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# Foreword

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The Nunavut Research Institute was created in 1995 when the Science Institute of the NWT was divided into eastern and western operations. In the Eastern Arctic, the re-named institute was amalgamated with Nunavut Arctic College.

The Nunavut Research Institute focuses on supporting scientific research and technology development across a broad spectrum of issues and concerns. The Institute's interpretation of research is broad – incorporating Inuit Qaujimanituqangit, social sciences, and natural sciences. The following mission statement guides the activities and services provided by the Institute:

*The mission of the Nunavut Research Institute is to provide leadership in developing, facilitating and promoting Inuit Qaujimanituqangit, science, research and technology as a resource for the well being of people in Nunavut.*

Institute services are guided by the core values of Nunavut Arctic College - strong communities, cultural appropriateness, partnerships, quality, access, responsiveness and life-long learning. The Nunavut Research Institute places emphasis on brokering northern-based research that is linked to community needs, and making greater use of Inuit Qaujimanituqangit in research projects.

This Compendium of Research has been produced as part of the Institute's effort to communicate information about research projects that have recently taken place in Nunavut under the authority of the Nunavut Scientists Act.

## **FOR MORE INFORMATION**

For more information about the research projects listed in this Compendium, please contact:

Nunavut Research Institute  
P.O. Box 1720  
Iqaluit, Nunavut  
X0A 0H0  
Phone: (867) 979-4108/4105  
Fax: (867) 979-4681  
E-mail: [slcnri@nunanet.com](mailto:slcnri@nunanet.com)  
[stsnri@nunanet.com](mailto:stsnri@nunanet.com)

Internet: <http://pooka.nunanet.com/~research>

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**Name:** Banerji, Anna  
**Department:** Emergency Department  
**Affiliation:** BC Children's Hospital  
**City/Town:** Vancouver  
**Province/State:** BC  
**Country:** Canada  
**Phone:** 604-739-3051  
**Fax:** 604-681-8930  
**E-mail:** abanerji@sprint.ca  
**Number in party:** 6  
**Location/Region:** North and South Baffin  
**Project Title:** **Simkania negevensis and respiratory viruses in Inuit Children on Baffin Island**

**Summary:** Studies completed by our research group found that Inuit children on Baffin Island have one of the highest rates of lung infections in the world. Lung infections are the leading cause of admission, medical evacuation and medical costs for children at the Baffin Regional Hospital. Inuit children have severe and frequent infections that often need life support. Recurrent lung infections can result in chronic lung disease. For us to reduce the risk of lung infections, we need to understand why they happen. Studies have linked cigarette smoke exposure, living in crowded conditions, being born prematurely, and the lack of breast feeding as possible risk factors. We don't know what are the risk factors on Baffin Island. It was thought that most lung infections in young Inuit children were due to a virus. Viruses are generally difficult to treat. Recently we have discovered a new infection called simkania negevensis (SN) which may be treatable. We are proposing a 1 year study of all children less than 5 years of age admitted to BRH with lung infection, to search for the factors that increase the risk of lung infections. We will be comparing sick children to healthy children of a similar ages. We would try to see how factors such as cigarette smoke exposure, lack of breastfeeding, overcrowding, affect lung infection. We would also be looking for the type of infection, including viruses and SN.

**Name:** Tester, Frank  
**Department:** School of Social Work  
**Affiliation:** University of British Columbia  
**City/Town:** Vancouver  
**Province/State:** British Columbia  
**Country:** Canada  
**Phone:** 604-822-2100  
**Fax:** 604-822-8656  
**E-mail:** ftester@socialwork.ubc.ca  
**Number in party:** 3  
**Location/Region:** Nunavut  
**Project Title:** **Historical Relations of Health Care in the Eastern Arctic: Health Care Policy Implications**

**Summary:** We are planning to do a critical analysis of the history of medical services in the eastern Arctic: 1) The project will clarify the past history; 2) The results from the critical analysis will lead us to identify the assumptions that framed and limited the development of health services in the North and shed light on a broader set of possibilities for the future development of health policies; and 3) Because we will be working with Inuit students, the project will also be a training opportunity and prepare Inuit co-researchers for continuing involvement in health policy or other forms of policy research, e.g., social welfare, education, analysis of contemporary documents. To achieve these goals, we have started to collect data from various archives (e.g. National Archives, Prince of Wales Heritage Centre) and we propose to interview people who have played a role in the history of medical services in the eastern Arctic. We are planning to work closely with Inuit students and the three Nunavut health boards throughout the project.

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**Name:** Aiken, Susan  
**Affiliation:** Canadian Museum of Nature  
**City/Town:** Ottawa  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-364-4073  
**Fax:** 613-364-4027  
**E-mail:** saiken@mus-nature.ca  
**Number in party:** 2  
**Location/Region:** Nunavut  
**Project Title:** **Flora of the Canadian Arctic Archipelago**

**Summary:** The last Flora of the Canadian Arctic Archipelago was written by A.E. Porsild and published first in 1957 with a supplement in 1964. It is out of date, very skimpy on details useful for identifying plants and in illustrations limited to black and white line drawings and maps. Data for the current work are being gathered in electronic database format that can be accessed interactively by computer for plant identifications. Coloured slides are being digitized showing habitats in which plants grow, and also close up pictures of plants, such as flowers and fruits. The results are more complete information than has been previously been available for identifying arctic plants. Results to date may be viewed at [www.mun.ca/biology/delta/arcticf](http://www.mun.ca/biology/delta/arcticf). My reason for going to Coral Harbour and Crocker on Devon Island would be to study grass *Dupontia* and obtain samples for a circumpolar study on this genus of grasses. The areas have otherwise been very well collected and I would anticipate taking a minimum of samples.

**Name:** Allard, Michel  
**Department:** Centre d'etudes nordiques  
**Affiliation:** Laval University  
**City/Town:** Ste.Foy  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 418-656-5416/5106  
**Fax:** 418-656-2978  
**E-mail:** michel.allard@gr.ulaval.ca  
**Number in party:** 4  
**Location/Region:** North Baffin  
**Project Title:** **Geomorphological and Climatological Permafrost Dynamic of the Valley Glacier**

**Summary:** The valley of glacier C-79 on Bylot Island presents a variety of permafrost features : ice wedge polygons, pingos, thermokarst lakes, etc. The objectives of this project are : 1) to understand the historical development of these features during the recent Quaternary, with an emphasis on the impacts of the climate change of the last 3000 years 2) to observe and characterize the actual processes that govern the dynamics of these features as well as the climatic parameters the control the processes 3) to modelize the present day thermal regime of permafrost 4) to reconstruct paleoclimatological and paleoecological changes recorded in ground ice and sedimentary sequences 5) to establish correlations between our findings and other existing Arctic records.

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**Name:** Amyot, Marc  
**Department:** INRS-Eau  
**Affiliation:** University du Quebec  
**City/Town:** Sainte-Foy  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 418-645-2542  
**Fax:** 418-654-2600  
**E-mail:** marc\_amyot@inrs-eau.quebec.ca  
**Number in party:** 3  
**Location/Region:** North Baffin  
**Project Title:** **Oxydo-reduction du mercure dans les eaux douces et saeles de l'extreme Arctic**

**Summary:** Mercury levels have increased in the atmosphere, lakes and oceans since the start of the industrial period. Once emitted in the atmosphere by natural and human related sources, mercury takes part in a complicated chemistry that can lead to its deposition onto snow packs, lakes, and oceans. These compartments can therefore be seen as reservoirs of mercury where it is important to understand the reactions mercury can undergo. In particular, it would be helpful to know if snow acts as a stable reservoir accumulating mercury throughout the winter that could be released all at once in the environment at snow melt or if mercury in snow is transient. The goal of this proposed project is to observe, quantify and understand the potential mercury reactions occurring in arctic snow as well as in fresh and salt arctic waters. To achieve this goal, we would need to collect surface snow and water samples close enough to the laboratories of PCSP for rapid chemical analysis but far enough to avoid contamination from camp. The freshwater site would include Maretta Lake and North lake while the saltwater site would be in Barrow Strait in front of the PCSP laboratories.

**Name:** Ash, Gary  
**Affiliation:** R.L. & L. Environmental Services Ltd.  
**City/Town:** Edmonton  
**Province/State:** Alberta  
**Country:** Canada  
**Phone:** 780-483-3499  
**Fax:** 780-483-1574  
**E-mail:** edmonton@rll.ca  
**Number in party:** 4  
**Location/Region:** Kitikmeot  
**Project Title:** **Hope Bay Aquatic Investigations**

**Summary:** The Hope Bay Joint Venture plan to carry out additional baseline investigations during the 2001 field program. The program is considered to be an extension of the work done in 2000 and the data collected is requires to fill in some gaps as we continue our advanced exploration activities in the Hope bay belt. A considerable amount of aquatic surveys have been completed on the belt since 1992 under a previous owner. The 2001 program will focus on the Roberts Bay, Little Roberts Lake and Roberts Lake area . The study program is designed to compliment existing information and fill in data gaps on aquatic habitat and fish populations in the study area. The work will include both spring and fall field surveys, focusing on Arctic grayling spawning locations and Arctic char migration patterns in and out of Roberts lake. Tissue samples will be collected from approximately 60 fish ( 30 Arctic char and 30 lake trout) and analyzed for metal concentrations. Where possible, fish tagging will be undertaken to enable longer term monitoring. In addition, sediment samples will be collected in Roberts Bay and Roberts Lake to determine the present concentrations of metals and organic contaminants. The collected data will be incorporated into our project description as part of the environmental impact assessment and permitting process.



**Name:** Barber, David G  
**Department:** Department of Geography  
**Affiliation:** University of Manitoba  
**City/Town:** Winnipeg  
**Province/State:** Manitoba  
**Country:** Canada  
**Phone:** 204-474-6891  
**Fax:** 204-474-7699  
**E-mail:** dbarber@ms.umanitoba.ca  
**Number in party:** 14  
**Location/Region:** North Baffin  
**Project Title:** **Collaborative Interdisciplinary Cryospheric Experiment**

**Summary:** The C-ICE 2001 experiment's objectives continue to address our principal motivation, namely to understand the nature of ocean-sea ice-atmosphere processes so that we can make informed predications about the response of the marine cryosphere to climate change. In particular we intend to continue with the observations of the geophysical characteristics of the snow and sea ice and to couple the evolution in these physical properties to the energy balance of the ocean-sea ice atmosphere interface. By maintaining the sampling program we are building a valuable dataset of climate variability and change in Arctic Canada. During the C-ICE 2001 experiment we will specifically address objectives within four interrelated themes: a) snow and sea ice physical sampling program: to measure on a daily basis, snow and sea ice microstructure, sea ice macrostructure and the snow and sea ice complex; b) surface energy balance program: automated climate stations will be erected within 5 km of base camp to record all the components of the surface energy balance as 15-minute averages; c) atmospheric boundary layer program: to collect information on the role clouds play in moderating the radiation flux at the surface; d) remote sensing program: an electromagnetic sampling tower will be installed over smooth first year ice, housing a passive microwave radiometer operating at 19, 37 and 85 GHz. The location of this sampling will be conducted close (<5km) to the main base camp, situated on Truro Island. The primary mode of transportation will be snowmobile. A number of semi-permanent structures will be erected during the field program, including a number of parcols, a tv tower to support the surface energy balance program and a scaffolding unit to support the passive microwave radiometer. All structures will be dismantled and returned to Resolute for storage.

**Name:** Blanchette, Robert  
**Department:** Department of Plant Pathology  
**Affiliation:** University of Minnesota  
**City/Town:** St. Paul  
**Province/State:** Minnesota  
**Country:** USA  
**Phone:** 612-625-0202  
**Fax:** 612-625-9728  
**E-mail:** robertb@puccini.crl.umn.edu  
**Number in party:** 6  
**Location/Region:** North Baffin  
**Project Title:** **Microbial diversity and decomposition processes in Arctic environments**

**Summary:** The fragile nature of the arctic tundra and peat ecosystems has been demonstrated by research completed over the last decade. However, microbial communities that facilitate much of the early decomposition of plant tissue in the arctic have not received much research attention. To gain insight into these processes we plan to study the biology and ecology to microorganisms that decompose wood. We will focus on dead and dying arctic willow to determine the microorganisms present and the types of decay found. We also want to study wood deterioration that is taking its toll on historic woods left by the early explorers. The proper conservation of these historic resources requires that the agents causing the deterioration be known. We would also investigate modern and ancient deterioration of the high arctic fossil forests, which were preserved in a near pristine state for millions of years but are now eroding. These systems represent natural laboratories for microbial decay. We will sample small amounts of soil and decomposing wood, bring these samples back to the laboratory to characterize microbial degraders and the type and extent of decay using microscopy and molecular techniques.

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**Name:** Bradley, Raymond  
**Department:** Department of Geosciences  
**Affiliation:** Morrill Science Center, University of Massachusetts  
**City/Town:** Amherst  
**Province/State:** MA  
**Country:** USA  
**Phone:** 413-545-2120  
**Fax:** 413-545-1200  
**E-mail:** rbradley@geo.umass.ed  
**Number in party:** 6  
**Location/Region:** North Baffin  
**Project Title:** **Study of Climate Change in the Arctic Environment**

**Summary:** We plan to remove sediment cores from several lakes on Ellesmere Island to be used in a study of how the climate of the region has changed. We want to understand how "global warming" has affected the Arctic environment. At present, we can't fully understand this because measurements based on thermometers are too short -- the longest records only go back to around 1950. By looking at lake sediments and trying to understand how the climate has changed over the past few hundred, or even a few thousand years. Our studies involve coring into the sediments at the bottom of the lake (from the lake ice surface), measuring streamflow and taking sediment samples from the streams coming into each lake, setting up one or two weather stations in the study areas (for the period of study) and making measurements in the lakes themselves. Our field groups are generally small (4-5 people at most).

**Name:** Bradley, Raymond  
**Department:** Dept. of Geosciences  
**Affiliation:** University of Massachusetts  
**City/Town:** Amherst  
**Province/State:** Maine  
**Country:** USA  
**Phone:** 413-545-2120  
**Fax:** 413-545-1200  
**E-mail:** rbradley@geo.umass.edu  
**Number in party:** 4  
**Location/Region:** North Baffin  
**Project Title:** **Weather Stations to Study Climate Change**

**Summary:** We propose to set up several weather stations on an upland plateau of northern Ellesmere Island to study the way in which snow and ice expand over the tundra during cold periods, or melt and retreat during warm periods. We want to try and understand how the high plateau will be affected by climatic change, and how the snow cover itself plays a role in cooling the surface, compared to the snow-free tundra nearby. We selected the Hazen plateau of northern Ellesmere Island because at the beginning of each summer, it is snow-covered but as the summer progresses, dark patches of tundra emerge from beneath the snow and rapidly change the way energy from the sun is used to warm up the land surface. By measuring weather conditions across the plateau we can study the different climates created by snow cover, dark tundra surfaces and small ice caps. A small field party will maintain the instruments from late May to late August. Some of the weather stations will operate (unattended) all year. The project will last for 3 summer seasons.

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**Name:** Bright, Doug A.  
**Department:** Applied Research  
**Affiliation:** Royal Roads University  
**City/Town:** Victoria  
**Province/State:** British Columbia  
**Country:** Canada  
**Phone:** 205-391-2560  
**Fax:** 205-391-2560  
**E-mail:** doug.bright@royalroads.ca  
**Number in party:** 6  
**Location/Region:** North and South Baffin  
**Project Title:** **Fish From High Arctic Lakes as Cumulative Effects Indicators of Long-Range Atmospheric Contaminant Transport and Climate Change**

**Summary:** Up to 30 Arctic char each from small lakes containing land-locked char will be collected using a combination of hand lines and gill nets. We are interested in land-locked char populations as possible early warning indicators of global climate change, based on trends in metal uptake from lake water. The collection methods and collection sites will be adjusted based on local knowledge; especially feedback from the communities, and from fisheries and renewable resources officers, on local conservation efforts, important stocks for local sustenance, and preferred catch and management strategies. The fish will be processed and then shipped back to the University of Innsbruck, Royal Roads University, the Freshwater Institute, or the National Water Research Institute, where the researchers will look at the concentrations of copper, zinc, lead, and organochlorines in several tissues, and also measure biochemical indicators of metal exposure and stress. We will also measure the temperature and characteristics of the lake water, since we believe that the lake water temperature and water hardness help determine how much of various essential (copper, zinc) and non-essential (lead, mercury) metals the fish take up across their gills and outer skin.

**Name:** Briner, Jason P.  
**Department:** INSTAAR  
**Affiliation:** University of Colorado  
**City/Town:** Boulder  
**Province/State:** Colorado  
**Country:** USA  
**Phone:** 303-492-5075  
**Fax:** 303-492-6388  
**E-mail:** jason.briner@colorado.edu  
**Number in party:** 4  
**Location/Region:** North Baffin  
**Project Title:** **Laurentide Ice Sheet dynamics and Chronology in the Clyde River Region, Nunavut**

**Summary:** We aim to revisit the Clyde River region to better understand the history of the Laurentide ice sheet during the last ice age. Our objectives are to study glacier deposits on the Clyde and Cape Aston forelands, and along Clyde Inlet, from the settlement of Clyde River to the fiord head. Our research methods include travelling on foot across the landscape, collecting about 25 rock samples and analysing soils to investigate the substrate. Rock and soil samples are required for dating the glacier deposits.

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**Name:** Budkewitsch, Paul  
**Affiliation:** Canada Centre for Remote Sensing  
**City/Town:** Ottawa  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-947-1331  
**Fax:** 613-947-1385  
**E-mail:** paul.budkewitsch@ccrs.nrcan.gc.ca  
**Number in party:** 6  
**Location/Region:** North Baffin  
**Project Title:** **Radar Signatures of Evaporite Exposures and Hyperspectral Imaging for Mineral Exploration**

**Summary:** The CCRS is conducting field testing for the purpose of gathering ground observations of different terrain types to help develop satellite-based mapping tools for geological mapping and mineral exploration activities. The project will provide information to assist users of satellite images in the north to make better maps. The project has 2 goals. One is to see if satellite radar images can be used to detect changes in the permafrost or active layer and for mapping different rock types. The second part of the study will be carried out from Nanisivik to understand the reasons why some rock types appear differently than others in photographs from satellites and airborne imaging systems.

**Name:** Carlson, Ron  
**Affiliation:** Partners by Design Incorporated  
**City/Town:** Chicago  
**Province/State:** Illinois  
**Country:** USA  
**Phone:** 630-399-3333  
**Fax:** 312-649-0993  
**E-mail:** clutchcargo1@email.msn.com  
**Number in party:** 1  
**Location/Region:** Kitikmeot  
**Project Title:** **Water Search for Erebus or Terror (Franklin Expedition)**

**Summary:** Using side scan sonar, I plan to grid search areas around the 2 possible locations near Grant Point or north of O'Reilly Island.. The underwater sonar probe will be trolled approximately 15 feet above the bottom. I also will use underwater camera systems.

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**Name:** Dufresne, France  
**Department:** Department de biologie  
**Affiliation:** Universite du Quebec a Rimouski  
**City/Town:** Rimouski  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 418-723-1986 (1223)  
**Fax:** 418-724-1849  
**E-mail:** france\_dufresne@uqar.qc.cq  
**Number in party:** 1  
**Location/Region:** North Baffin  
**Project Title:** **Clonal diversity in daphnia pulex from Resolute Bay**

**Summary:** My research is on the crustacean, *Daphnia pulex*, that inhabits ponds and lakes throughout the arctic. By contrast to the temperate zone, populations of this species reproduce almost exclusively by asexual reproduction in the Arctic; females produce clones of themselves. Previous genetic work on this species has shown that there is tremendous clonal diversity, with thousands of clones being present in arctic areas. The arctic is not homogeneous, some regions have not experienced the last Pleistocene glaciations harbor more genetic diversity than those that have been covered by ice. The goal of my research project is to understand which factors favor clonal diversity. The study is important in that it will help us elucidate the evolutionary potential of these animals and hence a better comprehension of how they will adapt to future environmental changes.

**Name:** Eberle, Jaelyn  
**Affiliation:** Canadian Museum of Nature  
**City/Town:** Ottawa  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-364-4027  
**Fax:** 613-364-4145  
**E-mail:** jeberle@mus-nature.ca  
**Number in party:** 1  
**Location/Region:** North Baffin  
**Project Title:** **Fossil plants and animals on Ellesmere Island near Bay Fiord**

**Summary:** 50-60 million year old rocks south of Bay Fiord contain fossils of fish, turtles, alligators, mammals clams, and plants. For 3 weeks in July 2001, we plan to prospect and collect these fossils, measure the thickness of the rocks in which the fossils occur and map out the geology of the area. By studying these fossils and the rocks that contain them we hope to better understand the ancient climate and environment in which these animals and plants lived. Most of the fossils occur at the surface , so very little digging and quarrying below surface layers will be done. We plan to sift through surface material with hand screens , in hopes of finding tiny fossil teeth and bones. Two ATVs provided by Polar Continental Shelf Project will be used for transportation to and from localities. Once collected, fossil teeth and bones will be housed at the Museum of Nature in Ottawa, the clam shells will be housed at the Geological Survey of Canada and the fossil plants will be housed at the University of Saskatchewan in Saskatoon.

**Name:** Ecclestone, Miles  
**Department:** Department of Geography  
**Affiliation:** Trent University  
**City/Town:** Peterborough  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 705-748-1546  
**Fax:** 705-748-1205  
**E-mail:** mecclestone@trentu.ca  
**Number in party:** 3  
**Location/Region:** North Baffin  
**Project Title:** Expedition Fiord, Axel Heiberg Island

**Summary:**

Our research objective is, simply, to continue the mass balance measurements for White and Baby Glaciers, which began in the early 1960's. Analysis of our data over the past few years has shown that the glaciers we are monitoring are representative of glacierized islands in the high arctic. Thus, we are also trying to increase the measurement network and improve on measurement techniques so that the annual results will become even more meaningful and useful in helping determine whether high arctic glaciers in general are showing signs of being affected by changing climate (e.g. getting warmer). Present projections from some models suggest that Arctic regions will get warmer by 1-6 degrees C in the next few decades. We hope that the mass balance measurements we make can provide first hand evidence of any changes. Essentially, the mass balance of a glacier is determined by measuring the amount of snow that falls and accumulates at the top of the glacier, which slowly turns to ice versus measuring the amount of ice that melts at the bottom. If there is more accumulation than melt then the glacier is gaining mass or is getting bigger. If there is more ice melt than snow gained then the glacier is shrinking. We need a very long record of these annual measurements to be able to distinguish whether the glacier is reacting to normal weather variations or because there is climate change. We are also trying to make more measurements over the glaciers surface and make them more accurate (using new technology such as Global Positioning Satellites (GPS) to locate our sampling points). The work on the glacier is best carried out in the late spring (April), for approximately one month, when the winter accumulation is largely over but the ice has not yet started to melt. This makes it safe to travel on the glacier. We are transported to our site by PCSP and we use skidoos provided by them. We need skidoos to travel safely on the glacier and to get to and from the glacier and to cover the large surface areas of the glaciers (White Glacier is 39 square km in size, for example). We stay at the McGill University high Arctic camp so we do not build or erect any structures. We are very careful to ensure that our impact on the environment is minimal.

**Name:** England, John  
**Department:** Department of Earth and Atmospheric Sciences  
**Affiliation:** University of Alberta  
**City/Town:** Edmonton  
**Province/State:** Alberta  
**Country:** Canada  
**Phone:** 780-492-3265  
**Fax:** 780-492-7598  
**E-mail:** john.england@ualberta  
**Number in party:** 5  
**Location/Region:** North Baffin  
**Project Title:** **Paleoenvironmental change in Arctic Canada**

**Summary:** The broad objective of our research is to obtain a long term paleoclimatic record from former ice conditions and to determine whether this scale of glaciation could happen again or with ongoing global warming will glaciers and sea ice be progressively removed from the Arctic high latitude areas such as the Canadian Arctic provide diverse records of past global changes since they are the first areas to be affected by climate variability. It is of prime importance to obtain more data from these regions and to place them in a context of much longer environmental changes in order to understanding of possible future climatic conditions.

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**Name:** Estrada, Solveig  
**Affiliation:** Bundessanstalt f. Geowissenschaften und Rohstoffe  
**City/Town:** Hanover  
**Country:** Germany  
**Phone:** 0511-643 32 33  
**Fax:** 0511- 643 36 63  
**E-mail:** Solveig.Estrada@bgr.de  
**Number in party:** 6  
**Location/Region:** North Baffin  
**Project Title:** **Ancient volcanism and mountain building on NW Ellesmere Island**

**Summary:** From about 85 million years ago to the present the northernmost Arctic regions have been under a tectonic regime of extension, which led to the formation of the Arctic Ocean, extending from Svalbard, the Barents Shelf, North Greenland and into the Canadian Arctic Islands. These 2 different tectonic regimes, extension in the north and compression on the land to the south, are difficult to reconcile. Gathering data to try to resolve this enigma is the objective of this project sponsored by BGR.



**Name:** Forbes, Donald  
**Department:** Geological Survey of Canada  
**Affiliation:** Bedford Institute of Oceanography  
**City/Town:** Dartmouth  
**Province/State:** NS  
**Country:** Canada  
**Phone:** 902-426-7737  
**Fax:** 902-426-6786  
**E-mail:** dforbes@nrcan.gc.ca  
**Number in party:** 5  
**Location/Region:** North Baffin and Kitikmeot  
**Project Title:** **Relative sea level changes and associated climate impacts on northern coasts and waterways.**

**Summary:** One of the most confidently predicted impacts of climate change warming is a rise in sea level. Rates of sea level rise will vary geographically and the change in sea level relative to the land at any location will be also affected by vertical motion of the earth's crust. Because of changes in ice and water distribution over thousands of years, ground motion ranges from 20 cm/century subsidence west of Banks Island to more than 30 cm/century uplift at Resolute Bay. The implications of these changes for sustainable development in the Nunavut coastal zone may be significant, particularly when combined with other climate change factors such as reduced sea ice and a resulting increase in wave energy. Arctic coasts may be particularly affected by these changes, as climate warming is projected to be more severe in the north and may lead to unexpected rapid coastal change by waves and ice. The zone of submergence in the western Arctic can be expected to expand towards the central part of Nunavut. This project involves refining estimates of uplift or subsidence by global positioning system and gravity measurements at sites throughout the western Arctic, supported by a compilation of data on coastal submergence and emergence from geological observations. This will be followed by satellite remote sensing, aerial oblique video imaging, and shore surveys of coastal and shallow marine geology and processes, focusing on sites with previous data, coastal communities, locations of past and projected developments, or particularly vulnerable sites. Long term coastal change under existing climate and sea level trends will be determined at reference sites of Geological Survey's coastal monitoring network, which will be expanded to provide useful information near communities. With results from other projects on changes in sea ice, this will be used to forecast future impacts of climate change on Nunavut coasts.

**Name:** Gates, Laura  
**Department:** Geological Sciences and Geological Engineering  
**Affiliation:** Queen's University  
**City/Town:** Kingston  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-533-2597  
**Fax:** 613-533-6592  
**E-mail:** gates@geoladm.geol.queensu.ca  
**Number in party:** 4  
**Location/Region:** North Baffin  
**Project Title:** **Late Permian biogenic chert sedimentation in the Sverdrup Basin**

**Summary:** The Earth's largest mass extinction and most profound environmental turnover occurred 251 years ago near the end of the Permian period. This change is no better preserved than in the Sverdrup Basin of the Canadian Arctic Archipelago. Late Permian rocks are represented by widespread deposits that formed through the breakdown of sponges, thus providing evidence for a unique set of environmental conditions immediately prior to the end Permian devastation. A series of well exposed outcrops on the NW Ellesmere Island will be examined as part of this project to reconstruct the ancient environments of deposition of this unique assemblage. This study will shed some light into an ancient worlds that has very few analogues in both the modern and ancient sedimentary record of the planet.

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**Name:** Gillespie, Lynn  
**Affiliation:** Canadian Museum of Nature  
**City/Town:** Ottawa  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-364-4075  
**Fax:** 613-364-4027  
**E-mail:** lgillespie@mus-nature.ca  
**Number in party:** 1  
**Location/Region:** North Baffin  
**Project Title:** **Morphological and Genetic Variation among Arctic Plants**

**Summary:** We are studying the morphological and genetic variation among arctic plants. Our goals are to better define species and to write identification keys and guides so that arctic plants may be more easily identified. We are also interested in understanding the origin and evolutionary relationships of arctic plants. Our studies are focused on two genera of grasses, the bludegrasses (Poa) and the alkali grasses (Puccinellia), which are ecologically important as indicator species of disturbed environments. We will also be commencing studies on arctic poppies and arctic mustards. Our research involves short visits to many sites in order to observe how plants vary from site to site across the arctic region. About five to seven different sites will be visited each year. At each site, we will make observations on the morphology, reproductive status, ecology and distribution of each species we are studying. Collections will be made of 1-3 plants of each species. Part of each plant will be pressed, dried, and deposited as a voucher research specimen in the Canadian Museum of Nature. Another part of each plant will be preserved for DNA analysis. We will visit each site for 1-5 days. Our team of 2-3 people will travel by PCSP helicopter to remote sites and set up 2-3 small backpacking tents as our camp.

**Name:** Grant, Jon  
**Department:** Department of Oceanography  
**Affiliation:** Dalhousie University  
**City/Town:** Halifax  
**Province/State:** NS  
**Country:** Canada  
**Phone:** 902-494-2021  
**Fax:** 902-494-3877  
**E-mail:** jon.grant@dal.ca  
**Number in party:** 2  
**Location/Region:** North Baffin  
**Project Title:** **Carbon flow through Arctic megafaunal benthos**  
**Summary:** Arctic sediments are characterized by a brief but intense production season, mainly due to microscopic algae. The micro algae sink and fall to the seafloor where they provide food for a variety of bottom animals. These animals are particularly important as part of the food chain that supports bottom feeding marine mammals. Scientific studies of the benthos (bottom communities) often use oxygen consumption as a measure of how important various animals are at processing falling production. When respiration is coupled with the density of animals on the seabed, a budget of their activities may be calculated for broader areas in terms of the benthic food web. Seafloor photography provides a convenient way to assess the distribution of mobile animals. In the planned research, I will conduct remote camera surveys of Resolute Bay and Slidre Fjord. From a small boat in order to estimate the density of a common invertebrate (brittlestars). I will then use pieces of fish bait in small minnow traps to attract and collect brittle stars to make laboratory measurements of respiration. Work will be conducted at the DFO marine lab in Resolute and at the PCSP base in Eureka. There are no remote camps involved. Collections will involve only about 30 brittle stars and any other animals collected will be released. No environmental impact will occur from this work.

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**Name:** Hamilton, Jim  
**Department:** Ocean Sciences Division, DFO  
**Affiliation:** Bedford Institute of Oceanography  
**City/Town:** Dartmouth  
**Province/State:** Nova Scotia  
**Country:** Canada  
**Phone:** 902-426-3638  
**Fax:** 902-426-3717  
**E-mail:** HamiltonJ@mar.dfo-mpo.gc.ca  
**Number in party:** 3  
**Location/Region:** North Baffin  
**Project Title:** **Arctic Ocean Climate Change Project**  
**Summary:** This is the second year of an oceanographic field study designed to add to our knowledge of the Arctic Ocean circulation, and to quantify the heat and salt movement between the Arctic Ocean and the Northwest Atlantic. The measurements being made will provide information needed to develop circulation models for the region, and forecasting models for predicting climate change impacts on the Canadian Arctic. Field program goals for 1999 include: 1) the replacement of the instrumented mooring array that was deployed in August 1998, 2) the addition of one mooring to will support a new instrument to measure temperature and salinity information in the top 25 m of the water column, and 3) the carrying out of a CTD survey, repeating the stations of the 1998 survey. All moorings presently set will be recovered during the August 1999 cruise, and 10 new moorings in total, will be deployed. The tops of the moorings will be well below the surface. These moorings will remain on site until August 2000 when they will be recovered and replaced with a 3rd and final array, which will be recovered in August of 2001. This work will be conducted from a Canadian Coast Guard Ice Breaker deployed in the area at that time.

**Name:** Harington, Charles Richard  
**Department:** Research Division (Paleobiology)  
**Affiliation:** Canadian Museum of Nature  
**City/Town:** Ottawa  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-364-4052  
**Fax:** 613-364-4027  
**E-mail:** dharington@mus-nature.ca  
**Number in party:** 3  
**Location/Region:** North Baffin  
**Project Title:** **Animal Fossils of an ancient beaver-pond site**

**Summary:** The object of this study ( began in 19920 is to add to our knowledge of the animal fossils of an ancient ( 3.5 million year old) beaver pond site near Strathcona Fiord on Ellesmere Island by collecting bones and other fossils so as to better understand: 1) the ways these animals have changes through time and the ways they reached this arctic locality; 2) a unique boreal forest environment that existed in Pliocene time (2-5 million years ago) ; and3) the specific geological age of the deposit determined mainly by the kinds of fossils represented.

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**Name:** Hebert, Paul  
**Department:** Department of Zoology  
**Affiliation:** University of Guelph  
**City/Town:** Guelph  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 519-824-4120 Ext. 6668  
**Fax:** 519-767-1656  
**E-mail:** phebert@uoguelph.ca  
**Number in party:** 6  
**Location/Region:** North and South Baffin  
**Project Title:** **Biodiversity patterns in Arctic Marine Life**

**Summary:** Over the next three years, my research group will focus its efforts upon the examination of marine biodiversity at 5 sites in the arctic ( Churchill, Iqaluit, Igloolik, Resolute, truelove Lowlands). Our studies have 2 goals, We plan firstly to gather photographs and video of marine organisms for use on a website and CD-ROMs on artic lifffe. These projects will be used by students across Canada. We will also carry out studies which examine the patterns of genetic diversity in marine life. This work will aid in the identification of species and provide information that is useful to consevation efforts, Our investigations will focus largely on invertebrates but we will also do some work on fishes. We will collect animals at each site via scuba as well as by benthic and plankton nets, We will be based at the research statin at each site while doing our work. We will require a boat to collect our samples and will use a Zodiak for this purpose, We expect to be based at each site 10-20 days and plan to visit each site on 2 occacsions over the next 3 years.

**Name:** Henry, Greg  
**Department:** Department of Geography  
**Affiliation:** University of British Columbia  
**City/Town:** Vancouver  
**Province/State:** British Columbia  
**Country:** Canada  
**Phone:** 604-822-2985  
**Fax:** 604-822-6150  
**E-mail:** ghenry@geog.ubc.ca  
**Number in party:** 12  
**Location/Region:** North Baffin  
**Project Title:** **Causes and Consequences of Biodiversity Change in Arctic Tundra**

**Summary:** This project started last year and builds on a long-term study I established in 1992 to investigate the effects of climate warming on tundra ecosystems. My long-term experimental plots are established at Alexandra Fiord, Ellesmere Island, where I have conducted ecological research since 1980. The plots are warmed by placing small (1.5 m diameter), open top greenhouses over them. In some of the plots, the snow is removed so plants start to grow earlier, and in others snow is added so that the plants will start to grow later. In other plots, I add a little fertilizer to stimulate plant growth. In a new study, I will clip the plants to imitate grazing, and do this in and out of the open top greenhouses. All of these experiments are meant to be like changes we expect in the future. These changes will likely affect the numbers and kinds of plants in the plots, which is part of the biodiversity. We do not know what these changes in biodiversity will mean for tundra ecosystems, but changes in numbers and types of plants will affect animals feeding on them. One of the most important ways we can find out the effects is to measure the changes in plots like these over many years. My site at Alexandra Fiord is part of the International Tundra Experiment (ITEX), which is a network of arctic sites and scientists around the world during similar studies. My site is one of the oldest and most comprehensive ITEX sites, and is the only site in the High Arctic. My group of 2-4 students and 1-2 colleagues usually arrive at the site in late May or early June and stay until late August. We use the RCMP buildings at Alexandra Fiord as our camp.

**Name:** Jackson, H. Ruth  
**Department:** Geological Survey of Canada  
**City/Town:** Dartmouth  
**Province/State:** Nova Scotia  
**Country:** Canada  
**Phone:** 902-426-3791  
**Fax:** 902-426-6152  
**E-mail:** jacksonr@agc.bio.ns.ca  
**Number in party:** 45  
**Location/Region:** North Baffin  
**Project Title:** **Nares Strait : Origin, Environmental Monitoring and Climate Change Studies**

**Summary:** A multi-disciplinary experiment is proposed for Nares strait, the waterway that separates Ellesmere Island and Greenland , from August 6 to September of 2001. The ship CCGS Louis St. Laurent ,will be used to tow scientific equipment and provide a base for helicopter operations, The ship will carry a scientific crew of up to fifty people. The funding id provided by the German Geological Survey and is available only in 2001. The goals of the survey are to: 1) to understand how and when the mountains of Ellesmere were formed and 2) to study climate and to monitor the environment. Sound waves will be generated below the sea surface to obtain an image of the rocks to a depth of 30 km below the sea floor. The sound after it has traveled through the earth is recorded on 20 instruments on the seafloor and up to 150 instrumets on Greenland and Ellesmere. The instruments are put on land by helicopters . They are small and removed at the end of the experiment. The energy of the sound is created by repeatedly creating an air bubble of less than 1 cubic meter. The repetition of the sound allows marine life to become accustomed to it and does not startle them. Previous work shows that whales avoid the sound when they come within 100 m. If a whale is sited the sound will be turned off. The marine air gun array does not harm fish or larva. The second objective will require small amounts of water and sediment samples from the seafloor.

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**Name:** Koerner, Roy Martindale  
**Department:** Terrain Sciences  
**Affiliation:** Geological Survey Of Canada  
**City/Town:** Ottawa  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-996-7623  
**Fax:** 613-996-5448  
**E-mail:** koerner@gsc.nrcan.gc.ca  
**Number in party:** 1  
**Location/Region:** North Baffin  
**Project Title:** **Ice Core Analysis, Glacier Mass Balance & Atmospheric Pollution**

**Summary:** We plan to measure the mass balance (amount of snowfall, amount of summer ice melt) on Agassiz (N Ellesmere), Meighen, Melville South and Devon Ice Caps. When this is completed, we will test a new thermal drill at the top of Devon Ice Cap, and collect surface ice samples down the northwest side of the Ice Cap. The ice samples from the drilling, as well as the surface, will be used for carbon-14 dating, carbon dioxide content and chemistry and stable isotope analysis. The results will be studied for signs of climate change and pollution over the last 10,000 years.

**Name:** Laasonen, Erkki/Lena  
**Affiliation:** University of Tampere  
**City/Town:** Helsinki  
**Country:** Finland  
**Phone:** 358-3-247-6970  
**Fax:** 358-3-247-5586  
**E-mail:** erkki.laasonen@tays.fi  
**Number in party:** 2  
**Location/Region:** North Baffin  
**Project Title:** **Torticoidea of the High Arctic Areas**

**Summary:** Around the Arctic areas there are perhaps 3000 small moths. From the Scandinavian Arctic areas these specialized moths are best known, many new species have been recognized in the last 50 years and the relationship of these to those in European Alpine areas are well studied, In Canada and Alaska the research on butterflies has been the main focus. However, the comparison between Nearctic Areas ( Greenland, Canada and Alaska and the Palearctic Areas ( from Iceland to Tchukotchka) is in its initial state- are the moths the same or are there really so many different moths. We have made about 50 excursions to the Scandinavian Arctic and can claim that we now know how to find these moths in the field and how to determine them later in the laboratory with microscope. We have also collected comparative materials from Spetsbergen (1984), Iceland (1971-1992-4 trips) to Disko Bay in Greenland (1987) and Hold-with-Hope in Greenland (1990) Our secondary objective is to collect vascular plants and other insects.

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**Name:** Lamoureux, Scott  
**Department:** Department of Geography  
**Affiliation:** Queen's University  
**City/Town:** Kingston,  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-533-6122  
**Fax:** 613-533-6033  
**E-mail:** lamoureux@lake.geog.queensu.ca  
**Number in party:** 5  
**Location/Region:** Kitikmeot  
**Project Title:** **Reconstructing Weather Events from the Sediments of Sanagak Lake, Boothia Peninsula**

**Summary:** The work is intended to develop a long record of past weather and streamflow conditions from the region using lake sediments. The work will involve obtaining sediment from the lake and measuring processes that control sediment in Sanagak Lake, This lake has a large river that supplies abundant sediment and it appears to be deep. The researchers will collect samples from the lake by pounding plastic tubes into the sediment through holes in the ice. The researchers will study specimens in the laboratory and measure the amount of sediment that has accumulated each year in the past. They will look for evidence of major rainfall events during the summer and late fall . They will place instruments in the lake and on a nearby hill. These will be collected in August. The information will tell how the rivers respond to weather and how sediment is transported during the summer.

**Name:** Lee, Pascal  
**Affiliation:** Mars Society  
**City/Town:** San Jose  
**Province/State:** California  
**Country:** USA  
**Phone:** 408-666-2001  
**Fax:** 650-604-6779  
**E-mail:** pcee@best.com  
**Number in party:** 16  
**Location/Region:** North Baffin  
**Project Title:** **The Mars Society "Flashline" Mars Arctic Research Station : An International Research Station at Houghton Crater, Devon Island, To Support Human Mars Exploration Research**

**Summary:**

The Mars Society is a private international society dedicated to furthering the human exploration and settlement of the planet Mars. The Mars Society, in July 2000 established a research facility named the Flashline Mars Arctic Research Station (FMARS) at the Houghton impact crater on Devon Island. Designed to stimulate a landed spacecraft on Mars, FMARS allows a substantial enhancement in the level of fidelity of human Mars exploration operations research on Devon. The project serves 3 main goals: 1) to provide a test bed for studying the many aspects of field exploration operations on a human mission to Mars 2) to provide a capable field research laboratory to help further our understanding of the Arctic, the Earth and Mars and the possibilities and limits of life on our planet and beyond 3) to generate public support for sending humans to Mars by informing and inspiring audiences around the world. The FMARS established the value of this site as a unique "Mars Analog" for scientific studies of Mars and as a simulation site to study how humans will one day explore Mars. Designs to simulate a landed spacecraft on Mars, the FMARS will allow a substantial enhancement of Mars exploration research. The habitat will meet 3 goals 1) generate public support for sending humans to Mars by informing and inspiring audiences around the world 2) serve as a test bed for studying the many aspects of field operations on a human mission to Mars 3) serve as a field research laboratory to help further our understanding of the Arctic, of Earth, of Mars and of the possibilities and limits of life on our planet and beyond. The FMARS allows for the participation of researchers and students from a wide range of horizons. For 2001, it is proposed that the FMARS be occupied by a succession seven 6-person crews, Each crew will provide a distinct opportunity to study a set of Mars surface exploration operations including robot teleoperation, field science operations, sample processing, spacesuits, roving vehicles, and field communications.



**Name:** Lee, Pascal  
**Department:** SETI Institute  
**Affiliation:** NASA Ames Research Center  
**City/Town:** Moffet Field  
**Province/State:** California  
**Country:** U.S.A.  
**Phone:** 408-666-2001  
**Fax:** 650-604-6779  
**E-mail:** pcee@mail.arc.nasa.gov  
**Number in party:** 31  
**Location/Region:** Houghton Crater, Devon Island  
**Project Title:** **Houghton-Mars Project: Mars Analog Studies at the Houghton Impact Crater, Devon Island, Nunavut**

**Summary:** The HMP research has 2 components: science and Exploration Research. The Science program focuses on geology and biology and addresses the following questions 1) what can be learn about Mars by comparison with Earth 2) what are the effects of impacts on the Earth and other planets 3) what are the adaptations and limits in extreme environments and its possibilities elsewhere. The Exploration research program builds on the Science program to further studies of technologies, strategies and human factors relevant to the future exploration of Mars by robots and humans, We propose to continue mapping and characterizing the wide variety of impact damaged rocks at Haughton, the craters ancient hydrothermal vents, its ancient lakebeds, deep structures, glacial features, and many types of valleys and gullies found on Devon. We plan to continue microbiology studies with focus on microbial life in soils, rocks, snow and ice.

**Name:** Lenz, Alfred  
**Department:** Dept. of Earth Science  
**Affiliation:** University of Western Ontario  
**City/Town:** London  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 519-661-3195  
**Fax:** 519-661-3198  
**E-mail:** aclenz@uwo.ca  
**Number in party:** 4  
**Location/Region:** North Baffin  
**Project Title:** **Upper Silurian graptolite and radiolarian taxonomy, biostratigraphy and evolution, Arctic Islands**

**Summary:** Our research plan is to sample Silurian rocks at Cape John Franklin, Rookery Creek and in the Cape Manning area. The rocks in this area are rich in fossils, graptolites and radiolarians, both of which lived near the surface of the tropical seas that covered the entire Arctic during the Silurian (about 420 million years ago). These particular fossils in the Arctic are among the best and most beautifully preserved in the world and for that reason alone, are worthy of careful study of these ancient animals. Also, they are extremely useful in determining the precise age of rocks and in helping to understand ancient environments. We plan to measure the rock sections and sample all promising looking limestone rocks. The fossils are small and generally can not be seen with the naked eye. Following this, the limestone rocks are dissolved with a weak acid in our labs and all fossils in the residue are collected for a study by Scanning Electron Microscope. Small samples of rock will be chemically analyzed for their Carbon 13 and Oxygen 18 isotope content in order to understand the chemistry and temperature of the ocean waters during the Silurian, both being factors in the extinction and evolution of these ancient organisms. The ultimate goal of this, and similar studies, is to better understand the geological history of the arctic, including its environmental history.

**Name:** LePage, Ben A.  
**Department:** Department of Earth and Environmental Science  
**Affiliation:** University of Pennsylvania  
**City/Town:** Philadelphia  
**Province/State:** Pennsylvania  
**Country:** USA  
**Phone:** 215-898-5618  
**Fax:** 215-898-0964  
**E-mail:** blepage@sas.upenn.edu  
**Number in party:** 10  
**Location/Region:** North Baffin  
**Project Title:** **Composition, Structure, Dynamics, and Climate of Paleocene Forests of the Canadian High Arctic : Comparing Reconstructions from field measurements and Nearest Living Relatives**

**Summary:** A 450 metre thick sequence of late Paleocene-early Eocene swamp forests growing on an alluvial plain are well preserved at Stenkul Fiord. The fossil plants are well preserved and provide excellent opportunity to reconstruct many aspects of these ancient forest communities using modern field techniques. Using standard ecological field techniques we will be able to determine the types of trees that grew in these forests, the type of forest, how the various tree species interacted with their neighbors and how well these forests grew. In Addition, using oxygen isotopic values preserved in the ironstone that is present in these deposits, the mean annual temperatures under which these polar grew can be determines Suitable logs and stumps will be located and small areas exposed so that we can measure the logs and stumps and collect samples. All Excavations will be returned it as close as possible to their original appearance. Our previous work at Napartulik has yielded exciting new results and we would like to extend our current stand and plant level studies to a regional scale to show how the plants and ecosystems functioned with respect to regulating carbon fluxes.

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**Name:** Mair, Douglas Watson Fraser  
**Department:** Department of Earth and Atmospheric Sciences  
**Affiliation:** University of Alberta  
**City/Town:** Edmonton  
**Province/State:** Alberta  
**Country:** Canada  
**Phone:** 780-492-4156  
**Fax:** 780-494-2030  
**E-mail:** mair@ualberta.ca  
**Number in party:** 1  
**Location/Region:** North Baffin  
**Project Title:** **Causses of long-Term Changes in the Geometry of Devon Ice Cap and Prince of Wales Icefield**

**Summary:** The aims of this research will be to: a) retrieve data from temperature loggers deployed during spring 2000 at 3 sites across Devon Island Ice cap to determine how air temperature varies spatially and for input to computer models of ice cap surface melting b) measure spatial patterns of glacier surface velocities across Devon Ice cap and Prince of Wales ice field c) determine the spatial pattern of long tern ice accumulation across Price of Wales ice field by shallow ice coring d) determine ice thickness across several profiles of Prince of Ales ice field for comparison with measures of volume and geometry changes of the ice cap as identified from satellite data sets.

**Name:** Melling, Humfrey  
**Department:** Institute of Ocean Sciences  
**Affiliation:** Fisheries and Oceans Canada  
**City/Town:** Sidney  
**Province/State:** BC  
**Country:** Canada  
**Phone:** 250-363-6552  
**Fax:** 250-363-6746  
**E-mail:** mellingh@dfo-mpo.gc.ca  
**Number in party:** 4  
**Location/Region:** North Baffin  
**Project Title:** **Sea Ice in the Arctic**

**Summary:** The thickness and continued presence of sea ice in the Arctic are sensitive to temperature and mobility of the ocean just beneath it. At present, the upper layer of the Arctic Ocean is cold, and protects Arctic ice from melting. One influence on the temperature of this layer is the outflow of water through the Canadian Arctic Archipelago. The focus of this project is the measurement of the physical and trace chemical properties of this outflow, both using sensors lowered by cable, and by acquiring seawater samples for analysis in the laboratory. Measurements will be made on the narrow cross-sections of the channels. Lowered sensors will measure temperature and salinity. Seawater samples will be analyzed for dissolved nutrients and oxygen, to distinguish Atlantic from Pacific waters, oxygen isotopes, to identify the freshwater from rivers and from melting ice, and freons, to provide water ages.

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**Name:** Modeland, Sheldon  
**Department:** Earth and Planetary Studies  
**Affiliation:** McGill University  
**City/Town:** Montreal  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 514-398-6767  
**Fax:** 514-398-4680  
**E-mail:** modeland@eps.mcgill.ca  
**Number in party:** 3  
**Location/Region:** South Baffin  
**Project Title:** **Paleoproterozoic Magmatism on South-central Baffin Island**

**Summary:** The proposed study will consist of geological mapping and sampling of a Paleoproterozoic mafic volcanic suite. First sized volcanic rocks will be collected from 4 different field camp locations and will be returned to McGill for geochemical analyses. This project will be the focus of a thesis and was initiated during the summer of 2000 in collaboration with the Geological Survey and the Canada -Nunavut Geological office regional geological mapping project on central Baffin Island.

**Name:** Moore, Steve  
**Affiliation:** EBA Engineering Consultants Ltd.  
**City/Town:** Yellowknife  
**Province/State:** NWT  
**Country:** Canada  
**Phone:** 867-920-2287  
**Fax:** 867-873-3324  
**E-mail:** smoore@eba.ca  
**Number in party:** 3  
**Location/Region:** Kivalliq  
**Project Title:** **Baseline Vegetation Studies at Ferguson Lake**

**Summary:** Vegetation and terrain baseline studies will be required in order to assess current conditions and determine potential project impacts. Information collected in these studies will allow scientifically sound analyses of potential effects and will allow assessment of wildlife habitat capability. The objective of the vegetation component of this study is to characterize the existing vegetation potentially impacted by the proposed development , to determine the impacts and to recommend mitigation measures to minimize potential effects. Detailed vegetation plots will be carried out. This will include examining plant communities and assigning them habitat names and plotting them on topographic maps. The purpose of these plots is to confirm the vegetation community types in the area around Ferguson Lake.

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**Name:** Moorman, Brian  
**Department:** Earth Science Program  
**Affiliation:** University of Calgary  
**City/Town:** Calgary  
**Province/State:** Alberta  
**Country:** Canada  
**Phone:** 403-220-4835  
**Fax:** 403-282-6561  
**E-mail:** moorman@ucalgary.ca  
**Number in party:** 3  
**Location/Region:** North Baffin  
**Project Title:** **The Study of Glacial and Permafrost Systems on Bylot Island**

**Summary:** The purpose of this research is to study the glaciers and surrounding permafrost on Bylot Island. Some of the specific questions to be addressed are: 1) why are some glaciers retreating and others not, 2) how do parts of some glaciers get buried and how long is the ice preserved in the permafrost, 3) what can the buried ice tell us about the past climate of the area, 4) why do icings form in front of some glaciers and what can they tell us about glacial processes, and 5) what is the regional variability of snow fall and temperature, and how does that affect the glaciers. To address these questions we will collect weather data, take snow and ice samples from the glaciers, and use non-destructive geophysical methods to image beneath the glaciers. This work will be based out of a tent camp located about 13 km from the shore near Semilik Glacier. Transportation to and from the camp will be by helicopter, as will be the regional snow and ice sampling. It is hoped that this research can continue in future years to assist in the environmental monitoring of the island.

**Name:** Muggli, Deborah  
**Affiliation:** Rescan Environmental Services Ltd.  
**City/Town:** Vancouver  
**Province/State:** BC  
**Country:** Canada  
**Phone:** 604-689-9460  
**Fax:** 604-687-4277  
**E-mail:** rescan@rescan.com  
**Number in party:** 30  
**Location/Region:** Kitikmeot  
**Project Title:** **Bathurst Inlet Port and Road Project**

**Summary:** The fieldwork is intended to provide baseline environmental data for the bathurst Inlet port and road project. The environmental baseline work that will need to be conducted includes climate and meteorology, freshwater, marine, vegetation and soil studies to understand baseline conditions and historical land use patterns.

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**Name:** Newitt, Larry  
**Department:** Geomagnetic Laboratory  
**Affiliation:** Geological Survey of Canada  
**City/Town:** Ottawa  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-837-7915  
**Fax:** 613-824-9803  
**E-mail:** newitt@geolab.nrcan.gc.ca  
**Number in party:** 6  
**Location/Region:** North Baffin  
**Project Title:** **North Magnetic Pole Project**

**Summary:** The North Magnetic Pole is the point on the earth's surface where the magnetic field points vertically downwards. It is the point where all lines of magnetic declination converge. Knowing the location of the North Magnetic Pole is important for the production of magnetic declination charts and related information which are required by anyone navigating by compass. The Pole is constantly moving; therefore periodic surveys are required to keep track of its position. We propose to carry out such a survey during May 2001. The survey consists of measurements of the Earth's magnetic field at 8-10 locations surrounding the Pole. All of these locations are on the sea ice northwest of Ellef Ringnes Island. At each site, the direction and the strength of the magnetic field are measured using portable equipment. Each session lasts 1-2 hours. Two possibly three days are required to complete the survey.

**Name:** Poland, Dr. John  
**Department:** Analytical Services Unit, Biosciences Complex  
**Affiliation:** Queen's University  
**City/Town:** Kingston  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-533-2642  
**Fax:** 613-533-2897  
**E-mail:** polandj@biology.queensu.ca  
**Number in party:** 9  
**Location/Region:** South Baffin  
**Project Title:** **Chemical Sampling and Analysis**

**Summary:** The Analytical Services Unit, Queen's University will have a team on site at Resolution Bay over the next few years. Our work is to support the major cleanup being undertaken by Qikiqtalluk Corporation for Indian and Northern Affairs Canada. The majority of the work will involve sampling and analysis of soil, barrel contents and miscellaneous items such as concrete, insulation materials and sludge's. Work will commence this year on the removal of the PCB-contaminated furniture dump and soil from around the buildings and packaging and removal of PCB-contaminated furniture dump and solid from around the buildings and packaging and removal of PCB liquids and electrical components from the island. Other work we will be undertaking includes testing the lake and drinking water, setting up thermistors to test freeze back into landfills under various conditions and monitoring the performance of the existing barriers in drainage pathways and testing new barrier and silt control systems.

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**Name:** Pollard, Wayne  
**Department:** Department of Geogrpahy  
**Affiliation:** McGill University  
**City/Town:** Montreal  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 514-398-4454  
**Fax:** 514-398-7437  
**E-mail:** pollard@felix.geog.mcgill.ca  
**Number in party:** 7  
**Location/Region:** North Baffin  
**Project Title:** **Permafrost hydrology and environmental significance of perennial springs, Expedition Fiord, Axel Heiberg Island**

**Summary:** The primary aim of this study is to assess the environmental significance of spring discharge on the desert ecosystem of Expedition Fiord. Perennial springs are extremely rare in high arctic settings because permafrost forms an impermeable barrier to groundwater movement. A spring is a point on the ground surface marked by a continuous flow of water that rises from deep in the ground. The springs at Expedition Fiord contain high amounts of salt and other dissolved minerals indicating the water comes from below the permafrost. The presence of several springs in the Expedition Fiord area, together with discharge-related features like frost mounds and icings are unusual and therefore a source of considerable scientific interest. Of possibly greater interest is the activity of micro organisms that flourish in the cold mineralized water. Sulphur, iron and calcium precipitates are produced at least partly by bacterial action. The specific aims of this research project are: a) to determine the nature of hydrologic activity, including groundwater source and residence time, b) to investigate the geomorphic impacts of perennial spring discharge, c) to model saline groundwater flow through permafrost, and d) to assess its significance in terms of biological activity. The potential significant of this research lies in two areas - permafrost hydrology and extreme environment biology.

**Name:** Pollard, Wayne  
**Department:** Department of Geogrphahy  
**Affiliation:** McGill University  
**City/Town:** Montreal  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 514-398-4454  
**Fax:** 514-398-7437  
**E-mail:** pollard@felix.geog.mcgill.ca  
**Number in party:** 6  
**Location/Region:** North Baffin  
**Project Title:** **Impacts of global change on permafrost in Eureka**

**Summary:** In areas of the arctic which have human habitation (the area surrounding the Eureka Weather station and airstrip) there is evidence that the instability of the landscape can be caused by human activities. The project involves long term mapping of the areas of ice-rich permafrost and the areas of melting permafrost. We will be using our records together with the records provided by scientists and oil companies that have worked in the area, air photos, public work records, together with climate data from the weather station to determine the extent to which instability is a natural part of the local landscape evolution and to what extent it is being caused by changes in climate. We plan to look at the 50 year climate record to determine the extent to which the climate has changed . We will make detailed maps of erosion and slumping in the Eureka area and compare short-term changes with summer temperature and sunshine patterns in an attempt to determine their direct relationship to weather.

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**Name:** Retelle, Michael  
**Department:** Department of Geology  
**Affiliation:** Bates College  
**City/Town:** Lewiston  
**Province/State:** Maine  
**Country:** USA  
**Phone:** 207-786-6155  
**Fax:** 207-786-8334  
**E-mail:** mretelle@bates.edu  
**Number in party:** 9  
**Location/Region:** North Baffin  
**Project Title:** **Study of Climate in the High Arctic Archipelago**

**Summary:** We propose to continue a study of the climate in the high arctic archipelago of the past 1,000 years using laminated sediments from lakes and isolated marine inlets. The field sites for the 1999 field season include a number of lakes located in a transect from Cornwallis Island to eastern Devon Island that were visited during May and June 1998 during a reconnaissance sampling trip of the field area. During the first phase of the study, we found several lakes along the southern coast of Devon Island and on eastern Bathurst Island contain finely layered sediments that may be annual layers. The thickness of the yearly layers is controlled by how much stream runoff transports fine-grained mud to the basin which is, in turn, controlled by summer temperature and snowpack available for melting. In several lakes in the region (Ellesmere Island) that we have previously studied we have recovered sediment cores that contain climate records that extend to as long as 3,000 years before present. These sediments may provide a detailed and long term record of changing climate in this area of the arctic similar to records of tree rings that are used for climate reconstruction in the subarctic. The long-term goal is to achieve an understanding of climate variability in the arctic islands over the period of the last 2,000 years in order to be able to more accurately predict impacts of future climate change in the region.



**Name:** Ross, Julie  
**Department:** Department of Anthropology  
**Affiliation:** University of Toronto  
**City/Town:** Toronto  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 416-924-6473  
**Fax:** 416-978-3217  
**E-mail:** julieross@hotmail.com  
**Number in party:** 5  
**Location/Region:** Kitikmeot  
**Project Title:** **Environmental Reconstruction- Iqaluktuuq Project**

**Summary:** There are 2 components to this field season. The work may occur in may when the lake is covered by ice. The first component is a survey of the lakes and involves establishing the depth and sediment characteristics of the lake, The purpose of this survey is to identify which lakes in the area have the characteristics need to address the issue of environmental change. The second component involves sampling two of the most appropriate lakes. Sampling involves dropping a corer through a hole in the ice and then lifting it out of the lake.

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**Name:** Sandeman, Hamish  
**Department:** Canada-Nunavut Geoscience Office  
**City/Town:** Iqaluit  
**Province/State:** Nunavut  
**Country:** Canada  
**Phone:** 867-979-3539  
**Fax:** 867-979-0708  
**E-mail:** kmarkwel@nrcan.gc.ca  
**Number in party:** 26  
**Location/Region:** Kivalliq  
**Project Title:** **Committee Bay Project 2000**

**Summary:** The three year geological mapping project on northeastern mainland of Nunavut is proposed to start in 2000 and has as its primary goal, new bedrock and surficial materials map coverage of the following NTS 1:250 000 scale map areas. 56J Walker Lake; 56K Laughland Lake; 56-O Armshow River; 56P Ellice Hills

**Name:** Scott, David  
**Department:** Canada-Nunavut Geoscience Office  
**Affiliation:** Geological Survey of Canada  
**City/Town:** Iqaluit  
**Province/State:** NU  
**Country:** Canada  
**Phone:** 867-979-3539  
**Fax:** 867-979-0708  
**E-mail:** kmarkwel@nrcan.gc.ca  
**Number in party:** 13  
**Location/Region:** North Baffin  
**Project Title:** **Central Baffin Project 2000**

**Summary:** The 3 year mapping project of central Baffin Island is proposed and has as a primary goal, 1:100 000 scale bedrock and surficial coverage of the following NTS 1:250 000 scale map area. 37A Foley Island, 37D Lake Gillian, 27B McBeth Fiord (west half) and 27C Ekulugad (west half).

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**Name:** Sharp, Martin  
**Department:** Department of Earth and Atmospheric Sciences  
**Affiliation:** University of Alberta  
**City/Town:** Edmonton  
**Province/State:** Alberta  
**Country:** Canada  
**Phone:** 403-492-4156  
**Fax:** 403-492-7598  
**E-mail:** martin.sharp@ualberta.ca  
**Number in party:** 6  
**Location/Region:** North Baffin  
**Project Title:** **The Hydrology and Dynamics of John Evans Glacier, Ellesmere Island**

**Summary:** This project aims to investigate the hydrology and flow dynamics of John Evans Glacier, their role in its response to climate change, and processes of carbon cycling in a high Arctic glacial environment. Major objectives for 2001-2003 are: a) mass balance and snow depth surveys b) Climate monitoring with 3 automatic weather stations on the glacier) an investigation of the role of re-freezing of melt-water in surface snow and firn in the mass balance of the glacier d) surveys of glacier surface velocity at annual, seasonal and daily time scales e) a study if the supra-glacial hydrology of the glacier, to determine the causes and controls on the timing of major discharge inputs into the sub-glacial drainage system g) dye tracer investigations of the structure and dynamics of the sub-glacial drainage system h) monitoring of the amount and chemistry of water drainage from the glacier i) a study of the organic carbon budget of the glacier designed to determine whether microbial mineralisation of organic carbon is occurring under the glacier and j) a study of the CO<sub>2</sub> fluxes over recently deglaciated surfaces to determine whether these are a source or sink of CO<sub>2</sub> to the atmosphere.

**Name:** Smol, John  
**Department:** Department of Biology  
**Affiliation:** Queen's University  
**City/Town:** Kingston  
**Province/State:** ON  
**Country:** Canada  
**Phone:** 613-533-6147  
**Fax:** 613-633-6617  
**E-mail:** smolj@biology.queensu.ca  
**Number in party:** 6  
**Location/Region:** North Baffin  
**Project Title:** **Water Quality and Environmental Change in Arctic Lakes and Ponds**

**Summary:** The main objective is to undertake a brief survey of water quality variables in a series of lakes and ponds near Cape Herschell. Monitoring of these ponds began in 1983 and continued in 1984, 1986, 1987, 1995 and 1998 (often with M. Douglas). Our data suggest that these sites are excellent monitors of environmental change. These ponds now represent the longest series of water quality data available for any freshwater sites in the High Arctic, and so Cape Hershel has become an important long term monitoring site. As these sites are very important for studies of environmental and climatic change, we hope to continue monitoring them on a 3 year cycle. We hope to return in July 2001. Our main goal is to assess the present day water quality of these ponds and determine if they are changing, especially in response to climatic change. At each of the 40 study ponds, we will remove a small quantity of water (less than a litre). These samples will be required for analysis. In addition, we also collect a small amount of lake and pond mud samples and determine their contents. These types of studies can be used to reconstruct past environmental and climatic changes.

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**Name:** Turner, Elizabeth  
**Department:** Canada-Nunavut Geoscience Office  
**Affiliation:** Geological Survey of Canada  
**City/Town:** Iqaluit  
**Province/State:** NU  
**Country:** Canada  
**Phone:** 867-979-3539  
**Fax:** 867-979-0708  
**E-mail:** kmarkwel@nrcan.gc.ca  
**Number in party:** 5  
**Location/Region:** North Baffin  
**Project Title:** **Arctic Zinc Project 2000**

**Summary:** The 3 year field investigation in the Polaris district is proposed to start in 2000. It has as a primary goal new detailed investigations of areas with known zinc mineralizations.

**Name:** Vincent, Warwick  
**Department:** Department de Biologie  
**Affiliation:** University of Laval  
**City/Town:** St.-Foy  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 418-656-5644  
**Fax:** 418-656-2043  
**E-mail:** warwick.vincent@bio.ulaval.ca  
**Number in party:** 7  
**Location/Region:** North Baffin  
**Project Title:** **Microbial responses to global climate change in Arctic lakes and rivers**

**Summary:** Microbial organisms control the flux of energy and biomass at the base of food webs in the arctic lakes and rivers. Our research program is focuses on understanding how these communities are structured and how they respond to global change. These ecosystems integrate the modifications occurring in their catchment and their characteristics depend on the energy input from solar radiation, which in turn for most of the year is largely determined by snow and ice cover which are known to be affected by climate change. Inuit have used Nettilling Lake as a fishing and hunting area for centuries. Its hydrographic system drains most of the southern lowlands of Baffin Island. Even though the area has been well characterized , very few studies have been conducted on the lake itself. Water and ice samples will be taken for chemical/biological analysis and measurements of the penetration of light for primary production and UV radiation through the ice cover will be made. This lake is large enough to be monitored from space and we will be obtaining ground truth data for our project supported by the European Space Administration. The camp will be at Nikku Island at the CWS station. Water and ice sampling will be near Nettilling Lake to provide an integrated measure of the lake system. Holes will be drilled and melted out using a portable melting system developed at Lake Hazen. Snowmobiles will be used to get from camp to the sampling site on the lake.

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**Name:** Wassenaar, Len  
**Department:** National Water Research Institute  
**Affiliation:** Environment Canada  
**City/Town:** Saskatoon  
**Province/State:** Sask.  
**Country:** Canada  
**Phone:** 306-975-5747  
**Fax:** 306-975-5143  
**E-mail:** len.wassenaar@ec.gc.ca  
**Number in party:** 3  
**Location/Region:** North Baffin  
**Project Title:** **Production, cycling and stable isotopic composition of dissolved oxygen in high arctic lakes**

**Summary:** The goal of this project is to assess the production to composition ratios of dissolved oxygen during the extended arctic photo period. The natural stable isotopic ratios of dissolved oxygen will be used to quantify the inputs of atmospheric O<sub>2</sub>, photosynthetic o<sub>2</sub> and consumption by benthos respiration. The results will be used to aid in the re-evaluation of the CCME water quality guidelines for dissolved oxygen in northern climes.

**Name:** Wheeler, Ben  
**City/Town:** Iqaluit  
**Province/State:** NU  
**Country:** Canada  
**Phone:** 867-979-3881  
**Fax:** 867-979-4257  
**E-mail:** bwheeler@nv.sympatico.ca  
**Number in party:** 7  
**Location/Region:** North Baffin  
**Project Title:** **Igaliqtuuq Habitat Stewardship Project**

**Summary:** This important project has been initiated both to learn more about the ecology and dynamics of this endangered bowhead population and to train residents of Clyde River in scientific monitoring techniques. This project will run for 3 years. The primary activities revolve around the monitoring of bowhead whales. Monitoring will be non invasive and will be conducted from kayaks, motorized boat and shore. Such variables as salinity, water depth, water temperature, current floe and plankton composition/density will be also observed. Six residents from Clyde River will be trained in the monitoring of bowheads by a marine ecologist.

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**Name:** Woodman, David  
**City/Town:** Prince Rupert  
**Province/State:** B.C.  
**Country:** Canada  
**Phone:** 2250-627-7545  
**Fax:** 250-627-7101  
**E-mail:** dwoodman@rupertpor.com  
**Number in party:** 7  
**Location/Region:** Kitikmeot  
**Project Title:** **Utjulik 2001**

**Summary:** The objective of the project is to conduct further survey of the remaining search area to find evidence of a sunken wreck. Calculations indicate that the iron of the vessel's engines and hull sheathing will give a suitable return at a line spacing of 200m. Sledborne magnetometers and echo sounders will be used through the sea ice to locate anomalies which could be later investigated by underwater search. Location will be controlled using GPS. No penetration of the ice or interference with any targets will be involved. The field party will consist of 4-5 individuals on 2-3 snowmobiles. Camps will be established on small islands in Wilmot and Crampton Bay for the 2 identified search areas.

**Name:** Young, Kathy  
**Department:** Department of Geography  
**Affiliation:** York University  
**City/Town:** North York  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 416-736-5107  
**Fax:** 416-736-5988  
**E-mail:** klyoung@yorku.ca  
**Number in party:** 4  
**Location/Region:** North Baffin  
**Project Title:** **Ecohydrology of transition zones in the high Arctic Landscape**

**Summary:** This study aims to examine how water flow in transitional zones is impacted by soil and plant variability and the ramifications that this has for energy inputs and losses in these areas compared to main landscape types. Another aim is to understand interactions and feedbacks between surface conditions and the atmosphere in these buffer zones, since these types of information will be beneficial to climate change modelers. The study also aims to identify and understand the processes which are leading to some boundary areas to flourish and others to fail through the use of a GIS framework. This approach will aid ecologists in determining the resilience of ecosystems to change and will benefit northern planners who are developing routes and sites for roads and airports. Meteorological stations will be placed in control sites and will move between transitional zones to record inputs of energy and losses. Detailed surveying of plant cover, soil moisture will be placed in a GIS framework, which will allow interactions of environmental conditions to be exemplified.

**Name:** Young, Kathy  
**Department:** Department of Geography  
**Affiliation:** York University  
**City/Town:** North York  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 416-736-5107  
**Fax:** 416-736-5988  
**E-mail:** klyoung@yorku.ca  
**Number in party:** 3  
**Location/Region:** North Baffin  
**Project Title:** **Ecohydrology of Vegetation Bands Associated with Late-Lying Snowbeds**

**Summary:**

Many late-lying snow beds occur in the High Arctic. They are usually found in topographical breaks-of-slope and arise from the redistribution of snow by wind in a treeless environment. Up and down slope of these snow bank sites are different vegetation zones that are uncovered from snow at varying times during an arctic summer. Therefore, these distinct vegetation zones have different growing seasons. The amount of time that the plants have to grow may vary between sites. This may influence the pattern of ground thaw that can limit the type and rates at which plant roots uptake nutrients needed for growth. Variation in ground thaw may also dictate whether melt water from the snowed or summer rains travel along the surface or deep below the ground. An interesting feature of studying the environmental factors that control this pattern of vegetation is that it is reasoned that these sites reflect the vegetation communities and their growing seasons existing on Cornwallis Is., NWT and adjacent islands. If it is possible to get a better understanding of the energy, water and nutrient patterns influencing this zonation at a local scale, then a better understanding of the environment existing a much larger scale will be obtained. Therefore, the major objectives of this project is to examine the environmental factors (energy, water flow, nutrients) which are allowing these different vegetation zones to exist. This information can then be extended to the regional scale to improve our understanding of interior environments. Fieldwork will be conducted near Resolute, NWT over several summers (mid May-August). Water, energy, and nutrient levels will be monitored for every vegetation zone. This study is important for northern ecologists since they will attain a better understanding of plant-environmental interactions and climate modelers interested in surface-atmospheric interactions in northern regions.

**Name:** Amirault, Marni  
**Affiliation:** Saint Mary's University  
**City/Town:** Halifax  
**Province/State:** NS  
**Country:** Canada  
**Phone:** 902-423-5930  
**E-mail:** m\_amirault@hotmail.com  
**Number in party:** 1  
**Location/Region:** North Baffin  
**Project Title:** **Producing Community Television in Igloolik : Strengthening Igloodimmiut**

**Summary:** In my thesis, I am interested in changes that are brought to story telling through the medium of film. A field trip to Igloolik would provide me with the opportunity to conduct interviews with members of Isuma staff to discuss further what they mean by strength; participants involved in the Tariagsuk Program; people in the community. My objective is to determine how strength is gained in the process.

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**Name:** Aylward, M. Lynn  
**City/Town:** Iqaluit  
**Province/State:** NU  
**Country:** Canada  
**Phone:** 867-979-3561  
**Fax:** 253-498-8750  
**E-mail:** laylward@nunanet.com  
**Number in party:** 1  
**Location/Region:** Kivalliq  
**Project Title:** **The Place of Inuit language and Culture in Nunavut Schools**

**Summary:** What is the place of Inuit language and culture in Nunavut schools? My research project will be a report of how Nunavut teachers infuse Inuit language and culture into their classroom practice and how their work relates to their school and community environments. These teachers' experiences will then be considered within the larger regional and territorial situation by examining the governments past ( 1975-1999) and present education policy and curriculum commitments related to Inuit language and culture.



**Name:** Briggs, Jean  
**Department:** Department of Anthropology  
**Affiliation:** Memorial University of NFLD  
**City/Town:** St. John's  
**Province/State:** Newfoundland  
**Country:** Canada  
**Phone:** 709-737-8870  
**Fax:** 709-737-8686  
**E-mail:** jbriggs@plato.ucs.mun  
**Number in party:** 1  
**Location/Region:** Nunavut  
**Project Title:** **Utkuhikhalingmiut Dictionary**

**Summary:** The project for which I am requesting a licence is a continuation of the project for which I was granted licences in 1997, 1998 and 1999. The objective is to complete the construction of a dictionary and postbase list for the Utkuhikhalingmiutitut dialect of Inuktitut. The dictionary will preserve Utkuhikhalingmiutitut, so that Utkuhikhalingmiut, if they want to, can remember their words. Linguists will use the dictionary too, to learn how Inuktitut changed as it was carried from one part of the Inuit territory to another in the past. This year I will continue the process of correcting the words I learned between 1963 and 1968 and in 1992, when I revisited Gjoa Haven. I say each word to an Utkuhikhalingmiut elder and ask that person to say it back to me and explain what it means; and I tape-record what they say.

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**Name:** Burkhardt, Kate  
**Department:** Department of Psychology  
**Affiliation:** University of Windsor  
**City/Town:** Dorion  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 1-807-857-2373  
**Fax:** 1-807-857-0331  
**E-mail:** ktb\_good@hotmail.com  
**Number in party:** 2  
**Location/Region:** South Baffin  
**Project Title:** **Narratives of the Inuit: Crime, Healing and Community Corrections**

**Summary:** The rates and nature of Inuit criminal activity are of great concern in Nunavut. The victimization of women and appropriate rehabilitation strategies are particularly salient issues in Nunavut communities, The current project is a qualitative study that will investigate avenues for the treatment of Inuit offenders while considering the impact that such programs may have upon eliciting secondary harm to female victims, Interviews will be gathered from inmates of BCC , women residing at Qimavik and employees of the Department of Justice. The interview protocol will aim to unearth community perspectives regarding crime behavior, with particular attention devoted to issues regarding violence against women.

**Name:** Capozza, Koren  
**Department:** Pew Trust for International Journalism  
**Affiliation:** John Hopkins School of International Studies  
**City/Town:** Washington  
**Province/State:** DC  
**Country:** USA  
**Phone:** 415-824-0516  
**Fax:** 202-663-7762  
**E-mail:** kcapozza@msn.com  
**Number in party:** 1  
**Location/Region:** South Baffin  
**Project Title:** **Impacts of northern contaminants on Baffin communities**

**Summary:** I will be interviewing residents on how environmental changes such as the increase in Persistent Organic Pollutants ( POPs) in the Arctic environment are affecting their daily lives. I am looking at how concerns over contamination affecting the way Baffin residents hunt and consume country food. I will be contacting and interviewing researchers in the region who are investigating the ecological impact of POPs and other contaminants.

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**Name:** Clark, Mary  
**Affiliation:** Geomatics Canada  
**City/Town:** Iqaluit  
**Province/State:** NU  
**Country:** Canada  
**Phone:** 416-481-0555  
**Fax:** 415-487-0913  
**E-mail:** mclark@nunanet.com  
**Number in party:** 2  
**Location/Region:** South Baffin  
**Project Title:** **Mapping the Historical and Territorial Evolution of Iqaluit**

**Summary:** The historical and territorial evolution of Iqaluit interactive mapping project is a component of the Internet-Based Cartographic Visualization project initiated in 1999 by Geomatics Canada, Ottawa. The main objective of this project is to develop an electronic interactive map of Iqaluit based on multi-date aerial photographs to demonstrate visualization techniques for the Internet. Understanding the development of the city over time is valuable for education of youth and interesting for city visitors and tourists. Through these techniques the user will be able to interactively visualize the early history of development of the region as well as the evolution of the city over the last 50 years, through dynamic or animated maps on a computer screen. The primary source of aerial photographic data is the Centre for Topographic Information in Ottawa from which orthomosaics are generated for the years 1948, 1958, 1969, 1995 and 2000. Other source data includes an historical outline prepared by Mary Clark, GIS data, archive documents and records on population. A few interviews will also be conducted in Iqaluit with Inuit elders and local historical figures to demonstrate how these techniques can be supplemented with audio-visual material. The final demonstration product will be available by October 2001.

**Name:** Cowan, Cindy  
**Affiliation:** St. Francis Xavier  
**City/Town:** Iqaluit  
**Province/State:** NU  
**Country:** Canada  
**Phone:** 867-979-2085  
**Fax:** 867-979-4579  
**E-mail:** ccowan@nac.nu.ca  
**Number in party:** 1  
**Location/Region:** South Baffin  
**Project Title:** **Discovering the traditional art of Sanikiluaq Grass Basket-making**

**Summary:** In this research I propose to re-research the certificate program in the art of traditional basket-making in Sanikiluaq offered for 2 years to 15 women . This adult education project is an example of an attempt to create a program that enabled adult women to employ their beliefs, values and lived experience in the classroom. It succeeded in nurturing cultural identity and providing education and skills necessary to enhance the women's participation within the traditional mixed economy of the community.

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**Name:** Dorais, Louis-Jacques  
**Department:** Department d'anthropologie  
**Affiliation:** Laval University  
**City/Town:** Quebec  
**Province/State:** QC  
**Country:** Canada  
**Phone:** 418-656-2131 ext. 7827  
**Fax:** 418-656-2831  
**E-mail:** louis-jacques.dorais@ant.ulaval.ca  
**Number in party:** 4  
**Location/Region:** Baffin  
**Project Title:** **Discourse and Identity in Iqaluit**

**Summary:** This research program - conducted in collaboration between Université Laval and Nunavut Arctic College - aims at expanding and completing our knowledge of the ways through which various individuals and groups communicate linguistically among themselves in Iqaluit, a multilingual community of the Canadian Arctic, and to examine how these discourse practices contribute to define the ethnic identity of the speakers. The program (1998-2001) is a continuation of the investigators' 1994-1997 research on discourse practices in the Baffin. In order to be better understood, the situation has to be further documented and its analysis refined. This is precisely the aim of the present program, whose specific objectives are threefold: 1) To complete the analysis of the data on discourse practices already collected by the investigators; 2) To enrich these data through the observation of language behaviour in Inuit homes and offices; 3) To gather new data on the contents of discourse and on its role in enacting one's identity, by means of a roundtable including both Inuit and Qallunaat.

**Name:** Fox, Shari  
**Department:** Cooperative Institute for Research in Environmental Sciences  
**Affiliation:** University of Colorado  
**City/Town:** Boulder  
**Province/State:** Colorado  
**Country:** USA  
**Phone:** 303-492-6115  
**Fax:** 303-492-2468  
**E-mail:** sfox@kryos.colorado.edu  
**Number in party:** 1  
**Location/Region:** Keewatin and North Baffin  
**Project Title:** **Inuit Knowledge of Climate and Climate Change in the Eastern Canadian Arctic**

**Summary:** The project proposed builds on previous research of Shari Fox (Inuit knowledge of climate and climate change, in Igloolik and Iqaluit 1997-1998). The purpose is to continue to examine Inuit climate knowledge and their responses to climate change. Also, the research proposes to work with Inuit and scientists to develop a model for cooperative sharing of Arctic climate information. Specifically the research asks: What do the Inuit know about climate and climate change and how do they construct this knowledge? How have the Inuit dealt with climate change in the past and how are they responding to present environmental changes? Can a model be developed to optimize the response of northern communities to future scenarios of climate change? Can Inuit climate knowledge be corroborated with scientific data such as known severe climate events? What the regional differences of indigenous climate knowledge and how does this compare to scientific record? Can the knowledge of Inuit Elders and hunters provide information which predates some scientific methods of observation, (such as sea ice distribution and physical characteristics before the 1960s)? Finally, what the the interests and needs of both Inuit and Scientists which would help to define a model for the coordination and sharing of knowledge on matters concerning the Arctic climate?

**Name:** Henshaw, Anne  
**Department:** Department of Sociology and Anthropology  
**Affiliation:** Bowdoin College  
**City/Town:** Brunswick  
**Province/State:** Maine  
**Country:** USA  
**Phone:** 207-725-3085  
**Fax:** 207-725-3499  
**E-mail:** ahenshaw@bowdoin.edu  
**Number in party:** 1  
**Location/Region:** South Baffin  
**Project Title:** **Baffin Island Photographic Identification and Oral History Project**

**Summary:** The proposed study builds on initial oral history research conducted by the applicant to identify the people and places pictured in historic photographs taken by explorer Donald MacMillan at various locations on Baffin Island . In the present study, additional historic photographs from south Baffin Island will be incorporated into the project in order to conduct more focused oral history interview relating to Inuit environmental knowledge. Research is proposed to take place in three Nunavut communities: Iqaluit, Kinngait, and Kimmirut. The project will use photographs to help interview elders and youth about their understandings of short and long term changes in climate and its effect on sea ice conditions, animal availability, vegetation and land use during the 20th century. The photographic collections consist of images taken by three photographers including: Robert Flaherty, Donald MacMillan, and Peter Pitseolak. These collections, currently housed in three separate repositories in southern Canada and the United States, will be brought north to the communities where research is to be undertaken.

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**Name:** Hornagold, Louise  
**Department:** Department of Anthropology  
**Affiliation:** Trent University  
**City/Town:** Peterborough  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 705-743-2414  
**E-mail:** lhornagold@trentu.ca  
**Number in party:** 1  
**Location/Region:** North and South Baffin  
**Project Title:** **Sustainability, Authenticity and Tourism in Nunavut**

**Summary:** This project will examine how what tourists who come to Nunavut are seeking to experience intersects with the principles of sustainable tourism and sustainable development in general in Nunavut. My research will be grounded in the qualitative methodologies of cultural anthropology, employing participant observation among a small group of tourists, and formal and informal interviews with a range of tour operators and individuals involved in tourism policy in Nunavut. To date I have made contact with individuals who work in various aspects of sustainable development and culture and heritage in Nunavut, as well as tourism operators. I am presently compiling materials on what is being offered to tourists who come to Nunavut, and expanding my knowledge of the political, social and cultural history of the region. I am interested in the ways in which indigenous peoples have been represented in both academic and popular media. These representations play a role on the context of the tourism industry. I feel that it is important to understand the complexities of these issues as they are being played out in Nunavut, as they speak to issues pertinent to the entire country.

**Name:** McCready, Catherine  
**Department:** Canadian Heritage and Development Studies  
**Affiliation:** Trent University  
**City/Town:** Peterborough  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 705-755-1020  
**E-mail:** james.caite@sympatico.ca  
**Number in party:** 1  
**Location/Region:** South Baffin  
**Project Title:** **Nunavut: A Living Policy?**

**Summary:** I am intending to conduct research on the use of Inuit Qaujimajatuqangit (IQ) in the Nunavut government. The purpose of the research is to gain an understanding of how IQ will provide the context in which there us developed an open, responsive and accountable government that pursues the development Inuit language, culture and interests. This research will involve 15-20 voluntary interviews with various individuals from various institutions in Iqaluit including: the Language Commissioner, the GN Department's of Human Resources, Statistics, CLEY and the Nunavut Social Development Council. The overall goal and objective of this project is to explore the use of IQ as a type of "Living Policy", simply meaning a way of employing through policy development, Inuit language, culture, and interests within the Nunavut government. Possible benefits to be gained from this project are that the results of the research may be contributed to ongoing investigations of IQ currently talking place in Nunavut.

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**Name:** Muggli, Deborah  
**Affiliation:** Rescan Environmental Services  
**City/Town:** Vancouver  
**Province/State:** BC  
**Country:** Canada  
**Phone:** 604-689-9460  
**Fax:** 604-687-4277  
**E-mail:** dmuggli@rescan.com  
**Number in party:** 6  
**Location/Region:** Kitikmeot  
**Project Title:** **Bathurst Inlet Port and Road Project**

**Summary:** The information on the socio-economic effects from sources such as literature and research reports on the region, community visits, discussions with local, regional, and Nunavut decision makers and in-person interviews with individuals in the community. Information sharing sessions will be arranges by sharing time on local events and meetings. Special efforts will be made to determine public opinion concerning key traditional issues and concerns. Local Inuit speaking interviewers will be used in each community.

**Name:** Myers, Heather  
**Affiliation:** University of Northern BC  
**City/Town:** Prince George  
**Province/State:** BC  
**Country:** Canada  
**Phone:** 250-964-9415  
**Fax:** 250-960-5544  
**E-mail:** myers@unbc.ca  
**Number in party:** 1  
**Location/Region:** North and South Baffin  
**Project Title:** **Food security in the Arctic: community and store bought food in Nunavut**

**Summary:** This project is part of a larger circumpolar project that is concerned with food security in the Arctic. Food security is concerned with issues of supply and quality of food. This project is about the Nunavut situation with regard for the production and distribution of food in Nunavut communities and the food that is sold by stores in Nunavut. The communities which are included in the sample are (Iqaluit, Clyde River, Cambridge Bay, and Pond Inlet). These are the capitol, a small community and a larger community. Interviews will be conducted in these communities asking simple questions about whether they produced food in the last week, whether they shared food and with whom, and whether they bought or sold food. This will result in an understanding of the nature of food and scope of peoples' production, sharing and consumption of food. The second part will look at food sold by stores in Nunavut - where it comes from, how much is sold, what the value is, how many are employed, what technologies are used and so on. These interviews will be conducted with store representatives.

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**Name:** Pollick, Jason  
**Department:** GETIC  
**Affiliation:** University of Laval  
**City/Town:** St. Foy  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 418-650-3779  
**Fax:** 418-656-3023  
**E-mail:** jpollick@sprint.ca  
**Number in party:** 1  
**Location/Region:** Kitikmeot  
**Project Title:** **Objects of Power in Traditional Inuit Culture**

**Summary:** The research I propose to conduct in Cambridge Bay is a detailed study of traditional objects of power used by inhabitants in the area. I have compiled a photographic collection of Cambridge Bay artifacts in storage at the Canadian Museum of Civilization that have not been identified. My intention is to discuss these objects with elders who have living memories of these objects in particular or similar ones drawing on the oral tradition and knowledge of the elders. The identification of these objects, the details of their histories and their functions will commit the stories of these objects to history, thereby preserving an aspect of traditional Inuit life that might otherwise be lost. As such, this project falls under the heading of the memory and History in Nunavut in association with the Iqaluit Oral History project.

**Name:** Powell, Richard  
**Department:** Department of Geography  
**Affiliation:** University of Cambridge  
**City/Town:** Cambridge  
**Country:** England  
**Phone:** 44-1223-333399  
**Fax:** 44-1223-333392  
**E-mail:** rcp@cam.ac.uk  
**Number in party:** 1  
**Location/Region:** North Baffin  
**Project Title:** **Field practices and environmental science in the Canadian Arctic, 1950-2000**

**Summary:** My research is concerned with the changing role of fieldwork in Canadian environmental science over the half century. I intend to consider how the conduct of northern field science has changes in relation to indigenous communities, resource developments, and global environmental concerns. My specific aims are twofold. First, I will document the evolving technological, legislative and institutional structures governing field practices in northern scientific research over the last 50 years. Second, I will discuss how these shifting contexts have influenced the positions of environmental scientists regarding their own research. The overall project involves both ethnographic and historical research. Archival work will undertaken at the National Archives, Earth Sciences Information Centre and the other archives in Ottawa. This will be supplemented by 2 periods of residence at the research base at Resolute. During the first period I will interview base officials and field scientists embarking and returning from their field sites during the second period my concerns will be the activities of scientists at their specific field camps.

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**Name:** Shirley, Jamal  
**Department:** School for Resource and Environmental Studies  
**Affiliation:** Dalhousie  
**City/Town:** Halifax  
**Province/State:** Nova Scotia  
**Country:** Canaaaada  
**Phone:** 902-425-7072  
**Fax:** 902-494-3728  
**E-mail:** jamalshirley@hotmail.com  
**Number in party:** 1  
**Location/Region:** South Baffin  
**Project Title:** **Community Involvement in Environmental Monitoring in Nunavut : Challenges and Opportunities**

**Summary:** The goal of this project is to provide a better understanding of the issues related to community involvement in long tern environmental monitoring in Nunavut. Field research in 2001 will take place July 15 to August 15 in Iqaluit and shall consist of preliminary informal discussions and interviews with federal and territorial government departments and agencies, Nunavut land claims organizations, and other relevant institutions, involved in planning, reviewing, managing and/or conducting environmental monitoring activities in Nunavut. Research in 2001 will focus on identifying the present types and the level of environmental monitoring in Nunavut and the role of local participation in monitoring initiatives, Based on results of the researcher will return to Iqaluit in 2002 to further evaluate the various ways Nunavut residents are involved in environmental monitoring and to identify the challenges, opportunities and potential methods for improving local involvement in monitoring.



**Name:** Tedford, Sarah Kristina  
**Department:** Department of Sociology  
**Affiliation:** McMaster University  
**City/Town:** Hamilton  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 905-546-0337  
**Fax:** 905-546-5211  
**E-mail:** tedforsk@mcmaster.ca  
**Number in party:** 1  
**Location/Region:** Nunavut  
**Project Title:** **Experience and Practice: Health, Health Care and Self-Determination in Nunavut**

**Summary:** This is an exploration of how Nunavut residents link health, health care and self-determination. Many planners have identified health and well being as key planning areas for the new territory. I hope to explore understandings of these and the innovative ways in which health is being framed within a model of self-determination. I will conduct interviews with planners, health practitioners, members of non-government organizations and community members. This research will take place in Iqaluit, Igloolik and Rankin Inlet.

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**Name:** Trudel, Francois  
**Department:** Departement d'anthropologie  
**Affiliation:** Universite Laval  
**City/Town:** Ste-Foy  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 418-656-3039  
**Fax:** 418-656-2831  
**E-mail:** Francois.trudel@ant.ulaval.ca  
**Number in party:** 8  
**Location/Region:** Nunavut  
**Project Title:** **Memory and History in Nunavut**

**Summary:** The aim of this project is to explore and highlight the oral tradition of the Nunavut Inuit. It is a combination and an expansion of an innovative oral history project that is based on close cooperation between local and outside researchers, students and Inuit elders and is designed to collect, preserve and analyse the historical knowledge of the elders of Iqaluit and disseminate it effectively in Nunavut and elsewhere. The research activities take place in Iqaluit and focus on 3 themes; shamanism and Christianity; communities and identities; life stories, oral history and ethnohistory. Training activities will take place at Nunavut Arctic College - a yearly seminar in Iqaluit(2000), Igloolik(2001), and Rankin Inlet (2002) and at the Getic at Laval. Three books on oral tradition will be published as well as articles. Participation of Inuit and non-Inuit at national and international conferences will take place.

**Name:** Wenzel, George W.  
**Department:** Department of Geography  
**Affiliation:** McGill University  
**City/Town:** Montreal  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 514-398-4346  
**Fax:** 514-398-7437  
**E-mail:** wenzel@felix.geog.mcgill.ca  
**Number in party:** 2  
**Location/Region:** Nunavut  
**Project Title:** **Polar Bear Mangement in the Qikitaaluk and McClintock Channel Regions of Nunavut : Inuit, Outfitted Hunting and Conservation**

**Summary:** The central focus of the research will centre on how outfitted sports hunting of polar bear can enhance the economics of small Inuit communities while playing an increasingly integral role in the conservation management of the species in Nunavut. Both aspects are important to Nunavut and it is hypothesized that sport hunting may contribute to both these objectives.

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**Name:** Woodley, Susan  
**Department:** Department of Geography  
**Affiliation:** McGill University  
**City/Town:** Montreal  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 514-398-4111  
**Fax:** 514-398-7427  
**E-mail:** s\_woodley@hotmail.com  
**Number in party:** 1  
**Location/Region:** Nunavut  
**Project Title:** **Social Scientists and Inuit : A Socio-Political Analysis of Research in Nunavut**

**Summary:** The relationship between Inuit and social scientists, what defines the relationship, and how social scientists function within it are explored in 3 objectives 1) how social scientists change their methodological and ethical conduct and ideologies to accommodate Inuit political, cultural and individual needs? 2) how have research partnerships developed between social science researchers and northern institutions and communities? Who do these partnerships benefit, especially in the light of the increased northern control over the research process? 3) What are the research priorities of Nunavut and of its communities? This objective exists in the context of other questions, namely: How can researchers best serve these interests? How do Nunavummiut view the research process and researchers' practices and behavior? Interviews will be done with 3 groups: social scientists, Nunavut government and institutions and the local level. I will do these consultations throughout 2001 in 6 communities throughout Nunavut and complete the thesis in 2003. Archival research will provide quantitative summary of what types of research have been done and in what communities, as well as shifts in ethical research guidelines and policies.

**Name:** Zamparo, Joanne  
**Department:** School of Social Work  
**Affiliation:** Memorial University of Newfoundland  
**City/Town:** St. John's  
**Province/State:** Newfoundland  
**Country:** Canada  
**Phone:** (709) 737-7516(w)  
**Fax:** (709) 737-2408  
**E-mail:** jzamparo@plato.ucs.mun.ca  
**Number in party:** 9  
**Location/Region:** North Baffin  
**Project Title:** **Documenting traditional knowledge on helping and healing ways: Creating culturally sensitive Nunavut Social and Health policies.**

**Summary:** The first objective of this research project is to build community involvement and participation by Inuit in a study of social supports and social networks. These supports are the natural helping ways of the people in a local community. The purpose of this study is to describe Inuit adaptability and resilience to change and look at how Inuit may be able to use this knowledge to prepare for Nunavut. The first objective will identify an Inuit Community liaison person in Pond Inlet and Lake Harbor as a contact person to assist with the ongoing development of the project. With the assistance of this person, other Inuit will be identified to contribute information to the study. The second objective will be to identify local people to work for the project as interpreters, research assistants and participants in the study. A third objective will be to identify people who will contribute stories and share their knowledge of social support within the family context and kinship patterns. The focus will be to describe the informal and formal strengths and capabilities of Inuit that have supported their well-being during the dramatic change over the past thirty years of settlement life.

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**Name:** Zamparo, Joanne  
**Department:** School of Social Work  
**Affiliation:** Memorial University of Newfoundland  
**City/Town:** St. John's  
**Province/State:** Newfoundland  
**Country:** Canada  
**Phone:** (709) 737-7516(w)  
**Fax:** (709) 737-2408  
**E-mail:** jzamparo@plato.ucs.mun.ca  
**Number in party:** 7  
**Location/Region:** North Baffin  
**Project Title:** **Changes to Inuit family life.**

**Summary:** We are proposing a project in partnership with NSDC, several Inuit communities, and some researchers in the south who have already worked with Inuit on other projects. In this project we plan to collect stories about family from different generations of Inuit, to find out what family life was like for the elders when they were young to what family life has been like for young people. We will ask Inuit of all ages what family life is like today and what they see as the most important things about family life, We will be asking how the family is important, and now we wish to find out what ways it is important.

**Name:** Laidler, Gita  
**Department:** Department of Geography  
**Affiliation:** Queen's University  
**City/Town:** Kingston  
**Province/State:** Ontario  
**Country:** Canada  
**Phone:** 613-533-6000 ext.75785  
**Fax:** 613-533-6122  
**E-mail:** 9gjl@qlink.queensu.ca  
**Number in party:** 1  
**Location/Region:** Kivalliq  
**Project Title:** **Integrating Remote Sensing , Field studies and Traditional Ecological Knowledge to Estimate the Biomass on the Boothia Peninsula**

**Summary:** The aims of this proposed research project are to: 1) investigate tundra vegetation health, diversity and distribution as indicators of climate change 2) relate field studies and measurements to satellite images of the Lord Lindsay River watershed and 3) discuss issues of tundra ecology and vegetation with community members of Taloyoak. The combination of scientific investigations and TEK may be important to increase scientific efficiency, while also bridging cross-cultural boundaries. The methodology includes a 2-week stay in Taloyoak. The main method of information collection will be to listen and learn during discussions and/or semi-directed interviews. Volunteer participants will consent to being audio taped to facilitate conversation, confidentiality is guaranteed. Elders and others knowledgeable about traditional ways of knowing the local environment are especially encouraged to participate. Individual participants from the community will be offered copies of the taped and transcribed interviews, along with photos. Research results will be made available to the community, regional and Nunavut organizations and the NRI.

**Name:** Laugrand, Frederic  
**Department:** Faculte de Theol.et de Sciences Religieuses  
**Affiliation:** Universite Laval  
**City/Town:** Quebec  
**Province/State:** Quebec  
**Country:** Canada  
**Phone:** 418-656-2131  
**Fax:** 418-656-3273  
**E-mail:** Frederic.Laugrand@ftsrl.ulaval.ca  
**Number in party:** 1  
**Location/Region:** Baffin, Kivalliq, Kitikmeot  
**Project Title:** **Inuit Spirituality and Religious Transformations**

**Summary:**

Oral traditional reflect changing Inuit perspectives of the world. In a rapidly changing society, the preservation of the knowledge of Inuit elders is of great value to the cultural identity of modern Inuit. This research project consists in recording various interviews with elders on Inuit spirituality and religious transformation in order to preserve this knowledge for future Inuit generations. In this perspective, the project is willing to take into account both the regional differences and the common knowledge that appears through this diversity. The project hopes to provide new data to students on both traditional religion and Christianity in order that they could have the knowledge from two worlds as an elder stated I during a course on Inuit perspectives on traditional law: " You will have the knowledge from two worlds. There are regional differences but when the elders talk about knowledge the thought and substance is always the same, even though they use different words in their dialects." In this project also, oral traditional is used to provide a better understanding of archival documents collected or written by missionaries, either Catholic or Anglican. The research will be conducted in close collaboration with the Nunavut Arctic College and especially with the Language and Culture Program coordinated by Dr. Susan Sammons and Alexina Kublu. The research fits into the Inuit Knowledge Project conducted by the Nunavut Arctic College over the last five years in which elders from different communities of Nunavut were interviewed by students. As the production of traditional knowledge requires the exchange of questions and answers, this project will try to think about questions that allow us to go further in our understanding of both traditional and modern spirituality.

**Name:** Mallory, Mark  
**Department:** Canadian Wildlife Service  
**City/Town:** Iqaluit  
**Province/State:** Nunavut  
**Country:** Canada  
**Phone:** 867-975-4637  
**Fax:** 867-975-4645  
**E-mail:** mark.mallory@ec.gc.ca  
**Number in party:** 4  
**Location/Region:** South Baffin  
**Project Title:** **Traditional knowledge of the Cape Searle and Reid Bay Candidate National Wildlife Areas**

**Summary:** The community of Qiliqtarjuaq agreed to initiate the process of creating 2 new National Wildlife Areas at Cape Searle (Qaquluit) and Reid Bay (Akpait) with the Canadian Wildlife Service, to protect existing seabird colonies. As part of this process, the community is conducting a traditional knowledge study of these sites, with support from the Hamlet, the World Wildlife Fund, and the Canadian Wildlife Service. The resulting report and information will be provided to all stakeholders, in English and Inuktitut, and will be used to help guide boundary choices and land use plans for these sites.

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