Engaging indigenous peoples and mobilizing Traditional Knowledge as part of the Arctic PRCC-Network

Guiding Principles and Contributions from TK

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Climate Services for Polar Regions: Establishing PRCCs – Scoping Workshop
Geneva, November 17-19, 2015

Background – Richard Thoman

- Climate Science and Services Manager, National Weather Service Alaska Region
  - Meteorologist/Climatologist/Linguist
  - 32 years professional Alaska/Arctic weather and climate experience
  - Linguistic work in Alaskan Athabascan (Dene)

Photo: R. Thoman

Background – Dominique Henri

- Wildlife Science and Traditional Knowledge Specialist at Environment Canada
  - Support wildlife researchers in engaging with Aboriginal communities and TK as part of scientific projects
  - Conduct collaborative research on TK and wildlife science
  - Social scientist
  - Experience in working with Aboriginal communities in northern Canada

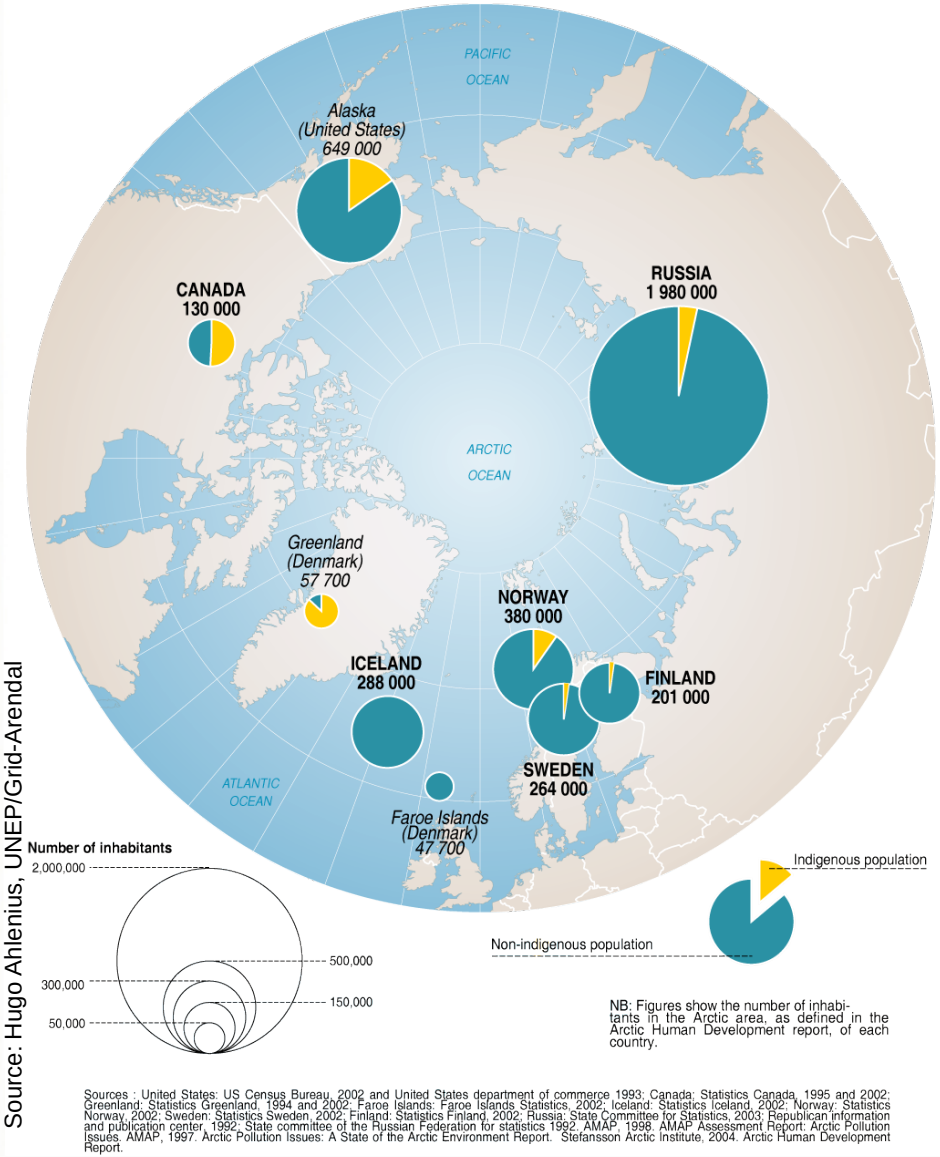
Overview

- Part I: Introduction
  - Indigenous peoples of the Arctic
  - Defining Traditional Knowledge (TK)
  - TK in environmental governance
- Part II: Guiding principles for indigenous engagement and TK use
- Part III: Potential areas of contributions of TK to weather/climate forecasting
- Conclusion

PART I

INTRODUCTION

Indigenous peoples of the Arctic

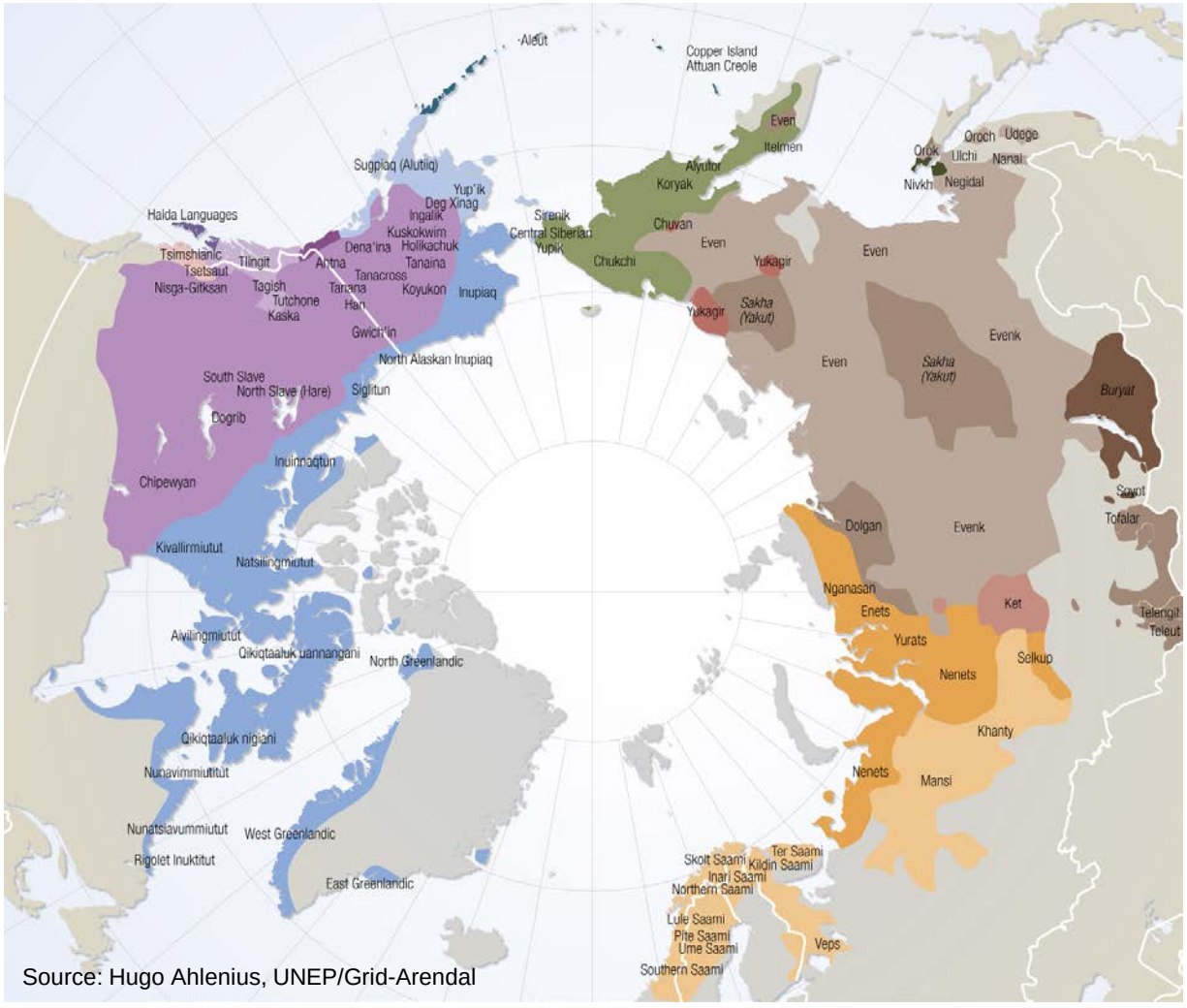


Source: Hugo Ahlenius, UNEP/Grid-Arendal

- Demography
  - 10% of the Arctic population
  - ≈ 400,000 people
- Economy
  - Natural resources
  - Tourism
  - Government services
  - Subsistence and barter economies
    - Source of food
    - Cultural activity / rooted in cultural identity

Indigenous peoples of the Arctic

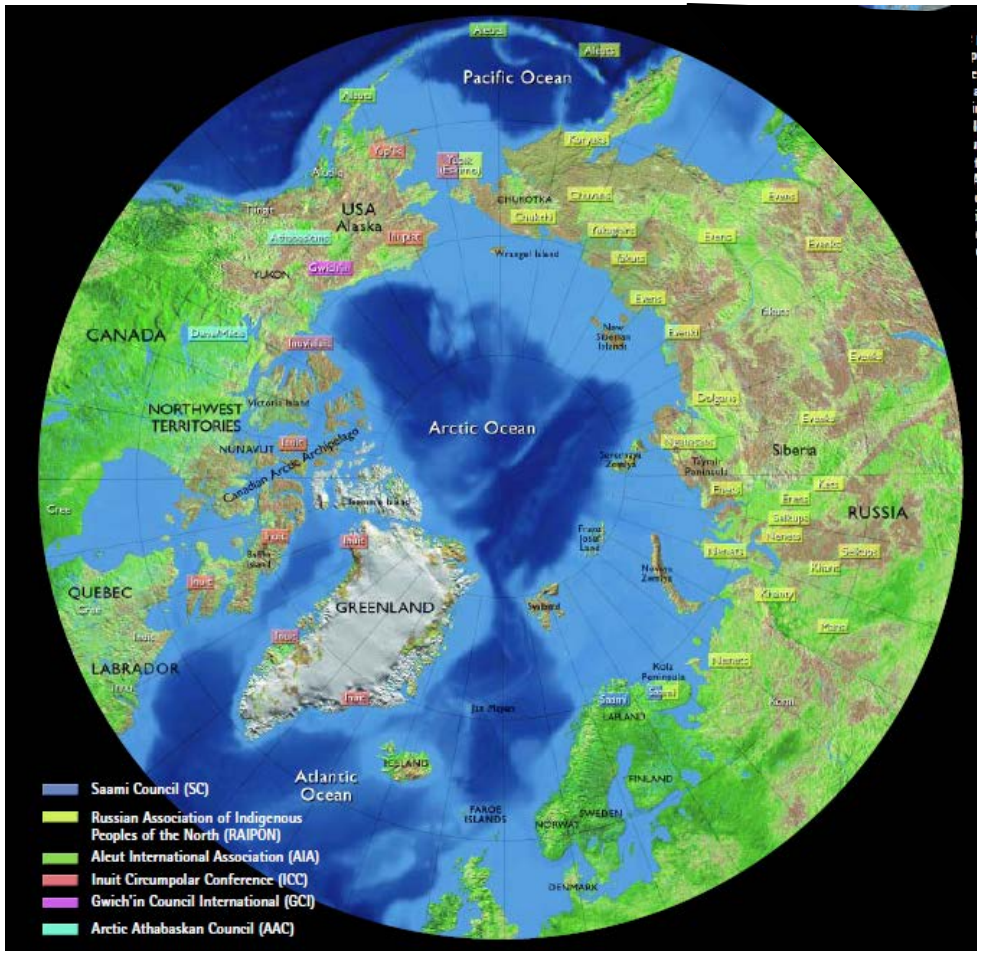
- Cultural and linguistic diversity



Source: Hugo Ahlenius, UNEP/Grid-Arendal

Indigenous peoples of the Arctic

- Political representation and governance
  - Diverse/complex
  - Differentiated
  - Indigenous rights
  - Arctic Council IPOs
    - Sámi Council (2000)
    - RAIPON (1990)
    - Aleut International Association (1998)
    - Inuit Circumpolar Conference (1977)
    - Gwich'in Council International (1999)
    - Arctic Athabaskan Council (2000)



Source: ACIA, 2005

Indigenous peoples of the Arctic

- Climate change
  - Most dramatic and rapid in the Arctic
  - Indigenous communities considered most vulnerable
  - Impacts on indigenous societies (ACIA, 2005)
    - Loss of hunting culture
    - Declining food security
    - Human health concerns
    - Disrupted land transport
    - Increased opportunities for marine shipping and resource development

Defining Traditional Knowledge

- History of TK
- Definition
  - Multiple definitions of TK
  - The Arctic Council defines TK as

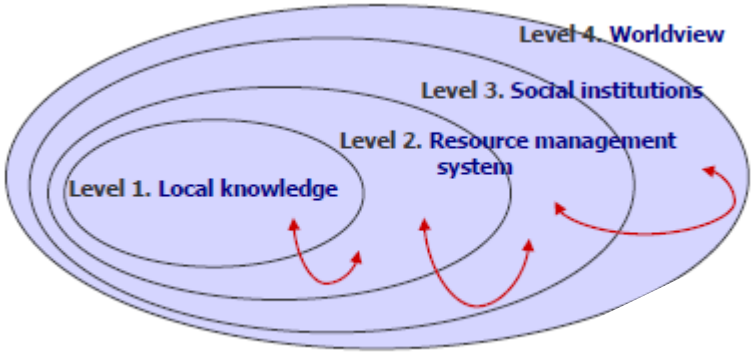
a systematic way of thinking and knowing that is elaborated and applied to phenomena **across biological, physical, cultural and linguistic systems**. Traditional Knowledge is owned by the holders of that knowledge, often collectively, and is uniquely expressed and transmitted through indigenous languages. It is a body of knowledge generated **through cultural practices, lived experiences** including extensive and multigenerational observations, lessons and skills. It has been developed and verified over millennia and is still developing in **a living process**, including knowledge acquired today and in the future, and it is **passed on from generation to generation.**

Source: Arctic Council, Ottawa Traditional Knowledge Principles, 2015

- ✓ holistic
- ✓ collective
- ✓ rooted in language
- ✓ rooted in territory
- ✓ passed down
- ✓ adaptive

Defining Traditional Knowledge

- TK can be viewed as a *knowledge-practice-belief* system



Source: Berkes, 1999

✓ How TK is acquired is as important and what TK says

✓TK as context-specific and rooted in observations performed at distinct spatial/temporal scales

- Related terminology
  - Indigenous Knowledge (IK) and Indigenous Local Knowledge (ILK)
  - Traditional Ecological Knowledge (TEK) and Local Ecological Knowledge (LEK) = about the environment
  - Terminology specific to indigenous groups (e.g. Inuit Qaujimajatuqangit or IQ)

TK in environmental governance

- International level
  - Conventions and agreements
    - United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)
    - Convention on Biological Diversity (CBD)
    - Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
    - Ramsar Convention on the Conservation of Wetlands
    - 1973 Agreement on the Conservation of Polar Bears
  - Arctic Council
    - Kiruna Declaration (2013) and Ottawa TK Principles (2015)

      Recognize that **the use of traditional and local knowledge is essential to a sustainable future in the Arctic**, and decide to develop recommendations to integrate traditional and local knowledge in the work of the Arctic Council
- National level

PART II

GUIDING PRINCIPLES FOR INDIGENOUS ENGAGEMENT AND TK USE IN ARCTIC PRCC-NETWORK

Guiding principles

- Principles for indigenous engagement and TK use
  - Synthesized from
    - Ottawa Traditional Knowledge Principles (Arctic Council, 2015)
    - Environment Canada's Approach to TK (in development)
    - Research Protocols developed by indigenous organizations

— *These are suggestions* —

  - Advantages
    - Common vision for collaborating with indigenous groups
    - Increase engagement efficiency and meaningfulness

Guiding principles

- *Principle 1* – Build and strengthen relationships with indigenous partners and stakeholders
  - Collaborative and trustful working relationships as foundation for meaningful engagement
  - Early engagement is a must; a long-term, ongoing process
  - Engagement strategy must be adapted to cultural context
- *Principle 2* – Assess and address the needs of indigenous data users
  - Information needs of indigenous users may be different than what mainstream weather/climate forecasts can offer (e.g. weather/climate forecasts vs. environmental impacts)
  - "Good vs. bad" weather/climate varies across cultures

Guiding principles

- *Principle 3* – Build on existing TK initiatives/networks
  - Crucial step given that various TK projects/networks are already in place in the Arctic
  - Key principle to address research/consultation fatigue among northern indigenous communities + limited local capacity
  - Examples of existing projects
    - LEO Project
    - Sea Ice for Walrus

LEO Project: Alaska

ALASKA NATIVE TRIBAL HEALTH CONSORTIUM

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Local Environmental Observer (LEO) Network

Northern communities are changing due to environmental impacts, climate change and development. Monitoring the environment is important for understanding the risks and benefits and for adaptation. The LEOs are the eyes, ears and voice of environmental change in our communities.

We are tribal professionals who apply traditional knowledge, western science and technology to document unusual plants and wildlife, extreme weather, erosion, flooding, droughts, wildfire and other events that can threaten food security, water security and community health. Checkout our LEO Public Maps, and resource links to learn more. You can view our observation data on our 2012, 2013, and 2014 spreadsheets.

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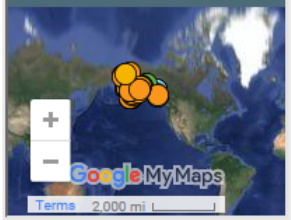
LEO Network - 2015 Posted Observations

LEO Net...



Monthly Maps
LEO Network 2015 Go

Category Maps
Air Quality Go

Alaska Region Maps
Aleutian-Pribilof Isl Go

Canada Region Maps
British Columbia Go

LEO communities at a glance, click icon:

Related Pages
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14,050 Visits
1 Recent Hit Anchorage, Alaska

Sea Ice for Walrus: Alaska

SEARCH : STUDY OF ENVIRONMENTAL ARCTIC CHANGE

ABOUT SCIENCE THEMES MEETINGS/EVENTS PRODUCTS NEWS

Search

Sea Ice for Walrus Outlook (SIWO)

Update

Status: The 2015 SIWO season ended with the last report released 5 June 2015. All ice was gone from the areas of interest several weeks earlier than in the previous years.

If you have comments or thoughts about the 2015 ice and hunting season in your area, you can send them to Kristina Creek (creek@arcus.org). We will continue to post them to the Observations section below. You can also follow SIWO on Facebook: https://www.facebook.com/seaiceforwalrus.

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Overview Resources Contact

The Sea Ice for Walrus Outlook (SIWO), an activity of the SEARCH Sea Ice Outlook started in 2010, is a resource for Alaska Native subsistence hunters, coastal communities, and others interested in sea ice and walrus. The SIWO provides weekly reports from April through June with information on sea ice conditions relevant to walrus in the Northern Bering Sea and southern Chukchi Sea regions of Alaska.

Photo by Maggie Prevenas - PolarTREC/ARCUS

If you are a local hunter, expert, or a scientist with observations on sea ice, please send your comments to creek@arcus.org; your comments will be posted to this page.

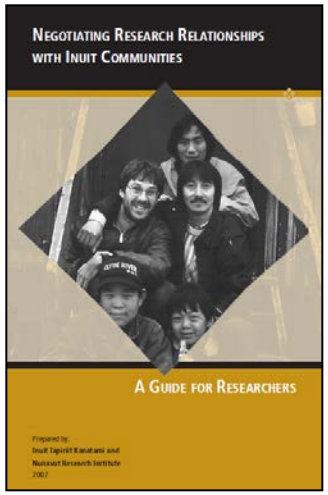
This collaboration includes weather and ice forecasters, climate scientists and sea-ice researchers at NOAA, the National Weather Service, the University of Alaska, and the Arctic Research Consortium of the U.S. (ARCUS, with funding from the National Science Foundation's Division of Arctic Sciences), who are teaming up with Alaska Native sea-ice experts and the Eskimo Walrus Commission.

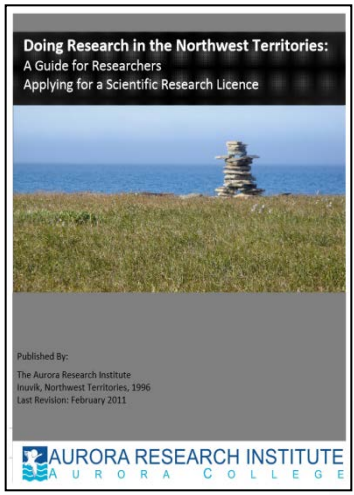
Sea Ice for Walrus Outlook

- Overview
- Resources
- Contact

Guiding principles

- *Principle 4* – Establish adequate procedures related to ownership and control of TK
  - Agree on TK protection and information sharing procedures
    - Informed consent (e.g. FPIC, OPAC, IRB)
    - Information sharing agreement
    - Intellectual property rights
    - Acknowledgement of TK holders
  - Learn from and follow established research protocols and guidelines





Guiding principles

- *Principle 5* – Mobilize adequate financial/human resources for TK
  - just like producing “good science”, making good use of TK requires resources
  - role for
    - TK holders
    - representatives from indigenous organizations
    - social scientists
    - meteorologists/climatologists

Guiding principles

- *Principle 6* – Maintain good communication practices
  - Giving back to TK holders = a priority
  - Acknowledging cultural differences in appropriate communication strategies
    - Prepare relevant communication materials
      (i.e. format, use of technical terms)
    - Choose adequate forums
      (i.e. meetings, conferences, local radio, school presentations)
    - Get the timing right
      (i.e. be mindful of local priorities, such as hunting/fishing seasons)
  - Understanding and acknowledging language differences
  - Importance of indigenous gatekeepers
  - Discuss expectations

Guiding principles

- *Principle 7* – Acknowledge the validity and diversity of TK
  - Recognize diversity of TK holders
  - Recognize TK on its own terms as valid
- *Principle 8* – Create opportunities for indigenous capacity building and education
  - Ongoing issues with TK related to weather/climate
    - Knowledge loss/erosion due to rapid cultural change observed among various indigenous groups (Takano, 2007)
    - Traditional weather indicators not as reliable as they used to be given fast changing environmental conditions in the Arctic
  - Capacity building/education can contribute to the preservation of TK and to the development of local adaptation strategies

Guiding principles – SUMMARY

- **Build and maintain long term relationships: without this nothing will follow**
- Start early
  - Learn community interests and needs
  - Use existing structures
  - Follow existing protocols
- Listen and respect
  - Local needs, priorities, perspectives
  - Appropriate ways to communicate information
  - Diversity and ownership of Traditional Knowledge
  - Two way involvement

PART III

POTENTIAL AREAS OF CONTRIBUTIONS FROM TK IN WEATHER/CLIMATE FORECASTING

- Arctic indigenous peoples and weather/climate
- Traditional weather forecasting techniques
- Differences between TK/science forecasting
- Challenge to TK contribution: loss of TK predictive power
- Areas of convergence between TK/science
- Importance of temporal/spatial scales and TK validation

Contributions from TK

- Arctic indigenous peoples and weather/climate
  - Weather as determining factor of daily activities
  - Weather is critical to safe travel and successful hunting/fishing/trapping activities
  - Climate expectations inform preparation
  - Experienced indigenous harvesters have great depth of knowledge of the environment and weather patterns (e.g. Oozeva et. al. 2004)
    - Precise, descriptive language
    - Careful observation techniques
    - Focus on practice (knowledge tested and refined)

Contributions from TK

- Traditional weather forecasting
  - Inuit across the Canadian Arctic and beyond have been practicing traditional weather forecasting for generations (i.e. *anijaaq*, routine of going outside to observe the weather)
  - Traditional weather indicators used by Inuit
    - Wind direction and speed
    - Cloud formation (types)
      (e.g. Henshaw (2006) documents11 distinct cloud formations used by Inuit forecasters)
    - Ocean currents and sea-ice patterns
    - Animal behavior
    - Stars, sun and moon

I know that *Singuuriq* (Sirius) was used to predict the weather and the severity of the temperatures. When the weather is going to be extremely cold the star turns reddish. If the star does not twinkle, milder weather will come. And when the wind is going to blow, the star behaves like a flame exposed to a draft.

– Amarualik, 1992, Igloolik, Canada, cited in MacDonald, 1998

Contributions from TK

- Differences between scientific and TK weather forecasting
  - TK forecast emphasizing relationships between multiple indicators vs. scientific forecast focusing on individual parameters of high predictive value
    (e.g. mean T°, wind speed, atmospheric pressure)
  - TK forecasting is impacts focused
    - TK: holistic assessment informs go/no-go, safe/unsafe decisions
    - Science: focus on individual parameters/mean values vs. extreme/unusual events
  - Bringing TK/science can be challenging

Contributions from TK

- Loss of predictive power of TK for weather forecasting
  - Reported since the 1990s by various indigenous communities across the Arctic (Krupnik and Jolly, 2002)

    Even if we try to predict what it is going to be like tomorrow (…) the environmental indication isn't what the Elders said it would be. Sometimes, it is still true but sometimes it isn't. In the past, when they said, "it's going to be like this tomorrow," it was. But our weather and environment are changing so our knowledge isn't true all the time now.

    – Lucassie Arrangutainaq, Sanikiluaq, Canada, cited in MacDonald, 1998
  - Is this due to changing weather patterns or the erosion of indigenous forecasting skills?
  - TK observations consistent with recent scientific findings
    - Spring (June) as time of year most frequently cited by Inuit as increasingly unpredictable
    - Over the last 20 years, temperature persistence has dropped during spring in Baker Lake, Canada, implying more chaotic daily variability (Weatherhead et al., 2010)
  - Some indigenous experts becoming reluctant to use their prediction skills + take additional precautions

Contributions from TK

- Areas of convergence between TK and science for understanding Arctic weather/climate

Description	Explanation
Local-scale expertise	- Combining science with local expertise can translate global processes (such as climate change) into local-scale understanding of potential impacts - Given regional variability expected from weather/climate models using coarse spatial and temporal scales, TK can offers unique information at local or regional scales - TK can “ground-truth” scientific predictions and provide supporting evidence for coarse weather/climate models - Although not homogeneously distributed (both within and across indigenous communities), TK is available about a range of local variables and their interactions over time (e.g. water and air temperatures, wind patterns, marine currents, ice conditions, animal abundance/distribution/health)
Source of climate history and baseline data	- Through cumulative experience and oral history, TK can provide insights into past climate variability (i.e. qualitative climate trends and unusual events) - TK can complement scientific information (i.e. meteorological observations and proxy data) for reconstructing climate history and provide a more comprehensive baseline against which unidirectional/cyclical changes in climate can be established

Source: adapted from Riedlinger and Berkes, 2001

Contributions from TK

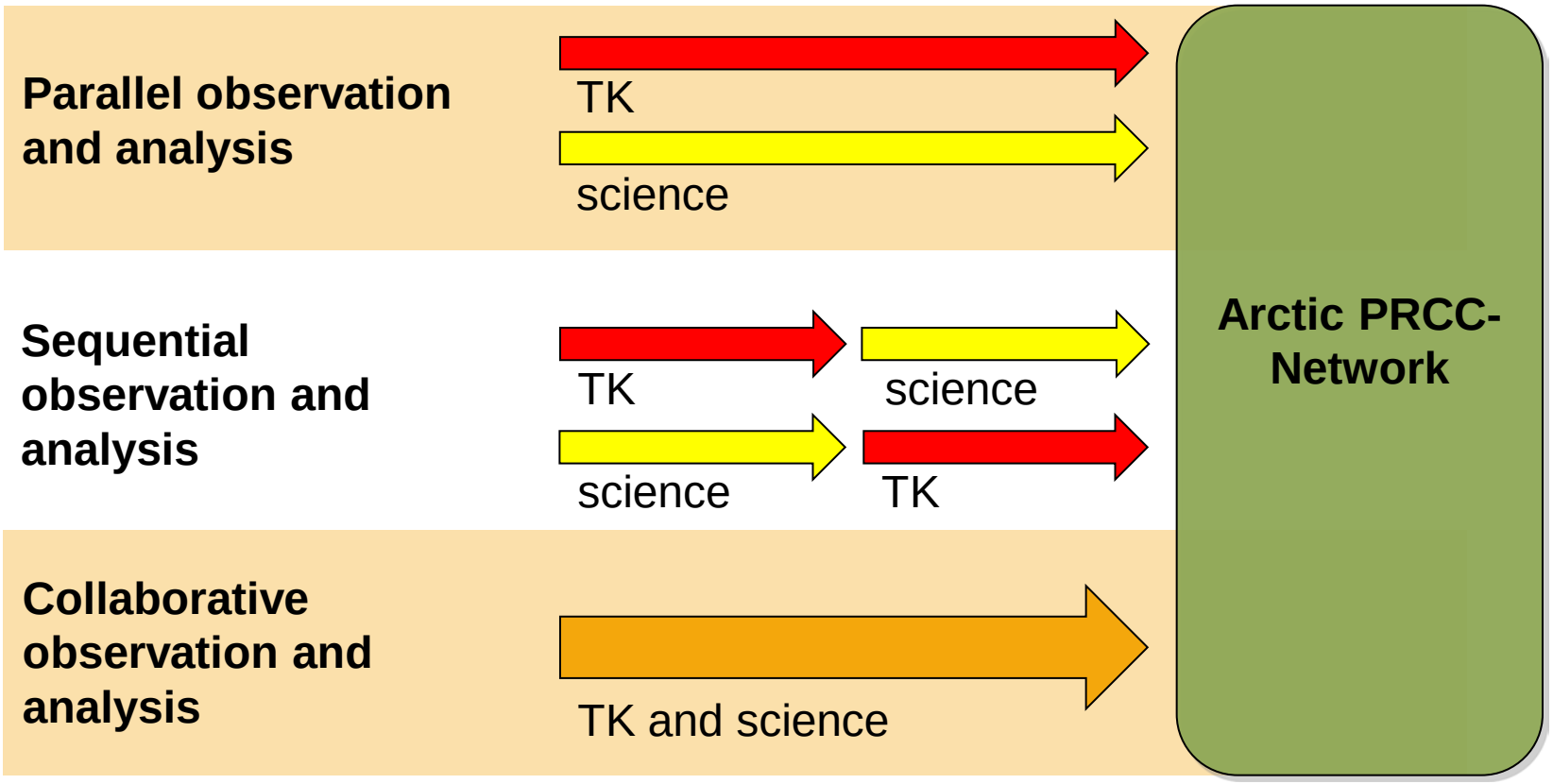
- Areas of convergence between TK and science for understanding Arctic weather/climate

Description	Explanation
Formulating research questions/hypothesis	- Scientific researchers formulate hypotheses based on observations and questions they are aware of, and then test them empirically - TK can expand the range of concepts and possibilities on which to base scientific research questions and help formulate hypotheses through insights into ecological relationships (e.g. Inuit observations of weather variability and scientific study of weather persistence)
Long-term, community-based monitoring	- TK holders are resource users and are typically present on the territory year-round; TK holders perform environmental observations in the context of seasonal rounds of resource harvesting and land-based activities - This presence is often beyond the potential of scientific monitoring programs in remote regions - TK can enhance scientific monitoring programs by: adding site-specific information, bringing attention to signs or indicators, highlighting relational information, capturing anomalous events - Community-based monitoring can provide ongoing and cost-effective means of establishing baseline data and monitoring environmental change

Source: adapted from Riedlinger and Berkes, 2001

Contributions from TK

- Consider TK/science relationship carefully to maximize project outputs (adapted from Furgal, 2006)



Contributions from TK

- Consider spatial and temporal scales carefully
  - Research combining TK and science productively has looked at the similarity or complimentarity of scales
  - TK generally provides a longer temporal perspective than scientific information but a more geographically restrained view of the system being studied (Gagnon and Berteaux, 2009)
  - TK/science comparisons can be challenging
    - Differences in spatial/temporal scales or “coarseness” of TK/science resolution
    - Conflicts between scientific observations and TK
  - This raises key questions for the Arctic PRCC-Network
    - Spatial/temporal scales of scientific information/TK available?
    - Do these scales overlap? Do they complement one another?
    - What are the implications of this for Arctic PRCC-Network data products?

Contributions from TK

- Importance of validating TK representation and use
  - Significant added value from validation = crucial step (i.e. increases confidence in knowledge products and project credibility)
  - TK holders engagement in validation and analysis

Minimal engagement

Maximal engagement

Contributions from TK – SUMMARY

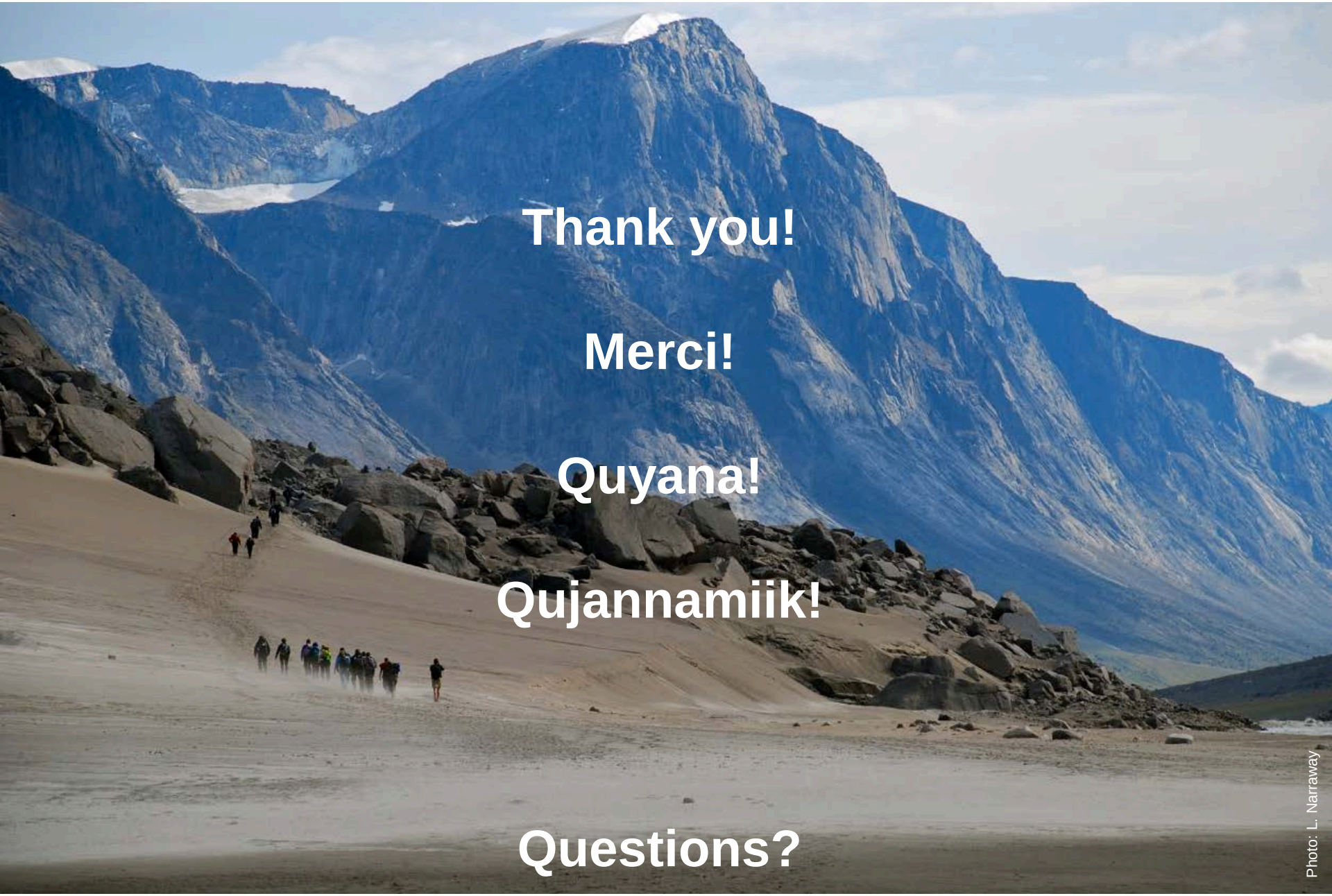
- Contributions from TK
  - Integrated, continuous environmental view
  - Holistic viewpoint leading to critical subsistence decisions
  - Compliment/augment science observations
  - Fine spatial and temporal scales can guide/correct western science approaches
  - Review and validation are critical

Conclusion

- Key messages
  - TK compliments science
  - TK helps focus on “what’s important”
- Where do we go from here?
  - Support to include guiding principles on TK?
  - Indigenous engagement strategy at the PRCC planning stage?
    - Beginning a dialogue with indigenous partners
    - Indigenous needs assessment
    - Taking stock of existing networks/projects

Conclusion

- Questions for discussion about the Arctic PRCC-Network
  - What benefits do you expect from indigenous engagement?
  - What challenges do you foresee?
  - How could TK contribute to PRCC data products?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Merci!
Quyana!
Qujannamiik!
Questions?
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