



DATE: November 16, 2008

TO: Public Infrastructure (PI) Work Group and PI Adaptation Advisory Group (AAG) Members

FROM: Barbara Sheinberg, PI TWG facilitator

SUBJECT: Material for November 19 PI TWG Meeting

Materials to Support the November 19 PI TWG Meeting include:

- Agenda (PI#5\_Meeting\_Agenda\_111908.doc)
- This cover memo (PI#5\_Meeting Memo\_and\_Discussion Guide\_111908.doc)
- Meeting Summary from October 27 ACTEM and PI TWG meetings (PI#3\_Draft\_Meeting\_Summary.doc)
- Meeting Summary from October 31 PI TWG Meeting (PI#4\_Draft\_Meeting\_Summary.doc)
- Example Policy Catalog (PI TWG Policy Options\_111908A.doc)
- Example Policy Concept (PI TWG Policy Concept 111908B.doc)

To prepare for the November 19 meeting, I have used input from:

- 1) The PI TWG meetings on October 27 and October 31 meeting (*meeting summaries are attached to this email - please review PI#3\_Draft\_Meeting\_Summary.doc and PI#4\_Draft\_Meeting\_Summary.doc*);
- 2) Comments sent via email on either the October 28 or November 3 draft catalog from Amy Holman, Greg Magee, Vlad Romanovsky, Billy Connor, Larry Dietrick, Steve Weaver, Peter Larsen, and Bob Pawlowski.
- 3) Comments from the AAG during the November 7 presentation on PI TWG status.

## **1.0 DEFINITIONS**

One of two main comment themes is that the catalog should continue to list the PI TWG working definitions for climate change, public infrastructure and consider adding one for adaptation.

### Suggested Definitions

Climate change is a significant shift in the variability of average or extremes climatic conditions for a specific location and over a period of time.

#### **OR**

Effects of climate change in Alaska include increased coastal and flood inundation, increased coastal erosion due to reduced sea ice (longer fetch and more wave action), increased storminess, increased storm surge, increased thawing and degradation of permafrost, reduced extent of sea ice and a longer ice-free season in Arctic Ocean and Beaufort Sea, more rapid

glacial melting resulting in increased siltation, changes to sea surface temperature, increased riverbank erosion, thermal erosion and thermokarst due to degradation of permafrost, and increased in slope instability.

**OR**

Effects of climate change in Alaska include: difficulty maintaining subsistence hunting cultures; expanded marine shipping; declining food security; human health concerns (increased incidences of vector-borne diseases and asthma); effects on wildlife migratory patterns; increased access to offshore resources, including minerals and petroleum; changes in marine fisheries; decline in freshwater fisheries such as arctic char and salmon; enhanced agriculture growing seasons; increased forest fire and insect infestation activity; disrupted land transportation from thawing permafrost and melting ice roads; increased damage to community infrastructure from coastal erosion and thawing permafrost.

**OR**

Scientific evidence shows many areas of Alaska are experiencing a warming trend. Many experts predict that Alaska, along with our northern latitude neighbors, will continue to warm at a faster pace than any other state, and the warming will continue for decades. Climate change is not just an environmental issue. It is also a social, cultural, and economic issue important to all Alaskans. As a result of this warming, coastal erosion, thawing permafrost, retreating sea ice, record forest fires, and other changes are affecting, and will continue to affect, the lifestyles and livelihoods of Alaskans. (Governor's Administrative Order No. 238)

- Further, it is suggested that after a definition for climate change effects has been listed in the catalog, when specific actions/ specific infrastructure is listed, use the term "climate related effects or hazards" and do not call out one specific hazard (for example, sea level rise) over others.

**Critical infrastructure** is a term used to describe the "material assets" that are essential for society and the economy to function<sup>1</sup>. **Public infrastructure** is assets owned by local, state, and federal governments that are critical for delivering goods and services to communities. (Moteff, et al., 2003).

**Adaptation** is the attempt to limit adverse impacts by becoming more resilient to climate changes that will occur while society purses the first set of actions (i.e. mitigation). (Arctic Climate Impact Assessment report)

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<sup>1</sup> Larsen, P.H., et al., Estimating future costs for Alaska public infrastructure at risk from climate change. Global Environmental Change (2008). Doi:10.1016/j.gloenvcha.2008.03.005

## 2.0 POLICIES

The second of the two main comment themes is that many PI TWG members, as well as the AAG, are recommending that TWG generally consolidate and “lump” policies and make them high level.

Most seem to be in agreement with this direction. However there does seem to be a lack of consensus on exactly how high, “high level” is and thus how many policies are appropriate. It has been suggested that there should be as few as two or as many as seven policies.

Also, there are differing ideas on organization of high level themes for policy development.

### Suggested Policy Options

#### Suggestion A

1. It is the policy of the State of Alaska to protect existing public infrastructure.
2. It is the policy of the State of Alaska to site, build and operate future public infrastructure in a manner that accounts for the hazards that climate change is and will create.

Suggestion B (see attached document “PI TWG Policy Options 111908A.doc” to see how a catalog of policies-programs and actions would be organized under the 3 policies here).

1. It is the policy of the State of Alaska to create a Public Infrastructure Commission on Climate Change (PICCC) to develop, implement and administer technical programs on collecting data to formulate criteria for adapting public infrastructure to a changing climate.

The PICCC would consist of state and local government officials and representatives from the University of Alaska, engineering profession and other interested stakeholders. Also, the PICCC would advise the Adaptation Advisory Group on the current and future effects of climate change on public infrastructure and the strategies and approaches for state agencies and local governments to adapt public infrastructure to a changing climate.

2. It is the policy of the State of Alaska to create a statewide planning initiative for state agencies and local governments to collaborate and develop adaptation action plans for addressing climate change impacts to public infrastructure.
3. It is the policy of the State of Alaska to establish a statewide capital funding program to fund sustainable solutions that will adapt public infrastructure currently at risk and future public infrastructure to a changing climate.

### Suggestion C

1. It is the policy of the State of Alaska to identify and annually report on key indicators and impacts of climate change.
2. It is the policy of the State of Alaska to coordinate community, transportation and emergency planning to address climate change hazards and vulnerabilities. (Add narrative on how or where this will take place.)
3. It is the policy of the State of Alaska to establish a decision-making system to determine which infrastructure investments are appropriate, where and why, and how much risk is acceptable to the public. (This is probably a task under a higher order policy)
4. It is the policy of the State of Alaska to develop the capability to be the nation's leader in climate change adaptation engineering
5. It is the policy of the State of Alaska to seek to sustain public infrastructure before investing in new infrastructure.

Suggestion D (See attached document PI TWG Policy Options 111908B.doc to review how a program of action would be organized under this single policy)

1. It is the policy of the State of Alaska to give local community leaders the information, the tools and the opportunity to incorporate climate change adaptation into their current community plans. The goal is to inspire and inform residents to maximize the opportunity for orderly transition.

### Suggestion E

1. It the policy of the State of Alaska to follow consistent guidelines for documenting changes occurring and likely to occur due to climate change. Set a consistent context for adaptation policy setting and analysis by documenting and describing the changes occurring and likely to occur due to climate change in Alaska.
2. It is the policy of the State of Alaska to document the condition of existing public infrastructure and to document it vulnerability to climate change. Develop an observation network to document the current condition of public infrastructure in Alaska.
3. It is the policy of the State of Alaska to systematically assess the level of risk to existing public infrastructure due to climate change conditions and hazards.
4. It is the policy of the State of Alaska to coordinate community, transportation and emergency planning related to climate change hazards and vulnerabilities.
5. It is the policy of the State of Alaska to evaluate the appropriate level of risk related to climate change for infrastructure investment. Establish a decision-making system to determine which infrastructure investments are appropriate, where and why, and how much risk is acceptable to the public.

6. It is the policy of the State of Alaska that new design and building codes for public infrastructure accommodate climate change. Amend Alaska's educational curricula to include research and development of new standards and codes to site, design and engineer public infrastructure to address climate change conditions and hazards.
7. It is the policy of the State of Alaska to minimize the life cycle cost while maintaining the function of the public infrastructure. (Note this currently being done and will be done irrespective of climate change.)

Other comments to add where appropriate to catalog

We need to think about siting future infrastructure to also consider the fact that wildlife habitat/migration corridors may be changing significantly. Plant and animal species may be put at great risk because of new infrastructure development and climate change and we need to ensure that building decisions minimize impacts to these ecosystems.

Coupling climate models with engineering models and then with economics models creates a very complex set of mathematical issues including A) how to communicate statistical uncertainty to land planners who need to make decisions now, B) what shape of statistical distributions (HINT: do not use normal/gaussian statistics to evaluate likelihoods of occurrence) are most appropriate when trying to evaluate building projects in high-to-medium risk areas, and C) how to accurately discount future economic risk to the present.

There should not be any yes no/policies.

We do not want infrastructure projects competing against one another; we need to establish a sequence of actions that focus around projects that must happen immediately, those that must happen within 10 years, those that must happen in 11-20 years, and those that must happen in more than 20 years.

And, please see meeting summary from October 27 meeting for other considerations.