

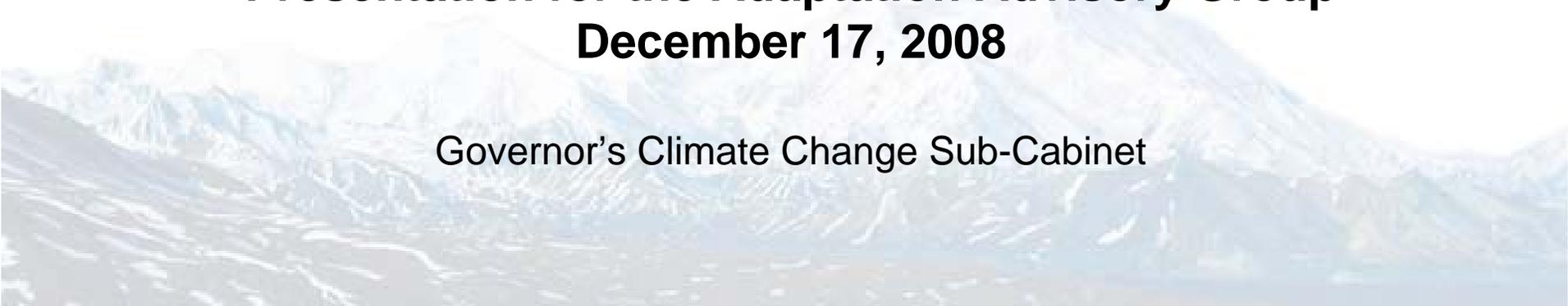
# Alaska Climate Change Strategy

Photo: J. Hardesty

## **Public Infrastructure Technical Working Group (PI TWG)**

**Presentation for the Adaptation Advisory Group  
December 17, 2008**

Governor's Climate Change Sub-Cabinet



# Overview

- **Membership:** Representatives from Alaska State DEC, DOT&PF, DEM&HS, DCCED; Federal USCOE & NOAA; a cooperative utility; Alaska Native Tribal Health Consortium; Denali Commission; a northwest and southeast Alaska city; and University.
- **Focus:** The purpose of the Public Infrastructure Technical Work Group (PI TWG) is to provide policy options for adapting infrastructure to a changing climate.

# Definitions

- **Public Infrastructure** are the essential facilities and utilities under public, cooperative or private ownership that deliver goods and services to communities.
- The **Effects of Climate Change in Alaska** that impact public infrastructure are:
  - Increased flooding (this includes increased coastal inundation, storm surges, coastal and river erosion, siltation, and sea level rise);
  - Decreased duration and extent of sea ice;
  - Increased wind;
  - Thawing permafrost; and
  - Increased fire risk.

# Process

- **Organize the catalog hierarchically on policy-programs-tasks-details.**
  1. Identify the key policy issues and decisions that are and will be needed with regard to climate change and the effect on Alaska's public infrastructure and spending.
  2. Translate policies to program areas for which direction is needed.
  3. Identify priority tasks, with details, in program areas.



# Process

- There are only a few policy issues, other decisions and programs “fall-out” once policy options are established.
- We considered the same 6 criteria other TWG used in our policy option discussions (significance, benefits/effectiveness, costs, feasibility, timing of impact, adaptive capacity), but we did not ballot since there are only a few policy options. We will use criteria further as policy option papers are prepared.

# Status

- Voted December 7-10 on level of endorsement for the catalog and its three policy options.
  - One full endorsement. All others voted to endorse to keep moving forward and knowing that language will be refined as policy papers are developed. (No one voted to reject.)
- As TWG prepares policy papers, catalog language will be revised a bit to reflect deeper work.
- Today, we seek AAG comment and ‘nod’ that:
  - This is a cohesive framework,
  - The broad structure and policy-program-task approach is appropriate, and
  - Any other guidance on the developing options.

# 3 Policy Options

1. **Collect, assess, and monitor data** needed to develop sustainable solutions to adapt public infrastructure to the effects of a changing climate.
2. Adopt a **statewide planning initiative** requiring that state agencies and local governments collaborate to address the effect of climate change on public infrastructure.
3. **Enact sustainable solutions** to adapt public infrastructure that is currently at significant risk, and future public infrastructure, to the effects of climate change. Accomplish by establishing a **statewide capital program**.

# Outcomes/Actions of a Successful Climate Change Strategy to Adapt Public Infrastructure

1. Conduct modeling with climate change inputs to identify hazard zones. Conduct a public infrastructure vulnerability analysis.
2. Share hazard and vulnerability analysis results and subsequent monitoring data, in an actionable format, among local, state and federal agencies.
3. Identify the *specific* areas where new engineering standards or design are needed, conduct the research and generate standards or designs.
4. Retrofit existing vulnerable infrastructure. Locate new infrastructure outside hazard zones or design it to withstand expected hazards/forces. Develop a system to prioritize investments.
5. Community and State emergency, community and transportation planning integrates adaptation to climate change.

**Some detail now presented for  
Policy Option 1**



## **POLICY OPTION 1.** Collect, assess and monitor data needed to develop sustainable solutions to adapt public infrastructure to the effects of a changing climate.

- **PROGRAM A:** Develop an *adaptive climate change model* for public infrastructure.
- **PROGRAM B:** Establish a statewide *baseline inventory* of public infrastructure to evaluate climate change impacts on infrastructure.
- **PROGRAM C:** Conduct a statewide assessment and analysis on the *vulnerabilities of public infrastructure* to the impacts of climate change.
- **PROGRAM D:** Create a statewide *observation network* to monitor and update the infrastructure database.
- **PROGRAM E:** Enact a law to create and authorize a *Public Infrastructure Commission on Climate Change (PICCC)* to develop, implement and administer the databases and modeling programs listed above under a central source and to facilitate inter-agency cooperation.

## **PROGRAM A. Develop an *adaptive climate change model* for public infrastructure.**

*NOTES: Forward this to Research Needs group. It is assumed that research for improving climatic models, and conduct of modeling will be done by others. However, the output data from the climatic models would be required as input into the vulnerability assessment.*

- Task i. Develop the adaptive model using results of the public infrastructure database, the vulnerability analysis, and output data from climatic models.
- Task ii. Develop and recommend strategies and approaches to identify short and long-term sustainable solutions to climate change.
- Task iii. Begin a process based on the modeling results to review and modify engineering design standards, building codes, and operation and maintenance practices to adapt for future climate changes.

## **PROGRAM B. Establish a statewide *baseline inventory* of public infrastructure to evaluate climate change impacts on infrastructure.**

- Task i. Inventory existing public infrastructure in Alaska and document its existing conditions. *(ISER-UAA has developed a preliminary and limited database of existing public infrastructure that was created to project the added cost (above normal wear and tear) from the effects of climate change on infrastructure at risk.)*
- Task ii. Estimate the remaining useful life of the existing public infrastructure.
- Task iii. Estimate the present value replacement costs of the existing public infrastructure.
- Task vi. Inventory the physical and environmental conditions (permafrost, river and coastal shorelines, etc.) that exist at the locations of the existing public infrastructure.

## **PROGRAM C: Conduct a statewide assessment and analysis on the vulnerabilities of public infrastructure to the impacts of climate change.**

- Task i. Conduct vulnerability assessments and evaluate the associated risks from the effects of climate change to existing public infrastructure.
- Task ii. Based on the assessments and new climate projections, analyze for future vulnerabilities based on risk levels.
- Task iii. Develop statewide, regional and local vulnerability assessment tools based on the results of the assessment and analysis.



## **PROGRAM C, Task i. Conduct vulnerability assessments and evaluate the associated risks from the effects of climate change to existing public infrastructure.**

*Examples of 3 specific infrastructure vulnerabilities to assess:*

- Airports and Landing Strips – Evaluate the effects on airports and landing strips related to thawing permafrost, coastal and river erosion and flooding, including the need to relocate, re-align or repair airstrips.
- Buildings - Evaluate the existing damage and loss to public buildings due to shoreline erosion, less shorefast ice, melting permafrost, storms, realignment of rivers and flooding and identify the need to relocate buildings (e.g. Koyukuk) and plan for future siting. Evaluate wild fire risk to buildings due to increased wild fire intensity and frequency and increased threat from diseased/dead trees (e.g. Caribou Hills fire in 2007).
- Coastal and River Shorelines - Evaluate the vulnerability of existing and future unprotected reaches of shoreline with respect to existing infrastructure. Determine need for and type of shoreline protection appropriate to these reaches.

# **Policy Options 2 and 3**



**POLICY OPTION 2.** Adopt a statewide planning initiative requiring that state agencies and local governments collaborate to address the effects of climate change on public infrastructure.

- PROGRAM 2A. Develop a public infrastructure planning network between state agencies and local governments.
- PROGRAM 2B. Empower local community leaders to develop adaptation action plans and incorporate this information into their community plans.



**POLICY OPTION 3.** Enact sustainable solutions to adapt public infrastructure currently at significant risk, and future public infrastructure, to the effects of climate change. Accomplish by establishing a statewide capital program.

- PROGRAM 3A. Enact a law to create and authorize a state funding program.

