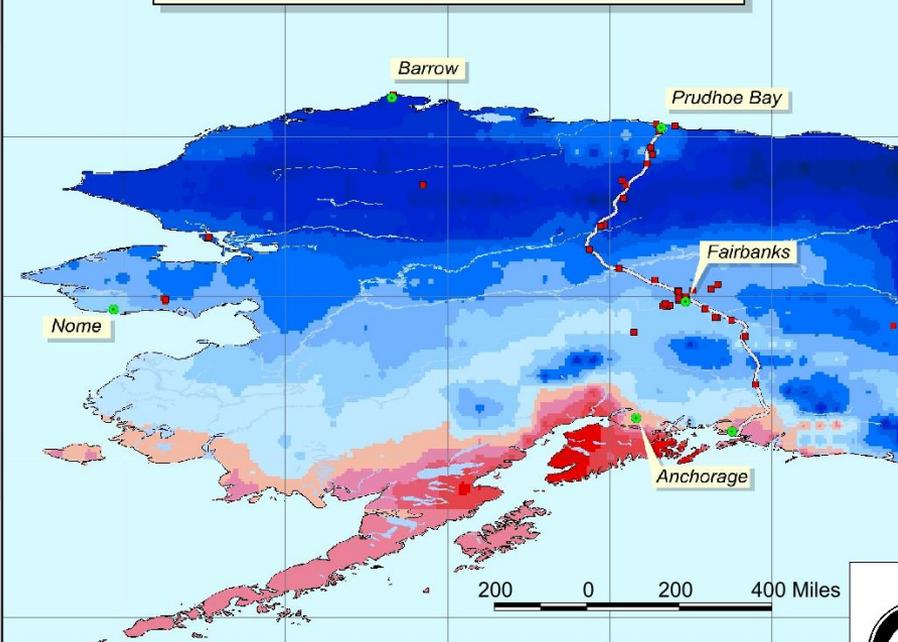


2005

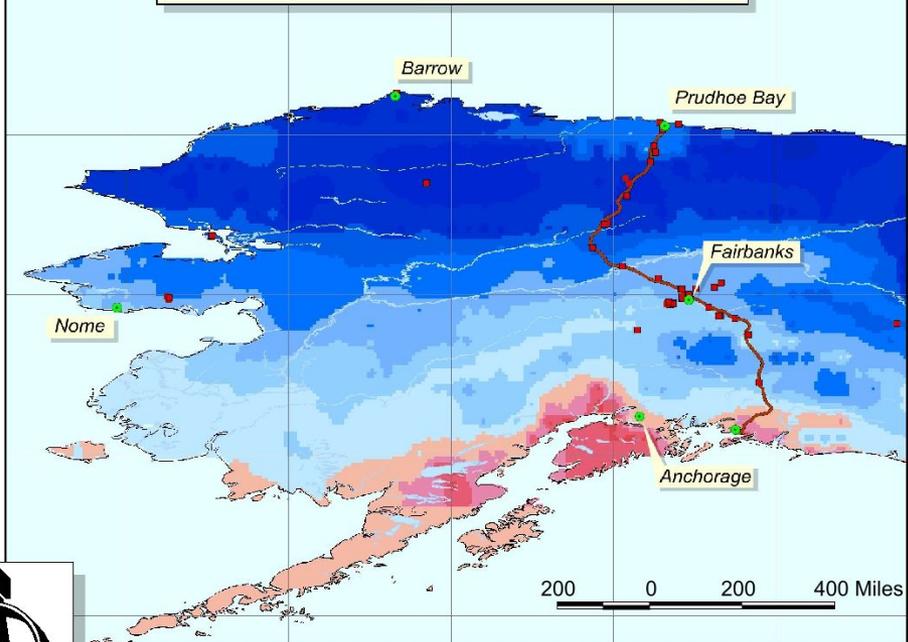
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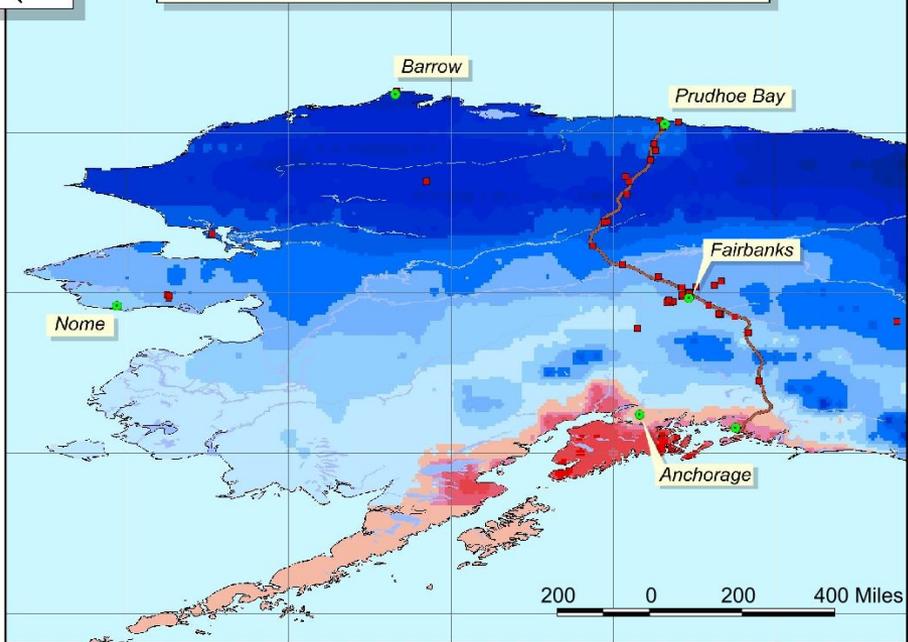
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Mean Annual Temperature at 5 m Depth

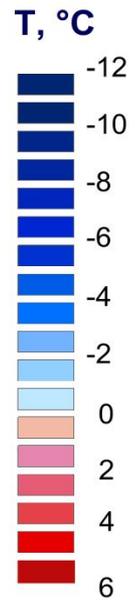


Mean Annual Temperature at 20 m Depth

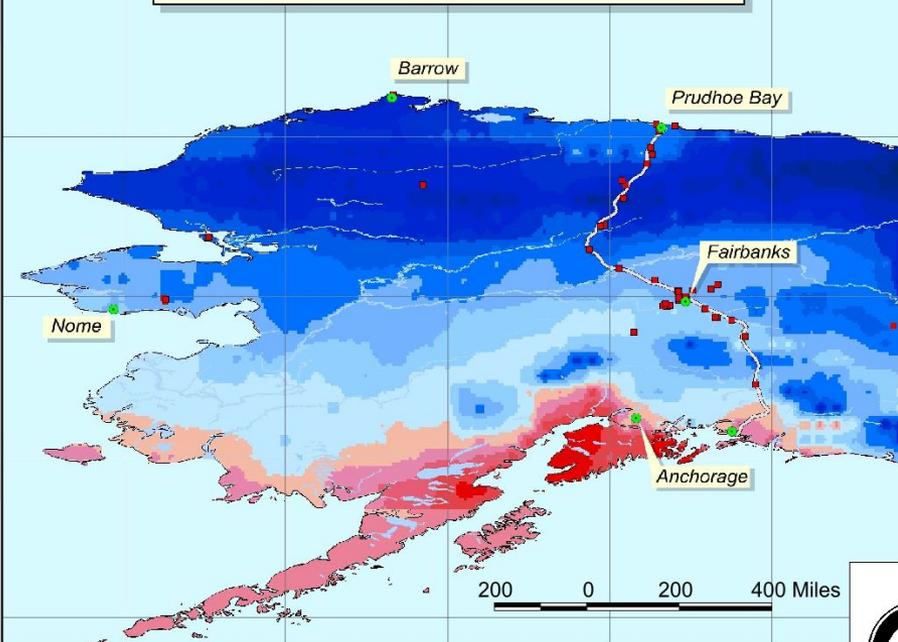


2010

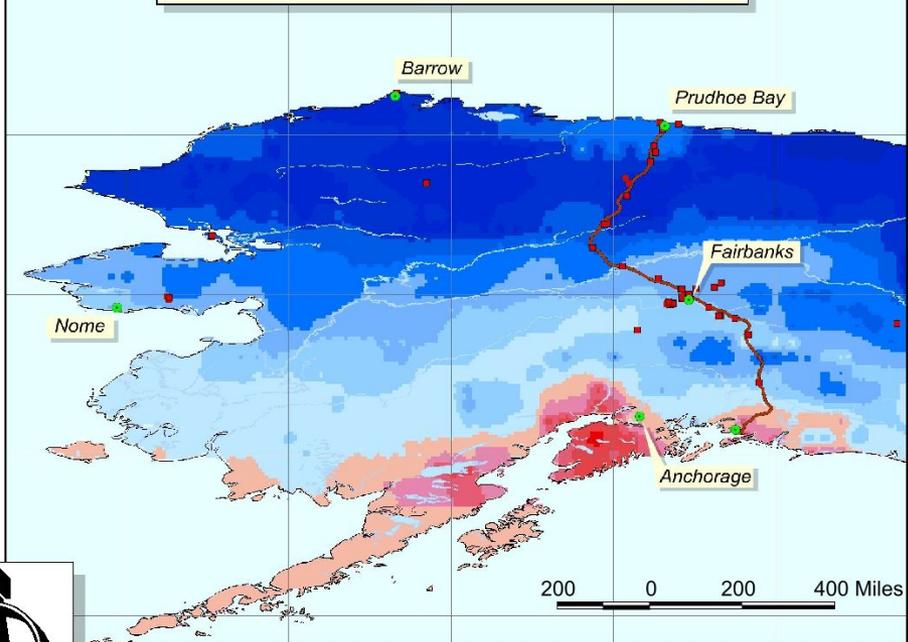
Spatially Distributed Model of Permafrost Dynamics in Alaska



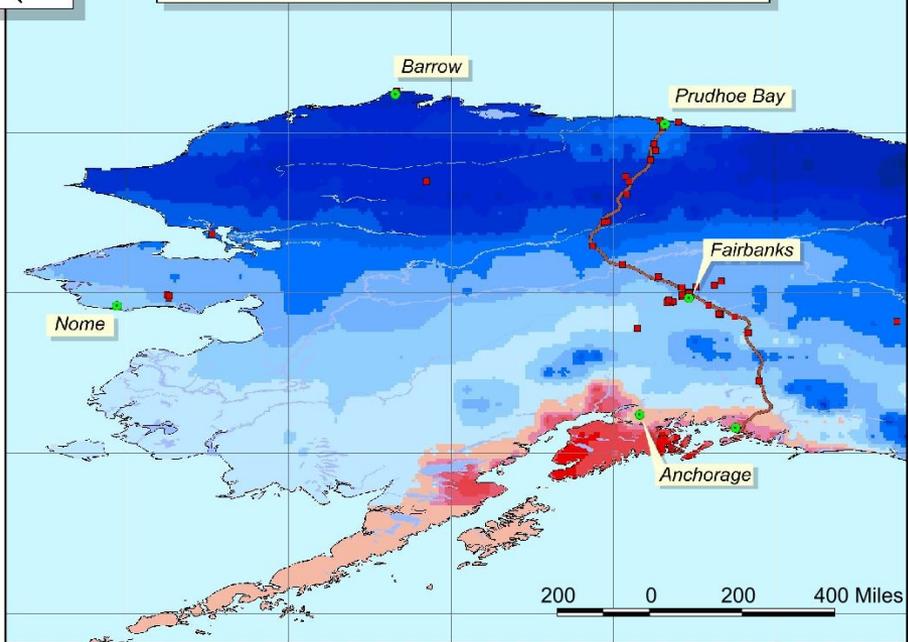
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

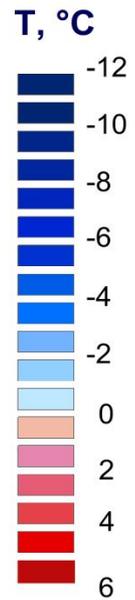


Mean Annual Temperature at 20 m Depth

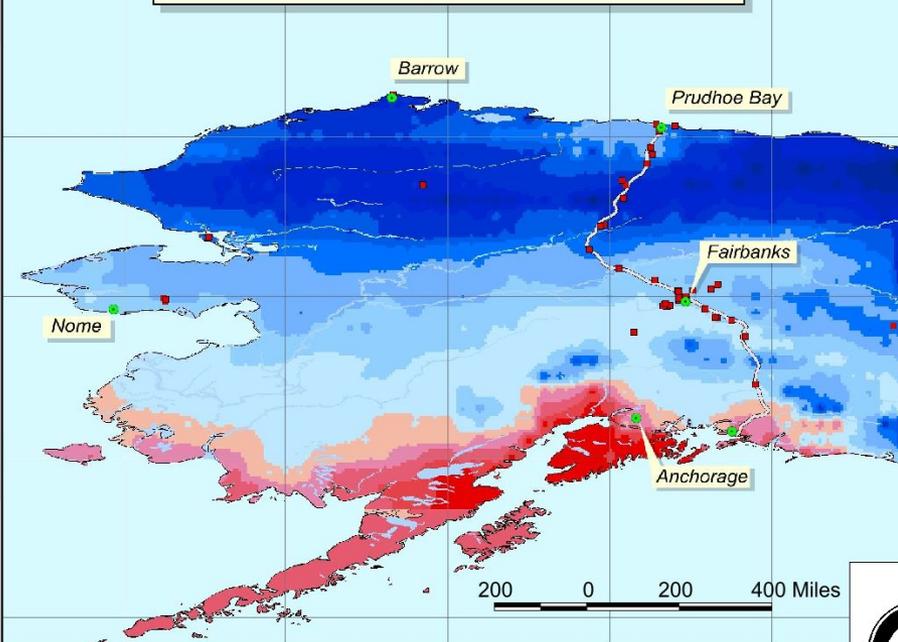


2015

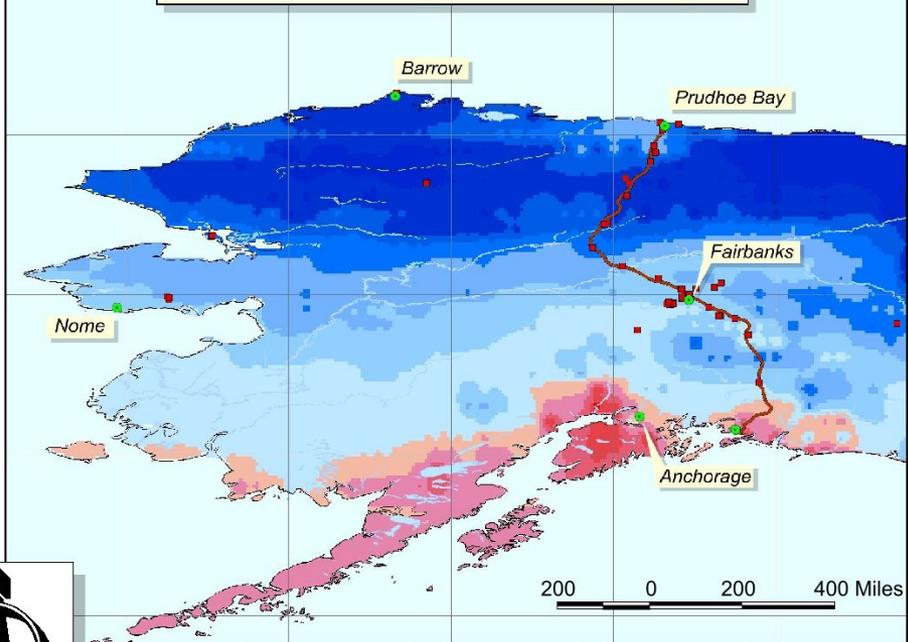
Spatially Distributed Model of Permafrost Dynamics in Alaska



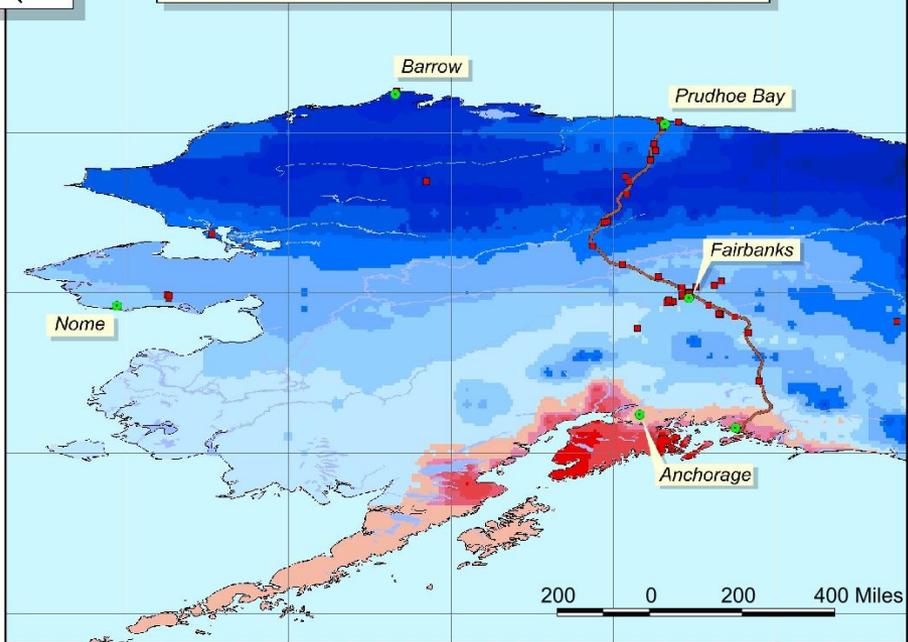
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

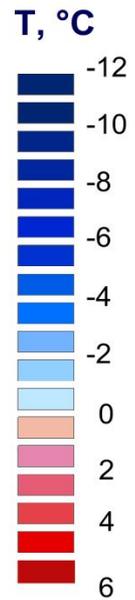


Mean Annual Temperature at 20 m Depth

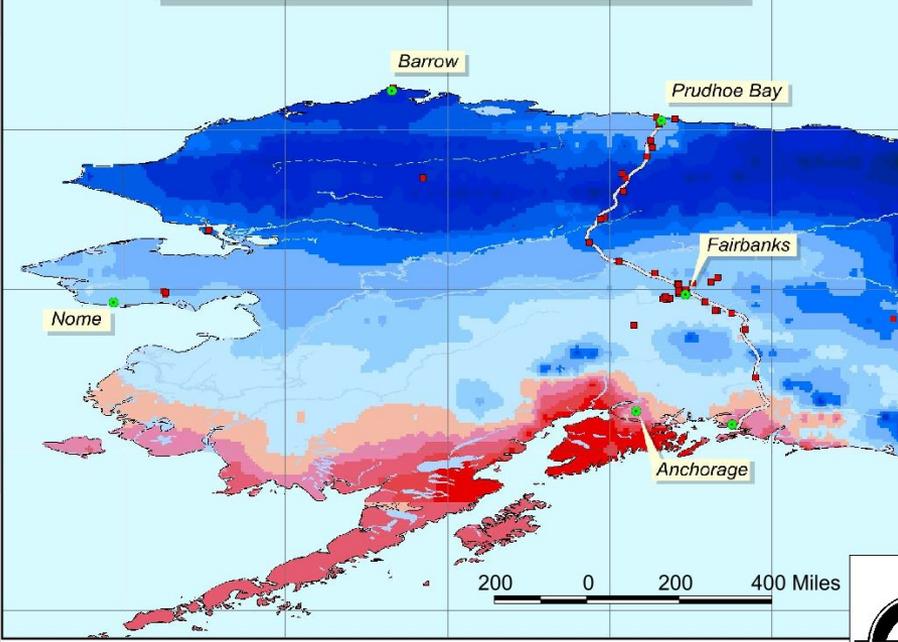


2020

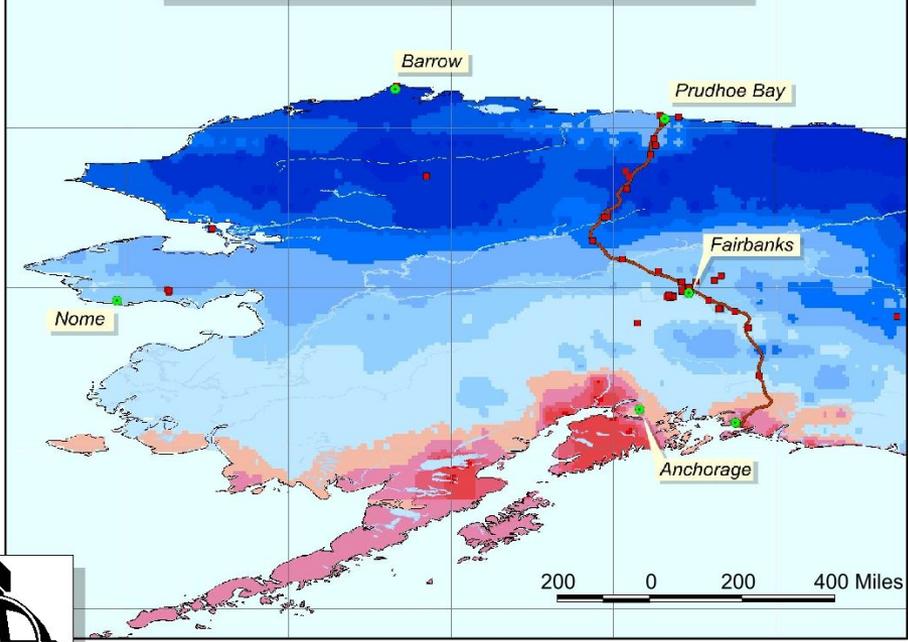
Spatially Distributed Model of Permafrost Dynamics in Alaska



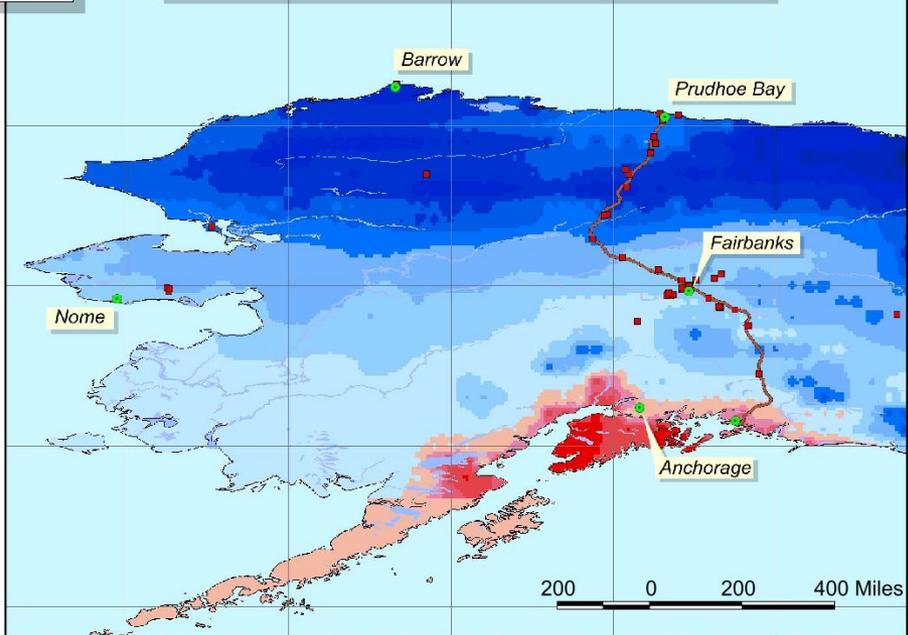
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

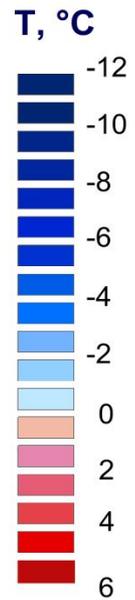


Mean Annual Temperature at 20 m Depth

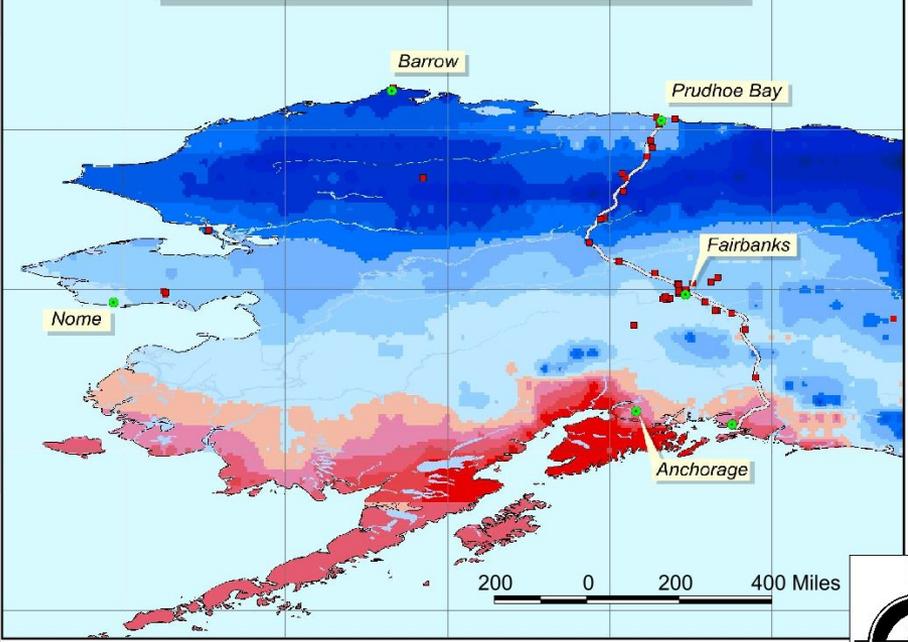


2025

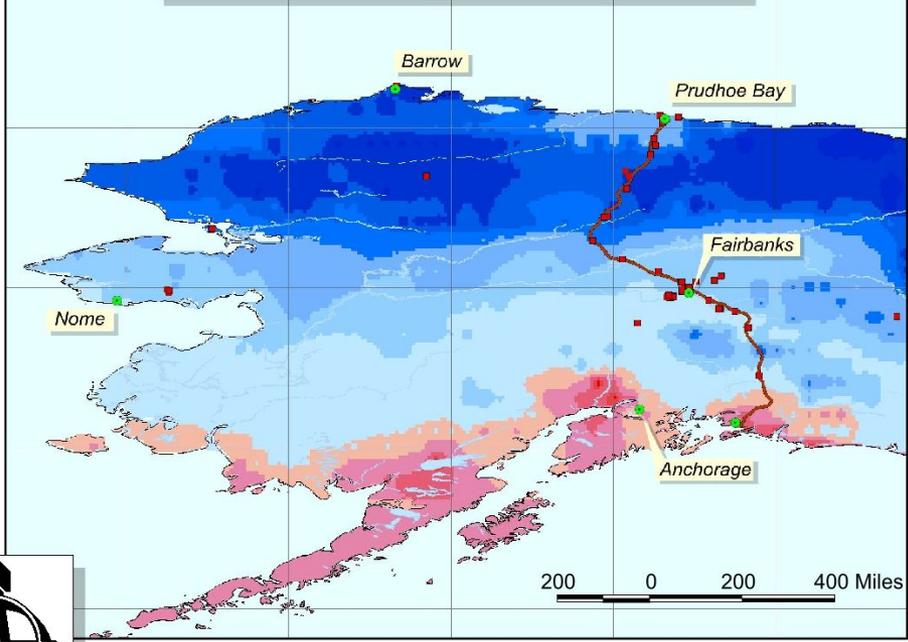
Spatially Distributed Model of Permafrost Dynamics in Alaska



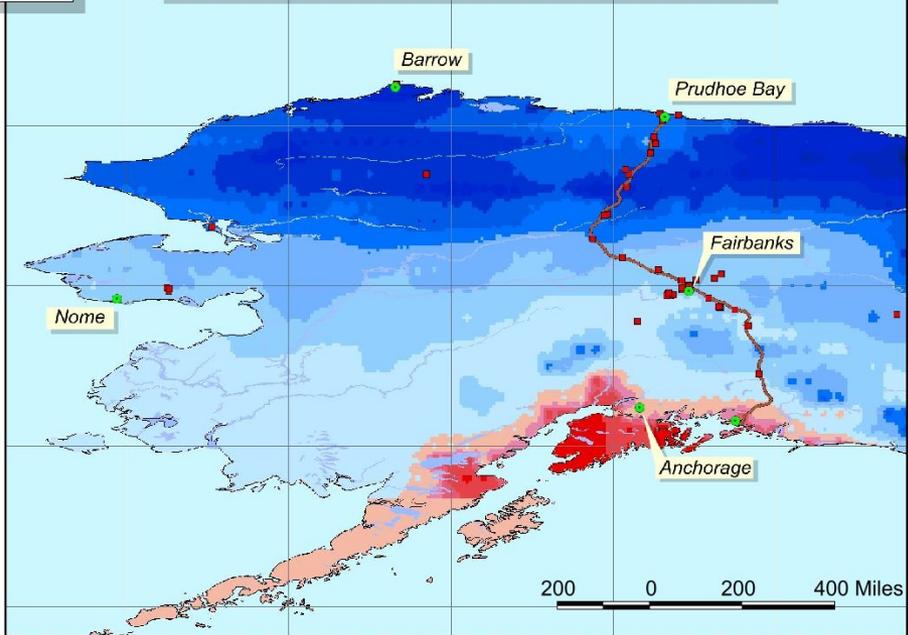
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

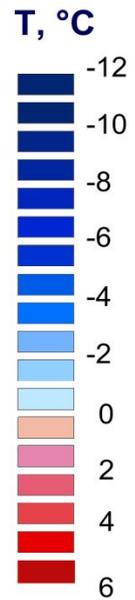


Mean Annual Temperature at 20 m Depth

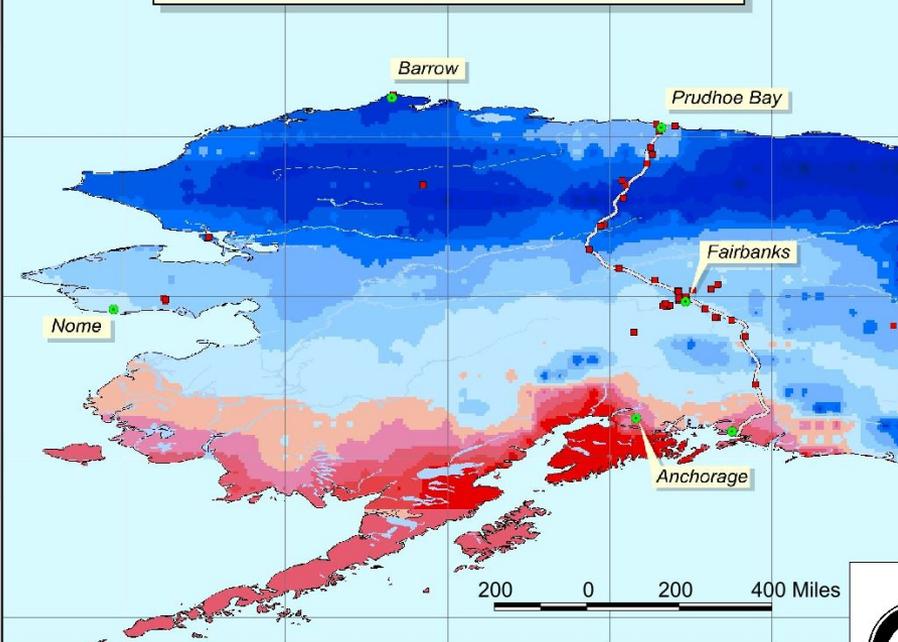


2030

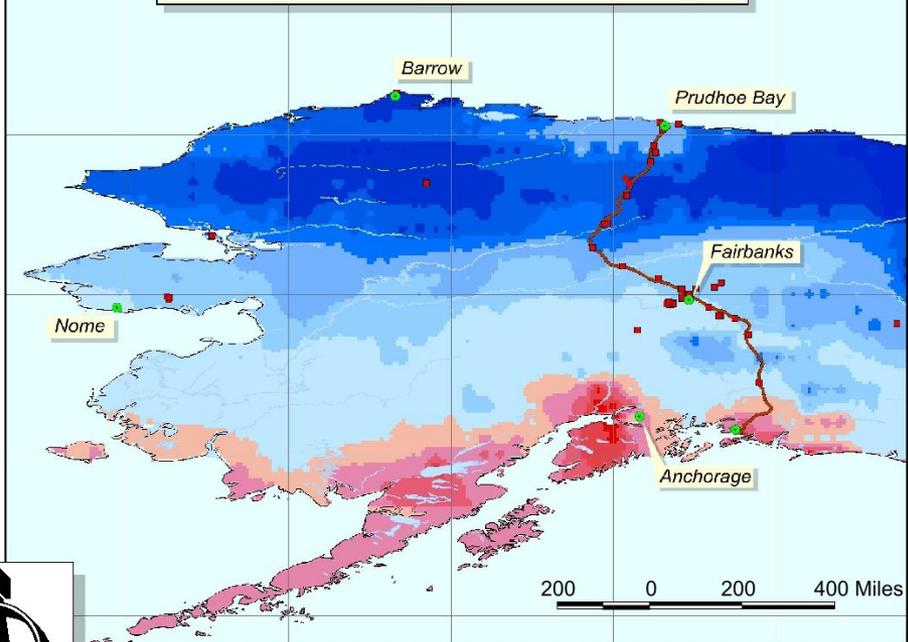
Spatially Distributed Model of Permafrost Dynamics in Alaska



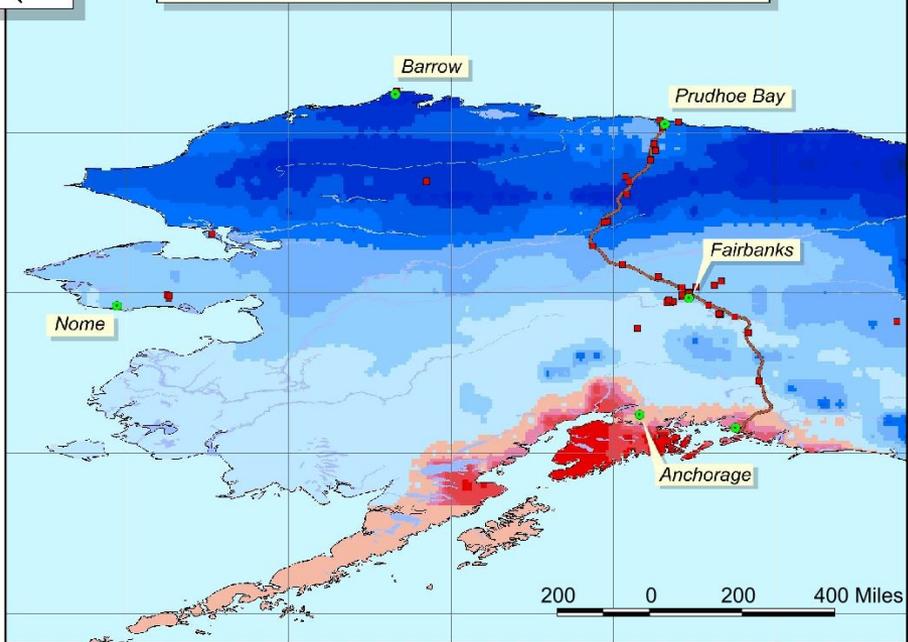
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

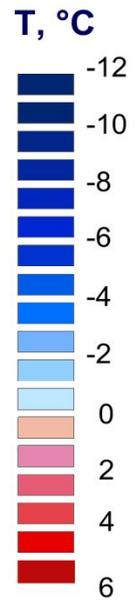


Mean Annual Temperature at 20 m Depth

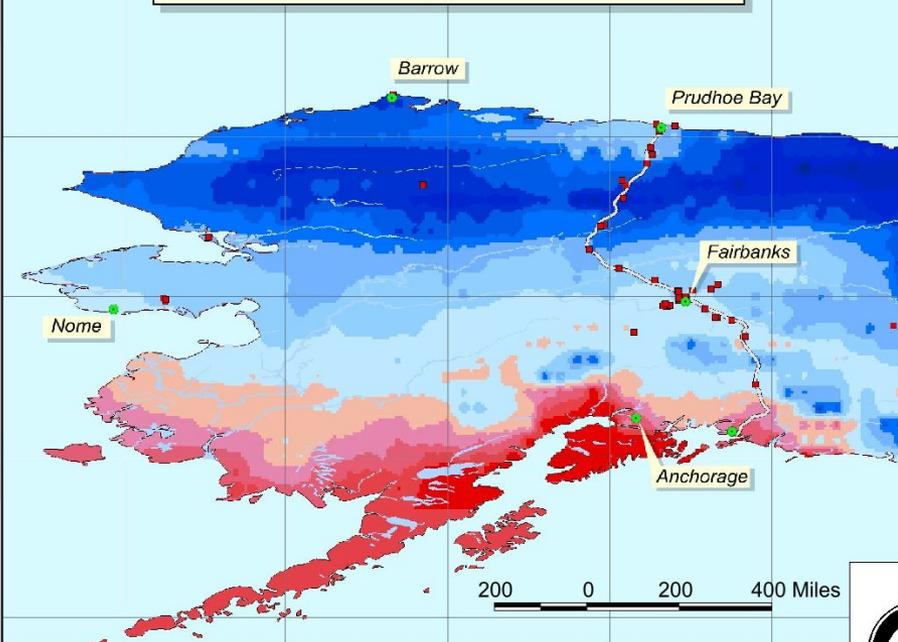


2035

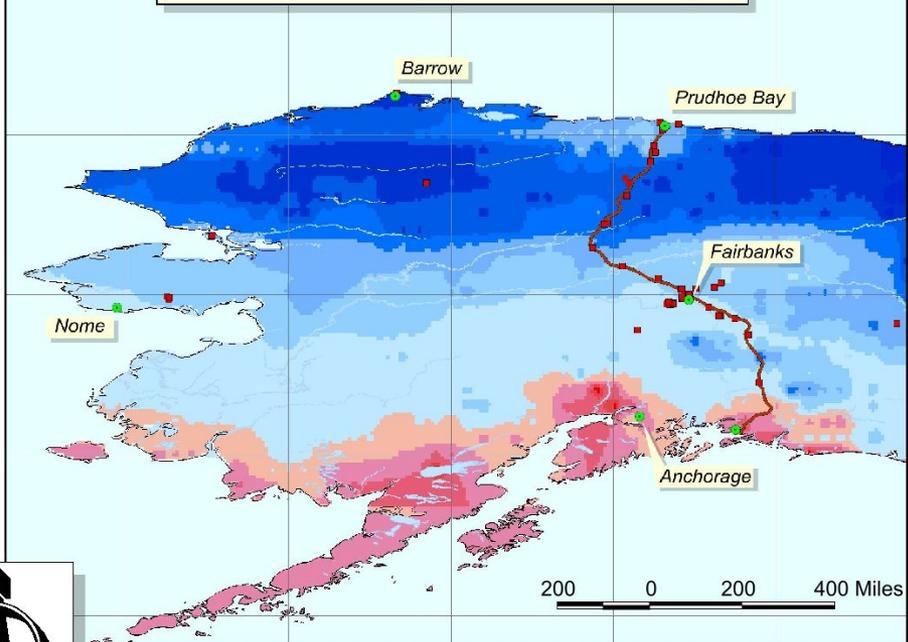
Spatially Distributed Model of Permafrost Dynamics in Alaska



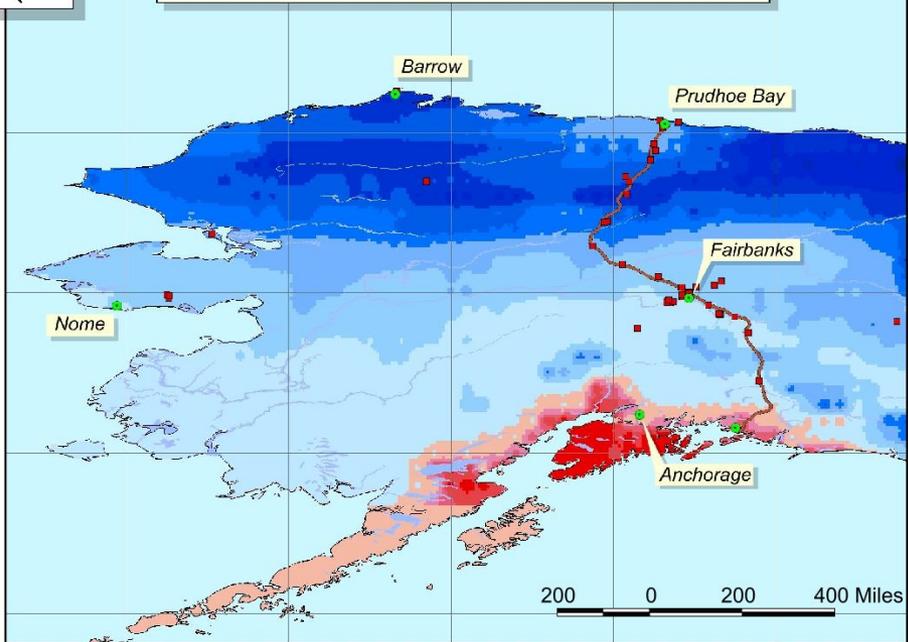
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

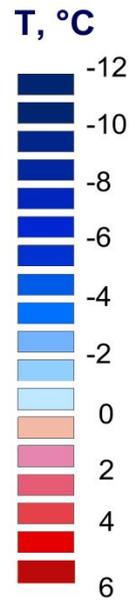


Mean Annual Temperature at 20 m Depth

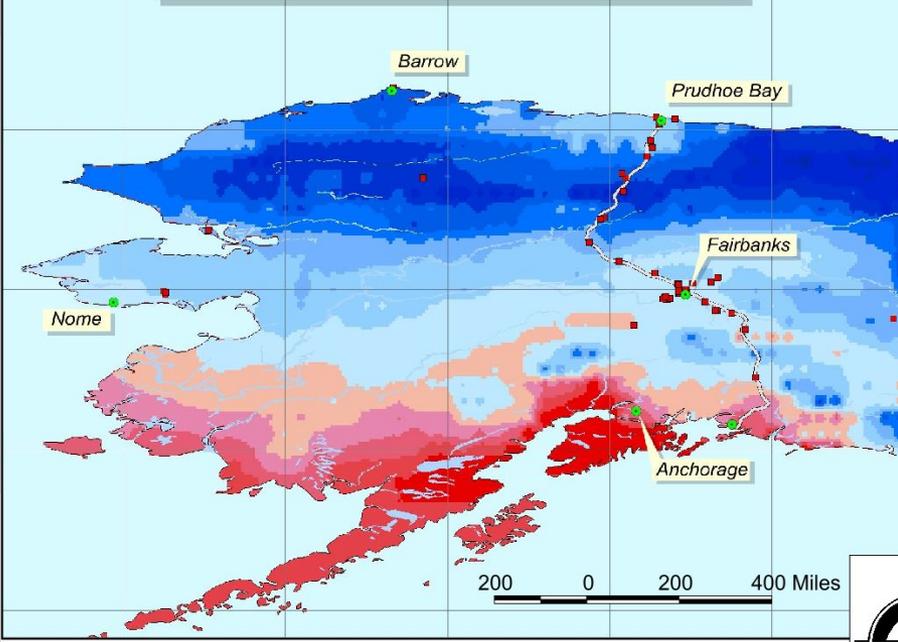


2040

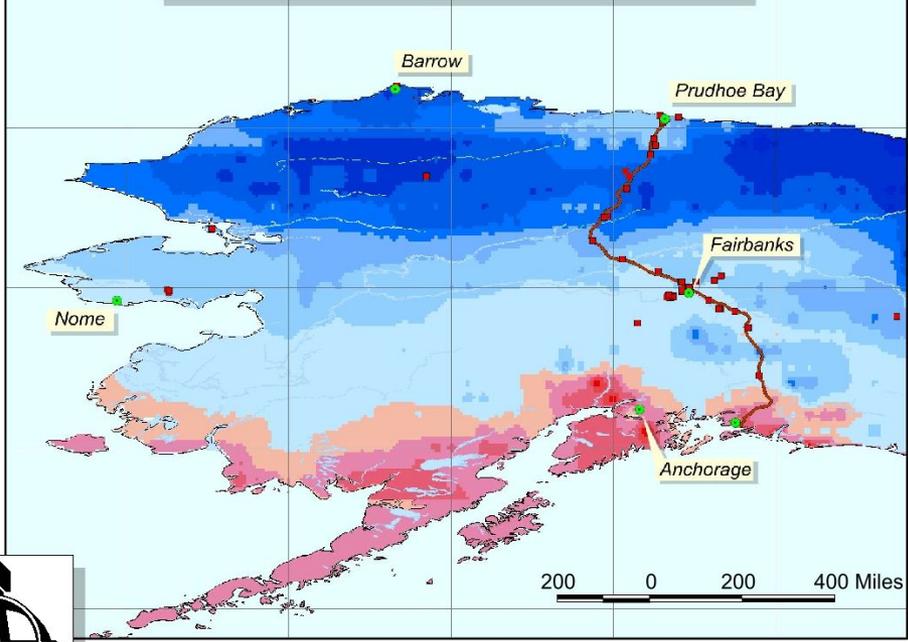
Spatially Distributed Model of Permafrost Dynamics in Alaska



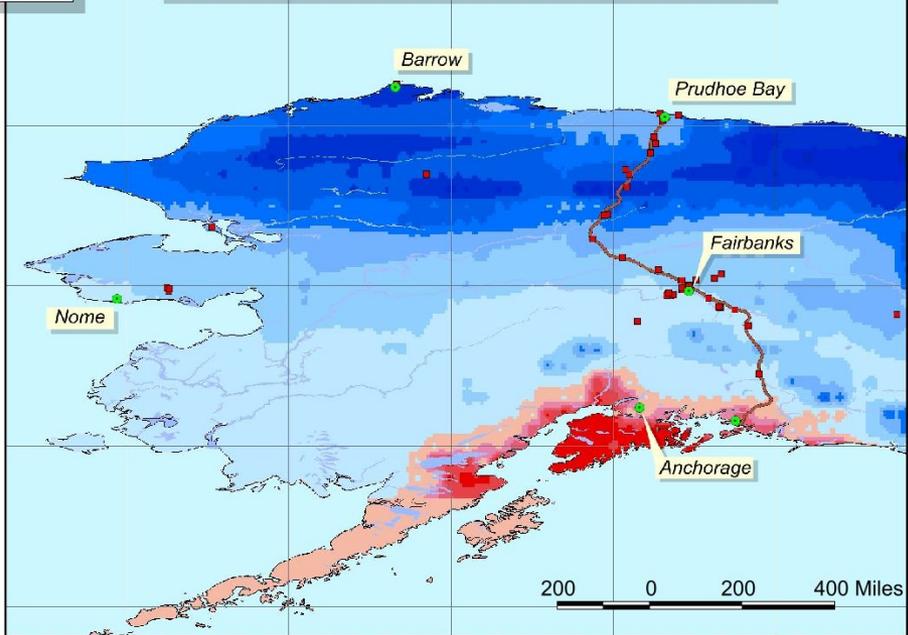
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

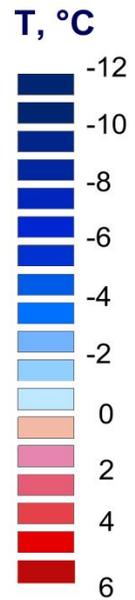


Mean Annual Temperature at 20 m Depth



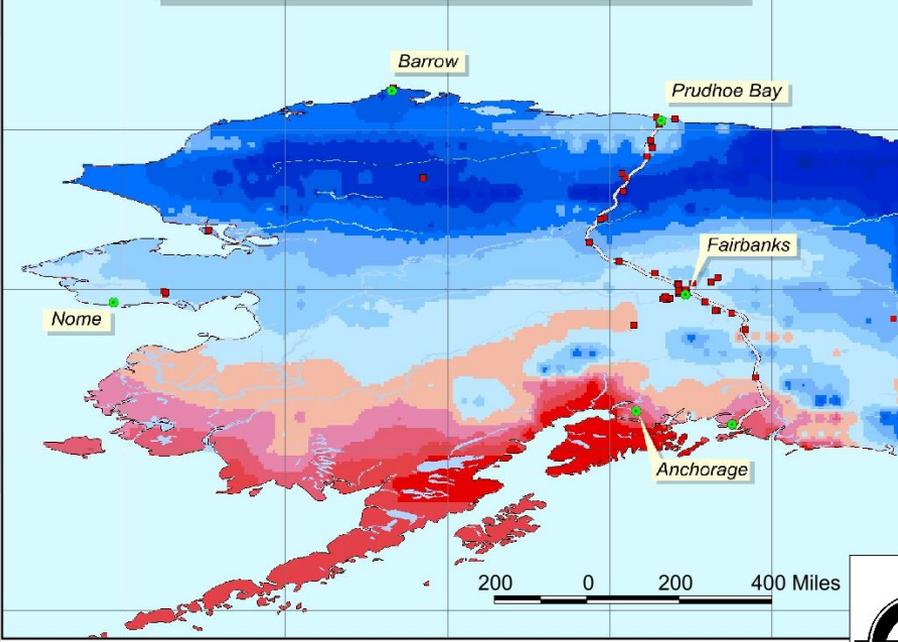
2045

Spatially Distributed Model of Permafrost Dynamics in Alaska

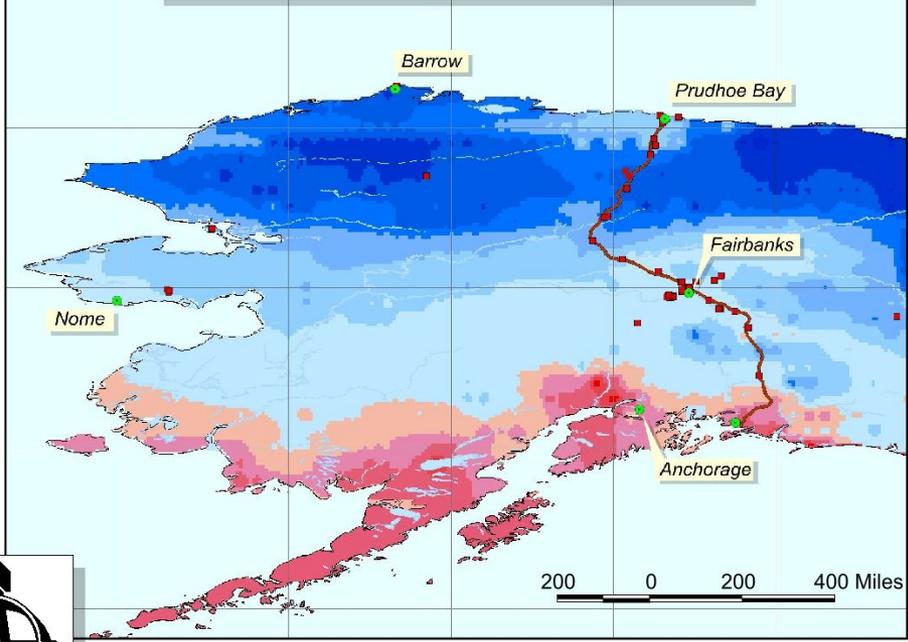


200 0 200 400 Miles

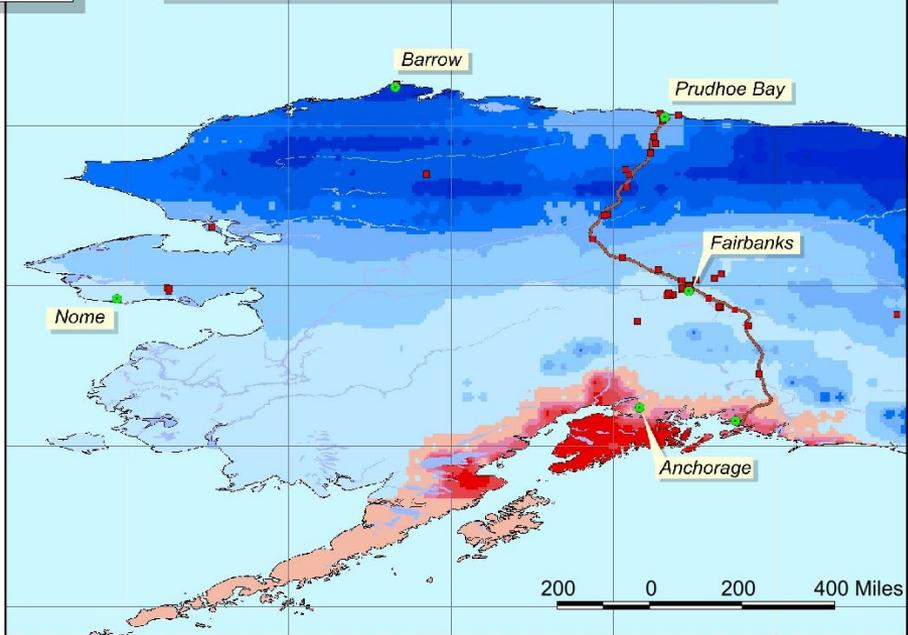
Mean Annual Temperature at 2 m Depth



Mean Annual Temperature at 5 m Depth

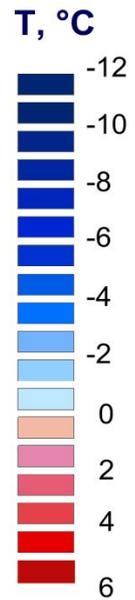


Mean Annual Temperature at 20 m Depth



2050

Spatially Distributed Model of Permafrost Dynamics in Alaska



Technical: Seismic



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

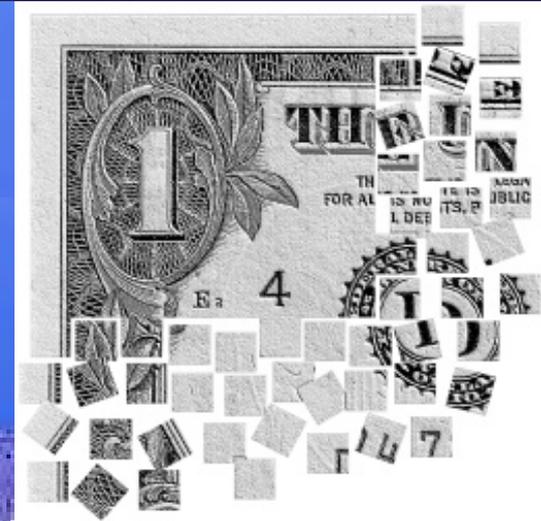
- ❖ Financing a \$26+ Billion Enterprise
- ❖ Infrastructure
- ❖ Steel
- ❖ Training/Retaining Qualified Labor
- ❖ Natural Gas Prices

Economic: Financing a \$26+ Billion Enterprise

- ❖ Federal Loan Guarantees

- ❖ Public Law 108-324, Section 116

- ❖ \$18 Billion in 2004 U.S. dollars



Economic: Infrastructure

- ❖ 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

Economic: Steel

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

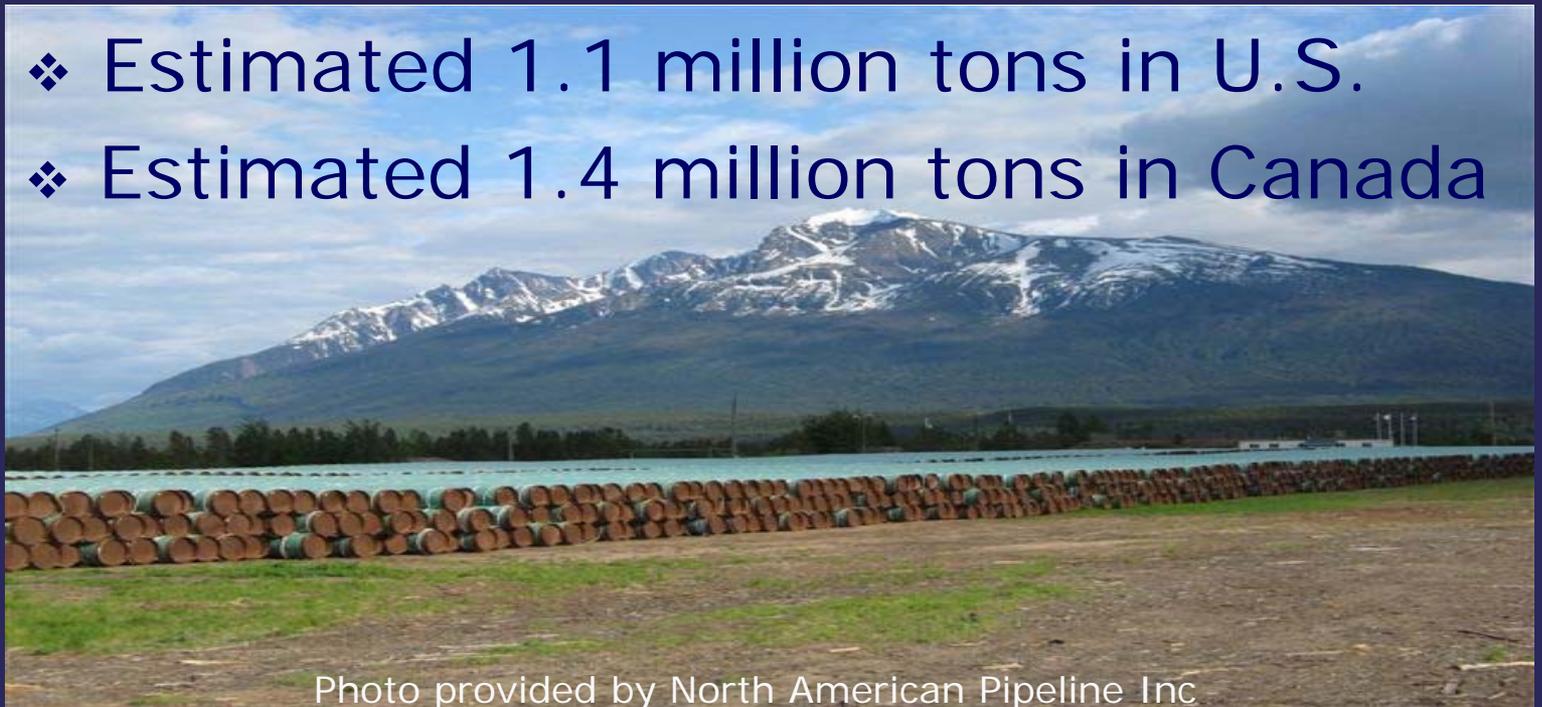
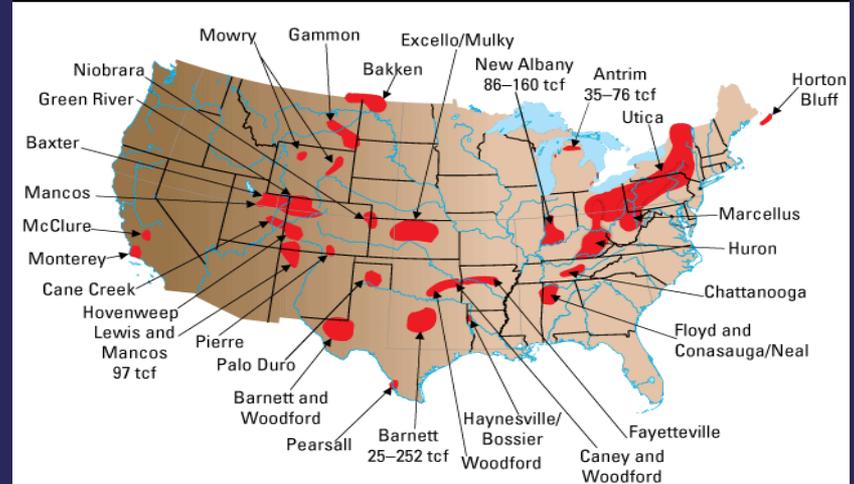
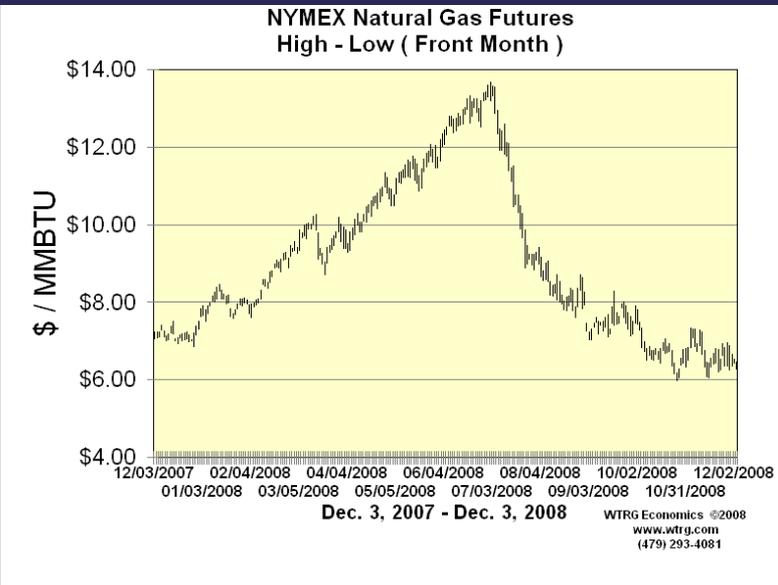


Photo provided by North American Pipeline Inc

Economic: Training/Retaining Qualified Labor



Economic: Natural Gas Prices



POLITICS!

The Competitors



Key Players

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

Process Related Issues

- ❖ 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

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

FERC Pre-Filing Environmental Review Process

Applicant Process

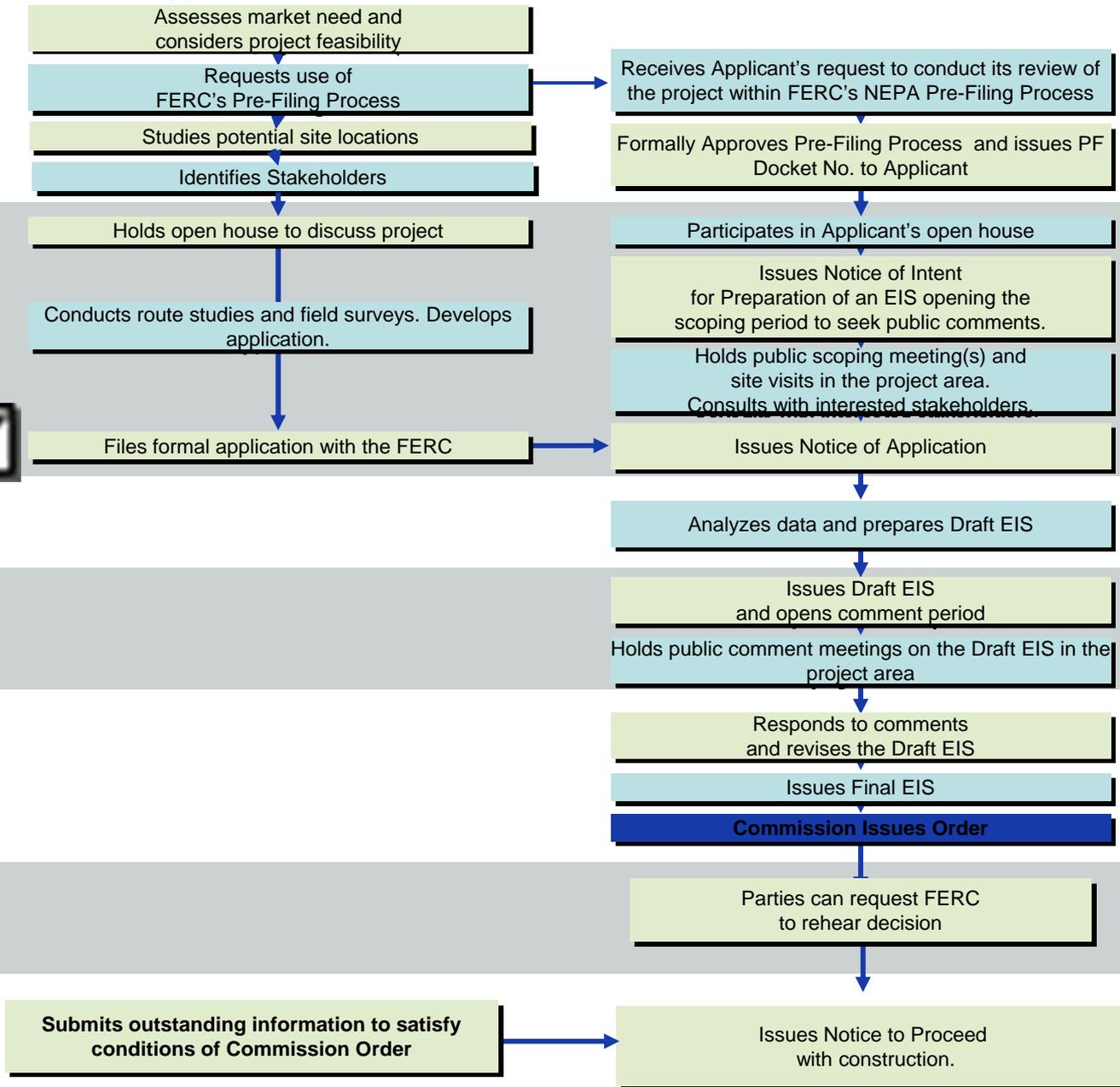
FERC Process

Public
Input
Opportunities



Public
Input
Opportunities

Public
Input
Opportunities



Process: FERC Resource Reports

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

For more information on each report, you can find the FERC regulations at http://edocket.access.gpo.gov/cfr_2005/aprqtr/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





**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**

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

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info@arcticgas.gov**