

**Good Afternoon**

# **Research Implications Derived from the Arctic Climate Impact Assessment (ACIA)**

## **AGENDA:**

- **Elements of future assessments, and**
- **What are some of the elements of a research and observation/monitoring agenda for the future.**

# Where to we go from here, in the near future and over the coming years ?

- **Elements of a future assessment,**
- What are some of the elements of a research and observation/monitoring agenda for the future, and

## • **The Assessment should have these Four Elements:**

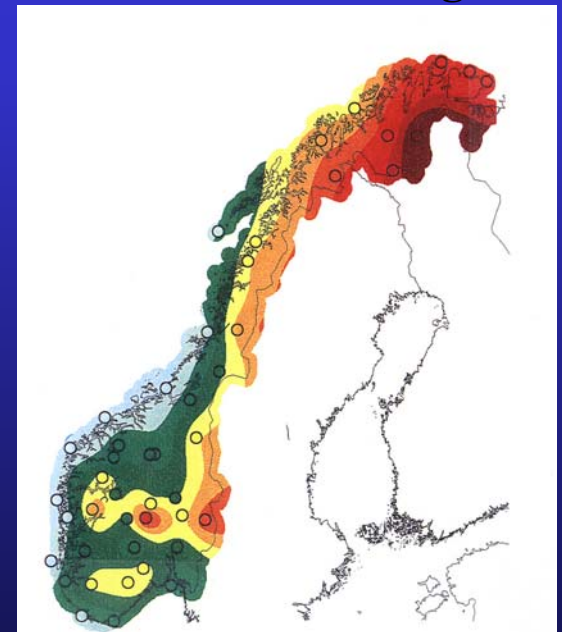
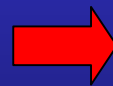
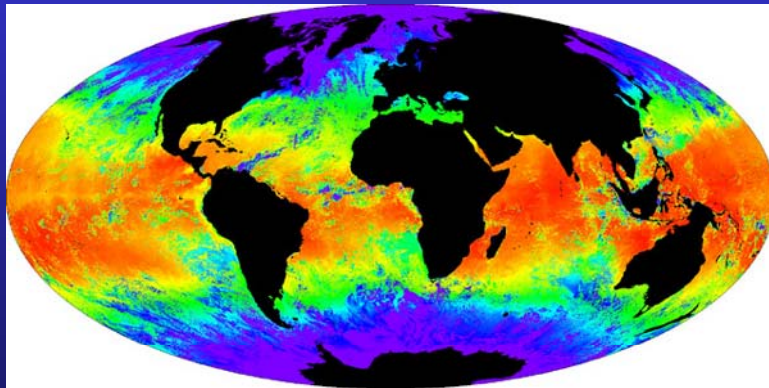
- ✓ **Engage the “Best” of Science: Organize under some recognized framework that engages and facilitate the involvement of the best scientific/expert talent of the nation/world,**
- ✓ **Involves those Impacted: Nested in the a legitimate and recognized framework that engages those impact/affected (local residents, stakeholders, etc.) by the potential changes in climate, and**
- ✓ **Legitimate Governmental Engagement: Organized and enabled by governments (at several levels) or through a recognized “agreement” among governments (e.g., Arctic Council).**
- ✓ **Engaged and Equal: All equal partners and all at the “table” in the planning and implementation.**

## A Central Reality:

While IPCC and climate and global change research, during the past 10-20 years, have substantially enhanced and deepened our knowledge of the global means and large-scale trends of climate change and its consequences, **the reality is that now we must extend that knowledge to the regional or more local scales** where the “patchiness”, extremes, and “surprises” are most likely to be expressed. This is where residents, stakeholders, and governments “see” the consequences of climate variability and change. Research and assessments should, then, increasingly focus at these scales.

**Regional variations are significant.**

### Maintain the Global Context



Where to we go from here, in the near future and over the coming years ?

- **Elements of a future assessment, and**
- **What are some of the elements of a research and observation/monitoring agenda for the future.**

# Implications for Research, Observations, and Future Assessments

***Regional Impacts:*** While the ACIA was successful in many respects it addressed mostly impacts at the large-scale pan-arctic level. There is a need to focus future research and assessments on smaller regions (e.g., at the landscape level) where an understanding of impacts of climate change has the greatest relevance and use for residents in the region, their activities, and their institutions.

***Economic Impacts:*** There are many important economic sectors in the Arctic, including oil and gas production, mining, transportation, fisheries, forestry and agriculture, and tourism. Only qualitative information on the economic impacts (in monetary terms) of climate change is presently available in most cases. It is now essential to involve a wide range of experts and stakeholders in future climate impact assessments to fill this gap and provide relevant information to users and to decision makers.

***Assessing Vulnerabilities:*** Climate change occurs amidst a number of other interacting social and environmental changes across scales from local to regional and even global, and include industrial development, contaminant transport and effects, and changes in social, political, and economic conditions. In this context it has become important to assess the vulnerabilities and resiliencies of coupled arctic human-environment systems.

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***Assessing Adaptation and Vulnerabilities:*** Climate change occurs amidst a number of other interacting social and environmental changes across scales from local to regional and even global, and include industrial development, contaminant transport and effects, and changes in social, political, and economic conditions. In this context it has become important to understand adaptive capacities, vulnerabilities, and the resiliencies of fully coupled human-environment systems within an arctic context.

# Implications for Research, Observations, and Future Assessments

**At a more detailed level, ACIA has  
identified these critical needs:**

# Implications for Research, Observations, and Future Assessments

***Observations:*** To improve future climate impact assessments, many arctic processes require further study, both through scientific investigations and more detailed systematic documentation of indigenous knowledge.

***Long-Term Monitoring:*** Long-term time series of climate and climate-related parameters are available only from a few locations in the Arctic.

***Climate Modeling:*** Improvements in numerical modeling of potential changes in climate are needed, including the representation of key arctic processes in climate models such as sea ice processes and status, ocean processes, permafrost-soil-vegetation interactions, important feedback processes, and extreme events; and most importantly, developing and using very high-resolution coupled regional models of the Arctic that provide useful detailed information to local experts and decision makers at scales relevant to their needs.

***Analysis of Impacts on Society:*** Critical needs for improving projections of possible consequences for the environment and society include evaluating approaches for expressing relative levels of certainty and uncertainty; developing linkages between traditional and scientific knowledge; preparing scenarios of arctic population and economic development; and identifying and evaluating potential mitigative and adaptive measures to meet expected impacts.

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**An ACIA Workshop** is planned for September to develop an agenda **to address the research needs, gaps in knowledge, and observations/monitoring** needs out of which a report will be prepared for the Arctic Council, PP's, IASC, IPY, ICARP II, GEO and other interested research and observations programs and projects. The Report will be submitted to AMAP, CAFF, IASC, and through them to the SAO's and Ministers in time for the November Ministerial. It can also be used in in other planning venues, e.g., ICARP II, IPY, ArcticNet, SEARCH, etc.

The background of the slide is a photograph of a sunset or sunrise over a body of water. The sun is low on the horizon, creating a bright, golden glow that reflects on the water's surface. The sky is filled with wispy, white clouds that catch the light from the sun. In the foreground, the dark silhouettes of several islands or landmasses are visible against the horizon line. The overall mood is serene and majestic.

**International Conference on Arctic Research Planning II  
(ICARP II)**

**Is there a role that ICARP II can play to  
facilitate the implementation of IPY?**

**Mid-November 2005**

**Copenhagen, Denmark**

## **Recalling that the Strategy for the Planning Process is:**

**Twelve Working Groups have been established and have been asked to identify the critical research needs, gaps in knowledge, and requirements for long-term observations-monitoring that are essential to:**

- Understanding the coupling between those human and natural systems that govern the behavior of the overall arctic system.**
- Identifying the governing natural systems in the arctic region that are essential to understanding of the behavior of the overall arctic system.**
- Understanding the essential social and societal systems across the arctic region that control the overall behavior of the arctic system.**
- Enhancing the capacity to meet social interests and to enable a robust set of programs of scientific research in the arctic region.**

**The Working Groups will prepare detailed science plans by June 2005 which will be widely circulated to the arctic community and serve as the basis for the discussions in Copenhagen. At a more detailed level, these Working Groups are “grouped” into four broad categories.**

**First, understanding the coupling between those human and natural systems that govern the behavior of the overall Arctic system.**

- Coastal (Volker Rachold)
- Indigenous Peoples and Change in the Arctic: Adaptation, Adjustment and Empowerment
- Sustainable Development – Arctic Economies (Henry Huntington)

**Second, identifying the governing natural systems in the Arctic Region that are essential to understanding of the behavior of the overall Arctic system**

- Arctic Ocean Margins and Gateways (Jackie Grebmeier)
- Arctic Shelf Seas (Heidimarie Kassens)
- Terrestrial Processes and Systems (Terry Prowse)
- Deep Central Basin of the Arctic Ocean (Bernie Coakley)
- Future Trends and Patterns of Change in Climate, Ozone, Ecosystems, and other Systems ( Lennart Bengtsson)

**Third, understanding the essential social and societal systems across the Arctic region that control the overall behavior of the Arctic System**

- Vulnerability, Resilience, and Rapid Change in the Arctic (Gary Kofinas)

**Fourth, enhancing the capacity to meet social interests and to enable a robust set of programs of scientific research in the Arctic Region**

- Arctic Science in the Public Interest (Lars Kullerud)
- Enabling Research Infrastructure (Joint Team)
- Resources and Funding to Enable Research (Joint Team)

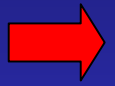
## **A Question:**

**The ICARP II process is all about planning. It is designed to engage a broad range of scientific, technical, and indigenous perspectives to document research needs, gaps in knowledge that must be understood, and determine the most needed observations and long-term monitoring requirements. The Conference, therefore, might provide a venue for the IPY community to pause, mid-stream, to reflect on their scientific implementation plans and to share them broadly with those gathered at the ICARP II Conference in late 2005 -- about one and one-half years before full implementation of the IPY set of programs, projects, and activities. Therefore, does ICARP II afford an opportunity for the IPY process?**

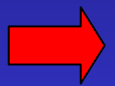
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**A new level of commitment to research, observations, and monitoring in the polar regions**

Ongoing Research



ACIA



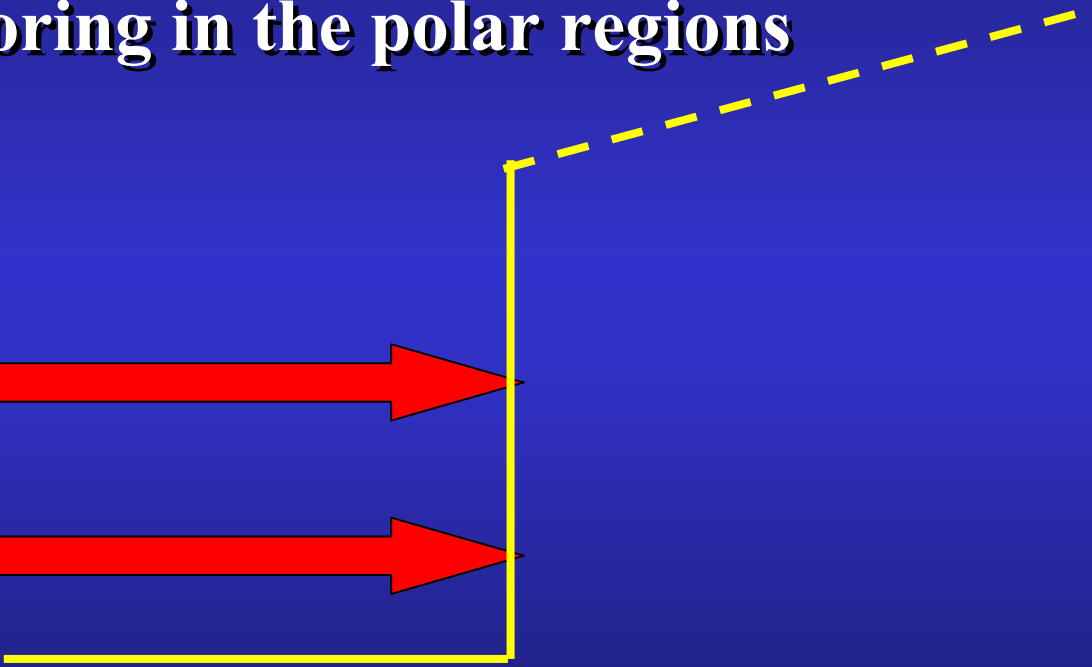
ICARP II



IPY



Future Research





**International Conference  
On  
Arctic Research Planning**

**Copenhagen, Denmark  
November, 2005**

<http://www.dpc.dk/ICARP>

**Thank You**

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