



WWF

MAGAZINE

No. 1

2015

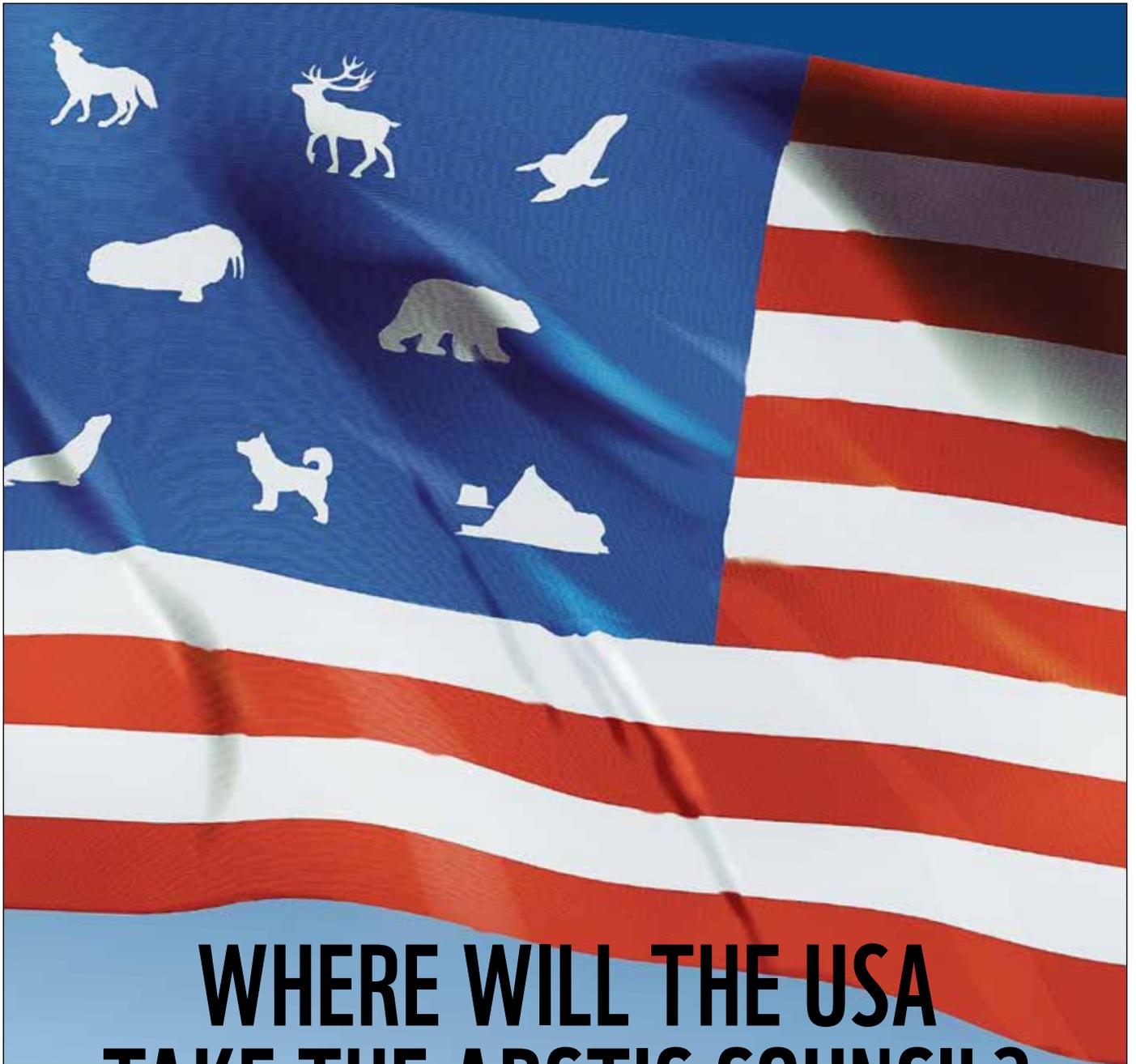
THE CIRCLE



Permanent Participants' Perspective 16

A regional approach for the Arctic 20

Renewable energy in the north 24



WHERE WILL THE USA TAKE THE ARCTIC COUNCIL?

Contents

- EDITORIAL** Time for all nations to act on recommendations 3
- IN BRIEF** 4
- LEONA AGLUKKAQ** Improving the lives of Northerners 6
- ROBERT J. PAPP** United States leadership in the Arctic 7
- ALEKSI HÄRKÖNEN** Finland on deck 9
- ANDREA CHARRON** Canada, the Arctic Council and rough seas 10
- Canada versus USA** 14

PERMANENT PARTICIPANTS' PERSPECTIVE

- Focus on marine environment** 16
- Cooperation, climate change, cutting through geopolitics key to upcoming term** 17
- Put energy into energy** 18
- Expectations for the US chairmanship** 19

- BROOKS YEAGER** A regional seas approach for the Arctic: what does it mean? 20
- TOM ARMSTRONG** U.S. action needed 22
- KLAUS DOHRING** Renewable energy in the far north – is it feasible? 24
- SANTINA GAY** and **RODERICK PHILLIP** Towards a sustainable future 26
- JOHN WALSH** and **LARRY HINZMAN** Opportunities, Challenges, Responsibilities 28
- EIRIK SIVERTSEN** For people and the environment 30
- THE PICTURE** 32

The Circle is published quarterly by the WWF Global Arctic Programme. Reproduction and quotation with appropriate credit are encouraged. Articles by non-affiliated sources do not necessarily reflect the views or policies of WWF. Send change of address and subscription queries to the address on the right. We reserve the right to edit letters for publication, and assume no responsibility for unsolicited material.

Publisher:
WWF Global Arctic Programme
8th floor, 275 Slater St., Ottawa,
ON, Canada K1P 5H9.
Tel: +1 613-232-8706
Fax: +1 613-232-4181

Internet: www.panda.org/arctic

ISSN 2073-980X = The Circle

Date of publication:
March, 2015.

Editor in Chief: Clive Tesar,
CTesar@WWFCanada.org

Managing Editor: Becky Rynor,
brynor@uniserve.com

Design and production:
Film & Form/Ketill Berger,
ketill.berger@filmform.no

Printed by St. Joseph Communications

COVER: Arctic US flag.
Illustration: Ketill Berger, filmform.no.

ABOVE: Melting iceberg on coast
Qaanaaq, Greenland,
Photo: Staffan Widstrand / WWF

Thank you
for your interest in
The Circle. Many of our
subscribers have moved to an e-version.
To receive an electronic copy in your email
instead of a paper copy, please write to us at
gap@wwfcanada.org and help us reduce our
costs and footprint.



Time for all nations to act on recommendations

THIS IS AN IMPORTANT YEAR for the Arctic. Every two years, the Chairmanship of the Arctic Council rotates and the eight Arctic states and six Arctic Indigenous peoples' organizations that comprise the Council have an opportunity to review and renew their collective vision of the far north.

We welcome the decision of the incoming Arctic Council chair, the United States government, to offer a comprehensive public outline of what it would like the Council to focus on over the next two years. A major feature of its agenda is the tantalizing prospect of a regional seas agreement for the Arctic, something that could help settle long-standing thorny questions of how states could cooperate and harmonize their approach to the ocean waters that many of them share. A focus on renewable energy for the Arctic is an equally crucial component of the agenda and in this issue we profile the example already being set by an Alaskan village.

As an observer, WWF doesn't get to play an official role in the negotiations on the ministerial statement, but we certainly make our opinions heard. WWF has put forward its position on the US proposals, which can be found on our website at panda.org/ministerial. However, one of the biggest changes we would like to see can't be made by the chair, or by the Council operating as a collective. It is a change that each member state must take on as a national responsibility. For many years, the Arctic Council has produced fine reports compiling the state of knowledge on Arctic issues from climate change to ocean acidification to Arctic biodiversity. These outstanding reports come with a series of recommendations, also often excellent. But there the process breaks down, as the

FIRM AND BOLD COMMITMENTS TO LIMIT EACH NATION'S GREENHOUSE GAS EMISSIONS WOULD GO A LONG WAY TO ADDRESSING MANY OF THE ISSUES FACING THE ARCTIC

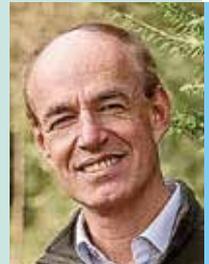
issues and policy actions require national implementation which is often patchy at best. WWF believes it is time for Arctic nations to take seriously the reports the Council commissions – and the policy recommendations that accompany them – by developing national implementation plans that respond with appropriate urgency.

However, responsibility for the Arctic does not end with its peoples and states. Countries such as China, South Korea and India that have recently come on board as observers also have an important role to play. That should include proving their concern for the Arctic environment by playing a constructive part in other international fora. For instance, the second part

of the International Maritime Organization's Polar Code will soon be negotiated. So far, this process has failed to address some serious environmental issues associated with Arctic shipping such as the use and car-

riage of polluting heavy fuel oils, along with provisions to prevent invasive species from being introduced to the Arctic by ships.

Another obvious example where all Arctic countries and observers must commit without hesitation is the upcoming global negotiations in Paris for a much-needed, strong climate agreement. Firm and bold commitments to limit each nation's greenhouse gas emissions would go a long way to addressing many of the issues facing the Arctic. This will provide a powerful example for the rest of the world – which should care as much as the Arctic nations about the future of this inspirational, vital and fragile global linchpin. ○



MARCO LAMBERTINI is Director General, WWF International



*"King Salmon".
Bristol Bay,
Alaska, USA.*

Photo: Chris Ford, Creative Commons, Flickr.com

Protection for America's fish basket

U.S. PRESIDENT Barack Obama has used a Presidential Memorandum to ban future oil and gas drilling in Bristol Bay, Alaska. Bristol Bay is one of the most productive wild salmon fisheries in the world and the last pristine salmon ecosystem in North America. Nearly 50 per cent of the world's wild sockeye salmon comes from these waters.

Environmental groups and Native Alaskans have been working for years to secure protection for the area.

"Because of the great work that was done by local communities, Native Alaskans, folks who cared about making sure that we preserved this natural wonder for generations to come, we were able to take action that is going to take Bristol Bay off the bidders block and make sure that it is preserved into the future," Obama said.

Bristol Bay is home to rivers

that witness salmon runs of over 37 million fish each year. The bay supports 31 Alaska Native Villages, creates more than 12,000 jobs for fishermen and processors, and provides millions of dollars in jobs for commercial fishermen.

"The Obama Administration's decision to protect Bristol Bay is a huge win for both Bristol Bay fishermen and the region's coastal communities" said Margaret Williams, Managing Director of the WWF US Arctic Program

The U.S. President protected the 52,234 square miles of Bristol Bay under the Outer Continental Shelf Lands Act. The President's announcement does not, however, apply to mining, and as a result will not affect hotly contested plans for Pebble Mine, a giant open-pit gold and copper mine proposed for the Bristol Bay region.

WWF supports Baffin Island caribou harvesting moratorium

THE GOVERNMENT of Nunavut in northern Canada has placed a moratorium on hunting caribou on Baffin Island, effective January 1, 2015. The decision is in keeping with Nunavut's wildlife co-management system of combining best available science and traditional and local knowledge.

"This is a decision that needed to be made," says David Miller, President and CEO of WWF-Canada. "We appreciate that making this decision was not easy, knowing how important caribou harvesting is to Nunavut families, many of whom are suffering from insecure food sources."

Caribou across the Arctic face numerous pressures to their long-term survival. The latest draft Nunavut Land Use Plan proposed in 2014 by the Nunavut Planning Commission does not exclude industrial development from caribou calving and post-calving areas.

"It is difficult to imagine how caribou populations are going to thrive over the long-term without protecting their most important habitat," says Paul Crowley, Director of Arctic Programs for WWF-Canada. "The next steps should be to strengthen protection in the Land Use Plan and adopt long-term

caribou management plans. These measures combined can help ensure that caribou will be part of the diet of future generations of Inuit and Northerners."

Baffin Island is the fifth largest island in the world, covering more than 500,000 square kilometres, making it slightly larger than Spain.

Polar bear conflict hits record high in Greenland

A NEW WWF REPORT shows increasing numbers of polar bears are being killed in self-defence in Greenland. The loss of sea ice habitat is pushing the bears into communities where they are coming into increasing conflict with people. The situation is particularly critical in East Greenland.

In the first nine months of 2014, twelve polar bears were shot in self-defence in Greenland. That is the highest figure ever recorded.

Reductions in sea ice mean the bears have fewer opportunities to hunt ringed seals, their primary prey. The hungry bears then tend to move towards land and will prowl villages in search of food. In the East Greenland village of Ittoqqortoormiit, polar bears have been spotted in or around the community several times a week, says the report, which focuses specifically on conflicts between people and bears in Ittoqqortoormiit.

Denmark lays legal claim to North Pole

THE TINY Scandinavian nation of Denmark has announced it will join the battle brewing over who owns the seabed under the North Pole. The International Business Times reports this new claim could lay the groundwork for a fight with far more powerful states over the resources that may be untapped at the top of the world. Several other nations with an Arctic Ocean border have made similar claims, including Russia's planting of a flag in the seabed in 2007.

The claim is based on the continental shelf of Greenland, an autonomous country within the Danish kingdom, extending from its eastern Arctic coast toward the North Pole. The newspaper says the claim may put the small country of 5.6 million

people on a geopolitical collision course with far bigger countries, including Canada and Russia, both holding legitimate claims on the area as well.

"It's important to mention that we're only talking about the seabed," said Alexander Shestakov, an environmental law expert and director of the World Wildlife Fund's Global Arctic Programme. "This claim does not affect the water column or the use of the water, which stays under international law. They only have rights to the seabed, meaning no one has an exclusive right over the North Pole as we know it."

The geological feature that connects Greenland to the areas around the North Pole is known as the Lomonosov

Lomonosov Ridge

Denmark, Canada and Russia claim that the Lomonosov Ridge connects their territory to the North Pole.



Ridge, a 2,000km (1,240-mile) underwater mountain range that extends from Canada and Greenland all the

way to the shores of the Russian Federation's own continental shelf, giving all three a potential claim.

"It is a serious problem, which has long been overlooked. People are worried about encountering one of the polar bears that are increasingly coming right into town", says Charlotte M. Moshøj, a WWF biologist and author of the report.

Recommendations in the report include:

- Ensure waste and dog food are stored in a way that doesn't attract bears
- Organize a formal polar bear patrol to scare bears away from towns
- Install electric fences around town dumps
- hire a dedicated polar bear

patroller to chase bears from town.

WWF has already helped local communities in other parts of the Arctic to better deal with human-bear conflict.

Moving the goalposts

NORWAY'S Climate and Environmental Minister, Tine Sundtoft, has redefined what area of the North Barents Sea would be protected, on the grounds that the ice edge has moved north. The move

was immediately followed by the release of blocks within the newly unprotected zone for petroleum licencing. The announcement was ironically made during the Norwegian "Arctic Frontiers" meeting where government ministers were announcing plans for sustainability in the Arctic.

"The government is willing to put nature on the line to look for more oil and gas," says WWF Norway Conservation Director Arild Skedsmo. "It is showing that it does not intend to follow its own promises of restructuring and lifting Norway out of oil dependency. Any transition

to a renewable economy has been postponed and it's full throttle toward the north. This is totally unacceptable"

The announcement of petroleum licenses defies clear advice from the scientific authorities at Norway's Environment Directorate and the Norwegian Polar Institute. Both have strongly discouraged petroleum activities in the area along the ice edge and point out that knowledge about species and ecosystems in this area of the Barents Sea is very lacking. What is known is that this ice edge area is the most productive part of the ecosystem.

Improving the lives of Northerners

Leona Aglukkaq

A S CANADA APPROACHES the conclusion of its two-year Arctic Council Chairmanship, I'm proud to say we have worked to directly improve the lives of Northerners and foster environmentally responsible development throughout the Arctic.

Following my appointment as Minister for the Arctic Council in August 2012, I consulted with Northerners from across the Arctic and their message was clear: the well-being and prosperity of the people living in the North must be the top priority for the Council.

For this reason, Canada's Chairmanship has focused Arctic Council work on the theme, "Development for the People of the North."

There have been more than a few examples of the projects that we have developed over the course of our two-year chairmanship, reflecting this overarching agenda.

A key priority has been the establishment of the Arctic Economic Council (AEC), which held its inaugural meet-

ing in September 2014. Many economic and social challenges including high costs of living, skilled labour shortages, and extreme weather are common across the Arctic. From my travels, it became clear to me that we often do not share information well between Arctic peoples. Often times when we face a challenge, someone somewhere else in the Arctic has already faced that same challenge and has a solution. Rather than reinvent the wheel, we, as a Council, should foster collaboration

across the Arctic. The AEC will serve as a fundamental mechanism to facilitate Arctic-to-Arctic collaboration between business leaders by providing a forum to discuss common challenges, share best practices and look for business opportunities to develop and benefit the North.

The AEC will also serve as a link between business and government by enabling businesses to inform the work of the Arctic Council. Additionally – and this will be key to its success – Arctic Indigenous peoples have representation on the AEC, which ensures that those living in the North are active participants in decisions affecting their communities.

The AEC's work is forging ahead, and it has now established working groups on responsible resource development, maritime transportation and stewardship in the Arctic.

Development has many aspects, including economic, social and environmental. These elements should all be considered as we work to achieve sustainable Arctic communities.

With this in mind, Canada is also working with its Arctic Council partners to promote mental wellness across the North. The goal of this project is to identify and share best practices to

MANY ECONOMIC AND SOCIAL CHALLENGES INCLUDING HIGH COSTS OF LIVING, SKILLED LABOUR SHORTAGES, AND EXTREME WEATHER ARE COMMON ACROSS THE ARCTIC.

enable communities to improve support for mental wellness and resiliency of their residents. I am especially looking forward to the Mental Wellness Symposium taking place in Iqaluit, Nunavut in March which will focus on working with communities to advance efforts in mental wellness intervention.

Another key priority of Canada's Chairmanship has been to incorporate traditional and local knowledge more effectively into the Council's ongoing work. This knowledge has helped Indigenous peoples survive for millennia, and helps us understand changes in the region. The value of traditional knowledge is immense. By better incorporating it into decision making processes we will ultimately see better results for the Arctic and the people who live there.

The importance of traditional knowledge was recently highlighted in the search for Sir John Franklin's ships from his failed 1845 voyage. One of his ships, *HMS Erebus*, was found just off the coast of my hometown of Gjoa Haven, Nunavut (see p. 32). For generations of oral history, Inuit have said the location was near King William Island, which is exactly where *Erebus* was found. This discovery emphasizes the strength and importance traditional knowledge plays in shaping not only our past, but also our present and our future. Successes such as these should make Inuit and all Arctic Indigenous peoples proud.

Over the course of Canada's two-year Chairmanship, we have also advanced the Council's work on other key issues, including climate change, biodiversity conservation, and shipping safety. These actions range from developing a framework for action to reduce black carbon and methane emissions in the Arctic to a new action plan to enhance oil pollution prevention.

LEONA AGLUKKAQ is the Conservative Canadian Member of Parliament for the riding of Nunavut and Minister for the Arctic.





Photo: Mads Pihl / Destination Arctic Circle

Inuit children, Greenland.

A fundamental objective of our Chairmanship has been to strengthen the Arctic Council. This included enhancing the capacity of the six Indigenous Permanent Participant organizations to contribute to the Council's work. The Permanent Participants have a unique and fundamental role at the Council – they are at the table with the Arctic States to ensure that they are involved in decisions affecting their communities.

As we move towards the end of our Chairmanship, we are working closely with our neighbour and the incoming Chair, the United States, to advance our shared priorities for the Arctic region.

I look forward to welcoming our Arctic Council partners to Iqaluit in April for the ninth Ministerial Meeting, where we will highlight our accomplishments, and chart a path for the next two years and beyond. ○

INCOMING CHAIR:

United States leadership in the Arctic

Robert J. Papp, Special Representative for the Arctic Region

WHEN I BECAME the first United States Special Representative for the Arctic in July 2014, I had just retired from nearly 40 years in the United States Coast Guard, finishing my career as the 24th Commandant. Ironically, I both started and ended my Coast Guard service focusing on

the U.S. portion of the Arctic. My first assignment was aboard a Coast Guard cutter homeported in Adak, Alaska, in the Aleutian Island chain. During this assignment, I saw first-hand what the Arctic was all about. At the end of my career, I oversaw the completion of the first-ever Coast Guard Arctic Strategy, an achievement I'm very proud of and that has served our country well.

Now I have the great fortune to lead U.S. Arctic diplomacy and prepare for

the United States' chairmanship of the Arctic Council. I feel very privileged to do so at such an important time in the history of the Arctic region. Not since

the Cold War has there been such a focus on the Arctic and the critical role it plays in the world. The Arctic Council – the only forum focused solely on the circum-polar Arctic – has evolved in encouraging ways to help

Arctic governments and residents meet new challenges.

As chair, Canada has done a fantastic job of raising public awareness about Arctic indigenous peoples and their eco-

IMPROVING ECONOMIC AND LIVING CONDITIONS IS A HIGH PRIORITY FOR THE UNITED STATES

economic needs. We will follow Canada's leadership and many of its priorities as we take the chair on April 25, 2015. Our chairmanship theme, "One Arctic: Shared Opportunities, Challenges, and Responsibilities," reflects the fact that although there are many dimensions to the Arctic, in the end it is one region of peace, stability and cooperation.

We see three general sub-themes logically flowing from the overarching theme under which we will organize

a number of new initiatives: Arctic Ocean safety, security and stewardship; improving economic and living conditions; and addressing the impacts of climate change.

The Arctic Ocean is still relatively unstudied as compared to the other oceans. We want the Council to support scientific research cooperation through a binding agreement that would reduce barriers to access for ships, equipment, research teams, samples and other logistical issues, and at the same time explore whether a Regional Seas Program for the Arctic Ocean might further cooperation on research priorities and joint efforts. We want to shine a light on the emerging problem of ocean acidification – a direct consequence of climate change that is happening more intensively in the Arctic Ocean than

ADMIRAL ROBERT

J. PAPP, JR.,
USCG (Ret.)

is the US
State Depart-
ment's Special

Representative for the
Arctic.



Photo: Patrick Kelley, U.S. Coast Guard

The Canadian Coast Guard Ship Louis S. St-Laurent ties up to the US Coast Guard Cutter Healy in the Arctic Ocean Sept. 5, 2009. The two ships are taking part in a multi-year, multi-agency Arctic survey that will help define the Arctic continental shelf.

anywhere else owing to its cold temperatures. With the ever-increasing human presence in the Arctic Ocean, we plan to hold tabletop and live exercises among the Coast Guards and rescue services to ensure we are all prepared for the natural and/or man-made disasters that are all but inevitable.

Improving economic and living conditions is a high priority for the United States because all of the Arctic States have citizens living there, albeit in different circumstances. Much of the Nordic Arctic is well-developed; generally speaking, the Saami Indigenous peoples enjoy better economic and living conditions than Indigenous peoples in the United States, Canada, Denmark/Greenland and Russia. Our communities are largely remote, often poverty-stricken, and lacking in some of the most basic human needs such as access to clean water, indoor plumbing and sewage services, reliable, affordable electricity and fuel, and good jobs. These conditions contribute to physical and mental health problems, and eventually to high suicide rates, especially in men and boys. We hope that all eight Arctic States will join us in exploring solutions to these problems, including testing and deploying new technologies through public/private partnerships, encouraging foreign direct investment to stimulate job growth, and sharing expertise and best practices across our borders.

We all know that climate change is happening faster in the Arctic than in other regions of the world; in fact, the impacts of climate change underlie nearly all human activity in the region. We hope to focus on climate change in our chairmanship in several ways, but most importantly by pressing the Arctic States *and* the Observer States to reduce their black carbon and methane emissions.

Our country does not contain the largest piece of the Arctic, but we do take the Arctic region very seriously and we look forward to our coming two years in the chair of the Arctic Council. ○

NEXT CHAIR:

Finland on deck

In 2017, Finland will take its turn as the next Arctic state to chair the Arctic Council. ALEKSI HÄRKÖNEN says intensified cooperation between the Arctic states is crucial to meet this new era of challenges in the far north.

FINLAND'S LONG-STANDING priorities in Arctic activities are to preserve the Arctic environment, to encourage economic activity based on sustainable development, and to safeguard the stability of the Arctic region in cooperation with other countries and actors. We trust that these are goals that all Arctic states can share.

Finland as a whole is an Arctic country while Finns make up one third of the world's population living above the 60th parallel. For Finland, cooperation through the Arctic Council and the Barents Euro-Arctic Council has been a welcome addition to our foreign policy for the past two decades. Finland was one of the initiators, starting in 1991, of Arctic cooperation through the Rovaniemi Process, which concentrated on the preservation of endangered Arctic nature. We joined the Barents Euro-Arctic Council as a founding member in 1992. And we became one of the founding members of the Arctic Council in 1996.

The scope of Arctic activities has become broader over the years, and in order to formulate a more coherent policy Finland prepared a Strategy for the Arctic Region with the latest version issued in 2013. Finland will have parliamentary elections in the spring of 2015. The next government will undoubtedly emphasize Finland's continuing interest in Arctic and northern issues, given that Finland will chair the Arctic Council after the U.S. in 2017-19. But will the future of Arctic cooperation be as smooth as we

have become accustomed to?

The first two decades of Arctic cooperation have produced some important results, in no small part due to the participation of Indigenous peoples. The Saami are the only Indigenous people in the European Union, and their organizations are actively involved in Finland and elsewhere in Northern Europe. But clearly there are still many issues to be resolved, including some that are just emerging. The last thing we would want is an international atmosphere where badly needed next steps in Arctic activities would be impeded.

The question is how the Arctic countries are looking at their involvement. Will it be business as usual? Will common interests prevail? Will the present structures and methods of cooperation be sufficient? And what about the role of other countries with a growing interest in the Arctic region?

Climate change is the most compelling reason to continue to intensify cooperation. This is the fundamental factor that will change the Arctic region profoundly. Global warming may proceed faster than predicted, especially in the Arctic and sub-Arctic regions.

Reaching a meaningful climate deal without delay is in the best interest of all Arctic countries, since the effects of non-action would leave our region vulnerable. It is encouraging that the

ALEKSI HÄRKÖNEN
is Finland's
Ambassador
for Arctic
Affairs



Canada, the

U.S. sees climate issues as the number one priority in their chairmanship of the Arctic Council and we hope this pays off.

The international climate negotiations are, once more, approaching a decisive moment. A globally binding climate agreement will hopefully be concluded in 2015. The Arctic countries need to make a concerted, visible effort to positively contribute to the negotiations.

Another great challenge will be how increasing economic activity in the Arctic region will support the goal of sustainable development, while benefiting Indigenous and other local communities. Here the U.S. chairmanship agenda also offers several ways to move forward. Business organizations will have to be involved in economic development issues. We should look at ways to create a natural contact between the Arctic Council and the newly established Arctic Economic Council.

The U.S. has emphasized that it wants to prepare a program for the Arctic Council as a whole, not just for the country holding the chairmanship. Continuity is certainly a principle that Finland appreciates and we are keen to identify items on the U.S. chairmanship program that we could continue in ours.

In order to be successful, Arctic cooperation requires openness and trust among the stakeholders, especially the Arctic states. A spill-over from the rather turbulent state of international relations has, so far, been avoided for the most part. In Finland's view, the decision to invite the European Union to participate as an observer to the Arctic Council should be implemented without delay. Without question, the EU is an important Arctic actor.

The U.S. chairmanship program for the Arctic Council was prepared with the understanding that the business of the Council will go on as usual while reflecting the aspirations that we all share as Arctic countries. When the time comes, Finland will prepare its chairmanship program based on the same values where possible. Considering the huge challenges ahead, Arctic cooperation will figure prominently. ○

Photo: Paul Nicklen/National Geographic Stock / WWF-Canada



An Inuk hunter on a snowmobile observing an icebreaker ship, Admiralty Inlet, Nunavut, Canada.

Arctic Council and rough seas

In 1996, Canada was the first of eight Member States to chair a newly-founded Arctic Council. From May 2013 to April 2015, Canada again resumed the chair and set development for the people of the North as the overall theme. To achieve this goal, Canada called for responsible Arctic resource development, safe Arctic shipping and sustainable circumpolar communities with subthemes under each of these 3 goals. Unique to Canada was the call to create an Arctic Economic Council – a subgoal of responsible resource development. How should we evaluate this agenda? Did Canada’s Chairship break new ground or was it just caretaking? To evaluate Canada’s success as chair and, in particular, in achieving its three goals, **ANDREA CHARRON** says the limitations of the Arctic Council must be understood.



IN 1996, CANADA was the first of eight Member States to chair a newly-founded Arctic Council. From May 2013 to April 2015, Canada again resumed the chair and set development for the people of the North as the overall theme. To achieve this goal, Canada called for responsible Arctic resource development, safe Arctic shipping and sustainable circumpolar communities with subthemes under each of these 3 goals. Unique to Canada was the call to create an Arctic Economic

ANDREA CHARRON



is Assistant Professor and Deputy-Director of the Centre for Defence and Security Studies at the University of Manitoba, Canada. She holds a PhD from the Royal Military College of Canada and has Masters degrees in International Relations from Webster University, Leiden, The Netherlands, and in Public Administration from Dalhousie University.

on issues of sustainable development and environmental protection of the Arctic. The Council, however, only has “soft legal” status -- meaning it cannot take any binding decisions or enforce any of its decisions. Secondly, while the Arctic Council has been instrumental in keeping the Arctic a zone of cooperation, outside geopolitical events (such as Russia’s action in the Ukraine) have proved a challenge to this cooperation. In addition, the ratio of Member States (those with a veto, although rarely exercised) and Permanent Participants (those afforded special decision-making status) to Observers (including states, organizations and nongovernmental agencies) is now terribly out of balance; there are now only 14 decision makers which means they

CANADA STILL HAS A FEW MONTHS LEFT IN ITS MANDATE, BUT IT CAN ALREADY BE SEEN THAT ITS TWO YEARS AS CHAIR ARE BEST DESCRIBED AS PLACE HOLDING.

are outnumbered by the 32 observers (and some very powerful ones at that when we consider China, Germany, Japan and others). Non-voters outnumber voters by more than two to one. Finally, the Council has always suffered from an inclusive/exclusive debate. Some think the issues of the Arctic region (such as climate change and northern development) would be better tackled at strictly a regional level while others believe that an international organization like the UN is more appropriate since such issues affect the entire world.

Canada still has a few months left in its mandate, but it can already be seen that its two years as Chair are best described as place holding. While the Arctic Council cannot be expected to make grand pronouncements every year (it is voluntarily funded and has only recently benefited from a permanent secretariat), Canada’s attention to the Arctic has been lacklustre. On the one hand, the focus it has directed on the people of the North is laudable. However, Canada’s priority was presented as development “for” the people not “with”, an unfortunate use of prepositions.* Perhaps “for” can be excused as simply a poor choice of words rather than an indication that Canada’s intent was to tell the people of the North what they need. While the development priority included safe Arctic shipping and sustainable, healthy communities, nevertheless that prepositional slip suggests that the underlying goal of Canada to improve the

* French version: “Le développement au service de la population du Nord”. De is translated as “of” and not “for” (which would be “pour”). The French version invites input from Northerners whereas the English translation suggests their exclusion.

economy of the North is for state interests.

Canada achieved its third goal, the creation of an Arctic Economic Council. But this is a shift from two of the goals of the Arctic Council: sustainable development and protection of the environment. Of course economics is related, even crucial to the goals of environmental protection and sustainable development, but the creation of an Arctic Economic Council has not been popular with all of the Arctic State members and exacerbates the exclusive/inclusive friction.

At the same time, action outside the Arctic Council is doing more, arguably, for the people of the Arctic. A little known agreement called the *Minamata Convention* - a global treaty to protect human health and the environment from the adverse effects of mercury- is especially important for the Arctic, which has higher levels of mercury. And yet, while the US has ratified the Convention, (along with only eight other countries - from Africa, South America and Monaco), none of the other Arctic States -- including Canada - have; nor have the Observer states. The Arctic Council, under Canada’s leadership, could have made ratification of this convention by all of its members - observers or others - a goal. While the Arctic Council has made a statement** supporting the Convention, this is the ideal forum to encourage the Convention’s ratification.

Meanwhile, the working groups of the Arctic Council are doing some very important work indeed. Projects include an Arctic biodiversity assessment and creation of offshore oil and gas guidelines. Volunteer funding from member and observer states, however, makes planning of these multi-year projects a challenge.

The Arctic Council has had other successes. The *Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic* and the *Agreement on Cooperation on Marine Oil Pollution, Preparedness and Response* in the Arctic are examples of the Arctic Council coming together to create useful, guiding documents.

Perhaps more importantly, Canada should be commended for its diplomatic

** See <http://bit.ly/1bhV2Ty>

Arctic Council: members, Permanent Participants and observers

The Arctic Council consists of the eight Arctic States. Indigenous peoples' organizations have been granted permanent participants status in the Arctic Council. The permanent participants have full consultation rights in connection with the Council's negotiations and decisions. Observer status in the Arctic Council is open to non-Arctic states, inter-governmental and inter-parliamentary organizations and non-governmental organizations.

■ Member states □ Observer countries

Permanent participants



Aleut
International
Association (AIA)



Gwich'in
Council
International (GCI)



Arctic
Athabaskan
Council (AAC)



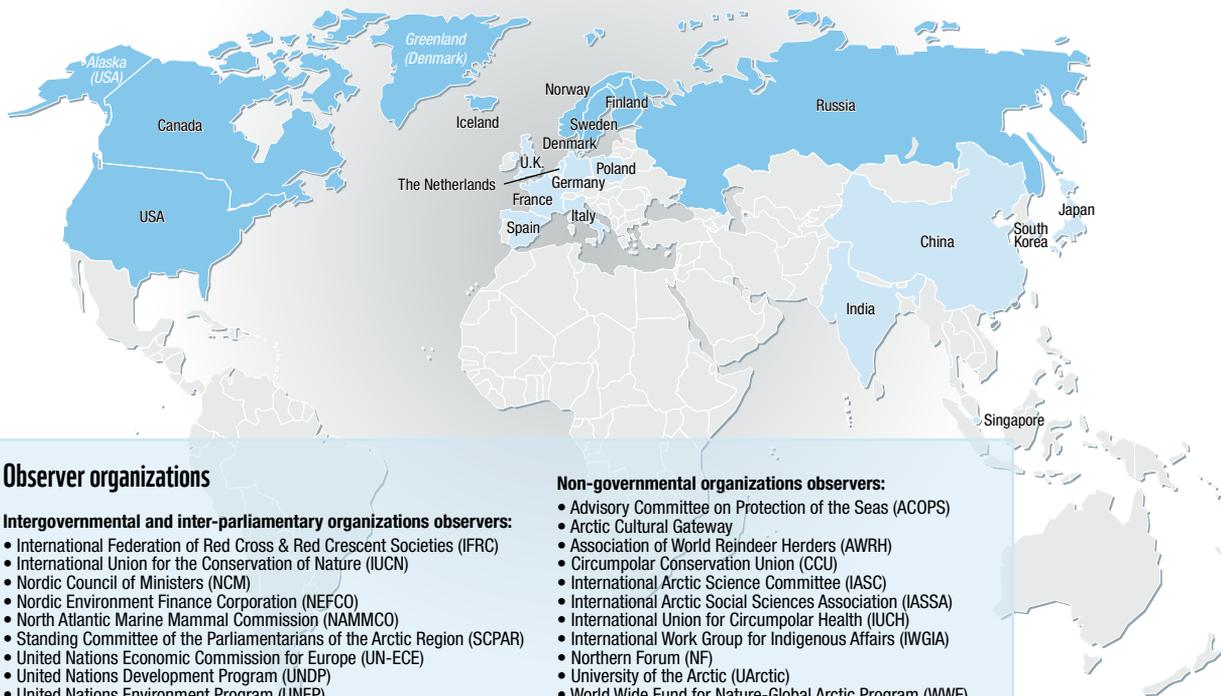
Inuit
Circumpolar
Council (ICC)



Saami
Council (SC)



Russian Association
of Indigenous Peoples
of the North (RAIPON)



Observer organizations

Intergovernmental and inter-parliamentary organizations observers:

- International Federation of Red Cross & Red Crescent Societies (IFRC)
- International Union for the Conservation of Nature (IUCN)
- Nordic Council of Ministers (NCM)
- Nordic Environment Finance Corporation (NEFCO)
- North Atlantic Marine Mammal Commission (NAMMCO)
- Standing Committee of the Parliamentarians of the Arctic Region (SCPAR)
- United Nations Economic Commission for Europe (UN-ECE)
- United Nations Development Program (UNDP)
- United Nations Environment Program (UNEP)

Non-governmental organizations observers:

- Advisory Committee on Protection of the Seas (ACOPS)
- Arctic Cultural Gateway
- Association of World Reindeer Herders (AWRH)
- Circumpolar Conservation Union (CCU)
- International Arctic Science Committee (IASC)
- International Arctic Social Sciences Association (IASSA)
- International Union for Circumpolar Health (IUCH)
- International Work Group for Indigenous Affairs (IWGIA)
- Northern Forum (NF)
- University of the Arctic (UArctic)
- World Wide Fund for Nature-Global Arctic Program (WWF)

Source: www.arctic-council.org. Graphic: Ketill Berger, Film & Form, www.filmform.no

efforts. That the Arctic Council is still meeting despite geopolitical tensions between Russia and the five NATO Arctic Council Member States is a testament to Canada's adept chairmanship.

What does the future hold for the Arctic Council?

Likely all future chairs will run into the same problem as Canada – the “low hanging fruit” issues have been picked. In other words, the issues that were not of vital national interest, but were readily agreed to by the Arctic States, have been tackled. This leaves some truly difficult and

contentious issues, like fishing rights and climate change. Furthermore, the Arctic Council may be reaching a tipping point in terms of the number of observers versus decision-making members and Permanent Participants. Exactly how much weight is given to the ideas of Permanent Participants also needs to be considered.

What is more, the eight Arctic States are chary of an overly ambitious, “UN-like” Arctic Council. When the United States takes over as the next chair it will turn to its Senior Arctic Official as well as the State Department's Special Representa-

tive for the Arctic, US Admiral (ret) Papp –former Commandant of the US Coast Guard – to advance U.S. interests in the Arctic Region. They have a Herculean task ahead of them: a recalcitrant Russia, cash strapped Permanent Participants, eager Observer states who want more decision-making influence, and diversely-interested Arctic Member States. Papp's years sailing rough seas may be his best training yet as the U.S. assumes the Chair in April 2015. ○



Canada versus USA

The table below compares the US plans for its chairmanship, as laid out in a presentation at the Senior Arctic Officials Meeting in Yellowknife, October 2014, with Canada's programme as laid out in a brochure from October 2013. This is not a direct comparison of national priorities. Canada's agenda was laid out after it had been negotiated with the other Arctic states and Permanent Participants. The US programme has yet to go through that negotiating process.

Points of comparison	 Canada's Arctic Council Chairmanship program 2013-2015*	 United States' proposed Arctic Council Chairmanship program 2015-2017**
Chairmanship Brand	Development for the People of the North	One Arctic: Shared Opportunities, Challenges and Responsibilities
Organizational Thematic Areas	1) Responsible Arctic resource development 2) Safe Arctic shipping 3) Sustainable circumpolar communities.	1) Addressing the Impacts of Climate Change in the Arctic 2) Stewardship of the Arctic Ocean 3) Improving Economic and Living Conditions.
Improving Economic and Social Conditions	The Council is developing recommendations for incorporating traditional and local knowledge into its work.	The U.S. proposes that the Council develop Renewable Energy Demonstrations
	The Council is establishing the Arctic Economic Council to foster circumpolar economic development and provide opportunities for business to engage with the Arctic Council.	The Council should develop an Arctic-wide Arctic Water Resources Vulnerability Index.
	The Council is working to improve and develop mental wellness promotion strategies.	The Council should examine the role of freshwater in Arctic systems.
	The Council should create a common system of metrics to track suicidal behaviors, interventions, and outcomes across Arctic States.	The Council should develop an Arctic-wide telecommunications infrastructure assessment.

Points of comparison



Canada's Arctic Council Chairmanship program 2013-2015*



United States' proposed Arctic Council Chairmanship program 2015-2017**

Acting on Climate Change	The Council is developing arrangements on actions to achieve enhanced black carbon and methane emission reductions in the Arctic.	The Arctic States should develop domestic black carbon inventories, with an initial focus on gas flaring and increase data collection and monitoring of black carbon emissions affecting the Arctic.
	The Arctic Council is facilitating the sharing of communities' knowledge and best practices to adapt to the impacts of climate change.	The U.S. will propose Arctic Council to further work on Arctic Climate Adaptation and Resilience. The Council should enhance Arctic climate science by developing a Pan-Arctic Digital Elevation Map; an Arctic Indicators Network, and an Early Warning Indicator System for the Arctic.
Protecting the Arctic Environment	The Council is developing an action plan on oil pollution prevention.	The Council should set an Arctic-wide target for protecting marine areas and examine various models of marine protected areas, taking into account ecosystem-based management of marine activities.
	Arctic Council states are continuing to work closely together to encourage the International Maritime Organization's efforts to develop a mandatory polar code for the Arctic Ocean.	The Arctic States should initiate the development of Phase II of the Polar Code.
	The Council is working to establish guidelines for sustainable tourism and cruise-ship operations in the Arctic.	The Council should consider whether a Regional Seas Program for Arctic Ocean management.
	The Arctic Council is pursuing cooperation among Arctic and non-Arctic states to support the conservation of migratory birds.	The Council should expand information sharing on the environmental impacts of hazardous substances, mechanical recovery efficacy, and in-situ burning in open water, broken ice, and hard packed ice for oil products. The Council should increase sharing of oil spill preparedness and response capabilities and continue the development of specialized pollution response resources and operational guidelines for responses in broken ice and ice covered areas. The Council should enhance monitoring of Arctic Ocean Acidification and educate the media and the public about ocean acidification.
Strengthening the Arctic Council	The Council is working to enhance the capacity of the Permanent Participant organizations, improve the Council's coordination and maximize efficiencies.	The U.S. SAO chair could lead SAO discussions on how the Council should relate to outside bodies (e.g. Arctic Regulators Forum, Arctic Regional Hydrographic Commission, IMO, etc.).
	The Council is working on an Archiving Project.	The U.S. SAO chair could lead a SAO review of the internal Council structure to see if it continues to meet the Council's needs.

* as per the Canadian Chairmanship Programme 2013-2015 Brochure October 2013

** as per the U.S. State Department presentation at the October 2014 Senior Arctic Officials meeting in Yellowknife

PERMANENT PARTICIPANTS WEIGH IN

ALEUT INTERNATIONAL ASSOCIATION

Focus on marine environment

AS THE REPRESENTATIVE of an island region, the Aleut International Association would like to see a focus on protection of the marine environment during the next term of the Arctic Council. This would be a continuation of work by the Arctic Council, particularly in the recent past with the agreement on marine oil pollution preparedness and response, and the arrangement on marine oil pollution prevention worked on during the Canadian Chairmanship.

In particular we hope that there will be an emphasis on safe shipping, perhaps with measures that will take the provisions of the International Marine Organization's (IMO) Polar Code a step further. In addition, we hope that the U.S. Chairmanship will continue to expand efforts to better include Traditional Knowledge in the work of the Arctic Council, as well as examine ways to better support the Permanent Participants to engage more fully.

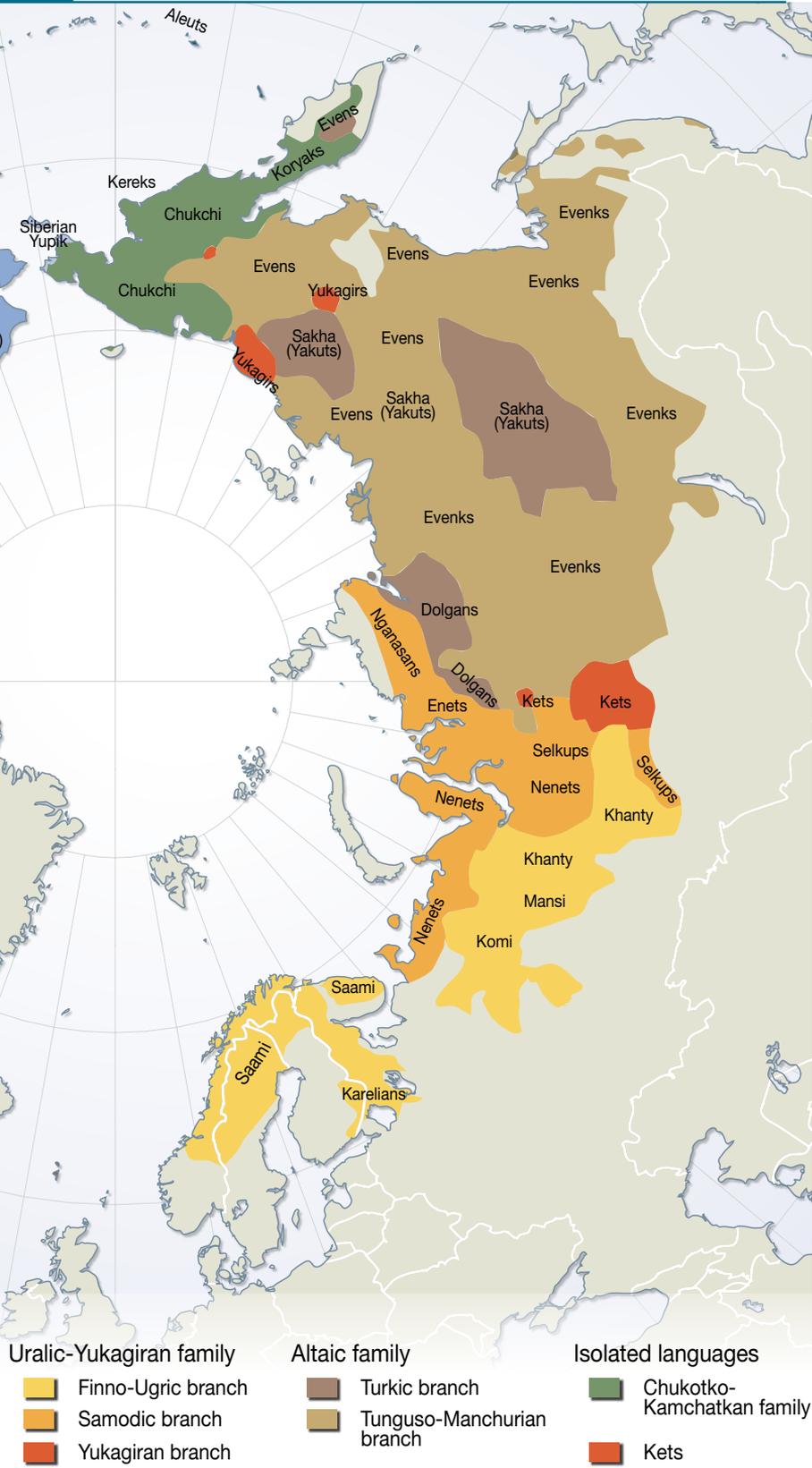
We hope that the U.S. will encourage further steps to mitigate the effects of climate change, but also examine ways Arctic Communities can adapt to the changes that will likely happen regardless of mitigation efforts. We also hope to see a focus on living conditions for the Indigenous peoples of the Arctic which could build on ongoing work on issues such as mental wellness, suicide prevention, language retention, and food security.

We would also like to see an initiative that examines energy in the Arctic, and looks at innovative ways to bring down the cost and environmental effects of heating and power generation with a focus on both improving existing technologies, but also an examination of new technologies such as renewables. Finally, we hope to see a renewed focus on outreach, to get the word out about the work of the Arctic Council, and the changes that are affecting the Arctic, to the global audience. ○

Demography of indigenous peoples of the Arctic based on linguistic c



Map: Hugo Ahlenius



UNEP/GRID-Arendal. Sources: Arctic Human Development Report, 2004 and Norwegian Polar Institute (W.K. Dallmann).

THE ARCTIC ATHABASKAN COUNCIL

Cooperation, climate change, cutting through geopolitics key to upcoming term

THE UNITED STATES ASSUMES the Chair of the Arctic Council at a time when relations between Russia and the other circumpolar states has deteriorated due to Russia’s annexation of Crimea and support of rebels in eastern Ukraine. Some have accused President Putin of seeking to expand Russia to something like the old frontiers of the Soviet Union with the intent of increasing Russia’s influence globally. What might this mean for co-operation in the circumpolar world? Russia’s geography – eleven time zones – make it indispensable to circumpolar collaboration.

The United States has announced a thought-provoking and ambitious agenda for its term as Chair of the Arctic Council including initiatives on mitigation and adaptation to climate change, improving governance of the Arctic Ocean, and economic development within the region. It appears that coordinating national programmes and activities by the five Arctic Ocean littoral states is what is meant by improving governance in the Arctic Ocean. Whatever it proposes will take place in the context of proposals by all littoral states to extend their continental shelves into the Arctic Ocean according to processes detailed in the UN Convention on the Law of the Sea. Claims by these states to extended continental shelves overlap. It may be that during the American term as Chair of the Council, negotiation particularly with Russia outside this forum will take place among and between Arctic states to resolve competing claims.

Regarding climate – an issue not pri- ➤

oritized by Canada during its term as chair – the US may stress reduction in emissions of black carbon, a short-lived climate pollutant, both within the region and more broadly. The Council established a task force to look into this issue some years ago and an agreement to reduce emissions may well be announced at the April 2015 ministerial meeting in Iqaluit. The Arctic Athabaskan Council (AAC) has attended all meetings of this task force and repeatedly urged states to commit to reduce black carbon emissions. To date, Arctic states have addressed mitigation of climate change caused through emission of greenhouse gases – long-lived climate pollutants – globally through the UN Framework Convention on Climate Change. A regional climate change mitigation agreement would signal a significant evolution of the Council and perhaps prompt other states to consider similar regional agreements. The US may soon have an opportunity to turn a paper agreement into on-the-ground reality.

In the late 1980s and early 1990s, co-operation between the circumpolar states was new and untested. It was also confined primarily to scientific and environmental issues defined in the 1991 Arctic Environmental Protection Strategy in which Arctic Indigenous Peoples had only a limited role. Nearly 20 years later co-operation between the eight circumpolar states through the Arctic Council has become the natural order of things, and Arctic Indigenous peoples intervene in debates and decision-making as Permanent Participants. AAC is committed to deepening and broadening circumpolar co-operation and informing global institutions about what the Arctic – the world's barometer of climate change – is reading. Much depends on the political and diplomatic abilities of the United States during its term as chair of the Arctic Council to promote circumpolar co-operation at a time of changing and challenging geopolitics. ○

GWICH'IN COUNCIL INTERNATIONAL

Put energy into energy

THE ARCTIC IS A MAGNIFICENT but formidable place to call home. The winters are long, cold and dark and per capita energy use is almost twice the Canadian average. The Gwich'in people have survived and prospered in this climate due to a strong connection to the land and resourceful communities, however the cost of energy effects all Gwich'in people living in the remote north. These costs can be attributed to energy production, residential building science for the north and heating appliances. Gwich'in Council International would recommend the US Chairmanship explore each of these cost drivers and develop tools to assist communities in making decisions for addressing their unique energy needs during their tenure.

The majority of Gwich'in communities rely on diesel fuel for energy production. The diesel fuel for the most part is trucked in and in some cases flown in! The exploration of scalable renewable power generation technologies in the remote north would help to research sources of reliable, affordable and applicable alternative energy production in our communities to ensure continued prosperity of the people of the north.

Residential building science has improved to the point of Net-zero homes (homes that produce and consume equal amounts of energy). However, many homes built in the Gwich'in settlement area still use dated building practices and less efficient heating appliances. This combination yields poor insulation value, inadequate air tightness and inefficient use of resources for heat generation. GCI suggests a review of current housing inventories in the north and a comparative cost analysis of current residential building science vs. efficient building practices. The knowledge sharing of best building practices of States and Permanent Participants would be a tool to assist communities to make educated decisions for the future development and construction of homes in the north.

Gwich'in Council International looks forward to working on energy solutions with the United States Chairmanship in supporting the wellbeing and sustainability of the northern communities of the Gwich'in People. ○

*Winter in Iqaluit,
Baffin Island,
Nunavut, Canada.*





Expectations for the US chairmanship

THE SAAMI COUNCIL supports the concept of being one Arctic. We live in the Arctic together, even though the challenges might differ. The Saami Council, as one of the six Permanent Participants to the Arctic Council, is ready to share the responsibilities in the Arctic. As an Indigenous people in the Arctic, we do, however, face a reality that we are confronted with an uneven share of the challenges with the change in environment and not least with the change in land use. We have expectations that with the US lead, the Arctic Council and its member states will ensure and contribute so that the Indigenous peoples in the Arctic also have equal access to the opportunities.

During the last decade there has been a lot of focus on climate changes and the Arctic Council is monitoring and addressing the impacts of these. With climate changes come also changes in the environment and changes in land use. To cope with these changes from a Saami perspective it is important to build robust and resilient communities in the high north. Socio-economic resilience is important for the communities to live through changes we still do not fully understand without lost identity and culture. This is the essence of sustainable development. The Saami Council therefore welcomes the conclusion of the Arctic Resilience Report during the US Chairmanship, as well as initiatives coming from the Adaptation Actions for a Changing Arctic (AACA) that will “produce information to assist local decision-makers and stakeholders...in developing adaptation tools and strategies to better deal with climate change and other pertinent environmental stressors”.

Saami Council looks forward to the US continuing the Canadian initiative to make better use of traditional knowledge and implementing actions to include TK in Arctic Council activities. ○

A regional seas approach for the Arctic: what does it mean?

As part of a wide-ranging and ambitious agenda for its upcoming chairmanship of the Arctic Council, the US has expressed its interest in moving towards a regional seas approach to improve stewardship and governance of the Arctic marine environment. What this means has not yet been fully detailed by U.S. officials, although as **BROOKS YEAGER** writes, enough has been said that we may make some educated guesses.

THE REGIONAL SEAS approach has its roots in Regional Seas Agreements, which are cooperative intergovernmental frameworks for ocean management and conservation in various areas of the world's

oceans. A number of such agreements, or RSAs, have been formed under the auspices of the United Nations Environment Program (UNEP), while others are essentially autonomous regional associations

based in the sovereign authority of their member governments.

Although RSAs are by their nature frameworks, often crafted with enough flexibility to evolve over time, they fre-

Polar Bear (Ursus arctos maritimus) mother and two cubs playing around iceberg. Svalbard, Norway, Europe.



quently have specific aims with respect to which their member governments organize their efforts.

Notable among existing RSAs are: OSPAR, the Convention for the Protection of the Marine Environment of the North-East Atlantic which seeks to conserve and prevent pollution in the NE Atlantic; HELCOM, the Baltic marine Environment Protection Commission which aims to restore and protect the environment of the Baltic Sea; and the Black Sea Convention, which seeks to maintain the health of the Black Sea ecosystem. There are, of course, many more RSAs, including in the Mediterranean, the Caribbean, the Eastern Pacific, and even for the Caspian Sea.

What would be the primary purpose of an Arctic RSA, should one be established? Of course, this would be subject to negotiation among the Arctic governments. However, State Department officials have dropped some hints relating to US objectives. One of the three principal pillars of the US chairmanship is “strengthening

ALTHOUGH THE U.S. WAS HISTORICALLY A RELUCTANT PARTNER IN THE INITIAL FORMATION OF THE COUNCIL, THE COUNCIL’S UTILITY AS A FORUM FOR DISCUSSING ARCTIC POLICY MATTERS, AND THE SUCCESS OF ITS WORKING GROUPS HAS CAUGHT THE ATTENTION OF SUCCESSIVE U.S. ADMINISTRATIONS.

stewardship and management of the Arctic marine environment.”

An RSA oriented to such a goal might be expected to emphasize cooperation in science and monitoring, as well as management techniques such as ecosystem-based management (EBM) and the conservation of valuable and vulnerable marine habitat.

At the same time, Admiral Robert Papp, the new US Special Envoy for the Arctic, has made it clear that there is also an interest in maintaining and advancing practical cooperation on maritime safety and navigational issues, including pursuing coordinated implementation of the existing agreements on search and rescue (SAR) and oil spill preparedness and response (OPPR). ➤

BROOKS YEAGER

has considerable experience with issues in the U.S. and Circumpolar Arctic including: Deputy Assistant Secretary for Environment and Development at State; lead U.S. negotiator for the 2001 Stockholm Convention on Persistent Organic Pollutants; Deputy Assistant Secretary for Policy and International Affairs at the Interior Department. He also worked with the State Department on the establishment of the Arctic Council.



It seems likely, therefore, that an Arctic RSA would have such a practical orientation at its core.

The question of the appropriate membership of an Arctic RSA is an interesting one. Although one could imagine such an RSA including only the Arctic littoral states, i.e. Canada, Denmark (for Greenland), Norway, Russia and the U.S., U.S. officials have made it clear that they would seek to include all eight Arctic governments, as well as the so-called “Permanent Participants,” the representatives of the Arctic’s Indigenous peoples. In part, this preference reflects strong U.S. support for the existing Council, as the appropriate forum for the coordination of policy and management approaches in the region. Although the U.S. was historically a reluctant partner in the initial formation of the Council, the Council’s utility as a forum for discussing Arctic policy matters, and the success of its working groups over twenty years in framing significant problems for resolution has caught the attention of successive US administrations. The result is that strengthening the Council has now become a significant priority for the U.S. chairmanship agenda.

Whether the specific potential benefits of an RSA that the U.S. conceives can actually be brought to fruition depends on the reaction of the other seven Arctic Council nations, the Permanent Participants and the broader community of institutions and organizations who concern themselves with development and conservation issues in the Arctic region. There have already been some encouraging signs, in terms of the responses of the Senior Arctic Officials in the recent Yellowknife meeting, and of various interested groups, including the informal Ecosystem-Based Management Expert Panel, which endorsed the regional seas approach at its recent meeting in Trondheim. The EBM panel, in particular, pointed out that an Arctic Regional Seas Agreement would be a useful framework in which to share experiences and methodologies and to improve coordination of implementation of the ecosystem approach to management of the Arctic marine environment. ○

U.S. action needed

The ocean regulates our climate and our weather and plays a fundamental role in maintaining Earth’s water, carbon and nutrient cycles. Since the start of the Industrial Revolution, human activities have upset the natural balance of nutrients in the ocean. TOM ARMSTRONG warns changes in the oceanic carbon cycle are causing dramatic changes in the Arctic Ocean and need a strong response from the incoming chair of the Arctic Council

THE OCEAN has absorbed nearly one-third of the carbon dioxide (CO₂) added to the atmosphere by humans from deforestation and the burning of fossil fuels. Because the ocean has absorbed so much CO₂, greenhouse warming of the atmosphere is less severe. But, there is a critical downside: the dissolved CO₂ increases the acidity of ocean water, threatening aquatic life and the livelihoods that depend on it. Without global action to limit CO₂ emissions, this trend will continue.

Ocean acidification is a big issue for the Arctic, where relatively shallow water depths and significantly large CO₂ influx from both human and natural sources can result in acidic waters, leading to substantial impacts on a very vulnerable food web. Exacerbating the problem is the fact that the relatively cold waters of the Arctic allow CO₂ to be absorbed more easily than in warmer tropical waters, amplifying the acidifying effect of atmospheric CO₂ at polar latitudes. In addition, as ice melts in the Arctic, the seawater becomes less salty, and less salty water absorbs CO₂ more efficiently. Yet with all of these potentially significant impacts and related consequences, acidification of the Arctic Ocean is poorly understood, under-observed and under-researched. Continued anthropogenic climate change and increasing amounts of carbon uptake

by the Arctic Ocean are likely to have significant detrimental impacts on the physical, biological, social and economic state of today’s, and especially tomorrow’s, Arctic communities.

ACIDIFICATION OF THE ARCTIC OCEAN IS POORLY UNDERSTOOD, UNDER-OBSERVED AND UNDER-RESEARCHED.

WHAT WE ALREADY KNOW

The Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report included several important findings with relevance to both global ocean health and acidification of the Arctic Ocean, including:

- Ocean warming dominates the increase in energy stored in the climate system, accounting for more than 90% of the energy accumulated between 1971 and 2010 (60% above 700m, 30% below 700m)
- Ocean acidity has increased approximately 30 percent since the Industrial Revolution
- More acidic oceans will have broad



Ocean acidification was one of the three topics that Secretary John Kerry chose to highlight in the Our Ocean conference.

and significant impacts on marine ecosystems, the services they provide, and the coastal economies, which depend on them

■ Oceanic uptake of anthropogenic CO₂ will continue under all future emission scenarios, however, uptake is greater for higher concentration pathways – causing even more acidification, with carbon cycle feedbacks that will exacerbate climate change

THE U.S. PERSPECTIVE

U.S. federal agencies are currently conducting research, implementing policies and developing measures to better understand and address the effects of ocean acidification. But more is needed. We believe the U.S. must continue to lead the charge for the international community to increase international collaboration on ocean acidification research in the Arctic, particularly with regard to the effects of acidification on shell-forming organisms, marine biodiversity and food security.

Ocean acidification was one of the three topics that Secretary John Kerry chose to highlight in the *Our Ocean* conference. The *Our Ocean* Action Plan, released by Secretary Kerry during the conference, identified the importance of reducing CO₂ emissions to stem the increase in ocean acidification and the need to create worldwide capability to monitor ocean acidification.

The U.S. continues to promote the development and establishment of the Global Ocean Acidification Observing Network (GOA-ON), which will measure ocean acidification through the deployment of instruments in key ocean areas. This is a new network with broad international cooperation and a commitment to build capacity in developing countries. Since 2012, the United States has provided financial support totaling approximately \$1 million, and related in-kind support for the establishment of a new Ocean Acidification International Coordination Center (OAICC) based in Monaco, which will help facilitate global cooperation to advance our understanding of ocean acidification.

RECOMMENDATIONS FOR ACTION BY THE ARCTIC COUNCIL

During its 2015 to 2017 Chairmanship of the Arctic Council, the U.S. should take a leadership role in:

- Promoting the development of a full-scale, rigorous assessment of Arctic Ocean acidification by the Arctic Monitoring and Assessment Programme’s (AMAP) Arctic Ocean Acidification Expert Group.
- Continuing to support efforts like the Global Ocean Acidification Observing Network through monetary and expertise contributions.
- Developing a communications and

outreach strategy aimed at raising awareness of Arctic Ocean acidification (OA) as an issue that impacts the globe – not just the Arctic

■ Developing a focused mechanism for directly connecting the U.S. OA Interagency Working Group (IWG) with states, NGOs, foundations, academia, local communities and private industry within the U.S. and across the Arctic Council countries to share best practices and lessons learned in addressing the causes of and impacts from OA.

■ Developing strategies for raising the profile of OA – and Arctic Council-led solutions – in upcoming UN Framework Convention on Climate Change (UNFCCC) COPs

■ Developing strategies/efforts for raising the profile and scientific expertise capacity of OA within the more mainstream Arctic Council climate change efforts, such as AMAP’s assessments and monitoring activities.

■ Utilizing the circum-Arctic countries’ leadership elements within AMAP and Sustaining Arctic Ocean

Observing Networks (SAON) to find creative ways to help fund standardized OA monitoring instruments across international borders and leverage existing and planned activities across borders

■ Organizing a roundtable discussion with leading industry players, NGO and/or philanthropic leaders with a focus on determining the requisite science and monitoring assets needed to better understand past, present and future trends of OA as well as the resultant impacts and effects

■ Proposing oil and gas companies with offshore oil platforms in the Arctic add monitoring devices to their installations. ○

DR. THOMAS ARM-STRONG is the Deputy Secretary of the Arctic Monitoring and Assessment Programme and leads the Adaptation Actions for a Changing Arctic. He previously served in the Obama Whitehouse as the Executive Director of the U.S. Global Change Research Program



Renewable energy in the far north



All photos: Green Sun Rising.

Three electric vehicles at a solar charging station in Hay River, Northwest Territories.

Using solar energy in Northern communities is a tough sell. Just ask [KLAUS DOHRING](#), president of Green Sun Rising, a Canadian company based in Windsor, Ontario that develops and supplies solar systems to generate clean electricity and heat. He says reaction to using these forms of renewable energy in the Arctic is still a mix of preconceptions, misconceptions and skepticism even though it is already meeting with success.

WHENEVER I SUGGEST using solar energy in Northern communities, the typical response is that there is too little, or no sunshine in the winter months. This is irrefutable. But so is the flip side of that argument: in the summer there is an abundance of sunshine in the far north. The city of Yellowknife in Canada's Northwest Territories gets about 8 per cent more sun energy per year than

Berlin, Germany. In its peak summer months of May and June, Inuvik – also in the Northwest Territories and located 2 degrees above the Arctic Circle – gets more sun energy per month than Rio de Janeiro in any of its best months. For a good half of the year the sun is a great energy resource for the north.

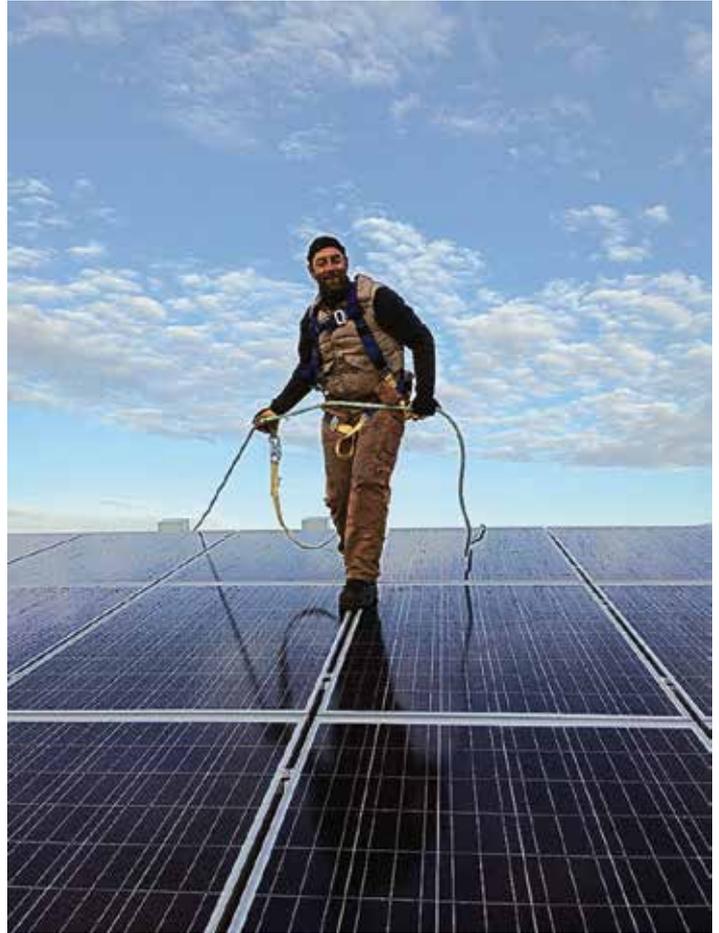
The harsh northern climate is usually cited next in the argument against

solar energy in northern climes. Space is an even harsher environment than the Arctic, yet satellites and the International Space Station are great examples of solar powered systems operating well in space. The Mars rover is an electric vehicle purely solar powered, also operating under extremely harsh conditions. Solar cells actually get more efficient with lower ambient tempera-

- is it feasible?



This bikeport is purely solar powered. It is used year-around.



Photos of solar energy technology being installed in Hay River, Northwest Territories, Canada.

tures because they like being cold. With no moving parts, a solar photovoltaic system in which light (photons) are converted into electricity (volts) can hibernate through the harsh arctic winter and generate electricity as soon as the sunshine is available for the solar cells.

We have introduced both solar photovoltaic as well as solar thermal systems into Northwest Territories applications, and the systems operate well.

Solar thermal systems can be used to generate heat energy. While the system itself is different from solar photovoltaic, the sun availability is the same. A solar thermal system allows for simple and easy generation and storage of heat energy, in the form of hot water.

One litre of diesel fuel typically provides 3 kilowatt hours (kWh) of electricity via the generator. At current economics of C\$1.20 per liter plus an assumed 25 per cent transportation cost added, this results in variable cost of at least C\$0.50 per kWh just for fuel cost reduction, higher for more remote communities. The full cost of diesel generated electricity is typically in the several dollars per kWh range, two-thirds of which is government-subsidized in Canada.

In the province of Ontario, the current solar incentive program puts a value of less than C\$0.40 per kWh on solar generated power, and the incentive program is still considered attractive.

Against the variable cost of diesel fuel reduction, a solar system is already financially viable. When considering the true cost of diesel generation, a solar system will be a substantial cost savings. In terms of quality of life and pollution, a solar system is quiet, has no emissions, and is the most environmentally friendly way to provide energy. Once installed, the ongoing operating cost is zero.

Northern communities are accustomed to large diesel tanks with fuel delivery once per year, and using fuel from the tanks all year around. A large scale solar thermal system with big and very well insulated storage tanks allows the harvest of abundant summer solar energy which can also be stored for year ▶

round usage. Now the sun is the fuel delivery vehicle coming very reliably every summer, providing clean energy free of charge. Drake Landing Solar Community in Alberta, Canada has an operating example of such a long term storage system for solar thermal energy. There are over 100 others in operation across Europe. Conceptually, a solar thermal system with seasonal heat storage of sufficient size can meet all of the heat energy needs of a northern community.

Wind power has yet to build a track record of being able to withstand Arctic conditions, but it is starting to. For electricity, after the summer solar photovoltaic potential has been exhausted, a combination of solar system with battery storage plus wind power can provide most of the communities' needs, with a diesel back-up system. In Antarctica, a harsher environment than the Arctic, the Princess Elisabeth Station has been operating since 2004 purely on solar and wind power.

With the onset of electric vehicles (EV) there is now significant development in battery storage systems. Utility scale battery systems are being introduced, and northern communities will be able to benefit from clean and quiet electricity storage in battery systems, which can at least bridge the daily variations of solar power, and start to reduce the seasonal impacts. The community of Colville Lake, Northwest Territories is set to receive such a utility battery system in 2015. It is expected that the combination of a solar system with battery storage will greatly reduce diesel usage in summer.

Ultimately, electric vehicles will also become a preferred choice for Northern communities, once clean and renewable energy is available. We operated two electric cars through last winter, when the Arctic vortex brought Arctic winters to Ontario. Both EVs did well, with reduced range. The Arctic Energy Alliance is now starting to operate one EV in Yellowknife, and will generate real life experience with an EV under Northern conditions. ○

ENERGY

Towards a sustainable future

The remote northern village of Kongiganak, Alaska found itself in a potentially life-threatening predicament when the winter barge carrying the village's winter fuel supply got stuck in the ice due to an early freeze up in October 2014. SANTINA GAY and RODERICK PHILLIPS say the incident underscores how important it is for the village to continue to be proactive in using alternative energy to lessen its dependence on fossil fuels.

KONGIGANAK IS A SMALL VILLAGE of just over 400 people hundreds of kilometres east of Anchorage at the mouth of the Kuskokwim River. When the winter fuel shipment from Northstar Gas became icebound, community members rallied and headed out in their small aluminum fishing boats to create a path for the fuel barge. After several days of chipping away ice that was often three inches thick, the barge finally made it to the pumping station to deliver and secure the village's supply of heating fuel and gasoline.

The village sits on coastal tundra, connected to a beautiful labyrinth of lakes, rivers, and streams. A boardwalk runs along the Kongiganak River

FOR ALASKAN NATIVES, HARVESTING AND EATING SUBSISTENCE FOODS IS ESSENTIAL TO PERSONAL, SOCIAL, AND CULTURAL IDENTITY

and through the community, making it easy to get around quickly by foot or ATV. Like many Alaska Native Villages, Kongiganak is a fly- or boat-in only community. Access is primarily through small aircraft which greatly inhibits frequency, duration, and ability to get in and out. Weather and increased risk factors also have a major effect on travel within Alaska.

The cost of living for items like groceries, fuel and energy can be five times higher than those in urban areas. This extreme cost paired with poverty and high unemployment makes maintaining a life in rural Alaska much more difficult than in a city. This is why it is very important for the villages to harvest from the land and waters throughout the year to secure their winter food supply.

Kongiganak has built a robust environmental program that protects the living lands, waters, and air. The importance of subsistence foods is vital to the Native Village of Kongiganak. For Alaskan Natives, harvesting and eating subsistence foods is essential to personal, social, and cultural identity. For this reason, we need to do all we can to preserve

Photo: Cayce, Flickr.com, Creative Commons



*Windturbines,
Kongiganak,
Alaska*

our land and keep our land, water, and air contaminant free so our ecosystem will keep producing subsistence foods for future generations.

Kongiganak has five, 95 kilowatt Windmatic wind turbines that have been in place since 2013. The turbines now heat 20 homes and a laundromat in the village. Diesel fuel savings already stand at 33,000 gallons annually. The priorities

for the wind turbine energy are to lower diesel engine use; heat the boiler in the power plant and heat 20 homes through electronic thermal stoves (ETS). The Tribal Government has also partnered with three other villages – Kwigillingok, Tuntutuliak, and Kipnuk – to create Chaninik Wind Group (CWG) in 2005. Their goal was to install wind turbines to lower the cost of energy (heat and electricity).

The wind turbine project was completed in December 2012 with oil stoves off and thermal stoves on in 20 residential homes. The average price is \$0.65/kilowatt.

When the winds are blowing, the power plant is only burning five gallons per hour (gph)

compared to 13-15/gph when the wind is not blowing. The boiler acts like a shock absorber for the wind gust which creates a boost of energy to the power plant and keeps the generator engines at stable revolutions per minute (rpm).

The coolant from the boiler also keeps the engines warm enough to run at a minimum rpm. Once this is achieved at the power plant, extra energy goes to the electronic thermal stoves (ETS) which provide enough heat to keep entire houses warm and allows the homeowners to turn off their oil stoves. The cost of electricity for the ETS units is \$0.10/kw which is equivalent to \$2.90/gallon of diesel heating fuel. The cost of diesel heating fuel in Kongiganak is \$6.91/gallon at the gas station.

The Tribal government of Kongiganak's strides in alternative energy are putting the small fishing community on the cutting edge of community-led climate resiliency efforts in Alaska. ○

RODERICK PHILLIP, is the Environmental Director of the Tribal government of Kongiganak, Alaska.

SANTINA GAY is the Alaska Tribal Coordinator with the US Environmental Protection Agency

Opportunities, Challenges,

The U.S. State Department, which represents the United States on the Arctic Council, has established priorities for the U.S. Chair including climate change impacts in the Arctic, stewardship of the Arctic Ocean, and improving Arctic economic and living conditions. Here, **JOHN WALSH** and **LARRY HINZMAN** highlight several topics under these themes that can galvanize research communities within the United States and other nations during the coming U.S. Chair period.

ADAPTATION AND RESILIENCE TO ARCTIC CLIMATE CHANGE

Mitigation activities such as reduced emissions have the potential to alter the trajectory of Arctic climate change in the latter decades of the present century. However, some changes are already “locked” in the evolving climate system, making adaptation a crucial element for dealing with climate change over the next few decades. And despite increasing awareness of their importance, climate change adaptations, in the U.S. Arctic (Alaska) and other Arctic regions have to date been dominated by planning and monitoring, rather than implementation. The identification of adaptation options for northern regions is the objective of an existing, ongoing Arctic Council assessment (“Adaptation Actions for a Changing Arctic”). With this report scheduled for release in 2017, the facilitation of adaptation actions and resilience can be one of the signature activities of the U.S. Chair of the Arctic Council.

HIGH-LATITUDE OCEAN ACIDIFICATION

The global ocean is 25 % more acidic today than it was 300 years ago, a change traceable to increasing levels of

atmospheric CO₂. The Arctic Ocean and Subarctic seas are especially vulnerable to increasing ocean acidity because of their large shallow shelf seas, cold water, and high rates of productivity. Acidification is a threat to Subarctic fisheries, including the Bering Sea, with major socioeconomic consequences. However, large uncertainties pervade our understanding and prediction of the rate of high-latitude ocean acidification, as well as its geographical distribution. Monitoring of ocean acidity in the Arctic has largely been done through occa-

CLIMATE CHANGE ADAPTATIONS, IN THE U.S. ARCTIC (ALASKA) AND OTHER ARCTIC REGIONS HAVE TO DATE BEEN DOMINATED BY PLANNING AND MONITORING, RATHER THAN IMPLEMENTATION

sional cruises (mostly during the warm season) and just a few buoys, while the modeling of variations in ocean acidification remains in its infancy. With a heightened global awareness of the threats posed by ocean acidification, the next few years present an opportunity for significant progress in understanding and predicting ocean acidification in the Arctic. Chairing the Arctic Council can serve as a catalyst for coordinated and systematic monitoring (by cruises, buoys, sub-ice sampling, and emerging technologies, such as underwater autonomous vehicles) of high-latitude water acidification. Analysis of the collected data can improve understanding of Arctic water sensitivity to CO₂ uptake and acidification, and in turn inform the development of predictive models, enabling planning and adaptation by industry and coastal communities. The Arctic Council’s Arctic Monitoring and Assessment Programme can also play an important role in the assessment of high-latitude ocean acidification.

ARCTIC INDICATORS NETWORK AND EARLY INDICATORS WARNING SYSTEM FOR THE ARCTIC

It is well known that recent global

Responsibilities

changes have been amplified in the Arctic. However, the Arctic is a complex system, and change will not manifest at similar rates within all components. Present monitoring of the Arctic is characterized by a reliance on remote sensing and sparse networks of *in situ* measurements, unevenly distributed among system components. A holistic picture of Arctic change requires that we define, implement, and maintain a more comprehensive and robust set of Arctic indicators. These indicators, highlighting the most imminent risks and thereby informing priorities for planning and adaptation activities, must span the physical, social, and economic components of the Arctic system. Physical indicators for the Arctic can build upon the monitoring activities of NOAA and NASA, and can augment the set of essential climate variables already identified to guide the Global Climate Observing System. Socioeconomic indicators, including land use, infrastructure, and measures of human well-being, have heretofore been generally uncoordinated internationally, inconsistently structured, and poorly (or not at all) integrated with physical indicators. Such integration represents an interdisciplinary challenge but also an outstanding opportunity for the period of the U.S. Chair.

FRESHWATER SECURITY

Though the Arctic may appear a very wet area with ample water resources, the availability of freshwater is quite limited. Annual precipitation over the entire U.S. Arctic is less than that of any western U.S. state, including Wyoming

and Arizona. Limited water availability is further constrained by the Arctic's long winters, when surface water is bound up as ice or snow, and access to groundwater is limited by permafrost. Such restrictions place severe constraints on communities and industry. Villages in northern Alaska typically harvest water from small streams or lakes during the summer months and attempt to store adequate volumes to sustain the community for the nine or more winter months. Further, the extremely harsh climate greatly complicates the handling and processing of waste water, requiring large investments of capital, energy, and time. The strict limits and great costs associated with both obtaining clean water and eliminating waste water present serious challenges to family health and sanitation.

PUBLIC OUTREACH

The U. S. Chair of the Arctic Council comes at a unique time in the evolution of public awareness of Arctic change. The rapidity of recent changes at high latitudes creates an urgent need for greater public understanding of the Arctic, especially as the Arctic acts as a sentinel for broader global change. The potential change in global sea level as a result of a warming Arctic is an obvious example. The recent emergence of potential links between Arctic warming and extremes in mid-latitude weather and climate has also received recent media attention – often with conflicting interpretations about the Arctic's role. Accurately conveying the evolving state of scientific knowledge about Arc-

tic mid-latitude weather connections represents a challenge for the scientific community, as well as a tremendous opportunity to stimulate the broader public's interest in the Arctic.

CLOSING PERSPECTIVE

Policy leadership is essential. The Arctic is changing rapidly with regard to global access, resources, and exploitation. Improved scientific understanding of the Arctic environment will enable the international community to develop sound policies for the region's use and sustainability, including the protection of its pristine environment, small populations of wildlife, fragile ecosystems, and sensitive communities of Indigenous peoples. This U.S. chair brings prestige and opportunities for U.S. interests, while also carrying a responsibility to balance development and environmental protection. ○

LARRY HINZMAN is the Director of the International Arctic Research Center at the University of Alaska Fairbanks. He is also chief scientist for the U.S. Department of Energy's Next Generation Ecosystem Experiments (NGEE-Arctic)



DR. JOHN WALSH is the Chief Scientist of the International Research Center at the University of Alaska, Fairbanks. His research has addressed arctic climate weather variability, with an emphasis on sea ice variability and the role of sea ice and snow cover in weather and climate.



For people and the environment

Climate change means life change in the Arctic. **ERIK SIVERTSEN** says the coming COP 21 (Conference of the Parties to the United Nations Framework Convention on Climate Change) meeting in Paris in 2015 will be an opportunity for the incoming US Chairmanship of the Arctic Council to send a strong message about the changes we are witnessing and the consequences of climate change in the Arctic.

HUMANKIND FACES unprecedented challenges and opportunities from climate and environmental change, shifting economic conditions,

food and water security, energy and socioeconomic development, national security, and changes in population and demographics. While these trends are global in character, they disproportionately

affect the Arctic region, which provides major challenges as well as new socioeconomic development opportunities. Climate change makes the Arctic more accessible and integrated within the global economy, with extensive socioeconomic implications.

As Arctic parliamentarians, we are committed to stay focused on the situation of people living in the Arctic, who are experiencing the changes first hand. In building on the knowledge and experiences of the people in the Arctic, we can shape a sustainable future both for them and the environment. We must develop diversified economies in the Arctic to build sustainable societies, and work together to develop better knowl-

edge about the effects of climate change in the Arctic. We have to remember that the Arctic is not just one place. In the Arctic, each place differs a lot from the next.

Governing the Arctic is not only an international or national concern – it is first and foremost a concern for the inhabitants of the north. We cannot, and do not wish to, dictate how the different countries in the Arctic govern their land. They are all sover-

eign nations. But we can promote the exchange of good practices. There are a lot of good examples. We will keep on encouraging governments, companies and others who operate in the Arctic to continue to explore new ways of involving local and regional stakeholders in all decision making processes.

INNOVATION AND EDUCATION

Developing natural resources involves additional risks to the local environment and to the societies concerned. For the local people to accept this risk as worthwhile, they need to be able to see the benefits from the activity. Thus, strong partnerships between Arctic communities, business and governments are crucial.

We call for broader cooperation between the Arctic states to enable local residents to make use of new opportunities in the Arctic. As many of the challenges and opportunities facing the peoples of the Arctic are similar, we should address innovative capacity building and economic development together.

This is why the US should put innovation on the agenda for Arctic cooperation. The Arctic parliamentarians propose establishing an Arctic innovation system linking the scientific community, the business sector, political society and

MANY COMMUNITIES IN THE ARCTIC STRUGGLE WITH INCREASED COSTS OF LIVING AND THE HIGH PRICE OF ENERGY. THE US CHAIRMANSHIP SHOULD ADDRESS HOW WE CAN SHARE AND UTILIZE EXISTING TECHNOLOGIES AND AFFORDABLE ENERGY GENERATION.

ERIK SIVERTSEN



is a Labour Party member of Norway's parliament

and chair of the Standing Committee of Arctic Parliamentarians.



Makenzie Phillip with her catch during a spring seal hunt

fish stocks further north, and enhanced tourism opportunities all result in a need for considerable infrastructure investments in the Arctic. Increased maritime activities lead to increased demand for search and rescue services, ports, navigational aids, adequate charts, etc., which may come into place faster, better and less costly if all Arctic nations pull their resources together. Enhanced Arctic cooperation when developing infrastructure will also improve the possibilities for travelling east-west in the North, and not only north-south.

A connected topic is the cost of living in the Arctic. Many communities in the Arctic struggle with increased costs of living and the high price of energy. The US Chairmanship should address how we can share and utilize existing technologies and affordable energy generation. We should look at how deployment practices, particularly

Photo: Roderick Phillip

local populations, for instance through an Arctic mentorship and mobility program.

We strongly recommend strengthening and expanding student exchange programs as a way to increase knowledge sharing and build capacity. Student exchanges strengthen the northern identity and shared community of the students, who share and learn new skills which are directly relevant for their further studies and work in their home community.

The innovation taking place in Arctic Indigenous societies to strengthen

their adaptive capacity to change are important contributions to added value. Initiatives such as the Arctic Indigenous Peoples' Culinary Institute and the Arctic Council Indigenous Youth Engagement Leadership Program need to be supported and further developed. It is vital that capacity development is rooted in and relevant for the people living in the region itself.

INFRASTRUCTURE AND ENERGY

Increase in polar shipping, greater access to natural resources, shifting of

in remote communities, can reduce the cost of energy, reduce carbon emissions, support infrastructure development, and contribute to the well-being of residents of the Arctic. New innovative solutions in this area would be valuable contributions in the global effort to reduce black carbon emissions.

The 11th Conference of Parliamentarians of the Arctic Region took place in Whitehorse 9-11 September 2014. The proposals presented in this article and more can be found in the Conference Statement from the conference. ○

THE PICTURE

Old mystery solved



Photo: Parks Canada

This sonar generated image shows the wreck of HMS Erebus on the ocean floor of the coast of King William Island, Nunavut, Canada. The combination of state-of-the-art technology with 19th century Inuit oral testimony led to the discovery of one of the two ships from the English explorer Sir John Franklin's ill-fated 1845 arctic voyage. All the 129 expedition members perished. In 2014, the Victoria Strait Expedition led by Parks Canada solved the mystery of the ship's location. (Source: Parks Canada)



Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

www.panda.org/arctic