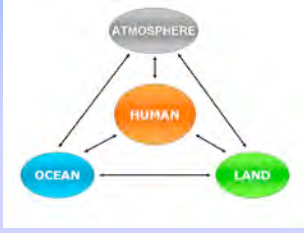




International Study of Arctic Change ISAC Science Programme



- ISAC is a pan-arctic **research programme**.
- ISAC is international.
- ISAC is cross-disciplinary and interdisciplinary.
- ISAC is **open-ended** and focused on **observing, understanding** and **responding** to pan-Arctic system-scale changes.



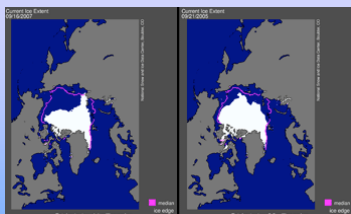
The ISAC Science Plan

- Introduction
- Observing, understanding and responding to Arctic System Changes
- ISAC Science Questions
- ISAC Objectives
- ISAC Components
- Implementation



Introduction - ISAC Goals

- Observe and track arctic changes across all domains.
- Understand the nature of, causes, feedbacks & connectivities among these changes.
- Elucidate linkages between the arctic & the global systems.
- Provide scientifically based information for the development of response strategies to society & decision makers.

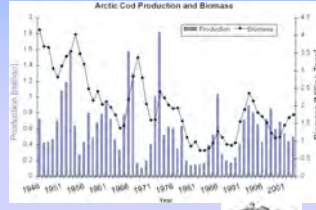
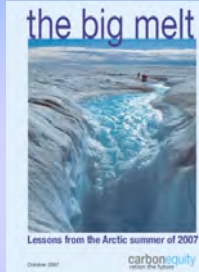


Sea ice extent for September 16, 2007 compared to previous record. NSIDC.



Kevin Kallaugher, *The Economist* August 2008.

Observations of Arctic System Change



Time Series - Arctic Cod - Barents Sea, Harald Loeng, Institute of Marine Research, Bergen, Norway

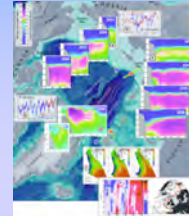


Image courtesy I. Polyakov, International Arctic Research Center, UAF

- Change is occurring across all domains.
- Recent change is best documented in the physical system.
- Changes are interrelated.
- Some changes are cumulative and have already an impact on life in the Arctic.



Photo: V. Romanovsky

ISAC Science Questions

- How is Arctic Change linked to Global Change?
- Why are many aspects of Arctic Change amplified with respect to global conditions?
- How do natural variability and secular trends interact and how well can Arctic Change be predicted/projected?
- What are the feedbacks between the environment and the human system; how do these effect Arctic Change?
- How do ecosystems and socio-ecological systems respond to Arctic Change; how vulnerable are they to Arctic Change?
- What mitigation and adaptation strategies can be employed?



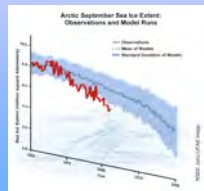
ISAC Objectives

Observe, Understand & Project the Past, Present, & Future States of the Arctic System

- Establish an integrated observing system.
- Synthesis of observations.
- Attribute Arctic Change.
- Project Arctic Change into the future.
- Provide options for response strategies.
- Establish the links between Arctic Change and Global Change.
- Dissemination of information.



August 18 1776 - Captain Cook reaches the ice pack at 70° 44'N., north of Icy Cape. He reports a chilly mist, and a wall of ice about 12 feet high, stretching from horizon to horizon. He notes that the pack ice was advancing at the rate of 15 miles in 10 hours, and heads south again.



Bill Gould, forest ecologist, left, and Skip Walker, Institute of Arctic Biology, University of Alaska Fairbanks, right, collect plants for vegetation studies in Isachsen, Ellef Ringnes Island, Nunuvut, Canada, July 2005. [Photo by](#) [Hans-Joachim Schell](#)

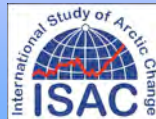
ISAC Components

- Observation
 - Design and establish an integrated observing system which is informed by scientific understanding and societal needs.
- Understanding
 - Analysis of observations, synthesis.
 - Modeling, reanalysis, projections
 - Is informed by and feeds back to observation systems.
- Responding
 - Adaptation and mitigation strategies.
 - Understanding resilience and vulnerabilities.
 - Draws on and feeds back to observations, understanding and projection.



ISAC Programme Implementation

- **Strategic vision** for integrating diverse areas and constituents and providing focused research on arctic change.
- **Science and implementation plan** that identifies the means best suited for addressing ISAC scientific hypotheses
- Basis for science plan is **ISAC Science Overview Document**
http://www.iasc.se/iasc/ISAC_SOD.pdf



ISAC Programme Development

- 2003
 - International Arctic Science Committee (IASC)
 - Arctic Ocean Sciences Board (AOSB)
- 2004
 - Interim Science Planning Group (ISPG) formed.
- 2005 January
 - ISPG publishes ISAC Science Overview Document.
 - ISAC endorsed as an IPY project.
- 2006
 - ISAC Science Steering Group formed.
- 2007
 - ISAC Executive Director hired.
 - Science plan in development.



ISAC International Programme Office

- Foster community of arctic researchers & research programs that are united in efforts to remove obstacles to observation, synthesis, modeling, and understanding.
- Provide a forum for discussion of scientific standards/norms & sharing of such information among organizations.
- Develop links to similar programs on arctic and global change.
- Coordinate existing & emerging national & international ISAC projects.
- Inform other arctic programs of ISAC scientific progress & ensure appropriate data dissemination.
- Provide information to scientists, arctic residents & the general public (web site, regular publication of bulletins and/or newsletters).
- Build & maintain a catalogue of ISAC projects that will be used to guide the program.



Recent and Upcoming Activities

Presentations

- SEARCH SSC Meeting, Washington DC. 5-7 Nov 2007.
- DAMOCLES General Assembly, Oslo, 27-30 Nov 2007.
- AGU San Francisco, 11-15 Dec 2007.
- Arctic Observation Integration Workshops, Palisades, N.Y., 17-20 March 2008.
- Arctic Science Summit Week, Syktyvkar, 29 March, 2008.

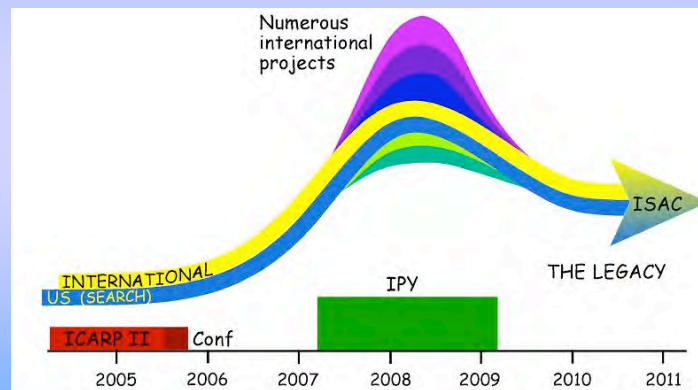
Planning Activities and Co-Sponsorships

- First IPY Workshop on Sustaining Arctic Observing Networks (SAON), Stockholm, 12-14 Nov 2007.
- ISAC SSG Meeting, 6-8 February 2008.
- Second IPY Workshop on Sustaining Arctic Observing Networks, Edmonton, 9-11 April 2008.
- Third IPY Workshop on Sustaining Arctic Observing Networks, Helsinki, 15-17 October 2008.
- State of the Arctic Meeting, 2009 (joint sponsorship with DAMOCLES and SEARCH).



IPY Legacy and ISAC

ISAC will integrate IPY legacy programs



For Further Information

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<http://www.iasc.se/isac.htm>

