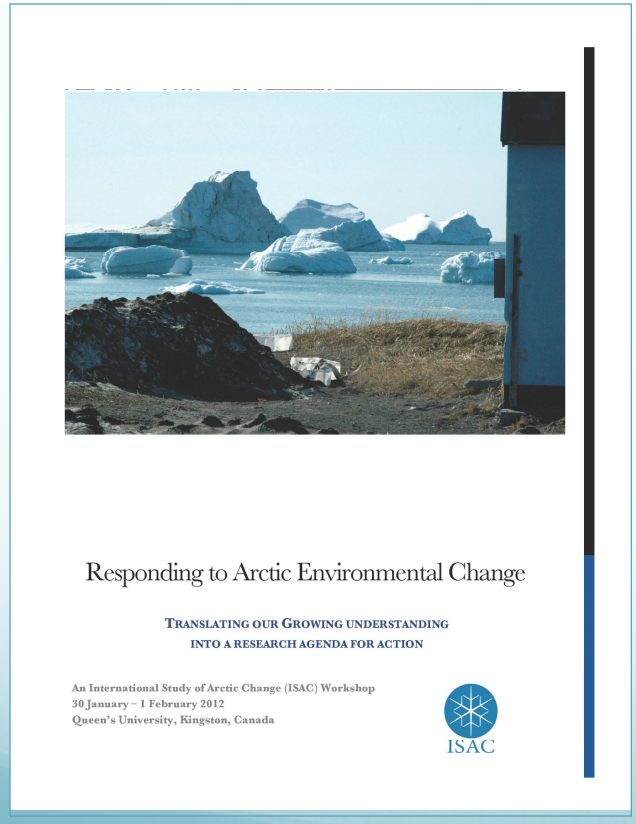
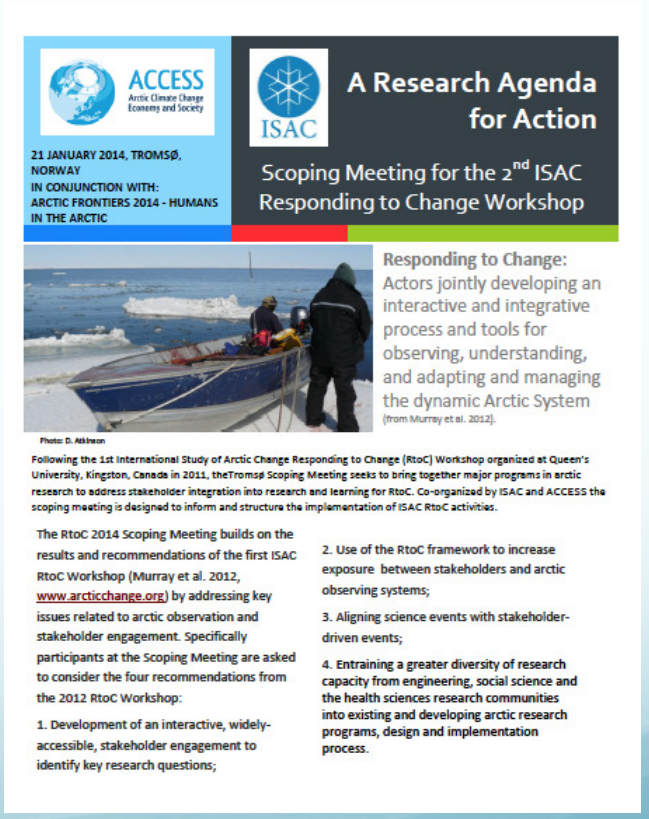
International Study of Arctic Change

Responding to Change Workshop 2012

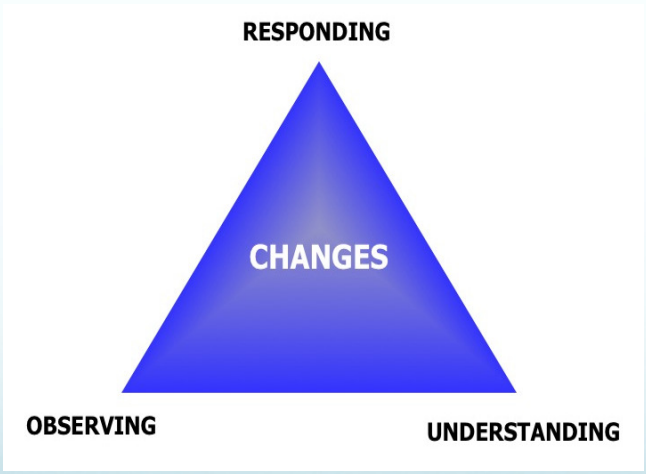


Responding to Change Scoping Meeting 2014



RtoC Background

- Responding to Change is one of the three components of the International Study of Arctic Change Science Plan



- First RtoC Workshop held 2012, Kingsto, Canada
- Defined a common reference framework for RtoC
- Identified fundamental research activities to implement RtoC
- Outlined a pathway for RtoC to inform Arctic system observing initiatives

RtoC
A Research Agenda for Action

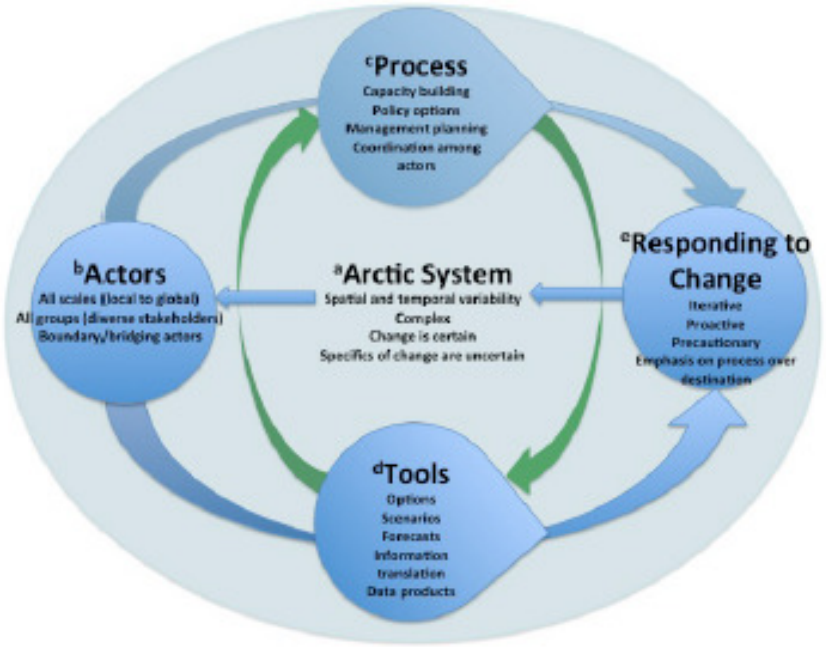


Figure 2. Given the dynamic nature of the arctic system[a], RtoC means actors[b] jointly developing and iterative and integrative process[c] and tools[d] for responding to change[e]

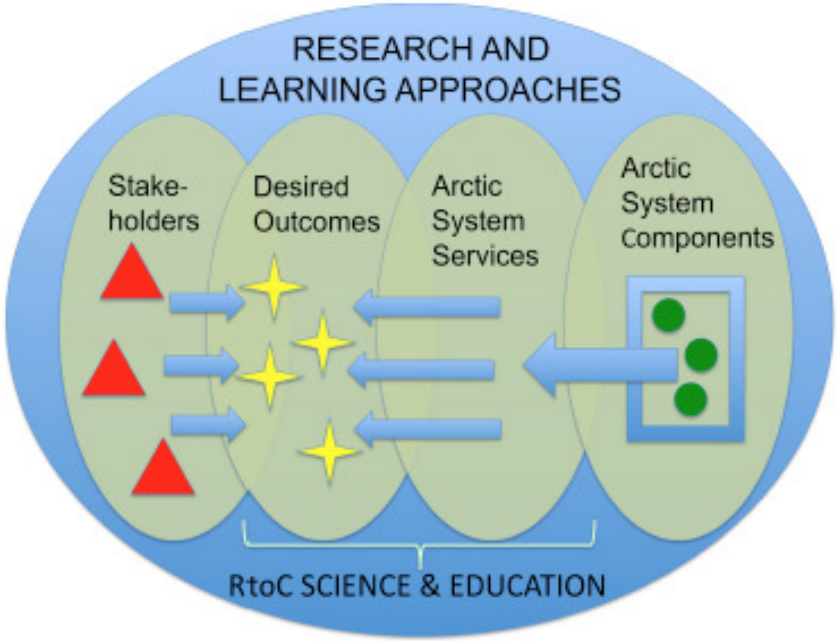


*Figure 3. Schematic representation of a reference framework for research and learning approaches related to RtoC. This illustrates how specific arctic system components and processes, associated with variables that relate to the state and dynamics of the system, translate into specific **Arctic System Services** of interest to stakeholders. Such services are key in assessing or shaping outcomes seen as desirable by different stakeholder groups. In this sense, the realms of desired outcomes and arctic system services bridge stakeholders and broader, fundamental scientific interests.*

Figures from: Murray, M.S.,Eicken,H.,Starkweather,S.,Gerlach,S.C., Evengård, B., Gearheard,S., Schlosser, P., Karcher, M.,P., McLennan, D., Epstein, H., Bock,N., Juillet, C.,Graben,S., Grimwood,B., Labonté,D., Pletnikof,K.,Scott,N.,Sommerkorn, M.,Vardy, M., Vitale,V., Wagner,I., Wandel,J. (2012) **Responding to Arctic Environmental Change:Translating Our Growing Understanding Into a Research Agenda for Action**. International Study of Arctic Change, Stockholm/Fairbanks.

2012 RtoC Recommendations

- Develop an interactive, widely accessible, stakeholder engagement tool to identify key research questions;
- Use the RtoC framework to increase exposure between stakeholders and Arctic observing systems;
- Align science events with stakeholder driven events;
- Entrain greater diversity of research capacity from engineering, social science and the health sciences into existing and developing Arctic research programs, and the research design and implementation process.

2014 RtoC
ICARP Recommendations

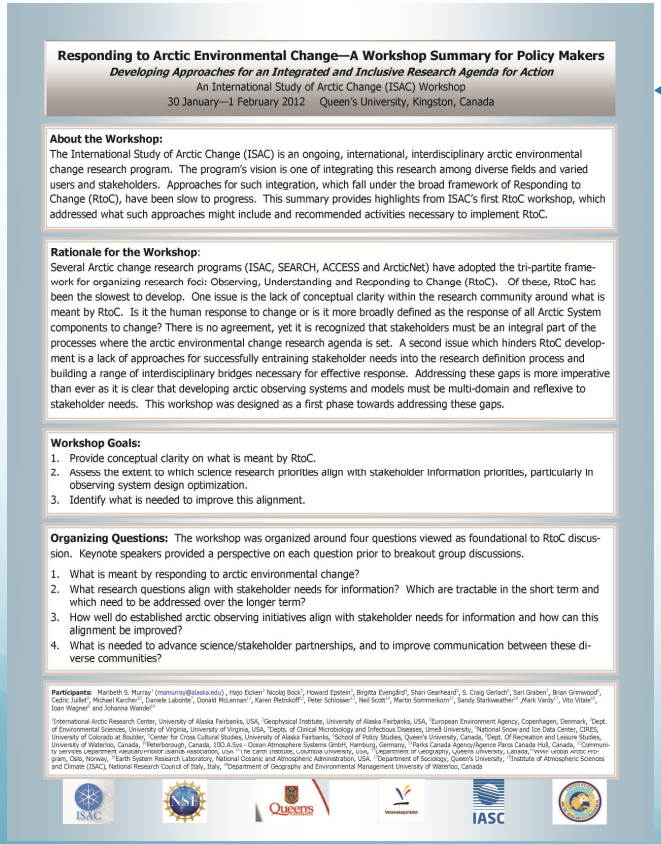
- **Identify Arctic Science Priorities**
  - Through ISAC develop an implementation plan for responding to change research;
  - Develop new conceptual models of change for the coming decades (beyond environmental change);
  - Refine processes for better identification of emerging scientific issues;
  - Prioritize the collection, rescue and analysis of long-term data sets and use that data to inform response to change (e.g. scientific, local and policy responses) in light of emerging issues;
  - Identify and build on areas where science is actually informing response (Including scientific response) on issues of key concern (e.g. loss of critical habitat, changes to the cryosphere, human and wildlife health, development)

2014 RtoC
ICARP Contributions

- **Coordinate Various Arctic Research Agendas**
  - Building momentum for Arctic Observing Summit(s), the first RtoC Workshop and the Tromsø scoping meeting brought diverse groups together to tackle synthesis specifically designed to address needs for responding to change.
  - RtoC activities bring missing members of the research community into the discussion (engineers, health researchers, educators, economists, etc.)
  - More broadly, ISAC activities are directed toward development of an international synthesis effort to advance scientific inquiry, translate knowledge, and inform end users.

2014 RtoC ICARP Contributions & Recommendations

- **Inform Policy Makers, People in or near the Arctic and the Global Community**



Responding to Arctic Environmental Change—A Workshop Summary for Policy Makers

Developing Approaches for an Integrated and Inclusive Research Agenda for Action

An International Study of Arctic Change (ISAC) Workshop

30 January—1 February 2012 Queen's University, Kingston, Canada

About the Workshop:
The International Study of Arctic Change (ISAC) is an ongoing, international, interdisciplinary arctic environmental change research program. The program's vision is one of integrating this research among diverse fields and varied users and stakeholders. Approaches for such integration, which fall under the broad framework of Responding to Change (RtoC), have been slow to progress. This summary provides highlights from ISAC's first RtoC workshop, which addressed what such approaches might include and recommended activities necessary to implement RtoC.

Rationale for the Workshop:
Several Arctic change research programs (ISAC, SEARCH, ACCESS and ArcticNet) have adopted the tri-partite framework for organizing research foci: Observing, Understanding and Responding to Change (RtoC). Of these, RtoC has been the slowest to develop. One issue is the lack of conceptual clarity within the research community around what is meant by RtoC. Is it the human response to change or is it more broadly defined as the response of all Arctic System components to change? There is no agreement, yet it is recognized that stakeholders must be an integral part of the processes where the arctic environmental change research agenda is set. A second issue which hinders RtoC development is a lack of approaches for successfully entraining stakeholder needs into the research definition process and building a range of interdisciplinary bridges necessary for effective response. Addressing these gaps is more imperative than ever as it is clear that developing arctic observing systems and models must be multi-domain and reflexive to stakeholder needs. This workshop was designed as a first phase towards addressing these gaps.

Workshop Goals:
1. Provide conceptual clarity on what is meant by RtoC.
2. Assess the extent to which science research priorities align with stakeholder information priorities, particularly in observing system design optimization.
3. Identify what is needed to improve this alignment.

Organizing Questions: The workshop was organized around four questions viewed as foundational to RtoC discussion. Keynote speakers provided a perspective on each question prior to breakout group discussions.

1. What is meant by responding to arctic environmental change?
2. What research questions align with stakeholder needs for information? Which are tractable in the short term and which need to be addressed over the longer term?
3. How well do established arctic observing initiatives align with stakeholder needs for information and how can this alignment be improved?
4. What is needed to advance science/stakeholder partnerships, and to improve communication between these diverse communities?

Participants: Maribeth S. Murray[1] (mmurray@alaska.edu) , Hajo Eicken[1] Nicolej Bock[2], Howard Epstein[3], Birgitta Evengård[4], Shari Gearheard[5], S. Craig Gerlach[6], Sari Graben[7], Brian Grimwood[8], Cedric Jullet[9], Michael Kercher[10], Danielle Laborie[11], Donald McLennan[12], Karen Melnikoff[13], Peter Schlosser[14], Neil Scott[15], Martin Sommerkorn[16], Sandy Starkweather[17], Mark Vardy[18], Vito Vitale[19], Joan Wagner[1] and Johanna Wandel[20]

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RtoC activities include preparation of materials for the policy and decision-making communities and for ICARP

RtoC recommendations include:

1. Identify critical gaps between science and policy;

2. Work in concert with the Permanent Participants and other Indigenous organizations to advance translating both TK and science into policy relevant information.

RtoC
ICARP Contributions

- **Build Constructive Relationships between Producers and Users of Knowledge**
  - RtoC activities have led to the following recommendations:
    - Identify those outside research and operational communities who can, do, or might use observational information;
    - Consider the knowledge needs of the broadest possible spectrum of stakeholders;
    - Improve engagement with private sector knowledge producers and users;
    - Look to regions outside the Arctic for examples of managing the complexities of environmental change, while respecting Indigenous rights and knowledge;
    - Look to regions outside the Arctic for examples of concrete actions leading to policy;
    - Develop new and more effective communication mechanisms so that the need for long-term observation is clearly understood by those outside scientific community.