'Sustainable Development of the Arctic in the face of Global Climate Change: scientific, social, cultural and educational challenges'.
Monaco, March 3-6, 2009

Arctic Monitoring Systems

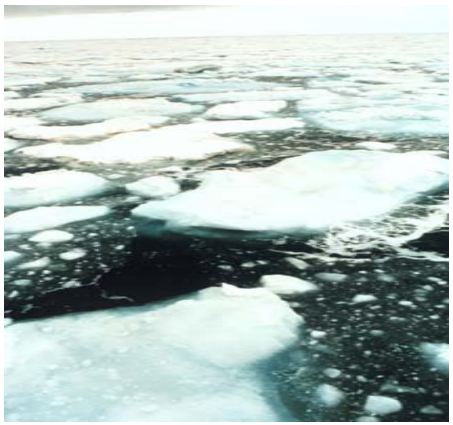
Joan Nymand Larsen
Stefansson Arctic Institute
Akureyri, Iceland

Arctic Monitoring with focus on

- Current challenges
- Changes in research needs
- Current state of Arctic monitoring
- New development: SAON
- Monitoring in the social sciences
- Communication and partnerships with Arctic/indigenous communities
- Arctic monitoring and cross-disciplinary and integrated research

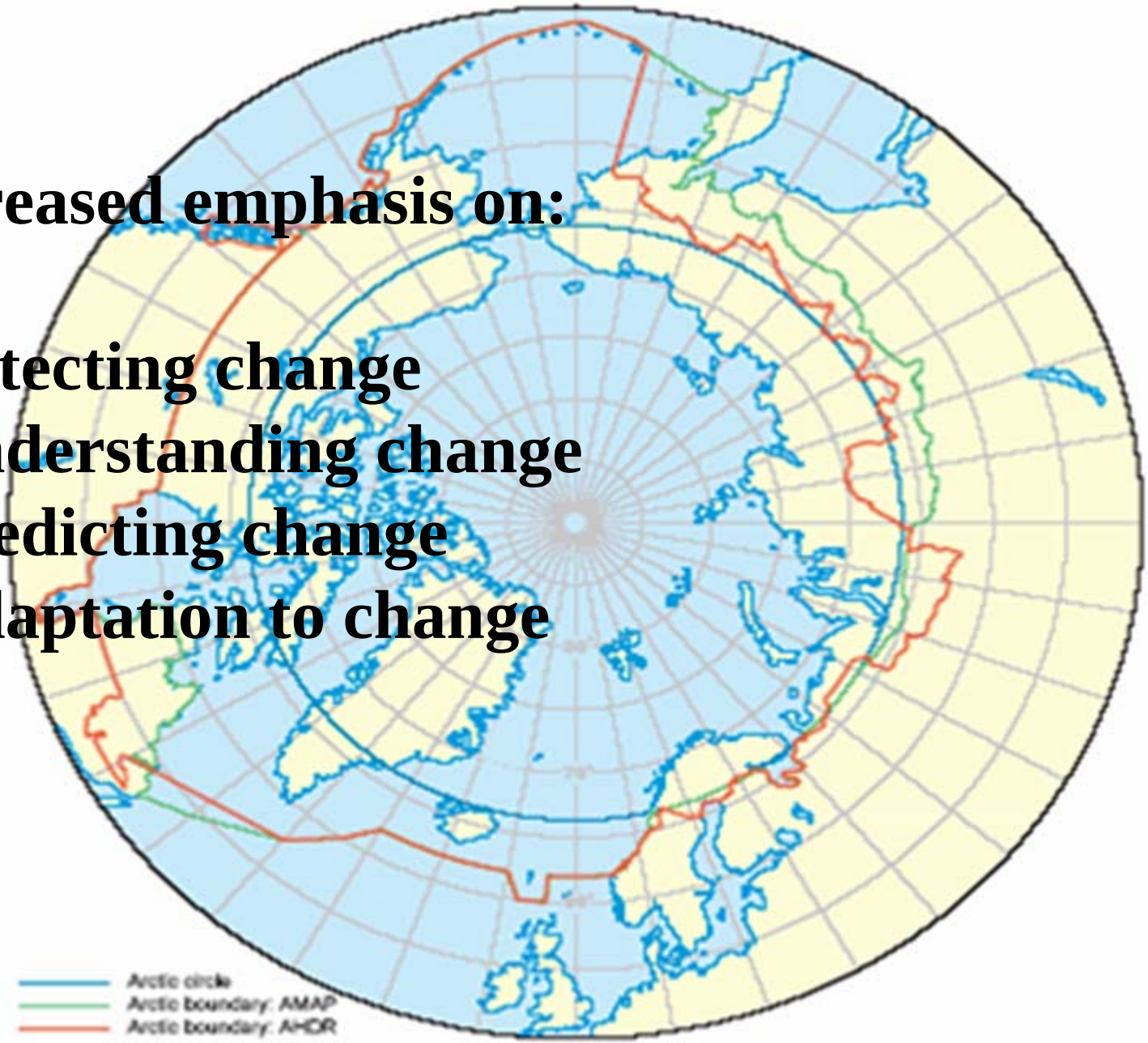
Current Arctic Challenges
Multiple Stressors

- Environmental processes
- Economic changes
- Industrial development
- Cultural developments
- Political changes
- Constraints on adaptive capacity



Increased emphasis on:

- **Detecting change**
- **Understanding change**
- **Predicting change**
- **Adaptation to change**



Changes in research needs

- Increase in range of disciplines, topics, geographical areas covered, and collaboration.
- Analysis of impacts of change on system at various scales.
- New demands on access to data.
- New demands on cross-disciplinary collaboration

Changing data needs

- Data to enable research and analysis at various scales, across disciplines, across the Arctic
- Access to relevant, accurate and timely data and information (translation russian/english)
- Data appropriate for Arctic context
- Continuity in data collection method/definitions
- Data for comparisons/contrasts
- Data for tracking, monitoring
- Physical science data for social science research on impact of change and adaptation
- Need for Arctic monitoring system

SAON – Sustaining Arctic Observing Networks

- SAON is a process to further multinational engagement in developing sustained and coordinated pan-Arctic observing and data sharing systems. The goal of such a system is to serve societal needs, particularly related to environmental, social, economic and cultural issues. Objective of SAON-IG : ”to develop a set of recommendations to AC and partners on how to achieve long-term, Arctic-wide observing activities that meets identified societal need”.
- The work of SAON on monitoring and observing across interdisciplinary boundaries has contributed significantly to moving us closer to a pan-Arctic observing system.
- An important new development in the effort to achieve better coordination within and among existing observing networks and the broad range of existing programmes.

Salekhard Declaration

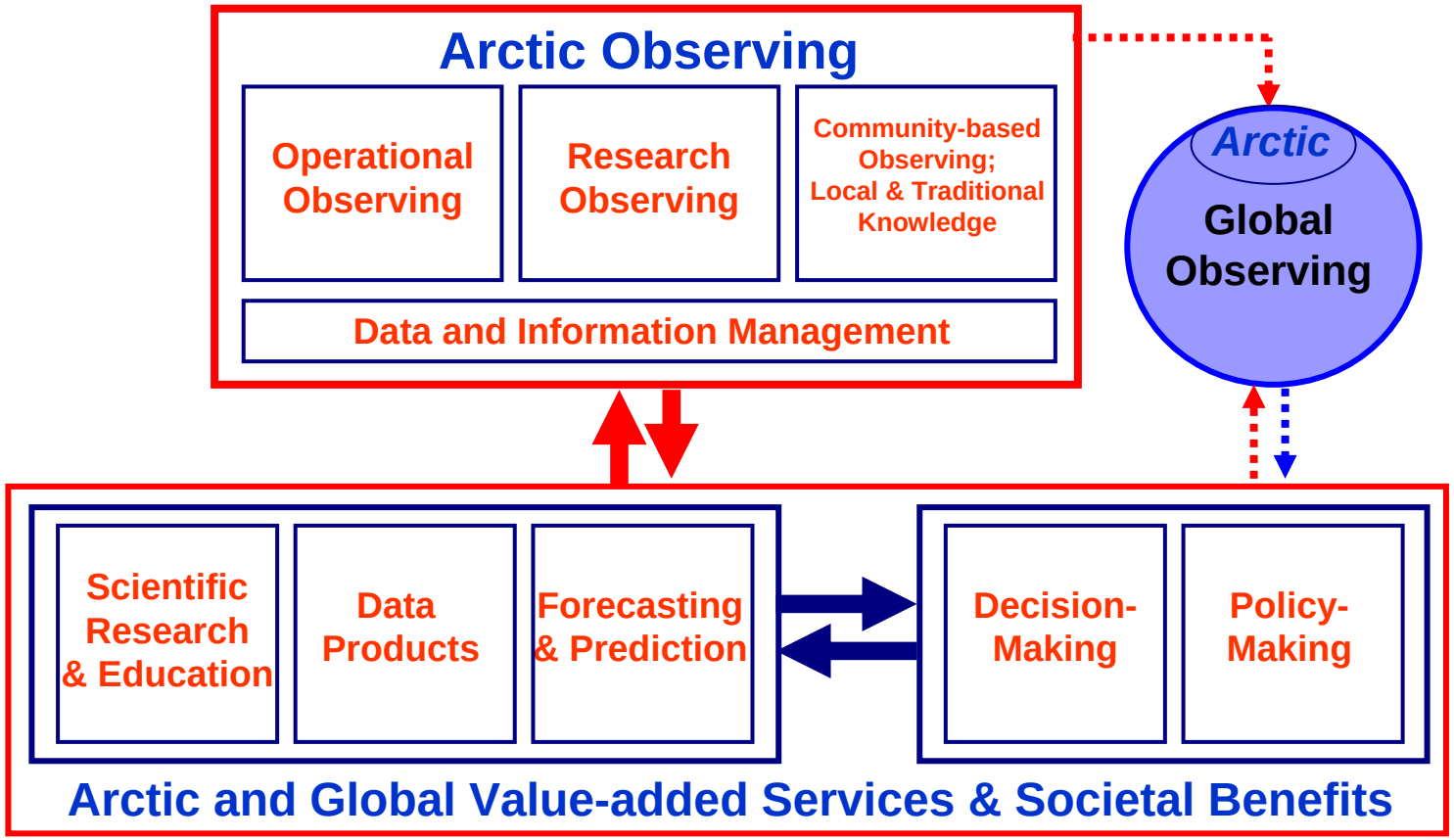
In November 2006, the Arctic Council urged all member nations to maintain and extend long-term monitoring of change in the Arctic, with a view to building a lasting legacy of the International Polar Year. Further, the AC requested that the Arctic Monitoring and Assessment Program work with other AC working groups, the International Arctic Science Committee (IASC) and other partners in this effort, to meet identified societal needs.

The goal of developing an Arctic Observing Network as a legacy of IPY was also endorsed by the WMO XV Congress in May 2007.

SAON - Initiating Group (IG)

Arctic Council (represented by AMAP)
Arctic Ocean Sciences Board (AOSB)
Climate and Cryosphere (World Climate Research Program/WMO)
Forum of Arctic Research Operators (FARO)
Indigenous Peoples Secretariat (IPS)
International Arctic Science Committee (IASC)
International Arctic Social Science Association (IASSA)
International Polar Year (IPY)
International Study of Arctic Change (ISAC)
National Science Foundation (NSF, USA)
Global Ocean Observing System (GOOS)
International Permafrost Association (IPA)
European Polar Board (EPB)

Arctic Observing Networks & Systems support many needs



Existing Observing Networks are the SAON Building Blocks

Ocean, Sea Ice
- IABP
- IAOOS

Coasts
- ACCO-Net

Rivers
- Arctic-HYDRA

Terrestrial
- SCANNET
- CEON

Cryosphere
- IGOS
- TSP, GTN-P, CALM
- GLACIODYN

Atmosphere
- IASOA
- WMO Networks
  - GAW
  - GUAN

Biodiversity / Biology
- CBMP
- Polar Bear Group
- CARMA

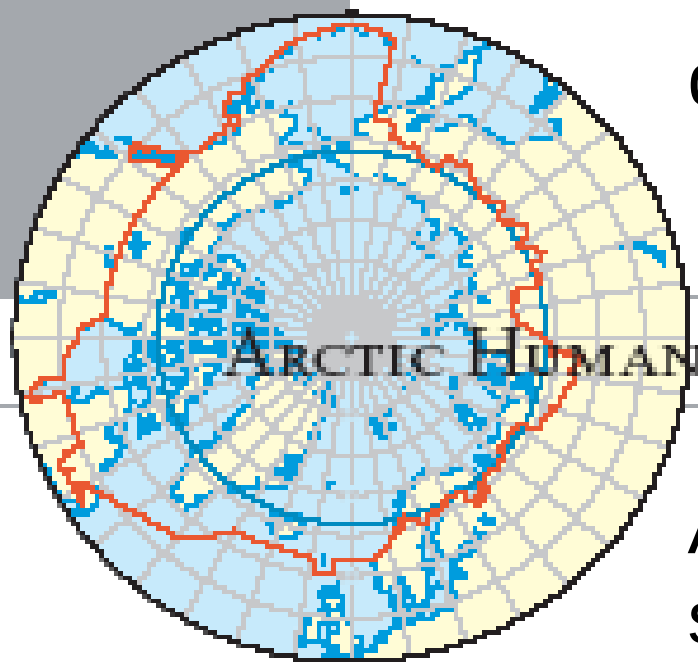
Human Dimensions
- Arctic Social Indicators
- Bering Sea Sub-Network
- ELOKA
- Arctic Human Health Initiative
- SLiCA
- ArcticStat

(..and many others)

SAON recommendations focused on

- Promoting a sustainable pan-Arctic observing system
- Establishment of an Arctic Observing Forum
- Data availability and dissemination protocol
- Increased inter-governmental cooperation in coordinating and integrating Arctic observing activities

Arctic Human Development Report

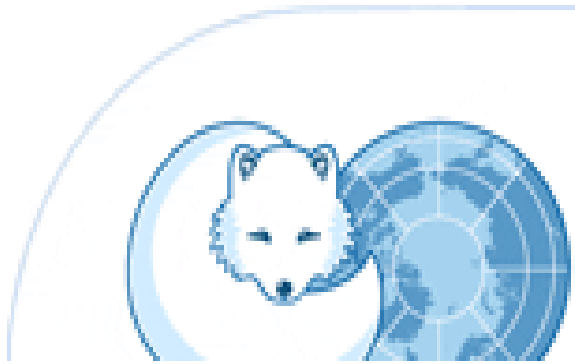


AHDR provides a snapshot – a baseline of human development in the Arctic.

AHDR does not present a suite of quantifiable indicators to monitor and track changes.

Arctic Social Indicators (ASI) Project
Long-term monitoring of human development
Project duration: 2006-2008/09

- **Objective**: To devise a limited set of indicators, reflecting key aspects of human development, tractable in terms of measurement, and monitoring at reasonable cost.
- Moving beyond AHDR baseline.
- First step in long-term effort to monitor/track human development in the Arctic.



Arctic Social Indicators (ASI)

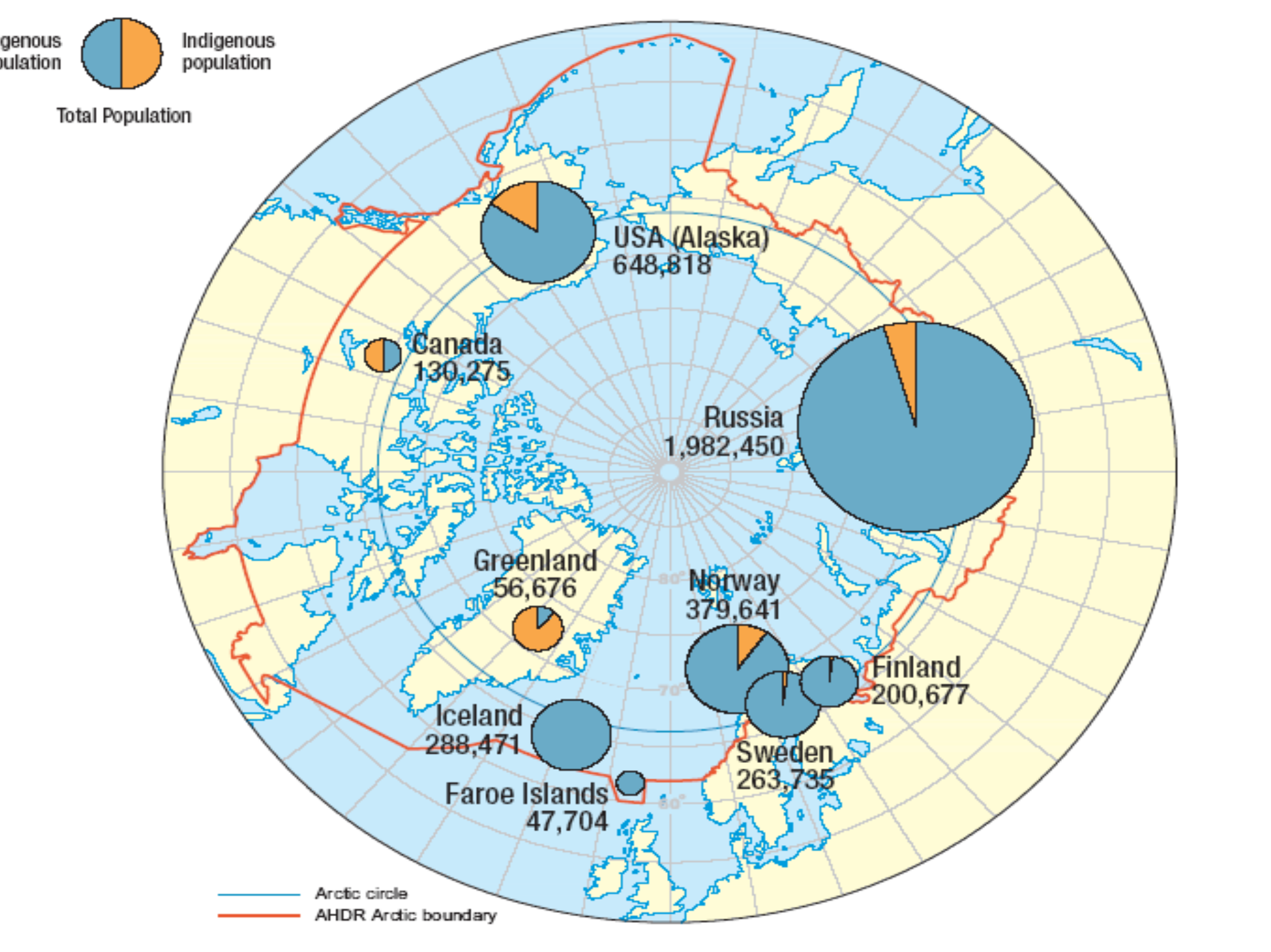
- Need for indicators appropriate to Arctic context.
- AHDR proposed elements of human development that are particularly prominent in the Arctic.
- ASI builds on this.

Six domains chosen for selection of Arctic social indicators (**ASI**)

- Fate control and or the ability to guide one's own destiny
- Cultural well-being or belonging to a viable local culture
- Contact with nature or interacting closely with the natural world
- Education
- Health/population
- Material well-being

Monitoring of human development in the Arctic: ASI data challenges

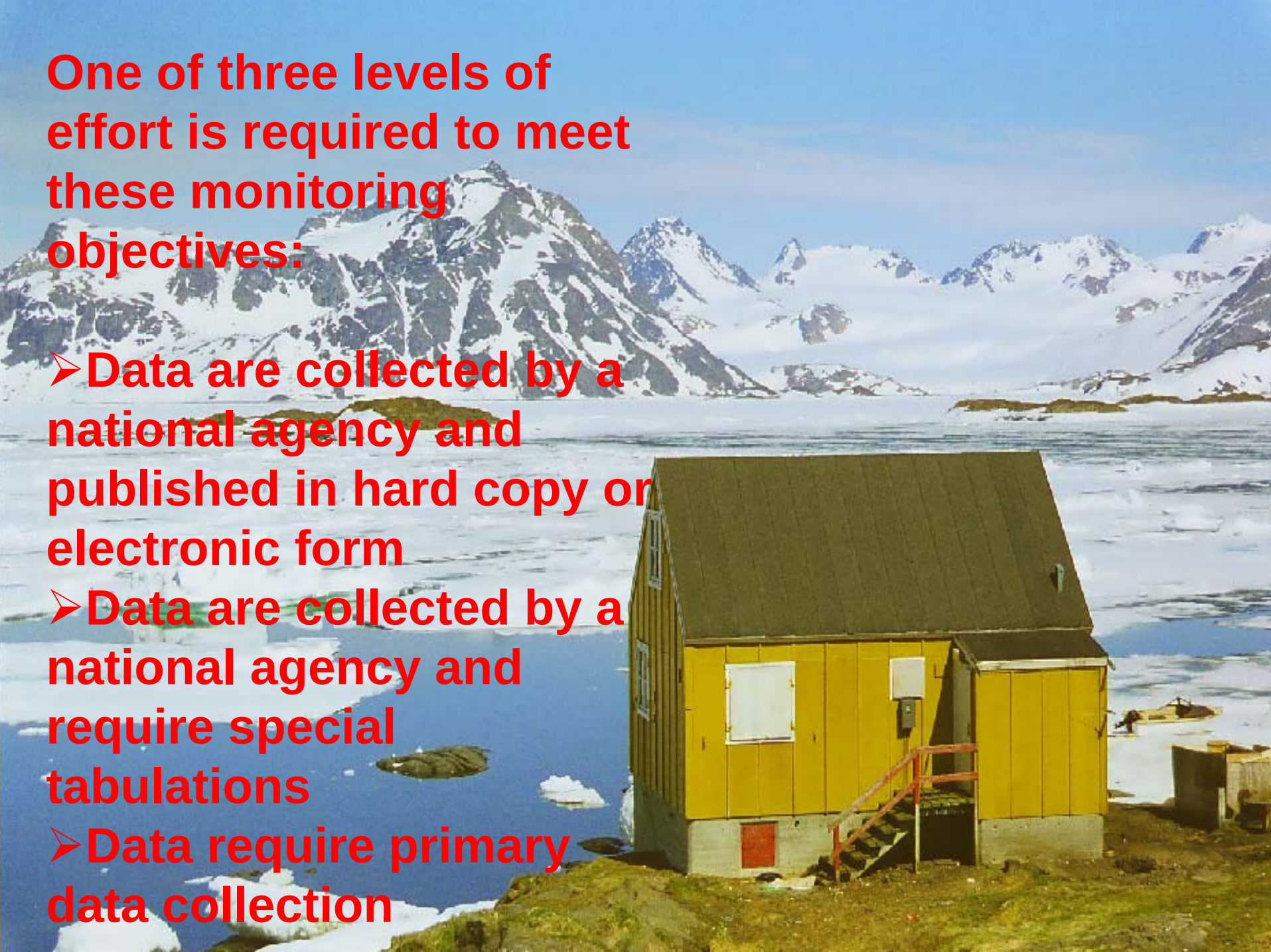
- Data availability, affordability, and level and applicability to both indigenous and non-indigenous inhabitants of the Arctic
- Although specific thresholds vary from country to country, they sometimes preclude release of accurate data on small Arctic communities
- Communities of small size can be of great interest to researchers and policy makers, but indicators at this scale must be interpreted with care


genous
ulation
Indigenous
population
Total Population
USA (Alaska)
648,818
Canada
130,275
Russia
1,982,450
Greenland
56,676
Norway
379,641
Finland
200,677
Iceland
288,471
Sweden
263,735
Faroe Islands
47,704
Arctic circle
AHDR Arctic boundary

ASI recommendations – in brief

Establish an Arctic Social Indicator Monitoring System with the following objectives:

- Data are available at the regional level
- Data are available separately for indigenous and non-indigenous populations
- Data are available on at least a five-year reporting period



One of three levels of effort is required to meet these monitoring objectives:

- Data are collected by a national agency and published in hard copy or electronic form
- Data are collected by a national agency and require special tabulations
- Data require primary data collection

Arctic/Indigenous communities: Participation and collaboration

- Expanding research impacts
- Strengthening communication and partnerships with local and Arctic communities
- Research collaboration
- Integrating local and traditional knowledge; a critical link

Integrated approach to Arctic research

Arctic Change puts increased demand on:

- Long-term observations of components of the Arctic system and the interlinkages.
- Level of cross-disciplinary and integrated research.
- Partnerships with Arctic communities.

Observing System/Network: current needs

- Meeting needs for spatial, temporal, and disciplinary integration
- Common data protocols, data standards, continuity
- Methods for data archiving, sharing and use
- Timely data
- Database: descriptions; analysis; quantitative and qualitative data; translations
- Effective data management system to ensure legacy
- International coordination and cooperation
- Integration with Arctic stakeholders, local and indigenous communities
- Interdisciplinary collaboration: increased accessibility to policy makers

Support issues

- Infrastructure and support.
- Resources for logistics and data collection.
- Resources for organizing, and connecting system.
- Communication, data transmission, and management.
- Improving communication and coordination between agencies.

Conclusion

- Improved access to disaggregated, timely, appropriate data for more accurate projections and assessment of impacts.
- Research and data to enable monitoring of the impact of change.
- Integration of research
- Inclusion of indigenous communities and arctic residents in research


STEFANSSON ARCTIC INSTITUTE
AKUREYRI ICELAND