ArcticNet

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13 | 14

ANNUAL REPORT

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RAPPORT ANNUEL

NCE RCE
Networks of Centres of Excellence of Canada | Réseaux de centres d'excellence du Canada

13 | 14
ANNUAL REPORT
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RAPPORT ANNUEL

ArcticNet is hosted at Université Laval, Quebec City, Canada.

ArcticNet is funded by the Government of Canada through the Networks of Centres of Excellence program, a joint initiative of the Natural Sciences and Engineering Research Council, the Canadian Institutes of Health Research, the Social Sciences and Humanities Research Council and Industry Canada.

The Networks of Centres of Excellence are unique partnerships among universities, industry, government and not-for-profit organizations aimed at turning Canadian research and entrepreneurial talent into economic and social benefits for all Canadians. An integral part of the federal government's Innovation Strategy, these nation-wide, multidisciplinary and multisectorial research partnerships connect excellent research with industrial know-how and strategic investment.

The ArcticNet Network of Centres of Excellence was incorporated as a not-for-profit corporation under the name "ArcticNet Inc." in December 2003.

Canada

ECOSYSTEMS

INTERNATIONAL

EDUCATION

DEVELOPMENT

STUDENTS

INUIT

FIELD

SCIENCE

IMPACTS

STRATEGY

CHANGES

ARCTIC

POLICY

RESEARCH

COMMUNITIES

HEALTH

ENVIRONMENT

ICE

COASTAL

KNOWLEDGE

AMUNDSEN

MARINE

TOGETHER IN THE STUDY OF A CHANGING CANADIAN ARCTIC

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TRAVAILLER ENSEMBLE À L'ÉTUDE DE L'ARCTIQUE CANADIEN DE DEMAIN

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CORPORATE PROFILE

Understanding the transformation of the Arctic environment is one of the great challenges faced by Canadians, the Canadian government and the national and international scientific communities.

ArcticNet brings together scientists and other experts in the natural, human health and social sciences with their partners in Inuit organizations, northern communities, governments and the private sector to help Canadians prepare for the impacts and opportunities brought by climate change and modernization in the Arctic. Over 140 researchers and 1000 graduate students, postdoctoral fellows, research associates, technicians and other specialists from 29 Canadian universities and numerous federal, provincial and regional departments and agencies collaborate on 38 ArcticNet research projects with over 150 partner organizations from 14 countries.

150+
Partner organizations

14
Countries

140
Network Investigators

1000+
Graduate students, postdoctoral fellows, research associates, technicians and other specialists

29
Canadian universities

38
Research projects

2013-2014
Corporate Profile

OUR VISION

A future where knowledge exchange, monitoring, modelling and capacity building will have enabled scientists, Northerners and decision makers to jointly attenuate the negative impacts and maximize the positive outcomes of the transformation of the Canadian Arctic.

OUR MISSION

- Build synergy among Centres of Excellence in the natural, human health and social arctic sciences.
- Involve Northerners, government and the private sector in the steering of the Network and scientific process through bilateral exchange of knowledge, training and technology.
- Increase and update the observational basis needed to address the ecosystem-level questions raised by climate change and modernization in the Arctic.
- Provide academic researchers and their national and international collaborators with stable access to the coastal Canadian Arctic.
- Consolidate national and international collaborations in the study of the Canadian Arctic.
- Contribute to the training of the next generation of experts, from north and south, needed to study, model and ensure the stewardship of the changing Canadian Arctic.
- Translate our growing understanding of the changing Arctic into regional impact assessments, national policies and adaptation strategies.

2013-2014
Message from the Chair of the Board,
Scientific Director and Executive Director

MESSAGE FROM THE CHAIR OF THE BOARD, SCIENTIFIC DIRECTOR AND EXECUTIVE DIRECTOR

A TIME OF UNCERTAINTY AND PROMISES

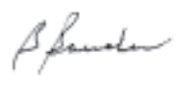
From Knowledge to Action, the theme of the IPY closing meeting in 2012 in Montréal, perfectly reflected the raison d'être of ArcticNet. In 10 years of operation, the Network has transformed the way research is conducted in the Canadian Arctic by engaging Inuit and other stakeholders in defining the research; by creating synergy among the natural, social and health sciences; by training the next generation of Arctic specialists in a unique transectoral context; by consolidating international collaborations; by providing its Network Investigators and their collaborators with unprecedented access to the Canadian Arctic; and by implementing an Integrated Regional Impact Study (IRIS) framework that truly informs decision and policy. From Inuit communities redesigning their infrastructure according to our permafrost maps to the Arctic Council emulating the IRIS framework for their upcoming Adaptation Actions for a Changing Arctic (AACA) assessment, from national energy regulators and shipping companies using our seafloor data to Arctic countries solving territorial disputes along the lines proposed by our geopolitical experts, from informing Inuit on health issues to working with northern communities to improve education, ArcticNet is truly moving knowledge into action.

By 2017-2018, ArcticNet's funding and mandate under the Network of Centres of Excellence program will be completed. Yet new environmental and socio-economic issues will keep emerging at an increasing rate as the warming and development of the Canadian North continues to accelerate. Thus, there is increasing pressure to consolidate the spectacular advances made by ArcticNet by morphing the Network into a stronger and permanent alliance encompassing Canada's northern expertise. More than ever, Canada needs a truly national Arctic research institute of international calibre to help implement its Northern Strategy and to coordinate the activities of the research community that will exploit existing and new Arctic research infrastructure such as the numerous northern research institutes, the Polar Continental Shelf Program, the CCGS *Amundsen*, the Canadian High Arctic Research Station and the polar icebreaker *Diefenbaker.* As early as 2009, a strategy to achieve this goal was outlined by the academic community at a meeting in Montréal. The plan built on existing strengths and infrastructure and took into account the immense geographical expanse of the country. The envisioned institute will be made up of hubs distributed among leading Arctic research universities located across Canada in Newfoundland, Quebec, Ontario, Manitoba, Alberta and British Columbia, each contributing their own world renowned northern research expertise and networks. Regionally, each of these hubs will liaise with other universities and existing northern institutes in their province or region.

Already, some of the hubs are making significant progress towards consolidating and expanding their northern research capacity into full components of a future Canadian Arctic Research Institute. The University of Manitoba has recently built a 10,000 m^2 addition to the Wallace building to house the Centre for Earth Observation Science and the Nellie Cournoyea Arctic Research Facility, complete with state-of-the-art scientific research laboratories. At Université Laval, the project for an Institut nordique du Québec, a major research complex with branches in several universities and northern research centres, has been included in the provincial budget. Memorial University recently launched Cold Ocean and Arctic Science, Technology, and Society (COASTS), a university-wide initiative that seeks to position Memorial as a world leader in Cold Ocean and Arctic-related research and innovation across all disciplines.

Needless to say, this academic-led institute will maintain and expand collaborations with northern partners, academia, industry and internationally. In particular, the institute will make sure that all Canadian universities with a northern focus develop strong collaborations with government-led organisations such as CHARS that will play an increasing role in mobilising the Canadian Arctic research community.

Although much work and uncertainty lay ahead, the project for an academic-based pan-Canadian Arctic Research Institute is gaining momentum. For the newly trained generation of Arctic specialists in the natural, health and social sciences, this may be the most promising avenue to maintain the scientific excellence, collaborations, spirit and fun of the ArcticNet adventure.



Mr. Bernie Boucher,
Chair of the Board
of Directors

Dr. Martin Fortier,
Executive Director,
Vice-President and COO

Dr. Louis Fortier,
Scientific Director,
President and CEO

MESSAGE FROM THE CO-CHAIR OF THE BOARD

The Arctic is no longer emerging as a globally important region. The Arctic has emerged. No longer is climate change the driving force for Arctic decision making, the climate has changed. Today global commodity prices for natural resources are the variables influencing research directions, policy and decision making. This new reality and understanding is crucial for Inuit if we are to have a say in the future of Inuit Nunaat. The Arctic and its peoples have proved the value of their engagement and the knowledge they bring to the table and are now central to many global environmental and economic decisions – this must be true in Canada as well.

For the last two decades, the essential role the Arctic plays on the global stage has been a focal point in media and at negotiating tables all over the world. This has provided Inuit, at times, the opportunity to underscore the importance of evidence based decision making and the need to use the best knowledge available. To go slow and make decisions which will enhance the future of the Arctic and its peoples rather than erode it. The understood significance of western and Inuit knowledge related to environmental change, social and economic change, and human well-being in the Arctic is a critical step toward an improved understanding of how best to respond, adapt, mitigate and yes, take advantage of the changing Arctic for Inuit communities, the Canadian environment, economy and broader global interests. Over the life of the Network, we have observed the broadened scope, outreach and awareness to the other Inuit regions in Greenland, Alaska and Chukotka by ArcticNet. As ArcticNet moves towards the final years of funding, the experience and knowledge gained both by researchers and Inuit will be employed to design, facilitate and partner in this new Arctic. Our hope is partnerships with communities will continue to grow and that ArcticNet knowledge will be used responsibly and effectively. Research developments will inform the operation of the Canadian High Arctic Research Station (CHARS), and create stronger Arctic colleges, training facilities and programs that ensure Inuit are more directly involved in the acquisition and use of knowledge.

A central feature of the program's partnership with Inuit has been the creation of and continued development of the Inuit Research Advisor (IRA) positions in each Inuit region. This long term commitment to building Inuit capacity to inform and participate in the research process is invaluable. The IRAs are central to increasing research capacity and successful partnerships between Inuit communities and regions and research projects within the ArcticNet program and are the future of Canadian Arctic research capacity. The IRA Training Fund was established to enhance skills and training of the IRAs and this year's investment has yielded a collective success in leadership development. IRAs are now assuming more leadership roles and are all chairing regional, program, and/or national committees.

2013-2014
Message from the
Co-Chair of the Board

This year has also seen important efforts come to fruition regionally. The Sustainable Communities Initiative project in Nunatsiavut was awarded an Arctic Inspiration Prize this past December. The prize will sustain and augment this impressive community based and Inuit led project to address a number of community priorities in the region including housing, mental wellness, health, and intergenerational transfer of traditional knowledge. An equally important contribution has been NTI's critical review and assessment of how health projects can better include Inuit and improve the outcomes and impacts of the Inuit Health Survey, "… the expectation for the future conduct of research in our communities, both as a means of ensuring that researchers and research institutions uphold their ethical responsibilities to Inuit and communities and in order to facilitate the use of research by advocates and policy-makers." (2011-2013 Annual Report on the State of Inuit Culture and Society, Nunavut Tunngavik Inc.)

Working in partnership with ArcticNet, the Inuit Qaujisarvingat/Inuit Knowledge Centre (IQ) has continued to develop its collaborative networks to identify projects that will respond appropriately to the needs and interests of both Inuit and ArcticNet stakeholders. Other work that ArcticNet has contributed to includes efforts to streamline the "research partner/support request" process by developing and implementing a Research Request system. Progress continues on a project focused on developing information technology infrastructure to support the overarching goal of making Inuit knowledge more accessible to science/policy-makers and making science/policy resources more accessible to Inuit and their representative organizations.

Within the circumpolar and international context, the first half of the Canadian chairmanship of the Arctic Council has brought attention to several issues of importance to Inuit. One such activity is to better understand through an initiative carried out by the Sustainable Development Working Group (SDWG) how traditional knowledge can be operationalized through the Arctic Council. ICC along with representatives from all of the Permanent Participant organizations have been working together to develop the foundations upon which Traditional Knowledge should be applied within the work of the Arctic Council.

ICC has been preparing for the quadrennial General Assembly to take place in Inuvik in July 2014, with the theme "One Arctic One Future" at which Inuit delegates from Russia, US, Canada and Greenland will discuss and determine the priorities and focus of work for the period 2014-2018. This is also the time that Canada will host the ICC Chairmanship and we welcome the appointment of Okalik Eegeesiak as ICC Chair. The Arctic's role in the global economy, the fate and future of the wide range of Arctic biodiversity, the sustainable future of Arctic communities and the health and wellbeing of Inuit will be central to discussions. The wealth of Inuit knowledge and ArcticNet research will inform these discussions not only for Canada but for Inuit from all four circumpolar regions.

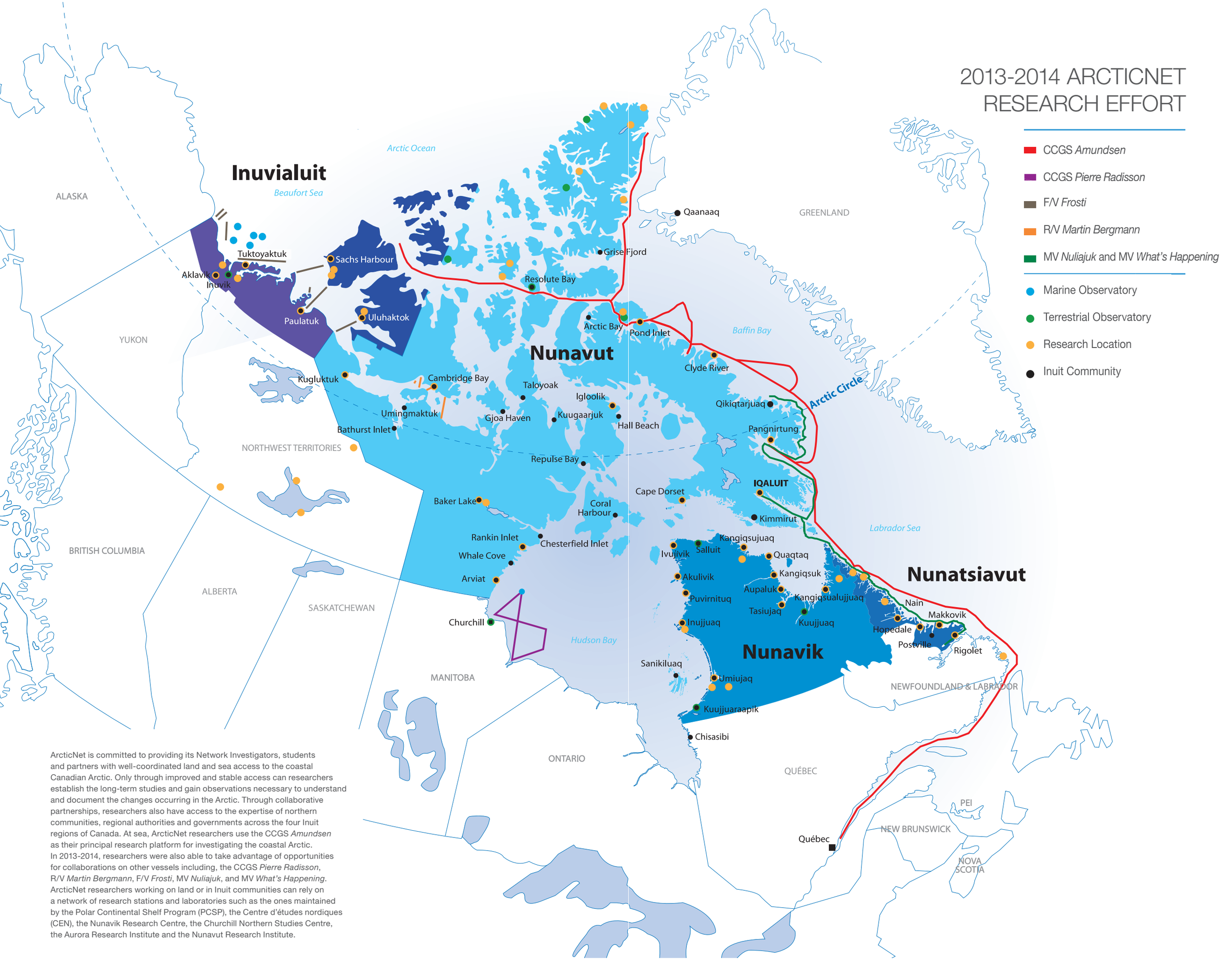
Inuit have equally ambitious plans to continue directing Arctic research as ArcticNet considers its own legacy once the NCE funding has concluded. Inuit research capacity established through the Network will continue to flourish within our international, national, and regional organizations - and at the heart of our efforts, our communities.

At each ArcticNet Annual Scientific Meeting the presence and engagement of Inuit grows. The ASM2013 in Halifax, NS reflected this growing capacity through the largest Inuit participation to date, with a strong Inuit Advisory Committee presence and participation at the IRIS 3 open meeting. We look forward to a similar enthusiasm and presence at the international Arctic Change 2014 conference where it will be reflected that the mutual collaborations between scientists and Inuit have complemented and provided understanding of Arctic issues to everyone's benefit.

Mr. Duane Smith, Co-Chair of the Board of Directors
and President of the Inuit Circumpolar Council (Canada)

RESEARCH AND MONITORING

2013-2014 ARCTICNET RESEARCH EFFORT



ArcticNet is committed to providing its Network Investigators, students and partners with well-coordinated land and sea access to the coastal Canadian Arctic. Only through improved and stable access can researchers establish the long-term studies and gain observations necessary to understand and document the changes occurring in the Arctic. Through collaborative partnerships, researchers also have access to the expertise of northern communities, regional authorities and governments across the four Inuit regions of Canada. At sea, ArcticNet researchers use the CCGS *Amundsen* as their principal research platform for investigating the coastal Arctic. In 2013-2014, researchers were also able to take advantage of opportunities for collaborations on other vessels including, the CCGS *Pierre Radisson*, R/V *Martin Bergmann*, F/V *Frosti*, MV *Nuliajuk*, and MV *What's Happening*. ArcticNet researchers working on land or in Inuit communities can rely on a network of research stations and laboratories such as the ones maintained by the Polar Continental Shelf Program (PCSP), the Centre d'études nordiques (CEN), the Nunavik Research Centre, the Churchill Northern Studies Centre, the Aurora Research Institute and the Nunavut Research Institute.

ArcticNet's research program continues to support a multidisciplinary approach to address the challenges facing the coastal Canadian Arctic, with the objective of filling identified knowledge gaps to help the formulation and implementation of policies and adaptation strategies. ArcticNet addresses the present state of the coastal Canadian Arctic, and aims to anticipate the nature and magnitude of the impacts of climate change and modernization at the regional level over the coming 40 years.

Helping Canadians, particularly Inuit and other Northerners living in the coastal communities of the Canadian Arctic, adapt to their changing environment is at the core of the Network's research program. Diverse research teams from 29 universities across Canada, collaborate with stakeholders from Inuit organizations, northern communities, research institutes, industry as well as government and international agencies, creating a unique multi-disciplinary and cross-sectorial environment for managing the Canadian Arctic of tomorrow.

The Network's 38 research projects focus on five main themes: marine systems; terrestrial systems; Inuit health, education and adaptation; northern policy and development and knowledge transfer and operate across northern Manitoba, northern Yukon and the four Inuit regions of Canada: the Inuvialuit Settlement Region, Nunavut, Nunavik and Nunatsiavut.

2 ArcticNet Network Investigators hold Canada Excellence Research Chairs

20+ ArcticNet Network Investigators hold Research Chairs

ARCTICNET IRISES

ArcticNet's 38 research projects also contribute to four Integrated Regional Impact Studies (IRISes) that each underpin an Integrated Regional Impact Assessment (IRIA). Along with the results of other Arctic research programs and assessments, and the expertise of the Network's partners, the scientific conclusions and recommendations produced by ArcticNet projects are compiled in the Assessments developed for each region. As most ArcticNet projects operate across the Canadian Arctic, many contribute to several of the four Assessments.

IRIS 1:
WESTERN AND CENTRAL ARCTIC

Leader: Gary Stern, University of Manitoba
Coordinator: Ashley Gaden

IRIS 2:
EASTERN ARCTIC

Leader: Trevor Bell, Memorial University of Newfoundland
Coordinator: Philippe Leblanc
(until June 2013), Kathleen Parewick

IRIS 3:
HUDSON BAY

Leader: David Barber, University of Manitoba
Coordinator: Brian Horton

IRIS 4:
EASTERN SUBARCTIC

Leader: Michel Allard, Université Laval
Coordinator: Mickaël Lemay

MARINE SYSTEMS

In 2013-2014 ArcticNet researchers used the CCGS *Amundsen* as their primary platform for conducting marine sampling and monitoring activities. Research conducted from several other vessels, as well as community-based research programs and remote survey and sensing techniques complimented this effort that extended from the coast of Labrador to northern Baffin Bay, throughout the Northwest Passage, into Hudson Bay and all the way to collaborative field campaigns in Greenland.

With a suite of state-of-the-art scientific sampling equipment, the *Amundsen* collected data from the seafloor to the ocean-atmosphere boundary and into the upper atmosphere. Mapping of bathymetry and seafloor sediments using the *Amundsen*'s multibeam sonar and sub-bottom profiling systems was conducted in support of ROV dives on deep water coral sites off of Baffin Island, to delineate fish habitats, and to trace past ice stream activity in Parry Channel. Examination of the myriad physical, biogeochemical and biological processes affecting the exchange of carbon dioxide across the air-ocean interface, and the probing of the Arctic atmosphere using radiosondes, ceilometers, and cameras provided new insight into the dynamics of greenhouse gases and the factors affecting atmosphere-ocean interactions.

In an effort to further understand changing sea ice regimes, remote sensing and physical sampling techniques were employed and data from ice buoys was collected in order to measure internal sea ice stresses, ice movement and air and ocean temperatures. The University of Manitoba's Sea Ice Environmental Research Facility, the first experimental sea ice facility in Canada, enabled ArcticNet's researchers to measure and monitor a wide range of physical, chemical and biological properties of sea ice, snow and sea water, by replicating conditions found in the Arctic.

Intensive investigations by ship, ROV, AUV, glider, and profiling float, as well as water column and benthic sampling, shed new light on biological productivity, fish populations and mercury concentrations in the food web in Canadian Arctic waters. Tissue samples, photographs, and aerial survey data were collected to determine population dynamics, and changes in environmental and ecological conditions for seals, beluga whales, bowhead whales, killer whales, and polar bears.

REMOTE SENSING OF CANADA'S NEW ARCTIC FRONTIER

Project Leader: Marcel Babin (Université Laval)

The objectives of this project are aligned with those of the Canada Excellence Research Chair on "Remote Sensing of Canada's New Arctic Frontier" to: (1) Augment the observation of arctic marine ecosystems by implementing new algorithms for remote-sensing; (2) Develop, validate, and implement the ecosystem models that will help anticipate the impacts of climate change and industrialization on Arctic resources and services; (3) Adapt new observing technologies to the extreme conditions of the Arctic Ocean; (4) Mesh the expertise of ArcticNet and project partners into the development of state-of-the-art geo-referenced data archiving systems.

SEA ICE, CLIMATE CHANGE AND THE MARINE ECOSYSTEM

Project Leader: David Barber (University of Manitoba)

The arctic system is changing from one dominated by multiyear sea ice to one dominated by first-year sea ice-related processes. In the next few decades, marine ecosystems will come under incremental pressure, industrial activity will increase as more exploration and development occurs, and Inuit will find it more and more challenging to use sea ice for cultural and subsistence purposes. This project provides sea ice expertise to the coordinated ArcticNet Integrated Regional Impact Studies of the coastal Canadian Arctic, supplying the required information for sound management of these issues.

FRESHWATER-MARINE COUPLING IN HUDSON BAY

Project Leaders: David Barber (University of Manitoba) and Kevin Sydor (Manitoba Hydro)

Climate models predict warming in the Hudson Bay watershed that may alter the amount and timing of runoff and therefore the load of suspended solids, dissolved organic matter, nutrients, and heat delivered to the Bay. The overarching objective of this project is to describe the impact of such runoff on marine processes within Hudson Bay and to examine the cumulative impacts of climate change and hydroelectric development on these processes.

IMPACTS OF GLOBAL WARMING ON ARCTIC MARINE MAMMALS

Project Leader: Steven Ferguson (University of Manitoba / Fisheries and Oceans Canada)

Knowing how polar ecosystems may change with global warming will help develop strategies for conservation and species management. It is important to recognize the changing distribution and numbers of Arctic mammals, as Northerners depend on these species as a food source and integral part of their unique culture. This project examines climate change and its effects on water-based mammals in the Arctic. Research results will help Inuit communities adapt to changes in marine mammal distribution and abundance.

THE ARCTIC COD (*BOREOGADUS SAIDA*) ECOSYSTEM UNDER THE DOUBLE PRESSURE OF CLIMATE CHANGE AND INDUSTRIALIZATION

Project Leader: Louis Fortier (Université Laval)

The Arctic cod is a key component of the Arctic Ocean pelagic ecosystem that effects up to 75% of the energy transfer between the plankton and the vertebrate fauna. Well adapted to life in ice-covered seas, Arctic cod is likely to be displaced by southern generalists (capelin, sand lance) as the ice regime becomes less severe. This project collaborates closely with other ArcticNet marine research projects to map the distribution and reproduction of Arctic cod in the Canadian Arctic, and to measure variations in its early life history in relation to changes in ice regime, surface temperature, and zooplankton abundance.

LONG-TERM MARINE OBSERVATORIES IN THE CANADIAN ARCTIC

Project Leader: Yves Gratton (Institut national de la recherche scientifique - Eau, Terre et Environnement)

This project correlates sub-surface ocean properties recorded by ArcticNet moored instruments to satellite records of surface temperature, chlorophyll, suspended sediments and sea ice type and thermodynamic state. The objectives are 1) to provide long-term detailed observations of the ocean-sea ice-atmosphere coupling in the Canadian High Arctic, 2) to identify the oceanic/atmospheric processes underlying changes in these variables, and 3) to provide baseline physical information required to understand the complexities of physical-biological coupling in the Arctic marine environment.

THE CANADIAN ARCTIC SEABED: NAVIGATION AND RESOURCE MAPPING

Project Leader: John Hughes Clarke (University of New Brunswick)

This project undertakes the core seabed mapping component of the ArcticNet research program. Acoustic mapping of the seabed relief, sediment distribution and shallow subsurface sediments are the prime datasets used by researchers to understand the geological processes shaping the seafloor, to assess natural hazards, hazards to navigation and coastal habitats, and to reconstruct the history of past climatic changes.

CARBON EXCHANGE DYNAMICS IN COASTAL AND MARINE ECOSYSTEMS

Project Leader: Tim Papakyriakou (University of Manitoba)

Absorption and release of carbon dioxide (CO_2) by the oceans is one of the primary factors controlling atmospheric CO_2 concentration, and some of the highest CO_2 uptake rates reported anywhere have been observed within the Arctic's peripheral seas. Project researchers are undertaking field studies to parameterize the effects of several factors affecting both the distribution of dissolved CO_2 in Arctic surface water and the mechanism by which the gas is exchanged with the atmosphere. A newly developed coupled atmosphere-sea ice-ocean biogeochemistry model is used to learn how the ocean's response to climate change and variability will affect the atmosphere-ocean cycling of CO_2.

2013-2014
Research and Monitoring

ARCTIC GEOMICROBIOLOGY AND CLIMATE CHANGE

Project Leader: Søren Rysgaard (University of Manitoba)

Biogeochemical transformations of carbon in sea ice will have a direct impact on the concentration of carbon dioxide in the atmosphere, and, therefore, the rate of climate change. Under the aegis of the newly funded Canada Excellence Research Chair in Arctic Geomicrobiology and Climate Change, this project is studying microbial activity and chemical transformations within sea ice and ocean sediments as they occur and is the first to intensely investigate the Arctic at the micro-scale.

EFFECTS OF CLIMATE CHANGE ON CONTAMINANT CYCLING IN THE COASTAL AND MARINE ECOSYSTEMS

Project Leaders: Gary Stern, Robie Macdonald, and Feiyue Wang (University of Manitoba / Fisheries and Oceans Canada)

Contaminants pose a potential hazard to Arctic fish and marine mammal health, and ultimately to Northerners that consume their meat. The project research will help assess the vulnerability of coastal Inuit communities to climate change, document and project impacts of climate change on traditional food security and community health, and provide the information required to develop adaptation strategies.

MARINE BIOLOGICAL HOTSPOTS: ECOSYSTEM SERVICES AND SUSCEPTIBILITY TO CLIMATE CHANGE

Project Leaders: Jean-Éric Tremblay (Université Laval), Michel Gosselin (Université du Québec à Rimouski), Philippe Archambault (Université du Québec à Rimouski)

Microalgae growing in sea ice or in surface waters are the primary source of energy for the Arctic marine food web. Changes affecting the base of the food web will ultimately impact the energy intake and spatial distribution of higher trophic level marine animals such as fish, seals, whales, and polar bears. This project examines how changes in the physical environment affect the productivity and species dominance of marine organisms, particularly at the base of the food web. A comprehensive synthesis of the entire Arctic marine food web will then be assembled and made available to inform stakeholders.

TERRESTRIAL SYSTEMS

Terrestrially, warmer temperatures are already affecting wildlife and freshwater systems, and the degradation of permafrost is disrupting transportation and destabilizing infrastructures across the Arctic. These aspects have direct impacts on northern peoples who rely on this environment for their livelihood and wellbeing. On land, ArcticNet is focused on monitoring and evaluating these changes to the physical environment and formulating recommendations for adaptation strategies.

In 2013-2014, using remote sensing techniques, geophysical methods, ground sampling and fibre optics, ArcticNet researchers continued to collect data to understand the changing permafrost and ground ice regime and subsequently inform the design of new northern airstrips and roads. Community-based research to monitor permafrost as well as vegetation, berry shrubs, and ice phenology was continued throughout many of Nunavik's communities.

Continuing long term measurements in the lakes and fjords of Northern Ellesmere Island helped to examine the Arctic's aquatic resources and their biodiversity, ecosystem structure, hydrological and biological functioning and potential ecological response to climate change. Ongoing studies of the glaciers, fjords and ice shelves of the High Arctic as well as water and sediment sampling of many Arctic lakes helped researchers to understand changing hydrological and landscape processes.

Over 30 animal populations including caribou, wolves, black bears, Arctic charr and numerous bird species continue to be monitored annually by ArcticNet researchers. Examination of weather station data; tissue collection; observation of feeding patterns; satellite tagging of birds, fish and mammals; monitoring of nest sites and dens; and analysis of animal behaviour, habitat use and reproductive activity helped researchers to determine how diminishing sea ice, warming tundra and increasing development activities are affecting Arctic wildlife.

PERMAFROST AND CLIMATE CHANGE IN NORTHERN COASTAL CANADA

Project Leaders: Michel Allard (Université Laval) and Wayne Pollard (McGill University)

How is permafrost likely to respond to a changing climate? Using regional climate models to determine ground surface temperatures, this project monitors changes to the landscape, including the development of landforms, modification of drainage patterns, and coastal erosion. The project will provide policy makers, managers and land use planners with the tools needed to assess the impact of landscape modifications on northern communities and ecosystems.

EFFECTS OF CLIMATE CHANGE ON CANADIAN ARCTIC WILDLIFE

Project Leader: Dominique Berteaux (Université du Québec à Rimouski)

Northern biological systems are undergoing major shifts related to climate change. An understanding of this transformation and its consequences is critical to anticipating ways in which effects on wildlife populations may be mitigated or addressed. Through the implementation of a wildlife monitoring program, the project identifies the main vulnerabilities of arctic wildlife using the collected data to analyze past and present responses of wildlife to climatic variability. Decision makers in the wildlife sector will be provided with a sound basis for developing appropriate management and adaptation strategies.

CLIMATE ANALYSIS AND SCENARIO DEVELOPMENT FOR THE CANADIAN ARCTIC AND SUBARCTIC

Project Leader: Ross Brown (Environment Canada)

This project will provide researchers, stakeholders, decision-makers and communities with more accurate knowledge of current and anticipated climate changes and support sustainable development in this complex and rapidly changing environment. The main objectives of the project are: 1) to supply climate change information in support of the ArcticNet IRISes, 2) to build a climate database to support impact and adaptation studies and the production of climate projection scenarios, 3) to analyze the recent climate trends and the natural climate variability over the IRIS regions and assess the potential of the climate model to capture the observed variability and physical processes, 4) to track state-of-the-art developments in coupled cryosphere/atmosphere/ocean models to improve the reliability of climate scenarios.

POPULATION DYNAMICS OF MIGRATORY CARIBOU IN NUNAVIK/NUNATSIAVUT

Project Leader: Steeve Côté (Université Laval)

Migratory caribou are now declining almost everywhere in Canada, including northern Quebec and Labrador. The factors responsible for these declines are poorly known. This project is establishing how climate, population density, and industrial activities affect caribou abundance and distribution in the Arctic. It will provide new tools to monitor the demography of caribou and improve their conservation in the face of a changing Arctic.

IMPACTS OF VEGETATION CHANGE IN THE CANADIAN ARCTIC: LOCAL AND REGIONAL ASSESSMENTS

Project Leader: Greg Henry (University of British Columbia)

The tundra across the Canadian Arctic is already reacting to climate change. This research team studies changes to tundra vegetation near Arctic communities across the North, including changes in the amount of berries produced annually in traditional picking areas. Community members are involved in designing the studies and in conducting measurements. The results will be used by communities and will contribute to national and international efforts to understand the responses of tundra ecosystems to climate variability and change.

HIGH ARCTIC HYDROLOGICAL, LANDSCAPE AND ECOSYSTEM RESPONSES TO CLIMATE CHANGE

Project Leaders: Scott Lamoureux and Melissa Lafrenière (Queen's University)

Research at the Cape Bounty Arctic Watershed Observatory, Melville Island, Nunavut, investigates how climate change affects rivers, permafrost, soils, vegetation, greenhouse gas emissions and the release of contaminants into High Arctic rivers and lakes. Impact models based on river flow and related environmental systems are being developed. This integrated watershed network will provide an unprecedented understanding of the sensitivity and anticipated future effects of climate change on the High Arctic ecosystem.

2013-2014
Research and Monitoring

GROWTH VARIABILITY AND MERCURY TISSUE CONCENTRATION IN ANADROMOUS ARCTIC CHARR

Project Leader: Michael Power (University of Waterloo)

This project examines climate change related impacts on land-locked and migratory populations of Arctic charr. Differences in total mercury accumulation rates in the two types of charr are analysed to assess the relative influences of diet, temperature and habitat on growth and total mercury accumulation along a north-south gradient. An enhanced understanding will permit more accurate prediction of the effects of climate change on the important migratory stocks of Arctic charr used by Inuit in traditional subsistence fisheries. This research will also inform policy on the issues associated with country food consumption in the face of climate change.

FRESHWATER RESOURCES OF THE EASTERN CANADIAN ARCTIC

Project Leader: Warwick Vincent (Université Laval)

Lakes and wetlands are major ecological features of the circumpolar Arctic, and they provide many essential services including habitats for wildlife, drinking water supplies for northern residents, and water for industrial activities. This project continues and extends observations on lakes and wetlands at key sites in the eastern Canadian Arctic to identify and measure aquatic indicators of environmental change in the past and present. These studies will allow assessments of future changes in northern freshwater ecosystems to help guide the formulation of environmental management and monitoring policies.

HYDRO-ECOLOGICAL RESPONSES OF ARCTIC TUNDRA LAKES TO CLIMATE CHANGE AND LANDSCAPE PERTURBATION

Project Leader: Fred Wrona (University of Victoria)

Significant changes in climatic regimes are expected to have far-reaching impacts on the hydrology and ecology of Arctic freshwater ecosystems. This project is aimed at conducting integrated landscape-lake process and modelling studies to improve the regional understanding of the upland tundra lakes sensitivities and responses to climate variability and change. An integrated landscape-geochemical, lake-ice, hydro-ecological model for Arctic systems is being developed and validated. Project outputs will inform adaptation options for the conservation, protection and management of Arctic freshwater ecosystems.

INUIT HEALTH, EDUCATION AND ADAPTATION

The central objective of ArcticNet is the formulation of adaptation strategies to help Northerners face the impacts and opportunities of climate change and modernization across the coastal Canadian Arctic. Over the last year, ArcticNet teams conducted multidisciplinary research in each of the four Inuit regions of Canada: Inuvialuit, Nunavut, Nunavik and Nunatsiavut in an effort to address issues important to Northerners. In addition to collecting data, ArcticNet researchers and students coordinated numerous workshops, meetings, and outreach activities and built on a growing number of community-based and community-led research and monitoring projects in over 40 of Canada's 53 Inuit communities.

Adding to an increasing collection of over 300 mammal, bird, fish and plant food samples, researchers analysed the foods that make up traditional diets to examine how nutrients, phytochemicals, fats and proteins are linked to disease prevention. Through surveys, interviews, the establishment of working groups and committees, and country food development initiatives, researchers worked to determine the factors affecting country food consumption and food security across the North and to establish frameworks for adaption within the context of environmental change.

Projects to improve quality and access to northern education included the production of a new documentary on the revitalization of the Inuinnaqtun language and the official launch of the Tukitaarvik Inuit Student Centre, an online resource providing information and networking for Inuit students in post-secondary education. Within two communities, a program to diagnose, examine and treat individuals with *H. pylori* infection of the stomach was continued along with efforts to inform Northerners about the bacteria and manage the risks of infection.

Environmentally, ArcticNet researchers worked with community members to collect bathymetric, GPS, habitat and anecdotal data as well as photos and video to study the increasing challenges facing coastal communities across the Arctic due to changing sea levels, flooding, erosion, shifting weather patterns and changes in coastal ecosystems.

2013-2014
Research and Monitoring

INSTABILITY OF COASTAL LANDSCAPES IN ARCTIC COMMUNITIES AND REGIONS

Project Leaders: Trevor Bell (Memorial University) and Don Forbes (Memorial University / Natural Resources Canada – Geological Survey of Canada)

Future climate scenarios and impact modelling predict changes in climate variables that may increase coastal landscape instability and hazard risk. Through improved understanding of changes in climate, sea level, sea ice, storms and waves, this project assesses integrated impacts on coastal landscape stability, including flooding, erosion, habitat integrity, and community vulnerability. Together with northern communities and partners, the project will promote informed choices of adaptation measures and enhanced resilience in northern coastal communities.

UNDERSTANDING AND RESPONDING TO THE EFFECTS OF CLIMATE CHANGE AND MODERNIZATION IN NUNATSIAVUT

Project Leaders: Trevor Bell (Memorial University) and Tom Sheldon (Nunatsiavut Department of Lands and Natural Resources)

With the involvement of Inuit and other partners, Nunatsiavut Nuluak is addressing Inuit concerns about the impacts of climate change, modernization and contaminants on the health of marine ecosystems and communities of Northern Labrador. Project findings are used to develop adaptation strategies and polices that have direct relevance for the people, industries and environment of Northern Labrador.

FOOD SECURITY, ICE, CLIMATE AND COMMUNITY HEALTH: CLIMATE CHANGE IMPACTS ON TRADITIONAL FOOD SECURITY IN CANADIAN INUIT COMMUNITIES

Project Leaders: Laurie Chan (University of Northern British Columbia) and Christopher Furgal (Trent University)

Collaborating with Canadian Arctic communities, this project is investigating how and to what extent climate change is presently affecting the traditional diet profile of northern aboriginal residents and how and to what extent it may affect it in the future, and subsequently, what implications this may have for individuals' health. The project focuses on nutrition and potential changes in nutrient intake, exposure to contaminants, and levels of food security.

COUNTRY FOODS HEALTH BENEFITS IN A CHANGING CANADIAN ARCTIC

Project Leader: Éric Dewailly (Université Laval)

For centuries, to survive in the Arctic, Inuit had to rely on fish, mammals and some plants such as wild berries. However, since the 1990s, they have increasingly adopted a western diet, which has led to excessive intake of carbohydrate, salt and trans-fatty acids. Cardiovascular diseases and risk factors have recently become major health issues. This project studies the overall benefits of nutrients present in the country foods consumed in Nunavik with the goal of informing public policies aiming to improve country food consumption and food security, minimize the risks from environmental contaminant exposure and limit the emergence of obesity, diabetes and cardiovascular diseases in Arctic peoples.

INTERNATIONAL INUIT COHORT STUDY: DEVELOPING THE NEXT PHASE

Project Leader: Éric Dewailly (Université Laval)

This project merges the data from the major Inuit health surveys conducted in Canada and Greenland. From this new database, health indicators of global changes are being extracted to show geographical differences according to Inuit regions and IRIS territories. New information is also being collected at the community level in order to understand if different infrastructure or demographic variables are associated with chronic diseases or risk factors.

CLIMATE CHANGE AND FOOD SECURITY IN REGIONAL INUIT CENTRES

Project Leader: James Ford (McGill University)

Food insecurity is a chronic problem affecting many Inuit communities and is likely to predispose Inuit food systems to the negative effects of climate change. Using in-depth case studies, this project aims to identify and characterize the vulnerability of food systems in four regional Inuit centres to climate change as a basis for identifying adaptation entry points.

INUIT KNOWLEDGE AND GEOSPATIAL ONTOLOGIES IN NUNATSIAVUT

Project Leaders: Chris Furgal (Trent University) and Tom Sheldon (Nunatsiavut Department of Lands and Natural Resources)

This project undertakes a participatory geographic information system (GIS) and geospatial ontology research exercise with expert knowledge holders in the Nunatsiavut Settlement Area. The goal is the development of a geospatial ontology application and interface that complements existing GIS for land-use planning, environment and development decision-making, as well as Inuit knowledge representation and transmission in Nunatsiavut.

2013-2014
Research and Monitoring

COMMUNITY-DRIVEN RESEARCH ON *H. PYLORI* INFECTION IN THE INUVIALUIT SETTLEMENT REGION

Project Leader: Karen Goodman (University of Alberta)

Helicobacter pylori infection has become a major concern for many northern communities and their health care providers. These concerns initiated a large collaborative project to investigate the health risks of *H. pylori* and develop locally appropriate control strategies. This project seeks to expand these efforts to include other northern communities and ultimately to improve the success of *H. pylori* infection treatment methods, provide health authorities with information to guide relevant public health policy, and to help concerned community members understand *H. pylori* health risks.

IMPROVING ACCESS TO UNIVERSITY EDUCATION IN THE CANADIAN ARCTIC

Project Leader: Thierry Rodon (Université Laval)

This project provides evidence-based research on Inuit participation in university education with the objective of promoting a national discussion amongst providers of university programs in Inuit Nunaat, northern institutions and Inuit organizations in order to define a more coordinated effort in program delivery and curriculum development.

ADAPTATION IN A CHANGING ARCTIC: ECOSYSTEM SERVICES, COMMUNITIES AND POLICY

Project Leader: Barry Smit (University of Guelph)

This project documents the changing physical, biological and socio-economic conditions that are affecting people in the Arctic and identifies policies and strategies to assist communities in dealing with these changes. The main focus of the project involves integrating scientific and traditional knowledge of ice, permafrost, coastal dynamics and wildlife with information about community use of these ecosystem services.

INUIT QAUJIMAJATUQANGIT AND THE TRANSFORMATION OF HIGH SCHOOL EDUCATION IN NUNAVUT

Project Leader: Fiona Walton (University of Prince Edward Island)

How can Inuit educational leaders work with parents in communities to create a school system to meet the challenges of the 21st century? How can a curriculum grounded in traditional beliefs and values contribute to the personal and academic success of Inuit high school students? This project aims to explore these questions and to document the role of culture and language in student learning in order to provide ideas and examples as tools for northern communities attempting to transform local education.

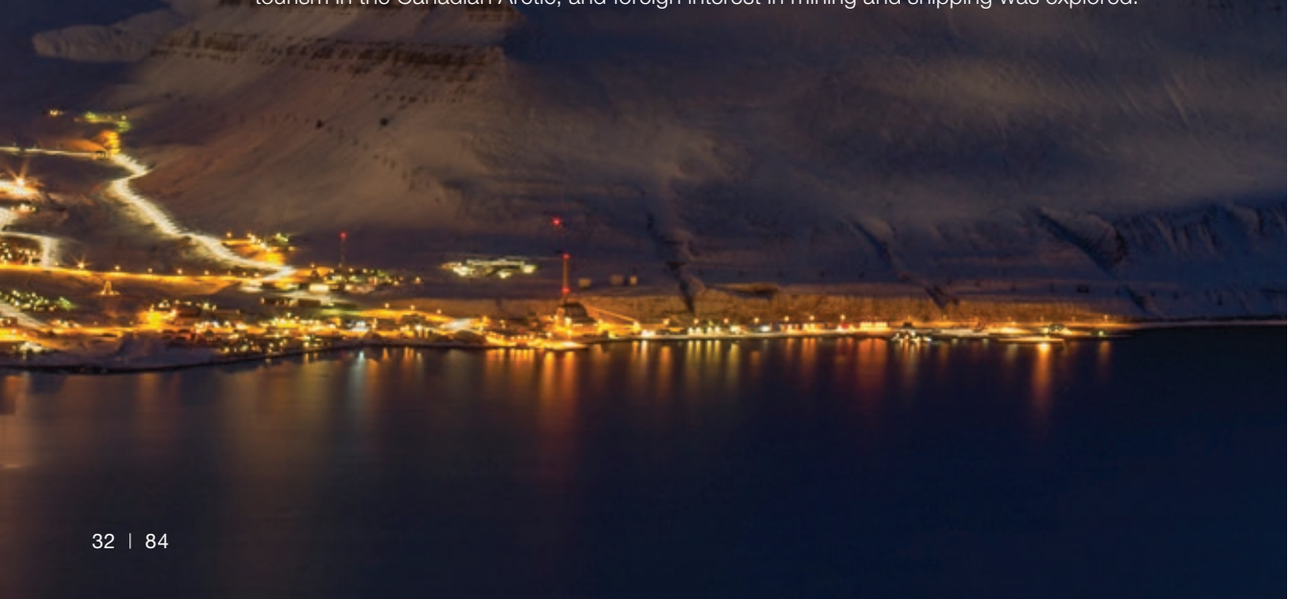
NORTHERN POLICY AND DEVELOPMENT

ArcticNet's research effort is aimed at the development and dissemination of knowledge to formulate adaptation strategies and national policies for Canadians as well as other stakeholders including industry (oil and gas, navigation, mining, tourism, hydroelectric) and government, whose mandate it is to manage a changing Arctic. Throughout 2013-2014, ArcticNet researchers worked with regional, provincial, federal and foreign governments; community organisations and industry stakeholders to inform questions relating to northern development, shipping, geopolitics and security in Canada's Arctic.

ArcticNet researchers were directly involved in the preparation of Canada's submission concerning extended continental shelves in the Central Arctic Ocean and in assisting the Canadian government with Beaufort Sea and Lincoln Sea boundary discussions and negotiations. Through international workshops and conferences, interviews with foreign lawyers and diplomats and meetings with indigenous communities across the Arctic, researchers promoted communication, coordination and cooperation for the resolution of politically sensitive issues.

By examining the success of ArcticNet's Integrated Regional Impact Study (IRIS) process and the incorporation of Indigenous Knowledge into policy, as well as through surveys of scientist, advisor and decision-maker perspectives, the Network's researchers were able to determine how best to translate research results on urgent issues such as climate change and how research can have the most impact on informing northern policy in the future. Researchers examined the history, politics and social impact of northern resource development through the collection of archival and policy documents, interviews, and the development of long-term research relationships with community and territorial organizations.

Network members served as academic representatives in the multi-sectoral Arctic Security Working Group, made frequent media appearances and provided advice to the Canadian Armed Forces, federal departments and other senior government officials and stakeholders on Arctic security issues. They led meetings, discussions, and debates and delivered lectures and courses to better understand the developing Arctic security trends in the circumpolar region and what ramifications the foreign, defense and security policies of Arctic states may have for the likelihood of conflict and cooperation in the region. In addition, research and interviews were conducted concerning the development trends of shipping, fishing and cruise tourism in the Canadian Arctic, and foreign interest in mining and shipping was explored.



THE LAW AND POLITICS OF CANADIAN JURISDICTION ON ARCTIC OCEAN SEABED

Project Leader: Michael Byers (University of British Columbia)

The possibility that the Arctic Ocean seabed contains vast deposits of hydrocarbons is attracting considerable attention. This research project focuses on several outstanding maritime boundary disputes—involving the United States, Denmark and potentially Russia—that had to be resolved before Canada submitted a comprehensive package of information to the UN Commission on the Limits of the Continental Shelf in 2013. The project analyzes the legal and political differences involved in the different disputes, explores the various options for resolving them, and provides detailed recommendations.

INTEGRATING AND TRANSLATING ARCTICNET SCIENCE FOR SUSTAINABLE COMMUNITIES AND NATIONAL AND GLOBAL POLICY AND DECISION-MAKING

Project Leaders: David Hik (University of Alberta) and Chris Furgal (Trent University)

This project investigates the arctic policy landscape and how ArcticNet science contributes to informed policy decisions in Canada and globally. The conclusions from this project will allow ArcticNet to address the most effective ways to use and translate ArcticNet research results on urgent issues such as climate change into "action" or decision-making at the local, regional, national or international levels.

THE EMERGING ARCTIC SECURITY ENVIRONMENT

Project Leaders: Rob Huebert (University of Calgary) and Whitney Lackenbauer (St. Jerome's University)

This project aims to better understand the developing Arctic security trends in the circumpolar region by addressing these questions: (1) What are the reasons behind the new foreign, defence and security policies of Arctic states? (2) What are the ramifications of these actions and the possibilities/probabilities for conflict and cooperation in the region? The project also systematically analyzes the relationship between sovereignty, security and safety in Canadian political discourse and policy, and critically examines the historic and contemporary practice of Arctic sovereignty and security assertion in evolving cultural, political and spatial contexts.

ADAPTATION, INDUSTRIAL DEVELOPMENT AND ARCTIC COMMUNITIES

Project Leader: Arn Keeling (Memorial University)

This project is engaging in community-based, historical and comparative research on industrial development as a driver of social, cultural and environmental change in the Arctic. In particular, researchers explore the cultural, economic and environmental impacts of mineral exploration and development on three Arctic communities. Ultimately, this project will be useful for communities and policy makers in assessing the potential benefits and impacts of current development proposals.

CLIMATE CHANGE AND COMMERCIAL SHIPPING DEVELOPMENT IN THE ARCTIC

Project Leader: Frédéric Lasserre (Université Laval)

Is Arctic shipping really going to develop as fast as generally predicted in Canada? What sectors of the shipping industry might be interested in plying a seasonal, poorly mapped, unsupported northern route? Will containerized cargo liners between Europe and Asia rush to utilize the route? Working closely with international shipping companies, this project is addressing these questions in order to evaluate the issues of shipping development in the region.

KNOWLEDGE TRANSFER

Information derived from ArcticNet's research effort and initiatives such as the International Polar Year feeds into ArcticNet's knowledge management and transfer system which was developed to facilitate data sharing among ArcticNet researchers, partners and stakeholders. In 2013-2014, ArcticNet's knowledge transfer projects continued to engage with ArcticNet scientists and students to archive new metadata records and datasets in the Polar Data Catalogue (PDC). Working with researchers and program staff from the Beaufort Regional Environmental Assessment (BREA), the Northern Contaminants Program (NCP), and most recently, the Nunavut General Monitoring Program, data from these programs was also collected and archived within the PDC. Creation and entry of metadata records into the PDC was continued for the Circumpolar Biodiversity Monitoring Program (CBMP) of the Conservation of Arctic Flora and Fauna (CAFF) working group of the Arctic Council. As well as hardware and infrastructure upgrades, significant changes to the PDC Search application were made to improve security and increase performance and several new features were added to provide faster searching and better functioning for users. Network members continue to work with other polar data portals to enable sharing of metadata amongst partner organizations internationally.

Inuit Qaujisarvingat (IQ), the Inuit Knowledge Centre of Inuit Tapiriit Kanatami (ITK) continued to expand and foster partnerships between Inuit and Arctic researchers to take advantage of expertise in the areas of knowledge, training, data management, and the development of funding proposals. IQ collaborated with researchers from several of ArcticNet's other projects, administering the website for the Tukitaarvik: Inuit Student Centre, building partnerships between Inuit organizations and researchers and contributing to the evaluation of the IRIS process in Nunavik and Nunatsiavut. A metadata link was established with the PDC and IQ staff continue to work to extract data records of specific interest to Inuit. Bibliographic references on education, food security, health and language were collected with the goal of developing a bibliographic database for northern interests and meetings were held to discuss the dissemination of data from past Inuit health surveys.

POLAR DATA MANAGEMENT FOR NORTHERN SCIENCE

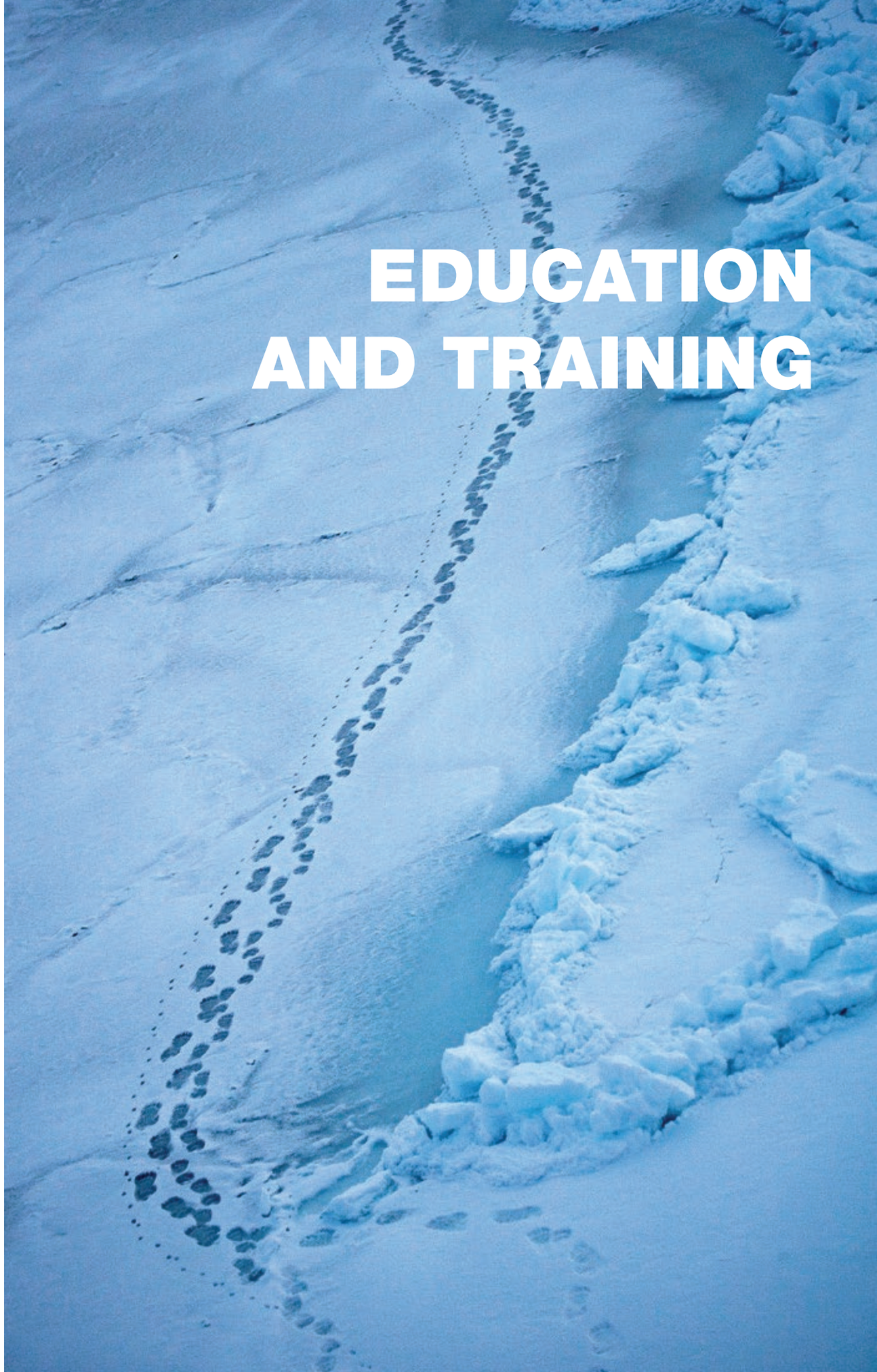
Project Leader: Ellsworth LeDrew (University of Waterloo)

The central objective of this project is to facilitate exchange of information and data about the polar regions among researchers and other user groups, including northern communities and international programs. Initially established by ArcticNet and CCIN, the Polar Data Catalogue (PDC) is now Canada's primary on-line source for data and information on research in the polar regions. The project team is now working with other national and international projects toward integrated data management systems to ensure (1) that polar metadata and datasets are preserved for the long term and are publicly accessible on the PDC in a timely and user-friendly format, and (2) the development of PDC data tools for use by various stakeholders, especially northern communities.

ENABLING THE COPRODUCTION OF INUIT AND SCIENCE KNOWLEDGE THROUGH INTEGRATED INFORMATION MANAGEMENT

Project Leader: Scot Nickels (Inuit Tapiriit Kanatami)

Led by Inuit Qaujisarvingat: The Inuit Knowledge Centre (IQ) of Inuit Tapiriit Kanatami (ITK), the goal of this project is to develop and maintain an Inuit-specific integrated information management system (IIMS) that supports the ethical collection, discovery, preservation and use of Inuit knowledge and provides access to this information. The project will initially focus on: 1) procedural tools, 2) a database of funded Arctic research projects, and 3) datasets including bibliographic databases, Inuit health data, and local environmental knowledge data. The development of this IIMS will give Inuit and northern researchers in Canada and abroad the appropriate levels of data and information required to prepare for the changes to their world.



Since its inception, ArcticNet has been implementing a comprehensive training strategy to recruit and train a complete generation of researchers and technicians critical for studying and monitoring the transformation of the North. ArcticNet continues to strive to increase the awareness of young Canadians to Canada's Arctic dimension and to the possibilities of fascinating careers in the North.

Over 50 undergraduate students, 400 graduate students and post-doctoral fellows and 500 research associates and technical staff are currently completing their training or working within ArcticNet's unique multidisciplinary, trans-sector and international network. Whether at sea, on the Arctic tundra, across glaciers and ice shelves, in Inuit communities, or attending international schools and meetings, ArcticNet's young researchers are working, discussing and debating with the best Canadian and foreign experts in the natural, health and social Arctic sciences. They have formed the remarkably active ArcticNet Student Association (ASA), which hosts Student Day during the Annual Scientific Meeting as well as regional workshops to discuss how to adapt student research to meet Network objectives. ArcticNet's Training Fund has supported the participation of dozens of Network students in international Arctic field schools, courses and learning programs. The accomplishments of these hundreds of young ArcticNet researchers provide a positive direction for future Arctic research and the management and stewardship of a rapidly changing Arctic world.

SCHOOLS ON BOARD & SCHOOLS ON TUNDRA

Through the Schools on Board and Schools on Tundra outreach programs, secondary school students receive hands-on experience in ArcticNet's multidisciplinary research environment and learn about future career opportunities involving the study and management of the Arctic. Although the Schools on Board field program did not take place in 2013 due to the curtailment of the *Amundsen* expedition, Schools on Board continued to promote and encourage outreach initiatives within the ArcticNet community and to develop and strengthen its partnership with the ArcticNet Student Association (ASA). Schools on Board was instrumental in designing an interactive workshop "Tell the world about science: Jobs in science education" in partnership with ARCTIConnexion at the 2013 ASA Student Day. Following a very successful *Arctic Science Day* in Winnipeg in February 2014, Schools on Board in collaboration with the ASA, the Arctic Science Partnership, and NSERC Promoscience held *Arctic Science/Ice-Camp Day* in Cambridge Bay, Nunavut. On 7 May 2014, 35 students and 4 teachers from Kiilinik High School visited the ICE-CAMPS sea ice camp in Dease Strait to learn about Arctic research by participating in ice, snow, and plankton sampling activities, and by exploring techniques in remote sensing and atmospheric monitoring.

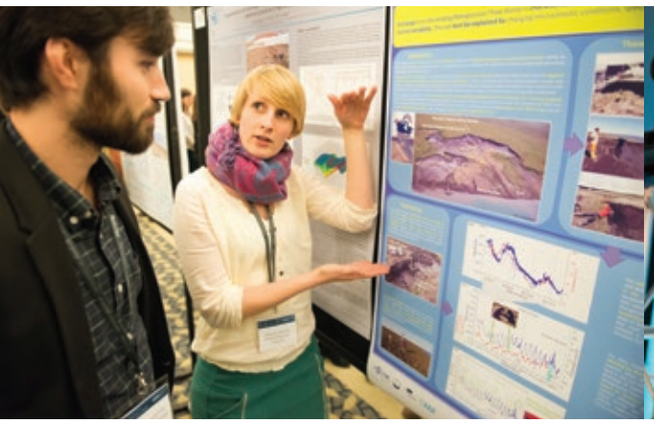
Schools on Board is currently exploring a partnership with Let's Talk Science, an award-winning charitable organization, to develop hands on workshops and learning toolkits that will demonstrate the key principals of Arctic system science and Arctic climate change to youth. As part of the Schools on Tundra program established in 2013, a partnership with the Assiniboine Park Zoo and its new Journey to Churchill exhibit is also being pursued. A field program on board the *Amundsen* is planned for 2014 and Schools on Board is organizing the Arctic Climate Change Youth Forum in conjunction with the international Arctic Change 2014 conference in Ottawa.

ARCTICNET STUDENT ASSOCIATION

Representing over 500 students, the ArcticNet Student Association (ASA) promotes student learning, leadership, research and networking opportunities between students, academics, government partners, and Northerners. The ASA Executive Committee, composed of highly motivated graduate students from across Canada, organized many outreach and training activities designed to broaden the ArcticNet student experience, including the organization of regional and national meetings, support for the Schools on Board program and collaboration with both the Arctic Science Partnership (ASP) and Centre d'études nordiques (CEN). Throughout 2013-2014, ASA students also remained active in presenting their research and organizing outreach activities in the northern communities where they work.

2013 STUDENT DAY: NAVIGATING YOUR POLAR CAREER

To kick-off ArcticNet's annual meeting in Halifax, the 2013 Student Day took place from 9 to 10 December. Plenary speakers helped students explore the different career paths available both within and outside of academia, and various workshops were held covering a range of topics including; preparing for academic life, finding the right job, interview techniques, networking, and writing skills. Researchers, educators, science writers and experts representing a variety of career choices were present to demonstrate the numerous opportunities available to ArcticNet students outside of the traditional academic environment. Approximately 200 students benefited from the 2013 Student Day, making it one of the largest gatherings of early career Arctic scientists ever held in Canada.



REGIONAL TRAINING EVENTS

The ASA provided support for training events at Memorial University and the University of Manitoba. At Memorial University, ASA members hosted a number of outreach events including partnership building workshops, speaker series, and film screenings in an effort to reach students and community members across the province, including Nunatsiavut, and to promote networking amongst Arctic researchers and stakeholders. The ASA continued to support the very successful ArcticNet Seminar Series in collaboration with Dr. David Barber at the University of Manitoba. The course featured presentations from a range of Arctic disciplines and was taken as a credited course by eight students in Fall 2013, as well as being regularly attended by members of the Centre for Earth Observation Science.

The ASA was also instrumental in the organization and execution of the annual Arctic Science Day held on 21 February in collaboration with the ASP, Schools on Board, and NSERC Promoscience. This very successful outreach event was attended by over 200 students and teachers from middle schools and high schools in the Winnipeg area and featured demonstrations and activities presented by 22 graduate students on a broad range of topics such as contaminants, remote sensing and archeology. The success of this event was expanded on when Arctic Science Day was taken North to the community of Cambridge Bay, Nunavut in May 2013 with a visit to the ICE-CAMPS sea ice camp in Dease Strait.

MAAMUITAAU – ILLINNIA (GATHER – LEARN) FIELD SCHOOL

From 16 to 23 February 2014, the ASA in partnership with the ASP and CEN held a field school at the CEN's Whapmagoostui-Kuujjuarapik research station in northern Quebec. The event brought together 17 graduate students from across Canada, Denmark and Greenland to learn about Arctic marine and freshwater systems as well as the challenges faced by Northerners through both lectures and field activities. Outreach activities included a tour of the community led by local youth and teachers, a science day involving graduate students and youth, and a community knowledge exchange on Arctic research.

TRAINING FUND

70+ graduate students have benefited from ArcticNet's training fund since 2004

Well established within the Network since 2005, the ArcticNet Training Fund encourages ArcticNet students to take part in international field schools covering different aspects of Arctic research. The field courses provide students with an opportunity to interact with world-renowned scientists and fellow students to share expert insight and technical training in fields ranging from glaciology and climate to remote sensing and microbial ecology. Over 70 ArcticNet graduate students have taken advantage of the training fund since its inception. In 2013-2014, 11 students were granted a total of over $25,000 to attend high level national and international training offered by leading Arctic researchers in China, Iceland, Italy, Norway, Nunavut and the United Kingdom.

"My training experience at the University Centre in Svalbard really emphasized the value of arctic research endeavors and fostered a healthy learning atmosphere for international students. I personally have grown and gained perspective through this experience in Svalbard, Norway."

- Graduate Student, University of Alberta
  Biotelemetrics Methods course, The University Centre in Svalbard, Norway

"The workshop I attended provided a great diversity of opportunities to work with people from various disciplines and to learn about wastewater treatment in the North. The introduction to both the Inuit culture and dealing with logistics in the North will prove invaluable in my future career."

- Graduate Student, University of Waterloo
  Arctic Water: Challenges and Opportunities of the North workshop, Iqaluit, Nunavut

RECOGNITION OF EXCELLENCE FOR ARCTICNET STUDENTS

In addition to the numerous ArcticNet students who were awarded highly competitive scholarships from national and provincial granting councils, ArcticNet is proud to have a number of its graduate students among the recipients of the prestigious 2013-2014 academic awards for student research in northern Canada.

W. GARFIELD WESTON AWARDS

The W. Garfield Weston Awards for Northern Research enable leading scientists to pursue rigorous research in Canada's sensitive northern regions. Awards at the Masters, Doctoral, and Postdoctoral level are presented to outstanding students and researchers, whose work spans Canada's great North during each field season.

Postdoctoral Fellowships ($50,000)

- Dr. Igor Lehnherr, Earth and Environmental Sciences, University of Waterloo

Doctoral Scholarships ($50,000)

- Dominique Fauteux, Biology, Université Laval
- Jean-François Lamarre, Biology, Université du Québec à Rimouski
- Vincent L'Hérault, Biology, Université du Québec à Rimouski
- Jennifer Provencher, Biology, Carleton University
- Ashley Rudy, Geography, Queen's University

Masters Scholarships ($15,000)

- Vincent Lamarre, Wildlife Management and Habitat, Université du Québec à Rimouski
- Kristen Peck, Wildlife Management and Habitat, Université du Québec à Rimouski

NORTHERN RESIDENT SCHOLARSHIP ($10,000)

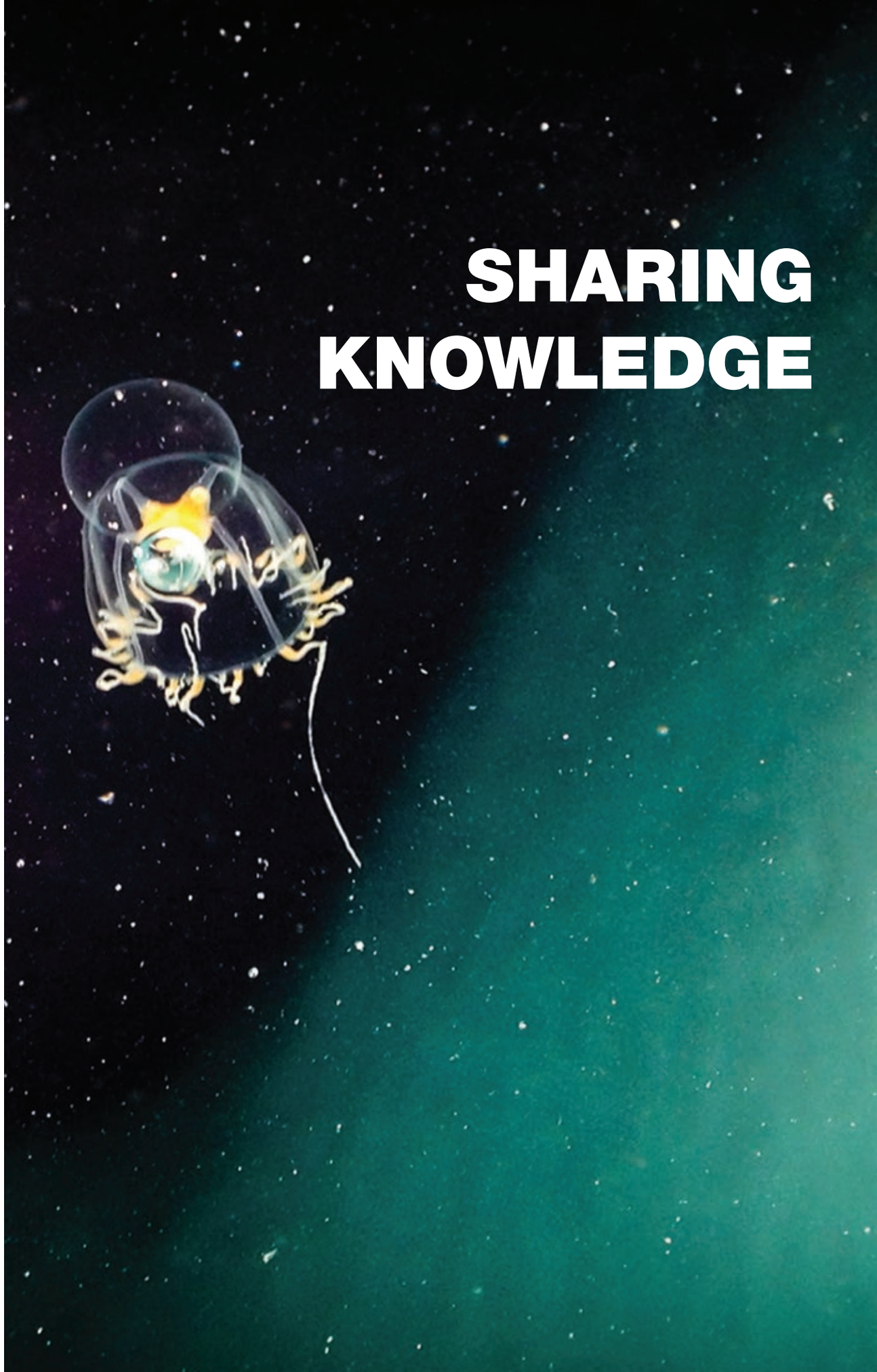
The Northern Resident Scholarship is awarded to graduate students from the North who demonstrate leadership in northern scholarship and whose circumpolar research is making a contribution to the Canadian North.

- Cathy Lee, PhD Candidate, Educational Leadership, University of Toronto
- Heather McGregor, PhD Candidate, Education, University of British Columbia

CANADIAN NORTHERN STUDIES TRUST SCHOLARSHIP ($10,000)

The Canadian Northern Studies Trust Scholarship is awarded to a doctoral student who has achieved academic excellence, has shown interest in and commitment to the North, and whose research is relevant to northern challenges or issues.

- Noémie Boulanger-Lapointe, PhD Candidate, Geography, University of British Columbia



Disseminating the findings and the results of our research is a key component of ArcticNet's mission. We share our knowledge with an increasing number of stakeholders, from decision makers to fellow scientists and the general public. Published research results also spur new and more innovative projects, and widen the possibilities for collaborations. At the community level, access to results enables individuals to make informed decisions about their environment. It also helps decision makers in addressing the issues that Northerners deal with on a daily basis.

ARCTICNET SCIENTIFIC PUBLICATIONS

www.aina.ucalgary.ca/arcticnet

1,100+

Scientific publications by ArcticNet researchers in 2013-2014

450+

Refereed publications by ArcticNet researchers in 2013-2014

2,600+

Publications in the ArcticNet Publications Database

1,500+

Referred publications in the ArcticNet Publications Database

The number of ArcticNet scientific publications continues to grow every year, reflecting the successful implementation of ArcticNet's research plan and the breadth of activities undertaken by the Network's researchers. These publications illustrate the expansion of our understanding of the on-going transformation of the Arctic and its impact on northern ecosystems and societies. In the past year, ArcticNet members delivered over 1,100 scientific publications, including more than 450 in refereed books and journals including *Geophysical Research Letters*, *Journal of Marine Systems*, *Ecology*, *Journal of Geophysical Research*, *Nature Geoscience*, *Scientific Reports*, *American Journal of Public Health*, *Environmental Research*, *Journal of Canadian Foreign Policy*, and *International Journal*.

The ArcticNet Publications Database now lists a total of over 2,600 publications including 1,500 refereed publications. The online database is updated annually and is maintained by the Arctic Science and Technology Information System (ASTIS), a project of the Arctic Institute of North America at the University of Calgary.

2013-2014
Sharing Knowledge

POLAR DATA CATALOGUE

www.polardata.ca

ArcticNet recognizes the importance of managing the wealth of knowledge and data generated by polar research to ensure and maximize the exchange and accessibility of relevant data and to leave a lasting legacy. The Polar Data Catalogue (PDC) is the public metadata and data repository for ArcticNet and a growing number of Canadian and international research institutions, programs and organizations including, the Northern Contaminants Program (NCP), the Circumpolar Biodiversity Monitoring Program (CBMP), the Canadian International Polar Year Program (IPY), the Beaufort Regional Environmental Assessment (BREA) and the Nunavut General Monitoring Plan (NGMP). The PDC was initially developed as a collaborative effort between ArcticNet, the Canadian Cryospheric Information Network (CCIN), Fisheries and Oceans Canada (DFO) and Noetix Research Inc. to facilitate the exchange of information on the Canadian Arctic between researchers and other user groups, including northern communities and international programs. The PDC's discovery portal describes and provides access to Arctic and Antarctic datasets covering a wide range of disciplines from natural sciences and policy, to health and social sciences. The PDC Search geospatial tool is available to the public and allows data searching using a web-based mapping interface in combination with other search parameters (i.e., keyword, date, research program). The PDC has been recognized as a repository for polar metadata and data by both Canadian and US granting agencies and the Canadian federal government. The management of the PDC is coordinated by the inter-agency Polar Data Management Committee, which includes representatives from ArcticNet, the ArcticNet Student Association, CCIN, Centre d'études nordiques, the NCP, DFO, Environment Canada – Canadian Ice Service, Inuit Tapiriit Kanatami, the Canadian Space Agency, the Canadian Polar Commission and observers from other organizations.

During 2013 and 2014, archiving and publication of metadata and data in the PDC increased substantially, with the addition of several hundred new metadata and almost 100 new datasets from partner programs and contributing scientists. Over 20,000 new RADARSAT-1 images of the Canadian North were also added to the archive. Through membership in the Canadian Polar Data Network, the PDC collaborated with scientists from the Canadian High Arctic Research Station (CHARS) to begin archiving and serving online the datasets emerging from this new federal program. To support researchers and the interested public, a new interactive Help Manual was released, and FaceBook and LinkedIn accounts were created to complement the @polardata Twitter account. These and other ongoing activities continue to strengthen polar data management in Canada and position ArcticNet and the PDC as critical contributors to Arctic and Antarctic science data management for the future.

INFORMING POLICY

Communicating results to non-scientific audiences is central to the Network's mission and ArcticNet strives to provide information that will allow policy makers to make informed decisions. To address identified knowledge gaps and research challenges, ArcticNet's 38 research projects contribute to four Integrated Regional Impact Studies (IRISes), corresponding to the main political-physiographic-oceanographic regions of the coastal Canadian Arctic. ArcticNet is working together with its partners in the four Inuit regions of Canada: the Inuvialuit Settlement Region, Nunavut, Nunavik and Nunatsiavut as well as stakeholders from the public, private and government sectors to focus its research efforts on priority issues for Canadians as they deal with the challenges and opportunities of climate change and modernization in the North.

Building on ArcticNet's IRIS concept, the Arctic Council recently initiated the flagship project "Adaptation Actions for a Changing Arctic" (AACA) to respond to the unprecedented challenges and opportunities of climate, environmental and socio-economic changes that are occurring and expected all across the circumpolar Arctic. AACA covers three pilot regions (Barents Region, Baffin Bay and Davis Strait Region, and Bering, Beaufort, and Chukchi Region) in which both terrestrial and marine areas are addressed. In Canada, the scientific input to the AACA assessment is mainly based on ArcticNet's IRISes, with many ArcticNet researchers and managers involved in the leadership of the regional assessments and as lead authors. Over the last year, ArcticNet managers have represented the Network as part of many national and international Arctic research organizations, serving on the management Boards of the Norwegian Arctic Frontiers Conference, the Canadian High Arctic Research Station (CHARS), the Northern Contaminants Program (NCP), the Beaufort Regional Environmental Assessment (BREA) and the Canadian Polar Commission. They have also presented ArcticNet and its research program at scientific and diplomatic Arctic events in Canada and internationally.

ARCTICNET IN THE NEWS 2013-2014

ArcticNet research featured in

300+

media articles and broadcasts in 2013-2014

70+

articles and news stories generated from the ASM2013 conference

With ArcticNet's high level of knowledge and expertise, the Network's managers and researchers are often called upon by the media for interviews regarding issues of critical importance to Canada's north, its People and the Arctic in general. Many projects led by ArcticNet Network Investigators received intense national and international media coverage throughout 2013-2014, bringing Arctic research to the attention of many viewers and readers worldwide. The work of ArcticNet researchers was featured in print, broadcast and new media, informing the public about the rapidly changing Arctic. Some of the highlights include:

- Over 300 articles and programs featuring ArcticNet research were printed and broadcast by international (Al Jazerra, Deutsche Welle, Fox News, Le Monde, Los Angeles Times, Nature News, Popular Science, The Christian Science Monitor, The Japan Times, The Times of India, The Washington Post), national (Aboriginal Peoples Television Network, Calgary Herald, CBC, CTV, Embassy Magazine, Global News, Le Devoir, La Presse, National Post, Ottawa Citizen, Policy Options, Radio-Canada, The Chronicle Herald, The Gazette, The Globe and Mail, The Hill Times, Toronto Star, Winnipeg Free Press) and northern (Above & Beyond, Northern Journal, Nunatsiaq News) media and from many countries including Australia, Canada, China, France, Germany, India, Japan, Qatar, the UK, and the United States.
- ArcticNet's Annual Scientific Meeting in Halifax (ASM2013) generated over 70 articles and news stories in written, online and broadcast media. Interviews were held with ArcticNet's Directors and many of the Network's researchers before, during and after the conference. A highlight was Warwick Vincent's presentation on the 54-year-old "Message in a Bottle" he and colleagues found at the edge of a receding glacier on Ward Hunt Island, that received immense national and international media attention.
- Filmmaker and series director, Jeff Turner, joined ArcticNet scientists on board the CCGS *Amundsen* in Baffin Bay for the shooting of *Wild Canada*, a documentary series exploring the natural beauty of Canada's remote landscapes. Broadcast on CBC's *The Nature of Things*, footage from the *Amundsen* was featured in the fourth episode of the series, *Ice Edge*, as well as in a special behind-the-scenes look at filming on board the ship and through the Wild Canada app for iPad, iPhone and iPod.
- President of the Inuit Circumpolar Council (Canada) and Co-Chair of the ArcticNet Board of Directors, Duane Smith, and President of Inuit Tapiriit Kanatami (ITK) and ArcticNet Board Member, Terry Audla were interviewed regularly in northern and national media. They provided commentary on Canada's Chairmanship of the Arctic Council, resource development, living standards for Canada's Inuit, support and funding for northern research initiatives and changes in northern culture and traditions.
- Rob Huebert and Michael Byers were featured in national and international media throughout the year discussing Arctic sovereignty, militarization and security; resource development; and Canada's proposed Arctic patrol vessels. Media attention ramped up to a pinnacle with Canada's submission to the United Nations in December 2013 detailing its claim to an extended continental shelf as well as its intention to submit a subsequent claim that includes the North Pole.
- Radio-Canada's Découverte, a documentary television series focusing on current scientific and technological developments, featured interviews with ArcticNet's Scientific Director, Louis Fortier and researcher, David Barber during special episodes on the world's oceans and climate change impacts in the Arctic.

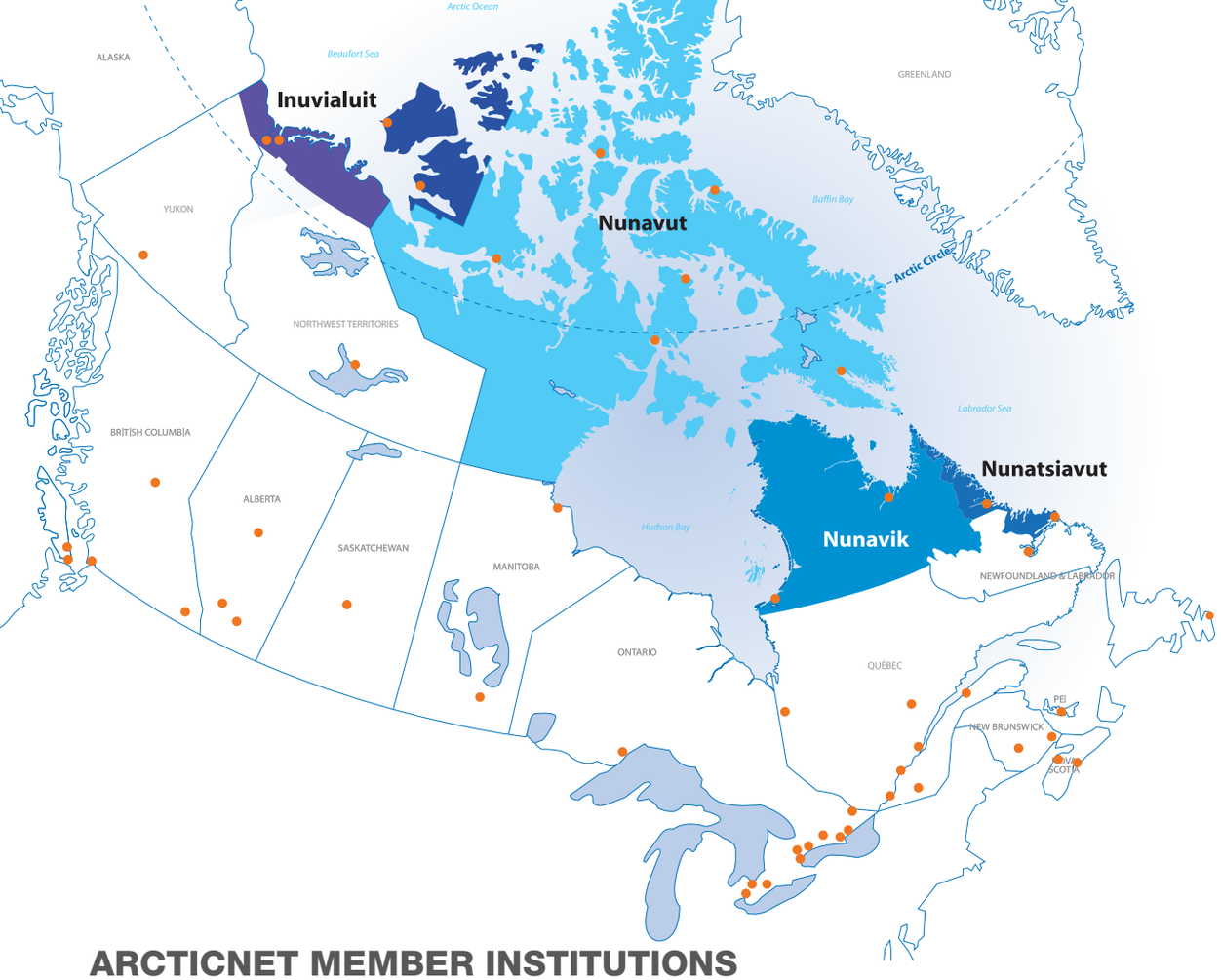
POLAR PHOTOGRAPHY

POLAR PHOTOGRAPHY

www.polarphotogallery.com

Over the years, ArcticNet's photo gallery has been an important tool for the Network to communicate and illustrate its research activities and share images of the rapidly changing Arctic with the general public. ArcticNet photos have been featured in dozens of prominent national (The Gazette, Ottawa Life, Globe and Mail, UpHere, Above & Beyond, Canadian Geographic) and international (Time Magazine, GEO Magazine, Washington Post, Le Monde, Al Jazeera) print and electronic media publications. Our photos have also illustrated numerous policy relevant documents such as Canada's Northern Strategy, Canadian Polar Commission reports, and numerous AANDC reports.

The Polar Photography gallery currently displays over 760 dynamic and eye-catching photos of the Arctic and Antarctic regions. Captured through the efforts of the Network as well as other organizations and individuals, these photos showcase the research, landscapes, wildlife and people of the Polar regions. ArcticNet continues to seek new contributions from external organizations and professional photographers to build on this growing collection.



ARCTICNET MEMBER INSTITUTIONS AND CANADIAN PARTNER ORGANIZATIONS

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ÉTABLISSEMENTS MEMBRES ET ORGANISATIONS PARTENAIRES CANADIENS D'ARCTICNET

Yukon

Yukon College
Yukon Government

Northwest Territories

AANDC
- Cumulative Impact Monitoring Program

De Beers Canada
Environment Canada
- Canadian Wildlife Service - Northern Conservation Division

Government of the Northwest Territories
Institute for Circumpolar Health Research
NWT Health and Social Services
Stanton Territorial Health Authority

Inuvialuit

Aklavik Health Centre
Aklavik Health Committee
Aurora Research Institute
Beaufort-Delta Health & Social Services
Fisheries and Oceans Canada
- Pacific Region
- Fisheries Joint Management Committee

Inuvialuit Joint Secretariat
Inuvialuit Regional Corporation
Moose Kerr School
Olokhaktomiut Hunters and Trappers Committee
Sachs Harbour Community Corporation
Sachs Harbour Hunters and Trappers Committee

Nunavut

AANDC
- Nunavut Implementation Fund

Coalition of District Education Authorities of Nunavut
Department of Health and Social Services (Iqaluit)
Environment Canada
- Canadian Wildlife Service - Nunavut

Government of Nunavut
Government of Nunavut Wildlife Management Division
Iqaluit Community Tukisigiarvik Society
Kitikmeot Heritage Society
Natural Resources Canada
- Polar Continental Shelf Program
- Nunavut Arctic College
- Nunavut Department of Education

Nunavut General Monitoring Plan
Nunavut Tunngavik Incorporated
Nunavut Research Institute
Nunavut Wildlife Management Board
Parks Canada
- Nunavut Field Unit

Qaujigiartiit Health Research Centre

British Columbia

Canadian Scientific Submersible Facility
Fisheries and Oceans Canada
- Institute of Ocean Sciences

Natural Resources Canada
- Geological Survey of Canada (Pacific)

S. and A. Inspiration Foundation
Sitka Scientific
The Axys Group
University of British Columbia
University of Northern British Columbia
University of Victoria
Wildlife Genetics International

Alberta

Arctic Institute of North America
Arctic Raptors Inc.
Campbell Scientific
Canadian Circumpolar Institute
Centre for Military and Strategic Studies
Environment Canada
- Canadian Wildlife Service - Prairie and Northern Region

University of Alberta
University of Calgary
University of Lethbridge

Saskatchewan

University of Saskatchewan

Manitoba

Centre for Earth Observation Science
Churchill Gateway Development Corporation
Churchill Northern Studies Centre
Fisheries and Oceans Canada
- Freshwater Institute
- National Contaminants Advisory Group

Government of Manitoba
Manitoba Hydro
Manitoba Innovation Fund
University of Manitoba
University of Winnipeg

Ontario

AANDC
- Northern Contaminants Program
- Northern Scientific Training Program
- Environmental Studies Research Fund

Agnico-Eagle Mines
Arctic Research Foundation
Baffinland Iron Mines Corporation
Balsillie School of International Affairs
Carleton University
Canadian Cryospheric Information Network
Canadian Museum of Nature
Canadian Polar Commission
Canadian Space Agency
Canadian Women's Foundation
Environment Canada
- Canadian Ice Service
- Meteorological Service of Canada
- National Water Research Institute
- Science and Technology Branch

Federation for the Humanities and Social Sciences
First Air
Fisheries and Oceans Canada
- Aboriginal Aquatic Resource and Oceans Management Program
- Canadian Hydrographic Service
- Central & Arctic Region
- Integrated Science Data Management
- Species at Risk Act
- Strategic Program for Ecosystem Based Research and Advice

Geosensors Inc.
Government of Ontario
International Development Research Centre
Inuit Circumpolar Council (Canada)
Inuit Tapiriit Kanatami
JF Boucher Consulting Ltd
Lakehead University
McMaster University
Nasivvik Centre for Inuit Health and Changing Environments
Natural Resources Canada
- Canada Centre for Remote Sensing
- Earth Sciences Sector
- Geological Survey of Canada
- NRCan - Ottawa
- Program of Energy Research and Development

Network in Canadian History and Environment
Nunavut Sivuniksavut
Ontario Ministry of Natural Resources
Pauktuutit
Public Health Agency of Canada
Queen's University
St. Jerome's University
Sensors by Design
Statistics Canada
The Kenneth M Molson Foundation
Walter & Duncan Gordon Foundation
Wildlife Conservation Society Canada
World Wildlife Fund Canada
Transport Canada
Trent University
University of Guelph
University of Ottawa
University of Toronto
University of Waterloo
University of Western Ontario
University of Windsor
Wilfrid Laurier University
York University

Nunavik

Kativik Regional Government
Kativik School Board
Makivik Corporation
Nayumivik Landholding Corporation
Nunavik Regional Board of Health and Social Services
Nunavik Research Center
Sakkuq Land Holding Corporation

Quebec

AANDC
- AANDC - Gatineau
- Beaufort Regional Environmental Assessment
- Inuit Relations Directorate

Air Inuit
Bishop's University
Canadian High Arctic Research Station
Centre d'étude des politiques étrangères et de sécurité
Centre d'études nordiques
Centre de recherche du Centre hospitalier de l'Université Laval
Cinémathèque québécoise
Concordia University
École nationale d'administration publique
Environment Canada
- Canadian Wildlife Service - Quebec Region

EnviroNorth
Fednav Limited
Hydro-Québec
Institut de recherche en biologie végétale
Institut des sciences de la mer de Rimouski
Institut Hydro-Québec en environnement, développement et société
Institut national de la recherche scientifique
Institut national de santé publique du Québec
K-Films Amérique
Les productions Oxydant
McGill University
Ministère de l'Économie, de l'Innovation et des Exportations
Ministère des Ressources naturelles et de la Faune
Ministère des transports du Québec
Natural Resources Canada
- Geological Survey of Canada (Québec)

Ouranos
Pêches et Océans Canada
- Garde côtière canadienne
- Institut Maurice-Lamontagne

Québec-Océan
Québec Outfitter Federation Inc.
Quest Rare Minerals
Unité de recherche en santé publique
Université de Montréal
Université de Sherbrooke
Université du Québec à Chicoutimi
Université du Québec à Montréal
Université du Québec à Rimouski
Université du Québec à Trois-Rivières
Université Laval
Vision Globale
Wapikoni
Xstrata Nickel - Raglan Mine

New Brunswick

Mount Allison University
University of New Brunswick

Prince Edward Island

Beachwalker Films
University of Prince Edward Island

Nova Scotia

Coalition of District Education Authorities (Wolfville)
Dalhousie University
Fisheries and Oceans Canada
- Bedford Institute of Oceanography
- Canadian Hydrographic Service - Atlantic

Natural Resources Canada
- Geological Survey of Canada (Atlantic)

Ocean Tracking Network

Nunatsiavut

Kangidluasuk
Nunatsiavut Government
Nunatsiavut Department of Environment
Nunatsiavut Department of Lands and Natural Resources
Rigolet Digital Story Telling

Newfoundland

Canadian Healthy Oceans Network
Fisheries and Oceans Canada
- Science Branch Newfoundland

Food Security Network of Newfoundland and Labrador
Government of Newfoundland and Labrador (Environment and Conservation)
Labrador Institute of Memorial University
Memorial University of Newfoundland
Sikumiut Environmental Consulting

ArcticNet is a truly pan-Canadian network with strong international connections, reflecting the global dimension of Arctic issues. Over 140 ArcticNet researchers and 1000 graduate students, postdoctoral fellows, research associates, and technicians from 29 Canadian universities, and numerous federal, provincial and regional departments and agencies participate meaningfully in the Network. These partners are distributed throughout all Canadian provinces, northern territories and Inuit Land Claim Settlement Regions, covering not only the usual east-west dimension of Canada, but her south-north dimension as well. An increasing number of academic and government-based partners in the United States, Norway, France, Denmark, the UK, Spain, Russia, Japan and Germany provide ArcticNet's international dimension.

Since 2004, ArcticNet has engaged Inuit directly at all levels of the planning of the research program and the strategic framework. ArcticNet collaborates closely with Inuit Tapiriit Kanatami (ITK), the Inuit Circumpolar Council (Canada) and all four Regional Inuit Land Claim organizations in developing and conducting its research program and defining its Strategic Plan. Members from all six organizations serve on the Network's Research Management Committee and Board of Directors.

Consulting Inuit and northern stakeholders in over 50 remote coastal Arctic communities scattered over millions of square kilometres presents important logistical and financial challenges. In collaboration with the Northern Contaminants Program (NCP), the Nasivvik Centre for Inuit Health and Changing Environments, and the Regional Inuit Land Claim organizations, ArcticNet supports an Inuit Research Advisor (IRA) position in each of the four Inuit regions. The mandate of the IRAs includes the facilitation of community visits and consultations to present research projects to northern communities and research licensing bodies and the collection of input by Northerners into specific projects and the overall research program of ArcticNet. IRAs act as a liaison between Inuit and researchers, whereby they play an important role for both the research community and their regions.

As part of the ASM2013 Student Day in Halifax, the IRAs facilitated a variety of sessions under the theme of northern careers. The IRAs led a discussion with students on what to expect when seeking employment in northern communities and delivered a topical session to help researchers brainstorm creative ways to engage Inuit in their research. The IRAs and Inuit members of the RMC meet several times a year as members of the Inuit Advisory Committee (IAC), making recommendations with regards to the research program and priorities. This past year, the IAC members have also continued to be actively involved in the development and compilation of the remaining IRIS reports.

INUIT EDUCATION

Despite efforts to improve student success by reflecting Inuit language and culture in schools, Inuit K-12 graduation rates are among the lowest in Canada for aboriginal populations. Though northern colleges provide programs in specific fields, access to post-secondary education remains extremely limited for Inuit despite some basic initiatives by southern universities. Inuit education continues to be a priority research area for the Network and in 2014, ArcticNet launched a Call for Proposals to address research priority areas in Inuit education developed through a collaboration between ArcticNet and the Amaujaq National Centre for Inuit Education following roundtable sessions at the ArcticNet Annual Scientific Meeting in December 2012 and the Forum on Research in Inuit Education held in Iqaluit in February 2013.

CONSOLIDATING CANADIAN-LED RESEARCH

ArcticNet Network Investigators were part of three successful research proposals to receive funding through the new NSERC Climate Change and Atmospheric Research (CCAR) initiative. The Network on Climate and Aerosols (NETCARE), Ventilation, Interactions and Transports Across the Labrador Sea (VITALS), and the Canadian Arctic GEOTRACES Program were amongst seven environmental projects that will benefit from more than $32 million in research funding over five years. Some of these programs will be conducted on board the CCGS *Amundsen* during joint expeditions with ArcticNet in 2014 and 2015.

GROWING INTERNATIONAL COLLABORATIONS

In past years, ArcticNet has benefited from incredible opportunities to create and strengthen its ever-growing international collaborations, enhancing the Network's recognition and contribution at a global level. The networking of Canadian and international Arctic specialists, Inuit experts, the private sector, and policy-makers through ArcticNet has added tremendous value to national initiatives such as the research icebreaker *Amundsen* project, the Canada Research Chair program, the Canada Excellence Research Chair program, and the Strategic Network program.

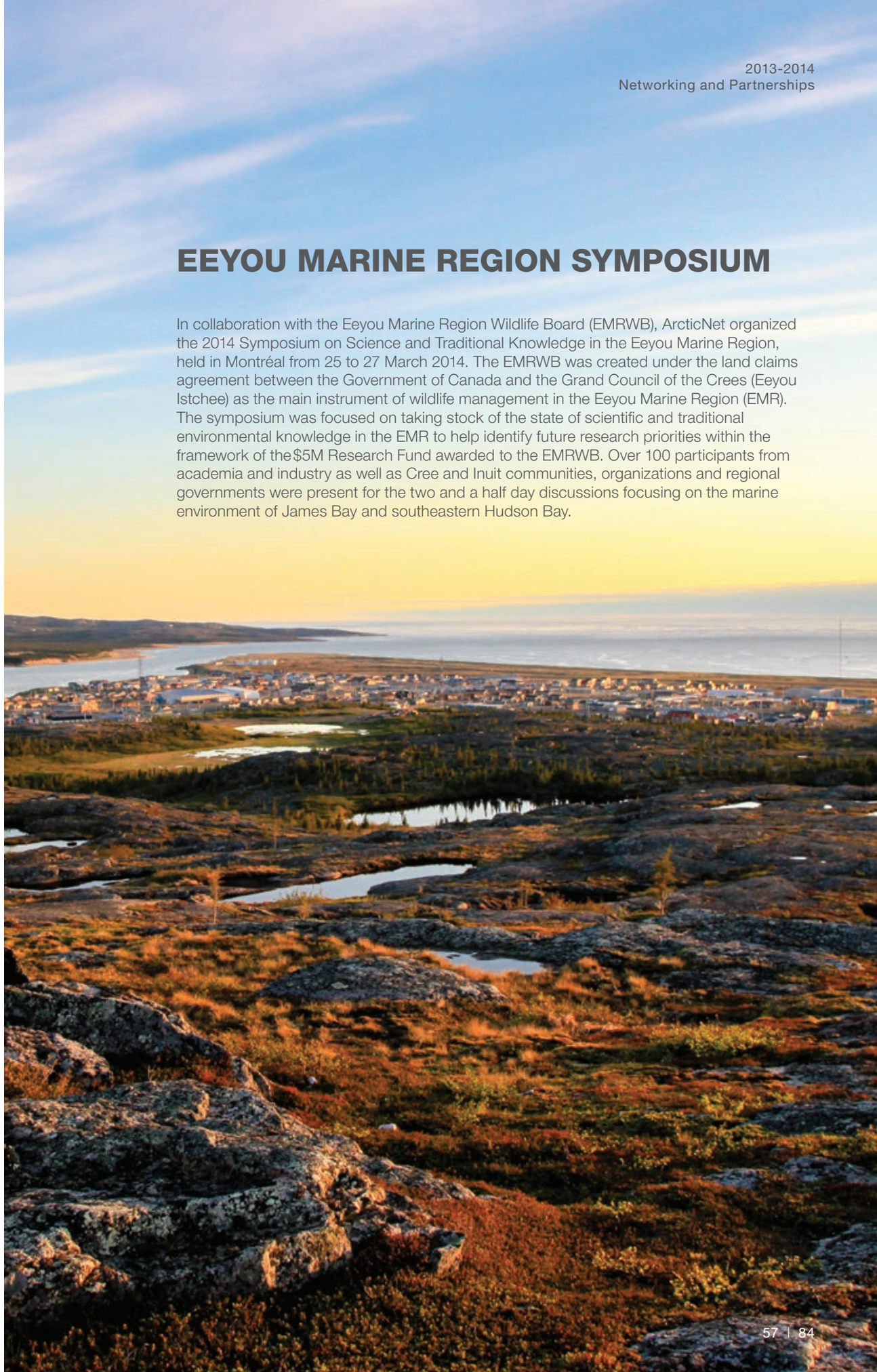
Takuvik, a Centre National de la Recherche Scientifique (CNRS) Unité Mixte Internationale (UMI) for Arctic research, established in 2011 for the study and modelling of Arctic and Subarctic ecosystems and geosystems now provides French polar specialists with access to the Canadian Arctic and Canada's northern research infrastructure, and enriches the on-going Canadian research effort with scientific and engineering expertise from France. Housed at Université Laval in Quebec City, the Takuvik UMI is a unique avenue to consolidate international collaborations within ArcticNet and has added a new centre of excellence to the Network. Initiatives like the International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT) and the Arctic Science Partnership (ASP), driven by ArcticNet's researchers at the Université Laval-based Centre d'études nordiques (CEN) and the Centre for Earth Observation Science (CEOS) at the University of Manitoba are great examples of international collaborations that are currently facilitating knowledge exchange and encouraging joint research efforts across Arctic boundaries.

With the Arctic being identified as a research priority and an area for increased international collaboration by major international research and innovation programs such as the European Union's Horizon 2020, ArcticNet and its centres of excellence are looking forward to welcoming more international colleagues as part of their research teams working in Canada and beyond.

In 2014, ArcticNet and its partners will welcome the international Arctic research community to Ottawa, Ontario for the Arctic Change 2014 conference from 8-12 December. The conference will bring together researchers, students, Northerners, policy makers, and stakeholders from all fields of Arctic research and all countries to address the numerous environmental, social, economical and political challenges and opportunities that are emerging in the changing Arctic. With over 1,000 participants expected to attend, Arctic Change 2014 will be one of the largest trans-sectoral international Arctic research conferences ever held in Canada.

EEYOU MARINE REGION SYMPOSIUM

In collaboration with the Eeyou Marine Region Wildlife Board (EMRWB), ArcticNet organized the 2014 Symposium on Science and Traditional Knowledge in the Eeyou Marine Region, held in Montréal from 25 to 27 March 2014. The EMRWB was created under the land claims agreement between the Government of Canada and the Grand Council of the Crees (Eeyou Istchee) as the main instrument of wildlife management in the Eeyou Marine Region (EMR). The symposium was focused on taking stock of the state of scientific and traditional environmental knowledge in the EMR to help identify future research priorities within the framework of the $5M Research Fund awarded to the EMRWB. Over 100 participants from academia and industry as well as Cree and Inuit communities, organizations and regional governments were present for the two and a half day discussions focusing on the marine environment of James Bay and southeastern Hudson Bay.



ARCTICNET ANNUAL SCIENTIFIC MEETING: CANADA'S PREMIER ARCTIC RESEARCH CONFERENCE

"The 2013 ArcticNet ASM has been a really successful week. With more than 550 people attending and over 300 presentations both oral and poster, it's wonderful to see the variety and the depth of information that has been collected as part of ArcticNet's research effort."

- 2013 ASM Attendee

Since its inception in 2004, ArcticNet's Annual Scientific Meeting (ASM) has become THE annual Arctic science meeting in Canada. Filling an obvious gap, the ASM has now developed into an established, recurrent and extremely well attended national and international Arctic research conference.

ArcticNet hosted its ninth annual meeting at the World Trade and Convention Centre in Halifax, Nova Scotia from 9 to 13 December 2013. With over 550 participants, the ASM2013 proved to be a successful and dynamic networking event, providing an excellent opportunity for Network Investigators, post-doctoral fellows, graduate students, research staff, and network partners from governments, Inuit organizations and industry, as well as Board and committee members to meet and discuss the latest in Arctic science.

More than 200 oral presentations and 175 scientific posters from the social and natural fields of Arctic research were presented during the meeting, reflecting the tremendous research effort supported by ArcticNet and its multidisciplinary program.

As evidence of a promising future for Canadian Arctic research, more than 300 graduate students, post-doctoral fellows and researchers attended the eighth annual ArcticNet Student Day. Moreover, thirteen students were awarded prizes for the excellence of their posters and their research.

ARCTIC INSPIRATION PRIZE

www.arcticinspirationprize.ca

Launched at the International Polar Year conference in Montréal in 2012, the $1 million CAD Arctic Inspiration Prize is awarded annually to recognize and promote the extraordinary contribution made by teams in the gathering of Arctic knowledge and their plans to implement this knowledge into real world applications for the benefit of the Canadian Arctic, Arctic Peoples and therefore Canada as a whole. The initiative is made possible through the generous endowment of the S. and A. Inspiration Foundation, the commitment of ArcticNet to voluntarily manage the prize, as well as the contribution of numerous volunteers and partners.

The second Arctic Inspiration Prize Awards Ceremony was held in December 2013 in Halifax in conjunction with ArcticNet's Annual Scientific Meeting, and featured a spectacular performance by northern artists Sylvia Cloutier, Beatrice Deer, Leela Gilday, Walter Landry, Joseph Nayally, David Serkoak, and Nelson Tagoona presented in collaboration with the National Arts Centre. The $1 million award was shared amongst three Canadian teams whose projects address pressing issues facing Canada's Arctic and its Peoples. Ikaarvik: From Barriers to Bridges received $325,000 for their plan to establish lasting relationships between the five northern communities of Cambridge Bay, Pond Inlet, Kugluktuk, Pangnirtung and Gjoa Haven, and five of the largest zoos and aquariums in Southern Canada (Assiniboine Park Zoo, Aquarium du Québec, Ecomuseum Zoo, Vancouver Aquarium, Toronto Zoo); the National Strategy on Inuit Education – National Parent Mobilization Initiative received $325,000 for their knowledge to action plan to mobilize parents, with the key message: "Getting children to school every day, all day, well rested and ready to learn"; and SakKijânginnatuk Nunalik: Healthy homes in thriving Nunatsiavut communities received $350,000 for their plan to use local Inuit knowledge, professional assessments and literature reviews to build and monitor Nunatsiavut's first sustainable, multi-unit residential dwelling and establish a prototype for northern housing development that addresses the changing northern climate, infrastructure requirements and Inuit housing needs and preferences.

AWARDS AND RECOGNITIONS

BARRY SMIT - SOCIAL SCIENCES AND HUMANITIES RESEARCH COUNCIL GOLD MEDAL WINNER

University of Guelph geography professor, Canada Research Chair in Global Environmental Change and ArcticNet Network Investigator Barry Smit was awarded the 2013 Social Sciences and Humanities Research Council's highest honour, the Gold Medal. The $100,000 prize is awarded to individuals whose sustained leadership, dedication and originality of thought have inspired students and colleagues alike. Dr. Smit is internationally recognized for his groundbreaking work on the human aspects of climate change.

MICHAEL BYERS - $50,000 DONNER PRIZE

Michael Byers, Canada Research Chair in Global Politics and International Law at the University of British Columbia and ArcticNet Network Investigator received the $50,000 Donner Prize in 2013-2014 for the best public policy book by a Canadian, for his publication *International Law and the Arctic.*

"This book is an accessible and thorough analysis of the current state of play in the Central Arctic Ocean and its five bordering coastal states, an area where the combination of melting sea-ice and the growing demand for oil and gas has increased international interest in resource exploration, shipping rights and environmental protection. Written with passion and first-hand experience of the subject, International Law and the Arctic reminds us that we cannot ignore the importance of the Arctic to Canada and all its people."

- Donner Prize Jury

ARCTICNET COMMUNITY
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LA COMMUNAUTÉ ARCTICNET

BOARD OF DIRECTORS
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CONSEIL D'ADMINISTRATION

Bernie Boucher (Chair), President, JF Boucher Consulting Ltd.

Duane Smith (Co-Chair), President, Inuit Circumpolar Council (Canada)

Terry Audla, President, Inuit Tapiriit Kanatami

William Barbour, Member of the Nunatsiavut Assembly for Nain

Yves Bégin, Director, Institut national de la recherche scientifique

Louis Fortier, Scientific Director and CEO, ArcticNet Inc.

Martin Fortier, Executive Director and COO, ArcticNet Inc. (*non-voting*)

Brian Gray, Assistant Deputy Minister, Natural Resources Canada

Digvir Jayas, Vice-President (Research), University of Manitoba

Janet King, Assistant Deputy Minister, Aboriginal Affairs and Northern Development Canada

Charles Lin, Director General, Environment Canada

Richard Marceau, Vice-President (Research), Memorial University of Newfoundland

Denis Mayrand, Deputy Vice Rector, Research and Innovation, Université Laval

Natan Obed, Director, Nunavut Tunngavik Inc.

Tom Paddon, President & CEO, Baffinland Iron Mines Corporation

Tom Paterson, Vice-President, Fednav Limited

Geneviève Tanguay, Vice Rector, Research, Creation and Innovation, Université de Montréal

David J. Thomas, President and Chairman, The Axys Group

Brigit Viens, Senior Program Manager, Networks of Centres of Excellence (*Observer*)

EXECUTIVE COMMITTEE
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CONSEIL EXÉCUTIF

Bernie Boucher (Chair), President, JF Boucher Consulting Ltd.

Louis Fortier, Scientific Director and CEO, ArcticNet Inc.

Martin Fortier, Executive Director and COO, ArcticNet Inc. *(non-voting)*

Brian Gray, Assistant Deputy Minister, Natural Resources Canada

Denis Mayrand, Deputy Vice Rector, Research and Innovation, Université Laval

Duane Smith (Co-Chair), President, Inuit Circumpolar Council (Canada)

David J. Thomas, President and Chairman, The Axys Group

2013-2014
ArcticNet Community / ᐅᑭᐅᖅᑕᖅᑐᑦ ᑐᑭᓯᐊᖅᑎᑎᑦ ᓄᓇᕗᒻᒥᑦ / La Communauté ArcticNet

AUDIT AND FINANCE COMMITTEE
ᑭᓇᐅᔭᓕᕆᓂᖅᓯᒪᑦ ᖃᑎᖃᑎᖏᓪᓗᑎᑦ ᑲᑎᒪᔨᐊᑦᑕᑦ
COMITÉ DE VÉRIFICATION ET DES FINANCES

Bernie Boucher, President, JF Boucher Consulting Ltd.

Martin Fortier, Executive Director and COO, ArcticNet Inc. *(non-voting)*

Digvir Jayas, Vice-President (Research), University of Manitoba

David J. Thomas (Chair), President and Chairman, The Axys Group

RESEARCH MANAGEMENT COMMITTEE
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COMITÉ DE GESTION DE LA RECHERCHE

Russel Shearer (Chair), Director, Northern Science and Contaminants Research Directorate, Aboriginal Affairs and Northern Development Canada

Michel Allard, Professor, Université Laval

Michael Barrett, Assistant Director, Kativik Regional Government

Trevor Bell, Professor, Memorial University of Newfoundland

Leah Braithwaite, Chief, Strategic Planning, Canadian Ice Service, Environment Canada

Karley Campbell, President, ArcticNet Student Association *(ex-officio,* until December 2013*)*

Larry Carpenter, Chair, Joint Secretariat Council (NWT), Inuvialuit Joint Secretariat

John Cheechoo, Director, Inuit Tapiriit Kanatami

Réjean Couture, Acting Program Manager, Natural Resources Canada, Geological Survey of Canada

Louis Fortier, Scientific Director and CEO, ArcticNet Inc. *(ex-officio)*

Martin Fortier, Executive Director and COO, ArcticNet Inc. *(ex-officio, non-voting)*

Chris Furgal, Professor, Indigenous Studies Department, Trent University

Helen Joseph, Director, Oceanography and Climate Branch, Fisheries and Oceans Canada

Gayle Kabloona, Policy Advisor, Nunavut Tunngavik Inc. (until July 2013)

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MINISTÈRES ET ORGANISMES FÉDÉRAUX

Aboriginal Affairs and Northern Development Canada (AANDC)

AANDC - Gatineau
Beaufort Regional Environmental Assessment
Cumulative Impact Monitoring Program
Environmental Studies Research Fund
Inuit Relations Directorate
Northern Contaminants Program
Northern Scientific Training Program
Nunavut Implementation Fund

Canadian Embassy in Beijing

Canadian High Arctic Research Station

Canadian Polar Commission

Canadian Space Agency

Environment Canada

Canadian Ice Service
Canadian Wildlife Service - Northern Conservation Division
Canadian Wildlife Service - Nunavut
Canadian Wildlife Service - Prairie and Northern Region
Canadian Wildlife Service - Quebec Region
Meteorological Service of Canada
National Water Research Institute
Science and Technology Branch

Fisheries and Oceans Canada

Aboriginal Aquatic Resource and Oceans Management Program
Bedford Institute of Oceanography
Canadian Hydrographic Service - Atlantic
Canadian Hydrographic Service - Central & Arctic
Central & Arctic Region
Freshwater Institute
Garde côtière canadienne
Institute of Ocean Sciences
Integrated Science Data Management
Maurice Lamontagne Institute
National Contaminants Advisory Group
Pacific Region
Science Branch Newfoundland
Species at Risk Act
Strategic Program for Ecosystem Based Research and Advice

Natural Resources Canada (NRCan)

Canada Centre for Remote Sensing
Earth Sciences Sector
Geological Survey of Canada
Geological Survey of Canada (Atlantic)
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Polar Continental Shelf Program
Program of Energy Research and Development

Parks Canada

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Public Health Agency of Canada

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Ontario Ministry of Natural Resources
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Nunatsiavut:

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Nunatsiavut Government
Nunatsiavut Department of Lands and Natural Resources

Nunavik:

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Qamani'tuaq, NU (Baker Lake)
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Tuktoyaktuk, NT
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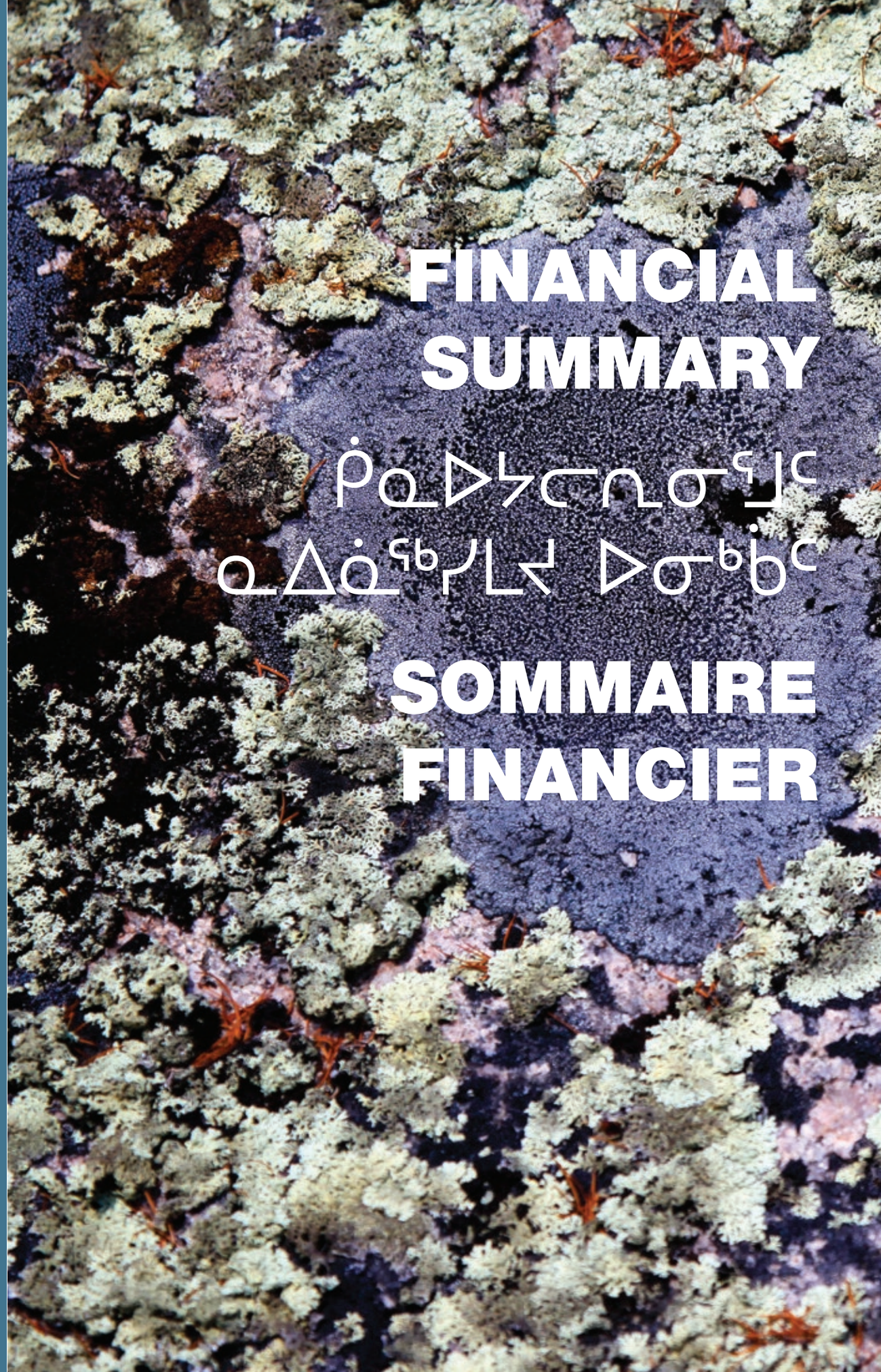
World Wildlife Fund Canada
Yukon College



ArcticNet was audited in June 2014 in accordance with generally accepted Canadian auditing standards. The following figures and financial summary are prepared from the unqualified financial statements.

ArcticNet a été vérifié en juin 2014 selon les normes de vérification généralement reconnues du Canada. Les données financières suivantes sont extraites des rapports financiers produits sans restriction.

REVENUES, EXPENSES AND NET ASSETS / REVENUS, DÉPENSES ET ACTIF NET

For the fiscal year ending 31 March 2014/ Pour l'année fiscale se terminant le 31 mars 2014.

Revenues / Revenus	
Networks of Centres of Excellence Grant / Subvention des réseaux de centres d'excellence	9,595,000
Network partner contributions / Contributions des partenaires du réseau	1,268,907
Arctic Inspiration Prize / Prix Inspiration Arctique	1,000,000
Others / Autres	230,949
Total revenues / Revenus totaux	**$12,094,856**
Expenses / Dépenses	
Research Projects (NCE) / Projets de recherche (RCE)	4,384,969
Research Projects (Non-NCE) / Projets de recherche (Non-RCE)	220,000
Core infrastructure (NCE) / Infrastructure majeure (RCE)	4,204,097
Core infrastructure – (Non-NCE) / Infrastructure majeure – (Non-RCE)	380,896
Amortization of equipment / Amortissement équipement	380,897
Arctic Inspiration Prize / Prix Inspiration Arctique	1,053,316
Administrative Centre / Centre administratif	2,324,663
Total expenses / Dépenses totales	**$12,948,838**
Excess (deficiency) of revenues over expenses / Excédent (déficit) des revenus sur les dépenses	**$(853,982)**
Net assets, beginning of year / Actifs net, début de l'exercice	4,412,412
Net assets, end of year / Actifs net, fin de l'exercice	**$3,558,430**

BALANCE SHEET AS OF 31 MARCH 2014 / BILAN AU 31 MARS 2014

ASSETS / ACTIF	
Cash / Encaisse	7,840,476
Accounts receivable / Comptes à recevoir	192,063
Prepaid expenses / Frais payés d'avance	382,014
Total Current Assets / Total actif à court terme	**$8,414,553**
Capital assets / Immobilisations	1,533,113
Total Assets / Total actif	**$9,947,666**
LIABILITIES / PASSIF	
Accounts payable and accrued liabilities / Comptes à payer et frais courus	631,636
Deferred grants / Apports reportés	5,757,599
	$6,389,235
NET ASSETS / ACTIF NET	
Invested in capital assets / Investi en immobilisations	43,138
Unrestricted Assets / Actif non affecté	3,515,293
Total Liabilities and Net Assets / Total passif et actif net	**$9,947,666**

STATEMENT OF CASH AND IN-KIND CONTRIBUTIONS 2013-2014 / SOMMAIRE DES CONTRIBUTIONS EN ESPÈCES ET EN NATURE 2013-2014

	Cash / En espèces	**In-kind / En nature**	**Total**
NCE / RCE	9,595,000	0	9,595,000
Non-NCE1 / Non-RCE[1]			
Provincial / Provinciales	1,907,829	448,600	2,356,429
Federal[2] / Fédérales[2]	3,907,885	6,986,678	10,894,563
University / Universitaires	1,812,079	2,769,077	4,581,156
Industry / Industrielles	605,800	195,500	801,300
Others / Autres	1,886,077	2,062,678	3,948,755
Non-NCE / Non-RCE	10,119,670	12,462,533	22,582,203
Total NCE and non-NCE Total RCE et non-RCE	**$19,714,670**	**$12,462,533**	**$32,177,203**

1 Certain funds contributed by Network Partners to support research projects are forwarded directly to researchers and are not managed by the ArcticNet Administrative Centre / Certaines contributions des partenaires du réseau aux projets de recherche parviennent directement aux chercheurs et ne sont pas gérées par le centre administratif d'ArcticNet.

2 These federal contributions do not include contributions received from the Federal granting councils, the Canada Foundation for Innovation and Genome Canada. / Ces contributions fédérales n'incluent pas les contributions des conseils de recherche, de la fondation canadienne pour l'innovation et de Génôme Canada.

Daniel Dubé
Transport Canada
1957 – 2013

Captain Marc Thibault
Canadian Coast Guard
1965 – 2013

Dr. Klaus Hochheim
Centre for Earth Observation Science,
University of Manitoba
1958 – 2013

REMEMBERING FRIENDS AND COLLEAGUES

ArcticNet tragically lost three of its colleagues, Daniel Dubé, helicopter pilot, Marc Thibault, Commanding Officer of the CCGS *Amundsen* and Dr. Klaus Hochheim, research scientist at the Centre for Earth Observation Science at the University of Manitoba, when the *Amundsen's* helicopter crashed in M'Clure Strait on 9 September 2013. Daniel, Klaus and Marc were long time members of the ArcticNet - Coast Guard family and were highly respected for their expertise and commitment to Arctic research. They were passionate about life and dedicated to their work and will be very deeply missed.

Dr. Éric Dewailly
Centre de recherche du Centre hospitalier de l'Université Laval
1957 – 2014

With great sadness ArcticNet mourned the loss of Dr. Éric Dewailly, a world-renowned expert in the field of environmental and human health in northern Canada and the circumpolar world.

As the pillar of ArcticNet's human health program, he developed, managed and completed with brio the *Amundsen*-based Nunavik Health Survey "Qanuippitaa? How are we?" and continuously proposed new ideas and projects, from research chairs to research institutes.

Always enthusiastic about the Arctic and its inhabitants, Éric was a close friend and colleague to many within the ArcticNet family.

This report is available in English, French and Inuktitut
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Ce rapport est disponible en anglais, en français et en inuktitut

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ArcticNet

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