

CLIMATE CHANGE EXECUTIVE ROUNDTABLE COLLABORATIVE OPPORTUNITIES

1. Data Integration and Collaboration

Statement of Need:

The relatively data-poor environment in Alaska, together with a serious need of increased access to information to respond to climate-driven changes and increasingly complex resource management issues, makes existing information prized by many. Each of our agencies or organizations recognizes this and is attempting to improve resource data management systems and develop new tools to support decision-making and data visualization.

Purpose of Collaboration:

To efficiently share data through as many access points as possible by describing best data management practices, identifying tools that will facilitate increased access to information, and determining how systems may be made interoperable.

2. Physical Parameter Monitoring Networks

Statement of Need:

Alaskan ecosystems change in response to physical processes operating in the atmosphere (climate and meteorology), lithosphere (erosion and soil formation), cryosphere (continental and sea ice, permafrost), and hydrosphere (water). The mechanisms by which a changing climate may affect biological communities are exceedingly complex and poorly understood; however, understanding how these environmental features relate to past and present ecosystems will help shape our understanding of the climate-related changes that may be anticipated with further warming. There are currently too few monitoring stations dispersed over the state to adequately monitor physical parameters or to provide a basis for predictive modeling, and many networks have significant gaps in coverage.

Purpose of Collaboration:

To identify shared abiotic information needs (permafrost, climate, hydrology, coastal geomorphology) that can be best met through cooperative data collection and sharing efforts among agencies, assess adequacy of statewide coverage of monitoring networks, identify monitoring gaps, and develop cooperative strategy for collecting, sharing, and monitoring physical processes data.

3. Scaled Down Climate Data and Models

Statement of Need:

While General Circulation Models are the most widely used tools for projections of global climate change over 100 years, the climate information required for most resource management decisions is at a spatial scale much finer than that provided by global models. Predicting impacts of climate change on natural systems requires the equivalent of point climate observations, not yet available, and is sensitive to finer scale climate variations due to complex topography and coastal influences. Examples of specific needs include: downscaled global climate model data for permafrost distribution and glacial recession.

Purpose of Collaboration:

To identify and prioritize areas most in need of down-scaled climate modeling and to identify opportunities for leveraging resources to acquire stepped-down models.

4. Coastal Resources and Sea Level Rise

Statement of Need:

Many natural, cultural and constructed assets are in areas likely to be affected by coastal erosion, flooding, salinization, and submergence. Mitigation and adaptive responses need to be designed with knowledge of the

full magnitude of changes likely to occur. Specific data needs include: historical and current shoreline configuration, sea level modeling input data such as post-glacial isostatic rebound rates, and coastal substrate (bedrock, permafrost, ice, sand, etc.) data to identify areas at risk of subsidence or collapse.

Purpose of Collaboration:

To identify data needs and opportunities to leverage resources to acquire detailed sea level change maps for low elevation coastal areas using 25, 50, 75, and 100 year modeling forecasts.

5. Forecasting Vegetation and Wildlife Habitat Change

Statement of Need:

Understanding how climate change will affect our ability to sustain species, biodiversity, and traditional subsistence uses into the future is a common challenge faced by Federal, State, Native and Private land managers in Alaska. Rather than focusing on restoring connectivity to fragmented ecosystems, the challenge facing Alaska's resource managers is to maintain relatively intact systems in a time of rapid ecological and development changes. Identifying lands, regardless of ownership, which are important to ensure connectivity for resource movement and long-term sustainability would help refine and coordinate conservation and management direction. Specific data needs include: statewide landcover data layers (National Land Cover Database, LandFire, Unified Ecoregions of Alaska); current wildlife and fish species Alaska range maps; wildlife-vegetation associations; and digital elevation models.

Purpose of Collaboration:

Many efforts to anticipate future threats to wildlife populations and to prioritize management actions and scientific programs are ongoing. Collaboration is needed to identify the common underlying needs that will benefit these and future efforts.

6. Biological Inventory, Monitoring, and Research

Statement of Need:

Understanding the effects of climate change on Alaska's biological populations, and the ecosystems they contribute to, will require bringing a level of coordination to many of the disparate inventory, monitoring, and research activities that federal, state, and non-governmental organizations are involved in. Establishing baselines through ongoing inventory and census programs, monitoring for changes in status, documenting trends through repeated sampling and analysis, and conducting research to understand response will serve to provide the scientific basis for developing predictive models, as well as assessments for measuring the effectiveness of the adaptation and mitigation strategies enacted by managers and policy makers as part of an adaptive management framework.

Purpose of Collaboration:

To identify shared biotic information needs (population census, demographics, vitality, migration, reproduction, phenology, for example) that can be best met through cooperative data collection and sharing efforts among agencies, assess adequacy of statewide coverage of inventory and monitoring programs and networks, identify inventory, monitoring, and research gaps, and develop cooperative strategy for collecting, sharing, and monitoring biological status and trends and process data.

7. Invasive Species and Biological Hazards

Statement of Need:

Changing temperatures and moisture levels can put native plants, animals, and aquatic species at stress and increase their susceptibility to both native and non-native competitors, pests, and disease organisms. Disease risk, for plants, animals and humans, can be expected to increase as additional vector species and intermediate hosts expand into Alaska. Understanding trigger points and transmission routes will facilitate prioritization of prevention and control efforts and identifying common needs and priorities will facilitate coordinated action.

Specific data needs include: invasive species (plant, animal, aquatic, pests) Alaska distribution data/maps and native pest species outbreak maps.

Purpose of Collaboration:

To identify specific risks to native species and ecosystems, trigger points/conditions, and potential transmission routes; to identify common needs and priorities; and to model potential transmission routes, areas, and native species at risk of invasive species due to increased temperature/moisture stress, fire, insect pests and disease impacts.

8. Determining Wildland Fire Trends in Alaska

Statement of Need:

Fire frequency and intensity affects wildlife and fish habitat suitability. Arctic and subarctic plant communities may require many years to recover from a severe fire and under changing climatic conditions may not be replaced by the same or similar plant types. Resource managers need to understand fire trends to determine appropriate management responses.

Purpose of Collaboration:

To identify data needs and opportunities to leverage resources to acquire detailed projections of wildland fire frequency, intensity, and area as a result of climate change over the next 25, 50, 75, and 100 years.

9. Climate Change Physical Hazards Assessments

Statement of Need:

The rapid retreat of glaciers in Southeast Alaska has left several steep and unstable slopes, including some now over water. In Glacier Bay National park there is a very slow moving landslide that, if triggered by tectonic shaking or slope failure, could produce a tsunami in the West Arm of Glacier Bay, an area regularly transited by large and small ships. Other examples are widespread in Southeast Alaska. As glacial melting accelerates, risk of outburst flooding increases and could be catastrophic for people down slope in some locations. Specific data needs include: remote sensing data to identify areas of rapid change; GIS analysis to identify potentially unstable landforms; and site inspections.

Purpose of Collaboration:

To assess physical and biological hazards caused by climate change, rapid glacier retreat, and permafrost thaw, including: landslides, slope collapse tsunami hazards (surface and subsurface), glacial lake outbursts, other flooding, and avalanche.

10. Regulatory and Policy Issues

Statement of Need:

Many environmental laws, regulations and policies on the federal, state, and local levels were developed before the signs of climate change were observed. The challenge for environmental and resource management agencies will be to manage for healthy, productive ecosystems in a future made less certain due to a changing climate. This will necessitate possible changes to their institutional, legal and policy frameworks to respond quickly enough to sustain the natural resources they manage for the “public trust”. For example, resource managers in Alaska may need to revise Alaska policies relative to wildland fire management in light of the effects of climate change.

Purpose of Collaboration:

This group will identify and address statutory, regulatory and policy changes needed at the federal, state, and local levels to effectively address and manage climate change impacts on natural resources.