

APPENDICES
To
SDWG Report to SAOs
Kautokeino, Norway
19-20 November 2008

**APPENDIX I:
SDWG List of Projects**

Project or Activity	Lead	Expected to Continue to Danish Chairmanship
1. Arctic Energy Summit	USA	Yes
2. Best Practices in Ecosystem-based Ocean Management	Norway	Possible follow on project or activity
3. SDWG Report to Ministers on Arctic Energy	Norway	Possible follow on project or activity
4. Circumpolar Information Tool Kit on Minerals, and Oils and Gas for Indigenous People and Northern Communities	Canada	Yes
5. EALAT: Reindeer herding, traditional knowledge and adaptation to climate change and loss of grazing land	Norway	Yes
6. Vulnerability and Adaptation to Climate Change in the Arctic	Norway	Possible follow on project or activity
7. SDWG Arctic Human Health Expert Group (AHHEG)	USA/Canada	Yes
8. Arctic Human Health Initiative	USA	Merged with AHHEG?
9. International Circumpolar Surveillance (ICS): Prevention and Control of Emerging Infectious Diseases in the Arctic	USA	Yes
10. Research & Action Plan for Human Health Risk Reduction in the Arctic	Russia	No
11. Advancing Alcohol & Drug Abuse Treatment in the Circumpolar North	USA	Yes
12. Telemedicine	USA	No

13. Arctic ICT Assessment	USA	No
14. Action Arctic ICT	Sweden	Yes
15. Arctic Social Indicators	Iceland	Possible follow on project or activity
16. ArcticStat	Canada	Yes
17. ECONOR 2	Norway	Possible follow on project or activity
18. Survey of Living Conditions in the Arctic, SLiCA	Denmark/Greenland/Faroe Islands	Yes
19. Sustainable Development of Indigenous Peoples of Russian North	Russia/RAIPON	No
20. Arctic Indigenous Languages Symposium	Canada	Possible follow on project or activity

APPENDIX II: Summary Project Reports as of 25 October 2008

Management of Natural Resources

1) Arctic Energy Summit

At the core of the AES was the Arctic Energy Technology Conference held 15 - 18 October 2007 in Anchorage, Alaska. The focus of the conference was in three areas: 1) Extractive energy development (oil, gas, coal bed methane, methane gas hydrates, coal); 2) Rural and renewable power, especially in extreme remote areas; 3) Environmental, socio-economic and sustainability impacts of energy projects in the Arctic. The presentations covered a wide variety of topics including energy security, the integration of renewable energy sources into village power systems, geothermal applications, energy infrastructure, methane hydrates, coal bed methane, the use of snow as a year round refrigerant, arctic coal, wind and tidal power. The papers, abstracts and presentations from the conference can be found at the project website, www.arcticenergysummit.org.

In addition, outreach activity has continued throughout the International Polar Year with the goal of capturing the interest of the public and decision-makers, and attracting and developing the next generation of scientists, engineers and leaders. This activity has been anchored by the weekly electronic newsletter, the Arctic Synergy, and by the Arctic Energy Summit web page.

The third area of the Energy Summit was the organization and deployment of an Arctic Energy Action Team, convened at the Technology Conference to develop a practical way forward on the deployment of key Arctic energy technology. This working group is addressing three key energy arenas; the development of an extractive energy source (development of Arctic coal); the development of a renewal energy source (tidal power) and the creation of a solution to a rural energy problem (transportation fuels).

Interim Results

The interim results are broken down into two categories, technology and sustainability. The technology findings deal specifically with those results or conclusions that have evolved from discussion and analysis of the three energy technology challenges.

The final step for the Arctic Energy Action Team will be the development of the technology roadmaps for each of the energy arenas. It is important to note that the results defined to date tend to be macro in nature, looking toward trends of technology and implementation challenges.

The sustainability factors identified by the AES will be the key factor in future energy projects; therefore a management system to assure the balanced application of these factors will need to be developed.

A. Technology Findings

General:

- Technology in general is not the problem. Technical solutions exist for each challenge area. Economies of scale, however, are the key limiting factor. Reasonable development of any new energy source or asset, either for internal or external use, will require the identification and development of a load anchor or economic hub to provide the base load for the generation or the exportation of energy. This will be best accomplished by looking for multi- modal uses of that energy source. Simplistically this means the technology used for power generation must also be combined with transportation power; looking for synergies is also a way to create a load anchor.
- Infrastructure is a limiting factor to the development and deployment of Arctic energy. Micro- and mini-grid systems must be evaluated as ways to connect rural communities to each other or to development areas. These grids must be viewed as total infrastructure corridors in order to gain needed economy of scale. A corridor should not exist as a single road, pipeline, or transmission line, but as a corridor that would contain multiple functions.
- Research would indicate that while the technology exists to deploy (conceptually) a variety of energy technologies both renewable and rural in character, methods are not specifically hardened for the Arctic environment or to supply the reliability required for remote locations at the end of long supply chains. At the same time there is a need for the development of a management process that would allow for quick demonstration and evaluation of Arctic energy technologies. Therefore, it is recommended that the International Energy Agency or like organization be formed to create an Arctic energy policy and to coordinate research, testing and education of technologies specifically related to Arctic energy.

Arctic Coal

- One of the overarching concerns related to the development of Arctic coal is the control of how it is used elsewhere in the world. Prevailing air currents tend to bring pollutants to Arctic lands. Therefore it is essential that at all times adverse effects of the use of coal that might impact the fragile Arctic environment must be prevented.
- The use of Arctic coal must be tied to an enforceable international policy preventing the release of pollutants during combustion; or, technologies must all relate to the transformation of Arctic coal into a useful energy product through processes such as in situ gasification, coal-to-liquids and coal gasification.
- A paradigm shift must be encouraged to view coal as a transformational and transitional hydrocarbon resource, not just the combustion of a rock.

Arctic Tidal

- No current technology exists that will work in ice conditions. The use of tidal power will either be limited to far offshore open water areas with expensive long runs of subsea cable: or technologies that might be more robust in ice conditions, technologies that are sea bed anchored or at a minimum lowered below the depths of ice generation.
- Technologies appear to be limited to axial flow turbines and bottom- tethered turbines.
- Any wave action generation will be likewise limited to ice free areas or far offshore in open water, again incurring large transmission costs.
- Infrastructure developed to support offshore drilling in the Arctic could be used for the support of any Arctic tidal or wave action facility.

Rural Transportation Fuels

- One third of energy usage in a rural community is attributed to transportation fuels. High costs of these fuels significantly impact rural subsistence lifestyles and the viability of these communities.
- New usage patterns must be developed to reduce the fuel usage. This could be related to shared usage “in town” or the use of more sophisticated tracking technology to locate hunting herds.
- Immediate application of efficiency technology could lead to immediate impact on the use of transportation fuels. As an example, recent work on retrofitting two-stroke snow machine engines with carburetor injection has been demonstrated to reduce pollutants and increase fuel economy by 30%.
- Most gasoline or diesel engines can be converted to a natural gas or propane fuel. While transportation penalties still exist the cost of using a natural gas fuel is considerably less expensive than gasoline or diesel. These costs must be weighed against infrastructure modification costs. The local production of these fuels through coal bed methane or biomass could significantly alter the transportation fuel paradigm.

B. Sustainability Factors

General

Energy projects in the Arctic are at the best fragile: their very existence is subject to a variety of outside forces that could at any time make the project non-viable. The ability to sustain a project, to make it viable over its lifetime, therefore is dependent on a number of factors that are not at all related to the energy technology itself. No discussion on the development of energy projects in the Arctic will be complete without discussion and understanding of sustainability. In exploring the concept of a sustainable Arctic energy project three key topics must be examined and addressed: economics, environment and impact on the people of the North.

For an energy project to be successful in the Arctic, as elsewhere in the world, the basis needs to be economically sound and robust (not sensitive to change). While this is not unique to the Arctic, the economic parameters that a project will be based on are. These situational economics must reflect both the costs and the benefits of a given energy project for its locale and the community that it serves. For example, the use of natural gas for electrical generation in a village environment would look at the price of fuel and cost of conversion. But it would also look at risk-based savings on eliminating barge fuel shipping and maintenance of tanks with the associated elimination of potential spill response.

First and foremost, on any energy development endeavor is the requirement to do no harm to the environment. This includes not only the air quality and wildlife issues as detailed in any permitting activity, but carbon footprint as well. Climate change and its impact on the Arctic are well-documented; how this will play out in the development of energy projects is less clear. There is the obvious impact on infrastructure (roads, pipeline supports), tundra access for exploration (seasons are getting shorter); but the less obvious include increased northern route shipping (and resultant environmental impact) and reduced access from rural community to rural community as traditional frozen (rivers, tundra) travel ways become less available.

With regard to carbon footprint the Arctic energy projects must consider CO₂ capture and sequestration. This is an interesting and at present unexplored option. In oil and gas fields, CO₂ is a powerful enhanced oil recovery opportunity. Coalfields provide excellent sequestration capabilities and in those seams where natural gas is available, CO₂ has been shown to increase gas production. Work is currently being done to examine how CO₂ can be sequestered as a

hydrate in deep Arctic waters, displacing methane hydrates while maintaining the integrity of the hydrate structure.

Foremost in any discussion on sustainability of Arctic energy projects must be the impact those activities have on the people of the North, both positive and negative. High energy costs have a devastating impact on rural Arctic communities; the development of new technologies to lower not only the electrical, but heating and transportation costs must be given priority – especially as it relates to a subsistence lifestyle.

Other areas that must be considered as it relates to sustainability include the maintenance and training necessary for any village-based energy project; the impact of exploration on subsistence lifestyle as recently demonstrated in Alaska with concerns of offshore seismic exploration and the impact on whale hunting; the rights and ownership issues of extractive resources on native lands (Alaska Native Claims Settlement Act, Mackenzie Valley Pipeline); and joint ventures between extractive energy use and local energy needs, e.g., an offshore gas development in Bristol Bay could bring natural gas to the Dillingham area with resulting lower electrical and heating costs and the possibility for an alternative transportation fuel.

Sustainability includes those efforts that must go into any activity to assure that the project can be sustained and maintained without impacting the environment in the largest sense and the people involved in that activity. To allow the Arctic to be developed as a true energy province - one that is not be exploited but stands as its own territory - will require robust and situational economics on all its energy projects, while doing no harm to the environment and serving those who reside in our Arctic communities.

Panel sessions were created to discuss the issue of sustainability at the Arctic Energy Technology Conference. In these panel sessions, it was concluded that technology alone will not result in the development of the Arctic as an energy province; sustainability is at the heart of that development and the three sustainability topics discussed above were further refined into eight sustainability factors. To assure the successful implementation of energy technology the following factors must be addressed and incorporated into every energy delivery plan.

Policy

Policy decisions, even more than technical capabilities, have a large influence on the selection of technology, projects, economics and funding as they relate to the development of energy projects. Policy determines energy security, land use, emissions, project economics, fuel prices and, in some cases, which communities survive and which communities do not. The development of the Arctic as an energy province versus an exploitable resource will be determined by development of a comprehensive, integrated energy policy including industry development, environmental concerns and collaborative Arctic policies.

Human Resources

The development and operation of energy facilities in the Arctic will require simultaneous development of human resources in the Arctic, including provision of those skill sets necessary to bring the next generation of energy projects to fruition. Specific attention must be focused on the energy systems required for rural and remote communities. Achieving this new level of competency will require an entirely new curriculum addressing the breadth of Arctic energy including engineering, design, operations, maintenance, management, economics and all aspects of care of the environment. For any technology the key required skill sets must be determined in conjunction with the appropriate training and competency program.

Rural Energy in the Arctic

The Arctic is a region of tremendous energy wealth; however, rural Arctic communities are attempting to exist in spite of tremendous energy poverty. These communities - off the electrical grid, off the road system and populated by predominately indigenous people living a subsistence lifestyle - suffer crippling energy costs threatening their very existence. New approaches are needed to prevent the extinction of these communities and to moderate energy costs for electricity, heating and transportation, using both extractive and renewable energy sources. While seemingly redundant, the development of any Arctic energy resource as an export must first begin with the identification of how that energy source may be used in rural communities in the area.

Shipping and Transportation Options

The ability for the Arctic to emerge as a global energy province will be both driven and constrained by transportation. Climate change, while potentially opening new sea routes, is also changing the structure of seasonal river shipping, weakening existing road systems, affecting runways and shortening tundra travel. More open sea travel will necessitate increased air support (search and rescue). The basic logistics paradigm for the Arctic is changing and shipping and transportation options will have to change as well. The discussion must include the impacts on the entire transportation system (marine, ground and air) that extractive and renewable energy development will present.

Environmental Concerns

The Arctic and its associated cryosphere are home to some of the world's most fragile environments. First and foremost in any energy development endeavor is the requirement to do no harm to the environment. This includes air and water quality, impacts on permafrost and wildlife issues as detailed in any permitting activity, as well as attention to the carbon footprint. Increased offshore exploration and the potential for increased shipping will continue to emphasize the need for improved spill response and for an understanding of the impact these increases will have on fisheries. Renewable energy (battery storage, geothermal impacts, hydro-turbines and wind turbines) also presents a variety of environmental challenges that will require a new generation of solutions. The development and application of all the Arctic's energy assets must address the associated environmental challenges and opportunities.

Infrastructures and the Impact of Climate Change

The development of infrastructure (roads, ports, transmission lines, etc.) is a basic economic foundation for the development of an energy technology. The combination of separate infrastructure projects into infrastructure corridors is an opportunity that must be taken to take advantage of full development of any resource. Additionally, as the Arctic continues its long cycle of warming, the infrastructure developed and built in a colder environment will be impacted. This will include roads, harbors, bridges, foundations, transmission lines, pipelines and airstrips, as well as ice roads and rivers (traditional Arctic thoroughfares). The damage will be concentrated in places where permafrost thaws; flooding increases and coastal erosion worsens. At a time where the development of the Arctic as an energy province is essential to global and energy security and when energy costs are rising in rural Arctic communities, the infrastructure necessary for these projects is under attack. In the development and deployment of energy resources in the

Arctic, the various impacts – opportunities as well as challenges – of climate change on Arctic infrastructure must be addressed.

Impacts of Energy Development on the People of the North

The development of energy projects in the Far North have had and will have significant impact on the people of the North, specifically those native or indigenous peoples living a subsistence lifestyle in remote communities. Energy development will have both positive and negative impacts on a community. Extractive development could bring wealth and jobs but impact a subsistence lifestyle. High energy costs drain community resources but the development of new lower cost energy facilities could require a differently trained workforce for operation and maintenance. The total costs of energy development in the Arctic must include the impacts that development will bring to the people of the North.

Energy Security

The development of the Arctic's energy resource potential has an impact on how the world defines energy security. Different and changing shipping and transportation routes, new geopolitical boundaries (as evidenced by recent North Pole activities), transnational indigenous organizations, technological advancements, new wealth, sensitive environments - all will have an impact on defining global and energy security. The examination of the changing face of energy security and the role played by the emergence of the Arctic as an energy province must be considered.

C. Arctic Energy Action Team

General

The objective of the Arctic Energy Action Team (AEAT) is to cooperatively develop an international energy vision of the North through a broad coalition of experts and stakeholders in the areas of energy, technology and policy. The AEAT provides a forum and a framework to formulate strategy and identify enabling technologies for the enhancement of extractive and renewable energy recovery; and the deployment of economical and environmentally sensitive energy sources to rural Arctic communities, with the goal of expanding the Arctic as an energy province.

Extractive Energy – The Development of Arctic Coal

Large amounts of high quality coal exist in the Arctic (12% to 15% of known world reserves), yet currently it is an underdeveloped asset. The AEAT will develop an action plan and technology roadmap to define how this resource can be developed in an environmentally appropriate manner to benefit an export economy, as well as meet local needs. Potential technologies that may allow this resource to be utilized include gasification, liquefaction, coal slurry and small-scale mining.

Two questions have been raised as it relates to the development of coal in the Arctic. The first is in the shipping of a hard rock material in areas where the ports may be ice covered; the second relates to the use of coal and its environmental impact. Both of these questions then focus the technology on transformation. What technologies exist for coal to change it to a product that would be more exportable? These products include ultraclean fuels, synthetic gas, hydrogen and electricity. Additional products could also include petrochemicals and fertilizer. In exporting coal itself, we will look at the feasibility of pre-cleaning or pre-processing the coal.

CO2 capture and sequestration in the Arctic will be a key enabling technology. Canada's Clean Coal Technology Roadmap (www.cleancoaltrm.gc.ca) is being adopted as our central focus on technology development.

Renewable Energy – The Development of Tidal Generation

There are large tidal resources in the Arctic. Technology is becoming more available to take advantage of this resource in lower latitudes. The AEAT will develop an action plan and technology roadmap to define how this resource can be best utilized in Arctic environments. What technology or approach currently under development would best fit the Arctic environment or is there a combination of technologies? What carryover will tidal technology play in other open water (wave) technology or in- river hydro? Are there barriers (such as tidal ice) that would prevent this renewable resource from being used?

A variety of tidal technology applications including partial impoundment and technology providers have been identified. There appears to be no application currently being tested in ice conditions.

Technology providers will be contacted to develop a more complete picture of Arctic-based tidal power.

Rural Energy – The Development of Alternative Transportation Fuels

Fully a third of energy usage in a rural community is in transportation fuels (ATVs, snow machines, boats, personal vehicles). High costs of these fuels significantly impact rural subsistence lifestyles and the viability of these communities. The AEAT will develop an action plan and technology roadmap to assist in the development of these needed fuels. What alternate fuel technologies can be developed to provide an economical and environmentally appropriate fuel to the rural Arctic communities that may be off any energy grid? Possibilities may include propane, compressed natural gas, hydrogen and battery/fuel cells.

The identification of an alternate approach to rural (and remote) transportation fuel needs has been a true challenge. As a fuel, gasoline and diesel are easily transported, easily stored and run in a wide variety of engines. Additionally, diesel fuel (specifically Jet A) can be run in diesel generators, trucks and used as home heat. Any alternative transportation fuel will have to have similar properties. The results of our reviews have identified the four following technologies or technology needs that must be addressed to develop alternatives to gasoline as fuel source.

- New micro-reformers that can produce a syn-fuel product from natural gas, coal bed methane, gas hydrates and biomass suitable for IC engines.
- Modification of engines to run on propane or compressed natural gas and the infrastructure and storage that could provide inexpensive delivery of these products from a gas pipeline.
- Development of a new storage “tank” to contain hydrogen that could be generated from renewable energy sources

D. Conclusions

What is most important about the development of energy roadmaps is the examination of the total system and the possibilities for synergies between needs. The key is in finding anchors for the different technologies that can then serve different applications. For example, a coal mine in Northwest Alaska will require energy for that development, as does the world-class zinc mine to the south. Coal gasification/IGCC could provide that power in a clean manner, sequester carbon and potentially create syn-fuels for use in the area as well as export. An electric energy corridor

could then be created, anchored by the coal mine and the zinc mine, thus bringing less expensive power to the region.

The Arctic is a region of great energy wealth that is challenged by great energy poverty. The goal is energy self-sufficiency in the Arctic.

2) Best Practices in Ecosystems Based Oceans Management

A. Draft BEPOMAR Report

For a copy of the full draft report, please visit <http://portal.sdwg.org> and click on "Draft Final Reports" in the sidebar on the left side of the homepage. Login is required.

B. Draft Observed Best Practices Document: (the text below is the draft OBP Document as of 29 Oct. 2009)

Observed Best Practices in Ecosystem-based Oceans Management in the Arctic Countries

Background and objective

The need for oceans management based on an ecosystem approach is widely recognized by the international community, as reflected in calls for the implementation of the ecosystem approach by 2010 in the 2002 Johannesburg Plan of Implementation from the World Summit on Sustainable Development (WSSD), in recommendations from the UN General Assembly, in the work under the Convention on Biological Diversity, and in the 2001 Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem. These international commitments have proved particularly important in the Arctic region, where this project represents a collective attempt at demonstrating progress towards the WSSD goals in the region.

Many Arctic communities and settlements are based on the sustainable use of natural resources, and see themselves as integrated parts of these ecosystems. The importance of the non-renewable resources is growing, and offshore petroleum developments are expanding to new areas of the Arctic. Likewise, tourism is growing in importance, and with it cruiseship traffic. Other economic developments include expansion of mining, bioprospecting, aquaculture, and marine transportation. At the same time, climate change, increased pollution and other human-induced pressures brings unprecedented rates of change in marine ecosystems.

The aggregate effects of these multiple pressures on the oceans call for an ecosystem-based and integrated approach to oceans management. This is critical to the protection and sustainable use of marine ecosystems and the natural resources there. To aid in this process, the Arctic Marine Strategic Plan, which describes the ecosystem approach and calls for its application, was adopted by the Arctic Council in November 2004. Ecosystem-based management is the key principle of the Arctic Marine Strategic Plan.

Many countries are now in the process of reviewing and developing their oceans management policies in order to base their management and use of the oceans on ecosystem considerations. In the Arctic, for instance, most countries are working to implement ecosystem-based management of their oceans.

The Best Practices in Ecosystem-based Oceans Management project, carried out by the Arctic Council working groups on Sustainable Development and Protection of the Arctic Marine Environment, has observed a number of Best Practices in this regard, which governments may want to consider. These practices have proved useful and may be relevant also to other Arctic countries as well as in the world beyond, in order to provide for sustainable development and protection of the marine environment.

Core elements

Although definitions may differ, some core elements are essential to ecosystems based oceans management:

- The geographical scope of ecosystems defined by ecological criteria.
- The development of scientific understanding of systems and of the relationship between human actions and changes in other system components.
- The application of the best available scientific and other knowledge to understand ecosystem interactions and manage human activities accordingly.
- An integrated and multidisciplinary approach to management that takes into account the entire ecosystem, including humans.
- Area-based management and use of scientific and other information on ecosystem changes to continually adapt management of human activities.
- The assessment of cumulative impacts of different sectors on the eco-system, instead of single species, sectoral approaches.
- A comprehensive framework with explicit conservation standards, targets and indicators in order to facilitate responses to changes in the eco-system
- Transboundary arrangements for resolution and handling of transboundary ecosystems and issues.

Conclusions

In reviewing the practices countries have established in developing and implementing ecosystem-based oceans management, the following have been found useful: 1) flexible application, 2) integrated and science based decision-making, 3) commitment to ecosystem-based oceans management, 4) area-based approaches and transboundary perspectives 5) stakeholder participation , and 6) adaptive management.

1) Flexible application of effective ecosystem-based oceans management

- Differences in circumstances and contexts have to be taken into consideration as ecosystem-based oceans management is context sensitive. There is not one single method for ecosystem-based management. A number of different practices and understandings of the concept appear to work.
- Ecosystem-based management is a work in progress and should be considered a process rather than an end state.
- Rule-based relationships between countries in oceans affairs, based on applicable international law and agreements, have to be promoted.
- Recognition of humans as an ecosystem component, and increased consideration of social effects when food security and poverty alleviation are issues of concern.
- Management must be based on best available science. Open lines of communication between managers, resource users, and the general public are necessary to foster mutual understanding and recognition of shared interests.
- Biodiversity conservation strengthens the structure and functions of ecosystems, thus ensuring the long term delivery of ecosystem services.

2) Decision-making must be integrated and science based

- Increased communication and exchanges among both states and sectors are also key components of successful ecosystem-based management. A great deal of scientific knowledge already exists. However, much of this information needs to be better synthesized and communicated to a variety of audiences. Cooperation in science and exchange of relevant information within and between countries is important for understanding the cumulative impacts to the marine environment. Another challenge is to address what information exists and what information still needs to be gathered. Knowledge gaps can be closed through development/identification of key ecosystem indicators and comprehensive modelling, mapping, monitoring, and analysis.
- Various forms of scientific, traditional, and management knowledge need to be integrated to improve ecosystem-based management. Potential advantages of integrating various forms of knowledge include decision-making that is better informed, more flexible, and incorporates traditional ecological knowledge.
- A multi-sector approach lies at the core of the ecosystem approach as it contributes to a common understanding of challenges in oceans management and thereby an increased trust between authorities with different sector responsibilities/interests. Ecosystem-based management calls for coordination and shared responsibility between all levels of government and cooperation across sectors, both with respect to monitoring, mapping and research. The challenge of monitoring, however, is both a scientific challenge and a policy issue. Monitoring programs can provide the ongoing basis for management, but require a long-term commitment of resources. Secondly, a multi-sector approach depends on providing opportunity for stakeholder comments on how a specific sector is to be managed or how to assess the impact of that sector in relation to the ecosystem. This is a difficult process, requiring care and time.

3) National commitment is required for effective management

- National commitment to conservation and sustainable use of ocean resources is necessary. A “roadmap”, management plan or national action plan for addressing priorities in oceans management is developed in many of the Arctic countries.
- An integrated organizational structure (framework) to support the coordination of a holistic approach to the implementation of EBM at the national level through inter-agency cooperation seems to be effective. In this respect, harmonization of domestic laws governing use of ocean resources with EBM principles, as well as with regional and international management efforts may be appropriate. This requires legislation and enforceable policy tools to provide government strategic directions and overall framework for ecosystem-based management implementation.

4) Area based approaches and transboundary perspectives are necessary

- Area based management approaches are central to ecosystem-based management. The identification of management units within ecosystems should be based on ecological criteria. Management measures should reflect the status of areas and take into account the human element.
- Ecosystem-based management requires specific geographical units at various scales.
- Issues of scale can be addressed viewing ecosystems as nested systems.
- The identification and protection (including through protected areas and networks) of key areas, species, and features that play a significant role within the marine ecosystem help management set priorities and ensure ecosystem structure and function are maintained.

- Increased international cooperation in shared ecosystems could be addressed through existing regional management bodies and, as necessary, new collaborative efforts focused on individual ecosystems.
- Effective area-based approaches include mechanisms for addressing effects of land-based activities and atmospheric deposition on ocean ecosystems.

5) Stakeholder participation is a key element

- Stakeholder consultation is important to build understanding and foster development of knowledge.
- Stakeholder participation can be encouraged by providing for public participation in a manner that enables stakeholders and members of the public who lack the capacity to prepare for/attend numerous meetings to make their voices heard in a meaningful fashion.
- Stakeholders can be engaged to develop and strengthen cooperative processes to sustain ecosystem structure and function.
- Effective stakeholder participation can encourage and achieve compliance with necessary conservation measures through education and enforcement.

6) Adaptive management is critical

- Effective management requires adaptive management strategies that reflect changing circumstances. This is especially important in view of the accelerating effects of climate change on marine ecosystems.
- Implementation of ecosystem-based management should be approached incrementally.
- Conservation objectives and targets, benchmarks and action thresholds should be set for the measurement of achievement of ecosystem health.
- Flexible mechanisms should be used for implementing ecosystem-based management

3) SDWG Report to Ministers on Energy

For a copy of the full draft report, please visit <http://portal.sdwg.org> and click on “Draft Final Reports” in the sidebar on the left side of the homepage. Login is required.

4) Circumpolar Information Tool Kit on Minerals, and Oils and Gas for Indigenous People and Northern Communities

Following the approval of the Tool Kit proposal at the November 2007 Senior Arctic Officials meeting as an endorsed Council project, Canada began to explore potential partnerships with interested member states, Permanent Participants and industry. Due to timing constraints and human resource challenges, the initial start of the initiative was delayed. However, at present, Canada has commenced research into the development of the toolkit.

At this juncture, given the size of the initiative, Canada will take a staged approach in order to sufficiently address the intricacies of each resource sector. Consequently, Canada will move forward with this initial project to address mining in the Circumpolar north.

To help facilitate the development of this initiative it will be based on Canada's Mining Information Kit for Aboriginal Communities, which was developed in conjunction with Aboriginal communities and organizations across Canada, and has been well received both domestically and internationally. Given the nature and structure of the information tool kit it has been adapted by Peru to address their own local situation and is drawn upon and referenced by a host of other countries including New Caledonia, the Philippines, Mali, and Australia. As such, Canada believes that it will serve as a solid base for a circumpolar toolkit.

Phase I: Proposed Work Plan

Mobilization, preparation:

As an initial step, partnerships will be established with Indigenous Peoples, northern communities as well as with Member States and Permanent Participants. These partners will be consulted in order to obtain a mutual understanding of the purpose and direction of the initiative, its goals, expectations, timelines content and delivery. Early consultation and participation by Indigenous Peoples and northern communities will provide an opportunity to make necessary adjustments to the toolkit to ensure that it responds to their needs. A Project Steering Committee will be established to oversee the development of the project.

Draft Mining Toolkit:

The first draft of the toolkit will be developed by the Government of Canada in conjunction with the Project Steering Committee who will assist in the review of existing information and tools, as well as the development of the draft toolkit to be presented to Council members. Its contents will be customized to reflect the needs and concerns of northern and Indigenous communities. It is anticipated that the toolkit will be comprised of the following:

- Basic information and explanations of activities at the different stages of the minerals and metals industries
- Government, industry and community roles
- Potential environmental effects, mitigation measures and monitoring activities
- Traditional knowledge
- Opportunities for community involvement
- Community employment and other economic opportunities
- Lessons learned
- Ways to maximize benefits to Arctic Indigenous peoples
- Leading practices
- Useful resources and links

The draft toolkit will be reviewed and validated by the Project Steering Committee, other partners, and the SDWG.

Estimated Timeline

Fall 2008

Goal: Establish Process

- Identify partners
- Establish Project Steering Committee
- Consult with partners (Indigenous People, Northern communities, Industries and governments) on: goal, time line, content.
- Review existing tools, information and sustainable development processes.

- Collect additional information
- Table report on revised work program and approach for the initiative at the SDWG, October 24- 25, 2008

Winter 2008-2009

Goal: Develop toolkit outline

- Develop a draft outline of the toolkit
- Review the draft outline with partners and key stakeholders
- An outline of the mining toolkit to be submitted for consideration by Council members at the Spring Ministerial 2009.

Spring/Summer 2009

Goal: Develop a draft toolkit

- Develop a draft toolkit in conjunction with the Steering Committee for consideration by Member States and Permanent Participants.
- Revise the draft toolkit based on Council Member and Steering Committee comments.

Fall 2009/Winter 2009-2010

Goal: Finalize a Draft Mining Toolkit

- Present a penultimate draft of the toolkit to the Fall SDWG and SAO meeting.
- Revise the toolkit based on comments from the Steering Committee and Member States (end of Phase I).

Revised Cost estimates and budget

Given the revised approach to the development of the toolkit, the initial costs of this phase of the initiative have changed as follows:

Phase and activities	Estimated cost	Notes
<u>Phase I: Draft Mining Toolkit Development</u>		
Preparation, consultation, (incl. Permanent Participants)	\$10,000	
Research, development	\$10,000	
Printing	\$ 2,000	
Miscellaneous		
Total Phase 1	\$22,000	

Sources of Funding

Funds will come from various sources within the Government of Canada, and potential partners (Member States, industry, communities).

Phase II Preliminary Outline***Testing of the toolkit in communities***

Following the revision of the draft toolkit based on comments from Council members, validation and information sessions on the toolkit will be held in an Indigenous and in a northern community selected in collaboration with Arctic Council Member States and Permanent Participants. The information will be delivered on site in working sessions, with industry participation. Attention will be given to ensure that the views and concerns of elders, women and youth are included.

Phase II Estimated Timeline**Winter 2009 / Spring 2010**

Goal: Validate the mining tool kit and finalize documentation for Spring 2010 SDWG and SAO meeting.

- Identify member states interested in hosting pilot community validation of the toolkit (2 pilot communities required).
- Prepare the delivery plan
- Coordinate and deliver two validation and information sessions

Revise the toolkit based on input from information session and deliver final mining toolkit to the Spring 2010 SDWG and SAO meetings for consideration.

Adaptation to Climate Change**5) EALAT-Information****Brief summary of activities during Norwegian chairmanship:**

The project is organising a series of community-based workshops in local reindeer herding societies across the Arctic, where reindeer herders from different areas, scientists and local authorities are brought together to address the challenges of climate change and land use change while focusing on adaptation and traditional knowledge. In 2007 a starting workshop was held in Kautokeino, Norway in February (prel.). There have also been two community-based workshops in Yamal in the Russian Federation, in Nadym in March (prel.) and in Yar-Sale in September. In 2008 there have been held four more community-based workshops: In Kanchalan, Chukotka in February/ March, in Topoliniye, Sakha-Yakutia in April, in Aldaan, Southern Sakha- Yakutia, and finally Inari, Finland. There has also been planning and coordinating efforts with other regions and partners, also within the IPY EALÁT- Consortium. Currently, local activities and community-based workshops are being prepared in Russia (Southern Sakha-Yakutia, Kola Peninsula and Nenets AO) and USA (Alaska).

Current Status of work:

Historical local climate data has been collected from each region (Fennoscandia, Yamal, Sakha and Chukotka), in cooperation with the Norwegian Meteorological Institute and Arctic and Antarctic Research Institute in St.Petersburg, among others. Collection of climate data from the regions are continuing. Statistical downscaling of these data are subsequently being conducted.

Through including the Aldaan- region in Southern Sakha-Yakutia, the project now includes both the tundra- based and taiga-based reindeer husbandry. Reindeer herding in the taiga areas of South- Eastern Russia, Northern China and Mongolia faces particular conditions and challenges of the Sub-Arctic regions, for instance related to climate change and climatic conditions for reindeer.

Through the workshops, examples of adaptation and traditional knowledge has been identified and collected in different herding communities in Fennoskandia and Russia. Experiences with climate variability have been discussed. Experiences with loss of pastures in the Sámi area/ Fennoskandia have been discussed. Planning and coordination with other regions and partners continue. There is an urgent need for action in Arctic indigenous societies related to the effects of climate change. Due to the demand for regional indigenous participation in the project, the project will continue into the next chairmanship. The final report will be delivered to the Danish Chairmanship.

Anticipated deliverables for 2009 Ministerial:

An information book about reindeer herding societies in Fennoskandia and Russia, will be prepared focusing on traditional knowledge and adaptation to climate change and loss of grazing land. The book will be based on materials from the community-based workshops of the project.

Reindeer Herders' Voice: Reindeer herding, traditional knowledge and adaptation to climate change and loss of grazing land

Main authors: Anders Oskal, Johan Mathis Turi, Svein D. Mathiesen and Philip Burgess

Outline:

- Information book from reindeer herding societies, focusing on traditional knowledge and adaptation to climate change and loss of grazing land
- Based on input from the community-based workshops in Fennoskandia and Russia held so far
 - Local data on climate change and the status of development
 - Include statements etc. from reindeer herders; reindeer herders' voice
 - Inspire thought: Bring out and focus on central questions, but not necessarily giving all answers at this stage
 - Extensive picture material from local reindeer herding communities, illustrating the themes of SDWG EALÁT-Information
- Preliminary draft version
 - Structure, by regions:
 - Fennoskandia
 - Kautokeino, Norway
 - Inari, Finland
 - Yamalo-Nenets AO
 - Nadym
 - Yar-Sale
 - Sakha (Yakutia) Republic
 - Topolinoe
 - Khatystyr, Aldan
 - Chukotka

- Anadyr
- Kanchalan
- Structure, by content:
 - Introduction
 - Regional Chapters
 - Introduction to the region
 - The Impacts
 - Climate Change
 - Loss of Pastures
 - Traditional Knowledge and Adaptation
 - Dialogue, Communication and Capacity Building
 - Conclusions
 - Appendix

A preliminary draft version of this book is available on the SDWG website in the password area: <http://portal.sdwg.org> .

Draft Interim recommendations from the EALAT project:

- Support knowledge sharing on impacts and adaptation measures connected to climate change and loss of grazing land, recognizing the value of traditional knowledge for adaptation
- Capacity building for indigenous societies facing climate change and loss of grazing land:
 - Support recruitment of young scientists from reindeer herding communities
 - Support institution building in local reindeer herding communities, for local competence building
- We are concerned about the explosion of human activity linked to climate change and loss of grazing land for reindeer and caribou. Grazing land used for reindeer has to be protected as an adaptive measure to climate change and sustainable Arctic societies
- Importance of defining institutional mechanisms which constrain indigenous peoples' original resilience and ability to adapt to climate change.

6) Vulnerability and Adaptation to Climate Change in the Arctic

Please note: the document below is a draft and is not for citation. This document is provided for information purposes only, as it may be subject to further editing and final consideration by the SDWG Heads of Delegation at their meeting in Copenhagen, Denmark in December, 2008.

Outcomes from the VACCA Workshop
(Vulnerability and Adaptation to Climate Change in the Arctic)
Held 22-23 October 2008 in Tromsø, Norway

Purpose of this document:

This document discusses, from the workshop participants' points of view, what might need to be done with regards to vulnerability and adaptation to climate change in the Arctic. It does not necessarily state what the Arctic Council should or should not be doing.

Background and context for VACCA:

VACCA stands for Vulnerability and Adaptation to Climate Change in the Arctic.

The Arctic Climate Impact Assessment from 2004 was groundbreaking in assessing climate change impacts in order to provide a basis for addressing climate change challenges in the Arctic. One of the recommendations from this process was the need to focus on community vulnerability and adaptation. On this basis, a Workshop on Adaptation to Climate Change in the Arctic held from 26-27 June 2006 in Oslo to start the dialogue.

The Arctic Council, through the Salekhard Declaration of 26 October 2006, requested the Senior Arctic

Officers to:

"...direct the SDWG, drawing on the expertise of other Working Groups, experts and stakeholders, to identify and share adaptation expertise and best practices and possible actions, unique to the needs and conditions of the Arctic, so that indigenous and other residents can better adapt to climate change, and to report on the status of this activity at the 2008 Ministerial meeting [now scheduled for April 2009], and to make publicly available any results or lessons learned from this undertaking".

The Workshop on Climate Change Impacts and Adaptation Strategies for Arctic Indigenous Communities held from 20-21 September 2008 in Copenhagen provided an important input into this process.

Principal messages for policy, practice, and exchange include:

- Climate change does not occur in isolation from other social, economic, and political factors. These factors interact to shape vulnerability and adaptation. Effective adaptation strategies address other stressors in conjunction with climate change. Climate change should be brought into ongoing discussions from other sectors; for example, natural resource management, land use planning, and social services.
- Climate change factors should be incorporated into decision processes in such a way that uncertainties are acknowledged, yet dealt with, including by delivering user-defined information in useful and timely formats.
- History and culture, indigenous and non-indigenous, can teach adaptation as part of the lifestyle and livelihoods. Such knowledge should be considered for regulations, laws, policies, decision-making, and comanagement of the environment and natural resources. Mechanisms are needed to support such processes.
- Materials for and approaches to education, communication, capacity building, outreach, and training need to be tailored for different audiences and different venues and made accessible.
- Mitigation needs to be considered in addition to adaptation.
- Resilience needs to be considered in addition to vulnerability and adaptation.

Potential directions for continuing with vulnerability and adaptation work are:

1. Establish a (community-led) expert group / team / network [the exact term needs to be chosen] on vulnerability and adaptation in the Arctic.

- Work inside and outside the Arctic on vulnerability and adaptation could further share lessons and cooperate with other initiatives.
- Compiling and sharing information, pooling resources including data and stories, breaking down institutional barriers, and comparing similar methods across efforts, projects, and case stories is needed. Such actions help to build capacity and institutional memory, leading to more informed and more robust decisions.

- Adequate resources are required to support such work.
- Suggested tasks for the (community-led) expert group / team / network [the exact term needs to be chosen]:

1.1. Enhance coordination, cooperation, and exchange of information for Arctic vulnerability and adaptation work.

- This action should synthesise and disseminate material and consider aspects of good practices, guidelines, and making connections.
- This action should consider thematic areas that are relevant to other working groups of the Arctic Council.

1.2. Continue working on a database for collecting and disseminating information for Arctic vulnerability and adaptation work.

- Continuing the database would capture initiatives that were not included in the VACCA scoping study survey, as long as that information were useful and made accessible.
- Lessons from the VACCA scoping study should be used to improve the database to ensure that it is useful for and accessible to the users.
- In compiling and sharing information, different knowledge systems, such as scientific, indigenous, and local, should be involved. These knowledge systems are not mutually exclusive, but complement each other.

2. Produce a series of analyses and assessments to promote and facilitate Arctic vulnerability and adaptation related action.

- One conclusion in the Arctic Climate Impact Assessment was that an impact assessment is not sufficient, but needs to be expanded to include adaptation and vulnerability to climate change in the Arctic.
- More than an assessment is needed, but the activities should be specific and targeted with the following actions particularly highlighted: an infrastructure vulnerability and adaptation assessment; a food security assessment involving a workshop; an economic analysis of the costs and benefits of climate change impacts and adaptation; and an assessment of information needs.
- These analyses and assessments would build on previous work and would include ongoing work such as the Arctic Marine Shipping Assessment and the Arctic Biodiversity Assessment, in order to approach new endeavours in a strategic manner.
- These actions should be timely, accessible, useful, and useable so that the results have relevance and applicability for users. They should also be linked to other ongoing work in the Arctic Council, with one example being the Sustaining Arctic Observing Networks project.

3. Encourage and foster Arctic vulnerability and adaptation related collaborations, meetings, and projects.

- These actions should build on existing initiatives, including those mentioned above.
- Certain principles assist in ensuring action-orientated collaborations, meetings, and projects:
- Partnerships amongst all people and all sectors are needed for dealing with climate change and these should be effected through collaborative efforts at all scales, from local to international.
- Consultation should be completed with partners before acting, in order to involve them in developing projects, policies, and strategies on Arctic vulnerability and adaptation.
- As part of the partnership-driven actions, knowledge acquired in or from a community should be returned to that community on their terms in a useful and accessible manner.

Suggestions from the breakout groups during the workshop:

(Agreement on all these suggestions was not necessarily reached during the workshop.)

Breakout groups #1: Good practices in local climate change adaptation

Livelihoods.

- Resilience needs to be considered, not just adaptation.
- Indigenous communities must be able to use their own knowledge to adapt.
- Institutional barriers need to be broken down to support livelihoods.
- Knowledge sharing and use is needed, especially incorporating traditional and local knowledge.
- To support livelihoods, seek political stability of the Arctic where possible, e.g. social equity, safety, infrastructure.

Local infrastructure (design and maintenance).

- Arctic Council could focus on an information-sharing mechanism. How can the Arctic Council help to deliver this? In order to do this we must understand how people use the knowledge and what they use it for.
- Sharing between bodies and organizations is needed; for example, key user groups and professional organizations.
- Existing case studies need to be made useful and accessible.
- Often, a new solution is not needed.
- Build on existing Arctic Council assessments to move towards future work; for example, the Arctic Marine Shipping Assessment.

Gender.

- Gender is a necessary topic of discussion that is not limited to women.
 - A follow up conference is needed to “Taking Wing – Conference on Gender Equality and Women in the Arctic”, held in Saariselkä/Inari 4-6 August 2002.
 - We need to find a way to talk about gender indirectly and in context in order to be inclusive.
 - The title and theme of the conference could be the “Arctic Food Conference”.
- (The following sentiments were expressed after the breakout groups meeting and presentation. A few felt that the use of the word “gender” is not a relevant topic of discussion, and should be omitted from the program and discussion groups. This was because gender is not perceived to be relevant to certain indigenous cultures or communities. This perspective highlights an area of debate within the gender field, and for this reason has been included in the Gender Breakout Group summary. However, considering the wide and growing discourse on gender within indigenous academic discourse and the important points raised above, the group maintains that gender is a pressing issue within discussion of vulnerability and adaptability.)

Youth and the elderly.

- The overall goal should be to enhance capacity for elders and youth to spend time together. Successful examples are:
 - (1) Community-based monitoring projects where youth and elders are managing or “testing” their environs together.
 - (2) Creating schools on the landscape or schools that emphasise multiple forms of knowledge that can teach youth amongst their elders and in locations in which elders have environmental and other life knowledge. That helps more youth stay in their own communities rather than leaving for their schooling.
 - (3) There needs to be economic development in rural locations so that youth are able to return to a community where there are opportunities to flourish. There needs to be structures in place that can care for elders so they are there when youth return.
 - (4) Create an Arctic Council level conference on youth and elders, so that these groups across the Arctic and from many different communities can learn from one another and share experiences.

Breakout groups #2: Good practices to support and link adaptation at the local and national levels

Climate information

- Organize a meeting/conference on climate information that brings key users together. This audience should be asked what they need and in what format they need it in. Scientists and other technical experts could attend as well.
- There is a range of climate information that is needed in the Arctic environment. That includes downscaled temperature and precipitation, permafrost, sea-level (tide gauge), vegetation, etc.
- A dialogue with users (for example, Reindeer Herders) is the most productive way to determine what types of specific products need to be or could be produced.
- If data gaps for climate information are identified across one Arctic region, there may be a way for the Arctic Council to coordinate new work with countries to ensure that priority locations are addressed.

Methods and tools for understanding and assessing risk and vulnerability

- Conduct an inventory of available methods and tools.
 - Should identify both the strengths and limitations of various approaches.
 - Need to first ensure this is not duplicating existing efforts.
 - Much is going on globally on this topic; for example, UNFCCC's compendium of methods and tools.
 - The group did not identify conditions unique to the Arctic which would dictate the necessity for new / unique tools and methods. Instead, an opportunity exists to benefit from, and contribute to, global initiatives.
- A workshop / forum to examine available tools and methods and to share practical experiences with their application might be useful.
 - Such a workshop would need to be driven by the users of tools, rather than by tool developers.
- The breakout group did not think it was useful, or even appropriate, for the Arctic Council to:
 - Endorse any specific method or tool as a best practice.
 - Develop guidance / guidelines for the application of methods and tools.
 - Insist on mainstreaming in the short term, although this is a desirable long term goal; for example, to integrate assessment of climate change risks with all other risks considered in planning processes.
- The group felt there was a need for consideration of the issues and challenges associated with implementing adaptation, beyond simply assessing risks and vulnerability.

Energy infrastructure for adaptation

- Energy infrastructure contributes to not only mitigation but also to adaptation and can form a key part of sustainable Arctic communities.
- Many northern communities rely on diesel energy systems which are inherently unsustainable.
- Build on and promote existing initiatives, such as the SDWG's Arctic Energy Summit.
- Need to investigate the questions: What sort of energy? What sort of technologies? Who pays? What opportunities? How can energy be used to create jobs, livelihoods, self-sufficiency. Such studies would investigate the need for energy in Arctic communities, capability of infrastructure, positives and negatives of different energy approaches, education regarding sustainable energy solutions and access and skills (for example, auditing energy use, installing solar water heaters).
- The Arctic Council should not necessarily provide money for such work, but could help the communities to find and get the needed money.
- To support training, build on UArctic and Artek to develop a technical college which would assist in coordination and strengthening, also helping to raise awareness and to exchange and share experiences.
- The Cool 100 project is capturing 100 examples of sustainable energy examples across the Arctic.

Biodiversity/ecodiversity

- The Arctic Biodiversity Assessment (Conservation of Arctic Flora and Fauna working group of the Arctic Council) should include relevant information and recommendations to policymakers with respect to climate change vulnerability and adaptation options. Include relevant aspects on ecosystem services; link and increase incentives to protect biodiversity.
- Support and strengthen the monitoring programs (Conservation of Arctic Flora and Fauna) of terrestrial, freshwater and marine systems. Implement the traditional knowledge strategy in the monitoring programs.

- A project within the Arctic Council would be to make available a catalogue/database of possible management tools and resilient building measures. Make the data from the VACCA scoping study survey accessible.
- Where possible/relevant, make connections amongst the different Arctic Council groups; for example, SDWG, CAFF, AMAP, and PAME.

Health

- The Arctic Council should encourage action on the Arctic Council Impact Assessment recommendations, and where appropriate provide technical assistance regarding monitoring strategies, pilot studies, data collection analysis, and evaluation.
- Need to establish a relationship between climate change and individual and community health.
- There is an urgent need to implement community-based monitoring strategies.
- Establish a network of communities within and across regions reporting a common set of standardised climate and health indicators.

Breakout groups #3: Good practices in climate change capacity building, education, and outreach

Communication and outreach

- The audience is broad. Trust must be established locally, such as through local champions and the media. The audience must be engaged and feel ownership, needs specific information, and provides guidance and information such as through community-based monitoring.
- The process of communication and outreach should involve a common “language”, plus information must be clear, understandable so that the right and relevant information is targeted to the right people. User feedback and demands need pathways.
- Providers must have a constant awareness of user needs and reception of information, so that messages can be targeted. Consistent messaging helps to build trust. Use the right method (many users, many purposes, many methods) guide how to use the information (education). Communicate uncertainties.
- A Centre of Excellence or similar mechanism (for example, virtual and user-driven) would bring together outreach and education, would share experience and workload, would build on national resources, and would optimise communication and translations of materials.

Building capacity through networks and collaboration

- Use already existing networks, when possible.
- Avoid overnetworking; that is, avoid being involved in too many networks.
- Reduce meetings by using phone/video/internet conferences.
- Maintain built-up capacity, especially when networks close.
- Results should be reported back to supporting bodies, especially funders.
- Transfer funded networks into unfunded forms before they formally stop in order to continue that work.

Education and training

- The audience would be communities and local people starting from the bottom level (children and youth) who could be reached by teaching teachers. Traditional knowledge should be collected, shared, and used in teaching (starting from day care to higher education) including also the knowledge of other than indigenous northern people.
- Elders visiting schools is needed to talk about their own traditional knowledge. Joint projects could be schools cooperating with other schools and researchers on the climate change, such as for data collection and community-based monitoring, along with a web site/portal (kidszone) gathering the data and information with local languages.

- The Arctic Council could establish a forum where traditional knowledge of people in north will be collected and shared in their own language and made accessible to the communities. Work done in the Arctic Council working groups should be taken to the communities.
- The education and training should be done in co-operation with other Arctic organizations, such as University of Arctic and its relevant strategic areas.

Research

- To implement research, it should be (i) done through partnership with local and indigenous communities, (ii) inclusive of all knowledge systems, (iii) combined with education and capacity building at a local level.
- Synthesize adaptation relevant findings, and identify what is transferable and how to transfer it. Double efforts should be reduced. Results should be made available and “digestible”.
- The Arctic is fairly advanced in integrating different knowledge systems and could contribute to the rest of the world.
- In order to generate the knowledge that we think is needed to strengthen resilience in the Arctic, Arctic Council research activities (ongoing and future) should be multidisciplinary, more diverse in approaches, and have a resilience and adaptation relevant objective.
- Specific research needs identified are (i) improved understanding of the resilience of Arctic social-ecological systems, (ii) how can ethical and value-based considerations be more strongly reflected in research efforts, and (iii) a “Stern Report” for the Arctic.

Final Panel: Amy Lovecraft

- There must be a searchable, user-friendly database that has peer review (minimal) and can serve as a digital library for climate change vulnerability and adaptation in the Arctic.
- There must be incentives for people to participate in populating the library with data.
- There must be a mechanism within the library for people to “meet in the stacks” and form communities of practice.
- The library must be publicised.

Final Panel: Leanna Ellsworth

- Do not portray Arctic indigenous peoples as victims of climate change, but as part of the solution.
- The indigenous summit on climate change in Anchorage in 2009 will be an important venue for addressing climate change vulnerability and adaptation.
- The Arctic Council and SDWG need to support the involvement of Inuit in processes such as the IPCC to ensure that traditional knowledge is considered equally to the science being forwarded.
- The Arctic Council should facilitate work on adaptation and mitigation.
- The Arctic Council should facilitate Permanent Participants’ participation in UNFCCC’s COP14 and COP15.

Final Panel: Victoria Tauli-Corpuz

- Indigenous peoples have shown their ability to adapt to changes in the climate “since time immemorial”.
- Indigenous people are doing their own climate change assessments using their own knowledge and worldviews, including using their own technologies and customary laws. That helps in training indigenous peoples to do their own research.
- Several summits are happening which will be summarised and presented at the UNFPII meeting in May 2009 and then presented formally to UNFCCC.
- IPCC is being lobbied include a chapter on indigenous peoples.
- Climate change is a social justice and human rights issue.
- UNFPII will support their indigenous counterparts in the Arctic Council in dealing with climate change.

Offer from EALÁT

- The EALÁT Network offered to share their information resources for any one interested in vulnerability and adaptation to climate change in the Arctic.

Offer from the World Meteorological Organization

- Work with the Arctic Council to create an Arctic Regional Climate Outlook Forum to help bring weather and climate information and forecasts to users on their own terms.

Arctic Human Health

7) SDWG Arctic Human Health Expert Group (AHHEG)

In the interests of ensuring greater integration of human health activities and of strengthening cooperation and collaboration between Arctic Council Working Groups (WGs) and other circumpolar human health organizations, at their meeting in Salekhard, Russia in October 2006, the Arctic Council Ministers “[w]elcome[d] the heightened importance placed on human health in the Arctic by the formation of a cluster of health projects”, and “endorse[d] action to create further synergies and strategic directions in human health .”

Over the past two years, the SDWG has exceeded expectations through its concerted efforts to deliver on the AC Ministers’ call to action on Arctic human health. The following provides an overview of the activities undertaken by the SDWG.

Overview of SDWG Activities to better integrate and collaborate on Arctic Human Health

At the SDWG Meeting (Tromsø, April 2007), the SDWG Chair invited the Arctic Monitoring and Assessment Program (AMAP) Chair and Executive Secretary to provide an overview of AMAP’s human health activities and to participate in preliminary discussions on how to move forward on the October Ministerial directive. From this discussion and in an effort to find a way forward, it was decided that both the SDWG and AMAP health experts meet to draft a discussion paper which would address opportunities for greater collaboration and synergy between Arctic Council working Groups and other organizations to explore the contribution that a “cluster” approach to human health might offer. Canada and the US offered to coordinate this initiative.

In June 2007, a workshop with representative human health leads from AMAP, SDWG, Inuit Circumpolar Council, Gwich’in Council International, and the International Union for Circumpolar Health (IUCH) was held in Ottawa, Canada. The workshop focused on achieving a common understanding of the opportunities for horizontal coordination and strategic partnerships related to circumpolar human health. Topics for discussion included identification of issues and opportunities related to the current human health activity within the Arctic Council and discussion of what might be done to better coordinate activities between Working Groups.

Although it had been used in the Salekhard Ministerial directive to the SDWG, workshop participants agreed that using the term “health cluster approach” could be confining and misinterpreted. It was agreed that the term should be put aside to encourage open thinking about opportunities for, and approaches to, improving strategic coordination across Arctic Council Working Groups and with outside circumpolar health expertise.

The following assumptions helped to frame and focus discussion:

- Neither the AMAP nor the SDWG (or any other Working Group) engagement in human health issues would be dissolved or subsumed by any new structures or processes that may be created;
- Any approach to coordination should be pragmatic, and must not fragment existing and necessary work and mandates of any AC Working Group;
- Engagement of Permanent Participant organizations (PPs) and traditional knowledge are critical to the success of strategies aimed at improving human health in the Circumpolar Region.

During the Ottawa workshop a number of strategies were discussed from the simplest, to take conscious steps to better coordinate planning and priority setting on human health issues, to the complex, the establishment of an AC expert circumpolar human health resource group, accessible to circumpolar human health organizations and interests. Participants identified issues and opportunities as a basis for determining where progress could be made in terms of coordination and enhanced human health impact. Two options, the third a work in progress, were considered for improving the Arctic Council and Working Groups horizontal coordination of its human health activities, and for enhancing strategic circumpolar human health partnerships.

The following three basic options were developed for the purpose of further exploration and discussion at the SDWG meeting in Vadsø, October 30-November 1, 2007.

- Option 1- Improve communication, coordination & planning between AC WGs
- Option 2 - Role and mandate for a proposed Human Health Assessment Committee
- Option 3 - Human Health Expert Group

At the conclusion of the workshop, the participants agreed that a more strategic approach to human health activities requires building stronger relationships with other Working Groups and health organizations engaged in human health activities in the Arctic. It was further agreed that it is necessary to continue clarifying goals and priorities as well as identifying human health areas for collaboration, if AC WGs are to achieve a more integrated approach and to provide more effective responses to the growing human health impacts occurring throughout the Arctic Region - be it from climate change or socio-economic change.

Subsequently, at its meeting in Vadsø (October 2007), Canada and the US provided a presentation to the SDWG plenary on the outcome of the Ottawa SDWG/AMAP Human Health Workshop. There was a clear consensus from the States and PPs in their support of the option aimed at improving communication, coordination and planning between AC WGs. Also attending this meeting were representatives of the AMAP Arctic Human Health Assessment Group and the International Union for Circumpolar Health who took the opportunity to express their support for this option and re-affirmed their interest in continuing with this process.

It was further decided that the next steps would be:

- to establish a SDWG human health group, but firstly a draft terms of reference for this group would need to be developed and circulated for SDWG review and agreement;
- in parallel to the above, the SDWG Chair was to follow-up with the WG Chairs engaged in human health activities to agree on developing a joint framework for collaboration;
- in this regard, a tentative date for an AC WG human health experts meeting would be determined and the purpose of this meeting would be to initiate the development of a framework for collaboration on Arctic human health.

Canada and the US accepted the SDWG Chair's request for their continued leadership and a small ad-hoc group was struck (the lead countries and two Permanent Participant Organizations, the Gwich'in Council International and the Saami Council) to take on the development of terms of reference for an SDWG human health group. The lead countries were also directed to report back at the next Meeting of the SDWG in May 2008.

The ad hoc group completed the SDWG Arctic Human Health Expert Group (AHHEG) Terms of Reference (see ANNEX 1) and in May 2008 these were approved by the SDWG. Succinctly, the AHHEG is an integrated research community with interest in circumpolar community health and wellness. The mandate of this expert group is to support and advance knowledge gained through ecosystem and community based research to support circumpolar communities in developing practical responses to the human health impacts. Moreover, the AHHEG aims toward greater collaboration and synergies between Arctic Council Working Groups, Indigenous communities and organizations, academic institutions and other relevant circumpolar organizations in the development of sustainable and integrated approaches to address attendant human health issues.

The AHHEG objectives are:

- to establish an interdisciplinary group of health experts and researchers, statisticians, social scientists, community health specialists and others to provide from an Arctic region perspective further insight on the relationship between human health and society;
- to fully engage Indigenous communities and organizations in developing the research instruments and in understanding community responses;
- to strengthen cooperation and collaboration between Arctic Council Working Groups, academic institutions as well as circumpolar human health organizations;
- to provide timely communications and outreach on the activities of the AHHEG at meetings, conferences and gatherings.

A feature of the AHHEG is to develop a communications strategy to undertake strategic education outreach and communication activities which will focus public and political attention on Arctic human health issues, using a variety of media: print and electronic reports and publications from scientific conferences, symposia, and workshops targeting researchers, students, communities, and policy makers. In addition, AHHEG will develop in collaboration with the SDWG Secretariat a 'chat room' within its portal where information on circumpolar health and related information can be posted on a regular basis.

Next Steps

Since the SDWG May 2008 meeting, Arctic States and Permanent Participants Organizations have been canvassed to put forward human health expert nominations for the SDWG AHHEG. Once the list is completed, the next step will be to host a founding SDWG Arctic Human Health Expert Group Meeting/Workshop which will provide the opportunity to initiate:

- further exploration and definition of the parameters of its engagement in the field of circumpolar human health with other AC WGs; and
- to identify priorities and to initiate opportunities for strategic coordination and synergy with its AC colleagues and outside circumpolar human health organizations.

8) Arctic Human Health initiative (AHHI)

Human health concerns and challenges that face Arctic peoples include:

- The health impacts of environmental contaminants, climate change, and rapidly changing social and economic parameters within Arctic communities,
- The changing patterns of chronic diseases (increasing rates of obesity, diabetes heart disease, and some cancers)
- The high rates of intentional and unintentional injuries that occur in Arctic regions
- The continuing health disparities that exist between indigenous and non indigenous segments of the Arctic populations

The human health activities of the Arctic Council currently reside in the Arctic Monitoring and Assessment Program's (AMAP) Human Health Assessment Group, responsible for assessments of the relationship between environmental contaminants and health, and the Sustainable Development and Utilizations Working Group (SDWG) which has a goal to advance sustainable development in the Arctic, including opportunities to protect and enhance health of the indigenous communities and other inhabitants of the Arctic.

A number other of multi-national governmental and non- governmental organizations collaborate on improving the health and well-being in circumpolar regions. These include: The International Union for Circumpolar Health (IUCH), the International Arctic Social Sciences Association (IASSA), the International Network of Circumpolar Health Researchers (INCHR), the Northern Dimension (ND) Partnership in Public Health and Social Wellbeing (NDPHS), Barents Euro Arctic Council and the Co- operation Program on Health and Related Issues in the Barents Euro Arctic Region (BEAC), and the Northern Forum (NF).

It will be important for human health programs within the Arctic Council to develop linkages with other health organizations to ensure synergy between programs and avoidance of duplication of effort in specific program areas.

The IPY presents an opportunity to advance the circumpolar human health research agenda of the Arctic Council. The Arctic Human Health Initiative (AHHI) was submitted to the IPY International Program Office as an Arctic Council, as a US led SDWG IPY coordinating project that aimed to serve as a focal point for human health research, education, outreach, and communication activities during IPY (2007-2009). The overall goal of the AHHI is to: "Increase awareness and visibility of human health concerns of Arctic peoples, foster human health research, and promote health strategies that will improve health and well being of all Arctic residents". Proposed activities included:

- Expanding research networks that will enhance surveillance and monitoring of health issues of concern to Arctic peoples, and increase collaboration and coordination of human health research;
- Fostering research that will examine the health impact of anthropogenic pollution, rapid modernization and economic development, climate variability, infectious and chronic diseases, intentional and unintentional injuries;
- Promoting education outreach and communication that will focus public and political attention on Arctic health issues. This should include using a variety of publications, printed and electronic reports from scientific conferences, symposia, and workshops targeting researchers, students, communities, and policy makers;

- Promoting the translation of research into health policy, community action including implementation of prevention strategies and health promotion.

As of December 31, 2008, 18 Expressions of Interest's , 8 Full Proposals, and 8 National IPY Initiatives have been submitted to AHHI as potential IPY human health projects. Of these 22 are active. Details can be found at www.arctichealth.org

This expansion of and interest in Arctic Council human health activities during the IPY underscores the need to develop a strategic plan, direction and management structure for human health within the SDWG ensuring synergy with activities within other working groups of the Arctic Council and other circumpolar organizations engaged in improving the health of Arctic peoples.

Brief summary of activities during Norwegian chairmanship:

An AHHI website has been established at www.arctichealth.org. The website contains detailed information on the aim and objectives of the AHHI, a listing of projects proposed as part of AHHI, linked to project descriptions, AHHI partners, publications and past and upcoming events.

A Steering Committee was established at a meeting in Banff Alberta, Canada, April 24, 2007. Members were selected from the membership of the IUCH. Members were selected on their expertise, professional experience, and experience within the fields of Arctic human health. All eight Arctic Countries and indigenous peoples organizations are represented on the Steering Committee. The role of the Steering Committee is to provide scientific expertise on matters relating to the AHHI, and as needed to the Arctic Council SDWG, and to provide general guidance in regard to the operation, management, coordination and communication of IPY AHHI projects and activities. A Steering Committee meeting was also held in Tromsø, Norway, May 15, 2008.

A secretariat has been formed to provide support for core AHHI administrative activities and is located in Anchorage, Alaska. Support for the secretariat is provided by the University of Alaska Anchorage and the US Centers for Disease Control & Prevention, Arctic Investigations Program.

AHHI held project workshops in association with The INCHR (www.inchr.org) Circumpolar Health Research meetings, Banff, Alberta, Canada April 20-25, 2007, and in Tromsø, Norway, May 12-16, 2008. (http://uit.no/sih/circumpolar_health)

An international workshop on Climate Change and Human health in the Arctic was held February 13- 15, 2008, Anchorage, Alaska, USA, as part of the Alaska Forum on the Environment (www.akforum.org). This IPY workshop re-examined, and reaffirmed the conclusions and recommendations of the human health chapter of the Arctic Climate Impact Assessment Report. Proceedings will be available at www.arctichealth.org and will be published in the International Journal of Circumpolar Health.

An AHHI workshop was held as part of the 6th International Congress of Arctic Social Sciences (ICASS VI) Nuuk, Greenland, August, 25-29, 2008. www.icass.gl The aim of this workshop was to begin to consolidate the natural and social science human health activities of the IPY.

Three IPY AHHI reports have been published. These include:

- A Proceedings 13th International Congress on Circumpolar Health June 12- 16, 2006, Novosibirsk, Russia. "Gateway to the International Polar Year". A limited number of free hard copies will be available via the AHHI web site at www.arctichealth.org.

- Special IPY Edition of the CDC's Emerging Infectious Diseases Journal, January 2008. The issue can be accessed at (www.cdc.gov/eid/content/14/1/contents_v14n1.htm).
- Parkinson, AJ., Hassi, J. International Polar Year and Arctic Public Health Initiative. Russian Journal Human Ecology. Issue No. 2, 2008. [In Russian].

Plans for 2009-2010:

The AHHI will continue through 2009 and 2010.

The AHHI Steering committee will continue to monitor projects, maintain the AHHI Website, and provide updates on IPY Human health projects through 2009-2010.

The International Union for Circumpolar Health will host the 14th International Congress on Circumpolar Health, Securing the IPY Legacy: From Research to Action, July 12-16, 2009, in Yellowknife Northwest Territories, Canada. An AHHI Steering committee will be held July 12 in conjunction with this meeting. <http://www.icch2009.com>

An Arctic Human Health Initiative Symposium will be conducted at the Oslo IPY Science Conference, 7-11 June 2010 (www.ipy-osc.no)

Recommendations:

Develop a strategic plan, direction and management structure for human health within the SDWG that ensures synergy with human health activities within other working groups of the Arctic Council and other circumpolar organizations engaged in improving the health of Arctic peoples.

Anticipated deliverables for 2009 Ministerial:

A comprehensive report on AHHI Activities 2007-2008 will be published as an IPY Supplement of the International Journal of Circumpolar Health, April 2009

9) International Circumpolar Surveillance: Prevention and Control of Emerging Infectious Diseases in the Arctic (ICS)

The ICS network was established in 1999 and approved as an Arctic Council SDWG project at the ministerial meeting in Barrow Alaska in 2000. The project first linked clinical and public health laboratories in the U.S. Arctic (Alaska), and northern Canada for the surveillance of invasive diseases caused by *Streptococcus pneumoniae*. Greenland joined the pneumococcal surveillance network in 2000, followed by Iceland, Norway and Finland in 2001, and the northern Swedish country of Norbotten in 2003. In 2000, expanded surveillance of other invasive bacterial diseases caused by *Haemophilus influenzae*, *Neisseria meningitidis*, and groups A and B *Streptococcus* was implemented in the U.S. Arctic and northern Canada; Greenland began expanded reporting in 2001, N. Sweden in 2003 and Norway in 2005. Surveillance of invasive disease caused by these bacteria was chosen because rates of these diseases are elevated in indigenous peoples of the north, strains of these bacteria may acquire antibiotic resistance, these bacteria are routinely cultured in the clinical laboratory, and diseases caused by clinically important serotypes of *Streptococcus pneumoniae*, *Haemophilus influenzae* and *Neisseria meningitidis* are vaccine preventable. The surveillance system contributed to the identification of an outbreak of pneumonia caused by *Streptococcus pneumoniae* serotype 1 in communities of northern Canada in 2001 which resulted in the implementation of pneumococcal vaccine

programs in these communities in 2002. ICS is being used to monitor the impact of these vaccine programs in the U.S. and Canadian Arctic to provide data to support implementation of similar programs in other Arctic countries.

Brief summary of activities during Norwegian chairmanship:

ICS continued surveillance of invasive bacterial diseases and related quality control programs in the US Arctic, northern Canada, Greenland, Iceland, Norway, Finland and northern Sweden during 2007- 2008. A number of new ICS activities were undertaken during the Norwegian Chairmanship as part of the International Polar Year's Arctic Human Health Initiative. These included:

Reports of ICS activities (1999-2005 data) were published in the January 2008 issue of Emerging Infectious Diseases (www.cdc.gov/eid/content/14/1/contents_v14n1.htm). ICS Papers include:

- The International Polar Year, 2007- 2008., An opportunity to focus on Infectious Diseases in Arctic regions. Parkinson, AJ. Emerg. Infect Dis J. 2008. 14 (1) 1-3.
- International Circumpolar Surveillance, an Arctic network for surveillance of infectious diseases. Parkinson, AJ., Bruce MG, Zulz T. Emerg. Infect Dis J. 2008. 14 (1) 18-24.
- International Circumpolar Surveillance for invasive pneumococcal disease, 1999-2005. Bruce, MG., Deeks, SL., Zulz, T., Druden, D., Navarro C., Lovegren, M., Jette, L., Kristinsson, K, Sigmundsdottir, G., Jensen, KB., Lovoll, O., Nuorti JP., Herva E., Nystedt, A., Sjostedt, A., Koch., Hennessey TW., Parkinson, AJ. Emerg. Infect Dis J. 2008. 14 (1) 25-33.
- Epidemiology of Haemophilus influenzae serotype a, North American Arctic 200-2005. Bruce, MG., Deeks, SL., Zulz, T., Navarro, C., Palacios, C., Case, C., Hemsley C., Hennessy, T., Corriveau, A., Larke, B., Sobel, I., Lovegren M., DeByle C., Tsang R., Parkinson AJ. Emerg. Infect Dis J. 2008. 14 (1) 48-55
- Invasive Bacterial Diseases in Northern Canada. Naushaba Degani, Christine Navarro, Shelley L. Deeks, Marguerite Lovgren, and the Canadian International Circumpolar Surveillance Working Group. Emerg. Infect Dis J. 2008. 14 (1) 34-40

An ICS tuberculosis working group was established with participation from the US, Canada, Greenland/Denmark and the Russian Federation (lead country Canada).

The ICS viral hepatitis research working group established in Novosibirsk, Russian Federation, June 16, 2006, conducted meetings in Copenhagen, Denmark, October 16-17, 2007, and September 16-17, 2008. The purpose of this working group is to coordinate collaborative viral hepatitis research activities in circumpolar countries.

An ICS Helicobacter pylori working group was established and conducted a meetings in Copenhagen, Denmark, October 18, 2007, and September 18, 2008. The purpose of this working group is to coordinate collaborative research activities on Helicobacter pylori infections and diseases in circumpolar countries.

An ICS Sexually Transmitted Infections working group will be established following a working group meeting on Alaska Native Inuit, First Nations and Metis that was held in Anchorage, Alaska, US, April 16-17, 2008. A follow- up meeting is expected to occur at the 14th International Congress on Circumpolar Health, July 12-16, 2009, Yellowknife, NWT Canada.

Together with the Northern Forum, ICS conducted a workshop on Infectious Diseases and Surveillance Methods, in Moscow April 24-26, 2008. This workshop was attended by infectious disease experts from Moscow and 12 northern regions of the Russian Federation. The purpose of this workshop was to explore potential linkages, and sharing of surveillance information between public health authorities in northern regions of the Russian Federation and ICS participating countries.

A major objective of the IPY is the establishment of well-coordinated and Sustained Arctic Observing Networks (SAON) (www.arcticobserving.org). ICS represents an international circumpolar collaborative information system for infectious diseases and potentially could be considered a model SAON for human health. This concept was presented at the Sustainable Arctic Observing Networks II meeting in Edmonton, Alberta, Canada. April 9- 11, 2008.

Plans 2009-2010:

- ICS will continue surveillance of invasive bacterial diseases and related quality control programs in the US Arctic, northern Canada, Greenland, Iceland, Norway, Finland and northern Sweden during 2009- 2010.
- ICS will initiate standardized collection of tuberculosis data in the US Arctic, northern Canada and Greenland.
- ICS will explore potential mechanisms for sharing of infectious disease surveillance information between public health authorities in northern regions of the Russian Federation and ICS participating countries.
- Coordination of Hepatitis and Helicobacter pylori research activities will continue.
- A circumpolar Sexually Transmitted Infections working group will be formed to explore collaborative research and intervention activities in circumpolar countries.
- ICS will expand to include non- infectious disease problems important in Arctic communities. It is anticipated that an ICS surveillance system for Birth Defects will be established in 2009 (lead country Canada).
- ICS will explore options for establishing a pilot community based monitoring system for the detection of climate sensitive zoonotic infectious diseases (potential linkages with AMAP, CAFF).

Recommendations:

- Continue to support ICS activities in 2009-2010.
- Promote ICS as a SAON for human health.

Anticipated deliverables for 2009 Ministerial:

A comprehensive report on ICS activities 2000-2008 will be published as an IPY Supplement of the International Journal of Circumpolar Health, April 2009.

11) Advancing Alcohol & Drug Abuse Treatment in the Circumpolar North

Lead Country (ies):

- USA, Russia

Project Coordinator:

- Asida Prather, Program Coordinator, APrather@northernforum.org

Participating Arctic states and Permanent Participants:

- USA, Russia

Summary of Objectives:

- To support mutual efforts on healthy lifestyle promotion in northern regions, to facilitate knowledge and experience exchange in the areas of drug addiction and alcoholism.

Brief summary of activities during Norwegian chairmanship:

Dr. Bernard Segal is actively involved in this project and provides continued project support through identification of programs in Alaska, establishing contacts with specialists in the field, and providing research information to the working group. Dr. Segal has been involved in the Northern Forum's Healthy Lifestyles project since 2005 Summit in Whitehorse. Since 2006, Dr. Segal conducted several training sessions in Russia and the information from the training sessions have been published in Russian and distributed (Title: Additional materials "Modern approach to treatment of drug addiction and psychiatric diseases" Khanty-Mansiysk 2006)

Delegation visit:

To continue with the goals of the project the Northern Forum organized a visit for a delegation consisting of three doctors from Khanty-Mansiysk's Clinical Neuro- psychological Hospital. The visit took place in Anchorage and Seattle from May 24 - June 4, 2008. Three substance abuse treatment programs were visited by the group and included Clithroe Alcoholism Treatment Program in Anchorage, Therapeutic Health Services and Lakeside Milan programs in Seattle. The doctors were provided with in-depth information about each program, including patient intake procedures, patient interviewing techniques, diagnostics, treatment, and detox approaches, as well as funding, and other information pertinent to each program.

Participants of the visit were:

- Dr. Konstantin Misyura, Head Doctor, Khanty-Mansiysk Clinical Psycho- neurological Hospital
- Dr. Andrey Novikov, Deputy Head Doctor, Outpatient treatment department, Khanty-Mansiysk Clinical Psycho-neurological Hospital
- Ms. Marina Dukhina, Doctor, Nizhnevartovskiy Psycho- neurological hospital
- Ms. Inna Balabanova, Interpreter

In Clithroe program visiting doctors learned about residential service for men and women including a dual- diagnosis treatment program for individuals with mental health issues, family services, and patient assessment techniques. Each visit involved active discussions and questions from the group and answers from the staff regarding how the program operates.

In addition, the group visited Alaska Youth Crisis Center and the Community Services Patrol's (CSP) Sleep-Off Center, both located in Anchorage. In Seattle the group visited Therapeutic Health Services (THS) and Lakeside Milan programs. Program staff provided a detailed overview of how the program is implemented. During their visit they also met with the President of THS program and one of their Russian staff, who was very helpful in explaining and describing how the programs work. One of the main outcomes of the visit to THS was an invitation to host 1 Russian practitioner in the program. Moreover, they agreed to assist with a stipend and other

living expenses. The training would be for 3 months and the trainees to come have to know English.

Both visits were extremely successful. The doctors were especially interested in the way programs are operated and funded. The group also learned about the paperless data system, which they would like to institute in their hospital. They were interested in learning that the primary services providers are not physicians but rather social workers, psychologists, and in some cases nurses. In addition, they received extensive materials from both the THS and Lakeside Milam programs. The group agreed to review these materials and extract what's applicable to their treatment program.

Current Status of work:

A three-day videoconference focusing on short-term outpatient substance abuse rehabilitation strategies and stages is planned for November 2009. The videoconference is planned for practitioners from regions participating in the substance abuse treatment and prevention working group, which was initially formed in 2006. The goal is to share information with a broader audience while minimizing costs. Participants will include specialists from Alaska who will share and exchange substance abuse rehabilitation strategies and their Russian counterparts.

Planning for additional training in the THS program is underway with tentative dates set for April 2009. Khanty- Mansiysk Narcological Hospital will identify practitioners who will undergo training in Seattle. It should be noted that due to limited funding opportunities for this project, each region participating in the working group is responsible for their expenses. Funding limitations resulted in weak participation from other members of the working group.

Any matters requiring decisions or directions:

- To continue the Substance Abuse project into the Danish Chairmanship

Anticipated deliverables for 2009 Ministerial

- To be determined.

12) Telemedicine

Lead Country (ies):

- USA, Russia

Project Coordinator:

- Asida Prather, Program Coordinator, APrather@northernforum.org

Participating Arctic states and Permanent Participants:

- USA, Russia

Summary of Objectives:

The goal of the Telemedicine pilot project is to promote the establishment of a mutually beneficial collaboration in telemedicine, telehealth, mobile medicine and distance learning in remote areas of the Russian north. Project implementation sites – Sakha Republic and Khanty- Mansiysk AO.

Brief summary of activities during Norwegian chairmanship:

The series of visits, workshops, and information exchange between 2004 and 2008 resulted in effective promotion and use of telemedicine technology in the two pilot regions. For instance, in Khanty-Mansiysk (KHMAO) telemedicine equipment is in place and operational in several remote areas. KHMAO is currently operating 52 telemedicine stations and a boat with telemedicine equipment that goes up the Ob River to provide basic healthcare to communities with no health clinics. Each year the service is extended to other remote areas of the region. The region provides comprehensive telemedicine training for doctors and nurses. In the Sakha Republic, over 500 patients received medical consultation from hospitals in Russia and abroad. About 146 tele-training sessions have been provided to local doctors and 300 regional videoconferences took place with participation of about 3000 people. In addition, local Medical Institute established an innovative educational program on telemedicine. Sakha Telemedicine experts are continuing to work on practical implementation and use of telemedicine technology in the region. These positive outcomes can be directly linked to project activities that took place between 2004 and 2008.

Current Status of work:

Project participants are continuing to implement what they learned through this project in their regions.

The Northern Forum is planning to hold a final working group workshop to share lessons learned. It was also recommended to invite telemedicine equipment manufacturers to participate in this workshop.

Any matters requiring decisions or directions:

The Northern Forum proposes that the project is finalized within the Arctic Council. Following the final workshop participants may continue to collaborate independently.

Anticipated deliverables for 2009 Ministerial:

- None.

13) Arctic Information and Communication Technologies Assessment (AICTA)[USA]

Current Status of work:

Further work is required on the draft report and draft recommendations before they can be forwarded to SAOs. The SDWG agreed to give further consider to the draft report and recommendations at its Heads of Delegation meeting scheduled for 8-9 December 2008.

14) Arctic ActionICT [Sweden]

Summary of Objectives:

The activity is organized as research and development in the EU FP7 financed project Networking for Communications Challenged Communities (N4C), Exchange of ideas between the N4C environment and research and development in U.S.A/Alaska with contact person Richard Beck. The coordinator is Luleå University of Technology in Sweden, with contact person Maria

Udén. The present funding allows development within N4C 2008-2011, and idea and know-how exchange with Dr. Beck's U.S.A/Alaska based activities. The present set of Arctic Action will be able to present technical developments of interest for Arctic populations, publicly accessible through the N4C wiki. However, throughout the Arctic there are a number of initiatives to develop, test and implement both technical and business model solutions. Arctic Action could play a supporting role if developed to a platform for exchange of ideas and experiences.

Even if generic technologies such as TCP/IP have formed the powerful core, the conditions for building and establishing Information and Communication Technologies differ throughout the world. The Arctic conditions challenge ICT state-of-the art both in terms of software, hardware, business models, infra structure and regulations. Arctic Action is an initiative to develop solutions for Arctic populations, especially the rural populations that cannot benefit from technology effectively developed for urban conditions, and for demanding tasks in unsettled areas such as mobile outdoor work e.g. reindeer herding, and climate monitoring.

The activity is organized as: 1. Research and development in the EU FP7 financed project Networking for Communications Challenged Communities (N4C). The coordinator is Luleå University of Technology in Sweden (LTU). This European project is a development of the previous nationally funded Sámi Network Connectivity project.

2. Exchange of ideas between the LTU environment and research and development in U.S.A/Alaska with contact person Richard Beck, University of Cincinnati. The base of activities is Ukpéagvik/Barrow, <http://www.arcticsscience.org/>.

Recommendations

The present funding allows development within N4C, which will be active 2008-2011 (April), and where the activities take place in one Arctic area in Northern Sweden, and idea and know-how exchange with Dr. Beck's U.S.A/Alaska based activities.

The present set of Arctic Action will be able to present technical developments of interest for Arctic populations, publicly accessible through the N4C wiki, and to sketch some directions for the other factors indicated in the suggestions above.

However, throughout the Arctic there are a number of initiatives that develops, tests and implements both technical and business model solutions.

- *Arctic Action could play a supporting role for these initiatives if developed to a platform for exchange of ideas and experiences among people actively involved in such development. Additionally, technically focused initiatives could here be matched with service and business ideas and initiatives for creating sustainable business cases.*
- *Furthermore, establishing some of the existing initiatives as test beds with interconnected evaluation, bench- marking and dissemination procedures, and with close co-operation between users (local populations) and developers/researchers would be a convincing measure to promote genuine and well functioning ICT for the Arctic economy.*

An Arctic-wide effective impact as sketched above requires dedicated funding. The funding needed can be estimated to the order of 400.000 Euro for a four year exchange platform project including coordinating staff, production of common material and travel/lodging support.

Establishment of test beds will have a higher cost, but may if organized in accordance with best practice for ICT R&D show to have great interest for national and other R&D funds.

Follow On to the Arctic Human Development Report

15) Arctic Social Indicators

Background:

The AHDR came to life formally as a mandate emanating from the 2002 Arctic Council Ministerial Meeting calling on Iceland (the council chair during the biennium 2002-2004) to launch the AHDR as a “priority project” intended to provide “... a comprehensive knowledge base for the Arctic Council’s Sustainable Development Programme” (Inari Declaration 2002). Officially, the project ended with Iceland’s delivery of the completed AHDR to the 4th Arctic Council Ministerial Meeting in 2004 and the decision on the part of the ministers to “... accept with appreciation the Arctic Human Development Report and recommend that the Sustainable Development Working Group make full use of the report as a comprehensive knowledge base for the development of the Arctic Council’s Sustainable Development Programme and direct Member States and the relevant working groups of the Arctic Council to consider appropriate follow up actions” (emphasis in original).

ASI purpose:

The Arctic Social Indicators (ASI) project is a project following up on the activities of the Arctic Human Development Report (AHDR), and was initiated by the Stefansson Arctic Institute, Akureyri, Iceland, which also hosts the secretariat. ASI has been endorsed by the Arctic Council, and has also received the endorsement of the IPY.

The goal is to devise Arctic social indicators which will help facilitate the tracking and monitoring of human development in the Arctic over time. It is apparent that the development of some means of monitoring trends in human development in the Arctic would be extremely helpful from the perspective of those involved in the policy process. Those wishing to track developments relating to the status of Arctic cultures, the evolution of indigenous rights, or the growth of the region’s economy, for example, can take the picture presented in the AHDR as a point of departure and compare on changes over time in human development or social welfare in the Arctic. The AHDR does not, however, provide time series data regarding the various elements of human development in the Arctic, and nor does it present a suite of quantifiable indicators suitable for use on the part of those seeking to monitor or track changes in human development in the Arctic.

The goal of the ASI project is to move toward filling this gap. It is the first step in a long-term effort to monitor and track human development in the Arctic. The development of indicators falls within six domains:

- (1) *Fate control and or the ability to guide one’s own destiny;*
- (2) *Cultural integrity or belonging to a viable local culture;*
- (3) *Contact with nature or interacting closely with the natural world;*
- (4) *Material Well-being;*
- (5) *Education;*
- (6) *Health/Population.*

Criteria for testing include: ease of measurement, affordability, robustness, data availability, interest of stakeholders, measurability at different levels, applicability to both indigenous and non-indigenous inhabitants, and internal validity.

All efforts to develop indicators must strike a balance between the analytic attractions of relying on a single indicator and the desire to introduce a large number of indicators in the interests of developing an accurate picture of complex and multi-dimensional phenomena. Tempting as it is analytically, the use of a single indicator such as GDP per capita as an indicator of economic development is problematic in addressing any complex phenomenon. This would certainly be the case with regard to something as multi-dimensional as human development. But going to the other extreme and ending up with dozens of indicators in the interests of capturing all the dimensions of a complex phenomenon is equally problematic. Not only does this create major measurement problems; it also can lead to disparate measures that are difficult to interpret. Thus, the objective is to devise a limited set of indicators that reflect key aspects of human development in the Arctic, that are tractable in terms of measurement, and that can be monitored over time at a reasonable cost in terms of labour and material resources.

There is no doubt that creating and refining suitable indicators of human development in the Arctic will take time and involve a step-wise process in which initial proposals are vetted empirically and refined or replaced over time as our ability to capture the essential features of human development under the specific conditions arising in the Arctic rises. Viewed in this light, the work of the ASI constitutes a significant step forward in moving us toward an ability to track trends in key elements of human development in the Arctic and, as a result, guiding discussions regarding questions of policy in the SDWG and in the Arctic Council more generally.

The report on Arctic social indicators will be directed at a broad audience, including the science community, inhabitants of the Arctic, policymakers at all levels, and in particular the Arctic Council and its SDWG. The plan is to have a report on Arctic social indicators completed in year 2008.

ASI Domains and Recommended Indicators:

(1) Health and Population Domain:

Health: Classical indicators of public health and health care include infant mortality, child mortality, and access to health care; mental health indicators include suicide rate and self-assessed health; and chronic disease indicators include obesity and smoking rate. Each indicator would be particularly informative if we could break it down further according to age, gender and ethnicity. With survey data such analyses are straightforward, and this is one of the main attractions of survey research methods. With other data sources, ethnic breakdowns in particular are difficult. There also are privacy and publication constraints. Government vital statistics are collected initially with individual-level detail, but released to the public in aggregated forms that do not always permit sub-regional or subgroup analysis.

Population: A general set of population indicators would include: Total population, number of births, number of deaths, and net migration. All of these indicators are best in the form of time series covering many years, and where possible, broken down by age, sex or ethnicity. Secondary indicators derived from population numbers include birth rates, teenage birth rates, mortality rates, infant or child mortality rates, population growth or decline rates and projections, and age/sex/ethnicity composition of the population, including age and sex ratios. Each of these indicators has relevance to sustainability and socioeconomic development.

To advance beyond the AHDR, we seek indicators that can be compared for geographies more specific than the nine general regions. The term “place” is deliberately vague, but for each indicator there are practical constraints on how small our geography can be. One obvious limitation is data availability. Statistical agencies do not provide breakdowns below certain minimum thresholds of population counts. Although specific thresholds vary from country to

country, they sometimes preclude the release of accurate data on small Arctic communities, or make the released data a patchwork of true and artificially rounded or suppressed numbers. Communities with populations of a few hundred or a few thousand people can be of great interest to social science and policy makers, but social indicators on this scale must be interpreted with care.

Recommended Health Indicator:

Infant mortality

Rationale: Quality of life is not a single dimension. Even using the simple summaries of social indicators, we get a much better picture looking at multiple indicators, comparing them across places and times. If we nevertheless select one indicator for health, infant mortality seems the best choice. This measure relates directly to quality of life and people's sense of well-being. It integrates a wide range of health-relevant conditions including health infrastructure, sanitation, nutrition, behavior, social problems and disease. International comparisons have established its broad validity as a proxy for societal development, and its influence on other dimensions such as fertility and women's work. Finally, the infant mortality rate makes a good indicator because it is clearly defined, comparable and widely available, including data for time series and sub-regional scales. One drawback is that it is based on small numbers. This drawback is shared by other health indicators, however. It constrains the possibilities for applying health indicators at sub-regional or community levels, or without time series, because statistics become less stable as sample size decreases. Confidence intervals help to describe the range of uncertainty surrounding a given indicator value.

Recommended Population Indicator:

Net-migration

Rationale: Choosing a single indicator regarding population or demography is also difficult. Population size, rates and components of change, and composition all are important. One demographic indicator of particular importance to Arctic communities has been net migration. Out-migration by young adults can make places economically and culturally less viable. Conversely, proportionately large in-migration could signal economic strength, but also places pressure on traditional ways of life. Both in- and out-migration reflect the current local sum of various push and pull factors, although we often need local knowledge to understand how. Like infant mortality, net migration thus integrates different forces, and tells something basic about where one place is heading, or how it compares with others.

Migration and other demographic indicators remain usable at smaller population scales than most health indicators do, insofar as they are calculated from a larger fraction of those populations.

(2) Material Wellbeing Domain:

We define material well-being in the Arctic region as some measure of local residents' command over goods and services. Material well-being is not happiness or general well-being, but in its strict sense 'material'. Material well-being is a measure of what is consumed not what is produced. It can be thought of on a continuum from basic necessities to the control of resources and wealth.

The construction and measurement of material well-being in the Arctic must consider the Arctic as a special case. In the Arctic material well-being is derived from market and non-market activity, as well as from transfers from higher levels of government. The importance of the traditional and transfer sector to material well-being is what makes the Arctic economy unique. The Arctic is also

not a homogenous region. Regions vary by the type, quality, and quantity of industrial resources produced, by the relative size of the indigenous population, by the size and relative importance of the local economy, and by economic and political system. These differences are a major complicating factor in devising appropriate indicators of material well-being for the Arctic.

There are essentially four important differences that must be captured by any indicator of material well-being. First, residents of the north gain command over goods and services through market work, government transfers, and work in traditional activities. Second, the relative importance of each of these sectors varies throughout the north. Third, because of the capital and skill intensive nature of industrial resource production, much of the value produced in this sector becomes payment to people outside of the region. Finally, climate change and globalization make change a fundamental characteristic of material well-being in the Arctic.

What would make a good indicator of material well-being? The perfect indicator would tell us exactly the level of consumption from all sources that the average citizen of an arctic region consumes. It would also measure both the distribution of this consumption and the potential for it to change over time, and it would allow us to compare across regions and over time.

Unfortunately, the perfect indicator may be too costly to construct. In selecting the appropriate indicator we need to balance or trade-off the information it provides with the cost of constructing the indicator.

The discussion of material wellbeing in the North takes as its point of departure the general criticism of GDP. Beyond the general criticism of GDP as a measure of material well-being, the Arctic poses additional questions, since material well-being is derived from more than just formal and recorded economic activity: inclusion of non-market production, flow of resource rents, differences in cost-of-living, annual price and output fluctuations, and the lack of consideration of distribution of income and environmental impacts are all important factors of material well-being in the Arctic.

Five groups of indicators – each group posting several possible indicators - are discussed and evaluated. The five groups are: income indicators, economic participation indicators, indicators of basic necessities and housing, poverty, and indicators of net-migration. While some of the indicators represent an improvement over GDP, they also have weaknesses when applied to the Arctic context. Four indicators of material wellbeing are proposed and evaluated according to selection criteria: per capita household income, net-migration, subsistence harvest, and finally a composite index that includes elements from each of the three sectors of the arctic economy.

Proposed Indicators:

(i) Per capita Household Income: This indicator scores high on a range of selection criteria. The major problem with the income indicator is that it ignores both direct services purchased with public transfers and also production in the traditional economy. Ignoring subsistence harvest and the transfer economy would leave us with an indicator of minimum material well-being. One of its particularly important strengths is that it provides a more accurate estimate of income in the North than does the standard measure of GDP.

(ii) Net-migration: Although the net-migration indicator has several weaknesses, it scores high on selection criteria and would be reasonably easy to measure – an important criteria to meet. It is robust and makes for easy comparison across scales, time, and regions. As long as we assume the cost of moving is similar for all people it is applicable to both indigenous and non-indigenous inhabitants. While this is a broad assumption to make this indicator still has considerable attraction.

(iii) Subsistence harvest per person: Subsistence is an indicator that we recognize as critical to the arctic context. At the same time, this indicator cannot stand alone as an indicator of material well-being, and serious data challenges need to be addressed before such an indicator can be relied on for an acceptable proxy.

(iv) Composite Index: Based on the core characteristics of the Arctic economy - the formal economy, the subsistence sector, and transfer sector (government services) - a composite index of material well-being could in principle be constructed, and it would include the following three component indicators: (1) Household income per capita as a measure of the monetary value of material well-being. This would represent the formal and wage earning part of the economy; (2) Harvest per capita in terms of weight, representing the subsistence or informal, also referred to as traditional, economy. Conversion into monetary equivalent can be done by assigning a value (e.g. hamburger meat price) to each kilo of harvest; (3) Housing affordability in terms of rooms per capita or square feet, representing the provision of goods and services from government or the transfer economy. Conversion into monetary equivalent can as one possible option be achieved by assigning a value equivalent to the average rental price per square feet.

Recommended indicator:

Per capita Household Income

(3) Education Domain:

By focusing on the post-secondary level, we intend to encompass and recognize all forms of educational attainment at an advanced level, including the development of vocational, technical and subsistence skills and expertise as well as the completion of certificate and degree programs that are of benefit to the individual and the community. Such an indicator also serves as an indirect measure of the overall quality of pre- tertiary educational services, since without strong educational support from early childhood and on through the elementary and secondary schools, post- secondary educational attainment is likely to be weak.

Three indicators of education are considered: The proportion of students pursuing post-secondary education opportunities; the ratio of students successfully completing post-secondary education opportunities; the proportion of graduates who are still in the community 10 years later.

Recommended indicator:

The ratio of students successfully completing post-secondary education opportunities.

Rationale: It is one thing to attract people into post-secondary educational opportunities, but that in itself is insufficient to determine the contribution education makes to community well- being. There is also the question of to what extent students who enter a program actually complete it. This is especially important in fields where a credential is required and educational programs lead to a formal certificate or degree. Many factors can come into play in determining whether a student completes a program or not.

- *Completion rates provide an indication of the level of pre- qualifications a student has acquired prior to entering a program. Poor preparation, particularly in basic skills areas such as reading, writing and math are likely to have a negative impact on completion rates, unless efforts are made by education providers to help students overcome such deficiencies in the course of completing a program.*

- *Completion rates also provide a measure of the extent to which there is a connection between the aspirations and expectations of the students and the kind of programs that are readily available to them. Due to economies-of-scale, post-secondary program offerings at the local community level are often limited, so students may end up enrolling in a program just because it is the only option available, and then find that it is not suitable to their needs or interests.*
- *Completion rates are also a reflection of commitment and adaptability on the part of sponsoring institutions to support students through to graduation. If the institution takes a sink-or-swim approach with little accommodation to assist students in meeting the demands of the program, the completion rate is likely to be quite low. This is especially the case with students who are first-generation in their family or community to pursue post-secondary education. If more institutions take an active interest in helping students succeed through to graduation by offering targeted support services and reaching out to work with students on their own terms, the effort will be reflected in higher completion rates.*

Participation in and completion of post-secondary education opportunities is one sign of a healthy community, and as such can serve as a reliable indicator of the role of education generally in contributing to the well-being of Arctic communities. This is especially the case in small, remote, indigenous communities where education can serve as a vehicle not only for achieving individual aspirations, but for community aspirations as well. Historically, schooling has been used as a tool for assimilation under conditions of colonial rule. This role is gradually giving way as indigenous people assert their inherent rights of self-determination and put education to use as a tool for empowerment. It is our intent that the education indicators outlined here capture and reflect the significance of such a transformation.

(4) Cultural Wellbeing Domain:

The ASI domain of cultural well-being (or cultural integrity/vitality) results from the conclusions of the AHDR. The report had concluded that “maintaining cultural identity” was one of three dimensions of human development recognized by residents in the Arctic to be relevant over and above those dimensions included in the UN HDI.

One way to monitor “cultural well-being” in the many distinct Arctic societies (ethnic minorities, etc.) that do not enjoy a high degree of self-governance, is to construct a composite indicator taking into account diverse dimensions of culture. Whereas expressions of (dis)satisfaction with cultural conditions can only be elicited through expensive and limited surveys, cultural integrity can be evaluated with the help of data that are regularly collected (e.g. language vitality), and by ranking local or regional policies and social realities that influence cultural integrity.

Part of the value of an indicator for cultural well being is its universal applicability. It is recognized that no society is of a uniform culture: in an increasingly technologically accessible, physically mobile, and virtually accessible world, identifying an indicator relevant to all ethnic, age, gender, and occupational groups within societies poses a challenge. Within recognized “cultures” there is also often great diversity, including an understandings of “traditional” versus contemporary cultural practices. Indicators should not emphasize or privilege certain groups or sectors of a society. Indicators must be universally applicable and meaningful. For example, youth participation in cultural activities seems higher for ones associated with cultural change, development, and transition. In contrast adults and Elders tend to gravitate to activities associated with cultural preservation and/or transmission. Cultural activity participation may vary along gender lines.

Several potential indicators are identified and evaluated. Indicators of language, cultural autonomy, and belonging are discussed and evaluated in terms of data limitations.

Recommended indicator (preliminary):

A composite indicator of Cultural Vitality is proposed which includes the following elements:

(i) Cultural Autonomy: “Do laws and policies recognize institutions that exist to advocate for the cultural autonomy of national minority populations”? Do institutions representing national minority/cultures exist? What is the proportion of institutions to minority peoples (e.g. are all peoples represented through such organizations? Are resources available to such institutions? Do funding policies exist and how well- resourced are they as a current year allocation per national minority/cultural group?

(ii) Language Retention (The percentage of the population which speaks its ancestral language as compared to the population as a whole); and

(ii) Belonging – the percentage of people who engage in recreational or subsistence survival land-based activities; or the relative size of the informal sector of the economy (subsistence activities).

Rationale: A composite index presents the advantage of taking into account developments that affect cultural well- being, but that may diverge. E.g. language retention in a group may decrease, while the ‘subsistence way of life’ (including economic, social and cultural aspects) may remain comparatively strong. Likewise, cultural autonomy per se may not provide sufficient a buffer against language erosion, or the reduction of subsistence activities due e.g. to the encroachment of industrial uses of the land. The weighing of the different parameters of such a composite indicator could only be accomplished meaningfully when attempting to apply it with real data, an exercise which is beyond the scope of the present study.

As a second option ‘Language Retention’ is recommended as a stand- alone indicator of cultural wellbeing.

(5) Closeness to Nature Domain:

Closeness to Nature is highlighted in the AHDR as being a prominent feature of human development in the arctic.

Potential indicators include: (1) Participation in Traditional/Outdoor Activities; (2) Time on the land; (3) Consumption of country food; (4) Youth retention in the Arctic.

(1) Participation in Traditional/Outdoor Activities: This indicator requires the accounting of the diversity of activities for different regions and concomitantly, different measures for different regions, allowing also for the indicator to be adaptable to both indigenous and non indigenous populations. Although Participation in Traditional/Outdoor Activities is an excellent indicator of contact with nature, there is poor data availability and the need to adapt the measure to the diversity of populations makes consistent tracking and measurement difficult.

(2) Time on the land: Spending less time on the land has been shown to be a direct correlate of obesity in arctic populations (Young 1996). Contact with nature could potentially be gauged by the amount of ‘time on the land,’ or time spent in nature and away from a household context, involved in subsistence and/or other outdoor activities. Many rural Arctic populations depend on subsistence resources for some percent of their household food. The activities involved in procuring those subsistence resources requires time spent in nature. For example, active subsistence harvesters, by design, need to spend significant time in nature in their harvesting

activities (Berkes & Jolly 2001). It could be argued that the more a household depends on subsistence resources, the more time members need to spend 'on the land,' and the more contact with nature they have. Although the concept, at first glance, seems robust, there are irreconcilable issues that render it not the top choice as an indicator for closeness to nature. First of all, not all subsistence activities require the same time on the land (or sea) input in relation to energy/kCal return. A second problem with time on the land as an indicator is deciding how it should be measured. A third problem is lack of data. Another problem is the tendency for women to be settled in villages and only the men going out on the land, presenting a gender-biased measure. This could be resolved by developing different measures for men and women.

(3) Consumption of country food: Each of our contact with nature measures is subject to interpretation with respect to whether an increase in the measure means an increase in human development. It is possible for an increase in contact with nature to occur as a response to a decrease in material well-being – as in a loss of wage jobs. We can understand what a change in consumption of country food means if we examine the measure in the context of change in material success.

(4) Youth retention in the Arctic: This indicator relates to the standard HDI of Education – existence and extent of place – based education/ transmission of knowledge about traditional pursuits. According to Turi (2002), in general there are no recruitment problems in reindeer herding, except in certain taiga regions of Russia. There is a general agreement among reindeer herders, scientists and local authorities that reindeer husbandry cannot be learned in institutes or schools. To be a good herder, one must grow up in a reindeer herding family. For the sake of recruitment, it is important that the child spend his/her first years before school in a brigade (Ulvevadet and Klokov 2004:72). In order to get a school education, children from herding families can only stay with their parents for a few months a year, during the summer holidays. The school administration accommodates the wishes of children who want to spend more time in the camp with their parents and learn more about reindeer herding and husbandry. These students are allowed to leave before the official end of the school year, and sometimes arrive after it has begun. In this way the school children can stay in the herding camps up to five months a year (Ulvevadet and Klokov 2004:73).

Recommended indicator:

Consumption or harvest of country food

Rationale: One of the most frequently cited means of maintaining contact with nature is the harvesting and eating of traditional foods. The rationale for recommending the consumption and harvest of country food is covered fully above but the primary reasons for our recommendation is the centrality of country food consumption to Arctic cultures and peoples, the availability of data and ability of communities across the Arctic to collect those data, and finally, the generalizability of the concept across Arctic regions, for indigenous and non indigenous people, for rural and urban residents and for women and men. The data also lend themselves well to aggregation and to time series. To use this indicator, one could measure both harvest and consumption or could choose one or the other depending on relevance to the particular region as well as ease and feasibility of data collection. Choices must also be made between household and individuals or aggregates of communities or regions. Proportion of food consumed by the household (none, less than half, half, more than half) harvest by species, kg per household could be used. We do not wish to underestimate the challenges of this task, but we strongly believe that consumption and harvest of country or traditional foods is the best proxy indicator for contact with nature in all Arctic regions.

(6) Fate Control Domain:

Fate control is, simply put, the ability to guide one's own destiny. While indicators literature on fate control is scant, the concept is highly linked the more common term of 'empowerment'- the process of achieving the capacity to 'make choices and then to transform those choices into desired actions and outcomes (Alsop et al. 2006:10, quoted in Ibrahim & Alkire 2007:7). Fate control thus is the outcome of empowerment. To control one's fate one must have the capacity to make one's own decisions; one must also have the resources to implement these decisions (World Bank 2000). Each of these aspects in turn has an internal and external component – a person or community needs both the internal capacity and resources and a lack of external barriers to make and implement decisions. The “concrete material, social, and institutional preconditions to exert agency” are critical to empowerment (Ibrahim & Alkire 2007:11), and it is these to which we paid special attention.

Fate control, or the lack thereof can be experienced at the personal, household, community, and regional levels. Individuals and households in an Arctic community may experience more or less control over their fate than do their neighbors, depending on their capacities and resources. Yet it is the collective control of fate which seems of critical concern to Arctic residents. Many communities and regions of the Arctic endure a residual dependence on outsiders, who play a major role in administering political, economic and cultural institutions even at the local level, and notably at higher scales. Boom-bust economic cycles characterize large parts of the Arctic, with concomitant high unemployment and underemployment in many regions, and dependence on transfer payments. Thus, we have focused first and foremost on fate control as a collective benefit.

Twelve possible indicators of fate control are identified. There are grouped under the following categories, acknowledging that the categories are not discrete; overlaps exists among them: (1) Political Power & Political Activism (political participation, perceived political influence, resistance); (2) Decision- making Power (proportion of local personnel in key decision making positions, local control over place names, rights to land & sea resources); (3) Economic Control (self-generated income, local control of the economy); (4) Knowledge Construction (knowledge/information about politics, access to information, language retention); (5) Human Rights (Recognition of human rights).

Recommended indicator:

Composite Index of fate Control

Rationale: In elaborating these indicators and considering potential measures for them it was determined that a relatively simple and transparent index of fate control could be created to incorporate elements from the above categories above. A possible and rather simple, but powerful, way of looking at fate control is to create an index, where a region (community, district/county, province/territory/republic) would be evaluated under each of the following four measures. In proposing this index we recognize that “composite indexes generate problems of attribute selection and weighting” (Crilly et al. 1999:153; Fahey 1995). Transparency is sacrificed, and aggregation is problematic. On the other hand, their advantage for comparative and analytical purposes is difficult to dispute, and, not surprisingly, many existing human development and well-being indices are composite ones (e.g., UN HDI, Community Well-Being Index [McHardy and O'Sullivan 2004]). We developed the Fate Control Index as a combination of

individual indices that characterize the sub-domains of fate control (Table 4.1). The four components of the fate control index are: The Percentage of Indigenous Members in Governing Bodies Relative to the Percentage of the Indigenous People in the Total Population; The percentage of surface lands legally controlled by the inhabitants through regional and local public governments, native organizations and communes; The percentage of public expenses within the region (regional government, municipal taxes, community sales taxes) raised locally; The Percentage of Individuals who Speak the Language of their Ancestors (whether 'indigenous' or not) in Relation to the Percentage of Individuals Reporting Corresponding Ethnicity.

General Observations on Data Challenges

Several of the indicators we suggest here have weaknesses related to availability of data, affordability, and level and applicability to both indigenous and non-indigenous inhabitants of the Arctic. An indicator should be the most accurate statistic for measuring both the level and extent of change in the social outcome of interest. It should adequately reflect what it is intended to measure, and ideally there should be wide support for the indicators chosen so they will not be changed regularly. It is critical that the chosen indicators are consistent over time and across places, as the usefulness of indicators is related directly to the ability to track trends over time and compare the well being of regions.

The chosen indicators should do well in terms of selection criteria such as data availability, ease of measurement, internal validity, affordability, robustness, applicability at various levels (household, local, regional), and applicability to indigenous as well as non-indigenous populations.

To advance beyond the AHDR, we seek indicators that can be compared for geographies more specific than the nine general regions. The term "place" above is deliberately vague, but for each indicator there are practical constraints on how small our geography can be. One obvious limitation is data availability. Statistical agencies do not provide breakdowns below certain minimum thresholds of population counts. Although specific thresholds vary from country to country, they sometimes preclude the release of accurate data on small Arctic communities, or make the released data a patchwork of true and artificially rounded or suppressed numbers. Communities with populations of a few hundred or a few thousand people can be of great interest to social science and policy makers, but social indicators on this scale must be interpreted with care.

Recommended Small Set of Indicators for Tracking Human Development

(Preliminary. Work in progress):

The main objective of the ASI project is to arrive at a small set of arctic social indicators that as a collective can be used for tracking and monitoring change in human development in the Arctic. For this purpose, and based on a number of selection criteria, the ASI working group recommends the following list of seven arctic social indicators, with each indicator being proposed by one or more domains:

- (1) Infant Mortality (Domain: Health/Population)*
- (2) Net-migration (Domains: Health/Population and Material wellbeing)*
- (3) Consumption/harvest of local foods (Domains: Closeness to Nature and Material wellbeing)*
- (4) Per capita household income (Domain: Material wellbeing)*
- (5) Ratio of students successfully completing post-secondary education (Domain: Education)*

(6) *Language retention (Domain: Cultural wellbeing)*

(7) *Fate control index (Domain: Fate Control)*

Chosen indicators and Tiers:

Consider the following working definition of relevant terms:

- National data are collected by a national agency
- Comparable data collected by a national agency are comparable to that collected elsewhere
- Publication data are available in hard copy or electronic form from the collecting agency
- Spatial data are available at the county level (e.g. census area, district)
- Period data are available over time on at least a 5 year frequency
- Indigenous populations represented among the permanent participants of the Arctic Council
- Special tabulation data could be made available if the collecting agency made, or permitted, special tabulations
- Compilation data could be compiled by researchers from existing information
- New data collection data could be collected using no more than 10 minutes of interview time. Ideally, a chosen indicator fits one of the following combinations of criteria:
 - Data are collected by a national agency, are comparable, are published, are available at a county level, are collected at least every five years, and are available for indigenous populations.
 - Data can be made available with special tabulations and otherwise meet all criteria listed in #1.
 - Data can be compiled from existing information and otherwise meet all criteria listed in #1.
 - New data could be collected that otherwise meet all criteria listed in #1.

For each indicator proposed in the six domains limitations are considered with respect to data limitations: National limitations, Publication limitations, Spatial limitations, Period limitations, Indigenous population limitations, Special tabulation limitations, Compilation limitations, New data collection limitations.

Based on this, indicators will be divided into tiers:

Tier 1: based on existing published data

Tier 2: data that would be produced by special tabulations from existing unpublished data

Tier 3: would require primary data collection

Overall ASI recommendations (draft/preliminary):

Arctic Social Indicator Data Recommendations:

At the outset of ASI, the stated intent was to identify a small set of indicators of human development relevant to the Arctic that could be monitored at reasonable cost. The ASI team hoped that “reasonable cost” could be operationally defined in terms of indicators that are based on existing information. The team also agreed on that a good indicator should:

- have a clear meaning relevant to one or more of the six domains of Arctic human development (health and demography, material well-being, education, cultural integrity, contact with nature, and fate control)
- be sensitive to change over time

- be available at least down to a regional level
- be applicable to, and reported separately for, indigenous and non-indigenous populations

Participants at the first ASI workshop were able to achieve consensus on using the six domains of Arctic human development contained in the Arctic Human Development Report recommendations as the basis for organizing the work of ASI. At the two subsequent workshops it became clear that, within each of these domains, meeting the combined challenges posed by the criteria defining a “good indicator” require either sacrifice of one or more of the criteria, or a relaxation of the assumption that indicators can be based on existing information.

The individual domain chapters detail these challenges. Net migration, for example, while ostensibly based on the most basic data (population, births, and deaths) is not uniformly available for all countries nor for indigenous and non-indigenous populations in some countries. Time series data on harvest and consumption of local resources, another recommended Arctic Social Indicator, are not available on a decadal time scale in North America, Russia, Norway, Sweden, or Finland. It is therefore not enough to recommend a set of Arctic Social Indicators. Recommendations on the steps necessary to monitor them are also required.

(i) Arctic Social Indicator Monitoring Objectives

Recommendation: ***Design the Arctic Social Indicator monitoring system to meet the following objectives:***

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

The operational definition of these objectives will, of practical necessity, differ across countries. A practical definition for region in Alaska, for example, is the census area, and in arctic Canada and Iceland it is the region, while in Greenland it is the municipality, in Norway, Sweden, and Finland the county, and in Russia the oblast or republic (see map generated from Hamilton AHDR/Arctic RIMS). Differentiating indigenous and non-indigenous populations is commonplace in North America, uncommon in Scandinavia, varying over time in Russia, and less important in Iceland. Scandinavian countries, Greenland, and Iceland base much of social indicators on administrative data available annually while Canada collects such data every five years and the US has switched from decadal observations to a ongoing sample design that can probably support five year averages.

Depending on the indicator and the nation one of three levels of effort are 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 to be made available.
- Data require primary data collection.

(ii) ASI Indicators Based on Existing Published Data

Recommendation: ***Encourage national statistical agencies to participate in development of a meta database identifying ASI indicators that are already monitored by a national agency and published in hard copy or electronic form.***

While it may seem like a trivial exercise to identify existing published sources of ASI indicators, the experience of ASI team members is that the task is in fact quite challenging. Small differences in national statistical programs (e.g. the definition of an infant used in constructing infant mortality estimates) can affect the comparability of data across countries, or over time.

(iii) ASI Indicators Requiring Special Tabulations

Recommendation: ***Encourage establishment of an international task force composed of national statistical agency analysts and Arctic researchers to identify the special tabulations required to produce comparable ASI indicators and to recommend approaches to produce these special tabulations.***

Special tabulations can assume three forms: (1) processing of publically available electronic files by arctic researchers; (2) processing of confidential agency data files by arctic researchers who obtain special permission to do so; and, (3) processing of confidential agency files by agency personnel. In some cases it is possible for arctic researchers to use published, publically available, electronic files to construct ASI variables. This process is not necessarily straightforward. Construction of comparable time-series data often requires different rules in each time period. Geographic boundaries change over time, for example, as do variable definitions. Processing of confidential agency files by arctic researchers is currently possible as special projects, usually confined to a single data set. Construction of time series ASI variables will require processing of multiple data sets over a longer time period than normally associated with a special project. Processing of confidential agency data to generate ASI indicators by agency personnel represents a currently unbudgeted agency expense. Task Force recommendations can serve as a basis for agency budget requests.

(iv) ASI Indicators Requiring Primary Data Collection

Recommendation: ***Initiate ASI Phase Two with the objective of testing ASI indicators, including those produced in collaboration with funded research primary data collection projects.***

ASI has made significant progress toward the development of an Arctic social indicator system: ASI has identified a small set of indicators to monitor arctic human development. The next logical step in the development of an Arctic social indicator system is to test and validate the ASI indicators. In the case of indicators requiring primary data collection, ASI needs to collaborate with researchers who are funded through national research councils to collect such data. Such collaboration makes sense for both ASI and funded researchers. ASI benefits from having data required to test and validate measures, and funded researchers can build on the conceptual groundwork of ASI and the joint participation of project researchers and ASI in the testing and validation process. Also important to the full implementation of an Arctic social indicators system is the demonstration of an approach to cost-effective primary data collection.

Follow-up to ASI (2009):

The ASI working group plans to seek funding for a follow-up to ASI that will address data issues, testing and implementation. (Perhaps in AON and SAON network as a major building block.)

Launch of ASI might be at the Ministerial but work should be done by the end of 2008. Might also become a part of the curriculum of the UArctic.

16) ArcticStat

Introduction

This report is aimed at:

- a) Updating the SDWG on the current status of ArcticStat and its working relationship with other SDWG initiatives;*
- b) Identifying future challenges for ArcticStat; and*
- c) Putting forward ideas on how ArcticStat can continue to assist the SDWG, and other Working Groups, in their current and ongoing socioeconomic data requirements.*

Overview

ArcticStat is a web-based socio- economic statistical database which is intended to bring together data pertaining to population, language, health, education, economy, employment (and other social data) collected by the Arctic Council member states. ArcticStat covers 30 Arctic sub-regions within Alaska, Northern Canada, Greenland, Iceland, Faroe Islands, Northern Norway, Northern Sweden, Northern Finland and Northern Russian Federation.

ArcticStat operates mainly as a user- friendly portal with direct linkages to the National Statistics Agencies web sites. It serves to centralize relevant Arctic research data; facilitates comparative research between circumpolar statistical agencies databanks and other data sources; and supports timely policy decision- making by continuously updating its data information. It is also a primary statistical research instrument for circumpolar academic institutions, especially for those involved in circumpolar studies such as the universities affiliated with the University of the Arctic.

ArcticStat represents a major Canadian contribution to the International Polar Year and is complementary to other Arctic Council SDWG initiatives, such as the Survey of Living Conditions in the Arctic (SLiCA), Arctic Social Indicators (ASI) and ECONOR. ArcticStat also contributes to other AC Working Groups such as AMAP most recently by providing the socio- economic data to support Chapter 3- of the Oil and Gas Assessment 2008.

ArcticStat is led by Professor Gérard Duhaime of the Université Laval, who is also the Canada Research Chair on Comparative Aboriginal Conditions.

Current Status

Arcticstat website launch

- ArcticStat website (www.arcticstat.org) was launched on October 1st 2007 and is linked to the several websites: SDWG Secretariat, IPY Canada and the Arctic Council Portal. The website has generated positive feedback from many countries, organizations and researchers.
- ArcticStat has also completed its first phase in the development of its database. It currently houses approximately 4500 tables sourced mainly from circumpolar states national statistic agencies. ArcticStat data currently covers 9 indicators and 75 sub-indicators.
- The Metadata section, a tool for better interpreting documents and tables, has been completed but will require ongoing updating.

ArcticStat update

ArcticStat continues to collect and update its data banks. New indicators are being added, such as health indicators and related sub- indicators. During the summer 2008, major improvements

were made to the website aimed at further expanding and facilitating access for its users. In addition, a new administrative site was created and the web interface was upgraded.

User statistics

Between June and August 2008, ArcticStat website had more than 5,800 visits. Results show that ArcticStat is being widely used, especially by Arctic Council Member Countries.

Hundreds of tables were downloaded, and the recently released metadata page is also a popular page. As stated earlier, ArcticStat is linked to the SDWG Secretariat, IPY Canada, and the Arctic Council Portal. ArcticStat can also be accessed via many of the Permanent Participant organizations, universities, governments departments and NGOs' websites.

Table 1: ARTICSTAT ACTIVITY STATISTICS, JUNE TO AUGUST 2008

	June	July	August	Total
Hits	32 978	35 598	28 534	97 110
Visits	2 106	2 449	1 251	5 806
Total unique IPs	1 068	1 160	719	2 947
Average visit length	21,41	19.24	36.44	25.70

Source: Prepared by the *Service informatique de la Faculté des sciences sociales*, Université Laval. These statistics were captured during the "low season"; excluded « accidental » hits generated automatically by research engines such as *Google*; and also excluded the ArcticStat team visits during this period. Otherwise, the hits would have reached in the hundreds of thousands.

Specific uses

ArcticStat is an instrument that supports several SDWG and Arctic Council initiatives and projects. An agreement with SLiCA-International will allow ArcticStat to incorporate hundreds of SLiCA's data tables from Alaska, Canada, Greenland and Russia. SLiCA data from Scandinavia will also be added when completed.

Under the direction of Statistics Norway, ArcticStat is playing a pivotal role in the development and completion of ECONOR II. ArcticStat is currently part of both the ASI and AON-SIP project teams and is providing data tables on all aspects of these two initiatives. In cooperation with AON-SIP, ArcticStat is developing research proposals aimed at achieving greater collaboration. ArcticStat is also a source of comparative data for the Arctic Atlas Project, led by the University of the Arctic. All the aforementioned projects and initiatives are of circumpolar interest and ArcticStat contributes significantly. It is ArcticStat's intention to eventually establish itself as the primary point of access to source current and comparative circumpolar data.

Challenges

ArcticStat is facing many challenges, not only in terms of data maintenance and development, but also in terms of better coordination and integration between ArcticStat and AC State statistical agencies.

Limitations of available data from the national statistics agencies

Arctic State statistical information has at times been difficult to access due to a significant amount of data not being available in English and consequently requiring translation. In some agencies, only a few tables are available in English, while many other relevant tables remain inaccessible due to the high cost of translation. Moreover, in some statistical agencies, access to specific data tables comes with a fee – in some cases costing in excess of a \$1000 dollars per table.

There is currently, an agreement with Rosstat which allows for the translation of Russian tables into English. Other similar agreements with state agencies could be concluded. However, data acquisition and translation are costly, and funding support is required.

Another challenge is the lack of data on Indigenous people in a number of agencies, particularly in Scandinavian countries. Statistics Norway has recently released data on the Saami, but these were not translated into English.

Finally, it would be useful for all statistical agencies to provide a calendar of when their data will be updated or made available.

Multiple initiatives and limitations to effective participation

Over the years, ArcticStat has been increasingly solicited to participate in several initiatives. Projects endorsed by the Arctic Council have also asked ArcticStat to undertake special tabulations which limits ArcticStat's staff to updating and developing the database. To ensure that ArcticStat is updated on an ongoing basis, additional resources are required.

These issues can not be solved without discussing directly with the heads of the relevant agencies. Other initiatives, including SAON, AON-SIP, ASI and ECONOR, recognize the limitation of available statistics and in some cases have adopted resolutions to encourage the Arctic Council to convene national statistical agencies to find appropriate solutions.

ArcticStat is currently developing a proposal that will address all the issues mentioned above and, as a way forward will propose options for consideration for the SDWG.

17) ECONOR 2

1. Progress of the report and broad substance of findings

The main purpose of the ECONOR II project is to produce an updated and enhanced version of the report of the ECONOR I project, The Economy of the North, that was presented to the Arctic Council SAO meetings in Tromsø in March 2007 and Svolvær in April 2008. In addition, two supplementary reports on petroleum in the Arctic and the subsistence economy in the Arctic will be produced, as advised earlier. In 2008, the ECONOR II project team has continued the work on model based analysis of petroleum production in the Arctic regions, with updated estimates of reserves, production and costs. A theoretical basis for studies of the mixed subsistence-market economies of the Arctic has been defined. Preliminary research papers have been presented at international conferences, see Appendix (below).

The new report *The Economy of the North 2008* is, as the first report, a large joint effort involving information gathering and analysis providing from a network of statisticians and researchers from several academic disciplines throughout the circumpolar North, as well as contributions from many co-authors. The ECONOR network of Arctic statisticians and researchers has continued its cooperation as planned, with the ECONOR workshop in Oslo, 19-20 May. The workshop was the starting point for work on the updated ECONOR II report. At the moment, the first chapter drafts have arrived, and in November and December the extensive editorial process will take place.

We expect that the report will be printed in January 2009. If the printed version is not ready for the meeting on 8 January 2009, we expect that representative parts of the preliminary version can be submitted. After the printed version is published, we expect a great interest in the new report, as was the case with the previous report, and we anticipate the need for travelling and presenting the new report throughout the first half year. In addition, the two supplementary reports, to be elaborated in parallel with the main report, will be finalized. Hence, ECONOR II project work will continue into 2009, in terms of finalization of reports and presentations.

As for the broad substance of our findings, we anticipate that the updated report *The Economy of the North 2008*, will confirm the main findings of the previous report, fill some of the gaps in knowledge pointed out by that report, and point to still existing gaps in knowledge and need for enhanced statistical efforts, identifying challenges for continued statistical and research cooperation in the circumpolar North on the level of integrated analysis of economic, social and ecological aspects of the path to a sustainable future for the Arctic.

The objective of *The Economy of the North 2008* is to present a comprehensive overview of the economy of the circumpolar Arctic, including the traditional production activities of the indigenous people. The report will discuss the importance of the Arctic economy from a global perspective, with particular focus on the natural resources in the Arctic region.

Like the first ECONOR report, *The Economy of the North 2008* is indeed a pilot report from a pioneer project, encountering challenges of statistical and conceptual nature. It is our hope that the overview of the Arctic economy given by the ECONOR project will inspire work to further strengthen the information basis from where to assess the sustainability of the Arctic communities in terms of natural wealth management and environmental challenges.

The preliminary chapter outline of *The Economy of the North 2008* is as follows:

- Introduction
- The circumpolar Arctic: Economic and social indicators.
- Capital and sources of income and wealth
- Mining of minerals in the Arctic
- Petroleum in the Arctic
- Arctic economy within the Arctic nations
- Some aspects of the intertwined subsistence and market economy of the indigenous people in the Arctic
- Gaps in knowledge and statistical challenges: Towards an improved statistical overview of the Arctic
- Discussion and concluding remarks

Chapter 2 will illustrate how individual Arctic regions differ in terms of GDP level and how regional per capita GDP level stands in comparison with that of other region's and nation's economies, including improved description of statistics on income and living conditions. In particular, we seek to collect data on return to labour, disposable income and consumption, comparing these data to

resource rents and return to capital in the Arctic regions. Chapter 3 will describe capital and sources of income and wealth. Chapters 4 and 5 will outline a description of mineral and petroleum resources in the Arctic, including the share of Arctic reserves in the total global reserves. Chapter 6 will take a closer look at the role of each Arctic regional economy in the national context. The core tables in this chapter are compiled to present a consistent set of data by region, at the same level of detail by industry in order to show economic structure in comparable definitions. Chapter 7 will give a description of how Arctic indigenous populations combine traditional life and production with participation in the market economy. For the preservation of tradition and cultural identities it is important to picture the symbiosis of subsistence and the market, and to identify how economic incentives and institutional barriers together affect the decisions to sustain and develop the traditional basis of life, now challenged by climate change impacts. The economy of indigenous people is partly a hunters' and gatherer's genuine lifestyle of high cultural value – hence their economic life has a multitude of dimensions other than the mere market value of the output. Chapter 8 will identify and discuss gaps in knowledge and identify future research challenges.

The ECONOR network consists of the following persons and institutions:

- Alexander Goncharov, Federal State Statistical Service, Russia
- Gérard Duhaime, Université Laval, Canada
- Andrée Caron, Université Laval, Canada
- Helen McDonald, Statistics Canada
- Birger Poppel, Ilisimatusarfik, University of Greenland
- Carsten Pedersen, Statistics Greenland
- Scott Goldsmith, University of Alaska at Anchorage, USA
- Ilmo Mäenpää, University of Oulo, Finland
- Lars Lindholt, Statistics Norway
- Chen, Xiaoming, Statistics Norway
- Høydahl, Even, Statistics Norway
- Solveig Glomsrød (project leader and main editor)
Lulie Aslaksen Statistics Norway (co- editor)

We would like to acknowledge the funding and support from the Norwegian Ministry of Foreign Affairs, the Nordic Council of Ministers, and Statistics Norway. The ECONOR projects is the result of contributions from the network of researchers from national statistical offices and academic institutions located across the Arctic nations. Statistics Norway hosts the editorial group that compiles and edits the contributions from the project network.

2. Draft recommendations to SAOs and ministers that might appear in the ECONOR II report

For draft recommendations in The Economy of the North 2008, we anticipate that they will be of the same nature as the recommendations given in The Economy of the North, that is, confirming the main findings of the previous report, filling some of the gaps in knowledge pointed out by that report, and pointing to still existing gaps in knowledge and need for enhanced statistical efforts, identifying challenges for continued statistical and research cooperation in the circumpolar North on the level of integrated analysis of economic, social and ecological aspects of the path to a sustainable future for the Arctic.

We anticipate that the main draft recommendation will be to continue the effort by Arctic statistical agencies and researchers to extract and compile economic, environmental and social statistics

for the Arctic regions. There is a clear potential for establishing a wider set of useful data and indicators for the circumpolar Arctic. The network that has been established as a part of the ECONOR project consisting of researchers and representatives from the statistical agencies of the Arctic nations should be continued. We also recommend that the ECONOR project is followed up by more focused studies with a more direct sustainable management application. In particular, we suggest:

- Develop sustainability indicators based on the national accounts for the Arctic regions, and if possible compute these indicators for selected previous years. This will give qualified information about whether the economic development in the Arctic has been sustainable, and will provide a valuable reference for future policy.
- Improve the statistical indicators for disposable income and consumption and develop time series to give a better indication of social welfare within regions.
- Improve the statistical indicators to take into account the subsistence economy of the indigenous people of the Arctic. The statistical indicators should be comparable with the national account concepts and enable the development of so-called satellite accounts. The statistical indicators should be able to yield more qualified assessment of the welfare implications of climate change and other forms of trans-boundary pollution, in particular on the possibilities for traditional subsistence activities in Arctic. The environmental and social costs need to be addressed.
- Initiate more research on how climate change will impact future access to Arctic natural resources, with focus on management strategies combining principles of sustainability with an international environmental treaty perspective.

The list above does not at all aim to be complete, and there are certainly more areas that need further study. Taking into account that economic statistics and economic analysis of the Circumpolar Arctic hardly has been produced earlier, there are many tasks that deserve further efforts. However, a stronger focus on the income and welfare issues, resource dependence and sustainable management is to be regarded as a synthesis of the main recommendations from the ECONOR project.

3. Intentions to continue the project work or initiate a new project

We hope to continue the ECONOR work, in close cooperation with other groups, for example along the lines recently suggested by AMAP, related to the efforts to include socio-economic aspects in the SWIPA climate project. It would be valuable to build on and extend the informal cooperation between ECONOR, Arctic Stat, SLiCA and Arctic Social Indicators. We would like to contribute to the discussion of how the ECONOR group can continue to strengthen the knowledge basis on the level of integrated analysis of economic, social and ecological aspects of the path to a sustainable future for the Arctic.

Appendix

ECONOR Overview of activities and publications 2008

Publications:

Aslaksen, Iulie, Solveig Glomsrød and Anne Ingeborg Myhr: ***Environmental Uncertainty in the Arctic – Economic Valuation and Precautionary Approaches***. In P. Kankaanpää, S. Ovaskainen, L. Pekkala and M. Tennberg (eds.): Knowledge and Power in the Arctic. Conference proceedings. Arctic Centre Reports 48, University of Lapland, 2007, 99-105.

Lulie Aslaksen og Solveig Glomsrød: Arktis på terskelen til en ny epoke. Kronikk i Nordlys, 2. januar 2008.

Publications - forthcoming:

Aslaksen, Lulie, Solveig Glomsrød and Anne Ingeborg Myhr: **Ecology and economy in the Arctic. Uncertainty, knowledge and precaution.** Forthcoming 2008 in A. Pereira and S. Funtowicz (eds.): Science for policy: New challenges, new opportunities, Oxford University Press.

Reinert, E.S. , I. Aslaksen, I. M. G. Eira, S. D. Mathiesen, H. Reinert, and E. I. Turi: **Adapting to Climate Change in Reindeer Herding: The Nation-State as Problem and Solution.** Conference paper accepted in forthcoming book from Cambridge University Press.

Aslaksen, I., S. Glomsrød and A.I. Myhr: **Climate change and economic system impacts of self-sufficiency constraints and potentials – perspectives from ecological economics.** Forthcoming 2008 in yearbook from Nordic Council of Ministers, from IPY workshop "The Political Economy of Northern Regional Development", Skagen, 1.-3. November 2007.

Aslaksen, I. and S. Glomsrød: **The Economy of the North.** Forthcoming 2008 in yearbook from Nordic Council of Ministers, from IPY workshop "The Political Economy of Northern Regional Development", Skagen, 1.-3. November 2007.

Arctic Council presentations:

Aslaksen, I. and S. Glomsrød: The Economy of the North. Presentation to Arctic Council, Svølvær 23 April 2008.

Conference presentations:

Aslaksen, Lulie, Solveig Glomsrød and Anne Ingeborg Myhr: **Ecology, economy and well-being in the Arctic: Economy and climate change affecting indigenous people.** Paper presented at ICASS International Conference of Arctic Social Science, Nuuk, 22-26 August 2008.

Reinert, E.S. , I. Aslaksen, I. M. G. Eira, S. D. Mathiesen, H. Reinert, and E. I. Turi: **Adapting to Climate Change in Reindeer Herding: The Nation-State as Problem and Solution.** Paper presented at conference "Living with climate change: are there limits to adaptation?" Tyndall Centre for Climate Change Research and Royal Geographical Society, London, 7.-8. February 2008.

18) Survey of Living Conditions in the Arctic

Background, methodology and questionnaire

SLiCA's phase I (development of an international core questionnaire to be used among Inuit, Sami and the indigenous peoples of Chukotka and the Kola Peninsula) is well documented in a number of scientific articles and conference papers. See the SLiCA web site for a number of these: www.arcticlivingconditions.org.

The report

Living Conditions in the Arctic – How to Measure Living Conditions and Individual Well-being among Inuit and Saami Peoples in the Arctic by Thomas Andersen has been handed out to the participants in the Ministerial meeting of the Arctic Council, November 2004 and at the Meeting, August 2005 for the Nordic ministers responsible for co-ordinating Nordic activities.

Results

SLiCA's phase II (validation of data, data entry, processing of data and analyses) has been split into two parts (an Inuit focused analysis to be followed by a Saami focused analysis) due to the fact that interviewing was first concluded in Arctic Canada, Alaska, Greenland and Chukotka. Interviewing in Sweden was concluded in 2006/07 whereas data collection in Norway and in the Kola Peninsula has been concluded in the summer 2008. The Arctic Centre/Rovaniemi in collaboration with the Sami Council is trying to develop the preconditions to include Finland in SLiCA.

The Ministerial meeting of the Arctic Council, Reykjavik, November 2004 was the first forum where SLiCA presented empirical results (from the Alaskan part of the survey). Since then SLiCA results have been presented in different fora and in March 2007 the first comprehensive report was released at a joint SLiCA- IPY event at the University of Alaska Anchorage. The report consists of a Review article; almost 600 tables and the international SLiCA questionnaire (www.arcticlivingconditions.org). Some of the key findings (as examples) will be listed below.

SLiCA International Steering Committee:

Ann Ragnhild Broderstad, Centre for Sámi Health Research, University of Tromsø, Norway

Gerard Duhaime, Université Laval, Canada

Hugh Beach, Dept. of Cultural Anthropology and Ethnology, Uppsala University, Sweden

Larissa Abrutina, RAIPON, Russia

Birger Poppel, Ilisimatusarfik, University of Greenland (Research Project Chief)

Jack Kruse, ISER, University of Anchorage, Alaska, USA (Program Director)

Some key findings

Key findings are to be further developed and to be discussed in 2009 in a SAO meeting during the Danish/Greenlandic/Faeroe Islands' Arctic Council chairmanship along with a number of recommendations.

- A combination of traditional activities and cash employment is the prevailing lifestyle of Arctic indigenous peoples. It takes money to pursue traditional activities; households with higher incomes can, and do, choose to spend income on these activities. Nine in ten Inuit think traditional activities are important to their identity.
- Health conditions vary widely in the Arctic: Most of the indigenous peoples surveyed rate their own health as good or excellent —almost all respondents in Canada and Greenland and three- quarters of those in Northern Alaska. The exception is Chukotka, where more than half rated their health as only fair or poor.
- Even though most are satisfied with life in their communities, indigenous people also cite widespread social problems: unemployment, alcohol abuse, suicide, drug abuse, family violence and sexual abuse are on average considered major social problems by more than six Inuit out of ten. Most problems are reported from Chukotka as at least eight out of ten cite most of these problems.

- In the face of rapid changes in the Arctic, most indigenous peoples have maintained their traditional subsistence activities. Many also continue to speak their native languages – in addition to Western languages. More than 90% of the Greenlanders and the Inuit in Canada – young and old – are fluent in their native languages. In Northern Alaska and Chukotka, indigenous people of all ages are much less likely to speak their native languages — and those who can are more likely to be 55 or older. In Northern Alaska, just 5% of those 16 to 19 say they are fluent in a native language.
- The indigenous peoples of Chukotka, Northern Alaska and Greenland were asked about environmental concerns, if any. On average three out of four perceive climate change to be a problem in their communities and more than half of all Inuit mention local contaminated sites, pollution of local lakes and streams and pollution from industrial development as problems in the region. A significantly larger proportion of indigenous people in Chukotka are concerned with these problems. In Greenland pollution from other countries and in Chukotka and Alaska erosion of coastal areas or riverbanks are cited as problems by vast majorities.

Ongoing and future activities within the SLiCA project

The aims of SLiCA have been to:

- Measure living conditions in a way relevant to Arctic residents
- Document and compare the present state of living conditions among the indigenous peoples of the Arctic
- Improve the understanding of living conditions to the benefit of Arctic residents
- To provide local, regional, national, and international organizations an improved basis for decision-making

In developing a new research design and releasing a comprehensive collection of tables the SLiCA team has taken important steps to reach our goals, but there is still a long way to go. The near future plans of the SLiCA project can be summarized into the following activities:

- Concluding data entry and conducting analyses in Sápmi and comparing to the findings from the Inuit part of the survey
- SLiCA is part of four IPY endorsed projects:
 - SLiCA - Remote Access Analysis System, RAAS IPY #386
 - The Arctic Human Health Initiative (AHHI) #167
 - The Political Economy of Northern Regional Development, POENORD #227
 - SLiCA - Remote Access Analysis System, RAAS IPY #386
 - Social Indicator Project (ASI) #462
- Contributing to different Arctic Council/SDWG projects:
 - Social Indicator Project (ASI)
 - The Economy of the North (ECONOR)
 - ArcticStat Project
 - The Arctic Human Health Initiative (AHHI)
- Executive summary of conclusions in a 'lay man's' version translated into the languages of the participants in the survey.
- Publication of a CD-ROM containing the three parts of the SLiCA Results.

In a future perspective –it should be considered

- To run a “benchmark” survey like SLiCA every ten years, plus a much smaller social indicator survey to track change over time. This might be part of the Arctic Council’s Arctic Social Indicator initiative

SLiCA data gains much of its meaning from the policy context from which it is viewed. Decisions affecting the well-being of Arctic indigenous peoples occur at the local, regional, national, and international levels. The Arctic Council is one of these fora, thus it is a hope that the SLiCA results will be food for thoughts and discussions in the future work of the Arctic Council.

Following the above and in conclusion:

- There will be no deliverables from SLiCA to the SAO and the upcoming Ministerial meeting under the this chairmanship;
- The Survey of Living Conditions in the Arctic project is intended to continue into the next chairmanship.

SLiCA overview of activities and publications 2008

- **Articles and Books:**

- Andersen, T. and Poppel, B. (in press). “Living Conditions in the Arctic”. In "Indicators Relevant to Indigenous Peoples, A Resource Book". Tebtebba Foundation.
- Kruse, J., Poppel, B., Abryutina, L., Duhaime, G., Martin, S., Poppel, M., Kruse, M., Ward, E., Cochran, P., Hanna, V. (2008). **Survey of Living Conditions in the Arctic, SLiCA**. In: Møller, V., Huschka, D, and Michalos, A. C. (eds.): Barometers of Quality of Life around the Globe. Springer Social Indicators Research Series. Springer Verlag,
- Poppel, B . 2008. **Er subsistensaktiviteter i Arktis en del af den markedsøkonomiske virkelighed eller er markedsøkonomien en del af en subsistensbaseret blandingsøkonomi?** [Are subsistence activities in the Arctic part of the market economic reality or - is the market economy a part of a subsistence based mixed economy?]. In: Grønlandsk Kultur og Samfundsforskning 2006-07. Ilisimatusarfik/Forlaget Atuagkat. Nuuk.
- Poppel, B . 2008. **Measuring Ways of Living and Living Conditions of Indigenous Peoples of the Arctic – The Greenlandic Inuit as an example**. In: Engell, M. and Søndergaard, J. (eds.): Menneskesjæl. Festskrift til Finn Lynge. Forlaget Atuagkat.
- Poppel, B. and Kruse, J. (in press). **The importance of a mixed cash- and harvest herding based economy to living in the Arctic – an analysis based on Survey of Living Conditions in the Arctic (SLiCA)**. In: Møller, V. and Huscka, D. (editors): Quality of Life in the New Millenium: Advances in Quality-of-Life Studies, Theory and Research. Social Indicators Research Series. Springer Verlag.
- **Arctic Council presentations:**
- Poppel, Birger and Jack Kruse. 2007. **SLiCA Results presentation**. Arctic Council, Sustainable Development Working Group meeting. Tromsø, Norway. April 10-11.
- Poppel, Birger and Jack Kruse. 2007. **SLiCA Results presentation**. Arctic Council, Senior Arctic Officials meeting. Tromsø, Norway. April 12-13.

- **Conference, Seminar and Workshop Presentations:**
- Belisimbi, Felicity. 2008. ***The Impact of Education on Inuit Living Conditions – the Case of Nunavik***, 6th International Congress of Arctic Social Sciences (ICASS VI), Nuuk Greenland, August 22-26
- Berman, Matt. 2008. ***Moving or Staying for the Best Part of Life: Theory and Evidence for the Role of Subsistence in Migration Decisions and Well-being of Arctic Inupiat Residents***, 6th International Congress of Arctic Social Sciences (ICASS VI), Nuuk Greenland, August 22-26
- Cleveland, Victoria. 2008. ***Large Economic Development: Responsible for Cultural Erosion?*** 6th International Congress of Arctic Social Sciences (ICASS VI), Nuuk Greenland, August 22-26
- Koke, Paul. 2008. ***The Impact of Mining Development on Subsistence Practices of Indigenous Peoples. Lessons Learned from Northern Quebec and Alaska***, 6th International Congress of Arctic Social Sciences (ICASS VI), Nuuk Greenland, August 22-26.
- Kruse, Jack. 2008. ***Promoting Self-Determination with Cyberinfrastructure***, 6th International Congress of Arctic Social Sciences (ICASS VI), Nuuk Greenland, August 22-26
- Kruse, Jack. 2008. ***Relationships between social problems and other dimensions of living conditions: an international Arctic analysis***, 6th International Congress of Arctic Social Sciences (ICASS VI), Nuuk Greenland, August 22-26.
- Pedersen, Janemaria Mekoline, Birger Poppel, and Peter Bjerregaard 2008. ***Social epidemiology among circumpolar indigenous people Health and social inequality in Greenland***, National Institute of Public Health, Southern University, Denmark & Ilisimatusarfik, University of Greenland, 6th International Congress of Arctic Social Sciences (ICASS VI), Nuuk Greenland, August 22-26.
- Poppel, Birger. 2008. ***Living Conditions of Children and Youth in Greenland – a sketch of a youth profile***. World Winter Cities Association for Mayors (WWCAM) – Mayors’ Conference in Nuuk. January 18-19.
- Poppel, Birger. 2008. ***Den arktiske Levevilkårsundersøgelse, SLiCA”. Nordisk Statistiktræf. Nuuk. Grønland***. August 11.-14.
- Poppel, Birger. 2008. ***Overview of the Survey of Living Conditions in the Arctic***. 6th International Congress of Arctic Social Sciences (ICASS VI). Nuuk Greenland. August 22-26.
- Poppel, Birger. 2008. ***Grønlandernes levevilkår – nogle resultater fra Den arktiske Levevilkårsundersøgelse, SLiCA***. Lunch seminar, Institute of Criminology, University of Oslo. October 3.
- Poppel, Birger. 2008. ***Grønland under forandring – mødet mellem subsistensøkonomi og moderne markedsøkonomi – eller hvorfor vælger***

mennesker at bosætte sig og blive boende i et ofte barskt klima og ugæstfrit miljø?
Lunch seminar, Statistics Norway, October 6.

- Poppel, Birger. 2008. ***The importance of a mixed cash- and harvest herding based economy to living in the Arctic – an analysis based on the Survey of Living Conditions in the Arctic, SLiCA.*** Conference: Human Dimensions in the Circumpolar Arctic. Umeå University, Sweden. October 8-10.
- Poppel, MarieKathrine. 2008. ***Relationships between violence and different living conditions – An analysis based on the Survey of Living Conditions in the Arctic, SLiCA,*** 6th International Congress of Arctic Social Sciences (ICASS VI). Nuuk, Greenland. August 22-26.
- Roberson, Edward. 2008. ***The Equation of Inuit Well-being - Can APS-SLiCA Contribute to the Debate about Well-being and Development?*** 6th International Congress of Arctic Social Sciences (ICASS VI), Nuuk Greenland, August 22-26.

20) Arctic Indigenous Languages Symposium

Please note: the document below is for information purposes only. This document will be the subject of consideration by the SDWG Heads of Delegation at their meeting in Copenhagen, Denmark in December, 2008. Any recommendations of the SDWG based on the Arctic Indigenous Languages Symposium will be forwarded to SAOs by 08 January 2009.

Recommendations of the Arctic Indigenous Languages Symposium

1. The Arctic Indigenous Languages Symposium was held in Tromsø, Norway from October 19-21, 2008.
2. Its aim was to provide a forum where Arctic indigenous peoples could learn from one another and develop practical ways to revitalize their languages to ensure their strength for generations to come. The Symposium was mandated by the Arctic Council which in the Salekhard Declaration of 2006 encouraged Member States and other parties to support the cultural diversity of the Arctic and especially uphold and revitalize the indigenous languages, support the Arctic Indigenous Languages Symposium and welcome further projects in this important field.
3. The Symposium focused on five different but cross-cutting themes:
 - the State of Arctic Indigenous Languages
 - Protecting knowledge (traditional and other) – the critical role of indigenous language
 - Using new technology and media to promote and empower indigenous languages

- Indigenous Languages: an important key to preserving the Arctic environment
- Legislative development and standards setting to promote and enhance indigenous languages

4. Coming out of the Symposium's discussions are the following recommendations which recognize and are addressed to those parties which are considered the most appropriate for responding to and implementing the proposed actions.

Recommendations to the Arctic Council:

5. As recognized by the Arctic Council in the Salekhard Declaration, the Arctic Council supports and encourages the revitalization of indigenous languages. It is important to go beyond good intentions. As such, it is recommended that the Arctic Council:

a) Reinforce the importance of Arctic Indigenous Languages in promoting and supporting the social, spiritual, cultural, physical and economic wellbeing of Arctic indigenous peoples and by extension, the Arctic and its environment.

b) Lead and facilitate inter-regional, international, and intergovernmental activities to strengthen the use of indigenous languages across the Arctic.

c) Through the Sustainable Development Working Group, undertake an assessment of Arctic Indigenous Languages to facilitate a comprehensive understanding of the state of Arctic indigenous languages which will inform future action aimed at maintaining their diversity and vibrancy. Such assessment should include:

- collection of adequate and accurate data on the current status of Arctic indigenous languages;
- specific indicators of language endangerment in the Arctic context which, if they are observed, should mandate state response.

Particular attention should be paid to seriously endangered languages.

d) Recognizing that youth must be empowered to participate in international politics and spearhead linguistic research, it is recommended that the Arctic Council mandate the University of the Arctic to enhance opportunities for language exchange and to engage youth in international collaborative research specifically involving language.

Recommendations to Arctic States:

6. Recognizing that Arctic indigenous peoples have the right to revitalize, use, develop and transmit to future generations their languages, oral traditions, histories, writing systems, literatures, Arctic States should:

a) In partnership with indigenous people, undertake multi-year, comprehensive, complex and holistic responses, with long-term vision and sustained support, to support the growth of indigenous languages.

b) Recognize the uniqueness, legitimacy and value of each language, including the importance of indigenous languages to health, development and well-being of indigenous communities.

c) Use the United Nations Declaration on the Rights of Indigenous Peoples and other relevant human rights standards as the basis to develop legislation, policies, and programs which

strengthen the daily use of indigenous languages at all levels, within and outside indigenous communities.

d) Ratify existing regional and international instruments that contribute to the protection of endangered languages including the European Charter for Regional or Minority Languages (1992), the Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005) and the Convention for the Safeguarding of the Intangible Cultural Heritage (2003).

e) Ensure that an enabling environment in which speakers of indigenous languages are not forced or coerced to give up their languages in order to succeed in national life.

f) Indigenous people should establish and control their education system. Education policies for indigenous languages must include opportunities for all indigenous people, including people of all ages, to achieve and maintain high levels of competence in their mother tongue. Educational policies must further include mechanisms and incentives for training and retaining indigenous educators at all levels. Special attention should be paid to implementing quality indigenous bilingual education policies.

g) Support the United Nations system in its efforts to encourage and promote indigenous languages and the establishment of instruments which underpin this encouragement and promotion.

h) Support efforts in recognizing language development, curriculum development and standardization where initiated by Arctic indigenous education authorities, language institutes or commissions.

i) Ensure that Arctic Council states make the necessary resources available to achieve substantive equality between indigenous peoples and national dominant societies for the preservation, revitalization and promotion of indigenous languages and cultures, recognizing the cost of implementing programs and projects in remote areas.

j) Arctic indigenous peoples' languages will always be used in the management of natural resources locally, regionally, nationally and internationally.

k) Arctic states, territorial, regional and indigenous governments must support the preservation, enhancement and development of indigenous languages.

Recommendations to the United Nations system including the UN Permanent Forum on Indigenous Issues and UNICEF and other intergovernmental organizations:

7. The United Nations system is called upon to take the following actions:

(a) In recognition of the importance of indigenous language in protecting and promoting indigenous peoples' identity and culture, and given the diverse richness of Arctic indigenous languages, the international community, through the United Nations, is asked to draft a convention to protect and encourage indigenous languages. Such a convention should include applicable criteria for recognizing and defining languages as endangered, with attention to how these criteria may be applied differently in different contexts.

(b) Information on UNESCO's work on standard-setting instruments should be made available to Arctic indigenous peoples and Arctic States to support their work in establishing appropriate standardization mechanisms across the Arctic;

(c) UNESCO is asked to support , intellectually and financially, Arctic Indigenous peoples in their engagement in and contribution to standard setting activities and programs of policy development; and

(d) UNEP, UNFCCC and other UN and intergovernmental organizations active in climate change and related environment issues are asked to recognize and incorporate in their deliberations and decisions acknowledgement of the importance of indigenous languages in conveying traditional knowledge and concepts which are an essential and significant element in understanding and responding to the impact of climate change in the Arctic. Furthermore, such organizations are asked to continue to recognize indigenous languages as essential elements of sustainable development in the North, and as indicators of community well-being.

Recommendations to Arctic Indigenous Peoples (individuals and organizations)

8. Arctic indigenous peoples should:

(a) Encourage cooperation amongst indigenous peoples and governments at regional, national, and international levels recognizing the significant contribution indigenous languages make to the social, cultural and economic prosperity of the Arctic.

(b) Urge indigenous leaders to put priority on indigenous languages.

(c) Ensure that future Arctic indigenous generations are able to maintain and enrich these languages, in part by:

- focusing on intergenerational transmission of the indigenous language;
- promoting career opportunities that require the knowledge and use of the indigenous language;
- making efforts to use the indigenous language in all facets of daily life;
- developing effective mechanisms to motivate learning and use indigenous languages;
- accepting innovative ways of using the indigenous language.

(d) Select and promote auxiliary, standard dialects as a strategy to increase inter-regional and international sharing of information and materials and as a language survival strategy, while respecting the richness of dialectal diversity.

(e) Promote and create effective programs and materials for teaching and learning the indigenous language, cultural, social and political history and encourage creative expression in the indigenous language using new and traditional media.

(f) Ensure that regulatory bodies in the realm of telecommunications recognize and respect indigenous languages in their policies and decisions to afford an equitable level of services to indigenous communities.

(g) Establish mechanisms for communicating information, best practices, and recommendations for Arctic indigenous languages and for assessment and evaluation of the results of the proposed recommendations.

(h) Exercise the right to protect the collective knowledge of one's culture against mass publication and distribution while being researched for the study of climate change.

